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THE IRON AGE

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The Grey Structural Mill at South Bethlehem.

Some Important Improvements Upon Its German Prototype.

The starting up this month of the Grey structural steel mill of the Bethlehem Steel Company, at South Bethlehem, Pa., is an event not without significance in connection with the widening of the field for steel as a material of construction. In previous issues of *The Iron Age** the characteristics of the Grey sections and some of the essential features of the method of rolling them have been touched upon. The present article gives a description and illustration of the Grey mill, as now completed, forming a part of the new Saucon plant at South Bethlehem, on which all together, including new blast furnace construction, ore handling equipment and additions to the original plant, an outlay of about $12,000,000 has been made.

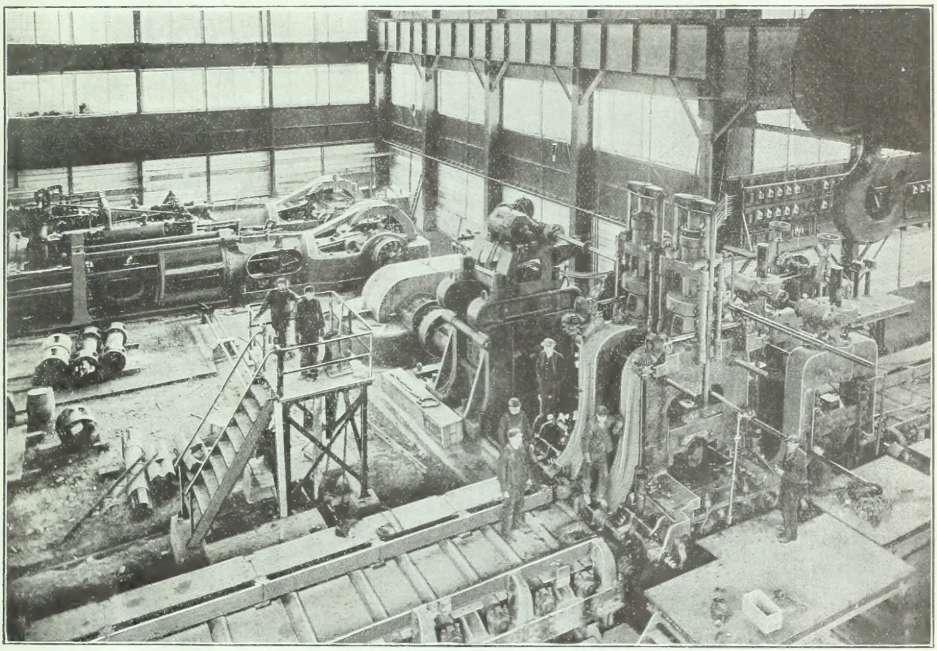


Fig. 1.—One of the Grey Structural Mills at the Bethlehem Steel Company's Saucon Plant, South Bethlehem, Pa.

An important departure is made at Bethlehem from the original Grey mill, installed at the Differdingen Iron & Steel Works, Differdingen, Germany. At Differdingen the beams are finished from the blooms by a single Grey mill, but at Bethlehem, by the use of two Grey mills of identical construction, the No. 1 as a roughing or intermediate mill and the No. 2 as a finishing mill, a considerably larger output will be secured. The Bethlehem mills, moreover, are larger than the one at Differdingen and embody a number of improvements. In Fig. 1 a view of one of the Grey mills at South Bethlehem is given and in Fig. 2 a plan view of the entire structural plant. This shows the relation of the blooming mill and the No. 1 and No. 2 Grey mills. Between the first or intermediate Grey mill and the second or finishing mill are about 300 ft. of mill table, this length being necessary when bars are simultaneously passing from each mill in the direction of the other. Fig. 3 is a plan of the blooming mill and Figs. 4 to 9 give details of the Grey mills and their method of rolling. In Figs. 4 and 5 the main horizontal rolls are marked M and the supplementary rolls S. Figs. 10 to 12 show the special hot beds and the run-out tables.

In the description given in our issue of September 26, 1907, it was explained that the rail mill and the Grey structural mill, which are arranged on parallel lines, headed by two groups of soaking pit furnaces and gas producers, had each its own blooming mill. The structural steel plant thus consists, first, of vertical pit furnaces, approach tables, a 46-in. blooming mill, with tables in front and back of the mill, each with a Wellman-Kennedy manipulator, similar to that already described in the rail mill article, and modified so as to handle satisfactorily the various sections required from the blooming mill. Then, in order from the rear blooming mill table are the front shear table, an 800-ton shear with hydraulic intensifier, a back shear table, and following these a No. 1 and a No. 2 Grey structural mill, with hot beds, straighteners and other accessories to which more detailed reference will be made below.

All the Grey sections are rolled direct from the ingot in one length. The method pursued in the production of the various sections is as follows: The ingot, which is always of open hearth steel, is delivered to the vertical pit furnaces from the ingot stripper. It is charged, withdrawn and placed in the traveling ingot seat by the

* *The Iron Age*, November 1, 1906, p. 1142; September 26, 1907, p. 831.

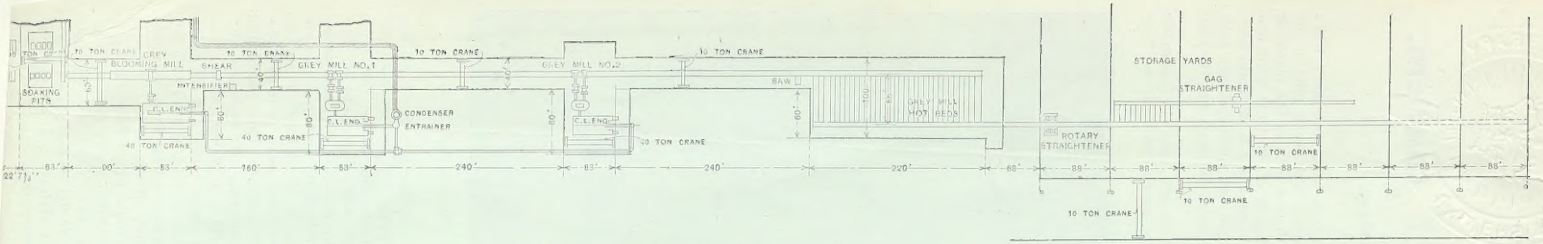


Fig. 2.—Plan View, Showing Arrangement of the Grey Structural Plant.

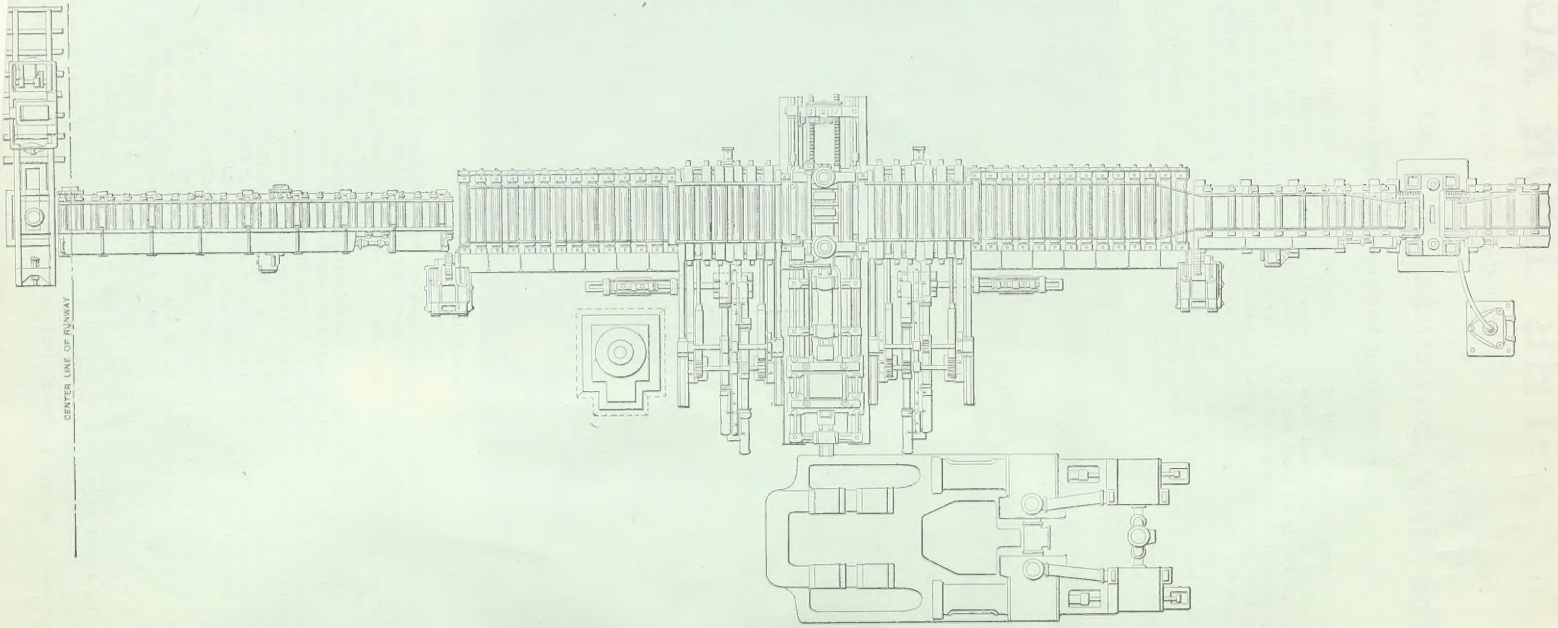
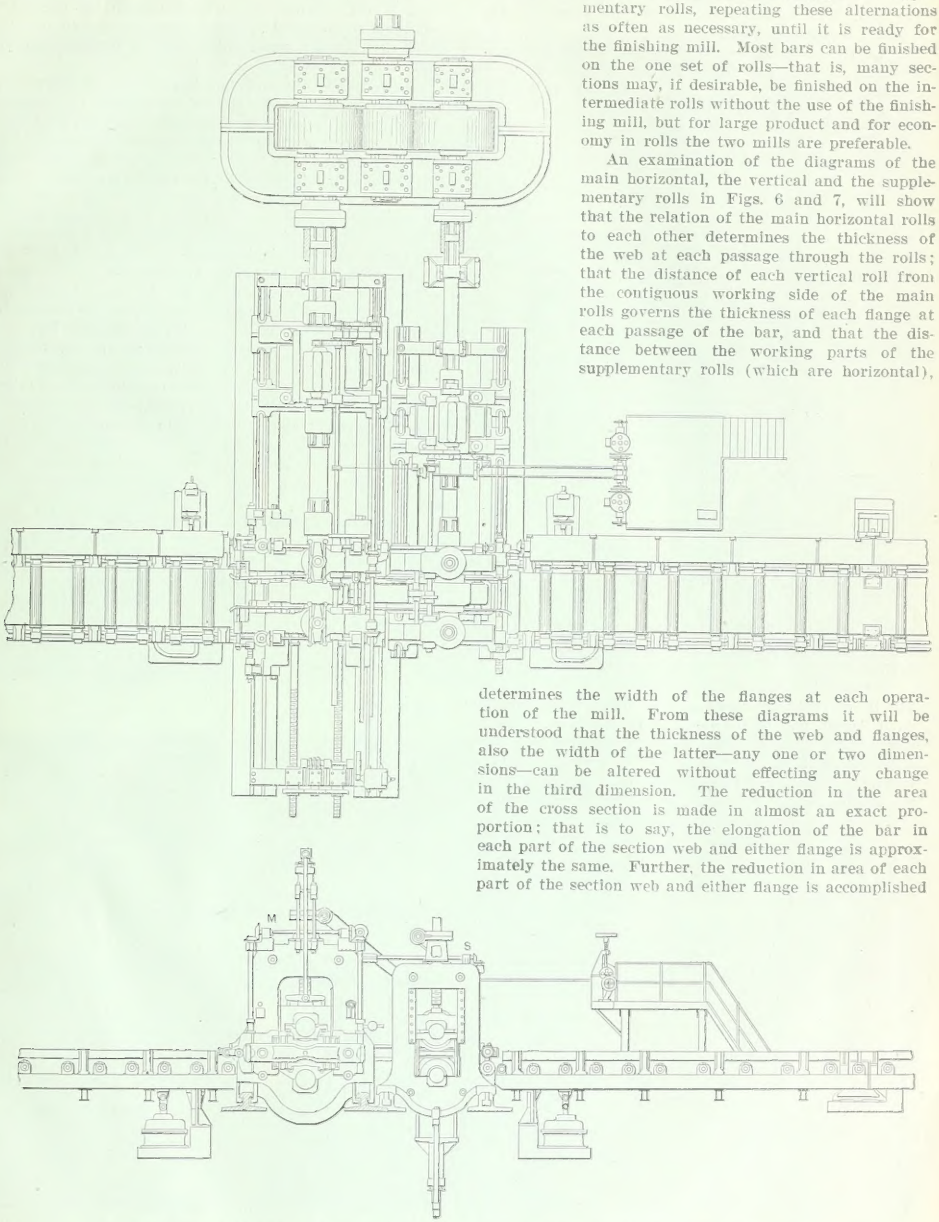


Fig. 3.—Plan of the Blooming Mill with Tables, from the Ingot Buggy Track on the Left to the Shear on the Right.

pit crane. The ingot seat is moved up to the approach table and tilted thereon by suitable mechanism. The ingot is carried up to the blooming mill on the roller tables, is squared up and then passed through the beam blank forming passes the number of times necessary to give the blank suitable thickness on web and flanges and a predetermined width of the latter. When rolled to the proper proportions the blank is passed on to the shear, in which the ends are cropped so as to secure a blank solid throughout its entire length. The thickness of the web and flanges of the blank should bear the same proportion to each other as will the web and flanges of the desired finished section. The blank is passed on to the first or intermediate Grey mill, where it is gradually reduced in cross section. It should be understood that the beam plank passes first through the supplementary rolls of the intermediate mill; that it continues on through the main and vertical rolls; that it returns on its backward passage (after the adjustment of all rolls) first through the main and vertical rolls and then through the supplementary rolls, repeating these alternations as often as necessary, until it is ready for the finishing mill. Most bars can be finished on the one set of rolls—that is, many sections may, if desirable, be finished on the intermediate rolls without the use of the finishing mill, but for large product and for economy in rolls the two mills are preferable.

An examination of the diagrams of the main horizontal, the vertical and the supplementary rolls in Figs. 6 and 7, will show that the relation of the main horizontal rolls to each other determines the thickness of the web at each passage through the rolls; that the distance of each vertical roll from the contiguous working side of the main rolls governs the thickness of each flange at each passage of the bar, and that the distance between the working parts of the supplementary rolls (which are horizontal), determines the width of the flanges at each operation of the mill. From these diagrams it will be understood that the thickness of the web and flanges, also the width of the latter—any one or two dimensions—can be altered without effecting any change in the third dimension. The reduction in the area of the cross section is made in almost an exact proportion; that is to say, the elongation of the bar in each part of the section web and either flange is approximately the same. Further, the reduction in area of each part of the section web and either flange is accomplished for the most part in the same direction; that is, each is proportionately reduced in thickness at each passage through the rolls. Hence it is argued by the designers, as like causes produce like effects, the ultimate strength of the flanges and that of the web will be found more nearly approaching one another than similar parts do on beams rolled by the old collar and groove process. While the number of passes on either the intermediate or fin-



Figs. 4 and 5.—Plan and Elevation of Grey Mill, Showing Main (M) and Supplementary (S) Rolls.

ishing Grey mill will be determined by the nature of the section it is desired to roll, the whole number of passes will be between 10 and 14. In most cases of beam and girder sections from three to five passes will be made upon the finishing mill, while for column sections of the heavier weights but one pass will be made in the finishing mill. The rolling surfaces are also shown in Figs. 6 and 7, and are marked *x*.

The two mills have a number of interesting minor features, some of which are clearly shown in the illustrations, including special side guards, top and bottom

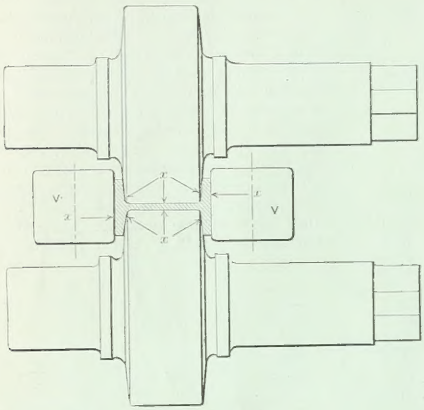


Fig. 6.—Diagram of Main and Vertical Rolls.—Rolling Surfaces Are Indicated by *x*.

guides, screw mechanism for horizontal and side rolls, indicators, &c., in addition to special scrap handling devices.

Between the No. 2 mill and the hot saw there is about 240 ft. of table, as there will be times when bars 200 ft. in length will be delivered to the hot saw. Leaving the saw the bars run out on the ingoing hot bed table, which as well as the outgoing table is about 250 ft. in length, to such a point as may be desirable. The beams are pushed off the ingoing table into such a position on

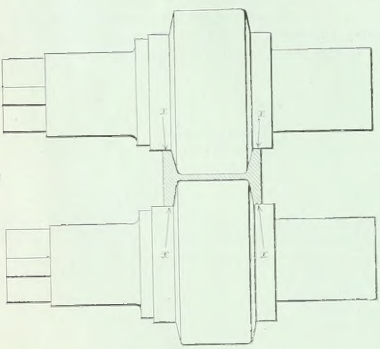


Fig. 7.—Diagram of Supplementary Rolls.—Rolling Surfaces Indicated by *x*.—No Rolling Action on the Web of the Beam.

the hot bed as to be within the radius of the mechanism used for turning them from a horizontal to a vertical position. They are then moved toward the outgoing table and when cold are deposited on it by the rake off mechanism. The hot beds, Figs. 10 and 11, are a radical departure from anything at present used in this country. The rails are of cast iron and are water cooled with the discharge water from the various hydraulic appliances at the saws and hot beds. These beds are built heavy to resist as far as possible the tendency to buckle which would be very great, as many of the sections rolled on these mills are much heavier than anything heretofore made. The section modulus of the heaviest beam now rolled is 198.4, while the section modulus of the heaviest beam at present designed for the Bethleham plant is 610.3. Thus the carrying capacity of the heaviest beam to be rolled at these works is more than three times that of the largest rolled beam at present made in this country.

Between the outgoing hot bed table and the rotary straightener is placed suitable mechanism for turning the beams on the edges of their flanges, so that they may be in a suitable position to enter and be operated on by the rotary straightener. Only the narrow flanged beams need be edge straightened by the rotary machine. When the mill is working on girder or column sections the machine will be withdrawn from its position and a section of table will be introduced so as to make a continuous passage from the outgoing table of the hot bed to the yard tables. The bars will be delivered on the yard tables. Such as need to go to the gag straightener will be carried on the transfer mechanism to the line of feed rollers working in unison with the machine in which they will be straightened. The material will be distributed, some to the cars for direct shipment and some to the stock piles. That which is to go through the fabrication department will be delivered to the south longitudinal runway; that which is to become part of an assorted order and such beams as merely have to be coped or cut to length on the cold saws will be delivered to the north longitudinal runway and shipped from there.

It will be appreciated that roll turning is reduced to

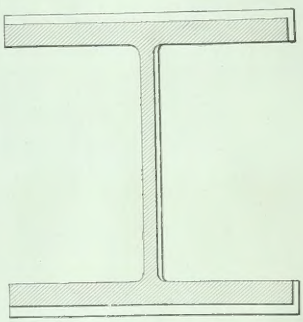


Fig. 8.—Method of Increasing Area of Column Sections.

a minimum by the Grey mill. The finishing rolls when worn out for a certain size can be either turned off so as to make the next smaller profile or a pair of rolls designed and used to roll special beams may be altered for girder sections; or either may be used, if put into the roll lathe, for a section of column steel. The adaptability and pliability of this type of mill is great, and the designers believe that time will show that for economy and scope it is a desirable addition to the manufacture of shapes and of much value to the architect and engineer. The Bethlehem mills are built for an output of 800 to 1000 tons a day, according to the section produced.

As illustrating the scope of the Grey mill, the interior columns of an actual 14-story building with basement may be taken as an example. All the columns for this building can be rolled on one set of rolls and without any change on main horizontal rolls of the Grey mills or any change on the blooming mill, although the loads on a single column vary from 345 tons in the basement to 32 tons on the fourteenth story. If the beam and girder sections designed for the Bethlehem Steel Company are increased in weight in the same manner as are the column sections, that is, if the thickness of the flanges is increased proportionately to the increased thickness of the web, and the width of flanges increased

to the same extent as is the thickness of the web, then the increase in the section modulus will be in the same or nearly the same proportion as the increase in weight. Of course, such sections would be special, but the example is given to show the scope of the mill and its flexibility in supplying the wants of the engineer. Such sections with the increased weight added in the manner described could be furnished without the delay and cost attendant upon providing special rolls, as in the ordinary structural mill.

The complete layout and all the various appliances used in connection with the new plant were designed and specified for by the consulting engineers, Henry Grey & Son, 68 William street, New York, who are the patentees of the Grey mill. The vertical furnaces were built by S. R. Smythe & Co., Pittsburgh, and the cranes serving them by the Alliance Machine Company, Alliance, Ohio. The engines used for driving the blooming mill were built by the Wm. Tod Company, Youngstown, Ohio. They are of the twin compound condensing, geared reversing type, 40 x 66 x 54 in., geared 61 to 101. The gears are cut and have 40-in. face. The engines for the Grey mills are of the same size and design as the above, but differ in that they are direct connected to the mechanism for simultaneously driving the main and supplementary mills. The condensing plant was built by the Alberger Condenser Company, New York, and is designed to handle the exhaust from the three engines mentioned. The condenser is of the largest type the above company has turned out. It is supplied with necessary circulating water by one

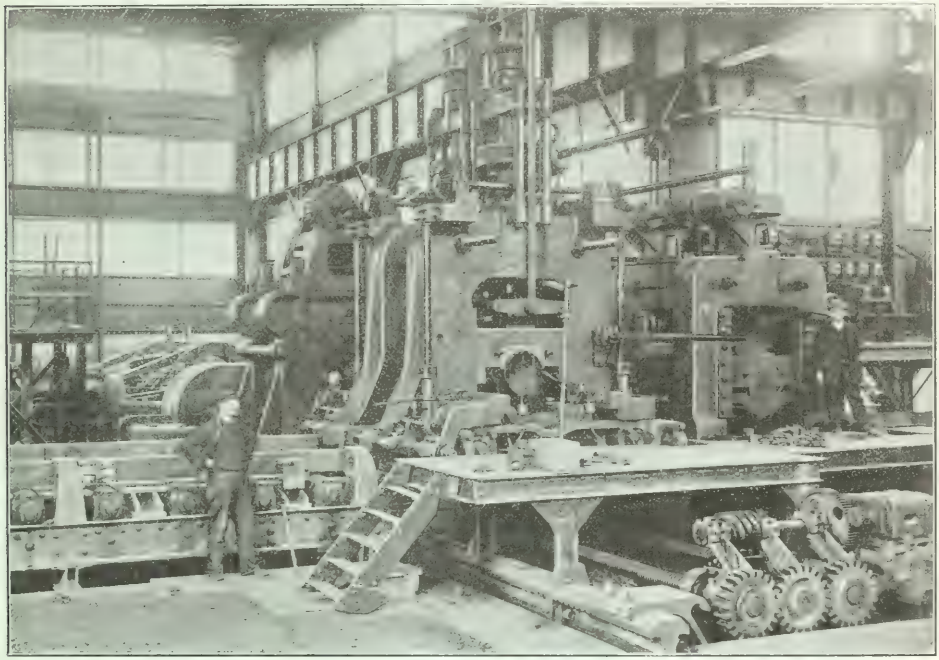


Fig. 9.—Side View of Grey Mill

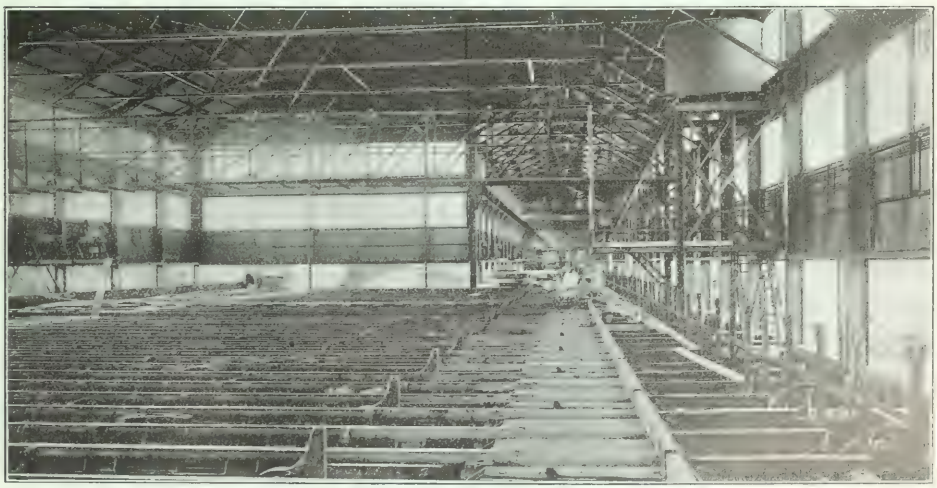


Fig. 10.—Hot Beds, with Cast Iron Water Cooled Rails.—No. 2 Grey Mill in the Distance.



Fig. 11.—Another View of the Hot Beds.

20-in. two-stage water pump, assisted by one 20-in. return water turbine, the return water being supplied by the hot well of the condenser. The two-stage pump is driven by a 350-hp. cross compound vertical engine, which works normally at 225 hp.

All the feed tables and hot beds were built by the Wheeling Mold & Foundry Company, with the exception of the blooming mill tables and manipulators, which were furnished by the Mesta Machine Company, Pittsburgh. These latter tables are driven by Crane engines



Fig. 12. Runout Tables Which Carry Beams from the Hot Beds to the Straighteners and Shipping Yards.

controlled by the Ahlen mechanism. All other mill tables are driven by Crocker-Wheeler mill type motors, which are manipulated by the magnetic controllers of the Electric Controller & Supply Company, Cleveland, Ohio. The same types of motors and controllers are used on all the screw-down mechanism on the blooming, intermediate and finishing mills. The 800-ton shear and hydraulic intensifier were built by the Mesta Machine Company, Pittsburgh. All hydraulic valves are of the Henry Aiken type. The blooming mill, both the intermediate and finishing mills, the gag straightener and the indicators for the several mills, all were built by the Bethlehem Steel Company. The rotary straightener was furnished by the United Engineering & Foundry Company, Pittsburgh, and the yard tables and transfer by the Wheeling Mold & Foundry Company. These tables are driven by constant speed motors and are reversed and handled by a patented induction drive, supplied by the last mentioned company.

A Record Car and Locomotive Output.

The figures compiled by the *Railroad Gazette* show a record breaking output for the car and locomotive works of the country in 1907. As might be expected, the number of orders on the books late in December, both for cars and locomotives, showed a very great falling off from the figures at the same time in 1906. Many car and locomotive works are running now on orders placed last spring with no new work in prospect. One of the large locomotive building companies reported a falling off of 75 per cent. in orders, as compared with last year. The Canadian car and locomotive builders have not felt the effect of the disturbance in financial and business conditions to any extent. All of the companies in Canada report as many or more unfilled orders on their books now as they reported last year.

Official returns from 36 car building companies in the United States and Canada (estimating two small plants not heard from) give the total number of railroad cars built during 1907 as 284,645, an increase of 19 per cent. over the record breaking output of 1906. This includes subway and elevated cars, but does not include electric street and interurban cars. No estimate has been made of the number of cars, both freight and passenger, built by the railroads in their own shops. Of the total number of cars built by manufacturers, 284,188 were for freight service and 5457 for passenger service; 280,216 were for domestic use and 9429 for export. The number of passenger cars built during the years shows an increase of more than 70 per cent. over last year's output. About 72 per cent. of the freight cars built were of steel or steel underframe construction. Canada built 9159 freight cars and 106 passenger cars, an increase of 30 per cent. over last year's output; all of these cars were for domestic use. The one company building cars in Mexico retired from business in the year and no returns were received from it. The following is the *Railroad Gazette's* compilation of the number of cars built in the last nine years:

Year.	Freight.	Passenger.	Total.
1899	119,886	1,305	121,191
1900	115,631	1,636	117,267
1901	136,950	2,055	139,005
1902	162,599	1,948	164,547
1903	153,195	2,007	155,202
1904	60,806	2,144	62,950
1905	165,455	2,551	*168,006
1906	240,503	3,167	*243,670
1907	284,188	5,457	*289,645

* Includes Canadian output.

The locomotive output shows a smaller increase over 1906 than the car building output. This is probably due to the fact that the locomotive builders worked their plants practically to their full capacity in 1906. The 12 builders in the United States and Canada built 7362 locomotives in 1907, of which 6564 were for domestic use and 798 for export. This is an increase of 6 per cent. in the total output; the export output increased 11 per cent. as against 5 per cent. for domestic output. These figures do not include locomotives built in railroad shops or locomotives rebuilt or repaired. There were 330 electric locomotives and 240 compound locomotives built, as against 237 and 292 respectively in 1906. The Canadian output of locomotives was 264. The following table shows the number of locomotives built in the last 15 years:

Year.	No. built.	Year.	No. built.
1893	2,011	1901	3,384
1894	695	1902	4,070
1895	1,101	1903	5,152
1896	1,175	1904	3,441
1897	1,251	1905	*5,491
1898	1,251	1906	*6,952
1899	2,475	1907	*7,362
1900	3,153		

* Includes Canadian output.

The cost of cars and locomotives has increased slightly over 1906, due largely, in the case of locomotives, to the increased average weight. Estimating the average cost of freight cars at $1100, the total spent for freight cars amounts to $312,607,000; for passenger cars at $8500 the cost was $46,384,000, and for locomotives at $16,000 the cost was $117,792,000. The total amount spent by the railroads for new rolling stock and locomotive power approximates $477,000,000 for 1907, an increase of about 25 per cent. over 1906.

The American Furnace & Machine Company.

During 1907 the American Furnace & Machine Company, Diamond Bank Building, Pittsburgh, did some very successful work in the furnace line. It recently built a new 40-ton open hearth furnace for the United Steel Company, Canton, Ohio. It has also designed some new and modern sheet and pair furnaces and producer gas fired annealing furnaces, erecting five sheet and pair furnaces and three producer gas fired sheet annealing furnaces, and also two of the James H. Swindell patent water seal gas producers at the plant of the Seneca Iron & Steel Company, Blasdell, N. Y. These furnaces are so arranged as to give a soft and uniform heat throughout and are easily operated. The sheet and annealing furnaces are equipped with frictionless charging machines.

Three 12 ft. x 12 ft. James H. Swindell patent water seal gas producers were recently installed in the plant of the Jessop Steel Company, Washington, Pa., to operate three 36-pot crucible furnaces, built by the American Furnace & Machine Company some time ago. These producers are also of a new design and are said to be giving entire satisfaction in every respect. The company has a large number under construction at the present time.

The same company builds four types of gas producers, including small gas producers 10 ft. in diameter by 12 ft. high, fed by one bell coal hopper, and a large gas producer 12 ft. in diameter by 12 ft. high, fed by two bell coal hoppers. These producers are operated by poke holes located on top, and there are no side poke holes, doors or false bars to contend with. These bell coal hoppers are so arranged as to spread the coal evenly around the producer. A third type of gas producer is known as the suction producer and is used for gas engine and illuminating purposes. The gas from this producer is pure and strong and free from dust and carbon, and does not cut valves or clog pipes. A fourth type, which will be found adapted to many purposes, is mechanically poked and mechanically fed.

The above company has just completed a new design of copper smelting and refining furnace for the Algoma Custom Copper Smelting & Refining Company, Thessalon, Ont. This furnace will be in operation about April 1, 1908, and is of different construction from any smelting furnace now in use. It is said to be constructed so as to obtain all the copper in the ore, without allowing any to escape through the stack. There is no direct connection to the stack, the melting chamber being separate from the draft of the stack, and all metal contained in the ores will be extracted and melted down into the receiving bosh, where it can be either dipped out by ladles or tapped through a spout into a ladle, as desired. This is a 200-ton furnace operated by two James H. Swindell patent water seal gas producers.

The Goulds Manufacturing Company's New Foundry.

An Extensive Plant for the Production of Pump Castings.

The Goulds Mfg. Company, Seneca Falls, N. Y., has recently occupied a group of new buildings, consisting of a large foundry and pattern shop, with accessory power plant. Their erection was in progress for nearly 18 months, the new buildings being part of a comprehensive plan of construction that was undertaken six years ago and that will require several years for complete rounding out. At the outset the problem presented was that of a long established company that had outgrown the facilities afforded at its original site. Addition after addition had been made, but the old works were hedged in by the Seneca River and the Seneca and Cayuga Canal and the growing up of the town about them. Several buildings had been erected, indeed, extending over both the canal and river, to such unusual measures was the company driven by the demand for increased facilities. Originally confined to small pumps, the business had developed rapidly in the manufacture of power pumps, which was entered upon in the late eighties. Therefore the natural first step, when another site became a necessity, was to provide in the new place sufficient foundry and machine shop capacity to take care of the heavy work. This was done in 1900, when the company acquired 10 acres of land in the western part of the city, about a mile from the original plant. A foundry and machine shop were built first, and thereafter the No. 1 plant and the No. 2 plant were distinguished in all the operating records, "No. 1 work" designating the smaller pumps and "No. 2 work" the large power pumps.

The present article deals with the extensive new foundry and pattern shops that were under construction in 1906 and 1907, Joseph H. Wallace & Co., industrial engineers, New York, being the architects. These buildings came in response to constant expansion in both the large and small pump departments since the first erection on the new site. They will be followed by others in pursuance of a plan under which the foundry will be on one side of and at right angles to a series of machine shops, shown in broken lines in Fig. 1. At the other side of the proposed machine shops and heading all of them will be an assembling department. This last named building will receive work from all the shops, and in it and alongside of it will run tracks for shipping out the finished product. The entire layout of the No. 2 plant has a frontage of 2100 ft. on the New York Central Railroad, and the rectangle marked out by the final group of buildings will be 931 ft. from north to south, as in Fig. 1. Additional property has been acquired since the first purchase in 1900, so that the company now has 66 acres at the new site.

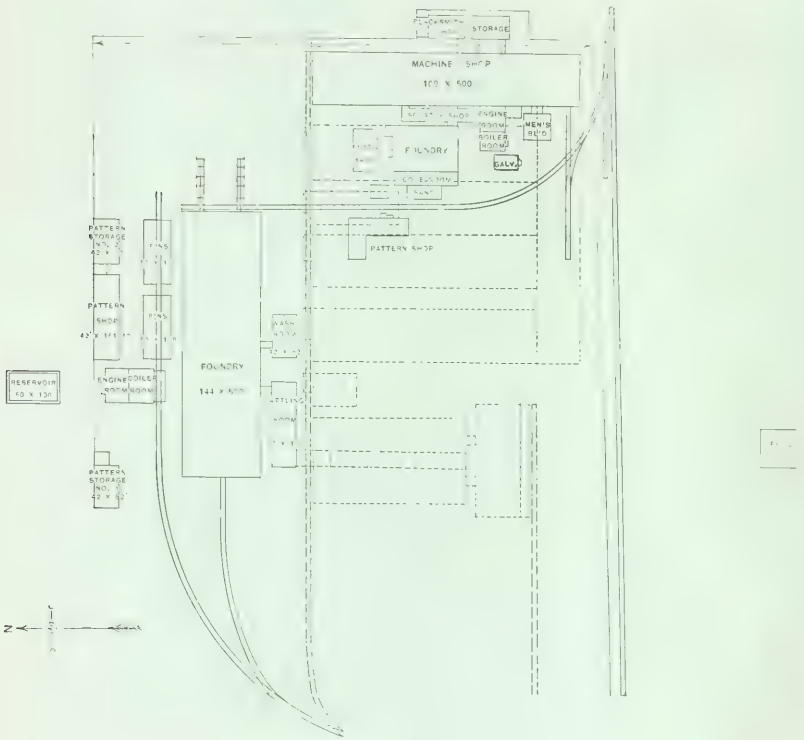


Fig. 1.—Plan of the No. 2 Plant of the Goulds Mfg. Company, the New Buildings Being the Group at the Left.

The Original No. 2 Plant.

Before giving a description of the new plant, which is the group of buildings in the left-hand portion of the sketch in Fig. 1, reference should be made to the machine shop shown on the upper side of the plan drawing. This building, erected in 1900, is 500 x 100 ft., and is equipped throughout with modern tools and labor saving devices, including three 10-ton electric cranes, with runways the entire length of the building. Just east of the machine shop are the blacksmith shop and storeroom buildings. On the west side of the machine shop and south of the group of smaller buildings is the men's building, with complete system of plumbing and equipment of lockers, wash trays, &c., for the convenience of employees. The upper floor of this building is devoted exclusively to a large reading room, on the tables of

which are provided trade, technical and other publications. This room is used during the noon hour as a lunch and smoking room, and is in charge of a special janitor.

The engine and boiler room of the group of buildings

buildings and those provided for cores, sand and flasks have been abandoned, and will be used to supplement the

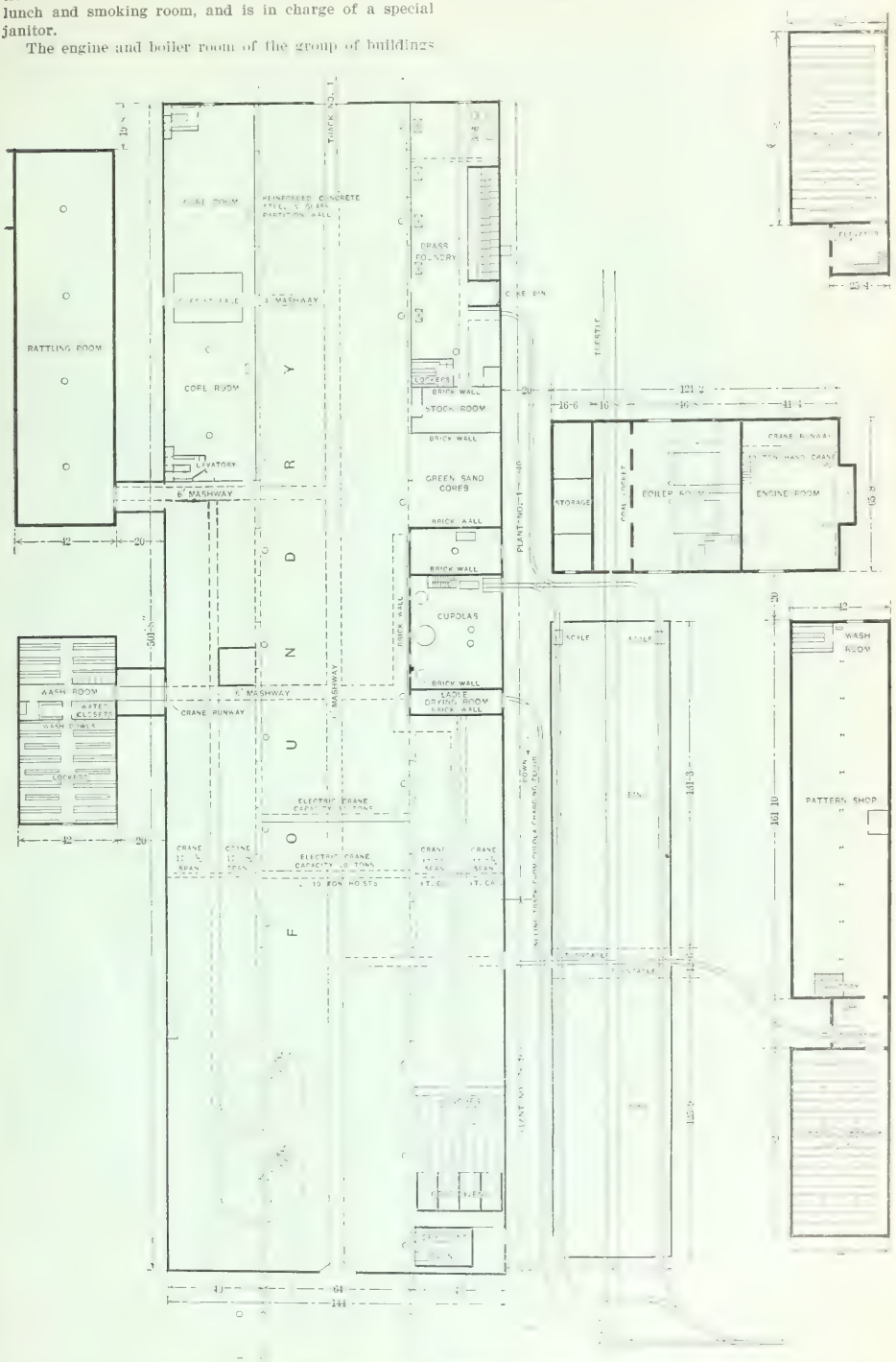


Fig. 2.—Plan of the New Foundry and Auxiliary Plant.

west of the machine shop have been abandoned, the equipment being transferred to the new power house, of which mention will be made later. The foundry and cleaning

machine shop. The pattern storage building in the upper central portion of the sketch will continue to be used for the same purpose.

The New Plant.

The new foundry and the buildings connected with it are shown in plan in Fig. 2, which gives a good idea of their extent and equipment. The foundry is 500 x 144 ft., of steel and brick construction, with monitor roof. From the floor to the ridge is 66 ft. The monitor extends the full length of the building. There is a complete system of transom windows on both sides, these being opened and closed by devices operated from the foundry floor. Four series of skylights are provided—one on each slope of the main foundry roof and one on each bay, the former being 10 ft. 10 in. wide and the latter 15 ft. 6 in. The skylights are of ribbed glass and extend the full length of the building. The building is fireproof. The foundations are of concrete and the walls are brick. The roof and ends are of steel frame and reinforced concrete. The roof is waterproofed with five-ply roofing felt, laid in asphalt, with coating of stag. The flashing is of 14-oz. copper.

The new foundry building has a standard gauge switch track running into the main span. Another connection with the New York Central tracks is the trestle track shown, running over the coal storage end of the boiler room and thence over the storage bins at the right of the main building in Fig. 2. Another feature to which attention is particularly called is the inclined track shown in Fig. 3, leading from the cupola charging floor and supported by heavy brackets carried on the side of the storage bin building.

Fig. 4 gives an interior view of the foundry looking



Fig. 3. View at East End of the New Plant, Showing Foundry Crane Serving the Flask Yard. Also the Inclined Trackway and the Trestle Crossing the Roof of the Bin System.



Fig. 4.—Interior View of the Foundry.—"C" Indicates the Location of Cupolas. The Illustration Shows the Exceptional Provision for Lighting, Heating and Ventilation.

toward the west end. The location of the three cupolas is indicated by the letter C, in the central portion of the right hand side. The iron is distributed by track ladles through the various avenues which were not completed when this view was taken. For large castings the heavier ladles are transported by a 20-ton crane serving the center bay, which is 64 ft. wide. This crane is of the two trolley, five motor Alliance Machine Company type. The crane runway extends beyond the east end of the building, a distance of 100 ft., to serve the heavy flask storage, and to reach cars on the switch. The swing door in the end of the building, which opens to allow the passage of the crane to the outside, is operated by an electric hoist.

Two 5-ton electrically driven jib cranes, as shown in the plan in Fig. 2, and one of which is included in Fig. 4, are provided for handling large castings. They have 19 ft. arms and are arranged to swing entirely around the supporting columns. They were built by the Northern Engineering Works, Detroit, Mich.

Fig. 5 gives a view of the western end of the foundry floor, which is devoted to small pump work. The heating pipes are shown plainly in this view, as also in Fig. 4. The side bays of the main foundry are each served by two small cranes. Those in the north bay, which are Niles electric cranes of 3 tons capacity, can be utilized in handling large cores to and from the core oven cars running on the industrial track. Hoists operated by compressed air are provided in the south bay.

The cupola room is 60 by 40 ft., and contains at present a 92-in. cupola, built by Byram & Co., Detroit, Mich., and used especially for small castings; also a 72-in. cupola built by Byram & Co., which was transferred from the old foundry and serves for the heavier or triplex castings, and a 48-in. cupola built by the Northern Engineering Works, Detroit, used for special mixtures.

Loaded cars are taken to the charging floor on an hydraulic elevator. The empties are returned to the ground level at the east end of the storage bins by an inclined industrial trackway; thus all interference with the incoming loaded cars is avoided. On the second floor of the blower room is one of the two steam engine driven blowers which supply warm air for heating the foundry. The other blower which heats the south side of the foundry, the rattling and grinding building, shown on the left in Fig. 2, and the washroom and locker building, 82 x 42 ft., is located on the south side of the foundry building.

An Ingersoll-Sergeant 16½ and 10½ by 10-in. air compressor is located in a room adjoining the cupola room. From a large air receiver on the north side of the compressor room pipes run through the cupola room to the foundry to the molding machines and air hoists. A branch pipe goes to the pattern storage buildings, supplying the air valves of the sprinkler system. A line also runs to the No. 2 machine shop for supplying air hoists, chipping tools, &c., and to the cleaning room for sand blast.

Core Department.

The drying ovens for power pump work are located in the east end of the north bay of the foundry, as shown in Fig. 6. There are five of these, one being 16 x 24 ft. inside measurement for the dry sand molds, and the other four 9 x 16 ft., for drying the large cores. The rooms in which the smaller cores are made are located in the west end of the south bay, occupying a space 160 x 40 ft. This department is separated from the foundry by a steel and ribbed glass partition. In the small core rooms are seven tracks, on each of which runs a car. Each track runs into a separate oven. The car runs between the benches, and the coremakers have only to turn around from their benches and place the finished work directly on the shelves of the core cars. In addition to the ovens for the cars five Millet core ovens have been installed, which are used during the day and are arranged so as to use the same stacks as the main ovens. The large core oven doors are counterweighted and thus easily raised, the cables running over ball bearing sheave wheels. The furnaces heating these ovens are located at the rear. The fuel is not carried through the core room, but through a walled passageway at the rear, thus doing away with the handling of coke and ashes through the core room proper. Midway of the small core department is a room 20 by 28 ft., fitted with shelves for storing cores not required for immediate use.



Fig. 5.—View in the West End of the Foundry, Devoted to Small Pump Work. The Cross Marks the Entrance to the Small Core Department.

The Brass Foundry.

The brass foundry, which occupies the northwest corner of the main foundry building, is 120 by 40 ft. It is

well equipped for the production of a variety of brass work ranging in weight up to 1500 lb. There is a bank of 16 melting pots. The brass foundry floor is served by two cranes of 2 tons capacity each. The equipment includes two tumblers, two sprue cutters and one grinder.

Rattling Room.

Connected with the main foundry by an enclosed passageway is the rattling room, 42 by 160 ft., one story high, with truss roof. Skylights 8 ft. wide are provided on each side of the roof, the entire length of the building. Twelve tumbling barrels, driven by Westinghouse motors, were supplied by the W. W. Sly Mfg. Company, Cleveland, Ohio. Nine direct connected grinders were furnished by the Bridgeport Safety Emery Wheel Company, Bridgeport, Conn. The exhaust ducts from the grinders are led under the floor, a Sterling exhaust fan being located on the north side of the room. It draws the dust and air into the dust separator just outside of the building, the air being discharged back into the room.

Pattern Storage Buildings.

The two buildings for the storage of patterns are located to the north of the foundry as shown in Fig. 2. Each is 82 x 42 ft., and they are designated as pattern storage No. 1 and pattern storage No. 2, the former being for small pump patterns and the latter for the patterns for triplex power pumps. The walls of these buildings are without windows, excepting on the north side, or the one remote from the other buildings. Pattern storage No. 2 is 65 ft. high, or four stories, and has a tower 92 ft. high, containing a 33,000 gal. tank. Each of the pattern storage buildings has a hydraulic elevator in an outside fireproof stairway tower. These elevators are operated from pressure tanks supplied by triplex power pumps of the Goulds make, which are driven by Crocker-Wheeler 250-volt motors. The pattern storage buildings are equipped with automatic sprinklers having dry pipe valves to control them during the winter months. The pattern making department is located in a two story building west of pattern storage No. 2, 162 ft. x 42 ft. The lathes, band saws, jig saws, surface planers and core box machines are duplicated toward opposite ends of the pattern shop, so that a workman does not have to go far to reach any kind of machine.

Storage Bins.

It will be seen by reference to Figs. 2 and 3 that the trestle, 22 ft. high, which runs across the coal pocket room, continues over the roof of the storage house, which has a total length of 268 ft. The roof of the storage department is for the most part a series of hatch coverings which are removed so that pig iron, sand, coke and other supplies may be dropped into their proper bins. Industrial tracks traverse the stock storage house on either side and a transverse track with turntables is laid in a middle passageway as shown in Fig. 2. The industrial railroad, which was furnished by the Arthur Koppel Company, reaches also to pattern storage building No. 2, and to the brass foundry. The industrial cars loaded with pig iron and coke are pushed by hand to the cupola room where an elevator carries them to the charging floor. As indicated above, the empty cars from the charging floor are pushed out upon an inclined industrial track leading to the yard at the east end of the bin storage house. On coming down into the yard the empty cars run up a slight incline from which they return by gravity to either side of the storage house, the switch being set as cars are needed.

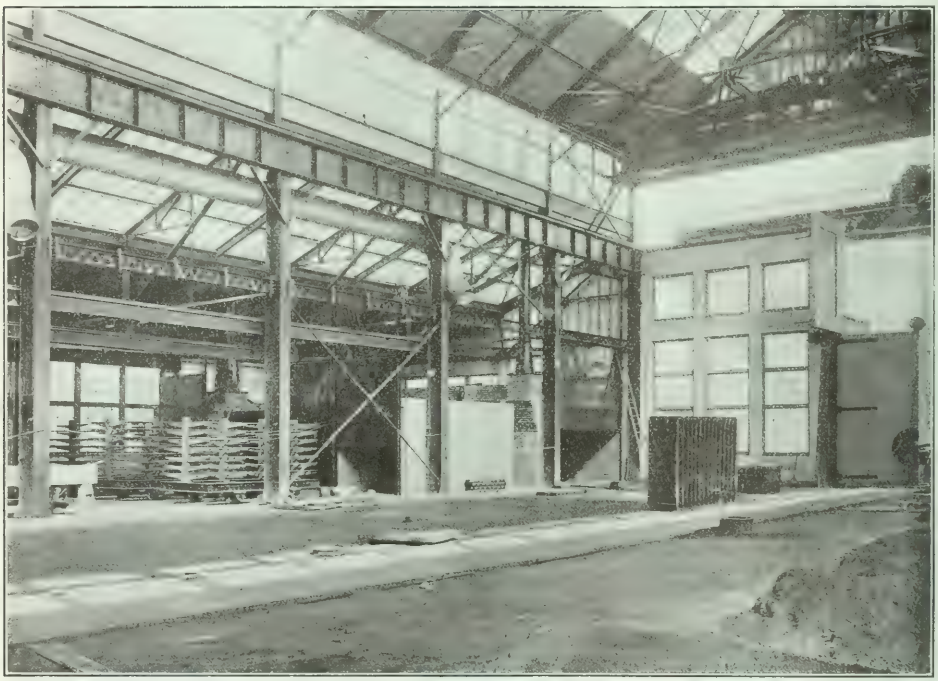


Fig. 6.—Northeast Corner of the Foundry, Showing Large Core Department, with Ovens and Racks.

Washrooms and Lockers.

Unusually complete provisions have been made for washrooms and lockers. The large washroom shown at the left in Fig. 2, is reached by an enclosed passageway from the main foundry. It contains 232 lockers, and the rows of washbowls alternate with the lockers. For the small coreroom, 32 lockers are provided, with separate lavatory. The pattern shop has 20 lockers, and the brass foundry 24 lockers. The main washroom is intended for coremakers as well as molders.

Heating System.

For the American Blower Company's heating system, already referred to, exhaust steam is carried through a 16-in. pipe leading from the power house, and the distribution is through 12, 10, 8 and 6 in. pipes to various por-

tions of the plant, including the No. 2 machine shop. There are two fan blowers in the foundry, one in the pattern shop and four in the machine shop. The steam pipe conduit carries the exhaust steam pipe for heating and also the live steam pipe supplying the engines driving the fan blowers and the pumps at the receivers. A third pipe in the conduit returns to the feed water heater in the power house the condensation from the three receivers. The three pipes are carried in a Portland sectional conduit, supplied by the H. W. Johns Manville Company. The steam and exhaust piping and Holly return system were installed by the Walworth Mfg. Company, Boston, Mass. The pipe conduit is about 900 ft. in length.

Water Supply.

A very complete system of pressure mains has been provided, having two underwriters' pumps at one end and a connection with the city water supply through an 8-in. pipe at the other end. In addition the company has a 6-in. line of its own extending from the pump house at the Seneca River 1700 ft. to a 450,000-gal. reservoir at the north of the power house. The reservoir is 60 x 100 ft. and 8 ft. deep. At the river is a Goulds' electrically driven 8 x 10 triplex pump, designed primarily to supply a 33,000-gal. tank in the tower of pattern storage No. 2. There is a by-pass in the pipe located near the power house, so that the river supply can be turned into the reservoir referred to above. The lower half of the tower tank supplies the sprinkler system in case the city pressure becomes lower than the tank pressure. Only the upper half of the tank supply can be used for industrial purposes, including the supply to wetting down tanks in the foundry, testing water, washroom supply, &c. The electric pump at the river is controlled by a float switch at the tank. For drinking purposes the city water is used, supplied through a 2-in. pipe. The drinking water will pass through a filter, to be installed in the basement of the engine room.

In the basement of the power house are two underwriters' fire pumps, one of 1000 gal. and the other of 750 gal. capacity per minute. These pumps take suction from the reservoir, and their discharge pipes are connected with the complete system of the pressure mains running to 15 hydrants distributed about the plant. A 5-in. connection is made to the city service for use in the boiler room and for drinking. A gate and check valve are provided in this line, and in case the river supply is interfered with the city supply from the 5-in. pipe can be turned into the 6-in. pipe leading to the pattern storage tower tank and supplying river water for various purposes about the plant.

Power Plant.

The power house, Fig. 8, which includes engine room, boiler room and coal storage space, is 128 by 66 ft., and room has been left for an addition to the west. Two engines are at present installed, the larger being a 24 x 36 in. Allis-Chalmers heavy duty engine direct connected to a 300 kw. Westinghouse three wire direct current generator of 250 volts, running at 120 rev. per min. The smaller engine is 14 x 42 in., of similar type. It is belted to a 150 kw. Westinghouse generator. Space is provided for a duplicate of the larger unit. The engine room is served by a 10-ton Maris crane. The switchboard is located in a bay 24 x 6 ft., on the north side of the engine room. The boiler room contains four 150 hp. Babcock & Wilcox boilers, carrying 125 lb. steam pressure. The chimney is built of radial brick and is 5 ft. inside diameter and 125 ft. high. It is lined for 72 ft. The builder is the W. M. Kellogg Company. A Cochrane feed water heater and a Gould 4 x 6 triplex boiler feed pump driven by a variable speed motor, are installed in the boiler room. The boilers can also be fed by an injector. The south side of the boiler room is devoted to coal pockets, the coal being dumped from cars running on a trestle built over the roof of the pockets. Large storage rooms are provided adjoining the coal pockets, entrance to these being from the outside. A room 15 x 22 ft. is given up to pig copper and other brass foundry stock. There is a similar room for the iron

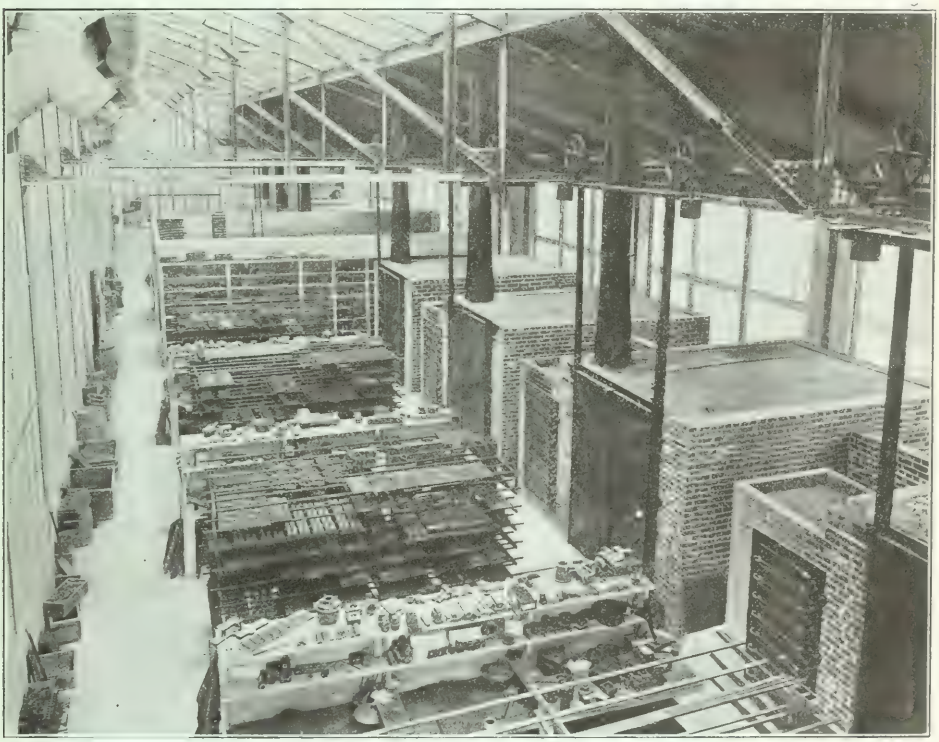


Fig. 7.—Small Core Department, with Ovens and Racks.

foundry and a third room, 15 x 15 ft., contains oils and powerhouse supplies.

The Offices.

The erection of a new office building was one of the important features of the Goulds Mfg. Company's construction programme of the past year. It is located on a separate plot of ground, as shown in Fig. 1, at a convenient distance from the works, and faces the western extension of the main street of the town. The building is of brick with stone trimmings, is 72 ft. square, with two stories and a basement, and is attractive both as to exterior and interior. In general, the plan carried out was to put the offices of heads of departments and officers of the company on the sides, having in the center the main office, lighted from the roof. The fireproof vault, measuring 16 x 20 ft. inside, which is in the center of the building, extends from the basement through to the roof. Each floor has an entrance to the vault, doing away with the usual carrying of records from one floor to another for purposes of safekeeping. On the first floor, in addition to the rooms of various officers of the company, are the cost, bookkeeping, credit, purchasing and foreign departments, and a large room is occupied by the stenographic force. The second floor is devoted to the drafting, sales, advertising, order, billing and translating departments, and in front on this floor is a directors and conference room. The building is nearly fireproof. Its finish and furniture are in oak, with oak and maple floors, and the appointments of all the departments are handsome and convenient.

Historical.

The Goulds Mfg. Company illustrates the evolution that has marked the careers of so many of the older industries of the country—a growth not due to consolidation, but to the intelligent broadening of the original lines. The company is the outgrowth of the firm of Downs & Co., which established a pump factory in Seneca Falls in 1848, occupying a small stone shop. About 25 men were employed. S. S. Gould, president of the Goulds Mfg. Company, became connected with the business in 1852, and its development for more than a half century has been due to his initiative. Additional property was purchased in the fifties, and what was then regarded as an extensive plant was built. The present corporate name dates from 1864. There was a succession of additions in the sixties, and a fire in 1870, which destroyed the works and resulted in their rebuilding on a larger scale. In the past 30 years numerous additions have been made, until now the company employs upwards of 1000 persons and occupies over 500,000 sq. ft. of floor space. Its products embrace about 1500 kinds of pumps, from the small bucket variety to large pumps for water works, with a capacity of 5,000,000 gal. in 24 hr.

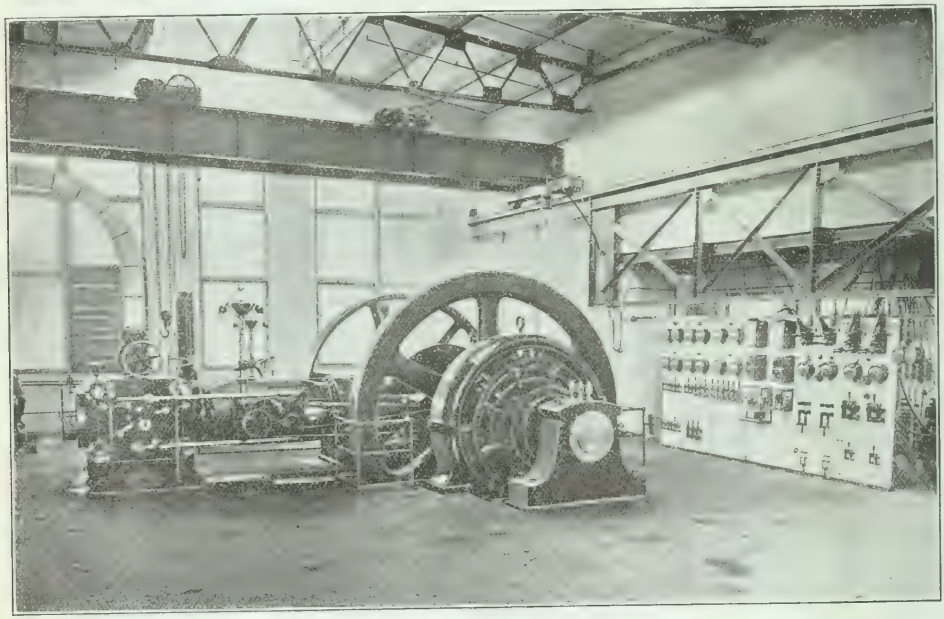


Fig. 8.—View in the Power House.

Proposed Rule of Transcontinental Railroads.

The rule or condition regarding loss or damage which the transcontinental railroads propose to incorporate in their commodity tariffs is said to be substantially as follows:

Commodity rates named in this tariff are for shipments made subject to the following conditions:

No carrier or party in possession of any of the property provided for in this tariff shall be liable for any loss thereof or damage thereto from causes beyond its control, or by floods, or by fire, or by quarantine, riots, strikes or stoppage of labor, or by leakage, breakage, or decay, rust of metals or metallic goods, escape of bees, live poultry or live fish, tearing, cutting or soiling of fabrics or paper in bales or bundles, fermentation of liquids, chipping of stone or manufactures thereof, injuries of live animals to themselves or each other, or from any cause to property carried on open cars.

Shippers who do not desire to forward shipments under above provision must note on the shipping order or bill of lading "carrier's risk," in which case an additional charge of 20 per cent. will be made.

This rule differs only slightly from a standing rule of the Western classification, and similar provisions are found in the Official and Southern classifications. These rules, however, have never been enforced. Transcontinental officials say that their purpose in incorporating it in the tariff, as a condition of the commodity rate, is to make it valid and binding on both the shipper and the railroad.

R. L. A.

One of the best lubricants for cutting aluminum in a lathe is said to be kerosene oil, as it to a great extent prevents the liability to tear the surface of the metal and enables a better finish to be obtained.

Hydro-Electric Power at Duluth.

The Great Northern Power Company's Developments.

BY DWIGHT E. WOODBRIDGE.

For more than 30 years the plan of a water power development at the head of Lake Superior, based on the improvement of the St. Louis River, has been under consideration. Beginning with the financing of the Northern Pacific Railroad by Jay Cooke & Co., Mr. Cooke dreamed of the utilization of the St. Louis River's fall of nearly 500 ft. by the construction of direct hydraulic dams in series, and it was not until a short time before his death that an active association of Duluth men secured from him his rights and lands along the river. By that time the improvement in electrical machinery, transmission, &c., had so far changed the method of utilization of water powers that it seemed best to completely reverse Mr. Cooke's ideas, and the present Great Northern Power Company development has resulted.



Fig. 1.—Part of the Service Reservoir, Main Dam and Spillway and Rock Waterway of the Great Northern Power Company.

For the past seven years the Great Northern Power Company has been at work, in preliminaries, construction and, since September 13, 1907, in operation. Great difficulties have been overcome, and the work is now in successful and continuous operation, with power to the amount of 22,000 hp. under contract, though not yet all in use, and already with a sufficient income to more than care for its fixed charges and operating costs. It may be said, therefore, that the dream of a generation has been fulfilled.

A Most Interesting Hydro-Electric Development.

In many respects this is the most interesting hydro-electric proposition so far consummated, in that it combines all features that enter into any water power development. While at Niagara, for instance, no storage is necessary and the comparatively short vertical drop of the column of water makes its momentum slight, and its speed regulation simple, the operation at Duluth includes all factors of storage and regulation of water, from that whose periodicity is years and seasons to that which is of instantaneous application; while its mile long column of water, 7 ft. in diameter, coming down at the rate of 12 ft. a second, is of such character that whenever load conditions change the tendency is for momentum and pressures also to change and to a most considerable degree. It is a strictly up to date undertaking, substantial and worked out with exceeding care and accuracy. Architecturally it is consistent, solid and handsome. Its projectors have been notably fair and above board in meeting other interests and adverse rights.

This work includes a 3700 square mile drainage area, largely consisting of spongy swamps, forests and hills of little value for agriculture, with a clay subsoil, drained by one series of rivers converging above the works into the St. Louis River, which drops over a series of slight falls and long rapids till it debouches into the harbor of Duluth-Superior, a combined fall of 465 ft. in a distance measured in tangent of less than 5 miles. Within this drainage area are numerous basins sufficient for storage reservoirs, and covering lands from which the bulk of the standing pine timber has been removed, making the prop-



Fig. 2.—Construction of the Main Dam of the Great Northern Power Company, Showing [illegible] and Overhead Cableway for Handling Concrete.

erty of little value. In the entire area are still standing large tracts of pine, which companies with a combined annual capacity for manufacturing some 400,000,000 ft. expect to denude in the next 8 or 10 years. Of the total fall of 465 ft. on the lower reach of the river, the Great Northern Power Company has developed 378 ft. in the present hydro-electric station, and expects to develop an additional 70 ft. below the generating station.

The Preliminary Investigations.

In planning its works the company was able to secure Government records of rainfall for 37 years, and its own gaugings of river flow have been carried forward for a period of seven years, these latter including the most exaggerated term of rainfall deficiency that has ever been known, this ending in the year 1902. At this time there was a year of low rainfall, coming after four years of great deficiency. The minimum flow at the date when the effect of this drouth showed its culmination in run off was but 500 cu. ft. per second. The company took this figure, and the period of deficiency in which it culminated, as the basis for its calculations of water storage necessary, after arbitrarily increasing the deficiency by 20 per cent., and estimates of the storage reservoirs required for the ultimate capacity of the plant have proceeded upon that basis.

A system of reservoirs has been planned, to be established as required, conserving the run off and regulating the flow of the catchment area from year to year and season to season. One of these has been constructed. There is also, at the upper end of the present improvement, a service reservoir for the regulation of the daily flow, making a pondage to avoid a waste of water for short periods. The forebay, moreover, is planned for a regulation into finer periods of time than the service reservoir permits, averting frequent changes and regulations at the headgates; while near the power house a stand pipe will act as a safety valve for the regulation of instantaneous changes in customers' requirements of water. This careful regulation of water supply is necessitated by the extreme fluctuations of the flow and the low minimum of the river. On account of topography, &c., the cost of the system of storage reservoirs for the ultimate works will be exceedingly light.

Extent of the Power Plant.

The plant is laid out for the symmetrical development of eight units of a generator rating of 10,000 hp. each, of which three are completed and in operation, and the remainder are to be installed as occasion requires. For this power the storage reservoirs planned, the service reservoir, canal, forebay, &c., already built, are sufficient, and to increase to this limit there need but be added single units of pipe line, wheel and generator and distributing system to the amount desired. Below this power house is an available fall of 70 ft., at which a dam is planned that will furnish 10,000 hp. A further increase of 55,000 hp. is available when additional storage dams are placed in the catchment area.



Fig. 3.—Curtain Wall, Under Construction, and Eight Submerged Arches for Pipe Lines, at the Head of the Line of the Great Northern Power Company.

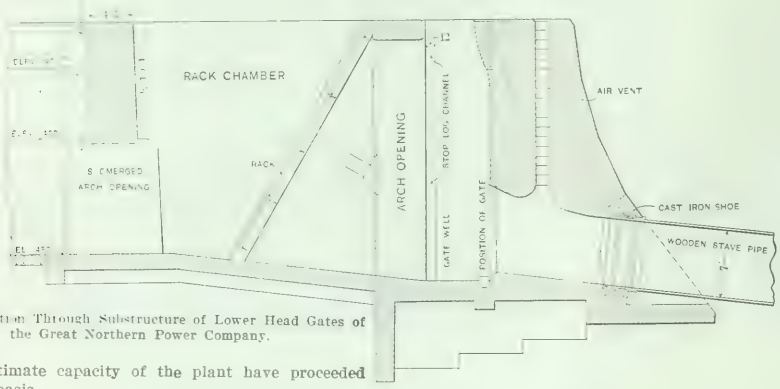


Fig. 4.—Section Through Substructure of Lower Head Gates of the Great Northern Power Company.

Provision has been made for the extension of this development to an ultimate based on using 9 in. of the run off from the drain area, regulated by storage reservoirs, and upon an ultimate station load factor of 60 per cent., which rate was arrived at after careful study of the various industries in this locality likely to use the power, and of those deemed liable to be developed in the district. Judging from present indications, it is not likely that this station load factor will be less than 60 per cent. If it

should prove to be greater, less units of power will be required, and vice versa, to utilize the same amount of water, the design providing for flexibility in that direction. This flexibility, of course, including all that portion of the design from the service reservoir to the wheels. It has been the aim of the company and its contracting agents to secure as high a load factor as possible, and the

the greater portion of its bounding walls on the lower sides is of upturned slates. A main dam, Fig. 2, was built across the channel, with a dozen low dams, of earth, rock, with concrete core, and concrete, connecting the slate walls. Most are of the gravity type, concrete retaining dams. The main dam is of concrete, and is 110 ft. long, its spill way section is 365 ft. long, 40 ft. high and 42 ft.



Fig. 5.—First Installation of Three Pipe Lines, Under Construction in Trench, of the Great Northern Power Company.

various contracts in force accomplish this result excellently.

By a distinct development this latter portion of the power can be doubled, but it is considered quite doubtful if this ultimate development shall be undertaken, at least for a long time. It calls for the diversion of the water from some of the area and through some of the storage reservoirs, by the way of several small channels and through a low elevation to the hights directly above Duluth, there to fall through pipes 740 ft. to wheels. With this proposition adopted, the ultimate capacity of the

wide at the base. In this part of the dam are three sluice ways with gates 7 x 9 ft., controlled by stems passing up into covered gate houses.

In order to form an ample spill way for the maximum floods of the river, a section of the slate ridge has been cut off to 18 in. above the level of the spill way section of the dam. This opens above a small creek, which flows into the main river below the dam. On account of the fact that the maximum flood of the river has been as high as 50,000 cu. ft. per second, 100 times the minimum flow of deficiency seasons, this precaution is considered neces-

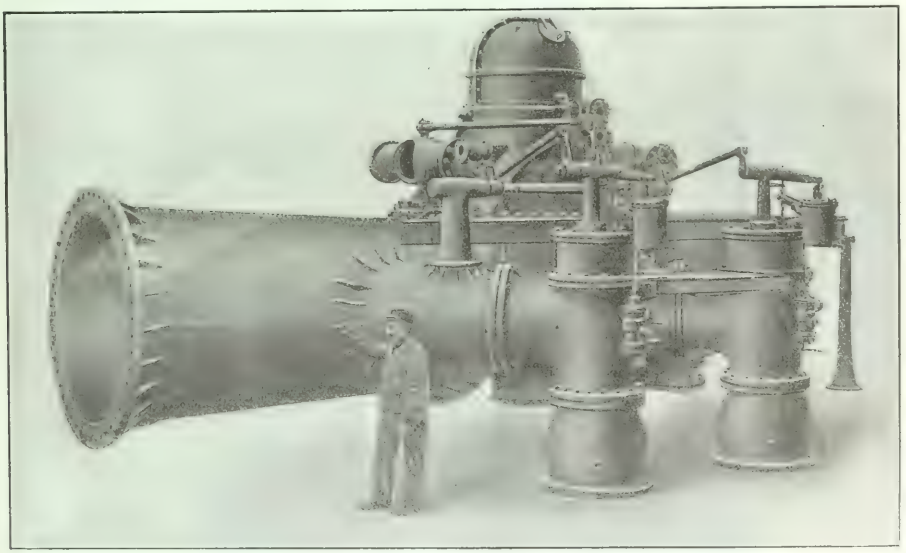


Fig. 6.—One of the Great Northern Power Company's 13,000-Hp. High Pressure Francis Turbines.

company will be 200,000 hp.—without it, 145,000 hp.—at a load factor of 60 per cent., and based on utilizing each year water equivalent to a 9 in. fall over the drainage area, which is the minimum run off.

The Service Reservoir.

There is a service reservoir, Fig. 1, near the village of Thomson, 464 ft. above Lake Superior, of a gross capacity, on its 12 ft. of available draft, of 130,000,000 cu. ft. of water, amply sufficient to accomplish the purposes of conservation and regulation before referred to. This reservoir is about 1½ miles by ½ mile in surface area, and

sary. One of the dozen dams around this service reservoir is a segment of a circle, whose arc is 100 ft. It has a clear span of 60 ft. at the crest, and is 60 ft. high at the deepest point. The space to be dammed and the configuration of the ground made such a form of wall most economical.

This service reservoir has an important function in clearing the water from needle ice. No anchor ice has ever been observed in this river. Needle ice, on the contrary, the result of water below the freezing temperature meeting a physical shock, is naturally frequent on

the St. Louis River below Thomson, and the head gates of this development. Due to the nature of the river above the lower reservoir little such ice is liable to be found there. The mile and a half stretch of quiet water in the service reservoir is a sufficiently considerable body of water to dissipate such ice should any form. If any should make in the open canal below, it will be again dissolved in the quiet water of the forebay. In the racks at the lower ends of these two reservoirs no needle ice has so far been observed. As to anchor ice, conditions are excellent. The river becomes covered by ice and snow in its quieter parts. At the discharge of the service reservoir and forebay are curtain walls with submerged arches through which the water flows. These are of ample sec-

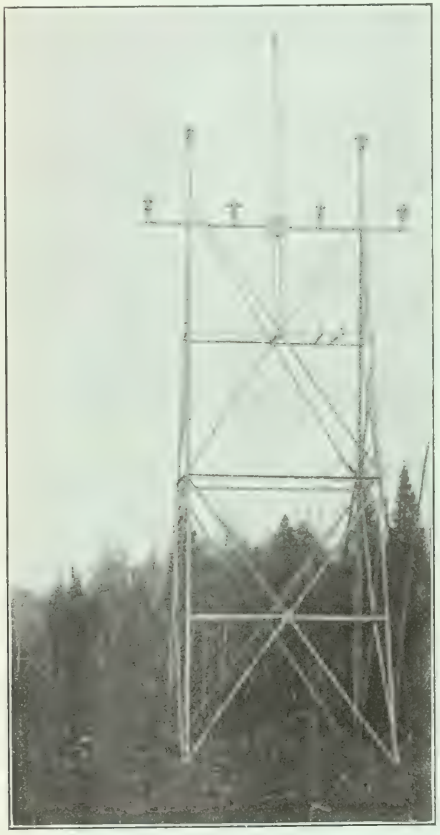


Fig. 7. Transmission Lines of the Great Northern Power Company.

tion to make the current passing through them quite slow. It is a fact that, while the entire surface of the service reservoir may be covered with bark, chips and other débris from saw and pulp mills above, the water coming out of these arches and flowing along the canal toward the power station is perfectly clean, although the rack screens in the reservoir are coarse. Another series of curtain walls, submerged arches and a finer rack will perform the same duty at the lower end of the forebay.

The Canal and Forebay.

Water from the service reservoir passes into a canal 8500 ft. long to the forebay itself, 3000 ft. long. This canal is excavated for its entire length in the slope of a hillside. For a mile of its length it is through clay and occasional rock ridges; the remainder of its length is in slate rock section, with occasional earth interpositions. The limiting condition of construction of the earth section was the required capacity of the canal or sufficient water to supply 80,000 hp. at the power house, and erosion of its banks at a speed of water of 3 ft. per second. In order to harmonize conditions it was planned for a cross section of 36 ft. wide at bottom, 15 ft. deep and slopes of 2 to 1. It was originally designed that the entire canal should be lined with concrete, which would have lessened the grade and diminished the cross sections. But this plan was changed, and the base of the earth canal was built 66 ft. wide and the slopes steeper than originally designed, in part because the work was done by steam shovel and the wider full excavation was cheaper. In the rock sections the cross section is in no place less than 450 sq. ft., though somewhat irregular. The Northern Pacific Railroad crosses this canal on a plate girder double track bridge of 70-ft. span on concrete abutments. As a protection to the forebay embankment, which is an earth mass of some 500,000 cu. yd., there is a canal spillway of concrete 200 ft. long which can discharge into a stream flowing into the river below.

The forebay itself is of about 40 acres in area, its lower side being an embankment and its upper side merely the contour of the hillside on water level. At its lower end the water is designed to debouch into eight pipe lines, three of which are constructed, and all of which are to be of 7 ft. diameter. Water is drawn into these pipes from the bottom of the forebay through eight submerged arches, Fig. 3, one for each pipe line, and a screen, with large sluice gates, one for each pipe line. These gates will be operated by motors controlled locally and from the switchboard in the power house. Fig. 4 illustrates the course of the water at this point. A sluiceway has been provided for flushing out of the way all ice and débris that may collect in front of the curtain wall. As before stated, so far nothing has come down the canal that will require attention.

The Pipe Lines and Connections.

Pipe lines carry water from the forebay to the wheels. At this point the plant divides itself into units, one for each wheel. Each pipe is 5000 ft. long and drops 378 ft. The pipe for the upper 4000 ft. of distance and 150 ft. of drop is of wood construction, and the remainder of steel. The wood pipe is built of redwood clear timber staves, each stick forming its proper arc of the 7-ft. circle of diameter of the line. The staves are tied by ¾-in. steel rods with malleable shoes and turn buckles and spaced along the pipe in accordance with the pressure. The staves are made continuous for the length of the line by metal plates inserted in saw cuts at each end of each stave, and designed to prevent leakage. Each wood pipe at its foot passes into a cast bell shaped section of the steel line, where it is thoroughly caulked with lead and oakum. There are similar sections at the upper ends of the wood pipes. The steel pipe is of plates thoroughly riveted and designed with a factor of safety of 5, with an allowance of 1-16 in. for rust. The steel work of the pipe line was dipped in hot asphalt when laid. The entire line is laid in a covered trench, Fig. 5. At its lower end this pipe is anchored in concrete built up from bedrock beneath the power house. Although the grade of this line is continuously down, automatic air valves have been placed at points where there is a variation in grade, to prevent any possible tendency toward the formation of a vacuum due to sudden changes in the speed of water.

These pipe lines are expected to deliver water at the rate of 335 cu. ft. per second, equivalent to 10,000 electrical horsepower. The friction loss in the pipe lines is equivalent to about 10 ft. of head, and that in the canals is about 6 ft. more when running full. A steel tower, surmounted by a tank 30 x 69 ft., stands on the bank above the power house, the top of this tank being 23 ft. above the water of the forebay. This standpipe is connected by a set of risers into a cross receiver, with each of the pipe lines, and is the final one of the various plans for water regulation, having as its especial function the relieving of instantaneous changes of pressure due to additional or less loads on the wheels through momentary changes of consumers' demands. It will not only care for excess pressures due to lessening of load, but to slighter pressures due to increased load, while the water in the pipe lines is gaining acceleration to meet the increased demands of the wheels. The standpipe has sufficient capacity to take up a load of 15,000 hp. until the

water in the pen stocks is sufficiently accelerated from the main lines to care for it. This figure of 15,000 hp. was considered ample for the purpose. The standpipe will also avert any tendency toward a vacuum along the pipe lines, being above their level, or will catch any air bubbles that may have gotten into the line. It will also permit, by means of cross connections, the operation of all the pipe lines in unison, no matter how small or how large may be the amount of power in use and the number of wheels in operation, thus keeping water in circulation in all of them, avoiding friction, loss and danger of freezing.

The Wheel House and Its Equipment.

Water is carried into a fireproof building ample for four wheels and designed as about half of what will be erected when the entire eight wheels of this portion of the company's development shall have been called for. It is now 77 x 181 ft. in area and 90 ft. high. In a high basement are the penstocks, water wheels, pumps, &c., and on the floor above them are three generators and their exciters, with room for another wheel. The turbine water wheels, each of 13,000 hp. rated capacity, and known to be capable of running up to 18,000 hp., are of a modified Escher-Wyss design, built by the Allis-Chalmers Company, Fig. 6. They have vertical shafts, are directly connected to the generators above, and are of the Francis pressure type, the wheel operating at 375 rev. per min. Penstocks connect them with the pipe lines, the water column having at the wheels a diameter of 66 in. In each penstock is to set a hydraulically operated gate valve, the first of which was placed in position a few days ago. These are the largest ever constructed for such pressures. They weigh 35 tons each and occupy a floor space 28 ft. long. Relief by-pass valves have been installed in each penstock between the big valves and their water wheels, two on each. These are modified Escher-Wyss, one arranged to operate automatically from the governor of the wheel or set to open at certain presures; the other to work as a pop valve with the standpipe and to open before it overflows. These are operated in multiple through the cross receiver of the standpipe, and if one fails the remaining ones will serve. It will be noted that these water wheel units are the largest and most powerful ever put into service. The running portion of each wheel is 62 in. in diameter, and their speed is greater than any other wheels of such size.

Each generator is of 7500 kw., and is a 25-cycle three-phase 6600-volt General Electric machine. The revolving field is mounted on the vertical shaft of the wheel, and the whole weight of the revolving element of the unit is carried on an oil thrust bearing on the shaft. Oil is fed to the bearings by two-stage force pumps that can deliver it at 400 lb. pressure. The current generated is stepped up for transmission to the substation in single 7500-kw. three-phase oil insulated watercooled transformers, these being the largest in service. They are 14.88 ft. high, 15 ft. long and 5.88 fe. wide, and contain windings to transform the current to 30,000 or 60,000 volts, as desired. The core and windings weigh about 65 tons, and can be lifted bodily out of the casing, as they are attached to the covers. Worthington surface condensers cool the oil for these transformers, and it is driven to the transformers by a special motor pump set. With an actual capacity running overload of 18,000 hp. at the wheels and with an overload capacity in generators of 50 per cent. for a period so long as to care for any probable peak of load, these form a most imposing combined unit of power, considerably exceeding anything now in operation.

Power is carried to a city distributing station 14 miles away, with the wires placed on steel towers, Fig. 7, along a right of way 100 ft. wide, the property of the company. These towers are spaced from 300 to 1000 ft. apart and are from 40 to 60 ft. high, changing conditions depending on topography. These are carrying a voltage of 30,000 on No. 00 six-strand copper cables. An overhead steel cable is carried on the towers as a lightning arrester, and a telephone line, running into insulated booths, is also carried along beside the high tension lines.

Machinery at the city station consists of transformers to get the high tension currents down to 13,200 volts, at which potential it is supplied to large consumers. The Duluth & Superior street railroad systems, utilizing direct current at 600 volts, are supplied through motor generator sets that change over the alternating to direct current for this purpose. There are three of these of 1500 kw. each and one of 750 kw. in the city stations.

Voltage on the transmission lines has been fixed at so high a potential as mentioned in order that, if desired, current may be transmitted a considerable distance, and it is estimated that power consuming centers up to 150 miles away may be considered under the system. These, as shown in Fig. 8, would include the cities of Minneapolis and St. Paul and intervening points and the Mesaba, Vermillion and Gogebic ore ranges, which consume about 40,000 hp. in steam, for pumping, hoisting, &c. But it may be doubted if these more distant fields are invaded by the company, for the local market, for power has grown amazingly since the inception, due in part at least to the decision of the United States Steel Corporation to erect at Duluth a modern open hearth steel works.

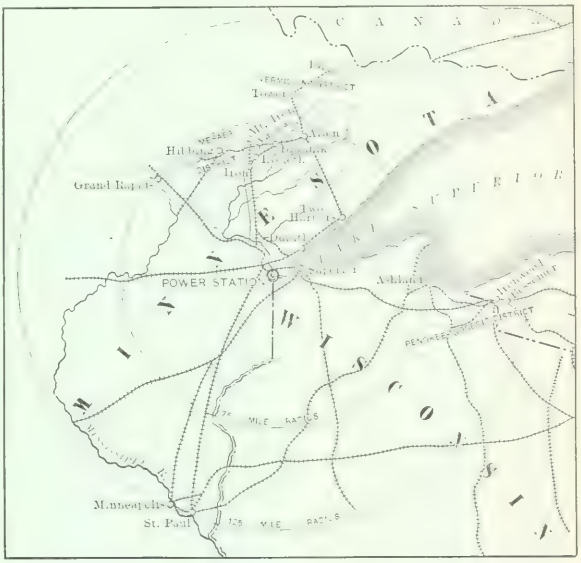


Fig. 8.—Map of the Region Capable of Being Supplied with Power by the Great Northern Power Company.

Local Distribution of Power.

The company has now contracts for the delivery of 22,000 e.h.p., and has several excellent and good sized contracts in sight. Those to whom it is now supplying power are the street railroad and commercial lighting and retail power companies of Duluth and Superior; the Duluth city pumping station, which has just installed a General Electric turbine pump of 13,500,000 gal. capacity in 24 hr.; the American Carbolite Company, which is now operating nine furnaces and is adding more up to an immediate total of 21, each of which requires about 350 hp.; the Zenith furnace company, which operates a blast furnace, a coal dock and coke ovens; the Berwind Fuel Company and Northern Fuel & Dock Company, having

coal docks, these being the first, by the way, to operate with alternating current; the Duluth, Missabe & Northern Railroad's and Pittsburgh Fuel Company's No. 5 dock and Clyde Iron Works, to be connected up next spring; the Great Northern Railroad's elevator system, and others. Additional concerns are gradually connecting up, and it is probable that all the modernly equipped among the 20 or more great coal docks at the head of the lake will be electrically operated soon. There has been talk of electrifying the terminals of the Duluth, Missabe & Northern Railroad, but this project is now in abeyance. The Steel Corporation will require considerably more power than its waste gases from by-product coking will furnish economically, and has been considering as high as 10,000 hp. from the great Northern Power Company.

In laying out the system of underground distributing cables through the cities at the head of Lake Superior, it was assumed that the development of power would be along the water front, and the company now has some 12 miles of cable skirting the harbor and railroad lines, as well as 16 miles of overhead circuits, additional to the main feeders from the power station. One of the cables is laid across the harbor to Superior, in a trench dredged 30 ft. below low water line, or 8 ft. beneath the keel of the deepest laden ship that can pass the Sault River, either now or during the continuance of the present Governmental plan for the improvement of the lakes.

The two large power buildings of the company are of most pleasing and substantial design, fitted for their purposes. They are entirely fireproof, built of steel, brick and concrete. They have steel frame superstructures set with brick masonry and trimmed with concrete blocks, instead of stone. The floors are of steel reinforced concrete, where they are not heavy arches, and the roofs are of tile, covered with asphalt and gravel. The interiors of the main rooms are wainscoted in white enamel brick and finished above with white and buff brick laid in right lines in panels between the columns of the steel frames. Other interior faces are in white brick, giving a fine diffusion of light all through the buildings. Traveling cranes of large capacity cover the main units.

The entire electrical equipment has been supplied by the General Electric Company, and is exceedingly complete. In the wiring scheme for the power stations, all connections between the bus bars and the units are made through motor operated oil switches, all arranged for distant control from a benchboard placed on a gallery that gives the operator unobstructed view of the main units. All low tension wiring is insulated and carried in conduits laid in the floors, while all high tension wiring is bare and is hung on insulated supports in brick compartments. Throughout the scheme each set of unit wiring can be carried through any transformer and to any one of the transmission lines, and this plan will be continued as the number of units is increased to the maximum. For the control of the entire 80,000 hp., there is a switchboard that is less than 19 ft. long and so unusually compact. In the center of this board is the panel containing control of all station lighting and power, and on each side are four panels, one for each of the eight units of the completed plant.

A map of the system, with the profile of the line, is shown in Fig. 9. Origination of this Great Northern power works, now so happily completed, was the result of a visit to Duluth some eight years ago of C. C. Cokefair, then a resident of Plainfield, N. J. His son, Frank A. Cokefair, became interested and worked out the general plan and its details. After some years of work carried forward by them and one or two associates, a local company was organized, of which C. A. Duncan of Duluth was made president, several large capitalists of Duluth becoming interested. Chas. D. Barney & Co. of New York and Tucker, Anthony & Co. of Boston acted as syndicate managers for the underwriters for the bond issue, and the Knickerbocker Trust Company of New York became trustee. F. O. Blackwell of New York, J. T. Fanning of Minneapolis and W. A. Brackenridge of Niagara have been consulting engineers, working in conjunction with F. A. Cokefair, who has been chief engineer throughout the entire period of construction.

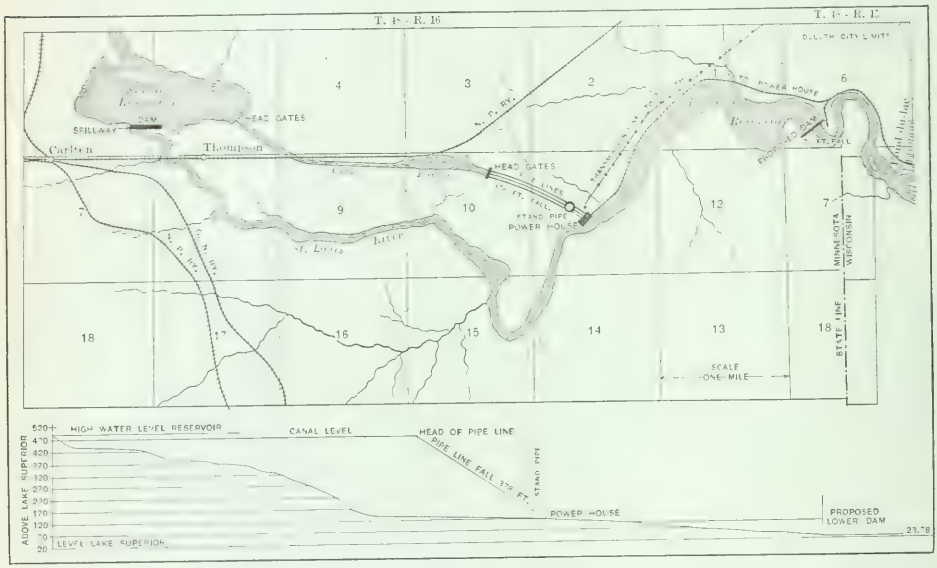


Fig. 9.—Map of the Great Northern Power Company's System from the Service Reservoir to the Power House and Beyond, the Profile Being Shown Below the Map.

The soil pipe plant of the Coosa Pipe & Foundry Company at Gadsden, Ala., has been closed down for the holidays. Work will be resumed this week with at least half a force, which will be gradually increased. Eight pipe floors will be put in operation, and the fitting foundry will run with a full force.

Following elaborate experiments to prevent the recurrence of accidents to submarine vessels, the French Minister of the Navy has issued orders that all submarines be supplied with detachable telephone buoys which in case of accident, will permit of communication with the surface.

Foundry Blower Practice.*

BY WALTER B. SNOW, BOSTON, MASS.

The primary function of a blower is to move air against resistance. Its performance is dependent upon the relation expressed by the formula:

$V = \sqrt{2gh}$, in which V = velocity in feet per second, h = head in feet and g = acceleration due to gravity = 32.16, or $V = \sqrt{2g\frac{p}{d}}$

when h is expressed in terms of p = pressure and d = density.

When applied under the conditions of p = pressure in ounces per square inch, d = density or weight per cubic foot of dry air at 50 degrees F., and under atmospheric pressure of 14.69 lb. or 235 oz. = 0.077884 lb.,

$$V = \sqrt{64.32 \times \frac{p \times 144}{16 \quad 0.077884 \quad \frac{235 - p}{235}}}$$

which reduces to $V = \sqrt{\frac{1740659 \cdot p}{235 - p}}$

Allowance is evidently made therein for compression of air but not for change of temperature during discharge.

In Table I the velocities were calculated by this formula, the volumes by multiplying velocity and effective area, and the theoretical horsepower by multiplying volume and pressure.

TABLE 1

RELATIONS OF PRESSURE, VELOCITY, VOLUME AND HORSE POWER

PRESSURE PER SQ. IN. OZS.	VELOCITY OF DRY AIR AT 50 DEGREES FAHR. ESCAPING INTO OUTER ATMOSPHERE THROUGH ANY SHAPED ORIFICE		VOLUME DISCHARGED IN ONE MINUTE THROUGH AN ORIFICE HAVING EFFECTIVE AREA OF ONE SQ. IN., CU. FT.	HORSE POWER REQUIRED TO MOVE GIVEN VOLUME UNDER GIVEN CONDITIONS
	Feet per sec.	Feet per sec.		
1	85 03	5 161.7	35 85	0 00975
2. ..	121 41	7 284.4	50 59	0 02759
3..... ..	148 38	8 902.8	61.83	0 05058
4.	170 98	10 258 6	71 24	0 07771
5 . .	190 76	11 445.5	79.48	0 1084.
6 .	208 53	12 511.9	86 89	0 1422
7	224 77	13 486 4	93 66	0 1788
8 ...	239 80	14 387.9	99 92	0 2180
9 . . .	253.83	15.229 6	105 76	0 2596
10.....	267 00	16 020.4	111 25	0.3034
11...	279 70	16 768.1	116 45	0 3493
12 . . .	291 30	17 478.2	121 38	0 3972
13 . .	302 59	18 155 2	126 06	0 4476
14	313 38	18 802.7	130 57	0 4986
15	323 73	19 423 6	134.89	0 5518
16	333 68	20 020 7	139 03	0 6067
17	341 26	20 595 8	143 03	0 6631
18 .	352 52	21 151.0	146 88	0 7211
19	361 46	21 687.8	150 61	0.7804
20	370.13	22 207.5	154 22	0 8412

For refined work, or under conditions of wide variation from the basis of the table, corrections should be made for differences in humidity and temperature.

In the ordinary processes of the foundry, where iron or the less refractory metals are to be reduced, the resistance of the crucible, air or cupola furnace will roughly range from somewhat above 1 oz. to a possible but usually unnecessary pressure in excess of 20 oz. per square inch. Up to about 8 oz. the fan blower cannot be excelled for convenience and efficiency. From 8 to 16 oz. the field is fairly divided between the fan and the rotary types, the advantage gradually shifting from the former to the latter as the pressure increases. Above 16 oz. the superiority of the rotary type is manifest, until it in turn encroaches upon the efficient field of the blowing engine at about 5 lb.; a pressure far in excess of the practical requirements of the foundry. The air compressor, as an aid to combustion, is economically useful only in connection with the burning of liquid fuel.

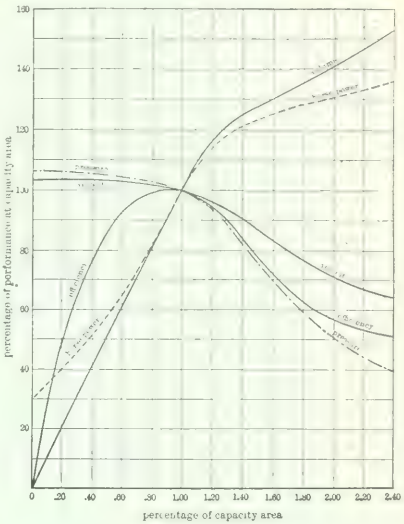


Fig. 2.—Relative Performance of a Fan at Constant Speed with Variable Outlet Area.

The fundamental differences between the fan and the rotary type of blower lie in the manner of creating pressure and in the effect of resistance. In the fan type, velocity is given to the air as it passes from the inlet to the circumference of the wheel. This is transformable into pressure with corresponding density within the inclosing case and connections; the pressure being dependent upon the speed. At constant speed, the volume and

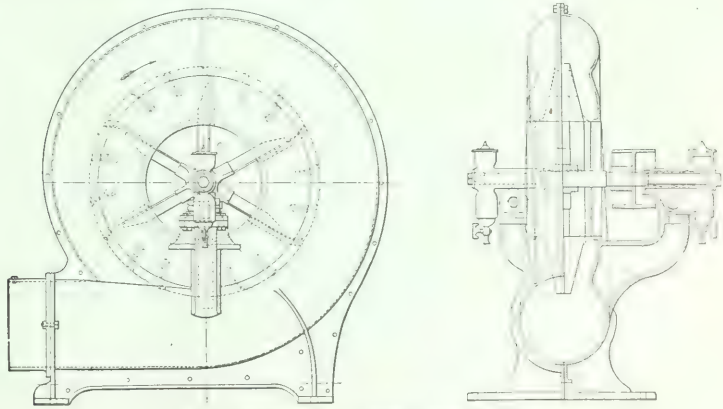


Fig. 1.—Elevations of a Typical Cupola Fan Blower.

* Presented at the New York meeting (December, 1907) of the American Society of Mechanical Engineers.

power decrease as the resistance increases. When the outlet is closed, the wheel continues to revolve, but without effective delivery, and with minimum power expenditure. In the rotary, or so-called "positive" type, air in regularly succeeding volumes is imprisoned by one or more inclosed revolving impellers, and forced forward against the imposed resistance. It is thereby compressed

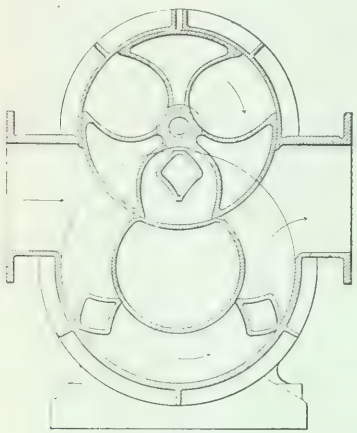


Fig. 3.—Cross Section of a Rotary Blower of the Single Impeller, Triple Bladed Type.

to a density, and given a pressure proportionate to that resistance. This pressure is fundamentally independent of the speed. The delivery remains practically constant for a given speed as long as discharge is permitted, while the power expenditure increases with the resistance. When the outlet is closed the maximum power is required and the displacement, though ineffective, is just equal to the slip; up to the limit of power to drive and of strength to endure.

The construction and proportions of a prevalent type of cupola fan blower are illustrated in Fig. 1. The cas-

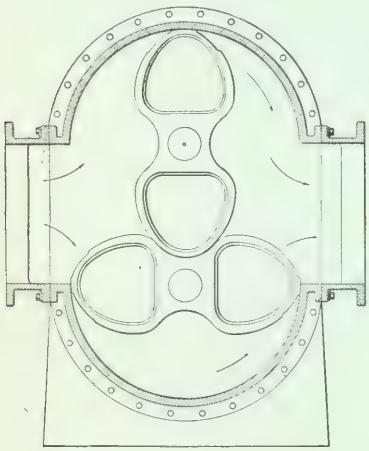


Fig. 4.—Cross Section of a Rotary Blower of the Double Impeller Type.

ing and wheel are provided with two inlets, which, in ordinary construction, are about one-half the diameter of the wheel. The width of such a wheel at its periphery ranges from 5 to 8 per cent. of the diameter, the width between side plates at the inlet being approximately one-sixth of the diameter. From six to eight major blades extend from inlet to circumference; between these are one, two or three minor blades of about one-half the radial length. All blades are slightly curved backward at the circumference of the wheel. The cast iron casing is of involute form, its greatest diameter being approximately one and three-quarter times the diameter of the inclosed wheel. In the volume type, designed for much lower pressures, such as are required in air furnace operation, the peripheral width of the wheel ranges from 20 to 40 per cent. of its diameter. The casing is often of steel plate.

Refined consideration of blower design is not necessary in a discussion of foundry blower practice, but a knowledge of fundamental principles and empirical relations is essential to a clear understanding of the subject. The manufacturers' rating of the type of blower shown in Fig. 1 is based upon the greatest effective area over which it will maintain the maximum velocity of discharge. As originally established by Sturtevant, this "capacity area" or "square inches of blast" is represented by the empirical formula

$$\text{Capacity area} = \frac{DW}{3}$$

in which D = diameter of wheel in inches, and W = width of wheel at circumference in inches. This formula

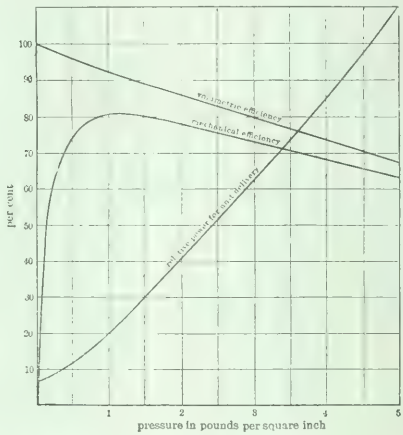


Fig. 5.—Relative Performance of a Single Impeller Rotary Blower at Constant Speed with Variable Resistance.

was derived from the pressure type of fan blower. The value of the divisor must necessarily vary with the proportions of the wheel, the number of inlets, the number and curvature of the blades and the form of the inclosing case. But as a merely arbitrary basis, the formula has been generally accepted for the ready comparison of wheels of substantially the same type.

Manifestly the maximum velocity of discharge will create the maximum total pressure. As a factor in the manufacturers' rating this attainable velocity has been accepted as being equal to the circumferential speed of the wheel. This assumption is by no means universally correct. Recent developments in fan construction with very large inlets, numerous shallow blades and unusual width, show discharge velocities far in excess of the circumferential speed, approximating a theoretical maximum of twice that speed. But successful application of such fans has not yet been made under the resistance obtaining in cupola practice.

It is evident that, disregarding the effect of changes in density and temperature, the following relations should hold for a given fan with constant capacity area: The volume varies directly as the revolutions; the pressure varies directly as the square of the revolutions, and the power varies directly as the cube of the revolutions. These relations clearly point to the economic desirability of closely proportioning the fan to the work it is to perform. An increase of only 25 per cent. in the speed,

which may be necessitated by deficiency in the volumetric capacity of a given fan, nearly doubles the power required, and creates a pressure more than 50 per cent. in excess of that at normal speed. It is seldom that the sum of fixed charges and operating expense cannot be materially reduced by substituting a larger and more costly fan for one that must be run at unnecessary speed to deliver the required volume.

TABLE 2.

PERFORMANCE OF CUPOLA FAN BLOWERS AT CAPACITY AREA PER INCH OF PERIPHERAL WIDTH

DIAM. OF WHEEL INCHES	CAP. AREA SQ. INS.	ITEM	TOTAL PRESSURE IN OUNCES PER SQUARE INCH										
			6	7	8	9	10	11	12	13	14	15	16
18 in.	6 sq. in.	r.p.m.	2660	2760	2850	2940	3030	3100	3170	3240	3300	3360	3420
		cu. ft.	520	560	600	640	670	700	730	760	780	810	830
		h.p.	1.7	2.1	2.5	3.1	3.6	4.2	4.8	5.4	[illegible]	6.6	7.0
24 in.	8 sq. in.	r.p.m.	2000	2150	2290	2420	2550	2670	2780	2890	2990	3080	3170
		cu. ft.	700	750	800	850	890	930	970	1010	1040	1080	1110
		h.p.	2.3	2.9	3.5	4.2	4.9	5.6	6.4	7.1	8.0	8.8	9.7
30 in.	10 sq. in.	r.p.m.	1590	1720	1830	1940	2040	2140	2230	2310	2390	2470	2550
		cu. ft.	870	940	1000	1060	1110	1160	1210	1260	1300	1350	1390
		h.p.	2.8	3.6	4.4	5.2	6.1	7.0	7.9	8.9	[illegible]	11.0	12.1
36 in.	12 sq. in.	r.p.m.	1330	1430	1520	1620	1700	1780	1850	1930	2000	2060	2120
		cu. ft.	1040	1120	1200	1270	1340	1400	1460	1520	1570	1620	1670
		h.p.	3.4	4.3	5.2	6.2	7.3	8.4	9.5	10.7	11.9	13.2	14.5
42 in.	14 sq. in.	r.p.m.	1140	1230	[illegible]	1390	1460	1530	1590	1650	1710	1770	1820
		cu. ft.	1220	1310	1400	1480	1560	1630	1690	1760	1830	1890	1950
		h.p.	3.9	5.0	6.1	7.3	8.5	9.8	11.1	12.5	13.9	15.4	17.0
48 in.	16 sq. in.	r.p.m.	1000	1070	1150	1210	1270	1330	1390	1450	1500	1550	1590
		cu. ft.	1390	1500	1600	1690	1780	1860	1940	2020	2090	2160	2230
		h.p.	4.5	5.7	7.0	8.3	9.7	11.2	12.7	14.3	15.9	17.7	21.0

The speed of a fan is usually fixed, and variations occur only in the effective area of discharge. In cupola practice such variation is extensive, and changes often succeed each other frequently. Hence it is difficult to proportion the fan to secure the most economical average performance. It must have capacity to deliver the required volume under the greatest resistance, toward the end of the heat, but the power provided must be sufficient to drive it during the early part of the heat when there is less resistance, greater delivery and consequently more work to be done.

For the ordinary type of fan it has been generally accepted that within the capacity area the velocity and pressure are maximum and constant, and the volume and horse-power are proportional to the area. These relations are only approximate, as is evident from Fig. 2. The curves are characteristic of an individual instance in which the fan ran at constant speed while discharging through various outlet areas. All values are relative to the performance at capacity area. Changes in the proportion or the speed of the fan would materially affect these relations, causing them to approach or recede from the conditions expressed in the preceding paragraph, and shifting the point of maximum efficiency. These curves serve to show that maximum efficiency in power and pressure are secured at or near the capacity area, that the power per unit of volume and the pressure decrease as the discharge area and volume increase, and that with closed outlet the power is approximately one-third of that at capacity area.

No simple exact basis of calculation can be established for varying fan proportions and conditions, but for all practical purposes the manufacturer's basis, although only approximately correct, is sufficiently accurate, particularly in cupola practice, where operation at or near the capacity area is essential. Upon this basis Table 2 has been calculated to show the performance at capacity area per inch of peripheral width of typical diameters of cupola fan blowers. Basic values are taken from Table 1, the air being dry, and of 50 degrees F. temperature; the velocity of discharge is taken as equal to the circumferential speed of the wheel, and the power, as double the theoretical. While 50 per cent. efficiency is below that which may be attained in good cupola installations, it is always desirable to provide ample surplus above the power required at capacity area. Even a change of 50 degrees from the ordinary inlet temperature makes a difference of about 10 per cent. in the power.

Characteristic types of single and double impeller rotary blowers are presented in Figs. 3 and 4. In the type shown in cross section in Fig. 3, the single impeller is made up of three diamond shaped blades extending from a central web. On either side of the web a stationary core fills the space within the inner circumference of the blades, forming in connection with the inclosing case an annular space within which they revolve. The rotor which coincidentally revolves in the smaller part of the casing, successively provides pockets to receive and pass the impeller blades to the suction side without allowing compressed air to escape.

In the type shown in Fig. 4, both impellers are symmetrical and alike. The surfaces are so formed, and the impellers are so located on their respective shafts, as to permit of rotation with uniform clearance, and without metallic contact. Release of air on the discharge side of each impeller is practically coincident with the cut-off of admission on the inlet side.

In both types, the air passing through the inlet is imprisoned, and carried forward to the outlet side. Here it meets and mingles with an air of greater density, already compressed by previous action of the impellers. Equalization of pressure instantly results. As a consequence, there is more or less fluctuation coincident with the revolutions of the blower. The degree of fluctuation depends upon the ratio between the released volume and

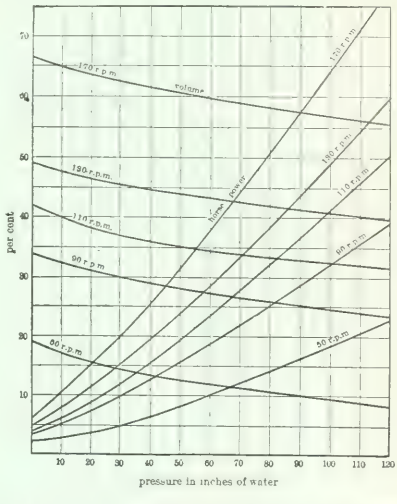


Fig. 6.—Relative Performance of a Double Impeller Rotary Blower at Various Speeds and Pressures.

the total volume under compression, and also upon the extent to which the air has been previously compressed in transit through the blower. This occurs in the case of the single, but not of the double impeller type here illustrated.

The theoretical relations in a rotary blower having a fixed free area of discharge and no slip, are those in the fan type operating within its capacity area, namely, the volume, and consequently the velocity, vary as the number of revolutions, the pressure varies as the square, and the power as the cube of the revolutions. But here the similarity ends, for in the fan the number of revolutions is an essential function of the pressure, while in the rotary blower they are entirely independent. In other words, material change of total pressure with the fan type can only be secured within the capacity area by change in revolutions, while with the rotary type, great range in pressure is attainable, at constant revolutions by merely varying the resistance. Under constant speed and variable outlet or resistance, the performance relations of a theoretically perfect rotary blower are as follows, the effect of changes in temperature and density being disregarded: The volume is constant; The velocity varies inversely as the effective outlet area; The pressure varies inversely as the square of the outlet area, hence as the square of the velocity, and the power varies

directly as the pressure. But the mechanical necessity of clearance, and the consequent slip or backward leakage, affect these relations particularly as the conditions depart from the field of maximum efficiency. The slip is approximately proportioned to the square root of the pressure difference between the atmosphere and the imprisoned air, that is, to the velocity which it creates. Therefore the volumetric efficiency decreases as the pressure increases.

Fig. 5 presents characteristic curves showing relative performance of a single impeller blower of the type illustrated in Fig. 3. The rapid drop in mechanical efficiency at pressures below ½ lb. is manifest. The performance of a two impeller type, like Fig. 4, at different speeds and resistances, is illustrated by the curves in Fig. 6. Volumes and horsepowers are relative.

Under specific conditions of constant speed and resistance, it might be possible to establish the superiority of one type of blower based primarily upon first cost and operative efficiency. But conditions vary as do blowers, which for commercial reasons are built in stated sizes from which selection must be made. Hence the problem is complicated, and the solution depends largely upon the intangible factor of "adaptability." With no purpose of definition as to advantages or disadvantages, the characteristics of the two types operating within practical limits may be thus summarized and contrasted: With a fan blower the maximum pressure is determined by the number of revolutions; with a rotary blower it depends upon existing resistance or the weighting of the

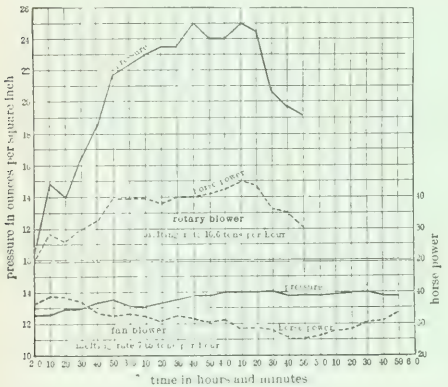


Fig. 7. Performance of Fan and Rotary Blower on a 54-In. Cupola.

relief valve. The volume discharged by a fan blower depends upon the outlet area and the corresponding pressure; in the rotary type it is independent of both. The maximum power is required when a fan blower discharges against the least, and when a rotary blower discharges against the greatest resistance. The fan blower automatically increases the created pressure as the opposing resistance becomes greater, until it equals the maximum pressure capacity of the fan. The volume, although coincidentally decreased, is rendered effective by the greater pressure, while the power is roughly proportional to the effective work. The rotary blower is likewise automatic up to the limit of pressure temporarily established by the resistance of the relief valve, but without material change of volume, and with increase in power. Above the pressure limit set by the valve, air escapes to the atmosphere, and the power expended thereon has no useful effect. The weight and cost of a fan blower are far less and the speed far higher than in the case of a rotary blower; at low pressures the efficiency of the fan is superior, while at the higher pressures necessary in the cupola, the rotary type excels.

As the total head or pressure created by a blower represents the sole means of producing movement of the air, whatever portion of this head is consumed in overcoming the frictional resistance of piping and fuel, reduces by just so much the amount remaining available for the production of velocity. The greater the ratio between the surface of a pipe and the quantity and the higher the velocity the greater is the resistance. Were the outlet in the casing of a fan blower to be made equivalent to the capacity area the velocity and corresponding friction would be excessive. But in both the fan and rotary types, the area of the outlet is such that the velocity of discharge seldom exceeds 3000 ft. per minute. Even this is so great that material saving in power may be secured in a long pipe by making its area considerably in excess of the blower outlet. For instance, the frictional loss in 100 ft. of 10-in. pipe, with 3000 ft. velocity, will be practically 1 oz., while that in a 12-in. pipe, passing about the same volume at 2000 ft. velocity, will be approximately ⅜ oz. If a certain velocity pressure is required at the final delivery the blower, if distant, must create a total pressure sufficiently in excess to allow for the loss by friction. A drop of a couple of ounces is not uncommon with an ordinary piping system.

The actual conditions in a conduit may be determined by a Pitot tube, and calculations of volume made therefrom. The most satisfactory form of instrument appears to be that devised by D. W. Taylor. Care must be exercised in the use of any form of pressure gauge to avoid misleading readings. This is particularly true regarding determination of pressure in the wind box of a cupola, wherein the direction of air currents is uncertain.

The modern cupola furnace is typical of metallurgical progress in which conservation of heat has been secured by massing fuel and metal. As arranged in successive charges with a melting zone of maximum temperature beneath, the best possible opportunity is presented for the gradual ignition of the fuel and heating of the metal in their downward course. It would at first appear that equal facility was provided for securing complete combustion, and that the quantity of air furnished might closely approximate the chemical requirements. But to secure the best results the volume is reduced in practice considerably below that theoretically required; of necessity incomplete combustion results. The conditions are closely similar to those in the blast furnace. The reason for this condition is the arrangement of the superimposed charges of fuel and metal with relation to the air supply, which necessitates passing through the lower charges all of the air required for those above. Although perfect combustion with an excess of air is thereby secured in the melting zone the tendency of excessive dilution is to cool the gaseous mixture to a temperature even below that of the molten iron. Under such conditions less heat is transferred to the upper changes, because of the higher velocity and lower temperature of the gases.

The air supply to a cupola is not, therefore, to be determined by the chemical requirements of the entire body of fuel, but by the excess which the lower charges are able to endure without disastrous cooling. The level of the ignition zone, and the completeness of combustion, are necessarily limited by this excess. The introduction of two or more rows of tuyeres with large aggregate area, has served to distribute the air admission, to reduce the cooling effect in the melting zone, to raise the level of the ignition zone, and to perfect the combustion. But a coincident—and otherwise beneficent—increase in the hight of the charging door has still prevented the attainment of complete combustion, although a larger proportion of the heat is utilized. Authoritative chemical analysis of the escaping gases are exceedingly rare, but such as are available show that only about 50 per cent. of the carbon combines to form carbon dioxide. The balance escapes as an element of carbon monoxide, having less than one-third of the heat value. In other words, only about two-thirds of the possible heat of combustion is utilized. This indicates a shortage of about 25 per cent. in the air supply.

Intermittent operation of the ordinary cupola is not conducive to the ready utilization of the waste heat by external means, as in the blast furnace. Further economy is therefore to be sought within the cupola itself, and in the application of the blower thereto, presumably along the lines in which improvement has already been

made. The air supply to a cupola is usually expressed in cubic feet per net ton of iron melted. The amount necessarily varies with the melting ratio, the density of the charges, and the incidental leakage. Fair average practice is represented by the following:

6 lb. iron per pound coke, 33,000 cu. ft. of air per ton of iron.
7 lb. iron per pound coke, 31,000 cu. ft. of air per ton of iron.
8 lb. iron per pound coke, 29,000 cu. ft. of air per ton of iron.
9 lb. iron per pound coke, 27,000 cu. ft. of air per ton of iron.
10 lb. iron per pound coke, 25,000 cu. ft. of air per ton of iron.

It is customary to provide blower capacity on a basis of 30,000 cu. ft., which corresponds to 75 or 80 per cent. of the chemical requirements with average coke, and a melting ratio of 7.5 to 1. This is evidently ample for any higher ratio.

Obviously, neither the rate of combustion, nor the rate of melting, can remain constant under the varying conditions within the cupola. In fact, it is not fundamentally necessary that they should. But the blower is usually

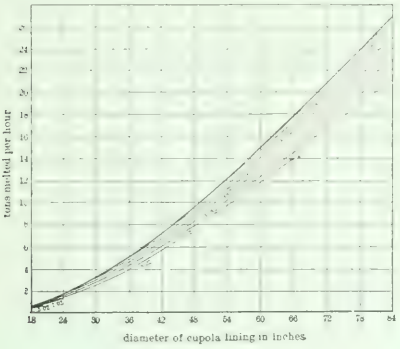


Fig. 8.—Cupola Performance at Different Pressures.

run at constant speed, and delivers uniform volume except as reduced by resistance. As a rule, this reduction, which occurs only in the case of the fan, is relatively slight, for the volume (of which the velocity is a function) varies as the square root of the pressure. Hence, for instance, a 20 per cent. drop in pressure entails only about 10 per cent. loss in volume. Fairly constant pressure with a more regular, though not uniform volume, is therefore to be expected in fan blower cupola practice, as well as a moderate melting rate due to delayed combustion, resulting from reduction in air supply coincident with increase in resistance.

As ordinarily installed the resistance of a cupola will never exceed the pressure which a rotary blower can create if sufficient power is supplied. If no relief valve is provided, or it is set high enough to prevent escape, all air must be discharged through the cupola, hence the volume will be practically constant. As the pressure equals the resistance considerable variation is to be expected during the heat, while owing to the maintenance of uniform air supply, a more rapid rate of melting may be possible than with the fan.

These expectations are usually fulfilled in practice, although the contrast lessens as the proportioning of the blower to the cupola approaches the ideal. So far as the blower is concerned its actual volumetric output, relatively to the cupola requirements, is the determining factor in the melting rate. Fundamentally, the resistance regulates the volume in the case of the fan, while the volume regulates the resistance in the case of the rotary blower. Otherwise expressed, the fan type adjusts itself to the conditions, decreases the power and volume and somewhat reduces the melting rate, while the rotary type in a resistless way continues to force through the cupola the prescribed volume regardless of immediate requirements or power expenditure, and usually maintains the maximum hourly output.

For the purpose of illustration, extreme contrasts between the operation of a fan blower and a rotary blower are graphically presented in Fig. 7. These curves are based on tests reported by H. E. Field at the December, 1904, meeting of the Pittsburgh Foundrymen's Association. The blowers, a No. 10 Sturtevant fan and a 33-cu.-ft. Connersville rotary, were installed for alternate use in connection with a 54-in. cupola. So far as possible the charges were alike in weight and character in both cases. The scrap was heavy, and of such shape as to pack closely. Here are practically identical conditions of cupola and contents, but great contrasts in operation, which show the effect of variation in air volume and pressure. With the fan blower the pressure was comparatively constant, the variation being between 12½ and 14½ oz. in the wind box, with an average of 13.6. The net power ranged from 25 to 38.5 hp., with an average of 31.2. The pressure with the rotary blower varied through the extreme range between 10½ and 25 oz., while the average stood at 20.63. The variation in horsepower was between 19 and 45, the average being 35.8.

With the fan 28.84 tons were melted in 3.77 hr., at the rate of 7.65 tons per hour, while with the rotary blower 2.82 hr. were required to melt 31.5 tons, at an hourly rate of 10.6 tons, an increase of nearly 40 per cent. in output. This reduces to a net input of 4.09 hp. per ton melted per hour with the fan and 2.98 hp. with the rotary blower, an apparent advantage of 27 per cent. in favor of the rotary. By far the larger quantity of air was discharged by the rotary blower, the rate of melting being closely proportional to the volume, as may be shown by a careful analysis of the tests. The rate is low for the size of the cupola, extremely so in the case of the fan, and is in part at least the result of excessive resistance presented by large pieces of scrap. The results shown by these tests emphasize the possible effect of changes in the relation of the blowers to the cupola. Had the rotary blower been of smaller capacity such excessive pressures would not have been necessary to force the constant volume through the cupola, the power would have been decreased and the duration of the heat prolonged, with probable decrease in the horsepower hours per ton. Had the fan been run at higher, but not excessive, speed to permit of passing of a larger volume, which it was fully capable of delivering, the horsepower would have increased, the time decreased and the power

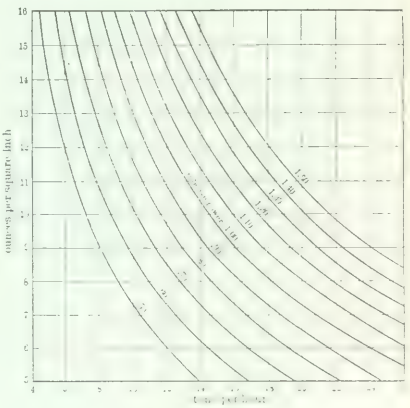


Fig. 9.—Rotative Power for Different [illegible] Rates.

per ton per hour would certainly have more closely approached that required by the rotary blower. In a subsequent test made upon the same cupola equipped with a No. 8 Sturtevant fan the conditions were identical, except that a small amount of very light scrap was charged. The results showed 9.41 tons melted per hour, with an average pressure of 12.5 oz., and a power expenditure per ton per hour less than 80 per cent. of that required with the No. 10 fan.

The preceding indicates the difficulties of exactly proportioning blowers to their work, and the futility of comparing ultimate efficiency upon such limited experiments.

In contrast thereto it can be shown that a No. 10 Sturtevant fan, upon a 60-in. cupola, regularly melted 13.8 tons per hour, with an expenditure of 2.6 hp. per ton, and a No. 8, upon a 42½-in., required only 2.9 hp. per ton upon a total output of 6.46 tons per hour. And likewise that rotary blowers of identical size and quality have shown results both inferior and superior to those here reported.

The higher speed of melting, which, because of its ability to overcome excessive resistances, may be maintained by the rotary blower, is universally recognized, as is also the increased time thus rendered available for molding before the first iron is tapped. But the greater pressure incident to the higher rate is much more severe upon the the lining, while the value of the time gained for molding depends upon individual foundry conditions. The superior mechanical efficiency of the rotary type is more or less offset by much lower first cost and fixed charges on the fan. The necessity of providing power capacity greatly in excess of the average in the case of the rotary blower is not to be overlooked. Neither is it to be forgotten that the brief duration of the heat reduces the difference in annual expenditure for power to a relatively unimportant item. For instance, under the exceptional conditions in the tests shown in Fig. 7, the daily difference in electrical horsepower hours input was only 20.3. On a basis of 10 hr. per day this equals only 2 hp. continuously exerted.

Theoretically, for otherwise constant conditions, the following relations hold for cupolas and melting rates within the range of practical operation: The melting rate with constant volume varies directly as the square of the diameter—that is, as the cross sectional area of the cupola, and directly as the volume, as the square root of the pressure—and as the cube root of the power for a given cupola; the volume varies inversely as the square of the cupola diameter for a given melting rate, and directly as the melting rate for any cupola; the pressure with a given cupola varies directly as the square of the volume—that is, as the square of the melting rate—and as the depth of the charges for a given melting rate; the power with a given cupola varies directly as the cube of the melting rate, and as the cube of the square root of the pressure, and directly as the pressure for a given melting rate and any cupola—*i. e.*, inversely as the fourth power of the diameter for a given melting rate; the power per ton per hour (the operating efficiency) for a given cupola varies directly as the square of the melting rate—that is, as the pressure—and for a given melting rate directly as the rate for a given pressure, directly as the pressure and inversely as the fourth power of the diameter; and the duration of the heat for a total output for a given cupola varies inversely as the square root of the pressure.

These relations might afford practical formulæ were accurate coefficients possible, but the great variety in cupolas, tuyerage proportions, and character of fuel and iron, the difference in charging practice in different foundries, or the variety in the same foundry are bewildering and discouraging. Maximum efficiency in a given case can only be assured after direct experiment. Even though subject to some variation under working conditions, the preceding relations point clearly to the factors that make for maximum efficiency. It is obvious that pressure and melting rates should be as low, and cupola diameters as great as practical considerations will allow.

High pressure is a relic of small tuyere area in a single course, of coal as fuel, of false economy in buying a fan blower so small as to require excessive speed to deliver the required volume, or a rotary blower so proportioned to the cupola that high pressure is inevitable, and above all, of forcing the cupola beyond the economical limit. It is no longer considered creditable to secure the largest possible output from a given cupola; it is better practice to use a larger cupola for the same output. The tendency is distinctly toward moderation, both because of higher ultimate operating efficiency and the improved quality of the castings. Figs. 8 and 9 clearly indicate the economy of such a course. It is to be noted that although the curve of maximum output in Fig. 8 is freely drawn through points representing good current practice, it conforms closely to the relations that the melting rate varies directly as the square of the diameter. Wide variations are to be expected in individual cases. The maximum pressures capable of maintaining the corresponding melting rates under proper conditions vary with the diameter and the hight of the cupola, as well as with the proportions of the charges. Other melting rates are plotted in proportion to the square roots of lesser pressures for corresponding cupola diameters. It is, however, because of the great variety in conditions that the values indicated by this or any other set of curves are purely relative and cannot be made directly applicable to cupola practice in general. The power economy of low pressures and melting rates is clearly shown by Fig. 9. The lines of unit expenditure have been arbitrarily fixed in the middle field of good practice.

The actual melting range of a cupola is ordinarily between 0.6 and 0.75 ton per hour per square foot of cross section. The limits of air supply per minute per square foot are roughly 2500 and 4000 cu. ft., with the mean as representative of fair practice. The possible power required varies even more widely, ranging from 1.5 to 3.75 hp. per square foot, corresponding respectively to 2.5 and 5 hp. per ton per hour for the melting rates specified above. Current practice can only be expressed between limits as in the case of Table 3. Therein is given the ordinary range of the different variables for stated cupola diameters. The specified pressures prevail most extensively in recent installations. In so far as it is possible to determine the melting rate and the necessary pressure therefor, the power may be roughly calculated, from the theoretical requirement of 0.27 hp. to deliver 1000 cu. ft. per minute against 1 oz. pressure. The power increases directly with the pressure, and is practically dependent upon the efficiency of the blower. This will range from 50 to nearly 70 per cent. in a good fan installation, and up to a possible maximum of 90 per cent. with a first class rotary blower. The drop in pressure due to an extended system of piping must not be neglected in such calculations.

TABLE 3
RANGE OF PERFORMANCE OF CUPOLA BLOWERS

DIAMETER INSIDE LINING. IN.	CAPACITY PER HOUR TONS	PRESSURE PER SQ IN. OZ.	VOLUME OF AIR PER MIN CU. FT.	HORSE POWER
18	0.25– 0.5	5– 7	150– 300	0 5– 1 5
24	1.00– 1.5	7– 9	600– 900	2 0– 6 0
30	2.00– 3.5	8–11	1 200– 2 000	5 0– 15 0
36	4.00– 5.0	8–12	2 200– 2 800	10 0– 23 0
42	5.00– 7.0	8–13	2 700– 3 700	12 0– 32 0
48	8.00–10.0	8–13	4 000– 5 000	18 0– 45 0
54	9.00–12.0	9–14	4 500– 6 000	22 0– 60 0
60	12.00–15 0	9–14	6 000– 7 500	30.0– 75.0
66	14.00–18.0	9–15	7 000– 9 000	35 0– 90 0
72	17.00–21.0	10–15	8 500–10 500	45 0–110 0
78	19.00–24.0	10–16	9 500–12 000	52 0–130 0
84	21.00–27.0	10–16	10 500–13 500	60 0–150 0

The trend toward lower pressures in the cupola is reflected in current air furnace practice. The high pressure fan blower with small volumetric capacity has been superseded by the volume fan having ample capacity at much lower pressure. Both volume and pressure are dependent upon the quality of the coal and the rate of combustion. The deep fire lends itself to complete utilization of the air supply, with minimum excess and maximum temperature. Both under and over grate supply pipes should be of ample size to avoid excessive loss by friction, and the pressure should be the lowest which, with a properly proportioned blower, will pass the required volume. This pressure need not exceed 2½ oz. per square inch, and under good conditions should be considerably less. The volume delivered beneath the fire may be kept well down toward the theoretical requirements, not exceeding 200 to 225 cu. ft. per pound of coal. In the crucible furnace still lower pressures prevail, but the air supply is not as effectively utilized. Flexibility in the application and operation of a blower is sufficient to permit of approximation in its size. Unfortunately its size number conveys no idea of its capacity, although rotary blowers are secondarily classified by volumetric displacement. The manufacturers' recommendation, checked by the purchaser's experience, must generally serve as the simplest rule of selection.

The Coometer.

An Apparatus for Analyzing Gases.

Quantities of fuel are wasted in the furnaces of almost every boiler, which might readily be avoided if the firemen had some indication of the efficiency of the combustion, such as the composition of the flue gases would afford. Numerous devices have been offered which aimed to give such an indication by automatically measuring and recording the amount of carbon dioxide contained in the waste gases. The objections to most of them are that they are too much in the nature of laboratory apparatus, being constructed largely of glass and rubber, and requiring some skill to read them and put their indications to advantage; but, worst of all, their records are not made until 2 to 6 min. after the sample of gas was taken. In the meantime there is likely to have been a material alteration in the state of the fire, and the corrections that would seem to be required might be entirely unsuitable. At best it is a matter of guesswork. In the ordinary hand firing, total combustion takes from 3 to 6 min., and it is most important to adjust the damper directly after the coal has been fired.

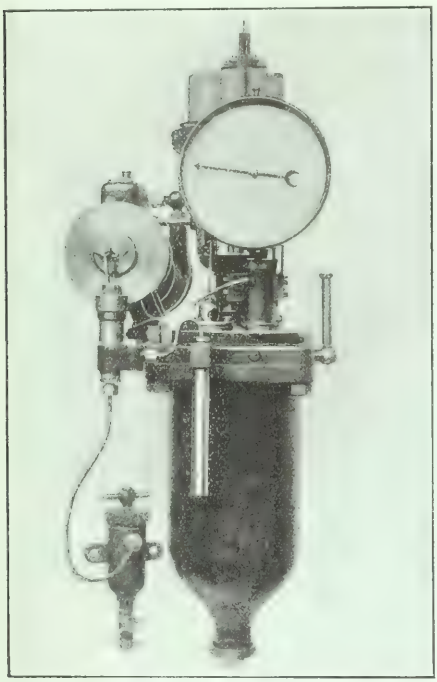


Fig. 1.—The Coometer (CO_2 Recorder). Sold by Michael Pal & Co., London, England.

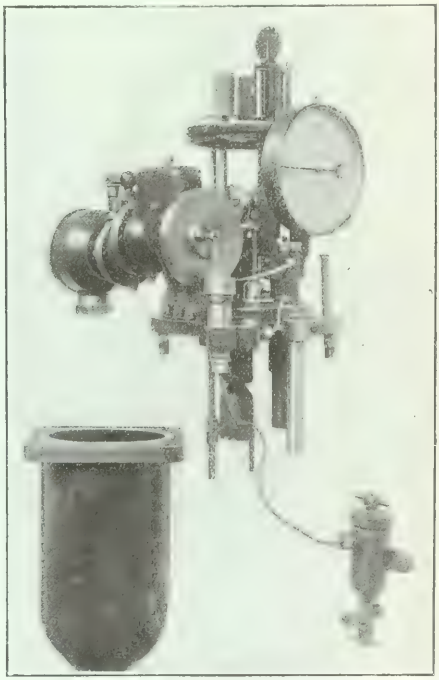


Fig. 2.—Another View of the Coometer with the Reagent Reservoir Removed.

The disadvantages of earlier forms appear to be overcome in a new combustion recorder known as the Coometer, patented by Schlatter & Deutsch and controlled by Michael Pal & Co., Parliament Mansions, Victoria street, London, S. W., England. Like a pressure gauge, it can be mounted in a convenient location in the boiler room, where the stoker can watch its records and indications and be guided in his firing. Since it makes four records every minute, an almost instant and practically continuous knowledge may be had of the condition of the fire. It is substantially constructed, being made of steel, iron and brass, and contained in a sheet iron case, protecting it from dust. Little attention is required to keep it in order.

Figs. 1 and 2 herewith show the instrument assembled and opened, and Fig. 3 diagrammatically shows its principal parts from which the manner of its operation may be understood. A connection is made at Z with a small pipe leading from a point where a fair sample of gas may be withdrawn, and the gas after passing through a filter is introduced at constant pressure when the valve G is opened. This valve is operated by the crank I on the shaft K and is opened while the piston D is making its upstroke. Before the latter begins its down stroke the valve G is closed and the valve H is opened by the crank I I. The gas, which has been drawn into the chamber L, is then forced out through the tube M and disperser B into the bell C. This bell is in communication with the vessel A, containing a solution which absorbs carbon dioxide. The measured quantity of gas, as determined by the volume of the chamber L, is reduced according to the content of CO_2, and the remainder of the gas, rising as tiny bubbles to the top of the bell C, displaces its volume of the liquid into the chamber F, raising the piston E. At this instant the crank I V releases the brake S, allowing the rack R to descend until it touches the rod T. The amount that R descends is proportional to the volume of CO_2 absorbed, and the pointer, which is rotated through the pinion X by the rack, plays over a scale calibrated to read directly in per cent. of CO_2. At the lowest position of the piston D and the highest position of the piston E, respectively, the crank disk I V again tightens the brake S against the disk X, restoring the pointer to zero and holding the rack R while the discharge valve J is opened by the crank I I I, allowing the gas collected in the bell C to be exhausted by the weight of the piston E, and another charge is drawn into the chamber L and analyzed as before. In addition to the indication afforded by the dial a permanent record is made on a drum by perforations on a continuous strip chart which is moved by clockwork. The point records made on this chart are regulated in hight by the travel of the rack R, and the fluctuations of the curve traced show how well the firing has been performed. A steam motor connected to the shaft K completes the equipment, mak-

ing the instrument entirely automatic. As a matter of course, special care is taken that the materials employed for all parts shall not be corroded or attacked by the gases or liquids, and that the cylinder F shall always contain a neutral solution and not an alkali.

With certain modifications, it is stated that the Coometer can be used for registering the analysis of other

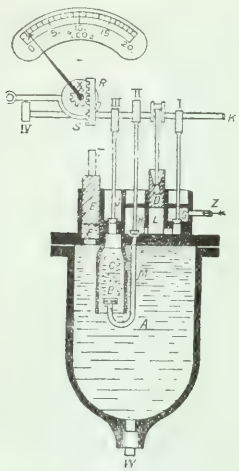


Fig. 3.—Diagram Illustrating the Action of the Coometer.

kinds of gases, such as those in gas engines, gas generators, gas stokers of any kind, and still further applications are possible in chemical, ceramic, sugar and other industries. The American rights to the Coometer have not yet been acquired.

A Gas-Driven Electric Railroad Plant.

The wonderful development that in recent years has taken place in electric interurban traction systems has made this field an inviting one for motive power engineers. Steam and hydraulic generating units which, until within a comparatively short time ago, were used almost exclusively for this service in large installations are beginning to share prestige with gas engines of large capacity in connection with gas producer equipment. A notable installation of the latter type has just been completed by the Milwaukee Northern Railway, having an electric line extending from Milwaukee, Wis., northward to Port Washington, Wis., which was thrown open to traffic on October 28.

The main power plant is located at Port Washington and comprises two concrete, steel and brick buildings, one of which houses the gas producers and the other the engines, generators and electrical apparatus. The gas supply is run outside of and along the entire length of the power house from the producer plant.

The Gas Engines.

The initial power equipment consists of three gas engines, two of which are shown in the illustration herewith, the third not being yet installed. Each of these is of 1000 kw. capacity and consists of a twin tandem horizontal double acting Allis-Chalmers gas engine direct connected to a 405-volt, 25-cycle alternator built by the same company. Although the rating of each unit is given as 1000 kw., both engine and generator were designed with large overload capacities, the engine being capable of developing upward of 2000 hp., and the generator having a corresponding capacity. Each engine has four cylinders, 32 in. in diameter by 42 in. stroke, and a rated speed of 107 rev. per min.

The valve gear is of the standard Allis-Chalmers cut-off type and the engine operates with constant compression, thus tending to insure smooth running under the highly variable loads to which it is subjected. The inlet gear is extremely simple, consisting of a main inlet valve of the single beat poppet type, eccentric operated, thus insuring long life and quiet running. The mixture of the air and gas is thoroughly effected before entering the cylinder by a patented annular mixing chamber located under the main inlet bonnet; the design and operation of this device is such that, at the instant of closing of the main inlet valve there is practically no explosive mixture left outside the cylinder. The gas valve is of the double beat poppet type controlled by a variable lift rolling lever operated by a single link connection to the main inlet gear. The life of the valve and consequently the amount of gas admitted and the time of admission is regulated by the governor. The exhaust gear is of the single beat poppet valve type, eccentric operated, and is in this respect a duplicate of the main inlet gear. A distinctive feature of the engine is the location of this exhaust bonnet with its valve at the bottom of the cylinder, where all the dirt is removed by the action of the exhaust gases, and the provision of a substantial jack to lower the entire exhaust mechanism out of place to allow inspection and regrinding of the valve. By this means the valve chamber, with the valve and its entire operating mechanism complete, may be swung out to one side, where it can be reached by the crane hoist. The removal of one pin, either in the inlet or exhaust mechanism, is all that is necessary to allow the removal of either the inlet or exhaust bonnets, with their valves and entire operating mechanism, without disturbing any adjustment whatever.

The igniters are electrically controlled and so arranged that the time of ignition may be regulated by a single hand wheel. Direct current at 60 volts is used in the ignition system. Duplicate igniters are provided at each end of the cylinder to insure prompt firing of low heat value gases and also to avoid the danger of shut down due to short circuit. The entire ignition system, from the motor generator set which furnishes the current to the electrically operated igniters, is designed with extreme care to make its action positive.

The air starting device consists of a small poppet inlet air valve at each end of each cylinder, with a main distributing valve operated by the layshaft. Air is admitted to each cylinder in turn at what would be the explosion stroke. As the high compression carried prevents the engine from stopping on the dead center, this arrangement insures the prompt starting of even a tandem engine without the use of a barring gear. The Port Washington engines being twin tandem will, of course, start from any position.

Simplicity of design, solidity of construction and quiet operation are features claimed for these engines. They are exceptionally heavy and rigid, the weight being concentrated in the frame cylinders and tie pieces in the direct line of stresses to which an engine of this type is subjected. In the design of the engine frame the difference between American and European practice in gas engine construction is illustrated. This design provides a side crank in place of the double throw crank, which is the standard practice abroad. Although the stresses admitted to the side frame in a side crank gas engine are very great they are not more severe, even in the largest sized units, than have been successfully taken care of in steam engine practice. The jaw, which is subject to a particularly severe stress, is so formed as to insure maximum strength of the casting and is reinforced by two steel tie bolts carried above the shaft, which are of sufficient size to sustain their proportion of the load without appreciable elongation. This construction entirely eliminates any bending stress in the frame at this point. Subjected as they are, at the present time, to an extremely variable load swinging from ½ underload to 50 per cent. overload, with momentary peaks greatly in excess of this, the engines handle these varying conditions with practically the same freedom from vibration that characterize their operation under normal conditions.

All wearing surfaces, including the main bearings, slides, crank and crosshead pins are arrangged for a continuous oiling system; the cylinders are lubricated by carefully timed admission of cylinder oil injected by Richardson sight feed oil pumps. Water for the cooling sys-

tem, which includes ample provision for cooling the cylinder walls, cylinder heads, piston, rods, exhaust valves and bonnets, is circulated by means of two Norris and two Deming pumps, each driven by an induction motor.

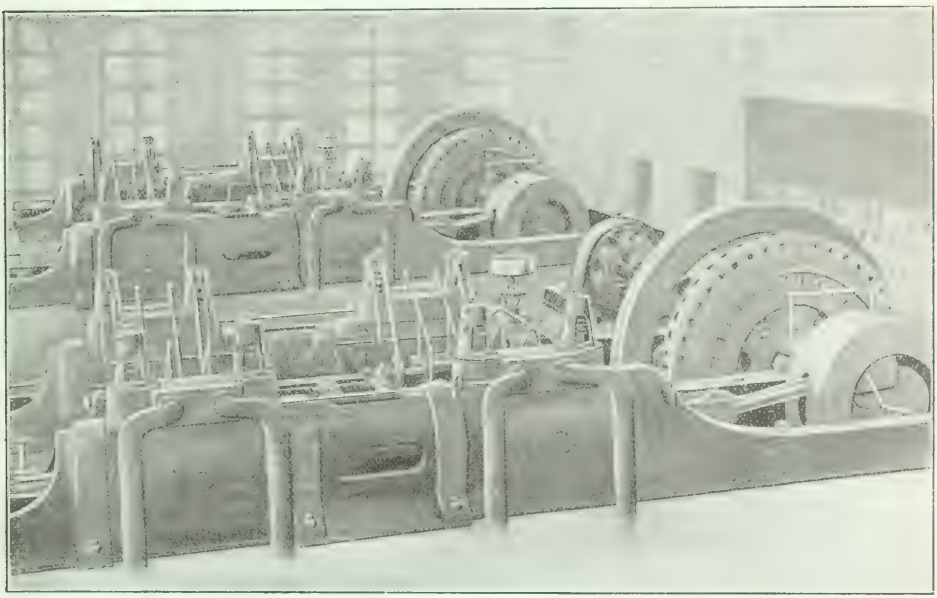
The Gas Producers.

Gas for the engines is furnished by producers of the Loomis-Pettibone type. The present installation comprises two generating units, each consisting of a pair of gas producers connected to a common economizer, wet scrubber and exhauster. Gas is delivered into a holder of 30,000 cu. ft. capacity. At its normal rating the present plant has a producing capacity of 4000 hp., which may be increased to take care of 25 per cent. overload for five hours at a stretch. The apparatus is contained in a single brick building with a 19-ft. basement and the operating or charging floor is about 6 ft. above the level of the ground outside the building. A coal tank 50 ft. long is located in the operating floor with openings in front of the charging doors, thus bringing the fuel to points convenient for charging. Being operated on the down draft principle, air is admitted through the charging door at the top of each producer, the necessary suction being produced by an exhauster located beyond the wet scrubber. Reverse runs of steam, generated by the gas passing through the economizer, or waste heat boiler, are occasionally made for breaking up the fuel bed. The water gas made by this process, mixed with the producer gas in the holder, slightly enriches it. An average calorific value of 125 B.t.u. per cubic foot is obtained in the gas delivered from the holder.

Electrical and Other Equipment.

The electrical equipment consists of a three phase alternating current generator of 1000 kw. normal capacity, direct connected to each engine unit, and delivers current at 405 volts and 3000 alternations. The revolving fields are of special construction having sold cast steel field poles bolted to a heavy cast iron spider; they are, therefore, easily removed when necessary to get at the field coil. These generators are designed to deliver their rated output of 1000 kw. continually at 90 per cent. power factor, with a rise in temperature not exceeding 35 degrees C.; and with 50 per cent. greater current for two hours following a full load run, a temperature rise not exceeding 50 degrees C.

The greater part of the road's equipment, including all of its power and electric machinery was built by the Allis-Chalmers Company. Auxiliary apparatus furnished by other concerns include a coal handling plant supplied by the Industrial Works, Bay City, Mich.; power house and car repair shop built by the Whiting Foundry Equipment Company, Harvey, Ill.; oil filters from the factory of the Van Dyck-Churchill Company, New York City; trucks constructed by the American Locomotive Company, Schenectady, N. Y., and the New York Car & Truck Company, Kingston, N. Y., and shop machinery from the Niles-Bement-Pond Company, New York City.



Two of the 2000 Hp. Twin Tandem Allis Chalmers Gas Engines and Direct Connected Generators in the Power Plant of the Milwaukee Northern Railway.

Results with Large Gas Engines.

Replying in London *Engineering* to some criticisms on the economy and reliability of large gas engines, Ehrhardt & Sehmer, Schleifmühle, Germany, say: "There is no doubt that the four cycle, two cylinder tandem engine, as built here, is just as much to be relied upon as the best modern steam engine. As far as 'getatableness' is concerned, your readers may be interested to hear that our engines can be, and are, thoroughly cleaned and inspected—*i. e.*, pistons taken out, cylinders cleaned, valves removed, &c.—in a day. The bugbear of grinding in exhaust valves exists only in imagination, as this is not necessary from one year's end to another. There are no three or six cylinder engines built over here." In the same connection the following quotation is made from a paper prepared recently by Fritz Sellge, manager of the Differdingen Iron & Steel Works: "In November, 1905, our coal consumption under boilers was 5300 tons; the iron production, 21,400 tons; of this, 70 to 80 per cent. was converted into steel and rolled in the mills to partly or wholly manufactured material, and about 20 per cent. was turned out as billets. After our gas engine plant was completed, the coal consumption steadily declined, and to-day is only about 500 tons per month, whereas the iron production amounts to 30,000 tons, this iron being still further manufactured as before. The coal costs 18 marks per ton delivered, so that the saving can easily be determined. Besides the money saved here, the expense of unloading, firing and attending to the boilers is also very largely diminished."

The Positive Driving System for Automobiles.

The Principal Causes of Automobile Accidents and the Means for Reducing Their Frequency.

BY M. C. KRARUP, NEW YORK.

Attempts to check the frequency of accidents in which automobiles play a part have been so singularly unsuccessful that one may doubt if their principal cause has been discovered. Usually, excessive speed is considered the root of the evil, because relatively high speed is the most conspicuous characteristic by which automobile traffic differs from other traffic on the highways, and because it is self-evident that extremely low speed would make accidents less probable.

Together with many other features in the life centering in the automobile, the liability to accident is commonly taken at its face value and looked upon as a natural outgrowth of the automobile principle. From the standpoint of the general public, this view means an indictment of automobiles and their users, while from the other side it means, as frequently said in published interviews, that the public "must adapt itself to the new conditions." As the increased mortality from accident is no less pronounced among those who use automobiles than among pedestrians, this view is not always considered unreasonable, its holders accepting the supposition that eventually caution, and thereby avoidance of fatalities, will be learned on both sides. But, unfortunately, the facts of record do not confirm this supposition. Though the dominant type of automobile has been practically unchanged for the past five years, and the public as well as the user has had ample time to become accustomed to its peculiarities, the accidents continue to multiply, and at the same time a widespread contempt for legally enacted speed regulations is reflected in the columns of every journal commenting upon automobile affairs.

Speed No Measure of Danger.

The difficulties in basing traffic regulation upon speed restriction are many and are becoming gradually understood. A legal speed limit sufficiently low to insure safety destroys the purpose and value of automobiles to an extent which is not tolerated by those who can see that the future depends, for improvements of traffic, upon the development of mechanical locomotion and not upon a return to animal power; and it cannot be enforced. A high limit does little to prevent accident and even tends to exculpate those guilty of inflicting injury at moderate speed or at a speed which cannot be determined. Against mixed speed limits both the objections referred to hold good. In some States and countries "excessive speed" is prohibited—a term upon the meaning of which no agreement can be reached. Those who would justify a speed of 30 to 40 miles per hour on the open highway, by the infrequency of "obstacles," seem to leave out of consideration the suddenness with which an obstacle, and often a human obstacle, may at times appear. The desired adaptation to new conditions seems decidedly one-sided in a sudden encounter of this kind, and poetic justice receives its tribute only when two automobiles meet at a turn in the road or when the obstacle unexpectedly encountered happens to be a rapidly moving locomotive.

Not only does disagreement with regard to what constitutes excessive speed under different external circumstances render legal speed regulation on this basis ineffective for preventing accidents. The fact that danger from high speed may be reduced to a small fraction of what it usually is, by high skill and intense watchfulness on the part of the driver, and that, on the other hand, it may be increased almost infinitely by a temperament prone to confusion in emergencies, or by the influence of alcohol, by engrossing emotions or by simple preoccupation of the driver's mind, accounts very largely for the contempt in which any law is held that prescribes certain speed limits; or even a law according to which it is assumed that judge or jury may determine from a known set of external circumstances whether a certain speed known to have been maintained was permissible or not.

Realizing the absurdity of measuring responsibility, civil and criminal, by a speed yard, so long as a yard of speed may mean anywhere from an ounce to a ton of real danger or real recklessness, one begins to look for other causes of the insecurity of automobile traffic; causes which, while less obvious, should show themselves more fundamental than high speed by a closer correspondence between cause and effect.

The Traffic Regulation in France.

In the search for these more fundamental causes it is not always forgotten that high speed in itself at present constitutes an offense against the slower moving members of the general traffic by disturbing that tranquillity which is rightly considered one of the boons of civilization and entitled to protection, but it is maintained that when the infliction of actual bodily injury ceases to be common the sense of security, wherein tranquillity consists, will follow security, whether the latter is obtained by speed reduction or by other means. Meanwhile, "adaptation to new conditions" must consist in the temporary sacrifice of tranquillity, while the modern problem of reconciling high speed traffic with safety is being worked out. This logic lies behind the methods adopted in France for safeguarding the traffic; speed being practically unrestricted, while severe sentences are meted out to those who by causing accidents show themselves unfit for driving automobiles, whether the reason for their unfitness be shortcomings in skill, in temperament or in character. The license card which every driver (owners included) must carry receives an annotation of every accident of which he becomes a party anywhere in France, and whether he is held culpable or not, and in case of repetition he finds it exceedingly difficult to get the most plausible explanations of innocence accepted.

In aiming to stamp out insecurity, France thus recognizes that speed in itself is not the most fundamental cause of danger, but is largely neutralized by mental factors, which in the average person assert themselves with an intensity that grows with the speed. By trying out the skill of those who would be licensed to drive, and eliminating by substantial punishment those whose personal characteristics constitute a danger in the traffic, her authorities seek to establish a safe *modus vivendi* on a basis of facts of record rather than on a preconceived theory to the effect that high speed is the one feature to be suppressed. The automobile traffic in France is thus both speedier and safer than in other countries, though not yet safe enough. Reprehensible accidents are greatly reduced in number, but blameless accidents are still common, and sentences are frequently imposed which seem excessively severe.

Dangers Due to Violation of Natural Laws.

Are there, then, factors still more fundamental in determining the safety of traffic than skill, temperament, character and habits of the drivers? Laws aiming to regulate these factors must assume certain average standards, above which the law can ask no more and ceases to be applicable. With full justice such laws can be brought to bear only against a small minority of drivers, unless in reality automobiles should be condemned as unfit to be driven by the average person. By this reasoning one finally reaches to the automobile itself—though not the automobile principle—as the possible cause of unsafety. There may be factors of unsafety in automobiles which apply in equal degree to all drivers; there may be physiological laws operative in all human beings which interfere with the safe operation of automobiles, as automobiles are usually constituted. That would be more fundamental. Any form of traffic regulation ignoring an always existing conflict with an inexorable natural law, even if that law relates to something so intricate as the

relations between mental and physical mechanism, would never be likely to give wholly satisfactory results.

The logic of the situation compels a search in this direction for a new, hitherto unrecognized and strong factor of unsafety; for some restriction which nature, mental and physical, places upon the use of automatic machinery for locomotion before such use may be considered safe in traffic of the highways, but which is not observed in the automobile.

How "Innocent Accidents" Take Place.

Clues are so plentiful that one starts by wondering that they have not been followed. It is generally conceded and in itself evident that the dangers of speed are neutralized as much as possible only when the condition of the driver's mind is expressed in such terms as watchfulness, unremitting attention, readiness to observe and readiness to act in accordance with the observations. It is also an uncontradicted fact that where the high pressure of difficult external conditions, such as in congested city traffic, enforces unceasing watchfulness, there speed is of itself reduced, and, though it remain relatively high, accidents very seldom take place, though just there the danger appears to be greatest, and there the so-called narrow escapes—which in dense traffic are virtually little more than optical delusions—are most frequent. And it is known that under these circumstances the driver is in unceasing rapport with his clutch and brake pedal. The real accidents take place where the street or road seems clear, and when an unexpected occurrence happens to coincide with a slip in the driver's attention—speaking of those cases only which cannot be charged directly to lack of ordinary skill, faulty condition of the vehicle or objectionable personal characteristics of the driver. These may be taken care of by preventive and punitive legislation, as in France.

Slips in attention! Legislation may prevent positive wrongdoing in a measure. It may check gross carelessness, but can it make weak average men infallibly and minutely attentive, unless it does what close city traffic does automatically where most congested—namely, reminding the driver unceasingly by an uninterrupted and everchanging succession of appeals directly to his senses? To this string of forcible reminders he responds by keeping his foot on the speed reduction pedal, acting or full ready for action till the street clears and the reminders cease.

The Vigilance of a Normal Person.

Attention, as an attitude of the mind, was formerly considered mostly depending upon volition, but the modern schoolmaster or psychologist knows that it depends on facts, mostly external facts, and must be a spontaneous result of these. Moreover, all know that monotony dulls attention, and physiologists know it as a law that sensations—meaning impressions upon the senses of man—must be continuously varied in some manner or degree in order to reach consciousness continuously. They know it to be the heart and essence of mentality to crave constantly fresh associations, and that the normal mind invariably wanders from a sensation which is unchanging. But to those not familiar with the uncompromising nature of this law it may be difficult to become fully convinced that no man or statute law can set it aside, and it may therefore be left to authorities in mental science to pronounce upon the somewhat abstruse application of this natural law to the case which arises when the automatic automobile rolls monotonously forward without any organic connection between its motion and the driver's body or volition, and without apparently demanding any other attention than a slight steering movement which has become second nature.

There seems little need for scientific data, however, for reaching the belief that the attention of any normal person under these circumstances is likely to flag and to drift more or less to other subjects than the apparently wholly satisfactory speed of the car. In fact, it seems that the more mentality he possesses the more it will be likely to drift, and then, when the unexpected happens, the question is not how law-abiding he is, but how far he has been taken away from readiness to act with regard to the speed of his vehicle.

Conditions for Safety and Means of Control.

Now the clues already point directly to one fruitful cause of accidents and to the means for preventing their frequency. Safety demands that the driver's attention shall be kept keyed up to complete responsiveness to anything that may happen, and the natural laws of mental mechanism declare that attention can be so kept up only by a constant receipt of sense impressions related to the movements of the vehicle. Such a continuous interaction between the driver and his work is now mechanically established with regard to the proper direction of an automobile, through the fact that the latitude for deviation to the sides is so very small that the hands of the driver are compelled to rest upon or grasp the steering wheel continuously; and in very close traffic the driver temporarily establishes a similar interaction with regard to speed by keeping his foot responsively on the clutch pedal, as before referred to, overcoming the resistance of the clutch spring more or less, according to the speed requirements. But when the clutch is set, the spring resistance ceases and the interaction disappears. Thereafter, as long as the road seems fairly clear, the speed of the vehicle is influenced only by the road conditions and by intermittent, purpose determined acts of the driver. That this is so is wholly a matter of a design feature thoughtlessly copied from locomotive, steamship and stationary engine practice long ago, when automobiles were in their infancy and no adequate thought had been given to questions of the safety of the general traffic.

If Steering Were Intermittent.

Nothing probably illustrates the value of continuity in control as strikingly as would a car that was steered intermittently, on the plan actually adopted for speed control. Imagine it running while the driver sits perfectly idle. Suddenly something appears in the car's path, and the driver quickly grasps the steering wheel, turns it just enough to avoid a collision or the ditch, then lets go of the wheel again until another mishap threatens, grasps it again for a moment, and so on! Ruts and roughness in the road he disregards because it is too much trouble to grasp the wheel when not positively necessary for avoiding damage. The course of a car on this plan of intermittent control of its direction would be a zig-zag line with sharp turns, and it is readily perceived that the safety would not be great, even if the driver were unusually skillful in grasping the steering wheel just in time.

When in actual automobile practice he manages to grasp the speed levers on this plan just in time in 99 cases out of 100, his measure of success in this respect is doubtless due to the fortunate fact that the steering gear is not operated on the same principle and, therefore, does not exact a conscious effort which would distract his attention from the more difficult speed adjustment. And when in one case out of 100 or out of 1000 he fails to gauge his speed right for the avoidance of a collision, and one of those accidents takes place whose number in the aggregate is so appalling, it seems justifiable to infer that one of the principal causes is the absence of any element in his speed control compelling the same degree of uninterrupted attention that the steering gear exacts or that congested city traffic forces upon him temporarily with regard to both steering and speed.

Subconscious Effects of Intermittence.

Apart from the unavoidable physiological effect of undermining the foundations of vigilance in all drivers the present system of intermittent speed control has certain other effects toward demoralizing volition of scarcely less importance, and which may be observed on streets and roads every day. While the skillful driver instinctively steers clear of ruts and obstacles in the road, if they may be be avoided by mere steering, he does not instinctively slow up to ease the car over roughness, or at turns or crossings or in other places where unseen dangers may be anticipated. The act required for a speed change, and especially for a speed reduction, is a definite incident in driving, not an integral part of driving (except under those conditions several times referred to when the driver in close traffic feels impelled to keep

his foot responsively on the more or less slipping clutch). To cause this definite act something more definite than a fleeting impression is required. Between no action and action a physical effort must intervene, and this physical effort is not made unless the surrounding conditions render it plainly imperative.

In the case of a fleeting impression of doubt, as might be caused by something dimly seen in the road without certainty that there is really anything there, or by a sound which reaches the ear faintly without rousing conscious attention, no action is taken, partly because any action by clutch, brakes or gear change would have an effect out of all proportion to the vagueness of the sensation and to the remoteness of the chance of necessity for action, and partly because the action itself is so complicated, relatively speaking, and subject to so much choice of means (throttling with or without adjustment of the spark, slipping of clutch with or without brake effect, emergency brake, any one of several gear changes constituting the various means at command), that any subconscious impression upon the driver's mind is insufficient to overcome the mental inertia and cause the action to be taken.

Strong action is not caused by a weak impulse. Skill that has become second nature undoubtedly helps somewhat, especially in the control by throttle, which requires less initiative and physical effort than the other means, but the throttle in a gasoline car is a weak agency for retardation, having no direct effect on the car's momentum, and the degree of skill required for good results is not adapted for public regulation, because in trials of skill the very fact of being on trial stimulates consciousness temporarily, exactly as do the natural difficulties in congested traffic. In everyday driving the finer sensibilities of the driver, which all operate subconsciously, are nullified, so far as any influence upon the speed of the car is concerned, by reason of the grossness of the operating mechanism, which obeys only conscious action. When the driver hesitates the car goes ahead, though it ought to be slowed up in accordance with the hesitation, because the hesitation represents a possibility of trouble, which is a possibility of a necessity for slowing up.

Dangers of Prevailing Control System.

Summarizing, it is now clearly seen that the prevailing system of intermittent speed control involves two well defined dangers to traffic; it undermines the quality of attention or vigilance and thereby destroys readiness for suitable action in emergencies; it superinduces neglect of indefinite factors of danger and thereby, in addition, inculcates habits in driving which have the same effect as temperamental or moral recklessness would have. Both dangers are necessary results of the operation of natural laws and beyond reach by statute law.

Continuity of Speed Control Demanded.

The remedy for these dangers is, of course, much simpler than if the question were of influencing the minds of all who use automobiles by admonition or threat of punishment. What is required for safety is, first of all, the adoption of continuous speed control instead of intermittent speed control, and this is to be accomplished by incorporating in the construction of automobiles an instrumentality which, by the laws of mechanics, must be in continuous and graduated interaction with the driver's body and mind, and the effect of which must range from that of mild throttling to a severe brake effect, the latter coming into action when the device is not actuated by the driver.

Legislation to take care of incompetence and criminal inclinations need be only subsidiary.

The Principle Previously Acknowledged.

This principle of safety is acknowledged in practice when the locomotive engineer under dangerous circumstances keeps his hands cautiously on throttle and air brake, though he has no steering to attend to. In steam automobiles it might be easily incorporated by rendering it necessary for the driver to keep his hand or foot on the throttle to prevent it from closing. One well-known American car was once equipped with a foot button which shut off the gas when not depressed, but its effect was not radical enough for emergencies and the operation of it was burdensome. New developments in pedal control and commercial competition compelled its abandonment. In numerous cars the accelerator throttle must be forcibly held open to produce maximum speed, but this precaution, while an acknowledgment of the right principle, is applied only to top speeds, usually above 40 miles per hour.

A Simple Mechanical Remedy.

An extremely simple method for compelling the mentality of the driver, which constitutes the fundamental source of safety against the irresponsible machine to remain always active and to get an expression in the speed of the car of his doubts and hesitations, would consist in reversing the usual method of operating the clutch or clutches. They now grip when the driver does nothing. When the driver presses the pedal the clutch is released, cutting off the motor power from the wheels (and often throttling the motor automatically), and when he presses more, or presses another pedal at the same time, brakes are set.

By exactly the opposite action—the spring releasing the clutch, throttling and applying the brakes, when itself released—constant pressure of the driver's foot would be required for keeping the car in motion, and in case of hesitation or doubts the natural relaxation of his foot pressure would bring the spring into graduated action to slow up the car, and, if needs be, stop it. The driving operation in close traffic would be exactly similar to what it is now—a constant play of the clutch pedal—but in the open the driver would still be compelled to remain in active touch with his power. The car would automatically stop if the driver dropped dead, but this is not highly important. While alive, however, he would become a real driver, rather than the watchman of an automatic, self-moving machine.

Drivers probably would not like this expedient at first, but by complying with the natural physiological conditions for insuring watchfulness in drivers, it would save speed from most of its dangers, besides contributing to the driver's voluntary reduction of speed to reasonable limits. A few thousand lives would be saved and many drivers' lives among them.

More Than One Remedy at Command.

Mechanically, the reversal of the clutch mechanism would be nothing more radical than a step in an evolution; a step rendered possible by the advance in clutch construction now permitting the clutch to be operated frequently without risk of spoiling it or of unexpected seizing or slippage. The same advance is applicable to brakes, however. The traditional objection to "braking against the motor," while still honored, no longer holds good, since it is possible to construct brakes which are quite as subtle in adding resistance as the throttle is for reducing power; and the reversal of the clutch is therefore not the only means at command. The instrumentality for securing the safety of traffic may be a finely graduated brake, compounded with the clutch only in such manner as to secure against accidental stalling of the motor, but capable before the action interferes with clutch and throttle, of retarding the momentum of a fast moving car considerably whenever the pressure of the driver's foot upon the brake is reduced. This would obviate frequent low throttling of the engine, which is now a refractory cause of irregular lubrication and the consequent emission of blue smoke, constituting a nuisance in the traffic.

Involving no mechanical difficulties and less restriction than any other plan for safeguarding the traffic, the Positive Driving System, as here proposed, or in some other form, giving control by hand rather than by the foot, would probably long ago have been fully recognized in practice were it not that competition absolutely prevents any one manufacturer from embodying the principle in his product until other manufacturers are required by law to do likewise, the law also serving to protect the system against any interference by means of ratchet stops and similar devices to which the unscrupulous might resort.

The Cincinnati Pig Iron Trade in 1907.

BY JAMES A. GREEN.

Business these last few weeks in pig iron offices has been so insufferably dull that the clerks amused themselves one day in writing limericks. As models of poetry their work deserves no commendation, but as describing the events of 1907 they do it so concisely that little is left to be desired. The limericks were all along the lines of the two that follow:

When the year began we were feeling fine.
Eating lobsters and drinking wine.
Oh! Isn't it strange
How quick things change?
Now it's corn beef and cabbage for mine.

Pig Iron was a prince of high degree,
And he was IT most certainly;
But too soon, alas!
It came to pass
That a pauper he found himself to be.

Another resort to pass the time was the making of a fake calendar, as follows:

January—Feeling out of sight.
February—All sold up.
March—Nothing can hurt us this year. We have got things cinched.
April—My! What a month! Everything coming our way!
May—No iron left for anybody.
June—It is funny, the buyer is a little quiet.
July—Oh, well, this was vacation month, and what could you expect?
August—It feels as if somebody were hitting us in the back.
September—Hello! A change is coming over the spirit of our dreams.
October—Panic.
November—Where are we at, anyhow? Who threw that brick?
December—Requiescat in pace.

Now that the year has passed and gone, it seems almost impossible that we could have felt in the early months of the year such an overwhelming confidence in the situation. In January, Southern No. 2 Foundry was selling for immediate shipment at $23, Birmingham, and Northern was bringing $24 at furnace. Prices have now receded so that No. 2 Foundry has been sold at $14, Birmingham, and less than $17 has been made on Northern iron.

How the Year Opened and Closed.

The progress of the iron trade in the opening months of the year was like the progress of a victorious army with banners, and now that same victorious army, panic-stricken, is in dire retreat, banners draggled in the mire, and gloom and disaster on every countenance.

Of course the year has been a grievous disappointment. It has not ended well, and its happy beginning is all but forgotten in the calamity of its finish. There is one consolation to be found in the situation, however, and that is, provided it is any consolation, pig iron itself is not to blame. The ironmasters of the country did not precipitate the trouble. While prices were high, yet at no time did the excessive prices quotable on spot iron represent anything like the prices which consumers were paying for the bulk of their iron. The greater part of Southern iron delivered during the first nine months of the year was sold on long time contracts at $18, Birmingham, and the Northern iron ranged from $18 to $20, at furnace. Considering the general market, these figures were not particularly out of line, nor did they work any serious hardship on consumers. Of course there were individual cases where melters of iron did not cover themselves by contract and depended for their supplies on orders they were able to pick up from time to time. These men, undoubtedly, were severely handicapped. Against instances of this kind, however, it must be remembered that the furnaces had a large amount of iron sold as low at $14, Birmingham, and the Northern furnaces very considerable quantities of iron as low at $16, which they carried over into 1907 and which they delivered at these prices. So it may be safely said that as a rule consumers were not in a position to complain regarding the cost of their iron. Pig iron to the consumer was not at the prohibitive price which throttled business.

Not only that, but general business was excellent. Most melters of iron can look to the first nine months of 1907 as one of the most profitable periods in their career. And the odd part of it in retrospect is that the prosperity we were all enjoying seemed on such a permanent and substantial footing. The crops were good; there was peace at home and abroad; no great political questions were disturbing men's minds; and if ever our tremendous industrial development sailed before a fair wind, with sunny skies and a safe harbor in prospect, it was in the past year. There were scores of consumers who felt that, like Job, they would have to tear down their barns and build greater. They had all they could do, and they saw ahead of them more and more.

Conservatism at the Hight of Activity.

Producers of iron were perfectly tranquil. They were running at the maximum rate and getting prices that left little to be desired. Their order books were full to the end of the year. Yet in spite of the general feeling of confidence it was odd that there was no buying ahead for 1908. That was the one real tangible evidence in August, when usually a considerable quantity of iron is bought for delivery in the coming year, that the surface indications were not all they seemed to be.

Buyers talked of their excellent trade, and that things were certainly going to continue well with them, but they hesitated to obligate themselves for the future. Some decided effort was made to sell iron for 1908, but even when inducements were offered in the way of lower than the ruling prices the trade refused to purchase and persisted in waiting. And so when the slump came it found furnaces with order books free for the future.

There never was before just such a state of affairs as now exists in the iron business. Heretofore, when there has been a decline in prices it usually has been a more gradual affair. But this came in a night like a sudden killing frost in September. In the process of declines in other years furnace and consumers' yards alike have been well filled with iron. When previous declines occurred, the cost of manufacture has had time to adjust itself gradually to a falling market, so that furnaces have been able to keep on running even if the margin between the cost of making and the selling price was dangerously close. But on this occasion costs were at the top. There was never a year before when costs were so high, and when even with high prices the furnaces did not have as large a profit as was supposed. Ore and coke were both at the top and labor was being paid at the utmost rate. Not only was labor being paid very high wages, but it is the universal testimony that the efficiency of labor was at its lowest ebb.

Inefficiency of Labor.

It seems to be an economic law that the more labor is paid the less it produces. As an example, an ironmaster in Virginia operating an old-fashioned stack, said that in the former days of struggle and adversity, when he only paid his men a fraction of what they received in 1907, three men easily did a certain task where in 1907 six men were needed, and the six grumbled that they were overworked.

Another instance of the absolute working of this law is found in a Virginia ore mine where in November the miners suffered a reduction not only of 15 per cent. in their wages, but in the number of men in the mine, and yet, strange to say, the output of the mine at once increased. Of course the miners immediately felt that they must work, that there would be a survival of the fittest, and only the best men would be retained, hence they strove to do their best.

A prominent ironmaster in Birmingham figures that labor in the South in 1907 was getting from $2.50 to $3 for the same work that was furnished in 1900 for $1. Labor has constantly been insistent in its demands for more money. Higher wages have been paid right along, there having been three advances in the South in the last three years. Each advance has made labor more in-

dependent and less efficient. The average laborer has not made more than half time. In other words, at the mines and furnaces there have been of late twice as many names on the books as there should have been. A man working three days and stopping three days has but little heart in his work. He loses touch. The constant uncertainty regarding labor has been extremely trying. The Birmingham iron men for two years have never been sure from day to day that they had full shifts. And this has made the expense of management and supervision excessive. And in the South the shortage of labor has been pronounced, not because of a lack of men, but because of a lack of willingness to work. And while these hard times are a grievous burden, yet in one way they are a distinct relief, as they will make labor a tolerably certain quantity.

The Decline Came Like a Stroke of Paralysis.

But I started out to say that this decline in prices was so sudden that it was like a stroke of paralysis. Business simply stopped. Without warning the price of iron sank below the cost of production. And money was so tight that it was impossible to keep furnaces in operation on the indefinite hope that things would soon be better. Consequently, there was such a sudden and simultaneous shutting down of furnaces as the country has never before seen. And they went out with no iron on their yards. Consumers are in precisely the same condition. There is in America to-day no great reserve stock of iron on which to draw.

It is the intention of makers of iron not to pile any surplus output on the yards. They are going to stay out until the demand springs into life again. And of course since the panic began there has commenced the slow process of the readjustment of wages and costs, so as to get the expense of making iron down to a point where it will harmonize with the changed condition in the trade.

It may be accepted as a fact that the days of very cheap iron have gone forever. To tell the truth, it is questionable if iron was ever produced on quite as low a basis as is generally believed. There are many tales of iron being made at $6 per ton f.o.b., Birmingham, but in all probability bookkeeping details of the iron made in 1893, which was said to have been that cheaply produced, were not complete and various items of large expense were omitted. Yet in those earlier days the makers of iron were favored with ores that cost much less to get out than now and everything was on a cheaper basis. There is not the slightest prospect of ever again matching the genuine records for cheap iron that were made in 1893, 1894 and 1895. In those years an immense amount of raw material was used up without any adequate return. Many companies did business for the mere pleasure of doing it. A juster estimate is now placed upon the value of raw materials, and they will not again be long sacrificed in a fruitless effort to simply keep things moving.

And on this occasion, while the plants most favorably situated to make cheap iron will naturally profit by such a situation, yet it is not to be anticipated that reckless competition will consume, without gain to the owners, ore and coal that can be made profitable in the future by a waiting policy. So, while the prices of iron will inevitably be made cheaper by the panic of the fall of 1907, yet there is a dead line beyond which prices can hardly go.

The Most Remarkable Development of the Year.

Perhaps the most remarkable development of the year was the haste with which producers recognized changed conditions in the trade with practical unanimity in the effort to meet them. It was a very wonderful exhibition from an industrial standpoint to see the sudden cessation of activity all along the line. Furnaces were blown out by the wholesale and foundries stopped in almost the same proportion. It reminds one of a rich man who had been spending $25,000 annually on his household expenses, and who all at once realized that his income was in jeopardy and reduced his outgo to $5000.

In the iron trade itself nothing is seriously wrong. The business certainly has not been overdone. This is evident from the fact that for much of the year American furnaces were not able to take care of the local demand, and many cargoes of English iron were imported to make up the home deficiency. This foreign iron was sent as far West as Chicago, and in the early summer about half of the foundry iron used on the Atlantic coast came from abroad. And marvelous—or ridiculous as it may seem—one cargo of foreign iron was brought into New Orleans and shipped from there 350 miles by rail to Birmingham for use in a pipe foundry. This does not look as if there were too many furnaces or as if overproduction of iron could be blamed for the year's disastrous ending. On the contrary, it is the well founded opinion of the best men in the trade—and the events of this year abundantly prove it—that our consumptive capacity in good times is in excess of our productive capacity. In the South, particularly, there has been no notable increase in furnace capacity. Certainly there has been no such remarkable increase in that direction as there has been in the melting of iron.

Ten years ago about 95 per cent. of all the iron made in the South had to go north of the Ohio River to find a market. To-day more than 50 per cent. is used locally, and this percentage is bound to grow. At the time the coals were brought to Newcastle in the shape of the English pig iron shipped into Birmingham, the Southern furnaces were about 90 days behind on contract deliveries, and there appeared to be no prospect of any change in this condition for months; in fact, as late as October the furnaces generally, in the North as well as in the South, were not up on orders. They were all behind, but so rapidly did consumers request shipments held that within 30 days the furnaces did not know where to ship. In this connection the word "request" is a mild term. Most of them simply said that if any more iron was shipped they could not pay for it. Or they were even more peremptory, and said that if iron was shipped they could not receive it, and it would necessarily stay on railroad tracks accumulating demurrage. Perhaps extracts from some letters on the subject may be interesting. I quote as follows:

"We are so full of iron that we shall have to ask you to hold back shipments for the present. The two cars you shipped a month ago are still on hand."

"At the present time we are closed down for inventorying and have a goodly supply of iron on our yard. We expect to resume operations next month, but until then we must ask you not to ship us another pound of iron."

"Do not ship us any more Southern iron and not more than one car per week of Northern until further notice. We simply cannot use it."

"In answer to your favor of the 20th asking for shipping instructions, will say that we are not as yet ready for the pig iron and cannot give you the exact date when we will be. Don't ship anything more under any circumstances."

"We purchased an over supply of this iron and we do not think the furnace should be too insistent on our taking in the balance at the present time. When we find we are in position to accept some more we will advise you."

"We have been closed down since early in October for the purpose of taking inventory, and later we concluded in view of the disturbed conditions of the financial world to remain closed until they should change for the better. We cannot say just now when we will resume operating, and as we have plenty of iron on our yards to take cars of our wants for some time after we resume operating, we do not want any further shipments made."

"While expressing our appreciation of the accommodation extended to us in holding up shipments, we find it absolutely necessary for us to ask you to extend the accommodation for a still further period. We might write several pages as to our reasons for this request, but we think it will suffice to say that business is not looking at all good and we are curtailing our output in every way possible. We are only running every other day, and have a large stock of iron on hand. Hope we can advise you soon to resume shipments, but please don't send us any more until we do."

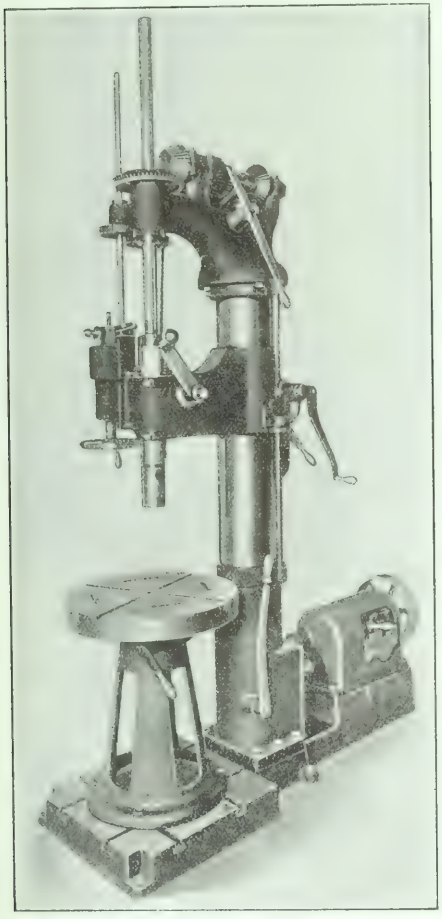
Yet no explanations were necessary. The furnaces understood. The industries of the country and the financial institutions of the country stand or fall together. They are like the dominoes that children stand on end in a row, and when the first one is knocked over the others fall, too. Banks stopping credit stopped the foundries; they in turn stopped the furnaces; the latter have stopped many coke ovens and have curtailed the output of ore and coal mines, so that at the present writing the

great iron trade and its allied branches are not quite but partially in a state of suspended animation.

Yet, fundamentally, the trade is sound. And it is in better condition than it ever was before in a period of depression to recover quickly.

The New National 24-in. Drill Press.

One of the most striking features of originality of the new 24-in. upright drill, built by the National Machine Tool Company, Cincinnati, Ohio, is the absence of back supports and top braces. These, as might be judged from the illustration, are not needed because of the liberal



The New 24-In. Upright Drill Built by the National Machine Tool Company, Cincinnati, Ohio.

proportions of the parts and the distribution of the metal where it is most effective in affording rigidity and strength. A similarity between this machine and a radial drill is the provision for revolving the head around the column, which is advantageous when drilling heavy work, and in connection with the revolving table makes is possible to drill holes on any part of the table. The stump or column is 8 in. in diameter, and has a bearing two-thirds the hight of the sleeve which surrounds it. The sleeve fits this stump and revolves on roller bearings, carrying with it the drill head and the driving mechanism at the top. An important advantage gained by the design of the machine is the ability to use an exceptionally large crown gear 9¼ in. in diameter.

The sliding head and the spindle are counterbalanced and are raised and lowered by means of a crank, pinion and screw. The back gears are located in the base of the column and are so arranged that they may be engaged or disengaged while the machine is running. The change gears in the speed box, through which a variable driving speed is obtained from a constant speed driving pulley, are also capable of being manipulated without stopping the machine. The six changes possible are made from any one to any other by sliding a double tumbler gear and dropping it into the desired combination. The range of speed obtained through the speed box is doubled by the back gears making a total of 12 speeds, which are so selected as to give proper spindle speeds for all drills from ½ to 2½ in. in diameter. Directly behind the back gears is located the tapping attachment, where it insures the greatest power, and the controlling lever for stopping, starting and reversing the machine is situated immediately under the hand of the operator.

The transmission of the spindle drive and feed from the top of the machine is apparent in the engraving. Four changes of geared feed are provided in a gear box, which is a part of the head. All of these changes can be made instantly while the machine is in operation. The feeds per revolution of the spindle are 0.008, 0.012, 0.016 and 0.02 in., and the spindle speeds are 36, 43, 51, 61, 75 and 94 rev. per min., with the back gears, and 107, 123, 144, 171, 210 and 267 rev. per min., without the back gears, the ratio of the back gears being 2.8 to 1. These speeds correspond to a driving pulley speed of 360 rev per min. The quick return and approach lever, located near the top of the column, also engages and disengages the feed, so that it is only necessary to use one hand for all of these operations. The diameter of the spindle above its sleeve is 1 11-16 in. and in the sleeve 1 13-16 in. The spindle is fitted with a No. 4 Morse taper socket and has a traverse of 11 in. The traverse of the head on the column is 23 in.

Any style of table can be provided. The one illustrated is made very rigid and stiff by being supported directly from beneath, and insures the retention of the original alignment at all times. As before stated the table is revolvable to facilitate positioning of the work and it is 22 in. in diameter. When work is to be drilled directly on the base the table can readily be removed entire, and a working surface is then available of 22 x 22½ in. The greatest distance between the spindle and the base is 43 in, and between the spindle and the table 23 in. The machine occupies a floor space of 22½ x 55 in., has an over-all hight of 7 ft. 5 in., and a total weight of 2100 lb. The weight and the dimensions of the principal parts are interesting as they compare favorably with those of a much larger machine of the usual type.

Summarizing the investigation of alloys of nickel and silicon by W. Guertler and G. Tammann *Engineering* says they find five definite compounds, the proportions of Ni to Si being 2 : 1, 1 : 1, 2 : 3, 3 : 1, 3 : 2. Alloys containing from 5 to 15 per cent. of silicon can, like nickel, be forged cold, but not when at red heat. When the silicon percentage exceeds 22, the hardness of the alloy increases; a regulus with 25 per cent. of Si cleaves like mica in sheets, and alloys containing more than 50 per cent. of Si can be powdered. It is interesting that an alloy containing 20 per cent. of silicon is much harder when slowly cooled than when suddenly chilled; with higher percentages of silicon this peculiar behavior of silicon, which in this respect differs from carbon, becomes less marked.

The report of the Alabama Car Service Association for the month of November shows a total of 57,000 cars handled as against 65,000 in the same month of the preceding year, when every maker of pig iron was doing his utmost to have the metal rushed to the impatient customers.

The Columbus Iron & Steel Company has blown out its furnaces at South Columbus, Ohio. Both stacks will remain idle until such time as the market improves.

THE PITTSBURGH IRON TRADE IN 1907.

BY ROBERT A. WALKER.

Were it possible to eliminate from a review of the Pittsburgh iron trade in 1907 the last two months of the year, it would be the pleasure of the writer to state that the year was not only one of the best, but probably the best, that the iron trade ever saw. There were signs, both financial and otherwise, of a slowing down in the steel business in September and October, but even the habitual pessimist did not conceive that the steel business could dwindle in such a short time from a demand in excess of the supply to practical stagnation. Various reasons have been set forth as to the direct causes of the financial panic and the depression in the steel business through which the country is passing, but it is not the purpose of the writer to go into details regarding these, it being sufficient to state that the one great cause of our present troubles was the impairment of confidence.

General conditions throughout the entire country could hardly have been better than in the greater part of 1907. Labor was steadily employed at high wages, consumption was going on at an enormous rate, crops were fairly large and farmers were receiving most lucrative prices ever paid for their products. It was, of course, recognized that the extraordinary prosperity in the steel business and in general trade as well, that had prevailed in this country for three years or more could not go on indefinitely, and that there would have to be a slowing up some time and a return to less strenuous conditions. A moderate shrinkage in the demand would have been welcomed by the steel trade, which for many months had been congested with orders that could not be turned out as promptly as wanted by customers. As late as August and September, our largest steel concerns were from four to six months behind in deliveries on some products, and were turning down almost daily excellent orders for which consumers were willing to pay heavy premiums. Instead of a moderate shrinkage, however, business suffered almost a complete collapse.

The financial stringency which had its inception in New York, spread westward in October and Pittsburgh was very hard hit; on the 23d of that month came the announcement of receivers for the Westinghouse Electric & Mfg. Company and the closing of the Pittsburgh Stock Exchange,, which has not opened since that date. In an incredibly short space of time depositors were withdrawing their money from the banks and locking it up in safe deposit vaults and other places, and perhaps the worst monetary scarcity the country has ever known became a realization. In the last two months of the year large employers of labor could not get currency from the banks to pay their men and recourse was had to clearing house checks, most concerns being compelled to issue these checks to the extent of 80 per cent. of pay rolls, paying only 20 per cent. in cash. In the early part of December came the failure of the Fort Pitt National Bank, Pittsburgh, which was a large creditor of the embarrassed firm of Whitney, Stephenson & Co., leading stock brokers of the city. These events, with failures in other parts of the country, naturally further increased the distrust, and business and financial conditions in Pittsburgh at the close of the year were in very unsatisfactory condition. However, as it is darkest before dawn, there are already signs of coming betterment for both financial and manufacturing interests. The supply of currency is getting larger, the feeling is more cheerful, and unless there are more unfavorable developments it is believed that very early this year conditions will improve materially not only in Pittsburgh but all over the country.

In 1893, when the country passed through a similarly severe depression, the large steel interests in an endeavor to keep their plants running, set out to force their products on the market and prices were made which resulted in a number of concerns being forced to the wall. An entirely different course is being pursued in the present depression, through the leadership of the United States Steel Corporation, the policy adopted by steel manufacturers being to keep down output and prevent ruinous competition in prices. This policy has been closely adhered to, and the close of the year found a reduction in pig iron output of more than 50 per cent.; in crude steel output close to 75 per cent.; in coke production more than 50 per cent., and in finished iron and steel fully 50 per cent. It is true that prices of pig iron, scrap and coke have heavily declined, but on the other hand it has been claimed that these were unduly high and would stand some readjustment. They are now on a basis that will warrant consumers placing contracts as soon as financial and other conditions will permit.

New Construction.

In the latter part of 1906, large appropriations were made by the directors of the United States Steel Corporation, Jones & Laughlin Steel Company, Republic Iron & Steel Company, La Belle Iron Works, Youngstown Sheet & Tube Company and many local companies for large additions to old plants and the building of new furnaces and mills that would add greatly to producing capacity. In the Pittsburgh District, the Carnegie Steel Company, a subsidiary of the Steel Corporation, has been prominent in the building of new blast furnaces, steel works and finishing mills, much of which work has been completed. At the opening of 1906, the Carnegie Steel Company owned and operated in the immediate Pittsburgh District 30 blast furnaces. In the year 1907, two new furnaces at its Carrie plant were completed and put in operation, with a daily capacity of about 1200 tons. The National Tube Company, another subsidiary, added one new blast furnace at McKeesport and another at Lorain, each with a capacity of about 450 tons per day. There are now under erection at the Duquesne Works of the Carnegie Company, two blast furnaces and 18 50-ton open hearth furnaces. There have also been built at the Clairton Works of the Carnegie Company 14 and 22-in. structural mills, together with large additions of other equipment. At the Duquesne Works, a new 16-in. merchant bar mill has been erected, and this plant is now the largest producer of steel bars of the entire works owned by the Carnegie Company. At the same company's Homestead Works, the No. 4 open hearth department was added, containing 10 50-ton furnaces. Six open hearth furnaces were built at the Ohio Works of the same company, while two blast furnaces of 450 tons daily capacity and 12 50-ton open hearth furnaces are under construction. A new and heavier blooming mill is also being installed in the Ohio Works and other additions to equipment are being made.

Next in importance to the Carnegie Steel Company in the matter of increase in producing capacity by the building of new furnaces and mills is the Jones & Laughlin Steel Company. This company has acquired a very desirable manufacturing site at Aliquippa, on the Pittsburgh & Lake Erie Railroad, containing over 800 acres, and made plans for the building there of four blast furnaces, six Talbot open hearth furnaces, and blooming rail, structural and plate mills. Work on three of the blast furnaces was started in the summer of 1907, contract for their erection having been placed with the Riter-Conley Mfg. Company of this city. The work was pushed actively until the financial stringency, when operations were slowed down considerably. At present it is the intention to finish up two of the blast furnaces, while the other new construction will be held in abeyance until times improve. The La Belle Iron Works built at Steubenville, new sheet and jobbing mills, also one open hearth furnace and made other large additions to its plant, which will materially increase its output. This company has gone steadily ahead in the extension and betterment of its plants and has plans for still more work of the same kind, definite announcement of which will be made when they are fully matured. The Youngstown Sheet & Tube Company set aside $2,000,000 early

in the year for the building of two blast furnaces, work on which is under way, and when these have been finished the building of two more will be started. This company has also added new butt and lap weld furnaces and a new plate mill and has very largely increased its capacity for the manufacture of pipe, sheets and other products.

The American Sheet & Tin Plate Company, with its fixed policy of steadily bettering the physical condition of its plants, has made large improvements and extensions to its works at Scottdale, Vandergrift and other points, and is now able to turn out about 100,000 tons of tin mill and sheet mill products. The Pittsburgh Steel Company, with large rod and wire mills at Monessen, Pa., started work early in the year on the building of 12 50-ton open hearth furnaces, which will be making steel before the summer of 1908. This company has plans under way for the building of blast furnaces and more finishing mills, but desires to get its steel plant in operation first, and for a time will be a buyer of pig iron in the open market. Taken all in all, construction work in the Pittsburgh District in 1907 has been larger than the annual average. It would have been much larger had it not been for the financial stringency which made the securing of funds for this purpose practically impossible. A great amount of new work has been held up for which plans had been definitely made and in some cases contracts placed.

Labor Matters.

The year 1907 was practically free from labor troubles of any kind. While some little time was spent in arranging the puddling and finishing scales of the Amalgamated Association, an agreement was reached without serious trouble, and the mills of the Republic Iron & Steel Company and other concerns who sign these scales continued to work without interruption. The same was true of the sheet and tin plate scales, and during the year, up to November, labor was steadily employed and at very high wages.

With the financial panic and the slowing down of manufacturing operations, thousands of men have been laid off and more men were idle in December in all branches of trade than at any time in the last three or four years. For a time it was expected that the United States Steel Corporation through its subsidiaries' interests would make a general reduction in wages of 10 per cent., effective January 1, but it was decided not to make any reduction, and wages, for the present, at least, will remain on the same basis as they have been.

Foreign Trade.

With the falling off in domestic business, the United States Steel Corporation and other large interests that have a regular trade abroad made special efforts to increase their foreign business, with the result that their export shipments in November were the heaviest of any month in the year. A notable fact in connection with the export trade is that better prices are being obtained than was the case a year or two ago. In some lines practically as high prices are being obtained for products for export as are being secured in the domestic market. It has been the policy of the Steel Corporation since its organization to take a certain amount of export business in the belief that on the falling off in demand in this country a larger export trade could be easily obtained.

The Pig Iron Trade.—Bessemer Pig Iron.

Pig iron producing capacity in the Pittsburgh District is now much larger than ever before, there being a total of 47 furnaces within 40 miles of the heart of the city, and with an annual capacity of more than 7,000,000 tons. More than 25 per cent. of all the pig iron made in the United States is now made in this 40 mile radius.

The pig iron prices quoted in this review are all given f.o.b. furnace in the Mahoning or Shenango valley. To these prices should be added 85 cents for freight to either Pittsburgh or Cleveland up to June 1, 1907, and 90 cents from that time forward.

The range of prices on Bessemer pig iron during the year, or up to November, was much narrower than in the preceding year. In the first week in January, with a fairly active demand, it was selling on the basis of $22, Valley furnace. This price held with very little variation until April. Early in that month the Youngstown Sheet & Tube Company, which has latterly been the largest buyer of Bessemer iron in the open market, purchased 10,000 tons for June delivery at $22, and 150,000 tons for delivery over the last half of the year at $21. At the same time W. P. Snyder & Co. sold a very heavy tonnage to the Cambria Steel Company, the Sharon Steel Hoop Company, the Page Woven Wire Fence Company and other interests without naming a fixed price, the seller to charge the buyers the average monthly price f.o.b. Pittsburgh, during the life of the contract.

These sales took practically the available supply out of the market for the first half of the year and nearly all for the second half. They naturally had the effect of considerably strengthening the market, and in May Bessemer iron was selling at $23 at furnace in the early part of the month and $24 in the latter part. The price ranged from $23.25 to $23.50 from June to September, when the demand slowed down and values went off to some extent. Commencing with October, the decline in prices was rapid. During November and December there were practically no sales, only a few small lots figuring in the market and these were for spot shipment. The year closed with the price nominally $19.

In the early part of the year the United States Steel Corporation was a buyer of Bessemer iron to a moderate extent, but after April, owing to its own increased pig iron output, the corporation did not again enter the market and it is not probable that it will in the future purchase Bessemer iron unless a time of abnormal demand may make this necessary. The Cambria Steel Company has been a steady buyer of both Bessemer and basic iron, but as it started up two new blast furnaces in 1907 it is now probably in a position to supply its entire requirements. The Youngstown Sheet & Tube Company, which is a heavy consumer, buys its entire supply from furnaces in the Youngstown District, but it is also putting itself in condition to supply its own requirements.

Gray Forge Pig Iron.

The demand for gray forge iron up to September was quite active and prices ruled high. In January it was quoted on the basis of about $22 at furnace, but in March and April the demand had fallen off and the price had declined to about $21. In the latter part of April the market on gray forge was strengthened by the heavy sales of Bessemer and basic iron, and the price advanced to $22, while in June as high as $22.50 was paid. In September, in sympathy with the market for Bessemer and basic, prices on gray forge commenced to decline rapidly, and in October the market was dull at about $19.50. In November and December prices declined still further, and the year closed with Northern forge being held nominally at $17.50 at furnace, with a probability that $17 or even lower could have been done had there been any orders coming out.

Foundry Pig Iron.

As in the case of Bessemer and gray forge, the demand for foundry iron through the entire year up to September was active and prices were strong. The year opened with Northern No. 2 ruling firm at about $24 at furnace. This price held steadily with slight variations up to May, when on account of the oversold condition of the furnaces and the scarcity of foundry iron, it sold for spot shipment as high as $25.50 and even $26. However, most of the tonnage was sold on contracts at prices ranging from $22 and up to $24. In September the decline started and with a shrunken demand prices went off rapidly, and in November, Northern No. 2 could have been bought freely as low as $19 to $19.50. In December, prices declined still further and in the latter part of that month, Northern No. 2 for spot shipment sold as low as $17 at furnace.

To show the range in pig iron prices a statement of average prices, f.o.b. Pittsburgh, during the year is appended. Up to June 1, 85 cents a ton should be deducted from these prices to give the price f.o.b. Valley furnace, and after June 1, 90 cents a ton should be deducted to

show the price at furnace. Average monthly prices were as follows:

1907.	Bessemer.	Gray forge.	No. 2 foundry.
January	$22.90	$22.55	$24.75
February	22.80	21.95	24.75
March	22.85	21.75	24.85
April	22.20	21.68	24.50
May	24.16	22.75	25.50
June	24.10	23.15	25.90
July	22.35	22.70	24.30
August	22.90	21.70	23.65
September	22.40	20.90	22.15
October	22.75	19.75	20.20
November	20.65	19.25	19.25
December	19.65	18.30	18.15

Steel Billets.

Up to September the year was probably the most active in the steel billet and sheet and tin bar trades ever known. In the first half of the year and, in fact, up to about August, it was almost impossible to get prompt deliveries, and there were many times during that period when the consuming mills were compelled to shut down, waiting for steel to arrive. The output was at very high pressure and new records of production were being made, but in spite of this the mills were utterly unable to meet the enormous demand promptly.

The year opened with Bessemer billets ruling at $29.50 to $30 and open hearth from $32 to $32.50, Pittsburgh. Sheet and tin bars were about $30, and were very hard to obtain. These prices ruled firm throughout the first half of the year, but in a number of cases premiums of $1 to $2 a ton were paid on billets and bars to secure prompt shipment. The Carnegie Steel Company was a heavy buyer of billets in the first half of the year, making large purchases from the New York State Steel Company, the Alan Wood Iron & Steel Company and other Eastern concerns to apply on its Eastern contracts. The Carnegie Company was practically out of the market as a seller of steel, except on its own contracts, for the first eight months of the year.

In April and May Bessemer billets for prompt shipment sold as high as $30.50, Pittsburgh, and sheet and tin bars as high as $31. In May and June some fairly large sales of billets were made, one local interest buying 6000 tons of 4 x 4 in., deliveries being 1000 tons a month, July to December, at $29, at mill, or $29.50, Pittsburgh. In June the Carnegie Company, being much behind in deliveries, made a purchase of 10,000 tons of 2 x 2 in. and 4 x 4 in. billets from the Cambria Steel Company. In June the Carnegie Company notified its sheet and tin bar customers that the price for the quarter commencing July 1 would be $31, Pittsburgh, an advance of $1 a ton over the previous quarter. At this time the supply of steel was somewhat better, and prices were a shade easier, Bessemer billets being offered at $29 to $29.50 and open hearth $31 to $31.50. Consumers of steel were then pretty well covered by contracts, and the demand was quiet.

In August the Carnegie Company bought 3000 tons of 4 x 4 in. open hearth billets from the Alan Wood Iron & Steel Company at Conshohocken for delivery to the American Bridge Company at Pencoyd, Pa. In the latter part of August the Youngstown Sheet & Tube Company had a break down at its Bessemer plant, which took it out of the market for about three weeks.

In October the price of Bessemer billets had declined to $28 and open hearth to $29, Pittsburgh. The demand was then very dull. In the latter part of October the Columbus Works of the Carnegie Company closed down, and this was a forerunner of the depression in the steel trade which marked the last two months of the year. The closing of the Columbus Works was quickly followed by the shutting down of the company's works at Bellaire, Mingo Junction, Donora, North Sharon, and finally, the Ohio Works at Youngstown. All other plants of the Carnegie Company and other interests had been slowed down, and in the latter part of December the steel output in the Pittsburgh, Wheeling and Mahoning and Shenango Valley districts was down to less than 25 per cent. of the normal output. The situation was so serious that on October 30 a meeting of the steel interests was held in the University Club, Pittsburgh, the result of which was that prices of Bessemer and open hearth billets have since held on the basis of $28, Pittsburgh. There was practically no demand for steel in the last two months of the year.

Steel Rails.

The price of standard section steel rails was steadily maintained during the year on the basis of $28, Pittsburgh. All the rail mills were steadily employed and conditions were prosperous until about August, when, on account of the very high rates of interest asked, the railroads found they could not raise the funds necessary and withdrew from the market as buyers of rails. At this time the question of new specifications for rails was taken up, the railroads and steel rail mills appointing committees which held a number of meetings and finally new specifications were adopted by the rail mills, but have not yet been officially accepted by the railroads.

In the last four months of 1907, only a small tonnage of steel rails was placed, and the rail mills entered 1908 with less tonnage on their books than in any previous year for a long time. No additions to rail capacity were made during the year, but some enormous records for output were made by the Carnegie Steel Company both at its Edgar Thomson and Ohio mills.

Connellsville Coke.

In sympathy with the active demand and high prices ruling for pig iron in the first eight months of 1907, prices on coke were also high and both demand and output were unprecedented. In January the best grades of Connellsville furnace coke for prompt shipment were bringing $3.50 and foundry coke $4 to $4.25 a ton, at oven. The output in the Upper and Lower Connellsville regions was running at the rate of over 400,000 tons a week and coke for prompt shipment was very hard to obtain. These active conditions in the coke trade continued through most of the year, and in the summer months the output of coke in these regions was running as high as 425,000 tons per week.

In September a marked falling off took place, and prices commenced to decline. In the latter part of October it was found that the demand was much less than the output and the blowing out of ovens started at a rapid rate. At the close of the year the producers of these two regions had more than 50 per cent. of their ovens idle and the output had fallen from the high mark of 425,000 tons per week to less than 200,000 tons. Connellsville furnace coke at the close of the year was offered for prompt shipment as low as $2.25 a ton, at oven, while Mountain coke, which runs higher in sulphur than Connellsville, was being offered for prompt shipment at $2 a ton and lower.

Finished Iron and Steel.

The demand for all kinds of finished iron and steel up to September was the heaviest ever known in the history of the trade. In that month orders commenced to fall off very materially and at the close of the year there was no buying, except in small lots for spot shipment and to cover actual needs. Prices during the year were very stable, few changes occurring. In the last three months of the year, in spite of the tremendous falling off in the demand, prices were reasonably firm, due to the conservative action of large producers in shutting down mills and keeping the output down to the minimum.

The year 1907 opened with structural material on the basis of 1.70 cents for beams and channels up to 15 in. and 1.80 cents for over 15 in. This price was maintained steadily throughout the year. Plates were also unchanged in price, remaining on the basis of 1.70 cents for tank steel, ¼ in. and heavier, but in certain periods of the year, owing to shortage in supply, sheared plates sold as high as 2 cents, or at a premium of $6 a ton over the regular price.

Both black and galvanized sheets were in enormously heavy demand throughout the year. Prices on black sheets were unchanged, remaining on the basis of 2.60 cents for No. 28 throughout the entire year. There was one advance in galvanized sheets of $2 a ton, this having been made on January 24, and on the same date blue an-

nealed sheets and galvanized roofing sheets were advanced $1 a ton. In hoops and bands the demand was active until September, and prices remained unchanged on the basis of 1.60 cents for bands and 2 cents for steel hoops.

The contract price of steel bars remained firm on the basis of 1.60 cents throughout the year, but there were periods in the year up to July or August, when, on account of the enormous demand, some mills that could make reasonably prompt shipments were able to obtain as high as 1.80 cents. Iron bars ruled from 1.80 cents at the opening of the year down to 1.60 cents at the close of the year, the decline being caused by a falling off in demand and to meet the competition of steel bars.

Tin plate in the first half of the year was in exceedingly heavy demand, but trade fell off very much toward the close of the year, and in the latter part of December the American Sheet & Tin Plate Company was operating less than 20 per cent. of its actual capacity and independent mills not more than 40 to 50 per cent., if that much. The price of tin plate remained firm at $3.90 per base box throughout the entire year, on which a rebate of 5 cents a box is allowed to the large trade.

Tubular goods never before were in such demand, and early in March the National Tube Company withdrew from the market as a seller of pipe for delivery prior to June 1, and also withdrew all prices. This active condition continued up until September, when a lull started, and at the close of the year the output was down to about 50 per cent. of capacity. A great many large contracts were held up and pipe mills were entering only small orders for prompt shipment. There were two advances in pipe of one point each during the year. In spite of the serious fall in the demand the year closed with prices on steel pipe ruling firm, but on iron pipe somewhat uneven, having declined from $4 to $6 a ton. Boiler tubes were in very active demand during the year until about September, when in sympathy with other lines of finished products orders fell off materially and prices on both merchant and railroad tubes were shaded to a considerable extent.

The mills rolling finished iron and steel entered 1908 with very much less undelivered tonnage on their books than at the close of 1907, and with prospects of the future rather uncertain. It is believed, however, that if financial conditions continue to improve, there will be a recovery in the demand for iron and steel products, but it is not believed that the volume of tonnage in 1908 will be as heavy as in 1907, even considering the excessive shrinkage in the last three months of that year, from which there must be some rebound. As there is always more or less uncertainty in a Presidential year, it is not probable that this year will prove any exception.

Iron and Steel Scrap.

The movement of old material in the Pittsburgh District in the first eight months of 1907 was fairly heavy. Owing to active conditions in the steel trade the demand for melting steel scrap, old rails in short pieces and bundled sheet scrap was particularly strong, at times it being almost impossible to get prompt deliveries of these grades of scrap. The Carnegie Steel Company, La Belle Iron Works, Sharon Steel Hoop Company and Crucible Steel Company of America were quite heavy buyers in the early part of the year.

In the latter part of August the scrap trade took a change for the worse, the demand being dull and prices showing a decided downward tendency. This condition became more acute toward the close of the year, and in November and December the whole scrap trade was badly demoralized, with the lowest prices ruling that had prevailed for some years.

The year closed with heavy melting steel scrap selling at about $11 a ton, showing a decline over the highest price ruling in the year of about $8 a ton, while other grades of scrap had declined in proportion. No. 1 wrought scrap at the close of the year was weak at about $13, bundled sheet scrap had declined to $8 or less, No. 1 cast scrap was about $14, and cast iron borings were lifeless at $6 a ton or less. For purposes of comparison a table is appended showing the average monthly prices per gross ton, f.o.b. Pittsburgh, during 1907.

	Heavy steel scrap.	No. 1 wrought scrap.	Bundled sheet scrap.	Cast iron borings.	No. 1 cast scrap.
January	$18.90	$20.40	$16.70	$12.40	$20.50
February	18.06	19.44	15.75	12.12	19.75
March	18.00	19.50	16.69	14.25	21.38
April	17.75	19.50	16.60	14.25	21.25
May	18.20	18.80	16.60	13.90	21.90
June	18.37	18.75	16.60	14.25	21.75
July	17.85	18.40	16.50	13.50	21.00
August	17.50	17.20	15.25	11.50	19.50
September	17.25	17.25	14.75	13.00	19.60
October	16.95	16.90	14.40	12.35	18.90
November	14.90	15.50	12.50	9.50	16.50
December	13.00	14.25	10.30	6.50	14.25

The Buffalo & Susquehanna Iron Company.

In connection with the application of the Buffalo & Susquehanna Iron Company for the listing of $1,500,000 of 20-year 5 per cent. bonds by the New York Stock Exchange, a statement of net earnings is given for the six months ending October 31, 1907. The total was $716,479, against $775,913 for the 12 months ending April 30, 1907, or nearly double the rate in the latter period. The surplus October 31, 1907, was $1,120,408, as against $597,980 on April 30. The condensed balance sheet of October 31, 1907, is as follows:

ASSETS.

Buffalo plant, real estate, &c.		$3,713,143.26
Leaseholds in ore properties		1,190,898.38
Canal		191,102.23
Stock in coal companies		300,700.00
Accounts receivable, &c.		934,246.09
Cash		137,503.93
Ore, pig iron, &c., on hand		880,871.35
Deferred charges: *Discount on debenture bonds		70,416.67
Total assets		$7,418,881.91

LIABILITIES.

Capital stock		$1,000,000.00
First mortgage 5 per cent. bonds	$3,000,000.00	
Less in hands of trustee for Sinking Fund	100,000.00	2,900,000.00
Debenture 5 per cent. bonds		1,500,000.00
Bills payable		244,000.00
Accounts payable		533,682.52
Accounts in suspense		7,771.19
Accrued interest		72,916.68
Reserve for renewal of furnace lining		21,015.95
Reserve for extinguishment of coal and ore properties		19,087.15
Surplus		1,120,408.42
Total liabilities		$7,418,881.91

* To be reduced by equal annual amounts covering the life of the bonds and charged to profit and loss account.

Of the proceeds of the sale of the $1,500,000 of debenture bonds, $400,000 was spent in acquiring and developing new ore property through the Munro Iron Company, and the balance was used in providing additional working capital.

The *Brass World*, in referring to the use of the tumbling barrel for taking the rough edges from small steel articles made by blanking and drawing in a press, says that the barrel, usually an oblique one, is partly filled with the articles and a quantity of sharp sand and gravel, but not sea sand, is added. The articles are covered with water and an ounce or two of salsoda is used for each gallon of water. The sal soda renders the water alkaline and prevents rusting. The steel is tumbled until the sharp edges and burrs have been worn off. This may take from 24 hours to several weeks, according to the character of the work. Care must be used to prevent pitting of the steel surfaces. This will occur unless the water is alkaline and there is enough water to cover all the articles when the barrel is at rest.

November exports of steel products through Eastern seaports were the heaviest for any one month for nearly three years. The steel rail shipments were particularly heavy, their destination being the Far East.

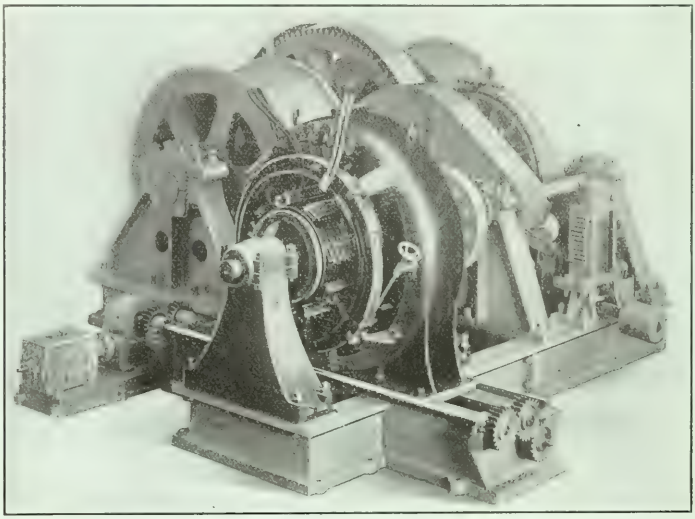
A Lidgerwood Furnace Charging Drum Hoist.

In the operation of a blast furnace it is necessary to avoid as far as possible anything which might interrupt the regularity of the charging. To minimize one of the causes of a furnace going out of commission, the Lidgerwood Mfg. Company, New York, has designed a new type of automatic electric blast furnace skip hoist, the principal feature of which is an arrangement for quickly separating the frame of the motor when it is necessary to replace the armature or any of the field coils. By this arrangement parts can be renewed with unusual facility.

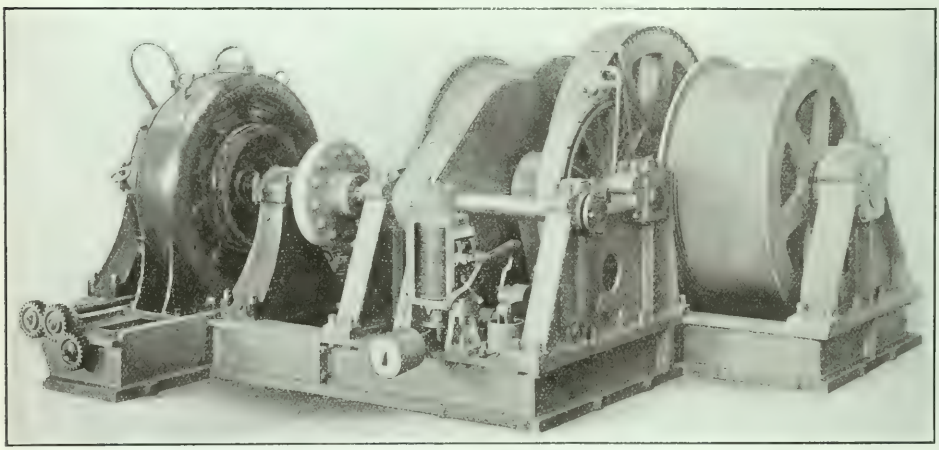
The motor frame is in halves split vertically and held together with two bolts at the top and two at the bottom. The brush rigging is also divided and one-half is attached to each side of the motor frame, so that the two parts may be separated with the frame. There are two large square threaded screws running under the motor, one on each side, through brass nuts which are attached to the respective halves of the base of the motor. These screws when revolved through spur gears and a worm and gear by a 6-hp. 220-volt motor, capable of making 650 rev. per min., can very quickly separate the frame of the motor after the four bolts holding the yoke are removed, 16 sec. being sufficient to withdraw the parts of the frame enough to permit the armature to be removed. To expedite changing the armature two trolleys with chain blocks are suspended from a beam directly over the hoist motor. One of these supports a spare armature while the other is in readiness to remove the old armature. By this means it is claimed an armature can be replaced in 30 min.

The main hoist is of the double drum type, with four bearings supporting the drum shaft, the main driving gear being placed between the two center bearings. This gear is made in halves and is keyed to the drum shaft, which is 15 in. in diameter in the center and 11 in. in diameter in the drum. The main gear wheel is 88 in. in diameter, has 100 teeth, a 12-in. face and 2¾-in. pitch. The pinion is of cast steel and has 19 teeth and the secondary gear, which is 16 in. in diameter, has 89 teeth, 9-in. face and 1½-in. pitch. The pinion for the latter gear is of forged steel and has 20 teeth and 1½-in. pitch.

The main drums are 66 in. in diameter, 30-in. face and are grooved for 1¼-in. rope. The motor gears are inclosed in an oil tight gear case, and the drum gears are covered by a wrought iron guard band. There is a solenoid brake on the intermediate shaft, which is of the V type and of



The Driving End of a Special Lidgerwood Drum Hoist for Blast Furnace Charging.



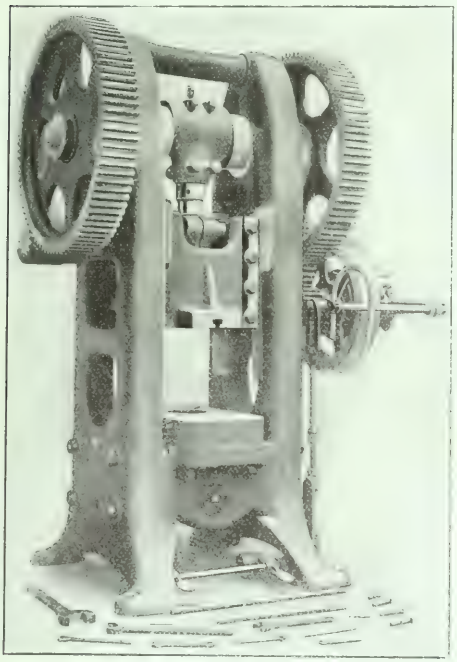
Another View of the Hoist, Showing the Flexible Coupling, Solenoid Brake and Gearing.

special toggle construction. This brake is operated by a 550-lb. solenoid with a 3½ in. travel and settles in a dash pot 8 in. in diameter, to cushion the shock due to the falling of the brake weight. The hoist is mounted on a continuous cast iron bed plate made in sections and bolted together, and is capable of lifting 24,000 lb. at the rate of 225 ft. a minute.

The hoist motor is of 175-hp. capacity, and is of the continuous service type, compound wound and 300 rev. per min. normal speed. The motor throughout is of extra heavy construction, having been designed especially for skip hoist service. The armature shaft has the standard extension and is connected to the hoist by a Baehr flexible coupling. The slow down device is purely mechanical, being mounted on a heavy cast iron bed plate and driven from the armature shaft. It is so constructed that the speed of the bucket at the slow down is exactly the same in every case regardless of the load. A test of 25 trips with varying loads has demonstrated that the bucket will stop within ⅜ in. of the same spot every time. The complete hoist weighs 51 tons and it is set on a solid concrete foundation and bolted down with 32 1¼-in. foundation bolts. No internal gears are used, and therefore no overhung pinion is required. A noticeable feature in the construction of the hoist is the absence of tap or stud bolts, all the bolts being fitted with double hexagon nuts.

A New Ferracute Single Crank Press.

A massive single crank press, built from new patterns by the Ferracute Machine Company, Bridgeton, N. J., and designed by Oberlin Smith, president



A New Heavy Single Crank Press Built by the Ferracute Machine Company, Bridgeton, N. J.

and mechanical engineer of the company, is shown in the accompanying illustration. The press has a long stroke which adapts it for drawing cold from heavy sheet steel, deep drawn seamless shells, automobile hubs, cups for ball bearings and similar work. It can be built with shorter stroke for heavy blanking, trimming, shearing and embossing. A somewhat larger press of this series, recently built by the company for the United States Government, is being used in the manufacture of cartridge shells for [illegible].

The machine illustrated is designated as press DGG 121. The castings which compose the frame are exceedingly heavy and have been made to present an attractive appearance by their neatly rounded corners. Other noteworthy features are the heavily trussed bed and the wide-faced twin gears on each side of the press. These gears are cut from the solid. Having two gears on the crank shaft instead of one tends to relieve the shaft of torsional stress and affords an even pressure by dividing the load between the gears. The back shaft, with its two pinions, which engage the large gears, is a single steel forging made enormously strong to obviate any torsional effect. It provides an equal and even pressure from the pinions to the twin gears and prevents uneven strains to the frame and moving parts connected thereto. The main shaft is forged from high carbon steel. The pitman stem is also of steel and is 6 in. in diameter. The clutch and flywheel are mounted on a stud, which is rigidly attached to the frame, which avoids disturbance of alignment, such as is apt to occur when the supports are detached and bolted to the floor.

The press is equipped with a multi-disk friction clutch of a new and effective design. It is of the automatic stop type, but can be quickly adjusted for stopping the ram by hand at any point of its descent or ascent, or, if desired, can be set for continuous running. Positive knockouts (not shown) are provided when desired, the press being designed so that they can be readily attached. The distance between columns is 28 in; stroke, 3 in.; greatest hight from bed to ram, 19½ in.; adjustment of ram, 6 in.; diameter of flywheel, 35 in.; face of flywheel, 6 in.; weight of flywheel, 750 lb. The press occupies a floor space of 8 ft. 7 in. from right to left and 5 ft. 5 in. front to back, and is 10 ft. 7 in. high. It weighs 25,000 lb., and exerts a pressure of 200 tons. The press can be built with any length of stroke up to 17 in.

The Cockerill Works.—The Société Anonyme John Cockerill turned out product valued at $9,250,000 in the fiscal year ending June 30, 1907. The profits were $1,102,540. Deductions for depreciation, interest, commission, reconstruction of blast furnaces and general expenses, amounted to $570,850. Dividends amounting to 17 per cent. were declared, or about $425,000. The total surplus at the close of the year was $1,960,000. Fresh discoveries were made in the year in the company's Sommorostro iron mines in Spain, which will prolong the working of these deposits several years. New works with special and highly improved tools have been established by the company for turning out quick firing guns. The company expended, in 1906-7, $156,000 in assisting sick workpeople, educating children, pensioning old employees, &c. The balance to the credit of depositors in the savings banks formed by the company for its employees and workmen increased last year from $1,886,500 to $1,981,500.

On October 26, at the hight of the panic, many depositors in New York savings banks who desired to withdraw their funds were required to give 60 days' notice. The time expired last Thursday and many of the banks had prepared themselves for the payment of large sums. It was found, however, that the appreciable restoration of confidence in the meantime had wrought a change in the views of savings bank depositors and the withdrawals were light.

The Bristol Company, Waterbury, Conn., has been awarded a silver medal for its recording instruments exhibited at the Jamestown Exposition. These recorders have received high awards at every exhibition in which they have been entered as competitors in recent years, including the ones held at Paris, Chicago and St. Louis.

Repairs to be made at the Newburg plant of the American Steel & Wire Company, Cleveland, Ohio, include the installation of electrically driven tables for the 23-in. billet mill and the addition of high pressure cylinders to the new 35-in. blooming mill engine, which will be operated hereafter as compound condensing.

The Year in Copper.

BY H. M. COLE, BOSTON.

A furious pace was set in the copper industry in 1907. History was made fast. In point of spectacular price movements the year stands without a parallel in the annals of the industry.

How the Year Opened.

The year opened with the metal market strong, at around 25 cents per pound. Manufacturers were clamoring for their copper deliveries. Retailers were wildly protesting against delays in forwarding manufactured copper goods. Copper smelters were working day and night in a vain endeavor to keep pace with the shipments of ore from the mines. The factories and foundries in the Connecticut Valley and elsewhere could be seen working furiously in the endeavor to make some impression on the steadily accumulating pile of orders pouring in from all parts of the world.

Manufacturers, commission merchants and copper consumers were unanimous in the belief that a famine in the metal was imminent. They all told tales of delayed deliveries and orders on their books for months ahead. The whole manufacturing world was in a frenzy of wild endeavor to keep up with the ever increasing avalanche of orders.

This was the situation in every department of the industry—from the mine to the consumer—which existed for the first quarter of 1907.

A Change Takes Place.

In the latter part of March there were ominous indications here and there that a change was taking place. There was a halt in new orders, but by reason of the vast amount of business booked for future delivery little attention was at that time paid to the slackening tendency in new business. Not a man could be found even as late as April who would publicly venture the assertion that anything more than a temporary halt or breathing spell was taking place, and it may be added that there was general thanksgiving in manufacturing circles over this turn of events, which meant a relief from overwrought and expensive operating conditions.

In June those copper producing interests that had been testing the market found that some of the larger selling companies were cutting prices abroad in order to secure business. The Calumet & Hecla Company was one of the first to discover that competitive selling interests were cutting prices in Paris, and quick to foresee the coming decline, they at once inaugurated the policy of offering to supply their Lake brand—the purest and highest grade of copper in the world—to such buyers as had been quoted prices on electrolytic, which usually sells about ¼ cent per pound below the market for Lake copper. Before the month of July had passed, it was plainly evident that a great transformation had taken place in the copper industry. In contrast with the rush and turmoil of the first three months of the year, there had come an abrupt cessation of new business, and by the time the mining companies had made up their accounts for the first six months of the year they discovered, to their amazement, that but few new orders for copper had been booked since the latter part of March. Copper quotations thereupon literally melted away.

Such a bewildering right-about-face so staggered the large interests in the mining, manufacturing and consuming trades that they were loathe to believe that the new and portentous developments could be more than "a spasm" to be quickly followed by advancing prices.

All Were Fooled.

There are very few men in the trade who can take to themselves any credit for prophesying the disaster which overtook the prices for copper and copper securities in the last half of the year. All were fooled. The copper world had been educating itself to the belief that there was not enough copper to go round, a perfectly natural assumption by reason of the hysterical and ineffectual attempts to keep pace with new business during the first quarter of the year.

The high price of a fraction above 26 cents for copper was not the result of any attempt on the part of the mining companies to squeeze the last drop of blood from the copper buyer. The consumers were alone responsible. In their feverish anxiety to protect themselves with raw material they were continually outbidding each other for copper supplies, and the mining companies, being well sold ahead, would only take the new business at extravagantly high prices.

An Appalling Shrinkage.

During the last six months of the year there was an appalling shrinkage in the prices of copper securities by reason of the sudden and unforseeable transformation in the copper trade. The Boston *News Bureau* showed in one of its numerous statistical compilations that on October 19 there had been a shrinkage in the market price of 46 of the more prominent copper shares of $586,000,000 from the high price of this year. The price of copper, the metal, by that date had been cut in half and more, or from 26 to 12½ cents. If all of the miscellaneous copper issues had been included in the statistical table referred to, the total shrinkage would easily have exceeded $600,000,000, and this is the price which copper investors throughout the country have paid for their bitter experience of the past 12 months.

It was fortunate, indeed, that this loss, awful as it was, came upon the market before the general money panic which followed in the latter part of October and November, as if the New York panic had come upon us at a time of high priced copper, and before the banks and brokerage houses had had opportunity to adjust their loans and customers' accounts to lower metal and share prices, the disaster would have been still more overwhelming.

In view of all that has transpired in copperdom during the past 12 months, the tremendous shrinkages which have been sustained and the losses almost monumental in the aggregate which have fallen upon the investing and manufacturing community, it is truly surprising and a source of congratulation that there has not been a single failure on the Boston Stock Exchange—still the great center of copper investments. Of course, Boston has been scarred and has liquidated millions of dollars' worth of copper stocks, and the cities of Pittsburgh, Duluth, Butte, Chicago, &c., have also been compelled to share with Boston and New York the unfortunate consequence following in the wake of a practically $600,000,000 loss in copper share prices.

An Accumulation of Copper.

Long before the year was brought to a close there had been accumulated—largely by the United Metals Selling Company and the mining companies for which it operates—a total of 300,000,000 lb. of copper, or about 25 per cent. of our Continental production. At this writing the demand from consumers is yet at a low ebb, and it is thought that the production in this country is still a trifle ahead of our consumption and exports, a process which is adding by degrees to the unconsumed store of copper on hand.

In October the United Metals Selling Company succeeded in disposing of 100,000,000 lb. of its copper at around 13 to 14 cents per pound to a foreign syndicate, and to this extent it was relieved from the embarrassing necessity of financing a steadily growing pile of copper at a time when the money stringency was at its hight and the condition of the metal market at its worst.

In the latter part of December the Amalgamated Copper Company, that had already given orders to its Butte managers to cut in half the volume of their output, decided to close down the magnificent Washoe smelter and to cease operations entirely at the Anaconda, Butte Coalition, North Butte, Parrott, Trenton and Washoe properties, leaving only the Boston and Montana to operate to full capacity. The Boston and Montana has a possible output of 95,000,000 lb. per annum, which it can make for 9 cents per pound, treating its product at the Great Falls smelter. Butte is now a city of desolation. This curtail-

ment will reduce the American continental output by 200,000,000 lb. per annum, if maintained for that period

The Greene Cananea in Mexico was one of the first mines to suspend operations by reason of the fact that its low grade rock and high copper costs made mining operations unprofitable on a 14-cent market; thus 40,000,000 lb. of copper per annum was saved from the accumulating supplies.

Phelps, Dodge & Co., with their Arizona mines, were disposed to co-operate with the Amalgamated policy, and they are now operating at about 75 per cent. of normal capacity.

Some of the Canadian-British Columbia mines, by reason of their high costs, have been compelled to shorten their output materially. It is therefore doubtful if the copper mines of the United States, Canada and Mexico, which last year showed an output of 1,200,000,000 lb. of copper, will, for the year 1907, show an output exceeding 1,000,000,000 lb., and it is furthermore quite likely that at the present time this output is not at the rate of over 750,000,000 lb.

What the Figures Tell.

In illustration of the great fall which has taken place in the prices of copper shares, there are presented in the table below some figures giving by months the average prices of 10 active representative dividend paying copper shares—viz.: Amalgamated, Anaconda, Butte Coalition, Calumet & Hecla, Copper Range, North Butte, Osceola, Quincy, Utah, Consolidated and Wolverine. It is seen by this table that on March 1 the average price of these 10 stocks was $194.68 per share. On December 1 the average had fallen to $107.34. Calumet & Hecla sold as high as $1000 per share and is now selling around $600 per share. In the second column of the same table is presented the average price of Lake copper in cents per pound for each of the 12 months in 1907, and in the third column the exports from this country are shown. The table follows:

Share Prices, Copper Prices and Exports.

	Average price 10 stocks.	Average price Lake copper (In cents per pound.)	Exports of copper for month. (In gross tons.)
January 1	$185.03	25.55	17,039
February 1	193.76	25.71	9,174
March 1	194.68	26.05	13,432
April 1	170.28	25.37	17,363
May 1	170.89	25.21	9,010
June 1	158.25	24.87	16,193
July 1	160.67	23.35	14,774
August 1	153.21	20.92	13,458
September 1	138.91	16.75	17,157
October 1	116.96	14.12	29,161
November 1	110.51	14.10	33,787
December 1	107.34	*13.75	*28,000

* Estimated.

The one primary cause for the general smashup in copper was the inability of the great manufacturing and consuming companies to finance new construction. With the scarcity of money and the ever contracting ability to sell new securities, trolley companies, power transmission enterprises, electrical propositions, &c., found themselves face to face with conditions which prohibited further expansion. Operatives were discharged, construction forces were laid off, contraction and curtailment were the orders given at every turn. Little wonder was it, therefore, that new orders for copper were cut off as with a knife.

The above is largely a reflection of conditions peculiar to the United States. While the money panic was in many respects worldwide in scope, still Europe has been in much better shape in the matter of copper consumption than the United States, and Europe has taken, not altogether for immediate consumption, however, an enormous amount of copper which menaced the American situation.

The Outlook.

The outlook for copper, depends, of course, primarily upon the developments in the money market. With confidence regained, with currency gravitating back to the great reserve centers where new industries are financed, with money ruling at such figures as will permit and encourage the sale of new securities, the wheels of industry will once more revolve as before and the demand for copper will again be stimulated. When this demand comes it will find the producers utterly unable immediately to supply it. Discharged miners must be brought back, smelter fires must be relighted and it will take months for the refined product to find its way to the New York market after orders have been given to the Western mines to resume.

This is still the age of electricity. We are not going back to the days of the stage coach. A period of needed rest has been forced upon us. Labor, in many instances autocratic and unreasonable, having had its pay reduced will now come nearer giving a day's work for a day's wages.

From the standpoint of the investor it can be said that never were copper shares so widely distributed as to-day. Every dividend paying mine, and, in fact, many which are not dividend payers, have shown a wonderful increase in the number of stockholders, testifying to the wide distribution which has taken place during the great liquidation of 1907. The floating supply of copper stocks was never smaller than to-day. When the inevitable improvement in general conditions finally arrives it will find speculative conditions ideal.

Just when this improvement will take place no one is wise enough to prophesy. Much depends upon the money rate and the ability of the American people to recover quickly from the shattering blows of the past 12 months.

Lake Commerce Through the Sault Canals.

The comparative statement of lake commerce through the canals at Sault Ste. Marie, Michigan and Ontario, for the seasons 1907 and 1906, shows an increase of 12 per cent. in net freight, while traffic in 1906 exceeded that of 1905 by 17 per cent. The total east and west bound freight movement was 58,217,214 net tons in 1907, against 51,751,080 net tons in 1906 and 44,270,680 net tons in 1905. Coal shows the heaviest percentage of increase, being 49 per cent. for hard and 28 per cent for soft coal, but in bulk iron ore is more important, increasing from 35,357,042 net tons in 1906 to 39,594,944 net tons in 1907, or a gain of 12 per cent. Wheat shipments were 16 per cent. ahead of 1906, but all other commodities fell off.

The United States Canal was opened April 23 and closed December 11, 1907; season, 233 days. The Canadian Canal was opened April 22 and closed December 15, 1907; season, 238 days.

The following table, which is part of those compiled at St. Marys Falls Canal, Michigan, under direction of Col. Chas. E. L. B. Davis, Corps of Engineers, United States Army, gives some details of traffic:

	Total traffic— Season 1906.	Season 1907.	Per cent. decrease.
Vessels:			
Steamers, number	18,138	17,245	5
Sailing, number	2,817	2,303	18
Unregistered, number	1,200	889	26
Total number	22,155	20,437	8
Tonnage:			
Registered net	41,098,324	44,087,974	*7
Freight, net	51,751,080	58,217,214	*12
Coal			
Hard, net tons	1,011,375	1,506,668	*49
Soft, net tons	7,728,255	9,893,427	*28
Flour, barrels	6,495,350	6,524,770	.
Wheat, bushels	84,271,358	98,135,775	*16
Other grain, bushels	54,343,155	43,463,338	20
Manufactured and pig iron, net tons	391,105	307,941	21
Salt, barrels	468,162	460,802	2
Copper, net tons	107,633	89,959	16
Iron ore, net tons	35,357,042	39,594,944	*12
Lumber, M ft. B. M.	900,631	649,320	28

* Increase.

The proportion of freight carried in the United States and Canadian canals is shown in another statement, from which it appears that out of a total east and west bound movement of 58,217,214 tons only 26 per cent., or 15,585,368 tons, passed through the Canadian Canal.

THE CHICAGO IRON TRADE IN 1907.

BY T. J. WRIGHT.

Under the impulse of a forward movement that gained great impetus toward the close of the previous year, 1907 opened with a phenomenal demand for iron and steel products and material. Every furnace, mill and factory in this district was overwhelmed with accumulated orders, the result being that deliveries were delayed weeks and months by the sheer incapacity of plants to produce the volume of goods required.

This condition continued with unabated force until June, when a tightening money market, far reaching in its effects, began to be noticeably felt throughout the Middle West. It was first manifested in the hesitancy of consumers to contract freely for future requirements, but had no immediate effect upon manufacturing interests, which were then bending every energy to complete overdue orders. But the slow subsidence of demand, starting at that time, culminated in a sensational drop in November when, following an extreme and precipitate contraction of currency, compelling a resort to clearing house checks and other emergency measures, business was temporarily brought well night to a standstill. A slight recovery followed, but a universal policy of curtailment was inaugurated, which resulted in cancellation and postponement of orders, so that the year closed with under 50 per cent. of the productive capacity of Chicago's steel making and steel working plants in operation. Thus within a brief 12-month cycle was witnessed a complete reversal of industrial conditions. Crowding activity was succeeded by extreme dullness, inadequate supply gave way to an unplaced surplus, and progressive expansion yielded to systematic retrenchment.

A Year of Distinctive Achievement.

Nevertheless, in all that makes for permanency in growth and advancement toward greater importance as a productive center for iron and steel, the record of 1907 will go down as one of distinctive achievement for the Chicago District. Although the sum total of accomplishment was somewhat diminished by the effects of unfavorable financial developments, yet it can safely be said that the temporary halt thus imposed upon forward progress was fraught with no lasting results prejudicial to the continued ascendency of this territory as a steel making and steel consuming district.

By reason of its imposing magnitude and the influential bearing it will have upon the promotion of steel consuming industries of Chicago and the Middle West, the new steel plant of the United States Steel Corporation, now rapidly taking form at Gary, Ind., continues to occupy a foremost place of interest. The work of construction, actively began in 1906, was pushed vigorously forward through the year. Enough has already been accomplished to insure the entrance of this plant into the ranks of producers before the close of 1908, if it is desired to put it in operation within that period. Of the eight blast furnaces, with a total annual capacity of 1,400,000 tons, now under construction, four are almost completed, and the remainder are well under way. Fifty per cent. of work on the rail mill, which will add 900,000 tons to the Western product, is finished, and the billet mills are about one-quarter done. Work has steadily progressed through the year on the 56 open hearth furnaces, designed to furnish 2,400,000 tons of steel annually. The entire steel output of the plant will be open hearth.

The South Works of the Illinois Steel Company were enlarged by the addition of two new finishing mills, one a 24-in. rerolling rail mill of 10,000 tons monthly capacity, and the other a 30-in. universal plate mill, designed to turn out 10,000 tons a month. The latter is the first mill of the kind to be established west of the Pittsburgh District and forms a needed complement to the structural output of the works. It also possesses the distinction of being the first mill of its kind in this country to be electrically driven by direct connected motors.

While the independent interests did not contribute largely to the gain in new tonnage capacity, they have under way and well toward completion plant additions and new works that will help materially to swell the local aggregate production in finished material. These include a continuous bar mill under construction by the Inland Steel Company at Indiana Harbor; a sheet bar mill nearing completion at Chicago Heights, built by the Calumet Steel Company, and a small bar iron mill, the erection of which was begun early in the year at Joliet, Ill., by the Joliet Iron Products Company.

Mill and Furnace Construction Summarized.

The following list comprises completed, under construction and projected additions to the iron and steel producing capacity of the Chicago District in 1907. Four of the eight furnaces of the Indiana Steel Company, though practically finished, will not be put into operation for some months:

BLAST FURNACES.

Blast furnaces completed in 1907, annual capacity 1,110,000 tons:

Four, Indiana Steel Company, Gary, Ind.; annual capacity, 720,000 tons.
One, Inland Steel Company, Indiana Harbor, Ind.; annual capacity, 140,000 tons.
One, Federal Furnace Company, South Deering; annual capacity, 125,000 tons.
One, Northwestern Iron Company, Mayville, Wis.; annual capacity, 125,000 tons.

Blast furnaces under construction, annual capacity 945,000 tons:

Four, Indiana Steel Company, Gary, Ind.; annual capacity, 720,000 tons.
One, Federal Furnace Company, South Deering; annual capacity, 125,000 tons.
One, Thomas Iron Company, Milwaukee, Wis.; annual capacity, 100,000 tons.

OPEN HEARTH STEEL FURNACES.

Open hearth steel furnaces completed:

Two, 50-ton, Inland Steel Company, Indiana Harbor, Ind.

Open hearth steel furnaces under construction:

Fifty-six 60-ton furnaces, Indiana Steel Company, Gary, Ind.

FINISHING MILLS.

Rail mills completed:

Illinois Steel Company, South Works, 24-in. light rerolling rail, 12 to 80 lb. sections; monthly capacity, 10,000 tons.

Rail mills under construction:

Indiana Steel Company, Gary, Ind., standard section open hearth rails; monthly capacity, 75,000 tons.

Plate mills completed:

Illinois Steel Company, South Chicago, 30-in. universal plate mill for plates 6 in. to 30 in. wide; monthly capacity, 10,000 tons.

Plate mills under construction:

Indiana Steel Company, Gary, Ind., sheared plate mills; monthly capacity, 30,000 tons.

Bar mills completed:

Wisconsin Steel Company, South Deering, continuous bar mill, eight stands of 16-in. and three stands of 14-in. rolls; monthly capacity, 6500 tons.

Bar mills under construction:

Inland Steel Company, Indiana Harbor, Ind., continuous bar mill; monthly capacity, 6500 tons.
Calumet Steel Company, Chicago Heights, Ill., 14-in. bar mill to roll steel bars and hard angles.
Joliet Iron Products Company, Joliet, Ill., bar iron mill to roll from scrap.

MISCELLANEOUS.

Under construction:

Indiana Steel Company, Gary, Ind., blooming, slabbing and billet mills.
Inland Steel Company, Indiana Harbor, Ind., blooming and sheet bar mill.
Sellers Mfg. Company, Mayfair, Ill., tie plate and splice bar mill.

Building Plans.

Few years have been more prolific in the development of building plans than 1907. Some of the most important projects, however, were arrested by the unfavorable turn in financial affairs, which made it difficult to provide funds for even the soundest undertakings. Notwithstanding these and other defections, the permits for the year showed a decline of but $2,044,560 over the re-

markable record of 1906. The figures for 1907 and the two preceding years were: 1905, $62,500,000; 1906, $64,247,350, as compared with $50,094,180 for 1907. Permits issued the last week in December swelled the total for that month by $3,600,000. The structures of chief importance contributing to the above total, which include notable tonnages of structural steel, were as follows: Corn Exchange Bank, Chicago Telephone Company, La Salle Hotel, University Club, Commonwealth Edison Company, power house extension; Joseph T. Ryerson & Sons' fabricating shops, Montgomery, Ward & Co., warehouse. The last mentioned is of reinforced concrete and is probably the largest building of this construction yet undertaken, 5000 tons of steel being required for the reinforcing. An aggregate of 35,000 tons of steel is comprised in the above buildings.

Among the industrial plants of note completed during the year the most conspicuous perhaps was that of the Standard Steel Car Company, at Hammond, Ind., which began operations in June. The importance of this plant is better appreciated when it is stated that it will normally consume more than 300,000 tons of plates annually. A notable addition to the foundry interests was made by the Griffin Wheel Company, which enlarged its West Pullman plant by the building of new shops, having a capacity of 1000 wheels per day. Besides a new plant under construction by the Chicago Railway Equipment Company, prospective work in this line developed during the year, embraces large additions contemplated by the Pullman Company and the Blue Island Car & Equipment Company. The American Car & Foundry Company secured a site adjacent to the Steel Corporation's new plant at Gary, Ind., for the establishment of an extensive plant.

Railroad Retrenchment.

But little extension work projected by Western railroads, which was not already financed and under way at or soon after the first of the year, was undertaken in 1907. Rail purchases for 1908, which, following the precedent of the former year would have been made early, were first delayed, and then in a large measure indefinitely postponed. Some tonnage contracted for delivery in 1907 was carried over into the succeeding year at the request of the roads; but the Illinois Steel Company's rail mill had specifications sufficient to keep it in operation beyond December. Curtailment of expenditures for equipment, made necessary by inability to secure needed funds, was carried by the railroad interests to the farthest limit.

The effect of this policy was keenly felt by every department of the iron and steel trade. Cancellations of car orders placed and the withholding of those contemplated resulted in a wholesale reduction in the output of car shops. With plans completed and bids in on construction and equipment of new shops requiring 9000 tons of structural material, the Pullman Company decided, in view of the unfavorable developments, to defer the work. Two other railroad equipment plants would in all probability have been added to the list of completed improvements but for the untoward turn of events.

The Course of Prices.

Considering the unprecedented demand that prevailed for iron and steel during the first five months of the year, the limited range of fluctuations in prices of finished material was most remarkable. Instead of soaring upward as in other boom periods, but few advances were made, and these were generally restricted within moderate limits. This was chiefly due to the conservative attitude assumed by the leading producer that exerted a powerful influence in restraint of undue expansion of values. The wisdom of this policy became apparent later when reaction set in and orders were insufficient to keep mills going. Instead of a demoralizing slump such as is usually seen in like circumstances, prices were maintained at practically an even level. The pursuance of this policy, it is predicted, will go far toward the elimination of extreme price fluctuations in the future, such as have characterized the course of the iron and steel market in the past. Owing to mill congestion and consequent delay in execution of orders, premiums for prompt shipment from independent mills were sometimes charged. Comparison of prices of finished iron and steel for the year with those of former years is afforded in the following table:

Average Chicago Base Prices of Finished Iron and Steel, 1907.

Month	Common bar iron. Cents	Soft steel bars. Cents	Structural shapes. Cents	Smooth machinery steel. Cents
January	1.81½	1.76½	1.86½	2.01½
February	1.81½	1.76½	1.86½	2.16⅔
March	1.81½	1.76½	1.86½	2.16½
April	1.80	1.76½	1.86¼	2.16½
May	1.76½	1.76½	1.86½	2.16⅔
June	1.78	1.78	1.88	2.18
July	1.78	1.78	1.88	2.18
August	1.78	1.78	1.88	2.18
September	1.78	1.78	1.88	2.18
October	1.78	1.78	1.88	2.18
November	1.76	1.78	1.88	2.18
December	1.75	1.78	1.88	2.18
Average for year	1.78½	1.77⅓	1.87⅓	2.16⅓
Average for 1906	1.71¼	1.67¾	1.86½	1.92⅓
Average for 1905	1.64⅜	1.64⅜	1.78⅓	1.89¾
Average for 1904	1.41¼	1.49½	1.70¾	1.74¼
Average for 1903	1.64¾	1.72	1.75	1.97¼
Average for 1902	1.71	1.73½	1.75	2.00
Average for 1901	1.58	1.58	1.70	1.96
Average for 1900	1.75	1.75	2.00	2.25
Average for 1899	1.80	1.90	2.00	2.50
Average for 1898	1.05	1.10	1.25	1.55
Average for 1897	1.11½	1.13	1.19	1.53

It will be noted by reference to the price tables of finished iron and steel that, aside from an advance of 1½ cents in freight rate from Pittsburgh, the monthly averages of quotations show an extreme variation of only $1 a ton on bar iron. Steel bars and structural shapes were unchanged, and barring $3 a ton advance in January, smooth machinery steel remained steady throughout the year. Though at the hight of the demand, premiums on prompt plate shipments ran up to $4 a ton, the only advance made by the principal interest was one of $2 a ton in February. Crude iron prices, on the other hand, being subject to no moderating influence, went steadily upward until June, at which time a decline set in that culminated at the close of the year with a spread of over $7.50 between the high and low monthly average of quotations.

PIG IRON.

Notwithstanding the steady increase in pig iron production that has taken place, the year opened with a rate of consumption equal to, if not somewhat in excess of, furnace capacity. With every available furnace, both North and South, in blast there was a pronounced shortage of foundry irons during the first three months of the year. The scarcity was emphasized and aggravated by inadequate car service that from February until May seriously interfered with the movement of iron from furnace yards. Shipments were delayed to such an extent that melters were in some instances compelled to shut down a few days at a time pending the arrival of iron. This condition gave rise to an extravagant spread between prompt and forward delivery prices, which ranged from $3 to $4 a ton. In spite of the abnormal advance in prices which in the latter part of January reached $23, Chicago, for Northern No. 2, and $19, Birmingham, for Southern No. 2 Foundry on second half requirements, a large tonnage was placed for this period.

By May furnace schedules of tonnage for sale for the entire year had been so nearly completed that some of the principal Southern producers announced their withdrawal from the market for second half delivery, and a large part of the Northern merchant output was engaged. Best illustrative, perhaps, of the abnormal situation created by the extraordinary demand and high prices that prevailed in the first half of the year is the fact that imports of foreign pig iron in this market not only became possible, but were actually made. Approximately 25,000 tons were brought in before changing conditions made the domestic product available for all requirements.

Influenced by indications that developed in May pointing to a decrease in consumption and distrust of the permanency of existing price levels, purchasers began to grow wary of future commitments, and the demand for forward tonnage dropped off sharply in June; in consequence all through the latter half of the year purchases were largely confined to small lots for immediate use.

Yet, had it not been for the cancellations and postponements of booked orders resulting from the financial upheaval in November, furnaces would have been able to continue operations throughout the year. As it was, however, more than 50 per cent. of the producing capacity contiguous to this market was compelled to blow out before the end of December for lack of live orders.

Pursuant to an announcement made prior to January 1, the freight rate from the Birmingham District was, in April, advanced 45 cents a ton. This rate was first scheduled to be effective February 1, but, as a result of vigorous protests made by shippers, it was postponed in order to afford time for the moving of iron delayed in furnace yards because of car shortage.

By-product coke, which has heretofore been a factor only in the foundry trade, will in the future figure importantly in furnace consumption. At Joliet, Ill., 275 Koppers by-product ovens are now being built to furnish coke for the local plant of the Illinois Steel Company. If the results expected from these ovens are realized, it is the intention of the Steel Corporation to supply coke for the new plant at Gary in the same manner; this will, of course, necessitate the construction of a large number of ovens at that place, which would obstruct a promising prospective outlet for Eastern coke. The By-Product Coke Corporation has now in operation at South Chicago 180 Solvay ovens, and a like number are being operated by the Milwaukee Solvay Company at Milwaukee.

A merger of the Northern charcoal pig iron interests was effected in May by the formation of the Lake Superior Iron & Chemical Company, Detroit, Mich., which took over the Ashland Furnace in Wisconsin, and the Manistique, Newberry, Elk Rapids, Boyne City and Chocolay furnaces in Michigan.

Price fluctuations of pig iron for the year, as compared with those of preceding years, are shown in the following table:

Average Chicago Prices of Pig Iron, 1907.

Month.	Northern coke No. 2.	Lake Superior charcoal.	Ohio strong softeners No. 1.	Southern coke No. 2.
January	$25.50	$26.80	$26.00	$26.75
February	25.50	27.00	26.00	26.85
March	25.75	26.75	26.00	26.23
April	26.00	26.50	26.00	25.85
May	26.50	27.40	26.50	26.65
June	26.25	27.50	26.25	26.60
July	25.38	27.00	26.00	25.85
August	24.50	27.20	25.50	24.45
September	23.75	27.00	25.00	23.10
October	22.10	26.20	22.90	22.15
November	20.32	25.12	21.56	20.35
December	18.63	24.25	20.38	18.85
Average for the year	$24.18⅛	$26.56	$24.84	$24.47⅛
Average for 1906	20.15	20.72	20.70	19.44¾
Average for 1905	17.30¼	17.99¾	18.50¾	16.66½
Average for 1904	14.04¾	15.50	15.64¾	13.92½
Average for 1903	18.88½	22.13¼	21.33	18.31¼
Average for 1902	20.50	23.50	23.30	20.10
Average for 1901	15.00	17.50	16.50	14.60
Average for 1900	19.12½	22.00	20.75	18.35
Average for 1899	17.65	19.80	19.67	17.75
Average for 1898	11.00	11.60	12.00	10.45
Average for 1897	10.60	13.00	12.25	10.25

OLD MATERIALS.

An extremely high level of prices was reached in scrap, and for the first six months it was well maintained. The scarcity of pig iron during a part of this period brought on a strong demand for melting grades, and the proportion of scrap used for foundry mix was largely increased. No. 1 cast rose above $20 in March and heavy melting steel brought $16. Rerolling rails were in demand, and touched $19, while the general average of quotations on No. 1 wrought in January was $16.35. Reaction began with the wane of consumption in July, and thence forward a steady decline took place, which in December showed a net loss in values of a little more than $6 a ton.

The steady growth of the scrap supply makes it a factor of increasing importance in the production of iron and steel. Owing to its position as the center of a large extent of railroad mileage, Chicago is pre-eminently a scrap market. In order to facilitate the handling and distribution of the large tonnage which naturally seeks an outlet here, scrap yards equipped with modern machinery for the economical sorting and preparation of material ready for use are needed.

The monthly average of prices for the year, together with the yearly averages for former years, is shown as follows:

Average Chicago Prices of Old Material, 1907.

Month.	Old iron rails. Gross tons.	No. 1 railroad wrought. Net ton.	No. 1 busheling scrap. Net ton.	Heavy cast scrap. Net ton.	Heavy melting scrap. Gross ton.
January	$27.40	$16.35	$11.80	$17.80	$16.80
February	25.50	15.50	11.13	18.25	15.75
March	25.00	15.25	11.00	19.50	16.00
April	24.88	15.25	11.00	18.88	15.75
May	24.50	15.45	11.50	18.55	15.60
June	24.50	16.06	11.94	18.94	16.25
July	23.75	15.06	11.25	18.44	16.12
August	20.65	14.40	10.50	16.75	15.10
September	20.25	14.38	10.50	16.81	14.75
October	20.05	14.60	10.30	16.25	14.70
November	17.63	12.32	8.25	14.00	12.63
December	15.50	11.00	7.50	13.00	11.50
Average for year	$22.46¾	$14.63½	$10.55½	$17.26½	$15.08
Average for 1906	23.04	15.62	10.69	14.55	14.74
Average for 1905	20.18	16.14½	11.11¾	13.49½	13.96½
Average for 1904	16.56¼	12.45	8.76½	10.95½	10.72
Average for 1903	20.28¾	16.07	12.05	14.74½	15.50½
Average for 1902	23.91	19.68½	13.81½	15.03	17.37½
Average for 1901	19.50	15.00	10.80	11.25	....
Average for 1900	17.90	15.00	8.00	11.00	....
Average for 1899	21.00	17.25	10.15	12.40	....
Average for 1898	12.37½	11.25	6.62½	8.15	....
Average for 1897	11.67	11.20	7.00	7.25	....

Labor.

Freedom from disturbing controversies has, with a few comparatively unimportant exceptions, characterized the relations of organized labor and employers. Numerous demands for higher wages were made in the first half of the year, and were in the majority of cases met by advances representing in whole or in part what was demanded. The most potent influence operating to support the contentions of workers for increased wage scales was the pronounced scarcity of labor. Shops were frequently compelled to run short of their capacity because of inability to secure help.

The stove molders secured a 5 per cent. advance with an agreement extending through 1908, and the Illinois Steel Company began the year with a 10-cent advance in daily wages of unskilled labor. The most serious strike of the year occurred in the works of the Chicago Shipbuilding Company at South Chicago in February, resulting in a shutdown of the plant, which remained practically closed throughout the year.

Following the money panic in October conditions were reversed and working forces were then reduced, throwing thousands of men out of employment. No general reduction of wages took place up to the end of the year, but the outlook promises readjustment on the basis of lower wage scales when present agreements have expired, unless a strong revival of business takes place and commodity values are sustained.

The Outlook.

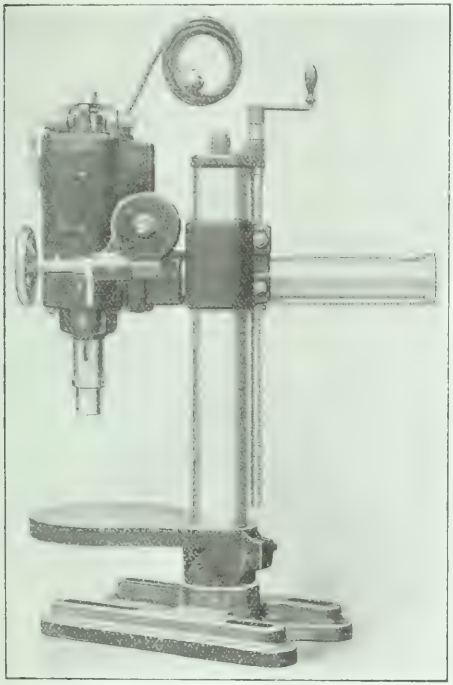
Preceding all else in the rehabilitation of industrial activity and the restoration of public confidence there must come a satisfactory clearing of the financial situation. A hopeful degree of progress in this direction is observable throughout the West; the stringency of currency has relaxed locally, and within a few weeks is expected to disappear entirely.

Owing to the prompt action taken in blowing out and shutting down furnaces and mills, producers enter the new year with no surplus of accumulated stock. Consumers of finished product have for several months been buying material only for current requirements, and for the past two months specifications on existing contracts have been generally withheld. Melters of foundry pig iron, it is estimated, will not as a rule be forced into the market for possibly 60 days, but inquiries in the market indicate that a few large consumers will need considerable tonnage. With the balance of foreign trade strongly in our favor, a large surplus of cereal products to be marketed which will command profitable prices, and conditions basically sound existing throughout the country, it seems only reasonable to expect at least a normally prosperous business in 1908.

The Hisey Portable Electric Radial Drill.

Herewith is illustrated the improved Hisey portable electric Scotch radial drill of 2-in. capacity, made by the Hisey-Wolf Machine Company, Cincinnati, Ohio. This drill has a feed through the hand wheel, with quick return by hand, and the head may be swiveled and adjusted radially to drill at any part of a circle of 24 in. radius. The hand wheel and wormbox have a swivel adjustment in a vertical plane, permitting the drill to be inclined at any angle below the horizontal, making it possible to drill in corners and close places. The motor has two speeds controlled by a thumb lever at the lower end of the head.

The horizontal and vertical columns are of hollow steel tubing. The upright column is fitted with a screw to raise and lower the horizontal arm, and the latter has a rack and pinion for in and out adjustment. By



The 2-In. Portable Electric Scotch Radial Drill Made by the Hisey-Wolf Machine Company, Cincinnati, Ohio.

means of these adjustments the operator can position the motor to the work by merely turning crank handles. The table is adjustable and detachable. The drills are made in three sizes of ⅞, 1¼ and 2 in. capacities, and for either direct or alternating current. Current for the motor is obtained from an ordinary lamp socket.

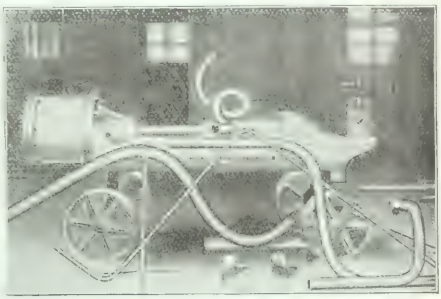
This drill is entirely self-contained, and is portable in the full sense of the word, as one man can easily handle it. The range of work is unlimited, as it can be taken to any part of the shop or any distance for outside work. Since it can be carried to heavy work, which cannot conveniently be taken to a drill press, the usefulness of the drill in large machine shops, boiler works, shipbuilding plants and bridge building and general construction work will be readily recognized.

Six gates weighing 20,000 lb. each will be used at the Roosevelt dam in connection with the Salt River project being erected by the United States Reclamation Service. The gates will be subjected to a total maximum pressure of 80,000 lb.

The Underwood Pneumatic Pipe Bender.

A machine particularly adapted to railroad repair shop work, where a large amount of pipe bending is required in connection with the erection and repair of locomotives, is shown in the accompanying illustration. It is a new portable pneumatic pipe bending machine, which is being manufactured and placed on the market by H. B. Underwood & Co., Philadelphia, Pa., and is equally well suited for general pipe bending work. The machine is about 5 ft. long and is mounted on truck wheels for convenience in h uling about the shop.

Compressed air of ordinary shop pressure, say, 80 to 90 lb., supplies the power for the operation of the machine. The cylinder is 12 x 16 in. in size, and the piston head is normally held against the head of the cylinder by a heavy spring. To the end of the piston rod the female die of the machine is fastened. The male dies, which vary in size according to the work to be done, are loosely laid against the angle block at the right of the machine, being maintained central by means of an ordinary slot and projection. This permits of ready change of the dies and enables the work of bending to be done with great rapidity. The pipe to be bent is not clamped in any way, but is simply held in position by the operator of the machine. The operation of bending



A Portable Pneumatic Pipe Bending Machine Made by H. B. Underwood & Co., Philadelphia, Pa.

is controlled entirely by a three-way cock at the right of the machine (not shown in the accompanying engravings), the opening of which admits air to the cylinder, exerting the necessary pressure against the head to force the female die against the pipe. The pressure can be varied by this means, and there is claimed to be absolutely no danger of flattening the pipe. A 2-in. pipe can be bent to a right angle on this machine in 2 min.

Dies are furnished of standard radius for locomotive work for ½ to 2 in. pipe, and of 12 to 13 in. radius. Special dies of any required radius or shape can, however, be furnished if desired. It is the intention of the builders to supply this tool either with or without trucks or pipe vise, the latter being simply attached to the machine for convenience.

The Reeves Engineering Company, Mt. Vernon, Ohio, has recently been incorporated and has purchased the equipment of Reeves Brothers, builders of gas and gasoline engines. The new company will continue to build these designs of engines, as well as a line of compressors, and will also manufacture gray iron castings. The plant of the Challingsworth Foundry & Machine Company, at Mt. Vernon, has been purchased and is now being rebuilt. A number of machine tools will be added to the previous equipment of Reeves Brothers, to make the plant complete in both foundry and machine departments.

A mixture of boric acid, 1 lb., pulverized chlorate of potash 4 ounces, and carbonate of iron, 3 ounces, is claimed to be a good flux for brazing cast iron. The flux should not be applied until the metal has been carefully cleaned and the sections to be brazed have reached a bright red heat.

THE LARGEST PLANER IN THE WORLD.

The planer which has just been finished for Mackintosh, Hemphill & Co., Pittsburgh, Pa., by the Niles-Bement-Pond Company's Bement-Miles Works, Philadelphia, Pa., is not only the largest, heaviest and most powerful planer in all probability that has ever been built, but is also the most versatile. In a sense it combines the functions of a slotter, a shaper and a planer, since each of the two heads is fitted with a slotter bar and is arranged for transverse planing. Obviously a machine weighing over 420 tons, or 845,000 lb. to be exact, is intended for extremely heavy work, and it is expedient to perform as many operations as possible with one setting of the work. Other features of interest are the use of pneumatic clutches to give the necessary reversing motions, pneumatic control of the feeds to the heads and the table, and the entire absence of belts, all driving being direct through gearing from electric motors. There are four of these representing a total capacity of over 200 hp. A 100-hp. motor provides the main drive, a 50-hp. motor operates the slotting and cross planing movements, a 20-hp. motor raises and lowers the cross rail, and a 7½-hp. motor travels the heads on the cross rail. It will be seen that all adjustments are by power, for it would be impracticable to make more than the very fine settings by hand, as the time lost would defeat the most important advantage of the machine, the ability to do heavy work with the greatest rapidity. In addition a 30-hp. motor, which might be regarded as an auxiliary, drives an air compressor, making the pneumatic clutches independent of the shop compressed air system. This motor can, however, be dispensed with if it should prove desirable to connect to the existing air supply. All of the motors are controlled from a switch panel at the rear of the right housing.

As further evidence of the remarkable size of this planer the following dimensions are interesting: Distance between the uprights, 14 ft. 4 in.; maximum distance from the table to the bottom of the cross rail, 12 ft. 2 in.; maximum stroke of the table, 30 ft.; maximum stroke of the slotter bar, 8 ft.; total width of the bed, 13 ft.; length of the bed, 60 ft.; width of each of the table ways, 15 in.; hight of the tool slides, 7 ft. 8 in.; vertical traverse of the tool slides, 4 ft.; width of face of each upright, 2 ft. 6 in., and hight of the cross rail, including the top rib bracing, 5 ft. The cross rail is long enough to permit the full traverse of either head between the uprights.

In Figs. 1 and 4 may be seen the main drive through gearing from the 100-hp. motor to the pneumatic clutches at the base of the upright. The speed of these clutches may be varied somewhat by changing the speed of the motor, which has a variation of 1 to 1¼, and a further range is effected by reversing the two change gears, so that cutting speeds are available from 14 to 25 ft. per minute and return speeds from 52½ to 65½ ft. per minute. The pneumatic clutches are completely inclosed, and are of the already familiar type made by this company in which a large number of friction disks are used to give an enormous friction area within a compact space. The compressed air to operate these clutches is controlled by a small valve, easily moved by hand, to start, stop or reverse the table. It will readily be appreciated that it would be almost out of the question to transmit power to a planer from so large a motor by belt, but the pneumatic clutches have been found fully capable of doing the work satisfactorily. Except for being unusually heavy and powerful the drive from the clutches to the table racks, which are in duplicate, is substantially the

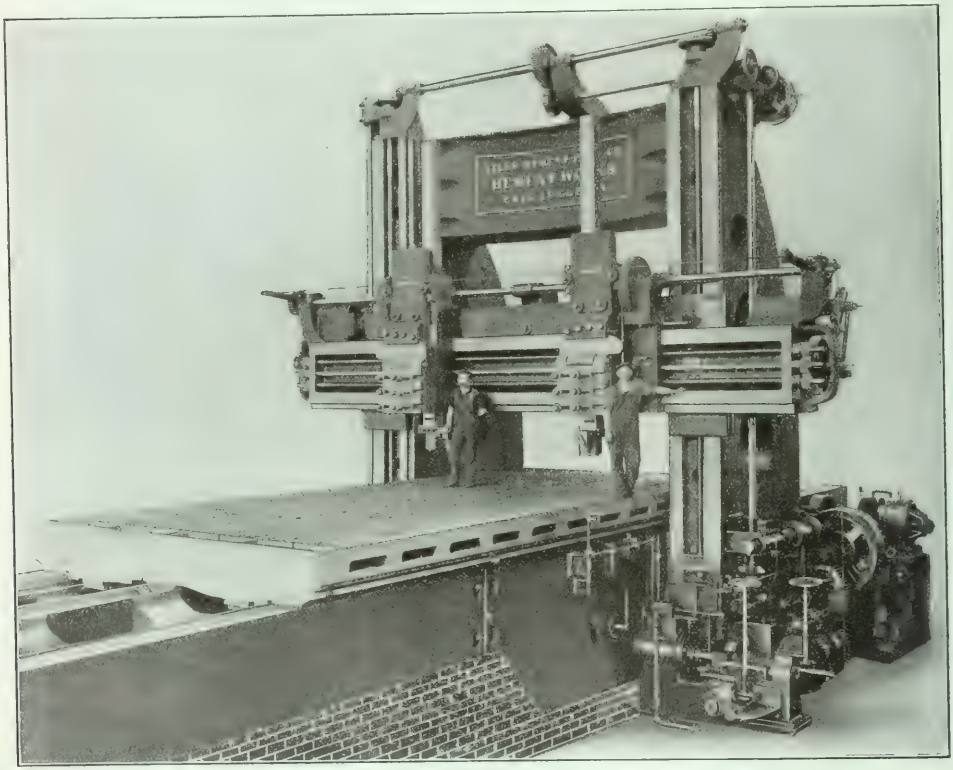


Fig. 1. Operating Side of the Big Planer, Showing Main Driving and Feeding Mechanism.

same as that of any planer. All of the gears are of steel, and the two bull pinions are forged directly on the shaft. To increase the smoothness of the motion the pinions are cut half pitch apart, and the bull wheels, shown in Fig. 6, which are connected by a sleeve, are set to correspond The sleeve and gears revolve on a stationary shaft. To allow the gearing to be easily removed the shaft may be drawn out endwise, and the center bearing of the sleeve is capped.

Fig. 4 also shows the pneumatic feed to the cross heads. Immediately above the main gearing on the side of the upright is a cylinder with its piston rod extending to the left. This rod carries a rack engaging a gear on the adjacent vertical feed shaft, and the latter through bevel gears and a horizontal shaft drives the corresponding vertical feed shaft on the opposite upright. Variation in the amount and direction of the head feeds is obtained by adjusting the position of the

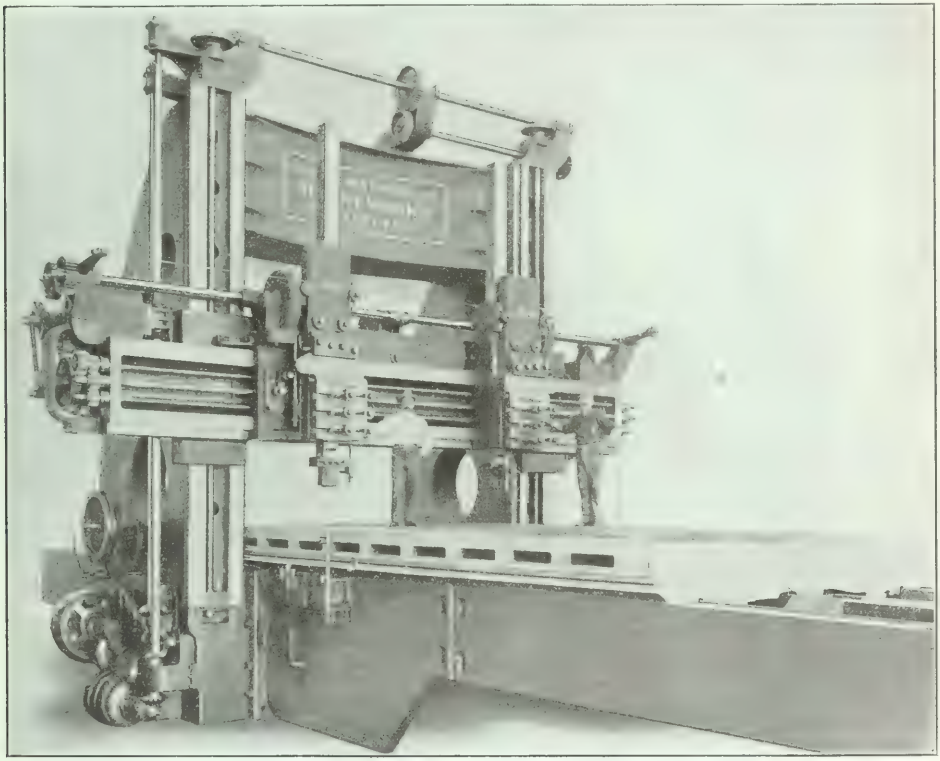


Fig. 2 Opposite Side of Planer, Showing Slotting and Cross Planing Drive.

connecting rod pins in the crank disks at the ends of the cross rail. Graduations on the disks make it possible to obtain definite cross and vertical feeds. By using the cranks on both sides at the same time, one for vertical and the other for horizontal feed, an angular feed can be given to the tool even though the heads as a whole are not arranged to swivel. At each end of the stroke, the valve controlling the air to the feed cylinder is thrown automatically. Ordinarily this movement is taken from the main driving gearing to the table, but when slotting is being done it is taken from the slotter gearing. Closing a valve to cut off the air supply throws the feed out of action. The rear view of the cross rail given in Fig. 3, shows the feed gearing at the ends and the upper parts of the backs of the cross heads which are shown projecting above the rail near the ends.

For either slotting or transverse planing it is necessary to disengage the main driving mechanism from the table and connect the latter to a separate feed motion distinct from that for the cross heads. Disconnecting the table from the main drive involves merely throwing the pneumatic driving clutches to their neutral position. Figs. 2 and 5 show the slotter drive, which is similar to the main drive up to and including the pneumatic clutches. From this point it is transmitted to a vertical square shaft, and thence by bevel and spur gears to a horizontal square shaft extending along the top of the cross rail. The tumbler bearing at the center of this shaft is seen in Fig. 3. Sliding pinions on this shaft drive larger gears which are connected to and enclosed with pinions meshing the racks on the backs of the cutter bars. The sliding pinions can be thrown in or out of gear to drive the bars independently or simultaneously. A cutting speed is obtained that is practically constant from one end of the stroke to the other, and a quick return. Both cutting and return speeds can be changed through the motor and change gears, similarly as for the main drive, giving ranges of 18½ to 30 ft. per minute for the cutting speed, and from 57 to 71 ft. for the quick return. The length of stroke is governed by the disk shown just above the motor in Fig. 5, which is driven by a worm wheel and worm on an inclined shaft bevel gear connected to the main train of slotter gearing. Adjustable stops on the periphery of this disk can be set after the manner of dogs on the side of a planer table, to effect the reversals. The same drive is used for transverse planing for which cutting speeds from 11½ to 19 ft. per minute can be obtained and quick return speeds from 35 to 43½ ft. per minute. The bevel gears on the vertical square shaft, Fig. 5, just above the cross rail, are used for changing the drive from slotting to cross planing. When the machine is used as a regular planer, single tooth pinions, which may be seen in Fig. 3, operated by worms and worm wheels, hold the slotter bars in their extreme upper positions.

In Fig. 5 can be seen near the bottom of the square vertical shaft, a bevel gear on the end of a horizontal shaft which extends through the bed and can be connected to the mechanism operating the valve of the feed cylinder on the opposite side in front of the upright. This operates the feed to the table when slotting or transverse planing is being done. This mechanism is not in position in the view given in Fig. 4, but may be seen in Fig. 1, directly in front of and at the base of the position usually occupied by the reversing hand lever of a standard planer. At the upper end of this shaft are two sockets in which a handle may be inserted. The upper socket is the hand control of the slotter and is connected to a shaft which runs down to the bottom lever or crank. The connections can be easily traced in Figs. 1 and 2 from this lever to the curved rod on the opposite side of the bed extending back to and out through the upright to the slotter reversing mechanism

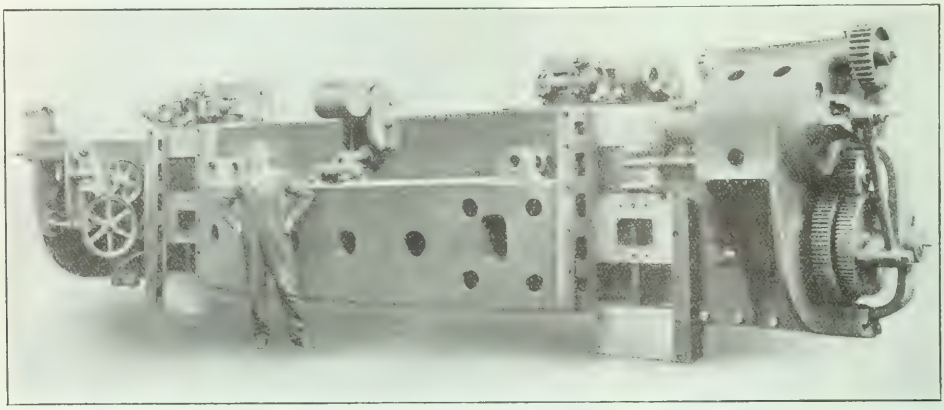


Fig. 3. Rear View of the Cross Rail, Illustrating the Feed Gearing at the Ends.

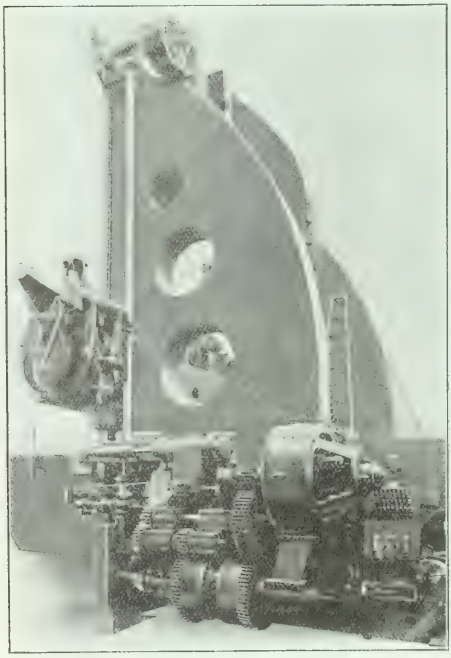


Fig. 4.—Detail of the Main Drive.—The Table Feed Mechanism Is Not Shown.

at the reversing disk. The lower socket controls the table movement in regular planing and is connected by levers and rods on both sides to the rocker shafts operated by the reversing dogs on the bed. Only one handle is furnished for each side to help avoid mistakes arising from throwing the wrong lever.

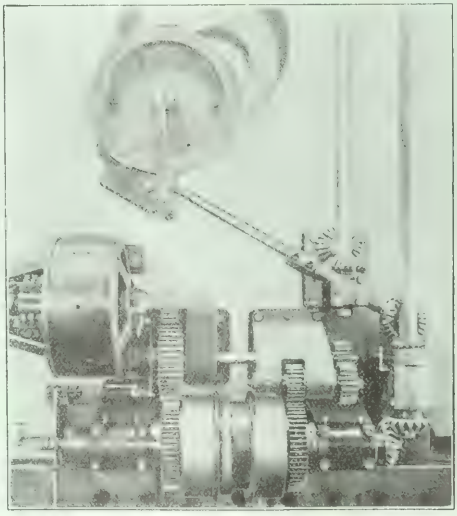


Fig. 5.—Detail of the Slotting and Cross Planing Drive on the Left Upright.

the upright. The action is practically the same as that for the cross head feed already described, except that variation in amount of feed is effected through an adjustable stop which limits the extent of the movement of the air cylinder piston. This adjustment is made by the hand wheel at the right, and the connection to the main driving works is made or broken by the left hand wheel.

In Figs. 1, 2 and 4 a vertical shaft will be seen in

The motor for the fast traverse of the heads is shown on the end of the cross rail in Fig. 4. The reversing is done through friction clutches, and a safety device is provided, which prevents throwing the fast traverse and the feed mechanism in at the same time. The cross traverse speed to the heads is 50 in. per minute. The motor for operating the rail is situated at the top of the upright, as shown in Figs. 1 and 4. This motor is connected at all times to the elevating screws and is

stopped, started and reversed electrically. The vertical speed in raising and lowering the cross rail is 26 in. per minute.

Owing to the great weight and large dimensions it was impracticable, both from a manufacturing and shipping standpoint, to make the bed or table in one piece. They were, therefore, divided to bring them within reasonable limits. The central section of the bed, which is 73 in. deep, is divided longitudinally into three parts and the two end sections into two parts, or seven parts in all. The parts are held together with taper bolts in reamed holes, and keys in keyways insure the alignment. The total weight of the bed is about 275,000 lb. The table is made in two sections, divided longitudinally in the center, and weighs about 140,000 lb. The table rests on two flat ways, near the outer edges, and one central V-way. Inside of the flat ways the table extends down a short distance to prevent any possible side movement under heavy cuts. The holes in the table for stop bolts, &c., run entirely through the upper plate, while below this is a second plate without openings, extending the full width of table for catching all chips. The chips can then be removed through the side openings of the table, which are clearly shown in Figs. 1 and 2. As these same illustrations indicate, there are finished pads on the end of the table over the V and flat ways. These

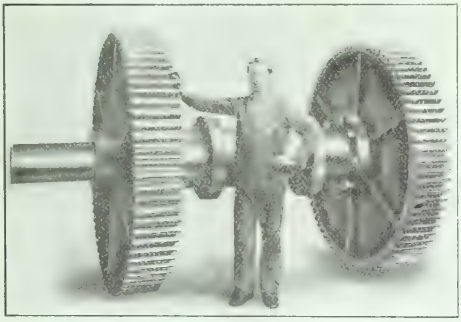


Fig. 6.—The Two Large Bull Wheels.

are to carry the heads used for truing up the ways when they are worn out of alignment. The method is as follows: The table is raised, say, ¼ in. above the ways, and is supported in this position on sliding blocks fitting the inner small auxiliary shears, which are used only for this purpose. The truing heads being fastened to the end of the table the ways are trued up from the center to the end. The heads are then placed on the opposite end of the table and the remainder of the ways finished. Near the center of the bed are pockets in the ways, in which the same truing heads are placed and the table is in its turn then planed up in the same manner. The accuracy of the finished work is dependent entirely upon the accuracy of the small auxiliary ways, and these are therefore finished and erected with great accuracy.

The elevating screws for the cross slides are firmly held top and bottom, and the nuts in the cross slides set into shouldered ends in square pockets. It is expected that this will take care of the slotter bar thrust satisfactorily, but if any loosening or trouble is experienced, arrangements have been made so that the slide can be firmly braced to the uprights. The cross heads are counterweighted and are of right and left hand construction, so that the slotter bars can be brought close together. Special tool holders are provided for the slotter bars. The outside aprons of the cross heads allow the tools to be brought very close to the edge. Each apron swivels, according to the usual practice, but in this case the adjustment is made by a worm meshing worm wheel teeth on the upper edge of the apron segment. The two hexagonal heads on the cross head slides are for the vertical hand adjustment of the tool slide and the horizontal hand adjustment of the head on the cross rail.

Railroad Building in 1907.

The record of new railroad lines built in the United States in 1907, as compiled by the *Railroad Gazette*, shows the effect of antirailroad legislation in various States, and the consequent difficulty in borrowing money. At the close of 1906 the outlook was for an increase in 1907 over the railroad construction of that year. The figures show 7½ per cent. less than for 1906, however, or 5212 miles of steam railroad, against 5623 miles. In the early part of 1907 the difficulty of getting labor and supplies to carry on authorized work was a factor. The statistics do not include second, third or fourth track, sidings or electric lines.

The Portland & Seattle, a joint low grade line of the Great Northern and the Northern Pacific, from Kennewick, Wash., west to Vancouver, 220 miles, was the longest single stretch of new road built. On the St. Paul's Pacific extension 39 miles of track were laid in 1906 and 298 miles were added in 1907, leaving between 1100 and 1200 miles yet to be built to finish the line to Seattle. The Kansas City, Mexico & Orient built 47 miles in Oklahoma, 25 in Texas and 18 in Mexico. Over 900 miles are yet to be built to finish the line from Kansas City through to Topolebampo, on the west coast of Mexico. On the Western Pacific all of the road in Utah, 122 miles, has been finished; in Nevada 39 miles have been laid, and 102 in California, leaving 577 miles yet to be built.

In Canada, the Grand Trunk Pacific has full surveys from Moncton, N. B., west to Winnipeg, Man., 1800 miles, and has let contracts for 852 miles on this section. Track has now been laid on about 300 miles west of Winnipeg. The Canadian Northern recently finished a connecting line from Brandon, Man., west to Regina, Sask., 175 miles, and has projected a large number of other extentions. The Canadian Pacific has finished an extension from Strassburg, Assin., to Saskatoon, 91 miles, so that it now has a through line from Winnipeg west to Saskatoon. It has work under way in Western Canada on several hundred miles additional. In Mexico the Southern Pacific built 205 miles on the west coast, and is pushing work from San Blas, which is on the Kansas City, Mexico & Orient, down the west coast of Guadalajara, 650 miles.

New main track mileage is reported in 44 States and Territories, including Alaska, with 90 miles of new track. Louisiana, which was third in 1906, was first in 1907, with 384 miles. Texas, South Dakota and Washington came next in order, each with between 340 and 320 miles. In 1906 Texas was first with 635 miles. The largest decrease in 1906 was in North Dakota, where only 247 miles were built, as compared with 521 in 1905. In addition to the States which lead the list, Alabama, Arkansas, Georgia, Idaho, Indiana, Minesota, Mississippi, Montana, North Carolina, North Dakota, Oklahoma, Pennsylvania, Virginia, West Virginia and Wisconsin each built over 100 miles of main line in 1907. No new mileage was reported in Connecticut, Delaware, Iowa, Massachusetts, New Hampshire, Rhode Island and Vermont.

The number of miles built in Canada was 590, a decrease of nearly one-half as from 1906, when 1007 miles were built, mostly by the Canadian Northern and the Canadian Pacific. The number of miles built in Mexico was 333, as against 297 in 1906.

According to statistics compiled by the *Railway Age*, the total number of miles of new track laid in 1907 was 5730, of which 422 miles were in Louisiana, 341 in Florida, 385 in South Dakota, 314 in Texas and 311 in Washington. In Canada last year 723 miles were built and in Mexico 349 miles.

In a discussion at the recent meeting of the Society of Naval Architects and Marine Engineers some advantages of the motor boat over the steam launch for naval service were brought out. In view of improvements in design and construction the gasoline engine, when well built and in the hands of a man trained for the work, was considered sufficiently reliable for naval use. The saving in space in the use of the automobile motor is 20 to 25 per cent. over that required for the steam launch.

A Dill Slotter with Right Angle Drive.

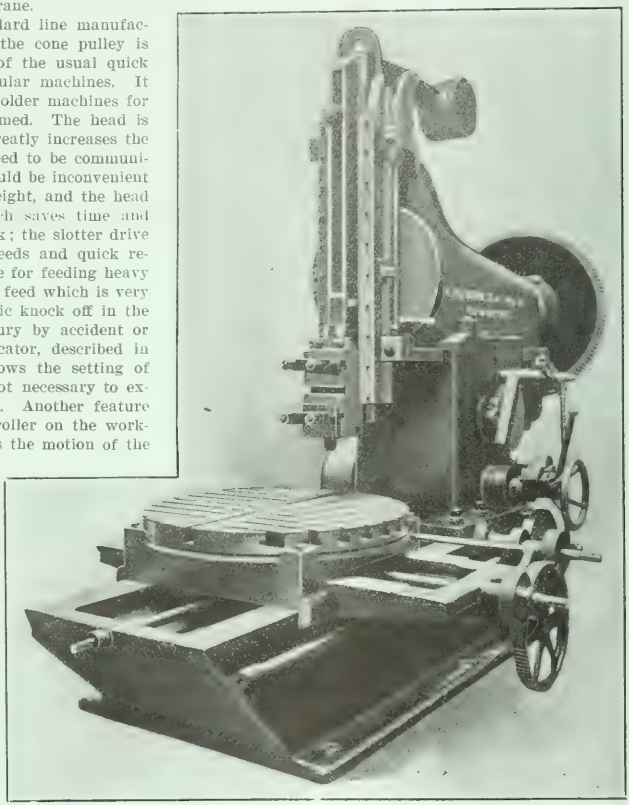
The principal distinction between the machine illustrated and other slotters which have been manufactured by the T. C. Dill Machine Company, Philadelphia, Pa., is the arrangement for the right angle drive. The receiving cone pulley is on the side opposite the working side of the machine, on a shaft, which is perpendicular to the usual cone pulley shaft. This slotter is believed to be the first provided with a right angle drive, and because of it can often be located to better advantage in a shop. The line shaft usually runs lengthwise of the shop, and it is very convenient to have a slotting machine, particularly when as large as the one illustrated, 20-24 in., set crosswise of the shop so that the upper part of the machine may not be in the way and the work can be handled by a traveling crane.

The slotter is similar to the standard line manufactured by this company, except that the cone pulley is mounted on what is a continuation of the usual quick traverse shaft on the company's regular machines. It also has the features common to the older machines for which particular advantages are claimed. The head is moveable from front to rear, which greatly increases the range of the machine, allowing the feed to be communicated to the head at times when it would be inconvenient to feed the work on account of its weight, and the head also has a quick traverse gear which saves time and labor in adjusting the tool to the work; the slotter drive permits high and uniform cutting speeds and quick return; an intermittent feed is available for feeding heavy work at high speeds and a continuous feed which is very desirable for some work; an automatic knock off in the feed mechanism protects it from injury by accident or careless handling, and a stroke indicator, described in *The Iron Age*, January 31, 1907, shows the setting of the stroke adjustment so that it is not necessary to experiment in obtaining the proper one. Another feature of advantage is the hand wheel controller on the working side of the machine which arrests the motion of the machine when the power has been turned off, and also adjusts the ram a portion of the stroke. The machine has six changes of speed, three being obtained by the three step cone pulley and this range doubled by gearing. The tool post which is provided in the relief apron is handy when changing tools. The machine is powerfully geared, being stated to have about double the usual ratio and may be provided with either belt or motor drive, special designs being built for each.

The maximum stroke of the machine is 25 in.; the longitudinal movement of the table, 48 in.; transverse movement of the table, 40 in.; table diameter, 44 in.; movement of the head, 30 in.; greatest distance from the table to the head, 24½ in., and the adjustment of the ram, 32 in. The machine will cut to the center of a 92-in. circle and to the outside of a 108-in. circle. The usual changes of speed provide a range from 5½ to 27 strokes of the ram per minute. The feeds of the table per stroke vary from 0.009 to 0.138 in., and the circular feeds per stroke at a diameter of 12 in., from 0.005 to 0.11 in. The gear ratio between the cone pulley shaft to the crank shaft is 24 to 1. The feed of the head per stroke ranges from 0.00345 in. to 0.069 in. Where the machine is motor driven it requires a motor of 10 hp. The weight of the machine without the motor is 24,000 lb.

The traveling head, which is a distinguishing feature of the Dill slotters, is also arranged to be clamped rigidly in any position desired. On work which does not need an extended reach the cutting bar or ram may be brought back close to the column where the greatest possible rigidity is secured and the best view of the work, and the table may be brought forward to its limit to machine the outside of work of the maximum diameter. When the head is extended forward the standard behind the column, mounted on an extension of the bed, is in sliding contact with the head, giving the frame an additional support to withstand the cutting thrust.

The quick traverse gear is for moving the head and compound table in all directions quickly by power. It enables the setting of work by power instead of by hand as is the usual method and is effective in the saving of time and labor. On duplicate work it is an advantage as it brings the parts back to their original position before starting the next operation. The quick traverse is operable with the machine at rest or in motion. It is simply a direct connection between the driving shaft and the feed gears, giving a more rapid movement than is effected through the regular feed mechanism.



A 20-24 In. Slotter with Right Angle Drive, Built by the T. C. Dill Machine Company, Philadelphia, Pa.

The quick return to the head is obtained by the use of an eccentric mounting of the driving gear on the crank shaft, and the connection of this gear through a crank and link with the shaft. The result is a more uniform cutting stroke, and a quick return which begins action at the lower end of the stroke where usually there is the greatest dwell. The feed can be changed to any portion of the stroke. The safety device in the feed mechanism is also useful when forming duplicate work as with the aid of stops the feed may be thrown out at any predetermined position. The guide which supports the cutter bar can be raised or lowered by convenient crank handles to the position in which it best supports the ram.

The motor driven machines may be arranged either for constant speed or variable speed motors. For the

former a mechanical speed box is supplied which gives three changes, these being in turn doubled by the regular back gears, making six changes in all, as in the belt driven machines. The variable speed motor has a range from 3 to 1 and gives the same number of changes in connection with the back gears without the employment of a speed box.

The Gayley Dry Air Blast at Warwick Furnace.

The results obtained during the past few months at the No. 2 Furnace of the Warwick Iron & Steel Company, at Pottstown, Pa., show what can be done with dry air blast on a furnace, which, under ordinary conditions, would have been blown out. Edgar S. Cook, the president of the company, has furnished some data respecting the use of the Gayley dry air blast at this furnace. The furnace had practically completed its second blast, and by reason of the worn condition of the lining and irregularity of working would have been blown out in August, if the dry air blast plant had not been ready to operate.

It was expected that the use of dry air would enable the management to prolong the life of the furnace sufficiently to complete certain profitable contracts for basic iron, and such proved to be the case. It is well known that the manufacture of basic iron in a merchant furnace is quite a different proposition from making it in a furnace as an adjunct of a steel works. In the merchant furnace the iron must be clearly within specifications, whereas at the steel works furnace a wider latitude in composition is permissible, since it is more economical to mix in the off grades rather than remelt.

Prior to the introduction of dry air the furnace had been working very irregularly, and Mr. Cook has preferred to make a comparison of dry air with natural air at contemporaneous periods in each blast, as representing similar furnace conditions resulting from a wornout lining. He advises as follows: "The No. 2 Furnace is still in operation, notwithstanding that we have stopped a number of times to patch up the top. The stock line has been cut out so much that the brickwork around the hopper has fallen in on several occasions, first one section then another, so that all the gas made by the furnace would pass to the atmosphere through these openings, instead of being taken by the flues to the boilers and hot blast stoves. We have been able to patch up these openings with plates and concrete, so as to keep the furnace running. Our idea in running, is to accumulate sufficient basic iron to ship on contracts while the furnace is being relined." The comparative working statement shows as follows:

	Product per week.	Per ct. of basic iron	Pounds of coke per ton of iron.	Yield of coke.	Pounds of ore per pound.	Hot blast temp.	Stops per week.	Product for blast.
First blast blown in October 8, 1901. Blown out June 4, 1904. Natural air.								
1904.	Tons.	grade.		%		Deg.F.	Min.	Tons.
April	2,660	54	2,716	55.6	1.48	971	560	.....
May	2,634	46	2,745	55.4	1.54	1,087	238	328,251
Second blast blown in November, 1904. Dry air.								December 1, still in operation.
1907.								
Sept.	2,638	78	2,503	54.4	1.76	959	441	.....
Oct.	2,927	82.2	2,501	55.9	1.70	962	336	.....
Nov.	2,735	80.4	2,339	54.8	1.93	1,002	336	546,567.16

The record for the past four weeks shows as follows:

Week ending—	Product. Tons.	Per cent. of basic grade.	Fuel consumption per ton of iron. Pounds.	Ore yield. Per cent.
November 30	2,833	98.2	2,188	55.06
December 7	2,787	81.8	2,347	56.6
December 14	2,973	77.1	2,320	55.8
December 21	2,679	90.6	2,380	52.3

In the week ending December 21, the furnace was standing all day Sunday, December 15, repairing top, and the stock line was cut back so badly that brick dropped away from the hopper.

The weekly average of the two periods shown above is as follows:

	Weekly product. Tons.	Coke per ton iron. Pounds.	Percentage of basic iron grade.
Natural air	2,647	2,735	50.0
Dry air	2,779	2,414	81.9
Difference	132 increase.	321 decrease.	
Showing a percentage of.	5 increase.	11.7 decrease.	

Considering the very bad physical condition of the furnace, Mr. Cook considers these records as being exceptionally good. He further advises that when the silicon in the metal fell as low as 0.10 per cent., with natural air, the sulphur would be so high as to make the iron unmarketable and would have to be remelted, but under similar conditions with dry air the sulphur would not exceed 0.04 per cent.

Wherever the dry blast has been used there are found to exist many collateral advantages the importance of which has perhaps not been generally recognized. The remarkable increase in percentage of the desired grade of metal is significant to merchant furnaces, and especially to those engaged in the foundry trade, where the difference in grade represents considerable profit or loss. The life of this furnace has been extended through the use of dry air and on a basis of economical working. The results obtained at the Isabella Furnace show an increased life on a lining of 32 per cent.

Under present conditions of trade, when economies of the first order command attention, the advantages of dry air blast rank first in economical importance, as it makes a greater return on the investment than any other adjunct of furnace working. The Gayley dry blast process is no longer an experiment, for it has demonstrated its efficiency, both in this country and abroad. The question is being increasingly asked, "why are the captains of the iron and steel industry so dilatory in installing a meritorious and well demonstrated process which makes for such economies?"

The Lisk Mfg. Company Fails.—The largest petition in bankruptcy ever filed in the United States District Court at Buffalo was placed on record December 27 against the Lisk Mfg. Company, Ltd., of Canandaigua, N. Y., the capital stock of which is $2,000,000, all paid in. At the same time a petition was filed against the Reed Mfg. Company of Newark, N. Y., the capital stock of which is $500,000, owned by the Lisk Company. The total indebtedness of both companies is upward of $1,500,000. Both companies have about $1,000,000 of manufactured goods and stock on hand. Immediately following the filing of the two petitions application was made for the appointment of receivers, in order to prevent a sacrifice of the business and property. The court appointed as receivers Frank H. Hamlin of Canandaigua, Frank H. Garlock of Newark, and Henry E. Boller of Buffalo. The receivers are required to file a bond of $100,000 upon each application and are authorized and directed to continue the business. Under their management it is believed the indebtedness will be fully paid and the property saved to the stockholders. The Lisk Company manufacture enameled and tin house furnishing goods and cooking utensils. The present condition of the money market is given as the cause of the failures.

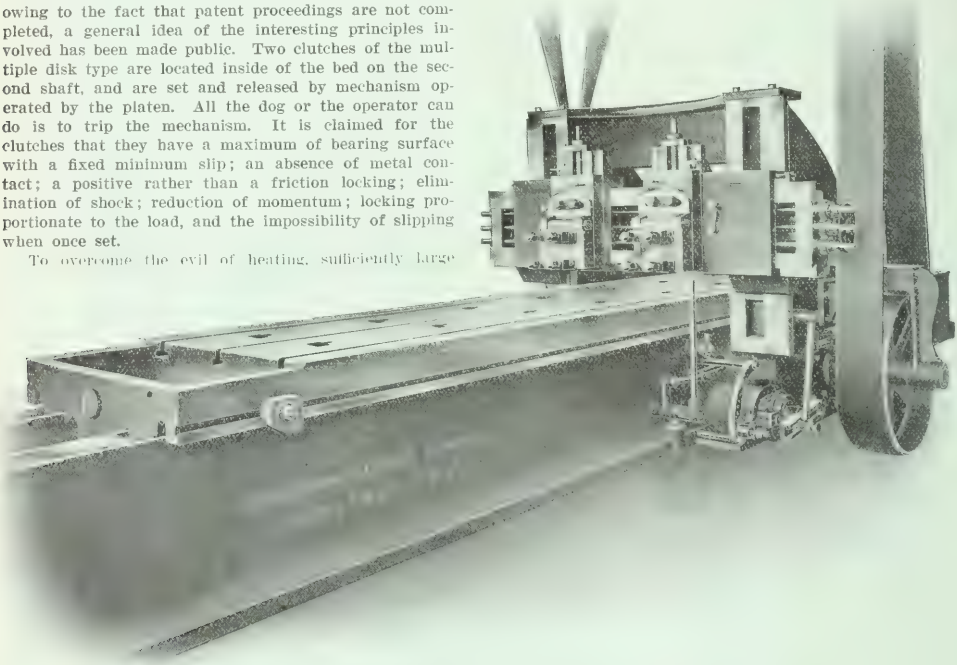
The formal transfer of the property of the National Wire Corporation, New Haven, Conn., to the American Steel & Wire Company has been made. The new owner does not intend to start up this plant for the present, unless business shall take an unusually sharp turn for the better. There would naturally be no reason for doing so. Neither has the company made plans to increase the works at New Haven, a report quite widely circulated in the daily press. It may be stated with emphasis that the situation at New Haven, from its manufacturing and engineering side, has been given little consideration by the American Steel & Wire Company. The location is esteemed a very desirable one, being so close to the New York market, and exceptionally well situated for the export trade. It is believed that eventually the works will become an important factor in the company's manufacturing operations, but for the immediate future little in the way of enlargement may be looked for.

The Chandler Clutch-Driven Planer.

The 42-in. planer shown in the illustration is unique in that the drive to the table is transmitted through mechanical clutches. Designed for frog and switch work or other heavy duty, it is a machine of great power as will be seen in the fact that the drive is through a 10-in. double belt running at a speed of 1860 ft. a minute, with ratio of 93 ft. of belt travel to 1 ft. travel of the platen. At a cutting speed of 20 ft., the machine has removed from a 40 point carbon steel forging a chip ¾ in. deep with ¾ in. feed. It was built by the Chandler Planer Company, Ayer, Mass.

The characteristic feature of this planer is the clutch mechanism, through which power is transmitted to drive the table alternately forward and back. While details of the clutches and their operation are not available owing to the fact that patent proceedings are not completed, a general idea of the interesting principles involved has been made public. Two clutches of the multiple disk type are located inside of the bed on the second shaft, and are set and released by mechanism operated by the platen. All the dog or the operator can do is to trip the mechanism. It is claimed for the clutches that they have a maximum of bearing surface with a fixed minimum slip; an absence of metal contact; a positive rather than a friction locking; elimination of shock; reduction of momentum; locking proportionate to the load, and the impossibility of slipping when once set.

To overcome the evil of heating, sufficiently large



A 42-In. Planer with Mechanical Clutch Drive, Built by the Chandler Planer Company, Ayer, Mass.

bearing surfaces are employed, consisting of multiple disks, alternately keyed to the shaft and shell of the clutch, all moving laterally. The closing of the clutch presses the disks together. In certain general features the clutch resembles the type which is coming into common use on automobiles. The shell of the clutch, which transmits the drive, is a case within which the disks run in a bath of oil. The oil not only lubricates and reduces the tendency to heat, but also serves as a cushion to give to the clutch a soft, smooth engagement. The planer has been taken down after two months operation, including severe tests of endurance and of heavy reduction, and it is stated that the disks show no signs of heating and the tool marks are still visible. Examination of the disks showed that a film of oil is always interposed between the clutch faces and upon this fact is based the contention that as long as the disks do not come into actual contact there can be no wearing and heating. The clutches being two in number, one engaging with the cutting belt shaft, the other with the reversing belt shaft, one clutch is idle while the other is working, giving each a chance to rest and become thoroughly lubricated between its engagements.

The two belts are on opposite sides of the planer, that of the reverse being crossed. Each pulley is mounted on a short shaft, the two being in line, and each shaft also carries a pinion. The pinion meshes a gear on the shell of its corresponding clutch and the clutches are mounted upon the same shaft. When the driving clutch is engaged the clutch shaft revolves for the forward movement of the platen; when the reverse clutch is operating the shaft takes the opposite motion. When the lever operating the clutch, actuated by dogs on the platen, is thrown to either extreme of its movement, the table is driven in one or the other direction, and when the lever is manually brought to its neutral vertical position, neither clutch is engaged and the table is idle. On the end of the clutch shaft, away from the operator, is mounted a gear, meshing a pinion on the third shaft which drives the bull gear.

Each main clutch has what is called an auxiliary clutch, which is also on the clutch shaft. Its function is to engage the main clutch by bringing its disks together. When one of the main clutches is disengaged it revolves idle with its auxiliary, at the same speed. When the drive, either cutting or reversing, is to operate, the planer dog trips the shifting mechanism which engages the auxiliary clutch, causing it to grip the shaft, retarding its motion so that it runs at a slower speed than the main clutch. The difference in speed between the two causes the main clutch to tighten. This differential insures a locking in proportion to the load, for it is apparent that if there is a slip caused by a sudden accession of load the differential again asserts itself, causing the main clutch disks to take a tighter hold. The amount of slip before locking is accurately determined by a timing mechanism between the primary and main clutch.

Supplementing the main and primary clutches is a mechanically operated device, the details of which are not revealed, which insures a positive engagement of the primary clutch, leaves nothing to a mischance of dogging and provides a proper margin of safety to meet all conditions of varying platen load. The difficulty of reversing is reduced as momentum is decreased, so that the smaller the weight and the lower the velocity the greater the advantage in this respect. In the clutch planer this is accomplished to a very material extent

by mounting the clutches on the slower running second shaft, and designing the clutch so that the only parts that reverse are the disks keyed to the shaft. The clutch cases and all other operating mechanism move constantly in one direction.

The planer is a 42 x 20 in. x 20 ft. machine and weighs about 30 tons, being of massive construction throughout. It was fashioned of the frog and planer type in order to test the clutches for the severest class of work. The cutting speed is 20 ft., with a return of 4 to 1. The cutting belt, as stated, is 10 in. The reversing belt is 5 in. wide, and runs at a speed of 3900 ft. a minute. Most of the tools used in the tests were 2½ x 3 in. in size. The planer removed the side of the head, up to the web, on a pair of extra hard 70-lb. relay switch points, cutting back 9 in. in less than 6 min., and the company expects to be able to reduce this time at least 30 per cent. The planer has been run for hours on a 14-in. stroke without showing signs of injurious heating or wearing. Between 6 and 7 hp. is required to run the planer light at a cutting speed of 20 ft. with return speed of 80 ft. The reverse requires about 20 hp. On severe cutting loads the clutches have demonstrated their ability to hold without slipping under a load of over 50 hp. according to the builders' tests.

The company claims that the planer secures a greatly increased cutting efficiency because of its steadiness. The contention is made that while most frog and switch manufacturers have claimed to have reached the limit of their tool steels with less power than used in the new clutch planer, this is not the case, because of the effect of shock upon the molecular structure of steel, especially at high temperatures. Consequently the elimination of shock by increased steadiness increases the efficiency of tool steel to carry out the reduction. This is demonstrated, according to the argument, by the fact that after a tool is forged it has no cutting capacity until the molecules are permitted to readjust themselves by the process of annealing. If the planer vibrates and chatters while the tool is in the chip, there takes place in the tool, especially at its cutting edge, a disturbance practically the same as that which results from forging.

Planers with pneumatic clutches operated by compressed air have already proved successful, but so far as can be learned this planer is the first to be operated by mechanical clutches, without the assistance of belt shifting mechanism. Many attempts, it is reported, have been made to secure such a machine, but this is believed to be the first planer of its type offered for commercial work. Clutches operated by the direct action of the platen have proved impracticable, the mechanism being too positive under some conditions. The career of this new Chandler planer will consequently be watched with unusual attention by builders and users of the heavier type of planing machines.

Steel Rail Breakages in France.—Owing to frequent steel rail breakages due to hidden defects, the French railroad companies recently ordered a thorough inspection of their principal tracks, particularly at the joints where, owing to the fish plates, it is not easy to see the state of the web. The London *Times Engineering Supplement* says such inspections are now made every other year on the secondary lines and once every three months or more frequently on main lines. Steel hammers are used with two round heads and a long handle. If the rail is sound the hammer rebounds and the ring of the metal is clear, while at the least defect the shock is dull and the hammer does not rebound. When a rail is discovered that is thought to be defective the fish plates are taken off and further investigation made. If necessary the rail is renewed. In other cases the rail is marked in order that it may be frequently examined by the plate layers on their rounds. In addition to the periodical inspections, bonuses are paid to ordinary plate layers who discover breakages or cracks, either hidden or visible.

George H. Wadsworth, superintendent of the Falls Rivet & Machine Company, Cuyahoga Falls, Ohio, read a paper on "Foundry Cores, Core Sand and Core Making Machinery," at the meeting of the Chicago Foundry Foremen's Association, held at the Lewis Institute, Chicago, December 18. In this paper Mr. Wadsworth went very fully into the composition and methods of making cores, and exhibited and described the line of core machines of his invention which are manufactured by the above named company. These machines were illustrated and described in *The Iron Age* of January 10, 1907.

The Prevention of Coal Mining Accidents.

A timely report, in view of recent appalling accidents in coal mines, is that just issued by the United States Geological Survey as Bulletin No. 333, entitled "Coal Mine Accidents: Their Causes and Prevention," a preliminary statistical report by Clarence Hall and Walter O. Snelling of the technologic branch of the Survey. This report is the direct result of an order from the Secretary of the Interior, dated June 10, 1907, transferring to the Geological Survey the general supervision of the work of the coal mine inspectors in New Mexico and Indian Territory.

In endeavoring to carry out the suggestions of the Secretary relative to the improvement of mining conditions and the prevention of accidents in the coal mines of the Territories, a number of examinations of the more dangerous mines of Indian Territory were made by Clarence Hall, Samuel Sanford and Rollin T. Chamberlin, and Prof. J. A. Holmes, the expert in charge of the technologic branch. Other and more extended examinations in both Indian Territory and New Mexico have been planned. Meanwhile, Mr. Hall and his associates have been investigating the nature, extent, causes and results of a number of disastrous coal mine explosions in several of the States. These studies have been carried on in connection with the general investigations of the waste and destruction of coal in mining operations. In connection with all these investigations, and with a view to determining the practicability of preventing coal mine explosions and improving mining conditions, Mr. Hall, with the assistance of Walter O. Snelling and under the advice of Prof. C. E. Munroe, began an inquiry concerning the nature and extent of such explosions and the methods employed in the United States and foreign countries to prevent their occurrence. The results of these inquiries are embodied in the publication named.

The authors point out that the increase both in the number and seriousness of mine explosions in the United States shown in the past may be expected to continue unless most energetic measures are taken to counteract the prevailing tendency. With the depletion of the thicker and more favorably situated seams of coal, thinner and less regular seams must be worked. This factor will undoubtedly be of the greatest importance within a comparatively few years and the natural result will be to increase greatly the death rate. The rising price of timber will have the effect of decreasing the number of props used and thus increasing the chance of accidents from falls of roofs and coal, which were the direct cause of 50 per cent. of the deaths in mines in 1906. The varied nationality of the miners is also a factor to be reckoned with. At the Monongah mine, which was visited by Mr. Snelling just after the accident, signs printed in seven different languages were placarded on the walls. A large proportion of the foreign born miners are unable to understand English, and a still larger number are unable to read or write the language. The reckless disregard shown by some of the inexperienced men for their own safety and that of others can be restrained only by rigidly enforced laws.

Curtailment of production is being enforced in other industries as well as in the iron and steel trades. Under the leadership of the Arkwright Club of Boston the cotton manufacturers are arranging for a suspension of operation of 25 per cent. of the working days between the present time and March 1, which will amount to 16 days. It may assume the form of a four days' working schedule per week.

A Special Gantry Crane Dredge.

Built by Pawling & Harnischfeger for the Utah Copper Company.

When in full operation the Garfield plant of the Utah Copper Company turns out every 10 hr. about 300 tons of finely screened copper concentrates. To handle this immense amount of product rapidly and economically the special electric gantry crane dredge illustrated in the accompanying engravings was furnished by Pawling & Harnischfeger, Milwaukee, Wis.

From the concentrating plant the finely screened concentrates, which weigh approximately 150 lb. per cubic foot, are sluiced with water to the concrete tanks that are served by the dredge, as shown in Fig. 1. The tanks are arranged in series side by side, and each is 22 x 16 x 11 ft. deep; that provides a storage capacity of about 275 tons in each tank, and there are six or eight of them. The concentrates settle in the tanks, while the water flows off from one to the next through channels in the top of the partition walls until it is perfectly clear when it is run to waste. When a tank is filled the surplus water is pumped from the depressions in the surface of concentrates, and as much as can conveniently be extracted is drained through a small filter in the bottom of the tank. The service of the gantry, which travels on rails laid along the outer edge of the tanks, is to dig the accumulation which has precipitated and convey it to gondola cars standing on tracks alongside of the tanks.

The gantry and bridge are of the usual construction for cranes of this type, with the exception of the provision made for supporting a corrugated iron housing extending the full length of the bridge. The operator's cage is also inclosed, but is provided with a swinging sash that may be opened if desired.

The trolley and the method of operating the clam shell bucket are the particular features deserving description. Two views of the trolley on the partly assembled crane before the housing was added, as it appeared on the floor of the builder's erecting shop, are given in Figs. 2 and 3, and present very clearly the operating mechanism and the attached operator's cage. The cage is provided with three controllers for the three motors which respectively operate the crane travel, the trolley travel and the hoisting, and two quadrant levers for operating the hoisting and dumping brakes, I and K, and one operating lever for the friction clutch L. The hoisting machinery consists essentially of the hoist motor D, which has an automatic electric brake, a motor pinion and gear, a ratchet and pawl, N, for sustaining the load, and a main pinion and drum gear, O. The hosting drum P runs free on its shaft, except when engaged with the wood lined cone friction clutch, L, that is keyed to the same shaft. The dumping drum Q is driven by the slip gear R. Both drums are equipped with wood lined band brakes, I and K. The trolley drive and gearing is plainly indicated in the illustrations and needs no explanation.

The operation is as follows: After the clam shell bucket has been lowered open into the stockpile and settled to take its load, the clutch L is thrown in and the motor D started. This causes the bucket to close and rise, and when it reaches the desired hight the motor D is stopped, the brake I applied and the trolley run out to the discharging point. Then the clutch L is disengaged and the brake I released until the bucket has descended to the discharging level, when the brake K is applied and the brake I being released the load is dumped. After this the trolley is run back to the stockpile, the brake K is released and the bucket is again lowered into the pile, thus completing the cycle.

The concentrates pack very solidly in the tanks and are exceedingly hard to dig, the bucket filling to only about 60 per cent. of its capacity. The dredge was rated to handle 30 tons of wet concentrates per hour, but it has been demonstrated to have a capacity in excess of this requirement by loading at the rate of 100 tons per hour. The information relating to the duty of this machine was furnished by D. C. Jackling, vice-president and general manager of the Utah Copper Company.



Fig. 1.—The Electric Gantry Crane Dredge as Installed for the Utah Copper Company by Pawling & Harnischfeger, Milwaukee, Wis.

On about 75 per cent. of the city lines of the Montreal Street Railway steel cross ties of trough section, placed 6 ft. on centers, have been used. There is a concrete

beam under each line of rails, and the usual concrete foundation for the pavement between the beams.

The Indianapolis & Louisville Traction Company has recently put into service between Scottsburg and Sey-

stalled on the docks at the harbor of Santa Cruz, on the island of Teneriffe. The 20-ft. tower section is carried on six legs, each traveling on a four-wheel truck. The crane member is a double truss structure, 138 ft. long, overhanging 105 ft. from the pivot to the housing end,

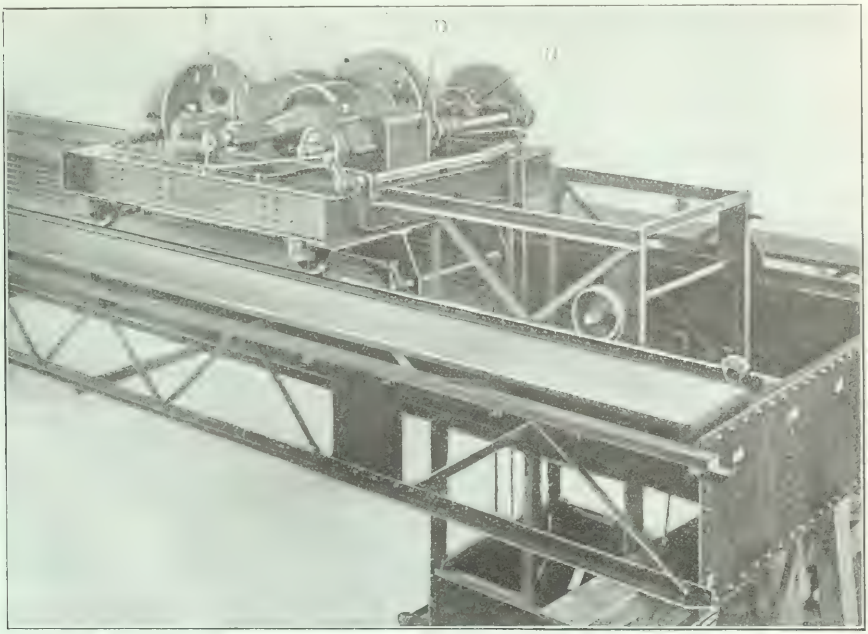


Fig. 2.—The Trolley and Operator's Cage with the Housing Removed.

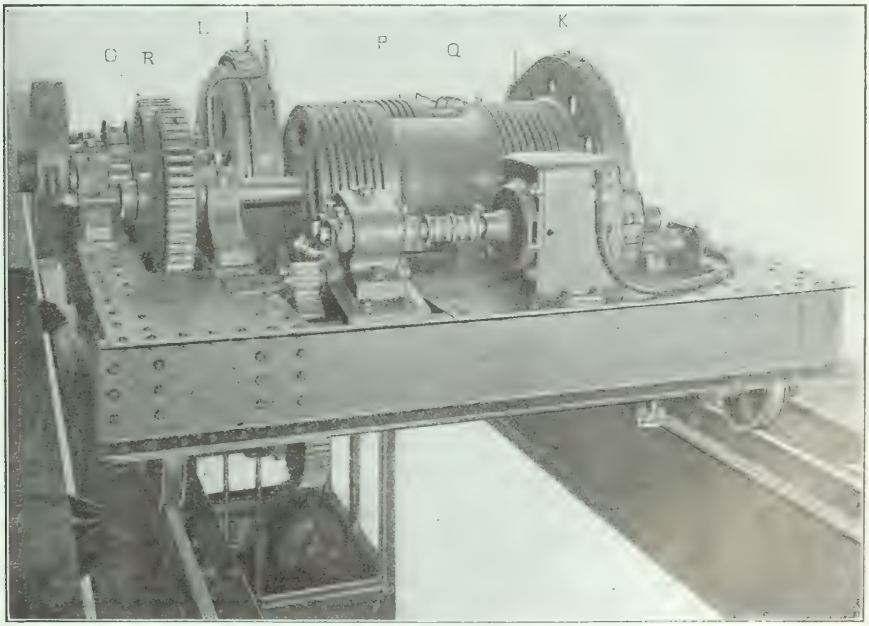


Fig. 3.—Another View of the Trolley, Showing the Trolley [illegible]

mour, Ind., a 1200 volt, direct current, overhead trolley electric railroad.

A traveling tower crane having the unusual working radius of 55 tons at 58 ft. from the pivot, has been in-

and 33 ft. in length from the pivot to the counterbalance. A 54-hp. electric motor is used for hoisting and moving the tower, a 15-hp. motor for revolving the crane and a 30-hp. for the trolley.

The Shepard Electric Hoists.

Speaking comparatively of electric hoists in general, it might be proper to say that the two most prominent features of the Shepard electric hoists built by the General Pneumatic Tool Company, Montour Falls, N. Y., are accessibility of all parts of the mechanism and interchangeability of many parts in these hoists with similar parts in the Shepard electric traveling cranes and pneumatic hoists. While compactness is desirable it was considered by the designer of these hoists to be of second-

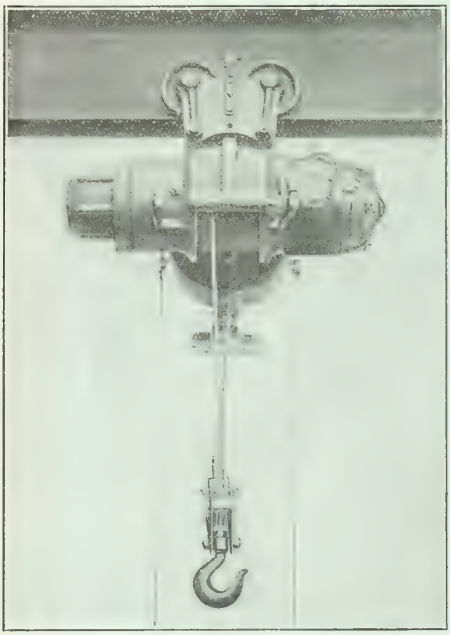


Fig. 1.—The Shepard Electric Hoist, Built by the General Pneumatic Tool Company, Montour Falls, N. Y.

dary importance to accessibility, and although the first has been obtained in a remarkable degree, it was at no sacrifice of the second characteristic. In fact, the result is a very creditable combination of the two features.

In practical use the parts most likely to require attention are the parts of the motor, and these in the Shepard hoists are very conveniently removed and replaced. To remove the armature, for instance, it is not necessary to disconnect any of the electric wiring except the armature leads, and the end shield of the motor is the only part of the frame that needs to be removed. During their removal or replacement all of the parts are easy of access. Each of the other important groups of parts is similarly accessible without disturbing any of the related parts. A common monkey wrench and a screw driver are the only tools required to take apart or reassemble the hoist.

Figs. 1 and 2, which compare the electric and pneumatic hoists, are indicative of the interchangeability of the two, and practically all of the running parts are identical in material and construction with the parts of the hoisting member of a Shepard electric crane.* This practice of assembling hoists from the same group of parts employed in cranes of equal capacity is distinctive, and is of advantage to the builder in reducing the cost to manufacture and to the user who needs to carry only one set of repair parts for different machines of the same capacity, and relatively few spare parts will suffice for a large and varied equipment. The hoists are unique also in the facility with which they can be applied to miscellanous hoisting purposes without material change of any part except to adapt the frames to the structures to which they are attached. Examples of this are shown in the two typical but different applications of the hoist illustrated in Figs. 3 and 4. The first is in operation at the new plant of the American La France Fire Engine Company, Elmira, N. Y., and is provided with a second motor for electric traveling and an operator's cage. The hoist shown in Fig. 4 also has electric travel, but is controlled from the floor. This hoist was installed for the Norton Company, Worcester, Mass.

None of the points so far mentioned are of so much importance as ample strength and reliability. No hoist, however ingenious, convenient, or commendable in other particulars, will be a success unless it is mechanically sound and sufficient for its work. Since the electric hoist is designed principally for light and medium loads, and is intended to be operated by unskilled workmen, it must be capable of withstanding without injury large overloads and inconsiderate handling. The compact design of the Shepard hoist is favorable to the making of all

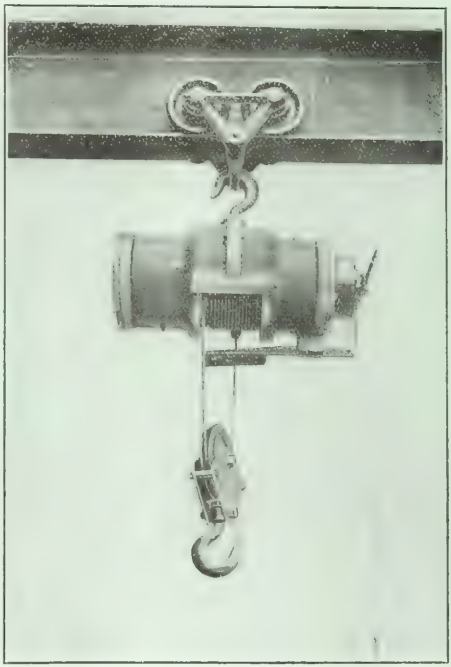


Fig. 2.—A Shepard Pneumatic Motor Hoist Showing the General Resemblance to the Electric Hoist.

parts of unusual strength. This and the making of all wearing parts larger than usually considered necessary, has been found possible without exceeding the dimensions and weight that are standard in a hoist of a given rated capacity.

For the same reasons that a hoist should be strong it should require as little attention as possible. By making all parts take permanently their proper position and leaving sufficient margin of safety so that natural and reasonable wear will not affect their perfect operation it was possible to do without the need of any adjustments. Lubrication can never be omitted in any machinery, no matter what its design or material, so that the best that can be done is to insure constant and thorough lubrication of all running parts with as infrequent necessity of renewing the oil supply as possible. In these hoists all parts are properly oiled by keeping three conspicuous oil reservoirs supplied, and their capacities are sufficient so that one filling will last for a considerable period.

Disagreeing with the common belief that in electric

* An illustrated description of the Shepard inclosed electric cranes appeared in *The Iron Age*, October 17, 1907.

hoists not intended for delicate handling of the load, speed control for gradual starting and stopping is superfluous, this company provides controllers with an exceptional number of resistance steps. Turning full voltage into series motors of small size shows no immediate damage, but ultimately the motor suffers, and certain it is that the unnecessary shock upon shafts, gears and hoisting rope, and unnecessary burning of the controller contacts by opening the circuit under full voltage and current strength, should be avoided. The number of resistance steps which have been used in the past on Shepard hoists have proved of such value in protecting the motor and controller that it has been decided to extend their number to 14 for hoists of the smallest size and to 18 for those of larger size. This will have the ever present advantage of affording delicate control of the hoisting and lowering speeds when needed. Experience has already indicated that much of the care formerly necessary to maintain the electrical features of the hoist in good condition will no longer be required, and the company believes that an important step will have been

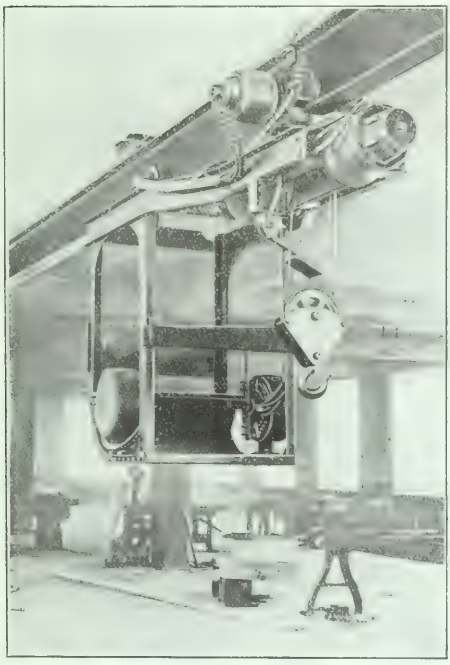


Fig. 3.—A Cage Controlled Two-Motor Shepard Traveling Electric Hoist.

taken in making the electric hoist an even more useful piece of equipment.

Guaranteeing Bank Deposits.

The New York *Evening Post* publishes the following correspondence from Kansas City, Mo.:

The bankers of the Middle West are talking of little else just now than the plan adopted by Oklahoma for guaranteeing bank deposits. The new law, which is to take effect February 15, is the first of this sort, and its operation is certain to be watched with great interest. The effect on the surrounding States is likewise of importance to the banks, and this furnishes a fruitful topic of discussion.

The Oklahoma law provides that every State bank shall pay to the State Banking Board 1 per cent. of its deposits to constitute a fund for the protection of the banks. When a bank fails, the bank commissioner is to step in and forthwith pay off the depositors, taking over the assets, the State becoming a preferred creditor. If the bank can pay out through the usual form of receivership the fund will be replenished; if not, the fund stands the loss. Should the fund not be large enough, it may be increased through assessment. It is expected that the national banks will be allowed by the comptroller to come under the same law through their voluntary contribution of 1 per cent. of daily deposits, a bill to that effect being introduced into Congress. Of course, should it not be allowed, the national banks would have to take out State

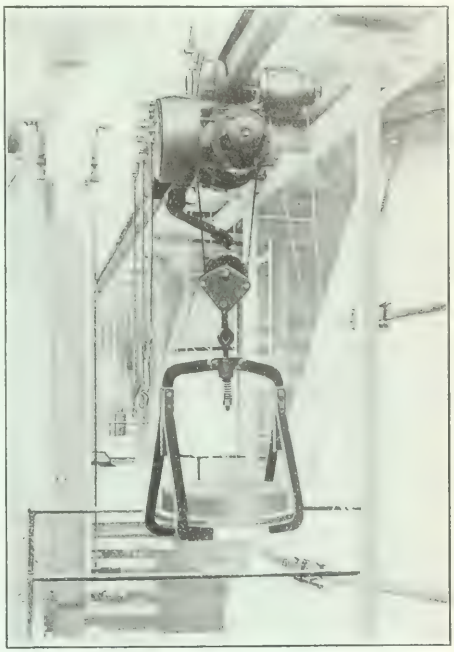


Fig. 4.—A Floor Controlled Two-Motor Shepard Traveling Electric Hoist.

charters, as they would not be able to retain their deposits.

The plan has been received with commendation by the people, if not entirely so by the bankers. The people of Oklahoma have had a great deal of money deposited in the banks of Wichita and other southern Kansas towns, growing out of the unsettled condition of banking in the territory days. Many have given notice that they will withdraw their accounts when the new law takes effect, and this has caused much perturbation among the Kansas bankers. They are calling on the Governor to convene a special session of the Legislature to enact a similar law for the Kansas banks, of which there are over 900, with deposits of $150,000,000. The indications at this writing are that this will be done and that a similar law will take effect in Kansas at the same date as that of the Oklahoma law. Then it follows that the Kansas banks, which make this city a reserve center, will be tempted to withdraw their accounts and transfer them to the banks of their own State over the line in Kansas City, Kan., which are already making strong bids for the deposits. So it is possible that Missouri will have to take the same step, and the movement may spread throughout the West as a matter of protection of each State against the rivalry of its neighbor.

It is held by the advocates of the plan that it will bring back to the banks the millions that have been withdrawn, and that it will create a stability heretofore unknown among the bankers of the new States.

Due to a recent earthquake the only direct cable connecting America with the Orient was put out of commission between Midway Island and Guam.

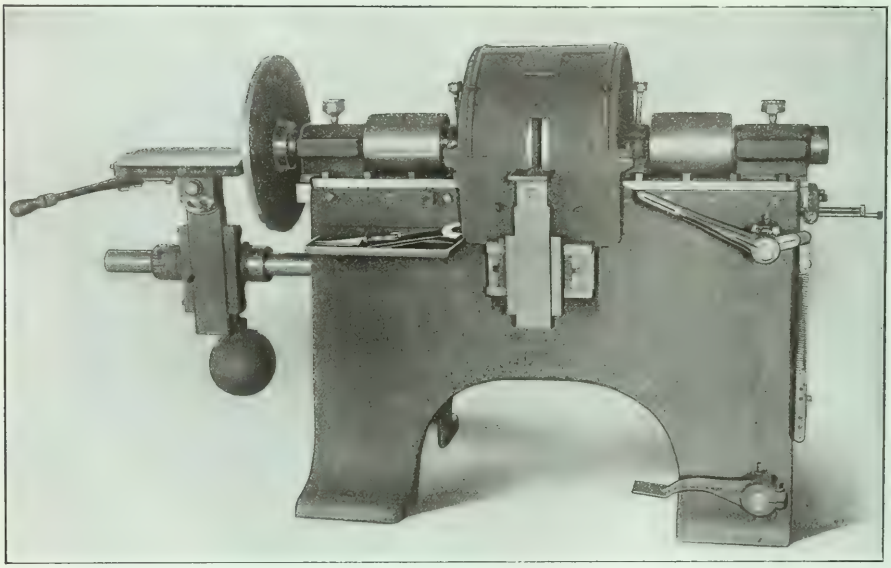
The F. N. Gardner No. 14 Combination Disk Grinder.

The advantages of both a single head and a double head disk grinder are combined in the new No. 14 improved disk grinder, built by the Gardner Machine Company, Beliot, Wis. In its construction, as a double head machine, the right head is moved to and from the work by a hand lever or by a treadle, acting on a heavy steel rack, which is secured to the bottom of the right-hand head. The left head carries two wheels and has a free lateral adjustment of 8 in. A 2¾-in. diameter rocker shaft is extended from left hand end of the bed, and on this can be mounted any style of work table required. The table shown in the engraving is a universal lever feed table, and is especially adapted for a very large variety of manufacturing operations. The double head feature is practically adapted for machining from the rough pieces having equal opposite parallel faces, such as washers, nuts, bolt heads, &c. For double face grinding 20-in. diameter wheels are used. The open or left-hand end will swing disk wheels 23 in. in diameter.

As shown in the illustration this machine is of very rigid and powerful construction. The end thrust is taken on large hardened steel collars bearing on composite babbitt and cast iron. The double wheels are completely inclosed in a cast iron hood, which can be swung back allowing free access to the wheels. The hood is provided with an opening in the back of the machine bed for a connection to an exhaust fan. This hood is fitted with sheet shields, in which openings of any size can be made to accommodate the work in hand. When connected with an exhaust system the machine is claimed to be as clean and free from dust as an engine lathe or milling machine. A hood with exhaust connection can be furnished for the single wheel at the left end, but is not so shown. Both double machine and the lever feed table are provided with micrometer stop screws, which allow the production of duplicate and interchangeable work. The right movable head is also provided with an adjustable back stop to regulate the backward movement of the head when the retracting spring is used in connection with the foot lever. It will be noticed that this arrangement allows the operator free use of both hands for handling the work.

With this machine are furnished a floor setting-up press for cementing cloth circles to the face of steel disks, four 20-in. and two 23-in. by 13-16 in. steel disk wheels, a complete assortment of Gardner's improved cloth circles, special cold cement, grease and wrenches, or if preferred, three special chucks for ring emery wheels are furnished in place of the disk wheels. These special chucks are interchangeable with the disk wheels, and both chucks and disk wheels can be furnished with the machine.

This machine is perhaps the largest and heaviest disk grinder ever built. The spindles are very large and the machine is driven with 8-in. belts.



The New No. 14 Combination Improved Disk Grinder Built by the Gardner Machine Company, Beloit, Wis.

The Westinghouse Electric Industrial Cars.

In its own solution of the problem of economically transporting material from one part of the works to another the Westinghouse Machine Company has developed a line of storage battery autotrucks in capacities of from 10 to 40 tons. Before installing these trucks the company used small cast iron trucks of 3 ft. gauge, moved by hand, whose load was necessarily restricted to a few tons. Heavy castings were transported to within reach of overhead cranes by 50-ton trucks, which were usually moved by a rope passing under a snatch block and attached to a crane hook. Now with the storage battery autotrucks delays of material in transit, it is claimed, have been practically done away with, and since the trucks furnished their own power the labor has been greatly reduced. Another advantage was a marked improvement in crane service, since a crane was no longer needed for transporting castings below 10 tons in weight (the capacity of the first trucks installed) from one end of the long shops to the other, driving several cranes before it and putting them temporarily out of commission. When larger trucks were added there was a corresponding further improvement in crane service.

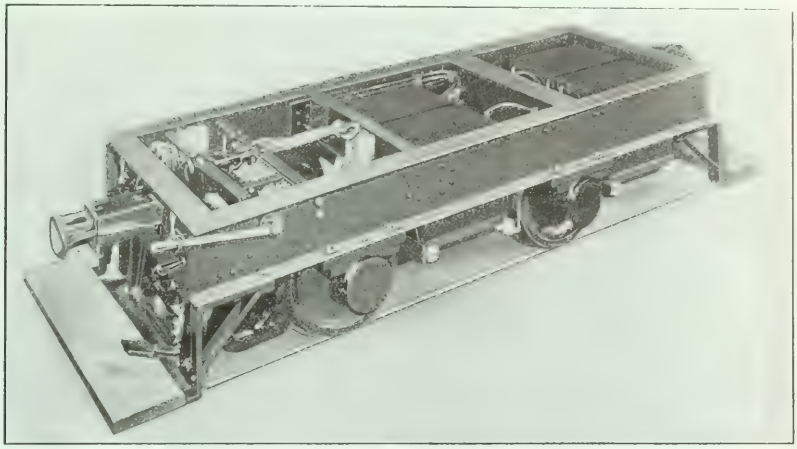
The trucks are of simple and substantial construction. A steel frame, thoroughly braced, is carried on four wheels, the journals of which run in roller bearings. The driving axle or axles, as the case may be, carry the motor, or motors, as in street railroad practice. The motor is spring suspended from the frame at one end, and connected to the driving axle by reducing gearing. A spring suspended cradle of angle iron carries the battery trays. At the operating end of the truck are mounted the controller, brake, charging receptacle, cut-out switch and

volt ammeter. A convenient step and drawbar head are provided at each end.

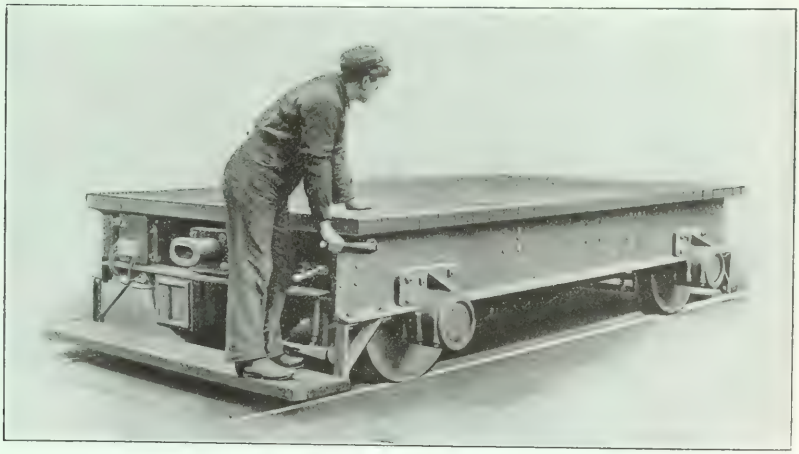
All the machinery is below the top of the frame and is covered by a heavy wooden deck for carrying the load. This deck is made in sections, so that any part of the mechanism is readily accessible. The motor is of the Westinghouse vehicle type, capable of standing heavy overloads, is dustproof and self-oiling. The controller is of the same type, and gives four speeds in either direction. It is provided with operating and reverse levers, which are interlocking to prevent premature reversal, thus protecting the motor and the batteries.

The battery is contained in two or more trays of cells, and is of ample capacity for the particular service. It is especially designed to operate at high rates of charge and discharge, and, therefore, a battery of four or five times the capacity, as is usually employed in similar service, is not needed, since the plates in this battery are capable of discharging at a very high rate for 3 or 4 min. at a time without injury. Another reason for adopting a battery of smaller ampere-hour capacity than customary is that the time available for charging during the working hours is usually thrice the period of time that the truck is actually running. Charging is made so simple that the truck can easily be charged during these idle periods. During a six months' test of the standard 10-ton. truck, herewith illustrated, the power required to charge the battery in regular and heavy shop service was accurately metered. It averaged 63 kw.-hr. per month. At the high figure of 5 cents per kilowatt-hour the cost for the current would be only $3.15. The work done was recorded and averaged practically 700 ton-miles per month, the loads running from a few hundred pounds to 15 tons.

These trucks used as locomotives on a level track and without any weight to secure adhesion can haul on suitable cars from one-half to their full rated capacity as a truck, depending upon the condition of the track and kind of bearings on the cars hauled. By placing sufficient weight over the drivers to secure adhesion they are capable of handling from one to two times their capacity as a truck for a continuous period of not more than 5 min. Standard trucks are made for six different gauges—18, 21½, 24, 30 and 36 in., and 4 ft. 8½ in. For track systems provided with turn tables they are made with rigid trucks. Where tracks are installed with curves the trucks for all gauges up to 36 in. are provided with swiveled front axle, permitting free operation on curves as low as 12 ft. in radius.



A 10-Ton Westinghouse Storage Battery Truck with the Deck Removed.



Operating End of a 40-Ton Flat Car Electrically Driven from Storage Batteries.

The Lorain Steel Company, Lorain, Ohio, has received from the Chicago City Railway Company a large contract for special equipment.

THE IRON AGE

Established in 1855.

New York, Thursday, January 2, 1908.

Entered at the New York Post Office, as Second Class Mail Matter.

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The Outlook.

The metal trades enter the year 1908 with greater hopes and in a very much chastened spirit. In some respects the scale of working to which they crowded themselves during November and December has created an exaggerated estimate of the decline in the country's requirements. The actual consumption of metal goods of all kinds, measured by the natural wear and tear, could not possibly be represented by so little as one-third of the capacity, and yet that is all that we have been doing lately in new bookings. We know that replacement of worn or weakened material can be made to wait for an astonishingly long period by patching or by temporary repairs, but even under such adverse influences tonnage must be very much greater than the artificial minimum of the past two months.

A resumption of activity is therefore unavoidable; it is only a question to what extent it will go. The stopping of works prior to the holidays had little significance. It went so far that during the past week, the active furnaces of the Steel Corporation represented only 20 per cent. of the total capacity. As little importance attaches to the restarting after the holidays, concerning which dispatches in the daily journals make so much. That our iron and metal industries will operate during the first quarter of 1908 at the rate of at least two-thirds capacity is the estimate of leading interests who possess exceptional facilities for gauging the situation. How much beyond that estimated minimum we shall go depends primarily upon the developments in the finances of the country. Business men have become cautious about cheerful utterances by bankers. The premium on currency has not disappeared in the schedule time fixed by financial authorities. Many an almost boastful word has been spoken, with the mental reservation that while it was good for the audience, it need not necessarily guide the speaker.

While there has been an almost continuous betterment in the financial situation, the consensus of opinion when frankly expressed is that we need time to get over the shocks to which the business world has been subjected. Our country has wonderful recuperative powers, but those are doomed to disappointment who expect us to jump back at one mighty bound to the plane of abounding prosperity from which we have been thrown. We cannot expect to run full during the first half of 1908, and, recognizing that fact, must make the best of the conditions forced upon the industries.

The best guarantee for the immediate future, however, for the iron and metal trades is the spirit which has become dominant in their councils. In former years the first sign of a decline in the demand was the signal for an indiscriminate onslaught upon the trade and territory of others, with its accompanying cutting of prices. Often such a course was dictated by the necessities due to inadequate working capital or credit. Selling by manufacturers or merchants made desperate by impending ruin has not been in evidence during this panic, the metal industries being sound beyond all precedent. The iron trade has before it the startling example of mismanagement in the copper industry, and is profiting by it. In fact, the critical period has passed safely, since stocks have not been allowed to accumulate, and prices were never inflated. It remains for those who are guiding the destinies of the iron and steel industries to meet buyers and encourage consumption by wise and fair readjustments of prices. New enterprises must show good prospects of larger returns than hitherto, in competition with the higher rates of returns which tried and proved undertakings now yield. That must come through lower cost of investment in new enterprises, to which both labor and the producer of materials must contribute their share.

The Problem of Iron and Steel Prices.

The question at what prices iron and steel products will again be freely bought after a period of suspended buying has always been discussed with the liveliest interest. These periods in which the market is dormant often result from conditions within the iron trade itself, as, for example, after a pool has conducted an apparently successful campaign at high prices, such as the wire nail trade well remembers. Less marked, but at the same time noticeable, intervals of abstention by buyers have been seen in the pig iron trade on several occasions. One of these came in the summer of 1905, another briefer one was noticed in the late spring and early summer of 1906 and was terminated by considerable sales of Southern No. 2 foundry iron at $13, Birmingham, the identical price, it may be noted, which the market touched last week on its return from the high levels reached in the boom of 1906 and 1907. Very often, after high prices have existed for months, consuming interests pause to take their bearings and to determine from the best light available whether general conditions are such as to warrant going on for a further stretch at substantially the prices that had prevailed. These tests, like the one in 1905, amount to a measuring of strength by producer and consumer to determine which side is really moving with the currents of trade and finance.

Much more of a problem is presented by such a paralyzing blow to business as has been dealt by the late panic. From a condition in which the machinery of production is strained almost to the breaking point, the iron trade within a few weeks passes to a condition in which capacity is apparently twice or three times the country's power to take up product. The possibilities of demoralization to the prices of iron and steel products in the months preceding recovery from panic and depression were well impressed upon every one connected with the trade in the years following 1893. With the exception of steel rails (and for a time rails were no exception) there was unrestricted competition in the products of iron mines, coke ovens, blast furnaces and rolling mills. The play of so-called natural laws of trade—if anything due to panic can be called natural—resulted in the low-

est prices the American iron trade has ever seen, accompanied by unparalleled distress to labor and the wiping out of millions of capital invested in iron and steel property.

It has been the common thing to say in the past eight or nine years, in which, except for a brief period in the midsummer of 1900, no form of finished steel has gone below 1¼ cents a pound, that the low prices of 1897 and 1898 would never come again, and the probabilities are that they will not. At 2·3 cent a pound for steel billets and 0.85 cent a pound for steel bars and steel beams the steel trade sunk to the lowest depths of distress. Since that day there has come a doubling and in some cases almost trebling of mineral values, and coal and iron ore, it is safe to say, are permanently well above the level to which they were crowded in the days of weak, scattered ownerships of iron and coal mines. It may not be far from the mark to say that, taking the average of raw material prices in the past 10 years, finished material on a 1.5 cent basis to-day is relatively cheaper than at 1.25 cents, before the very general pre-emption of the choice iron ores and coking coals of the country.

To what level the readjustment now in progress will bring iron and steel products in 1908 is a question of no small moment. The fact that leading manufacturers have conferred about the situation that each may have the best judgment of all as to the wise course to pursue, does not mean, as it has been interpreted in some quarters, that prices will not be changed. In 1904, when concerted action was taken on certain steel products through associations that no longer exist, steel billets were reduced to $23 and later to $19.50, Pittsburgh; steel bars to 1.30 cents; plates to 1.30 cents and 1.40 cents, according to width, and beams to 1.40 cents. In the case of plates and structural steel the reductions were from a long maintained basis of 1.60 cents, as compared with 1.70 cents in 1907.

The conditions to-day differ in a number of respects from those of the slowing down in 1904. The sharp shock of serious money panic was absent then. On the other hand, wages and commodity prices in general responded more quickly then to the liquidation in undigested securities and the cutting off of railroad and other large buying. Thus far in the present depression wage reductions have been few and the cost of living has been practically undiminished. If there is yet to come, as may be expected, a period of liquidation in industries, following the liquidation in securities and in banking, the problem of the right price for steel—the price at which consumption will be the largest possible under the conditions in the money market and in all steel consuming industries—will be more complicated. If history counts for anything it is folly to look upon the panic as an experience which the business world can quickly put behind it and call a closed incident. Credit has been sorely hurt and will need time to get back to soundness. The iron trade thus far has responded promptly to the conditions about it by reducing output to the shrunken ability of the country to absorb product. Its part in the general readjustment of values cannot be determined in advance, but as in other periods of uncertainty time will be required while patiently and somewhat painfully the industries of the country find their way back to good ground.

For large integrated companies, owning their raw materials and going into the market only for their labor, the way through a period of readjustment would naturally be shorter than for the merchant interests, whose costs are dependent largely upon the prices at which they can buy from others. The average producer of foundry iron, for example, must have lower ore and lower coke than he had last year before he can sell iron to meet the price recently made in sales by Southern furnaces. A mistake by ore producers in naming their prices would be a serious thing for him. Similarly iron rolling mills and the smaller producers of open hearth steel must know what the new basis for scrap is to be before they can commit htmselves to lower prices for their own products. And the large steel interests, even with complete control of raw materials, must consider the effect of their action upon the market at large in deciding at what prices they will sell their finished product. It is well that men of large experience in the iron trade are joined in the effort to meet the present crisis in a way that will make recovery as speedy as possible and with no false starts.

The Iron Trade Not Guilty.

In the effort to widen the responsibility for the financial revulsion the charge has been made that one of the contributing causes is extravagance. The American people have been taken to task in a wholesale way for extravagance—the individual as to his personal expenses, the family as to its methods of living, the commercial house as to its ambition to outshine its rivals, and the manufacturing company as to its sinking of more and more capital in means of increasing output. It is easy to make indiscriminate charges of this character, but in fact they have been made against Americans from time immemorial. Our people have invariably been held to be less frugal or more wasteful than the people of other countries. But conditions are here not the same as those prevailing in other lands. Opportunities are greater and returns from productive energy are more remunerative. Standards of living and of doing business are altogether different. It does not take a lifetime for an immigrant from some European country, with traditions of frugality and cheeseparing handed down from a long line of ancestors, to learn that he can safely indulge in personal comforts and household conveniences that in his own country would be hopelessly beyond his reach. He spends his earnings more freely, especially when he finds that even then he is able to accumulate. The huge sums in savings banks and the widespread ownership of homes by workingmen bear testimony to the truth of the assertion that pinching economy is not such a necessity in America that a liberal standard of individual or family expenditures can be styled national extravagance. Turning to agriculture, our farmers are not peasants, toiling from dawn to dark for a mere subsistence. Nowhere in the world are the rewards of agriculture more munificent or those who till the soil able to gratify their needs or desires more liberally. On such a substructure of generous living is our business fabric erected. Our merchants can usually take greater risks and our manufacturers can be more daring than would be the case if parsimony was the law of every American family and expenditures limited to necessities was part of the religion of every American citizen. Those who live beyond their incomes are the exception and not the rule in any American community. Their neighbors are far more apt to criticise than to imitate them.

The prosperity which this country has enjoyed for several years has not been merely superficial. It has been of the most substantial character. From the Atlantic to the Pacific and from the Great Lakes to the Gulf of Mexico our people have been most busily employed in winning fruitful returns from the soil, in developing our great mineral resources, in building huge irrigation systems for the reclamation of desert wastes,

in harnessing numberless water powers for generating electrical energy, in more thoroughly equipping cities, towns and villages with lighting plants and water works, in improving and extending urban and interurban transportation lines and in enormously enlarging the terminal facilities, trackage and equipment of our great railroads. Stupendous have been the achievements of the past four years in adding to the material wealth of the country and in making preparations for the future which will increase immeasurably the earnings of the productive forces of the nation. With this abounding activity in constructive development, the floating supply of labor has been far from adequate, and several European countries have found their apparently permanent surplus of labor exhausted because of the greater inducements offered here. The rapid increase in our population thus greatly stimulated building operations to house the new arrivals. All this meant a heavy concurrent consumption of manufactured products, and especially of all classes of iron and steel products. Commendable and not blameworthy has been the action of those enterprising men who have striven to meet the demand for such products which persistently increased every year. Despite their efforts, the demand even outran the supply for a time, as in the early months of 1907 it was necessary to import considerable quantities of pig iron as well as other merchandise. Unquestionably, if our manufacturing facilities had not expanded as they did, the prices of manufactured products would have risen beyond all reason, so insatiable was the demand. As it is, notwithstanding the fact that we look back to 1904-1907 as a "boom" period, there have been similar periods in the past when prices of iron and steel have risen much higher.

Those who charge the iron trade with contributing to the excessive draft on liquid capital, alleged to have been one of the causes of the financial breakdown, may have in mind such failures in the trade as those of Milliken Bros., the New York State Steel Company, the Southern Steel Company, the Westinghouse Electric & Mfg. Company and the Westinghouse Machine Company. If these failures had been the result of overproduction and had taken place at a time of declining demand, amidst merciless competition for orders attended by the recession of prices below cost of production, they could well have been cited as proof of the fact that manufacturing expansion had been pushed too far. But such was not the case. In every instance the failure was due to lack of working capital or faulty methods of financing. The error was made of not securing ample funds, while liquid capital was still available at reasonable rates. Each failure occurred with the works crowded with orders. But, it may be said, there is no doubt that we are now suffering from overproduction, as iron and steel works are idle by the score. There are many idle works, it is true, but not because manufacturing capacity has to that extent exceeded the consumptive requirements of the country. The derangement of business by the financial breakdown has restricted the consumption of iron and steel to a far greater extent than it was stimulated by the prosperity of the country in 1904-1907. Recovery is bound to take place as confidence revives, slowly at first and with greater rapidity afterward, until eventually every iron and steel plant properly located and judiciously managed will find a ready market for its product. The longer the period of recovery the stronger will be the demand, as the needs of this great country of ours steadily become heavier and heavier. When that time is at hand it will be seen that those manufacturers who, like the United States Steel Corporation, have projects under way for still greater expansion of their producing capacity, will find their increased output needed by hungry consumers. They deserve the praise and not the censure of a discriminating public.

Interstate Commerce Commission Decisions.

It is held that under the rate act no distinction is made between interstate railroads that are operated by electricity and those that use steam for motive power. It is further held that section 15 of the law limiting the power of the commission to establish through routes and joint rates to cases where "no reasonable or satisfactory through route exists" was not intended to afford a means by which new lines, with the aid of the commission, may profitably force their way into shipping districts built up and already well served by other lines.

Its attention being called to a tariff which in effect created a distributing point for a special industry by granting it free storage at that point, either in its own or the carriers' warehouses and practically without limit as to time, the merchandise when shipped out to go on balance of through rate, the commission expressed its disapproval.

A shipment consigned to one point was reconsigned en route to another, the tariffs then in effect containing no reconsignment privilege. As a consequence local rates to and from the reconsigning point were applied and made higher than the through rate. Held, under subsequent tariff that did not reduce rates, but incorporated a reconsignment privilege, that the benefit of such privilege could not be applied retroactively to a previous shipment and cannot be accepted as the basis for a refund on special reparation docket.

The commission has no power to relieve carriers from the obligations of tariffs providing for demurrage charges on the ground that such charges have been occasioned by a strike.

Claims filed with the commission since August 28, 1907, must have accrued within two years prior to the date when they are filed, otherwise they are barred by the statute. Claims filed on or before August 28, 1907, are not affected by the two years' limitation in the act.

The Weight Committee of the New England Foundrymen's Association, in accordance with resolution passed November 20, regarding a meeting of representatives of the different transportation, iron and coke producing companies with committees of the different foundrymen's associations, announces that it has been favored with replies from practically all the parties interested, and a meeting has been called to be held February 5, 1908, at 10 a.m., at the Bellevue-Stratford Hotel, Philadelphia.

According to the *Chemical Trade Journal*, there is considerable activity in Cumberland, England, in the production of wolfram and scheelite, and the Carrock mines have recently been sold to the Cumbrian Mining Company, Ltd. The ores were tried some years ago by Mushet, the inventor of self-hardening steel, who wrote adversely as to the contents in phosphoric acid, but more recent analyses tend to prove that the mineral is free from phosphorus and sulphur.

A party of electrical engineering students from the Iowa State College visited Milwaukee last week and inspected the plants of the Allis-Chalmers Company and the Cutler-Hammer Mfg. Company. From Milwaukee they went to Chicago to visit the South Chicago plant of the Illinois Steel Company. The party was in charge of Prof. F. A. Fish of the electrical engineering department.

The Engineers' Club of Philadelphia has purchased for a clubhouse a four-story building and lot, 25 x 170 ft., on Spruce street. After it has been remodeled the second floor will contain an assembly room for general meetings, and the first floor, dining, smoking and committee rooms. A billiard room and other social conveniences will also be provided.

THE PHILADELPHIA IRON TRADE IN 1907

BY A. A. MILLER.

The past year began under the most favorable circumstances. Every branch of the trade was working under an enormous pressure, which continued practically during the entire first half of the year, but it was clearly evident that the tremendous pace at which business had been going during the last year or two could not be maintained, and when the recession came, which followed during the closing six months of the year, it was not unexpected and had been in many ways prepared for. The year 1906 was a prosperous one, and, as we all know, record tonnages were made in almost every branch of the trade, but had we not struck the down grade during the last half of 1907 it would be safe to say that 1906 would have been totally eclipsed by the records which would have been made during the past year. Even as it is, production in many lines will show up, even after the sharp curtailment, almost as well and in some instances even greater than in 1906.

Consumption in the first half of the year was exceedingly large, greater considerably in a number of instances than was the case in the same period in 1906. Makers of crude and finished materials were pressed to the utmost to meet the demand for deliveries, and in many cases prompt shipments were absolutely unobtainable. Manufacturing consumers were likewise pressed for deliveries in every line, and it was not unfrequent that plants had to be temporarily closed down owing to the inability to get deliveries of raw materials. The tonnages of iron and steel required were enormous, and every available method was employed to get out sufficient quantities to meet the demand. Mills were so fully booked ahead early in the year that, instead of contracting for materials for the customary periods of three or six months, they placed their requirements during the first few months of the year; in many instances for the entire year's supply. As the year wore on, however, evidences of the approaching decline became more and more apparent, but the trade was hardly prepared for the complete apathy which prevailed during the last quarter.

An Abrupt Change.

The recession, which began shortly after midyear, had been going on in a regular fashion, and the trade in a number of cases was welcoming the relief from the excessive strain which it had been under for so long, but the end was an abrupt one, and was due largely to unsettled financial conditions. The railroads were almost the first to feel the effect of the money disturbances, and their policy of withholding business for a time was the beginning of the decline. As financial troubles became more pronounced, curtailment on the part of the railroads became more extensive until a complete hold up of propositions under consideration was made, and operations were suspended on some classes of work under way. This was followed later by the announcement on the part of the railroads of their policies for 1908, under which new work of every kind was to be held in abeyance. This position taken by the railroads naturally had its effect on the large industrial concerns, who also determined on curtailment policies, and then gradually extended through the various branches of the trade.

The actual money stringency in this territory, which developed in the last quarter of the year, was probably not as pronounced as it was in some others. Failures were extremely few, and in no way affected the trade at large. Suspensions for short periods, due to the inability to get funds to keep plants going, were heard of occasionally, but were not serious. The banks were solid, and, outside of the inability to get currency, had no difficulty in doing business. In most cases funds were furnished to meet current payrolls, but except for the adoption of making payments for current accounts through the clearing house for a short time, no other relief was necessary in this city. Collections during the last four or five months of the year were naturally slow, and in most cases the larger concerns, which require extensive capital to keep plants going, were said to be the hardest to get payment from. It was impossible for a time to obtain loans on good securities, but creditors being situated in a like position were not pushing debtors very hard. Considering the gravity of the situation for a time this territory can be said to have weathered the financial storm in a very satisfactory manner.

From a practical standpoint, business was at a standstill during the last quarter of the year. In many cases contracts were canceled, and those who did not or could not cancel, curtailed deliveries to a very marked degree. Consumers almost without exception bought only such materials as were required to work up orders in hand, and all classes of available material, which had been accumulating in consumers' yards, was worked up rather than to go into the market under the existing financial conditions, and thereby incur increased indebtedness for raw materials.

Some Special Features.

One of the most remarkable features of the iron trade in the last half of 1907 was the absolute control that producers had of the situation, and the equanimity displayed in the adjusting of affairs to meet the changing conditions. Manufacturers of both crude and finished materials worked in perfect harmony, and while the decline in prices, particularly in crude materials, was very sharp, the recession was orderly and without the disastrous features so frequently found in a strongly declining market.

Buying during the year had been extremely varied. There was a strong purchasing movement early in the year, when the purchaser believed that if he did not get his tonnage for the year contracted for he would be unable to get materials later in the year, while during the last quarter the buyer was absolutely disinterested, no matter what the price might be. At times producers had orders in hand for their output for almost the entire year and were not seeking any further business. Buyers likewise had their requirements covered for a long period ahead, and current business was frequently at a standstill, simply because all the business that could be done had been taken care of.

Along about midyear several of the larger consumers of basic pig iron in this territory considered seriously the proposition of purchasing and operating furnaces themselves, so that their supply of pig iron might be assured. The Lukens Iron & Steel Company, Coatesville, Pa., one of the largest makers of basic open hearth steel and steel plates, with this in view, purchased the properties of the Allegheny Ore & Iron Company, operating furnaces at Buena Vista, Iron Gate and Shenandoah, Va., and owning and operating ore mines at Oriskany and Vesuvius, Va. Negotiations by other large consumers for furnace plants were also conducted, but purchases failed to be concluded.

Pig Iron Production Huge But Short of the Demand.

The country's production of pig iron the first half of the year showed a gain of almost 1,000,000 tons over that of the same period in 1906, and at the rate furnaces were going, and with the number of new furnaces that were going in, the production for the year promised to surpass greatly all former records. Yet even with the increase shown in production, consumption in the early part of the year was materially greater, and the scarcity in domestic iron was only relieved by the importation of foreign iron, which for a few months came in at the rate of about 50,000 tons a month.

Domestic production of pig iron increased more or less steadily through the first 10 months of the year, averaging nearly the 2,250,000-ton mark monthly. During the third quarter of the year, however, producers saw clearly that, with the reduced demand unless concerted action was taken to curtail production, the market would soon

become demoralized, and it was pretty generally believed that the reduction of output to a point somewhere near the level of consumption would be the proper method to follow. Many of the furnaces were badly in need of repairs and had been kept in blast long beyond the usual period, because of the contracts for high priced iron still on the books. In the last quarter, however, producers found these contracts getting pretty well cleaned up, and with the decline in prices, which fell below actual cost at some works, they began to blow out their furnaces, so that production for November underwent a marked decline, and the active weekly capacity on December 1 showed a falling off of 29 per cent. when compared with the same period in November. One of the most satisfactory features of the market to-day, however, is the fact that there is no accumulation of stocks of pig iron, either on the furnace banks or in consumers' yards, and when business does return to more normal conditions there will be no great tonnages of iron to be moved and the trade can go ahead on a bettter basis than has ever before been the case after a period of depression.

The Course of Pig Iron Prices.

Prices of pig iron varied greatly during the year. The market at many different times was difficult to quote. Prices on the same grade of iron from different makers frequently showed a variation of as much as $1 a ton. So many individual conditions had to be taken into consideration at times that quotations made were largely nominal. Early in the year, when consumers placed large tonnages covering deliveries almost throughout the year, prices were at a high level. The difficulty experienced by consumers in getting deliveries in the last half of 1906 encouraged this class of buying, and makers soon had their year's tonnage pretty well covered. Under these conditions, special quotations covering spot delivery and first, second and third quarter were usually named, and this practice continued during the first half of the year. No. 2 X foundry iron reached the high level of $27 for deliveries in the first quarter, which is higher than at any previous time during the past 30 years, except during a brief period in 1880.

In January the range for No. 2 X foundry was from $24 to $27, for delivery in the first half, while for the second half prices for the same grade ranged from $23 to $24.50. Spot deliveries commanded all kinds of premiums, varying according to the tonnage desired and who the customer might be, frequently running up to $2 and even in some cases $3 per ton. The high level for foundry irons was pretty well maintained throughout the first half of the year. Quotations in June for No. 2 X foundry averaged $24.75 for the third quarter delivery and $23.75 for the fourth quarter, while spot iron was still about $1 above the third quarter's figures.

With the coming of the stoppage in demand, however, there was a sharp falling off in prices. In October the question of delivery was fast being obliterated. Iron makers who were still working on high priced contracts in varying amounts were willing to make concessions to get tonnage to piece out their production in the remainder of the year, while those who had their make pretty well booked were holding firmly. For this reason prices of No. 2 X foundry showed a wide variation, and were based largely on how badly the maker needed iron.

In the closing month of the year producers were on a more equal basis. The curtailment policies adopted by consumers held up deliveries very extensively, and producers were willing to take business at materially lower figures, and the range of prices in December was between $18.50 and $19 for delivery in that month and January, 1908. In fact, some sales were made at prices which in individual cases were said to be considerably below cost, but could be advantageously handled, together with the higher priced orders still on hand.

The same wide range in prices noted in foundry iron was also to be found in the various other grades of pig iron. Steel making irons were bought in large blocks early in the year, covering in many cases almost the full requirements of consumers in 1907, and prices for delivery over the first half were held pretty closely around $25, delivered, practically all through that period. Beginning in June, however, a gradual weakening set in and prices receded from $23.50 for second half delivery to $17.50 for prompt delivery in December. The price of forge irons followed the same general course, the average being close to $23 during the first six months for deliveries in that period, and declining gradually during the second half to $16.75 in December. Low phosphorus irons were firm almost all through the year. The consumption and production of low phosphorus iron have been closer together than on any other grade, the supply having been limited. The heavy tonnages of this grade were sold early in the year, and late sales were almost entirely confined to small lots. Prices in January averaged $27.25, and the same figures ruled in October, after which, however, there was a recession to $25.25 in December. The following table shows the average price for the different grades for each month of the year based on deliveries in buyers' yards, Philadelphia and adjoining territory:

Prices of Pig Iron at Philadelphia in 1907.

	January.			February.		
	Spot.	First half.	Second half.	Spot.	First half.	Second half
No. 2 X foundry	$28.50	$26.00	$23.75	$28.00	$26.00	$23.50
Standard gray forge	23.50	22.75	22.50	23.50	23.00	22.50
Basic	26.50	25.50	23.75	26.50	24.75	23.50
Low phosphorus	28.00	27.25	27.75	27.00	26.50	26.25
Middlesbrough No. 3	23.25	27.00	....	23.50	23.25	....

	March.			April		
	Spot.	First half.	Second half.	Spot.	First half.	Second half.
No. 2 X foundry	$26.00	$25.00	$23.75	$25.75	$24.75	$23.75
Standard gray forge	23.50	23.00	22.50	23.00	22.75	22.00
Basic	25.50	24.50	23.25	25.00	24.25	23.25
Low phosphorus	27.50	27.25	26.75	27.50	27.25	26.75
Middlesbrough No. 3	22.00	21.75	....	21.75	21.50	....

	May.			June.		
	Spot.	First half.	Second half.	Spot.	Third qrtr.	Fourth qrtr.
No. 2 X foundry	$26.00	$24.75	$23.50	$25.75	$24.75	$23.75
Standard gray forge	23.25	22.75	22.25	23.00	22.60	22.25
Basic	25.50	25.00	23.50	24.25	24.00	23.25
Low phosphorus	27.75	27.50	27.75	27.50	27.75	27.75
Middlesbrough No. 3	22.75	22.50	....	22.60	22.25	....

	July.		August.		September.	
	Spot.	Second half.	Spot.	Last half.	Spot.	Last qrtr.
No. 2 X foundry	$23.00	$22.75	$23.00	$22.50	$21.75	$21.00
Standard gray forge	22.50	22.00	20.25	19.25	19.50	19.00
Basic	22.75	22.25	21.50	20.75	19.25	19.00
Low phosphorus	28.00	27.50	28.00	27.50	28.00	27.50

	October.		November.	December.
	Spot.	Last quarter.	Spot.	Spot.
No. 2 X foundry	$20.50	$21.00	$19.00	$18.75
Standard gray forge	18.75	18.25	17.00	16.75
Basic	19.00	18.50	17.75	17.50
Low phosphorus	27.50	27.25	26.00	25.25

Foreign Pig Iron.

While shipments of foreign iron began to come in pretty freely in the closing months of 1906, the greatest tonnage was imported in the early months of 1907, averaging for a time something like 50,000 tons monthly. Occasionally the large imports of iron, particularly of foundry grade, had a tendency to unsettle that market, but it was only to a slight extent, as deliveries of domestic irons were for the most part very unsatisfying.

The great bulk of the iron arriving at this port was Middlesbrough No. 3, which sold early in the year at $23 to $23.25 on dock. In March there was a little decline, owing to the heavy arrivals, and the price receded to $21.75 to $22 on dock. In May the demand strengthened a trifle and sales were made at $22.50 to $22.75 on dock for early delivery. In June and July, however, the prices for domestic iron began to fall off a bit, and the immediate supply appeared to be greater, so that the demand for foreign irons became weaker and the price sagged to from $22 to $22.50 on dock. As the domestic supply then began to improve and the consumption showed signs of declining, the demand for foreign iron dwindled and, outside of iron bought previously to arrive, the tonnage imported fell off until, except in the usual small lots, it had practically ceased.

In the early months of the year there was also a good tonnage of Scotch iron received at this port, the average price of which on dock was from $25 to $25.25. This grade also showed a falling off toward midsummer, when the price declined to $24.50 on dock.

Ferromanganese.

There was a wide range of prices in ferromanganese during 1907. Steel makers early in the year appeared to be afraid that they would not be able to get supplies to see them through the year, and the rush to get orders in raised prices very materially. In January 80 per cent. ferro was quoted at $79 to $80 for spot delivery, with $74 to $75 being named for delivery during the last half, while in May it had declined to $65 to $68 for early shipment, and to $63 for the last half delivery. But buyers as a rule had covered earlier and little business was to be placed. The demand during the remainder of the year was therefore dull, and as a rule was confined to small tonnages. Prices declined steadily until the end of the year, quotations in December being about $50, delivered in this territory, with almost no buying.

Steel Billets.

The steel mills in this territory began 1907 with heavy tonnages on their books, and for the first half of the year there was little let-up in the demand. Heavy orders were placed for forward delivery, and if at times new business was dull, specifications on old contracts came out freely, so that mills were fully occupied for the first nine months of the year. There was often an urgent demand for prompt delivery, for which premiums were paid. The demand, however, fell off decidedly during the last three months of the year. Consumers would not specify against old orders, and new business was extremely scarce, so that mills keeping in line with the general curtailment policy decreased production heavily, and at the close of the year were practically at a standstill.

Prices during the year did not show a very great variation. In the early months they ranged from $33 to $34 for ordinary rolling steel, declining toward midyear to about $31.50 to $32, and during the third quarter to $31 to $32. From $30 to $31 was the nominal quotation for billets the last quarter of the year, but had there been any reasonable demand this would undoubtedly have been shaded.

Plates.

Notwithstanding the fact that sales in the closing months of the year fell off very extensively, the production of steel plates in this territory probably made a gain of 5 to 10 per cent. over that of 1906. There was such a heavy pressure in the first nine or ten months of the year that mills were scarcely able to meet the demand. Deliveries at times were much delayed, and customers were willing, early in the year, to pay premiums for prompt shipment. The demand covered pretty fully all the various grades of plates, and there was but little change to be noted until late in the year, when in connection with the decline in other lines the demand for plates began to fall off. About November mills began to catch up on their orders, and with business decreasing, curtailments were adopted, reducing the output to about one-half, at which capacity most of the mills were running at the close of the year.

Prices of plates during 1907 did not show a great variation. They were highest at the beginning of the year, when 2.13½ to 2.18½ cents per pound was quoted for delivery in this territory. In April, tank, bridge and boat steel declined to 2.03½ to 2.08½ cents, and shortly afterward to 1.93½ to 1.98½ cents, with a corresponding decline in the other grades. These prices continued until the close of June, when the readjustment in freight rates, together with a weakening demand, made a readjustment of mill prices necessary, and the makers named 1.85 to 1.90 cents, which figures were maintained for the entire last half of the year. At a time, however, it looked very much as if there would be a further decline, but the concerted and harmonious action of makers steadied the market and made it possible to hold prices on an even basis.

Structural Material.

The structural steel mills in this territory have been uniformly active, almost throughout the year. Early in 1907 there was a comparatively large volume of orders on hand, but new business fell off as the year advanced, and although there was some fluctuation in immediate business, mills had enough to keep them fully occupied well toward the end of the year. When the financial depression came during the last quarter of the year, there was a recession in the demand for shapes, although orders continued to come in quite freely. The business, however, was confined to miscellaneous propositions, and nothing of any size developed until just at the close of the year, when several fair sized bridge contracts were placed. As a rule, mills were operated at their utmost capacity until about November, when some little curtailment was necessary, owing to the lack of orders. The output for the year, however, made a material gain on that of 1906.

Increased facilities were added to a number of mills during the year, while the new Saucon plant of the Bethlehem Steel Company will become a producer during the early months of 1908. This mill will make a specialty of the larger and heavier shapes for bridge and railroad work. Prices of structural material have been on an even basis throughout the entire year. The base price of 1.83½ to 2 cents has not varied, although premiums were paid at times for prompt deliveries which were frequently hard to get.

Bars.

The output of iron bars in the eastern Pennsylvania territory in 1907 was fully up to and in instances exceeded the tonnage for the previous year. The mills in the first half and part of the third quarter of the year had about as much business as they could take care of, and were in most instances booked well ahead. In the later portion of the year, however, orders were not so plentiful, and furthermore, owing to the general depression, bar iron makers were unable to get specifications on contracts taken earlier in the year, which had they materialized would have kept the mills uniformly busy. The production of bars was the heaviest during the month of March . There was a little decline in production in the second and third quarters, while a sharp falling off was to be noted in each succeeding month of the last quarter. In fact, the output for the month of November was just about half that of the month of March and December without doubt suffered a still further decline.

Prices for iron bars were at the highest early in the year. In January they were quoted at 1.83½ to 1.93½ cents, delivered, Philadelphia. There was a sagging in March, however, when 1.73½ to 1.83½ cents was the ruling price. After the month of June, when freight rates were rearranged, the price was 1.75 to 1.85 cents, which was maintained pretty firmly throughout the remainder of the year. For the first half of the year steel bars were in very short supply. Makers would take orders for forward delivery at the same prices as for iron bars, but until late in the year prompt deliveries almost always commanded a premium.

Old Material.

Speculative features have been so pronounced in the market for old materials that it was frequently almost impossible to tell just what the actual values of the various grades of scrap might be. It was not at all unusual to find dealers willing to pay $1 or $2 a ton more than the actual consumer would, as it was frequently necessary for them to get the material, no matter what the price, in order to complete a contract on specified time. Generally speaking, scrap was at the highest price in the second quarter of the year. Mills had been buying quite extensively for their future needs, and there was an apparent scarcity of old material at about that time.

No. 1 steel scrap, for melting, averaged about $18.50, delivered in buyers' yards, in the opening month of the year, but advanced steadily on heavy buying to about $19 to $19.25 in May and June for forward shipment, while spot was quoted at about $20. When it became apparent, about midyear, that the consumption would not be so great in the last half, prices weakened gradually, until in November the average price for this grade was about $13.25, delivered. In December the falling off was very heavy, and by the close of the year No. 1 steel scrap could have been bought in limited quantities at $11.50 to $12, delivered.

The other grades of scrap, as a rule, followed this same general course, there being exceptions from time to time as the demand for the particular grades became more or less urgent, as may be noted from the accompanying tables. It is to be observed that in the first half of the

year the gain in prices was comparatively uniform, while in the last half, or up to December 1, the decline was just as regular. In the closing month, however, prices on nearly every grade shrunk heavily and at the close of the year were at the lowest. With the exception of some of the specialties, prices were then fully one-third below those at the opening of the year, while in a few instances the decline has been practically 50 per cent. The range of prices, showing the highest, lowest and average prices during each month of the year, was as follows, per gross ton:

Prices of Old Material at Philadelphia in 1907.

	January.		February.		March.	
	High.	Low.	High.	Low.	High.	Low.
No. 1 steel scrap	$19.00	$18.00	$19.50	$18.50	$19.50	$18.75
Old iron rails	28.00	27.00	28.00	27.00	28.00	27.00
Old car wheels	23.50	22.00	24.00	22.50	25.00	23.25
Choice No. 1 railroad wrought	23.50	21.50	22.50	21.00	22.00	21.00
Machinery cast	22.25	21.25	22.50	22.00	22.75	22.25
Wrought turnings	16.50	16.00	17.00	16.00	17.25	16.50
Cast borings	14.50	13.25	15.50	14.40	16.50	15.00
Stove plate	17.00	16.50	17.25	16.50	18.50	16.75
Wrought iron pipe	16.50	16.00	16.50	16.00	17.50	16.50

	April.		May.		June.	
	High.	Low.	High.	Low.	High.	Low.
No. 1 steel scrap	$19.25	$18.75	$20.00	$18.75	$20.00	$18.25
Old iron rails	27.50	27.00	28.00	27.25	28.00	27.00
Old car wheels	25.00	24.00	26.00	24.00	26.00	25.00
Choice No. 1 railroad wrought	21.00	20.50	21.00	20.50	21.50	20.00
Machinery cast	21.50	21.00	21.50	20.50	21.50	20.00
Wrought turnings	17.25	16.25	17.50	16.75	17.50	16.75
Cast borings	16.00	15.50	16.25	16.00	16.50	16.00
Stove plate	17.75	17.25	18.25	17.50	18.25	17.75
Wrought iron pipe	17.50	16.75	17.50	17.00	17.50	16.75

	July.		August.		September.	
	High.	Low.	High.	Low.	High.	Low.
No. 1 steel scrap	$18.75	$17.50	$17.50	$16.50	$17.00	$16.50
Old iron rails	25.50	25.00	23.00	20.50	21.00	20.50
Old car wheels	25.00	25.00	25.00	23.00	23.50	23.00
Choice No. 1 railroad wrought	20.00	19.00	19.50	18.00	18.50	18.00
Machinery cast	20.50	19.00	19.50	18.00	18.50	18.00
Wrought turnings	17.00	15.00	15.50	14.00	14.50	14.00
Cast borings	15.50	14.00	14.50	13.00	13.50	12.50
Stove plate	17.50	16.00	16.00	14.50	15.00	14.50
Wrought iron pipe	16.75	15.50	15.75	14.75	15.00	14.50

	October.		November.		December.	
	High.	Low.	High.	Low.	High.	Low.
No. 1 steel scrap	$16.75	$15.00	$14.00	$12.00	$12.00	$11.50
Old iron rails	21.00	20.50	21.00	17.50	18.00	17.50
Old car wheels	23.50	22.75	21.00	19.00	20.00	19.00
Choice No. 1 railroad wrought	18.50	17.00	17.50	15.00	15.50	14.50
Machinery cast	18.50	17.00	17.50	16.00	16.00	15.50
Wrought turnings	14.00	12.25	12.50	10.50	9.50	9.00
Cast borings	12.75	10.50	9.00	8.00	7.50	7.00
Stove plate	15.00	14.50	15.00	13.00	13.00	12.50
Wrought iron pipe	15.00	14.00	14.00	13.50	13.00	12.50

The Outlook for 1908.

One of the most difficult problems presented to those who are usually pretty well posted on conditions is that of estimating on the probable course of the iron trade in the coming year. The governing conditions are so unusual that no comparisons with the past can be made. The financial situation is far from satisfactory, and, until that is adjusted and becomes more nearly normal, business will certainly be conducted on a conservative basis. Production and consumption must be brought nearer to a parity if prices are not to recede, and while the co-operation of producers and consumers and the policies of curtailment have had a beneficial effect in preventing utter demoralization, readjustments will have to be made in many directions if business is to again begin an upward trend.

From many standpoints the cost of materials, raw and finished, has been too high. Projects requiring large capital have been held up, owing to the apparent excessively high cost, and it will probably be necessary to start in again at a lower level in order to bring about the heavy consumption of the past few years. It is a slow and tedious process, however, to restore confidence after a period of depression, and with the usual handicap of a Presidential year ahead of us, it looks as if business would hardly be resumed as rapidly as it might be in other years.

The thought has been pretty generally expressed that there would be some improvement shown in buying shortly after the turn of the yeaar, principally because stocks in consumers' yards are so low; but it is more than likely that purchases for some time will be made on a conservative basis, to cover immediate needs, rather than to take care of possible future business.

The Theory of High Speed Tool Steel.

George Auchy of Philadelphia, furnishes the following additional contribution to his discussion of the above subject:

"In the article published in *The Iron Age* of December 26, on 'The Theory of High Speed Tool Steel,' the writer asked why Hadfield manganese steel does not serve for high speed tool steel. The answer to this question is probably to be found in a paper by Dr. Guillet in *Revue de Metallurgie*, 1905, pp. 350-367, abstracted in the *Journal* of the Iron and Steel Institute for 1905, volume 2. In this paper the fact is brought out that manganese gamma steel differs from nickel gamma steel in that it is exceedingly difficult to work. Here, then, is probably the practical difficulty that lies in the way of the use of such steel for high speed tools. But yet another question remains. It is probably the experience of every steel maker that all high speed steel is 'exceedingly difficult to work.' The question then is, Is gamma manganese steel more so than the present high speed steel? Probably it is, but it is obviously a point that steel makers want to be sure about. But if it is a fact that gamma manganese steel is exceptionally difficult to work compared with other high speed steels, then, of course, still less would martensitic manganese steels serve, not only for this same reason, but to a greater degree, also on account of the great brittleness of such steels."

The Krupp Annual Report.

The annual report of Fried. Krupp, a stock company of Essen, a. d. Ruhr, Germany, shows the financial results of the fourth year of the company into which the Krupp works were converted. The balance sheet for the year ending June 30, 1907, shows that the works and properties stood at 180,534,551.92 marks, there having been written off during the year 16,601,221.19 marks. Improvements and tools, railroad cars and ships are down at 9,379,232.32 marks and supplies and stock of finished goods and goods in course of manufacture at 115,499,123.84 marks. Patents and licenses are inventoried at 1,193,515 marks, and cash, drafts, &c., at 12,347,773.77 marks. The gross profit was 37,148,076.26 marks, from which are deducted taxes to the amount of 4,137,578.41 marks, workmen's insurance 3,391,041.57 marks, and for social service, &c., 4,775,190.18 marks, leaving net profits of 24,844,266.10 marks, or, adding the previous balance of 208,829.11 marks, a total available of 25,053,095.21 marks. The stockholders at their meeting decided to write off 5 per cent. under the law, amounting to 1,242,213 marks and a special amount of 4,500,000 marks. A dividend of 18,000,000 marks, or 10 per cent., was declared, and 1,000,000 marks was assigned as a special contribution to the workmen's fund. There are outstanding 16,915,000 marks out of 24,000,000 marks of the loan of 1893 and 18,885,300 marks of the loan of 1901.

A meeting of the Western Bar Iron Association will be held at the Fort Pitt Hotel, Pittsburgh, January 7. The purpose of this organization is to deal with labor questions, and the object of the approaching meeting is to consider the terms of an agreement with the Amalgamated Association relative to the operation of continuous mills, together with such other amendments to the scale as may be considered necessary. Any other business that may be presented touching the interest of the association will be considered.

The car ferry service of the Grand Trunk and Buffalo, Rochester & Pittsburgh lines, across Lake Ontario, between Coburg and Rochester, which was recently inaugurated, establishes another direct railroad connection between Canadian points and Pittsburgh.

THE SHEET AND TIN PLATE TRADES IN 1907.

BY B. E. V. LUTY, PITTSBURGH.

The year 1907 was, on the whole, one of the most prosperous the sheet and tin plate industries have enjoyed for several years; the first 10 months were certainly the most prosperous. There was a somewhat more satisfactory spread between raw material and finished prices in 1907 than in 1906, while there was a steadiness in demand and prices which contributed much to comfortable operations. Through the first three-quarters of the year production was maintained at record rate, but owing to the slump in demand late in the year the year's total tonnages will hardly show up as well as those of 1906.

Costs and Selling Prices.

Taking the Carnegie Steel Company's adjustment prices, per gross ton, on quarterly sheet bar contracts as a convenient and accurate index, for comparative purposes, to the cost of steel to both sheet and tin plate mills, the following averages can be struck:

	1906.	1907.		1906.	1907.
First quarter...	$26.00	$30.00	Fourth quarter..	$30.00	$31.00
Second quarter..	28.00	30.00			
Third quarter...	29.00	31.00	Year average..	$28.25	$30.50

This comparison indicates an average cost of sheet bars $2.25 higher in 1907 than in 1906, but the actual advance has, if anything, been less than this, as in 1907 outside mills furnished a greater proportion of the sheet bar supply than in 1906, and their sales for the second half were at $30, rather than at $31. Besides this, first half deliveries were much larger than second half, so that it is entirely fair to assume that the average cost of sheet bars in 1907 was no more than $2 a ton higher than in 1906.

The slight unevenness in sheet prices late in 1907 need not be considered in a comparison of realized prices on account of the extreme smallness of the tonnage involved. The recognized market prices of sheets and tin plates were unchanged throughout 1907, with the exception that galvanized sheets were advanced $2 a ton on January 24. In 1906 sheets were advanced $2 a ton on January 8, June 5 and October 25, the last advance establishing a price of 2.60 cents per pound on No. 28 black sheets, which has since been the recognized market. Average realized prices on the sheets shipped may be taken at about 2.45 cents for 1906 and 2.60 cents for 1907, showing an advance of $3 a ton. Tin plates were advanced four times in 1906, the year beginning with a $3.40 price, advancing by 10 cents on January 8 and April 9 and by 15 cents on May 18 and October 25, leaving a price of $3.90, which was maintained throughout 1907. For comparative purposes the average price of tin plate shipments in 1906 may be taken at $3.60, the price in 1907 being 30 cents a box, or $6 a ton, higher.

With an average selling price of sheets $3 a ton higher in 1907 than in 1906, compared with an advance of $2 a ton in sheet bars, there appears to have been a slight advantage to sheet mills in the spread. This was helped by the fact that sheet scrap brought measurably higher prices in 1907 than in 1906, but, on the other hand, other costs were higher, so that the net balance in favor of 1907 was very slight.

In tin plate the advantage of 1907 over 1906 was more marked than in sheets. The average realized price was $6 a ton higher, with slightly better prices for scrap, against an advance of $2 in sheet bars. In pig tin 1907 had a slight advantage, as the average price in that year was about 1½ cents per pound lower than in 1906, equal to about 6 cents per box of tin plate, or, on an average, about $1.25 per ton. The average daily closing price of spot tin in New York in 1906 was 39.82 cents, and in 1907 about 38.30 cents. The advantage was a statistical rather than a real one, since the lowest prices in 1907 were in the closing months, when the least tin was used. There is little question, however, that averages of daily prices are a correct index of pig tin costs. Except with almost unlimited means of consumption, the buyer of pig tin cannot hope to beat the daily average by much, while the most bungling buyer, apparently, cannot lose a great deal.

The reader may feel that the price comparisons we have just indulged in endeavor to make too fine distinctions and do not give the exact line on costs or profits which they appear to. Very true; they are not presented for that purpose. The desire is to show how finely the lines have been drawn in this industry in the prices of sheets and tin plates, relative to raw material and other costs. Prior to the establishment, only in very recent years, of this close alignment, there were the widest fluctuations in the spread between raw materials and finished product. The sheet mill not possessed of an independent steel supply was placed in a speculative position as to the buying of the one and the selling of the other, and with the exercise of the best judgment had still to be content with alternations of periods of high and low profits. The situation has been changed; perhaps, on the whole, profits are less than they used to be. The skill now is in attending to the details of the business in mill operations and in selling.

The Galvanizing Branch.

Some interesting comparisons could be made of the spread between black and galvanized sheets in different periods, and the average cost of spelter, but the statistical results might be misleading. There are other factors which enter into the case, but on the whole it is quite safe to say that the manufacture of galvanized sheets was relatively much more profitable in 1907 than in 1906. The demand for galvanized sheets, as against black, has been rapidly increasing, and mills have always been farther behind in shipments of galvanized than of black product, despite the constant increases in galvanizing capacity. As remarked in a review two years ago, the sheet industry is constantly tending toward galvanizing a larger and larger proportion of its output.

On November 15, 1904, the spread between black and galvanized sheets was increased from 1 to 1.05 cents per pound, the new prices being, on No. 28, 2.20 cents and 3.25 cents. Through various price changes this spread was maintained until on January 24, 1907, an independent advance of $2 a ton was made on galvanized sheets, increasing the spread to 1.15 cents, where it now stands. When the spread was increased from 1 to 1.05 cents on November 15, 1904, spelter at St. Louis was 5.35 cents per pound; when the spread was increased to 1.15 cents on January 24, 1907, spelter at St. Louis was 6.75 cents, and there were expectations of its soon reaching 7 cents. Within a month or two spelter began to decline, and later in the year it declined rapidly. In the middle of October, when *The Iron Age* reported some unevenness in black sheet prices, but very little in galvanized, spelter was at 5.35 cents, the same price which ruled when the spread between black and galvanized sheets was increased from 1 to 1.05 cents, while in December spelter declined to below 4½ cents; yet galvanized sheet prices were maintained better than black, with a nominal spread of 1.15 cents between them.

In all this there has been the influence of demand and competition, rather than of cost of raw material, and in this respect the galvanizing branch has been under a different alignment, as to costs and selling prices, than the sheet and tin plate industry in general.

Tonnage Production.

There are no accurate statistics of sheet production in the United States. Prior to 1905 the American Iron and Steel Association presented two totals, one including the production of all plates and sheets, including black plates, and the other covering black plates only. For 1905, at the request of manufacturers, the production of No. 12 and thicker was separated from the production of No. 13 and thinner. This distinction is useful to certain manufacturers for one reason only, which grows out of the arrangements which have come into vogue for the quoting of prices. It is not especially useful, for general

statistical purposes, without a further separation in the material No. 13 and lighter, into sheets which are box annealed and sheets which are not annealed, or are only annealed in an open fire. It is here submitted that this further distinction ought to be made. With the hearty co-operation of the manufacturers it could be introduced without difficulty. From 1894 to 1898, inclusive, sheet production was reported with a still finer subdivision as to gauges, and it is unfortunate that the practice had to be dropped.

In its annual reports the United States Steel Corporation gives the production of the American Sheet & Tin Plate Company, but does not separate sheets from tin plates. In our annual review one year ago it was estimated that the tonnage thus to be named in the forthcoming Steel Corporation report for the year 1906 would be about 1,100,000 gross tons. This estimate was made without the aid of any information from the company. The report which appeared later showed 1,112,542 gross tons, being only 1.1 per cent. different from our estimate. Also, without aid from the company, we now estimate that the tonnage to be reported for 1907 will be about 1,000,000 gross tons. This compares with previously reported tonnages as follows:

Production of the American Sheet & Tin Plate Company.

	Gross tons.		Gross tons.
1902	699,621	1905	924,439
1903	763,670	1906	1,112,542
1904	735,482	1907	*1,000,000

*Estimated.

Of black plate and tin and terne plate production in the United States the American Iron and Steel Association does return statistics. In our review a year ago we estimated that the production in 1906 was 560,000 gross tons of black plates and 540,000 gross tons of tin and terne plates. It was not until the month of December, 1907, that the American Iron and Steel Association was able to complete its statistics of black plate and tin plate production in 1906, then finding that the production of black plate amounted to 576,079 gross tons and the production of tin and terne plate to 577,562 gross tons, so that our estimates, almost a year earlier, had been but 3 and 6 per cent., respectively, short of the officially presented figures. Such differences are almost negligible in statistics relating to these products, on account of different methods of reporting used by different producers. It can hardly be accepted that the figures are reported on the same principle from year to year when it is observed, for instance, that in 1898 18,339 tons more black plate than tin and terne plate is reported; in 1901 1265 tons more tin plate than black plate is reported; in 1905 14,087 tons more black plate is reported, and in 1906 1483 tons more tin plate is reported. There is a quantity of black plate made each year for purposes other than tinning, and that tonnage is not subject to great changes: the black plate which is coated into tin plate and terne plate has a weight of tin and lead added, which weight does not vary materially from year to year.

We estimate the production in 1907 at 495,000 gross tons for black plates and the same for tin and terne plates. This compares with the previous official figures as follows:

United States Production of Black Plates and Tin and Terne Plates.

	Black plates. Gross tons.	Tin and terne plates. Gross tons.		Black plates. Gross tons.	Tin and terne plates. Gross tons.
1894	52,359	74,260	1901	398,026	399,291
1895	129,615	113,666	1902	365,743	360,000
1896	185,387	160,362	1903	490,652	480,000
1897	271,886	256,598	1904	472,569	458,000
1898	345,254	326,915	1905	507,587	493,500
1899	375,000	360,875	1906	576,079	577,562
1900	315,000	302,665	1907	*495,000	*495,000

* Estimated.

Thus production made a gain in 1906 over 1905, the best previous record, of 15 per cent., but in 1907 fell back to a production about equaling that in 1905. Even with this decrease, the production of tin plate in 1907 was substantially double that of 1897, 10 years earlier, and in 1897 the American industry supplied nearly all the domestic demand, the excess of imports in that year over tin plates required for drawback purposes being only about 25,000 tons.

The Course of Demand in 1907.

The sheet and tin plate mills opened the year with order books very well filled, and prospects of full operations for many months. Throughout the first half, new demand in both sheets and tin plates remained good. By June the situation was such that the leading interest's ordinary promises of delivery on new business in sheets ran from four to six months, such promises, of course, not being predicated entirely upon specifications actually in hand, but being based in part upon the rates at which regular customers were turning in specifications.

By the beginning of the second quarter of the year a number of large jobbers had become convinced that it would be desirable to have stocks as small as possible, in view of impending financial difficulties, but efforts to reduce stocks were repeatedly met by fresh demands for material which required them to specify anew. When, however, the decline in demand did come they were found with only moderate stocks. The demand for sheets from the small trade held out after the recession in general activity had become obvious, and the collections of jobbers also remained good for a period which surprised them, in view of what they knew was occurring in other lines.

The demand for canning plates was not altogether as good as in 1906, but was fairly satisfactory. The demand for tin plates for other than canning purposes was, on the whole, well sustained.

Toward the close of the year buyers of tin plate became thoroughly imbued with the idea that tin plate prices for 1908 deliveries would be on a substantially lower basis. This was argued from the decline in pig tin, the statement, generally credited at the beginning of December, that the Chinese had stocks of between 8000 and 9000 tons of pig tin—enough to supply the American tin plate industry for almost a year—and the prospect, as generally accepted, that steel would be lower for 1908. The fact that mills were ready, as usual, to make sales guaranteed against decline, and to hold the tin plate for some time before shipment, was not sufficient to induce buying, and in November the number of tin mills in operation dropped to the lowest point in years, barring temporary midsummer closings.

It has been the necessary practice of the tin plate trade to make up stocks toward the close of the year and early in January, to meet the rush in February and March, on account of the spring canning crops. In a normal year it is impossible for the mills to supply this February-March demand by their current production. Usually the orders are placed and the mills make up stocks, which are not their own, but their customers', held against shipping instructions. At this time the mills were confronted, through the apathy of buyers, with the alternatives of making their own stocks or closing, and they promptly chose the latter.

The tin mills usually reach January 1 with 1,500,000 boxes of tin plate in their warehouses. This year they have practically none. It appears probable that there will be a shortage of tin plate for the spring demand, and if inconvenience results it cannot be laid to the mills.

On account of this condition the production of tin plate was very light in the last quarter of 1907. This was in sharp contrast with 1906, when, contrary to precedent, the second half production actually exceeded that in the first half. The following table shows, approximately, the average number of tin mills in operation in each quarter in the past four years. These figures refer only to tin mills the product of which is actually coated, and are compiled from data set down from time to time. The averages cannot be absolutely correct, but are believed to be within 10 mills of the truth in all cases:

Average Number of Tin Mills in Operation.

	1904.	1905.	1906.	1907.
First quarter	265	295	270	285
Second quarter	270	300	260	290
Third quarter	175	150	265	225
Fourth quarter	215	170	285	125
Year	231	229	270	231

New Construction.

The independent tin plate industry underwent no material change in the year. There were only some minor changes in ownership of mills and no new construction of note.

The American Sheet & Tin Plate Company completed the addition of three mills to the New Kensington plants about the beginning of the year. On January 1 it closed the Star plant, Pittsburgh, containing eight tin mills, and in June the Falcon plant, at Niles, Ohio, containing six tin mills. Both these plants have been abandoned. The Star plant required some important changes to bring it up to the standard. On account of the excellence of its equipment the improvements would have been considered advisable, but there was not enough room, and besides it was not deemed advisable to prepare for the continued operation of a tin plate plant so near the heart of Pittsburgh. The company now has 242 tin mills in 18 plants.

Two important independent sheet plants have been completed in 1907—namely, those of the La Belle Iron Works, Steubenville, Ohio, and the Seneca Iron & Steel Company, Buffalo, N. Y. The La Belle plant comprises eight sheet and two jobbing mills, as an adjunct to the company's large and efficient steel mill. At the close of the year this sheet plant was practically completed, but in company with older mills was practically idle. During the year the company completed a 72-in. plate mill, on which light plates could be rolled. The Seneca Iron & Steel Company's plant comprises five sheet mills, with provision for three more, and a complete galvanizing plant. It has been completed for about three months, and has been operated to part capacity.

Early in the year the American Sheet & Tin Plate Company completed and started operating eight additional sheet mills at Vandergrift, Pa., making this a 37-mill plant. It has made important improvements at Vandergrift and elsewhere, but has not otherwise changed the number of its sheet mills.

The Number of Mills.

A year ago this report contained a table of "actually operative mills at the close of the year." The table of figures is repeated below, with the addition of data for 1907, but on account of doubts as to a few plants it will be designated merely as a list of mills in existence. Under tin plate the independent list contains a number of mills which are operated tin mill style, but the product of which is not actually tinned. This will largely explain the disparity between these totals and the figures of tin mills in operation by quarters, as previously given:

Number of Mills at the Close of the Year.

	Sheet.—		Tin plate.—	
	Corporation.	Independent.	Corporation.	Independent.
1907	179	148	242	110
1906	171	130	255	110
1905	171	130	248	109
1904	163	170	242	83
1903	164	155	264	71
1902	164	136	264	71

It is not pretended that these totals, except in the case of the leading interest, are absolutely correct to the last mill. The plants of the leading interest are as follows:

American Sheet & Tin Plate Company's Plants.

	Tin.		Sheet.	Job-bing.	Light plate.
American	28	Vandergrift	37	..	..
Anderson	7	Leechburg	11	..	..
Cambridge	7	Hyde Park	6	..	..
Chester	7	Saltsburg	4	..	..
Crescent	6	Etna-Standard	16	5	1
Humbert	6	Canal Dover	11	..	..
La Belle	10	New Philadelphia	9	1	..
Laughlin	23	Canton	5	..	..
Monongahela	8	Dresden	4	..	..
Morewood	8	Guernsey	7	..	..
National	25	Mercer	7	..	..
New Castle	20	Midland	7	..	..
Pennsylvania	8	Piqua	4	..	..
Pittsburgh	8	Old Meadow	8	..	..
Sabraton	10	Scottdale	9	..	..
Sharon	20	Struthers	6	..	..
Shenango	30	Wellsville	10	..	..
United States	11	Wood	12	..	1
Eighteen plants	242	Eighteen plants	171	6	2

* Also Bray corrugating mill.

The Tin Plate Wage Rebate.

The collection of the 3 per cent. from the wages of union tin mill workmen employed by the leading interest, to provide for the manufacture of rebate plates, was suspended February 1 and has not been resumed. There was a large sum in the fund at the time of the suspension, against which rebate tin plate had already been made, or was made soon thereafter.

This rebate system was inaugurated late in 1902, for the purpose of capturing a part of the tin plate trade which involves the making of containers for exported products, including petroleum and food products. The Government allows a rebate of 99 per cent. of the duty paid on tin plate made into such containers, on their exportation. The American Sheet & Tin Plate Company has a system whereby it pays a rebate on the exportation of containers made from its plates, and its arrangement with the union workmen is that they made such tin plate at 25 per cent. under the accepted scale. A deduction is made from their pay whereby to establish a fund; the deduction usually being 3 per cent., although this has been reduced to 1½ per cent. at times, and at other times has been totally suspended. From the fund thus created, which is in control of the Amalgamated Association, drafts are made as the company itself pays rebates to its customers, the drafts amounting to 25 per cent. of the wages originally paid for the making of the tin plates involved. The amount of rebate business thus done by the leading interest we should estimate roughly to have averaged between 300,000 and 400,000 boxes a year.

The Pittsburgh Emery Wheel Company.—At a meeting held in the offices of the company, Park Building, Pittsburgh, on December 14, a report of operations submitted by the president showed that remarkable progress had been made in the building of the plant at Rochester, Pa. A permanent organization of the company had been effected and plans outlined October 7. On November 2 a site of 5 acres of ground was purchased and excavating work begun the same day. The report above mentioned showed that a two-story building, 70 x 100 ft., to be used for mixing, drying and turning, is under roof and will be prepared for operation early in January, at which time work will also be completed on the four initial kilns the company is building, and the kilns fired up with an approximate output of 5000 wheels per month. By February 1 the company will be ready to ship adamite, corundum, borundum and emery wheels. A siding of 650 ft. is being laid to connect the plant with the main line of the Pennsylvania Railroad at Rochester. C. G. Smith is president; David B. Hyde, vice-president; Albert W. Smith, treasurer, and Jacob W. Hetzel, secretary. All of the officers of the company are experienced in the manufacture and practical uses of grinding machinery and accessories.

The Tri-State Mining Association, composed of representatives of the zinc mining interests of Wisconsin, Illinois and Iowa, will hold its next meeting at Galena, Ill., January 17. The association is doing much to advance the mining and metallurgical development of the lead and zinc regions of the three States. Prof. U. S. Grant, dean of the Northwestern University, who was responsible for the geological mapping of the tri-State field, will attend the meeting and deliver an address. The Governors of the three States have been given special invitations to attend.

The first electric car running under its own power was successfully sent through the north tube of the McAdoo tunnel under the Hudson River between Hoboken, N. J., and Christopher street, New York City, December 28. It carried Walter G. Oakman, president of the Hudson Companies; W. G. McAdoo, president of the tunnel company; Charles M. Jacobs, chief engineer; J. V. Davies, his deputy; Wilbur Fisk of J. Harvey Fisk & Sons; L. B. Stillwell, consulting electrical engineer, and Hugh Hazelton, electrical engineer. E. M. Hedley, general superintendent of the company, acted as motorman.

NEWS OF THE WORKS.

Iron and Steel.

The Wright Wire Company, Worcester, Mass., has resumed full production in its wire mills at Palmer and in its weaving department, comprising about two-thirds of the total capacity of the works. The remainder of the two plants are running on 50 hours a week. The company has laid off few men, with the exception of certain construction gangs engaged in the erection of new buildings. A considerable amount of new business has been booked.

General Machinery.

The Niles Tool Works of the Niles-Bement-Pond Company, at Hamilton, Ohio, which was closed down December 21 for two weeks for inventory and repairs, will be reopened January 6.

The Refractory Ore Extraction Company has been organized at Ft. Wayne, Ind., and incorporated with $100,000 capital stock, to manufacture machinery for extracting metals from ores. The directors are J. H. Bass, Wm. Geake and L. A. Centlivre.

It is stated that the Lake Shore & Michigan Southern Railroad has purchased 25 acres of land at Elkhart, Ind., to be used as a site for new shops.

Foundries.

Tate, Joncs & Co., Inc., Pittsburgh, have received a contract for a complete installation of their combination oil and gas furnace equipment in the core ovens of the Westinghouse Air Brake Company at Wilmerding, Pa. Some time ago the company installed one of these furnaces in this foundry, and it gave such good results that the Westinghouse Air Brake Company decided to install additional furnaces.

Charles D. Thompson of Jersey City has been appointed receiver for the Reliance Steel Company, which operated the old plant of the Wiegand-Cooke Company at Delawanna, N. J.

Power Plant Equipment.

Recent installations of the B. F. Sturtevant Company, Hyde Park, Mass., through its electrical department, include: Board of Water Supply, Babylon, N. Y., one 9 x 8 in. vertical center crank engine, direct connected to one of its standard slow speed 25-kw. generators; Hanover National Bank, New York, one 12 x 10 in. engine, 50-kw. generator; Eberhard Faber Pencil Company, Brooklyn, N. Y., one 16 x 14 in. horizontal automatic center crank engine, direct connected to one 100-kw. generator; Bouker Contracting Company, New York, one 4½ x 4½ in. engine, direct connected to 5-kw. generator; Central Union Gas Company, New York, one 5 x 7 in. engine, direct connected to 15-kw. generator; Vulcan Detinning Company, Sewaren, N. J., one 7 x 7 in. vertical engine; Hotel Takanassee, Long Branch, N. J., one 16 x 14 in. horizontal engine, direct connected to 75-kw. generator, and one 13 x 12 in. horizontal engine, direct connected to 50-kw. generator; H. J. McCoy, New York, one 11 x 9 in. vertical engine; Washburn Brothers, Saugerties, N. Y., one 25-hp. motor; New York State Reformatory for Women, Bedford, N. Y., one 13 x 12 in. horizontal engine, direct connected to 50-kw. generator; Isidor Fajans, New York, one 6 x 6 in. engine, direct connected to 10-kw. generator; Johnson & Johnson, steamer Robert Johnson, one 6 x 6 in. vertical engine, direct connected to 7½-kw. generator; Andrew McLean Company, Passaic, N. J., one 6 x 6 in. vertical engine; Royal Mfg. Company, Rahway, N. J., one 8 x 6 in. vertical engine, direct connected to 6-kw. generator; New York Engineering Company, New York, three 4½ x 4½ in. vertical engines, direct connected to 5-kw. generators; Parker Engineering Company, New York, one 14 x 14 in. engine, direct connected to 75-kw. generator; Henry Steers, Inc., New York, three 7½-kw. generators; Samuel Smith & Sons, Paterson, N. J., one 14 x 14 in. engine, direct connected to two 50-kw. generators.

Citizens of Knightstown, Ind., have voted in favor of reconstructing the municipal electric light plant, at a cost of $12,000.

Fires.

The plant of the Carborundum Company, Niagara Falls, N. Y., was damaged $20,000 by fire December 23.

The plant of the Holbrook, Armstrong Iron Company, Racine Junction, Wis., was damaged $5000 by fire December 24.

Bridges and Buildings.

The Pittsburgh Construction Company, Diamond Bank Building, Pittsburgh, Pa., has received a contract to reinforce the steel work and renew the deck of the Thirty-third street viaduct of the Baltimore & Ohio Railroad at Pittsburgh.

Hardware.

The factory of the Knox Metal Wheel Company, Knox, Ind., was recently destroyed by fire. The plant had not been entirely completed, but would have been ready for operation within a few days. Work is in progress on a new building, which will be ready for occupancy early in January.

The Meeks Mfg. Company has been organized at South Bend, Ind., and incorporated with $10,000 capital stock. The company will manufacture an automatically propelled swimming device patented by U. S. Meeks, for teaching people to swim.

Fluctuations in Pig Iron Production.

The record of pig iron production in the United States in the past four years begins and ends with output at a low level. A curve plotted from the figures representing production month by month in that period would begin with a sharp ascent, after the drastic curtailment in the closing months of 1903, and end with a plunge to a depth not yet determined. We have prepared such a diagram in the accompanying chart, based on the figures for the production of coke and anthracite pig iron given month by month in the blast furnace statistics of *The Iron Age*. The year 1903 has been included also, so that comparison may be made between the curtailment movement of 1903 and that of 1907. A more striking exhibit could be made of the sharp cutting off of production in the past two months were it possible to show the output of the coke and anthracite furnaces in December, 1907. All indications at this writing are that the December figures will carry the curve into the space for that month at almost, if not quite, the same sharp angle of descent made by the line for November. The figures on which the diagram is based are the following:

Table of Coke and Anthracite Pig Iron Production by Months in 1903-1907.—Gross Tons.

	1903.	1904.	1905.	1906.	1907.
January	1,472,788	921,231	1,781,847	2,068,893	2,205,607
February	1,390,615	1,205,449	1,597,343	1,904,032	2,045,068
March	1,590,470	1,447,065	1,936,264	2,165,632	2,226,457
April	1,614,121	1,555,267	1,922,041	2,073,645	2,216,558
May	1,599,703	1,533,350	1,963,717	2,098,746	2,295,505
June	1,673,228	1,292,030	1,793,289	1,976,733	2,234,575
July	1,546,184	1,106,207	1,741,935	2,013,402	2,255,660
August	1,571,126	1,167,672	1,843,673	1,926,736	2,250,410
September	1,553,717	1,352,677	1,899,500	1,970,962	2,183,487
October	1,425,282	1,450,401	2,053,174	2,196,808	2,336,972
November	1,039,622	1,486,605	2,014,021	2,187,665	1,828,125
December	846,695	1,616,007	2,045,718	2,235,306	

It should be said that the plotted lines do not give an exact representation of the changing rate of coke and anthracite production in the past 60 months. The varying lengths of the months result in sharper angles than would result if the spaces from left to right were one-twelfth parts of a year, instead of 30-day and 31-day, and, in the case of February, 28-day periods. The dip for February, coming between the 31-day months January and March, is noticeable in every year, with the exception of 1904, when, irrespective of the short month, production increased in February because the curtailment in the last two months of 1903 had been too drastic. Another feature of the curve is the more or less pronounced dip in the summer season—not so noticeable in 1907, because every nerve was being strained in the first three quarters of the year to increase pig iron output, and only when linings had been worn to the last degree were stacks put out of commission. Partly due to heat and humidity and partly to the annual pause for assurance as to crop outcome, the blast furnace industry seems to have taken on a habit of midsummer slackening. The abruptness of the descent in the early summer of 1904 tells graphically the story of the false start made in the spring of that year, when the United States Steel Corporation took options on a large tonnage of Bessemer pig iron, only a portion of which was afterward actually purchased.

It will be seen that the swing in the period beginning with December, 1903, and ending with October, 1907, both months of 31 days, is from 846,695 tons to 2,336,972 tons, or in the one case a yearly rate of 10,000,000 tons of coke and anthracite iron and in the other a yearly rate of 27,500,000 tons—a remarkable variation for a period of but 46 months. It indicates that in spite of the common belief that the iron trade of the United States has become more regular in its habits there is still much to be gained in that direction.

Perhaps the most impressive feature of the chart is the spectacular way in which the pig iron trade took leave of prosperity. The record peak in October stands out as a monument to the most remarkable stretch of sustained high level production in our history. It prompts the question, on which present conditions throw little light, When shall its like be seen again?

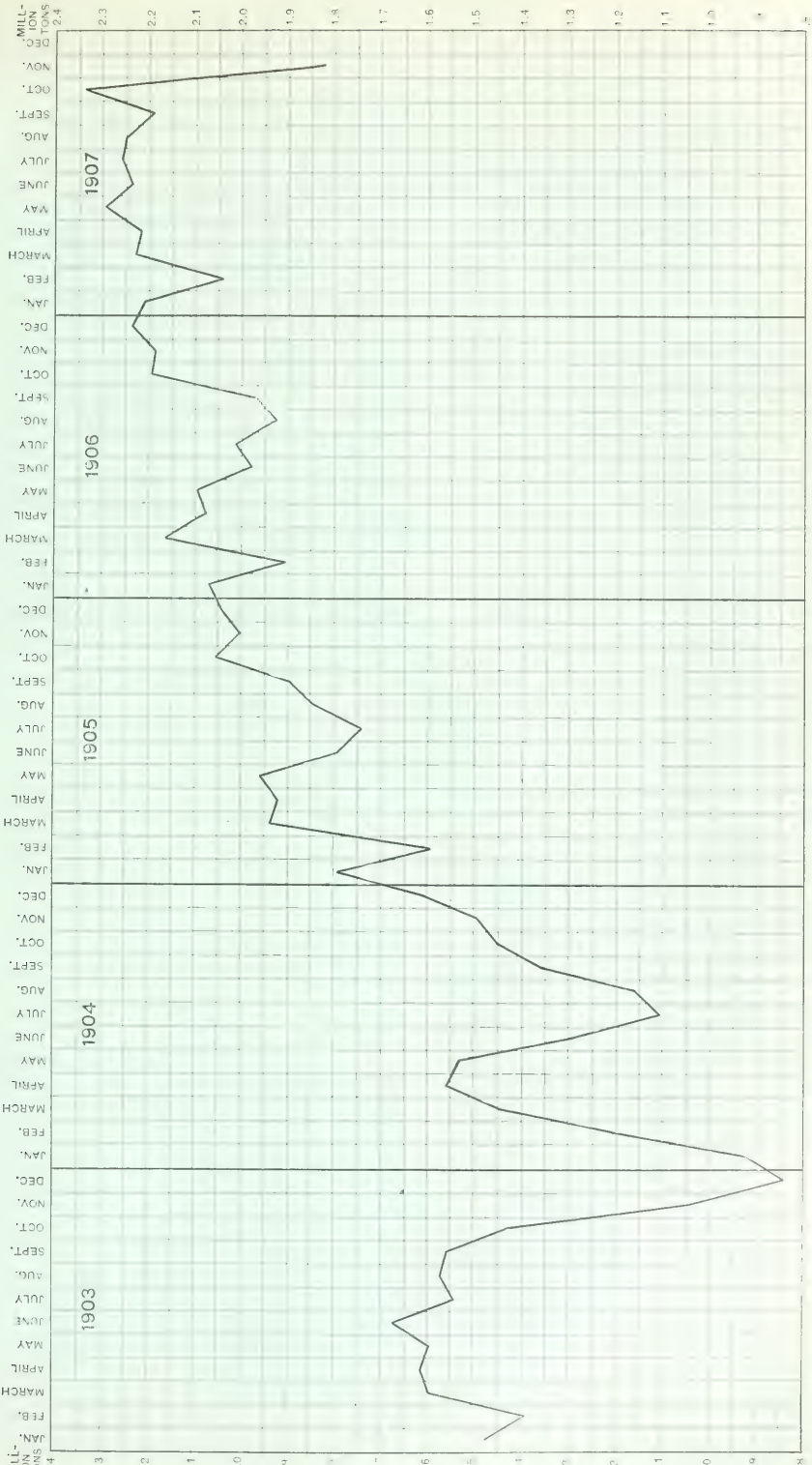


Chart Showing the Fluctuations in Coke and Anthracite Pig Iron Production in the United States in the Years 1903 to 1907, Inclusive

The Iron and Metal Trades

The report has been given considerable currency that there would become effective on January 1 a lower range of prices on Structural Material, Plates, Tubes, Sheets and Tin Plate. The plans of the makers, as developed thus far, do not justify the expectation of an immediate readjustment of prices, although some change in Sheets and Tin Plate may be made toward the middle of the coming month.

Pittsburgh seems to have become the headquarters of a group of publicity managers, who are attempting to force "restoration of confidence" by sending out elaborate accounts of a widespread resumption of industrial activity. Unfortunately many of these reports are either untrue or misleading. The number of plants active during the holidays was very small, and naturally a considerable percentage of the idle ones will start up, in some cases because they have accumulated orders, but such resumption will not restore the industry there or elsewhere to anything like its normal rate of productiveness. Any exaggerated statements as to the near future now will only create the greater disappointment later on, when the truth is realized. The work now in sight justifies operations to the extent of close to 50 per cent. of the capacity.

The Pig Iron Committee is in session at the present writing, all the leading interests being represented. During the past week inquiries have improved in all the principal distributing markets, but very little new tonnage has been booked, and in some quarters a weakening tendency has developed. Other makers, however, are holding aloof and are not meeting the lowest prices named, this being notably the case with some Southern producers who decline to go below $13.50, Birmingham, for No. 2.

No new Rail orders have been placed, and outside of two or three moderate lots, one of them for Cuba, no tangible business is in sight at the present moment. Some business in Structural Material has been placed in Chicago, and several good sized lots are in sight in New York. Moderate orders have been booked for Plates, and it is expected that some shipbuilding work will come out on the Delaware.

In the Cast Iron Pipe trade we note the placing of one 4000-ton contract in New York, and there is the prospect of some heavy work for Boston.

There have been no new developments in the markets for Old Material throughout the country, which remains in a very unsatisfactory condition from the standpoint of the sellers.

There is a little better feeling in the Copper trade and Electrolytic has sold up to 13.50c. Lead, too, has hardened to 3.75c., New York, with quite a good volume of business done during the past few days.

LATER.—Tin Plates will be reduced 20c. or from $3.90 to $3.70, per base box, Pittsburgh, effective January 6.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Jan. 1, 1908.	Dec. 24, 1907.	Dec. 4, 1907.	Jan. 2, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	*$18.00*	$18.25	$18.75	$25.75
Foundry No. 2, Southern, Cincinnati	*16.25*	16.25	18.00	26.00
Foundry No. 2, Local, Chicago	*18.50*	18.00	19.00	25.50
Bessemer, Pittsburgh	*19.40*	19.40*	19.90	23.35
Gray Forge, Pittsburgh	*17.65*	17.90	18.90	22.85
Lake Superior Charcoal, Chicago	*23.50*	23.50	25.00	26.00
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	29.50
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.50
Open Hearth Billets, Phila	30.00	30.00	30.00	34.00
Wire Rods, Pittsburgh	34.00	34.00	34.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	*12.00*	12.00	13.75	18.00
Steel Rails, Melting, Phila	11.50	11.50	11.50	20.00
Iron Rails, Chicago	*15.00*	15.00	15.50	28.00
Iron Rails, Philadelphia	17.50	17.50	17.50	27.75
Car Wheels, Chicago	*20.00*	20.00	22.00	25.00
Car Wheels, Philadelphia	19.00	19.00	19.00	23.00
Heavy Steel Scrap, Pittsburgh	*12.50*	12.50	13.50	20.00
Heavy Steel Scrap, Chicago	*10.75*	10.75	12.00	17.00
Heavy Steel Scrap, Phila	11.50	11.50	11.50	17.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.75	1.75	1.75	1.88½
Common Iron Bars, Chicago	1.75	1.75	1.75	1.81½
Common Iron Bars, Pittsburgh	1.60	1.60	1.60	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.70	1.70	1.70	1.65
Skelp, Sheared Steel, Pittsburgh	1.80	1.80	1.80	1.70
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.50	2.50	2.50	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	2.00	2.00	2.00	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	*13.62½*	13.50	13.75	23.75
Electrolytic Copper, New York	*13.50*	13.37½	13.62½	23.25
Spelter, New York	*4.20*	4.30	4.60	6.67½
Spelter, St. Louis	*4.05*	4.20	4.45	6.55
Lead, New York	*3.75*	3.60	4.12½	6.30
Lead, St. Louis	*3.60*	3.50	4.00	6.05
Tin, New York	*27.25*	27.00	30.10	41.85
Antimony, Hallett, New York	*8.50*	8.50	8.75	25.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$4.09	$4.09	$4.09	$4.09

* The price of $18.50 printed last week was the price at furnace.

Chicago.

FISHER BUILDING, December 31, 1907.—(*By Telegraph.*)

With no marked change in the general situation, save such as comes from continued financial improvement, there is none the less a more hopeful feeling prevalent concerning the trade outlook for the new year. True, there is nothing of a positive character in present market movements upon which to ground a firm prediction of an early trade revival; but with production reduced to a low ebb and no large surplus ahead, only a moderate demand is needed to start the tide running the other way. There is among consumers a deep seated conviction that prices on finished material will be readjusted to a lower basis on or soon after the first of the year. This feeling, combined with other causes, has exerted no little influence in restricting demand. It is not improbable, therefore, that steps may be taken at an early date to remove this obstacle and pave the way for a resumption of buying. Contracts aggregating over 2600 tons of fabricated material for building and bridges were closed last week and new work involving more than 6000 tons came in for figures. A permit for the Lasalle Hotel, representing a cost of $2,800,000, has been taken out and the contract for the Structural Material, amounting to 8000 tons, will soon be awarded. The combined incoming tonnage of new business and specifications on Sheets is extremely light, but because of the large number of mills shutdown or running short of capacity there is no threatened accumulation of stock. The Sylvan Mills of the Republic Iron & Steel Company, at Moline, Ill., started up December 30 after a shutdown of six weeks. While there is nothing to record in the way of not-

and Pig Iron transactions, the market gives evidence of a somewhat stronger feeling which has had the effect of, at least, preventing further demoralization of prices. The amount of tonnage placed during the week shows a slightly growing volume, but represents only purchases for present needs. The Scrap Iron market has not rallied from its weakness, but was spared the assault of fresh offerings of large tonnage, which was expected from railroad sources this week.

Pig Iron. Although there have been no developments that would mark a positive turn in either direction, indications point to a little stronger feeling among furnace interests. There is no doubt that the sharp curtailment of output has helped to steady the market, and there is seemingly less disposition among sellers to gravitate toward lower price levels. An encouraging feature is observed in the fact that more of the inquiries received during the past week have resulted in sales. These ranged in amounts from car lots up to 500 tons, but of course the aggregate of tonnage taken was small. Of the numerous inquiries for from 500 to 5000 tons, a good proportion is believed to represent needs that must be supplied early in the first quarter. Notwithstanding the majority of consumers probably have enough stock in yards and due on postponed shipments to last them well through this period, there may be buyers enough who are not so supplied to start a spurt of buying early in the year. Beyond one inquiry for 1000 tons of Malleable Bessemer there is no indication of anything doing on this grade. Requirements of most of the Malleable melters were covered by contracts for last half requirements, and because of light consumption they are carrying over a good deal of tonnage. A slightly firmer tone is exhibited in the position of the Northern furnaces, which now declare their unwillingness to do better than $18.50 on No. 2 Foundry, although a minimum of $18 has been done. There is no question that some low prices have been made on Southern Irons, but it is doubtful if much tonnage for forward delivery can be placed at the extreme price of recent transactions. While it cannot be said what might be done on a specific offer of desirable tonnage, the attitude of sellers in this market would indicate that for strictly No. 2 grades $13.50, Birmingham, is at present the minimum, and a number of the important producers of that district are asking $14. The establishment of a firm, unyielding price, even though it be a peg above the recent low point, would go far to induce buyers to come into the market. The following prices are for January, February and March delivery, f.o.b. Chicago:

Lake Superior Charcoal	$22.50 to $24.00
Northern Coke Foundry, No. 1	19.00 to 19.50
Northern Coke Foundry, No. 2	18.50 to 19.00
Northern Coke Foundry, No. 3	18.00 to 18.50
Northern Scotch, No. 1	19.50 to 20.00
Southern Coke, No. 1	18.35 to 18.85
Southern Coke, No. 2	17.85 to 18.35
Southern Coke, No. 3	17.35 to 17.85
Southern Coke, No. 4	16.85 to 17.35
Southern Coke, No. 1 Soft	18.35 to 18.85
Southern Coke, No. 2 Soft	17.85 to 18.35
Southern Gray Forge	17.85 to 18.35
Southern Mottled	14.85 to 15.35
Malleable Bessemer	19.00 to 19.50
Standard Bessemer	21.00
Jackson Co. and Kentucky Silvery, 6 %	28.00 to 28.90
Jackson Co. and Kentucky Silvery, 8 %	30.40 to 30.90
Jackson Co. and Kentucky Silvery, 10 %	32.40 to 32.90

(By Wire.)

Billets and Rods.—The quiet movement of more highly finished lines is reflected in a greatly reduced demand for Billets. The character of orders received and the small tonnage involved indicates that purchases are being made only for urgent requirements. For business of this character Forging Billets continue to be quoted nominally at $33 to $34, Chicago. Wire Rods are unchanged at $34 to $35, Pittsburgh.

Rails and Track Supplies.—The closing week of the year has brought no reported developments in purchases of Standard Section Rails for 1908 delivery. The question of uncompleted purchases will, from present indications, doubtless occupy the attention of the roads in the near future, and it is unlikely that there will be insufficient tonnage to supply the rail making capacity of mills through the coming year. There is but little inquiry with few orders for Light Rails, the prices of which are revised on a basis of $2 a ton lower than the previous quotations. A slight improvement in the demand for Spikes, Bolts, and Track Supplies is observed in transactions of the past week. The volume of business involved, however, is relatively small. We quote as follows: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.90c. to 2c., according to delivery; Track Bolts, 2.40c. to 2.50c., base, Square Nuts; and 2.55c. to 2.65c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb. sections, $30; 20-lb., $31; 16-lb., $32; 12-lb., $34, f.o.b. mill. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—The placing of a contract for 830 tons of fabricated material, taken by E. Bolton & Sons, Chicago, for the E. S. Hunter Building, at Madison and Market streets, Chicago, though not of special significance on account of the tonnage involved, represents the conclusion of a transaction hitherto held up by the adverse condition of the money market. Through Bayne & Hewitt, general contractors, the American Bridge Company secured an aggregate of 1828 tons for the Fort Snelling Government bridge, Fort Snelling, Minn., and the Minnehaha Creek bridge, Minneapolis, Minn. In addition to the tonnage placed there has been new business figured on during the week to the extent of over 6000 tons, which gives promise of closure in the not distant future. Prices are without change.

Plates.—Only orders for small lots, which are evidently required to supply immediate needs, are coming in. Not much interest in future requirements is manifested either by consumers or jobbers. Store stocks are moving slowly, but prices on both mill and store shipments are fairly well maintained.

Sheets.—New business is coming in slowly, and shipments are light, although the inquiries received are of firmer tone and inspire hopes for a better demand as soon as the business of the new year is fairly under way. The radical restriction of output by manufacturers and harmony of action in competition has operated to sustain prices. As a result of a recent meeting of the independent interests it is expected that concessions of from $1 to $2 a ton heretofore made by a few mills will be discontinued. Store prices are unchanged and reasonably firm.

Bars.—With only a small portion of the mill capacity of this district in operation, business has been reduced to a low ebb. Such mills as are not wholly idle are running only intermittently. Specifications from all sources are coming forward very slowly, and in point of tonnage the new business offered is light. We quote: Steel Bars, 1.78c., with half extras; Iron Bars, 1.75c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—The strongest feature of the situation seems to be that stocks in the hands of jobbers are below rather than above the normal. While orders being placed are not large, they are growing more frequent. There is good reason to believe that as soon as buyers are convinced of the stability of prices a buying movement will begin, which will result in the placing or tonnage contracts.

Boiler Tubes.—What demand there is is made up of small orders for current requirements. These are by no means large since there is not much new work in the boiler shops. Store trade, influenced by the same conditions, is of moderate volume.

Old Materials.—With no increase in consumption and a disinclination on the part of consumers to add to their present stocks, prices are weak and continue to sag. The tonnages offered in this market are necessarily more widely distributed than usual, since few buyers can be found who care to take any large lots. Melters are buying sparingly because of lessened consumption, and the mills have already accumulated a large amount of stock. A considerable quantity of railroad material which was expected to be offered this week did not make its appearance. It is perhaps fortunate for the market it was withheld, for in the present state of demand it would have borne heavily on values. We quote, per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$15.00 to $15.50
Old Steel Rails, rerolling	12.00 to 12.50
Old Steel Rails, less than 3 ft.	12.00 to 12.50
Relaying Rails, standard sections, subject to inspection	22.00 to 25.00
Old Car Wheels	20.00 to 20.50
Heavy Melting Steel Scrap	10.75 to 11.25
Frogs, Switches and Guards, cut apart	11.00 to 11.50
Mixed Steel	[illegible]

The following quotations are per net ton:

Iron Fish Plates	$13.00 to $13.50
Iron Car Axles	[illegible]
Steel Car Axles	[illegible]
No. 1 Railroad Wrought	10.50 to 11.00
No. 2 Railroad Wrought	[illegible]
Railway Springs	10.00 to 10.50
Locomotive Tires	[illegible]
No. 1 Dealers	[illegible]
Mixed Busheling	7.50 to 8.00
Iron Axle Turnings	6.75 to 7.25
Steel Axle Turnings	[illegible]
Machine Shop Turnings	[illegible]
Cast Borings	4.75 to 5.25
Mixed Borings, &c.	5.00 to 5.50
No. 1 Mill	7.00 to 7.50
No. 2 Mill	[illegible]
No. 1 Boilers, cut to Sheets and Rings	7.00 to 7.50
No. 1 Wrought	[illegible]
Stove Plate and Light Cast Scrap	12.00 to 12.50
Railroad Malleable	10.00 to 10.50
Agricultural Malleable	9.50 to 10.00
Tank	[illegible]

Merchant Steel.—Although at present exceedingly quiet as respects both new business and specifications against contracts, there are strong indications of a better

demand in January after inventories are taken. This movement will, perhaps, first take form in the reinstatement of postponed deliveries.

Cast Iron Pipe.—Trade is waiting first upon a positive and final solution of the financial situation, and second on the establishment of Pig Iron prices at a minimum level. It is believed that with the settlement of these questions much tonnage heretofore held back will begin to come out. Outside of a few small lots for maintenance and repairs, new business is extremely quiet. No new lettings of importance are reported. We quote, per net ton, Chicago, as follows: Water Pipe, 4-in., $33; 6 to 12 in., $32; 16-in. and up, $31, with $1 extra for Gas Pipe.

Metals.—The general inactivity of the holidays has contributed to the slowness in Metals as well as other lines. It was evident from the Copper orders, which ranged from 100 to 1000 lb., that buyers were taking only what they had to have for work in hand. Other metals were equally quiet, but with the exception of ½c. decline in Pig Tin, prices on the entire list are practically unchanged. We quote as follows: Casting Copper, 14c.; Lake, 14½c. to 15c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 29½c.; small lots, 30½c.; Lead, Desilverized, 4c. to 4.05c., for 50-ton lots; Corroding, 5.15c. to 5.25c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 4½c.; Cookson's Antimony, 13c., and other grades, 11c. to 11½c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 13½c.; Heavy Copper, 13½c.; Copper Bottoms, 12c.; Copper Clips, 12c.; Red Brass, 13c.; Yellow Brass, 10½c.; Light Brass 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 23c.; Block Tin Pipe, 25c.

Philadelphia.

PHILADELPHIA, PA., December 30, 1907.

The Iron and Steel markets are very quiet, which is characteristic of the closing days of the year. Consumers are occupied with their annual inventories, and mills in many cases have been closed down for the holidays, while repairs are being made, and to facilitate the taking of stock accounts. But little attention has therefore been given to the purchase of supplies, and not much new business is expected until toward the middle or latter part of January. Financial conditions continue to be an important factor, and while the situation shows further slight improvement, it is still far from normal, and a marked gain in the demand for Iron and Steel can hardly be looked for until the money market is on a more satisfactory basis.

Pig Iron.—There has been a somewhat better inquiry for Pig Iron, and the number of buyers in the market appears to be increasing. As was generally expected, the closing week of the year was rather dull as far as actual sales are concerned, there being a general disposition to defer the placing of orders until after the turn of the year. Prices continue to show a tendency toward weakness, sellers being willing to shade a bit for fair tonnages, particularly where it is necessary to keep furnaces in blast to take care of business still on the books. Curtailment of Pig Iron production continues, and the month of December will show, in all probability, the smallest output for a long time. Sales of Foundry Iron have been mainly of small lots, ranging from carloads up to a few hundred tons, some of it for delivery in the first quarter and half of 1908. No. 2 X Foundry has been sold at from $18 to $18.50, delivered, mostly, however, for early delivery. Pipe makers have shown more interest in the market recently, and several sales of 1000-ton lots have recently been made of suitable grades for their use at prices close to $16.25, delivered. Forge Iron has not been active, although there has been some inquiry for future delivery. Mills as a rule are not in the market to any great extent, owing to the general suspension of operations. Sellers would not be unwilling to shade prices a bit for good tonnages, and $16.25 to $16.50, delivered, could readily be done. Basic Iron continues rather quiet, there being but little demand, and while quotations have been nominally $17.25 to $17.50, sellers would accept $16.50 to $16.75 on good orders. There is some inquiry for Low Phosphorus Iron, but actual orders have been light. Prices for delivery in buyers' yards, eastern Pennsylvania and nearby territory, for the early portion of the year, are quoted as follows:

No. 2 X Foundry	$18.00 to $18.50
Gray Forge	16.25 to 16.50
Basic	16.50 to 16.75
Low Phosphorus	25.00 to 25.50

Ferromanganese.—There is no movement in Ferromanganese, the market being extremely quiet. Quotations are unchanged, $48 to $49, Baltimore, being named.

Steel.—Orders have not yet been received in sufficient quantity by makers to warrant the restarting of mills, and they will not resume until the demand improves. Sales are extremely light, and there is nothing around for forward delivery. Prices are nominally unchanged, ordinary Rolling Steel being quoted at $30 to $31, while $33 to $35 is still quoted for Forging Billets. Orders for a round tonnage, however, could be placed at somewhat lower figures.

Plates.—The makers of Plates have felt the effect of the holidays, and little new business has been taken. The prospects, however, are somewhat brighter. Orders will shortly be placed for 2500 tons of Plates for bridge work on the new elevated tracks for the Philadelphia & Reading Railroad, the contract for which was awarded early in the week. Shipbuilders are figuring on several boats, and other Plate users have considerable work in hand, and in view, but orders for the Plates are largely being withheld until after the first of the year. Prices are firmly maintained as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼ in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Steel.—The demand has not been very heavy during the week. Mills have a fair amount of business on hand, however, and the suspension for the holidays was of short duration. The outlook is encouraging. Some good orders are in sight, and it is believed that a moderate volume of business will continue to come out. Prices are fully maintained, being quoted at 1.85c. to 2c., according to specification. The Philadelphia & Reading Railroad Company has awarded, under what is known as contract No. 8, the bridges to be built in connection with its elevated railroad between Berks street and Broad street, to the McClintic-Marshall Construction Company, Pottstown, Pa., for $336,785. As previously stated, some 5000 tons of Plates and Shapes will be required in this work, orders for which, it is understood, are still to be placed with the makers.

Bars.—Mills are practically all shut down. When they will resume depends entirely on the demand. Sales have been light and makers have been largely able to take care of current business from stock. Prices are being maintained at 1.75c. for Philadelphia and nearby delivery. Steel Bars are quoted at the same price, but there is little business being done.

Sheets.—There has been no improvement in the demand and mills are still idle. What little business comes in is for immediate delivery, and is taken care of from stocks on hand. No disposition is shown on the part of buyers to place orders for forward delivery, although makers believe the situation in this respect will improve early in the coming year. Prices for mill shipments are quoted as follows, with a tenth extra for small lots: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 to 26, 3c.; No. 27, 3.10c., and No. 28, 3.20c.

Old Material.—Business is at a standstill. The low prices do not attract buyers, and dealers are waiting further developments. In the absence of business, prices are unchanged, and are quoted nominally for prompt shipment only, about as follows, for delivery in buyers' yards, eastern Pennsylvania and nearby territory:

No. 1 Steel Scrap and Crops	$11.50 to $12.00
Low Phosphorus	16.00 to 16.50
Old Steel Axles	18.50 to 19.00
Old Iron Axles	23.00 to 24.00
Old Iron Rails	17.50 to 18.00
Old Car Wheels	19.00 to 20.00
Choice No. 1 R. R. Wrought	14.50 to 15.00
Machinery Cast	15.50 to 16.00
Wrought Iron Pipe	12.50 to 13.00
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	8.00 to 8.50
Wrought Turning	9.00 to 9.50
Stove Plate	12.50 to 13.00
Cast Borings	7.00 to 7.50
Grate Bars	13.00 to 13.50

Coke.—There is not a great deal of movement in the Coke market. Makers have considerable Coke on hand, but production has been materially curtailed. Furnace Coke is quoted at $2, at oven, for spot delivery, and $2 to $2.25 for forward delivery. Foundry Coke commands $2.50 to $2.75, at oven, any delivery. These prices apply to both Connellsville and Mountain Coke. The freight rate to Philadelphia and nearby points, however, is higher on the former than the latter, so that delivered prices would range about as follows:

Connellsville, Furnace Coke	$4.15 to $4.40
Foundry Coke	4.65 to 4.90
Mountain Furnace Coke	3.85 to 4.15
Foundry Coke	4.35 to 4.60

Cincinnati.

CINCINNATI, OHIO, December 31, 1907. (*By Telegraph.*)

The turn of the year finds a sentimental balance on the side of the optimists, and there is a feeling among all factors from crude to finished product that the bottom has been reached, and it is but a question of hours rather than days or weeks ere the pace is upward, instead of, as for months, downward. This opinion is formulated from mingling with the men who make the market, who are familiar with all its eccentricities and follow more closely than anybody else the various conditions which have a bearing on prices and sales. The reports from the South that a gentleman's agreement is in process of making, fathered by the Steel people, to fix the minimum price of Southern Iron on a basis of $14, finds few interested here, not only because of experience which teaches that when the bottom has been reached a strong recovery has been the rule within 12 to 24 hr., but because principally of the unusual conditions which marked production this year when business began to drop off. Never before have there been such restrictions, such wholesale banking and blowing out of furnaces, with but a pittance of Iron on furnace yards and comparatively none in the possession of the melters. Because buying has been of the hand to mouth order for several months, there is little need for any concerted movement at this time. January 6 has been fixed as the date upon which many idle or partly idle plants will begin operations, and as Iron has been used up to the barest degree buying for quick delivery will be a feature.

Pig Iron.—While there are few actual sales reported, inquiries have increased wonderfully, and sellers are getting in readiness for a strong buying movement. Some very recently returned visitors to the Birmingham District report practically no Iron in furnace yards, and but nine stacks in blast in the Birmingham and six in the Tennessee districts. In the Hanging Rock District there is but one in blast, the Nellie, and that, it is said, will be banked in the next few days. With the very limited amount of Iron in furnace yards, and practically all resale Iron claimed out, there is a feeling among Iron factors that buyers will come from under cover very soon, and market letters are being sent from many sources advising purchases. While the price of $13 on Southern No. 2 Foundry is generally conceded as having been done, and there is said to be some tonnage now in negotiation for January delivery at the same rate, a number of orders offered at that figure are said to have been refused by leading Southern furnace companies, which make a $13.50 price as the minimum for prompt or first quarter delivery, while some of them are even demanding $14 and $15. The same conditions prevail as to the Northern product which, while quoted at $16.50 for prompt delivery, is difficult to contract at a less price than $17. A Hamilton, Ohio, melter is in the market for a 200-ton lot of Southern No. 4. There will be little contract Iron in dispute at the turn of the year, for most last quarter deliveries not needed by the melter have been extended by the selling agents or sold for his account, and there was no trouble on the part of the furnaces during the last quarter in supplying all demands. For prompt shipment and for the first quarter of 1908 we quote, f.o.b Cincinnati, as follows, the freight rates being from Birmingham $3.25, and from the Hanging Rock District $1.20:

Southern Coke, No. 1	$16.75 to $17.25
Southern Coke, No. 2	16.25 to 16.75
Southern Coke, No. 3	15.75 to 16.25
Southern Coke, No. 4	15.25 to 15.75
Southern Coke, No. 1 Soft	16.75 to 17.25
Southern Coke, No. 2 Soft	16.25 to 16.75
Southern Coke, Gray Forge	14.75 to 15.25
Southern Coke, Mottled	14.25 to 14.75
Ohio Silvery, 8 per cent. Silicon	23.70 to 24.20
Lake Superior Coke, No. 1	18.20 to 18.70
Lake Superior Coke, No. 2	17.70 to 18.20
Lake Superior Coke, No. 3	17.20 to 17.70

Car Wheel Irons.

Standard Southern Wheel	$25.75 to $26.25
Lake Superior Car Wheel	26.50 to 27.00

Coke.—There is no marked change in Coke. Production is reported to be increasing somewhat, and the better brands of Foundry are in fair demand. The range is about $2.75 to $3.25 at oven, and Virginia furnace grades about $2 to $2.25 at oven. It is reported that some melters have come into the market for first quarter and half requirements, and that the above prices have been shaded a little on good sized tonnages.

Finished Iron and Steel.—Holiday week finds a number of the Iron stores invoicing and getting ready for the new year. There is practically no business going, save small purchases for immediate requirements, which are promptly supplied from stores. The largest of these are occupied with collections which are not excellent, attributable by some dealers to the position of the banks in advising customers. Prices are unchanged. Dealers quote f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.80c., with half extras; small lots from store, 1.85c., base, full extras; Steel Bars, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, full extras; Base Angles, carload lots, 1.75c.; small lots from store, 2.10c.; Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c.; Plates, ¼-in. and heavier, carload lots, 1.95c.; small lots from store, 2.20c.; Sheets, No. 16, carload lots, 2.20c.; small lots from store, 2.50c.; No. 14, carload lots, 2.10c.; small lots from store, 2.40c.; Steel Tire, 4-in. or heavier, carload lots, 1.95c., base; Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.25c.; Sheets, No. 10, 2c., carload lots; 2.30c. from store; Sheets, No. 12, 2.05c., carload lots; 2.35c. from store; Light Sheets, Black, No. 28, carload lots, 2.75c.; Galvanized, No. 28, 3.90c.

Old Material.—Scrap dealers are not confident as to the immediate future, and most of them are simply waiting. There is not enough business to warrant a schedule of prices that would represent the real market value of material in any kind of demand, and the quotations appended are given as the best obtainable under the circumstances, and are f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$10.50 to $11.00
Cast Borings, net ton	3.50 to 4.50
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought, net ton	7.00 to 8.00
Old Iron Axles, net ton	15.00 to 16.00
Old Iron Rails, gross ton	15.00 to 16.00
Old Steel Rails, long, gross ton	10.50 to 11.00
Relaying Rails, 56 lb. and up, gross ton	21.00 to 22.00
Old Car Wheels, gross ton	16.00 to 17.00
Low Phosphorus Scrap, gross ton	13.50 to 14.50

San Francisco.

SAN FRANCISCO, December 24, 1907.

The special bank holidays came to an end December 21, and with the full resumption of banking business on the usual scale this week, confidence has been largely restored. Business prospects are brighter and the Iron and Steel trade is already feeling the effects of the decided improvement. Stocks have been steadily diminished by moderate consumption, and as soon as it is known where the money is coming from, the dealers will be encouraged to buy more heavily in these lines. Mining business has been hit hard by the labor troubles at Goldfield, Nev., so that local foundries and engineering works have had comparatively few orders for castings and repair parts since the financial stringency began. A gradual recovery is looked for, although the future actions of the Western Federation of Miners, in working or forcing labor disturbances, will have much to do with it. The arrival of the Federal troops at Goldfield improved the situation. The financial stringency following the Wall Street panic had the effect of bringing many new projects, such as electric railroads, electric power plants and embryo manufacturing enterprises, to a standstill for lack of funds to carry the plans to completion. Money is now somewhat easier, and some of the new infant industries will yet be placed on their feet, while others may be nipped in the bud. An attempt has been made in Southern California to block the $23,000,000 bond issue of the city of Los Angeles for its Owens River water project. On this system some preliminary work has been done, and deliveries are being made on a 6000-ton contract for Cast Iron Pipe for improving the local distribution of water. What is understood to be the first of 14 suits which will be begun against the city of Los Angeles to prevent the construction of the Owens River aqueduct has been begun in Inyo County, California, by the Inyo Consolidated Water Company. The complaint holds that the city of Los Angeles owns only 180 in. of the flow of Cottonwood Creek, a tributary of Owens River, and demands that the city be required to show cause why it should not be restrained from asserting further rights. The plaintiff claims 130,000 in. of the flow perpetually. The large electrical corporations operating in that part of California are understood to be behind the suit. Preparations are on foot for the construction of a telephone system along the line of the projected 240-mile aqueduct.

Pig Iron.—The market is still very inactive, and there is no change in prices of Pig Iron locally. Importations by sea from Europe have been light in December, but a number of vessels are now en route to this port with from 1000 to 1500 tons each. Girvin & Eyre recently imported a cargo of Coke and Pig Iron from England, the latter including 750 tons of Glengarnock and 250 tons of Eglinton.

Coke.—Arrivals of foreign Coke by sea during November and early in December have made a good showing as to quantity, and have had a tendency to depress prices somewhat. December arrivals to date aggregate about 9740 tons, which, with the exception of one cargo of 2840 tons, from Australia, was from Europe.

Structural Material.—While no large contracts for Structural Steel for buildings in San Francisco have been closed very recently, there is some inquiry, and the prospect is good for the erection of a large number of Steel frame structures in 1908. The only unfavorable feature is the possibility of labor troubles in the building trades, to which any city is liable. The San Francisco Building Trades Council has clashed with the local representatives of D. O.

Mills, and of D. H. Burnham & Co., over the reconstruction of the Mills Building, which is nearly ready for occupancy. The point at issue is whether the elevator workers or the steam fitters shall install the pipe connections to the elevator apparatus. It is reported that the affair is really the beginning of a battle for local supremacy between the presidents of the Building Trades Council and the American Federation of Labor. Strong influences will be brought to bear by the contractors and material men of the city to prevent a general tie-up of building operations in case the trouble extends further. According to the plans just adopted by the Royal Insurance Company for a new 10-story Class A office building on the corner of Pine and Sansome streets, a considerable quantity of Structural Steel will be required. The Palace Hotel Company has awarded contracts aggregating $144,260 to Winslow Brothers' Company and the Otis Elevator Company for the ornamental Iron and elevator work for the new eight-story hotel on Market street. The W. B. Abbitt Company has taken the riveting contract on the Steel frame at $9 per ton.

Merchant Pipe.—The jobbing conditions in Merchant Pipe have not changed materially since last report. Stocks are being reduced, however, and buying cannot be postponed much longer. Discounts on Steel Pipe are about as follows on jobbers' carloads:

	Steel.	
	Black.	Galv
¼ and ⅜ in	58.5	42.5
½ in	60.5	46.5
½ in	62.5	50.5
¾ to 6 in	66.5	56.5
7 to 12 in	63.5	48.5
Extra strong, plain ends:		
⅛ to ⅜ in	51.5	39.5
½ to 4 in	58.5	46.5
4½ to 8 in	54.5	42.5
Double extra strong, plain ends:		
¼ to ⅜ in	47.5	36.5

Cast Iron Pipe.—Only a few small inquiries have been received of late for Cast Iron Pipe, but a number of municipalities and water companies in California and other Coast States are planning extensions that will require a good deal of Pipe in the new year. The city of Los Angeles has purchased 1000 acres of land at the head of the San Fernando Valley as a site for twin storage reservoirs for the waters of the Owens River, to impound 10,000,000,000 gal. of water. This space supply would be sufficient for the city's needs for six months in case of injury to the conduit system.

The electric furnace at Héroult, Cal., has closed down after a successful run of two weeks on Ferrosilicon. The shutdown is only temporary. The furnace will start up when electrodes now on the way from the East arrive, which will be in about 10 days, according to present calculations. By that time the track of the Sacramento Valley & Eastern Railroad will be laid to the furnace, facilitating the shipment of the stock of Pig Iron and Ferrosilicon now in the furnace yards. A 250-hp. transformer is being installed at this furnace. The transformer was made under the direction of Professor Dorsey A. Lyon of Stanford University. He is also the designer of a new and larger furnace that is almost completed in San Francisco, and will soon be shipped to Héroult, and has been granted six months' leave of absence from the university, in order that he may devote that much time to the Héroult enterprise. His furnace is said to be an improvement on the design of Dr. Héroult.

The Shelby Steel Tube Company will, in future, market its products on the Pacific Coast through the National Tube Company, represented in San Francisco by G. S. Garritt, sales manager, with offices in the Crocker Building.

W. P. Barba, the metallurgical engineer of the Midvale Steel Company, Philadelphia, has returned East, after making an inspection tour of the principal mining mills and smelters of the Pacific Coast, in company with J. C. H. Ferguson, the general sales manager, with headquarters in San Francisco. While business is still very dull in the lines of Castings, Steel Bars, &c., required by the plants above referred to, these investigators were convinced that there is a probability of a decided improvement within the next three months.

The Union Iron & Steel Company, whose main office is at 71 Broadway, New York, and works are at Ironton, Ohio, and Big Gap, Va., has succeeded in having dismissed the petition in bankruptcy filed against it November 14. Judge Hough of the United States District Court, New York, took this action on the ground that there were not three creditors with provable claims who filed the petition.

To extinguish a mine fire with carbon dioxide gas, it is stated that 7 per cent. of a mine's capacity must be filled.

Cleveland.

CLEVELAND, OHIO, December 30, 1907.

Iron Ore.—As a result of the limited consumption of Ore, the piles on the docks are scarcely being touched. Because of the curtailment of the production of Pig Iron a large number of furnaces will have considerable Ore on hand at the opening of navigation next spring. The amount of this surplus will depend, of course, on the length of time the furnaces will be compelled to stay out of blast. The existing conditions indicate a considerable falling off in Ore purchases and shipments next year, for furnaces that have enough Ore to last them until well along in the summer will not buy so much as they would if their supply ran out two or three months earlier. In view of the conditions, it is certain that this year's record breaking Ore movement will not be equaled next year. The all rail Ore movement in 1907 was approximately 850,000 tons, making the total shipments for the year, in round figures, 42,150,000 gross tons. During 1907 lake shipbuilders launched 44 vessels, which is regarded as a very satisfactory record, considering the fact that a number of plants were tied up by labor troubles early in the year. With about four exceptions all the boats that were ordered for 1907 delivery were turned out. Three freighters that were completed late in the season were not placed in commission because of the falling off in freight movement late in the season. Of the 44 vessels built, 41 were bulk freighters, their average capacity being about 9000 tons. Many of the new boats came out late in the season and made but a few trips. No interest is as yet being aroused in 1908 Ore, and nothing is being done about fixing prices. Nominal prices remain as follows at Lake Erie docks, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.25; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—Considerably more inquiry for Northern Foundry Iron for the first quarter and first half of 1908 has developed during the week. The inquiries are mostly from foundries that are figuring on contracts for castings and want quotations on which to base those contracts. The inquiries are for lots ranging from 100 to 1500 tons. A number of the foundries ask for quotations both for the first half and for prompt shipment, indicating that some of them are disposed to buy only for their immediate needs instead of making contracts for three or six months. Many of the local consumers have enough Iron in stock or under contract to last two or three months. The ruling price seems to be $17, Valley furnace, for No. 2 Foundry Iron for prompt shipment and for the first quarter and first half delivery. One local furnace is asking $17.50 for prompt shipment and for first quarter and first half. One local interest reports a little better demand for spot Iron at its Eastern furnaces, having made some sales in 50 to 100 ton lots at from $17 to $17.15, at furnace, for No. 2. Taken altogether, the demand for spot Iron, however, shows no improvement, and unless there is a change for the better other furnaces will go out of blast within a week or two. Ella Furnace of Pickands, Mather & Co. will be blown out January 1, and it is expected that the Dover Furnace of the Penn Iron & Coal Company will be blown out in a day or two. Other furnaces that have gone out of blast in addition to those previously noted are the furnaces of the Perry Iron Company, Erie, Pa., and of the Detroit Iron & Steel Company, at Detroit. Corrigan, McKinley & Co. have decided to rebuild their Scottdale Furnace, which was shutdown a few days ago as the result of a breakout. The furnace, which was a very old one, is now being torn down. The River Furnace of the Upson Nut Company, which has been banked for about three weeks for repairs, will start up January 2. This furnace has enough shipping orders on hand to keep it running for a few weeks. There are a number of inquiries in the local market for Southern Iron for first half delivery, including one for several hundred tons of No. 2 Soft from a stove interest. Quotations for prompt shipment, f.o.b. Cleveland, are as follows:

Bessemer	$19.90
Northern Foundry, No. 1	$17.50 to 18.00
Northern Foundry, No. 2	17.00 to 17.50
Northern Foundry, No. 3	16.50 to 17.00
Southern Foundry, No. 2	17.85 to 18.35
Gray Forge	17.40

Coke.—A local furnace interest closed a contract last week for about 40,000 tons of Furnace Coke for the first half of 1908 at a price slightly under $2, at oven. With the exception of this transaction the market has been lifeless. Price quotations are largely nominal. For first quarter and half delivery we quote Furnace Coke at $2 to $2.15, at oven, and Connellsville Foundry Coke at $2.75 to $3.25, at oven.

Finished Iron and Steel.—Collections are much better, and banks are easing up a little more on money. The satisfactory change in financial conditions leads to the belief that business in the Iron and Steel trade will pick up materially soon after the first of the year, but a rapid return to normal activity is not expected. A fair volume of orders is looked for, however, late in January. Many in-

dustrial plants that have been running on reduced capacity shut down during the holidays and are taking stock. A large portion of them are expected to resume soon after the first of the year, and their resumption will be quickly followed by a better demand for Finished Material, as most consumers have a very limited stock on hand. The full resumption of work by the American Shipbuilding Company, which is expected soon after the turn in the year, will help considerably in restoring the normal volume of orders on contracts. Some of the sales agents of mills report that owing to the business depression during the latter part of the year many of their customers have not specified for over about 25 per cent. of the material that they had purchased under contracts that expire January 1. The plant of the Otis Steel Company, which shut down last week for repairs, started up again this week. The mills of the Union Rolling Mill Company and Empire Rolling Mills Company, Cleveland, which shut down before Christmas, are still idle, and it is uncertain when they will start up, that depending on when they receive enough orders to warrant a resumption. There are some inquiries for Iron Bars from railroads which are expected to place their orders this week. Following the policy adopted by Eastern Bar Iron manufacturers, an attempt has been made by some of the Western Bar Iron mills to maintain prices at 1.60c., Pittsburgh. The attempt has met with but slight success, however, and orders could, doubtless, be placed with local mills on the basis of 1.55c., Pittsburgh. There is some demand for Light Rails for coal mines in car lots, on which mills rerolling Rails are cutting prices $2 or more per ton. Some independent mills are shading prices $2 per ton on Light Plates, and prices are also being shaded on Black and Galvanized Sheets. We quote Steel Bars at 1.70c., Cleveland, for carload lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼ in. and heavier, 1.80c., base, Cleveland. Regular mill prices on Sheets, carload lots, Cleveland, are as follows: Blue Annealed, No. 10, 1.95c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Jobbers report light sales, with no change in prices. We quote Steel Bars, out of stock, at 1.90c. to 1.95c., and Iron Bars at 1.95c. to 2c. Beams and Channels, out of stock, are 2.10c. to 2.15c., base. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.20c.; Box Annealed, No. 28, 2.90c.; Galvanized, No. 28, 4.05c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—The market shows no improvement. A number of mills are shut down for the holidays, and those that have bought any Scrap during the week have wanted only car lots for immediate use. Dealers have expected some buying for the first of the year delivery, but as yet have received no inquiries from the mills for Scrap for January shipment. Nominal prices remain about the same. Dealers believe that the bottom has been reached and there is some speculative buying. The sale of 1000 tons of Scrap by the Lake Shore Railroad last week is said to have brought out somewhat better prices than any similar sale in the past six weeks. A local manufacturing concern sold 500 tons of Busheling of a superior quality at $12 and 300 tons of Turnings at $7.50. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$11.00 to $11.50
Old Iron Rails	16.00 to 17.00
Steel Car Axles	18.00 to 19.00
Old Car Wheels	16.00 to 17.00
Relaying Rails, 50 lb. and over	25.50 to 26.00
Relaying Rails, under 50 lb.	28.00 to 29.00
Heavy Melting Steel	11.00 to 11.50
Railroad Malleable	12.00 to 13.00
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	9.00 to 10.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$17.00 to $18.00
Cast Borings	4.50 to 5.00
Iron and Steel Turnings and Drillings	6.50 to 7.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	10.50 to 11.00
No. 1 Railroad Wrought	11.00 to 12.00
No. 1 Cast	12.00 to 13.00
Stove Plate	10.00 to 10.50
Bundled Tin Scrap	9.00

The first turbine propelled United States battleship will be No. 29, now building. It will also have an interesting electrical equipment, including four 300-kw. Curtis turbogenerating sets, supplying light and power to 100 motors of sizes ranging from 2 to 75 hp.

Regarding structural steel tests, Professor Arnold, in a lecture before the Sheffield Society of Engineers, England, recommended abandoning the breaking stress as the basis for the factor of safety, and using instead, four tons less than the elastic limit with a factor of safety of at least three.

Pittsburgh.

[illegible]

Pig Iron.—While there is a little more inquiry for Steel making Iron, little tonnage has been actually closed. One Eastern Steel company is inquiring for 3000 tons of Bessemer, another for 2000 tons and a third for 1000 tons, all for January and February shipment. On these inquiries $18.50 at Valley Furnace is being quoted, equal to $19.40, Pittsburgh. Reports are that Basic Iron has been sold as low as $17, Valley Furnace, but this is not confirmed. The furnace interests are trying to maintain a differential of $1 a ton between Bessemer and Basic. We quote Bessemer Iron at $18.50, Valley Furnace, and Basic at $17.50, Valley Furnace, freight to Pittsburgh being 90 cents. Inquiries for Foundry Iron are few and only for small lots. We quote Northern No. 2 Foundry for first quarter delivery at $17, Valley Furnace, or $17.90, Pittsburgh, but several makers of Iron having a high reputation among consumers are not quoting below $17.50, Valley Furnace. A local consumer has bought 1500 tons of Northern Forge Iron at $16.75, Valley Furnace, or $17.65, Pittsburgh, and we quote the market at that price.

Steel.—The market is very quiet, and the output of Steel is at the lowest point for some years. The Carnegie Steel Company has seven plants closed down—Columbus, Mingo Junction, Bellaire, North and South Sharon and Ohio. The Shenango Steel Works of the Carnegie Company, at New Castle, idle last week, started up on Monday morning this week, rolling Sheet and Tin Bars. We continue to quote Bessemer and Open Hearth Billets nominally at $28, and Sheet and Tin Bars at $29, Pittsburgh. Consumers of Forging Billets are said to be specifying more freely against contracts. We quote Forging Billets at $30, Pittsburgh.

(By Mail.)

The close of the year finds general conditions in the Steel trade a little better. There are more inquiries in the market for Pig Iron, Steel and Finished Material. The new tonnage actually contracted for, however, continues very light, and does not represent more than 25 per cent. of the capacity of the mills, if that much. Reports are current of readjustments in prices of nearly all lines of Finished Iron and Steel to become effective early in January, possibly before this week is out, but from reliable sources, it is learned, that the only reductions in prices definitely decided upon are on Galvanized Sheets, which will be reduced, owing to the heavy decline in the price of Spelter, and also Tin Plate, due to the much lower cost of Tin. The reduction in Galvanized Sheets will be $3 or $4 a ton, and on Tin Plate probably 25c. per base box. It is possible, too, that Black Sheets will be reduced. Official notice of these reductions will likely be sent to the trade by the Sheet and Tin Plate interests before this week is out. In regard to Plates, Structural Material, Steel Bars and Pipe, while it is possible that reductions on these products may be made in February or March, it is not believed that any change will be made in January. Restriction in the output of Pig Iron, Steel and Finished Material is still going on, and at the end of this week it is expected that only four or five of the Valley furnaces, which sell their Pig Iron in the open market, will be in blast. Another meeting of the furnace interests making Foundry Iron was held in Cleveland, Ohio, December 28, at which a report of the committee appointed at the previous meeting was presented. The furnaces west of the Allegheny Mountains that make Foundry Iron are working closely together in restricting output and sustaining prices. A meeting of the subcommittee representing the American Sheet & Tin Plate Company and the independent Sheet and Tin Plate mills will be held in Pittsburgh, January 2, at which time it is probable that the readjustments decided upon in the prices of Black and Galvanized Sheets and Tin Plate will be announced.

Ferromanganese.—No new business is being placed, and we quote 80 per cent. foreign Ferro nominally at $50 to $51, Pittsburgh. Possibly these prices could be shaded.

Muck Bar.—Northern Forge Iron has sold recently as low as $16.75, Valley furnace, equal to $17.65, Pittsburgh, and this fully explains the low prices at which Bar is being offered. We quote best grades of Muck Bar made from all Pig Iron at $29 to $30, Pittsburgh.

Wire Rods.—We do not hear of any orders being placed, and we quote Bessemer and Open Hearth Rods at about $34, Pittsburgh.

Steel Rails.—Some inquiries are in the market for small lots of Standard Sections, ranging from 2000 to 5000 tons, but the terms of payment offered by the prospective purchasers, which are usually bonds or some other forms of securities, are not satisfactory to the Rail mills, and the business is usually declined. The Edgar Thomson mill of the Carnegie Steel Company is again in operation, but is running light, making only 1000 to 1200 tons a day against a normal capacity of at least 2500 tons. New tonnage in Light Rails being placed is being taken mostly by the mills that reroll Rails, on which low prices are made, 25 lb. to

45 lb. Rails having sold recently as low as $27, at mill. Usual quotations are as follows: 25 to 45 lb., $30; 20-lb., $31; 16-lb., $32; 12-lb., $34; 10-lb., $36, and 8-lb., $40. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—The Steel car companies and the Standard Oil Company are still taking out a fairly heavy tonnage of Plates, but the demand from other consumers is very light. The Steel car interests have orders for about six weeks yet, but after that time their requirements for Plates will be very small, unless they receive some orders for cars in the meantime. Some Plate mills that do not make a full range of sizes are shading prices on narrow Plates about $2 a ton. We quote: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in.	
Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in	.05
Plates over 110 to 115 in	.10
Plates over 115 to 120 in	.15
Plates over 120 to 125 in	.25
Plates over 125 to 130 in	.50
Plates over 130 in	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
A. S. M. A. to ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell grade of steel is abandoned.	

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—Inquiries are reported as a little better and some tonnage has been placed. The McClintic-Marshall Construction Company has taken a contract from the Philadelphia & Reading Railroad for the elevation of its four track system in Philadelphia, about 4200 tons; also some bridge work from the Pennsylvania Railroad, about 500 tons, and additional Steel work for the new Open Hearth plant of the Pittsburgh Steel Company at Monessen, Pa., about 500 tons, all this material to be rolled by the Carnegie Steel Company. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—The subcommittee recently appointed by the independent Sheet mills will meet in this city January 2, at which it is expected the readjustment in prices agreed upon will be announced to the trade. It is expected that Galvanized Sheets will be reduced $4 to $5 a ton, and Black Sheets $2 or possibly $3 a ton. Nothing official has been given out and will not be until after this subcommittee meets. Regular prices on Sheets in effect at this writing are as follows: Blue Annealed Sheets, No. 10 gauge and heavier, 1.85c.; Nos. 11 and 12, 1.90c.; Nos. 13 and 14, 1.95c.; Nos. 15 and 16, 2.05c.; Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.65c.; Nos. 12 and 14, 2.75c.; Nos. 15 and 16, 2.85c.; Nos. 17 to 21, 3c.; Nos. 22 and 24, 3.15c.; Nos. 25 and 26, 3.35c.; No. 27, 3.55c.; No. 28, 3.75c.; No. 29, 4c., and No. 30, 4.25c. We quote No. 2 gauge Painted Roofing Sheets at $1.85 per square, and Galvanized Roofing Sheets, No. 28 gauge, $3.25 per square, for 2-in. corrugations. These prices are subject to a rebate of 5 cents per 100 lb. to the large trade, jobbers charging the usual advances for small lots from store.

Tin Plate.—The subcommittee appointed by the Tin Plate mill to handle the matter of a readjustment in prices of Tin Plate will meet in this city January 2, after which it is likely the reduction agreed upon will be given out. This reduction is due almost entirely to the heavy decline in the price of Pig Tin in the last three months. Present quotation is $3.90 for 100 lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5 cents per base box in large lots.

Bars.—The situation continues very quiet, and little new business in either Iron or Steel Bars is being placed. Specifications against contracts are only fair, and do not represent more than 25 to 30 per cent. of output of the mills. Prices are still being firmly held. We quote Iron and Steel Bars on the basis of 1.60c., Pittsburgh.

Spelter.—From the low price of 4c., St. Louis, made last week, the market is a little firmer, and prime grades of Western Spelter are now held at 4.05c. and 4.10c., St. Louis, equal to 4.17½c. and 4.22½c., Pittsburgh. New buying is light, and the smelters are cutting down the output.

Hoops and Bands.—Very little new business is being placed, and specifications against contracts are only fair. We quote Steel Hoops 2c., and Bands for all purposes at 1.60c., base, half extras as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of $2 a ton being charged for less than carloads.

Spikes.—There is no improvement in the demand, and all the mills making Spikes are short of orders. We quote Railroad Spikes at $1.90 to $1.95, and smaller sizes at $2.05 to $2.10 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—New demand is practically stagnant, and specifications against contracts are so light that the mills are all short of work, some running only half time or less. Prices are weak, except on Shafting, and we quote nominally as follows: Cold Rolled Shafting at 54 per cent. off in large lots and 48 per cent. off in carload lots, delivered in base territory; Smooth Finished Machinery Steel, 1,85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades, and 10c. and upward for special grades.

Merchant Pipe.—Contracts have been pretty well filled, except for such tonnage as has been held up, and the Pipe mills will enter the new year with less unfilled orders on their books than for many months. In the absence of new demand, prices are being well sustained on Steel Pipe, but on Iron Pipe continue to be shaded. The net discount on Steel Pipe to the large trade on ¾ to 6 in. is 74 and 5 per cent. off list, while on Iron Pipe ¾ to 2 in., 71 and 5 per cent., and over 2 to 6 in., 70 and 5 per cent. are quoted. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black. %	Galv. %
⅛ to ¼ in	65	49
⅜ in	67	53
½ in	69	57
¾ to 6 in	73	63
7 to 12 in	70	55
Extra strong, plain ends:		
⅛ to ¾ in	58	46
½ to 4 in	65	53
4½ to 8 in	61	49
Double extra strong, plain ends:		
½ to 8 in	54	43

To the large trade all above discounts are subject to 1 point on the base, and 5 per cent. on the net.

Boiler Tubes.—The market is quiet, and prices are more or less shaded. Usual discounts on Merchant Tubes are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ in	42	47
1¾ to 2¼ in	42	59
2½ in	47	61
2¾ to 3 in	52	65
3½ to 13 in	42	59

2¼ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Iron and Steel Scrap.—Reports are current that Heavy Steel Scrap has sold under pressure as low as $11 a ton. Nominal prices, which would probably be shaded $1 a ton or more, if any business was offering, are as follows: Heavy Steel Scrap, for Pittsburgh, Steubenville or Sharon delivery, $12.50; Cast Iron Borings, $6; No. 1 Cast Scrap, $14.50; Bundled Sheet Scrap, $9; Low Phosphorus Melting Stock, $16; Rerolling Rails, $12.50; No. 1 Busheling Scrap, $12.50; No. 2, $9.50 to $10; Old Steel Rails, short pieces, for Open Hearth use, $12.50; Steel Axles, $17.50 to $18; Standard Sheet Bar Crop Ends, $15; Iron Axles, $22.50; Grate Bars, $11.50 to $12; Stove Plate, $10.50. All these prices are per gross ton, f.o.b. Pittsburgh, unless otherwise noted.

Coke.—Some Furnace Coke has been sold for delivery in first three months and first half of next year on the basis of $2.25 a ton, at oven. Connellsville Furnace Coke for prompt shipment is offered as low as $2 a ton, at oven, and there have been some sales at that price. The output of Coke continues to grow materially less, due to the blowing out of ovens, and last week the Upper and Lower Connellsville regions made less than 150,000 tons. More than two-thirds of the ovens in the Upper and Lower Connellsville regions are idle, and this number will be increased unless the demand for Coke soon improves.

The Connecticut Can Company, Hartford, Conn., has been incorporated in Connecticut to manufacture tin cans, to begin business with $2000 capital. The incorporators are Havilah A. Blakeslee, Roger H. Blakeslee and Florence C. Blakeslee. No new plant is contemplated, and the necessary machinery to begin manufacturing has been purchased. Baking powder and coffee cans will be manufactured.

Birmingham.

BIRMINGHAM, ALA., December 28, 1907.

Pig Iron.—The number of inquiries made as to requirements for the first quarter is very gratifying, but little business has resulted. Melters are manifesting more interest as to market conditions than at any time for weeks, but it seems to be generally conceded that prices will not have been established on a firm basis until the readjustment of financial and commercial affairs has been more effective. While $14 on a No. 2 Foundry basis, f.o.b. Birmingham, is quoted, it seems to be pretty well understood that this quotation is nominal, and would no doubt be shaded considerably for a round tonnage. It is problematic, to say the least, as to just what basis will have been reached when the market is again active. At any rate, there is no doubt that producers in general will be in better shape to adjust themselves to changed conditions than at any time for a decade. With the exception of the furnace operated by the Central Iron Company, at Holt, Ala., which, it is reported, will be put in blast about March 1, there are indications that the output of Merchant Pig Iron will be increased within the near future.

Cast Iron Pipe.—Notwithstanding the fact that a considerable tonnage is now being held up by reason of the unsettled condition of the Pig Iron market, producers appear to be confident of the prospect for future business, and no doubt plants now idle by reason of the holidays will be put in operation early in January. No new lettings are in sight for the immediate future, and no doubt order books for the first part of the year will consist largely of small lots. We quote, nominally, per net ton, f.o.b. cars here: 4 to 6 in., $30; 8 to 12 in., $29; over 12 in., average, $26, with $1 per ton extra for Gas Pipe.

Old Material.—No interest whatever is being manifested by consumers as to future requirements. An occasional sale of Cast Scrap at variations in price, is reported, and is the feature of the market. Some stock has accumulated on dealers' yards, but it is to be noted that only bargain lots are being purchased, and indications generally are that lower prices are being anticipated. We quote nominally as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$22.00 to $22.50
Old Iron Axles	18.50 to 19.00
Old Steel Axles	17.00 to 17.50
Old Car Wheels	20.50 to 21.00
No. 1 Railroad Wrought	17.50 to 18.00
No. 2 Railroad Wrought	13.00 to 13.50
No. 1 Country Wrought	14.50 to 15.00
No. 2 Country Wrought	12.00 to 12.50
Wrought Pipe and Flues	13.50 to 14.00
Railroad Malleable	14.00 to 14.50
No. 1 Steel	13.50 to 14.00
No. 1 Machinery Cast	12.50 to 13.00
Stove Plate and Light Cast	8.75 to 9.25
Cast Borings	7.75 to 8.25

New York.

NEW YORK, December 31, 1907.

Pig Iron.—The pressure of Southern competition is being more keenly felt in these markets, the price of $13 for No. 2 Foundry, at Birmingham, being equivalent to $17 in New York harbor. The greater number of melters must of course add inland freights. There is more inquiry, foundrymen being in some cases down pretty low. We quote, tidewater, $18.50 to $18.75 for No. 1 Northern Foundry, $17.25 to $17.75 for No. 2 Foundry and $16.75 to $17 for No. 2 Plain. Alabama Irons are quoted $18.25 to $18.50 for No. 1 Foundry, and $17.25 to $17.50 for No. 2 Foundry.

Steel Rails.—Buying is still postponed, though advices have been received from a few roads as to their expected requirements in 1908. The New Haven, for example, will want 12,000 tons, a small part of which, probably 1000 tons, will be Open Hearth Rails. This road bought 42,000 tons in 1907, but this included extraordinary requirements, due to six-tracking the Harlem Division and to trolley line mileage. An inquiry on behalf of the Havana Central is for 5000 tons or more, but is only tentative thus far.

Structural Material.—The past week has intensified the recent quietness in structural lines. A few bridge contracts have been closed, but for only small tonnages. The Baltimore & Ohio took 250 tons and the Lackawanna and Delaware & Hudson smaller amounts, from the American Bridge Company. There has also been some small business from the P. & L. E. and the Grand Trunk. At Easton, Pa., for a proposed bank building calling for a few hundred tons of Steel, bids are to go in this week. On the Eno Building, on the Fifth Avenue Hotel site, bids went in about 10 days ago, but nothing has come out as yet. From 7000 to 8000 tons will be required, according to present plans. Quite a little city work is waiting in Manhattan on the making of financial arrangements. A beginning was made this week in negotiations for an issue of bonds. A new factor appears in the Structural Steel market with the starting of the Grey mill of the Bethlehem Steel Company this month. The Grey sections have already been specified to some extent for work that is pending. We continue to quote mill shipments of Structural Shapes, f.o.b. at tidewater, as follows: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—The Eastern Bar Iron mills are gradually accumulating orders, and it is possible that some of them may have a sufficient quantity in hand to warrant resumption of operations on January 6. It is known, however, that other manufacturers will not reopen their mills until somewhat later in the month. Prices are continued at 1.60c. Pittsburgh, or 1.76c. tidewater, for either Iron or Steel Bars.

Plates.—Trade continues quiet and not much immediate business is expected in this locality. Most consumers of Plates are either doing little or have closed for the holidays.

Cast Iron Pipe.—The most cheerful reports are now coming from the South. Quite a number of fair sized lettings have recently been made by Southern cities, and more of these are expected to come out. Inquiries in that section are considerably better than some time ago. The Northern users of Pipe are not yet making inquiries for spring delivery, but it is expected that some of these may make their appearance early in January. It transpires that within the past week a contractor on city work, who was the successful bidder on a piece of Pipe construction which has been held up, placed his order for the Pipe with a local foundry and finds himself the gainer by many thousand dollars as compared with the price he would have been obliged to pay in the summer, when his contract was closed. Carload lots of 6-in. are quoted at about $28.50 per net ton at tidewater, but larger lots can of course be placed at somewhat lower figures.

Old Material.—The market has been exceedingly quiet. Possibly holders of Old Material have been pressing smaller quantities on the market than for the previous two or three weeks, as prices are beginning to show a little indication of stability. It is expected that some buying will be done by those rolling mills which are understood to be contemplating the resumption of operations early in January. Quotations per gross ton, New York City, are as follows:

Old Girder and T Rails for melting	$8.50 to $9.00
Heavy Melting Steel Scrap	8.50 to 9.00
Old Steel Rails, rerolling lengths	10.00 to 11.00
Relaying Rails	16.00 to 17.00
Old Iron Rails	14.00 to 14.50
Standard Hammered Iron Car Axles	17.00 to 18.00
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	10.50 to 11.50
Iron Track Scrap	9.50 to 10.00
No. 1 Yard Wrought, long	10.00 to 10.50
No. 1 Yard Wrought, short	9.50 to 10.00
Light Iron	4.50 to 5.50
Cast Borings	4.50 to 5.00
Wrought Turnings	6.00 to 6.50
Wrought Pipe	8.00 to 8.50
Old Car Wheels	15.00 to 15.50
No. 1 Heavy Cast, broken up	12.00 to 12.50
Stove Plate	11.00 to 11.50
Grate Bars	8.50 to 9.00
Malleable Cast	11.00 to 11.50

Metal Market.

NEW YORK, December 31, 1907.

Pig Tin.—The Pig Tin market for the week has been just about as dull as those for the few preceding weeks. Prices have worked up a trifle, but there has been no great change. Daily fluctuations are as follows:

	Cents.
December 24	27.00
December 26	27.00
December 27	26.62½
December 30	27.12½
December 31	27.25@27.37½

Deliveries into consumption for the month of December will be small, totaling about 1200 tons. It is necessary to go back 10 years to find a parallel for these small deliveries. The arrivals at the Atlantic seaboard for the month of December will be 1184 tons, so that the stocks at the end of the month will be practically the same as at the end of November. There are afloat for American ports 740 tons. The London market closes a trifle firmer to-day, £123 10s. being quoted for spot, and £124 10s. for futures.

Copper.—An improvement in sentiment, both in this country and abroad, has been responsible for a further advance of prices. Actual business, however, is very small; yet there is a more hopeful feeling in the trade than for several weeks. Some Lake was sold on Saturday at 13.50c. To-day's quotations are from 13.62½c. to 13.87½c. There has been a little further inquiry for Electrolytic, and bids in the market at 13.50c. on Monday were not taken, the general asking price being 13.62½c. Casting Copper can be had at 13.25c. to 13.50c. A gradual improvement is looked for with the opening of the new year, and it would not be surprising if 14c. were paid some time during January. The industrial condition in Germany is not so bad as has been painted, and while conditions there are far from satisfactory, they are considerably better than in this country. Consumers of Copper in this country could scarcely

use less, and any change will probably be in the form of an improved demand. A rapid advance like that which took place in October would, however, be the signal for considerable unloading of metal. Exports for 30 days of the month will exceed 33,000 tons.

Spelter.—Business is dull, and quotations are slightly easier. Metal has been sold on a basis of 4.05c., St. Louis, and 4.20c., New York.

Antimony.—Prices of Antimony are largely nominal, and are believed to be more or less fictitious. Hallett's can be imported at 8.50c. and Cookson's at about 9c. There is an unusually large quantity of Antimony on the way to this country.

Pig Lead.—Again there has been a good demand for Lead, particularly on Monday of this week, when there were inquiries in the market for a large tonnage. Prompt shipments from the West were sold at 3.50c. to 3.60c., f.o.b. St. Louis, and some metal went at 3.75c., New York. The inquiry was for January, February and March, as well as for futures.

Ferroalloys.—The market for Ferromanganese would be represented at $48 to $49. These prices are considered low. Dullness prevails in the market for 50 per cent. Ferrosilicon. Domestic rules around $90, but imported is held at higher figures.

Nickel.—Prices are without change, at 45c. for large lots, and 55c. to 60c. for smaller quantities.

Tin Plates.—Some new business has developed during the week, and the market is strong, at $3.90, Pittsburgh, and $4.09, New York.

Old Metals.—There is an almost entire absence of business, and although there is no change in quotations from last week, the market is a trifle steadier.

Iron and Industrial Stocks.

NEW YORK, December 31, 1907.

The stock market naturally continues to suffer from lack of interest and transactions are light. Prices for the greater part of the period since last week's report were maintained at about the level then quoted, but on Saturday a change for the better occurred, which was due to the increasing supply of currency and more favorable reports from the banking interests. The range of prices for the week, therefore, shows a somewhat wider range than at first seemed likely from the occurrences of the previous days of the week. This range, taking in the period from Thursday of last week to Monday of this week, was as follows on the active stocks: United States Steel common 25¼ to 27¼, preferred 86⅝ to 89¼; Car and Foundry common 29¼ to 31¾, preferred 83¼ to 86; Locomotive common 34 to 36, preferred 85½ to 87; Steel Foundries common 6 to 6⅝, preferred 29 to 29½; Colorado Fuel 18¼ to 20; Pressed Steel common 18½ to 19¾, preferred 67 to 69; Railway Spring common 26, preferred 77; Republic common 15¾ to 16½, preferred 65½ to 66½; Sloss-Sheffield common 33⅜ to 34; Cast Iron Pipe common 20 to 20⅝, preferred 56 to 56⅞; Can preferred 41½. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 26⅜, preferred 88⅜; Car & Foundry common 31⅜, preferred 83¼; Locomotive common 35⅛, preferred 86½; Colorado Fuel 19½; Pressed Steel common 20, preferred 67; Railway Spring common 26⅝; Republic common 16⅜, preferred 66¼; Sloss-Sheffield common 36½; Cast Iron Pipe common 20½, preferred 58¼; Can common 4¼, preferred 41½.

Directors of the Chicago Pneumatic Tool Company deferred action December 27 on the quarterly dividend. The company has been paying 4 per cent. quarterly. President Duntley says: "We have deferred action on the dividend until we see how the year opens and what the prospects are, and to see whether general trade conditions become better or otherwise. The money has been earned, but we thought it better policy to defer the action. The company has had a prosperous year."

Dividends.—The Washburn Wire Company, Providence, R. I., has declared a quarterly dividend of 1¾ per cent. on its preferred stock.

The Nicholson File Company, Providence, R. I., has declared a quarterly dividend of 2 per cent. on its capital stock.

The American Rolling Mill Company, Middletown, Ohio, has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable January 15.

It has been erroneously stated in press dispatches that the Iroquois Iron Company, Chicago, had passed its usual dividend, whereas it should be stated that the usual dividend was never declared and paid.

The American Rolling Mill Company, Middletown, Ohio, has declared a quarterly dividend of 1½ per cent. on its preferred stock.

The Tennessee Coal, Iron & Railroad Company's Sales Department.

General office, Woodward Building, Birmingham, Ala. Frank A. Burr, general manager of sales; Willard Wilson, assistant general manager of sales; F. A. Dilworth, assistant general manager of sales.

Offices for the sale of all products other than coal and coke are as follows:

Pittsburgh, Pa., Carnegie Building. A. M. Harper, manager of sales; Frank E. Spencer, assistant manager of sales.

New York, Empire Building, 71 Broadway. Charles W. Baker, manager of sales; Charles C. Cluff, assistant manager of sales.

Philadelphia, Pa., Pennsylvania Building. James B. Bonner, manager of sales.

Cleveland, Ohio., 1610 Rockefeller Building. John R. Scott, manager of sales; R. S. Le Barre, assistant manager of sales.

Chicago, Ill., Commercial National Bank Building. George Baker, manager of sales; W. J. Totten, assistant manager of sales.

Cincinnati, Ohio, Union Trust Building. John E. Woods, manager of sales.

St. Louis, Mo., Chemical Building. Wm. B. Weston, manager of sales; Stillman W. Wheelock, assistant manager of sales.

Detroit, Mich., Union Trust Building. N. D. Carpenter, manager of sales; W. C. Bogue, assistant manager of sales.

Buffalo, N. Y., 203 Ellicott square. T. Guilford Smith, manager of sales; Fred C. Deming, assistant manager of sales.

Boston, Mass., 125 Milk street. Wilbur Sargent Locke, manager of sales; Wm. Fred Hickey, assistant manager of sales.

St. Paul, Minn., Pioneer Press Building. George Allen McDougall, manager of sales; Edwin S. Mills, assistant manager of sales.

Portland, Ore., Wells Fargo Building. R. R. Hoge, manager of sales.

San Francisco, Cal., Crocker Building. Richard B. Carr, manager of sales.

Denver, Colo., 222 Equitable Building, Edw. M. Sparhawk, manager of sales. New Orleans, La., 916 Hennen Building, James R. Mills, Jr., manager of sales.

Offices for the sale of coal and coke are as follows:

Birmingham, Ala., Woodward Building, J. W. Whatley, manager of sales.

New Orleans, La., 325 Carondelet street, Frank S. Walshe, manager of sales.

Export business for all products: United States Steel Products Export Company, 21 State street, New York.

The Reading Iron Company, Reading, Pa., has issued the sixth edition of its pamphlet, entitled "Wrought Iron Pipe Versus Steel Pipe," from which considerable extracts were given in *The Iron Age* of August 2, 1906, page 277. This last edition gives additional testimony from users of wrought iron pipe. In reference to galvanized pipe the introduction to the last pamphlet calls attention to the fact that owing to the roughness of its surface wrought iron requires more zinc for galvanizing than steel.

In the past week some readjustments of wages have been made at Alabama blast furnaces, where labor has been abnormally high for two years, with the maintenance for most of that time of a scale of pig iron prices very much above the market to-day.

The Lackawanna Steel Company will start up its No. 2 blooming mill at South Buffalo, N. Y., on Monday, January 6, and on January 13 the plate mill will resume in view of accumulated plate orders.

The plant of the Washington Tin Plate Company, Washington, Pa., which has been closed for repairs, will start again on January 6.

The Machinery Trade.

Prospects for the New Year.

NEW YORK, December 31, 1907.

In the midst of great prosperity in every branch of trade, the year 1907 opened with the best of conditions prevailing, and with every indication of a continuance of the large demand then existing for machinery of almost every description. For the two years previous there had been a steady and healthy growth of trade, due to the continued expansion of enterprises using metal working machinery, to cope with which machinery manufacturers also largely increased their facilities; but even with the greater output they were wholly unable to supply the demand which was steadily increasing at the beginning of the past year. Consequently shops became congested with work and delivery dates were extended months ahead. Manufacturers sought every possible way to increase production, but, do what they could, business came in faster than they could take care of it. Practically all makes of tools became scarce, and so pressing was the demand that many new companies were formed and new plants erected; but even with the greater number of works the supply did not equal the demand, and so eager were buyers to secure machines that thy made large purchases of second-hand machinery to tide them over until they could get new tools. Prices were good, and within the first few months they were advanced another 10 per cent., so that the business received was very profitable. This exceptionally heavy demand for machinery was the result of the continued expansion of trade throughout the country, no one class contributing a conspicuously large proportion, though three branches of industry developed to an extent worthy of note. Of these the most important were the railroads. The large systems greatly augmented their rolling stock and extensively increased their shop facilities by both the erection of new buildings and the purchase of new equipment. It is believed that during no similar period in recent years did the railroads buy so heavily and issue so many large lists of machine tools as they did during the first seven months of 1907. The steel companies were large purchasers of machinery, as were also the cement manufacturers. The use of cement in the construction of buildings had bcome so general that a great many new beds were developed and plants installed. In March came the first indicatiou that a recession of business could be looked for. During that month there was a slump in the stock market, which indicated a downward trend, though the demand for machinery held up surprisingly well at the time, and it was not until August that business began to fall off to any considerable extent. Then the volume of transactions became noticeably smaller, plans for new plants and extensions diminished in number and importance, and the railroads began to retrench. Then followed the collapse of the copper market. Although trade fell off badly shops were full of work, with fair prospects; but in October came the money panic, which caused the peculiar situation of works with plenty of orders on hand having to close down or reduce forces because they could not get money to carry on their business. Several important companies became financially embarrassed and were placed in the hands of receivers. The financial disturbance also caused the sudden stoppage of new enterprises, and a large number of cancellations of orders for machinery were received by manufacturers. Deliveries soon became normal. In spite of the fact that during the last three months business was rather light, machinery houses had a prosperous year.

The present demand for machinery is rather light, but this is not unnatural for the time of the year and does not indicate a change from a normal volume of business. At the opening of the new year trade has an upward tendency, general conditions appear to be good, the financial situation is clearing up and what is considered a healthy sign—the general disposition is to maintain prices. There is a wide difference of opinion among machinery men, however, as to the outlook for the immediate future, many believing that by spring money will be easier, confidence will be restored and a more active demand will follow. The basis for this opinion, the entire clearing up of the financial atmosphere, will undoubtedly play an important part in the trend of business next year, as many projects are being held in abeyance because of the inability to secure the necessary funds to carry them to completion. The railroads have been affected more than any other industry by the scarcity of money, and they will probably be among the first to re-enter the market, as many of them are in need of additional equipment. It has been pointed out that the railroads have largely increased their rolling stock the past two years, but their shop facilities have not been proportionately enlarged. The heavier locomotives which were purchased have been in service a year or more and now need repairs. It is understood that many roads are in the same predicament as the large system which was forced to come into the market last month for a round lot of machine tools for making repairs to heavy equipment. The worst feature of the present situation is the uncertainty with which the future is viewed by a great proportion of users of metal working machinery. With few exceptions the railroads are planning no extensive improvements for this year, and intend to confine their energies principally to the completion of work under way. A majority of the large systems report that any large or extensive work will be contingent upon better conditions than prevail at the present time. Plans have been prepared, however, for enlargement of mechanical facilities by several roads, and it is believed that these will be carried through this year. Many industrial companies, which have plans for extensions to their plants state that they will not start work of construction until business materially improves. The important inquiries that came before the trade the past two weeks restored confidence to a considerable degree, and these with the tendency of the larger interests to ente. the market indicate a more active demand early in the year.

Trade Associations.

Trade associations were particularly active during the last year, and the various conventions, especially the spring and fall meetings of the National Machine Tool Builders' Association, were marked by large attendances. At the session of this organization and at the annual meeting of the Leather Belting Manufacturers' Association, it was decided to make no changes in prices during the coming year, and the indications are that this course will be strictly adhered to. One of the most important developments at any of the conventions was the decision of the National Machine Tool Builders' Association to consider at the next meeting a form of selling agreement betweeen manufacturers and dealers. The United Gas Engine Builders, an organization to further the interests of builders of gas engines, was formed during the summer, and manufacturers of Corliss engines and automatic high speed engines held conferences during the year with a view to furthering their interests. A similar session was held between manufacturers of pneumatic stone tools. The decision of the American Supply & Machinery Manufacturers' Association, the National Supply & Machinery Dealers' Association and the Southern Supply & Machinery Dealers' Association to meet in joint session at Richmond, Va., on May 14, 15 and 16, 1908, will no doubt result in a closer friendship between manufacturers and dealers.

The movement to form a Machinery Club in New York developed during the year into a marked success, and within six months the organization expects to be installed in its quarters in the Hudson Terminal Building. The club now has about 500 members, which include prominent people in the trade from all parts of the country.

Prospective Machinery Requirements of the Railroads.

The amount of construction work carried over and that thus far planned for the new year can be readily found by glancing backward at the more important projects that have come to the general notice of the trade.

From the viewpoint of purchases of machinery, the New York Central Railroad will probably be of considerable importance to the trade if the officials decide to carry out the plans formulated by the motive power department. This road is in need of a large amount of mechanical equipment to take care of its heavy rolling stock, and only last month was forced to come into the market for about $75,000 worth of machinery. The purchases made at that time are understood to be the beginning of a buying movement that will extend over a considerable period and cover a large amount of equipment. It is understood from a reliable source that the motive power department has asked for between $2,000,000 and $3,000,000 for the purchase of machinery next year, and it is likely that even if the whole amount is not appropriated the officials will decide upon the expenditure of a considerable sum of money. It is understood that the company has in course of preparation a small list of tools for its shops at West Albany, N. Y.

One of the first roads to place orders for machinery this year will be the New York, New Haven & Hartford Railroad, which only two weeks ago issued a list covering 24 machine tools, the orders for which will undoubtedly be placed within a very short time. This road has in contemplation building operations which will entail the expenditure of a large sum of money for mechanical equipment, and which are likely to be carried out as soon as business conditions justify. Only last year the company equipped its large shops at Readville, Mass., to take care of repairs at the eastern end of its system, and is in need of shops at the western end of the system. This matter has been talked over, but no definite plans have been prepared, nor has the site been announced, but it is generally understood that the shops are to be erected at New Haven.

In connection with the operations of the New York, New

Haven & Hartford Railroad, the plans of the New York, Westchester & Boston Railroad and the New York, Port Chester & Boston Railroad are of considerable interest, as the former railroad has secured control of the two latter and will undoubtedly take up the construction of these roads, which has been held in abeyance the past year, as the franchises are considered valuable. These two trolley roads, which were combined some time ago, had plans prepared for the erection of a power plant of about 15,000 kw. capacity, and repair shops near Mt. Vernon, N. Y., and had issued a list of its machinery requirements. The construction of the road and purchase of equipment were delayed by money stringency, and it will not be surprising to see these taken up again as soon as the New Haven Railroad considers the time propitious.

The main construction work to be undertaken this year by the Delaware, Lackawanna & Western Railroad will be the completion of its extensive shops at Scranton, Pa., the building of which was started last year and part of the equipment purchased. This plant is to comprise a group of large buildings, the estimated cost of which, complete with tools and machinery, is about $2,500,000. The construction work on several buildings is well under way, and during this year the company will complete these and begin the erection of a main machine shop about 346 x 582 ft.; power house, 90 x 160 ft.; store house and several other buildings, for the equipment of which a large amount of machinery will be purchased. In addition to these, the plant when completed will include a foundry, 120 x 400 ft.; blacksmith shop, 120 x 300 ft., paint shop, 90 x 162 ft., &c.

The destruction by fire in December of the repair shops of the Boston & Maine Railroad at East Cambridge, Mass., will undoubtedly hasten plans for the proposed new shops to be erected in Summerville, just outside of Boston. While plans for the new shops have not been entirely completed, they are well under way, and work of constructing the buildings will be commenced this year. As a result of the loss by fire of its East Cambridge shops, the repair facilities of the road, at no time during the past year adequate, are still further restricted, and the road will likely come into the market early in the year for new machinery.

The Central of Georgia Railroad has had plans under way for some time for the construction of new shops at Macon, Ga., and early last year some of the power equipment for these shops was purchased and the ground prepared for the construction of the buildings. While plans for the new buildings have not been made public, the size of the undertaking is indicated by the fact that about $1,000,000 is to be expended for the shops and equipment. As soon as the road decides to go ahead with the construction of the shops it will undoubtedly come into the market for a large number of machine tools.

During the past year the Grand Trunk Pacific Railroad, Montreal, Canada, made practically no progress toward the construction of its new shops, to be erected at Edmonton, where an extensive site has been secured. The construction of these shops depends upon the progress made in the building of the road, and it may be some little time before the company will be in a position to take up the matter of equipment.

Quite a large sum of money is to be spent by the Kansas City, Mexico & Orient Railroad in the construction of new shops at Wichita, plans for which are being prepared by Westinghouse, Church, Kerr & Co., New York.

The Atlanta, Birmingham & Atlantic Railroad, Atlanta, Ga., is completing the construction of its road from that city to Birmingham, Ala., and intends to complete the work outlined in its original plans, but does not intend to undertake any new work of importance this year. The plans as laid down some time ago contemplate the erection of shops, yards and freight and passenger stations on a site at Atlanta, which was secured some time ago.

The Tidewater Railroad, owned by the Virginia Railroad Company, Norfolk, Va., contemplates the erection of new shops, but has not yet fully developed plans.

The Idaho & Washington Northern Railroad, Cœur d'Alene, Idaho, intends to build shops and a round house at Spirit Lake to cost about $100,000. Plans for the buildings have not yet been completed, but it is the intention of the company to erect the shops this year.

The Missouri, Kansas & Texas Railroad has under consideration the erection of extensive additions to its shops at Smithville, Texas, plans for which have not been definitely decided upon.

The New York & Queens County Railroad, Long Island City, N. Y., purchased about four acres of ground on the Flushing meadows about three months ago, to be used as a site for a large car house and shops.

The Atchison, Topeka & Santa Fé Railway is to make improvements to its shops at San Bernardino, Cal., including the erection of an addition to the machine shop, 100 x 500 ft., and the enlargement of the round house.

New Industrial Plants and Additions.

Of the construction of new industrial plants and additions a great deal of work has been outlined, the carrying out of which depends upon business conditions this year. The principal obstacle has been the money stringency, which seems to be becoming easier, and indications are that a large part of this work will be undertaken provided no further depression occurs. During the past year a large amount of business was received by machinery houses from the steel companies which expanded materially, the largest purchaser being the United States Steel Corporation, which has plans prepared for work that will necessitate the purchase of a great deal of additional equipment. The principal work of the corporation which has engaged the attention of the trade is the construction of a new plant at Gary, Ind., by its subsidiary, the Indiana Steel Company. Another important project of the corporation is the proposed new plant of the Minnesota Steel Works, to be constructed at Duluth, Minn.

A project which is engaging the attention of the trade, possibly more than any other industrial enterprise, is that of the Standard Oil Company, which has started work on the construction of a plant at Bayway, N. J., for which a large amount of mechanical equipment will be required. This company issued a list of about 20 machine tools for this plant three weeks ago. The preliminary plans for the undertaking call for the erection of a machine shop about 100 x 200 ft.; woodworking building, 150 x 300 ft.; foundry, 50 x 100 ft.; forge shop, 75 x 100 ft.; power house, 100 x 200 ft.; a large refinery and the other necessary buildings. In addition the company is to do considerable construction work at Oil City, Pa., through its subsidiary, the National Transit Company, at an expenditure of $250,000 for buildings and equipment. These will include an addition to the machine shop about 130 x 200 ft., and the erection of a new foundry, 70 x 100 ft.

The American Car & Foundry Company, St. Louis, Mo., purchased 170 acres of land at Gary, Ind., last spring as a site for a new steel car plant. The plans for the buildings have not yet been completed, and the construction of the plant will depend upon the condition of business this year.

The American Locomotive Company intends to still further increase the capacity and efficiency of its plants at Schenectady and Dunkirk, N. Y.; Richmond, Va., and Montreal, Canada. For this year the company has set aside an extraordinary addition and betterment fund of $2,000,000.

The Chicago Pneumatic Tool Company has plans for increasing the capacity and rearranging its air compressor works at Franklin, Pa., to carry out which it purchased early last year the Grant Tool Works. This latter property consists of a main machine shop, 150 x 300 ft.; machine shop, 150 x 200 ft.; power plant, pattern shop and other smaller buildings. It is the intention to equip these buildings with the most modern machinery for the manufacture of air compressors as soon as business conditions shall warrant.

Plans are being developed by the General Electric Company, Schenectady, N. Y., for the utilization of the large site it purchased at Erie, Pa., as a location for a new plant. At the present time the company is making considerable additions to its lamp factories at Harrison and Newark, N. J.

The Heine Safety Boiler Company, St. Louis, Mo., which purchased a site of 6½ acres last August as a location for its proposed new plant, has postponed the construction of the plant until spring. It is the intention to erect a plant on the property at a cost of about $300,000, for which it will require a complete equipment as soon as plans have been fully developed.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, it is understood, has not yet purchased the 20 electric cranes, bids on which it asked in November. Two of these cranes are to be of 100 tons capacity, and are to be used for the 300-ton mixers which were recently installed in its plant. The other cranes are to be installed in the company's new tube mills.

The A. P. Smith Mfg. Company, Newark, N. J., expects to take up this year the matter of equipping its new plant which is to be erected at East Orange, N. J. The plant, which will be equipped for the manufacturing of tapping machines, valves and general supplies for water works, will include a building 50 x 215 ft. for foundry, storage and office; casting, storage and cleaning building, 50 x 100 ft., and a one-story machine shop of steel construction, 100 x 155 ft.

Considerable machinery will probably be purchased within the next few months by the South Atlantic Car & Mfg. Company, Waycross, Ga., which is to rebuild its plant which was recently destroyed by fire, the new works to include an assembling shed about 20 x 500 ft.; foundry, 100 x 200 ft.; paint shop, 50 x 300 ft.; woodworking shop, 100 x 280 ft., and other buildings.

The Oscar Barnett Foundry Company, Newark, N. J., contemplates the erection of a new plant, plans for which have not been fully perfected.

Complete mechanical equipment for boiler, machine and smithshop will be required by the International Engineering Company, Box 33, Scranton, Pa., for a modern plant which it intends to erect for the manufacturing of steam boilers and engines. The company's mechanical engineer is now working on plans and specifications which will be finished within a short time. H. S. Jeffrey is president.

The J. H. Ladew Company, Newark, N. J., has purchased a site of 20 acres on the Newark meadows upon which it intends to erect a large plant. Plans for the buildings are being prepared by Harvey Murdock, 116 Nassau street, New York.

The Midland Bridge Company, Kansas City, Mo., has purchased property in Rosedale, where it intends to build a bridge shop of moderate capacity.

The Rivetless Chain & Engineering Company, Lebanon, Pa., which is building a new plant, consisting of a machine shop, 60 x 94 ft.; drop forge shop, 50 x 128 ft., and power house, 50 x 56 ft., intends to erect additional buildings in the spring.

The Andes Smokeless Fuel Company, Pittsburgh, Pa., which was recently organized with a capital stock of $100,000 by T. Moran, Ferguson Building, and associates, will erect a new plant in the spring for the manufacture of artificial smokeless fuel, and at that time will be in the market for boilers, engines, grinding, crushing and conveying machinery and other equipment.

The Harlan & Hollingsworth Corporation, Wilmington, Del., contemplates enlarging its plant by the erection of three additional buildings.

The American Electrical Heater Company, Detroit, Mich., has purchased property, fronting 156 ft. on Cass street and 290 ft. on Vienna street, upon which it intends to erect a plant in the spring to cost about $50,000. The company manufactures electrical heating appliances.

Charles H. Birmingham, Baltimore, Md., has purchased about 6 acres of land at the junction of the Baltimore & Ohio and Pennsylvania railroads, where he will establish a brass foundry, wire mill, rolling mill and metal testing plant. Plans for the buildings have not been fully perfected.

The Luitwieler Pumping Engine Company, Los Angeles, Cal., intends to erect a plant in the East to take care of its growing business. The site has not yet been selected.

Plans have been prepared by the Coatesville Boiler Works, Coatesville, Pa., for the erection of a new plant to consist of a foundry and machine shop about 60 x 120 ft. each, for the manufacture of boiler fronts, grate bars and castings of a cognate nature.

The new chain works of the Pittsburgh Chain & Forge Company at Paden City, W. Va., 30 miles below Wheeling, W. Va., is expected to be placed in operation this month. Later the company intends to erect a building about 75 x 300 ft., in which a general line of drop forgings will be made, and which will be equipped with steam hammers and other modern machinery.

Edwin S. Cramp and others of Philadelphia contemplate the establishment of a large shipbuilding plant at Norfolk, Va., where they have secured 26 acres of ground with 1000 ft. of water front.

At its annual meeting in February the Hamilton Watch Company, Lancaster, Pa., will vote upon an increase in the capital stock from $500,000 to $1,000,000, the additional capital to be used for extending the business. The company has not yet decided upon the amount and character of new machinery it will require for increasing its output, but the machinery to be added will be of the same class as that now installed.

The Calumet Iron Works, Newark, N. J., which has taken over the partially equipped plant of Charles V. Hesselbach, will be in the market in the near future for drill presses, cold saws, blacksmith forges and other machinery for the manufacture of structural steel and ornamental ironwork.

The Pittsburgh Emery Wheel Company, Pittsburgh, Pa., which is building a new plant for the manufacture of emery wheels, intends to erect a machine shop for the manufacture of grinding and polishing machinery of new design as soon as it gets its emery wheel plant in operation.

Among the large orders to be placed during the year will probably be that of the Hudson Companies, New York, for $50,000 worth of air compressors, bids for which were received last fall. This company is also expected to come into the market for considerable machine tool equipment for a new shop to be erected at the Hoboken terminal.

The American Electrical Novelty & Mfg. Company, New York, has purchased 115 acres of ground in South Elizabeth, N. J., where it intends to erect a plant for the manufacture of electrical novelties.

Jabez Burns & Sons, New York, manufacturers of coffee and spice machinery, intend to move their plant to Jersey City, N. J., where they are to erect a new building, 150 x 275 ft. As soon as the building is completed the company will probably come into the market for turret lathes, radial drills, a boring mill, presses and punches.

The Buffalo Foundry & Machine Company, Buffalo, N. Y., which recently took over the Buffalo Foundry Company and the David Bell Engineering Works, has not yet purchased the equipment for the new machine shop it intends to erect 160 ft. long with a main bay, 64 ft. wide and a side bay 30 ft. wide.

The H. G. Kotten Company, New York, has purchased ground at Marion, N. J., 150 x 250 ft., upon which it will erect a plant, 75 x 150 ft., for the manufacture of pneumatic tools. The present equipment will be moved into the new building, and in addition considerable new equipment will probably be installed, including a producer gas plant of about 75 hp.

The American Wheel & Vehicle Company, Penobscot Building, Detroit, Mich., has purchased a site for a new plant, the main building to be 157 x 200 ft. This will be equipped with wood and ironworking machinery, which will be driven by independent motors. The company will manufacture principally the Jeffrey patent wheel.

The Three Forks Portland Cement Company, Three Forks, Mont., contemplates the establishment of a cement plant, plans for which are being prepared by L. G. Smidth & Co., New York.

Power and Tunnel Work.

While a great deal of business resulted from large power projects during the year just ended, many of them, which it was anticipated would mature toward the end of the year, were postponed chiefly because of the financial situation, and in consequence it is expected that they will develop during the present year. In addition to the projects, which for one reason or another did not materialize in business, there have come to life during the last few months a number of new propositions which will result in some large purchasing. Noticeable among these is the plant of the Juneau Water, Light & Power Company, 42 Broadway, New York, which is planning to erect a hydraulic plant of about 40,000 hp. at a point which has not yet been made public. This company has been capitalized for about $4,000,000, which it is expected will cover the cost of the erection of the plant.

Considerable buying will be done during the year by J. G. White & Co., 49 Exchange place, New York, for the railroads which the company is constructing on the islands of Negros, Cebu and Panay, in the Philippines, where it is expected some large car repair plants will be equipped. Altogether about $30,000,000 is being spent on these islands by this company. There will be a large list of machine tool requirements for this project. The J. G. White Co. also has under way the construction of a large dam nine miles west of Denver, Colo., at a cost of $4,000,000, for which considerable equipment will be required. Another extensive railroad project which is being undertaken by the company is the construction of a number of railroad lines for the Bolivian Government, and the project is being financed by Speyer & Co., New York. It is anticipated that $26,000,000 will be spent on this project.

The Southern Power Company, Charlotte, S. C., has announced its intention of constructing a steam plant of about 50,000 hp. at a cost of $2,000,000. This plant is intended to augment the company's water power electric plants during the period of low water, and it is stated that construction work on the first section will be begun early this year. Turbines of 10,000 hp. will be used. The company now has under construction two water power plants to furnish 60,000 hp., and W. S. Lee, Jr., chief engineer, has in preparation plans which with a completed plant of about 40,000 hp. will provide the company with about 200,000 hp.

It is possible that during the year the New York Edison Company will carry out its plan to erect a power house at 120th street and the Harlem River which, it will be remembered, was postponed some months ago because of the existing financial conditions. The company has made no announcement as yet as to the size of the proposed plant, and the only information the trade has had on the subject which would indicate how large it was contemplated to make the plant is contained in the fact that about 12,000 tons of structural steel will be required if the company's plans are carried out.

One of the big power propositions on which purchasing was postponed toward the end of the year was that of the Duquesne Light Company, Pittsburgh, Pa., of which Robert C. Hall is one of the principal stockholders. This company had arranged to build a power plant on the Monongahela River at a cost of $1,500,000, and it is thought probable that the matter will develop during the present year.

The Birmingham Railway, Light & Power Company, Birmingham, Ala., contemplates the construction of a power plant to be located near the company's coal fields. An issue of $25,000,000 of bonds has been authorized, of which $15,000,000 is to be used for improvements to extend over a period of 15 years, and work on the power plant in question will mark the beginning of these expenditures.

The Great Western Power Company, of which Edwin Hawley, 25 Broad street, is president, will purchase a large amount of equipment during the year for a hydro-electric plant at Feather River, Cal., which will eventually develop 420,000 hp. The first installation is to be of about 60,000 hp. and several years will be required to complete the work. The company is capitalized for $25,000,000.

The York Haven Water & Power Company, York Haven, Pa., will double its plant during the year, according to an announcement recently made by the company, and this will result in the installation of about 10,000 additional horsepower normal capacity, with an overload equivalent to 15,000 hp. The company at present maintains a plant on the Susquehanna River, and its present 10,000 hp. has been contracted for.

It is expected that the first installation of the plant of the Long Acre Electric Light & Power Company, 74 Broadway, New York, which is to be built at 120th street and the East River, will be completed during the year. This company expects eventually to develop about 100,000 hp., and plans include a transformer station at Forty-second street and the East River. The American & British Mfg. Company, Providence, R. I., has the general contract for equipping the plant.

The Raystown Water Power Company, Huntingdon, Pa., has plans under way for the erection of a large dam and power house on the Raystown branch of the Juniata River, about six miles from Huntingdon. The company also proposes to erect a steam plant nearby to furnish auxiliary power, and altogether about 3500 hp. will be developed. It is stated that construction work will be begun this year, and the mechanical equipment has not been arranged for yet.

The Albany Power & Mfg. Company, Albany, Ga., expects to build a hydraulic power plant at Porter Shoals, near Albany, to develop about 10,000 hp. J. E. Sirrine of Greenville, S. C., is the company's chief engineer, and he will probably superintend the purchasing.

Plans are now being prepared by Frank W. Moore, Box 557, Indiana, Pa., for a plant to be erected by the Morrison's Cove Electric Light & Power Company, Royer, Pa., at a cost of $45,000. This plant will furnish light and power in the vicinity of Hartinsburg, Williamsburg and Royer, Pa.

The Public Service Corporation of New Jersey will build an extension to its power plant at Morristown, N. J., at a cost of $150,000, some of the requirements for which have been arranged for.

Plans are now being prepared by the Alpha Portland Cement Company, Easton, Pa., for a large power plant to be erected at the company's works at Martin's Creek, Pa. The size of the plant has not been announced as yet.

It is expected that during the year the United Railways & Electric Company of Baltimore, Md., will replace its Falls Road station, which was destroyed by fire several weeks ago. Plans are now under way for the proposed structure.

The Bridgewater Mfg. Company, Bridgewater, Pa., will come into the market in the spring for equipment for a power plant of about 500 hp. and a large dam the company proposes to build.

The Public Service Commission of the City of New York has decided to proceed with the arrangements for constructing an extensive subway system on Fourth avenue, Brooklyn, N. Y., at a cost of about $23,000,000. This work is expected to take about five years.

The Boston, Cape Cod & New York Canal Company expects to proceed with its plan to construct a new water way to connect Buzzards Bay, at the mouth of the Monument River, and Barnstable Bay, through the township of Bourne, Sandwich. William Barclay Parsons, 60 Wall street, is chief engineer. This project will result in the shortening of the route between New York and New England ports by 74 miles as compared with the route through Vineyard Haven.

It is expected that during the spring the Board of Water Supply, New York, will let some extensive contracts for work to be done at the city reservoirs, which will include the building of a large dam in Westchester County, extensive additions to the headwork of the Catskill aqueduct and the building of some high pressure tubes in the Rondout and Walkill divisions.

It is stated that for the Erie Barge Canal, which resulted in considerable buying the last year, several new important construction contracts will be placed the coming year.

Foreign Projects.

Foreign trade was particularly good toward the latter end of last year, and especially in some lines new fields were developed by many manufacturers. It was noticed, particularly, that trade with Mexico, Canada and South America was particularly good toward the latter end of the year, and inquiries now before the trade indicate that some big buying will be done from those countries. The Japanese Government was a large purchaser, and a great deal of business was placed by the Japanese export houses for private interests.

One of the largest foreign enterprises to develop during the year is that of the Tata Iron & Steel Company, Ltd., Bombay, India, to erect a big plant and develop ore properties in India. Charles Page Perin, 2 Rector street, New York, is the company's consulting engineer, and plans are being prepared under his supervision for the erection of two blast furnaces of about 200 tons capacity each, several 40-ton basic open hearth furnaces, a blooming mill, rail mill, beam mill, three merchant bar mills, &c. The Julian Kennedy-Sahlin Company, Ltd., London, England, has been engaged as engineer on the work.

It is expected that some large purchases will be made during the year for the Manchurian Railway, which is being constructed by the Japanese Government at a cost of $10,000,000, and it is believed in the trade that some inquiries now out include equipment for that project.

Another Japanese project which will result in some large purchases is that of the Yoshinotani Mining Company, which controls the Karatsu Iron Works of Tokio, Japan, to spend about $500,000 in the construction of a power plant, machine shop, boiler shop and foundry which will be maintained as a repair and manufacturing plant. Toshisuke Takeo, who is making his headquarters at the office of the General Engineering Company, 90 West street, New York, is the consulting engineer, and he expects to make the purchases in this country.

The Imperial Steel & Wire Company, Temple Building, Toronto, Ont., will, it is expected, complete the erection of works at Fort William, Canada, for the manufacture of wire fencing, wire staples and other wire products. This plant will employ about 200 hands.

The Michoacan Power Company of Mexico City, Mexico, which is closely connected with the Guanajuato Power & Electric Company, 25 Broad street, New York, has obtained concessions from the Mexico Federal Government for the construction of two hydro-electric power plants on the Angulo River, Mexico. One of the plants is to be of 8000 hp. and the other of about 4000 hp. Some inquiries for this enterprise have been placed in the trade, and the purchasing will be done from Mexico.

The Spanish-American Iron Company, 171 Broadway, New York, will probably have some purchasing to make for its enterprise at Mayari Incline, Cuba, where the company is spending about $5,000,000 in the development of valuable ore properties and for which a large amount of buying was done during the last few months.

Catalogues Wanted.—The A. A. B. A. Equipping Service, Missouri Trust Building, St. Louis, Mo., desires to receive catalogues of machinery, supplies and material for its files to assist it in purchasing for the manufacturers whom it represents.

Philadelphia Machinery Market.

PHILADELPHIA, PA., December 30, 1907.

Not a great volume of business is usually looked for in the closing week of the year, and the market for tools and equipment has been dull and featureless. Some few inquiries have come out, but they have been mainly single tool propositions, and were hardly expected to develop into orders until after the turn of the year. It is customary for many of the industrial plants to close down during the holidays for annual repairs and stock taking, and quite a few will most likely not fully resume until the general situation shows signs of improvement. Plants will be put in order, however, and will be in readiness for operation at short notice. After the turn of the year, when balance sheets have been gone over, buyers will be in a better position to take up the matter of making purchases of new equipment, and while it is expected that some fair business will develop, it is also believed that the buying will generally be on a conservative basis. What the new year will bring forth in the way of new propositions is problematical. General business is expected to improve materially early in the year, and a great deal depends on how extensive this business will be. The financial situation continues to improve, but must show a much more satisfactory condition before orders of any importance can be expected.

There has been a little more inquiry recently on the part of the railroads. The Pennsylvania is in the market for a few tools, orders for which will likely be placed before long, while scattered orders for special tools have been received from several of the Southern railroads. Until financial matters improve, however, the railroads can scarcely be expected to come into the market as large buyers.

Manufacturers of machine tools have a varied amount of work on their books. Some are covered to a certain extent, for their production for several months, while others are hardly so well fixed. Business continues to come in rather intermittently, and many plants must depend on day to day orders to keep them going. Moderate stocks of tools are being made, but there is little likelihood of manufacturers overstocking at the present cost of materials and labor. Curtailments continue, and unless there is a material improvement in the demand early in the year several of the larger industrial plants in this territory will further reduce their working hours.

Dealers have a better supply of tools and machinery on their floors and in warehouses than at any previous time in the year, and practically all the medium and smaller classes of tools can be had for spot delivery, while the heavier tools can also be had on very short notices, in some cases only long enough for manufacturers to assemble parts.

The demand for export is quiet. Practically nothing has developed in the way of inquiries for the standard lines of machine tools, while the demand for special tools and power transmission equipment shows but little improvement.

Inactive conditions continue in the second-hand machinery market. What business comes out is largely of a pick-up character, and confined to tools of the smaller class.

There has been an improved inquiry for castings, but actual orders are still rather light, and both iron and steel foundries are operating on restricted tonnages under which conditions they will no doubt continue until conditions improve.

Contracts of particular interest were awarded by the Philadelphia & Reading Railroad and the city of Philadelphia, jointly, during the week, for a portion of the work on the elevation of the surface tracks of the railroad along Ninth street in this city, at a cost of $1,130,000. The contracts provide for construction in connection with the elevated tracks beween Berks and Broad streets, and freight and engine yards, as per the following:

No. 5. Masonry work between Berks street and Susquehanna avenue; Armstrong & Latta, $368,700.
No. 7. Masonry work between Susquehanna avenue and Broad street; James McGraw, $276,718.
No. 8. Bridges between Berks and Broad streets; McClintic-Marshall Construction Company, $336,785.
No. 14. Freight yard between York and Cumberland streets; Armstrong & Latta, $100,718.
No. 28. Temporary engine yard at Wayne Junction; Armstrong & Latta, $47,200.

Work will be started as soon as practicable and rushed to completion. The city began several weeks ago on a large amount of sewer work, change of street grades, &c., in connection with the removal of the surface tracks, some of which is already well under way. Engineers for the railroad company and the city are now engaged in preparing plans for the next section of the elevated work, which will include that portion between Broad street and Wayne Junction.

To prevent the pollution of Maurice River, in south New Jersey, the City Council of Millville, N. J., decided at a recent meeting to install a plant for the disposal of sewage. A resolution was adopted, it is understood, to secure the services of an engineer to prepare the necessary plans and specifications for a plant to cost about $25,000.

The South Bethlehem & Saucon Street Railway Company, South Bethlehem, Pa., will extend its line to Colesville, a distance of 8 miles, and has in view a further extension from that place to Centre Valley, where it would connect with the Philadelphia division of the Lehigh Valley Traction Company.

Chicago Machinery Market.

CHICAGO, ILL., December 30, 1907.

Opening upon an era of widespread industrial expansion; experiencing reverses due to a financial upheaval; and closing with a movement of universal retrenchment, 1907 will be recorded as an epochal period in the machinery trade. The annals of former years afford no parallel to the heavy demand with which the year began. The rapid extension of manufacturing industries called for new equipment which overreached the capacity of machinery making plants to supply. By reason of the congestion which ensued factories fell farther and farther behind with deliveries until by midyear shipments were generally weeks and months delayed. In no line of machinery did the tide of business reach a greater hight than in machine tools. Orders were taken by some manufacturers in January on which no earlier delivery than June of the following year was promised. These of course represented the extremes of overcrowding, but few factories were able to execute orders placed at that time within six to eight months from date of order. In gauging the enormous volume of business required to produce this result it must be borne in mind that, under the prosperous conditions of recent years, the productive capacity of machinery plants had been largely increased, so that it was fully abreast of normal requirements. Even before the effects of a tightening money market began to be seriously felt it became evident that the inability of producers to meet the growing demand was of itself operating to restrict the placing of orders. Extravagant premiums for tools that could be furnished promptly were a natural result of these conditions and second-hand tools were eagerly sought at prices closely approximating those of new machines.

First checked by the effects of an over strenuous demand, purchases for forward delivery were well nigh suspended through the latter half of the year. Curtailment of industrial operations and vigorous retrenchment inaugurated by the railroads finally affected trade to such an extent that by the end of the year reaction had carried business to the opposite extreme. Following the sudden contraction of currency in November cancellations of orders placed earlier in the year became numerous and instead of a crying demand for shipment, requests for postponement became general. Notwithstanding the rebounding change from excessive activity to sluggish inaction, the year has on the whole yielded net results, which, though short of early estimates, were equal to, if not in excess of, the normal of yearly averages.

Chief among the enterprises contributing to the demand for machinery in this district was the new steel plant of the United States Steel Corporation, now in course of construction at Gary, Ind. A large amount of equipment, including pumps, boilers, engines, and electrical machinery, were installed during the year. An extensive machine shop and boiler shop equipped with modern tools were completed. Completion of work projected for 1908 contemplates large additions to equipment already provided, much of which is now under construction.

Adverse financial conditions caused the withdrawal of a number of important plans for plant construction and machinery purchases which would otherwise have added generously to the year's machinery business. Among these are included new shops for the Pullman Company and a new plant for the Chicago Railway Equipment Company. The purchase of a large amount of machinery on which bids were offered was postponed, which, with a favorable turn of the tide, will come into the market in 1908. Prominent among the numerous lists of this character are those of the Corn Products Company, equipment for a proposed plant at Summit, Ill., on which work has been begun; the new shops of the Frisco System, at Springfield, Mo., buildings well along toward completion and machinery requirements fully determined; the Chicago, Lake Shore & Eastern Railroad, machinery equipment for new car shops at Gary; Chicago Board of Education, tools for the equipment of two manual training schools on which bids will again be asked in January or February.

Under the direction of the Electrical Trades Exposition Company, the third annual Electrical Show will be held at the Coliseum, January 13-25. Last year this show attracted a large number of manufacturers of electrical machinery and appliances, and was attended by large crowds of interested visitors. Elaborate preparations have been made this year to present attractions in electrical displays, lighting effects and decorations that will eclipse all former efforts. From the fact that a large portion of the space for exhibits has already been taken, there is reason to believe that before the opening none will remain unsold. Large sections have been reserved by the Western Electric Company, General Electric Company, Chicago Pneumatic Tool Company, and other leading manufacturers of electrical machinery and equipment. McDowell, Stocker & Co. will have on exhibition a number of machine tools equipped with individual motor drive of the latest design. They will show two styles of motor driven engine lathes, one shaper, one riveting machine and a punch press. The latter will be in operation, and will punch aluminum discs which will be distributed to visitors as souvenirs.

Tool Requirements of the Chicago, Milwaukee & St. Paul Railroad.

The following list comprises requirements of woodworking machinery for which the Chicago, Milwaukee & St. Paul Railroad, Chicago, is now in the market:

One No. 4 patent band scroll and resaw, one swing saw, to carry a 24-in. saw; one five-spindle boring machine, with two universal spindles; one one-spindle horizontal radial car borer, one one-spindle universal horizontal boring machine, one large automatic car gainer, one No. 8 extra range horizontal hollow chisel mortiser, two four-spindle horizontal boring machines, one universal wood worker, one planer and sizer to dress timber, one four-spindle gang boring machine, 10-ft. bed; one shaper, one improved variety saw, one tool grinder, one automatic band saw setting machine, one 30-in. single surface planer, with sectional feed roll; one 60-in., three-drum sander; one 20-in. jointer, one universal double circular saw, one variety tip-table saw bench, one jig saw, one one-spindle universal horizontal boring machine, one two-spindle horizontal boring machine, one 10-in. outside moulder, one 12-in. jointer, one rip saw, one cut-off saw and one extra 12-in. cut-off saw, two shapers, one turning lathe, 18-in. swing, to turn lengths up to 8 ft.; one 4-in. four-side moulder, one automatic circular saw sharpener, one hand gaining machine, one Beach patent drill chuck.

Fairbanks, Morse & Co., Chicago, are erecting a new building at Wabash avenue and Eldredge court, which it is expected will be ready for occupancy about March or April. When completed the offices and storerooms of the company, now at Franklin and Monroe streets, will be transferred to the new quarters, which will afford every modern convenience for the transaction of its business. The first floor will be used as a sample and display room for gas and gasoline engines, scales, compressors, and other machinery manufactured and sold by the company, while the second floor will be handsomely finished and fitted for office purposes.

The B. F. Barnes Company has changed its name to Rockford Drilling Machine Company. This step was taken because of the multiplicity of Barnes companies manufacturing machine tools in Rockford, Ill., there being three of that style with only slight variation in their corporate names.

Cleveland Machinery Market.

CLEVELAND, OHIO, December 30, 1907.

Conditions have not changed in the local machinery market during the past week, with the exception that inquiries have been a little better. Dealers regard the outlook as quite encouraging, and expect a fair volume of business to develop about the middle of January. Actual sales of machine tools show no improvement over the previous few weeks, but dealers did not look for any renewal of activity during the holidays. The inquiries that have been received in the past two months amount to quite a fair volume in the aggregate, and it is believed that a large proportion of them will lead to sales soon after the first of the year, when, it is expected, business conditions will be further improved. A few scattering orders for single tools have been booked during the week, but the majority of those making inquiries say they are not ready to make purchases.

There have been no further cancellations of orders for machine tools in the past week or two, but of those who have canceled their orders in the past two months none have as yet come into the market with renewals. However, if business improves as much as is expected in the early part of the year, a large number of renewals are expected. Second-hand tools are quite scarce, very few being offered for sale to the dealers. This is attributed to the fact that manufacturers are keeping all their old tools until they are ready to replace them with new ones. Prices are being firmly maintaind on the general lines of machine tools, but some builders of punches and presses have recently revised their price lists, making quotations about 5 per cent. lower than those that had recently prevailed. Although prompt deliveries can be secured on the general run of sizes of machine tools, there is still considerable complaint from purchasers of slow deliveries on special sizes. This is particularly true of milling machines, on most sizes of which prompt deliveries cannot yet be secured.

The situation as regards machinery manufacturers and other industrial plants has not improved to any marked extent. A few report a slight improvement in orders, but, as a rule, about everybody is holding off until after the turn of the year to make purchases. A number of plants shut down during the holidays for inventories. In spite of the cancellation of orders, many plants that have been running at greatly reduced capacity still have enough work on hand to keep them busy, but found curtailment necessary because of the financial stringency. The money situation is rapidly improving, and not much further trouble is expected on this score.

Owing to the conservative policy adopted by the automobile builders in restricting their output for the coming year, manufacturers of automobile parts are suffering more than most other industries because of the falling off in orders. Some of the automobile builders, however, have increased their working force in the past week or two, and one automobile maker, who has confidence in the future, has placed an order in the past few days with a local dealer for two new machine tools.

While foundries in this territory are getting some new contracts for castings for the coming year, the consumers are holding back their specifications, and the work the foundries have on hand is quite limited.

Several important changes will take place in the Cleveland machine tool business with the first of the year. On that date the Republic Belting & Supply Company will take over the agency of the Becker-Brainard Milling Machine Company and will handle the tools made by that company and other lines of tools and machinery that have been sold by William H. Mortimer, the local agent of the Becker-Brainard Company. The latter company's office in the Williamson Building will be abolished, and Mr. Mortimer will go with the Republic Company as assistant sales manager in the machinery and machine tool department. Another new accession to the ranks of the selling force in the Republic's machine department will be F. W. Bowler, who for several years was connected with the Pattison Supply Company, and who for the past few months has been sales manager at the local office of the Modern Machinery & Engineering Company. The machinery and machine tool department of the Republic Company will be in charge of S. C. Cutler, vice-president, who has had charge for the company of the sales in this territory for the B. F. Sturtevant Company and the Sturtevant Mill Company. For the present the Republic Belting & Supply Company will carry only a small stock of machinery and machine tools, but it expects eventually to carry a full line of the machinery and tools of which it has the selling agency. The Republic Company will also make important additions to its belting department on January 1. On that date R. S. Hull, who has had charge of the outside salesmen of the E. R. Ladew Company, New York, manufacturer of belting, will take charge of the belting sales department of the Republic, and Frank S. Bennett, who has been associated with Maloney & Bennett, Chicago, manufacturers of belting, will take charge of the Republic's belting factory. The Republic Company regards the securing of these two men as a very strong acquisition to its belting department.

The Cleveland Crane & Car Company, Wickliffe, Ohio, reports that its business, which had fallen off with the financial depression, has shown much improvement in the past few weeks. Orders in December were much larger than those in November, and its plant is now running at nearly full capacity. In the past two weeks the company has received orders for four cranes from the Wall Paper Mfg. Company, London, England, and for one crane for Cuba, and another for Canada.

The village of Hudson, Ohio, will soon take steps toward the erection of an electric light plant and water works system. Money for the municipal improvements will be furnished by a donor whose name has not been announced, but who is supposed to be the great coal operator, J. W. Ellsworth, who is a native of Hudson.

New England Machinery Market.

WORCESTER, MASS., December 30, 1907.

The year in the machine tool trade is closing in an atmosphere of hopeful expectation. There are signs of awakening business. Here and there a manufacturing plant in metal lines is increasing its production by returning to full schedule of working hours. Others are planning to do the same. The machine tool builders are not affected for the better to any decided extent as yet in the actual volume of new business, though some new orders have been received, together with a greater number of promising inquiries. This branch of manufacturing is usually late in feeling a revival as compared with lines closer to the consumer. Among the dealers some orders have been received which were not expected until after the first of the year, which would be worthy of comment even at a time of prosperity, for the last days of December seldom produce orders. The totals of the sales of the month have been augmented by a share of the list of machines for the West Springfield shops of the New York Central, Boston & Albany Division, the Boston dealers profiting more than was anticipated.

No one has found a reason for changing his views of a reawakening of business in January, increasing in amount in February and March. The manufacturers and dealers share this view; there are few who do not in any line of production that can be named.

Collections continue slow, though some improvement is reported. Banking circles, excepting houses specializing on bonds, are looking for better times, and expect to see improvement as soon as "the January coupons are clipped," to quote one authority. With easier money commercial paper will be more favorably regarded by the banks, which will remove one of the great barriers in the way of a return of prosperity. It should be stated, though, that the New England banks have stood by their regular patrons during the financial crisis. The manufacturer or dealer doing business with one or two banks has fared better than larger concerns which have to sell their paper in the open market. With a resumption of buying of this class of commercial paper an important effect should be produced in bringing about a better demand in the machine tool trade, lack of available funds standing in the way of many purchases of tools that are really needed.

In totaling the year's business in the machinery trade, the past few months have brought down the figures to a point considerably under those of 1906, yet taken altogether 1907 must have been high above the average of past years. Orders placed in 1906, mounting into great sums of money, were delivered in 1907, and consequently figure in the year's business. Probably few will dispute the statement that the 12 months constitute, on the whole, a prosperous period.

In Connecticut the builders of special machinery are quite prosperous. A number of them have all they can do for some time to come, they report, and others are comfortably off in the way of business on their books. New business, including some from abroad, has helped to fill out, though the volume of these orders has not been great. Naturally orders for special machinery cannot be canceled with the same freedom as machinery of standard types; in fact, there has been little inclination on the part of customers to attempt to rescind their contracts for new work. On the contrary cases are cited of efforts to hurry up deliveries that machinery may be more quickly available for manufacturing.

The beginning of a decrease in wages, which it is believed will be general in New England, has been made. Formal announcement of a reduced schedule has been posted in some of the plants in metal lines, 10 per cent. being named. In these instances some disposition to resent the change is shown, and in one case a strike has followed

among tool makers who were specifically mentioned. Wages have been very high, records having been established in most of the trades, brought about by competition for the services of skilled workmen. With a lessened demand for labor it is deemed by the manufacturers only fair that wages should return to a normal level, even though it is expected that business will be better in a short time. The most sanguine expectation, however, is a good average business, and if this hope is realized it would only be obeying the laws of supply and demand if wages should become of an average corresponding to that of the volume of production. Where works have curtailed or shut down the decrease has been effected usually by treating with the workmen as individuals, while they are still employed or upon their return to work, and it is probable that many employers will follow this plan rather than to post notices affecting the men as a unit. This is considered to be an especially effective system of reduction under existing industrial conditions, because of the fact that it has been necessary during the past two years to consider men who are only partially skilled in a specialty as fully trained workmen, and to pay them accordingly, favoring them in somewhat the same degree as really valuable experts. In other words the reduction will be more in the nature of a readjustment on a descending scale than a flat decrease of wages.

Another factor to-day is the advantage taken of the situation to carry out previously formed plans of putting union works on an open shop basis. With works rushed to the last limit of capacity, to deliberately effect the change has seemed too costly an undertaking, unless the issue were forced by the men. The present depression affords this opportunity as well as others for improvements in shop and factory conditions.

The Royal Typewriter Company has not yet closed the contracts for the equipment of its large new factory at Hartford, Conn., but announcement of the awards to the dealers and manufacturers is expected in the near future. The list is a considerable one, and will furnish the trade with the outlet for a nice lot of tools.

The Flexible Tire Company, Springfield, Mass., organized to manufacture a flexible wheel designed to take up vibrations in vehicles, especially automobiles, announces that it will establish a new plant in the near future, probably in Springfield. William G. Marr, New Britain, Conn., is president; Joseph P. Hillard, Springfield, secretary, and Richard J. Talbot, Springfield, treasurer.

Pitt & Scott, Ltd., 39 Broadway, New York, and 138 Milk street, Boston, foreign freight brokers and express carriers, announce that they have accepted the general agency for the United States of a new institution to be known as the Bureau of American Manufacturers in Europe, which, according to the prospectus, will be located in a central part of the city of London, with premises covering 27,000 sq. ft. of floor space already arranged for. The purpose is to have a permanent exhibit in which members will have space. The Bureau management will personally represent them, the whole tending toward advancing the interests of American manufactured products.

Hill, Clarke & Co., Inc., Boston, will be the Eastern distributing agents for the new horizontal boring machine which is being brought out by the Universal Boring Machine Company, Hudson, Mass. Hill, Clarke & Co., Inc., Chicago, will be the Western distributing agents for the machine. The Boston office reports that a foreign demand for the boring machine has already developed, though it is not yet on the market.

Work on the new foundry of the General Electric Company at its Pittsfield, Mass., works is progressing. The steel work is being put in position at the present time, and it is said that the building will be ready for occupancy in the early summer. It will be 175 x 400 ft.

William T. Draper, formerly head of the Draper Company, Hopedale, Mass., states that there is no truth in the newspaper story that a new Draper company has been organized to manufacture textile machinery on a large scale in a plant to be erected at Concord Junction, Mass.

The Hendey Machine Company, Torrington, Conn., manufacturer of lathes, milling machines and shapers, shut down for Christmas Day only. The company states that while at the present time it is not getting a large amount of new business, it still has quite a good number of unfilled orders on its books, and up to the present time has put nothing in stock with the exception of a very few shapers of one or two sizes.

The Lucas Machine Tool Company, Cleveland, Ohio, manufacturer of boring, drilling and milling machines and power forcing presses, announces that it has extended its practice of selling direct to customers by including the New England territory.

The Conant & Donelson Company, Greenfield, Mass., manufacturer of screw plates and other screw cutting tools, will soon build a factory in that town. The details of the building are not yet completed. The company has recently increased its capital stock from $25,000 to $50,000. The business was established four years ago, and in the interim has grown to such an extent that new quarters have become necessary.

The Stamford Rubber Supply Company, Stamford, Conn., has had plans drawn for a new plant. The buildings will be of reinforced concrete, with a main factory, 50 x 122 ft., and two stories; a wing, 18 x 62 ft., and three stories, and a power house, 36 x 50 ft., and one story. The company states that it wishes no machinery specifications at this time.

The Union Metallic Cartridge Company officially states that no authority has been given from any one connected with the company to make the statement that the works of the plant of the Remington Arms Company would be removed from Ilion, N. Y., to Bridgeport, Conn., where the Union Metallic Cartridge Company's works are located. The report has received wide newspaper circulation.

New England industries will be favorably affected by the establishment by the New England Steamship Company of an all-water freight service between Boston and New York, with the three modern freight steamers Bunker Hill, Massachusetts and Old Colony. The Boston terminal will be Central Wharf, and the New York terminal piers 9, 10 and 11, North River. There will be three weekly sailings from each port.

Cincinnati Machinery Market.

CINCINNATI, OHIO, December 30, 1907.

The experience of the late fall is regarded by most Cincinnati manufacturers, particularly in the tool line, as a valuable one, albeit some of them have suffered pecuniary loss, and may not recover from the ill effects for several months. It is pointed out by older and more conservative concerns that the pace of the first three quarters of 1907 was entirely out of reason; that many small concerns were tempted into doing a business entirely out of proportion to their capital employed, and a toppling over of the producing structure was but a question of time. That that time should have come at the outset of a year of political interference with business is regarded as fortunate, or less unfortunate, for there is opportunity to divert a share of the responsibility. However, as noted in last week's report, there are actually establishments in this field which have felt no appreciable ill effects of the slump, and these concerns will have shut down but two days of the holiday season—Christmas day and New Year's day. Monday, the 6th, has been set by a number of large concerns which were running on reduced time and forces in the middle of December, and have been closed down during holiday week, to resume operations on practically a normal basis.

Reports from the South indicate that much machinery will be needed in that locality. The South American market looks especially promising. Some local tool manufacturers have given this latter field particular attention the past few years, and have accumulated data and figures which warrant a feeling that business from that section the coming year is to be big.

J. A. Andrews of the Newport Rolling Mill Company has just closed a contract with Pittsburgh parties for engines and other important machinery to be installed in the new plant of that company. Equipment for this establishment is being assembled, and the intention is to start up about April 1. This improvement represents an investment of $1,000,000.

The Barriett Electric Mfg. Company, 327 East Sixth street, has been reorganized, with Henry Burkhold as president and Philip Swing organizer and builder, of what is known as the Swing line, a traction property running up into Lebanon and vicinity, as secretary and general manager. The company will continue the manufacture of motors.

Along with the promised improvements in other manufacturing lines, the indications seem better for a resumption of activity in the two foundries that have been idle, one of them, the Steel Foundry, at Winton place, for a year or more, and the Weber Iron Foundry, which has been in the hands of a trustee in bankruptcy for only a few weeks. It is rumored that a large manufacturing concern of the Northwest is figuring on the first named property.

In the Hamilton District there have been no actual shutdowns, and most of the large establishments there have merely reduced time and forces along lines of former years. A large concern manufacturing Corliss engines ran straight through until a few days before Christmas on full time, and will resume its normal gait about January 6.

Concerns making a specialty of foundry supplies report business improving and collections about normal. Manufacturers of brass and engineers' specialties are running on an average of 45 hr. a week, and while reporting business quiet, believe there will be a very general improvement along about the middle of January. The Lunkenheimer Company closed all departments the day before Christmas and will reopen in all departments January 6. The few days' shutdown will enable this company to make a number of necessary improvements and repairs and outline its programme for the many changes to be made the coming year.

The company will then get into its new brass foundry building, said to be the largest and finest in the world devoted to this specialty.

The Wm. Powell Company is making extensive improvements and additions necessitated by its growing business, and will early in the new year occupy an additional frontage and enlarged office facilities.

A company of capitalists of Vincennes, Ind., has purchased the Recker plant in that place, and will manufacture a corn harvesting and husking machine invented by Joseph Ross.

The capital stock of the Dayton Hydraulic Machinery Company, Dayton, Ohio, has been increased to $350,000, for which 6 per cent. preferred stock will be issued. The business of the company is to be expanded.

Government Purchases.

WASHINGTON, D. C., December 30, 1907.

The Isthmian Canal Commission will soon ask bids for twelve rock drills, complete.

The Isthmian Canal Commission will receive bids until January 20, circular No. 412, for engine and generator, engine driven exciter, sand pumps, valve reseating machine, pump governors, &c.

The Isthmian Canal Commission will soon purchase one upright drill press.

The following bids were opened November 18 for locomotives, hoisting engines and boilers for Fort Stevens, Ore.:

Three locomotives—Bidder 1, Lima Locomotive & Machine Company, Lima, Ohio, $3585; 2, Baldwin Locomotive Works, Philadelphia, $3640; 3, H. K. Porter Company, Pittsburgh, $3092.50; 4, H. K. Porter Company, Pittsburgh, $3247.50; 5, Vulcan Iron Works, Wilkes-Barre, Pa., $3300; 6, American Locomotive Company, New York, $3300; 7, Davenport Locomotive Works, Davenport, Iowa, $3032.50, acceptance recommended, lowest bid upon satisfactory locomotive; 8, Portland Machinery Company, Portland, Ore., $3040; 9, J. J. Shannon & Co., Philadelphia, $3480.

Four single drum hoisting engines—Bidder 8, Portland Machinery Company, Portland, Ore., $1995; 9, J. J. Shannon & Co., Philadelphia, $1492.50; 10, G. & W. Mfg. Company, New York, $1479; 11, Willamette Iron Works, Portland, Ore., $1350, acceptance recommended, lowest bid upon satisfactory engine; 12, William B. Hough & Co., Chicago, $1450; 14, Reierson Machinery Company, Portland, Ore., $1395; 15, American Hoist & Derrick Company, Portland, Ore., $1816; 16, Tatum & Bowen, Portland, Ore., $1567.

Alternate bids were received on six single drum hoisting engines, but owing to the unsettled condition of the market it is considered best to purchase only four engines instead of six. Alternate bids were also received for four double drum hoisting engines and six double drum hoisting engines, but these bids were not considered, single drum engines being considered satisfactory.

Two boilers—Bidder 8, Portland Machinery Company, Portland, Ore., $1465; 9, J. J. Shannon & Co., Philadelphia, Pa., $1407.05 and $1717.05; 17, Gould Company, Portland, Ore., $1430 and $1595; 18, J. M. Arthur & Co., Portland, Ore., $1837; 20, Caldwell Bros. Company, Seattle, Wash., $1374, acceptance recommended, lowest bid upon satisfactory boilers; 21, Joshua Hendy Iron Works, San Francisco, Cal., $1656.

Under bids opened October 14 for supplies for the Isthmian Canal Commission, circular No. 392, Manning, Maxwell & Moore, New York, have been awarded class 18, one tool room engine lathe, $833.

The following awards have been made for supplies for the navy yards, bids for which were opened December 10:

Niles-Bement-Pond Company, New York, class 13, one engine lathe, $1085.

H. A. Rogers Company, New York, class 118, 45 hydraulic jacks, $1588.35.

The Vandyck-Churchill Company, New York, has been awarded class 62, one four-spindle nut tapper, $425, under opening of October 29, for supplies for the navy yards.

OBITUARY.

DR. COLEMAN SELLERS.

Dr. Coleman Sellers died at his home in Philadelphia December 28, aged 81 years. He was born in Philadelphia and his education was obtained at private schools and at Bolmar's Academy, West Chester, Pa. He first went to work in 1846 as a draftsman in the Globe rolling mill, Cincinnati, Ohio, and was soon advanced to superintendent. Three years later he entered the services of Niles & Co., locomotive builders, and remained with them for five years as foreman. In 1856, at the request of his kinsman, the senior partner of the firm of William Sellers & Co., he returned to Philadelphia and entered that establishment as chief engineer. Later he was admitted to to the firm as a partner. He retired from active interest in the business in 1888 and had since devoted himself to private practice as a consulting engineer.

One of the first and most important of Dr. Sellers' inventions was the coupling device for connecting shafting. His connection of feeds for lathes and other machinery tools solved the problem of infinite gradation of feeds. His other inventions have done much to advance the efficiency of mechanical appliances. In 1861 he recommended the use of absorbent cotton for surgical purposes, which has since become indispensable. In connection with his experiments in photography he proposed the employment of glycerine to keep the plates damp. In 1889 he was called upon by several capitalists to consider the possibility of developing the water power of Niagara Falls. Upon his advice the enterprise was undertaken and proved successful. Since 1890 he had been the acting engineer of the Cataract Constructing Company and the chief engineer of the Niagara Falls Power Company. The important mechanical features of the great dynamos are of his design and invention.

The King of Sweden in 1887 conferred on Dr. Sellers the Royal Norwegian Order of St. Olaf. In 1888 he received from the Stevens Institute the degree of D. E., and one year later the University of Pennsylvania conferred upon him the degree of D. Sc. He was a member of the Board of Managers of the Franklin Institute and had been its president for five years. He had also been president of the American Society of Mechanical Engineers and of the Pennsylvania Museum and School of Industrial Art.

HARRISON LORING, SR., one of the first American builders of iron steamships, died at Roxbury, Mass., December 26, aged 85 years. He was the founder and for years the proprietor of the City Point Works, South Boston, where many famous ships were built. His exceptional inventive ability also led him into various other branches of engineering, including pulp and paper mill machinery, in the earlier development of which he played an important part. He built the first air compressor used to supply fresh air during the construction of the Hoosac Tunnel, and many of the lighthouses of the Atlantic Coast were his creations. He was born in Massachusetts, and when 17 years old was apprenticed to a millwright and steam engine builder at South Boston, and worked as a journeyman until 1847, when he engaged in business for himself. Ten years later he established the City Point Works. Among the first of his merchant ships was the De Molay, which was fitted with a ventilating system of piping, a then unique idea that attracted a great deal of attention. The United States Government gave the system a test by chartering the vessel, and afterward purchased it for use as a hospital ship, in which capacity it served during the Civil War. Of the war vessels which took prominent part in that conflict Mr. Loring built the Winnipeg, Huron and Chocorua, and the monitors Nahant and Canonicus. The engines and machinery of Farragut's flagship Hartford were constructed at these yards. A number of the earlier Atlantic liners were built there. As late as 1890 he built the cruiser Marblehead, four lightships and several sea-going tugs. Before the Civil War he manufactured sugar machinery for Cuba on a large scale, and in 1855 the first rotary printing press was built in his shops. He leaves a widow, three sons and a daughter.

WILLIAM E. BIDDLE, head of the Biddle & Smart Carriage Company, Amesbury, Mass., and part owner of the Amesbury Brass & Foundry Company, died December 27, aged 62 years. He managed what is said to be the largest factory for the manufacture of automobile bodies in the country. He was a native of Millbury, Mass. He leaves a widow, a son, William E. Biddle, Jr., vice-president of the Biddle & Smart Company, and two daughters.

SAMUEL A. KENSIL, president of the Tioga Foundry Company and Keystone Spring Works, died December 24, at his home in Philadelphia, aged 74 years. He had been prominent in charitable work.

GEORGE E. NEEDHAM, for many years president of the Garry Iron Roofing Company, Cleveland, now the Garry Iron & Steel Company, died December 29, after a short illness. He retired from business several years ago.

The equivalent coal consumption of various forms of pumps is compared in the London *Iron and Coal Trades Review*, as follows: Triplex power pumps, 1½ to 5 lb.; small steam pumps, 25 lb.; large compound steam pumps, 13 lb.; pulsometer pumps, 60 to 70 lb., and injectors and inspirators, 100 lb. per horsepower per hour.

PERSONAL.

Charles E. Sargent, who for the past seven years has been manager of the Sargent Engineering Company, Plymouth Building, Chicago, has resigned to accept the position of chief engineer and manager of the gas engine department of the Wisconsin Engine Company, Corliss, Wis., which will now build the Sargent complete expansion gas engine, the invention of Mr. Sargent. The Sargent Engineering Company's specialty has been the designing and testing of internal combustion engines and producers, and while engaged in this work Mr. Sargent saw the necessity of better testing apparatus, and invented and put upon the market an automatic gas calorimeter, an integrating dynamometer, a dust determinator for dirty gas, a gas washer and the Sargent draft gauge, steam meter and anglemeter. His successor in the management of the Sargent Engineering Company is C. E. Beck, who has heretofore been assistant manager and engineer.

Howard T. Muzzy, formerly with the Pittsburgh office of the Cooper-Hewitt Lamp Company, has resigned to accept a position as Pittsburgh District salesman for the Pennsylvania Steel Pulley Company, Pittsburgh. Stuart L. Howes, formerly with the Boston branch of the Fairbanks Company, has accepted a position with the pulley company, and will act as its special agency salesman.

Albert Ladd Colby, consulting engineer, of New York, who left for Germany last July on by-product coke oven matters, has postponed his return until March. His address is Park Hotel, Rudolf Platz, Cologne.

R. M. Stuart-Wortly has retired from the stock exchange firm of Edward Sweet & Co. to become treasurer of the United Metals Selling Company of New York.

W. C. Davis, rail mill roller for the Algoma Steel Company, Sault Ste. Marie, Ont., has resigned to accept a similar position with the Dominion Iron & Steel Company, Sydney, Nova Scotia.

Dr. Haarmann, the ironmaster, of Osnabrueck, Germany, has just been awarded the Carl Lueg medal by the Verein Deutscher Eisenhuettenleute, for his life long work in connection with the design and introduction of the steel railroad tie.

Benjamin Talbot has been unanimously elected managing director of the Cargo Fleet Iron Company, Ltd., of Middlesbrough, England. At the plant a fourth Talbot furnace is soon to start, and another blast furnace is to be erected at once.

George Baker, sales manager of the Illinois Steel Company, has also been appointed manager of sales at Chicago for the Tennessee Coal, Iron & Railroad Company recently acquired by the United States Steel Corporation. A. H. Carpenter, formerly sales agent of the Tennessee Company, will have charge of the pig iron department under Mr. Baker.

John Becker has been elected treasurer and general manager of the Becker-Brainard Milling Machine Company, Hyde Park, Mass., succeeding A. L. Lovejoy, resigned.

Calvin Wells, president of the Pittsburgh Forge & Iron Company, Pittsburgh, and proprietor of the Philadelphia *Press*, celebrated his eightieth birthday anniversary on Thursday, December 26, receiving the congratulations of his friends and having with him his children and grandchildren to the number of 19.

Edwin H. Fowle, who has represented the Western Tube Company on the Pacific Coast as general sales agent for some years, has removed to Denver, Colo., where he will open offices in the Majestic Building. He will represent the Carnegie Steel Company, the Illinois Steel Company, the American Sheet & Tin Plate Company and the National Tube Company, in addition to his original line. In San Francisco the representation of the Western Tube Company will be taken over by one of the above mentioned concerns, all of which have offices on the ninth floor of the Crocker Building.

It has been incorrectly reported that V. L. Wills, formerly connected with the Tennessee Coal, Iron & Railroad Company, as assistant superintendent of [illegible] at Ensley, Ala., has engaged with the Inland Steel Company, Chicago. No such connection has been made.

Floyd Rose, superintendent of the Portsmouth Steel Company, Portsmouth, Ohio, has resigned.

George Collord, formerly superintendent of the Ensley furnaces of the Tennessee Coal, Iron & Railroad Company, has resigned that position, having been appointed general superintendent of furnaces of the Shenango Furnace Company, Sharpsville, Pa., taking effect January 1. W. A. Barrows, Jr., has been given a vacation of a few months, and on his return will be transferred to other duties in a different department.

Quincy Bent, manager of the Pennsylvania Steel Company's blast furnaces at Lebanon, Pa., has gone to Cuba on a trip to the company's new iron ore property in the Mayari District.

Receivers for the Passaic Steel Company.

The United States District Court at Trenton, N. J., on December 30 appointed John R. Lee, Oakley Cook and William Arnold of Paterson, receivers of the Passaic Steel Company, Paterson, N. J. The bonds of the receivers were fixed at $150,000 each. Joseph O'Brien and Michael Martin of Scranton made the application for the receivership on the grounds that interest on the $2,500,000 of gold bonds had not been paid for October, 1906; April, 1907, and October, 1907, and that the corporation owed the city of Paterson three years' taxes amounting to $45,000. The directors joined with the applicants for a receiver, and admitted insolvency. It was stated in court in connection with the application that the company's financial difficulties dated from its earlier days after the acquisition of the property of the Passaic Rolling Mill Company. The transfer to the Passaic Steel Company was made in February, 1903. The new company issued $5,000,000 of stock, and there was a bond issue of $2,500,000, of which the proceeds of $2,000,000 went to the purchase of the leading holdings of the old company.

In 1905 $1,000,000 of preferred stock was issued by the company for improvements, a part of it being taken by various creditors. From that time the company has been hampered financially and various changes in management have taken place. For several months its rolling mills have been idle, owing in the beginning to the high price of raw materials and inability to make steel at a profit. The plant at Paterson consists of two 50-ton and five 25-ton open hearth furnaces, 21 in. and 28 in. structural mills and a 30-in. universal mill. There is also a fabricating shop with an annual capacity of 12,000 tons.

The Cincinnati Foundry Foremen Meet.

The holiday meeting of the Cincinnati section of Associated Foundry Foremen occurred on the evening of December 28. After a dinner the members listened to addresses by Prof. John J. Porter of the University of Cincinnati and James A. Murphy, foreman of the Hooven-Owens-Rentschler Company's foundry at Hamilton, Ohio. Professor Porter's subject was "Direct Castings from Blast Furnace Metal," Mr. Murphy's "The Jobbing Foundry." President C. H. Thomas, who is at the head of the Model Foundry Company, the new enterprise of the Cincinnati Milling Machine Company and other large local interests, presided at the meeting.

It was reported that Cincinnati has the best chance for the 1909 meeting of the national organization, which the coming year goes to Toronto, Canada. The next or at least an early meeting of the local association will be held in Dayton, Ohio, the home of the National Cash Register Company, whose foundry superintendent, John A. Logan, is an enthusiastic member of the Cincinnati organization, and will give arrangements for the meeting his careful attention. Arrangements are to be made for an illustrated lecture on a new molding machine for handling complicated and special castings at the next meeting of the organization on Saturday, January 25.

HARDWARE

IT is eminently proper for retail merchants in the towns and villages throughout the country to oppose by all legitimate means the encroachments of the catalogue houses, whose competition is already so troublesome and whose growth is so serious a menace to the smaller distributers. To break the force of the fact that the catalogue houses militate against the welfare of the retail merchants is set up the claim that they serve the public, and that individual or class interests must give way. If the claim that the catalogue houses are a benefit to the public is well founded, the opposition of merchants, wholesale and retail, will fail to be justified in the judgment of those who take a broad view of the subject. On the other hand, if the public really needs the catalogue house and finds its welfare promoted by its operations, the opposition of the merchants is sure to come to naught. If, considered in all its bearings and influences and results, the system of these great mail order houses conducted in a few of the commercial centers is a good thing for the country, it may be accepted as settled that these houses will continue to grow in spite of all efforts to repress them.

The fundamental question in connection with the catalogue house competition is whether or not it is, taken all in all, a good thing. Those who oppose this method of distribution maintain, and we believe rightly, that the system by which a few great houses in a few large cities sell goods throughout practically the entire country by means of printed catalogues and without giving their customers an opportunity to inspect the goods, is in many ways exceedingly undesirable, in view of the interests of the public generally. If this contention is well founded, merchants, as citizens taking a broad view of things, are justified in opposing catalogue house methods on grounds of public policy, and not simply because this method of distribution is injurious to their own business.

There are many considerations which might with propriety be urged against the catalogue houses on the ground of public policy. We allude now to only one—the injurious influence which this system of distribution has on the smaller communities, especially in the rural districts. Just so far as this method of marketing goods prevails do the local merchants suffer. If it should greatly extend, the selling of goods by the smaller merchants throughout the country would greatly diminish. Little by little their business would dry up. Many of them would sooner or later be obliged to shut up shop. The tendency of the mail order business is to build up the great cities at the expense of the towns and villages. With a merchandise post by which goods relatively bulky could be sent thousands of miles for the same postage that would carry them 10 miles, it is hard to set a limit to the growth of this method of distribution. Under such influences it is conceivable that the story given on another page of A DESERTED VILLAGE would find many a counterpart in real life. On the broadest principles of public utility merchants and citizens generally are justified in repressing as far as possible catalogue house encroachments on the trade of the smaller communities, where resides so much of the intelligence, strength and virtue of the land.

Condition of Trade.

At the opening of the past year we were, as recent events have shown, in the culminating period of a long era of expansion in business. Trade was of large volume and commodities were selling at a range of prices attained by successive advances during the previous year. There was a shortage of many Hardware products, and merchants in many cases still felt it wise to discount a continuation of the upward movement by liberal if not speculative purchases. Supplies of raw material were inadequate to meet the requirements of manufacturers who were also handicapped by scarcity of labor and delays in transportation. Business was being conducted at a high tension. Wiser heads foresaw that the feverish pace could not be indefinitely maintained, but without much appreciable lull, winter was succeeded by spring and the half year closed with record breaking totals. After the changes incident to the early part of the year prices showed little tendency to advance further in spite of the unusual volume of business. Speculative purchases ceased, and while the jobbing trade continued in undiminished activity it was apparent that manufacturers were catching up with their deliveries, and that large buyers were growing conservative with regard to their future requirements. A financial stringency developed and collections became slower and more difficult. Many in the commercial world gave little heed to these signs of reaction, and there continued to be a large, though diminished volume of business. Summer dullness set in early and was accentuated by the uncertainty of the Copper market in which, after a slight reaction, buyers and sellers came to a deadlock. This was followed in the late summer and early fall by a break in prices and a demoralized condition in quotations on the finished product. A sympathetic effect of this break was felt in other branches of the trade. Notwithstanding the beneficial influence of the generally favorable crop situation there was increased financial stringency and collapse of the securities markets, succeeded by an acute shortage of currency. Inability to get cash for payrolls, the apprehension of stagnation in business and possible financial disaster led to the shutting down of many factories. Building operations slackened materially and industrial enterprises were postponed. Notwithstanding this condition of things, with a much smaller volume of business and weakness in the raw material, the prices of Hardware have been pretty well maintained. With many minor concessions there has been no violent and general break, a very satisfactory result which is to be credited largely to the good sense, the conservatism and the disposition to work together for the good of all, which has been exhibited by the leading manufacturers. The situation to-day is not without many elements of hopefulness. Jobbers have been reducing their stocks and have attempted no replenishment, except to fill in immediate requirements. When the spring trade opens they will probably need to place fair sized orders which will keep manufacturers moderately busy, especially as their production has been greatly curtailed. The possibility of a shortage of goods in some lines is also to be recognized. Retail trade still continues at least fair in many sections. Agricultural communities are prosperous, and have a purchasing ability probably greater than ever before. Reasonable reductions in prices in the presence of slack-

ened demand and lower raw material should not be regarded as undesirable when the interests of the trade in the long run are considered. The effect of the existing quiet in business with the jobbers and manufacturers is to reduce stocks in the merchants' stores and warehouses, thus laying a solid foundation for a brisk demand, which is expected to set in before long. With the people of the country, and especially the farmers well off financially, and with merchants and manufacturers in possession of assets which in general largely exceed their liabilities, the commercial situation seems to be fundamentally sound. In spite of the uncertainty always to be reckoned with in a Presidential year, it is hoped that 1908 will bring a marked improvement in the situation and a profitable business.

Chicago.

Attention has been so far diverted from serious business by holiday pleasures that the jobbing trade for the week has, as a matter of course, been quiet. With characteristic enterprise, the retail dealers are now prepared to cater more than ever to the wants of gift buyers at this season, and it is no longer a period of enforced dullness with them. While not so large perhaps as in former years, the local trade enjoyed a prosperous and profitable business on special lines. Some disappointment was felt at the poor demand for Skates, which on account of the mild weather prevailing, did not move. Other lines, such as Cutlery, Scroll Saws, Chafing Dishes, &c., found ready sale. The Christmas shopper is being more and more attracted to the Hardware stocks for suitable gift articles, and with proper attention to the requirements of such trade the Hardware merchant can do much toward adding to the popularity and profit of his business. For the coming week or 10 days the trade will doubtless be fully occupied with inventory work and squaring up accounts for the year. In the meantime salesmen will be returning to their work, so that in all probability there will be no acceleration of business until well toward the middle of the month. If by that time confidence in existing price levels is established there should be a decided improvement in demand. It is stated on good authority that stocks both of jobbers and retailers throughout the country are rather below than above normal, and are steadily being depleted without corresponding replenishment. Consumption, even if restricted, still goes on, and there seems, therefore, to be something substantial back of the belief in the renewal of buying that is expected early in the year.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—1907 came in like a lion and has crawled out like a lamb—and a well sheared lamb at that. Notwithstanding the decrease in business the last two months of the year, 1907 will not make a bad showing. We "made hay while the sun shone," and when it rained we tried to get in out of the wet.

There is always a bright side to every prospect. Suppose the panic had arrived in July instead of November 1. What would have happened to our fall business? Taking it all in all, if a panic was inevitable, in many ways it could not have come at a more opportune time than it did. Our fall goods had been shipped. We were collecting instead of borrowing money. We were already drawing in instead of spreading out. Things might have been a good deal worse.

Retail Christmas trade here in St. Louis, judging by the crowds and the reports of the various stores, seems to have been fully equal to any former year. In fact, many of our large department stores report better Christmas sales than a year ago.

A strange feature of the Christmas shopping was the fact that great quantities of real money—actual cash in coin of the realm—came from somewhere. "John Doe" checks were not in evidence. Santa Claus has done more than the Honorable Secretary of the Treasury of these United States to put actual money into circulation.

We note, however, that you wish us to prephesy for the future. Therefore, as the seventh son of a seventh son, we "take a chance." We can only be right or wrong, so 50 per cent. of the chances are in our favor.

We predict a very fair volume of business the next six months. The crops and the money are in the country, and there is actually no good reason why the agricultural districts especially should not be in prosperous condition.

It may be a little selfish to refer to it, but bad times often helps the jobbers. It is our custom to put a small merchant into business. We sell him $2000 worth of goods when he has $1000 cash. We nurse him along until he pays out. During this period he buys carefully and in fractions of a dozen.

After a while, when he becomes independent, along comes a special salesman direct from a manufacturer. Then where formerly he bought in lots of one-quarter dozen he buys a gross. He is justified in doing this because he gets the same price as the jobber. Why pay the middleman a profit? Of course he buys enough of the item at one time to last him two years—but then just think of that 5 per cent.!

Laying joking aside, in very good times the retail trade will buy from almost every fellow who comes along. In bad times they concentrate their purchases, they cut out the salesman who wants orders for gross lots, and those jobbers who happen to be on the favored list often get as much or more business from many customers than they did in good times.

We cannot but feel the recent financial flurry was, in a large measure, unnecessary. One of the reasons for the panic was that so many financial prognosticators had decided it was due. We had been prosperous too long. Notwithstanding the protestations of some of our banking friends, we still believe they lost their nerve. We still think many banks issued clearing house checks when there was no necessity for it. It is still a question in our minds whether it was wise for the banks, through the clearing house, to take united action and tide over the "weak brothers," or whether it would not have been better to let nature take its course.

The papers have fully advised the public of every movement of the banks, and it is a question if the scramble of the banks to get under the protection of clearing house checks has not done more than anything else to cause a lack of confidence on the part of the people.

Then does it not seem queer that the trust companies should put vast sums of money into fire and burlgar proof vaults and rent safe deposit boxes, when in such times as we have recently had they so much object to the people putting their money into these boxes?

Have we not in the past 60 days witnessed a too evident attempt on the part of those who are interested to tell the people just what they should do with their own money?

Millions of people never borrow any money. They are never under obligations to any of the banks. On the other hand, the banks are under obligations to them for their deposits. It would therefore appear more consistent for the depositors to give the banks advice than to have advice coming the other way. Who is the dog and who is the tail?

But all this, we are thankful to say, is almost ancient history. In future we will keep a weather eye open for a year ending with an odd number. We notice all the panics have happened in years that ended in 7 or 3. Therefore we can now breathe easily until 1913.

All jobbers are naturally interested in the course of prices in the next few months. As *The Iron Age* has stated, some of these prices are under suspicion. In our opinion there is only one way to get rid of this suspicion, and that is for manufacturers to maintain prices. We believe if prices are reduced there will be still more "suspicion."

It has been announced by the strongest manufacturing interests that, while production would be curtailed, prices would not be reduced. These announcements have been received with loud applause.

Now if after such proclamations at the beginning of the panic prices should be reduced it will not help business, but will simply increase "suspicion." If some of the

big manufacturing corporations cannot hold the market level, as they have claimed, what are they here for?

In looking forward to the business of the next six months, we believe the crucial test will be what happens in the months of January and February. If prices are maintained throughout these months everything will be lovely. If, however, the large manufacturing interests reduce prices they will be quickly followed by the small interests. Both jobbers and retail dealers will be timid in buying.

If we do not have a fair business in January and February then the game is up for the first half of the year. Spring buying is like a man who needs an overcoat or a stove. If he has not bought by January he decides he can go through the winter without them. If spring goods are not bought by March 1 then they won't be bought. The dealers will get through the season without them. The catalogue houses will get the business.

On the other hand, if the trade finds the manufacturers are carrying out their announcements that they would maintain prices they will not be afraid to buy.

It is all a matter of sentiment, anyhow. Thousands of communities have actually not been affected by the panic. If they did not read the newspapers they would not know there was such a thing in the land.

Even if there were reductions in prices it would not amount to much to the average retail dealer on his year's business. But as long as he thinks it would, and as long as he won't buy for fear his $3000 stock might decline in value 5 per cent., or $150, in the course of a year, we must take his feelings into consideration.

We therefore believe it would be to the general interest of the merchants in the Hardware line if there were no reductions in prices in the immediate future, and we further will go on record as stating we do not look forward to serious reductions of any kind. We believe the manufacturers to-day are a smarter class of men than they were 20 years ago. They must know that reductions in prices will not stimulate business.

Then again, taking into consideration the increased cost of many other commodities, it is our opinion goods in our line, upon the average, are not too high. It surely must be known that the advances in our line have been nothing compared to the advances in other lines of business, and it seems to us some of these other lines should come down a whole lot before we start to reduce Hardware.

We look upon the Hardware trade to-day as being a patient who needs only a little rest in order to fully recuperate. We trust he won't have a bunch of firecrackers in the shape of declines in prices let go under him to disturb his already shattered nerves.

We wish *The Iron Age*, its officers and employees, and the general Hardware trade a happy and prosperous New Year, and we assure them they can have entire confidence in the situation as the year 1908 does not end in an odd number. Look out for 1913. (This prophecy is patented. All rights reserved.)

Portland, Oregon.

FAILING, HAINES & MCCALMAN.—The year just closing has been a remarkably prosperous one for this section of the country, taking it as a whole. Crops have been good in all lines and prices have been more than fair, excepting on hops. The year was remarkable up to about November 1 for the increase in business over previous years which was common to all firms in our line, and, in fact, in all mercantile lines. The only trouble we have had here which has really affected the merchants of this territory seriously has been the cessation of lumbering in Oregon and Washington, due to the rise of the lumber rate to points east of Salt Lake. This rate effectually shut the Oregon and Washington lumbermen off from all territory east of this point, and in consequence shut down practically all the lumber camps and mills in this territory except such as were shipping by water. This question, however, is now before the Interstate Commerce Commission, and from a report given the writer by a gentleman who has just left Washington and who is fairly well acquainted with the situation the lumbermen seem to have made out a remarkably good case against the railroads in their endeavor to have the rate lowered to the former one. Should the Interstate Commerce Commission take this view of the case we can expect an immediate revival in activity of lumber interests here.

We, in common with the rest of the country, suffered from the refusal of the New York banks to ship cash to their Western correspondents, but the panic did not affect mercantile trade locally to any great extent. What harm was done was due simply to uncertainty, as our customers all held off as much as possible on buying until they saw the results. Notwithstanding this, we think that local trade, both the holiday lines and regular channels, has for the last two months been fully as good as last year, and in some cases better.

It is true that in this city four banks have been forced to close their doors. Three of these were comparatively small institutions, one having only $9000 on deposit, and the district attorney is investigating the cause of these failures. Whether or not the district attorney will act, it is undoubtedly true that in these three cases the failures were caused by very singular methods of banking. The fourth closing was that of the Merchants National Bank and was caused absolutely by malicious rumors of its insolvency. This bank expects to open with the full concurrence of the Controller of the Currency in about 60 days, with a largely increased capital stock. Merely to show the condition of this bank, which was probably in a weaker condition as regards reserves than the other national banks here, it paid out 45 per cent. of its total deposits in 30 days, and then did not call a single commercial loan, preferring rather to be forced to close its doors than to force its customers who relied on it to cover their notes in the financial conditions that were then prevailing. This bank was absolutely solvent, and would not only have paid its stockholders their full amount of stock, but a very large proportion of the surplus and the undivided profits if it had been liquidated.

As to next year, the outlook is bright. The wheat crop is as yet pretty nearly half in the hands of the farmer; in fact, in Morrow County it is only within the last two weeks that they have finished threshing. What wheat has been sold has not yet by any means been shipped to its final market, and in consequence the money which we will receive for this wheat has not yet been paid us. As a slight indication of the outlook for wheat, there are to-day over 100 vessels chartered to carry wheat to foreign ports. This does not include other than foreign shipments, and it is the largest fleet ever chartered for wheat at any one time at this or any other port on the Pacific Coast. This wheat crop alone means that business will be good with us for the first six months of the year, and as Oregon and Washington have never had a real crop failure, and as our agricultural products are so diversified, it is reasonable to expect that even with fairly moderate prices for our products business will be good all the year. Should the Interstate Commerce Commission take the action desired by the lumbermen, business in Oregon and Washington will receive a decided impetus.

Taking everything into consideration, it seems reasonable and probable that business in this territory will be very good for some time to come. Of course it is probable that business will not be so brisk as it was up to November of this year, but we think we can confidently look forward to doing a very fair business for the next 12 months.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—It is the general feeling that we begin the New Year of 1908 with financial matters improved, and with every appearance of the banks throughout the country resuming business in the usual or ordinary manner, and, it is stated, increasing their deposits by persons not holding them off, and possibly they have largely ceased to advise their customers (as some of them have) to keep up their deposits, which, if done, would prevent their paying their bills as they fell due.

Old Santa Claus made strong efforts to control the feeling of financial anxiety of the many citizens of our

city. Many days before Christmas the city showed great activity, the weather was exceedingly fine, and it is estimated that from 100,000 to 125,000 evergreen trees were scattered for sale through the streets. The department stores, it is stated, added some 20,000 persons temporarily to their force of employees, and it is said that while the purchases of expensive goods were not so great, it is estimated that the variety sold was greater than in previous years. The crowd in the streets on the Saturday before Christmas was something astonishing. The writer in passing out Market street west from Fifth to Fourteenth street took a trolley car, and had reason to estimate that over 100,000 persons, nine-tenths of whom were women, were crowded in the streets. The department stores were jammed. The car had occasion to stop from three to five minutes, and it happened to be in front of one of the three entrances to a large depatrment store, and fully 300 persons passed into that one entrance to the store during the stop. It is stated that over 1,350,000 packages were handled by the express companies in ten days and over 80,000,000 pieces of mail were distributed in 25 days, and from early each morning until midnight wagons were distributing packages.

So far as the above is concerned, there were but few indications of the depressed feeling regarding the financial trouble which has extended so far over the country. It is estimated that over $185,000,000 will be paid out in dividends within 10 days from January 2, and this amount is greater than in any other year. We believe there never was a panic in this country for which there was less actual cause than there has been this year, with the country in such a prosperous condition. It did paralyze and restrict general business throughout the country considerably; but with the opening of the new year it is generally felt that the usual trade conditions will soon present themselves and all collections begin to improve.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—The retail shopping, the overloaded mails and expresses and other usual characteristics which mark the Christmas trade did not seem much affected, at least to the ordinary observer, by the recent financial troubles. It may be that the American Santa Claus had to trade off his automobile and go back to old fashioned reindeer and sled transportation, but even with that he got there just the same. The stockings bulged out and ran over, and the old folks had their usual chance to play with the children's new toys.

As to the general wholesale market, there is a good deal of voluntary buying in a small way. Nobody is waiting for prices to go down apparently, but waiting more likely for the demand to come up. There are hundreds of reasons given for believing that the new year will be a prosperous one, and we have hopes of this optimism justifying itself rather early in the year. There are ten optimists to one pessimist, we do believe, but it may be that there is some commercial liquidation due to take place after the financiers have had their dose and resumed their pleasant expressions.

It is evident that a large amount of commercial credit has been fostered by brokerage firms who had the ear of bank presidents and cashiers in prosperous times for almost unlimited money, but the resources of these same gentlemen were sorely put to the test when it came to renewals in October and November. There are some signs of animation indicating revival in that branch of industry just now, provided you do not care what rate of interest you pay. This high rate of interest prevalent, unless the money is turned over very rapidly, is bound to cut a big figure in reducing the earnings on the part of borrowers. It makes a vast difference to the borrower whether money is paying 4 or 8 per cent. One well-known brokerage firm recently sent out a list of names "not at all bad," to use the English phrase, who were willing to pay 10 per cent. on time loans, presumably renewals. Of course as long as this state of affairs continues there will be few new enterprises and certainly precious little speculation.

In the meanwhile, little by little, liquidation is going on; notes as they come due must be paid, or partially paid, but there is no money yet to play with, and but few orders given for future delivery of merchandise. This is the dull time of the year for the Hardware trade anyhow, and most of the dealers take advantage of it to inventory their stock and close up the year's business. Quite a number, however, owing to the dark hours and the demoralizing holiday features of the midwinter season, take stock in spring or early summer. This is growing to be more and more the practice, we believe.

The showing of the banks here was most creditable. All seem to be in excellent shape, and, unlike some few cities in the Western and Southern country, they have not put out any clearing house certificates for circulation. While the supply of currency was well guarded, it was always to be had for pay roll purposes and in legitimate amounts for any depositor. Altogether we are satisfied and gratified with the stand maintained by our financial institutions. It resulted in Louisville exchange being at par in the West and Northwest, and even in the East, when some of the other neighboring cities were offering heavy discounts.

Prices are apparently firm, but it remains to be seen whether controlling interests can uphold prices artificially or whether they are bound to go down in obedience to sentiment and to the general market conditions, which affect commodities other than steel and iron. We smile when Mr. Gompers tells us that labor has had no part in this panic and therefore shall not be made to suffer, because we believe that, whatever our wishes and desires might be in the matter, our political economy is not wrong when it refers us back to the inexorable law of supply and demand. The example of money itself is in point. Nobody wanted to pay the rates demanded by those who had it to lend, but we simply had to do it. It is not unlikely that the advances made to labor in the days of expansion and prosperity will have to take a back track as the prices of commodities decline. But we will not anticipate. We're looking to 1908.

Cleveland.

THE W. BINGHAM COMPANY.—It is said that confidence is not a plant of quick growth, but we believe the plant has started and will continue to grow strong and healthy in the coming days and months, and that trade conditions will improve. Prosperity always brings high prices for commodities and labor, and we have had it all over this country, and we sincerely hope that the clouds of adversity that have lately appeared on the horizon will soon pass away, and that all may enjoy peace, happiness and a good, healthy trade the coming year.

If our factories curtail their products very much there will be a scarcity of some lines of goods very soon, and we are led to believe as the retail merchants have been conservative in buying of late their stocks will soon need replenishing, and we think trade will start in briskly in the early months of the coming year. A great many inquiries are coming to us for season goods, and some good fair orders have been placed for future shipment.

On the whole the outlook to us is quite hopeful, for, as Ambassador Reid has said, "we still have the country that Providence gave us and we still have boundless opportunities, and after every reverse in the past invariably our country has speedily recovered and risen higher and yet higher in commercial prosperity."

We extend to all of our friends and fellow countrymen greeting, and wish that they may all enjoy a prosperous and happy New Year.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—In writing our closing report for the year 1907 our mind naturally reverts back to the report sent you at the opening of this year, when we were constrained to predict that 1907 would be a year of great prosperity. We do not now feel called upon to make any apologies for our record as a prophet. While it is true 1907 commercially is not going out in a blaze of glory, yet we have enjoyed during the year ten months of unprecedented prosperity. The year taken as a whole has been unusually satisfactory for business of every kind in this section of country.

Statistics show that the output of the mines, factories and lumber mills of the South during 1907 has broken all previous records. The agricultural, poultry and stock interests have made more money than any previous year.

The people of the South to-day are in better financial condition than they have ever been since the Civil War. If we were not now in the midst of a money panic we would say that 1908 would be a prosperous year, because we have everything in the world that goes to make prosperity, except confidence in our banking and general financial system. This we will not undertake to criticise, but we are strongly impressed with the idea that there must be something radically wrong with it. Our people are by no means discouraged. As a general rule they are not in debt; this particularly applies to the agriculturalist. They know that the country is in good condition and that this financial depression cannot last very long, and every one seems to think that the recovery will be very rapid when confidence is restored. With this obstacle removed, we cannot see any reason why we won't have a good trade in 1908.

Boston.

BIGELOW & DOWSE COMPANY.—1907 is fast nearing its end. It has been a year of general prosperity for the merchant doing a legitimate business and attending to his own affairs. Nineteen hundred and six was considered a banner year, but ten months of 1907 showed a larger volume of business, which will more than make up any slight falling off of sales during the past two months.

Values have been well maintained throughout the year. Collections have been above the average of a series of years. We hear there has been a financial panic, but everything has been in a normal condition in our business world. Speculators and dishonest financiers may have lost fortunes, but legitimate business has met with no serious reverse. Bankers deserted the speculator during the crisis and left him to his own resources, but never for a moment have they failed to support and accommodate the merchant.

Market values for iron and steel products have been firmly held by the large interests working together and curtailing the production to meet the demand. Stock inventories will show a marked reduction in goods on hand as compared with last year. The majority of Hardware products are necessities that are used by the farmer, the mechanic and the whole people. Throughout the year the mechanics and the laborers have been fully employed at high wages.

The farmers were never so prosperous, as the published report of the Secretary of Agriculture shows the value of farm products for 1907 to be $7,412,000,000. This is an increase of about $660,000,000 over their value in 1906.

The great "bugbear" in the whole situation has been the hoarding of the currency by those who demanded and obtained large premiums from employers of labor to meet their weekly pay rolls. Once these premiums are abolished the circulation should return to its normal condition, when there will be a superabundance of money to move the crops and set every wheel in motion.

Everything in the business world is in prime shape to start the new year with a rush. We congratulate *The Iron Age* on the good work it is doing, and wish it a happy and prosperous New Year.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—The season has now arrived when a let-up in the movement of goods is anticipated, a realization not unwelcome just now, as all the jobbing trade are very busy taking stock preparatory to closing their books and balancing results of the past year's traffic.

Taking the year 1907 throughout, it is conceded that for volume of business transactions it has been unequaled. It is expected that a season of comparative quiet in business circles will intervene between now and the opening of the spring campaign. This is customary. The general feeling of business men throughout the trans-Missouri region is one of uniform confidence, and the conviction prevails that all conditions point to a healthy spring trade as soon as the season opens.

The question of the future of values appears to be attracting some attention at this time. Opinions seem to be at variance on this subject. It is held by many that present values are likely to remain about where they are for some time, while others assert that a readjustment to a lower plane of prices for most commodities is near at hand. Conditions, however, are so excellent, not only in the West, but all over the country, that the recent monetary stringency could affect general business only for a very short time. It is even now a recollection.

With an easier money market, a lower cost of raw materials and possibly a reduction in cost of labor from the extreme high level figures would make the outlook for all industrial enterprises reasonably bright.

Baltimore.

CARLIN & FULTON.—It can hardly be disputed that the year 1907 has been in regard to trade the most remarkable in the history of this country. From January 1 to the end of October there was no abatement in the demand for goods, the immensity of which had made the record of the previous year phenomenal. Large harvests, good prices, busy factories, labor well employed, high wages, railroads taxed beyond their carrying capacity, all contribute to swell the volume of trade both foreign and domestic.

Suddenly came the chilling frost of suspicion as to the reality of stock values, and we to-day see the contrast in business activity resulting from that lack of confidence.

In spite, however, of the shrinkage of the market value of securities, the most of which continue to pay their usual dividends, the foundations of material prosperity were never stronger. Real estate has not depreciated in value. A large portion of this year's crops is still held by the farmers unsold. Farm mortgages have been greatly reduced and the average indebtedness of the individual is less than it has ever been, while the average circulation of money is greater per capita.

The country needs goods, for there is no accumulation of stocks anywhere. Production has been curtailed, and while there is a temporary decrease in the demand, the requirements for consumption are bound in a very short time to put business on its feet again. It is a noticeable fact that the manufacturing interests of the country are looking forward to the resumption of business activity, which they have not found necessary to stimulate by reduction in prices, and no doubt the average inventory of to-day will show values fully equal to if not higher than those of a year ago.

Stability in prices has marked the conduct of the Hardware business, and with its productions, which are necessary to every line of industry and not subject to the whims and uncertain demand of fashion, it is almost safe to predict that in a little while the demand for Hardware will inspire other lines and prove to be an object lesson as to the value of conservatism in prices by both manufacturers and the wholesale trade.

Our best wishes to our friends in the trade for a prosperous year.

NOTES ON PRICES.

Wire Nails.—It is the policy of the manufacturers to refrain from pushing Nails on the market, contenting themselves, so far as sales are concerned, in taking care of the few orders which come into them from the merchants to cover immediate requirements. This naturally tends to keep prices from being demoralized, and the market remains remarkably even. They are also taking advantage of the opportunity to get the mills in shape after the long and heavy pressure to which they have been subjected. In most cases, also, they are materially reducing production. There is, however, a willingness, especially on the part of the larger mills to accumulate goods to a reasonable, but not excessive, amount, so as to be ready to take care of the demand when it sets in. Under the conservative policy which is being pursued

and the good degree of harmony which prevails among the various manufacturers it is hoped, whether quotations are maintained at their present level or are somewhat lowered to correspond with changed conditions, that demoralizing irregularities in prices will be avoided. Quotations are unchanged, as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

New York.—The demand is so limited that it is practically equivalent to no business at all. As a rule jobbers are wisely refraining from pressing Nails on the trade at cut prices, as this effort would not result in sales at this time and would only demoralize the market. Local jobbers and Nail houses are holding small lots at store at $2.30, base. This price is shaded by some sellers, while others are adhering to the above price.

Chicago.—New orders constitutes a very small part of the tonnage coming to the mills, the bulk of it being furnished by specifications against contracts. Shipments though greatly reduced in volume continue at a fair rate. The strongest feature of the situation is the fact that salesmen report stocks throughout the country to be light and an early improvement in demand is therefore looked for. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—In present unsatisfactory conditions the Wire Nail mills are not trying to force sales, but are giving their efforts to keeping down output and sustaining prices, with very successful results. The mills are taking advantage of the present dull demand to shut down and make improvements, so as to be in as good shape as possible when the expected heavy spring demand starts. In the almost entire absence of buying prices are being well maintained by the mills, but are occasionally slightly shaded by some of the jobbers. Quotations on base sizes are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

Cut Nails.—The Cut Nail market continues to be characterized by a very moderate volume of business. Merchants have been buying during the past week only such Nails as they must have immediately, and the mills are wisely awaiting such orders as are sent them rather than attempting to force sales on an unresponsive market. There is not entire regularity in prices, and what might be called established quotations are slightly shaded. The regular price to jobbers is $2.05 base for carloads, f.o.b. Pittsburgh, with freight added to destination. Retail merchants should theoretically be charged 5 cents more, but this differential is not in all cases enforced.

New York.—Similar conditions rule in the local market in Cut Nails as in Wire Nails. Lack of consumptive demand is pronounced, and concessions in price are apparently no inducement to retailers to stock up at this season. Local jobbers and Nail houses are holding small lots at store at $2.30, base. This price is shaded by some sellers.

Chicago.—Coupled with other conditions tending to restrict trade, the general suspension of active work during the holiday week has operated to intensify existing dullness. There is practically no demand, but with a large portion of the mill capacity idle there is no attempt to crowd goods on an unwilling market. Prices are, therefore, generally well maintained on current business. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; steel, to jobbers, in carloads, $2.28; to retailers, $2.33.

Pittsburgh.—Output of Cut Nails at present is very light, most of the mills being closed down to make repairs and improvements during the present dull demand. Some mills that are still in operation are inclined to shade prices to secure what little business is being offered. Prices named below continue to be shaded by some mills about 5 cents per keg. We quote Steel Cut Nails at $2 to $2.05, f.o.b. Pittsburgh, for carload lots, and small lots at $2.10, to which freight to destination is added. Iron Cut Nails are being held at about $2.15, at mill.

Barb Wire.—The fact that the farming population are, as a rule, prosperous and in admirable financial condition to purchase such commodities as they want encourages the expectation that there will be during the season a good demand for Barb Wire and for Wire Fencing. Since the financial trouble developed in October there have been a good many requests from merchants to the manufacturers, asking them to cancel orders or to defer shipments. There has, however, been within the past month less of this than heretofore, and a good many goods will be shipped early in the year. Quotations continue as before, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—New orders have practically ceased, and the mills are clearing up shipments on existing contracts. Demand to cover the coming seasons requirements is expected to make its appearance soon, and orders from the Southwest should begin to come in early in January. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—This trade is practically stagnant, there being no new demand while contracts have been pretty well cleaned up. The mills are taking advantage of the present situation to make needed repairs and improvements, and to make plans for the expected large volume in business when spring trade opens up. We are advised prices are being firmly held. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Fence Wire.—The volume of new business is light, but there is apparently a better feeling with a probability that fairly liberal orders to the manufacturers may be expected within a few weeks. If financial conditions should call for economies on the part of the farmers, this will naturally diminish the amount of Fencing sold during the coming season, but those in close touch with the situation are anticipating at least a fair volume of trade. There is no complaint of irregularity in prices, but when there is enough business to test the market it will be seen to what extent it will be deemed feasible or desirable to maintain existing quotations, which are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—It was scarcely expected that with radical change of conditions there would be any renewal of buying interest until after the turn of the year. Merchants and manufacturers are too busy just now with closing up the year's business to give a thought to forward requirements, but the coming weeks of January will probably see the movement of many postponed orders and the placing of new ones. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—New demand is very light and specifications against contracts have in many cases been suspended, so that shipments by the mills at present are much lighter than for some time. It is expected that early in the new year conditions in the Plain Wire trade will show material improvement. Quotations for base numbers 6 to 9 are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Coes Wrenches.—The Coes Wrench Company, Worcester, Mass., for whom J. C. McCarty & Co., 21 Murray street, New York, and John H. Graham & Co., 113 Chambers street, New York, are agents, announce a revised list on their Bright Knife Handle and Hammer Handle Wrenches, and also a change in terms of sale. The change in list prices is to overcome an inequality in the old list under which the Bright Wrenches were selling at too low a figure as compared with the Black, the old list not representing the increased cost of manufacture. To correct this the list prices for the Bright Wrenches have been advanced so that the new list is as follows:

Knife Handle and Hammer Handle Bright Wrenches.

Inches.	Per dozen.	Inches.	Per dozen.
6	$11.50	15	$30.00
8	12.50	18	36.00
10	15.00	21	42.00
12	19.00		

These advances in list, in effect January 1, are referred to as very conservative, not quite covering the cost of polishing the goods. The company also announces that on and after January 1 all goods sold by it will be billed on the following terms: 3 per cent. for cash strictly within 10 days, or 60 days net. It is understood that these terms will be adhered to in all cases.

Blacksmiths' Aprons.—Following are the current discounts on Leather Aprons for blacksmiths, &c., quoted by the Richard Pick Mfg. Company, Chicago, for whom the Livingston Nail Company, 302-304 Broadway, New York, is Eastern sales agent: 1 dozen, 10 per cent.; 2 dozen, 15 per cent.; 3 dozen and over, 20 per cent.

Rope.—The first of the year finds Cordage manufacturers and jobbers devoting their energies to making collections. Some find this comparatively easy, while others are experiencing difficulty in securing prompt remittances. The latter condition hinges upon the fact that their customers have not been very successful in collecting accounts. Business seems to be practically at a standstill, and not much of a revival is anticipated during the present month. The following quotations fairly represent the market for base sizes: Pure Manila, 11½ cents; B quality grades down to 8½ to 9 cents; Pure Sisal, 8 cents; lower grades Sisal, 7 to 7¼ cents; No. 1 Jute, ¼-in. and up, 7½ cents; No. 2 Jute, 7 cents.

Window Glass.—The past week has recorded little new of interest in Window Glass affairs. There has been some difference of opinion between the Amalgamated Window Glass Workers' Association and the cutters' and flatteners' organization, which has prevented the latter making satisfactory arrangements with the manufacturers. It is now understood that a way out of the difficulty will probably be found. The product of the 400 to 500 pot capacity of hand operated factories now in operation is being offered, according to reports, at about 90 and 30 per cent. discount for single and 90 and 40 per cent. discount for double strength Glass. Business is light with jobbers. Prices recommended at the last meeting of the Eastern Window Glass Jobbers' Association are as follows: In the States of New York and New Jersey 90 and 15 per cent. discount for single and 90 and 20 per cent. discount for double strength Glass. Similar prices are supposed to prevail in Pennsylvania, but in New England discounts are said to be fixed at 90 and 20 per cent. for single and 90 and 25 per cent. discount for double strength Glass.

Linseed Oil.—The market has gained temporary firmness from the advance of Seed, and this in the face of an exceedingly light demand for Oil. Manipulation of the Seed market is apparently the only available explanation for this unusual condition. Demand is restricted to small lots for prompt delivery. Quotations are as follows: State and Western Raw, in five-barrel lots, 42 to 43 cents; City Raw, in like quantity, 45 cents, with 1 cent per gallon additional for less than five barrels. Boiled Oil is 1 cent advance on Raw Oil.

Spirits Turpentine.—Holiday dullness is reflected in the Turpentine market. The Southern market has declined during the week, and this has been reflected in values at this point, which has caused buyers to hold off buying until conditions become more settled. The New York market is represented by the following quotations: Oil Barrels, 43½ to 44 cents; Machine Made Barrels, 44 to 44½ cents.

INTERESTING SHOW WINDOWS.

THE window shown in Fig. 1 is one of a pair in the store of J. Russell & Co., Holyoke, Mass. The feature which instantly attracts the attention of the observer is the effective panel set in below the window proper which, at the time the photograph was taken, contained a display of Door Checks and other Builders' Hardware. The lower window is of course not accessible from the



Fig. 1.—Portion of Store Front, Showing Panel Window Reached Through Basement.

main floor of the store, being reached through the basement, from which it is separated by an inclosed back to keep out dirt. Many merchants by making use of this clever idea could greatly increase the attractiveness of their store fronts, furnishing a setting for many effective displays of specialties, &c.

Above the panel will be observed the firm's Thanksgiving display of Carvers, &c., reproduced on a larger scale in Fig. 2. The layout was exceedingly attractive and

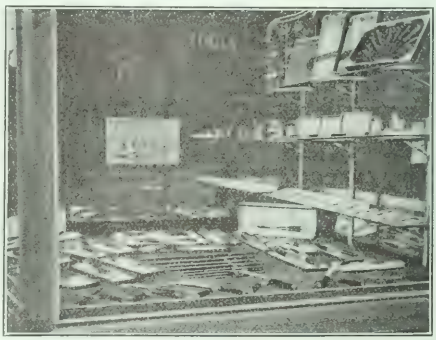


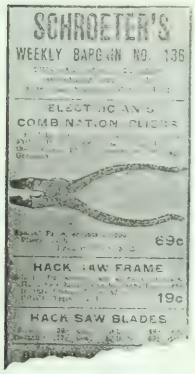
Fig. 2.—Thanksgiving Window of J. Russell & Co.

tastefully arranged. It will be noted that the window is inclosed with a mirror back which adds to the effectiveness of the display. There is also a mirror on the wall at the right with an adjustable frame for glass shelves on which goods may be prominently shown. At the left the window has a broad side glass adjoining the main entrance to the store.

SPECIAL SALES THE KEYNOTE TO WOMEN'S TRADE.

BY S. M. S.

HAVE you ever noticed how the dry goods and department stores frequently make a special sale of some popular household article in order to attract women's attention? The department store man fully knows that even though there isn't a cent of direct profit in it, and that he will in a great many cases sell at the cut price to a regular customer, who would, perhaps, willingly have bought the same article at a higher price, he knows from experience that he will also get in touch with some new and desirable customers whom he might never reach otherwise.



The Hardware merchant who is seeking women's trade can well afford to emulate this example of the department and dry goods stores, and even to greater advantage, in that the idea is more new in his case. The Hardwareman's customers are pretty much like other human beings. They have sympathies, feelings, warm blood, ambitions, and the desire to buy as cheap as possible.

Low and Cut Prices Are the Mighty Lever

that bring the crowd and start the special sale going. Bargains and more bargains are the fuel that keeps the steam up to the selling point and moves the goods. The special sale articles advertised as leaders or fliers must be cut in price. How deeply? As little as possible to save the dealer all the profit possible, yet as deeply as necessary to bring the crowd and attract buyers. Policy must, of course, determine just what goods are to be sold at a loss, what articles are to be sold at actual cost, and what goods are to be sold at a small profit. There should, however, always be enough goods sold at a profit, even during the special sale, to overbalance the loss on any goods sold as special sale bargains.

Offer Real Genuine Bargains.

In conducting a special sale, there must be real, genuine, attractive bargains, otherwise there will be no tremendous sale, only a small dash or splurge. Any useful, low priced article of known value will make a good special sale leader, but the value should be genuine, and furthermore, it must be such that the cut in price is easily recognized. For instance: A Coffee Pot or Dish Pan that usually sells for 50 cents, offered at 19 cents, will be a good leader in a special sale, provided the public knows that it is always sold at 50 cents, or can easily see that it is worth much more than the special sale advertised price. The special sale leaders should be sold at less than cost, or at best at actual cost. They are the bait with which to catch the public eye and to draw people into your store where they see the other goods you have on display.

Display Bargain Goods in Windows.

In the matter of displaying goods during a special sale—any goods advertised as leaders in the newspapers should be displayed in the show windows. And the special sale articles should be displayed at intervals all down through the store to the special sale counter, which should preferably be way in the rear somewhere. Then, while the crowd is waiting its turn at the special sale counter, they see many other things that interest them. Saturdays, Mondays and pay days make the best days for running a special sale.

Advertising the Sale.

In the matter of advertising a special sale, this should be on as large a scale as costs and the multitude of people you aim to reach will permit. Take all the newspaper space you can afford, have dodgers printed and distributed throughout the town, and even in the country for miles around, and remember, the greater number of people you invite to come, the more will come and the greater will be your store crowd. Put signs on your windows and your store front and do everything possible to create interest and enthusiasm in your special sale.

Experience of a Western Retailer.

Some of the most profitable and far reaching special sales have been those on which there was a direct money loss on the leader sold. I personally know of one small store in a Western State that appropriated $25 each week for a limited period to spend on special sales. Their first sale was on Coffee Pots. They bought 250 Coffee Pots and sold them at a special sale at a loss of 10 cents each. Their principal window was full of Coffee Pots, with the whole story on a big card, stating the number of Coffee Pots they had, the exact regular price, the cut price, and at what time the sale would begin. The purpose of the special sale was also stated: "To attract quick attention to the largest and lowest priced line of kitchen furnishings in the city." They had Coffee Pots on display at intervals in conspicuous places all through the store.

Women and More Women.

During the sale several hundred women lined up for Coffee Pots, and while they were waiting their turns saw many other things that interested them. Two hundred and fifty women bought Coffee Pots—the best Coffee Pot bargain they had ever seen; they also bought a lot of other things at regular prices and profits on their way out. These 250 women showed their Coffee Pot bargain to 500 other women, and $25 never bought more or better word-of-mouth advertising than did this amount invested in a Coffee Pot special sale. The Coffee Pots were bought low in the first place, and selling at an average of 10 cents each below actual cost made a most striking contrast between the regular price and the cut price. Women and more women came to that store who had never before been inside of its doors, and you may be sure they came again and willingly paid regular prices.

Any Hardware merchant can run a special sale. He can spend $25 or $100 just as he chooses. He can even sell at cost if he pleases and lose nothing. But the force that comes from advertising real bargains—bargains that everybody will have to acknowledge are such—the more and greater attention it will get, besides it helps to establish a reputation for low prices all along the line, and if you cut deeply—go well below cost—your competitors will not be so likely to follow you.

Some May Hold Up Hands in Horror

at this scheme for supplying at an actual money loss a demand that might be supplied at a profit. Some of you may forget that you couldn't possibly sell all those Coffee Pots at the regular price, because a good many of those women would ordinarily buy their Coffee Pots elsewhere without ever thinking of you in that connection. Perhaps some of you would rather give up that $25 for an ad. in a hotel directory, a theater programme, or in some of the many other places where it would soon be out of sight and out of mind.

Cost Not Heavy.

It doesn't cost much to try a special sale, and it is certainly attractive, and it works out on the profit side, because it wins women and their trade. Once you have tried a special sale you will need no further prodding to keep up the good work at regular intervals. You could not after that, be induced to give it up. This special sale plan would become a habit, a part of your business, and your women's trade would become a live, growing thing.

Anyway, isn't it high time for the Hardwareman to wake up and come into the main tent and make up his mind to go after the women's trade in real earnest. Hasn't he been content to be regarded as the concert after the big show long enough?

The Strike on the 3rd.

BY WESTMOUNT.

NOTICE.

In order that stock taking may be finished and everything straightened out by the end of the month, the management has found it necessary to ask the staff to put in some extra time.

Starting to-morrow evening, the warehouse will be open from 7 to 10 p.m. until further notice.

JAS. B. M'KIM,
Vice-President.

Supper money may be obtained from the cashier.

ON coming to work one cold miserable morning about the middle of November the employees of the Colonial Hardware Company were confronted with the above dispiriting intelligence from the powers that sit at the directors' table. It was pinned on the notice board at the warehouse entrance, beside the time clock, and gave no one the opportunity of staying off and pleading ignorance of the order as an excuse. A sudden icy feeling in the atmosphere had followed weeks of beautiful fall weather, when winter overcoats were the last things the boys had thought of, and this particular morning had found most of them unprepared for it. This didn't improve their tempers, and the remarks which were passed about the management were anything but complimentary to the dignified and portly gentlemen composing it.

The third floor staff were particularly bitter, as they had exerted themselves pretty hard, and in consequence their stock had nearly all been gone over and listed. Ned Burton, the manager of the floor, had a way all his own of getting the best out of his boys that there was in them, without making them think they were working unusually hard. He had kept them going steadily all through stock taking with the hope that his floor would be the first one finished, and just when his wish was about to be realized it riled him to have to come back at night to help out the other floors, where most of the staff had been loafing every chance they got. Besides, he had promised the boys that if they would "get a hustle on them" and keep the work up, he would see that they had no night work to put in.

Tom Lynch's Oration.

When he arrived at work this particular morning he found his boys holding an indignation meeting. Tom Lynch was occupying the floor and delivering quite an oration on the subject of "bosses" from the rather shaky elevation of a couple of cartridge boxes.

"Fellows, there's nothing in this giving in game. The more we do for 'Old Whiskers' the more he'll expect from us. He's all right and fair enough when you can convince him that he's in the wrong, but the trouble is to convince him. He won't give us a chance to state our case if we go to him.

"Haven't we worked like slaves for the last two weeks? Haven't we got our work in better shape than any of the other floors? You bet we have. We're not a bunch of knockers generally. When our own work's behind we come back and get it up without asking help from anybody. Last summer we didn't kick when we had to show up three nights in succession to get out that big Western order. We wouldn't be kicking now if our own work was behind, but you know as well as I do that the fellows on all the other floors have been loafing 'round half the time instead of working on the stock, and now we have to suffer with them.

"That's the question we want to settle right now. Are we going to lie down and let the boss walk over our faces, or are we going to stand up for our rights and speak out like free citizens? If we're going to kick we've got to do it in a way that will interest 'his nibs' so much in the matter that he will hear us out. We've also got to stand together. A couple of us would get fired if we opened our mouths, but if we all stick together they can't very well clean out the whole floor without holding over a lot of orders and putting the whole system on the bum.

"What's the verdict, get down on our knees to the powers or stick up for our rights? I'm in favor of fighting the whole thing to a finish now. All in favor? Good! Let's make our plans and have Ned see the boss about it as soon as possible, for from now on we're on strike."

An Ultimatum.

Ned had noticed that the boys were very much excited over the prospect of overtime, but had said nothing, expecting they would settle down to work as soon as they had blown off a little steam. He was rather surprised, therefore, to see them all coming toward him in a bunch.

"Come fellows. Let's get what orders we have on hand filled at once, so we can get at our stock. I want to have it all finished by to-morrow afternoon."

"Sorry, Ned," came from Tom Lynch, who had retained the position of spokesman, "but the staff of the 3d is on strike."

"On strike! Quit your fooling, fellows, and get to work. You've loafed enough this morning already."

"Nothing doing, Ned; we mean what we say. We understood from the way you talked that if we could get our stock finished within reasonable time you'd see that we had no overtime to put in. You saw the notice on the board this morning, and you know what that means. If the 'old man' says all departments are to come back he means it. We have decided that we have other things to do with our evenings besides coming down to this hole and helping a gang of loafers get their work done. If we come back we want to be paid for it, and paid well—time and a half—otherwise we don't come back. We have also decided that if we want anything from the 'old boy' we have to put him in a corner and help ourselves, as it's no use asking for it. He's always too busy to pay attention to what we say, and only wants us to get out and leave him to his correspondence.

"We want you to see 'his lordship,' explain to him that we don't think our constitutions will stand the strain of night work, and that we are at present resting up, while he changes his notice to read, 'With the exception of the third floor.' That will make him sit up and take notice, and you'll have a chance to say all you want to before he thinks of his letters again."

"Do you really mean it, boys? I think you are going a little fast. Hadn't you better think it over again? This may cost you your jobs."

"Jobs or no jobs, our terms are time and a half for night work, or no night work, and the sooner we know what he intends to do the better for all hands. Will you see him for us or will we go ourselves and storm his stronghold?"

"Oh, Lord! don't do that; you'll drive him crazy, and he'll never listen to you. I'll see him and do the best I can about it. In the meantime don't put the place on the bum. If I don't come back you'll know he's finished me for fair."

Delivering the Ultimatum.

Although Ned Burton often found it necessary to consult the vice-president on matters of business and felt more or less at his ease in the private sanctuary, his knees shook slightly as he approached the door on this particular occasion. His visit was a little out of the ordinary, and he knew that he would get all that was coming to him and a little bit more when the "chief" heard how some of the staff had decided to run things to suit themselves. However, he put on a bold front, and without waiting for the usual invitation to "Come in," which usually followed a knock on the door, he strode up and stood at attention beside the large flat top desk.

"Well, Burton, what can I do for you? Be as brief as possible, please, I'm exceedingly busy this morning."

"I'm sorry to trouble you, sir, but it's about the notice on the board this morning that I want to see you."

"Well, what about it? Can't you understand that I want the staff back here every night until stock taking is finished? I took pains to word my notice so that any person with half a knowledge of the English language would understand my meaning, and I'm surprised that a young man of your intelligence should, above all others, be the one to require a further explanation."

"I don't think there's any doubt, sir, that everybody in the warehouse understands the notice, but——"

"Well, Burton, if everybody understands it, why are you down here wasting my time as well as your own? Haven't you got anything to do upstairs?"

"Yes, sir, plenty; but the fact of the matter is my men have gone on strike."

"Gone on strike! Is that what you said, Burton? Have you been drinking, sir? Have you the cheek to come down here and tell me that a lot of young whippersnappers on your floor have the audacity, the downright cheek, to go on strike, to try and tell me and my directors what shall or shall not be done in this firm? Burton, you take my breath away, you make me—oh, Lord! Go upstairs at once, sir, at once, and tell every mother's son on the flat to get his money and get out. Understand me? Get out before noon."

"But, sir——"

"Don't but me, Burton. Do as I say or I'll include you with the rest of them."

Ned Burton has His Say.

"Mr. McKim, let me say a few words, please. If you'll listen to me for a few moments I don't think you'll regret it, sir. If you remember, at the time you put me in charge of the 3rd, you gave me many valuable hints about how to get along with the boys under me, and get them to work steadily without bullying them. You told me that a little kindness and diplomacy would get more out of a mule than any amount of thrashing, and that boys and mules were first cousins. I took your advice, and all the time I've been manager of that flat I've never had any trouble about keeping the work up to date. The boys are always ready and willing to come back at night if our orders get behind. When stock taking started I told them if they would have their stock finished first I would see to it that they wouldn't have to come back at night to help any of the other floors. Our stock will all be finished by to-morrow afternoon and our orders are up to date. The boys have been working so hard for two weeks now that it's got on their nerves. I came down to see you this morning to see if in consideration for what they have done you wouldn't change your mind in this case."

"Burton, you have been here long enough to know that what you ask is impossible. I can't make fish of one floor and flesh of another; anyway, you should not have taken it on yourself to make any rash promises."

"Well, sir, if you won't let them off, won't you arrange to have them paid overtime after 6 p.m.? They think that if they are docked for being absent they should be paid extra for night work."

"I'll do the thinking for this establishment, Burton. You go up and tell those insolent puppies that they are paid so much per week to do the work of this firm, and that the hours are from 8 o'clock in the morning until it's finished, if it takes until 11 every night. Now I hope we understand each other. Get upstairs and get things going. If those fellows won't obey orders fire them out."

"But, sir, think what a mess that will make of the floor. We are just in the middle of our Christmas orders, and if you discharge all the boys and put in a lot of green hands who don't know the stock the stuff will never go out in time."

"Why not, Burton? Don't you know the stock well enough to show the new fellows where things are?"

"Yes, sir, I know where things are, but if I'm supposed to be manager of a floor, I want to know that anything I do within reason will have your approval. I gave the boys my word that they would have no night work, expecting that you would sanction what I had done when I had explained my reasons for doing so to you. Instead of backing me up you want to discharge everybody on my flat because they try to make me keep my word. Under the circumstances, sir, I see nothing for me to do but resign with the rest of the bunch."

"I didn't think, Burton, that you were that spiteful. Do you think you are so valuable to me that your resigning will make any difference? Do you think I can't fill your place?"

"No, sir; I'm not trying to influence you by resigning, nor do I think you can't fill my place; but I can't go back to work and face the fellows under the circumstances. I never go back on my word."

"Burton, do you think under different circumstances you would stick up for me like you are sticking up for your boys?"

"Certainly, sir."

"Well, get back upstairs and tell them that I can't cancel their order for night work, but if they'll come back and help us out chances might be good for increasing some salaries about New Year's. I may also want a good, honest young fellow with a will of his own to assist one of the buyers. I'll consider you, as it's not safe to have you where you can make rash promises."

"Thanks——"

"Get out; I've letters to write!"

RETURN POSTAGE PROPOSITION.

THE RETURN POSTAGE ASSOCIATION, John A. Stewart, secretary, 35 Nassau street, New York, which was incorporated under the laws of the State of New York a few months since, has been organized for the purpose of establishing a system of postage by which the original senders of stamped addressed envelopes and postal cards shall be saved all expense for return postage, except where the return envelopes and postals are actually used in replies. This result is sought to be accomplished by a patented method, so guarded and regulated as to fully protect the Government from any possible loss. A deposit in cash of several hundred thousand dollars, it is proposed, shall be made with the postal authorities at Washington every week, based on the actual matter thus transmitted through postal channels as shown by daily reports from the post office authorities. Such a project would obviously be confined to general post offices in large cities.

The saving to manufacturers, merchants and others, if something can be done in this direction, would certainly be large, it being computed that of the prepaid addressed envelopes and postal cards sent out only about 10 per cent. are used for the purpose they are designed to serve. More than 70 per cent. of the postal cards and nearly a like proportion of the stamped envelopes sold last year, it is said, were used for circularizing, while not less than 75 per cent. of the money thus expended was a total loss. At the same time the postal revenue derived from actual return postage would probably be increased, once a practical working plan was found acceptable to the postal officials.

The idea of saving such postage is not new, such a proposal having been made at least as far back as the '80s, and many of the Postmasters-General have approved it. In the execution of this plan it is proposed to supply postal cards and envelopes of such form and color as to facilitate the separation of them from other mail matter, and bearing a printed address and subaddress, or one address with the legend conspicuously displayed, "Unmailable if address be altered."

DEATH OF MARTEN DOSCHER.

MARTEN DOSCHER, the active head of the Doscher Plane & Tool Company, Saugatuck, Conn., died at his home, in that town, December 26, of pneumonia, after a week's illness, aged 55 years. Mr. Doscher was born in New York and had been in the Hardware business since he was 16 years old, at first with Nathan Weed, who years ago was the New York representative of several Southern Hardware houses. Afterward he was the agent for G. W. Bradley's Sons and their well-known Edge Tools, Axes, &c. Then he began the manufacture of Wood Planes, Tool Handles, Mallets and kindred goods. Mr. Doscher was a man of excellent character and habits, and enjoyed the trust and respect of those who knew or dealt with him. His wife died during the past year and he leaves two daughters and one son.

The Cox Hardware Company, Paragould, Ark., having purchased the stock and fixtures of Edward Weber, Dexter, Mo., will conduct a general Hardware business at the former place.

NAIL AND WIRE MARKET IN 1907.

PRICES on Wire Nails, Barb and Plain Wire during the year just closed were remarkably even, as indicated by the accompanying table, which shows but one change and that an advance of $1 per ton, in the early part of September. Large orders were placed in the fall of 1906 in anticipation of an advance in price, which was announced in the early part of December. The impulse then given to the demand continued heavy up to October, when the trade was becoming convinced that conservatism in purchasing was the proper policy. Owing to the heavy demand there was little opportunity for the usual midsummer closing of mills for repairs. Prompt shipments were as a rule difficult to obtain during the greater part of the year, owing to the large volume of business, with premiums being paid for Nails in some instances for preferred shipments. Steel Cut Nails started the year 5 cents higher in price than Wire Nails, and in September were quoted at an advance of 10 cents. Orders placed during the early part of the year were phenomenally heavy, the demand exceeding the productive capacity of the mills. From September it was difficult to maintain the relatively higher price, owing to diminished demand, and the year closes with Cut and Wire Nails at about the same price, there having been, however, some inequality in Cut Nails. The curtailment of production in both Wire products and Cut Nails during the closing months of the year, and the conservative course pursued by the manufacturers has imparted a steadiness to the market which otherwise would not have characterized it. The beneficial influence of this conservatism has also been felt on the Hardware trade as a whole.

The following table gives the opening base prices (f.o.b. Pittsburgh, for car lots to jobbers) on Wire and Nails for 1907, together with the subsequent changes and dates when they went into effect:

	Wire nails.	Cut nails.	Painted barb wire.	Smooth fence wire.
January 3.....	$2.00	$2.05	$2.15	$1.85
August 1.....	2.00	2.10	2.15	1.85
September 3.....	2.05	2.15	2.20	1.90
October 3.....	2.05	2.10	2.20	1.90
October 31.....	2.05	2.05	2.20	1.90
November 21.....	2.05	2.00	2.20	1.90
December 26.....	2.05	2.05	2.20	1.90

THE CHICAGO HARDWARE MARKET IN 1907.

OUTLINED in bold relief against a background of more or less important market events comprising the record for 1907, and conspicuous by reason of its overshadowing prominence, is the striking contrast presented in a comparison of trade conditions existing at the opening and at the closing of the year. Continuing onward from an impetus gained in the preceding year, the volume of business early in the season attained such proportions that the manufacturing capacity in many lines proved inadequate to meet the demands. Factories were filled to overflowing with orders, and were unable to keep pace with the rising tide of business. Shipments were accordingly delayed and jobbers and retailers alike found it difficult to maintain stocks, and were on every hand beset by a clamoring demand for goods. Each succeeding month developed an increase in sales totals over the extraordinary high records established for the corresponding months of the previous year. This condition continued up to and beyond the midyear without abatement, and there was little diminution of business in the Hardware trade until September, when the effects of a growing financial stringency began to be felt. This movement culminated in November in a sudden and severe contraction of the currency supply, resulting in a sharp reaction, and all buying save for immediate and imperative needs was suspended, the year ending with business at an exceedingly low ebb. Fortunately, however, the preponderance of prosperity that characterized the business of the first 10 months outweighed the reversals of the remaining two, and the year as a whole can therefore be set down as one of profitable results.

No Demoralization in Prices.

Contrary to the usual experience in like periods of depression, the sudden slump in business was not accompanied by demoralization of prices. Freedom from the natural consequences that would have followed indiscriminate competition was mainly due to a remarkable unanimity of action between trade interests in refraining from pressing sales upon a weak and unwilling market. There was, in fact, no reason for a precipitate decline in most lines of finished Hardware, since prices had not been advanced in ratio with the cost of raw material; this being particularly true of cast iron and copper goods. Owing to the extreme high cost finally reached by ingot copper the prices of its products were necessarily advanced from time to time, and when a reaction, starting in August, culminated in a drop from around 26 cents to 13 cents at the close of the year, a revision of prices in copper wares and related lines became necessary.

Under the stimulus of continued prosperity, backed by the wonderful development throughout the West and Northwest, the Hardware jobbing interests represented by substantial and progressive houses in Milwaukee, Minneapolis, St. Paul, Duluth, Omaha, Sioux City, Des Moines, Kansas City and St. Louis have made rapid and permanent advances. During January and February, and even into March, trade movements in a large section of the Northwest were badly interfered with by a pronounced car shortage, which was further aggravated by blizzards and snow blockades. The stoppage of traffic thus occasioned was largely made up later by the rush of shipments that followed the lifting of these embargoes. The effects of car shortage were also felt to a greater or less extent elsewhere, and contributed not a little in adding to delay of factory shipments.

Building Operations in Chicago for 1907,

as represented by the cost of permits issued, reached a total of $59,094,180, as against the high mark set in 1906 of $64,247,330, the decrease amounting to $5,153,150. When it is considered that the building records of 1906 included four large structures which alone amounted to more than $8,000,000, it will be seen that in spite of unfavorable developments there is little to complain of in the volume of building business. But for the tightening of the money market, which arrested a large amount of building for which plans had already been completed, a new record would doubtless have been established in 1907. The character of building was not of a kind to create a large demand for high grade Builders' Hardware and these lines showed some falling off, but the large amount of factory, warehouse and apartment building undertaken furnished a satisfactory volume of business in medium grades.

Wire and Wire Products Eclipsed All Other Lines

in volume and insistence of demand from consuming interests. At no time during the year up until the middle of November were the mills fully caught up with their orders and able to ship promptly. It was not until the lack of currency made it impossible to move crops that business slackened up. After that time the mills began to receive orders for postponement of shipment because of either present or anticipated difficulty in meeting obligations.

Only one advance of 5 cents on Wire Nails took place during the year; no reduction was made when trade fell off in November and December. A similar advance on Cut Nails was made in August and was maintained with reasonable firmness, although business declined, so that in December a large part of the mill producing capacity was closed to prevent overproduction. The strength of the country at large was reflected in the urgent demand for Fencing Wire, which until toward the end of the year, when financial conditions were seriously disturbed, outstripped productive capacity.

Chicago as a Manufacturing Center.

Added to its established prestige as a distributing center, Chicago has made material gains in manufacture, and is rapidly taking rank as a producer of Hardware goods. Attracted by the superior market facilities af-

forded and the availability of an increasing supply and extended range of iron and steel materials, a number of new enterprises of this character have entered the field within the past 12 months. Influenced by the same causes, more such industries are expected to follow, thereby adding to the growing supremacy of Western manufacturing interests.

Outlook Far from Discouraging.

Despite recent reverses that have temporarily blocked forward progress, the outlook for the future is far from discouraging. And in no field of industrial activity are the indications of a more hopeful character than in the Hardware trade. Business is waiting a solution of the puzzling financial situation, the worst aspects of which have already yielded to remedial measures, and the restoration of normality seems to be gradually approaching. In reckoning with the possibilities of future demand there must be taken into account the vast resources of agricultural districts. These forces can be counted on to support the market by liberal purchases, and when an unrestricted money supply has effected the conversion of crops they will be felt in an increased demand for goods. If the phenomenal activity seen in the first half of 1907 is not realized in 1908, there is at least abundant reason to expect a satisfactory business for this period.

Chicago Wire Nail Prices, 1907.

The course of prices of carload lots at Chicago during 1907, and for several years preceding, is shown in the following table, the monthly prices being averaged from the weekly quotations contained in our market reports:

Month.	1907. $	1906. $	1905. $	1904. $	1903. $	1902. $	1901. $	1900. $
January	2.15	1.94	1.90	2.04	2.08	2.16	2.35	3.53
February	2.15	1.95	1.95	2.05	2.12½	2.20	2.45	3.53
March	2.15	1.95	1.95	2.09	2.20	2.20	2.45	3.53
April	2.15	1.95	1.95	2.10	2.15	2.20	2.45	3.28
May	2.15	1.95	1.95	2.10	2.15	2.20	2.45	2.53
June	2.18	1.95	1.95	2.07	2.15	2.20	2.45	2.48
July	2.18	1.95	1.95	2.05	2.15	2.20	2.45	2.43
August	2.18	1.95	1.87	1.90	2.15	2.20	2.45	2.43
September	2.23	1.96	1.87½	1.75	2.15	2.15	2.45	2.35
October	2.23	2.00	1.95	1.75	2.15	2.05	2.42½	2.35
November	2.23	2.04	1.95	1.77	2.15	2.00	2.35	2.35
December	2.23	2.15	1.95	1.78	2.00	2.00	2.35	2.35
Aver. for year.	2.18	1.98	1.93¼	1.97	2.13	2.14½	2.41	2.76

Chicago Cut Nail Prices, 1907.

The following are the Chicago prices for Cut Nails, car lots, during the year:

January	$2.30	July	$2.33
February	2.30	August	2.38
March	2.30	September	2.38
April	2.30	October	2.38
May	2.30	November	2.38
June	2.33	December	2.38

Average for 1907, $2.34; 1906, $1.96; 1905, $1.84; 1904, $1.84½; 1903, $2.33; 1902, $2.25; 1901, $2.34; 1900, $2.48.

Chicago Barb Wire Prices, 1907.

The course of prices of Galvanized Barb Wire in carload lots, Chicago, in 1907, and for several years preceding, averaged from weekly quotations, is as follows:

Month	1907. $	1906. $	1905. $	1904. $	1903. $	1902. $	1901. $	1900. $
January	2.60	2.39	2.35	2.64	2.68	3.01	2.95	4.13
February	2.60	2.40	2.40	2.65	2.75	3.10	3.05	4.13
March	2.60	2.40	2.40	2.69	2.80	3.10	3.05	4.13
April	2.60	2.40	2.40	2.70	2.77	3.10	3.05	3.88
May	2.60	2.40	2.40	2.70	2.75	3.10	3.05	3.13
June	2.63	2.40	2.40	2.68	2.75	3.10	3.05	3.13
July	2.63	2.40	2.40	2.65	2.75	3.06	3.05	3.10
August	2.63	2.40	2.32	2.42½	2.75	3.00	3.05	3.10
September	2.68	2.41	2.32½	2.20	2.75	3.00	3.05	3.00
October	2.68	2.45	2.40	2.20	2.75	2.68	3.05	3.00
November	2.68	2.49	2.40	2.22½	2.75	2.60	3.05	3.00
December	2.68	2.60	2.40	2.33	2.60	2.60	3.00	3.00
Aver. for year.	2.64	2.43	2.38	2.51	2.93	2.93	3.04	3.39

C. J. Fitzsimmons has purchased the business of Smith & Weimer in Carleton, Neb., and will handle Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting and Athletic Goods.

RETAIL MERCHANTS GETTING TOGETHER.

BY HOOP IRON.

At a recent national retail Hardware convention a delegate from one of the Western States was speaking on the subject of whether the word "dealer" or "merchant" should be used in the name of the association. He said that before the day of associations "junk dealers" would have been the most appropriate name for the Hardwaremen of his State, but now, since they have had a chance to get together, there had been such a slicking up of stocks, and change in the method of bookkeeping and system of doing business, that he thought they might call themselves "merchants."

We must not delude ourselves with the thought because we are doing business in 1907 that we are superior business men to our daddies of 50 years ago. Some of those old merchants who went to New York twice a year to buy goods were merchant princes beside some of the woodchuck dealers who never get but a few rods away from their holes.

The old-time merchant rubbed up against larger and better business heads during their trip and came home with broader ideas and better prepared to increase their prestige in business affairs.

In times of unusual conditions, for instance, like the present financial stringency, a Hardwareman wants to consult with Hardware men. He can read in his morning paper what Mr. Morgan, Mr. Cortelyou or Mr. Bryan says about the situation, which is good so far as it goes, but if he could get the ideas of half a dozen good, hustling Hardwaremen in nearby towns or cities, he can make up his mind much better just how to handle his business in his own town.

The getting together is an absolute necessity to those who desire and expect to better their business conditions, as well as make better citizens, and have a broader understanding of matters and men.

A HARDWARE FIRM'S SAVINGS COUNTING HOUSE.

THE enterprising Hardware house of Amiot, Lecours & Lariviere, Montreal, Canada, whose original and efficient methods have several times been referred to in these columns, has established what is known as "The Savings Counting House of the Staff." This is a scheme somewhat along profit sharing lines, which has been evolved with the idea of encouraging economy and thrift on the part of employees and at the same time stimulating a lively, personal interest in the welfare and progress of the firm. The following

Rules and Regulations

are quoted from a prospectus issued by the firm in which the exceptional opportunities offered to the members of its staff are described:

Those who wish to place their savings with the company will receive in making their first transaction an account book after having given their names, address and occupation.

Interest at the rate of 6 per cent. per annum will be paid to each one except where the money will not be in the hands of the company for at least 30 days.

Each year, on December 31, the interest will be figured out and placed to the credit of each one and will then bear interest. On no other date will the interest be figured out except for closing an account.

Any one having $100 to his credit will have the right by informing in writing the secretary of the company to place that amount in the Profit Sharing System herewith established, in proportion of the year's earning and pro rata for the time the amount will be in the company's hands. This will entitle the owner to participate in all the earnings of the company on the same basis as the capital stock of the company, and these net profits shall be placed to the credit of each one entitled to on February 1 each year, and will then bear interest.

A limit of $1000 is hereby fixed for each one except by permission of the Board of Directors.

Any one having $100 or more invested in the Profit Sharing System described in Article Four will have the privilege to be allotted stock in the company by making application to the secretary.

The company reserves itself the right to refuse to receive at any time funds from the staff for the account of the savings counting house, also the privilege to refund one, a few, or all those having amounts to their credits at any time but without prejudice to acquired rights and privileges.

THE OUTLOOK FOR BUSINESS

From the Retailers' Point of View.

THE business condition of the country is clearly reflected in the activity of the retail trade. The prosperity of individual manufacturers may be influenced by circumstances affecting only their peculiar and necessarily restricted lines; jobbers may experience a temporary slackening in the demand when the retail trade is going on with vigor, but the retailer, speaking generally, is the closest observer of consumption by which in the end both manufacturer and distributer must measure their operations.

With the object, therefore, of securing the most definite and accurate information obtainable regarding the outlook for the coming year, we have addressed letters of inquiry to a large number of representative retail merchants in all parts of the country. Their reports, here summarized and in a few instances quoted in condensed form, will afford our readers the most valuable data by which to gauge the present anomalous situation.

A Complex Problem.

In the first place, it is very generally conceded by our correspondents that the problem before the trade is one of the most perplexing that has ever presented itself. Some of them do not attempt to judge the future by the past, for the past affords no parallel. Their experience in former times of expansion and depression goes almost for naught. Conditions are observed which are not only complex, but distinctly contradictory. The prevailing uncertainty is well voiced by an able and prominent merchant in the Middle West, who writes:

It is the hardest time to figure on future trade that I have ever known. Our country is full of good crops, and farmers are well off. Factories are without orders, and are laying off men, working short time, and closing down entirely in some cases. Those who are working are frightened, and not spending any more than absolutely necessary. Our savings banks are taking advantage of requiring a six months' notice from depositors, and are calling in all call loans. Our business fell behind 12 per cent. in November, and up to December 15 was 26 per cent. behind the same period in 1906. Last week our cash sales were a trifle ahead of the corresponding days last year, which we attribute to the fact that people are buying useful presents instead of luxuries. Most of our stores who cater largely to the holiday trade have cut prices on this class of goods from 25 to 50 per cent. I look for quiet times during January and February, and possibly longer. If we should get an early spring this would help some. As I said before, the country is rich, but every one is wondering what is going to happen next, and the outcome is hard to predict. I do not look for anything serious, but think it wise to go slow.

Paradoxical Conditions.

Looks for Quiet Times.

A similar view is expressed by a Nebraska house, which writes:

It is almost impossible to convey to you the uncertainty which exists in the mind of every thinking man as to what the future may develop. Conservative business men will limit their orders and watch their collections carefully during the coming year. The Presidential election will be a strong factor in business conditions, while the outcome of our 1908 crops will determine our local financial future. As yet business in our section has not suffered very much from the late financial flurry. Reports from over the State indicate that the volume of trade for November and December has been ahead of the corresponding months of 1906. The action of the banks in refusing to pay cash during the few weeks of the flurry has caused a feeling of bitterness in the minds of many depositors, and they will undoubtedly withdraw their money from circulation. We refer to the wage earner and the farmer; business men are banking the same as usual and indorse the action taken by the banks. It is a recognized fact that the Middle West is in the strongest possible condition to withstand a panic, yet our financial affairs are so closely connected with those of the East that we do not feel safe in our strength. We shall note with a great deal of interest the coming issue of *The Iron Age*, and we wish to congratulate the press of the country on the efforts they have made to inspire confidence in the minds of the people.

Political Uncertainty.

Middle West Well Fixed.

Diverging Views.

On the other hand, as would be expected where contradictory conditions exist, there is a wide divergence of opinion. An Ohio merchant expresses views in some respects almost directly opposite to those just quoted:

The year has been an unusually good one with me, much larger in most respects than ever before. I handle a great many Stoves, and the mild weather this fall has interfered with the Stove sales somewhat, but still, even considering the mild weather, my Stove business has been unusually large. In general Hardware, Cutlery, Sporting Goods, &c., the trade has been larger than usual and much more satisfactory as regards profits. The present month of December my sales are ahead of December, 1906. October, 1907, was the largest month's business I ever did. Conditions do not look very bad to me in the future, although I have no doubt there will be a curtailment in the spring.

Just at present money matters are in the same condition as they are in other parts of the country, and there is a feeling of economy in the minds of all business people. Among my business friends I do not find as much fear expressed for the future as among bankers and professional men. There are a few more men out of employment at this time of the year in this city than heretofore, still general trade seems to be excellent in most lines.

Ahead of Last Fall.

Business Men Confident.

An Illinois merchant also takes a hopeful view. He says:

So far our trade for the last three months is ahead of last year for the same months, and we have no complaint to make. We do look forward to rather a quiet trade in January and February—we hardly know how much longer—on account of partial shutdown of factories. We should say, as near as we can estimate it, that there are 25 per cent. of our mechanics out of work. However, we do not expect this to continue a great while.

No Complaint to Make.

Loss of Trade Only Temporary.

A Minnesota merchant argues that wholesalers and manufacturers are experiencing only a temporary loss of trade, due to retailers reducing stocks, which they are doing because they feel sure that prices will go no higher and may go lower. He sizes up the situation hopefully as follows:

We see nothing to show unusual dullness ahead. Trade may not be up to the high record mark, but it will be far above the low record. In the agricultural sections like this, consumption is steadily going on. The lessening of the retailer's purchases is not because he isn't selling, but because he is thoroughly convinced that prices will be no higher, and may perhaps be lower. If this feeling should result in each retailer throughout the United States reducing his stock only $500, it is easy to see that the temporary loss in trade to jobbers and manufacturers would be a vast sum. Consumption may be curtailed to a certain extent, but whatever loss in trade is felt just now by the wholesaler and manufacturer is largely because of the conservative attitude of the retailers. As soon as the retailer is forced to begin buying, the effect of steady consumption in the meantime will become apparent.

Consumption Going On.

Prosperity in Farming Communities.

As has already been brought out, nearly all agricultural sections are prosperous. Crops have been good and

the prices realized for them have been high. The farmers have money and are spending it, as is evidenced by many reports from different sections, extracts from which are given below:

No Danger of Hard Times.

FROM A MERCHANT IN MINNESOTA: Our community, being a farming one, I am not afraid of "Hard Times," nevertheless, I feel it the part of wisdom to be conservative, *i. e.*, expansions should be carefully considered, and all chances discounted. The only thing that makes hard times in a farming community is a total or partial crop failure. This we have not had.

The following cheerful note is sounded by a merchant in New York State:

Scarcity of Help.

Our business has been very good and the outlook for trade for the coming year is excellent. Our farmers are prosperous and all making good money. Help is the only thing that troubles us; it is very scarce and high. We believe the coming year will be better for us than the present closing one.

Don't Feel Depression.

FROM AN OHIO HARDWARE HOUSE: Trade is almost normal with us. Our holiday sales have been quite up to the standard, and we have no complaints to offer regarding the year's business. Our community being dependent almost entirely upon the farming interests about us, we do not feel a slight depression at all. We believe that the outlook for business next year is very good.

Money Plenty.

FROM A MERCHANT IN TENNESSEE: In reply to this will say that our trade, considering the depression in the money market, is good and the outlook as far as we can see is also good. People seem to have plenty of money and are trading quite freely.

Confidence in 1908.

FROM A MERCHANT IN MICHIGAN: We believe the outlook is good from the fact that the farmers have received good prices for their crops. Our customers are chiefly farmers, and they all seem to have plenty of money and are buying seasonable goods. While there has been no doubt some retrenching and more or less caution in the future in assuming new obligations, we have confidence in 1908 developing into at least a fair business year in the face of present conditions and Presidential year. Prosperity is more firmly intrenched, and we find a large percentage of our customers not deeply in debt, and have been able to meet their obligations when due during the fall and winter.

Financial Optimism.

The following letter from a merchant in the Northwest emphasises the financial strength of the farmers and of the banks of his section:

We were blessed with a good average of all crops, except corn, which did not get fully ripe. The prices for all farm products more than made good. Trade and collections were starting finely, when in the twinkling of an eye we "went bump." Trade will not recover its momentum as rapidly, but the outlook for the early future is most encouraging.

The farmers have the means; they can get an occasional man to work. The improvements prosperity (?) has delayed are greatly needed, and I believe will now be made.

While Eastern mortgage loaners have "put on the lid," and "call" the expirations, the man's *neighbors* have the money in bank, and are gleefully exchanging 4 per cent. for 7. In such a situation, how *can* we be pessimists?

Effects of the Financial Stringency.

In some agricultural districts, however, the effects of the November financial flurry have been more or less severely felt, and recovery has been slow. Many merchants suggest that if a moderate trade is enjoyed during the opening months of the year they will be more than satisfied. A well-known merchant in the Northwest differs from the writers of the letters just quoted. He says:

Business was very good in this vicinity until the Wall Street flurry broke in on us, and since then it has been different. An agricultural community would naturally feel such a financial depression quicker than any other, for the reason that prices of the products of the farm were the first to suffer in price. Farmers could not market their produce at all for a time, and since money has been obtainable for moving crops, there has been little desire to accept the lower prices. Some schemers have undoubtedly used these conditions as an excuse for hoarding. While sales have been as good, or ever better that might have been expected under the conditions, collections have been something fierce. Our people are hopeful that after the New Year prices will gain somewhat, and business, as well as collections, will pick up. At any rate, our customers have promised not to keep us waiting very long after January 1. I do not look for trade to increase enough after January 1 to make up for losses sustained during the past two months, but I do believe that January will be a better month than ordinary, by reason of the conditions that have prevailed for the past 60 days.

Farm Products Lower.

Improvement Expected.

The difficulty in marketing farm produce is also noted by a merchant in Wisconsin, who writes:

Local Effects.

Our business up to about November 1 was exceptionally good. Since then we have felt the effect of the money flurry, especially since our farmers have been stopped, to a great extent, in marketing their produce. The past week, however, owing to the fine weather and the Christmas buying, our trade has assumed its natural proportions. The main manufacturing interests of our vicinity are paper and pulp mills. These mills are also feeling the effects of the markets and the lack of orders. Nearly all the mills have been closed down for from one to two and three weeks making repairs. We rather expect a quiet trade for the balance of the winter, but hope that by spring things generally will assume normal proportions.

This is the way it looks in the cotton country:

Premiums on Currency.

Business was good this year up to the first of October, since which time it has steadily declined, and the prospects for the next month or two are anything but good. The St. Louis banks are still charging a premium on currency to move the cotton crop, and at the same time they claim that the panic is over. The farmers, that is, a great many of them, are holding their cotton for 15 cents, the price fixed early in the season. This makes business dull and collections very slow. We are not expecting very much business nefore next spring.

Criticism of the Banks.

In this letter may be detected a note of bitterness against the policy adopted by the banks, which is distinctively sounded by several others. Another merchant in the cotton district writes:

From the time that the banks quit paying, business has been dull, and the future outlook depends entirely on the resumption of payments by the banks. As soon as this is brought about we can look for a fair business.

A clear statement of one correspondent's view of the responsibility of the banks is also given in the following forecast:

Depends on Banks.

We believe that the first half of 1908 will fall 25 per cent. below the sales in 1907. The last half of the year will depend entirely with us on how the Eastern banks handle their cash, and the cash they hold as reserve agents for the Western banks. Our trade this fall would have been normal if the Eastern banks had sent us the money due us. Prices on farm products are high and crops average good. In all farming communities where new settlers are coming in every year the demand for farm loans is great every year. When our banks have their cash tied up in the East they cannot loan, and therefore merchants must also curtail their sales. We believe, however, that 1908 will, in the end, turn out as good a year as 1907.

Need of Cash.

From Manufacturing Sections

reports are not very encouraging. Owing to the scarcity of orders, mills and factories are being partially shut down, although some are trying to keep all hands

employed on reduced time. A few are courageously accumulating stock. A prominent Massachusetts house writes:

The outlook for trade in this particular section is not very encouraging for the next two months. Most of our factories are running on short time, and a good many are shut down entirely. There will be very little building, and the tight money market also adds to the trouble. We have an impression, however, that things will look brighter by the first of next year, and that business ought to commence to pick up during March and April.

A HOUSE IN PENNSYLVANIA SAYS: We are sorry to say that business in this section seems to be slowing up each day, and the outlook for the future in our opinion is not very promising.

Another Pennsylvania merchant writes as follows:

There has been a very serious falling off in the demand for coal in this vicinity, and the price has declined. The furnaces in this vicinity cannot find any market for their iron, but are still in blast, stocking their iron. The farmers are in a very prosperous condition, and to date local trade has held up well, but, all things considered, we look for a very quiet January and February. There seems to be great hesitancy on the part of the country merchant placing orders for futures, and their immediate requirements they are buying very conservatively.

No Market for Iron.

FROM A MERCHANT IN NEW YORK STATE: Indications point to but little activity in business for Hardware merchants in this section. We have little hopes of improvement before April, but believe that with the opening of spring business will be good.

FROM A MERCHANT IN NEW HAMPSHIRE: Present conditions in this vicinity indicate a falling off in business to quite an extent. Many manufacturers are running their plants under reduced hours or smaller forces, but in many cases we believe this condition to be owing to the financial stringency rather than to a shutting off of demand for goods. We are looking for a quiet season for the next two months, and for a year perhaps of comparatively quiet conditions after the season of high pressure of the past five years. We expect a dull season in building and extension of manufacturing plants.

More Encouraging Views,

however, are to be heard from the same sections, indicating that the outlook is not entirely devoid of hopeful features. One Massachusetts merchant says:

The situation locally is distinctly hopeful. Our mills as a rule have reduced their hours of labor instead of discharging help, so that while the help are receiving less pay, they are not entirely thrown out. The farmers and country stores are apparently prosperous, and the holiday business now going on, while less than a year ago, is still of fairly good proportions.

FROM A MERCHANT IN NEW YORK STATE: The panic in New York did not seem to affect us here very much. There was a little uneasiness for a few days, then business returned to its natural level. Our holiday trade is first class, and there is some building going on in the village, more than there was a year ago. This may be due to some distrust of the banks or to the fact that building material is slightly lower in price. There is about the same amount of work going on this winter, and our factories are all running full time with the usual amount of help. So far as we can see trade will be as good this winter as last or the year preceding.

A prominent merchant in the heart of the Connecticut manufacturing district takes a decidedly hopeful view. He says:

Up to the present time our retail trade has been quite satisfactory, and we have not felt the effect of the stringency in the money market to any great extent. The holiday business seemed a little slow in starting, but for the past day or two it seems to the writer that it is up to a normal condition.

Holiday Trade Normal.

Our manufacturers are taking a very conservative course, having reduced working hours quite materially and many of them shutting down for a longer period than usual for the holiday season. The effect of these short hours and shutting down is not felt by the retail trade suddenly; we will see the effect of this more when the spring season opens. It does not seem that we can experience extremely dull business, for the reason that, as I understand it, none of the manufacturers have any large stock of goods on hand. I think this is the condition of manufacturers throughout the country. This season of short money has had a tendency to curtail production, and I believe that this has been one of the best things that could have happened at this time.

Manufacturers' Stocks Small

Manufacturers everywhere have been unable to fill their orders and have increased their capacity seemingly to almost an absurd limit; we have all predicted a reaction sooner or later, and yet none of us seem to have been prepared for it. It seems to me that this lesson will put a stop to increase of production until another boom strikes the country.

Certainly the manufacturers of this country could not go on increasing their production as they have done during the past three or four years and find an outlet for the goods that this increase would produce, so that, as I have said, I feel that this is simply a condition that eventually had to come, and this probably was as good a time for it as any future time could have been.

Over Expansion Had to Cease.

THE TAYLOR INSTRUMENT COMPANIES.

THE TAYLOR INSTRUMENT COMPANIES, Rochester, N. Y., has lately been incorporated with a capital of $535,000. This corporation is the outgrowth of the Thermometer business established in 1851 by George Taylor, who retired temporarily from the business about 1859. About 1865 the business was revived by Frank Taylor and H. G. Richardson, under the name of Taylor & Richardson. In the early 70's, owing to ill health, Mr. Richardson retired and George Taylor and Frank Taylor became associated under the name of Taylor Brothers. Under this style the business was continued until 1890, when following the death of George Taylor it was incorporated as Taylor Brothers Company.

Since that time the Taylor Brothers Company has acquired the business of the Hohmann & Maurer Mfg. Company, manufacturer of Thermometers and Gauges for industrial purposes; Watertown Thermometer Company, manufacturing a general line of Commercial Thermometers and Thermometers for advertising purposes; Short & Mason, Ltd., of London, England, manufacturing Aneroid Barometers, Compasses, Recording Meteorological Instruments and Minor Surveying Instruments; the H. & M. Automatic Regulator Company, owning valuable patents on temperature and pressure regulation and control for domestic as well as industrial purposes, and the American branch of the Cambridge Scientific Instrument Company of Cambridge, England, manufacturing an extensive line of thermometric and other physical apparatus, mostly electrical, both for industrial and educational purposes.

The business thus founded by George Taylor more than fifty years ago, from manufacturing in a very small way the most ordinary types of Commercial Thermometers, now covers not only the entire field of commercial, industrial and scientific thermometric application, but meterological instruments of all kinds as well as an extensive line of surveying, engineering and scientific apparatus. The officers of the Taylor Instrument Companies are G. Elbert Taylor, president; J. Merton Taylor, vice-president; Herbert J. Winn, treasurer; Henry W. Kimmel, secretary, the directors being as follows: G. Elbert Taylor, J. Merton Taylor, Frank Taylor, Edward Bausch, Henry W. Maurer, H. J. Winn, Isaac Mayer, M. H. VanBergh and John W. Taylor. The company has branches in New York City, Chicago, Boston, St. Louis, Philadelphia, and London, England.

On January 1 D. L. Hamill, Buffalo, N. Y., jobber of Plumbers' Supplies, &c., was succeeded by D. L. Hamill Company, D. L. Hamill, president and treasurer, and Geo. Salzman, Jr., secretary. The business remains under the management which has conducted it successfully for more than a dozen years.

System for the Retailer.

Eighth Article.

DELIVERY OF GOODS.

BY JOHN A. MANSON, BURLINGTON, VT.

HANDLING orders to be delivered is one of the most important matters in the conduct of a business, for over half of the business of many merchants involves delivery of some kind—orders received by mail, orders received on the telephone and orders taken by salesmen and clerks—some of these orders are to be charged, some paid for and some to be paid for when delivered. Goods to be called for at some later time than when ordered should also be handled as delivery transactions. In addition, goods occasionally have to be credited to a customer, and the merchant is requested to call at the customer's for them. Now and then there is a no-charge transaction or a transaction that becomes void through non-ability to fill.

Some method to safeguard these varied transactions and insure prompt and definite results and prove that no goods are being delivered without having been charged or paid for, is most important in these days of sharp competition and close profits. Soon after starting in business I felt the need of some kind of register, follow-up and check-off, on all delivery transactions, something that would be thoroughly adaptable to a moderate sized business and prove that all delivery transactions were appearing in the charges and cash sales. Being unable to find on the market just what seemed neecssary, I finally developed, after considerable test and practical application, Manson's Delivery Record,* an idea of the arrangement of which is given herewith.

With this book in use all transactions can be followed up systematically—every entry is called to account and records are obtained showing that all delivery charges and cash sales have appeared in the charges and cash sales of the day. The object in indicating in "What" column the nature of the goods or the customer's order number is to identify that transaction. Should any question come up regarding the delivery of an order, reference to the book gives particulars. In many businesses more than one carter is employed who makes deliveries; under "Delivery" is noted who delivered, so that when carters' bills are brought in a check-up on each delivery is readily obtained. The book can be used to record any kind of delivery transaction that is apt to come up in store, shop or factory.

Referring to the illustrations, which represent broken away portions of one page of the book, the significance of the various headings will be seen. Under "Date" is noted the month and day; "Who" gives the customer's name; "What" the nature of the goods ordered; "Where" the place of delivery or place of business; "When" the time goods are wanted. The foregoing are the essential particulars regarding the entry of an order for delivery.

Under "Delivery" are the following divisions: "When," under which is noted the time of delivery; "How," the name of the carter, messenger or customer who took the goods, or if they were sent by freight, express or mail; "Checked By," the name of the person who checked the goods out of the place of business.

The orders of the day, those left by customers, those received by mail, telephone or telegraph, are at once entered, as shown in Fig. 1, and then handed out to be filled. It is suggested that in an ordinary business deliveries should be superintended and checked out by one person, who sees that the proper entries regarding deliveries are made and who uses the book as a follow-up on every transaction.

DATE	WHO	WHAT	WHERE	WHEN	DELIVERY WHEN	DELIVERY HOW	DELIVERY CHECKED BY	TRANSACTION	REVIEW CHECK
May 25	H. E. Thomas	Tools	99 Hickok St.	9 A.M.				P	
	Otter Lumber Co.	Order No. 5741	Mill	10 A.M.				b	
	R. J. Jones	Roofing for Credit	16 Elm St.	to-day				R.	
	F. M. Godfrey	Machine Screws	56 Penn St.	4 P.M.				b	
	Simons & Rundt	Belting - due $6.25	J. B. & F.	to-day					
	Richards Mfg. Co.	Nails & Hangers	Shelburne Vt. 6 V ft	to-day				b	

Fig. 1.—Delivery Record, Showing Entries.

DATE	WHO	WHAT	WHERE	WHEN	DELIVERY WHEN	DELIVERY HOW	DELIVERY CHECKED BY	TRANSACTION	REVIEW CHECK
May 25	H. E. Thomas	Tools	99 Hickok St.	9 A.M.	9 A.M.	Lander	Prouty	P	
	Otter Lumber Co.	Order No. 5741	Mill	10 A.M.	10 A.M.	Muir	Prouty	b	
	R. J. Jones	Roofing for Credit	16 Elm St.	to-day	2 P.M.	Lander	Prouty	R.	
	F. M. Godfrey	Machine Screws	56 Penn St.	4 P.M.		Void.			
	Simons & Rundt	Belting - due $6.25	J. B. & F.	to-day	4 P.M.	Simons	Prouty	P.	
	Richards Mfg. Co.	Nails & Hangers	Shelburne Vt. 6 V ft	to-day	4 P.M.	Muir	Prouty	b	

Fig. 2.—Delivery Record, Showing Entries and Deliveries.

DATE	WHO	WHAT	WHERE	WHEN	DELIVERY WHEN	DELIVERY HOW	DELIVERY CHECKED BY	TRANSACTION	REVIEW CHECK
May 25	H. E. Thomas	Tools	99 Hickok St.	9 A.M.	9 A.M.	Lander	Prouty	P	5/25
	Otter Lumber Co.	Order No. 5741	Mill	10 A.M.	10 A.M.	Muir	Prouty	b	5/25
	R. J. Jones	Roofing for Credit	16 Elm St.	to-day	2 P.M.	Lander	Prouty	R.	5/25
	F. M. Godfrey	Machine Screws	56 Penn St.	4 P.M.		Void			5/25
	Simons & Rundt	Belting - due $6.25	J. B. & F.	to-day	4 P.M.	Simons	Prouty	P.	5/25
	Richards Mfg. Co.	Nails & Hangers	Shelburne Vt. 6 V ft	to-day	4 P.M.	Muir	Prouty	b	5/25

Fig. 3.—Delivery Record, Showing Transactions Checked in Full.

* Published by David Williams Company, 14-16 Park place, New York. Canvas cover, $1. Heavy manila cover, 50 cents.

In Fig. 2 the record shows the entries and deliveries. The key to the nature of the transaction is as follows: "C" stands for charges, "P" for payment, "R" for goods returned for credit, "N" for no charge, "V" for void, "F" for forward. The letters "T.B.C.F." are used in the "Where" column to indicate that goods are in the place of business and are to be called for.

The transactions checked in full for the day are shown in Fig. 3. The person who reviews the business of the day notes under "Review Check" the date when each transaction was verified with the day's charges and cash sales, or became void, or was disposed of, or was carried forward. In an ordinary business all orders not disposed of should be carried forward once a week.

Indiana Commercial Club Condemns Parcels Post.

THE Postmaster-General, having addressed a letter to the Commercial Club of Richmond, Ind., asking for its opinion of his proposed parcels post legislation, the club replied in part as follows:

There is a deficiency at the present time in the postal service each year of over $10,000,000. Under this proposed change this deficit would be greatly increased. The deficit as it is does not flatter the postal management, and to increase it for the benefit of a small number of traders in large cities would be the worst kind of class legislation.

Now as to the effect on the local retail merchant. The retail merchant does not care to do a mail order business. He does not carry a stock that can be catalogued successfully. His business depends on customers coming to his store. Mail orders to local merchants mean a credit business, whether the orders come by mail or by telephone, and a credit business of this kind is unsatisfactory, as every retailer in this city will verify.

If the local retailer should go into the mail order business, and thus tend to keep trade from visiting his place of business, he would seek the low rent section of the city, and the appearance of our principal thoroughfare would be changed.

The saving to the local merchant in postage, as business is now conducted, would be very little. At the present time the rural carrier is allowed to deliver goods on his route with or without pay as he chooses. Under this new law all this is stopped.

The local merchant gets no benefit in obtaining supplies of goods for his own use, as this does not apply to wholesale quantities.

The wholesaler, and in most cases the manufacturer, depends upon the retail merchant. If he is successful, they are prosperous. If the retail merchant's business declines, the wholesaler shares in the depression.

The fact that the wholesale interests of the entire country are against the parcels post is evidence conclusive that it will be detrimental to the retail merchant, and the retail and wholesale interests are the life and backbone of the city.

We believe that any intelligent farmer who studies the full effect and meaning of domestic parcels post will condemn it. The wise farmer knows that his home market is his best friend. He knows that when his home town is filled with life and trade he shares in its prosperity.

The mail order houses have had unbounded prosperity in the past at a 16-cent mail rate. Now reduce this 25 per cent., or to 12 cents, and they will profit still more. A certain mail order house would save $40,000 a year alone on mailing their catalogues by this reduction.

Parcels post encourages long distance transactions, which is a condition that merchants in cities of our size and smaller have been trying to discourage as a matter of self-preservation.

Is there a demand for a domestic parcels post? If so, from what source?

The farmer is not demanding it. The laboring man is not demanding it. Practically every jobbing and manufacturing association of the United States is on record against it. Who have we left as being for it? The answer is plain.

It is the conviction of your committee that the passage of a domestic parcels post such as proposed would be detrimental to the business interests of our city, in that the disadvantages far outweigh the advantages of such proposed legislation.

It was accordingly resolved "that the Richmond Commercial Club is opposed to the passage of a Domestic Parcels Post measure, such as proposed by our Postmaster-General."

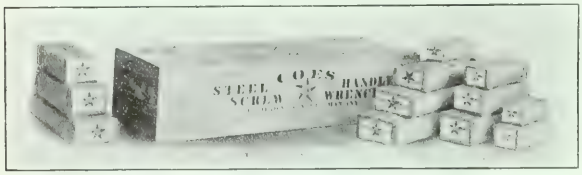
An Ingenious Holiday Greeting.

THE BERNARD GLOEKLER COMPANY, Pittsburgh, Pa., manufacturer of Refrigerators, Store Fixtures, Butchers' Supplies, &c., is extending the season's compliments to the trade by means of the clever design here reproduced, which is stamped on correspondence, &c. The device is ingeniously contrived so that a horseshoe, the recognized symbol of good luck, forms the letter C of the word compliments, in the familiar phrase "Compliments of the season." The original idea is such as to attract attention, and those who receive this kindly expression should be put in good humor by it.



The Coes Wrench Company's Assortment Case.

THE COES WRENCH COMPANY, Worcester, Mass., has found that an important factor in introducing its line of steel handle Star Model Screw wrenches to the trade is what is termed an Introduction Assortment Case, which is shown in the illustration. It goes to the retailer through the jobber only, and no merchant gets more than one case. The theory is that many houses would have had this Wrench before if there had been a way to get a starting stock. The contents of the case provide such a stock, for it contains five and one-third dozen Wrenches of assorted sizes. There are a dozen each of the 6, 8, 10 and 12 in. sizes; two-thirds dozen of 15-in., and one-third dozen each of 18 and 20 in. Wrenches. The case weighs 230 lb. gross, which covers minimum freight charges to any point. The merchant who receives the assortment is given an excellent opportunity to try the Wrench on his trade, and the Coes Company states that it is satisfied to abide by the results in their effect upon the retailer's future buying.



Assortment Case of Coes Wrenches.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

SPECIALTY MFG. COMPANY, St. Anthony Park, Minn.: Catalogue illustrating Grass Catchers, Mechanics' Aprons, Hose Holder, Detachable Hose Rack, &c.

JOHNSON HARVESTER COMPANY, Batavia, N. Y.: Catalogue relating to Binders, Mowers, Steel Hay Tedders and Rakes, Reapers, Corn Binders, Disk Harrows, &c.

ECLIPSE REFRIGERATOR WORKS, Burlington, Vt.: Illustrated catalogue for 1908 of Eclipse Cleanable Refrigerators with removable ice chambers.

BUTLER BROS., Chicago: Midwinter edition of "Our Drummer" catalogue in which special attention is paid to Tinware, 5 and 10 cent goods and Hardware specialties.

BALDWIN REFRIGERATOR COMPANY, Burlington, Vt.: Large illustrated catalogue referring to an extensive line of domestic and grocers' Refrigerators, Ice Chests, Coolers, &c.

IMPERVIOUS PACKAGE COMPANY, Keene, N. H.: Illustrated price-list referring to Wood Drums, Kits, Kegs, Buckets, Oil Cans, &c.

AUSTRALIAN NOTES.

FROM OUR SPECIAL CORRESPONDENT.

MELBOURNE, November 25, 1907.

IT is doubtful if the general trade of any country in the world is so dependent on weather conditions as this continent, and in no other country in the world is the weather more erratic. When meteorology is a thoroughly understood science and when this science can be turned to commercial use, then Australia will come with a jump into the forefront of the nations.

The reason for its dependence on weather conditions is not far to seek, because its primary industries are wheat and wool. Its mining industry is also dependent on good average rainfalls inasmuch as without rainfall machinery in the back country cannot be driven and cattle for trucking die. For the past couple of months the weather has been the chief subject of talk out here as the spring rains have almost entirely failed. The past day or two has given us a slight rainfall over a large area, but a fall of several inches is required before the sun gets too hot.

The price of all cereals is pretty well doubled, and the railroads have got every available truck booked for weeks ahead for the purpose of shifting starving stock from one part of the country to the other. Shearing is in full swing in the northern States, and in spite of the increase in sheep it is expected that we shall have less wool. This is due to the fact that last year the fleece had a growth of 13 months with a good season, against one of 11 months this year with a poor season, and sheep are cutting on an average nearly a pound of wool less per head this year.

So far the weather can scarcely be said to have had a direct influence on the Hardware trade. Traders are, however, watching the situation pretty closely, and living in hope that even yet a general rainfall may come. If it does not orders will drop off pretty suddenly in the very near future. It may be a pessimistic outlook, but it is no use being optimistic in the face of hard facts.

Australia's Trade for 1906.

Financial statistics have recently been made available, showing that the total Australian trade (imports and exports) during 1906 amounted to £114,500,000 sterling, showing an increase of over £19,000,000 sterling, as compared with 1905. Of this £19,000,000, £6,000,000 were represented by imports and £13,000,000 exports. Iron and Hardware imports during 1906 totaled roughly £45,000,000, of which £26,000,000 were from the United Kingdom, less than £5,000,000 from America and £13,000,000 sterling from other countries.

Irrigation Works

are being pushed ahead rapidly, especially by the New South Wales Government. A huge dam is being erected by Barren Jack, which, when completed, will give one of the largest reservoirs in the world, calculated to hold considerably more than all the water in Sydney Harbor. The dam itself is to be built of red granite in 10-ton and 15-ton blocks. The hight from top to bottom will be about 240 ft., and it will be about 200 ft. in width at the bottom, narrowing to 20 ft. at the top.

New Hardware Clerks' Association.

The New South Wales Hardware Assistants' and Trade Association has recently been formed on the lines of the Victorian Association of a similar style. The Victorian organization has been in existence a good many years, has built up an institution on healthy lines, is in a sound financial position, and has admittedly been of vast benefit to the younger members of the trade in keeping them together, promoting friendly feeling, and securing positions for them. It works with the full cooperation of the employers, and has such enthusiastic backing that early in the coming year it will occupy very handsome clubrooms in Little Collins street, Melbourne, in the heart of the Hardware community of the city.

H. R. IVES COMPANY, Montreal, Canada, states that newspaper reports of the fire which lately took place on its premises were much exaggerated. The entire loss on building, machinery and stock was less than $12,000, of which but a comparatively small amount applied to machinery.

TREE BRAND CUTLERY.

HERMANN BOKER & CO., 101-103 Duane street, New York, manufacturers and importers of American, English, German and French Cutlery and Hardware, Steel and Metals, are giving particular attention to the marketing of their Tree Brand Cutlery, which, although but one of several important departments of their business, is one on which increased effort is being concentrated. Tree Brand Cutlery covers large assortments of Pocket Knives, Razors, Shears, Scissors, Manicure Articles and other Cutlery in solid dozens or fancy cases. The most active numbers are liberally stocked in New York and illustrated and described in their latest catalogue, which will be sent on application. The familiar brand, as here illustrated, has been sold in this market by Hermann Boker & Co. for more than half a century and long in the principal foreign markets of the world. The New York house of Hermann Boker & Co. was established in 1837, the brand itself symbolizing growth. H. Boker & Co. originated the Tree brand about 75 years ago, and ever since have owned and controlled it for high grade products, made both in Solingen, Germany, and at the American works. The trade in these goods has steadily increased, both in quantity and value, it being asserted that there is not a jobbing center where the goods are not known and dealt in.



It is conceded by Cutlery makers that the best process for making Pocket Knife Blades is by the old method of hand forging, as are all blades of this brand, thus producing uniformly high grade results. The essential characteristics of this brand in the various lines are quality and cutting edge, finish, patterns and price, the relative importance, from the manufacturers' standpoint, being in the order named. Tree Brand Cutlery is warranted to cut sharply and keenly and hold an edge with fair usage. All blades and similar parts are made of S. & C. Wardlow's Sheffield steel. The hardening and tempering of each blade is done singly and separately and similarly tested to detect flaws, while the various parts are frequently inspected during the numerous stages of manufacture. The manufacturers have assembled during the long years a community of skilled and experienced labor. Costly experiments have been made in improved methods of grinding to be discarded for that of hand grinding, than which no process as good has yet been developed, in this instance the house using the so-called "English system," employed also by the best known and most famous English cutlers. In forged blades the fiber of the steel is made homogeneous and tough, and from it a keen, lasting cutting edge is possible, it being an accepted fact that the finest tools are hand forged.

Staple, special and fancy patterns and new models are added liberally every year, and the product is sold under full warranty. The sales last year, we are informed, aggregated several hundreds of thousands of dollars in this market, on which all claims of dissatisfaction totaled less than $700, and of the latter amount an actual inspection and test showed that more than 60 per cent. of the value claimed was for Knives abused or worn out.

FOLLOWING its usual custom, Sickels, Preston & Nutting Company, Davenport, Iowa, has recognized the holiday season by sending to its friends and patrons a handsome brochure containing six modern paintings effectively reproduced by color photography. The pictures are each mounted on a large mat and are entirely suitable for framing, although making a very pleasing collection in the form in which they are distributed.

Hardware Store Conferences.

CHANDLER & BARBER, Boston, Mass., make a feature of monthly conferences with their principal salesmen and endeavor to introduce some new subject or revive some of the older matters which have been allowed to lapse and which need brushing up. Occasionally it is found desirable to invite a specialist on a certain line and give up nearly a whole evening to that one subject. Some time since, for example, Mr. Leeds, connected with the Russell & Erwin Mfg. Company, New Britain, Conn., delivered an interesting talk on the subject of Door Checks and Unit Locks, dwelling on the mechanical features and the various reasons for their adoption, and illustrating by means of the goods properly arranged for this purpose. This information is especially valuable, as it enables the store salesmen to talk intelligently on the subject.

These meetings are also taken advantage of to call attention to certain lines of goods which need to be moved and to discuss with the salesmen the best means for disposing of them. In fact, all of their work is gone over, not in the spirit of criticism, but in a friendly conference of employers with employees as to the ways and means of best conducting business, the employers urging upon each of their employees to be ready to give suggestions. The spirit of mutual helpfulness is a large factor in conferences of this sort.

Occasionally time is taken to go out to supper, but generally it has been found more satisfactory to the employees to go out and get a light collation and get back within a short time, so as not to make the conference a late one, the deliberations usually ending at 8.30 or 9 p.m. Where it has been advisable to ask all the employees to stay the firm has found that a few minutes right after the closing time, usually not over 15 minutes, has been sufficient.

Importers' Automobile Salon.

THE fourth annual automobile exhibition of the Importers' Automobile Salon, Inc., opened Saturday evening, December 28, in the Madison Square Garden, New York City, and will continue until January 4. This handsome display is strictly one of fine foreign motor cars for many purposes, but in the accessories there are some domestic exhibits. The decorative scheme includes a tunnel-like archway, with Louis Quinze decorations and Pals' famous conception of the "Spirit of Speed." There is also a long colonnade reaching across the Madison avenue end, a central figure or group of four figures at each corner of a pedestal, surrounding which is a plastic representation of the "Spirit of Speed," together with a fountain in a basin 30 ft. in diameter. The Garden arena has been transformed into a Parisian Boulevard scene. The signs bearing the names of the automobiles are internally lighted by electricity, artistic drapery dividing the numerous exhibits. New Year's Eve and New Year's Day were signalized by some unique features, the most noteworthy being a spectacular carnival, in which oxen, Hindoos carrying a palanquin, Japanese using a jinrikisha, Egyptians, Romans and Greeks in their chariots drawn by horses, Medes and Persians using elephants for locomotion and transportation, participated. The age of steam was represented by an engine, followed by bicycles, and, finally, the triumph of modern genius in the field of locomotion and transportation—the automobile.

The Lefever Arms Company.

THE LEFEVER ARMS COMPANY, Syracuse, N. Y., has announced its 1908 schedule of retail selling prices, the purpose of which is to insure a satisfactory profit to the merchant on the company's line of high grade Guns. The sale of these Guns is confined to Hardware jobbers and retailers and Sporting Goods houses, orders from catalogue and mail order concerns not being accepted. That the effort to insure satisfaction on the part of the trade from handling its product is appreciated is referred to as evident from the fact that the company's business has increased to such an extent during the past year or two as to necessitate the erection of a large addition to the plant, which is now under construction. A large amount of machinery of the most approved type is also being installed.

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NEWHOUSE GAME TRAPS.

THE name of Sewall Newhouse is linked with the manufacture of Game and Animal Traps the world over, and he is known as the pioneer in the origin and production of devices for catching game, whether for food, pelts or protection from attacks of dangerous beasts, ranging in capacity from bear and larger game to pests, such as gophers and rats. As the trade knows, the making of Traps for hunters was the first attempt at manufacturing by the Oneida Community, established at Oneida, in central New York, in 1848, expanding with time until factories were also built at Sherrill and Niagara Falls, N. Y., and Niagara Falls, Canada, turning out in addition silver plated ware, sewing silks and canned goods, but it is with Traps, Chains and similar accessories that this article is concerned.

The Indians and bushmen were not without skill in trapping, though their implements were necessarily crude. The old-fashioned "tree fall" was one of the earliest devices, and it felled an animal as with a bludgeon. In those days furs were regarded more as a necessity than as a luxury. Farmers had long hauls to market in zero weather. They went bundled in rough furs set together more for comfort than fashion. It is the same way in Canada to-day with lumbermen, farmers, teamsters, &c. It was under such primitive conditions that in 1848 the Oneida Community undertook to reclaim a wilderness in central New York. Led by John Humphrey Noyes, they settled on the old Indian reserve, now Kenwood, near Oneida. These pioneers were largely rugged New England farmers and mechanics, who had inherited force of character, strict integrity and a certain hardihood and grim determination from their Puritan forefathers. Conspicuous among them was Sewall Newhouse, one of those ingenious and inventive souls whose fertility of resource enable them to adapt themselves to any surroundings. To his gifts as a trapper and hunter was added rare mechanical skill.

It happened that there was a rude blacksmith's forge on the land secured by the Oneida Community. It was found there, so that by happy coincidence there was a "forge for Newhouse and a Newhouse for the forge." It was at this forge that Sewall Newhouse laboriously hammered out his first Steel Traps by hand. It was noticed that they had a relentless grip. They did not lose their tenacity from use or exposure to the elements. Indeed, one of those old, original, hand forged Newhouse Traps was recently found in an out of the way region where it had lain for many years forgotten; but the spring and the snap were still there ready for use, in spite of grime and surface rust. The first demand for these Traps naturally came from the immediate neighborhood. The Indians and farmers' boys used to come and beg or barter for the Traps when they could not pay in money. Wild and dangerous game rendered the Traps a protective necessity, aside from considerations of sport or trade; and professional trappers were quick to appreciate the build, and mechanism of the Traps. They gradually found their way into the stores, and additional forges had to be set up to keep pace with the demand. Mr. Newhouse broke in the young men of the Community, teaching them how to make the Traps; so that he soon had a corps of efficient assistants. Large orders began to come in from important customers, including the famous Hudson Bay Company, with its great trade in furs.

The growth of the demand necessitated the introduction of machinery; the business had outgrown the limitations of manual labor. Machinery gave great impetus to the output. Traps were soon turned out in seven sizes by the thousand dozens. The addition of further machinery from time to time was simply a matter of detail. A point that is interesting to note is that the greater part of this machinery was invented on the spot by the Community's own men. The output of the factory now reaches the figure of about 4,000,000 game Traps a year.

THE wholesale Hardware stock of McVoy, Wessling & Co., 74-76 West Lake street, Chicago, was badly damaged by fire on December 26, the loss entailed being estimated at $100,000. Although not entirely consumed by flames the unburned contents of the building were all more or less injured by smoke and water. Temporary quarters were immediately secured at 22 East Lake street, where the company's offices are now established. Business will be conducted at this location pending the adjustment of the loss and the installation of a new stock. Whether the business will be continued at the former site has not been determined, but in any case will be resumed with as little delay as possible, either there or in new quarters.

FOREST, FISH AND GAME SOCIETY'S EXHIBITION.

THE first annual Forest, Fish, Game and Sportsmen's Exhibition, under the auspices of the Forest, Fish and Game Society of America, opened December 23 in the Grand Central Palace, New York City, and will continue until January 4. There are many features that make it distinctively a sportsmen's show, characteristics that are designed to be permanent. There are exhibits of wild game animals in cages from bears to lynxes, beautiful pheasants, &c., numerous specimens of water fowl, including ducks, geese, swans, ibises, &c., game fish, both in the large open tank shared with the water fowl and beaver and fish in transparent glass tanks, together with trout and other fish eggs in various stages of development. There are innumerable fine exhibits of forest scenes of an educational character photographed on large sheets of glass, the effects of which are brought out both by artificial and natural light, showing approved methods of forestry, clearing up and burning brush scientifically, the planting of trees, correct lumbering methods, &c., with a view to inculcating correct knowledge as to the propagation and preservation of forest preserves. In the art rooms are examples of animal life in oil and water-color by Rosa Bonheur and others, photographs of game, specimens of taxidermy, a generous display of Arctic Club flags carried by Peary, Wellman and others, studies in oil of Arctic scenes, boats and sun dials built in the Arctic regions and many other kindred displays. The frequent programmes of moving pictures at half hour intervals, both afternoon and evening in the main auditorium, which can be seen from both sides of the three floors, depict hunting scenes of domestic and foreign character, even to hunting elephants in India, as caught by amateur photographers on numerous expensive jaunts. They all have an educational value, some of the subjects being tuna fishing, quail shooting, uses of the dog, caribou and moose hunts, ostrich and broncho training, tarpon fishing, &c.

Some exhibits are given under the auspices of the Audubon Society for the protection of wild birds and animals, and the New York Zoological Society, and there is a school boy rifle shooting tournament supervised by the National Rifle Association of America and the Public Schools Athletic League of New York for individual and team shooting under United States Government regulations, using army rifles and open to all school boys 18 years old or under. In this connection there is an extensive exhibit of rifles and arms by the National Government; also the Palma international rifle trophy, first won by the United States team in 1876 at Creedmoor and last at Ottawa in 1907, a large bronze tablet given by the United States Congress for rifle shooting and several other trophies. In the shooting contest the prizes include "junior marksmen's" medals, authorized by the Secretary of War, a Winchester cup for school boy teams, a U. M. C. challenge cup, a Remington rifle, Winchester musket, Hopkins & Allen rifle, Stevens gallery rifle and a piece of statuary for an intercollegiate match. The contributors of prizes and ammunition include the Winchester Repeating Arms Company, Union Metallic Cartridge Company, J. Stevens Arms & Tool Company, Remington Arms Company, Hopkins & Allen Arms Company, E. I. Du Pont de Nemours Powder Company and Peters Cartridge Company.

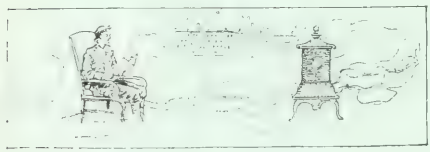
A Deserted Village

Copyright, 1907, by The Iron Age.

Tom Plowman lived on a section farm
Not far from a prosperous village;
He worked late and early and calloused his palm
But thrived by industrious tillage.



He saved up some money and stood very well,
His luck would have lasted for all we can tell
If he never had heard of Chicago.



One day a big catalogue came through the mail
That told of a wonderful heater;
The figures were tempting, Tom swallowed the tale,
Says he, "Mr. Merchant's a cheater.



His profit must be near a hundred per cent.,
I'll just call his bluff and unless he'll relent
I'll order a stove from Chicago."

So he drove to the village and entered the store
With an air that was lofty and knowing.
Says he, "Mr. Merchant, please tell me once more
The price of that stove you were showing."



"Thirty-five, cash or credit, the best one in town."
Tom turned on his heel and went out with a frown,
And sent off a check to Chicago.



He bragged to his neighbors and they in a trice
Sent away for whatever they needed;
They often were stuck, but they got a low price,
Which, of course, was the one thing they heeded.



The merchant soon failed and sold out his store,
And this was the notice he left on his door:
"Gone to look for a job in Chicago."



Tom's mail order stove didn't work very long,
But no one in town could repair it;
At last he was forced to admit he was wrong,
His neighbors weren't slow to declare it.



With no stores there was no one to buy or to sell,
The drummers stopped coming, they closed the hotel,
'Twas surprising how quickly the town went to—well
A very long way from Chicago.



The lawyer, the doctor, the editor, too,
They all got cold feet very quickly;
The parson soon noticed the way the wind blew,
He left, for his children were sickly.



At last Tom decided to sell his old farm,
But no one, he found with the greatest alarm,
Would buy one so far from Chicago.

When blank desolation stared Tom in the face
His courage grew weaker and weaker,
Till he made up his mind to get out of the place
And go on a jaunt as home seeker.



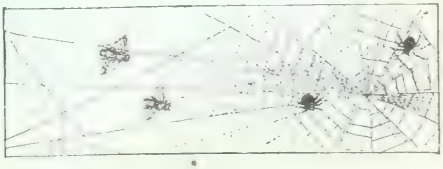
So he put on his overcoat, packed up his grip,
Says he, "I'll be giving my neighbors the slip
For I must be off to Chicago."



When he got to the station to Tom's great surprise
He found it deserted and dusty,
Inhabited only by spiders and flies,
And the siding was crooked and rusty.

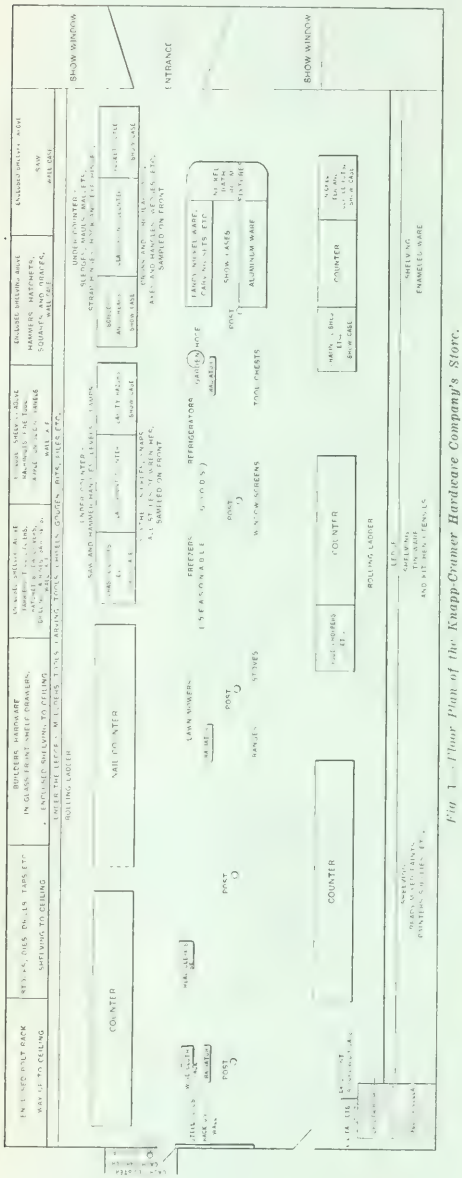


The trains flew by whizzing, Tom waited in vain,—
Says he "Neither merchant nor doctor nor train
Will stop any place but Chicago."



THE KNAPP-CRAMER HARDWARE COMPANY'S STORE.

AN attractive and conveniently arranged store is that of the Knapp-Cramer Hardware Company, located in North Tonawanda, N. Y. The store is 32 x 85 ft. in size, two stories and basement, there being three warehouses in the rear, where surplus stock is stored. The hight of the first floor ceiling is 12 ft. By referring to Fig. 1 it will be seen that the entrance is to one side of


SHOW WINDOW
ENTRANCE
SHOW WINDOW
COUNTER
NAIL COUNTER
COUNTER
COUNTER
POST
POST
POST
POST
POST
STOVES
SCREENS
TOOL CHESTS
REFRIGERATOR
ROLLING LADDER
ROLLING LADDER
SHELVING
SHELVING
SHELVING

on rollers, which run on track. The samples are protected by the sliding door of the wall case.

Arrangement for Drawing Oil.

Fig. 3 illustrates the arrangement for drawing Oil, which is located at the side of the staircase. The letters above the six faucets stand for Boiled Linseed Oil, Raw Oil, Dryer, Spirits Turpentine, Machine Oil and Kerosene. The pipes from the faucets extend to the tanks in the cellar containing the different liquids. The pump on the wall shelf is run by water pressure and forces air into a storage tank located under the floor. The air is let into the various tanks by opening the valves, shown at the right of the illustration, which forces up the liquids. The tray in which the measures stand is removable for cleaning, and also serves to catch any drip or overflow from the faucets. The hand pump in the corner was used before the beer pump was installed.

At the back of the room is the desk of the head clerk, a Steel Goods Rack and Wire Cloth Rack. The cash carrier wires enter the office at the rear of the store.

Domestic Parcels Post Bill Introduced.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., December 30, 1907.

THE first measure designed to carry into effect the Postmaster-General's programme for the establishment of a domestic parcels post was presented in the House on the eve of the holiday recess by Representative Daniel F. Lafean of Pennsylvania. It provides for the authorization of an experimental parcels post system in York and Adams counties, Pennsylvania, with a view to testing the feasibility of the Postmaster-General's project for a cheap rural parcels post. Mr. Lafean's bill provides as follows:

Be it enacted, &c., That the Postmaster-General, for the purpose of ascertaining the practicability of establishing the special parcels post system on the rural delivery routes throughout the United States, be, and he is hereby, authorized and directed to experiment and report to Congress not later than January 1, 1909, the result of such experiment by establishing a special parcels post system on the rural delivery routes in York and Adams counties, Pennsylvania, for packages originating on the rural delivery routes in said York and Adams counties, or at the distributing offices thereof, for delivery by rural carriers to patrons thereof at such rates as he may deem best and proper for carrying out the provisions embodied in this act; and the sum of $10,000 or so much thereof as may be necessary, be, and the same is hereby, appropriated, out of any money in the Treasury not otherwise appropriated, for the purpose of carrying out the provisions of this act.

It should be clearly understood that Mr. Lafean's bill is designed as an alternative, or substitute proposition, to be brought forward only in the event that the Postmaster-General's much more comprehensive projects are rejected by the Post Office Committees of the two houses. The tremendous wave of popular disapproval that has swept over the country since the details of the Post Office Department's schemes were fully disclosed in the annual departmental reports has served to admonish General Meyer that Congress will have to ignore the wishes of the people at large if it provides the legislation he desires, and he therefore proposes to forestall failure by taking advantage of the experience of the Department in the establishment of the rural free delivery service, which, it will be remembered, started out with an "experimental" appropriation of $10,000, but which for the coming fiscal year will cost nearly $40,000,000, four-fifths of which vast sum will be paid by the public at large, which receives no benefit whatever from this costly service. It is significant that the appropriation carried by this measure is exactly the same as the sum originally allotted to test the rural free delivery plan.

Scope and Purpose of the Measure.

Mr. Lafean states very frankly that his bill represents the views of the Postmaster-General, whom he has consulted, and upon whose orders he has been furnished with data which he has incorporated in a statement regarding the scope and purpose of his measure, in part as follows:

If the recommendation of the Postmaster-General is carried out the patron along the route can order and have the local country merchant deliver goods to him at the average cost of 2 cents a pound, or 25 cents for 11 lb., whereas under the present system if this patron desires to order merchandise from his dealer he can only have delivered to him packages which are mailable and not in excess of 4 lb. in weight, which at the present rate of postage would cost him 64 cents.

The Government by the establishment of this special parcels post would have an additional source of revenue in that it would be paid for the carrying of all packages of merchandise by the carrier.

The proposed experiment would do more to remove the prejudice and opposition against the parcels post than anything that could be done. When the rural free delivery service was in its infancy the progress was slow because of the determined opposition from the country merchants, who were invariably the postmasters, and who were under the impression that the establishment of the rural free delivery would mean the discontinuance of the office and necessarily affect their business by driving trade to larger cities and towns, from which the rural free delivery routes started.

For this reason these same merchants object to the establishing of the parcels post in the United States, alleging that the rural residents would then order merchandise from mail order houses in the larger cities, thus adversely affecting the business of the country merchant.

York and Adams counties are particularly well adapted for making the test. In the first place, these two counties have a rural free delivery service excelled by no other district in the country, there being 142 routes in the two counties, which were laid out not to serve any particular person or afford employment to any particular carrier, or to be a source of revenue to any particular postmaster, but distributed all over the district from such points as would afford the patrons the best possible service with the least expense to the Government.

The reason I did not fix any definite amount to be charged, as suggested by both the Postmaster-General and the Fourth Assistant Postmaster-General, is that the work which I intend to be done in the Twentieth Congressional District is to be experimental, and for this reason did not deem it wise to tie the hands of the Postmaster-General in the matter of charges.

As to the $10,000 asked to be appropriated, it is hardly likely that it will be necessary to expend much thereof other than possibly for traveling expenses of officials or special inspectors who may have this experimental work in charge and possibly a few dollars for special stationery and blanks.

In preparing this statement Mr. Lafean has inadvertently fallen into errors which are absolutely fatal to the project he advocates. For example, he states that if the patron of a rural route desires to order merchandise from a local dealer he can only have delivered to him packages which are mailable and not in excess of 4 lb. in weight and at a cost of 64 cents. The facts are exactly the reverse. The patron of any route can have delivered to him by a carrier any package weighing in excess of 4 lb., even though it may be made up of a number of smaller packages, and the charge is never more than 10 cents, but is usually practically gratuitous. It is this cheap service by carriers, the cost of which, if there is any cost, is borne by the purchaser, that the Postmaster-General proposes to abolish and in its place to require retail merchants to make deliveries by mail, prepaying the postage at rates which, however small, are nevertheless recognized by all experienced merchants as absolutely prohibitory.

Bill Is Part of Carefully Arranged Programme.

The Lafean bill appears to have been launched by a preconcerted movement, of which the catalogue house concerns have been fully advised, for Senators and Representatives who are spending the holidays in Washington are already beginning to receive petitions in its favor bearing evidence of a common origin and closely resembling the post card memorials which the mail order houses have distributed in large numbers in packages of merchandise. The catalogue concerns are making a clumsy attempt, however, to throw dust in the eyes of the public by pretending indifference or hostility to the Postmaster-General's projects, and press dispatches have been sent out from Chicago during the past week to the effect that "the project of defeating the parcels post measures in Congress has been undertaken by Chicago mail order houses as a matter of self-defense." It is doubtful if any one will be deceived by these tactics. To those who are familiar with the facts they indicate the character of the expedients these concerns are resorting to for the purpose of concealing their real interest in this campaign.

Retail Hardware Conventions.

As usual most of the retail Hardware conventions of the year will be held in February, although quite a number are slated for January. All of the associations which meet during the first three months of the year have selected dates for the annual gatherings, except California, and particulars as to the dates and places are given below. Many of the associations have made elaborate plans for accommodating Hardware exhibits by manufacturers and jobbers, and where this is the case the fact is indicated by an asterisk in connection with the name of the association:

IDAHO ASSOCIATION, Boise, January 3 and 4. Secretary, J. F. Cook, Boise.

INLAND EMPIRE ASSOCIATION, Spokane, Wash., January 15, 16 and 17. Secretary, E. W. Evenson, Spokane.

OREGON ASSOCIATION, Portland, January 21 and 22. Acting Secretary, C. D. Lownsdale, Portland.

TEXAS ASSOCIATION,* Dallas, January 21-23. Secretary, J. W. McManus, Dallas.

PACIFIC FEDERATION, Portland, Ore., January 23-25. Secretary, E. W. Evenson, Spokane, Wash.

NORTH DAKOTA ASSOCIATION, Fargo, January 28-30. Secretary, C. N. Barnes, Grand Forks.

SOUTH DAKOTA ASSOCIATION,* Aberdeen, February 4-7. Secretary, H. E. Johnson, Redfield.

WISCONSIN ASSOCIATION,* Milwaukee, February 5-7. Secretary, C. A. Peck, Berlin.

CONNECTICUT ASSOCIATION, Meriden, February 10 and 11. Secretary, James de F. Phelps, Windsor Locks.

KENTUCKY ASSOCIATION, Louisville, February 11-13. Secretary, John R. Sower, Frankfort.

NEBRASKA ASSOCIATION,* Lincoln, February 11-14. Secretary, J. Frank Barr, Lincoln.

INDIANA ASSOCIATION,* Indianapolis, February 18-21. Secretary, M. L. Corey, Argos.

IOWA ASSOCIATION,* Cedar Rapids, February 18-21. Secretary, A. R. Sale, Mason City.

NEW YORK ASSOCIATION,* Buffalo, February 18-22. Secretary, John B. Foley, Syracuse.

OHIO ASSOCIATION,* Columbus, February 25-27. Secretary, Frank A. Bare, Mansfield.

MINNESOTA,* St. Paul, February 25-28. Secretary, M. S. Mathews, Guaranty Building, Minneapolis.

ILLINOIS ASSOCIATION,* Peoria, February 26-28. Secretary, L. D. Nish, Elgin.

NEW ENGLAND ASSOCIATION,* Boston, March 11 and 12. Secretary, Chas. L. Underhill, Somerville, Mass.

Iowa Retail Hardware Association.

It has been arranged to hold the business sessions of the tenth annual convention of the Iowa Retail Hardware Association at Cedar Rapids, February 18-21, in the Y. M. C. A. auditorium, the headquarters being at the Montrose Hotel. One of the important topics which will be brought up for discussion will be parcel post, and Charles W. Burrows of Cleveland, Ohio, who has given much study to this subject, will make a formal address. A large number of manufacturers and jobbers will be represented by exhibits, and we understand that more than 50 per cent. of the space in the large auditorium has already been contracted for. The entertainment features of the convention are in the efficient charge of George T. Gadd of the George T. Gadd Hardware Company, and Secretary Rolland Shaver of the Commercial Club of Cedar Rapids.

THE MANSON HARDWARE COMPANY, Burlington, Vt., successor to John A. Manson & Co., has recently built a large addition to its store so as to connect it with storehouse. Through purchase of the property the company now owns the entire space from Church to Center street, a depth of nearly 250 ft. Many improvements have been made in the store arrangement and several new lines of goods added. The company gives special attention to such lines as P. & F. Corbin's Builders' Hardware, Jewell Belting Company's Belting, J. C. Pearson Company's Coated Nails, Pittsburgh Perfect Fencing, Rex Flintkote Roofing, Patterson & Sargent's Paints, Rutland Asbestos Wall Plaster and the Union Metal Corner Company's product. The Manson Company is one of the most prominent and successful Hardware houses in the State, and its facilities for the conduct of the business are up to date and complete.

CHILDREN AS AN ADVERTISING MEDIUM.

MANY Hardware retailers have recognized the importance and value of the good will of children, and have cultivated it in one way or another as an asset of the business. It makes good advertising for the store, and as children later become adults it often lays a foundation for future trade. One merchant running a small general store in a Western town has gone a little further in this direction than usual. Desirous of developing his modest business, and figuring that this could perhaps be done through interesting the youngsters in the vicinity, he adopted the plan of handing out gifts to the children when they made purchases.

Similarly the baker often bestows a cake or a bun, the grocer an apple or an orange and the confectioner a piece of chocolate or a lemon stick; but this wideawake shopkeeper did not select his presents from stock, but as was more effective from an advertising standpoint, bought them especially for gift purposes. After studying the situation carefully he laid in a supply of candies and cheap toys and books. Good judgment was used in the selection of the latter, the toys being of a somewhat substantial character and the books of the wholesome and humorous type. When the boys and girls came to the store to make purchases on behalf of their elders he handed each a present, the value of which was determined by the size of and profit on the purchase made. He also reminded each child that he was ready to supply anything at all in his line, and that every order had its reward for the bearer.

At first the profits yielded by the business were less than before, for the children whose appetite had been whetted came to the store for nearly everything from a needle to an ocean steamer, and the proprietor was obliged to add many articles to his stock. In many cases these were obtained by paying full price, from neighboring stores, so that there was no financial gain in selling them. Gradually, however, the regular stock was enlarged until the merchant was able to fill a very large proportion of the children's requirements without resorting to pick-up methods, and then the business showed handsome returns. An interesting feature of our friend's experience is that he has frequently been thanked in person by the parents of the children dealing with the store for putting the gift practice into effect. He seems to have overcome the antipathy with which most youngsters view the running of errands when no reward is promised or expected.

GEORGE L. MARBLE of the Union Metallic Cartridge Company, Bridgeport, Conn., is in attendance at the first annual exposition of the Forest, Fish, Game and Sportsmen's Exhibition, at the Grand Central Palace, New York, for the two weeks ending January 4. He is in charge of the company's interests in connection with the School Boy Rifle Shooting Tournament, which is being conducted under the auspices of the National Rifle Association of America and the Public Schools Athletic League of New York, and which is also receiving the financial and moral support of President Roosevelt and Secretary of War Taft. Mr. Marble is assistant to William M. Thomas, ballistic engineer to the Union Metallic Cartridge Company.

LEWIS G. KUHN has been appointed New York manager of the branch houses of L. S. Starrett Company, Athol, Mass., and S. W. Card Mfg. Company, Mansfield, Mass., manufacturers, respectively, of mechanics' fine Tools and Taps, Dies and Screw Cutting Tools, with headquarters as heretofore, at 132 Liberty street, where completed stocks are carried for the prompt execution of orders. Mr. Kuhn has been educated in this line from the start, having entered it as office boy with A. H. Briggs,

who established the Starrett branch in New York about 10 years ago, but who has resigned to go into business for himself as representative for manufacturers in allied lines. Mr. Kuhn has traveled for the Starrett Company for the last six years, covering all territory east of Pittsburgh and south as far as Richmond.

Ham Automobile Lamps.

The C. T. Ham Mfg. Company, Rochester, N. Y., represented directly by John H. Graham & Co., 113 Chambers street, New York, has recently brought out a gray-black nickel finish on brass, in connection with lanterns for automobiles. No polishing is required, a damp rag being sufficient with which to wipe off dust and soil, and notwithstanding the disadvantages of heat, oil and weather, the luster is retained. The finish is put on by an electroplating process and can be obtained in connection with any of the Ham automobile lamps.

Adjustable Flexible Door Hangers.

The accompanying illustrations show the adjustable feature in door hangers, recently adopted by F. E. Myers & Bro., Ashland, Ohio. The front and rear views of single and tandem hangers are shown, also the flexible feature. Both styles of hanger can be adjusted perpendicularly so as to locate the door above the ground at any point, or laterally, so as to adjust the door to or from the building, and also to any thickness of door. The perpendicular and lateral adjustments are made with an ordinary wrench, at the will of the user. In Fig. 1 the manner in which the wheel is mostly covered and the bracing of the frame is shown. The back view is also given with the center bolt and nut, by means of which the door can be raised or lowered at either end. In Fig. 3 a side view of the hanger is shown with the cross bolt by means of which the door can be adjusted to or from the building. The adjustable features are the same in both styles of hanger.

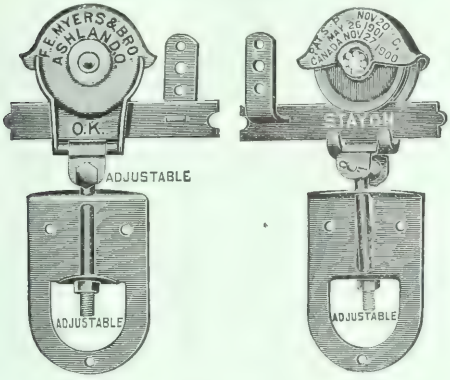


Fig. 1. O. K. Adjustable Stayon Flexible Door Hanger



Fig. 3.—Swing Out Device.

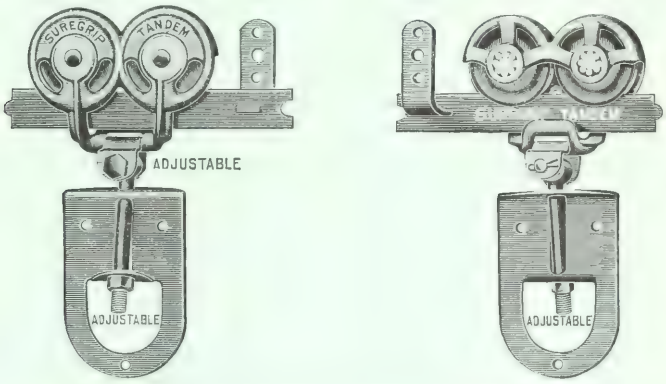
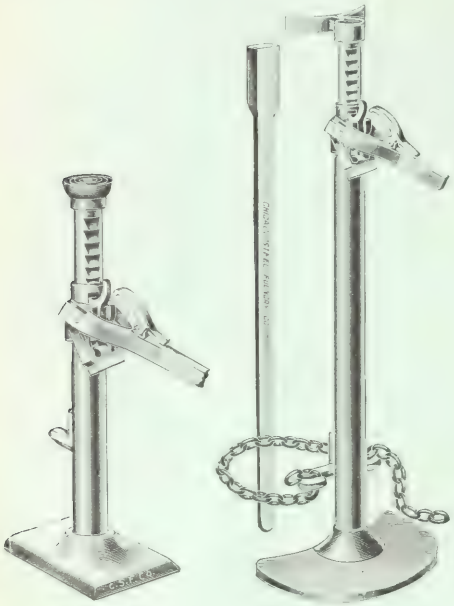


Fig. 2.—Sure Grip Tandem Flexible Door Hanger.

Lifting Jacks.

The Chicago Steel Foundry Company, Chicago, is putting out a new line of jacks, two examples of which are shown in the accompanying illustrations. They are designed to embody a maximum lifting capacity with a minimum of weight and mechanism. These points, together with ease and durability of operation, constitute the principal features of excellence claimed. The No. 6 heavy machinery jack is built for heavy work and is described as strong enough to stand any leverage that may be applied. It is supplied with double triggers so arranged that one takes hold before the other releases, thereby guarding against a slip under the pressure of a load. The shell is cast steel 2 in. in diameter and carries a ratcheted lifting post made of cold rolled steel. It is provided with a lifting foot for convenience in getting under low loads and for service on railroad track work. The jack has a capacity of 12 tons, weighs 50 lb., stands 23 in. in hight, and has a length of lift of 12 in. It is mounted on a broad firm base and is entirely self-contained. The other jack illustrated is specially designed for pulling telegraph or telephone poles. Its lifting mechanism is similar in all respects to the machinery jack already described and is made of like material. It is

fitted with cast steel yokes and is clamped to the pole near the base by means of a chain. The semi-circular base is cut away on concave form on one side, to conform to the shape of the pole, thus permitting a direct upward pull. It is of the same dimensions of the machinery jack except that it stands 45 in. in hight, and weighs 100 lb.



No. 6. No. 7.

Lifting Jacks.

It has a lift per stroke of ¾ in. and a total length of lift 31 in. Besides the patterns here illustrated, the company makes a number of other jacks adapted to special uses, chief of which is a light, quick acting automobile jack furnished with a detachable lifting foot, which enables the operator to lift loads which are close to the ground.

Wire Chairs and Stools.

The Chicago Wire Chair Company, 129 La Salle avenue, Chicago, is offering a line of steel wire factory stools and office chairs, examples of which are illustrated herewith. Besides limiting the amount of combustible material in a building this furniture is said to be exceptionally strong and durable. The legs are constructed of double Bessemer steel wires closely twisted at the lower end to give proper rigidity, and are braced by a continuous wire band passing through each leg. The seats are



Fig. 1.—Steel Wire Office Chair.



Fig. 2.—Wire Stool Without Back.

made either wholly of steel or with wooden tops, as desired. The stool as shown in Fig. 2 is also made with a high or low back, which adds greatly to the comfort of the user and is especially desirable for certain kinds of work. The backs supplied to both chairs and stools are flexible and at the same time strong and reliable. Frames are finished in antique, and the seats, when made of wood, are of quartered oak, golden or mahogany finish. For use in offices having hardwood floors or linoleum carpets both stools and chairs are equipped with rubber feet, which makes them noiseless and prevents damage to the floor.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₰ gal.
Linseed, Strictly Pure and Western	
Raw	
City Boiled	
City Raw	
Raw Country	
Lard, Extra Prime, Winter	
Extra No. 1	
No. 1	
Neatsfoot, Extra Pale	
No. 1 Winter	
Sperm, Crude	
Natural Winter	
Bleached Winter	
Bleached Winter, Extra	@
Tallow, Prime	@60
Whale, Crude	@36
Natural Winter	
Bleached Winter	
Extra Bleached Winter	
Menhaden, Brown, Strained	@42
Light Strained	@42
Neatsfoot	@
Shark	
Cocoanut, Ceylon	
Cocoanut, Cochin	@44
Palm, Lagos	@47
Red	
Soya	
Cod, Newfoundland	
Cod, Norwegian	
Cod, Domestic	
Cod, Japan	
Cod, Straits	
Cod, Domestic Pale	
Menhaden, Pure	
Whale, Arctic	
Whale, Sperm	
Whale, Southern	
Whale, Pale Winter	
Whale, Natural	
Whale, Bleached Winter	
Whale, Extra Bleached Winter	

Mineral Oils—

	₰ gal.
Lubricating	
Paraffine, 24 gravity	
Paraffine, 27 gravity	
Paraffine, 30 gravity	
Paraffine, 32 gravity	
Red	
Spindle, 150 sec.	
Spindle, 200 sec.	
Spindle, 300 sec.	
Cylinder, 400 sec.	
Cylinder, 600 sec.	
Cylinder, 800 sec.	
Cylinder, 1000 sec.	
Cylinder, 1200 sec.	
Cylinder, 1500 sec.	
Cylinder, 2000 sec.	
Dynamo, 150 sec.	
Dynamo, 200 sec.	
Dynamo, 300 sec.	
Dynamo, 400 sec.	
Dynamo, 600 sec.	
Dynamo, 800 sec.	
Dynamo, 1000 sec.	
Dynamo, 1200 sec.	
Dynamo, 1500 sec.	
Dynamo, 2000 sec.	
Engine, 150 sec.	
Engine, 200 sec.	
Engine, 300 sec.	
Engine, 400 sec.	
Engine, 600 sec.	
Engine, 800 sec.	
Engine, 1000 sec.	
Engine, 1200 sec.	
Engine, 1500 sec.	
Engine, 2000 sec.	
Loom, 150 sec.	
Loom, 200 sec.	
Loom, 300 sec.	
Loom, 400 sec.	
Loom, 600 sec.	
Loom, 800 sec.	
Loom, 1000 sec.	
Loom, 1200 sec.	
Loom, 1500 sec.	
Loom, 2000 sec.	

Miscellaneous—

	₰ lb
Barytes:	
White, Foreign	₰ ton, $18.50@20.50
American	ton, 18 @20
Off color	ton, 15 @16
Chrome, Yellow	₰ lb
Lemon	
Orange	
Medium	
Dark	
Chrome, Green	
Coach Colors	
Vermilion, Pale	
Vermilion, Dark	
Vermilion, Chinese	
Vermilion, Quaker	
Indian Red, Pale	
Indian Red, Dark	
Ochre, French	
Ochre, American	
Ochre, Golden	

Putty, Commercial—

	₰ 100 lb
In bladders	$1.75 @1.85
In bbls. or tubs	1.20 @1.45
In 1 lb to 5 lb cans	1.65 @1.75
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—

	₰ gal.
In cans	44 @49
In barrels	44 @45

Glue—

	₰ lb
Cabinet	12 @15
Chair	12 @14
Extra No. 1	12 @13
Light No. 1 White	11½ @14
Light No. 1 Brown	11 @11½
Common Brown	12 @18
Russian	11 @10
Hide	11 @15
Lace Grade	11 @22
Medium White	11 @17

Gum Shellac—

	₰ lb
Bleached	35 @
Bone Dry	35 @37
Button	31 @70
Garnet	31 @
Orange Fine	31 @
Orange Superfine	31 @
Pale	31 @
Ruby	31 @
Seed	31 @
Shellac Varnish	31 @
T. N.	26 @27
Vinegar	@52

Colors in Oil—

	₰ lb
Black, Lampblack	12 @14
Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	15 @16
Brown, Vandyke	11 @11
Green, Chrome	12 @16
Green, Paris	@21
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @11

White Lead, Zinc, &c.—

	₰ lb
Lead, English, white in Oil, 1	@
Lead, American White:	
Lots of 500 lb or over, in Oil	@ 6¾
Less than 500 lb, in Oil	@
Lead, White, in oil, 25 lb tin pails	@ 7¾
Lead, White, in oil, 12½ lb tin pails	@ 7¾
Lead, White, in oil, 1 to 5 lb tin pails	@
Lead, American. Terms: On lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice.	@ 6¾
Zinc, American, dry	5¾ @ 5½
Zinc, French:	
Antwerp, Red Seal, dry	8¼
Antwerp, Green Seal, dry	8¼
Paris, Red Seal, dry	9¾
Paris, Green Seal, dry	10¾
Zinc, V. M., French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over	12¾ @13¾
Lots of less than 1 ton	13½ @13¾
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over	11¾ @11¾
Lots of less than 1 ton	11½ @12¼
Discounts.—French Zinc.—Discounts to buyers of 10 ton lots of one or assorted grades	1¼

Dry Colors—

	₰ lb
Black, Carbon	6½ @10
Black, Drop, American	5 @ 8
Black, Drop, English	5 @15
Black, Ivory	16 @20
Blue, Antwerp	8 @
Blue, Bremen	8 @
Blue, Celestial	14 @ 6
Blue, Chinese	30 @33
Blue, Prussian	28 @32
Blue, Ultramarine	3½ @15
Brown, Spanish	2 @ 1
Carmine, No. 40	$3.10@3.25
Green, Chrome, ordinary	3½@ 5
Green, Chrome, pure	17 @25
Lead, Red, Dry, 95 @ 96%	6¾
Lithopone, Dry, 30%	6¾
Ochre, American	₰ ton, $8.50@ 9.00
American Golden	2½@ 3¼
French	1¾ @ 2
French, Golden	3 @ 4
Orange Mineral, English	10 @12
French	11¾ @12
German	11 @12
American	8¾@ 9
Red Indian, English	4½@ 6
American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	@10
Red, Venetian, Amer	₰ 100 lb, $3.50@4.25
English	₰ 100 lb, $1.15@1.60
Sienna, Italian, Burnt and Powdered	3 @ 9
Paler, Raw, Powdered	3 @ 7
American, Raw	1¼@ 2
American Burnt and Pow'd.	1¼@ 2
Talc, French	₰ ton $18.00@25.00
American	₰ ton, 15.00@25.00
Terra Alba, French	₰ 100 lb .90@ 1.00
English	₰ 100 lb .80@ 1.00
American	₰ 100 lb, No. 1 .75@ .80
American	₰ 100 lb, No. 2, .60@ .65
Umber, Turkey, Bst & Pow	2 @ 3¼
Turkey, Raw and Powdered	2¼@ 3¼
Burnt, American	1¼@ 2
Raw, American	1¼@ 3
Yellow Chrome, Pure	12 @14
Vermilion, American, Lead	@25
Quicksilver, bulk	65 @
Quicksilver, bags	@66
English, Imported	65 @70
Chinese	$0.90@1.00

Current Hardware Prices.

General Goods. In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol *to*. Thus 33⅓ *to* 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic ..... 50&5
North's ..... 40&5
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent 35%
Taplin's Perfection 30%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—

Fernald Mfg. Co.: Burton Anti-Rattlers for door hasps, No. 1, Steel, $3.60; 1, Silver, $5.75; 2, $9.50.
Fernald Quick Shifter, per doz. pairs ..... $2.00@$3.00

Anvils—American—

Eagle Anvils ..... per lb. 9½c
Hay-Budden, Wrought ..... 9½@9¾c
Trenton ..... per lb. 9½@9¾c

Imported—

Peter Wright & Sons: per lb. 84 to 349 lb. Wt., 350 to 699 lb. Wt., base

Anvil, Vise and Drill—

Millers Falls Co.: $5.00 ..... 15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Leather: No. 1 ..... each

Augers and Bits—

Com. Double Spur ..... 75@80%
Jennings' Pat. Bright ..... 50&10@70%
Black Lip Bland ..... 60@70%
Boring Mach. Augers 70%
Car Bits, Ram. twist ..... 40&10%
Ford's Auger and Car Bits ..... 40&5
Ft. Washington Auger Co., Cook's 35%
Forstner Pat. Auger Bits 35
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, ... 25&10%
No. 30, R. Jennings' list 60%
Russell Jennings' ..... 25&10&5%
L. H. Immedieu Car Bits 15
Mayhew's Countersink Bits 45
Pugh's Black 20
Pugh's Jennings' Pattern 35
Snell's Auger Bits 60
Snell's Bell Hangers' Bits 60
Snell's Car Bits, 12-in. twist 60
Snell's King Auger Bits 50
Wright's Jennings' Bits 50%

Bit Stock Drills—See *Drills, Twist.*

Expansive Bits—

Clark's Pattern, No. 1, per doz. $26; No. 2, $20; No. 3, $16.
Ford's, Clark's Pattern ..... 60&5
C. E. Jennings & Co., Steer's Pat. 25%
Lavigne Pat., small size, $18.00; large size, $26.00 ..... 50&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut ..... $3.00@3.25
German Pattern, Nos. 1 to 7 ..... $4.75; *11 to 13*, $5.75

Hollow Augers—

Bonney Pat., per doz. ..... $6.50@7.00
Ames 20%
Universal 20%

Ship Augers and Bits—

Ship Augers 30%
Ford's ..... 30&5
C. E. Jennings & Co.:
L. H. Immedieu 6
Watrous ..... 30&5&2%
Swan's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled ..... gro. $2.75@3.00
Unhdld., Shldered ..... gro. 65@66¢
Unhandled, Patent ..... gro. 66@70¢
Peg Awls:
Unhandled, Patent ..... gro. 41@51¢
Unhdld., Shldered ..... gro. 65@70¢
Scratch Awls:
Handled, Com. ..... gro. $3.50@4.00
Handled, Socket ..... gro. $11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality ..... $4.75@5.00
Second Quality ..... $4.25@4.50
Double Bit, base weights:
First Quality ..... $5.00@7.50
Second Quality ..... $6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles—

Iron or Steel

Concord, Loose Collar ..... 4½@5 ¢
Concord, Solid Collar ..... 4½@5 ¢
No. 1 Common, Loose ..... 3½@4 ¢
No. 1 Common, Nor. Stake ..... 3½@4 ¢
No. 2 Solid Collar ..... 3½@4 ¢

Half Patent:
Nos. 7, 8, 11 and 12 ..... 65@65&10%
Nos. 13 to 14 ..... 65@65&10%
Nos. 15 to 18 ..... 70@70&10%
Nos. 19 to 22 ..... 70@70&10%

Boxes, Axle—

Common and Concord, not turned ..... lb., 5@6¢
Common and Concord, turned. ..... lb., 6@7¢
Half Patent ..... lb., 9½@10¢

Bait— Fishing—

Hendrsx:
A Bait 20%
B Bait 25%
Competitor Bait ..... 20&5

Balances— Sash—

Caldwell new list 50%
Pullman ..... 50&10@60%

Spring—

Spring Balances ..... 50&10@60%
Chatillon's:
Inside Spr. Balances ..... 50&5&10%
Straight Balances ..... 40&10&5%
Circular Balances ..... 50&10%
Large Dial 30%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb. ..... per lb. 4@4½@5¢

Towel -

No 10 Ideal, Nickel Plate ..... per gro $8.50

Beams, Scale—

Scale Beams 40%
Chatillon's No. 1 ..... 40%
Chatillon's No. 2 ..... 40%

Beaters, Carpet—

Hart Lace Co.:
No. 12 Wire Coppered ..... per doz. $1.50
Tinned $1.85
No. 11 Wire Coppered ..... per doz. $1.15;
Tinned $1.40
No. 11 Wire Tinned ..... per doz. $1.50

Beaters, Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. 6, Jap'd, $1.15; No. 8, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $12.00; No. 155, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202 Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.: T. & S. Dover $6.00

Bellows—

Blacksmith, Standard List.
Split Leather ..... 60@60&10%
Grain Leather ..... 50@50&10%

Hand—

Inch 3 4 5 6 8 10
Price $2.25 $2.75 $3.50 $4.50 $6.50 $9.00

Molders—

Inch 7 8 9 10 12
Price $3.75 $4.50 $5.50 $6.50 $8.50

Bells— Cow—

Ordinary Goods ..... 75&5@75&10&5%
High grade ..... 70@70&10%
Jersey ..... 50&10%
Texas Star 50

Door—

Home R & E Mfg. Co. ..... 55&10%

Hand

Polished, Brass ..... list
White Metal ..... list
Nickel Plated ..... list
Brass ..... list
Cone's Globe Hand Bells ..... list

Miscellaneous—

Farm Bells ..... lb. 21½@23¢
Church and School ..... 60@60&5%

Belting— Leather—

Extra Heavy, Short Lap ..... 60&5%
Regular Short Lap ..... 60&10&5%
Standard ..... 50&10%
Light Standard 50%
Cut Leather Lacing ..... 40&10%
Leather Lacing Strips, per sq. ft ..... 2½¢

Rubber—

Agricultural (Low Grade) ..... 75@75&5
Common Standard ..... 70@70&10
Standard ..... 70@70&5
Extra ..... 60&10&5@10
High Grade ..... 50&5@50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 10

Bicycle Goods—

John S. Leng's Sons & Co.'s 1907 list:
Chain, Paris Style 5
Tubes 60

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden 75%
B. & L. B. Co.:
Boston Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 50
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined 40
Lockwood 50

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co. 33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):
Square Head ..... list
Longer and Larger ..... list
Phila. Eagle, $3.00 list ..... 80@[illegible]
Boat Ends ..... 65&10
Machine (Cut Thread):
Square Head ..... list
Longer and Larger ..... list

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:
Inch 3 4 5 6 8
Per doz. ..... $ $ $ $ $

Cast Iron Spring Foot, Jap'd:
Inch 3 4 5 6
Per doz. $1.25 $1.50 $1.75 $2.00

Cast Iron Chain, Flat, Japanned:
Inch 5 6
Per doz. $1.50 $1.75

Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch 6 8 10
Per doz. $2.50 $3.00 $3.50

Wrought Barrel Japd. ..... 80@80&10%
Brass ..... 50&10%
Square ..... 50&10%
Steel ..... 50&10%
Square Head ..... 75&75&10%
Square ..... 70&70&10%
Iron Rolling Door 55%
Iron Wire Mesh 45%

Expansion—

Richards Mfg. Co. ..... 25&5

Plow and Stove

Plow ..... list
Stove ..... list

Tire—

Common Iron 80%
Norway Iron 80%
American Screw Co. (plain):
Norway Phila., list Oct. 16, '84 ..... 80%
Eagle Phila., list Oct. 16, '84 ..... 82½%
Bay State, list Dec. 28, '99 ..... 80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84 ..... 80%
Eagle Phila., list Oct. 16, '84 ..... 82½%
Eclipse, list Dec. 28, '99 ..... 80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99 ..... 80%
Norway Phila., list Oct., '84 ..... 80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99 ..... 80%
Phila. Eagle, list Oct. 16, 1884 ..... 82½%
Union 75%
Tire Bolts 72½%

Borers, Bung—

Borers Bung, Ring, with Handle:
Inch 1½ 1¾ 2
Per doz. $4.50 $4.75 $5.00
Inch 2¼ 2½
Per doz. $5.50 $6.00
Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each 25%

Boxes, Mitre—

C. E. Jennings & Co. 25%
Langdon's, New Improved ..... list
Langdon Improved, 2-in. ..... Langdon's
Ame ..... 15&10%
Perfection 40%
Swan's 15%

Braces—

Common Ball, American $1.50
Barber ..... 50&10&5@60&5%
Fray's Genuine Spofford's 60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 ..... 60%
C. E. Jennings & Co. ..... 50&5%
Mayhew's Ratchet 50%
Mayhew's Quick Action Hay Pat. 50%
Millers Falls Drill Brace ..... 25&10%
P., S. & W. Co., Peck's Pat. ..... 60&10%

Brackets—

Wrought Steel ..... 70&10@75&10%
Bradley Metal Clasp ..... 80&10@85&10&5%
Griffith's Pierced Steel ..... 75@75&10%
Trimmer's Lining Bracket 50%
Tripp Victor Handle Egg Beater Bracket $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co. ..... 40&10%
Wire Goods Co. 75%

Buckets, Galvanized—

M'f'g'r's list, price per gross.

	Quart	10	12	14
Water Pail				
Water Pail				
Fire, Rd. Bilge	82			
Well				

Bull Rings See *Rings, Bull*

Butts— Brass—

Cast Brass, Tiebout's 40%

Cast Iron—

Fast Joint, Broad ..... 40@40&10&5%
Fast Joint, Narrow ..... 40@40&10&5%
Loose Joint ..... 70@70&10&5%
Loose Pin ..... 70@70&10&5%
Wrought Steel—
Square Head ..... 65&5
Parliament Hinge ..... 70&5

Wrought Steel—

Loose Joint, Narrow, Light ..... list
Japanned ..... list
Light Narrow, Loose Pin ..... list
Light Narrow, Ball Tip ..... list
Light ..... list
Strap and Tee 70%
Ball Tipped 70%

ages, Bird—

...rvx Brass: Series 3000, 5000, 90. net list; 1200 15%; 200, 300, 0 ..... 30%
...rvx Bronze, Series 700, 800, 50 35
...rvx Enameled 35

Calipers—See *Compasses.*

Calks, Toe and Heel—

...nt, 1 prong, per lb. 4½¢ 4¾¢
...rp, 1 prong, per lb. 4½¢ 5¼¢
...rke s, Blunt, 4@4¼¢; Sharp, 4½@5¼¢
...utier, Blunt, 4@4¼¢; Sharp, 5½@6¼¢
...rkins' Blunt, ₱ lb. 3.65¢, Sharp, 4.15¢

Can Openers—

See *Openers, Can.*

Caps, Percussion—

...y's E. B ..... $2@$5¢
D ..... *per M* $4@$5¢
L ..... *per M* 40@48¢
E ..... *per M* $4@$5¢
...sket ..... *per M* 62@63¢

Primers—

...erdan Primers, $2 per M ..20@25¢
...rimer Shells and Bullets ..15@16¢
...ll other primers per M $1.52@1.60

Carpet Stretchers—

...e Stretchers, Carpet.

Cartridges—

...lank Cartridges:

.32 C. F., $5.50 ..... 10@25¢
.38 C. F., $7.00 ..... 10@25¢
.22 cal. Rim, $1.50 ..... 10@25¢
.32 cal. Rim, $2.75 ..... 10@25¢
...B. Caps, Con. Ball, Shotgd. $1.90
...B. Caps, Round Ball $1.49
...entral Fire 25%
...arget and Sporting Rifle ..15@25¢
...rimed Shells and Bullets ..15@10¢
...im Fire, Sporting 50%
...im Fire, Military ..... 15@25¢

Casters—

...ed ..... 65@10%
...Plate ..... 60@5%
...Philadelphia ..... 70@10%
Acme, Ball Bearing 35%
Gem (Roller Bearing) ....70c10@10&5
Steel Gulmore 20%
Standard Ball Bearing 45%
Yale (Double Wheel) low list ..40&10%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:

5/16	3/8	7/16	½	9/16
$8.77	6.17	4.92	4.37	4.37	4.27	4.22

In 1 to 1 1/8 to 1¼ inch.

$4.17	4.07	4.02	4.12

In cask lots, deduct 25¢.

German Coil:

6-9 to 1 ..... 70@5¢ 70@10%
2 and 3 ..66@10¢ 66@10¢ 70@10¢5%
¼ 5 and 6 ..... 50@10¢ 50@10¢5%

Halter—

Halter Chains ..... 60@60&5%
German Pattern Halter Chains, list July 24, '97 ..... 60¢10¢5%
Covert Mfg. Co.
Halter ..... 35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Straight, with ring $30.00
6½—6-3, Straight, with ring $29.00
6½—3 2, Straight, with ring $32.00
6½—10-2, Straight, with ring $37.00

NOTE.—Add 2c per pair for Hooks. Twist Traces; add per pair for Nos 2 and 3, 2c; No. 1, 3c; No 0, 4c to price of Straight Link.

Eastern Standard Traces, Wagon Chain, &c. ..60¢10@60¢10&5

Miscellaneous—

Jack Chain, list July 10, '93:
Iron ..... 60¢10%
Brass 60%
Safety and Plumbers' Chain, 60¢10
Gal. Pump Chain ....*lb.* 4½@4¾¢
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion 40%
Oneida Community:
American Halter, Dog and Kennel Chains ..... 35&2½@40%
Niagara Dog Leads and Kennel Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain 70%
Universal Dbl Jointed Chain 50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain 60%
Pullman:
Bronze Chain, 60%; Steel Chain ..... 60&10%
Sash Chain Attachments, per set 9¢
Aluminum Sash Ribbon per 100 ft ..... $1.25@$3.00
Sash Ribbon Attachments, per set 8¢

Chalk—From Jobbers

Carpenters' Blue ..... gro. 50@55¢
Carpenters' Red ..... gro. 45@55¢
Carpenters' White ..... gro. 40@45¢

Checks, Door—

Parkhurst 45%
Pullman, per gro $51.00
Russwin 33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools 50
Youths' Chests with Tools 25
Gentlemen's Chests, with Tools..25%
Farmers', Carpenters,' etc., Chests with Tools 20%
Machinists' and Pipe Fitters' Chests, Empty 45
Tool Cabinets 45
C. E. Jennings & Co.'s Machinists' Tool Chests 75

Chisels—

Socket Framing and Firmer

Standard List .....75¢10@ —
Buck Bros. 30
C. E. Jennings & Co.:
Socket Firmer No. 10 ..... 25&7½%
Socket Framing No. 15 ..... 25&7½%
Swan's ..... 66⅔@70
L. & I. J. White Co. ..... 30@30&5%

Tanged—

Tanged Firmers .....30¢5@35%
Buck Bros. 30
C. E. Jennings & Co. Nos 191, 181 ..25%
L. & I. J. White Co. ..... 25&5%

Cold— *lb.*

Cold Chisels, good quality ..13@15¢
Cold Chisels, fair quality ..11@13¢
Cold Chisels, ordinary ... 9@10¢

Chucks—

Almond Drill Chucks 35%
Almond Turret Six-Tool Chuck 40%
Beach Pat., each $8.00 ..... 25%
Empire 25%
Blacksmiths' 25%
Jacobs' Drill Chucks 35%
Pratt's Positive Drive 25%
Skinner Patent Chucks:
Independent Lathe Chucks 35%
Universal, Reversible Jaws 35%
Combination, Reversible Jaws 35%
Drill Chucks, New Model, 25%; Standard, 45%; Skinner Pat., 25%; Positive Drive 40%
Planer Chucks 30%
Face Plate Jaws 35%
Standard Tool Co.:
Improved Drill Chuck 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 10%; No. 21 ..... 35%
Scroll Combination, Nos. 83 and 84 ..... 30%
Geared Scroll Nos. 33, 34 and 35 ..25%
Independent Iron, Nos 18 and 318 ..35%
Independent Steel, No. 64 ..... 25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104 ..... 35%
Union Czar Drill 25%
Universal, 11, 12, 16, 17, 13, 14, 15 ..40%
Universal, No. 42 ..... 35%
Iron Face Plate Jaws, Nos 28, 30, 48 and 50 ..... 35%
Steel Face Plate Jaws, Nos. 70 and 72 ..... 30%
Westcott Patent Chucks:
Lathe Chucks 50%
Little Giant Universal Drill 50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved..... 50%
Oneida Drill 50%
Scroll Combination Lathe 50%

Clamps—

Adjustable, Hammers' ..... 20@20&5%
Carriage Makers', P., S. & W. Co. ..... 50&10%
Besly, Parallel ..... 33⅓&10%
Myers' Hay Rack 65%
Linemen's Swedish Neverturn 65%
Wood Workers, Hammers' ..... 40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable 50%
Iwan's Champion, Stationary 40%

Sidewalk—

Star Socket, All Steel, ₱ doz. $4.05 net
Star Shank, All Steel, ₱ doz. $3.24 net
W. & C. Shank, All Steel, ₱ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros. 30%
Fayette R. Plumb 30%
L. & I. J. White Co. 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each..$10.75
20th Century Horse, each. $5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each.$20.00
Stewart's Enclosed Gear Horse, each $6.75
Stewart's Patent Sheep Shearing Machine, each $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$8.75

Clips, Axle—

Regular Styles, list July 1, '05, ..40¢&60¢10%

Cloth and Netting, Wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Backing, Liquor, Bottling, &c ..... 70@—%
Compression Bibbs ..60¢10@ —%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list 40%
Leather, Walter B. Stevens & Son's 40%

Compasses, Dividers, &c.

Ordinary Goods .....70¢10@75%
Wm. Schollhorn Co.:
Excelsior Dividers 60%
Lodi Dividers ..... 70&10%

Conductor Pipe,—

L. C. L. to Dealers:
Galvanized

Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16@20 oz.*
Eastern:		
70&5%	50¢10½%	15%
Central:		
70&5%	55%	15%
Western and Southern:		
65&10%	50¢20½%	10&5%
So. Western		
65&5%	55&5%	10@20½%

Terms, 60 days, 2% cash 10 days. Factory shipments generally delivered.

See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:

Gal.	2	3	4	6	8
Galvanized	$1.85	$2.00	$2.25	$2.80	$4.90

Galvanized, Lined, side handles,

Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled 10%
Agate Lined 10%

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 25@27¢; lighter than 3 lb. to pair .....26@29¢

Cord— Sash—

Braided, Drab .....*lb.* 35¢
Braided, White, Com., Nos. 8 to 12, 23¢; No. 7, 23½¢; No. 6, 24½¢. In lots of 15 doz. or more, 1 cent less per pound.
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India .....*lb.,* 11@11½¢
Cotton Sash Cord, Tw'ted.18@20¢
Patent Russia .....*lb.* 23¢
Cable Laid Russia .....*lb.* 21¢
India Hemp, Br'd'd .....*lb.* 21¢
India Hemp, Twisted..lb. 13@14¢
Patent India, Twisted...lb. 17¢
Pearl Braided, cotton, No. 6, ₱ lb. 25½¢; No. 7, 26½¢; Nos 8 to 12, 26¢
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 26½¢; 6, 27½¢.
Harmony Cable Laid Italian, Nos 7 to 10 ..... ₱ lb 23 ¢
Pullman:
Wire Sash Cord 10%
Sash Cord Attachments, per doz.10¢
Samson, Nos 8 to 12:
Braided, ₱ lb. Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord..... 50¢@
Massachusetts, White..... ₱ lb 40¢
Massachusetts, Drab..... ₱ lb 40¢
Phoenix, White, Nos. 8 to 12, 27¢;
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢;
B, Drab, 40¢; B, White, 35¢;
Italian Hemp, 40¢; Linen...57½¢
See also Chain and Ribbon

Wire, Picture—

List July 10, 1906 .....90¢—%
Heudryx Standard Wire Picture Cord, old list. 85¢10%
Turner & Stanton Co. Wire Picture Cord ..... 85&10%

Cradles—

Grain .....40¢12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber, ₱ gro.
White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black..... $4.00
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $16.25; Indelibles 15%
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¾ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3 16 ..... $3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $5.50; Light $5.00

Crow Bars—See *Bars, Crow*

Cultivators—

Victor Garden 50%

Cutlery, Table—

International Silver Company:
No. 12 Mid'm Knives, 1847, ₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor ..... ₱ doz. $3.00
Wm. Rogers & Son ..... ₱ doz $2.50

Cutters— Glass—

H. H. Mayhew Co 40%
Red Devil 60%
B. Mfg. Co 50
Woodward 50

Meat and Food—

American 30%

Nos.	401	402	403	404	405	406	407
Each	$5	$7	$10	$12	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$1.50	$6

25@25&7½%
No. 202 $1.50 ..... 10&7½%
P., S. & W. Co.:

Dixies	1	2	3	3½	33½%
Nos	1	2	3	4	5
Each	$14.00	$17.00	$18.00	$20.00	

Ideal ..... 10&10&5%
Hales ..... 60&10&5%
Little Giant ..... ₱ doz. 40&10&5%

No.	202	310	312	322	322
	$35.00	$48.00	$44.00	$52.00	$68.00

New Triumph No. 606 ..... $24.00 10&10%
Russwin Food No. 1, $21.00 No. 2 $20.00 ..... 45&10&10%
$15.00 $18.00
Enterprise Beef Shavers..... 25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters..... 35%
Corn Graters..... 30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife.... ₱ doz. $3.00
Combined Slaw Cutter and Corn Grater ..... ₱ doz. $1.00

Tobacco—

All Iron, Cheap...doz. $4.25@$4.50
Enterprise ..... 25@30%
National, ₱ doz., No. 1, $21; No. 2, $18 ..... 40%

Diggers, Post Hole, &c.—

Disston's:
Rapid, ₱ doz., $24.00 ..... 25%
Samson, ₱ doz., $34.00 ..... 25%
Iwan's Imp ted Post Hole Auger..40%
Vaughan Pattern Post Hole Augers, ₱ doz., $7.00
Perfection Post Hole Diggers, ₱ doz. $8.75
Split Handle Post Hole Diggers, ₱ doz., $7.75
Hercules Pattern, ₱ doz..... $10.00
Kohler's, ₱ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer..... $7.50
Never-Break Post Hole Diggers ₱ doz., $24.00..... 60%

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers.....35%
Sterling Wheel Dresser Cutters.....35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines ..... $1.50@$1.75
Breast, Millers Falls..... 15&10%
Breast, P. S. & W..... 33⅓%
Goodell Automatic Drills.50&10@60&10%
Millers Falls Automatic..... 33⅓%
Ratchet, Curtis & Curtis..... 25%
Ratchet, Parker's..... 40%
Ratchet, Weston's..... 40%
Ratchet, Weston's, Style H Improved 40%
Ratchet, No. 012..... 40%
Ratchet, Celebrated..... 40%
Ratchet, Whitney's, P., S. & W., 50&5%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00..... 33⅓%

Twist Drills—

Bit Stock .....60¢10&10@70%
Taper and Straight Shank ..... 60¢10@60¢10&5%

Drivers, Screw—

Screw D'ver Bits, per doz..45@50¢
Balsey's Screw Driver Bits..... ₱ doz., 2¼-in., $6; 4-in., $7.50; 6-in. ₱ doz. 50%
Buck Bros.' Screw Driver Bits..... 30%
Champion 50%
Disston's 70%
Pray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers.....40&10%
Gay's Double Action Ratchet..... 35%
Goodell's Auto..... 65@65&10%
Mayhew's Black Handle..... 40%
Mayhew's Monarch..... 40%
Millers Falls, Nos. 20 and 21.....25&10%
Millers Falls Nos. 11, 12, 41, 42..15&10%
Smith & Hemenway Co., Neverturn, 66⅔; Elmora, 60%; Star, 30&10%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized*		
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16@20 oz.*
Eastern:			
75&5%	60¢10%		15%
Central:			
75&10%	65%		15%
Western and Southern:			
75&5%	60¢5%		10&5%
So. Western:			
70¢10%	55¢7½%		12½%

Terms, 2% for cash. Factory shipments generally delivered.

See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. I. Standard Gauge 80%
No. 26 ..... 50%
No. 24 ..... 35%
No 22 ..... 10%
Copper ..... 50¢10%

Elbows, Stove Pipe—

Edwards, Standard Blue.....40&10&10%
Edwards, Royal Blue..... 40&10&10%
Reeves, Dover, one piece..... 40&10%

Emery, Turkish—

	4 to 46:	5½ to 226:	Flour.
Kegs .....*lb.*	5 5½¢	5½¢	9¼¢
½ *Kegs* ...*lb.*	5¼¢	5¾¢	9¾¢
¼ *Kegs* ...*lb.*	5½¢	6 ¢	9 ¢
10 lb. cans, 10 in case	6½¢	7 ¢	9 ¢
10 lb. cans, less than 10	10 ¢	10 ¢	8 ¢
1 lb. cans	10 ¢	10 ¢	8 ¢

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's ..... 50&10
Walling's ..... 50&10
Upson's Patent 40%

Cord and Weight—

Ives and Titan ..... 33⅓ %

Corrugated—

Acme Corrugated Fasteners 70%

Faucets—

Cork Lined ..... 50&10@60%
Metallic Key, Leather Lined.
50&10@70%
Red Cedar ..... 40@50&10@65%
Petroleum ..... 70&10@75%
B. & L. & S. Co.:
Metal Key ..... 60&10%
Star ..... 60&10%
West Lock ..... 50&10%
John Sommer's Peerless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Mfd. Key 50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock 60%
John Sommer's I. X. L. Cork Lined..50%
John Sommer's Reliable Cork Lined.
50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No. Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
Self Measuring
Enterprise, ₱ doz $36.00 ..... 40&10%
Lane's, ₱ doz $36.00 ..... 40&10%
National Measuring, ₱ doz, $36.40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List Nov. 1, 1899.
Best Brands ..... 70&10@75&10%
Standard Brands ..... 70&10@75%
Lower Grade ..... 75&10@10&10&10%

Imported -

Stubs' Tapers, Stubs' list, July 24, '97 ..... $3 1-3@40%

Fixtures, Fire Door—

Allith Underwriters' Approved..... 50%
Richards Mfg. Co:
Universal, No. 103; Special, No. 104 ..... $3.75
Flexible Links, No. 96 ..... 60%
Expansion Bolts, No 107 ..... 60&10%

Grindstone—

Net Prices:
Inch 15 17 19 21
Per doz $3.60 3.85 4.15 4.65
P., S. & W. Co 60%
Readily Hardware Co 60%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Eze Potato ..... 60&10%
Victor, Hay ..... 60&15&2½%
Victor, Manure 66%
Victor, Header 66%
Champion, Hay 66⅔%
Champion, Header 65%
Champion, Manure ..... 60&15&2½%
Columbia, Hay ..... 60&20%
Columbia, Manure 70%
Columbia, Spading ..... 70&12½%
Hawkeye Wood Barley 60%
W. & C. Potato Digger ..... 60&10%
Acme Hay ..... 60&20%
Acme Manure, 4 tine ..... 60&15%
Dakota Steel Barley ..... 60&20%
Jackson Steel Barley ..... 60&20%
Kansas Header 65%
W. & C. Barley Wood Barley 40%
Plated.—See Spoons.

Frames— Wood Saw—

White, S'g't Bar, per doz. 75@80¢
Red, S'g't Bar, per doz. $1.00@1.25
Red, Dbl. Brace, per doz. $1.40@1.50

Freezers, Ice Cream—

Qt.	1	2	3	4	6
Each	$1.25	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp	$2.75
Cotton	3.20
Waterproof Sgl. Taped	3.65
Waterproof Dbl Taped	4.40
Waterproof Tpl. Taped	5.15

Extra 60% on fuse given.

Gates, Molasses and Oil—

Stebbins' Pattern ..... 75@80%

Gauges—

Marking, Mortise, &c. 50@50&10%
Chapin-Stephens Co.:
Marking Mortise &c ..... 50&50&10%
Disston's Marking Mortise &c 67½%
Wire, Brown & Sharpe's 33⅓%
Wire Morse 25%
Wire P., S. & W. Co 33⅓%

Gimlets— Single Cut—

Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.40
Spike, Metal, No. 1, $4.00; 2, $4.80
Nail, Wood Handled, No. 1, $2.80; 2, $3.60
Spike, Wood Handled, No. 1, $4.80; 2, $6.00

Glass, American Window
See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co ..... 65@65&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush.
25&10@50%
Elwell's 50%

Grease, Axle—

Common Grade ..... *gro. $6.00@6.50*
Dixon's Everlasting Lub pads 24 8¢, in boxes, ₱ doz., 1 lb. $1.20, 2 lb. $2.40
Helmet Hard Oil 25%

Griddles, Soapstone—

Pike Mfg. Co ..... 33⅓@33⅓&10%

Grinders—

Royal Mfg. Co:
Alundum Grinding Machines, each, Nos. 01, $1.75, 1A, $2.50, 1, $5.00 ..... 30%
Alundum Sickle Grinders, each, Nos. 20, $3.00, 20A, $6.00, 20A Combined, $6.00 ..... 30%
Alundum Disc Grinders, each, $2.50 ..... 30%

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., ₱ 33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted 40

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... *60&5@60&10%*
Covert Mfg. Co.:
Web ..... 30&2%
Jute Rope 35%
Sisal Rope 35%
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am. Coil and Halters ..... 40@40&5
Am. Cow Ties ..... 45@50%
Niagara Coil and Halters..45@50&2%
Niagara Cow Ties ..... 45&5@50&10&5%

Hammers—
Handled Hammers—

Heller's Machinists' ..... 55&10@55&10&5%
Heller's Farriers' ..... 40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel 50%
Farriers ..... 10&10&5
Riveting 50%
Machinists', revised list ..... 66⅔&5%
Blacksmiths' ..... 50&5%
Fayette R. Plumb:
A. E. Nail ..... 40&2½&10&5%
Eng. and B. S. Hand 50&10&5 @60
Machinists' Hammers ..... 50@60&10
Rivet and Tinners 40&2½&10&5

Heavy Hammers and Sledges—

Under 3 lb., per lb., 5¢ ..... 50&5%
3 to 5 lb., per lb., 10¢ ..... 50&5%
Over 5 lb., per lb., 20¢
..... 50&10&5%

Wilkinson's Smiths' ..... lb. 9½@10¢

Handles—

Agricultural Tool Handles
Axe, Pick, &c. ..... *60&10@60&10&5%*
Hoe, Rake, &c. *40%*
Fork, Shovel, Spade, &c.:
Long Handles *40%*
D Handles *40%*

Cross-Cut Saw Handles—

Atasco 40%
Champion 50%
Rastus 50%

Mechanics' Tool Handles—

Auger, assorted...gro. $3.00@$3.50
Brad Awl ..... *gro. $1.65@$1.75*
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory ..... *$2.15@2.40*
Socket Firmer, Apple, $1.75@ $1.95; Hickory ..... *$1.60@$1.75*
Socket Framing, Hickory, $1.60@$1.75
File, assorted ..... *gro. $1.30@$1.40*
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz. $0.85@$1.50; Not Varnished ..... *.65@.75¢*
Plane Handles:
Jack, doz. 80¢; Jack, Bolted 75¢
Fore, doz. 45¢; Fore, Bolted 90¢
Chapin-Stephens Co.:
Carving Tool ..... 30&10&10%
Chisel ..... 60&10&10
File and Awl ..... 60&10&10
Saw and Plane ..... 30@30&10%
Sash Pulley ..... 30&10&10%
Miller Falls Adj. and Ratchet Auger Handles ..... 15&10%
Nicholson Simplicity File Handle..... 50&10&5%
W. A. Zelnicker Supply Co.:
Hammer ₱ doz., 12 in. $2.00, 14 in. $2.50, 16 in. $3.00, 18 in., $2.50, 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge ₱ doz., oval 20 in., $5.80; octagon, 20 in., $4.90; oval, 36 in., $4.00; octagon, 36 in., $5.80.
Axe ₱ doz., 28 to 34 in. $5.60
Adze ₱ doz., 36 in., $5.80; 36 in., $7.80.
Pick ₱ doz., R. R. 36 in., $8.00; coal, 34 in., $5.80.
Hatchet ₱ doz., 12 to 14 in., $2.40

Hangers—

NOTE—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.
Allith Mfg. Co.:
Reliable, Nos. 1 and 2; Allith, No. 3; Allith Admirable No. 6; Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 35%
Big Twin 35%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60&2½%
Roller Bearing ..... 70&2½%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, ... 60&10%
Roller Bearing, Ex. Hy. No. 22, $18.00 ..... 60&10%
Bull Dog, $24.00 ..... 70%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard 60%
Hinged ..... net $6.08
Covered ..... 60&5%
Special ..... 70&5%
Lawrence Bros.:
Advance ..... 55&10
Cleveland ..... 70&7½
Climax, No. 75 60
Crown ..... 55&10
Cyclone, No. 40 ..... net $6.50
Tandem, No. 50 ..... net $7.50
New York ..... 55&10
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2.70%
Anti-Friction 60%
Hinged Hangers, King Charm..60
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, ... 60&5
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12.$2.20
Roller B'r'g St'l Track No. 13.$2.50
Roller B'r'g, Nos. 39, 41, 43, 45 ..... 70&5%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16 ..... 50&10%
Seal, Steel Track No. 8..... $2.25
Auto Adj. Track No. 22..—50&5%
Trolley B, D. No. 17, $1.25; F. D. No. 27, $2.25. No. 121, $2.45; No. 150 ..... $2.50
Safety Underwriters F. D. No. 101 ..... 50%
Tandem No. 41 2⅞ and 3 60&10%
Palace, Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 122 ..... 50&5%
Ives' Wood Track No. 1 ..... $2.25
Trolley B. D. No. 24 ..... 50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43 and Steel Track ..... 70&5%
Anti-friction, No. 42; No. 44, sizes 2½ and 3 ..... 60%
Hinged Tandem No. 48..—60&5%
Folding Door B. B. Swivel No. 135 ..... 40%
Taylor & Boggis F'y Co.'s Kid-Ader Roller Bearing 50&15&10&5%
Myers' Stayon Hangers 60%

Hangers— Garment—

Pullman Trouser, ₱ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00. 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $10.50; Garment Hanger Loops, Round Nickeled, per gro. $9.50
Victor Folding ..... ₱ gro. $9.60

Gate—

Myers' Patent Gate Hangers, ₱ doz. net $4.50

Joist and Timber—

Lane Bros. Co 30%

Hasps—

Griffin's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, ₱ doz 60

Hatchets—

Regular list, first qual. 40&2½%@—
Second quality ..... *50&5%—*

Heaters, Carriage—

Clark, No. 5 $1.75; No. 5B, $2.00; No. 2 $2.50; No. 3 $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50 ..... 25%
Clark Coal, ₱ doz., $0.75 ..... 20%

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	1½	2
Doz. pair	$0.75	1.35	2.70

Mortise Shutter:

No.	1	1½	2
Doz. pair	$0.75	.65	.60

Mortise Reversible Shutter (Buffalo, &c.):

No.	1	1½	2
Doz. pair	$0.70	65	60

North's Automatic Blind Fixtures, No. 1 ₱ doz. $2.00 No. 3 $3.00
Brick, $2.50 ..... 33⅓%
Charles Parker Co ..... 70&25%
Parker Wire Goods Co:
Hale & Benjamin Automatic Blind Hinge 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00 ..... 25%
Reading's Gravity 50%
Stanley's Steel Gravity Blind Hinges, No. 1045, ₱ box, 100 pairs, wrought steel, with screws, $1.25 ..... 30%
Wrightsville Hardware Co.:
O. S., Lull & Porter ..... 75&5%
Acme Lock & Trimmings 75%
Acme Rod Fixtures 75%
Standard Manufacturing Co 55%
Niagara, Gravity Locking, No. 1 ..... 30%
No. 2 ..... 30%
Tip Hinges, No. 1 ..... 30%
No. 2 ..... 30%
Ball-Bearing Locking, No. 1 ..... 30%
Shepard's Double Locking 75%
Champion Gravity Locking ..... 75&5%
Piano 30%
Binge 30%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 30%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with Latches	$2.00	$2.50	$3.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	.85

New England:
With Latch ..... doz. ....@$2.00
Without Latch ..... doz. ....@$1.60
Reversible Self-Closing:
With Latch ..... doz. ....@$1.75
Without Latch ..... doz. ....@$1.35
Western:
With Latch ..... doz. $1.75
Without Latch ..... doz. $1.15
Wrightsville Hardware Co.:
Sluggett's or Clarks Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 ..... 30%

Pivot Hinges—

Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—

Holdback, Cast Iron...$6.75@6.00
Non-Holdback, Cast Iron...$6.00@5.25

J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 40%
Bardsley's Patent Checking..33⅓%
Bommer Bros
Bommer Ball Bearing Floor..40%
Bommer Spring Hinges 40%
No. 999 Wrot, Steel Hold Back, ₱ gr $9
Chicago Spring Butt Co.:
Chicago Spring Hinges 25
Triple End Spring Hinges 50
Chicago (Ball Bearing) Floor 50
Garden City Engine House 25
Keene's Saloon Door 25
Columbian Hardware Co.:
Acme, Wrought Steel 30
Acme, Brass 25
American 30%
Columbia, ₱ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ₱ gr. $12.00
Columbian Hinges ..... 60&10%
Gem, new list 30%
Clover Leaf ..... ₱ gr $12.00
Oxford, new list 30%
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co., Matchless....30%
Richards Mfg. Co:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co:
Buckeye All Steel Holdback Screen Door ..... ₱ gr. $9.00
Chief Ball Bearing Floor Hinge 50
Ball Bearing Door 25
No. 1777, Sheet Steel Holdback, ₱ gr, pr $9.00
Superior Spring Hinge Co:
Superior Floor Hinges..... 33⅓%

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges ..... *60&10%*
Heavy Strap Hinges ..... *60&10%*
Light T Hinges *55%*
Heavy T Hinges *55%*
Extra Heavy Hinges ..... *50&10%*
Hinge Hasps *55%*
Cox Heavy Strap *60%*
Cox Ex. Heavy T ..... *50&10%*

Screw Hook and Strap { 6 to 12 in., lb. 3½¢; 13 to 20 in., lb. 3½¢; 22 to 36 in., lb. 3½¢

Screw Hook and Eye:
½ inch ..... lb. 6½¢
⅝ inch ..... lb. 7½¢
¾ inch ..... lb. 8½¢

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—

M'f'gr's list, price per gross.

Inch	15	16	17
Galv. Steel	$8	$10	$12
Copper	12	13	15
Tinned	12	13	15
Tap Riveted	22	26	30

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick, No. 162 ..... each $1.35
Steel Mortar, No. 158 ..... each $1.35

Hoes— Eye—

Scovil and Oval Pattern ..... *60&10%*

Grub, list Feb. 23, 1899 ..... *70&10@75&10%*

Extra 10% often given on most of these Hinges.

O. & H Scovil 27½
Am. Tack & Hoc Co. (Scovil Pat. term) 60

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cross's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit $3.20
Ft. Madison Cotton Hoe ..... 70&10&5
Ft. Madison Crescent Cultivator Hoe, ₱ doz ..... 70&10%
Ft. Madison Mattock Hoes:
Regular Weight ..... ₱ doz. 30&5
Lighter Weight ..... ₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz., net ..... 60&10
Ft. Madison Dixie Tobacco Hoe ..... 75&10&7½
Kretsinger's Cut Easy ..... 70&10%
Warren Hoe ..... 45&10
Adjustable Trainhoe ..... 75&2
B. B. 6 in. Cultivator Hoe $3.40
B. B., 6½ in. $3.80
Acme Weeding ..... ₱ doz. net, $4.25
W. & C. Lifting Shuffle Hoe, ₱ doz. $3.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders—Bit—

Augular, ₱ doz. $24.00 ..... 45&10%

Door—

Bardsley's, Iron, 40 .; Brass and Bronze 50
Empire 50%
Fullman 35%
Richards Mfg. Co.: No. 117, Ever ready, 40 .; Nos. 118, 119, Sure Grip 50
Superior 33⅓%

File and Tool—

Nicholson File Holders and File Handles ..... 33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, ₱ gross, $10.80; ₱ doz. $1.25

Trace and Rein—

Fernald Double Trace Holder, ₱ doz. pairs $1.25
Dash Rein Holder, ₱ doz. pairs. $1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German 35%

Hooks—Cast Iron—

Bird Cage, Reading 40%
Clothes Line, Reading List 40%
Coat and Hat, Reading ..... 45&20%
Coat and Hat, Wrightsville ..... 60&5
Harness, Reading List 40%

Wire—

Belt 80%
Wire C. & H. Hooks 75%
Bradley, Metal Clasp Wire, Coat and Hat, Reading ..... 70&10
Columbian Hdw Co., Gem ..... 70&5
Parker Wire Goods Co., King ..... 70&10%
Wire Goods Co.: Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Boz, 6 in., per doz., $1.60; 8 in., $1.25; 10 in., $1.50.
Cotton ..... *doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Rush, Light, doz. $4.80; Medium, $6.75; Heavy, $7.65.
Grass, best, all sizes, per doz. $3.00
Grass, common grades, all sizes, per doz. *$1.50*
Whiffletree ..... *lb. 5¾@6¢*
Hooks and Eyes:
Brass ..... *60&10&10%*
Malleable Iron ..... *70@70&10%*
Covert Mfg Co. Gate and Scuttle Hooks 40%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $3.25 net
Turner & Stanten Co. Cup and Shoulder ..... 80&10
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾ inch:
Competition ..... *ft. 5¢@6¢*
3 ply Guaranteed ..... *ft. 8¢@9¢*
4 ply Guaranteed ..... *ft 10¢@11¢*
Cotton Garden, ¾ in., complete:
Low Grade ..... *ft. 8¢@9¢*
Fair Quality ..... *ft 10¢@11¢*

Irons—Sad—

From 4 to 10 ..... *lb 3¢@3½¢*
B. B. Sad Irons ..... *lb 3½@3¾¢*
Mrs. Potts', cents per set:

Nos	50	55	60	65
Japed Tops	85	80	93	91
Tin'd Tops	88	85	98	95

New England Pressing ..... *lb 3½@4¢*

Bar and Corner—

Richards Mfg. Co.: Bar, 60&10%; Corner 60

Pinking—

Pinking Irons ..... *doz. 60¢*

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw ..... 30&2%; Steel 45%
Lockport 50%
Lane's Steel ..... 30&5%
Richards' Tiger Steel, No. 130 ..... 50&10%
Smith & Hemenway Co.'s 25%

Ladder—

Richards Mfg. Co., Ladder Jacks. 50%

Kettles—

Brass, Spun, Plain ..... *20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c. 30%
Wilkinson Shear & Cutlery Co. 60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks 60%
Withington Acme, ₱ doz. $2.85
Dent, $2.75; Adj. Serated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List ..... *75&5@75&10%*
C. E. Jennings & Co., Nos. 45, 46, 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½
Swan's ..... 66⅔&7½
Watrous 16⅔
L. & I. J. White ..... 20&5@25

Hay and Straw—

Serrated Edge, per doz. $3.00@3.75
Iwan's Sickle Edge ..... ₱ doz. $9.50
Iwan's Serrated ..... ₱ doz. $10.00

Miscellaneous—

Farriers' ..... *doz. $3.00@3.25*
Wostenholm's ..... ₱ doz. $3.00@3.25

Knobs—

Base, 2½ inch, Birch, or Maple, Rubber Tip ..... *gro. $1.25@$1.40*
Carriage, Jap., all sizes ..... *gro. 40@45¢*
Door, Mineral ..... *doz. 65@70¢*
Door, Por. Jap'd ..... *doz. 70@75¢*
Door, Por. Nickel ..... *doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—

See *Belting, Leather.*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable 50%
Lane's Store 25%
Myers' Noiseless Store Ladders 50
Richards Mfg. Co.:
Improved Noiseless, No. 112 ..... 50%
Climax Shelf, No. 113 ..... 50%
Trolley, No. 109 ..... 50%

Ladles, Melting—

L. & G. Mfg. Co. (low list) 20%
P. S. & W ..... 40&10%
Reading 60%

Lanterns—Tubular—

Regular, No. 0 ..... *doz. $4.35@4.50*
Side Lift, No. 0 ..... *doz. $5.00@5.75*
Hinge Globe, No. 0. doz. $4.60@4.75
Other Styles ..... *40@40&10%*

Bull's Eye Police—

8-inch ..... *$4.25@4.50*

Latches— Thumb—

Roggin's Latches, with screw ..... *doz. 35@40¢*

Door—

Allith Mfg. Co., Reliable and Alligator, 50%; Reliable Cold Storage, 50%
Crouk & Carrier Mfg. Co., No. 10, ₱ doz. $2.90
Richards' Bull Dog, Heavy, No. 125 ..... 50&5%
Richards' Trump, No. 127 ..... $1.50

Leaders, Cattle—

Small ..... *doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E 10%

Lines—

Wire Clothes, Nos. 18 19 20
100 feet *$2.00 2.25 2.00*
75 feet *$2.10 1.80 1.65*
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3 ..... 40%
Solid Braided Masons' 30%
Silver Lake Braided Chalk, ₱ doz. $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ..... ₱ gr. 20%
Masons' Linen, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50 ..... 20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 ..... 20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25 ..... 20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines 40%
Clothes Lines, White Cotton 20
Shade Cord, Cotton or Linen 20%

Locks— Cabinet—

Cabinet Locks *33⅓%*

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co. 40%
R. & E. Mfg. 10

Padlocks—

R. & E. Mfg. Co., Wrought Steel and Brass ..... 25&10%

Sash, &c.—

Iron, Patent:
Brass and Brass, 55&5%; Crescent 60%, 60&5; Window Ventilating 10&20%; Richards Pat. Ventilating Sash Lock, 33⅓%
Pullman Patent Ventilating Lock 35%
Reading Sash Locks 40%

Machines—Boring—

Com. Upr't, without Augers, $2.00@2.25
Com. Angl'r, without Augers, $2.25@2.50
Swan's Improved ..... 40&10%
Jennings', Nos. 1 and 4 ..... 25&7½%
Millers Falls 5 75
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Invincible Hand Power, ₱ doz. $18.00

Fence—

Williams' Fence Machines ..... each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist. 30%
Moore's Hand Hoist, with Lock Brake 21%
Moore's Cyclon, High Speed Chain Hoist 25

Ice Cutting—

Chandler's 12½%

Washing

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$54.00
Boss Rotary	$57.00
Champion Rotary Banner No. 1	$57.00
Standard Champion No. 1	$50.00
Standard Perfection	$27.00
Cincinnati Square Western	$33.00
Uneeda American, Round	$33.60

Mallets—

Hickory ..... *45@45@30%*
Lignumvitæ ..... *40@40@30%*
Tinners' Hickory and Apple wood ..... *doz. 45@45@50%*

Mangers, Stable—

Swett Iron Works 50%

Mats, Door—

Acme Flexible Steel 50
Elastic Steel (W. G. Co.), new list. 50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co. ..... 20@25%
National list Jan. 1, 1902 ..... 30%
Parker's Columbia and Victoria 33⅓%
Parker's Hand and Side ..... 50&10%
Swift, Lane Bros. Co. 30%

Motors, Water—

Divine's Red Devil 30%
Lippincott's 30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest ..... *all sizes, $1.85@2.00*
Cheap ..... *all sizes, $2.00@2.50*
Better Grade ..... *all sizes, $2.50@3.50*

	12	14	16	18-in.
High Grade	$4.50	4.75	5.00	5.25

Continental 60%
Great American 70%
Great American Ball Br'g, new list. 70%
Quaker City 70%
Pennsylvania 60%
Pennsylvania, Jr., Ball Bearing, 50&10&5%
Pennsylvania Golf 50%
Pennsylvania Horse ..... 35&5&5%
Pennsylvania Pony ..... 40&5%
Granite State:
Style A, Low Wheel 70%
Style B, Low Wheel 70%
Style C, High Wheel, spcl, list, 70&10
Style D, High Wheel, spcl, list. 70%
Philadelphia:
Styles M., S., C., K., T. ..... 70&10&5%
Style A, all Steel ..... 60&10&5%
Style E, High Wheel ..... 70&10&5%
Drexel and Gold Coin, special list. 40%
Horse ..... 10&5
Pony ..... 10&5
36-in. Horse ..... 30&10%
Eagle Horse ..... 30&5%
I. X. L. Horse 50%

Nails—

Wire Nails and Brads, Miscellaneous ..... *87½@87½@10%*
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	22	20	19	18	..	40&5%
Coleman	13	12	12	11	..	net
New Haven	23	21	20	19	18	..40&5%
Livingston	19	18	17	16	15	.. 10%
Western	..	..	..	..	..	₱ lb 8½¢

Jobbers' Special Brands ..... *per lb. 9@10¢*

Picture—

	1½	2	2½	3	in.
Brass H'd.	*45*	*55*	*60*	*70*	*.. gro*
Por. Head	*.. 1.10*	*1.10*	*1.10*	*.. gro*	

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: Off list.
Square, Blank or Tapped ..... *4.80¢*
Hexagon, Blank or Tapped ..... *5.00¢*
Square, Blk. C. T. & C. R ..... *5.10¢*
Hexagon Blk. C. T. & C. R ..... *5.20¢*
Hot Pressed:
Square, Blank ..... *7.30¢*
Hexagon, Blank ..... *5.70¢*
Square, Tapped ..... *7.30¢*
Hexagon, Tapped ..... *5.60¢*

Oakum—

Best ..... *lb. 6½¢*
U. S. Navy ..... *6¢*
Navy ..... *5¢*
Plumbers' Spun Jackson ..... *8½@8¾¢*

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated *75%*
Chase or Paragon:
Brass and Copper ..... *50&10%*
Zinc ..... *65&10%*
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 80%.
American Tube & Stamping Co.:
Spring Bottom Cans ..... 70&10%
Railroad Oilers, &c. ..... 60@60&10%

Openers— Can— *Per doz.*

Sprague, Iron Handle ..... *.30@35¢*
Sprague, Wood Handle ..... *.35¢ per*
Sardine Scissors ..... *$1.75@$3.00*
Yankee Can and Bottle Opener, ₱ doz., net, $0.75; Little Gem, ₱ doz., net $0.65

Egg—

Hartigan Nickel Plate, ₱ doz., $2.00. Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope ..... *.20@25¢*

Rubber—

(Fair quality goods.)

Sheet, C. I. ..... *.11@12¢*
Sheet, C. O. S. ..... *.11@12¢*
Sheet, C. B. S. ..... *.12@13¢*
Sheet, Pure Gum ..... *.40@45¢*
Sheet, Red ..... *.40@50¢*
Jenkins' '96, ₱ lb. 80¢ 25%

Miscellaneous—

American Packing .. *lb. 7@10 ¢*
Colton Packing ..... *lb. 16@25 ¢*
Italian Packing ..... *lb. 9@12½¢*
Jute ..... *lb. 4@4½¢*
Russia Packing ..... *lb. 8@11 ¢*

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List ..... *65&7½@70%*
Edwards, Royal Blue ..... 65&7½

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos:	*lb.*
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.	*3½@105¢*
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.	*6¢*
Mill Board, Sheet, 40 & 40 lb., 1-32 to 1/4 in.	*3@5¢*
	Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll	*$4@5.85¢*
Medium weight, 30 lbs. to roll	*56@70¢*
Heavy weight, 40 lbs. to roll	*77@78¢*
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.	
Deafening Felt, 9, 6 and 4½ sq. ft. to Ib. to roll	*$4@5.50*
Red Rope Roofing, 250 sq. ft. per roll	*$1.75*

Tarred Paper—

1 ply (roll 400 sq. ft.), ton ..... *$3.00@$38.00*
2 ply, roll 108 sq. ft. ..... *65¢*
3 ply, roll 108 sq. ft. ..... *88¢*
Slater's Felt (roll 500 sq. ft.) .80¢

Sand and Emery—

Flint Paper and Cloth ..... *50&10@—%*
Garnet Paper and Cloth *25%*
Emery Paper and Cl'h ..... *50&10@60%*

Parers— Apple—

Goodell Co.:
Family Bay State ..... ₱ doz. $15 00
Improved Bay State ..... ₱ doz. $36.00
New Lightning ..... ₱ doz. $7.00
Tip Top ..... ₱ doz. $6.00
White Mountain ..... ₱ doz. $9.00
Bonanza Improved ..... each $7.50
Dandy ..... each $10.00
Enterprise Improved ..... each $20.00
New Century ..... each $20.00
Ranger ..... each $25.00

Livingston Nail Co.:
Daisy ..... ₱ doz. $4.00
Little Star ..... ₱ doz. $5.00
Rocking Table ..... ₱ doz. $6.20

Reading Hardware Co.:
Advance ..... ₱ doz. $4.00
Baldwin ..... ₱ doz. $4.00
Reading 72 ..... ₱ doz. $3.25
Reading 78 ..... ₱ doz. $6.25

Potato—

Saratoga ..... ₱ doz. $7.00
White Mountain ..... ₱ doz. $6.00

Picks and Mattocks—

List, Feb. 23, 1899. 70&10%@70&10&5%
Cronk's Hurdled Garden Mattock, ₱ doz., No. 2 $2.60; No. 3 $6.40.

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass .....50@50&10%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in......60@60%
Extra Heavy, 2-6 in......70@70% "
Fittings, Standard and Heavy.....75&10@ "

Pipe, Merchant—
Consumers, Carloads. Steel. Blk. Galv.	Iron. Blk. Galv.
% %	% %
⅛ & ¼ in....61 48	55 41
⅜ in.....66 52	59 44
½ in.....68 56	61 49
¾ to 6 in....72 62	66 56
7 to 12 in....69 54	61 46

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First class 82%
Second class .....85 "

Pipe, Stove—
Per 100 joints

	C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue....	$6.25	$7.25
6 in., Standard Blue....	6.75	7.75
7 in., Standard Blue....	7.75	8.75
5 in., Royal Blue.....	7.00	8.00
6 in., Royal Blue.....	7.50	8.50
7 in., Royal Blue.....	8.50	9.50
Whecling Corrugating Co.'s Nested:		
5 in., Uniform Color..	$6.15	$7.15
6 in., Uniform Color..	6.65	7.65
7 in., Uniform Color..	7.65	8.65

Planes and Plane Irons—
Wood Planes—
Bench, first qual.....30@30&10%
Bench, second qual.....30@30&10%
Molding .....25@25&10%
Chapin-Stephens Co.:
Bench, First Quality.....30%
Bench, Second Quality.....40 "
Molding and Miscellaneous.....25 "
Toy and German.....30 "
Union 60%

Iron Planes -
Chaplin's Iron Planes.....50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06.....25%
Buck Bros.....30%
Chapin-Stephens Co.....50 "
Union .....50 "
L. & I. J. White.....20&5@25 "

Planters, Corn, Hand—
Kohler's Eclipse.....₩ doz. $8.00

Plates—
Felloe .....lb. 4@4¼¢

Pliers and Nippers -
Button Pliers.....75@75&10@5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe.. 7 8 10 12-in.
$2.00 $2.25 $2.75 $3.50

Acme Nippers.....50&5%
Cronk & Carrier Mfg. Co.:
American Iron.....80%
Improved Button.....75&10%
Cronk's .....60 "
No. 80 Linemen's.....50 "
Studley's .....45 "
Combination and others.....33⅓ "
Heller's Farriers' Nippers, Pincers and Tools.....40&5@40&10&5%
P., S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 35%; Elm City, 35%; Farad, 35%; Lodi, 55%.
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels.....20@25&10
Chapin's Imp. Brass Cor...40@40&10%
Pocket Levels.....40&10 "
Extension Sights.....40&10 "
Master Workmen's Levels.....40&10 "
Disston's Plumbs and Levels.....60&10%
Disston's Pocket Levels.....60&10%
Stanley's Duplex 45%
Wood's Extension.....33⅓ "

Points, Glaziers'—
Bulk and 1 lb. papers..lb. 9¼¢
½ lb. papers.....lb. 10 "
¼ lb. papers.....lb. 10½ "

Police Goods—
Manufacturers' Lists. 25@25&5%
Towers 25%

Polish—Metal, Etc—
Prestolite, Liquid, No. 1 ½ pt., ₩ doz. $3.00; No. 2 (1 qu.), $5.00 ...40%
Prestolite Paste .....60 "
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₩ doz. 50 ¢; ₩ gro. $4.50, ½ lb. boxes, ₩ doz. $1.25; 1 lb. boxes, ₩ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₩ doz., $1.25.
Barkeepers' Friend Metal Polish, ₩ doz., $1.75

Stove—
Black Eagle Benzine Paste, 5 lb. cans, ₩ doz. 10 ¢
Black Eagle, Liquid, ½ pt. cans, ₩ doz. 75 ¢
Black Jack Paste, 5 lb. cans, ₩ gr. $9.00
Black Kid Paste, 5 lb. can.....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's.....₩ gr. $5.75.....10%
Dixon's Plumbago.....₩ lb. 10 ¢
Fireside .....₩ gr. $2.50
Gem .....₩ gr. $1.50.....10 "
Japanese .....₩ gr. $.90
Jet Black .....₩ gr. $3.50
Peerless Iron Enamel, 10 oz. cans, ₩ doz. $1.50

Poppers, Corn—
1 qt. Square..doz.$0.88; gro.$8.75
1 qt. Round..doz.$1.00; gro.$10.00
Pt. qt. Square..doz.$1.10; gro.$11.00
2 qt. Square..doz.$1.35; gro.$13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42 ¢; 6 ft., 46 ¢., 6½ ft., 48 ¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled .....35&10%
Tinned .....30&10 "

Powder—
In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb.....each 15¢
Rifle, 1-lb.....each 25¢
In Kegs:
12½ lb. kegs.....$3.50
25-lb. kegs.....$6.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb. bulk).....$3.50
Quarter Keg (6¼ lb. bulk).....$1.80
Case 24 (1 lb cans bulk).....$6.50
Half case (1 lb cans bulk).....$4.50
King's Smokeless: Shot Gun. Rifle.
Keg (25 lb bulk).....$12.00 $15.00
Half Keg (12½ lb bulk)... 6 25 7 75
Quarter Keg (6¼ lb bulk). 3.25 4 00
Case 24 (1 lb cans bulk).. 14.00 17.00
Half case 12 (1 lb c. bk)... 7.25 8.75

Presses—
Fruit and Jelly—
Enterprise Mfg Co.....20@25%

Seal Presses—
Morrill's No. 1, ₩ doz., $20.00.....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 50%
Miller's Falls, No. 3, ₩ doz.. $12.00
.....33⅓&10%
Morrill's No. 1, Nail Puller, ₩ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
The Stranton Co. Case Lots:
No. 1B (nail).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co:
Diamond B.....70%
Giant .....50 "
Staple Pullers, Utica and Davison 60%

Pulleys, Single Wheel—
Inch	*1½*	*1¾*	*2*	*3*
Awning or Tackle, doz.	*$0.30*	*.45*	*.60*	*1.05*
Hay Fork, Swivel or Solid Eye. doz., 4 in., $1.25; 5 in., $1.55				
Inch	*2*	*2¼*	*2½*	
Hot House, doz.	*$0.65*	*.85*	*1.20*	
Inch	*1¼*	*1½*	*1¾*	*2*
Screw, doz.	*$0.16*	*.19*	*.25*	*.30*
Inch	*1¾*	*2*	*2¼*	*2½*
Side, doz.	*$0.25*	*.40*	*.55*	*.60*
Inch	*1½*	*1¾*	*2*	*2½*

Sash Pulleys—
Common Frame; Square or Round End, per doz., 1¾ and 2 in......17@20¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in......20@21¢
Acme No. 25, 1¾ in., 1.....
American Pulley Co.:
Wright Steel Axle.....
Wright Steel Edge.....
Ewald-Steel, Nos. 3 and 7, 2 in.
.....
Grand Rapids All Steel No.....
Niagara No. 25, 1¾ in., Pat.....
No. 36, Tron, 1¾ in., 1.....
Star No. 25, 1¾ in., 1.....
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout.....75&5@75&10@5%
Wood Pumps, Tubing, &c......50%
Barnes DH, Acting (low list)...40&5%
Bass, Pitcher .....
Contractors' Rubber Diaphragm No.
Dayton Wood Pump .....
Duisy Spray Pump .....12 to 50

Flint & Walling's, Fast Mail Hand, (low list) .....
Flint & Walling's, Fast Mail, (high list) .....
Flint & Walling's Tight Top Pitcher, ₩ doz. .....
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.00 .....
Myers' Pumps (low list) .....1 "
Myers' Power Pumps .....1 "
Myers' Spray Pumps .....1 "

Pump Leathers—
Plunger and Valve Leathers, Per gro.:

No.....	2	2½	3	4
	$3.40	3.70	4.45	4.95 5.50
Cup Leathers, Per doz. Inch.....	*2½*	*3*	*3½*	*4*
	$2.80	3.15	3.60	4.80

Punches—
Saddlers' or Drive, good.....doz. 50@75¢
Spring, single tube, good quality.....$1.75
Revolving (4 tubes).....doz. $3.60
Bemis & Call Co.'s Cast St'l Drive.50%
Merrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00.....50 "
Hornbeck, 1 die, each $5.50.....5 "
Niagara Hollow Punches .....10 "
Niagara Steel Punches.....35&.....
Wm. Schollhorn Co.:
Best and Tinkel, Bernard, 35%; Paragon, 50%; Lodi.....55%
Tinners' Hollow, P., S. & W. Co..40%
Tinners Solid, P., S. & W. Co., ₩ doz., $1.44.....40 "

Rail—Barn Door, &c.—
Sliding Door, Painted Iron.....2½@2¾ ¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢.....30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..₩ ft. 3¼ ¢
O. N. T. Rail.....$3.12
Griffin's:
xxx, ₩ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ₩ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ₩ 100 ft. $3.45
O. N. T., ₩ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in .....₩ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ₩ 100 ft., $7.50; 1¼ x 3-16 in., $8.75.....55&1½%
McKinney's:
Hinged Hanger Track, ₩ ft., 11 ¢.
1 x 3-16 Track.....55&5%
Myers' Stayon Track.....60&5 "
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1⅛ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ₩ ft., No. 31, &c., No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor.....80&5%
Queen Lawn, ₩ doz., 20 teeth. $2.85; 24, $3.30.....net
Adriatic Lawn, ₩ doz. $4.00
Malleable Garden .....net
Ideal Steel Garden, ₩ doz., 12 teeth, $15.00, 14, $16.00, 16, $18.00 .....net
Kohler's:
Lawn Queen, 20-tooth....₩ doz. $3.15
Lawn Queen, 24-tooth....₩ doz. $3.25
Paragon, 20-tooth .....₩ doz. $2.70
Paragon, 24-tooth .....₩ doz. $2.75
Steel Garden, 14-tooth....₩ doz. $2.40
Malleable Garden, 14-tooth, ₩ doz. $2.00@2.25

Rasps, Horse—
Disston's 75%
Heller Bros.....70&5%
Hartell Bros.' Gold Medal.70&10@75%
McCaffrey's American Standard .....60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—
Lamb Barber .....60 "
Fay Razors, ₩ doz., No. 42, $20.00; No. 44, $20.00; No. 92, Platina, $27.00 .....
Hall Bros.....65 "

Reels, Fishing—
Horton:
Meek, 6, 6, 8, 8, 8

aws—

...45%
...50@50&10
...50
...35
...14
...50
...35&5
...1
...45%
...40&10
...
...30@30&10%
...
...Scind and Ins'ted Tooth..50%
...and, 2 to 18 in. wide.....60%
...nd, ¼ to 1¾.....45%
...Cossetts.....45%
...arrow Crosscuts.....50
...way, Mill and Drag.....50%
...ramed Woodsaws.....25%
...odsaw Blades.....25%
...oodsaw Rods, Tinned.....15
...and Saws, Nos. 12, 99, 9, 16, dl100.....
...8, 120, 76, 77, 8.....50%
...and Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination.....30%
...ompass, Key Hole, &c.....25%
...ncher Saw and Blades.....30%
...E. Jennings & Co.'s:
...ack Saws.....16⅔
...atcher Saws.....25&5%
...ompass and Key Hole Saws.....33⅓&5%
...ramed Wood Saws.....25&5%
...and Saws.....12½
...Wood Saw Blades.....33⅓&5%
...lers Fails:
...utcher Saws.....15&10%
...utcher Saws.....15&10%
...ranshuetts Saw Works:
...ctor Kitchen Saws.....40&10&5%
...utcher Saws Blades.....35@40%
...ce & Richardson's Hand Saws.....30%
...eonds':
...ircular Saws.....45%
...resent Ground Cross Cut Saws.....30
...ree Man Cross Cuts.....40&10
...ang Mill, Mulay and Drag Saws.....45
...and Saws.....25
...lack Saws.....25@25&7½
...utcher Saws.....35@35&5%
...and Saws.....25@25&7½
...and Saws, Bay State Brand.....7½
...ompass Saw, Key Hole, &c.....25@25&7½
...Wood Saws.....40&7½
...eeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws.....40%

Hack Saw Blades and Frames—

...kins' Hack Saw Blades A A A..25%
...eston's:
...oncave Blades.....25%
...Keystone Blades.....30%
...lack Saw Blades.....30%
...nonds Mfg. Co.....35%
...E. Jennings & Co.'s:
...lack Saw Frames, Nos. 175, 180.....40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
...oodell's Hack Saw Blades.....40&10%
...riffin's Hack Saw Frames.....35&5&10%
...riffin's Hack Saw Blades.....35&5&10%
...ar Hack Saws and Blades.....15&10%
...erling Hack Saw Blades.....30&10&5%
...erling Hack Saw Frames.....30&10&10%
...erling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00.....10%
...ictor Hack Saw Blades.....20%
...ictor Hack Saw Frames.....40%

Scroll—

...ames, No. 7, $15.....25%
...arnes' Scroll Saw Blades.....40%
...arnes' Velocipede Power Scroll Saw, without boring attachment, $13; with boring attachment, $20.....20%
...ester, complete, $10.00.....15&10%
...gers, complete, $3.50 and $4.00.....15&10%

Scales—

...amily, Turnbull's.....50@50&10%
...anies:
...Hatch, Platforms, 12 oz. to 4 lbs.....doz. $5.50
...Two Platforms, 12 oz. to 8 lbs.....doz. $16.00
...Union Platform, Plain.$1.70@1.90
...Union Platform, Stpd.$1.85@2.15
...Bathbone's:
...Eureka.....
...Favorite.....
...Grocers' Tray Scales.....
...he Standard Portable.....40%
...he Standard R. R. and Wagon.....50&10%

Scrapers—

...oz, 1 Handle.....doz. $2.00@2.25
...oz, 2 Handle.....doz. $2.50@2.60
...hip.....Light, $2.00; Heavy, $4.50
...hapin-Stephens Co., Box...30@30&10%
...ichards Mfg. Co. Pat.....60%

Screws—Bench and Hand

...inch, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1½, $3.50@3.75
...Bench, Wood.....20@20&10%
...Hand, Wood.....70@70@70&10%
...Chapin Stephens Co., Hand.....70@70&10%

Coach, Lag and Hand Rail—

...ag, Cone Point.....75@75&10%
...Coach, Gimlet Point.....75@10&5%
...Hand Rail.....70@10@5%

Jack Screws—

...Standard List.....70&10@75%
.....50&10&10%
.....70@75

Machine—

...Cut Thread, Iron, Brass or Steel:
.....Round Head.....
.....50@50&10%
.....Flat Head.....10@10&10%
...Sharp Thread, F. H. or R. H. Iron.....75&10%
...Iron, F. H. or R. H., Brass, Nos. 8 to 14.....65&10%

Set and Cap—

...Set (Iron).....75&10&7½%
...Set (Steel), net advance over Iron.....25%
...Sq. Hd. Cap.....50@10&7½%
...Hex Hd. Cap.....70@10&7½%
...Rd. Hd. Cap.....50&7½%
...Fillister Hd. Cap.....60&7½%

Wood—

List July 23, 1903.

...Flat Head, Iron.....87½@5%
...Round Head, Iron.....85@5%
...Flat Head, Brass.....80@5%
...Round Head, Brass.....77½@5%
...Flat Head, Bronze.....75@5%
...Round Head, Bronze.....72½@5%
...Drive Screws.....87½@5%

Scroll Saws—

See *Saws, Scroll.*

Scythes—

Per doz.

...Grass, No. 1, Plain.....$6.25@6.75
...Clipper, Bronzed Web.....$6.50@7.00
...No. 3 Clipper, Pol'd Webb.....$6.75@7.25
...No. 6 Clipper and Solid Steel.....$7.00@7.50
...Bush, Weed and Bramble, No. 2.....$6.50@7.00
...Grain, No. 1.....$8.25@8.75
...Bronzed Webb, No. 1.....$8.50@9.00
...Nos. 3 and 4 Clipper, Grain.....$8.75@9.25
...Solid Steel, No. 6.....$9.25@9.75

Seeders, Raisin—

Enterprise.....25@30%

Sets— Awl and Tool—

...Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
...Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18.....20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel.....₰ doz sets $9.00

Sets, Nail—

...Octagon.....gro. $3.50@3.75
...Buck Bros.....27½%
...Cannon's Diamond Point, ₰ gro, $12.....10&10
...Mayhew's.....₰ gro $1.90
...Snell's Corrugated, Cup Pt.....10&1
...Snell's Knurled, Cup Pt.....40&10
...Victor Knurled Cup Pt.....₰ gro. $7.50

Rivet—

...Regular list.....75@75&10%

Saw—

...Atkin's:
...Criterion.....40%
...Adjustable.....40%
...Disston's Star, Monarch and Triumph.....30%
...Morrill's, No. 1.....$15.00
...Nos. 3 and 4, Cross Cut.....$20.60
...No. 5, Mill.....$30.00
...Nos. 10, 11, 12.....$13.60
...No. 1 Old Style.....$10.00
...Special.....$16.25
...Giant, Royal Cross Cut.....₰ doz. $8.00
...Royal, Hand.....₰ doz. $4.50
...Taintor Positive.....₰ doz. $4.75

Shaving—

Fox Shaving Sets, No 30.....
₰ doz., net, $24.00
Smith & Hemenway Co.'s.....75%

Sharpeners, Knife—

...Pike Mfg. Co.:
...Fast Cut Pocket Knife Hones, ₰ doz.....$1.50
...Mounted Kitchen Sand Stone, ₰ doz.....$1.50
...Natural Grit Carving Knife Hones, ₰ doz.....$2.00
...Quick Cut Emery Carving Knife Hones, ₰ doz.....$1.50
...Quick Edge Pocket Knife Hones, ₰ doz.....$2.50

50%

Skate—

Smith & Hemenway Co., Eureka..50%

Shaves, Spoke—

...Iron.....doz.$1.10@1.25
...Wood.....doz.$1.75@2.25
...Bailey's (Stanley R. & L. Co.).....45%
...Chapin-Stephens Co.....30@30&10%
...Goodell's ₰ doz. $9.00.....15&10%

Shears—

	7	8	9 in.	
Cast Iron..				
Best...	$16.00	18.00	20.00	gro.
Good...	13.00	15.00	17.00	gro.
Cheap..	5.00	6.00	7.00	gro.

...Straight Trimmers, &c.....70@70&10%
...Best quality Jap.....70@70&10%
...Best quality, Nickel..60@60&10%
...Tailors' Shears.....40@40&5%
...Acme Cast Shears.....40@40&5%
...Heinisch's Tailor's Shears.....10%
...Wilkinson Shear & Cutlery Co.:
...Sheep, 1900 list.....30&10&5%
...Grass.....50&10%
...Horse or Mule.....50&10%

Tinners' Snips—

...Steel Blades.....20&5@20&10%
...Steel Laid Blades.....40&10@50%
...Forged Handles, Steel Blades, Berlin.....50%
...Heinisch's Snips.....40%
...Jennings & Griffin Mfg. Co.'s 6½ to 11 in.....33⅓&7½%
...Niagara Snips.....40%
...Pexto Snips, Forged Handles, 250's.....
...W R W.....40&10%

Pruning Shears—

...Cronk's Hand Shears.....33⅓%
...Cronk's Wood Handle Shears.....33⅓%
...Disston's Combined Pruning Hook and Saw ₰ doz $18.00.....25%
...Disston's Pruning Hook only, ₰ doz., $12.00.....25%
...John T. Henry Mfg. Co.:
...Pruning Shears, all grades.....40%
...Pexto & W. Co.....40&10%
...Columbian-Cutlery Co.:
...Hedge, Wilcut Brand.....60&10%
...Lawn and Border, Wilcut Brand, 60&10%

Sheaves— Sliding Door—

Reading.....40%
R. & E. list.....15%

Sliding Shutter—

Reading list.....40%
R & E. list.....10%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge.....65&10%
Club, Rival, 65&5%; First Quality, 60&5

Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, 25&5%
Union, League, 12 and 12 gauge; Rival Grade.....25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge.....20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%

Shells, Loaded—

...Loaded with Black Powder..40%
...Loaded with Smokeless Powder, medium grade.....40&5%
...Loaded with Smokeless Powder, high grade.....40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders.....40%
Nitro Club, Smokeless Powders.40&5%
Arrow, Smokeless Powders.40&10&10%
Winchester:
Smokeless Repeater Grade.....40&5%
Smokeless Leader Grade...40&10&10%
Black Powder.....40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50
Wheeling Corrugating Co.:		
Dixie, 14 x 20 in	$4.25	$5.50
Dixie, 10 x 14 in	4.50	6.00
Dixie, 7 x 10 in	5.00	6.75

Shoes, Horse, Mule,&c.—

F.o.b. Pittsburgh:

...Iron.....per keg.$4.10
...Steel.....per keg.$3.85
Burden's, all sizes.....₰ keg $3.90

Shot—

	25-lb. bag.
Drop, up to B	$1.85
Drop, B and larger	2.10
Buck	2.10
Chilled	2.10
Dust	2.30

Shovels and Spades—

...Association List, Nov. 15, 1902..40%
Avery Stamping Co.....40%

Snow Shovels—

...Long Handle.....$3.25@3.50
...Wood and Mall. D. Handle.....$3.75@4.00

Sieves and Sifters—

...Hunter's Imitation.....gro.$9.50@10.00
...Hunter's Genuine.....per gro. $12.00@12.50

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each, $3.25; per doz.....$39.00

Sieves, Seamless Metallic

	Per dozen.—			
Mesh	14	16	18	20
Iron Wire...	$1.05	1.05	1.10	1.20
Tinned Wire..	$1.15	1.15	1.20	1.30

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.

...Mesh 18, Nested.....doz.$0.90@0.95
...Mesh 20, Nested.....doz. $1.00@1.05
...Mesh 24, Nested.....doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:

...12 x 12 to 22 x 36 in.....60%
...20 x 30 to 24 x 50 in.....50%
...24 x 60 to 24 x 120 in.....40%

Barnes' low list:
Up to and including 20 x 36 in. 50%
20 x 40 to 24 x 50 in. 45%

NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

...Cast Iron.....70@75&10%
...Steel.....50@55%

Slates, School—

Factory Shipments.

...“D” Slates.....50@50&10%
...Eureka, Unexcelled Noiseless.....60&5 tens
...Victor A, Noiseless.60&4 tens&5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

...German.....40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2½; Yankee Roller, 30&2%
High Grade, 40%; Trojan.....40%
Jockey.....25%

Snaths—

...Scythe.....55&10%

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

...Good Quality.....50&10@60&5%
...Cheap.....60@60&10%
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton.....50&10%
Rogers & Bro., William Rogers, Eagle Brand.....50&10%
Anchor, Rogers Brand.....40&10%
Wm. Rogers & Son.....60&10%

Miscellaneous

...German Silver.....60@60&5%

Tinned Iron—

...Teas.....per gro. 50@1.55
...Tables.....per gro.$0.90@$1.00

Springs— Door—

Bardsley's Spring and Check.....40%
Chicago (Mill).....40&10%
Gem (Coil).....
Pullman (Coil).....35%
Reliance (Coil).....40&10%
Star (Coil).....40%
Torrey's Rod, 39 in.....₰ doz. $1.10

Carriage, Wagon, &c.—

...12 in. and Wider: Per 100 lb.
...Black.....$1.75@1.85.00
...Half Bright.....$1.75@1.85.00
...Bright.....$1.75@1.85.00
...Painted Seat Springs:
...12 x 2 x 26.....per pr. 49@52¢
...12 x 3 x 28.....per pr. 70@77¢

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65; Japanese, 70; National, ₰ doz.....$12.00
Enterprise.....25@30%
Philadelphia No. 1, ₰ doz $12. No. 2, $15; No. 3, $20.....30%

Squares—

...Nickel plated.....List Jan. 5, 1900.
...Steel and Iron.....75&10@80
...Rosewood Hdl. Try Square and T-Bevels.....60&10&10@70%
...Iron Hdl. Try Squares and T-Bevels.....40&10@40&10&10%
Disston's Try Squares and Bevels, Rosewood Handle.....60&10%; Iron Stock and Bevel.....15%

Squeezers, Lemon

...Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
...Wood, Porcelain Lined:
...Cheap.....doz. $1.00
...Good Grade.....doz. $1.25
...Tinned Iron.....doz. $0.75@1.25
...Iron, Porcelain Lined...doz.$1.75

Staples—

...Barbed Blind.....lb. 6@6¼¢
...Electricians', Association list..80&10&10&10%
...Fence Staples, Plain, $2.15; Galvanized.....$2.45
...Poultry Netting Staples.....per lb. 3¼@3½¢

Steels, Butchers'—

Dick's.....30%
Foster Bros.'.....30%

Steelyards—....50@30&10%

Stocks and Dies—

...Blacksmiths'.....50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates.....25%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25%

Stoners, Cherry—

Enterprise.....25@30%

Stones—Oil, &c.

Pike Mfg. Co., 1907 list:	₰ lb
Arkansas St. No. 1, 3 to 5½ in	42
Arkansas St. No. 1, 5½ to 8 in	$3.50
Arkansas Slips No. 1	$4.00
Lily White Washita, 4 to 8 in.	60¢
Rosy Red Washita, 4 to 8 in.	60¢
Washita St., Extra, 4 to 8 in.	50¢
Washita St., No. 1, 4 to 8 in.	40¢
Washita St., No. 2, 4 to 8 in.	25¢
Lily White Slips	90¢
Rosy Red Slips	90¢
Washita Slips, Extra	80¢
Washita Slips, No. 1	70¢
Washita Slips, No. 2	40¢
India Oil Stones (entire list)	33⅓%
Quick Emery and Corundum Axe Stone, Double Grit	40¢
Quickcut Emery and Corundum Axe Stone, Double Grit	33⅓%
Quickcut Emery Rubbing Bricks	40¢
Hindostan No. 1, R'g'lar	8¢
Hindostan No. 1, Small	10¢
Axe Stone, all kinds	20¢
Turkey Oil Stones, Extra, 5 to 8 in	80¢
Queer Creek Stones, 4 to 8 in.	20¢
Queer Creek Slips	40¢
Sand Stone	6¢

Scythe Stones—

Pike Mfg. Co., 1901 list:
Black Diamond S. S. ₰ gro. $12.00
Lamoille S. S. ₰ gro. $11.00
White Mountain S. S. ₰ gro. $9.00
Green Mountain S. S. ₰ gro. $6.00
Extra Indian Pond S. S. ₰ gro. $7.50
No. 1 Indian Pond S. S. ₰ gro. $7.00
No. 2 Indian Pond S. S. ₰ gro. $4.50
Leader Red End S. S. ₰ gro. $4.50
Quick Cut Emery ₰ gro. $10.00
Pure Corundum ₰ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Reliance (1904 list 33⅓%)
Electro (Artificial) ₰ gro. $12.00 33⅓
Lightning Artificial ₰ gro. $18.00 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers ₰ gro. $9.00

Stops— Bench—

Millers Falls 15&10%
Morrill's, ₰ doz., No. 1, $13.00 50%
Morrill's, No. 2, $12.50 50%

Door—

Chapin-Stephens Co. 50@50&10%

Plane—

Chapin-Stephens Co. 20%

Straps— Box—

Acme Embossed, assorted sizes 20&10&10
Cary's Universal, case lots 20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, dos. 60@60&10%
Socket doz. $1.00
Excelsior Stretcher and Tack Hammer Combined. ₰ doz. $6.00 20%

Stuffers, Sausage—

Enterprise Mfg. Co. 25@25&1¼%
National Specialty Co., list Jan. 1, 1902 30&5%
P., S. & W. Co. 40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ₰ doz.
Superba, Crotch Mahogany $36.00
Triumph, Fancy Veneers $33.00
Parlor Queen, Fig, Rosewood $30.00
Elite, Hungarian Ash $25.80
Am. Queen, Fig. Mahogany $27.00
Ideal, Bird's-Eye Maple $25.00
Grand Rapids, Nickel, Japan $24.00
Japan $22.00
Standard, Nickel, $22.00; Japan $20.00
Crown Jewel, Nickel, $21.00; Jap. $19.00
Crystal, Glass Top $36.00
Grand, 17 in. wide $36.00
Club, 24 in. wide $54.00
Hall, 28 in. wide $60.00

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks 90&25%
American Cut Tacks 90&25%
Swedes' Cut Tacks 90&25%
Swedes' Upholsterers' 90&25%
Gimp Tacks 90&25%
Lace Tacks 90&25%
Trimmers' Tacks 90&25%
Looking Glass Tacks 65%
Bill Posters' and Railroad Tacks, 90&10%
Hungarian Nails 80&10%
Finishing Nails 70%
Trunk and Clout Nails 80%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks 90&10@90&10&10&65%

See also Nails, Wire

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin 60@—%
Patent Leather 25@30&65%
Steel 33⅓&65%
Chesterman's 25@25&65%
Kendall & Esser Co.:
Favorite Net Skin 45&10%
Favorite Duck and Leather 25&10%
Metallic and Steel, Lower list, 35@ 35&55; Pocket, 35@35&55%
Lufkin's:
Asses' Skin 40&10&50%
Metallic 30@30&5%
Patent Bend, Leather 25&5@25&10%
Pocket 10@10&5%
Steel 33⅓@35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L, etc. 25%
Chesterman's Steel, No. 1938L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs $3.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c. 8@33⅓%

Ties, Bale—Steel Wire—

Single Loop 50&10&5
Monitor, Cross Head, &c. 50&25%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White 20@20&5%

Haying—

Myers' Hay Tools 45%

Miniature—

Smith & Hemenway Co.'s, Davidson, ₰ doz., Nickel Plated $1.50; Gold Plated $2.00

Saw—

Atkins' Cross Cut Saw Tools 35&5%
Simonds' Improved 33⅓%
Simonds' Crescent 25%

Ship—

L. & I. J. White 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro. $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $15.00@15.50

Game—

Imitation Oneida 75@10%
Newhouse 40@40&5
Hawley & Norton 65%
Victor 75@75&10
Oneida Community Jump 50%
Hecker 75@75&10

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ₰ doz., $13.25..$11.50 doz.
No. 3, Rat, ₰ doz., $6.50...$5.75 doz.
No. 3½, Rat, ₰ doz., $5.25. $4.70 doz.
No. 4, Mouse, ₰ doz., $3.85...$3.50 doz.
No. 5, Mouse, ₰ doz., $3.00. $2.25 doz.
Oneida Community:
Out o' Sight, Mouse, ₰ doz....$0.60
Out o' Sight, Rat, ₰ doz..... 1.25
Easy Set, Mouse, ₰ doz..... .35
Easy Set, Rat, ₰ doz..... 1.00
Wood Choker, Rat, ₰ doz. holes .12
Premier Tin Choker, 3 hole, ₰ doz. traps..... .75

Trowels—

Disston Brick and Pointing 25%
Disston Plastering 20%
Disston "Standard Brand" and Garden Trowels 30%
Kohler's Steel Garden Trowels, ₰ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels, ₰ gro. $6.00
Woodrough & McParlin, Plastering 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Form 50&10%
Western Pattern 60&10%
Handy Trucks ₰ doz. $16.00
Grocery ₰ doz. $15.00
McKinney Trucks each, net $100.00
Model Store Trucks ₰ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.

No.	0	1	2	3	
Galvanized.	$67	$79	$89	$99	10%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls 25@25&10%
No. 12, ¼ and ½-lb. Ball 21@25&10%
No. 18, ¼ and ½-lb. Balls 18@25&10%
No. 24, ¼ and ½-lb. Balls. 15@25&10%
No. 36, ¼ and ½-lb. Balls 12@25&10%
Chalk Line, Cotton 25%
Balls 26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz. 11@19¢
Cotton Wrapping, 5 Balls to lb., according to quality. 15½@23¢
American 2-Ply Hemp, ¼ and ½-lb. Balls 14½@15¢
American 3-Ply Hemp, ¼-lb. Balls 15½@16½¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) 11½@13½¢
India 3-Ply Hemp, ¼-lb. Balls 10½@11½¢
India 3-Ply Hemp, ½-lb. Balls 10½@11½¢
S. S. ¼ and 3-Ply Jute Balls 13½@14½¢
Mason Line, Linen, ½-lb. Balls 47¢
No. 365 Mattress ¼ and ½-lb. Balls, according to quality. 36@100¢
Wool, 3 to 6 ply. . .B 9¢: A 10¢

Vises—

Solid Box 50&10%

Parallel—

Athol Machine Co. 40%
Simpson's Adjustable 40%
Standard 40
Amateur 25
Columbian Hdw. Co. 40%
Fisher & Norris Double Screw, net, each, Nos. 2, $13.50; 3, $16.20; 4, $20.50; 5, $27.00
Fulton Mach. & Vise Co.:
Reed, Swivel 25
Star, Solid Jaw 40%
Hollands':
Mammoth 1 40&10%
Kennedy 50&5%
Lewis Tool Co.:
Adjustable Lay 40%
Mammoth, ₰ doz., Solid Jaw 75
Massey Vise Co.:
Clincher 40
Perfect, 15%, Lightning Grip 15
Merrill's 20
Millers Falls Oval Slide Pattern 60&10
Parker's:
Victor, 20@25%; Regulars 20@25%
Vulcan's 40&15
Combination Pipe 55&60
Prentiss 20@25
Rock Island 25%
Snediker's X. L. 33⅓
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ₰ doz., $24.00, 30%; Clamps 30
Perfection Saw Clamps, ₰ doz. $4.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed 25
Star 40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe 60@60&5%
Massey's Quick Action Pipe 40%
Parker's Combination Pipe:
67 Series, 60%; 187 Series, 60&5%; No. 870 40%
Rock Island Pipe 25%

Wads—*Price per M.*

B. E., 11 up 60¢
B. E., 9 and 10 70¢
B. E., 8 80¢
B. E., 7 80¢
P. E., 11 up $1.00
P. E., 9 and 10 1.25
P. E., 8 1.50
P. E., 7 1.50
Ely's B. E., 11 and larger $1.70@1.75
Ely's P. E., 12 to 20 $3.00@3.25

Dis 15%

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled 45&10%
Ground 50&5
Plain or Unground 60
Country Hollow Ware, per 100 lbs. $3.00
White Enameled Ware:
Maslin Kettles 65&10%
Covered Wares:
Tinned and Turned 35&10%
Enameled 45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware 33⅓%
Iron Clad Ware 70&10
Lava and Volcanic, Enameled 40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Spiders and Griddles 65@65&5%
Avery Stamped Ware 60%
Porcelained 50&5%
Never Break Spiders and Griddles, 65&5%
Never Break Kettles 60%
Solid Steel Spiders and Griddles 65&5%
Solid Steel Kettles 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone 40@40&10%

Washboards—

Solid Zinc ₰ doz.
Crescent, family size, bent frame $4.05
Red Star, family size, stationary protector $4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $3.55
Less than case lots $3.60
Single Zinc Surface:
Niagara, family size, open back, bent frame $3.45
Single Surface Globe $3.45
Brass Surface:
Plain King, Single Surface, open back $5.35
Nickel Plate Surface:
No. 1001 Nickel Plate Single Surface $7.60
Glass Surface:
Plain King, Single Surface, open back $5.05
Enamel Surface:
Enamel King, Single Surface, ventilated back $3.95

Washers—Leather, Axle

Solid per 100
Patent 80@90
Cast 1" 1¼ 1½ 1¾ 2 per 100
1½ 12c 15c 17c per h

Iron or Steel—

Size by t. ⅜ ½ ⅝ ¾ ⅞
Washers... $5.00 7.00 8.70 8.50 8.
The above prices are current
Sizes off list.
In lots less than one keg a
½¢ per lb.; 5 lb. boxes add
to list.

Cast Washers—

Over ½ inch, barrel lots per lb. 1¾@

Wedges—

Oil Finish lb., .@

Weights—Hitching—

Covert Mfg. Co. 50%

Sash—

Per ton, f.o.b. factory:
Eastern District $30.
Southern Territory $24 to $27.
Western and Central Districts $25 to $28.

Wheels, Well—

Size, $2.32; 14-in., $2.82; 12-in $3.36; 14-in., $4.80.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 72&10&17½
10 to 15 72½&10&10
16 to 18 73½&10&10
19 to 26 75&10&10&2½
27 to 36 77½&10&10
Galvanized:
6 to 9 72½&10
10 to 14 72½&10&5
15 to 16 73½&10&5
17 to 18 74½&10&5
19 to 26 70&5&2½
27 to 36 65&10&10
Copper:
6 to 9 65&10&10
10 to 14 70&10&5
15 to 18 65&10&10
19 to 26 70&5&2½
27 to 36 72½&10&2½
Tinned
6 to 18 65&10&10
Brass 171¢ lb., ba
Copper 52¢ lb., ba
Cast Steel Wire 50

Spooled Wire—

Annealed and Tinned 70&10&10
Brass and Copper 80&10&10
Retailers' Assortments, per box, $2.10@$2.
Wire Clothes Line see Lines
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods 90&10&10&25
Brass Wire Goods 90@90&10
Brass Cup and Shoulder Hooks, 80&15

Wire Cloth and Netting—

Galvanized Poultry Netting, 50&50&50&10
Painted Screen Cloth, 100 ft., $1.
Standard Galv. Hardware Grade per 100 sq. ft.
Nos. 1 2 3 & 4 Mesh 82
Nos. 5 and 5 Mesh 82
No. 6 Mesh 83
No. 8 Mesh 83

Wire, Barb—See *Trade Repo*

Wrenches—

Agricultural 75@75&10
Alligator or Crocodile 70&10@75
Baxter Pattern S Wrenches 70&5&10&10

Drop Forged S 45&15&65
Acme 60&10
Alligator Pattern, 70%; Bull Dog 70
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pip 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut 50
Combination Black 40&5
Merrick Pattern 50
Boardman's 40
Coes' Genuine Knife Hdl. 40&10&5&5
Coes' Genuine Steel Hdl. 40&10&5&5
Coes' Genuine Key Model 40&10&5&5
Coes', Genuine Hammer Handle 40&5&5
Coes' "Mechanics'" 40&10&10&5&5
Donohue's Engineer 40&5
Eagle 70
Gem Pattern 70
Hammond 60
W. & B. Machinist: 50&5
Oak lots 50&5
Less than case lots 50&5
W. & B. Railroad Special: 50&5
Oak lots 50&5
Less than case lots 40&5
Solid Handles, P., S. & W., 50&10%
full cases 50&10&5
Universal 60
Uwanta Wrench Co.: 50
Railroad Special, Iron Handle 50&5
Other Wrenches 50
Vulcan and Acme Chain 50

Wrought Goods—

Staples, Hooks, &c., list March 10, '02 90

Zinc— (Cask lots at

Sheet per 100 lb. $7

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:
1 to 1½ in. round and square) ₡ lb 2.10¢
1½ to 4 in. x ½ to 1 in.)
1½ to 4 in. x ¼ to 5-16 in. ₡ lb 2.30¢
Rods—⅜ and 11-16 round and square ₡ lb 2.30¢
Angles:
3 in. x ¼ in. and larger Cut ₡ ft
3 in. x ¼ in. and larger, except 3 in. and 4 in. x ¼ in. 2.10¢
5 in. x 5-16 in. and 4 in. x ⅜ in. 2.65¢
1½ to 2 in. x ¼ in. 2.15¢
1½ to 2½ in. x 3-16 in. and thicker 2.10¢
1 to 1¼ in. x ⅜ in. 2.45¢
1 to 1¼ in. x ¼ in. 2.50¢
⅝ x ⅛ in. 2.65¢
½ x ⅛ in. 2.75¢
½ x ⅛ in. 3.00¢
½ x 3-32 in. 3.30¢
Tees:
1 in. 2.75¢
1¼ in. 2.35¢
1½ to 2 in. 2.15¢
3 in. and larger 2.10¢
Beams 2.10¢
Channels, 3 in. and larger 2.10¢
Bands—1 to 6 in. x 5-16 to No. 8 2.15¢
"Burden's Best" Iron, base price 3.30¢
Burden's "H. B. & S." Iron, base price 3.10¢
"Ulster" 3.10¢
Norway Bars 3.00¢
Norway Shapes 3.80¢

Merchant Steel from Store—

per ₡

Bessemer Machinery 2.10¢
Toe Calk, Tire and Sleigh Shoe 2.50@3.00¢
Best Cast Steel, base price in small lots .7¢

Sheets from Store—

Black

	One Pass, C.R. Soft Steel.	R. G. Cleaned.
No. 14	₡ lb 3.25	3.40¢
Nos. 16 to 21	₡ lb 3.35	3.50¢
No. 27	₡ lb 3.45	3.70¢
No. 28	₡ lb 3.50	3.60¢

Russia, Planished, &c.

Genuine Russia, according to assortment, W. D. Wedgwood ₡ lb 11½ @ 13½¢
Patent Planished ₡ lb A, 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16 ₡ lb 3.75¢
Nos. 22 to 24 ₡ lb 3.55¢
No. 27 ₡ lb 4.20¢
No. 28 ₡ lb 4.45¢
No. 29 and lighter 36 inches wide, 25¢ higher

Tin Plates—

American Charcoal Plates (per box.)

A A A Charcoal:
IC, 14 x 20 $6.00
IX, 14 x 20 7.85
A. Charcoal:
IC, 14 x 20 $5.65
IX, 14 x 20 6.55

American Coke Plates—Bessemer-

IC, 14 x 20 $4.65
IX, 14 x 20 5.65

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating $9.00
IX, 20 x 28 with an 8 lb. coating 11.00

Seamless Brass Tubes—

List December 4, 1905. Base price 20¢

Brass Tubes, Iron Pipe Sizes—

List December 4, 1905. Base price 20¢

Copper Tubes—

List December 4, 1905. Base price 23¢

Brazed Brass Tubes—

List June 6, 1898. 23¾¢ ₡ lb

High Brass Rods—

16¾¢ ₡ lb

Roll and Sheet Brass—

List June 6, 1898. 16¾¢ ₡ lb

METALS—

Tin—

Straits Pig ₡ lb 29 @ 30 ¢

Copper—

Lake Ingot ₡ lb 15 @ 15½¢
Electrolytic ₡ lb 14¾ @ 15¼¢
Casting ₡ lb 14¾ @ 15 ¢

Sheet Copper Hot Rolled, 16 oz. ₡ lb 18¢
" " " 14 " " " 19¢
Sheet Copper Cold Rolled, 1¢ ₡ lb advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, 1¢ advance over Cold Rolled.
Sheet Copper Polished over 20 in. wide, 2¢ advance over Cold Rolled.
Bottoms, Flats and Flats ₡ lb 23¢ basis
Planished Copper, 1¢ ₡ lb more than Polished.

Spelter—

Western ₡ lb 5¾@6 ¢

Zinc.

No. 9, base, casks, ₡ lb 7.50¢ | Open ₡ lb 8.00¢

Lead.

American Pig ₡ lb 4½@5 ¢
Bar ₡ lb 5¾@6 ¢

Solder.

½ & ½, guaranteed ₡ lb 21 @ 23¢
No. 1 ₡ lb 19 @ 19½¢
Refined ₡ lb 17 @ 17½¢
Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ₡ lb @ 15¢
Hallett's @ 15¢
Other Brands @ 14¢

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:
Small lots nominal
100-lb lots nominal

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy and Wire	₡ lb 11.00@11.50
Copper, Light and Bottoms	₡ lb 10.00@10.50
Brass, Heavy	₡ lb 8.00@8.50
Heavy Machine Composition	₡ lb 10.50@11.00
Clean Brass Turnings	₡ lb 6.50@7.00
Composition Turnings	₡ lb 8.00@9.00
Lead, Heavy	₡ lb .@9.00
Tea Lead	₡ lb .@3.25
Zinc Scrap	₡ lb .@3.25
No. 1 Yard Wrought, Long	$ 8.50@9.00
No. 1 Yard Wrought, Short	$ 8.00@8.50
Wrought Pipe	$ 6.50@7.25
No. 1 Machinery Cast	$10.50@11.50
Stove Plate	$ 9.50@10.00

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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THE IRON AGE

New York, Thursday, January 9, 1908.

The Steel Ore Dock at Narvik, Norway.

The Outlet for the Kiirunavaara Iron Ores Terms of the Swedish Government Contract.

BY JOHN BIRKINBINE, PHILADELPHIA

In handling the enormous quantities of iron ore produced in the Lake Superior region there has been developed at upper lake ports a system of loading docks, which now aggregate about 8 miles in length, having pockets of sufficient capacity to hold approximately 1,300,000 tons of iron ore. The convenience of this system of docks, in which ore conveyed from the mines falls from drop-bottom cars into pockets, the rapidity with which vessels are loaded from the pockets by hinged spouts, and the small cost per ton for handling the ore have naturally drawn attention to them, and they have served as models for construction elsewhere.

Twelve years ago a distinguished Norwegian engineer, Col. Ole W. Lund, came to the writer with letters of introduction and was assisted in an inspection of the ore handling facilities then provided on the Great Lakes, in which inspection he secured courteous consideration from the local managers. Returning to Norway he, as chief engineer of the Luossavaara-Kiirunavaara Aktiebolag, undertook the design and construction of the harbor, docks, railroad terminus and other accessories at Narvik, and is now in charge of the company's affairs in Norway.

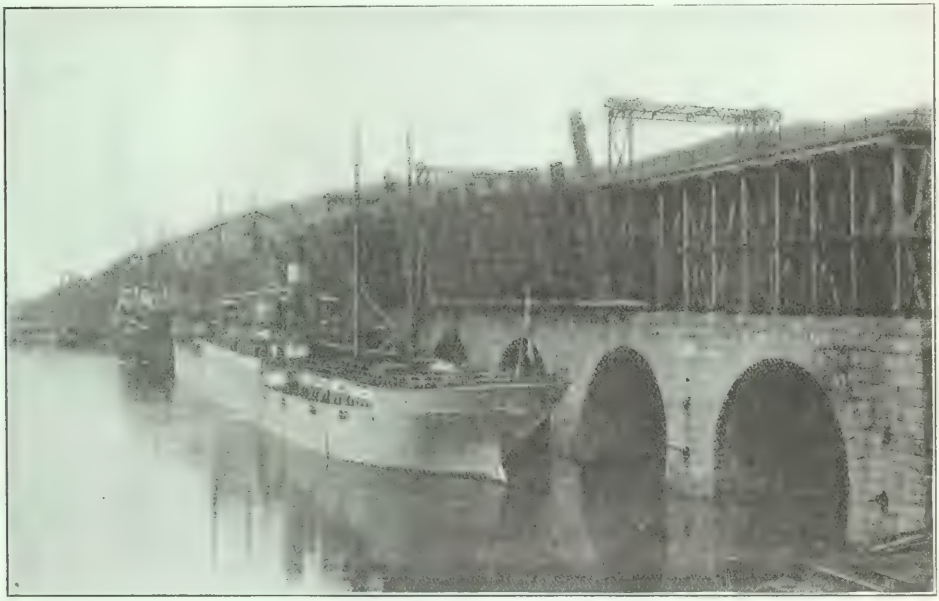


Fig. 1.—Steel Ore Dock at Narvik, Norway.

The Kiirunavaara Deposits.

The large iron ore deposits of Kiirunavaara in the North of Sweden have been wrought since 1902, producing hard magnetite, which contains from 60 to 70 per cent. of metallic iron, with phosphorus ranging from less than 0.05 to 3 per cent. or even 4 per cent., the average ore mined carrying from 0.75 to 1.5 per cent. of phosphorus. The following excerpts are taken from a paper presented at the meeting of the American Institute of Mining Engineers in July, 1907, by Prof Hjalmar Sjögren, Ph.D., of Stockholm, Sweden:

> The province of Norrbotten contains many times as much iron as all the rest of Sweden. Some of the deposits in this province may be reckoned among the largest in the world. . . . The iron ore deposit of Kiirunavaara is undoubtedly the largest deposit of ore found in Europe. . . . The iron ore occurring among the porphyry masses forms, on the whole, pure, nearly homogeneous ore deposits. Other minerals found in it are of comparatively subordinate significance. . . . The only mineral that occurs in the ore with undoubtedly primary characters is apatite, the distribution of which is exceedingly irregular, so that the percentage of phosphorus in the ore varies greatly. . . . The large ore deposit of Kiirunavaara is an enormous mass, roughly rectilinear in outline. In length the ore is exposed in the hills for more than 2800 m., and through drilling and magnetic investigation has been proved to extend at least 1200 m. further. The width of the deposits in some places exceeds 200 m. . . . Owing to the absence of other impurities the iron percentage of these ores is very high. . . . Apart from the ores richest in apatite, the average amount of iron is from 68 to 69 per cent.

Prof. Hjalmar Lundbohm in a description of the deposits says: "The main mass of the ore of Kiirunavaara contains more than 0.8 per cent., generally from 1 to 2 per cent., and not infrequently from 3 to 4 per cent., or still more of phosphorus. On the whole the iron ores of Kiirunavaara may be said to contain a higher percentage of phosphorus than any other known ore deposit of great extent."

With an iron industry limited by fuel conditions Sweden can use but a small amount of this ore; and Norway requires practically no iron ore. The development of the deposits, therefore, depends upon exportation.

The Kiirunavaara (Ptarmigan Mountain) deposits are the most important of a number of groups of iron ore properties in Swedish Lapland, which have lately attracted much attention, but the Gellivaara deposits were the first group exploited.

At present 1,500,000 metric tons (1000 k. g., 2204 lb.) are shipped annually from Narvik to Germany, Belgium and England, and some cargoes have reachel the United States, but it is intended to increase the shipment by 400,000 tons annually until the maximum of 3,300,000 tons per year is attained. The Swedish official statistics for 1906 give the total iron ore production of Sweden as 4,502,597 metric tons, of which 2,674,266 tons came from Swedish Lapland (Norrbottens Lan). Of this last named amount the deposits of Kiirunavaara, the ore from which reached consumers via Narvik, produced 1,488,022 metric tons. The contract under which the group of mines is operated and the facilities provided for conveying ore to the shipping port of Narvik, north of the Arctic Circle, and landing it there from cars to vessels may prove of interest to the readers of *The Iron Age*. The description, prepared with the assistance of Col. Ole W. Lund, is submitted with a number of illustrations.

The Swedish Government constructed a railroad, as part of the contract, from the Kiirunavaara to the Norwegian frontier (107 miles), and has undertaken to transport to the frontier, during 25 years from January 1, 1908, a total not exceeding 75,000,000 tons at a freight rate of 71 cents per ton. The railroad from the frontier to the shipping port of Narvik, Norway (25 miles), has been built by the Norwegian Government. The freight rate has hitherto been 20 cents per ton, but may be altered in the future. The rail traffic charge at present is therefore 91 cents for 132 miles, or slightly less than 7 mills per ton-mile.

The Norwegian Government constructed its part of the railroad from the Swedish frontier to the first switch rail at Narvik, and the company built the entire installation at Narvik, comprising an extensive switching yard, stockyard for storing ore, repair shop and ore dock; also a central plant for supplying electric light and power and a plant for unloading coal. At Kiirunavaara the railroad has an elevation of 500 m. above sea level,

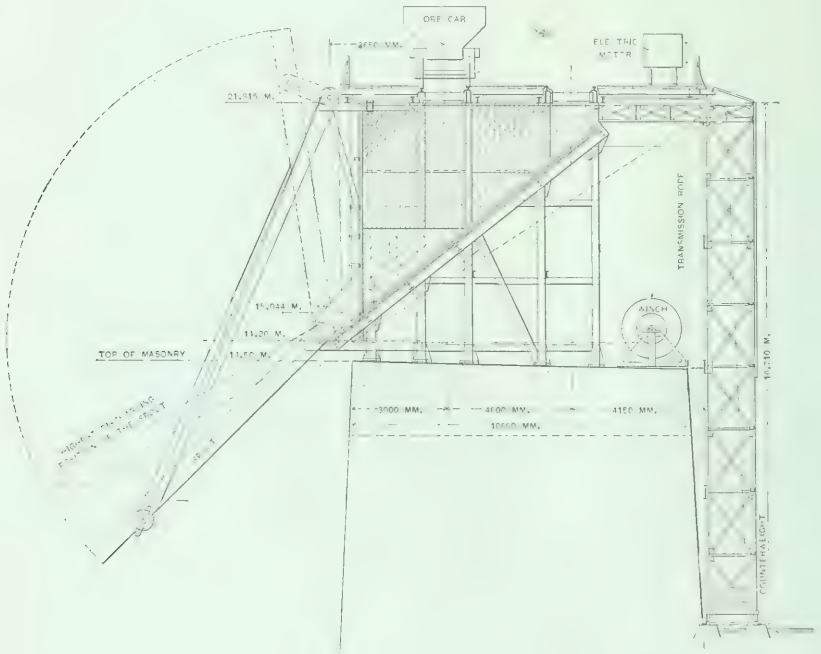


Fig. 2.—Elevation of Steel Pockets.—Section Through the Center of a Spout of Ordinary Hight.

The Swedish Government Ore Contract.

The maximum output from the Kiirunavaara group of mines, 3,300,000 tons, has been fixed by contract, made between the Swedish Government and the owners of the ore deposits, the Luossavaara-Kiirunavaara Aktiebolag, by which the former seems to be favored. This contract provides that the company shall from January 1, 1908, increase its capital stock to 80,000,000 Swedish crowns ($21,600,000) in fully paid up shares. One-half of the stock (being 5 per cent. preference shares) is to be delivered without cost to the Swedish Government, together with an option, under which the Government may purchase in 1933 the other half of the company's stock at a price which is to be fixed by valuation. In addition the company had to transfer to the Swedish Government without remuneration the important ore deposits of Mertainen and Ekstromsberg; also a part of Luossavaara, the latter being 4 miles northeast of Kiirunavaara.

and where the Swedish-Norwegian boundary is passed the level is 520 m. The maximum grade on the portion of the railroad in Sweden is 1 per cent. against traffic, but in Norway there are no adverse grades, although 1.9 per cent. in favor of traffic limits the train capacity to the ability of the locomotives to haul empty cars over a short section toward the mines.

A portion of the rails laid on the Norwegian Railroad were manufactured in the United States. The locomotives on this section are of Swiss and Norwegian make, while those on the Swedish Railroad and the dock switching equipment were made in Sweden. Most of the machine tools, the hoisting engines, cableways, &c., were of American manufacture or followed United States patterns. The air compressors and drills used at the mines also came from the United States.

The Harbor at Narvik.

The port of Narvik is situated at the end of the Ofoten Fjord on the West Coast of Norway, at 68° 30' north latitude. Owing to the influence of the Gulf Stream and the mild climate of Western Norway, even at this high northern latitude, the harbor does not freeze

and navigation is always open. On the other hand, the outlet for the Gellivaara ore deposit in the same district, Norrbottens Lan, is the port of Lulea at the head of the Gulf of Bothnia, about 3 degrees south of Narvik and below the Arctic Circle, is closed by ice for about seven months of the year.

The Narvik harbor, a natural bay of 1½ to 2 miles in width and length, is well protected and easily accessible from the sea. The depth averages 35 m. (115 ft.), and the anchorage is good. The ordinary tide is 10 ft., but spring tides occasionally rise to 16½ ft. above low water. The harbor is surrounded by rather steep rocky hills and mountains extending into the water, which reaches its full depth at a short distance from shore. It was therefore impracticable to erect a double sided dock projecting out into the harbor, similar to the practice at Lake Superior ports, and a loading dock was constructed nearly paralleling the shore, with pockets and spouts on one side only. The dock was built inside a substantial

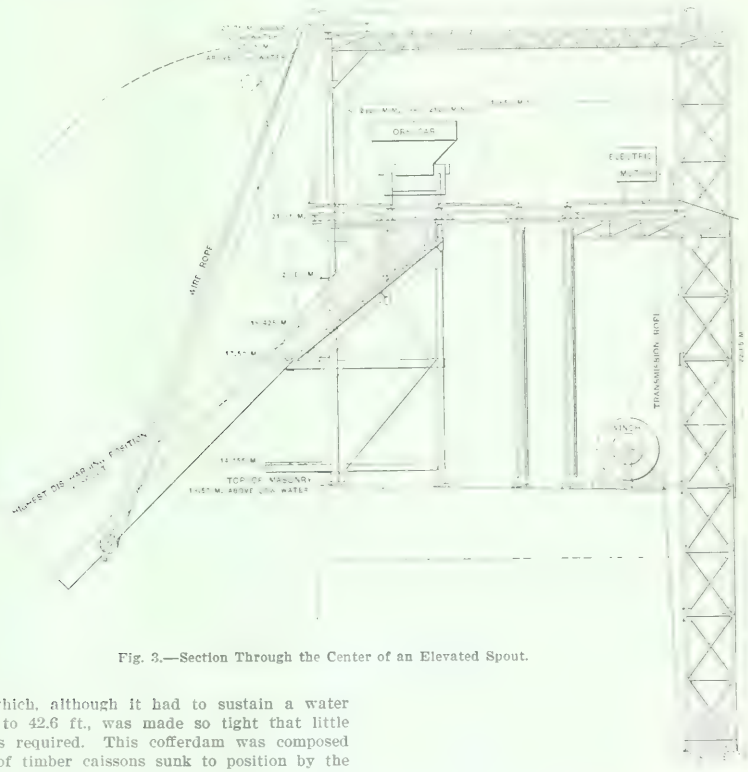


Fig. 3.—Section Through the Center of an Elevated Spout.

cofferdam, which, although it had to sustain a water pressure up to 42.6 ft., was made so tight that little pumping was required. This cofferdam was composed of a series of timber caissons sunk to position by the weight of rails placed upon them. They were subsequently filled with clay and backed with the same material, held in place by a masonry retaining wall. After the rock within the cofferdam had been blasted away to secure the requisite depth and the masonry piers had been carried above high water, the temporary work was removed.

The Construction of the Dock.

The ore dock is 356 m. (1168 ft.) long and the rails are 72 ft. above low water. The depth alongside the dock is 26 ft. at low water. The steel superstructure of the dock is carried upon a granite masonry base, consisting of a series of arches of 39.4 ft. span, supported on granite piers, which are 16½ ft. thick. The piers rest upon the solid rock, which has been blasted away to afford a uniform depth of 26 ft. below low water. The location and general features of the ore dock and its size, as compared with two 7000-ton vessels, are illustrated by Fig. 1.

The top of the granite base is 44 ft. above low water, and at this level its width is 35 ft. From the granite base the superstructure rises. This is composed entirely of structural steel and plate steel, except the wooden top platform and the timber lining of the pockets, the latter being faced with rails to withstand the abrasion from hard ore. The steel was rolled in Germany and fabricated in Norway.

Twenty-six steel pockets and three elevated spouts have been built covering a length of 370 ft., and the remaining portion of the dock is provided for the present with a timber superstructure, from which the ore can be loaded through spouts direct from the cars into the vessels. The distance from center to center of the pockets is 13 ft., and the capacity of each pocket is 240 metric tons.

The spouts, which are 33 ft. long, are balanced by counterweights and raised or lowered by winches placed placed underneath the pockets. All of the winches are worked by means of a transmission rope from an electric motor placed on a trolley car, as shown in Figs. 2 and 3, which travels on a 2-ft. gauge track on top of the superstructure, so that it can be shifted from one spout to another. Figs. 4 and 5 will also assist in explaining some of the details of construction. These four illustrations are from drawings supplied by Colonel Lund. The dimensions, it will be noted, are given in meters.

The hight of the dock is insufficient to accommodate at high tide empty vessels of, say, 7000 tons, such as shown in Fig.1. In order to load such steamers under these circumstances extra spouts are placed at a higher level at intervals, so that ore can be dumped into the hatches direct from railroad cars until the steamer settles sufficiently for the ordinary spouts to become available. Fig. 3 shows a section of one of these high spouts.

The ore is brought from the mines or stock piles to the dock in three-axled hopper cars, discharging at the bottom. The weight of the car is 11 tons and the net load of ore is 35 tons. The superstructure of the dock, the

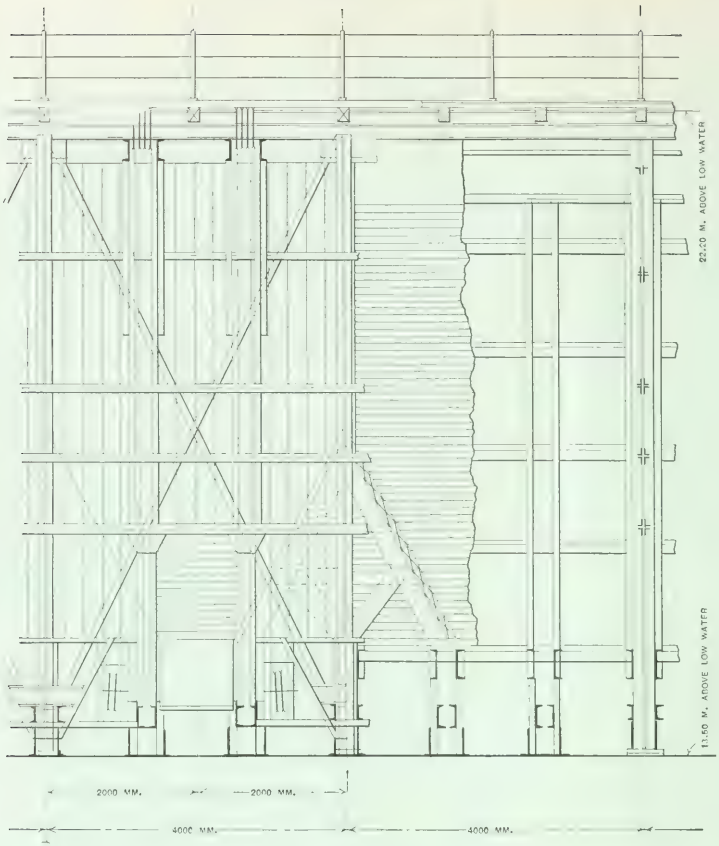


Fig. 4.—Front Elevation, Partly Sectional, of Pocket.

railroad bridges, &c., are made amply strong to permit of the load being increased to 20 tons per axle.

The construction of the dock was commenced in October, 1889, and finished in 1906. Its entire length is sufficient to accommodate two 7000-ton steamers, and a third steamer of the same size can be loaded simultaneously at a timber dock, constructed as a temporary accessory, because the permanent dock could not be finished in time

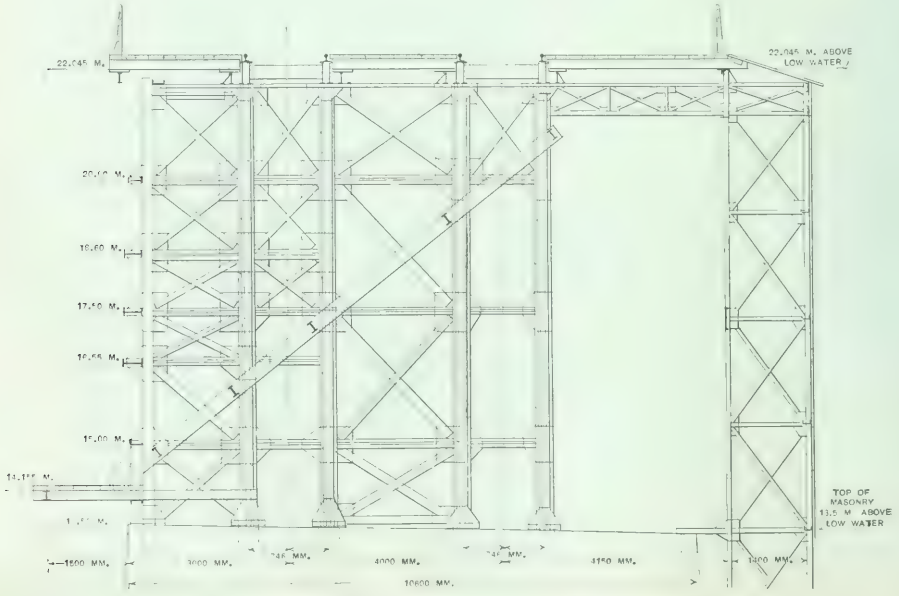


Fig. 5.—Vertical Section Showing Construction of Pocket Partition Walls.

for the opening of traffic in 1903. This dock will be retained. As the switching yard is at a level with the ore dock approaches are unnecessary.

With the present dock accommodations, about 20,000 tons of iron ore could be shipped daily from Narvik, an aggregate of 6,000,000 tons in 300 days, if vessels were always available, but, as stated above, the quantity to be carried on the railroad is limited to a maximum of 3,300,000 tons per year.

Steamers do not arrive in the harbor at regular intervals, and to meet emergencies in mining and transportation it has been found necessary to stock about 500,000 tons of iron ore at Narvik. To deliver ore on the stock pile at least expense a high level track is being constructed 44 ft. above low water, the stock yard being 75 ft. above the same level. From this track ore is to be dumped from cars coming from the mines on stock piles, from which it is taken by steam shovels when required for vessel cargoes. Only a small portion of the ore, however, has to pass to the stock piles, for as a rule the ore cars from the mines are taken direct to the dock.

The Narvik ore dock has cost about $1,000,000, and the entire expenditure for work carried out at Narvik by the Luossavaara-Kiirunavaara Aktiebolag amounts to $2,160,000, including the switching yard (10 miles of track), ore dock, stock pile yard, repair shop, coal handling machinery, &c.

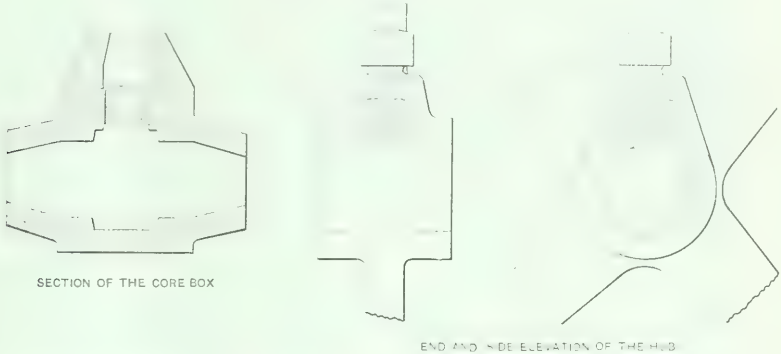
But little of the work was done by day labor, nor was it contract work, as understood in the United States. For such as was done on time allowance the prevailing rates were 10 cents per hour for unskilled and 15 cents per hour for skilled labor. Better wages, however, were earned by the system which was employed and which may be classed as piece work. Groups of men combined to excavate earth or rock, form embankments, carry forward submarine blasting, construct masonry, &c., at fixed prices per cubic meter. The compensation was divided among the individuals of the group, the foreman receiving an amount in excess of the others.

The tools used were supplied by the company, but charged to the employees, who were subsequently credited with the portions returned. Explosives were also furnished by the company at prices which limited their use to what was necessary to remove the rock without damage to the work under construction. Cement of Norwegian and German manufacture was furnished by the company, its cost during the time of construction approximating $2 per barrel.

The Berlin Construction Company, Berlin, Conn., has established a record of construction in bridge work. Recently a wooden bridge at Hartford, Conn., leading from Mulberry street to Bushnell Park, became unsafe and was closed to travel. At 5 p.m., December 11, the city awarded the contract to the Berlin Construction Company to remove the old bridge, repair the masonry, and build a new steel bridge 105 ft. long in 14 working days. The shop drawings were completed and approved by the city engineer December 12, at 4.30 p.m., and on December 14, at 11 a.m., the steel work of the entire bridge was loaded ready for shipment. On December 16 the erecting gang from Berlin started to tear out the old bridge, and on December 20, at 5 p.m., the entire work was completed and the bridge open for travel, only eight working days having elapsed after the contract was awarded.

Casting a Nut in a Pulley Hub.

An ingenious and economical substitute for drilling and tapping a hole in a casting is the method recently patented by the B. F. Barnes Company, Rockford, Ill. Briefly, it consists of casting a threaded nut in position in a pulley hub or similar part, so that the more laborious, less convenient and slower operation of later handling the casting to drill and tap a hole for a set screw is done away with. The nuts can be very cheaply and rapidly made or even purchased in bulk ready to use, and can be incorporated in the castings with practically no additional foundry work, and a very material saving in small drilling and tapping operations can thus be effected.



Details of a Means for Casting a Nut in a Pulley Hub to Take the Place of a Tapped Hole.—Patented by the B. F. Barnes Company, Rockford, Ill.

The illustration shows the scheme very clearly. At the left is a section of the core box for a pulley casting with the nut placed in position ready for the core to be formed through it. The core with the nut intact is then transferred to the mold, and the finished result is seen in the end and side elevations of a pulley hub shown at the right in the illustration. Another advantage of the scheme is that it does away with the necessity of drilling through the rim of the casting and into the hub. Where a pulley is of large diameter taps are frequently broken in performing the tapping operation, and this annoyance is avoided.

The device is applicable to a great many castings, such as cone pulleys, sheaves, hangers and even larger castings, and will have its principal utility in embodying threads in locations where it would be difficult to drill and tap the finished castings. The nut is held securely in the core box, insuring its being accurately placed in the core, and the core material protects the thread from being injured by the hot metal while the casting is poured. Still another advantage of the device that suggests itself is that the thread may thus be formed of wrought iron or soft steel which would be stronger than a thread cut directly in the cast iron. The nut might be thus formed in a casting of either gray iron, malleable iron, brass or steel. At present the scheme is employed in a great many operations in the company's own shops. Nuts are cast in the hubs of tight pulleys, cones, hanger castings and also in several places in the base casting of drilling machines, where they have been found to be thoroughly practical and effective in every way.

Two New Lapointe Broaching Machines.

Important developments in broaching machine design and practice have been made by the Lapointe Machine Tool Company, Hudson, Mass. As a result a method of machining metals formerly little used promises to become more common, especially where holes of unusual shape are to be cut. The company's first broaching machine was designed for small work only, but the demand has caused advances in size and power until the No. 4 machine was built, which broaches a hole 8 in. square, 12 in. long in a steel casting, the task being the more difficult because the hole is tapered.

The machine works on the principle of pulling the broach through the hole. It is held in an adjustable sliding head operating in ways and pulled by a heavy screw. The driving nut is keyed to a sliding clutch which engages either the driving gear for the cut or a friction that reverses the movement of the head, returning the broach or cutter ready for the next piece of work. The driving gear pulls the screw during the cut, the drive being positive by means of pins in the clutch and gear. The sliding head carries a finger which coming in contact with a collar mounted on a sliding rod on the back of the machine acts as a stop, disconnecting the clutch from the driving gear and placing it in its neutral position. To secure the quick return the operator must throw in the friction by means of a lever.

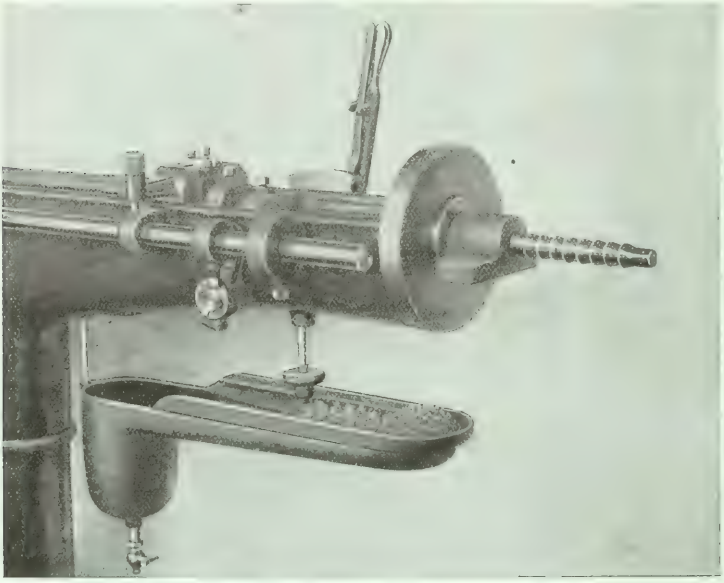


Fig. 1.—Detail of a No. 4 Broaching Machine Built by the Lapointe Machine Tool Company, Hudson, Mass.

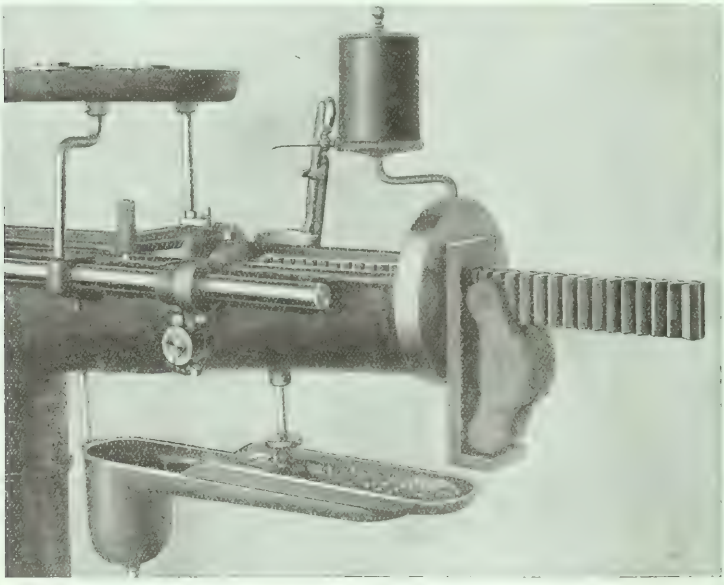


Fig. 2.—A Similar Detail of a No. 4 Lapointe Broaching Machine Illustrating a Different Operation.

The machines shown in the illustrations are equipped for special kinds of broaching, though they are essentially the same as the standard tools. In Fig. 1 a 1½ in. bearing is being broached instead of reamed, in a casting of peculiar shape, rendering it difficult to hold in a chuck. The hole is first rough drilled in a drill press or other machine, 1-32 in., or even 1-16 in. smaller than finished size. The broach, in its single passage through the hole finishes it to size, with a smooth and perfectly cylindrical interior surface. The broach is made in tapering form so that the first and each succeeding tooth takes only its proportionate share of the work, a few thousandths of an inch, until the extreme end of the broach is reached, where the last few teeth are of the full size required for the hole, this larger end being accurately ground to standard size. It has been found that a broaching tool is more durable than a reamer, and there is a saving of time. This includes setting up the work. It will be seen in the illustrations that no clamping or fastening is needed to hold the piece while broaching. The approximate time required for one piece is about one minute.

The second illustration, Fig. 2, shows a machine broaching a slot in a casting of peculiar shape, instead of milling it, a process that is very accurate as well as rapid, especially because no fastening of the work is required during the actual operation.

An important field of work for the broaching machine is that of cutting square holes and holes of shapes other than round. Square holes are replacing keyways because they can be cheaply broached. In producing such a hole a round hole is first drilled, no larger and if anything smaller than any side of the finished broaching. For instance, a 1¼-in. square hole is drilled 1-64 in. small. The neck of the broach is made to fill the drill hole, and the tool is of such a shape, as in the round broach, that each tooth in succession does its share of the work, the last of the series being of the required finished size. In cutting keyways the broach is carried on a bushing, so-called, which fits the hole in the work and acts as a guide, the final teeth of the tool giving the finished depth. When necessary a deeper keyway may be cut with the same broach by placing a block or key between the bottom of the bushing and the bar.

The Tin Plate Industry in Canada.

The new tin plate factory at Morrisburg, Ontario, which began work in the closing days of 1907, will have for some time to come two claims to distinction. It is the first tin plate factory established within the Dominion of Canada, and it is the only manufacturing industry that is without either protection in the Dominion tariff or bounties from the Dominion Treasury. It is not the fault of the promoters of the new factory that it is in its present isolated position as regards the tariff. Its output has no protection because, in 1906, when the Canadian tariff was revised, the Dominion Government feared the opposition of the farmers of Ontario, the fruit and vegetable canners of that province, and the fish packers on the Pacific and Atlantic coasts.

Work on the plant at Morrisburg had only recently been begun at the time of the last tariff revision. Municipal aid had been given to the undertaking by the town of Morrisburg, and there had been application to Ottawa for free water from a Government canal in the neighborhood of Morrisburg. This application was reported in the newspapers all over Canada. Farmers and canners thus had warning that the new company would seek for tariff protection when the act of 1897 was revised, and without waiting for the Morrisburg company to put in its plea, the farmers and canners lined up in opposition and urged that there should be no change in the tariff.

Tin plate was put on the free list in 1884. From 1879 to 1884 it had been in the protective schedules. The Morrisburg Company waited until the Tariff Commission was nearing the end of its six months' work before it presented its case. Its representatives appeared at the last of the public sessions of the commission—at Ottawa in February, 1906—and asked for a duty of 35 per cent., laying much emphasis on the fact that the promoters were starting a new industry, and that the municipality of Morrisburg had come to its aid. It was November, 1906, before the new tariff was submitted to the House of Commons. Concessions were then made to many of the industries which had pressed for higher duties against American and British imports. The bounties to the iron and steel plants were also continued until 1912, but no concession of any kind was made to the Morrisburg industry. The company's application for Government aid could not be ignored altogether. It had attracted too much attention to admit of its being passed over in silence by the Minister of Finance, who, on the contrary, explained at some length why it had been turned down, and why tin plate was to continue on the free list. Mr. Fielding then said:

> Very strong representations have been made to us to put a duty on tin plate in order that we might manufacture it in Canada. There is certainly no difficulty about manufacturing all the tin plate we want in Canada if we are prepared to pay the price, and some enterprising gentlemen have already taken steps to establish a factory in some town in eastern Ontario. We say at once that while it would be a desirable thing to have a tin plate factory in Canada or any other factory that will give employment to the people, what we have to consider is whether the advantages to be derived from establishing an industry of that character are at all equal to the burdens that would be imposed on the mass of the people by its establishment.
>
> Tin is an article which enters into the industries and domestic life of the people to a very large extent. Its price affects the price of home utensils and of dairy utensils in a very large degree, and the tremendous canning industry we are building up—an industry to which we are looking with pride and satisfaction and hope to see very largely developed. This canning industry is a vast one; and I think it would be a mistake if because of this idea of making things in Canada, or even for the establishment of a factory, important as this might be to the locality in which it was situated, worthy as the enterprise might be and commendable as might be the spirit of the gentlemen who would undertake it, we should cultivate that industry by putting a heavy burden upon all this varied range of industries that require tin. And therefore we are not prepared to put a duty on tin plate.

Canada is now importing annually a little over 452,000 boxes of tin plate, of which, in 1906-7, 351,000 boxes were obtained from England and a little over 100,000 boxes from the United States. There is plenty of business in sight for the Morrisburg plant, but it will be hard sledding for the new concern to get its full share as long as these large importations are coming in and tin plate remains on the free list. It is scarcely possible, however, that the peculiar position of this pioneer plant will be permanent. In the past, tariff duties have been established in Canada to help the smallest industries. At one revision, when the Conservatives were in power, all importations of parasols and umbrellas were made liable to a stiff duty in the interest of a single umbrella shop in Toronto. There are many similar instances in the tariff history of Canada, and as recently as the last revision a duty on essence of peppermint was established in the interest of a small distillery at Windsor, Ontario.

Both political parties are now protectionist. Both have hitherto been equally alert in bringing new industries inside the tariff breastworks. The attitude of the Laurier Government is illogical and without precedent, and it will need only a little more pressure to secure either the benefit of the tariff or of the bounty code for the Morrisburg enterprise. The likelihood is that tin plate will be added to the bounty list before the next general election comes around. Such a policy on the part of the Government would disarm the opposition at least of the canners and packers. It would, moreover, obviate any disturbance of the export trade in canned goods and the necessity of establishing a system of drawbacks on tin plate in favor of exporters of canned goods. E. P.

The West End Tube Works, McKees Rocks, Pa., has issued a circular stating that with greatly increased facilities, additional equipment and arrangements insuring a steady and ample supply of skelp, it is in good shape to handle promptly a larger volume of business. The company manufactures welded bending tubing, running from ⅝ to 2 in. outside diameter, which is uniform in size and finish and of a quality to work satisfactorily. Within a short time the company will be prepared to furnish square tubing in sizes ⅝ x ⅝ in. up to 2 x 2 in., either hot finished or smoothly cold drawn. The company makes a specialty of cutting tubing to short lengths, but does no threading.

A Canadian Time Keeping System.

Employed by John Bertram & Sons Company, Dundas, Ont.

BY J. A. THOMPSON, DUNDAS, ONT.

The time system in use at the Canada Tool Works, John Bertram & Sons Company, Dundas, Ont., is so arranged that each man keeps his own time, not for only the day, but for each individual job. On a time register, placed in a convenient position in the section or department in which he is engaged, he registers his time of commencing and leaving off work for the day; then on a daily time card he registers the time of commencing and leaving off each job or operation during the day.

The time card has spaces to be filled in with the workman's clock number, his name, the number of the order, number of the machine, and also the number of 15 min., the time of commencing and leaving off will be the same on each, but the time cards for the second or more jobs done within the 15 min. must be marked "With No.——" as in Figs. 3 and 4. It will be seen that provision has been made for men running more than one machine to record the actual time running each machine.

All time cards are returned to the time department the following morning, where they are checked with the time register, then sorted in their respective operations and listed on a summary sheet, Fig. 6, with a Burroughs adding machine, which lists the hours according to the order numbers. This sheet also gives the total hours of each operation for the day as well as the total machine hours. From each day's sheet are transferred to a time summary card, Fig. 5, for each order number, the hours spent on each class of work, as boring, turning, &c. This card shows the total number of hours that have been spent on a given order to date. To illustrate, it is compiled as follows: From the time summary sheet for

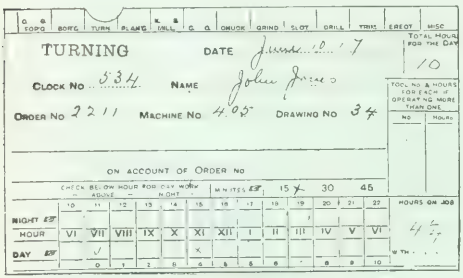


Fig. 1.

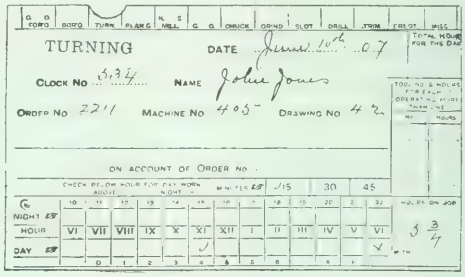


Fig. 2.

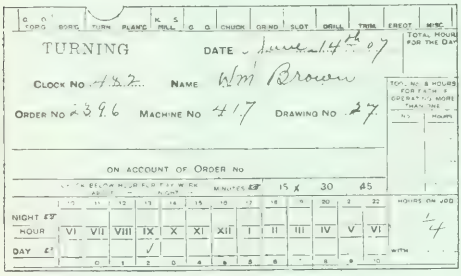


Fig. 3.

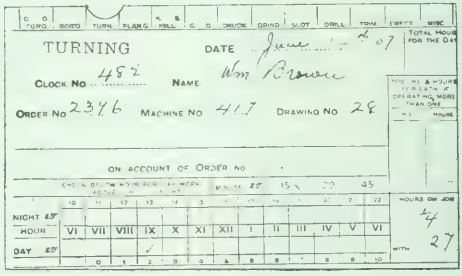


Fig. 4.

Facsimiles of Time Cards for Individual Turning Operations.—Actual Size of Cards, 3 x 5 In.

the part upon which he is at work, as shown in Fig. 1. When he starts an operation, in this case turning, he marks the time card with a check mark under the hour when he commenced the operation, (*e. g.*, 7 a. m.), proceeds with the work and when finished (say at 11.15 a. m.), places a cross under the hour and also beside the nearest fraction of an hour as measured in quarters in the line headed "Minutes." The lapsed time (4¼ hr.) is entered on the lower right hand corner of the card under "Hours on Job," as is also shown in Fig. 1. The operator then proceeds with his next job, this time marking the time of beginning on another card (only one entry is made on each card), with a check as before. A card succeeding that of Fig. 1 is shown in Fig. 2, where checks are placed under hour XI and also in front of minute 15. If the job on which he is working is not completed at the close of the day, he marks his card as though it were finished at the closing time, entering the hours occupied during that day, and on the following morning a new card is used as though commencing a new job.

There are many jobs that occupy but a small amount of time, possibly only 5 min. The wish is to keep a record of these, but not to charge less than 15 min. against any one job; hence if two or more jobs are done in the Monday, June 10 (Fig. 6), is checked off order No. 2211, and on the time summary card (Fig. 5), under week ending June 15, are entered forging, 2¼ hr., boring, 4½ hr., turning, 12½ hr., and so forth. The entries from Tuesday's sheet are totalled with the previous entry, *e. g.*, if there was 4 hr. under forging, there would be entered under Tuesday, 6¼ hr., for this would be the total to date for the week, and so on for the remaining days of the week; each operation is carried out in like manner. The week's operations are totaled, giving total hours on the order up to that point. It is to be noticed that the daily entries for the next week begin anew, but that the totaled hours for the previous week are added in the second week's totals. These time summary cards are continued until the order is completed, and the cost is made up from the information they give.

A glance at this card always indicates the total hours to date of any operation or the total time to date of any order in process of manufacture in the works. Another advantage is that comparisons may be made with former orders at any stage in the process. This information also saves much time when making up the inventory when required, as the necessary information is immediately at hand.

A premium system is also carried on which is prov-

ing very satisfactory, as it appeals to the individual workman who is willing to exert himself, and the company profits in the increased production.

Iron Ore on Lake Erie Docks.—Figures compiled by the *Marine Review* show that the receipts of iron ore at Lake Erie ports in the season of 1907 were 35,195,758 gross tons. The total shipments from Lake Superior docks, as heretofore given, were 41,288,755 tons. The stocks of ore on Lake Erie docks December 1, which for statistical purposes is the date taken for the close of navigation, amounted to 7,385,728 tons, the largest total for dock stocks at the end of the season in the history of Lake Superior ore shipments. As winter shipments from docks to furnaces will be light in 1908, the opening of navigation next spring will probably show a high record figure for stocks on dock. It is safe to assume that in most cases the stocks of ore now in furnace yards will be sufficient for the requirements between the present date and the opening of navigation. In many cases they will be much more than sufficient according to the present outlook.

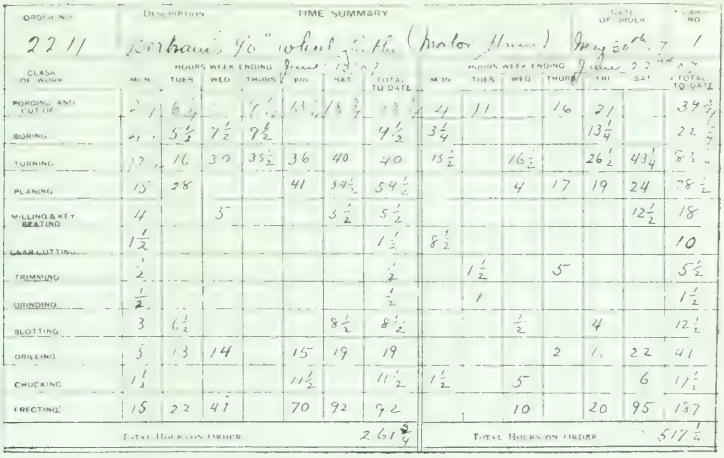


Fig. 5.—Facsimile of Time Summary Card.—Actual Size, 5 x 8 In.

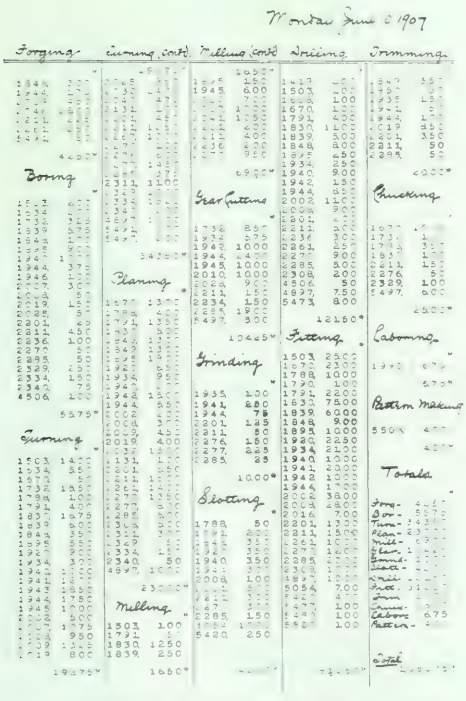


Fig. 6.—Reproduction of Summary Sheet Made on an Adding Machine.

The Westinghouse Machine Company Receivership Plans.

Last week plans for taking the Westinghouse Machine Company out of the hands of the receivers—William McConway, W. H. Donner and E. E. Keller—were sent to the creditors. These plans consist briefly in a proposal to issue three-year 6 per cent. notes to pay off the existing indebtedness, these notes to be secured by the company's bonds at 85 per cent. of their face value as collateral, and issued in denominations of $500 or multiples thereof. Claims of less than $1000 are to be paid in cash. The plans are said to have the indorsement of some of the best financiers in Pittsburgh. From an accompanying financial statement the following schedule of liabilities as of October 23 is taken:

Capital stock	$7,373,450.00
Funded debt:	
First mortgage bonds	245,000.00
Debenture certificates	1,020,000.00
Current liabilities:	
Notes payable	5,943,528.49
Current accounts (including payrolls, &c., amounting to about $225,000)	1,874,142.95
For inventory depreciations and extraordinary adjustments	200,000.00
Profit and loss surplus	6,687,303.51
Total liabilities	$23,343,424.95

On October 23, 1907, the company had paid in advance interest charges amounting to $103,142.15, being the interest from October 23 until maturity on notes discounted. This amount has been deducted from the surplus account in the above statement.

Current liabilities as above, $7,817,671.44, will be reduced to an amount less than the $7,200,000 of three-year notes proposed to be issued, by "set-offs" in accounts receivable and the payment by the receivers of preferred claims in the nature of payrolls, &c.

The Pennsylvania Engineering Works, New Castle, Pa., builder of blast furnace and steel plant construction, has received a contract for the building of a blast furnace for the Keystone Construction Company, at Hamilton, Ohio.

The Nisbet Dust Catcher, Gas Washer and Reheater.

The dust content of blast furnace gases will vary from 2 to 5 grains per cubic foot, and assuming the average at 3 grains per cubic foot, a furnace giving off 125,000 cu. ft. of gas per ton, which is a fair average in present practice, would carry over 375,000 grains, or 53.5 lb., for every ton of iron produced. The amount of water vapor carried over varies according to the amount of moisture in the burden. By eliminating the dust and water vapor from the gases it is possible to dispense with the use of one stove and at least one spare boiler, and also, as the purified gases have a higher calorific value, there is a saving in coke because of the hotter blast that is possible by use of the purified gas.

It is obvious that the only practicable way by which the water vapor can be eliminated economically is by cooling the gas to a point where the vapor will be condensed; that the simplest condensing medium is water, which is also the logical medium for washing the gases to eliminate the dust particles, and, further, that the greater the washing surface the more thoroughly the gases are purified.

The apparatus shown herewith, designed by D. F. Nisbet, consulting engineer, Pittsburgh, comprises a dry dust catcher, which may be supplemental to an ordinary dust catcher already installed, or may be used as a primary dust catcher, a gas washer, cooler and reheater. The hot unpurified gases enter the dust catcher element, as in Fig. 1, where the velocity of flow is reduced, permitting the heavier particles of dust to fall by the action of gravity to the lower portion of the apparatus, where it impinges on the surface of the water in the bottom tank and is intercepted. The deflecting diaphragms in the dust catcher element guide the dust to the center of the lower passage, so as to prevent the "short circuiting" of the dust laden gases, and cause them to impinge more directly on the water. The gas, now deprived of the heavier portions of the dust, is divided into two streams and is carried along the surface of the water, in the tank element, as shown by the arrows, and enters the outer washing and cooling passes. At the tops of the latter are perforated water pipes, which deliver a thin sheet of water downward to the tank, while the gases flow upward. This passing of the gases in a direction opposite to the flow of water has a tendency to cause the gases impinging on the water, through frictional contact, to take the direction of the flow of water, giving the gases a rolling motion. This brings them into intimate contact with the wetted surface, which will rapidly absorb the heat of the gases, at the same time intercepting the finer dust particles and carrying them into the tank below. In the three-pass apparatus, shown in Fig. 1, the gases, after passing upward through the outer passes, descend along the center passes, where they are further cooled and purified; then pass into the inner reheating passes on either side of the dust catcher, and thence to the upper reheating pass and to the stoves and boilers. In the single pass washer, a section of which is shown in Fig. 2, the gases go direct from the one washing and cooling pass to the reheating pass over the roof of the dust catcher element, where the hot unpurified gas gives up some of its heat by conduction to the purified gas.

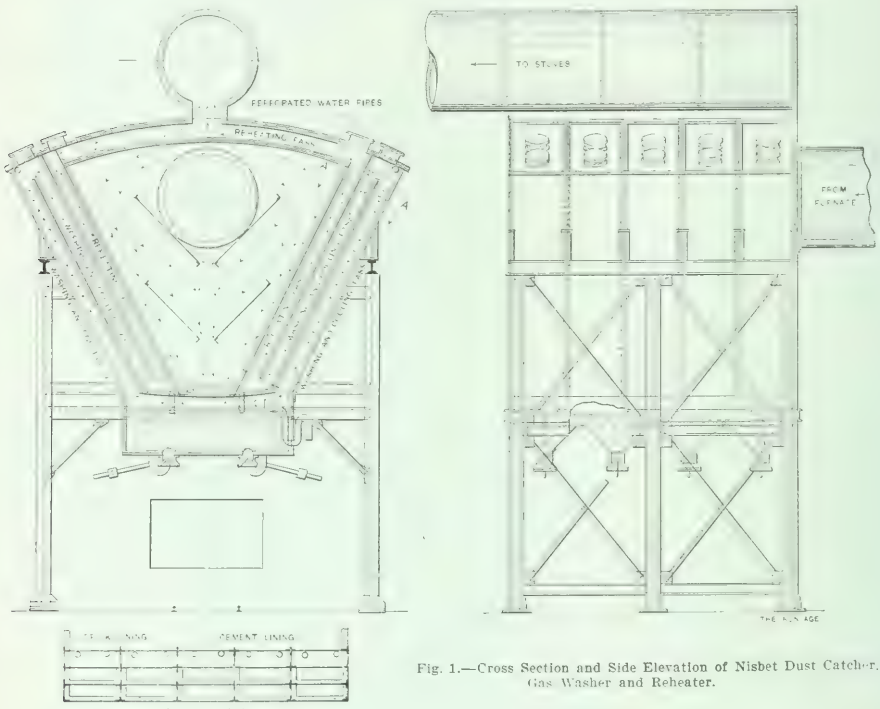


Fig. 1.—Cross Section and Side Elevation of Nisbet Dust Catcher, Gas Washer and Reheater.

It is obvious that since the purity of the gases depends on the extent of the washing and cooling surfaces, the three-pass apparatus has a much greater efficiency than the single pass; therefore the choice of apparatus for a given installation would depend largely on the dust content of the gases and other economic considerations.

Where these washers are to be used in conjunction with other apparatus, as a preliminary to further purification of the gases for use in gas engines, the washing and cooling surfaces can be greatly augmented by placing perforated pipes at the sides and end opposite the intake of the dust catcher element. It will be noted that the wash water is practically used twice, once in oblique passages and again in the tank, thus making it very economical in the use of water. The tank, as will be seen, is divided into four compartments, each of which is provided with sludge gates for drawing off the accumulation of dust which settles to the bottom. Each compartment can be drained and thoroughly cleaned without materially affecting the efficiency of the washer, pro-

viding this is done rapidly. Provision has also been made for taking care of the overflow and skimming the surface of the water in the tank.

The designer of the apparatus is negotiating with several large steel companies for its installation at their plants in the near future.

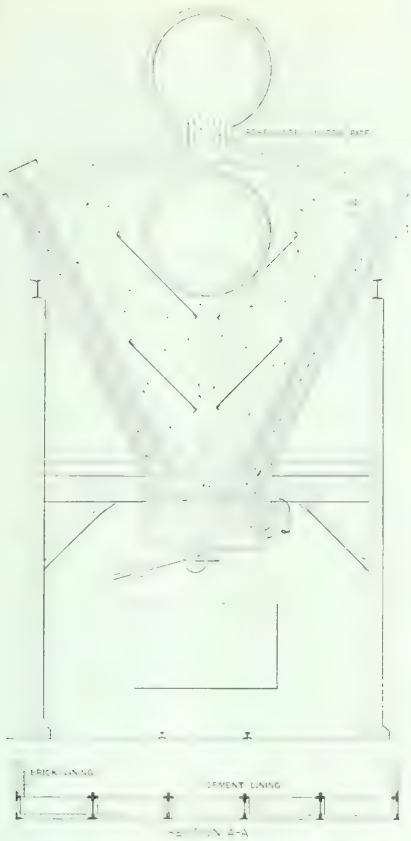


Fig. 2—Section of the Single Pass Gas Washer

Customs Decisions.

Burnt Iron Annealing Pots.

The Board of United States General Appraisers January 4 ended a long drawn out customs controversy regarding the classification to accrue on old burnt iron annealing pots, when it was decided that the articles come within the purview of "scrap iron," as that term is used in the tariff act. This classification was imposed by the custom house authorities at Buffalo, and carries duty at the rate of $4 per ton. The Pratt & Letchworth Company, the importer of the merchandise, objected to the return made by the collector, and filed an appeal with the Board of Appraisers, in which it was alleged that the articles should be deemed "non-enumerated manufactured articles," with assessment at the rate of 10 per cent. ad valorem. The board, in its written opinion, characterizes the claim as wholly untenable. In part, the decision says:

The merchandise is admitted to be old burnt and worn iron articles. In our opinion they are provided for in paragraph 122 of the tariff, as scrap iron. The importers contend that the old iron annealing pots are to be used only as an ingredient or sort of flux, in the manufacture of pig iron, and that such use is not a process of remanufacture. Their case thus rests on their claim that, as the proviso to paragraph 122 limits the application of the term scrap iron, "nothing shall be deemed scrap iron or scrap steel except waste or refuse iron or steel fit only to be remanufactured," the goods they have imported do not fall within it, and are dutiable under section 6 of the tariff. We regard that claim as wholly untenable. When an article, such as a metal worn out by use and no longer fit for the use for which it was made, is thrown into a melting furnace, it certainly is being subjected to a process of remanufacture. It does not matter that the articles are to be melted with other metals so as to form an alloy for some specific use, the process is a process of manufacture and the reuse of old material accordingly makes it a process of remanufacture. . . .

To sustain the importers' contention would result in holding that no metal is subjected to process of manufacture or remanufacture unless made directly into the form of completed articles. This old scrap iron is to be put in the furnace for the purpose and with the object of combining itself with the other materials present and thus to form the ultimate product. This use is a remanufacture in every sense of the term so used. We hold that these old iron annealing pots are refuse iron, and that they are provided for under paragraph 122 as scrap iron, and are properly dutiable as assessed. The protests are overruled and the decision of the collector in each case is affirmed.

Lead in Pigs.

The board has made a decision overruling the claim of Arthur Seligmann, New York, for a reduction of duty on merchandise described by the appraising officers as "lead in pigs." Duty was accordingly assessed at the rate of 2½ cents per pound, whereas the importer set up the claim for classification as "type metal," with a tax of 1½ cents per pound for the lead contained therein. In order to sustain his claim, the importer was obliged to show affirmatively that the pigs of antimonial lead or type metal contained at least 9 per cent. of antimony. According to the appraiser, the pigs contained only 7.10 per cent. of the antimony, and upon analysis this return was confirmed. The decision says:

The burden of proof is upon the importer to establish his claim by a preponderance of evidence, otherwise the action of the collector is presumed to be correct. The importer has introduced in evidence certain *ex parte* affidavits in regard to an analysis of samples which are claimed to represent the antimonial lead imported. The affidavit of the manufacturer recites that there were "three meltings in all to produce the 173 pigs." One pig out of each melting or three in all were remelted and sample sticks poured or cast and these submitted for assay. The *ex parte* affidavit as to said assay shows a presence of 10.52 per cent. of antimony. That the amount of antimony in any given melting varies is testified to by the importers' own witness. There is no proof presented as to what each melting assayed, or as to how many pigs were poured from such respective melting, and consequently no proof that the samples taken are representative. It is not sufficient to indicate that certain tests made of samples from meltings prior to the actual casting of the pigs might afford a fairer basis for computing the amount of antimony than a test by the Government of the precise goods imported. It might be a fairer test of the meltings and still not a representative test of the 173 pigs of metal here in question.

We are not satisfied with such proof, and think the protestant has failed to furnish the best evidence. It may be well to point out that the importer admits that he was acquainted with the fact that his importation would be sampled and he had ample notice that two pigs had been taken by the collector which would be subjected to an analysis or assay by the Government, the results of which would determine the classification of his goods. Knowing this, no reason is advanced why he could not have retained adequate and representative borings of a sufficient number of the pigs of metal that arrived, an analysis of which would properly have determined the issue beyond question. The record does not in our opinion show the importers' claim to be established by a preponderance of the evidence, and we must therefore hold that the goods are properly dutiable as assessed. The decision of the collector is affirmed and the protest overruled.

Finished Machines.

A decision has been handed down by the board overruling a claim filed by Robert Reiner and others of New York. It is held that fully finished machines must pay duty at the rate of 45 per cent. ad valorem under the provision for "manufactures of metal." Several claims for lower rates than that assessed were made, but as the importers failed to produce any testimony on the trial in favor of their allegations, the board is obliged to overrule the claims. Another firm making a similar claim was Sidney, Blumenthal & Co., New York.

Lee C. Moore, Clarence E. Swanson and David S. McCann will apply for a charter on January 20 for an intended corporation to be called Lee C. Moore & Co., Inc., to conduct a general engineering and construction business, and will take over the business formerly conducted by Lee C. Moore, Fulton Building, Pittsburgh, Pa.

The Stewart Gas Furnace.

For the successful hardening of high speed tool steel the maintenance of a uniform temperature and non-oxidizing heat is absolutely essential. To obtain the best results with steel of this character it should be heated slowly up to 1600 degrees F., from which point onward

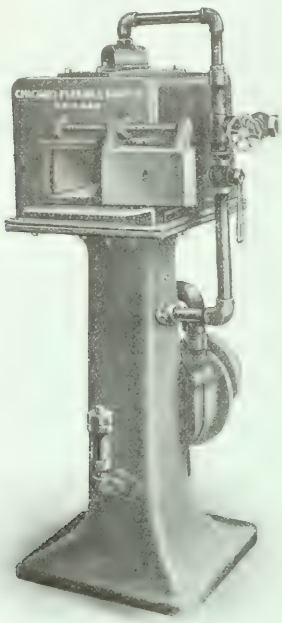


Fig. 1.—The Stewart Gas Furnace Made by the Chicago Flexible Shaft Company.

the faster the temperature is increased the better. The Stewart high speed steel furnace manufactured by the Chicago Flexible Shaft Company, Chicago, and illustrated in Fig. 1, is designed to accomplish these results, provision being made for the control and regulation of both the air and gas supply.

A small pressure blower attached to the back of the



Fig. 2.—Bench Pattern of the Stewart Gas Furnace.

cast iron column supporting the furnace supplies the air blast, which is conducted by a pipe at the rear to the furnace. The interior of this column is used as an air reservoir in which the desired pressure can be maintained by the proper adjustment of the relief valve located near the foot of the column in front. The inlet connection for fuel gas supply is at the globe valve on the pipe line at the right, through which gas is introduced into the top of the furnace. At the point of inlet is located an air and gas mixer and a stop cock in the air line just below it furnishes the means of control for the air blast.

Flames from two burners which are located in the top of the furnace chamber are deflected downward against the steel; this arrangement is designed to utilize to the fullest extent all the heat generated. It is stated that a non-oxidizing heat of 2500 degrees F. can be generated and maintained with absolute uniformity. The furnace chamber is provided with lining that will stand a temperature of 3000 degrees F., and is furnished with an easily operated sliding door. The size of the opening is 4 x 6 in., and the dimensions of the heat chamber are 10 x 7½ x 6 in. For the air line 1½ in. pipe is used, and for the gas supply 1¼ in. With all burners full open, the maximum gas consumption is 80 cu. ft. per hour. The furnace occupies a floor space of 21 x 29 in., and weighs 475 lb.

Fig. 2 illustrates the same furnace with short legs for mounting upon a bench. When used in this way a detached blower and reservoir is necessary. In other respects the equipment is the same as that shown in Fig. 1.

The Power Specialty Company, New York, manufacturer of the Foster patented steam superheater, states that notwithstanding the business depression which has been experienced during the past few months, it has entered a large number of important contracts since September, and that its business for 1907 shows a very gratifying increase in volume over any previous year. Present indications in the way of renewed inquiries and resumption of negotiations temporarily suspended by reason of the business depression, point to the closing of a large amount of business within the next few months. Among many contracts which have recently been secured are: Alabama White Marble Company, 600 hp.; Babcock & Wilcox, for Pensacola Navy Yard, 1600 hp.; United Shoe Machinery Company, 1032 hp.; Clark Thread Company, Newark, N. J., 2500 hp.; American Railways Company, 838 hp.; Louisville & Eastern Railroad, 600 hp.; Schlitz Brewing Company, 2000 hp.; Anheuser-Busch Brewing Association, 2000 hp.; Tonawanda Board & Paper Company, 900 hp.

In the ore traffic of the lakes in 1907 the vessels had an exceptionally easy season. Rates remained constant at the opening prices, which were the same as the previous year, and there were few marine disasters. The fleets were kept busy and some remarkable records were made. As high as 25 down trips with ore were made by ships carrying from 10,000 to 12,000 gross tons per trip. Single loads of ore were carried out of Lake Superior running to 13,136 gross, or 15,123 net, tons, and the average cargo of ore vessels plying to head of the lake ports increased to about 6500 gross tons. It is probable that these figures cannot be equaled in any other port in the world on salt or fresh water.

Robert W. Hunt & Co., inspecting and consulting engineers, Chicago, have decided to establish a branch office and chemical laboratory in St. Louis, Mo., to be under the charge of Charles W. Gennett, Jr., a Cornell graduate. He was for some time in the inspecting and testing department of the Southern Railway Company, and during the latter part of that connection was in charge of the company's inspection work in Pittsburgh and the West. Since then and up to the time of entering the service of Robert W. Hunt & Co., he has been the Western sales agent of the Atha Steel Casting Company, with headquarters in Chicago.

W. E. Shipley, Philadelphia, announces that the business heretofore conducted by him under his own name has been incorporated under the name of W. E. Shipley Machinery Company. Geo. A. Bauer, W. S. Hagaman and J. L. Stewart, who have been connected with the business for several years, are associated with Mr. Shipley in the incorporation.

The New Hanchett Automatic Saw Sharpeners.

At no time since saws have been manufactured have the mill men using the saws given such close attention to their care as at present. The Hanchett Swage Works, Big Rapids, Mich., manufactures a complete line of modern machinery for the care of saws to which the latest additions are the improved machines for sharpening saws automatically, herewith illustrated, of which Fig. 1 shows a rip and cross cut circular saw sharpener, and Fig. 2 a band saw sharpener.

Simplicity of construction, ease of adjustment, strength and durability have been aimed at in the design of these machines, and one of the most important results which is claimed to have been obtained is the elimination of vibration. This is absolutely essential in an automatic saw sharpener while in operation if even and uniformly ground teeth are to be the result. There are two features of these machines which together have made this possible. The emery wheel is driven direct from the countershaft which, unlike other machines, is located near the base of the machine instead of on the top, and the feed is obtained by means of a friction and disk instead of a gear and pinion, which is easily adjusted for any desired speed.

In the circular saw sharpener the work is held stationary, except while indexing, and the emery wheel is adjusted to it. Through a double head with vertical and cross slides controlled by screws and hand wheels, adjustment is made for depth of throat of the saw and lateral adjustment. Four different speeds are provided for the wheel, and the wear of its arbor is taken up by a thumb screw adjustment. The friction feed makes possible any number of strokes from 20 to 45 per minute, and the new feed motion gives strokes ranging from ¼ to 3 in. One adjustable cam with a graduated scale allows for any shape of tooth. Both sides of the saw can be bevelled, or the front can be bevelled and the back squared, or vice versa. The bevel on the saw tooth can be changed while the machine is in motion by means of a hand wheel, and a graduated scale indicates the exact degree of bevel, which ranges from 0 to 45 degrees. The sharpeners are made in three sizes with or without beveling attachment. The latter can be omitted when rip saws only are to be ground. The three sizes have capacities, respectively, for 12 to 72 in., 10 to 50 in., and 6 to 24 in. saws, and weigh 1300, 1000 and 600 lb. respectively.

The band saw sharpener has a new improved back feed, one of the exclusive Hanchett patents, which eliminates a great amount of strain and lost motion that was very noticeable on the old line of sharpeners. Acting in conjunction with the front feed lever a positively uniform feed is maintained. Another special feature is an adjustable cam by the use of which any shape of tooth can be obtained quickly and accurately. The friction and disk feed gives a range from 18 to 40 teeth a minute. The emery wheel on this machine also has four different speeds, and may be adjusted to any angle from 0 to 45 degrees. Wear of the slide in the head is taken up by a gib. The automatic band saw sharpeners are made in both right and left hand patterns and in five sizes. The smallest takes 2 to 7 in. saws and weighs 650 lb.; the others in order have the following capacities and weights: 4 to 10 in. saws, 1200 lb.; saws up to 16 in., 1400 lb.; saws up to 18 in., 1600 lb., and saws up to 20 in., 1800 lb.

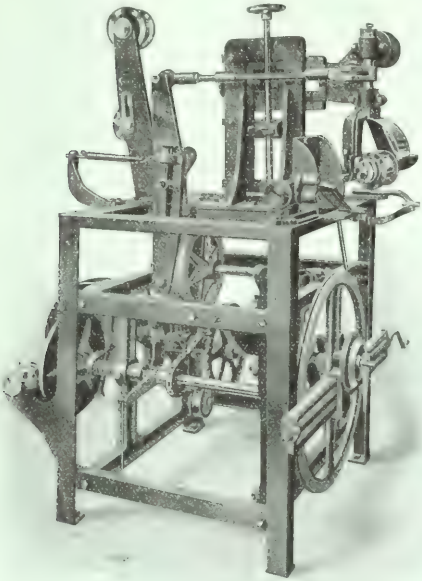


Fig. 1. The Hanchett Automatic Rip and Cross Cut Circular Saw Sharpener.

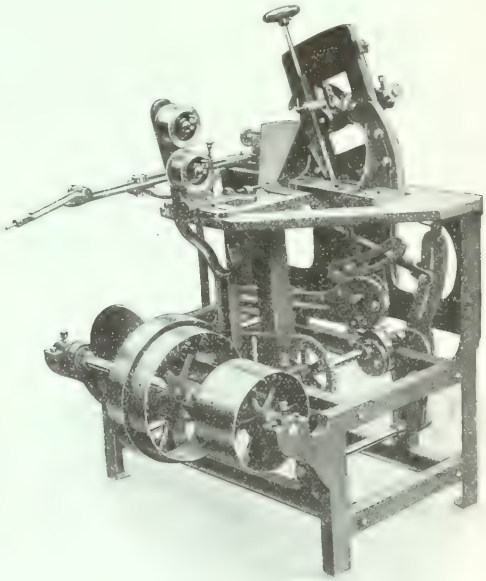


Fig. 2. The Hanchett Automatic Band Saw Sharpener (Left Hand Pattern).

In addition to the automatic sharpeners referred to above, the company manufactures a complete line of filing room machinery, including saw stretchers, re-toothers, brazing tables, lap grinders, filing clamps, swages and swage shapers.

The affairs of the Northwestern Iron Company, Milwaukee, Wis., were turned over on January 2 to Ferdinand Schlesinger and his associates, the new owners, who proceeded with the election of the following officers: President, Ferdinand Schlesinger; vice-president, E. N. Dickson; second vice-president, Henry J. Schlesinger; treasurer, Armin A. Schlesinger; secretary, Jerome Havlisch; general manager, W. K. Packman. The directors are Ferdinand Schlesinger, E. N. Dickson, W. L. Brown, C. P. Wheeler and Henry J. and Armin A. Schlesinger. The general offices of the company will remain in Milwaukee, in the present quarters in the Colby & Abbot Building. Messrs. Brown and Wheeler are members of the firm of Pickands, Brown & Co., Chicago.

Lake Superior Iron Mining in 1907.

BY DWIGHT E. WOODBRIDGE.

The year 1907 showed iron ore shipments from the Lake Superior region amounting to slightly more than 42,000,000 gross tons, in comparison with 38,522,239 tons in the previous year. This new total was almost as much as the lake region shipped in the 35 years prior to 1890, and was more than double the business of so recent a period as 1901. The general average yearly increase has been well maintained, but, as has been the case after every period of augmentation, a decline is on, and the iron ore business of 1908 cannot fail to diminish from that of the past season. The same decline occurred in 1891 and 1893, in 1896 and in 1903 and 1904, the break from 1901 to 1904 having been almost 6,000,000 tons. It is quite possible that a decline proportionately as severe as that of 1904 will take place the coming year.

Figures for the various ranges show that the entire increase of the year took place on the Mesaba District. They give totals as follows:

	1905.—Tons.	1906.—Tons.	1907.—Tons.	Per ct. in 1907.
Mesaba range	20,153,699	23,792,882	27,455,116	65.5
Menominee	4,495,491	5,109,088	5,130,167	12.3
Marquette	4,210,522	4,057,187	3,991,479	9.6
Gogebic	3,705,207	3,641,985	3,555,672	8.5
Vermillion	1,677,186	1,792,355	1,684,891	4.0

The overwhelming importance of the Mesaba District will be even more clearly shown in the following table, which gives the year each range was opened and its total and proportionate shipments since then:

	Year opened.	Total to date.—Tons.	Per cent. of total.
Marquette	1855	84,849,280	22.34
Menominee	1877	63,806,652	16.79
Gogebic	1884	54,023,478	14.23
Vermillion	1884	26,785,050	7.05
Mesaba	1892	150,198,054	39.58

The various railroad systems engaged in the transportation of iron ore on a large scale from the mines of Lake Superior have handled tonnages as follows in the past three years:

	1905.	1906.	1907.
Duluth, Missabe & Northern	8,804,443	11,220,218	13,445,979
Duluth & Iron Range	7,778,768	8,205,128	8,188,905
Great Northern	5,118,385	6,133,057	7,505,125
Chicago & Northwestern	6,729,975	6,706,986	6,975,111
Lake Superior & Ishpeming	1,844,823	1,889,631	1,916,168
Chicago, Milwaukee & St. Paul	1,310,021	1,931,244	1,585,961
Duluth, South Shore & Atlantic	1,243,388	1,074,945	1,323,346
Wisconsin Central	799,394	693,892	876,730

Unusual Difficulties Encountered.

During the year there were many unusual difficulties, and that they were surmounted so well is a tribute to the genius of those in charge of the various branches of the business, from mining to lower lake dock unloaders. To begin with, the season started late; it was April 18 before any ore laden ships left the head of Lake Superior, just nine days later than in the spring previous. This put a handicap of at least 500,000 tons on the new year. In May and June all records for those months were broken by the Duluth, Missabe & Northern Railroad, which moved an average of 2,000,000 tons each month from mines to docks at Duluth. In July, with the traffic swinging along at tremendous pace, the ore dock laborers at all head of the lake harbors struck for advanced pay, regardless of agreements they had previously made with their employers. No sooner was this strike fought to a standstill than the Western Federation of Miners, then trying to secure a foothold on the Mesaba, notified mine operators that in a week it would call out its men unless there was recognition of its organization. The Western Federation was not wanted in the Lake Superior region, and the Oliver Iron Mining Company took a most firm stand in opposition. On August 1, the day the dock strike ended, ore began to move from Hibbing, the center of the Federation's activities, and in volume greater than ever before. During the very time of the strike, the month of July, the company in stripping its Sellers mine at Hibbing broke the world's record for earth removal by taking off, with three shovels working day and night, week days only, 250,000 cu. yd. of material. In neither of these strikes did the employers recede from the position first taken and no concessions were made to the strikers. It is worthy of remark that strikes begun by the breaking of agreements and carried along unlawfully or without due reason, and contrary to public sympathy, never win, and these two were no exception to the rule. By shifting vessels and pushing stockpile loading on other ranges the net diminution in shipments by reason of this strike was during July less than 1,000,000 tons from the corresponding figures of the year before, though its effect was, to be sure, considerably more than this.

The season ended somewhat earlier than usual, the last ore boats leaving head of the lake ports about December 1 and Escanaba December 11. So warm was the late fall that operations were triflingly impeded, and there was no need of the usual thawing of ore in cars and dock pockets. In this short season the traffic moved was far larger than ever before. The Duluth, Missabe & Northern Railroad was responsible for more of this excess than any other line, its daily business averaging 100,000 tons for weeks continuously. In the month of October it handled 2,502,000 tons. The ore moved this season of navigation by this road, if loaded in steel 50-ton cars, would reach from the mines of northern Minnesota to New York City.

Improved Methods Introduced.

For the first time advantage was taken in the lake country of compressed air for sinking shafts in wet ground and of concrete for lining them. For a year or two Pickands, Mather & Co. had been attempting to get some shafts ledged near the Embarras Lake section of the Mesaba. The overburden was quicksand mixed with boulders. All ordinary methods, including the driving of steel interlocking piling, failed. Several shafts and tunnels were abandoned. Finally the Foundation Company of New York tried the method it had used successfully in the construction of foundations in that city and the shafts were placed. The plan attracted the attention of the Cleveland Cliffs Iron Company, which had in its new Gwinn District of the Marquette range somewhat similar conditions. The Foundation Company was employed and the Smith shaft was ledged just before the close of the season. While the Mesaba shafts were of cylindrical section, that at the Smith is rectangular. All are with walls of reinforced concrete, from 3 to 4 ft. thick, and the material taken out was either lifted through an inner steel core or by a grab device that worked with no men in the shaft. The air lock was not required in some instances till the shaft had touched the ledge and it was necessary to make a tight connection with rock ledge. These shafts are all dry and secure, and have cost the companies owning them from $600 to $750 per foot. While the cost is great, it is probably less than the cost of the prior attempts to reach the same points. It was thought that the Kellogg mine, near Embarras Lake and overlain by the same quicksand, would be reached by the same method, but the engineers found conditions slightly different and have been able to get down by a drop shaft of the form frequently employed on the Mesaba and elsewhere.

The Oliver Iron Mining Company has been perfecting its devices for the concentration of sandy ores of the western Mesaba, immense quantities of which it has secured possession of during the past few years. The initial washery at Trout Lake has been combined with supplementary log agitators and scrapers for loosening the sand from ore; Hancock jigs, settling tanks and tables have been added, in the hope of saving the fine ores previously lost, and the problem is now understood to be well settled. The company has elaborate plans for the mining of this class of ore, and does not wish to take any final step for the construction of the enormous concentration works it has in mind until the last difficulty is out of the way and it is known definitely just what the costs and savings will be. By the addition of supplementary

logs in the preliminary washing and some finer adjustments elsewhere the cost is not much increased, while savings are materially improved, so that it is understood the construction of the large plant will begin shortly. The company has continued its policy of securing lands containing these washing ores and now controls the entire west Mesaba District. Its deal for the purchase of the Great Northern lands in that district has at last been closed and work has commenced on one of the tracts.

Achievements in Opening and Equipping Mines.

During the year the Maas mine, on which the Cleveland Cliffs Iron Company has been working since 1901, was opened and is now hoisting ore. It is 1160 ft. deep, and is equipped throughout in the most modern and substantial manner. A very large deposit of ore has been found in this property, and the entire Negaunee basin, in which it lies, has been shown to contain a tonnage that was not before expected. The same company has opened its new Cascade mines, at the new and model town of Gwinn, south of Marquette, and now has three mines where a year ago it had but one. The district is very promising and its development is important.

On the Menominee range a number of new mines have been developed and opened during the year, while explorations now in progress promise to reveal still more. A very considerable tonnage has been added to lake reserves by the work of the year in that district, and it is regarded as perhaps the most promising section for new mines. The Loretto Mining Company has let a contract for the change of the course of Sturgeon River and tributaries for a mile or more, an undertaking of considerable magnitude and one that will permit the mining of large bodies of ore lying beneath the river bed and heretofore inaccessible. The Cleveland-Cliffs Iron Company has undertaken the most comprehensive scheme for reforesting waste lands near its Marquette mines that has ever been put through by any private company or corporation.

Greatest Achievements on the Mesaba.

But the astonishing achievements of the year have been on the Mesaba range. For rapidity of operation, size of undertakings, boldness of conception and almost every other superlative of industrial progress the Mesaba mine operators have led. The Oliver Iron Mining Company alone has moved off its open pit mines during the year more than 20,000,000 yd. of overburden, and its entire removal of overburden and ore from steam shovel mines alone has been more than 27,000,000 yd. In addition to this, it mined underground on the Mesaba 5,000,000 tons and on other ranges 6,000,000 tons. For the year it operated from 75 to 80 steam shovels, with the requisite number of attendant locomotives, &c. From its Sellers mine three shovels moved 250,000 yd. of material in 30 days. All last winter, with the thermometer away below zero, with several feet of snow and with the most heart breaking difficulties to contend against, it was stripping at the various Mesaba centers of Hibbing, Canisteo, Eveleth, Virginia and McKinley. In the Hibbing District alone in the winter period it moved 3,250,000 cu. yd., enough to make a pit ½ mile square and 12 ft. deep.

Three years ago this winter work was begun on the stripping of the Hull-Rust pit, and since that date this pit has already mined 3,650,000 tons of ore. Nine steam shovels have been employed at one time in this property, and in the 16 adjacent acres of the Hull-Rust and the Mahoning, as they appeared last spring, 15 shovels have been working at one time. When the Mahoning, Hull-Rust, Sellers, Burt-Pool and other vast pits adjoining the city of Hibbing are connected up according to plans there will be a single deep mine more than 12,000 ft. east and west and 3000 ft. north and south. In the stripping under way at the Canisteo, which is averaging more than 80 ft. in depth, there will be a total of 30,000,000 yd., and there are mines within a few miles that will add nearly as much more to that total. A year ago the stripping of the Virginia group was commenced at the Ohio, and the past season that group shipped 1,000,000 tons.

The cost of stripping has run from 23 and 24 cents a yard to 60 and 65 cents, the high figures being due to unusual conditions—winter work, shallow pits, bad weather, &c. The average yardage per shovel for the year has run from 2000 to 2700, no great change from preceding work. In one month five shovels, of which three were Bucyrus and two were Marion, moved 276,000 cu. yd. of material, the average number of hours worked by each shovel during the month being 471. Mesaba operators have so far been able to move about twice as much material per machine as the Government seems to get out at Panama, other conditions being fairly equal.

The Use of Electricity.

The Penn Iron Mining Company has equipped its Vulcan and East Vulcan mines with electricity, and is doing drilling, hoisting, pumping and shop work by power transmitted from the falls of the Sturgeon River, some 5 miles from the mines. Among other details it has a six-stage pump, running at 1200 rev. per min. and lifting 900 gal. per min. against a head of 1200 ft. Cages and skips are run by electricity, and with ease and precision. The acceleration of the load is very rapid and the power consumed is slight. So successful has this installation been that the Chapin Mining Company, which has for years used a great hydraulic plant on the Menominee River, transmitting compressed air to the mine, is thinking of abandoning this plant and installing electrical transmission.

On the Gogebic range, while there has been no extension of the boundaries of the valuable portion of the range east or west, though strenuous attempts have been made to that end, there has been an extension of the defined limits of the formation toward the center of the earth, and shafts are now going down to the depth of 3000 ft. Fifteen shafts either sunk or now sinking there are of steel, either steel head frames and shaft timbering and lining or one or the other of these. These shafts are in the footwall side of the lode, and are connected with it by cross cut at the various levels. Developments of recent years at such mines as the Newport, Tilden and others have shown that the importance of the Gogebic has never been properly estimated, and that its ore deposits are probably far larger than has been supposed.

Standardizing of power houses and plants, of boiler equipment, hoisting machinery, underground appliances, timbering and layout of properties has been in progress. This is in line with the more advanced practice of the day and companies can afford it better than a few years ago, when they were selling ore for about enough to bring a new dollar in place of an old one.

Explorations Actively Prosecuted.

Explorations during the year have been very general. At the close of 1906 there was considerable talk of a very large property a short distance east of Port Arthur, Ont., on which 200,000,000 tons were said to be shown. Nothing has come of this, and it is now generally understood that the showings made there were most delusive. No such tonnage nor approximation thereof was ever really found there. Of other new districts the Cuyuna is most talked of. One firm has taken a property in the vicinity of Rabbit Lake and is sinking a mine shaft. Its drill holes show ore running better than 57 per cent., and partly Bessemer, in a deep body. No one else has found good ore yet, though great depths of lean ore have been discovered.

Mesaba explorations have not shown any great tonnage. For the first time it may be doubted if as much new ore has been measured as has been mined. Explorations have been confined, for the most part, to more accurate measurements of ore bodies and a closer delimitation of what had been found previously. This work does not increase tonnage to any extent; frequently an increase by the swelling of one bounding line will be offset by the shrinkage of another; rock walls may contract, horses may be shown in the deposits and the bottoms of the deposits may come closer to the top than expected. Some new ore has been shown on the east side of Embarras Lake and more close to the quartzite line in 56-23. Some ore has been found in other west Mesaba townships, but the large deposits have been found, and what may be opened in future will be quite small, such as might have been missed by drill holes 300 ft. apart, as most of the earlier work was. These facts are significant.

Developments on the Marquette District have been referred to in the work of the Cleveland Cliffs Iron Company on the Cascade range. There a new iron bearing

section has been opened, and it is reasonable to expect that the large areas held by the Cleveland Cliffs and other companies will develop more mines than have been shown. On the western part of the Marquette range the development of old and long abandoned mines is proceeding with some vigor, and it may be that this, too, will show good deposits that can add materially to the reserves of the region.

On the Menominee Range.

Menominee developments have been extensive and a number of properties have been brought in, as the saying is, while more are in such condition that they may come into the mine enumeration another season. More exploration is in progress than elsewhere in the Lake Superior region, and the number of diamond drills boring there is greater than has been known in any lake district except the Mesaba. Conditions are such that explorations are conducted with promise over a very wide area, and for many miles the indications are such as to give much hope.

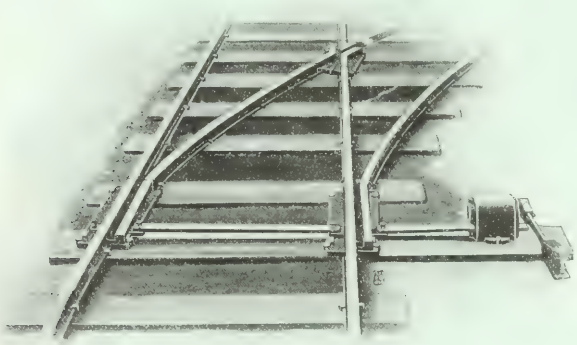
Some work has been done in western Ontario. The Atikokan country has come in with one mine found by the Oliver Iron Mining Company, and the opening of the property of the Atikokan Iron Company for its Port Arthur Furnace. The latter has shipped an average of about 200 tons a day for the past six months, and the ore is being treated successfully and unmixed at that furnace. As it is a sulphuretted magnetite, it is roasted in furnace waste gas before going into the furnace and most of the small percentage of sulphur is eliminated. A year ago exploration was in progress far to the northward, on the east shores of Nepigon Lake, and west from there along the projected line of the Grand Trunk & Pacific, but this has been abandoned, temporarily at least. Some work has been done around Hudson Bay by explorers with more of a sanguine temperament than cool reason in their blood, and they report great things. But however great the showings of iron ore may be in that region is of little consequence, now or to the next generation at least.

During the year wages at mines were raised to the highest point known. Average daily wages of mine crews were from $2.27 on the Mesaba to $2.50 on some of the older ranges; mine captains received $4.50 to $5 per day, and the lowest class of helpers and laborers from $1.86 to $2. With the advent of the present depression some mining companies have reduced pay and other have closed their mines altogether. The Oliver Iron Mining Company, the chief employer of labor in the region, has decided to make no change in the standard and will maintain wages throughout the winter at the high level of the previous summer. The number of men employed will be materially reduced.

There will be a considerable difference between the shipments of 1907 and those probable for 1908. The shipments of 1907 were sufficient, in the flood tide of consumption, to keep furnaces at work and provide a supply for the coming winter. When furnaces began to close ore piled up at lower lake docks and in steel company yards at a rapid rate, until, late in the season, the docks and yards were clogged and lower lake railroads were congested. More and more furnaces closed, the consumption of ore diminished to less than half of what it was, and still the forwardings from upper lakes remained at high pressure. This was continued to the very close of navigation, so there is on hand in the East more ore than has been known in the history of the trade, not only actually in tons, but proportionately to average consumption. As there is little hope of a general resumption of furnaces before the coming spring, much of this ore will be on the market when navigation opens. In other words, there will be no incentive for excessive shipments the coming season. Doubtless large melters among the steel companies will endeavor to maintain reserve stocks near furnaces in order to guard against a famine, should there be labor troubles or accidents to any one of the many links in the chain of transportation. But representatives of some of the largest shippers look for diminished shipments to the extent of from 25 to 33 percent. This would make the business of 1908 from 28,000,000 to 32,000,000 tons. The writer does not think they will be reduced quite so much, but this is altogether too early to make any predictions. There have been no sales of ore and inquiries for the new year are rare. Other than for a few of the standard Bessemers there are practically none.

The Chase Improved Industrial Railroad Switch.

A new development in industrial railroad switches, which is manufactured and placed on the market by the Chase Foundry & Mfg. Company, Columbus, Ohio, is shown in the accompanying illustration. Many advantages are claimed for this switch; it is simple, durable, economical and reliable, and can be placed in position and in working order by an ordinary workman without the assistance of a blacksmith or skilled mechanic.



The Style 75 Patent Switch Made by the Chase Foundry & Mfg. Company, Columbus, Ohio.

As will be seen from the engraving, the switch consists of two plates which carry the double oscillating rail, two sections of double rail, frog, switchstand complete and connecting rods. The plates of both the switch and the frog are recessed to receive the end of the rail to which it joins, preventing any possibility of either the rail or the switch being forced out of position or alignment by hard usage or frost. In many cases where the loads to be carried are not heavy, or the speed of the car not over 5 or 6 miles an hour, the switch is used independently of the switchstand. In this case the switch is operated by the foot, which is very easily and quickly done.

The illustration shows the switch as set for the main line connection. To connect with the branch track, the weighted lever at the right is thrown over to the rear, and the other two sections of rail on the switch plates are brought into line with the main track rails in the foreground.

The improved switch is the latest addition to the company's already extensive line of industrial railroad equipment, which includes in addition to everything pertaining to track systems, trucks, cars, &c.

The Petroleum Iron Works Company, manufacturing all classes of steel plate construction, is located at Sharon, Pa., and not at South Sharon, as mentioned in a recent issue of this paper.

The Chicago Hardware Foundry Company.

The Chicago Hardware Foundry Company, North Chicago, Ill., in the execution of plans to take care of its growing business, has added to its plant two substantial buildings. One of these is designed for the convenient storage of patterns and is built entirely of fireproof materials. The walls are of brick, resting on rubble concrete foundations, and are not pierced by openings of any kind, except one door at each end of the building, both doors being fireproof. Light is admitted by two skylights, each 6 ft. wide, running the entire length of the building, and artificial illumination is furnished by electric lights. The skylights have metal frames and are glazed with ¼ in. thick wire glass.



Fig. 1. Shelves for Patterns in the Pattern Storage Building of the Chicago Hardware Foundry Company, North Chicago, Ill.

The provision made for the storage of patterns is shown in Fig. 1. This consists of a system of easily accessible shelves, affording means for the orderly disposal of a great number of patterns. These shelves, or racks, are arranged in double tiers, which extend the full length of the building, with a central aisle between each tier. They are 12 ft. in hight and are constructed entirely of steel. The shelves of the lower tier are reached from the floor and those of the upper tier are made accessible by stairways leading to galleries from which the higher shelves are easily reached. In order to prevent the obstruction of light, and also to avoid the use of combustible material, the gallery walks are made of heavy wire held in steel frames. Each tier contains 24 steel racks for small patterns, 12 on each side of the building abutting the walls with cross aisles opening into the center aisle, thus affording free access to both sides of the rack. In addition to the main racks shown in the illustration there are placed along the walls at the end of the building additional racks for the storage of larger patterns. The building is warmed by steam, carried in overhead pipes supported from the trusses, and is ventilated by registers placed in the outside walls at the floor level and by ventilators in the roof. In its design and construction, from a viewpoint of convenience and security, the building is a model one.

Fig. 2 shows an interior view of the new sand storage building. This structure is 66 x 210 ft., with a railroad track in the center and storage bins on each side, into which the sand is unloaded directly from the cars. At the outside ends of the bin there are covered passageways, giving access to all the sand stored in the building. The sides of the bins are constructed of concrete reinforced with rods and expanded metal fabric and are 6 in. thick. The roof, which is framed of wood, rests on posts supported by the concrete sides of the bins and is covered with No. 18 corrugated steel. The company makes a specialty of hardware castings in soft gray iron, brass and aluminum, and also has well equipped departments for enameling and nickel plating.



Fig. 2. Interior of Sand Storage Building of the Chicago Hardware Foundry Company.

The Baldwin Locomotive Works, Philadelphia, Pa., built 2663 locomotives in 1907. This is the largest output in the history of the works. It equaled the entire output for the first 30 years of the works' history and is nearly as many as were constructed during the years 1872 to 1880, inclusive. To produce these results a weekly average of 18,655 men was employed. Of the 1907 output of engines, 363 were for export to Santo Domingo, Korea, Australia, Russia, Argentine, Peru, Panama, Manchuria, Haiti, Spain, Alaska, Philippines, Newfoundland, Costa Rica, Egypt, Canada, France, Nicaragua, Nova Scotia, Chile, Hawaii, Mexico, China, Porto Rico, Colombia, Cuba, Japan and Brazil. The output comprised 2371 steam locomotives and 292 electric locomotives. Of the steam locomotives 40 were of the Mallet type, which comprises two sets of driving wheels, cylinders and valve gear under one large boiler. Two of these locomotives are about equivalent to three ordinary locomotives. They have, of course, been counted in as only one each.

The semiannual or spring meeting of the American Society of Mechanical Engineers will be held this year in Detroit, Mich. The date has not been announced, but will probably be in the early part of May, as usual.

Fluctuations in the Prices of Iron and Steel Products 1898-1907.

In the Supplement accompanying this issue is our annual chart which represents by plotted lines the course of prices for pig iron, Bessemer steel billets and the leading forms of finished iron and steel in the ten-year period 1898—1907. The diagrams are based on monthly averages of prices given week by week in the market reports of *The Iron Age* from the leading distributing centers. The figures on the margin of the chart represent dollars and all the plotted lines refer to gross tons. In the case of finished material market prices per pound have been multiplied by 2240 so that the diagrams might show the direct relation between like quantities of raw materials and semi-finished and finished materials.

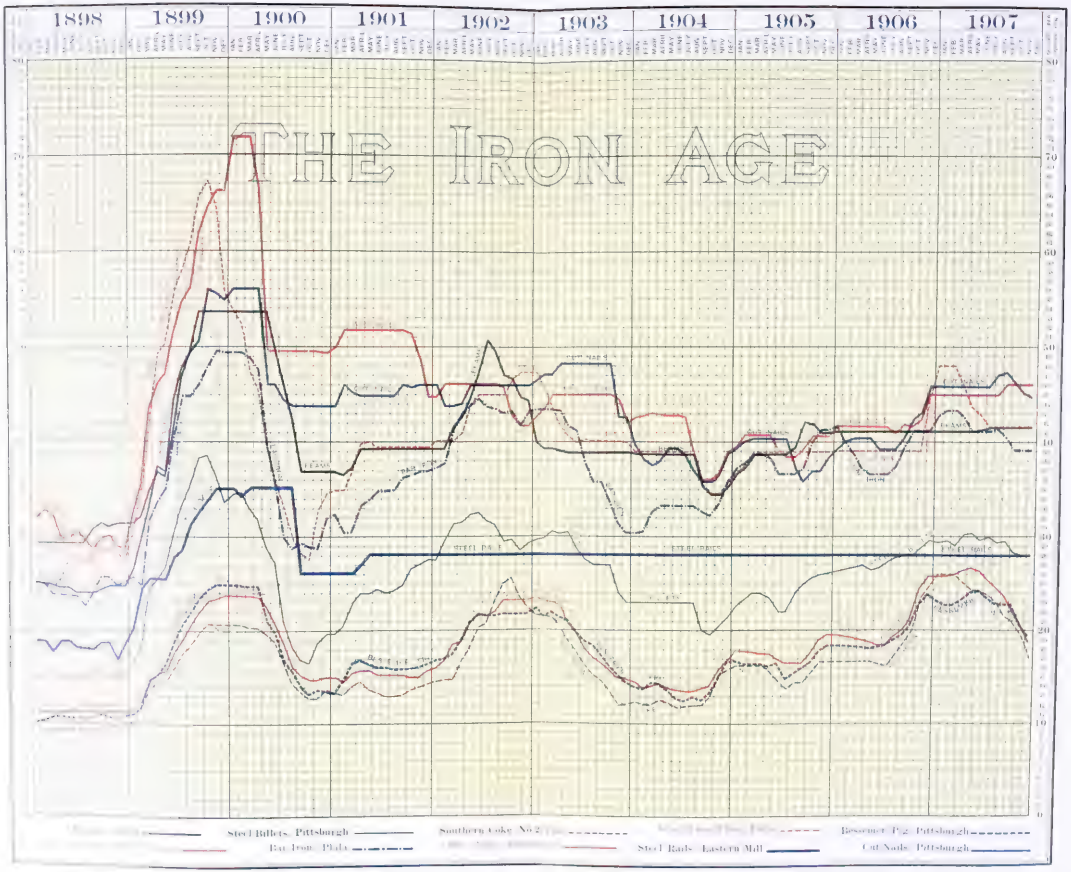
In the table herewith are given the monthly average prices—that is, the average of the weekly market quotations for each month—these being for Bessemer pig iron at Pittsburgh, Southern No. 2 foundry iron at Cincinnati, Local No. 2 foundry iron at Chicago, Bessemer steel billets at Pittsburgh, tank plates, refined bar iron and beams at Philadelphia and cut nails and wire nails at Pittsburgh. In addition the chart gives the monthly average price of steel rails, which can be readily ascertained from the plotted lines. In the table below the prices for pig iron and steel billets are in dollars per gross ton, while those for finished materials are in cents per pound:

Average Monthly Prices, 1898-1907.

Months.	Bessemer pig, Pittsburgh.	Steel billets, Pittsburgh	So. No. 2 foun dry, Cincinnati.	Local No. 2 foun dry, Chicago.	Cut nails, Pittsburgh.	Tank plate, Philadelphia.	Beams, Philadelphia.	Ref'd bar iron, Philadelphia.	Wire nails, Pittsburgh.
1898									
Jan.	9.87	14.93	9.50	11.00	1.10	1.10	1.30	1.11	1.42
Feb.	10.05	15.06	9.25	10.93	1.10	1.10	1.30	1.11	1.45
March ..	10.39	15.25	9.25	10.75	1.10	1.08	1.30	1.06	1.43
April	10.41	15.06	9.25	10.91	1.08	1.12	1.30	1.05	1.31
May	10.30	14.85	9.37	11.00	1.08	1.21	1.30	1.05	1.31
June	10.34	14.65	9.30	11.00	1.06	1.23	1.30	1.05	1.35
July	10.25	14.50	9.25	11.00	1.06	1.20	1.30	1.00	1.31
Aug.	10.35	15.85	9.37	11.00	1.05	1.23	1.37	1.06	1.26
Sept.	10.78	16.00	9.55	11.00	1.08	1.27	1.40	1.14	1.32
Oct.	10.36	15.56	9.75	11.00	1.10	1.27	1.38	1.13	1.33
Nov.	10.15	15.06	9.75	11.00	1.10	1.25	1.35	1.10	1.28
Dec.	10.58	15.80	9.90	11.00	1.10	1.26	1.35	1.11	1.27
1899									
Jan.	10.87	16.62	10.31	11.12	1.18	1.35	1.40	1.15	1.43
Feb.	11.60	18.00	11.69	12.12	1.32	1.55	1.42	1.20	1.57
March ..	14.59	24.30	13.75	14.60	1.48	1.89	1.55	1.41	1.94
April	15.03	25.37	14.50	15.12	1.67	2.18	1.64	1.50	2.05
May	16.20	26.75	14.56	15.37	1.65	2.23	1.63	1.56	2.10
June	18.51	30.10	16.00	17.60	1.97	2.48	1.82	1.81	2.30
July	20.65	33.12	17.56	18.87	2.12	2.58	2.08	2.00	2.42
Aug.	21.75	35.40	18.35	20.30	2.20	2.72	2.20	2.00	2.50
Sept.	23.43	38.37	19.94	21.87	2.45	2.92	2.40	2.05	2.76
Oct.	24.18	38.75	20.75	23.00	2.50	3.00	2.40	2.13	2.87
Nov.	24.78	36.50	20.75	23.10	2.48	2.87	2.40	2.21	2.95
Dec.	24.90	33.75	20.75	23.50	2.45	2.48	2.40	2.20	2.95
1900									
Jan.	24.90	34.50	20.69	23.50	2.50	2.38	2.40	2.20	3.20
Feb.	24.80	34.87	20.50	23.50	2.50	2.32	2.40	2.20	3.20
March ..	24.72	33.00	20.30	23.50	2.50	2.10	2.40	2.18	3.20
April	24.70	32.00	20.19	23.37	2.50	2.02	2.40	2.12	2.95
May	21.00	28.90	19.75	22.30	2.05	1.75	2.40	1.77	2.20
June	19.72	27.25	18.75	20.37	2.05	1.60	2.22	1.56	2.20
July	16.75	21.00	16.81	18.25	1.97	1.37	2.05	1.33	2.20
Aug.	15.60	18.20	14.25	15.90	1.95	1.30	1.89	1.28	2.20
Sept.	13.87	16.93	13.62	15.00	1.95	1.25	1.65	1.30	2.20
Oct.	13.06	16.50	12.87	14.50	1.95	1.21	1.65	1.28	2.20
Nov.	13.48	18.95	12.95	14.50	1.95	1.44	1.65	1.28	2.20
Dec.	13.43	19.75	13.75	14.75	1.95	1.54	1.65	1.42	2.20
1901									
Jan.	13.15	19.75	13.45	14.75	1.95	1.55	1.65	1.44	2.22
Feb.	14.43	20.31	13.12	14.25	2.05	1.55	1.63	1.35	2.30
March ..	16.31	22.88	14.00	15.25	2.01	1.62	1.66	1.35	2.30
April	16.75	24.00	14.50	15.50	2.00	1.76	1.75	1.47	2.30
May	16.30	24.00	13.85	15.50	2.00	1.78	1.75	1.51	2.30
June	16.00	24.38	13.37	15.00	2.00	1.75	1.75	1.55	2.30
July	16.00	24.00	13.00	15.00	2.00	1.75	1.75	1.55	2.30
Aug.	15.75	24.20	13.00	15.00	2.00	1.75	1.75	1.56	2.30
Sept.	15.75	24.88	13.06	15.00	2.05	1.75	1.75	1.61	2.30
Oct.	15.89	26.70	13.75	14.75	2.04	1.75	1.75	1.62	2.28
Nov.	16.00	27.00	14.00	14.88	2.05	1.75	1.75	1.64	2.17
Dec.	16.31	27.50	14.25	15.50	2.05	1.75	1.75	1.65	1.99

Months	Bessemer pig, Pittsburgh.	Steel billets, Pittsburgh.	So. No. 2 foun dry, Cincinnati.	Local No. 2 foun dry, Chicago	Cut nails, Pittsburgh.	Tank plate, Philadelphia.	Beams, Philadelphia.	Ref'd bar iron, Philadelphia.	Wire nails, Pittsburgh.
1902									
Jan.	16.70	27.50	14.55	15.90	2.05	1.78	1.75	1.66	1.99
Feb.	16.93	29.37	14.75	16.50	1.95	1.78	1.75	1.68	2.05
March ..	17.37	31.25	14.75	18.16	1.95	1.78	1.85	1.84	2.05
April	18.75	31.50	16.87	18.62	1.96	1.81	1.90	1.92	2.05
May	20.75	32.20	18.35	20.50	2.05	1.95	1.99	1.96	2.05
June	21.56	32.37	20.19	21.50	2.05	2.00	2.11	1.99	2.05
July	21.50	31.75	20.75	21.25	2.05	2.00	2.27	1.95	2.05
Aug.	21.62	31.06	23.06	21.75	2.05	2.00	2.21	1.93	2.05
Sept.	21.75	29.50	25.00	23.00	2.05	2.00	2.10	1.92	2.03
Oct.	21.75	29.70	25.65	23.00	2.05	2.06	2.09	1.93	1.89
Nov.	21.68	28.50	23.62	23.00	2.05	2.10	2.00	1.87	1.85
Dec.	21.75	29.12	22.44	23.00	2.05	2.10	1.97	1.92	1.85
1903									
Jan.	22.15	29.60	21.65	23.10	2.07	2.10	1.78	1.93	1.89
Feb.	21.45	29.87	21.50	23.00	2.10	2.05	1.75	1.93	1.92
March ..	21.85	30.62	21.37	22.87	2.10	1.94	1.75	1.94	2.00
April	21.28	30.25	20.15	22.52	2.15	1.85	1.74	1.93	2.00
May	20.01	30.37	18.87	20.37	2.15	1.80	1.73	1.86	2.00
June	19.72	28.87	17.75	19.50	2.15	1.78	1.73	1.79	2.00
July	18.89	27.60	16.15	17.90	2.15	1.77	1.73	1.69	2.00
Aug.	18.35	27.00	15.19	16.87	2.15	1.78	1.73	1.60	2.00
Sept.	17.22	27.00	14.75	16.06	2.15	1.78	1.73	1.60	2.00
Oct.	16.05	27.00	13.50	15.35	2.15	1.78	1.73	1.50	2.00
Nov.	15.18	24.00	12.00	14.75	1.90	1.78	1.73	1.40	1.97
Dec.	14.40	23.00	12.05	14.46	1.90	1.77	1.73	1.35	1.87
1904									
Jan.	13.91	23.00	12.37	14.12	1.77	1.73	1.73	1.35	1.89
Feb.	13.66	23.00	12.12	13.56	1.70	1.73	1.73	1.36	1.90
March ..	14.25	23.00	12.10	13.70	1.72	1.73	1.73	1.45	1.91
April	14.18	23.00	12.50	14.00	1.74	1.73	1.73	1.48	1.90
May	13.60	23.00	12.25	13.50	1.75	1.73	1.73	1.48	1.90
June	12.81	23.00	11.80	13.35	1.75	1.73	1.73	1.48	1.90
July	12.40	23.00	11.81	13.25	1.72	1.73	1.73	1.48	1.89
Aug.	12.81	23.00	12.00	13.25	1.65	1.73	1.73	1.48	1.71
Sept.	12.63	20.00	12.00	13.50	1.60	1.57	1.57	1.45	1.60
Oct.	13.10	19.50	12.81	13.75	1.60	1.53	1.53	1.43	1.60
Nov.	14.85	20.25	13.19	15.63	1.62	1.53	1.53	1.47	1.62
Dec.	16.65	21.20	15.85	16.60	1.73	1.57	1.57	1.60	1.73
1905									
Jan.	16.85	22.75	16.25	17.50	1.75	1.63	1.63	1.65	1.75
Feb.	16.41	23.50	16.25	17.50	1.79	1.66	1.66	1.68	1.80
March ..	16.35	24.00	16.25	17.45	1.80	1.73	1.73	1.73	1.80
April	16.35	24.00	16.25	17.25	1.80	1.73	1.73	1.73	1.80
May	16.16	23.50	15.81	17.25	1.80	1.73	1.73	1.71	1.80
June	16.05	22.00	14.65	16.65	1.80	1.73	1.73	1.63	1.74
July	14.85	22.00	13.94	16.12	1.80	1.73	1.73	1.63	1.70
Aug.	15.20	24.00	14.40	16.25	1.66	1.73	1.76	1.63	1.70
Sept.	15.91	25.00	14.37	16.25	1.60	1.73	1.88	1.66	1.74
Oct.	16.54	25.62	15.31	17.31	1.65	1.73	1.87	1.78	1.80
Nov.	17.85	26.00	16.60	18.80	1.65	1.73	1.83	1.83	1.80
Dec.	18.35	26.00	16.75	19.25	1.71	1.73	1.83	1.83	1.80
1906									
Jan.	18.35	26.25	16.75	19.25	1.75	1.73	1.83	1.86	1.85
Feb.	18.35	26.50	16.75	19.06	1.79	1.73	1.83	1.78	1.85
March ..	18.28	26.70	16.65	19.00	1.80	1.73	1.83	1.73	1.85
April	18.19	27.00	16.63	18.75	1.80	1.73	1.83	1.66	1.85
May	18.10	26.40	16.75	18.55	1.80	1.73	1.83	1.63	1.85
June	18.23	26.63	16.44	18.19	1.75	1.73	1.83	1.63	1.85
July	18.41	27.25	16.06	18.25	1.75	1.73	1.83	1.63	1.84
Aug.	19.00	27.80	17.30	19.10	1.75	1.73	1.83	1.67	1.82
Sept.	19.54	28.00	18.69	19.81	1.80	1.73	1.83	1.76	1.86
Oct.	20.35	28.00	20.00	21.13	1.90	1.73	1.83	1.83	1.85
Nov.	22.85	28.88	23.38	24.35	1.93	1.73	1.83	1.83	1.88
Dec.	23.75	29.50	25.00	25.50	2.05	1.99	1.83	1.83	2.00
1907									
Jan.	23.15	29.40	26.00	25.50	2.05	2.13	1.83	1.91	2.00
Feb.	22.85	29.50	26.00	25.50	2.05	2.13	1.83	1.93	2.00
March ..	22.85	29.00	26.00	25.75	2.05	2.13	1.83	1.93	2.00
April	23.35	30.12	25.06	26.00	2.05	2.03	1.83	1.91	2.00
May	24.01	30.30	24.25	26.50	2.05	1.94	1.83	1.83	2.00
June	24.27	29.62	24.10	26.25	2.05	1.91	1.84	1.83	2.00
July	23.55	30.00	23.85	25.20	2.05	1.85	1.85	1.84	2.00
Aug.	22.90	29.25	23.00	24.50	2.10	1.85	1.85	1.85	2.00
Sept.	22.90	29.37	21.50	23.75	2.11	1.85	1.85	1.81	2.05
Oct.	22.90	28.20	20.95	22.10	2.07	1.85	1.85	1.75	2.05
Nov.	20.65	28.00	19.50	20.31	2.01	1.85	1.85	1.75	2.05
Dec.	19.34	28.00	17.00	18.45	2.00	1.85	1.85	1.75	2.05

Referring to the chart, the lines representing pig iron prices in the second half of 1906 and the first half of 1907 tell the story of the way in which pig iron became a law to itself, and made a violent advance in contrast with the generally even tenor of the markets for most finished materials. In the latter part of last year pig iron declined, and the reverse curve again contrasts with the moderate dip of some of the lines for rolled products and the uniform maintenance of others. Southern iron, because of a special scarcity of labor and of raw materials in that section, was held on a relatively higher basis than



Fluctuations in the Prices of Crude and Finished Iron and Steel from January 1, 1898, to January 1, 1908 Gross Tons.

Northern iron. The prices given in all cases represent the market for early deliveries. Naturally a curve based on contract prices, under which deliveries were made for periods of six months or longer, would show a much less steep ascent and descent. The period covered by the chart is one of the most interesting in the history of the iron trade of the country. The year 1898 was the first good year following the panic of 1893 and the ensuing depression. Then came the boom of 1899, shown by an unparalleled steepness of the ascending price lines and a like sharp angle in the decline of 1900. Another boom, but of less violence, is shown in 1902, and last of all came that of 1906 and 1907.

Iron and Steel Production in 1906.

Publication was made in the early months of 1907 of the statistics of production of pig iron, steel ingots and steel rails in the United States in 1906, as compiled by the American Iron and Steel Association. From advance sheets of "Statistics of the American Iron Trade for 1906," which is the Annual Report of the Association, we take the following general statistical summary. The table gives the total production in 1905 and 1906 of all kinds of iron and steel, and the figures are in gross tons, except those for nails:

	1905.	1906.
Pig iron, including spiegeleisen and ferromanganese	22,992,380	25,307,191
Spiegeleisen, ferromanganese, ferrophosphorus, &c.	293,076	305,642
Bessemer steel ingots and castings	10,941,375	12,275,830
Open hearth steel ingots and castings	8,971,376	10,980,413
All kinds of steel ingots and castings	20,023,947	23,398,135
Structural shapes, not including plates	1,660,519	2,118,772
Plates and sheets, except nail plate	3,532,230	4,182,156
Iron and steel wire rods	1,808,688	1,871,614
All rolled iron and steel, except rails	13,464,086	15,610,581
Bessemer steel rails	3,192,347	3,791,459
All kinds of rails	3,375,929	3,977,887
All rolled iron and steel, including rails	16,840,015	19,588,468
Iron and steel cut nails, in kegs	1,357,549	1,189,239
Iron and steel wire nails, in kegs	10,854,892	11,486,647

The increase in the production of structural shapes and of plates and sheets are noteworthy features of the table. It appears that in the case of wire rods there was a comparatively slight increase over the output of 1905. In all rolled iron and steel products the increase was from 16,840,015 gross tons to 19,588,468 tons, or over 16 per cent.

Pig Iron Production by Grades.

The pig iron figures for 1906, which were published at the end of January last year, did not give the distribution by grades. This additional information is furnished in the following table taken from the Report, the figures representing gross tons, and comparison being made with the three preceding years:

	1903.	1904.	1905.	1906.
Bessemer and low phosphorus	9,989,908	9,098,659	12,407,116	13,840,518
Basic (mineral fuel)	2,040,726	2,483,104	4,105,179	5,018,674
Forge pig iron	783,016	550,836	727,817	597,420
Foundry and high silicon	4,409,023	3,827,229	4,755,288	4,768,011
Malleable Bessemer	473,781	263,529	635,236	699,701
Spiegeleisen	156,700	162,370	227,797	244,980
Ferromanganese	35,961	58,022	66,179	60,662
White, mottled, &c. (Direct castings)	120,137	53,284	67,768	77,225
Totals	18,009,252	16,497,033	22,992,380	25,307,191

The Bessemer figures include low phosphorus pig iron—that is, iron running below 0.04 per cent. in phosphorus. Pig iron containing from 0.04 to 0.10 per cent. of phosphorus is classified as Bessemer. The basic figures are confined strictly to pig iron made with mineral fuel and do not include the small quantity of basic iron that is made with charcoal. A few thousand tons of castings direct from the blast furnace are included in the totals for the last two items in the table.

Production of Steel Castings.

The preliminary statistics of the production of Bessemer and open hearth steel castings in 1906 have already been published. Complete figures are now available and are given below. Of the total of 719,891 tons of open hearth castings, 406,343 tons was acid and 313,548 tons basic castings, as compared with 320,381 tons and 206,159 tons, respectively, in 1905:

	Bessemer	Open hearth.	Crucible and all other.	Total. Gross tons.
Massachusetts, Rhode Island, Connecticut, New York and New Jersey	8,921	89,510	11,295	109,726
Pennsylvania	3,497	305,062	2,303	310,862
Delaware, District of Columbia, Virginia, Tennessee, Alabama and Ohio	10,791	105,383	1,400	117,574
Indiana, Illinois and Michigan	5,063	158,242	2,729	166,024
Wisconsin, Minnesota, Missouri, Colorado, Oregon and California	4,329	61,694	3,486	69,509
Totals	32,601	719,891	21,213	773,705

The total production of steel castings in 1905 was 560,767 tons, so that the increase in 1906 was 212,938 tons, or over 37.9 per cent. Of the total production in 1906 Pennsylvania made over 40.1 per cent., against over 42.1 per cent. in 1905; Illinois over 17.6 per cent., against over 17.5 per cent. in 1905; and Ohio over 12.4 per cent., against over 12.6 per cent. in 1905. No other State made 7 per cent. in 1906 or 1905.

The preliminary figures for steel rail production in 1906, published in April last year, showed that the total would be close to 4,000,000 gross tons. It was then stated that the open hearth rail output would probably not be over 200,000 tons. The completed statistics show a total of 186,413 tons, against 183,264 tons in 1905, 145,883 tons in 1904 and 45,054 tons in 1903. Alabama made over 84 per cent. of the open hearth rails rolled in 1906, Pennsylvania, Georgia and Colorado rolling the remainder. The total Bessemer rail production in 1906 was 3,791,459 tons, while 15 tons of iron rails were rolled. The total of all kinds of rails produced in 1906 was 3,977,887 tons.

American Society for Testing Materials.—Arrangements have been made for holding meetings of the various standing technical committees of the American Society for Testing Materials at Columbia University, New York, Tuesday and Wednesday, January 28 and 29. The sessions will be opened by a joint meeting of the members of the committees January 28, at 10 o'clock, in room 302, Engineering Building. The several committees will make their own arrangements for subsequent meetings, which will be held separately. Announcement is made in a circular just issued by Secretary Marburg of the result of the ballot on the proposed standard specifications for steel rails, submitted at the Atlantic City meeting in June, 1907. The number of ballots cast was 161, of which 125 were affirmative and 18 negative, with 18 not voting.

A pamphlet has been published by the Goldschmidt Thermit Company, New York, reprinting from the *Journal* of the Franklin Institute extracts from a report made by Engineer Albert Obholzer, on the methods used to avoid piping in steel ingots in the Hungarian Government steel foundries at Diosgyör. Thermit put up in a box fastened tightly to an iron rod, so as to be sunk in the fluid steel was used in the tops of heavy ingots to increase their solidity. Sink heads are employed and on the introduction of the thermit charge there is a strong boiling up of the steel bringing slag to the surface plentifully. The slag is lifted off and more fluid steel poured in. The result is a considerable reduction in piping. The aim is to keep the steel liquid until the piping can be filled up from the feeding head. Illustrations are given of ingots poured with and without feeding heads, and with and without thermit. The advantage of pouring heavy ingots with feeding heads is demonstrated, and it is stated to be possible by the use of thermit and by the continued introduction of fresh fluid steel to remove piping entirely.

The most powerful engine ever put in an automobile is one of six cylinders and 200 hp. in a French Darracq racing machine. In its preliminary trials it is reported to have attained an average speed of 125 miles an hour.

A Universal Edge Tool Grinder.

An additional function is the principal difference between the machine illustrated and the Quick-Sharpening edge tool grinder, both made by the Mummert, Wolf & Dixon Company, Hanover, Pa. While the latter, which was described in *The Iron Age* June 6, 1907, is adapted for sharpening all kinds of edge tools, the new machine has a knife grinding attachment for grinding long knives such as those used in wood planers. Both are equipped with revolving oil stones in place of emery wheels, and in other respects are similar to grinding machines which are already familiar. Fig. 1 shows a rear view of the completely equipped machine, and Fig. 2 a front view with the knife grinding attachment removed.

As will be seen the arbor carries two oil stone wheels: one of these is comparatively coarse grained for fast grinding and the other is fine grained for giving the final smooth keen edge. On the end of the main spindle is a grinding cone for shapening patternmakers' gouges, and at the back as may be seen in Fig. 1 is a small grinding wheel for doing general light grinding. Equipped as it is, this machine is very appropriately called a universal grinder, for to quickly sharpen all kinds of edge tools, it does of itself the work which would ordinarily require a grindstone, emery grinders and bench oil stones.

The wheel arbor is driven by a quarter turn belt from a driving shaft mounted on the base at right angles with the arbor, and an idler pulley serves to take up the stretch of the belt. An advantage in the location of the main driving pulleys is that they are at the rear where the driving belt is out of the way, and can conveniently be run to an overhead shaft or one below the floor.

The knife grinding attachment is fully automatic, and has a strong and rigid knife bar to which the knife to be ground is easily attachable and as easily removed. The bar is adjustable so that either an acute or a blunt angle may be ground, and the attachment is swiveled at the center to permit bringing the work in contact with either of the wheels. The attachments are made for 30, 40 and 50 in. knives. To remove the attachment does not require the taking out of any bolts, as hand screws are provided for holding the device. It is therefore convenient to apply the attachment only as needed, which is generally seldom, as long knives would perhaps need to be ground only once or twice a month, and at all other times the machine can be left in condition for the more common every day uses of sharpening hand tools.

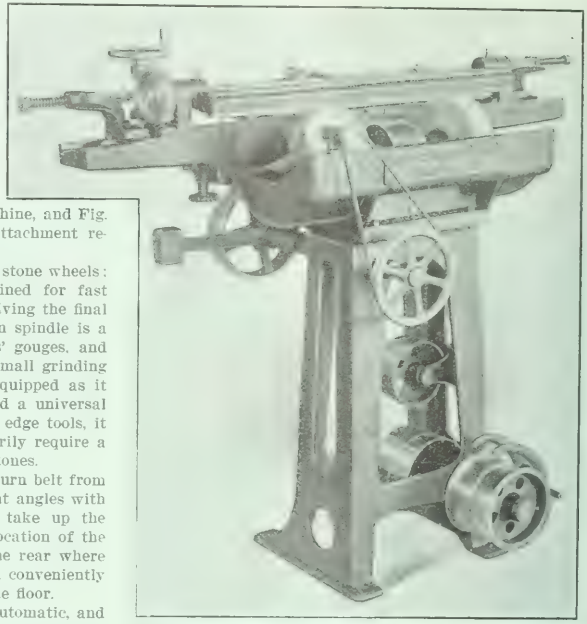


Fig. 1 Rear View of the Universal Edge Tool Grinder Made by the Mummert, Wolf & Dixon Company, Hanover, Pa.

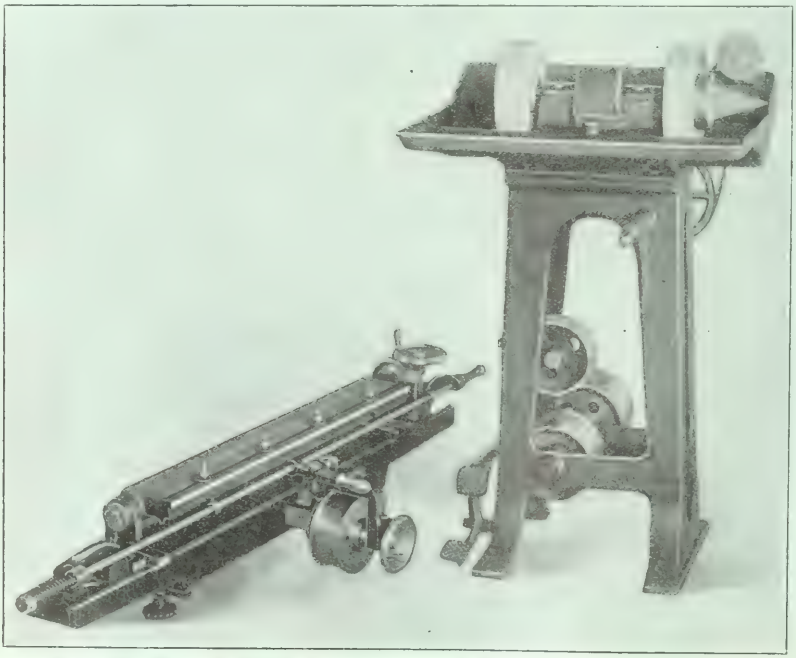


Fig. 2 Front View of the Universal Edge Tool Grinder with the Knife Grinding Attachment Removed

In the use of the machines it is necessary before

starting to see that the oil stone wheels are thoroughly saturated with kerosene. The wheels readily absorb the oil, and when not running appear to be dry, but when in operation at the proper speed centrifugal force causes the oil to work to the surface. It is not thrown off, however, on account of the adhesion of the oil to the stone. The oil fulfills two purposes: by keeping the surface of the wheels moist it prevents the tool from heating, and it also keeps the surface of the stones clean and sharp preventing glazing. After the stones have been once saturated it is only necessary to apply a few drops of oil occasionally.

The regular equipment of the grinder includes two oil stone wheels 8 in. in diameter by 2 in. face, one grinding cone 3 in. in diameter by 5 in. long, and one grinding wheel 3 in. in diameter by 3-16 in. thick. The tight and loose pulleys are 6 in. in diameter by 2-in. face, and are intended to run at 260 rev. per min.

Hardening High Speed Steels.

BY NELS GROSS.

It is not the purpose of this article to lay down any hard or fast rules for heating high speed steels. A method that can be practiced with excellent results on one brand may not prove at all practical on another. A common error is to treat different brands in the same manner, disregarding entirely the special instructions by the makers. As it is a known fact that many users of high speed steels are yet experiencing difficulties in successfully hardening tools made from this material, some suggestions may be of value to them.

General Considerations.

Most high speed steels will begin to harden at about 1600 degrees F., which is a little higher than a cherry red. However, a tool quenched at this temperature will not give satisfactory results. A suitable temperature for high speed steels is approximately 2450 degrees F., at which temperature the tool will have a brilliant white color in the furnace. As soon as this is reached, the tool should be quenched at once as, if allowed to "soak" in the fire, it will become coarse grained and extremely brittle.

An excellent rule to follow when heating high speed steels is to apply the heat slowly up to, say 1600 degrees, or a cherry red. As soon as this point is reached the more rapidly the heat is raised to the required temperature the better for the tool. The above temperatures, while approximate only, need be varied but slightly with the different brands of steel. Most makers of this material recommend an exact temperature at which their steels will give the best results.

A very important point is uniform heating. A tool unevenly heated will be soft in spots which, of course, detracts enormously from its value when put to work. Another and most highly important point to observe is the necessity of heating a tool in a nonoxidizing atmosphere: in other words, one in which free oxygen from the atmosphere cannot attack the surface of the steel while highly heated. At temperatures above 2300 degrees oxygen rapidly attacks the steel, causing pitting and scaling of the work.

Quenching.

No fixed rule can be laid down for quenching tools made from the various brands of high speed steel that will work equally well in all cases. It has been the author's experience that fish or lard oil gives the best results for a great variety of tools. If quenched in water the grain will be coarse and unsuitable for use. Certain high speed or alloy steels, commonly called self-hardening steels, give best results when cooled by air blast. They should be heated in the same manner as other high speed steels and cooled by being held in a blast of air from a fan or other source. All above described tools reach their maximum efficiency only when the strain set up by such cooling is relieved by a drawing or toughening process. While many writers contend that high speed steel hardened at a temperature above 1700 degrees F. cannot be drawn except by annealing processes, the author has found that the strength and general efficiency of most tools are increased many fold by drawing to a blue color. This drawing does not seem to have the effect of reducing the hardness or cutting quality of the tool at all, but it does give sufficient toughness and strength to withstand uses that would destroy it were it not drawn but used as it came from the bath. Certain tools, by reason of their size, shape and the work that they have to perform need not be drawn.

Heating.

Granting that the above mentioned temperatures will give good results when quenched and drawn as described above, the problem yet remains to secure these temperatures under everyday conditions in the average workshop. With a coal or coke fire, even if extreme care is exercised, overheating is well nigh unavoidable. When such a fire is operated in connection with an air blast small tongues of highly heated flame attack one portion of the tool, bringing it rapidly to a temperature much above the part immediately adjoining it, with the frequent result that when quenched one portion of the tool has been much overheated, while another portion has not yet arrived at the proper temperature. Under these conditions it is also quite impossible to prevent the steel from becoming blistered and scaled by reason of a surplus of free oxygen in the flame. When crude oil is the fuel close regulation of the heat is difficult, and, as is frequently the case, sulphur and other injurious elements are introduced into the flame, which act on the steel to a disadvantage.

Of all methods of heating, the gas blast furnace seems to be the ideal one. When properly designed, a perfect combustion, under absolute control, can be easily maintained. Gas, composed as it is mainly of carbon and hydrogen, can be so regulated in relation to the amount of air blast introduced into the furnace with it that a perfectly nonoxidizing temperature can be maintained, thus insuring the work against the injurious attack of oxygen and carbonic oxide. Tools heated directly in the path of such a flame can be raised to the required temperature, and if quickly quenched will be absolutely free from scale or blister.

Results.

The enormous advantage of high speed steels over ordinary carbon steels on certain classes of work can only be fully realized with proper hardening. A case that will illustrate this point recently came under the author's observation. Two sets of blanking dies and punches made from the same bar of steel, one hardened in a coal fire and the other in a gas furnace, which when tested with a file showed relatively the same degree of hardness, were put to work blanking the same class of material under substantially identical conditions. One set, hardened in a gas furnace, punched 70,000 stampings before requiring to be reground, while the other, heated in a coal fire, required grinding after blanking 38,000 pieces. Upon examination the die heated in a coal fire bore evidence of having been unevenly heated, despite the care exercised, and was soft in spots. On the other hand, the die heated in a gas furnace, having been uniformly heated, presented an edge to the work that retained its shape and cutting qualities long after the other was too dull for use. The old saying that a chain is no stronger than its weakest link, applies here in the sense that a tool is no better than its softest spot.

The one hundredth anniversary of the opening of the port of Rio de Janeiro, Brazil, to international commerce is to be celebrated in that city next year by a national exhibition of industrial, pastoral and art products, from June 15 to September 7.

Statistics of railroad receiverships in 1907 show that only 349 miles of railroad, owned by nine companies, with total capital of $6,395,460, went into receivers' hands, as against 657 miles in 1906, last year's mileage being the smallest in four years.

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The Iron Age Index.

The index to the reading matter of Volume 80 of *The Iron Age*, for July 1 to December 31, 1907, has been compiled and is now being printed. It will be mailed to those subscribers of *The Iron Age* who will make application for it.

To relieve those who bind or file *The Iron Age* of the trouble of future applications for the semiannual index, we have a special list of addresses to which the index is forwarded without further notice. Subscribers who desire their addresses entered upon that list will kindly so advise us.

Progress in Machine Tool Design.

From conception on, an idea is like a human being. The experimental stage is its babyhood, the promise of future success its youth and the approval of the world its maturity, until finally it is succeeded by a demonstrated improvement, even as an old man relinquishes his work to a more active one of younger years who has passed his probation. The percentage of mortality in infancy of inventions and discoveries is tremendous, as shown by a comparison of the birth record, the *Patent Office Gazette*, with the advertising pages of the trade papers as personals of the living. Lots of new things are tried—these are experiments—of which some come to commercial success, but more fail, chiefly because the inventor has been so engrossed merely with the attainment of a purpose that the elements of the practical side—first cost, maintenance expense, or sufficiently large demand—are overlooked, and these considerations must stand the test before capital can be interested. Leaving out the inventions that succumb, there remain the matured and developed improvements that constitute tangible advance.

The changes by which we are accustomed to measure progress occur more rapidly in some fields than in others. In the art of machine tool design, for example, one year may show a relatively small advance, but in five years the progress is readily apparent. The feature of the last five years has been the increasing of producing capacity demanded with the introduction of high speed tool steels, and this has had many subsidiary effects. By increasing the range of speeds, it made variable speed devices more necessary and many mechanical devices were brought out. Belt shifting was too inconvenient, and discouraged the operator from changing speeds as frequently as the most efficient cutting required. More and more are tools being equipped with easily variable speeds and feeds through mechanical devices, making dependence upon electric drive by variable speed motors unnecessary. Many have gone so far as to make all changes through gears, using a single main driving pulley instead of a cone pulley. Increased strength and power and more attention to lubrication, avoidance of frequent repairs and renewals and provision for adjusting for wear—all have been occasioned by the use of more efficient tools.

The first principle of all endeavor is economy, and conjointly with the attainment of greater producing capacity, labor cost has been reduced. The skill required to operate has been decreased, either by automatic devices which insure accuracy of themselves or by indexes to guide the operator in setting the work or the machine's movements. These include speed and feed changes, feed trips, safety devices, &c. An expert workman for each machine is no longer the rule. The new order of things is one expert, usually a foremen, to set up a number of machines for the first operation, and cheaper labor to watch them and replace each finished piece of work with a new piece; or, perhaps, one expert to start a series of machines in operation which attend to themselves thereafter until the supply of stock to be machined is exhausted or a change of work is necessary. A lesser degree of skill required is one saving, and another is saving of time in making the tool ready between operations. Controlling handles are now placed whenever possible within reach from one convenient position where the operator can keep the work in sight while manipulating them. This applies particularly to the frequently used levers, not to those that may be involved only occasionally.

Specialization continues to be the trend in moderate sized tools, making them capable of a large capacity of a limited range of product; certain of these are sometimes called "single-purpose" machines. The exception to this rule are universal machines capable of a variety of movements, but these are principally intended for heavy work that should have as many operations performed at one setting as possible. For very large work a practice is growing that may be properly accredited a development belonging to the last year or two, which is the setting of the work on floor plates in one convenient central location and bringing the tools to the work for performing the various operations. These tools belong to the growing class of portable tools, including both those that can be handled manually and those that require the service of a crane. Many of the smaller tools, particularly pneumatic hammers, drills, &c., have been in use for a long time, but tools too large for a man to hold while in use, or even to carry, are relatively recent. Electric drills and grinders have become of notable importance in late years, and motor drive of the larger portable tools has been perforce necessary; in fact, looking at it from the opposite standpoint, it may be said to have made possible the present portable boring bar, the big brother of the electric drill, and portable slotters, shapers, valve seating machines and others too numerous to mention.

Unsound Machinery Criticisms by Foreign Buyers.

American machine tool builders occasionally receive complaints from foreign users of poor workmanship in machines. Sometimes bills are forwarded for changes, such as replacing or improving parts. It may of course happen that there is just ground for such a complaint. Undiscovered imperfections may exist before leaving the shop, or injury may be received during shipment, and the expense of putting a tool in perfect working order

should then be charged to the builder. But there are also occasions where the criticism is based upon some condition that is intentionally embodied in the design, either because it tends to increase the effectiveness of the machine or because there is no good purpose to be served in finishing or fitting the part in question, or otherwise giving it mechanical perfection, especially when by so doing nothing would be accomplished except adding to the cost of manufacture. It is the opinion of American designers that many European machinery builders go to unnecessary expense by giving the same degree of accuracy and finish to unessential parts as to those where extreme perfection of design is imperative in order to secure sought-for results.

According to the ideas of the most advanced and successful of the American designers, including those to whose credit belong the most important precision tools, a machine should be considered by the work it is intended to perform, and not at all as to how it should look, except where grace of outline and degree of finish may be had at no important addition to cost. The greatest care is taken to differentiate between what may be termed the vital parts of a machine, which do the real work and secure its accuracy, and, on the other hand, those parts which, though necessary, do not work toward excellence of product. Cost is put into the former class of machine parts, to give them the nearest possible approach to perfection. Workmanship, materials, tools with which to do the work, are carried to the highest point of good practice. The second group of parts is manufactured as economically as possible, each piece being designed to be good enough for its function, with proper margin of safety, but not too good and consequently not too expensive. Abroad the tendency still is in many works to give the two groups almost equal workmanship. This, of course, works to the advantage of American competitors in the foreign market, for the additional cost which the European manufacturers impose upon themselves serves to nullify the advantage that they gain by cheaper labor.

Nevertheless, the American machine tool builder finds such conditions a source of annoyance and sometimes of expense. The customer abroad who discovers that some part of a machine is not fitted exactly, or is not quite in alignment, may scrape a surface or replace a cylindrical part or otherwise strive to improve that which is sufficiently accurate for its purpose, and then ask the builder of the machine to pay the bill. Naturally, some friction must result. The desire for perfection of details takes another even more disturbing form, according to the complaint occasionally heard, in its interference with the construction of some vitally important machine member, which has been worked out by the designer to precision of detail. It sometimes happens in machine construction that what seems to be indifferent design and workmanship is intentional. Cases are cited to illustrate the point. In one machine it was found after long and somewhat costly experiment that the only manner in which a certain very important mechanism would do its work exactly as required was to leave it loose, with poor fits, an almost "wobbly" construction. For some reason the mechanism worked perfectly to accomplish its object when so constructed. A foreign customer, in critical examination of the tool, discovered what to his eyes seemed a gross blemish in construction, and proceeded to remedy the fault by manufacturing a similar part, perfectly fitted throughout—a nice piece of mechanical workmanship. The machine was started up and the perfected part failed signally to do its work. The builder of the machine had had the same experience, and his remedy was embodied in the tool. Finally the original mechanism was put back and there was no more trouble.

No immediate remedy is possible in overcoming a form of difference begot from a variance in established custom and practice, except that of education. American tools are now so well established abroad that their characteristics are becoming well known everywhere that metal is fashioned by machinery. The inexperienced purchaser need have little difficulty usually in getting from his neighbors information as to what he may expect if he buys American machinery, and the American manufacturers need fear little from the reports that users of their tools will make of their quality. Experience teaches the lesson and remedies the troubles resulting from lack of understanding. New types of machinery must take their turn in the critical analyses of foreign engineers, who have not accepted the practice of the United States in designing machine tools on the basis of the greatest perfection where it is needed, regardless of cost, and the greatest possible economy where it may be applied without sacrifice to the product.

A Good Outlook for Lake Shipyards.

The statistics of vessel construction under contract at the lake shipyards at the beginning of 1908 show a contrast between that industry and the car and locomotive building industries. While many car and locomotive works are now running on orders placed in the early months of 1907 and have little new work in prospect, the lake shipbuilders have a very satisfactory programme of new construction ahead of them, besides an unusual amount and variety of repair work. It is true that much of the new vessel work was placed when the outlook for traffic on the Great Lakes in 1908 was much better than it is at present, and there were not the same storm signals flying in the lake trade that were in evidence in the great land transportation industry months ago, as legislature after legislature followed the lead of the powers at Washington. However, strong interests, whose policy is not determined by the developments of a single season, are behind these orders for lake vessels, and cancellations are not the fashion in the vessel trade.

Figures compiled at the beginning of the year show a total of 42 vessels under contract for delivery in 1908, including 26 bulk freighters, 2 passenger boats, 2 package freighters, 2 fireboats, 2 dredges, 1 car ferry, 1 fuel lighter, 1 lightship, 1 tug, 1 sandsucker and 3 hopper barges. This exhibit compares favorably with the record of launchings on the lakes last year, a total of 52 vessels having gone off the ways in 1907, 40 of which were bulk freighters. Thus the total of new work now on the books is numerically 75 per cent. of the vessels launched last year, and, taking only bulk freighters into account, represents two-thirds of the new coarse freight carrying capacity brought out in 1907. The *Marine Review*, which has gathered the above statistics, thus summarizes the additions made in recent years to the Great Lakes fleet:

[illegible] carrying [illegible] 7,220,000 tons in an average season of 20 trips. In the past six [illegible] tons in a full season have been added to the Lake fleet. The 1908 programme will increase this to 33,867,200 tons, which is greater than the total movement of ore in any one year up to 1905. With the exception of the Tonawanda Iron & Steel Company, none of the great ore producing and steel making companies figure in the 1908 programme. The vessels are all building for independent interests. There is noted also a decided preference for the 8000 and 9000 ton ship, only six in the lot being larger than this.

No doubt the old question, Where will all the boats find cargoes? will be asked many times in the season of

1908. Vessel owners have become quite hardened in recent years to the bringing out of this bugaboo that used to produce the desired effect on weak kneed owners at chartering time after a long winter. The lake carrying outfit is still in process of making over, a process that involves the eventual elimination of boats of small capacity from the coarse freight trade. A single season, following a period of unexampled activity, may give the impression that vessel building is being overdone, but the example of the leading steel interest in providing steel making capacity against the future needs of the country has a direct application to the lake traffic. What on its face seems strange is that merchant vessel firms should furnish nearly all the business in new freighters for 1908; but it is to be remembered that the ore producers were prodigiously active as patrons of the shipyards in the three years beginning with 1905, and that their orders in 1905 particularly were the marvel of the vessel trade of the lakes. It is evident that the independent vessel owners are not yet in serious fear of the absorption of the lake carrying trade by large corporations which consume what they carry.

CORRESPONDENCE.

Steel Ingot Uniformity.

To the Editor: On page 1828 of *The Iron Age* of December 26, Dr. Charles B. Dudley considers the discard requisite for uniform integrity in steel rails. I beg to remark that if 18 per. cent. is cut off the top of an ingot cast vertically the remainder, 82 per cent., will still differ in density, becoming more compact by degrees until the bottom is reached. There cannot be uniformity in an ingot cast perpendicularly. But cast an ingot on the horizontal, say, 8 in. square and 3 ft. long, cut it into half a dozen different lengths, and each will be found practically uniform. Mr. Bessemer considered that he could make iron by the process still in vogue—developed, of course. He did not succeed. Mr. Mushet told him to use spiegel. I hammered at a steam hammer the first ingot he ever made. A duplicate of that ingot may be found in the Kelvin Grove Museum, Glasgow, Scotland. It was almost as fragile as a red brick. A small portion only could be saved, hammered 4 in. square and rolled into a ½ in. round. Just the same now as then, the bottom part of the ingot is the best. Hence, I suggest that uniformity can only be secured by casting the ingots horizontally. The occluded gases, silicate floss, &c., which enter into cavities—inevitable to contraction in the interior, while the exterior has been chilled against the surface of a cold mold—would be eliminated, simply because all the excrescences, being lighter than the solid metal, must rise to the surface, where they are accessible and may be controlled. It has been said that open hearth steel would be more satisfactory than Bessemer. But J. J. Hill of the Great Northern Railroad has said it breaks more readily than Bessemer. I realize that this is a great problem, involving immense outlay, and submit my views with diffidence and trust they may be of some value.

JOSEPH PARKES.

MINNEAPOLIS, January 2, 1908.

Freight Overcharges.

To the Editor: Your editorial in issue of December 26 entitled "Freight Overcharges," has been read with much interest. In this connection I would like to submit the manner in which we handle this particular business.

Each morning our office calls the different railroad cashiers over the telephone and secures the amount of freight due, and checks are sent each day to cover. On receipt of freight bills they are assembled with the invoices and bills of lading covering the different shipments. The next step is the checking of freight charges as shown by freight bills. When overcharges are discovered the overcharge is submitted to the rate clerk in the local freight office, and we have him O. K. it. Unless the overcharge originated with their connecting lines, the railroads pay these amounts in cash at their office. In the event that the overcharge originated with a connecting line we do not file a formal claim, but leave the freight bill with the rate clerk and keep a cash ticket against the railroad company for the amount. In nearly every instance, as soon as the connecting line acknowledges the overcharge, we receive a voucher to cover our claim. When a formal claim is filed there is no doubt that it becomes a thing of the past or future, whichever may be most convenient.

There is no doubt that most of the trouble existing between shippers or consignees and the railroad companies is due to a lack of team work. Railroad employees are only human, and as such are liable to err in their work as well as clerks in mercantile offices, and surely there is no mercantile office that has not fully taken advantage of its quota of errors, especially in billing. Let us give the railroad rate clerk a chance to correct his errors. Let us go to him as we would have our customers come to us—in a pleasant manner—and above all things let us take the chip off our shoulder before we go in his office. If we would cut out the general feeling of antagonism against railroads and give the employees a fair chance it would certainly clear the atmosphere surrounding our dealings with the local offices. We have tried very hard to carry out the above rules, and our relations with the different agents in this city are more than agreeable.

W. J. FRITTS,
Tom Fritts Hardware Company.

CHATTANOOGA, TENN., December 27, 1907.

To the Editor: We have read with much interest your editorial in issue of December 26 on "Freight Overcharges." Your remarks are pertinent, and we hope you will continue to agitate the question until some relief is afforded.

We recite an incident on a shipment of steel from an Ohio River point to an Alabama point, it being a prepaid shipment. It traveled over several different systems of railroad, and the delivering line presented an expense bill for its proportion of the freight, which was paid by the consignee and charges deducted from the invoice value of the goods. Claim was made upon the railroad company for a refund, and with the usual "Pigs is pigs" (presume you have read it) tactics on the part of the railroad, we finally placed the claim in the hands of our attorney for collection, the result being that very shortly a tender of the amount of the overcharge was made and has been made several times. It being such a case of gross negligence we have insisted on the full amount of the overcharge, with legal interest from date, and we are going to see the case through.

We believe it would be well, if you care to pursue the matter further through your editorial columns, to bring up the question of "Why interest should not be paid by a railroad upon all overcharges." We believe if all shippers would insist upon the payment of interest as well as principal in all overcharge cases, that the railroads would soon be much more prompt in settling such claims.

MANUFACTURER.

December 27, 1907.

The Lash Steel Process.—The building formerly occupied by the Acetyvone Company on the lands of the Niagara Falls Power Company, Niagara Falls, N. Y., has been acquired by the Lash Process Company and the Canadian Lash Steel Process Company, for the purpose of making an exhaustive experimental study of the application of electric furnaces to the Lash process. The Lash steel process is a method developed by Horace W. Lash to cheapen the cost of ordinary mild steel by entirely eliminating the use of scrap, decreasing the amount of pig iron and substituting therefor a special mixture. It is stated that in this mixture the cost of the iron content of the furnace charge is very much less per ton than in the case of ordinary open hearth furnace mixtures. The tests at Niagara Falls will be carried on with an electric furnace of the Héroult type, using 1000 hp.

The Dire Cost of and Best Remedy for Carelessness.*

In the Foundry, Shop, Transportation and Traveling.

BY THOMAS D. WEST.

Our esteemed President, in his address at Jamestown and his recent message to Congress, signals a movement that will no doubt eventually be national in rendering greater security to life and property and the reimbursing of sufferers from accidents. In the writer's experience the measures advocated by the President in dealing with this great evil are not advisable in placing costs, or as a preventive of accidents, the latter being the chief factor all should seek.

As Many Casualties in Times of Peace as in War.

There are on the average about as many appalling casualties in times of peace as in war, but much less thought and attention are given to their dire afflictions, for the reason that the slaughter and costs are by units and spread over months, whereas those of war are by thousands spread over but a day. The soldier leaving his home for the seat of war bids farewell to his own with grave fears of ever returning, whereas the civilan has no preparation or thought of death, but without a moment's warning may be stricken down and generally because of the carelessness of some fellow being or of himself.

When we seriously consider the hundreds of thousands that are maimed and killed annually by accidents, is there any subject that should cause a greater degree of research to get at the root of its evil, and if possible implant customs and enact laws that will afford civilians in times of peace greater protection, or more assurance that they will not be brought home maimed or killed in a short time after leaving it in happiness and vigor? When a person is crippled for life or meets an untimely death it is a fate that can seldom be paralleled by any other misfortune that may befall a human being.

In times of war the Church and State become aroused; armies spring into existence and the masses become absorbed in the thought of the great sacrifices of life that will be made in efforts to save the home and the country. Very few sit in ease and contentment, indifferent to the outcome of the struggle. Almost all people become apprehensive of serious results, and as a body are ready to labor and to make sacrifices in an effort to lessen or stop the dire adversities of war, but what is said of the dire adversities of peace when about 600,000 beings are maimed or killed annually by accidents in one country alone, as is the record of the United States of America?

Efforts to Hold the Employer Responsible.

The November number of *Everybody's Magazine* published an article by William Hard on "The Making of Steel and Killing of Men." Like many other articles which the writer has read, it advocates placing the whole cost, responsibility or blame upon the employer, and expecting him to do a work that should have been done in the school and home, or developed before the youth becomes an adult. As for getting at the root of the chief cause of accidents, such writers are as far off the mark as an archer would be in missing a barn, to say nothing about the practicability of any good remedy they have suggested.

It is right and just to hold an employer responsible when he does not provide the best safeguards to life and limb that can practicably be devised, but unless we enact laws that provide for fining and imprisoning a person for carelessness, we will never be guaranteed the protection than can and should exist to decrease greatly our loss of life and property through this cause. What can be conducted in Europe as to the liability of employers cannot be done as justly in America.

It is safe to say that where there is one casualty in Europe caused by the downright carelessness of the employees, there are nearly half a dozen in America. Why? Simply because the American employee is less careful, more flippant and indifferent to his duties. In fact, as an example, if in a railroad crew or a shoplers gang, one of their number exhibits any great interest in being careful or economical, he is generally derided and in time often expelled from among them, and made to seek another situation. The "don't-care" spirit is so prevalent in America that the foreigner, who at the start exhibits much seriousness in aiming to be careful, is in a short time often worse than the native, for the reason that many know no bounds when they discover the flippancy that is tolerated and so often common to many workers, a defect which is imbibed in their youth, chiefly through the American spirit of independence, buoyancy and pleasure seeking, which tends to create a nation of "don't cares," "smart alecks," and "sports," instead of earnest, careful workers. In passing, it is to be said that the qualities generating carelessness in workers are much more pronounced in prosperous than dull times, which greatly accounts for the increase of casualties in the past five years referred to later on.

One effect of the training just cited is also exhibited by our Fourth of July celebration. As shown by Mrs. Isaac I. Rice, originator of the society for the suppression of unnecessary noise, 5000 persons were killed last Independence Day, and hardly any notice was paid to it. Had it been a battle, with less than one-fifth of 5000 injured, every tongue in the land would have commented upon the deplorable killing and maiming of men.

Statistics of Casualties Through Carelessness.

The writer's claim of there being more casualties in our country than in Europe through carelessness is well sustained by Secretary Garfield's commissioners' report given later on, as well as by E. B. Phelps' able article on "America's Lead in Railroad Accidents" in the *World's Work* of November. Here a careful collection of statistics shows that the number of casualties in train accidents for each 100,000,000 passengers carried for the years 1901-1905 was 31.64 killed and 72.23 injured in the United States, as against 1.27 killed and 4.88 injured in the United Kingdom. Mr. Phelps states that "investigation shows that the increase of accidents of late years has proportionally far exceeded the increase in density of volume of traffic," and farther on says that "the primary cause, in the opinion of all men who have studied the subject, is the recklessness of the American temperament manifested alike by the railroad president and the railroad trainmen," and also claims that "organized labor" is responsible in a secondary manner.

Heretofore there has been a universal propensity on the part of the public press and politicians that cater to the working classes for patronage to lay the blame of all casualities on the employers and to make demands, like our President, that all the costs and responsibility be saddled upon the employer. It is certainly encouraging to note such an expression as was given publicity by the Cleveland *Leader* of December 11, when with large headlines it stated "Big Disasters—Miners' Fault," and in which Rev. S. Von Krug, in referring to the killing of over 400 miners in the recent appalling disaster at the Monongah collieries, asserts that in living 25 years in the coal mining country he found that the great majority of mine disasters were the result of carelessness on the part of some individual miner.

Secretary Garfield's commissioners, in examining coal mine disasters of the United States, assert, as found in the Cleveland *Leader*, December 19, that our country is killing three times as many men for each 1000 employed as those of most European countries, but claim that the accidents are due to ignorance. The writer's experience in handling men and machinery for over 30 years credits but a very small percentage of accidents to ignorance or stupidity, compared with sheer carelessness by persons of fair and often very good intelligence.

The Subject Is One of Popular Interest.

The occasional appearance of such courageous expressions as that of Rev. Mr. Von Krug, that disregard public politics and press patronage by our great popular dail-

* Read at the meeting of the Philadelphia Foundrymen's Association, Philadelphia, Pa., January 8, 1908.

ies, will have an immense weight in aiding employers and others to prevent accidents, and which should certainly concern the masses as much if not more than how to pay for them, if they will but take a common sense view of the subject.

Page after page could be written about accidents caused by the carelessness of people that no possible provision of safeguards on the part of employers could have prevented, and such accidents are occurring by the thousand daily in this broad land of ours. If one wishes to surprise himself in obtaining an inkling of what exists to jeopardize the limbs and life of the civilian leaving his home for recreation or labor, let him clip and study the reports of accidents from several of our large daily papers for one month. A person who will do this will find himself doing some serious thinking on one subject, and such that must greatly alter any previous views on it.

When people come to weigh seriously the manner in which they jeopardize their lives, and how indifferent they are to a subject that should engage the best attention of all civilians, they cannot but marvel at the lack of public interest in the past in what is truly a dire adversity in time of peace. Some employees may look upon this paper as being written in the interests of employers, but any who will do this are very blind to their own interests. What can be of greater benefit to any person than taking an interest in getting at the root of what is essential to best prevent their own persons from being maimed or killed? What father, mother, son or daughter upon leaving a home has any positive assurance of returning unmaimed or alive? It may be one's own or another's carelessness that may send them without a moment's warning into the great unknown or be crippled for life. The guarding against accidents cannot be disputed as being of as much importance to employees as well as to employers, and both should strive to diminish their occurrence and to do what is necessary to enhance the best protection against the present dire adversities of peace.

The Careless Employee and the Inconsiderate Employer.

To obtain the best protection, or to decrease present risks of losing life or limb to any appreciable extent, we must see to it that the careless employee can be publicly censured and punished as well as the inconsiderate employer. To hold either one wholly responsible and let the other go blameless would be as gross an injustice and impracticable procedure in remedying a world's great evil as any other that is recorded in the annals of civilization.

This subject also involves the great cost attached to the destruction of property through carelessness. Much is written upon the ravages of war being so destructive of wealth that the cost of living greatly increases, depriving the ordinary worker of many of the comforts and luxuries of life. How many give any thought to the ravages of peace by the destruction of property through carelessness? As an example of this, it is estimated that fires started by carelessness in throwing away burning matches and cigarettes cause New York City a loss of about $2,500,000 each year. This great metropolis has a population of about 4,000,000, and taking its losses as a basis for all the cities of the United States, we have something like a loss of $53,000,000 through carelessness in the use of matches and cigarettes alone. This, it must be remembered, includes only the ordinary daily fires, and does not take into consideration the great conflagrations like the recent Baltimore fire, some of which have been started through carelessness.

Considering the subject of losses by manufacturers through carelessness, it is safe to figure that breakage and other losses caused by operatives' carelessness are, on an average, fully $20 per employee each year. Allotting one-sixth of the population of the United States as being employed in manufacturing, we have a total loss of about $28,000,000 from this class of employment. Add to manufacturing the work of the farmer and domestic labor, and the grand total can easily reach $150,000,000 that could have been saved to the people and added yearly to our nation's wealth, had there been due care exercised in the labors or actions of the people.

Founders Would Be Benefited Greatly by More Carefulness.

While on the subject of losses caused to manufacturers, &c., through carelessness, there are few, if any, that could be benefited by due heedfulness on the part of workers more than founders. It is a question if losses in bad castings through carelessness or inattention are not greater than losses through ignorance or want of skill on the part of molders, and that losses through carelessness per dollar of output for inferior or bad work exceed those of other lines of manufacture.

As the first organized step to make the subject of carelessness one of national issue along educational lines few measures, if any, could be more beneficial than to have our various foundrymen's associations take up the work of collecting statistics of shop accidents and losses caused by individual carelessness, so that those outside of the actual control of manufacturers could have facts to influence moral support in portraying the chief cause of casualties, and thereby aid other societies and organizations to influence legislative bodies in enacting laws and devising other agencies that would be very helpful in greatly decreasing present day casualties and insure a greater lease of life and preservation of limbs to all civilians. The above is merely a suggestion given with the belief that actions not words are what we must chiefly look to in order to achieve the reform in carelessness that should and can be brought about.

To reduce the present great loss of life and limb in connection with that of property, some may say, use the power of discharge to discipline workers. This would help in dull times, but in brisk periods, like the past five years, when a man had to walk but a few streets to find a dozen positions awaiting him, this would have little restraint.

It would seem that with the 600,000 persons who are maimed or killed, in connection with the $150,000,000 worth of property lost yearly, and chiefly through carelessness, there would be a universal awakening to apply needed remedies. There could be better discipline in our homes and schools and societies, for the development of carefulness could be formed, but the most effective remedy that can be had would be to enact laws whereby any guilty party, whether employer or employee, can be summoned to answer charges for carelessness, and be liable to fine and imprisonment for any accidents of which they may be the cause. To support such laws we will have to educate popular opinion, as by reading such papers as this, and by the presentation of actual facts demonstrating that the great majority of accidents are due to sheer carelessness of individuals.

An Injustice to Business Men of Small Capital.

Another phase of this subject is the effect that the placing of the whole responsibility and cost of employees' injuries on employers would have in debarring many with small capital from starting in business for themselves. It would kill most of such prospects for many, and few movements would do more to help make this strictly a rich man's country and take from us present advantages which permit many employees to become proprietors, all for the reason that no one of small means would dare risk his hard earned savings to help pay for an unfortunate man's life or limbs lost through some chance accident that was beyond his employer's control.

Some will claim that employers' liability insurance companies can be relied upon to protect employers in paying their costs of accidents. Make the new Pennsylvania law for holding proprietors wholly universal in our country, instead of the old law which excused an employer, if negligence on the part of an employee could be proved, and these insurance companies would in a few years be a thing of the past, or their rates would be so high that a small beginner could not spare the capital necessary to insure himself. Whichever way we turn, the plan of loading the whole responsibility and cost upon employers for accidents is an ill advised one, and, like a boomerang, will turn to injure also those that believed themselves furthest from harm. The courts can heavily fine the employer and those who can carry the load will

endeavor, if possible, to make the consumer pay, thereby still further increasing the cost of living. How much more sensible for all to labor for every possible removal of the chief cause of accidents, which is individual carelessness, and hereby save our country's great loss of life and limb, as well as the many millions of dollars of the people's money.

The endeavor to place the whole responsibility and cost due to individual carelessness upon the employer will have little weight in this country in preventing accidents under the present régime. It suggests the question if the public is satisfied to continue enduring its loss of millions and further lessen opportunities for small capitalists to start business, as well as taking the hazardous risk of life and limb that they must under the present unpunishable dire carelessness of so many of our employees and unresponsible civilians.

Connecticut Industrial Dividends.

A banking house of Hartford, Conn., has prepared a list of dividends declared or to be declared by corporations of that city and vicinity, which tell of most prosperous results of recent business, in most cases comprising the last quarter of 1907. Among them are:

The American Hardware Corporation, New Britain, 1¾ per cent. quarterly; Billings & Spencer Company, Hartford, 1½ per cent. quarterly; Colts Patent Fire Arms Mfg. Company, 1¼ per cent. quarterly; Collins Company, Collinsville, 4 per cent. semi-annual; Eagle Lock Company, Terryville, 3 per cent. quarterly; Johns-Pratt Company, Hartford, 5 per cent. quarterly; Landers, Frary & Clark, New Britain, 2 per cent. quarterly, and extra 6 per cent.; New Britain Machine Company, New Britain, 1½ per cent. quarterly; Pratt & Cady Company, Hartford, 2½ per cent. quarterly; Peck, Stow & Wilcox Company, Southington, 2½ per cent. quarterly; Stanley Works, New Britain, 2 per cent. quarterly; Standard Screw Company, 3 per cent. semi-annual, both common and preferred; Stanley Rule & Level Company, New Britain, 2 per cent. quarterly, and extra 3½ per cent.; Traut & Hine Company, New Britain, 1½ per cent. quarterly, and extra 2 per cent.; Union Mfg. Company, New Britain, 2 per cent. quarterly; Whitlock Coil Pipe Company, Hartford, 1¾ per cent. quarterly.

The Trade Co-operative Committees.

The following names have been added to those recently printed as members of committees to secure conciliation and co-operation in the iron and steel trade:

Ore and Pig Iron: W. A. Rogers, president Buffalo & Susquehanna Iron Company, Buffalo, N. Y.

Sheet and Tin Plate: Thomas K. Niedringhaus, president National Enameling & Stamping Company, St. Louis, Mo.; James A. Campbell, president Youngstown Sheet & Tube Company, Youngstown, Ohio.

Pipe and Tubular Products: I. M. Scott, president La Belle Iron Works, Steubenville, Ohio.

Electrical and auxiliary manufactures for 1907 are estimated by the *Western Electrician*, Chicago, at $315,920,000, this being a slight decrease from the total for 1906, but an increase of about 30 per cent. over 1903. The decline for 1907 has been anticipated, and seems to have been chiefly in the line of new construction. Wire and cable manufactures for the year amounted to $88,625,000; dynamos and motors, $74,000,000; telephone apparatus, $28,500,000; lamps of all kinds, $13,125,000; cars, trucks and railroad supplies, $15,700,000, and prime movers, $27,750,000.

The McKeesport Tin Plate Company, McKeesport, Pa., has started up its tin mill plant on full time, giving employment to about 700 men. This company enjoys the distinction of having the largest independent tin plate plant in the country. It contains 12 hot mills and 10 cold mills. The company expects to be able to operate full time for some months.

November Exports and Imports of Iron and Steel.

The official figures of our foreign trade in November, just issued by the Bureau of Statistics of the Department of Commerce and Labor, do not bear out the impression which gained currency during that month that the exports of iron and steel were on an unusually large scale. It appears that, as compared with October, the exports slightly declined, while the imports increased. The total value of the exports of iron, steel and manufactures thereof, not including ore, for November was $17,051,755, against $18,951,198 in October. The value of similar imports in November was $2,623,551, against $2,419,184 in October.

Taking the commodities for which quantities are given, the exports in November totaled 116,308 gross tons, against 123,216 tons in October, 115,869 tons in September, 118,944 tons in August, and 121,400 tons in July.

The following table gives details of the exports of these commodities for November, and for the 11 months ending with November in 1907 and 1906:

Exports of Iron and Steel.

	November.		Eleven months.	
	1907.	1906.	1907.	1906.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	6,184	9,589	70,740	75,052
Scrap	689	671	24,966	10,602
Bar iron	1,473	4,308	23,236	51,260
Wire rods	268	164	10,524	5,849
Steel bars	6,497	4,172	69,848	29,316
Billets, blooms, &c.	8,698	5,847	74,831	186,479
Hoop, band, &c.	1,013	200	7,244	4,369
Steel rails	30,141	23,869	318,143	296,879
Iron sheets and plates	4,615	2,177	36,689	15,441
Steel sheets and plates	6,365	10,071	76,855	87,480
Tin and terne plates	512	445	9,900	11,502
Structural iron and steel	11,267	9,217	129,041	102,677
Wire	15,355	16,652	147,653	160,822
Cut nails	830	357	6,567	7,111
Wire nails	1,990	2,436	39,685	44,044
All other nails, including tacks	654	537	7,285	4,906
Pipes and fittings	19,757	8,713	163,365	132,075
Totals	116,308	99,425	1,216,572	1,225,864

Turning to the imports, the quantity figures for November totaled 35,255 gross tons, against 21,223 tons in October, 40,682 tons in September, 51,700 tons in August and 75,406 tons in July. The following table shows the details of the imports of these commodities for November and for the 11 months ending with November in 1907 and 1906:

Imports of Iron and Steel.

	November.		Eleven months.	
	1907.	1906.	1907.	1906.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	19,408	39,751	478,448	305,416
Scrap	897	7,249	26,516	18,379
Bar iron	3,093	2,704	35,854	31,458
Rails	107	958	3,551	4,655
Hoop, band, &c.	31	238	1,467	10,200
Billets, bars, and steel in forms, n.e.s.	5,397	2,071	18,441	19,139
Sheets and plates	313	169	3,517	3,055
Tin and terne plates	4,385	5,094	56,231	48,940
Wire rods	1,512	1,188	15,806	16,269
Structural iron and steel	112	1,248	2,271	27,872
Totals	35,255	60,670	642,102	485,383

The total value of the exports of iron and steel and manufactures thereof, not including ore, for the 11 months ending with November was $182,068,912, against $157,755,080 in the corresponding period of the previous year. The imports in the same time were respectively valued at $36,740,432 and $30,840,473. The quantity of iron ore imported in the 11 months ending with October was 1,149,129 gross tons, while the exports for the same period were 261,469 tons.

Judge E. H. Gary, chairman of the United States Steel Corporation, announced after the meeting of the Finance Committee January 7 that a price of $87.50 per share has been fixed at which employees can this year subscribe for the preferred stock under the profit sharing plan. This compares with a price of $102 for 1907.

Congress to Enact a New Census Law.

WASHINGTON, D. C., January 6, 1908.—Manufacturers in all industries will follow with interest the movement soon to be undertaken in Congress to secure the passage of a bill recently introduced by Representative Crumpacker, of Indiana, providing for the taking of the Thirteenth and subsequent decennial censuses. The bill is now before the House Committee on the Census, of which its author is chairman, and it is expected that the measure will be put through during the present session, or in any event during the present Congress. The Thirteenth Census, as applied to manufactures, will cover as nearly as practicable the calendar year ending December 31, 1909, and the schedules therefor will be prepared by the Census Bureau during the coming fiscal year.

The Crumpacker bill has been prepared with great care, and is an exceedingly comprehensive measure. Provisions of special interest to manufacturers have been incorporated, conferring authority upon the Director of the Census to frame inquiries and to compel manufacturers to answer them under severe penalties for refusal to do so, or for supplying false or misleading information. The statute under which the census of 1905 was taken penalized the refusal to furnish information, but acting upon the advice of the law officers of the Department of Commerce and Labor, and also moved by a desire to secure the co-operation of the manufacturers of the country in obtaining a complete and accurate census, the Director decided not to invoke the law in any case, but to rely upon negotiating through the medium of special agents to secure the desired data and in nearly all cases these methods proved successful.

The new bill outlines the scope of the schedules of inquiry to be used for the next census, to be confined to mines and quarries and manufacturing establishments which were in active operation during all or a portion of that year and had a product valued at $500 or more, and further confined to manufacturing establishments conducted under what is known as the factory system, exclusive of the so-called neighborhood and mechanical industries.

A special provision of the bill makes it a misdemeanor to refuse to furnish information desired by the Census Bureau and provides heavy penalties therefor. This section of the bill is as follows:

> Any owner, president, secretary, director, agent or other officer of any manufacturing establishment, mine, quarry or other establishment of productive industry, who under the conditions hereinbefore stated shall refuse or wilfully neglect to answer any of these questions, or shall wilfully give answers that are false, shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not exceeding $10,000 or imprisoned for a period not exceeding one year, or both so fined and imprisoned, at the discretion of the court.
>
> All fines and penalties imposed by the proposed law are to be enforced by indictment or information "in any court of competent jurisdiction," which is understood to mean any Federal court in the district in which the parties refusing to comply with the law may reside.

Mr. Crumpacker has also incorporated in the measure a provision for the protection of manufacturers, which forbids the Director of the Census to publish or disclose any statistics regarding individual operations. Employees who make public information received by them in their official capacity are also punishable by fine and imprisonment.

In the enactment of the Crumpacker bill it is not the intention of Congress to delegate to the Director of the Census the power to prescribe arbitrary and unreasonable regulations with a view to forcing manufacturers to furnish information contrary to their best judgment as to what data may properly be communicated to the bureau and its representatives, and although the terms of the Crumpacker bill give the director a wide discretion, manufacturers may be assured that it will not be improperly exercised. W. L. C.

The Terre Haute Shaft Coupling & Novelty Company has been incorporated at Terre Haute, Ind., with $40,000 capital stock, to manufacture novelties. The directors are C. B. Brown, N. M. Ely and T. J. Martin.

Judge Gary's Forecast.

Judge E. H. Gary, chairman of the United States Steel Corporation, contributed the following to the annual review of the New York *Times*, issued January 5:

The renewal of conditions which preceded recent unpleasantness and doubt is near at hand, and I look for an era of prosperity when confidence is fully restored, as it unquestionably should be without delay. The basis for a renewal of activity is markedly strong. The mining and shipment and marketing of pig iron and finished steel have been greater than in any previous year, more men employed, a higher scale of wages paid, and more profits realized. The country's wealth has increased and gold to the value of $8,000,000 a month is being produced in the United States alone. What is necessary for a permanent improvement in the finances of our country is proper management and economy. The conditions are excellent, and conservative direction and keener scrutiny are needed to insure a long continued period of prosperity. There need be no fear that the wealth of this country is diminishing. The exports for 1907 exceeded the imports by $400,000,000, and the value of farm produce and mining output will reach the magnificent total of $10,000,000,000. These are figures which may well inspire courage and confidence as to the future of our republic.

It would be well, too, to modify ambitious views with regard to results and not to expect extravagant returns on moderate outlays, always bearing in mind that, according to sound business principles, there is danger where large interest is returned on comparatively small investments. Violent changes in legislative enactments are to be deplored; legal remedies should be applied slowly.

The recent tempest has in a great measure purified the financial atmosphere. The demands of the law have been made clearer and forcibly emphasized. The men who are engaged in great financial enterprises are taking more wholesome views of what they owe the public and are establishing more dignified, and certainly more righteous, regard for their own obligations. In this way values will be largely increased and will not be liable to wide and sudden fluctuations.

There was a time when a spell of bad weather meant unfavorable crop reports, which reacted on the securities market and business generally. To a very considerable extent the possibility of serious crop damage is minimized by an extension of area, and as agriculture moves further out so does the likelihood of a general climatic influence cease to exist.

A word as to industrial co-operation and the consolidation of interests in certain industries. There is no intention in recent iron and steel developments to destroy or restrict competition or to control the market by any nefarious process; on the contrary, it is sought to stimulate competition in every way, open and fair competition and fair dealing.

The power of the press in restoring confidence is of the utmost value. The press has in the discussion of important problems done its duty to the public, and to a very great extent the reform in conditions is due to its sleepless vigilance. The object being obtained, the newspapers can help much to instill into the public mind a sense of security and contentment, and they are doing so with a full appreciation of the worth of the information at their command.

My view of the future, based as it is on the conditions of the iron and steel industries—and these are the barometers by which we read—is optimistic, and I look for an immediate improvement in all spheres of commercial enterprise.

New issues of stocks and bonds in Germany in 1907 amounted to only $460,500,000, as compared with $703,250,000 in 1906. Of these issues only $60,000,000 were industrial shares, which in 1906 amounted to $156,000,000.

Trade Publications.

Tools.—Charles H. Besly & Co., 15 South Clinton street, Chicago, Ill. 10 catalogue, 1908. Size 6 x 9 in.; pages 335. Cloth bound. Describes and illustrates the company's full line of products and is unique in the logical sequence of its contents. The first pages are devoted to brass and copper in sheet, rod, wire and tubing forms, and following this drills, reamers, taps, dies, screw plates, chucks of all forms, screws, wrenches, files, vises and clamps are dealt with. Various lines of small tools as used in metal working shops and laboratory specialties, tool holders, tool chests and engineers' supplies are next listed. Some 42 pages are devoted to Besly spiral disk grinders and Besly band wheels, showing new forms and types. Next follows plating and polishing supplies, grease cups, parallel clamps, oil cups and Helmet oil, the various applications of which are shown. Lists of useful tables of goods shown in the catalogue and a complete index are included.

Wire Drawing Machines.—W. Gerhardi, Lüdenscheid, Westphalia, Germany. Folder. Gives a description of the Nos. 0, 00, 1, 2, 3, 4 and 5 multiple drawing machines, with illustrations of the Nos. 0, 2 and 3 machines. Patent friction blocks are also illustrated.

Bench Lathes.—Stark Tool Company, Waltham, Mass. Catalogue. Size 5¾ x 8¾ in.; pages 40. Contains descriptions in English, German, French and Spanish of the company's various types of bench lathes, pinion cutters, profiling machines, milling machines, damaskeening machines, &c.

Traction Engines.—C. H. A. Dissinger & Bro. Company, Wrightsville, Pa. Catalogue B. Concerns the Capital gasoline traction engines, built in sizes from 16 to 80 hp., with any number of speeds forward or backward. The parts are illustrated and described separately, and specifications are given on an appended sheet.

Tobin Bronze.—Ansonia Brass & Copper Company, 99 John street, New York. Pamphlet. Refers to Tobin bronze and its advantages from the standpoint of strength and ability to resist corrosion. Testimonials are included.

Boring Mills.—Gisholt Machine Company, Madison, Wis. Pages 79 and 80 for insertion in binder. Deals with tool equipment for a 30-in. vertical boring mill, which is shown finishing valve openings and automobile crank cases.

Optical Pyrometers.—Morse Thermo-Gage Company, Trumansburg, N. Y. Pamphlet. Describes the Morse thermo-gage, an optical pyrometer adapted to read temperatures of materials heated to any degree of incandescence. Recent improvements are a telescopic form which may be held in the hand or on a fixed or movable support, and provision for inserting Jena Rauch glass for reading the highest temperatures, or Jena copper red glass for gauging the temperatures of such substances as molten brass, which have a peculiar color, by permitting only the red rays to pass to the eye.

Derails.—Hayes Track Appliance Company, Geneva, N. Y. Circulars. No. 47 describes Hayes model F. portable derails, for use where it is desired to install a derail temporarily without spiking it to the ties, and No. 48 gives some new pictures of Hayes derails in track.

Power Pumps.—Goulds Mfg. Company, Seneca Falls, N. Y. Catalogue. Size 4½ x 8½ in.; pages 48. Gives illustrations and descriptions of Goulds pumps and buildings in which they have been installed, such as apartment houses, theatres, hotels, office buildings, &c., and pumps in connection with railroad and hydraulic elevator service. Mill, power plant and mine pumping installations are also shown, and illustrated descriptions with specification tables of the various types of pumps are given.

Motors and Electrical Equipment.—Sprague Electric Company, 527 West Thirty-fourth street, New York City. Four bulletins. No. 108 pertains to electric dynamometers for testing gasoline engines. No. 229 (74 pages) gives descriptions and illustrations of direct current electric motor equipments for printing, electrotyping, stereotyping and binding machinery. This line includes the company's enclosed and semi-enclosed type D direct current motors, round type motors and small motors from 1-20 to ¼ hp. Controllers for electric motor driven printing machinery are shown, and illustrations of these motors in connection with numerous types of machines are included. No. 230 contains a reprint from the *Electrical World* entitled "The Electric Equipment of a Modern Factory," describing the plant of the F. Wesel Mfg. Company in Brooklyn, N. Y., and is an example of the application of Sprague products to factory work. No. 231 refers to direct current motor equipments for single or double magazine Mengenthaler linotype machines.

Steam Turbine-Generators.—General Electric Company, Schenectady, N. Y. Bulletin No. 4531. Size 8¼ x 10¾ in.; pages 29. Illustrates and describes the construction and operation of the Curtis steam turbine-generator, and gives interesting information with respect to superheat, vacuum, economy, &c. Tests of 9000, 5000, 2250 and 1000 kw. turbines are reported, showing some remarkably high efficiencies. The descriptive matter calls special attention to the flat efficiency curve, giving high efficiency at overloads and light loads, the simplicity of design, the low maintenance cost, the economy in space, &c. The illustrations show installations of these machines, their parts, and sectional views.

Oiling Devices.—Bowen Mfg. Company, Auburn, N. Y. Catalogue No. 5. Size 7¾ x 10¼ in.; pages 24. This illustrates and describes the company's style A, B, D, G, N. H and K oil cups, Empress plain and ratchet compression brass grease cups and plain compression steel grease cups, springs, miscellaneous oil hole covers, and stampings. Tables of prices are included.

Engines and Boilers.—Edwin H. Ludeman & Co., 42 Broadway, New York. Hanger. Illustrates examples of the products for which this firm is the New York sales office, including Houston, Stanwood & Gamble horizontal slide valve engines (15 to 1100 hp.), return tubular and locomotive boilers and combined engine and boiler outfits; Crescent safety vertical engines (side and center crank types); Wetherill heavy duty Corliss engines, and Fitchburg heavy duty four-valve engines.

Lubricators.—Michigan Lubricator Company, 661 Beaubien street, Detroit, Mich. Catalogue No. 10. Size 5½ x 7½ in.; pages 108. Covers the company's complete line, including lubricators, oilers, grease cups, oil pumps, water gauges, gauge cocks, throttle valves, oil gauges, oiling devices, flue cleaners, &c.

Automatic Drain Valves.—Michigan Lubricator Company, 661 Beaubien street, Detroit, Mich. Circular. Illustrates and describes the Michigan automatic drain valve for locomotive lubricators, a device recently patented, the purpose of which is to prevent the waste of oil during the draining of water from locomotive lubricators. It automatically closes when the water has been drained and leaves the oil in the lubricator. It is simple in construction and operation, consisting merely of a ball float, working freely in a cage, which rises and falls with the water level in the reservoir, always remaining below the level of the oil. When all of the water has been drained out the float seats, retaining the oil above it. The Michigan Bull's-eye locomotive lubricator is equipped with this automatic drain valve.

Radial Reamers.—Hanna Engineering Works, 820 Elston avenue, Chicago, Ill. Circular. Refers to the Hanna radial 6-ft. portable reamer for bridge, ship, car and other structural shops.

Pneumatic Screen Shakers.—Hanna Engineering Works, 820 Elston avenue, Chicago, Ill. Catalogue No. 1 and circular. The latter illustrates an electric shaker for screening foundry sand and the catalogue relates to Hanna pneumatic screen shakers, which are made in small tripod, large tripod, stationary post and swivel post types. Each of these are shown and described, and a price-list and some testimonial letters are appended.

Plate Prices for Sixteen Years.

The accompanying table, which has been averaged monthly from weekly quotations in the Pittsburgh market reports of *The Iron Age*, gives the price of ¼-in. steel plates in cents per pound, f.o.b. Pittsburgh, from 1892 to 1907, inclusive, which is a period of 16 years:

	Jan. Cents.	Feb. Cents.	March. Cents.	April. Cents.	May. Cents.	June. Cents.	July. Cents.	Aug. Cents.	Sept. Cents.	Oct. Cents.	Nov. Cents.	Dec. Cents.	Aver. Cents.
1892	1.91	1.98	1.90	1.90	1.86	1.75	1.75	1.83	1.83	1.75	1.75	1.71	1.83½
1893	1.70	1.70	1.66	1.64	1.60	1.51	1.50	1.54	1.60	1.52	1.38	1.35	1.56
1894	1.30	1.25	1.15	1.10	1.18	1.25	1.25	1.20	1.19	1.18	1.19	1.15	1.20
1895	1.13	1.13	1.10	1.14	1.16	1.34	1.52	1.80	1.88	1.74	1.63	1.51	1.42
1896	1.36	1.35	1.35	1.39	1.29	1.27	1.25	1.17	1.15	1.14	1.10	1.12	1.24½
1897	1.10	1.10	1.10	1.08	1.05	1.05	1.01	1.00	1.00	1.06	1.05	1.00	1.05
1898	1.00	1.00	1.00	1.02	1.10	1.10	1.08	1.11	1.15	1.12	1.11	1.17	1.08
1899	1.29	1.45	1.73	2.05	2.12	2.32	2.45	2.55	2.85	2.79	2.52	2.30	2.20
1900	2.25	2.21	2.04	1.87	1.69	1.39	1.19	1.08	1.12	1.10	1.31	1.39	1.55
1901	1.40	1.40	1.47	1.50	1.58	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.55
1902	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1903	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1904	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1905	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1906	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.70	1.70	1.61⅔
1907	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70

Many More Furnaces Out.

Active Capacity 232,652 Tons a Week.

Pig Iron Production in 1907 Estimated at 25,737,000 Tons.

December pig iron production showed a great decline from that of November, roundly 600,000 tons, as against a falling off of about 500,000 tons in November from the record output of 2,336,972 tons in October. Relatively a greater cut is shown when a comparison is made of active capacity December 1 and January 1. On the latter date the weekly capacity of coke and anthracite furnaces in blast was but 232,652 tons, or about 45 per cent. of the average for the four months preceding November, and 115,000 tons less than on December 1. But once in the past seven years, according to the records of *The Iron Age*, has so low a point been touched. That was on January 1, 1904, at the beginning of the month in which bottom was reached in the remarkable curtailment movement of 1903-4, the active weekly capacity on that date being 185,636 tons. It is significant that we have now approached the low point of the last spectacular blowing out movement, and more so when it is considered that consumption in the first 10 months of 1903 was fully one-third less than in the like period of 1907.

Pig Iron Production in 1907.

An estimate is now possible of the pig iron production in 1907, based on our monthly figures for coke and anthracite pig iron output in the past six months, estimating charcoal iron for the second half of the year at 170,000 tons, as against 205,796 tons in the first half:

First half of 1907	13,478,044
Second half of 1907	12,258,933
Total	25,736,977

The rate of pig iron production in the first four months of the second half of last year fully warranted the expectation that the output for the first half would be exceeded and that the year's total would reach 27,000,000 tons. It appears, therefore, that the panic and the resultant contraction have already shorn the iron industry of over 1,250,000 tons of pig iron product.

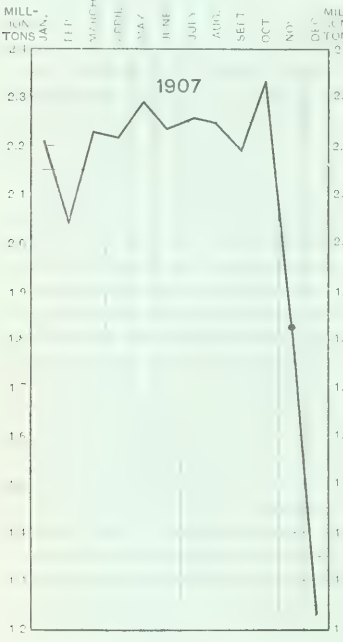


Diagram of Coke and Anthracite Pig Iron Production by Months in 1907.

The Slump Shown in Diagram.

Herewith is plotted the line of coke and anthracite pig iron production in 1907 by months. Had the October output carried the curve to the top of the diagram, or 2,400,000 tons, and had the plunging lines for November and December gone to 1,200,000 tons in the latter month, the falling off in two months would have been just 50 per cent.

It will be interesting to note on what angle the line moves from the December space to the point representing January production. Steel works furnaces are now producing at a greater rate than at the close of December, while the merchant furnace output promises to decrease further, in view of plans for blowing out more furnaces in January. A considerable number of idle stacks are banked, so that their starting up will not be difficult, should the iron be needed.

December Production.

The table below gives the production of coke and anthracite furnaces in December and the four months preceding:

Monthly Pig Iron Production -Gross Tons.

	August. (31 days)	Sept. (30 days)	Oct. (31 days)	Nov. (30 days)	Dec. (31 days)
New York	150,385	150,264	152,710	111,407	86,993
New Jersey	35,026	32,877	30,574	24,079	22,555
Lehigh Valley	60,160	68,559	71,936	61,969	54,881
Schuylkill Val.	59,807	53,978	48,543	43,876	37,747
Lower Susquehanna and Lebanon Val.	64,456	59,580	67,286	47,683	31,090
Pittsburgh Dis.	525,341	509,497	533,078	409,024	258,412
Shenango Val.	152,917	144,978	158,315	124,159	76,086
West. Penn	129,922	133,906	143,078	130,192	105,671
Md., Va., and Kentucky	84,462	81,398	86,829	79,293	61,433
Wheeling Dis.	121,078	117,445	134,445	76,014	12,051
Mahoning Val.	177,438	162,644	180,968	129,334	68,776
Central and North. Ohio	176,700	164,314	185,422	149,362	84,087
Hocking Valley and Hanging Rock	35,590	32,138	33,843	28,017	15,658
Mich.,Minn.,Mo., Wis., Colo	77,961	79,112	81,155	59,697	48,950
Chicago Dis.	215,641	212,413	244,645	200,309	148,691
Alabama	144,374	142,766	146,354	118,190	94,810
Tennessee, Georgia and Texas	39,152	37,618	37,791	35,520	26,388
Totals	2,250,410	2,183,487	2,336,972	1,828,125	1,234,279

Production of Steel Companies.

The steel companies have led in the curtailment movement thus far—that is, they have put out a greater percentage of their capacity than has been the case with the merchant furnaces. Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Republic, Youngstown Sheet & Tube Company, Jones & Laughlin, La Belle, Bethlehem, Calumet, Inland and Colorado companies show the following totals of product month by month. We give separately a statement of the output of spiegeleisen and ferromanganese, which is included for each month in the total production:

Production of Steel Companies - Gross Tons.

	Pig.—Total production.—		Spiegeleisen and ferromanganese.	
	1905.	1906.	1906.	1907.
January	1,129,042	1,358,015	1,406,397	26,305	21,477
February	1,027,937	1,226,760	1,317,923	26,988	19,444
March	1,232,255	1,400,395	1,424,827	23,595	31,091
April	1,222,710	1,333,591	1,446,788	28,054	26,527
May	1,287,438	1,372,423	1,470,080	29,447	28,822
June	1,149,404	1,293,437	1,457,230	22,737	30,942
July	1,114,409	1,323,391	1,452,557	20,153	25,343
August	1,186,050	1,237,485	1,445,685	18,327	23,696
September	1,262,033	1,264,380	1,417,153	24,078	30,270
October	1,370,960	1,452,200	1,514,521	23,517	35,105
November	1,334,644	1,411,350	1,084,114	29,119	21,861
December	1,356,962	1,445,528	659,459	21,707	19,480

Capacity Active January 1 and December 1.

The following table gives the weekly capacity of coke and anthracite furnaces in blast January 1 and December 1:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	January 1, Number in blast.	January 1, Capacity per week.	December 1, Number in blast.	December 1, Capacity per week.
New York:					
Buffalo	14	6	12,048	8	17,845
Other New York	10	3	3,346	4	5,105
New Jersey	8	5	4,977	5	4,846
Spiegel	2	0	0	0	0
Pennsylvania:					
Lehigh Valley	25	13	10,382	16	12,742
Spiegel	3	2	658	2	608
Schuylkill Valley	14	4	5,182	8	6,845
Spiegel	1	1	921	1	730
Low. Susquehanna	8	2	2,975	5	6,709
Spiegel	1	0	0	0	0
Lebanon Valley	10	3	2,415	4	3,382
Pittsburgh Dist.	45	26	70,127	26	72,843
Spiegel	3	1	596	2	1,452
Shenango Valley	20	5	9,240	12	21,861
West. Penn.	27	13	19,516	20	30,242
Maryland	4	1	2,018	3	6,155
Wheeling Dist.	14	0	0	4	6,935
Ohio:					
Mahoning Valley	18	5	8,748	10	20,267
Central and North. and Michigan	22	6	10,115	13	30,270
Hocking Valley and Hanging Rock	12	5	2,351	9	4,891
Illinois and Indiana	23	11	27,160	16	40,625
Spiegel	2	0	0	1	910
Minnesota	1	1	845	1	730
Wisconsin	6	1	1,650	3	3,197
Missouri	1	0	0	1	524
Colorado	6	3	6,817	3	5,424
The South:					
Virginia	23	5	3,741	12	7,710
Kentucky	7	2	1,582	3	2,254
Alabama	16	16	20,454	20	24,248
Tennessee	18	9	4,788	14	8,022
Georgia and Texas.	3	0	0	0	0
Totals	397	149	232,652	226	347,372

A Five Year Record.

The active weekly capacity in coke and anthracite iron has shown the following fluctuations since January 1, 1903. The comparison of the curtailment of 1903-4 with that of 1907-8 is interesting:

	Capacity per week.		Capacity per week.
January 1, 1908	232,652	June 1	443,092
December 1, 1907	347,372	May 1	452,031
November 1	491,436	April 1	439,564
October 1	511,397	March 1	403,157
September 1	507,768	February 1	405,792
August 1	513,471	January 1, 1905	377,879
July 1	528,170	December 1, 1904	357,846
June 1	523,220	November 1	334,249
May 1	524,538	October 1	319,249
April 1	496,456	September 1	291,573
March 1	511,035	August 1	246,092
February 1	492,359	July 1	272,301
January 1, 1907	507,397	June 1	336,107
December 1, 1906	513,860	May 1	368,244
November 1	500,580	April 1	337,257
October 1	469,665	March 1	308,751
September 1	441,426	February 1	273,692
August 1	449,908	January 1, 1904	185,636
July 1	460,570	December 1, 1903	244,156
June 1	472,622	November 1	273,715
May 1	484,031	October 1	353,142
April 1	484,240	September 1	360,197
March 1	479,737	August 1	353,681
February 1	482,156	July 1	384,825
January 1, 1906	463,673	June 1	388,178
December 1, 1905	475,814	May 1	373,496
November 1	460,449	April 1	386,215
October 1	445,468	March 1	347,424
September 1	412,563	February 1	335,239
August 1	410,088	January 1, 1903	346,073
July 1	408,617		

Furnaces Blown Out in December

Among furnaces which went out of blast between December 1 and January 2, were Missouri at St. Louis; the Detroit Iron & Steel Company's stack; two Lackawanna and Burden in New York; one Brooke, Topton, Temple and one Warwick in the Schuylkill Valley; two Bethlehem and one Hokendauqua in the Lehigh Valley; Edith, Neville Island, one Edgar Thomson and Clinton at Pittsburgh; Claire, Ella, Fannie, two New Castle, one South Sharon and one Shenango in the Shenango Valley; three Cambria, Nittany, Perry, Rebecca and Scottdale in western Pennsylvania; Lochiel and two Steelton in the Susquehanna Valley; Sheridan in the Lebanon Valley; Gem, Big Stone Gap, Low Moor, Covington, Princess, Victoria, Bristol and Radford Crane in Virginia; two Maryland Steel in Maryland; one Ashland in Kentucky; one La Belle and three Wheeling Steel & Iron in the Wheeling District; one Central at Cleveland, two Columbus, Dover and two Lorain in northern and central Ohio; Bird, Hamilton, Marting and one Wellston in the Hanging Rock District; one Calumet, four Illinois Steel and one Iroquois in Illinois; Spring Valley and Thomas in Wisconsin; Anna, Cherry Valley, Brier Hill and two Haselton in the Mahoning Valley; Central, Sheffield and two Southern Steel Company in Alabama; one Allen's Creek, Chattanooga, Citico, one Dayton and Goodrich in Tennessee.

The resumptions were few: One New Castle, one Duquesne and two Edgar Thomson, while several furnaces (as in the case of the American Steel & Wire Company) that had been banked for a good part of December, started up with the beginning of the new year.

PERSONAL.

T. Vaughan Stapler, for several years advertising manager for the American Sheet & Tin Plate Company, Pittsburgh, has resigned his position, and is now associated with the Hill & Stocking Company, Commonwealth Building, Pittsburgh, making a specialty of advertising literature, such as catalogues, booklets, mail folders, &c., and also in the preparation of advertising campaigns. He has been very successful in his particular line of work, and has already made some valuable connections among leading advertisers.

On January 2, Capt. Irving M. Bean of Milwaukee retired as president and head of the Northwestern Iron Company, after managing its business for 40 years. During the day a committee from the company's plant at Mayville, Wis., representing all the employees, presented the retiring president with a solid silver loving cup.

J. C. Miller, formerly sales agent of the Columbus Iron & Steel Company, Columbus, Ohio, has been elected secretary of that company.

Charles H. Norton of the Norton Grinding Company, Worcester, Mass., sails from New York on the Celtic, January 9, for a three months' business trip in Europe.

Lucien C. Brown, purchasing agent for the Ralston Steel Car Company, Columbus, Ohio, has been promoted to be manager of the New York office, which has been opened in the United States Express Building, 2 Rector street. Forest E. Green, Mr. Brown's assistant at Columbus, is promoted to the post of purchasing agent.

Charles M. Schwab and Archibald Johnston have gone to Cuba for the purpose of making an inspection of the iron ore mines of the Bethlehem Steel Corporation.

Reports that the Union Switch & Signal Company, Swissvale, Pittsburgh, had received a contract from the Pennsylvania Railroad for switch and signal equipment amounting to $25,000,000 are absurd. The company got a contract from the Pennsylvania Railroad about a year ago for considerable equipment, but the order has long since been filled. Its plant was shut down for a week, but started up again January 2, this being the original intention. The company has only a fair amount of work on hand.

The Commonwealth Trust Company, Pittsburgh, Pa., has been appointed receiver for the General Casting Company, Verona, Pa., near Pittsburgh. The bill on which the appointment was made was filed by Daniel Eagan, who says the company owes him $100,000, and that he has stock worth $5000. It is claimed that the debts of the company aggregate $216,000. His prayer for a receiver was joined in by the company.

The Automatic Vending Machine Company has been incorporated at Indianapolis, Ind., with $15,000 capital stock, to manufacture vending machines. The directors are R. E. Ressler, M. J. Ressler and G. A. McColley.

NEWS OF THE WORKS.

Iron and Steel.

The entire plant of the Youngstown Iron & Steel Roofing Company, at Youngstown, Ohio, manufacturer of black and galvanized sheets in iron and steel, metal lathing and flooring, was in full operation last week. For some time four hot mills have been operated, but the plant is on full now in all departments.

The Standard Iron Company blew out its blast furnace at Goodrich, Tenn., December 26. It will be out for something less than three months for relining and other repairs. The furnace had been run continuously since the latter part of March, 1904, and in the interval had not been banked in all more than two weeks. In addition to relining the furnace the company is putting in the C. W. Hunt system and will also raise the mantle and somewhat increase the capacity of the furnace.

The Illinois Steel Company blew out furnace No. 4 at its old South Works December 4, and furnace No. 7 at the new South works December 11. Joliet Furnace No. 1 was blown out December 14, and Union Furnace No. 3, December 19.

The St. Louis Blast Furnace Company, St. Louis, Mo., blew out its furnace, December 30, for relining.

No. 1 furnace of the Lackawanna Steel Company, Buffalo, N. Y., was banked December 27, and No. 2 furnace was blown out December 24.

The Bethlehem Steel Company blew out Furnace A at South Bethlehem, Pa., December 21, for repairs. Furnace D was blown out December 6.

Of the Pittsburgh District furnaces of the American steel & Wire Company, Edith and Neville Island are idle. The two Shoenberger stacks, which were banked for a considerable portion of December, were put in blast last week. In the Cleveland District the company now has two Central furnaces in blast, while one of this group and the Emma and Newburgh furnaces are out.

In the Pittsburgh District, 27 furnaces were in blast January 1 against 28 December 1. Clinton Furnace was blown out December 14. One Edgar Thomson spiegel furnace was blown out in December and two furnaces of the American Steel & Wire Company. One more Duquesne furnace and one more Edgar Thomson furnace were in blast January 1 than on December 1.

The Cambria Steel Company, Johnstown, Pa., had three out of eight furnaces in blast January 1, one having gone out December 9 and two December 23. Other western Pennsylvania furnaces which went out in December were Nittany at Bellefonte, Pa.; Perry at Erie, Pa., blown out December 16, and Scottdale at Scottdale, Pa., which had a break out December 17 and will be reconstructed.

The furnace of the Berkshire Iron Works, Sheridan, Pa., was blown out for repairs December 17.

Princess Furnace, at Glen Wilton, Va., was blown out December 9.

Victoria Furnace of the Goshen Iron Company, Goshen, Va., was blown out December 18.

The Wheeling Steel & Iron Company blew out its Belmont Furnace for relining December 8, and its Martins Ferry Furnace for the same purpose December 22. The former stack will be remodeled. Its Top Mill furnace was banked December 2.

Hamilton Furnace of the Hanging Rock Iron Company, Hanging Rock, Ohio, was banked December 24.

One stack of the Wellston Steel & Iron Company, Wellston, Ohio, was blown out December 7.

All the furnaces of the Republic Iron & Steel Company in the Shenango and Mahoning valleys, four in the former and two in the latter, were out of blast January 1.

No. 4 furnace of the Shenango Furnace Company, at Sharpsville, Pa., was blown out January 3.

Ella Furnace of Pickands, Mather & Co., at Sharpsville, Pa., was blown out December 31.

Brier Hill Furnace of the Brier Hill Coal & Iron Company, Youngstown, Ohio, was blown out January 1.

Mary Furnace of the Ohio Iron & Steel Company, Lowellville, Ohio, will probably be blown out on January 10.

The blast furnace of the Sharpsville Furnace Company, at Sharpsville, Pa., is expected to go out of blast about January 15.

Claire Furnace of the Claire Furnace Company, at Sharpsville, Pa., was blown out December 27.

Of the four Monongahela blast furnaces of the National Tube Company at McKeesport, Pa., stacks A and C were out of blast all of December, while furnaces B and D operated 13 days each in that month. The Lorain, Ohio, furnaces were all out of blast January 1.

The Washington Steel & Bolt Company, Edmonds, Wash., contemplates the installation of a rolling mill some time in the future to run in conjunction with its present works.

The entire plant of the Youngstown Sheet & Tube Company, Youngstown, Ohio, consisting of Bessemer steel plant, puddling department, pipe and sheet mills, is running practically full this week, after being closed down in nearly all departments for several weeks.

The 8, 9 and 10 in. finishing mills of the Sharon Steel Hoop Company, Sharon, Pa., have been started up after being idle nearly a month. The open hearth steel plant and blooming mill are still closed, but may possibly be started this month.

Blast furnaces Nos. 2 and 4 at the Ohio Works of the Carnegie Steel Company, Youngstown, Ohio, have been blown in again, but most of the metal is being shipped to New Castle, Pa., the Bessemer plant at Youngstown being closed to allow a new blooming mill to be installed.

The Worth Brothers Company, Coatesville, Pa., contemplates the installation of about 12 more forge fires in connection with its tube works.

The sheet mills of the Alan Wood Iron & Steel Company, Conshohocken, Pa., were started at half capacity January 6, after several weeks' idleness.

General Machinery.

The Nodamp Machinery Company, Minneapolis, Minn., manufacturer of concrete machinery, may enlarge its plant in the spring and install additional machinery. At the present time the company contracts for its castings and does the assembling at its own plant. F. W. Tidhall is president; D. J. Ames, vice-president, and J. T. Thurman, secretary and treasurer.

Thomas Carlin's Sons Company, 1600 River avenue, Allegheny, Pa., manufacturer of contractors' equipment, including hoisting engines, steam shovels, &c., also grinding pans and shearing machinery, has received an order through Takata & Co., the New York export house, for one of its concrete mixers for the Imperial Railway of Japan. Other export business includes shipment of a hoisting engine to Spain and a gold dredging engine for Central America. The company has recently supplied two large hoisting engines for Mobile, Ala., and has contracts for five grinding pans and 15 shears, aggregating a considerable tonnage, for shipment to various other points.

H. L. Dixon, Pittsburgh, expects to occupy his new plant at Rosslyn Station, near Carnegie, Pittsburgh, about February 1, at which time he will have removed the machinery from his present plant at Carnegie. The buildings to accommodate the foundry, machine and forge departments are about completed. Electric drive by line shaft and individual motors will be used throughout the works wherever practicable. Mr. Dixon makes a specialty of glass works construction and machinery and does job casting work. About four months ago he sold the ground and buildings now occupied at Carnegie to the Superior Steel Company, which will use a portion of the ground for an open hearth plant.

The Frick & Lindsay Company, mine and mill supplies, Pittsburgh, Pa., has leased space in the Pittsburgh Terminal Warehouses on the South Side, and will shortly make all shipments from the new location, as well as receiving all inbound freight there. Messenger, Pringle & Co., also of Pittsburgh, and dealers in oil well supplies and machinery, have leased space in the same building, and will use it for a similar purpose. Both concerns will, however, maintain their downtown sales offices and stores.

Power Plant Equipment.

The N. C. Davison Company, Empire Building, Pittsburgh, Pa., has recently taken orders for Riverside gas engines made by the Riverside Engine Company, Oil City, Pa., as follows: Pittsburgh Plaster Company, 40-hp.; Fort Pitt Bedding Company, Allegheny, 80-hp.; Burgettstown Milling Company, 80-hp. Bessemer gas engines made by the Bessemer Gas Engine Company, Grove City, Pa.: Herberts Brothers, Brownsville, Pa., 25-hp.; Haller Bread Company, 15-hp.; Bergman Mfg. Company, Pittsburgh, 25-hp.; United States Radiator Company, West Newton, 150-hp.; West Newton Water Works, 20-hp. Bessemer gas engine for furnishing pumping power: United States Coal Company, Gary, W. Va., 5 x 6 in. track pumps, and from the Hitchman Coal Company, Glendale, W. Va., a 6½ x 7 in. triplex pump.

The Mosher Water Tube Boiler Company, New York, has increased its capital stock from $200,000 to $300,000.

The United States Boiler Appliance Company of Pittsburgh has been granted a charter with a capital of $25,000 and will erect a plant in the Pittsburgh District to manufacture boilers and engines. The incorporators are A. K. Young and H. D. Gamble of Pittsburgh and Harry W. Davis of Wilmington, Del.

The Pittsburgh office of A. D. Granger & Co. has secured an order for two 400-hp. automatic compound Skinner-Corliss engines for the Pittsburgh Seamless Tube Company at Monessen, Pa.

The Mountain State Boiler Works, Parkersburg, W. Va., recently destroyed by fire, has erected a temporary building to carry on operations until spring, when a concrete building will be erected. A stock company will be formed with a capital of $25,000, and the equipment of the plant will be increased at that time.

The West Newton Light, Heat & Power Company, West Newton, Pa., has been incorporated by Manning Stires, Edward McSweeney and L. V. Sutton, all of West Newton, to furnish

electric light, heat and power to the residents and industries of that borough and vicinity.

It is reported that the northern division of the Baltimore & Ohio Railroad, from Butler to Kane, Pa., will be converted into an electric trolley line this year. The power station will be located at the Butler end of the line, with substations distributed at convenient points between that city and Kane.

Foundries.

The Damascus Bronze Company, South avenue, Allegheny, Pa., has recently purchased more ground adjoining its present plant, on which it will erect in the spring a 75 x 100 ft. brick and steel building as an extension to its foundry. This will give it an increased production in its line of brass and bronze castings.

The King Stove & Range Company, Sheffield, Ala., is arranging to rebuild the portion of its plant recently destroyed by fire. A new foundry room, 300 ft. long, with concrete walls, will be erected and equipped with complete overhead trolley system and foundry equipment.

The Arcade Malleable Iron Company, Worcester, Mass., manufacturer of malleable iron castings, has vacated its works at Washington square and occupied the remodelled plant at Albany and Muskeego streets. The company is now equipped to manufacture on a larger scale than ever before, with a force of 100 men.

The Sharon Foundry Company, Sharon, Pa., has started up its foundry at Wheatland, Pa., practically full time, after running half time or less for three or four weeks.

An application for a charter will be made on January 21 by Richard W. Jones, Hubert P. Wiggins and Henry A. Jones for a corporation to be called the Titanic Steel Casting Company, Pittsburgh, Pa.

The business of the Norton Foundry Company, Norton, Va., has been taken over by a new company which will use the plant for the manufacture of mine cars and light mining and sawmill machinery and for general repair work. Rudolph Schwank is president and manager; C. J. Schwenk, vice-president, and J. R. McNutt, secretary and treasurer.

Fires.

The plant of the W. Cummings Leather Company, Woburn, Mass., was destroyed by fire January 5, the loss being about $50,000.

The coal tipple and power plant of the Belmont Coal Company at Crown Hill, W. Va., near Montgomery, was burned January 1. The loss is placed at $25,000.

The electric light plant at the Edgar Thomson steel works of the Carnegie Steel Company, Braddock, Pa., was badly damaged by fire January 2. The loss will amount to about $10,000. The building was 50 x 100 ft., and will be repaired at once.

Hardware.

The John Knape Machine Company, Grand Rapids, Mich., manufacturer of special machinery and metal press work, has increased its capital stock from $15,000 to $20,000. Owing to the rapidly increasing business the company found it necessary to enlarge its factory and plating plant, and is now provided with facilities to make and finish its newly patented Monarch show case bracket and standard. The officers of the company are John Knape, president; E. J. Vogt, treasurer; J. Pearn, secretary.

The Schwene Mfg. Company, Ogden, Iowa, and the Perry Mfg. Company, Perry, Iowa, have been consolidated under the latter style. The new company at Perry, Iowa, will manufacture a line of steel hardware and specialties, including a pressed steel toy wagon; also dies and special machinery. In order to take care of the business and make prompt shipments plans have been completed for the construction of a new factory, 50 by 100, two stories high, also drying sheds and storage warehouse for steel, the buildings to be erected as soon as the weather permits.

The Ward Fence Company has moved its office from Marion, Ind., to Decatur, Ind., where it is building a large factory for the manufacture of poultry fencing, ornamental wire and steel picket lawn fence, &c.

Dufur & Co., Baltimore, Md., manufacturers of wire goods, have been enlarging their weaving department and state that they are now in a better position than ever in the past to furnish the trade promptly all size meshes and grades of brass, copper, tinned and steel wire cloth.

Miscellaneous.

The Woods-Evertz Stove Company, Springfield, Mo., has increased its capital stock from $100,000 to $130,000, fully paid up. A new factory building, 86 x 160 ft., and a foundry 60 x 150 ft., both modern fireproof buildings, construction of concrete blocks, have just been completed.

The Edison Phonograph Works, Orange, N. J., which has been engaged upon building extensions to its plant for the last few years, has about completed the last one of a group of five-story concrete buildings and has arranged for the equipment. An addition to the power plant has been completed, consisting of a boiler house, 35 x 67 ft., equipped with three Morrin Climax boilers, two of 750 hp. and one of 500 hp. capacity. The company has also added a 1500-hp. Allis vertical compound engine, direct connected to General Electric generator of 100-kw. capacity.

The Simplex Faucet Company, Hyde Park, Mass., has taken commodious manufacturing quarters in that place, and has begun the manufacture of Simplex faucets and Whitney faucets and ball cocks on a larger scale. The works are equipped for the production of its specialties on a commercial basis, in a building admirably fitted for the purpose. Alfred L. Lovejoy is the president and Charles B. Whitney treasurer.

James E. McWilliam, Hubbardstown, Mass., manufacturer of fire extinguishers and textile machine goods, whose plant was wrecked recently by the explosion of a boiler, announces that he will rebuild on the premises.

The Pease Machine Company, Pittsburgh, Pa., is installing the last of the motors, compressors and dynamos to operate the window glass making machines that are being installed in the old factory of the Johnston Glass Company at Hartford City, Ind. The first work will be largely experimentary, but Rodger S. Pease, the inventor of the machine that is to make the glass cylinders, will have supervision of the plant, and he is confident that a marketable product will be made from the start. Mr. Pease is the inventor of the mechanical blowers now in use in the plants of the American Window Glass Company. The machine blows the glass with compressed air. One of them will make as much glass as eight human blowers in the same time.

D. E. Berry & Co., Evansville, Ind., have been incorporated, with $10,000 capital stock, to manufacture and deal in electrical fixtures and supplies. The directors are D. E. Berry, H. McKay Berry and C. E. Jett.

The Metal Web & Spring Company has been incorporated at Indianapolis, Ind., with $15,000 capital stock, to manufacture metal webbing for upholstery. The directors are T. A. Cole, A. L. Henry and P. J. McDonald.

The Elkhart Dry Battery & Signal Company has been incorporated at Elkhart, Ind., with $25,000 capital stock, to manufacture dry batteries and electric signals. The directors are Wm. F. Seidel, Ernesto Sassenhoff, A. Elmer Manning and Chas. W. Stockdale.

The McDowell Mfg. Company has been incorporated at Auburn, Ind., with $20,000 capital stock, to manufacture motor vehicles. The directors are Willis McDowell and Alverow McDowell.

A decree in dissolution has been asked for in the Allegheny County courts by the Ferguson Tin Plate Company, operating a plant at Torrens street and Pennsylvania Railroad, Pittsburgh. The company has no liabilities, and the dissolution was agreed upon by the stockholders.

The Ohio Suits Against the Plumbing Supply Trade.

Without explanation, a wrong impression is given in the newspaper accounts of the decree of the Ohio Court in the suits brought in Franklin County by Attorney General Wade Ellis against concerns engaged in the plumbing supply business and members of the supply associations. The final action by the court is extremely moderate, and only has bearing on those resolutions adopted years ago by the supply associations, which were found to contravene the provisions of the Valentine law and which resolutions were rescinded months ago. The suit in the courts was carried through, and it is gratifying to the trade that the decree disposes of the matter with no further orders than were anticipated and complied with in the rescinding of the above mentioned resolutions.

Notwithstanding the impression that might be gathered from the newspaper presentation of the decree, it does not apply in any way to the supply associations or their members in Ohio, except in reference to the Detroit and other resolutions, which were rescinded. It does not require the Ohio members to withdraw and forego the benefits from membership in a co-operative association or apply to other rules of the association than those already mentioned. This is the situation that is left after the courts are through with the case. It is very encouraging after the irritation and anxiety to business men which it has naturally caused.

The attitude of the Ohio courts is shown to be much more reasonable than some who have been excessively nervous or unnecessarily impatient and vexed were prepared to believe. The whole course of the Ohio officials and the association leaders in this case has been to conserve business interests and to avoid any of the deplorable effects that were feared by business men in other lines who were watching with interest the final disposition of the case.

The Iron and Metal Trades

To drop within less than three months from a rate of production of Pig Iron of 27,000,000 tons per annum to a rate of 12,000,000 tons on the first of January is what the industry has accomplished. It shows how thoroughly manufacturers have been imbued with the conviction that it is wiser to meet changed conditions rather than continue in the hope of early betterment and pile Iron in the interval.

The returns to *The Iron Age* show that the production of Coke and Anthracite Pig Iron during December was 1,234,279 gross tons, as compared with 1,828,125 tons in November and 2,336,972 tons in October. While there were 226 furnaces in blast on December 1, with a capacity of 347,372 tons per week, there were only 149 furnaces in operation at the opening of the current year with a capacity of 232,652 tons, which is practically at the rate of 1,000,000 tons per month.

The output of the Steel companies, which was 1,514,521 tons in October, fell to 659,459 tons in December. The merchant furnaces which lagged at first in adjusting themselves are now following suit. Their production was 822,451 tons in October, fell only to 744,011 tons in November, but dropped to 574,820 tons in December. During that interval there was some accumulation of metal.

These figures are significant because they reflect closely the attitude and the action of the whole industry.

The majority of Pig Iron makers have withdrawn the lowest quotations which they have recently made, and the markets are firmer, although there are still some isolated sellers at former figures. Thus the leading Southern producers are asking $13.50 for No. 2 Foundry at Birmingham, and Eastern furnacemen are quoting $18.25 for No. 2 in the Philadelphia District, $17.75 to Pipe foundries on the Delaware River, $18.50 at Jersey City and $19.50 in New England. Basic is quoted $17.25, delivered.

There has been more business in the leading distributing centers, both in Foundry Irons and in Basic Pig, and inquiries are more numerous, but the quantities involved are not large.

Reports from the finishing mills are rather discouraging. There has been some accumulation of orders, justifying temporary resumption of operations, but no really important new business has been booked. The Rail trade is dull and the irregularity of prices in Light Rails seems to foreshadow lower prices. The Structural mills have a little business in sight, among which is a 4000 ton inquiry from the New York Central for terminal work, and the first installment of 1500 tons out of a total of 4000 tons for the New Haven viaduct at Providence.

The leading interests have announced a reduction in prices of Blue Annealed Sheets of $1 per net ton, of Black Sheets $2 per ton, except Nos 29 and 30, which are down $3 per ton, of Galvanized Sheets $4 per ton, except Nos. 29 and 30, which are lowered $6 per ton, of Painted Roofing Sheets 10 cents per square and of Galvanized Roofing Sheets of 15 cents a square. The larger reductions in Galvanized material are due to the decline in Spelter. The lower price of Pig Tin has led to a reduction of 20c. per box in the price of Tin Plate.

In the Connellsville Coke District product has been cut down in a manner unprecedented in the history of the industry. The wages have just been restored to the figures prevailing before the last advance in March of last year. Prices are weak and standard Connellsville Furnace Coke is being offered at $1.90, at oven.

Copper is steadier and first hands are asking 14c. for both Electrolytic and Lake, which second hands are shading slightly.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Jan. 8, 1908.	Jan. 1, 1908.	Dec. 11, 1907.	Jan. 9, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	*$18.25*	$18.00	$18.50	$25.50
Foundry No. 2, Southern, Cincinnati	*16.25*	16.25	17.50	26.00
Foundry No. 2, Local, Chicago	*18.00*	18.50	19.00	25.50
Bessemer, Pittsburgh	*18.90*	19.40	19.90	23.35
Gray Forge, Pittsburgh	*17.40*	17.65	18.40	22.85
Lake Superior Charcoal, Chicago	*22.50*	23.50	25.00	27.00
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	29.50
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.50
Open Hearth Billets, Phila.	30.00	30.00	30.00	33.00
Wire Rods, Pittsburgh	34.00	34.00	34.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	*12.00*	12.00	13.00	18.00
Steel Rails, Melting, Phila.	11.50	11.50	11.50	18.75
Iron Rails, Chicago	*15.00*	15.00	15.50	28.00
Iron Rails, Philadelphia	*16.50*	17.50	17.50	27.50
Car Wheels, Chicago	*19.00*	20.00	22.00	25.00
Car Wheels, Philadeelphia	19.00	19.00	19.00	23.00
Heavy Steel Scrap, Pittsburgh	....	12.50	13.50	19.00
Heavy Steel Scrap, Chicago	*10.75*	10.75	11.50	17.00
Heavy Steel Scrap, Philadelphia	11.50	11.50	11.50	18.50
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.75	1.75	1.75	1.88½
Common Iron Bars, Chicago	1.75	1.75	1.75	1.81½
Common Iron Bars, Pittsburgh	1.60	1.60	1.60	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.70	1.70	1.70	1.65
Skelp, Sheared Steel, Pittsburgh	1.80	1.80	1.80	1.70
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	*2.40*	2.50	2.50	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	2.00	2.00	2.00	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	**13.87½**	13.62½	13.62½	24.25
Electrolytic Copper, New York	**13.75**	13.50	13.50	24.00
Spelter, New York	*4.40*	4.20	4.50	6.80
Spelter, St. Louis	*4.27½*	4.05	4.35	6.60
Lead, New York	*3.65*	3.75	4.00	6.30
Lead, St. Louis	*3.60*	3.60	3.75	6.10
Tin, New York	*28.75*	27.25	28.40	41.55
Antimony, Hallett, New York	8.75	8.50	8.75	25.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	*$3.89*	$4.09	$4.09	$4.09

Chicago.

FISHER BUILDING, January 8, 1908.—(*By Telegraph.*)

Responsive to the decline in raw materials, and directly following the recent rdeadjustment of Sheet Bars to $29, Pittsburgh, a reduction in the price of Sheets has been announced. The new prices now effective represent a decline ranging from $1 a ton on heavy and $2 a ton on light Black Sheets to $4 on Galvanized. The present schedule makes No. 10 Blue Annealed 1.98c.; No. 28 Box Annealed, 2.68c., and No. 28 Galvanized, 3.73c., Chicago. Cast Iron Pipe has also receded another $1 a ton, but even with this concession current quotations would likely be strongly shaded on round lots. Market activity is, however, principally confined to inquiries, which in the main are regarded as reflecting a desire to keep in touch with the market rather than a purpose to buy. A weaker tendency is observed in Light Rails, which notwithstanding a recent reduction of $2 a ton have been sold at a substantial concession from regular prices. There is but little demand for Light Rails from any source, and Track Supplies are equally quiet. Not much new business in Structural Shapes is coming out, the tonnage comprised in last week's contracts taken by the American Bridge Company amounting to but 2700. Pending accumulation of orders the Structural mills of the Illinois Steel Company are closed down. Other finishing departments, as well as independent mills in this district, are running intermittently so that the reported starting and stopping of this or that mill has no other significance than to indicate the volume of business offered. Efforts made by furnacemen to prevent further sagging of Pig Iron prices, through a better understanding

between the various interests, have not shown desired results. With several of the chief producers holding nominally at a basis of $13.50, Birmingham, for No. 2 Foundry, and $18.50, Chicago, for Northern No. 2, $13 is still being offered freely on the former and $18 on the latter. Attracted by the low prices ruling on Scrap material, dealers are beginning to show an inclination to buy when inducements are offered. There is practically no demand from consumers.

Pig Iron.—The fact that $13, Birmingham, for No. 2 Foundry is still being offered on deliveries extending through the first quarter, and that at least $13.25 has been done during the week on first half contracts, would indicate that the influences which were relied upon to hold the market above this point have thus far proved ineffective. Several of the largest Southern interests are quoting $13.50, Birmingham, as a minimum, but the uniformity necessary to maintain this level is lacking. Curtailment of production, drastic as it has been, scarcely equals the decrease in consumption, and there is nothing in the present situation that lends encouragement to the hope of immediate improvement in this respect. Of the numerous inquiries received but few result in orders. Among the sales reported for the week were several lots of from 50 to 500 tons, mostly for shipment within the first quarter. Inquiries for Basic aggregating 2000 tons from two large consumers, which were in the market some weeks ago, have reappeared and are now believed to represent actual requirements. A firmer attitude of the Northern furnaces, which a week ago seemed to warrant an inside quotation of $18.50, has not been rigidly maintained, due doubtless to the unresponsive action of Southern Iron. As an indication of melters' stocks, it may be noted that practically no demands are being made for reinstatement of shipping orders on suspended contracts. Such orders may be reasonably expected to precede a renewal of buying on a considerable scale. The following prices are for January, February and March delivery, f.o.b. Chicago:

Lake Superior Charcoal	$22.50 to $23.50
Northern Coke Foundry, No. 1	18.50 to 19.00
Northern Coke Foundry, No. 2	18.00 to 18.50
Northern Coke Foundry, No. 3	17.50 to 18.00
Northern Scotch, No. 1	19.00 to 19.50
Southern Coke, No. 1	17.85 to 18.35
Southern Coke, No. 2	17.35 to 17.85
Southern Coke, No. 3	16.85 to 17.35
Southern Coke, No. 4	16.35 to 16.85
Southern Coke, No. 1 Soft	17.85 to 18.35
Southern Coke, No. 2 Soft	17.35 to 17.85
Southern Gray Forge	15.35 to 15.85
Southern Mottled	14.85 to 15.35
Malleable Bessemer	18.50 to 19.00
Standard Bessemer	21.00
Jackson Co. and Kentucky Silvery, 6 %	28.40 to 28.90
Jackson Co. and Kentucky Silvery, 8 %	30.40 to 30.90
Jackson Co. and Kentucky Silvery, 10 %	32.40 to 32.90

(*By Mail.*)

Billets and Rods.—The demand for Forging Billets continues to be restricted to small lots for immediate requirements, there being no inquiries for, or sales of, any considerable tonnage reported. On current business $33 to $34 is still quoted. In the absence of transactions Wire Rods remain nominally at $34 to $35, Pittsburgh.

Rails and Track Supplies.—The entrance of the new year has thus far not been marked by any signs of activity on part of the railroads looking toward the placing of orders for 1908 Rail requirements. Neither has there been any better offering of specifications on tonnage carried over from last year, and unless a betterment in this respect develops in the near future the local mills will be compelled to suspend operation. The combined effect of cheap rerolling sections and scant demand is reflected in irregularity of quotations on Light Rails, which seem to foreshadow lower prices. We quote as follows: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.90c. to 2c., according to delivery; Track Bolts, 2.40c. to 2.50c., base, Square Nuts, and 2.55c. to 2.65c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb. sections, $30; 20-lb., $31; 16-lb., $32; 12-lb., $33, f.o.b. mill. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—Orders totaling 1000 tons, comprising material for two St. Louis buildings, were taken during the week by the American Bridge Company, together with 2700 tons of miscellaneous orders, including railroad bridges and small Structural jobs. Under the pressure of competition prices on fabricated work have been so far reduced as to leave but a very small margin of profit. The Structural mill of the Illinois Steel Company is at present idle, and new business is accumulating very slowly. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—Business in Plates is exceedingly dull, and, judging from the lack of inquiries, there are no offerings of important tonnage in contemplation for the immediate future. Shipments of store stocks are made up principally of small orders representing immediate needs, the aggregate tonnage of which is light. No change in prices has yet been announced, either from mill or store stocks. We quote for shipment from mill as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.20c. to 2.30c.; from 72 to 96 in. wide, 2.30c. to 2.40c.; 3-16 in. up to 60 in. wide, 2.30c. to 2.40c.; 72 in. wide, 2.50c. to 2.65c.; No. 8, up to 60 in. wide, 2.35c. to 2.45c.; Flange and Head quality, 0.25c. extra.

Sheets.—Following a persistent offering of concessions from established prices by some mills, a reduction of $1 a ton on Blue Annealed, $2 a ton on Box Annealed and $4 a ton on Galvanized Sheets has been made by the principal interest. The increased spread between Black and Galvanized is due to the continued cheapening of Spelter. In view of the recent reduction in store prices, quotations are not correspondingly lowered, although Blue Annealed and Galvanized are revised and are quoted $1 and $2 lower, respectively. Both mill and store business is at low ebb, and the effect of cheaper prices in stimulating buying will be watched with interest. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 to 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c. Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c. Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—Nothing has developed to change the situation in Bars as respects either price or demand. Enough orders for Bar Iron are coming out to keep the local mills running about half time. Steel Bars are extremely quiet. There have, as yet, been few forwarding orders on suspended shipments, and new specifications against contracts are equally scarce. The amount of new orders offered is too small to cut any appreciable figure in the maintenance of rolling schedules. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.75c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—The demand is closely limited to filling in orders. Since it is now possible to get prompt shipment from the mills there is no necessity for jobbers to anticipate their wants far ahead; consequently they are buying only what is needed for nearby needs. Jobbers report a light demand for store shipments, orders being principally to cover uncompleted work. Prices are unchanged and the following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 72 per cent. on Black Steel Pipe, ¾ to 6 in. About four points advance above these prices is asked for Iron Pipe.

Boiler Tubes.—Merchant Tubes are inactive, there being no demand beyond small orders for work in hand. Locomotive Tubes are also moving slowly. Store trade is quiet, but prices are fairly maintained at the usual discounts. Mill quotations for future delivery, on the base sizes, are as follows: 2¾ to 3 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2¾ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1¼ in.			
1½ to 2 in.			
2½ in.			
3 to 3½ in.			
4 in.			

Merchant Steel.—Business is practically at a standstill. Neither the implement makers nor the jobbing trade are asking for shipments on held-up specifications, and new orders are few and insignificant in point of tonnage. What little business there is in Shafting is characterized by more or less irregularity as to quotations, and the market price is frequently shaded. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c.; Iron Finish, 1½ x ½ in. and larger, 1.78c., base; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c.,

and 1⅛ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 54 per cent. off in car lots; 48 per cent., less than car lots, base territory delivery.

Cast Iron Pipe.—A little encouragement is felt in the greater number of inquiries received within the past few days. Several of the larger Western municipalities have been asking prices, and it is believed that when buyers are convinced that the bottom has been reached business will improve in a very decided manner. At the present time orders are confined to miscellaneous lots of small tonnage. After a two weeks' shutdown most of the plants of the United States Cast Iron Pipe & Foundry Company has resumed, though all of them are running light. Prices are reduced $1 a ton and herewith revised. We quote, per net ton, Chicago, as follows: Water Pipe, 4-in., $32; 6 to 12 in., $31; 16-in. and up, $30, with $1 extra for Gas Pipe.

Old Material.—Offerings for the past week from railroads and other sources have been extremely small, and there has in consequence been not enough doing to influence the market one way or the other. As a result, values have remained practically stationary, except for a slight recession on a few grades. Having accumulated considerable stock on the downward trend of the market, the mills are not actively seeking additional tonnage even at the low prices now ruling. Nor is the demand any better for Melting grades. Easier money conditions now prevailing are expected to bring the dealers into the market a little more actively, though it is doubtful if there will be much buying of this character until the future course of trade is better established. The railroad offerings for this week comprise 3150 tons, of which the Santa Fé tendered 2800 tons and the Wisconsin Central 350 tons. We quote per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$15.00 to $15.50
Old Steel Rails, rerolling	12.00 to 12.50
Old Steel Rails, less than 3 ft	12.00 to 12.50
Relaying Rails, standard sections, subject to inspection	22.00 to 25.00
Old Car Wheels	19.00 to 19.50
Heavy Melting Steel Scrap	10.75 to 11.25
Frogs, Switches and Guards, cut apart	11.00 to 11.50
Mixed Steel	8.50 to 9.00

The following quotations are per net ton:

Iron Fish Plates	$13.00 to $13.50
Iron Car Axles	15.50 to 16.00
Steel Car Axles	15.00 to 15.50
No. 1 Railroad Wrought	10.75 to 11.25
No. 2 Railroad Wrought	9.50 to 10.00
Railway Springs	10.00 to 10.50
Locomotive Tires, smooth	15.00 to 15.50
No. 1 Dealers' Forge	8.50 to 9.00
Mixed Busheling	7.50 to 8.00
Iron Axle Turnings	6.75 to 7.25
Soft Steel Axle Turnings	6.75 to 7.25
Machine Shop Turnings	6.75 to 7.25
Cast Borings	4.75 to 5.25
Mixed Borings, &c	4.75 to 5.25
No. 1 Mill	7.00 to 7.50
No. 2 Mill	6.00 to 6.50
No. 1 Boilers, cut to Sheets and Rings	7.00 to 7.50
No. 1 Cast Scrap	12.75 to 13.25
Stove Plate and Light Cast Scrap	11.50 to 12.00
Railroad Malleable	10.00 to 10.50
Agricultural Malleable	9.00 to 9.50
Pipes and Flues	8.00 to 8.50

Metals.—Due to a stronger tone in the Metal market, which is reflected in a slight advance on Copper, a little better volume of business has developed during the week. Actual orders placed were not, as a rule, for large amounts, but a good many inquiries have been received asking for prices on round lots for delivery through the first quarter. Other Metals are also somewhat firmer, although the demand cannot be said to have greatly improved. A little better feeling is observed in the Old Metal market, but has not developed far enough to influence prices, which remain unchanged. We quote as follows: Casting Copper, 14¼c.; Lake, 14¾c. to 15c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 29½c.; small lots, 30½c.; Lead, Desilverized, 4c. to 4.05c., for 50-ton lots; Corroding, 5.15c. to 5.25c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 4.60c.; Cookson's Antimony, 13c., and other grades, 11c. to 11½c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 13½c.; Heavy Copper, 13½c.; Copper Bottoms, 12c.; Copper Clips, 12c.; Red Brass, 13c.; Yellow Brass, 10½c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 23c.; Block Tin Pipe, 25c.

Although combined cars and mail cars of steel construction have been turned out of the Pennsylvania Railroad Company's shops at Altoona, it was not until December 28 that the first all-steel passenger car was finished and given a trial run to Huntingdon. The new coach is 74 ft. 10 in. long, weighs 116,100 lb., is lighted by electricity and seats 88 people.

Cleveland.

CLEVELAND, OHIO, January 7, 1908.

Iron Ore.—With a large proportion of the blast furnaces idle the Ore movement from the docks shows no improvement, there being practically no shipping orders. Nothing is being done as yet about Ore prices for the coming season, and it is not expected that a buying movement will start before spring. Lake shipbuilders have booked orders for 20 bulk freighters for delivery during 1908. This is a large falling off as compared with the past season, when 41 such freighters were built. The capacity of the new boats will not be quite so large as those built during 1907. During the past season a number of 600-ft. boats were placed in commission, but the largest vessels ordered for this year will be only 564 ft. long. The average carrying capacity of the new boats is 8710 tons. Most of the new boats are to be completed in time to go into commission at the opening of navigation in the spring. The leading shippers have not ordered any new tonnage, and nearly all the vessels to be built for this season will be operated by independent owners. To the list of 20 new freighters may be added about half a dozen boats that were ordered for 1907 delivery, but were not placed in commission. Nominal Ore prices remain as follows at Lake Erie docks, per gross ton: Old Range Bessemer, $5; Old Range Non-Bessemer, $4.75; Old Range Non-Bessemer, $4.25; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.25; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—As the result of the inquiries for Northern Foundry Iron during the past two weeks, one local interest has sold between 2000 and 3000 tons of No. 2 Iron for first quarter and first half delivery. Some of the Iron was sold at $17.50, some at $17.25 and some at between $17 and $17.25, the above prices being at Toledo furnace. Inquiries continue to come in, and it is believed that there will be a fair volume of buying before the end of the month. The inquiries are all from outside foundries. Local foundries as a rule have enough Iron in their stock piles or undelivered on old contracts to last them about two months. For first quarter and first half delivery $17 seems to be the established price for No. 2 Foundry Iron at Valley furnace, although some interests are asking $17.50. One local furnace is quoting No. 2 Foundry at $17 for outside shipment during the first half and $17.50 delivered here. Nearly all the furnaces that have gone out of blast in this territory accumulated stock piles sufficient to fill all old contracts before going out of blast. These stock piles are not being depleted very rapidly by shipping orders. There is little inquiry for spot Iron, and that is mostly for car lots. With perhaps one exception it is not probable that any more furnaces will go out of blast in this territory. There are two inquiries in the local market for Basic Iron, one for 1000 to 2000 tons and the other for 500 tons. The most of the Iron is wanted for January delivery. There are some small inquiries for Southern Iron, but they seem to be mainly for the purpose of testing the market. Quotations for prompt shipment, first quarter and first half, f.o.b. Cleveland, are as follows:

Bessemer	$19.40
Northern Foundry, No. 1	$17.50 to 18.00
Northern Foundry, No. 2	17.00 to 17.50
Northern Foundry, No. 3	16.50 to 17.00
Southern Foundry, No. 2	17.35 to 17.85
Gray Forge	17.40

Coke.—The market is weak and inactive. The only transaction of any size during the week was the purchase by local interests of a supply of Furnace Coke for January. What is claimed to be standard Connellsville Furnace Coke is offered for delivery during the year at $1.85, at oven. Most producers are holding standard Connellsville Furnace Coke at $2 for spot delivery and $2 to $2.25 at oven, for first half. We quote Connellsville Foundry Coke at $2.75 for spot and first half. Inferior grades are selling at $2.50.

Finished Iron and Steel.—While the situation has not changed materially, there is a slight improvement in the demand, and inquiries are coming in a little better. The general feeling has improved considerably, and while it is too soon after the holidays to notice much of a renewal of activity, it is believed that orders will show considerable improvement before the end of the month. The possibility that prices will be lower is believed to be holding back some consumers who would place orders covering their early requirements without delay were they certain that present prices are to be maintained. Notification of the reduction of the price of Sheets has been received by local jobbers. A reduction of $2 per ton is made on Black Sheets and $4 per ton on Galvanized. The establishment of new prices is expected to have a good effect on the Sheet market by bringing out orders from consumers who have been waiting for such action. Local jobbers announce that they will probably not make a reduction in the warehouse price on Sheets because of the small margin of profit that they have been getting. During the week some small contracts for Steel Bars for the first half delivery have been closed. Mills are receiving some orders on contracts, but they are limited in tonnage. Local mills have taken some orders for Bar Iron

during the week. The two local Bar mills which shut down before the holidays will start up in a few days to fill their accumulated orders, probably next Monday. Prices on Bar Iron remain weak, and orders have been placed at 1.50c., Cleveland, and possibly lower. The mill of the Cleveland Steel Company, which shut down early in December for extensive repairs, will be started up about January 20. The Structural situation shows considerable improvement. Local shops received one inquiry for 800 tons and another for 400 tons during the week. Although there is no large work in sight, it is believed that there will be a fair demand for Structural Material for small construction work in this territory during the next few weeks. The demand for Light Rails for coal mines is keeping up fairly well in lots of one and two carloads, but mills rerolling Rails are getting about all the orders by shading prices from $3 to $4 per ton. There are inquiries for 150 tons of Standard Sections from traction lines. The price on Steel Bars is being firmly maintained. We quote Steel Bars at 1.70c., Cleveland, for carload lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼ in. and heavier, 1.80c., base, Cleveland. Revised mill prices on Sheets, carload lots, Cleveland, are as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Warehouse sales continue light. Jobbers' prices are unchanged. We quote Steel Bars, out of stock, at 1.90c. to 1.95c., and Iron Bars at 1.95c. to 2c. Beams and Channels out of stock are 2.10c. to 2.15c., base. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.20c.; Box Annealed, No. 28, 2.90c.; Galvanized, No. 28, 4.05c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—No improvement is as yet noticeable, but dealers think that the demand will pick up somewhat in the next two or three weeks. Local mills are still shut down, and consumers are making no contracts for future needs. Some dealers, who believe that prices are at the bottom, are buying Scrap on speculation, and piling it in their yards, but are unable to pick up a great deal, as owners are holding it for higher prices. The railroad offerings this week include about 2000 tons to be sold by the Pennsylvania Lines, West. Prices, which are largely nominal, are unchanged. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$11.00 to $11.50
Old Iron Rails	16.00 to 17.00
Steel Car Axles	18.00 to 19.00
Old Car Wheels	16.00 to 17.00
Relaying Rails, 50 lb. and over	25.50 to 26.00
Relaying Rails, under 50 lb	28.00 to 29.00
Heavy Melting Steel	11.00 to 11.50
Railroad Malleable	12.00 to 13.00
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	9.00 to 10.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$17.00 to $18.00
Cast Borings	4.50 to 5.00
Iron and Steel Turnings and Drillings	6.50 to 7.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	10.50 to 11.00
No. 1 Railroad Wrought	11.00 to 12.00
No. 1 Cast	12.00 to 13.00
Stove Plate	10.00 to 10.50
Bundled Tin Scrap	9.00

Cincinnati.

CINCINNATI, OHIO, January 8, 1908.—(*By Telegraph.*)

While there is yet apparent no evidence of a normal market nor a restoration of the influences which tend to induce normal conditions in Iron and Steel products, the feeling in the trade and among Pig Iron people is that the bottom has been reached in prices, particularly of Northern Irons, and that with the slow but steadily increasing melt and buyers and furnacemen practically at a standstill the situation is not unpromising. The banks in this section are less conservative than for the last quarter of 1907. The Scrap stock is being gradually reduced, the idle tool concerns have all resumed, and machinery dealers report some unexpected but welcome buying within the past four and five days. There is a better feeling, and it is not confined to any special class of Iron or Steel workers. The purification process temporarily embarrasses some large manufacturers, but it has also brought to a standstill all unnatural or unreasonable demands or effects of over inflation. The statement is made at National Metal Trades headquarters in this city to-day that it is the first time in the history of the organization that their officers can say, "We have not a single strike to deal with. The strike page is absolutely clean."

Pig Iron.—More inquiry is the ruling comment throughout the local field of sellers, and there are some feelers out for Iron for the last half. Withdrawing the $13 quotation on Southern No. 2 is having a tendency to stimulate some of the halting ones. There is still some $13 Iron to be had, however, and for second quarter requirements there is no doubt that that figure could be done. Some of the Southern furnaces are holding the price firm at $13.50. Basic seems to have the call this week, and there are known to be at least three inquiries for good sized tonnages out. The largest is for 5000 tons for first half delivery to an Ohio melter. Another is for 2000 tons for prompt shipment to a Chicago concern. The third comes from Cleveland, and is for 1000 to 2000 tons for first quarter delivery. An inquiry for 2000 tons of Southern No. 2 is accredited to an Ohio melter, who wants deliveries to commence early in the second half. The stove manufacturers, who had the distinction through the Detroit purchase of last week of setting the pace for the first quarter, are buying some Iron in lots of few carloads at a time. The unanimity of sellers of the Northern product on a basis of $17 for No. 2 bears out the assertion that there is an understanding among the producers of that section, and it would seem that this district is better off in a general trade way than the Southern District. Local foundries are at this time up to about a third of their normal business. Where for several weeks it had taken the accumulation of a week or so to warrant one day's heat, the larger foundries are now pouring three days a week and announce a little better feeling and vastly improved possibilities. Summing up the situation, the appreciable increase in inquiries, particularly of the two days of this week, leads sellers to believe that there are not apt to be any further declines for this quarter, considering the bareness of consumers' yards and the restricted production and small stocks at furnaces. For prompt shipment and for balance of first quarter of 1908 we quote, f.o.b. Cincinnati, as follows, the freight rates being from Birmingham $3.25, and from the Hanging Rock District $1.20:

Southern, Coke, No. 1	$16.75 to $17.25
Southern Coke, No. 2	16.25 to 16.75
Southern Coke, No. 3	15.75 to 16.25
Southern Coke, No. 4	15.25 to 15.75
Southern Coke, No. 1 Soft	16.75 to 17.25
Southern Coke, No. 2 Soft	16.25 to 16.75
Southern Coke, No. 3 Soft	15.75 to 16.25
Southern Coke, Mottled	14.25 to 14.75
Ohio Silvery, No. 1	17.50 to 18.00
Lake Superior Coke, No. 1	18.70 to 19.20
Lake Superior Coke, No. 2	18.20 to 18.70
Lake Superior Coke, No. 3	17.70 to 18.20
(Car Wheel)	
Standard Southern Wheel	$25.75 to $26.25
Lake Superior Car Wheel	26.50 to 27.00
(Bar Coal)	

Coke.—There is some little contracting, but in the main the situation is unchanged. Connellsville Foundry grades are held firm, at $2.75 to $3.25 at oven; Virginia Foundry, $2.50 to $2.75; Furnace brands, $2 to $2.25. There may be a little shading on good sized tonnages of Foundry Cokes of indifferent brands, but the best grades are held firm. There is a slight additional restriction of output noted since our last report.

Finished Iron and Steel.—Sales offices are in receipt (Monday) of the new scale of prices on Black and Galvanized Sheets. The new prices have not affected store quotations to any great extent, most dealers maintaining the scale that has been effective for several weeks. Many dealers refuse to believe that the reduction will improve the prevailing situation which is marked by most conservative buying and for pressing needs only. Dealers quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.75c., with half extras; small lots from store, 1.90c., base, one-half extras. Steel Bars, carload lots, 1.75c., base, half extras; small lots from store, 1.90c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c. Blue Annealed Sheets (heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c.; No. 14, carload lots, 2.05c.; small lots from store, 2.40c.; No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.25c.; No. 12, carload lots, 2c.; small lots from store, 2.35c. Sheets (light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Tin Plate, 100 lb. basis, 112 sheets, 14 x 20, 3.70c., Pittsburgh. Steel Tire, 4-in. or heavier, carload lots, 1.95c., base. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Old Material.—Scrap dealers see no improvement in the market, which is, if anything, duller and absolutely featureless. Something is expected in the way of business from tool manufacturers who have taken on a little activity since the holidays, but present developments do not warrant any material change in prices. As the best obtainable the following quotations are given, and are f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$10.00 to $11.00
Cast Borings	[illegible]
Steel Turnings	[illegible]
No. 1 Busheling	[illegible]
Bundled Sheet Stock	[illegible]
No. 1 Machine Cast	[illegible]
No. 1 Railroad Cast	[illegible]
No. 2 Railroad Cast	[illegible]
Low Phosphorus Scrap, gross ton	13.50 to 14.50

Rogers, Brown & Co. have been reappointed by the Allegheny Ore & Iron Company representatives of that com-

pany's three furnaces at Iron Gate, Buena Vista and Shenandoah, Va. Some three months ago the Allegheny corporation determined to direct its own business from Clifton Forge headquarters, but now the old relations are resumed. The Buena Vista will blow out soon for repairs, leaving only the Iron Gate in blast.

Philadelphia.

PHILADELPHIA, PA., January 7, 1908.

An improvement is to be noted in the demand for some grades of Pig Iron as well as finished materials. Buyers in need of materials, who have been holding up orders for a time, have been coming into the market, but the tonnages taken, while larger than have been placed, as a rule, during the past month or two, have by no means been heavy. In most cases consumers are operating but a small part of their capacity, some not having over 40 or 50 per cent. of their plants in operation, while others which were closed down during the holidays have not yet resumed work. The feeling that a moderate improvement in the demand will continue to be shown is still strong, particularly when it is taken into consideration that the supply of crude and finished materials in consumers' yards is very small. Producers, however, are adjusting themselves to existing conditions as far as possible, and the output will undoubtedly be restricted so as to meet the demand, and will not be again increased until conditions generally fully warrant the same.

Pig Iron.—The leading feature in the Pig Iron market is the turn that prices have taken during the past few days. Producers will not continue to sell Iron at prices which, if continued, would mean a large loss; neither will they continue to produce Iron at the present prices and accumulate stocks on the furnace banks. Curtailment of production has been quite extensive during the month of December, and will, without doubt, show a decline of some 600,000 tons, while it is believed that in the month of January a further decline is to be expected. Just how great this will be is problematical at this time, but it is believed by some in the trade that it will show a further decrease of several hundred thousand tons. This should bring the production of Pig Iron pretty close to the consumption, and will probably enable prices to be held at about to-day's figures until business conditions generally show material betterment. On the basis of production and consumption, makers have determined on a range of prices which are now effective, and practically all the leading producers have expressed a willingness, it is understood, not to sell below those figures. This range of prices shows an advance of from 25c. to 50c. a ton above those which have prevailed recently. Sales have been made during the week at lower figures, but these were before the new prices went into effect or had been covered by options which had not expired at the time. No. 2 X Foundry Iron has been in considerably better demand, and has been sold in varying quantities, ranging from 100 tons up to 1000-ton lots, for delivery during the first quarter and half of the year, at prices close to $18, delivered. Forge Iron has not been in very good demand, and what few sales have been made were of small lots only, at prices close to $16.50, delivered. Consumers of Basic Iron have not been in the market, as mills have, as a rule, bought fairly well ahead. A few small sales of Low Phosphorus Iron have been made for early delivery, at prices in the neighborhood of $25, delivered. The demand for some brands of Virginia Irons has increased quite largely since the first of the year, and considerable business in these Irons, which was evidently held over until after the close of the year, has been placed. Most of the Iron sold has been No. 2 X and No. 2 Plain Foundry, the tonnages ranging from 200 upward, including several of 1000, the delivery being largely through the first quarter and first half of the year, at prices which were close to $15.50, furnace, for No. 2 X and $15 to $15.25, furnace, for No. 2 Plain. Southern Iron is still held firmly, at $13.50, furnace, for No. 2 X Foundry, but sales in this territory are reported very scarce. Prices which are quoted below are those which have been determined upon as the minimum by the majority of the producers, for delivery in buyers' yards, Philadelphia and adjoining territory:

No. 2 X Foundry	$18.25 to $18.50
No. 2 Plain	17.75 to 18.00
No. 3 Foundry	17.25 to 17.50
Gray Forge	16.50 to 16.75
Basic	17.25
Low Phosphorus	24.50 to 25.00

Ferromanganese.—The demand is extremely light, the business done during the past few weeks having been confined to occasional broken lots. Quotations remain practically unchanged at $48 to $49, Baltimore.

Steel.—New business is scarce, and mills are still idle. There has been some inquiry, but there is no disposition to place orders, even when concessions in price are made. Quotations are nominally $30 to $31 for ordinary Rolling Steel, and $33 to $35 for Forging Steel, but makers would accept business at $2 per ton under these figures for round lots to start things moving.

Plates.—Several orders, which were temporarily held up, have been placed during the past week, and Plate makers note a moderate improvement in the demand. Mills are now getting enough day to day business to keep them in operation at about half their capacity. Specifications are coming out a little more freely, one maker in this territory receiving specifications for 1000 tons of boat and bridge Steel. Prices of Plates are being well maintained as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—Mills have taken on more orders since the first of the year, and indications are thought favorable for a continued moderate business. No large contracts have been placed, although a few are expected to be closed at an early date. Meanwhile orders have been largely of a miscellaneous character. Prices are firmly maintained, and are quoted at 1.85c. to 2c., according to specification.

Bars.—The situation regarding Bars shows practically no change. The demand has been light, and while some mills have started up on part time, others are still idle. There is practically no buying for forward delivery, buyers taking, as a rule, only enough to take care of their immediate wants. Prices are being fairly well maintained at 1.75c. for Best Refined Iron for delivery Philadelphia and nearby points.

Sheets.—There has been some improvement in the demand, and some of the mills in this territory, which have been shut down for several weeks, have restarted on about half capacity. The business coming out is mostly made up of small orders for early delivery, no orders for forward delivery having been booked.

Old Material.—The market continues extremely inactive. The trade is marking time and awaiting further developments. Railroads are not disposing of Scrap very extensively at present prices, and the greater part of the business done has been between dealers. Quotations are, therefore, entirely nominal and are governed by individual conditions. For prompt shipment we quote the following range, delivered in buyers' yards, Philadelphia and adjoining territory:

No. 1 Steel Scrap and Crops	$11.50 to $12.00
Low Phosphorus	16.00 to 16.50
Old Steel Axles	18.00 to 18.50
Old Iron Axles	23.00 to 24.00
Old Iron Rails	16.50 to 17.50
Old Car Wheels	19.00 to 20.00
Choice No. 1 R. R. Wrought	14.00 to 14.50
Machinery Cast	15.50 to 16.00
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	10.50 to 11.00
No. 2 Light Iron	8.00 to 8.50
Wrought Turnings	9.00 to 9.50
Stove Plate	12.50 to 13.00
Cast Borings	7.00 to 7.50
Grate Bars	13.00 to 13.50

Coke.—The market shows no particular change. A lot of 5000 tons of Connellsville Furnace Coke, for early delivery, has been done at $1.90 at oven, although the price for prompt Coke is in most cases still being held at $2 at oven. Foundry Coke is held at $2.50 at oven for prompt shipment, and from $2.75 to $3 at oven, according to grade, for forward delivery. Quotations, Philadelphia and nearby territory, would therefore range about as follows:

Connellsville Furnace Coke	$4.15 to $4.40
Foundry Coke	4.65 to 5.15
Mountain Furnace Coke	3.85 to 4.15
Foundry Coke	4.35 to 4.60

The recently organized Smith-Booth-Usher Company, Los Angeles, Cal., is a consolidation of the S. J. Smith Machinery Company and L. Booth & Sons, both firms long identified with the manufacture and distribution of machinery and supplies at that place. The offices and warerooms require the entire building at 212-214 South Los Angeles street, which is 40 x 150 ft., comprising five floors and basement. The company handles a large line of mill and mining machinery and supplies, including boilers, engines and other motive power equipment.

Pittsburgh.

PARK BUILDING, January 8, 1908.—(*By Telegraph.*)

Pig Iron.—Of the 19 merchant blast furnaces in the two valleys only seven are in blast at this writing, and two of these will likely go out this week. The active stacks are one Shenango, one M. A. Hanna & Co., Girard, Mary at Lowellville, one Brier Hill, Sharpsville Furnace and the stack of the Youngstown Steel Company. While there is a little more inquiry for Pig Iron, very little new tonnage is being actually closed. The furnace interests are endeavoring to maintain the price of Bessemer at $18.50, Valley furnace, but some of the dealers have secured control of fair sized lots which they are offering for January, February and March shipment as low as $18, at Valley furnace. Only small lots of Foundry are being sold, and we quote Northern No. 2 for first quarter shipment at $16.75 to $17, Valley furnace, but some furnaces continue to quote $17.50. There is practically no inquiry for Basic, which we quote at $17, Valley furnace. The same is true of Gray Forge, and we quote Northern Forge at $16.50, Valley furnace, or $17.40, Pittsburgh.

Steel.—Most of the finishing mills that use Steel are shut down, and none is being sold. We continue to quote Bessemer and Open Hearth Billets nominally at $28, and Forging Billets at about $30, Pittsburgh. The official price of Sheet and Tin Bars is $29, Pittsburgh.

(*By Mail.*)

The principal events of the week were the price reductions of $4 a ton on Galvanized Sheets, $2 a ton on Black Sheets and 20c. per base box on Tin Plate, all effective January 6, and reductions in wages of Coke workers averaging about 9 per cent. by the H. C. Frick Coke Company and most of the independent Coke interests, which went into effect January 1. Advices from a number of sales managers of leading Steel companies are to the effect that specifications against contracts for the first week in this month are slightly better than in the first week in December. The general feeling is also more hopeful, and there is no doubt whatever that the money situation is better, the issuance of Clearing House checks by manufacturing concerns for payrolls having almost entirely disappeared. It is the opinion that the worst is over, and that while improvement will be slow, it will show progress, but it is also believed that January, February and March will be quite dull months. The output of Pig Iron continues to be further restricted. Of the 19 blast furnaces in the two valleys that sell their Iron in the open market, only eight are in operation at this writing, and two or three more stacks will blow out this month. The Republic Iron & Steel Company may soon start one of its blast furnaces at Haselton, Ohio, as it is running short of metal. This company has this week started its Bessemer Steel plant and Valley mills at Youngstown, and its Shafting works there is also running full. The Youngstown Sheet & Tube Company is operating its Bessemer Steel plant and practically all of its Finishing mills full time this week, and indications are good for next week. The American Sheet & Tin Plate Company has started up in part several of its Sheet and Tin Plate mills, and is operating a greater percentage of its Sheet and Tin Plate capacity now than in December. The reduction in wages of Coke workers has naturally led to lower prices on Coke, and strictly Connellsville Furnace Coke on contracts for first half of this year has been offered as low as $2 a ton at oven, but some business was closed recently at higher figures.

Ferromanganese.—In the absence of any new business, we quote 80 per cent. foreign Ferro nominally at $49 to $50, Pittsburgh. If any tonnage was wanted, probably the lower price would be shaded.

Muck Bar.—The market is absolutely bare of new business, but we continue to quote best grades of Muck Bar, made from all Pig Iron, at, nominally, $29, Pittsburgh. Probably this price would be shaded on a firm offer.

Wire Rods.—Most of the leading Wire mills are closed down for lack of orders, and the demand for Rods is stagnant. We quote Bessemer and Open Hearth Rods nominally at $34, Pittsburgh, but on a firm offer and for any considerable tonnage this price would be shaded.

Steel Rails.—The largest contract for Standard Sections taken during the week by the Carnegie Steel Company was for 500 tons, and in addition some smaller lots were placed. It is expected that any day now several of the leading roads, including the Pennsylvania, Baltimore & Ohio, Lake Shore and Norfolk & Western, may place their contracts for 1908 delivery, as negotiations with these roads have reached such a stage that the contracts will hardly be withheld much longer. The demand for Light Rails is only fair and most of the business is going to the mills that reroll Rails, and which are naming lowest prices. Regular prices on Light Rails, which are shaded about $3 a ton, are as follows: 25 to 45 lb., $30; 20-lb., $31; 16-lb., $32; 12-lb., $34; 10-lb., $36, and 8-lb., $40. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—New orders continue to be for small lots only and for actual needs. The leading Plate mills are pretty fast cleaning up contracts on their books, and unless some large tonnage is placed this month it is likely that some of the mills now running will have to close early in February for lack of orders. While prices are fairly well maintained, concessions of about $2 a ton, mostly in narrow Plates, are still being made. Regular prices are as follows: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in.	
[illegible]	$0.10
Gauges No. [illegible]	.15
Gauge No. [illegible]	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell grade of steel is abandoned.

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—No local contracts have been placed in the past week, the situation being very quiet. Some work is in prospect, but owing to present monetary conditions it will likely be some time before it comes out. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—As foreshadowed in this report last week, prices on Blue Annealed Sheets have been reduced $1 a ton, Black Sheets $2 (except gauges 29 and 30, which were cut $3), Galvanized Sheets $4 (except gauges 29 and 30, which were reduced $6), Painted Roofing Sheets 10c. per square and Galvanized Roofing Sheets 15c. per square, the new prices going into effect on January 6. Opinion is divided as to whether these reductions in prices of Sheets will stimulate the demand, which at present is stangant, most of the Sheet mills being shut down for lack of orders. The new prices are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets $1.75 per square and Galvanized Roofing Sheets, No. 28, $3.10 per square for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—Effective January 6, prices on Tin Plate were reduced 20c. per base box. Whether the reduction will stimulate demand remains to be seen, some of the trade believing that it will, while others state it will have the effect of causing buyers to hold off still further. We are advised that some business has been taken at the new prices, but the general demand is very quiet. We quote at $3.70 for 100 lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Iron and Steel Bars.—Several leading makers of Steel Bars advised us that so far this month specifications against contracts are better than in the corresponding period in December. However, new orders in both Iron and Steel Bars are very light, and some of the mills continue closed entirely, while others are running to only about half capacity. In the face of the present dull trade prices are being well maintained and we continue to quote Iron and Steel Bars on the basis of 1.60c., Pittsburgh.

Spelter.—The demand continues dull, and prices have again reacted, prime grades of Western Spelter being offered at 4c., St. Louis, equal to 4.12½c., Pittsburgh. Even this low price, which smelters claim is below cost of production, does not have the effect of stimulating the demand.

Hoops and Bands.—New business is light, and has been for several months, but specifications against contracts are still coming in, but not at a satisfactory rate. The four concerns rolling Steel Hoops and Bands are said to be strictly maintaining prices.

Spikes.—None of the mills making Spikes have any orders on their books to speak of, buyers placing orders only for actual needs. We quote Railroad Spikes at $1.85 to $1.90 and smaller sizes at $1.95 to $2 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—The mills report that specifications against contracts are showing some signs of getting better, but new demand is practically stagnant. This is also true of Shafting, new business in which has been light for some time and does not promise early improvement. We quote nominally as follows: Cold Rolled Shafting at 54 per cent. off in large lots and 48 per cent. off in carload lots, delivered in base territory; Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades, and 10c. and upward for special grades.

Merchant Pipe.—The leading Pipe mills continue to work closely together, and it has been decided not to make any change in prices for the present at least, it being the sense of the manufacturers that to readjust prices on a lower basis at this time would not stimulate the demand. A fair amount of tonnage is being placed, and specifications against contracts are said to be coming in a little more freely. We are advised that prices on Steel Pipe are being firmly held, but on Iron Pipe concessions are being made. The net discount on Steel Pipe to the large trade on ¾ to 6 in. is 74 and 5 per cent. off list, while on Iron Pipe ¾ to 2 in., 71 and 5 per cent., and over 2 to 6 in., 70 and 5 per cent. are quoted. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black.	Galv.
	%	%
⅛ to ¼ in.	65	49
⅜ in.	67	53
½ in.	69	57
¾ to 6 in.	73	63
7 to 12 in.	70	55
Extra strong, plain ends:		
⅛ to ¼ in.	58	46
⅜ to 4 in.	65	53
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

To the large trade all above discounts are subject to 1 point on the base, and 5 per cent. on the net.

Boiler Tubes.—New business is light, the railroads not placing any tonnage of moment, while the demand for Merchant Tubes is also dull. Discounts on Merchant Tubes, which are more or less shaded, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ in.	42	47
1½ to 2¼ in.	42	50
2½ in.	47	61
2¾ to 5 in.	52	65
6 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Coke.—Effective January 1, wages of Coke workers were reduced by the H. C. Frick Coke Company and other independent Coke operators on an average of about 9 per cent. This reduction has had the natural effect of causing lower prices to be made on Coke, and we are advised that Connellsville Furnace Coke, on contracts for shipment over first three months and first six months of this year, has been quoted as low as $2 per ton at oven. We note, however, that some business in Connellsville Furnace Coke has been placed at $2.15 and $2.25, at oven. Connellsville 72-hr. Foundry Coke is being quoted at $2.40 to $2.65 per ton, at oven. The Upper and Lower Connellsville regions made last week only 107,053 tons. It is probable that their output this week will be less than 100,000 tons, the smallest for some years.

Iron and Steel Scrap.—The market is absolutely stagnant, no sales being made on which to base prices. We omit quotations, as they would be absolutely valueless.

The Bessemer & Lake Erie Railroad, owned and operated by the Carnegie Steel Company, Pittsburgh, expects to lay about 70,000 steel ties this year in new construction, while 70,000 such ties will be used by the road for renewals and repairs at points where wooden ties are now used.

Birmingham.

BIRMINGHAM, ALA., January 6, 1908.

Pig Iron.—A marked improvement is noted in the number of inquiries received, and the sales which have resulted are greater in proportion than formerly. Some requests are reported for quotations on deliveries as far advanced as the third quarter, which are believed to be bona fide, and the sincerity displayed in inquiries by prospective purchasers of significant lots, generally, is encouraging. It is true that the tonnage actually booked is small as compared with what would have been expected under normal conditions, but in view of the lack of evidence that bottom prices have been reached, together with the fact that new business in foundry trades has been slow to develop, the market is about as active as could be expected. Sales aggregating an attractive tonnage are reported to have been made on a basis of $14, f.o.b. Birmingham, but this price has not been maintained, and $13.50 on the same basis is freely quoted. The sale of 1000 tons reported at figures around $13, f.o.b. Birmingham, is understood to have been made under special conditions, and it is not believed that additional tonnage could now be had from the same source at this price. The quotations now established are general, producers who heretofore have not been in the market having quoted on this basis; but there is no display of eagerness to close contracts for advance deliveries, and it may be said that an effort to maintain present prices is anticipated. Repairs are being made to idle stacks in some cases, and with the completion of the new stack of the Birmingham Coal & Iron Company, which will be accomplished about March 1, the producing capacity will no doubt be able to meet an increased demand on short notice. It is also to be noted that effective steps have recently been taken toward an adjustment of the wage scales, and the indications are favorable for a material decrease in the cost of production.

Cast Iron Pipe.—Sales of small lots for maintenance work form the feature of the market, and notwithstanding the fact that indications are favorable for some lettings of consequence in the future, the prospects for an immediate improvement are not bright. Inquiries have been made which lend a cheerful tone to the situation, but it is generally conceded that purchasers will not be disposed to make contracts until it can be better judged what the ultimate level reached in Pig Iron prices will be. Owing to the lack of a firm demand, only nominal quotations are warranted, and we quote as follows, per net ton, f.o.b. cars here: 4 to 6 in., $30; 8 to 12 in., $29; over 12-in. average, $26, with $1 per ton extra for Gas Pipe.

Old Material.—Some requests are reported for quotations on future deliveries, but no sales have resulted and the market is extremely quiet. In view of the fact that indications favor an early increase in consumption, dealers are more encouraged, but a readjustment of prices is conceded imminent and developments in the Pig Iron market are being awaited with interest. We quote nominally as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$22.00 to $22.50
Old Iron Axles	18.50 to 19.00
Old Steel Axles	17.00 to 17.50
Old Car Wheels	20.50 to 21.00
No. 1 Railroad Wrought	17.50 to 18.00
No. 2 Railroad Wrought	13.00 to 13.50
No. 1 Country Wrought	14.50 to 15.00
No. 2 Country Wrought	12.00 to 12.50
Wrought Pipe and Flues	13.50 to 14.00
Railroad Malleable	14.00 to 14.50
No. 1 Steel	13.50 to 14.00
No. 1 Machinery Cast	12.50 to 13.00
Stove Plate and Light Cast	9.25 to 9.75
Cast Borings	6.75 to 7.25

The E. H. Mumford Company has acquired by purchase all the patent rights, molding machines and equipment of Ph. Bonvillain and E. Ronceray in the United States, and has added to its molding machine line these very important machines and pattern processes. The offices of the E. H. Mumford Company will be removed from Seventeenth and Callowhill streets, their present location, to 1315 Race street, Philadelphia, where the French machines have for some months been installed as a working exhibit.

The monthly report of the Treasury Department gives the amount of money in circulation on January 1, as $3,078,989,298, or $35.48 per capita, the highest figure per head ever reached. On January 1, 1907, the average was $33.78. The actual increase in the year was $195,088,970, of which $70,747,715 was in December. The Treasury experts estimate the population of the United States as 86,734,000.

Metal Market.

NEW YORK, January 8, 1908.

Pig Tin.—An improvement in the volume of business is noted, and it is probable that 400 tons were disposed of during the week. This was principally in orders for future delivery, which command premiums over spot. Price changes during the week have been as follows:

	Cents.
January 2	26.75
January 3	26.35
January 4	26.35
January 6	27.15
January 7	27.30
January 8	26.75

The Pig Tin situation has improved substantially, and while there may be lower prices the following points should not be lost sight of. Deliveries of Tin for three months have been the smallest in a decade. No large stocks exist. The world's visible supply at the end of December was 12,058 tons, which was nearly 1000 tons less than that at the end of 1906. Every indication points to a large business in Tin Plate during the next few months. Tin Plates are a necessity, and are used for cans good years or bad. No stocks have been accumulated at the mills, and there must be some buying of Pig Tin. The London market closes at £121 5s. for spot and £122 5s. for futures.

Copper.—Prices are steadily advancing. Actual business, although limited, shows a noticeable increase. Europe continues to buy, and American consumers are becoming somewhat alarmed over the large takings by these European interests. Fundamentally, the Copper market is on a sounder basis than for some time, for it has been demonstrated twice that 13c. is a level at which speculative buying comes in and rapidly absorbs the floating supply. This supply as far as America is concerned continues to grow less. No one in the trade pretends to believe that European melters had immediate use for the 100,000 tons purchased during the last three months and 10,000 tons additional sent in January, but many seem to forget that the invisible supplies in Europe were down to a very low ebb. Manufacturers made contracts and did not purchase metal to fill these contracts. Supplies in the hands of manufacturers, jobbers and dealers were the lowest in years. In fact, Europe has been short of Copper for six months. The demand from domestic consumers is not what could be called brisk, but it is believed that the best interests in the trade can be better served by keeping the market on a steady level with only a slight upward tendency until the financial situation clears further. The advance during the last week can be very properly attributed to improved financial conditions, and a growing belief that funds will be easier. This is already manifesting itself. It will be some time, however, before the ambitious schemes of many railroads as to the electrification of urban lines can be carried out. Lake Copper can be quoted at 13.87½c. to 14.12½c., net cash. Producers refused to accept firm offers at 13.87½c. for round lots on Tuesday. Electrolytic is quoted at 13.75c. to 14c., net cash, the inside figure representing buyers' views, but there is no metal to be had from first hands at that figure. Prime casting commands 13.50c. to 13.75c. The total exports of Copper for December were about 38,000 tons exclusive of Pacific ports. The total exports for the year 1907 were about 229,000 tons, compared with 205,500 tons during 1906. This shows an increase of 23,500 tons. The imports of Copper for the month of November amounted to 8300 tons, showing a falling off compared with the previous month, owing to the curtailment of Mexican production. The exports so far this month are 8174 tons. The London market is easier at £61 15s. for spot and £62 15s. for futures. Best selected is held at £66.

Waterbury Average.—The Waterbury average for December was 13.75c.

Pig Lead.—The leading producer is taking most of the business. Offers by consumers for future shipments are not entertained by producers. Prices are without change, at 3.65c. to 3.75c., New York, and 3.60c., St. Louis.

Spelter.—Prices are firmer, due to prospects of better business from Galvanizing works on account of the expected improved demand for Sheets due to the lower price. The price in New York is 4.40c. to 4.45c., although a car or two was on the market Tuesday which could have been had under that figure. The St. Louis market is much firmer, at 4.27½c.

Antimony.—The market looks stronger, but it is hard to see how there can be any great permanent improvement with the large amount of metal now coming in. Hallett's can be imported at about 8.75c., Cookson's at about 9.25c.

Nickel.—No change has occurred in the price of Nickel, which rules at 45c. for ton lots, and 55c. to 60c. for smaller quantities.

Tin Plate.—The expected cut was announced January 6. The reduction, which is the first change in price since October, 1906, was 20c. per base box, bringing the price of 100-lb. IC Plates down to $3.70, f.o.b. Pittsburgh, and $3.89, f.o.b. New York. The mills have been running on greatly reduced time for over three months, and there are no large stocks. An increased demand may be expected, which, however, will not be in full swing for a month at least.

Old Metals.—More interest is being taken in the market for Old Metals, but business is small, and the following dealers' buying prices are more or less nominal:

Copper, Heavy Cut and Crucible	13.00 to 13.25
Copper, Heavy and Wire	[illegible]
Copper, Light and Bottoms	11.50 to 11.75
Brass, Heavy	10.00 to 10.50
Brass, Light	7.75 to 8.00
Heavy Machine Composition	12.00 to 12.50
Clean Brass Turnings	[illegible]
Composition Turnings	10.50 to 11.00
Lead, Heavy	4.00
Lead, Tea	[illegible]
Zinc, Scrap	[illegible]

New York.

NEW YORK, January 8, 1908.

Pig Iron.—There have been some round sales of Foundry Iron in this city, by local founders, for delivery during the first quarter. The majority of sellers have withdrawn former prices, and are now quoting on the basis of $18.50, Jersey City, for Northern Iron, and $13.50, Birmingham, for Southern Iron. We quote, at tidewater, $19.00 to $19.25 for No. 1 Northern Foundry, $18.50 to $18.75 for No. 2 Foundry, $18 to $18.25 for No. 2 Plain, and $17 to $17.25 for Gray Forge. Southern Iron is quoted $18 to $18.25 for No. 1 Foundry, and $17.50 to $17.75 for No. 2 Foundry.

Steel Rails.—Railroad interest in the situation is still wanting, and the Bessemer Rail mills are practically at a standstill, with little prospect of early activity. The financial phase of the Rail situation is just now uppermost, and settlements for Rails already delivered are in some cases of as much importance as the placing of business for the year ahead.

Structural Material.—The absence of bridge work makes the beginning of the new year exceedingly quiet for fabricating companies. Some time will naturally elapse, also, before the new construction that may be expected to result from a gradual accumulation of money. Among work on which bids have gone in, but on which no award has been made, is 4000 tons for a building at the Forty-second street terminal of the New York Central. The entire construction will require 12,000 tons more eventually. There is also pending 1500 tons of viaduct work, connecting the New Haven station at Providence, R. I., with the tunnel of the East Providence Branch. This work will require 4000 tons in all. The municipal contracts in New York develop slowly. Of 30,000 tons of Steel for eight piers awarded last year only the 7000 tons needed for two piers will be taken for the present. Fabricating shops have several months' work ahead, but deliveries are in reduced volume, and shop schedules are adjusted accordingly. We continue to quote mill shipments, tidewater deliveries, as follows: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—While the current demand is light, Bar Iron manufacturers are quite firmly maintaining the old price of 1.60c., Pittsburgh, or 1.76c., tidewater. It is understood that a few of the Eastern Bar Iron mills resumed operations on Monday, but in practically every case these mills have an outlet for their product in some finished form, so that little comes on the market in the form of Bars. It will be some time until orders accumulate in sufficient quantity to enable many of the mills to resume active operations. Steel Bars are firmly held at 1.60c., Pittsburgh, or 1.76c., tidewater, with only a moderate demand.

Plates.—Local trade appears to be confined to small quantities for immediate shipment. About the largest orders recently placed were for 50 tons or less. The new work pending in this locality, which will require considerable quantities of Plates, will probably not be in shape for the placing of the actual orders for some time. It is understood that the subject of a reduction in prices is now under consideration by the leading Plate manufacturers. Prices up to the present have been maintained as follows for tidewater delivery: Sheared Tank Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—A rather better feeling is noted. Inquiries for small quantities are growing a little more numerous, some of the New England towns beginning to ask for bids on their requirements for the approaching season. New York City is getting ready for some of the work laid out for this year, and it is understood that it will soon advertise for bids on about 5000 tons. The 1000-ton contract for the city of Richmond, Va., which was let last week, was secured by the Glamorgan Pipe & Foundry Company, Lynchburg, Va. Competition for this business was exceedingly sharp. Car-

load lots of 6-in. are quoted at about $28.50 per net ton at tidewater, with concessions on larger quantities.

Old Material.—Special weakness is observed in such material as Relaying Rails for which there is practically no demand, while railroad companies continue to bring forward fresh offerings. Within the past week a railroad in the North has asked for bids on 3000 tons of 56-lb. Relaying Rails as well as about 3000 tons of other kinds of track material including 500 tons of Old Iron Rails. Dealers are disinclined to make bids on this lot of Relayers, except at prices which are much under those recently quoted. In other grades of Old Material a little more stability is observed, as it is evidently expected that as the month passes more and more manufacturing establishments consuming Scrap will get in active operation and may need considerable stock. Quotations per gross ton, New York City, are as follows:

Old Girder and T Rails for melting	$8.50 to $9.00
Heavy Melting Steel Scrap	9.50 to 10.00
Old Steel Rails, rerolling	10.00 to 11.00
Relaying Rails	15.00 to 16.00
Old Iron Rails	14.00 to 14.50
Standard Hammered Iron Car Axles	17.00 to 18.00
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	10.50 to 11.50
Iron Track Scrap	9.50 to 10.00
No. 1 Yard Wrought, new	10.00 to 10.50
No. 1 Yard Wrought, old	9.50 to 10.00
Light Iron	4.50 to 5.50
Cast Borings	4.50 to 5.00
Wrought Turnings	6.00 to 6.50
Wrought Pipe	8.00 to 8.50
Old Car Wheels	15.00 to 15.50
No. 1 Heavy Cast, broken up	12.00 to 12.50
Stove Plate	11.00 to 11.50
Grate Bars	8.50 to 9.00
Malleable Cast	11.00 to 11.50

Iron and Industrial Stocks.

NEW YORK, January 8, 1908.

The stock market has steadily been gathering strength with the improvement in the financial situation. More interest is evidently being taken in all kinds of stocks which have a sound basis of values, and quotations have therefore risen with the improvement in the demand. The range of prices on active iron and steel stocks from Thursday of last week to Tuesday of this week has been as follows: United States Steel common 25¾ to 27¼, preferred 87¼ to 90; Car and Foundry common, 30 to 32, preferred 88 to 90; Locomotive common 34⅜ to 38, preferred 85½ to 87; Steel Foundries common 6½, preferred 29 to 29⅜; Colorado Fuel 19 to 21¼; Pressed Steel common 19½ to 20½, preferred 69 to 70; Railway Spring common 26½ to 28; Republic common 16 to 17, preferred 66¼ to 69½; Sloss-Sheffield common 36 to 38; Cast Iron Pipe common 19½ to 21⅛, preferred 50⅝ to 58½; Can common 1¼ to 3⅛, preferred 44 to 51. Last transactions on active stocks up to 1.30 p.m. to-day are reported as follows: United States Steel common 26⅝, preferred 89⅜, bonds 88; Car & Foundry common 31, preferred 81⅞; Locomotive common 36⅞, preferred 87; Colorado Fuel 19⅜; Pressed Steel common 20, preferred 70⅛; Railway Spring common 28; Republic common 16¾, preferred 69; Sloss-Sheffield common 38; Cast Iron Pipe common 20½, preferred 51½; Can common 4¾, preferred 51.

Receivers of the Westinghouse Machine Company, Pittsburgh, are applying bonds of the debenture certificates, due 1920, that they will pay the January coupon at the office of the Fidelity Title & Trust Company, Pittsburgh.

The receivers of the Westinghouse Electric & Mfg. Company have notified holders of the convertible sinking fund gold bonds, due 1931, and debenture certificates, due 1913, that the coupons due January 1 will be paid at the Farmers' Deposit National Bank, Pittsburgh. The receivers have made formal application to the court for permission to pay the January interest on the $18,500,000 bonds. The interest on $6,000,000 bonds, due February 1, will, it is said, be paid when it becomes due, as the receivers have the necessary cash on hand.

Dividends.—The Board of Directors of the Riehle Brothers Testing Machine Company, Philadelphia, at a meeting held at the office December 30, declared an annual dividend of 6 per cent. on the capital stock for the year 1907.

The Standard Underground Cable Company has declared the regular quarterly dividend of 3 per cent. and an extra dividend of 3 per cent., payable January 10.

The Harbison-Walker Refractories Company, Pittsburgh, has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable January 20.

According to the North German Lloyd Line, which has made a careful computation, more than $110,000,000 was taken out of the United States by the immigrants who returned to their native places last year. It is estimated that each of the 550,045 foreigners had about $200 with him. On the other hand, it is figured that 1,564,688 aliens who arrived last year brought with them about $27,293,760, though much of this had been furnished by relatives or friends in the United States.

Charles M. Schwab's Views.

The annual review of the New York *Times*, printed January 5, gave the following statement by President Charles M. Schwab, of the Bethlehem Steel Corporation:

It is impossible at the moment to make any definite predictions with regard to the business conditions that are likely to develop during the year 1908, nor would it be wise under prevailing conditions to attempt to figure out when the present depression will end and the upward healthy movement begin. Nothing is gained by any such attempt to make definite forecasts, but there are some general deductions that may be made and which can be based on the actual facts existing at the present time and on the historical data of half a century.

You must not lose sight of the undoubted prosperity of the country while you are studying the recent panic and the present depression. It must be admitted that the depression is severe and entirely logical in view of the financial developments of the past three months; yes, of the past year. Fundamental conditions are splendid, and I have not the least doubt that the recovery in business in every line will be quick and effective. It takes a little time to restore confidence, but when the basic situation is all right that can be accomplished easily enough.

So far as the future of our country's business is concerned, I have not seen anything that does not indicate the greatest possible prosperity. I am talking broadly now, not taking specific and isolated facts, but looking rather at the business of the country generally and its future. In the steel and iron trade, with which I am familiar, every year marks an increase, and every year in the future will continue to show an increase, a betterment and a broadening and extension, keeping pace with the country's needs and the country's world position.

We may have, we shall have, periods of depression like the present, but they are just incidents, economic incidents, eventually making for sounder and better conditions. The ultimate trend will be upward always, and I do not recall any period of prosperity in the past that, in my opinion, will equal the normal condition of this country in the future. There is no cause for pessimism if the outlook be viewed in the light of common sense and obvious logic. I am an optimist, and my optimism is based on an intimate knowledge of the iron and steel trades in this country.

Aids to Cheerfulness.—The Du Bois Iron Works, Du Bois, Pa., maker of high grade machinery castings and gas engines, producers and pumps, is sending out an exceedingly cheerful letter calculated to help relieve anxiety over the present business conditions, and showing that the company is not at all dismayed. Other industrial companies are sending out similarly optimistic letters. One from the S. Obermayer Company, Cincinnati, states that from its point of view the worst of the present financial flurry is about over, and it looks forward to a brighter year in 1908. The *Publicity Magazine*, published by the Underfeed Stoker Company of America, Chicago, is similarly buoyant, and in extending its holiday greetings adds that it is "confidently expectant of a speedy return of the business conditions prevailing during the past few years." The Chain Belt Company, Milwaukee, Wis., adds its efforts in the same line, citing the highly favorable condition of our foreign trade as evidence of the substantial basis on which business conditions rest.

The Autopress Company, New York, manufacturer of printing presses, has moved its general offices to the Barclay Building, 299 Broadway.

The Machinery Trade.

NEW YORK, JANUARY 8, 1908.

The first week of the new year brought forth but little new business, and that reported covered chiefly small lots of tools and was distributed generally among machinery houses. The increase in inquiries noted the two previous weeks had led to the belief that the past week would experience a more active demand for machinery, but contrary to expectations there appears to have been no improvement in any direction. Not only were there no sizable orders reported placed, but no inquiries worthy of mention were received, and the volume was rather small. It was expected that at least one of the two small lists upon which bids were submitted a few weeks ago would be closed by this time, but these are still pending, with a prospect of purchases being made within the next couple of weeks. While there is much disappointment in the way the new year opened, merchants are hopeful of renewed activity after the middle of the month, by which time it is thought some of the present adverse conditions will be straightened out. Until the financial situation clears up it is doubtful whether large purchasers will come into the market very freely. It is the opinion among machinery men that this feature of trade will show a perceptible improvement by the end of the month. At present much complaint is heard about collections. The active propositions before the trade do not indicate any further recession in business, nor have there developed sufficient new projects to indicate a marked increase in the demand in the immediate future. Much importance is attached to the report that the Delaware, Lackawanna & Western Railroad will issue a substantial list of machinery requirements for its Scranton shops within a few days.

The demand for steel castings has improved to some extent of late, and although foundrymen in that line are not making many long term contracts, they hope that during the next two months some such business will develop. When business is good and there is a lively demand for castings foundrymen find their customers very willing to make long term contracts, but as soon as work slackens up there is a general disposition to order only in individual lots. Just now the foundrymen are fairly busy, and it is thought that when this becomes generally known their customers will show a disposition to renew long term contracts which have expired. Many of the customers whose contracts expired the last of the year gave orders for small lots instead of renewing their contracts, but it is expected that during the next two months they will see their way clear to place their business on the same basis as they did last year. Already some of the larger steel casting manufacturers have received inquiries for prices based on a year's supply, and with the business now on hand they state that they have no complaint to make regarding the outlook.

At a meeting of the Board of Governors of the Machinery Club, held at the Engineers' Club, New York, on Monday, the contracts let by the House Committee for furniture, silver ware, and other furnishings were confirmed. At the meeting considerable discussion developed over the nonresident membership fee of admission which is $10. Owing to the large number of nonresidents desiring to become members of the club it was the opinion that the fee of admission of this class of members should be raised. The matter has been referred to the Constitution Committee, which will shortly hold a meeting to revise the constitution in accordance with the suggestions of the Board of Governors, and probably within the next 90 days a meeting of the club will be called to pass on the change. A great many nonresidents are joining the club daily, and until the change in the constitution is decided upon at the meeting of the club they will be admitted to membership at the present fee.

New York, New Haven & Hartford Railroad Machinery List.

It is learned that bids are to be in this week on the machines in the list sent out a few weeks ago by the New York, New Haven & Hartford Railroad, and from this it is inferred that orders will be placed shortly. This list covers about 20 tools, including a number of woodworking machines, the principal metal working tools being as follows: One double head bolt cutter, one 42-in. steel tired car wheel lathe, one 20 x 24 in. crank planing machine, one 18-in. single head back geared shaper, two 20-in. engine lathes, one 36 x 36 in. x 12 ft. planer, one 18-in. engine lathe, two pipe cutting and threading machines, one automatic saw sharpening machine, one 20-in. water tool grinder and one cutter and reamer grinder.

It is understood that the list of the machine tools for the new Scranton shops of the Delaware, Lackawanna & Western Railroad will be before the trade very shortly. The list comprises a good sized lot of equipment, covering a general line of machinery adaptable for a large car repair plant. The mechanical department of the company has completed its investigation as to the machinery needed, and it is understood that a tabulated list of the requirements will be in the hands of the company's purchasing agent within a few days.

It is said in the trade that the Baltimore & Ohio Railroad does not intend to follow the large list sent out several months ago with purchases, but before long it is understood a list will be issued covering some of the requirements specified in the old list. This will be followed with other lists later on until the requirements specified by the company's mechanical department are met with.

The New York Central Railroad has about completed plans for additions to its shops at East Buffalo, N. Y., which include a new machine shop and a fan house. The roundhouse at that point is also to be enlarged.

The new eight-story addition to the plant of the Mergenthaler Linotype Company on Ryerson street, Brooklyn, N. Y., is rapidly nearing completion, and although the company has bought considerable equipment for the addition, it is understood that some more machinery will be needed, as it is highly probable that later on some more or less obsolete equipment now in use in the existing plant will be discarded. The new building is 165 x 174 ft., and is being constructed of concrete and brick. A reorganization of the company's mechanical department has been made, and W. W. Morehouse, formerly assistant superintendent of the plant, has been made superintendent, to succeed W. H. Radall, while E. A. Sytz, who formerly had charge of the manufacture of all the light parts of the company's machines, has been made assistant superintendent. R. M. Bedell is now in charge of the assembling department, and W. M. Brown is master mechanic.

Engine, boiler and brick making machinery are required by the Paterson Clay Products Company, New Mossop Building, Clearfield, Pa., for equipping its new plant. The company has recently been organized and is excavating and grading for its new machinery buildings and kilns, which are to be located on a site near Clearfield, adjacent to the Clearfield & Mahoning Railroad, a branch of the Buffalo, Rochester & Pittsburgh Railroad. The plant will have a daily capacity of 25,000 building and paving bricks, to be increased to 50,000 as business may warrant. Allison O. Smith is president; Alex. Paterson, secretary and treasurer, and R. H. Thompson, general manager.

The National Casket Company, 48 Great Jones street, New York, has purchased a large tract of land in Jersey City, on which it intends to erect a plant to replace its present manufacturing establishment at Hoboken, N. J. The requirements will include a good sized power plant, but as yet the plans for the new buildings have not been prepared. The engineering details are in charge of J. W. Whitmore, who can be addressed in care of the National Casket Company.

The Royal Typewriter Company, Brooklyn, N. Y., has been buying some machinery of late for its plant at Hartford, Conn., and it is understood that there are still some scattered purchases to be closed out. The company has in course of construction at Hartford one building 357 ft. long and four stories in hight, another 50 x 150 ft., four stories, and two one-story buildings, each about 50 x 130 ft.

At a meeting of the Public Service Commission last week the route for a new four track rapid transit subway, to extend from the Battery to the Bronx, was approved, and as soon as plans can be prepared the Board of Estimate will be asked to authorize the expenditure of $60,000,000, which it is estimated the road will cost. It is hoped that plans can be ready so that bids can be advertised in March.

McClave, Rimmer & Co., 90 West street, New York, have sold to the Eaton, Cole & Burnham Company, Bridgeport, Conn., a 10-ton crane. This is McClave, Rimmer & Co.'s second installation of similar equipment for that company.

Cleveland Machinery Market.

CLEVELAND, OHIO, January 7, 1908.

The general situation has shown considerable improvement since the beginning of the new year. In the machine tool market there have been a few sales of single tools during the week, and quite a number of new inquiries. While the sales were limited, the awakening of a little activity was very agreeable to dealers who had received practically nothing in the way of either orders or inquiries during December. The general feeling is better all around, and while dealers are not expecting very much business during the present month, they look for a gradual improvement of orders during the next few weeks. The orders placed during the week came mostly from concerns that were in the market with inquiries before the recent financial disturbance, but which delayed their purchases because of the money stringency

and accompanying industrial depression. Orders were not placed by a number of other concerns that made inquiries at about the same time, the delay being due to the same causes, but now that the situation has become much brighter and collections have grown much better these pending inquiries are expected to result soon in the placing of some orders for new tools. The orders and inquiries during the past few days have about all come from the smaller industrial plants. None of the new inquiries are for a large amount of machine tool equipment, but as conditions continue to grow better inquiries for a larger amount of tools are expected to come from some of the larger interests.

With the new year a turn for the better is also noticed in practically all the local manufacturing interests. Plants that shut down for inventories during the holidays started up promptly after the New Year's holiday, and every day reports are coming in of more men being put back to work. Plants that have been running on one-half or less of their capacity for six weeks or more have not resumed with their full force of men, but workmen are being taken back gradually in small lots as conditions warrant greater activity. Machine tool builders report that while orders are not yet plentiful, they have improved during the past few days, and inquiries are coming in considerably better. While no speedy resumption of industrial activity is anticipated, it is believed that every day will show a slight improvement. Secretary Philip Frankel of the Cleveland branch of the National Metal Trades Association, who has made a canvass of the local situation during the past few days, predicts that by February 1 the local factories engaged in the metal trades will be running at 75 per cent. of their normal capacity. During the rush preceding the recent depression they were being operated at about 30 per cent. above their normal capacity, according to Mr. Frankel's estimate.

The plant of the Brown Hoisting Machinery Company is running at practically full capacity with its day force of workmen. While the company is still held up on some orders for large work which was ordered suspended a few weeks ago because of the financial stringency, orders continue to come in for small work which are keeping the plant busy.

The Browning Engineering Company started up its plant January 2 after a two weeks' shutdown for the holidays. The company has considerable work on hand, and reports an improvement in its orders during the past week or two.

The Standard Pattern Works reports considerable improvement in inquiries for patterns from metal working concerns that are planning to put new machinery on the market. The works have been partially shut down for improvements for a short time, but will soon be running at full capacity.

The Defiance Pressed Steel Company, Defiance, Ohio, which was recently incorporated with a capital stock of $300,000, and in which a number of Cleveland men are interested, has elected the following officers: President, Henry Seither; vice-president, Joseph Fink; secretary and treasurer, C. C. Hoffman, all of Defiance; directors, W. H. Becker, John A. Donaldson, H. J. Slatmyer, F. H. Seither, John W. Harter, J. L. Fontaine, John Beck and Frank Seither, of Cleveland, and several Defiance men, in addition to the officers. The company, which will manufacture steel shipping cases, has taken over the plant of the Clipper Plow Company.

The Falls Rivet & Machine Company, Cuyahoga Falls, Ohio, has been given a 50-year franchise to transmit electric power through the streets of that village. The company at present has two plants. One of these is located on the river, from which water power is secured. It is the intention to increase the capacity of this plant from 500 to 1000 hp. The power will be converted into electricity, which will be used to operate the company's other plant in the village, and the surplus will probably be sold to other manufacturers.

J. W. Hance and Harry Hance, who have been operating a foundry in Plain City, Ohio, have purchased the plant of the Westerville Foundry & Machine Company from the receiver, H. P. Beery. The Plain City foundry will be removed to Westerville and combined with the foundry there.

With a capitalization of $25,000 the Davis Steam Generator & Mfg. Company, Sidney, Ohio, has been incorporated by Samuel S. Davis, Walker C. Morrison, A. W. Wells, E. L. Hoskins and Frank Lucas.

The Hann Mfg. Company, Columbus, Ohio, has increased its capital stock from $10,000 to $25,000, the increase being demanded by the company's growing business. The company makes grass catchers, rural mail boxes and other specialties. The officers are C. K. Hann, president; J. E. Dager, vice-president, and A. M. Hann, secretary.

W. H. S. Bateman, sales agent for the Champion Rivet Company, Cleveland, Ohio, has opened an office at 412 Arcade Building, Philadelphia, Pa., where the business of the company in eastern Pennsylvania, western New York and the Southern States will be looked after.

Philadelphia Machinery Market in 1907.

PHILADELPHIA, PA., January 7, 1908.

That the past year in the Philadelphia machinery market was one of the most remarkable that the trade ever experienced is without doubt. There have been years of extreme prosperity, poor years and years in which a moderate volume of business was transacted, but never before has the trade experienced the two extremes of business prosperity and almost total apathy under the conditions which prevailed during the year just concluded.

The year opened most auspiciously. December, 1906, was probably one of the greatest months for a closing month of the year that the trade had ever known, except, possibly, December, 1905. Manufacturers and merchants early in the year had order books crowded so full that there was but little necessity to seek business. Orders were given with the greatest freedom, and the only anxiety on the part of buyers was that they could not get the tools they wanted within a reasonable time. Deliveries were the all-important factor in a great proportion of sales during the early portion of the year. Price was only of secondary consideration in the majority of cases, and the dealer or manufacturer who could make the best delivery was generally the recipient of the order.

Manufacturers of practically every class of tools had orders for six to eight months ahead on their books, and deliveries promised were frequently subject to delays of a month or more, owing to the inability to get deliveries of raw and finished materials entering into the construction of tools.

In some sizes and classes of tools deliveries were extended as much as 12 months, and manufacturing plants in every direction were being operated at their utmost capacity during the first half, and in many cases even the third quarter of the year. About midyear, however, the demand for equipment began to fall off. Financial matters developed unsatisfactory features, and the trade began to prepare for a recession, which it was felt was bound to come, and which would be welcomed to a large extent by many tool builders, who had been operating under a heavy pressure during the last two years. That the decline in business was general was felt during the third quarter of the year, when orders for new tools fell off quite materially, but when during the last quarter of the year the acute financial disturbance prevailed, business came to a veritable standstill, and outside of an occasional order for a tool or so, mostly for those of the smaller class, practically no new business was done.

The railroads felt the pressure of unfavorable finances along about midyear and began curtailing expenditures. Announcements made later in the year that no further purchases, except for equipment absolutely needed to keep up repairs would be made, that some of the work under way would be suspended, and that the policies for 1908 would be on a conservative basis, had a very depressing effect on the trade. Curtailment policies adopted by the railroads were soon followed by many of the large industrial plants, and later by manufacturing plants of almost every character. These curtailments were of a varied nature, not only were operating expenses reduced, but orders for tools and equipment were for a time quite freely canceled. Tool builders, with the decline in new business, together with a certain proportion of cancellations, began rapidly to catch up with the work on hand, and before the third quarter had advanced very far, were adopting the same curtailment policies that were being enforced in other directions.

In this territory the financial storm toward the close of the year did not affect tool builders to any particular extent. Failures were few, although collections were extremely hard to make, and in some cases plants were temporarily suspended owing to the fact that sufficient funds to keep them in operation could not be had. Currency was hard to get. Some companies were at times unable to get sufficient to meet payrolls, and payment by check was temporarily employed. This condition, however, did not prevail for any length of time, as the local banks were not affected, and for the most part were able to supply sufficient currency to meet the regular payroll accounts. At the close of the year the financial situation became more settled, but was far from normal, and business continued greatly restricted on this account.

The Export Trade.

Conditions during the greater portion of the year did not favor export business to a greater extent than did those which prevailed during the previous year. Manufacturers of the usually termed standard tools were so far booked ahead on domestic orders that little if any attention was paid to the foreign demand, and when quotations were made, deliveries as a rule were so far extended that there was

little possibility of getting the business. Comparatively speaking, however, the volume of business was good under the circumstances. Makers of special tools and machinery probably did a greater export business than did the regular tool builders. At times there was quite a good demand for some classes of special tools, and builders had export work on their books almost throughout the year. File making machinery, portable tools for railroad shop repair work, as well as portable power driven tools for work of a general nature, all came in for a good share of the export demand. Most of the buying in machine tools for the foreign trade was of an individual character, large equipments being rather scarce in this territory. Power transmission machinery and specialties of this character were again in excellent demand, and manufacturers who have established connections abroad report very fair sales, which were the largest, however, during the early half of the year. Pressed steel shaft hangers and pulley manufacturers report a very good year in the export trade in their particular specialties.

The Machine Tool Trade.

The demand for machine tools was unprecedented during the first half of the year, and even with the decline during the last quarter the volume of business in many lines exceeded that of the previous year. The demand was diversified, and heavy sales of tools of every character were to be noted during the first six months. Deliveries were the important factor in many of the propositions before the trade, and sales in many instances depended almost entirely on the question of delivery. Prospective purchasers were frequently willing to pay a good bonus to get early deliveries, but manufacturers were so fully booked ahead that it was impossible for them to meet demands. As the tools could not be had with any greater degree of promptness from any other source, buyers were compelled to be satisfied with such deliveries as they could get. Some tool builders during the spring covered for their output of certain sizes of tools for the balance of the year, while six months' delivery on others were considered good, and it was not until after midsummer that any material improvement in delivery was to be noted, and then it was confined to but few lines and sizes of tools. The demand throughout the year was general. There was a particularly good demand for milling machines and some makes of lathes, which were consequently hard to get.

Heavy machine tools were bought extensively by the large iron and steel plants, as well as industrial companies. Special tools, however, came in for a large share of business, and even many of the standard tools were fitted with special features to take care of work of a peculiar character. Large propositions in the way of shop equipment were not very numerous, as but few large undertakings were launched in this territory. A number were contemplated but were deferred to some extent by the unfavorable financial situation.

Dealers as a rule had a very successful year. During the first half more business was offered than could be taken care of, owing to their inability to get deliveries of tools from the makers. Stocks on their floors and in warehouses were depleted, and in instances second-hand tools and other substitutions were made to satisfy customers and appease delays. These at times resulted in cancellations of orders, but this caused no particular anxiety on the part of the dealer, as during the first half of the year there was seldom any difficulty in making a resale, in most cases at a higher price, owing to the better delivery that could be made. Along about midsummer, however, this condition began to change, and before the end of the year was completely reversed. Buyers could not be interested in making purchases of tools at any price, owing to the generally changed conditions. Dealers who had placed orders for tools with manufacturers earlier in the year began to receive the tools, and as they were unable to move them, stocks on floors and in warehouses rapidly increased until along toward the close of the year the supply was probably the largest that has been on hand for a number of years.

Second Hand Machine Tools.

Sales of second-hand machine tools were particularly good during the first half of the year, when buyers found it next to impossible to get deliveries on new tools with any degree of promptness. Tools of the heavier class were in especially good demand, and equipment of almost every character was taken early in the year, if for temporary use only, to help purchasers out while waiting for delivery on tools already ordered from manufacturers and dealers. For some months tools of the better class were very scarce, and prices in a number of cases ran up pretty well toward the cost of new tools. Delivery, however, was the main factor, and the price was a secondary consideration. As the demand for new tools began to fall off, and as manufacturers became more and more in a position to make prompt deliveries, the business in second-hand tools began to fall off, and during the third quarter of the year was closer to the normal conditions in that branch of the trade. Later, however, when financial disturbances held up buying in every direction, the second-hand machinery sales fell off largely, and toward the close of the year the demand was very light and buying meager, reflecting the conditions of the trade generally.

Boilers and Engines.

While the business transacted by manufacturers and dealers in boilers and engines throughout the year has been fairly good in the aggregate, this branch of the trade experienced the same active and inactive conditions as were to be found in the various other branches of the trade. The demand was the heaviest during the first half. Buyers of the heavier types of equipment felt the unfavorable financial conditions before midyear. New projects which would require extensive power installations were hard to finance, and a number of the larger propositions were held in abeyance. The medium and smaller class of equipment continued in fairly good demand until the early fall, when there was a sharp decline in the demand. Gas and gasolene engines have been brought more and more to the front during the past year. Gas and oil engines of the higher powers have been substituted for the usual steam boiler and engine to some extent, while the replacement in those of the small horsepowers by gas and gasolene engines was more extensive, and has been a considerable factor in the smaller engine and boiler trade. Boilermakers have had a pretty good year on the whole, and like the engine builders, were uniformly busy throughout the greater portion of the year. During the last quarter the boiler and engine trade was very dull, and will probably not regain normal conditions until the general situation has cleared.

Locomotives.

The builders of locomotives in this territory entered the year with a large volume of orders on their books, sufficient in instances to keep them occupied at full capacity for almost the first half of 1907. As the year advanced the demand became smaller, and before the close of the year plants were being operated with materially reduced forces. In instances railroads did not fully exercise the options taken with builders for 1907 delivery. The railroads were first to feel the effect of the financial situation, and buying was at first curtailed, and then came practically to a standstill, so that orders taken during the last half of the year were few and small at that. At times there was a good export demand, particularly during the last half of the year. The Baldwin Locomotive Works built during 1907 a total of 2663 locomotives, which is the record output for any one year, and exceeds that of 1906 by 53 engines. Of this number, 2371 were steam locomotives and 292 were electric locomotives. Of the former, 363 were for export. What will develop in the locomotive trade in 1908 is problematical. Builders have but few orders on their books at the time, and there is little disposition shown by the railroads to enter the market, so that it is likely that further retrenchments will be made at an early date by the locomotive builders.

Shipbuilding.

The Delaware River shipyards had a prosperous year. Plants were operated pretty fully and the effect of the general depression, except in the holding up of new business, has not been very pronounced. Sixty-two steel and 47 wooden vessels, aggregating nearly 100,000 gross tons, were completed by the shipbuilders, which compares very favorably with other years. Twenty-four steel vessels, including five battleships, three torpedo boat destroyers, two steamships, one steamboat, two revenue cutters, three steam tugs and eight lighthouse tenders, as well as three wooden vessels, are in course of construction at various yards. During the last half of the year the demand for vessels of almost every character declined, and although there has been considerable figuring done by the builders, but few orders of any consequence were placed, owing largely to the financial situation during the last quarter of the year.

Prices.

Prices of machinery and tools showed advancing tendencies during the first half of the year, and advances varying from 5 to 10 per cent., and in a few instances more were announced as cost of manufacture increased. The cost of practically all materials increased and the continual rush of work, overtime, &c., made the cost of labor proportionately higher. Higher prices, however, seemed to act as no check on buying; in fact, in a great number of cases they were of secondary consideration, delivery being the important feature of the first six months' transactions. Premiums were offered in many cases for prompt delivery, but unfortunately builders of tools, as well as dealers, were frequently not in shape to benefit by this, owing to inability to make the delivery required. When business began to fall off prices in some grades of tools weakened perceptibly. On others, however, and principally those of the higher grades, prices were firmly maintained at all times during the year.

Iron and Steel Foundries.

The iron and steel foundries in this territory have had much the same experience as have the tool builders and other industrial plants. They entered the year with an exceedingly large number of orders on their books, and for six or eight months record tonnages were the order of the day. As the machine tool and general trade began to fall off, foundries found buying less urgent, and during the latter portion of the year orders were scarce, and as far as those

for future delivery were concerned, almost impossible to get. Business during the last quarter was largely of a hand-to-mouth character, and plants ran irregularly, and at times on short time only. Owing to the scarcity of raw materials deliveries during the first half of the year were somewhat unsatisfactory. During the last half prompt shipments could be had in almost every case. Prices of castings were high early in the year, owing to the scarcity and high price of raw materials, as well as the scarcity of skilled workmen. When conditions became easier, however, buyers could not be interested in placing orders for any quantity, and when prices of raw materials declined and finances became unsettled, purchasers in many instances could not be interested in contracting for future requirements at any price.

In view of the exceedingly good demand for steel castings, several of the foundries in this territory increased the capacities of their plants. Several new plants were started, while preparations for the building of several others were made—notably those of the Tropenas Steel Company and the Deemer Steel Casting Company at New Castle, Del. The Keystone Steel Casting Company, Chester, Pa., was one of the new plants which went into operation during the year.

Improvements to Plants.

Notwithstanding the great volume of business that was coming out early in the year, and the apparent inability on the part of tool builders to take care of the business offered, there was little disposition to extend plants to meet the urgent need. Manufacturers had had their lesson in this respect several years ago, and the conservative policy prevailed, it being pretty generally believed that the tremendous demand for tools and equipment could not continue, and after the experience of keeping greatly increased plants in operation in dull periods, it was thought by many to be better to take care of as much business as possible with the present facilities rather than to increase capacities to any material extent. Nevertheless, a number of good sized projects in the way of plant extensions and extensions to equipment came before the trade.

The city of Philadelphia has itself been a very extensive buyer of equipment for the completion and extension of its filtration plants, in connection with the water supply, and has outlined some very large expenditures for various equipment during the coming year. One of the great projects in which the city has been jointly interested with the Pennsylvania and Philadelphia & Reading railroads has been the elevation of the surface tracks of these roads in some sections of the city. This matter has been agitated for years, and was finally arranged during 1907, and contracts for part of the work have already been given out.

The Standard Cast Iron Pipe & Foundry Company, which was formed in 1906, began operations at Bristol, Pa., during the year on what promises to be one of the largest pipe manufacturing plants in this country. While not fully completed ,a large amount of the work of building has been done, and some of the equipment installed.

The Bethlehem Steel Company was also a very extensive buyer of equipment during 1907, particularly for its new Saucon plant, which is now approaching completion and expected to be in operation during the coming month.

The Standard Roller Bearing Company greatly extended its plant during the past year. It purchased the large plant of the Pennsylvania Iron Works Company adjoining, and altered and extended it to meet its requirements. The latter company after the sale removing to Eddystone, Pa., where it in turn erected a new plant.

The automobile industry has been of particular interest to the trade in this territory, and several plants were built and equipped during the past year, while a good volume of business developed from garages, a number of which were built, and some of which have extensive repair shops.

The Outlook for 1908.

To give any clear outline of the probabilities of business during 1908 in the machinery trade is indeed a difficult proposition. Future developments are dependent entirely on conditions, and these themselves are so complex that they can scarcely be analyzed with any degree of satisfaction. The general opinion, however, is that the year will not be a very active one. Manufacturing concerns are carrying but a small proportion of work over into the year, and new business has been extremely small. Inquiries are light, compared with those during the greater portion of last year, and although somewhat better at the close of the year than early in December, they are confined to small propositions. Prospective buyers appear to be in no hurry to place orders, and until the financial situation becomes more satisfactory it is scarcely probable that any great volume of business will come out. Restoration of confidence is a slow process at any time, particularly during a Presidential year, so that it is more than likely that very conservative policies will prevail, at least until after the Presidential nominations have been made. There is no doubt, however, that a fair volume of business will develop from time to time, particularly along the line of the smaller propositions. There is an encouraging amount of business in sight, and in many cases it is believed that along about February 1, after inventories have been cleaned up, a moderate quantity of orders will develop. Manufacturers as a rule will be satisfied if enough business comes along to keep them in position to run their plants regularly at normal capacity, which is more than the majority can do at the present time. Under the circumstances, therefore, it will be necessary to await further developments generally before any concise statement as to the future can be made.

Chicago Machinery Market.

CHICAGO, ILL., January 7, 1908.

It is too soon after the holiday interim to expect any positive change in the situation. That the development of a stronger trade movement is generally anticipated is evident from the optimism and better feeling prevailing in the market. A fair run of inquiries, coming mainly from the smaller manufacturing interests throughout the West, is reported for the past week among machine tool dealers. No large installations are included in these inquiries, they being mainly comprised of single tools or small lots for replacements or additional equipment in existing plants. Dealers have for some time been gradually reducing their stocks of second-hand tools, which in the meantime have been but sparingly replenished on account of the stiff prices at which such machines are still held. Now that new tools of standard make and pattern can be furnished promptly from stock there is less demand for inferior second-hand machines such as, during the period of congestion last year, were sold at relatively high prices. Good second-hand tools are, however, moved as readily as new ones, and dealers are now in position to add to their stocks when satisfactory prices are offered. Among the moderate number of sales made during the week were included a few tools bought by the Santa Fé and the Chicago, Indiana & Southern railroads. While it is hardly expected that the railroads will enter the market as active buyers immediately, there are indications pointing to a fair amount of business from these sources not far hence.

Touching the future of the machinery market in general, the opinion of W. H. Whiteside, president of the Allis-Chalmers Company, Milwaukee, expressed in a recent interview, is of interest, because of the extended range of the company's operations and the opportunities for observation they afford: "It is daily becoming more apparent," said Mr. Whiteside, "that the general business of the country has not been so seriously injured by the recent sudden financial depression as the public has been inclined to believe. And I am firmly of the opinion that the thing now most necessary is to loosen the chains of conservatism and give courage an opportunity to assert itself and make advances consistent with the general prosperous conditions and well distributed resources of the country. As the production and use of basic machinery, such as prime movers for the generation of power, is a very potent and a leading factor in our commercial activities, very naturally it is one of the first lines of business to be affected when the pendulum swings from optimism to pessimism; and likewise the first to feel the effect when the change in sentiment again manifests itself. The number and character of inquiries which our offices located in the principal commercial centers of the country have recently been receiving convincingly demonstrate a return of confidence, and bear evidence that not only a diversified, but a large volume of business will be offering ere the middle of the first quarter of 1908 has been passed. The railroads of the country, whose policy of retrenchment has continued for approximately a year, notwithstanding the largest offerings of traffic, with resultant increased earnings, in their entire history, must shortly be compelled to again enter the market and make large expenditures for renewals, including train equipment, steel rails and general supplies. This, coupled with the approaching need for the renewal of stocks of metal employed in all branches of industry, which, through shutdowns of furnaces and smelters and the continued use of iron, steel and copper for current consumption, have now been lowered very near to the minimum, and giving due consideration to the large balance now in our favor in our commerce with foreign nations, and to the well distributed revenues from our exceptionally large agricultural products, cannot fail to create an early demand for new machinery and auxiliary equipment. The outlook is, therefore, distinctly encouraging."

Of the numerous light and power projects in contemplation throughout the West, quite a number are ready to go forward as soon as financial conditions make funds available. One of these now under way is the Southwestern Light & Power Company, Sallisaw, Okla., which has been incorporated with a capital stock of $25,000. The company is specially desirous of securing information on ice plants

and gas producers, and solicits catalogues and correspondence relative to such apparatus. The incorporators are W. A. Loudon and W. W. Ray.

The Dake-American Steam Turbine Company, Grand Rapids, Mich., which was formed two years ago, has been incorporated with a capital stock of $200,000, and will enlarge its plant for the manufacture and sale of an elastic fluid turbine patented by Charles W. Dake. The incorporators are Richard G. Peters, president; Frank M. Byam, secretary and treasurer; Charles W. Dake, William Donker and Herbert B. Gillette.

The securing of a site at West Adams and Desplaines streets on a long term lease by the Monarch Electric & Wire Company, Chicago, foreshadows the construction of a large manufacturing building, which will eventually be erected at that location. While it is probable that work on this building will not actively be begun during the present year, plans will doubtless be developed within the next few months for the factory and its equipment, which will be adapted to the manufacture of high grade electrical necessities, including weather proof copper and iron wire, annunciator wire, &c.

Cincinnati Machinery Market.

CINCINNATI, OHIO, January 7, 1908.

As Monday, January 6, of the new year was tacitly understood to mark a sort of crisis in the machinery and machine tool manufacturing world—that is, the shop centers of industry—the representative of *The Iron Age* made a canvass of the larger establishments on that morning to determine the status of the situation. So far as the inquiry was extended no idle plants were found, and investigation of those that had been shut down during the holiday season and prior to that—some two or three only—disclosed that they have resumed operations. One of the largest of the tool manufacturing concerns which has been shut down for two weeks started up again on Monday morning with 325 men. The mails of the morning brought enough generally interesting information to induce this statement from the official in charge: "We had a nice lot of inquiries and orders this morning. Two small orders came from abroad, and all in all the results are sufficient to warrant the statement that it was the most satisfactory mail we have had for two months. We do not look for anything big or wonderful, but believe that the situation will steadily improve."

There is some talk of possibilities of price cutting in the tool trade, but the manufacturers in this section are apparently maintaining lists, and rumors when run down result usually in finding that they emanate from some enthusiastic purchasing agent who has been working on the sales agents. A large tool manufacturer here was called by long distance telephone a few days ago by one of his interior sales agents and told that a prominent purchasing agent wanted to buy some machines, and stated that he "could make the sale if he could cut the price"; that another representative of Cincinnati concerns had made a certain offer. The manufacturer held firm and told the agent to let the parties buy the machines at a cut price if they could. When this firm finally got the order, and at the asked price, this manufacturer reasoned that there was no cutting being done or else he certainly would have lost the order. Whether this satisfactory condition of things will continue to rule when the buying movement finally strikes the overstocked selling forces remains to be seen.

The Cincinnati Southern Railroad (Queen & Crescent) is in the market for a small list of tools for immediate delivery. The list includes one lathe, one shaper, one drill press, one sensitive drill and one planer. The tools are for installation in the shops at Ludlow, Ky.

One of the largest of the early year improvements, which has in no wise been modified because of the recent stringency, is the building of the Heekin Can Company, to be erected at Sixth and Culvert streets. Samuel Hannaford's Sons, architects, will have charge of the building and will be ready for bids in about a week for power equipment which will include four boilers of 250 hp. capacity, six electric elevators, two large direct connected units for operating the factory, and a lot of individual motors. The architects will ask for about a six months' delivery on this equipment. The company will manufacture cans for spices, teas, drugs and similar lines and will be one of the largest in the country.

From the large list of tool manufacturers seen and interviewed it is possible to make the statement that while pessimism may play no part in the new year business equipment of the manufacturers in this section, the business going and in immediate prospect is not more than 20 or 25 per cent. of what would be considered normal from the experience of the past year. One of the shaper manufacturers is still working on back orders that escaped cancellation. A tool concern that has been shut down for two weeks, and started up on Monday morning with half force and on 35 hr. per week time, reports that foreign inquiries have been heavier during the last month than domestic.

The foundries are still working with greatly reduced forces, and the melt is very much off; in some cases being one-fifth of the normal capacity.

Dealers all have plenty of tools on their floors and in warehouses, and announce ability to make immediate delivery on practically all the medium and smaller lines of tools. There is little doing among the second-hand dealers. Such business as is going is of an insignificant character.

Earl H. Turner of the legal firm of Gotschall & Turner, Dayton, Ohio, has been named receiver for the Nutting Machine Company of that city. It is claimed that the assets are in excess of the liabilities, and that it will easily pay all, the financial depression and need of ready money being responsible for the failure.

It is claimed that the Implement Mfg. Company, Marion, Ohio, which recently applied for a receiver, is in excellent shape, and the business will be continued and enlarged. The death of the president, Henry A. Martin, who was also general manager, left the corporation in such shape that it was found necessary to reorganize.

The Toledo & Ohio Central Railroad has just finished one of the largest shop buildings on the Hocking Valley-Ohio Central System. It is located in Bucyrus, Ohio, and is to be used for general repair work on freight cars. It has ground dimensions of 90 x 400 ft.

The Lake Shore Railroad has purchased a plot of land at Elkhart, Ind., on which to build a new locomotive shop. About 25 acres is in the tract. The matter of building, it is understood, will depend upon business conditions, which, if favorable, will see work commenced soon. Estimates of cost have been prepared.

New England Machinery Market.

WORCESTER, MASS., January 7, 1908.

No change of any importance has developed in the situation affecting the machinery trade. A few orders are being booked by the dealers, and some of the machine tool builders report new business, indicating a degree of improvement, which is slightly accentuated by inquiries promising increased business later in the month. As little was expected in the way of business during the first week of the new year, no discouragement is in evidence, and the trade continues hopeful of a return to a fair demand a little later.

Instances of decreases in wages in the metal industry are becoming more numerous. In those cases where employees resent a cut-down their places are quickly filled. There is no scarcity of good workmen out of employment who are willing to accept less than the rate of wages which has been prevailing. The more intelligent workmen who are untrammeled by union affiliations accept the situation philosophically, knowing that a decrease in wages must be inevitable under the greatly changed industrial conditions. The changes apply to contract and piece work as well as to hourly wages.

The daily newspaper accounts of the renewal of active manufacturing after the shutdown over the holidays are occasionally exaggerated in the number of hours to be operated and the number of men employed. But on the whole, including the metal lines other than machine tools, production has increased in New England. The machine tool trade and its kindred lines are hit hardest of all, naturally. Manufacturing for stock is increasing, and when the demand revives there will be an abundance of machinery for immediate delivery. Among the large concerns that are stocking up in anticipation of a future demand is the Pratt & Whitney Company, Hartford, Conn., which has started up after a 10 days' shutdown on a 50-hr. schedule, and with a force of men reduced only as less skillful workmen have been released.

W. & B. Douglas, Middletown, Conn., pump manufacturers, are building an addition to their plant, of mill construction, 24 x 40 ft., which will eventually be enlarged to 40 x 80 ft. The new room will be used for the assembling department and for storage.

The R. H. Long Machinery Company, South Framingham, Mass., has been incorporated under Massachusetts laws to manufacture shoe machinery, needles, eyelets, &c., used in the manufacture of shoes. The capital stock is $200,000, of which $150,000 will be paid in in cash and the balance in the good will and property of the Framingham Shoe Company so far as they relate to machinery. R. H. Long is the principal owner of the business, subscribing to all but three of the 2000 shares. The company is a result of the successful contest waged against the United Shoe Machinery Company, last winter, in the effort to make illegal the practice of leasing shoe machinery on the condition only that machinery of other makes be not used in a factory. The South Framingham business has been carried on for some time, but on rather an experimental basis. The new company is not ready to announce its plans, but it

may be taken for granted that the considerable access of new capital means the intention of proceeding with the manufacture of shoe machinery on a larger scale, and if this proves to be the case new equipment will be required. R. H. Long is about completing the erection of a large factory building, of reinforced concrete, at South Framingham, on the line of the Boston & Albany Railroad. It may be decided to utilize this building, or a part of it, for the shoe machinery business, but Mr. Long states that this has not yet been determined. Charles F. Pooler is the president of the new company; Richard H. Long, treasurer; George G. Whittemore, Framingham, clerk, these officers and Stephen S. Taft, Jr., Springfield, Mass., constituting the Board of Directors.

The John L. Parker Company, Worcester, Mass., manufacturer of pressed metal goods, has added a department for the manufacture of screw machine specialties. The company has installed two National Acme machines, a Warner & Swazey and a Pratt & Whitney, and proposes to purchase additional machine screw equipment in the near future. Thomas E. Griffin, recently with the American Roller Bearing Company, South Framingham, and formerly with the Locomobile Company of America, is the head of this new department.

The Boston & Maine Railroad is planning to take care of immediate demands upon its locomotive repair department by increasing the capacity of its shops at Concord and Keene, N. H.; by building an addition to its engine house at Somerville, and by the installation of new machinery in that portion of the shops at East Cambridge, Mass., which was not destroyed by the recent fire that burned the machine and boiler shops. New tools will be added at Concord and Keene and at East Cambridge, and the new shop space at Somerville will, of course, require equipment. The East Cambridge fire converted the machinery into junk. It is stated that the proposed improvements will take care of the repairs of the system until the great shops planned to be erected at East Somerville are built, involving an eventual expenditure of $2,000,000.

The Prentice Bros. Company, Worcester, Mass., manufacturer of upright drills, radials and engine lathes, has taken a new five years' lease of the buildings occupied by the business.

The proposed improvements on the Connecticut River between Hartford, Conn., and Springfield, Mass., which would have made the river navigable for boats of some size, must be abandoned for the present at least. Congress made $1,500,000 available for the purpose, on the condition that no damages be claimed for loss of private rights. The Connecticut River Company, which operates a dam, locks and water power at Windsor Locks, declines to accede to such an agreement, demanding $2,000,000 for its rights, which, naturally, put a stop to the whole undertaking. A considerable manufacturing community is located at Windsor Locks, the plants being dependent for their power upon the canal and locks which furnish water from the river.

The Bigelow Carpet Company, Clinton, Mass., is planning to erect a new power plant in the spring, with the purpose of lighting and heating the entire great plant from this central station. A large addition to the weaving mill will also be built this year.

The first apprentice to receive the diploma of the National Machine Tool Builders' Association ended his course at the works of the Norton Grinding Company, Worcester, Mass., January 6, there being informal exercises to commemorate the event. The diploma, recently adopted by the association, is a handsome piece of work on parchment paper and bears the signature of Frederick L. Eberhardt and Secretary Paul E. Montanus of the association, as well as those of officers of the Norton Grinding Company. The presentation was a little in advance of time because of the departure for Europe this week of Charles H. Norton, superintendent and mechanical engineer of the company.

Government Purchases.

WASHINGTON, D. C., January 7, 1908.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until January 28 for the following machine tools for the New York and Washington navy yards: One flat turret lathe, one motor driven punching and shearing machine, one horizontal punching machine, two milling machines, two bolt heading, upsetting and forging machines, one 72-in. planer, one duplex hydraulic pump, one plate bending rolls and one 10-in. slotter.

The Isthmian Canal Commission will receive bids until January 27, circular No. 413, for rock drills, upright drill presses and other supplies.

The following bids were opened December 26 for an engine lathe, etc., for the Norfolk Navy Yard:

Class 167, one engine lathe, one lathe chuck, one grinder head and one head shaper—Bidder 22, Baird Machinery Company, Pittsburgh, $518.50; 78, Fairbanks Company, Baltimore, Md., $505.33; 81, Frevert Machinery Company, New York, $418 and $459; 87, Garvin Machine Company, New York, $534; 102, Hendey Machine Company, Torrington, Conn., $450, part; 103, Hill-Clarke & Company, Boston, $142.50, part; 136, Manning, Maxwell & Moore, New York, $577.75 and $452.75; 150, Niles-Bement-Pond Company, New York, $524; 193, Smith-Courtney Company, Richmond, Va., $568.40.

Under opening of November 4, circular No. 396, for supplies for the Isthmian Canal Commission, all bids have been rejected and new bids will be asked at a later date. This circular included class 2, two punching and shearng machines, and class 3, one horizontal punching machine.

The Babcock & Wilcox Company, New York, has been awarded contract for one steam boiler for the Key West Barracks, Fla., at $3345, bids for which were opened November 12.

The following awards have been made for machinery for the navy yards, bids for which were opened December 17:

Westinghouse Electric & Mfg. Company, Pittsburgh, class 1, five induction motors, $1943.

Niles-Bement-Pond Company, New York, class 2, one universal radial drill, $2255.

Western Electric Company, New York, class 3, two double emery grinders, $325.

Frevert Machinery Company, New York, class 4, one band saw, $764.

The Interstate Commerce Commission Urges More Legislation.

WASHINGTON, D. C., January 7, 1908.—The annual report of the Interstate Commerce Commission, just made public, discusses some important topics to which the attention of Congress is invited as subjects for legislation, among them being the desirability of clothing the commission with power to restrain advances in rates by common carriers and how to check the great destruction of life in railroad accidents. Concerning the propriety of authorizing the commission to restrain advances in rates pending proceedings, the report says in part:

Under the operation of the Interstate Commerce Act, the right to initiate interstate rates rests entirely with the railroad, which may, on giving 30 days' notice, put into effect any rate or any regulation or practice affecting a rate which it sees fit. The commission is not required to approve these rates and has no authority whatever to condemn them. It can only act upon a rate so established by the railroad in case a formal complaint is filed attacking that rate and after a full hearing.

It is certainly just that carriers should not be required to reduce their transportation charges, nor to alter their rules or practices affecting such charges, without opportunity to be heard upon their part, for these charges are, in essence, the property of the railroad. It seems, therefore, ordinarily a just provision to require that formal notice shall be given the railroad, with opportunity to justify its rate, before a reduction is ordered. When, however, the carrier advances a rate or so changes a regulation or practice as to impose upon the shipping public a higher charge or some more onerous condition, an entirely different question is presented. Assuming that the advanced rate would be perfectly just in the end, it may nevertheless be entirely unjust to suffer it to go into effect at the time named by the carriers.

In the majority of instances, perhaps, advances may properly be made before the reasonableness of the advanced rate has been finally passed upon by this commission; but there are also many instances where great injustice must result unless matters can be kept in *statu quo* while proceedings are pending to test the reasonableness of the advance. Where a rate has been maintained for a considerable time, and where business interests will be seriously affected by its change, it is no undue hardship to require the carrier to continue that rate in effect until the propriety of the advance can be passed upon, and to finally make the advance itself at such time as will work no unnecessary injury. Certainly there ought to be some tribunal to which shippers can appeal, with authority, if such a course seems just, to prohibit the advance or the change until the general question can be considered.

We suggest that when an advance in rates or a change in any regulation or practice is attacked by complaint to this commission, the commission shall have the power, in its discretion, after notice to and hearing of the parties, to prohibit the taking effect of the advance or change until the matter has been finally heard and determined. At all events, Congress should definitely understand that we, under the present law, are powerless to act in reference to these advances except upon the filing of a formal complaint and after a full hearing of the case.

In discussing the disastrous railroad accidents of the past few years the commission submits a report showing that during the fiscal year 1907 5000 persons were killed and 76,286 injured, an increase of about 17 per cent. as compared with 1906 and 33 per cent. as compared with 1905 and 1904. With a view to reducing this terrible loss of life the commission strongly recommends prompt legislation for the enforcement of the use of the block system on all railroads doing an interstate business. W. L. C.

OBITUARY.

GEORGE HUNTINGTON REYNOLDS, well known as an inventor, died, January 3, at Mansfield, Conn., his birthplace, aged 78 years. His early life was one of hard work, for he became self-supporting as a farmer's boy. He was afterward a spinner, but his bent toward engineering was a strong one. His first work to attract notice was a steam engine exhibited in 1856 at the American Institute Fair, New York. He received a gold medal and the next year was made superintendent of the fair. In 1859 he became chief draftsman for the Delamater Iron Works and three years later was made superintendent and general manager of the Mystic Iron Works, established to build ships and engines during the Civil War. Returning to the Delamater Works as superintendent after the war, he remained until 1884, when he took a similar position with the Crane Elevator Company, Chicago, and from that time was responsible for much of the development of the passenger elevator. He was then employed as consulting engineer by the Pneumatic Dynamite Gun Company of New York, and superintended the installation of the battery of the dynamite cruiser Vesuvius. He afterward was a consulting engineer of the Locomobile Company of America. He leaves two sons, one of them being Irving H. Reynolds, formerly chief engineer of the Allis-Chalmers Company, and now of the William Tod Company, Youngstown, Ohio. Edwin Reynolds, the famous engineer of Milwaukee, is his brother.

ALEXANDER W. SLOCUM died, December 31, at his home in Pittsburgh, aged 44 years. He was born in Washington county, N. Y., and was educated in the public schools of New York City. He afterward entered Columbia University and won a prize scholarship when only 15 years old. After he graduated he was connected with a number of car wheel concerns in this country and in Europe. In 1896 he went to Budapest, Hungary, and also Leobras, Germany, to superintend the erection and starting of car wheel plants at those places. He was largely instrumental in organizing and developing the Pennsylvania Car Wheel Company at McKees Rocks, Pittsburgh, which was later absorbed by the Schoen Pressed Steel Car Company. He was also one of the projectors of the Keystone Car Wheel Company, which later became the National Car Wheel Company of Pittsburgh. In 1906 he made a contract with the Dixon Car Wheel Company, Houston, Texas, to build and put in operation a car wheel foundry in Houston, and this he completed about 60 days ago. He was a member and former president of the Pittsburgh Foundrymen's Association, and was also a member of the Pittsburgh Club, the Engineers' Society of Western Pennsylvania and the Thalia Club of Houston, Texas. He leaves a widow.

ISAAC REESE, a former iron manufacturer, but in more recent years connected with the firebrick industry, died, January 1, at his home in Pittsburgh, aged 87 years. He was born in Wales and came with his parents to America. As a lad he assisted his father in making the first bloom in a sand-bottomed furnace as applied to puddling in the United States. This was in Bellefonte, Pa. When 16 years of age he went to Pittsburgh and began work as hammerman. After this he became a partner in blast furnace construction in Clarion county and later a member of the firm of Johnson, Taylor & Co., in the manufacture of firebrick. He discovered a new clay and by a process made better brick known as the Woodland. This was a firebrick for crucible furnaces. Three years after entering the firm he purchased all other interests of the concern and controlled it 14 years. Later he invented the famous Reese silica brick, which stands a test of 5000 degrees and is used in open hearth furnaces. He established other plants and has practically had exclusive control of the output of fireclay brick for crucible furnace building in Pittsburgh and vicinity. In 1896 he took his sons into partnership, the firm being known as Isaac Reese & Sons, and later as Isaac Reese & Sons Company, and with offices in the Lewis Building, Pittsburgh. In 1900 the business was incorporated under the latter name, Mr. Reese being president and general manager. Two years later the firm entered the consolidation known as the Harbison-Walker Refractories Company, but still retained the firm name and has always had its own offices, being the only firm in this combine of 30 plants to retain its own individuality. He is survived by his sons, George of Kittanning, and Walter L. of Pittsburgh, and two daughters.

WILSON H. FAIRBANK, Warren, Mass., president of the Warren Steam Pump Company, died January 5, aged 71 years. He was a native of Warren, and as a young man was associated with his father in the lumber business. The chief business of his life was that of contracting for telegraph poles for the great telegraph and railroad companies. He served in the Massachusetts House of Representatives and Senate and as a member of the Governor's Council, and represented his State as a commissioner at the St. Louis, Lewis and Clark, and Jamestown expositions.

STEWART P. CHISHOLM, formerly of Cleveland, Ohio, and a director in the Union Steel Screw Company of that city, died at Princeton, N. J., December 27, aged 57 years. He was a son of William Chisholm, Sr., of Cleveland.

Labor Notes.

The readjustment of the wage scale for salaried men at the Bessemer steel plant of the Republic Iron & Steel Company, Youngstown, Ohio, has been made, and those who formerly received a stipulated salary and a percentage over a certain tonnage per month will hereafter be paid strictly upon a tonnage basis. It is stated that under normal conditions the earnings of the men will be fully as large as heretofore.

The McClintic-Marshall Construction Company, January 4, began to distribute extra compensation to the workmen in its Pittsburgh plant in pursuance of a new profit sharing plan. The scheme is that when the shops push their output beyond a certain fair limit for a day's work, the workmen employed there shall receive a bonus for every 100 tons production.

Owing to the installation of improved machinery for manipulating the material about the blooming mills, the Jones & Laughlin Steel Company, Pittsburgh, intends to operate them hereafter on a 12-hr. schedule. Heretofore these mills have been operating on an eight-hour basis, which necessitated three crews of workmen for the 24 hr. The new practice does away with one crew of men and permits a reduction in wages paid per ton of output. This reduction in wages is compensated for by the increased tonnage these mills are expected to produce with the new apparatus, and thus a satisfactory adjustment in a scale of wages is accomplished.

The open hearth furnaces at the Lackawanna Steel Company's plant at Buffalo will go back into service the latter part of this week, and a merchant mill and some other finishing equipment will also be placed in operation as soon as the open hearth furnaces get to turning out steel. Plans are being made for resumption in the Bessemer division, and it is hoped that the entire plant will be running early in February.

Both furnaces of the United Iron & Steel Company, Pittsburgh, are out of blast. Fannie Furnace at West Middlesex, which was running on Bessemer iron, blew out December 10, and Leetonia at Leetonia, Ohio, which was running on foundry iron, blew out December 31.

For the past year or so paper making in Japan has been very active. Old companies have enlarged and new ones have been formed. Steam for motive power is used in most Japanese mills, and nearly all of the machinery used is of American make.

The Bethlehem Steel Company has removed its Philadelphia offices from 1518 Pennsylvania Building to 811 in the same building.

Of the world's supply of India rubber 63 per cent. is estimated to be furnished by South America.

HARDWARE

IN connection with the organization and work of the various State associations a grave responsibility rests upon the committees, whether designated as legislative or by some other name, who are charged with formulating the judgment of the association in regard to legislation. They should be made up of the ablest and most broad-minded men in the organization, men who will be able to look at all sides of the subjects presented to them and who will refuse to recommend, as has sometimes been done, ill-considered and even mischievous measures. They should be able to withhold approval of resolutions no matter how popular, even though presented and urged by enthusiastic and prominent members of the association, if in their judgment the resolutions are based on wrong principles or the contemplated action is for any reason unwise. They must remember that a meeting crowded with business and called upon to consider some matters of unquestioned practical importance and many others involving much detail, is not likely to be characterized by the care and deliberation which are necessary in forming a judgment in regard to legislation which will be equitable and beneficial in view of all the interests affected. Such committee should be able to pass intelligently on the various commercial questions which come before it, should possess something of a judicial spirit and have strength to resist pressure in favor of unnecessary and unreasonable projects.

There are many questions which relate so closely to commercial matters that intelligent merchants should take an interest in them, and form opinions in regard to the legislative action which should be taken. Thus, for example, there is in some States reason for modifying the lien, garnishee, exemption and other laws enacted or needing to be enacted for the protection of merchants and others to whom money is due. Merchants in convention assembled can very properly express by resolution their attitude on such questions, and thus do their part in securing the passage of equitable laws to meet the case. Local or State regulation of itinerant merchants or peddlers is also a matter to which some of the associations have given attention, finding reason for memorializing their legislatures with a view to securing protection not only for the regular distributers, but also for the public against the imposition to which they are often subjected by these roving vendors. Another class of legislation to which the associations in some States have given a good deal of attention is represented by the laws in regard to pure Paint, prescribing its composition, the kind of label to be used, conditions of sale, &c. A similar principle might obviously be applied to a multitude of other commodities if it were deemed advisable, for it is difficult to find any logical stopping place if the attempt is made to protect the public in the matter of quality. This is, therefore, a class of enactment which should be regarded with some suspicion, as there is great danger that foolish and impracticable measures will thus receive indorsement. Postal matters, so far as they bear directly upon the business of the merchant are an eminently proper subject for consideration, and in regard to which resolutions expressing the association's opinion are in order.

It may indeed be assumed that every Hardware Convention this season will pass resolutions in regard to parcels post, a matter which is sure to be a prominent subject of consideration. While there is a substantially unanimous opinion in opposition to the passing of laws which will permit the carriage of merchandise through the mails to any considerable extent, it is desirable that anything looking like a cut and dried treatment of the subject should be avoided. For this reason each convention should get up its own resolutions rather than follow any set form. Such expressions on the part of merchants so intelligent and influential as those identified with the Hardware trade will unquestionably have weight with Congress, and tend to discourage the passage of any of the laws proposed for the establishment of a merchandise post. Without referring at this time to the great questions which are commanding the attention of all thinking men in regard, for example, to such matters as the national finances, the control of corporations, the regulation of the railroads and the Governmental direction or operation of public utilities, there are other matters in which the retail merchants of the country are peculiarly interested which will naturally suggest themselves to our readers as proper subjects for recommendations of legislative action. The importance of having the committees in charge of this department of association work made up of broad minded and able men, endowed with something of a judicial spirit, is thus enforced.

Condition of Trade.

The activities of merchants and manufacturers continue to be devoted largely to the closing up of accounts, to ascertaining the results of the business of the past year, and in a general way getting ready for the opening season. In a time like the present, when it is especially desirable to know definitely how the business is doing, not only as a whole, but in its various departments, the importance of having a good system of accounting is brought home with peculiar force. Books and balance sheets are accordingly studied with especial care. Much attention is also given to a consideration of the general business situation, and the indications of improvement which in one way or another are apparent, so as to be able to form an intelligent judgment in regard to the policy to be pursued. A cautious and conservative spirit is evident, and merchants and manufacturers are generally endeavoring to pursue a safe rather than an aggressive course. While there is a general clearing of the financial skies and things are looking decidedly brighter, there is a good deal of scrutinizing of credits and a looking into the question whether or not much trouble, such as frequently accompanies or follows monetary disturbance, is to be expected from the failure of commercial houses. The general impression seems to be that the Hardware trade is sound and that not much is to be apprehended in the way of financial embarrassment. While these questions are under advisement there is naturally comparatively little placing of orders, especially as the trade are waiting to see if reductions in price are to be at all general. Thus far the manufacturers are for the most part following a conservative course, and like their customers, waiting to see how things are going before committing themselves by an announcement of revised prices. There are concessions being made here and there, but in general, quotations are well maintained. The disposition

of the manufacturers to work together so far as this is feasible, is a feature which promises well for a reasonable stability in the market. As giving an admirable review of the situation we append the following letter from our special correspondents in St. Paul, which was received too late for our last issue:

FARWELL, OZMUN, KIRK & CO.—Taking of inventories and preparations for the new year are now the work in hand, and will be for some days ahead; 1907, with all its promises, its successes and defeats, its realizations and its disappointments, has come and gone. Upon the whole it has dealt kindly with the commercial houses, and while its path has not been smooth or always strewn with roses, it has offered some mitigating and perhaps even compensating advantages.

The year came in with some lowering clouds, which, however, it was hoped were too far distant to break upon us during the year. But the storm came and the last half of the year was not an easy time for the conduct of business. Throughout this period, however, there were so many elements of strength in the situation that the great body of business men over the entire country never lost their implicit faith in the outcome. Prosperous conditions prevailed in nearly all parts of the country.

There was, to some extent, it is true, an over use of credits for the time, owing to the unusual activity of business generally, but this abnormal feature could be depended on to cure itself in time. Farmers were fairly prosperous, perhaps seldom or never more so, and so were the lumbering and mining and other large interests. The railways, while not crowded with business, as in 1906, were still busy, and all lines of business were much the same.

Resting on this foundation and believing that there was little of a speculative or fictitious character in the legitimate and regular business interests of the country the commercial houses went straight ahead, and they have come through the ordeal in a way that is not only creditable and advantageous to them personally but that must also command the approval and admiration of thoughtful men. It is very remarkable that during this long period of stringency there have been so few failures. So far as the writer knows, not a single Hardware house, of any prominence, has been crippled, or has been obliged to go into port for repairs. We also believe this to be the condition substantially of other lines of trade, which certainly shows in a very favorable light both the character of the men at the head of the houses and also the condition of the houses themselves.

Better days are now probably at hand, and if these many ships of commerce can sail into the smoother seas ahead with as good a record as they have thus far made, they will richly deserve the success in store for them and their part in the commercial history of the country will read well in the future.

There are many lessons to be found in such a school of experience as this. We now mention only one—the most important one of all at this time to the business interests of the country—that of a practical, safe, flexible currency. Are the business interests of the country willing to go into the strain of another fall's experience without some better provision for the necessary addition to the currency for moving the crops?

All these years we have been waiting for the banks to agree on some plan. But bankers have their individual pet schemes and do not agree. Besides, bankers are not interested in the same way as are merchants, manufacturers and others. In an ordinary stringency the banker simply gets higher rates of interest and the merchant and manufacturer pay them.

But of all things that the banker dreads a panic is easily the first, and the danger of a stringency running into a panic at some time is always before him, and thus the banks are interested in the common cause. But the time has now come when the men who have carried a large part of this unnecessary burden should demand relief from Congress.

There should be a strong committee now at work on it—such a committee as served on the monetary commission years ago. The value of such a committee in advising with bankers and members of Congress and also in the effect their recommendations would have on the public would be large. There is little or no danger of unsafe legislation on this subject. It is safeguarded by so many connected interests as to put aside any fear of this danger. What is wanted now is action!

Chicago.

Trade movements are still eddying in the aftermath of holiday diversions, and have not yet got straightened out in their course. It will take a week or two to get inventory work wholly out of the way and business running smoothly in its accustomed channels. By that time there should be some indication of the attitude of buyers respecting the placing of orders for both present and future requirements. The most optimistic are not looking for the development of an unusual volume of business, but there is a widespread conviction that provision so far made will be found short, rather than in excess of the demand of the coming spring months. The price question is one which is commanding much attention. Confidence in values is necessary to insure active buying. It is not so much a matter of cheaper prices as it is the establishment of a reasonably stable level. In face of a widespread expectation of the advent of lower prices in many lines, buyers naturally hesitate to anticipate their wants in future commitments. It would seem therefore that if readjustment in important staples is contemplated in the near future the sooner decisive action is taken the better it will be for all interests. Along this line it is noted that a reduction of $1 a ton on Blue Annealed, $2 a ton on Box Annealed, and $4 a ton on Galvanized Sheets, to take effect on the 6th, has been announced by the principal producer. Concessions of $2 a ton have been made with more or less frequency for some time, especially on Black Sheets. Favored by mild weather, building work throughout the West has gone forward without serious interruption, and trade in builders' hardware has been benefited accordingly. Lower prices of building material, especially of lumber and cement, are also favorable to increased activity in building construction, so that on the whole the outlook in this direction is not unpromising. Wire Nails are quiet, and with the moderate stocks represented to be held by both jobbers and retailers, it will not require a very heavy consumptive demand to start a renewal of buying. The next two weeks' work, of salesmen now returning to their fields, should afford some indication of the general trend of sentiment and the pulse of trade.

NOTES ON PRICES.

Wire Nails.—While in general the trade is still in a waiting attitude and very little is doing between the mills and their customers, the year opens with a hopeful feeling that before long there may be a fair volume of business. The merchants are undoubtedly waiting until the policy to be pursued by the manufacturers is determined upon and announced. While something of a concession in price is thought to be not unlikely, the trade would be disposed to receive without disapproval an announcement that prices are to be maintained, assuming that the course of the market would justify such policy. When the question is definitely settled it is anticipated that orders will begin to be placed; meanwhile the market is gradually but slowly being cleared of goods, so that with the diminished production of the mills the danger of an oversupply is being avoided. Quotations are unchanged, as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

[illegible] $2.05
[illegible] 2.10

New York.—Some Nails are going out in small lots at jobbers' store, but demand is very limited. As a rule prices are not shaded as an inducement to merchants to purchase. Local jobbers and Nail houses are holding small lots at store at $2.30, base. This price is, however, shaded by some sellers, while others are adhering to it.

Chicago.—Business is waiting, and pending the return

to their posts of the sales force from holiday vacations, no effort is being made either by mills or jobbers to secure orders. Active work will, however, be renewed this week. There is no doubt but that the general expectation of a readjustment of prices to a lower basis is a strong factor in holding up purchases that might otherwise be made. There is after all not so much an insistent demand for lower prices as a desire for assurance of stability of values. This question will doubtless be settled before the end of the month, either by the revision or reaffirmation of present schedules. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Cut Nails.—The situation is practically the same as at our last report. The mills are either closed or running at a greatly slackened pace, and are at the same time refraining from attempting to force goods on the market. There is, however, more inquiry and indications that before long Nails may again be moving. Prices in general are fairly even, with occasional shading of what may be considered the regular quotations, which are to jobbers $2.05, base, per carload, f.o.b. Pittsburgh, with freight added to destination.

New York.—Demand is very light and concessions in price are not calculated to induce merchants to stock up. Local jobbers and Nail houses are holding small lots at store at $2.30 base. This price is, however, shaded in some cases.

Chicago.—There is practically no demand for Cut Nails. Jobbers report that nothing more than stray orders for a few kegs at a time are coming from any source. Prices are unchanged; in fact, there is nothing to induce a change. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; steel, to jobbers, in carloads, $2.28; to retailers, $2.33.

Barb Wire.—In sympathy with Wire products generally, and indeed with all staple goods, Barb Wire is waiting a definite return to normal conditions, financial and commercial. With the improvement in the financial situation the trade is beginning to consider the placing of orders, and when the question of prices for the season is settled it is expected that there will be something doing. Meanwhile, existing quotations are quite regularly maintained as before, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—In addition to other influences adverse to the development of new business, the fact that this is an interim between the closing of the old and the beginning of the new season has brought trade practically to a standstill. New orders are not looked for until near the first of February, when spring work in the Southwest will be opening up. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Plain Wire.—Shipments are being made more freely to the manufacturers of Fencing and others to whom Wire is a raw material. The trade generally are not placing many orders, but some shipments are being made to them on orders booked in the fall. Present quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—The increased number of inquiries that are reported to have been received within the past few days seem to indicate a better feeling among buyers. There is apparently no doubt but that there will be at least a fair average demand for Fencing during the year, and manufacturers are beginning to think of the provision necessary to meet it. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Table Cutlery.—The Table Cutlery market seems to be in a very satisfactory condition, with the prospect of prices remaining on their present level. There appears to be no disposition on the part of any of the manufacturers to announce lower quotations, and they are accordingly declining to do so, intending to maintain existing prices, which were established indeed when the cost of producing the goods was probably less than at present. As is well known, no advances in price on this line of goods have been made during the recent marked activity in trade, and the manufacturers feel with good reason that if they did not advance prices in good times they should not be expected to lower prices in dull times. Undoubtedly the jobbers generally appreciate the fact that the present prices of Table Cutlery are close to cost, and they will probably approve the conservative disposition of the manufacturers as enabling them to place their orders for Table Cutlery with confidence that prices will be firmly maintained.

Tin and Galvanized Ware, &c.—It is as yet too early for the declines in Black and Galvanized Sheets and Tin Plates which went into effect the first of the week to have had much influence on the market for Tinware, Galvanized Ware, &c. A reduction of 5 per cent. in Galvanized Pails and Tubs was made a couple of weeks ago, discounting in part at least the present change in raw material. Other lines of Galvanized Ware will probably come down and a moderate reduction in Tinware is generally expected by the trade.

Builders' Hardware.—Trade in Builders' Hardware is in light volume and an earnest desire to book orders is evinced by most manufacturers who are in one way and another offering inducements to possible purchasers. So-called readjusements of prices give the market here and there an appearance of weakness, and contracts are being solicited at terms decidedly favorable to the buyers.

Registers.—In recognition of general market tendencies and the demand of the trade Register manufacturers have made a reduction in prices, taking effect the first of the year. The decline amounts to about 20 per cent on japanned, bronzed and plated Registers, which are quoted in lots of 50 pieces at a discount of 70 and 10 per cent. The discount on white porcelain enameled is 50 and 10, and on solid brass or bronze metal 40 per cent. A change should be noted in quotations on japanned, bronzed and plated Register Faces, which have previously taken the same discount as Registers, but are now somewhat lower, the corresponding discount being 75 and 10 per cent.

Drop Forged Wrenches.—A reduction in selling prices of about 10 per cent. has been put into effect by manufacturers of Drop Forged Engineers' Wrenches, which may now be quoted in a general way at a discount of 50 per cent.

Sash Cord.—No change is reported in the Sash Cord market, which continues to exhibit the irregular features observed for some time past. It is reported that a conference of leading manufacturers will be held this week.

Escutcheon Pins.—Prices on Escutcheon Pins show a declining tendency, moderate concessions being reported to good buyers.

Rope.—While no marked change has taken place in the cordage market, no retrograde movement has set in. Collections are referred to as being a little easier, and the number of orders shows a slight increase. Manufacturers do not anticipate anything like a revival of demand until the last of the month, or even later, if conditions this season follow those of previous years. The following quotations fairly represent the market for base sizes: Pure Manila, 11½ cents; B quality grades down to 8½ to 9 cents; Pure Sisal, 8 cents; lower grades Sisal, 7 to 7¼ cents; No. 1 Jute, ¼-in. and up, 7½ cents; No. 2 Jute, 7 cents.

Window Glass—Apparently no progress has been made in the way of any general resumption of the idle Glass factories, and the majority of those that are in operation seem to be the factories working on the co-

operative plan, where "market money" is paid at the end of each week. This means that workmen who were making from $75 to $150 per week last fire are now receiving about $1.50 per day. One such factory has offered Glass recently at 90 and 30 per cent. discount for single and 90 and 40 and 5 per cent. discount for double strength Glass, in carload lots, from manufacturers' list. These prices are supposed to represent no profit, even at reduced wages, and the only reason for selling is to obtain money to keep the factory running. Jobbers' prices are usually very elastic, and in the eastern and central districts it is reported that Glass is being offered at 90 and 40 per cent. discount on single and 90 and 45 per cent. discount on double strength Glass, from jobbers' list, for car lots.

Linseed Oil.—Business is confined to small lots at this point, covering immediate requirements. Crushers are not attempting to secure orders for delivery more than 30 days in advance, and comparatively few transactions even on this basis are reported. Prices in five barrel lots are about as follows: State and Western Raw, 43 cents; City Raw, 44 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—The Southern market has shown an advance of nearly 10 cents per gallon during the week, attributed to light receipts at Savannah. Purchases have been principally for export account, and some in the trade are of the opinion that the shorts were caught and have been covering. Buying at this point has been light, as it is considered doubtful whether these high prices will prove permanent. The New York market is represented by the following quotations: Oil Barrels, 51½ to 52 cents; Machine Made Barrels, 52 to 52½ cents.

Death of Thomas H. Lane.

THOMAS H. LANE, until recently senior member of the firm of Wolff, Lane & Co., Hardware jobbers, Pittsburgh, Pa., died at his home in that city on January 1, aged 79 years. Death was due to the infirmities incident to old age. A year ago his health began to decline, and for the past four months he had been confined to bed. When 14 years of age Mr. Lane went to Pittsburgh and entered the employ of Whittemore & Wolff, with which firm he was identified for over 60 years. Several years since the firm became Wolff, Lane & Co. Mr. Lane was for many years a director of the Bank of Pittsburgh, a trustee of the Dollar Savings Bank, and also a trustee of the Western Pennsylvania Institute for the Deaf and Dumb at Edgewood. During his entire life in Pittsburgh he had been closely identified with the First Evangelical Lutheran Church on Grant street, having been an elder and a deacon for over half a century, and the superintendent of its Sabbath school for 36 years. He was also one of the projectors and an early officer of the Pittsburgh Y. M. C. A., and was closely associated with the American Bible Society. During the war he was active in the work of the Sanitary Commission.

Mossman, Yarnelle & Co.'s New Building.

MOSSMAN, YARNELLE & CO., Fort Wayne, Ind., have just taken possession of their new building, which is one of the largest and most completely equipped structures in the country devoted to Iron and Heavy Hardware, and Wagon and Carriage Material. The building is an imposing one, 122 x 150 ft. in size, with four stories above a 12-ft. basement, is massively constructed, to sustain the great demands of weight upon it, and is as nearly fireproof as mill construction can make it. This business was started in 1882 by E. F. Yarnelle and the late Frank Alderman, under the firm name of Alderman & Yarnelle. In 1890 the firm became Mossman, Yarnelle & Co., as at present, the partners being W. E. Mossman, E. F. Yarnelle, B. Paul Mossman, and E. R. Yarnelle. The business done by the house has grown until it is now considerably in excess of $1,000,000 annually.

I. L. Lockhart has purchased the Hardware stock of John Lathan, Sanwich, Ill., and will continue the business as heretofore.

PITTSBURGH NAIL AND WIRE MARKET.

Wire Nails.—New orders for Wire Nails continue very light, the product of the mills being nearly altogether specifications against contracts, and these are not coming in very freely. Reduction in prices on some lines of Finished Iron and Steel have led many in the trade to believe that possibly there will be a readjustment in prices of Wire Nails on a lower basis, but nothing official relating to this has been given out. A material improvement in specifications on contracts is looked for this month, but it is probable new business will continue light until spring trade opens up. We are advised that prices are being firmly maintained by the mills, but are sometimes slightly shaded by jobbers who have Nails in stock bought at lower prices than are ruling now and who are anxious to move them. Quotations on base sizes are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

Cut Nails.—The demand for Cut Nails is entirely of a hand to mouth character, the trade placing orders only for small lots for actual needs, while specifications against contracts are very light. The Cut Nail mills are not showing a desire to force their product on the market under present conditions, realizing the futility of such a course, but are rather disposed to keep down output and endeavor to sustain the market until conditions improve. We understand that some mills are making slight concessions in our prices, but even this does not seem to have the effect of stimulating demand. We quote Steel Cut Nails at $2 to $2.05, f.o.b. Pittsburgh, for carload lots, and small lots at $2.10, to which freight to destination is added. Iron Cut Nails are being held at about $2.15, at mill.

Barb Wire.—Practically no new business is being placed, and shipments against contracts have about been finished up, so that the mills are doing very little. The demand for spring trade is expected to open up from some sections of the country, notably the Southwest, before this month is out. It is believed that very soon some of the contracts that have been held up by request of customers, will soon be released and shipments on these go forward. It is stated that in the absence of business, prices are being held. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Smooth Fence Wire.—There is practically no new buying, and specifications against contracts are coming in very sparingly, so that shipments by the mills at present are very light. It is the opinion that consumption of Wire Fencing this year will not be as heavy as last year and in 1906. In the present quiet condition of the trade, it is stated that prices are being well maintained. Quotations for base numbers 6 to 9 are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

JOHN A. GREGG, Burlington, Iowa., who has been representing in his territory a number of manufacturers of Hardware and Hardware Specialties, has incorporated his business under the name of John A. Gregg Company. This company will continue to look after the interests of the manufacturers whom Mr. Gregg has personally represented for so many years.

THE MOSSBERG WRENCH COMPANY, Central Falls, R. I., is remembering its agents for the sale of "Sim-Pull" Countershafts with a souvenir in the form of a letter scale. The scale is a thoroughly practical and accurate machine of attractive design and nickel plate finish, and makes a handsome and useful piece of desk furniture.

RETAIL HARDWARE ADVERTISING.

RESOLVED: That the retail Hardware merchants throughout the country should, as a rule, prepare their own advertisements rather than call upon outside talent to do that work for them.

BY H. L. M.

At the outset we will assume that Hustle is a Hardwareman of average mentality and rating, owning a stock that inventories about $15,000, with everything he owns invested in his business, having on hand a working capital of $2500 and confronted by the necessity of paddling his business canoe by his own strength and gray matter in a community of say 20,000 souls.

This man, Hustle, has been in business several years; he has seen the changes that a few years have wrought; he has experienced the rebuffs to be charged to catalogue house competition; he has seen his margin of profit fluctuate on a declining scale, and in various ways he has come to realize that he must make good his name. His competitors have the bulk of the retail trade of the town. After taking a careful mental summary of the situation, Hustle resolves to advertise. Just at this psychological moment a circular comes to him from one who would do just that work for him. "No," Hustle soliloquizes, "I'll do it myself. I know my trade, I know my people, and I know my conditions and competition. Guess I'll write my own ads."

Hustle's First Snag

But Hustle's first dilemma arises when he essays to buy space from his local newspapers. "Seventy-five dollars a year for a 5-in. space! That is pretty high, isn't it?" he remarks to his local editor. "But I'll pay it;" and the contract is made. Now, Hustle's idea of advertising is that which 999 men out of 1000 hold.

He thinks advertising should be written to specify big black type, so he proceeds to announce that Hustle is selling Lawn Mowers at $1.98 all the coming week. It looked well in print, too (to Hustle), but somehow or other it didn't sell Lawn Mowers. Picking up the paper one night at home he saw a notice that was headed:

IS YOURS
A LAWN
OR A HAY FIELD ?

and inasmuch as his own grass needed cutting he jokingly repeated it to his wife, and reading on he found he had read the advertisement of a competitor, who was talking about Lawn Mowers, too.

Following His Competitor's Example.

Hustle didn't like the advertisement, either. "What good is it to head a Lawn Mower ad. like that?" he mused. "How does a hay field affect a Lawn Mower? Why, I don't believe that'll do a bit of good in moving Blank's stock of Mowers." It sort of made him mad, too, to think he had been caught by a competitor, but he was madder than ever next day to see a whole truck load of Lawn Mowers unloaded in front of his competitor's store.

Hustle reflected that this was the *second* shipment the other fellow had received inside of a month, and the Lawn Mower season had only begun. The stores were adjacent, so he had a clerk watch to see how many Lawn Mowers Blank put into his delivery wagon that day. At night the clerk reported six—which was just five more than he, Hustle, had sold. "H-m," mused Hustle, "maybe that ad. is doing it. Mine isn't selling any Mowers, that's a cinch. I'll just re-write my copy and swipe Blank's style." Forthwith he sent to the newspaper offices an advertisement of which the heading looked like this:

YOU HAVE
YOUR HAIR CUT,
DON'T YOU ?

and the text went on to say that hair and grass were no different in appearance, if allowed to grow long; that either would show the owner thereof to be careless and slouchy, &c. When that came to be printed, some of Hustle's friends dropped in and joked about the "hair cut," but two of them bought Lawn Mowers. And the sales of Mowers that week really amazed the surprised and delighted Hustle.

Doing the Same with Screens and Screen Doors.

The next week he featured Screens and Screen Doors, and he advertised them in print just as he would talk to a prospective customer. He used a style that was chatty and which looked like reading matter, and that had alluring headings. He talked but of the twin subjects. The salesmen noticed and told Hustle how the Screens were being asked for by customers, and Hustle knew the demand was being created by the ad. and nothing else, so he smiled, and when it was necessary he ordered more Screens.

Hustle had *learned how to advertise*, and thereafter he found his cash sales as well as charges were increasing at a gait that was very satisfactory.

Advantages of Being Your Own Advertising Writer

There are basic principles about advertising that any man may grasp and put into operation. Advertising Hardware properly can be learned just as well as learning to buy it. The fact of knowing one's own trade is a factor that must operate in favor of a Hardwareman who writes his own ads.

Then, too, local news may be taken advantage of, and so embodied into one's advertising as to create interest which in itself must attract readers. And attracting readers is to pave the way for a sale. But by far the greatest factor is that a Hardwareman knows his climatic conditions best, by which I mean that if Screens are seasonable, he can so advertise. No expert service, however good, could foresee the need of the particular season as well as the man on the ground.

If a Hardwareman will subscribe to any good publication of the advertising profession, he will learn much that will aid him immensely. Any influence so potent as advertising is worth the time looking into, and if a bit of reading on the subject can aid a man the time consumed in that way is very profitable.

Learning by Experience.

I think the vast majority of business men do not know the potentiality of advertising and do not approach the subject with a proper recognition of its great interest, not only from its return giving features, but its intensely entertaining aspect. There is nothing prosaic about it. Advertising is ambition since it reflects a man's striving to better his condition. To be without ambition is to be dead without the knowledge of being so. And to do without advertising is to die a business death.

Approached thoughtfully, the problem of advertising is one that any man may reduce for himself by simply treating it as he treats himself on any other score that must needs be learned. And it can be learned only by experience. Therefore, he who would master it must do so for and by himself.

Importance and Value of Advertising.

Our forefathers gave us a priceless legacy in bequeathing the love of bartering. Apart from the financial aspect is there anything more alluring than to possess something that others want and need, and to bring about the transaction that supplies the demand? That it yields the wherewithal which allows us creature comforts is a reason par excellence, but the triumph of wit is highly satisfactory.

The Connecticut Yankee who dealt in wooden nutmegs was far ahead of his time; yet, think what his wit plus advertising would have done! And do you think he would have allowed any one else to write his advertising? Not much!

The schemer who advertised to sell a steel engraving of George Washington for $1, and who sent a 2-cent stamp to those who replied, knew the value of advertising. Mark you, *he* knew it, and *he* used it. So, too, the scamp who, at the hight of the Bicycle craze, offered an up to date safety model for $5, and who sent a Safety Pin to such people as bit his bait, knew the potentiality of advertising, but he did his own ad. work.

An advertising writer of national reputation has this

to say of his work: "Where is there greater romance and excitement than in battling with all the force of heart and brain for the development and success of an idea into which a man has put his whole soul? Yes, there is the point: a man must use his soul to find the higher side of any business; it is the soulless grind that is death to ideals."

Grit, Grace and Gumption.

Handle one's own advertising! Indeed, a man should do so, for then one's grasp of it is the more supreme. Very often the kindest turn one man may do another is to kick out the props from under the other and let the other gather headway and impetus of his own generating. "No lane so long but has its turning," and to the man of grit, grace and gumption advertising will prove no exception. "Where there's a will there's a way," but there's never a signboard showing the path. Each must find the way, and the more earnest the seeker the surer he is to pay the price of the search and to seek it alone. If the path be worth seeking he will have to hunt for it alone, for man is so constituted that he refrains from giving away information when silence is golden—to him.

TINWARE LOCOMOTIVE.

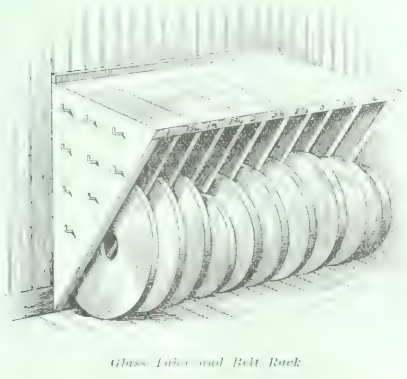
AN addition to the rolling stock of the Hardware line is offered by Brownell-Mason Company, Fitchburg, Mass., whose show window served as a round house for the locomotive here shown. The ingenious machine is said to contain pretty nearly everything in the way of Tinware carried by the company, so that an enumeration is scarcely necessary. Most of the articles will be recognized in the photograph, such as the Dark Lantern which forms the headlight, the Cake Pan wheels, with a Long Handled Spoon for a connecting rod, and Gem Pans forming the roof of the cab. A Soap Dish below the cab makes a step for the engineer. A Wire Toaster represents the cow catcher, and the boiler of the locomotive is a good sized Garbage Can. The Wire body of the tender contains a plentiful supply of Pots and Pans, &c., to represent fuel.



Rolling Stock for the Hardware Line

GLASS TABLE AND BELT RACK.

THE novel piece of Hardware furniture illustrated herewith was seen in the store of James H. Bryan Company, Westfield, Mass. Strictly speaking, it is a glass cutting table, but the space underneath is ingeniously used for the accommodation of the narrower widths of leather belting. Compartments of the proper width to contain the different sized coils are formed with thin pieces of board, and are marked with figures indicating the width of the belt, ranging from 1 in. up. A feature of noteworthy convenience is the use to which the table may be put in cutting belting, as well as glass and for laying out goods, wrapping packages, &c., when not otherwise occupied.



Glass Table and Belt Rack

TRADE ITEMS.

THE GRATON & KNIGHT MFG. COMPANY, Worcester, Mass., has recently completed a 72-in. three-ply Leather Belt for a prominent lumber company of San Francisco. In the construction of this Belt the backbone centers of 245 steer hides were used. The Belt is 141 ft. long, weighs 2827 lb., and will be, so far as the company has been able to discover, the largest Belt on the Pacific Coast.

THE AMERICAN RIVET COMPANY, New Haven, Conn., has added a department of Metal Stampings, with George S. Davis, recently with the Boston Pressed Metal Company, Worcester, Mass., in charge. Mr. Davis will include in his duties visiting the trade in New England and Pennsylvania.

THE WYOMING SHOVEL WORKS, Wyoming, Pa., manufacturer of Shovels, Scoops, Drain Tools, &c., has favored its customers and friends with a reminder of the season in the shape of a convenient weekly memorandum calendar for 1908.

FRED. E. LAY, for 15 years manager of the American Whip Company, Westfield, Mass., has resigned his position to become associated with the Lay Whip Company, Rock Island, P. Q., of which his father, Edwin R. Lay, is president. Mr. Lay had been a director of the United States Whip Company, the parent corporation, during his management at Westfield, and is well known as one of the expert manufacturers of Whips in this country. He will retain his residence at Westfield.

IWAN BROTHERS, manufacturers of Post Hole Augers and Diggers, Drain and Mining Tools, Hay Knives, &c., Streator, Ill., have issued a large paged and very striking folder, entitled "How We Dig Up Dollars for You," in which they describe a portion of their plan for increasing the sales of their products during 1908. A partial list is presented of agricultural publications in which their advertisements will appear regularly during the year, with the remark that as many millions of readers will see these announcements every month it will be well for the Hardware merchant to get ready to supply the increased demand for the goods thus developed. Their business policy is tersely described as "co-operation and profit for the dealer who sells Iwan specialties—satisfaction for the man who uses them." A new edition of "Easy Digging," a booklet intended for general circulation, has recently been issued, and merchants will be supplied with as many copies as desired on application.

THE Sporting Goods business heretofore conducted by Mrs. Rosa Koenig, under the name of E. G. Koenig, 875 Broad street, Newark, N. J., has just been incorporated under the style of E. G. Koenig's Sons. The officers of the new company are Albert S. Koenig, president; Mrs. Rosa Koenig, vice-president, and Edwin G. Koenig, secretary and treasurer.

M. G. RODEARMEL, 206 Commercial Building, Minneapolis, Minn., has issued his 1908 booklet, enumerating the 16 manufacturers, and their principal products, for whom he acts as agent in the Northwestern States. Mr. Rodearmel has represented several of the concerns for the past 20 years.

RETAIL HARDWARE CONVENTIONS.

During the next two or three months the following retail Hardware conventions will be held. Where the asterisk appears elaborate plans are being made by the association officials for the accommodation of Hardware exhibits by manufacturers and jobbers.

INLAND EMPIRE ASSOCIATION, Spokane, Wash., January 15, 16 and 17. Secretary, E. W. Evenson, Spokane.

OREGON ASSOCIATION, Portland, January 21 and 22. Acting Secretary, C. D. Lownsdale, Portland.

TEXAS ASSOCIATION,* Dallas, January 21-23. Secretary, J. W. McManus, Dallas.

PACIFIC FEDERATION, Portland, Ore., January 23-25. Secretary, E. W. Evenson, Spokane, Wash.

NORTH DAKOTA ASSOCIATION, Fargo, January 28-30. Secretary, C. N. Barnes, Grand Forks.

SOUTH DAKOTA ASSOCIATION,* Aberdeen, February 4-7. Secretary, H. E. Johnson, Redfield.

WISCONSIN ASSOCIATION,* Milwaukee, February 5-7. Secretary, C. A. Peck, Berlin.

CONNECTICUT ASSOCIATION, Meriden, February 10 and 11. Secretary, James de F. Phelps, Windsor Locks.

KENTUCKY ASSOCIATION, Louisville, February 11-13. Secretary, John R. Sower, Frankfort.

NEBRASKA ASSOCIATION,* Lincoln, February 11-14. Secretary, J. Frank Barr, Lincoln.

INDIANA ASSOCIATION,* Indianapolis, February 18-21. Secretary, M. L. Corey, Argos.

IOWA ASSOCIATION,* Cedar Rapids, February 18-21. Secretary, A. R. Sale, Mason City.

NEW YORK ASSOCIATION,* Buffalo, February 18-22. Secretary, John B. Foley, Syracuse.

PENNSYLVANIA ASSOCIATION,* Altoona, February 24, 25 and 26. Secretary, J. E. Digby, McKees Rocks.

OHIO ASSOCIATION,* Columbus, February 25-27. Secretary, Frank A. Bare, Mansfield.

MINNESOTA,* St. Paul, February 25-28. Secretary, M. S. Mathews, Guaranty Building, Minneapolis.

ILLINOIS ASSOCIATION,* Peoria, February 26-28. Secretary, L. D. Nish, Elgin.

NEW ENGLAND ASSOCIATION,* Boston, March 11 and 12. Secretary, Chas. L. Underhill, Somerville, Mass.

North Dakota Retail Hardware Association.

Weather conditions permitting it is believed that the twelfth annual meeting of the North Dakota Retail Hardware Association will be the most largely attended gathering in the history of the organization, as during the past year quite a number of accessions to the membership are reported. The railroads have agreed to a rate of a fare and three-fifths on the certificate plan, which brings it down as heretofore on a basis of 2 cents a mile each way. At the morning session on Wednesday, January 29, Governor Burke of North Dakota will make an address. S. R. Miles, president of the National Retail Hardware Association, will also be in attendance, and will make an address. A good deal of the convention time will be devoted to the Question Box, and it is hoped that this general discussion of practical topics will be interesting and instructive. Papers will be read by R. E. Saberson, general manager of the Berkley System Company, on "Effective Advertising," and by N. A. Burdick on "Independence in Business or Standing on Your Own Basis." Other features of the meeting will be talks by Prof. E. F. Ladd on practical Paint tests and their results, and by Chas. F. Ladner, president of the Retail Hardware Mutual Fire Insurance Company of Minnesota, on mutual fire insurance.

Ohio Hardware Association.

At the suggestion of a number of last year's exhibitors the committee in charge of the exposition feature of the Ohio convention has made arrangements to erect a number of universal booths. This booth obviates the expense and annoyance to the exhibitor of looking up a carpenter and decorator, the booth being ready to move into when turned over to the party engaging the space, who defrays the actual cost of erection. Frank A Bare, Mansfield, secretary, in a felicitous New Year's greeting to the merchants of the State, reminds them in regard to the time and place of the next annual meeting, and suggests as a good resolution to make at the beginning of the year that of attending this gathering of the trade, which promises to be a notable one.

Minnesota Retail Hardware Association.

The Minnesota Retail Hardware Association has lately distributed two postals, one of which gives an exterior and the other an inferior view of the Auditorium in St. Paul, in which the association's first Hardware exposition will be held in conjunction with the annual meeting, February 25-28. The Auditorium is a very large structure, and is admirably adapted for exhibition purposes.

Annual Banquet of Pacific Hardware & Steel Company.

THE PACIFIC HARDWARE & STEEL COMPANY, San Francisco, held its annual banquet at the St. Francis Hotel in that city on December 20. It was participated in by upwards of 140 members of the company's selling and executive force. The attractive menu bore a photographic view of the city after the earthquake and another taken last month, with the terse comment, "No magic, but work." An illustrated souvenir was also issued, embellished with clever drawings, referring in a more or less humorous and pointed way to members of the staff. Of a rather more serious nature are the business maxims and well turned epigrams scattered through the pages, from which we quote the following:

There are never too many competitors in a business. If a salesman does not get trade it is not because it is overdone, but because the salesman is outdone.

When complaints are made by customers, always count them. Then compare the number of complaints with the number of customers. Do not be governed by one dealer's opinion, but form your judgment from the counting. The majority rules.

Continual urging is the price of success to the salesman.

Finding good business is in reality finding good friends who will do business your way and profit thereby.

A dealer cannot get a low price unless he seeks it. A salesman cannot get a fair price unless he asks it. Each in his place.

A sense of hurry will do more to befuddle the human faculties than any other feeling. Work quick, but don't bother about the train. Sell goods as long as there are any goods to be sold. Take the train afterward.

In salesmanship a smile is a little thing, yet it has brought more customers than have price or merit in merchandise.

Enthusiasm is a quality which any one can make grow by persistent practice.

A strong pull together means more for both house and salesman. In a tug of war the house will win from the salesman, but both will lose with the customer.

Industry—persistent industry—will win where mere brilliancy will prove an utter failure.

The best you can do for a customer must be determined by an estimate of the best you can do for your employer. The employer first, the customer next, but justice to both.

JOHN J. SNYDER, founder of the prominent Brooklyn, N. Y., house of John J. Snyder & Son, died January 6, in his 78th year. He was giving active attention to business up to within two weeks of his death. Mr. Snyder was recognized as one of the pioneer business men in Flatbush, and his advertising under the style of Snyder of Flatbush has long been familiar in that district. He was an able and successful merchant, and a public spirited citizen, active in promoting the welfare of his community, as well as in church work. His sons, who have been associated with him, have long relieved him of the detail of the business and will of course carry it on without change.

MAIL ORDER FREIGHT RATE CASE.

THERE has been a good deal of mystery in shipping circles regarding a complaint pending before the Interstate Commerce Commission in the name of the Export Commission Company, which has evoked so much interest that the commission decided to call a public hearing at Washington this month, where all parties interested could appear to give evidence or offer arguments; and it is understood that the commission is open to receive light from any source on the subject.

The Case Involves the Right of Forwarding Agents

to combine less than carload shipments into carloads, to be carried by the railroads at the carload rate. The Western and Southern roads permit this, although they have other restrictions on carload rates which are not in force on Eastern lines, but the Official Classification has rules that are carefully framed to prevent forwarding agents from obtaining carload rates on mixed shipments.

The mail order houses have not appeared openly in the case, but it is understood that they have a considerable interest in it, as they are able, by working through forwarding agents, to get carload rates on small shipments, a very important advantage on long distance orders.

The rule of the Official Classification, which defines and limits the right of the shipper to carload rates, is as follows:

> In order to entitle a shipment to the carload rate, the quantity of freight required under the rules to secure such carload rate must be delivered at one forwarding station, in one working day, by one consignor, consigned to one consignee at destination, except that when such freight is loaded in cars by consignor it will be subject to the Car Service Rules and charges of the forwarding railroad. (See Note.)
>
> Note.—Rule 5B will apply only when the consignor or consignee is the actual owner of the property.

The complaint before the commission is against this "note," which excludes the forwarding agent from carload rates, because in such traffic neither the consignor nor the consignee is the owner of the property. This note throws such traffic under the ban of another rule in the Official Classification, No. "15 E." which expressly forbids combining shipments into carloads by forwarding agents excepting at the less than carload rate for each lot of goods.

The Present Rules of the Official Classification

do not afford many cases for complaint on the part of manufacturers or merchants. A Hardware merchant, for example, may buy from two or three or a dozen firms in New York, and if the goods take the same carload class rate they can all be loaded in a car at the carload rate. The shipment must, of course, be delivered to the railroad by one firm on one bill of lading. The fact that the consignee is the actual owner or buyer of the property entitles him to the carload rate. There may be cases where a zealous local agent of a railroad, in seeking to protect the less than carload rates of his company, has attempted to interpret the rule otherwise, but such objections can be overcome by making the shipment in the name of the merchant or consignee. The consignee is then in the position of shipping his own property to himself. As a rule, however, the Eastern roads do not object to this right of retailers and jobbers to obtain the carload rate on "combined" shipments of which they are the actual owners.

The Leading Eastern Roads Also Permit

a manufacturer or jobber to load in a car, at the carload rate, goods for two or more consignees at the same destination, if shipped on one bill of lading, and the principal roads have stop over privileges in their tariffs, which allow a car to be loaded for buyers in different towns on the same line, the car stopping in transit at the first town, and going on to destination at the full carload rate. The Official Classification rule is very liberal in permitting any articles taking the same carload class rate to be loaded together. The Western roads do not permit this mixing of different articles of the same class rate, except in a few cases, which are specially provided for. The general rule in the West is to limit carload rates to straight cars of each article named in the classification. This rule is maintained in deference to the wishes of local jobbers through the West.

Efforts Have Been Made to Confuse the Issue

before the Interstate Commerce Commission, by having it appear that the right of merchants and manufacturers to make combined shipments in carloads is involved in the case now pending. The railroads, however, do not object to giving the carload rate, where either the shipper or the consignee is the actual owner of the property. The real issue in this case is not, after all, the rule of the Official Classification. What the forwarding agents and mail order houses hope to prevent is the adoption of similar rules in the West, by Western or transcontinental roads, whose less than carload rates are high compared with eastern rates. On shipments to the Pacific Coast the forwarding agent often makes a profit or saving of several hundred dollars per car, especially on "household goods," a classification which embraces a large line of mail order business.

Position of the Forwarding Agents.

The forwarding agents, of course, feel that they have a well founded grievance against the railroads, when a rule is enforced which destroys their business. They claim that a common carrier has no right to inquire into the ownership of property offered for shipment. When a quantity of goods of one class, sufficient to make a carload, is offered to the railroad by one shipper, and is unloaded at the other end by one consignee, it is immaterial, they say, to the railroad, whether the shipper manufactured the goods, bought them in trade or stole them, or whether a part of them belong to some one else. On export shipments, especially, it is claimed the roads should not interfere with a method of shipping which promotes business.

The Railroad View.

To the railroads, however, the issue is solely a question of revenue. They want the less than carload rate whenever the shipment is not a bona fide carload as defined by their rules. They claim that if they opened the door to forwarding agents in the Eastern States they would be overrun with bureaus and agencies of this kind, and parcel delivery companies which would do an express business at carload rates by working in co-operation with similar agencies in other cities and towns. They have gone so far in their efforts to stamp out business of this nature that in Cincinnati they have frequently required affidavits from shippers certifying to the ownership of property.

Perhaps the strongest argument, from the railroad point of view, is that neither the carriers nor the Interstate Commerce Commission would have any control over the rate which the forwarding agent would quote to the shipper. If, for example, the carload rate is 30 cents and the L. C. L. rate 50 cents, the forwarding agent might quote his patron 35 or 40 cents, or any intermediate figure that would be mutually satisfactory, thus creating a new and irregular basis of rates, in which there would be more or less discrimination. On some classes of goods the rates to the Pacific Coast show a margin as high as $1.50 per hundred, between the carload and less than carload tariffs.

Judge Kohlsaat's Decision Against the Forwarding Agents.

In 1901 Judge Kohlsaat, in the Federal District Court in Chicago, upheld the right of the railroads to enforce an earlier form than the present rule of the Official Classification, in which the same end was sought to withhold carload rates from forwarding agents. A forwarding agent had asked for an injunction to restrain the roads from enforcing the rule, but the case was dismissed, and in reviewing the questions involved, the court said:

> The difference between the carload and less than carload rates placed at the disposal of the forwarding agent may easily be so manipulated by him as to defeat the spirit of the Interstate Commerce Act. He is not subject to the provisions of that [illegible] which he is claiming the defendants are defeating in this case. He can offer different rates to the different shippers, with no other limit than business necessity. Not only this, but he can give his principals lower rates than those given by the defend-

suits to their less than carload shippers. The logical outcome of such a condition would be, according to the inexorable rules of commerce, that the defendants would be obliged either to do an injustice to their shippers of less than carload lots or reduce all their rates to a carload basis.

On the issue of "like and contemporaneous service," for which the Interstate Commerce law declares that rates must be equal, the court announced the conclusion that there is an important legal distinction in the service. Where shipments owned by several people are merged in one car, there would be an additional liability on the part of the railroad to the "beneficial owners," for which the carrier is entitled to charge a higher rate than where the property belongs to one owner.

In Many Respects This Question Presents a Close Parallel

between the freight forwarding agent and the ticket broker. The broker or scalper buys the wholesale excursion rate tickets of the railroad and sells them to the "retail" passenger. The railroads have spent an enormous amount of money in efforts to prevent any one from dealing in this form of transportation, and have recently won important decisions in the courts. The latest of these decisions in a federal court, is that if the railroad has stated in its printed tariff filed with the commission, that tickets sold under the tariff are not transferable, the condition thus established will be binding on the purchaser.

Death of John G. Brown.

JOHN GREENWOOD BROWN of the Heavy Hardware and Supply house of Brown-Wales Company, Boston, Mass., died January 1, at the age of 61. He was born in Cambridge, and was educated in the local public schools. After the war he went to work for the iron merchants, Fuller, Dana & Co., then located on Fulton street, Boston. After several years with this firm he engaged as traveling salesman for Gay, Manson & Co., iron merchants of that city, with whom he remained until 1869, when he left to enter into partnership with Josiah Bacon, under the firm name of Bacon & Brown, also in the iron business, located on Fulton street.

In 1876, while located on Purchase street, he bought Mr. Bacon's interest, and continued the business until 1883 as John G. Brown & Co. In 1883 he took as partner Manley W. McClure, the firm name being changed to Brown, McClure & Co. In 1890 he erected the six-story brick building now occupied by the company, and Wm. Quincy Wales became associated with the firm under the name of Brown, McClure & Wales. The firm continued as above until the death of Mr. McClure in 1893, when it was changed to Brown & Wales, being incorporated in 1903 as Brown-Wales Company, with Mr. Brown as president. Since 1895 new lines have been added, including Plumbers' and Steam Fitters' Supplies, Power Transmission, &c.

Mr. Brown was a man of the highest standing in the community. He was deacon for many years, and up to the time of his death in the Old Cambridge Baptist Church a very regular attendant and much interested in the work. He was vice-president for several years and president for one year of the Cambridge Y. M. C. A., a member of the Cambridge Club, on the Executive Committee of the General Theological Library and a member of several other charitable and religious organizations. He was obliged to resign from many offices last year on account of his health. He left a widow and daughter.

A special meeting of the New England Iron and Hardware Association was held to take action on his death, and eulogistic remarks were made by many representative men in the trade. A special committee attended the funeral services held in Cambridge last Sunday.

THE OHIO RENEWING COMPANY, Niles, Ohio, has a process of resharpening Files, by which any File of good quality may be resharpened, it is said, from three to six times. The resharpened File will be as good as a new one, it is claimed. The company's plant consists of two buildings equipped for the renewing of worn or dulled Files and a two-story office structure.

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DEVELOPING EXPORT BUSINESS BY CORRESPONDENCE.

BY OBSERVER.

HOW can small manufacturers, not able to spend much money on the effort, get a share of export business? The question is sometimes answered with the declaration that small manufacturers had best stay out of the field. This summary solution is unsatisfactory to interested manufacturers, nor is it in principle in accord with American spirit. It is not impossible for the small manufacturer to obtain remunerative foreign connections, and that without the expenditure of much money, unless time, care and study count as money. One example of what has been and can again be done is well illustrated by the following

True Story of Small Beginnings.

Not 10 years ago a young man with the export "bee in his bonnet" came to New York to try his luck with the hundreds of others then, and now, engaged in export business. He controlled certain lines of goods that cannot be particularized here further than to remark that they are first cousins to Hardware and are bought by most Hardware dealers the world over. This person had a total capital of $1500 in cash, and his first move was to select complaisant and accommodating bankers. To them he explained that his initial deposit and subsequent patronage depended upon the banker's assistance and co-operation, and that first of all he expected the bank that he patronized to obtain for him, through its foreign correspondents, the names of one, two or three possible customers in his line, in every city of any importance throughout the world, whom said correspondents could and would recommend as financially good and responsible and generally desirable customers. The young man found a bank that accepted his terms and in due course the addresses of responsible and highly recommended merchants in the line began to arrive in New York. With these merchants the young man began a persistent and intelligent course of correspondence. The result may be gauged by the fact that last year he had $30,000 to lose in a disappointing venture of another sort.

Study and Time Required.

The method just outlined appears plausible enough to be within the compass of any man, and wonder may be expressed that scores of other young men have not essayed similar procedure. The answer is, they have. That but few have been similarly successful is to be accounted for on two grounds: First, lines of goods unsuited to foreign demands. Second, and far commoner, lack of intelligence in cultivating the foreign correspondent. Intelligence is a broad term. Here it is meant to cover thought and study concerning foreign markets and export conditions; broad mindedness—*i. e.*, ability to put one's self in the other man's place; shrewdness in selecting the telling, fetching points; ability as a letter writer to put before one's correspondents telling features of goods that will appeal to them, and a generally broad education and culture, which (or the lack of which) is bound to make itself apparent in the course of correspondence.

One thing, however, that will obviate the foregoing qualifications in building up an export business is appreciably lower quotations than any competitors, domestic or foreign, are able to offer. The manufacturer who can offer lower prices than competitors has no excuse for not obtaining a large foreign business. However, few manufacturers are in that fortunate position, and most of them regard it as the more desirable policy to maintain prices at as near a parity as possible with competitors. Under the latter circumstances the problem of successfully cultivating an export trade by means of correspondence resolves itself into

How Effectively to Present Quality and Superiority.

It is a fact, repeatedly demonstrated in the personal experience of the writer, that not 1 in 20 American manufacturers knows how to present the important features of his goods in a letter. This is no exclusive reflection on the American manufacturer, for precisely the same thing is true of his British cousin. But the small manufacturer whose interests we are considering must learn how to write letters, for largely on them depends his success. A certain foreign merchant on a visit to the United States was greatly impressed with the claims made by one of the manufacturers with whom he was doing business for a new line of goods that was just being brought out and ordered a sample lot. In about six months the new goods arrived, but by that time the foreign merchant had quite forgotten the forceful way in which their advantages had been presented to him at the factory, and he found it difficult to impress his salesmen in the same way that he had been impressed. He therefore wrote to his American suppliers, "Please have Mr. Smith write me personally about these goods. Let him sit down with his stenographer for half an hour and talk to her precisely as he talked to me. I believe in the goods, but I must inspire my salesmen here as I was inspired in America, and I cannot do it alone." In reply a letter was indeed received from Mr. Smith, a half page, double spaced letter, saying nothing of any interest at all. Mr. Smith could not talk to a stenographer as he talked to a customer.

This incident is not only true but by no means an isolated case. It is illustrative of a deficiency that the small manufacturer who hopes for success in export business through correspondence must overcome.

Condensation in Correspondence.

With some business men it seems to be a physical impossibility to say more in a letter than: "Dear Sir: Our terms are less 50—10 and 5 per cent., delivery f.o.b. Keokuk. We hope to receive your order." The man who can do no more may, quite by accident, receive a sporadic order or two, but he will never get rich from export demands for his goods. Brevity is sometimes considered not only the "soul of wit," but to lend strength to a letter. Without attempting to infringe on the prerogative of certain schools established for the express purpose of teaching how to write letters, it may be observed that in thus attempting to cultivate export connections the fact must not be forgotten that what is familiar to us may be absolutely new, strange, unheard of, to the foreign correspondent. An American manufacturer of machines for making cement building blocks has lately been circularizing Europe, including many places where similar apparatus or, in fact, this method of construction has never been heard of. His circulars merely describe his machines, and that, by the way, in none too lucid a manner. A large percentage of the recipients of these circulars have not the remotest idea of what it is all about. They are not aware of the extent to which the industry has been carried in the United States, nor have they any notion whatever of the comparative costs of such construction or of the advantages claimed for it. One of our manufacturers of Marine Gasoline Engines can find nothing more interesting to say in a recent circular letter than: "We always carry large stocks and can make prompt shipments. Special inducements to foreign agents." Condensation sounds well in theory: how to make it pay dividends is a question for serious study.

To Obtain the Addresses of Desirable Foreign Correspondents.

is a comparatively simple matter. Perhaps times have changed in the last 10 years, and it may not be so easy now as then to secure the co-operation of bankers in getting addresses which, of course, when thus received, are especially desirable, not only because reliable, but because of the induced willingness of the home bankers to finance bills upon houses thus recommended to them. But other means of securing such addresses are not lacking. There are Americans, individuals, associations and trade papers, making a specialty of supplying such names, and if a fee of one sort or another is required it will not, probably, be exorbitant. In almost every foreign country there exists so-called "information bureaus," the business of which is to give reports as to the financial position of local merchants, and even if such reports are not wanted at

the outset, arrangements may be made for the supply only of names and addresses of desirable correspondents.

Personal Selling Trips.

However small the manufacturer, there would seem to be no insuperable obstacle to his making at least one personal visit to what, in his opinion, is likely to prove his largest market. In most lines of goods such a market may be assumed to lie in Europe. A trip to Europe and a visit of two or even three weeks among probable buyers of a manufacturer's goods need not cost over $250 beyond New York, and if really in earnest in a desire to build up foreign business and confident that he has the goods to do it with, such an expenditure would seem to be well within the means of, as well as a desirable investment by, even small manufacturers.

Fell & Lovatt, Crawfordsville, Ind., have opened a new Hardware, Sporting Goods and Cutlery store.

A TWO-STORY STEEL RACK.

THE CONGDON & CARPENTER COMPANY, Providence, R. I., has recently increased its business facilities by the addition of an adjoining building on Canal street, having two fronts. It has four stories and basement, with 40 ft. frontage on Canal street and a depth of 90 feet, the increased space being utilized principally for the more expeditious handling of the iron and steel portion of the business.

A part of the equipment, as here illustrated, is a capacious rack for carrying steel bars, but equally serviceable for any kindred material, such as tubes, rods, &c. The rack is buried to the extent of 6 in. in the cement floor of the basement. A plate of steel 1 x 6 in. runs crosswise of the rack under each upright, all of the many uprights extending upward through the main floor above and anchored to the under portion of the second floor, thus providing large bin capacity, accessible on two floors.

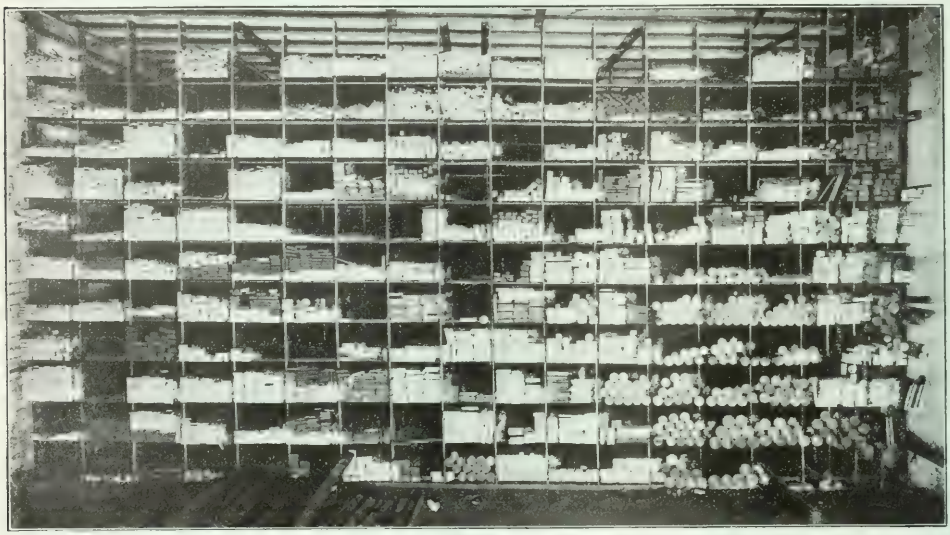


Fig. 1.—Upper Portion of Steel Rack as Seen from Street Floor.



Fig. 2.—Lower Portion of Rack in Basement.

There are separate places for 120 different kinds and sizes of bars or rods in the basement portion, and 165 spaces on the street floor above, the openings of which are principally 12 in. wide and 10 in. high, but for smaller stock there are 44 bins 6 in. wide and 10 in. high. In building this rack, which is of exceptionally solid character to hold great weight, steel bars ½ x 4 in. were used, with ⅜-in. round rods run laterally. There is a division in every third rack, which has a separator of 1¼-in. extra heavy pipe to give increased rigidity and stability. In depth the rack is 20 ft. from front to back, and is electrically lighted at both ends for convenience in storing or getting out material. Near by there has been installed a Nutter & Barnes sawing off machine, for the quick cutting of material to length in accordance with specifications and with square ends up to 6 in. in diameter. This machine is operated by an electric motor on top of the machine. There is also an overhead crane, which transports heavy bars directly from the street to the machine. This is a trolleylike arrangement, running on an I-beam and equipped with a chain hoist.

The company now carries its stock of Nails, Horseshoes, Toe Calks and Blacksmiths' Supplies on the main floor to expedite the handling of an important department of its business. The main building, which the addition adjoins, has a frontage on two streets, with a side street running its entire length, while opposite and across the side street is a warehouse two stories high and 50 ft. long, in which is stored White Lead, Oil and Turpentine. The main buildings occupy the larger part of the entire square, the stock carried consisting largely of Harness, Iron and Steel, Carriage Woodwork, Carriage and Heavy Hardware, Paints, Oils and Varnishes, Horse Clothing, Carriage Trimmings, Tinsmiths', Blacksmiths' and Machinists' Supplies, Sheet Iron, Tin Plate and metals. There is an electric crane in the rear for handling heavy shafting.

This business was established some time previous to 1790, the exact date not being known. A large branch has been located at Fall River, Mass., since January 1, 1874. Just how old the business actually is, is somewhat uncertain, but in the office in Providence hangs a portion of the United States *Chronicle*, dated "Providence, 12th of fifth month, 1790," bearing the signature of Joseph Congdon, greatgrandfather of the John H. Congdon the present vice-president of the company. The body of the advertisement reads as follows: "Lately come to hand and now for sale a quantity of iron stock for the use of forges, amongst which is a large proportion of iron suitable for the blacksmith business." Another branch of the business was established in Bridgeport, Conn., in 1887, but it was afterward sold to some of the employees.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

BARNEY & BERRY, Springfield, Mass.: Illustrated booklet referring to Ice Planers for maintaining a smooth skating surface.

CLEVELAND LOCK COMPANY, Cleveland, Ohio: Illustrated price-list No. 16, referring to Hasp Locks, Corn Huskers, Spring, Strap and T Hinges, Wire Scoops, Steel Shelf Brackets, Miners' Candlesticks, Lawn Sprinklers and Square Auger Bits.

GRAND RAPIDS HARDWARE COMPANY, Grand Rapids, Mich.: Illustrated catalogue of patent all steel Sash Pulleys.

N. R. DAVIS & SONS, Assonet, Mass.: Illustrated booklet referring to Davis Guns, with price-list of parts.

WEEKS SCALE WORKS, Buffalo, N. Y.: Illustrated catalogue No. 30, referring to Scales of various kinds and to Trucks.

OWEN WALSH MFG. COMPANY, 78-80 Barclay street, New York: Illustrated catalogues No. 9 and 10, referring to Portables, Brackets, Gas, Electric and Combination Fixtures, Lighting Specialties, Speaking Tube Materials and Electric Push Buttons.

M. B. SCHENCK COMPANY, Meriden, Conn.: Illustrated catalogue covering an extensive line of Casters, including new price list dated January 1, 1908.

FULTON MACHINE & VISE COMPANY, Lowville, N. Y., Surpless, Dunn & Co., 74-76 Murray street, New York, sales agents: Illustrated catalogue E, referring to Vises.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM A. A. CAVINES, who has engaged in the Hardware business at Cambridge, Idaho.

FROM ROSHOLT HARDWARE COMPANY, Edmore, N. D., whose store was recently damaged by fire to the extent of $13,000, fully covered by insurance. The company handles Shelf and Heavy Hardware, Stoves, Tinware, Paints and Sporting Goods.

FROM WENK & CO., who have succeeded Wenk & Hoesley in the Hardware and Furniture business in Leigh, Neb.

FROM BLAKELY & SON, who have purchased the business of G. W. Bowersox in Cambria, Mich., handling Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Sporting Goods, &c.

FROM LONGMONT HARDWARE COMPANY, Longmont, Colo., handling Shelf and Heavy Hardware, Stoves, Tinware, &c.

FROM J. R. NAGEL HARDWARE COMPANY, which has succeeded J. R. Nagel & Son, in Cuero, Texas. In the newly organized corporation the stockholders are the sons of the late J. R. Nagel, who established the business in 1871. The company has a paid up capital of $10,000, and the business will be under practically the same management as during the past 10 years since the death of the founder, in 1897.

FROM GEO. W. DRULINER, who has purchased the business of W. R. Barger in Benkelman, Neb., and is handling Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting and Athletic Goods.

FROM C. E. SHAVER, who has purchased the Hardware, Stove, Implement, Paint and Sporting Goods business of Richards Hardware Company, Sugar City, Colo.

FROM SRSEN SUPPLY COMPANY, Owatonna, Minn., which has opened a new store and will transact a general Hardware business.

HARRY PARDON BROWNELL, vice-president of the Aspinwall Hardware Company, Providence, R. I., died by accident December 31, aged 33 years. He was a native of Little Compton, R. I., and went to Providence about 16 years ago, entering the employ of Belcher & Loomis, Hardware merchants, and remained with them until August, 1906, when he bought the interest held by W. A. Bosworth in the firm of Bosworth & Aspinwall. The business was reorganized as the Aspinwall Hardware Company, with Charles W. Aspinwall, who had been the junior partner, as president, and Mr. Brownell as vice-president. The latter's specialty was Builders' Hardware. He was a Mason and an Odd Fellow.

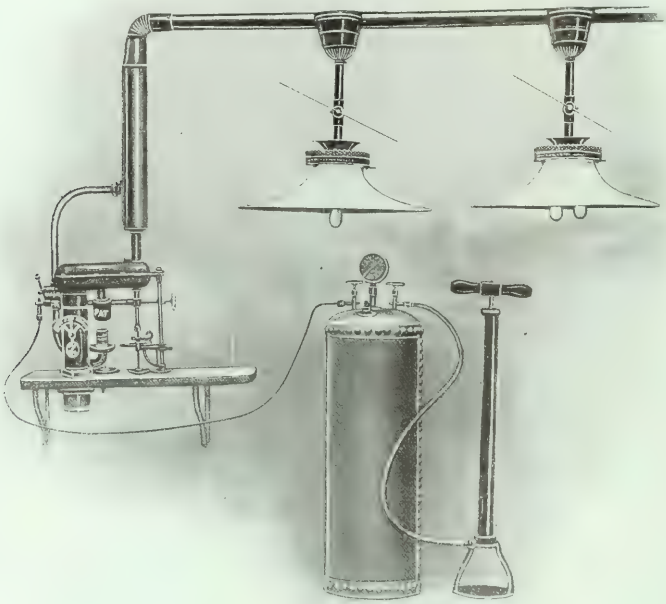
ANTON PETERSON, Stockholm, Wis., has removed his Hardware, Implement and Furniture stock to a new building.

BUTLER BROTHERS' ST. LOUIS BUILDING.

BUTLER BROTHERS, Chicago, announce that their St. Louis branch is now fully established in the splendid new building which has been constructed for it. It occupies the entire block bounded by Seventeenth, Eighteenth, Olive and Locust streets, and is only three blocks from the Union Station. The building is of reinforced concrete construction, and is said to be the largest structure of this kind in the world. Statistics of its size, floor space and the material used in its erection form an imposing array of figures. Architecturally, it is massive and dignified, and every provision is made for the expeditious loading and unloading of freight, and conducting all departments of the business in the most economical and efficient manner. Work on the building was begun in September, 1906, and it was finished in November last, when the work of installing fixtures and removing stock was begun, and only recently concluded.

The Little Giant Gas Machine.

The Little Giant gas machine herewith illustrated is manufactured by the American Self-Lighting Lamp Company, Peoria, Ill., and is designed to furnish illumination for dwellings, stores, halls and other buildings. The mechanism comprised in the generating apparatus is simple, and its parts are easily accessible for cleaning and replacement. It will be observed that the generator is of the overhead type, being fed from above, so that the full effects of the rising heat are obtained. It is also claimed that the generation of gas is economically accomplished by a small subflame to feed which but little oil is required. Air is supplied under pressure from a cold tank system, and is controlled by a regulating device having an indicator attachment, which shows the position of the admission ports. The flame is also regulated by an adjusting mechanism, and the number of lights of the system is indicated by a registering dial. Provision is made to keep dust from mixing with the gas, and a heating damper prevents the heated gas from condensing in the pipes. If it is desired the gasoline supply tank may be placed at any point outside of the building, although it is claimed that it may be operated safely on the inside. The accompanying illustration represents the system connected with the latest improved mantle fixtures with a drop light



The Little Giant Gas Machine.

The Bull Terrier Wrench.

The Whitman & Barnes Mfg. Company, Chicago, Ill., has recently added to its line the wrench herewith illustrated. The small end of the wrench will hold pipe ⅛ to ¼ in., inclusive, and round iron ¼ to 9-16 in., inclusive. The large end will hold pipe ⅛ to ⅜ in., inclusive, and round iron ¼ to ¾ in., inclusive. The wrench is 5¾ in. long, having hardened and tempered jaws. The entire tool is highly polished, and each one is wrapped in oiled paper, inclosed in an envelope and packed six in a neat pasteboard box



The Bull Terrier Wrench.

Bathroom Fixtures.

The National Mfg. Company, Worcester, Mass., has added to its product a full line of nickel plated bathroom fixtures, supplementing a line of the same class of goods of the cheaper grades

Pressed Steel Factory Equipment.

The Kilbourne & Jacobs Mfg. Company, Columbus, Ohio, is offering a line of steel factory equipment, including pressed steel pans, riveted tote boxes, steel barrels, &c. The line, several selections from which are illustrated herewith, is designed with a view to economizing time and labor in the production and storage departments of factories. Fig. 1 illustrates a pan offered for the use of manufacturers of electrical and other instruments suitable for handling or storing parts of electrical instruments, typewriters, adding machines, sewing machines, clocks, watches, &c. The pan has flat steel handles, and is made perfectly smooth on the inside without seams or rivets. It is pressed from No. 16 gauge steel, but can be made of heavier or lighter stock, as desired. It is 13¾ in. wide, 21½ in. long, 5¾ in. deep and weighs 9 lb. It is offered plain, painted or galvanized. In Fig. 2 are shown pans or baskets for foundries, factories, excavating work, &c. They have rolled flanges with concave bottoms, and are especially adapted to carrying ore, earth or other material in mines and smelters, and for use in excavating where labor conditions make it undesirable to use larger receptacles. They are also suitable for handling small castings, valves, washers, &c., in factories and foundries. They are easily cleaned, having no corners or joints, and when partially filled with sawdust or ashes are said to make sanitary cuspidors. Steel barrels with corrugated bottoms designed for handling castings, parts of valves or heavy materials are shown in Fig. 3. They can be equipped with false wood bottoms or double steel bottoms. They are 18 in. in diameter and 28 in. deep. The shells are made from a single sheet of No. 16 gauge steel, and the bottoms are stamped from a single sheet forming a flange 1 in. deep, which is riveted to the shell. The barrels are bound at the top with 1½ x ¾ in. steel, and are painted black outside. They can be made water tight if desired.

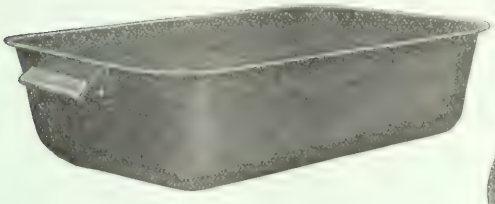


Fig. 1.—Pressed Steel Pan.



Fig. 2.—Foundry Pans or Ore Baskets.



Fig. 3.—Steel Barrels.

Knapp Electric & Novelty Company.

Knapp Electric & Novelty Company, 511-513 West Fifty-first street, New York, manufacturer of battery motors, electrical toys and specialties, has recently added to its line a series of new motors and dynamos, including several types, listing from numbers 120 to 130. These little motors are models of larger machines, and are entirely practical and efficient for teaching the theory and practice of electrical power. The company has issued a booklet briefly stating the elementary principles of electricity and giving directions for winding and assembling its type S and type H motors. Accompanying it are illustrated price-lists, with some detailed descriptions of the machines.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	Per Gal.
Linseed, Strictly Pure	
Linseed, Boiled	
Linseed, Raw	
Raw Cottonseed	
Lard, Extra Prime, Winter	73 @76
Extra No. 1	
No. 1	
Cottonseed, Prime	
Summer Yellow	
Summer White	
Yellow Waxine	
Storm Oil	
Natural White	
Bleached Winter	
Bleached Winter, Extra	@..
Tallow, Prime	
Whale, Crude	
Natural White	
Bleached White	
Extra Bleached White	
Menhaden, Brown	
Light Straw	
Natural	
Crocker's Crude	
Crocker's	
Cod, Domestic, Prime	42 @44
Natural	
Red Bleached	
Olive, Yellow	68 @70
Neatsfoot, Prime	
Palm, Lagos	

Mineral Oils—

Benzine, 76 gravity, 63 cold test	13 @13½
29 gravity, 15 cold test	13½@14
Cylinder, light filtered	20½@21
Dark	
Paraffine	
Red	13½@14

Miscellaneous—

Barytes:	
White, Foreign	$18.50 @ 20.00
Alsace, Bleached	25.00 @ 30.00
Off Color	15.00 @ 18.00
Glucose, Domestic	
In bulk	.35
In bbls	.37
Imported	
Cobalt, Oxide	₱ 100 lb 2.50@ 2.60
Whiting, Commercial	₱ 100 lb .43@ .52
Gilders'	.65

Putty, Commercial—₱ 100 lb

Bulk	$2.75
In bbls	
In kegs	
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—

In Cans	
In bbls	

Glue—

	₱ lb.
Cabinet	12 @15
Common Bone	7½@ 9
Extra	
White	
Foot Stock, Brown	9 @11
Oil	
Russia	
Isinglass	
Irish Moss	14 @

Gum Shellac—

	₱ lb.
Bleached, Commercial	27 @28
Fine	
Fine Orange	
Fine Garnet	
Fine Ruby	
Orange	
Garnet	
Ruby	
Dry Colors	
Orange	

Colors in Oil—

Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	
Brown, Vandyke	
Green, Paris	
Green, Imitation	
Green, Brunswick	
Indian Red	
Sienna, Burnt	12 @15
Sienna, Raw	
Umber, Burnt	11 @14
Umber, Raw	

White Lead, Zinc, &c.—

Lead, English white, in Oil	10½@10¾
Lead, American White:	
Extra	
No. 1	
No. 2	
Lead, White, in oil, 25 lb tin	
Lead, White, in oil, 12½ lb tin	
Lead, White, Dry	
Lead, Red	
Lead, Orange Mineral	
Lead, Sublimed Blue	
Lead, Corroding	
Lead, Patent Desilverized	
Lead, Carbonate	
Lead, Sulphate	
Lead, Basic Sulphate	
Lead, Nitrate	
Lead, Acetate	
Lead, Chromate	
Lead, Metallic	
Lead, Litharge	
Lead, Red	
Lead, Black Sulphide	
Lead, Tungstate	
Lead, Arsenate	
Lead, Iodide	
Lead, Chromate	
Lead, Fluoride	
Lead, Fluosilicate	
Lead, Fluoborate	
Lead, Hydrate	
Lead, Peroxide	
Lead, Nitrite	
Lead, Oxalate	
Lead, Phosphate	
Lead, Phosphite	
Lead, Hypophosphite	
Lead, Salicylate	
Lead, Tannate	
Lead, Valerianate	
Lead, Valerianate, Basic	
Lead, Valerianate, Normal	
Lead, Valerianate, Acid	
Lead, Valerianate, Neutral

Current Hardware Prices

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol *@*. Thus 33⅓ *@* 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓ & ..
North's 10%
Zimmerman's See Fasteners, Blind.

Window Stop—

Ives' Patent 35%
Taplin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—

Fetnald Mfg. Co Burton Anti-Rattlers ₱ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $3.50.
Fernald Quick Shifter, ₱ doz pairs .....$2.00@$3.00

Anvils—American—

Eagle Anvils .....₱ lb @8½¢
Hay-Budden, Wrought.....9½@9¾¢
Trenton .....₱ lb 9½@9¾¢

Imported—

Peter Wright & Sons, ₱ lb, 84 to 349 lb. 11¢; 350 to 600 lb. 11½¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co 10%

Augers and Bits—

Com. Double Spur.....75¢@80%
Jennings' Pat. Bright,65&10@70%
Black Lip Bland.....65@65&5
Boring Mach. Augers.....70%
Car Bits, 12-in. twist.....40&10%
Ford's Auger and Car Bits .....40&5%
Ft. Washington Auger Co., Cons'd's 35%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, 25&5%
No. 30, R. Jennings' list.....50%
Russell Jennings .....25&10&2½%
L'Hommedieu Car Bits.....15%
Mathew's Countersunk Bits.....45%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's Pattern, No. 1, ₱ doz $26; No. 3, $42 .....60&10%
Ford's, Clark's Pattern.....66⅔&5%
C. E. Jennings & Co., Steer's Pat. 25%
Lavigne Pat., small size, $18.00; large size, $20.00 .....60&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut.... $3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$6.50@7.00
Ames .....25&10%
Universal 20%

Ship Augers and Bits—

Ship Augers .....40&10%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' .....33⅓&7½
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdld, Shldered...gro.63¢@66¢
Unhandled, Patent..gro.66¢@70¢
Peg Awls:
Unhandled, Patent gro. 31¢@34¢
Unhdld, Shldered..gro. 65¢@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro $11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality..... $4.75@5.00
Second Quality..... $4.25@4.50
Double Bit, base weights:
First Quality..... $7.00@7.50
Second Quality..... $6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles—

Iron or Steel
Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar..4¾@5¼¢
No. 1 Common, Loose.....3¾@4¼¢
No. 1½ Com., New Style..4¼@5 ¢
No. 2 Solid Collar.....4½@5 ¢
Half Patent.
Nos. 7, 8, 11 and 12..67½@65&10%
Nos. 13 to 14 .....67½@65&10%
Nos. 15 to 18.....70@70&10%
Nos. 19 to 22.....70@70&10%

Boxes, Axle—

Common and Concord, not turned lb., 5@6¢
Common and Concord, turned. lb., 6@7¢
Half Patent.....lb., 9½@10¢

Bait—Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances..... 50&10@60%
Chatillon's:
Light Spg. Balances.....50@50&10%
Straight Balances.....40@40&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb.... per lb. .....@2½@2¾¢

Towel—

No. 10 Ideal, Nickel Plate..₱ gro. $8.50

Beams, Scale—

Scale Beams.....40%
Chatillon's No. 1.....30%
Chatillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₱ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ₱ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned.....₱ doz. $1.50

Beaters, Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. 4, Jap'd, $1.15; No. 8, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro. No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tinn'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202 Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg Co.:
T. & S. Dover.....$6.50

Bellows—

Blacksmith, Standard List.
Split Leather..... 60&10@65%
Grain Leather..... 50@50&10%

Hand—

Inch... 6 7 8 9 10
Doz...$5.00 5.50 6.00 6.50 7.50

Molders—

Inch... 10 12 14 16
Doz...$7.50 9.00 12.00 15.00

Bells—Cow—

Ordinary Goods.. 75&5@75&10&5%
High grade..... 70&10@75%
Jersey .....75&10%
Texas Star 50%

Door—

Home, R. & E. Mfg. Co.'s.....55&10%

Hand—

Polished, Brass..... 70&10@60
White Metal....50&10@50&10&5%
Nickel Plated..... 60&5
Swiss .....60&5
Cone's Globe Hand Bells.....30&5%

Miscellaneous—

Farm Bells.....lb., 21¢@21½¢
Church and School.... 60@60&5%

Belting—Leather—

Extra Heavy, Short Lap..60@65%
Regular Short Lap....60&10@65%
Standard .....70@75%
Light Standard.....75%
Cut Leather Lacing.....40&10%
Leather Lacing Sides, per sq. ft. .....24¢

Rubber—

Agricultural (Low Grade)..... 75@75&5%
Common Standard....70@70&10%
Standard .....70@70&5
Extra .....60&5@60&10%
High Grade.....50&5@50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 30%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list:
Chain, Parts, Spokes.....50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden.....75%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....40%
Embossed 50%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):
¾ in. and smaller..70@70&—%
Larger and longer .....65@—%
Phila. Eagle, $3.00 list.. 50@—%
Bolt Ends.....65@70&—%
Machine (Cut Thread):
¾ in. and smaller..70@70&—%
Larger and longer...65@65&—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob.
Inch... 4 5 6 8
Per doz.$0.50 .55 .60 .80
Cast Iron Spring Foot, Jap'd:
Inch..... 6 8 10
Per doz..... $1.20 1.50 2.25
Cast Iron Chain, Flat, Japanned:
Inch..... 6 8 10
Per doz..... $1.00 1.20 1.65
Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch..... 6 8 10
Per doz..... $0.75 .95 1.25
Wrought Barrel Japd..80@80&10%
Barrel Bronzed..... 60@60%
Spring .....70@70&10@70&10%
Shutter .....50@50&5@50@50&5%
Square Neck..... 75@75&10%
Square .....70@70&10@70%
Ives' Patent Door.....55%
Ives' Wrought Metal.....45%

Expansion—

Richards Mfg. Co.....50&10%

Plow and Stove—

Plow .....65@65@—%
Stove .....55@55@65%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99.....80%
Phila., Eagle, list Oct, 16,1884..82½%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:
Inch..... 1¼ 1½ 1¾ 2
Per doz....$4.80 5.60 6.40 8.00
Inch..... 2¼ 2½
Per doz..... $8.65 11.50
Enterprise Mfg. Co. No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme .....15&10%
Peerless 60%
Seavey 45%

Braces—

Common Ball, American....$1.50
Barber's .....50&10&10@60&10
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 214 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pa....50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat..60&10%

Brackets—

Wrought Steel.....70&10@75&10%
Bradley Metal Clasp..80&10@80&10&5%
Griffin's Pressed Steel.....75@75&10%
Griffin's Bolting Brackets.....70&10%
Taplin Victor Handy Egg Beater Bracket .....₱ doz. $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Wire Goods Co.....75%

Buckets, Galvanized—

M'f'gr's list, price per gross.

	Quart	10	12	14	
Water, Reg.		*25.35*	*28.00*	*32.00*	10&5%
Water, Hvy		*33.35*	*38.00*	*53.00*	
Fire, Rd. Btm.		*32.00*	*34.65*	*38.65*	
Well		*37.35*	*41.35*	*45.35*	

Bull Rings—See *Rings, Bull*

Butts—Brass—

Wrought, List, Oct. 26,'06.55%
Cast Brass, Tiebout's.....40%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow....40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—

Bright.
Light Narrow, Light Reversible .....70@75%
Reversible and Broad..70@75%
Loose Joint, Narrow, Light Inside Blind, &c.....70%
Back Flaps, Table Chest..65% Japanned.
Light Narrow, Loose Pin, ...70@75%
Light Narrow, Ball Tip..60%
Broad .....70@75%
Staple Tipped.....70%
Ball Tipped.....70%

Extra 10@—

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1000, net list: 1200 15% 200 300, 900 .30
Hendryx Brass, Series 700, 800 .30
Hendryx Enameled .35

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb. 4½¢
Sharp, 1 prong, per lb. 4½¢
Blunt, Extra Heavy, Sharp, Extra Heavy, Sharp, Heel and Toe, Sharp, Heel and Toe, Extra Heavy, Sharp, Heel and Toe, Blunt, per lb. 5 60¢, Sharp, per lb. 5 60¢ 4.15¢

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Eley's E. B. .52@55¢
G. D. .per M 54@55¢
F. L. .per M 40@42¢
G. E. .per M 50@50¢
Musket .per M 62@65¢

Primers—

Berdan Primers, S. per M. 20@65
Primer Shells and Bulk ts. 15@10
All other primers per M. $1.52@1.60

Carpet Stretche s —

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:

32 C. F., $5.50 .10@5%
38 C. F., $7.00 .10@5%
22 cal. Rim, $1.50 .10@5%
32 cal. Rim, $2.75 .10@5%
B. B. Caps, Con. Ball, Sieyd $1.90
B. B. Caps, Round Ball .$1.40
Central Fire .25%
Target and Sporting Rifle .15@5%
Primed Shells and Bullets .15@10%
Rim Fire, Sporting .50%
Rim Fire, Military .15@5%

Casters—

Bed .65@10 %
Plate .60@5 %
Philadelphia .50@10 %
Acme, Ball Bearing .50
Gem (Roller Bearing) .70@10@10%
Steel Gem .20 %
Standard Ball Bearing .45%
Yale (Double Wheel, low list, 40@10

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:

5/16	1/4	5/16	3/8	7/16	1/2	9/16
$8.57	6.17	5.02	4.37	3.87	3.27	4.22
5/8	3/4	7/8 and 1		1 1/8 to 1 1/4 inch.		
$4.17	4.07	3.92		4.12		

In cask lots, deduct 25¢.

German Coil:

6-0 to 1 .70@5@70@10@7
2 and 3 .50@10@50@10@3
4, 5 and 6 .30@10@30@10@3

Halter—

Halter Chains .60@10@5%
German Pattern Halter Chains, list July 24, '97 .60@10@5%
Covert Mfg. Co.
Halter .35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Straight, with ring $28.00
6½ 6-2, Straight, with ring 30.00
6½—8-2, Straight, with ring $32.00
6½ 10-2, Bevel Point, with ring $37.00

NOTE—Add 25¢ per pair for Hooks Twist Traces, add per pair for No. 5 and 5, 25; No. 1, 50; No. 0, to improve Straight Link.

Eastern Standard Traces, Wagon Chain, &c., 60@10@10@5

Miscellaneous—

Jack Chain, list July 16, '98:
Iron .60@10%
Brass .60%
Safety and Plumbers' Chain, .60@10
Gal. Pump Chain .lb. 7¢
Covert Mfg. Co.
Breast, Halter, Heel, Rein, Stall
Oneida Community:
American Halter, Dog and Kennel Chains
Niagara Dog Leads and Kennel Chains .45@50&5
Wire Goods Co.:
Dog Chain
Universal Dbl. Jointed Chain. 50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain .60
Pullman:
Bronze Chain, 60"; Steel Chain 60
Sash Chain Attachments, per set 8¢
Aluminum Sash Ribbon per 100 ft. $1.25@3.00
Sash Ribbon Attachments, per set 8¢

Chalk—(From Jobbers.)

Carpenters' Blue .gro. 50@55¢
Carpenters' Red .gro. 45@5 ¢
Carpenters' White .gro., 40@45¢

Checks, Door—

Barbier's .45%
Pullman, per gro .$51.00
Russwin .33⅓%

Chests, Tool—

American Tool Chest Co.:
Boss Chests, with Tools
Youths' Chests, with Tools
Gentleman's Chests, with Tools
Farmers', Carpenters,' etc., Chests, with Tools
Mechanics' and Pipe Fitters' Chests, Empty
Tool Cabinets
C. Jennings & Co.'s Machinists' Tool Chests

Chisels—

Socket Framing and Firmer

Standard List .75&10@5
Buck Bros.
C. E. Jennings & Co.:
Socket Firmer, N. C. 15
Socket Framing No. 15
Swan's
L. & I. J. White Co. 30@30&5%

Tanged—

Tanged Firmers .30@50@5
Buck Bros.
C. E. Jennings & Co. Nos. 10, 15, 25
L. & I. J. White Co. 25&5%

Cold—

Cold Chisels, good quality .13@15¢
Cold Chisels, fair quality .11@12¢
Cold Chisels, ordinary .9@10¢

Chucks—

Almond Drill Chucks .35%
Almond Turret Six-Tool Chuck .40
Beach Pat., each $8.00 .35&5
Empire .25
Ideal .25%
Jacobs' Drill Chucks .35%
Pratt's Positive Drive .25%
Skinner Patent Chucks:
Independent Lathe Chucks .35
Universal, Reversible Jaws .35%
Combination, Reversible Jaws .35
Drill Chucks, New Model, 25; Standard, 45%; Skinner Pat., 25%; Positive Drive .40
Planer Chucks .30%
Face Plate Jaws .35%
Standard Tool Co.:
Improved Drill Chuck .45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40; No. 21 .35%
Scroll Combination, Nos. 85 and 81 .40
Geared Scroll, Nos. 33, 34 and 35 .25%
Independent Iron, Nos. 18 and 318 .35%
Independent Steel, No. 64 .25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104 .35%
Union Czar Drill .25%
Universal, 11, 12, 16, 17, 13, 14, 15, 40%
Universal, No. 42 .35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50 .35%
Steel Face Plate Jaws, Nos. 70 and 72 .30%
Westcott Patent Chucks:
Lathe Chucks .50%
Little Giant Auxiliary Drill .50%
Little Giant Double Grip Drill .50%
Little Giant Drill, Improved .50%
Oneida Drill .50%
Scroll Combination Lathe .50%

Clamps—

Adjustable Hammers' .20@20&5%
Carriage Makers', P., S & W. Co. .50&10
Rosty Parallel .33⅓&10
Myers' Hay Rack .45
Lineman's Swedish Neverturn .50%
Wood Workers' Hammers .40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable .50%
Iwan's Champion, Stationary .40%

Sidewalk—

Star Socket, All Steel, ₰ doz. $4.05 net
Star Shank, All Steel, ₰ doz. $3.24 net
W. & C. Shank, All Steel, ₰ doz., 2½ in., $3.00, 3 in., $3.25

Cleavers, Butchers'—

Foster Bros. .30%
Fayette R. Plumb .30%
L. & I. J. White Co. .30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each $16.75
20th Century Horse, each $5.00
Lightning Belt Horse, each $15.00
Chicago Belt Horse, each $20.00
Stewart's Enclosed Gear Horse, each $8.75
Stewart's Patent Shearing Machine, each $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each $9.75

Clips, Axle—

Regular Styles, list July 1, '97. .80@10@10%

Cloth and Netting, Wire—

See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Ribbs, Globe, Kerosene, Locking, Liquor, Bathing, &c. .70@—
Compression Ribbs .60@10%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list 40
Leather Walter B. Stevens & Son's list 40

Compasses, Dividers, &c.

Ordinary Goods .70@10@5
Wm. Schollhorn Co.:
Excelsior Dividers 60
Lodi Dividers 75

Conductor Pipe,—

L. C. L. to Dealers.

	Galvanized Galv. Steel.	Charcoal Iron.	Copper. 14, 16&20 oz.
Eastern:			
Central:			
Western and Southern:			
So. Western			

Terms, 60 days, 2 cash 10 days. Due to freight allowed.
See also Lawn Troughs.

Coolers, Water—

L. & G. Mfg. Co.:
Galvanized, each $1.85 $2.00 $2.25 $2.90 $3.90
Galvanized, Lined, side handles, each
Galvanized, Lined, end handles, each
White Enameled
Agate Lined .10%

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 24@25¢; lighter than 3 lb. to pair .26@29¢

Cord— Sash—

Braided, Drab .lb. 35¢
Braided, White, Com., Nos. 8 to 12, 23¢; No. 7, 23½¢; No. 6, 24½¢. In lots of 12 doz. or more, 1 cent less per pound.
Cable Laid Italian, lb., No. 18 .37¢
Italian, lb., No. 15, 35¢; 12 .34¢
Common India .lb., 11@11½¢
Cotton Sash Cord, In bed .18@20¢
Patent Russia .lb. .20¢
Cable Laid Russia .lb. .21¢
India Hemp, Br'd'd .lb. .21¢
India Hemp, Twisted .lb. 13@15¢
Patent India, Twisted .lb. .17¢
Best Braided Cotton, No. 7, 25½¢; No. 8, 25¢; No. 9, 24½¢; Nos. 8 to 12 .26¢
Edlystone, Braided, Nos. 8 to 12, 26¢, 7, 25½¢, 6, 25½¢
Harmony Cable Laid Italian, Nos. 7 to 10 ₰ lb 23 ¢
Pullman:
Wire Sash Cord .10%
Sash Cord Attachments, per doz. 10¢
Samson, Nos 8 to 12:
Braided, ₰ lb., Drab Cotton, 55¢; Italian Hemp, 49¢; 53¢; Linen, 65¢; White Cotton 50¢; Spot Cord 50¢
Massachusetts, White, ₰ lb 49¢
Massachusetts, Drab, ₰ lb 45¢
Phoenix, White, Nos. 8 to 12, 27¢;
Silver Lake, per lb.:
A., Drab, 45¢; A., White, 40¢; B., Drab, 40¢; B., White, 35¢; Italian Hemp 46¢, Linen 57½¢
See also Chain and Ribbon.

Wire, Picture—

List July 19, 1906 .90@—
Hendryx Standard Wire Picture Cord, old list, 85&10%
Turner & Stanton Co., Wire Picture Cord 55&10

Cradles—

Grain .40@12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@7.50 at factory, but many grades made by jobbers.
Zellner's Lumber Pencils, White and Purple, Indelible $7.50
Blue Red Green Yellow and Terra Cotta, $5.50; Black $4.00
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $16.25; Indelibles $2.75
Genuine Soapstone, Metal Workers', 5 in. x ¾ in. Round, $2.50; 5 in. x ¾ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 1/8 $3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $5.50
Light .$5.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden .50%

Cutlery, Table—

International Silver Company:
No. 12 Meriden, Rogers, Simeon L. & G. Nos. 1 and 2 $1.75
Star Edge, Rogers & Hall and Meriden
Wm. Rogers & Son

Cutters— Glass—

H. H. Maydew & Co.
Red Devil
H. Mitz Co.
Wonderful

Meat and Food

American 30%
Enterprise:
P. S. & W. Co.:

Slaw and Kraut—

Henry Disston & Sons' Slaw and Kraut Cutters
Corn Graters
J. M. Mann Mfg. Co.:
Slaw Cutters, 1 Knife, ₰ doz. $3.00
Combined Slaw Cutter and Grater

Tobacco—

All Iron, Cheap .doz. $2.25@18.00
Enterprise
Nos. 1 to 8, No. 1 $36, No. 8 $18 60%

Diggers, Post Hole, &c —

Disston's:
Rapid, ₰ doz., $24.00 25%
Samson, ₰ doz., $34.00 25%
Iwan's Improved Post Hole Augers
Vaughan's Patent Post Hole Augers
Perfection Post Hole Diggers, ₰ doz
Split Handle Post Hole Diggers, ₰ doz. $7.75
Hercules Pattern, ₰ doz. $10.00
Kohler's, ₰ doz., Universal, $15.00; Little Giant, $12; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer $7.50
New Reading Post Hole Diggers, ₰ doz., $24.00 60

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers 35%
Sterling Wheel Dresser Cutters 35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines .$1.50@$1.75
Breast, Millers Falls 15&10%
Breast, Parker's 40%
Goodell Automatic Drills .50&10@60&10%
Millers Falls Automatic Drills .33⅓&10%
Ratchet, Curtis & Curtis 25%
Ratchet, Parker's 40%
Ratchet, Weston's 40%
Ratchet, Weston's, Style H Improved 40%
Ratchet, No. 012 50&5%
Ratchet, Celebrated 40%
Ratchet, Whitney's, P., S. & W.
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00 33⅓%

Twist Drills—

Bit Stock .60@10@10@70%
Taper and Straight Shank .60@10@10@10@5%

Drivers, Screw—

Screw Driver Bits, per doz. .45@50¢
Baldt's Screw Holder and Driver, ₰ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9 50%
Buck Bros. Screw Driver Bits
Hampden
Disston's 70
Fray's Hol. H'dle Sets, No. 3, $12 50%
Fray's Hol. Brace Screw Drivers 40&10%
Gay Ratchet Action Ratchet
Goodell's Auto 65@65&10%
Mayhew's Black Handle 40%
Mayhew's Monarch 40%
Millers Falls, Nos. 20 and 21 25&10%
Millers Falls, Nos. 11, 12, 41, 42 15&10%
Smith & Hemenway Co., Neverturn, 66⅔%; Elmora, 60⅔; Star, 30&10%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized* Galv. Steel.	*Charcoal Iron.*	*Copper.* 14, 16&20 oz.
Eastern:			
Central:			
Western and Southern:			
So. Western:			

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. I.
Nos. 5
Nos. 6
Nos. 7
Nos. 8
Nos. 9
Nos. 10
Nos. 11
Nos. 12
Nos. 13
Nos. 14
Nos. 15
Nos. 16
Nos. 17
Nos. 18
Nos. 19
Nos. 20
Nos. 21
Nos. 22
Nos. 23
Nos. 24
Nos.

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's ..... 50&10
Wallabe ..... 40&10
Upson's Patent 40

Cord and Weight—

Ives and Titan 33⅓

Corrugated—

Acme Corrugated Fastenets 70

Faucets—

Cork Lined ..... 50&10@60
Metallic Key, Leather Lined ..... 60&10@70
Red Cedar ..... 40&10@70&10&5
Petroleum ..... 70&10@75
B. & L. B. Co.:
Metal Key ..... 60&10
Star 60
West Lock ..... 50&10
John Sommer's Perfess Tin Key 40
John Sommer's Boss Tin Key 50
John Sommer's Star Mfg. Key ..... 50&10
John Sommer's Duplex Metal Key 60
John Sommer's Diamond Lock 40
John Sommer's A. X. L. Cork Lined 50
John Sommer's Reliable Cork Lined ..... 50&10
John Sommer's Chicago Cork Lined 60
John Sommer's O. K. Cork Lined 50
John Sommer's No Brand, Cedar 55
John Sommer's Perfection, Cedar 40
Self Measuring
Enterprise, ℔ doz $36.00 ..... 40&10
Lane's, ℔ doz $36.00 ..... 40&10
National Measuring, ℔ doz. $36 ..... 40&10

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List Nov. 1, 1899.
Best Brands ..... 70&10@75&10
Standard Brands ..... 75&10
Lower Grades ..... 75&10@80&10

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 ..... 33 1/3@40

Fixtures, Fire Door—

Allith Underwriters' Approved 50
Richards Mfg. Co.:
Universal, No. 133, Special, No. 104 ..... $3.75
Fusible Links, No. 96 50
Expansion Bolts, No. 137 ..... 60&10

Grindstone—

Net Prices:

Inch	15	17	19	21
Per doz.	$3.00	$3.75	$4.45	$5.65

P. S. & W. Co. 25
Reading Hardware Co. 60

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1898, or selling at net prices.

Iowa Dig-Ezy Potato ..... 60&10
Victor, Hay ..... 60&15&2½
Victor, Manure 60
Victor, Header 65
Champion, Hay 60
Champion, Header 60
Champion, Manure ..... 60&10
Columbia, Hay ..... 60&20
Columbia, Manure ..... 60&10
Columbia, Spading ..... 70&12½
Hawkeye Wood Barley 40
W. & C. Potato Digger ..... 60&10
Acme Hay ..... 60&25
Acme Manure, 4 tine ..... 60&15&5
Dakota Header ..... 60&20
Jaynes Steel Barley ..... 60&20
Kansas Header 65
W. & C. Worlite Wood Barley 40
Plated.—See Spoons.

Frames— Wood Saw—

White, S'g't Bar, per doz. ..... 75@80
Red, S'g't Bar, per doz. ..... $1.00@1.25
Red, Dbl. Brace, per doz ..... $1.40@1.50

Freezers, Ice Cream—

Qt.	1	2	3	4	6
Each	$1.25	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped .. 3.65
Waterproof Dbl. Taped .. 4.40
Waterproof Tpl. Taped .. 5.15

Gates, Molasses and Oil—

Stebbins' Pattern ..... 75@80

Gauges—

Marking, Mortise, &c. ..... 50@50&10
Disston's Marking, Mortise, &c. 67½
Wire Brass & Sharpe's 33⅓
W. & B. 25
Wire D. S. & W. Co. 33⅓

Gimlets— Single Cut—

Numbered assortments, per gro.

Nail, Metal, No. 1 ..... $2.50 @ $2.80
Spike, Metal, No. 1 ..... $1.80 @ $1.90
Nail, Wood Handled, No. 1, $2.80 @ $2.80
Spike, Wood Handled, No. 1, $1.80 @ $1.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin Stephens Co. ..... 65@65&10

Glue, Liquid Fish—
Bottles or Cans, with Brush .. *$5&10@50%*
Elwell's 10

Grease, Axle—
Common Grade .... *gro. $6.00@6.50*
Dixon's Everlasting, 10-lb pails, ea. $6; in boxes, ℔ doz., 1 lb., $1.20; 2 lb. $2.00
Helmet Hard Oil 25

Griddles, Soapstone—
Pike Mfg. Co. ..... 33⅓&33⅓&10

Grinders—
Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 30
Alundum Sickle Grinders, each, No. 2, $3.50; 2A, $6.00; 2AA Combined, $6.50 30
Alundum Disc Grinders, each, $2.50 30

Grindstones—
Pike Mfg. Co.:
Improved Family Grindstones, ℔ inch, ℔ doz., $2.00 ..... 33⅓
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted 40

Grips, Nipple—
Perfect Nipple Grips ..... 40&10&2

Halters and Ties—

Cow Ties ..... *60&5@60&10*
Conrt Mfg. Co.:
Web ..... 30&2
Jute Rope 35
Sisal Rope 35
Cotton Rope 45
Hemp Rope 45
Oneida Community:
Am. Coil and Halters ..... 40@40&5
Am. Cow Ties ..... 45@50
Niagara Coil and Halters .. 45@50&5
Niagara Cow Ties ..... 45&5@50&10&5

Hammers—
Handled Hammers—

Heller's Machinists' ..... 55&10@55&10&5
Heller's Farriers' ..... 40&5@40&10&5
Peck, Stow & Wilcox Co.:
Crucible Steel 50
Farriers' ..... 40&10&5
Riveting 50
Machinists', revised list ..... 66⅔&5
Blacksmiths ..... 50&5
Fayette R. Plumb:
A. E. Nail ..... 40&2½@40&12½&5
Eng. and U. S. Hand ..... 50&10&5@60&5
Machinists' Hammers ..... 60@60&10
Rivet and Tinners' ..... 40&7½@40&12½&5

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢ .. *80&5@—%*
3 to 5 lb., per lb., 40¢ .. *80&5@—%*
Over 5 lb., per lb., 30¢ ..... *80&10&5@—%*
Wilkinson's Smiths' ..... lb. *9½@10¢*

Handles—
Agricultural Tool Handles

Axe, Pick &c. ..... *60&10@60&10&5*
Hoe, Rake, &c. *40%*
Fork, Shovel, Spade, &c.:
Long Handles *40%*
D Handles *40%*

Cross-Cut Saw Handles—

Atkins 50
Champion 50
Disston 50

Mechanics' Tool Handles—

Augur, assorted ..... *gro. $3.00@$3.50*
Brad Awl ..... *gro. $1.05@$1.75*
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory ..... *$2.15@2.40*
Socket Firming, Apple, $1.75@ $1.9; Hickory ..... *$1.80@$1.75*
Socket Framing, Hickory, $1.60@$1.75
File, assorted ..... *gro. $1.30@$1.40*
Hammer, Hatchet, &c. ..... *60&10@60&10&5%*
Hand Saw, Varnished, doz. 80¢@85¢; Not Varnished .. *65@75¢*
Plane Handles:
Jack, doz. 80¢; Jack, Bolted 75¢
Fore, doz. 45¢; Fore, Bolted 90¢
Champion-Stephens Co.:
Carving Tool ..... 30&30&10%
Corn Cutter ..... 30&30&10%
File and Awl ..... 60&60&10%
Screw Driver ..... 30&30&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 15&10
Nicholson Simplicity File Handle 60%
W. A. Zelnicker Supply Co.:
Hammer handles, 12 in., $2.00; 13 in., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80 ..... 50%
Shovel handles, oval, 30 in., $1.00; 36 in., $1.20 ..... 50%
Axe handles, 28 to 34 in., $5.60; 36 in., $5.85 ..... 50%
Adz handles, 30 in., $5.80; 36 in., $6.00 ..... 50%
D handles, R R, 36 in., $7.00 ..... 50%
Hoe handles, 12 to 14 in., $2.50 ..... 50%

Hangers—

NOTE—Barn Door Hangers are generally quoted per pair, without track, and Barber Door Hangers per double set with track, &c.
Allith Mfg. Co.:
Reliable, Nos. 1 and 2; Allith, No. 2; Allith Adjustable No. 6; Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25
Oscillating 25
Big Twin 25
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30
Railroad 50
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 50&5
Roller Bearing ..... 70&2½%
Cushion Mfg. Co.:
Solid Axle, No. 10, $12.00 .. 60&10%
Roller Bearing, No. 11, $15.00 .. 60&10%
Roller Bearing, Ex. H ..... net $22.50
Ball Bearing, $24.00 ..... net $18.00
Covered ..... 60&5%
Special 50%
Lawrence Bros:
Advance 55A11
Cleveland 55
Clipper, No. 25 55
Crown ..... 55&10%
Cyclone, No. 40 ..... net $6.50
Tandem, No. 50 ..... net $7.50
New York 55A11
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2 .. 70%
Anti Friction 60
Hinged Hangers, King Charm .. 60
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5
Pioneer Wood Track, No. 3 .. $2.25
Roller B'r'g St'l Track No. 13 .. $2.00
Roller B'r'g St'l Track No. 13 .. $2.50
Roller B'r'g, Nos. 39, 41, 43, 70&5
Hero, Adj. Track No. 19 .. 50%
Adjustable Track Tandem Trolley Track, No. 16 ..... 50&10%
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22 .. 50&5%
Trolley B, D, No. 17, $1.25; F, D, No. 120, $2.25; No. 121, $2.45; No. 150 ..... $2.50
Safety Underwriters F. D. No. 101 50
Tandem No. 41 2½ and 3 .. 60&10%
Palace, Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 124 ..... 50&10%
Ives' Wood Track No. 1 ..... $2.25
Trolley B, D, No. 2 ..... 50&10%
Trolley B, D, No. 24, $1.30; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2 .. 70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3 ..... 60%
Hinged Tandem, No. 48 ..... 55&5
Folding Door B. B. Swivel No. 135 ..... 40%
Taylor & Boggis Fty Co.'s Kidder's Roller Bearing 50&15&10&5%
Myers' Stayen Hangers 60%

Hangers— Garment—

Pullman Trouser, ℔ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 1 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $12.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $10.50; Garment Hanger Loops, Round Nickeled, per gro. $10.50
Victor Folding ..... ℔ gro. $9.60

Gate—

Myers' Patent Gate Hangers, ℔ doz. net $4.50

Joist and Timber—

Lane Bros Co. 30

Hasps—

Griffith's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, ℔ doz. .. 60

Hatchets—

Regular list, first qual. ..... *70&21½%*
Second quality ..... *50&7½%*

Heaters, Carriage—

Clark No. 5, $4.35; No. 5B, $5.00; No. 5 $5.35; No. 5D, $5.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50 ..... 25%
Clark Coal, ℔ doz. $9.75 20

Hinges—
Blind and Shutter Hinges

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	3	5
Doz. pair	$0.75	1.35	2.70

Mortise Shutter:
(L. & P. O. S., Lowe & Co.)

No.	1	1½	2	2½
Doz. pair	$0.70	.65	.60	.55

Mortise Reversible Shutter (Buffalo, &c.):

No.	1	1½	2
Doz. pair	$0.70	.65	.60

North's Automatic Blind Fixtures No. 2, for Wood, $9.60; No. 3, for Brick, $11.50 50
Charles Parker Co. ..... 70&75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20
Hale's Blind Awning Hinges, No 110, for wood, $9.00; No. 111, for brick, $9.00 20
Reading's Gravity 60
Stanley's Steel Gravity Blind Hinges, No. 1642½, ℔ doz., sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter ..... 75&5
Acme, Lull & Porter 75
Queen City Reversible 75
Shepard's Noiseless, Nos. 1 to 55 ..... 75&5
Niagara Gravity Locking, Nos. 3 & 5 ..... 75&5
Tip Pat'n, No. 1 ..... 75&10
No. 3 ..... 75&5
Buffalo Gravity Locking, Nos. 2 & 3 ..... 75&5
Shepard's Double Locking 75
Champion Gravity Locking ..... 75&5
Pioneer ..... 70&10
Empire 65
W. H. Co's Mortise Gravity Locking, No. 2 ..... 60&10

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with L'tches	$2.00	2.75	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	.35

New England:
With Latch ..... *doz. ...@$2.00*
Without Latch ..... *doz. ...@$1.60*
Reversible Self-Closing:
With Latch ..... *doz. ...@$1.75*
Without Latch ..... *doz. ...@$1.35*
Western:
With Latch ..... *doz. $1.75*
Without Latch ..... *doz. $1.15*
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 ..... 70%

Pivot Hinges—

Bommer Bros. Pivot 40
Lawson Mfg. Co. Matchless 50

Spring Hinges—

Holdback, Cast Iron ..... *$6.75@$7.00*
Non-Holdback, Cast Iron ..... *$6.50@$6.75*

J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 40
Bardsley's Patent Checking 33⅓
Bommer Bros.:
Bommer Ball Bearing Floor 40
Bommer Ball Bearing Hinges 40
No. 999 Wrot. Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges 25
Triple End Spring Hinges 50
Chicago (Ball Bearing) Floor 50
Garden City Eugine House 25
Keene's Saloon Door 25
Columbian Hardware Co.:
Acme, Wrought Steel 30
Acme, Cast Brass 25
American 30
Columbia, ℔ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ℔ gr. $12.00
Columbian Hinges ..... 60&10
Gem, new list 30
Clover Leaf ..... ℔ gr. $12.00
Oxford, new list 30
Floor Spring Hinges ..... 65&10
Lawson Mfg. Co. Matchless 30
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door ..... ℔ gr. $9.00
Chief Ball Bearing Floor Hinge 50
Ball Bearing Door 25
No. 777, Sheet Steel Holdback, ℔ gr. pr. $9.00
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges ..... *50&10%*
Heavy Strap Hinges ..... *60&5%*
Light T Hinges *50*
Heavy T Hinges *50%*
Extra Heavy T Hinges *50%*
Home Hasps *33⅓%*
Cor. Cor. Strap ..... *60&5%*
Cor. Ex. Heavy T ..... *50&10%*

Screw Hook and Strap.

6 to 12 in., lb.	*8¢*
14 to 20 in., lb.	*8½¢*
22 to 36 in., lb.	*8½¢*

Screw Hook and Eye:

3 to 1 inch ..... *lb.*	*6½¢*
3 inch ..... *lb.*	*7½¢*
4 inch ..... *lb.*	*8½¢*

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers ..... 30&2%

Hods— Coal—

M'f'gr's list, price per gross.

Inch	15	16	17	18
Galv. Open	$35	$39	$42	$46
Jap. Open	26	28	31	35
Galv. Funnel	28	30	32	36
Jap. Funnel	23	26	29	33

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick, No. 162 ..... each $1.05
Steel Mortar, No. 158 ..... each $1.35

Hoes— Eye—

Scorii and Oval Pattern ..... *60&10@60&10&10%*
Grub, list Feb. 28, 1899 ..... *70&10@75&10%*

Extra 10% often given on most of these Hinges.

Extra 10% often given.

D. & H. Scroll 37½
Am. Fork & Hoe Co.: (Scroll Pat. term) 60

Handles—

NOTE—Manufacturers are selling from the list of September 1, 1903, but many jobbers are still using the list of August 1, 1899, or some old list of their own.

Cranes Wrought No. 1 ..... $ 5.00
Cranes Wrought No. 2 ..... $ 5.20
Star Double Bit ..... $ 5.20
D. Maltese Crescent Cultivator Hoe ..... 50&10
I. Maltese Crescent Cultivator Hoe ..... 50&10
F. Miller's Match Hoe:
Regular Weight ..... $ 4.80
Junior Size ..... $ 4.30
Ft. Madison Sprouting Hoe 50
D. Maltese Dixie Tobacco Hoe ..... 50&10
Kretsinger's Cut Easy ..... 70&10
Watson Hoe ..... 45&10
A. & J. Iwan 50
B. & B. m. Cultivator Hoe 50
B. B. Cultivator Hoe 50
Acme Weeding ..... per doz. net, $4.35
W. & C. L. Ewing Seeding Hoe 50

Hoisting Apparatus—

See Machines, Hoisting.

Holders—Bit—

Angular, per lb. ..... $2.10 ..... 45&10%

Door—

Bardsley's, Iron 40
Brass 50
Eclipse 50
Pullman 50
Riverside Mfg. Co.: No. ..... per dozen, 40; Nos. 11, 12, 13 50
Grip 50
Superior 30

File and Tool—

Nicholson Line Holders and File Handles ..... 33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, per gross, $10.80, per doz. $1.25

Trace and Rein—

Fernald Double Trace Holder, per doz. pairs ..... $.75
Dash Rein Holder, per doz. pairs ..... $.75

Hones—Razor—

Pike Mfg. Co., Belgian and Swarts, 50, German 50

Hooks—Cast Iron—

Bird Cage, Reading 40%
Clothes Line, Reading List 40%
Coat and Hat, Reading ..... 45&10%
Coat and Hat, Wrightsville ..... 60&5
Harness, Reading List 40

Wire—

Belt 80%
Wire Cloth Hooks 75
Bradley Metal Cloth Wire Cloth and Hooks 50
Columbian Hdw. Co., Gem 50
Parker Wire Goods Co., King ..... 70&10%
Wire Goods Co.:
Acme, 6-in., per doz., $1.00; Chief, 79; Crown, 75...; Czar, 65; V Brave, 75...; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.90; 8 in., $1.25; 10 in., $2.50. 50
Cotton ..... doz. $1.05@$1.25
Wrought Staples, Hinges, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Breech, see Stops. Bench, Bush, Light, dog, Coat, Medium, ... 80&75; *Heavy,* $2.65
Grass, best, all sizes, per doz. $2.00
Grass, common grades, all sizes, per doz. $1.50
Whiffletree ..... lb. 5¾@6¢
Hooks and Eyes:
Brass ..... 60&10 & 5
Malleable ..... 70@70&10%
Cowell Mfg. Co. Gate and Scuttle Hooks 40%
Ft. Madison Cut-Easy Corn Hooks, per doz. $3.25 net
Turner & Stanton, Shepard 50
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See Nails, Horse.

Horseshoes—

See Shoes, Horses.

Hose, Rubber—

Garden Hose, ¾ inch:
Competition ..... ft. 5¢
3 ply, Guaranteed ..... ft. 8¢
4 ply, Guaranteed ..... ft. 11¢
Cotton Garden, 3-ply, required ..... ft. 8¢
Low Grade ..... ft. 5¢
Low Quality ..... ft. 11¢

Irons—Sad—

Irons 4 to 10 ..... lb. 5¢
B. B. Sad Irons ..... lb. 5¢
Mrs. Potts', cents per set:

Nos.	50	55	60	65
Japd Tops	88	80	93	91
Tin'd Tops	88	85	93	95

New England Pressing ..... lb. 5¢

Bar and Corner—

Richards Mfg. Co. Bar and Corner 60

Pinking—

Pinking Irons ..... doz. 60¢

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Corert Mfg. Co.:
Auto Screw ..... 30&2%; Steel 45%
Lockport 50%
Lane's Steel 50
Richards Tight Stee ..... 50&5
Smith & Hemenway Co.'s 25

Ladder—

Richards Mfg. Co., Ladder Jacks 50

Kettles—

Brass Spun, Plain ..... 20@25
Enameled and Cast Iron See Ware, House.

Knives—

Butcher, Kitchen, &c.—

Ingalls Bros. Butcher & 50
Wilkinson Sheffield Cutlery Co. 60%

Corn—

Columbian Cutlery Co. Wilbur Bronze Knives and Holders 60
Wisconsin Axe & Cutlery Co.:
Dual, $2.25; Adj. Serrated, $2.50; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15

Drawing—

Standard List ..... 60&50&40%
C. E. Jennings & Co., Nos. 1 to 10, per doz. net $1.00
Jennings & Griffin, Nos. 1 to 10, per doz. net $1.00
Shaw's 50
Walrous 60
L. & I. J. White ..... 20&10&5

Hay and Straw—

Standard Lever, per doz. ..... $.75
Iwan's Sickle Edge ..... per doz. $2.50
Iwan's Serrated ..... per doz. $10.00

Miscellaneous—

Farriers' ..... doz. $3.00@13.25
Westerndike ..... per doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber Tip ..... gro $1.25@$1.40
Carriage, Jap., all sizes ..... gro. 40@45¢
Door, Mineral ..... doz. 70@75¢
Door, Por. Jap'd ..... doz. 70@75¢
Door, Por. Nickel ..... doz. $2.00@2.15
Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—

See Belting, Leather—

Ladders, Store, &c.—

Alath Mfg. Co., Rehable 50%
Lane's Step 25
Myers' Noiseless Store Ladders 50%
Richards Mfg. Co.:
Improved Nonpareil, No. 112 ..... 50%
Climax Shelf, No. 113 ..... 50%
Trolley, No. 104 ..... 50%

Ladles, Melting—

L. & G. Mfg. Co. (low list 20
P. S. & W. ..... 40&10
Reading 60%

Lanterns—Tubular—

Regular, No. ..... doz. $3.50@4.50
Side Lift, No. ..... doz. $4.00@4.75
Hinge Globe, No. 0 ..... doz. $4.00@4.75
Other Styles ..... 40&10%

Bull's Eye Police—

Switch ..... $1.20@1.50

Latches—Thumb—

Roggin's Latches, with screw ..... doz. 35@40¢

Door—

Allith Mfg. Co., Reliable and Alle-[illegible] Reliable Cast Iron 50
Clow & Carrier Mfg. Co. ..... per doz. $2.00
Richards' Bull Dog, Heavy, No. 25 ..... 50&25%
Richards Trump, No. 127 ..... $1.50

Leaders, Cattle—

Small ..... doz. 50¢; *large,* 60¢
Covert Mfg. Co.:
Hemp, Rope, Halter, 45; Jute, 35; Sisal, 20%.

Leathers, Pump—

See Pumps.

Lifters, Transom—

R. & E. 10%

Lines—

Wire Clothes, Nos.	18	19	20
Ten feet	$2.00	2.25	2.00
75 feet	$2.10	1.80	1.65

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3 ..... 40%
Solid Braided Masons' 40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ..... per doz. 20
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 4½, $2.50; No. 5, $3.50; No. 6½, $4.50 20
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 20
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25 20
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Plasterers' 40
Shade Cord, Cotton or Linen 20%

Locks—Cabinet—

Cabinet Locks ..... 33⅓ & 5

Door Locks, Latches, &c.—

NOTE—Net prices are very often made on these goods.
Reading Hardware Co. 4
R. & E. Mfg. Co. 4

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass 50

Sash, &c.—

Iron Pattern:
Bronze and Brass ..... 55&5
Reading 60
Window Weighing ..... 40&10
Rubber Patent Sash Locks 33⅓

Machines—Boring—

Com. Upset, without Augers ..... $2.00@2.25
Com. Angle, without Augers ..... $2.25@2.50
Swan's Improved ..... 10&5
Swan's Nos. 1 and 1 10
Swan's Nos. 1 and 1 10
Swan's Upright 10
Swan's Upright, $4.65, Auger ..... $.60

Corking—

Reisinger Improved Hand Power ..... per doz. $12.00

Fence—

Williams' Fence Stretcher ..... each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist 30%
Moore's Hand Power Wire Rope Hoister 50
Moore's Crown, Hog, Stand Chain Hoist 50

Ice Cutting—

Chandlers ..... 10&5

Washing

	Per doz.
Bass Washing Machine Co.	$ 6.00
Bass No. 2	$ 7.50
Bass Rival	$ 9.00
Champion Rotary Banner No. 1	$5.00
Standard Champion No. 1	$30.00
Standard Perfection	$27.00
Cincinnati Square Western	$33.00
Uncola American, Round	$30.00

Mallets—

Hickory ..... 45&5&50%
Lignumvita ..... 40&5&50
Tinners' Hickory and Apple wood ..... doz. 45&5@50%

Mangers, Stable—

Swett Iron Wetmore 50%

Mats, Door—

Acme Leather Co. 50
Baeder Steel (W. G. Co., new list 50

Mattocks—

See Picks and Mattocks.

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co. ..... 20@25%
National list Jan. 1, 1902 ..... 30%
Parkers Columbian and Victoria 30%
Peter's Boss and Sidewinder ..... 5&10
Swift, Lane Bros. Co. 30%

Motors, Water—

Divine's Red Devil 30%
Lippincott 30

Mowers, Lawn—

NOTE—Net prices generally quoted
Cheapest ..... *all sizes, $1.50@2.00*
Cheap ..... *all sizes, $2.00@2.50*
Better Grade ..... *all sizes, $2.50@4.50*

	12	14	16	18-in.
High Grade	$4.50	4.75	5.00	5.25
Continental				60%
Great American				70%
Great American Ball Bearing, new list				70%
Quaker City				70%
Pennsylvania				60
Pennsylvania, Jr., Ball Bearing				50&10%
Pennsylvania Golf				50%
Pennsylvania Horse				30&5%
Peter's Boss				45&5%
Granite State:				
Style A, Low Wheel				70%
Style B, Low Wheel				70%
Style C, High Wheel, spel. list,				70&10%
Style D, High Wheel, spel. list,				70%
Pennsylvania				50
Silver Mfg. Co.: C., K., T.				45
Style A, all Steel				60&10&5%
Style E, Ball Bearing				45&5%
Drexel and Gold Coin, special list				40%
Horse				45
Pony				45
Acme, Horse				40
Eagle				30&5
L. L. L. Horse				50%

Nails—

Wire Nails and Brads, Miscellaneous ..... 85&10&5&1
Cut and Wire. See Trade Report. Hungarian, Finishing, Upholsterers' &c. See Tacks.

Horse—

Nos.	6	7	8	9	10
Anchor	17	16	15	14	13
Coleman	17	16	15	14	13
New Haven	17	16	15	14	13
Lumen	17	16	15	14	13
Putnam	17	16	15	14	13

Jobbers' Special Brands .....

Picture—

Brass Head .....
Por. Head ..... 1.10 1.10 1.10 .. gro

Nippers—

See Pliers and Nippers.

Nuts—

Cold Punched: ..... *Off list.*
Square, Blank or Tapped ..... 4.80¢
Hexagon .....
Square, Rivet, C., T. & R. ..... 5.10¢
Hexagon .....
Jam .....
Lock .....

Oakum—

..... lb. 6½¢
..... lb. 6¢
..... lb. 5¢
Lead Sheet Oakum ..... 2½@3¢

Oil Tanks—*See Tanks, Oil*

Oilers—

Steel, Copper Plated 75
Chase or Paragon .....
Brass and Copper .....
Zinc .....
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50.
American Tube & Stamping Co.:
Spout, Bottom Cap 50
Railroad Oilers, &c. .....

Openers—Can—*Per doz.*

Sprague, Iron Handle ..... 30@35¢
Sprague, Wood Handle ..... 35@40¢
Sardine Scissors ..... $1.00@1.50
Yankee Can and Bottle Opener, per doz., net, $0.75; Little Gem, per doz., net $0.65

Egg—

Hartigan Nickel Plate, per doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope ..... 20@25¢

Rubber—

(Fair quality goods.)

Sheet, C. I. ..... 11@12¢
Sheet, C. O. S. ..... 11@12¢
Sheet, C. B. S. ..... 12@14¢
Sheet, Pure Gum ..... 40@45¢
Sheet, Red ..... 40@45¢
Jenkins' '96, per lb. 80¢ 25%

Miscellaneous—

American Packing ..... lb. 7@10 ¢
Cotton Packing ..... lb. 16@25 ¢
Italian Packing ..... lb. 9@12½¢
Jute ..... lb. 4½@ 7½¢
Russia Packing ..... lb. 8@11 ¢

Pails, Water, Well, &c.—

See *Buckets.*

Pans—Dripping—

Standard List ..... 65&7½&5%
Edwards, Royal Blue ..... 65&7½&5

Fry—

Common Lipped:

Nos.	1	2	3	4	5
Per doz.	$0.75	0.80	0.90	1.10	1.30

Refrigerator, Galva.—

Inch	12	14	16	18
Per doz.	$1.75	2.25	2.80	3.15

Paper—Building Paper

Asbestos: ..... lb.
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft. ..... 3½@5¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft. ..... 6¢
Mill Board, Sheet, 40 x 40 in., 1-32 to ⅛ in. ..... 3@5¢

Per roll

Rosin Sized Sheathing; 500 sq. ft. Light weight, 25 lbs. to roll ..... 45@75¢
Medium weight, 30 lbs. to roll ..... 50@70¢
Heavy weight, 40 lbs. to roll ..... 75@75¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.00; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton $54.50
Red Rope Roofing, 250 sq. ft. per roll $1.75

Tarred Paper—

1 ply (roll 400 sq. ft.) ..... ton .....
..... per roll .....
2 ply, roll 108 sq. ft. ..... 65¢
3 ply, roll 108 sq. ft. ..... 85¢
Slater's Felt (roll 500 sq. ft.) .89¢

Sand and Emery—

Flint Paper .....
Garnet Paper .....
Emery Paper .....

Pareys—Ag[illegible]

[illegible]

Lumbard Nail Co.:
[illegible]

Reading Hardware Co.:
[illegible]
Reading 78 ..... per doz. $6.25

Potato—

[illegible] ..... per doz. $ 80
Wire Mattocks ..... per doz. $6 00

Picks and Mattocks—

List Feb. 28, 1899 ..... 70&10&10%
Clow's Hardpan Garden Mattocks ..... per doz. No. 2, $2.60; No. 3, $2.40

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass .....50@50&10%
Iron, list Nov. 11, '05..60@60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in......60&10@—%
Extra Heavy, same.....70&10@—%
Fittings, Standard and Heavy.....75&10@—%

Pipe, Merchant—
Consumers, Carloads.

	Steel.		*Iron.*	
	Blk.	*Galv.*	*Blk.*	*Galv.*
	%	%	%	%
1/8 & 1/4 in...	65	48	57	41
3/8 in.....	66	52	59	44
1/2 in.....	68	56	61	49
3/4 to 6 in....	72	62	66	56
7 to 12 in....	69	54	61	46

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First class 82%
Second class 85%

Pipe, Stove—

	Per 100 joints	
Edwards' Nested:	C. L.	L. C. L.
5 in., Standard Blue...	$6.25	$7.25
6 in., Standard Blue....	6.75	7.75
7 in., Standard Blue....	7.75	8.75
5 in., Royal Blue	7 00	8 00
6 in., Royal Blue.....	7.50	8.50
7 in., Royal Blue.....	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color..	$6.15	$7.15
6 in., Uniform Color..	6.65	7.65
7 in., Uniform Color..	7.65	8.65

Planes and Plane Irons—
Wood Planes—
Bench, first qual.....30@30&10%
Bench, second qual.....40@40&10%
Molding .....25@25&10%
Chapin-Stephens Co.:
Bench, First Quality 30%
Bench, Second Quality 40%
Molding and Miscellaneous..... 25%
Toy and German 30%
Union 60%

Iron Planes -
Chaplin's Iron Planes.....50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06..... 25%
Buck Bros..... 30%
Chapin-Stephens Co 50%
Union 60%
L. & I. J. White.....20&50@25%

Planters, Corn, Hand—
Kohler's Eclipse..... ₩ doz. $8.00

Plates—
Felloe .....lb. 4@4¼¢

Pliers and Nippers—
Button Pliers....25@25&10@25%
Gas Burner, per doz., 6 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe ..... 8 10 12-in.
$2.00 $2.25 $2.75 $3.50
Acme Nippers .....50&5%
Cronk & Carrier Mfg Co:
American Button..... 80%
Improved Button..... 15&10%
Cronk's 60%
No. 80 Linemen's..... 50%
Stub's Pattern..... 45%
Combination and others..... 33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&5@40&10&5%
P. S. & W. Tinners' Cutting Nippers 40%
W. Schollhorn Co.:
Bernard, 35%; Elm City, 35%; Paragon, 50; Lodi, 55%
Swedish Side, End and Diagonal Cutting Pliers..... 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels ..... 30@30&10%
Chapin's Brass Cap ..... 40@40&10%
Pocket Levels ..... 2@30&10%
Extension Sights..... 30@30&10%
Machinists' Levels..... 40@40&10%
Disston's Plumbs and Levels..... 60&10%
Disston's Pocket Levels..... 60&10%
Stanley's Duplex..... 30%
Woods' Extension..... 33⅓%

Points, Glaziers'—
Bulk and 1 lb. papers....lb. 9½¢
1 lb. papers ..... *lb. in* ¢
1 lb. papers ..... lb. 10½¢

Police Goods—
Manufacturers' Lists...25@25&5%
Tower's 25%

Polish—Metal, Etc—
Prest-dine Liquid, No. 1 (¼ pt.) ₩ doz., $3.00; No. 2 (1 qu.), $9.00 40%
Prest-dine Paste..... 40%
George William Hoffman:
No. 5 Metal Polish Paste, 3 oz. boxes, ₩ doz. 50¢, ₩ gro. $4.50, ½ lb boxes, ₩ doz $1.25; 1 lb boxes ₩ doz $2.25
No. 5 Liquid, 8 oz. cans, ₩ doz., $1.25.
Birkeepers' Friend Metal Polish, ₩ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ₩ lb 10¢
Black Eagle, Liquid, ½ pt. cans... ₩ doz. 75¢
Black Jack Paste, ¾ lb cans, ₩ gr. $9.00
Black Kid Paste, 5 lb can.....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's, ₩ gr. $5.75.....10%
Dixon's Plumbago..... ₩ lb 8¢
Fireside ..... ₩ gr. $2.50
Gem, ₩ gr. $4.50..... 10%
Japanese ..... ₩ gr. $3.50
Jet Black..... ₩ gr. $3.50
Peerless Iron Enamel, 10 oz. cans... ₩ doz. $1.50

Poppers, Corn—
1 qt. Square...doz. $0.88; gro. $8.75
1 qt. Round...doz. $1.00; gro. $10.00
1½ qt. Square.doz. $1.10; gro. $11.00
2 qt. Square...doz. $1.35; gro. $13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled .....35&10%
Tinned .....50&10%

Powder—
In Canisters:
Duck, 1 lb......each 45¢
Fine Sporting, 1 lb......each 75¢
Rifle, ½ lb......each 15¢
Rifle, 1 lb......each 25¢
In Kegs:
12½ lb. kegs.....$3.50
25 lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk)..... $6 50
Half Keg (12½ lb bulk)..... 3.50
Quarter Keg (6¼ lb bulk)..... 2.00
Case 24 (1 lb cans bulk)..... $8.50
Half case (1 lb cans bulk)..... $4.50
King's Smokeless: Shot Gun. Rifle.
Keg (25 lb bulk)..... $12.00 $15 00
Half Keg (12½ lb bulk).... 6 25 7.75
Quarter Keg (6¼ lb bulk). 3.25 4 00
Case 24 (1 lb cans bulk).. 14.00 17.00
Half case 12 (1 lb c. bk).. 7.25 8.75

Presses—
Fruit and Jelly—
Enterprise Mfg. Co.....20@25%

Seal Presses—
Morrill's No. 1, ₩ doz., $20.00.....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 60%
Miller's Falls, No. 3, ₩ doz., $12.00..... 33⅓&10%
Morrill's No. 1, Nail Puller, ₩ doz. $20.00 ..... 50%
Pearson No. 1, Cyclone Spike Puller, each $30.00..... 50%
The Scranton Co. Case Lots:
No. 2B (large)..... $5 50
No. 3B (small)..... $5.00
Smith & Hemenway Co.:
Diamond B..... 70%
Giant 50%
Staple Pullers, Utica and Davison 60%

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	*$0.30*	*.45*	*.60*	*1.05*
Hay Fork, Swivel or Solid Eye. doz., 4 in., $1.25; 5 in., $1.55				
Inch	1	2	2¼	2½
Hot House, doz.	*$0.65*	*.85*	*1.20*	
Inch	1¼	1½	1¾	2
Screw, doz.	*$0.16*	*.19*	*.23*	*.30*
Inch	1¾	2	2¼	2½
Side, doz.	*$0.25*	*.40*	*.55*	*.60*
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in......*Iron, 17@20¢*
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in......*20@21¢*
Acme No. 35, 1¾ in., 19¢; 2 in., 20¢
American Pulley Co.:
Wrought Steel American Plain Axle ..... 50&10%
Wrought Steel Eagle ..... 17@20¢
Fox-All-Steel, Nos. 3 and 7, 2 in..... 50%
Grand Rapids All Steel Noiseless..... 50%
Niagara, No. 25, 1¾ in., 19¢; 2 in., 20¢
No. 26, Prov. 1¾ in., 14½¢; 2 in., 16¢
Star, No. 26, 1¾ in., 19¢; 2 in., 20¢
Tickle Blocks See Blocks

Pumps—
Cistern 60%
Pitcher Spout .....75&5@75&10%
Wood Pumps, Tubing, &c......50%
Barnes Drl. Acting (low list) ..40&5%
Barnes Pitcher Spout ..... 75&10%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co. $16.00
Daisy Spray Pump ..... ₩ doz. $6 50
Flint & Walling's Fast Mail Hand, (low list)..... 50%
Flint & Walling's Fast Mail Tow (low list)..... 50%
Flint & Walling's Tight Top Pitcher ..... 75&10%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50 ..... 30%
Myers' Pumps (low list)..... 40@5%
Myers' Power Pumps..... 60&5%
Myers' Spray Pumps..... 60&5%

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No.	2½	3	3½	4
	$4.10	*3.70*	*4.35*	*4.95*	*5.60*

Cup Leathers Per pair:

Inch	2½	3	3½	4
	$7.80	*7.75*	*6.20*	*8.80*

Punches—
Saddlers' or Drive, good tube, doz. 50@75¢
Spring, single tube, good quality *$1.75*
Revolving (4 tubes)....*doz. $3.60*
Bemis & Call Co.'s Cast Steel Drive Sc.
Morrill's Nos. 1A, 1B, 1C, 1D, $15.00..... 50%
Hercules, 1 die, each $5.00..... 50%
Niagara Hollow Punches..... 40%
Niagara Solid Punches..... 55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35%; Paragon, 50%; Lodi..... 55%
Tinners' Hollow, P., S. & W. Co..40%
Tinners' Solid, P., S. & W. Co. ₩ doz., $1.41..... 40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron.....2¼@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb., 36¢ 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..₩ ft. 3¼¢
O. N. T. Rail..... $3.12
Griffin's:
3xxx, ₩ 100 ft., 1 x 3 16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ₩ 100 ft 1 x 3 16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ₩ 100 ft $3.45
O. N. T. ₩ 100 ft 1 in., $3.90; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¾ in..... ₩ 100 ft. $4.00
Lawrence Bros.
1 x 3-16 in. ₩ 100 ft., $7.50; 1¼ x 3-16 in., $8.75..... 55&7½%
McKinney's:
Hinged Hanger Track, ₩ ft 11¢, 60&5%
1 x 3-16 Track..... 55&7½%
Myers' Stayon Track..... 6@8%
Richards' Mfg. Co.:
Common, 1 x 3 16 in., $3.00; 1¼ x 3-16, $3.25; 1¾ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65..... 50%
Gauge Trolley Track, ₩ ft., No. 31, No. 32, 14c; No. 33, 20¢
No. 50..... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 65, $3.25; $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor..... 80&25%
Queen City Lawn, ₩ doz., 20 teeth, $2.85; 24, $3.00..... net
Anticlog Lawn, ₩ doz..... $1.90
Millerdale ..... 70&10%
Ideal Steel Garden, ₩ doz., 12 teeth, $15.00; 14, $16.00, 16, $18.00 ..... 80%
Kohler's:
Lawn Queen, 20-tooth ..₩ doz. $3.15
Lawn Queen, 24-tooth....₩ doz. $3.25
Paragon, 20-tooth..... ₩ doz. $2.70
Paragon, 24-tooth..... ₩ doz. $2.75
Steel Garden Net cloth ..₩ doz. $2.40
Malleable Garden, 14-tooth, ₩ doz. $2.00@2.25

Rasps, Horse—
Disston's 75%
Heller Bros.' ..... 70&5@70&10&5%
Kendall Bros.' Gold Medal 70&10@70%
M Cuffree's American Stand rd ..... 60&10&5%
New Nicholson ..... 70&10&5%
See also Files.

Razors—
Liann Barnside 60%
Fox Razors ₩ doz., No. 42 $20.00, No. 81, Platina $25.00 ..... 40%
Red Devil..... 65%

Reels, Fishing—
Hendrex:
M 6, Q 6, A 6, B 6, M 9½, M 16, Q 16, A 16, B 16, 4008, Rubber, Paradox, Nickeled Pumelo 25%
Aluminum, German Silv., Bronze 25%
1240 N, 124 N 20%
3001 N, 96 N, 6 RM, G 9 ..... 25%
4 N, 6 PN, 24 N 30%
2904 P, 331½ P, 2904 PN, 331½ PN, 2904 N, 331½ N, 2902 PN, 331½ P, 802 N, 331½ 25%
986 PN, 2901 N, 974 PN 25%
5099 PN, 5099 N 30%
Competitor 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20%
304 P, 304 PN, 00304 P, 00304 PN, 334½ 25%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed .....70&10&10%
White Porcelain Enamel.....60%
Solid Brass or Bronze Metal..25%

Revolvers—
Single Action.....*95¢@$1.00*
Double Action, except 44 cal..*$2.00*
Double Action, 44 caliber....*$2.00*
Automatic *$4.00*
Hammerless *$4.50*

Riddles, Hardware Grade
16 in......*per doz. $2.50@$2.75*
17 in......*per doz. $2.75@$3.00*
18 in......*per doz. $3.00@$3.25*

Rings and Ringers—Bull Rings—

	2	*2½*	*3 inch.*
Steel	*$0.70*	*0.75*	*0.80 doz.*
Copper	*$1.10*	*1.25*	*1.65 doz.*

Hog Rings and Ringers—
Hill's Rings, gro. boxes.....*$3.25*
Hill's Ringers, Gray Iron, doz. 60¢
Hill's Ringers, Malleable Iron, doz. 80¢
Blair's Rings.....*per gro. $3.00*
Blair's Ringers.....*per doz. 75¢*
Brown's Rings.....*per gro. $3.25*
Brown's Ringers....*per doz. 75¢*

Rivets and Burrs—
Copper .....40&10@50%
Carriage, Coopers', Tinners, &c.: Black .....70&10%
Metallic Tinned.....70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, 23@23¢; Tin boxes, 100 count, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—
Cronk's Stay, No. 50..... $1.00
Cronk's Workerhoff, No. 55, $0.80; No. 56, $0.75; No. 60..... $0.75
Lane's Stay..... 40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57..... 50%
Underwriter's, Nos. 59, 60..... 60%
Favorite, No. 54..... 60%

Rope—
Manila, 7-16 in. diam. and larger: Pure .....*lb., 11½@12¢*
Sisal, 7-16 in. diam. and larger: Pure .....*lb., 8¢*
Sisal, 7-16 in. diam. and larger: No. 2 quality.....*lb., 7@7¼¢*
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed .....*lb., 7@7¼¢*
Pure .....*lb., 9¼¢*
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred: Mixed .....*lb., 6¼@6¾¢*
Pure .....*lb., 7¼¢*
Cotton Rope: Best, ¼-in. and larger...18@20¢
Medium, ¼-in. and larger.16@17¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope: Thread, No. 1, ¼-in. & up, lb. .....*7¼@8¢*
Thread, No. 2, ¼-in. & up, lb. .....*6¢@7½¢*

Wire Rope—
Galvanized .....*37½&2½%*
Plain .....*45&2½%*

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal..... 20%

Rules
Boxwood .....*60@60&10%*
Ivory .....*35&10@35&10&5%*
Chapin-Stephens Co.:
Boxwood..... 60%
Flexifold 10%
Ivory ..... 35@35&10
Miscellaneous ..... 50@50&10%
Stephens' Combination..... 55%
Stationers' ..... 50@50&10%
Kendall & Esser Co.:
Folding, Wood..... 35&10%
Folding, Steel..... 33⅓&10%
Lufkin's Steel..... 50&10%
Lufkin's Lumber..... 50&10%
Union Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 45
Band ..... 30 & 10 & 10
Butcher Saws 10
Cross Cuts 40
One Man Cross Cut 40
Nurse & Cross Cut 40
Hand Rip and Cut ..... 40 & 10
Mill Rip and Cut 40
Muley, Mill and Drag 40
Wood Saws ..... 10 & 10
Chapin-Stevens Co.:
Turning Saws and Frames ..... 40 & 10
Drag and Saw & Stamping Works:
Sterling Kitchen Saws ..... 30 & 10 & 10
Disston's:
Circular Solid and Inserted Tooth Saws 40
Band, 2 to 3 in. wide 60
Band, 4 to 8 in. 60
Crosscuts 40
Narrow Crosscuts 50
Mill & Drag 50
Framed Woodsaws 50
Woodsaw Blades 50
Woodsaw Rods, Tinned 75
Hand Saws, Nos. 12, 20, 5, 10, 6100 50
Dis. 122, 76, 77, 8 45
Hand Saws, Nos. 7, 107, 107½, 3, 1, 9, 00 40
Compass, Key Hole, &c. 25
Butcher Saws and Blades 30
C. E. Jennings & Co.'s:
Back Saws ..... 10 & 5
Butcher Saws 40
Compass and Key Hole Saws 40
Framed Wood Saws ..... 40 & 5
Hand Saws 12½
Wood Saw Blades ..... 40 & 10
Millers Falls:
Butcher Saws ..... 15 & 10
Star Saw Blades ..... 15 & 10
Massachusetts Saw Works:
Victor Hacksaws ..... 40 & 10 & 5
Butcher Saws Blades ..... 35 & 10
Peace & Richardson's Hand Saws 30
Simonds':
Circular Saws 45
Crescent Ground Cross Cut Saws 30
One Man Cross Cuts ..... 40 & 10
Gang Mill, Mulay and Drag Saws 45
Band Saws 50
Back Saws ..... 25 & 25 & 5
Butcher Saws ..... 35 & 35 & 5
Compass Saws ..... 25 & 25 & 5
Hand Saws, Bay State Brand 45
Compass, Key Hole, &c. ..... 25 & 25 & 5
Wood Saws ..... 40 & 5
Wheeler, Osgood & Clemson Mfg. Co.'s Cross Cut Saws 50

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A 25
Disston's:
Concave Blades 25
Keystone Blades 35
Hack Saw Frames 30
Simonds' Hack 35
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 ..... 40 & 5
Hack Saws Nos 175, 180, complete ..... 40 & 10
Goodell's Hack Saw Blades ..... 40 & 10
Griffin's Hack Saw Frames 35
Griffin's Hack Saw Blades ..... 35 & 5 & 10
Star Hack Saws and Blades ..... 15 & 10
Sterling Hack Saw Blades ..... 30 & 10 & 5
Sterling Hack Saw Frames ..... 30 & 10 & 10
Sterling Tuner Hack Saw Machines, each No. 1 $5.00, No. 2, $30 10
Victor Hack Saw Blades 20
Victor Hack Saw Frames 40

Scroll—

Barnes, No. 7, $15 25
Barnes' Saw Blades 40
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18, with boring attachment, $29 20
Lester Blades ..... 15 & 10
Rogers, complete $3.50 and $4.00 ..... 15 & 10

Scales—

Family, Turnbull's ..... 50 & 5 & 10
Counter:
Hatch, Platform, 12 oz. to 1 lbs. ..... doz. $4.50
Two Platforms, 12 oz. to 1 lb. ..... doz. $48.00
Union Platform, Plain ..... $1.70 & 1.90
Union Platform, Steel $2.15
Chatillon's:
Eureka 20
Favorite 40
Ormsby Tea Scales 50
The Standard Portables 40
The Standard R. R. and Warehouse Co. 40

Scrapers—

Box, 1 Handle ..... doz. $2.00 & $2.25
Box, 2 Handle ..... doz. $2.50 & $2.80
Ship Light, $2.00; Heavy, $1.50
Chapin-Stevens Co., Box ..... 70 & 10 & 5
Richards Mfg. Co., Box 40

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50 & 2.75; 1¼, $3.00 & 3.25; 1½, $3.50 & 3.75
Bench, Wood ..... 2 & 2 & 10
Hand, Wood ..... 70 & 10 & 5
Chapin-Stevens Co., Hand ..... 70 & 10 & 5

Coach, Lag and Hand Rail—

Lag, Cone Point ..... 75 & 10 & 5
Coach, Gimlet Point ..... 75 & 10 & 5
Hand Rail ..... 75 & 10 & 5

Jack Screws—

Standard List ..... 70 & 10 & 5
Millers Falls ..... 30 & 5 & 10
Swett Iron Works 75

Machine—

Cut Thread, Iron, Brass or Bronze:
Flat Head or Round Head ..... 50 & 5 & 10 & 2
Fillister Head ..... 40 & 10 & 10 & 2
Rolled Thread, F. H. or R. H., Iron ..... 75 & 10 & 2
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65 & 10 & 10

Set and Cap—

Set (Iron) ..... 75 & 10 & 5 & 2
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70 & 10 & 5
Hex. Hd. Cap ..... 70 & 10 & 5
Rd. Hd. Cap ..... 70 & 10 & 5
Fillister Hd. Cap ..... 60 & 10 & 5

Wood—

List July 29, 1907.
Flat Head, Iron ..... 85 & 10 & 5 & 2
Round Head, Iron ..... 85 & 10 & 5
Flat Head, Brass ..... 80 & 10 & 5
Round Head, Brass ..... 75 & 10 & 5
Flat Head, Bronze ..... 75 & 10 & 5
Round Head, Bronze ..... 70 & 10 & 5
Drive Screws ..... 87½ & 5 & 10 & 2%

Scroll Saws—

See Saws, Scroll.

Scythes—

Per doz.

Grass, No. 1, Plain ..... $8.25 & 6.75
Clipper, Bronzed Webb ..... $6.50 & 7.00
No. 3 Clipper, Pol'd Webb ..... $8.75 & 7.25
No. 6 Clipper and Solid Steel ..... $7.00 & 7.50
Bush, Weed and Bramble, No. 2 ..... $6.50 & 7.00
Grain, No. 1 ..... $8.25 & 8.75
Bronzed Webb, No. 1 ..... $8.50 & 9.00
Nos. 3 and 4 Clipper, Grain ..... $8.75 & 9.25
Solid Steel, No. 6 ..... $9.25 & 9.75

Seeders, Raisin—

Enterprise ..... 25 & 10 & 30

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18, 3, $12; 4, $9, 5, $7 ..... 50%
Millers Falls Awl Tool Handles, No. 1, $12; No. 4, $12, No. 5, $9 ..... 20 & 10
Stanley 50

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ₱ doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50 & 3.75
Buck Bros. ..... 27½ & 5
Cannon's Diamond Point, ₱ gro, $12 ..... 40 & 10
Mayhew's ..... ₱ gro $9.00
Snell's Corrugated, Cup Pt. ..... 40 & 10 & 5
Snell's Knurled, Cup Pt. ..... 40 & 10 & 5
Victor Knurled Cup Pt. ..... ₱ gro. $7.50

Rivet—

Regular list ..... 75 & 25 & 10 & 5

Saw—

Atkin's:
Criterion ..... 40 & 5
Adjustable ..... 40 & 5
Disston's Star, Monarch and Trimmph ..... 30 & 5
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut $20.60
No. 5, Mill $30.00
Nos. 11, 11, 95 ..... $15.60
No. 1 Old Style $10.00
Special $10.25
Giant Royal Cross Cut ..... ₱ doz. $8.00
Royal, Hand ..... ₱ doz $4.50
Taintor Positive ..... ₱ doz. $6.75

Shaving—

Fox Shaving Sets, No 30 ..... ₱ d z. net $24.0
Smith & Hemenway Co.'s 75

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₱ doz $1.50
Mounted Kitchen Sand Stone ₱ doz $1.50
Natural Grit Carving Knife Hones, ₱ doz $1.50
Quick Cut Emery Carving Knife Hones, ₱ doz. $1.50
Quick Edge Pocket Knife Hones, ₱ doz $2.50

Skate—

Smith & Hemenway Co., Eureka 50

Shaves, Spoke—

Iron ..... doz $1.10 & 1.25
Wood ..... doz. $1.75 & 2.25
Bailey's (Stubbs R. & L.) 15
Chapin-Stephens Co. ..... 20 & 10 & 5
Goodell's, ₱ doz. $9.00 ..... 15 & 10 %

Shears—

Cast Iron.. 7 8 9 in.
Best ....$16.00 18.00 20.00 gro.
Good ....$13.00 15.00 17.00 gro.
Cheap ....$5.00 6.00 7.00 gro.
Straight Trimmers, &c.:
Best quality Jap ..... 70 & 20 & 10 %
Best quality, Nickel ..... 60 & 20 & 10 %
Tailors' Shears ..... 40 & 10 & 5
Acme Cast Shears ..... 10 & 5
Clauss 5
Wilkinson Sheer & Cutlery Co.:
Steel, 1900 list ..... 20 & 5
Grass ..... 50 & 5
Horse or Mule ..... 50 & 10 %

Tinners' Snips—

Steel Blades ..... 20 & 5 & 20 & 10 %
Steel Laid Blades ..... 20 & 10 & 5
Forged Handles, Steel Blades, Bent 50
Heinisch's Snips 10
Jennings & Griffin Mfg. Co.'s 6½ to 10 in. ..... 20 & 5
Niagara Snips 40
P. S. & W. Forged Handles 25
P. W. R. W. ..... 10 & 10

Pruning Shears—

Cross Cut Saws ..... 35 %
Cronk's Wood Handle Shears ..... 33⅓ %
Disston's Combined Pruning Hook and Saw 25
Disston's Pruning Hook only, ₱ doz. 2
Pruning Shears, all grades ..... 40 & 10 & 5
Columbian Cutlery Co.:
Hollow Ground Blades ..... 25 %
Lever and Ratchet Wood Handle ..... 40 %

Sheaves— Sliding Door—

Reading 40
R. & E. list 15

Sliding Shutter—

Reading 40
R. & E. list 10

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge ..... 25 & 10 %
Club, Rival, 65 & 5 %; First Quality, 60 & 5 %
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25 & 10 %
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 15, 12, 16 and 20 gauge; Leader Grade ..... 20 %
Union, League, 12 and 12 gauge; Rival Grade ..... 25 %
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20 %
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade ..... 20 %

Shells, Loaded—

Loaded with Black Powder ..... 40 %
Loaded with Smokeless Powder, medium grade ..... 40 & 5 %
Loaded with Smokeless Powder, high grade ..... 40 & 10 & 10 %
Union Metallic Cartridge Co.:
New Club, Blue Ribbon 40
Nitro Club, Smokeless Powders ..... 40 & 5 %
Arrow, Smokeless Powders ..... 40 & 10 & 10 %
Winchester:
Smokeless Repeater Grade ..... 40 & 5 %
Smokeless Leader Grade ..... 40 & 10 & 10 %
Black Powder ..... 40 %

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.50	$6.00
10 x 14	3.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 to 20 in.	$4.25	$5.50
Dixie, 10 x 14 in.	4.50	6.00
Dixie, 7 x 10 in.	5.00	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg $4.10
Steel ..... per keg $3.85
Burden's, all sizes ..... ₱ keg $3.90

Shot—

25-lb. bag
Drop, up to B $1.85
Drop, B and larger 1.90
Buck 1.90
Chilled 1.90
Dust 2.00

Shovels and Spades—

Association List, Nov. 15, 1902 ..... 40%
Avery Standard Co. 10

Snow Shovels—

Long Handle ..... $3.50 & $3.50
Wood and Mall. D. Handle ..... $3.75 & $4.00

Sieves and Sifters—

Hunter's Imitation ..... gro. $9.50 & 10.00
Hunter's Genuine ..... per gro. $12.00 & 12.50

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each, $3.25; 10

Sieves, Seamless Metallic

—Per dozen

Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... doz. $0.90 & 0.95
Mesh 20, Nested ..... doz. $1.00 & 1.05
Mesh 24, Nested ..... doz. $1.30 & 1.40

Sinks, Cast Iron—

Painted Sinks ..... 40 & 10 & 5
Tinned Sinks ..... 40 & 10 & 5
Barnes' low list: ..... 40 & 10 & 5
Note ..... 40 & 10 & 5
Enameled Sinks ..... 40 & 10 & 5

Skeins, Wagon—

Cast Iron ..... 40 & 10 & 5
Steel ..... 40 & 10 & 5

Slates, School—

Factory Shipments.
"D" Slates ..... 50 & 5 & 10 %
Eureka, Unexcelled Noiseless ..... 60 & 5 tens
Victor A. Noiseless ..... 60 & 5 tens & 5 %

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40 & 10 & 5
Covert Mfg. Co.:
Dee ..... 40 & 10
Roller, 30 & 2 ..... 40 & 10
Harness Goods, D, Tee ..... 40 & 10
Leather 35

Snaths—

Scythe ..... 55 & 10 & 60 %

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality ..... 60 & 10 & 5 & 2%
Cheap ..... 70 & 10 & 5 & 2%
International Silver Co.:
1847 Rogers Bros., 40 & 10 %; Rogers & Hamilton ..... 40 & 10 %
Rogers, Bro., William, Rogers, Eagle Brand ..... 50 & 10 %
Alcobar Rogers Brand 30
Wm. Rogers & Son ..... 40 & 10

Miscellaneous

German Silver ..... 60 & 10 & 5

Tinned Iron—

Teas ..... per gro. net $0.90
Tables ..... per gro. $1.20 & $1.50

Springs— Door—

Bardsley's Spring and Check 40
Chicago Case ..... 10 & 5
Grip Co. 20
Pullman (Coil) ..... 35 %
Reliance (Coil) ..... 40 & 10 %
Star (Coil) 30
Torrey's Rod, 30 in. ..... ₱ doz $1.10

Carriage, Wagon, &c.—

1¼ in. and Wider: Per 100 lb.
Blister ..... $4.75 & $5.00
Half Bright ..... $4.75 & $5.00
Bright ..... $5.25 & $5.50
Painted Seat Springs:
Under 26 in. ..... per pr. 20 & 2c
Over 26 in. ..... per pr. 75 & 75c

Sprinklers, Lawn—

American Hardware Mfg. Co.:
Cactus, 6 ..... Japanese, 7 ..... Nautilus, 6 ..... $1.00
Enterprise ..... 25 & 10 & 5
Philadelphia, No. 1, ₱ doz $12; No. 2, $15; No. 3, $20 ..... 30 %

Squares—

Nickel plated ..} List Jan 5, 1900.
Steel and Iron ..} 75 & 10 & 10 & 5 %
Rosewood Hdl. Try Squares and T Bevels ..... 60 & 10 & 10 & 5 %
Iron Hdl. Try Squares and T-Bevels ..... 40 & 10 & 10 & 10 %
Disston's Try Squares and Bevels, Rosewood Handle, 60 & 10 %; Iron Stock and Bevel ..... 15 %

Squeezers, Lemon

Wood, Common, gro., No. 0, $3.25 & $3.50; No. 1, $6.25 & $6.50.
Wood, Porcelain Lined:
Cheap ..... doz $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75 & $1.25
Iron, Porcelain Lined ..... doz. $1.75

Staples—

Barbed Blind ..... lb. 6 & 6½ & 7 ¢
Electricians', Association list ..... 80 & 10 & 10 & 10 %
Fence Staples, Plain, $2.15; Galvanized $2.45
Poultry Netting Staples ..... per lb. 3½ & 4 & 5½ ¢

Steels, Butchers'—

Dick's 3
Foster Bros 50

Steelyards— ..... 30 & 30 & 10

Stocks and Dies—

Blacksmiths' ..... 30 & 10 & 5
Curtis Rev'ble Ratchet Die Stock ..... 25 %
Derby Screw Plate 25
Green River 25
Lightning Screw Plate 35
Little Giant 25
Reeves Screw Plate 25

Stoners, Cherry—

Lancaster 50

Stones—Oil, &c.

Pike Mfg. Co. 1907 list:

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	$1.00
[illegible]	[illegible]
[illegible]	[illegible]
Washita St., Extra, 4 to 8 in.	50 ¢
[illegible]	[illegible]
[illegible]	60 ¢
Washita Slips, Extra	60 ¢
Washita Slips, No. 1	70 ¢
[illegible]	40 ¢
India G.2 Stones (entire list)	33⅓ %
G.2 Stones, 1 Corundum Grit	10 %
Quickcut Emery and Corundum Axe Stones, Double Face	25 %
Quickcut Emery Rubbing Bricks	10 %
Hindostan No. 1 Regular	8 ¢
Hindostan No. 1 Small	10 ¢
Axe Stones, fall kinds	10 %
Turkey Oil Stones, Extra, 5 to 8 in.	20 & 5 %
Queer Creek Stones 4 to 8 in.	20 ¢
Queer Creek Slips	40 ¢
Sand Stone	6 ¢

Scythe Stones—

Pike Mfg. Co., 1901 list:
Black Diamond S. S., ₰ gro. $12.00
Lamoille S. S., ₰ gro. $11.00
White Mountain S. S., ₰ gro. $9.00
Green Mountain S. S., ₰ gro. $6.00
Extra Indian Pond S. S., ₰ gro. $5.50
No. 1 Indian Pond S. S., ₰ gro. $4.50
No. 2 Indian Pond S. S., ₰ gro. $3.50
Leader Red End Pond, ₰ gro. $4.50
Quick Cut Emery, ₰ gro. $10.00
Pure Corundum, ₰ gro. $12.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $
Emery Scythe Rifles, 3 Coat, $
Emery Scythe Rifles, 4 Coat, $12.00
Balance of 1901 list 33⅓%
Electro (Artificial), ₰ gro. $12.00
Lightning (Artificial), ₰ gro. $18.00 ..... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers..... ₰ gro. $9.00

Stops— Bench—

Millers Falls..... 15&10%
Morrill's, ₰ doz., No. 1, $1.00..... 50%
Morrill's, No. 2, $0.50..... 50%

Door—

Chapin-Stephens Co..... 5 & 5&10%

Plane—

Chapin-Stephens Co..... 20%

Straps— Box—

Acme, Embossed, case lots..... 20&10&10%
Cary's Universal, case lots..... 20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket ..... doz. $1.60
Excelsior Stretcher and Tack Hammer Combined, ₰ doz. $6.00..... 20%

Stuffers, Sausage—

Enterprise Mfg. Co..... 25@25&7½%
National Specialty Co., list Jan. 1, 1902..... 30&5%
P., S. & W. Co..... 40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ₰ doz.
Superba, Birch Mahogany..... $36.00
Triumph, Fancy Veneers..... $33.00
Parlor Queen, Fig, Rosewood..$30.00
Elite, Hungarian, Ash..... $30.00
Am. Queen, Mahogany..... $27.00
Ideal, Bird's-Eye Maple..... $25.00
Grand Rapids, Nickel, $24.00; Japan..... $22.00
Standard, Nickel, $22.00; Japan $21.00
Crown Jewel, Nickel, $21.00; Jap.$19.00
Crystal, Glass Tip..... $36.00
Grand, 17 in. wide..... $54.00
Club, 28 in. wide..... $54.00
Hall, 38 in. wide..... $66.00

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five dozen lots; $2 per dozen on ten dozen lots; $2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks.. 90@25%
American Cut Tacks.. 90@25%
American Cut Tacks.. 90@25%
Saddlers' Upholsterers'.. 90@25%
Gimp Tacks.. 90@25%
Lace Tacks.. 90@25%
Trimmers' Tacks.. 90@25%
Looking Glass Tacks.. 65%
Bill Posters' and Railroad Tacks, 90@40%
Hungarian Nails.. 80@70%
Finishing Nails.. 70%
Trunk and Clout Nails.. 80%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks
.. 90@10&90@10&10&65%

See also Nails, Wire

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin.. 60@—%
Patent Leather.. 25@10&65%
Steel.. 33⅓&65%
Chesterman's.. 25@25&65%
Keuffel & Esser Co.:
Dia. Tape Ass'd..... 14&10&50
Flexible Linen Tape..... 50&5
Metallic and Steel Linen list, 35@35&5%; Pocket, 35@35&5%
Lufkin Rule Co.:
Asses' Skin..... 40&10&50%
Metallic..... 33⅓&5%
Patent Bend, Leather.... 25&5@25&10%
Steel..... 40&10&5%
Linen..... 33⅓&35%
Merrill & Hilser:
Linen, Metallic, No. 34L..... 35%
Oil Stone or Steel, No. 1038L..... 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c..... 30@33⅓%

Ties, Bale—Steel Wire—

Single Loop..... 80&10&5
Monitor, Cross Head, &c. 70&2

Tinners' Shears, &c.—

See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.—

See Benders and Upsetters, Tire.

Tools—Coopers'—

L. & I. J. White..... 20@20&5%

Haying—

Myers' Hay Tools..... 45%

Miniature—

Smith & Hemenway Co.'s, Davidson, ₰ doz., Nickel Plated $1.50; Gold Plated..... $2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simonds' Improved..... 33⅓
Simonds' Crescent..... 25%

Ship—

L. & I. J. White..... 33%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.... $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida..... 75&10%
Newhouse..... Dagtons
Hawes & Norton..... 65%
Victor..... 75@75&5%
Oneida Community Jump..... 50%
Hector..... 75&5&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85@90¢

Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ₰ doz., $13.25..$11.50 doz.
No. 1, Rat, ₰ doz. $6.50.... $5.75 doz.
No. 3½, Rat, ₰ doz., $8.25.. $4.70 doz.
No. 4, Mouse, ₰ doz., $3.85.. $3.00 doz.
No. 5, Mouse, ₰ doz., $3.00.. $2.25 doz.
Oneida Community:
Out o' Sight, Mouse, ₰ doz....$0.60
Out o' Sight, Rat, ₰ doz..... 1.25
Easy Set, Mouse, ₰ doz..... 1.00
Easy Set, Rat, ₰ doz..... 1.00
Wood Choker, Rat, ₰ doz. holes, .12
Premier Tin Choker, 5 holes, ₰ doz. traps..... .75

Trowels—

Disston Brick and Pointing..... 25%
Disston Plastering..... 20%
Disston "Standard Brand" and "Garden Trowels..... 30%
Kohler's Steel Garden Trowels, ₰ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels., ₰ gro. $6.00
Woodrough & McParlin, Plastering..25%

Trucks, Warehouse, &c.—

B. & L. Barrow Co.:
New York Pattern..... 50&10%
Western Pattern..... 60&10%
Handy Trucks..... ₰ doz. $16.00
Grocery ..... ₰ doz. $15.30
McKinney Trucks..... each, net $10.00
Model Stove Trucks..... ₰ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.
No. 1 2 3
Galvanized. $87 $79 $89 $99 10%

Twine, Miscellaneous—

Flax Twine:
No. 9, 1¼ and 1½ lb. Balls 20@21¢
No. 12, 1¼ and 1½ lb. Balls..21@22¢
No. 15, 1¼ and 1½ lb. Balls..18@20¢
No. 24, 1¼ and 1½ lb. Balls 17@19¢
No. 36, 1¼ and 1½ lb. Balls..17@19¢
Chalk Line. Cotton Balls..... 26@33¢
Cotton Mops, 6, 8, 12 and 16 lb. to doz..... 110@19¢
Cotton Wrapping, 5 Balls to lb., according to quality... 15@21¢
American 2-Ply Hemp, 1¼ and 1½ lb. Balls..... 14½@15¢
American 3-Ply Hemp, 1¼ and 1½ lb. Balls..... 15@16½¢
Indian 2-Ply Hemp, 1¼ and 1½ lb. Balls (Spring Twine) 13½@14½¢
India 3-Ply Hemp, 1½ lb. Balls..... 16½¢
India 3-Ply Hemp, 1½-lb. Balls, according to quality..... 17@18¢
2, 3, 4 and 5-Ply Jute Balls..... 13½@14½¢
Mason Line, Linen, 1½ lb. Balls 47¢
No. 20, Mattress, 1¼ and 1½ lb. Balls, according to quality, 7@9¢
Wool, 3 to 6 ply. B 9¢: A 10¢

Vises—

Solid Box..... 50&10&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable..... 40%
Standard 40
Amateur 25%
Columbian Hdw. Co.: 40%
Fisher & Norris Double Screw, net, each, Nos. 2, $14.50; 3, $16.00; 4, $20.50; 5, $27.00.
Fulton Mach. & Vise Co.:
Reed, Swivel..... 25%
Star, Solid Jaw..... 40%
Hollands':
Machinists' ..... 15&10&5
Reversible ..... 15&5&10
Lewis Tool Co.:
Adjustable Jaw..... 30
Monarch, 50%; Solid Jaw..... 50%
Massey Vise Co.:
Cutter 40
Perfect, 15%; Lightning Grip 15
Merrill's 50
Millers Falls Oval Slide Pattern 60&10%
Parker's:
Victor, 20@25%; Regulars..... 20@25%
Yukau's ..... 40&15
Combination Pipe..... 50&5
Prentiss 50
Rock Island 25%
Suedhelm & X. L. 33⅓
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ₰ doz., $24.00, 30%; Clamps..... 30%
Perfection Saw Clamps, ₰ doz.....$4.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed 25%
Star 40
Massey Vise Co.:
Lightning Grip, 15%; Perfect..... 15%
Wyman & Gordon's Quick Action, 6 in., $6.00, 9 in., $7.50, 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe..... 40%
Parker's Combination Pipe 50%
Stephens' 50%; 187 Series, 60&5%; No. 870, 40%
Rock Island Pipe..... 25%

Wads—*Price per M.*

	Dis. 15%
B. E., 11 up..... 60¢	
B. E., 9 and 10..... 70¢	
B. E., 8..... 80¢	
B. E., 7..... 80¢	
P. E., 11 up..... $1.00	
P. E., 9 and 10..... 1.25	
P. E., 8..... 1.50	
P. E., 7..... 1.50	
Ely's B. E., 11 and larger.$1.70@1.75	
Ely's P. E., 12 to 20.... $3.00@3.25	

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled..... 45&10%
Ground..... 30&5%
Plain or Unground..... 60%
Country Hollow Ware, per 100 lbs..... $3.00
White Enameled Ware:
Maslin Kettles..... 65&10%
Covered Wares:
Tinned and Turned..... 35&10%
Enameled..... 45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware..... 33⅓%
Iron Clad Ware..... 70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles..... 60%
Porcelained ..... 50&5&50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles..... 60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles..... 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ₰ doz.
Crescent, family size, bent frame.$1.05
Rex, family, tinned, zinc, stationary bracket $1.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector..... $3.55
Other [illegible] size, stationary [illegible] $3.60
Single Zinc Surface:
Wood frame, size, open back, perforated $2.00
Single [illegible] Glass $2.85
Brass Surface:
Brass King, Single Surface, open back $4.05
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.60
Glass Surface:
Glass King, Single Surface, open back $3.95
Enamel Surface:
Enamel King, Single Surface, ventilated back $3.95

Washers—Leather, Axle—

Solid ..... 90@10&90&10%
Patent ..... 90@10&90&5%
Coil: ⅝ in. 1 in. Inch.
11c. 12c. 13c. 15c. per box

Iron or Steel—

Size, inch.... 5/16 ⅜ ½ ⅝ ¾
Washers.. $5.90 5.00 3.70 3.50 3.30
The above prices are based on $5.50 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@12¢

Wedges—

Oil Finish..... lb., ..@3¢

Weights—Hitching—

Covert Mfg. Co..... 30&2%

Sash—

Per ton, f.o.b. factory:
Eastern District..... $30.00
Southern Territory..$24.00@25.00
Western and Central Districts ..... $25.00@28.50

Wheels, Well—

8 in., $2.22; 10 in., $2.52; 12-in., $3.36; 14-in., $4.80.

Wire and Wire Goods—

Bright and Annealed:
6 to 9..... 72¢10&7½%
10 to 18..... 72½¢10&10%
19 to 26..... 75¢10&10&2½%
27 to 36..... 77½¢67½%
Galvanized.
6 to 9..... 72½&10%
10 to 14..... 72½¢10&5%
15 to 18..... 72½&10&5%
19 to 26..... 75¢10&2½%
27 to 36..... 65¢10&10%
Copper.
6 to 9..... 65¢10¢1%
10 to 14..... 70¢10&5%
15 to 18..... 65¢10&10%
19 to 26..... 70¢10&2½%
27 to 36..... 72½¢10&2½%
Tinned.
6 to 18..... 67¢10&10%
Brass ..... 17½¢ lb., base
Copper ..... 32¢ lb., base
Cast Steel Wire..... 50%

Spooled Wire—

Annealed and Tinned..70@10&10
Brass and Copper..... 60&10&10
Retailers' Assortments, per box. $2.10@$2.40

Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods 90@20@90@25
Brass Wire Goods.... 90@90@10%
Brass Cup and Shoulder Hooks, 80@15%

Wire Cloth and Netting—

Galvanized Poultry Netting. 80@50&80&10%
Painted Screen Cloth, 100 ft., $1.30
Standard Gate Hardware Grade: Per 100 sq. ft.
Nos. 2, 2½ & 3 Mesh.... $2.50
Nos. 4 and 5 Mesh..... $2.75
No. 6 Mesh..... $3.00
No. 8 Mesh..... $3.50

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ..... 75@75&10%
Alligator or Crocodile..70¢10@75%
Baxter Pattern S Wrenches. 70¢50¢70&10%
Drop Forged S..... 45¢10&65%
Acme ..... 60&10%
Alligator Pattern, 70%; Bull Dog..70%
Barnes & Calls:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut..... 50%
Combination Black..... 40&5%
Merrick Pattern..... 50
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle ..... 40&10&5&5%
Coes' "Mechanics'"....40&10&10&5&5%
Donohue's Engineer's ..... 40&10%
Engle 70%
Gem Pocket..... 50
Hercules 70%
J. W. B. Machinist:
Case lots..... 50&5%
Less than case lots 50%
W. & B. Railroad Special:
Case lots..... 50%
Less than case lots..... 40&10&5%
Solid Handles, P., S. & W., 50&10%; full cases..... 50&10&10%
Stephens 65%
Uwanta Wrench Co.:
Railroad Special, Iron Handle, 40&10&5%
Other Wrenches..... 50%
Vulcan and Acrippa Chain 50

Wrought Goods—

Staples, Hooks, &c., list March 17, '92..... 90%

Zinc—*(Cask lots at mill.)*

Sheet..... per 100 lb $7.00

THE IRON AGE

New York, Thursday, January 16, 1908.

The Sheldon Retort Coke Oven and Process.

A Chamber for Precoking and the Coal Under Compression During the Coking Operation.

BY S. B. SHELDON, BUFFALO.*

In the last few years the commercial aspect of the manufacture of coke for blast furnace purposes has been forced to the attention of both the pig iron producer and the coke manufacturer with ever increasing acuteness. The technical good quality of the so-called Connellsville coke, which we used to hear so much of, has ceased to be anything but pleasant fiction, except in the case of a few specific operations that have been conserved by certain of the large producing companies for special uses. The tendency for a number of years has been toward deterioration in the physical quality, from the tremendous pressure brought to bear upon production, and on account of increasing sulphur and ash, and in many cases phosphorus, owing to change in the character of the coal as mining has proceeded. Relief is to be found in a process which will conserve the coal supply and produce a larger yield of merchantable coke from a given tonnage of raw material, which means a lower loss in conversion, this in turn giving a lower percentage of phosphorus, sulphur and ash than the more wasteful process. If at the same time this process makes available for use and for sale valuable by-products which are now thrown away in the production of a vast majority of our coke, it must of necessity take precedence over one which offers a less theoretical commercial advantage.

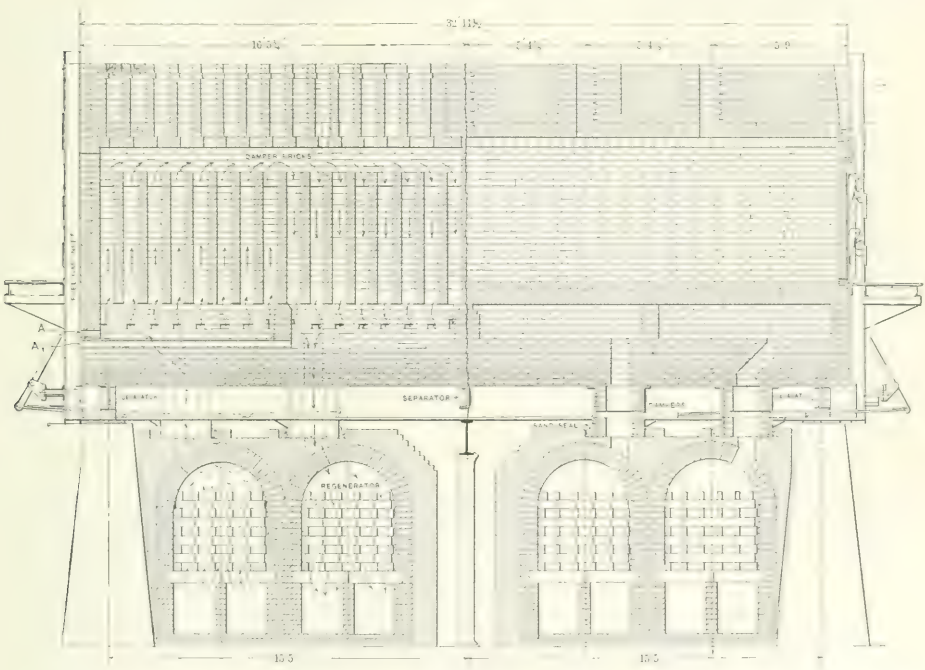


Fig. 1.—The Sheldon Retort Coke Oven in Section, One Half Through the Coking Chamber and the Other Half Through the Flue System.

What the New Process Proposes.

Of any number of processes for the manufacture of a given article, if the quality remains the same with each, it becomes a matter of simple commercial computation to know which to adopt. This appears to be true of practically every commodity on earth except the very necessary and, to put it mildly, disappointingly variable material called coke, which is so largely the basis of the iron industry. It is not the intention in this article to go into the discussion of the wherefore of good or bad coke from this or that process, but rather to make a general commercial comparison between the merits of the beehive and retort ovens, and to suggest an oven and process which appear to solve a large number of technical difficulties in the manufacture of coke. This process, which is almost revolutionary, at the same time offers possibilities of commercial return and regularity of product, with the elimination of a considerable amount of operating complication, in a more logical manner than any similar device which has been placed on the market in recent years. The figures quoted should not be considered as statistically accurate, but are cited in a general way for a comparison of the beehive and retort processes, and the article is written with the idea that a large proportion of those who read it are familiar with many details of both. In developing the new process two

* General superintendent of the Lackawanna Steel Company.

things were kept in mind: The commercial needs of the producer of coke, whose path has certainly not been one of roses, in view of the labor situation of the last three years at least, and also the technical requirements of blast furnace managers, upon whom the burden finally falls, and who, it must be admitted, have been patient in long suffering.

Beginnings of the Retort Oven.

The beehive oven came into existence about 1750 in England, and in 1835 in the United States. In this country at least it has marched down the commercial highway, brushing aside all competitors—really having little or no competition until within the last four years. About 1856 the first retort oven was introduced in Europe, and it has progressed to such an extent that for many years coke in Germany has been synonymous with by-product coke. While the old process has maintained its supremacy in this country, its competitor has superseded it in Germany in a comparatively short time.

In 1894 the Cambria Steel Company installed at Johnstown, Pa., a battery of retort ovens. The plant has been steadily added to, until now practically all the company's coke is made by this process. The use of retort ovens in the United States since the original installation at Cambria has so extended that in 1907 the production was, approximately, 5,000,000 tons of coke by this process, or probably 20 to 25 per cent. of the total produced in the State of Pennsylvania. The retort oven has forced its way to the front thus far in the face of high installation cost, as compared with that of a plant for an equivalent output from beehive ovens, and also in the face of a decided prejudice on the part of the average furnaceman against retort or by-product coke. It must be self-evident that its use in Europe must be commercially successful, otherwise new installations would cease. It is evident also that this method of manufacture is satisfactory to the pioneers of the process in this country, and it follows that it must be commercially desirable at other points or its erection would cease.

Possible Saving on the Pennsylvania Output.

The production of beehive coke in Pennsylvania in the year 1907 was probably over 20,000,000 tons. If we estimate the cost of this coke and that of an equivalent amount made in a retort oven, with by-product recovery, at the present price of coal, sulphate of ammonia and of gas at Pittsburgh, we find that it has cost about $15,000,000 more than it would to produce it in retort ovens. This estimate has taken into consideration a probable decrease in the price of sulphate, and the value of the tar has been neglected, in order to compensate for the probable decrease in selling price if such a large quantity of sulphate were placed on the market as would result from the production of the tonnage of coke referred to above. This is permissible, since the minimum value of the tar produced would be equal to a corresponding number of pounds of coal for fuel purposes, and actually would be considerably greater.

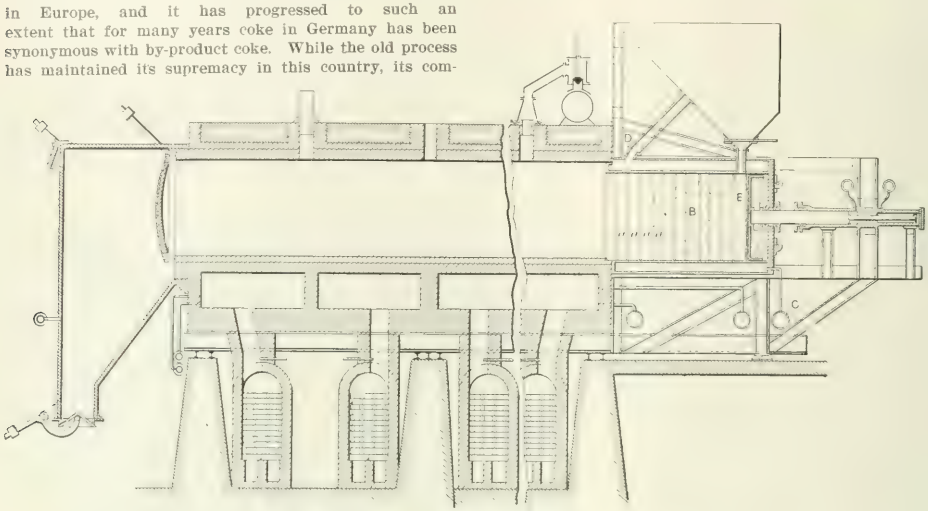


Fig. 2.—The Precoking Chamber and Compressing Apparatus Applied to Existing Retort Ovens.

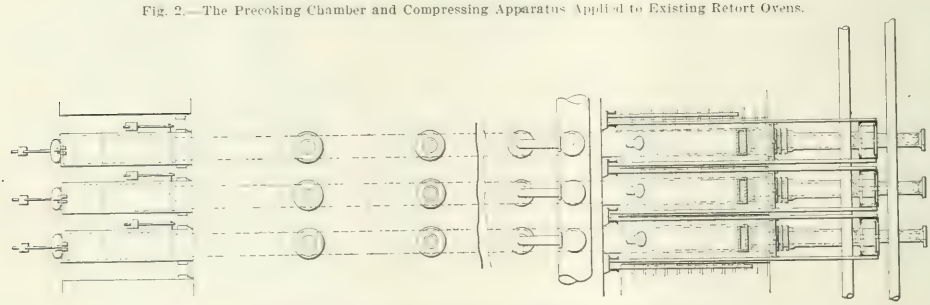


Fig. 3.—Plan View Showing General Arrangement of the System.

The figures indicate in a general way the relative economic conditions. It has been demonstrated time and again in this country that a ton of by-product coke will make as much iron in the same furnace, from the same ores, as will a ton of average beehive coke. Exceptions may be taken to this statement, but it is a fact, and is well known to those who have impartially investigated both sides of the question. We have, then, a somewhat incongruous state of affairs—namely, a crude, wasteful method successfully competing with one having economies never claimed for the old process, and which produces under certain conditions an article equivalent in quality. It would seem a pertinent question to ask why this waste

is still allowed to go on, and why the larger portion of our coke is still made as in the days of our greatgrandfathers, with the same, or, in most cases, a larger waste. It is not sufficient to pass the question by with the answer that because of our plethora of raw material, we have not yet reached the economic state, where maximum economies are desirable or necessary. Neither would the assertion that the cost of the investment per unit of product is prohibitive satisfactorily answer the question. It is taken for granted that the inherent theoretical economies of the retort process are accepted without question.

Why Not More Retort Ovens.

Some other reason why retort ovens long ago have not driven the more poorly equipped competitor from the market must be looked for. As a matter of fact, the arguments are many and varied. In the opinion of the writer, they can be summarized as follows:

1. The fact that very few people in this country thoroughly understand the rationale of both processes. For instance, there are many who are skilled in the art of manufacture of coke in a beehive oven who know practically nothing of even the mechanical side of the retort oven, to say nothing of the chemical side thereof. There are others who are builders of this or that type of oven whose conception of the merits of their own device is possibly of a higher order than may be realized when subjected to the rigorous demands of commercial operation.

2. There has always been a veil of mystery surrounding the manufacture of retort coke, which has not tended to increase the use of the higher grade machine.

3. The retort oven costs more money to erect.

4. Possibly the crucial reason is the fact that while a larger range of coals may be coked in a retort oven than in a beehive oven, with unquestionably greater efficiency both as to quality and cost, yet it is not a machine for universal use in the present state of the art, for the following reasons:

a. It is very difficult to make satisfactory blast furnace coke out of coal that runs over 28 per cent. in volatile constituents; and it so happens that the majority of those who might be attracted to the commercial side of the retort process, unfortunately for both themselves and the process, possess coal which will make a brittle coke in a retort oven.

b. The retort oven is a relatively complicated, high cost machine, in the operation of which a considerable degree of technical skill is required as well as executive ability. The product is susceptible to the personal equation not only of the superintendent, but of every man who is concerned in the manipulation of the oven.

Essentials of a Retort Oven.

Refined as the retort process is by comparison with the beehive, there is still much to be desired as to the mechanical operation. As far as the selection of the type of machine is concerned, it would appear that this should be the simplest part of the proposition if viewed from the standpoint of one about to purchase an ordinary regenerative furnace. Stripped of its mystery, a retort oven in its elements is a simple type of furnace wherein to heat coal. Like all furnaces for any specific purpose, it has certain functions to fulfill to be commercially permissible. The first of these must be even distribution of heat throughout its entire length. Without this feature no satisfactory coke can be made. If a part of the oven runs cold and part hot, there will be finished coke in one place and unfinished coke in another, resulting in a variable mass in the length of the oven.

The apparatus should be substantial and durable, with as few complications as possible, both structural and operative. It should be built of brick of as nearly standard shapes as possible, and it should be cheap. These considerations are not usually given sufficient weight in the selection of an oven. It is a common expression that this or that specific type makes good or bad coke out of the same kind of coal. The fact is that there is no oven on the market, either in this country or abroad, that cannot be made to produce good coke; neither is there any oven which will not produce bad coke from coals within the range of the process. A large number of the ovens on the market are structurally inadmissible. Another class does not give a satisfactory distribution of heat, although it is only fair to say of this latter kind that all of them can be made to produce satisfactory coke in the hands of skilled operators. Those of still another class, while they possess the necessary and desirable features of such a machine, are unduly expensive to construct and are imperative in their demands for space, creating in some cases an objectionable and expensive delivery of coke on the discharge side of the oven, and their complicated structure renders safe the prediction of early and frequently recurring repairs.

Features of the Sheldon Oven.

In view of these conditions, the writer has been prompted to devote some thought to the improvement of the retort process, having in mind the possible economies and the necessity for some economic change in the manufacture of coke in this country, as we with such rapidity approach the conditions of our European competitors in depleted fuel reserves of the higher quality. This leads to a consideration of the oven and process upon which patents have recently been granted the writer.

The oven is shown in Fig. 1, the cut representing a broken section longitudinally of the oven, one-half being through the coking chamber and the other half through the flue system. The burners are shown at A A. The interior burner is made up of hollow brick provided with shoulders, making a male and female joint which may be clayed up and made gas tight. This burner lies loosely in the floor of the combustion chamber as shown. It is very evident then that the gas passes up through eight flues at a time in place of 16, as in the ordinary construction. The total surface heated is the same as in the ordinary construction, since we have two sections of flues carrying the immediate products of combustion, the sum total being equal to the length of the flue section in ordinary use. The damper brick on top of the flues regulate the draft of each flue in proportion to its distance from the stack. It will also be noted that various combinations of the travel of the gases may be made should occasion arise. The paths of travel are shown by the various arrows. This will do away completely with the occurrence of zones of variable temperature, which are liable to be present in every oven thus far built, regardless of the regulation usually provided in the attempt to equalize this effect. There is probably no oven built to date that is not subjected to trouble upon exposure to severe winds blowing continuously from one direction, impinging on the end of the oven. Under such conditions one-half of the oven in question can be reversed once an hour, or as often as may be necessary to preserve the heat near the door of the end exposed, the other half being operated independently.

Points in Construction.

Structurally, this oven is simple. It embodies the strong structural features of a well-known type, but will do away with the only point susceptible of logical criticism on the type in question—the equalization and the preservation of the uniformity of the heat. The oven, as shown in the drawing, is built on beams, which are carried on retaining walls, the floor of the oven resting on the sole plate on top of the beams, thus effectually sealing the oven and allowing the brick to slide in case of expansion. Connection to the regenerators is made by means of brick lined metal tubes, riveted to the sole plate and connected to the regenerators by means of a sand seal. This makes the superstructure practically independent of the regenerators, so that no broken connections result from difference in expansion; it also provides a means whereby the elevation of the oven proper may be made any hight desirable without the necessity of raising the regenerators.

It should be noted that the number of special shaped brick is reduced to a minimum, the oven being practically built of tongue and groove rectangular brick. It is claimed for this oven that greater heat uniformity with less operative complications may be obtained than in any type yet proposed, and that it can be built at a much

lower cost than any other desirable type now in the market.

Preheating the Coal.

The process is continuous, and can be applied to practically all retort ovens. It consists in general of preheating the coal outside of the oven proper, and then charging by gravity into a metal chamber forming an extension to the coking chamber and flue system. The chamber is made of iron, and is called the precoking chamber. It is provided with a door and a hydraulic plunger for each oven, the plunger working inside the door. In present retort practice 50 per cent. approximately of the coking time is absorbed in raising the geometrical center of the mass within the oven to about 400 degrees F. This is shown by actual test in Canada, Europe and the United States of ovens from 14 to 22 in. wide, and of various types. Since practically all coals will stand a temperature approaching 400 degrees for a reasonable length of time without suffering physical change as far as their coking properties are concerned, it follows that a logical advantage may be obtained both in fuel consumption and decrease in time of coking, if this fact is taken advantage of and the coal preheated approximately to this temperature by waste heat preliminary to its being charged into the precoking chamber.

Fig. 2 shows diagramatically, the adaptation of this process to a retort oven. B is the precoking chamber. Gas is introduced at C, and ascends through the flues *aa*, formed by ribs on the apparatus, transmitting heat to the iron, and leaving the apparatus through the flue D. It ascends around and through a bin system continuous in structure, and extending over the chambers devised to heat coal before its introduction into the precoking chamber. The coal is heated to somewhat below 400 degrees. It is then fed in front of the plunger E through a gate provided for the purpose, and exposed to the coking action. Fig. 3 shows the general arrangement in plan.

The Method of Compression.

It has been found that under these conditions at the end of one hour the mass is superficially coked to such an extent that it may be moved by the plunger. After introduction into the coking chamber the coal is compressed by the action of the plunger to a considerable degree. It should be noted here that we have an effective means for the compression of coal in a coking chamber and the maintenance of that pressure in whole or in part during the coking operation. It has been found that three hours' exposure in the iron apparatus surrounds the mass with coke of sufficient strength to push a mass equal to that in an oven of the ordinary length and width ahead of this superficially coked mass. This mass may be compared to a girder, built of coke on the outside and coal in the interior. At the end of the first hour the plunger is advanced one-third of the length of the precoking chamber; the plunger is then withdrawn and coal allowed to feed in. At the end of the second hour the operation is repeated, and so on indefinitely. The discharge of the finished coke is effected by trapping the coke off, by means of a depending chamber provided with two separated valves, shown diagramatically at the discharge end of the oven. Since the coal is effectually compressed and pressure maintained during the coking action, a harder coke would be expected than in the ordinary method; and an oven of this description has made, from a 35 per cent. volatile coal, coke having a crushing strength of 1100 lb. per square inch. It would also be expected that the tendency to produce the initial cross fracture so common in the retort process would be eliminated in whole or in part. This is found to be the case.

As the coal is introduced progressively at the rate of a fractional part of an oven per hour, a gas more uniform and much higher in heat units will be obtained. The gas must of necessity be driven through the coal in the precoking chamber, there being no other means of egress. It is therefore fair to expect a decided chemical change, which would result in a radical difference in the chemical composition of the tar. Samples taken from the experimental oven show as high as 8½ per cent. in phenol and as low as 9 per cent. of fixed carbon, thus making the tar higher in value than ordinary retort tar.

A 200 Per Cent. Production.

In actual practice the plant will be designed to operate the process in units of 10. For instance, in a battery of 50 ovens, there would be five operative units of 10 each, the movement of one valve only being necessary to move 10 plungers and discharge an amount equal to the length exposed 1 hr. in the precoking chamber from each oven. It has been found in an experimental oven, that a rate of coking may be obtained equal to 200 per cent. of the rate of the oven when charged from the top with unprepared coal and coked in the ordinary manner, the same heating means being used in both cases. Since the early part of the coking operations are carried on in contact with iron walls in place of brick walls, only a very low temperature head is necessary, which will be well within the limits of the cast iron. On the basis of the operations of a given oven at 200 per cent. of present production now obtained per 24 hr., the rate of discharge will then be one-twelfth of the length of an oven each hour. We therefore have in 10 receiving chambers at the end of each hour, a little more than the equivalent of 83 per cent. of the contents of one oven. A standard gauge car especially adapted for the purpose, will receive this coke quenched and ready for shipment, the quenching having been done in the discharge chamber between the two separated valves. This feature renders steam quenching possible, which will insure the delivery of moisture free coke at the shipping point. It should also be noted that practically the only handling the coke gets is in sliding from the oven into the chamber and from the chamber into the car. Since hot coke breaks up less than cold coke under similar conditions, and since the handling is reduced to a minimum, a very small amount of coke breeze will result, thereby increasing the yield of coke and saving considerable money now expended in cleaning up.

The gas collecting main will be placed very near the entrance end of the oven, and since the maximum temperatures will not be obtained at this point on account of the continuous introduction of fresh material, relief may be expected from carbon deposits, doing away with the trouble and expense of tar chasing, so well known to retort oven operators. As the oven is never empty and the brickwork is never completely cooled, but remains at uniform temperature, favorable conditions for the long life of the brickwork have been introduced. It should be noted also that the precoker is slightly less in width than the oven proper. This reduces the wear of the oven walls by confining abrasion to the bottom of the oven.

Since 50 per cent. of the work is done outside of the oven proper and with waste heat, and in any coke oven as ordinarily operated practically all the gas is burned that the combustion areas will allow during the entire time of the conversion from coal to coke, it follows that just as in any producing operation requiring heat the amount of fuel used per ton of material will be dependent on the rate of production of that material per unit of time, other things being equal. It can readily be seen, therefore, that large savings in gas may be expected from this apparatus, both from the work done by waste heat outside of the oven, the increased heat transmission efficiency of the primary iron chamber as against brick, and the maintenance of the temperature of the oven from the progressive introduction of coal.

Labor Saving Through Continuous Operation.

Through the elimination of operations by the application of the continuous principle and the increased output made possible, a large saving of labor may be expected. A comparison of the number of men necessary for the two processes is interesting. In a plant of two batteries and comprising 100 ovens, operated by existing methods, it would be possible to so arrange and equip it to operate with the following number of men per turn:

1 foreman.	2 tar chasers.
1 pusherman.	1 mud mixer.
1 quenching car operator.	4 door luters.
1 doorman on top.	2 door operators.
2 standpipe men	—
1 larryman.	17 men, or 34 for 24 hr.
1 heater.	

The product, operating with about 100 per cent. effi-

ciency, assuming the units to be five tons, would therefore be 500 tons per 24 hr., or 14.7 tons per man. However, it should be noted here that this condition has never been obtained in present practice. With the continuous process, the following men would be necessary per turn for the purposes specified:

1 heater for each battery who will be in complete charge of battery.
1 larryman.
1 receiving car man.
1 man on top for each battery, who will operate discharge door and who will quench the coke in the discharge chamber.
Total for 24 hr. and two batteries, 12 men.

The product, based on 200 per cent. of the present output, would be 1000 tons, or 83 tons per man. The ratio of efficiency will be, therefore, 14.7 to 83 tons per man. Another very apparent advantage in the continuous process will be absolute freedom from black ends and non-uniform coke resulting from variable temperatures, since all parts of the mass must pass by each point in the oven, and also since all the coke will be produced from coal which is, to say the least, moisture free before entering the oven. Further, since the receiving car will carry away each hour a portion of the material from 10 ovens, a still further uniformity of product may be expected. It has been found by experiment that a rate of coking may be obtained by this process which will completely coke the mass some distance before the discharge end of the oven is reached, even when working at a rate 100 per cent. greater than that obtained in present practice.

The possibilities under this process of improving the present method of operating retort ovens by affording a logical mechanical control, replacing the cumbersome and relatively crude methods now necessary owing to the limitations of the present machine, the maintenance and betterment of the economic advantages inherent in the retort process, the widening of the range of raw material usable, the close regulation and improvement in the quality of the product, will, it is believed, furnish food for reflection to both producer and consumer of coke.

Customs Decisions.

Notice of 30 Days Before Changing a Duty.

The Treasury Department, acting on the petition of influential importing interests of the country, announces that hereafter a notice of 30 days will be given when it is proposed to change from lower to higher rates of duty. This concession is made by the Government, in order to obviate the disadvantages under which importers have suffered in the past by reason of sudden changes in the classification of imported merchandise. An official statement on the subject says:

Under the operation of the present tariff law for the past 10 years, changes in classification to higher rates have been made, as is well known, without previous notice, resulting, in instances, in considerable loss to importers, especially on those lines of merchandise carrying a very small margin of profit. Under the recent instructions of the Department, the importing trade will have 30 days' notice of intended raise in the rate of duty to be applied to any particular line of merchandise. This will give fair opportunity for the readjustment of contracts and terms of sale to meet the prospective change of tariff conditions. During the pendency of such 30 days' notice the old prevailing rate will be returned as the advisory classification by the appraiser, while in the meantime the matter will be submitted to the Treasury Department, and, in the absence of contrary instructions therefrom, the higher rate will become effective on all like importations on and after the date fixed in the notice to the importer.

This question does not, of course, apply to errors, intentional or accidental, made by importers or brokers when making entry, but where changes are contemplated in the rate of duty that has prevailed in the official returns of appraising officers. It is desired by the Department that as wide publicity as possible be given in each instance of proposed change of classification to a higher rate, and besides especially notifying the importer upon whose invoice the question first arises, the appraiser's office will furnish to the press, and also conspicuously post on bulletin boards throughout the Public Stores, notice of any such contemplated advance in rate.

In view of the fact that the Board of General Appraisers and the courts have been for some years threshing out questions of classification, most of which would now appear as permanently settled under the present law, it is not expected that the number of changes from lower to higher rates will be very large.

Duty on Statuary.

In a decision handed down by the United States Circuit Court of Appeals at New York, it is held that, regardless of the fact that artisans perform work on metal statues, they are nevertheless to be deemed "statuary" within the meaning of that word, as used in the tariff act, and accordingly dutiable at the rate of 15 per cent. ad valorem under the terms of the reciprocity treaty with France. The case before the appellate tribunal stood in the name of Tiffany & Co., who objected to the action of the customs authorities in exacting duty on a statue of ivory and metal representing La Bellona, the Roman goddess of war, as a manufacture of ivory at 35 per cent. ad valorem. The work was one of the last pieces wrought by Gerome, the famous French sculptor, and the claim was made by the importers that the piece should be classified as "statuary" with duty at only 15 per cent. The Board of General Appraisers, while acknowledging that the figure was artistic in its production, held to the view that as the tariff stands it is requisite to the entry at the lower rate of duty that all of the work on a statue be done by the professional sculptor himself. On this account the board overruled the contention of the firm, and affirmed the action of the Collector of Customs in classifying the work as a "manufacture." The Circuit Court, however, took a different view, and held that, while some parts of the statue was executed by ordinary workmen, it was all done under the personal supervision of M. Gerome.

Sundry Decisions.

The Board of General Appraisers has decided that knives having deerfoot handles, with folding blades 5 in. long, are to be regarded as "hunting knives," with duty at the rate of 45 per cent. The issue came before the tribunal on appeal by George Borgfeldt & Co., New York, who objected to the action of the customs authorities in returning the articles for duty as clasp knives at the compound rates applicable under the provisions of paragraph 183 of the tariff act. The protest is sustained.

The board has taken favorable action on a protest filed by the Electric Goods Mfg. Company, Boston, it being held that hollow cylinders of carbon are dutiable properly under the tariff provision for porous carbon pots for electric batteries. The tribunal directs that the collector's assessment of 35 per cent. under the provision in the law for "carbon not specially provided for" be set aside.

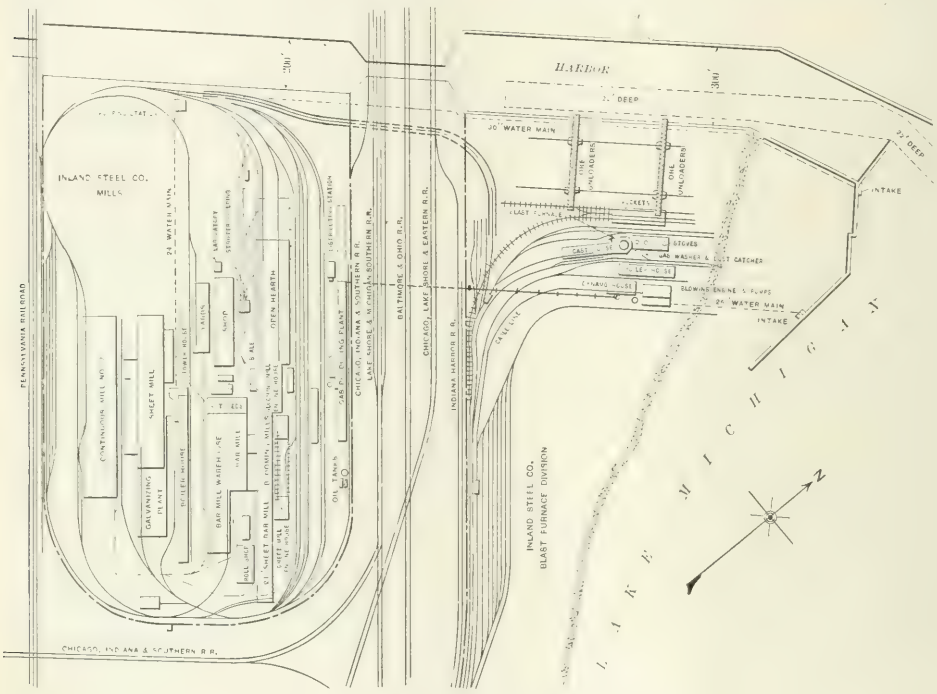
In a finding against the contention of A. Kastor & Bro., New York, the board lays down the principle that diminutive pen knives, with cutting blades and other metal parts of cheap Bessemer steel, are not to be deemed "toys" within the meaning of the word as used in the tariff. Instead, the board rules that such articles are dutiable as "pen knives" at the rate of 40 per cent.

Berger Salesmen Meet.—The annual meeting of the salesmen of the Berger Mfg. Company, Canton, Ohio, was held during New Year week. Thirty-two traveling salesmen were present from various sections of the country, as well as representatives from several of the company's branch houses. The meeting closed with a banquet given by the company at the Courtland Hotel on the evening of January 3. At the beginning of the banquet Ed. A. Langenbach, president of the company, was presented with a mahogany hall clock. A programme of speech making followed the banquet. The Berger Company has just increased its capital stock from $1,500,000 to $2,000,000, more capital being needed because of the growth of the company's business.

The Gautemalan Railroad, a new transcontinental line, running from Puerto Barrios on the Atlantic side to San Jose on the Pacific side of Gautemala, has been completed and its opening to traffic will be celebrated within a few days. It is 270 miles long. Construction was begun 25 years ago, but lagged until 1903, when American enterprise and capital took charge and pushed the work through.

The Inland Steel Company's New Furnace.

On July 28, 1907, the first lake cargo of iron ore to enter the State of Indiana was received at the docks of the Inland Steel Company's new blast furnace. This, the Madeline, is situated on the east shore of Lake Michigan at Indiana Harbor, about midway between the South Works and the new Gary plant of the Steel Corporation. A little more than a month later, on August 31, the furnace was blown in, thus achieving for the Inland Steel Company the distinction of having put into operation the first of a group of furnaces that will soon give Indiana important rank as a steel producing State. Previous to the installation of the furnace, the company had purchased its steel making iron from outside sources, but it is now a producer from ore to the finished product. Both in design and construction this furnace plant embodies and represents the best ideas in modern ore



Plan of the Inland Steel Company's Works at Indiana Harbor, Ind.

reducing practice, suitably adapted to meet the requirements of local conditions.

As is usual when extensive improvements not included in the original layout are to be made, the construction of this plant involved problems of co-ordinate operations of the furnace and steel mills that required special consideration and treatment. For instance, as the plan of the works indicates, the furnace is separated from the steel mills by the tracks of the Lake Shore & Michigan Southern, Baltimore & Ohio and Chicago, Lake Shore & Eastern railroads. To transport hot metal from the blast furnace to the open hearth plant a concrete subway and tunnel under the tracks was planned and is now under construction. Through this hot metal in truck ladles will be speedily transferred to the open hearth furnace beyond the tracks, or to the pig machine at the casting house east of the tracks, as desired. In the meantime the tracks of the Indian Harbor Railroad, which pass at the south of the furnace property, are being used. Other conditions to be met in the general design of the plant required the furnace filling and distribution to be as far as possible automatic; coke and limestone to be unloaded into bins and stock piles from cars on the trestle; electric power equipment with its complement of boilers, engines and generators of ample capacity to furnish power to the steel mill in addition to supplying the blast furnace; the provision of water storage capacity for two or more furnaces and a possible steel plant, and all tracks and buildings to be laid out with a view to future extensions. A well protected harbor 300 feet wide, a good dock 1000 ft. long for receiving raw material and an abundant supply of pure lake water, for cooling and other purposes, made the site one of great economic advantage. The harbor and dock alongside of the plant were constructed several years ago, but the channel, having an average depth of only 17 ft., it was necessary to dredge it to a depth of 22 ft., to accommodate the largest lake vessels. New features have been introduced in the construction of the ore bridges, whereby ore is taken direct from boats to storage piles, or, when required, direct to the bins, thus saving much rehandling. Particular mention of this equipment will be made later.

The yard level near the furnace was established at 15 ft. above lake level. As the natural profile of the ground here averaged only 2 ft. above, a large amount of filling was necessary. This was accomplished by a sand sucker, which deposited the soil obtained in deepening the harbor on one side, and by dumping from cars on land. Only enough filling was placed to establish tracks and yardways at the proper level to start the furnace; the remainder of the filling will afford a convenient disposition of the slag from the furnace.

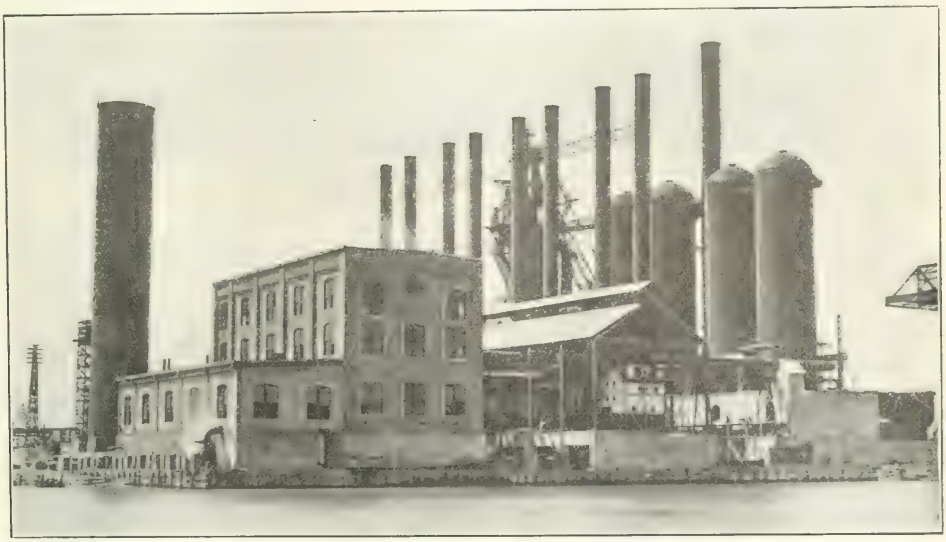
The Blast Furnace.

The stack is of 400 tons capacity, 85 ft. high, with bosh and hearth diameters of 20 ft. 6 in. and 13 ft. 6 in., respectively. The hearth jacket, 20 ft. 6 in. in diameter, is built up of 1¼-in. plates and is 9 ft. 6 in. high. For cooling the hearth, 1½-in. pipes, each 9 ft. 6 in. long, are

used and spaced 12 in. apart around the inside of the jacket. Feed pipes of ¾-in. diameter were placed within the 1½-in. pipes and supply water to the bottom of the latter. The water overflows from the top of the larger pipes and flows down the outside of the jacket wall into the well. Cast iron cooling plates, 9 ft. 6 in. long, are used on the iron and cinder notches.

A unique feature of this furnace is that it is supported by six cast iron columns, making the distribution of its twelve 6-in. tuyeres uniform, and much more satisfactory than when eight columns are used, as has been the practice in furnaces of this size. The bosh is built up with Smeeth cooling plates and is reinforced with 12 cast steel buckstays and seven rows of 1-in. bosh bands, one 8-in., one 10-in. and five 12-in. wide.

The stock is delivered to the McKee distributer from the stock house by a double track skip bridge, which has a pin connection with the furnace platform. The large and small bells are controlled through bell beams by 14-in. and 10-in. steam cylinders, respectively. These are operated from the cage at the base of the skip bridge. Ample room was allowed on the platform to provide for



The Iron and Steel Company's New Furnace Plant as Seen from the Water Side, Looking West.

dismantling the top parts, if necessary; a jib crane handles these parts to the slag pouring track at the base of the cast house. The skip cars on the bridge are operated by a 14 x 14 in. Otis double drum hoist engine, which is located in a small brick engine house at the bottom of the bridge.

The Stock House Equipment.

The steel stock bins are of a simple and inexpensive type that has been found satisfactory after years of service in a number of plants. The coke bin, 60 ft. long, has two doors, one feeding directly into each skip car, and operated through a system of levers from the operator's cage nearby. The bin system served by the ore bridge is covered by a three-track steel trestle, 211 ft. long, connected with the outside railroad system and with a spur running the entire length of the stock yard. Six limestone and ore bins, 91 ft. 9 in. long, covered by two of the trestle tracks, deliver material to the electrically operated scale car of 10 tons capacity. The ore bins are filled either directly from the stock pile by the bridges from the track system, or by a 30-ton transfer car operated along 568 ft. of trestle. The cast house is 108 ft. long, with an addition 104 ft. long, used for clay mixing and ladle drying purposes. The cast house, which will accommodate 10 iron ladles, is spanned by a Case crane of 25 tons main hoist capacity and a 5-ton auxiliary.

The Hot Blast Stoves.

The furnace is equipped with four stoves of the Kennedy center combustion type. Each stove is 22 ft. in diameter and 93 ft. high. They discharge to a self-supporting steel stack through brick lined flues laid in the foundation 11 ft. below the base of the stoves, and are arranged to offset the center line of the furnace 16 ft., thereby permitting a straight lead of the hot blast pipe to the furnace. The two down comers, each 5 ft. 9 in. inside diameter, connect with a dust catcher 20 ft. in diameter. Directly connected to the dust catcher is a Mullen gas washer, from which two leads from the opposite side of the washer convey gas to the boilers and stoves. The gas main to the stoves is also provided with a 12-in. connection, which leads to the ladle drying house. The stove foundations were brought up to the level of the cast house floor in order to assure ready access from one to the other. This level is 17 ft. above the general yard level.

The Power Plant.

The boiler plant, situated directly back of the furnace, comprises eight 500-hp. Stirling boilers, with independent stacks. Three Epping-Carpenter duplex pressure pumps, 14 x 8 x 16 in., supply these boilers with water, first passing it through two Cochrane feed water heaters of 250 hp. Service water is supplied by two Epping-Carpenter compound duplex outside packed plunger pumps of 4,000,000 gal. capacity each. These pumps are provided with two discharge lines, one leading directly to the furnace and the other to the standpipe. The latter main is also by-passed around the standpipe, which has a diameter of 20 ft. and is 125 ft. high.

The blowing engine plant comprises two pairs of 44 and 84 by 60 in. and 84 and 84 by 60 in. vertical, disconnected, long crosshead engines, built by the Allis-Chalmers Company. These engines are designed to run either single or in compound condensing pairs. The steam may pass through a reducing valve when the low pressure side is run singly. A 25-ton Case crane commands the blowing engine house. The condensing plant comprises one Helander barometric condenser, and 10 x 22 x 20 in. air pump, and a centrifugal steam driven circulating pump of 4,000,000 gal. capacity.

The power plant is equipped with three 20 and 42 x 42 in. horizontal cross compound condensing Corliss engines, directly connected to 550-kw. direct current generators. The Allis-Chalmers Company furnished both engines and generators. Power is transmitted from the

power house to a distributing station at the steel mills, a distance of about 1200 ft., by conducting cables on steel towers to the property line of the blast furnace plant, and from this point by underground conduits beneath the intervening railroad tracks.

The Ore Docks and Bridges.

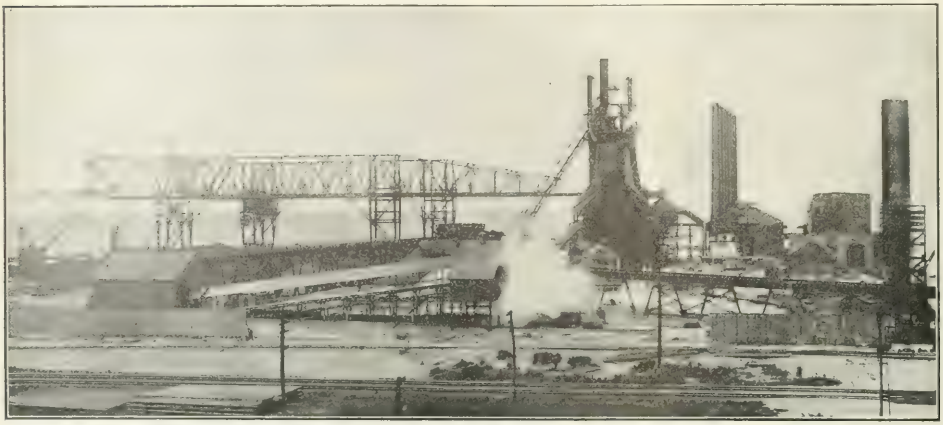
The ore yard parallels the harbor and is 756 ft. long. It will accommodate 400 tons of ore to the running foot, making its total storage capacity approximately 300,000 tons. Two shear leg concrete foundations, 8 ft. wide by 9 ft. high, and spaced 180 ft. apart, traverse the yard and carry two Hoover & Mason combined unloaders and bridges. The front shear leg is 80 ft. from the face of the dock and the back leg 100 ft. from the center line of the trestle. The bridges rest on turntable trucks to allow a minimum skew of 17 degrees.

Each machine is provided with the latest design of Hoover & Mason 6-ton grab bucket. This is controlled from a traveling trolley in which the operator rides. Appliances which enable the operator to twist the grab at right angles to the line of travel are a feature of the trolley. Motors are provided of sufficient capacity to enable the machine to operate continuously with a vertical speed of the grab of 200 ft. per minute and a trolley traverse speed of 800 ft. per minute. A cantilever covers the bins, and a boom connected to the opposite end of the bridge covers the ore boats. Two Hulett "whirlies," with 2½-ton grabs, were used during the summer to facilitate the unloading of ore from vessels before the bridges were completed.

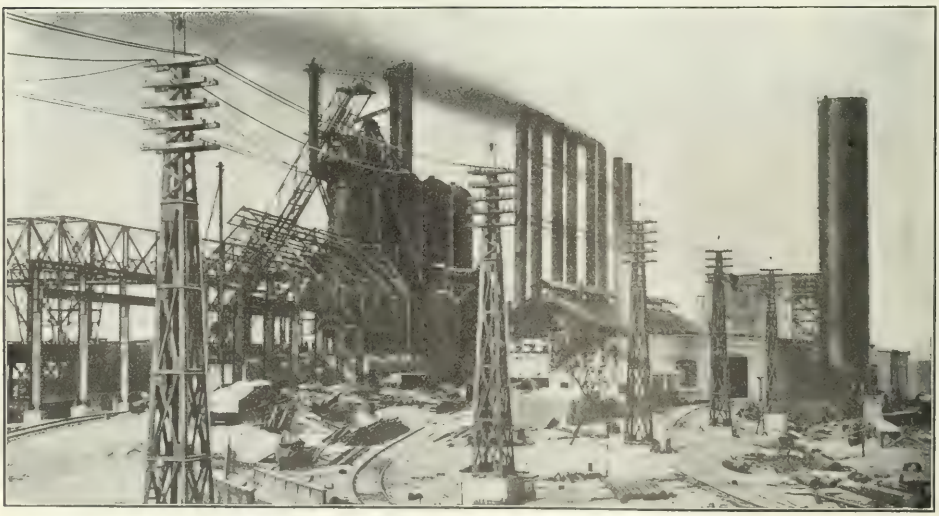
Other Equipment.

For switching purposes two standard gauge American locomotives of special low design are employed on account of the small head room in the hot metal tunnel; the distance from the rail to the top of the engines is only 9 ft. 6 in. Eight 20-ton hot metal cars of McKee design were built by the M. H. Treadwell Company to convey the iron to the open hearth plant. On Sundays the metal will be run through a two-strand Uhling pig machine located along the property line to the south of the furnace. The slag is handled by six standard P. T. Berg cinder cars manufactured by the Wm. B. Pollock Company, Youngstown, Ohio. These cars are dumped by steam or air power, cylinders for this purpose being mounted on each car. A Browning Engineering Company's 20-ton locomotive crane of special design was used to great advantage during all stages of construction.

The plant was designed and its erection superintended by Arthur G. McKee, engineer, Cleveland. The steel



View Looking Northeast, Showing the Ore Bridges and Furnace Plant.



A Nearer View of the Furnace, Stoves and Power House, Looking North.

work was fabricated and erected by the following: Plate work for stoves, stand pipe, mains, &c., by the Wm. B. Pollock Company, Youngstown, Ohio; trestle and bins by the Hansell & Elcock Company, Chicago, and ore bridges by Hoover & Mason Company, Chicago. The dredging and pile driving and erection of the intake cribs was done by the Great Lakes Dredge & Dock Company.

Wage Scales in Navy Yards.

WASHINGTON, D. C., January 14, 1908.—The Secretary of the Navy has officially adopted new wage scales for all the principal navy yards and naval stations. These scales are based upon the rates prevailing in the respective "zones of influence" surrounding each of the Government establishments. As the adoption of these scales by the Navy Department will have an important effect upon the labor market, manufacturers in the metal trades will be interested in the details of the official schedules. The Department has therefore prepared expressly for *The Iron Age* a table showing the rates of pay of first-class metal workers in 26 different branches of the trade at the Boston, Brooklyn, League Island and Mare Island yards.

In fixing the scales adopted by the Department a general order was issued by the Secretary of the Navy convening a special board at each navy yard or naval station, with instructions to investigate the rates of pay in private establishments in the vicinity of the yard or station, and to recommend a wage scale conforming as nearly as possible to the average rates of pay. The reports of these boards were received several weeks ago, and have since been carefully analyzed, and, after some slight amendment, adopted and promulgated for the guidance of the commandants of the several Government establishments. Following is the table prepared for *The Iron Age*:

First-class Rates of Pay of Metal Workers at Navy Yards.

	Boston.	Brooklyn.	League Island.	Mare Island.
Blacksmiths	$3.36	$3.76	$3.52	$4.24
Blacksmiths, machine	...	3.76	3.52	4.24
Boilermakers	3.36	3.68	3.44	4.24
Buffers and polishers	...	2.64	2.72	3.52
Coppersmiths	3.52	4.00	3.52	4.24
Coremakers	3.04	3.20	3.04	...
Drillers	2.64	2.56	2.48	3.20
Electroplaters	3.60	4.00	3.20	4.00
Engine tenders	3.12	4.00	3.20	4.24
Finishers, brass	3.20	2.88	3.28	4.00
Finishers, iron	3.12	2.88	3.28	...
Firemen	2.80	2.48	2.32	3.28
Forgers, heavy	4.64	4.96	3.52	4.88
Galvanizers	2.88	2.56	3.04	3.28
Galvanized iron workers	...	4.56	...	...
Machinists, all round	3.52	3.76	3.52	4.16
Machinists, electrical	3.36	4.24	3.60	4.32
Molders	3.52	3.68	3.28	4.16
Patternmakers	3.76	4.24	3.52	4.80
Pipe fitters	3.60	3.52	3.20	4.16
Punchers and shearers	2.64	3.04	2.48	3.20
Riveters	2.88	3.28	3.04	3.92
Toolmakers	3.12	4.00	3.52	4.32
Tool sharpeners	3.12	3.04	...	4.00
Wire workers	3.04	3.28	3.04	...
Wiremen	3.28	4.00	2.80	4.00

The significant features of the above table are the relatively high rates of wages prevailing on the Pacific Coast, as shown in the figures for the Mare Island yard, and the moderate schedule in force in the vicinity of Philadelphia, as shown by the League Island scale. In a few cases where there is a marked disparity between the wages in these and other yards a partial explanation is to be found in special conditions of employment or in the character of the work to be performed; but, generally speaking, the scales may be relied upon as an accurate index of the labor market in the neighborhood of the four yards mentioned. W. L. C.

The Rensselaer Polytechnic Institute, Troy, N. Y., the famous school of civil engineering, announces that it has inaugurated courses in mechanical engineering and in electrical engineering. The gift of Mrs. Russell Sage of $1,000,000 has insured mechanical and electrical laboratories.

The Philadelphia Foundrymen's Association.

The seventeenth annual meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club in that city on the evening of January 8, having been postponed from the regular first Wednesday of the month owing to that day being a holiday. President Thomas Devlin called the meeting to order at the usual hour.

After the receipt of the annual reports of the officers of the association, routine business was transacted. The Tropenas Steel Company, New Castle, Del., represented by Arthur Simonson, vice-president and general manager, was elected an active member of the association. The Short Weight Committee, through its secretary, announced that plans had been made by the New England committee for a conference between the committees and representatives of transportation interests and of iron, coal and coke producing concerns, to meet at the Bellevue-Stratford Hotel, February 5, at 10 a.m. It was decided to increase the local committee to seven, and the chairman made the following additional appointments: Stanley G. Flagg, Jr., of Stanley G. Flagg & Co.; Thomas Eynon, Eynon-Evans Mfg. Company; Walter Wood, R. D. Wood & Co., and W. S. Hallowell, Harrison Safety Boiler Works.

It was also decided to extend an invitation to the New England and the Pittsburgh foundrymen's associations to attend the next meeting of the local association on February 5, when a dinner will be given in their honor. The following committee was announced by President Devlin to make the necessary arrangements: Chairman, J. H. Sheeler, Howard Evans, Thomas Eynon, A. A. Miller, Josiah Thompson, H. L. Tripple, Arthur Simonson, H. L. Haldeman, Frank Krug, Thomas Devlin and W. H. Ridgway.

The annual election of officers resulted in the unanimous choice of the following to serve for the ensuing year:

President, Thomas Devlin, Thomas Devlin Mfg. Company, Philadelphia; vice-president, A. E. Outerbridge, Jr., Wm. Sellers & Co., Inc., Philadelphia; treasurer, Josiah Thompson, Josiah Thompson & Co., Philadelphia; secretary, Howard Evans, J. W. Paxson Company, Philadelphia. Executive Committee: E. E. Brown, E. E. Brown & Co., Philadelphia; Thomas M. Eynon, Eynon-Evans Mfg. Company, Philadelphia; H. L. Haldeman, Pulaski Iron Company, Philadelphia; George C. Davis, 39 South Tenth street, Philadelphia; James S. Stirling, Hilles & Jones Company, Wilmington, Del. Trustees: Thomas Devlin, Josiah Thompson and Howard Evans. Official chemist, George C. Davis.

The paper for the evening's discussion was on "The Dire Cost of and Best Remedy for Carelessness in the Foundry, Shop, Transportation and Traveling," by Thomas D. West. Mr. West's paper was printed in full in *The Iron Age* of January 9. It suggests means of overcoming accidents through the carelessness of employees, for which employers are liable, as is now the case under the Casey act, passed at the last session of the Pennsylvania Legislature. Thomas Eynon, Thomas Devlin, Howard Evans and others participated in the discussion of the paper, the general tenor being that careful shop systems must be devised and men trained more carefully and specifically in the various branches of work to bring the possibility of accidents to a minimum if the law is to be complied with. However, manufacturers will have to add to their expense enough to cover any possible liability, but just what would be a proper proportion in this case could only be determined by close and long observation. At the close of the discussion Mr. West was tendered a unanimous vote of thinks, after which the meeting adjourned.

The P. H. Standish Chain & Mfg. Company, Cleveland, Ohio, has been incorporated with a capitalization of $100,000 by P. H. Standish, Edward Lindmueller, Wallace N. Appleton, John R. Carey, Samuel Hinds, George Hardy and R. L. Harding. The company has not yet decided upon definite plans, but it may erect a plant for the manufacture of chain under new processes for which it controls patents.

The Illinois Steel Company's New Plate Mill.

The First Electrically Driven Reversing Universal Plate Mill.

Two features of special interest and importance characterize the new universal 30-in. plate mill recently installed in the South Works of the Illinois Steel Company at South Chicago, Ill. It is the first application in the United States of motor drive to a reversing mill, and the units are the largest that have ever been used. This mill, which is a two-high reversible type, is driven by two direct current reversing electric motors. The method of driving is known as the Ward Leonard-Ilgner system. The Ward Leonard control has been well known in this country for years, although it has not come into general use. It consists in reversing the direction of a direct current motor by reversing the direction of the current in its armature, the field excitation being constant. The reversal of the current is accomplished by reversing the field of the generator supplying current to the motor. The first application of this principle to rolling mill work was made by Carl Ilgner of Germany, whose contribution to the system consisted in devising means for varying the speed of a motor, to cause a flywheel to absorb and give up its stored energy, as required.

The specifications upon which the motors were built were written after a long series of experiments on the torque required to roll plates and slabs of varying widths and temperatures under various drafts. These experiments were conducted with continuous indicators on reversing slab mill engines and on plate mill engines. The results were plotted on charts, upon which also were plotted the speed variations required of the motors, to accomplish the cycle of rolling decided upon. From these charts were obtained the horsepower variations and, therefore, the sizes of the motors. This work constituted a very interesting line of research, the correctness of which has been proved by the results of the mill in operation, and will be referred to at greater length later.

The mill is situated at the west side of the plant, immediately north of the Eighty-eighth street gate, in a convenient location to receive the slabbing mill product from which the plates are rolled. At the north end of the mill, as shown in the general plan, Fig. 2, are two parallel standard gauge tracks with room for 14 cars, and these are covered by two Whiting 10-ton cranes, of 80 ft. span, which are used in loading the material to be shipped. The main building, from the roll tables to the end of the shipping room, is 616 ft. long and 83 ft. wide.

A general plan of the rolls and the driving unit complete is shown in Fig. 7. The driving unit consists of a direct current, direct connected motor, which derives its power from an equalizer set. The electrical equipment is located in a well lighted room separated by a wall from the mill room proper and provided with a roof that may be removed in sections; thus protection is afforded against the heat and dust from the mill. A 30-ton overhead traveling crane spans the mill building, and the runways are high enough to allow the crane to pass over the motor room. This crane is of 80-ft. span and is employed for changing rolls and all other work except shipping. By removing a few sections of the motor room roof the various machines can be reached by the crane should its service be required.

This is the first mill in the Chicago District capable of supplying its line of product and for which there has been a considerable demand for some time. It now is, and for the past four months has been, in position to supply plates of all thickness, from ¼ to 2 in., in maximum lengths of up to 80 ft. for certain sizes, and widths of from 6½ to 29½ in. The mill was erected under the supervision of Arthur E. Woolsey, superintendent of plate and slabbing mills. The mill proper was designed by the engineers of the Illinois Steel Company and the United Engineering & Foundry Company, Pittsburgh, Pa., which latter built it. The electrical features are the result of the combined work of the engineering department of the company, under the supervision of E. B. Clark, electrical engineer, which prepared the plans, and the Westinghouse Electric & Mfg. Company, Pittsburgh, which designed and built the special electric apparatus to meet these conditions. This plant has already demonstrated satisfactorily that the most severe conditions of rolling mill work can be accomplished with electric drive. As to what can be done in a rail mill has been shown in the one in operation at these same works and described in *The Iron Age*, November 28, 1907.

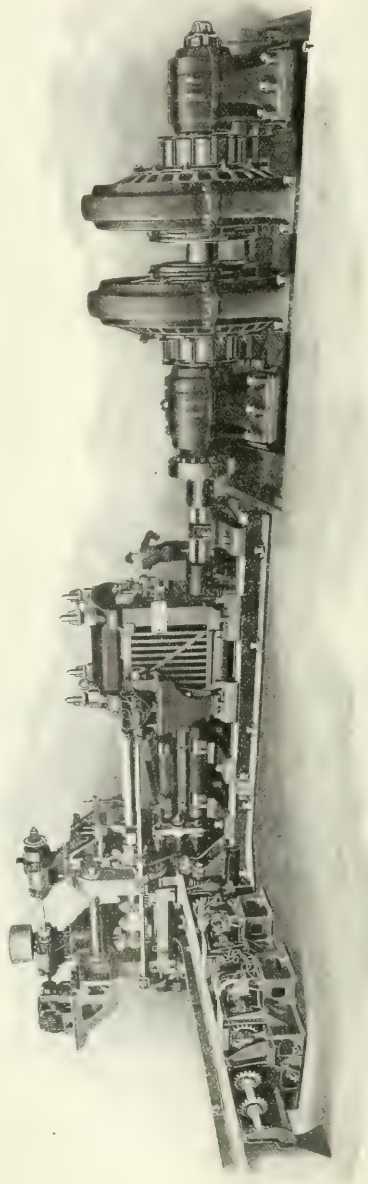


Fig. 1. The 30-In. Universal Plate Mill and Direct Connected Motor.

Why Electric Drive Was Adopted.

With the foregoing general remarks and before taking up the equipment of the plant more in detail and in logical order, it may be well to explain some of the reasons for applying motor drive to the mill. While there has been some success with gas engines direct connected to mills, they are generally conceded to fall short of the requirements on account of their limited overload capacities. On the other hand, from considerations of starting torque, the electric motor is ideal; for a comparatively short time it will carry extreme overloads in response to the demands upon it. Where steam or gas engines are employed it is necessary to install much larger ones than are required for average work, because of the occasions when it becomes expedient, or even compulsory, to increase the draft or use large stock to secure the desired length of finished material, with no change made in the rolling cycle. A motor can exert a maximum torque of from two to three times its normal full load torque; therefore in selecting a motor commensurate with the strength of the mill, it is not necessary to provide a normal capacity so great as would be required in an engine capable of meeting the same conditions. A gas engine to give same results as a motor would have to be practically twice as large.

A motor can always be designed for direct connection to any type of mill. This is usually not possible where a simple noncondensing twin engine is applied to the drive of a reversible mill; with the overhung crank arrangement a gear reduction is necessary between the engine and the mill driving shaft. Seldom does this gear reduction exceed a ratio of 1 to 1½, and though it reduces the first cost of the engine by permitting higher speeds, the mill is less efficient and the maintenance expense greater than when a direct connected unit is employed. What is, perhaps, most in the favor of electric drive for mills operating continuously is that they are capable of affording economically a speed variation of as high as three to one without the use of change gears or mechanical speed changing devices. The tendency now in the steel industry is to take advantage of the great economies that are possible in utilizing blast furnace gas in developing power through gas engines, and electric drive, as the means of transmitting this power to the mill, is considered to be the best from considerations of economy and the results obtained.

The Furnaces.

The slab storage yard is a continuation of the furnace building, as shown in Fig. 2. It is about 300 ft. long and 80 ft. wide and stores material for both the universal and the old sheared plate mill. The furnaces are at right angles to this yard and to the mill tables. They are two in number, of the continuous type, 40 ft. long and 11 ft. wide, and are capable of taking slabs 10 ft. long and 10 in. thick. They were designed by the company and are believed to embody the features that have been found to be the best in furnaces of similar type, as used throughout the country. Each is capable of heating from 175 to 200 tons in 12 hr., and the mill is equipped to roll up to 300 tons per turn, depending on the class of material being rolled. The slabs are delivered to the furnace on trucks underneath a 15-ton Whiting crane. The latter picks up the slabs and places them upon a transfer table 40 ft. long, which carries them to the mouth of the fur-

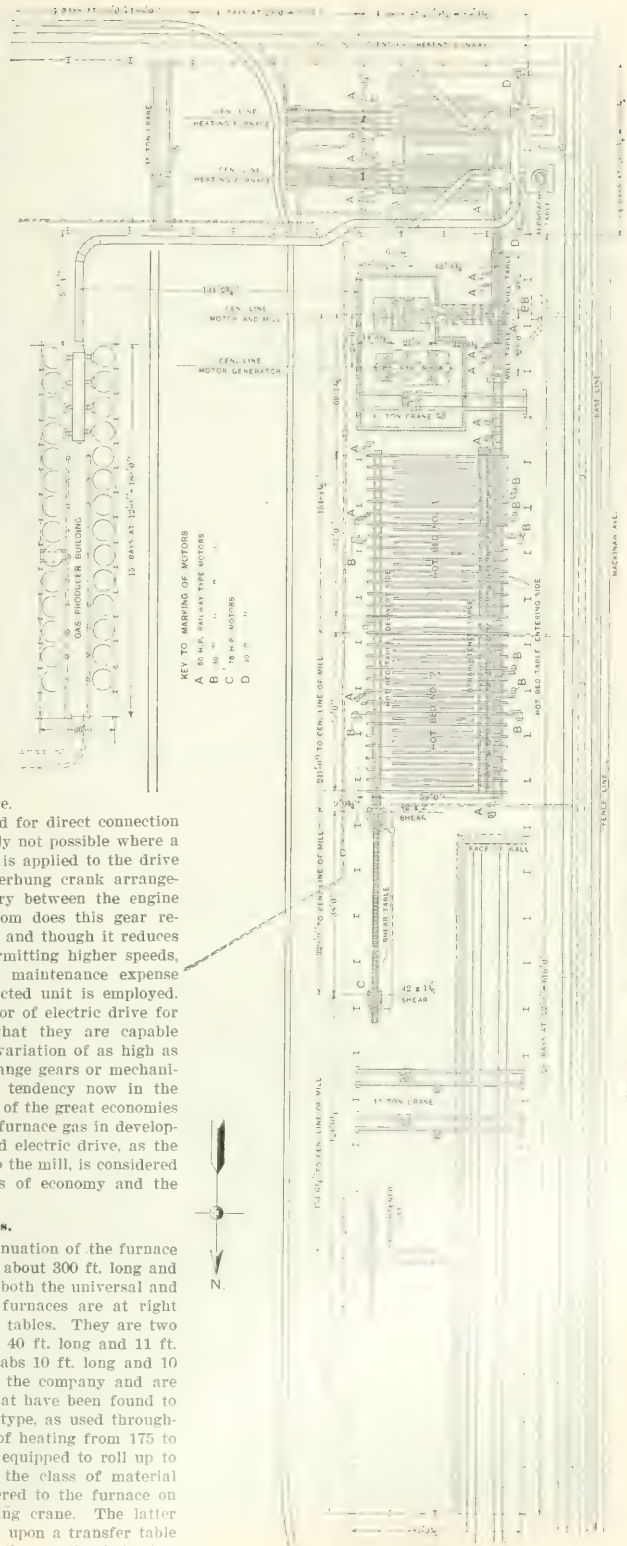


Fig. 2.—General Plan of the New 39-In. Universal Plate Mill of the Illinois Steel Company.



Fig. 3.—View of the Heating Furnaces at the Entering Side, Looking Northwest

naces, as shown in Fig. 3. The mill is 60 ft. from the north furnace, and quick delivery of the hot steel to the rolls is insured by the expulsion of the slabs from the furnace by means of a pusher over a gravity drop.

Roll Train and Tables.

The roll train and tables are the latest design of the United Engineering & Foundry Company and were specially constructed to permit of rapid roll changes and quick repairs. The design is unique in that the vertical rolls are set much closer to the horizontal rolls than is customary. The vertical rolls can be removed by a straight lift without disturbing the driving shafts, and the arrangement of the gears greatly facilitates repairs. The main rolls are 24 in. in diameter by 67 in. long, with 18-in. necks, and the side rolls are 15 in. in diameter, with 8-in. necks; all are driven from the same set of pinions. The main pinions are 26 in. in pitch diameter, with straight staggered teeth, and the pinions driving the side rolls are in proportion to the roll diameter. The main roll and side roll screws are driven by motors; these motors are strong enough to release the rolls from a plate under draft, when necessary. A view of the roll train and tables is given in Fig. 4 as they now appear. They are also shown in Fig. 1, which is an engraving from a retouched photograph to show the combination of the mill and motor, which was impossible in a view of the equipment installed on account of the wall separating the two.

Hot Beds and Finishing End.

The plates are delivered from the mill table to a set of tables, Fig. 5, 220 ft. long. Two of these tables, each 5 ft. long, place the plate in front of the straightening presses. The plates are then lifted to the table, which is a plane surface interrupted by slots through which the hot bed chains and straightening dogs pass. The straightening dogs, operated by worms, are then brought up to the plate, straightening it laterally against lugs, which are in a perfectly straight line on the opposite side of the table. After being straightened in this manner the plate is lifted to the chain hot bed;

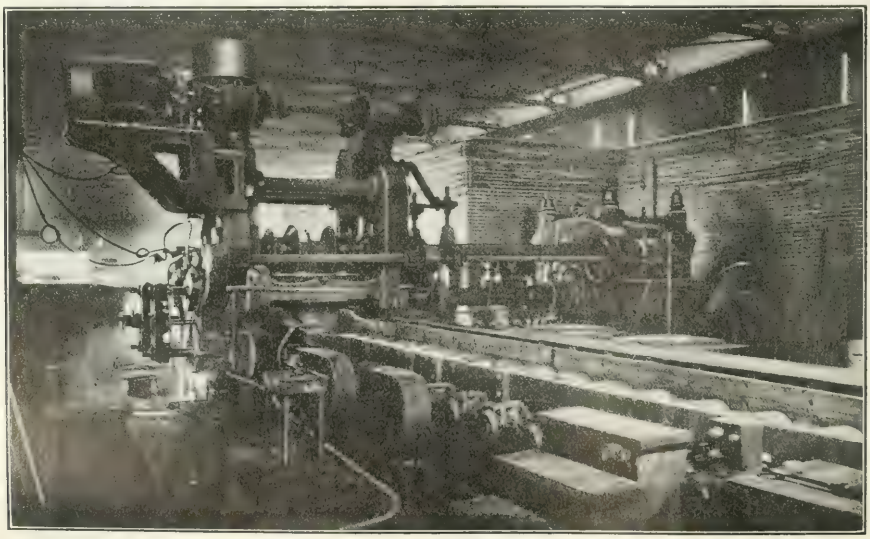


Fig. 4.—View of the 30-In. Universal Mill as Installed, Looking North.

these hot beds are 80 ft. long and 50 ft. wide. When the plate is sufficiently cool it is lifted from the hot bed by the same chain conveyor to a table which runs the plate into the straightening rolls, where all surface bends are removed. The plate is then pushed on to a laying out bed, where it is marked to proper size, painted and stamped with necessary information. From the bed it is placed on another table leading to the shears, where it is sheared, inspected and piled for shipment.

With the exception of the furnace valves and the slab pusher, which are hydraulically operated, all mechanisms in the mill are motor driven.

The Drive of the Mill.

To revert again to the mill and its electrical drive, it will be interesting to describe briefly the preliminary work done to determine what apparatus would be best suited to the operating requirements of the mill, for it must be remembered that until comparatively recently there was little practical data available to guide the selection. It would have been comparatively easy to decide upon the size of motor necessary to give a maximum torque equivalent to that of a steam engine that would perform the work, but there was no means of knowing what normal capacity the motor should have. The first case it would have been necessary to install apparatus capable of supplying a maximum demand of 10,000 hp., and the regulation of the power machines would have been so difficult that gas engine driven units could not have been considered.

To make an electrical proposition feasible the power requirements from the central station must be equalized, and the control apparatus for the mill motor must be of simple design, easy to operate and capable of producing the required changes of speed and direction of rotation very rapidly. The great transmission advantages afforded by high voltage alternating current are in general sufficient to warrant a selection of this class of station machines.

The power requirements for reversing mill work have received a great deal of attention during the last few years. Continuous indicator diagrams were taken from reversing engines and speed variations were noted. The moment of inertia of the system, and therefore its kinetic energy at any given speed was calculated; and the power required for acceleration determined. From the data thus obtained a torque curve was plotted, giving the torque actually required at the roll surface for the various passes, or in other words, for a given reduction of section,



Fig. 5.—View of the Hot Bed Tables, Looking North.

experiments were made on a nonreversing mill, and by carefully indicating the engine, taking observations of the flywheel speed, the nature of the material worked and the dimensions of the sectional area affected, the average horsepower required for the reduction of a given weight of material was determined. Using this data as a basis the power required by a nonreversing mill for any desired condition of rolling could be closely approximated. The application of motors to this class of service does not offer any very serious problems, for by supplying considerable flywheel effect in the system and providing a motor with a drooping speed characteristic the heavy and rapidly fluctuating loads can be equalized and the power drawn from the line reduced to a fairly uniform value. The service required of the controller is light, the main function being to start the motor, though in some cases it is necessary to provide automatic means for reducing the speed during the heavy loads.

The heavy reversing mill, however, presents a much more complicated problem. The units required are of a very much larger capacity, and the direct application of a flywheel to the roll shaft and the operation of the motor direct from the power station are not practical, owing to the rapid acceleration, retardation and reversing necessary in this class of service. In this particular making liberal allowance for friction. Certain corrections are made in using this data, as the power required during the latter part of the cycle for a given reduction increases on account of the diminished temperature of the material; but the reduction in the last few passes is small, and, as shown in the load curve hereafter referred to, the minimum and maximum power required for this portion of the cycle is not very large as compared to the load during the breaking down period; and consequently the average horsepower required will not be greatly affected by the finishing temperature conditions.

An analysis of the requirements for the driving unit in reversing mill work is best shown in the form of speed, torque and horsepower curves. It is necessary to decide on the number of passes in which a given reduction of section is to be effected, and this naturally depends on the power available and the amount of work it is desired to put into the finished product. Certain assumptions have to be made regarding the methods of rolling, and generally these are: That the acceleration from zero to full speed takes place in a certain time, varying from 2 to 5 sec.; that the material enters the rolls when they are at approximately half speed; that current is shut off from the motor and the rolling continued by the kinetic energy of the moving parts, so that the material leaves the rolls at half speed; and an interval of time is se-

lected for handling the material between passes which varies from 2 to 3 sec. A practical rolling speed is selected, and, having settled the above matters, a speed curve is constructed. The field data of power requirements that have been obtained are generally figured to give the foot-pounds torque at the roll surface to give a certain reduction section, and with the number of passes decided with a change of section per pass, the required torque curve is next plotted. From these two curves a horsepower curve can easily be calculated.

Fig. 6 gives the requirements for the 30-in. plate mill in the form of these three curves, A representing the speed curve, B the torque curve and C the horsepower curve. The data upon which these curves were based were obtained from steam engine driven units, and the time periods were carefully checked from actual operat-

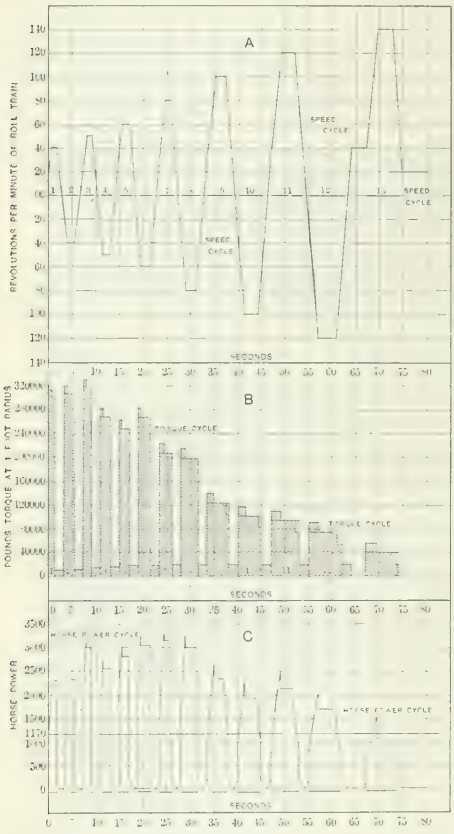


Fig. 6.—Charts of the Speed, Torque and Horsepower Cycles for 13 Passes Through the Mill.

ing observation. It is to be noticed that the speed increases throughout the cycle, while the torque decreases, with the result that the power required during the various passes is fairly uniform. The speed of the mill motor is varied from zero to 150 rev. per min. in one direction, and from this speed to 150 rev. in the opposite direction. The acceleration is at the rate of 100 rev. per min. per second, or a full reversal from the maximum speed in one direction to any speed in the opposite direction is made in 3 sec. As noted above, however, such conditions of operation are not required in actual practice.

The number of passes required to roll the average plate is 13 and the time for one cycle is 75 sec. This is divided into a working period of 48 sec., and a total interval of rest equal to 27 sec., with an approximate period of 2 sec. between passes. The horsepower required varies from zero to 3400, which gives an average for the cycle of 1170 hp.

In the case of the 30-in. mill equipment the various problems as shown by these specification curves have been solved by supplying a direct current shunt wound motor for driving the mill and using an equalizer, in the form of a flywheel type motor generator set, located electrically between the mill motor and the central station, which supplies high voltage alternating current power. The equalizer set operates continuously with relatively slight variation in speed. The field of the mill motor is permanent, while that of the shunt wound motor is variable. With zero current in the generator fields the electromotive force of the armature circuit is zero, and no current is supplied to the mill motor, the armature of which is connected permanently by heavy leads to the armature of the generator. Current is applied to the generator fields first through very high resistance, and, as this is cut out, the field is strengthened and the generator voltage is increased accordingly. The motor speed follows the variation directly and the amount of current which it takes will be governed by the torque required to perform the work. The reversing of the mill motor is accomplished by reversing the current in the generator field circuit, which changes the direction of flow of current in the armature circuit of both the generator and motor. Thus the full control of the mill motor is obtained by means of a field rheostat, which governs a current of less than 150 amp.

The function of the flywheel is to convert this varying load into a uniform constant load; consequently the required capacity of the alternating current motor of the equalizer set (and the power taken from the line) is designated by the average load condition. The three factors to be considered in figuring flywheel capacity are the amount of energy required from the flywheel, which is usually figured in horsepower-seconds; the percentage drop in speed allowed, and the time available for storing up energy in the wheel. By referring to the horsepower curve, Fig. 6, the amount of energy to be given out by the flywheel is that shown above the average line and the storing up periods (or periods of rest) are equal to the delivering periods (or periods of work). The drop in speed of the motor generator set ranges from 10 to 15 per cent. for the heaviest passes; and, in case the loads should be greater than is shown, a further drop in speed is obtained, automatically.

The Equalizer Set.

This set is shown in Fig. 8, and is of the four-bearing type, and consists of an alternating current induction motor, a direct current generator and a flywheel located between these machines. The revolving elements are mounted on a common shaft, and the four bearings and the machine frames are arranged on a common bedplate. In Fig. 7 the alternating current motor is designated by *a*, the flywheel bed plate by *b* and the direct current motor by *c*. The alternating current motor has a continuous load rating of 1300 hp., and will develop a maximum torque three times full load torque. It is of the "HF" type, with a wound secondary, and is 25-cycle, 2200-volt, 8-pole, with a synchronous speed of 375 rev. per min. No transformers are used, as the voltage of the motor primary is the same as that of the feeder circuit.

For reasons of manufacture and to keep the diameter as small as possible, the flywheel is composed of two units, one of which is shown in Fig. 9. Even with this arrangement, however, the peripheral speed, which is 250 ft. per second, is hardly within a safe limit for a cast steel wheel and a laminated type was provided. The total weight is 200,000 lb., the diameter is 13 ft. 2 in., the radius of gyration is 5 ft. 2½ in., and the flywheel effect is 2,660,000 lb. at 1-ft. radius. The wheel consists of a sheet steel rim and a cast steel spider with double spokes of comparatively small sections. This construction makes the wheel more elastic than it would be with single spokes of equal strength. The frame of the spider is machined with dovetail slots, and the thin steel sheets are punched in segments with tongues to fit the spider rim slots. These segments are assembled with over-

lapping joints, and on the outside are placed heavy one-piece steel end rings, which are clamped to the laminations by through bolts. Very little strain comes on these bolts, as the thin sheet construction gives a very high slipping resistance with a comparatively light pressure. An idea of the energy stored in this wheel and the efficiency of the motor generator set is afforded in the facts that it requires 1200 kw. for a period of 5 min. to accelerate it to full speed and the load, running light, is 200 kw.

The direct current generator has a continuous rating of 3000 kw. at 600 volts, 375 rev. per min., and will stand 150 per cent. overload without injurious sparking. The speed and direction of rotation of the mill motor is accomplished by varying and reversing the generator fields, which are separately excited from a 220-volt circuit. To facilitate the rapid reversal of the field magnetism the entire magnetic circuit is built up of laminated steel; and is supplied with interpoles (punched with the field laminations), with additional compensating turns, placed in slots in the face of the main poles. The machine is of the double commutator type, which provides a liberal capacity for the very heavy current required by the mill motor, and by permitting the use of a large number of bars the voltage between bars is reduced to a low value.

The shaft of the equalizer set is solid, and the bearings are of the ring oiling type and are supplied from an oiling system. The bottom shells are water jacketed, though the design is very liberal and water cooling is not necessary to insure good operating conditions.

The Mill Motor.

The direct current mill motor will safely carry a continuous load of 4000 hp. at 575 volts, 150 rev. per min., and will stand a maximum of 10,000 hp. momentarily. It is capable of exerting a maximum torque of 135,000 lb. at 1 ft. radius up to a speed of 75 rev. per min. in either direction. As shown in Fig. 10, it consists of two 2000-hp units, with the armatures mounted on the same shaft and with both motors arranged on a common bedplate, forming a two-bearing set. The principal reason for the subdivision is to reduce the flywheel effect by using armatures of small diameters. The power required for acceleration is thereby reduced which facilitates rapid reversing. The mechanical construction of the field is practically the same as that of the generator, including interpoles and main pole compensating windings, but the armatures have only one commutator each, which are in circuit with the two commutators on the generator of the equalizer set.

The normal speed of the motor is 100 rev. per min. and the higher speeds are obtained by shunt field control. It is to be remarked that thus far the maximum speed desired has been approximately 80 rev. per min., most of the product being of a comparatively heavy gauge. Eventually the efficiency of the mill will gradually be increased and the higher speeds thus available will be the means of greatly increasing the output.

The motor, indicated by *d* in Fig. 7, is connected by a flanged coupling *e* to the driving spindle *f* of the mill, which drives the pinion shaft *g* through loose box couplings or muffs and a short piece of shaft or wobbler. The pinions are mounted in a suitable housing and each pinion shaft is connected through muffs or wobblers to a horizontal roll. A pinion which meshes into the upper roll pinion drives two horizontal shafts which extend to the outside of the mill housing. These shafts carry the bevel pinions which drive the vertical rolls—two of which are located on each side of the horizontal rolls. The bearing next to the mill is exceptionally large and well reinforced. It is specially designed to withstand the heavy end thrust that occurs when the mill spindle breaks on a diagonal, thereby tending to lengthen itself between bearings. To provide for the ordinary thrust of the mill, a semi-circular Babbitt faced collar is bolted to the outside surface of the mill end bearing. A Babbitt faced collar provided with adjusting bolts is keyed to the ends of the flange couplings next to the bearing and this acts as the shaft wearing collar. It is split so as to be easily replaced or repaired. The connection of the mill and motor is best shown in the illustration before referred to, Fig. 1.

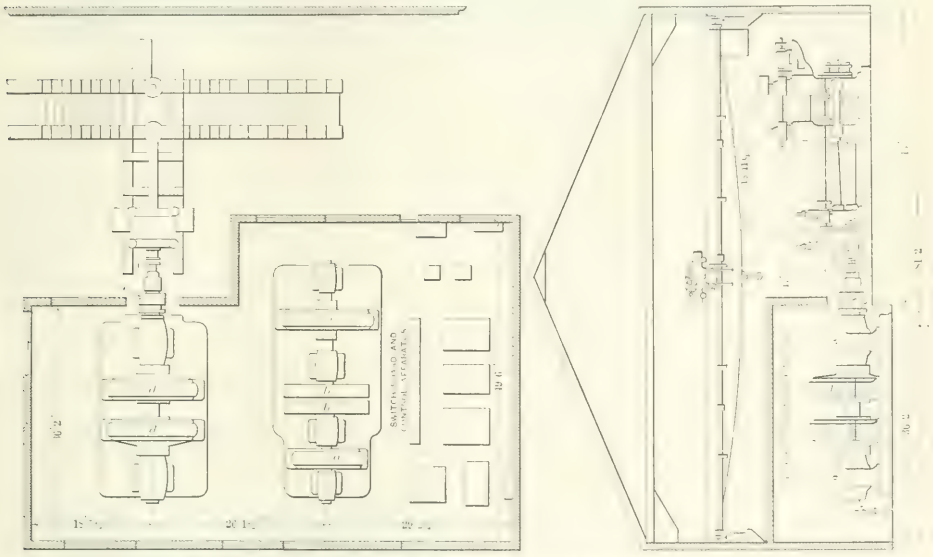


Fig. 7.—Plan and Elevation of the Electrical Equipment for the Mill Drive.

The general conditions for rolling a 10 x $^3/_4$ in. x 65 ft. universal plate from a 6 x 10 in. x 8 ft. slab were as follows: The average alternating current power required was 750 kw., with 15 per cent. variation above and below this amount, and the total peak loads on the direct current machines ranged from 4000 to 5000 amperes. The average time required to roll one plate was 2 min., giving the plate 15 passes.

The Mill Control.

As explained before, the voltage of the direct current generator and consequently the speed of the mill motor is varied from zero to full value in the opposite direction by means of a field rheostat. The type used is shown in Fig. 11, and the resistance is of the cast grid type mounted externally. This rheostat and also a duplicate which governs the maximum speed of the mill motor, are

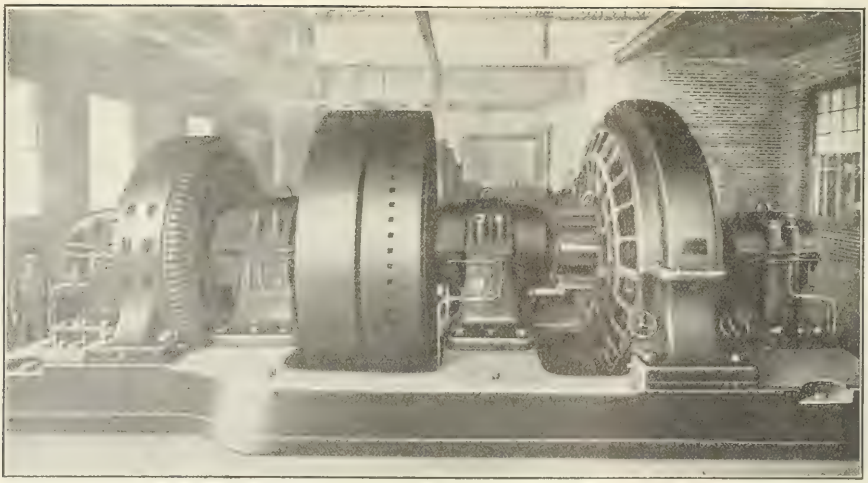


Fig. 8.—The Equalizer Set for Converting the Variable Load on the Mill Into a Uniform Demand on the Power Source.

mounted in the operator's pulpit; and to insure that the motor is always accelerated and reversed with full field, the two rheostats are provided with an interlocking device so that it is necessary to bring the mill motor to its normal speed (100 rev. per min.) before the motor rheostat can be operated to give the speeds ranging from 100 to 150 rev. per min.

The main feature of the control is the automatic slip regulator, which governs the speed of the motor generator. A series of pneumatically operated switches controlled by magnetically operated air valves are used to insert resistance in the secondary circuit of the alternating current motor; and thereby slow it down during the periods of heavy load; and also to cut out resistance, and bring the speed of the set to normal value during the light load interval. The air is supplied by a motor driven compressor, and the current for the magnet circuit of the switches is furnished by a battery connected as a shunt in the compressor motor circuit, so that it receives a charging current when this motor is operating. Two current relays, which act as opening and closing switches, are connected in the magnet control circuit. The relays are governed by current furnished from series transformers in the supply lines to the alternating current motor, and consequently the value of the relay current varies directly as the load on this motor. During the light load period the current relays close the control circuit to the air operated switches and the secondary resistance is cut out. When the alternating current motor load exceeds normal value one of the relays lifts and the switches open in regular order cutting in the secondary resistance gradually and reducing the speed of the motor generator set to such a value that the normal load on this motor plus the power given up by the flywheel equals the power required by the mill motor. In case of a sudden heavy overload both relays lift and full resistance is inserted in the secondary instantly to give a maximum drop in speed. To meet some conditions of operation it is desired to have the first relay act at a motor load somewhat below normal value and for some work to act at a value above normal. This adjustment is accomplished by a compensator in the relay governing circuit.

The equalizer set is started by throwing in the oil switch of the supply lines, and the acceleration is automatic, as explained above.

Safety Devices and Instruments.

A line relay, actuated by current from a small series transformer in the alternating current motor supply line, is connected in the magnet control circuit of the resistance switches, and is held normally closed as long as the motor is taking current. When the alternating current fails this relay is opened, which breaks the switch control circuit, and thereby insures that all the resistance will be in the secondary circuit when current is again applied to the motor.

To prevent excessive overloads on the direct current generator, either by a too rapid reversing of the mill motor or by supplying a heavy draft to the mill, two overload relays are placed in the circuit connecting the armature of the generator and mill motor. Under the influence of heavy currents these relays operate to open the circuit breaker of the generator and motor field supply line. A centrifugal switch is so arranged on the end of the mill motor shaft that it will open the field circuit of the generator in case of high speed of the motors, due to some derangement of the circuits, such as an accidental opening of the shunt fields. Under these conditions the electro-motive force of the generator will be reduced to zero and consequently no power can be furnished to the mill motor.

On the main switchboard the following instruments are provided: For alternating current—an ammeter, volt-

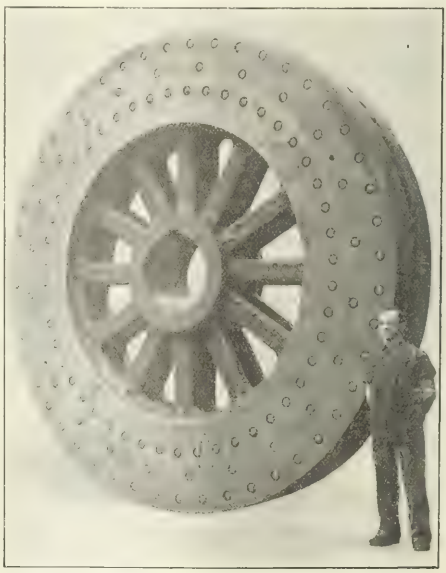


Fig. 9.—One of the Two Units of the Flywheel on the Equalizer Set.

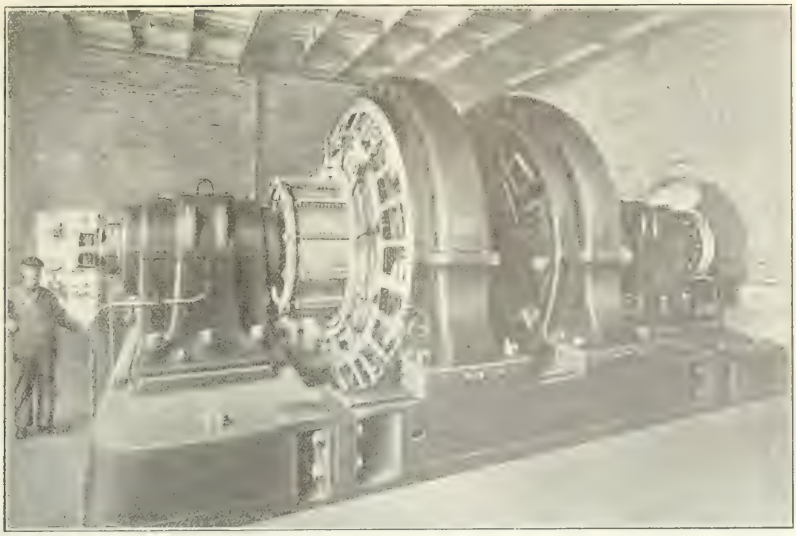


Fig. 10.—The Double Unit 4000-Hp. Mill Motor.

meter, power factor meter, indicating wattmeter and an integrating wattmeter, and for direct current—two ammeters, two voltmeters and a speed indicator, all of the indicating type. The latter instrument is operated by a small magneto-dynamo, which is belted to the mill motor shaft. A panel located in the operator's pulpit contains an alternating current indicating ammeter and a speed indicator for the mill motor similar to the one just described, thus the operator can see at a glance just how hard he is working the mill and at what speed.

The Power Plant.

At the present time the power station of the South Works contains three 2000-kw. generators, direct connected to steam engines and one 2000-kw. generator, direct connected to steam turbines, the output being three-phase alternating current at 2200 volts and 3000 alternations per minute. Additions are being made which will include four 2000-kw. generators, direct connected to gas engines, which will use blast furnace gas.

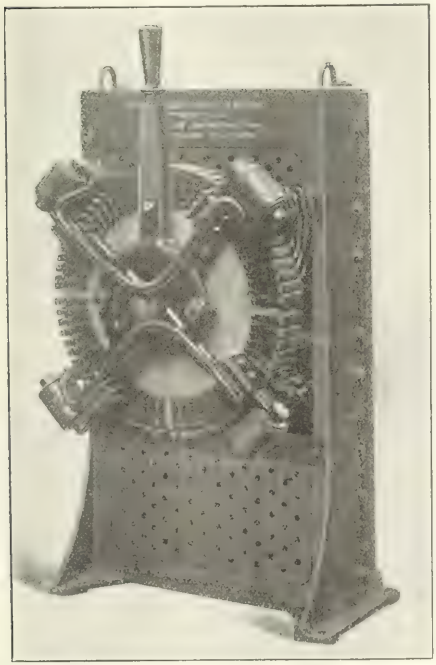


Fig. 11.—The Field Rheostat for the Generator on the Equalizer Set.

The New England Foundrymen's Association.

The New England Foundrymen's Association held its annual meeting at the Exchange Club, Boston, on the evening of January 8, with a very large attendance of members and guests. The election of officers and routine business were carried through in the afternoon, with President W. H. Bense in the chair. The report of the secretary showed a membership of 120 firms, and the treasurer reported a balance on hand and all bills paid. The Nominating Committee, consisting of Henry A. Carpenter, B. M. Shaw and George H. Gibby, made its report, recommending a list of officers for the ensuing year, and they were elected unanimously, as follows:

President, Henry F. Arnold, American Tool & Machine Company, Boston; vice-president, William A. Viall, Brown & Sharpe Mfg. Company, Providence, R. I.; treasurer, George H. Lincoln, G. H. Lincoln & Co., Boston; secretary, Fred. F. Stockwell, Barbour-Stockwell Company, Cambridge. Executive Committee: J. L. Anthony, Weir Stove Company, Taunton, Mass.; W. A. Jackson, Walworth Mfg. Company, Boston; William J. Breen, Hugh W. Adams & Son, Boston; Joseph Schilling, Russell & Irwin Mfg. Company, New Britain, Conn.; Arthur L. Goodnow, Goodnow Foundry Company, Fitchburg, Mass.

President Arnold, in taking the chair, made a brief speech of acceptance, after which two former presidents of the association, William H. Bense and Walter B. Snow, both of Boston, who have become engaged in other lines of business, were elected honorary members of the association.

The Committee on Shortages of Pig Iron, Coke and Coal reported that arrangements had been completed for a conference to be held at Bellevue-Stratford Hotel, Philadelphia, on February 5, and assurances had been received that delegates from at least 60 representative concerns and transportation companies would be in attendance. J. L. Anthony, Weir Stove Company; W. J. Breen of H. W. Adams & Son, and Henry A. Carpenter, General Fire Extinguisher Company, were chosen to represent this

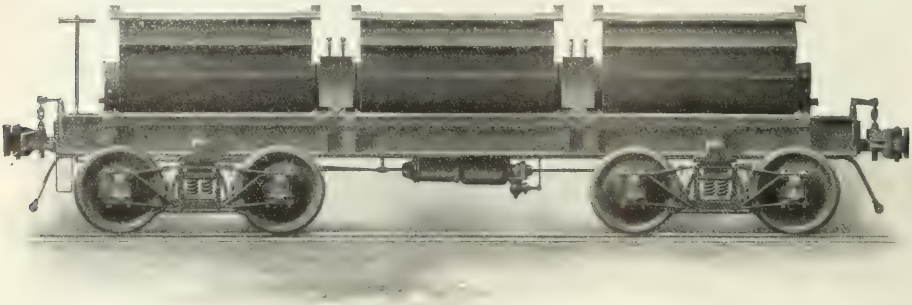
association at the conference. The other members of the association were also urged to attend, if possible.

President Arnold acted as toastmaster for the after dinner exercises in the evening. Among the speakers were E. E. Bartlett, vice-president of the Boston branch of the National Metal Trades' Association, and J. H. Cone, assistant secretary of the National Metal Trades Association. A musical entertainment followed the speaking.

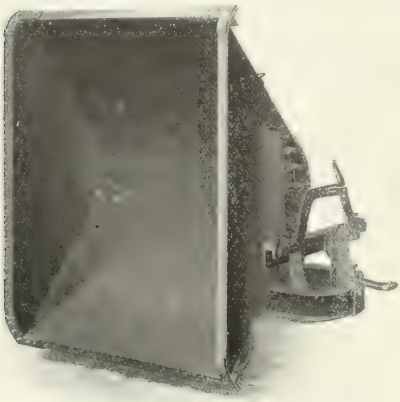
New Koppel Industrial Cars.

A number of new types of cars especially adapted to the requirements of contractors, steam and electric railroads, foundries, cement factories, brick yards, mines and quarries and other industries, for transporting coal, scrap, dirt, stones, sand, slack, ashes, &c., have recently been designed by the Arthur Koppel Company, Pittsburgh, Pa. These are built for standard or narrow gauge track, and in capacities of from 2 to 12 cu. yd. The two accompanying illustrations are representative of the line and show double side V-dumping cars built entirely of iron and steel.

The following are among their advantages: The discharge of the load is automatically performed by dumping the body, and takes place to the side of the rails and not between them; thus the car can be unloaded at any place, and a special installation is not required for unloading, as when a car is built for bottom discharge. The cars can be discharged to either or both sides, but do not have to be unloaded to both sides simultaneously, as do gable bottom cars. The body of each car is one rigid unit, devoid of doors, straps, bolts and other loose parts, and the shape is such as to render it exceedingly strong. The side and end plates are riveted together so that any strain on the end plates is transmitted to the side plates, thus eliminating a concentrated strain, and consequently greater wear and tear on one part. The dumping of the body being performed by rolling it over and outward, friction and resistance are reduced. The car can easily be dumped by one man without mechanical assistance, and the return of the body requires practically no effort. A slight push will dump and bring the body back to its loading position. Should one of the bodies be damaged by accident it can easily be removed from the car and another substituted. The cars are provided with a new locking device consisting of a simple latch plate, which is located on the diagonally opposite corners of the body and insures against accidental discharge. It can only be operated from the side opposite the dump, and automatically locks the body when returned to the load carrying position. These functions are of special value when considering the safety of the workmen, as the operator cannot be injured by the body accidentally dumping to the wrong side, nor can the car be damaged as a result of the operator failing to lock the body.



The New Triple Body Car Built by the Arthur Koppel Company, Pittsburgh, Pa.



A Single Body Car in Dumping Position.

Narrow gauge single body cars for industrial purposes are built in capacities of from 2 to 4 cu. yd. They are mounted on a rectangular under frame, built of heavy ship channel, and can be provided with either roller, brass or Babbitt bearings. They are provided with continuous drawbars, with special draft gear and link and pin couplers. Standard gauge cars of 4 to 6 yd. capacity are built after the same general design, but of heavier construction, and can be equipped with M. C. B. automatic couplers and spring draft gear. In these cars elliptical springs carry the load to the journal boxes.

Triple body cars similar to one of the illustrations are built for 12 cu. yd. capacity. Each of the three separate V-shaped bodies holds 4 cu. yd. and operates independently—*i. e.*, it has no connection with either of the others. The bodies are mounted on an under frame and standard arch bar trucks suitable for cars of 60,000 lb. capacity. They can be provided with hand or air brakes, and with M. C. B. automatic couplers and spring draft gear. One of the advantages of making the body in three parts is the facility for repairs. Should one of the bodies become damaged so as to render it inoperative it would not interfere with the other two-thirds of the car, and the damaged body could be removed when convenient and another substituted. Another advantage is that the three bodies can be much more easily dumped separately than could one box of the same capacity as the three. Of occasional importance is the fact that selective loading is possible; different materials can be placed in the three compartments and dumped where each may be desired.

The Cleveland Motor Car Company, formerly located at Cleveland, Ohio, has established its general office and selesroom at 1659 Broadway, New York, and has moved its factory from Cleveland to Milwaukee, Wis.

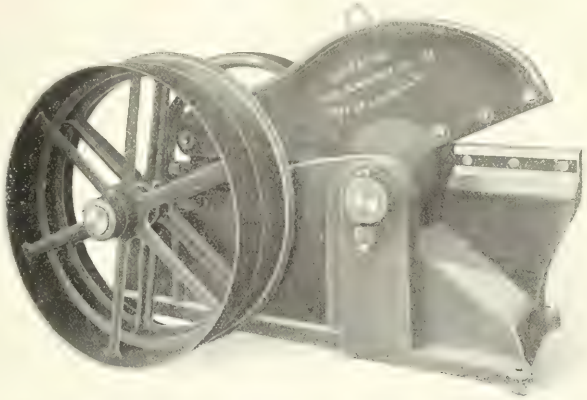
The Excelsior Alligator Busheling Shear.

A necessity in every scrap yard is a strong, rigid, reliable, simply constructed and well balanced alligator busheling shear. Such a one the Excelsior Tool & Machine Company, East St. Louis, Ill., claims to have in its redesigned and perfected shear herewith illustrated. It is especially adapted for general use on medium weight iron and soft steel, and for busheling boiler plates, pipe and the general run of scrap.

A special feature of the tool is the heavy bed plate with the metal distributed so as to best withstand the shocks and wear to which it is naturally subjected. The shear arm also is provided with an especially heavy bearing on the pivotal shaft; and to keep the shear blades in alignment this shaft has double bearings in the housings, fitted with taper wedges to take up wear. Besides an adjustable drift key and collar to take up the side wear, there is also a rubbing or bearing plate on the main lever on the reverse side of the shear, as shown in the illustration. These adjustments serve to keep the shear blades in alignment.

Another feature of construction is the position of the lower shear blade, which is set with its cutting edge flush with the bedplate, thus allowing a long sheet to be cut without striking the housing. The shear has a faster travel on the up stroke than when cutting on the down stroke if the pulley is driven in the direction indicated by the arrow on the rim. Dirtproof oil collars and oil cups afford protection to all bearings from clippings and dirt, and in this and other respects the shear is designed to meet the exacting requirements of the particular use to which it is adapted with the least exposure to interruption through the hazards of wear and breakage.

The shear has a capacity of 1¼ in. square iron or its equivalent, and is provided with shear blades 18¼ in. long by 4 in. wide and 1¼ in. thick, with four cutting edges to each knife, and an opening between shear blades of 8 in. Two flywheels, 6½ x 44 in., weighing 800 lb. each, serve to supply steadiness of movement under intermittent loads. The crankshaft is of cast steel 4 in. in diameter, and the lever pin is of forged steel 3½ in. in diameter. The shear is designed to run at a speed giving 60 to 75 cuts per minute. It occupies a floor space of 45 x 84 in. and weighs 6000 lb. One pair of reversible shear blades with four cutting edges, and tight and loose pulleys, are furnished with each machine.



A New Alligator Busheling Shear Built by the Excelsior Tool & Machine Company, East St. Louis, Ill.

The American Steel Foundries to Change Stock.

The American Steel Foundries proposes (in addition to the original plan to pay off the accumulated back dividends in interest bearing scrip and a cash distribution of 3 per cent.) the elimination of the present common and cumulative preferred stock, substituting therefor an issue of $17,184,000 capital stock. The new stock is to be exchanged for the cumulative preferred in the ratio of 77 for each 100 outstanding, and for the common at the rate of 25 for each 100.

The company has at present a total authorized capitalization of $37,650,000, of which $19,540,000 is preferred and $18,110,000 common. A special meeting of the stockholders has been called for February 8 to indorse the plan.

The scrip is to be paid to holders of the preferred stock at the rate of $20 on each $100 and is to be dated February 1. It is described in the announcement of the plan as "debentures of the company," and will bear 4 per cent. interest, being payable as to principal in 15 years from date. The cash distribution to be made is $3 per share on the preferred stock. The stockholders assenting to the plan are requested to deposit their stock with the Guaranty Trust Company, New York.

The Indiana Railroad Commission Works to Harmony.

The Indiana Railroad Commission, in its second annual report, discusses the results attained. In spite of the fact that it has become involved in a great amount of litigation with railroads, making it necessary to employ special counsel in many cases pending that are important to the public and the railroads, and the outcome of which is uncertain, the commission believes the public has been benefited in numerous ways. Chief of these, it says, is in having a tribunal with very comprehensive powers to appeal to; an organized body whose officers are always ready to receive and act promptly upon any application within its authority. Overcharges, car shortage, insufficient train facilities and grievances of many kinds have been corrected, sometimes by telegraph or telephone within a few hours after the matter was presented to it. Defects and neglects that might have caused accidents have been promptly taken up and remedied, and obstructions, overhead and lateral, have been discovered and removed.

The commission has a tariff department with files that may be consulted or inquired about by any shipper in the State. The tariffs when filed are examined by the commission, and if found out of line are at once called to the attention of the carrier for correction. Other steps failing, ormal proceedings are begun to the end that transportation in the State may be upon uniform classifications, and that fair, equal and reasonable rates may prevail. Indiana car service rules formerly made no exception of weather conditions, but required loading or unloading in 48 hr. time; no exception was made when cars were "bunched" on the shipper in number far beyond his capacity to load or unload, and no notice of arrival or placement was required. All this has been corrected.

The report continues: "The best part of our work may turn out to be the restoration of harmony between carriers and shippers. The commission does not pass an opportunity to bring about adjustments." There is an inspection bureau in connection with the commission, which investigates and reports upon the physical condition of the railroad property in the State.

In December export shipments of British pig iron fell off rapidly. A number of furnaces in the Cleveland District have been blown out, and the curtailment movement is expected to go farther. Pig iron stocks in warrant yards showed a slight decrease in December, the blowing out of furnaces preventing accumulations in spite thus far.

THE IRON AGE

Established in 1855.

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Steel Car Requirements.

The statistics of steel car construction in 1907 are not so definite as might be desired, since there is no separation of all-steel cars from cars having steel underframes. Moreover, the statements published concerning orders booked show some variation. For example, it was stated in the compilation made by one of the railroad journals one year ago that 142,000 cars of steel or steel underframes were ordered in 1906 out of a total of 259,000 freight cars. The statistics in the same journal published at the close of 1907, in giving the record of steel car or steel underframe orders for several years, credits 1906 with a total of only 90,000 of such cars ordered.

The statistics of cars built, as distinguished from cars ordered, are gathered by another journal. They show that 284,188 freight cars were built in contract shops last year—a figure which tallies measurably with the above statement of freight cars ordered in 1906 and with the announcement made at the close of 1905, and repeated a year later, that the contract car shops were booked for 10 to 12 months ahead. Of the freight cars built in 1907 it is stated that 72 per cent. were of all-steel or steel underframe construction, which would mean a total of about 204,000 cars of these two classes. It may be that this figure is above the actual, but it is well known that the street car shops had a very considerably increased capacity in 1907, compared with that available in 1906. According to some estimates made early last year 150,000 steel cars could be turned out in 1907, as compared with a capacity of 100,000 in 1906, leaving out of the account wooden cars with steel underframes. As some of the steel car companies were turning away orders for steel underframes last year, having their equipment completely engaged on all-steel cars, it is evident that the consumption of steel plates and shapes and steel axles for all-steel cars was much larger in 1907 than in any other year. It was probably above 2,000,000 tons.

Unfortunately there is no promise for anything like full employment of the car shops in 1908. The *Railway Age* reports the number of all steel cars ordered in 1907 to be 27,800, and of cars with steel underframes, 44,500. Assuming that some of these orders were filled in the same year and that work on others was held up, the books of the car builders are more nearly empty than has been the case since the close of 1903. The promptness with which shipments of all commodities have been made in recent weeks points, moreover, to a condition in which rolling stock and terminal facilities will be entirely adequate to the demands of manufacturers. The emphasis laid by the Interstate Commerce Commission in a report issued since the beginning of the year on the tremendous handicap to the country's development chargeable to insufficient equipment may not be impressive, viewed as a commentary on current conditions. But the problem is one not to be shelved by a mere halt in prosperity. Mr. Hill's familiar estimate that $1,100,000,000 a year for five years will be needed by the railroads for extensions and equipment, and the recent proposal of a well known railroad official that the Government build cars and locomotives and lease them to the railroads, give some idea of the extent to which, in the minds of such authorities, the country's future is involved in railroad financing. Such views suggest, moreover, that the now uppermost question as to the speediness with which business will return to normal is practically identical with the question how soon the investors of the country and of Europe can be persuaded to get under the programme that has been laid out with so bold a hand.

A Fallacy of Machinery Driving.

Certain users of machine tools conduct their works on the theory that the most economical practice is to push machinery to the extreme limit of production. They shorten its life, but get a great deal out of it in the briefer period of its usefulness. Among other manufacturing establishments a number of railroad shops are operated on this basis, their managers constantly seeking the opportunity to set a faster pace for each piece of machinery. They follow in the shop a railroad theory that rolling stock, especially a locomotive, should be forced to do its maximum of work during a few years rather than to attempt to lengthen its useful existence by more careful operation, avoiding the repair shop except when it is absolutely necessary that parts be renewed or renovated. The theory of this procedure is that, granting a machine a given amount of productive usefulness, it is cheaper to consume this energy in a limited period than to prolong the process by more conservative methods. However excellent a theory this may be in the traffic department of a railroad, its economy in industrial works is disputed by most experts in machine shop practice, except where it is very strictly safeguarded by the application to each individual machine of an exact cost system, which is not always available.

In practical every-day work nearly every machine tool has a limit at which it can be economically operated. Exceptions are to be found among the heavier tools which are built to do work up to the strength of the high speed steels, but even these, though able to stand up under severest strains, sometimes have a tendency to develop weaknesses when their maximum capacity is adopted as the standard for every-day work, necessitating their laying up for repairs. Below each class of rapid reduction machines are others of the same type, ranging down through the scale in degree of capacity and corresponding lightness of construction. Each is designed to do work up to its individual limit, and when that limit is passed an overstrain is imposed and the wear must necessarily be great and repairs frequent. And, as in the case of the heavier tools, constant service under maximum duty conditions, even as intended by the designer, is apt to develop weak spots in mechanisms, requiring the machine to be laid off for a time.

Production experts are tempted to set too high a required capacity on a machine tool in the endeavor to reduce time of manufacture. If they have a corrective system which will soon discover the error of excessive

load, their efforts should be fruitful of economies. Otherwise, what appears to be reduction in cost may prove to be added expense, or a failure to secure a saving which would have followed a less ambitious effort with the same machine, as experience has demonstrated in the relations of machine tool builders with their customers. On its face, the general proposition seems sound that if a machine will accomplish in 40 min. a task that has been taking 60 min. to perform, there is a saving of 33 1-3 per cent. in labor, and as the machine is producing a correspondingly greater amount of work each hour its items of cost other than labor, such as investment and share in overhead cost, are more widely distributed over its product. The life of the tool may be reduced, the time of its replacement may be brought much nearer, yet reckoning into account the saving in labor and the increased production there is a theoretical economy. This is the basis of the practice of extreme production.

But there is a well defined limit beyond which it does not pay to go. No machine should be given a service so severe that its days of idleness, due to breakdown, are materially increased. If in the case already cited, where 20 min. were saved on each piece by speeding up a machine, frequent breakdowns should follow as a result of the increased strain, the days of nonproduction would soon eat into the saving until it ceased to exist or until the apparent economy became a loss. This is the weak side of forced production. A superficial estimate may indicate a large increase in product, but, reckoning in the cost of repairs and the loss through idleness, all gain may be nullified. No one day's or one week's production tells the story; a protracted period of time must be taken to show up the actual condition. The factor of interference with shop routine by frequent repairs must also be taken into account in considering the question, for demoralization is always costly. In certain shops the number of high class tools out of commission is frequently noticeable, and the condition usually accompanies the efforts of a too ambitious production department.

According to the experience of a large manufacturer of heavy machine tools, the efforts of the production department require the corrective influence of a consistently maintained machinery record. The life of each machine tool should be closely followed from the day of its installation to its going out of commission for good, and each incident of its history entered upon its record. A card system accomplishes this end, constituting an adjunct of the regular cost system. In the works of this manufacturer each repair job on a tool, with the nature of the accident, is reported to him on the day it begins, the job card being placed on his desk, and when the work is completed he receives the record of the time and cost. The items are entered on the card of the machine, together with the number of days of idleness. Weak parts are soon brought to light; several repair jobs on the same member of a machine tell the story. Such instances are carefully investigated. Sometimes the trouble lies with the machine itself, but in other cases the cause is the nature of the work imposed upon it, the task being beyond the intentions of the designer. It may readily be seen that a production department could learn much of the success or nonsuccess of its efforts by the use of this system. In one case in these shops the cost of production on a milling machine job was reduced from 5 to 3 cents by speeding up the work. Breakdowns followed, however, until the personal attention of the manager was called to the matter, and his investigation revealed the fact that the work was actually costing more under the increased rate of production. The solution was an easy one; a machine of greater capacity was purchased and the cut in cost was accomplished. This is a typical instance, and serves to establish the fact that the correct practice is either to give a machine a load it can stand, or else replace it with one heavy and powerful enough to bear the heavier strains. Specialization enters into the subject of rapid production quite as largely as in any other branch of machine shop practice.

Concord on Steel Rail Questions.

We have noted heretofore the more pacific tenor of the comment from railroad sources on the issues that have been discussed for some months by the manufacturers and the buyers of steel rails. The intemperate and, in some cases, thoroughly reckless, criticisms of the rail manufacturers and their methods have disappeared, and the representatives of the mills are given credit for an honest effort to meet all reasonable requirements of the railroads. Some surprise has been expressed in quarters voicing the opinion of railroad engineers at what is referred to as the "quite general acceptance of the new specifications," but the *Railroad Gazette* does not consider unreasonable the scale of prices based on $28 for rails made from ingots with a 9 per cent. discard, with a graded additional charge for larger discards. While expressing disappointment at the failure to agree upon a fixed discard, our contemporary shows in the following that the arguments of the rail mill experts on this question have not been without their effect:

[illegible] Association Rail Committee. Experiments have been made at three different mills to learn if physical defects can always be detected by breaking up crop ends from rails made from that part of the ingot where such defects commonly occur. If this proves practicable, and if the whole heat is rejected when a physical defect is so found, it may be a more scientific method than saying arbitrarily that in every case either a quarter or a fifth of the ingot must not be used. Involved also in this undertaking is a legible numbering of each rail, locating its position in the ingot, so that the record of breakages may indicate something more than it now does; and also so that users may, if they choose, select for the severer services rails with the higher numbers—made from the lower end of the ingot. There is now intelligent co-operation between the manufacturers and the railroad officers to the end of finding whether the arbitrary discard, which may be presumed to be effective, but which is certainly wasteful, is the only way out. The object of the present study and experiments is, if possible, to devise a specification which will avoid that waste, secure sound rails and furnish to the mills the greatest possible incentive to the improvement of the ingot.

The temper of the above comment and the considerations cogently presented by Dr. Chas. B. Dudley, chemist of the Pennsylvania Railroad, in a recent communication favoring some latitude in the matter of discard are proof that co-operation, not accusation and controversy, is the basis on which the improvement of this important product of American steel works is to be worked out. The discomfiture of foreign competitors, who looked with mingled pleasure and anticipation upon the falling out of our railroads and our rail manufacturers, is not the least gratifying feature of the outcome.

The Contract Labor Laws.

A [illegible] laws with the purpose of restricting their interpretation by more sharply defining their limitations. It is stated that there have been so-called abuses under the clause which permits the importation of skilled workmen if unemployed labor of a like class cannot be found in this country. It is contended that this proviso was originally embodied in the law with the intention of permitting the bringing of skilled labor from abroad under contract only to assist in the establishment of new industries,

and the purpose of the movement referred to is so to amend the act that its interpretation shall be restricted to this very narrow limit.

The law as it exists, while doubtless working toward the immediate welfare of one class of the industrial community, does not always operate without hardship to employers of labor, and indirectly to their employees. It permits, among other conditions, the existence of unions so hedged about by rules as to apprentices that the classes of labor included are so sparsely represented in the community that even a slight increase in industrial activity beyond the normal produces a serious scarcity of the workmen in question. The injury caused by such restrictions is not merely that the wages of men in the restricted trades are extraordinarily high, but that more, when needed, are not to be had at any price, as so few youths have been trained in those specialties. This is only one form of industrial handicap that has followed the enforcement of the contract labor law in its stricter meanings, or would follow if no latitude whatever were given the authorities in its operation.

It could not have been the intention of those who drafted the contract labor law that it should restrict in any way the development of American industry. Probably the large majority of employers, with certain exceptions where private interests are benefited by the contract labor law, are of the opinion that Congress should incline toward loosening its application rather than toward tightening it. The argument is made that labor would be better served by placing no obstacles in the way of the immigration of specialized workmen, who would act not only as producers but as instructors, and whose utilization would promote the employment of many less skilled men.

CORRESPONDENCE.

The Darr Mine Rescue Work.

To the Editor: I have just had my attention called to an article appearing in your issue of December 26 last, under the head of "A Questionable Interference," in reference to members of the United States Geological Survey interfering with the rescue work at our Darr Mine at the time of the recent accident. This article does the Government officials an injustice, as they were at the mine only for the purpose of assisting in any way that they could, and particularly for the purpose of ascertaining the cause of the accident with a view of offering suggestions to prevent further accidents, and the management of this company was glad to have them there and extended to them every facility possible to aid them in their investigations. We would, therefore, thank you to correct the impression which your article seems to have created.

W. R. WOODFORD,
Vice-president Pittsburgh Coal Company.

PITTSBURGH, PA., January 10, 1908.

The General Committee on Co-operation in the Steel Trade has decided to divide the duties heretofore referred to the subcommittee on rails and billets and has appointed an independent subcommittee on billets and sheet bars. The list as made up is as follows: John A. Topping, chairman; E. C. Felton, A. C. Dinkey, E. A. S. Clarke, Willis L. King, J. A. Campbell and Howard Wood.

The Detroit Trust Company, Detroit, Mich., was on December 31 appointed receiver for the Glazier Stove Company, Chelsea, Mich. This action became necessary, it is stated, on account of the recent financial stringency and embarrassment of local banking facilities. It is the purpose of the receiver to resume operations in the plant as soon as the taking of inventory is completed. Pending a reorganization, the business will be continued and orders solicited as heretofore.

Carnegie Answers Crane on Technical Schools.

Richard T. Crane, president of the Crane Company, Chicago, severely criticised technical education in a recent speech, stating that Andrew Carnegie might as well have thrown in a lake the millions of dollars with which he built and endowed the Carnegie Technical Schools in Pittsburgh. Mr. Carnegie has made public the following reply addressed to Mr. Crane:

"I have little time to devote to the defense of technical education. I do not think it needs any. It is speaking for itself, and will speak for itself, and even you will be satisfied by and by that we are on the right path. You asked me four questions. To the first I answer that when I started in business I did not know of one technically educated mechanic, but several families in Pittsburgh were sending their young men to Troy, and especially to Boston. One of them happened to be a relative, and he has made a great success, and is a partner now in one of the leading firms for special steels. I do not believe that he would have achieved this so rapidly had it not been for his superior education. If I were in business to-day the young man who I would take into my service would be the most highly educated mechanic. This answers all four of your questions, and I should like to ask you one in return. The apprenticeship system is a thing of the past. What do you propose as a substitute? The best one, and the one better than the original, is to give instructions to young men in technical schools."

Beard's Tin Scrap Compressor.

Ambrose Beard, New Kensington, Pa., has designed and is prepared to furnish a machine of moderate price for compressing tin or sheet scrap in convenient shape for handling. Those who are operating can making factories, stamping and enameling works or other establishments making sheet metal products, and for this purpose are cutting up tin plate, sheet steel or light black plate, need a device of this character which is not too expensive. In the case of many factories it is probable that an expensive piece of machinery for baling scrap would take a long time to save its first cost. A great many shops, however, which accumulate from 1 to 20 carloads of such scrap each year can, from the standpoint of economy and cleanliness, afford to use a contrivance of moderate cost.

Beard's compressor, as this machine is called, is portable, and can be operated by a boy. The bundles made measure 16 in. square at the base and can be regulated from 12 to 24 in. in hight. The scrap is pressed together lightly or can be compressed in a dense, heavy mass to suit various requirements. For use in busheling furnaces of rolling mills a light bundle is required, running from 75 to 100 lb. in weight, while a larger package of 200 to 250 lb., which is the charging box size, can be used for open hearth furnaces. Machines of more elaborate construction, either belt driven or for electric motor power, are made according to plans and specifications, but the press now offered is merely intended to pay its own way in a large or small factory. One special feature of the compressor is in taking care of small pieces of doubling scrap on tin mills. A waster sheet forms a pan in the machine, and when filled the corners are pressed down and there is no loss of labor in picking up small particles when unloaded at the point of ultimate consumption.

The press has been born of necessity, Mr. Beard, who is a large consumer of scrap, having had many difficulties to surmount when handling light bulky scrap from cars, principally on account of broken bundles. He claims that the device which he has invented saves trouble and annoyance at the shops, because it takes care of scrap and puts it into marketable shape as fast as produced. It also saves money for the consumer, because cars can be quickly unloaded, and in these days it is an object to unload quickly, so as to save demurrage charges.

Director of the Mint F. A. Leach estimates that the United States last year produced gold to the value of $89,616,017, against $94,373,800 in 1906.

The Principal Coal Producing Countries.

Some very important statistics on the coal trade of the principal producing countries of the world are given in the recently issued report of the British Board of Trade. They cover the year 1906, to be sure, but there has been no great change in output from that year, nor yet in prices, for while there was a period of inflation in both respects, that has passed, and 1907 will average up pretty nearly what its predecessor was, with the exception, perhaps, of the output in the United States. This country arrived at so large an increase in the first half of the year that even the depression later did not wipe away the increase in output. The following table shows the production of coal in the five principal coal producing countries of the world in 1905 and 1906:

	1905. Gross tons.	1906. Gross tons.
Great Britain	236,129,000	251,068,000
Germany	119,350,000	134,914,000
France	34,652,000	33,762,000
Belgium	21,506,000	23,232,000
United States	350,821,000	369,672,000

Of the remaining countries, Russia alone had a production exceeding 20,000,000 tons.

The total known coal production of the world (exclusive of brown coal or lignite) in 1906 was about 905,000,000 tons, of which Great Britain produced rather less than a third.

The following statement shows the average value per ton of the coal produced, taken at the collieries, in the five above mentioned countries, in the years 1905 and 1906:

	1905. Per ton. s. d.	1906. Per ton. s. d.
Great Britain	6 11½	7 3½
Germany	8 7¾	8 11½
France	10 6¾	....
Belgium	10 2¾	....
United States	5 8	5 9¼

The following table shows the production and value at mine of coal in the principal British colonies and possessions in the years 1905 and 1906:

	1905. Tons.	1906. Tons.	1905. Per ton. s. d.	1906. Per ton. s. d.
British India	8,418,000	9,783,000	3 4	3 11
Australia	7,494,000	8,596,000	6 2	6 3
New Zealand	1,586,000	1,730,000	10 7	10 0
Canada	7,739,000	8,717,000	9 4	9 4
Transvaal	2,327,000	2,583,000	7 3	6 5
Cape of Good Hope	147,000	128,000	18 8	18 5
Natal	1,129,000	1,239,000	8 3	8 6

With regard to the number of persons employed in the coal mining industry, it is seen that a far larger number is employed in Great Britain than in any other country.

The countries which export coal in excess of the amount they import are Great Britain, Germany, the United States, Belgium and Japan. Of the British colonies and possessions included in the tables, Australia, the Transvaal, Natal and British India are in the same catagory. The following table gives particulars of the excess of exports over imports in 1906:

	Tons.		Tons.
Great Britain	76,739,000	Australia	2,046,000
Germany	15,632,000	Transvaal	62,000
Belgium	723,000	Natal	730,000
United States	8,180,000	British India	678,000
Japan	2,380,000		

The principal coal producing countries which imported coal in excess of the amount they exported were Russia, Sweden, France, Spain, Italy and Austria-Hungary, while of the British colonies and possessions included in the tables, Canada, the Cape of Good Hope and New Zealand are in the same category. The following statement shows the excess amount of coal imported in 1906:

	Tons.		Tons.
Russia	4,484,000	Austria-Hungary	6,745,000
Sweden	2,995,000	Canada	5,021,000
France	16,536,000	New Zealand	66,000
Spain	2,531,000	Cape of Good Hope	447,000
Italy	7,519,000		

The consumption of coal in some of the chief consuming countries is shown in the following statement:

	1905.—Tons.	1906.—Tons.
United States	343,281,000	361,492,000
Great Britain	169,017,000	174,329,000
Germany	106,716,000	120,482,000
France	45,915,000	50,298,000
Russia	22,680,000	25,786,000
Belgium	19,661,000	22,509,000
Austria-Hungary	19,314,000	21,181,000

It will be seen from these figures that the consumption of coal in the United States is now twice as great as that in any other country; exceeding, in fact, the combined consumption of Great Britain, Germany and France. The consumption of coal per head of population in the United States now exceeds that of Great Britain, as appears from the following statement, which applies to 1906:

	Tons.		Tons.
Great Britain	3.99	France	1.28
United States	4.30	Austria-Hungary	0.44
Belgium	3.17	Russia	0.17
Germany	1.94		

It appears from the above that Belgium is the only country except Great Britain and the United States in which the per capita consumption exceeds 3 tons per annum. Both in France and Germany the consumption per head appears small, but in these countries a large quantity of fuel of other sorts, such as turf, lignite and denatured spirits, is also in use.

The following table shows what has been the percentage proportion of the coal consumed in the principal coal producing countries, whether of native, British or other production. The figures refer to 1906:

	Coal of native production. Per cent.	British production. Per cent.	Production of other countries. Per cent.
Great Britain	99.98	...	0.02
United States	99.52	0.02	0.46
Germany	91.48	6.29	2.23
France	63.64	16.66	19.70
Belgium	73.43	6.79	19.78

In Germany the quantity of British coal consumed was about the same in quantity as in 1905, *viz.*, about 7,500,000 tons, although owing to the larger German production in 1906 the proportion has fallen from 6.95 per cent. of the German consumption in 1905 to 6.29 per cent. in 1906. The average quantity of British coal consumed in Germany during the 10 years, 1895-1904, was only 4,998,000 tons.

In the remaining coal producing countries the proportion of native coal, of British coal and of coal produced in other countries has been as follows, the figures relating to 1906:

	Coal of native production. Per cent.	British production. Per cent.	Production of other countries. Per cent.
Russia	82.24	11.59	6.17
Sweden	6.81	86.05	7.14
Spain	55.43	42.71	1.86
Austria-Hungary	91.28	2.54	6.18
Japan	99.79	0.10	0.11

Drawback on Pig Iron Made from Imported Ore. The regulations of the Treasury Department establishing a rate of drawback on pig iron and other products manufactured by the Maryland Steel Company, Sparrows Point, Md., from a mixture of imported ores, have been amended by ordering that the manufacturer shall keep a percentage record of the domestic ores used and the per cent. of loss sustained in converting iron into steel. The final metallic product of any block of manufacture shall equal the metallic product of the imported material used, plus the metallic product of the domestic material used, with an allowance for loss not exceeding 20 per cent. on any block nor a yearly average of 15 per cent.

It is expected that the programme of improvements of the United States Steel Corporation for 1908 will include the erection of a steel bridge across the Monongahela River, between Monessen and Donora, Pa. This bridge is desired to take steel from the Donora mills to the tin plate plant of the American Sheet & Tin Plate Company and the hoop and cotton tie mills of the Carnegie Steel Company, which are located at Monessen.

Retort versus Beehive Coke Ovens.

A Comparison of First Costs and of Economies in Operation.

BY ALFRED ERNST, PITTSBURGH.

The report of the United States Geological Survey for 1906 shows interesting facts relative to coke production in beehive and retort ovens. As this report gives authentic figures covering an entire year, it is perfectly safe to base on them a comparison between beehive and retort oven practice, illustrating the wastefulness of coking coal in the beehive oven and the superiority of the retort ovens in every respect. A summary of the statistics is as follows:

Active beehive ovens in 1906	85,234
Coke produced in beehive ovens, tons	31,843,090
Annual capacity of one beehive oven, tons	373.6
Quantity of coal consumed in beehive ovens to produce 31,843,090 tons coke, tons	49,554,288
Yield, per cent	64.26
Active by-product ovens in 1906	3,362
Coke produced in by-product ovens, tons	4,558,127
Annual capacity of one by-product oven, tons	1,356
Quantity of coal consumed in by-product ovens to produce 4,558,127 tons of coke, tons	6,192,086
Yield, per cent	73.6

These figures show that much larger yields can be obtained in retort ovens, as a portion of the fixed carbon is unavoidably burned in beehive practice, while in the retort oven the operation is one of distillation only, without the admission of air, and all the fixed carbon remains in the coke. If the quantity of coal which was used in beehive ovens had been coked in retort ovens, we should have received $49{,}554{,}288 \times 0.736 = 36{,}471{,}956$ tons of coke, or 4,628,865 tons more from the same quantity of coal. In other words, the waste in producing 31,843,090 tons of coke in beehive ovens amounted to 6,000,000 tons of coal in 1906.

Cost of Installation.

It has been frequently asserted that the slow introduction of the retort oven in this country is attributable to its prohibitive cost of installation. All other points made against the retort coke as to appearance, color, structure, &c., are mere prejudices, due either to a lack of knowledge or to knowledge gained by superficial investigation and are gradually dying out. Tests made by eminent metallurgists and blast furnace managers have shown that the retort oven will produce from the same coal a coke in every way equal, and in some respects superior, to beehive coke as a blast furnace fuel, and it is therefore unnecessary to investigate this subject further.

In order to derive proper conclusions as to the first cost of installation, the beehive and retort oven must be compared on the same basis and under the same conditions—that is, actual cost of oven compared with output from the same quantity and quality of coal used. Referring again to the report of the Geological Survey, we find that in 1906 the annual capacity of one beehive oven was 373.6 tons, and that of one retort oven 1356 tons. In other words, the output of one retort oven was equivalent to 3.62 beehive ovens. Comparing the actual net cost of construction of the two types of ovens, we find that one beehive oven, on the basis of 100 ovens per bank, can be built above foundations for $350 and one retort oven, on the basis of two batteries of 50 ovens in each, for $965.

In order to obtain the same results relative to coke produced, the 3.62 beehive ovens will cost $1267, against $965; or, in other words, the beehive plant will be practically 31 per cent. more expensive than the equivalent retort plant. This does not in either case include any machinery for charging and drawing or any other appurtenances connected with the plant, as coal bins, crushers, conveyors, loading and receiving tracks, power plant, &c., which in modern plants of either type will practically amount to the same expenditure. It must also be understood that the retort oven in this case is not to be considered as a by-product oven, and that all gases evolved will be burned to heat the ovens, while the waste products of combustion can be used elsewhere.

The rectangular or so-called Belgian oven, lately introduced at one or two coke oven plants of the Connellsville region, works on the same principle as a regular round beehive oven; that is, part of the carbon of the coal is burned up to produce the necessary heat for the coking process. It has the advantage, though, that the coke can be pushed out for less money than from a round oven by employing a coke pusher similar in construction to the machine used in retort plants. This oven, being far more expensive than a round oven and having practically the same capacity, will be, therefore, more expensive than the equivalent retort oven.

The Difference in Earning Power.

The report cited shows that the average annual yield from beehive ovens was 64.26 per cent., against 73.6 per cent. in retort ovens. The labor for charging and drawing 3.62 beehive ovens will undoubtedly cost more than that for one retort oven; and, even neglecting this item of labor, we find that the difference of yield alone with coal at $1 per ton will show a credit of $\frac{1}{0.6426} - \frac{1}{0.736} = 20$ cents, in favor of the retort oven. Each retort oven, therefore, will earn per year $1356 \times 0.2 = \$271.20$ more than the equivalent 3.62 beehive ovens, which amount at 6 per cent. represents a saving on an investment of $4500 in favor of the retort oven.

The item of repairs per ton of coke, which in a beehive plant amounts to 1.3 cent, against 5 cents in a retort plant can be neglected on account of having omitted the cost of labor, which will fully equalize the difference in cost of repairs.

The Use of Surplus Gas for Power.

By adding some apparatus to the retort oven for collecting raw gas and for cleaning and separating it from tar we will still remain inside of the cost of an equivalent beehive plant and derive certain profits from the commercial value of the surplus gas and tar. One ton of coal will give off during the 24 hr. of the coking process 10,000 cu. ft. of gas, of which 6000 cu. ft. are required for heating the ovens. The 4000 cu. ft. of surplus gas, having a thermal value of 500 B.t.u. per cubic foot, can be used under steam boilers or direct in gas engines. Better results, though, can be obtained by preheating the air for combustion, to which we will refer later.

One pound of water can be evaporated with $\frac{965.8}{0.7 \times 500} =$ 2.76 cu. ft. of this gas; 4000 cu. ft., therefore, can evaporate per hour $\frac{4000}{24 \times 2.76} = 60.38$ lb. of water. As 1 hp. results from the evaporation of 34½ lb. of water at 212 degrees F., we therefore get for every ton of coal coked surplus power amounting to $\frac{60.38}{34.5} = 1.75$ boiler horsepower hours. Assuming that the steam engine equipment will make 1 b.h.p on 20 lb. of water per hour, 1 ton of coal coked will produce 3-19 hp. during 24 hr. continuously.

This surplus gas can be utilized to better advantage in gas engines. Gas engine builders guarantee to produce 1 b.h.p. per hour on 10,000 B.t.u.; and as 1 cu. ft. of coke oven gas has 500 B.t.u., 1 hp. per hour can be produced on 20 cu. ft. of this gas. For each ton of coal coked we get, if the surplus gas is used in gas engines, $\frac{4000}{24 \times 20} = 8.333$ hp. per hour, or 2.6 times the power derived by using the gases under steam boilers.

In most of the present beehive oven plants the products of combustion are entirely wasted, and so much smoke and soot arise from them as to necessitate the restriction of their location to the more thinly populated regions, as no city or town of any pretensions would permit this nuisance in its vicinity. Very few of the existing plants, though, have adopted a flue system collecting these waste products of combustion and leading them to be utilized under steam boilers. Assuming the heat value of 1 lb. of coke to be 13,000 B.t.u., the coke produced from 1 lb. of coal will represent $13{,}000 \times 0.65 =$ 8450 B.t.u., as the best coking coal yields about 65 per cent. of coke.

The heat value of the coal would be about 13,500 B.t.u.; hence the thermal loss during the coking process is 13,500 — 8450 = 5050 B.t.u. Experience has shown that 50 per cent. of this is lost by radiation and 60 per cent. of the remainder can be utilized by proper arrangement of flues and stack in connection with a well designed boiler of ample heating surface.

The waste gases from 1 ton of coal coked in the beehive oven during 48 hr. will therefore evaporate:

$$\frac{2000 \times 5050 \times 0.5 \times 0.6}{965.8 \times 48} = 65.36 \text{ lb. of water per hour.}$$

If, as above, 1 b.h.p. per hour can be performed on 20 lb. of water we produce $\frac{65.36}{20} = 3.26$ hp. continuously during 48 hr.

It can readily be seen that the retort oven considered as a power producer is superior to the beehive oven. The cost of the gas engine equipment will not be higher than the combined boiler and steam engine plant.

By-Product Saving.

Greater economies can be obtained by adding to the retort oven a complete plant to recover all the by-products. By coking in by-product ovens 1 net ton of coal of quality as at present used in beehive ovens the following yield can be obtained:

Coke, pounds	1,470
Tar, pounds	100
Ammonia sulphate, pounds	20
Surplus gas, cubic feet	4,800

It has been repeatedly stated that there is no profitable market for tar in the United States, notwithstanding the fact that since July 1, 1907, coal tar pigments and products, not including alkaloids used as medicine, imported from Germany were valued, to the buyers, at $1,468,338, an increase over imports for a like period of 1906 of $253,381.

Here is an average monthly import of commodities for which there is a constantly expanding use and market of over $367,000, for the manufacture of which we have all necessary raw materials in abundance, and capital and knowledge; and yet there is not a pound of coal tar colors and dyes made in this country in a commercial way. There is not any trouble in disposing of the ammonia; for this a good demand exists.

The quantity of available surplus gas can be increased by proper construction of the ovens for the purpose of preheating the air necessary for the combustion of the gas used for heating the ovens. Theory and practice have proved that the waste products of combustion contain more than enough sensible heat to preheat the necessary quantity of air by means of regenerators to 1000 degrees F. and over, and therefore increase the surplus gas 20 to 25 per cent. over that available when the air is not preheated. The value of the coke oven gas as a source of power has been mentioned before, but we must add that this gas can also be used for illumianting purposes, as demonstrated successfully in several American cities.

By employing an up to date system of by-product ovens and efficient apparatus for the recovery of by-products, the returns from the sale of coke, tar, ammonia and gas will fully justify the installation of such ovens, instead of the wasteful beehive ovens, even at the greater first cost of investment.

Building Operations in 1907.—Building operations throughout the country showed a marked falling off in the last few months of 1907. Still, the operations for the entire year compare favorably with those of 1906 when the stress of the last two months is taken into consideration. The estimated value of contemplated buildings in 56 cities throughout the country was $588,769,000 in 1907, compared with $659,439,000 in 1906. In those cities located in the States commonly known as Northern, there was a decrease of 14 per cent., the figures for the two years being $297,639,000 and $340,137,000 respectively. The falling off in New York City alone would account for the entire decrease. In the Middle West the decrease amounted to but 5 per cent., and here the entire shrinkage could be accounted for in Chicago and St. Louis. In the Southern States nine cities showed a decrease of approximately 13 per cent. On the Pacific Coast there was a decrease of 20 per cent., due altogether to a marked falling off in San Francisco and Los Angeles where labor troubles have been rampant for months. In the Eastern States the fact must be taken into consideration that during the latter half of 1906 there was a marked falling off, consequently the comparative returns make the year 1907 show up better than the situation really is. The wave of decreased operations seems to be gradually spreading westward.

Uniformity of Basic Iron with the Gayley Dry Blast.

The Gayley dry blast has been in operation at the furnace of the E. & G. Brooke Iron Company, at Birdsboro, Pa., running on basic iron. The following analyses of silicon and sulphur contents compare with sulphur contents on corresponding dates a year previous, when the furnace was running on natural air:

Basic Iron Made with Dry Air Blast.

Date.	Dry air blast. 1907-1908. Silicon.	Dry air blast. 1907-1908. Sulphur.	Natural air. 1906-1907. Sulphur.
December 27	0.65	0.016	0.037
	0.75	0.021	0.030
	0.70	0.019	0.026
	0.35	0.036	0.027
	0.35	0.050	0.025
	0.30	0.046	0.029
December 28	0.45	0.033	0.030
	0.55	0.030	0.040
	0.65	0.027	0.036
	0.50	0.018	0.037
	0.50	0.016	0.042
	0.45	0.034	0.026
December 29	0.35	0.022	0.035
	0.50	0.024	0.032
	0.65	0.021	0.032
	0.55	0.023	0.028
	0.60	0.021	0.030
	0.35	**0.023**	**0.053**
December 30	0.50	0.021	0.050
	0.80	0.019	0.048
	0.55	0.027	0.055
	0.60	0.021	0.052
	0.50	0.015	0.037
	0.55	**0.024**	**0.061**
December 31	**0.50**	**0.019**	**0.050**
	0.45	0.021	0.058
	0.50	0.023	0.053
	0.60	0.021	0.037
	0.50	0.027	0.025
	0.50	**0.013**	**0.035**
January 1	0.40	0.024	0.042
	0.35	0.018	0.029
	0.35	0.034	0.046
	0.65	0.017	0.020
	0.80	0.019	0.030
	....	....	0.025
January 2	0.70	0.026	0.033
	0.45	0.033	0.024
	0.50	0.028	0.021
	0.55	0.024	0.027
	0.75	0.018	0.025
	0.50	0.013	0.020
January 3	0.40	0.019	0.022
	0.25	0.044	0.022
	0.30	0.028	0.029
	0.45	0.027	0.032
	0.50	0.029	0.026
	0.35	0.030	0.027
General average	0.51	0.024	0.035

It will be observed how regular are the silicon and sulphur with dry air, as compared with natural air. The results with basic iron, too, furnish a hint of the advantages through regularity of grade which would be obtained with a furnace making foundry iron.

At the plant of the Portsmouth Steel Company, Portsmouth, Ohio, the only department now running is the foundry, but work on the new bar mill to roll tie plates is being actively pushed.

The Lackawanna Steel Company, Buffalo, N. Y., started up on Monday morning of this week a part of the open hearth department and mills Nos. 4, 5, 6, 7 and 8 to fill accumulated orders.

The Engineers' Society of Western Pennsylvania, Pittsburgh, has elected J. K. Lyons president, E. K. Morse vice-president and A. E. Frost treasurer.

Changes in Customs Administrative Laws.

WASHINGTON, D. C., January 14, 1908.—The Ways and Means Committee of the House of Representatives will decide in a few days whether the customs administrative laws shall be amended in the present Congress or action deferred until after the Dingley Tariff act is revised. The committee's decision will certainly be reached before the end of the present month and will be awaited with much interest, for it will be recognized as involving much more than the mere question as to whether the act of June 10, 1890, shall be so modified as to bring it into line with the best modern business practice. The commercial relations of the United States with Germany, and possibly with France, depend to some extent upon the outcome.

Scope of the Movement.

The pressure for revision of the customs administrative laws comes from three distinct sources. The Secretary of State, in pursuance of the reciprocity agreement made with Germany through the instrumentality of the North Customs Commission, which went into force July 1, has recommended a series of amendments to section 7 of the act of 1890. The Secretary of the Treasury in his last annual report to Congress urged the adoption of a number of important modifications. Finally, certain influential interests, including both importers and domestic manufacturers, are urging upon the committee the enactment of a law forbidding the Treasury Department to continue to accept "export" prices as the basis of invoice valuations of imported merchandise.

The proposed amendment of section 7 of the act of June 10, 1890, having an international bearing, is naturally regarded as the most important phase of this interesting subject. The Secretary of State agreed to recommend these changes as a part of the concessions made by the United States to Germany in the reciprocity convention negotiated last spring, and it is obvious that if the recommendation should be ignored by Congress the German Government would be justified in denouncing the existing convention upon its expiration. The agreement expires on July 1, 1908, but will continue in force for six months from the date on which either of the signatory powers gives notice of its desire to terminate the arrangement. In the case of the reciprocity agreement now being negotiated with France, the recommendations of the Secretary of State regarding section 7 are also in view and will constitute a part of the consideration upon which it is hoped that France will consent to the application of the minimum rates of her tariff to a very large proportion of the current imports of American products.

Amendments to Section 7.

The modification of Section 7 as desired by the Secretary of State embodies the following changes: 1, giving to the owners of consigned merchandise the same privilege that is enjoyed by the consignees of purchased merchandise, namely, to add on entry to the invoice value in order to make market value; 2, to deduct from the invoice value of both consigned and purchased goods in order to make market value; 3, additional duties are not to be levied within a margin of 10 per cent.; 4, prima facie evidence of fraud arises where the merchandise is undervalued 35 per cent. instead of 50 per cent., as heretofore; 5, penal duties assessed for undervaluation are to be treated as penalties and not as duties, thus giving the Secretary of the Treasury authority to remit such penalties when the fact is demonstrated that no fraud was attempted; 6, penal duties are not to be assessed on goods paying specific duties where the rate of duty is not changed by the advance in value by the appraiser.

These amendments, taken as a whole, will constitute highly important concessions to the importing interests, and will apply to the products of all countries brought into the United States. Customs experts are fully convinced that no loss of revenue will result from these proposed changes, but that while the routine of importation will be facilitated the interests of the Government will be more adequately protected than at present.

Treasury Department Recommendations.

Second only in importance to the proposed amendment to Section 7 are the suggestions made by the Secretary of the Treasury, which cover a much broader field than the original act of 1890. Mr. Cortelyou will heartily indorse the recommendations of the Secretary of State regarding the amendment of Section 7, and in this connection will emphasize the need of legislation that will give to the Secretary of the Treasury such power as will enable him to remedy mistakes made by the importer whose transaction is in good faith and who has no intent to evade the law or defraud the revenue. He contends that the Secretary of the Treasury should be authorized to remit additional duties where unintentional errors have been committed and that similar power should be vested in him in regard to refunds, which he cannot now make in the absence of timely protest and appeal, in cases where more moneys have been paid to the customs officials than the law requires. The Secretary also recommends the licensing of customs brokers for the joint protection of reputable individuals engaged in this business and of the importers they may be called upon to serve and indirectly of the Government itself. A recommendation by the Secretary that will no doubt be promptly acquiesced in, if legislation is undertaken at this time, involves the application to mail importations of all regulations regarding invoice declarations, etc., which now apply to goods imported through the regular commercial channels. The Department frequently finds that the somewhat lax rules concerning the transmission of merchandise through the mails permit irregularities, especially in the undervaluation of goods of small bulk but high value, like fine cutlery or surgical instruments.

The Secretary of the Treasury also strongly recommends the extension of the time within which an importer may file a request for reappraisement or a protest against classification and the adoption of a protest fee. The Government has a year in which to request reappraisement or reliquidate entries, while the importer has but two days for filing a request for reappraisement and 10 days within which to protest against classification. It is apparent that this is inequitable, and the Department therefore urges that the period be extended to at least 15 days in both cases. With a view to putting a stop to the wholesale practice of filing protests in all cases, it is proposed that there shall be a filing fee of $5 to be refunded in case of a decision in favor of the protestant.

The Export Price Controversy.

The attempt of certain interests to compel the Treasury Department to abandon export prices as the basis of invoice valuations—an important concession made to Germany in the convention negotiated by the North Commission—will probably be unsuccessful. A case is now pending to determine whether the Department has the right under the present law to accept any invoice valuation except that based upon market value for home consumption in the country of origin, but the officials are confident of winning upon the contention that where goods are made for export only they can have no value for local consumption. To meet the assertions that the adoption of the export price has resulted in unusually large importations of German and French goods since July 1 last, the Department has compiled figures which seem to show that conditions have been absolutely normal, and that in the case of Germany, especially, the increase in our importations has been almost exactly offset by a gain in our exports to that country.

It is probable that in considering the advisability of amending the customs administrative laws at this time, the Ways and Means Committee will take into account the outlook for the comprehensive revision of the Dingley act. If the majority leaders believe that the present tariff law will be overhauled immediately after the next Presidential election, as has been suggested by President Roosevelt, it is likely that action as to the administrative statutes will be deferred and the two subjects taken up together. In view of the *personnel* of the new committee as made up by Speaker Cannon, however, the outlook for tariff revision in the near future is not promising, and a decision to revise the customs administrative laws at this time will therefore surprise no one here who has followed developments closely during the past few months.

W. L. C.

OBITUARY.

WILLIAM CHISHOLM, SR., one of the pioneer iron men of Cleveland, Ohio, and for the past 30 years head of the Chisholm Steel Shovel Works in that city, died January 10 of pneumonia. He was born in Scotland and came to this country in 1848. After residing in Montreal a few years he went to Cleveland early in the 50's. Mr. Chisholm's brother, Henry, who died several years ago, was one of the founders of the rolling mill industry in Cleveland, having been one of the organizers of the firm known as Chisholm, Jones & Co., and later as Stone, Chisholm & Jones, that in 1857 built a mill to roll rails and bar iron, this being the first rolling mill in Newburg. The Newburg mill later developed into the Cleveland Rolling Mills Company. William Chisholm gained his first experience in the iron and steel business as superintendent in the Newburg mill. Later he founded the Chisholm Steel Shovel Works. He remained at the head of the concern until his death, although his health during the past few years had not permitted great activity. He was also one of the founders of the Union Steel Screw Company of Cleveland. He leaves one daughter and one son, the latter being H. A. Chisholm, superintendent of the Chisholm Steel Shovel Works.

DAVID S. EGLESTON of the old and well-known firm of Egleston Brothers & Co., iron and steel merchants, New York, died January 1, after a lingering illness, aged 78 years. He had lived in New York almost all his life, and was actively engaged in business up to the time of his illness. He was a director of the Bank of America, the Seaman's Bank and the Hanover Fire Insurance Company, and was a member of the Union and Metropolitan clubs. He leaves a widow.

LEOPOLD VILSACK, Pittsburgh, died December 26, aged 69 years. He was president of the Epping-Carpenter Company, manufacturer of pumps and machinery; president of the Vilsack-Martin Company, manufacturer of machinery; vice-president of the Pittsburgh Brewing Company, director of the Crucible Steel Company of America, vice-president of the Allegheny Plate Glass Company and of the German National Bank and president of the East End Savings & Trust Company. He leaves 12 sons and daughters.

ROBERT B. BROWN, one of the organizers of the Duquesne Steel Company, absorbed by the Carnegie Steel Company, died at Pittsburgh, January 2, aged 61 years. He was a native of that city, was educated in the Western University and Sheffield Scientific School of Yale, and had been prominent in various lines of business. He became president of the Union Bank when a very young man, and was one of the organizers of the first company to pipe natural gas into Pittsburgh. He leaves a widow and three daughters.

LEFFERTS L. LEFFERTS, proprietor of a galvanizing works in New York City, died January 9, aged 67 years. He was a native of Michigan, and was a pioneer in the manufacture of enameled iron bathtubs. For some years he was connected with the firm of Jordan L. Mott & Co., New York.

JOHN NEELY, assistant treasurer of the Crucible Steel Company of America, Pittsburgh, died January 1, aged 68 years. Prior to the organization of that company he had been cashier of the Park Steel Company.

THEODORE L. WEBSTER, secretary of Warren Webster & Co., Inc., Camden, N. J., was killed in a railroad accident in that city December 27. He had been connected with the company from its establishment 20 years ago. He was a brother of Warren Webster, the president, and A. Spencer Webster, the treasurer, of the company.

GUSTAV KRUG, senior member of the firm of G. Krug & Son, manufacturers of wrought iron work, Baltimore, died January 4, aged 77 years. He was a native of Germany, but came to this country when a youth. He leaves one son and one daughter.

THEOPHILUS HARRISON, president of the Harrison Machine Works, Belleville, Ill., died at San Diego, Cal., December 31, aged 76 years. He was a native of Belleville, but had lived for some years in Colorado and California. He leaves a widow and two daughters.

GEORGE L. HENRION, for several years superintendent of the Michigan department of the American Car & Foundry Company, died at Detroit January 6, aged 49 years. He was a native of that city and had won a high reputation as a shop organizer. He leaves a widow, two sons and a daughter.

FREDERICK A. POTTER, for more than 45 years superintendent of the Fales & Jenks Machine Company, Pawtucket, R. I., died suddenly January 8. He had retired from active business early last year. He leaves a widow and a daughter.

PERSONAL.

The President has sent the name of George W. Wanmaker to the Senate to be Appraiser of the Port of New York in succession to Col. Edward S. Fowler, promoted to be Collector of the Port. Mr. Wanmaker has held the office of Assistant Appraiser since 1897, and has been Deputy Appraiser since 1899.

J. Gibson has been appointed superintendent of the furnaces of the Tennessee Coal, Iron & Railroad Company, which produce foundry iron, and will be in immediate charge of the company's Bessemer and Oxmoor furnaces.

E. P. Williams has been appointed superintendent of the Ensley furnaces of the Tennessee Coal, Iron & Railroad Company.

Alfred W. Kiddle, Charles A. Wendell and Lucius E. Varney have formed the firm of Kiddle, Wendell & Varney, and will continue the practice of patent law, with which they have been long connected. The offices are in the United States Realty Building, New York.

Walter S. Snow of Boston, a former president of the New England Foundrymen's Association, but now engaged in independent practice as a publicity engineer, was recently elected an honorary member of that organization.

F. K. Rhines, engineer, has become assistant to the treasurer and general manager of the General Fireproofing Company, Youngstown, Ohio. He was formerly engineer with the East Iron & Machine Company, bridge builder, at Lima, Ohio, and more recently has been chief engineer and general manager of the Dixon Engineering & Construction Company, Toledo, Ohio.

Herman Nieter has opened an office at 2 Rector street, New York, as Eastern agent for the Canton Boiler & Engineering Company, Canton, Ohio, and the Braddock Machine & Mfg. Company, Braddock, Pa.

An error was made in the issue of January 2 announcing that Edwin H. Fowle, formerly of San Francisco, had been appointed representative in Denver for the Carnegie Steel Company, Illinois Steel Company, American Sheet & Tin Plate Company and National Tube Company. Mr. Fowle, whose offices are in the Majestic Building, is to represent the National Tube Company, distributing in the Rocky Mountain District the products of that company, the Western Tube Company and the Shelby Steel Tube Company. Edw. M. Sparhawk, whose offices are in the Equitable Building, Denver, will continue to represent the Carnegie Steel Company, Illinois Steel Company and American Sheet & Tin Plate Company as heretofore.

The Wm. J. Smith Company, New Haven, Conn., manufacturer of adjustable reamers and taps and special machinery, has added to its staff as sales manager Gorham C. Parker, who has been conspicuously successful as head of the selling department of another company.

M. J. Drummond, New York, who has been seriously ill, has so far recovered that he is now able to be taken out for short rides.

H. Osterberg, formerly general manager of the Demmler plant of the American Sheet & Tin Plate Company, and H. J. Scanlon, until recently superintendent of the tinning department of the same plant, have resigned to accept positions with the Washington Tin Plate Com-

pany, Washington, Pa., the former having charge of the hot mills and the latter the tin house. The Washington Company has some orders booked and starts operations in all departments this week.

Robert M. Kilgore has been appointed district sales agent for the Cleveland District of the Jones & Laughlin Steel Company. On January 20 he will succeed Otis, Bonnell & Co., who have had the Cleveland sales agency of the Jones & Laughlin Company for several years. Mr. Kilgore has been connected with the sales department of the general offices in Pittsburgh for several years. His Cleveland office will be located at 804 to 808 Rockefeller Building.

The Production of Copper in 1906.

The revised figures from the United States Geological Survey regarding the production of copper are at hand in the official report by L. C. Gratton. The total smelter production was 917,805,682 lb. in 1906, as compared with 901,907,843 lb. in 1905. The production for 1906 constitutes a new high record. In the accompanying table is

Production of Copper in the United States in 1906.

	Smelter production. Pounds.	Mine production. Pounds.
Alaska	8,685,646	5,871,811
Arizona	262,566,103	266,831,864
California	28,153,202	28,726,448
Colorado	7,427,253	5,720,929
Georgia	17,182	26,198
Idaho	8,578,046	9,558,913
Massachusetts	9,744	9,744
Michigan	229,695,730	224,572,310
Missouri	54,347	54,347
Montana	294,701,252	290,700,975
Nevada	1,090,635	1,625,985
New Mexico	7,099,842	7,028,670
North Carolina	582,209	703,775
Oregon	545,859	415,803
Tennessee	17,809,442	17,979,317
Texas	51,377	51,377
Utah	50,329,119	56,593,576
Vermont	11,694	240,315
Washington	290,823	235,030
Wyoming	106,177	24,000
Totals	917,805,682	916,971,387

shown the production by States, this being given in two columns, showing the smelter and the mine production. There was an increase in Arizona in 1906 of nearly 30,000,000 lb. California likewise showed an increase as compared with the previous year, which, however, was below the average of several preceding years. In Montana, however, there was a decrease. The new camps in Nevada increased largely and this is likewise true of Alaska. The computed consumption in 1906 was figured at 677,434,937 lb., and the stocks at the refineries on January 1, 1907, were figured at 92,470,792 lb. An interesting estimate is made showing that the use of copper in 1906 for electrical purposes was practically half the consumption; brass manufacturers used 30 per cent.; in rolling mills and the manufacture of sheet copper 5 per cent. was used, and for miscellaneous uses, principally castings, 15 per cent.

The open hearth steel plant, sheet and tin plate mills of the Follansbee Brothers Company, Follansbee, W. Va., started up in full in all departments January 13, and will continue in full operation for the next two or three weeks at least.

Four sheet mills in the plant of the Allegheny Steel Company, Avenue, Pa., were put in operation on Monday, after being closed since December 21. The plate mill, bar mill and three of the open hearth furnaces were started last week.

A. M. Byers & Co., Inc., Pittsburgh, manufacturers of iron pipe, will make some large additions to their plant providing the City Councils will vacate a street alongside the plant, about 600 ft. in length. In case councils refuse to vacate this street, the firm states that it will remove its plant to Girard, Ohio, locating it near the Mattie Furnace, which it owns and operates.

NEWS OF THE WORKS.

Iron and Steel.

Furnace A of the Northwestern Iron Company, Mayville, Wis., which was blown out October 27, 1907, started again January 5. Both furnaces of this company are now active.

Earlston Furnace of Joseph E. Thropp, at Earlston, Pa., was blown out this week for repairs. It will not resume until business conditions have improved. The No. 2 Saxton Furnace of the same interest will continue in operation for the present.

Watts Furnace of the Virginia Iron, Coal & Coke Company, Bristol, Va., was blown out the latter part of December.

General Machinery.

Pawling & Harnischfeger, Milwaukee, Wis., after a partial shutdown for two weeks, have resumed operation, in all departments, but with a greatly reduced force, and in some departments on short time.

The Straubel Machine Company, Green Bay, Wis., heretofore a partnership, has been incorporated with a capital of $25,000. The company manufactures a line of marine gasoline engines and does a general machine shop business. The incorporators are L. A. Straubel, E. F. Straubel and Ed. Straubel.

The Noye Mfg. Company, Buffalo, N. Y., manufacturer of flour mill and general machinery, has added to its lines a department for the manufacture of automobile parts, including three types of radiators—vertical and flat tube, coil and honeycomb—and pressed steel hoods, dashes, tool boxes and battery boxes. Additional machinery and facilities for the accommodation of this department have been installed.

Foundries.

The Keystone Steel Foundry Company has been granted a Pennsylvania charter and will operate a foundry at Avonmore, Pa., for the manufacture of steel castings. The new company has a capital of $150,000, $75,000 of which is held by Joseph H. Sauers, whose foundry has been taken over.

C. M. Whitney of the Whitney Iron Works has been appointed receiver for the Schwartz Foundry Company, New Orleans, La.

The Wisconsin Malleable Iron Company, Milwaukee, Wis., whose works were shut down December 31, resumed operation January 6.

After a shutdown of one week, which was occupied in inventory work, the plant of the Central Foundry Company, Vincennes, Ind., has been started up and will continue to run on an average of three days a week, as it has been doing for some time.

Power Plant Equipment.

The Westinghouse Machine Company, East Pittsburgh, has received an order from Kingan & Co., Indianapolis, for a 750-hp. steam turbine-generator set; 900-hp. turbo-generator for shipment to South Manchester, Conn.; New York, New Haven & Hartford Railroad, large steam engine to be used in a pumping station. The company has also received an order for a gas engine for shipment to Japan. In a letter received recently, accompanying an order for gas engines, the Japanese purchaser stated that although it did not require the engines until fall the order was placed because it could secure better prices and feared that the works would be so busy at that time that it would be unable to get prompt delivery.

The Sullivan Electric Light & Power Company and the Sullivan Heat, Light & Power Company have been merged into the Sullivan Lighting Company, at Sullivan, Ind. The capital stock is $50,000.

The Struthers-Wells Company, Warren, Pa., manufacturer of gas engines, had a very large increase in its business during the year just closed. The company has recently opened a branch office at 310 House Building, Pittsburgh, to take care of its increasing business in the Pittsburgh District. The office is in charge of P. F. Heggarty, who has been connected with the company for nine years. Among recent installations of Warren gas engines were the following: One 180-hp., direct connected to generator, Ohio State University, Columbus, Ohio; one 600-hp., direct connected to generator, Kittanning & Leechburg Street Railway Company, Kittanning, Pa., second engine installed; two 125-hp. and one 100-hp., to drive generators, Ridgway Electric Light & Power Company, Ridgway, Pa.; one 110-hp., to drive generator, Corry & Columbus Street Railway Company, Corry, Pa.; one 125-hp., municipal water works, Ridgway, Pa.; two 300-hp., belted to gas compressors, Manufacturers Gas Company, McKinley, Pa.; two 300-hp., Potter Gas Company, Coudersport, Pa.; one 250-hp., to drive generator, Citizens Electric Light & Power Company, Lorain, Ohio; one 250-hp. and one 125-hp., Electric Light & Power Company, Kane, Pa.; two 80-hp., direct connected to generators, Franklin Railway Supply Company, Franklin, Pa.; four 600-hp., direct connected to alternating current generators, American Plate Glass Company, Kane, Pa.; also one 200-hp. and one 110-hp.; two 125-hp., direct connected to 60-cycle alternating current generators, American Fork & Hoe Company, Ashtabula, Ohio.

The Bristol Gas & Electric Company, Bristol, Tenn., in-

tends to spend about $100,000 in making improvements to its plant, to include the installation of a coke plant, 500 hp. turbines, boilers, &c. S. M. Vance is superintendent.

Fires.

The tipple, engine and boiler house of the Houston County Coal & Mfg. Company at its mines at Wooters, near Crockett, Texas were burned January 3.

The plant of the Holland Launch & Engine Company, Holland, Mich., was damaged $10,000 by fire January 8.

The machine shop, blacksmith shop and supply house of the Whitney Reduction Company, Whitney, N. C., were damaged $15,000 by fire January 6.

The building on Fifth avenue, New York, partly occupied by the Adam Happel Iron Works and the Edelmann Iron Works, was burned January 11.

The plant at the ore mines of the Bellefonte Furnace Company, Bellefonte, Pa., was burned January 11, the loss being about $20,000.

The plant of the William H. Page Boiler Company, Norwich, Conn., was burned January 14, the loss being about $50,000.

Hardware.

After having been in course of construction for a year and a half, the new factory of the Glidden Varnish Company, Cleveland, Ohio, is entirely completed and is in full operation, and the old factory, which has been the home of the company since it was organized in 1874 as Glidden, Brackett & Co., is idle for the first time in its history. This plant, which has cost over $500,000, occupies 17 acres and is built entirely of brick, concrete and steel, is one of the largest and most perfectly appointed exclusive varnish factories in the world, both in capacity for making and for storing varnish. It also has a very large and complete grinding department ,where Jap-A-Lac is made. The company is naturally proud of its new home, and extends an invitation to visitors to Cleveland who are interested to call and inspect the plant.

The Chas. R. Morse Mfg. Company, Chicago, Ill., has recently constructed for the Hazel-Atlas Glass Company, Clarksburg, W. Va., and Washington, Pa., four special Morse calculators to be used at its four plants for figuring tonnage of glass products. It is stated that the calculators have already made hundreds of dollars for the glass company by reducing the time in figuring this work.

Miscellaneous.

J. H. Wagenhorst & Co., Youngstown, Ohio, manufacturers of the Wagenhorst automatic electric blue printer, have recently made sales of these machines as follows: The Kelley Company, Birmingham, Ala.; Universal Portland Cement Company, East Chicago, Ill.; State College of Kentucky, Lexington, Ky.; University of Arkansas, Fayetteville, Ark.; Michelin Tire Company, Milltown, N. J.; Barber-Colman Company, Rockford, Ill.; Dake-American Steam Turbine Company, Grand Rapids, Mich.; Haskell-Barker Car Company, Michigan City, Ind.; Geo. L. Kopp, Pittsburgh, Pa. The company is particularly elated over the sale to the Barber-Colman Company, as this was secured after a trial of 30 days in competition with another type of electric blue printing machine.

The Brush-McLaren Motor Company, Newark, N. J., has been incorporated, with a capital stock of $50,000, to deal in automobiles, by Thayer McLaren and others.

Zahnisher Brothers, Waynesburg, Pa., machinists and blacksmiths, are building an addition to their works, to be used as a warehouse for carrying a larger stock of bar iron for their retail trade.

Preparatory to the building of its new wagon factory the Davenport Wagon Company, Davenport, Iowa, is tearing down old buildings and clearing the site for construction work on the new plant, which will be begun in the spring. The company makes a specialty of all steel farm wagons.

The Old Colony Trust Company's offices in the Ames Building and the office building of the Thorndike Estate, both in Boston, are being equipped with fans manufactured by the Massachusetts Fan Company, Watertown, Mass. All of the fans are to be electrically driven by direct connected motors.

The plant of the American Can Company, Davenport, Iowa, resumed operation in part on January 2 after a several weeks shut down. Additional lines will be put in operation as business demands until the entire factory is again running.

The Harry Brothers Mfg. Company, New Orleans, La., has been incorporated, with a capital stock of $100,000, and has taken over the business and plant of the former company of the same name. The company will continue the manufacture of corrugated galvanized steel cisterns and culverts. T. C. Harry is president; H. C. Harry, vice-president; W. H. Chandler secretary and treasurer, and J. S. Cave, general manager.

The Fire Protection & Equipment Company has been organized at Indianapolis, Ind., for the manufacture of sprinkler equipment, iron doors, wire glass and other fire protection devices. Thornton M. Goodloe, Lemcke Building, is manager.

The American Engineering Company, Indianapolis, Ind., has been reorganized and has been incorporated as the American National Corporation. It has the same officers as the former company, with the exception of the secretary, W. H. Kirshner taking the place of E. W. Barrows. The capital stock of the American Engineering Company was $200,000; the capital stock of the succeeding company is $50,000. The corporation will build electric and interurban lines and audit the accounts and appraise electric and interurban lines. Chas. N. Wilson, New York, heads the new corporation, as he did the old; W. W. Critchlow is vice-president. Other directors are Chas. N. VanCleve and F. S. Hines.

The Krell Auto-Grand Piano Company of America has been organized at Connersville, Ind., with $1,000,000 capital stock, to manufacture an auto-grand piano. Albert Krell, Newcastle, Ind., is president. The company will establish its plant in the buildings formerly used by the Indiana Furniture Company.

Trade Publications.

Fans and Motors.—Diehl Mfg. Company, Elizabethport, N. J. Bulletins as follows: No. 18, direct current electric ceiling fans; No. 19, direct current universal fans, and supplement to No. 19, universal oscillator fans; No. 40, belt fans for sewing machine power tables; No. 54, superseding No. 53, direct current sewing machine motors; No. 55, alternating current sewing machine motors; No. 63, superseding No. 62, motors and exhaust fans; No. 72, superseding No. 71, alternating current desk, ceiling and bracket fans; No. 75, direct current small power motors; No. 101, superseding No. 100, types D and E motors; No. 110, motors for driving sewing machine power tables; No. 111, direct current small printing press motors, and No. 150, types F and FC motors and generators. Price-list No. 219 covers parts of Diehl electric fans listed in bulletins Nos. 18 and 19.

Cupola Record Cards.—B. F. Sturtevant Company, Hyde Park, Mass. Daily cupola record cards for the month of January, 1908, offered for free distribution to foundries interested. Opposite each day are spaces for the quantity of each material charged, the total melt, waste of the sprues, pig bed, average blast pressure in ounces, time the blast went on, time the bottom was dropped, total good castings, and the good castings in the per cent. of melt. The idea is that it will be of value to the foundry to keep a record of the cupola and blower performance. The reverse side of the card shows a sectional view of the Sturtevant high pressure blower, with attention directed to the features of its operation which are of advantage, and also a cross section of a foundry with a Sturtevant high pressure blower installed for furnishing blast to the cupolas.

Electric Winches.—Lidgerwood Mfg. Company, 96 Liberty street, New York City. Bulletin No. 21. Pertains to the Lidgerwood patent slip-drum hauling-in winch for handling heavy car floats at car ferry slips, which was designed for the use of the Pennsylvania Railroad at its yards and docks at Greenville, N. J., and South Brooklyn.

Ventilators.—Howard & Morse, 45 Fulton street, New York City. Catalogue No. 160. Size 6 x 9¼ in.; pages 24. Illustrates and describes the Blackman ventilator for exhaust and low pressure service, giving price-lists of Blackman ventilator wheels, special blades, and fans without frames, and power, volume and dimension tables. Duplex cone fans and Blackman-Solano steam ventilators are similarly dealt with. A long list of installations is appended.

Motors.—Century Electric Company, 404 North Fourth street, St. Louis, Mo. Bulletin No. 8. Relates to the company's single-phase alternating current motors. The various parts are described separately, and illustrations show the different types, including vertical and variable speed motors. Horsepowers, code words, speeds, dimensions, &c., are given in tabular form.

Feed Water Heaters.—Harrison Safety Boiler Works, Philadelphia, Pa. Pamphlet 292. Gives information concerning the heating of boiler feed water where the main engine is run condensing, and the superior economy of steam driven as compared with electrically or mechanically driven auxiliaries, setting forth many advantages which are obtained by using the company's Cochrane heaters. A description is included of two Cochrane horizontal, cylindrical, open feed-water heaters rated at 6000 hp. each for heating boiler feed water in a street railroad power plant.

Emery Wheels and [illegible] Wheel Company, Leeds, Mass. Catalogue No. 45. Size 6 x 9 in.; pages 80. Gives illustrations, specifications and prices of the company's emery wheels and emery wheel machinery, including various types, sizes and grades of every and corundum wheels, and oil and foundry rub stones, bench grinding machines, floor machines, leg machines, bench and floor water tool grinders, surfacer and plain grinders, band wheel and stove plate grinders, disk and cup wheel automatic knife and shear blade grinders, buffing and polishing lathes, strapping machines, countershafts, Turkish emery, diamond tools and Huntington emery wheel dressers.

Seamless Flues.—Detroit Seamless Steel Tubes Company, Detroit, Mich. Circular. Pertains to Detroit seamless locomotive flues, made from cold drawn open hearth steel.

The Iron and Metal Trades

The improvement in the financial situation is reflected by a better feeling in the Iron trade, but as yet there has been little increased buying, except in Pig Iron.

The Cast Iron Pipe manufacturers, East and West, have been buyers on a fairly large scale, one shop in northeastern Ohio taking upward of 10,000 tons and makers in the Philadelphia District contracting for a somewhat larger quantity. It is understood that these sales were below the figures which the majority of the furnaces are quoting, but the principal question, not yet settled, is whether these transactions clean up the Iron available at concessions. The offerings of Southern Iron at $13 for No. 2 Birmingham, do not seem to have ceased entirely. An interesting subject which is now under discussion is the differential between Basic and Bessemer Pig, which affects the Central West more particularly.

Generally speaking, new orders for Finished Iron and Steel are still coming in very slowly, but there is more interest in the markets, and better things are hoped for in the near future.

The Steel Rail business is very light, and contractors for Structural Material are still holding back. In Chicago 2200 tons of bridge material were bought by the St. Paul road, while bids are going in for two bridges at Nashville, calling for 3000 tons. In the Pittsburgh District there may come up in the near future the contract for 16,000 tons for the Pittsburgh & Lake Erie bridge at Beaver, Pa. The Plate mills are only slightly employed, and there is some shading of prices going on.

In the Bar trade the reduction of Iron Bars to the 1.40c., base, Pittsburgh, by Western manufacturers, caused largely by the low prices of Scrap, is creating uneasiness, particularly since even that base price has not been adhered to. The makers of Steel Bars are facing the serious problem of maintaining the present 1.60c. base price in the face of that competition. While Iron and Steel largely occupy distinct fields, so wide a difference must divert some tonnage from Steel to Iron.

The recent reduction in the price of Sheets has led to only moderate increase in the sales, while, on the other hand, bookings in Tin Plate have been better. This is the season in which a considerable number of consumers enter their spring orders, and that they have done again, to a moderate extent.

While prices for Steel Merchant Pipe are being firmly held, there is some shading in Iron Merchant Pipe. It is not likely that a readjustment in prices of Pipe will be undertaken until it becomes clear that there is a good volume of business which may be tempted by a reduction.

The Tin market is firmer, the price having advanced 1c. per pound to 27¾c. Electrolytic Copper, for domestic consumption, is being held at 14c., with a moderate business. Lead is up to 3.75c., New York. The price of Aluminum, which was 36c., has been reduced to 33c. Overproduction is telling in this branch of the metal industry.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Jan. 15, 1908.	Jan. 8, 1908.	Dec. 18, 1907.	Jan. 16, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	$18.25	$18.25	$18.25	$26.50
Foundry No. 2, Southern, Cincinnati	*16.25*	16.25	17.00	26.00
Foundry No. 2, Local, Chicago	*18.00*	18.00	18.25	25.50
Bessemer, Pittsburgh	*18.90*	18.90	19.90	22.85
Gray Forge, Pittsburgh	*16.90*	17.40	18.40	22.35
Lake Superior Charcoal, Chicago	*22.50*	22.50	23.50	27.00
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	29.50
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.50
Open Hearth Billets, Phila	30.00	30.00	30.00	33.00
Wire Rods, Pittsburgh	34.00	34.00	34.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	12.00	12.00	12.00	18.00
Steel Rails, Melting, Phila	11.50	11.50	11.50	19.00
Iron Rails, Chicago	*15.00*	15.00	15.50	27.00
Iron Rails, Philadelphia	*16.50*	16.50	17.50	27.50
Car Wheels, Chicago	*19.00*	19.00	22.00	25.00
Car Wheels, Philadelphia	19.00	19.00	19.00	23.00
Heavy Steel Scrap, Pittsburgh	12.50	....	12.50	18.75
Heavy Steel Scrap, Chicago	*10.75*	10.75	11.50	17.00
Heavy Steel Scrap, Philadelphia	11.50	11.50	11.50	....
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.75	1.75	1.75	1.93½
Common Iron Bars, Chicago	*1.55*	1.75	1.75	1.81½
Common Iron Bars, Pittsburgh	*1.40*	1.60	1.55	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.70	1.70	1.70	1.65
Skelp, Sheared Steel, Pittsburgh	1.80	1.80	1.80	1.70
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	*2.40*	2.40	2.50	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	2.00	2.00	2.00	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	**14.00**	13.87½	13.00	24.75
Electrolytic Copper, New York	**13.87½**	13.75	12.62½	24.50
Spelter, New York	**4.70**	4.40	4.25	6.90
Spelter, St. Louis	**4.60**	4.27½	4.15	6.75
Lead, New York	**3.75**	3.65	3.50	6.30
Lead, St. Louis	**3.60**	3.60	3.35	6.12½
Tin, New York	**27.75**	26.75	26.10	41.30
Antimony, Hallett, New York	**8.75**	8.75	8.50	24.50
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	*$3.89*	$3.89	$4.09	$4.09

Chicago.

FISHER BUILDING, January 15, 1908.—(*By Telegraph.*)

An announcement of importance to the Wire and Nail trade was made on Monday by the American Steel & Wire Company, in which it was stated that the present prices of Wire products were reaffirmed, and that no reduction would be made for the spring trade. This action, while perhaps not in accordance with what was generally expected, will at least have a tenedncy to restore confidence in the general price level of such commodities. Underlying this action was the belief that a reduction of prices at this time would not be effective in bringing out any more business. The only decided change in prices of Finished Material during the week was a reduction of $4 a ton made by the Western mills on Bar Iron, by which the price of 1.55c., Chicago, has been substituted for 1.75c., previously in effect. This change had been strongly foreshadowed by the continued decline of Old Material. The demand for Iron Bars has slightly improved, but Steel Bars are exceedingly quiet. There is not enough tonnage of either coming in to furnish more than intermittent employment for the mills. In Structural Material 2260 tons for railroad bridge work constituted the bulk of business taken by fabricators. Building structure projects, of which there are a few pending involving considerable tonnage, are slow in reaching closure. Railroad requisitions are still being carefully pruned, so that the market has but little support from this source, either for new Rail tonnage or miscellaneous material. The general inactivity of industrial operations is reflected in a greatly diminished demand for Light Rails and prices are

being shaded from $1 to $2 a ton from ruling quotations. The only notable transaction in Cast Iron Pipe is a contract for 3000 tons of Water Pipe for Tucson, Ariz. Not enough tonnage is coming in to keep the Pipe foundries in operation, and in consequence those that are running are piling up more or less stock. There is a little better movement in Pig Iron, but it has not reached significant proportions. Approximately 6000 tons have been placed during the week, in which is included one sale of 2000 tons of Basic to a local consumer. Price conditions have not changed materially, there still being a spread of 50c. a ton or more between the prices nominally quoted by different interests.

Pig Iron.—The principal transaction of the week was a sale of 2000 tons of Basic, which was taken by a local consumer, for delivery within the first quarter. In addition to this there were orders placed aggregating 4000 tons, made up of various lots, which were supplied by Southern furnaces. The fact that practically all of this business covered deliveries extending through the first half would indicate a little stronger feeling of confidence among consumers concerning the future trend of the market. At the same time there continues to be more or less irregularity in prices, especially for immediate or nearby delivery. A number of the large interests are still quoting $13.50, Birmingham, for No. 2 Foundry for first half Iron, and some sales have been made at this figure. On the other hand, Iron continues to be offered at $13, Birmingham, but it is understood that this price is generally regarded as chiefly applicable to deliveries inside the first quarter. It is likely that within the next two weeks the production of Northern Iron will still be further curtailed, as it is probable that the Zenith Furnace will be blown out. This will leave but one furnace, the Iroquois, running exclusively on Merchant Iron, in operation in this district. Consumers of Malleable Bessemer are seemingly not interested even to the extent of keeping in touch with the market through inquiries, and there is nothing doing in this grade. The following prices are for January, February and March delivery, f.o.b. Chicago:

Lake Superior Charcoal	$22.50 to $23.50
Northern Coke Foundry, No. 1	18.50 to 19.00
Northern Coke Foundry, No. 2	18.00 to 18.50
Northern Coke Foundry, No. 3	17.50 to 18.00
Northern Scotch, No. 1	19.00 to 19.50
Southern Coke, No. 1	17.85 to 18.35
Southern Coke, No. 2	17.35 to 17.85
Southern Coke, No. 3	16.85 to 17.35
Southern Coke, No. 4	16.35 to 16.85
Southern Coke, No. 1 Soft	17.85 to 18.35
Southern Coke, No. 2 Soft	17.35 to 17.85
Southern Gray Forge	15.35 to 15.85
Southern Mottled	14.85 to 15.35
Malleable Bessemer	18.50 to 19.00
Standard Bessemer	21.00
Jackson Co. and Kentucky Silvery, 6 %	28.40 to 28.90
Jackson Co. and Kentucky Silvery, 8 %	30.40 to 30.90
Jackson Co. and Kentucky Silvery, 10 %	32.40 to 32.90

(*By Mail.*)

Billets and Rods.—There is practically no business being done in Forging Billets. Quotations continue to be nominally held at $33 to $34, Chicago. There is likewise no movement in Wire Rods, on which $34, Pittsburgh, is also nominally quoted.

Rails and Track Supplies.—None of the looked for tonnage which it was predicted would begin to come out after the turn of the year has yet made its appearance. The Rail mill of the Illinois Steel Company is still running, but unless specifications now in hand are soon reinforced with new offerings they will not suffice to keep it in operation many weeks longer. There is but little tonnage in Light Rails coming out, and quoted prices continue to be shaded from $1 to $2 a ton. Orders for Track Supplies are extremely light in volume, being confined closely to actual present needs. We quote as follows: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.90c. to 2c., according to delivery; Track Bolts, 2.40c. to 2.50c., base, Square Nuts, and 2.55c. to 2.65c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb. sections, $30; 20-lb., $31; 16-lb., $32; 12-lb., $33, f.o.b. mill. Standard Sections, $28, f.o.b. mill, full freight to destination.

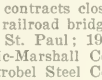
Structural Material.—Among the contracts closed during the week were about 2260 tons of railroad bridge material let by the Chicago, Milwaukee & St. Paul; 1900 tons of this were awarded to the McClintic-Marshall Construction Company, and 360 tons to the Strobel Steel Construction Company. The general contract for the Hotel Anthony, Fort Wayne, Ind., including 600 tons of Structural Material, was let to Henry Hilgermann, a local contractor. It is understood that 445 tons for the Seventh Regiment Armory will be let this week, and bids are being taken on 350 tons for an addition to the Board of Trade Building, Duluth, Minn. A building being constructed by the Meyer & Simon Mfg. Company, Kansas City, Mo., will require 400 tons, on which bids have been made. Inquiries for the week developed but little prospective tonnage. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—New business is limited to emergency orders, which consist almost wholly of small lots required for the completion of work in hand and stock assortments. The large industrial plants using Plates, such as car works and boiler shops, have but little work, either immediate or prospective, and are consequently neither specifying liberally on existing contracts nor are they interested in tonnage for forward requirements. Shipments from store stocks are correspondingly light. Prices are reasonably firm, save for occasional concessions of from $1 to $2 a ton made by some mills from ruling prices on desirable specifications. We quote for shipment from mill as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.20c. to 2.30c.; from 72 to 96 in. wide, 2.30c. to 2.40c.; 3-16 in. up to 60 in. wide, 2.30c. to 2.40c.; 72 in. wide, 2.50c. to 2.65c.; No. 8 up to 60 in. wide, 2.35c. to 2.45c.; Flange and Head quality, 0.25c. extra.

Sheets.—So far the recent reduction of prices has not been followed to an appreciable extent by an increase in tonnage offered. A few more inquiries have been coming in, but they include no large tonnage that would indicate a decided improvement in consumption. Store stocks are moving slowly, buying being for immediate use. There is no disposition in any quarter, as yet, to increase stocks. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 to 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c. Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c. Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—The chief feature of interest centers in the action taken last week by the Bar Iron mills, which resulted in a reduction of $4 a ton on Iron Bars, making the price 1.55c., Chicago. In response to this concession there has been a slight increase in the number of orders received during the week, but in the aggregate the tonnage offered is not sufficient to keep the mills in operation full time. Specifications against contracts for Steel Bars are still being withheld, and there is very little new business being placed. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.55c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Boiler Tubes.—Reflecting the inactivity in boiler construction, Merchant Tubes are moving slowly. There is no buying for anything beyond what is needed for immediate use. Requirements for the replenishment of jobbers' stocks are exceedingly light and the demand for Locomotive Tubes corresponds to the policy of extreme retrenchment now universally enforced by the railroads. Mill quotations for future delivery, on the base sizes, are as follows: 2¾ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2¼ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:



Merchant Pipe.—It is clear from the character of orders being placed that the demand is restricted to requirements for immediate use and stock assortments. The past week has, however, brought out more inquiries and a slightly increased volume of business, but there is no disposition shown by jobbers or consumers to contract ahead. The usual seasonable dullness in trade from store stocks is emphasized by present conditions and under the pressure of competition shipments from stock are being made at prices almost on a level with mill discounts. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago job-

bers quote 72 per cent. on Black Steel Pipe, ¾ to 6 in. About four points advance above these prices is asked for Iron Pipe.

Merchant Steel.—While there has been no notable increase in mill tonnage on specifications, there are indications pointing to a better feeling among consumers, which, it is hoped, will a little later result in distinct improvement. What new business is received is comprised of straggling orders of small tonnage, which add but little to the aggregate. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c.; Iron Finish, 1½ x ¾ in. and larger, 1.78c., base; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1⅛ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 54 per cent. off in car lots; 48 per cent., less than car lots, base territory delivery.

Cast Iron Pipe.—The contract for 3000 tons of 4 to 16 in. Water Pipe for a new conduit system at Tucson, Ariz., was at a reletting held last week awarded to the United States Cast Iron Pipe & Foundry Company. In addition to this, approximately 1000 tons, including the municipal requirements of several small towns, was also closed. The most encouraging feature of the situation is found in an increasing number of inquiries from various sources, which, it is believed, represents needs that will result in purchases a little later on. We quote, per net ton, Chicago, as follows: Water Pipe, 4-in., $32; 6 to 12 in., $31; 16 in. and up, $30, with $1 extra for Gas Pipe.

Old Material.—Consumers are taking very little material of any kind, and notwithstanding the figures offered are not inclined to increase their stocks. It is strictly a traders' market, and transactions of a speculative nature constitute the bulk of the business. Some tonnage of this character moved during the week is reported to have brought prices slightly in advance of current quotations, but there has been practically no change in the actual level of prices. A large portion of the tonnage offered last week by the Santa Fé was disposed of in other markets, and it is believed to have brought close to quoted prices. The Baltimore & Ohio Railroad is this week offering 6700 tons, in which there are 2500 tons of Rerollers and a little more than 1000 tons of No. 1 Wrought. Until there is a better consumptive demand it is difficult to see how there can be a substantial rise in values. We quote per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$15.00 to $15.50
Old Steel Rails, rerolling	12.00 to 12.50
Old Steel Rails, less than 3 ft.	12.00 to 12.50
Relaying Rails, standard sections, subject to inspection	22.00 to 25.00
Old Car Wheels	19.00 to 19.50
Heavy Melting Steel Scrap	10.75 to 11.25
Frogs, Switches and Guards, cut apart	11.00 to 11.50
Mixed Steel	8.50 to 9.00

The following quotations are per net ton:

Iron Fish Plates	$13.00 to $13.50
Low Car Axles	15.50 to 16.00
Steel Car Axles	15.00 to 15.50
No. 1 Railroad Wrought	10.75 to 11.25
No. 2 Railroad Wrought	9.50 to 10.00
Railway Springs	10.00 to 10.50
Locomotive Tires, smooth	15.00 to 15.50
No. 1 Dealers' Forge	8.50 to 9.00
Mixed Bushing	7.50 to 8.00
Iron Axle Turnings	6.75 to 7.25
Soft Steel Axle Turnings	6.75 to 7.25
Machine Shop Turnings	6.75 to 7.25
Cast Borings	4.25 to 5.25
Mixed Borings, &c.	4.75 to 5.25
No. 1 Mill	7.00 to 7.50
No. 2 Mill	6.00 to 6.50
No. 1 Boilers, cut to Sheets and Rings	7.00 to 7.50
No. 1 Cast Scrap	12.75 to 13.25
Stove Plate and Light Cast Scrap	11.50 to 12.00
Railroad Malleable	10.00 to 10.50
Agricultural Malleable	9.00 to 9.50
Pipes and Flues	8.00 to 8.50

Metals.—The market is practically stationary so far as prices are concerned, and beyond a hand to mouth buying in small lots there is no movement in Copper. The number and character of inquiries received give no promise of an impending change in the situation, since users are content to buy in small quantities as the Metal is needed. Other Metals remain unchanged both as to price and demand. Old Metals are dull and inactive. We quote as follows: Casting Copper, 14¼c.; Lake, 14⅜c. to 15c., in car lots for prompt shipment; small lots, ⅛c. to ⅜c. higher; Pig Tin, car lots, 29½c.; small lots, 30½c.; Lead, Desilverized, 4c. to 4.05c., for 50-ton lots; Corroding, 5.15c. to 5.25c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 4.60c.; Cookson's Antimony, 13c., and other grades, 11c. to 11½c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 13½c.; Heavy Copper, 13¼c.; Copper Bottoms, 12c.; Copper Clips, 12c.; Red Brass, 13c.; Yellow Brass, 10½c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 23c.; Block Tin Pipe, 25c.

The Great Western Iron & Metal Company, wholesale dealer in Scrap Iron, formerly at 303 South Halsted street, Chicago, is now located in its new office and yards at 990 to 1001 North Fifty-first avenue.

Philadelphia.

PHILADELPHIA, PA., January 14, 1908.

The Iron and Steel market has been without particular feature. There has been some moderate buying of both crude and finished materials, and the trade on the whole is of the opinion that conditions will continue to improve, in a quiet way, until we have again reached a point where business can go ahead uninterruptedly. The readjustment of prices, in some instances, has had a favorable impression, and while it can scarcely be said that it has resulted in any great activity, neither can it be said to have held up business. Consumers who have but a small volume of business on their books are not likely to buy very extensively at any price, but will continue the policy of purchasing such tonnages only as are necessary for their immediate needs, and if any forward buying is done the practice has been to take only a small proportion of what the estimated requirement for the future will be. General business is beginning to feel the effect of curtailment policies to a greater extent, and it will, no doubt, require some time to get back to anything like normal conditions.

Pig Iron.—Buying continues on a moderate scale, there being no inclination on the part of melters to take any heavy tonnages for forward delivery. The readjustment of prices by practically all of the Eastern producers has been going on in an orderly fashion, and while many of the low quotations made previous to last week have either developed into orders or lapsed, a few still remain open. Sales therefore have been recorded recently at figures which apparently show more or less variation, but this has been almost entirely due to the readjustment policy. Sales of moderate lots of No. 2 X Foundry are noted at $17.90 and $18.25, delivered, the former being the old and the latter the new quotation. Practically all the sellers now hold prices firmly at the new basis and are making sales at those figures. There is also a disposition shown not to accept large tonnages for forward deliveries on this basis, as it is believed that until the market can be more fully tested there will be more or less uncertainty as to the future. Bids at lower figures on the part of buyers are being generally refused by sellers, who consider that, in view of the continued curtailment in production and the cost of manufacture on the present basis, even to-day's prices are too low. At the same time consumers in many instances do not consider present prices excessive, but the tendency on the part of the buyer continues on very conservative lines, and there is no doubt that consumers will hardly be much attracted by price conditions unless there is some material improvement shown in the demand for their various products. Sales during the week have been almost entirely confined to Foundry Irons. There has been some moderate buying of No. 1 X and No. 2 X at the new quotations, $18.75, delivered, for the former, and $18.25, delivered, for the latter. The tonnages, however, have not been large and range from 50 up to 500. Cast Iron Pipe manufacturers are still in the market for Iron for that class of work, but no heavy tonnages have been placed in this territory during the week. A few small lots were sold, however, for early delivery, at figures close to $17.25, delivered. Forge Irons continue inactive. Mills in some cases have not yet resumed, while others are running on restricted output. Under the circumstances, therefore, buyers have not come into the market to any extent. Basic and Low Phosphorous Irons show no movement, melters being pretty well supplied and as a rule have accumulated considerable stocks during the recent depression. Southern Iron is quoted on the basis of $13.50, furnace, for No. 2 X Foundry, but there has been practically no business done in this territory. Prices quoted below are those now named by the majority of Eastern producers for delivery in buyers' yards, Philadelphia and adjoining territory:

No. 2 X Foundry	$18.25 to $18.50
No. 2 Plain	17.75 to 18.00
No. 3 Foundry	17.25 to 17.50
Gray Forge	16.50 to 16.75
Basic	17.25
Low Phosphorus	24.50 to 25.00

Ferromanganese.—Business continues extremely light. Prices are still held at $48 to $49, Baltimore, but it is difficult to say what they would be if there was any demand for a good tonnage.

Steel.—There is absolutely no change in the Steel market. New business is very scarce and mills are putting no tonnage on their books. Plants are still idle, not enough specifications coming out to warrant starting. Prices are nominally unchanged, being still quoted at $30 to $31 for ordinary Rolling Steel and $33 to $35 for Forging Steel. Concessions could be had, however, on orders for round lots.

Plates.—A fair run of small orders, covering immediate needs of consumers, has come out during the week. There is an absence, however, of any large tonnage, and mills are

running at about half their capacity, although orders are expected to develop in the near future on several very fair propositions. Prices of Plates continue to be firmly maintained at the following quotations:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—No material change is to be noted in the demand. The business coming out continues of a miscellaneous character, and mills are fairly well occupied. Some pretty fair business in the way of Bridge Material is expected to come out, however, in the course of a few weeks. There has been no change in the price of Structural Material, the quotations of 1.85c. to 2c., according to specification, being fully maintained.

Bars.—The demand for Iron and Steel Bars is still very poor. Some few inquiries have come out, but the tonnage wanted has been comparatively small, neither consumers nor stores being inclined to buy for forward delivery. Prices are being fairly well maintained, 1.75c. being still quoted for Philadelphia and nearby delivery.

Sheets.—Orders have not been so plentiful during the week, and production at some of the mills has receded, so that plants are running at about 35 to 40 per cent. of their capacity. The outlook is not very encouraging, as consumers are not inclined to place orders for anything more than immediate requirements. Prices have been reduced, and the following quotations are now named for mill shipments in this territory, with a tenth extra for small lots: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.70c.; Nos. 25 to 26, 2.80c.; No. 27, 2.90c.; No. 29, 3c.

Old Material.—There has been practically no change in the market. Buying has been light and prices are largely governed by individual circumstances and are therefore hard to name. Sales of Low Phosphorus Scrap have been reported, however, at higher prices than heretofore quoted. We quote nominally for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory, about as follows:

No. 1 Steel Scrap and Crops	$11.50 to $12.00
Low Phosphorus	18.00 to 18.50
Old Steel Axles	18.00 to 18.50
Old Iron Axles	23.00 to 24.00
Old Iron Rails	16.50 to 17.50
Old Car Wheels	19.00 to 20.00
Choice No. 1 R. R. Wrought	14.00 to 14.50
Machinery Cast	15.50 to 16.00
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	10.50 to 11.00
No. 2 Light Iron	8.00 to 8.50
Wrought Turnings	9.00 to 9.50
Stove Plate	12.50 to 13.00
Cast Borings	7.00 to 7.50
Grate Bars	13.00 to 13.50

Coke.—The market continues quiet. Furnace Coke has been sold for delivery during the first quarter at $2.05, at oven, or $3.90, delivered in this territory, although some producers are holding for $2.25 to $2.50 at oven, but without getting much business. Foundry Coke is dull and is held at $2.50 to $3 at oven, but sales are very light. We quote about the following range of prices for deliveries in the Philadelphia territory:

Connellsville Furnace Coke	$4.15 to $4.65
Foundry Coke	4.65 to 5.15
Mountain Furnace Coke	3.90 to 4.25
Foundry Coke	4.35 to 4.85

Birmingham.

BIRMINGHAM, ALA., January 13, 1908.

Pig Iron.—A definite statement as to the status of the market is difficult to make. The recent inquiries and the sales which resulted have indicated a firmer basis, but the actual transactions recorded fail to materialize the expectation. The schedule of $13.50 on a No. 2 Foundry basis, f.o.b. Birmingham, with a differential of 50c. per ton for lower grades, is being adhered to, and from the nature of quotations it would seem that the market was steady at these figures; yet it is known that a lot of something like 10,000 tons has been divided with the leading interests at figures possibly under $13, and this price has even been done on one or more lots of 200 tons. On the other hand, small lots for immediate shipment have brought $14, f.o.b. Birmingham, and the tonnage sold at $13.50 is very significant, the latest sale reported having been a lot of 1500 tons. A lot of 1000 tons, No. 2 Southern, sold at $13.25. [illegible] delivery, and sales of carload lots have been made at from $13.50 to $14. Gray Forge has been offered at $11.25, but there is apparently a disposition with producers who have any stock of this grade to sell at a greater differential than 50c. per ton on No. 2 quotations. The number of acceptances recently made by wire are considered good indications that prices are becoming more attractive and quotations on advanced deliveries are being made with some reluctance. Shipments against contracts, which were held up early in December, have been resumed in some cases, and indications favor a betterment of conditions in foundry trades. The Water Pipe plants, which are the leading consumers in the district, have resumed operation, and the local melt is considerably above that of some weeks past. Production has also increased, the Ironaton Furnace of the Alabama Consolidated Coal & Iron Company having been put in blast after a suspension of about three weeks. It is also authentically reported that additional capacity of the same concern will be put in operation within the next 30 days.

Cast Iron Pipe.—In view of the fact that lettings of consequence are believed to have been withheld as a result of the unsettled conditions of the Pig Iron market, recent developments in that line are very gratifying to producers, and an early revival of interest in the market is anticipated. The local plants of the United States Cast Iron Pipe & Foundry Company, after an idleness of about two weeks, have resumed operations and production is now close to normal. It is true that orders on the books consist principally of small lots and unfinished contracts, but it is believed that the present prices of raw material would admit of continued operation, even if an accumulation of stock resulted. Prices are nominal, and we quote as follows, per net ton, f.o.b. cars here: 4 to 6 in., $29; 8 to 12 in., $28; over 12-in., average, $26, with $1 per ton extra for Gas Pipe.

Old Material.—The recent inquiries have resulted in practically no sales for future delivery. Sales of carload lots for immediate shipment continue to compose the market, and while the indications are favorable for an increase in the demand later on, there is no evidence offered that any buying of consequence will result in the immediate future. Nominal quotations are as follows, per gross ton, f.o.b cars here:

Old Iron Rails	$22.00 to $22.50
Old Iron Axles	18.50 to 19.00
Old Steel Axles	17.00 to 17.50
Old Car Wheels	20.50 to 21.00
No. 1 Railroad Wrought	17.50 to 18.00
No. 2 Railroad Wrought	13.00 to 13.50
No. 1 Country Wrought	14.50 to 15.00
No. 2 Country Wrought	12.00 to 12.50
Wrought Pipe and Flues	13.50 to 14.00
Railroad Malleable	14.00 to 14.50
No. 1 Steel	13.50 to 14.00
No. 1 Machinery Cast	12.50 to 13.00
Stove Plate and Light Cast	10.00 to 10.50
Cast Borings	6.00 to 6.25

Cincinnati.

CINCINNATI, OHIO, January 15, 1908. (By Telegraph.)

Under the stimulus of reports from the Pig Iron offices which indicate a steady increase in inquiry on Iron for the first quarter and half, melters and the users of castings take a little more hopeful view of the situation. The week opened with marked activity among sellers, with inquiries principally from makers of Pipe, manufacturers of agricultural implements and malleable parts. Among the jobbing foundries there is still marked inactivity, and the local melt through this channel is not expected to improve much before March or April, while the sudden and coincidental wakefulness of Pipe makers, implement manufacturers and the like in the northern section of the Middle States shows a general bareness of yards and a belief that the minimum in costs has been reached, all of which in turn pleases the tool maker, for he knows his turn will come next. It is believed that restriction in manufacture has about reached its limit, both with the Iron makers and the tool producer, borne out by results of an excursion into northern Ohio on a big inquiry, told further on, and the attitude of some local manufacturers who are working their forces on machines for the stockroom.

Pig Iron.—A sphinx-like mystery has surrounded negotiations in the first good inquiry of the week coming from a Pipe maker in northeastern Ohio, whose requirements have footed up 13,500 tons of Nos. 2, 3 and 4 Foundry for February, March and April delivery. About 11 representatives spent considerable eloquence and submitted figures during Monday with apparently no result so far as those on the ground were concerned, the announcement being made that 10,800 tons had been negotiated privately at a price less than those in evidence, which were on a basis of about $13, Birmingham, for Southern and $16.50 at furnace for Northern. Later reports were to the effect that no sale had been made, and some representatives are still on the ground at this hour. The positive statement that the Cleveland interest usually concerned in sales to this melter had withdrawn from the contest contributed additional mystery. A

later rumor had it that the sale has been made, divided equally between Northern and Southern on a basis of $16 and $12.50 at furnace, which would make the Iron delivered figure at $16.90 and $16.85, respectively. Another good sale of the day which is to be accredited to the Eastern offices of a leading local interest is that of between 15,000 and 20,000 tons of Southern to anayize equal to Nos. 2, 3 and 4 Foundry on 90 day delivery, taking the product of a furnace, and on a basis of $13, Birmingham delivery, to commence approximately at once. Along with these reports of close figuring comes the emphatic declaration of certain furnace representatives that $13.50 is the very best figure for Southern No. 2 for first quarter and half, and that no business would be accepted at that figure for second half alone. There appears to have been a weakening in the Hanging Rock District, and it is generally conceded that $16.50 may be done on any fair sized tonnage for spot delivery and first quarter. An inquiry from a northern Ohio malleable concern calls for 2000 tons first quarter; two from agricultural implement makers in the Chicago District ask for 2500 tons of Foundry; one Michigan manufacturer of implements is in the market for 1200 tons, equally divided between Northern and Southern No. 2 Foundry, first quarter and half; a Michigan stove manufacturer asks for prices on 2000 tons of Southern No. 2 for the last half; an inquiry from a northern Indiana concern asks for prices on 450 tons of Southern and 300 Northern for the second and third quarters. Local melters have just began to feel the market, and inquiries aggregate about 2000 tons for early deliveries. For prompt shipment and balance of first quarter we quote f.o.b. Cincinnati, as follows, freight rates from Birmingham being $3.25 and from the Hanging Rock District $1.20:

Southern Coke, No. 1	$16.75 to $17.25
Southern Coke, No. 2	16.25 to 16.75
Southern Coke, No. 3	15.75 to 16.25
Southern Coke, No. 4	15.25 to 15.75
Southern Coke, No. 1 Soft	16.75 to 17.25
Southern Coke, No. 2 Soft	16.25 to 16.75
Southern Coke, Gray Forge	14.75 to 15.25
Southern Coke, Mottled	14.25 to 14.75
Ohio Silvery, 8 per cent. Silicon	23.20 to 23.70
Lake Superior Coke, No. 1	18.20 to 18.70
Lake Superior Coke, No. 2	17.70 to 18.20
Lake Superior Coke, No. 3	17.20 to 17.70

Car Wheel Irons.

Standard Southern Wheel	$25.75 to $26.25
Lake Superior Car Wheel	26.50 to 27.00

(*By Mail.*)

Coke.—A little better feeling may be noted in this market, but the announced reduction of wages by independent producers, affecting large shipments in the Pittsburgh and Eastern markets, has had little effect here. There is but little Foundry Coke going, and practically no furnace grades, and what buying there is is still of the hand-to-mouth order. Inquiries cover the first half, and some sales of spot Connellsville Foundry Coke have been made at between $2.75 and $3, at oven. Connellsville Foundry is quotable at $2.50 to $2.75, at oven; Furnace, $2.10 to $2.25; Standard Virginia Foundry, $2.25 to $2.40; Furnace, $2 to $2.15. New River Foundry grades are quoted at $2.69 to $2.75, with no demand for Furnace.

Old Material.—Offerings from the railroads and other sources are light, and sales to consumers are lighter. Local Scrap yards are bursting with stocks, which have been accumulating during the extremely low market, and dealers are now close observers of the money situation and evidences of expansion and resumption in mills and foundries which will start inquiries for Melting Scrap and other material needed in building and trade reorganization. It is felt that this market has about reached the bottom, and that February 1 should bring some inquiries for good sized tonnages. Under the existing apathetic conditions the following prices are given as the most reliable obtainable, and are f.o.b. Cincinnati:

No. 1 R. R. Wrought, net ton	$10.00 to $11.00
Cast Borings, net ton	4.00 to 4.50
Steel Turnings, net ton	5.50 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought, net ton	7.00 to 8.00
Old Iron Axles, net ton	14.50 to 15.50
Old Iron Rails, gross ton	14.50 to 15.50
Old Steel Rails, long, gross ton	10.00 to 11.00
Relaying Rails, 56 lb. and up, gross ton	22.00 to 23.00
Old Car Wheels, gross ton	16.00 to 17.00
Low Phosphorus Scrap, gross ton	13.50 to 14.50

Finished Iron and Steel.—Prices are well maintained, but business is quiet, with the sales agencies who do not anticipate any change before February 1, if then. Rumored pending reductions on Steel Bars are pronounced by agents of leading interests as without foundation, and officials say no change is contemplated. Dealers quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.75c., with half extras; small lots from store, 1.90c., base, one-half extras. Steel Bars, carload lots, 1.75c., base, half extras; small lots from store, 1.90c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c. Blue Annealed Sheets (heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c.; No. 14, carload lots, 2.05c.; small lots from store, 2.40c.; No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.25c.; No. 12, carload lots 2c.; small lots from store, 2.35c. Sheets (light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Tin Plate, 100-lb. basis, 112 sheets, 14 x 20, 3.70c., Pittsburgh. Steel Tire, 4-in. or heavier, carload lots, 1.95c., base. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Pittsburgh.

PARK BUILDING, January 15, 1908.—(*By Telegraph.*)

Pig Iron.—Of the 19 merchant blast furnaces in the two valleys only 6 are active, namely, one Shenango, Girard, Ohio Iron & Steel, Brier Hill, Sharpsville and Youngstown Steel Company. It is probable that in the next week or two the Brier Hill, Ohio Iron & Steel and Sharpsville will go out. Sales of Pig Iron are very few and only small lots for actual needs. Reports are current of excessively low prices being made on Bessemer, Basic and Foundry Iron, but it is thought that most of these low prices emanate from dealers, as some of the furnaces that are out of blast absolutely refuse to quote. Bessemer Iron is nominally $18, Valley furnace, or $18.90, Pittsburgh, but none seems to be wanted even at this low price. Northern No. 2 Foundry is offered down to $16.50, Valley furnace, with reports that lower prices have been named. Basic Iron is held at about $17, Valley furnace, but lower quotations have been made, presumably by dealers. There is no demand for Forge Iron and it has been offered as low as $16, Valley furnace, or $16.90, Pittsburgh. A meeting of the blast furnace interests of the two valleys will be held in Youngstown January 21, at which labor matters will be taken up, and it is probable that a general reduction in wages will be made.

Steel.—The market is absolutely stagnant as regards sales, and we repeat $28, Pittsburgh, as the nominal quotation on Bessemer and Open Hearth Billets, and $29 on Sheet and Tin Bars. It is stated that Steel is being offered from some sources at lower prices, but this is not verified.

(*By Mail.*)

On nearly all lines of Finished Iron and Steel, specifications against contracts, while still calling for small lots, are somewhat better, and in some cases new business is showing an increase. It is the unanimous opinion that the crisis has been passed, and that recovery while slow will be steady. Last week many large employers of labor paid their men in all cash, for the first time since October. The daily press, however, continues to print reports of the starting up of idle plants which are largely untrue and misleading. The restriction of production of Pig Iron and Steel has possibly reached its minimum. The reduction in prices of Sheets and Tin Plates has stimulated demand to a slight extent and some of the idle mills are gradually being started. This has led to a better demand for Sheet and Tin Bars. Next week the Ohio Works of the Carnegie Steel Company will be started up on Sheet Bars and Billets, to a little more than 50 per cent. capacity, the Billets to be shipped to the American Steel & Wire Company at Newburg, while the larger part of the output of Sheet and Tin Bars will go to the New Castle mills of the American Sheet & Tin Plate Company. The Columbus, Mingo Junction, Bellaire, North Sharon and Donora works of the Carnegie Company are still idle, and may not resume for some time. Its Duquesne, Clairton, Shenango and South Sharon works are being operated to about 50 per cent. capacity. The Bessemer department at the Homestead Works is idle, while the Jones & Laughlin Steel Company is operating its Bessemer plant to about 50 per cent. capacity. The Bessemer plants of the Republic Iron & Steel Company and Youngstown Sheet & Tube Company are on this week. Low prices continue to be made on Coke. The feeling in the Scrap market is a little better, and it is believed that prices have about reached bottom.

Ferromanganese.—We note a sale of about 50 tons of foreign 80 per cent. to a local consumer on the basis of about $48.50, Pittsburgh. We quote the market on foreign 80 per cent. at $48.50 to $49, Pittsburgh.

Muck Bar.—In the absence of sales, we quote best grades of Muck Bar, made from all Pig Iron, at, nominally, $28 to $29, Pittsburgh.

Wire Rods.—With no new demand, we quote Bessemer and Open Hearth Rods nominally at $34, Pittsburgh. If any business was offering probably a lower price would be named.

Steel Rails.—None of the large roads has yet come in the market, so that new business in Standard Sections is still very small, the Carnegie Steel Company having taken only about 1000 tons last week. The demand for Light

Rails is fairly active, the Carnegie Company having booked in the past week about 1500 tons. It shipped out in December about 3500 tons of Light Rails, which is a good record when conditions are considered. Regular prices on Light Rails, which are still being shaded about $2 a ton by the mills that reroll Rails, are as follows: 25 to 45 lb., $30; 20-lb., $31; 16-lb., $32; 12-lb., $34; 10-lb., $36, and 8-lb., $40. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—New orders are for small lots only, and specifications against contracts are not satisfactory. Some of the larger mills are operating to 50 per cent. or less, and unless the demand soon improves will be running to lighter capacity before long. In some cases prices are being shaded by a few mills $1 to $2 a ton, regular quotations being as follows: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell grade of steel is abandoned.

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—There is almost an entire absence of new bridge work, and no large buildings are under way in this district. The largest work in sight, and which will likely come up soon, is the Pittsburgh & Lake Erie Railroad bridge at Beaver, which, if put through, will take about 16,000 tons. None of the Structural mills is operating to more than 50 per cent. capacity, and some are running much lighter. There is no trouble whatever in getting prompt deliveries. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—The recent reduction in prices has stimulated demand to some extent. The American Sheet & Tin Plate Company has started up some of its Sheet mills that were idle, the Follansbee Brothers Company's works at Follansbee, W. Va., is on full this week, with fair prospects, and some of the other independent Sheet mills are operating more steadily, while still others are getting ready to start up to partial capacity. Regular prices are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets $1.75 per square and Galvanized Roofing Sheets, No. 28, $3.10 per square for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—The demand has already shown betterment as a result of the recent price reduction, and the percentage of active capacity among the Tin Plate mills is larger now than on January 1. The Shenango Works of the American Sheet & Tin Plate Company at New Castle, which has 30 hot mills, will be on full this week, after being closed for some months. The New Castle Works is expected to be soon running full, and some of the independent Tin Plate concerns are running to larger capacity than two weeks ago. We quote at $3.70 for 100 lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Iron and Steel Bars.—The action of the Western Bar Iron mills in reducing prices on Iron Bars to the basis of 1.40c., Pittsburgh, for Western shipment, will not affect prices on Steel Bars for the present at least. Many in the trade believe that the reduction in prices of Iron Bars at this time was a mistake. It is feared that it will not stimulate demand for the present at least, but may have the opposite effect of making customers hold off in the hope of still lower prices. New demand for both Iron and Steel Bars is very light, and specifications against contracts are coming in sparingly. None of the Bar mills is operating to full time, some being closed entirely, while others are running to one-third capacity, or even less. We quote Steel Bars at 1.60c. and Iron Bars at 1.40c., Pittsburgh, for Western shipment, and 1.55c. for delivery in the Pittsburgh District.

Spelter.—The recent reduction in prices of Galvanized Sheets is expected to lead to a better demand for Spelter. For this reason the market is firmer, prime grades of Western Spelter being held at about 4.15c., St. Louis, equal to 4.27½c., Pittsburgh.

Hoops and Bands.—There is no new business of any moment. Consumers are specifying only for such tonnage as they absolutely need. Quotations are nominally unchanged.

Spikes.—The mills making Spikes are practically without business and are either closed entirely or running to half capacity or less. We quote Railroad Spikes at $1.85 to $1.90, and smaller sizes at $1.95 to $2 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—New business is stagnant, the implement makers specifying for very small lots for actual needs. In Shafting the demand is lifeless, and it is stated that official discounts are being more or less shaded. Nominal quotations in the absence of business are as follows: Cold Rolled Shafting at 54 per cent. off in large lots and 48 per cent. off in carload lots, delivered in base territory; Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades, and 10c. and upward for special grades.

Merchant Pipe.—The subcommittee on Pipe and Tubular Products met in this city yesterday, and it was decided to make no change in prices for the present. Specifications against contracts, while still calling for small lots, are coming in a little better, and new demand is also reported as showing some improvement. New tonnage and specifications at present represent about 30 per cent. of the capacity of the leading mills. Prices on Steel Pipe are firm and unchanged, but on Iron Pipe continue to be more or less shaded. The net discount on Steel Pipe to the large trade on ¾ to 6 in. is 74 and 5 per cent. off list, while on Iron Pipe, ¾ to 2 in., 71 and 5 per cent., and over 2 to 6 in., 70 and 5 per cent. are quoted. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black. %	Galv. %
⅛ to ¼ in.	65	49
⅜ in.	67	53
½ in.	69	57
¾ to 6 in.	73	63
7 to 12 in.	70	55
Extra strong, plain ends:		
⅛ to ¾ in.	58	46
½ to 4 in.	65	53
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

To the large trade all above discounts are subject to 1 point on the base, and 5 per cent. on the net.

Boiler Tubes.—New business is still very light, and on Railroad Tubes is practically stagnant. Discounts on Merchant Tubes are more or less shaded and are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in.	42	47
1¾ to 2¼ in.	42	59
2½ in.	47	61
2¾ to 3 in.	52	65
3½ to 4½ in.	52	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Iron and Steel Scrap.—For the first time in three months or more we can report a slightly better feeling in the Scrap trade. While the demand is still from hand to mouth, and only for small lots, it is believed that prices have about reached bottom. It may be noted that prices on Scrap are lower in proportion than on any other crude materials. Dealers quote about as follows: Heavy Steel Scrap, for Pittsburgh, Steubenville or Sharon delivery, $12.50 to $13; No. 1 Cast Scrap, $14.50; Cast Iron Borings, $12.50 to $13; No. 1 Busheling Scrap, $12.50; No. 2, $9.50 to $10; Low Phosphorus Melting Stock, $16.50 to $17; Rerolling Rails, $12.50 to $13; No. 1 Busheling Scrap, $12.50; No. 2, $9.50 to $10; Old Steel Rails, short pieces for Open Hearth use, $12.50 to $13; Steel Axles, $16 to $16.50; Standard Sheet Bar Crop Ends, $15 to $15.50; Grate Bars, $11.50 to $12; Iron Axles, $21.50. All these prices are per gross ton, f.o.b., Pittsburgh, unless otherwise stated.

Coke.—Negotiations are under way between furnaces and Coke producers on contracts for first half of the year, but so far very little tonnage has been closed. Standard Connellsville Furnace Coke on contracts is held at $2 to $2.10, but is stated that in some cases $1.90, at oven, has been

named. Standard Connellsville 72-hr. Foundry Coke on contracts is held at $2.40 to $2.50, at oven, but other grades of Furnace and Foundry Coke made outside the Connellsville region are offered at somewhat lower prices. The output of Coke in the Upper and Lower Connellsville regions is running somewhat under 100,000 tons per week.

The offices of Max Solomon, dealer in Iron and Steel Scrap, have been removed from room 1209 to rooms 1204-05 Park Building, Pittsburgh.

Cleveland.

CLEVELAND, OHIO, January 14, 1908.—(*By Telegraph.*)

The Massillon Iron & Steel Company, Massillon, Ohio, closed contracts to-day for 13,500 tons of Foundry Iron for first half delivery. The company refused to state whether it bought Northern or Southern Iron, or to give the price, but a local furnace company that asked $17 was told that it got none of the contract because its price was much too high. The manager of the company says that he had bought all of the cheap Iron available and that he is surprised at the firmness of the market.

(*By Mail.*)

Iron Ore.—As a result of the curtailment of Ore consumption, due to the shutting down of blast furnaces during the past two months, shippers estimate that if the furnaces should start up to-day and produce the normal output of Pig Iron, there would be enough Ore in the furnace yards and on the docks to last until August 1. Last year, at the opening of navigation, there was very little of the previous season's Ore left on the docks. Under the circumstances it is not surprising that furnacemen are taking no interest in this year's Ore, and it is doubtful if any buying movement starts until well along in the spring. The first chartering for the coming season has been done by a Tonawanda shipper, who has contracted for carrying a small block of Ore from Escanaba to Tonawanda at 75c., the same rate that prevailed last year. The leading shippers, however, are not expected to close freight contracts for some time. Ore piles still remain untouched on the docks, practically no shipping orders coming from the furnaces. Nominal prices remain as follows at Lake Erie docks, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.25; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—There is an increase in inquiries for Northern Foundry Iron for first half delivery, but consumers who seem ready to buy are slow about placing contracts. While No. 2 Foundry is claimed to be held at $17, Valley furnace, for first quarter and first half, the sale of some No. 2 is reported as low as $16.50. One furnace interest reports sales during the week of 1500 to 2000 tons of No. 2 at prices ranging from $16.90 to $17.25, Toledo, for first half delivery. Outside of these sales very little tonnage was contracted for during the week. Local furnaces quote No. 2 at $17 for outside shipment and $17.25 to $17.75 delivered here for prompt shipment and first half. There is some improvement in the inquiry for Southern Iron, and a few sales are reported in small lots at $13.50, Birmingham, for the first quarter. Inquiries made recently for Basic Iron have not resulted in any sales, and are believed to have been made for the purpose of testing the market. Quotations for prompt shipment, first quarter and first half, f.o.b. Cleveland, are as follows:

Bessemer	$19.40
Northern Foundry, No. 1	$17.50 to 18.00
Northern Foundry, No. 2	17.00 to 17.50
Northern Foundry, No. 3	16.50 to 17.00
Southern Foundry, No. 2	17.35 to 17.85
Gray Forge	17.25

Coke.—The market continues quiet, there being little inquiry for either Furnace or Foundry grades. We quote Connellsville Furnace Coke at $2 to $2.25, at oven. Connellsville 72-hr. Foundry Coke is being quoted at $2.75 to $3 at oven.

Finished Iron and Steel.—While the volume of new business and specifications on contracts is still light, a few of the mills and jobbers note a slight improvement. The local district sales agent of one mill has closed a contract with a Structural shop for 2000 tons of Plates, Shapes and Bars, and received specifications on contract for seven carloads of Plates for tank work. Following the action of the Western Bar Iron Association, local mills have made a reduction of $4 a ton on Iron Bars. The reduction has resulted in the placing of some new Bar contracts, but local mills that shut down before the holidays have not started up yet. While the price of Steel Bars is still firm, some consumers believe that independent mills will not be willing to permit the Bar Iron mills to divert business from them through the reduction in price and will follow shortly with a reduction in the price of Steel Bars. The local trade has received notification that the subsidiaries of the Steel Corporation have reaffirmed prices on Steel Bars, Shapes, Plates, Tubes and Wire products for the spring trade. The leading interest is not urging consumers to make new contracts, advising them to place orders only for their immediate needs. Local mills are quoting Iron Bars on the basis of 1.40c., Pittsburgh, or 1.50c., Cleveland. We quote Steel Bars at 1.70c., Cleveland, for carload lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼ in. and heavier, 1.80c., base, Cleveland. Mill prices on Sheets, carload lots, Cleveland, are as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Jobbers' prices are unchanged, except on Iron Bars. We quote Steel Bars, out of stock, at 1.90c. to 1.95c., and Iron Bars at 1.80c. Beams and Channels out of stock are 2.10c. to 2.15c., base. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.20c.; Box Annealed, No. 28, 2.90c.; Galvanized, 4.05c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—The local mills are still shut down and are not in the market for any Scrap. There are some inquiries from foundries that appear disposed to accumulate a stock of low priced Scrap, but buyers and sellers are so far apart on prices that no sales are reported. The reduction in the price of Bar Iron, it is believed, will result in a little more activity in the Scrap market, although with the present price of Bars better Scrap prices are not expected. There is a fair demand for Busheling, and its price is a little firmer. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are nominally as follows:

Old Steel Rails	$11.50 to $12.00
Old Iron Rails	16.00 to 17.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	16.00 to 17.00
Relaying Rails, 50 lb. and over	25.50 to 26.00
Relaying Rails, under 50 lb.	28.00 to 29.00
Heavy Melting Steel	11.50 to 12.00
Railroad Malleable	12.00 to 13.00
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	9.00 to 10.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$17.00 to $18.00
Cast Borings	4.50 to 5.00
Iron and Steel Turnings and Drillings	7.00 to 8.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	11.50 to 12.00
No. 1 Railroad Wrought	11.00 to 12.00
No. 1 Cast	12.00 to 13.00
Stove Plate	10.50 to 11.00
Bundled Tin Scrap	9.00

San Francisco.

SAN FRANCISCO, CAL., January 8, 1908.

The new year has opened rather auspiciously, considering what has transpired during the past three months. A number of large Steel frame structures are being erected in this city which are larger than anything that has been built here since the fire. There is enough clear weather between rainstorms to permit of good progress being made on Steel work. Fortunately for the building situation, the threatened trouble between the various unions was prevented from going too far. The warring unions returned to work after a few days, pending a final settlement of the questions at issue.

Structural Material.—Shipments of Fabricated Steel for structural purposes are coming through in good time, the falling off in many lines of freight having prevented a car shortage such as caused vexatious delays on goods in transit last winter and spring. The erection of Steel for the new Palace Hotel on the immense site formerly covered by the old one was commenced January 7, and an effort will be made to complete the work in record time. The contract for the 1700 tons of Structural Steel required for the new Academy of Sciences Building was recently awarded to Milliken Brothers, Ltd. The demand or steel frame office buildings has almost been supplied, and there will soon be enough hotels here for the present population. Under the new city administration, which took entire charge of municipal affairs this week, confidence will be restored. With an honest city government thousands of additional citizens will be attracted, and many new buildings will have to be erected in consequence.

Cast Iron Pipe.—There is not much immediate demand for Cast Iron Pipe on this coast and no large contracts have been closed recently, but a great deal of business is expected during the year from municipalities and water companies. A strong effort is to be made to have the Transcontinental Association change the differential, so that Cast Pipe will have a more equitable freight rate per foot to the Pacific Coast. It is asserted by the interested persons that on account of the great difference in the weight of Cast Iron and Steel Pipe foot for foot the latter has the advantage on the Pacific Coast. The Transcontinental Association will hear both sides of the question soon in Chicago. The United States Cast Iron Pipe & Foundry Company was the lowest bidder on a small contract for 8 and 12 in. Cast Iron Pipe for the use of the municipal water system of the town of

Oceanside, Cal. The recent drop of $1.75 in the price of Cast Iron Pipe in Cincinnati makes the Pacific Coast prices about as follows, f.o.b. cars San Francisco and other terminal points: 4-in., $28 to $29; 6-in., $27 to $28; 12-in., $26.50 to $27.50.

Merchant Pipe.—The demand for Merchant Pipe has not improved since the last report. Jobbers' stocks are sufficient for present needs. Discounts on Steel Pipe are about as follows, on jobbers' carloads:

	Steel. Black.	Galv.
	%	%
⅛ to ¼ in.	58.5	42.5
⅜ in.	60.5	46.5
½ in.	62.5	50.5
¾ to 6 in.	66.5	56.5
7 to 12 in.	63.5	48.5
Extra strong, plain ends:		
⅛ to ⅜ in.	51.5	39.5
½ to 4 in.	58.5	46.5
4½ to 8 in.	54.5	42.5
Double extra strong, plain ends:		
½ to 8 in.	47.5	36.5

Oil Well Supplies.—While it cannot be said that there has yet been a decided increase in the jobbing demand for Oil Casings, Well Tools, and general Oil Well Supplies, things are looking up in the principal Oil districts of California, owing to the growing evidence that the present consumption of Oil considerably exceeds the rate of production on the Pacific Coast. The increase in the price of Oil has stimulated the drilling of wells, and several new companies have been incorporated in California. Prices will undoubtedly go considerably higher, and after a little time there must be quite an improvement in the demand for Oil Well Supplies of all kinds. The Oil Well Supply Company, Pittsburgh, Pa., has leased for a long term of years the Griffith mill site on North Main street, in Los Angeles. It has been given out that this company purposes to expend $250,000 in building and equipping a factory, but this is untrue.

Pig Iron.—There has been little change in the situation since the last report. Foundries, however, cannot put off purchasing largely much longer and there should be a better movement in Pig Iron before long. Some large orders for castings have been placed with local plants and others are expected as business revives. Several shipments of English Pig Iron have arrived by sea sonce the beginning of December, aggregating 9393 tons. The market is rather weak at unchanged prices. A shipment of 1000 tons of Chinese Pig Iron, made at Hankow, China, is due here within the next two weeks. The Asiatic product seems to be gradually growing in favor here, and as but little of the United States product can be used on account of high rail freights it seems to be a question of choosing between British and Oriental Pig Iron.

The total estimated valuation of San Francisco buildings for which permits were issued in the month of December was $4,140,000. This increase of almost $2,000,000 over November did not indicate improvement in building activities, but was accounted for by the filing of permits for two very large structures. The total amount of building work undertaken in 1907 was $52,292,000, as compared with about $39,000,000 for 1906. The permits issued in April of last year exceeded in total valuation those of any other month since the reconstruction of San Francisco commenced. The total amount expended in rebuilding the city since the fire of April 18, 1906, is $85,070,000. More than one-fourth of the 28,000 buildings destroyed have been replaced, and at least 1000 more are in course of construction.

The building statistics of Los Angeles, Cal., show a falling off in the number and valuation of buildings for which permits were issued last year, as compared with 1906 and 1905. The total valuation in 1907 was $13,851,154 and in 1906 was $18,502,446. The total building permit valuation for December, 1907, was $371,432.

The Arthur Koppel Company has been awarded a contract by the Los Angeles Water Commission for 30 Steel cars of special design and a large quantity of Light Rails for use on the aqueduct, which is to be constructed in connection with the extension of the water system.

The Union Iron Works, which closed during the Christmas holidays, reopened January 6, giving employment to more than 2000 men. J. J. Tynan is now superintendent of the plant, which is constructing several steamers. Many changes have taken place during the past year in the various departments. A great deal of repair work on the vessels of the coming battle ship squadron is expected.

The Fulton Iron Works has placed 200 additional men on its pay roll, owing to its increased business. This company has just received a large order for mining machinery for Alaska, requiring 60 tons of castings. Other orders have been received from mines in Alaska and California.

The Standard Steel Works, recently formed by the Baldwin Locomotive Works to operate the steel plant at Burnham, Pa., has increased its capital stock to $3,000,000. The bonded debt has been made $5,000,000.

The German Iron Market.

BERLIN, December 29, 1907.

Price reductions have ruled in all departments of the trade. There is probably no line of goods, except finished machinery castings, that has not been reduced since the end of October. The Steel Syndicate held out longest against granting lower prices. It has made a cut of 10 marks on material to be used in manufacturing goods for export, but when the manufacturers of Sheets and Bars complained that this cut was not big enough a further reduction of 5 marks was made in the first week of this month. At the same time a reduction of 10 marks on Structural Shapes and on half-rolled Steel for further manufacture was voted, this being the first concession the syndicate has made on home prices. But this was not all: the association followed this about the middle of the month with a reduction of 5 marks on small lots of Steel Rails and Ties for the home market and 10 marks for export. This latter step is all the more noteworthy in view of the fact that Steel Rails remain the most active feature of the market, there being still very large orders on hand, both for home and for foreign account. Some of the new prices are as follows: Ingots, 87.50 marks; Blooms, 92.50; Billets, 100; Puddled Bars, 102.50—all of soft (Thomas) Steel. The price of Beams is 122 to 125 marks.

The new prices of half-rolled material have not satisfied the rolling mills dependent upon the syndicate for their supplies of Steel. Especially are the mills running on Bars and Sheets discontented. A manufacturer of Bars has pointed out that he can only operate his rolls at a loss under present conditions. The price of Bars, he says, averages about 108 marks, while other authorities claim that German manufacturers are actually offering Bars abroad at less than 100 marks. But at the former price he claims that there is a loss of about 10 marks a ton on the Billets used in manufacturing a ton of Bars. Also in the case of Sheets, there is great dissatisfaction. The association of manufacturers of this specialty recently passed a resolution expressing disapproval of the price reduction made by the syndicate, and declaring a further reduction of 10 marks on Steel material to be necessary.

The syndicate's shipments for November show some interesting changes. The sales of structural forms reached only 85,000 tons, which is the lightest movement for any month since February, 1905, when the trade was injuriously affected by a huge strike of coal miners. The movement in October had been nearly 130,000 tons, and in November, 1906, it was 151,300 tons. These figures strikingly illustrate the restricted business in building this winter; and it is highly probable, in view of the dearness of money that building operations will remain light for some considerable time. The shipments of half-rolled material were also the lightest for about four years. They amounted to 115,900 tons, as compared with 150,000 tons last year, and 173,000 tons in 1905. On the other hand, more Steel Rails and Ties were shipped in November than ever before, the total reaching 222,000 tons, as against 181,000 tons in 1906, and 145,700 tons in 1905. This is the one section of the market where orders remain satisfactory.

The Pig Iron Trade.

The situation of Pig Iron had remained relatively strong till about a month ago. The highest output for any month in the history of the German Iron trade was reached in October, when 1,138,676 metric tons were produced. The November figures were 1,112,225 tons, which means a gain of some 300 tons per day over October. The year's production will probably reach a total of 13,050,000 tons, as compared with 12,478,067 tons for 1906.

It is probable that the December output will show a somewhat reduced rate of production, inasmuch as several furnaces have been reported as blown out since the beginning of the month. It is also expected that a further slowing up will continue for some time, since the furnace owners have no disposition to accumulate stocks at a moment when money is so extremely dear. For this latter reason furnaces will probably be blown out as fast as orders become exhausted. The building of new furnaces will also be curtailed or stopped entirely. Already the case has been reported of Lorraine concern, Sambre et Moselle, which had broken ground for two new furnaces, but has recently suspended work on them.

Prices of Pig have been further reduced within a month. The Luxemburg Syndicate, which supplies most of the Foundry Iron for the western part of the country, reduced its price to 54 marks in the second week of the month, in order to meet the competition of a large wholesale firm which, as was claimed, was selling Iron at a very low price for account of two or three of the great companies in the Rhenish-Westphalian region. It has been also reported in the press that even so low a price as 52 marks has been conceded in some cases. Under these circumstances the Luxemburg Syndicate is securing very few orders, inasmuch as consumers look for still further reductions. The Duesseldorf Syndicate, which includes the furnaces of the Rhine Province and Westphalia, has recently given out reduced prices for

the first half of 1908. Hematite was fixed at 83 marks, No. 1 Foundry at 79 and No. 3 at 71 marks. Puddling Iron was fixed at 74 and Steel making grades at 76 marks for the first quarter of the new year. The Siegerland Syndicate also recently knocked off 5 marks on Spiegeleisen. This syndicate has decided to restrict its production of Pig Iron by 25 per cent. from January 1. This is the first organized action looking toward reducing production. It should be added, however, that the output of the Siegen furnaces represents a comparatively small part of the Iron production of the empire.

Improvement in Some Finished Lines.

Quite recently some indications of an improvement have been reported in certain lines of goods. This is particularly the case with Bars. The low prices for this specialty, 145 to 150 marks, have brought finally an increased buying demand. Foreign orders in particular have been on a more liberal scale for a few weeks. Japan and India are mentioned as larger takers. Some of the works report that the increase of new business in Bars has been so good that they now have work enough for their rolls for several months ahead. Sheet mills are also doing a better foreign business.

The steadiness in the prices of Castings was mentioned above. About 10 days ago several of the organizations of foundrymen met and decided to make no reduction in view of the high costs of Coal and Iron, together with the high wages now paid for labor. The foundries still have a great deal of work coming in from the machine shops and electrical companies, and the outlook for the future is by no means bad. The Prussian railroad authorities have recently ordered 710 locomotives, 2100 passenger and baggage cars and 14,160 freight cars, to be delivered by October 1, while about 680 locomotives and 16,000 cars remain to be ordered. The orders aggregate fully $100,000,000, and they will keep the shops busy for a long time. Besides this, the railroads of several of the South German States have recently placed good orders for rolling stock, the amount of which has not yet been stated.

The Ore Trade.

The Siegerland Ore Syndicate has recently reduced the price of brown Iron Ore for the first half of 1908, and it is said that it has already sold out its entire output of roasted Ores for that period. The cut on roasted Ores is 1.50 marks per ton. The imports of Ore in November reached 643,000 tons, or fully 50 per cent. more than in November, 1906, but less than for the preceding autumn months. The Siegen mines turned out more Ores in October and November than for the same months in 1906, which shows that the demand of the furnaces had kept up well.

A number of the great Rhenish-Westphalian Iron companies have within a year become interested in Iron mines across the Lorraine frontier in France. These are a part of the same great deposits which have made Lorraine and Luxemburg the greatest sources of Iron Ore in Germany, but those new French mines supply a richer Ore than that found on this side of the frontier. Hence, the companies mentioned have for some time been trying to induce the Government railroad authorities to transport the French Ores at the same cut rate as prevails for Lorraine and Luxemburg, and this action was decided upon a few weeks ago.

The Hardware Trade.

From the Hardware trade about Remscheid and other sections it is reported that business has again become less satisfactory. Now that the home trade is relaxing, the shops feel more perceptibly than before that the new commercial treaties that took effect nearly two years ago are having an injurious influence upon their foreign trade. This is particularly true of Austria and Spain. Some sections of the Hardware trade, however, particularly those that make fittings for railroad cars, are still doing a good business. From the cutlery trade at Solingen the news comes that the American crisis is having a very restrictive effect upon American orders. Not a few Americans have countermanded orders already placed, while some Solingen firms have suffered losses through recent American failures. Owing to the dropping off of the American trade some cutlery shops have already had to discharge labor, and it is expected that the lack of work will be felt still more keenly after the beginning of the new year.

The Dominion Iron & Steel Company has again won its case against the Dominion Coal Company. At Halifax, January 14, the Supreme Court of Nova Scotia unanimously dismissed the coal company's appeal and sustained the decision of the court at Sydney last summer in favor of the steel company. The amount at issue between the companies directly and indirectly is over $15,000,000. The steel company claims damages from the coal company for breach of contract in not supplying the quality and quantity of coal required at the works of the steel company. An appeal can still be taken to the Privy Council of England.

New York.

NEW YORK, January 15, 1908.

Pig Iron.—The most important event of the week has been the purchase of upward of 12,000 tons of Pig Iron by a pipe shop at private terms. The market is firmer, but some makers are still offering a figure below those quoted by the majority of sellers. We quote at tidewater $19 to $19.25 for No. 1 Northern Foundry, $18.25 to $18.75 for No. 2 Foundry, $18 to $18.25 for No. 2 Plain, and $17 to $17.25 for Gray Forge. Alabama Iron is quoted $18 to $18.25 for No. 1 Foundry and $17.50 to $17.75 for No. 2 Foundry.

Structural Material.—The Cumberland River Bridge Committee, Nashville, Tenn., will open bids January 22 for two bridges over the river at that city, requiring about 3000 tons of Steel. In this locality not any of the large undertakings recently mentioned has yet been closed. It is not understood that any of them has been indefinitely laid over, but in every case some special reason has caused delay in placing the contract. New propositions are backward in taking definite shape. Some hope is entertained that increasing ease in money may enable railroad companies to secure funds to push needed improvements. Mills report a light demand for plain material. We continue to quote mill shipments, tidewater deliveries, as follows: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—New business is light, both in Iron and Steel Bars. The Eastern Bar Iron mills are still idle, with few exceptions, and the mills that are running are only operating on part time. Much interest is being taken in the meeting of the Eastern Bar Iron manufacturers, which will be held on Thursday of this week, as it seems probable that some action may be taken with regard to a revision of prices. In the meantime quotations on both Iron and Steel Bars are continued at 1.60c., Pittsburgh, or 1.76c., tidewater.

Plates.—While inquiries are increasing, buyers are slow to close, and it is possible that most of the interest shown in the market has been for the purpose of ascertaining whether prices continue to be maintained or whether some concessions are now possible. No change has yet taken place in prices, which are quoted as follows for tidewater delivery: Sheared Tank Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—A fair January business is in progress. The New England buying movement, referred to last week as having begun, is assuming larger proportions, quite a number of the smaller cities and towns asking proposals on lots running from 200 to 800 tons. Inquiry from other sections is also better. That the Pipe manufacturers feel some confidence in the future is shown by the liberal purchases of Pig Iron which they are now making for future delivery. Carload lots of 6-in. are to be had at $26 to $26.50 per net ton, tidewater.

Old Material.—While the market is far from being what it should be, some indications of a change for the better are observed. A few sales by dealers are noted, comprising small quantities of Heavy Melting Scrap, Wrought Pipe and cheap grades of rolling mill stock, but most business has been done in Cast Scrap, of which some foundries have bought quite liberally. Railroad offerings are still heavy, but they are not pressing uniformly on all classes of material, being most severe on Rails. The low prices made here are attracting further attention in foreign markets and sales have been made of Old Car Wheels and possibly other Scrap Material for shipment to Europe. Quotations per gross ton, New York City, are as follows:

Old Girder and T Rails for melting	$8.00 to $9.00
Heavy Melting Steel Scrap	8.00 to 9.00
Old Steel Rails, rerolling lengths	10.00 to 11.00
Relaying Rails	15.00 to 16.00
Old Iron Rails	13.00 to 14.00
Standard Homogeneal Iron Car Axles	15.50 to 16.50
Old Steel Car Axles	13.00 to 14.00
No. 1 Railroad Wrought	10.50 to 11.50
Iron Track Scrap	9.00 to 10.00
No. 1 Yard Wrought, long	10.00 to 10.50
No. 1 Yard Wrought, short	9.50 to 10.00
Light Iron	4.50 to 5.50
Cast Borings	4.00 to 5.00
Wrought Turnings	5.50 to 6.50
Wrought Pipe	8.00 to 8.50
Old Car Wheels	15.50 to 16.00
No. 1 Heavy Cast, broken up	12.00 to 12.50
Stove Plate	11.00 to 11.50
Grate Bars	8.50 to 9.00
Malleable Cast	11.00 to 11.50

Wellman, Seaver & Head, Ltd., is the name under which the business of the Wellman-Seaver-Morgan Company will be carried on in Great Britain hereafter, the name of the managing director in London being used. The British company has recently formed a special furnace department and an electrical department, the latter dealing with the business in controllers and brakes.

Metal Market.

NEW YORK, January 15, 1908.

Pig Tin.—Prices are 1c. per pound higher. New business is scarce, and although the average turnover is in excess of that during December, it is not up to that of a week ago. The range of prices has been as follows:

	Cents.
January 9	27.15
January 10	27.10
January 11	27.15
January 13	27.25
January 14	27.15
January 15	27.75

The arrivals are small, amounting to but 475 tons. Since November 1, the receipts have not equaled the meager consumptive demand and stocks are again at a low point. Figuring the stocks on hand January 1, the arrivals since then and the metal due before February 1, would only give 1950 tons. The deliveries will exceed those of December and a squeeze before the end of the month would not be unexpected. Of course, the Mesaba will sail from London January 16 and might make this month's delivery, but she is a slow boat. The visible supply in Europe is increasing. The London market closes easy at £125 10 s. for spot and £126 for futures.

Copper.—The market is firmer, and prices are higher, due to European orders. Domestic consumers are uninterested as yet. Lake may be quoted at 14c. to 14.25c., Electrolytic at 13.87½c. to 14.12½c. and Casting Grades at 13.62½c. to 13.87½c. The inside price on Electrolytic is not obtainable by domestic consumers. The above prices are for large lots and for small orders of a carload a slight advance would probably be demanded. Exports continue to dominate the market. During the last 100 days exports have been in excess of production, which has largely reduced American stocks. The outgo so far this month has been 18,286 tons; the total exports since October 1 have been 120,000 tons. Notwithstanding the extraordinary takings by European consumers and middlemen and the amount of metal held there for financial reasons, buyers on the Continent are eager to make contracts whenever concessions are offered. The theory is advanced in some quarters that should American consumers enter the market and buy liberally, as they doubtless will do, Copper will be quickly reshipped across the Atlantic. This happened after the heavy export to China a few years ago, the metal afterwards being reshipped to Europe. In other well-informed quarters, with perhaps closer European connections, this idea is scouted, the belief being that before prices advance to give European holders a sufficient margin to compensate them, producers in this country will supply the demand. At such times exports will probably again fall to low figures. The re-importation of small quantities of Copper, however, would cause no surprise. Industrial conditions abroad are better than a few weeks ago. The strength in our own market, nevertheless, is largely influenced by the fear of depleting stocks through these heavy exports. Prompt Copper is scarce. The London market closes at £64 5s. for spot and £64 10s. for futures. A large business in futures was done to-day in London.

Pig Lead.—Firmer tendencies prevail in the Lead market. Prices are higher, especially for futures, which are held at a premium. Some business was transacted as high as 3.85c., New York, but the leading producer is a seller at 3.75c. Deliveries during February are held at 3.85c. In St. Louis prices are higher at 3.60c. to 3.65c. for spot, with no offerings of futures.

Spelter.—Higher prices are named, but the volume of business is limited. Sales have been made at 4.65c. to 4.75c., New York, and 4.55c. to 4.60c. St. Louis. Future deliveries are held at a slight premium with little or no resultant business.

Antimony.—Prices are nominal and unchanged. Hallett's is quoted at 8.75c., and Cookson's at 9c. to 9.25c.

Aluminum.—Revised prices have been issued on Aluminum by the producers. No. 1 Ingots, guaranteed over 99 per cent. pure, are held at 33c., per pound, in ton lots. No. 2 Ingots at 32c. For small lots of 100 lb. and over advances of 3c. per pound are charged.

Ferroalloys.—Lower prices have been named on Ferrosilicon by both domestic and foreign makers. For 50 per cent. Ferrosilicon $85 is now asked, either at seaboard or the works of domestic manufacturers. The high price last year was $104. The new price on 75 per cent. Ferrosilicon is $127.50. Ferromanganese is unchanged at $48 to $49, seaboard.

Nickel.—There has been no change in price. Ton lots are held at 45c. and smaller quantities at 50c. to 60c.

Tin Plate.—New business is not active. Buying, however, is expected to commence about February 1. The price of 100 lb. IC Coke Plates is $4.89 f.o.b. New York, and $4.70 f.o.b. Pittsburgh. Tin Plates in Swansea are 3d. lower at 11s. 9d.

Old Metals.—An improvement in the demand is noted, but dealers' selling prices are unchanged from last week, as follows:

	Cents.
Copper, Heavy Cut and Crucible	13.00 to 13.25
Copper, Heavy and Wire	[illegible]
Copper, Light and Bottoms	11.50 to 11.75
Brass, Heavy	[illegible]
Brass, Light	7.75 to 8.00
Heavy Machine Composition	12.00 to 12.50
Clean Brass Turnings	[illegible]
Composition Turnings	10.50 to 11.00
Lead, Heavy	[illegible]
Lead, Tea	[illegible]
Zinc Scrap	[illegible]

Iron and Industrial Stocks.

NEW YORK, January 15, 1908.

The stock market has been almost buoyant. A heavy weight has been removed from it by the remarkable change in the financial situation. The deficit in the bank reserves in this city was completely wiped out last week, and in its place was substituted a surplus over the legal reserve of more than $6,000,000. It took the New York banks just seven weeks since the deficit reached the record breaking amount of $54,103,600, on November 23, to make good this amount with an additional $6,000,000 thrown in to make the surplus secure for a considerable period to come. The week before the deficit had stood at a little over $11,000,000. The good feeling over this condition of affairs was not impaired by the application for receivers for the Chicago Great Western and the Seaboard Air Line railroads. In both these cases special causes were known to have existed, aside from the recent financial disturbance. Prices of iron and steel stocks improved rapidly, the United States Steel stocks having been specially strong on reports that the corporation will make a much more favorable statement on its operations for the last quarter in 1907 than had been expected. One of the features of the week was an advance in the Allis-Chalmers 5 per cent. bonds, which sold up to 60, after having sold at 55 the previous week. The range of prices on active stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 26¾ to 30⅜, preferred 89¾ to 95⅜; Car & Foundry common 30⅝ to 32⅜, preferred 90; Locomotive common 36⅞ to 41¾, preferred 86½ to 90; Steel Foundries common 6¾ to 7, preferred 30 to 32½; Colorado Fuel 19¾ to 21⅞; Pressed Steel common 20½ to 23, preferred 71½ to 73; Railway Spring common 29 to 29¼; Republic common 17 to 18¾, preferred 68¾ to 71¼; Sloss-Sheffield common 37½ to 41½, preferred 88; Cast Iron Pipe common 19⅞ to 21, preferred 59½ to 62½; Can common 5 to 5½, preferred 50½ to 52⅜. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 29⅞, preferred 94⅝; bonds 88¾; Car & Foundry common 32, preferred 90; Locomotive common 41, preferred 90½; Colorado Fuel 21¾; Pressed Steel common 22, preferred 73⅛; Railway Spring common 29½; Republic common 18½, preferred 71¼; Sloss-Sheffield common 41; Cast Iron Pipe common 19, preferred 62½; Can common 5½, preferred 51¼.

The New York Air Brake Company, like many other concerns selling to the railroads, has found itself in need of ready money, although doing a large business, because of the slowness of collections. The directors of the company are stated to have reached an agreement with the Advisory Committee of creditors by which the company's floating debt will be extended and the directors left free to consider the advisability of increasing their capital obligations without the embarrassment of having to consider at the same time the necessity of meeting current debts. The plan finally agreed upon by the committee and the directors involves the placing of a mortgage on the company's property, which is at present unincumbered, to cover the total amount of the current indebtedness and the issuance of new paper to the creditors, which is to run for six months, specifically secured on its face by the mortgage.

The receivers of Milliken Brothers, Inc., announced January 10 that they would anticipate the payment of interest on the company's outstanding $3,000,000 6 per cent. bonds by paying it on January 15 instead of on February 1, when it actually falls due. They have no receivers' certificates outstanding, and have ample funds on hand. The company, it is said, has taken in more orders recently than in any similar period in its history, and is increasing its working force.

Dividends.—The United States Cast Iron Pipe & Foundry Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable March 2. Action on the common stock dividend, which has been at the rate of 1 per cent. quarterly, was deferred.

[illegible] the Midvale Steel Co. [illegible] the 110, 32, 72 and 84 in. [illegible] the 36 in. [illegible] department at the Homestead Works of the Carnegie Steel Company, at Homestead, Pa., were started up. The Bessemer plant remains idle.

The Tariff in Congress.

Bills for Commissions and Repeal of Duties on Crude Iron.

WASHINGTON, D. C., January 14, 1908.—The unmistakable drift of the sentiment in Congress toward the revision of the tariff at a comparatively early date has been emphasized during the past week by the introduction of several measures of comprehensive scope. It is significant that while many tariff bills have been presented in the past two Congresses by minority members of the House and Senate, nearly all those introduced since the holiday recess have been drawn by Republicans of considerable prominence.

The Beveridge Tariff Commission Bill.

By far the most important bill relating to the tariff presented in the present Congress has been introduced by Senator Beveridge of Indiana, a leading member of the Republican Senatorial Steering Committee. This measure, which its author has been engaged upon since before the convening of Congress, provides for the creation of a tariff commission of five members to be appointed by the President "solely with a view to their qualifications as specified in this act and without regard to political affiliations." One member must be "identified with the producing interests," another is to be a lawyer "who has made a special study of customs and tariff laws," another must have a "special experience in connection with the administration of customs and tariff laws," another must be "familiar with industrial and commercial conditions in foreign countries affecting the competition of foreign products with products of the United States and thoroughly conversant with the customs and tariff laws of those countries," while the fifth must be "an economist and statistician who has given special attention to the subject of prices and cost of production as affecting the tariff." The members of the commission are to be appointed for terms of seven years, each commissioner to receive an annual salary of $7500. The duties of the commission are set forth in the bill as follows:

SEC. 4. That said commission shall tabulate the results of said investigation and submit the same to Congress, together with an explanatory report of said facts so ascertained; and said tabulation of said facts and report in explanation of the same shall be laid before Congress at the earliest possible moment for the use, information and guidance of Congress; and at the request of the Ways and Means Committee of the House and the Finance Committee of the Senate, or by the direction of Congress by resolution, said commission shall sit with said above named committees of the House and of the Senate during the sessions of said committees when said committees are drafting or considering any bill affecting the customs tariff laws of the United States.

In presenting this bill in the Senate Senator Beveridge stated that while he had given considerable thought to its formulation, he was not absolutely wedded to it, but would support any measure along similar lines which promise greater efficiency. He insisted, however, that it was the duty of Congress to create a tariff commission at an early date, and he gave notice that he would follow the matter up vigorously. The bill was referred to the Senate Finance Committee, which is already receiving petitions and memorials in its favor.

The Warner Tariff Commission Bill.

Another bill providing for a tariff commission has been presented by Senator Warner of Missouri, who puts it forward as indicative of the sentiments of the Middle West, where the people, in his opinion, strongly favor a conservative measure of tariff revision in the early future. The bill authorizes the President to designate three members of the Board of United States General Appraisers to serve as a commission to inquire into industrial and commercial conditions as affecting the tariff. The information obtained by the commission is required by the bill to be reported from time to time to the Secretary of the Treasury, with appropriate recommendations, and it is made the duty of the Secretary upon the convening of Congress in December each year to transmit to the House, with his recommendations, all reports received from the commission.

Bill to Repeal Duty on Iron.

Representative Russell of Missouri, has introduced a bill providing that "from and after the approval of this act no import tax duty shall be collected upon iron ore, iron in pigs and bar iron." Mr. Russell is a member of the minority, but asserts that throughout the Middle West there is a strong sentiment, without regard to party, that the duties on the cruder forms of iron should be repealed. The bill has been referred to the Ways and Means Committee, but although its author proposes to urge a favorable report upon it, there is little likelihood that it will be acted upon at the present session.

W. L. C.

The Southern Steel Company's Affairs.

A petition was filed January 11 in the Federal Court at Birmingham for the return of certain of the Southern Steel Company's properties in the State of Alabama to the possesion of the Lacey Buek Iron Company, the American Trust & Savings Bank of Chicago, trustee for about $2,000,000 worth of collateral notes guaranteed by the stock of the company, and W. F. Stowers of Gadsden. Judge Hundley set January 20 as the date of the hearing.

Following the action of the Birmingham court, a petition was filed in the Federal Court at Chattonooga, Tenn., in which the Trust Company of America of New York, trustee, under mortgage to secure an original issue of $600,000 of bonds, and the Chattanooga Iron & Coal Company pray for the possession of the properties of the latter company, now held by the Southern Steel Company.

A press dispatch from Birmingham dated January 12, says: "The receivers appointed by the Federal Court for the Southern Steel Company will shortly file their final report and ask to be discharged. The creditors will be authorized, it is believed, to elect trustees, and already the following have been suggested: W. H. Hassinger, former vice-president and Southern manager of the Republic Iron & Steel Company; John A. Morris, capitalist and wholesale grocer; J. M. Kyle of Gadsden, Ala., lumber manufacturer. These trustees appear to be satisfactory to the majority of the creditors. It is understood that a fund can be raised among the stockholders to start operations in the near future, and that within a short time the operation of the works will bring about a reorganization of the company, with the creditors getting dollar for dollar for their claims, or near that amount."

Labor Notes.

The bi-monthly wage settlement between the Amalgamated Association and Western bar iron mills was made on an average selling price of 1.55 cents for iron bars in November and December, which reduces the scale for puddlers from $6.50 to $6.37½ a ton for January and February. The finishers are reduced about 1 per cent. for the same months.

Labor at the blast furnaces and in the mines in the vicinity of Birmingham, Ala., is being notified of reductions in wages of 12½ to 15 per cent.

A proposition to amend the anti-conspiracy section of the penal code of the United States, so as to declare specifically the right of labor unions to strike and to boycott, brought out a sharp and heated contest in the House of Representatives January 11, resulting finally in the defeat of the measure. No roll call was taken. The fight against the proposed amendment was led by Mr. Sherley of Kentucky, a Democrat, who said in the course of his remarks: "The laboring man is entitled to his rights, but the time has not come in this country when any class of men is entitled to special rights over any other class. I am willing to defend the laboring man, but I am not willing to be demagogic about it."

The National Department of the National Tube Company, at McKeesport, Pa., which has been shut down since late in December, started up on Monday, practically full in all departments. Improvements and repairs were made to the plant during the shutdown.

The Machinery Trade.

NEW YORK, January 15, 1908.

Business with machinery houses the past week was rather quiet with inquiries and orders of too little importance to perceptibly change the situation from that of the previous week. There are a few fair sized projects being carried forward, for which equipment is being bought, and these, with the orders for single tools and small lots, constitute the entire volume of trade. Most of the large projects have been shelved for the present and will not be taken up until the financial situation shall again become normal. Without doubt the chief obstacle to the return of a better demand is the scarcity of money, which is restricting business in many directions. It is said that the railroads are suffering a heavy loss of freight, on account of the money stringency, and that they have large numbers of idle cars and locomotives. At this time the roads ought to be carrying grain in large quantities from the West, but it is learned from a reliable source that the grain is in the storehouses, the owners not being able to move it because of their inability to borrow money on it. This is only one of the adverse conditions affecting the railroads, whose policies are usually looked upon as indicative of the trend of business—either toward expansion or restriction.

While some departments of the more important manufacturers have received a fair amount of business since the first of the year, others report a considerable falling off in the demand; and strange though it seems, the department of one of the large interests producing expensive machines, which are not replaced every year, is receiving a great deal more business than the other departments which make small tools, which are constantly wearing out and being renewed. The activity in some classes of machines, due to an extent to export orders, has been widely circulated and exaggerated by the daily press, leading some manufacturers in the West to believe that business is much better in the East than it is.

Sales managers in the heavy power equipment line say that there is a large amount of prospective business in sight, but they bewail the fact that little purchasing is being done. Some inquiries now before the trade have been placed time and again during the last few months, and power men say that the actions of prospective purchasers indicate that they are expecting lower prices. The fact that these inquiries recur with the same firms frequently indicates that prices are being maintained, and it is declared that there is little possibility of a break. Manufacturers have been at considerable cost to produce the equipment now offered for sale, because of the high price of labor and material, and it is hardly possible that any of them can well afford to make a reduction. It is expected that the patience of those waiting for lower prices will soon be exhausted, and when it is time for them to make purchases, not only those in the power equipment line, but the trade in general will be benefitted.

Another association has been formed to promote the business interests of the members and to otherwise facilitate the carrying on of business. About 25 of the leading export houses of New York have organized the American Exporters' and Importers' Association, principally for the purpose of promoting trade with foreign countries.

Important Power Plant Extension.

Ford, Bacon & Davis, 115 Broadway, New York, will buy machinery for an extensive addition which is being made to the Smith street power house of the Coney Island & Brooklyn Railway Company at Ninth and Smith streets and Gowanus Canal, Brooklyn. The plant will be of about 4800 hp., and the general contract for the construction of building has been awarded to A. Pasquini, 1123 Broadway, and the foundation work will be done by the Raymond Concrete Pile Company, 71 Nassau street.

Some time ago the Lake Shore & Michigan Southern Railroad purchased a large plot of additional ground at Elkhart, Ind., as a site for new repair shops. While it is the intention to wait until business conditions improve before proceeding with the erection of the shops, it will in all probability do some building at that point shortly. The company's machine shops and other buildings in that city were recently destroyed by fire, and it is understood that these will be rebuilt as quickly as plans can be prepared.

It is stated that the Georgia, Florida & Alabama Railroad has completed plans for its new shops at Bainbridge, Ga., to include machine shop, 60 x 90 ft., power house and blacksmith shop, 26 x 42 ft., and other buildings.

The recent purchase by J. P. Morgan & Co. of $30,000,000 equipment trust notes from the New York Central Railroad will likely result in the early purchase of new machinery by the road. We can state upon reliable authority that specifications have been prepared for a considerable amount of machinery equipment which has been held up by the officials for some time, and as soon as the road receives the additional funds it is probable that these specifications will be released.

After the Panama Railroad has liquidated its obligations to the Government, it is understood that a considerable amount of money will be expended for additional equipment, to include a large coal handling plant.

Quite a little new machinery will probably be purchased by the Hudson Structural Steel Company, South boulevard and 136th street, New York, which has taken out a permit for the construction of a one and two story steel shop, 60 x 103 ft. The shop will be used for fabricating iron and will be equipped with new machinery.

A large plant for the manufacture of printing machinery will be erected, it is expected, by the Rotary Composing Machine Company, 261 Broadway, New York, which has been organized with a capital stock of $2,000,000. The company has been incorporated under the laws of the State of New York, with William G. McGrath, William C. Evans and William H. Webb as directors. This organization, it is understood, is only temporary and in the near future the company will hold a meeting to select its officers. At present the company maintains a small plant in Brooklyn, where sample machines have been constructed, but plans are being made for the construction of one of the largest plants of the kind in the country. George Wishart is at present in charge of the mechanical details, but it is thought that it will be some time before the company will come into the market for machinery equipment, as it is not known as yet just what will be needed in that line.

While the large warehouse of the Carnegie Steel Company at Newark, N. J., has been completed and considerable machinery equipment has been purchased and installed, it is stated in the trade that the specifications have not been entirely filled as yet, and the company will soon require some electric hoists and similar equipment. The power plant has been installed and is in working order, and some heavy cranes have been purchased. The company has also bought some fabricating machinery, but it is expected that when the plant is in full running order more will be needed. This warehouse is the largest of its kind in the country, and is intended for the storage of material for export and supplying the Manhattan district.

It was stated in these columns last week, in reporting changes in the Mergenthaler Linotype Company, that R. M. Bedell had been given charge of the assembling department. This was erroneous, as Mr. Bedell has been made master mechanic, succeeding W. M. Brown.

The East Liverpool Foundry, Machine & Supply Company, East Liverpool, Ohio, desires to communicate with manufacturers of engine room and machine shop supplies of all kinds. The company expects to carry a general line of such stock for the trade, and would like to secure agencies.

The Elkins Power Company, Elkins, W. Va., is having plans prepared for a new electric light and power plant, to be equipped with engines, generators and other machinery, at a cost of $30,000. John T. Davis is president.

The Department of Water Supply, Gas and Electricity of New York, will, on January 22, open bids for furnishing hand traveling cranes for the high pressure fire service stations of the Borough of Brooklyn. The surety required is $3000, and specifications can be secured at the office of the commissioner, 13-21 Park row, New York.

The air compressor department of the Chicago Pneumatic Tool Company, New York, has received a good amount of business since the first of the year, it having received orders for more than fifteen compressors during the first 10 days, some of them of the larger size. The recent sales include four large compressors, to the Los Angeles Water Works, Los Angeles, Cal.; one 2000-ft. compressor, Aqueduct Commission, New York; two large compressors, Butler Brothers & Hoff Company, Detroit, Mich., for constructing the tunnel under the Detroit River; one large compressor, Boston & Albany Railroad, for the shops at Springfield, Mass., and one compressor, Rutland Railroad, for the shops at Rutland, Vt. Important orders were also received for shipment to foreign countries, including two large electrically driven compressors for the Portuguese navy; 1000-ft. steam compressor for Russia; two 500-ft. machines for Italy; 2000-ft. compressor, Intercolonial Railroad, and one 2000-ft. compressor, Canadian Northern Railroad, Canada.

Catalogues Wanted.—The Yetman Typewriter Company, North Adams, Mass., desires catalogues and prices on rubber vulcanizing outfits and japanning ovens. James M. Ryan is the company's purchasing agent.

The Niles Iron & Steel Company, Niles, Ohio, whose [illegible] expects to start up in full January 20. The company has added two more pots to the equipment in the galvanizing department and two new corrugating machines in the corrugating department, which give it a capacity of 2000 tons of galvanized sheets per month and about 2500 tons of corrugating roofing.

Chicago Machinery Market.

CHICAGO, ILL., January 14, 1908.

In attempting to represent the state of trade in any line from time to time it is difficult to preserve a correct sense of relative proportions. The volume of business moving at any given time may be small as compared with that of another period, yet it may, notwithstanding, be by no means of insignificant proportions. Measured by the standard of sales in the first half of last year, business in all machinery lines is, at the present time, undeniably dull, but when contrasted with some former seasons of depression and inactivity it presents a more favorable aspect. A glance at past records will convince the most pessimistic that what is now apt to be characterized as extreme dullness would have been, in other days, regarded as a decided improvement over then existing conditions. The market, it is true, lacks momentum such as is imparted by a demand arising from the progressive development of large industrial interests. Tool requirements embracing long lists of machines for shop extensions or equipment for new enterprises of notable size are now as rare as they were plentiful a few months since. But for all that the aggregate of orders comprising the incidental necessities of such plants and the growing needs of the vast number of small industries which dot the country constitute a business that, even now, is by no means inconsiderable. Orders for machine tools reported by dealers for the past week include several good sized millers and other machines, which were well distributed, the majority of sales representing but a single tool. Besides an increasing number of mail inquiries, which, it is observed, come largely from points west of Chicago, there are more prospective buyers visiting tool warerooms to investigate machines which they want now, or will purchase soon. A better assortment of stock, especially in new tools, is seen on dealers' floors than has been shown in many months, and shipments can be made of almost any standard machines without delay. A portion, at least, of the trade now coming in is comprised of orders that would have been placed last year had it been possible to get delivery within any reasonable time. This is evidenced by the large proportion of millers being sold; now that they can be supplied at once shops that have been waiting are coming in for such odd tools as they need. One sales agency states that within the past 60 days it has sold more milling machines than in any like period of 1906. This business was principally composed of scattered orders and included no large lots. A maker of presses and punches notes a more active inquiry for smaller machines coming chiefly from light manufacturing concerns throughout the West, which seem to be sanguine of a future demand for their product. On the other hand, very few orders are being placed by the big producers, nor are any of consequence expected until business picks up sufficiently to keep what machines they have busy.

A recent contract for an important installation of boiler shop equipment was secured by Jos. T. Ryerson & Sons, Chicago, from the Grand Trunk Railroad. These tools are for installation in the road's new Battle Creek, Mich., shops. The machines furnished by the company comprised a complete equipment of hydraulic punches, shears and other tools, including one four-column hydraulic flanging press of 750 tons capacity, sectional flanger, forging press, accumulator, two 35-gal, triplex pumps, one Ryerson flue cleaning machine, one bevel shear and two cold saws.

Although the amount of new work received within the last month or six weeks has been light, the Fort Wayne Foundry & Machine Company, Fort Wayne, Ind., has had work enough on back orders to keep it constantly engaged on full time. Among the orders now being turned out are: One 150-hp. and one 100-hp. tandem gas engine, together with a 250-hp. Wayne suction gas producer; one 100-hp. tandem gas producer engine, with one 150-hp. Wayne producer, for the Sanitary Can Company, Bridgeport, N. J. The company is now installing a 75-hp. gas producer equipment in the Jersey City plant of Charles Mundt & Sons, New York. Several other equipments are either under way or being installed, and it is stated that the company has work enough on hand to keep it running at full capacity for the next 60 days, at least.

Contracts for power plant equipment amounting to $70,000 have been placed by the Continental Realty Company, Milwaukee, for installation in its new electric generating station now in course of erection. The electrical machinery, including two 1000-kw. and one 500-kw. alternating generators, together with engines and fittings, are being supplied by the Allis-Chalmers Company. The boiler battery will be comprised of Edgemore water tube boilers.

In pursuance of plans formed to admit a number of the old employees as shareholders, Hill, Clarke & Co., Inc., Chicago, have increased their capital stock from $100,000 to $150,000.

Sealed proposals are invited by the United States Reclamation Service, Federal Building, Chicago, until January 28, for the delivery, f.o.b. cars at shipping point, of materials for a coal conveyor. This will include a feeder system, an incline cable conveyor with capacity of not less than 5 tons per hour, and other parts necessary to complete the construction. Motive power for the conveyor will consist of a three-phase, 200-volt, 60-cycle, six-pole, induction motor, which will also be included in the proposal. Another proposal upon which bids will be received on January 28 calls for two special ball bearing jacks having a 6½-ft. travel and 35 tons capacity. Blue prints and specifications of all of the above equipment can be had upon application to E. T. Perkins, engineer, Reclamation Service, Federal Building, Chicago.

Philadelphia Machinery Market.

PHILADELPHIA, PA., January 14, 1908.

More inquiry for machinery and tools has developed, and local manufacturers and merchants feel more encouraged regarding business conditions. While the demand has been confined almost entirely to single tool propositions and largely for the smaller class of equipment, the fact that new business is actually moving has resulted in a much better feeling. It is not expected, however, that there will be any very aggressive buying movement at the time. In fact, if business develops in a moderate way only during the next 30 or 60 days, the trade will be pretty well satisfied.

Competition for business is pretty sharp. Manufacturers and dealers are anxious to get orders, and in some cases prices have been shaded. In others, however, such as the better grade of tools, quotations are being pretty fairly held. Stocks on dealers' floors are large, and prompt delivery can be had on almost all classes of tools except those of the larger and heavier types.

Manufacturers have in many cases caught up pretty well with the business on their books, and further curtailment policies have been adopted in some cases. Some plants that had temporarily closed down over the holidays have not yet restarted, or in cases where they have done so the production has been curtailed, so that some departments are only running on half time. Here and there a plant is found which is still being operated at its full capacity, and with enough orders on hand to keep going from one to three months ahead, but they are exceptional cases.

There is practically nothing being done in the way of export of machine tools. Inquiries for the standard tools have been very light, and while some business has been taken in special tools, it has been small compared to that of several months ago.

Second-hand machinery merchants have not had a very active week. The demannd has been of a scattered nature, and sales have been few and confined almost entirely to tools of the smaller classes.

The demand for boilers and engines, both new and second-hand, has been rather quiet. Some good propositions, which have been held in abeyance owing to unfavorable financial conditions, are expected to develop as soon as the general situation improves.

Foundries are not taking on any material tonnage. Practically all of the business placed is for early delivery, there being nothing of any importance for future delivery before the trade. In some cases a slight improvement is to be noted in new business, but foundries are in most instances running with restricted output, some being in operation but three or four days a week.

The Tropenas Steel Company, New Castle, Del., expects to let the contracts for the construction of the foundry, power house and office building of its new plant in the course of the next 10 days. The foundry building is 100 x 200 ft. Active work on the building of the plant will be started as early in the spring as possible.

The city of Philadelphia now has available almost $1,000,000 for municipal improvement, under the last installment of the $6,000,000 portion of the recent $13,000,000 loan. This money will be expended for work including the following, specifications for which will shortly be ready and bids advertised for by the various departments: Bridges, $75,000; repairs, pumping station, $180,000; high pressure fire main extension, center of city, $150,000; filtration, pipe lines, $60,000; extensions to water system, $117,500.

Stearns & Castor, engineers and architects, have plans and specifications prepared for a one-story stone garage, 40 x 50 ft., to be built at Somerton, Pa., for H. A. Houseman.

Proposals were opened by the Director of the Department of Public Works of Philadelphia on the 15th inst. for a large quantity of supplies for the current year. These included 20 different classes of supplies for engineering, chemical and electrical purposes, wrought iron pipe, fittings, bolts,

nuts, washers, brass fittings and other supplies. The bids were ordered scheduled and the awards will be announced later.

The Baldwin Locomotive Works has reduced the working hours at both its local and Eddystone plants. There has been a decline in the total number of men employed (which, however, has been gradual), and they now number at the two plants about 15,000, as compared with 19,000 several months ago. Both plants went on 8 hr. a day on the 13th inst., while night work has practically ceased, and in some departments a full week is not being made. This concern reports inquiries rather light, and does not expect a very heavy resumption of orders until the financial situation, as far as the railroads are concerned, has improved.

The E. H. Mumford Company, builder of foundry molding machines, who recently purchased the American rights of the Universal system of machine molding and the line of machines made by Ph. Bonvillain & E. Ronceray, Paris, France, which system has been demonstrated at the latter concern's plant at 1315 Race street, this city, has moved its offices from Seventeenth and Callowhill streets to the former address. The machines for American sale will be manufactured by the Mumford Company. Meanwhile 22 machines, some for delivery and others for stock, so that prompt shipment can be had, are now in course of transportation from abroad. The company reports an improved demand for molding machines, quite a few orders having been taken since the first of the year.

New England Machinery Market.

WORCESTER, MASS., January 14, 1908.

A noticeable improvement has been felt in the machinery trade. Dealers report that they are receiving more orders, and machine tool builders are booking a little new business and are receiving favorable reports from their agents, who state that they are disposing of stock in a manner to indicate some buying on their part before a great while. The deduction should not be made that an immediate flourishing condition of trade is to be expected, but it is believed that the improvement already noted will be accentuated from now on until a fair volume of business is in hand. December, with some of the dealers, was better than the combined business of October and November. This was the experience of those who shared in recent railroad business. January, thus far, has been even better. One of the Boston dealers has just bought a considerable lot of second-hand tools, which indicates confidence in the early future.

Many good workmen are idle, and some employers are taking advantage of the opportunity to replace less skilled employees, perfecting their organization. Manufacturing establishments that have been compelled to let their good men go will suffer more in consequence when good business returns than those concerns which have maintained the skilled men of their forces, shortening working hours instead of laying them off.

The private development of water power for long distance electric transmission is becoming a common enterprise in New England. Manufacturing houses are establishing electric plants on water powers, even though these are at a distance from their works. The latest instance of plans for such an installation is that of the Stanley Works, New Britain, Conn., manufacturer of builders' hardware, which has received legislative permission to amend its charter so that it may transmit power from the Housatanic River at Kent in Litchfield County, Conn., for operating and lighting the New Britain plant. The company is also authorized to increase its capital stock from $1,000,000 to $3,000,000.

Albert M. Powell, until recently president and superintendent of the Woodward & Powell Planer Company, Worcester, Mass., has established a new business for the manufacture of metal planers under the name of the Powell Tool Company. He has taken a large space in the building on Gold street, Worcester, recently occupied by the L. W. Pond Machine Company for the manufacture of planers, and is at present equipping it with machinery. His lease includes machinery and tools formerly used by the Pond Company, and he has bought new tools, and expects to be in the market for more in the near future, though his list is not yet ready for announcement. Mr. Powell will manufacture an entirely new high speed planer, upon which he has been at work for several years. The machine will be fitted with several new mechanisms, which are unique in their class. The Powell Tool Company will first build one type of machine in one size, a 24-in. planer, designed especially for high speed forge work of the heaviest kind. Later, other sizes and types may be added. The plan is to manufacture it with interchangable parts, "like a sewing machine," to quote Mr. Powell, and the first work of the shop will be the manufacture of a complete set of jigs and fixtures for specialized processes of planer building. It is the plan to incorporate the business in Massachusetts. The officers will be Mr. Powell and his two sons, Charles S. and Alric M. Edward P. Taft, who for 39 years has been in charge of the planing department of P. Blaisdell & Co. and their successor, the Whitcomb & Blaisdell Machine Tool Company, will be superintendent of the shop. Mr. Powell has a wide reputation among builders and users of machine tools as the originator of the Powell planer and the founder of the Powell Planer Company, which later became the present Woodward & Powell Planer Company, and for 17 years he was president and superintendent of the company.

The A. H. Nilson Machine Company, Bridgeport, Conn., manufacturer of special machinery, is prepared to begin work on the addition to its plant in the spring, the structural material being already on the ground. The new part will practically double the capacity of the plant. The present building has been occupied but a comparatively short time, but the business has grown to demand the additional space. The company will buy new machinery when the enlargement has been made, the prospective list being a sizable one.

The Bristol & Warren Water Works are building at Warren, R. I., a new pumping station and mechanical filters with a capacity of 2,000,000 gal. a day. H. R. Worthington, New York, is contractor for the high lift pumps; the Lawrence Machine Company, Lawrence, Mass., for the centrifugal pumps; the New York Continental Jewell Filtration Company, New York, for the filters, and the Babcock & Wilcox Company for the boilers.

The Bristol Instrument Company, Waterbury, Conn., recently incorporated to manufacture measuring instruments, has changed its name to the Industrial Implement Company. The directors of the company are Bennett B. Bristol, Edgar H. Bristol and Watson E. Goodyear. The company is not ready to make announcement of its manufacturing plans.

Cleveland Machinery Market.

CLEVELAND, OHIO, January 14, 1908.

While the local machine tool market has not improved a great deal, it is better than during the last few weeks of last year. Dealers are not looking for much activity during the next few weeks, but general conditions lead them to believe that the demand for tools will gradually but slowly grow better. There have been some sales of single tools during the week, and there is a slightly better volume of inquiries. No large sized inquiries have developed, however, the prospective purchasers being small concerns that are in the market for one or two tools. A large share of these inquiries are for second-hand tools.

The general situation has not improved as rapidly as exaggerated newspaper reports regarding the resumption of activity would lead one to believe, but industrial plants are putting back some of their workmen from day to day, and a number are now running at 75 per cent. or more of their normal capacity. Machine tool builders report that their business is picking up, both in the volume of orders and inquiries. One local plant that builds bolt and nut machinery, which has a large foreign trade to help out when domestic orders are limited, is now running at practically full capacity. Crane building plants are getting a few orders for small single cranes for foundries or other small shops, but no new inquiries for cranes are coming from large industrial companies.

The local financial situation continues to improve, and 25 per cent. of the certificates issued by the Cleveland banks through the Clearing House Association have been recalled during the past week. The total issue was about $3,000,000. Currency seems to have become fairly plentiful with the banks, but they are following a very conservative policy and are making only loans that are regarded as gilt edged. The recent financial stringency is still felt among the smaller industrial concerns, so that there is still considerable complaint about slow collections.

Prices of machine tools are being firmly maintained by dealers, although some purchasers look around a good deal before placing their orders, in the hope that they may be able to secure some concessions. Most dealers have large stocks of tools on hand, more than they wish to carry with business as it is at present, although they would not regard their stocks as too large if their volume of business was normal.

What is regarded as one of the most up to date drop forge plants in the country has just been completed by the Park Drop Forge Company of this city, which was organized a few months ago, and the new plant will be placed in operation in a few days. The plant is located on a 3-acre site, providing an abundance of room for extensions as they are needed, at East Seventy-ninth street and Gordon Park. A track from the Lake Shore Railroad, which is but a short distance away, runs directly into the plant. The plant is 65 x 200 ft., with an L 60 x 60 ft. The building is of steel

construction, covered with corrugated asbestos. Large windows provide and abundance of light. The plant is equipped with two automatic drop hammers made by the Waterbury Farrel Foundry & Machine Company, and seven steam drop hammers built by the Chambersburg Engineering Company. The hammers range in size from 1000 to 3000 lb. There is room in the plant for more than doubling the present hammer equipment. For handling material there are two 15-ton electric cranes built by the Cleveland Crane & Car Company. Power for operating the hammers is furnished by an Erie tubular boiler. The most improved furnaces have been installed for heat treating, annealing and oil tempering. One section of the building is built two stories high, providing room on the second floor for a well equipped machine shop. The group system of motors is used in driving the machinery. The plant is especially equipped to forge and refine steels for the larger class of automobile and special forgings. The secretary, treasurer and active manager is Dwight Goddard, who for some time was Cleveland manager of the Wyman & Gordon Company. Thomas B. Smith, the superintendent, was formerly with J. H. Williams & Co., Transue & Williams Company and the Wyman & Gordon Company.

The G. H. Williams Company, builder of hoisting machinery, has added revolving derricks to its line of products during the past few months. The derricks are intended principally for handling coal, ore, sand and gravel. The company has recently received an order for one of the derricks from the Toronto Sand & Dredging Company, Ltd., Toronto, Ont., and for one with an 85-ft. boom from the Great Lakes Construction Company of Buffalo for canal work.

The Notman Stove Company, Alliance, Ohio, has been incorporated with a capital stock of $50,000. The company intends to build a plant for the manufacture of stoves, but has not yet decided on a site. The plant will probably be located in Canton or Alliance, Ohio. The directors are C. A. Notman and A. S. Armstrong of Alliance, and A. H. Elliott, R. P. Lambright and R. B. Davis of Canton. Officers were elected as follows: A. S. Armstrong, president and treasurer; R. P. Lambright, vice-president; A. H. Elliott, secretary, and C. A. Notman, general manager.

The annual meeting of the Burt Mfg. Company, manufacturer of ventilators, oil filters, exhaust heads, &c., Akron, Ohio, was held January 6. The old officers were re-elected, as follows: W. F. Warden, president and general manager; H. F. Maranville, vice-president; M. E. Knowles, second vice-pr sident; J. Asa Palmer, secretary. The report showed an increase of about 25 per cent. in sales during 1907 over the previous year, and that the prospects for the present year are very bright.

The Electric Controller & Supply Company reports an improvement in orders during the past few days, and the company's plant, which was entirely shut down for a short time, has resumed operations on half of its full capacity.

The Standard Machine Company has been incorporated at Columbus, Ohio, with a capital stock of $10,000, to engage in a general manufacturing business. The incorporators are H. J. Odell, J. C. Burns, R. M. Lucas, C. E. Blanchard and M. L. Reed.

Extensive repairs and improvements are being made to the plant of the Dover Mfg. Company, Canal Dover, Ohio. The power has been insufficient for the growing needs of the plant and a new engine will be installed to furnish adequate power.

Cincinnati Machinery Market.

CINCINNATI, OHIO, January 14, 1908.

Bearing out the generally accepted statement that the machine tool industry is the first to feel the ill effects of a money depression and the last to recover, developments of the new year in this section fully illustrate its truth. Sales agents of the pig iron furnaces, representing the industry both North and South, are in receipt of inquiries, both of the nature of "feelers" and requests, for figures on early deliveries of good tonnages; makers of boilers and builders of engines are feeling much better, as some orders for power equipment are coming in; makers of medium and smaller sized units, motors and generators have had a gradually increasing inquiry and sale since the beginning of the year; but the tool man cannot truthfully attest to any brighter outlook, and as his order book is now about cleaned up of business placed last year, such as escaped the cancellation period, he looks anxiously about for straws to show what is in store for the future.

The newspaper accounts of conditions have in many instances been exaggerated somewhat, particularly in the case of the larger tool manufacturers; but this is not an unnatural result, realizing the great strain and heavy payroll under which many of them were working when the slump came, and the hastily inaugurated alternative of reducing time and employees to the minimum. Beginning the first of the year, these establishments have been putting men back here and there, assembling parts, finishing up some essential department work, and getting the establishment in shape for an early resumption in the event it should be justified; but to say that the inquiries and sales have warranted the starting up of establishments on anything like the speed of the first half of 1907 would be ridiculous.

A glance over the field shows the majority of the tool builders working on schedules of from 30 to 40 hr. weekly, and with forces of from 50 to 75 per cent. of their normal payroll, although there are a few manufacturers who have retained practically their entire force in order to keep it intact, but have reduced working hours. Still further reductions in forces are looked for ere the tide of fortune turns in favor of the tool makers; for the end of January will see the greater part of advance orders booked last year finished and shipped.

The jobbing foundries were hit hard, and the reduction of melt has been marked. Aside from the failure of the Weber Foundry Company, however, there have been no serious results, and it may be truthfully said that the field is in very good shape. The period of shutdown has been utilized by a number of them to clean up, replace worn out machinery and accessories, and in several instances electric power equipment has been substituted for the boiler and engine. Among these is the Insurance Foundry of Covington, which has just substituted a motor, and reports a gain of 25 min. on the first heat of 7 tons. A good record during the depression and one worthy of note is that of the Star Foundry of Covington, which ran full time and normal capacity, save the loss of a day each week during three weeks and the shutdown of holiday week.

The report that the machine builders of this section have submitted to the demands of the foundrymen in the matter of uniform contract for renewals in the making of castings is exaggerated. Most of the local tool concerns whose contracts ran out the first of the year have either renewed on the basis of last year or sent their patterns out of town to other foundries. A form of contract gotten up by a committee of manufacturers and submitted to the foundrymen has been modified in several instances, and, it is said, is now acceptable to the latter. Such of those concerns as have not renewed with their foundrymen may do so on the basis of this form. Another meeting is to be held soon to determine the matter.

A matter which is now agitating the local machinery trade, and is receiving much attention at the hands of the press and capitalists, is the project of an elevated road, first agitated by J. G. Schmidlapp, president of the Union Savings Bank & Trust Company. The threatened loss to Cincinnati of the J. A. Fay & Egan Company, woodworking machinery, renewed the agitation, and it now looks as though the road would be built, which will give the Oakley factory colony the necessary stimulus, and bring about its completion on the elaborate lines first projected. As to the Egan Company's departure to other fields, the last word from President Thomas P. Egan dispels the danger of any such contingency, and it can be stated that the company will build its factory on its site on Bond Hill, and the transportation facilities will be provided whether the Traction Company recedes from its announced position or not. It was announced that the company would not build the road until certain population figures were in evidence and some financial assistance secured. The elevated road would give the factory colony at Oakley the biggest kind of a boom, for the question of housing the workmen has been one of the stumbling blocks, while the present transportation facilities from the city proper are inadequate.

On January 6 two departments of the Republic Iron & Steel Company's plant at Brazil, Ind., the nut and bolt and the turnbuckle shops, resumed operations with a force of about 400 men. The plant had been closed for three weeks.

The Brownell Boiler Works at Dayton, Ohio, which was shut down for a few days during the holidays, is running with a practically full force, and reports prospects brighter than for several weeks.

P. A. Myers was re-elected president; Guy C. Myers, vice-president; S. M. Chase, general manager; W. C. Stocklin, superintendent, and Edward Kaemmerer, secretary-treasurer of the Chase Foundry & Mfg. Company at the annual meeting. The president's report stated that the business of 1907 was the best in the company's history.

The annual meeting of the Cincinnati Metal Trades Association will be held on Thursday, March 5, when new officers will be elected and work outlined for the coming year. The association now has 70 members, covering 75 per cent. of the factories and 90 per cent. of the larger producers.

Huston Lowe of Lowe Brothers Company, Dayton, Ohio, will read a paper before the monthly meeting of the Engineers' Club of Cincinnati on Thursday evening, January 16, on "The Preservation of Structural Steel."

Rumors that the Cincinnati, Hamilton & Dayton Railroad had in preparation a list of specifications for new tools for the Lima shops prove to be unfounded, save that there is talk of such a list at headquarters, but no definite time has been set for its submission to manufacturers and dealers.

Makers of patterns for machinery, agricultural and stove manufacturers are doing very little, but think chances favorable for the future through reports from the engravers who make a specialty of machinery designs. One of the largest of these latter has been rushed the past week or 10 days, making engravings of machinery and parts from which it is argued that the catalogue and advertising departments are preparing for aggressive campaigns.

Government Purchases.

WASHINGTON, D. C., January 14, 1908.

From the estimates submitted to Congress, it is evident that the Isthmian Canal Commission will purchase a great deal of additional machinery this year, for work on the Panama Canal. The appropriations asked for cover machinery and appliances, $5000; power plant, $432,010; pumping plant, $30,000; power plant, $110,000; concrete mixers and conveyors, $20,000; rolling stock, excavating equipment, shop machinery and electric light plants, $1,742,100; tools, $225,500.

The Isthmian Canal Commission will receive bids until February 6, circular No. 415, for a power plant, including boilers, boiler feed pumps, feed water heater, fuel economizer, generators, condensers, vacuum pumps, circulating pumps, electric crane, rotary converters, &c.

The following bids were opened January 2, for machinery for the navy yards:

Class 1. One 1500-lb. steam hammer. Bidder 2, Allfree Machine Imports, Ltd., Ipswich, Eng., $2170; 69, Erie Foundry Company, Erie, Pa., $2086; 116, Manning, Maxwell & Moore, New York, $2946; 153, Niles-Bement-Pond Company, New York, $1950; 159, Prentiss Tool & Supply Company, New York, $2265; 179, Pacific Tool & Supply Company, San Francisco, Cal., $2200; 179, Rix Compressed Air & Drill Company, San Francisco, Cal., $2250; 211, William Sellers & Co., Philadelphia, $2095; 259, Dreer Machinery Agency, Manchester, N. H., $2243.

Class 2. One motor driven patternmakers' lathe.—Bidder 71, J. A. Fay & Egan Company, Cincinnati, Ohio, $800; 91, Hallidie Machinery Company, Seattle, Wash., $645; 161, Oliver Machinery Company, Grand Rapids, Mich., $1318, $1500 and $1739.

Class 3. One motor driven boring, drilling and milling machine. Bidder 128, Lucas Machine Tool Company, Cleveland, Ohio, $3696; 153, Niles-Bement-Pond Company, New York, $4075 and $3925; 159, Prentiss Tool & Supply Company, New York, $3405; 170, Pacific Tool & Supply Company, San Francisco, Cal., $3675.

Class 11. Three pipe bending machines.—Bidder 32, Baird Machinery Company, Pittsburgh, $525; 50, Chicago Pneumatic Tool Company, New York, $300; 100, Handlan-Buck Mfg. Company, St. Louis, Mo., $519; 123, Knox & Brother, New York, $486; 203, Charles A. Smith, Chester, Pa., $495.

Class 61. Twenty motors.—Bidder 85, General Electric Company, Schenectady, N. Y., $20,430; 206, B. F. Sturtevant Company, Hyde Park, Mass., $21,100; 246, Western Electric Company, New York, $13,565 and $14,315.

Class 62. Twenty motors.—Bidder 85, General Electric Company, Schenectady, N. Y., $12,430; 206, B. F. Sturtevant Company, Hyde Park, Mass., $9900; 246, Western Electric Company, New York, $7415 and $8075.

Class 63. Twenty master controllers.—Bidder 38, Cutler Hammer Mfg. Company, Milwaukee, Wis., $11,800; 85, General Electric Company, Schenectady, N. Y., $24,330; 160, Otis Elevator Company, New York, $36,500; 192, James Schawel, New York, $16,640.

Class 64. Twenty master controllers.—Bidder 38, Cutler-Hammer Mfg. Company, Milwaukee, Wis., $9840; 85, General Electric Company, Schenectady, N. Y., $17,760; 160, Otis Elevator Company, New York, $30,800.

Class 65. Twenty shunt motors.—Bidder 60, Diehl Mfg. Company, Elizabethport, N. J., $14,273.20; 85, General Electric Company, Schenectady, N. Y., $11,240; 126, Lincoln Motor Works Company, Cleveland, Ohio, $5500; 206, B. F. Sturtevant Company, Hyde Park, Mass., $9680; 246, Western Electric Company, New York, $5670 and $6270.

Class 66. Twenty series motors.—Bidder 60, Diehl Mfg. Company, Elizabethport, N. J., $9524; 85, General Electric Company, Schenectady, N. Y., $4140; 206, B. F. Sturtevant Company, Hyde Park, Mass., $5360; 246, Western Electric Company, New York, $2515 and $3045.

Class 67. Twenty complete controllers.—Bidder 38, Cutler-Hammer Mfg. Company, Milwaukee, Wis., $1950; 85, General Electric Company, Schenectady, N. Y., $5290.

Class 68. Twenty shunt motors.—Bidder 60, Diehl Mfg. Company, Elizabethport, N. J., $4976; 85, General Electric Company, Schenectady, N. Y., $4980; 126, Lincoln Motor Works Company, Cleveland, Ohio, $3200; 206, B. F. Sturtevant Company, Hyde Park, Mass., $3240; 246, Western Electric Company, New York, $2730 and $4230.

Class 71. One power punch.—Bidder 29, E. W. Bliss Company, Brooklyn, N. Y., $614; 92, Henshaw-Bulkley Company, San Francisco, Cal., $352; 153, Niles-Bement-Pond Company, New York, $349; 176, Queen City Punch & Shear Company, Cincinnati, Ohio, $285; 182, Harron-Rickard & McCone, San Francisco, Cal., $460; 219, Toledo Machine & Tool Company, Toledo, Ohio, $375.

Class 72. One motor driven emery grinder.—Bidder 57, Connecticut Dynamo & Engine Company, New York, $315; 77, Frevert Machinery Company, New York, $412; 92, Henshaw-Bulkley Company, San Francisco, Cal., $310; 147, Manhattan Supply Company, New York, $174; 182, Harron, Rickard & McCone, San Francisco, Cal., $343.55; 185, Ransom Mfg. Company, Oshkosh, Wis., $330.

Class 73. One groover, one double steaming machine and one hand beading machine.—Bidder 20, Berger-Carter Company, San Francisco, Cal., $250; 92, Henshaw-Bulkley Company, San Francisco, $133; 123, Knox & Brother, New York, $295.63; 147, Manhattan Supply Company, New York, $285; 173, Peck, Stow & Wilcox Company, Southington, Conn., $185.43; 182, Harron, Rickard & McCone, San Francisco, Cal., $249.76.

Class 74. One pump.—Bidder 18, Blake & Knowles Steam Pump Works, New York, $765; 63, M. T. Davidson, Brooklyn, N. Y., $650; 92, Henshaw Bulkley Company, San Francisco, Cal., $712; 150, National Electrical Supply Company, Washington, D. C., $650; 212, Sandusky Foundry & Machine Company, Sandusky, Ohio, $475.

Class 142. One metal saw machine.—Bidder 151, Niles-Bement-Pond Company, New York, $795; 153, Niles-Bement-Pond Company, New York, $797 and $912; 169, Prentiss Tool & Supply Company, New York, $695; 231, Vandyck-Churchill Company, New York, $835; 260, Excelsior Equipment Company, Pittsburgh, Pa., $675 and $450.

Class 171. One milling machine, &c.—Bidder 9, Brown & Sharpe Mfg. Company, Providence, R. I., $2038.69; 78, Fairbanks Company, New York, $2253.07; 123, Knox & Brother, New York, $2373.10; 141, Montgomery & Co., New York, $2032.38; 146, Manning, Maxwell & Moore, New York, $2343.10; 147, Manhattan Supply Company, New York, $2084.83; 190, Rudolph & West Company, Washington, D. C., $2372.56; 193, Sherman, Brown, Clements Company, New York, $2107.24; 227, Union Twist Drill Company, Athol, Mass., $1942; 260, Excelsior Equipment Company, Pittsburgh, Pa., $1250.33.

The following bids were opened January 6, circular No. 408, for supplies for the Isthmian Canal Commission:

Class 16. One single noncondensing engine.—Bidder 9, Ball Engine Company, Philadelphia, Pa., $1375; 17, Buffalo Forge Company, Buffalo, N. Y., $1065; 47, A. D. Granger Company, New York, $1374 and $1442; 58, A. L. Ide & Sons, New York, $1350; 101, Ridgway Dynamo & Engine Company, Ridgway, Pa., $1540; 129, Westinghouse Electric & Mfg. Company, Pittsburgh, $1362.

Class 17. One engine type revolving field generator.—Bidder 42, General Electric Company, Schenectady, N. Y., $1840; 47, A. D. Granger Company, New York, $1700 and $2136; 127, Western Electric Company, New York, $2050; 129, Westinghouse Electric & Mfg. Company, Pittsburgh, $1424.

Class 19. One vertical boring and turning mill.—Bidder 18, Bullard Machine Tool Company, Bridgeport, Conn., $1803.18; 58, Bert Bros. & Co., New York, $1785; 99, Manning, Maxwell & Moore, New York, $1615.70 and $1730.70; 85, Niles-Bement-Pond Company, New York, $2090.

The following bids were opened January 7, for supplies for the navy yards:

Class 1. One No. 4 improved pipe threading machine.—Bidder 26, Crane Company, Chicago, $799.20; 37, Walter H. Foster Company, New York, $1075; 40, Frevert Machinery Company, New York, $809; 68, Manning, Maxwell & Moore, New York, $1050; 73, Niles-Bement-Pond Company, New York, $1225; 90, Thomas Sommerville Company, Washington, D. C., $1028.16; 93, Vermilye & Power, New York, $347.50; 101, Ernst Wiener Company, New York, $1075 and $363.80; 108, Excelsior Equipment Company, Pittsburgh, $1095.

Class 11. One metal cold saw.—Bidder 17, Birdsboro Steel Foundry & Machine Company, Birdsboro, Pa., $857; 73, Niles-Bement-Pond Company, New York, $735; 74, Nutter, Barnes & Co., Boston, Mass., $792; 106, Central Metal & Supply Company, Baltimore, Md., $895; 108, Excelsior Equipment Company, Pittsburgh, $675 and $450.

Class 21. One adjustable band saw machine.—Bidder 3, Atlantic Works, Philadelphia, $3300 and $3100.

Class 31. One 18-in. universal milling machine.—Bidder 18, Becker-Brainard Milling Machine Company, Hyde Park, Mass., $741; 19, Baird Machinery Company, Pittsburgh, $798; 20, Brown & Sharpe Mfg. Company, Providence, R. I., $742.53; 38, Fairbanks Company, New York, $798; 45, Garvin Machine Company, New York, $727.53; 47, Hill, Clarke & Co., Boston, $680; 68, Manning, Maxwell & Moore, New York, $660; 69, Motley, Green & Co., New York, $937.50; 73, Niles-Bement-Pond Company, New York, $695.

Class 32. One reheating or forging furnace.—Bidder 59, Kenworthy Engineering Company, Waterbury, Conn., $2240; 76, Rockwell Engineering Company, New York, $2450.

Class 91. One surface condenser.—Bidder 4, Alberger Condenser Company, New York, $1135; 6, Blake & Knowles Steam Pump Works, New York, $1096 and $837; 32, M. T. Davidson, Brooklyn, N. Y., $985; 99, Manning, Maxwell & Moore, New York, $1128.75; 69, Motley, Green & Co., New York, $1087.50; 93, Vermilye & Power, New York, $824.90; 95, Wheeler Condenser & Engineering Company, New York, $1000; 99, Williamson Bros. Company, Philadelphia, $950; 100, C. H. Wheeler Mfg. Company, Philadelphia, $805; 119, Pusey & Jones Company, Wilmington, Del., $886.

Class 92. Two vertical duplex pumps and two horizontal piston pumps.—Bidder 6, Blake & Knowles Steam Pump Works, New York, $1033; 119, Pusey & Jones Company, Wilmington, Del., $1392.

Under bids opened November 4, circular No. 396, for supplies for the Isthmian Canal Commission, Joseph T. Rverson & Sons, Chicago, have been awarded class 2, two punching and shearing machines, $1284, and class 3, one horizontal punching machine, $8[illegible].

The following awards have been made for supplies for the navy yards, bids for which were opened December 17:

Vandyck-Churchill Company, New York, class 91, one engine lathe, $[illegible].

Niles-Bement-Pond Company, New York, class 94, one shaper, $715; class 105, one steam hammer, $1350.

Pratt & Whitney Company, Hartford, Conn., class 102, one centering machine, $260.

Bullard Machine Tool Company, Bridgeport, Conn., class 95, one boring and turning mill, $1667.85.

American Wood Working Machinery Company, Rochester, N. Y., class 101, one rod and dowel machine, $265.

Fairbanks Company, New York, class 103, one crank shaper, $700; class 106, one power miller, $709; class 108, one gear generator, $2400.

Hilles & Jones Company, Wilmington, Del., class 104, one punch and shear, $[illegible].

Bauman & Smith, [illegible] milling machine, $[illegible].

Class 92, one engine lathe, and class 93, one crank shaper, have been awarded [illegible].

Under bids opened [illegible] supplies for the Isthmian Canal Commission, the Frevert Machinery Company, New York, [illegible] gine [illegible].

During [illegible] Sons, Taitville, [illegible] works in the past [illegible] [illegible] [illegible] of the tool used in [illegible] [illegible] [illegible]

HARDWARE

WHAT may be regarded as the formal opening of the Post Office Department's campaign to secure legislation establishing a domestic parcels post has been made in the House. Representative Sims of Tennessee has introduced a bill foreshadowed by the Postmaster-General and drafted in the Department, "providing for the establishment of a system of local rural parcels post." The bill is made up of five sections and is as follows:

Be it enacted, &c., That the Postmaster-General be, and is hereby, authorized and directed to establish a system of local rural parcels post, as hereinafter provided, and to formulate and prescribe such rules and regulations under which such system shall be conducted as may be deemed necessary.

Sec. 2. That for the purpose of this act local rural parcels post shall be confined to and consist of the transportation and delivery by rural mail carriers, as mail matter and at the rates of postage prescribed in section 4 of this act, of articles and parcels of merchandise or matter, each article or parcel, not to exceed 11 lb. in weight, when originating and mailed at a rural delivery distributing post office and addressed to a patron of rural delivery from such office or any rural postal station tributary thereto; or when originating and mailed on a rural delivery route and addressed to a patron of the same rural delivery route or to any patron of any rural delivery route or rural postal station having the same distributing office as the rural delivery route on which the article or parcel is mailed.

Sec. 3. That the provisions of this act shall not apply to matter which is classified by law as first, second and third class, nor affect existing rates of postage thereon; nor shall there be accepted for transportation and delivery, as mail matter, by rural mail carriers, any intoxicating liquors (ardent, vinous, spirituous or malt), habit forming drugs, explosives, liquids liable to explosion by shock or jar or to spontaneous combustion, or any matter exhaling bad odor, or which from its nature or constituency is liable to contaminate or damage the mails.

Sec. 4. That the rates of postage on all articles, matter or parcels entitled to transportation and delivery under the provisions of this act shall be 1 cent for 2 ounces or less, 2 cents for more than 2 ounces but not more than 4 ounces, 3 cents for more than 4 ounces but not more than 8 ounces, 4 cents for more than 8 ounces but not more than 12 ounces, 5 cents for more than 12 ounces but not more than 1 lb., and 2 cents per pound for each additional pound or fractional part of an additional pound up to and including a total of 11 lb.

Sec. 5. That the compensation of rural carriers be increased to the extent of all receipts for such parcels post service hereby established, on each route, respectively, not to exceed $300 per annum to each carrier, to be paid under such rules and regulations as may be established by the Postmaster-General.

This interesting measure is well worthy of a little analysis, leaving to a subsequent issue a fuller consideration of the objections to it. The first section, it will be noted, clothes the Postmaster-General with full authority to frame all rules and regulations under which the system is to be conducted, and as the bill describes only the character of the merchandise and the points between which it is to be conveyed and the rates of the service, it is clear that the Postmaster-General's discretion is intended to be exceedingly broad, covering especially all matters connected with the *personnel* of the service.

The second section is taken almost verbatim from the recommendations contained in the Postmaster-General's last annual report, and is designed to limit the service to rural routes, but obviously does not shut out matter which may be transmitted by freight to a distributing office and there placed in the rural mail, a use of the service which would undoubtedly be made by the mail order houses.

The third section of the bill is of special interest. By specific provision it cuts off from the benefits of the reduced rate of postage all books and printed matter of every description, thus confining the proposed advantages to shippers of merchandise and depriving the service of the "educational feature," which has always constituted one of the strongest stock arguments in favor of the extension of the rural free delivery. A bid for the support of prohibitionists is also made in this section by the restriction denying the low rate of postage to intoxicating liquors. The exclusion of habit forming drugs as proposed by this section reflects an ingenious attempt to offset the opposition of the National Association of Retail Druggists, which, in a memorial addressed to Representative Overstreet, chairman of the House Post Office Committee, opposes the proposed postage reductions on the ground that they will stimulate the shipment into rural communities of "habit forming narcotic drugs, the sale of which is prohibited by law in these same communities except on physicians' prescriptions, but which are now being scattered broadcast by the catalogue concerns, which, of course, are not amenable to local statutes."

The fourth section of the bill embodies the schedule of rates of postage as originally drafted by the Postmaster-General, ranging from 1 cent for 2 oz. or less up to 25 cents for 11 lb. Attention should be called to the fact, in this connection, that these rates are the same as those originally incorporated in the Henry Parcels Post bill, so that if the Sims measure should become a law Congress could at any time extend the rural parcels post to the entire postal service by inserting half a dozen words in the annual Post Office Appropriation bill.

Section 5 of this extraordinary bill should receive very careful attention. Its provisions are little less than preposterous. They would in effect turn over to the rural carriers practically every dollar of additional revenue that might be derived under the bill, for it goes without saying that only in rare cases would the total receipts per route, which now average about $150, exceed $300 additional. The adoption of this section would mean that the enormous increase in the cost of the rural service to properly equip it to handle merchandise would have to be paid by the taxpayers at large, while the gross increased receipts would go to the carriers. The Postmaster-General has not indorsed this feature of the bill so far as is known, but he has been careful not to repudiate it, and it goes without saying that its effect upon the rural carriers throughout the country will be to induce them to exert all possible influence in favor of the passage of the measure. Of course, the chances are that if the bill should be favorably reported from committee under the pressure thus brought to bear, Section 5 would be eliminated before passage, and thus the carriers would have nothing to show for their labor and misspent enthusiasm.

The official proposition for a rural parcel post is thus before the country. The parties in interest are the resi-

dents of the rural routes, the merchants in the towns from which they emanate, and last, but not least, the public at large. The Post Office Committee will soon begin a series of hearings on the annual appropriation bill, with a view to reporting it as soon as possible. The Postmaster-General and his aides will be heard at length concerning the needs of the department and will take the opportunity to urge the passage of the Sims bill. The time is ripe, therefore, for all opponents of these propositions to protest against them to their Representatives and Senators. These protests, however, should not merely express opposition to the project, but should assign the reasons for such opposition. Protests should be directed also against the bill recently introduced by Representative Lafean of Pennsylvania, providing for the establishment of an experimental rural parcels delivery, for if the Sims bill fails the postal "reformers" intend to come forward with the experimental proposition, which they will urge on the ground that it will shed light on a very serious problem, "and will only cost $10,000." a well worn phrase with which Congress has become quite familiar since it was first presented as an apology for the experimental appropriation for the rural free delivery service.

Condition of Trade.

There is a perceptible improvement in the general situation with more activity and a better feeling in the Hardware market. This results from the notable progress which is being made in the clearing of the financial skies with a general return to pretty nearly normal banking conditions, and the prospect of easy money before long. That the trade are preparing for the season's business is evidenced by the increase in the placing of orders. Buying is indeed not in large volume, but in quantities which are needed to complete assortments, and it is entirely free from the speculative element, being on cautious and conservative lines. The most noteworthy event of the week, so far as Hardware is concerned, was the announcement made on Monday by the American Steel & Wire Company that there would be no change in prices on Wire products for the spring trade, this decision having been reached after conference with other manufacturers. It was indeed the sense of the committee appointed at the Gary meeting that all interests would be better served by the maintenance of prices rather than by a readjustment on a lower level. The following of this policy by the Wire manufacturers will doubtless have an important influence in the trade, and will tend to reassure merchants and the public. In the lines directly affected it is thought that there will be a quickening of the demand at once, as stocks are low and in many cases broken. In other lines there is more or less attention being given to the revision of prices, but the changes are not radical or general. The extent to which production has been suspended or seriously curtailed suggests the possibility of a shortage of goods in some lines when the spring demand sets in. While it is no time for speculative buying or the laying aside of conservatism in the conduct of business, it is for each merchant to get his establishment into shape so as to be ready to take care of the demand which under existing conditions it is reasonable for him to expect. Special attention should probably be given to collections and to credits. The conditions are such as to justify and indeed call for a vigorous and energetic prosecution of business so as to keep up the volume of sales to about a normal amount.

Chicago.

Slowly, but surely, the financial atmosphere is clearing, and even now [illegible] requirements of business. Considering the tense strain imposed upon manufacturing and commercial interests by the recent scarcity of money and general impairment of confidence, it speaks well for the soundness of such institutions that they have, with remarkably few exceptions, weathered the storm on an even keel, and, though still pretty closely reefed, are steering a safe course. It is perhaps a little too early to expect important results from the spring campaign in the Hardware trade, which has but fairly begun; besides, buyers are moving carefully and are disposed to restrict purchase to actual needs until conditions are more clearly developed. This is true not only of manufacturers and jobbers, but is equally the case with retailers and consumers. Noting the growing spread between the prices of raw and finished materials all interests are inclined to hesitate in placing forward orders on a basis of present costs. Possibly price reductions will not be immediately followed by a marked increase in demand, but, on the other hand, as long as the market is dominated by uncertainty tinged with a strong conviction of ultimate recession, buying will continue to be of hand to mouth order. Following the reductions announced in last week's issue in the price of Sheets affecting all gauges of both Black and Galvanized, new prices on Bar Iron have been agreed upon, which represent a decline of $4 a ton from the former price of 1.75 cents, Chicago. Heavy Hardware jobbers report a quiet demand, which includes only filling in orders, there being no general reinstatement of held up shipments by the Wagon and Implement makers. Much interest and satisfaction is manifested by the trade in the announcement by the American Steel & Wire Company that present prices on Wire products will be maintained for spring trade.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—We have had a big storm, and the commercial craft has suffered more or less. While it lasted it was a sure enough tempest, and one which will be remembered for a long time. The Great Ship of Commerce, of which the Hardware trade is no unimportant passenger, has been for the last few years officered and commanded by financiers, and ordinary commercial men have been assigned positions of various responsibilities among the crew.

It is no reflection upon the bankers and other trustees of wealth that among them have been found men who were wanting in seamanship, and who, during the stress of the great storm we have just passed through, were compelled to resign their place of responsibility and leadership to others. The silver lining of the dark cloud is now showing, and will appear more visible as the days go by in the substitution of a different class of leaders—men who will do the banking business with more regard to the needs of commerce, and not handle the Great Ship as if it were on a voyage of piracy and adventure.

There is some consolation in reviewing the experience we have just passed through to realize that the Hardware part of the ship's company have come through the storm with very little permanent injury. We were not in command of the situation, and were obliged to keep below decks and seek our berths as best we could during the fury of the storm. The storm has passed, but it is by no means a calm sea as yet. The tempest has left the waters rough, and it will be many days before it is smooth sailing again. In the meantime, however, the Great Ship goes forward gathering speed daily, and before long we expect to be making normal progress again.

When the student of commercial history in future years reviews the story of the panic of 1907, we feel sure he will be impressed with the magnificent record made by both the Hardware manufacturer and retailer in the conservative way which they handled the question of panic prices.

The writer is not familiar enough with what has been done in other lines of merchandise to make a comparison.

but surely the contrast between the handling of stocks in the financial market and the almost unaffected prices of Hardware values is decidedly significant. Those of us who were fortunate enough to hear a representative of the Steel Corporation make some remarks at Atlantic City can appreciate how powerful has been the influence of this great organization, and others who have helped to sustain values until the period of hysteria had passed. Many million dollars have been saved to both wholesaler and retailer by this conservative force, and it is a great pleasure to acknowledge their testimony to the effect that all trusts are not bad trusts, and to suggest along with the denunciation and punishment of unworthy ones the commendation of those who deserve it.

Local business in Philadelphia is making steady progress. The number of orders shows a weekly increase, and while somewhat decreased in value give evidence of a wise conservatism on the part of the merchant.

The year is likely to see a policy of ordering often and in small quantities, as there is small excuse for speculative buying.

We are decidedly optimistic; the great forces of Nature had pretty well gone into their winter's rest before the storm broke, and when the sap begins to flow and the grass begins to grow, fields and forests will demand attention, and the calls for seasonable goods will come from all sections of our land, insuring the average spring business.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—The first of the year has come; we are quite confident of that, for it was marked by the receipt of an unusual number of calendars. Nothing so definitely marks the flight of time as the periodic advent of the annual calendar. What a variety of shapes it takes on! From the tiny leaflet which turns over on its nickel slides day by day to the large bank hanger with the startling announcement: "This is the —— day." In between these contrasts there are pictures of horses and dogs, and farm scenes, marines and pictures of beautiful ladies, a little too suggestive perhaps of the harem, and some with the reminder on Saturday that to-morrow is a Sunday, that you are made to realize that you are not expected to work on the days which are marked in red. These calendars in all their multiplicity are a kindly evidence of thought on the part of somebody who has put you on his list and serve as a testimony either of friendship or past favors, or hopes for some to come. Never a one comes in to our desk but what we feel more or less indebted to the sender for his good will and the outlay he has made in our behalf.

Withal, there is a difference. Natural selection begins at once to operate. Some we choose for our own individual desk or office wall; some fall to the portion of the stenographer or to the porter to take home and one or more—they are apt to be of the beautiful ladies of the harem aforesaid—to the lot of the messenger boy. The distinction comes in either as a result of first choice of a truly artistic production in drawing and color; may be it is a tiger by Church, or a reproduction of Swarz of Germany, or some equally distinguished contributor to the salon of Paris; and, again, others come down to the matter of fact embossed representation of corn and pumpkins. All of them have their place, and all of them are judiciously distributed. What a lonesome New Year it would be without any calendars! After all, the essential features are the days of the week, with the holidays and Sundays differentiated from the working days by colored ink, usually red—this, in order possibly, that the "Bromide" may remark something about the red letter days.

But business is what we want to talk about and think about, selling goods we mean, not selling paper. It was not overstrenuous this same sales proposition in November and December more particularly. As for that period we would be more than pleased to take the advice of the small boy and "fergit it." Now, orders are coming in freely, we confess, but the volume is comparatively small. Manufacturers have overtaken the demand, and jobbers can now fill orders on receipt as a rule; or, at least, there is no great lot of orders held over for the morrow. This enables the buyer to carry a smaller stock, and that is exactly what he is doing. When the buying movement once begins there will be a world of stuff required to fill the empty bins. Whether this buying movement will be delayed until more declines take place other than those already on bars and sheets and roofing remains to be seen. It would only be natural if it should. Meanwhile the sidings are marked by long strings of empty cars that only three or four months ago were so hard to get for the impatient shippers.

It is folly to say that consumption is not increased by low prices. It would be a great relief to the railroads, for instance, if rails could be gotten off that dead level price indicated on *The Iron Age* chart by the long, blue line without a wave since 1901. Fortunately, on the other hand, prices are held down by firm controlling hands and not permitted to go soaring when temptation is strongest.

The most hopeful signs are things financial—the obliteration of the premium for currency, the resumption in the banks of their normal functions of taking deposits and crediting same, thus giving the commercial world something to work on, the reduction in the rate of interest for commercial paper—all of these have come back within a short time, so we soon ought to be doing business at the old stand as though nothing disturbing had occurred. Business will be done unquestionably, but the volume, what about that? Has the army of consumers learned the lesson of close economy, or will they spend lavishly as in the past few years? It is safe to say that the smartest man will win where his competitor fails; the economical man will have credit whereas the spendthrift flounders in debt. The same old principles which have governed the world from the days of the prodigal son down, who spent his substance, will still be in operation, and we shall be working under them whether we will or no. Somebody may bestow new names upon them, but their functions are just the same. Settling day comes and then we know if we have been fooling ourselves, our business policies are put to the test. Happy is he who is justified in his work.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—Business in the new year has opened much better than we expected. After taking their annual inventory, merchants are placing nice, long sorting up orders. Specifications for spring goods, such as Wire Cloth, Poultry Netting, Screen Doors, Steel Goods, Ice Cream Freezers, Clevises, Hames, Trace Chains, &c., are coming in good volume.

We have received from our salesmen on the road a number of very handsome new stock orders, and have also sold several here in the house.

It now appears to us there is some danger of the recovery from the recent financial flurry being too sudden. We fear there is going to be a shortage of goods in many lines.

It is an old axiom with us that spring trade depends upon the weather; that fall trade depends upon the crops. Therefore we believe the character of the weather in the next 60 days will have a great influence over business. If we have favorable weather we predict a strong demand for goods.

What is sauce for the goose is not always sauce for the gander. It has been our experience that the changes in conditions affect lines of goods in very peculiar ways. In the South, for instance, when the lumber business is good and all the lumber mills are running full time labor leaves the farm and works in the mills. When these mills shut down this labor goes back to farming. The same thing is true when the factories in the large cities shut down either wholly or partly. Labor hikes out for the country. Therefore we have noticed in such years there has been an increase in the demand for Agricultural Tools, such as Hoes, Forks, Rakes, Shovels, Spades, &c.

We have also noticed that in bad years for manufacturing, or when large numbers of men are out of employment or on strikes, the Sporting Goods business is always better than at any other time. To illustrate, our sales of Loaded Shells in the panic months of November and December were the heaviest in our history. For-

tunately for us, we had a good stock to take care of the business. If you stop to think of it, it is perfectly natural that men who are out of work will devote their time to hunting and fishing.

As far as prices go, the market seems to be holding up very well. All jobbers' stocks are low—probably lower than they have been for years. They will be compelled to buy goods. No doubt these orders will stiffen the backbones of the manufacturers and those who may have been a little "wobbly" about prices will take a more hopeful view of the situation.

In our opinion the manufacturer, jobber and retailer who have the goods on hand to fill orders promptly in the next 90 days will have no cause to regret it.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—Business continues to improve steadily. Stocks in the hands of retail dealers have been reduced to a minimum, and it is confidently expected that a steady and increasing run of business will develop from now on. Grain and live stock is moving Eastward rapidly. The resumption of a number of Steel mills which suspended operations during the late financial disturbance is a very encouraging feature.

It could hardly be expected that the severe blow sustained recently by the business activity of the country could be healed in a hurry by a quick revival of business. We do look, however, for a gradual and cautious improvement for several months to come.

When we reflect, it does seem passing strange that within 24 hr. the financial fabric of this great and prosperous country could be shaken from "turret to foundation stone." The surprising feature was the suddenness of the metamorphosis; one jump from a national currency to a Christian Science circulating medium.

All indications now point to the fact that the industrial interests have been benefited by the temporary lull in business and have had an opportunity to readjust their plans on a more stable and conservative basis. The resumption, while it may not be as rapid as desired, is inevitable.

New Orleans.

WOODWARD, WIGHT & CO.—The general business of the year 1907, up to November 1, was very good and equal to or better than any former year in this section. Of course, the financial panic, coming on as it did very suddenly, curtailed business about one-half for the period of two months, and has left a large number of houses with considerable stocks of goods on hand which they expected to market during November and December.

We believe, however, that the most serious part of the depression is over; in other words, we believe that in the next 60 days the currency question will have solved itself; that the banks will have resumed payment, and that general mercantile paper of good standing will be sought for by the banks as heretofore. Our reason for this belief is that this is an agricultural country, and that our crops are good and that our prices, on cotton particularly, are remunerative and the sugar and rice crops have certainly been able to about hold their own, even on the depressed prices.

Taking it all in all, there is no need for any panicky feeling among the agriculturalists, and as they are the largest part of the purchasers in the South, improvement must gradually commence.

We believe, however, from the serious financial conditions of the last few months, the great falling off in the purchase of supplies by the consumers and the accumulation of stocks that has naturally resulted, and from the fact that this is a Presidential election year, we are likely to have a limited demand, or a hand to mouth purchasing condition for 1908. Therefore, we think that all of the leading manufacturers in the country will probably be obliged, in order to create a demand to greatly reduce their prices, as we do not believe that a sound condition will obtain until commodities and labor are on a lower basis of cost than the prices that have been in effect for the last six months or a year.

We do not feel depressed with the situation here, but as we said before, we believe it is going to be rather a lean year for merchants, and that by the end of next year business will get pretty near up to its former standard.

In the meanwhile prices will average considerably lower, and the cost of producing goods will be greatly lowered to the manufacturer by the reduction in the cost of labor and material.

It will take conditions of this kind particularly to revive the lumber industry, as building operations will not assume their former proportions until the costs of materials and construction are very much lowered. As Louisiana is now the second largest lumber State in the Union, and has a large number of mills, most of which are closed down, we cannot see any immediate good that will result in this trade to bring the mills back to running to their full capacity at least for the next five or six months, and as far as we hear the manufacturers of yellow pine lumber have reduced their prices to conform to the times. We presume that that will be the case also in the iron, steel and metal trades in general, and when all building material has reached this point we look for a strong, healthy and continuous demand in Hardware and other lines of kindred jobbers' supplies.

Cleveland.

THE W. BINGHAM COMPANY.—With the advent of the new year, activity in all branches of general Hardware, mining, milling and manufacturers' supplies is quite prevalent. On account of the many inquiries for material for the next six months, and some inquiries for prices on commodities to be used during the whole of 1908, the outlook for a good, fair trade is quite hopeful.

Many business houses have completed their inventory of stock on hand, and their books will soon be closed against the past year, and we believe the balance will show on the right side of the ledger in spite of the adverse times we have passed through in the past three months.

We, like some other jobbers, are taking into our warehouses goods ordered months ago to fill up our depleted stocks in many lines, and we shall be ready, like many other jobbers, who did not get stampeded and cancelled their orders, to serve our many customers promptly and give them many good bargains.

As is usual at this time of the year, there are some changes in prices taking place; some higher and some lower, but no great or radical changes have been announced, and we do not look for any extreme changes.

Many orders for spring goods that were placed with us months ago are now going forward, such as Steel Goods, Shovels and Spades, Wire Cloth, Poultry Netting, Freezers, Lawn Mowers, Hardware grade of Wire Cloth, Butts, Strap Hinges, Locks, Knobs, medium priced Lock Sets, Step Ladders and Screen Doors and Windows. The jobbers who have the goods in stock and can ship promptly, and the retailers who sort up their stocks will be the ones that will get the trade and make the profit.

Mills that were shut down for repairs and other causes are starting up, and many men are returning to their workshops.

Money matters are getting in better shape daily, and business in general is beginning to float along in its natural and easy channel. You cannot keep a good thing down long; there are too many good, wise and patriotic business men at the helm throughout the land to allow pessimists and demogogues to flourish very long in this, our great and glorious Union.

Nashville.

[redacted] We are pleased to state that we can see a considerable improvement in business conditions during the past two weeks. Most of our salesmen are now on the road, and the majority of them are doing a good business, some of them exceedingly good, and are sending in some nice orders for spring goods.

While we do not expect the month of January to be as large as last year, it is going to make a fairly satisfactory showing. We think business will get better as the season progresses, and would not be surprised to see February and March very heavy months.

The banks in this city and throughout the South have practically resumed their normal condition, and are now giving the public the usual banking services and facilities. Collections continue to be exceedingly good.

We regard the panic now entirely a thing of the past, and hope that everybody will endeavor to forget it.

Portland, Oregon.

FAILING, HAINES & MCCALMAN.—With the first of the year, conditions are looking considerably better in this section of the world than we had any reason to expect. Business has begun to pick up, and it looks as though there would be still further improvement. From the writer's conversation with men engaged in other lines, it would appear that prospects for other lines in this territory are equally as good as the prospects for the Hardware dealer. The general consensus of opinion seems to be that this year will be a prosperous and busy year, but we do not except to be so rushed and so busy as we were in 1907. We, however, expect it to exceed the year 1906.

Local conditions financially are looking much brighter. Notwithstanding the failure of four banks in this city, Portland was almost the first city of its size to go on an absolutely cash basis. Commercial loans are being made, although not as freely as before the panic, with due regard to the general conditions, and no one who has a deserving proposition finds himself unable to obtain the backing. As to the four banks that closed their doors, one, the Merchants' National, expects to open shortly with the full approval of the Controller of the Currency. The depositors of the Title Guarantee & Trust Company have been guaranteed against loss by W. M. Ladd, who was at one time a director of that institution, and felt himself morally, though not legally, bound to see them safe. The prospect is bright for the reorganization of the Oregon Trust & Savings Bank, and its amalgamation with another bank in this city. The only bank whose depositors are not reasonably certain of getting their money back is the Commonwealth Trust Company, whose deposits total less than $10,000.

This state of affairs has naturally greatly increased the confidence of the public in the future, and it will have a great deal to do with helping us to have a prosperous year. All businesses are in a prosperous condition, except lumbering. This, however, is beginning to revive somewhat and looks better than two weeks ago. Should the Interstate Commerce Commission decide in favor of the contentions of the Oregon and Washington lumbermen, we will see this year a very sudden and very remarkable development in this important industry.

It remains only to be said that crops look as well as they ever do at this time of the year and that our collections continue to be much better than we have any reason to expect in the present disturbed state of affairs. We only hope all other sections of the country are in as good shape as the Pacific Northwest is, for if they are then we all can look forward with confidence to the year upon which we have entered.

NOTES ON PRICES.

Wire Nails.—The American Steel & Wire Company, after a very careful canvass of the whole situation and after conferences with the other manufacturers, has decided to maintain present prices on Wire Nails and other Wire products, the announcement being made by F. Baackes, vice-president and general sales agent of the company, in the following letter to the trade under date of January 13:

This is to advise you that our present prices on Wire products are reaffirmed, and there will be no reduction for the spring trade. You can, therefore, with confidence advise your trade of this action, and inasmuch as there has been a great curtailment of production during the past four months, and the stocks of the trade have been reduced to a minimum, we advise that you anticipate your wants as far ahead as possible, so you will have the goods when the demand springs up.

Under the policy thus determined upon the leading interest will have, it is understood, the co-operation of the other manufacturers who have expressed their approval of it and their purpose to maintain prices on the present level. The stocks in the hands of the mills are unquestionably exceptionally low, especially as full advantage has been taken of the opportunity afforded by the practical cessation of demand for a month or more to overhaul and repair the mills. The result has been that they have on hand much less than a normal supply for the spring trade. At the same time the market is thought to be exceptionally bare of goods as both jobbers and retailers as well as the large consumers have been going very slow in the matter of purchases and have permitted their stocks to run down to a minimum. It is confidently expected that orders, now that the manufacturers have declared their policy, will begin to set in, probably for moderate quantities at first, but sufficient to replenish badly broken assortments, and with a growing volume of business as the condition becomes more settled and trade resumes at least part of its customary volume. Quotations are unchanged, as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

New York.—Merchants are buying meagerly and with only such frequency as to supply present demand. It is anticipated that the announcement made by the American Steel & Wire Company that it would make no reduction in price for the spring trade, will increase confidence in the stability of the market. Local jobbers and Nail houses are holding small lots at store at $2.30, base. This price is, however, shaded by some sellers, while others are adhering to it.

Chicago.—What effect the reaffirmation of prices on Wire products by the American Steel & Wire Company, coupled with the assurance that there will be no reduction for the spring trade, will have on the placing of new business for this period will be watched with interest. There was a growing feeling that prices would be reduced and as long as uncertainty on this point existed buyers would naturally hesitate to place orders for forward requirements. Now that the price has been announced there will be nothing to hinder an unrestricted movement when the demand warrants a resumption of buying. Trade at present is extremely quiet, though it is said that stocks in all hands are light. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The Wire Nail trade has been in a waiting attitude, buyers believing that very soon there would be an announcement from the manufacturers of a positive nature in regard to the maintenance or readjustment of prices. In this condition, orders have been scarce, representing actual needs of customers and for small lots. It is believed now that the policy of the manufacturers as to prices has been determined there will be a perceptible increase in demand for Wire Nails, stocks held by jobbers all over the country being extremely light. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

Cut Nails.—There is no noticeable change in the Cut Nail market, regular quotations remaining as before. The reaffirming of prices on Wire Nails will probably have an excellent effect on the makers of Cut Nails, and with a largely diminished production it is hoped that prices will on the whole be at least fairly well maintained. During the present week there has set in a better demand for Nails than for some time and it looks as if the trade were disposed to order in quantities to cover their needs. A better feeling, though thus far with a moderate volume of business, certainly characterizes the market. We continue to quote as before, $2.05 base for carload lots f.o.b. Pittsburgh with occasional concessions.

New York.—Demand for Cut Nails is proportionately small as compared with that for Wire Nails. Prices

which have been ruling were reaffirmed at a recent meeting of the Cut Nail Association. Local jobbers and Nail houses are holding small lots at store at $2.30 base. This price is, however, shaded in some cases.

Chicago.—Demand is extremely light, and stocks are being diminished very slowly. Jobbers are buying only for assortment since prices show too little stability to warrant liberal stock purchases. For the small orders that are filled from jobbers' stocks prices are fairly well maintained. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; steel, to jobbers, in carloads, $2.28; to retailers, $2.33.

Pittsburgh.—The situation in the Cut Nail trade is extremely quiet, some of the mills being closed, while others are operating to very limited capacity. Demand is very light, and only for small lots for actual needs. Prices continue to be shaded, even on the small amount of new business that is being placed. We quote Steel Cut Nails at $2 to $2.05, f.o.b. Pittsburgh, for carload lots, and small lots at $2.10, to which freight to destination is added. Iron Cut Nails are being held at about $2.15, at mill.

Barb Wire.—The reaffirmation of prices on Barb Wire and other Wire products is the principal event of the week, and puts these lines on a basis at which it is expected that there will be a resumption of purchases. The fact that the farming population is in excellent shape financially leaves the way clear for a good volume of business, and while there is no reason to expect anything like speculative buying the manufacturers are confident that a good deal of Wire will be called for to meet the present needs of the trade. Meanwhile, existing quotations are quite regularly maintained as before, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—Inquiries from the Southwest are beginning to come in, and in view of the announcement that Wire prices for the spring trade will be maintained at a fairly good and early demand is looked for from this section. There is apparently no reason why there should not be at least a normal consumption of Fencing Wire since there is no impairment of puchasing power in the territory where it is most used. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—As in the case with Wire Nails, the Barb Wire trade has been in a waiting condition, merchants not having been disposed to place orders until some definite announcement from the manufacturers has been made as to the course to be pursued in regard to prices. Practically no new tonnage was placed during the past week, and shipments by the mills were of very limited volume. Now that it has been decided to maintain present prices, it is expected that orders will begin to be placed with confidence. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—Within the past few weeks the manufacturers of Fencing and other products, of which Plain Wire is the raw material, have been receiving shipments and placing some orders for the season's supply. The announcement by the leading manufacturers of their determination to maintain prices is pretty sure to act as a stimulus to buying, and from both manufacturers and merchants a quickened demand is expected. With a moderate stock in the warehouses of the manufacturers and the diminished production at this time it is thought by some that difficulty may be experienced before the season is over in getting orders executed with comfortable promptness. Present quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—There has been practically no new business being offered and specifications against contracts are light. With the reassurance offered by the reaffirmation of prices for the coming season there will be nothing to retard the placing of orders when conditions favor the resumption of buying. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—Very little new tonnage is being placed, but there is a moderate amount of specifying on contracts. It is believed the demand for Plain Wire will soon show material improvement, as announcement from the manufacturers of their decision to maintain prices has been made. Quotations for base numbers 6 to 9 are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Oilers.—A somewhat firmer tone characterizes the market for Oilers. Quotations of the leading manufacturers exhibit greater steadiness and regularity than a few weeks ago.

Sash Cord.—A conference of numerous Sash Cord manufacturers was held last week with a view to improving, if possible, the unsettled condition of the market. As a result several producers have established an extreme price of 22 cents per pound, representing some advance over the figures recently ruling. It remains to be seen what will be the attitude of jobbers whose contracts, entered at the extreme low level, would enable them to undersell the manufacturers.

Sash Weights.—Lower quotations on Sash Weights are generally reported on the part of local foundries in various sections, due to declines in scrap and active competition for the small business offering.

Gilt Furniture Nails.—The market for Gilt Furniture Nails has taken on a somewhat more regular appearance, and prices are somewhat stiffer, as some manufacturers have withdrawn their recent extreme quotations.

Burners.—Quotations representing a moderate reduction in prices have been sent out by a leading manufacturer of Lamp and Lantern Burners.

Hammers and Sledges.—Leading manufacturers of Hammers and Sledges have reduced their prices 10 per cent. or more. The market on heavy lines on retail lots may be represented by a discount of 80 and 2-10 per cent., and on the lighter lines by 80 and 10 per cent.

Asbestos.—There has been some advance in certain Asbestos products by some of the independent manufacturers who have advanced prices to more nearly an equality of the makers who adhere to regular prices. On Asbestos Building Paper and Felt some of the advances reach $5 per ton. There is also irregularity on Mill Board in sheets, the makers in agreement not only meeting prices made by independent makers, but in some instances giving lower quotations. Asbestos Pipe Coverings have been advanced about 10 per cent.

Peck, Stow & Wilcox Company.—The Peck, Stow & Wilcox Company, Southington, Conn., and New York City, under date of the 10th inst., issues a circular in which it is stated that the high costs of material and labor which prevailed during the last six months of 1907 would have necessitated, under normal conditions, a corresponding advance in the selling price of the company's product, which it had expected to announce previous to the above date. After careful consideration of existing conditions the company has, however, decided to let its general quotations remain as heretofore, all prices being subject to change without notice.

Axles.—Volume of business in Axles is unusually light, although it is generally rather quiet at this season of the year. Manufacturers state, however, that the prices established in the fall have been fairly well maintained, and while orders are in moderate volume, the

condition is regarded as, on the whole, fairly satisfactory. An early increase in business is anticipated.

Leather Belting.—Reflecting some weakness in the leather market, prices on Belting have recently shown a declining tendency, which is especially marked on competitive grades.

Bolts and Nuts.—Although prices have been formally reaffirmed for this month, the market for Bolts and Nuts is not firm, special concessions being reported here and there by one and another manufacturer. Actual buyers are able to obtain low prices on moderate quantities.

Steward & Romaine Mfg. Company.—The Steward & Romaine Mfg. Company, Philadelphia, Pa., manufacturer of Expansion Bolts, Toggle Bolts, &c., announces that beginning this month discounts to the trade will be as follows: No. 13 Double Expansions, expansions of annealed steel, 55 per cent.; No. 1 Single Lock Nutted, 55 per cent.; No. 100 Double Jaw Single, 50 per cent. In lots of 500 and over an extra 5 per cent. is offered on the above lines. On Lag Screw Expansion Bolts the discounts remains the same, 66 2-3 per cent.

Binder Twine.—The price of Binder Twine has not yet been announced by the largest producer. A few weeks ago indications were that Sisal and Standard Twine would possibly be quoted at 8 cents for small lots. Since that time the planters have organized and arranged to get bank advances on their Fiber, and at present it is understood that no Fiber is being offered for sale. It is reported that manufacturers have as yet purchased only a small part of their season requirements, so it is difficult to form a correct idea of the price Twine will start at.

Conductor Elbows and Shoes.—Current prices on Conductor Elbows and Shoes are, apparently, little affected by the declines in Sheets, as the market has long been in such a demoralized condition that quotations did not bear the usual relation to productive costs. Discounts of 85 to 85 and 10 per cent. on standard gauges are commonly reported at the present time.

Tinware, Galvanized Ware, &c.—The expected readjustment of prices on Tinware, Galvanized Ware, &c., consequent to recent declines in Sheets and Tin Plates, has not yet been made. It is understood that conferences are under way, and announcement of reductions in one form or another are looked for daily.

Chain.—Prices on Pump Chain recently announced by several manufacturers show advances of ½ to ¾ cent. The market may be represented by a quotation of 4¼ cents per pound.

Coil Chain.—Coil Chain continues to exhibit the irregularity observed during the last three or four weeks. Larger manufacturers are apparently allowing the market to shift for itself, and smaller producers seem to be getting the most of the business, which can hardly be very profitable. A quotation on ⅜-in. of $3.75 per 100 lb., f.o.b. Pittsburgh, represents the market in a general way.

Rope.—Manufacturers refer to demand being fair, but not as good as they anticipated it would be after the first of the year. Collections are improving. A stiffening in Rope prices, as the result of the higher values of Fiber, would be appreciated by Rope manufacturers, as many have high priced Fiber on hand. Manufacturers are not accumulating stocks to any extent, so that early orders will stand the best chance of being filled promptly, when spring demand commences. The following quotations fairly represent the market for base sizes: Pure Manila, 11½ cents; B quality grades down to 8½ to 9 cents; Pure Sisal, 8 cents; lower grades Sisal, 7 to 7¼ cents; No. 1 Jute, ¼-in. and up, 7½ cents; No. 2 Jute, 7 cents.

Window Glass.—Succeeding weeks record a smaller quantity of Glass being made, as additional Glass factories suspend operations, owing to the inability of getting workmen at wages which would yield manufacturers profit. The smaller the quantity of Glass produced under ruling conditions is regarded as best for the manufacturers. The low prices made by manufacturers, which have ruled for some time, have failed to stimulate demand to any marked extent, buying being restricted to assorting up stocks. A consumptive demand for Glass will undoubtedly show itself in time, as building operations are not going to be entirely suspended. Under present conditions jobbers' prices are more or less elastic. Prices recommended at the last meeting of the Eastern Window Glass Jobbers' Association are as follows: In the States of New York and New Jersey 90 and 15 per cent. discount for single and 90 and 20 per cent. discount for double strength Glass. Similar prices are supposed to prevail in Pennsylvania, but in New England discounts are said to be fixed at 90 and 20 per cent. for single and 90 and 25 per cent. discount for double strength Glass.

Spirits Turpentine.—As a result of the manipulation of the Southern market prices continued to advance last week. Buyers considered the 12-cent advance in prices too rapid, so that purchases at this point have been confined to small lots. The New York market is represented by the following quotations: Oil Barrels, 55½ to 56 cents; Machine Made Barrels, 56 to 56½ cents.

Linseed Oil.—Business at this point continues light, being confined to small lots, covering immediate requirements. Crushers are unwilling to accept orders for car lots for delivery covering a longer period than to March 1. It is stated upon reliable authority the manufacturers cannot sell State and Western Oil at 40 cents per gallon and make any profit, owing to the high priced Seed on hand. Prices in five barrel lots are about as follows: State and Western Raw, 42 to 43 cents; City Raw, 44 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM OGRAM & TREW, who have bought out the Hardware, Stove, Implement, Paint and Sporting Goods business of Meiner Hardware Company, Creswell, Ore.

FROM HAWS HARDWARE & FURNITURE COMPANY, Minden, Neb., which has just completed and equipped a substantial modern store building into which it has moved its Hardware, Stove, Paint, Sporting Goods and Furniture business.

FROM GALOGAN & HEALY, Elysian, Minn., who are about to open a Hardware, Stove, Implement and Paint store.

FROM KENNERLY-SPRAGINS HARDWARE & LUMBER COMPANY, Ardmore, Okla., which has been incorporated with a capital of $100,000.

FROM LONG-LEWIS HARDWARE COMPANY, Bessemer, Ala., successor to Bessemer Cornice Works and Lewis Hardware Company, who desire catalogues of Hardware, Mill Supplies, Paints, Wagon and Buggy Material, &c.

FROM H. W. SHEELER, Red Lion, Pa., who will be pleased to receive catalogues relating to Shelf and Heavy Hardware, Paints, Oils, Sporting Goods, Wood and Willow Ware, Harness, &c. Mr. Sheeler has just completed an addition, 40 x 50 ft. in size, to his store building.

THE second annual convention of the salesmen of the Berger Mfg. Company, Canton, Ohio, was held during the week beginning December 30. It was attended by representatives of the company from all parts of the country. The conference was fittingly terminated on the evening of January 2 with a very enjoyable banquet tendered by the company at the Courtland Hotel, at which more than 60 persons sat down. One of the features of the banquet was the presentation to Edward Langenbach, general manager of the company, of a clock as an evidence of the esteem in which he is held by the selling representatives of the company.

RETAIL HARDWARE CONVENTIONS.

During the next two or three months the following retail Hardware conventions will be held. Where the asterisk appears elaborate plans are being made by the association officials for the accommodation of Hardware exhibits by manufacturers and jobbers.

INLAND EMPIRE ASSOCIATION, Spokane, Wash., January 15, 16 and 17. Secretary, E. W. Evenson, Spokane.

OREGON ASSOCIATION, Portland, January 21 and 22. Acting Secretary, C. D. Lownsdale, Portland.

TEXAS ASSOCIATION,* Dallas, January 21-23. Secretary, J. W. McManus, Dallas.

PACIFIC FEDERATION, Portland, Ore., January 23-25. Secretary, E. W. Evenson, Spokane, Wash.

NORTH DAKOTA ASSOCIATION, Fargo, January 28-30. Secretary, C. N. Barnes, Grand Forks.

SOUTH DAKOTA ASSOCIATION,* Aberdeen, February 4-7. Secretary, H. E. Johnson, Redfield.

WISCONSIN ASSOCIATION,* Milwaukee, February 5-7. Secretary, C. A. Peck, Berlin.

CONNECTICUT ASSOCIATION, Meriden, February 10 and 11. Secretary, James de F. Phelps, Windsor Locks.

KENTUCKY ASSOCIATION, Louisville, February 11-13. Secretary, John R. Sower, Frankfort.

NEBRASKA ASSOCIATION,* Lincoln, February 11-14. Secretary, J. Frank Barr, Lincoln.

INDIANA ASSOCIATION,* Indianapolis, February 18-21. Secretary, M. L. Corey, Argos.

IOWA ASSOCIATION,* Cedar Rapids, February 18-21. Secretary, A. R. Sale, Mason City.

NEW YORK ASSOCIATION,* Buffalo, February 18-22. Secretary, John B. Foley, Syracuse.

PENNSYLVANIA ASSOCIATION,* Altoona, February 24, 25 and 26. Secretary, J. E. Digby, McKees Rocks.

OHIO ASSOCIATION,* Columbus, February 25-27. Secretary, Frank A. Bare, Mansfield.

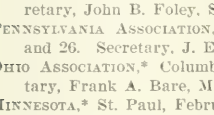
MINNESOTA,* St. Paul, February 25-28. Secretary, M. S. Mathews, Guaranty Building, Minneapolis.

ILLINOIS ASSOCIATION,* Peoria, February 26-28. Secretary, L. D. Nish, Elgin.

NEW ENGLAND ASSOCIATION,* Boston, March 11 and 12. Secretary, Chas. L. Underhill, Somerville, Mass.

Iowa Retail Hardware Association.

The Iowa Retail Hardware Association will issue an official gazette, in which the full proceedings of the four-day convention on February 18-21 will be given, together with 50 pages illustrating Iowa Hardware store interiors. The association is inviting the attention of manufacturers and jobbers to the benefit to be derived from advertising space in the gazette, each advertiser being guaranteed a location opposite a page of the proceedings or an illustrated page. It is intended to print and mail 2500 copies of the gazette. Particulars in regard to terms, &c., may be obtained from A. R. Sale, secretary, Mason City. The stamp reproduced herewith is being used freely in the correspondence of the association. It will be observed that it calls attention in an effective way to the time and place of the approaching meeting.



Ohio Hardware Association.

Frank A. Bare, secretary, Mansfield, states that members of the Ohio Association are already sending in suggestions for the next convention, which is regarded as indicating that the merchants of the State are thinking of the annual meeting earlier than usual. It is intended in connection with this convention to have one night session, as this feature seems to be meeting with the hearty approval of the members. Many applications for membership are reported and a very large and enthusiastic gathering at Columbus on February 25, 26 and 27 is looked for.

B. E. Walter, S. Milwaukee, Wis., who has conducted the Walter Hardware Company for the past 12 years, has retired from the business, selling his interest to his son, A. W. Walter, who will run the business in the future.

Display Stand for Wrenches.

THE FRANK MOSSBERG COMPANY, Attleboro, Mass., has perfected the ingenious metal display stand for Wrenches shown in the accompanying illustration. It is 17 in. high, with a base 7 in. in diameter. It is designed to accommodate a representative assortment of the company's goods, being capable of holding 20 different types and sizes. The stand is nickel plated and highly finished, and when mounted full of Wrenches it is said to make an attractive window or showcase display. To introduce its complete line the company offers one of the stands with three different assortments according to the requirements of the trade.



Frank Mossberg Company's Display Stand for Wrenches.

POST E. of the Travelers' Protective Association, Lafayette, Ind., and leading merchants of that city have sent to Vice-President Fairbanks and to the Indiana Senators and Congressmen at Washington an appeal against the parcels post bill, on the ground that it will harm the business interests of the country, especially the retail stores in small towns, in addition to causing a great loss to the Postal Department revenue. The petition says, in addition: "We believe that a Government department of this kind should be self-supporting; that its affairs should be so administered that it could not incur losses to be charged to the deficit account. We believe it is wrong to tax any class of citizens for the benefit of another class, which would in this case tend to build up a monopoly and trust which would be against the public welfare. We believe that if any changes are made in the postal rates they should be reduced on letters and increased on bulky packages."

AMONG the manufacturing interests treated in "Marshalltown Illustrated," which has been issued under the supervision of the Retail Merchants' Association of Marshalltown, Iowa, is that of the Marshalltown Buggy Company. This company was organized two years ago and now employs 165 men. During the past year the company manufactured and sold more than 4600 vehicles, and with enlarged capacity expects to turn out between 6000 and 7000 during 1908. The officers of the Marshalltown Buggy Company are L. M. Osborne, president; W. A. Tuttle, vice-president; F. E. Gates, manager, and Ray R. East, secretary-treasurer.

THE C. J. ROOT COMPANY has succeeded to the business of the late C. J. Root, manufacturer of Wrought Brass Hinges, Counting Machines, Specialties, &c., Bristol, Conn. The officers of the company are C. F. Barnes, president, and John T. Chidsey, secretary and treasurer.

Simonds' Seventy-fifth Anniversary.

THE SIMONDS MFG. COMPANY, Fitchburg, Mass., has just issued a handsome and comprehensive book souvenir, commemorative of the establishment, progress and industrial advance of the business since its founding in 1832 by Abel Simonds, father of Daniel Simonds, who is now president of the company. Originally Scythes were made, followed by Machine Knives, Mower and Reaper sections, Saws for all purposes, from power to hand, and Files for mechanics. Since 1900 the company has made its own steel in Chicago, and more recently has acquired a large File plant in Fitchburg, in addition to the works proper there. The plant of the Canada Saw Company of Montreal, Toronto, and St. John, was also acquired in January, 1906, a new plant being erected at Montreal and the business conducted under the style of Simonds Canada Saw Company.

The book throughout is highly artistic, both in conception and execution. The letter-press occupies most of the early pages, the remainder of the volume containing illustrations, more than 400 in number, of works, domestic and foreign branches, office scenes, officials, managers and specialists, superintendents, salesmen, employees, "the old guard" of over 20 years' service, working staff at mills and the many branches, a page at the end showing four generations of the Simonds family.

Referred to Our Readers.

THE following inquiry from a Southern house for a method of keeping track of stock is respectfully referred to our readers. We shall value any pointers or suggestions with which merchants may be good enough to favor us:

> Please let us know if you have any stock form of sheets suitable for keeping track of goods. If not, do you know of any jobber that has a good system for keeping tab on stock at all times? We are weak in this particular, and would like to be able to adopt some system whereby we can have a card system that will keep us in touch with what we have on hand and what we have sold of each item for some time back. If you can assist us it will be duly appreciated.

Covert Mfg. Company's Catalogue.

THE COVERT MFG. COMPANY, Troy, N. Y., has just issued its new catalogue No. 25 referring to its well-known Square Brand line of Harness Hardware, &c. The book is of handy size, 5½ x 8 in., and contains 144 pages, divided into four sections. Section 1 includes Snaps of all descriptions; section 2 covers Hitching Posts, Weights, Jacks, Dees and other miscellaneous articles; section 3 refers to all kinds of Chains, and section 4 to Rope and Web Goods and special Snaps for Fire Harness and Electrical Equipment. The goods are fully described, and there is an elaborate index of 11 pages arranged in both alphabetical and numerical form, which should make the catalogue a great convenience to the trade.

The Bernard Gloekler Company.

THE BERNARD GLOEKLER COMPANY, Pittsburgh, manufacturer of Eclipse Refrigerators, Refrigerating Machinery and Butchers' Supplies, has added a new line to its products, consisting of hotel kitchen equipment, and the business will hereafter be able to contract for everything required in hotel, restaurant or public institutions, such as Burton Steel Ranges, French-American Chophouse Broilers, &c. A sample room has been fitted up on the second floor of the company's building, where a complete line of this equipment is shown.

THE Twist Drill department of the Union Twist Drill Company, Athol, Mass., is now in operation, marketing the wire sizes and adding larger sizes as rapidly as possible. The company states that the delay in the production has been principally due to the care that has been taken with a view to turning out tools of superior quality.

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Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

C. E. BONNER MFG. COMPANY, Chrisman, Ill.: Illustrated catalogue and price-list of Victor Chain Wrenches, Wire Pliers and Cutters, Fence Tools, Engineers' Wrenches, &c.

GENERAL AUTOMOBILE SUPPLY COMPANY, 11 Warren street, New York: Illustrated catalogue covering an extensive line of Automobile Accessories and Supplies.

JOHN A. GREGG COMPANY, Burlington, Iowa: Memorandum book containing announcement of the manufacturers represented by the company with lists of their products.

INDIANA MFG. COMPANY, Peru, Ind., for whom Wm. A. Stokes & Co. are agents, 30 Warren street, New York: Illustrated catalogue and price-list of North Star Refrigerators.

I. DURLACH, 54 Vesey street, New York: Illustrated circulars referring to Ash and Garbage Cans, Town Improvement Cans, Asphalt Scrapers and other sheet metal specialties.

S. R. DROESCHER, 79 Warren street, New York: Illustrated catalogues referring respectively to Hones and Oil Stones and Key Rings, Key Chains, Watch Chains, Dog Chains, &c.

J. H. EDWARDS, 59 Park Place, New York: Illustrated price-list of Goshen and Tiger Galvanized Steel Tanks and Troughs, Goshen Tank Heaters and Feed Cookers and Kelly and Goshen R. F. D. Mail Boxes.

J. W. FISKE IRON WORKS, 39-41 Park Place, New York: Large illustrated catalogue referring to an extensive line of Stable Fixtures.

WHITMAN & BARNES MFG. COMPANY, Chicago, Ill.: Circular illustrating Mounted Grindstones, with wooden and steel tubular frames.

W. & B. DOUGLAS, Middletown, Conn.: Illustrated catalogue, 1908, devoted to Hand and Power Pumps, Hydrants, Hydraulic Rams, Well Fixtures, Garden Engines, &c.

EMERSON ELECTRIC MFG. COMPANY, St. Louis, Mo.; New York office, 136 Liberty street: Catalogue No. 4700, under date of January 1, 1908, devoted to Alternating Current Fans, including Desk, Bracket, Ceiling and Column Styles.

WIARD PLOW COMPANY, Batavia, N. Y.: Catalogue No. 33, relating to Plows, Hay Rakes, Bean Harvesters, Hand Corn Planters, Adjustable Weeders, Harrows, &c.

POTTER MFG. COMPANY, Geneva, Ohio: Illustrated price-list of Tools and Specialties, including Housekeepers' Hardware, Cross Cut Saw Handles and Garden and Floral Tools.

E. H. H. SMITH SILVER COMPANY, Bridgeport, Conn.: Circular illustrating numerous designs of Silver Plated Flatware.

J. W. BUCKLEY RUBBER COMPANY, 69 Warren street, New York: Illustrated price-list of Hose, Belting, Packing Gaskets, Mats, Matting and Mechanical Rubber Goods.

CARPENTER & BAYLES, 91 Chambers street, New York: Illustrated price-list of Hickory, Ash and Small Tool Handles.

BURGER & BAUMGARD, 105 Chambers street, New York: Illustrated circulars referring to Challenge Axes, Scythes, Hoes, Pruners, &c.

RAZORINE MFG. COMPANY, 69 Warren street, New York: Illustrated circular referring to Shaving Specialties.

NATIONAL METAL FABRIC COMPANY, 84 Chambers street, New York: Illustrated booklet referring to the company's Expanded Metal Fabric and its uses.

LANCASTER MACHINE & KNIFE WORKS, Lancaster, N. Y.: Catalogue No. 16, 1908, illustrating Braces, Extension Bit Holders, Chucks, Breast Drills, Oval Drill Sockets, Oval Steel Sleeves, Drifts or Center Keys, Oval Taper Shank Drills, Machine Knives, Planer Head Bolts, &c.

IVER JOHNSON'S ARMS & CYCLE WORKS, Fitchburg, Mass.: Attractive illustrated catalogue of Bicycles for 1908.

ECLIPSE NOVELTY WORKS, Pulaski, Pa.: Illustrated booklet referring to Boyd's Revolving Flower Stands.

HANCHETT SWAGE WORKS, Big Rapids, Mich.: Illustrated catalogue referring to an extensive line of Automatic Filing Room Machinery and Saw Fitting Tools and Parts.

TURNER & SEYMOUR MFG. COMPANY, Torrington, Conn.: Illustrated catalogue of Gas and Electric Portables, Ornamental Shade Rings, &c., together with appendix showing new designs.

TRADE ITEMS.

AFTER 50 years the Boetticher-Kellogg Company, Evansville, Ind., reincorporated its business January 1, the old charter having expired by limitation. The capital stock of the new corporation is $300,000, representing a large increase over the former amount. The incorporators are Edw. Boetticher, W. H. Boetticher, Oscar Boetticher, Carl F. Botticher and O. H. Kellogg, Edward Boetticher being president; W. H. Boetticher, vice-president, and Oakley H. Kellogg, secretary and treasurer.

THE SIMMONS HARDWARE COMPANY, St. Louis, Mo., at a recent meeting of its Board of Directors re-elected the following persons who compose its staff of officers: E. C. Simmons, chairman of the board; W. D. Simmons, president; G. R. Barclay, A. W. Douglas, F. J. Semple, E. H. Simmons, G. W. Simmons and J. E. Smith, vice-presidents; A. E. Dann, treasurer; William Enders, secretary; L. S. Hasham, assistant treasurer; F. W. Allen, assistant secretary; O. F. Richards, general manager.

W. H. HENDER died at his home in Davenport, Iowa, December 28. Mr. Hender was a veteran stove merchant and was for a number of years a member of the firm of Washburn & Hender. He was 72 years of age, having retired from active business on his sixtieth birthday, when he turned over his business interests to his three sons, by whom he is survived.

BELIEVING that dull times call for increased rather than diminished effort in pushing business, the Norvell-Shapleigh Hardware Company, St. Louis, Mo., has added 25 traveling salesmen to its force, having opened up that many new territories. The enterprise back of such expansion at the present time should be rewarded by profitable results.

THE published report to the effect that the Heusinger Hardware Company, San Antonio, Texas, has filed a petition in voluntary bankruptcy, is stated by A. Heusinger, president of the company, to be without foundation, and furthermore the company was never in better condition than at the present time. The fact that it is discounting its bills is referred to as ample refutation of the prejudicial financial report.

THE new British patents and designs act became operative January 1. This act makes compulsory the working "to an adequate extent" in the United Kingdom of patents having the benefit of the protection of the British patent laws, and will doubtless force the manufacture in the United Kingdom of many articles now made in the United States for export to the United Kingdom. Work will thus be furnished to British labor, which is what the act is intended to accomplish. Its effect will probably be most striking in connection with the manufacture of shoe machinery.

THE KANAWHA NAIL & IRON COMPANY, manufacturers' agent and jobber of Hardware, Charleston, W. Va., has removed from 317 Clendennin street to 428 State street.

WILLIAM H. BENSE, for many years connected with the Kinsley Iron & Machine Company, Canton, Mass., which concern recently went out of business, has established himself at 170 Summer street, Boston, as New England sales agent for the Logan Iron & Steel Com-

pany, Burnham, Pa., and the E. J. Gardner Axle & Machine Company, Carlyle, Pa.

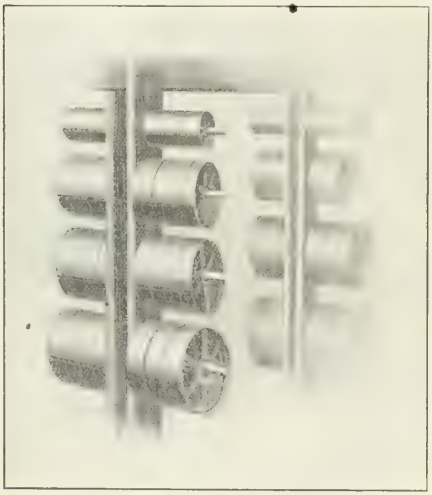
THE AMERICAN WRINGER COMPANY, 99 Chambers street, New York, recently held its annual gathering of salesmen, managers and officers in New York City at which plans for the business of the new year were discussed, and views exchanged as to marketing the large lines of Wringers made by the company. At the close of the conference a sumptuous banquet was tendered the force at the Hotel Astor.

THE secretary's report to the Auditing Committee of the Hardware Dealers' Mutual Fire Insurance Company of Wisconsin, December 27, 1907, shows that the losses paid during 1907 aggregated $7,438.97, and that the assets on the 27th ult. were $28,123.40. During 1907 1252 policies amounting to $1,869,075 were written, with applications on file to write amounting to $127,350. The profit for the year exceeds $12,000.

THE St. John Iron and Hardware Association held its annual meeting at St. John, N. B., on Monday, 6th inst. The following officers were chosen for the ensuing year: W. S. Fisher, president; M. F. Irwin, vice-president: Fred C. Owens, secretary-treasurer, and W. H. Thorne, Thomas McAvity and M. E. Agar directors.

A Good Pulley Rack.

THE Hardware firm of Lyon & Grumman, Bridgeport, Conn., does an extensive mill supply business. In the accompanying drawing is illustrated the method devised by the firm for accommodating its large stock of Pulleys. They are kept in the basement, being easily moved in or out by means of a chute. Heavy boards are erected in pairs face to face, as shown in the illustration. Holes are bored in these uprights, through which are run short pieces of 2-in. gas pipe, forming strong pegs from 2 to 3 ft. long on either side. The Pulleys are grouped according to size on these projecting ends of pipe, with larger sizes at the bottom. They are easily slipped on and off and present a fine, orderly appearaance. This method of arrangement is economical of space, as the number of pegs between floor and ceiling may be closely gauged according to the diameter of the wheels and the hight of the floor. The largest Pulleys are not kept on the pegs, but are lined up on the floor.



Pulley Rack of Lyon & Grumman.

The Shipley Hardware Company has been incorporated at Meyersdale, Pa., by M. C., J. T. and B. E. Shipley. The company will conduct both a wholesale and retail business.

J. RUSSELL & CO.'S BUILDERS' HARDWARE DEPARTMENT.

THE large business done by J. Russell & Co., Holyoke, Mass., necessitates carrying a heavy stock of goods. The firm's activities are not confined to its home city and environs, but extends over a much wider field. Much attention is paid to Builders' Hardware, and a large and varied stock of samples is required. These are kept in the specially designed counter and showcase here illustrated. The counter is perhaps 15 ft. long and is backed by sliding doors. In the illustration some of the doors are pushed back, revealing a fine array of sample boards which slide in and out in runs constructed by nailing strips of wood onto the upright partitions by which the space under the counter is divided. On top of the counter is a large showcase nearly 3 ft. high, in which large and elaborate Door Sets, &c., are shown on the upright stands with which the trade is familiar. The back of the case is divided into four slides, making it easy of access at any point. A portion of the counter is not covered by the showcase, being left clear for laying out samples, &c. The effect of the entire equipment upon a customer is sure to be favorable and impress him with the size of the stock and the excellence of the facilities for making selection.



Builders' Hardware Department of J. Russell & Co.

Among the Hardware Trade.

The Thomas-Davidson-Ogilvie Hardware Company, Ltd., Shreveport, La., has been incorporated with a capital of $200,000, of which $75,000 is paid in. It is expected that the active capital will be increased to $100,000 or more as soon as the present financial stringency is relaxed. The company will do a wholesale Hardware business. The officers of the concern are as follows: E. A. Thomas, president; R. J. Ogilvie, vice-president; F. Davidson, secretary and treasurer.

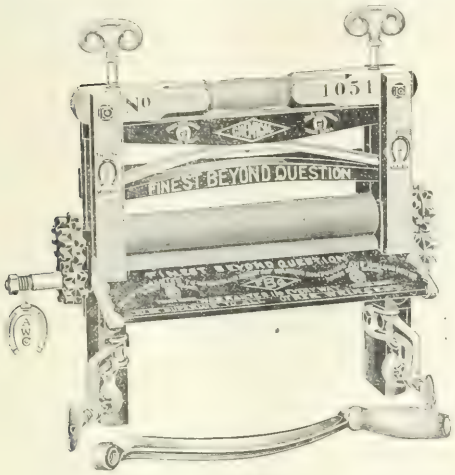
Wood Brothers, Martinsville, Ill., has purchased the Hardware stock of Byron McNary, which will be carried in connection with their Implement business, now established at that place.

The Edward Dick Hardware Company, Terre Haute, Ind., has purchased the Hardware stock of Rector & Polson, 311 Wabash avenue, and is moving the stock carried at its former location, 30 South Fourth street, to 311 Wabash avenue, where it will be merged with the goods just purchased. The entire three floors of the building will be occupied, the main floor being devoted to Builders' Hardware, Stoves, Tinware, &c., and on the second floor will be added a line of Mowers, Binders and Farm Implements, while the third floor will have a complete tin shop.

Cox Hardware Company, Paragould, Ark., has engaged in business under the management of Geo. W. Cox.

Chemical Original Dark Roll Wringer.

The American Wringer Company, 99 Chambers street, New York, is about to put on the market the Chemical Original dark roll clothes wringer, one style of which is here illustrated. This higher grade of clothes wringer has become necessary in consequence of the present methods of hasty laundering with soaps, powders and numerous washing compounds containing strong chemicals to cleanse without rubbing, which, while affecting the fabric and dirt also serve to disintegrate the rubber rolls. To neutralize this destructive tendency a new group of wringers has been produced in 10, 11 and 12 in. lengths of rolls and 1¾, 1⅞ and 2 in. diameters, with both plain



Chemical Original Dark Roll Wringer.

and ball bearings, according to price. There are 32 sizes in all for folding benches, stationary tubs, narrow and wide partitions and roll rim porcelain tubs. If desired some of the kinds and sizes, so designated in the company's literature, can be furnished with inclosed cogs. With each Chemical wringer is given a five-year warrant on the rolls, which are manufactured by an improved process, although the assertion is made that with ordinary care they will wear at least 10 years. The darker hue of the rolls used in these wringers is indicative of the greater amount of pure rubber contained, which more closely resembles rubber in its natural state. There is also obviously a greater resiliency or elasticity in the rolls which yield under pressure the more readily to inequality of fabrics passing through, and at the same time there is less tendency to injure clothing and buttons and garments are wrung drier. The wringers will be manufactured and sold under the brand Chemical, as here illus-



trated, which is peculiar to this highest grade type, together with the brand F B Q in a diamond, signifying "finest beyond question," as well as the familiar horseshoe brand used on all warranted wringers made by the company. This brand of wringers will be extensively introduced to the trade by specially qualified representatives of the company, who have been provided with suitable receptacles in which they can be conveniently carried and shown. Other important features of this group are the use of selected material and handsome distinctive finishes for the various parts which increase salability. The two wood springs and folding apron are enameled in a rich royal blue with gold lettering, the curved steel tension spring is aluminized, metal parts galvanized and the selected maple frame varnished natural. Attractive literature in facsimile colors illustrating and describing this particular line is now ready for distribution by the trade.

The Perfect Ventilating Sash Lock.

The Taylor Mfg. Company, Hartford, Conn., is placing on the market the ventilating sash lock herewith shown. It is made of steel, and is referred to as being unbreak-



The Perfect Ventilating Sash Lock.

able. The lock is designed to be placed about 5 in. above the lower sash at the point shown in the illustration. With the device either the upper or lower sash, or both, can be opened a few inches for ventilation, and yet be secure from intrusion. By pressing in the catch the window can be opened full width, and the act of closing the window automatically locks it. A bumper plate is provided to prevent marring the lower sash. The device can also be used in place of the ordinary sash lock. While the lock can be furnished in any finish desired, the standard finishes are dull nickel, bright nickel, oxidized copper and plain brass. The locks are packed one dozen in a box with template, full directions and necessary screws.

Carpenters' Chisels.

The Braunsdorf-Mueller Company, Elizabeth, N. J., for whom Warner & Haviland, 49 Warren street, New York, are sales agents, has recently put on the market in addition to a large line of mechanics' tools for many different trades, a full line of chisels for carpenters. It includes firmers, socket and tang, in both plain and beveled edges, all tanged chisels and gouges having the company's patented sliding toothed concealed bolster, also used on screw drivers, needle point ice picks, &c. There are also notching chisels for stair builders, butt chisels, tanged and socket gouges, turning chisels and turning gouges. All chisels and gouges have second growth dogwood handles and are sharpened ready for use.

THE GALTON MFG. COMPANY, Cleveland, Ohio, manufactures an extensive line of brooms and brushes made of flat and round wire, bristle and fiber. In addition to the varieties used by foundries, factories, plating establishments, heater and boiler manufacturers, painters, packers, &c., the company's product includes a full line of floor and window brushes, counter dusters, push brooms and all goods regularly carried by the hardware trade.

THE [illegible] COMPANY, [illegible], has recently been appointed sales agent and New York representative of the Prouty Mfg. Company, Albion, Mich., which manufactures Parlor and Barn Door Hangers, Hasp Locks and Screen Door and double acting Floor Hinges.

THE W. H. DAYCOCK, JR., COMPANY, 81-83 Fulton street, New York, has just been appointed the Eastern sales agent of the Buffalo Copper & Brass Rolling Mill, Buffalo, N. Y. The company is in a position to make quick deliveries on the long lines of Sheet Copper and Brass in its various forms and finishes.

Lufkin Combination Tape for Foreign Trade.

The Lufkin Rule Company, Saginaw, Mich., and 280 Broadway, New York, has added to an extensive line of measuring tapes one for individuals handling foreign trade, either export or import, two views of which, reduced, are given herewith. Fig. 1 shows it with one side of the tape visible, the graduations being etched in accordance with the metric or French system on the upper edge and in feet and inches of the English system below, the 5-16-in. steel tape being two meters or approximately 78¾ in. long, with German silver case and stop, ½ x 1¾ in. in outer dimensions. On the reverse side of the tape, Fig. 2, there are two kinds of graduations; pounds or avoirdupois weight on the upper half and kilograms below. Thus, any one having to use English or metric equivalents in measurements and weights, has also conveniently at hand the means for quickly determining or converting the equivalent of one quantity into the other without hindrance or liability of error through computation or necessity for consulting printed tables not always accessible, as this compact self-contained instrument occupies little space in a pocket. The first 10 in. of tape on one side records avordupois weights up to 10 lb. by sixteenths or ounces, the lower table in kilos, being a trifle more than 4½ kilograms, the units being by fiftieths of a kilo. Then follows a table in avoirdupois from 1 lb. to 1120 lb. equal to a half ton, gross, in gradation by

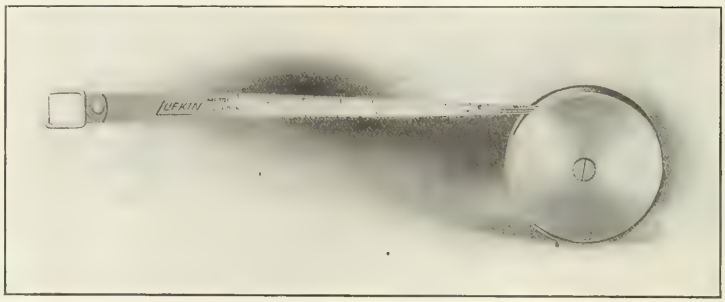


Fig. 1.—Lufkin Combination Tape, Showing Meters and Inches.

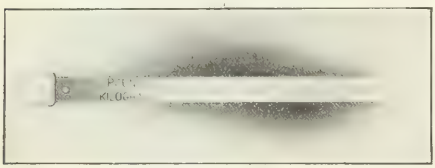


Fig. 2.—Section of Reverse Side, Having Pounds and Kilograms.

pounds, and underneath 505 6-10 kilos subdivided into unit kilos (a kilo being about 2 1-5 lb.). With this serviceable article a shipping clerk, customs officer or any one charged with such duties, can quickly ascertain the cubic contents of a package in either system of measurement, and with a knowledge of the weight can transpose it instantly either way.

Robinson Pin Vises.

The M. W. Robinson Company, 79 Chambers street, New York, has just put on the market two pin vises, as

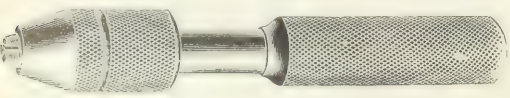


Fig. 1.—Robinson Pin Vise, No. 1.

here shown, similar in principle but proportioned to meet varying requirements. Fig. 1 illustrates the No. 1 vise, which is 5¼ in. long over all, with chuck ⅞ in. outer diameter, and pin capacity from 0 to 11-64 in. Fig. 2 reproduces the smaller size, No. 2, for more delicate purposes, which is 4½ in. long, with chuck ⅝ in. in diameter and a pin capacity of 0 to 5-64 in. Both have hollow handles, are finely polished, nickeled and knurled, and



Fig. 2.—Robinson Pin Vise for Delicate Work, No. 2.

while suitable for innumerable purposes in working metals are especially designed for the use of machinists, jewelers and kindred mechanics. Both the material and workmanship are of a fine order for a discriminating trade, the chuck jaws being made of high grade tool steel, slotted transversely near their base, so that they are easily and positively carried for opening or closing by means of three longitudinal spring steel members operated by revolving the tubular handle, there being no spiral springs or other working parts to easily get out of order. Each tool is put up in a double pasteboard box attractive in appearance and labeled on top and end.

Unique Ice Cream Disher.

The Mosteller Mfg. Company, 5 West Madison street, Chicago, includes in its line of hardware specialties the Unique ice cream disher, here illustrated. It is made



Fig. 1.—Unique Ice Cream Disher, Full of Cream.

of noncorrosive white metal, having few parts, all of which are said to be easily accessible and very strong. Fig. 1 shows the implement scooped full of cream and Fig. 2 shows how, by a pressure of the thumb on a lever,

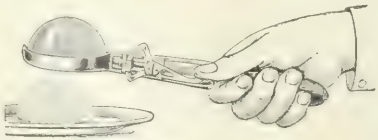


Fig. 2.—Ice Cream Disher, Emptied.

it deposits the cream on the plate in a neat mold. It is made in sizes to serve 6, 8, 10, 12, 16 and 20 to the quart. The device is self-cleaning and rapidly and easily operated.

Fancy Scissors and Toilet Knives.

The Clauss Shear Company, Fremont, Ohio, has recently issued a new catalogue showing several articles which have been added to its line, three of which are illustrated herewith. Fig. 1 shows the colonial pattern scissors, having hand forged blades and forged handles. They are hardened in water and tempered by natural

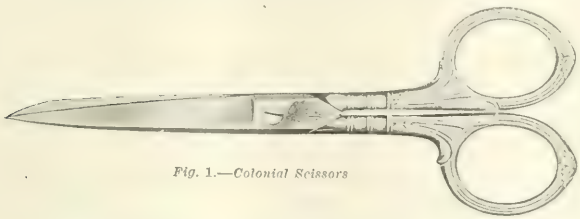


Fig. 1.—Colonial Scissors

gas, offered in 3½ to 6½ in. sizes and in nickel, silver and gold platinized finishes. The Horn of Plenty scissors,

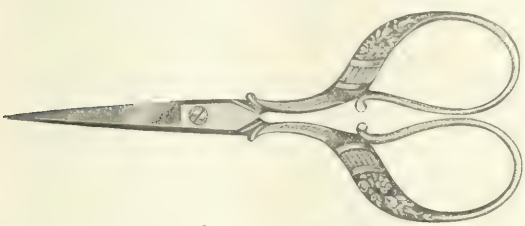


Fig. 2.—Horn of Plenty Scissors.

shown in Fig. 2, are of the same high quality and are made on extra strong lines, although unusually light. Sizes range from 3 to 6 in., and full crocus finish, with



Fig. 3.—Flower Design Cuticle Knife.

oxidized or gold platinized handles, is offered. In Fig. 3 is shown a special flower design cuticle knife, which is listed in oxidized, silver or gold platinized finish. In the same design are a corn knife and nail file. Each handle a complete matched set.

Steel Salamander.

R. Monroe & Sons Mfg. Corporation, Pittsburgh, Pa., manufacturer of boilers, stacks, tanks, &c., is placing on



Steel Salamander.

the market a line of salamanders for use in heating cellars and buildings in course of construction, drying plaster and concrete, heating manufacturing plants, using either coke or gas for fuel, or for burning paper and rubbish, as illustrated herewith. These shells are 18 in. in diameter, 24 in. high, 1-16 in. thick, having at the top two circular holes, directly opposite each other, through which a bar can be inserted and the salamanders easily moved about from place to place, even though they contain a hot fire. In the larger and heavier special sizes built to order the hooks of a crane chain can be inserted when moving them. The shells are set on three legs, which keeps the salamander from tilting on uneven floors. These legs are also bent in at the top, thus forming lugs on which the cast iron circular grates rest.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₩ gal.
Linseed, State and West'n,	
Raw	.41 @42
City, Boiled	.44 @..
City, Raw	.44 @..
Raw, Carnetta, in bbls	.. @..
Lard, Extra Prime, Western	.56
Extra No. 1	.53 @56
No. 1	.47 @52
Cottonseed, Crude, tank, mills	.. @32
Summer Yellow, prime	.. @34
Summer White	.41 @42
Yellow Winter	.. @42
Sperm, Crude	.70 @75
Natural White	.75 @85
Bleached White	.75 @86
Bleached White, Extra	.. @..
Tallow, Prime	.. @60
Whale, Crude	.. @..
Natural White	.. @48
Bleached White	.. @51
Extra Bleached White	.. @54
Menhaden, Brown, Strained	.41 @42
Light Strained	.43 @45
Natural	.. @..
Southern	.. @..
Cocoanut, Ceylon	.. @..
Cochin	₩ lb 8½@ 8¾
Cod, Domestic, Prime	.42 @44
Newfoundland	.41 @46
Red, Elaine	.12 @13
Saponified	₩ lb .. @..
Olive, Yellow	.. @..
Neatsfoot, Prime	.. @..
Palm, Lagos	.. @..

Mineral Oils—

Black, 20 gravity, 2 cent	₩ gal.
Red	.. @..
26 gravity, 15 cent test	.13 @14
Summer	.. @..
Cylinder, light filtered	.18 @19
Dark filtered	.16 @17
Paraffine, 30 deg. gravity	.11 @12
903 sp. gravity	.13 @14
887 sp. gravity	.. @..
Red	.13½@14

Miscellaneous—

Barytes:	
White, Foreign	₩ ton $18.50@20.50
Ashort, floated	₩ ton 21.00@24.00
Off color	₩ ton 13.00@16.50
Chalk, in bbls	₩ lb .. @..
In bags	₩ lb .. @..
China Clay, Imported	₩ ton 11.50@18.00
Cobalt, Oxide	.. @..
Whiting, Commercial, in bbls	.. @..
Gilders	₩ lb .. @..
Ex. Gilders	₩ lb .6@ .65

Putty, Commercial—₩ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.40 @1.45
In 1 lb. to 5 lb cans	2.25 @2.35
In 12½ to 25 lb cans	1.50 @1.60

Spirits Turpentine—₩ gal.

In 5 to 10 bbls	.54 @..
In machine bbls	.55 @..

Glue—

	₩ lb
Cabinet	.12 @15
Common Bone	.. @..
Lodi's White	.18 @..
Fish, liquid, 50 gal. bbls., per gallon	.60 @1.20
Foot Stock, White	.12 @14
Foot Stock, Brown	.. @..
Glucose, Common Hide	.. @..
German Hide	.12 @18
Irish	.. @..
Isinglass	.. @..
Low Grade	.11 @..
Medium White	.14 @17

Gum Shellac—

	₩ lb
Bleached, Commercial	.. @..
Bone Dry	.. @..
Button	.. @..
Lemon, Orange	.. @..
Fine, Orange	.. @..
A. C. Garnet	.. @..
G. A. L.	.. @..
Kid's Button	.. @..
Pale	.. @..
Octagon, B	.51 @72
T.	.. @..
V. S. O.	.18 @19

Colors in Oil—

	₩ lb
Black, Lamp	.12 @14
Blue, Chinese	.. @16
Blue, Prussian	.. @26
Blue, Ultramarine	.16 @..
Brunswick, Vandyke	.. @14
Green, Chrome	.12 @16
Green, Paris	.. @24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.—

	₩ lb
Lead, French, Ground in Oil	.. @..
Lead, American White:	
Lots of 500 lb or over, in Oil	.. @ 6½
Less than 500 lb	.. @..
Lead, White, in oil, 25 lb tin	
Extra	.. @..
Lead, White, in oil, 12½ lb tin	
Extra	.. @..
Lead, White, Dry	.. @..
Extra	.. @..
in 15 days from date of invoice	
Zinc, American:	
Extra	.. @..
Zinc, French:	
Extra	.. @..
Zinc, Sublimed White	.. @..
Extra	.. @..

Dry Colors

	₩ lb
Chrome Green	.. @10
Lemon	.. @ 8
Black, Ivory	.. @..
Black, Lamp	5 @15
Black, Drop	.16 @..
Lamp, commercial	4 @ 6
Blue, Cobalt	.. @..
Blue, Cerulean	.. @..
Blue, Celestial	.. @..
Blue, Ultramarine	.. @..
Brown, Spanish	.. @ 1
Carmine, No. 40	.. @..
Carmine, Chinese	.. @..
Green, Chrome, pure	.17 @25
Lead, Red	.. @..
Lead, White	.. @..
Umber, Vandyke	.. @..
Vermilion, English	.. @..
Vermilion, Chinese	.. @..
Yellow, Chrome, Pure	.13 @15
Yellow, Lemon	.. @25
Quicksilver, bulk	.65 @..
Quicksilver, flasks	.. @.66
Red, Imported	.65 @70
Chinese	$0.90@1.30

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list lines of prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic ..... 30 & 5
North's ..... 40 & 10
Zimmerman's See Fasteners, Blind.

Window Stop—

Ives' Patent 35%
Taplin's Perfection 35%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—

Leonard Mfg. Co. Button Anti-Rattlers for any Lamp, No. 1, $3.75; No. 2, $4.50; No. 3, $5.00.
Tolhurst Quick Shutter, per doz. bottles ..... $2.00@$3.00

Anvils—American—

Eagle Anvil ..... @ lb. 9½c
Hay Budden, Wright ..... @ lb. 9½c
Trenton ..... @ lb. 9½c

Imported—

Peter Wright & Sons, 50 lb. and over 8½c
Under 50 lb. 9½c

Anvil, Vise and Drill—

Millers Falls Co. ..... 15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Leather 40%

Augers and Bits—

Cen. Double Spur ..... 75 & 5
Jennings' Pattern, Bright ..... 40 & 10 & 7½
Black Lip or Bluing ..... 40 & 10
Barney Mach. Augers 70
Car Bits, Iron, Lever ..... 40 & 10
Car Bits, Steel, Lever ..... 40 & 10
Solid Angle Bits 15
Ft. Washington Auger Co., Cards 35
Ft. Washington Auger Bits 25
Ohio Tool Co.'s Auger Bits 25
C. E. Jennings & Co.'s
No. 10 ext. lip, R. Jennings' pat. 60
No. 24, R. Jennings' pat. ..... 25 & 10 & 5
Ratchet Bradawls 40
Lip Irwin Car Bits 15
Machine & Countersink Bits 40
Push & Ratchet 40
Expan. Adjustable Pattern 35
Snell's Auger Bits 60
Snell's Ext. Lip Auger Bits 60
Snell's Car Bits, Lip, Irwin 60
Snell's Ext. Lip Auger Bits 50
Wright's Jennings Bits 50

Bit Stock Drills— See *Drills, Twist.*

Expansive Bits—

Clark's, No. 1 ..... 1-2 ..... $.6
No. 2 ..... $.75
Ford's, Clark's Pattern ..... 66⅔ & 5
Ford's, Jennings' & Co. Steeple Pat. 25
Lavigne Pat. Shell ..... per doz. $.60
Shell 6
Snell's 6

Gimlet Bits—

Per gro.
Common Dble. Cut ..... $3.00@$3.25
German Pattern, Nos. 1 to 12, $3.75; 14 to 18, $5.75

Hollow Augers—

Donney Pat., per doz. ..... $6.50@7.00
Ames ..... 40 & 5
Universal ..... 40 & 5

Ship Augers and Bits—

Ames ..... 70 & 10
Ford's ..... 33⅓ & 5
C. E. Jennings & Co.'s 6
L. H. immediate 6
Ohio Tool Co. ..... 33⅓ & 7½
Snell's 40%

Awl Hafts— See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled ..... gro. $2.75@3.00
Unhandled, Shldered ..... gro. 65¢@66¢
Unhandled, Patent ..... gro. 66¢@70¢
Pegging Awls:
Unhandled, Patent ..... gro. $1@$1.50
Unhandled, Shldered ..... gro. 65¢@70¢
Scratch Awls:
Handled, Cast ..... gro. $4.50@$5.00
Handled, Socket ..... gro. $11.50@$12.00

Awl and Tool Sets— See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality ..... $4.75@$5.00
Second Quality ..... $4.25@$4.50
Double Bit, base weights:
First Quality ..... $7.00@7.50
Second Quality ..... $6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles— *Iron or Steel*

Concord, Loose Collar ..... 4½@4.5 c
Concord, Solid Collar ..... 4½@5¼¢
No. 1 Common, Loose ..... 3¾@4¼¢
No. 1½ Cut, Nos. 5 to 11 ..... 4¼¢
No. 2 Solid Collar ..... 4.50 c
Half Patent
Nos. 5, 11 and 12 ..... 6¾@6¾10%
Nos. 13 to 15 ..... 6¾@6¾10%
Nos. 16 to 18 ..... 7@7¼10%
Nos. 19 to 22 ..... 7@7¼10%

Boxes, Axle—

Common and Concord, not turned ..... lb. 4½c
Common and Concord, turned ..... lb. 6@7c
Half Patent ..... lb. 9½@10¢

Bait— Fishing—

Hendryx:
A Bait 20%
B Bait 25%
Competitor Bait ..... 20&5

Balances— Sash—

Cardwell new list 50%
Putnam ..... 50&10@60%

Spring—

Spring Balances ..... 50&10@60%
Chatillon:
Light Spg. Balances ..... 5 & 7½ & 10
Strong Balances ..... 4 & 7½ & 10
Chesterman Balances ..... 50 & 5
Large Iron 50%

Barb Wire— See *Wire, Barb.*

Bars— Crow—

Steel Crowbars ..... 4c to 5c lb.
per lb. ..... 4@4½@4½c

Towel

No. 10 15-in. Nickel Plate ..... $ gro. $8.50

Beams, Scale—

Fairbanks 40%
Computing, No. 1 ..... 40%
Computing, No. 2 ..... 40%

Beaters, Carpet—

Hendryx:
No. 1 Wire Capped ..... per doz. $1.80
No. 1 Wire $1.65
No. 1 Wire Capped ..... per doz. $1.85
No. 1 Wire $1.70
No. 1 Wire Tinned ..... per doz. $1.95

Beaters, Egg—

Holt Lyon Co.:
Holt per doz., No. 5 Tapid $0.80
No. A Jap'd ..... B. Jap'd.
No. 1 Jap'd ..... $.65
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dasher, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Tin'd, $9.00; No. 155, Tumbler Tin'd, $8.50; No. 200, Tumbler Tin'd, $9.00; No. 202, Tumbler Tin'd, $9.50; No. 200, Mammoth, per doz., $25.00.
Texas Cotton Gin Mfg. Co.:
T. & S. Dasher $6.50

Bellows—

Blacksmith, Standard List.
Split Leather ..... 60&10@65%
Green Leather ..... 50&5&10%

Hand—

Inch. 6 8 10
Doz. $3.75 $5.00 $6.50 } *Net Prices.*

Molders—

Inch. 10 12 14 16 18
Doz. $7.50 $9.00 $12.00 $15.00 $18.00

Bells— Cow—

Ordinary Goods ..... 75&5@75&10&5%
High grade ..... 70&10@75&5%
Brass ..... 75&10%
T. & S. Star 50%

Door—

Hand, R. & E. Mfg. Co.'s ..... 55&10%

Hand

Cone's Globe Hand Bells ..... 33⅓@35%

Miscellaneous—

Farm Bells ..... lb. 21½@21½¢
Church and School ..... 60@60&5%

Belting— Leather—

Extra Heavy, Short Lap ..... 60&5%
Regular Short Lap ..... 60&10&5%
Standard ..... 70&5
Light Standard 50
Cut Leather Lacing ..... 40&10
Leather Lacing Sides, per sq. ft. ..... 2½¢

Rubber—

Agricultural (Low Grade) ..... 75&5@5
Common Standard ..... 70&5&10%
Standard ..... 70&10&5
Latex ..... 60&10@60&10
High Grade ..... 50&5@50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list:
Chain, Parts of 25
Tubes 60

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden 75%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Unlock 50
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined 40
Enameled 50

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co. 40

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):
Square ..... 50&5
Larger and longer ..... 50&5
Plow, Large, Square Cut ..... 50&5
Bolt Ends ..... 65&10%
Machine (Cut Thread):
Square and Hexagon ..... 50&5
Larger and longer ..... 50&5

Door and Shutter—

Cast Iron Barrel, Japanned:
Round Brass Knob:
Inch. 4 5 6 8 10
Per doz. $1.25 $1.50 $1.75 $2.00 $2.50
Cast Iron Spring Foot, Jap'd:
Inch. 4 5 6 8 10
Per doz. $1.25 $1.50 $1.75 $2.25
Cast Iron Chain, Flat, Japanned:
Inch 8 9 10
Per doz $1.00 1.40 1.65
Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch 6 8 10
Per doz $1.25 1.50 2.00
Wrought Barrel Japd. ..... 80@60&10%
Round Brass ..... 60&10%
Spring ..... 70&10&5%
Shutter ..... 60&10&5%
Square Neck ..... 75&5&10%
Square ..... 70&10&10%
Iles' Patent Door 55%
Iles' Wrought Metal 45%

Expansion—

Richards Mfg. Co. ..... 50&10%
Steward & Romaine Mfg. Co.
Sash No. 1 .....
Sash No. 2 .....
Sash No. 3 .....
Door .....

Plow and Stove—

Plow ..... 60&10@—&
Stove ..... 50@50&5%

Tire—

Common Iron 80%
Norway Iron 80%
American Screw Company:
Norway Plain, list Oct. 16, '84 ..... 80%
Eagle Plain, list Oct. 16, '84 ..... 82½%
Bay State, list Dec. 28, '99 ..... 80%
Franklin Moore Co.:
Norway Plain, list Oct. 16, '84 ..... 80%
Eagle Plain, list Oct. 16, '84 ..... 82½%
Eclipse, list Dec. 28, '99 ..... 80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99 ..... 80%
Norway Plain, list Oct. '84 ..... 80%
Eagle 82½
Shelton Co.:
Tiger Brand, list Dec. 28, '99 ..... 80%
Phila., Eagle, list Oct. 16, 1884 ..... 82½%
Upson Nut Co.:
Tire Bolts 72½%

Borers, Bung—

Borers, Bung, Ring, with Handle:
Inch 1¼ 1½ 2
Per doz $3.00 3.60 4.80
Inch 2 2½
Per doz $8.00 11.50
Enterprise Mfg. Co.:
No. 1, $1.75; No. 3, $2.50 each 25

Boxes, Mitre—

C. E. Jennings & Co. 5
Langdon's New Lap Joint Mitre Box, Tinned ..... Langdon
Acme ..... 15&10%
Pittsburgh 10
Seaver's 15

Braces—

Common Ball, American $1.50
Barnes ..... 50&10&5@60&10&5
Fray's Genuine Spofford's 60%
Fray's No. 70 to 120, 81 to 123, 207 to 211 60
C. E. Jennings & Co. ..... 50&5
Mayhew's Ratchet 60%
Mayhew's Quick Action Hay Pat. 50%
Nichols Lap Joint Brace ..... 25&10%
Peck, Stow & Wilcox Co.'s Pat. 60

Brackets—

Wrought Steel ..... 70&10@75&10%
Bridgeport Hardware Mfg. Co. ..... 75&5&10
Griffin's Pressed Steel ..... 75@75&10%
Hall's ..... 75&5
Light Vise Hook Egg Beater Bracket ..... per doz. $1.50

Bright Wire Goods— See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co. ..... 75&20%
Wire Goods Co. 75%

Buckets, Galvanized—

M'f'g'r's list, price per gross.

	Quart	10	12	14	
Water, Brass		*27.00*	*28.00*	*32.00*	*10&5%*
Water, Iron		*37.50*	*43.00*	*52.00*	
Fire, Rd. Bttm		*$2.00*	*$2.65*	*$3.65*	
Well		*37.35*	*$4.35*	*$5.35*	

Bull Rings— See *Rings, Bull*

Butts— Brass—

Wrought, High List, Oct. 26, '06 ..... 55%
Cast Brass, Tinned 40

Cast Iron—

Fast Joint, Broad ..... 40&10@50%
Fast Joint, Narrow ..... 40&10@50%
Loose Joint ..... 70&10@75%
Loose Pin ..... 70&10@75%
Mayer's Hinges ..... 70@70&5
Parliament Butts ..... 70@70&5

Wrought Steel—

Light, Narrow, Light Pin 70%
Reversible and Broad ..... 70&5%
Loose Joint, Narrow, Light 70%
Loose Joint, Broad 70%
Back Flaps, Table Chest of Drawers 70%
Light Narrow, Loose Pin, Light 70%
Light, Narrow, Ball Tip 70%
Broad ..... 70&5%
Steeple Tipped 70%
Ball Tipped 70

Extra 10%

Cages, Bird—

Hendryx Brass Screw 50c net
Hendryx Enamel Co.

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb.
Screw, 1 prong, per lb.
Plow, per lb.
Horse Nail, per lb.
Ice, per lb.

Can Openers—

See Openers, Can.

Caps, Percussion—

Eagle, U. M. C. $2.75@3.50
G. D. per M 3.00@3.50
U. M. C. per M 2.00@2.50
G. D. per M 2.00@3.50
Musket per M 0.60@0.65

Primers—

Berdan Primers, \$ per M 0.65
Primer Shells and Bullets, 15&10%
All other primers per M \$1.25@1.60

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

Rank Cartridges:

32 C. F., \$3.50 Net
38 C. F., \$3.00 Net
32 Cal. Rim, \$1.20 Net
32 Cal. Rim, \$2.50 Net
B. B. Caps, Gun, Box of 100 \$1.00
B. B. Caps, Round Ball \$1.00
Central Fire 20%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets..15&10%
Rim Fire, Sporting 30%
Rim Fire, Military 15&5%

Casters—

Bed 50&10
Parlor 60&10
Piano (plate) 40&10
Ash, Bed 50
Gem, Bed 50&10
Steel, Bed 50
Standard Ball Bearing 35
Yale & Towne Ball Bearing 40&10

Cattle Leaders—

See Leaders, Cattle.

Chain, Proof Coil—

American Coil, Straight Link:
\$ per 100 lb. 9.10
\$ per 100 lb. 4.55 to 4.75 for 1 inch.
\$ per 100 lb. 4.25 to 4.45 for 1 1/8 inch.
In cask lots, deduct 25c.
German Coil:
6-0 to 1 70&5@70&10%
2 60&10%
3 60&10%

Halter—

Halter Chains 60&10@60&10%
German Pattern Halter Chains, list July 24, 1905 60&10%
Covert Mfg. Co.
Halter 35&5%

Cow Ties—

See Halters and Ties.

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6/8—6-ft. Straight 60&10%
6/8—6-ft. Stayed 60&10%
6/8—6-ft. Stayed with ring \$32 00
6/8—6-ft. Stayed with ring and hook 60&10%
7/8—6-ft. Straight 60&10%
7/8—6-ft. Stayed 60&10%
Standard Lines
Eastern Standard Traces, Wagon Chain, &c. 60&10@60&10%

Miscellaneous—

Jack Chain, list July 24, '05
Iron 60&10%
Brass 60%
Sash and Pulleyless Chains 60&10%
Gal. Pump Chain 60&10%
Breast, Halter, Heel, Rein, Stallion
American Halter, Dog and Kennel
Wire Goods Co.:
Wire

Chain and Ribbon, Sash—

Steel
Bronze
Sash Cord
Sash Balance
Sash Ribbon

Chalk—

Carpenters' Blue 50c
Carpenters' Red 50c
Carpenters' White 50c

Checks, Door—

Bird-lee's 40%
Reading 65&10%
Russell 33⅓%

Chests, Tool—

American Tool Chest Co.
Empire
Keystone
Yankee
Farmers', Carpenters', etc., Chests
Apollo
Eclipse Tattoo
Lloyds
Tool Cabinets
Tool Chests & Co's Machinists' Tool Chests

Chisels—

Socket Framing and Firmer

Standard List 75&10%
Socket Firmer No. 10 25&7½%
Socket Framing
L. & I. J. White Co.

Tanged—

Tanged Firmers 60&10%
Buck Bros.
Firmer & Framing, No. 191 Bevel
L. & I. J. White Co. 25&5

Cold—

lb.
Cold Chisels, good quality..18@15¢
Cold Chisels, fair quality..17@12¢
Cold Chisels, ordinary.. 9@8¢

Chucks—

Adjustable Chucks 35%
Adjustable Taper Shank Chuck 40%
Combination
Empire
Independent Chucks
Independent Drive 25%
Lathe Dog Chucks
Standard Tool Co.:
Improved Lathe Chuck 45
Union Mfg. Co.:
Combination, No. 1, 2, 3, 4, 5, 6
Nos. 1, 2, 3, 4, 5, 6
Scroll Combination, Nos. 83 and 84
Geared Scroll, Nos. 33, 34 and 35 25%
Independent Iron, Nos. 18 and 318 35%
Independent Steel, No. 64 25%
Union Drill, Nos. 000, 00, 100, 101, 102
Universal
Union Czar Drill 25%
Universal, 11, 12, 16, 17, 13, 11, 15 40%
Universal, No. 1
Iron Face Plate Jaws, Nos. 28, 30, 48 and 72 35%
Steel Face Plate Jaws, No. 70 and 72 30%
Westcott Patent Chucks:
Lathe Chuck 50
Little Giant Auxiliary Drill 55
Little Giant Double Grip Drill 50
Little Giant Drill, Improved 50
Oswego Lathe 50%
Scroll Combination Lathe 50

Clamps—

Adjustable, Hammers' 20@20&5%
Carriage Makers', Ex., S. & W. Co. 50&10%
Iron Handle
Metal Hay Rack 45
Lineman's Swedish Neverturn 65%
Wire Weave Hammers 1 & 1½
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable 50%
Iwan's Champion, Stationary 40%

Sidewalk—

Star Socket, All Steel, ₰ doz. \$4.05 net
Star Sidewalk, All Steel, ₰ doz. \$4 net
W. & C. Sidewalk, All Steel, ₰ doz., 2½ in., \$3.00; 3 in., \$2.25

Cleavers, Butchers'—

Empire Brand 35%
Empire Polished 30%
L. & I. J. White Co. 30%

Clippers, Horse and Sheep—

See Page 1 Small Ads.
1902 Chicago Horse, each, \$10.75
20th Century Horse, each, \$5.00
Lightning Belt Horse, each \$15.00
Chicago Belt Horse, each \$20.00
Stewart's Enclosed Gear Horse, each \$6.75
Stewart's Patent Sheep Shearing Machine, each \$7.25
Stewart Ball Bearing Sheep Shearing Machine, No. 8, each..\$9.75

Clips, Axle—

Regular Styles, list July 1, '05.

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibb, Globe, Kerosene, Bath, Lever, Basin, &c. 70%

Coffee Mills—

See Mills, Coffee.

Collars, Dog—

Nickel Chain, Walter B. Stevens & Co.
Leather, Walter B. Stevens & Co.

Compasses, Dividers, &c.

Wm. Schollhorn Co.:
Dividers
Trammels
Electric Beef Shears \$15.00

Conductor Pipe,—

L. C. L. to Dealers:

	Galvanized		
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&18 oz.*
Eastern:			
Central:			
Western and Southern:			
So. Western			

See also Eave Troughs.

Coolers, Water—

L. & I. J. White Co.
White Enameled 10%

Coopers' Tools—

See Tools, Coopers'.

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair 30@29¢
Soldering Coppers, more than 3 lb. to pair 26@29¢

Cord— Sash—

Braided, Drab lb. 35¢
Braided, White
Cable Laid Italian, lb. 57¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India lb., 11@11½¢
Cotton Sash Cord, Drab
Patent Russia lb. 20¢
Cotton Lamp Wick 25¢
India Hemp, B'd'd lb. 21¢
India Hemp, Twisted lb. 13@14¢
Patent India, Twisted lb. 17¢
Linen Braided
Linen, No. 1, 2, 3, 4, 5, 6
Linen, No. 7, 8, 9, 10, 11, 12
Linen Braided
Linen Sash Cord
Harmony Cable Laid Italian, Nos. 7 to 12 ₰ lb. 35¢
Fullman:
Wire Sash Cord 10¢
Sash Cord Attachments, per doz. 10¢
Solmes & Sons
Braided, ₰ lb., Drab, Cotton
Braided, ₰ lb., Drab, Linen
Linen, 6/8, White
Linen Sash Cord
Mussel Sheets, White, ₰ lb. 45¢
Massachusetts, Drab 45¢
Phoenix, White, Nos. 8 to 12, 27¢;
Silver Lake, per lb.:
Ax Drab, 45¢; A, White, 43¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen 57½¢
See also Chain and Rope

Wire, Picture—

List July 15, 1906 90%
Hendryx Standard Wire Picture Cord.
Turner & Stanton Co. Wire Picture Cord

Cradles—

Grain 40&10@40&10%

Crayons—

White Round Crayons, Cases, 100 gro., \$6.50@7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber, ₰ gro
White and Purple, Indelible \$7.50
Blue, Red, Green, Yellow and Terra Cotta, \$6.50; Black \$4.00
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, \$16.25; Indelible
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, \$2.50; 5 in. x ½ in. Square, \$2.50; 5 in. x 1 in. Square, \$2.50

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, \$5.50; Light \$5.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden 50%

Cutlery, Table—

Ivorine
No. 12 M'd'm Knives, 1847, ₰ doz. \$3.50
Star, Eagle, Rogers & Hamilton
Wm. Rogers & Son

Cutters— Glass—

Meat and Food—

Enterprise
Nos.
S. & W. Co.
Nos.

Slaw and Kraut—

Bliss, Dexter & Co.
Samson, ₰ doz., \$3.00
Iwan's Improved Post Hole Auger
Kohler's, ₰ doz., Universal, \$15.00; Little Giant \$12.00; Hercules, \$10.00; Intermediate, \$9.00; Rival, \$8.50; Pioneer
Nonpareil Post Hole Diggers, ₰ doz., \$24.00 60%

Tobacco—

All Iron, Cheap..doz. \$1; 25&5%
National, ₰ doz., No. 1, \$21; No. 2

Diggers, Post Hole, &c.—

Disston's:
Rapid, ₰ doz., \$24.00
Samson, ₰ doz., \$34.00
Iwan's Improved Post Hole Auger
Kohler's, ₰ doz., Universal, \$15.00; Little Giant \$12.00; Hercules, \$10.00; Intermediate, \$9.00; Rival, \$8.50; Pioneer
Nonpareil Post Hole Diggers, ₰ doz., \$24.00 60%

Dividers—See *Compasses.*

Drawing Knives—

See Knives, Drawing.

Dressers, Emery Wheel—

Standard Emery Wheel Dresser

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines \$4.50@\$4.75
Breast, Millers Falls
Hand, Ps. & W. and Ingalls
Goodell Automatic Drills 50&10@60&10%
Millers Falls Automatic Drills 35 & 5%
Ratchet, Curtis & Curtis 25%
Ratchet, Parker's 40%
Ratchet, Standard
Ratchet, Western, style H Imp. 40%
Ratchet, No. 012 40%
Ratchet, Celebrated 40%
Ratchet, Whitney's, Ps. & W.
Whitney's Hand Drill No. 1
Adjustable, No. 2

Twist Drills—

Bit Stock 60&10@40&10%
Taper and Straight Shank 60&10@40&10%

Drivers, Screw—

Screw Driver Bits, per doz. list July 24, '05
Bailey's Screw Handle and Ingalls', ₰ doz., \$6.00; 4 in., \$7.50; 6 in., \$9 50%
Buck Bros.' Screw Driver Bits
Cleveland
Disston's
Fray's Hol. Handle Set
Ford's Brace Screw Drivers
Gay's Double Action Handle
Goodell's Auto 65@65&10%
Morse's Black Handle
Mathews' Monarch 40%
Millers Falls, Nos. 20 and 21 25&10
Millers Falls, Nos. 11, 12, 41, 42 15&10
Smith & Hemenway
Stanley 66⅔%; Elmora, 60%; Star, 30&10
Standard
Nos. 1 to 6
Nos. 7 to 12
Nos.

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized*		
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&18 oz.*
Eastern:			
Central:			
Western and Southern:			
So. Western			

Factory shipments, all territories:

Elbows, Stove Pipe—

Emery, Turkish—

	¼ to 1 lb.	*½ to 220 lb.*	*Flour.*
Kegs	7½¢	6½¢	6½¢
½ Kegs	7½¢	6½¢	6½¢
Kegs	7½¢	6½¢	6½¢
Kegs	7½¢	6½¢	4 ¢
Kegs	7½¢	6½¢	4 ¢
Kegs	7½¢	6½¢	4 ¢
lb. quantities less than 10	*10 ¢*	*10 ¢*	*7 ¢*
Less quantity	*10 ¢*	*7 ¢*	*5 ¢*

NOTE—In lots 1 to 3 tons a discount of 5% is allowed.

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's ..... 50&10
Watling's ..... 10&10
Upson's Patent 30

Cord and Wire

Ives and Talcott 25%

Corrugated—

Acme Corrugated Fasteners 40

Faucets—

Cork Lined ..... 50&10&10&10%
Metallic Key, Leather Lined,
sold to the trade ..... 70&10%
Red Cedar ..... 40&10&10&10%
Petroleum ..... 70&10&10&10%
B. & L. B. Co.:
Metal Key ..... 60&10%
Star 60%
West Lock ..... 50&10%
John Sommer's Perfless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Mfl. Key..50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock 40%
John Sommer's I.X.L. Cork Lined...50%
John Sommer's Reliable Cork Lined.
sold to the trade 40%
John Sommer's Chicago Cork Lined..80%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar...50%
John Sommer's Perfection, Cedar...40%
Seal Measuring:
Enterprise, ₱ doz. $36.00 ..... 40&10%
Lane's, ₱ doz. $36.00 ..... 40&10%
National Measuring, ₱ doz. $36.40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List Nov. 1, 1899.
Best Brands ..... 70&10&75&10%
Standard Brands ..... 75&10&10%
Lower Grades ..... 75&10&10&10&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 ..... 33 1-3&40%

Fixtures, Fire Door—

Allith Underwriters' Approved 50%
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 ..... $3.75
Fusible Links, No. 66 50
Expansion Bolts, No. 107 ..... 60&10%

Grindstone—

Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.60*	*3.85*	*4.15*	*4.65*

P., S. & W. Co. 25
Reading Hardware Co. 60%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1905, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato ..... 60&10%
Victor, Hay ..... 60&15&10%
Victor, Manure 60%
Victor, Header 60%
Champion, Hay 60%
Champion, Header 60%
Champion, Manure ..... 60&15&2½%
Columbia, Hay ..... 60&20%
Columbia, Manure 10%
Columbia, Spading ..... 70&12½%
Hawkeye Wood Barley 40%
W. & C. Potato Digger ..... 60&10%
Acme Hay ..... 60&10&10%
Acme Manure, 4 tine ..... 60&10&10%
Dakota Header ..... 60&20%
Jackson Steel Barley ..... 60&10%
Kansas Steel Barley 65%
W. & C. Favorite Wood Barley 40%
Plated.—See Spoons.

Frames— Wood Saw—

White, S'g't Bar, per doz..75@80¢
Red, S'g't Bar, per doz..$1.00@1.25
Red, Dbl. Brace, per doz $1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	$1.25	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp	$2.75
Cotton	3.20
Waterproof Sgl. Taped ..	3.65
Waterproof Dbl. Taped ..	4.40
Waterproof Tpl. Taped ..	5.15

10&10&10%

Gates, Molasses and Oil—

Stebbins' Pattern ..... 75@80%

Gauges—

Marking, Mortise, &c..50@50&10%
Lufkin Rule Co.:
Mortise, Marking, Mortise, &c. 50&10%
Ware Bros. & Sharpe's 33⅓%
Stanley 30
W. P. S. & W. Co. 33⅓%

Gimlets— Single Cut—

Numbered assortments, per gr.
Nail, Metal, No. 1, $2.00; 2, $1.80
Sight, Metal, No. 1, $4.00; 2, $3.80
Nail, Wood Handled, No. 1, $2.80; 2, $2.60
Spike, Wood Handled, No. 1, $3.80 ₱ gr. 2, $3.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Cattle Supports Co. ..... 65a65&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush..
25&10@50%
Upson's 10%

Grease, Axle—

Common Grade....gro. $6.00@6.50
Dixon's Everlasting, lo-lb pails, ea. 80¢, in kegs, ₱ doz., 1 lb, $1.20; 2 lb $2.00
Helmet Hard Oil 25%

Griddles, Soapstone—

Pike Mfg. Co. ..... 33⅓&33⅓&10%

Grinders—

Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 ..... 30%
Alundum Sickle Grinders, each, No. 2, $3.00; 2nA, $6.00; 2nA Combined, $6.50 ..... 30%
Alundum Disc Grinders, each, $2.50 ..... 30%

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., $2.00 ..... 33⅓%
Richards Mfg. Co., Eh and Cycle, Ball Bearing, mounted 40%

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... 60&65@60&10%
Court Mfg. Co.:
Web ..... 30&2%
Jute Rope 35%
Sash Rope 45%
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am Coil and Halters ..... 40@40&5%
Am Cow Ties ..... 45@50%
Niagara Coil and Halters..45@50&5%
Niagara Cow Ties ..... 45&5@50&10&5%

Hammers—
Handled Hammers—

Heller's Machinists ..... 35&5 45&10&5%
Heller's Farriers' ..... 40&5@40&10&5%
Iron Stone Axle Co.:
Cuticle Steel 50%
Farriers ..... 40&10&5%
Riveting 40%
Machinists, revised list ..... 60&5%
Blacksmiths' ..... 50&5%
Peter Wright & Plumb:
A. E. Nail ..... 40&2½@45&12½%
Eng and B. S. ..... 40&10&5 10&5%
Machinists' Hammers ..... 60@60&10%
Rivet and Tinners' ..... 40&7½@40&12½&5%

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢..80¢55@—%
3 to 5 lb., per lb., 40¢..80¢55@—%
Over 5 lb., per lb., 30¢.....
80¢10¢55@—%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—
Agricultural Tool Handles

Axe, Pick, &c.....60¢10@60¢10¢5%
Hoe, Rake, &c.....40%
Fork, Shovel, Spade, &c.:
Long Handles.....40%
D Handles.....40%

Cross-Cut Saw Handles

Atkins 40%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—

Auger, assorted...gro. $3.00@$3.50
Brad Awl.....gro. $1.65@$1.75
Chisel Handles, as'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory.....$2.15@2.40
Socket Firming, Apple, $1.75@ $1.95; Hickory.....$1.60@1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, &c. 60¢10@60¢10¢5%
Hand Saw, Varnished, doz. 80¢85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted 75¢
Fore, doz. 45¢; Fore, Bolted 90¢
Chapin-Stephens Co.:
Carving Tool ..... 30&20&10%
Chisel ..... 60&10&10%
File and Awl ..... 40&10%
Saw and Plane ..... 30&20&10%
Screw Driver ..... 30&20&10%
Millers Falls Adj. and Ratchet Auger Bit Handles 50%
Nicholson Simplicity File Handle.....
₱ gr., $0.85@$1.50
W. A. Zelnicker Supply Co.:
Hammer, ₱ doz., 12 lbs ..... $2.00; 14 in., $2.00; 16 in., $2.25; 18 in., $2.50; 20 in., $2.75; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80
Sledge, ₱ doz., oval 20 in., $2.50; octagon, 20 in., $2.80; oval 22 in., $3.00; octagon, 22 in., $3.30
Axe, ₱ doz., 28 in., $5.60; 36 in., $5.80
Adze, ₱ doz., 30 in., $5.80; 36 in., $7.80
Pick, ₱ doz., R R., 36 in., $5.40; oval 24 in., $5.80
Hatchet, ₱ doz., 12 to 14 in., $2.00

50%

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.
Adair Mfg. Co.:
Reliable, Nos. 1 and 1-2; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Clayton & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 70&5%
Roller Bearing ..... 70&5%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00..60&10%
Roller Bearing, Ex. Hy. No. 22, $18.00 ..... 60&10%
Ball Bearing, $24.00 70
Lane Bros. Co.:
Parlor, Ball Bearing, $1.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion 37½ 35
Barn Door, Standard ..... 60&10%
Hinged ..... net $6.00
Covered ..... 60&5%
Special ..... 70&5%
Lawrence Bros.:
Advance ..... 55&10%
Cleveland ..... 70&7½%
Clipper, No. 75 ..... 60%
Crown ..... 55&10%
Cyclone, No. 40 ..... net $6.50
Tandem, No. 50 ..... net $7.00
New York ..... 55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2..70%
Anti-Friction 60%
Hinged Hangers, King Charm..60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, ... 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 11..$2.50
Roller B'r'g St'l Track No. 13..$2.50
Roller B'r'g, Nos. 39, 41, 43, ... 70&3½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track, Tandem Trolley Track No. 16 ..... 50&10%
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22..50&5%
Trolley B. B. No. 17, $1.25; F. D. No. 129, $2.25; No. 121, $2.45; No. 150 ..... $2.50
Safety Underwriters F. D. No. 101 ..... 50&5%
Tandem No. 44 2½ and 3 ..... 60&10%
Palace, Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 122 ..... 50&10%
Ives' Wood Track No. 1..... $2.25
Trolley B. B. No. 24, $1.40; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2..70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3 60
Hinged Transom No. 48 ..... 60&5%
Folding Door B. B. Swivel No. 135 ..... 40%
Taylor & Boggis Foy Co.'s Kidder's Roller Bearing ..... 50&15&10&5%
Myers' Stayon Hangers 60%

Hangers— Garment—

Pullman Trouser, ₱ gro., 1 pair Flat Aluminum, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $10.50; Garment Hanger Loops, Round Nickeled, per gro $10.50
Victor Folding ..... ₱ gro. $9.60

Gate—

Myers' Patent Gate Hangers, ₱ doz. net $4.50

Joist and Timber—

Lane Bros. Co. 30%

Hasps—

Griffin's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, ₱ doz. 60

Hatchets—

Regular list, first qual..40&10%&—
Second quality.....50&5%&—

Heaters, Carriage—

Clark No. 5, $1.15; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50 ..... 25%
Clark Coal, ₱ doz. $9.75 ..... 20%

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*1½*	*2*	*2½*	*3*
Doz. pair	*$0.75*	*.75*	*.85*	*1.05*	*2.70*

Mortise Shutter: (L. & P., O. S., Acme, &c.)

No	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Charles Parker Co. ..... 70&7½%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00 ..... 20%
Reading's Gravity 60%
Stanley's Steel Gravity Blind Hinges, No. 164½ ₱ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter ..... 75&5%
Acme, Lull & Porter 75%
Queen City Reversible 75%
Shepard's Noiseless, Nos. 65, 55 ..... 75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&5%
Tip Pat'n, No. 1 ..... 75&10%
No 3 ..... 75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 70&10&5%
Shepard's Double Locking 75%
Champion Gravity Locking ..... 75&5%
Pioneer ..... 50&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L't'ches.	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.85*

New England:
With Latch.....doz. ...@$2.00
Without Latch...doz. ...@$1.60
Reversible Self-Closing:
With Latch.....doz. ...@$1.75
Without Latch...doz. ...@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz. $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 ..... 70%

Pivot Hinges—

Bommer Bros Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—

Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, Cast Iron $6.50@$6.75

J. Bardsley:
Bardsley's Non-Checking Mortise Door Hinges 40%
Bardsley's Patent Checking..33⅓%
Bommer Bros
Bommer Ball Bearing Floor..40%
Bommer Spring Hinges 40%
No. 999 Wrot. Steel Hold Back, ₱ gr. $9 00
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor..50%
Garden City Engine House 25%
Keene's Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Cast 25%
American 30%
Columbia, ₱ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ₱ gr. $12.00
Columbian Hinges ..... 60&10%
Gem, new list 30%
Clover Leaf ..... ₱ gr. $12.00
Oxford, new list 25%
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co., Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Hawkeye Steel Holdback Screen Door ..... ₱ gr. $9.00
Chief Ball Bearing Floor Hinges 50%
Ball Bearing Door 25%
No. 777, Sheet Steel Holdb'k, ₱ gr. pr $9.00
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges..50&10%
Heavy Strap Hinges..60&5%
Light T Hinges..... 50%
Heavy T Hinges..... 50%
Extra Heavy T Hinges 50&10%
Hinge Straps..... 33⅓%
Cor. Heavy Strap..60&5%
Cor. Ex. Heavy T..50&10%

Extra 10&5%

Screw Hook and Strap.

6 to 12 in..lb.	*3¾¢*
14 to 20 in..lb.	*3½¢*
22 to 36 in..lb.	*3¼¢*

Screw Hook and Eye:

¾ to 1 inch	*lb.*	*6¼¢*
1¼ inch	*lb.*	*7½¢*
1½ inch	*lb.*	*8½¢*

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—

M'f'gr's list, price per gross.

Inch	*15*	*16*	*17*	*18*
Galv. Open	*$35*	*$39*	*$42*	*$46*
Jap. Open	*36*	*38*	*41*	*45*
Galv. Funnel	*48*	*48*	*52*	*56*
Jap. Funnel	*33*	*36*	*39*	*43*

50&10%

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick, No. 160 ..... each $1.05
Steel Mortar, No. 158 ..... each $1.35

Hoes— Eye—

Scovil and Oval Pattern.....
60¢10@60¢10¢10%
Grub, list Feb. 23, 1899
70¢10@75¢10%

Extra 10% often given.

D. & H. Scovil.....27½%
Am. Fork & Hoe Co (Scovil Patterns) 60%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding, No. 1.$2.00, No. 2.$2.50
Star Double Bit.....$3.20
Ft. Madison Cotton Hoe.....75c, $.10
Ft. Madison Crescent Cultivator Hoe, ₰ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₰ doz. $4.85
Junior Size.....₰ doz. $4.00
Ft. Madison Sprouting Hoe, ₰ doz.....60&10%
Ft. Madison Dixie Tobacco Hoe.....75&10%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75%
B. B. 6 in., Cultivator Hoe.....$3.40
B. B. 8 in.....$3.60
Acme Weeding.....₰ doz. net, $4.35
W. & C. L'ning Shuffle Hoe, ₰doz.$5.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ₰ doz. $24.00.....45&10%

Door—

Bardsley's, Iron, 40.....Brass and Bronze 25%
Empire 50%
Pullman 35%
Richards Mfg. Co.: No. 117, Everready, 40%; Nos. 118, 119, Sure Grip 50%
Superior 33⅓%

File and Tool—

Nicholson File Holders and File Handles .....33⅓&40%

Fruit Jar—

Triumph Fruit Jar Holder, ₰ gross, $10.80; ₰ doz.....$1.25

Trace and Rein—

Fernald Double Trace Holder, ₰ doz. pairs $1.25
Dash Rein Holder, ₰ doz. pairs..$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50.....German.....33⅓%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Coat and Hat, Reading.....15&20%
Coat and Hat, Wrightsville.....60&10%
Harness, Reading List.....40%

Wire—

Belt 80%
Wire C. & H. Hooks.....75% —%
Bradley Metal Clasp Wire, Coat and Hat, 70&10%.....70&10%
Columbian Hdw. Co., Gem.....70&5%
Parker Wire Goods Co., King..70&10%
Wire Goods Co.:
Acme, 60&65%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Boz, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $1.50.
Cotton .....*doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench. Rush, Light, doz., $6.20; Medium, $8.25; Heavy, $7.65*
Grass, best, all sizes, per doz.$3.00
Grass, common grades, all sizes, per doz *$1.50*
Whiffletree .....*lb. 5%@6¢*
Hooks and Eyes:
Brass .....*60@60&10%*
Malleable Iron.....*70@70&10%*
Covert Mfg. Co., Gate and Scuttle Hooks 40%
Ft. Madison Cut-Easy Corn Hooks, ₰ doz. $3.25 net
Turner & Stanton Co., Snap and Shoulder .....80&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition .....*ft. 5¢1 6¢*
3 ply Guaranteed.....*ft. 8¢ 9¢*
4 ply Guaranteed.....*ft. 10¢ 11¢*
Cotton Garden, ¾-in., coupled:
Low Grade .....*ft. 8¢ 9¢*
Fair Quality.....*ft. 10¢ 11¢*

Irons— Sad—

From 4 to 10.....*lb. 3¢@3½¢*
R. B. Sad Irons .....*lb. 3½¢@3¾¢*
Mrs. Potts', cents per set:

Nos	50	55	60	65
Jap'd Tops	88	80	98	91
Tin'd Tops	88	87	98	96

New England Pressing .*lb.* 3½¢@4¢

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%; Corner 60%

Pinking—

Pinking Irons.....*doz.60¢*

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%; Lockport 50%
Lane's Steel.....30&5%
Richards' Tiger Steel, No. 130..50&10%
Smith & Hemenway Co.'s.....25%

Ladder—

Richards Mfg. Co., Ladder Jacks .50%

Kettles—

Brass, Spun, Plain.....*20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....20%
Wilkinson Shear & Cutlery Co.....60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks 60%
Wilmington Acme, ₰ doz. $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Tankee No. 1, $1.60; Yankee No. 2, $1.15.

Drawing—

Standard List.....*75&5@75&10%*
C. E. Jennings & Co., Nos. 45, 46, 230 .....20%
Jennings & Griffin, Nos. 41, 42, 60, 61 .....20%
Swan's 50%
Watrous 20%
L. & J. White.....20&5@25%

Hay and Straw—

Serrated Edge, per doz. $1.50@1.75
Iwan's Sickle Edge.....₰ doz. $9.50
Iwan's Serrated.....₰ doz. $10.00

Miscellaneous—

Farriers' .....*doz. $3.00@3.25*
Wostenholm's .....₰ doz. $3.00@3.25

Knobs—

Base, 2½ inch, Birch, or Maple, Rubber Tip.....*gro. $1.25@$1.40*
Carriage, Jap., all sizes.....*gro. 40@45¢*
Door, Mineral.....*doz. 65@70¢*
Door, Por. Jap'd.....*doz. 70@75¢*
Door, Por. Nickel..*doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c..15%

Lacing, Leather—

See *Belting, Leather.*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable.....50%
Lane's Step.....25%
Myers' Noiseless Store Ladders...50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....20
P. S. & W.....40&10%
Reading 60%

Lanterns—Tubular—

Regular, No. 0.....*doz. $4.35@4.50*
Side Lift, No. 0.....*doz. $4.60@4.75*
Hinge Globe, No. 0..*doz. $4.60@4.75*
Other Styles.....*40@50&10%*

Bull's Eye Police—

8-inch .....*$4.25@4.50*

Latches— Thumb—

Roggin's Latches, with screw..*doz. 55@40¢*

Door—

Allith Mfg. Co., Reliable and Alligator, 50.....Reliable Cold Storage, 50%
Cronk & Carrier Mfg. Co.....No. 101, ₰ doz. $2.00
Richards' Bull Dog, Heavy, No. 125 .....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....*doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E.....10%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.50*	*2.25*	*2.00*
75 feet	*$2.10*	*1.80*	*1.65*

Samson Carriage Works.....
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₰ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons and Awning Lines.....40
Clothes Lines, White Cotton.....
Shade Cord, Cotton or Linen....20%

Locks— Cabinet—

Cabinet Locks.....*33⅓%*

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass .....75&5%

Sash, &c.—

Ives' Patent
Bronze and Brass, 55&5%; Crescent, 60%; Iron, 60%; Window Ventilating, 40&20%; Robinson Pat. Ventilating Sash Lock, 33⅓%.....
Paxman Patent Ventilating Lock...50%
Reading Sash Locks.....40%

Machines—Boring—

Com. Expert, without Augers.....*$2.00@2.25*
Com. Angl'r, without Augers.....*$2.25@2.50*
Swan's Improved.....40&10%
Jennings', Nos. 1 and 4.....25&5%
Seymour, Canada.....50%
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Interchge Hand Power.....₰ doz. $15.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Link Chain 30%
Moore's Cyclone, High Speed Chain Hoist .....

Ice Cutting—

Chandler's 12½%

Washing

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$5.00
Boss Rotary	$37.00
Champion Rotary Banner No. 1	$37.00
Standard Champion No. 1	$50.00
Standard Perfection	$27.00
Cincinnati Square Western	$33.00
Uneeda American, Round	$33.60

Mallets—

Hickory .....*45@50&10%*
Lignumvitæ .....*40&10%*
Tinners' Hickory and Applewood .....*doz. 45@50%*

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Acme Flexible Steel.....50%
Elastic Steel (W. G. Co.), new list.50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....20@25%
National list Jan. 1, 1902.....
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side.....50&10%
Swift, Enterprise Co.....

Motors, Water—

Divine's Red Devil.....30%
Lippincott's .....

Mowers, Lawn—

NOTE—Net prices are generally quoted
Cheapest.....*all sizes, $1.50@2.00*
Cheap .....*all sizes, $2.00@2.50*
Better Grade..*all sizes, $2.50@4.50*

	12	*14*	*16*	*Inch*
High Grade.....	*$4.50*	*4.75*	*5.00*	*5.25*
Continental				60%
Great American				60%
Great American Ball Bearing, new list				70%
Quaker City				60%
Pennsylvania				60%
Pennsylvania, Jr., Ball Bearing				50&10&5%
Pennsylvania Golf				50%
Pennsylvania Horse				30&5%
Pennsylvania Pony				40&5%
Granite State:				
Style A, Low Wheel				70%
Style B, Low Wheel				70%
Style C, High Wheel, spcl. list, No.				70&10%
Style D, High Wheel, spcl. list				70%
Philadelphia				
Styles M., S., C., K., T.				70&10&5%
Style A, all Steel				60&10&5%
Style E, High Wheel				70&10&5%
Drexel and Gold Coin, special list				40%
Horse				
Pony				40&5%
36-in. Horse				30&10%
Eagle Horse				30&5%
L. X. L. Horse				50%

Nails—

Wire Nails and Brads, Miscellaneous.....*85%@87½&10%*
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	40&5%
Coleman	15	12	12	11	11	net
New Haven	23	21	20	19	18	40%
Livingston	19	18	17	16	16	50%
Western						

Jobbers' Special Brands.....*per lb. 9@10¢*

Picture—

	Bx	*2*	*2½*	*3*	*4*	*in*
Brass H'd	*45*	*5*				
Por. Head	*1.10*	*1.10*	*1.10*			*.. gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched.....
Square, Blank.....
Hexagon, Blank.....

Oakum—

Bed.....*lb.* 6½¢
Ship.....*lb.* 6¢
Navy.....*lb.* 5¢
Packers' Spun Oakum..*2¼@3¢*

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated.....75%
Chase or Carriage, Brass and Copper Tips.....5&10%
Tips.....*6d lb.*
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....
Railroad Oilers, &c.....

Openers, Can— *Per doz.*

Sprague, Iron Handle.....*30@35¢*
Sprague, Wood Handle.....
Sardine Scissors.....*$1.75@$3.00*
Yankee Can and Bottle Opener, ₰ doz., net, $2.75; Little Giant, ₰ doz., net.....$0.65

Egg—

Hartigan Nickel Plate, ₰ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope .....*20@25¢*

Rubber—

(Fair quality goods.)

Sheet, C. I......*11@12¢*
Sheet, C. O. S......*11@12¢*
Sheet, C. B. S......*12@13¢*
Sheet, Pure Gum.....*40@45¢*
Sheet, Red .....*40@50¢*
Jenkins' '96, ₰ lb. 80¢.....25%

Miscellaneous—

American Packing.. *lb.* 7@10 ¢
Cotton Packing.....*lb.* 10@25 ¢
Italian Packing.....*lb.* 8@12½¢
Jute .....*lb.* 4@5½¢
Russia Packing.....*lb.* 8@11 ¢

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.....*65&5%@70%*
Edwards, Royal Blue.....65&7½%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos:	*lb.*
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft..3½@5¢	
Roll Board or Building Felt, 3-32 and 1/8 in., 45 to 60 lb., per 100 sq. ft.	.....6¢
Mill Board, Sheet, 40 to 40 in., 1-32 to 1/8 in.	.....3½@5¢
	Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll	.....$3.50@4.50
Medium weight, 30 lbs. to roll.	.....$4.00@4.50
Heavy weight, 40 lbs. to roll	.....$4.75@5.00
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25	
Deafening Felt, 9, 6 and 4½ sq. ft. to the ton.....	.....$7.50
Red Rope roofing, 250 sq. ft. per roll.....	.....$1.75

Tarred Paper—

1 ply (roll 400 sq. ft.), ton.....
2 ply, roll 168 sq. ft.....
3 ply, roll 108 sq. ft.....
Slater's Felt (roll 500 sq. ft.)..80¢

Sand and Emery—

Flint Paper and Cloth.50&10@—%
Garnet Paper and Cloth.....25%
Emery Paper and Cloth.....

Parers— Apple—

Goodell Co.:
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Livingston Nail Co.:
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.....
Reading Hardware Co.:
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.....
Reading 78.....₰ doz. $6.25

Potato—

Saratoga .....₰ doz $7.00
White Mountain.....₰ doz. $6.00

Picks and Mattocks—

List, Feb. 28, 1899, 70&10@75&10@75%
Cronk's Hy. Pat. Garden Mattock, ₰ doz., No. 2, $2.60; No. 3 $5.40.

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass .....50@50&10%
Iron, list Nov. 11, '85.. .60@60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in. .....60&10@—%
Extra Heavy, 2-6 in. .....70&10@—%
Fittings, Standard and Heavy, ...75&10@—%

Pipe, Merchant—

	Consumers. Steel. Blk.	Galv.	Carloads. Iron. Blk.	Galv.
	%	%	%	%
⅛ & ¼ in...to ½	65	57	44	37
⅜ in.....to ½	62	59	41	
½ in.....to ¾	68	56	61	49
¾ to 6 in....to 12	62	66	56	
7 to 12 in....to 18	69	64	61	46

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First-class 82%
Second-class 85%

Pipe, Stove—

	Per 100 joints. C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	6.75	7.75
7 in., Standard Blue	7.75	8.75
5 in., Royal Blue	7.00	8.00
6 in., Royal Blue	7.50	8.50
7 in., Royal Blue	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color	$6.15	$7.15
6 in., Uniform Color	6.65	7.65
7 in., Uniform Color	7.65	8.65

Planes and Plane Irons—
Wood Planes—
Bench, first qual. ....50@50&10%
Bench, second qual. ....40@40&10%
Molding .....25@25&10%
Chapin-Stephens Co.:
Bench, First Quality 30%
Bench, Second Quality 40%
Molding and Miscellaneous 25%
Toy and German 30%
Union 60%

Iron Planes—
Chaplin's Iron Planes .....50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06. .....25%
Buck Bros. 30%
Chapin-Stephens Co. 25%
Union 50%
L. & I. J. White .....20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse .....₩ doz. $8.00

Plates—
Felloe .....lb. 4@4¼¢

Pliers and Nippers—
Button Pliers... 75&5@75&10&5%
Gas Burner, per doz., 5 in., $1.25 @ $1.50; 6 in., $1.45 @ $1.50.
Gas Pipe.. 7 8 10 12-in.
$2.00 $2.25 $2.75 $3.50

Acme Nippers .....50&5%
Cronk & Carrier Mfg. Co.:
American 50%
Improved Button .....75&10%
Cronk's 60%
No. 80 Linemen's 50%
Stub's Patterns 45%
Combination and others 33⅓%
Heller's Farriers' Nippers, Pincers and Tools .....40&5@40&10&5%
P., S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 33⅓; Elm City, 35%; Paragon, 35; Lodi, 55%.
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.: Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels .....20@20&10%
Chapin's Imp. Brass Cor. .....40@40&10%
Pocket Levels .....30@30&10%
Extension Sights .....30@30&10%
Machinists' Levels .....40@40&10%
Disston's Plumbs and Levels .....60&10%
Disston's Pocket Levels .....60&10%
Stanley's Duplex 30%
Woods' Extension 33⅓%

Points, Glaziers'—
Bulk and 1-lb. papers... 1 lb. 9¼¢
¼-lb. papers .....¼ lb. 10 ¢
1-lb. papers .....lb. 10½¢

Police Goods—
Manufacturers' Lists... .....25@25&5%
Tower's 25%

Polish—Metal, Etc—
Prestoline Liquid, No. 1 (¼ pt.), ₩ doz. $3.00; No. 2 (1 qu.), $9.00 .....40%
Prestoline Paste 60%

George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₩ doz. 50¢; ₩ gro. $4.50; ½ lb. boxes, ₩ doz. $1.25; 1 lb boxes ₩ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₩ doz., $1.25.
Bateskeepers' Friend Metal Polish, ₩ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ₩ 10¢
Black Eagle, Liquid, ⅛ pt. cans, ₩ doz. 75¢
Black Jack Paste, ¾ lb cans, ₩ gr. $9.00
Black Kid Paste, 5 lb cans, each $0.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon's, ₩ gr. $5.75 .....10%
Dixon's Plumbago .....₩ 8¢
Fireside .....₩ gr. $5.50
Gem, ₩ gr. $4.50 .....10%
Japanese .....₩ gr. $3.50
Jet Black .....₩ gr. $3.50
Peerless Iron Enamel, 10 oz. cans, ₩ doz. $1.50

Poppers, Corn—
1 qt. Square..doz.$0.88; gro.$8.75
1 qt. Round..doz.$1.00; gro.$10.00
1½ qt. Square.doz.$1.10; gro.$11.00
2 qt. Square..doz.$1.35; gro.$13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts .....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled .....35&10%
Tinned .....30&10%

Powder—
In Canisters:
Duck, 1 lb. .....each 45¢
Fine Sporting, 1 lb. ....each 75¢
Rifle, ½ lb. .....each 15¢
Rifle, 1 lb. .....each 25¢
In Kegs:
25-lb. kegs $3.50
25-lb. kegs $4.50
King's Semi-Smokeless:
Keg (25 lb bulk) $6.50
Half Keg (12½ lb bulk) $3.50
Quarter Keg (6¼ lb bulk) $1.90
Case 24 (1 lb cans bulk) $8.50
Half case (1 lb cans bulk) $4.50
King's Smokeless Shot Gun Rifle.
Keg (25 lb bulk) $12.00 $15.00
Half Keg (12½ lb bulk) 6.25 7.75
Quarter Keg (6¼ lb bulk) 3.25 4.00
Case 24 (1 lb cans bulk) 14.00 17.00
Half case 12 (1 lb c. bk).. 7.25 8.75

Presses—
Fruit and Jelly—
Enterprise Mfg. Co. .....20@25%

Seal Presses—
Morrill's No. 1, ₩ doz., $20.00 .....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 50%
Miller's Falls, No. 3, ₩ doz., $12.00 .....33⅓&10%
Morrill's No. 1, Nail Puller, ₩ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 .....50%
The Stratton Co., Case Lots:
No. 3B (large) $5.50
No. 3B (small) $5.00
Smith & Hemenway Co.:
Diamond B 70%
Giant 50%
Staple Pullers, Utica and Davison 60%

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05

Hay Fork, Swivel or Solid Eye, doz., 4 in., $1.25; 5 in., $1.55

Inch	2	2¼	2½
Hot House, doz.	$0.65	.85	1.20
Inch	1¼	1½	1¾
Screw, doz.	$0.16	.19	.23
Inch	1¾	2	2¼
Side, doz.	$0.25	.30	.35
Inch	1¾	1¾	2

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in. .....17@20¢
Auger Mortise, no Face Plate per doz., 1¾ and 2 in. ....20@21¢
Acme, No. 35, 1¾ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel, American Plain Axle .....50&10%
Wrought Steel, Eagle .....17½@20¢
Fox-All-Steel, Nos. 3 and 7, 2 in., ₩ doz. 50%
Grand Rapids All Steel Noiseless 50%
Niagara, No. 25, 1¾ in., 19¢; 2 in., 20½¢
No. 26 Troy, 1¾ in., 14½¢; 2 in., 16½¢
Star, No. 26, 1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout .....75&5@75&10%
Wood Pumps, Tubing, &c. 50%
Barnes Dbl. Acting Claw list .....25&5%
Barnes Pitcher Spout .....75&10%
Contractors' Rubber Diaphragm No. 2 B. & I. Block Co. $7.00
Daisy Spray Pump .....₩ doz. $6.50
Flint & Walling's, Fast Mail Hand, (low list) 50%
Flint & Walling's Fast Mail (low list) 50%
Flint & Walling's Tight Top Pitcher, ...75&10%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50 .....50%
Myers' Pumps (low list) .....40&5%
Myers' Power Pumps .....40&5%
Myers' Spray Pumps .....40&5%

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No.	2	2½	3	3½	4
	$3.10	3.70	4.35	4.95	5.60

Cup Leathers—Per 100:

Inch	2½	3	3½	4	
	$2.80	4.35	6.20	8.80	

Punches—
Saddlers' or Drive, good .....doz. 50@75¢
Spring, single tube, good qual. .....doz. $4.75
Revolving (4 tubes) .....doz. $3.60
Bemis & Call Co.'s Cast St'l Drive 50%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00 .....50%
Hercules, 1 die, each $5.00 .....50%
Niagara Hollow Punches 40%
Niagara Solid Punches .....55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35%; Paragon, 50%; Lodi 55%
Tinners' Hollow, P., S. & W. Co. 40%
Tinners Solid, P., S. & W. Co., ₩ doz., $1.44 .....40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron .....2½@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb., 36¢ 50%
Allith Mfg. Co.: Reliable Hanger Track 60%
Crook's:
Double Braced Steel Rail..₩ ft. 3¼¢
O. N. T. Rail $3.12
Griffin's:
XXX, ₩ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ₩ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ₩ 100 ft. $3.45
O. N. T., ₩ 100 ft., 1 in., $3.00; 1¼ in., $3.25; 1½ in., $4.00.
Standard, 1¼ in. .....₩ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ₩ 100 ft., $7.50; 1¼ x 3-16 in., $8.75 .....55&7½%
Mc'Conway's:
Hinged Hanger Track, ₩ ft., 11¢ .....60&5%
1 x 3-16 Track .....55&7½%
Mayer Stapon Track .....60&5%
Ricuards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65 .....50%
Gauge Trolley Track, ₩ ft., No. 31, 9¢; No. 32, 11¢; No. 33, 20¢ .....60&10%
No. 50 .....60&10%
No. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn $3.25
Fort Madison Blue Head Lawn $2.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80; Victor .....80&2.5%
Queen City Lawn, ₩ doz., 20 teeth, $2.85; 24, $3.00 .....net
Antelope Lawn, ₩ doz. $1.00
Malleable Garden .....70&10%
Ideal Steel Garden, ₩ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00 .....80%
Kohler's:
Lawn Queen, 20-tooth .....₩ doz. $3.15
Lawn Queen, 24-tooth .....₩ doz. $3.25
Paragon, 20-tooth .....₩ doz. $2.70
Paragon, 24-tooth .....₩ doz. $2.75
Steel Garden, 14-tooth .....₩ doz. $2.40
Malleable Garden, 14-tooth, ₩ doz. $3.00@2.25

Rasps, Horse—
Disston's 75%
Heller Bros .....70&5@70&10&5%
Liverpool Bros. & Co. .....70&10%
McCaffrey's American Standard 70%
New Nicholson .....70&10&5%
See also Files.

Razors—
Lewis Bros. 60%
Fox Razors, ₩ doz., No. 12, $30.00; No. 14, $20.00; No. 82, Plattna, $25.00 .....net
Red Devil 65%

Reels, Fishing—
Hendryx:
M. 6, Q. 6, A. 6, B. 6, M. 9¾, M. 16, Q. 16, A. 16, B. 16, 4008, Rubber Pomelo, Nickeled Pomelo 20%
Aluminum, German Silv., Bronze 25%
1240 N, 124 N 20%
3004 N, 06 N, 6 RM, G 9 .....25%
4 N, 6 PN, 24 N, 26 PN 20%
2904 P, 3034% P, 2904 PN, 3034% P, 2904 N, 3034% P, 002904 PN, 3034% P, 002904 N, 3034% P 25%
986 PN, 2904 N, 974 PN 25%
5009 PN, 5009 N 20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20%
304 P, 304 PN, 00304 P, 00304 PN, 3034% P, 3034% PN, 00304 N, 00304 PN, 3034% P, 3034% PN 25%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed .....70@70&10%
White Porcelain Enamel .....50&10%
Solid Brass or Bronze Metal 40%

Revolvers—
Single Action .....$5@$31.00
Double Action, except 44 cal. $2.00
Double Action 44 calibre $2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grade
16 in. .....per doz. $2.50@$2.75
17 in. .....per doz. $2.75@$3.00
18 in. .....per doz. $3.00@$3.25

Rings and Ringers—Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.10	1.25	1.35 doz.

Hog Rings and Ringers—
Hill's Rings, gro. boxes $4.25
Hill's Ringers, Gray Iron, doz. .60¢
Hill's Ringers, Malleable Iron, doz. .80¢
Blair's Rings .....per gro. $4.00
Blair's Ringers .....per doz. 75¢
Brown's Rings .....per gro. $3.25
Brown's Ringers .....per doz. 75¢

Rivets and Burrs—
Copper .....40¢10@50%
Carriage, Coopers', Tinners, &c.:
Black .....70¢10%
Metallic Tinned 70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, 23@25¢; Tin boxes, 100 count, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—
Cronk's Stay, No. 50 .....$1.00
Cronk's Brickerhoff No. 55, $0.60; No. 56, $0.75; No. 60 .....$0.75
Lane's Stay 40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57 .....50%
Underwriters', Nos. 59, 60 .....50%
Favorite, No. 54 .....60%

Rope—
Manila, 7-16 in. diam. and larger: Pure .....lb., 11½@12¢
Sisal, 7-16 in. diam. and larger: Pure .....lb., 8¢
Sisal, ½ in. diam. and under: No. 2 quality .....lb., 7@7¼¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed .....lb., 7@7¼¢
Pure .....lb., 9¼¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred: Mixed .....lb., 6¼@6¾¢
Pure .....lb. 7¼¢
Cotton Rope: Best, ¼-in. and larger... 18@20¢
Medium, ¼-in. and larger. 16@17¢
Common, ¼-in. and larger... 10¢
In coils, ½¢ advance.
Jute Rope: Thread, No. 1, ¼-in. & up. lb., 7¼@8¢
Thread, No. 2, ¼-in. & up. lb. 7@7½¢

Wire Rope—
Galvanized .....37½&2½%
Plain .....45&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal 20%

Rules
Boxwood .....60@60&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory .....25@35&10
Miscellaneous .....50&10&5
Stephens' Combination 55%
Stimpson's .....50&10&5%
Keuffel & Esser Co.:
Folding, Wood .....35&10%
Folding, Steel .....33⅓&10%
Lufkin's Steel .....50&10%
Lufkin's Lumber .....50&10%
Upson Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins': Circular 45%
Band ..... 50@50&10%
Butcher Saws 35%
Cross Cut 40%
One-Man Cross Cut 40%
Narrow Cross Cut 50%
Hand, Rip and Panel ..... 35&10%
Miter Box and Compass 40
Mulay, Mill and Drag 45%
Wood Saws ..... 10&10%

Chapin-Stephens Co.:
Turning Saws and Frames ..... 30@30&10%

Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%

Disston's:
Circular, Solid and Ins'ted Tooth 50%
Band, 2 to 18 in. wide 60%
Band, ¾ to 1¼ 45%
Crosscuts 50%
Narrow Crosscuts 50%
Mulay, Mill and Drag 50%
Framed Woodsaws 25%
Woodsaw Blades 5%
Woodsaw Rods, Tinned 15
Hand Saws, Nos. 12, 99, 9, 16, dito 30%
D8, 12S, 7c, 7, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c. 25%
Butcher Saws and Blades 30%

C. E. Jennings & Co.'s:
Back Saws 10%
Butcher Saws 20%
Compass and Key Hole Saws, Frames ..... 33⅓&7½%
Framed Wood Saws 40%
Hand Saws 12½%
Wood Saw Blades 25%

Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%

Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&5%
Butcher Saws ..... 35&10%

Peace & Richardson's Hand Saws 30%

Simonds':
Circular Saws 45%
Crescent Ground Cross Cut Saws 30%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws 50%
Band Saws ..... 25@25&7½%
Back Saws ..... 35@35&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. ..... 25@25&7½%
Wood Saws ..... 40&7½%

Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A 25%

Disston's:
Concave Blades 25%
Keystone Blades 35%
Hack, 7 Frames 35%

Simonds Mfg. Co. 35%

C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete, each ..... 40&7½%

Goodell's Hack Saw Blades ..... 40&10%
Grubs's Hack Saw Frames ..... 35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..... 30&10&5%
Sterling Hack Saw Frames ..... 30&10&10%
Sterling Power Hack Saw Machine, each, $60.00; No. 2, $30.00 ..... 10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without lacing attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00 ..... 15&10%

Scales—

Family, Turnbull's ..... 50@50&10%
County:
Hatch, Platform, ½ oz. to 4 lbs. ..... doz., $5.50
Two Platforms, ½ oz. to 8 lbs. ..... doz., $16.00
Union Platform, Plain, $1.75@1.90
Union Platform, Stpd. $1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Crown Trip Scales 50%
The Standard Portables 40%
The Standard R. R. and Wagon ..... 50&10%

Scrapers—

Boz, 1 Handle ..... doz. $2.00@2.25
Boz, 2 Handle ..... doz. $2.50@2.60
Ship ..... *Light, $2.00; Heavy, $1.50*
Chapin-Stephens Co., Box ..... 30@30&10%
Richards Mfg. Co., Foot 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1½, $3.50@3.75
Bench, Wood ..... @
Hand, Wood ..... @
Chapin-Stephens Co., Hand ..... @

Coach, Lag and Hand Rail—

Lag, Cone Point ..... @
Coach, Gimlet Point ..... @
Hand Rail ..... @

Jack Screws—

Standard List ..... @
Millers Falls ..... 50&10%
Swett Iron Works ..... 70&75

Machine—

Cut Thread, Iron, Brass or Bronze:
Flat Head or Round Head. ..... @
Fillister Head ..... @
Rolled Thread, F. H. or R. H. Iron ..... @
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65&10%

Set and Cap—

Set (Iron) ..... 75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... @
Hex. Hd. Cap ..... @
Rd. Hd. Cap ..... @
Fillister Hd. Cap ..... @

Wood—

List July 23, 1903.
Flat Head, Iron ..... 85%@5%
Round Head, Iron ..... 85&5%
Flat Head, Brass ..... 80&5%
Round Head, Brass ..... 75&5%
Flat Head, Bronze ..... 75&5%
Round Head, Bronze ..... 75&5%
Drive Screws ..... 85%@5%

Scroll Saws—

See *Saws, Scroll.*

Scythes— *Per doz.*

Grass, No. 1, Plain ..... $6.25@6.75
Clipper, Bronzed Webb ..... $6.50@7.00
No. 3 Clipper, Pol'd Webb ..... $6.75@7.25
No. 6 Clipper and Solid Steel ..... $7.00@7.50
Bush, Weed and Bramble, No. 2 ..... $6.50@7.00
Grain, No. 1 ..... $8.25@8.75
Bronzed Webb, No. 1 ..... $8.50@9.00
Nos. 3 and 4 Clipper, Grain ..... $8.75@9.25
Solid Steel, No. 6 ..... $9.25@9.75

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18 ..... 20&10

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... @ doz sets $9.00

Sets, Nail—

Octagon ..... *gro. $3.50@3.75*
Buck Bros. 25%
Cannon's Diamond Point, @ gro, $12, 48&10

Mayhew's ..... @ gro $2.00
Snell's Corrugated, Cup Pt. ..... 40&10
Snell's Knurled, Cup Pt. ..... 40&10
Victor Knurled Cup Pt. ..... @ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Tri-umph 30%
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut $20.60
No. 5, Mill $30.00
Nos. 10, 11, 95 ..... $15.60
No. 1 Old Style $10.00
Special $16.25
Giant Royal Cross Cut ..... @ doz. $8.00
Royal, Hand ..... @ doz. $4.60
Tainter Positive ..... @ doz. $6.75

Shaving—

Fox Shaving Sets, No. 80 ..... @ doz., net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, @ doz. $1.50
Mounted Kitchen Sand Stone, @ doz. $1.50
Natural Grit Carving Knife Hones, @ doz. $3.00
Quick Cut Emery Carving Knife Hones, @ doz. $1.50
Quick Edge Pocket Knife Hones, @ doz. $2.50

60%

Skate—

Smith & Hemenway Co., Eureka 50%

Shaves, Spoke—

Iron ..... *doz $1.10@1.25*
Wood ..... *doz $1.75@2.25*
Buck's (Stanley R & L Co.) 15
Chapin-Stephens Co. ..... 30&10%
Goodell's, @ doz. $9.00 ..... 15&10%

Shears—

Cast Iron..	7	8	9 in.
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Cheap	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality Jap ..... @
Best quality, Nickel ..... @
Tailors' Shears ..... @
Acme Cast Shears ..... 40&10%
Hoopskirt Cast Shears 10%
Wilkinson Shear & Cutlery Co.:
Sheep, 1900 list ..... 30&10&5%
Grass 50%
Horse or Mule 50%

Tinners' Snips—

Steel Blades ..... @
Steel Laid Blades ..... @
Forged Handles, Steel Blades, Berlin

Bainisch's Snips
Jennings & Griffin Mfg. Co.'s, 10 in
Niagara Snips
P. S. & W. Forged Hardles
W. R. W.

Pruning Shears—

Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Disston's Combined Pruning Hook and Saw, @ doz $18 ..... @
Disston's Pruning Hook only, @ doz. $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
P. S. & W. Co. ..... 40&10%
Columbian-Harry Co.:
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand ..... 60&10%

Sheaves— Sliding Door—

Reading 40%
R & E. list 15%

Sliding Shutter—

Reading list 40%
R. & E. list 10%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge ..... 65&10%
Club, Rival, 65&5%; First Quality ..... 60&5

Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge ..... 25&10
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge, Leader and Rival ..... 25&5
Union, League, 12 and 12 gauge; Rival Grade 25%
New Climax, Defiance, 10, 12, 16, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge, League, Unique, 14, 16 and 20 gauge; Repeater Grade 20%

Shells, Loaded—

Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40%
Nitro Club, Smokeless Powders ..... 40&5%
Arrow, Smokeless Powders ..... 40&10&10%
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Leader Grade ..... 40&10&10%
Black Powder Grade 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:	Painted.	Galv.
14 x 20	$1.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20 in.	$4.25	$5.50
Dixie, 10 x 14 in.	4.50	6.00
Dixie, 7 x 10 in.	5.00	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... *per key, $4.10*
Steel ..... *per key, $5.85*
Burden's, all sizes ..... @ keg $3.90

Shot—

25-lb. bag.
Drop, up to B $1.85
Drop, B and larger 2.10
Buck 2.10
Chilled 2.10
Dust 2.30

Shovels and Spades—

Association List, Nov. 15, 1902. ..... 40%
Avery Stamping Co. 40%

Snow Shovels—

Long Handle ..... *$3.25@3.50*
Wood and Mall. D. Handle ..... *$3.75@$4.00*

Sieves and Sifters—

Hunter's Imitation ..... *gro. $9.50@10.00*
Hunter's Genuine ..... *per gro. $12.00@12.50*

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each, $3.25; ..... @

Sieves, Seamless Metallic

	Per dozen.			
Mesh	14	16	18	20
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.10*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.25*

Sieves, Wooden Rim—

Nested, 1, 11 and 12 ..... @
Mesh 18, Nested ..... *doz. $0.90@0.95*
Mesh 20, Nested ..... @
Mesh 24, Nested ..... @

Sinks, Cast Iron—

Painted, Standard list:

Barnes' list

Skeins, Wagon—

Collins Co. ..... @
Standard ..... @

Slates, School—

Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless ..... *60&5 tens*
Victor A, Noiseless ..... *60&5 tens &5%*

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... @
Conert Mfg. Co.:
Derby, 20; Yankee 30&5%, Yankee Roller, 30&5%
High Grade, 40%; Trojan 40%
Jockey 35%

Snaths—

Scythe ..... @

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality ..... @
Cheap ..... @
International Silver Co.:
1847 Rogers Bros., 40&5%; Rogers Bros., 40&5%
Rogers & Bro., William Rogers Eagle Brand ..... 50&10%
Am. Silvers, Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous

German Silver ..... @

Tinned Iron—

Teas ..... *per gro.*
Tables ..... *per gro. $0.90@$1.00*

Springs— Door—

Bardsley's Spring and Check 40%
Cuckoo Co. ..... 40&10%
Gem 50
Pullman (Coil) 35%
Reliance (Coil) ..... 40&10
Star (Coil) 50
Torrey's Rod, 39 in. ..... @ doz. $1.10

Carriage, Wagon, &c.—

1¼ in. and Wider! ..... *Per 100 lb.*
Black ..... @
Half Bright ..... @
Bright ..... @
Painted Seat Springs:
No. 2 x 28 ..... *per pr.*
No. 3 x 30 ..... *per pr.*

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; National, @ doz. $12.00
Enterprise 30%
Philadelphia No. 1, @ doz. $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated.. } *List Jan., 1900.*
Steel and Iron ..... *75&10&10%*
Rosewood Hdl. Try Squares and T-Bevels ..... @
Iron Hdl. Try Squares and T-Bevels ..... @
Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel 15%

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... *doz. $1.00*
Good Grade ..... *doz. $1.25*
Tinned Iron ..... *doz. $0.75@1.25*
Iron, Porcelain Lined ..... *doz. $1.75*

Staples—

Barbed Blind ..... *lb. 6@6½¢*
Electricians', Association list ..... 80&10&10&10%
Fence Staples, Plain, $2.15; Galvanized ..... @
Poultry Netting Staples ..... *per lb. 3½@3½¢*

Steels, Butchers'—

Dick's 30%
Foster Bros. 30%

Steelyards—

Stocks and Dies—

Bigelow's ..... @
Curtis Rev'ble Ratchet Die Stock 25%
Pipe ..... @
Screw ..... @
Solid ..... @

Stoners, Cherry—

Stones—Oil, &c.

Arkansas Slips No. 1 ..... $1.00
Washita St., Extra, 4 to 8 in. 50¢
Washita St., No. 1, 4 to 8 in. 40¢
Washita St., No. 2, 4 to 8 in. 25¢
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 70¢
Washita Slips, No. 2 ..... 40¢
India Oil Stones (entire list) 33⅓%
Queen Emery and Corundum Oil Stone, Double Grit 40%
Quinkut Emery and Corundum Axe Stone, Double Grit ..... 40¢
Quinkut Emery Rubbing Brick ..... 10¢
Hindostan No. 1 Regular ..... 80¢
Hindostan No. 1, Small ..... 10¢
Axe Stones (all kinds) 10%
Turkey Oil Stones, Extra, 5 to 8 in. ..... 80¢
Queer Creek Stones, 4 to 8 in. ..... 20¢
Queer Creek Slips ..... 10¢
Sand Stone ..... 6¢

Scythe Stones—

Pike Mfg. Co., 1901 list:
Black Diamond S. S. ..@ gro. $12.00
Lamoille S. S. ..@ gro. $11.00
White Mountain S. S. ..@ gro. $9.00
Green Mountain S. S. ..@ gro. $6.00
Extra Indian Pond S. S. ..@ gro. $5.50
No. 2 Indian Pond S. S. ..@ gro. $4.50
Leader Red End S. S. ..@ gro. $4.50
Quick Cut Emery ..@ gro. $10.00
Pure Corundum ..@ gro. $18.00
Crescent ..$7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%.
Electro (Artificial) ..@ gro. $12.00 ..33⅓%
Lightning (Artificial) ..@ gro. $18.00 ..33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers ..@ gro. $9.00

Stops— Bench—

Millers Falls ..15&10%
Morrill's, @ doz., No. 1, $10.00 ..50%
Morrill's, No. 2, $12.50 ..50%

Door—

Chapin-Stephens Co. ..50@50&10%

Plane—

Chapin-Stephens Co. ..20%

Straps— Box—

Acme Embossed, case lots ..20&10&10%
Carr's Universal, case lots ..20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket ..doz. $1.68
Excelsior Stretcher and Tack Hammer Combined, @ doz. $6.00 ..20%

Stuffers, Sausage—

Enterprise Mfg. Co. ..25@25&7½%
National Specialty Co., list Jan. 1, 1902 ..30&5%
P., S. & W. Co. ..40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: @ doz.
Superba, Crotch Mahogany ..$36.00
Triumph, Fancy Veneers ..$33.00
Parlor Queen, Fig. Rosewood ..$30.00
Elite, Hungarian Ash ..$29.00
Am. Queen, Fig. Mahogany ..$27.00
Ideal, Bird's-Eye Maple ..$25.00
Grand Rapids, Nickel, $24.00; Japan ..$22.00
Standard, Nickel, $22.00; Japan $20.00
Crown Jewel, Nickel, $21.00; Jap $19.00
Crystal, Glass Top ..$36.00
Grand, 17 in. wide ..$36.00
Club, 24 in. wide ..$54.00
Hall, 28 in. wide ..$60.00

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five dozen lots; $2 per dozen on ten dozen lots; $2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks ..90&25%
American Cut Tacks ..90&25%
Swedes' Cut Tacks ..90&25%
Swedes' Upholsterers' ..90&25%
Gimp Tacks ..90&25%
Lace Tacks ..90&25%
Tinners' Tacks ..90&25%
Looking Glass Tacks ..67%
Bill Posters' and Railroad Tacks, 90&10%
Hungarian Nails ..80&10%
Finishing Nails ..70%
Trunk and Clout Nails ..80%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks ..90&10@90&10&10&5%

See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.: Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather ..25@30&5%
Steel ..33 1-3&5%
Chesterman's ..25@25&5%

Kendall & Esser Co.:
Favorite, Asse Skin ..30&10@50%
Favorite, Buck and Leather ..25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.

Lufkin's:
Asse Skin ..40&10@50%
Metallic ..30@30&5%
Patent Bend Leather ..25&5@25&10%
Pocket ..10@10&5%
Steel ..33⅓@35%

Whitman & Baker:
Challenge Metallic, No. 34L ..35%
Chesterman's Steel, No. 1038L, 1 ft. ..35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger, per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c. ..30@33⅓%

Ties, Bale—Steel Wire—

Single Loop ..80&10&5%
Monitor, Cross Head, &c. 70&2½%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White ..20@20&5%

Haying—

Myers' Hay Tools ..45%

Miniature—

Smith & Hemenway Co.'s, Davidson, @ doz., Nickel Plated, $1.50; Gold Plated ..$2.00

Saw—

Atkins' Cross Cut Saw Tools ..35&5%
Simonds' Improved ..33⅓%
Simonds' Crescent ..25%

Ship—

L. & I. J. White ..25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro. ..$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Ontida ..75&10%
Newhouse ..40&10&5%
Hawley & Norton ..65%
Victor ..75&75&10%
Oneida Community Jump ..50%
Hector ..50&75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85@90¢

Marty French Rat and Mouse Traps (Genuine): @ doz., $13.25..$11.50 doz.
No. 1, Rat, @ doz. $6.50 ..$5.75 doz.
No. 3, Rat, @ doz. $5.25 ..$4.70 doz.
No. 4, Mouse, @ doz. $3.85 ..$3.00 doz.
No. 5, Mouse, @ doz. $3.00 ..$2.25 doz.
Oneida Community:
Out o' Sight, Mouse, @ doz. ..$0.60
Out o' Sight, Rat, @ doz. ..1.25
Easy Set, Rat, @ doz. ..35
Easy Set, Rat, @ doz. ..1.00
Wood Choker, Rat, @ doz. holes ..35
Premier Tin Choker, 5 hole, @ doz. traps ..75

Trowels—

Disston Brick and Pointing ..25%
Disston Plastering ..20%
Disston "Standard Braud" and Garden Trowels ..30%
Kohler's Steel Garden Trowels, @ gro., 5 in. $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels.. @ gro. $6.00
Woodrough & McParlin, Plastering ..25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern ..50&10%
Western Pattern ..60&10%
Handy Trucks ..@ doz. $16.00
Grocery ..@ doz. $15.00
McKinney Trucks ..each, net $10.00
Model Stove Trucks ..@ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.

No.	0	1	2	3
Galvanized.	$67	$79	$89	$99

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls ..25@25¢
No. 12, ¼ and ½-lb. Balls ..21@21¢
No. 18, ¼ and ½-lb. Balls ..18@20¢
No. 24, ¼ and ½-lb. Balls, 17½@19½¢
No. 36, ¼ and ½-lb. Balls ..17@19¢
Chalk Line, Cotton Balls ..26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz. ..11@19¢
Cotton Wrapping, 5 Balls to lb., according to quality ..15½@25¢
American 3-Ply Hemp, ¼ and ½-lb. Balls ..14½@15½¢
American 3-Ply Hemp, 1-lb. Balls ..15½@16½¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) ..10½@11½¢
India 3-Ply Hemp, 1-lb. Balls, 10½@11½¢
India 3-Ply Hemp, 1½-lb. Balls, 10@11¢
2 *ply, ¼ and 3-Ply Jute, 1-lb. Balls ..13½@14½¢*
Mason Line, Linen, ½-lb. Bls. 17¢
No. 24, Mattress, ¼ and ½-lb. Balls, according to quality, 9@60¢
Wool 3 to 6 ply ..B 9¢; A 10¢

Vises—

Solid Box ..50@50&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable ..40%
Standard ..40%
Amateur ..25%
Columbian Hdw. Co. ..40%
Fisher & Norris Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00 ..40%
Fulton Mach. & Vise Co.:
Reed, Swivel ..25
Star, Solid Jaw ..40%
Hollands':
Machinists' ..10&10&5%
Keystone ..65&5&10
Lewis Tool Co.:
Adjustable Jaw ..30%
Monarch, 50%; Solid Jaw ..50%
Massey Vise Co.:
Clincher ..40%
Perfect, 15%, Lightning Grip ..15%
Merrill's ..20%
Millers Falls Oval Slide Pattern ..60&10%
Parker-Kalon:
Victor, 20@25%; Regulars ..20@25%
Vulcan's ..40@45
Combination Pipe ..55@60
Prentiss ..20@25
Rock Island ..65%
Snedeker's X. L. ..33⅓%
Stephens' ..33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, @ doz., $24.00, 30%; Clamps ..30%
Perfection Saw Clamps, @ doz. ..$4.50
Reading ..60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed ..25%
Star ..40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect ..15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.50, 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe ..60@60&5%
Massey's Quick Action Pipe ..40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%
Rock Island Pipe ..25%

Wads— *Price per M.*

B. E., 11 up ..60¢
B. E., 9 and 10 ..70¢
B. E., 8 ..80¢
B. E., 7 ..80¢
P. E., 11 up ..$1.00
P. E., 9 and 10 ..1.25
P. E., 8 ..1.50
P. E., 7 ..1.50
Ely's B. E., 11 and larger..$1.70@1.75
Ely's P. E., 12 to 20 ..$3.00@3.25

Dis. 15%

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled ..45&10%
Ground ..50&45%
Plain or Unground ..60%
Country Hollow Ware, per 100 lbs. ..$3.00
White Enameled Ware:
Mashin Kettles ..65&10%
Covered Wares:
Tinned and Turned ..35&10%
Enameled ..45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware ..33⅓%
Iron Clad Ware ..70&10%
Lava and Volcanic, Enameled ..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles ..65@65&5%
Avery Kettles ..60%
Porcelained ..50&5@50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles ..60%
Solid Steel Spiders and Griddles ..65&5%
Solid Steel Kettles ..60%

Warmers, Foot—

Pike Mfg. Co., Soapstone ..40@40&10%

Washboards—

Solid Zinc: @ doz.
Crescent, family size, bent frame ..$4.05
Red Star, family size, stationary protector ..$4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector ..$3.55
Cable Cross, family size, stationary protector ..$3.60
Single Zinc Surface:
Nickel family size, open back, perforated ..$3.00
Single Saginaw Globe ..$2.85
Brass Surface:
Brass King, Single Surface, open back ..$4.05
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface ..$3.60
Glass Surface:
Glass King, Single Surface, open back ..$3.95
Enamel Surface:
Enamel King, Single Surface, perforated back ..$3.95

Washers—Leather, Axle—

Solid ..90@90&10%
Patent ..90@90&5%
Coil: ⅞ 1 1¼ Inch
11¢ 12¢ 13¢ 15¢ per box

Iron or Steel—

Size bolt... 5/16 ⅜ ½ ⅝ ¾
Washers... $5.00 7.00 3.50 3.50 3.30

The above prices are based on $5.50 off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots... per lb. 1¼@2¢

Wedges—

Oil Finish ..lb.. @3¢

Weights—Hitching—

Covert Mfg. Co. ..30&2%

Sash—

Per ton, f.o.b. factory:
Eastern District ..$30.00
Southern Territory..$24.00@25.00
Western and Central Districts ..$25.00@28.50

Wheels, Well—

8-in., $2.22; 10-in., $2.82; 12-in., $3.36; 14 in., $4.80.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 ..72¢10¢71½%
10 to 18 ..72½@10¢10%
19 to 26 ..75¢10¢10¢21½%
27 to 36 ..77½@71½%
Galvanized:
6 to 9 ..72½@10%
10 to 14 ..72½@10¢5%
15 to 18 ..72½@10¢5%
17 to 18 ..72½%
19 to 26 ..70¢5¢21½%
27 to 36 ..65¢10¢10%
Coppered:
6 to 9 ..65¢10¢10%
10 to 14 ..70¢10¢5%
15 to 16 ..65¢10¢10¢5%
19 to 26 ..70¢5¢21½%
27 to 36 ..72½@10¢21½%
Tinned:
6 to 18 ..67¢10¢10%
Brass ..17½¢ lb., base
Copper ..32¢ lb., base
Cast Steel Wire ..50%

Spooled Wire—

Annealed and Tinned ..50&10&10%
Brass and Copper ..60&10&10%
Retailers' Assortments, per box $2.10@$2.40

Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods..90&20@90&25%
Brass Wire Goods ..90@90&10%
Brass Cup and Shoulder Hooks, 80&15%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80&5@80&10%
Painted Screen Cloth, 100 ft., $1.30
Standard Galv. Hardware Grade: Per 100 sq. ft.
Nos. 2, 2½ & 3 Mesh ..$2.50
Nos. 4 and 5 Mesh ..$2.75
No. 6 Mesh ..$3.00
No. 8 Mesh ..$3.50

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ..75@75&10%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches, 70&5@70&10%
Drop Forged S ..45@45&5%
Acme ..60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut ..50%
Combination Black ..40&5%
Merrick Pattern ..50%
Boardman's ..40%
Coes' Genuine Knife Hdl. ..40&10&5&5%
Coes' Genuine Steel Hdl. ..40&10&5&5%
Coes' Genuine Key Model ..40&10&5&5%
Coes', Genuine Hammer Handle ..40&10&5&5%
Coes' "Mechanics'"..40&10&10&5&5%
Donohue's Engineer ..40&5%
Eagle ..70%
Gem Pocket ..50%
Hercules ..70%
W. & B. Machinist:
Case lots ..50&5%
Less than case lots ..50%
W. & B. Railroad Special:
Case lots ..40&10&5%
Less than case lots ..40&10&5%
Solid Handles, P., S. & W. ..50&10%;
full cases ..50&10&5%
Stillson ..65%
Uwanta Wrench Co.:
Railroad Special, Iron Handle, 40&10&5%
Other Wrenches ..50%
Vulcan and Agrippa Chain ..50%

Wrought Goods—

Staples, Hooks, &c., list March 17, '02 ..90%

Zinc— *(Cask lots at mill.)*

Sheet ..per 100 lb., $7.00

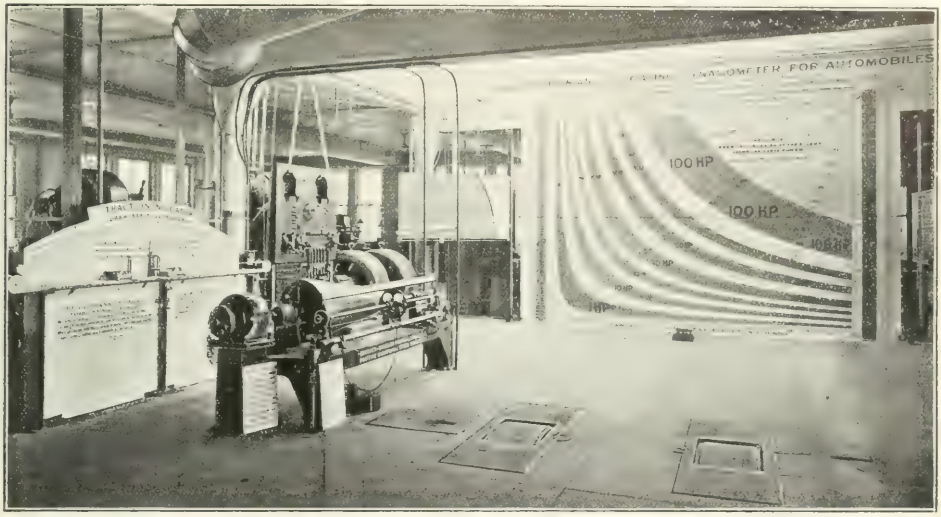
THE IRON AGE

New York, Thursday, January 23, 1908.

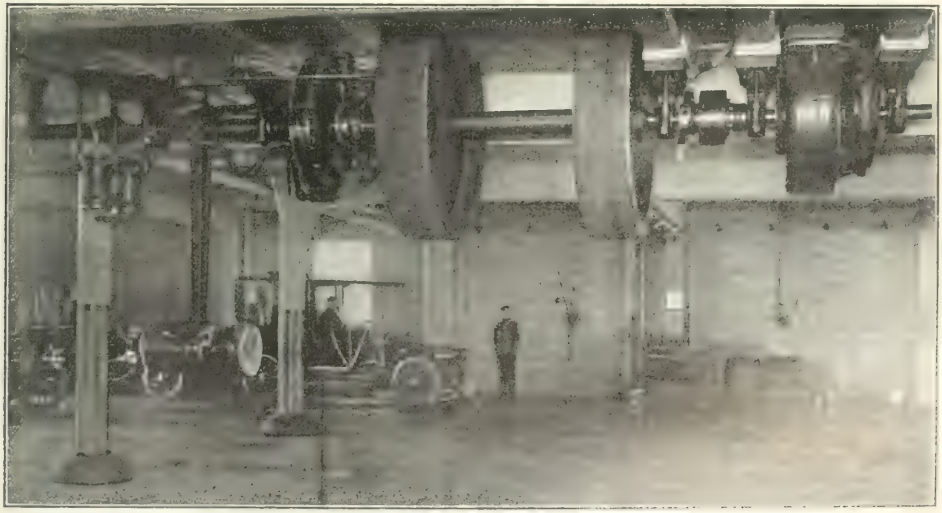
The Club Automobile Dynamometer.

Very complete and elaborate equipments have been built for testing locomotives in *situ*, such, for example, as the Pennsylvania Railroad's plant at Altoona, its earlier one exhibited at the Louisiana Purchase Exposition, and the oldest and most familiar one at Purdue University. On somewhat the same lines automobile testing equipments have been erected; among them one at the Worcester Polytechnic Institute and another in the New York School of Automobile Engineers. The most remarkable of the latter is that recently completed by the Automobile Club of America, in its immense garage and clubhouse on Fifty fourth street, New York City, and known as the Club Dynamometer.

It is particularly of interest because of its completely automatic character since it gives instantaneous indications of the speed in miles per hour and feet per minute, the draw bar pull or tractive effort in pounds, the horsepower (which is ordinarily a matter of calculation from the first two items), the grade climbing ability (another figure usually arrived at by mathematics) and the power of the brakes. There is no other outfit in the world that will do the work of this one; and probably no other institution could afford to construct and operate a similar machine. It is of great importance to owners and intending purchasers, who want to know the exact capabili-



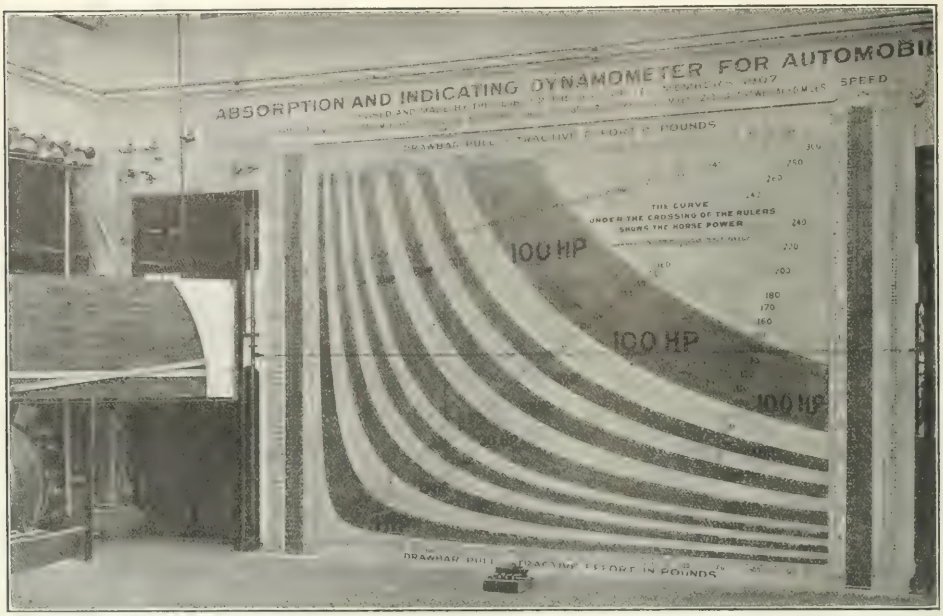
General View on the Testing Floor, Showing the Traction Indicator, Speed Indicator, Grade Meter, Horsepower Chart and Drums.



View on the Floor Beneath, Showing the Dash Pots, Pendulum, Alden Brake, Drums and Moto

ties of a car, and will be appreciated by manufacturers because it will enable them to determine precisely what their cars can do, and will give them a standard to which they can refer with confidence. Decided advantages are that the dynamometer makes it unnecessary to get sanction at the ground by the wheels of the automobile. This includes every element in the operation of the automobile; and, therefore, shows the net power that is available for driving the car.

Instead of traveling along as on a road the car is held

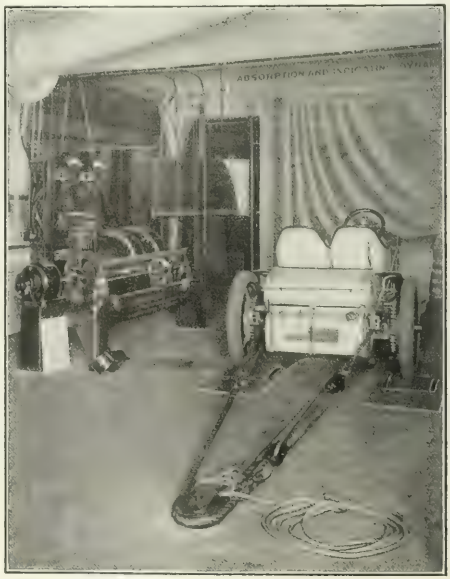


A Nearer View of the Grade Meter and Horsepower Chart.

cial permission to speed machines in making a running test, it eliminates all danger of road accidents during tests and gives the results more quickly and accurately than in any other way. The dynamometer, with the club scales for weighing cars, should provide conclusive means of deciding all problems connected with automobile performance.

The word "dynamo-meter" is usually applied to a simple apparatus, either a spring balance for weighing the draw bar pull required to draw a carriage or a railroad car at a given speed, or a power absorbing device for consuming the power developed by an engine under trial, but there are also numerous other forms. To obtain results from these it is always necessary to make calculations from the readings observed. The club dynamometer is an apparatus upon which an automobile of any kind may be placed and operated, and the result read at once in speed, pull and horsepower. It is therefore not only a dynamometer in the usual sense, but a calculator of the readings obtained by a dynamometer. It provides a moving track upon which cars can be fully tried out while remaining stationary and under observation. An exhaust fan, with a system of piping and interchangeable connections, removes the escaping gases from running automobiles, keeping the air in the room clear of smoke and fumes.

In 1904 Dr. Schuyler Skaats Wheeler, first vice-president of the Automobile Club, was requested by the club to invent, design and build a machine for determining accurately the performance of cars of all kinds. The present machine is the result of several years' attention to this problem on his part, and was built by the Crocker-Wheeler Company, Ampere, N. J. It is an assemblage of power absorbing and measuring instruments and a large power chart with automotically operated pointers. It carries the problem of power measurement, integration and automatic recording of the final results, much farther than has hitherto been attempted. It absorbs and measures the power so that, at a glance, the speed, tractive effort and horsepower can be clearly seen and read at each instant. The measurements show the power delivstationary by cables upon the floor with its driving wheels resting upon two large paper covered drums, which reach up through the floor and are revolved by the automo-



An Automobile in Position for Testing.

bile. The revolution of the drums is resisted by a huge pendulum hanging below the floor, and attached to the drum shaft through an Alden brake furnishing a

degree of friction which can be varied. The pendulum, in consequence, swings away from the vertical, a distance exactly proportional to the pull exerted by the car upon the drums. The amount of this pull, or "tractive effort," is indicated by a pointer attached to the pendulum and reaching above the floor. To steady the pointer and facilitate reading the indications, two dash pots are connected to a beam on the pendulum shaft. Sudden fluctuations in load are thus damped. This weighing apparatus, or pendulum, was calibrated and certified correct by the Fairbanks Company. The method of calibrating was interesting. The Alden brake being engaged, a band was passed over one of the drums, with one end attached to it, and on the free end known weights were hung, and the position of the pointer for each deflection of the pendulum was marked with the corresponding weight. The indications given by the pendulum are transferred by a wire cable to a vertical tape traveling across the face of a large chart in such manner that with each varying position of the pendulum pointer the tape is moved to correspond to its new position. The movement of the cable system is independently effected by a small electric motor when electric contacts are made by the swinging of the pendulum, so that the latter is not resisted, and no error is introduced that would attend an attempt to move the tape directly from the pendulum.

The more difficult operation of measuring accurately the speed of the car by moving a horizontal tape across the large chart is accomplished by special apparatus of some novelty. A cone is revolved by an electric motor at absolutely constant speed, 200 rev. per min. To verify this speed, a bell, attached to the cone shaft, rings at each 100 revolutions, or at intervals of 30 sec. A wheel, or roller, driven by the drum shaft at a speed proportionate to the peripheral speed of the drum, rolls upon the cone, and when there is a disparity in their surface speeds there is slipping between them, which, according to its direction, makes an electrical contact that causes another independent motor to travel the rollers along the cone until it finds the point where it does not slip, because that part of the cone has the same surface speed as the roller. This longitudinal adjustment of the roller is transmitted by a wire cable to the speed tape on the chart, and the power required for moving the tape is thus made independent of the automobile. It will be seen that both the load and speed indications on the chart are made without using the power of the automobile. The method of speed measurement employed, based upon one element running at a constant speed like a clock, that can be verified, insures great accuracy. The roller, driven by the car if running at 60 miles per hour, must be drawn to a position near the large end of the cone in order to run with the cone. Whereas, if the car drives the roller at only 5 miles per hour, it must be drawn to a position near the small end of the cone. When the position is reached where there is no slip between the cone and the roller both electric contacts are broken, and the tape comes to rest at a hight indicating at once the speed at which the machine under test is running at that instant.

The speed and power tapes are thus moved across the chart automatically to correspond with the speed, and the tractive effort, or pull, that the dynamometer shows the car is exerting. On the board are plotted the horsepower curves corresponding to each different speed and pull, so that the result at each moment can be read at a glance and without calculations by noting what curve underlies the intersection of the tapes. The chart is of large size, and can be read easily by the driver of the car, being placed directly in front of the position he occupies in running the machine. The speed of the car may be read from the chart in either of the popular ways of stating it: miles per hour, minutes per mile, kilometers per hour, &c., by means of the several different scales provided. All of the measuring apparatus is made reversible, so that when running backward the performance of the car may be measured. The provision for traveling the tapes in exact parallelism and eliminating back lash and lost motion has been very neatly and ingeniously made in the cable system with its adjustments. The tapes are held taut and straight by being stretched between rollers running on tracks and the cables are required only to move these carriages.

As a secondary apparatus, a grade meter is provided, operated by the pendulum indicator of the dynamometer. To use the grade meter the clamp is set upon the sliding scale at the point representing the weight of the car. The moving lever then assumes at each moment the angle of inclination of the grade the car would climb (if there were no wind resistance, slipping, &c.), with the effort that the car is then making.

To simulate the effect of an automobile coasting down hill, either forward or backward, it is necessary merely to start an electric motor on the shaft carrying the two large drums upon which the driving wheels of the automobile rest. The brakes may then be tested, and the wheels or gears or engine may be run free (not run by the power of the automobile), and the relative friction loss in the principal parts of the automobile may be ascertained, by reading electrical instruments to get the power imput and correcting for the efficiency of the motor and the transmission up to the automobile. A run under identical conditions with the automobile removed from the drums will give the amount of power consumed outside of the automobile, and this being deducted from the previous result gives the friction load of the automobile. The latter added to the maximum power developed at the wheels under a running test gives the maximum horsepower of the automobile engine or motor.

A Convention for the Promotion of Industrial Education.

The National Society for the Promotion of Industrial Eduction will hold a meeting at Chicago, January 23, 24 and 25. A public dinner will be given Thursday evening, January 23, at which Theodore W. Robinson, first vice-president of the Illinois Steel Company and chairman of the Illinois State Committee of the society, will act as toastmaster. Addresses will be given on "Industrial Education as an Essential Factor in Our National Prosperity," by President Eliot of Harvard University; Edgar E. Clark of the Interstate Commerce Commission, Washington, D. C., and James W. Van Cleave, St. Louis, president of the National Association of Manufacturers. Dr. Henry S. Pritchett, New York, will speak on "The Aims of the National Society for the Promotion of Industrial Education."

The first session of the convention will be held Friday morning, January 24, presided over by Carroll D. Wright. The general topic will be "The Apprenticeship System as a Means of Promoting Industrial Efficiency." Among the speakers announced for the morning are W. R. Warner, Warner & Swasey Company, Cleveland; James O'Connell, president of the International Association of Machinists; J. F. Deems, general superintendent of motive power, New York Central Lines, New York; E. P. Bullard, president of the Bullard Machine Tool Company, Bridgeport, Conn; Charles W. Price, International Harvester Company, Chicago. Among those who will speak at the following sessions of Friday and Saturday are Milton P. Higgins, president of the Norton Companies, Worcester, Mass., on "The Character of a Trade School That Will Meet American Industrial Needs"; H. W. Hoyt, vice-president of the Great Lakes Engineering Works, Detroit, Mich., on "The Development of Industries Depending on an Adequate Supply of Industrially Efficient Workers"; Dr. S. C. Dickey, president Winona Technical Institute, Indianapolis, Ind.

The conference will be participated in by representatives of various industrial institutes, technical and trade schools and labor organizations. The annual meeting of the society will be held Saturday afternoon. On Thursday afternoon, January 23, a meeting of the State committees will be held, presided over by Magnus W. Alexander, General Electric Company, Lynn, Mass., who is a vice-president of the society. The discussion at this meeting will be on "Methods of Promoting Industrial Education."

The Zenzes Converter.

The small Bessemer converter occupies a well defined and important position in the steel casting industry between the open hearth furnace and the crucible process, and is being used advantageously, either as an auxiliary to a gray iron or steel foundry, or as an independent steel plant. Such equipments have the advantage of being less expensive to install than open hearth furnaces and more economical of operation than crucibles. Small Bessemer converters are, therefore, peculiarly suited to the needs of industrial plants using but a limited tonnage of steel castings, since by their use foundries are able to make their own steel with a small plant investment.

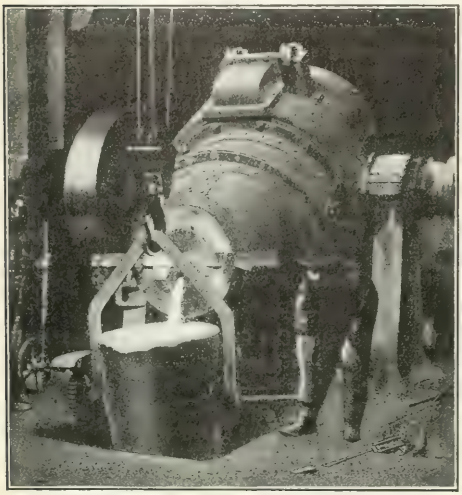


Fig. 1.—A Zenzes Converter in the Crane Company's Foundry.

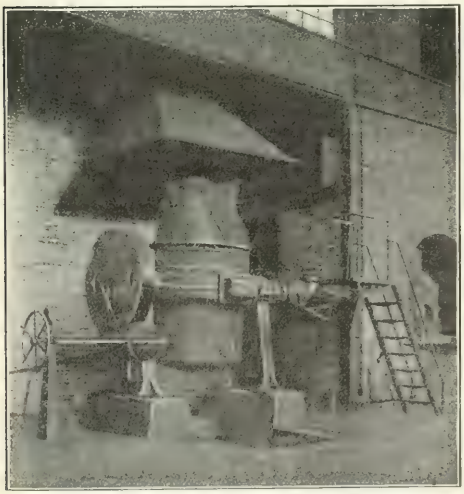


Fig. 2.—An Installation in the Link Belt Company's Plant, Chicago.

One of the latest equipments of this kind to be introduced in the United States is the Zenzes converter, two installations of which are herewith illustrated, together with drawings outlining their convenient arrangement with relation to the cupolas from which the molten iron is taken. The Zenzes converter has been in successful operation for a number of years in Europe, but it is only within the last 12 months that it has been introduced in this country, the first being that shown in Fig. 1, which was installed in the foundry of the Crane Company, Chicago; a later installation made in the plant of the Link Belt Company, Chicago, is shown in Fig. 2. This converter was invented by Alexander Zenzes, a metallurgical engineer of Berlin, and is now handled by the Zenzes Converter Company, Chicago.

In conjunction with certain new features of construction an improved method of making steel is employed by which it is claimed that the blowing time and loss in cupola and converter are materially reduced, with a corresponding lessening of the cost of production. A higher temperature than ordinarily developed is obtained, but on account of the short duration of the blow the output per lining is greater. The attainment of a higher temperature, moreover, insures a hotter and more fluid bath, thus permitting the holding over without risk of several charges in the ladle for heavy castings. These results are obtained by the mixtures used, the mode of blowing and the method of deoxidization.

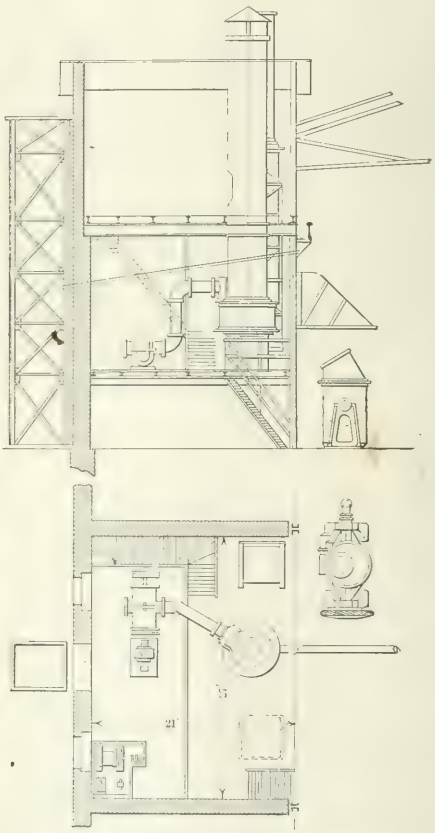


Fig. 3.—Elevation and Plan of a Typical Arrangement of a Single Cupola and One or Two Converters.

The Zenzes converter, like other small Bessemer converters, consists essentially of a shell, trunions, stands, &c. Though not materially different in form from similar types in common use the Zenzes converter embodies certain distinctive features in its tuyere arrangement and method of introducing the blast. It is also evenly counterbalanced, so that it may be easily tipped for pouring. This operation, as may be seen in Fig. 1, is accomplished through a spur gear attached to the trunnion, and may be arranged for either hand or power operation. The converters are made in three sizes of 1, 2 and

3 tons nominal capacity each. With the smallest size blowing 11½-ton heats at the rate of two heats per hour 20 heats may be taken off in 10 hr., making a total output of 30 tons of steel per day.

Two typical converter installations are shown in Figs. 3 and 4, in which the cupolas, it will be observed, are elevated sufficiently to admit pouring directly into the mouths of the converters. The advantage and economy of this arrangement are apparent, since it eliminates the handling otherwise required in conveying molten metal from the cupola and pouring into the converter by hand. It is entirely feasible to follow this plan in the building of new plants, but it will not always be found convenient

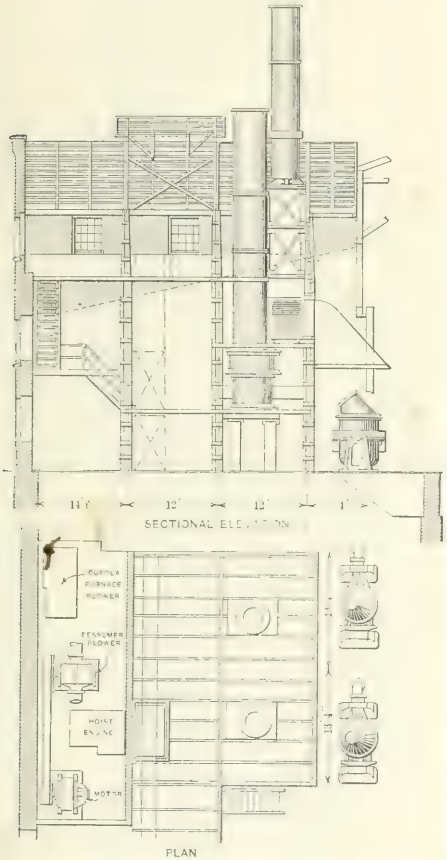


Fig. 4.—Arrangement of Two Cupolas and Two Converters.

to adopt it in established plants with cupolas built upon the foundry floor.

In Germany it is the usual practice to install two cupolas to serve one converter. This is done for convenience and comfort in cleaning out cupolas, which, being used alternately, can be allowed ample time to cool. The plan in Fig. 3 illustrates a convenient arrangement of using one cupola with two converters, the metal being delivered directly to each through a swinging trough. This plan, of course, contemplates the elevation of the cupolas, as shown in both drawings, Figs. 3 and 4. The slight expense attached to the starting up and shutting down of the small converters and the ability to make few or many castings have contributed much to their success.

The Cleveland Branch of the National Metal Trades Association has decided to hold its annual banquet at the Hollenden Hotel March 5. Committees have been appointed to make the necessary arrangements.

C. W. Hill & Co., 201 Woodward Building, Birmingham, Ala., have been made the special correspondents of the Southern States for Pawling & Harnischfeger, Milwaukee, Wis., builders of traveling cranes and horizontal drilling and boring machines.

ders, so that when there is an imperative immediate demand for material the knowledge as to who can supply it at shortest notice to the best advantage is easily obtainable. Even the names of sales managers are recorded in some instances, with a view to connecting with the source of supply in the shortest possible time.

HUDSON COMPANIES.

OFFICE OF THE PURCHASING AGENT

Report of Bills handled during Month of February 1908

DATE	WORTON ST	81ST ST	CHURCH STREET TERMINAL	129TH ST	W & F	PIER C	RAILROAD AVENUE	STORE HOUSE	R G SIEGEL	L B STILLWELL	FREIGHT BILLS TO TREAS	HOBOKEN TERMINAL	O'ROURKE ENGINEERING CONSTRUCTION	TUNNEL RINGS IN STOCK	DISCHARGES	DAYS TOTAL	NO BILLS PASSED	NO BILLS RET'D FOR CORRECTION	NUMBER OF CREDITS	AMOUNT OF CREDITS
1	9411 63	3153 41	29 74 22	3237 97	611 94	28 18 65	1054 89	1555 11		604 50		341 85		2102 22	2447 9	17166 14	119	19		
2																				
3																				
4																				
5																				
29																				
30																				
31																				
Totals	5261 250	6930 76	9929 86	11221 20	3485 49	11129 88	3621 26	5062 11	3911 52	8258 90	771 32	1603 287	1078 200	2648 000	25 7429	3 827 172 12	1254	195	103	1624 049
Daily Average	210 427	288 782	413 74	467 54	145 22	463 745	150 92	210 963	162 98	344 120	32 13	66 803	44 920	109 958	1072 891	159 484	52 25	8 125	4 291	67 674

Total for January - 610 981 50

" " February 527 172 12

Decrease 83 809 38

CORRECT.

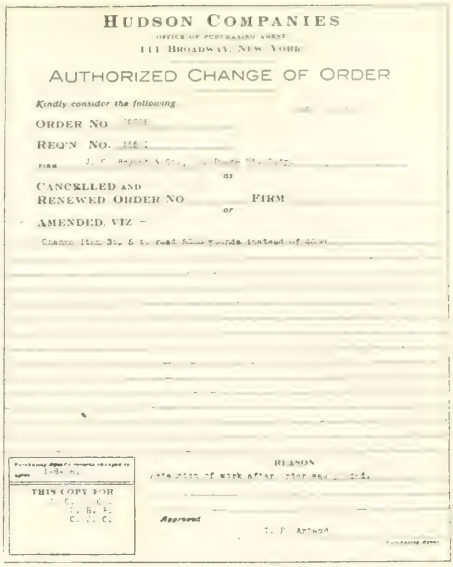
CHIEF CLERK BUD DIV

Monthly Report of Expenditures.—These Figures Are Imaginary and Merely for Illustration.

A reference to one of the accompanying forms showing a report of the bills handled during the month will give the reader a comprehensive idea of the manner in which the companies' operating departments are divided. A daily record similar to the monthly report is also kept, so that at the end of each day the president of the company can be informed at a glance how much has been spent and where it has been applied.

How Orders Are Handled.

The system of handling orders is especially complete, every detail being covered by regular forms so arranged that the exact status of every order placed can be ascertained at a moment's notice. The works clerk and the store keeper in every department are obliged to keep track of all material on hand, and when a low limit is reached or any material is needed a requisition is made out and forwarded to the purchasing department. If any item in the requisition is required in a short time, mention of the fact is made and these orders are placed first. It is required that all requisitions must be signed by the works manager, and a duplicate copy is sent to the purchasing department, while the original is sent to the chief engineer for approval. In the average case, the purchasing department recognizes the duplicate copy and acts at once, not waiting for the approval of the chief engineer. On special material or on orders for mechanical equipment the department waits for the arrival of the form approved by the chief engineer before placing an order. As in all cases where duplicate forms are used, different colored sheets have been adopted in order that they may be quickly assorted.



HUDSON COMPANIES

OFFICE OF PURCHASING AGENT
111 BROADWAY, NEW YORK

AUTHORIZED CHANGE OF ORDER

Kindly consider the following

ORDER NO.

REQ'N NO.

FIRM

CANCELLED AND RENEWED ORDER NO. FIRM

or

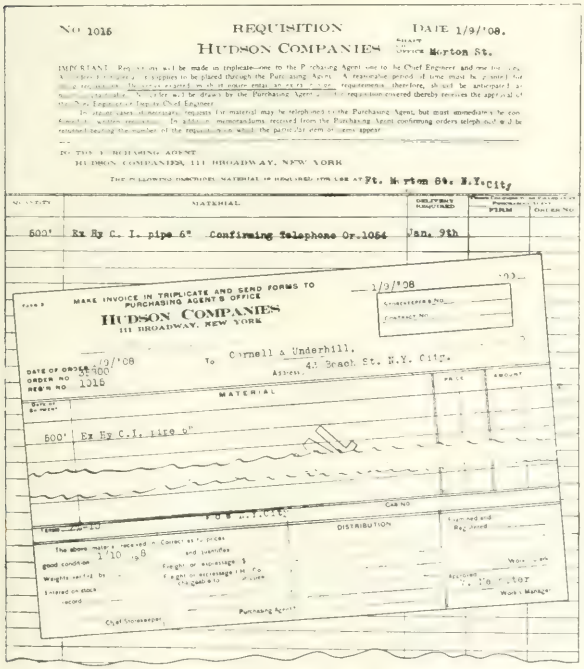
AMENDED, VIZ —

THIS COPY FOR
C. C.
C. E.
C. C. C.

REASON

Approved

Form for Changing Orders.



NO 1016 REQUISITION DATE 1/9/'08.

HUDSON COMPANIES Office Morton St.

IMPORTANT: Requisitions will be made in triplicate—one to the Purchasing Agent, one to the Chief Engineer, and one for the office. Duplicates of requisitions to be placed through the Purchasing Agent. A reasonable period of time must be granted for the requisition. The utmost regard in all requisitions must be had to the requirements, therefore, should be anticipated as much as practicable. No order will be drawn by the Purchasing Agent on a requisition covered thereby receives the approval of the Chief Engineer or Deputy Chief Engineer.

In exceptional cases, of necessity, requests for material may be telephoned to the Purchasing Agent, but must immediately be confirmed in writing on requisitions. In addition, memorandums received from the Purchasing Agent confirming orders telephoned should be retained bearing the number of the requisition to which the particular item or items appear.

TO THE PURCHASING AGENT
HUDSON COMPANIES, 111 BROADWAY, NEW YORK

The following materials or supplies are required for use at Ft. Morton St. N.Y.City

QUANTITY	MATERIAL	DELIVERY REQUIRED	FIRM	ORDER NO.
500'	Ex Hy C. I. pipe 6" Confirming Telephone Or.1064	Jan. 9th		

MAKE INVOICE IN TRIPLICATE AND SEND FORMS TO PURCHASING AGENT'S OFFICE

HUDSON COMPANIES
111 BROADWAY, NEW YORK

1/9/'08

DATE OF ORDER 1/9/'08
ORDER NO. 1016
REQ'N NO. 1016

To Cornell & Underhill,
Address 41 Beach St. N.Y. City.

QUANTITY	MATERIAL	PRICE	AMOUNT
500'	Ex Hy C.I. pipe 6"		

Requisition Form and Bill Form.—The Latter Is Sent with Each Order.

When bids have been obtained by the purchasing department on special material, the figures are submitted to the chief engineer for his recommendation and wherever possible they are followed. Each order sent out is accompanied by triplicate sets of bills, and the order contains instructions to bill on the Hudson Companies' forms. When these bills are returned they are checked as to extensions, discounts, &c., checked against the order, and if the bill does not agree with the order in every detail it is returned for an explanation with a form letter asking details. In cases of an excess shipment or short shipment, there must be an authorized change of order sheet issued before the bill can be passed.

When the bill is correct and approved by the chief clerk in the auditing department, it is passed to the purchasing agent for his approval and then listed to the department which ordered the material. This department is obliged to acknowledge all forms and the receipt of the material and O. K. the bill. Copies of these forms are sent to the treasurer's office, the duplicate is retained by the department for its own files and the triplicate copy is filed in the purchasing agent's office. Cases sometimes arise when it is necessary for the department to order material directly, as, for instance, in case of a breakdown or a sudden shortage of coal or other material is discoverd, and then the department makes the best arrangement possible to get the material and returns a confirming requisition giving the price they have obtained. Such orders have a distinguishing mark to indicate that the material was not ordered through the purchasing department. This is a precautionary measure against a future development that an excessive price was paid and shows that the fault was not with the purchasing department.

Emergency Orders.

An unusually complete system of forms has been devised covering the ordering [illegible] department. In cases of a breakdown or any other emergency, the works manager telephones the order department of the purchasing department stating what is needed and just how long he can wait for a delivery. Here the loose leaf reference book and the record of bids and delivery terms mentioned above come into service, as the order clerk selects the most likely firm from which the material can be purchased, making his judgment from the records as to whether this firm has lived up to its delivery and can be thoroughly relied upon, and immediately telephones

for advice as to how soon the material can be delivered.

If the delivery can be made within the time limit, the order is immediately placed over the telephone and a form confirming the telephone order is filled out and being provided with forms on which to make a complete report of the result of the order. A copy of the telephone order is also mailed to the department from which the telephone message was received, and that department is required to make a confirming requisition on the purchasing office.

ORIGINAL

ISSUED FROM OFFICE OF PURCHASING AGENT, 111 BROADWAY NEW YORK.

DATE 1/9/'08. **HUDSON COMPANIES** ORDER No. 35664

TERMS 30 DAYS **111 BROADWAY** REQ. No. 448

The New York Car Wheel Co.,
Buffalo, N. Y.

PLEASE FURNISH FOR THIS COMPANY THE FOLLOWING MATERIAL DELIVERY TO BE MADE F.O.B. General Storehouse, 13th and Henderson Sts., Jersey City, N. J.

IMPORTANT.

This Order Subject to the following conditions:

This order must be acknowledged on the slip hereto attached, and date of delivery given. The right is reserved to cancel this order if material specified is not received at time promised.

No charge allowed for Packing or Cartage. Price includes delivery, and freight charges, if any, to be prepaid. If there is any delivery charge on emergency order, make separate charge on bill, and state by whose authority.

No attention will be paid to bills for supplies furnished without an order bearing the signature of the Purchasing Agent. Mail bill in Triplicate on our invoice form hereto attached when goods are shipped.

Address all correspondence and bills to Purchasing Agent. The order number should invariably be given. Invoices without order number will not be accepted.

If you do not allow cash discount on any particular material we must be so informed before bill is rendered. B

ITEM

1 150 tons cast iron cars and collars and bases as shown on our drawing #2830E.
DELIVERY: Within a period of three weeks.
PRICE: $2.15 per hundred lbs. f.o.b. Jersey City.

Above to be subjected to the inspection of the Hudson Companies' Inspector.

T. P. Artaud, PURCHASING AGENT

The quantities and items on your invoice must agree exactly with those on order, or your invoice will not be accepted. Any change or variation must be explained by letter accompanying invoice.

NO.....

Detach and return this slip to T. P. ARTAUD, *Purchasing Agent* HUDSON COMPANIES, 111 Broadway, N. Y.

.....190

The receipt is hereby acknowledged of order bearing number of this slip. Delivery of material specified will be made ..... with the exception of the following, which will be shipped on the date set opposite respective items.

Signed.....

Per.....

Our Telephone is No.....

Order Form and Acknowledgment Slip.

In cases where the promises as to delivery are not lived up to, the purchasing office is informed through the inspector of supplies and the order is immediately canceled and placed with another firm. This seldom happens, however, as the information in the office records is of such a nature that the department does not frequently go wrong on emergency orders. Sometimes when a department calls up for emergency supplies it is authorized to go to some nearby firm and procure what is needed, but in that case the telephone forms mentioned above are filled out.

An idea of the varied line of purchasing done by the company can be obtained from the following extract from a single requisition:

Quantity.	Material.	Delivery required.
10	cars ¾ stone	Two a day T. F.
1	keg 10d wire nails	At once.
2	sacks coffee	At once.
1	No. 34 hoisting engine, complete,	Two days.
100	pieces 12 x 12 in. by 24 ft. L. L. Y. P.	One day.
25	pairs hip boots, leather soles	One day.
75	tons 85-lb. per yard ASCE rail.	Two weeks.

A system of keeping track on cars containing shipments to the company has been adopted, and a large book containing these records is in use in the office. This book contains headings under which the name of the railroad, the number of the car and the order number are entered. In another book are kept records of the date of shipment, the car number, the weight, the waybill number, the character of the material and the department to which the material is sent

HUDSON COMPANIES DATE 1/10/08

PURCHASING DEPARTMENT
111 BROADWAY
NEW YORK

DRAFT OR OFFICE Morton St

REPORT OF INSPECTOR OF SUPPLIES

T. P. ARTAUD,
Purchasing Agent,
111 Broadway, New York.

Dear Sir:

Morton St (DRAFT OR OFFICE) Boisitier (NAME) under date of 1/10/08

reported ~~by letter~~ by telephone the following described orders as incomplete in the manner hereinafter set forth, viz.

ORDER NO.	DATE	FIRM	MATERIAL	NATURE OF COMPLAINT	ACTION TAKEN	RESULT—This space to be filled in by person returning report
35800	1/9/08	C & U.	500' 8" Cl. B. pipe 6"	Not delivered as promised on 1/9	Phoned C & U - who advised that truck broke down - will deliver 1/10	Material received O.K. 1/10 AM

Signed Geo. Miller
Inspector of Supplies

DATE.....

HUDSON COMPANIES

DRAFT OR OFFICE.....

T. P. ARTAUD,
Purchasing Agent,
111 Broadway, New York.

Referring to orders within enumerated, I beg to report as below.

NOTE—The person returning this report will state in the left hand column opposite the orders concerned whether or not delivery has been accomplished within the time specified and such other remarks as may be necessary.

Signed Boisitier

Form for Inspector's Report.

mailed, the office copy being handed to the inspector of supplies with a notation on it as to when the delivery is to be accomplished, and it is the inspector's business to see that the promises of the seller are lived up to, he together with remarks explaining necessary details.

The Form Letters.

Considerable time of the average purchasing agent is taken up by correspondence, and during the early

period of the organization of his system Mr. Artaud found that many of the letters he was obliged to dictate in important matters to which he desired to give his personal attention related to details which had been paralleled by previous correspondence. Accordingly he evolved a series of form letters covering conditions which frequently arose and in consequence much of the correspondence of the office was simplified. One of the first of these was a letter which went out with the average order sent out by the company asking questions calculated to simplify the tabulated listing and handling of bids. This letter contained the following questions:

(1) At what price have you entered this order?
(2) Does the price quoted include delivery at point indicated?
(3) Will you prepay expense of delivery and charge to Hudson Companies?
(4) Will you allow any discount for cash payment within 10 days from receipt of material, and if so, how much?

These questions are asked simply in order to avoid any misunderstanding when certifying your invoice for payment. Without the information requested, the invoice cannot be audited. Where possible when quoting prices, the list price, discount off, catalogue, page and number are to be furnished.

Sometimes companies from whom it was especially desired to secure a bid, particularly where their output was considered to be superior to the average material in their line, neglected to answer the questions contained in the above mentioned letter. There were some who even chose to ignore the correspondence and instead sent back their own forms of contract covering in a way the desired information. For these parties the following form letter was framed:

We have as yet received no response to letter accompanying our order No....., requesting certain information made necessary under the rules of this office. A copy of the letter referred to is inclosed herewith, an early acknowledgment of which will be appreciated for the reasons stated therein.

Appeasing Unsuccessful Bidders.

It was found that after contracts were awarded the purchasing agent's office was deluged with correspondence from unsuccessful bidders, asking for reasons why they were not awarded the contract. In many cases salesmen called to request the information, while some heads of firms went so far as to ask for a personal explanation. To avoid the trouble and correspondence caused by these inquiries, a form letter was framed which is now sent out to all unsuccessful bidders where an important contract is awarded. In addition to containing a polite assurance that the unsuccessful company will be again given an opportunity to bid when material in its line is again required, the letter contains this salient paragraph:

I beg to advise that your numerical standing, in response to Hudson Companies' invitation to estimate on..... was No..... as compared with the most favorable figure received, and that therefore your proposal could not consistently be accepted.

Notwithstanding the comprehensive system of forms used in the internal business of the company, cases have frequently arisen which called for special expenditures by works' managers and others on orders covered by the average firms, and in keeping track of such expenses charged to the department, it was found that these special expenditures involved much correspondence. Accordingly a memorandum was devised in letter form to be used in this connection, as follows:

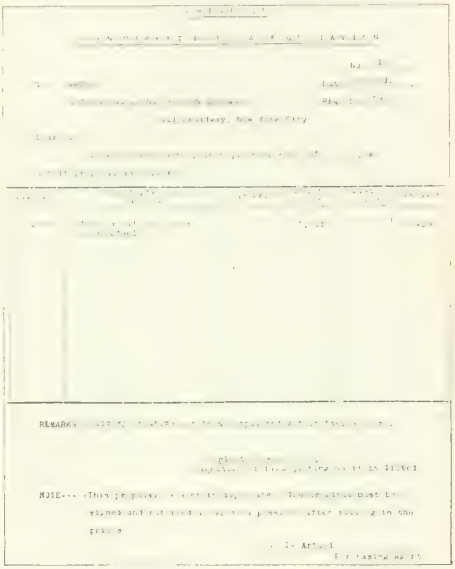
Referring to inclosure herewith, please return promptly, indicating requisition number against which payment is to be made, providing the charge is applicable to work under your supervision.

All bills for car service, demurrage, expressage, &c., where delivery is f.o.b. job, should be returned with full explanation as to why same could not be avoided.

In the same connection a "hurry up" memorandum is in use in the purchasing office, which consists of one sheet perforated so that it can be divided in half and each section bears a corresponding number. In this way a memorandum is kept in the office of the inquiry sent out and when the answer is returned on the corresponding half of the sheet they are filed together.

The Office Staff.

An office staff of 20 is required in operating the department, which includes Mr. Artaud, his principal assistant, Raymond Magee, an auditing department of eight people, a filing department employing three, an order department of four, two inspectors and a young man stationed outside capable of intelligently interrogating all callers, as the buying organization, spending, as it does, very large sums of money, has to contend with many ubiquitous salesmen who have nothing to interest the purchasing man if admitted and would only waste his time. A record is kept of all callers and their business,



Open Market Quotation Form.

however. Every Friday the office staff is called together by the head of the department, the week's work is reviewed, suggestions are heard and encouraged and minutes of the meetings are kept in regular form by Mr. Artaud's stenographer.

A 25,000 Horse Power Engine.

The Allis-Chalmers Company, Milwaukee, Wis., shipped from its West Allis shops last week what, when assembled, will be the largest engine ever installed in the world. The engine goes to the Carnegie Steel Company, at Sharon, Pa., and will have a capacity of no less than 25,000 hp. Two of the castings weighed, after machining, 118 tons each, and special reinforced 100-ton flat cars were built expressly for the Allis-Chalmers Company for their transportation. The engine when set up weighs 550 tons, without foundation plates or flywheel. It is a horizontal twin tandem rolling mill engine, with cylinders 42 in. and 70 x 54 in. stroke, designed to operate condensing at 175 lb. steam pressure and a speed of 150 to 200 rev. per min., developing its maximum power at the highest number of revolutions.

Notwithstanding the enormous size, the engine will require the services of but one engineer. Constructed to operate the rolls in a steel mill, it has to be quickly reversed at the end of each run, and the load varies at the end of a few moments from nothing to the maximum power exerted. The reversing mechanism used is of the Reynolds-Marshall type and run by a small independent engine with oil cylinder lock. Another small engine is employed in operating the steam throttle valves, all of these units being under the perfect control of one engineer.

Reports printed in the daily press of changes in the management or organization of the Niles Iron & Steel Company, Niles, Ohio, are officially stated to be untrue and without any basis in fact whatever.

French Decorations for Three Americans.

A dinner in recognition of the honor of decoration bestowed by the French Republic through the Minister of Public Instruction and Fine Arts on Charles Kirchhoff, editor in chief of *The Iron Age;* T. Commerford Martin, editor of the *Electrical World*, and Percy Stickney Grant, rector of the Church of the Ascension, members of the Committee of Direction of the American Museum of Safety Devices, was held at the Aldine Club, New York, on the evening of January 15. Judge Elbert H. Gary, chairman of the United States Steel Corporation, presided. Besides affording an opportunity for awarding under specially happy conditions the mark of international appreciation of the worth of the three gentlemen, the occasion may be said to have given additional publicity to the movement which has been inaugurated by the American Museum of Safety Devices toward fostering to the fullest extent the development and use of means for protecting life, particularly in industrial pursuits.

In the unavoidable absence of M. Bonzom, the acting French Consul-General, the formal presentation of the decorations was made by John LaFarge, the eminent painter. The three honored guests of the evening were separately introduced, William B. Dickson, second vice-president of the United States Steel Corporation, presenting Mr. Kirchhoff; Frank J. Sprague, past president of the American Institute of Electrical Engineers and pioneer in electric railroading, presenting Mr. Martin, and Bishop Henry C. Potter of New York presenting the Rev. Mr. Grant, the three *honorés* making responses at length. The decoration of the Officier de l'Instruction Publique is one of the important French orders, instituted early in the last century, and is awarded for scientific and literary attainments. The insignia consists of sprays of laurel and bay crossed, pendant on a purple ribbon.

Greetings were received from Andrew Carnegie, President Sir Hugh Bell and past presidents Sir James Kitson, Edward P. Martin and Robert A. Hadfield of the Iron and Steel Institute; F. Springorum, president, and Dr. Schroedter, secretary, of the Verein Deutscher Eisenhuettenleute; Dr. Hermann Wedding, Professor W. E. Ayrton, Wilhelm von Siemens, Blondel, Marconi and others whose names are enrolled on the scroll of fame as scientists and philanthropists. The large dining room of the club was filled to its capacity. Among those present were numerous men of national prominence in business affairs, while the occasion was graced by the participation of many ladies. Special guests were Edward D. Adams, James H. McGraw, Charles Allen Munn, David Williams and William R. Willcox.

Addresses were made by Dr. Josiah Strong, president, and Dr. William H. Tolman, director, of the American Museum of Safety Devices. Dr. Strong said: "If by some miracle of prudence all industrial accidents could be prevented for a year, and then half a million should occur in a single day, the shock would arouse the nation and something would be done about it. But the dead are quite as dead, the bereaved are quite as desolate and the maimed are quite as mutilated and helpless when these casualties are distributed through every day of the year as if, like the losses of a great battle, they had been crowded into a day or two." Dr. Tolman spoke of the enormous deaths by accident each year that are preventable and told how the American Museum of Safety Devices would work to overcome this death rate. The exhibits at the museum, which is at 239 West Thirty-ninth street, New York, will consist of devices for safeguarding the lives and limbs of workmen and preventing accidents under the ordinary conditions to which the general public is exposed. The exposition will display, as far as possible, "live exhibits," that is, machines or devices in operation; models of actual or reduced size and photographs. The museum is free and the public is cordially invited. As a guarantee for permanency, practicability and the wisest expenditure of money, representatives of the leading engineering and technical professions are personally directing the work; others are serving on subcommittees.

In all the speeches, however, much was said to arouse enthusiasm with regard to furthering the movement which the museum has instituted toward enlisting the substantial support of the general public, especially those in positions of authority, in the prevention of accidents. The museum already has some 50 vials filled with iron, steel, copper, coal, wood, cement, marble and other dusts common in various occupations, and side by side with each a photographic microscopic section of a workman's lung affected by these different dusts. It has also been proposed to set aside a portion of the museum's space as an inventors' laboratory, where inventors handicapped in carrying out ideas for any reason may work to advantage. The following interesting announcements were also made: For the best device for protecting life and limb a gold medal will be awarded annually by the *Scientific American*, the field of the award being limited to transportation and the medal to be awarded to the best device that has appeared or will appear between January 1, 1906, and December 31, 1908. Prizes of $100 each will be awarded, one for the best essay on the economic waste due to occupational diseases, and the other on the economic waste due to accidents. Each essay must not contain more than 5000 words; it must be typewritten, it must be sent to the director of the museum not later than April 1, and the writer must sign the essay with a nom de plume, sending his own name with it in a separate sealed envelope. F. H. Richards offers a gold medal, limiting the field to motor vehicles and motor boats.

Smokeless Combustion.

Bulletin No. 15 of the Engineering Experiment Station, University of Illinois, "How to Burn Illinois Coal Without Smoke," by L. P. Breckenridge, director, has just been issued. A few pages are devoted to the principles of combustion and the losses due to smoking chimneys, but the larger part of the bulletin relates to the constructive features of those boiler settings and furnaces that have been found practically smokeless in operation at the power plant and in the Experiment Station. The leading dimensions of the settings and furnaces are given and sectional engravings show the general character of the settings. With each is given a statement as to the range of capacity of each setting for smokeless operation.

Especial emphasis is given to the importance of knowing the rate at which the coal is to be burned on each square foot of grate surface, together with the per cent. of volatile combustible which the coal contains, and for which a suitable combustion space or chamber must be provided. Some interesting illustrations show clearly the significance of the numbers used in describing smoke densities, and also a chart devised for making graphic records of smoke observations. Five tables of tests are given, showing the conditions of operation of a smokeless furnace under changes of boiler capacity varying from 50 to 150 per cent. There are no illustrations showing approved settings for the horizontal fire tube boiler, but suggestions are given as to methods of hand firing which will tend to reduce smoke production.

While this bulletin discusses the smokeless burning of Illinois coals, the principles and methods explained apply equally well to the burning of all kinds of soft coal. Copies may be obtained gratis upon application to the director, Engineering Experiment Station, Urbana, Ill.

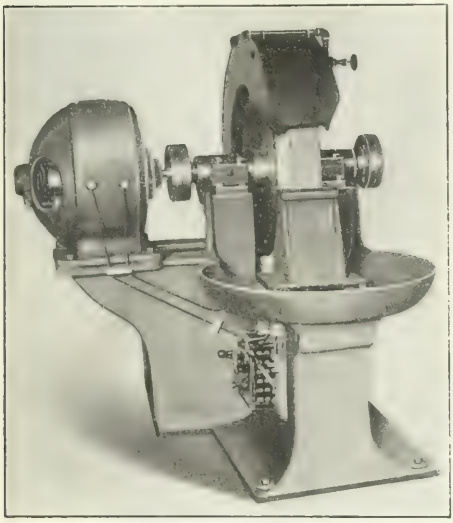
The report of Government receipts and expenditures for December shows a decrease in receipts, comparing with December, 1906, of $8,529,152, and an increase in expenditures of $9,381,414. The largest decrease is in customs, which fell off $6,895,959. The increase includes $4,000,000 for the navy, $2,400,000 for pensions, and $4,000,000 for public works.

The Massachusetts Fan Company, Watertown, Mass., manufacturer of fans, blowers, engines, heating and ventilating apparatus, &c., announces that its central district sales office has been removed from the Park Building to the Rockefeller Building, Cleveland, Ohio.

The Bridgeport No. 5 Drop Apron Tool Grinder.

The grinding of very long and large lathe and planer tools on an ordinary grinder is hampered by the customary location of the bowl or apron. It will readily be appreciated that the usual construction will not permit the outer end of a large tool to be dropped sufficiently to grind the proper bevel on the front edge. The grinder illustrated is a new type, known as the No. 5 drop apron tool grinder, built by the Bridgeport Safety Emery Wheel Company, Bridgeport, Conn., in which the bowl is placed considerably lower than formerly, so that long tools can be ground at almost any angle without difficulty.

In other respects the machine is similar to older designs of this company, and with this modification it is peculiarly well adapted for use in shops where long and heavy lathe and planer tools have to be ground. The base of the machine forms a large water tank, to which is attached a centrifugal pump, furnishing a supply of water to the wheel. The machine is made in two sizes, one carrying a wheel 36 in. in diameter by 4 in. thick and the



The New No. 5 Drop Apron Tool Grinder Built by the Bridgeport Safety Emery Wheel Company.

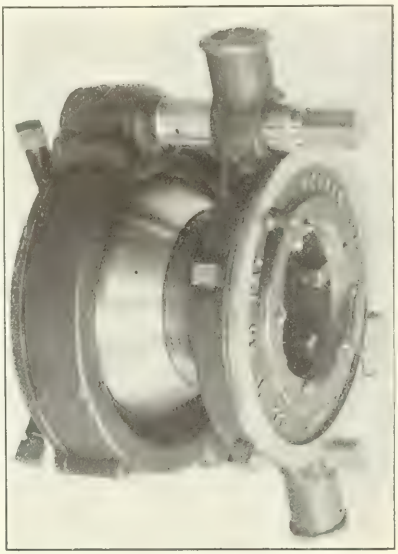
other a 20 x 2½ in. wheel. Both are made in either belt or motor driven patterns. When belt driven the machine is equipped with a special long rest and a truing device and is provided with tight and loose pulleys on the emery wheel spindle, with a self-locking belt shifter to retain the belt on the desired pulley. In this the machine is identical with the regular line of equivalent machines manufactured by the company. The shifter is within easy reach of the operator, on the left side of the machine.

When driven by a direct current motor the latter is mounted upon a bracket cast as part of the base, as shown in the engraving herewith, and the motor shaft is coupled directly to the emery wheel spindle. When an alternating current motor is used the motor shaft is back geared to the spindle, but the motor is mounted on a bracket similar to the one shown in the illustration. Both of these methods of driving by motor do away with belts, and the first mentioned also avoids the use of gears, making the machine almost noiseless in its operation.

Including the motor, the machine illustrated weighs 2600 lb. The hight from the floor to the center of the spindle is 36 in., and the floor space required, 26 x 47 in. The self-oiling bearings are 8 in. long and the spindle is 3 in. in diameter. The wheel is 36 x 4 in,, has a 24-in. hole, and is intended to run at between 425 and 450 rev. per min. The corresponding belt driven machine is alike in the principal dimensions, but substitutes for the motor tight and loose pulleys, 9 in. in diameter by 5½ in. face.

An Improved Hoefer Pipe Threading Machine.

An improved pipe threading machine, designated as No. 30, has been added by the Hoefer Mfg. Company, Freeport, Ill., to its line of pipe tools. This tool, which



The Hoefer Improved Pipe Threading Machine.

is herewith illustrated, has but one set of dies, which can be adjusted to thread 2½ to 4 in. pipe without change. By the action of a dog coming in contact with the surface of the cone in the main frame the scroll plate is engaged and the dies are automatically withdrawn to cut threads to a standard taper. When the threading is completed the dies can be released without changing the size for which they are set. This is done by shifting a small lever, which, when reversed to its original position, restores the dies to set size. The machine may be operated by either hand or power, as desired. Connection for power drive is provided by the shouldered stud at the left of the plate, as shown in the illustration. The lower end of this stud carries a spur gear by which the die plate is revolved. Being inclosed in a tight case, the gears are protected from chips and dirt. When it is desired to operate the machine by hand it can be used as an ordinary die plate by inserting handles in the two diametrically opposite sockets, which through ratchets operate pinions meshing the die plate gear. Lightness and durability are secured by the use of malleable iron and steel, of which materials it is constructed. The weight of the tool complete is under 60 lb.

The Bureau of Statistics has issued a bulletin in advance of the completed figures for the calendar year 1907 comparing the value of manufactures of iron and steel exported from the United States in 1887, 1897 and 1907. Exact figures are given for 11 months of each of those years, but the general statement is made that for the last full year the total is approximately $200,000,000 against $63,000,000 in 1897 and $16,250,000 in 1887. The increase in the last decade was more than 200 per cent., while that for other merchandise exported was less than 100 per cent.; and while iron and steel manufactures formed 5.8 per cent. of our total exports in 1897, they constituted 10.8 per cent. in 1907. Nearly half the total last year consisted of machinery of various kinds, the value reaching approximately $95,000,000.

The Thomas Spacing Table.

Reference has already been made in these columns (May 16, 1907) to the Thomas spacing machine built by the Standard Bridge Tool Company, Pittsburgh, Pa. The accompanying Figs. 1 and 2 show one of these machines as used in connection with a Sellers' multiple punch in the new structural shop of the Jones & Laughlin Steel Company in Soho, Pittsburgh, Pa. This spacer represents the latest type of Thomas' machine, and was designed to work. This type of machine can easily be arranged for automatic control of the rollers, the power being derived from a small motor and the whole being controlled by a controller suitably located near the punch within reach of the operator. In the issue before mentioned these machines were more fully described.

The special feature claimed is the ability to change quickly for different spacings, which consists merely of changing the templet strip clamped to the side of the spacing table. This templet strip, which is ¾ x 2 in. in

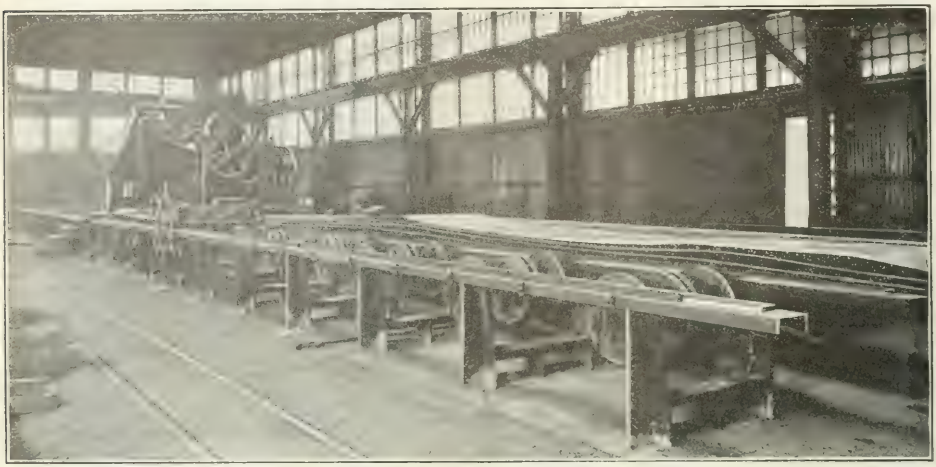


Fig. 1. The Thomas Spacing Table in the Structural Shop of the Jones & Laughlin Steel Company, Soho, Pittsburgh, Pa.

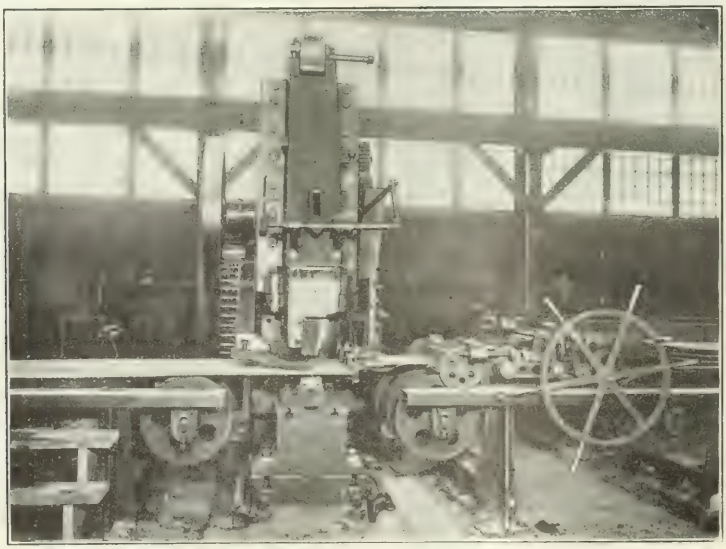


Fig. 2. The Plate Attached to the Spacing Carriage Ready for Punching

carry angles up to 8 x 8 in. size and plates up to 50 in. wide. A slight modification in the arrangement of rollers will permit handling plates up to 80 in. wide. These tables are built in 5-ft. sections, and can be made any length desired. The design can be modified to suit different classes of work; Figs. 3 and 4 show the same type of machine arranged with a special system of rollers designed not only to carry angles and plates, but also beams and channels for flange punchings. For this latter operation the rollers are simply dropped to the desired hight to suit the size of material to be handled.

A special flat roller is provided to carry this class of size, is prepared in the templet shop. The spacing carriage can be equipped with two or more spacing fingers if desired, which will permit obtaining an equal number of different spacings from the same templet strip without changing or disturbing the templet after clamping. This becomes especially desirable when punching the two legs of an angle on which different spacing occurs, and for stacks, round tanks, boilers and similar work on which the spacing on the inner and outer course sheets vary.

It is the general impression that spacing tables can be used to advantage only for duplicate work. The claim is made for the Thomas spacer that a single piece, either

an angle or a plate, can be punched on this machine cheaper than the usual templet could be made and the piece marked and punched by centers, not taking into consideration that the piece will be punched more accurately. For the economical production of riveted work in all its branches, in the structural or bridge shop, steel car plant or boiler shop, this machine, in connection with a suitable punch, is of special utility, as it makes it possible to greatly reduce the cost of production.

The most conspicuous gain from the use of a spacing table is the reduced cost of punching. Where it costs from 90 cents to $2, and even more, per 1000 holes to punch by centers, the same work may be done for from 20 to 40 cents on the spacer, and this is only one of the several economies obtained. The increasing price of templet lumber, added to the cost of making templets for marking material for punching by centers, becomes a considerable item. Marking the material alone, and the consequent handling for marking, figures on the average very nearly, if not quite, one-half the cost of punching.

While the spacing table will never entirely eliminate templet making and marking, it will in a well organized plant greatly reduce the amount of such work, and the better the organization the greater will be the reduction. The system must begin with the drafting room, and in the designing due regard must be given to the facilities in the shop for doing the work.

Other important operations directly affected by the

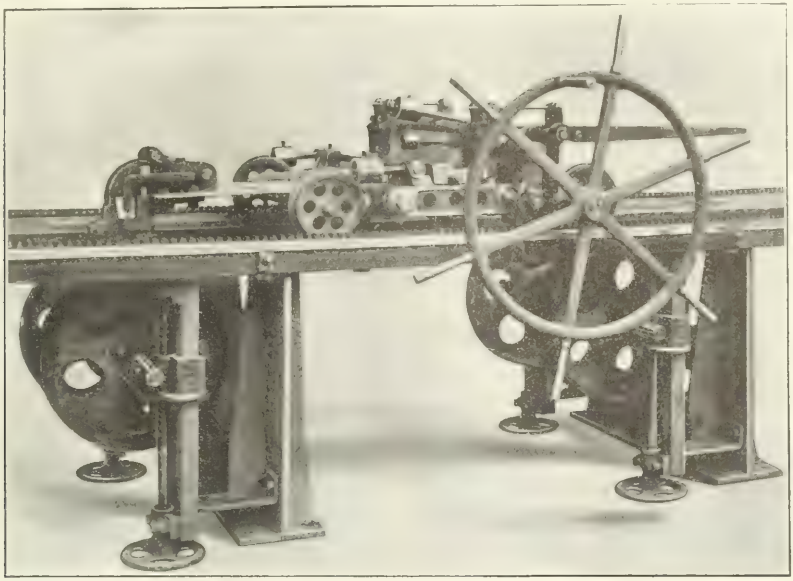


Fig. 3. The Spacing Carriage and Section of the Table

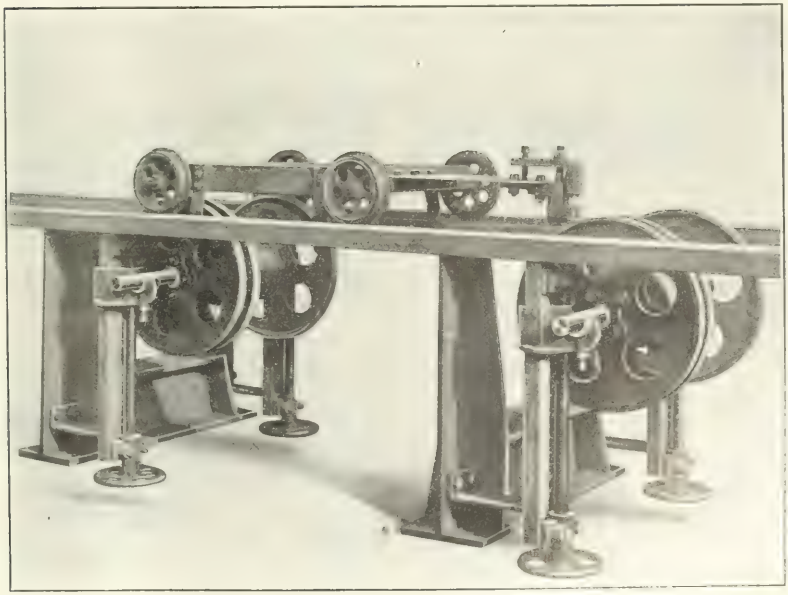


Fig. 4. The Trailer Carriage and Section

use of a spacer in the fabricating shop are the assembling and reaming. In the ordinary process of templet making, marking and punching by centers, small errors cannot possibly be avoided, and these errors will appear in the assembling, greatly increasing the cost of the latter by necessitating the reaming of the holes. It is possible to do accurate punching without a spacer and have holes match when assembling, but ordinarily extreme care must be exercised, and it is a question if reaming would not be cheaper.

In the process of punching, curving of material, necessitating straightening afterward, is very troublesome. This applies particularly to angles where the holes are close together and the material comparatively thick. Such work will stretch in punching which curves the material, and when the piece is straightened it will be found longer than the templet from which it was marked, which makes trouble for the assembler and work for the reamer. On a spacer it is possible to avoid this by punching such pieces in pairs, back to back. Suitable fixtures are provided on the head of the punch for guiding and gauging, and also to keep the material clamped together during the punching. The entire arrangement is extremely simple and easily set, and material punched in this manner will come out perfectly straight.

A spacing table handled intelligently eliminates costly operations, which have heretofore been considered necessary. This means that the men directly in charge must adapt themselves to new conditions to get the full benefit from the tool. With a little perseverance it is possible to obtain important results; the templet making will be greatly reduced, the marking and handling for marking entirely eliminated on some work, punching reduced 50 to 75 per cent., straightening eliminated by preventing curving of angles in punching, assembling greatly reduced by accurate punching, and reaming entirely eliminated on a large class of work when it is not specified.

Rail Fractures and Their Causes.

In Bulletin No. 93 of the American Railway Engineering and Maintenance of Way Association a discussion of rail fractures appears, by J. P. Snow of the Boston & Maine Railroad. He mentions the remedies that have been proposed to obviate the fractures, and then speaks from his own experience. A large proportion of the recent fractures have been flange breaks and side splits in the heads. The former are the most numerous and are almost invariably crescent shaped or derivatives of that type.

Minute Seams Observed.

In all the instances examined a more or less minute seam could be observed exactly parallel with the axis of the rail, and always in a vertical plane. These seams vary from a fraction of an inch to 3 ft. long, and from an almost invisible width to ⅛ in. Specimens cut from the base of such rails, and polished, show numberless seams, all parallel, some extending to the edge, but many wholly included within the specimen. All are true fissures, with sides nearly in contact, and extending deeply into the metal.

Where one of these seams is exposed by a fracture the sides are plainly striated, and when magnified appear like the surface of a slickenslide in rock structure. Some, that extend to the surface of the base, are sufficiently open to allow of oxidation, and show very plainly when fracture occurs; others can be traced on an unbroken rail as a minute longitudinal mark; others are so close and so protected from the weather, being on the under side of the rail, that corrosion does not set in, and when opened up by fracture they show a bright metallic surface.

The typical crescent or moon shaped break appears to start from one of these longitudinal seams near the center of the rail, to follow the seam its length, perhaps a small fraction of an inch or perhaps several inches, and then to burst out to the edge of the flange in a curve. This curve may represent the natural conchoidal fracture of homogeneous material. If the wheel service is severe enough to cause complete fracture of the rail, the break starts apparently from a seam as above, and bursts out to both edges of the base with similar curves, and then extends up through the web and head.

A rail is supposed to be supported by the tie uniformly across the width of its base. The load comes to the center of the base through the web. These forces produce a moment tending to split the base longitudinally. If the metal is sound the strains set up are not great enough to produce fracture, or even distortion, but if the base is full of incipient seams fracture will naturally follow. The fiber strain, produced by the moment referred to, is greatest at the center of the base. This explains why most of the fractures start from the center, or just under the side of the web, and although microscopic examination shows that there are seams across the whole width of the base, and throughout the metal of the base, it is the seams near the center that determine the fracture.

What Causes the Seams?

The question naturally arises, What causes these seams, and how they can be prevented? It is claimed by some that they are the result of the fracture. This is certainly not so, for they have been observed in large numbers in a polished specimen cut from a rail several feet from a break. Others claim they are caused by the improper application of the gag in the straightening process. The appearance of the sides of these seams, however, after fracture, proves them to have been in existence when the steel left the rolls. Laps or folds during rolling would account for seams at the surface but can hardly be charged with producing those in the interior of the metal. Shrinkage checks in the skin of the ingots, or surface cracks in the blooms, would seem to be in the same class. The seams may be due to microscopic flaws produced by high sulphur.

The most probable cause would seem to be the gas bubbles in the molten metal, producing blowholes in the solid steel, especially those forming a few inches inside the skin. This zone of blowholes is common to both Bessemer and open hearth steel. It is well known that steel will not weld much below the point of incipient fusion. During rolling, the blowholes are flattened out and elongated into seams parallel with the direction of rolling, which, in the case of rails, will be vertical when the rail is upright.

The breaking down of the heads of rails, due to a longitudinal fracture at or near the center, is very probably due to the same causes that produce flange breaks, that is, blowholes in the ingot. The action of the wheel load is the same as with the flange, except that the lever arm producing the moment is much less. The little flaw works downward under the vibration and wheel loads, and finally the side of the head drops off. It is wrong to always diagnose such breaks as being due to a pipe. An initial minute flaw is abundantly sufficient to work this mischief.

The January number, and the fourth issue, of *The Belt Book*, issued monthly by Charles A. Schieren & Co., Cliff and Ferry streets, New York City, shows that this publication is developing rapidly, having already doubled the original number of its pages. Among the special articles in the current issue are "The Making of a Belt," which describes the process from the tanned hides to the finished product; "The Swamp of To-day," a historical review of the changes which have occurred in the district which for a half century has been identified with the hide and leather business and in which the Schieren Building is located, and "Wonderful Big Belts," a descriptive article illustrated with views of 72, 64 and 60 in. belts in operation. Announcement is also made of the award of a gold medal by the Jamestown Exposition to Charles A. Schieren & Co. for their waterproof and steamproof leather belting, known by the trade name of Duxbak.

Makers of tin cans are hopeful of a large trade this year, as stocks of canned fruits and vegetables are reported to be in favorable condition for the coming packing season.

A Southern Blast Furnace of Improved Construction.

The Birmingham Coal & Iron Company, Birmingham, Ala., has near completion its new No. 2 furnace at Vanderbilt, near Birmingham. It was designed and constructed with a view to reducing the cost of pig iron to a minimum by introducing approved forms of labor saving machinery, the aim of the company being to make this the best equipped merchant furnace in the South. Ore from the company's own mines enters the furnace yard on an overhead double track trestle running parallel with the line of the furnace stoves. Below, between and parallel with the trestle tracks, is an ore tunnel, substantially built of reinforced concrete to withstand the pressure and wear of the stock. The arch of the tunnel is semicircular, with a span of 15 ft. 6 in. and an inside hight of 13 ft. 6 in. Above the spring line are cast iron chutes set in the arch, allowing the stock to drop by gravity into scale cars in the tunnel. These chutes are spaced 8 ft. between centers on either side of the tunnel and are provided with Keiser & Moffett's patented ore gate.

Arrangements for Handling Stock.

The stock yard is 370 ft. long and has an ore capacity of 60 tons per lineal foot, of which 25 tons per foot is available for the scale car without any extra labor. In the tunnel are two standard gauge tracks, parallel with the overhead trestle, leading across the skip pit and scale cars drop their charge direct into the skip cars. The tracks rest on Carnegie steel cross ties concreted in the floor. The scale cars are electrically driven and are of 10-tons capacity. They were furnished by Arthur G. McKee, Cleveland, Ohio. The ore stock yard is interrupted opposite the furnace by a steel coke bin 80 ft. long, with capacity of 550 tons. The bin is self-cleaning and self-screening, allowing the coke to be drawn from the bin direct into the skip cars. The tunnel and skip pit are below the water level, and two electrically driven emergency pumps, furnished by Dayton Hydraulic Engineering Company, are installed at the skip pit. A double tracked skip bridge leads to the top of the furnace and the skip cars are hoisted by a 14 x 14 in. direct gear double drum Otis steam engine, with automatic stop and slow down motion. The hoisting engine is located under the coke bin and is operated from the coke bin gate. The furnace top is of the McKee type, with automatic controlling device for revolving it. The incline and skip cars were also furnished by McKee.

The furnace crucible is 12 ft. in diameter and 8 ft. high. At the bosh the diameter is 18 ft., and 13 ft. at the top, while the total hight is 80 ft. The bosh is cooled by means of a steel petticoat with a series of removable shelf plates, allowing the water to overflow from one to the other. The lowest trough discharges into the sump around the hearth jacket. Below this petticoat is one row of copper cooling plates, and then the tuyere and hearth jackets, made of cast iron of extra heavy design and water cooled from the outside. The discharge water from the tuyeres, tuyere coolers, cinder coolers and cooler plates supplies the cooling water for the petticoat, in addition to its fresh water supply. The hearth is provided with 10 tuyeres, three cinder notches and one iron notch.

The Equipment.

The cast house has a span of 62 ft. and is 240 ft. long, 160 ft. of which is covered. At the extreme end of the cast house is a pig breaker building, 62 ft. wide and 40 ft. long, with a Brown pig breaker. A crane runway 280 ft. long runs through both buildings and a Brown electric traveling crane operated from the pig breaker building is designed to pick up the sow with 32 pigs from the cast house floor, and transfer it over the pig breaker to be broken up into suitable sizes. The pigs drop down on an assorting platform, from which they are pushed down through a chute into box cars ready for shipment. The cast house floor has a capacity of 350 tons. The slag is disposed of by means of Berg steam dump cinder cars manufactured by the Wm. B. Pollock Company, Youngstown, Ohio.

The boiler plant consists of six 400-hp. Wickes vertical boilers, with Parsons patent blower and grate bars for the use of coke braize. To this boiler plant will be added two 400-hp. Rust boilers. The compressed air is supplied by three units of 14 x 84 x 60 in. Wm. Tod vertical blowing engines. The feed pumps are two 14 x 7 x 18 in. special duplex outside packed plunger pumps of Knowles Steam Pump Works make, and the feed water is heated from two units of 1500-hp. Cochrane feed water heaters.

There are four stoves of the four-way type, 20 ft. in diameter and 85 ft. high, with individual stacks 4 ft. 9 in. in diameter and 140 ft. high. The furnace plant gets its water supply from Village Creek, a small stream crossing the company's property. On account of local conditions and in order to save a special engineer for the supply pumps, two sumps with screens and intake 8 ft. below the lowest water level are built at the creek. Each sump contains a Latta-Martin pneumatic pump with a capacity of 2000 gal. per minute. The air compressors for these pumps are located in the same building as the boiler feed pumps and electric power plant, 350 ft. from the pumps at the creek. A 6-in. overhead pipe line carries the air from the compressors to the supply pumps. The compressors are Ingersoll-Rand 22 and 24¼ in. by 24 in. The water line from the pumps is 16 in. and connects to a stand pipe 15 ft. in diameter and 95 ft. high. The electric power plant consists of two 12 x 14 in. Buckeye engines, directly connected to 75-kw. Westinghouse generators, and supplies power for the scale cars, the revolving top, emergency pumps in the skip pit, the pig breaker crane and for light. An emergency supply steam pump plant is installed in the power station building, utilizing an old independent suction line to the creek and a Cameron steam pump already on hand.

The steel work for the furnace shell, stoves and mains was erected by the McCune Iron Works, Birmingham, Ala. All structural work was manufactured by the Virginia Bridge & Iron Company, Roanoke, Va. The stand pipe and the erection of structural work were under contract to C. W. Hill & Co., Birmingham, Ala. Other contracts were the following: Steam and water piping, Pittsburg Valve, Foundry & Construction Company and the Crane Company; concrete work, H. L. Finklea, Birmingham, Ala.; fire brick, Harbison-Walker Refractories Company. The engineer of construction was T. A. Tesch.

The report of the Chief of the Bureau of Insular Affairs to the Secretary of War, published at Washington this week, shows that the government of the Philippines was run at a profit last year. The insular net revenues for the fiscal year ending June 30, 1907, were $11,186,213 and the expenditures $8,249,243. For the nine years the United States has had possession of the islands the receipts have been $115,646,945 and the expenditures $100,298,231. The postal savings bank authorized by the Philippine Commission in 1906 has shown a steady growth in monthly deposits. Last year 183 Filipino youths pursued studies in the colleges of the United States.

The Norwalk Steel & Iron Company and the William Kavenaugh Mfg. Company, Norwalk, Ohio, have been placed in the hands of Oliver S. Lau of Detroit and H. L. Smith of Cleveland, as receivers, as the result of proceedings instituted in the Federal Court in Toledo, Ohio. Following the receivership, involuntary bankruptcy proceedings were started against the first named company by some of the creditors. Steps were taken a few weeks ago to consolidate the [illegible] with the American Steel & Iron Company.

The January issue of the *Progress Reporter*, published by the Niles-Bement-Pond Company, 111 Broadway, New York City, is given to a description with numerous full page illustrations of the huge planer built by the Bement-Miles Works of the company for Mackintosh, Hemphill & Co., Pittsburgh. The issue of *The Iron Age* for January 2 contained an illustrated description of this planer.

A New Walker Surface Grinder.

Several new and interesting features are to be found in the No. 3 surface grinder built by the Walker Grinder Company, Worcester, Mass., three views of which are shown in Figs. 1 and 2. Among them the three most important are the base for the wheel column, having extensions through apertures in the rear of the bed and sliding on V tracks; the new adjustable tension belt drive, and the new noiseless friction clutch reversing mechanism. This machine is intended not only for grinding hardened steel work, but also for finishing soft stock. It can be used both for roughing and finishing flat surfaces on castings and forgings of all kinds, with a cut varying from the finest to one 0.015 or 0.02 in. deep, and a cross feed ranging up to 0.1 in. wide. The latter is automatically operated at each end of the stroke of the platen. An automatic stop is provided for any point in the cross feed movement. The platen runs on large V tracks, after the manner of a planer table, and the bearing surfaces are lubricated from oil wells in the center by wheel oilers.

In the line drawings, Figs. 3, 4 and 5, like letters and numbers, indicate like parts. The main bed of the grinder is of the conventional T-shaped horizontal cross section, forming a three-point bearing for the machine on the floor. Solid cast iron partitions increase the rigidity of the bed and form a tool cupboard in the interior. On top of the main bed are bolted the beds of the grinder column and table, which are two separate parts, A and B, Fig. 3, each separately bolted to the main bed, and fastened to each other by the bolt *a* against the adjustable set screws *b*, making the two parts practically one casting when adjusted. This construction allows the projecting horns, or bearings, *c*, on the rear bed A, to extend into the interior of the bed B, forming additional support and bearing surface for the wheel column C. The latter also has extended projections, *d*, which form elongated V tracks, and at the same time act as guards to protect the cross feed tracks when the wheel has been fed back to its limit. Apertures through the back of the bed B admit these projecting bearings. It will be observed that the bearings *d* extend to a position directly under the grinding wheel and that a very long bearing is obtained for the cross feed. The cross feed slide and housing weigh approximately 300 lb., so that there is no possibility of their lifting from their tracks, especially as a pressure greatly in excess of the weight of the parts is required to break the contact between the sliding surfaces, due to the pressure of air holding the closely fitting slides together.

The sliding platen D of the machine is provided, as shown, with three longitudinal T-slots. The two large V tracks of the platen are lubricated by the oil wheels *e*, which are held by springs against the bottom of the V's and are immersed in oil wells in the center of the bed. The platen is driven by a train of spur gears, transmitting to the main gear *f*, which is placed directly in the center of the bed and runs on hollow sleeves *g* and *h*, through which the cross feed screw *i* passes. The cross feed nut *j* is bolted to the wheel housing and can be easily removed. The wheel slide E is vertically adjustable and is mounted on the column C. It is raised or lowered by the feed screw *k* and the revolving nut *l*, which is operated by the hand wheel *m* through bevel gears contained in the housing *n*. This housing can be swung and clamped in any convenient position to suit the operator. The periphery of the hand wheel *m* is graduated in thousandths, and the amount of down feed is read from a pointer which can be set at any graduation at the start, being simply clamped around a hub and held by friction.

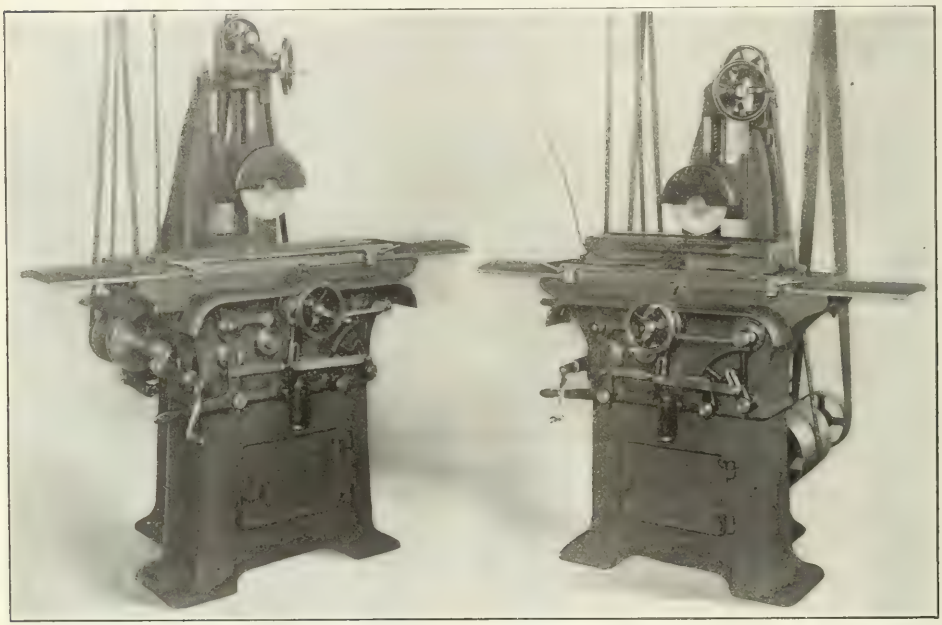


Fig. 1.—Two Views of the Working Side of the No. 3 Surface Grinder Built by the Walker Grinder Company, Worcester, Mass.

The grinding spindle *o* is hardened and ground and runs in hard bronze boxes, each provided with a ring oiler and adjustable for wear. End play is taken up by the adjustable cap *p* and the washer *q*, *r* being a collar which is rigidly fastened to the spindle. These details are best shown in Fig. 5.

On the overhead works furnished with the machine is a three-step pulley, which is belted to the pulley F at the rear of the base, Fig. 3. This pulley is mounted on a shaft which carries the drum G. The spindle belt passes around this drum and from thence vertically on the exterior of the machine to the adjustable idler pulley H at the

top of the wheel column C. This idler runs in ring oiled bronze bearings supported by a bracket, which is vertically adjusted and clamped by the screws shown, to take up the stretch of the belt. After passing around the idler H the belt passes down through the middle of the wheel column to the spindle pulley I, thence around this pulley to the idler J, which is journaled in the slide E. The belt continues from the idler J vertically down through slots in the bed, back to the drum G. It will be seen that the tension of the belt will not be affected by the position of the emery wheel spindle, and since the stretch of the belt is taken up by the idler on the bracket at the top, an endless belt may be used. About 5 or 6 in. stretch of the belt is provided for, therefore recementing is very seldom needed.

To prevent the possible jarring down of the wheel into the work after the threads of the screw *k* or its nut become worn, a counterweight, K, is provided. This is supported by a chain passing over a sheave pulley, from which it leads down to the top of the wheel slide. The counterweight is sufficient to just balance the weight of

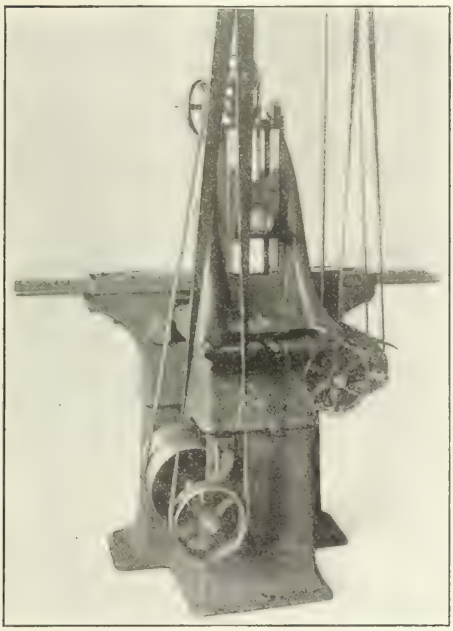


Fig. 2.—A Rear View of the Walker No. 3 Surface Grinder

the vertical moving parts, so that the wheel will feed upward as easily as downward. The grinding wheel is hooded, as indicated.

For reversing the movement of the platen the dogs *s* are provided. Hardened steel hinged fingers, *t*, are adjusted to these, which can be thrown back to allow the platen to run past the limit of stroke when desired, to allow examining the work. The dogs operate the vertical lever L, which swings about the axis of the cross feed bearing box and actuates both the cross feeding and the longitudinal feeding mechanism. At the lower end of this lever is the roller and spring plunger arrangement, common to other grinders, for preventing stoppage of the feeding mechanism on the center. To the lower end of the vertical lever L is attached the horizontal connecting bar M, which is adjustably attached to the gear quadrant N that rotates the cross feed crank through the pinion *u*. Adjustment of the cross feed is obtained by clamping the end of the connecting bar M in different positions in the radial slot of the gear quadrant.

A combination rod and rack, O, connects the cross feed crank with the pinion *r*, keyed to the ratchet casing *w*. The latter carries the ratchet pawl *x*, which meshes with the ratchet wheel *y*, keyed to the cross feed screw. By swinging the pawl lever to the right or to the left a feed in either direction can be obtained. Since the cross feed crank *z* describes nearly a whole revolution at the end of every stroke, and passes above and below the inside center, it reciprocates the connecting rod rack O, which in turn oscillates the ratchet pawl, causing the machine to feed in one direction each time the platen is reversed.

The longitudinal reversing mechanism, requiring but a very slight movement, is operated by strikers on the horizontal bar P, coming in contact with the lever L, as it is swung over to its limit. This bar operates the bell crank lever Q, connected to the clutch reversing mechanism through the horizontal shaft on which it is pivoted, as described later. The vertical portion of the bell crank lever Q forms the automatic stop for the platen by coming in contact with a lug on the bottom of the automatic stop lever R, which is made to drop down at any desired position of the cross feed movement. This automatic stop is operated by a dog, *a'*, fastened to the side of the cross feed slide, or housing, C. This dog supports one end of the stop rod *b'*, Fig. 4, on which are collars, *c'*, adjustable to any desired position. On the opposite side of the stop rod *b'* is permanently fixed the grooved collar *d'*, on which the horizontal automatic stop lever R normally rests. This lever has a projection fitting the groove in *d'* to hold it in a central position. When the stop rod *b'* is moved horizontally the lever R is lifted out of the groove and held up until the lever drops past the side of the collar. Then a lug on the side of the lever R comes in contact with a notch in the vertical part of the lever Q forcing it to stop in the middle of its stroke and at the exact point where the clutches are disengaged, thus stopping the movement of the platen. The collars *c'*, having stops on the rod *b'*, which they cannot exceed, the movement of the cross feed is positively checked at the limit of its stroke. The extreme outer end of the stop rod *b'* is provided with a knob for manipulating by hand, so that the platen may be stopped at an intermediate point in its stroke. The reversing bell crank lever Q can also be operated by hand at any time.

The automatic frictional reversing mechanism is driven from the main countershaft by two belts, one open and one crossed, which lead down to pulleys S and S', to operate the train of feed gears through oppositely rotating friction clutches. A clutch shifting fork lever, T, stands in a vertical position underneath the clutch pinion shaft and is hinged on a horizontal stud. At the bottom of this fork lever is a horizontal projecting arm, which connects with a second horizontal arm, U, attached to the clutch reversing shaft V. Motion is transmitted between the levers in vertical planes at right angles to each other through a ball and socket joint.

Each of the friction driving pulleys, S and S', is bored to receive a split friction ring, *e'*, which is carried on a flange spider pinned to the clutch pinion shaft. Each friction ring is in two parts, separated diametrically, and the separated parts are held to their seats by coil springs. In one of the openings between the ring segments are fitted two steel jaws, *f'*, each of which has a projection extending toward the center of the clutch, and between the ends of the two is a narrow opening for inserting the operating wedge *g'*. There is one of these wedges for each clutch, and both are fast to the sliding sleeve, which is operated by the clutch fork T. The steel jaws *f'* have circular seats in the clutch rings and roll together with a very short toggle joint leverage, so that a tremendous expanding power is obtained for the friction rings *e'*. On the opposite side from the expanding jaws *f'* of the friction ring segments is formed a conical seat for the adjusting screw *h'*. This screw is tapped through the exterior flange of the clutch spider and is held in place after adjusting a check nut, which is easily accessible on the outside. To adjust the clutch a screw driver is inserted through the hole *i'* on the back of either pulley and the clutch turned around until the screw *h'* can be [illegible] by holding the screw with the screw

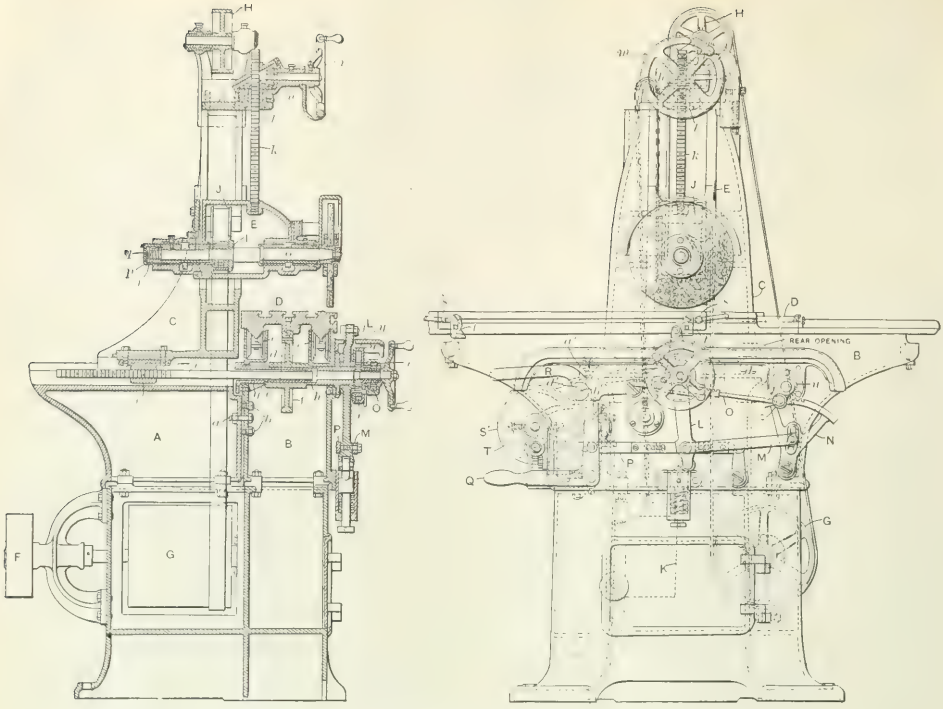


Fig. 3.—End Sectional Elevation and Front Elevation of the No. 3 Walker Surface Grinder.

driver the check nut can be loosened and the adjustment made, afterward retightening the nut. This is the only adjustment of this clutch and is very simple and positive. The advantage claimed for the friction clutch over the usual toothed clutch lies in the fact that it is practically noiseless, no matter at what speed it may be run. It is also very durable, as the wearing surfaces are large, and there is little or no slipping to create wear.

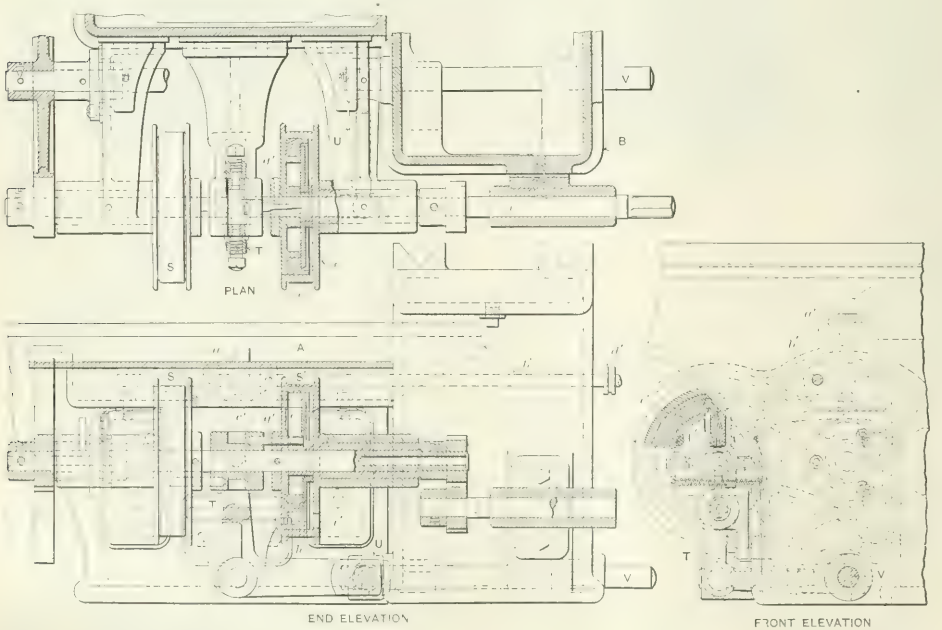


Fig. 4.—Details of the New Friction Clutch Reversing Mechanism.

The pulleys S and S' turn in opposite directions, as before explained, thus obtaining a reversing action of the clutches. Each pulley has an extended slide bearing running in boxes, and each bearing is made hollow, forming bearings for the clutch pinion shaft, which is slow running and is oiled from the center, as shown. Pinions connect this shaft to the hand crank shaft *j'*, which can be pushed in or out, and the pinions engaged or disengaged at pressure.

Two countershafts are involved in the overhead drive of the grinder; the first is belted to the second on three-step cone pulleys, so that proper speeds may be obtained for different sizes of grinding wheels. The manufacturer contends that, while provision should be made to change speed of wheels as they wear down, the changing of the belt should not be made too easy for the workman, so that he will not be tempted to experiment and run the wheels beyond their proper speed. Hence the speed changes are all made at the ceiling.

As particularly shown in Figs. 1 and 2, all the principal mechanism is on the exterior of the grinder, so that

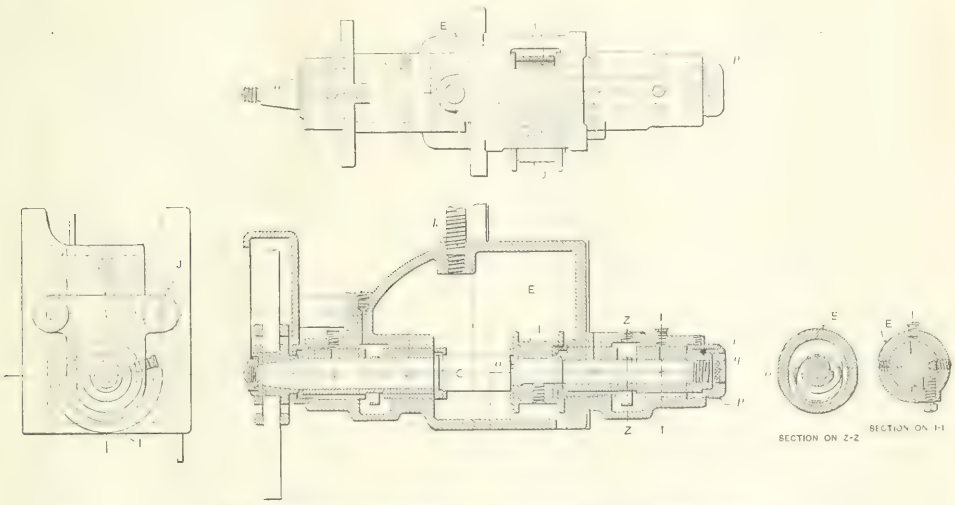


Fig. 5.—Details of the Wheel Spindle Head of the New Walker Surface Grinder

the adjustments are convenient, and protection from dust is afforded by ample guards. The grinding wheels furnished are 10 in. in diameter by ⅝ in. face. The longitudinal movement of the platen is 30 in., the cross feed movement 8 in., and by using an 8-in. diameter wheel work 10⅝ in. high can be admitted. The approximate net weight of the grinder is 1700 lb. When desired a magnetic chuck is supplied, built integral with the platen, or a separate magnetic chuck 26½ in. long can be used on top of the platen. A unit exhaust blower system is now being developed for the grinder, and the machine will also be arranged for driving by motor.

The Chamber of Commerce of Pittsburgh has issued under the title, "Pittsburgh the Powerful," a quarto of 104 pages as a special number of *Industry*, the official publication of that organization. The work presents attractively a résumé of the industrial and commercial life of Pittsburgh. Numerous photographic views are reproduced, showing the remarkable development in recent years of the downtown section of Pittsburgh, and there are half-tone plates of some of the important industrial works. A pictorial feature is a two-page bird's eye view of what is designated "The Pittsburgh District," but which extends as far on the northwest as Niles and Warren, Ohio, and to the southwest to Wheeling and Bellaire, while the eastern limits are stretched to include Johnstown, Pa. The picture is topographic, and makes an impressive showing of the industrial life of this wonderful region. "Pittsburgh in History" is the title of the leading article in the book, which sketches the industrial progress of the district through more than a century. The number of employees in the mills and factories of Pittsburgh is put at 85,000, the annual wages per man at $660, and the deposits in Pittsburgh savings banks and trust companies at $170,000,000.

New York State's $110,000,000 Barge Canal.

In a statement just issued Superintendent of Public Works Frederick C. Stevens of New York State recommends that Congress be memorialized to join the State in constructing a 21-ft. canal from the Hudson River to Lake Ontario. He says the State's share of such a project would not be greater than the expenditure needed to build the 12-ft. canal, and the result would be a canal capable of accommodating barges of 8400 tons instead of 1000 tons. The project, he adds, would not involve any abandonment of the barge canal from the west end of Oneida Lake to Lake Erie at Buffalo, nor of the Champlain Canal from Lake Champlin to Waterford or Troy. Superintendent Stevens shows that while actual work has been under way on the barge canal for three years only $22,000,000 worth of work is under contract, or about 20 per cent. of the total of $110,000,000, and only 20 per cent. of the work covered by these contracts has actually been done. An amendment of the law is suggested, which would permit paying contractors in bonds. It has been impossible to dispose of barge canal bonds in the past year. Superintendent Stevens fears that, owing to the long time required for construction under the present plan, the barge canal will prove a disappointment in not being suited to the commercial demands, as they will exist at the time of its completion. The Federal Government survey for a 21-ft. waterway in 1900 estimated the expense at $198,000,000, of which $42,500,000 was for that part of the canal connecting Lake Erie with Lake Ontario and [illegible] Lake Ontario with the Hudson River at tidewater by way of the [illegible].

The shops of the William Tod Company, engine builder, Youngstown, Ohio, are now running on one 8-hr. shift, except for a few large tools, which are running through. This company has had no cancellations of orders of any material size.

Fluctuations in Metal Prices from 1896 to 1908—Carload Lots.

(With Supplement.)

In the accompanying chart the fluctuations in prices of some of the more important metals during the period from 1896 to 1908 are represented. The price is the computed monthly average of the prices given in the Metal Market in *The Iron Age*, week by week. They are based on the price of car lots, at New York. Three columns of figures, on both sides of the chart, give the values, the column to the left being of tin in cents per pound; the second column, copper in cents per pound, while the third represents lead and spelter in cents per pound and tin plates in dollars per base box. The scale for the third column has been changed from previous years and its smaller divisions now represent fluctuations of 10 cents instead of 5 cents, as formerly. In practically every metal the high price for a number of years was reached during the early part of 1907.

COPPER.—A precipitous decline in the price of copper established a new precedent in the trade. The price was cut in half within the short period of seven months. During the early part of the year consumers vied with one another in their eagerness to procure supplies at steadily advancing quotations. After April, however, it became apparent that there would be plenty of metal to go round and the decline was started by small producers selling. The leading interests, however, steadfastly refused to cut their price until the last half of the year, and before October had accumulated a great surplus of metal. Consumption fell off during the first quarter and continually decreased throughout the year. No steps to curtail production, however, were made until the last quarter, and then it was too late to check the decline. The exports during the first part of the year were wofully small, and in fact during some months imports actually exceeded exports. With a sharp cut in price, made in October, however, foreign consumers bought largely, and during the last three months of the year over 100,000 tons of metal were exported, out of a total for the year aggregating 229,000 tons. The imports for the year amounted to 121,000 tons.

PIG TIN.—An absence of erratic fluctuations so common in former years marked the course of pig tin during 1907. With the exception of an advance of 2 cents, during April and May, the market declined steadily. This clearly reflects the influence of the United States Steel Corporation, which through one of its subsidiary companies was a seller of pig tin during the periods of artificial strength and a buyer during declines. The year opened with tin selling around 42 cents and the market did not go below 40 cents until August. The decline then was steady and orderly until the influence of heavy selling by Eastern operators in the London market began to make itself felt in October, and in that month there was a sharp drop of 5 cents. Deliveries into consumption and importations were very small during the last two months of the year. At the end of the year tin was selling at the lowest point for over three years and within 4 cents of the lowest point in eight years.

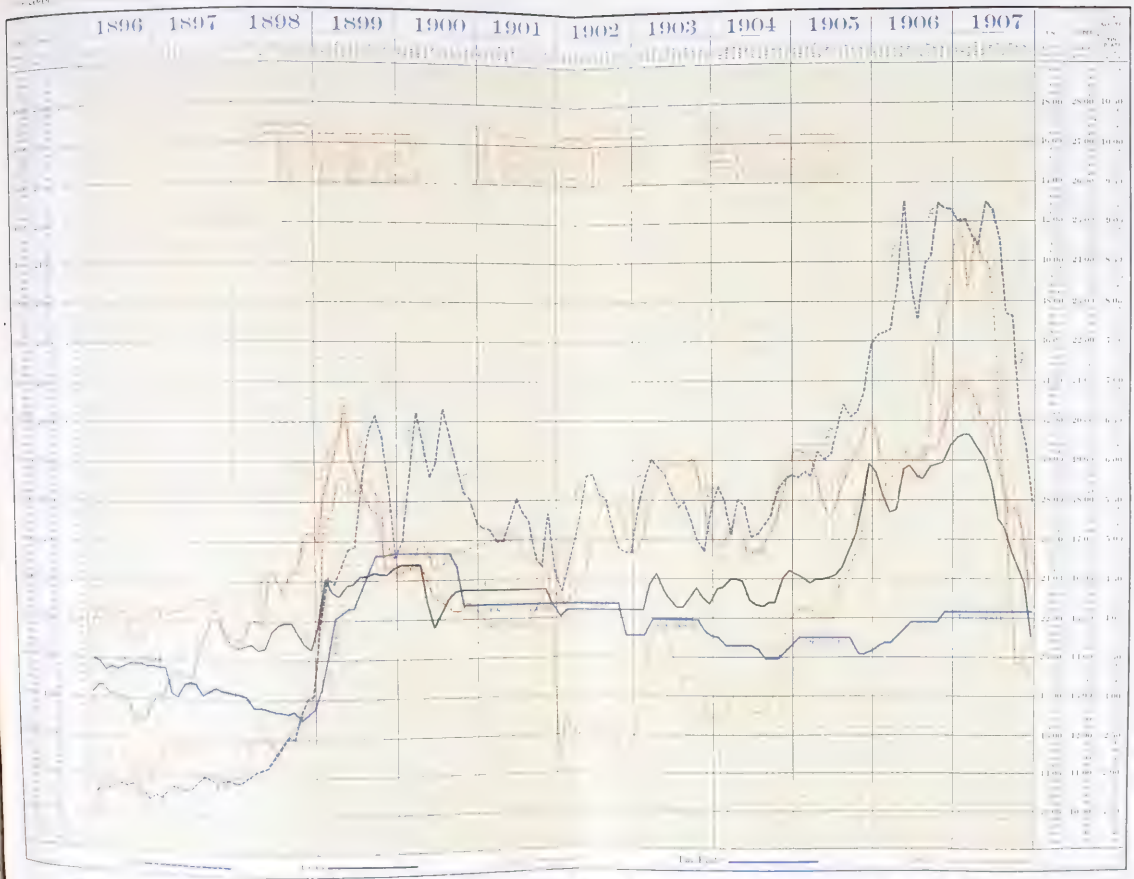
SPELTER.—Galvanizing works and brass mills bought sparingly of spelter throughout the year and after February there was a steady decline. The price of 7 cents in February was the highest reached in this country since October, 1876. By the end of the year, however, spelter was selling at lower figures than any time since April, 1892.

LEAD.—The high price of 6.31 cents reached in February established a record in this country since June, 1876. In common with other metals the rapid decline in price was caused by overproduction, coupled with under consumption. Never before in a single year has there been so rapid a decline in this metal. The average price in December was the lowest since December, 1898.

TIN PLATE.—No change in the price of tin plate was made during the year. Production was not equal to that of 1906, as in sympathy with the falling off in building operations there was a lessened demand for terne plates. Bright plates also suffered from want of demand, as during the early months of the year there was grave apprehension regarding the crop outlook. Fortunately, however, canning crops were better than expected. The rapid curtailment of production during the last two months of the year was an important factor, and although a reduction in price was imminent the last of the year it was felt that there would be no large stock pressing on the market during the first half of 1907. Since then there has been a fair buying by consumers and operations at the mills have been partially resumed.

TABLES OF PRICES.—The following tables give the monthly prices on which the chart is based:

Months.	Lake copper. Cents.	Spelter. Cents.	Lead. Cents.	Tin. Cents.	Tin plate. Dollars.
1895.					
January	9.55	3.32	3.07	13.47	3.95
February	9.67	3.15	3.10	13.42	3.90
March	9.39	3.20	3.10	13.57	3.87
April	9.53	3.27	3.08	14.00	3.80
May	10.25	3.47	3.16	14.53	3.75
June	10.69	3.71	3.28	13.94	3.75
July	10.81	3.70	3.32	14.17	3.80
August	12.10	4.07	3.52	14.26	3.80
September	12.37	4.26	3.37	14.37	3.80
October	11.92	4.16	3.33	14.60	3.80
November	11.37	3.68	3.23	14.46	3.80
December	10.56	3.49	3.26	13.81	3.80
1896.					
January	9.97	3.88	3.07	13.16	3.50
February	10.62	4.07	3.16	13.37	3.47
March	11.03	4.14	3.16	13.35	3.37
April	10.78	4.13	3.06	13.39	3.40
May	10.99	4.08	3.04	13.52	3.39
June	11.65	4.05	3.01	13.45	3.40
July	11.27	4.12	2.97	13.51	3.44
August	10.87	3.81	2.74	13.34	3.44
September	10.75	3.64	2.71	13.17	3.44
October	10.70	3.71	2.77	12.72	3.41
November	11.25	4.03	2.92	13.04	3.41
December	11.40	4.17	3.04	12.87	3.40
1897.					
January	11.78	4.02	3.05	13.26	3.40
February	12.00	4.06	3.22	13.47	3.09
March	11.87	4.12	3.39	13.40	3.02
April	11.50	4.11	3.33	13.23	3.20
May	11.97	4.17	3.26	13.37	3.22
June	11.03	4.25	3.30	13.69	3.20
July	11.10	4.27	3.68	13.92	3.06
August	11.12	4.28	3.81	13.86	3.10
September	11.25	4.14	4.12	13.71	3.16
October	11.12	4.10	4.12	13.74	3.11
November	10.84	3.89	3.81	13.77	3.10
December	11.07	3.75	3.70	13.68	3.09
1898.					
January	11.00	3.75	3.66	13.77	3.05
February	11.19	3.79	3.69	14.04	3.02
March	11.95	4.00	3.71	14.26	2.90
April	12.05	4.00	3.61	14.41	2.90
May	12.04	3.95	3.64	14.54	2.89
June	11.85	4.65	3.86	15.05	2.85
July	11.59	4.51	3.95	15.60	2.84
August	11.85	4.35	3.99	16.14	2.82
September	12.25	4.62	3.99	16.02	2.85
October	12.37	4.61	3.81	17.25	2.75
November	12.69	5.09	3.70	18.07	2.80
December	12.79	5.13	3.62	18.20	2.89
1899.					
January	14.02	4.90	4.02	22.12	3.11
February	17.66	5.68	4.53	24.25	3.50
March	17.55	5.99	4.37	23.86	4.03
April	18.56	6.25	4.30	24.82	4.10
May	18.65	6.72	4.42	25.61	4.05
June	18.20	6.02	4.45	25.69	4.05
July	18.37	5.79	4.55	28.72	4.38
August	18.50	5.55	4.56	31.40	4.60
September	18.47	5.40	4.60	32.40	4.82
October	18.03	5.37	4.59	31.35	4.82
November	17.00	4.64	4.58	28.52	4.83
December	16.69	4.68	4.65	25.19	4.84
1900.					
January	16.21	4.55	4.70	26.00	4.84
February	16.25	4.69	4.70	29.71	4.84
March	16.41	4.60	4.70	32.42	4.84
April	17.00	4.71	4.70	30.85	4.84
May	16.80	4.52	4.22	29.25	4.84
June	16.31	4.27	3.90	30.00	4.84
July	16.31	4.24	4.03	32.76	4.84
August	16.55	4.17	4.26	31.13	4.84
September	16.75	4.10	4.36	29.63	4.68
October	16.73	4.10	4.37	28.46	4.19
November	16.75	4.20	4.37	28.10	4.19
December	16.87	4.19	4.37	26.84	4.19
1901.					
January	16.90	4.08	4.37	26.60	4.19
February	16.97	3.94	4.37	26.55	4.19
March	17.00	3.89	4.37	25.95	4.19
April	17.00	3.94	4.37	25.94	4.19
May	17.00	3.97	4.37	26.82	4.19



Fluctuations in the Prices of Copper, Lead, Tin, Spelter, and Tin Plate in New York from 1896 to 1907. Carload Lots.

	Lake copper. Cents.	Spelter. Cents.	Lead. Cents.	Tin. Cents.	Tin plate. Dollars.
June	17.00	3.95	4.37	28.22	4.19
July	16.97	3.90	4.37	27.41	4.19
August	16.50	3.92	4.37	26.90	...
September	16.50	4.02	4.37	25.04	4.19
October	16.71	4.20	4.37	24.62	4.19
November	16.82	4.52	4.37	27.47	4.19
December	14.71	4.35	4.19	24.39	4.19
1902.					
January	11.45	4.28	4.02	23.38	4.19
February	12.47	4.18	4.10	24.73	4.19
March	12.12	4.29	4.10	26.16	4.19
April	11.97	4.41	4.10	27.29	4.19
May	12.10	4.50	4.10	29.26	4.19
June	12.23	4.88	4.10	29.29	4.19
July	11.94	5.23	4.10	28.28	4.19
August	11.59	5.46	4.10	28.14	4.19
September	11.60	5.45	4.10	26.55	4.19
October	11.71	5.48	4.10	25.76	4.19
November	11.44	5.29	4.10	25.43	3.79
December	11.61	4.91	4.10	25.33	3.79
1903.					
January	12.13	4.82	4.10	27.76	3.79
February	12.80	5.00	4.10	29.14	3.79
March	14.31	5.36	4.44	30.06	3.99
April	14.85	5.65	4.59	29.69	3.99
May	14.75	5.75	4.37	29.36	3.99
June	14.56	6.00	4.25	28.30	3.99
July	13.73	5.95	4.12	27.60	3.99
August	13.35	5.94	4.12	28.00	3.99
September	13.58	6.00	4.26	27.06	3.99
October	13.42	6.05	4.40	25.83	3.99
November	13.25	5.68	4.25	25.35	3.84
December	12.30	5.15	4.19	27.53	3.79
1904.					
January	12.62	4.95	4.39	28.75	3.75
February	12.34	4.95	4.40	27.98	3.64
March	12.60	5.05	4.50	26.19	3.64
April	13.19	5.22	4.50	27.99	3.64
May	13.28	5.14	4.48	27.76	3.64
June	12.74	4.79	4.22	26.14	3.64
July	12.62	4.85	4.17	26.28	3.60
August	12.50	4.85	4.15	26.74	3.49
September	12.67	5.06	4.20	27.27	3.49
October	13.09	5.17	4.20	28.53	3.49
November	14.22	5.49	4.51	29.00	3.56
December	14.87	5.80	4.60	29.27	3.66
1905.					
January	15.18	6.17	4.56	29.18	3.74
February	15.25	6.12	4.50	29.49	3.74
March	15.25	6.06	4.45	29.21	3.74
April	15.18	5.97	4.50	30.43	3.74
May	15.00	5.55	4.50	30.04	3.74
June	15.00	5.32	4.51	30.36	3.74
July	15.03	5.38	4.56	31.71	3.74
August	16.07	5.66	4.64	32.85	3.74
September	16.12	5.83	4.85	32.21	3.74
October	16.62	6.05	5.07	32.47	3.55
November	16.90	6.17	5.48	33.46	3.53
December	18.75	6.50	5.96	35.84	3.59
1906.					
January	18.78	6.48	5.86	36.36	3.66
February	17.94	6.09	5.56	36.48	3.69
March	18.50	5.96	5.35	36.62	3.69
April	18.62	6.05	5.39	38.86	3.76
May	18.70	5.95	5.90	43.08	3.85
June	18.69	6.14	5.94	38.97	3.94
July	18.47	5.98	5.80	37.18	3.94
August	18.65	6.06	5.78	39.90	3.94
September	19.31	6.19	5.92	40.32	3.94
October	21.81	6.18	5.94	42.90	3.94
November	22.50	6.36	5.97	42.70	4.09
December	23.06	6.62	6.19	42.62	4.09
1907.					
January	24.41	6.90	6.30	42.14	4.09
February	25.10	7.00	6.31	42.16	4.09
March	23.38	6.92	6.31	41.29	4.09
April	24.62	6.81	6.16	40.84	4.09
May	24.19	6.51	6.02	43.01	4.09
June	23.94	6.45	5.75	42.65	4.09
July	21.95	6.15	5.24	41.15	4.09
August	18.94	5.71	5.12	37.35	4.09
September	16.41	5.28	4.84	37.22	4.09
October	13.80	5.15	4.64	32.33	4.09
November	13.94	5.10	4.45	30.81	4.09
December	13.48	4.89	3.76	27.92	4.09

Arrangements have been completed for the annual banquet of the Cleveland Foundrymen's Association which will be held at the Hollenden Hotel January 28. Superintendent William H. Elson of the Cleveland Public Schools will speak on "Trade Education," and addresses will also be made by J. H. Webster of the Variety Iron Works, Cleveland; by J. P. Dawley, attorney for the association, and by others, including some representative of the National Founders' Association.

The Pocahontas Collieries Suit.

Charles S. Thorne, first vice-president of the Pocahontas Consolidated Collieries Company, Inc., has made a statement for publication in the name of Isaac T. Mann, president, in reference to the reports from Lynchburg, Va., of an application for a receiver of that company from which the following is taken:

"The suit is simply an attempt of a small number of security holders to obtain a cash appraisal of their stock. A small minority of the preferred stockholders of the original Pocahontas Collieries Company did not exercise their privilege to exchange their stock for bonds, which were offered and accepted in the merger by all the other stockholders. Of this minority 214 shares, being $21,100 in amount, have filed a bill asking the court to appraise the value of their securities, or, failing to get this relief in the alternative, to appoint a receiver for the company. Such an appraisement is provided for under the statute of Virginia, and was anticipated by the management of the company from the beginning, and can in no way disturb or injure its securities or credit. There is no question involved as to the financial condition or standing of the Pocahontas Consolidated Collieries Company, Inc., as it has no debts that are due, has paid all current bills to December 31, 1907, paid its bond interest and preferred stock dividend on January 1, 1908, and in addition recently paid a dividend of 6 per cent per annum on its common stock. It is in a stronger financial condition to-day than at the date of the merger, and likewise in a stronger condition than was either of the companies, of which it was formed prior to the merger."

New York and New Jersey Metal Trades.—The New York and New Jersey Branch of the National Metal Trades Association held its annual meeting at 203 Broadway, New York, January 14. Officers were elected as follows: President, George Q. Palmer, Quintard Iron Works; vice-president, Charles A. Haney, Slocum & Chase Company; treasurer, L. A. Bevin, Rider-Ericsson Engine Company; counsel and secretary, Henry C. Hunter. The new Board of Directors consists of H. N. Covell, W. J. Davidson, Gilbert M. Edgett, Robert S. Wyatt, Peter Weber, Mark W. Woman and W. D. Forbes. Secretary Hunter gave out the following statement, summarizing reports made at the meeting concerning present conditions and the developments of the past year: "Reports on the conditions of business prevailing in the plants of the members, including shipyards and plants manufacturing engines, boilers and general machinery, showed that the business had fallen off more than 50 per cent. during the last year, the greatest decline being shown during the last three months, except in ship repairing, shipyards being quite busy, with a prospect of improvement in the near future. In normal times the members employ about 12,000 men, and about one-half that number are employed now. No reductions in wages were made, and in some cases wages were increased. The shipwrights obtained a general increase, and 5 per cent. increase was granted by members to a number of individual employees in the shops."

The Pennsylvania Railroad tunnels under the East River, New York were pierced through January 11 with a final blast under Sixth avenue and Thirty-second street, which connected the east and west workings. Trains are now operated [illegible] and the work now remaining to be done in the cross town section is the completion of the terminal structure and the concrete and track work in the tunnels. Much of the latter has been done as the boring progressed. There still remains a great deal of work to be done in the tunnels under the East River, in the Long Island City yards and terminal, and on the New Jersey side at Weehawken and west to Harrison.

The report that the American Car & Foundry Company had received an order for 2000 steel cars, to be built at its works at Huntington, W. Va., is pronounced untrue.

Electrical Equipment for Rolling Mills.

Crocker-Wheeler Motors in the Bethlehem Rail and Structural Mills.

The Saucon plant of the Bethlehem Steel Company, South Bethlehem, Pa., described in *The Iron Age* of September 26, 1907, and January 2, 1908, is one of the most thoroughly equipped electrically of the steel plants of the country. It is probably the first plant designed and constructed with a view to using electrical drive wherever possible. Screwdowns, reversing tables, transfer tables, shifters, saws, straighteners are all operated directly by Crocker-Wheeler motors. In fact, all operations except the driving of the rolls, where steam engines are used, and operations, such as heavy shearing, requiring enormous pressure, where hydraulic power is employed, are carried on by means of electrical drive.

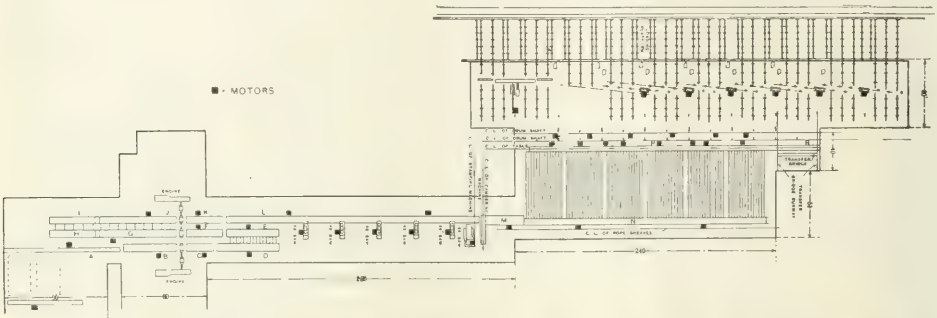


Fig. 1.—Plan of the Rail Mill at South Bethlehem, Pa., Showing Location of Crocker-Wheeler Motors.

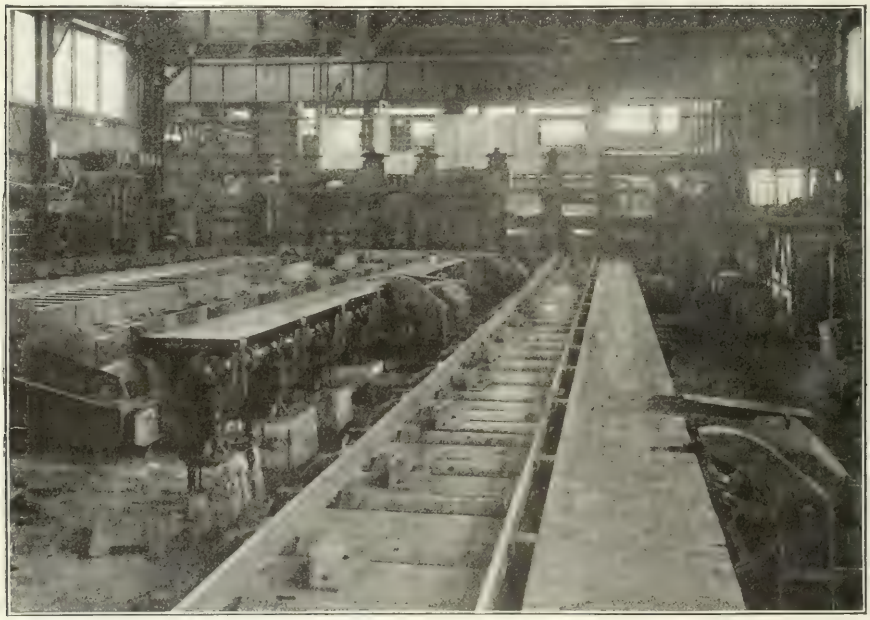


Fig. 2.—Four Motors Operating Rail Mill Reversing Tables.

While motors have long been used in steel mills for certain classes of comparatively light machinery, such as saws, grinders and straightening presses, it was impossible until very recent years to drive the tables, screwdowns and heavy work electrically. The sudden and frequent starting and stopping, the frequent violent reversal, the heavy overloads, high temperatures and general rough handling which a motor must receive if put to such work proved too much for any of the earlier motors, nor was it found possible to adapt any motor on the market to the conditions. Yet the obvious advantages of motor drive and the ease of manipulation and control made it desirable that a motor should be designed for steel mill work. In undertaking this the Crocker-Wheeler Company obtained the advice of leading mill engineers as to what was required and then proceeded to develop an entirely new design. The principal requirements were the following:

1. *Electrical.*—The motor must be designed primarily for 230 volts. Commutation must be such that sudden reversals and sudden and extreme overloads will not injure the commutator or produce undue heating. The insulation must be of such character that it will not deteriorate with heat. Shunt field winding must be provided in nearly all cases in addition to the series field to prevent racing. Finally, the motor must have tremendous starting torque.

2. *Mechanical.*—The frame must be of such design that it can be securely bolted down. The shaft must be of very large diameter, as all the extreme jars and shocks must be taken up in the bearings, not by springs. The frame must be split and readily separable, so that the armature can be instantly removed and replaced in case of injury to the shaft or windings. The armature must be of comparatively small diameter to avoid danger from high speeds and to minimize the inertia and facilitate sudden starting, stopping and reversal. The armature winding must be retained by means that will not give way under extreme heat. The shaft must be readily replaced. The journal boxes must prevent the escape of oil and the admission of dust. Means for oil lubrication must be provided. All parts must be readily accessible without disassembling the motor. In general, every part must be extremely strong and durable, fastened in such a way that no amount of vibration will loosen or dislodge it, yet readily replaceable at will. Parts must be interchangeable.

Railway motors, the most rugged of the previous types, had been used for roll tables in some plants. They were designed, however, for 550 volts, and their commutators were therefore too small to take care of the increased current for 230 volts satisfactorily, and for this reason were a source of trouble. In addition to very poor commutation on 230 volts rolling mill engineers urged the following objections to railway motors for rolling mill work: The shocks to which they are subjected in railway work are taken up by springs, and the shafts are therefore not heavy enough. The frames in motors of considerable size are not split. Moreover, the frame is so compact that the parts are not accessible and no room is available for shunt or compound field winding. Further, they are designed for grease lubrication only; they cannot be securely bolted to foundations, owing to

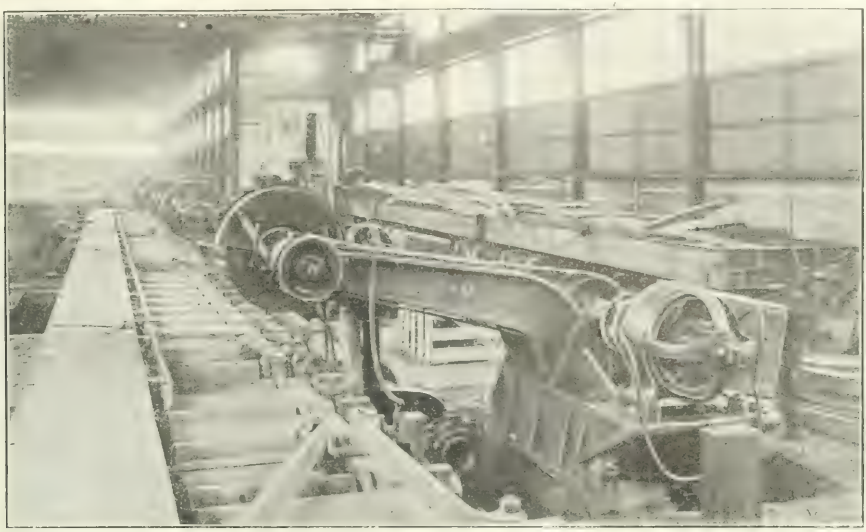


Fig. 3.—Hot Saws Driven by 45-Hp. Open Type Motors.

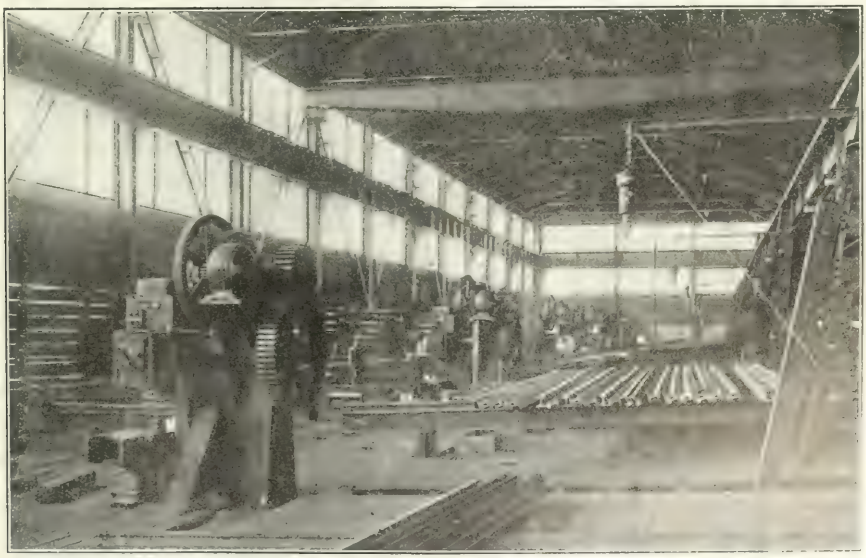


Fig. 4.—Straightening Presses in Rail Finishing Mill Driven by [illegible]

the absence of proper feet, and they have other objectionable features.

The accompanying views taken at the Saucon plant show some of the motor driven machinery. The control of all the motors is accomplished by means of solenoid controllers of the Electric Controller & Supply Company, Cleveland, Ohio. The present installations are in the rail mill and the Grey universal beam mill. The plan of the rail mill is given in Fig. 1. The motors are shown as small black squares. Billets for this mill are deposited on table A, operated by a Crocker-Wheeler rolling mill motor, shown on the plan, which delivers it to the reversing tables B and C, also operated by motors. On these tables the billet goes through five passes and is then delivered to the motor driven table D and transferred hydraulically to table E. Thence it is transferred again by Crocker-Wheeler motor to the reversing tables F and G of the intermediate stand, where it goes through seven passes and is then transferred to the reversing tables J and K of the finishing rolls, which are also operated by motors.

A view of the mill taken from the position of the first saw is shown in Fig. 2. This view shows the arrangement of four of the motors. Motor driven tables carry the rail to the hot saws, where it is cut into standard lengths. These saws are shown in Fig. 3. Each is driven by a 45-hp. Crocker-Wheeler motor of the open type. This view also shows one of the rolling mill motors operating the transfer table. When the mill is used for structural shapes the 54-in. sliding frame hot saw shown in Fig. 1 is used instead of the drop type saws. This

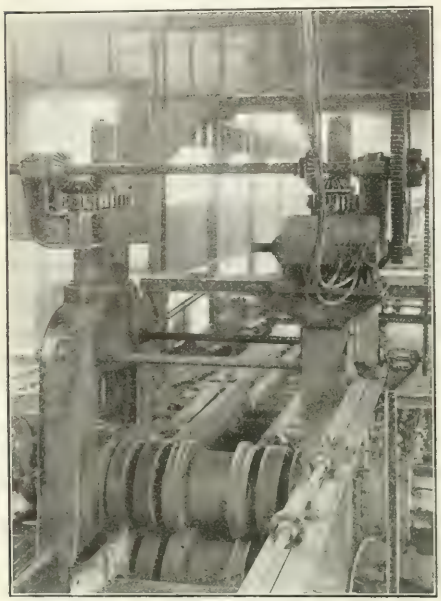


Fig. 5.—Motor Operating the Screw Down of the 46-In. Blooming Mill in the Grey Structural Plant.

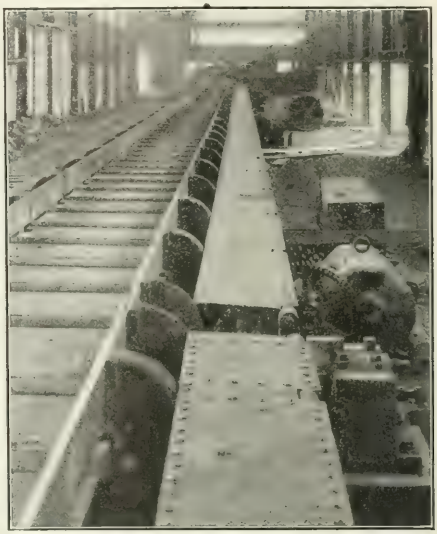


Fig. 7.—Three 50-Hp. Motors Driving Transfer Tables in the Grey Mill.

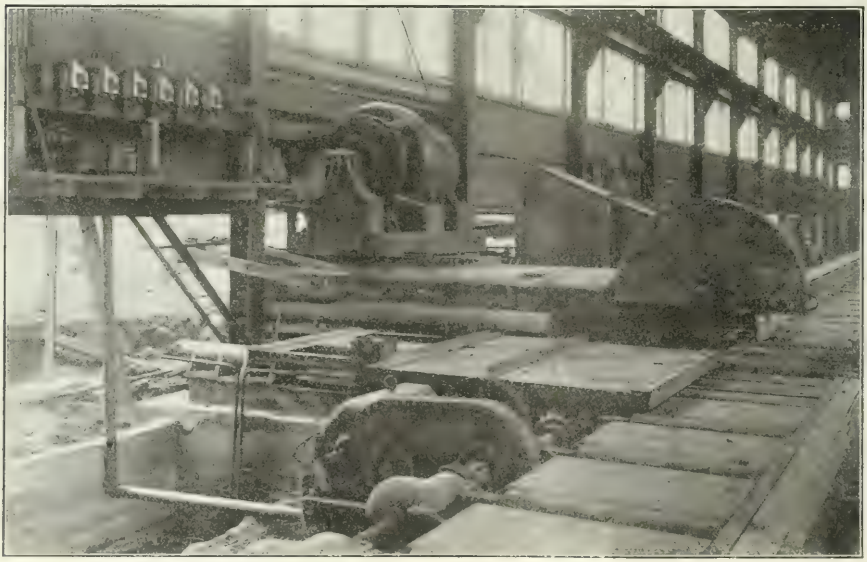


Fig. 3.—Hot Saw in Grey Mill Driven by a 225-Hp. Motor

saw is also driven by a motor. After being sawed into lengths the rails are transferred to the hot bed table N, driven by two rolling mill type motors. The pull on and the rake off are each operated by seven motors, and the delivery table of the hot beds is operated by two motors. Fig. 4 is a view of the rail finishing mill and the six straightening presses, each driven by a Crocker-Wheeler open type motor.

The rolling mill type of motor is also used in this plant on the screw downs of the various rolls. A 75-hp. motor is provided for the screw downs of the 40-in. blooming mill, and Fig. 5 shows a motor operating the screw down on the 46-in. blooming mill of the Grey structural plant. In this service rapid starting and stopping are important and can be accomplished only by motors capable of the most sudden and excessive overloads. The Grey mill differs from the rail mill, as shown in previous articles, in that the various units are arranged in line instead of side by side. The intermediate and finishing mills are each provided with two motors for the screw downs, and the reversing and transfer tables are operated by motors. The hot saw at the delivery end of the mill is shown in Fig. 6. It is driven by a 225-hp. Crocker-Wheeler motor. This view also shows one of the motors driving the transfer tables, and in Fig. 7 are shown three 50-hp. motors driving transfer tables in the Grey mill.

A fair idea of the arrangement of the hot bed motors can be obtained from Fig. 8, which shows the pull on, rake off and table motors of the Grey mill hot beds. About 20 Crocker-Wheeler motors for the 28-in. structural mill at South Bethlehem have been equipped with induction couplings of the Wheeling Mold & Foundry Company. One coupling is mounted on each end of the the shaft and the pinion is mounted on the center of the countershaft. With these couplings it is not necessary to reverse or stop the motor, as speed regulation is obtained by electrical control of the magnetic coupling.

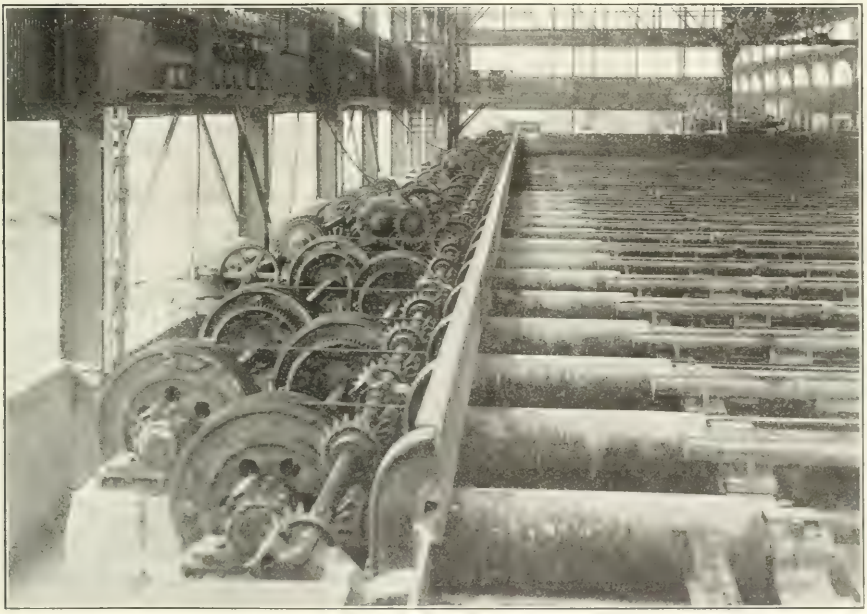


Fig. 8.—Fourteen 50-Hp. Motors Driving Pull-on, Rake-off and Transfer Tables of Grey Mill Hot Beds.

The Industrial Gas Mfg. Company has been incorporated at Elwood, Ind., with $150,000 capital. The incorporators are Winfield T. Durbin and W. N. Durbin of Anderson, Ind.; Gustav Saaler of Leipsic, Germany; George Pohl, New York; Michael J. Fogarty, S. J. Diamond and E. R. Call of Elwood. The company takes over the Diamond & McKenzie boiler works and the Elwood Foundry & Heating Supply Company. The plant will occupy the buildings of the latter company, while the former will be abandoned. The company will manufacture gas producers, which, it is claimed, make a chemically pure fuel gas. Gustav Saaler, the patentee, states that as many heat units are produced from 3 tons of soft coal as from 12 tons used under boilers in the ordinary way. The Penn American Glass Company's factory at Alexandria, Ind., is equipped with the new gas producers, and others are being installed in the Arcade File Works at Anderson. The company has contracts that will take nine months to fill.

Large Gas Holders at Wilkes-Barre, Pa., and Moline, Ill.

At Wilkes-Barre, Pa., and Moline, Ill., two 500,000-ft. gas holders, of similar design, are among recent improvements made by the Wilkes-Barre Gas & Electric Company and the Tri-City Railway & Light Company, respectively, in charge of J. G. White & Co., New York, operating managers. The holder at Wilkes-Barre has just been placed in service, and it is expected that the Moline holder will be completed very shortly. In each case the installation has been necessitated by heavy increase of business, resulting from active selling campaigns by the management.

The holder at Wilkes-Barre is the largest in northeastern Pennsylvania. It is built on the bank of the Susquehanna River, on a rock shelf, and is protected from floods and ice by a timber rock filled crib built along the shore. The crib also serves to protect the bank from the action of the river. The tanks of both holders are 100 ft. in diameter and 24 ft. 6 in. deep. The inner lifts are 93 ft. 7 in. in diameter and 23 ft. 8 in. deep. The middle and outer lifts are 95 ft. 6 in. by 24 ft. 4 in. and 97 ft. 8 in. by 24 ft. 4 in., respectively. The guide frames consists of 12 standards, 73 ft. in hight, which are supported by three rings of horizontal girders. The Camden Iron Works furnished the structural steel and iron.

THE IRON AGE

Established in 1855.

New York, Thursday, January 23, 1908.

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Temperament and British Iron Trade Progress.

Some diagnoses of the country's present monetary and commercial ailments have given the psychological factor a large place. We are assured that sentiment has been powerfully at work in our troubles and that material conditions have much better maintained their integrity than have confidence, courage and the spirit of hopefulness that count so much in business. This view is so obvious as to need no elaborating. It is true of every panic that the psychological element dominates; fear runs away with reason, and facts count for little for the time being. In what review of trade and finance in the United States in recent months has it not been said that "underlying conditions are sound?"

Substantially the above observations have been made lately about the situation in Great Britain—not as referring to any panic like that of October in New York, but to the habit Britons have formed of taking a pessimistic view of British industrial prospects. Speaking specifically of the British iron industry, the London *Iron and Coal Trades Review* says that its foundations are sound, but that the reason a greater structure has not been reared on them is that the British people lack confidence in themselves. Our contemporary's discussion of the situation, about which it shows evident concern, alternates between the assertion that the British iron industry has all the material elements of great success, and the statement that the great obstacle to such success is that Britons are "constantly fed on a diet of alarming predictions of their approaching doom."

It is admitted that while the world's per capita consumption of iron has increased by nearly 250 per cent. in the past 25 years, that of Great Britain has scarcely increased by a fraction; also it is granted that, "with all due allowances, things are not as they should be." The article leads one to believe that it is the British way to exaggerate the resources of rival nations and to take the gloomiest view of things British; that side by side with predictions of the early exhaustion of their country's coal and ore supplies, British newspapers give accounts of the fabulous and inexhaustible iron ore reserves of competing countries, and that between the Americans and Germans, British iron and steel manufacturers are likely to be wiped from the face of the earth. Just as the reader is led to believe that the meek and lowly Briton really needs an encouraging word in his self-distrust and self-effacement, he comes suddenly upon this, that somehow has a familiar British ring:

> And yet, what are the facts? We can assemble our raw materials—our coal and ironstone and limestone; we can produce a ton of pig iron; we can make a ton of steel; and we can load a ship with iron and steel goods just as we can build a ship and her engines—at a cost below that of our rivals. While that remains the case—and it is likely to remain the case for some generations yet—there is no reason why we should not hold our own in the international race, and there is no valid excuse for discouraging the investment of further capital in British industries by exaggerated statements about the resources of other nations. Our rivals possess no great fundamental advantages over us, and whenever and wherever they may have beaten us it has not been by virtue of natural favors, but by a more ready adaptability to new ideas, times and circumstances; by better technical training and mechanical inventions; by more highly organized and vigorous commercial methods; and, above all other things, by greater enthusiasm and confidence in their own abilities and capabilities. We have little hesitation in saying that, had we possessed a little of that faith in our future which the Americans have had in their destiny, or had we displayed that quiet confidence in our national resources, and adopted the intelligent combination of interests which we have seen among the Germans in recent years, we should have been making, and working up into finished goods, a great deal more iron than we are.

In other words, nature has been kind to the British ironmaster, but his temperamental outfit needs to be reinforced with a little "enthusiasm," "faith," "quiet confidence" and such like things to make him invincible. Time must necessarily be a very large element in such a programme. Think of the enormous depletion of natural resources meantime!

The National Employers' Liability Act.

The recent decision of the United States Supreme Court, which declared the Federal employers' liability act unconstitutional, and the attempt now being made to frame a new law that will hold, have called special attention to a general subject of great importance to the country's business interests. The trend of the law has always been toward favoring the workman who is injured in the service of his employer. In the process of evolution of the law the employer has occasionally been given some advantage, as in the adoption of the doctrine of the "assumption of risks" by employees, but on the whole the tendency has been constantly in favor of the employee. Originally there was no exception to the principle that no liability could exist where an accident resulted from the negligence of a fellow servant. On such a basis there could be no liability if the negligence was that of the president of a corporation, for technically he would be as truly a servant as a yard laborer. Step by step the apparent injustice of such a principle was corrected, until the employers' liability acts of to-day were developed. Laws do not stand still; there is a constant evolution, as in every other branch of the tree of human intellect. But it is rare that so radical a step forward is taken as that proposed in the Knox bill, which is typical of those from which the proposed corrective legislation will be framed.

Nothing could be more sweeping in its scope than this bill. It provides that every common carrier shall be liable in case of accident to an employee "for all damages which may result from the negligence of any of the officers, agents or employees of such carrier, or by reason of any defect or insufficiency in the cars, engines, appliances, machinery, track, roadbed, ways or works of such carrier due to such carrier's negligence." Furthermore, the bill provides that in all actions brought under the act "the fact that the employee may have been guilty of contributory negligence shall not bar a recovery, but it shall be for the jury to weigh all the evidence as to negligence causing the death or injury complained of and to determine its verdict upon the basis of deducting from the total amount of damages sustained a percentage equal to the percentage of negligence contributed by the plaintiff or the plaintiff's decedent." It is further provided that

no contract nor acceptance of employment insurance relief benefit or indemnity for injury or death shall constitute any bar or defense to any action to recover damages, excepting that they may be set off against the amount of damages awarded.

The principle of the negligence of a fellow servant and the doctrine of contributory negligence are to all intents and purposes eliminated in this bill. This may be just as applied to a railroad, whose complication of operation differentiates between it and the ordinary manufacturing industry. There may be room for a difference of opinion on the subject, and there may be those who would argue that a similar law applied to other dangerous callings would be as equitable. But if this should become the universal practice in the United States the influence upon business generally, and especially upon the manufacturing industry, would be serious. Costs of production would surely advance.

The danger lies in introducing into every State the operation of a national act with an inclusion of a large percentage of all accidents in its scope of liability, in contrast with local State laws that are not nearly so beneficent. The educational factor must naturally be strong; attempts at State legislation patterned in the same mold must follow. With the removal of the important doctrines of negligence of a fellow servant and contributory negligence must be coupled the always elevating standard assumed by juries in determining the amounts of verdicts in accident cases, forming a combination not pleasing to contemplate by those who must foot the bills.

It is small wonder that the companies that insure employers against liability for accident damages should be considering seriously whether it would not be better for all concerned if a workman's compensation law should be established in this country, patterned after the English law. Its provisions wipe out all question of liability and give damages to the injured workman or his heirs regardless of whether the negligence was his own or that of his fellow servant or of his employer, but regulate by statute the amount of the damage, which is based upon his own earning capacity. Such a law might be welcomed if the limit of damages could be kept down to the British standard. There would be the rub. It is true that the national law as proposed would apply only to common carriers doing an interstate business. The field is therefore a comparatively narrow one. Its extension is the danger.

Extraordinary Results of Our Foreign Trade.

The month of December established a new record for exports of merchandise from the United States. The Bureau of Statistics reports for that month a total value of $207,179,436, beating the largest previous month by nearly $5,000,000. The value of the imports for the month was $92,288,771, thus falling below any month since August, 1905. The excess of exports was $144,890,665, and this item also establishes a new record. Never before had the monthly export surplus passed the $100,000,000 mark.

The above figures, when taken in connection with similar statistics for November, explain the comparative ease with which gold was drawn from Europe during our financial crisis in the closing months of last year. November's excess of exports over imports was $93,655,751. Thus in the brief period covered by November and December this country had an apparent credit balance against the outside world of $208,546,416. Allowing most liberally for invisible drafts upon our credit, the gold imports of $108,000,000 in those two months were easily covered by the balance.

It was well for the country that in such a time of stress and strain our people had large stocks of grain and cotton which Europe wanted and for which it was willing to pay liberally. Our agriculturists made no sacrifices, but reaped good profits. Nevertheless the benefits derived from their sales to foreign consumers would have been far less to the nation if imports had not been so materially cut down. The diminution of such an offset against exports was partly voluntary and partly compulsory. It was, on the one hand, difficult for merchants to get funds with which to pay for imported merchandise, and, on the other hand, the prospects for future business were too precarious to risk the purchase of foreign goods. For some time we shall probably see imports of merchandise continue to decline.

Allegheny County as a Producer of Iron and Steel.

Pittsburgh and its environs can hardly be expected to maintain their old-time percentage of the country's production of pig iron and steel in view of the new capacity provided in recent years or now under erection in other sections. The statistics for 1906, just published, show that Allegheny County contributed in that year 22.5 per cent. of the total of pig iron and 30.4 per cent. of the total of steel ingots and direct castings, as against 23.5 per cent. of pig iron and 33 per cent. of steel in 1905. In the quiet year 1904 Allegheny County's product was 26.5 per cent. of the pig iron total and 38 per cent. of the steel total. Each year since 1904 has brought an increase in the total for Allegheny County, but the building of new steel works and the enlargement of existing plant in other parts of the country have gone on at a faster pace. Buffalo, Youngstown, Lorain and the Chicago District have been conspicuous in adding to the country's capacity in rolled steel, while a number of minor open hearth units have been built by rolling mill companies in various States, besides the additions to steel foundry capacity. The extensive work of the Tennessee and Bethlehem companies, finished in the past year, will count in the percentage outside the Pittsburgh District this year, while the heavy construction at Gary, Ind., will be heard from in the year following. The advantage of unloading Lake Superior ores from vessel into furnace yard and the development of the by-product coke oven may be expected to assist in the gradual widening of the interval between Pittsburgh District tonnage and that for the remainder of the country.

The Place of the Iron Rolling Mill.

For the first time [illegible] can Iron and Steel Association for 1905 separated the production of certain iron and steel finished forms, notably merchant bars and skelp, which represent two lines in which the competition between iron and steel is watched. After 1890 there was no separation even of the total of iron from the total of steel until 1904. Now that the data for 1906 are available a comparison is possible of the relative status of rolled iron and rolled steel in the more important lines in which iron still figures. The total of iron products in 1906 was slightly more than in the preceding year, but the percentage of rolled iron was not maintained, being 11 per cent. in 1906, against 12 per cent. in 1905 and 14.6 in 1904. The total tonnage of iron

and steel for 1906 and 1905 is given in the following table, and that of the principal forms of iron compared with the same products in steel, in gross tons:

	1906.		1905.	
	Iron.	Steel.	Iron.	Steel.
Total rolled products	2,186,557	17,401,911	2,059,990	14,780,025
Plates and sheets	74,373	4,107,783	72,156	3,460,074
Nail plate	17,179	37,032	24,059	40,083
Merchant bars	1,481,348	2,510,852	1,322,439	2,271,162
Skelp	391,517	1,137,068	452,797	983,198

It will be seen that iron plates and sheets have remained stationary, while in steel these products have advanced markedly. In 1904 the total was 67,713 tons of iron and 2,353,685 tons of steel sheets and plates. Due largely to the demand for plates for steel cars, though there has been an expansion in the use of steel sheets also, the increase in steel plates and sheets in two years was about 75 per cent. Iron merchant bars made a gain in 1906 as large proportionately as that of steel bars. The abundant scrap pile and not the puddling furnace, as is well known, maintains the position of the bar trade in iron. A noteworthy change shown by the table is the decline in the manufacture of iron skelp. Steel pipe increased, evidently in part at the expense of iron. The general conclusion to be drawn from the statistics is that while finished steel is still making nearly all the gain, the vitality of the iron rolling mill is greater than is credited by the common estimate.

Iron and Steel Bounties in Australia.

The bounty enactments which form part of the new tariff of the Commonwealth of Australia went into operation at the beginning of this year. So far as the iron and steel industry is concerned the new bounty system differs in one material particular from that which has been in operation in Canada since 1883. Under the Canadian system iron and steel production has both protection in the tariff and bounties from the Dominion Treasury. Bounties under the new Australian law are to be paid only until such time as the home production is protected by tariff duties.

Most of the articles on which bounties are paid are not now produced in Australia in sufficient quantities to meet the local need. For this reason the articles are continued on the free list, and bounties are to be paid for their local production. The bounties on iron from Australian ore are at the rate of $3 a ton. On other iron and steel products bounties are paid on an ad valorem basis, generally at the rate of 10 per cent. A sum of £300,000 has been earmarked for the payment of bounties. As the law now stands none of the bounties is to run for a longer period than five years; and when an industry has become sufficiently established to warrant the imposition of duties these duties are to go into force by proclamation based on Order in Council. Canadian bounties were begun in 1883 with a similar time limit, but they have been continued from time to time by both Conservative and Liberal administrations, and it will be 1912 before all the bounty enactments of the Dominion statute book expire.

Great Britain Not Likely to Interfere.

In the new Australian tariff many of the duties on imports from Great Britain are increased, and, although there is a preference in favor of Great Britain, it is small, and of not as much value to British manufacturers and exporters as the preference which has existed in the Canadian tariff since 1897. The higher duties in the commonwealth tariff have to some extent disconcerted the Chamberlainites in England, but it is not likely that there will be any effectual protest against them in the Imperial Parliament. All the British self-governing colonies obtained their fiscal freedom within a few years after 1846, when England went on a free trade basis, and preferences for colonial goods in the British tariff came to an end.

Canada led the way among British colonies in establishing protective duties against British imports. Many such duties were imposed as early as 1858 and 1859, although Canada did not adopt what is now known as the national policy until 1879. There was a sharp controversy in 1859 and 1860 between the Colonial Office in London and Sir Francis Hincks, who was then Minister of Finance in Canada, over these protective duties against imports from the old country. It ended in favor of Canada, and after 1860 there was no more attempted interference by the Colonial Office with Canadian tariffs. It was 1887, however, before there was an end to protests in Parliament—in the House of Lords as well as in the House of Commons—against increases in Canadian duties on British imports; and it is a remarkable fact that all these protests at Westminster were due to the continuous and systematic endeavors of the Government at Ottawa to foster the iron and steel industry of the Dominion.

After 1860 the Government in England held aloof from all these protests. Secretaries of State for the Colonies listened to them in the House of Commons or the House of Lords and regretted that protection was making such headway in Canada, but they refused either to appeal or remonstrate. For half a century Canada has enjoyed the right of making her tariffs to suit her own industrial needs without being compelled to pay any regard to Great Britain; and with such a precedent established in the case of Canada, the British Government will not interfere with the policy of high protection which the Commonwealth of Australia has now adopted. For three months past British chambers of commerce have been remonstrating against the new Australian tariff. Protests in Parliament are likely to result from these remonstrances; but nothing can come of them so far as action by the British Government is concerned.

Will Try to Induce British Industries to Locate.

In one other respect the bounty system in Australia differs from that in Canada. In 1883 bounties were first enacted in Canada to aid a plant at Londonderry, Nova Scotia, which was at that time in difficulties; and every re-enactment of the laws has been at the instance of existing iron and steel companies, or, as was the case in 1897, at the instance of promoters who stood ready to install a new plant. Behind the new Commonwealth Bounty law there is the hope and expectation that British iron and steel men will be induced to go out to Australia and establish plants. Even before Canada adopted the bounty system, one of the Australian provinces had made an ineffectual attempt to induce British capitalists to set up a rail mill within its border. If this expectation should now be realized the result of the bounty policy in Australia will be a variation from that in Canada.

British iron men in the era which preceded bounties were actively interested in small furnaces in New Brunswick, Nova Scotia and Ontario. But since the bounty system was begun in 1883, not a single iron and steel plant in Canada has been established by British capital; and two of the largest plants—those at Sydney and Sault Ste. Marie—were organized by American promoters. There is a wire drawing and wire weaving plant at Hamilton, Ontario, which may be regarded as to some extent an offshoot of a world famous wire plant at Warrington, Lancashire. It was in existence, however, before the national policy was adopted; and in spite of tariff protection and bounties and the patent laws, it is about the only manufacturing plant in Canada in the iron and steel industry that has been established by men who came out from England to avail themselves of the industrial opportunities which the Dominion has long been offering.

E. P.

Owing to its increasing Southwestern trade, the Wheeling Corrugating Company, Wheeling, W. Va., has moved its St. Louis offices and warehouses from 112 South Eighth street to one of the Cupples Warehouses located at 1006-10 Spruce street, St. Louis. The new warehouse has about one-third more floor space than the old one and has excellent shipping facilities, permitting the loading and unloading of stock to the best advantage.

Production of Various Iron and Steel Products in 1906.

Additional statistics of the output of iron and steel products in the United States in 1906 are now available from the annual report of the American Iron and Steel Association. It is noticeable that the various forms of rolled steel do not show equal gains in 1906 over 1905. Wire rods, for example, increased only from 1,808,688 gross tons to 1,871,614 tons. Plates and sheets, on the contrary, showed large gains. The differences are more noteworthy when we compare 1904, 1905 and 1906. Wire rods show a total of 1,699,028 tons in the lean year 1904, or well up to the output of each of the two years following. Of plates and sheets the production was 2,241,398 gross tons in 1904, advancing nearly 50 per cent., or to 3,532,230 tons in 1905, and to 4,182,156 tons in 1906. Thus it appears the plate and sheet production was 73 per cent. greater in 1906 than in 1904, while production of wire rods was only 10 per cent. greater.

It is plain that steel car manufacture accounts for the great variation in the plate and sheet total. The figures for plate and sheet production, respectively, were never separated prior to 1905. But it is plain from the table below that the great variation in the output of Pennsylvania in 1904 and 1905 (that State producing all but a relatively small percentage of the output of heavy plates) was due to the absence of steel car buying in 1904 and to the large demand for such cars in 1905. The table gives the production by States of plates and sheets in 1904, 1905 and 1906 in gross tons:

	1904.	1905.	1906.
New England, New York and New Jersey	14,599	76,197	124,725
Pennsylvania	1,555,941	2,308,389	2,624,284
Delaware, Maryland and Virginia	23,956	28,481	25,500
West Virginia	108,964	93,586	148,684
Kentucky and Alabama	44,845	47,303	51,642
Ohio	490,192	688,633	818,769
Indiana, Illinois, Missouri and California	182,901	289,641	388,552
Totals	2,421,398	3,532,230	4,182,156

Black Plates and Tin and Terne Plates.

The production of black plates, or sheets, for tinning in 1906, which is included in the preceding table, amounted to 576,079 tons, against 507,587 tons in 1905, an increase of 68,492 tons, or over 13.4 per cent. Of the total production in 1906 Pennsylvania made over 54.3 per cent., against almost 50.5 per cent. in 1905. Ohio, West Virginia, Indiana, Maryland and Illinois also made black plates, or sheets, for tinning in 1906 in the order named. Of the total production of black plates or sheets for tinning in 1906 about 5600 tons were rolled from iron and about 570,400 tons from steel, against a little over 3000 tons from iron and over 504,000 tons from steel in 1905.

The production of tin plates and terne plates in 1906 is estimated at 1,203,740,000 lb., or 577,562 tons, as compared with an estimated production of 493,500 tons in 1905, an increase of 84,062 tons. Of the total production in 1906 about 1,100,373,000 lb., or 491,237 tons, were tin plates and about 193,367,000 lb., or 86,325 tons, were terne plates.

Rolled Iron and Steel Compared.

The following table gives the production of leading articles of finished rolled steel in 1906, compared with finished rolled iron, gross tons:

	1906			1905.
	Iron.	Steel.	Total.	Iron and steel.
Rails	15	3,977,872	3,977,887	3,375,929
Structural shapes	4,719	2,114,053	2,118,772	1,660,519
Plates and sheets	74,373	4,107,783	4,182,156	3,532,230
Nail plate	17,179	37,032	54,211	64,542
Wire rods	1,201	1,870,413	1,871,614	1,808,688
Rolled forging blooms and rolled forging billets	462	205,648	206,110	41,754
Merchant bars	1,481,348	2,510,852	3,992,200	3,593,601
Skelp	391,517	1,137,068	1,528,585	1,435,995
Splice bars	10,934	213,977	224,911	197,322
Hoops	.....	172,332	172,332	445,527
Bands and cotton-ties	1,332	406,686	408,018	
All other finished rolled	203,477	648,195	851,672	683,908
Totals	2,186,557	17,401,911	19,588,468	16,840,015

Production of All Kinds of Rolled Iron and Steel.

The production of all kinds of iron and steel rolled into finished forms in 1906, including rolled forging blooms and rolled forging billets, but no other intermediate forms, amounted to 19,588,468 gross tons, against 16,840,015 tons in 1905, an increase of 2,748,453 tons, or over 16.3 per cent. Of the total production in 1906 about 17,401,911 tons were rolled from steel and about 2,186,557 tons from iron, as compared with about 14,780,025 tons rolled from steel and about 2,059,990 tons rolled from iron in 1905. The following table gives the total production by States in gross tons of all kinds of finished rolled iron and steel in 1905 and 1906:

	1905.	1906.
Maine and Massachusetts	176,562	170,967
Rhode Island and Connecticut	132,354	124,954
New York	911,742	1,228,293
New Jersey	170,690	179,220
Pennsylvania	8,918,290	10,036,639
Delaware	12,481	18,800
Maryland	361,692	430,546
Virginia	36,875	37,852
West Virginia	332,712	363,589
Kentucky	156,885	106,675
Tennessee, Georgia and Texas	40,765	46,725
Alabama	281,978	326,588
Ohio	2,302,142	2,979,367
Indiana	502,069	604,317
Illinois	1,743,460	2,131,517
Michigan	89,417	88,025
Wisconsin	240,195	242,679
Missouri	68,200	79,385
Colorado and Washington	330,035	348,079
Wyoming, Oregon and California	31,471	44,251
Totals	16,840,015	19,588,468

Production of Allegheny County, Pennsylvania.

The following table gives the number of blast furnaces and completed rolling mills and steel works and the production of pig iron and crude steel, rails, structural shapes, plates and sheets, miscellaneous rolled products, and all finished rolled iron and steel in Allegheny County, Pa., from 1902 to 1905 in gross tons. Rolled forging blooms and rolled forging billets are included for 1905:

	1903.	1904.	1905.	1906.
Furnaces built and building ....No.	41	42	42	47
Production of pig iron	1,211,569	1,383,169	5,410,890	5,702,721
Rolling mills and steel works...No.	65	64	65	67
Production of Bessemer steel	2,748,833	2,487,412	3,137,883	3,255,064
Production of open hearth steel	2,604,349	2,737,560	3,410,482	3,799,907
Production of all other steel	51,195	36,408	44,752	50,530
Total production of steel	5,404,377	5,261,380	6,593,117	7,105,501
Production of all kinds of rails	749,953	586,210	743,612	851,419
Production of structural shapes	689,849	601,025	881,932	1,054,747
Production of plates and sheets	945,327	839,015	1,232,705	1,300,873
Production of other rolled products	1,797,795	1,707,545	2,212,322	2,478,978
Production of all rolled products	4,182,924	3,733,795	5,070,571	5,686,017

Allegheny County produced 22.5 per cent. of the total of pig iron and 30.4 per cent of the total of steel ingots and castings in 1906.

The annual meeting of stockholders of Spang, Chalfant & Co., Inc., Etna Iron and Tube Works, Pittsburgh, was held January 13, at which the old officers were re-elected as follows: Henry Chalfant, president; D. B. McClelland, vice-president and treasurer; Walter C. Heath, secretary, and A. M. Bell, assistant treasurer. The old Board of Directors was also re-elected as follows: Henry Chalfant, D. B. McClelland, A. M. Bell, C. H. Spang and D. E. Park. This concern has started up its 12 and 16 in. mills, while part of its lapweld department has also been started.

The Pittsburgh Coal Company, Pittsburgh, has donated $20,000 for relief of the sufferers through the recent explosion at its Darr mines.

Reciprocal Demurrage Laws.

A Summary of State Laws on This Subject.

BY E. T. ARDERY.

Several of the Southern States have long had laws to regulate the supply of cars to shippers, providing for demurrage penalties payable to the shipper for failure to furnish cars promptly, and similar penalties for delay of cars in transit. These laws have stood the test of the courts, so far at least as they apply to local or State business, and there was a widespread demand during the car shortage of a year ago for similar legislation in other States. As a result of this agitation there are now 18 States with reciprocal demurrage laws, or rules of State railroad commissions having the same force as law. A formidable minority of intelligent shippers are disposed to question the wisdom of legislation of this character, and it is unnecessary to say that railroad officials are strongly opposed to any attempt at regulating operation by law; but whether wise or not reciprocal demurrage is an established fact over nearly half the Union, so far as State authority can establish it, and a host of shippers are determined to secure similar conditions in other States, as well as a national law of the same character.

Limit of Time Allowed.

Vermont has the most stringent law on car supply. The railroad is liable to a fine of $1000 for failure to furnish cars in four days, on written order, besides liability to the shipper for any loss he may sustain. In Alabama three cars or less must be furnished in two days, three to 10 cars in five days, and 10 to 25 cars in 10 days. In Arkansas the time allowed is six days, Colorado three days, Georgia four, Indiana 48 hr., Louisiana 10 days, Missouri four, Mississippi five, North Carolina four, North Dakota three, South Carolina four, Virginia four, these States making no distinction of time in the number of cars required. In Kansas orders for less than 10 cars must be filled in three days, 10 to 30 cars in six days, and 30 or more in 10 days. Oregon allows five days for five cars or less, 10 days for five to 10 cars, 15 days for 10 to 30 cars, and 20 days for more than 30 cars. South Dakota allows three days for less than 10 cars and six days for more than 10. Texas allows three days for 10 cars or less, and 10 days on orders for fifty cars or more. In Michigan, the Legislature has created a State Railroad Commission with power to make reciprocal demurrage rules, but the commission has not yet announced rules.

The Rate of Demurrage.

The prevailing rate of demurrage which the railroad is to pay the shipper for failure to furnish cars when ordered is $1 per car day, but in North Dakota and Oregon the rate is $2 per car day; in Arkansas and Kansas $5, and in Texas $25 per car day. In Indiana the rate is $1 on ordinary traffic, but $2 per car per day for failure to supply mines with coal cars. In Louisiana the shipper must make a deposit of $5 for each car ordered, and in North Carolina the railroad may demand a similar deposit. In North Dakota the railroad is not required to furnish more than two cars to one shipper at one time, and in Alamaba not more than 25, but otherwise there are no limitations in these laws on the number the shipper may require the railroad to furnish; excepting, of course, that the railroads would collect demurrage under their own rules for failure to load within the free time.

In Alabama the railroad can only collect $2 if the shipper fails to load a car. In Arkansas, if loading is not finished in the free time, 48 hr., the shipper must pay $5 per day for additional time; and if loading is not begun in free time the railroad may remove the car and collect $10. In Georgia, if loading is not commenced in free time, $2 may be collected. In Kansas the shipper must pay $5 per day for holding cars longer than the free time for loading, but 72 hr. are allowed on some commodities. In South Dakota, if loading is not begun in 48 hr., the shipper must pay $5 per day.

Minimum Time for Shipments.

Many of the States have endeavored to prevent delay of cars in transit by providing that a shipment must cover a minimum number of miles per day. In North Carolina, if the destination is within 50 miles of initial point, the shipment must be delivered within three days, an additional day being allowed for each additional 25 miles. In Alabama, Arkansas, Georgia, Indiana, Kansas, South Dakota and Virginia, the requirement is 50 miles per day. Missouri has set a little swifter pace by requiring a daily minimum of 60 miles. In Mississippi, if cars are delayed "by being switched to some track in transit," the railroad is liable for each day or fraction of day. The usual penalty for failure to cover the legal schedule is $1 per car day. Additional allowances at terminals are made in some cases, as in Indiana, where the car is to be moved through terminals at point of origin in 24 hr., and delivered in 24 hr. after arrival at destination. Florida, which has no general reciprocal demurrage rules, requires that perishable freight shall be forwarded within 24 hr., and other freight in 48 hr., and cars must be placed for unloading within 72 hr. after arrival at destination, the penalty for delays, either in forwarding or delivering, being $1 per car day. North Dakota has a severe requirement that if cars are offered within 2 hr. of the schedule of a local or next regular train, they must be taken, under penalty of 10 per cent. of freight charges for each 24 hr. delay, and if freight has not reached its destination within 60 hr. of the time due on schedule the consignee may refuse to accept it and the railroad is liable to the owner for the property.

In Illinois, Iowa, Minnesota and several other States, bills of the same character made good progress at recent sessions of the legislatures, and were only defeated by determined efforts of railroad lobbies. It is little wonder that railroad men have been alarmed at the growth of laws of this character, which reach down into the tender spots in railroad management and prescribe rules which it is difficult to evade and sometimes impossible to obey. There are times when it is unreasonable to expect that a railroad will fill all demands for cars, especially in the grain shipping States, but the agitation a year ago was so determined that it was impossible to check or modify it.

Court Decisions on Demurrage

The first decision of importance in the courts, under the legislative crop of 1907, is in Arkansas. In a suit brought by a shipper for demurrage, the railroad made the defense that a larg portion of its cars had gone out of the State to other roads, beyond its control, and that it was physically unable to fill all orders for cars, but the Supreme Court of that State has decided that this did not excuse the railroad from its duty under the law.

There have been decisions in the Federal courts to the effect that a railroad cannot be required, under a State law, to bring cars from another State to fill the order of a shipper, and there are some doubts as to what the ultimate rule of the courts will be. The general impression, however, among lawyers who have studied the question, is that the State may compel a railroad, doing business under its jurisdiction, to furnish cars to its citizens or submit to moderate penalties.

In Ohio the State Railroad Commission has fixed no penalty for failure to furnish cars, but it made a rule allowing three days to unload cars containing 66,000 lb. or more, which was very objectionable to the railroads. They intended to fight in the courts the jurisdiction of the State over demurrage, but finally abandoned the idea and submitted to the commission. In Indiana the railroads are having a struggle with the State commission over the question of supplying cars to coal mines, and there are no indications that they will be able to resist successfully the power of the commission.

Minimum Daily Movement Laws of Little Benefit.

State laws, or rules, requiring a minimum daily movement have proved of little benefit to shippers thus far. These can only be enforced on shipments that begin and end within the State, and in Indiana, it is estimated, that this intrastate traffic is only 12 per cent. of the total of carload traffic. There are more objections to rules of this character than to the regulation of car supply, unless the

minimum is merely fixed as a "backstop" to protect the shipper against possible discrimination in service.

The railroads are not paying any claims for delay in transit, and it is generally understood that the shipper who wants to recover any transit demurrage will have to sue for it. This, in fact, is likely to be the policy they will follow on claims for failure to supply cars. The railroad has a lien on each shipment it may deliver, for the freight charges, and it will not accept reciprocal demurrage claims in payment of freight bills.

The promoters of reciprocal demurrage, who have the active support of important coal, lumber and grain interests, hope to secure a national law through the passage of the Madden bill, now pending in the House of Representatives, or the Culberson bill in the Senate. Both of these bills provide for demurrage for failure to supply cars, as well as for delay in transit. The railroads, however, have very strong arguments to advance against a national law, and so long as they are as well supplied with empty cars as they are at present there is not much prospect of national legislation.

Canada's Rail Trade.

TORONTO, January 18, 1908.—Though trade in many lines has slackened very appreciably, the leading steel interests in Canada have still plenty to do. They have rail orders that will keep them busy for some time. Indeed, the rail mills seem assured of a demand that will last for more than one or two years.

Canada has entered upon a period of railroad expansion, and, unless the signs mislead, many thousands of miles will be built before there is any long pause in the work of pushing new lines into new territories. Should the country have to pass through an experience of hard times, the construction of the National Transcontinental Railway would go on, for the money is practically in hand, and the road is to be put down to serve in years of depression as well as in years of prosperity. It is to be part of the national outfit. The country's credit is behind the whole undertaking—that is, so far as the main line from Moncton, N. B., to Prince Rupert, on the Pacific, is concerned—for the Eastern Division is being built by the Dominion Government, and the bonds upon which the money for building the Western Division is raised are guaranteed by the Dominion Government. As to the 5000 miles of feeders, these are to be built by the Grand Trunk Pacific Branch Lines Company, which may be relied upon to be as enterprising in that work as the Canadian Pacific Railway Company has been in adding to the mileage of its branch lines.

The Canadian Northern Railway Company has been continuing its construction operations of late, and in a few years it may be expected to have its system much extended. Though an entirely private corporation, the Canadian Northern has the benefit of public credit and public subsidizing in large measure. Besides bonuses from the Dominion and from several of the Provinces traversed by its lines, it has bond guarantees from Ontario and Manitoba. The Canadian Pacific Railway Company keeps on spreading out and drawing a greater extent of country within its sphere of influence, its hand being forced by the competitive lines which the other two transcontinental systems are throwing out at various points. It is true there are no acts passed by the Federal Parliament or by Provincial legislatures for the giving of aid to the construction of Canadian Pacific Railway lines, but the original grant to the company was so huge and the land portion of that grant has become so valuable that the company has ample resources for the financing of its loans for any desired new construction work.

So far Canadian railroad companies have found in London a good market for their securities. Their borrowing propositions have not had the discouraging reception some United States railroad companies' loans have met with. Possibly the chief reason for this difference is that, while opinion in Canada is not partial to the railroads, legislation in reference to them is still rather for aiding than attacking them. Canadian Provinces do not pretend to such power over the railroads as many American States claim. The Federal jurisdiction here is not questioned to the extent it is in the United States.

At Sault Ste. Marie.

It is true there has been a shutting down of the rail mills at Sault Ste. Marie, but that is understood to be a consequence of excessive, not of deficient, demand. The rail mill stopped because its consumption had outrun the supplying capacity of the pig iron furnaces. These are kept going, and advantage is taken of the stoppage of the rail mill to make repairs. Very possibly the company will again become a buyer of raw material, and may prefer to keep off the market a short time, shutting down the mill in the interim and setting it in order for coming operations. The company has orders both from the Dominion Government and the Grand Trunk Pacific, as well as from other buyers. Moreover, the prices are materially above the parity of those ruling to-day.

At Sydney.

J. H. Plummer, president of the Dominion Iron & Steel Company, is now in Toronto. He reports trade conditions as extremely satisfactory to the company. A falling off in the consumption of rods has taken place, but all the steel made is being used in the manufacture of rails. The monthly output now is as good as the best in the company's record. The four blast furnaces are all at work. Referring to the litigation with the Dominion Coal Company, he noted that the latter had given notice of appeal from the judgment of the Nova Scotia Superior Court upholding the decision given in the trial court. There is yet the Supreme Court of Canada, and, after that, the Judicial Committee of the Imperial Privy Council, to which the case may be carried. Mr. Plummer says his company's claim now aggregates $2,400,000, made up of the excess paid for coal per ton above the price stated in the agreement with the coal company. He says that the steel company is paying nearly $1 a ton more than the railroads for its fuel. He said that as a proposal of settlement Premier Murray of Nova Scotia had suggested that the coal company transfer some of its areas to the steel company, but nothing had come of this. It was thought the coal company might prefer to give the steel company the coal in the ground rather than go on 90 years mining for the latter at what was alleged to be a loss. It had been reported that the Nova Scotia Legislature might intervene with legislation to stop the litigation between the companies, owing to the fact that the coal company is a large contributor to the Provincial revenue. As to this Mr. Plummer said:

> I should say that there is absolutely nothing in the situation that would necessitate any interference on the part of anybody. The only people who are suffering are the shareholders of the steel company, who are really paying far more for coal than they ought to do.

At Hamilton.

The Hamilton Steel & Iron Company has recently completed its new blast furnace, and it appears to have business in sight for the continued operation of its works to their full capacity. The capital stock of the company has just been increased from $1,513,600 to $5,000,000, the old certificates merely being exchanged for new ones of the higher denomination. This means that the company considers that its property has improved in value by more than 200 per cent. This improvement is not the result of additional capital, but is the outcome of growth of resources. Out of earnings back dividends have been paid and costly additions have been made to the plant. The company received large sums in bounties.

C. A. C. J.

The Jones & Laughlin Steel Company, Pittsburgh, has practically suspended all work in connection with its three new blast furnaces at Aliquippa, Pa. The shells of two of the furnaces are up and all the stoves for the three stacks are practically completed, while the engine house and some of the outside buildings are under roof, and some of the blowing engines have been installed. Active work will not be started again until April or May. Plans for the Talbot open hearth steel plant, plate and structural mills have been laid aside until conditions materially improve.

A Classification of Foundry Irons.

In connection with the work of the Ore and Pig Iron Committee, in the general movement for co-operation and conference in the iron and steel trades, questions have arisen, growing out of the diverse practice of producers in the grading of pig iron. The situation was somewhat complicated by the increasing percentage of pig iron sold by analysis rather than by grades determined by fracture. It was thus impossible to tell, when a sale of No. 2 foundry iron was reported, for example, whether the iron might not have been close to the No. 1 foundry of a competitive producer; on the other hand, the iron thus sold might closely correspond to what still another producer would classify as just below the maximum silicon and just under the maximum sulphur of his No. 3 grade. To harmonize the practice of different sections a subcommittee was appointed, consisting of the following: John A. Topping, Republic Iron & Steel Company, chairman; J. W. McQueen, Sloss-Sheffield Steel & Iron Company; B. F. Fackenthal, Thomas Iron Company; E. S. Cook, Warwick Iron & Steel Company; Leonard Peckitt, Empire Steel & Iron Company and Rogers, Brown & Co. interests; F. B. Richards, M. A. Hanna & Co., representing Central Western and Chicago district furnaces. This committee met in New York January 14 and drafted a schedule of analyses representing the various bases of grading existing in different sections. The variations in chemical content of irons bearing the same grade designation grow out of the different ores used in different districts, the three general classes being Southern, Eastern and Central Western. It was found, however, that the Buffalo group and the Chicago group of merchant furnaces had some deviations from the grading generally adopted by Valley and Ohio lake furnaces, and therefore separate silicon and sulphur schedules were set down for Buffalo and Chicago. The object of gathering and disseminating this information was to make it possible for producers in any district to quote in any other district on the grade of iron which, according to their own classification, most closely corresponds to No. 2, for example, or No. 3, as the case might be, as found in the grading scheme of their competitors. The following is the schedule as prepared by the committee:

Classification and Grades of Foundry Iron.

SOUTHERN POINTS.

	Silicon. Per cent.	Sulphur. Per cent.
No. 1 foundry	2.75 to 3.25	0.05 and under.
No. 2 foundry	2.25 to 2.75	0.05 and under.
No. 3 foundry	1.75 to 2.25	0.06 and under.
No. 4 foundry	1.25 to 2.00	0.065 and under.
Gray forge	1.25 to 1.75	0.07 and up.
No. 1 soft	3.00 and over.	0.05 and under.
No. 2 soft	2.50 to 3.25	0.05 and under.

EASTERN POINTS.

	Silicon. Per cent.	Sulphur. Per cent.
No. 1 foundry	2.75 and up.	0.03 and under.
No. 2 X foundry	2.25 to 2.75	0.045 and under.
No. 2 plain	1.75 to 2.25	0.05 and under.
No. 3 foundry	1.25 to 1.75	0.065 and under.
No. 2 mill	1.25 and under.	0.065 and under.
Gray forge	1.50 and under.	0.065 and up.

Note.—If sulphur is in excess of maximum, the iron is graded as lower grade, regardless of silicon.

CENTRAL WEST AND LAKE POINTS.

	Silicon. Per cent.	Sulphur. Per cent.
No. 1 foundry	2.25 to 2.75	0.05 and under.
No. 2 foundry	1.75 to 2.25	0.05 and under.
No. 3 foundry	1.75 and under.	0.05 and under.
Gray forge		0.05 and over

BUFFALO DISTRICT.

	Silicon. Per cent.	Sulphur. Per cent.
Scotch	3.00 and over.	0.05 and under.
No. 1 foundry	2.50 to 3.00	0.05 and under.
No. 2 foundry	2.00 to 2.50	0.05 and under.
No. 2 plain	1.50 to 2.00	0.05 and under.
No. 3 foundry	1.50 (under)	0.05 and under.
Gray forge		0.05 (over)

CHICAGO POINTS.

	Silicon. Per cent.	Sulphur. Per cent.
No. 1 foundry	2.25 to 2.50	0.02 to 0.05
No. 2 foundry	1.75 to 2.25	0.02 to 0.05
No. 3 foundry	1.35 to 1.75	0.06 and under.
Scotch	2.50 to 3.00	0.05 and under.
Silvery	3.00 to 3.50	0.05 and under.
Gray forge		0.06 and over.

Sampling.

The report contains the following on the subject of sampling:

The American Society for Testing Materials recommended the following method of sampling, which has been adopted by the American Foundrymen's Association:

In all contracts where pig iron is sold by chemical analysis each carload or its equivalent shall be considered as a unit. At least one pig shall be selected at random from each 4 tons of every carload, and so as to fairly represent it.

Drillings shall be taken so as to fairly represent the fracture surface of each pig, and the sample analyzed shall consist of an equal quantity of drillings from each pig, well mixed and ground before analysis.

In case of disagreement between buyer and seller an independent analyst, to be mutually agreed upon, shall be engaged to sample and analyze the iron. In this event each pig shall be taken to represent every 2 tons.

The cost of this sampling and analysis shall be borne by the buyer if the shipment is proved up to specifications and by the seller if otherwise.

The Testing Society's Pig Iron Specifications.

In view of the action taken by the manufacturers as detailed above, it is interesting to note that the committee of the American Society for Testing Materials, which has in hand standard specifications for cast iron and finished castings, is moving for a revision of that society's specifications for foundry pig iron. These were formulated as a result of the Delaware Water Gap meeting of the society in 1903, the committee having for its chairman Walter Wood of Philadelphia, and for its secretary Dr. Richard Moldenke, secretary of the American Foundrymen's Association. In calling a meeting of the committee in conjunction with other committees of the American Society for Testing Materials at Columbia University January 28 and 29, the secretary says:

It is now urgently necessary that a revision of the specifications for foundry pig iron be made. Progress in the purchase of pig iron for foundry purposes by analysis is now so marked, and the specifications we have issued are so obsolete, that your committee can no longer postpone action in the matter. The complaints that have come in recently are so strong and just that your chairman has taken advantage of the general meeting to call together your committee for this work.

At a recent meeting of mine owners and miners' representatives in Pittsburgh, called to discuss the shortcomings of mining laws, President John H. Jones of the Pittsburgh-Buffalo Company declared the time had come for a better system of laws to protect the miner and operator. He believed fully 50 per cent. of the disasters could be eliminated by a proper observance of the mine laws, but, most of all, the mine rules, which represented more closely the wisdom of practical experience. He appealed to the miners to labor among their colleagues for better observance of such rules and asked them to go to the mine managers and demand the arrest of any miner who disobeyed them.

From the original estimate of $135,000,000 as the cost of the Panama Canal the figures have been going steadily upward until the latest estimate, made January 14, before a committee of the House of Representatives at Washington, by Colonel Goethals, chief engineer and chairman of the Canal Commission, is that the canal would cost $300,000,000. This includes the $40,000,000 paid the French company and the $10,000,000 paid the Republic of Colombia.

The Washington Coal & Coke Company, Dawson, Pa., has recently formed an organization at Star Junction, Pa., which has for its object improvement in methods of miners. Meetings will be held at stated intervals for the purpose of discussing questions and circumstances which come up during practical work in the mines.

PERSONAL.

Morton & Burritt have opened offices at 2 Rector street, New York, to do a general engineering business. The firm is an outgrowth of the business of Walter S. Morton, consulting engineer for a number of municipal and corporate enterprises, whose office until December has been at Hartford, Conn. His partner is Wilmot W. Burritt of New York, who has had independent practice as an analytical chemist and is also experienced is metallurgical work and in the technical as well as in the commercial branches of a number of different lines of manufacturing.

Harold W. Slauson, graduate of the Cornell mechanical engineering department, has become associated with Harry W. Perry in conducting the Technical Press Bureau, 25 West Forty-second street, New York. Howard Greene has retired from active connection with the bureau to embark in commercial business at the same address.

Albert Couch Bradley, for many years with the G. Drouvé Company, Bridgeport, Conn., and for the last 10 years its president, has severed his connection with the business on account of his health. He has sold his interest to William P. Dee of the *Railway Age*, who, it is understood, will assume Mr. Bradley's duties with the company.

Walter B. Snow, publicity engineer, Boston, has been elected president of the Alumni Association of the Massachusetts Institute of Technology.

Peter Eyermann, metallurgical engineer of Dubois, Pa., has returned from a trip through Germany, England and Scotland, having visited the largest gas engine plants and shipyards.

Dr. Richard Moldenke, Watchung, N. J., secretary of the American Foundrymen's Association, has been appointed by the Governor of New Jersey a member of the Board of Managers of one of the State charitable institutions.

John C. Chandler will become the Cleveland, Ohio, sales representative of the Lackawanna Steel Company on February 1, succeeding C. D. Rhodes. Mr. Chandler has been a lifelong resident of Cleveland.

A. L. Roberts, for 18 years with the Morgan Engineering Company, has entered the employ of Pawling & Harnischfeger, Milwaukee, Wis., as mechanical and designing engineer.

William McConway, president of the McConway-Torley Company, Pittsburgh, has been elected vice-president of the Second National Bank of that city.

W. H. McFadden, vice-president and general manager of Mackintosh, Hemphill & Co., Pittsburgh, has returned from Europe.

N. Lilienberg, Philadelphia, Pa., metallurgical engineer, will address the Metallurgical Section of the Franklin Institute in that city, January 23, on the subject of Compression of Semiliquid Steel Ingots."

Invitations have been issued by the trustees and faculty of the University of Illinois to the installation, on February 5, of W. F. M. Goss, as dean of the College of Engineering.

Joseph Wharton has declined reelection as one of the directors of the Lehigh Valley Railroad, on the plea of ill health.

George W. Theiss has been elected president of the Monongahela River Consolidated Coal & Coke Company, Pittsburgh, to succeed Francis L. Robbins. Alexander Dempster was made chairman of the Board of Directors. Mr. Theiss was formerly vice-president of the company.

Major C. D. Rhodes, sales agent at Cleveland, Ohio, of the Lackawanna Steel Company, suffered a paralytic stroke while in New York this week. He was taken to the New York Hospital and is reported somewhat improved.

Reports that the Carnegie Steel Company recently purchased a new process for annealing armor plate have been officially denied.

Customs Decisions.

Steel Wire or Metallic Pins.

Notice has been served on importers by Henry M. Clapp, Acting Appraiser of the Port of New York, that unless specifically directed to the contrary by the Treasury Department, merchandise consisting of articles of round steel wire, 3 in. and 3½ in. in length, sharpened to a point at one end and bent into a circle at the other end, will be returned for duty as a manufacture of round steel wire, at 40 per cent ad valorem, plus 1¼ cents per pound, under paragraph 137 of the tariff. Heretofore, these articles had been returned for duty as metallic pins with solid heads as provided for in paragraph 188. The former classification called for duty at the rate of 35 per cent, but this return the department now finds incorrect, and the higher duty will be exacted at the expiration of 30 days in accordance with the recent determination of the Government to give importers a month's notice of impending changes in classification. Samples of the merchandise in question may be seen upon application to the assistant appraiser of the Ninth Division in the federal warehouse at Christopher and Washington streets.

Agate Bearings for Scales.

The Board of United States General Appraisers has overruled a claim filed by Albert Lorsch & Co., New York, regarding the classification to be accorded agate bearings for scales. Objection was made by the importers to the action of the Government in returning the merchandise for duty at the rate of 50 per cent, under the provision in the tariff for "manufactures of agate." Instead, the importers insisted that the bearings should be admitted as "precious stones, cut," under paragraph 435. Some time ago the board and the Federal Circuit Court ruled that the merchandise is entitled to entry at the lower rate, but on the Government's appeal to the Circuit Court of Appeals the decisions of the lower tribunals were reversed. The board now rules in harmony with the conclusion reached by the higher court.

Saddles for Motor Cycles.

The board has overruled a protest filed by R. F. Downing & Co., New York, concerning the rate of duty to apply to saddles for motor cycles. It was alleged by the protestants that the articles should be classified as manufactures of leather with duty at the rate of 35 per cent. On the other hand, the Custom House authorities claimed that the component of chief value is metal, and hence that the articles should pay 45 per cent.

Pocket Knives.

The board has taken favorable action in the protest filed by Thomas Irwin & Sons, New York, in a controversy dealing with the classification to be accorded pocket knives. The knives were assessed for duty at the rate of 40 per cent. ad valorem and 10 cents each, as being valued at more than $1.25 per dozen. It was maintained by the importers that the duty should be at the rate of 40 per cent. and 5 cents apiece as pocket knives valued at more than 50 cents a dozen, but not exceeding $1.25 per dozen. The claim was sustained.

Minor Decisions.

The board has found in favor of the contentions of the J. Wilckes Company, New York, and Wetherell Bros., Boston, who objected to the imposition of an additional duty on "cold rolled, smoothed only" steel products. A controversy regarding the classification of old bronze and other metals standing in the name of E. Denike, Laredo, Texas, was decided in favor of the Government as the importer failed to submit testimony in support of his contention.

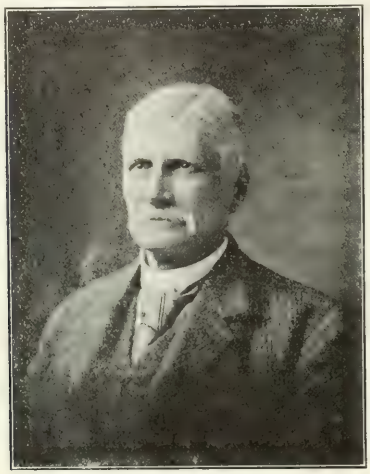
The factories of the Northampton Cutlery Company and the William A. Rogers, Ltd., Northampton, Mass., reopened after inventory taking on an open shop basis, following an announcement to the employees that such would be the policy of these companies hereafter. Both works had previously been operated under union conditions.

OBITUARY.

GEORGE V. CRESSON.

George Vaux Cresson, a well-known engineer and manufacturer, died January 18, after a long illness, at his country residence near Philadelphia. He was born in the city of Philadelphia September 10, 1836, and was therefore in the seventy-second year of his age at the time of his death. He was the son of William P. Cresson, a well-known philanthropist and manufacturer.

Mr. Cresson learned the machine business with Bement & Dougherty, and in 1859 established the firm of Cresson & Hubbard, general machinists and lathe builders, locating at Twelfth and Noble streets. As the business increased it outgrew the plant, and in 1866 moved to the corner of Eighteenth and Hamilton streets, the firm being changed at the time to Cresson, Hubbard & Smith. The new firm took up the specialty of shafting and power transmission, and added to its name that of the Philadelphia Shafting Works. The business was continued at this location for 22 years, by which time



GEORGE V. CRESSON.

it had so increased that a further expansion was necessary, and in 1888 it was again moved to Allegheny avenue, west of Seventeenth street, where it is still located. With this change the firm added an extensive iron foundry to its other lines.

In 1892 the firm was incorporated under the name of the George V. Cresson Company, with Mr. Cresson as its president. During the past few years, however, his activity in the company gradually lessened and for a year or more he had taken no active part in the business, although honorary president of the corporation. His wife died several months ago, and they had no children. He leaves a brother, Caleb Cresson, and three nephews, Francis M. Cresson, Caleb Cresson, Jr., and Emlen V. Cresson, all of whom are actively connected with the business. Mr. Cresson was a member of the Franklin Institute, the Engineers' Club and the Manufacturers' Club, which he served as president for three years. He was also a member of other social and business organizations.

MATTHIAS NACE FORNEY, who has been a prominent figure in the railroad engineering world for 40 years, died in New York January 14. He was born in Hanover, York County, Pa., March 28, 1835. Mechanism and science interested him very early in life. In 1852 he entered the locomotive shop of Ross Winans at Baltimore as an apprentice, and four years later became a draftsman in the shops of the Baltimore & Ohio Railroad. While employed in the machinery department of the Illinois Central Railroad in Chicago in the early 60's, he designed an improved tank locomotive, afterward known as the "Forney engine." It was adopted by the New York elevated railroads in 1875, or nearly 10 years after the patent was allowed. In 1870 Mr. Forney became associate editor of the *Railroad Gazette*, then published at Chicago. After the fire the paper was taken to New York, Mr. Forney becoming one of its proprietors and directing its policy on the technical side until 1884, when he retired from the editorship and sold his interest in the paper. Three years later he bought the *American Railroad Journal* and Van Nostrand's *Engineering Magazine*, and consolidated them under the name of the *Railroad and Engineering Journal*, which he published until the end of 1895. He then sold his interest under an agreement to edit the paper for one year thereafter. Mr. Forney patented a number of inventions relating to locomotives, railroad cars and railroad operation. Apart from the tank locomotive, the only patents which were profitable to him were those on car seats. He was active in the work of the American Railway Master Mechanics' Association and in the Master Car Builders' Association, the former electing him an honorary member in 1898 and the latter a life member in 1890. Mr. Forney was married in 1906, having remained a bachelor until his seventy-second year.

CHARLES H. SMYTH, for many years secretary and superintendent of the Franklin Iron Works, Clinton, N. Y., died January 19, at the age of 68, at the residence of his son, Charles H. Smyth, Jr., at Princeton, N. J. Although not a college graduate, he was interested in educational work and was a trustee of Hamilton College at Clinton, N. Y. He leaves a widow and two sons.

JAMES B. CLOW, president of James B. Clow & Sons, Chicago, died January 7, aged 76 years. He had been ill for some time and was on this account compelled two years ago to relinquish his duties as president of the company and active participation in business. He was born at North Sewickley, Pa. At the breaking out of the war he was among the first to respond to President Lincoln's call for troops, entering the service as captain. He served until January, 1865. He began his business career at Pittsburgh, where, in 1865, he established a plant for the manufacture of iron pipe. Going to Chicago in 1875 he continued in the same business, and three years later the firm of James B. Clow & Son was organized, which in 1894 was incorporated as James B. Clow & Sons, manufacturers of cast iron water pipe, heating and plumbing supplies. The company's pipe foundry is located at Newcomerstown, Ohio. He leaves three sons, W. E. Clow, Charles R. Clow and Harry B. Clow, all of whom are officially connected with the company.

JONAH L. BIRCH, master mechanic at the Union Works of the Carnegie Steel Company, Youngstown, Ohio, died January 17, aged 58 years. He was born in Cannock Wood, Staffordshire, England.

DANIEL C. STOVER, Freeport, Ill., heavily interested in local manufacturing enterprises as well as financial institutions, died January 17, aged 68 years.

HERBERT M. SMITH, Worcester, Mass., manager of the Commonwealth Machine Company, manufacturer of sheet metal working machinery, died January 20, aged 51 years. He was a native of Northfield, Conn., and conducted a sheet metal business at Waterbury, Conn., until he went to Worcester 16 years ago, establishing the New England Steel Roofing Company. He was well known as a designer of sheet metal working tools and as an expert in cornice construction.

ANTHONY P. SMITH, president of the A. P. Smith Mfg. Company, Newark, N. J., died January 21, aged 71 years. He was the inventor of a pipe tapping machine which made it possible to make as many connections as necessary with a water main without shutting off the water while the work was in progress. The company was formed about 10 years ago for the manufacture of these machines and other water works supplies. Born in Dublin, Ireland, Mr. Smith came to this country when a boy with his father, and learned the trade of patternmaker. About 30 years ago he was appointed by the old Newark

Aqueduct Board as supervisor of the water department and held the place until the board went out of existence 14 years later. He leaves two sons and two daughters.

NEWS OF THE WORKS.

Iron and Steel.

No. 2 blast furnace of the Bon Air Coal & Iron Company, Allen's Creek, Tenn., was blown out last week for repairs, after running continuously for nearly four years.

Furnaces Nos. 2 and 4 at the Ohio Works of the Carnegie Steel Company, Youngstown, Ohio, were blown in last week, after having been banked since December 1. It is probable another stack will be started this week, the output of these furnaces being needed for the Bessemer plant at the Ohio Works, which started up about a week ago.

No. 1 Furnace of the Tennessee Coal, Iron & Railroad Company's Ensley, Ala., plant has been blown in, after an idleness of two weeks for repairs.

During the coming week the furnace of the Alabama Consolidated Coal & Iron Company at Ironaton, which has been out of blast for about four weeks, will be put in operation, and within the next 10 days the Gadsden furnace of the company will be blown in.

It is authentically stated that the rolling mill of the Emery Steel Company at Gadsden, Ala., will resume operation before February 1. This plant has been out of operation for about 60 days.

At the annual meeting of the West End Rolling Mill Company, Lebanon, Pa., held last week, Christian Shenk was elected president, Eli Atwood vice-president and general manager and Harry F. Mattern secretary and treasurer.

The demand for Detroit tubing has grown so rapidly that the Detroit Seamless Tubes Company, Detroit, Mich., is installing additional machinery, to enable it to make larger sizes of cold drawn seamless steel mechanical tubes. The additional equipment will increase the output materially.

The plant of the Knoxville Iron Company, at Knoxville, Tenn., has resumed after a two weeks' shutdown. About 700 men are employed.

General Machinery.

The Wallace Machinery Company, Champaign, Ill., has completed its new factory building at North Champaign street, in which the equipment of the old Walnut street plant has been installed. The new building, which is of brick construction, two stories high, will be ready for operation within a few days.

The Louisiana & North West Railroad has moved its general offices from Magnolia, Ark., to Homer, La., and is now transferring its shops from Gibsland to the latter place.

The Atchison, Topeka & Santa Fé Railroad has recently purchased 80 acres of land near its roundhouse at Clovis, N. M., with the intention of erecting shop buildings on the site at some future time. It is not believed that any construction work will be undertaken at that point in the immediate future.

At the annual meeting of the directors of the Harrold Foundry & Machine Company, held at its general offices in New Kensington, Pa., on January 16, Charles M. Best was elected president. Mr. Best was for some years associated with the Monessen Foundry & Machine Company, Monessen, Pa. The Harrold Foundry & Machine Company manufactures heavy machinery, ice machines and does a general foundry business, having two cupolas, with a capacity of 100,000 lb. of rough and finished castings per day, and gives employment to about 300 men.

Power Plant Equipment.

A franchise has been granted to M. C. & G. C. Martin, Cleveland, Ohio, for the installation of an electric light plant at Springdale, Ark., work upon which has been begun. The plant is designed for a 110-220 volt three-wire system, and will include a 90-hp. Erie City balanced valve engine and two Westinghouse generators, which will be installed in a building 38 x 40 ft.

The Parker Boiler Company, Philadelphia, Pa., is installing boilers in the plants of the Continental Salt & Chemical Company, Alvarado, Cal., one 298 hp.; Lafayette Building, Philadelphia, owned by the Girard Estate, two 234 hp., and King Philip Copper Company, Winona, Mich., two 300 hp.

The capacity of the water and light plant of Hope, Ark., is to be increased by the installation of an additional engine and dynamo, and a new power house is to be built. The city has the engine on hand, but is not yet ready to purchase the dynamo. A new water works system will also be built, probably within the next six months. Charles M. Richards is superintendent.

The Gorman Light & Power Company, Gorman, Texas, has expended $15,000 in the erection and equipment of a new plant 60 x 80 ft. The company also operates a water works in connection with the light plant. J. R. Barclay is engineer in charge.

Bridges and Buildings.

The Scranton Iron Works, Scranton, Pa., has secured a contract from the Pennsylvania Steel Company for the ornamental iron work on the Pelham low bridge, on the New York, New Haven & Hartford Railroad.

Foundries.

W. J. Holloway, recently of Fort Worth, Texas, has opened an iron foundry at Stamford, Texas. The plant will be known as the Stamford Iron Works.

The Standard School Desk Company, Columbus, Ga., which has been incorporated by M. O. Berry and others, expects to build a large foundry.

The plant of the United States Cast Iron Pipe & Foundry Company at Anniston, Ala., having been shut down for 30 days for the installation of electric rammers, will resume operation about February 1.

The plant of the Vulcan Foundry & Machine Company, New Castle, Pa., will be offered for sale by the trustee in bankruptcy, C. L. Baldwin, on January 25.

Schedules in the bankruptcy case of the Pittsburgh Industrial Iron Works were filed in the United States District Court at Pittsburgh last week. They show liabilities of $220,601 and assets amounting to $295,973. Of the liabilities $167,081 of the amounts are in secured claims, while $49,745.82 are in unsecured claims. In addition to the liabilities, the schedules show that there is yet to be added the company's payroll for parts of October and November.

The East Liverpool Foundry, Machine & Supply Company, East Liverpool, Ohio, has installed a new crane capable of lifting 8 tons of molten metal to the flasks containing the molds for heavy castings, for which the company recently received a large order. The crane was built and installed by Mader & Sons of Chester, Pa.

The plant of the Bessemer Soil Pipe Company, Bessemer, Ala., employing more than 400 men, has resumed operations. R. O. Nelson of St. Louis is president and W. B. Graham of Chattanooga has been appointed general manager. It is understood that the prospects are for steady operation for some time to come.

At a meeting of the stockholders of the Salina Foundry & Mfg. Company, Salina, Kan., it was decided to enlarge the plant next spring and to purchase some additional machinery.

Fires.

The plant of the National Conduit & Cable Company, Hastings, N. Y., was badly damaged by fire January 16, the loss being about $75,000.

The plant of the Stahl Glass Company, Greensburg, Pa., was burned January 18, the loss being about $50,000.

The machine shop of M. E. Moore & Son, Westfield, Mass., was badly damaged by fire January 16.

The plant of the Winona Carriage Company, Winona, Minn., was damaged $5000 by fire January 16.

The plant of the Sunflower Glass Company, Coffeeville, Kan., was destroyed by fire January 20, the loss being about $50,000.

Hardware.

The Advance Machine & Supply Company, Indianapolis, Ind., has been succeeded by the Advance Stamping & Mfg. Company. New capital has been interested, the capacity of the plant has been doubled and the scope of the business has been considerably enlarged.

Miscellaneous.

The Escanaba Steam Boiler & Sheet Iron Works, Escanaba, Mich., Grosnick & Michels, proprietors, has been organized to do a general boiler making, sheet iron and repair business. The shop has been furnished with tools suitable for the work contemplated, additions to which will be made as necessity requires. Both Mr. Grosnick and Mr. Michels have for several years been employed as boiler makers in the shops of the Chicago & Northwestern Railroad.

The Chattanooga Car & Foundry Company, Chattanooga, Tenn., has after a short period of idleness started up again, but is running with a considerably reduced force. While business has not materially improved since the first of the year, the outlook is considered promising.

The Milwaukee Car Mfg. Company, Milwaukee, Wis., which for several years has been operating the Milwaukee refrigerator car line, has been incorporated under the title of the Milwaukee Refrigerator Transit Company, with a capital stock of $50,000. New car shops being built by the company on the Port Washington road, near Whitefish Bay, are nearing completion. Materials are on hand for the building of 100 refrigerator cars, the construction of which will be begun on February 1. The plant will have a capacity of five refrigerator or ten box cars a day, and is equipped with machinery for the economical handling of all wood and iron parts of freight cars. An installation of Allis-Chalmers direct connected engine and generator with group motor system furnishes the motive power. The officers of the company are Fred Pabst, president; Robert Nunnemacher, vice-president; T. F. How, secretary and general manager.

Warren Webster & Co., Camden, N. J., have recently sold

four Webster air washers and humidifiers of large size for installation in the new office building of Armour & Co., Chicago, Ill. The firm has organized a regular department for the design and manufacture of this apparatus, which was recently placed on the market, and is in a position to supply any demand. The new department is in charge of W. G. R. Braemer, formerly of Buffalo, N. Y., who has had considerable experience in this line of work.

The Savage Arms Company, Utica, N. Y., has increased its capital stock from $200,000 to $1,000,000.

Dumont C. Patterson has been appointed receiver for the Atlanta Furnace Company, Atlanta, Ga.

The Royal Mfg. Company, Lancaster, Pa., manufacturer of tool sharpeners made from iron, steel and cutting abrasives, has incorporated under the same name with a capital stock of $25,000. There will be no change in the management of the new company, which has organized with W. T. Brown as president, and C. N. Shank, secretary and treasurer.

A voluntary petition in bankruptcy was filed in the court at Pittsburgh last week against the Bingaman-Savage Brass Company of that city. The company at a meeting of its directors held on January 11 admitted its inability to pay its debts. Claims amounting to $14,037 were filed against the company.

The plant of the Davis Lead Company, Butler, Pa., which has been idle for six months, has been sold to the National Lead Company, New York, for the reported price of $196,597. It is said the purchaser will start the plant next spring.

Stockholders of the Dukesmith Air Brake Company of Pittsburgh met last week and re-elected the old officials, these being H. S. Dukesmith, president; Thomas A. Van Horn, vice-president, and A. K. Snodgrass, secretary and treasurer. These officials with F. W. Winter, John A. Murphy, A. J. Palm and John R. Snodgrass comprise the Board of Directors. Action of the directors in buying the former plant of the Snodgrass Mfg. Company, near Crafton, Pa., was ratified, and plans were approved for the installation of new machinery and the beginning of operations about February 1.

The annual meeting of the stockholders of the Pittsburgh Automatic Vise & Tool Company was held in Pittsburgh January 13, at which the old Board of Directors was re-elected. The directors organized by re-electing G. P. Blackiston, president and general manager; A. H. Blackiston, vice-president, and H. T. Kehew, secretary and treasurer.

The American Steel Package Company, Defiance, Ohio, has practically completed a large addition to its plant, which will be used in the manufacture of steel oil barrels. It is expected that the enlarged works will be in full operation by March 1.

The Safety Car Coupler Company, Chattanooga, Tenn., has been incorporated, with a capital stock of $100,000, by A. W. Boyd, M. A. Brown and others. A coupler patented by D. J. Sauls will be manufactured.

Owing to the unbreakable plate steel construction, which has reduced the weight of the Sturtevant roll jaw fine crusher one-half, doubled its strength and made a better machine at a greatly decreased cost, the Sturtevant Mill Company, Boston, Mass., announces a reduction of 50 per cent. in price on these mills. A large business and increased manufacturing facilities have also lessened the cost of production. These machines are able to crush large hard rock and ore to ½ in. in large quantities, and have been used in nearly all countries for the last 10 years on many kinds of mining work. Being made of plate steel they are especially strong and unbreakable by rock crushing shock. They are also light and can be easily dismantled, transferred and assembled on foundations. The chushers are made in eight sizes, with capacity at finest setting of from a few hundred pounds to 300 tons per day, or for 1 in., crushing up to 600 tons per day. The company also manufactures coarse breakers of special plate steel construction for ½ or 4 in. crushing, with capacities of from 150 to 3600 tons per day.

It is stated that locals of the Iron Molders' Union in the following cities have received word from the Cincinnati headquarters that strike benefits will be discontinued January 28, 1908, and that strikers must seek work wherever it may be obtained: San Francisco, Cal.; Moline, Ill.; Louisville, Ky.; St. Paul, Minn.; Detroit, Mich.; Buffalo, N. Y.; Port Chester, N. Y.; Pittsburg, Kan.; Aurora, Ill.; South Milwaukee, Wis.; Minneapolis, Minn.; Barberton, Ohio; Connellsville, Pa.; Warren, Pa.; Springfield, Mo.; Mattoon, Ill.; Beloit, Wis.; Dowagiac, Mich.; Cleveland, Ohio; Williamsport, Pa., and Jersey City, N. J. The strikers in the above cities are directed to accept work alongside of nonunion men, with a view to reorganizing the various shops on a union basis.

George A. McKeel & Co., Ltd., Jackson, Mich., manufacturers of Peninsular self-oiling roller bearings and sheet metal specialties have changed the name of the firm to Sparks-Withington Company, Ltd.

Trade Publications.

Core Drills.—Ingersoll-Rand Company, 11 Broadway, New York. Pamphlet 91-A. Pertains to diamondless core drills, and illustrates and describes the Davis Calyx drills, which are built in 10 different sizes, adapted for removing cores of various diameters and lengths and for driving by various motive powers.

Spring-Seat Valves.—Crosby Steam Gage & Valve Company, 16 Dey street, New York. December issue of the *Crosby*. Refers to the Crosby spring-seat valves, which are claimed to combine strength, quality and durability, and are guaranteed not to leak at high pressures.

Welded Pipe.—National Tube Company, Pittsburgh, Pa. Booklet. Size 6¼ x 9¼ in.; pages 31. Devoted to the manufacture and characteristics of modern welded pipe, illustrating and describing the progressive operations from the ore to the finished product, including the old process of refining by puddling and the new process of working pig iron into pipe steel.

Steam Heating.—Warren Webster & Co., Camden, N. J. Mailing card. Entitled "Winter Is Coming." Calls attention to the advantages of the Webster vacuum system of steam heating, with which more than 3000 buildings of one kind or another are now equipped.

Hoisting Engines and Mining Machinery.—Riverside Iron Works Company, Central avenue and Fourth street, Kansas City, Mo. Catalogue M. Contains descriptive matter, illustrations and full information concerning the dimensions, capacities, &c., of classes A, B and C hoisting engines, electric mine hoists, mine fans, mine cars, mine cages, hoisting sheaves, scales and wire rope. Tables of weights per foot of flat, round and square rolled iron are appended.

Pneumatic Tools.—Independent Pneumatic Tool Company, First National Bank Building, Chicago, Ill. Catalogue No. 8. Size 6 x 9¼ in.; pages 80. Cloth. This issue supersedes all previous ones and describes and illustrates the company's line of Thor pneumatic tools, including air compressors, chisels, air hose couplings, drills, flue rolling machines, flue rollers or expanders, forges, grinding machines, hammers, holders-on, hose, rivet sets, saws and wood boring machines. Many of the illustrations show these tools in operation, and lists of parts and tables of weights and dimensions are included.

Paints for Metals.—National Paint Works, Williamsport, Pa. Booklet. Size 6 x 9 in.; pages 47. A Review of Technical Paints for Metals, seventh edition. Relates to the causes of paint decay and how they may be prevented. A discussion of the pigments and vehicles used in the company's paints is given and the particular paints best suited to different outdoor purposes are indicated. The several grades and kinds of paints made are individually described in the last few pages, and illustrations throughout the booklet show structures on which National paints were used.

Steel, Iron and Machinery.—Scully Steel & Iron Company, Halstead and Fulton streets, Chicago, Ill. Stock list. The January and February issue of this company's list of steel and iron, sheets and plates, tubes, rivets, structural shapes, bars, shafting, tool steel, wire, small tools and hand and power machinery for metal working shops is now being distributed.

Calendar.—Shumacher & Boye, Cincinnati, Ohio. Monthly calendar, 8¾ x 14 in. The 12 sheets show views of different examples of the lathes built by the company, including roughing lathes and instantaneous change gear engine lathes, double back-geared and triple geared, ranging in sizes from 18 to 48 in. swing.

Planer Chucks.—Union Mfg. Company, New Britain, Conn. Circular. Illustrates Union planer chucks especially designed for planer and shaper work, and gives prices of round base types, No. 76, and square base types, No. 78. Both are made in eight sizes ranging in jaw opening from 3½ to 21½ in.

Tools and Tool Holders.—Western Tool & Mfg. Company, Springfield, Ohio. Mailing card. New Year's greetings and reminder of the company's products—Champion tool holders, Champion expanding mandrels, portable stands or movable benches, files and file handles. The company also handles Champion brand self-hardening steel.

Calendar.—Hazard Mfg. Company, Wilkes-Barre, Pa. Hanger calendar, 21 x 27 in. Calendar pad, 20 x 13½ in., with figures 1¾ in. high. Shows a view of anthracite collieries in the Wyoming Valley near Wilkes-Barre, where one of the company's products, wire rope, plays an important part in hoisting operations. The calendar also calls attention to another product, insulated wires.

The Battery tunnel under the East River, New York, was put in regular service January 9. The tunnel is part of the Rapid Transit Subway of New York City, and connects the Manhattan Borough system with the lines in Brooklyn Borough. Trains will be run only to Borough Hall for the present. The Hudson River tunnel of the Hudson & Manhattan Railroad Company will be opened in two months, the first electric train having run from Hoboken to New York January 4. The terminal station is at Thirty-third street and Sixth avenue.

The Iron and Metal Trades

The question uppermost in the minds of furnacemen and Steel makers alike is that of the prices for Lake Ores for the coming season, and it is possible that it may be settled at an early date. It is realized that these prices lie at the base of the whole structure. The interests are conflicting among producers and among consumers and are influenced by geographical considerations, too. There is a strong feeling in favor of maintaining prices, in the face of the fact that a good deal of Ore will be carried over, and that many furnace companies cannot meet even present selling figures of Pig Iron and escape a heavy loss.

While the majority of sellers of Pig Iron are adhering to recently established prices, there is a sufficient number of producers in each of the principal districts who are willing to accept prices $1 to $1.50 per ton less to establish the market. It is not quite clear whether the tonnage taken by these is and will continue to be large enough to cause a diversion of business to those who are holding out for higher prices.

The fact has now come out that a considerably larger tonnage of Foundry and Forge Iron has been placed since the beginning of the year than the trade generally realized, and that quite a good deal of it was marketed at a low level.

The output of the furnaces and mills is increasing somewhat, but it is difficult to express the improvement numerically. It is estimated that operations are close to 50 per cent. of full capacity, with the prospect of gradual betterment.

The policy of reaffirming prices seems to have been justified by the events in the case of Wire products and of Hoops and Bands. The former, it is true, are entering the spring buying period, but it is a fact that the bookings are more than normal, even when taking that into consideration.

Makers of Bolts and Nuts are putting pressure upon the Steel Bar manufacturers in order to induce them to meet the competition of makers who use Iron Bars, now so much cheaper than Steel Bars. On the other hand, the manufacturers of Agricultural Implements urge that prices on Steel Bars be maintained in the interest of stability of values on their own products.

The outlook in the Rail trade and in railroad equipment is not promising. With earnings declining sharply, and side tracks full of empty cars, Rail makers and car and locomotive builders cannot expect much new work during the first half of this year.

Prices of Light Rails have been reduced to $28 for 25 to 45 lb. sections, to meet the competition and the low quotations made by mills which reroll old Rails.

Some business of moderate tonnage has been placed in Structural material and bids have gone in on a number of fair jobs for the Pacific Coast, and for buildings in Chicago and New York.

There have been some sales aggregating close to 10,000 tons of Steel Melting Scrap to steel works in eastern and central Pennsylvania.

Copper is squarely 14c. for Lake and Electrolytic, but buying for shipment abroad has declined. The leading interest has reduced the price of Lead 10c. per 100 lb., while Spelter is dull and unchanged.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Jan.22, 1908.	Jan.15, 1908.	Dec.24, 1907.	Jan.23, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	$18.25	$18.25	$18.25	$26.50
Foundry No. 2, Southern, Cincinnati	*18.00*	*18.25*	*18.25*	*26.00*
Foundry No. 2 Local, Chicago	18.00	18.00	18.00	25.50
Bessemer, Pittsburgh	*18.90*	18.90	19.40,	22.85
Gray Forge, Pittsburgh	*16.1*	*16.90*	17.90	22.25
Lake Superior Charcoal, Chicago	*22.*	22.50	23.50	27.00
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	29.50
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.50
Open Hearth Billets, Phila.	30.00	30.00	30.00	33.00
Wire Rods, Pittsburgh	35.00	34.00	34.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	12.25	12.00	12.00	18.00
Steel Rails, Melting, Phila	12.00	11.50	11.50	19.00
Iron Rails, Chicago	16.00	15.00	15.00	27.00
Iron Rails, Philadelphia	*16.50*	16.50	17.50	27.50
Car Wheels, Chicago	*19.00*	19.00	20.00	25.00
Car Wheels, Philadelphia	*17.00*	19.00	19.00	23.00
Heavy Steel Scrap, Pittsburgh	12.50	12.50	12.50	18.50
Heavy Steel Scrap, Chicago	11.00	10.75	10.75	17.00
Heavy Steel Scrap, Phila.	12.00	11.50	11.50	18.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	*1.47*	1.75	1.75	1.93½
Common Iron Bars, Chicago	*1.5*	1.55	1.55	1.81½
Common Iron Bars, Pittsburgh	*1.50*	1.40	1.60	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.70	1.70	1.70	1.65
Skelp, Sheared Steel, Pittsburgh	1.80	1.80	1.80	1.70
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No 27, Pittsburgh	*2.40*	2.40	2.50	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	2.00	2.00	2.00	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	14.00	14.00	13.50	24.75
Electrolytic Copper, New York	14.00	13.87½	13.37½	24.50
Spelter, New York	4.70	4.70	4.30	7.00
Spelter, St. Louis	4.55	4.55	4.20	6.75
Lead, New York	3.75	3.75	3.60	6.30
Lead, St. Louis	3.60	3.60	3.50	6.12½
Tin, New York	27.60	27.75	27.00	42.00
Antimony, Hallett, New York	9.00	8.75	8.50	24.50
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$4.09	$4.09

Chicago.

FISHER BUILDING, January 22, 1908.—(*By Telegraph.*)

Measured in terms of tonnage, the change toward improvement in finished material lacks particular significance. At the same time some departments [illegible] stronger tone, giving rise to the hope [illegible] all along the line at an early date. The volume of available loan money [illegible] effect of stirring up some dormant building enterprise involving a considerable tonnage of Structural Material. Confidence in the [illegible] established well [illegible] tion. Closure of contracts is expected within a few terial for Pacific Coast buildings is expected within a few days, and there are also about 10,000 tons for local building structures, on which [illegible] are nearing the final stage. Very little new tonnage for railroad bridge work is [illegible] Standard Sections [illegible] into [illegible] [illegible] in delivery [illegible] the regular [illegible] [illegible] Rerolling Rails is to some extent [illegible] the unevenness existing in this product. Railroads are being compelled to increase their orders for Track Supplies somewhat, [illegible] for present needs. Standard Spikes [illegible] Base of 2.5 cents per 100 lb. Notwithstanding the nominal position of the leading Southern producers, who continue to quote $13.50, Birmingham, for No 2

Foundry, the actual price level holds at $13. The past week has developed but little business even at this price, which it is believed is not being shaded to any considerable extent. Reflecting the weakness observed in Pig Iron, Cast Iron Pipe has declined another dollar a ton. An aggregate of 5000 tons in municipal lettings is now in the market for figures. Although lacking the support of a firm demand, Scrap Iron shows a reactive tendency, which even moderate buying would develop into positive strength. Rolling Mill grades have advanced slightly and Melting material is firm at inside quotations.

Pig Iron.—Despite the efforts that have been made by a number of the principal Southern furnaces to maintain a price of $13.50, Birmingham, for No. 2 Foundry, it is this week plainly evident that they have proved fruitless of results. In addition to the several interests which were admittedly quoting $13, it now transpires that within the past 10 days sales have been made on a basis of $13, Birmingham, by sellers who were nominally holding at $13.50. There seems to be no question, therefore, but that $13, Birmingham, represents the general level of prices for first quarter and first half tonnage. It has also come to light that an important Southern interest has since the first of the year disposed of considerable tonnage in this market—estimated at from 15,000 to 20,000 tons—at prices ranging from $12 to $12.50. Very little of this business came into the market in a competitive way, but was in the main privately negotiated. There is no evidence of any Iron being offered at the present time at these prices, nor is it believed that any of the tonnage taken below $13 was for extended delivery, most of it being booked for shipment through the first quarter. The situation among Northern furnaces is not appreciably changed, $18, Chicago, for No. 2 Foundry still being held, and the principal interests maintain that it represents the minimum. The only exception reported is that of a sale of small tonnage at $17.50, Chicago, for delivery at a strongly competitive point. Dealers who have been visiting melters in various parts of this district say that there is on an average enough Iron in consumers' yards and due on contract to last the next 60 or 90 days. Quite a large percentage of heldup tonnage on old contracts has been canceled or delivery dates have been still further extended for a cash consideration. Inquiries for 100 to 500 tons, and including an occasional lot of 1000 tons, are perhaps a little more plentiful, but only a small proportion of them develop into orders. In the actual amount of business placed, the net results of the week are extremely meager. The following prices are for January, February and March delivery, f.o.b. Chicago:

Lake Superior Charcoal	$22.00 to $22.50
Northern Coke Foundry, No. 1	18.50 to 19.00
Northern Coke Foundry, No. 2	18.00 to 18.50
Northern Coke Foundry, No. 3	17.50 to 18.00
Northern Scotch, No. 1	19.00 to 19.50
Southern Coke, No. 1	17.85 to 18.35
Southern Coke, No. 2	17.35 to 17.85
Southern Coke, No. 3	16.85 to 17.35
Southern Coke, No. 4	16.35 to 16.85
Southern Coke, No. 1 Soft	17.85 to 18.35
Southern Coke, No. 2 Soft	17.35 to 17.85
Southern Gray Forge	15.85 to 16.35
Southern Mottled	15.60 to 16.10
Malleable Bessemer	18.50 to 19.00
Standard Bessemer	20.40 to 20.90
Jackson Co. and Kentucky Silvery, 6 %	22.40 to 22.90
Jackson Co. and Kentucky Silvery, 8 %	24.40 to 24.90
Jackson Co. and Kentucky Silvery, 10 %	26.40 to 26.90

(By Mail.)

Billets and Rods.—There is practically no market for Forging Billets, current transactions including only an occasional small lot, rarely exceeding a carload. Prices remain unchanged, at $33 to $34, Chicago. While the prospects seem brighter for a more active market for Wire Rods in the near future, the demand at the present time continues light. The prices quoted by the principal interest are for Bessemer, $35; Basic, $36; Chain, $37, Pittsburgh. These prices, it is stated, are being rigidly maintained by the chief producers.

Rails and Track Supplies.—No new tonnage in Standard Section Rails of any consequence has been offered during the week, nor, indeed, are there any inquiries reported in the market that would indicate any change in the waiting attitude of the railroads. Business in Light Rails has improved somewhat, but prices are decidedly weak. The ordinary spread usually maintained between Light Rail specifications, ranging from 45 lb. to 12 lb., are at present largely disregarded, with the result that a difference of not more than $2 a ton is observed between the two extremes. Prices, which for some little time have been persistently shaded, are now reduced by an average of $2.50 a ton. Spikes and Track Bolts are also lower, having declined 5c. per 100 lb. While business in Track Supplies is still relatively small, it nevertheless shows steady improvement. Railroads are ordering more frequently, but in small amounts for actual present needs. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.90c. to 2c., according to delivery; Track Bolts, 2.40c. to 2.50c., base, Square Nuts, and 2.55c. to 2.65c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 45 lb. to 12 lb. sections, f.o.b. mill, $28 to $30. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—The tonnage involved in actual business placed during the week is very small and comprises no contracts of notable size. Several building projects, seemingly ready for final closure, are being held up, apparently by the hope of a break in price of Structural Material. The strong reaffirmation of prices made by the American Bridge Company at its recent meeting in Pittsburgh may have the effect of reassuring such prospective purchases in the stability of the market, in which event the placing of several good tonnage lots may be expected. Among the Western building propositions now pending, for which it is expected that contracts for Structural Material will soon be placed, are the Hotel Renier Annex and the Leary Building, Seattle, Wash., each 1000 tons; two buildings at San Francisco, 600 tons, and one building at Los Angeles, 900 tons. The fabricating contract for 450 tons for the Seventh Regiment Armory Building has been let to Wm. F. Klemp & Co. The prospects are that bids will be asked in the near future on 2000 tons of material for the Orleans Street Bridge across the Chicago River, and it now seems likely that the new City Hall Building, which will require approximately 12,000 tons, will go through this year. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—What little change there is in the situation is clearly in the right direction. Orders continue to be for small amounts for immediate requirements, but they are somewhat more numerous. The Sheared Plate mill of the Illinois Steel Company is still in operation, but its supply of specifications, unless quickly reinforced by the receipt of new tonnage, will soon be exhausted. Business from store stocks consists almost wholly of small orders from miscellaneous shops, there being little demand from the contract boiler factories. We quote for shipment from mill as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.20c. to 2.30c.; from 72 to 96 in. wide, 2.30c. to 2.40c.; 3-16 in. up to 60 in. wide, 2.30c. to 2.40c.; 72 in. wide, 2.50c. to 2.65c.; No. 8 up to 60 in. wide, 2.35c. to 2.45c.; Flange and Head quality, 0.25c. extra.

Sheets.—The demand for Sheets is, if anything, a little better than a week ago, but there is an encouragingly better tone in the market. What buying there is continues to be for the needs of actual consumption, there being no disposition as yet to place stock orders in anticipation of future business. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 to 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c. Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c. Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—Since the recent reduction of price in Bar Iron, orders have been coming in a little more freely, but the aggregate tonnage is still too small to keep the mills in continuous operation. The Moline and East Chicago plants of the Republic Iron & Steel Company are again idle. Both new business and specifications for Steel Bars are extremely light, but prices are being firmly held despite the spread between Steel and Iron Bars. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.55c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—While the volume of business moving at the present time is far below the normal, there has been continued improvement since the beginning of the year. Orders for the past week have been more numerous, but in no case do they represent more than present requirements

for stocks or contract work. Doubtless here, as in other lines, the expectation of lower prices has had the effect of delaying some business, but in view of the assurance given by the Sub-Committee on Pipe and Tubular Products, at its recent meeting, that there will be no change for the present, such orders should begin to come out. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 72 per cent. on Black Steel Pipe, ¾ to 6 in. About four points advance above these prices is asked for Iron Pipe.

Boiler Tubes.—Until new work begins to come into the boiler shops, which are now exceedingly dull, not much betterment is expected in the demand for Merchant Tubes. Pick-up orders, which are mainly supplied from store stocks, constitute the bulk of business moving. Mill quotations for future delivery, on the base sizes, are as follows: 2⅜ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1¼ in.	35	35	35
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2¾ to 3 in.	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—Generally speaking, there are no signs of an improved demand from the implement makers, but within the past week there have been a few more small orders for Tire and Spring Steel from the carriage and wagon shops. There is little doing in Shafting, but it is apparent that quoted discounts are being shaded when business can be influenced by moderate price concessions. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c.; Iron Finish, 1½ x ½ in. and larger, 1.78c., base; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1½ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 54 per cent. off in car lots; 48 per cent., less than car lots, base territory delivery.

Cast Iron Pipe.—Lettings will be held by the cities of St. Paul and Minneapolis early in February for an aggregate of 5000 tons, of which the former municipality will take 2000 and the latter 3000 tons. About 1500 tons will also be required by the town of Minott, N. D., for extension to its water works system, contracts for which will be let as soon as necessary funds are realized from sale of warrants. While a fair number of small orders are being received from various sources, the total amount of business being done is far short of foundry capacities. Influenced by the reduced value of Pig Iron, prices have again declined $1 a ton. We quote, per net ton, Chicago, as follows: Water Pipe, 4-in., $31; 6 to 12 in., $30; 16-in. and up, $29, with $1 extra for Gas Pipe.

Metals.—Besides the development of a stronger feeling in Copper, small users are ordering with greater frequency. The past week has brought out some business of this character from the builders of electrical machinery, but the large consumers are making no inquiries or otherwise indicating any present interest in the market situation. Lead is fractionally weaker, and no improvement is shown in the demand for Spelter. Movement in Old Metals drags slowly, with no change in prices. We quote as follows: Casting Copper, 14¼c.; Lake, 14¾c. to 15c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 30c.; small lots, 31½c.; Lead, Desilverized, 4c. to 4.05c., for 50-ton lots; Corroding, 5.15c. to 5.25c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 4.60c.; Cookson's Antimony, 13c., and other grades, 11c. to 11¼c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 13½c.; Heavy Copper, 13½c.; Copper Bottoms, 12c.; Copper Clips, 12c.; Red Brass, 13c.; Yellow Brass, 10½c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 23c.; Block Tin Pipe, 25c.

Old Material.—Consumers generally are still holding aloof, taking only scattering lots actually needed for present requirements. The rolling mills, however, are buying a little more freely when bottom prices are offered, but are not in any sense actively in the market. Only the influence of a little buying movement is needed at the present low level of values to produce a reaction. In consequence of a slightly improved demand a few lines of mill material show slight advances. Railroad Wrought, for instance, is up $1 a ton. Old Iron Rails have also advanced $1. Melting lines, though not experiencing a decided advance, are sympathetically stronger and are in position to respond quickly to a quickened demand at any time. It is generally believed that the bottom has been reached for the present, at least, and that definite reaction will take place as soon as buyers begin to come into the market. No sales of the Baltimore & Ohio tonnage offered last week are reported in this market. In a list offered this week by the Chicago, Milwaukee & St. Paul there are 2100 tons. We quote per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$13.00 to $13.50
Old Steel Rails, rerolling	12.50 to 13.00
Old Steel Rails, less than 3 ft.	12.25 to 12.75
Relaying Rails, standard sections, sub-	
ject to inspection	22.00 to 25.00
Old Car Wheels	19.00 to 19.50
Heavy Melting Steel Scrap	11.00 to 11.50
Frogs, Switches and Guards, cut apart,	11.50 to 12.00
Mixed Steel Scrap	8.50 to 9.00

The following quotations are per net ton:

Iron Fish Plates	$13.50 to $14.00
Iron Car Axles	16.00 to 16.50
Steel Car Axles	15.00 to 15.50
No. 1 Railroad Wrought	11.75 to 12.25
No. 2 Railroad Wrought	10.75 to 11.25
Railway Specialties	10.00 to 10.50
Locomotive Tires, Steel	15.00 to 15.50
No. 1 Dealers' Forge	8.75 to 9.25
Mixed Barlings	7.50 to 8.00
Iron Axle Turnings	7.25 to 7.50
Steel Axle Turnings	7.00 to 7.50
Machine Shop Turnings	4.75 to 5.25
Cast Borings	4.75 to 5.25
Mixed Borings, &c.	7.25 to 7.75
No. 1 Mill	6.25 to 6.75
No. 2 Mill	7.25 to 7.75
No. 1 Boilers, cut to Sheets and Rings	13.00 to 13.50
No. 1 Cast Scrap	12.00 to 12.50
Stove Plate and Light Cast Scrap	10.00 to 10.50
Railroad Malleable	9.00 to 9.50
Agricultural Malleable	8.50 to 9.00
Pipes and Flues	

Cleveland.

CLEVELAND, OHIO, January 21, 1908.

Iron Ore.—The very small movement of Ore to the furnaces has been further curtailed by the cutting off of two or three small shipping orders. Not much improvement can be expected until a number of the idle furnaces start up. Because of the unfavorable outlook, operators of Ore properties in the Lake Superior District are doing considerably less work underground than a year ago, when mine operations were rushed as much as possible all winter. The present force of men at work is said to be about 60 to 65 per cent. of the men employed last winter. The poorer workmen have been weeded out, so that the efficiency of the working force has been increased about 10 per cent. No steps have been taken to reduce the pay of the miners. The wage question involving men employed in various branches of the Lake traffic will be taken up for consideration before the opening of navigation, and there is a strong feeling among several employers' organizations that wage schedules should be reduced. At the annual meeting of the Lake Carriers' Association, held in Detroit last week, the labor question was not taken up, but will be considered by the Executive Committee. A conference will probably be held in this city late in March by the dock managers and representatives of the 'longshoremen's association to try and agree on a wage scale for Ore handlers. Nothing is as yet being done about this year's Ore prices, nominal prices remaining as follows at Lake Erie docks, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.25; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—A fair sized buying movement in both Northern and Southern Foundry Iron is now in progress for the first half delivery. Sales during the week aggregate several thousand tons, and other inquiries are now pending for considerable tonnage. There were two sales of 1000-ton lots of Northern Iron and several of 500 tons and smaller amounts. While a number of melters believe that prices are now about at the bottom and are covering for their requirements, there are others who think prices may go a little lower, and are placing orders for only small lots for their immediate needs. The prevailing price for No. 2 Foundry for first half delivery is $16.50, Valley furnace, although there are reports that that price is being shaded in some instances. One local interest reports the sale of about 4000 tons at its Valley furnace in the past 10 days at $16.50, at furnace, for No. 2. A builder of farm engines in this district has closed a contract for 1000 tons of No. 2 Northern for the first half at about $16.50, and another melter expects to close a contract in a day or two for 1000 tons of Northern Iron for the second quarter. Local furnaces are asking $17 for the first half, but are shading this price to $16.50 for good sized orders for outside shipments. A local interest reports the sale of 600 tons of Nos. 1 and 2 at $17, Toledo furnace, to one melter, making the price $16.75 for No. 2, which is about the average price that is being received by this furnace. Among the inquiries now pending is one for 1000 tons of Northern Iron and another for 1500 to 2000 tons of both Northern and Southern. Two leading producers of Southern Iron are still holding at $13.50, Birmingham, for first quarter delivery, and report some sales at that price in

small lots. Other interests are asking $13 for the first half, and even this price is being shaded. One sale of 500 tons is reported to a northern Ohio melter during the week, part at $12.50 and the rest at $12.75, Birmingham, which would make the Iron $16.85 and $17.10, delivered. No definite information is obtainable regarding the price secured by the Massillon Iron & Steel Company that contracted for 13,500 tons of Iron as noted last week, but it is believed that the sale was made at $12.50, Birmingham, or perhaps a little under, making the price about $16.85, delivered. Local melters are still well supplied with Iron on old contracts, and practically no inquiries are coming from them. Furnaces in this district report some improvement in shipping orders, but they are still accumulating stock piles. There is no activity in Basic or Malleable Iron. Furnace No. 2 of Pickands, Mather & Co., Toledo, which is on Malleable Iron, may go out of blast this week. For prompt shipment, first quarter and first half, we quote f.o.b. Cleveland:

Bessemer	$18.90
Northern Foundry, No. 1	$17.50 to 17.75
Northern Foundry, No. 2	17.00 to 17.25
Northern Foundry, No. 3	16.50 to 16.75
Southern Foundry, No. 2	17.35 to 17.85
Gray Forge	16.90

Coke.—There are a few good inquiries in the market for Foundry Coke, but there is absolutely no demand for Furnace Coke. We quote Standard Connellsville 72-hr. Foundry Coke at $2.50 to $2.75 at oven, for prompt shipment and for the first half. Connellsville Furnace Coke is quoted at $2 to $2.15 at oven.

Old Material.—There is as yet practically no demand from consumers, about the only activity being of a speculative nature between dealers. The large producers who are not compelled to sell are holding their Scrap, being unwilling to sell at the present prices. A little improvement in inquiries is noted, but dealers and consumers are far apart on prices. Dealers prefer to keep their Scrap rather than to sell it at the present prices, and if they had a chance to make contracts for future delivery they would not be disposed to do so except at higher prices than the prevailing market quotations. Local Bar mills have started up, but are not in the market for Scrap, having a supply on hand. Little change is noted in prices. Quotations are still mainly nominal. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$11.50 to $12.00
Old Iron Rails	16.00 to 17.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	16.00 to 17.00
Relaying Rails, 50 lb. and over	25.50 to 26.00
Relaying Rails, under 50 lb.	28.00 to 29.00
Heavy Melting Steel	11.50 to 12.00
Railroad Malleable	12.00 to 13.00
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	8.00 to 9.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$17.00 to $18.00
Cast Borings	4.50 to 5.00
Iron and Steel Turnings and Drillings	7.00 to 8.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	11.00 to 12.00
No. 1 Railroad Wrought	11.00 to 12.00
No. 1 Cast	12.00 to 13.00
Stove Plate	10.50 to 11.00
Bundled Tin Scrap	9.00

Finished Iron and Steel.—The demand continues to improve slowly, although the aggregate tonnage that is being ordered is still light. Current business and orders on contracts have both been much better, but nearly all the orders are for very small tonnages. Traveling salesmen for the mills, while they are not bringing in a great deal of business as yet, are coming in with encouraging reports of many plants in partial operation which were entirely shut down at the time of their last visits. The reduction in the price of Iron Bars has resulted in the placing of some good orders, some of which have come from railroads. Consumers, however, are not buying far ahead. The two local Bar mills, which have been shut down since before the holidays, started up again this week, but the orders they now have on hand are not sufficient to keep them running a great length of time. Considerable improvement is noted in specifications for Steel Bars. The new price is being firmly maintained on Iron Bars, and the price on Steel Bars is being held firm. The recent reduction in the price of Sheets has somewhat stimulated the demand and some fairly good orders have been placed by furnace manufacturers. There is an improvement in the demand for Structural Material in small lots. Specifications are coming in a little better from shipbuilders, but as yet they are far below their normal volume. Local jobbers report a slight improvement in their warehouse business. Local mills quote Iron Bars on the basis of 1.40c., Pittsburgh, or 1.50c., Cleveland. We quote Steel Bars at 1.70c., Cleveland, for carload lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼ in. and heavier, 1.80c., base, Cleveland. Mill prices on Sheets, carload lots, Cleveland, are as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Jobbers' prices are unchanged. We quote Steel Bars, out of stock, at 1.90c. to 1.95c., and Iron Bars at 1.80c. Beams and Channels, out of stock, are 2.10c. to 2.15c., base. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.20c.; Box Annealed, No. 28, 2.90c.; Galvanized, No. 28, 4.05c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Pittsburgh.

PARK BUILDING, January 22, 1908.—(*By Telegraph.*)

Pig Iron.—A meeting of blast furnace operators of the Mahoning and Shenango valleys was held in Youngstown, Ohio, yesterday. The opinion was brought out that in view of the severe decline in prices of Pig Iron there should be a reduction in blast furnace labor, but it was decided to defer action until after the result of the meeting of the Pig Iron interests in New York this week is known. At present only four merchant blast furnaces in the two valleys are running on Bessemer Iron—Shenango No. 1 at Sharpsville, Mary at Lowellville, Sharpsville Furnace Company at Sharpsville and Brier Hill at Youngstown, making together about 1200 tons a day. It is stated that shipments of Bessemer Iron from the valleys are now larger than the output. In the two valleys three other stacks are in blast—Andrews & Hitchcock at Youngstown, running on Foundry Iron; Girard Iron Company on Foundry and Youngstown Steel Company on Washed Metal. Some small lots of Foundry Iron have been sold, but Bessemer and Forge are practically stagnant. We quote Bessemer nominally at $18 at furnace, or $18.90, Pittsburgh, but there are persistent reports that it is being offered from some source as low as $17 at Valley furnace. This, however, is not confirmed. Basic is about $17, Valley furnace, while Northern No. 2 Foundry is nominally $16.50, Valley furnace, with reports that $16 or less has been done. Prices on Forge Iron are lower, and we quote Northern Forge at about $15.25, Valley furnace, or $16.15, Pittsburgh.

Steel.—We do not hear of any new sales of Billets or Sheet or Tin Bars, and we repeat former nominal quotations of $28, Pittsburgh, on Bessemer and Open Hearth Billets, and $29 on Sheet and Tin Bars.

Light Steel Rails.—Effective to-day, the Carnegie Steel Company has reduced prices on Light Rails, the new schedule for the different sections being as follows: 25 to 45 lb. sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32, f.o.b. Pittsburgh.

(*By Mail.*)

The feeling is more cheerful than at any time since the slump started last October. Money conditions are decidedly better, the local banks are more liberal in the matter of discounts, and official announcement has just been made that the Pittsburgh Stock Exchange, which closed on October 23, will reopen next Monday. The decision to reopen was reached as soon as it was known that plans for the reorganization of the Westinghouse Electric & Mfg. Company had been completed in New York. The volume of new business in nearly all lines of Iron and Steel, and the specifications against contracts are better than at any time since last October. It is the general feeling that the worst is over. There is some inquiry for Pig Iron, but so far little tonnage has been actually closed. Production, however, is down to a minimum. The consumption of Sheet and Tin Bars is heavier, but the Ohio Works of the Carnegie Steel Company at Youngstown, which was scheduled to start last Sunday night, will not get started until probably next Sunday night. A large casting in one of the engines was broken. The makers of Hoops and Bands and also of Steel Bars met last week and reaffirmed prices. Reports are that the demand for Wire products and Hoops and Bands has improved materially since prices were reaffirmed. No more plants in the Pittsburgh District have closed since our last report, but a few are gradually starting. The Youngstown Sheet & Tube Company and Republic Iron & Steel Company are both running full this week with fair prospects for the future.

Ferromanganese.—The consumption since last October has been very light, owing to the fact that so many Steel plants have been closed down or operating at part capacity. No large inquiries are in the market. We quote foreign 80 per cent. at $48.50 to $49, Pittsburgh.

Muck Bar.—There is no new inquiry, and we quote best grades of Muck Bar, made from all Pig Iron, at nominally, $29, Pittsburgh.

Wire Rods.—The reaffirming of prices on Wire products by the leading Wire interests and the improved demand that followed have brought about some inquiry for Rods, which had been very dull for several months. The American Steel & Wire Company announces its minimum prices as follows: Bessemer Rods, $35; Open Hearth, $36, and Chain Rods, $37, Pittsburgh.

Steel Rails.—As yet no tonnage of any moment is being placed in Standard Sections. The Edgar Thomson mill of the Carnegie Steel Company has about cleaned up all its

orders, and may possibly shut down in the near future. The demand for Light Rails is fairly large, but some very low prices are being made by rerolling mills, which are reported to have sold Rails as low as $25, at mill. Regular prices on Light Rails, which, however, are likely to be reduced in the near future by the local interest, are as follows: 25 to 45 lb., $30; 20-lb., $31; 16-lb., $32; 12-lb., $34; 10-lb., $36, and 8-lb., $40. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill. We note a sale of 2000 tons of Splice Bars at 1.65c., Pittsburgh.

Plates.—The demand for Plates is still for small lots only and for actual needs. The Steel car interests are taking out a fairly large tonnage, but business from this source will likely show a decided falling off in the near future. Official prices, while well maintained, are sometimes shaded about $1 a ton by a few mills, on narrow sizes. We quote: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell grade of steel is abandoned.

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—The financial improvement has already brought out some tonnage that had been held up. The McClintic-Marshall Construction Company has taken about 2000 tons of bridge work for the Chicago, Milwaukee & St. Paul; about 400 tons for two Steel buildings for the Standard Plate Glass Company, Butler, Pa., and another contract for 3000 tons of Steel for viaduct work. The Riter-Conley Mfg. Company has taken about 400 tons for the New York Central at Buffalo, while the Fort Pitt Bridge Works is furnishing a fairly large tonnage for the railroad shops of the Delaware, Lackawanna & Western at Scranton, Pa., and for some overhead bridges for New York City improvements on the New York, New Haven & Hartford Railroad in the Bronx. It is believed that further suspended work will soon come out. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—We note a better demand for both Black and Galvanized Sheets, particularly on the latter, since the reduction in prices made two weeks ago. Some especially large orders for Galvanized Sheets have been placed. The percentage of mills in operation is larger than at any time since last October, when the slump in the Sheet trade started. We are advised that prices are being firmly held as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets $1.75 per square and Galvanized Roofing Sheets, No. 28, $3.10 per square for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—There has been a heavy increase in demand since the reduction of 20c. a box on January 6, and the leading Tin Plate manufacturers are receiving more orders than at any time in the last three months. The Greer Works of the American Sheet & Tin Plate Company, at New Castle, its second largest mill, is expected to be in full operation within a week. Its Shenango Works, also at New Castle, which has 30 hot mills, is now running full. We are advised the official price is being rigidly held. We quote at $3.70 for 100 lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Iron and Steel Bars.—Leading makers of Steel Bars have recently reaffirmed the price of 1.60c., Pittsburgh, and this is being rigidly held. It is not believed that a reduction in prices at this time would stimulate the demand, and for this reason no change was made. Actual new tonnage being placed in both Iron and Steel Bars is slightly better, and specifications are coming in more freely. Orders and specifications are said to represent 40 per cent. of capacity, while two weeks ago they represented less than 30 per cent. We quote Iron Bars at 1.40c., Pittsburgh, for Western shipment and 1.55c. for delivery in the Pittsburgh District, but it is stated that a few mills are shading the first named price. Prompt deliveries can readily be obtained on Steel Bars.

Spelter.—The volume of new business is larger and prices are somewhat better. We now quote prime grades of Western Spelter at 4.45c. to 4.50c., St. Louis, equal to 4.57½c. and 4.62½c., Pittsburgh.

Hoops and Bands.—A meeting of the three leading interests making Hoops and Bands—the Carnegie Steel Company, Pittsburgh Steel Company and Sharon Steel Hoop Company—was held last week, at which it was decided to reaffirm prices. Letters to that effect have been sent out, also, stating that all mills have been curtailing production and that stocks in the hands of manufacturers and dealers are very small. It was recommended that orders be placed at once so that satisfactory deliveries could be made. We are advised that already the trade has responded by placing quite a heavy tonnage. We quote Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60, base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Spikes.—A little more inquiry is noted, and several fair sized orders for Railroad Spikes have recently been placed by railroads. We quote Railroad Spikes at $1.85 to $1.90, and smaller sizes at $1.95 to $2 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—Business continues very quiet, but there is a better feeling in the trade, and it is believed that in a short time new business will preceptibly increase. Very few orders have been placed for Shafting for a long time, and, with stocks very low, a better demand is confidently looked for by the manufacturers. Regular prices, which are occasionally shaded, are as follows: Cold Rolled Shafting, 54 per cent. off in large lots and 48 per cent. off in carload lots, delivered in base territory; Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades, and 10c. and upward for special grades.

Merchant Pipe.—The trade is anxiously awaiting the outcome of the meeting of subcommittees on Finished Iron and Steel, which include Tubular Goods, being held in New York this week. We note that both new business and specifications on Steel and Iron Pipe are considerably better, and it is believed that the demand from this time forward will show a steady increase. Some mills are running to about 50 per cent. capacity and others to slightly less. Prices on Steel Pipe are firm and unchanged, but on Iron Pipe continue to be more or less shaded. The net discount on Steel Pipe to the large trade on ¾ to 6 in. is 74 and 5 per cent. off list, while on Iron Pipe, ¾ to 2 in., 71 and 5 per cent., and over 2 to 6 in., 70 and 5 per cent. are quoted. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black.	Galv.
⅛ to ¼ in.	67	47
⅜ in.	67	47
½ in.	69	57
¾ to 6 in.	73	63
7 to 12 in.	[illegible]	[illegible]
Extra strong, plain ends:		
⅛ to ¼ in.	[illegible]	[illegible]
⅜ to 2 in.	[illegible]	[illegible]
4½ to 8 in.	[illegible]	[illegible]
Double extra strong, plain ends:		
½ to 8 in.	54	43

To the large trade all above discounts are subject to 1 point on the base, and 5 per cent. on the net.

Boiler Tubes.—The demand for Railroad Tubes is showing betterment, a number of nice orders having been placed in the past week. A new discount sheet on such Tubes has recently been issued. There is a fair demand for Merchant Tubes, the discounts on small lots, on which an extra 5 per cent. is allowed in carloads, being as follows:

	Iron.	Steel.
[illegible]	[illegible]	[illegible]
[illegible]	42	[illegible]
2½ in.	47	61
2½ to 5 in.	52	65
6 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Iron and Steel Scrap.—While there is a better feeling in the Scrap market, the actual sales do not as yet show much betterment. It is believed that prices are about as low as they will go, and that with any decided improvement in

general conditions. Scrap values ought to advance. Dealers quote as follows: Heavy Steel Scrap, for Pittsburgh, Steubenville or Sharon delivery, $12.50 to $13; No. 1 Cast Scrap, $14.50; Cast Iron Borings, $6 to $6.50; Bundled Sheet Scrap, $9.50 to $10; Low Phosphorus Melting Stock, $16.50 to $17; Rerolling Rails, $12.50 to $13; No. 1 Busheling Scrap, $12.50; No. 2, $9.50 to $10; Old Steel Rails, short pieces for Open Hearth use, $12.50 to $13; Steel Axles, $16 to $16.50; Standard Sheet Bar Crop Ends, $15 to $15.50; Grate Bars, $11.50 to $12; Iron Axles, $21.50. All these prices are per gross ton, f.o.b. Pittsburgh, unless otherwise stated.

Coke.—While conditions in this trade have not as yet shown much betterment, there is more inquiry, and some idle ovens in the Connellsville region have been started. Best grades of Connellsville Furnace Coke are held at $1.90 to $2 a ton, at oven, while other grades of Furnace Coke, not so favorably known, are offered as low as $1.75, at oven. Connellsville 72-hr. Foundry Coke is quoted at about $2.50, at oven, while outside makes can be had at $2.25, or slightly lower. The output of Coke in the Upper and Lower Connellsville regions last week was 142,346 tons, showing a decided increase over the previous week.

Philadelphia.

PHILADELPHIA, PA., January 21, 1908.

While it is believed that business will continue to be transacted on a moderate basis for some little time, the feeling is somewhat more hopeful, although not much disposition is shown by either buyers or sellers to close for large tonnages or for forward delivery. There has been a little better demand for some lines of Finished Materials. In others, however, business is still very irregular. The situation in Bar Iron has become very unsatisfactory, prices having been badly slashed, with but little tonnage coming out. Although financial conditions show improvement, business does not respond very satisfactorily, owing largely to the uncertainty as to the demand for finished goods. All industrial plants are working at greatly reduced capacities, and the railroads show decreased earnings, having a considerable number of idle cars and locomotives. Until more confidence is shown in general business, therefore, any extensive improvement can hardly be expected, and it is more than likely that the present waiting market will continue for some little time.

Pig Iron.—Prices of Pig Iron continue to be fully maintained and sales on the recently established basis have been made in nearly all the different grades, but in small tonnages only. Buyers as a rule are pretty generally satisfied with the present range of prices, but what is of greater interest to them is the fact that they are being maintained. As they consider it, it is not so much what the price is, but that it be fairly uniform that interests them, as they are so much better able to take care of their own interests when the market continues on a more or less even basis. At the meeting of the Eastern Pig Iron Association, held in this city last week, it was stated that orders were about equal to the previous month; that curtailment of production was being maintained, and that prices were being fully held, with a fair share of business coming out, largely for delivery within the next 30 to 90 days. There was no disposition shown on the part of furnacemen to increase production at the present selling prices, which in many cases are still pretty close to cost, but if necessary a further curtailment in the production of the merchant furnaces will be made. The sale of from 15,000 to 18,000 tons of Southern Foundry Iron to one of the nearby Pipe foundries, made last week, on a basis of $13, Birmingham, has been confirmed. The buyer takes the output of a furnace for 90 days, covering practically all the grades made, and deliveries are to be started at a very early date. Outside of this the tonnages taken by the different foundries have been rather light, sales in most cases running from carloads up to a few hundred tons on a basis of $18.25, delivered. Some little No. 2 Plain was also sold at $17.75, delivered. Forge Irons have been in a little better demand. Sales, however, have been in small lots, ranging from 100 to 300 tons, the prices being at the basis of $16.50 to $16.75, delivered. Not much demand is noted for Basic Iron, and but one sale of several hundred tons for early delivery is reported, the price being $17.25, delivered. A sale of 600 tons of Bessemer Iron at $19.40, Eastern furnace, was also reported. Low Phosphorus Iron has not been in urgent demand. A sale of 300 tons was made at about $24.50, delivered, while several small lots of misfit Low Phosphorus were sold at prices varying according to analysis. Prices for early delivery in buyers' yards, eastern Pennsylvania and adjoining territory, are quoted about as follows:

No. 2 X Foundry	$18.25 to $18.50
No. 2 Plain	17.75 to 18.00
No. 3 Foundry	17.25 to 17.50
Gray Forge	16.50 to 16.75
Basic	17.25
Low Phosphorus	24.50 to 25.00

Ferromanganese.—The few sales recently made have been confined to broken lots, there being no market for any considerable tonnage. Prices show no material change, small lots selling around $48 to $49, Baltimore. A fair tonnage, however, could no doubt be done at a concession.

Steel.—There seems to be no movement whatever in Steel. Orders are very light, and mills have not yet booked sufficient orders, or received specifications on old orders, to warrant starting up idle mills. Prices continue unchanged, as it is not believed that any new business will come out even if lower quotations were made. Ordinary Rolling Steel is nominally quoted at $30 to $31, with Forging Steel at $33 to $35.

Plates.—New business is not very heavy. Specifications come out somewhat irregularly, but in the aggregate are of sufficient volume to keep the mills running at a little short of half their capacity. Practically all the business taken has been for early shipment, there being no disposition on the part of consumers to anticipate requirements. Prices are unchanged and are being firmly held, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—There has been some little improvement shown in the demand for Structural Material, and while the bulk of the business has been made up of small lots, several fair specifications have come out. One order for 1500 tons of bridge material was placed with an Eastern mill by the New York, New Haven & Hartford Railroad, while several other good sized propositions are in sight. Mills continue to be fairly well occupied, although some are not running up to their full capacity. Prices continue unchanged, 1.85c. to 2c. being named, according to specification.

Bars.—Prices of Bars have fallen off heavily during the past week. Since the meeting of the Eastern Bar Iron Association on Thursday last, when it was decided to meet competition in prices, makers have been privileged to quote any price they see fit, and the range of quotations in the past few days has therefore been pretty wide. Scarcely a maker will hold to the former basis of 1.75c., Philadelphia, but some whose mills are idle will not cut so low as others, particularly those making strictly refined Iron Bars. The lowest bona fide quotation that we can learn is 1.47c., delivered, Philadelphia, although it has been pretty generally stated that 1.35c. and even 1.25c. had been named for fair lots of common Bars. The tonnage coming out, however, is comparatively small, and consumers will hardly place much business until they feel that the bottom price has been reached.

Sheets.—Some little improvement was noted in the demand for Sheets the past week, and mills have been able to maintain operations at about half capacity. The business taken, however, has been almost entirely for early shipment, buyers showing no disposition to place orders for future delivery. Quotations for mill shipments are quoted as follows, with a tenth extra for small lots: Nos. 18 to 20, 2.50c.; No. 22 to 24, 2.70c.; Nos. 25 to 26, 2.80c.; No. 27, 2.90c.; No. 29, 3c.

Old Material.—A little more inquiry has developed on the part of some of the rolling mills, although the business done has been extremely light. Prices in some of the specialties are governed largely by individual conditions, and vary accordingly. A few sales of Heavy Melting Steel have been made between dealers at slightly advanced prices, but mills are taking no interest in the market whatever. We quote nominally, for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory, about as follows:

No. 1 Steel Scrap and Crops	$12.00 to $12.50
Low Phosphorus	18.00 to 18.50
Old Steel Axles	18.00 to 18.50
Old Iron Axles	23.00 to 24.00
Old Iron Rails	16.50 to 17.50
Old Car Wheels	17.00 to 17.50
Choice No. 1 R. R. Wrought	14.00 to 14.50
Machinery Cast	15.00 to 15.50
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	10.50 to 11.00
No. 2 Light Iron	8.00 to 8.50
Wrought Turnings	9.00 to 9.50
Stove Plate	12.50 to 13.00
Cast Borings	7.00 to 7.50
Grate Bars	12.00 to 12.50

Coke.—The demand for both Foundry and Furnace Coke has not been very urgent, and sales have therefore been

light. Spot Coke is, if anything, a trifle weaker, while that for future delivery is firmer. Some producers, who have been holding their Coke at high figures without getting much business, have reduced prices, so that the range of quotations is hardly so wide. We quote about as follows for deliveries in Philadelphia territory:

Connellsville Furnace Coke	$4.15 to $4.50
Foundry Coke	4.65 to 4.90
Mountain Furnace Coke	3.85 to 4.10
Foundry Coke	4.35 to 4.60

Cincinnati.

CINCINNATI, OHIO, January 22, 1908.—(*By Telegraph.*)

In a general way, conditions in this market may be said to be encouraging, although there is as yet little business doing, save in the way of Iron for the pipe makers, agricultural implement makers and for miscellaneous small castings. The reports of some good sized sales of the past week at attractive prices has stimulated inquiries that promise well. In finished lines there is a restricted but steady sale, and it is only the Scrap men who seem not to have experienced any appreciable benefit of the improved money market. A meeting of the Contract Committee of the Iron Buyers' Association, formed a few weeks ago, is scheduled for Wednesday in the Business Men's Club, to which the selling agents in this territory have been invited. At this meeting the proposed uniform contract for purchasers is to be presented and discussed in its various phases. The principal stipulations which the buyers would incorporate in this contract have already been discussed in *The Iron Age*, but it may be recalled here that they have to do chiefly with the matter of forward deliveries on contracts, particularly on a rising market. The buyers contend that they have been treated unfairly in some instances and are prepared with figures based on the experience of the past year. Another feature is the desired elimination of the strike clause in its possible effect on forward deliveries on contract Iron gauged by certain market conditions. It is believed that the furnaces will be ready to meet the buyers half way. Whatever may be determined upon by the committee will be incorporated in the proposed uniform contract and referred to their various furnaces by the sellers. Although the matter of freights from the Southern District is another much mooted subject at this time, that matter will be left to the Traffic Committee, which is headed by E. E. Williamson, who is commissioner of the Cincinnati Receivers' and Shippers' Association. Melters contend that past experience which brought about the freight advance from $2.75 to $3.25, or in other words, a raise in rate when Iron was $15 and over, warrants a reduction under present circumstances.

Pig Iron.—Sellers of the Massillon tonnage of last week guard details sedulously, but it is generally conceded that the larger part of the tonnage was booked through an Eastern office of the Southern furnace most concerned, and reports from that district indicate a stiffening of prices in the interval. The next largest inquiry, from a central Ohio consumer, calling for 5000 tons of Basic, is expected to be closed within the next 48 hours. The first local requirement of any size is out, and calls for 3000 tons of Basic and 1500 of Bessemer, one-half of each for delivery through February, March and April, and is destined for use in the new mills of a prominent Newport interest. A leading Ohio stove manufacturer asks for prices on 100 tons of High Silicon and a large plumbing supply concern in Chicago wants 1000 tons of High Phosphorus Iron. A report says that there has been some shading on Silicon grades on the quoted price of $21.50, and it is stated that $16, Valley furnace, is being done on Basic, with $17 to $17.50 on Malleable, at furnace. There are some inquiries for second half Iron, but furnaces are unwilling to quote on anything beyond the second quarter, and while the leading interests still quote $13.50, Birmingham, on Southern No. 2, there are sales being made at $13, and that figure has been shaded in a few sales of spot Iron, or for balance of first quarter. Although rumors of better than $16.50 at furnace for Northern No. 2 are rife, this price is given as reasonably representative of that market, for immediate delivery and balance of the quarter. For immediate delivery and balance of the first quarter we quote, f.o.b. Cincinnati, as follows, freight rates being from the Birmingham District, $3.25, and from the Hanging Rock District, $1.20:

Southern Coke, No. 1	$16.50 to $17.00
Southern Coke, No. 2	16.00 to 16.50
Southern Coke, No. 3	15.50 to 16.00
Southern Coke, No. 4	15.00 to 15.50
Southern Coke, No. 1 Soft	16.50 to 17.00
Southern Coke, No. 2 Soft	16.00 to 16.50
Southern Coke, Gray Forge	14.50 to 15.00
Southern Coke, Mottled	14.00 to 14.50
Ohio Silvery, 8 per cent. Silicon	22.20 to 23.20
Lake Superior Coke, No. 1	18.20 to 18.70
Lake Superior Coke, No. 2	17.70 to 18.20
Lake Superior Coke, No. 3	17.20 to 17.70

Car Wheel Irons.

Standard Southern Wheel	$25.75 to $26.25
Lake Superior Car Wheel	26.50 to 27.00

(*By Mail.*)

Coke.—Little change is to be noted in this market, although rumors of cutting on some Furnace brands are heard. Standard Connellsville Furnace Coke is held at about $2 at oven, and 72-hr. Foundry ranges from $2.50 to $3 for prompt shipment. Virginia Furnace grades are quoted at $2 at oven; Foundry, $2.50 to $2.65. New River Foundry is held firm in this market at $2.85 to $3; Furnace at $2.50. One Virginia product, on which it is charged there have been some good concessions made, is quoted at $2.50 to $2.65 on Foundry grades and $2, Furnace, shaded in some instances to $1.90.

Finished Iron and Steel.—There is no change in store prices, and business shows no great improvement. Collections are still slow. Larger stores are negotiating a few jobs of Structural Material for mill delivery, and there are some inquiries accumulating on Iron and Steel Bars. Dealers quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.75c., half extras; small lots from store, 1.90c., base, half extras; Steel Bars, carload lots, 1.75c., base, half extras; small lots from store, 1.90c., half extras; Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c.; Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c.; Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c.; Blue Annealed Sheets (heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c.; No. 14, carload lots, 2.05c.; small lots from store, 2.40c.; No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.25c.; No. 12, carload lots, 2c.; small lots from store, 2.35c.; Sheets (light), Black, No. 28, carload lots, 2.65c.; Galvanized Sheets, No. 28, carload lots, 3.70c.; Tin Plate, 100-lb. basis, 112 Sheets, 14 x 20, 3.70c., Pittsburgh; Steel Tire, 4-in. or heavier, carload lots, 1.95c., base; Plates, 3-16 in. and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Old Material.—Stocks in Scrap yards continue to accumulate, and business is very light. Some little interest is manifested in Relayers, a good sized tonnage of which has recently been shipped to the Pacific Coast, and there are some inquiries from Europe. The mills as yet evidence little or no interest in Melting Scrap, and in the absence of any normal movement the following prices are given as fairly representative, considering existing conditions, and are f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$10.00 to $11.00
Cast Borings, net ton	4.00 to 4.50
Steel Turnings, net ton	5.50 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought, net ton	7.00 to 8.00
Old Iron Axles, net ton	14.50 to 15.50
Old Iron Rails, gross ton	14.50 to 15.50
Old Steel Rails, long, gross ton	10.00 to 11.00
Relaying Rails, 56 lb. and up, gross ton	22.00 to 23.00
Old Car Wheels, gross ton	16.00 to 17.00
Low Phosphorus Scrap, gross ton	13.50 to 14.50

Birmingham.

BIRMINGHAM, ALA., January 20, 1908.

Pig Iron.—The tonnage sold during the week is believed to have been considerably above the aggregate sales of some weeks past, and as a result the market is decidedly stronger. The fact that purchasers of significant lots, who are no doubt best posted as to conditions, have entered the market for advanced deliveries more clearly indicates that prices are attractive and will in all probability be very effective toward maintaining the present basis. Quotations generally are firmer, and for the first time since the partial activity it is known that a bona fide offer for a round tonnage at figures slightly under the market quotation was not accepted. It is true that some Iron is to be had around $13; in fact, the recent sale of a lot of 10,000 tons for an Ohio concern was made at figures between $13 and $13.50, but leading interests are firmly adhering to a $13.50 basis, and on one of the popular brands the price has been advanced to $14. High Silicon Iron, *i. e.*, 2.50 to 3 per cent., has brought $14.50, and sales of carload lots for immediate delivery have been made at premium prices. The largest sale since the buying began has just been closed at $13.50 on a No. 2 Foundry basis f.o.b. Birmingham. This was a lot of 18,000 tons for an Eastern concern, and is for delivery during the first half. One or more lots of upward of 1000 tons each are known to have been sold on the $13.50 basis, and the aggregate of small lots sold at this price is very indicative of a firm market. There has no doubt been an improvement in all lines of the foundry trade, and it is believed that prices of raw material are now on an equitable basis. Repairs to furnaces out of blast are being rushed in some cases, and it is authentically stated that the idle capacity will be decreased by at least two stacks before February 1. Furnace yards are practically depleted of stock in some cases, and a further resumption of operations at an early date is expected by reason of the recent activity of the market.

Cast Iron Pipe.—Orders placed during the week have been principally of small lots, but the aggregate tonnage is

very satisfactory. It is true that recent lettings have been of such a nature that an opportunity to judge the market properly has not been afforded, but it is believed that quotations are firmer, and local producers are of the opinion that the letting of 2500 tons for the city of St. Paul, Minn., January 26, will be very effective toward establishing a firm basis. Reports are favorable for some lettings of consequence in the East, and indications are that good results from the readjustment of financial conditions are soon to be realized. We quote nominally as follows, per net ton, f.o.b. cars here: 4 to 6 in., $30; 8 to 12 in., $28; over 12 in., average, $26, with $1 per ton extra for Gas Pipe.

Old Materials.—So far as sales for future requirements are concerned the market is without feature. Inquiries continue to be made which are encouraging, and indications favor a resumption of operation at some of the mills, but no doubt the demand will be slow to increase, and an early reaction of the market is not anticipated. Prices are nominal, and we quote as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$22.00 to $22.50
Old Iron Axles	18.50 to 19.00
Old Steel Axles	17.00 to 17.50
Old Car Wheels	20.50 to 21.00
No. 1 Railroad Wrought	17.50 to 18.00
No. 2 Railroad Wrought	13.00 to 13.50
No. 1 Country Wrought	14.50 to 15.00
No. 2 Country Wrought	12.00 to 12.50
Wrought Pipe and Flues	13.50 to 14.00
Railroad Malleable	14.00 to 14.50
No. 1 Steel	13.50 to 14.00
No. 1 Machinery Cast	11.50 to 12.00
Stove Plate and Light Cast	10.00 to 10.50
Cast Borings	6.75 to 7.25

The Coal Trade.

BY FREDERICK E. SAWARD.

The coal trade is in a vastly different condition from that of a month ago. There have been many changes in the way of output and sales. The former has in many instances been cut to 60 per cent. of the October and November production. On December 1 it seemed as if the coal industry was the one bright spot in the cloud that overcast the entire trades of the country. Since then there has been a falling off in the use of coal for manufacturing, as is but too well known, and shipments on contracts have been delayed at the behest of the consignee, either in whole or in part. The consequence of all this has been a slump in prices, and we are now back to summer figures on the bituminous product of many districts, and in some instances even less figures have been taken, for demurrage coal has been the feature at all the junction points and at some ports and places along the Atlantic coast. People who refused to make sales on contracts in the fall of last year, having the expectancy that values would be higher during the winter season, are having their regrets.

At the same time, it is to be observed, as already stated, that consignees have begged off, in whole or in part, from their obligations, inasmuch as they themselves were not using up their fuel as rapidly as possible. It will be apparent to every one that this hand to mouth buying must end in the near future. With the curtailment of output at the mines there comes a nearer approach of supply to demand, even on the above basis, and any interruption to traffic will make a scarcity. Already this is the case in some parts of the West and at one or more ports in New England. We do not expect that the 1907 output will be equaled in the current year, but that there will be a falling off to the extent of at least 5 per cent. This, in any event, means a total that is greater than any year barring that of the one just past. This will give the opportunity for all the fuel which will be required, and as to prices, if the producers will put last summer's rate in force for all the year they will do as well as other trades. They cannot go below that and make any profit on their investments, for labor costs are high and not likely to be any lower; in fact, labor looks upon the situation as one entitling it to higher wages.

It can truly be said that the anthracite trade ended the year 1907 with maximum production, maximum consumption and sales, minimum stocks, satisfactory prices and all labor questions on a satisfactory basis until a year from next April. There is no great industry in the world which can equal its record for profits and generally satisfactory conditions in the year which has just closed. The amount of coal sent to market was more than 67,000,000 tons, and probably 9,000,000 tons more were consumed about the mines.

At the present moment pea coal is very scarce. There is an occasional cargo offered on the market by one of the companies which is accumulated at the ports by dealers not able to take their allotment. Buckwheat No. 1 is still easy; in fact, easier than it has been for some time past. At present $2.50 seems to be a good price for the best grades of buckwheat. No. 2 buckwheat, or rice coal, in most instances is a drug on the market. The price seems to rule at about $1.65 f.o.b., but it is not moving very rapidly even at that figure, only the very best grades; the poorer grades are hard to move at any price. Barley is also a drug, and the situation has not improved on this size for some time, and it is being offered at the prices prevailing last summer. There is almost always a surplus of this size, and the buyer has no difficulty in obtaining bargains.

The bituminous coal trade is at its low point now for several years at this season, and operators are, to say the least, quite skeptical as to the outlook for 1908. The year that has just closed was a phenomenal one, and until November enjoyed unequaled prosperity. Throughout the summer months the trade was at its hight, and prices for the cheapest grades soared to $2 at the mines. Now it is hard to get even $1.25 for some of the best grades. The car supply over the entire bituminous region has been good. The Pennsylvania regions have been troubled with heavy falls of snow that have caused a great number of the mines to shut down. The situation would be improved greatly, however, if the entire region would shut down for a short period, to give the shippers an opportunity to clean up some of the surplus coal. A great number of the mines have been compelled to shut down temporarily for lack of orders. Numerous operators, in order to keep their mines running and thereby hold their men, are offering their coal and almost begging firms to handle it at their own price, some of them going so far as to ship it to tidewater on a commission basis.

New York.

NEW YORK, January 22, 1908.

Pig Iron.—There have been some sales of fair lots of Foundry Iron, and at least one lot of Basic Pig for this district. The market, however, is unsteady, because of the efforts of some sellers to market Iron at prices somewhat below those generally quoted. We quote, at tidewater, $19 to $19.25 for No. 1 Northern Foundry; $18 to $18.25 for No. 2 Foundry; $17.75 to $18 for No. 2 Plain, and $17 to $17.25 for Gray Forge. Alabama Iron is quoted $17.50 to $18 for No. 1 Foundry, and $17 to $17.50 for No. 2 Foundry.

Steel Rails.—From Chicago and Pittsburgh are reported small orders in the past week amounting to about 4500 tons. The Brooklyn Heights Railroad has bought 500 tons of 80-lb. rails. Splice bar business is reported to have been fairly good.

Structural Material.—The amount of structural work on which bids are being asked has shrunk to minimum proportions. Mills are naturally running only intermittently, in view of the conditions in fabricating works and the very small demand upon jobbers and structural firms which carry yard stocks. At Buffalo the structural mill of the Lackawanna Steel Company is about to start up for a two weeks' run. In New York City the only new business of note is the National City Bank's new construction on the old Custom House site. Bids have been received on about 3100 tons of Steel. The railroads are very small contributors to the volume of current business, and show little signs of any greater interest in new contracts in the near future. The St. Paul road recently placed bridge work for its Pacific Coast extension amounting to about 2200 tons, most of this going to the McClintic-Marshall Construction Company, while the balance was taken by the Strobel Steel Construction Company. The Chicago & Northwestern Railroad is in the market for 1000 tons of bridge work for its Iowa Division. Prices recently named on fabricating contracts indicate the expectation of lower prices on Steel later in the year. Whether these will come is for the future to determine. We quote on mill shipments, tidewater deliveries, as follows: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—The price situation in Bar Iron has been somewhat complicated by the action taken at the meeting of the Eastern Bar Iron manufacturers in this city last week. It was decided to make no change in the regular price of 1.60c., Pittsburgh, but manufacturers were left free to meet such competition as might develop. It is understood that while some mills adhere strictly to the above named price, others have quoted 1.40c. and lower, but even those who named the low prices have not secured much business. Eastern mills generally are still standing idle, and conditions will have to improve decidedly to enable any considerable number of them to start up. The market on Bar Iron may be quoted at 1.51c. to 1.56c., tidewater, in view of the conditions above set forth. Steel Bars are quiet but unchanged at 1.60c., Pittsburgh, or 1.76c., tidewater.

Plates.—The market is not so completely stagnant as it has been, but the orders coming out are rather small. Inquiries indicate a slowly increasing demand. Prices are continued as follows for tidewater delivery. Sheared Tank

Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—General conditions have not improved, although some buying in small lots is being done. No lettings of any considerable size are in sight in this immediate territory. Carload lots of 6-in. are quoted at $26 to $27 per net ton tidewater.

Old Material.—A rather better business is proceeding in Foundry stock. Some of the railroad companies have been making contracts for Castings, and the jobbing foundries are also doing better than in December, so that purchases of raw materials are being made by the foundry trade. It is understood that no contracts for Cast Scrap are being placed for future delivery, but melters are merely purchasing to cover their requirements for a week or two. Further transactions for export are noted, the foreign demand for Old Car Wheels being especially strong. Good quantities of Heavy Melting Scrap have been sold to works in eastern Pennsylvania. Rolling mills are buying quite sparingly, purchasing agents making bids which in most cases are below the views of dealers. Quotations, per gross ton, New York City, are as follows:

Old Girder and T Rails for melting	$8.00 to $9.00
Heavy Melting Steel Scrap	8.00 to 9.00
Old Steel Rails, rerolling lengths	10.00 to 11.00
Relaying Rails	15.00 to 16.00
Old Iron Rails	13.00 to 14.00
Standard Hammered Iron Car Axles	15.50 to 16.50
Old Steel Car Axles	13.00 to 14.00
No. 1 Railroad Wrought	10.50 to 11.50
Iron Track Scrap	9.00 to 10.00
No. 1 Yard Wrought, long	10.00 to 10.50
No. 1 Yard Wrought, short	9.50 to 10.00
Light Iron	4.50 to 5.50
Cast Borings	4.00 to 5.00
Wrought Turnings	5.50 to 6.50
Wrought Pipe	8.00 to 8.50
Old Car Wheels	16.00 to 16.50
No. 1 Heavy Cast, broken up	12.50 to 13.00
Stove Plate	11.00 to 11.50
Grate Bars	8.50 to 9.00
Malleable Cast	12.00 to 12.50

Metal Market.

NEW YORK, January 22, 1908.

Pig Tin.—The price declined last week, advanced on Monday, and to-day is slightly under that of a week ago. Business has been dull with the exception of the last three days of last week, when there was some activity. The total turnover, however, was about 300 to 400 tons, half of which was for spot and the remainder Tin in transit and early shipment from London. The range of prices during the week has been as follows:

	Cents
January 16	27.40
January 17	27.25
January 18	27.25 to 27.50
January 20	28.00
January 21	27.60
January 22	27.60

The arrivals since the first of the month aggregate only 875 tons, and it is probable that deliveries into consumption exceed that. There are afloat for American ports 1075 tons, practically none of which will make this month's delivery. The deliveries into consumption during January are expected to reach 1500 tons. European advices are somewhat firmer than earlier in the year, but the outlook even from that viewpoint is not altogether reassuring. The visible supplies throughout the world should show a large increase by February 1. The demand in this country, or lack of it, is the only influence on price at present. It would not be at all surprising if shipments to this side during the next few months should show a marked increase. One reason for the small shipments for the last three months, and the principal one, is that it was very difficult to finance the Metal on this side, but this cause has now been removed and larger stocks may be expected. The London market closes to-day at £123 17s. 6d. for spot and £125 2s. 6d. for futures. It is rather a good sign in Tin, as well as most other metals, that the price for future delivery is higher than for spot.

Copper.—Prices are slightly firmer, but business is very dull. Lake and Electrolytic are practicaly on the same basis of 14c. to 14.12½c. Casting grades can be had at 13.62½c. to 13.87½c. Concessions of from 5 to 12½ points from the inside price of Electrolytic are made to exporters. The firmness in the market seems to have accentuated the dullness, and unless some good buying should develop shortly the price is expected to recede. Domestic consumption is undoubtedly at a lower ebb than for many years, being estimated at only one-third of the high rate of a year ago. In finished products there has been a slightly increased demand, with a better feeling. This should continue. The export situation, which has been such a dominant influence for months, is no more than holding its own. The exports during the last week have been less than 4000 tons. This is less than half what they were a month ago. The total exports for the first 22 days of the month aggregate 22,000 tons. Whether December will hold the record for exports or not remains to be seen, but it is fair to state that the buying by consumers in Europe has fallen off, and it is chiefly speculative buying that is now manifesting itself there. Some reports of low prices for the metal have been circulated, but even though the market is dull, it would be easy to find buyers at 13.75c. to 13.87½c. It might be, however, in only limited quantities. A stray car of best Lake was offered on Tuesday at 13.87½c., but this was a resale and did not represent the market. In London the market is easier than a week ago, at £62 12s. 6d. for spot and £63 2s. 6d. for futures. Best Selected is held at £66 10s.

Pig Lead.—The leading producer has advanced its price and is now quoting 3.85c., New York. This company until recently took most of the business offered, but since the first of the week outside interests have been quoting 3.80c. and have secured some of the orders. There was a fair business done on Monday, but since then it has dwindled to insignificant figures. The market at St. Louis is quoted at 3.65c. to 3.70c. The American Smelting & Refining Company revised its price this afternoon to 3.75c. This is being met by other sellers.

Spelter.—The situation of Spelter is considerably mixed. Some nearby business has been taken at figures unchanged from last week, of 4.70c., New York, and 4.55c., St. Louis. For future business, however, the market is considerably firmer. St. Louis holders are quoting for February and March shipment 4.57½c. In New York future shipments are held at 4.70c. to 4.75c. The volume of business is small.

Ferroalloys.—The market is dull and prices are unchanged from last week. Ferromanganese is held at $48 to $49, at seaboard. For 50 per cent. Ferrosilicon $85 is asked by domestic producers at their works and the same price by importers at seaboard. The price of 75 per cent. Ferrosilicon is unchanged, at $127.50.

Antimony.—Advices from Europe to-day state that a considerably better feeling prevails there regarding Antimony, and prices are higher. Domestic business is now being taken at higher figures, 9.50c. being the ruling quotation for Cookson's and 9c. for Hallett's, although considerable of this metal was sold at 8.75c.

Nickel.—Prices continue unchanged from last week, ton lots being held at 45c., and smaller quantities at 50c. to 60c. The larger consumers, however, who make yearly contracts, have better prices.

Tin Plates.—No activity is apparent. Prices of 100-lb. IC Coke Plates continue unchanged, at $3.85, f.o.b. New York, and $3.70, f.o.b. Pittsburgh. Tin Plates in Swansea are 1½d. lower, at 11s. 7½d.

Old Metals.—The market for Old Metals is dull. Receipts have been slightly larger, but the consumptive demands is meager. Dealers' selling prices are unchanged from last wek, as follows:

	Cents
Copper, Heavy Cut and Crucible	13.00 to 13.25
Copper, Heavy and Wire	12.50 to 13.00
Copper, Light and Bottoms	11.50 to 11.75
Brass, Heavy	10.00 to 10.50
Brass, Light	7.50 to 8.00
Heavy Machine Composition	12.00 to 12.50
Clean Brass Turnings	8.50 to 8.75
Composition Turnings	10.50 to 11.00
Lead, Heavy	3.40
Lead, Tea	3.25
Zinc Scrap	3.25

Iron and Industrial Stocks.

NEW YORK, January 22, 1908.

For the greater part of the past week the stock market has been consistently strong. Both railroad and industrial stocks have shown an advancing tendency, which has been, of course, largely due to the stimulating influence of cheaper interest rates for money and partly to developments indicating a somewhat better feeling toward corporations. Judicial decisions during the week have favored railroad companies. On Tuesday, however, some recession set in, which was, perhaps, the result of extended profit taking. The range of prices on active industrial stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 29 to 31¼, preferred 92½ to 95¼; Car & Foundry common 30½ to 32¼, preferred 89⅝ to 90; Locomotive common 38¾ to 40½, preferred 90 to 92; Steel Foundries common 6 to 6⅞, preferred 31 to 34; Cambria Steel 29¼ to 30¼; Colorado Fuel 20¾ to 22⅜; Pressed Steel common 21½ to 23, preferred 74 to 80; Railway Spring common 28 to 29½; Republic common 17¼ to 18⅛, preferred 70 to 71½; Sloss-Sheffield common 41 to 42; Cast Iron Pipe common 19 to 20, preferred 62 to 67; Can common 5¼ to 5⅜, preferred 50¾ to 52. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 29⅜, preferred 93¼, bonds 88¾; Car & Foundry common 30½, preferred 90; Loco-

motive common 38½, preferred 91; Colorado Fuel 20; Pressed Steel common 21⅝, preferred 79; Railway Spring common 28; Republic common 17¼, preferred 69¾; Sloss-Sheffield common 41⅛; Cast Iron Pipe common 19¾, preferred 64½; Can common 51⅝, preferred 51¼.

The Committee of Creditors of the Westinghouse Electric & Mfg. Company, which has been working out a scheme for the readjustment of the company's debt, has made its plan public. The announcement was the first official statement of the itemized account of the company's unsecured debt, to provide for which $35,000,000 of 5 per cent. bonds is to be issued. The consummation of the plan is conditioned upon the payment of $7,000,000 of new capital into the treasury for stock which, it has been understood, President George Westinghouse and his friends are to take up. It is also provided that the new Board of Directors shall meet with the approval of the committee, and it is specified that the future election of directors to the satisfaction of the creditors be insured by the creation of a voting trust or similar device. The committee reserves the power to modify the provisions of the published plan should it be found impracticable. The officers of the Westinghouse Company have expressed their confidence in the acceptance of the reorganization plan, and look for the early discharge of the receivers.

Dividends.—The Cambria Steel Company has declared a dividend of 1½ per cent., payable February 15.

The International Steam Pump Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable February 1.

The Westinghouse Air Brake Company has declared a dividend of 10 per cent. for the six months ending December 31, with a bonus of 5 per cent. for the year.

The United States Radiator Company, Dunkirk, N. Y., has declared a quarterly dividend of 1½ per cent.

At the fourteenth annual meeting of the American Society of Heating and Ventilating Engineers, held at the Engineers' Building, New York, January 21, C. B. J. Snyder, president, presented an address recommending some progressive work for the society, and gave some valuable information on the heating and ventilation of school buildings. The society also heard what was considered a very comprehensive report of the committee to collect data for fan blast heating. At the evening session the announcement of the election of the following officers was made: President, James Mackay, Chicago; first vice-president, James D. Hoffman, Lafayette, Ind.; second vice-president, B. F. Stangland, New York; secretary, William M. Mackay, New York; treasurer, U. G. Scollay, Brooklyn, N. Y. Board of Governors: C. B. J. Snyder, New York; R. C. Carpenter, Ithaca, N. Y.; August Kehm, Chicago; Frank K. Chew, New York, and John F. Hale, Chicago.

The Bristol Iron & Steel Company's plant at Bristol, Pa., has been purchased by John J. Caine, H. P. Miller and Charles M. Foster, all of Philadelphia, who will operate the mill as heretofore, manufacturing iron bars and bolt and nut iron. The mill, which has been idle for some time, was started up after necessary repairs January 20. John J. Caine is president and Charles M. Foster is treasurer of the company, which will be continued under the same name. B. F. Conner, who was until recently connected with the Susquehanna Iron & Steel Company, will be general manager, while Miller, Foster & Co., who have removed their offices from 1035 Real Estate Trust Building, Philadelphia, to 820-822 in the same building, will act as selling agents for the new owners.

A committee of stockholders of the Sheffield Coal & Iron Company, which recently went into the hands of a receiver, has been formed for the purpose of preparing a reorganization plan and a request is being sent out to other stockholders to deposit their holdings with the Bankers' Trust Company of New York, with the understanding that they can withdraw their stock if the plan formulated by the committee does not suit them. The committee is composed of E. C. Converse, president of the Bankers' Trust Company; James Gayley, vice-president of the United States Steel Corporation; Isaac Ellwood, W. M. Douglas and C. W. Funk of Philadelphia, who represents a number of stockholders in that vicinity. No arrangement has been made as to the nature of the committee's plans for the reorganization.

Pennsylvania Grade Crossing Elimination.

While invariably avoiding grade crossings on new and revised construction work, the Pennsylvania Railroad has in the last five years been eliminating crossings at grade as rapidly as practicable. A compilation for the period since January 1, 1902, shows that, whereas on that date there were 994 grade crossings on the lines of heaviest traffic between New York and Washington and between Philadelphia and Pittsburgh, 568 of these, or more than half, had been removed by January 1, 1908. When it is noted that the 426 grade crossings which still remain are, with few exceptions, at unfrequented highways and that they are scattered over 571 miles of road, the extent of the company's work in this direction will be further realized.

The completion of the new Washington terminal marks the consummation of the plan of the late President Cassatt to eliminate all grade crossings in the important cities between New York and Washington. To accomplish this has involved the elevation or depression of tracks in Jersey City, Newark, Elizabeth, New Brunswick, Trenton, Philadelphia, Chester, Wilmington, Baltimore and Washington. On the division between Philadelphia and Washington alone 101 grade crossings have been removed. Between Jersey City and Philadelphia a total of 58 were eliminated, owing to a revision of grades in New Brunswick, Morrisville and Trenton. On the Pittsburgh Division 44 crossings have been eliminated, leaving but 82 on the main passenger line between Altoona and Pittsburgh. Out of 101 grade crossings between Altoona and Harrisburg on January 1, 1902, only 51 remained on the first day of this year.

The figures given take no account of the very extensive and important revisions of grade—so conspicuous in Philadelphia—whereby tracks for trains in different directions have been either elevated or depressed, thereby eliminating the necessity for trains to cross tracks at grade. This has been a very great additional factor of safety at places where traffic is dense.

The bi-monthly adjustment of the wage scales for sheet and tin plate workers was made in Pittsburgh last week. It was found that the average price per base box of tin plate for November and December shipments was $3.70, and as the base of the tin plate scale is $3.40 a box, the tin plate workers will continue to receive an advance of 6 per cent. over the base of the scale for January and February. They have been getting this advance since the settlement last May. No change was made in sheet wages, the sheet workers continuing to receive an advance of 2.6 per cent. over the base of the scale.

The affairs of the Commonwealth Trust & Savings Bank, Chicago, established under the auspices of trade unions, will be wound up and the institution will go out of business. Of the $200,000 required to do business as a State bank, $126,000 had been subscribed. Only about $22,000 was actually paid in. There remained in the hands of the officials $14,000. This amount will be paid back to the 300 stockholders, leaving a deficit of about 40 per cent.

The Brier Hill Iron & Coal Company, Youngstown, Ohio, will blow out its blast furnace about March 1, when it will be torn down and rebuilt. The company has just re-elected its old officers, as follows: George Tod, president; J. G. Butler, Jr., vice-president and general manager; H. H. Stambaugh, treasurer, and R. C. Steese, secretary. The directors are George Tod, J. G. Butler, Jr., H. M. Stambaugh, John Tod and David Tod.

The entire plant of the Pittsburgh Steel Company, Monessen, Pa., comprising rod, wire nail and wire mills, which closed down December 21, resumed operations in full on double turn last week, with good prospects for the future.

The Machinery Trade.

NEW YORK, January 22, 1908.

There was practically no improvement in the demand for machinery the past week, though a better feeling prevails among merchants, caused by the receipt of a substantial list of tools from the Standard Oil Company, the purchases against the list issued some time ago by the same company and some scattered buying from various sources. Some, however, note a slight increase in inquiries for tools, but this is not the case generally, and with the majority of the trade there was no increase in either inquiries or orders. A great proportion of the business transacted consisted of small lots from industrial plants, the railroads doing practically nothing. It is thought that general conditions will have to show a perceptible improvement before trade shall materially increase. The buying of the past few weeks has been more in the nature of tools for replacement and for completing improvements started some time ago than for new work. There is a great deal of new construction work being held in abeyance which will require the installation of a large amount of mechanical equipment, and upon the carrying forward of which is dependent, to an extent, a more active demand for machinery. Collections are still slow, and some concessions have been made for spot cash. Prices on machine tools have been maintained generally, but the past week one builder announced a reduction of about 10 per cent.

Purchasers of steel castings, according to a representative of one of the largest steel foundries in the country, appear to be more confident over the future outlook for trade, and some of them who at the end of last year were holding back their orders are now giving contracts for their year's supply. While they are not asking for as many castings as they did last year, their orders indicate that they expect a fair amount of business, and the fact that they are willing to place yearly contracts rather than give orders for castings from time to time, indicates that they have confidence in the future.

People in the trade who are watching the work on the Isthmian Canal closely think it will not be long before some especially large requirements for machine tools will come from that source. A good deal of machinery has been purchased for the repair shops on the Isthmus, but with the constantly added equipment requiring repairs it has been noticed by some machinery representatives who have recently been on the canal zone that the repair facilities are being used to their utmost capacity. Consequently, it is expected that before long the engineers in charge will make additional requisitions for machine and repair shop equipment.

Some progress has been made in the formation of the association of manufacturers of pneumatic stone tools, and the association has been tentatively formed. It is understood that the organization rests upon the decision of certain manufacturers to lend their support, and if their cooperation is secured the association will undobutedly be organized. In many other industries associations have been beneficial in the correction of trade abuses, and it is contended that there is need of an association among manufacturers of pneumatic tools, as the attitude of the buyer toward the manufacturer is not by any means what it should be. H. G. Kotten of the H. G. Kotten Company, New York, is at the head of the movement.

It is the intention of the Transcontinental Railroad to construct new shops at St. Boniface, Canada, in the near future, plans for which have not yet been completed. Hugh D. Lumsden is chief engineer, with headquarters at Ottawa, Ont.

The Mexican Petroleum Company, Los Angeles, Cal., it is expected will be in the market shortly for a lot of machinery equipment to be used in the development of oil properties in Mexico. The company controls a large tract of land there and will be in the market, it is understood, for pumping equipment, pipes, &c. The oil is to be used for fuel on Mexican railroads. The Oil Fields of Mexico Company, 49 Exchange place, New York, has completed the purchase of a large amount of equipment for a 60-mile railroad and pipe line, together with pumping stations. The company has given up its idea of building refineries for the present, as it has been found that a nearby refinery in which the company is interested can take care of its product for the present. It may be added in this connection that there have been some rather large inquiries in the market of late for general railroad equipment in Mexico, one of the buying lines being the Mexico National, with offices in Mexico City, which is contemplating the construction of an extensive railroad line in the oil districts to connect them with Mexico City.

The new plant of the H. G. Kotten Company at Marion, N. J., is rapidly nearing completion, and that company will, it is thought, within a month or so be able to move in the new building. The company has been purchasing some machinery equipment of late which will be installed in the structure, together with the equipment now in use in its New York plant, which is to be abandoned. The building at Marion is 75 x 150 ft. and is two stories in front and one story in the rear. The first floor will be used for manufacturing purposes and will accommodate a producing gas plant of about 75 hp. The second floor will be used for drafting room and offices. The building, which is of brick, concrete and steel, is adjacent to the railroad track and makes a neat appearance.

There are inquiries in the trade from Alonzo Dumont & Co., 25 Broad street, New York, for a triplex pump capable of pumping 420 gal. a minute and elevating water 200 ft., together with an engine and boiler to match and other accessories. The firm is also buying some railroad motive power equipment.

The Jefferson City Electric Company, Jefferson City, Tenn., which intends to install an arc lighting system, will purchase a three-phase direct current generator. The company has contracted for the engine. M. C. Franklin is president and J. M. Coile, manager.

Another Machine Tool List Issued by Standard Oil Company.

The most important development in the trade the past week was the substantial list of machine tools sent out on Tuesday by the Standard Oil Company. This list, which covers 35 tools, aggregating $40,000 in value, covers the following machines:

One 16 in. x 4 ft. speed lathe.
One 16 in. x 4 ft. lathe.
One 16 in. x 4 ft. lathe.
One 20 in. x 21 ft. lathe.
One 30 in. x 12 ft. lathe.
One 42 in. x 16 ft. lathe.
One 48 in. x 16 ft. lathe.
One multiple punch, capacity 1⅛-in. hole in ¾-in. steel.
One bending roll, 20 ft. 2 in. between housings, 20 in. diameter top roll and 14 in. diameter lower roll.
One shear to cut 6 in. x 1½ in. iron.
One 2000-lb. steam hammer.
One 12-ft. post drill.
One power hammer.
Two wet tool grinders.
One 10-in. facing and tapping machine.
One 6-in. facing and tapping machine.
One 7-in. upright drill.
Two horizontal boring mills, 5 x 10 ft. bed, 36 in. vertical travel, 42 in. transverse travel.
One 36 x 72 in. shaper.
One 16-in. slotter.
One 5-in. radial drill press.
One 6-in. radial drill press.
One 4-in. radial drill press.
One 3-in. radial drill press.
One 36-in. upright drill press.
Two 24-in. upright drill presses.
Two 14-in. speed drills.
One twist drill grinder.
One 42 x 16 in. planer.
One No. 3 universal milling machine.
One 12-in. spindle multiple drill, to drill holes in 30-in. diameter circle.

These machines are required for the new plant the company is building at Bayway, N. J., and for the equipment of which the company will have to purchase a great deal of additional machinery. Only recently a small list of tools was issued for this plant, and purchases were made within the past 10 days, the orders being placed among a few houses.

Chicago Machinery Market.

With a resumption of currency payment in practically all Western cities and more liberal accommodation in bank loans, the most burdensome restriction to activity in machinery lines has in a large measure been removed. General confidence has, however, been too deeply shaken by the developments of recent months to expect a return at a single leap to normal conditions. But evidences of a better movement, responsive to the more favorable influences noted, are not lacking. Machinery houses in all lines continue to report a quiet trade, which, as yet, is unsupported by an adequate demand from the railroads and large manufacturing interests. But there is on the whole a noticeable improvement which in some directions is more marked than in others. A better average of inquiries are being received by the makers of electric motive power equipment, more of which are resulting in orders. Very few of these relate to enterprises requiring large installations, but are of a character which indicates pretty clearly that many small indus-

trial projects in light and power plants, the development of which was arrested by the late money panic, are now going forward.

The Electrical Show, now being held at the Coliseum by the Electrical Trades Exposition Company, is attracting quite a number of visitors from outside points, who are interested in electrical machinery and appliances. No sales of consequence are reported to have been made, but considerable prospective business has been lined up as a result of the inquiries made. The movement in boilers and engines is limited to a moderate demand for small units which, though gradually growing stronger, is yet quite scattered.

Trade in machine tools shows no material increase in volume of actual sales, though a few dealers report for the past week a fair amount of business from various sources. One buyer in the market this week from the West says that in his region conditions strongly favor active operations when spring opens. No difficulty, according to his statement, is being experienced by manufacturers or merchants in getting what money is needed for legitimate trade enterprises, and a strongly optimistic feeling as to the outlook prevails throughout the States of the Middle West. While no one seems to expect a marked change in the situation steady advancement toward improvement is looked for.

A list of tools amounting to over $18,000, on which all bids taken by the Chicago Board of Education in November last were rejected, will be again submitted to the trade for figures within the next three or four weeks. The tools comprised in this list are required for the equipment of the Lake High Manual Training School, and include lathes, planers, drill presses, millers and other machines necessary for a complete shop equipment.

A new gray iron foundry, 32 x 70 ft., will be built at Meridian, Miss., by Frank Marty. The foundry will be furnished with electric motor drive, and, though starting on a small scale, it is expected to widen its field of operation to include brass casting and general machine work. Mr. Marty would be glad to consider the manufacture of some marketable machine or foundry specialty.

A list of tools, the purchase of which has been in contemplation for some time by the School Board of Milwaukee, Wis., for the equipment of the School of Trades, has finally been bought. The purchase included one 14 in. by 6 ft. and one 16 in. by 8 ft. Bradford lathe; one 13 in. by 6 ft., and one 16 in. by 8 ft. Whitcomb-Blaisdell lathe; one 16 in. by 8 ft. Lodge & Shipley lathe; one 14 in. by 6 ft., and one 16 in. by 8 ft. Pratt & Whitney lathe; one 16 in. by 7 ft. Hendey-Norton lathe; one 16 in. by 12 ft. Cincinnati lathe; one 26 in. by 10 ft. Schumacher & Boye lathe; one 30 by 30 in. by 8 ft. Gray spiral gear planer; one No. 2-A Brown & Sharpe milling machine; one No. 2 12 by 30 in. Brown & Sharpe grinder; one Hendey 15-in. shaper; one 2½ by 12 in. stroke Garvin die slotter; one Baxter D. Whitney 26-ft. single surface planer; one Putnam pattern shop lathe.

The Utah Light & Railway Company, Ogden, Utah, which is controlled by the Harriman interests, has begun construction on a large electric power plant at Devil's Gate, near Uintah, Utah, which is designed to develop between 4000 and 5000 hp. About $20,000 has already been spent upon the preliminary work of this installation, the cost of which, when completed, will be approximately $250,000. It is expected that as soon as spring opens operations will be actively begun and the work pushed to completion.

The Hawkins & Barnett Machine Company, Trinidad, Colo., has secured a franchise from the town of Aguilar, Colo., to supply it with electric light and power. The company will at an early date begin construction of a $25,000 plant of sufficient capacity not only to meet local requirements, but also to furnish both light and power to adjacent coal mines.

The Wisconsin Engine Company, Corliss, Wis., reports its shops running full time with work enough on hand to keep them in operation for several months. New business to the extent of nearly $250,000 has been received within the past six weeks, included in which was an order for three 550-hp. gas engines for direct connection to 350-kw. 25-cycle alternators. Plans are in contemplation for additions to certain departments of the plant, also the building of a clubhouse for employees. These plans, however, have not been matured and are being held in abeyance pending improvement in general trade and financial conditions.

Sealed proposals will be received at the office of the United States Reclamation Service, Probo, Utah, until February 20 for 336 ft. of steel pressure pipe, consisting of 168 ft. 5 ft. 6 in. inside diameter made from plates ¼-in. thick; 168 ft. 5 ft. 6 in. inside diameter riveted steel pipe made from plates 3-16-in. thick. The successful bidder will provide a superintendent and all skilled mechanics and other necessary labor with necessary tools and appliances for the erection of the pipe.

The Detroit Steel Cooperage Plant, Detroit, Mich., has installed two electric cranes, one of 5 tons and one of 10 tons capacity, together with a 125-kw. generator for the operation of the cranes, and other tools in the factory. This equipment was furnished and installed by the Detroit Engineering Works, Detroit, Mich.

The Railway Specialty & Supply Company, Great Northern Building, Chicago, Ill., has been appointed agent for the Hayes Track Appliance Company in the Chicago District, and is prepared to furnish catalogues and all information desired in connection with the Hayes derail. The company has also been appointed Chicago agent for the sale of the Kopp signal glass, manufactured by the Pittsburgh Lamp, Brass & Glass Company, and is prepared to furnish promptly all styles of lenses, roundels and lantern globes. This glass has been used for a number of years on the important railroad systems, and is said to be the first solid color glass manufactured on a commercial scale.

Cleveland Machinery Market.

CLEVELAND, OHIO, January 21, 1908.

General conditions have improved in this city more rapidly during the past week than during any previous week since the country began to recover from the recent financial disturbance and attendant industrial depression. Manufacturers of all lines of products feel greatly encouraged over the outlook, and there are few now who do not believe that industrial activity will steadily improve until within the next two or three months it will get back to near the normal basis. More men were put back to work during the week by local industrial establishments than during any previous week since manufacturers began to ease up on their curtailment policy, and many plants are now running at about double the capacity they were a few weeks ago. Orders are coming in better, and there is a marked improvement in the volume of inquiries. The currency problem has practically ceased to appear. Although the amount of money is not yet normal, it is sufficient in view of the diminished payroll requirements. Loans are being made above the usual rates of interest, but it is not believed that these rates can long be maintained.

The volume of orders received by the local machine tool dealers is still light, but they expect to be about the last to be benefited by improved business conditions, for the reason that buyers will not consider purchases of new machine tools until their business is sufficient to keep all they have in their plants at present in full operation. The buying is mostly in single tools for small shops, a large share of those making inquiries wanting second-hand tools. Second-hand tools are rather scarce, few being offered to dealers. A few sales of single tools that are absolutely needed are being made to automobile dealers, but inquiries from large plants for additional tool equipment are very scarce. Competition among dealers for the little business that turns up is very lively, but prices seem to be firmly maintained.

While business with builders of heavy machinery, such as coal and ore handling and mining machinery and locomotive cranes, has not shown much improvement, inquiries for this class of machinery are more numerous, and one local builder has received inquiries from two railroads during the past few days.

Local jobbing foundries report a decided improvement in inquiries, but consumers demand lower prices. There is very strong competition among foundrymen for the business and price concessions are being made.

While there has been a general cut in wages in only a few, if any, cases, many industrial plants in the metal trades in taking back high class skilled laborers who received wages that were regarded as abnormally high during the recent prosperous times, are re-employing them at lower wages than they were paid when they were laid off.

The new plant of the Standard Welding Company on West Seventy-eighth street is nearing completion. The engines and new machinery are now being installed, but the machinery in the old plant will not be moved to the new quarters for a few weeks. The company expects to start its new plant in operation in a small way in about three weeks and to have it in full operation about March 15. The company reports that it has had a very satisfactory increase in orders during the past two or three weeks and that it is now getting a fair run of business.

Industrial activity is rapidly resuming its normal condition in Akron, Ohio. The plant of the Christy Steel Company, which shut down in November, started up this week with a fair amount of orders on hand. The plant of the Baker, McMillen Company is now running at full capacity, and orders are coming in in good shape. The Wise Furnace Company reports a satisfactory volume of orders and that the outlook for the year's business is good.

The village of Hudson, Ohio, has formally accepted the offer of J. W. Ellsworth, the prominent coal operator, to erect at his expense electric light and water plants and a system of sewerage, including a sewage disposal plant, in

that village. Mr. Ellsworth has appointed Albert A. Augustus of Cleveland and Arthur A. Dittrick of Hudson as his representatives in the matter, and the improvements will be put in under their direction. It is expected that the work will be started in a short time.

The Industrial Machine Company, Cleveland, has been incorporated with a capital stock of $15,000 to succeed the Industrial Machine Works, builder of special machinery and models, and tool makers, which for some time has been operating a plant at 517 Huron road, S. E. The officers of the new company are L. H. Freeman, president, and N. W. Thomas, secretary and treasurer.

The Cleveland Iron & Steel Supply Company has been incorporated with a capital stock of $10,000, by Edward H. Williams, A. M. Milbrandt, Oak McCray, Fred F. Dresser and P. F. Hannagan. The company plans to start a plant in a short time for the manufacture of some articles on which it controls patents.

The Ferry Cap & Set Screw Company, which recently built a new plant on Scranton road, Cleveland, has increased its capital stock from $50,000 to $100,000.

The Monitor Sad Iron Company, Big Prairie, Ohio, has been incorporated with a capital stock of $50,000 by J. C. Lake, R. R. Critchfield, B. A. Lake, Harvey Emmons and A. V. Rush.

The Byers Machine Company, Ravenna, Ohio, has closed a contract with the Ravenna Gas & Electric Company for the installation of two 20-hp. and two 15-hp. electric motors in the plant of the latter company.

The Ohio Cement Company has acquired a large site near Wellston, Ohio, and is planning the erection soon of a Portland cement plant with a daily capacity of 3000 barrels. W. I. Holmes of Detroit is president.

The Early Sun Stove Company, recently organized in Newark, Ohio, to manufacture gas stoves, has commenced operations in a foundry which the company has leased in Somerset, Ohio. The company will probably erect a new foundry in Newark.

Cincinnati Machinery Market.

CINCINNATI, OHIO, January 21, 1908.

Anticipation and realization as applied to manufacturing industry have had no better exemplifications than through the experiences of the past three months and a half. Realization is now in evidence—realization of just what such a sudden and unexpected slump in the heat of a great producing period means when advance orders have been worked up and there is practically nothing on the books to keep a force of men employed. Not until the past week or 10 days has this condition been manifest to any degree in this tool producing center, and now various expedients are being tried to alleviate the effect of the expected lack of business of the next few weeks, or until the rapidly improving financial conditions warrant a buying movement. A number of local shops shut down for a week or two, or, in some cases, three week, during the holiday season. Some of these have resumed and in doing so have established an entirely new scale of wages, in most cases a reduction of a few cents per hour; re-employing their old men, yet for practical purposes treating with them as an entirely new force. Other employers, taking their various foremen into their confidence and explaining the conditions with which they were confronted, did not shut down at all; simply reduced working hours to the minimum and retained practically the entire force, on the principle that a half loaf is better than none at all.

In the working out of these problems some criticism has emanated from the ranks of labor, and a rather sensational article in a local paper demonstrated the truth of the foregoing illustration to the detriment of three concerns whose names are given in the article. The presidents or general managers of all these establishments were interviewed by the representative of *The Iron Age*. In one case it was found that there is absolutely no truth in the statement that wages had been cut, the president making it very plain and positive that he had always been opposed to the cutting of wages. This establishment has been running without interruption with its entire force on a 44-hr. schedule, but began yesterday morning on half time—five hours a day, from 7 to 12 noon. It was the sentiment of the men in this establishment, consulted in the matter, that they would prefer this arrangement, with no cut in the hourly rate, to an absolute closing down of the entire plant for perhaps an indefinite period. The executive head of another of the works in question stated that there was no truth in the article, so far as his establishment was concerned, up to the hour of the interview. An official of the remaining plant under consideration quite frankly admitted that a slight cut had been made in the hourly wage at his establishment, explaining that the matter had been thoroughly canvassed with the men through heads of departments, and the arrangement accepted with but one dissenting voice. The nominal payroll of this concern is 325 to 350 men, and during the boom period of the late year it worked 450 men, with 80 to 90 in the foundry. This force is now reduced to about 40. The company ran every department to its utmost capacity, and employed many extra men during the time of work on its largest contacts, which have just been completed. One of these was for the Isthmus of Panama. It is this extra force of machinists and mechanics used during the boom period, now unemployed, that is agitating the matter and causing the sensational talk and newspaper articles.

As for business, there is but little coming out in the tool manufacturing districts; and a shipment of three and four machines a week is just now considered a pretty good one, outside of contracts booked earlier. There is always talk of cutting of prices in times like these, and the present furnishes no exception. Such sales are carefully safeguarded, however, and evidence is extremely difficult to secure.

The larger manufacturers are not inclined to look upon the week's rather extensive buying of pig iron as significant of better times. It is generally regarded as a speculative movement, and not superinduced by any special necessities. Local foundries are increasing their melts very slowly, and for the most part are running two or three days per week. Dealers in foundry supplies, on the other hand, report business fair, although strictly of the hand to mouth order. No great volume of business is anticipated until the railroads begin buying.

The Louisville Car Wheel & Railway Company, Louisville, Ky., is completing its new building, which is of concrete and steel, and expects to start about April 1. Pinckney E. Green is president and treasurer; James O. Green, vice-president; G. H. Cheney, superintendent. The new plant is strictly modern in every appointment, and will have a capacity of 350 to 400 wheels a day. The old plant has a capacity of but 150 wheels per day. The company has been in the market quite recently for foundry supplies, all of which have now been purchased; but it is understood that there are some purchases of grinders and other light machinery yet to be made.

A dispatch from Louisville tells of the taking over by A. Stuart Fenzel of Middletown, Ohio, of the stock of the old Louisville Bolt & Iron Company. It is reported that the new owner will make extensive repairs, and the work is to be completed so that the mills may be started in April or May. The capital is stated to be $500,000.

A late incorporation is that of the Model Brass Foundry Company, 1212 Race street, Cincinnati, by E. M. Boland, A. R. Ryan, N. Boland, A. M. Boland and Joseph Lemkuhl. The present officials are: A. R. Ryan, president; N. Boland, secretary and treasurer, and the present capital is $7500, which will be increased soon to $15,000. New machinery is to be installed for the manufacture of Babbitt metal. The work at present is confined to the making of castings in brass, bronze and aluminum. Mr. Ryan was formerly identified with the Edna Smelting & Refining Company of this city.

It is expected that the first heat will be poured on Friday or Saturday at the new plant in Oakley of the Modern Foundry Company, the enterprise started by officials of the Cincinnati Milling Machine Company and a few other prominent manufacturers in kindred lines. It is said that all the latest practical features known to the foundry trade are embodied in this plant, and much interest is taken in its affairs. The first heat and early subsequent operations will be largely of an experimental character, but eventually all the castings required by the company named will be made there.

One of the most pleasant anniversaries and reunions which members of the firm of Rogers, Brown & Co., pig iron merchants, have ever enjoyed has just gone into history. At the meeting, which covered a period of three days in the middle of last week, there were present William A. Rogers of Buffalo, A. A. Fowler of New York, E. L. Billingslea of Chicago, W. T. Shepard of Buffalo, and D. B. Meacham and J. K. Pollock of Cincinnati. The twenty-seventh anniversary of the founding of the firm was celebrated with a luncheon at the Country Club on January 15, and in the evening the company was royally entertained by Mr. Meacham at his Avondale residence.

It is stated that C. E. Anderson & Sons, owners of the Variety Machine Shops, La Porte, Ind., have under consideration a proposition from citizens of Elwood, Ind., looking to the location of that enterprise in the last named city.

The Iron Buyers' Association, recently formed in central and southern Ohio, to work out needed reforms and eradicate evils in the conduct of the buying end, is now thoroughly organized, and meetings are held frequently, principally in Dayton. The contract committee, composed of S. M. Blackburn, chairman, secretary of the John B. Morris Foundry Company, Cincinnati; W. B. Mayo, of the Hooven-Owens-Rentschler Company, Hamilton; C. L. Bauer, president of the Foos Mfg. Company, Springfield; P. E. Montanus, president of the Springfield Machine Tool Company, Springfield, and H. R. Viot, purchasing agent of the Barney & Smith Car Mfg. Company, Dayton, held a meeting during

the week in Dayton. President Wm. Fetzer of the association states that new members are being added constantly, and that the purposes of the association are being worked out to the satisfaction of the officers.

Secretary and Treasurer W. T. Agerter of the Lima Locomotive & Machine Company, Lima, Ohio, says some new contracts have been received recently, and that business affairs are brightening up very perceptibly. The works are running full time, but with a slightly decreased force of employees.

Philadelphia Machinery Market.

PHILADELPHIA, PA., January 21, 1908.

The local market for machinery and tools continues to take on a somewhat more favorable appearance. While the actual volume of business being placed has been small, the fact that there has been some improvement shown in the demand is considered encouraging. Inquiries have been a little more plentiful, although still largely confined to individual tool propositions. In many instances, however, orders are not coming out so promptly as the trade would like. Sales have been mainly of tools of the smaller class, ordinarily supplied from dealers' stocks, which are unusually large, and until these are moved manufacturers are hardly likely to get much new business on some lines of tools. One fair machine tool proposition, which has been held under advisement for some little time, was recently closed by one of the local merchants. It was the largest recent single order, but just what the character of the tools was, as well as the particulars regarding the sale, is not being given out for publication. Some little inquiry has developed recently from some of the railroads, but under their present retrenchment policy not a great deal is expected at the time. The volume of business which is being held up temporarily by the same policy in the various industrial concerns is very large, but under present working conditions, where many plants are still idle, while others are scarcely being operated at over 50 per cent. of their capacity, not much can be expected in the way of expenditures for new equipment.

On the whole, the general situation shows some improvement over that of a month ago. Financial affairs show a material betterment, but have not yet reached the stage where the trade considers that they are warranted in going ahead. Manufacturers generally report new business light and irregular. In some cases work enough is on hand to keep plants running at reduced capacity for some little time, but very few indeed are being operated at anything like full time. There is not much disposition to make extensive stocks under present conditions, but some manufacturers find it necessary to make moderate quantities along with such new work as comes in, in order that plants may be kept in operation and organization maintained as complete as possible. To do this, a number of plants are operating on shorter hours per day, and in some cases but four or five days a week are being made.

The foreign demand for machine tools shows no particular improvement. Inquiries for the standard lines of tools has been very light in this territory, although there has been some scattered demand for special tools for which a few orders have been booked.

The second-hand tool and machinery market has been very dull, reflecting general conditions. What business has come out has been of a miscellaneous nature. The same conditions are apparent in the demand for second-hand boilers and engines, although there have been some pretty fair propositions before the trade in new equipment of this character. Owing to the generally unsatisfactory conditions in the trade, it is found extremely difficult to close up any of the larger propositions.

The foundry trade does not show any great improvement. With conditions in the machinery and other casting consuming trades in an inactive state, not a great volume of business can be expected. Jobbing foundries are running intermittently, heats being run in many cases only when sufficient work has come in to make up the necessary tonnage. The steel plants and the larger gray iron foundries are likewise dull, the business coming in being small and mostly for immedjate delivery. Tonnage for future delivery is scarce, as consumers are pursuing a conservative policy and are not inclined to anticipate their requirements.

The Fairbanks Company, finding it desirable to increase its present floor space for the display of tools, machinery scales, equipment, &c., has acquired the first floor of the adjoining property, 707-709 Arch street, with a frontage of 40 ft. and 160 ft. deep, which will be merged with its present store at 701-703. This will give it some 6400 sq. ft. of additional floor space. It is the intention of the company to move the offices and clerical forces to the new building, which will then leave the entire present floor space in the old store for display purposes.

Plans are being prepared and practically completed by J. C. M. Shirk of this city for a number of buildings to be erected in Fairview, Wayne County, Pa., for a hospital for the criminal insane. The proposed asylum includes an administration building, ward building, shop and farm buildings, power house and building for a number of officials. The cost of the complete work is estimated at about $1,500,000, and it is expected that the plans will be ready for estimating in a few weeks.

The Hess Machine Works, manufacturer of file making machinery and special tools, is only fairly busy. There has been somewhat of a lull in the demand for machinery of this class from abroad, which is usually an extensive market. Some little new domestic business has come out, however, and the plant is still being operated on full time. One of the recent shipments made by the Hess Works included five sets of file making machinery for a New England concern.

The J. G. Brill Company, car builder, has had a fair volume of new business, with prospects of taking some further large orders for both domestic and export work. One large proposition in particular, now under estimate, is for a number of cars for export to Russia. The company is working on large orders for export, comprising cars and trucks for Australia, Turkey, Italy, Roumania, Argentine Republic, Siam, and the Philippines.

Ballenger & Perrot, architects and engineers, are now receiving bids for a large manufacturing building for the A. Schoenhut Company. The proposed factory will be 60 x 140 ft, five stories and basement. It will be fireproof; the walls of brick and the floors and roof of concrete.

The American Pulley Company notes a falling off in the volume of business. Orders are just as plentiful, but the quantity per individual order is less, buyers taking only enough pulleys to meet their immediate needs. The foreign demand also shows a falling off, but it has not been so great proportionately as the domestic. The South and West, usually heavy consumers of pulleys, have been buying in smaller quantities and shipments have consequently decreased. Recent deliveries on export orders include shipments to Australia, London, and Continental Europe.

New England Machinery Market.

WORCESTER, MASS., January 21, 1908.

A slight improvement in machinery sales is recorded, and inquiries continue to be numerous. It is amply demonstrated that a good many customers will need machinery as soon as business starts up a little, and confidence is based on this knowledge. There is less inclination on the part of buyers to postpone a serious discussion with the dealers and their salesmen as to their wants and prices. Nothing has occurred to mar the belief that the day of marked improvement over the recent depressed market is not far off, and that the remainder of the year should be considerably more profitable. Prices are well maintained. The dealers are making no concessions beyond those which are considered entirely legitimate at all times. The endless complaint by one dealer of another that prices are being cut, which has prevailed during former times of business depression, is never heard to-day, even in a small way, which tells the story of maintained prices better than anything else. Several of the machine tool builders have sent out new price-lists during the last few days, affording another very striking proof of how the trade regards the question of prices, for the new lists show an ascending rather than a descending scale. In these lists where prices have been lowered a trifle on certain machines, others built by the same house are increased, so that the average is entirely satisfactory. The new lists are the exception, most of the works being satisfied to permit their prices to remain unchanged.

The new delivery sheets show that immediate delivery is the rule in practically all lines excepting some of the milling machines and the gear cutters. The ability to make quick shipment has had an effect on foreign business, according to the experience of several of the machine tool builders, European buyers being attracted thereby in cases where there would have been no sales had deliveries remained as they have been until recently.

Some of the sizes of machine tools which the manufacturers dropped during the recent rush of orders are again being built. In some shops the former range of sizes has again been adopted entirely, while in others it has been decided to take on certain of the old sizes and permanently cut out others, and in a few instances no good reason has been found for going back to the more complicated line at all.

The manufacturers of wire drawing machinery state that there are increasing inquiries for their product, though as yet orders have shown no material gain. The builders of

rolling mill and similar equipment report their business slack, recent projects for new works of this description having been deferred temporarily.

Great numbers of machine tools are being put away in storehouses, where works are producing for stock. In Worcester, for instance, the F. E. Reed Company has been running full time, with practically full force ever since the depression set in. The Prentice Bros. Company has been following the same general policy on a 40-hr. a week schedule, with shop organization depleted to a slight extent only. The Woodward & Powell Planer Company is also on a 40-hr. week, with full force of men, building planers for stock. The advantage of having such a stock of tools on hand when business shall resume its wonted swing is obvious, and great sums of money are being invested in this way.

Hill, Clarke & Co., Inc., Boston, have purchased a large part of the equipment of the shops of the Agnew Auto Mailing Machine Company, Boston, which has gone into the hands of a receiver. The list is a long one, comprising more than 40 machine tools, including 10 Milwaukee milling machines, a Cincinnati planer and a number of Lodge & Shipley lathes. Hill, Clarke & Co. have already disposed of more than half of these tools, some of them to customers at home and the remainder to Hill, Clarke & Co. of Chicago.

The new building that the Wallace Barnes Company, Bristol, Conn., manufacturer of springs, will erect will be used for storage purposes only, and no equipment will be required. The building will be of brick, mill construction, 97 x 100 ft., three stories.

The Portsmouth Navy Yard, Portsmouth, N. H., expects to be in the market for new machine tools and other equipment this season, if the necessary appropriation is granted by Congress. It is known that some tools are already decided upon, and it is understood that the complete list will prove to be quite sizable.

The Standard Union Company, 414 Atlantic avenue, Boston, manufacturer of union couplings, requests catalogues and price-lists of tool room machinery, general machine shop equipment, brass tubing and leather belting. The present location of the factory is temporary, it being the intention of the company to move the business, though no decision has been reached as to where the new site will be. Edward Wilbur is the president of the company, Robert F. Bradford secretary, Herbert S. Crombie superintendent, and Edward A. Badger treasurer. It is a Massachusetts corporation.

A dispatch from Norwich, Conn., states that the W. H. Page Boiler Company, whose plant was seriously damaged by fire last week, has decided to fit up temporary quarters and resume operations at an early date. The storehouse will be equipped with shafting and machinery, and the machine shop put in shape for manufacturing. It is further stated that the plans of the company for the future will not be decided until after the insurance has been adjusted.

The Prentice Bros. Company, Worcester, Mass., has recently shipped to a customer in Italy what is believed to be the largest radial drill equipped with quick change feed and speed boxes ever built. It is an 8-ft. machine, built special to order. There are eight changes each of feed and speed, and it has tapping attachment, friction back gearing, quick return and approach of spindle, and a patent roller clutch by means of which the drill may be set ahead by hand after the power feed is engaged, saving time in starting the tool into the work. The saddle is fitted with rolls, so that the radial arm moves freely in the saddle, requiring little effort on the part of the operator in adjusting the drill to the work. The total hight of the machine is 12½ ft. and the weight about 12 tons.

A new Connecticut corporation, the Woodley Mfg. Company, organized at South Norwalk, Conn., to manufacture a new vibrator, will probably not carry out its plan to establish a shop at that place, because of the withdrawal of some of the interests named in the papers of incorporation. The incorporators as named were E. M. Sipperly and William T. Wood, South Norwalk, and E. M. Sipperly, Jr., Westport, Conn. It is officially stated that the Sipperly interests are about to withdraw because of a misunderstanding. The capital stock named in the papers was $50,000. It is understood that the vibrator will be manufactured elsewhere.

The Crompton & Knowles Loom Works, Worcester, Mass., manufacturer of textile machinery, announces that it intends to erect a large addition to its works at Grand street to cost $100,000, if a bill now before the Massachusetts Legislature becomes a law. The company wishes to maintain a bridge over a street, connecting its buildings, but the city ordinances makes this impossible without the special permission of the Legislature. The company conducts a very large business, one of the largest of its kind in the world, and its officers state that extensive additions are necessary. Plans have been prepared for the new building referred to which will be four stories high, to correspond with the rest of the works, and it is stated that the new space will be equipped with the best modern machinery. It is not given out when the work of construction will begin, if the bridge measure is carried through.

Government Purchases.

WASHINGTON, D. C., January 21, 1908.

The Isthmian Canal Commission will soon ask for bids for one 18-in. screw cutting lathe, one duplex high duty water pump and other supplies.

The Isthmian Canal Commission will receive bids until February 10, circular No. 416, for air hoists, lathe, &c.

The Constructing Quartermaster, Fort Dupont, Del., will receive bids until February 3 for one steam shovel.

The following bids were opened January 14 for supplies for the navy yards:

Class 71. One universal grinder, with automatic feed—Bidder 26, Brown & Sharpe Mfg. Company, Providence, R. I., $6267.7[illegible]; 28, Bilgram Machine Company, Philadelphia, $8420; 81, W. H. Bullard & Co., New York, $6000; 229, Wallace D. Sargent, Boston, Mass., $7500.

Class 81. One 36-in. automatic beveled gear planer—Bidder 27, Gleason Works, Rochester, N. Y., $6485.

Class 91. One horizontal spindle milling machine—Bidder 81, W. H. Bullard & Co., New York, $7750; 184, Niles-Bement-Pond Company, New York, $4100.

Class 92. One surface condenser—Bidder 14, Alberger Condenser Company, New York, $1790; 73, M. T. Davidson Company, Brooklyn, N. Y., $1215; 169, Motley, Green & Co., New York, $1595 and $1732.50; 262, C. H. Wheeler Mfg. Company, Philadelphia, $1625; 265, Henry R. Worthington, New York, $1083 and $968; 269, Wheeler Condenser & Engineering Company, New York, $1586; 272, Williamson Bros. Company, Philadelphia, $1075.

Class 93. Two watertube boilers—Bidder 158, Mosher Water Tube Boiler Company, New York, $3900.

Class 212. Five air compressors—Bidder 97, Gallaudet Engineering Company, Dayton, Ohio, $17,500; 192, Platt Iron Works, Dayton, Ohio, $18,000; 279, E. W. Bliss Company, Brooklyn, N. Y., $15,000; 281, Excelsior Equipment Company, Pittsburgh, $7475.

The following bids were opened January 15 for boiler feed pumps, motors, cranes, &c., for the power plant of the United States Capitol and Congressional Buildings:

Lump bid covering the entire equipment called for, consisting of two boiler feed pumps, four barometric condensing equipments, four induction motors, four single phase transformers, one electric crane and accessories—National Electrical Supply Company, Washington, D. C., $118,966; D'Olier Engineering Company, Philadelphia, Pa., lump bid B, C and E, $118,000; lump bid B, C and D, $40,000; N. W. Kellogg Company, New York, $104,006.

Bid A. Two boiler feed pumps and accessories—National Electrical Supply Company, Washington, D. C., $3520; Warren Steam Pump Company, New York, $4500; Buffalo Steam Pump Company, Buffalo, N. Y., $2725; Fred M. Prescott Steam Pump Company, Milwaukee, Wis., $6536, alternate $3761; Henry R. Worthington, New York, $4812; Epping, Carpenter Company, Pittsburgh, $3850; N. W. Kellogg Company, New York, $3975.

Bid C. Four induction motors, transformers and accessories—National Electrical Supply Company, Washington, D. C., $11,880; D'Olier Engineering Company, Philadelphia, $11,836; Westinghouse Electric & Mfg. Company, Pittsburgh, $11,027, alternate $10,124; General Electric Company, Schenectady, N. Y., $10,595; N .W. Kellogg Company, New York, $11,881.

Bid D. One electric crane and accessories—National Electrical Supply Company, Washington, D. C., $25,725; Alliance Machine Company, Alliance, Ohio, $14,580; Morgan Engineering Company, Alliance, Ohio, $11,690; Cleveland Crane & Car Company, Wickliffe, Ohio, $11,500; Whiting Foundry Equipment Company, Harvey, Ill., $14,220; Pawling & Harnischfeger, Milwaukee, Wis., $13,000; Case Mfg. Company, Columbus, Ohio, $14,275; Alfred Box & Co., Philadelphia, $12,500; Modern Steel Structural Company, Waukesha, Wis., $10,160; Niles-Bement-Pond Company, New York, $12,645; Northern Engineering Works, Detroit, Mich., $13,720; Manning, Maxwell & Moore, New York, $11,795; N. W. Kellogg Company, New York, $12,275.

The following awards have been made for supplies for the navy yards, bids for which were opened January 2:

Niles-Bement-Pond Company, New York, class 1, one 1500-lb. steam hammer, $7850; class 3, one motor driven boring, drilling and milling machine, $4075.

Hallidie Machinery Company, Seattle, Wash., class 2, one motor driven patternmakers' lathe, $645.

Union Twist Drill Company, Athol, Mass., class 171, one milling machine, &c., $1942.

Under bids opened December 17 for supplies for the navy yards the Williamson Bros. Company, Philadelphia, has been awarded class 81, one steam winch, $750.

General Manager James M. [illegible] Iron and Steel Association announces that the *Bulletin* of the association, which at one time was published once a week and [illegible] will be issued hereafter once a month.

All departments of the works of the Youngstown Sheet & Tube Company, Youngstown, Ohio, comprising Bessemer steel plant, pipe and tube mills, and plate and sheet mills, were started up in full January 20, with fair prospects for the future.

D. F. Patterson, 426 Diamond street, Pittsburgh, has been appointed auditor to report the distribution of funds in the hands of the receivers of the Fischer Foundry & Machine Company. Creditors should file their claims with Mr. Patterson prior to 8 p. m. February 10.

HARDWARE

THE retail associations will undoubtedly give a good deal of attention to parcel post questions and put themselves again on record in opposition to the projects now before Congress. At the same time we are receiving evidences of the activity of individuals in bringing the matter before their Congressmen and Senators, with a view to advising them how the establishment of a merchandise post is regarded by merchants and the commercial community generally. It is eminently proper that such activity should be continued, so as to prevent any possibility of the measures in question slipping through Congress because of ignorance in regard to the objections which hold against them, or under a misapprehension of the attitude of the trade in regard to them.

In order, however, to secure the most efficient action, Hardware merchants should endeavor to secure the cooperation of their fellow merchants, so that a united front, representing the commercial interests of the town or city, may be presented in opposing the project. This coming together of merchants in the same community engaged in different branches of business should indeed be advantageous on other grounds, leading, perhaps, to the formation of something in the way of a local association or board of trade, which, in connection with the cultivation of a home trade spirit, or in opposing any measures which are regarded with disfavor, might also get the merchants into closer alliance for mutual information and aid in regard to credits, for example, and other matters of common interest.

What is done by the associations in the way of combating evils and opposing mischievous legislation has always had prominent place in the activities of the associations. Thus, early in their history the sale of goods by jobbers and manufacturers to consumers was the subject of much complaint and called for the expression of the sentiments of the merchants in many a forcible resolution. Then for years the catalogue house question continued to be agitated and engrossed the attention of the merchants in their conventions. This year opposition to parcel post is a dominant note. All this is well. These are important matters and issues in which merchants can heartily unite. There is, however, need perhaps for the suggestion that other matters should not be neglected. The opposition to trade evils and the warding off of trade perils are negative and defensive rather than positive and productive. The keeping down of the weeds in a patch of ground does not make a garden. Those in charge of association work and especially those who are making preparations for the annual gatherings where so much of the real association work is done, should see to it that the arrangements for the meetings make due provision for a programme which will enrich those who attend, by giving them practical suggestions and information in regard to the conduct of their business, which will repay them for the time and money expended, making them better and more successful merchants because of what they have learned and enjoyed and the contact they have had with broad minded men engaged in the same business. There should be cultivation of the ground and not simply a constant fight with the weeds.

Condition of Trade.

The improvement in business to which reference was made in our last issue still continues, with a decidedly better feeling and a growing hopefulness that the season's trade will continue in fair volume. There is, however, a good deal of holding back in the matter of purchasing. Merchants are pursuing a conservative policy and are careful to avoid incurring obligations which they cannot meet or accumulate goods for which they will not in all probability find a ready sale. While retail merchants, like the wholesale houses and the manufacturers, have generally experienced a marked falling off in business as compared with what is usually enjoyed at this time, the change in the market conditions owing to the financial difficulties have not come home to them to anything like the same extent as to the makers and larger distributors of the goods. In many sections, especially those in which the farming trade is an important feature, there has been all along a moderate movement of business for the retailers to take care of. In this way there has been a gradual depletion of retail stocks, which as a rule are comparatively small, and in some lines need sorting up. The determination of the manufacturers of Wire products to keep prices on their present level has had an excellent effect on the market at large, confirming the appreciation of the fact that the great producers are pursuing a conservative policy and working together with a good degree of harmony. It has not been feasible to carry out the same policy in some other heavy lines, and the market shows evidence of a softening tendency, and in some cases there have been actual declines. The fact, however, that the costs of making the great mass of miscellaneous Shelf and general Hardware have scarcely been diminished furnishes a substantial reason for the maintenance of prices. What may happen as the result of competition and a struggle to secure such business as is going remains to be seen, but thus far prices are in general pretty well sustained. The market, however, is decidedly a buyers' market. The dictates of prudence suggest a careful buying of such quantities as are needed to meet the demand which is to be expected in the near future, avoiding the serious mistake sometimes made of starving the stock and permitting the service which the merchants should render the community to deteriorate. The rapid clearing up of the financial situation removes the great menace to business which put so effective a quietus on enterprise during the closing months of the year, and leaves the country free to resume commercial activities and a gradual return to normal trade conditions. In this state of things the improvement in the demand already experienced is most encouraging.

Chicago.

All estimates of the present situation and future outlook in the Hardware trade, however much they may differ in other respects, uniformly agree upon two points of vital interest—namely, that financial conditions have so far improved that they no longer seriously obstruct trade, and that stocks in the hands of retailers and jobbers are comparatively low. The latter consideration is one of a reassuring character, since it foreshadows general buying for replenishment in the near future that will doubtless bring out an increased volume of business. Trade in general has shown a slight improvement within the past week, but has been more marked in some lines than others. In Wire Cloth and Poultry Netting orders

have been coming in more freely, due in some measure, perhaps, to persistent rumors of a contemplated advance, which, however, lack confirmation. In any event no purchases of a speculative nature have been made on this account, the only effect of such an anticipation being to bring out conservative orders a little earlier than they might otherwise have come. Reports from outside jobbing centers reflect the general quietness of trade, but indicate a hopeful feeling that steady improvement may be confidently looked for. Weather conditions are not favorable to a heavy consumptive demand at present, but beginning in the South and Southwest early in February, the spring demand, gradually extending Northward, should bring gratifying results. Prices, though nominally steady in most lines, are frequently subject to shading when it is apparent that business can be secured by making concessions. It is too soon to observe the effect of the assurance given last week by the American Steel & Wire Company of the maintenance of prices of Wire products, but it is believed that buyers when ready to place orders will not hesitate to do so on account of distrust in the stability of these commodities. Bolts and Nuts are moving slowly and, though nominally unchanged, prices on actual transactions are somewhat irregular. While sharing fully the inactivity in other lines, there is in prospect a better demand for Builders' Hardware. Two important local buildings will soon submit specifications for figures on approximately $50,000 worth of such goods; these are the La Salle Hotel and University Club buildings. Builders also anticipate greater activity in apartment building than was seen last year.

NOTES ON PRICES.

Wire Nails.—The announcement of the decision of the manufacturers to maintain prices without change has had the effect of calling out a good many orders from the merchants. These relate to quantities needed to make good broken assortments and get in readiness for the spring trade. The extent to which stocks have been depleted, owing to the comparative absence of purchasing during the past two or three months, has made it necessary for most Hardware houses to replenish, especially in view of the fact that business in many places has continued fairly good when compared with the nearly total cessation in others. Quotations are unchanged, as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

New York.—The market is without special feature except that there is a somewhat improved demand, since the policy of the manufacturers in regard to prices was made known. The open winter has had some effect in permitting building operations to continue, but the general financial conditions have counted against much activity in these lines. Local trade is represented by the quotation of $2.30 for small lots from store.

Chicago.—There has been considerable improvement in demand resulting in a good increase of both orders and tonnage for the past week. The American Steel & Wire Company report that numerous responses to its circular letter reaffirming prices have been received from the trade strongly commending the action taken. The outlook as reported by salesmen now in the field is highly favorable to a gradually increasing demand, which should in the next few weeks attain fairly satisfactory proportions. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The action of the two leading interests, the American Steel & Wire Company and the Pittsburgh Steel Company, in sending out letters to the trade, stating there will be no reduction for the spring trade in Wire Nails, has had the effect of stimulating demand to considerable extent. The letters sent out by these two interests are construed by the trade to amount virtually to a guarantee in prices. The plant of the Pittsburgh Steel Company at Monessen, Pa., which was shut down on December 21, has resumed operations in full in all departments on double turn, and the concern expects to run in this manner right along. We are advised that many of the leading jobbers have already sent in orders that are as large in size as were placed by the same concerns at this time last year. It has been pointed out in this report frequently that just as soon as the trade had assurances that prices would not be disturbed, a quick increase in demand would come at once, and this has been the case. Prices as reaffirmed by the two leading interests are being strictly held, and demand and shipments are larger than in any time for some months. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

Cut Nails.—Cut Nails are sympathizing with the improved feeling in the market generally, without, however, change in price, or marked increase in the demand. The orders are for the most part for small lots, which are required to stock up with. The regular quotation on Steel Cut Nails is $2.05, f.o.b. mill, plus freight from Pittsburgh, and in a general way this represents the market, with a shading down to $2 in some cases. The mills are producing much less than normal quantities, and some of them are shut down altogether.

New York.—The New York jobbers and Nail houses are holding Cut Nails at $2.30, at store, with occasional concessions where need be. The demand is only moderate, though it has increased in connection with the improved feeling which characterizes the market.

Chicago.—Under the arrangement whereby Cut Nail prices automatically follow those of Wire Nails, it is assumed that present prices are also reaffirmed. Though not as yet reflecting the stronger feeling and somewhat better movement observed in Wire Nails, the Cut Nail market, which has been more or less irregular of late, will doubtless have a tendency toward greater firmness. Trade locally is limited to pickup orders, rarely exceeding a few kegs each, on which prices are reasonably well maintained. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; steel, to jobbers, in carloads, $2.28; to retailers, $2.33.

Pittsburgh.—The action of the Wire Nail manufacturers in reaffirming and practically guaranteeing prices on Wire Nails for spring trade is expected to bring about a firmer market in Cut Nails, which has been more or less uneven for some time. The trade is buying in larger lots, and the mills are making heavier shipments than for some time. Prices continue to be slightly shaded, but, as a whole, the market is firmer. We quote Steel Cut Nails at $2 to $2.05, f.o.b. Pittsburgh, for carload lots, and small lots at $2.10, to which freight to destination is added. Iron Cut Nails are being held at about $2.15, at mill.

Barb Wire.—Quite a little has been done in Barb Wire as the larger trade have been placing orders for early shipment. These purchases cover fair but not especially heavy lots, as merchants are moving conservatively and avoiding the accumulation of more goods than they are confident can easily be gotten rid of. On some accounts it is thought not unlikely that the sale of Barb Wire will be relatively good the coming season as compared with other kinds of Fencing. Prices as before are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—Following the re-affirmation of prices, orders have begun to come in from Southern territory where the spring demand will soon be on. Though not starting off with a rush, enough business has been placed in the past few days to indicate a disposition on the part of buyers to provide for a fairly good prospective trade. The price question being settled, there is now nothing to cause the withholding of orders when dealers are ready

to place them. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The demand is already better as a result of the assurances of the manufacturers that prices will not be reduced and more business is being placed than for some time. It is confidently anticipated that spring demand will be nearly as large, and possibly fully as heavy, as last year. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—Manufacturers using Plain Wire have been buying with more freedom during the past week and the volume of orders placed and of shipments made by the mills is larger. In the present condition of things manufacturers will naturally escape the annoyance they have frequently suffered of late in having difficulty in getting Wire promptly for working up into their products. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Chicago.—Plain Wire has shared fully in the moderate acceleration noted in Wire products. Fence makers and other users are specifying a little more freely, and some new orders have made their appearance. Altogether the situation, aside from the actual improvement that has taken place, has firmed up and much confidence is expressed in a progressive advance towards a satisfactory volume of trade. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—There has been a perceptible increase in tonnage since the announcements issued last week by the manufacturers that prices would not be changed. The trade was waiting for assurance of this kind, and upon it being given, quickly responded, by placing fairly liberal orders. It is believed that spring trade in Fence Wire will be fully as heavy as last year, as stocks at this time are much lighter than in the corresponding period in 1907. The market is very firm, and mills anticipate a good demand for some time to come. Quotations for base numbers 6 to 9 are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Copper Products.—The same inert market conditions in Copper products have obtained in the interval since the opening of the new year, as characterized trade in these commodities during the closing months of last year. Copper Sheets vary between 18 and 20 cents per lb., base, according to quantity and shrewdness of buyer. Ingot Copper on the other hand, is somewhat firmer, a considerable portion of the business being for foreign demand.

Sash Weights.—The Sash Weight market, considering general conditions, is regarded as in a fairly satisfactory shape. There is, however, some irregularity in prices, owing mainly to special local conditions. In the Eastern District the market in a general way is represented by the quotation of from $25 to $28 per ton, but in one or two cities an exceptionally low price is being made, probably below the cost of production. Higher prices, on the other hand, rule in some localities. In the Central District the prices run from $24 to $27.50. The general price throughout the West is about $25. The open winter is very favorable to building operations, and this has done something toward increasing the demand beyond what it would have been under other conditions. Stocks in the hands of merchants generally are said to be very low. The price of Scrap Iron has had, of course, a good deal of effect in reducing the cost of Sash Weights.

Builders' Hardware.—Leading manufacturers of Builders' Hardware have decided upon a general readjustment of their prices. Specific details, however, are not yet generally known. It is understood that while a few lines remain unchanged and there are one or two unimportant advances, the alterations represent reductions on most lines of 10 per cent. or more. It is already apparent that independent manufacturers, whose prices are usually 5 to 10 per cent. below those of the larger producers, will make corresponding cuts.

Soil Pipe.—Increased activity in Cast Iron Soil Pipe is reported, and prices are firmer. Speaking generally, the market may be said to be from 5 to 10 per cent. higher.

Wire Cloth and Poultry Netting.—It is stated that a meeting to determine prices of Wire Cloth and Poultry Netting after February 1 will be held this week. There is a general uncertainty in the trade as to what action will be taken, the prevailing opinion being that prices either will be slightly advanced or will remain as they are.

Tinware.—The expected readjustment of prices on Tinware has been effected, staple lines showing declines of from 5 to 7½ per cent. It is rumored that lists and discounts will again undergo a change, but as yet definite information is lacking as to what the new basis of quotation will be. No further changes in Galvanized Ware have been made.

Wm. Shimer, Son & Co.—Wm. Shimer, Son & Co., Freemansburg, Pa., whose line of Blank Cartridge Pistols is described on another page, advise us that they are offering these goods to the trade at a discount of 50 per cent. from list prices.

Window Glass.—No change is to be reported in the situation as reflected in our last issue. The demand is very limited, and prices continue low and unremunerative. Prices recommended at the last meeting of the Eastern Window Glass Jobbers' Association are as follows: In the States of New York and New Jersey 90 and 15 per cent. discount for single and 90 and 20 per cent. discount for double strength Glass. Similar prices are supposed to prevail in Pennsylvania, but in New England discounts are said to be fixed at 90 and 20 per cent. for single and 90 and 25 per cent. discount for double strength Glass.

Linseed Oil.—What may be regarded as a fair demand for Linseed Oil is reported. Seed has shown a tendency to advance, and in consequence the market exhibits a slightly firmer tone. Owing to the difference in views of buyers and sellers there is little inclination to contract for large quantities. Prices in five barrel lots are as follows: State and Western Raw, 42 to 43 cents; City Raw, 44 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—The market is characterized by a quiet tone. The demand is rather light and prices are somewhat easier. The New York market is represented by the following quotations: Oil Barrels, 55 to 55½ cents; Machine Made Barrels, 55½ to 56 cents.

THE indictments found by the Federal Grand Jury at Des Moines, Iowa, against a Chicago catalogue house upon the charge of using the mails to defraud are expected to lead to an airing of catalogue house methods that should prove interesting to the trade and public. The indictments found charged specificially in one count that Paint was sold as being of the highest grade, of the firm's own special make, and containing white lead, whereas the Paint was of inferior quality, was not made by the firm, and contained no white lead. In two other counts it is charged Rings were sold by catalogue numbers as containing a certain number of pearls, sapphires and rubies, and it is alleged that none of these stones were genuine.

Underwood & Hall Hardware Company, Guthrie, Okla., has recently embarked in the Hardware, Stove, Tinware and Sporting Goods business.

RETAIL HARDWARE CONVENTIONS.

PACIFIC FEDERATION, Portland, Ore., January 23-25. Secretary, E. W. Evenson, Spokane, Wash.
NORTH DAKOTA ASSOCIATION, Fargo, January 28-30. Secretary, C. N. Barnes, Grand Forks.
SOUTH DAKOTA ASSOCIATION,* Aberdeen, February 4-7. Secretary, H. E. Johnson, Redfield.
WISCONSIN ASSOCIATION,* Milwaukee, February 5-7. Secretary, C. A. Peck, Berlin.
CONNECTICUT ASSOCIATION, Meriden, February 10 and 11. Secretary, James de F. Phelps, Windsor Locks.
KENTUCKY ASSOCIATION, Louisville, February 11-13. Secretary, John R. Sower, Frankfort.
NEBRASKA ASSOCIATION,* Lincoln, February 11-14. Secretary, J. Frank Barr, Lincoln.
WEST VIRGINIA ASSOCIATION, Elkins, February 18, 19 and 20. Secretary, Leslie Hawker, Shinnston.
INDIANA ASSOCIATION,* Indianapolis, February 18-21. Secretary, M. L. Corey, Argos.
IOWA ASSOCIATION,* Cedar Rapids, February 18-21. Secretary, A. R. Sale, Mason City.
NEW YORK ASSOCIATION,* Buffalo, February 18-22. Secretary, John B. Foley, Syracuse.
MISSOURI ASSOCIATION, St. Louis, February 24 and 25. Secretary, F. D. Kansteiner, St. Louis.
PENNSYLVANIA ASSOCIATION,* Altoona, February 24, 25 and 26. Secretary, J. E. Digby, McKees Rocks.
OHIO ASSOCIATION,* Columbus, February 25-27. Secretary, Frank A. Bare, Mansfield.
MINNESOTA ASSOCIATION,* St. Paul., February 25-28. Secretary, M. S. Mathews, Guaranty Building, Minneapolis.
ILLINOIS ASSOCIATION,* Peoria, February 26-28. Secretary, L. D. Nish, Elgin.
NEW ENGLAND ASSOCIATION,* Boston, March 11 and 12. Secretary, Charles L. Underhill, Somerville, Mass.

A very imposing programme has been prepared for the meeting of the Iowa Retail Hardware Association at Cedar Rapids on February 18, 19, 20 and 21. The headquarters of the association will be at the Montrose Hotel, the sessions of the convention being held at the Y. M. C. A. Auditorium and the exhibits of manufacturers and jobbers being accommodated in the Cedar Rapids Auditorium. The meetings will be held in the afternoon of each day, so that the Hardware exhibits may be inspected mornings and evenings. The programme includes addresses by S. R. Miles, Mason City, president of the National Retail Hardware Association; by Charles W. Burrows, Cleveland, Ohio, on "Parcel Post"; by H. J. Fueller, Philadelphia, on "Heating and Ventilating"; by N. A. Gladding, E. C. Atkins & Co., Indianapolis, Ind., on "Salesmanship"; by Hon. F. F. Jones, Villisca, on "The Business Man in Politics"; by R. E. Saberson, Sioux City; by W. S. Wright, Omaha, Neb., president of the National Hardware Association, and by A. T. Stebbins, Rochester, Minn., vice-president of the National Retail Hardware Association. Thursday afternoon will be largely a Question Box session, under the leadership of a committee consisting of L. C. Abbott, Marshalltown, chairman; F. P. Marvin, Grinnell and F. R. Currie, Mason City. Members are requested to forward questions to the chairman of the committee or to the secretary of the association, A. R. Sale, at as early a date as possible. All members suggesting topics are requested to come to the meeting prepared to lead in the discussion of these subjects. Two special topics will be brought up for consideration, one by George A. Bieber, Ft. Atkinson, who will read a paper on "How to Conduct a Hardware Store in a Country Town," and the other by W. H. Stepanek, Cedar Rapids, who will discuss "Business Methods in a Hardware Store." A feature of the Friday afternoon session will be the "Traveling Men's Hour," during which topics of special interest to the Hardware trade as seen by the traveling salesman will be offered for discussion. All Hardware salesmen traveling in the State of Iowa are invited to be present at the convention and especially to participate in this discussion and suggest topics.

The formal programme for the meeting of the Wisconsin Retail Hardware Association at Milwaukee, February 5, 6 and 7 has been distributed. The official headquarters of the association will be at the Republican House, the Public Service Building being the scene of the business sessions of the convention and the Hardware exhibition by manufacturers and jobbers. Among the formal addresses which will be made during the convention will be those of H. F. Krueger, Neenah, on "Business Methods"; J. W. Jones, Racine, on "Lines Getting," and John M. Cavanaugh, freight agent C. & N. W. Railroad, on "Some Flies in our Ointment." A feature of the first session on Wednesday forenoon will be the effort of a well-known stove salesman to sell Secretary C. A. Peck a stove, notwithstanding the desire on the part of Mr. Peck to turn the salesman down. At this session there will also be a talk on insurance. The Question Box will be on the programme each day and among the questions thus discussed will be the following: "How Can We Take in Traveling Men as Members?"; "Is Cash Discount or Prize Giving for Cash Trade Desirable?"; "Why Hire a Bookkeeper and Give Personal Attention to Customers?" On Friday forenoon the reports of the different committees will be made, and there will also be discussions on advertising and window display, in which O. B. James, Richland Center, will take a prominent part, parcel post, express charges and other practical topics.

* Provision made for elaborate Hardware exhibits.

The following admirably arranged announcement in regard to the annual meeting of the New York State Association, signed by the president and secretary, has been issued in the form of a folder:

The Annual Meeting

We beg to advise that the sixth annual meeting will be held at Buffalo, February 18 to 22, inclusive.

A programme of unusual interest is being prepared by a committee of gentlemen, who are working hard to make the occasion one to be long remembered by those present. Details will be sent you as soon as completed.

Meetings will be held in the Buffalo Convention Hall, a large building admirably adapted for our uses, which has been secured for our exclusive use during the dates mentioned.

The Exposition

In connection with the meeting an exposition of hardware products and kindred lines will be given under the management of the Programme Committee; the entire main floor of the building being reserved for this purpose.

The cities available for large gatherings were canvassed and no other building offered such facilities for both display and meeting purposes as the building selected. Space has been sold rapidly, manufacturers and jobbers are making preparation for elaborate exhibits, and we feel confident that the exposition will be a source of education and pleasure to every person present.

Reduced Fares

Arrangements will be made, if possible, for special rates on all railroads, and notice of such arrangements will be mailed in ample time to avail yourself of them.

Hotels and Restaurants

Buffalo has a number of good, moderate priced hotels and restaurants where desirable accommodations may be obtained at reasonable cost. A list of hotels, rates and plan will be enclosed with our next letter.

Banquet

Following the custom established last year, the association will hold its own banquet, and those who were present at Syracuse will, we believe, approve of this method of conducting a very pleasant feature of our gatherings.

The City of Buffalo

Buffalo affords the visitors opportunity to spend many pleasant hours visiting places of interest. Its splendid business section, fine residences, great lake frontage and its proximity to Niagara Falls, place it among the notable cities of America. Its people are proverbially hospitable and particularly so at convention times. Everything is done to make the stranger welcome.

The Ladies

The evident pleasure which many ladies derived from visiting the exposition at Syracuse encourages us to urge their invitation to Buffalo. While no special arrangements will be made for their entertainment, we feel confident the trip will be most enjoyable.

Think It Over

This letter will probably reach you while inventory is at its hight, but we trust you will pause in the work long enough to decide to attend the Buffalo meeting. Make your arrangements early, the trip will pay you.

What Merchants Wholesale and Retail Say in Regard to Parcel Post Projects.

WE give below extracts from a number of letters which we have received relative to the parcel post measures now before Congress. Coming as they do from all sections of the country and from representative wholesale and retail merchants, these letters must be taken as fairly indicative of the attitude of the Hardware trade as a whole:

FROM A TEXAS JOBBING HOUSE: I will briefly sum up my objections to the parcel post on rural routes, as follows:

(1.) I am opposed to it on the ground that the Government should not engage in any industry that can be done as well or better by private enterprises.

(2.) Every move in that direction is a further step toward socialism. If the Government can carry small packages to better advantage than the express company it can do the entire express business better than the express companies. By the same reasoning, you can finally arrive at the conclusion that the Government can do everything better than private efforts, and land flatly in the socialistic state, when the Government does everything and the individual nothing, and where the citizen is like an ant or a bee in a hive.

Unjust and Socialistic.

(3.) If a parcel post is profitable to the Government it does an injustice to the express companies and common carriers. If it is unprofitable it does an injustice to the taxpayers.

(4.) In carrying merchandise for the public many complications arise with which the Post Office Department should not be burdened; for instance, claims for loss or damage in transit, C. O. D. shipments, &c. The greatest objection to registered mail or merchandise shipped by mail now is inability to collect for loss or damage in transit.

Difficult Complications.

(5.) The parcel post system would be a distinct move to injure the many for the benefit of the few; or, in other words, it would be of inestimable value to the large, wealthy mail order and catalogue houses, to the great injury of the retailers of the United States.

FROM A JOBBER IN MICHIGAN: We are opposed to the entire parcel post measure. By reading it carefully it develops that additional taxation might result if it was put in effect. We speak of this first, because taxes are paid to a considerable extent by local merchants and dealers in merchandise in all small and large cities. This bill seems to us to be directly in the interests of what is known as catalogue houses, who are located in very large cities like New York and Chicago, who pay no taxes in the rural districts whatever, who require cash in advance with the order, who would be thus enabled to reach every farmer and every business of every kind, in all the United States, thereby depriving the local merchant of business that justly and rightfully belong to him.

Might Increase Taxation.

It would in effect drive the small merchants out of business, little towns would die out for the want of trade, larger cities would have to go into the catalogue distributing business, or also retire, and it is our opinion that the man or firm who pays taxes for the support of the Government is the one who ought to be considered. Should this bill become a law, and should it reduce the number of merchants in all small towns, who would pay the taxes that they formerly paid, and who would pay the additional taxes that might have to be levied to maintain the system?

Who Would Pay?

FROM AN ILLINOIS JOBBING HOUSE: As long as parcel post is confined to local rural parcels it might be a benefit to the local dealer, but we are from principle opposed to any special or class legislation for the benefit of one class at the expense of another. We have for years believed that all postal rates which are less than it actually costs the Government should be raised to at least cost, and we also believe if this was done that the reduction should take place on the regular letter postage, as that is what has carried the postal department for years; and when letter postage is made not over 1 cent and there is no deficiency it is time enough then to talk about reduction in other classes, which would now mean a big deficiency to be made up by the general public. We believe that all this parcel postage agitation has behind it special classes or interests to be benefitted at the expense of others, and the general public should not pay for any such legislation.

Public Must Meet Deficiency.

FROM A MISSISSIPPI RETAIL MERCHANT: We are most emphatically opposed to the parcel post bill; we do not believe that the United States Post Office Department should become involved in the business of a common carrier of merchandise. We believe in the old adage, "Shoemaker stick to your last." The Post Office Department was established for the carrying of letters, and there are so many letters and other legitimate mail matter lost and miscarried under the present system of transition of mail, we think, if there is any more time and money to spare for the benefit of mail facilities in the United States, let it be expended in getting more reliable service, closer attention and greater efficiency in discharging the duties of the department as covered by the present regulations.

Improvement Needed.

FROM A MISSOURI RETAILER: We are very much opposed to parcel post or rural routes for several reasons. The first one is that it would soon lead to a general parcel post. Second, it would increase our charge accounts, when we are trying to get them nearer a cash basis. Third, if we were delivering to farmers by rural route they would not call at our store so often and thereby we would lose the opportunity of selling them other goods. Fourth, it would be just as easy to get a package from Chicago as from the home merchant, and we all know that this would increase the mail order business, which is big enough as it is. The parcel post will certainly not do.

Would Increase Charge Accounts.

FROM A RETAIL MERCHANT IN NEBRASKA: In our opinion there is no more justice in the proposed bill than there would be for us merchants to demand from the Government that it pay the freight and express on our goods bought in the Eastern market and tax the public to foot the bill. Neither do we think that any man is pushing this with any other view than to ultimately ring in the general free delivery of all parcels which would be the ruination of nine-tenths of all country merchants.

A Parallel Case.

FROM A WESTERN JOBBING HOUSE: Any legislation of this kind will be a serious blow to rural communities all over the country. The passage of an act, such as Representative Sims has introduced, will build up a few mail order houses, will take away business from thousands of retailers, and will embarrass them to such an extent as to cause failures of the small merchants all over the country. This parcel post measure, instead of being a blessing to the farmer, would be his ultimate ruin, as, without the general store in his neighborhood, he would have no place to dispose of his product; in fact, in a very short time he would not even

Ultimate Ruin of Farmer.

have a nearby station from which to ship his grain, as without the retailer, such stations could not be maintained. The establishment of a parcel post means the destruction of all small retailers, and as this class of merchants form the backbone of the mercantile business of the country, it would mean the curtailment of business and very serious embarrassment of the jobber. We are certainly opposed to any enactment that would injure the business of thousands of merchants, as this parcel post would do.

FROM A PENNSYLVANIA HOUSE: We wish to thank you for the able and vigorous manner in which you are opposing the act now before Congress. We will do all in our power to aid and shall be glad to follow your lead. The Retail Merchants' Association of our city has filed a letter of protest with the Government in answer to a request for their opinion on the subject. In a county like ours the operations of the bill would lead to such an overloading of our mail carriers as would be overwhelming. It would result in great injury to all our local merchants, not only the local wholesale houses, but also the good reliable retail stores in the city and the country. It is a scheme to benefit the catalogue houses to the ruin of the merchants throughout the country. We trust you will wage a hot fight against all who are favoring the bill.

Overloading Mail Carriers.

FROM AN OHIO JOBBER: We are firmly opposed to the parcel post bill for the following reasons: It is class legislation. It would put a burden on the Government that some one must pay and it will not be by those using the parcel post privileges. It will be an utter impossibility for many rural mail carriers to haul the goods that would be sent for delivery with a large per cent. of the public highways in their present condition. It would benefit large cities and catalogue houses, and be the death knell to small towns and villages. It would be harmful to farmers because it would ruin their local markets. It would inconvenience farmers more than it would benefit them. While they might be able to order goods from a distant city or their local merchant (but the local merchant would only get the leavings), they would not be able to market the products of their farms to advantage, without going to the stores or grain buyers. If merchants in rural districts don't have the support of the farming community, they will go out of business, and the farmer's home market is gone. That would mean that he must make long trips or ship to distant markets and be at the mercy of the purchaser as to quality, weights, grades, &c. The majority of commission men are honest, but not all. Farmers ordering goods must buy from circular or catalogue description, and those mediums will lay still enough to print anything on them. If they buy from a merchant they know, they are pretty sure to get goods as represented. If they don't, they will not hesitate to take it back and the merchant gladly makes his word good. When he buys from parties he never saw and never expects to see, he swallows his medicine and keeps his mouth shut, and oftentimes like a gambler, tries again, and tries to make himself believe he is getting a bargain; but if he got the same class of goods from his home merchant, he would insist upon having his money refunded or exchange the article. It is true, he would not get all poor goods, but any one buying goods from dealers at a distance and sending his good mazuma before he gets the goods, is bound to get stung a good many times. Give us 1 cent postage and save the Government from going into the draying business.

Class Legislation.

Would Destroy Home Markets.

Taking Medicine.

FROM A JOBBING HOUSE IN TENNESSEE: We are unalterably opposed to a parcel post system of any kind, shape or form in the United States, and we enter our protest against the bills as introduced by Representative Sims of Tennessee and Representative Lafean of Pennsylvania. They are the first steps to gain foothold for a general parcel post system, which would prove a great foe to all sections of the country, outside of the large centers, where big retailers and catalogue houses exist. It would create a tremendous influx of trade in the most profitable lines to large centers and simply mean death to merchants in small cities, villages and rural districts. In other words, it would make the rich richer and the poor poorer and finally close out small dealers throughout the country.

Would Ruin Small Dealers.

FROM A MERCHANT IN THE NORTHWEST: We believe that in establishing parcel post on rural routes the Government would be doing a great injustice to all of the retail stores of any kind in the smaller cities. It would be especially advantageous to the catalogue houses if they should make the postage rates lower on merchandise than they would on printed matter. We feel it to quite an extent here in our own city.

FROM A RETAILER IN SOUTH CAROLINA: We feel that the parcel post bill ought to be defeated by all means. It is class legislation and we do not need it at all. It would be injurious and deceptive in every sense. We don't want any parcel post bill.

FROM A MERCHANT IN WISCONSIN: We are unalterably opposed to a domestic parcel post of any nature whatsoever, and especially so on rural routes. The only ones who would benefit by such a measure are the large mail order houses.

FROM A RETAILER IN INDIANA: Personally, I think that too much power is given to the Postmaster-General, and it is very evident that if at any time he were that kind of a man there might be considerable in it for him. Surely the mail houses could afford to pay liberally to get a bill of this kind passed, and doubtless are not very scrupulous in matters of this kind. It is easy to be seen that they would, as suggested in *The Iron Age* ship by freight all over the United States to the post offices, from which goods would be delivered by the rural mail carrier. I do not believe that this law will pass because I think there are too many live merchants who have brought the matter forcibly before their members in Congress. Personally I have our member pledged against the passage of this bill.

Interest of Catalogue Houses.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM G. A. ASTOR, Newton, Mass., who has purchased the Shelf Hardware, Implement, Paint and Sporting Goods business of A. H. Waitt.

FROM COOLEY & SWEET, Vassar, Mich., who have bought out the Hardware, Stove, Paint and Furniture business of Frank Lazelle.

FROM J. M. PEERY, who has opened a Hardware, Tinware, Implement, Paint and Sporting Goods store at Roll, Okla.

FROM MILLER HARDWARE COMPANY, which has established a Hardware, Stove, Implement, Paint and Sporting Goods business at De Witt, Mo.

The Shelton-Ward Hardware Company, Kennett, Mo., has been incorporated with a capital stock of $15,000, as successor to Shelton & Ward. The incorporators are W. F. Shelton, W. F. Shelton, Jr., and W. J. Ward.

PRODUCTION OF WIRE AND CUT NAILS IN 1906.

THE following statistics in regard to the production of Wire and Cut Nails in 1906 are taken from advance sheets of the annual report of James M. Swank, general manager of the American Iron and Steel Association:

Production of Wire Nails.

The production of Wire Nails in 1906 amounted to 11,486,647 kegs of 100 lb., as compared with 10,854,892 kegs in 1905, an increase of 631,755 kegs, or over 5.8 per cent.

The following table gives the production of Wire Nails by States in 1904, 1905 and 1906 in kegs of 100 lb.:

States.	1904.	1905.	1906.
New Hampshire, Massachusetts, Rhode Island and Connecticut	247,157	264,024	281,472
New York, New Jersey and Pennsylvania	4,869,401	4,504,376	4,688,071
Maryland, Kentucky, Georgia, Alabama and Ohio	3,124,624	2,861,587	3,163,214
Indiana and Illinois	3,033,756	2,531,774	2,735,915
Michigan, Wisconsin and Colorado	651,723	693,131	617,975
Totals	11,926,661	10,854,892	11,486,647

The Wire Nails produced in 1906 were all made of steel and were made by 49 works in 14 States, as compared with 54 works in 16 States in 1905 and 56 works in 16 States in 1904. The maximum production of Wire Nails was reached in 1904, when it exceeded the production of 1906 by 440,014 kegs.

Our exports of Wire Nails in 1906 amounted to 103,570,539 lb., or 1,035,705 kegs, against 79,973,411 lb. in 1905.

Production of Cut Nails.

Our statistics of the production of Iron and Steel Cut Nails and Cut Spikes embrace only standard sizes of Nails and Spikes cut from plates. They do not embrace Railroad and other Forged Spikes, Wire Nails of any size, machine made Horseshoe Nails, Cut Tacks or Hob, Clout, Basket, Shoe or other small sizes of Nails. In our statistics Cut Spikes are always included with Cut Nails.

The production of Cut Nails and Cut Spikes in 1906 amounted to 1,189,239 kegs of 100 lb. each, against 1,357,549 kegs in 1905, a decrease of 168,310 kegs. In 1886 the maximum production of 8,160,973 kegs was reached.

The following table gives the production of Cut Nails and Cut Spikes by States in 1905 and 1906, Iron Nails being separated from Steel Nails for both years. In 1906 almost 30 per cent. was cut from iron plate and over 70 per cent. from steel plate, as compared with over 32 per cent. from iron plate and almost 68 per cent. from steel plate in 1905:

States.	1905. Iron.	1905. Steel.	1905. Total.	1906. Iron.	1906. Steel.	1906. Total.
Pennsylvania	345,076	412,331	757,407	279,607	378,229	657,836
West Virginia and Indiana	.....	210,345	210,345	.....	208,935	208,935
Massachusetts and Ohio	.....	158,113	158,113	.....	114,400	114,400
Maryland, Virginia, Kentucky, Illinois and California	89,503	142,181	231,684	70,158	137,910	208,068
Totals	434,579	922,970	1,357,549	349,765	839,474	1,189,239

Eight States made Cut Nails in 1906, as compared with 10 States in 1905. Ohio and Illinois were the only States which increased their production in 1906, as compared with 1905. Maryland and Virginia were not producers in 1906.

The following table gives the production by States of Cut Nails and Cut Spikes from 1901 to 1906 in kegs of 100 lb.:

States.	1901.	1902.	1903.	1904.	1905.	1906.
Pennsylvania	833,469	752,729	725,000	698,326	757,407	657,836
West Virginia and Indiana	150,222	271,392	274,808	245,997	210,345	208,935
Massachusetts and Ohio	303,262	267,901	263,138	182,981	158,113	114,400
Maryland, Virginia, Kentucky, Illinois, Wisconsin and California	255,287	341,770	232,947	156,058	231,684	208,068
Totals	1,542,240	1,633,762	1,435,893	1,283,362	1,357,549	1,189,239

In 1906 our exports of Cut Nails and Cut Spikes amounted to 16,951,893 lb., equivalent to 169,519 kegs of 100 lb., against 17,674,099 lb., or 176,741 kegs, in 1905. Our imports of Cut Nails and Cut Spikes now amount to only a few hundred kegs annually.

Comparative Production of Cut and Wire Nails.

In the following table we give the production in kegs of 100 lb. of standard sizes of Cut Nails and Spikes cut from plates from 1896 to 1906; also the production of standard sizes of Wire Nails during the same period. The annual increase of Wire Nails over Cut Nails in the 11 years is also shown. As already stated, the maximum production of Cut Nails, 8,160,973 kegs, was reached in 1886; of Wire Nails, 11,926,661 kegs, in 1904:

Years.	Cut Nails.	Wire Nails.	Total.	Wire Nails. over cut.
1896	1,615,870	4,719,860	6,335,730	3,103,990
1897	2,106,799	8,997,245	11,104,044	6,890,446
1898	1,572,221	7,418,475	8,990,696	5,846,254
1899	1,904,340	7,618,130	9,522,470	5,713,790
1900	1,573,494	7,233,979	8,807,473	5,660,485
1901	1,542,240	9,803,822	11,346,062	8,261,582
1902	1,633,762	10,982,246	12,616,008	9,348,484
1903	1,435,893	9,631,661	11,067,554	8,195,768
1904	1,283,362	11,926,661	13,210,023	10,643,299
1905	1,357,549	10,854,892	12,212,441	9,497,343
1906	1,189,239	11,486,647	12,675,886	10,297,408

TRADE ITEMS.

WILLIAM H. CROSSMAN, president of W. H. Crossman & Co., Inc., and son of William H. Crossman, founder of the export house of W. H. Crossman & Bro., now Crossman & Sielcken, died of pneumonia late in December. W. H. Crossman & Co. are exporters of American products on commission, along lines similar to those of the parent house, with which Mr. Crossman was identified until a few years ago, when he organized the present company. Frank O. Roe, cashier of the Mechanics National Bank of New York, one of the directors, has been elected to the presidency to fill the vacancy caused by Mr. Crossman's death.

THE firm of Henry, Wood & Marshall, Hardware merchants, Plattsburgh, N. Y., was dissolved January 1, Smith F. Henry retiring from the business. A New York corporation has been organized by Messrs. Marshall and Wood, Fred J. Riley, for the past seven years secretary and purchasing agent for the H. D. Thompson Company, Malone, N. Y., being also associated. The new corporation is styled the Marshall, Wood & Riley Company, Albert H. Marshall being president, W. Alvin Wood, secretary and treasurer, and Fred J. Riley, vice-president. The company, although capitalized only at $65,000, has perfected its plans, and has all needed capital greatly to extend the wholesale business of the old firm, which was a large and growing one. It will carry an especially complete line of general Hardware and Builders' Supplies. The store occupied by the old firm was closed January 4, for inventory, and reopened by the new company January 13.

J. G. ROLLINS of John G. Rollins & Sons, 15 Whitehall street, New York, and 124 Holborn, London, E. C., England, exporters of American manufactures in Metals, Wood, &c., returned to New York January 18 by the steamship Baltic, from a trip to their London branch, begun early last December. Mr. Rollins found business fairly good, and merchants hopeful regarding trade prospects. He observed a growing feeling in business circles that eventually Great Britain will adopt a customs tariff, although he believes more for use as a club than for the usual reasons governing a tariff. Warren D. Rollins, in charge of the London house, who usually visits this market annually in December and January, will cross the Atlantic in a month or two.

W. B. Keir, Centralia, Wash., Hardware, Stove, Implement, Paint and Sporting Goods merchant, has doubled the size of his store and added new fixtures, shelving, &c., for accommodating and displaying stock.

The Hardware, Implement and Paint store of R. B. Gaines, St. John, Wash., has been burned out at a loss of $2500. It is expected to rebuild shortly.

Idaho Retail Hardware and Implement Association.

THE fourth annual convention of the Idaho Retail Hardware and Implement Dealers' Association was held in the Commercial Club rooms, Boise, Idaho, on the 3d and 4th inst. The meeting was called to order by the president, A. B. Moss of the Moss Mercantile Company, Payette. Mayor John M. Haines of Boise welcomed the visitors to the city in a felicitous address. The attendance was not large at the opening session, owing to delay in arrival of trains, but many put in an appearance later in the day and the membership of the association was quite well represented and the proceedings were characterized by much spirit and interest.

The following convention committees were appointed by the chair: Nominations: R. K. Davis, chairman; W. P. Clements, W. B. Potter and E. E. Sims; By-Laws and Constitution: J. L. Keithley, chairman; Arthur Myers and E. A. Frazer; Resolutions: V. C. Kerr, chairman; A. E. Carlson, J. K. Loree, F. E. Fisk and Henry Bayhouse.

President's Address.

The address of A. B. Moss, president of the association, was largely devoted to the benefits to be derived from association work and co-operation. We give the following extracts from it:

One of the greatest benefits of an association like ours is that we get together and in a great measure understand one another, and while I must say in one or two parts of the territory covered by membership in the Idaho Association, there has not at all times been harmony, still, in these communities the conditions are changing for the better. I hope and believe time and the expenditure of some of the business acumen, push and untiring efforts of our members will bring about most satisfactory results.

The evolution of your business is within yourselves. The man who is ever ready to grasp new ideas is the one who is ever on the upward road. The success of this association is within yourselves. With intent of purpose, with the same display of energy in its upbuilding, that all of us are using in the conduct of our own affairs, the Idaho Association can, and soon will, be made one of the best of its kind in the entire West. Its membership is composed of as bright, progressive and capable a lot of men as can be found in any section of the country—men who are rearing business institutions here in our midst that are a credit to themselves, a credit to the city in which they not only reside, but in which they are an integral part; men whose names will live after them.

I had a letter from one of our members very recently in which he said: "I want to attend the annual meeting at Boise. I shall be in the midst of invoicing and just now can hardly see how I can arrange to leave the business, but shall shape it some way so that I can be present at the annual meeting. I have found that it pays to be present at these gatherings, and I do not think I can pass it up, so count on me being with you." My friends, if every business house, every member of our association felt and acted as does this member, don't you think we should soon have accomplished practically all our aims?

Report of Secretary.

The annual report of J. F. Cook, secretary, was an interesting one, touching on a variety of topics. We give the following extracts from it:

It is pretty well understood by the members that had the secretary been one during the past year who could have given the interest of the association the attention which those interests deserved, the little differences that may have arisen at different points on the territory could in all probability have been adjusted much more quickly and in a manner much more satisfactory than they have been. The old adage that "a stitch in time saves nine" is as true in reference to matters that come up in the shape of questions between members of an association as it is in any of the walks of life.

How necessary it is that there exist the spirit of good fellowship between dealers in the same town handling the same lines of goods is so well known to you all that it is hardly necessary for me at this time to say to you that this good fellowship can only be brought about by well established confidence in each other, and it seems to me that if we can bring about this feeling of good fellowship between members we will have accomplished the great aim of the association.

There have been times during the past year when, if the secretary had been advised of the conditions existing at certain points, a little well directed work would have helped to have brought about this feeling of good fellowship. It is his opinion that there should be some one man in every town whose business it should be to notify the secretary of the conditions existing and whether there is harmony between members or not. It should be this man's business to act as correspondent in that town, thus enabling the secretary to bring before the Executive Committee any matters of interest, not only to members in that town but to the association as a whole.

Information Committee.

I have, therefore, recommended the appointment of an Information Committee to consist of at least one member in every town represented in this association. The duty of this committee should be as indicated in what I have just said along this line and to report to the secretary any irregularities in the way of sales, wrongful methods on the part of either retailers or jobbers, &c. We want, therefore, to recommend to each and every member of this Information Committee not only to look upon it as a duty, but make it his business to see that no man sells Hardware or Implements in his town who is not a member of this association. Bring them in and make them one of us.

Terms on Implements.

At a convention held in October last the National Association of Vehicle and Implement Manufacturers adopted a resolution changing the terms on implements. These resolutions provided for the change from the due date to the present discount date. For instance, goods heretofore sold, payable October 1, with a discount of 5 per cent. July 1, under this new plan, would be made payable July 1 net, with 1 per cent. per month for anticipated payment. Through the action of the National Association this proposed change in terms has been abandoned for the present, but the time is fast approaching when all Implements and Vehicles will be bought on much shorter time than heretofore. It is not only my province to point out this matter to you, but I also consider it my province to advise you to make ready for this change, which is sure to come in the near future. These changes in terms are made necessary by the change in time and prices of raw material to the manufacturers.

The Question of Credits.

or the credit system, has been discussed so often and so fully that it has become known as one of the oldest questions, yet there are always new phases of this credit question. A word at this time, we think, will not be out of place. The business done on this territory covered by this association is conducted under the credit system, and in some portions of it this system is abused to a greater extent than it is in others; but no portion of it is ever free from the troubles that arise from this abuse.

The most valuable asset in your business is your credit, an asset which should be carefully taken care of and not abused. This abuse commonly comes about not from your own volition, but is forced upon you by your customer, and it is usually true that the well to do customer is the one who fails to meet his obligations promptly, and, of course, his account with you is the heaviest. You dare not go to him and demand settlement for fear that your competitor across the street will be only too glad to extend the desired time to him and, as a result, you would lose his business. So that the question resolves itself into the proposition of this association getting together and agreeing upon terms under which they will grant credit.

I believe the wholesalers and retailers should work together to this end, and from my observation, as a rule, it would be a kindness to a retailer for the wholesaler to insist on bills being met when due, according to the terms of the sale. If that was done, the retailer would push the man owing him, and he would settle up so you could pay. Now, if we will all make the same ruling, the man across the street will say to your customer that he will sell him upon exactly on the same terms that you will.

The credit system is more common in the farming district than in the cities, because the population has been educated to the idea that they could get whatever they wanted on time, regardless of the time in which the dealers have to pay for the goods. This is especially true of the Implement business. They will ask for credit of a year on goods that you have to pay for in 60 days just as quickly as they will on goods that you get on a much longer time.

I want, therefore, to recommend to you here to-day the advisability of inaugurating a system that provides for the taking of interest bearing notes for all farm Im-

plements and Vehicles sold on time. I recommend that action be taken along this line at this meeting looking to the putting into effect an agreement between members of this association, whereby all settlement should be made at the time of sale, either by a note drawing interest from date or by agreement in case of open account providing for interest after 30 days.

Delivery of Goods to the Store.

There is another matter about which I desire especially to speak at this time and which, it seems to me, is in the province of this association. I refer to the matter of receiving freight from common carriers. Oftentimes the trouble comes from careless handling on the part of employees of the transportation companies, and it must be remembered that these companies are responsible for the delivery of the goods in good order to the consignee.

Now, if the dealer will do his part, much of the trouble and expense will be avoided. The remedy is simple. See to it that you not only receive what your bill of lading calls for, but that the goods are in as good condition as they should be. If damaged or short do not accept any portion without first having agreed with the agents on such conditions or shortage in writing on the face of the expense bill. This is your foundation for a claim, and assures you that same will be made good. If your drayman insists on being careless in receiving the goods get another drayman without delay. The cheapest way to avoid expense and trouble is to be *exacting* in this respect, remembering that what is of interest to the house that ships the goods is to your interest also.

Traveling Salesmen and Their Treatment.

A paper entitled, "The Treatment to be Accorded to Traveling Salesmen," read by Sherman Coffin of the Marshall-Wells Hardware Company, Portland, Ore., was in part as follows:

The treatment to be accorded the traveling salesman is inherently a personal matter and in its application covers every feature of business intercourse. It is, therefore, a subject on which it is not only idle, but impossible to lay down fixed rules. The term "traveling salesman" is one of very modern application and has been built up from such words as "hawker," "drummer" and "solicitor," passing through these several stages of development as the calling has demanded men of more and more pronounced ability.

Beginning comparatively a few years ago, the business of selling goods on the road was first regarded as a more or less questionable calling, demanding no particular ability and less character. The "hawker" or "drummer" who could hang on to a customer the longest, sell him the largest bill of goods by questionable or other methods, irrespective of whether he could sell him again, who could most successfully stuff an order, was regarded as the highest type of road agent.

As the real duties, obligations and requirements of the traveling man became more thoroughly understood, the demand for better men developed, until to-day the traveling salesman is the best paid and most carefully selected employee in the wholesale trade.

Quite naturally, keeping pace with this advancement in ability and standing of the traveling man, the treatment accorded him by the merchant has become more and more cordial and gracious, until to-day I believe it is largely the rule for the merchant to regard him as the personal representative of the jobber or manufacturer, and to accord him the same courtesy and attention he would extend to the head of the house which he represents. But all this depends almost wholly upon the man, and here again we get back to the personal equation.

The traveling salesman of to-day who merits the confidence and patronage of the merchant finds no reason to criticise the treatment accorded him. He is consulted by the merchant and buyer on every subject relating to their business transactions. His advice is sought and heeded, and his relations with the merchant, both commercial and social, leave nothing to be desired.

There is, however, one phase of the subject upon which a full discussion may afford profitable food for thought—wasted time. Time is the traveling salesman's entire capital or stock in trade. It is one of the merchant's most valuable assets. He is paying hard cash for it every day and hour, and the fullest success in business demands that it shall no more be wasted and frittered away than his goods shall be filched from him through neglect or carelessness. The ideal condition in which this waste of time shall be eliminated is perhaps impossible of attainment. But it may be materially improved, and the time of both merchant and traveling man greatly conserved, by adopting a method of making appointments for the purchase of goods and the transaction of other business.

The Importance of Confidence.

An interesting paper was presented by Vice-President V. C. Kerr, under the head of "Our Organization." We give the following extract from it having special reference to the need and importance of confidence in the conduct of business and in association affairs:

There is one word that is on the lips of nearly all business men throughout our entire country to-day—it is the one word that should be the motto of our association—it is the foundation of it; it is the cardinal principle taught by it; it is the one that will perpetuate it for all time; it is in fact the foundation of all business relations—namely, confidence. It should be the aim of each and every member of this organization to gain for it the confidence and respect of all business men, and to have the confidence of each other. Let us conduct its affairs so that we may not be afraid to publish to the world its deliberations. Let us see that our own skirts are clear, so that when the time comes when we are compelled to take measures to protect out rights we are not confronted with the facts that *we ourselves* have been unfair.

It has been said that in case we are not able to establish a price-list and compel our members to stay by it our association is a failure. This is an old subject that has been worn threadbare, but permit me to say that in case this statement is true our association might as well disband. This cannot be done; we have not the power to do it.

Nor in justice to all classes should any man, or any number of men be given the absolute power to name arbitrary prices. Let supply and demand, the legal regulator of prices, govern this matter. There is only one way that we can acquire this power and that is by combining our capital, as is being done very largely at the present time and in an illegal manner. I am, however, in favor of having a quotation sheet for the reason that it guarantees more uniform prices and is a source of information that is perfectly right and just—but give me the confidence of my competitor and *vice versa*, and he may make the prices. If he is a business man he will make them so that there will be a reasonable profit in each and every sale. Bring about this condition of organization, which induces fraternity, a better understanding and acquaintance with each other, thus increasing our confidence in fellow man.

Why are we to-day passing through a business depression with our country—so far as production is concerned—above normal? Think of the immense value of our farm products. Secretary of Agriculture Wilson in his last report tells us that the total value of farm products for the year just past is $7,412,000,000, an amount almost beyond calculation. The corn crop for 1907 he valued at $1,350,000,000. Five times this amount would duplicate every mile of steam railroad in the United States. Consider that the consumption of manufacturing products has been beyond any year in our history, yet we have been compelled to admit we have been on the verge, if not in the throes, of panic—and why? There are a great many theories given as to the cause, but to most of us, I believe, there is but one reason, and that is lack of confidence. Let the cause of this distrust be what it may—we must set about to restore confidence. We must have this confidence.

Catalogue House Competition.

A paper on the subject of the "Catalogue House" was read by C. S. Graybill, Nampa Hardware & Furniture Company, Nampa, from which we make the following extracts:

Only a few years ago such a thing as a catalogue house was unknown, but by means of the modern business methods adopted by our factories and jobbers, a few men have been enabled to assemble immense stocks of goods and distribute them throughout the country in such a way as to accumulate large fortunes and to make their competition a serious problem for the retail dealers of our entire country.

Their success up to the present time goes to show that there have been certain things in their favor to make this profitable. In fact, so long as the retailer and the public make no effort to correct the evil these people are doing they have nearly everything their own way.

In the first place, their central location makes it possible for them to catalogue goods and after receiving an order to go out and get the goods, so as to make a shipment almost as promptly as if they had them in stock. In the second place, they get the cash with the order. Is it any wonder they can make a low price and still realize an immense profit when perhaps the bulk of their business is done without their even seeing the goods, and

merely writing the factory to make shipment after they have the cash?

Now, while these things are all in their favor, they are of no benefit to them until they get the order. In regard to getting the orders, I am inclined to believe that to quite an extent they are winning out on their merits over the local merchants.

Now, then, see if you are going after the business in our own territory as hard as the catalogue houses are. Remember that they send their catalogues right into the home, where it is often used as the family Bible, dictionary and encyclopedia. It is also valuable in teaching the children to read. In this connection it seems to me that if the parcel post act goes into effect the catalogue house will be in closer touch with our customers than we ourselves are.

When a farmer can write an order from the catalogue that he has in his home, post the order at his front gate and get his goods in the same way, it will be easier to get goods from Chicago than from his local dealer. Many an order is sent to Chicago just because our customers do not know that we have the article that they want.

If a customer comes into our store looking for an article and we are unable to make a sale by convincing him of the superiority of our goods and the fact that they are worth the price that we ask we must blame ourselves when he sends his order to Chicago. It shows a lack of ability on our part when we allow a customer whom we can meet face to face to walk out of our store and send his order to the catalogue house.

Membership.

The report of the Membership Committee was read by J. K. Loree, chairman, who made the following statement:

It gives the Membership Committee great pleasure to report a satisfactory growth in membership, though it has fallen far short of what we had hoped for. A glance at the list of membership shown on the secretary's book will reveal the fact that it is composed of wide awake dealers, who are interested in advancing their business and the good work of the association. This can only be realized through the activity not only of its officers, but to a great extent by the members generally.

Your honorary members, acting through the traveling salesmen representing several houses, have done much toward holding old members in line, as well as securing new ones.

Resolutions.

Among the resolutions adopted were the following:

Be it resolved, That we appoint a committee of two to attend the convention of the Pacific Federation at Portland, Ore., January 23, 24 and 25, to represent this association, and that one of same be our present secretary.

Be it resolved, That our secretary be instructed to confer with the general freight agent of the Oregon Short Line Railway regarding the shipment of new goods at immigrant rates, advising him that same is being done at all points along their line.

Be it resolved, That if any member is overstocked on any article he may notify the secretary, who shall notify other members of the association, thus enabling him to dispose of his surplus.

Whereas, The manufacturers of Farm Machinery and Vehicles are making a combined effort to eliminate the time proposition to dealers, except as secured by interest bearing notes, given upon receipt of the goods; and,

Whereas, We, as dealers, at all times are carrying a great amount of noninterest bearing notes and accounts, turning a part of our money once a year and part of it once in two years; therefore, be it

Resolved, That we Implement dealers take interest bearing notes, at the time of delivery, for all Farm Machinery. That we will use our best efforts to put Implement sales on the same basis as other merchandise.

Mr. Evenson's Address.

E. W. Evenson, Spokane, Wash., secretary of the Inland Empire Hardware and Implement Dealers' Association, was present at the meeting and was invited to address the gathering. In the course of his remarks Mr. Evenson pointed out that there was no asset so great in a business man as his character and that all men should have the motto, "What's mine is mine, what's yours is yours and what's ours is ours." He spoke of the benefits to be derived by being a member of the association. He asked if the dealer who does not belong, the one who does not pay his dues but still gets the benefits of the association, gets all his money honestly. He spoke of the failings of the catalogue houses and stated that the only way they could be fought was with their own weapons, that they resorted to almost anything to get trade and that merchants would have to meet them on their own ground.

Petition in Regard to Parcel Post.

The following petition was presented and signed by all present, to be sent to the members of Congress representing the State of Washington:

We, the following members of the Idaho Retail Hardware and Implement Dealers' Association, do urgently protest against any and all proposed changes in our present parcel post laws and respectfully request that you use your influence against the introduction of any measure pertaining to the reduction of the rate of the present parcel post.

We also protest against the manner in which the Postmaster-General has sought to influence public opinion in favor of his provisions for the changing of our present parcel post laws.

Officers and Committees.

The former Board of Officers were re-elected to serve during 1908, as follows:

PRESIDENT, A. B. Moss, Moss Mercantile Company, Payette.

VICE-PRESIDENT, V. C. Kerr, Kerr Hardware Company, Boise.

SECRETARY, J. F. Cook, Mitchell, Lewis & Staver Company, Boise.

TREASURER, E. A. Frazer, Malheur Mercantile Company, Ontario, Ore.

The Executive Committee consists of R. K. Davis and Chester Taylor, in addition to the president, vice-president and secretary.

The following Information Committee, the appointment of which was recommended in the secretary's report, was selected:

G. W. Cowden, chairman, Caldwell.	J. M. Waterhouse, Hot Springs.
W. D. Potter, Nampa.	I. F. S. Diven, Vale, Ore.
Elbert Butler, Ontario, Ore.	W. Y. Perkins, Soldier.
Bert Himler, Payette.	C. O. Meigs, Twin Falls.
Chester Taylor, Weiser.	G. G. Wright, Idaho Falls.
J. L. Keithley, Midvale.	S. P. Noble, Bruneau.
John C. Bane, Emmett.	W. W. Groves, Meridian.
Arthur Myers, New Plymouth.	H. C. Baldridge, Parma.
F. N. Victor, Rupert.	Robt. Von Gilsey, Nyssa.

On Legislation and Transportation the following committee was appointed: A. E. Carlson, chairman, Boise; E. E. Fisk, Parma; S. W. Dee, Boise; J. W. Cowden, Caldwell; C. S. Graybill, Nampa.

Question Box.

Quite a good deal of discussion was developed through the medium of the Question Box. Among the topics considered under this head were the best means of advertising the store, how to control merchants in other lines who order Hardware and Implements and turn the goods thus bought over to their customers at cost, the forming of local organizations for the purpose of rating customers and aiding in collections, and the best way to treat a catalogue house customer who asks for credit.

On invitation of the Nampa members the next quarterly meeting of the association will be held at that place on the first Saturday in April.

THE SCHREIBER & CONCHAR MFG. COMPANY, Dubuque, Iowa, has been succeeded by Loetscher-Ryan Mfg. Company. The concern will continue the manufacture of Sad Irons, Registers and Hardware specialties under the same management that has controlled it for the past two years.

AT the annual meeting of the Atwater Mfg. Company, Southington, Conn., manufacturer of Hardware specialties, Richard Eliott was elected president to succeed M. N. Woodruff, who resigned the office on account of ill health.

CHAS. E. SANTO, London, Ont., has been appointed direct representative for the Dominion of Canada for the Wilcox Mfg. Company, Aurora, Ill., Seidel Mfg. Company, St. Louis, Mo., and Minnesota Mining & Mfg. Company, Duluth, Minn.

ETOWAH HARDWARE & FURNITURE COMPANY, Etowah, Tenn., M. D. West, proprietor, has been incorporated with a capital of $5000.

Legislation in Interest of Mail Order Houses.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., January 21, 1908.

A BOLD attempt to put through Congress a measure in the interest of the mail order houses, which for impudence and audacity has never been exceeded in postal "reform" campaigns, is being made by certain parties who, under the guise of providing facilities for compiling "directories," propose that the postal laws and regulations shall be so amended that the names and addresses of all patrons of the service, including the residents of rural routes, shall be furnished by postmasters upon payment of a small fee. Readers of *The Iron Age* will remember that several projects for the modification of the postal regulations have been undertaken from time to time during the past two or three years, but in each case prompt exposure has resulted in their abandonment. In one instance the catalogue houses succeeded in having the regulations amended by a confidential order, which was smuggled through by the then chief of the rural free delivery service, who was subsequently removed from office, but this was soon rescinded.

In no way discouraged by lack of success in the past, the promoters of these schemes have come into the open, and have induced a member of the House to introduce a bill legalizing the publication of the names of the patrons of the postal service. The enormous value of such lists of names for advertising purposes will be appreciated by every manufacturer, jobber and retailer in the country. The names of the patrons of rural routes especially are valuable for the reason that they cannot now be secured except by a painstaking and costly canvass from house to house. The law on the subject is very stringent, section 549 of the postal laws providing that "postmasters shall not furnish lists of names of persons receiving mail at their offices; neither shall such information be furnished by members of postmasters' families."

Five Dollars Per 1000 for Names of Residents on Rural Routes.

With a view to opening up this rich field for exploitation a bill has been introduced by Representative Richardson of Alabama—but carefully indorsed, "By request," to indicate that the introducer does not father the measure—which provides as follows:

Be it enacted, &c., That postmasters shall not furnish lists of names of persons receiving mail at their offices; neither shall such information be furnished by members of postmasters' families; provided, however, that any person, firm or corporation who may make affidavit before any postmaster of the United States that such person, firm or corporation is compiling a directory for public use from such list of names, postmasters may furnish such lists upon the payment of a sufficient sum of money for the expenses of copying same, not to exceed $5 per 1000 names; provided, further, that any person, firm or corporation who wishes his name withheld from the public or from directories may notify the postmaster where he receives his mail in writing to withhold his name from such lists, when the postmaster shall withhold such name.

It is perfectly clear that the chief object of this measure is to secure the names of residents of rural routes. Practically all cities, towns and villages having free delivery also have local directories, which give the address by street and number of every patron of the service. In the case of the residents of very small villages and along the line of rural routes no directories are available, and ever since the establishment of the rural service efforts have been made to secure these valuable lists of addresses, but with indifferent success. At one time the mail order houses adopted the device of bribing rural carriers with offers of merchandise to make up and forward lists, and a great many were thus obtained, but the Post Office Department put a stop to this enterprise, and the catalogue concerns have since been forced to rely upon securing lists from their patrons residing on routes, usually some young boy or girl willing to make up a list for a trifle in the way of merchandise to be selected from the mail order house catalogue. Obviously, the businesslike method of obtaining these names is to buy them at the modest rate of 50 cents per hundred, as proposed in this bill, especially as this method would enable a single mail order house to secure

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a complete list covering the entire country in the course of a few days by employing the postmasters themselves to do the work.

Representative Richardson, who has presented this bill, desires it distinctly understood that he has put it in to "oblige a friend," and that he is not prepared to push it unless convinced that it is a proper measure and one desired by the majority of his constituents. The retailers in the Hardware and other trades should have no difficulty in convincing him that the measure is a most vicious one, and if enacted would work great injury to local merchants in all parts of the country.

Postmaster-General Tries to Meet Objections to Parcel Post.

The Postmaster-General has issued a statement in reply to a letter addressed to Chairman Overstreet of the House Post Office Committee, by the National Association of Retail Druggists. The statement made by General Meyer shows so clearly the fallacies in the whole parcel post propaganda that the opponents of the Department's plans are to be congratulated upon its publication at this time, especially in view of the fact that the objections which he undertakes to meet are practically identical with those which have been so convincingly urged by the representatives of the several Hardware associations. The Postmaster-General says in part:

1. You state as one of the results which would follow the enactment into law of the Department's recommendations for the extension of the parcel post: "One large mail order house alone would be enabled to save in postage on their catalogues nearly $200,000 a year." For your information I beg leave to state that catalogues are, under existing law, accepted as third-class mail matter, and are mailable at 8 cents a pound, so that the proposed reduction on the general parcel post to 12 cents a pound would not affect their distribution in any way.

2. With respect to the claim that the large mail order houses would utilize the special local parcel post on rural routes through agents, I wish to say that it is the intention of the Department to recommend a provision which will prevent any such use of the routes. It should, however, be borne in mind that even in the absence of such a prohibition any systematic attempt upon the part of a mail order house to so distribute its wares would necessitate the employment of many thousands of local representatives. An examination of the catalogues of the large mail order concerns will convince you that they pride themselves upon their remarkably low selling expense, and that the absence of any sort of agents is the principal feature of their argument in accounting for the supposedly low prices of their goods.

3. That the proposed extension of the general parcel post will not involve a loss to the Government is best shown by the latest official figures, which indicate a net profit on such business of $27.90 per ton.

4. You intimate that parcels carried by the postal service from Bangor, Maine, to Portland, Ore., at 12 cents a pound will be handled at a loss. Under existing law such packages, though they weigh 11 lb., may be deposited in the post office at Portland, Ore., for delivery to any one of 24 foreign countries with which we have postal conventions, and they must be carried at this rate. Does it seem consistent, or equitable to our own people, that similar parcels cannot be sent through the mails, for instance from Washington to Baltimore, for less than 16 cents a pound, the limit of weight, even at that rate, being 4 lb.

Brief Analysis of General Meyer's Argument.

Referring to the first paragraph of the Postmaster-General's statement, it is only necessary to call attention to the fact that the estimated saving in the postage on catalogues, referred to by the National Association of Retail Druggists, and also by the Hardware associations, is based upon the transportation by freight of catalogues in bulk to offices from which rural routes radiate and their distribution over such routes under the special rate proposed for merchandise thereon. The Postmaster-General is wholly in error in assuming that the retailers believe that the reduction from 16 to 12 cents per pound on merchandise would affect catalogues, but he entirely overlooks or ignores the opportunity for the distribution of catalogues under the proposed special rate for rural routes.

Concerning the second paragraph of General Meyer's reply, it is difficult to imagine any form of legislation that would be held by the courts to be constitutional which would prevent the handling on rural routes at the special postage rate of merchandise deposited in the post offices from which the routes radiated simply because it originated in a mail order house. One of the most convincing objections to the Postmaster-General's rural parcel post scheme is the strong probability that the courts would hold it to be invalid as being a direct discrimination in favor of certain citizens and communities as against others.

As to the difficulty or expense which the mail order houses would encounter in securing agents to receive their goods by freight and deposit them in the local post office, the records of the Post Office Department itself show conclusively that the problem is one of easy solution. About two years ago one of the large Chicago catalogue concerns induced several thousand carriers to become its agents for the collection of names and the distribution of merchandise at an expense so small as to be laughable if the possible serious consequences are for the moment ignored. In working up its list of agents this concern sent a letter to rural carriers, in part as follows:

We have lately received a large number of lists of names of patrons of R. F. D. routes, sent us by the carriers, and in every case where the list has contained 100 names, we have as a slight token of our appreciation of the favor given the carrier sending us the list his choice of the three items shown on the back of this sheet. If you are a smoker, we know that a box of 50 of our Vicente Portuondo cigars will please you, for they are very fine. Or perhaps a fountain pen with 14-k. gold point, or a pair of our extra fine kid shoes would be more acceptable to you. We should be very glad indeed to send you any of these items upon receipt from you of a list of 100 or more names of patrons of your route, and would leave it to you to make your own selection. The item selected will, of course, go forward charges paid. Can you consistently comply with this request? Kindly let us hear from you by return mail, using the inclosed envelope in sending your reply.

So successful was this scheme for securing names that many complaints reached the Department that carriers were neglecting their official duties to earn the insignificant rewards offered in the above letter, and the Post Office Department was obliged to take the matter up officially, and in a letter to the mail order house in question protested against any further attempt to debauch the service, declaring that any carrier accepting the offer made in the circular quoted would be dismissed from the service.

The statement made by the Postmaster-General in the third paragraph of his reply, in which he declares that the proposed extension of the general parcel post by the reduction in the rate from 16 to 12 cents on merchandise "will not involve a loss to the Government," and, further, that the net profit on such business would be $27.90 per ton, is, of course, based upon the assumption that the Government would get the same proportion of transported merchandise that it now carries in the mails. Of course it goes without saying the proposed reduction, combined with an increase in the weight limit to 11 lb., would greatly stimulate the patronage of the mails for long hauls, while the express companies would get the profitable short haul business, which they can handle at considerably less than 12 cents per pound. Furthermore, with reference to any greater reduction in the merchandise rate, it follows that the Government would continue to increase its proportion of unprofitable long haul business, while the express companies would handle practically all the merchandise on short hauls.

In the fourth paragraph of his letter the Postmaster-General, quoting the statement that parcels carried by the postal service from Bangor, Maine, to Portland, Ore., at 12 cents would be handled at a loss, inquires whether it is consistent or equitable to our own people that similar parcels should be sent from Portland, Ore., to any one of 24 foreign countries at the 12-cent rate. He is very careful, however, not to state that the 12-cent rate as applied to the international parcel post service is remunerative, his argument being merely that if you can send a parcel abroad at a certain rate it is not fair to charge more for its transportation within the boundaries of the United States. Of course, this merely begs the question, for it is freely conceded that the international postal rate on merchandise results in a substantial deficit which is offset by the exorbitant rate charged on foreign letters. There is certainly no force in the argument that because the Government loses a large sum on international parcels, it should be willing to lose a great deal more on domestic business.

February Sale of House Furnishings.

PRACTICAL suggestions can be gleaned from unexpected sources if the Hardware merchant is alert to his opportunities, as most of us have to be in the competition of this day. The suggestion for this window display was originally found on the children's page of a daily paper. It was published there as a puzzle for the children under the caption, "Some Puzzling Pans," and consisted of a picture of a little girl apparently questioning the wierd looking animal made up of Pots and Pans which appears in the foreground of this window display.

In conjunction with the picture, there were published three verses, in each line of which there is a conundrum,

A Large Doll

attractively dressed can be used to represent the little girl. This group used as a center piece for a window display of House Furnishing Goods should prove very effective.

The Detail Arrangement.

Much depends upon the size and shape of the window when it comes to the detailed arrangement of the merchandise, but the general idea illustrated herewith should prove useful in almost any window, perhaps with slight variations. Use large pieces for the extreme back. Make a square of Wash Boilers, three or four tiers high for the

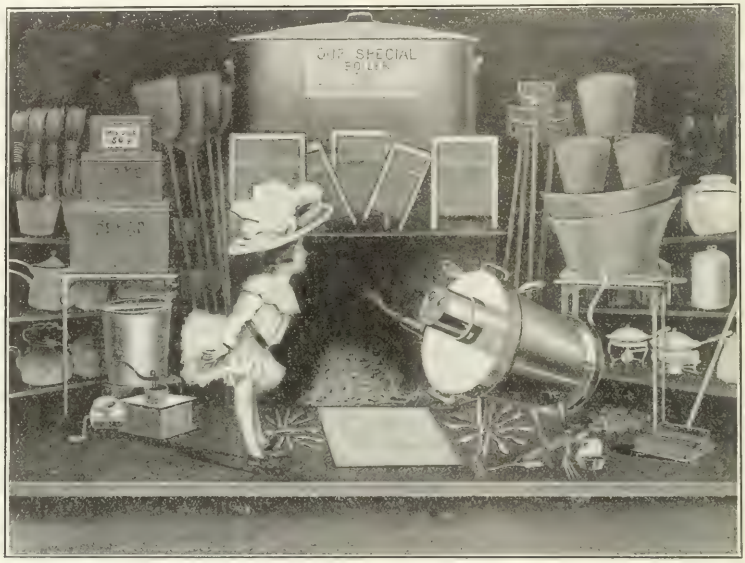


Fig. 1. Pictorial House Furnishing Window Display.

and it will attract interest and comment to the display if these verses are lettered upon a large card and placed in a conspicuous place in the window, as our artist has suggested in his sketch. The verses read as follows:

Guess the name of the pan that will have a canal.
The pan in which food may be found.
The pan that is sudden and causeless affright,
The pan that grows close to the ground.

The pan that will cure every ill of mankind.
The pan that is part of a door,
The pan that's a play in which nothing is said,
The pan where they make an uproar.

The pan that is spotted, ferocious and wild,
The pan that's a kind of small pan,
The pan that is spoken in praise of good deeds,
The pan that are worn by a man.

A footnote on the card should explain that the first Pan is "Panama," and invite the reader to make out the others, and then step into the store and see a solution of the puzzle to learn whether or not he has guessed correctly. The correct solution is as follows:

Panama.	Panacea.	Panther.
Pantry	Panel.	Pannikin
Panic.	Pantomime.	Paregoric
Pansy.	Pandemonium.	Pantaloons

The Animal of Pans.

It will be seen by the illustration in Fig. 1 that the animal is simple in construction, being made of Pans and Pails, held together with Wire. The head is made of the inner portion of a Double Boiler on the bottom of which has been painted with a Marking Brush the eyes, nose and mouth, as shown. The neck can be made with a Griddle, the body with a 10 or 15 quart Tin Pail, the back and tail with a Frying Pan, the legs of Cooking Forks and the ears of Spoons.

center of the back, and place the special Wash Boiler for the sale on the top with a large ticket.

At the right and left of the Wash Boilers, and also at the extreme back, arrange pyramids of Bread and Cake Boxes, Foot Tubs, Water Pails, Slop Pails and other House Furnishing needs, with the special numbers plainly marked with price tickets. Washboards can be arranged in the pile of Wash Boilers, as indicated: Brooms, Mops and Floor Brushes should lean against the window backing between the pyramids. Clothes Line, both in hanks and unwound, can be shown effectively suspended at the rear of the display.

On the right and left walls arrange three or four shelves of Enamel and Nickel Plated Ware, ticketed with prices. In the foreground on the floor of the window arrange Kitchen Cutlery, Spoons, small pyramids of Tacks and small single articles, such as Coffee Mills, Meat Choppers, Graters, Tack Claws, Hammers, &c.

In the back, on the floor, will be noted a pile of Clothes Pins. If this display is made late in the spring a similar pile of Camphor Balls in another part of the window will prove an attractive selling item.

The Proper Season.

The most timely season for such a display is, of course, governed largely by the location of the store. If prices are made unusually attractive, such an effort will almost invariably help to build up the sales of an otherwise dull month, say, February, and if the first effort is made during one week of this month it will bear repeating with even better results during the housecleaning period in April or May.

Advertising the Sale.

During the week of the window display the merchant should see to it that his advertisements in the local papers are made strong selling factors in the same direction. In addition to this, the display will be unique enough to occasion comment in the reading columns of the paper, and this in itself is valuable.

If the merchant sees fit, as is usually advisable, to employ more than his ordinary amount of space for such an occasion, an advertisement arranged across four columns as shown in reduced form in Fig. 2 will almost certainly bring paying results. The depth of the announcement will be governed by the number of merchandise items that he wishes to advertise, and more cuts can be employed in a larger announcement.

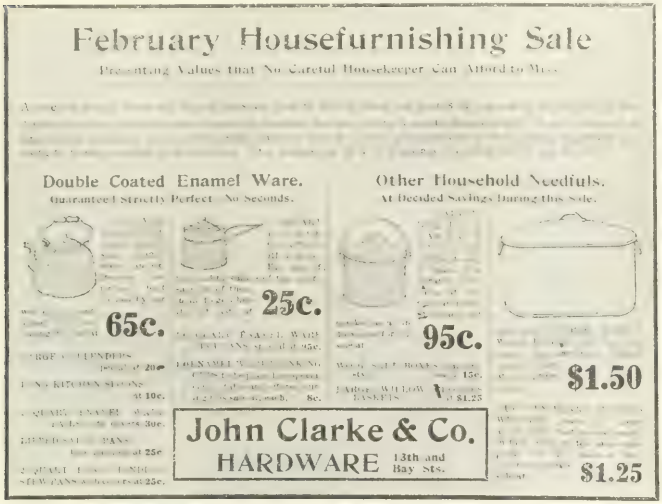


Fig. 2. A Four-Column Advertisement

The same wording, with slight variation in the headlines, can be used in a two-column advertisement, but the items would then be arranged to balance in two columns instead of four. If the merchant is in the habit of using single column cards, and does not see fit to increase his space for this occasion, then a series of special announcements, such as shown in Figs. 3 and 4, should be valuable.

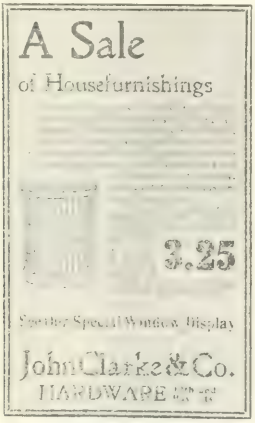


Fig. 4. A Two-Column Announcement

The announcements should be illustrated, by all means. Cuts can be obtained from the manufacturers gratis or from some engraver who makes a specialty of "stock cuts" at a nominal cost.

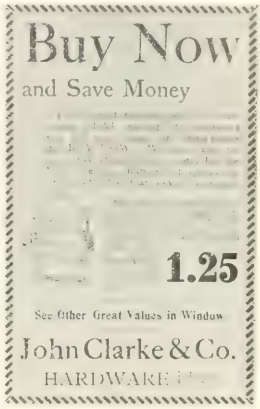


Fig. 3. Single Column Announcement.

Brass Pump Cylinders.

The Humphryes Mfg. Company, Mansfield, O., is a large manufacturer of brass pump cylinders for shallow and deep wells. Both the solid and brass lined pattern cylinders are manufactured, together with artesian cylinders which are made of heavy drawn tubing, and will not split under heavy pressure. It is remarked that the vital point of cylinder construction is the thickness of the brass tubing, and that thin, flimsy material will not stand severe wear and will rupture under moderate pressure.

A Plea for Prompt Remittances.

A TACTFUL method of reminding customers whose accounts are overdue of their obligations and the desirability of making prompt remittances with a view to restoring confidence generally is that adopted by a New York house whose appeal is here reproduced:

To the "Man Who Signs The Checks."

The spirit of [illegible] and co-operation, shown [illegible] at this time, and the best [illegible] is for us to pay each other the bills we owe. We are doing what we can in that direction. Will you help us? We'll promise to start your remittance on its way to help out the other fellow immediately upon its receipt to do its full share in restoring confidence and prosperity to us all.

[illegible]

On the reverse side of the neatly printed card appears the name of the customer and amount due in statement form. This way of calling attention to the matter seems to have been an effective one, as excellent results are reported.

THE PHOENIX WIRE WORKS Detroit, Mich., has compiled a convenient table of Wire gauges arranged progressively by [illegible] Birmingham or Stubbs, Washburn or Moen and American or Brown & Sharpe equivalents. It is printed in large, clear type, and was prepared primarily for the company's own use, but, we are advised, will be sent to any one in the trade on request.

The firm of Adamson & Sanner, Moweaqua, Ill., handling Farm Machinery, Vehicles and Heavy Hardware, has been succeeded by Adamson & Miller. Mr. Miller about a year ago sold his interest in this firm to Mr. Sanner, from whom he has repurchased it.

Kent's Knife Cleaners.

George Wostenholm & Son, London, whose American headquarters are at 105 Chambers street, New York, have become selling agents in this country for Kent's patent rotary knife cleaning machine. This is a well-known machine, which has been on the European market for many years, for cleaning and polishing steel blade table knives. It takes the form of a circular box set in a cast iron frame, with holders like slots around the circumference into which are stuck the blades of knives to be cleaned. Inside the box is a polisher operated by a crank, with leathers and brushes on alternate arms. As this revolves it picks up prepared emery, a supply of which is kept in the bottom of the box, and scours the knives. The machine is offered in eight sizes, cleaning from 3 to 10 knives at one time.

Busse Office and Rocker Chair Cushions.

W. A. Busse & Co., 36 to 38 Union Park court, Chicago, Ill., H. Berkele, 43 Leonard street, New York, sales agent, have added to their lines of chair seats for quick application to chairs with worn out cane bottoms the Busse cushion for office and rocker chairs. The cushion is made with a thick elastic filling of the finest quality of sea moss, covered with extra quality leatherette, edge double welted with cord and securely fastened with seven milonite buttons on each side. The cushions are made in two sizes, 15 x 15 in. and 18 x 18 in., with edges about 2 in. thick and centers 2½ to 3 in. thick, and in black only.

Combination Milk Bottle Opener and Stopper.

Windsor, Stephens & Co., Waltham, Mass., are putting on the market a combination milk bottle opener and stopper known as the Openclose. The wooden plug which serves as a stopper for a milk bottle has in its under surface a metal hook which perforates the paper stopper used for closing the bottles and renders it easy of removal without danger of the kind of accident that occasionally happens when the housewife seeks to accomplish the same result with her fingers or with some kitchen utensil, such as a knife or fork.

Fulton Machine & Vise Company.

The Fulton Machine & Vise Company, Lowville, N. Y., for whom Surpless, Dunn & Co., 74 and 76 Murray street, New York, are sales agents, has added to its former line of F. & R. vises, solid jaw vises, &c., a new combination pipe vise.

Stevens Repeating Gallery Rifles.

The Stevens Arms & Tool Company, Chicopee Falls, Mass., is offering its latest model repeating gallery rifle No. 81 equipped with Lyman front No. 5, Stevens Leaf and Lyman receiver sights. No. 82 has Lyman Front No. 5, Stevens Leaf and Lyman receiver, with cup disk sights. No. 80 is fitted with Bead Front and Sporting rear sights. These rifles have bolt type action operated by the sliding fore end. They are made to take 16 .22 short, 14 .22 long, 12 .22 long rifle and 12 .35 Stevens R. F. cartridges. They have 24-in. round barrels, with extreme length of 41½ in. varnished black walnut stocks, blued trigger guards and rubber butt plates.

F. E. Kohler & Co.

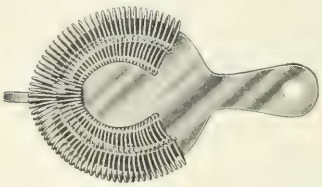
F. E. Kohler & Co., Canton, Ohio, who have doubled their capacity on curry combs, have added to their line combs Nos. 814 and 914, with braced shanks extending through the handles and riveted. Both are lacquered and have eight bars with enameled handles. No. 914 has a turned knocker. The combs are 3¼ x 4¾ in. in size.

Dixon's Powdered Stove Polish.

The Joseph Dixon Crucible Company, Jersey City, N. J., whose stove polish, "Carburet of Iron," has been on the market in bar form for many years, is now offering it in powdered form, which admits of easier and quicker application. In its new and modern form the polish comes in a small box, the top of which can be perforated and the powder sifted as desired on a damp cloth, or a paste can be made by mixing some of the powder with a little water. The polish given is said to be easily attained, brilliant and durable.

The Unique Strainer.

The strainer for juleps, egg shakes, &c., here illustrated is made by the Mosteller Mfg. Company, 5 West Madison street, Chicago. It is constructed with two coils, one large and one small, either of which can be used. The former is for large glasses and shakers and the latter for medium or small mixing glasses, the capacity of the two ranging from a 4-oz. glass to the largest tumbler or shaker. The frame and springs are made of German silver, highly polished, and the coils can be readily detached for cleaning and replaced without difficulty, and the article is especially recommended by the company for the use of all dispensers.



Unique Strainer.

Blank Cartridge Pistols.

Wm. Shimer, Son & Co., Freemansburg, Pa., have added to their assortment of toy pistols an improved line of blank cartridge pistols, one of which is here shown. They have bronzed stocks, nickel plated buffed barrels. The makers call special attention to the fact that the breech is entirely inclosed by a hood, which affords protection against flying particles of the cartridge. The hammer must be drawn back to the extreme limit before the barrel can be broken, and in breaking the barrel the hammer is locked, making it safe for withdrawing the shell and replacing the cartridge. The hammer cannot



Blank Cartridge Pistol.

be released until the barrel is again fixed in the head. Blank cartridges only can be used in this pistol.

Osborne's Extension Brick and Stone Drills.

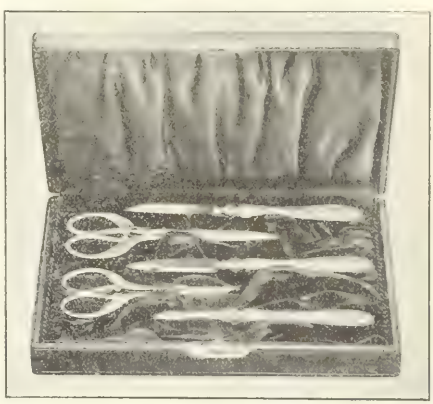
H. G. Osborne, 19 Park place, New York, has just put on the market Osborne's extension brick and stone drills, patent applied for, one of which screwed onto a section of gas pipe, is here shown, with a section cut away to indicate method of attaching. The salient feature of this device is that a mechanic away from the shop can easily carry an entire set of four of these hardened steel drill heads, weighing complete but 3 or 4 oz., put up in a small slide cover wood box, and screw the head temporarily onto the end of a piece of gas pipe, which, on a plumbing or similar job, is commonly at hand. The length of the pipe can be determined largely by the thickness of the wall of brick, concrete, granite, &c., to be drilled, whether a few inches or 6 ft. There is some flare to the teeth, so that the drill does not bind in the hole. The drill is said to cut a clean, smooth hole without chipping around the edges, and unlike a cold chisel, will not follow seams. A complete set consists of a drill head, each 9-16, 11-16, ⅞ and 1 in. diameters, to be handled with ⅛, ¼, ⅜ and ½ in. gas pipe, respectively. The heads will drill for expansion shields designed for use in connection with ⅜, ½, ⅝ and ¾ in. diameter bolts, but larger drill heads can be supplied than those here described, if wanted. Owing to compact form, wide range and the ease with which they can be screwed onto waste gas pipe, they are especially recommended by the maker to plumbers, gas fitters, engineeers, electricians, steam fitters, millwrights, sign hangers, carpenters, iron workers and others who are continually forced to run lines of pipe and other material through various kinds of walls. Another form in which they are marketed is by mounting three sets of four on a stiff cardboard display card, with easel back, for counter use, with signs and descriptive matter giving sizes, prices and other information in connection with each head.



Osborne's Detachable Extension Brick and Stone Drills

Clauss Manicure and Scissors Sets.

The Clauss Shear Company, Fremont, Ohio, and 7-9 Warren street, New York, is offering many of its lines of scissors and manicure goods in sets, one of which, the No. 5 manicure set, is here illustrated. They are intended for the finer trade which desires a display in addition to the beauty, quality and finish of the individual tools. Silk and plush lined leather or keratol cases are offered, and may be filled with different matching patterns and finishes, as selected. The set illustrated includes nail and corn knife, nail file, manicure scissors and straight nail or embroidery scissors. Other manicure sets contain only corn knife, nail file and manicure scissors. Scissors sets contain three, four or five pairs.



Clauss Manicure Set, No. 5.

G. W. Goldinger & Co., Tarentum, Pa., have sold their Hardware store to W. B. Thom, formerly of Butler, Pa., who assumed charge of the business on January 1.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, State and Western, raw	.41 @42
City, Boiled	.44 @..
City, Raw	.44 @..
Raw, Calcutta, in Bbls	.42 @..
Land Extra Prime, Winter	.71 @72
Extra No. 1	.51 @53
No. 1	.49 @52
Cottonseed, Crude, f.o.b. mill	.31½@32
Summer Yellow, prime	.41½@42
Summer White	.@41
Yellow Winter	.@46
Sperm, Crude	.50 @60
Natural White	.72 @74
Bleached White	.73 @76
Bleached Winter, Extra	.@..
Tallow, Prime	.59 @60
Whale, Crude	.55 @56
Natural White	.46 @48
Bleached Winter	.50 @52
Extra Bleached Winter	.52 @54
Menhaden, Brown, Strained	.41 @42
Light Strained	.41 @42
Northern	.@..
Southern	.@..
Cocoanut, Ceylon	.7½ lb @..
Ceylon	.7½ lb @..
Cod, Domestic, Prime	.42 @44
Newfoundland	.44 @46
Red, Extra	.42 @44
Saponaceous	.@..
Olive, Yellow	.@75
Neatsfoot, Prime	.55 @58
Palm, Lagos	.7½ lb @ 6¾

Mineral Oils—

	₱ gal.
Black, 20 gravity, 25@30 cold test	.12½@13½
20 gravity, 15 cold test	.12½@14
Summer	.12½@15
Crude, light, filtered	.20 @21
Dark, filtered	.18 @19
Paraffine, 30@32° sp. gravity	.14½@15
903 sp. gravity	.11½@12
884 sp. gravity	.11 @11½
Red	.13½@14

Miscellaneous—

Barytes, White, Foreign	₱ ton $18.50@20.50
American, ground	₱ ton 19.00@20.00
Off color	₱ ton 13.00@16.50
China, in bulk	₱ ton 3.00@ 3.25
In bbls	₱ 100 lb .55 @.65
China Clay, Imported	₱ ton 11.50@18.00
Cobalt Oxide	₱ 100 lb 2.50@ 2.60
Whiting, Commercial	₱ 100 lb .42½@ .52
Gilders	₱ 100 lb .60 @ .80
Ex. Gilders	₱ 100 lb 60@ .65

Putty, Commercial—

	₱ 100 lb
In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.45
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—

	₱ gal.
In Oil bbls	.56½@57
In machine bbls	.57 @57½

Glue—

	₱ lb
Cabinet	.12 @15
Common Rough	.7 @11
Extra White	.18 @21
Fish, liquid, 50 gal. bbls., per gallon	.60 @1.20
Foot Stock, White	.12 @14
Foot Stock, Brown	.9 @11
German Common Hide	.10 @12
German Hide	.13 @15
Flesh	.15 @17
Irish	.13 @16
Low Grade	.10 @12
Medium White	.14 @17

Gum Shellac—

	₱ lb
Bleached, Commercial	.27 @28
Bone Dry	.25 @26
Button	.1 @50
Diamond T. I.	.18 @19
Fine, Orange	.20 @35
A. C. Garnet	.. @..
G. A. L.	.. @..
Kala Button	.20 @22
D. C.	.. @..
Dragon, B.	.46 @47
T. N.	.. @..
V. S. O.	.48 @49

Colors in Oil—

	₱ lb
Black, Lampblack	.12 @14
Blue, Cobalt	.30 @40
Blue, Prussian	.@36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.13 @14
Green, Chrome	.12 @16
Green, Paris	.@24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, English white, in Oil	.10½@10⅝
Lead, American White:	
Lots of 500 lb or over, in Oil	.. @..
Lots less than 500 lb, in Oil	.. @..
Lead, White, in oil, 25 lb tin pails	.. @..
Lead, White, in oil, 12½ lb tin pails	.. @..
Lead, White, in oil, 2 to 5 lb assorted tins	.. @ 8¾
Lead, American, Pure, in 500 lbs. and over, in 15 days from date of invoice	.. @..
Zinc, American, lb	.. @..
Zinc, French:	
Extra, Red Seal	.. @..
Extra, Green Seal	.. @..
Prime, Red Seal	.. @..
Prime, Green Seal	.. @..
Zinc, White, in Pure Linseed Oil, Lots of 500 lb or over	.. @..
Less than 500 lb	.. @..
Zinc, White, in Pure Linseed Oil, in 25 lb tin pails	.. @..
Red Seal	.. @..
Green Seal	.. @..
Zinc, White, Dry, Pure, to buyers of 10 bbl. lots of one or mixed colors	6½@10

Dry Colors—

	₱ lb
Blue, Antwerp	.. @..
Blue, Dry, American	.. @..
Black, Drop, English	.5 @15
Black, Ivory	.16 @20
Lamp, commercial	.4 @ 6
Blue, Celestial	.4 @ 6
Blue, Chinese	.1 @..
Blue, Prussian	.. @..
Blue, Ultramarine	.. @15
Brown, Spanish	.½@ 1
Carmine, No. 40	$3.10@3.25
Green, Chrome, ordinary	.3½@ 5
Green, Chrome, pure	.. @..
Lead, Red, American	.. @..
Lead, Red, English	.. @..
Ochre, American	₱ ton $8.50@16.00
American, Gold	.. @..
French	.. @..
Orange, Mineral, English	.10 @11
French	.. @..
Red, American	.. @6
American	.. @..
Blue, American	.. @..
Blue, English	.. @..
Blue, French	.. @..
Blue, Prussian	.. @..
Blue, Ultramarine	.. @..
Brown, Vandyke	.. @..
Green, Chrome	.. @..
Green, Paris	.. @..
Sienna, Raw	.. @..
Sienna, Burnt	.. @..
Umber, Raw	.. @..
Umber, Burnt	.. @..
Vermilion, English	.. @..
Vermilion, American	.. @..
Whiting, per bbl	.65 @..
Gilders	.. @66
English, Imported	.65 @70
Chinese	.$0.30@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, 2 doz. pairs, Nos. 1, $0.75; 2, $1.00; 4, $1.00; 5, $1.50.
Fernald Quick Shifter, ₰ doz. pairs .....$2.00@$3.50

Anvils—American—

Eagle Anvils.....₰ lb @8½ ¢
Hay-Budden, Wrought.....9½@9¾ ¢
Trenton .....₰ lb 9½@9¾ ¢

Imported—

Peter Wright & Sons, ₰ lb, 84 to 349 lb. 11¢; 350 to 699 lb, 11½ ¢.

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....10%

Augers and Bits—

Com. Double Spur.....75@80%
Jennings' Pat., Bright.65&10@70%
Black Lip or Blued..65@65&5
Boring Mach. Augers.....70%
Car Bits, 12-in. twist.....40&10%
Ford's Auger and Car Bits.....40&5%
Ft. Washington Auger Co., Cincinnati's 35%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.'s:
No. 10 ext. lip, R. Jennings' list, 25&5&2½%
No. 30, R. Jennings' list.....50%
Russell Jennings'.....25&5&2½%
Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Pugh's Black.....30%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's Sing Auger Bits.....50%
Wright's Jennings' Bits.....60%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's Pattern, No. 1, ₰ doz $26; No. 2, $18.....60&10%
Ford's, Clark's Pattern.....66⅔&5%
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $26.00.....60&10%
Swan's 60%

Gimlet Bits—*Per gro.*

Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz...$6.50@7.00
Ames .....25&10%
Universal 20%

Ship Augers and Bits—

Ship Augers.....40&10%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' .....33⅓&7½%
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhandled, Shildered...gro.65@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdled, Shildered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro $1.50@1.60
Handled, Socket..gro $11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality.....$4.75@5.00
Second Quality.....$3.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles— *Iron or Steel*

Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar..4¾@5¼ ¢
No. 1 Common, Loose...3¾@4¼ ¢
No. 1½ Com., New Style..4@4½ ¢
No. 2 Solid Collar.....4½@5 ¢
Half Patent
Nos. 7, 8, 11 and 12..65@65&10%
Nos. 13 to 14.....65@65&10%
Nos. 15 to 18.....70@70&10%
Nos. 19 to 22.....70@70&10%

Boxes, Axle—

Common and Concord, not turned lb..6@6¢
Common and Concord, turned. lb., 6@7¢
Half Patent.....lb., 9½@10¢

Bait— Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances— Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....50@50&10%
Straight Balances.....10@10&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb.... per lb., —@21½@23¼¢

Towel—

No 10 Ideal, Nickel Plate..₰ gro. $8.50

Beams, Scale—

Scale Beams.....40%
Chattillon's No. 1.....40%
Chattillon's No. 2.....30%

Beaters, Carpet—

Holt-Lyon Co:
No. 12 Wire Coppered ₰ doz. $0.80; Tinned.....$0.85
No. 11 Wire Coppered ₰ doz. $1.15; Tinned.....$1.20
No. 10 Wire Tinned.....₰ doz. $1.50

Beaters, Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 8, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $16.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.50

Bellows—

Blacksmith, Standard List..
Split Leather.....60&10@65%
Grain Leather.....50@50&10%

Hand—

Inch..... 6 8 10
Doz.....$7.50 9.00 12.00

Molders—

Inch Per doz. 12 16 20
Doz.....$7.50 9.00 12.00

Bells— Cow—

Ordinary Goods...75&5@75&10@75%
High grade.....70&10@75%
Horses .....75&10%
Texas Star 50%

Door—

Hume, R. & E. Mfg. Co.'s .....55&10%

Hand—

Oakland Brass Co.....50@60@70%
White Metal .....50@60@70%
Nickel Plated.....60@65
Nickel .....60@65
Cone's Globe Hand Bells.....33⅓@35%

Miscellaneous—

Farm Bells.....lb., 2¼@2½¢
Church and School....60@60&5%

Belting— Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard .....70&5%
Light Standard.....70%
Cut Leather Lacing.....40&10%
Leather Lacing Sides, per sq. ft. 2½¢

Rubber—

Agricultural (Low Grade)..... 75@75&5%
Common Standard....70@70&10%
Standard .....70@70&5%
Extra .....60@60&10%
High Grade.....50@50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Spokes.....30%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden.....75%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....40%
Embossed 50%

Boards, Wash—

See Washboards.

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):
⅝ and smaller...70@75&5—%
Larger and longer.....65&5—%
Philadelphia Eagle, $3.00 list...50&5—%
Bolt Ends.....65@65&5—%
Machine (Cut Thread):
⅝ and smaller...70@75&5—%
Larger and longer...65&5—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:
Inch..... 4 5 6 8
Per doz..$0.50 .55 .65 .80
Cast Iron Spring Foot, Jap'd:
Inch..... 6 8 10
Per doz..... $1.20 1.50 2.25
Cast Iron Chain, Flat, Japanned:
Inch..... 6 8 10
Per doz..... $1.40 1.50 1.65
Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch..... 6 8 10
Per doz..... $1.25 1.50 1.75
Wrought Barrel Japd..50@50&10%
Barrel Bronzed.....60&10%
Spring .....70@70&10@70&10%
Shutter .....50@50&10@65%
Square Neck.....75@75&10%
Square .....70@70&10%
Iron Patent Door.....55%
Iron Wrought Metal 45%

Expansion—

Richards Mfg. Co. .....50&10%
Steward & Rumpp Mfg. Co.:
Style No. 13, Double 55
Style No. 14, Single 55
Style No. 100, Dbl. Jaw, Single..55%
Lane Screw 60%

Plow and Stove—

Plow .....65&5@—%
Stove .....85@85&5%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99....80%
Phila., Eagle, list Oct. 16,1884..82½%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch	*1¼*	*1½*	*1¾*	*2*
Per doz	*$4.80*	*5.60*	*6.40*	*8.00*
Inch			*2¼*	*2½*
Per doz			*$8.65*	*11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 25&10%; Langdon Arms .....15&10%
Perfection 40%
Seavey 45%

Braces—

Common Ball, American....$1.50
Barber's .....50&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....50%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Ball Braces.....25&10%
P., S. & W. Co., Peck's Pat..60&10%

Brackets—

Wrought Steel.....70&10@75&10%
Bradley Metal Clasp..80&10@80&10&5%
Griffin's Pressed Steel.....75@75&10%
Griffin's Folding Brackets.....70&10%
Taplin Victor Handy Egg Beater Bracket .....₰ doz. $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Wire Goods Co.....75%

Buckets, Galvanized—

M'f'gr's list, price per gross.

	Quart	*10*	*12*	*14*	
Water, Reg.		*$7.35*	*$8.00*	*$9.00*	*32&10%*
Water, Hvy		*$7.35*	*$8.00*	*$9.00*	
Fire, Rd. Btm.		*$2.00*	*$3.65*	*$8.65*	
Well		*$7.35*	*$1.85*	*$5.35*	

Bull Rings—See *Rings, Bull*

Butts— Brass—

Wrought, High List, Oct. 26,'06..55%
Cast Brass Tip-butts 40%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow....40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—

Light Narrow, Light Brazed.....50@55%
Brazed .....70@75%
Loose Joint, Narrow, Light .....70@75%
Inside Blind Shutter 70%
Back Flaps, Table Chest &c. Japanned.....70@75%
Light Narrow, Loose Pin .....70@75%
Light Narrow, Ball Tip.....60%
Brazed .....70@75%
Staple, Tipped.....70%
Ball Tipped.....70%

Extra 10@

Cages, Bird

Hendryx Brass: Series 3000 5000. Hdle and Inst. 1200 15" : 200 300. 300 " " 30%
Hendryx Brass, Series 1000 Hdle and Inst. Enameled 25

Calipers—See Compasses.

Calks, Toe and Heel—

Blunt, 1 prong, per lb. 11c
Sharp, 1 prong, per lb. 11c
Extra Heel Calks, Sharp, per lb. 11c
Toe Calks, Sharp, per lb. 11c
Heel Calks, Sharp, per lb. 3 50 " 4.15c

Can Openers—

See Openers, Can.

Caps, Percussion—

Eley's E. B. ..... $2@3.55c
G. D. ..... per M 3.75@3.95c
E. ..... per M 4.00@4.25
G. E. ..... per M 4.00@4.50
Musket ..... per M 02@3.03c

Primers—

Berdan Primers, $2 per M. 20@5
Primer Sheets and Bushels .15@10
All other primers per M. $1.52@1.60

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

Blank Cartridges:

32 C. F., $5.50 ..... 10@5%
38 C. F., $7.00 ..... 10@5%
22 cal. Rim, $1.50 ..... 10@5%
32 cal. Rim, $2.75 ..... 10@5%
B. B. Caps, Cen. Bad., Sagit $1.00
B. B. Caps, Round Ball ... $1.40
Central Fire 25%
Target and Sporting Rifle .15@5
Primed Shells and Bullets .15@10
Rim Fire, Sporting 50%
Rim Fire, Military ..... 15@5%

Casters—

Bed ..... 55@15
Plate ..... 40@10
Philadelphia ..... 40@10
Axle, Hub, Bearing 5
Gem Roller Bearing ..... 40@10
Ideal Ball Bearing 45%
Standard Ball Bearing 45%
Yale (Double Wheel) ..... 40@10

Cattle Leaders—

See Leaders, Cattle.

Chain, Proof Coil—

American Coil, Straight Link:
5/16 in. 3/8 in. 7/16 in. 1/2 in. 9/16
$8.75 6.87 5.62 4.75 4.22
5/8 in. 3/4 in. 7/8 in. 1 in. 1 1/8 inch.
$3.87 3.37 2.87 2.50 2.12
In cask lots, deduct 25¢.
Grocers' Coil:
1/4 in. 5/16 in. 3/8 in. 7/16 in. 1/2 in.
$4.25 3.75 3.25 2.87 2.50
5/8 in. 3/4 in. 7/8 in. 1 in. 1 1/8 in.
2.25 2.00 1.87 1.75 1.62

Halter—

Halter Chains ..... Quoted 5%
German Pattern Halter Chains, list July 26, 97 ..... Quoted 5%
Covert Halters, Hammerless ..... 10@5%
Halter ..... 35@5%

Cow Ties—

See Halters and Ties.

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr. 6/8 in. 3, Straight, with ring, $85.00
6/8 in. 3, Straight, with ring, $90.00
6/8 in. 3, Straight, with ring $92.00
6/8 in. 3, Straight, with ring $97.00
NOTE—Add 2c per pair for Hooks. Trace Chains, add per pair for No. 2 and 3, 2 c; No. 1 and No. 0 to piece of Strapped 4.
Eastern Standard Traces, Wagon Chains, &c. Quoted 5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron ..... 60@10%
Brass 60%
Safety and Fasteners: Chain, 60@10
Grab Hook Chain ..... Quoted
Cover Hasp, Hook and Staple 40%
Oneida Community:
American Halter, Dog and Key Chains 40%
Niagara Dog Leads and Key Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain 70
Universal Dbl.-Jointed Chain 50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain 60
Pullman:
Bronze Chain, 60%; Steel Chain ..... 60&10%
Sash Chain Attachments, per set 8c
Jamming Sash Ribbon, per lb. $1.75@2.00
Sash Ribbon Attachments, per set 8¢

Chalk—Prices to Jobbers:

Carpenters' Blue.... gro., 50@55¢
Carpenters' Red 75c
Carpenters' White ..... 10@15c

Checks, Door—

Brass 45%
Bronze ..... per M $50.00
Bronze 33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' 30
Youths' Chests with Tools 25%
Gentlemen's Chests 30
Farmers', Carpenters,' etc., Chests, with Tools 30
Machinists' and Pipe Fitters' Chests, Empty 10
Tool Cabinets 10
Cabinet Drawer & Cup Machines 10
Tool Chests 10

Chisels—

Socket Framing and Firmer

Standard List ..... Quoted
Buck Bros. 30
C. E. Jennings & Co. 30
Socket Firmer No. 1 30
Socket Firmer No. 2 30
No. 3 30
L. & I. J. White Co. ..... 30@30&5%

Tanged—

Tanged Firmers ..... Quoted
Buck Bros. 30
C. E. Jennings & Co. Nos. 191, 181 ..... 25%
L. & I. J. White Co. ..... 25&5%

Cold— lb.

Cold Chisels, good quality .13@15¢
Cold Chisels, fair quality .11@13¢
Cold Chisels, ordinary... 9@10¢

Chucks—

Almond Drill Chucks 35%
Almond Turret Six-Tool Chuck 40
Reece Pat., each $8.00 ..... 35&5
Empire 35
Blacksmiths' 15
Jacobs' Drill Chucks 35%
Peerless Pratte Chuck 2
Skinner Patent Chucks:
Independent Lathe Chucks 35%
Universal Receding Jaws 35
Combination, Reversible Jaws 35%
Drill Chucks Now Made:
Standard ..... Standard Taper
No. 25 Pin or Drive 40%
Planer Chucks ..... 20@5%
Face Plate Jaws 40
Standard Tool Co.:
Independent Drill Chuck 45
Universal Chuck:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21 30
Scroll Combination, Nos. 3 and 4 30
Geared Scroll, Nos. 4 and 35 25
Independent Iron, Nos. 18 and 318 ..... 35%
Independent Steel, No. 64 25
Little Giant: Nos. 10, 101, 102, 103, 104 35
Union Gear Drill 25
Universal, No. 12 35
Universal, No. 42 35
Iron Face Plate Jaws, Nos. 58 to 48, No. 1 35
Steel Face Plate Jaws, Nos. 70 and 72 30
Westcott Patent Chucks:
Lathe Chucks 50%
Little Giant Independent Drill 50
Little Giant Double Grip Drill 50%
Little Giant Drill, Improved 50
Oneida Drill 50%
Scroll Combination Lathe 50
Whitney Mfg. Co. 25
National Drill 25

Clamps—

Adjustable Hammers' ..... 20@5&5
Carriage Makers P., S. & W. Co. ..... 50&10%
Bench Dog ..... 50&5%
Morse Hat Rack 45
Linemans' Saw Belt Nut 15
Carpenters' Hammer ..... 10@5%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Ivan's Champion ..... Adopted the Ivan's Champion. Still carry 40

Sidewalk—

Star Socket Al. Steel ₰ doz. $4.05 net
Star Shank Al. Steel ₰ doz. $3.44 net
W. & E. Shank, All Steel, ₰ doz., 7/8 in. $ 2.75 1 in. $3.25

Cleavers, Butchers'—

Foster Bros. 30%
Fairbanks 30
L. & I. J. White Co. 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each.. $10.75
20th Century Horse, each.. $5.00
Lightning Belt Horse, each $15.00
Chicago Belt Horse, each $20.00
Stewart's Enclosed Gear Horse, each..... $8.75
Stewart's Patent Sheep Shearing Machine, each..... $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each.. $9.75

Clips, Axle—

Regular Stock, list July 1, '97 ..... Quoted

Cloth and Netting, Wire

—See Wire, &c.

Cocks, Brass—

Hardware list:
Plain Bibbs, Gate, Kerosene, Racking, Liquor, Bottling, &c. ..... 70@? —%
Compression Bibbs, Self ..... —%

Coffee Mills—

See Mills, Coffee.

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son ..... Quoted
Leather Walter B. Stevens & Son ..... Quoted

Compasses, Dividers, &c.

Ordinary Grade ..... 70@? 75
Wm. Schollhorn, Co.:
Engineer Dividers ..... Quoted
Ladi Dividers ..... Quoted

Conductor Pipe,—

Galvanized
Gals. *Charcoal* *Copper*
Steel. *Iron* *Iron* *Bright*
Eastern:
Jobbers ..... Quoted
Central:
Jobbers ..... Quoted
Western and Southern:
Jobbers ..... Quoted
So. Western
Jobbers ..... Quoted
Extra Couplings, Elbows, Shoes, Bends, Tees, Crosses, Reducers, Adjustable Elbows and Shoes ..... Quoted
See also Elbows, &c.

Coolers, Water—

Iron & Wire Co.:
Galvanized 1 50
Copper 1 50
Tinned 1 50
Wire 1 50
Agate 1 50

Coopers' Tools—

See Tools, Coopers'.

Coppers' Soldering—

Soldering Coppers, 8 lbs. to pair ..... Quoted
Under 8 lbs. to pair ..... Quoted

Cord— Sash—

Braided. Drab ..... lb. 35¢
Braided, Cream, Nos. 8 to 12 ..... 35¢
Braided, Cream, Nos. 14 to 18 ..... 30¢
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India ..... lb., *18@19¢*
Cotton Sash Cord, Drab, Nos. 8 to 12 ..... 25¢
Patent Russet ..... lb. *20¢*
Cable Laid Russia ..... lb. *21¢*
India Hemp, Br'd'd ..... lb. *21¢*
India Hemp, Twisted lb. 13@15¢
Patent India, Twisted ..... lb. *21¢*
Lamp Wicking, Nos. 1 to 3 12
Lamp Wicking, Nos. 8 to 12 12
Lamp Wicking, Nos. 14 to 20 12
Lamp Wicking, Nos. 22 to 30 12
Hemp Cable Laid Italian, Nos. 7 to 10 ..... ₰ lb. 3 c
Pullman:
Wire Sash Cord 15
Sash Cord Attachments, per doz. 10¢
Samson, Nos. 8 to 12 30
Braided, ₰ lb., Drab Cotton
50c., Italian Hemp 40
50c., Lamb, 65c., White Cotton 50
Sash Cord Tool Co. 12
Massachusetts, White.... ₰ lb 10¢
Massachusetts, Drab.... ₰ lb 10¢
Phenix, White, Nos. 8 to 12, 27¢; Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢;
B, Drab, 35¢; B, White, 30¢;
Italian Hemp, Drab, Italian, 55¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906 ..... 90@—%
Hendryx Standard Wire Picture Cord, old list, 85&10%
Turner & Stanton Co. Wire Picture Cord ..... Quoted

Cradles—

Grain ..... 40¢@12½

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber.
White and Purple, Indelible.. $7.50
Blue, Red, Green, Yellow and Brown ..... Quoted
Gold, Leaf Lettering ..... Quoted
Silver, Leaf Lettering ..... Quoted
Genuine Soapstone, Metal Workers', 3 doz. in a box, ₰ box ..... Quoted
$2.50 $3.25 $4.25 $5.00

Crooks, Shepherds'—

Pipe Metal, Iron, Hook $5.00

Crow Bars—See Bars, Crow.

Cultivators—

Vater Cultivator ..... Quoted

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ₰ doz. $3.50
Standard Engraved Blades & Steel Ferrules, ₰ doz. $3.50
Wm. Rogers & Son ..... Quoted

Cutters— Glass—

H. H. Mayhew Co. 40%
Red Devil 40
E. Mfg. Co. ..... Quoted
Wheeler ..... Quoted

Meat and Food—

American ..... Quoted
Ne ..... Quoted
E ..... Quoted
Enterpri ..... Quoted
F ..... Quoted
No. 202 51 ..... 1 85%
Ideal ..... Quoted
Dixon's ..... Quoted
Ideal ..... Quoted
Ne ..... Quoted
Ne ..... Quoted
Ne

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Z adjustable 45
Wall iron 40
Up-to-Date 50

Cord and Weight—
Ives and Etc. 3

Corrugated—
Acme Corrugated I. 50

Faucets—
Cork Lined .....
Metallic Key, Lockable Lever,
Red Cobra .....
Pettocrank .....
R. & L. B. Co.:
Metal Key 60
Star 50
West Rock 50
John Sommer's Perfect Tin Key 45
John Sommer's O. K. Cork Lined 50
John Sommer's Boss Tin Key 50
John Sommer's Vac. Metal Key ..... 50&10
John Sommer's Duplex Metal Key 60
John Sommer's Diamond Lever 60
John Sommer's X. L. Cork Lined 50
John Sommer's Reliable Cork Lined ..... 50&10
John Sommer's Chicago Cork Lined 50
John Sommer's O. K. Cork Lined 50
John Sommer's No Brand, Cedar 50
John Sommer's Perfection, Cedar 40
Self Measuring:
Enterprise, per doz. $.6 00 ..... 40&10
Lance, per doz. $.6 00 ..... 40&10
National Measuring, per doz. $.6 ..... 40&10

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic
List Nov. 1, 1899.
Best Brands ..... 70&10@75&10%
Standard Brands ..... 70&10@80%
Lower Grades ..... 50&10@60&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97 ..... 35 1-3&40%

Fixtures, Fire Door—
Alloth Underwriters Approved 50
Richards Mfg. Co.:
Universal No. 103; Special, No. 104 ..... $3.75
Fusible Links, No. 96 ..... 50%
Expansion Bolts, No. 107 ..... 60&10%

Grindstone—
Net Prices:
Per doz. 15 17 19 21
Per gross $2.00 $2.40 $2.85 $3.25
R. & S. Mfg. Co. 60
Reading Hardware Co. 60

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE—Manufacturers are selling from the list of September 1, 1903, but many jobbers are still using the list of August 1, 1899, or selling at net prices.
Iowa Dig Ezy Potato ..... 60&10%
Victor, Bay ..... 60&15&2½%
Victor, Mature 66⅔%
Victor, Header 66⅔%
Champion, Bay 66⅔%
Champion, Header 65%
Champion, Mature ..... 60&15&2½%
Columbia, Bay ..... 60&20%
Columbia, Mature 70%
Columbia Spading ..... 70&12½%
Hawkeye Wood Barley ..... 60&10%
W. & F. Potato Digger ..... 60&10%
Acme Hay ..... 60&20%
Acme Manure, 4 tine ..... 60&10&5%
Dakota Pitching ..... 60&10%
Jackson Steel Barley ..... 60&30%
Kansas Reader 65%
W. & F. Favorite Wood Barley 40%
Plated—See Spoons.

Freezers, Ice Cream—
Qt. 1 2 3 4 6
Each $1.25 $1.40 $1.90 $2.30 $2.80

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp $2.75
Cotton 3 20
Waterproof Sgl. Taped. 3 65
Waterproof Dbl Taped 4 40
Waterproof Tpl. Taped. 5.15

Gates, Molasses and Oil—
Stebbins' Pattern ..... 75@80%

Gauges—
Marking, Mortise, &c. 50@50&10%
Empire Stephens Co.:
Marking, Mortise, &c. ..... 50%50&10%
Dexter Marking, Mortise, &c. 67½%
Wire, Brown & Sharpe's 33⅓%
Wire, Pratt & Whitney 25%
Wire, B. & W. Co. 33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro
Nail, Metal, No. 1 ..... $2.00 2 $2.20
Spike, Metal No. 1 ..... $3.00 2 $3.30
Nail, Wood Handled, No. 1 ..... $2.00 2 $2.20
Spike, Wood Handled, No. 1 ..... $4.00 2 $4.60

Glass, American Window
See *Trade Report*

Glasses, Level—
Empire Stephens Co. ..... 65@65&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush ..... *$7.50&10@50%*

Grease, Axle—
Common Grade....gro. $6.00@6.50
Diamond Extracting 10 lb. pails, ea. $6.00; in boxes, per doz., 1 lb. $1.25, 2 lb. $2.00
Helmet Hard Oil 35

Griddles, Soapstone—
Pike Mfg. Co. ..... 33⅓&33⅓&10%

Grinders—
Royal Mfg. Co.:
Automatic Grinding Machines, each, No. 0, $1.75; 2A $4.50; 1B, $5 ..... 30%
Aluminum Sickle Grinders, each, No. 2 $5; 2A $4.00; 2BA Combined $6.50 50
Aluminum Disc Grinders, each, $2.50 ..... 33⅓

Grindstones—
Pike Mfg. Co.:
Improved Family Grindstones, per inch, per doz. $2.00 ..... 33⅓%
Knife Grinding Machines, Emery and Corundum Bearing mounted 40

Grips, Nipple—
Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—
Cow Ties ..... 60&5@60&10%
Ewert Mfg. Co.:
Web ..... 30&2
Jute Rope 35
Sash Rope 35
Cotton Rope 45
Hemp Rope 45%
Oneida Community:
Am Cow and Halters ..... 40@40&5
Am Cow Ties ..... 45@50
Niagara Cow and Halters ..... 45@50&5
Niagara Cow Ties ..... 45&5@50&10&5%

Hammers—
Handled Hammers—
Heller's Machinists' ..... 55&10@55&10&5%
Heller's Farriers' ..... 40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Adjustable Shoe 5
Carpet ..... 10&10%
Riveting 5
Mechanics' Unbreakable ..... 60&5
Blacksmiths' ..... 50&5
Fairbanks, Plumb:
A. E. Nail ..... 10&5&10&2%
Hand and Pig Hoof Adze ..... 20&5
Machinists' Ballpeen Hammers ..... 10&5
Railroad Timers ..... 10&5&10&5
Riveting ..... 10&5

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢ ..... 80&10%
Over 3 lb., per lb. 30¢ ..... 80&10%
Over 3 lb. per lb., 30¢ ..... 80&10%

Handles—
Agricultural Tool Handles
Ax, Hatchet, &c. ..... *60&10@60&10&5%*
Hoe, Rake, &c. 40%
Fork, Shovel, Spade, &c.:
Long Handles 40
D Handles 40%

Cross-Cut Saw Handles—
Alaska 45
Champion 50
Diamond 50

Mechanics' Tool Handles—
Axes, assorted, gro. $3.00@$3.50
Brad Awl ..... gro $1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.50@ $2.65; Hickory ..... $2.15@2.40
Socket Firmer, Apple, $1.75@ $2.25; Hickory ..... $1.60@1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted ..... gro. $1.80@$1.40
Hammer, Hatchet, &c. ..... 60&10@60&10&5%
Hand Saw, Varnished, doz. 80¢@85¢; Not Varnished ..... 65@75¢
Plane Handles:
Jack, doz. 50¢; Jack, Bolted 75¢
Fore, doz. 45¢; Fore, Bolted 90¢
Chapin-Stephens Co.:
Carving Tool ..... 20&5&10%
Chisel ..... 60&10&5
File and Awl ..... 50&5&10
Saw and Plane ..... 70&10&10
Screw Driver ..... 20&5&10
M. D. Files Axle and Rubber Vise Handles ..... 15&10
Nicholson Simplicity File Handle ..... $3.50&$4.50
W. A. Zelnicker Supply Co.:
Hammer handles, 10 in. $2.00
12 in. $2.25
14 in. $2.50
$3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge handles, oval, 30 in., $3.50; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe handles, 28 in., $5.60; 30 in., $5.80.
Adze handles, 28 in., $5.80; 36 in., $7.80.
Pick handles, R. R., 26 in., $8.00; coal, 34 in., $5.80.
Hatchet handles, 12 to 14 in., $2.
Extra 10&10&5% often given.

Hangers—
NOTE—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track.
Acme Mfg. Co.:
Reliable, Nos. 1 and 2; Allith No. 3; Ideal Adjustable No. 6; Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Crook & Carrier Mfg. Co.:
Loose Axle ..... 50&10%
Roller Bearing ..... 75&10%
Cushman Mfg. Co.:
Solid Axle, No. 10, $12.00 ..... 60&10%
Roller Bearing, No. 11, $15.00 ..... 60&10%
Roller Bearing, Ex. Hv No. 22, $18.00 ..... 60&10%
Ball Bearing 70%
Lane Bros. Co.:
Parlor, Ball Bearing, $1.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard ..... 60&10%
Hinged ..... net $6.00
Covered ..... 60&5%
Special ..... 70&5%
Lawrence Bros.:
Advance ..... 55&10%
Cleveland ..... 75&5%
Clipper, No. 75 ..... 60%
Crown ..... 55&10%
Cushion, No. 40 ..... net $6.50
Tandem, No. 50 ..... net $7.50
New York ..... 55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2 ..... 70%
Anti-Friction 60%
Hinged Hangers, King Charm 60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3 ..... $2.25
Roller Brg. St'l Track No. 12 ..... $2.20
Roller Brg. Brass Track No. 13 ..... $2.50
Roller Brg, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19 ..... 50&10%
Adjustable Track Tandem Trolley Track No. 28 ..... 50&10%
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22 ..... 50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25 ..... $1.60
$2.45; No. 150 ..... $2.50
Safety Underwriters F. D. No. 101 ..... 50%
Tandem No. 41 2⅝ and 3 ..... 60&10%
Place, Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 145 ..... 50&10%
Ives' Wood Track No. 1 ..... $2.25
Trolley B. D. No. 20 ..... 50&10%
Trolley B. D. No. 24, $1.30; No. 27 ..... $1.60
Roller Bearings, No. 37, 38, 39, 41, 43, 41, Sizes 1 and 2, 70&7½%
Anti-friction, No. 42, No. 44, sizes 2½ and 3 ..... 60%
Hinged Tandem No. 45 ..... 60&5%
Folding Door B. B. Swivel No. 135 ..... 40%
Taylor & Boggis Fry Co.'s Kidder Roller Bearing ..... 65&15&10&5%
Myers' Steam Hangers 60%

Hangers— Garment—
Pullman Trouser, per gro., 1 pair Flat Aluminum, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro. $10.50; Garment Hanger Loops, Round Nickeled, per gro. $10.50
Victor Folding ..... per gro. $9.60

Gate—
Myers' Patent Gate Hangers, per doz. net $4.50

Joist and Timber—
Lane Bros Co. 30%

Hasps—
Greene's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, per doz. 60%

Hatchets—
Regular list, first qual. ..... 50&5%
Second quality ..... 50&5%

Heaters, Carriage—
Clark No. 1, $.7.50; No. 5B, $2.00; No. 5, $.7.75; No. 7D, $3.00; No. 3E, $2.25 ..... 25%
Clark Coal, per doz. $9.75 ..... 20%

Hinges—
Blind and Shutter Hinges
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

	No. 1	No. 2	No. 5
Doz. pair	$0.75	1.35	2.70

Mortise Shutter (L. & P., O. S., Acme, &c.)

	No. 1	1½	2	2½
Doz. pair	$0.75	.65	.60	.55

Mortise Reversible Shutter (Buffalo, &c.):

	No. 1	1½	2
Doz. pair	$0.70	.65	.60

North's Automatic Blind Fastener No. 2 for Wood, $9.00. No. 3 for Brick, $11.50 ..... 10%
Charles Parker Co. ..... 70&75%
Parker Wire Goods Co.:
Hyde & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00, No. 111, for brick, $8.00 ..... 20%
Reading's Gravity 60%
Stanley's Steel Gravity Blind Hinges, No. 164½, per doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter ..... 75&5%
Acme, Lull & Porter 75
Queen City Reversible 75%
Shepard's Noiseless, Nos. 60, 65, 55 ..... 50&5
Niagara, Gravity Locking, Non L. 3 & 5 ..... 75&5%
Tip Pat'n, No. 1 ..... 75&10%
No. 2 ..... 75&5
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 70&10&5%
Shepard's Double Locking 75%
Champion Gravity Locking ..... 75&5%
Pioneer ..... 75&10%
Empire 65
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:	*No.*	1	2	3
Hinges with L't'chs.		$2.00	2.70	5.00
Hinges only		1.40	2.05	3.80
Latches only		.70	.70	.85

New England:

With Latch	*doz.*	*@$2.00*	
Without Latch	*doz.*	*@$1.60*	

Reversible Self-Closing:

With Latch	*doz.*	*@$1.75*	
Without Latch	*doz.*	*@$1.35*	

Western:

With Latch	*doz.*	*$1.75*	
Without Latch	*doz.*	*$1.15*	

Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 ..... 70%

Pivot Hinges—
Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—
Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, Cast Iron $6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 40%
Bardsley's Patent Checking 33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor 40%
Bommer Spring Hinges 40%
No. 999 Wrot, Steel Hold Back, per gr. $9.00
Chicago Spring Butt Co.:
Chicago Floor 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor 50%
Garden City Engine House 25%
Keystone Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 25%
American 30%
Columbia, per gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, per gr. $12.00
Columbian Hinges ..... 60&10%
Gem, new list 30%
Clover Leaf ..... per gr $12.00
Oxford, new list 30%
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co. Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door, per gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door 65%
No. 777, Sheet Steel Holdback, per gr. $9.00
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓%
Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges	*.50*	*&10%*
Heavy Strap Hinges	*.60*	*&5%*
Light T Hinges	*.50*	
Heavy T Hinges	*.40*	*&10%*
Extra Heavy T Hinges	*.50*	*&10%*
Hinge Hasps	*.33⅓*	
Cor. Heavy Strap	*.60*	*&5%*
Cor. Ex. Heavy T	*.50*	*&10%*

Extra 10&5% 10&10%

Screw Hook and Strap.	*6 to 12 in. lb.*	*3¾¢*
	14 to 20 in. lb.	*3½¢*
	22 to 36 in. lb.	*3¼¢*

Screw Hook and Eye:

¾ to 1 inch	*lb.*	*6¼¢*
⅝ inch	*lb.*	*7½¢*
½-inch	*lb.*	*8½¢*

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers ..... 30&2%

Hods— Coal—
M'f'gr's list, price per gross

Inch	*15*	*16*	*17*	*18*
Galv. Open	*$37*	*$39*	*$42*	*$46*
Jap Open	*36*	*38*	*41*	*45*
Galv Funnel	*34*	*38*	*32*	*36*
Jap. Funnel	*33*	*36*	*39*	*43*

Extra 10&5% 10&10%

Masons' Etc.
Cleveland Wire Spring Co.:
Steel Brick, No. 162 ..... each $1.05
Steel Mortar, No. 158 ..... each $1.35

Hoes— Eye—
Scorii and Oval Pattern ..... 60&10@60&10&10%
Grub, list Feb. 25, 1899 ..... 70&10@75&10%

D. & H. S. ... Per ton.

Handles

NOTE - When duties are collected from the old tariff, or from the existing tariffs for short periods, August 5, 1909, a special list will be issued.

Cross's Wrenches, No. 2 ... Net
Star Double Bit ... 45&10
Star Made of Cast Steel ... 45&10
1t Made of Cast Steel Cultivator Hoe, ... doz.
1t Made of Malleable Iron ... 45&10
Warren Hoe ... 45&10
W. & C. Trowel ... 45
B. B. 6 in. Cultivator ... 45
B. B., 6½ in. ... per doz. $4.50
Axe Welding ... 45
W. & C. L. ing Scuffle Hoe ... 45

Hoisting Apparatus—

See Machines, Hoisting.

Holders— Bit -

Augur, ₱ doz. $4.00 ... 45&10

Door-

Bardsley's, Iron, 10 ... Brass and Bronze ... 5
Langdon ... 5
Pullman ... 5
Reynolds' Mfg. Co., N. ... Best Quality, 40&10; No. 1, 40&10; Sure Grip ... 35
Superior ... 5

File and Tool -

Nicholson File Holders and File Handles ... 33⅓&40

Fruit Jar—

Triumph Fruit Jar Holder, ₱ gross, $1.80; ₱ doz. ... $1.25

Trace and Rein—

Fernald Double Trace Holder, ₱ doz. pairs ... $1.25
Dash Rein Holder, ₱ doz. pairs ... $1.25

Hones—Razor -

Pike Mfg. Co., Barber and Sanity, 50c., German ...

Hooks—Cast Iron—

Bird Cage, Reading ... 40%
Clothes Line, Reading List ... 40
Coat and Hat, Reading ... 45&5
Coat and Hat, Reading ... 40
Harness, Reading List ... 40

Wire-

Belt ... 80%
Wire Cloth, Hooks ... 60
Bradley Metal Clasp Wire ... 60
Hat ... 50&5
Columbian Hdw. Co., Gen. ... 10&5
Parker Wire Goods Co., Kng. ... 70&10%
Wire Goods Co. ... 60
Acme, 60; Chief, 70; Crown, 75; 65; V Brace, 75; Gear Harness, 5 &10

Wrought Iron—

Box, 6 in., per doz., $1.60; 8 in., $1.25; 10 in., $3.50.
Cotton ... *doz. $1.05@$1.25*
Wrought Staples, Hooks, &c. —
See Wrought Goods

Miscellaneous -

Hooks, Bench, see Stops, Bench.
Hush, Light, doz. ... *$0.45*
Grass, best, all sizes, per doz. ... *$0.90*
Grass, common grades, all sizes, per doz. ... *$1.50*
Woolleties ... *lb. 5¾@6¢*
Hooks and Eyes:
Brass ... *6 and 6½ ¢*
Malleable Iron ... *70&10%*
Covert Mfg. Co., Gate and Scuttle Hooks ... 40
1t Made of Cast Iron ... 45
Tiger & Stanley ... 45
Shoulder ... 45
Bent Hooks, See Bent ... 45
Cast Hooks, See Knives ... 45

Horse Nails—

See Nails, Horse.

Horseshoes—

See Shoes, Horses.

Hose, Rubber

Garden Hose, ¾ inch:
Cotton ... *ft. 5¢ 6¢*
1-ply Guaranteed ... *ft. 8¢ 9¢*
2-ply Guaranteed ... *ft. 10¢ 11¢*
Cotton Garden, ¾ in., unlined
Low Grade ... *ft. 5¢ 6¢*
Low Quality ... *ft. 7¢ 8¢*

Irons— Sad-

From ½ to 10 ... *lb. 8¢ 9¢*
B. B. Sad Irons ... *lb. 7¢ 8¢*
Mrs. Potts', cents per set:
Nos. 50 55 60 65
Japed Tops ... *88 89 93 97*
Tinned Tops ... *88 89 93 97*
New England Pressing ... *lb. 7¢ 8¢*

Bar and Corner-

Reynolds Mfg. Co., Bar ... 45&10
Corner ... 60

Pinking—

Pinking Irons ... *doz. 60¢*

Irons, Soldering

See Coppers.

Jacks, Wagon—

Ewart Mfg. Co.:
Auto Screw ... 30&2%; Steel, 45%
Imperial ... 50

Lacey Steel ... 45
Reynolds Bros. Saw Co. ... 25
Smith & Hemenway Co. ... 25

Ladder

Reynolds Mfg. Co., Extension ...

Kettles -

Brass, Spun, Plain ... *20@25%*
Enameled and Cast Iron, See Ware, Hollow

Knives—

Butcher, Kitchen, &c.—

Ivor 158 ... Butcher & Kitchen ... 60
Williamson Shear & Cutlery Co. ... 60

Corn

Columbian Cutlery Co., Without Board, Knives and Holder ... 60
Without Knives and Holder, $3.00; Deere, $2.25; Malleable, Serrated, $2.50; Serrated, $2.00; Yankee No. 1, $4.50; Yankee No. 2, $3.50

Drawing-

Standard List ... *50&10@50&10*
C. E. Jennings & Co., No. 10 ... 40
Jennings & Gardner, No. 12 ... 40
Smith's ... 60
Stearns ... 60
L. & I. J. White ... 25&10&5

Hay and Straw—

Serrated Edge, per doz. ... *$1.75*
Iwan's Straw Cutter ... ₱ doz. $6.00
Iwan's Serrated ... ₱ doz. $10.00

Miscellaneous-

Farriers ... *doz. $3.00@$4.25*
Westchester's ... ₱ doz. $3.00@3.25

Knobs—

Base, 2½ inch, Birch, or Maple, Rubber Tip ... *gro. $1.25@$1.40*
Carriage, Jap., all sizes ... *gro. 30@75¢*
Door, Mineral ... *doz. 50@75¢*
Door, Por. Jap'd ... *doz. 50@75¢*
Door, Por. Nickel ... *doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—

See Belting, Leather—

Ladders, Store, &c.—

Ainth Mfg. Co., Reliable ... 5
Lane & Bye ... 5
Morris Novelty Step Ladders ...
Richards Mfg. Co.:
Improved Noiseless, No. 112 ... 50%
Climax Shelf, No. 115 ... 50%
Trolley, No. 139 ... 50

Ladles, Melting—

L. & G. Mfg. Co., Cast ... 50
P. S. & W. ... 10&5
Reading ...

Lanterns—Tubular—

Reading, No ... *doz. $5.50*
Sun Light, No ... *doz. $3.75*
Columbian Hdw. Co., Gem ... 35
Other Styles ... *doz. $1.50*

Bull's Eye Police—

Sinch ... *doz. $2.50*

Latches— Thumb—

Roggin's Latches, with screw ... *doz. 37½@*

Door—

Allith Mfg. Co., Reliable ... 40
Ball, No. 50, Brass and Steel ... 50
Crook & Carrier Mfg. Co. ... 50
₱ doz.
Richards' Bull Dog, Heavy, No. 225 ... 50&5
Richards' Trump, No. 127 ... $1.50

Leaders, Cattle—

Small ... *doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 35%

Leathers, Pump—

See Pumps

Lifters, Transom—

R. & E. ... 10

Lines—

Hand Clothes, Nos. 18	19	20
per 100 feet	*$2.25*	*2.40*
72 feet	*$2.00*	*1.80*	*1.65*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3 ... 40
Solid Braided Masons' ... 30
Solid Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $8.50 ... 50 & 5 per cent. 50%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; No. 5, $3.00; No. 6, $4.00; No. 7, $5.00; No. 8, $6.00; No. 9, $7.00; No. 10, $8.00; No. 11, $9.00; No. 12, $10.00; No. 13, $11.00; No. 14, $12.00; No. 15, $13.00; No. 16, $14.00; No. 17, $15.00; No.

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass .....50@50&10%
Iron, list Nov. 11, '85. ..60@60&10%

Pipe, Cast Iron Soil—
Standard, 5/8 in. .....60&10%
Ladle Heating, 5/8 in. .....list
Fittings, Standard .....list

Pipe, Merchant—
Consumers, Carloads.

	Steel. Blk	Galv.	Iron. Blk	Galv.
½ in.	55	45	50	40
¾ in.	56	46	51	41
1 in.	56	46	51	41
1¼ to 1½ in.	62	50	57	45
2 to 12 in.	65	54	60	46

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 8 to 24 in., f.o.b. factory:
First-class 82½
Second-class 75

Pipe, Stove—

	Per 100 joints C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	6.75	7.75
7 in., Standard Blue	7.75	8.75
5 in. Royal Blue	7.50	8.50
6 in., Royal Blue	8.50	9.50
7 in., Royal Blue	9.50	10.50
Wedding:	C. L.	L. C. L.
5 in., Uniform Color	$6.15	$7.15
6 in., Uniform Color	7.65	8.65
7 in., Uniform Color	7.65	8.65

Planes and Plane Irons—
Wood Planes—
Bench, first qual. .....30@30&10%
Bench, second qual. .....20@20&10%
Molding .....25@25&10%
Chapin-Stephens Co.:
Bench, First Quality 30%
Bench, Second Quality 10%
Molding and Miscellaneous 25%
Toy and German 50%
Union 60%

Iron Planes -
Chaplin's Iron Planes .....50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06. .....25%
Buck Bros 30%
Chapin-Stephens Co 50%
Union 50
L. & I. J. White .....20&5&25%

Planters, Corn, Hand—
Kohler's Eclipse .....@ doz $8.00

Plates—
Fellow .....lb. 4@4½¢

Pliers and Nippers -
Button Pliers .....75&10&10&5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe .. 7 8 10 12-in.
$2.00 $2.25 $2.75 $3.50
Acme Nippers .....50&5%
Crosby & Carter Mfg. Co.:
American Button 80%
Improved Button .....75&10%
Cutting 60%
No. 80 Linemen's 50%
Stub's Pattern 45%
Combination and others 33⅓%
Heller's Farriers' Nippers, Pincers and Tools .....40&5&10&5%
P. S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 25%; Elm City, 35%; Paragon, 50%; Lodi, 55%.
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels .....30@30&10%
Chapin's Imp. Brass Cor. .....40@40&10%
Pocket Levels .....75&10%
Extras in Stock .....Catalogue
Mahogany Levels .....10@10&10%
Disston's Plumbs and Levels .....60&10%
Disston's Pocket Levels .....60&10%
Stanley Duplex 35%
Wood Universal 33⅓%

Points, Glaziers'—
Diamond .....lb. 40¢
Lead .....lb. 10¢
Zinc .....lb. 14½¢

Police Goods—
Manufacturers' Lists .....25@25&5%
Towels 25%

Polish—Metal, Etc—
Prestolite Tunnel No. 1 (6 qt.) @ doz. $3.00, No. 2 (1 qal.) $9.00 10%
Prestolite Paste 60%

George William Hoffman:
Universal Metal Polish Paste, 3 oz. boxes, @ doz. 75¢, @ gro $4.50, ½ lb boxes @ doz. $1.25; 1 lb boxes @ doz. $2.25.
Nickel Liquid, 8 oz cans, @ doz., $1.25.
Rochester Brand Metal Polish, @ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans @ lb 10¢
Black Eagle, Liquid, 1 a tt @ doz. 75¢
Black Lead Paste, 3, 5 cans, @ gr $3.00
Black Lead Paste, 5 lb can, each, $0.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon's, @ gr. $5.75 .....10%
Dixon's Pendulum .....@ lb 12¢
Fireside .....@ gr $2.50
Gem, @ gr. $4.50 10
Japanese .....@ gr. $3.50
Jet Black .....@ gr. $3.50
Peerless Iron Enamel, 10 oz. cans, @ doz. $1.50

Poppers, Corn—
1 qt. Square .....doz. $0.85; gro $8.75
1 qt. Round .....doz. $1.00; gro $10.00
½ qt. Square .....doz. $1.00; gro $11.00
½ qt. Square .....doz. $1.25; gro $13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft. 46¢, 6½ ft. 48¢.
Steel Hitching Posts .....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled .....35@10%
Tinned .....50@10%

Powder—
In Canisters:
Duck, 1 lb. .....*each 45¢*
Fine Sporting, 1 lb. .....*each 75¢*
Rifle, 5 lb. .....*each 18¢*
Rifle, 1 lb. .....*each 25¢*
In Kegs:
12½ lb. kegs *$3.50*
25 lb. kegs *$4.50*
King's Semi-Smokeless:
Keg 100 lb bulk $6.50
Half Keg (50 lb bulk) $3.60
Quarter Keg (25 lb bulk) $1.90
Case of 10 lb cans (bulk) $3.50
Half case (5 lb cans bulk) $1.80
Kings Smokeless: Shot Gun Rifle.
Keg (25 lb bulk) $12.00 $15.00
Half Keg (12½ lb bulk) 6.25 7.50
Quarter Keg (6¼ lb bulk) 3.25 4.00
Case of 10 lb cans (bulk) 14.00 17.00
Half case (5 lb cans bulk) 7.25 8.75

Presses—
Fruit and Jelly—
Enterprise Mfg. Co .....20@25%

Seal Presses—
Morrill's No. 1, @ doz., $20.00 .....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclone 50%
Miller's Falls, No. 3, @ doz., $12.00 .....33⅓&10%
Morrill's No. 1, Nail Puller, @ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $2.00 .....50%
The Stanton Co. Case Lots:
No. 1B size $5.50
No. 2B size 5.00
Smith & Hemenway Co.:
Pullers and Pinchers 75
Grant 50
Staple Puller and Driver and Davis 60%

Pulleys, Single Wheel—

Inch	1¼	1¾	2	3
Awning or Tackle, doz.	$0.50	.55	.60	1.05

Hay Fork, Swivel or Solid Eye, doz., 4 in., $1.25; 5 in., $1.55

Inch	2	2½	2¾
Hot House, doz	$0.65	.85	1.20
Inch	1¼	1¾	3
Screw, doz	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Slide, doz	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz. 1¾ and 2 in. .....17@20¢
Auger Mortise, no Face Plate, per doz. 1¾ and 2 in. .....20@21¢
Acme No. 5, 1¾ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wood Shell Wrought Plate Ash .....50&10
Wrought Steel, Eagle .....17@20¢
Fox-All-Steel, Nos. 3 and 4 .....@ doz. 50%
Grand Rapids All Steel Noiseless 50%
Norcross, No. 23, 1¾ in. .....19¢
No. 24, 2 in. .....20¢
No. 1, Tri-Metal, 1¾ in. .....16½¢
Star, No. 26, 1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Deep Well, Spout .....75&5@75&10%
Wood, Deep, Tubing, &c. 50%
Barrel, Full Copper .....25&10%
Brass, Plunger .....25&10%
Cistern, Rubber Diaphragm .....
Force & Lift, Brass .....
Daisy Spray Pump .....@ doz. $6.50
Flint & Walling's, Fast Mail Hand, (low list) 50%
Flint & Walling's Fast Mail (high list) 50%
Flint & Walling's Tight Top Pitcher, 7¾&10%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50 .....30%
Myers' Pumps (low list) .....40&5%
Myers' Power Pumps .....40&5%
Myers' Spray Pumps .....40&5%

Pump Leathers—
Plunger and Valve Leathers, Per gro.:

No.	2	3	4	5	7
	$3.10	3.50	3.75	4.35	5.60

Cup Leathers, Per 100:

Inch	2½	3	3½	4
	$2.50	2.75	3.50	4.80

Punches—
Saddlers' or Drive, good .....*doz. 50¢&75¢*
Spring, single tube, good quality *$1.75*
Revolving (4 tubes) .....*doz. $3.60*
Bemis & Call Co.'s Cast St'l Drive. 50%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00 .....50%
Hercules, 1 doz. each $5.00 .....50%
Niagara Hollow Punches 40%
Niagara Solid Punches .....35&10
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35%; Paragon, 50%; Lodi 55%
Tinners' Hollow, P., S. & W. Co. 40%
Tinners Solid, P., S. & W. Co. 40%
Drive, $1.00 .....40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron .....2¼@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢ 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail .@ ft. 3¼¢
O. N. T. Rail $3.12
Griffin's:
xxx, @ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, 1¼ ft. 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, @ 100 ft $3.45
O. N. T., @ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in .....@ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., @ 100 ft., $7.50; 1¼ x 3-16 in., $8.50 .....35&7½%
McKenney's
Hinged Hanger Track, @ ft., 11¢, doz 55&7½%
1 x 3-16 Track .....55&7½%
Myers' Stamped Track .....60&5%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1⅛ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail .....60&10%
Lag Screw Rail, No. 65 .....50%
Gauge Trolley Track, @ ft., No. 31, 2¾¢; No. 32, 14¢; No. 33, 23¢
No. 50 .....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn $3.25
Fort Madison Blue Head Lawn $2.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor .....80&25%
Queen City Lawn, @ doz., 20 teeth, $2.85; 24 teeth .....net
Anthony Lawn, @ doz $4.00
Malleable Garden .....70&10%
Ideal Steel Garden, @ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00 .....80%
Kohler's:
Lawn Queen, 20-tooth .....@ doz. $3.15
Lawn Queen, 24-tooth .....@ doz. $3.25
Paragon, 20-tooth .....@ doz. $2.70
Paragon, 24-tooth .....@ doz. $2.75
Steel Garden, 14-tooth .....@ doz. $2.40
Malleable Garden, 14-tooth, @ doz. $2.00 25

Rasps, Horse—
Disston's 75%
Heller Bros. .....70&10&10&5%
Liveright Bros.' Gold Medal .....70&10@75%
McCaffrey's American Standard, 60&10&5%
New Nicholson .....70&10@75%
See also Files.

Razors—
Llama Boar Bristle 60%
Fox Razors, @ doz., No. 42, $30.00; No. 44, $20.00; No. 82, Platina $25.00 .....10%
Red Devil 65%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 8, M 9¾, M 16, Q 16, A 16, B 16 .....40&8 Rubber Pearoid No. 1 .....20%
Aluminum German Silv., Bronze 25%
1240 N, 124 N 20%
2001 N, 200 N, RM, G 15%
1 N, 2 N, 3 N, 96 PN 30%
2901 P, 3314, 2901 PN, 3314, 2924 N, 3314, 00901 N, 3314, 00904 PN, 3314, 902, 3314 .....25%
946 PN, 2901 N, 974 PN 25%
5009 PN, 5009 N 20%
Competitor .....102 P, 102 PN, 202 P, 202 PR, 102 PR, 202 PR 20%
304 P, 304 PN, 00304 P, 00304 PN 33⅓%

Registers—*List July 1, 1905.*
Japanned, Electroplated and Bronzed .....50&10&10%
White Porcelain Lined .....50&10%
Solid Brass or Bronze Metal 40%

Revolvers—
Single Action .....*95¢@$1.00*
Double Action, except 44 cal. *$2.00*
Double Action, 44 caliber *$2.00*
Automatic *$5.00*
Hammerless *$4.50*

Riddles, Hardware Grade
16 in. .....*per doz. $2.50@$2.75*
17 in. .....*per doz. $2.75@$3.00*
18 in. .....*per doz. $3.00@$3.25*

Rings and Ringers—
Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.40	1.25	1.65 doz.

Hog Rings and Ringers—
Hill's Rings, gro. boxes $4.25
Hill's Ringers, Gray Iron, doz. .....60¢
Hill's Ringers, Malleable Iron, doz. .....80¢
Blair's Rings .....*per doz.* .....¢
Blair's Ringers .....*per doz.* .....75¢
Brown's Rings .....*per gro.* $3.25
Brown's Ringers .....*per doz.* .....75¢

Rivets and Burrs—
Copper .....40&10&10&5%
Carriage, Coopers', Tinners, &c.:
Blacks .....70&10%
Metallic Tinned 70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, 23@25¢; 100 boxes, 100 count, 45@42¢.
Tubular, per doz. boxes, 50 count, 20@35¢; 100 count, 37@38¢.

Rollers—
Cronk's Stay, No. 50 .....$1.00
Cronk's Reversible No. 55, $7.00; No. 56, $4.55; No. 60 .....$0.75
Lane's Stay 40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57 .....50%
Underwriters', Nos. 59, 60 .....50%
Favorite, No. 51 .....60%

Rope—
Manila, 7-16 in. diam. and larger: Pure .....*lb., 11½@12¢*
Sisal, 7-16 in. diam. and larger: Pure .....*lb., 8¢*
Sisal, ½ in. diam. and smaller: No. 2 quality .....*lb., 7¢@7¼¢*
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed .....*lb., 7@7¼¢*
Pure .....*lb., 9¼¢*
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred: Mixed .....*lb., 6¼@6¾¢*
Pure .....*lb., 7¼¢*
Cotton Rope:
Best, ¼-in. and larger .....*18@20¢*
Medium, ¼-in. and larger .....*16@17¢*
Common, ½-in. and larger .....*10¢*
In coils, ½¢ advance.
Jute Rope:
Thread, No. 1, ¼-in. & up, lb., 7¼@8¢
Thread, No. 2, ¼-in. & up, lb., 7@7½¢

Wire Rope—
Galvanized .....37½&2½%
Plain .....45¢&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal 20%

Rules
Boxwood .....60@60&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Plexifold 40%
Ivory .....50@50&10%
Miscellaneous .....50@50&10%
Stephens' Combination 55%
Stringer .....50&10&10
Keuffel & Esser Co.:
Folding, Wood .....35&10%
Folding, Steel .....30&10%
Leaf in Steel .....50&10%
Lufkin's Lumber .....50&10%
Union Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 45
Band ..... 10&10
Butcher Saws
Cross Cut
One Man Cross Cut
Nat'l Cross Cut
Hand Ripping and Pruning
Miller Bros. and Metcalf Co.
Mossy, Maynard & Dunn
Wood Saws
Chapin-Stephens Co.:
Framing Saws and Frames
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..30&10&10%
Disston's:
Crosbie Steel and Iron Tooth 50%
Band, 2 to 18 in. 60%
Band, 14 to 1 ..... 60%
Crescents 45%
Narrow Crescents 50%
Meteor Cross Cut Drag 50%
Framed Webb Saws 25%
Webb Hack Blades 25%
Webb Hack Rods, Tinned 15%
Hack Saw Nos. 12, 99, 8, 16, 41000, 25%
Hack Saw Blades, Nos. 7, 107, 107½, 3, 1, 41000 ..... 25%
Butcher Saws and Blades 30%
Cyclone Saws & Co.:
Rock Saws
Butcher Saws
Compass and Key Hole Saws
Drake & Wilson Saws
Hack Saws
Hand Saws
Meacham Saws
Nicholson File Co.:
Crescent Ground Cross Cut Saws..30%
Cross Cut Saws
Gang Mill, Mulay and Drag Saws
Band Saws 50%
Back Saws 35%
Butcher Saws 35%
Compass Saws 50%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. ..... 25@25&7½%
Wood Saws ..... 40&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 60%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A..25%
Disston's:
Crescent Blades 25%
Keystone Blades 30%
Hack Saw Blades 30%
Simonds' File Co. 35%
Cyclone Saws & Co.:
Hack Saw Frames, Nos. 175, 180.....
..... 40&7½%
Hack Saws, Nos. 175, 180, complete, ... 40&7½%
Goodell's Hack Saw Blades.....40&10%
Griffin's Hack Saw Frames..35&8&10%
Griffin's Hack Saw Blades.....35&8&10%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades.....30&10&5%
Sterling Hack Saw Frames..30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Vulcan Hack Saw Blades 20%
Vulcan Hack Saw Frames 40%
Whitaker Mfg. Co.:
National Hand Blades
National Hack Saws
National Power Blades ..... 30&10

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, with coil boring attachment, $20, with boring attachment, $20 ..... 20%
Lester complete, $3.50 ..... 15&10%
Rogers, complete, $3.50 and $4.00..
..... 15&10%

Scales—

Family, Turnbull's ..... 50@50&10%
Grocers':
Hitch, Platforms, 14 oz. to 4 lbs. ..... doz. $5.50
Two Platforms, 14 oz. to 8 lbs. ..... doz. $16.00
Union Platform, Plain.$1.70@1.90
Union Platform, Stpd.$1.85@2.15
Chatillon's:
Favorite 40%
Counter 40%
The Standard Portables 40%
The Standard R. R. and Warehouse 40%

Scrapers—

Box, 1 Handle ..... doz. $2.00@2.25
Box, 2 Handle ..... doz. $2.50@2.80
Scrub, Eight, $2.00; Heavy, $1.50
Chapin-Stephens Co. ..... 25&10%
Disston's Metal Scrapers

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 2 in., $3.00@3.25; 3 in., $3.50@3.75
Bench, Wood ..... 20@20&10%
Hand, Wood ..... 50&10&10%
Chapin-Stephens Co., Hand.....

Coach, Lag and Hand Rail—

Lag Coin Point ..... 75@75&10%
Coach, Gimlet Point ..... 75@75&10%
Hand Rail ..... 75@75&5%

Jack Screws—

Standard, List ..... 70@70@75
Wood Beam ..... 50&10&10%
Sweet Iron Worm ..... 70@75

Machine

Cut Thread, Iron, Brass or Steel:
Flat Head, Round Head, ... 75@75&10%
Fillister Head ..... 70@70&10%
Rolled Thread, F. H. or R. H. Iron ..... 75@75%
F. H. or R. H. Brass, Nos. 8 to 15 ..... 65&10%

Set and Cap—

Set (Iron) ..... 70@70@75%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 50@50@55%
Hex. Hd. Cap ..... 50@50@55%
Rd. Hd. Cap ..... 50@75%
Fillister Hd. Cap ..... 60@75%

Wood—

List July 28, 1903
Flat Head, Iron ..... 87½@65@..%
Round Head, Iron ..... 85@50@..%
Flat Head, Brass ..... 90@50@..%
Round Head, Brass ..... 85@50@..%
Flat Head, Bronze ..... 75@50@..%
Round Head, Bronze ..... 72½@50@..%
Drive Screws ..... 87½@65@..%

Scroll Saws—

See *Saws, Scroll.*

Scythes—

Per doz.

Grass, No. 1, Plain ..... $6.25@6.75
Clipper, Bronzed Webb ..... $6.50@7.00
No. 3 Clipper, Pol'd Webb ..... $6.75@7.25
No. 6 Clipper and Solid Steel, ... $7.00@7.50
Bush, Weed and Bramble, No. 2. ..... $6.50@7.00
Grain, No. 1 ..... $8.25@8.75
Bronzed Webb, No. 1 ..... $6.50@9.00
Nos. 3 and 4 Clipper, Grain. ..... $8.75@9.25
Solid Steel, No. 6 ..... $9.25@9.75

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18..20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ₩ doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 25%
Cannon's Diamond Point, ₩ gro. $12 ..... 40&10%
Mayhew's ..... ₩ gro $9.00
Snell's Corrugated Cup Pt.....40&10%
Snell's Knurled, Cup Pt.....40&10%
Victor Knurled Cup Pt.... ₩ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut.....$20.60
No. 5, Mill $30.00
Nos. 10, 11, 98 ..... $15.00
No. 1 Old Style $10.00
Special $16.25
Giant Royal Cross Cut..... ₩ doz. $8.00
Royal, Hand..... ₩ doz. $4.50
Taintor Positive..... ₩ doz. $4.75

Shaving—

Fox Shaving Sets, No 30 .....
₩ doz., net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₩ doz. $1.50
Mounted Kitchen Sand Stone, ₩ doz. $1.50
Natural Grit Carving Knife Hones, ₩ doz. $3.00
Quick Cut Emery Carving Knife Hones, ₩ doz. $1.50
Quick Edge Pocket Knife Hones, ₩ doz. $2.50
50%

Skate—

Smith & Hemenway Co., Eureka..50%

Shaves, Spoke—

Iron ..... doz.$1.10@1.25
Wood ..... doz.$1.75@2.25
Bailey's (Stanley R & L. Co.'s 15%
Chapin-Stephens Co. ..... 30&10%
Goodell's, ₩ doz. $9.00 ..... 15&10%

Shears—

	7	8	9 in
Cast Iron..			
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$12.00*	*13.00*	*17.00 gro.*
*Cheap .. *	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality lap ..... 70@70&10%
Best quality, Nickel ..60@60&10%
Tailors' Shears ..... 40@40@50%
Acme Cast Shears ..... 40&10%
Barnes' Tailors' Shears 33⅓%
Wilkinson Shear & Cutlery Co.:
Sheep, 1900 list ..... 30&10&5%
Grass ..... 50&10%
Hedge or Mule ..... 50&10

Tinners' Snips—

Steel Blades ..... 20&5@20&10%
Steel Laid Blades ..... 40@40&50%
Forged Handles, Steel Blades, Berlin
Heinisch's Snips .....
Jollifes & Griffin Mfg. Co.'s .....
Kayser's .....
P. S. & W. Forged Handles .....
W. R. W. ..... 40&10

Pruning Shears—

Clinton Pruning Shears 40%
Cronk's Wood Handle Shears.....33⅓%
Disston's Combined Pruning Hook Saw .....
Disston's Pruning Hook, ₩ doz. $12.00 .....
John T. Henry Mfg. Co.:
Pruning Shears 1
P. S. & W. Co. .....
Columbian Cutlery Co.:
Hedge, Wood, Reg. ..... 60&10
Lawn and Border, Wilcut Brand .....

Sheaves— Sliding Door—

Reading 40
R & E. list 15

Sliding Shutter—

Reading list 40
R & E. list 10

Shells—Shells, Empty—

Brass Shell, Empty:
Climax, 10 and 12 gauge ..... net
Club, Rival, Can. ..... List Quotations
Paper Shells, Empty
New Rapid, 10, 12, 16 and 20 gauge, ... 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, ... net
Union, League, 12 and 16 gauge; Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge, Climax, 8, 10 and 24 gauge 35%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%

Shells, Loaded—

Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade ..... 40@45%
Loaded with Smokeless Powder, high grade ..... 40@40&10%
Union Metallic Cartridge Co.:
New Club, Ball, Pistol 40
Nitro Club, Smokeless Powders,40&5%
Arrow, Smokeless Powders.40&10&10%
Winchester:
Smokeless Repeater Grade.....40&5%
Smokeless Leader Grade...40&10&10%
Black Powder 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted	Galv
14 x 20	$4.25	$6.00
10 x 14	4.50	6.50
7 x 15	4.75	6.50

Wheeling Corrugating Co.:

Dixie	14 x 20 in.	$5.50
Dixie	10 x 14 in.	6.00
Dixie	7 x 10 in.	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg $4.10
Steel ..... per keg $3.85
Burden's, all sizes ..... ₩ keg $5.00

Shot—

25 lb. bag
Drop, up to B $1.85
Drop, B and larger 1.70
Buck 1.70
Chilled 1.70
Dust 1.70

Shovels and Spades—

Association List, Nov. 15, 1902. 40%
Avery Stamping Co. .....

Snow Shovels—

Long Handle ..... $3.00@3.50
Wood and Mall, D. Handle ..... $3.75@4.25

Sieves and Sifters—

Hunter's Imitation .....
gro. $9.50@10.00
Hunter's Genuine .....
per gro. $12.00@12.50

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme .....
Automatic Ash Sifter .....

Sieves, Seamless Metallic

Mesh	Per dozen. ¼	½	¾	#1
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.30*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch
Mesh 18 Nested ..... doz $
Mesh 20, Nested ..... doz. $1.00@1.05
Mesh 24, Nested ..... doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:
12 x 12 x 5 ..... $
Stone ..... $
24 x 18 x 8 ..... $
Barnes' List .....
Kewaunee .....
Richardson .....

Skeins, Wagon—

Cast ..... 75@75&5%
Steel ..... 60@65%

Slates, School—

Factory Shipments.
Pencil ..... 50@75&10%
Eureka, Uncelled Noiseless ..... 60@65 tons
Victor A, Noiseless..60&4 tons 45%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German .....
Covert Mfg. Co.:
Dee .....
Roller, 30&2 .....
Heavy .....
Loose .....

Snaths

Scythe .....

Snips, Tinners

Spoons and Forks—

Silver Plated—

Good Quality .....
Cheap .....
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Bro. .....
Rogers & Bro. Wm. Rogers, Extra Brand .....
Atkins' Rogers Brand .....
Wm. Rogers & Son .....

Miscellaneous

German Silver ..... 60@60&5

Tinned Iron—

Teas ..... per gro.
Tobacco ..... per gro.

Springs— Door—

Bardsley's Spring and Check .....
Chicago Hardware .....
Geis (Coil) .....
Pullman (Coil) 35%
Reliance (Coil) ..... 40&10%
Star (Coil) 30%
Torrey's Rod, 39 in. ..... ₩ doz. $1.10

Carriage, Wagon, &c.—

1¼ in. and Wider: Per 100 lb.
Iron .....
Half Bright .....
Ike .....
Painted Seat Springs:
Long ..... per pair 20
Long ..... per set 75c

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; Nautilus .....
Enterprise .....
Pittsburgh Lawn, No. 1, $1; No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated .. } List Jan 5, 1900.
Steel and Iron .. } 75@10@10%
Rosewood Hdl. Try Square and T-Bevels ..... 60@60@10%
Iron Hdl. Try Squares and T-Bevels ..... 40@40@40&10@10%
Dixon's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Blade 15%

Squeezers, Lemon

Wood, Common, gro., No. 0, $3.25@3.50; No. 1, $4.25@4.50; No. 2, $5.50@6.50
Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.25
Iron, Porcelain Lined ..... doz. $1.75

Staples—

Barbed Blind ..... lb 6@6½¢
Electricians', Association list.. 80@40&10@10%
Fence Staples, Plain, $2.15; Galvanized $2.45
Poultry Netting Staples ..... per lb. 3¼@3½¢

Steels, Butchers'—

Berk .....
Foster Bros. 30%

Steelyards

Stocks and Dies—

Blacksmiths' .....
Combination .....
Green River 25%
Improved .....
Ratchet .....

Stoners, Cherry—

Stoners ..... 50@50%

Stones—Oil, &c.

Pike Mfg. Co., 1907 list:
[illegible] $3.50
[illegible] $1.00
Washita St., Extra, 4 to 8 in.50¢
Washita St., No. 2, 4 to 8 in.25¢
Lily White Slips ..... 50¢
Red Slips ..... 40¢
Washita Stone, Extra ..... 75¢
Washita Stone, No. 1 ..... 50¢
Washita Stone, No. 2 ..... 40¢
India Oil Stones, extra fine ..... 75¢
Queen Hone or Lubricating Stone, Double Grit ..... 35¢
Queen Hone or Lubricating Stone, Double Grit 15%
Quickcut Emery and Corundum Axe Stone, Double Grit ..... 35¢
Quickcut Emery Rubbing Bricks..40¢
Hindostan No. 1, Regular ..... 30¢
Hindostan No. 1, Small ..... 20¢
Axe Stones, all kinds .....
Turkey Oil Stones, Extra, 5 to 10 in. ..... $0.70@1.00
Queer Creek Stones, 4 to 8 in.20¢
Queer Creek Slips ..... 40¢
Sand Stone ..... 8¢

Scythe Stones—

Lee Mfg. Co., list:
Black Diamond S. S., ₰ gro. $12.00
Lambille S. S., ₰ gro. $11.00
Wide Metallish S. S., ₰ gro. $8.00
Green Mountain S. S., ₰ gro. $6.00
Extra Indian Pond S. S., ₰ gro. $5.00
No. 1 Indian Pond S. S., ₰ gro. $7.00
No. 2 Indian Pond S. S., ₰ gro. $4.50
Leader Red End S. S., ₰ gro. $4.5 — 33⅓%
Quick Cut Emery..., ₰ gro. $2.
Rare Combination..., ₰ gro. $2.
Crescent.....$7.00
Emery Scythe Rifles, 2 Coat. $10
Emery Scythe Rifles, 1 Coat. $12.
Ballston, 1 1/2-4 list 33⅓%.
Electro (Artificial), ₰ gro. $8.00
Lightning (Artificial), ₰ gro. 33⅓

Stoppers, Bottle—

Victor Bottle Stoppers ... ₰ gro. $9.00

Stops— Bench—

Millers Falls.....15&10⅔%
Morrill's, ₰ doz. No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....60%

Door—

Chapin-Stephens Co.....25&5%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Acme Embossed case lots.....40&10&5%
Carr's Universal, case lots.....20&10&5%

Stretchers, Carpet—

Cast Iron, Steel Points, doz.
60@60&10%
Socket.....doz. $1.05
Excelsior Stretcher and Tack Hammer Combined, ₰ doz. $6.00.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1, 1906.....40&5%
P., S. & W. Co.....40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ₰ doz.
Superba, Cloth Mat, Fancy.....$30.00
Triumph, Fancy Veneers.....$33.00
Parlor Queen, Fig, Rosewood..$30.00
Parlor, Hexagonal, Ash.....$20.00
Lady Hexagonal, Ash.....$15.00
Ajo, Queen, Fig, Mahogany.....$25.00
Ideal, Bird's-Eye Maple.....$25.00
Grand Rapids, Nickel, Ash.....$21.00
Ash.....$18.00
Standard, Nickel, Ash.....$15.00
Crown, Jewel, Nickel, $21.00, Japan.$18.00
Arcadia, Nickel, Ash.....$16.00
Grand, 17 in. wide.....$14.00
Club, 14 in. wide.....$12.00
Hall, 28 in. wide.....$20.00

NOTE.—Rebates: 50 per dozen on three dozen lots; $1 per dozen on five dozen lots; $2 per dozen on hundred lots; $3.00 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks...9@2½%
American Cut Tacks.....9@2½%
Swedes' Cut Tacks.....9@2½%
Swedes' Upholsterers'.....9@2½%
Gimp Tacks.....9@2½%
Lace Tacks.....9@2½%
Hammerless Tacks.....9@2½%
Looking Glass Tacks.....65%
Bill Posters' and Railroad Tacks, 90@40%
Hungarian Nails.....80@5%
Finishing Nails.....80@5%
Trunk and Coast Nails.....80@5%

NOTE.—The above prices are for straight Weights.

Miscellaneous—

Double Pointed Tacks.....
9@6%@10@10&5%
See also Nails, Wire

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
20	$2.75	$3.00
60	$3.50	$1.00
120	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather.....25@40&5%
Steel.....$3 1-5&5%
Chesterman's.....25@35&5%

Keystone Reeler:
Full Nickel.....40&10&50%
Brass, Dark and Leather.....40&5%

Metallic and Steel, lower list, 35@35&5%. Pocket, 35@35&5%.

Leather:
Asses' Skin.....40&10&50%
Mason.....35@35&5%
Patent Bend, Leather....25&5@25&10%
Linen.....25&10&5%
Steel.....33⅓&35%

Woods & Edgar:
Chesterman's Metallic, No. 34I, 50ft.....35%
Chesterman's Steel, No. 1029I, 50ft.....35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c.....25@33⅓%

Ties, Bale—Steel Wire—

Single Loop.....50@40&5%
Monitor, Cross Head, &c. 50@42½%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Haying—

Myers' Hay Tools.....15%

Miniature—

Smith & Hemenway Co.'s, Davidson, ₰ doz., Nickel Plated $1.50; Gold Plated.....$2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simonds, Improved.....33⅓%
Simonds' Circular.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Bannon Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.50; gro. $13.00@15.50

Game—

Imitation Uncolas.....7½@10%
Newhouse.....10@45&5%
Hawley & Norton.....65%
Victor.....75@75&10%
Oneida Community Jump.....50%
Hunter.....75@75&10

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85@30¢
Marty French Rat and Mouse Traps (Guillemot):
No. 1, Rat, ₰ doz., $13.25..$15.50 doz.
No. 3, Rat, ₰ doz., $6.50....$5.75 doz.
No. 31g, Rat, ₰ doz., $5.25..$4.70 doz.
No. 4, Mouse, ₰ doz., $3.00 doz.
No. 5, Mouse, ₰ doz., $3.00..$2.25 doz.
Oneida Community:
Out-o'-Sight Mouse, ₰ doz.....$4.00
Out-o'-Sight Rat, ₰ doz.....1.25
Easy Set Mouse, ₰ doz.....
Easy Set Rat, ₰ doz.....1.00
Wire Rat, Rat, ₰ doz. holes.....
Trunk Tie Chain, 5 feet, ₰ doz. traps.....75

Trowels—

Disston Brick and Pointing.....25%
Disston Plastering.....20%
Peerless Standard Brand and Garden Trowels.....40%
Kohler's Steel Garden Trowels, ₰ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels.. ₰ gro. $6.00
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Boss Co.:
New York Pattern.....50&10
Western Pattern.....60&10
Hands Trucks.....₰ doz. $16.00
Casters.....₰ doz. $15.00
McKinney Trucks.....each, net $10.00
Metal Stove Trucks.....₰ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.
No. 0 1 2 3 4
Galvanized $87 $79 $80 $99 10%

Twine, Miscellaneous—

Flax Twine:
No. 9, 1/4 and 1/2-lb. Balls 25@35¢
No. 12, 1/4 and 1/2-lb. Balls 21@26¢
No. 18, 1/4 and 1/2-lb. Balls 18@23¢
No. 24, 1/4 and 1/2-lb. Balls.....17@19¢
Clothes Line, Cotton.....17@19¢
Balls.....26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....11@19¢
Cotton Wrapping, 5 Balls to lb., according to quality...15½@23¢
Jute and Jute Hemp, 1-lb. Balls.....13½@16½¢
American 3-Ply Hemp, 1-lb. Balls.....15½@16½¢
Indian 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) 10½@11½¢
India 3-Ply Hemp, 1-lb. Balls.....10½@11½¢
India 3-Ply Hemp, 1½-lb. Balls.....10¢@11¢
2, 3 and 5-Ply Jute Balls.....13½@15½¢
Mason Line, Linen, ½-lb. Balls 17¢
No. 36, Mattress ¼ and ½-lb. Balls, according to quality.....30@40¢
Wool, 3 to 6 ply.....B 9¢; A 10¢

Vises—

Solid Box.....50@50&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard.....40%
Amateur.....25
Columbian Hdw. Co.....40
Fisher & Norris Double Screw, net, each nos. $4.50, 3, $16.00; 4, $20.50; 5, $27.00.
Fulton Mach. & Vise Co.:
Reed, Swivel.....25%
Star, Solid Jaw.....
Hodgman's:
Machinists'.....
K Type.....
Lewis Tool Co.:
Adjustable Jaw.....
Machinists', Solid Jaw.....
Massey Vise Co.:
Clincher.....40%
Perfect, 15%; Lightning Grip.....15%
Merrick.....70
Millers Falls Oval Slide Pattern 60&10%
Parker's:
Victor, 20@25; Regulars.....20@25
Vulcan's.....10@15
Combination Pipe.....30@40
Prentiss.....
Rock Island.....50
Wyman & Gordon.....
Stephens'.....33⅓

Saw Filers—

Disston's D 3 Clamp and Guide, ₰ doz., $24.00, 5 Clamps.....
Perfection Saw Clamps, ₰ doz.....$4.50
Reading.....60

Wood Workers—

Fulton Mach. & Vise Co.:.....
Reed.....25
Star.....40
Mason Vise Co.:
Lightning Grip, 15%; Perfect.....15%
Wyman & Gordon Quick Action, 6 in., $6.00; 8 in., $7.00, 11 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870 40%.
Rock Island Pipe.....25%

Wads—*Price per M.*

	Dis. 15%
B. E., 11 up.....60¢	
B. E., 9 and 10.....70¢	
B. E., 8.....80¢	
B. E., 7.....80¢	
P. E., 11 up.....$1.00	
P. E., 9 and 10.....1.25	
P. E., 8.....1.50	
P. E., 7.....1.50	
Ely's B. E., 11 and larger..$1.70@1.75	
Ely's P. E., 12 to 20.....$3.00@3.25	

Ware, Hollow—Cast Iron, Hollow—

Store Hollow Ware:
Enameled.....45&10%
Grooved.....30&5%
Plain or Lipped.....60%
Country Hollow Ware, per 100 lbs.....$3.00
White Enameled Ware:
Muslin Kettles.....65@15%
Covered Wares:
Tinned and Turned.....35&10%
Enameled.....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nutall Steel Ware.....33⅓%
Iron Clad Ware.....
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60%
Pyrolaned.....5 & 5&10%
Never Break Spiders and Griddles.....65&5%
Never Break Kettles.....60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ₰ doz.
Crescent, family size, bent frame $4.05
Red Star Family size stationary indicator.....$4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$3.55
Cable Cross, family size, stationary protector.....$3.60
Single Zinc Surface:
Naval family size open back, japanned.....$2.90
Single Saginaw Globe.....$2.85
Brass Surface:
Brass King, Single Surface, open back.....$4.05
Nickel Plate Surface:
No. 1291 Nickel Plate Single Surface.....$3.60
Glass Surface:
Glass King, Single Surface, open back.....$3.95
Enamel Surface:
Enamel King, Single Surface, ventilated back.....$3.95

Washers—Leather, Axle—

Solid.....30@40@10%
Patent.....90@30&3%
Coil: ⅞ 1 1¼ 1½ Inch
11¢. 12c. 13¢. 15¢ per box

Iron or Steel—

Size bolt... 5/16 ⅜ ½ ⅝ ¾
Washers...$5.90 5.00 3.70 3.50 3.30
The above prices are based on $5.50 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Wedges—

Oil Finish.....lb.,..@3¢

Weights—Hitching—

Covert Mfg. Co.....30&2

Sash—

Per ton, f.o.b. factory:
Eastern District.....$30.00
Southern Territory..$24.00@25.00
Western and Central Districts .....$25.00@28.50

Wheels, Well—

Sun, $2.32; 10-in., $2.82; 12-in., $3.82; 14-in., $5.00.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....72½@10&7½%
10 to 18.....72½@10&10%
19 to 26.....75@10&10&2½%
27 to 36.....75½@10&12½%
Galvanized:
6 to 9.....72½@10%
10 to 18.....72½@10&5%
15 to 16.....72½@10&5%
17 to 18.....72½%
19 to 26.....70&5&2½%
27 to 36.....65@10&10%
Coppered:
6 to 9.....65@10&10%
10 to 14.....70@10&5%
15 to 16.....65@10&10&10%
17 to 26.....70@10&5%
27 to 36.....72½@10&2½%
Tinned:
6 to 18.....67@10&10%
Brass.....17½¢ lb. base
Copper.....32¢ lb., base
Cast Steel.....50%

Spooled Wire—

Annealed and Tinned...70@10&10%
Brass and Copper.....60@10%
Retailers' Assortments, per box. $2.10@$2.25

Wire Clothes Line see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel.....70@10&10%
Brass Wire Goods....90@90&10%
Brass Cup and Shoulder Hooks.. 80&15%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80@50&10%
Painted Screen Cloth, 100 ft., $1.30
Standard Galv. Hardware Grade:
Per 100 sq. ft.
Nos. 2, 2½ & 3 Mesh.....$2.50
Nos. 4 and 5 Mesh.....$2.75
No. 6 Mesh.....$3.00
No. 8 Mesh.....$3.50

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural.....75@75&10%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S.....45@45&5%
Acme.....60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut.....50%
Combination Black.....40&5%
Hexagon Pattern.....50%
Boardman's.....40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics' "....40&10&10&5&5%
Donohue's Engineer.....40&5%
Eagle.....70%
Gem Pocket.....30%
Hercules.....10%
W. & B. Machinist:
Case lots.....50&5%
Less than case lots.....50%
W. & B. Railroad Special:
Case lots.....50%
Less than case lots.....40&10&5%
Solid Handles, P., S. & W..50&10%
Case lots.....50&10&5%
Stillson.....65%
Uwanta Wrench Co.:
Railroad Special, Iron Handle, 40&10&5%
Other Wrenches.....50%
Wellan and Azimpa Chain.....50
Whitaker Machinists':
Case lots.....50&10
Less than case lots.....50

Wrought Goods—

Staples, Hooks, &c., list March 17, '02.....90%

Zinc— (*Cask lots at mill.*)

Sheet.....per 100 lb. $7.00

THE IRON AGE

New York, Thursday, January 30, 1908.

The Greene Self-Dumping Car Haul.

A New System of Handling and Dumping Mine Cars.

The original purpose out of which grew the system herein described, did not include anything more than hoisting an empty car from its full dumping position on a plain horn dump directly to an overhead track, using a haul of some sort to accomplish this end. It became manifestly impracticable, if not impossible, to use an ordinary single chain haul to do the work, so two chains were used, placed either side of the dump, having two pipe cross bars attached at equal intervals in their length. When the horn dump was at its full dumping inclination, the receiving end of the dump registered with a track directly above the loaded track, and one of these pipe cross bars would engage with the low end of chain of 24 in. pitch, with 1¼ in. pins. The cross bars are of double extra heavy wrought iron pipe 4 in. in diameter, with a welded and pinned stub in each end. In addition to being attached to the chains at intervals of 36 ft., the cross bars run on wheels turning on the stubs. The cross bars on this particular haul engage with lugs placed on the bottoms of the mine cars, similar to an ordinary single chain haul, but in later hauls the lugs are dispensed with entirely, the cross bar lifting the rear end of the mine car bodily, supporting it up and down the slope and through all its evolutions. By engaging the cars in this way, it is practically impossible for them to get away and cause the wrecks and



Fig. 1.—The Trestle Approach to the Tipple, Showing Loaded Cars on the Lower Runway and Empty Cars on the Upper Runway. The Section of the Lower Runway Track on which the Loaded Car Is Standing Swings Down to Register with the Track on the Ground When Taking Supplies Into the Mine.

the empty mine car and push it up and over a knuckle to the upper track. This was rather crude, but it served the purpose of reducing the size of the tipple required and eliminated some of the men usually employed.

A proposition then came up embodying a slope to coal lying about 35 ft. below the surface. It was decided to try applying this double chain and cross bar idea with an upper and lower track, modified to suit the conditions imposed. The drawing, Fig. 2, shows the solution. This, as it finally worked out, developed into a conveyor of the endless double chain variety, without the buckets, but with two additional parts, a swing lift transfer and a track gate, each a simple one piece pivoted member operated positively. These are described later.

A description of this car haul conveyor as installed should naturally start by showing wherein it differs from an ordinary car haul, to suit the same conditions. Possibly the most marked distinctions on first glance are the substituting of double chains, with cross bars to engage the mine cars, for the usual single chain with dogs; and in putting one track above the other, instead of placing the empty and loaded tracks side by side or parallel. These features are apparent in Figs. 1 and 3, which show photographic views of the parts above ground.

The chain used in the haul is a Scranton drop forged

delays associated with a single chain haul where everything depends upon a dog staying put against a lug. Then again, by merely elevating the cross bar wheel tracks in relation to the mine car tracks, a car can be moved in a position to prevent coal from falling off on a slope pitch which would be considered prohibitive with an ordinary haul.

It will be seen from Fig. 4 that there are two tracks and a chain guide on both the upper and lower runways of the haul. One track, the inside one, is for the mine car wheels, and on either side of this, but using the same track center, are the rails of the cross bar wheel track, and outside of the latter are the chain guides—channels or plain, flat plate for the chain rollers to run on. A 12-lb. rail was used for the cross bar wheel tracks, and a 40-lb. rail for the mine car tracks. The chain guides are either 8-in. channels or 6 x ¼ in. plates. In this haul channels were used.

The chains track over head and tail sprockets, as in any endless double chain conveyor, and the driving mechanism is practically the same only larger. In the plant of the Wheeling Valley Coal Company illustrated, the driving sprockets at the head of the haul are solid steel castings 10 ft. pitch diameter. The driving gears attached to these sprockets, are solid steel castings, 11 ft.

in diameter, 8-in. face, driven by a train of cut steel gears, providing a reduction of about 300 to 1 from the motor speed.

A 75-hp. motor does the driving of both the car haul and the feeder at the bottom. When running under normal full load the motor is handling eight loaded cars, 10,000 lb. each, maximum, and eight empty cars, on a

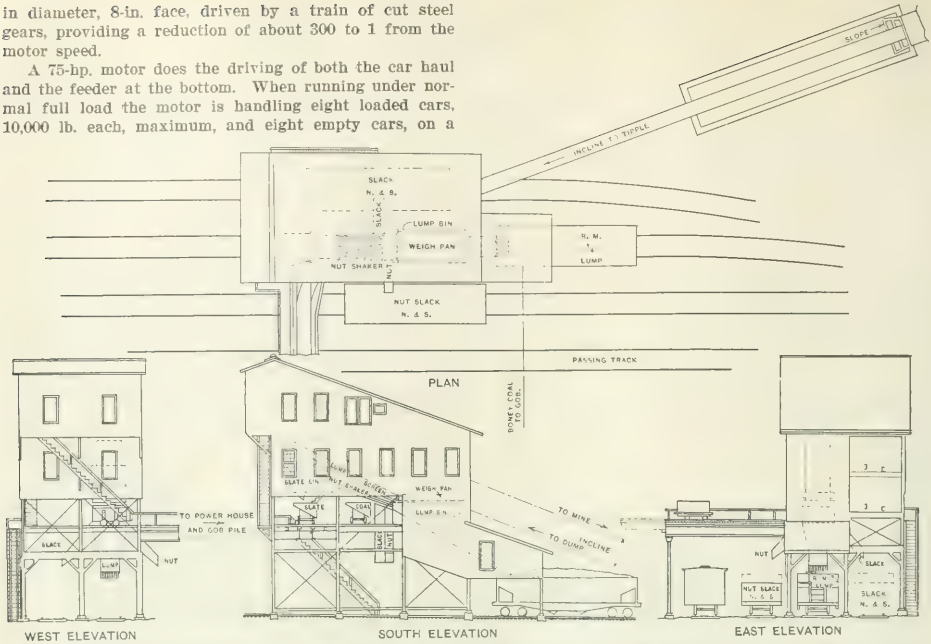


Fig. 2.—The General Arrangement of the Tipple and Car Haul Designed for the Wheeling Valley Coal Company, Lafferty, Ohio, by F. C. Greene, Cleveland.

23 deg. slope, besides operating the feeder, which pulls 40 cars on a ½ per cent. grade in favor of the loads. The maximum load on the motor occurs when the lower runway of the haul has its full quota of eight loaded cars with no empty cars on the top runway, and the feeder full. The balancing action of the empty cars against the loaded ones, when the empty runway is full, reduces considerably the power required.

It is rather a difficult matter to describe just how the loaded car is dumped and the empty car transferred from the lower to the upper runway at the head of the haul, in the tipplehead frame, because no one operation occurs

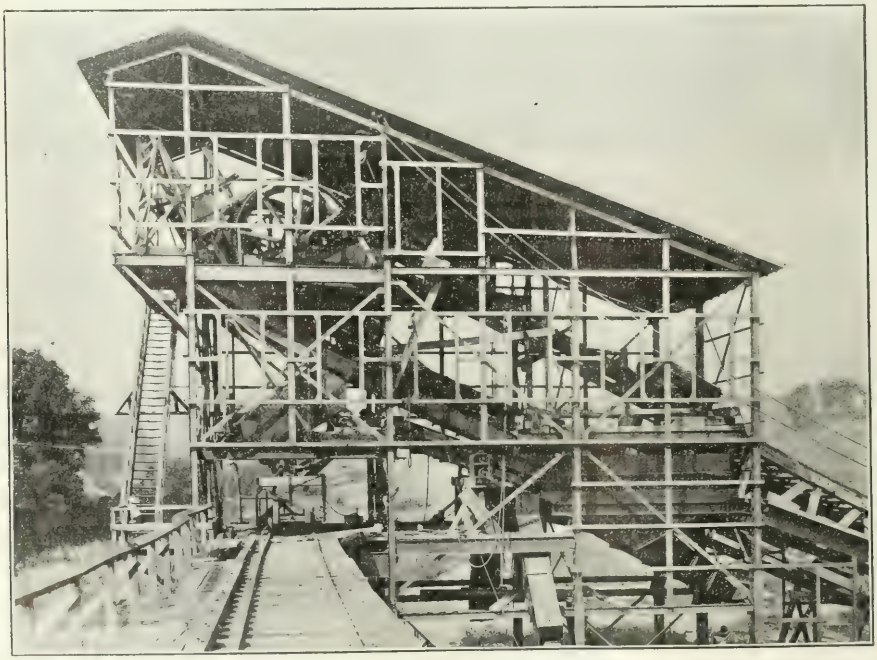


Fig. 3.—Side View of the Tipple Head Frame, Showing the Dumping Mechanism at the Top of the Haul. An Empty Car Has Just Been Placed on the Upper Runway and the Swing-Lift Transfer Is Registering with the Lower Runway Ready to Receive the Car Just Entering Between the Driving Sprockets.

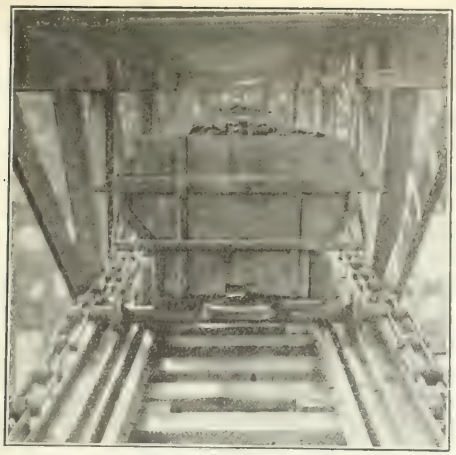


Fig. 4.—View Looking Up the Lower Runway of the Trestle Approach, Showing the Tracks and Chain Guides and a Cross Bar Pushing a Loaded Car. The Lugs on Each Side of the Lift-End Gate of the Car Are for Raising the Gate When the Car Is Over the Dump Plate.

singly. The dumping action is entirely dissimilar to that associated with present day devices. It occurs while the car is in transit. The mine car, one of the usual lift-end gate type of three tons capacity, is taken up the lower runway of the slope with the end gate facing down or toward the mine. A small lug is fastened on each side of the lift-end gate, and when the car has reached a position driectly over the dump plate in the tipple, these lugs contact with a suitably shaped set of rubbing plates placed either side of the car, as shown in Fig. 5, which causes the mine car door to open wider and wider as the car proceeds further up the slope. As soon as the car door starts to open, the normal pitch of the slope causes a partial discharge of the coal from the car. The full discharge is effected by the car door opening to its full extent, and the pitch of the car increasing from 23 to 60 degrees. This increase of pitch is attained gradually, as is also the discharge of the coal, by the cross bar pushing the car on the swing lift transfer, forming part of the haul mechanism at the top. Put another way, the car is gradually drawn from under the coal, producing a spreading action of the coal over the screens.

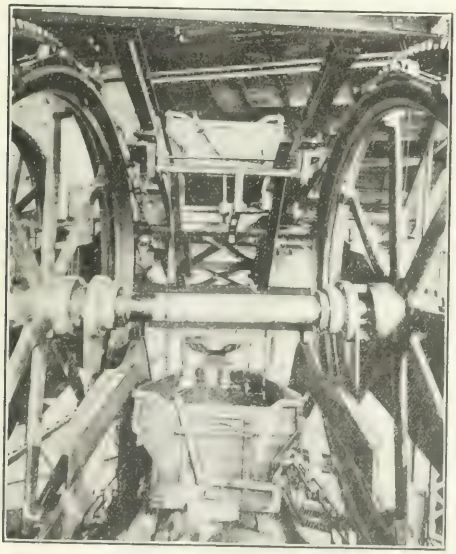


Fig. 5.—View of Dumping and Transferring Mechanism at the Top of the Haul, Looking Down the Slope from the Swing-Lift Transfer. Shows the Door Lifter Guides on Each Side of a Loaded Car on the Lower Runway. The Swing-Lift Transfer Is Latched in Register with the Upper Runway.

The swing-lift transfer, Fig. 6, is a single pivoted member, the free end of which describes an arc when it is lifted by a cross bar from its normal position in register with the lower runway, to register with the upper runway. It again describes the same arc, only reversely, when the lift drops from the upper to the lower runway.

Taking up again the movements just after the car is on the swing-lift transfer, the mine car door is wide open and the wheels on the cross bar, pushing this particular car, have run under the horns attached to the lift, as shown in Fig. 7. As soon as the cross bar starts on its travel around the driving sprocket, the mine car door starts to close, the car moves a little further up on the swing lift transfer, and the lift itself, together



Fig. 6.—View of the Swing Lift Transfer, Showing the Cage for Receiving the Car.

with the empty car, starts to raise. When the cross bar has reached the furthest point up and out on the circumference of the driving sprockets, the mine car door is fully closed, and the cross bar, having passed this point, the mine car starts to run forward on the swing lift. By the time the lift registers with the upper runway the cross bar is about ready to leave the horns on the swing lift transfer, and the car, now actuated by gravity, is ready to follow the bar off the lift and down the upper runway of the slope. However, the cross bar does not leave the horns on the swing-lift transfer, nor does the car run off, until the free end of the lift is latched in register with the upper runway. This being accomplished, both the car and the bar perform the operations mentioned, and the instant the car is clear of the swing lift transfer the cross bar trips a trigger, which releases the lift latch, allowing the lift to resume its normal position in register with the lower runway, ready to receive another car. This swing lift transfer is counterbalanced so that the shock in dropping from the upper to the lower runway is very slight. In fact, this slight shock is the only thing that disturbs the absolutely smooth

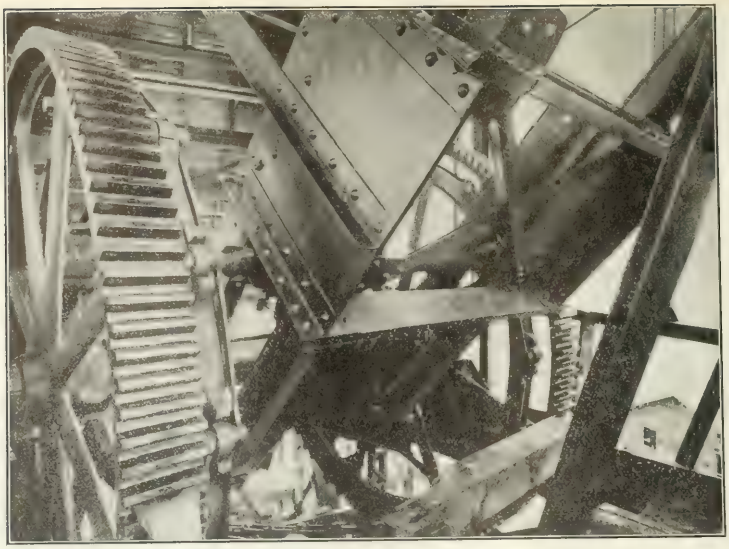


Fig. 7.—View Showing a Cross Bar Under the Swing-Lift Transfer Horns, Raising the Lift as the Bar Travels Around the Driving Sprockets.

The many varying movements are so intermingled and so seemingly dependent upon one another that it might be inferred that the apparatus is exceedingly complicated. This is not so, however. The chain is bound to travel its course around the head sprockets, and the swing lift transfer is bound to raise as the cross bars engage the horns. All the other movements are dependent upon these two simple positive movements.

The haul at the bottom is on a par for smooth, easy action and simplicity of moving parts with the top. The loaded cars are positively fed into the haul one at a time by the feeder, and in such a manner as to render it practically impossible for a cross bar traveling around the tail sprocket to collide with a car and do damage.

The feeder, which may be seen in Fig. 9, is a single chain running in the center of the loaded track, with two tilting dogs attached at equal intervals in its length. The dogs engage the lugs on the bottom of the cars, and while one dog is hauling the entire loaded trip along, the other one, in front, is taking a detached loaded car and pushing it into the haul, immediately following a cross bar. This loaded car stands in a pocket at the foot of the haul, until the next cross bar comes along, when it resumes its travel up the slope. Meanwhile another load is being fed into the haul in the manner previously described. The feeder is operated by an auxiliary double chain and gear arrangement attached to the tail sprockets of the main haul. The rate of travel of the feeder thus bears a positive ratio to the main haul rate of travel.

The question has no doubt arisen as to how the cross bar, which straddles not only the mine car track, but also the cross bar wheel track on both the lower and upper runways, is able to get through the upper runway tracks, at the foot of the haul. This is made clear in Fig. 8. The cross bar cannot slip away from the lug on the car, in the manner a dog does on a single chain haul, as the mine car wheels would still strike the cross bar. It is, therefore, necessary to stop the mine car, to allow

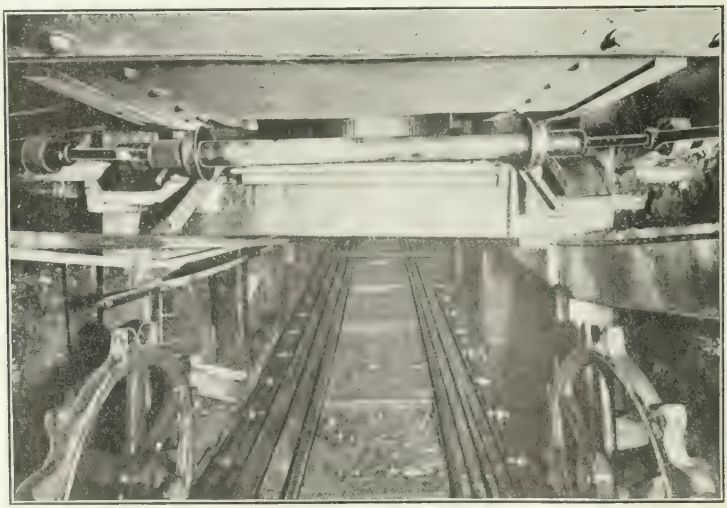


Fig. 8.—View Showing a Cross Bar Just Coming Through the Track Gate at the Bottom of the Upper Runway. The Sprocket Wheels Shown Are Idlers.

the cross bar to run away from the lug and get through the track before the car is released, something after the order of a flying switch on a railroad. This operation is effected by no more complicated means than a single piece pivoted track gate that lifts in a vertical direction, the free end of which engages with the tread of the mine car wheels, forming the car stop. The cross bar operates this track gate in a manner similar to the way it operates the swing lift transfer at the top.

The track gate is built up of a ⅝-in. plate, having a short section of mine car track attached, with a hinge at one end. The plate is sufficiently wide to accommodate two horns placed either side of the mine car track, and of a gauge to correspond with the gauge of the cross bar wheels. The horns are shaped so that when a cross bar on its travel down the slope, runs under them, they raise the track gate, and consequently the mine car tracks, making a sufficient aperture for the bar to pass through. When the raised or free end of the mine car track engages the tread of the car wheels, the car is momentarily stopped, until the cross bar gets through the aperture. Then the gate drops back to its normal position, permitting the empty car to run over the gate and on to the empty storage.

As will be noticed, the only additional parts needed in this conveyor car haul not found in the ordinary con-

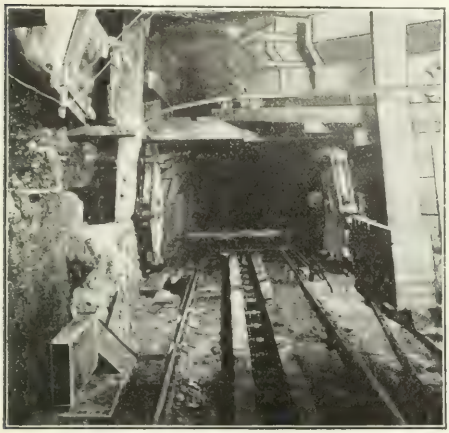


Fig. 9.—View at the Foot of the Haul, Showing the Tail Sprockets on the Main Haul and the Feeder Running Between the Rails on the Load Track, with Empty Cars Running Around to Storage from the Upper Runway.

veyor, are the swing lift transfer and the track gate. Both are single piece pivoted members, operated positively by the cross bars.

This upper and lower runway idea of the conveyor system can be applied with an efficiency and economy in handling and dumping mine cars greatly in excess of that possible with the parallel track system. Dumps have been evolved that in addition to controlling the dumping of the coal absolutely, transfer the empty cars from one track to the other. These transfer dumps are actuated either by steam or gravity, or both, and handle the empty car without the need of any auxiliary tracks, kickbacks or switches.

The car haul conveyor, or self-dumping car haul, as it is called, serves either slope or incline operations equally well, and at a pitch in either, that would be prohibitive with the ordinary single chain haul. It accomplishes the dumping into storage bins or tipple screens, or both, the receiving of the contents of the storage bins and the discharging of them into the tipple screens, with as much ease as in handling the loaded car direct from the mine to the tipple. Even in shaft operations, the upper and lower track system may be applied, leading directly into the cages, rendering unnecessary the usual car lifts, hauls, &c., for handling the empty cars at the shaft bottom.

The slopes are all double hight instead of double width, to accommodate the upper and lower runways, and the trestles are all double decked instead of double tracked. The excavation for the double hight slope is no greater than for the double width, and it is easier to excavate the former than the latter, for the reason that a man can work faster and to better advantage with plenty of head room than he can stooping or lying down. In the trestles there is less width to support and a consequent saving in supporting material. The tipples are smaller because it is not necessary to support additional tracks, kickbacks, switches, &c., in addition to the dump. Just sufficient structure is needed to properly support the dumps. There is no storage room required with the self-dumping car haul, thereby eliminating considerable trestle expense, in addition to the saving made in the small tipple.

Possibly the most attractive and valuable feature associated with this new system, outside of the safety, absolute control and material saving features, is the saving in labor expense. At the plant of the Wheeling Valley Coal Company the weighman operates the haul and a boy at the bottom takes care of the feeder and uncouples the loaded trip. These two can do all the handling and dumping for an output of considerably over 2000 tons per day of 8 hr.

This self-dumping car haul, or conveyor car haul, as you like, is even superior to a bucket conveyor for handling the output of a mine working in connection with the mine cars, as its takes the original package—the loaded mine car—and dumps the contents direct into the tipple, thereby saving additional handling, with its consequent breakage.

The plant of the Wheeling Valley Coal Company is located at Lafferty, Belmont County, Ohio, on the Cleveland, Lorain & Wheeling division of the Baltimore & Ohio Railroad. The self-dumping car haul installed at this plant was erected by the C. O. Bartlett & Snow Company, Cleveland, Ohio, in accordance with plans and specifications furnished by F. C. Greene, mining engineer, Republic Building, Cleveland, Ohio. All apparatus mentioned or described is fully protected by United States and foreign patents, issued or pending.

A Society for the Prevention of Accidents.—A large and exceedingly enthusiastic meeting was held at Sharpsville, Pa., on the evening of January 22 for the purpose of considering the advisability of organizing a national society for the prevention of accidents. The movement had originated with Thomas D. West of that place. After a brief address by Rev. Clarence J. Harris, who acted as chairman for the evening, Mr. West was introduced, and delivered a most exhaustive address concerning the formation of societies for the prevention of accidents. He was followed by a number of other persons who expressed in strong terms their feeling that a movement of this kind should be started. An organization was then effected as follows: President, Thomas D. West; vice-president, Samuel Dunham; secretary, Rev. C. J. Harris, and treasurer, Frank Pierce. It was decided that the organization should be national as well as local, and that the officers should endeavor to interest the country in a movement to organize like societies. Mr. West is now actively engaged in a campaign for the development of national interest in this matter, which he regards as one of urgent necessity.

Bradstreet's statistics of business failures in the United States in 1907 show that 7 houses out of every 1000 in business failed last year, as against 14 out of every 1000 in 1893, and 9 in 1873. The percentage of 1907 was lower than in any year of the past decade, except 1906, whereas the percentage of 1893 was the largest in a generation. In actual liabilities last year's failures broke all records, the total of $383,700,000 comparing with $127,200,000 in 1906, $105,500,000 in 1902, and $382,100,000 even in 1893. The ratio of total assets to total liabilities among the failed firms of 1907 was 75 per cent., the largest on record. In 1906 it was only 50 per cent., in 1893 it was 60.6 per cent.

The Gridley Multiple Spindle Automatic.

The multiple spindle turret lathe herewith illustrated is of the type that manufactures automatically from bar stock finished cylindrical work, its range of production being up to 1⅛ in. in diameter by 6 in. long. The design contains a number of radical changes from what has previously been considered standard practice in this class of machine. The builder, the Windsor Machine Company, Windsor, Vt., already has on the market a single spindle automatic known as the Gridley automatic turret lathe, and while the new machine can hardly be regarded wholly as an evolution of its predecessor, there are certain features in common which will be recognized by those who are familiar with the older one. Both were designed by George O. Gridley of the company.

Briefly, the characteristic features of the machine are as follows: A nonrotating tool slide mounted upon the spindle carrying cylinder, which secures permanent and accurate alignment, gives stiff and ample tool support and permits the use of an efficient type of tool; spindles which rotate in the same direction as in the common engine lathe, permitting of the use of standard drills and cutting tools; a constant high speed movement of the cams for the so-called idle movements of the machine, and a slower speed for cutting; a quick change feed mechanism, giving six changes for each of the three cam throws furnished, for work respectively up to 2, 4 and 6 in. long, the feeds remaining constant for each of the throws; all threading done at one spindle position; a weight feed for feeding stock for the new piece, giving a quick movement, regulating against shock by a cam surface, and nonadjustable spindle bearings with large bearing surfaces.

In general, the machine operates like others of the type, the spindles, four in number, being carried in a cylinder which is rotated step by step to bring each spindle successively into position to be operated upon by the various tools. All of the turret tools are held in a nonrotating tool slide, A, Figs. 1 and 2, and are fed forward together, one tool rough turning the bar in one spindle, another tool taking a finishing chip at the next spindle, a die threading the piece at the third spindle, while the finished piece is cut off and a new length of stock fed through the chuck at the fourth spindle. Or other operations may be arranged, as desired. All the operations are accomplished simultaneously, and consequently the time required to manufacture a finished piece and cut it off is only the time of the longest operation plus the time necessary to return the tool slide, revolve the spindle cylinder and bring the tools back to their cutting positions. The spindles, which have the usual collet and stock pusher, are driven by the pulley B, Fig. 1 (*a*, Fig. 3), keyed to one end of the driving shaft *b*, Fig. 4, which runs through the center of the spindle carrying cylinder *c*. The driving shaft carries at its other end a gear, *d*, meshing with a gear, *e*, on each of the spindles, which run constantly in one direction without stopping or reversing for the purpose of threading, that operation being taken care of by the threading mechanism located at one spindle position, instead of providing each of the spindles with frictions or clutches as commonly employed in this type of tool.

In this connection it should be emphasized that the machine departs from the usual design of the type, in that the spindles revolve in the same direction as in a hand operated machine or a lathe, which permits the use of standard commercial drills and tools which have been made for use on single spindle automatics or hand operated turret machines.

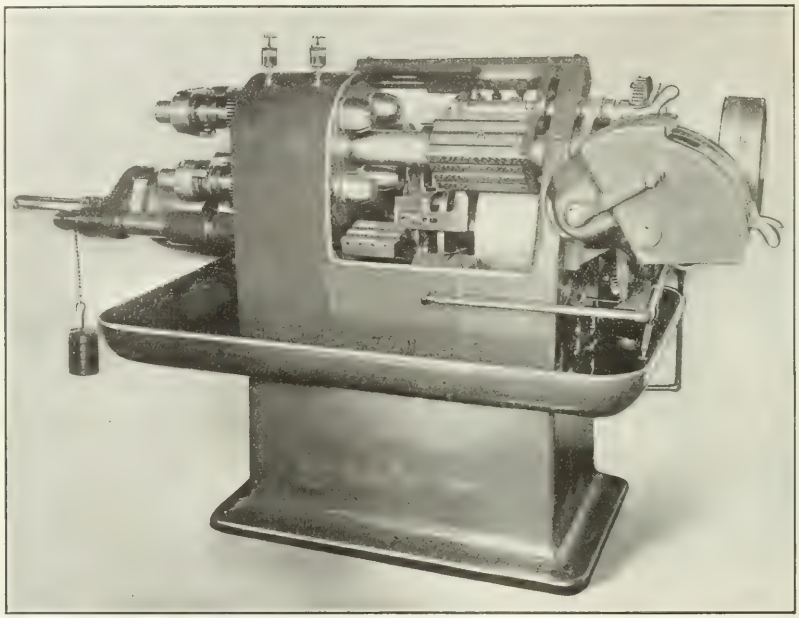


Fig. 1.—The New Gridley Automatic Multiple Spindle Turret Lathe Built by the Windsor Machine Company, Windsor, Vt.

The spindle carrying cylinder, which is the name given the members carrying the spindles, is shown in detail in Figs. 4, 5 and 6. Permanency of alignment and rigid support are obtained by making this member one solid piece, and by placing the spindles in one end of the piece, and supporting the tool slide A on its central part between the journals C and D in corresponding bearings C and D, Fig. 6, which constitutes an innovation in design. Alignment is assured because the spindle cylinder and the tool slide are in fixed relation, which is unaffected by wear in either bearing. The tool slide is held from rotating by its arm, E, Fig. 2, which bears on the guide F attached to the tie piece G, which is fastened at each end of the main frame.

The spindle bearings are also novel in that they are designed without adjustments on the ground that greater efficiency is secured with bearing surfaces of large area than with the cone bearings commonly employed for the purpose. In studying the general subject of multiple spindle automatics the designers of this new machine

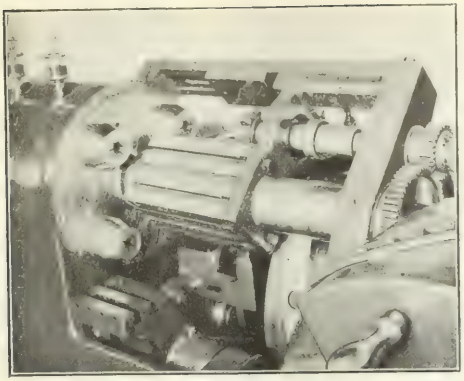


Fig. 2.—A Detail of the Working Features.

were convinced that much trouble results from the necessity of adjusting bearings, and consequently the nonadjustable bearing of large area was adopted, a departure which will interest machine designers generally. It will be noticed in Fig. 4 that the spindle bearing is a long straight lumen-bronze bushing without adjustment, and with nothing to get out of adjustment. The large area is favorable to long life by avoiding undue wear, and when finally wear has reached the point where adjustment is necessary the bushing may easily be renewed.

On the camshaft, shown in detail in the view of the rear of the machine, Fig. 7, are mounted all of the cams used in operating the several motions. Beginning at the head there is the worm gear which carries the cam clutching the loose pulley H to the worm wheel shaft for driving at high speed during the idle movements of the machine; the drum carrying the cam I which feeds the tool slide forward and returns it; a disk J carrying face cams on either side, one for operating the cutting off slide, the other for operating the forming slide; and an arm K carrying a cam for drawing the locking pin, and a roll for revolving the spindle cylinder.

The camshaft, Fig. 3, is driven at two speeds, one comparatively slow, for use during the time the tools are cutting, the other a high speed, for returning the tool slide and revolving the spindle cylinder. While the machine is cutting the camshaft is driven by the worm *g*, Fig. 3, on the spindle driving shaft *b*, through the change gear box *h*, worm shaft *i* and worm gear *j* on the camshaft. When the tools have finished cutting the loose pulley *k*, always running at constant speed, is clutched to the worm shaft *i*. The feed box has two handles, the lower *l* having three positions corresponding to the feed cam used, three of these cams being furnished with the machine, one for work not over 2 in. long, a second for work 2 to 4 in., and the third for work 4 to 6 in. long. The latter cam may be used for the shortest work, but there would be an appreciable loss of time in moving the tool slide its full travel when cutting short pieces. When the lower handle is in the position corresponding to the feed cam being used the upper handle *m* can be placed in any one of the six positions to give the desired feed, arbitrarily placed at 75, 100, 125, 150, 175, and 200 revolutions of the spindle to one inch of travel of the tool slide.

To go further into the details of the feeding mechanism the drive is direct from the spindle driving shaft upon which is the worm *o*, running in the worm gear *p*, keyed to shaft *r*, to which is also keyed the sliding gear *o*, embodied as a part of a member with the intermediate gear *p* and the handle *l*. The intermediate meshes one of the three gears of the cone *q*, *r*, *s*, according to the position of the handle. The lower position is for the 6-in. cam, the central for the 4-in., and the upper for the 2-in. cam. This member controlled by the handle *l* constitutes a part of a larger member operated by the upper handle *m*, which engages the gear *q* with any one of the cone of six gears. As to the amount of feed, the position of the lower handle does not matter; the six feeds are the same, no matter what the cam throw.

The mechanism permits of 18 changes of feed by the combination of the two levers and their cones of gears,

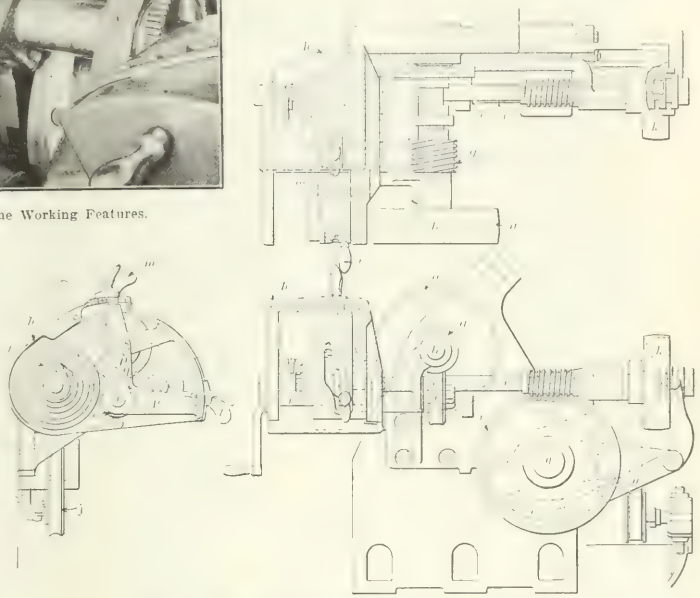


Fig. 3.—Top View and Elevations of the Feed Mechanism.

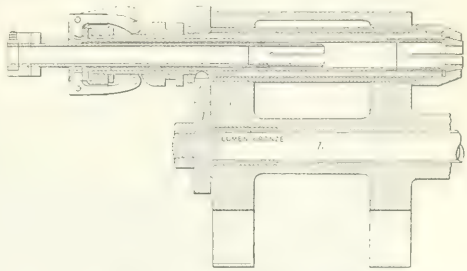


Fig. 4.—Sectional Detail of a Spindle.

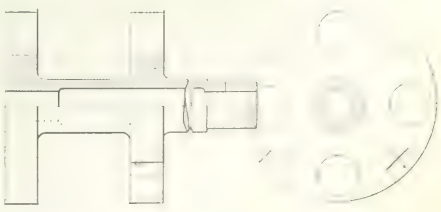


Fig. 5.—Detail of the Turret or Spindle Carrying Cylinder.

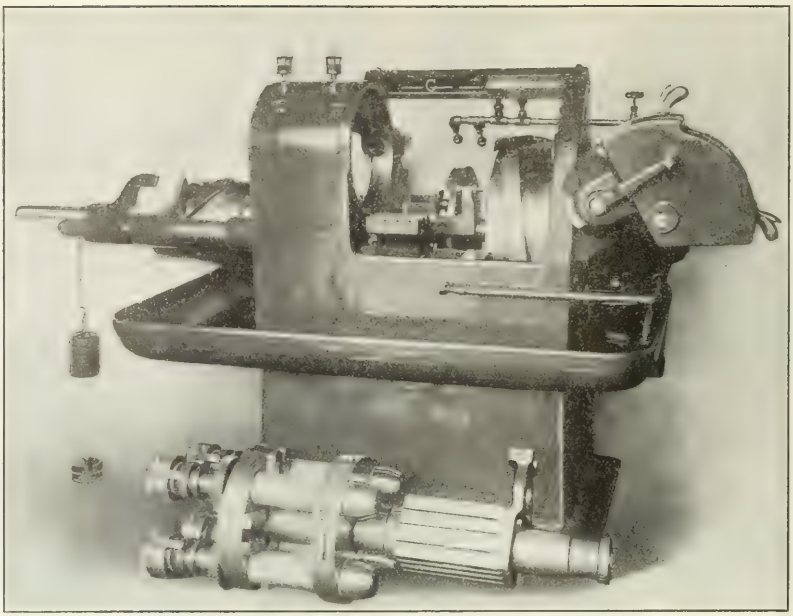


Fig. 6.—The Machine with the Revolving Turret and the Stationary Tool Slide Removed.

so that one of these machines can be adapted to unusual conditions or to the individual's idea of what constitutes the best practice as to cutting feeds. But this was not the intention of the designer. The purpose, as stated, is to furnish six given feeds, sufficiently varied for any desired work, which will remain unchanged, no matter which of the three cam throws are employed.

The loose pulley *k* accomplishes all movements other than when the tools are cutting. They operate at maximum practical speed. On the worm gear is a cam *v*, which actuates a lever *u*, clutching the loose pulley to the wormshaft *i*. The shaft runs at higher speed than the cone of feed gears *t*. The pawl that engages the ratchet *v* is carried on a sleeve to which is fastened the cone of gears. The ratchet is keyed to the shaft *i*. By this means the power is transmitted from the feed gears to the shaft. This construction permits the wormshaft, under the impulse of the loose pulley, to run faster than the feed gears, the ratchet running away from the pawl.

This mechanism gives a quick change feed for the cutting tools, and a constant maximum speed for the so-called idle movements of the machine, irrespective of its speed of movement during the cutting period, in place of the common practice of a given ratio between these two speeds.

The mechanism for feeding the stock is a new one.

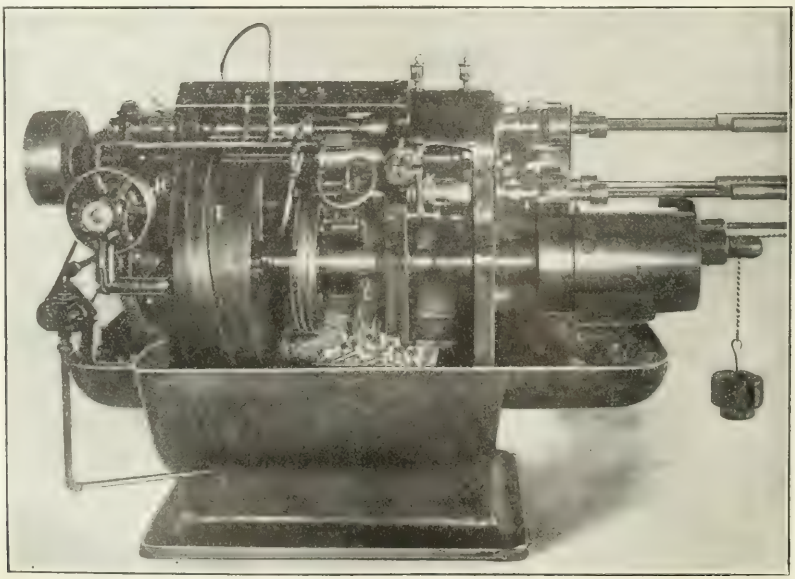


Fig. 7.—Rear View of the Gridley Automatic Multiple Spindle Turret Lathe.

On a shaft mounted on the end of the main frame of the machine are three sliding arms. That nearest the machine frame opens and closes the chuck; the second draws the stock pusher tube back on the stock ready for a new grip, while the third feeds the stock through the chuck for the new piece. The first two arms are operated by cams. The third is actuated while feeding the stock by a weight. The movement is a quick one, but a battering ram effect is avoided by the use of a roll mounted on the arm, which rides on a steep cam angle on the cam drum, shown best in Fig. 6, thus regulating the speed at which the weight can act. The weight is returned to position by a cam motion. It is made heavier or lighter according to the size of stock being used.

The stock stop is attached to the cutting off slide. After a piece has been cut off the cam draws the slide back, bringing the stop into line with the spindle. The chuck opens and the stock is fed through against the stop, whereupon the slide moves forward, carrying the stop away from the end of the piece and the cutting tool into position for its work.

The form of tool slide allows the use of a turning tool as shown in Fig. 8, which is that of the Gridley

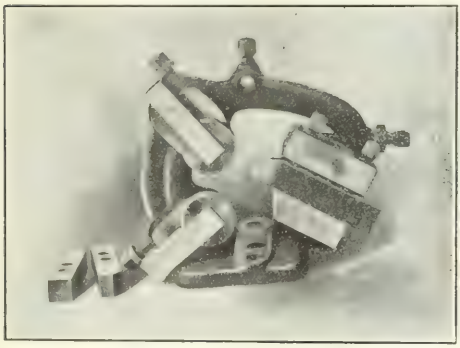


Fig. 8.—A Turning Tool as Used on the Gridley Automatic Turret Lathe.

automatic turret lathe. The slide has sufficient room to permit the placing of one tool back of another, to perform more than one operation at a time at one spindle position.

To secure an efficient, but simple spindle drive, requiring a minimum of attention and repair, the spindles are driven constantly in one direction, as already stated. To obtain a high cutting speed for the turning tools and a lower cutting speed for the die, it is necessary while threading to rotate the die at a speed slightly less than the speed of the spindle, and at a higher speed when running the die off the piece. This is accomplished by putting two gears into the spindle driving shaft, meshing with two loose gears on the threading shaft L, Fig. 1. These gears are of such a ratio that when one of them is clutched to the threading shaft it will rotate the die at a speed slightly less than that of the spindle, and when the other gear is engaged the die will rotate at a higher speed so as to run it off the work. When a left hand thread is being cut the die rotates faster than the spindle when cutting, and slower when running off.

The maximum capacity of the machine is 1⅛ in. round, 1 in. hexagon and ¾ in. square stock up to 6 in. long. The weight of the machine is 4500 lb.

The Abandonment of the "Technolexicon."—The staggering proportions of the work undertaken by the Verein Deutscher Ingenieure in the compilation and publication of the "Technolexicon" appear in the statement issued by the council of that organization explaining why the project was given up. The society had spent $100,000, and it was estimated that $20,000 more would be required to settle with the publisher and to meet other obligations. Five years were spent in collecting words and equivalents in German, French and English. This was completed by the end of 1906. The editorial work, however, was very slow. In four weeks in the autumn of 1907 with the entire editorial force at work the average of words handled was 276 per week. At that rate it would require 40 years to compile the estimated total of between 600,000 and 700,000 words. It was estimated that even under the most favorable conditions 10 or 12 years would be needed, though originally it was thought that the editorial work could be done in three years. Many engineers in the United States co-operated in the work of gathering together technical terms employed in the various branches of engineering and applied science.

Customs Decisions.

An Automobile Decision.

In denying on January 21 the Government's application for a writ of certiorari in the case of J. T. B. Hillhouse, the United States Supreme Court has settled finally a customs controversy of wide interest to automobilists of this country who use their cars for touring purposes abroad. While the case stands in the name of Mr. Hillhouse, he acts merely as agent for Mrs. Collis P. Huntington, the owner. Mrs. Huntington took her machine to Europe and during the progress of the tour several repairs were made. Upon the re-entry of the machine at the port of New York the collector demanded full duties at the rate of 45 per cent. on the car as a unit. Mrs. Huntington's lawyers took an appeal to the Board of General Appraisers, alleging that duty should only be exacted on the repairs or new parts at the 45 per cent. rate. After the board had found in favor of the importer's contention, the United States appealed the issue to the Federal Circuit Court and, later, to the Circuit Court of Appeals. The lower courts found against the claim of the Government, and as a last resort, the Attorney-General applied to the Supreme Court to review the case. The refusal of the Supreme Court to consider the case is regarded not only as deciding that only repairs are dutiable, but also that an automobile's use abroad for one year need not be consecutive. In other words, two periods aggregating more than one year will entitle a machine to free entry. It is stated that the Government would prefer to have automobiles which have been renovated abroad classified as entireties, owing to the difficulty experienced by the authorities in ascertaining the values of the new parts.

A Scrap Iron Decision.

In overruling a protest filed by G. W. Sheldon & Co. and others of New York, the Board of United States General Appraisers has laid down the rule that the provision in the tariff for "scrap iron" includes old refuse and worn out iron material, as well as new scrap or waste iron, fit only for remanufacture. The tribunal, therefore, overrules the contention that the merchandise the subject of the protest is free, and instead holds that worn-out iron chains, steel rails, &c., are dutiable properly at the rate of $4 per ton as "scrap iron."

Coverings.

In overruling a claim filed by A. A. Vantine & Co., New York, the board has decided that all coverings containing imported merchandise, if identical with cartons, cases, boxes or sacks, should be treated for customs purposes either as usual or unusual coverings. It was alleged by the importers that certain merchandise was packed as a matter of convenience in coverings neither usual nor unusual. In support of this contention, the importers stated that the coverings were not the ones generally employed in shipping the goods, and further, that the coverings in question were intended ultimately for another use. General Appraiser Hay in his decision says that it is clear to the board that, whatever the character of coverings, they should be treated as of one of the two classes of coverings enumerated by Section 19 of the Customs Administrative act.

New Cam Cutting Machine.

A new special milling machine, by the use of which peripheral and face or box cams can be cut, the third designed by A. C. Campbell, superintendent of the E. J. Manville Machine Company, Waterbury, Conn., is herewith illustrated. Cams of the types mentioned are more used than any other form, and in modern automatic machinery play a very important part. Machines to cut them are rare, except those designed to make some special cam for sewing machines, &c. There are attachments applicable to milling machines, which answer certain purposes, but what is believed to be the first machines intended especially for milling face and box cams, were designed by Mr. Campbell in 1889, one for small and one for larger cams. Before that cams were generally cut either on a vertical miller or a profiling machine, following the outline by hand, or with a former, or on a lathe with a suitable fixture. None of these methods were commercially satisfactory for producing cams in quantities.

The first Campbell machine had two parallel spindles, each carrying a face plate at one end and a worm wheel at the other, the two being connected to rotate in unison. One face plate carried the work and the other the former. A long slide at right angles with the spindles carried a milling spindle and roller, which, being impelled by a weight to bear against the former, caused the mill to cut the work with a contour corresponding to the pattern.

The other machine differed in having the two face plates on the opposite ends of a large spool, rotated by a worm wheel, and the mill and roller on a swinging member pivoted near the floor. One face plate carried

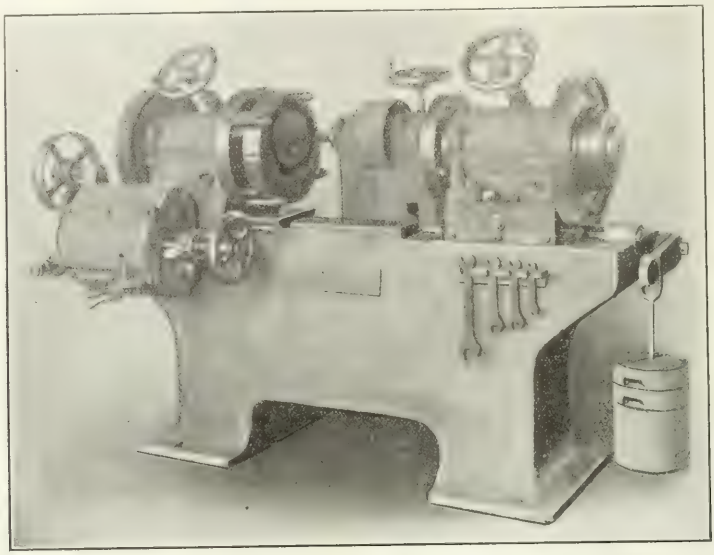


Fig. 1.—The New Cam Cutting Machine Built by the E. J. Manville Machine Company, Waterbury, Conn.

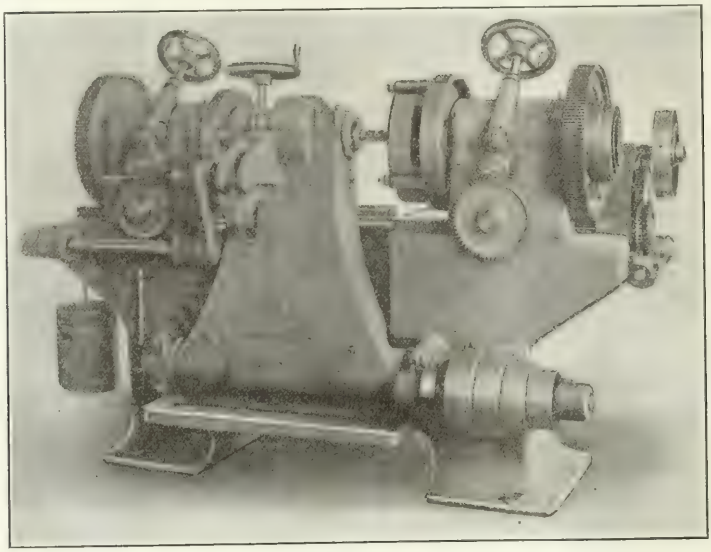


Fig. 2.—Rear View of the Machine, Showing the Swinging Arm Carrying the Milling Cutter.

the template and the other the cam to be cut, and the guide roller, bearing on the first, under the influence of a weight, caused the mill to duplicate in the work the size and form of the template.

The new machine is an improvement, combining the good points of the earlier machines with several new features. It is easy to set up and handle, and will cut cams of all sizes up to 20 in. in diameter and having grooves for rolls up to 2½ to 3 in. in diameter. In it the elements are the central swinging arm, pivoted near the floor at the back, and carrying at its upper end a large, well supported, rotating milling spindle, from one end of which projects the mill or cutter, and axially opposite a pin bearing a roller the size of the mill and which follows the template; the main frame to which the arm is pivoted, and two longitudinally sliding heads, dovetailed on the upper surface of the main frame and carrying spindles and face plates, geared together by a long pinion shaft so as to be rotated in unison by a train of belt driven feed mechanism. Both heads, whose axes are eccentric, may be moved to and from one another by a conveniently arranged hand wheel, operating through gears and pinions working with feed racks, and they may be firmly clamped in any position by locking levers.

By referring to Fig. 1, a front view of the machine, it will be seen at once how conveniently all parts are located. Without moving from his place, the operator has the work as well as all working parts and adjustments immediately under his hands and eyes. As will also be seen, the milling spindle is back beyond the machine center, and the swinging motion of the arm may be controlled by the hand wheel on top of it. Fig. 2 shows a rear view of the machine and Fig. 3 front and end elevations, from which the construction and operation will be readily understood with the following brief description:

In this machine, as in its predecessors, the guide roller is held against the former by a weight, but in addition there is a unique mechanism by which the arm is easily forced out away from the cam and former when it is required to put in another cam or to remove the mill. Pivoted on the back of the swinging arm is a worm wheel with its worm shaft terminating at the hand wheel visible on the top. On the side of this wheel is a projecting crank pin, which, as the worm wheel rotates, moves toward and from the machine center. Jointed to the frame and projecting horizontally rearward through and beyond the swinging arm is a bar or link, the out end of which is notched. When a cam is being cut, this link is dropped by gravity out of line with the crank pin and then has no mission, as at such times the arm is being forced toward the cam center by the weight shown, thus causing the roller to follow the contour of the former. When it is desired to change or regrind the mill or remove the work, the work carrying head is first moved longitudinally on the bed to the left, away from the mill, by the inclined handwheel at its top. Next, the end of the link above described is lifted by hand so that its notched end is in position to engage with the crank pin in the worm wheel. Thereafter, continued motion of the hand wheel on top forces the arm backward, since it cannot push the link forward. This enables the operator to easily overcome the heavy weight. Reversing this operation, the arm may be readily brought forward until the roll strikes the former, but as it is now in position for the weight to again control it, the link automatically disengages from the crank pin and drops, and the upper hand wheel runs free and has no further control. By this link and worm combination, if necessary, contour milling can be done without the use of a former, as a line on the cam can be followed while the face plate slowly revolves.

Adjustable double gears are used on the outer ends of the main spindles, to take up wear and lost motion.

The formers used are cast iron, ¾ in. thick, and are secured to a secondary adjustable face plate, which may be located with exactness to correspond with the cam to be cut. To easily accomplish this a finished surface is provided on top of the bed at the front, on which a surface gauge may be placed so as to readily compare the angular position of the cam and former.

Of the feedbox and gear train little need be said beyond the fact that both the mill and the heads may be rotated automatically in either direction, and provision is made for conveniently changing the speed of the same as the mill approaches or recedes from the cam center. It is also a simple matter to disengage the power feed, so that with one hand on the vertical upper back hand wheel, and the other on the horizontal front hand wheel, any line can be traced or followed on the cam to be cut.

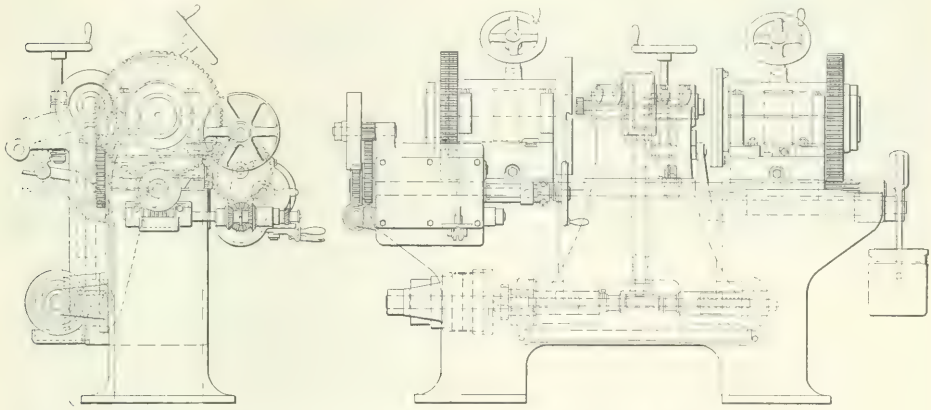


Fig. 3.—End and Front Elevations of the New Cam Cutting Machine

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The Baird Machine Company, Oakville, Conn., has made several improvements in its oblique tilting tumbling barrel, which was described in detail in *The Iron Age*, Jan. 18, 1906. The machine is now equipped with ring oilers to provide continuous lubrication without frequent attention, a hardened button is placed in the end of the swinging bracket to take end thrust of the large gear shaft; an adjusting screw is provided for regulating the thrust of the bevel gear shaft, and the pinion gear shaft has a bushing that may easily be replaced when worn.

The Pittsburgh Coal Company was exonerated, and the Darr mine disaster attributed to an explosion following the use of an open lamp, by the verdict returned by the coroner's jury. A rigid enforcement of the bituminous mining laws is recommended, as is also a greater number of inspectors at all mines where explosive gas is prevalent.

The Preservation of Steel in Concrete.

That steel used as reinforcement in concrete structures can be perfectly protected against corrosion has been the claim of engineers, and a recent demonstration of the fact was given at New Brighton, Staten Island, N. Y. A one-story reinforced concrete building of J. B. King & Co. was torn down to make room for a five-story building. Some details of the conditions found are given by the *Engineering Record*.

The building had a pile foundation, the piles being cut off at mean tide level. The footings consisted of reinforced concrete placed around and over the heads of these piles. The walls had a thickness of 9 in. up to the grade line and 5 in. from the grade line to the roof, a hight of approximately 15 ft. The roof consisted of reinforced concrete beams and girders, the roof slab having a thickness of 2½ in., reinforced with ¼-in. twisted steel bars spaced 12 in. on centers. The walls were strengthened by pilasters, and both walls and pilasters were reinforced with twisted steel bars. The interior columns had a cross section 11 in. square and were reinforced with four ⅝-in. twisted steel bars held together by ¼-in. hoops of twisted steel, spaced 2 ft., 6 in. on centers. All steel reinforcement was found in perfect preservation, excepting in a few cases where the hoops were allowed to come closer than ¾ in. to the surface. Some evidence of corrosion was found in such cases, thus demonstrating the necessity of keeping the steel reinforcement at least ¾ in. from the surface. The footings were covered by the tide twice daily. The concrete was extremely hard and showed no weakness whatever from the action of the salt water. The steel bars in the footings were perfectly preserved, even in cases where the concrete protection was only ¾ in. thick.

New Heavy New Haven Lathes.

A new line of heavy tools now being placed on the market by the New Haven Mfg. Company, New Haven, Conn., includes heavy pattern 24-in. and 28-in. lathes, an example of the latter of which is shown in Fig. 1. Among its special features is the quick change gear box, shown at A, which is of the sliding intermediate gear type. To make a change the gear handle M is placed under the column on the index plate containing the desired thread and the handle L is thrown down to engage the gears. A front elevation of the gear box with the index plate, shown separately, is given in Fig. 2, from which its operation will be readily understood. In this view the handle L of Fig. 1 is indicated by D. The gears will be seen to be not true spur gears, but bevel gears, arranged for a small angle between their shafts. The shaft G is the driven member, and through the gears F and A drives

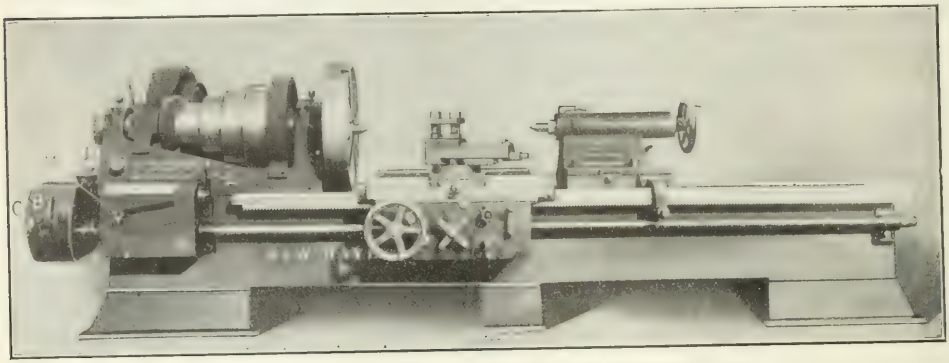


Fig. 1.—The New Heavy 28-In. Lathe Built by the New Haven Mfg. Company.

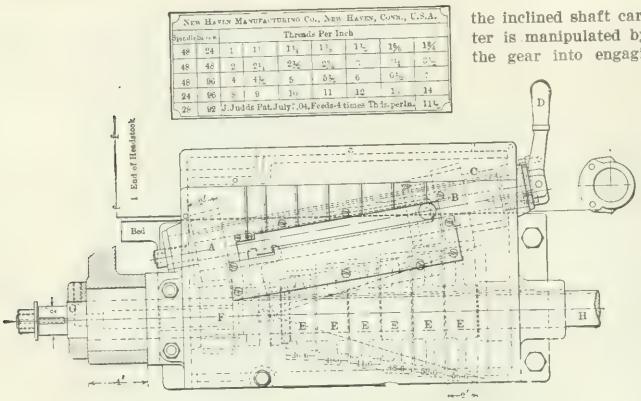


Fig. 2.—Detail of the Gear Box and Index Plate.

the inclined shaft carrying the sliding gear B. The latter is manipulated by the handle M of Fig. 1 to bring the gear into engaging position with any one of the cone of gears E. These gears are keyed to the shaft H, which is a prolongation of the lead screw. When D is thrown to disengage B from all of the gears E a clutch may be operated to connect the shaft G directly with the lead screw H.

The gear box A, Fig. 1, is supplemented by the box B on the stud plate. By the operation of a single lever, C, four changes of gears are obtained in the ratio of 1-2-4-8, which, with seven changes in box A for each of these positions, make 28 changes in all, having a range from 2 to 28 threads per inch. By the changing of a single gear on the end of the headstock, coarser, or any special threads may be cut. All gears have extra wide face in view of the heavy duty for which the lathes are intended, while the compact arrangement insures the rigidity of the device. Fig. 3 shows the mechanism removed from the box B, Fig. 1. The studs carrying the compound gears are held at each end in the steel yoke D, which swivels on the stud E. The handle C shifts the gear F on the end of the lead screw to the positions indicated on the front of the box, and also swings the gearing into mesh by an up or down motion.

The taper attachment, shown in Fig. 4, is supported on the back of the carriage on a bracket, the central part of which forms a complete box around the slide and swivel bar. Clamp H is secured to the rear of the bed and holds the slide, while the carriage moves in relation to it. One end of the swivel bar is graduated in inches per foot taper, and the other in degrees. By removing the pin I, the cross feed screw is released from

its driving pinion and left under control of the cross sliding block K, which moves in or out according to the offset of the swivel bar. By this arrangement the compound rest may be run in and out by the crank on the front end of the screw while using the taper attachment, which is a very desirable feature.

The following are the principal dimensions of the two new lathes:

	24-in. lathe.	28-in. lathe.
Swing over bed, inches....	25	29
Swing over carriage, inches.	16¾	19⅝
Head spindle, front bearing, inches.....	5 x 8	5½ x 9
Hole through spindle, in...	2 1/16	2⅝ 16
Nose of spindle, inches....	4¼	4¼
Cone diameters, inches....	10, 13, 16	11¼, 14, 16¾, 19½
Width of belt, inches.....	4½	4½
Back gear ratios.....	3.63 and 12.7 to 1	4 and 15 to 1
Number of spindle speeds..	12	12
Range of spindle speeds, revolutions per minute..	6.15 to 200	5 to 225
Maximum belt travel per revolution of spindle, feet.	53	76.5
Speed of countershaft, revolutions per minute.....	125	130
Countershaft pulleys, in...	18 x 5½	20 x 5½
Tailstock spindle, inches...	3	3½
Tailstock bearing on ways, inches	18¼	22½
Carriage bearing on ways, inches	36½	40
Range of screws per inch..	1 to 28	1 to 28
Range of feeds per inch...	6 to 168	6 to 168
Distance between centers with a 14-ft. bed, in....	100	87
Shipping weight of 14-ft. bed lathe.....	8,000	10,000

In place of the quick change gear drive the company is prepared to furnish a plain feed box having three in-

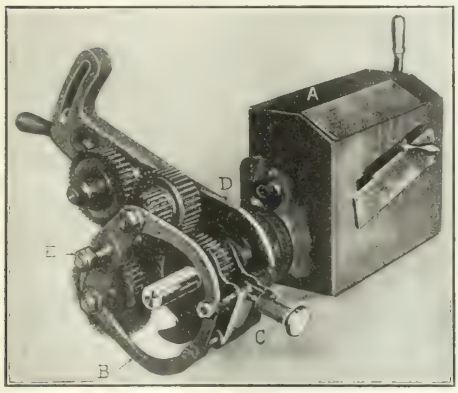


Fig. 3.—The Feed Change Mechanism Removed from the Lathe.

stantaneous changes of feed, obtained by throwing a single lever. These feeds are in the ratio of 1-2-4. Both lathes have offset tailstocks, allowing the tool block to be swung around parallel to the line of centers. The handle J in Fig. 1 operates the reverse gears, driving both screw cutting and feeds. There is also a reverse in the apron for feeds. The head spindle runs in adjustable taper boxes of special bronze. The compound rest on the 28-in. lathe has an angular power feed with a run of 10 in.

The Worcester Works of the American Steel & Wire Company are running on about one-half of a full payroll, the several departments having different weekly schedules, ranging on the whole from 40 to 50 hours. The Morgan Spring Company is operating on a 40-hr. schedule at Worcester. The Wright Wire Company is running full time at both Worcester and Palmer, Mass., a special effort being made in the production of poultry netting. The Spencer Wire Company is running full both at Spencer and Worcester, with a slight curtailment in a small portion of the latter works, in which a 55-hr. week has gone into effect. The wire goods manufacturers of Worcester are fairly busy.

Reductions in British Iron and Steel Prices.

Current British iron market reports reflect the readjustment that is going on in prices of pig iron and finished material. On January 10, Cleveland No. 3 pig iron was quoted 48 shillings 9 pence, and Cleveland warrants 48 shillings 6 pence. The "realized price" of Cleveland pig iron in the last quarter of 1907, as recently ascertained, was 54 shillings 4 pence, comparing with 57 shillings 3 pence for the third quarter. The market for hematite pig iron is weak, and 59 shillings is

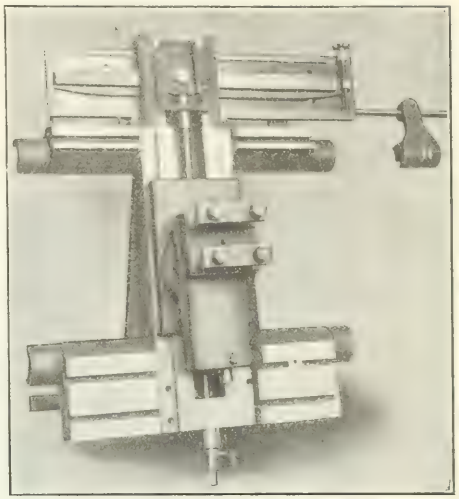


Fig. 4.—Top View of the Carriage and Taper Attachment.

now quoted on the Northeast Coast, as compared with 81 shillings 6 pence in the fall of 1907. The third quarter of 1907 saw the climax of the recent boom. The low point from which the advance in Cleveland iron was carried was 42 shillings 4 pence in the first quarter of 1904. The warrant stocks of Cleveland iron on December 31 were 89,203 tons, a reduction of only 6738 tons for December, the smallest since February, 1906. The decrease in stocks in warrant stores in 1907 was 448,951 tons. In January, in spite of curtailment of output by the blast furnaces, Cleveland iron in warrant stores has increased and is now close to 100,000 tons.

Values have been settling recently in finished iron and steel. Steel ship plates and angles were further reduced, making a decline of £1 in a few weeks. Plates are now £6 10s. and angles £6 2s. 6d. Other reductions made since the opening of the year are 10 shillings in Lancashire boiler plates, and 5 shillings in iron bars and angles in the North of England, where steel beams are down to £5 17s. 6d. In the Midlands, gas strip was officially reduced by 5 shillings [illegible] to 10 shillings.

The final account of the receivers of the Susquehanna Iron & Steel Company has been filed in the court at Lancaster, Pa. The receipts during the time of the receivership were $6,564,712.80, and the disbursements $6,541,618.79, leaving a balance of $23,094. In addition there remains due and payable to the receivers on account of the purchase money for the company's properties the sum of $100,000. The properties were sold some time ago, for $560,000, and are now being operated by the new owners, under the name of Susquehanna Iron Company. The balance in the hands of the receivers will, it is estimated, pay a dividend of about 40 per cent. to the creditors; but there will be nothing for the stockholders. The capital stock amounted to $1,500,000.

The Waltham Automatic Clock Gear Cutter.

A bench machine, designed primarily for cutting clock pinions, or gears for kindred mechanisms, where the most perfect work is desired, is herewith illustrated. It is adapted for cutting pinions of any size up to 1 in. in diameter and 1 in. in length of cut, the centers taking a staff longer than this. The machine is manufactured by the Waltham Machine Works, Waltham, Mass., and, as shown, is furnished with automatic feed from a magazine, but this may be dispensed with, the magazine being removable. For the most accurate, finished work three cuts are taken, but the mechanism allows for adjustment, so that either one or two cutters only may be employed if desired. In the highest class of work the pinion is first cut with a saw, then with a roughing cutter, and finally with a finishing cutter that removes only the slight imperfections left by the preceding operation.

The machine, a general view of which is given in Fig. 1, has two drives, one for the cutters, which is of constant speed, there being no necessity of varying the cutter speed, as the cutter is always of one diameter, the other for the cam shaft, which governs the automatic movements of the machine, and is taken from a three-step grooved pulley to provide for different lengths of work slide movement. The cutter drive is from a triple grooved pulley carrying three round belts. The duplication of belts is desirable that there may be no interruption to the operation should one belt break or slip. On the hub of the pulley is mounted a gear, which is one of a train of three gears that drives the cutter spindle. The gears, with the spindle, are carried on a swinging member, which is pivoted on the loose pulley shaft, permitting the cutter to be lifted from the work on the quick return stroke, and eliminating all belt pull from the spindle. The saw, roughing cutter and finishing cutter are carried on the spindle, the finishing cutter nearest the front bearing to give it the greatest stiffness. The spindle is of hardened steel, with bronze bushing and double cone bearings.

All automatic movements of the machine are from cams mounted on a single shaft, driven from the three-step grooved pulley through a hardened steel worm running in a bronze gear. The movement of the slide that carries the work is effected through the cam *a*, Fig. 2, in which runs a roll, *b*, Fig. 3, attached to the lever *c*. The lever is connected to the slide *d* by the connecting rod *e*, Fig. 4. This rod is adjustable in the lever so that it may be clamped at varying distances from the fulcrum, giving varying length of stroke to the work slide, as required. The opposite end of the rod is fastened to a rack connected to the slide by a pinion, the rack and pinion being used to adjust the work longitudinally in relation to the cutters. When adjusted they are securely clamped to the slide. The work is held between centers, as shown in Fig. 4, one end being driven into a taper hole, fitting the end of the pinion shaft, and the other on a conical dead center, so that it can turn freely.

The indexing is accomplished by means of a plate cut with the requisite number of notches, corresponding to the pitch of the pinion, and operated by a cam working through a lever and spring; this mechanism is of the company's standard type.

On the quick returns the cutter spindle is lifted by a plunger operated by a cam, the purpose being to prevent the cutter dragging through the work, and also that the indexing may be done during the return stroke without loss of time. When the index has completed a full revolution the slide *f*, Fig. 2, carrying the cutter spindle is automatically brought forward to place the next cutter in line with the work. On the slide *f* is mounted a cap, not shown in the drawing, which carries three-stop screws, one for each position of the cutter spindle. At the beginning of work on a blank the stop *h* on the plate *g* is in position for the stop screw regulating the spindle for the saw. At the end of the first revolution of the index the plate *g* shifts automatically, bringing its stop *i* in position to engage the roughing cutter stop screw. At the end of the second revolution of the index the screw regulating the position of the finishing cutter comes to a bearing on the stop *j*. The blank completed the screw *k* causes the plunger *l*, Fig. 5, to actuate the lever that throws back the slide. The plunger *m* operates with each revolution of the camshaft, but it performs no function except when the plunger *l* is brought into contact with it, when it returns the cutter slide to its orig-

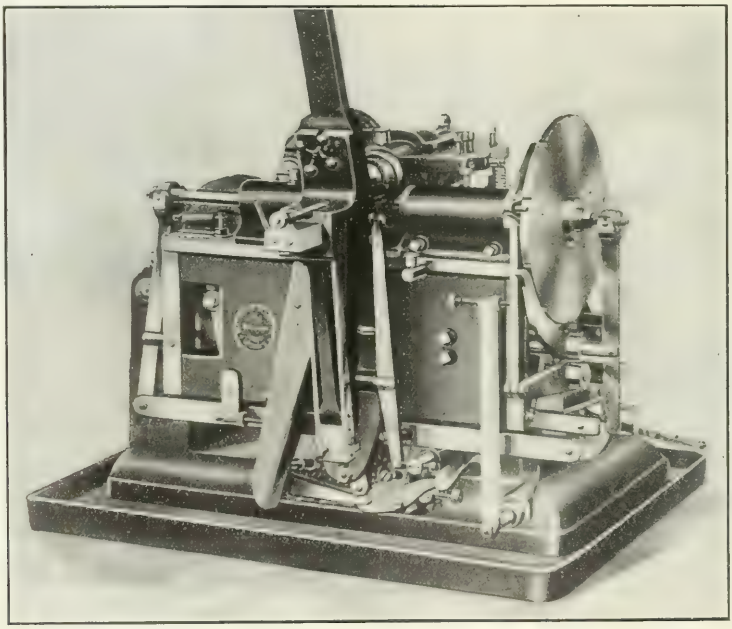


Fig. 1.—An Automatic Machine for Cutting Clock Gears, Made by the Waltham Machine Works, Waltham, Mass.

inal position for the first operation, that of the saw. While this is being done the part *n* of the plate *g*, Fig. 2, is brought into contact with the sliding bar *o*, causing the magazine to act and deliver a new blank to the work centers.

The power to operate the magazine feeding mechanism is transmitted from the return stroke of the work slide. The cut pinion is removed and a blank inserted in its place. To accomplish this the centers separate, the finished pinion is pushed out of its socket, a new blank is transferred to position in line with the centers by the sliding carrier *p*, Fig. 3, and the centers engage the blank, the carrier returning to position for another blank. The magazine feeding attachment can be easily removed and the machine used for hand feeding. A simple adjustment of an eccentric will adapt the machine to stop automatically at the end of the last cut. All working parts of the machine which are subject to wear are of hardened steel, and the same degree of care is carried through in the general construction of the tool.

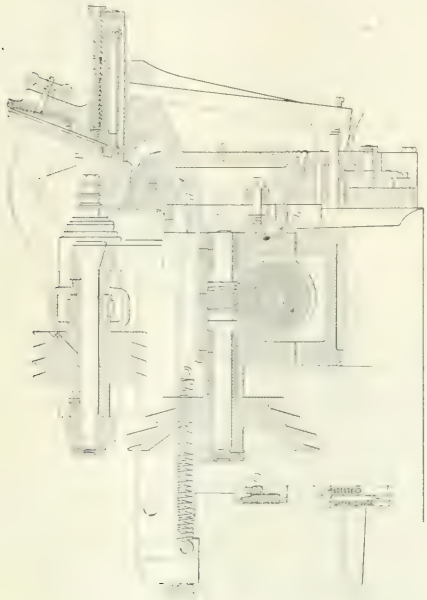


Fig. 3.—Left End Elevation.

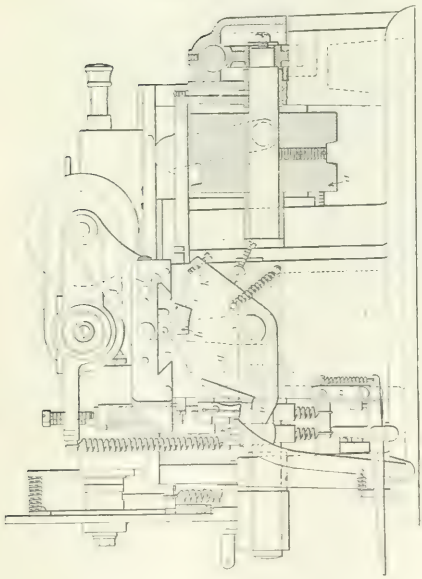


Fig. 2.—Front Elevation.

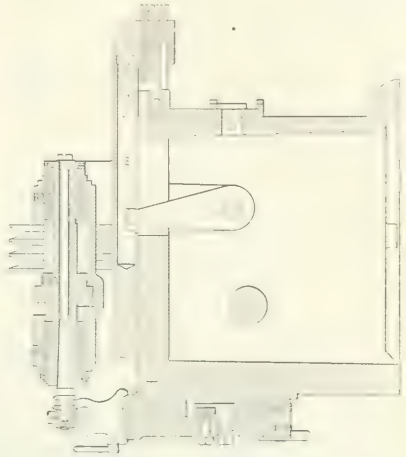


Fig. 5.—Right End Elevation.

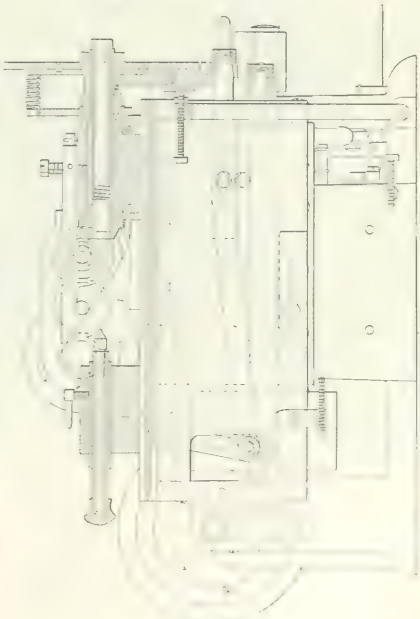


Fig. 4.—Rear Elevation.

THE WALTHAM AUTOMATIC CLOCK GEAR CUTTER.

During the late season of navigation the ore boat B. F. Jones, named in honor of the president of the Jones & Laughlin Steel Company, Pittsburgh, and owned by that company, brought down on its first trip 10,655 tons or ore, equal to a little more than 261 cars of 40 tons each. On the return trip the boat carried from Duluth to Buffalo 379,868 bushels of wheat, or 11,396 tons, said to be the largest cargo of wheat ever carried by a vessel. On the return trip north the boat carried 10,386 net tons of coal from Erie to Duluth, also one of the largest cargoes of coal ever carried by a single vessel.

At a meeting of the directors of the Republic Iron & Steel Company held in New York last week it was stated that the company was then operating more than 30 per cent. of its capacity, as compared with 18 per cent. in the last week in December. None of the idle blast furnaces of the company has been started up as yet.

The New Landis Staybolt Cutter.

One of the most important of the novel features of the new staybolt cutter, illustrated in Fig. 1, and recently placed on the market by the Landis Machine Company, Waynesboro, Pa., is its die equipment. The patent dies, although the same as used on other Landis bolt threading machines, are very different from those used on other staybolt machines. The chasers are each 4 in. long, and have threads milled on the flat side running the full length of the chasers, as shown in Fig. 2. These chasers are set tangent to the rod being threaded, which gives the correct cutting clearance. The rake can be ground to any angle desired to suit the kind of material being cut, and a rolling chip can be taken, as with a lathe tool, consequently the highest possible speed in thread cutting can be employed and the best results obtained. All chasers are perfectly interchangeable.

The fact that no lead screw is required to govern the pitch of the rod being threaded makes this die especially valuable in cutting staybolts. The chasers are not hobbed, but are milled, and are held in such a manner that the front or working teeth will do the cutting at all times, while the back teeth can do no cutting at all, but extend across the cutting line, and thus the four chasers form a lead nut, which bears on the threaded rod and draws it into the cutting teeth, true to the pitch of the die. This lead is so positive that it is claimed to be impossible to alter the pitch of the thread by retarding or forcing the rod into the die; the only effect would be either to strip the threads off the rod entirely, or to pull the teeth off the die. The lead remains constant always, since the die never needs to be ground in the throat; all grinding is done on the ends of the chasers, which gives them a uniform shape, and each grinding renews the leading qualities as well as the cutting ability of the dies. In Fig. 2 may be seen the line of bearing of the rod as it enters the die, showing the teeth that do the cutting, and it will be noticed that as the rod goes further into the die it takes bearing back of the face of the chaser.

Accuracy of pitch on work cut in machines using lead screws is doubly difficult to obtain, since it depends upon exact agreement between the leads of the dies and the screw, and both have to be hardened with a risk of suffering change of pitch. The best lead screw made must be cut with some form of die or on an engine lathe where accuracy cannot be guaranteed. With the Landis die there is only one hardening to contend with, that of the die itself, and in making these dies the shrinkage of the metal that may occur in hardening is taken into consideration, so that the inaccuracy of this die is minimized. When the dies and the lead screws in machines using the latter are not exactly of the same pitch, a bad and distorted thread will be produced, because the lead screw will work against the dies, and the lead screw nut being the most powerful the die is bound to distort the thread, making it ragged and frequently pulling off the tops of the threads, as all of the teeth of a hobbed die can shave the thread. The die in the Landis machine, it is claimed, never requires to be annealed, hobbed or retempered, consequently is not subject to the changes which are liable in rehobbing dies. The life of the die is also claimed to be greater than that of any other, and to have a much wider range on special diameters.

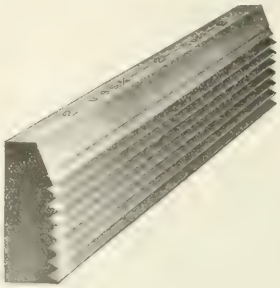


Fig. 2.—One of the Chasers, Four of Which Constitute the Die.

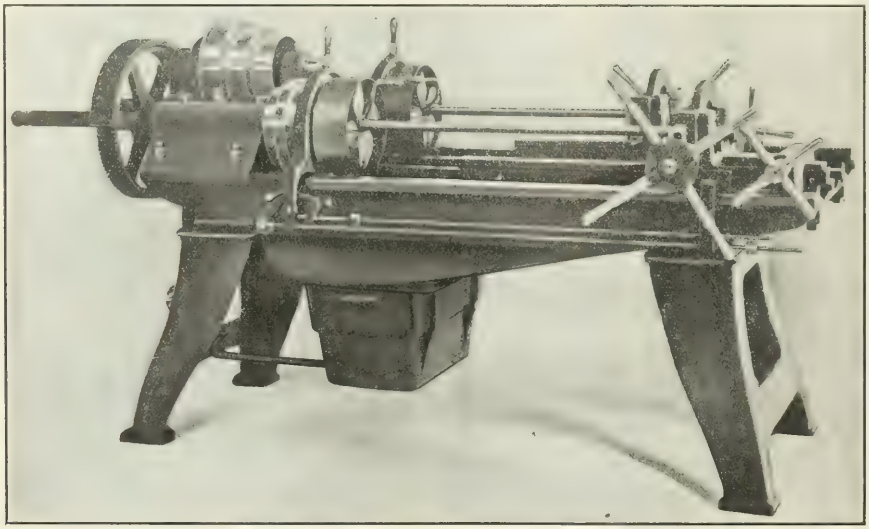


Fig. 1.—The New Staybolt Cutter Built by the Landis Machine Company, Waynesboro, Pa.

The carriage on the machine has adjustment up and down and sidewise, hence the work can be centered to the die and the cutting strain is central. The rack is provided with recesses between the teeth, so that chips or scale dropping on the rack will fall through and offer no interference to the teeth of the carriage pinion. The machine is built in single and double head patterns in sizes up to 1½ in. capacity. High speed dies can be furnished and used to great advantage, especially since they do not require rehobbing or retempering. Each machine is provided with a pump, a countershaft, wrenches and an automatic throw-out. The main spindles of the machines are so arranged that any oil which may be carried into the spindle will feed back into the oil tanks, and not be carried out at the rear end of the spindle to run on the floor.

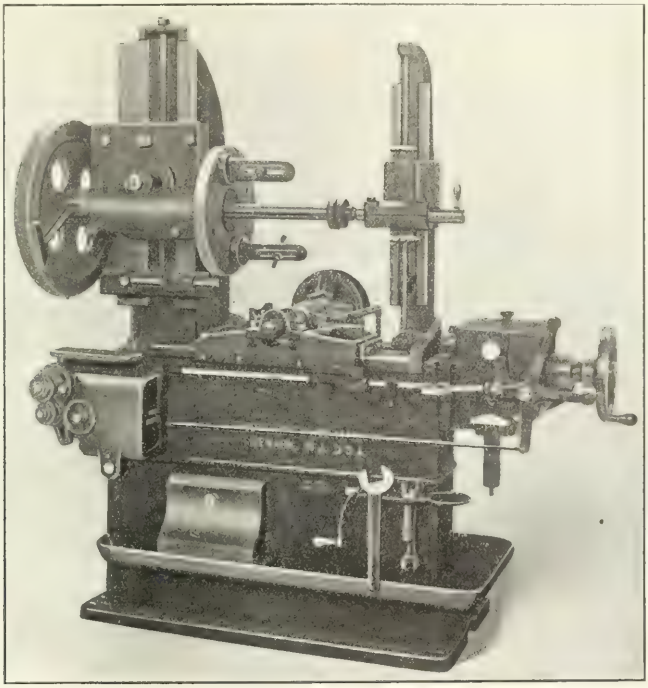
The Eberhardt Bros. No. 3 Spur Gear Cutter.

The machine herewith illustrated is new only in that it is a new size of the automatic spur gear cutting machine made by the Eberhardt Brothers Machine Company, Newark, N. J., and has an especially large face capacity. It is known as the No. 3 machine, and is intended to cut pinions and spur gears up to 36 in. diameter by 10 in. face. Cast iron gears of four diametral pitch and steel gears of five diametral pitch, can be formed at one cut and with a fast rate of feed; heavier work is possible by taking a preliminary stocking out cut.

The unusually wide face that it is possible to cut, 10 in., is an advantage when cutting narrower gears, since a stack of two or more can be cut at one setting. This is made possible by the arrangement of the frame and cutter slide; the extremities of the slide guides are allowed to run slightly past the column, so that the cutter spindle may be brought very close to the face of the column.

In respect to its mechanism the machine is similar to others that have been produced by this concern. The principal features—the positive indexing mechanism, the spur gear drive to the cutter spindle, the arrangement whereby the feed screw is under tension instead of compression, and the long cutter carriage with the spindle in the center of its length, have already been described in these columns in connection with the illustration of the No. 5, a 60-in. machine, which appeared in *The Iron Age*, May 30, 1907. A point deserving repeated mention is the placing of all of the controlling handles on the side and near the hand wheel at the end of the machine so that the operator has control of all of the movements from one position. The hand wheel has a clutch and spring to keep it disengaged during the operation of the machine.

The equipment regularly furnished includes an indicator for setting the cutter central; change gears for cutting all numbers of teeth from 10 to 100 and all from 100 to 400, including multiples of the prime number change gears, but excepting prime numbers over 100, and many higher numbers; change gears for speed and feed changes; a face plate with jacks and drivers for driving gears; a work arbor with collars and stepped flanges; a removable type of cutter arbor; an oil pump and fittings, and a countershaft. The countershaft is of the tight and loose type and is ring oiling. The loose pulley is fitted with a loose bush arranged for lubrication.



The No. 3 36-In Automatic Spur Gear Cutting Machine Built by the Eberhardt Brothers Machine Company, Newark, N. J.

The Forest Service at Washington estimates that the steam and street railroads of the country used in 1906 for new track and renewals more than 100,000,000 crossties. The average price was 48 cents. Oak furnished more than 44 per cent. and the Southern pines, which rank second, about one-sixth. Ten per cent. of the ties purchased were treated with preservatives. In the United States, estimating 2800 ties to the mile, there are over 800,000,000 ties in service. Cedar ties last 11 years, spruce 10 years, redwood nine years, but these woods are not generally available, and they lack the desired weight and hardness. Of tie timbers in general use—chestnut, white oak, tamarack, spruce and Douglas fir—the average life is but seven years. A treated tie, with equipment to lessen wear, will last 15 years. It is estimated that to maintain each tie now in track two trees must be growing.

At the annual meeting of stockholders of the Riter-Conley Mfg. Company, Pittsburgh, builder of iron and steel construction work of all kinds, H. A. Carpenter was elected president; J. Gilmore Fletcher, vice-president and general counsel; W. L. Jack, treasurer, and T. B. Riter, secretary. The resignations of John S. Craig, secretary and treasurer; W. C. Coffin, vice-president, and Robert A. McKean, general manager, were accepted by the board. Mr. Carpenter, who succeeds T. B. Riter, deceased, as president of the company, was graduated from the Sheffield Scientific School of Yale in 1891, and has been connected with the Riter-Conley Mfg. Company since 1896.

Gisholt Turret Lathe Work.

The following description of methods for finishing flywheels gives a good idea of what may be accomplished in the saving of time on this class of work when performed on a turret lathe of the type built by the Gisholt Machine Company, Madison, Wis. A method of finishing a flywheel of the type used on automobile or other gas engines at one chucking in the lathe is graphically indicated in Fig. 1. There are certain kinds of wheels that will permit of finishing to excellent advantage by this method

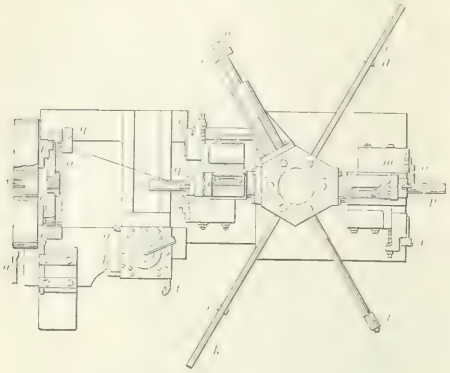


Fig. 1.—Finishing a Flywheel in One Operation.

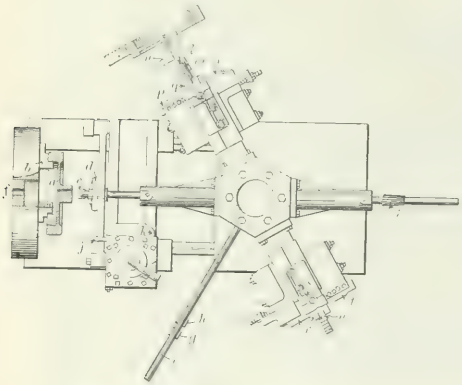


Fig. 2.—First Operation by Another Method.

which will effect a material saving in time over methods requiring a second operation. The carriage of the machine here illustrated is equipped with a wing rest, or auxiliary tool post, mounted, as shown. The adjustable

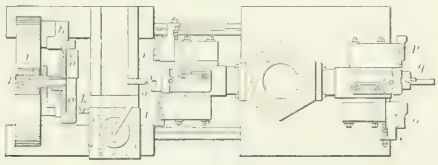


Fig. 3.—Second Operation by the Same Method.

tool holders shown on the main turret are hereinafter referred to as the facing heads.

The piece *a* is first chucked on the inside of the rim with special hard chuck jaws, *b*. The pieces *c* are clamped to the face of the chuck as stops, so that every piece of work may be chucked in exactly the same position. The first operation consists in rough boring the hole. This is done with the double ended cutters *d* in the boring bar *e*, while the bar is supported in the chuck bushing at *f*. While boring the hole, tools *g* and *h* are used for breaking the scale on the front face of the hub and rim. Tool *h* in the turret tool post is used for breaking the scale on the periphery, and tool *i* in the wing rest, is used for breaking the scale on the back face of the rim. As soon as the scale is removed the hole is finished with the cutter *j* in the bar *k*, and is reamed with a reamer *l* mounted on a floating arbor. Next, the cutters *m*, *n* and *o* in the facing head are used for rough facing the front of the rim and hub. The facing head is supported in the finished hole by the arbor *p*. The front of the rim and hub face are than finished with the cutters *q*, *r* and *s* in the finishing facing head. The periphery is finished with the cutter *t*, and the back face with the cutter *i*, and the cutter *u* is used for rounding the inside of the rim. For finishing the back of the hub, the cutter *v* is removed from the boring bar *w*. This bar is then inserted through the bore, and the cutter *v* reinserted in its slot; the turret carriage is then backed away, and the rear end of the hub faced.

A method of finishing flywheels in two operations is illustrated in Figs. 2 and 3. This is a webbed wheel, and is finished all over. The first operation consists of the following steps: The piece is chucked at *a* on the inside of the rim with the regular inside hard chuck jaws, *b*. First, the cored hole is rough bored with the cutter *c* in the end boring bar. This bar is held in the drill holder, which is bolted to the main turret, and is supported by the drill support *d*. Next, the turret is rotated one face to the left, bringing the boring bar *e* into position (the drill support being thrown back out of the way). The bar *e* is supported in the chuck bushing *f*, while the two cutters, *g* and *h*, are used to rough out the hole preparatory to using the taper reamer *i* shown on another face of the turret. The small end of the hole is finished to within 0.002 in. by the cutter *g*. While boring with the bar *e*, the scale is broken on the web and hub of the piece with the tool post tools shown at *j* and *k*. The scale on the periphery of the piece is broken with the tool *j*. The hole is reamed with the taper reamer *i* supported in a bushing in the chuck, and a taper bushing, *l*, is then inserted for receiving the supporting arbor *m* in the facing head. The piece is rough faced, and turned with cutters *n*, *o*, *p* and *q* in the facing head. This brings the piece approximately to size. For finishing, the cutters *r*, *s*, *t* and *u* in the finishing head are used, this head being supported in the taper bushing *l*, while a light finishing cut is taken.

In the second operation, as shown in Fig. 3, the piece is chucked on the outside diameter with soft slip jaws, *b*, which are bored to the exact diameter of the piece. The piece is further supported in the hole by the sliding bushing *l*, which is held in the chuck bushing *f*. First, the scale on the web and inside of the face of the rim is broken with the tool post tool *k*. These surfaces are then roughed off with the cutters *q*, *o* and *p* in the facing head, the arbor *m* being inserted in the bushing *l* for supporting this head, and the piece is brought approximately to size. Finally, a light cut is taken with the cutters *u*, *r* and *t* in the finishing facing head, which completes the operation.

At the annual meeting of stockholders of the Harbison-Walker Refractories Company, recently held in the Farmers' Bank Building, Pittsburgh, the retiring directors were re-elected, with the exception of S. C. Walker, deceased, and W. A. Stanton, resigned. William Walker and N. McQuillen were elected to fill the vacancies. At the meeting of the board H. C. Croft was elected president to succeed S. C. Walker. Mr. Croft had been vice-president of the company, and Hay Walker, Jr., was elected to succeed him in that capacity.

The shipyards on the Great Lakes are busy, after a short period of quiet. The American Shipbuilding Company now has at work about 75 per cent. of the force of 10,000 men normally employed. Within 10 days three large freighters will be launched, making a total of five since January 1.

The Napier Continuous Cutting Hack Saw.

A very unique tool is the continuous cutting power hack saw machine, built by the Napier Saw Machine Works, 119 Liberty street, Springfield, Mass., in that it applies the principle of a band saw to the cutting of metals and saws toward instead of away from the application of power. Its capacity is unusual, the vise taking work of a section 5 x 12 in., and this may be increased by extending the vise for length and raising the position of the arm for width. An I-beam may be cut with the machine; in fact, one of its important purposes is the cutting of structural steel, which it does quickly and accurately as to angle. Economy is claimed for the tool, not only because there is no idle stroke, since the saw is continuously cutting and the wear on the teeth is equal throughout, but because the wear is greatly reduced, due to the absence of back motion.

The saw, which is 10 ft. long, is driven by two of the three sprocket wheels, which engage the holes cut in the band. A worm on the pulley shaft meshes a worm gear mounted on the sprocket shaft at the front of the machine, Fig. 1. The worm gear also has bevel gear teeth, which engage a bevel gear driving the sprocket shaft at the rear of the head. The third sprocket mounted on a bracket at the end of the rod acts as an idler and also as a brake to maintain the saw in tension between it and the driving sprocket on the same side of the machine, the two points between which the cutting is done. The brake is a fricion located in this idler. An additional guide is mounted on a bracket adjustable on the rod. Each of the sprockets has its idler on the opposide side of the saw blade, insuring engagement of the sprocket and saw. The feed of the saw is by gravity, as in other hack saw machines the degree of feed being determined by the weight at the end of the rod. Located in the driving pulley is a friction clutch to engage the pulley with the driving shaft. This friction is operated by an automatic knock-off, the moment of action of which is determined by the position of the stop on the vertical rod, seen in Fig. 2.

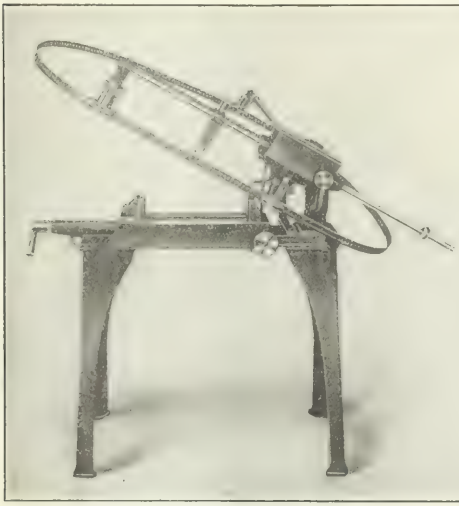


Fig. 1.

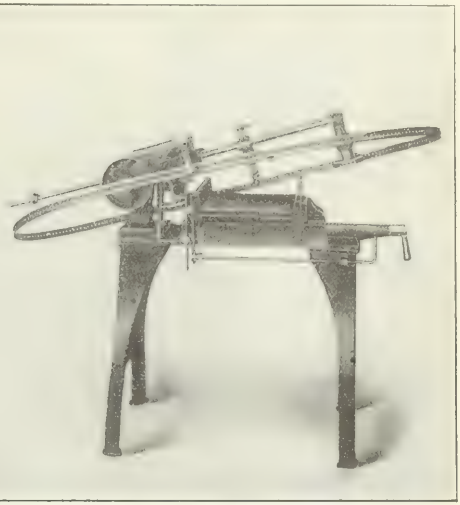


Fig. 2.

Views of the Opposite Sides of the Continuous Cutting Power Hack Saw Machine Built by the Napier Saw Machine Works, Springfield, Mass.

The General Committee on Co-operation in the Steel Trade has made the following additions to the subcommittee on Ore and Pig Iron: Frank S. Witherbee, 2 Rector street, New York; E. S. Cook, president Warwick Iron & Steel Company, Pottstown, Pa.; Charles H. Zehnder, president Allegheny Ore & Iron Company, 140 Cedar street, New York.

Plating Small Articles with Brass.

The method followed in the United States for depositing brass upon small articles, such as cigar box nails, rivets and safety pins, is explained by Charles H. Proctor in the *Metal Industry*. The plating barrel is used, or a regular plating bath with woven wire baskets. The sides and ends are made of celluloid, hard rubber, hard wood, or some other nonconducting material. The bottom of the basket is made of woven brass wire of a mesh so small that the articles will not pass through. Heavy conducting wires should lead from the woven wire in the shape of hooks or supports to hang the baskets upon the negative pole while the depositing is being done. The following formula should be used for the bath:

Water, gallons	25
Cyanide of potassium, 98 per cent., pounds	25
Carbonate of copper, pounds	10
Carbonate of zinc, pounds	5
Carbonate of soda, pounds	1
Ammonia water, 26 per cent., pints	2 to 3

A voltage of not less than 6 should be used, with a good amperage. The articles may be cleaned by tumbling in carbonate of soda water after the regular tumbling has been performed. A tumbling barrel may be used made up of wood and rotated slowly. The negative conductors should be small strips of copper. On the outside of the barrel are two copper bands. Provision is made by incisions in the barrel to make connections with the anode and the conductors in the baskets. The current is taken by the copper bands by spring contact strips, and thence to the anodes and cathode or basket. The time of deposit should be from 20 min. to half an hour. An angle barrel will be found the best and it should be of such size as to plate from 50 to 100 lb. at each immersion.

The Standard Steel Works Company, incorporated December 23, 1907, to take over the Standard Steel Works, Burnham, Pa., will sell at present only $4,000,000 of the proposed $5,000,000 bond issue. It is stipulated that the additional $1,000,000 of bonds be issued only to provide further extensions to the plant. The Standard Steel Works was established in 1871, with a capital of $100,000, and its mortgage indebtedness was $100,000. All the profits for many years were turned back, and at present the property is valued at $7,000,000. Burnham, Williams & Co., proprietors of the Baldwin Locomotive Works, own all the stock of the company, which is now

D'Amour's Improved 12-In. Sensitive Drill.

A more powerful drive than is provided in former drills of this type is one of the features of D'Amour's improved 12-in. bench drill press, illustrated in Fig. 1 herewith, and built by the Charles Ramsey Company, 135th street and Willow avenue, New York. The spindle pulley and the countershaft pulleys are of unusually large diameter, giving greater belt speed, and the spindle has a ball thrust bearing. Another feature is the manner of adjusting the idlers for the two different paths of the endless belt that connects the two-step pulleys on the

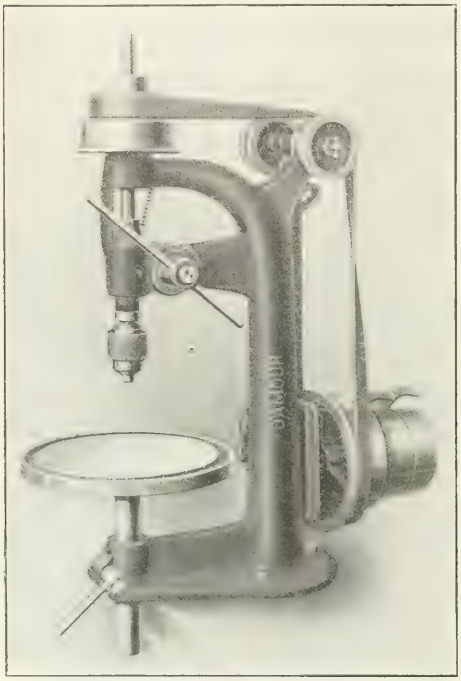


Fig. 1.—D'Amour's Improved 12-In. Bench Drill Press Made by the Charles Ramsey Company, New York.

countershaft and the spindle. As more clearly shown in Fig. 2, the idlers are mounted on a bracket carrying a quadrant that limits the oscillation of the bracket. At one extreme the idlers are in their highest and furthest forward position, causing the belt to align with the smallest step of the spindle pulley and the largest step of the countershaft pulley, giving the fast speed. Swinging the idlers to the opposite extreme lowers them the width of the belt and moves them rearward the same amount to properly guide the belt to and from the other two steps of the pulleys, corresponding to the slow speed. No provision is made in the idlers to take up the stretch of the belt; the countershaft pulleys are carried by a bracket that has a vertical adjustment, through which the belt may be tightened.

The pull of the belt is not transmitted to the spindle, as the driven pulley is carried by a quill, having an independent bearing. The spindle slides freely through this quill, but is feathered to rotate with it. The spindle is of open hearth steel, and is counterbalanced by a weight inside the frame, making the drill extremely sensitive and uniform to the touch. Means are provided for taking up wear or lost motion in the spindle bearings. As regularly furnished the machines have spindles fitted to receive 5-16-in. Almond or Jacobs drill chucks. If desired they are left plain or are fitted to any drill chuck submitted. On the spindle there is a nut above the taper upon which the chuck is fitted, for readily removing the latter.

The usual hand lever feed to the spindle through rack and pinion is provided, but instead of an adjustable stop mounted as a collar on the upper end of the spindle, the stop is applied directly to the hand lever or pinion shaft. This may be clamped at any angular relation, so as to contact with a fixed stop on the frame when the required drilling depth has been reached. It is thus possible to drill or counterbore any number of holes to exactly the same depth, and the device has the advantage that it does away with any tendency to spring the frame of the machine.

The table of the drill is 9 in. in diameter, and has an oil and chip retaining groove around the working surface. It may be revolved to any angle and raised and lowered a maximum of 5 in. The vertical adjustment of the spindle is 2 in. and the greatest distance from the spindle to the table is 8 in. Holes up to 5-16-in. may be drilled to the center of a 12-in. circle. The tight and loose pulleys on the countershaft are 4 in. in diameter by 1¼ in. face, and are intended to run at about 450 rev-per min. when drilling cast iron and soft steel. The countershaft being a part of the machine, it may be

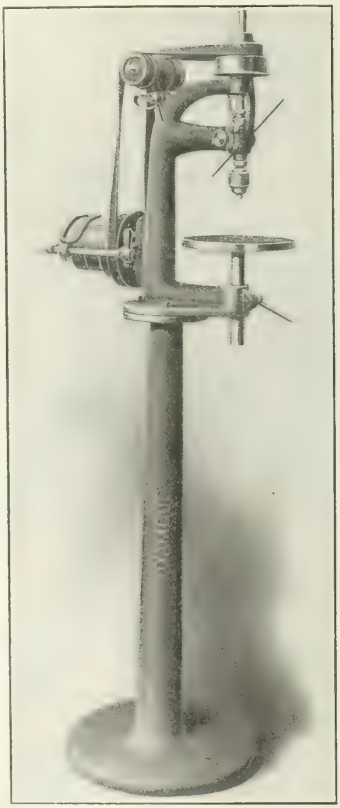


Fig. 2.—The Same Press Mounted on a Column, Showing the Opposite Side.

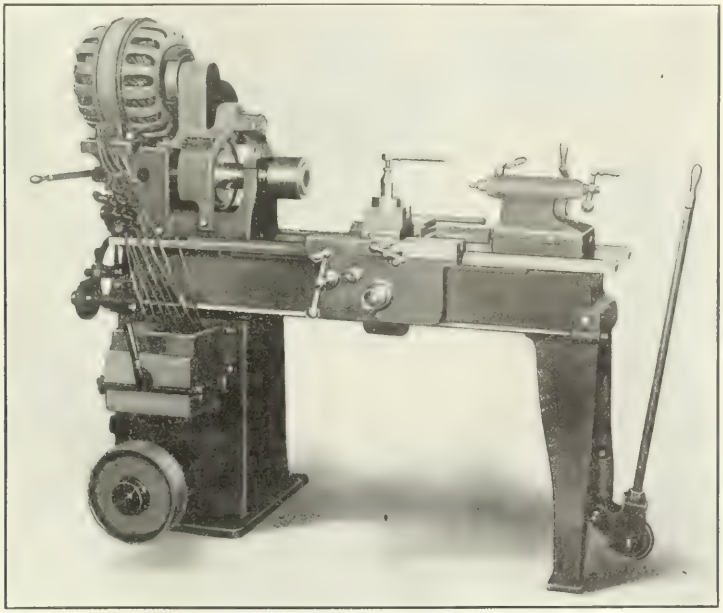
belted directly to the line shaft. The machine is carefully built, and the rotary parts are balanced so that it is allowable to run the spindle at a high rate of speed. Where it is not desirable to mount the drill on a bench it is supplied with a column, as shown in Fig. 2. The total weight with this column is 120 lb., and without it 60 lb.

The effort to form an association including the majority of the manufacturers in the United States of the small sized brass and copper tubes has been given up, one of the manufacturers participating in the preliminary conferences having withdrawn.

Westinghouse Motor-Driven Portable Lathe.

In an editorial in *The Iron Age*, January 9, 1908, "Progress in Machine Tool Design," comment was made of the increasing use of portable machine tools, which reversed the usual order of things in that the tool is brought to the work instead of the work to the tool. It was also remarked that electric drive has made such tools possible. That statement is well borne out in one of the latest examples of this class of tool, which is herewith illustrated, a portable motor driven lathe. It is particularly intended for turning bolts, and to be used in locomotive repair shops. The lathe was built by the Williams & Wilson Company, Montreal, Canada, and is equipped with a Westinghouse motor.

Two ways of transporting are possible. For short distances it may be rolled on the wheels upon which it it mounted, or it can be lifted by a crane and placed beside an erecting pit and then shifted to the exact position desired by hand. When in working position the



A Portable Lathe Built by the Williams & Wilson Company, Montreal, Canada, Equipped with a Westinghouse Motor.

single wheel at the tail end is deflected by lifting the tongue handle so as to allow the two rear legs to rest on the floor. The weight of the lathe is then sufficient to keep it from moving unintentionally during its operation.

An alternating current induction motor is applied on the machine illustrated and is of 2-hp. size, intended to run at 1700 rev. per min. Through a friction clutch and change gears it is connected with the lathe spindle, so as to drive the latter at either 200 or 400 rev. per min. When desired the machine is equipped with a direct current motor, and one of variable speed form may be selected to give a wider range of speeds for the spindle.

There are located about the shop at convenient intervals plug receptacles for connecting the motor through flexible cables to the electric current supply, and a simple and convenient plug is attached to the cable for that purpose.

The particular utility of this machine is that it enables the turning of each individual bolt to the exact size required in the place it is to be used, and saves the time which is ordinarily lost in making trips to and from the machine shop to get exactly what is wanted. At the same time the mechanic is allowed to carry on his work without interruption. When not in use the machine can be moved to some point in the shop where it will be out of the way of the workmen, and at such times it may be used as a convenient auxiliary to the regular machine shop equipment.

Increasing Use of Storage Batteries.—It is predicted by the *Electrical World* that the use of storage batteries will increase greatly in the next few years. It cites the belief of many engineers that the steam turbine marks only a transition period in prime movers, which must give way to the internal combustion engine because of the superior economy of the latter. The gas engine has no overload capacity; it operates best when delivering a steady amount of power, and is liable to give trouble when worked on light loads. The storage battery affords the required flexibility in respect to variations in the external load while maintaining a constant load on the generating equipment; as one writer puts it, "the storage battery is the natural consort of the gas engine." An extended use of gas engines for driving electric generators will undoubtedly be attended by a corresponding increase in storage battery work.

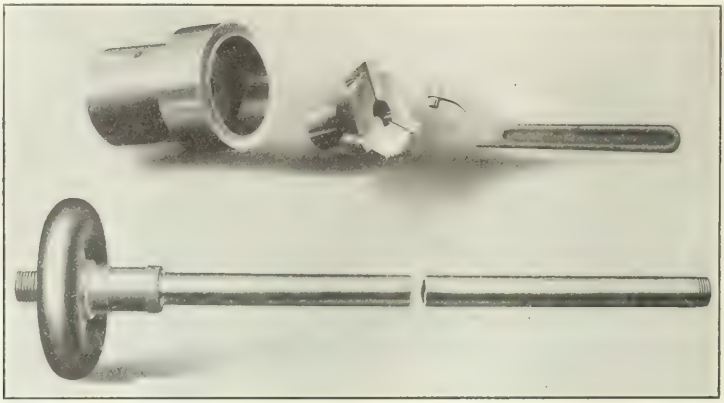
The Pittsburgh & Lake Erie Railroad, which was one of the first roads to use steel freight cars extensively, now has 55 per cent. of its cars of steel construction. This road has paid particular attention to the development of an economical system of repairing steel cars for several years, doing its work in the open and having few special facilities. At its McKees Rocks, Pa., shops it has now an extensive car repair department, equipped with special devices for expediting work on steel cars. A spraying machine is used in painting steel work. The company has 4174 twin hopper gondola cars, 3216 hopper cars, 1600 coke cars, 117 flat cars, all of steel, and 250 composite gondola cars with steel underframes.

Owing to the dullness in the iron market, the blast furnaces in the Broad Top Mountain District of Pennsylvania have nearly all blown out. The Colonial or Riddlesburg plant is now the only one running, and a shutdown is probable there. The Rockhill and Earlston furnaces went out a number of days ago, and the No. 2 Saxton furnace of Joseph E. Thropp has just been banked.

The A-C Adjustable Collet Lathe Attachment.

For holding small work in engine, speed or turret lathes, or end mills in vertical or horizontal milling machines, the device illustrated has been brought out by the Adjustable Collet Company, 224 High avenue, Cleveland, Ohio. It is known as the A-C draw in attachment, with adjustable spring collet chuck, and by replacing a full set of spring collets, as they are now made, it does away with the bother of changing from one size to another, since it will grip any diameter of stock over or under size within its range.

The hood is threaded for screwing directly to the spindle of the lathe and the adjustable spring collet is fitted into the hood, which insures its running true. The device is very easily attached to or detached from a lathe or other machine by the use of a spanner wrench, which is furnished with it for that purpose. Adjustment of the size of the collet is effected by turning the hand wheel to the right or left on the threaded portion of the draw tube.



The Separated Parts of a Draw-In Attachment with Adjustable Spring Collet Chuck, Made by the Adjustable Collet Company, Cleveland, Ohio.

These collets are made in three standard sizes: For 12 and 14 in. lathes the capacity is from ⅛ to ¾ in., inclusive; for 16 and 18 in. lathes, ⅛ to 1 in. inclusive, and for 20-in. lathes, ⅛ to 1½ in. inclusive. These figures refer to the passing capacity, or the opening of the jaws furnished for bar stock. All sizes are made with step jaws to take work of greater diameter, such as castings, collars or other work too large to be passed through the hole in the spindle. The attachments are also made to fit any special size not above mentioned and to meet the requirements of any size or make of lathe. In ordering it is necessary to specify the diameter, length and pitch of the thread on the spindle, and the length of draw bar required.

Results With Iron Crucibles.—Referring to the experience of brass founders in the use of iron crucibles, instead of graphite, in melting aluminum, the *Brass World* says: "Iron crucibles have been used to some extent by the large aluminum founders, not because they possess any particular advantages, but on account of their low cost. They have been used for melting large quantities of aluminum, and in instances where a large graphite crucible would not give the best results. Graphite crucibles larger than No. 300 are rarely used, and it is in cases where much larger melts are to be made than such a crucible would hold, that the iron crucible has been employed. It has been found, however, that the aluminum attacks the iron and not only becomes deteriorated itself, but injures the crucible. The crucible, too, frequently cracks. As far as we can ascertain, the experience with them has not been such as to warrant their extensive use."

Shafting Friction.

Interesting data concerning the friction load of shafting in an electrically driven machine shop when equipped with Hyatt roller bearings are given in bulletin No. 103, recently published by the Hyatt Roller Bearing Company, Newark, N. J. The figures are from official tests made in the locomotive shops of the Buffalo, Rochester & Pittsburgh Railway Company at Du Bois, Pa. This part of the test was incidental to a more complete investigation into the amount of power used by various machine tools when operating in regular routine work, and it was found by using group drive as here employed there was a saving of from 40 to 50 per cent. in the amount of power that would have been required in individual motors. The line shafts are cold rolled steel carried on Hyatt roller bearings. There are five lines of shafting, of which the following gives a summary of the data concerning each:

	Wheel section.	Boiler section.	Lathe section.	Tool section.	Blacksmith shop.
Length of shaft, feet	200	170	180	140	75
Diameter of shaft, inches	2½	2½	2½	2½	2½
Speed of shaft, revolutions per minute	160	158	155	155	..
Number of hangers	26	19	22	20	12
Power of driving motor, horsepower	40	30	30	20	40
Number of tools driven	13	11	22	20	9
Power consumed by shaft alone, horsepower	..	0.3	0.7	..	..
Power consumed by shaft and counters, horsepower	1.5	2	4.1	2.8	..
Power consumed by shaft and counters, a grindstone and two blowers, horsepower	..	..	..	..	14.5

For the wheel section, tool section and blacksmith shop line shafts, it was inconvenient to obtain a test of the line shafts alone. In the third case it was necessary also to run a grindstone and two blowers, as noted. These tests were carried out by H. M. Palmer and George H. Gibson of the Westinghouse Electric & Mfg. Company by permission of F. T. Hyndman, master mechanic, and with the assistance of C. D. McArthur, chief draftsman of the Buffalo, Rochester & Pittsburgh Railway Company.

The total trade of the Dominion of Canada for the calendar year 1907 was $658,599,974, as compared with $594,319,289 for 1906, an increase of $64,280,685. The total imports were $385,275,360, an increase of $60,433,675; total exports $273,324,614, an increase of $3,847,010. The total exports of domestic produce were $238,015,557, a decrease of $730,765. The total exports of foreign produce amounted to $35,309,057, an increase of $4,577,775.

The Hendershot Coupling.

Several new features which give it great strength and facilitate its quick and convenient application are found in the Hendershot coupling, now being introduced by Manning, Maxwell & Moore, Inc., 85 Liberty street, New York. The general appearance of the coupling assembled is shown in Fig. 1. The component parts are shown in Fig. 2 and in Fig. 3 the method of application is shown.

Two short taper compression sleeves, S, S, Fig. 2, are provided, which make it possible to put the two halves *a* and *b* parallel. The coupling is easily taken apart by screwing two bolts in holes that are tapped in the shell for the purpose.

In connecting shafting together this coupling enables time to be saved, especially in a new factory, where it is not convenient to start up to see how the line runs. This feature will appeal to millwrights and mechanics, who have had experience in coupling shafting with compression couplings of the single sleeve type, and to mill owners, as the time saved in using the coupling is quite an item. If put on properly the shafting cannot be sprung.

Slight inequality in size, or disparity of alignment, or both, is of no consequence, as the coupling will adjust

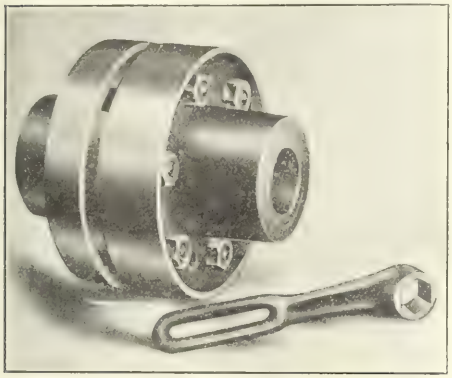


Fig. 1.—Assembled View of the Hendershot Coupling.

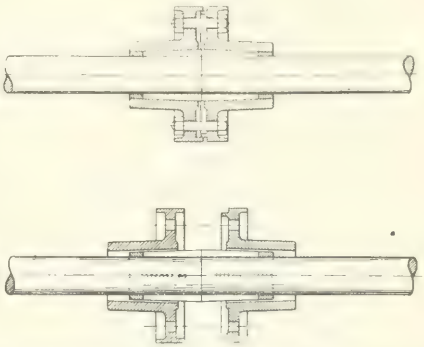


Fig. 3.—Sectional Views of the Coupling Connected and in Process of Connecting.

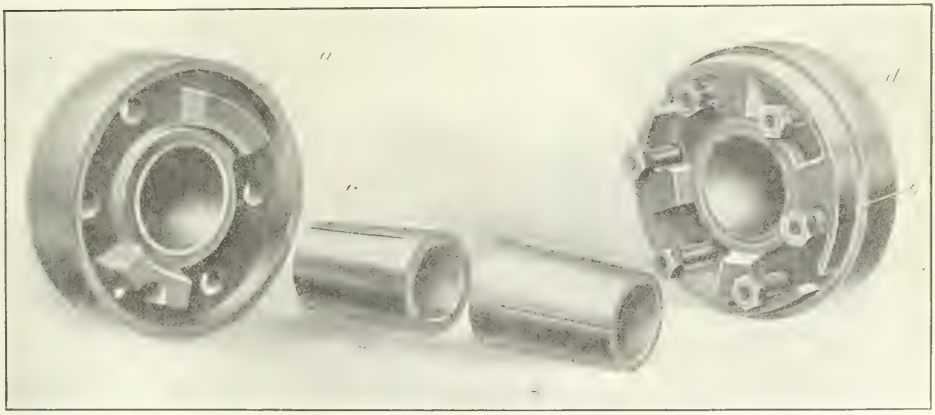


Fig. 2.—The Separated Parts of the Hendershot Shaft Coupling, Sold by Manning, Maxwell & Moore, Inc., New York.

of the coupling in place while the shafting is on the floor, so that it may be hoisted into position and bolted together as easily as the old fashioned plain flanged coupling. The shells A and B, Fig. 2, contain cast lugs which, interlocked, from a clutch, which puts all torsional strain upon the shells, leaving the bolts in tension only and making a rigid and durable connection. Although the bolts are subject to no shearing strain, six are used where generally four are considered sufficient. This is in keeping with the very large compression area of this type of coupling and the unusually large factor of safety provided.

In applying the coupling the shells A and B are slipped upon the shafting first. Then the sleeves S and S are put into place, so that the shells may be drawn over them. The lugs of shells A and B are brought into interlocking position and the shells are bolted together. The fitting surfaces *c* and *d* practically true up the coupling, but perfect alignment is insured by keeping the two faces itself and the compression will be the same the full length of the sleeve, which is not possible when the sleeve is one piece. The sleeves are made thinner and the hubs heavier, thereby greatly increasing the strength without increasing the outside diameter of the coupling. The coupling is made of the best gray iron, and is heavy enough to withstand all strains. Every coupling is put together on a test pin and inspected before it leaves the factory.

The subject of trade schools is attracting considerable attention among Cleveland manufacturers, and the matter will be discussed at a smoker and informal meeting of the Cleveland Branch of the National Metal Trades Association and other manufacturers of the city, to be held at the Hollenden Hotel, on the evening of January 31. J. H. Cone of Cincinnati will give a talk on "The Operating Trade Schools of the Country," outlining some plans for consideration and possible adoption by the Cleveland manufacturers.

Patent and Trademark Legislation Proposed.

WASHINGTON, D. C., January 27, 1908.—Eight important bills amending the patent and trademark laws of the United States have been presented in Congress, and it is understood that the House Committee on Patents will take them up for consideration at an early date. These include a bill creating a court of patent appeals; another reorganizing the Patent Office and increasing the salaries of the employees thereof; a third providing an appropriation for a new and commodious building, and a series of five measures amending the statutes relating to the allowance of patents and the registration of trademarks.

The proposition to establish a United States Court of Patent Appeals has been strongly urged by the various patent bar associations and by many owners of patents and trademarks. The bill recently introduced by Senator Beveridge of Indiana provides a tribunal of five judges to be designated by the United States Supreme Court from among the judges of the United States circuit and district courts, to have exclusive jurisdiction "to hear and determine appeals and writs of error from final judgments and decrees in the circuit courts of the United States," in cases arising under the patent and trademark laws. The necessity for such a tribunal grows out of the fact that under the present laws it frequently happens that the lower courts in two or more different jurisdictions will render diverse decisions with regard to the same question, and, there being no constitutional issue involved, these decisions cannot be harmonized by an appeal to the United States Supreme Court.

Amendments to Patent and Trademark Laws.

The five bills for the amendment of the patent and trademark laws, which are now pending, have been very carefully drafted by the Commissioner of Patents. Each makes certain changes in the text of the existing statutes, but the principal object is to expedite the consideration and allowance of patent and trademark applications. Under the present law appeals lie in *ex parte* cases from a primary examiner to the Board of Examiners-in-Chief, thence to the commissioner (or assistant commissioner), and from his decision to the Court of Appeals of the District of Columbia, and in interference cases the course of appeals from decisions of the examiner of interferences is the same, there being three appeals in each case.

The purpose of the proposed amendments is to shorten the course of prosecution by the elimination of one of the appeals within the office. This is designed to be accomplished by combining the commissioner, assistant commissioner and Examiners-in-Chief into a single appellate tribunal, any three of whom shall constitute a quorum, to which all appeals shall lie, whether from a primary examiner or from the examiner of interferences, and from which appeals would lie to the Court of Appeals of the District of Columbia.

The Board of Examiners-in-Chief as at present constituted consists of three members, and no provision is made under the present law to supply a temporary vacancy caused by the sickness or absence from other cause of any of the members. The absence of one member often results in an evenly divided Board, with the consequent necessity for a rehearing, and the absence of two members causes an entire suspension of business. With the proposed membership of five, the presence of a quorum of three would be practically assured at all times, which has not been the case in numerous instances in the past, owing to frequent absences of a member of the Board on account of periods of illness of greater or less duration and also by reason of annual leave and other causes.

The existing trademark law provides for appeals from the Examiner of Trademarks and from the Examiner of Interferences in trademark cases directly to the Commissioner (or Assistant Commissioner). From these tribunals appeals lie to the Court of Appeals of the District of Columbia, as in patent cases. The amendment submitted merely substitutes the proposed Board of Appeals for the Commissioner as the appellate tribunal of the Office, in cases relating to trademarks, making the course of appeals in this class of cases conform to the course of appeals recommended above in cases involving applications for patents.

These changes in the course of appeals would not only have the effect of expediting the prosecution of applications on appeal, but would be a saving to the inventors of one appeal fee, the attorney's fees, and other expenses incident thereto. Furthermore, having but one appeal within the office in lieu of two would result in giving greater stability to the decisions of the office tribunals, and would also obviate any want of comity that has existed in the past between the decisions of the Commissioner of Patents and the Assistant Commissioner. These proposed changes in the law in no wise affect the present legal status of the Commissioner of Patents, the Assistant Commissioner of Patents or the Examiners-in-Chief.

It is regarded as improbable that the present Congress will look with favor upon the proposition now being strongly urged by many patent attorneys and others making the infringement of a trademark a criminal offense. While many Senators and Representatives have been much impressed with the argument that no greater injury can be done to a property owner than may be accomplished through the piracy of a trademark, yet the majority have felt that in view of the important legislation of the past two or three years, which has created a large number of criminal offenses under Federal enactment, the time is not yet ripe to add another crime to the category. There has also been a feeling that it would be unwise to make so radical a departure in trademark legislation until the recently enacted Bonynge trademark law should be more fully tested. W. L. C.

The Application of Commodity Tariffs to Intermediate Points.

The Interstate Commerce Commission, in Special Tariff Circular No. 6, has disposed of a grave difficulty confronting shippers who use commodity tariffs, which was considered fully in *The Iron Age* of December 12, 1907, page 1685. Special Circulars Nos. 3 and 5, which were issued by the commission in October and November, would have technically invalidated the application of commodity tariffs on a large volume of shipments of iron and steel, which go to stations that are not specifically mentioned in commodity tariffs. The railroads have always applied a commodity rate to any "intermediate" point which is not specifically given a lower rate in the tariff, and this custom has made it unnecessary, in compiling commodity tariffs, to mention every station on the road, or all the roads covered by a through rate tariff. The commission has reconsidered the question in Special Circular No. 6 as follows:

The underlying principle of the commission's tariff regulations is that the statement of rates and fares and their application shall be affirmative and definite; and the incorporation of tariff rules which make the application of the rates or fares uncertain is prohibited, as is also any method of stating rates or fares which is ambiguous.

Many tariffs that were on file before May 1, 1907, contain long and short haul clauses, maxima rules, alternative rate or fare provisions, or other rules which make the application of the rates or fares uncertain, more particularly as to intermediate stations not specified in the tariff; and some such rules have, through misunderstanding, been included in tariffs which have been issued since May 1, 1907. Some carriers whose tariffs do not contain rules of the character in question have followed the practice of applying tariff rates or fares as maxima at intermediate stations except when tariffs specifically provide to the contrary.

The commission desires and requires that at the earliest practicable date all such features and practices as are above referred to shall be eliminated from tariffs and discontinued either by supplement or by reissue of the tariff. It does not underestimate the volume of work in checking of rates and fares and preparation of tariffs that is involved; it appreciates the efforts and the progress that have been made thus far; and as an aid in simplification and directness in providing and applying lawful tariff charges, and to avoid hardship to shippers and passengers at intermediate stations which would otherwise be left without rates or fares which they have heretofore enjoyed, and with the understanding that this work will be earnestly pursued with the purpose of completing it by the date named, the commission decides that until July 1, 1908, carriers may continue the use and present application of tariffs which were issued prior to January 15, 1908, and which contain rules of the character hereinbefore referred to, or under which, without specific

provision in the tariff therefor, the rates or fares have been applied at intermediate stations, and excepting those tariffs which, before July 1, are corrected by supplements or replaced by new issues. Tariffs issued subsequent to January 15, 1908, must not contain any such rules as are herein considered nor be applied in any manner not affirmatively provided therein.

Each carrier that has tariffs containing any of the rules referred to, or which, without containing such rules, are applied at stations not specified therein, will, on or before February 1, file with the commission a statement showing by Interstate Commerce Commission numbers all of the tariffs of its issue which contain such rules or which are so applied. This list shall contain both local and joint tariffs that are issued by the carrier making the list; and similar lists of their issues will be furnished on the same dates by joint agents who issue tariffs for carriers. Revisions of these lists will be furnished to the commission on April 1 and on June 1, from which will be omitted such tariffs as have been corrected or reissued.

These statements, when checked against the commission's tariff file, will indicate the progress that is being made in this work, and unless satisfactory headway is shown the commission may order the immediate reissue or cancellation of tariffs in question.

Paragraph *d* of Rule 4 and paragraph *c* of Rule 25, Tariff Circular 14A, provide that a tariff shall contain complete alphabetical indexes of the stations from and to which it applies. This is not to be understood as prohibiting the incorporation in a tariff of a rule providing for the affirmative and definite application of the rates or fares named in that tariff to stations not indexed and which are directly intermediate on the same line with stations that are indexed.

The permission for issuance on less than statutory notice of tariff supplements for the purpose of eliminating rules of the character referred to and of making tariff rates or fares definitely and affirmatively applicable, as given in commission's Special Circular No. 3, Tariff Department, of October 9, 1907, and extended in Special Circular No. 5, Tariff Department, of November 15, 1907, and in further extension notice of December 21, 1907, is hereby revoked, effective January 15, 1908.

A Notable Factory Power Plant.

Except where factories purchase electric current from an independently operated central station, it is unusual to find an isolated power plant. Mines and other works, distributed over a considerable area, find the practice expedient, or even necessary, but it is seldom that factories, particularly in proximity to large cities, avail themselves of the advantages that many accrue from removing their power plants to a point where the existing conditions are more favorable to their operation. An instance of the sort is the new power station of Walter Baker & Co., Ltd., at Dorchester, Mass., near Boston.

At the place mentioned, are three large mills manufacturing chocolate and cocoa products, each of which formerly had an independent steam plant. The greater economy to be realized by combining them in one station has led to the erection of a new plant at a little distance from the mills on the Neponset River, where an ample supply of water for boiler feed and condensing, and convenient railroad connections for receiving fuel are available. An ultimate capacity of 2800 hp. in boilers and 1750 kw. in electric generators has been planned for; the initial installation for present requirements, which call for less in steam generating capacity, includes 10 vertical fire tube boilers of 200 hp. each, and all of the power units—two vertical cross compound engines directly connected to 750-kw. generators, and two single horizontal engines directly connected to 125-kw. generators. The engines and generators were built by the Allis-Chalmers Company.

A feature of the engine installation is the use of reheaters for the compound engines, using the hot gases discharged from the boilers, before they are passed through the Sturtevant economizer. The remainder of the equipment is complete and modern in all of its details, including surface condensers, separators, feed and circulating pumps, feed water heaters, engine room crane, exciters, oiling system, telpherage system for handling coal from the storage yard, &c. A low pressure steam supply is furnished for manufacturing purposes and heating, taken from the exhaust of the non-condensing auxiliaries and augmented, if demanded, with live steam, through reducing valves. For security against shutdown, elaborate provisions are made in alternative ways of operating, with bypasses, ring mains, duplicate means of feed supply, &c. Power is generated as alternating current at 600 volts and used directly, or stepped down where necessary, for power and lighting. Both individual and group driving is employed, using induction motors entirely, of which there are about 100, ranging in size from 1 to 75 hp. Recording meters measure the power supplied to each department separately. The power plant and new power and lighting equipment of the mills were designed and installed under the superintendence of F. W. Dean, mill engineer and architect, Boston, Mass.

The Chicago Bench Miller.

The bench miller herewith illustrated as mounted on a column differs but slightly from the No. 1 hand miller made by the Chicago Machine Tool Company. Principally, it is simpler because the overhanging arm and vertical milling attachment are omitted. While in the larger machines the outboard support for the arbor is essential, and the vertical spindle increases the range of work that can be handled, neither is required in the manufacture of light work, such as parts of guns, sewing machines, typewriters, locks, electrical apparatus, &c. This machine is especially intended for that class of work, which consists for the most part of short milling and slitting operations.



A Bench Miller, Column Mounted, Made by the Chicago Machine Tool Company.

The machine and countershaft are equipped with the Chicago dustproof and self-oiling journals, which require oil only once in nine months or more and add materially to the life and accuracy of the spindle. The table has a feed of 9 in. longitudinally, by 2½ in. transversely, and the vertical movement of the knee is 4¼ in. The spindle is bored to receive a No. 9 B. & S. taper, and a collar arbor can be used. A sleeve is fitted to the spindle to take a drawing in collet. The countershaft is self-oiling and has two speeds, giving six spindle speeds to the machine through three step cone pulleys. The regular equipment consists of a quick acting vise, a drawing-in sleeve, one collet and the necessary wrenches.

The Chicago line of millers is carried in stock by Hill, Clarke & Co., Inc., Boston, Chicago, New York and Philadelphia; the Prentiss Tool & Supply Company, Buffalo, N. Y., and the Cotton States Belting & Supply Company, Atlanta, Ga.

THE IRON AGE

Established in 1855.

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Price Questions Go Back to Ore.

The question of the right price for finished forms of steel, on which the manufacturers have been unitedly seeking light, has resolved itself rather early into an ore problem. This may seem strange when it is known that only a small fraction of the Lake Superior ores that eventuate in some form of steel ever comes upon the market, and that almost all the steel making ores are mined by the steel companies themselves or by the leading producers of such Bessemer pig iron as is sold to steel makers. It is a fact, nevertheless, that the steel manufacturers are now disposed to regard the price the merchant ore firms at Cleveland will ask for 1908 as the pivot on which the market will turn. Much of this ore is bought by furnaces making foundry iron. It cannot have a direct relation to the price of finished steel. Therefore the inference is that the market is in such shape that the moral effect of the merchant ore price this year will be much greater than usual.

Pig iron and finished products, for well known reasons, did not follow parallel price lines in the late boom. But there is a disposition now to let pig iron, which is a product of so many widely separated and unaffiliated interests, show the way to the steel manufacturers, whose present concern is to know what changes, if any, should be made in their prices. Raw materials and labor are the chief items on the cost sheet. Eastern and Central Western producers of merchant pig iron find that the reductions thus far made in the price of their product have brought them to a point at which the ore on hand can be worked up at bare cost. Further reductions in pig iron, they argue, will mean a sacrifice on every ton of ore entering into such iron. If their Southern competitors, most of whom, though not all, mine their own ores, are to push for Northern business to the extent of making further reductions in prices, this can only be met by such concessions on ore prices for 1908 as will scale down the cost of the six or seven months or longer supply of ores on hand. But Southern furnacemen seem no more anxious than Northern to load up with unprofitable business, after three years of fair profits for most of them.

The question comes, therefore, what action can be taken by the merchant ore companies that will not demoralize the market and at the same time will recognize the changes that have come in the situation since the high ore prices of last year were named? It is argued by the steel manufacturers that any considerable reduction in merchant ores now will naturally strengthen the expectation of lower prices for rolled products when the next buying movement comes. An unusual responsibility is thus put upon the ore men. They had thought to postpone the issue until the situation had developed more. If pig iron production continues at anything like the present rate through the first half of the year, no new ore would be needed before fall, and therefore ore buyers would be in no hurry to make new contracts. But for the reasons indicated above, pig iron producers in the East and Central West have reached a point at which they want to know what the ore programme is to be.

As in 1904, when a somewhat similar situation arose, the steel companies consider that their interests will be best served by making no decided cut in the ore prices of 1907. Some of the merchant ore producers, moreover, have been represented as now averse to any considerable reduction from last year's prices. They argue that their labor and transportation costs have not been reduced as yet, and that the value of all ores has been enhanced by the developments of the past two years in iron ore, without reference to anything that has occurred in the steel market. It is also urged that many mine leases made in recent years when prosperity was at high tide, carry minimum outputs that will mean a large payment for every ton of ore that can be marketed in a lean year like the present. Consideration is given, too, in this view, to the fact that the pig iron market would quickly anticipate the lower ore basis, which would mean that furnacemen must write off heavily on last year's ores.

It would be surprising, however, if in the end, the merchant ore firms take a different position from that which they maintained in 1904 when the situation was in many respects similar to that of to-day. Then they separated from the steel companies and the furnace interests producing their own ore and insisted on a substantial reduction from the basis of 1903. Their principal reason was that the furnaces buying their ores were in close competition with Southern foundry iron furnaces, and if concessions were not made the Northern markets would be overrun with Southern iron, in some cases to the permanent displacement of a portion of the Northern product.

It will be interesting to note in this connection how the prices for Lake ores last year compare with those of 1903, also the prices finally fixed in 1904:

	1907.	1903.	1904.
Old Range Bessemer.....	$5.00	$4.50	$3.00 to $3.25
Mesaba Bessemer.....	4.75	4.00	2.75 to 3.00
Old Range non-Bessemer..	4.25	3.60	2.60 to 2.80
Mesaba non-Bessemer.....	4.00	3.20	2.35 to 2.50

It should be said that the above prices for 1904 were fixed after Southern iron had sold as low as $9, Birmingham, for No. 2 foundry, and after Bessemer iron had sold below $13, at Valley furnace, or more than $3.50 in the one case and more than $4 in the other, below the pig iron prices of to-day. On the other hand, it is to be considered that the ore prices for 1907, which were fixed in November, 1906, were based on $22 Bessemer pig iron, at furnace, or $5 a ton above the price in November, 1905, when the ore prices fixed for 1906 were 75 cents a ton below those of 1907 for Bessemer ores. On No. 2 foundry iron the prices ruling in November, 1906, were $21 to $22 at Northern, and $18 to $20 at Southern furnace, these representing advances of $6 to $6.50 in the preceding year, in which the prices on non-Bessemer ores were 50 cents lower than those fixed for 1907.

The history of Lake Superior ore prices is a record of fluctuations, determined for the most part by conditions existing in the pig iron market at the time each year's figures are named, taken in connection with the outlook for the year through which the ore contract will run. If a serious attempt should now be made to fix ore prices independently of changes in the pig iron market

and with a direct purpose of steadying pig iron and finished materials, the outcome will be watched with the greatest interest.

New Ruling on Commodity Rates.

The Interstate Commerce Commission has taken a step that will receive the approval of shipping interests, in reconsidering and revising its administrative rulings on the application of commodity rates. The commission may have found it embarrassing to recall the authoritative circulars which it issued in October and November, but its prompt action in reconsidering the subject will go far to win the confidence of many shippers who have had grave fears of the difficulties that might arise from arbitrary rulings which have the force of law. An article on "Intermediate Freight Rates" in our issue of December 12, 1907, pointed out fully the difficulties that shippers of iron and steel and other commodities would experience if buyers at "intermediate" points, which are not mentioned in commodity tariffs, were cut off from the benefits of commodity rates and forced to pay prohibitory class rates. Under the new circular which the commission has issued shippers will be protected in the enjoyment of rates which they have had heretofore, and the long and short haul clause of the law will be observed by the carriers.

Congress has given to the Interstate Commerce Commission greater power over the business affairs of the people than has ever before been vested in a small body of men in any constitutional government. The powers of the commission are primarily judicial and administrative, but it has also been given legislative powers of no small scope, regarding the constitutionality of which there is some question. The transportation business of the country is so vast and complex, and many of its tariff adjustments are so delicately balanced, that what Congress intended merely as power to make administrative rulings or regulations is, in fact, a legislative function of large possibilities. Legislatures are generally held in check by constitutional provisions, which require several public readings of a new bill and final executive approval before it becomes a law, but the vast powers which the commission may exercise in administrative rulings may become effective without notice to the public and without hearings for those whose property interests may be affected adversely. A century ago the people would have scorned to place so much responsibility in the hands of any commission or administrative body, and it is evidence of the growth of confidence in the integrity and judgment of public men that this vast power has been conferred upon the Interstate Commerce Commission.

The members of the commission have justified public confidence by the painstaking and impartial manner in which they have endeavored to deal with all complaints and questions of policy that have come under their consideration. While they have made mistakes and have announced rulings which have proved a hardship to small as well as large shippers, and the general tendency of their rulings has been to increase the earnings of the carriers rather than to reduce the cost of transportation to the industries of the country, it must be conceded that the commission has labored with earnestness and zeal to perform the great task committed to it, and no disappointed litigant has yet had occasion to question the impartiality of its tribunal.

A court is bound by traditions and cannot send out an open invitation to all parties interested to appear and discuss for its information any case that may be pending. Legislatures may seek light in this manner, through committees, but the members who vote to pass a measure seldom read the full reports of these committees. The Interstate Commerce Commission, however, is bound by no traditions, and it has acted in a manner that commends itself to all impartial men by the earnestness with which it seeks and is governed by light from all parties on important questions involving the traffic of the nation. Let us hope that the great powers of the commission may always be exercised by men of the high character of its present members.

Machinery Lists in Industrial Plants.

If the advantage of keeping complete machinery data was more generally appreciated by industrial superintendents much less delay and trouble would be encountered when equipment problems arise. Some plants have well kept lists of machine tools, hand operated devices and general supplies, but in others is found a deplorable lack of specific recorded information, either in the company's general offices or in the headquarters of different departments. Electrical machinery data when wanted are easily taken from the manufacturers' name plates, but even this work would often be saved if when the machine was first installed the essential particulars of the equipment were recorded in a card index, loose leaf book, or an ordinary ledger. For general machinery such data certainly should be preserved where it is readily accessible.

At least, the maker's name and the number and size or capacity of each machine should be kept. It is common to find the operating staff of a plant in doubt as to the make and size of a machine which has been in service a long time. Close estimates of equipment value and productive probabilities are thus rendered all the more difficult. In making up inventories and in plant appraisals, an equipment list, which shows the principal operating and mechanical particulars of each machine, is worth far more than it costs to prepare it. The date of purchase and the cost of the machine should be recorded with the other data when possible, and in places where a separate card or sheet is kept for each piece of apparatus, it is often desirable to record also replacements and possibly repair costs.

Progress in machine design is so rapid in many lines that the factories should be watched closely to reap the full benefits of improvements. Even then, unless specific data of costs, capacity and operating records for each important machine in the plant are available, it is difficult to decide wisely when old machines should be replaced with new and more efficient ones. It is not enough to trust the foreman's memory. While progressive, alert department heads should know approximately the productive limit of each machine in their charge, the most systematic operation of a plant as a whole demands that the best results with each machine, no less than the guaranteed capacity, should be recorded. Foremen come and go, and knowledge of the working power of a machine should remain permanently in the plant.

In connection with the problems of electric driving, the machinery list can be made of great value. The particulars of capacity, method of applying the power, size of gears, belts and pulleys, floor space required, tests of current consumption at different rates of output, load factors, hours of service and the like, constitute time saving data when new plants are to be erected or established ones expanded or remodeled. If these facts are noted when the original installations are made, it is sometimes found that the costs of making tests can be

divided in later work. The ordering of supplies and special parts is greatly facilitated by the use of adequate machinery data. An up to date purchasing agent will have many of the particulars wanted in his files, but the addition of operating records to the original facts, and the preservation of all the items in one place, are justified on every ground constituting the basis of broad economy.

Engineering Competition in the Navy.

The announcement that an engineering competition between the ships of the navy is to be inaugurated suggests possibilities of great usefulness, including increased efficiency in a most important department of our fighting fleets. According to dispatches from Admiral Evans' fleet, the plan is that each ship shall maintain a complete record of speed efficiency and economy; the amount of coal burned; the number of hours run under natural and under forced draft; distance covered and speed obtained, and all other details included in the operation of a ship that come within the province of the engineering staff. The competition will be between vessels of the same class and the award of honor made annually. It will be along the same general lines as the competition in marksmanship, which has assisted materially in raising the standard in the navy. Competitive engineering might easily have a like effect upon the engineering ability of the crews, which, if not of a high order, might be as disastrous in time of war as poor marksmanship, but if superior to that of the enemy, must be of inestimable value strategically.

An incentive to do the best is always an advantage; it is inherent in human nature to respond to the stimulus of competition. Each ship's engineering staff will be keen to improve appliances and equipment and their handling, but what is more important and in itself justifies the competition will be the effect upon the general knowledge necessary in the design of new ships and their equipment. At present certain engineering records must be kept, but doubtless they would be carried into greater detail in securing the data upon which to base the awards of merit and be that much more valuable.

PERSONAL.

Arthur A. Hamerschlag, director of the Carnegie Technical Schools, Pittsburgh, has sailed for Europe. He goes abroad to get in closer touch with the work being done by foreign technical schools.

The Walworth Mfg. Company, Boston, Mass., announces that W. P. F. Ayer, for many years in its employ as traveling salesman, has been elected assistant secretary of the company.

Edward H. Parker has been made superintendent of the New Haven plant of the American Steel & Wire Company, recently purchased from the National Wire Corporation. He will have charge of the management of the plant, the sales of which will be conducted from the company's New York office. Mr. Parker received his first training with the Washburn & Moen Works, at Worcester, Mass., and afterward was transferred to Cleveland to take charge of the American mill of the American Steel & Wire Company. Some two years ago he went to the National Wire Corporation as assistant to Herbert Smith, the manager. It is not the intention to start up the New Haven plant at present, neither is it decided just what its product will be.

J. C. Kurtz has been elected president of the American Aluminum Coating Company, Connellsville, Pa., succeeding Geo. J. Humbert, deceased, and Anna Clara Humbert has been elected secretary and treasurer.

F. V. McMullin, formerly foreman of the forging department of the Westinghouse Machine Company, Pittsburgh, has been made superintendent of the Cleveland City Forge & Iron Company, Cleveland. He is a former secretary of the Engineers' Society of Western Pennsylvania.

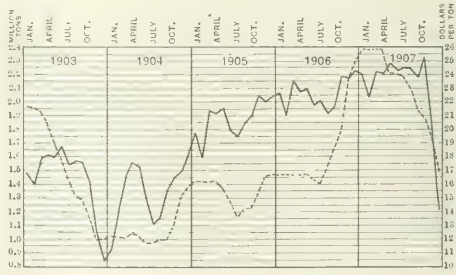
John R. Blakeslee, president of the Ajax Mfg. Company, Cleveland, Ohio, sailed for Europe a few days ago. He expects to spend three or four months in touring through various countries, including Egypt, and in visiting the company's agencies in several European cities.

Wilmer Wickersham, for some years connected with the Pope Tin Plate Company, Pittsburgh, whose mills are at Steubenville, Ohio, has been appointed its general sales agent. He is well and favorably known in the tin plate trade, and his friends will be pleased to hear of his advancement.

Fritz von Hiller has been appointed representative of the Pressed Steel Car Company, at Mexico City, Mexico, to succeed D. G. Farragut, resigned to engage in other business.

The Rate of Producing Iron and Its Prices.

The vicissitudes through which the iron trade passed during the last three months, as well as its advance from the low prices and small rate of production in the latter part of 1903 to the maximum capacity and high prices of 1907, are graphically shown in the accompanying chart. The solid line indicates the production month by month, according to statistics collected by *The Iron Age*, the figures at the left showing the production in millions of tons. In the dotted line is shown the price changes of No. 2 Southern foundry pig iron in Cincinnati, the figures at the right showing the price in dollars per ton. Some minor fluctuations regarding actual output are due to unavoidable causes, as, for instance, in each year except 1904 there is a sharp dip representing production during the month of February, on account of the less number of days in that month. The downward trend of prices always precedes a curtailment of production, as is shown during the entire year 1903 and during the second quarter of 1905, as well as the months following April, 1907. There is a lag in the matter of changes in production, showing that this is not as sensitive a barometer as that of prices. Perhaps it is a mere co-



Price and Production of Pig Iron.

incidence that the line representing prices is usually below the line representing production, and it will be interesting to conjecture when there is another crossing of these lines.

The shipments in December of the German Steel Syndicate show a sharp decline. During that month the shipments of "A products," including billets, track material and shapes, amounted to 359,515 metric tons, as compared with 423,055 tons in November, 1907, and 449,025 tons in December, 1906. These December shipments included 81,706 metric tons of billets and blooms, 58,279 tons of shapes and 219,530 tons of track material. In the corresponding month of 1906 the figures were 142,008 metric tons of billets, 131,873 tons of shapes and 175,144 tons of rails, &c.

Meetings of Testing Society Committees.

The call of the secretary, Prof. Edgar Marburg, for a general meeting of the committees of the American Society for Testing Materials, at Columbia University, January 28, was responded to by representatives of six committees, as follows:

Committee A, on Standard Specifications for Iron and Steel, William R. Webster, chairman.

Committee B, on Standard Specifications for Cast Iron and Finished Castings. Walter Wood, chairman.

Committee K, on Standard Methods of Testing. Gaetano Lanza, chairman.

Committee P, on Fireproofing Materials. Ira H. Woolson, chairman.

Committee S, on Waterproofing Materials. W. A. Aiken, chairman.

Committee T, on Tempering and Testing of Steel Springs and Standard Specifications for Spring Steel. J. A. Kinkead, chairman.

A session of all the committeemen present was held Tuesday morning in Room 302 of the Engineering Building, with Dr. Charles B. Dudley, Altoona, Pa., president of the society, in the chair. The various committees were then assigned to rooms in which their separate sessions were held. The largest representation was that of Committee A on Standard Specifications for Iron and Steel. The principal subject under discussion was specifications for steel rails, the drop test being the particular question considered.

A Scheme for Pig Iron Purchases by Analysis.

The meeting of Committee B on Standard Specifications for Cast Iron and Finished Castings took up the matter of revising the society's specifications for foundry pig iron. In view of the increasing employment of analysis as the basis of pig iron purchases it was thought best to provide specifications from which grading by fracture and the use of numbers to designate various grades of pig iron should be eliminated. The subject was discussed informally after being presented by Chairman Wood and Secretary Moldenke. A scheme was proposed in which the six vowels were made use of, together with the initial letter of the name of each metalloid, to construct a code designating percentages of the various nonferrous constituents of pig iron. Since silicon and sulphur have the same initial letter, C was suggested as the designation for the former. The percentages of the different elements and the corresponding symbol under this scheme are given in the following:

—Silicon—	
Symbol.	Per cent.
Ca	0.50
Ce	1.00
Ci	1.50
Co	2.00
Cu	2.50
Cy	3.00
Allowable variation	0.25

—Manganese—	
Symbol.	Per cent.
Ma	0.50
Me	0.75
Mi	1.00
Mo	1.25
Mu	1.50
My	1.75 and over.
Allowable variation	0.125

—Sulphur—	
Symbol.	Per cent.
Sa	0.04
Se	0.05
Si	0.06
So	0.07
Su	0.08
Sy	0.09
Percentages are maxima.	

—Phosphorus—	
Symbol.	Per cent.
Pa	0.25
Pe	0.50
Pi	0.75
Po	1.00
Pu	1.25
Py	1.50 and over.
Allowable variation	0.125

In the case of silicon, with an allowable variation of 0.25 per cent., Ca would stand for a range in silicon content from 0.25 to 0.75 per cent. In the case of manganese the allowable variation suggested was 0.125, so that Ma would represent a range of 0.375 to 0.625 per cent. Similarly in phosphorus the suggested variation was 0.125 per cent. In the case of sulphur, as determined by the gravimetric method, the percentage specified is the maximum, and any excess of sulphur would result in rejection. It should be noted that there is no connection between the symbols employing the same vowel. Naturally, high silicon would be accompanied by low sulphur, and therefore Sa as the symbol of a sulphur content under 0.04 per cent. has no correspondence to Ca, which represents the lowest silicon content in the schedule.

The above scheme as tentatively developed at the morning session of the Committee on Cast Iron was discussed on Tuesday afternoon by the sub-Committee on Pig Iron, of which E. S. Cook, Warwick Iron & Steel Company, Pottstown, Pa., is chairman.

Decisions Against Labor Unions.

Two important court decisions affecting trade unions have been given in the past week. At Washington, January 27, the United States Supreme Court declared in effect that any railroad or other common carrier engaged in handling interstate commerce may discharge an employee and assign no reason beyond the fact that he belongs to a labor organization. The case was that of William Adair, plaintiff in error, against the United States. Adair was master mechanic of the Louisville & Nashville Railroad. He discharged William Coppage, a locomotive engineer, because he belonged to a union. A prosecution of the foreman was brought under the Erdman act of July 1, 1898, and Adair was fined $100 in a district court in Kentucky. The tenth section of the Erdman act prohibits all common carriers engaged in interstate commerce from discriminating against members of labor organizations. Justice Harlan gave the decision, from which Justices Holmes and McKenna dissented. The decision expressly says that the tenth section of the Erdman act is unconstitutional, but limits this opinion to that section. The court said:

> It was the legal right of the defendant, Adair, however unwise such a course might have been, to discharge Coppage because of his being a member of a labor organization, as it was the legal right of Coppage, if he saw fit to do so, however unwise such a course on his part might have been, to quit the service in which he was engaged because the defendant employed those who were not members of some labor organization. In all such particulars the employer and the employee have equality of right, and any legislation that disturbs that equality is an arbitrary interference with the liberty of contract which no Government can legally justify in a free land.

The other of the two labor union decisions given in the past week was that of Judge Phillips, in the Cuyahoga County Common Pleas Court, Cleveland, Ohio, holding that the Amalgamated Glass Workers' Union is an organization in restraint of trade and ordering its dissolution, on the ground of public policy. The action was brought by the flatteners and cutters, members of the above union. They complained that the blowers and gatherers, who controlled the union, compelled them to accept wages less than they could secure if independent of the union. The flatteners and cutters insisted that they be allowed to use machinery in their work, but this was forbidden by the union by-laws, under penalty of expulsion. As secession from the union meant deprivation of work the flatteners and cutters attempted to have the by-laws changed, but without success. They then brought suit to dissolve the organization and to restrain it from interfering with the use of machinery.

The Arthur Koppel Company, Machesney Building, Pittsburgh, Pa., is distributing an illustrated pamphlet entitled "The Longest Narrow Gauge Light Railway in the World." This pamphlet describes a railroad of 24-in. gauge, built by Arthur Koppel of London, in German Southwest Africa. It is known as the Otavi Railway, is owned by the Otavi Mines & Railway Company, and extends a distance of 361 miles, running from Swakopmund on the Atlantic Ocean to Tsumeb in the interior. The pamphlet illustrates the construction of the line, showing the substantial character of the track and bridges and special features of the equipment.

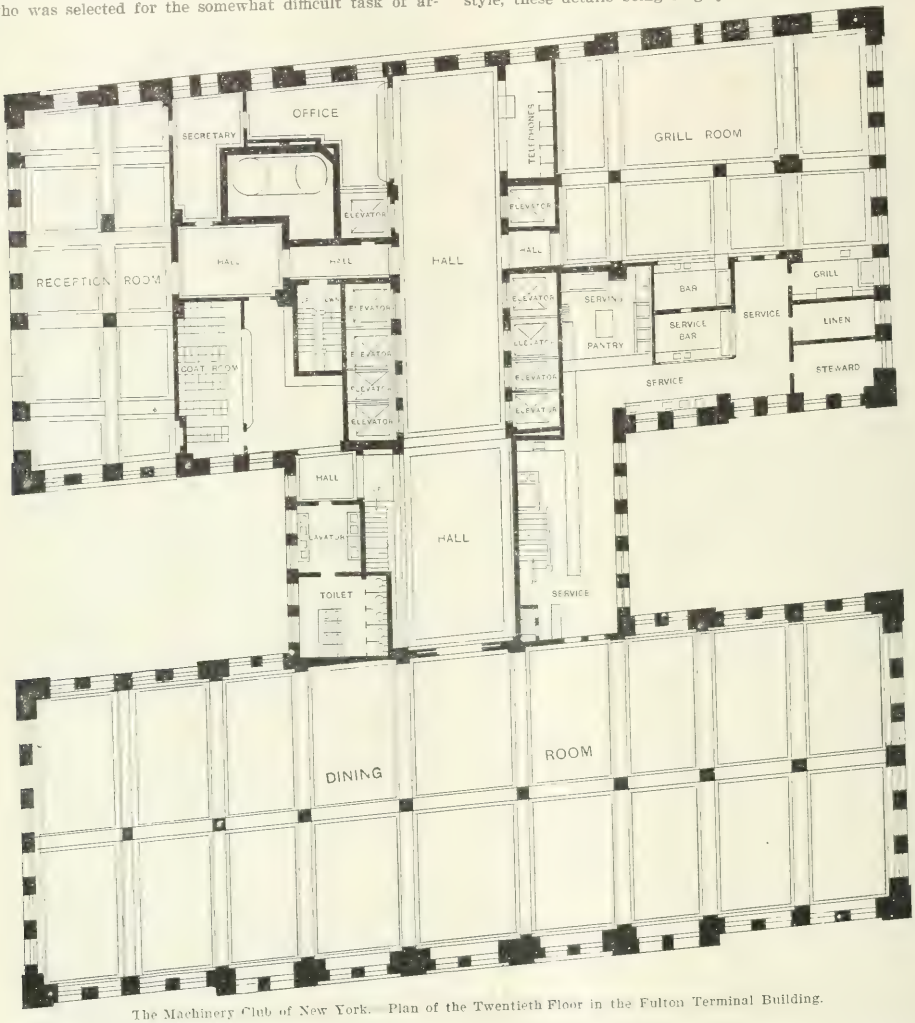
The Westinghouse Electric & Mfg. Company has won an important patent suit in the United States Circuit Court of New York against the Condit Electrical & Mfg. Company of Boston. The patent in question refers to the manufacture of circuit breakers, a very popular electrical appliance, which the Condit Company is alleged to have infringed. The same patent has been upheld in other United States Circuit courts on former occasions.

The Machinery Club.

Expects to Open Its Quarters in May.

The quarters of the Machinery Club of the City of New York, on the twentieth and twenty-first floors of the Fulton Terminal Building, are rapidly nearing completion and the organization has been assured that they will be ready for occupancy on May 1, when the officers expect to open the rooms to the members. The accompanying illustrations show the arrangement of the club's quarters, as designed by Percy Griffin, 225 Fifth avenue, who was selected for the somewhat difficult task of arranging rooms originally designed for office purposes to suit the requirements of a club. The officers and committees have been working hard since the organization of the movement last April, when F. H. Stillman, who conceived the idea of forming the club, called a general meeting of the trade for that purpose. The Membership Committee has accomplished much in the way of canvassing the trade for desirable members, and it is largely due to its efforts that the organization will have a class of members to be proud of.

To the House Committee has fallen the task of furnishing the club rooms and supervising and arranging for the purchase of the furniture, linen, silver ware, &c. As a result of the efforts of that committee the club will be furnished with elegance and comfort, while the arrangements will materially differ in effect from those of any downtown dining club, and the furnishings will, it is claimed, be of unusual originality. The main dining room, as can be seen by the accompanying plans, will be located on the twenty-first floor. Its dimensions will be 50 x 150 ft., and it will be furnished in East India mahogany, the style of the furniture being what is known in the furniture trade as the "Thomas Hope" effect, which is early English nineteenth century. It will be a most pleasant room because of the large number of windows. The reception room, which will be 26 x 63 ft., will be furnished in Mexican mahogany of the late Georgian style, these details being largely adhered to throughout the entire room, which will be one of the most luxurious in the club. The covers to be used on the various pieces of the furniture will be of many materials, including tapestry, mohair, damask and heavy leather, the color scheme being carefully balanced so as to produce a most homelike effect.

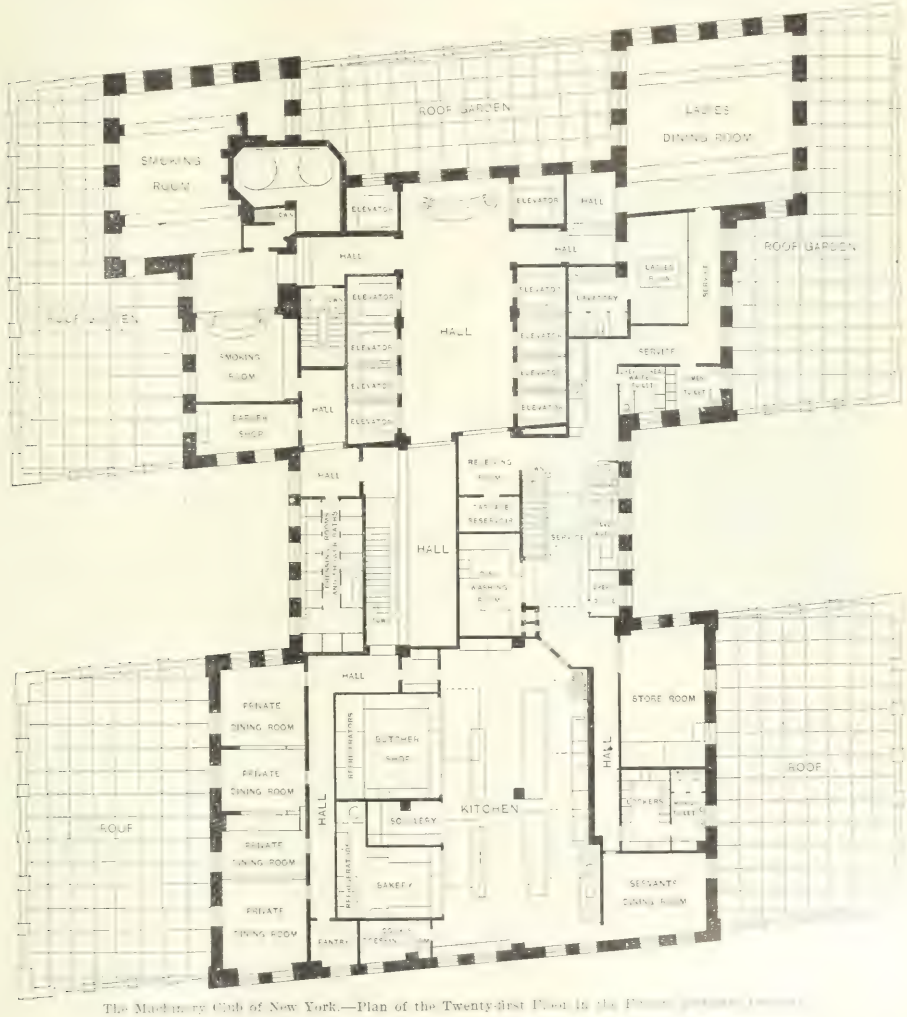


The Machinery Club of New York. Plan of the Twentieth Floor in the Fulton Terminal Building.

In the grillroom, which will be 38 x 54 ft., the furnishings will be particularly original, the room being carried out in Flemish renaissance. The wood is to be oak, finished antique cathedral, and the table tops are to be finished in natural wood, oil finish, with a view to using them without covers, as in mediæval times. The hall furnishings on both floors will be in Italian oak. The rear of the top floor will be given up largely to the

kitchen arrangements, as can be seen in the plan, and a series of private dining rooms, the largest of which will be 15 x 16 ft. These rooms are arranged so that they can be converted into one room when necessary, and they will be uniformly furnished in oak of the Jacobean style, covered with mediæval tapestry. Facing the Hudson River on the top floor on one side will be the ladies' dining room, retiring room, &c. The dining room will be finished in white, the style of the furniture being Heppelwhite, the coverings being in apple green silk damask. The ladies' retiring room will be sumptuously fitted out with lounges and easy chairs, the furniture being in Louis XVI style, and the color scheme will be in excellent contrast to that of the dining room. The smoking room, which will face the river on the opposite side of the building, will be irregular in shape, practically forming two rooms, 16 x 18 ft. and 22 x 29 ft. The furnishing of this room is one of the pet schemes of the House Committee, the predominating colors being brown and blue in rich and harmonious shades, the general effect being eighteenth century Colonial. As can be seen by the plans, the club will be furnished with a barber shop, shower baths, dressing rooms and every modern dining club convenience. One of the summer features will be the roof gardens, which are to be located on the roof section abutting on the top floor in the front section of the building.

Much credit for the carrying out of the organization plans of the club is due to President Stillman, who in addition to presiding over the meetings of the Board of Governors, has attended every meeting of the House and Membership committees. Both of these committees have met practically every week since the movement was started. Thornton M. Motley of T. N. Motley & Co. has also given a great deal of his time to the movement, he having spent several weeks in Europe last summer arranging for the importation of the china and some special supplies for the club. The officers of the organization are: F. H. Stillman, president; R. C. McKinney, vice-president; Walter L. Pierce, treasurer; Theodore Waters, secretary. Board of Governors: O. C. Gayley, second vice-president Pressed Steel Car Company; George A. Post, president Standard Coupler Company; Walter L. Pierce, secretary Lidgerwood Mfg. Company; F. H. Stillman, president Watson-Stillman Company; C. A. Moore, president Manning, Maxwell & Moore; R. C. McKinney, president Niles-Bement-Pond Company; W. P. Pressinger, Chicago Pneumatic Tool Company; T. N. Motley, president T. N. Motley & Co.; Henry Prentiss, president Prentiss Tool & Supply Company; A. B. See, president A. B. See Electric Elevator Company; W. H. Marshall, president American Locomotive Company; E. H. Wells, president Babcock & Wilcox Company; W. L. Saunders, president Ingersoll-Rand Company; Otis H. Cutler, presi-



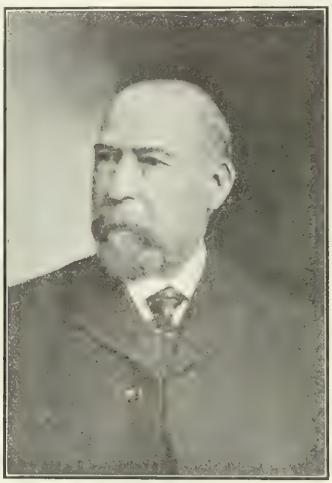
The Machinery Club of New York.—Plan of the Twenty-first Floor in the Proposed Quarters of the Club.

dent American Brake Shoe & Foundry Company; J. R. Vandyck, president Vandyck-Churchill Company; Kenyon B. Conger, secretary Hudson Companies; William B. Albright, Sherwin-Williams Company; Charles A. Schieren, Jr., Charles A. Schieren & Co. Executive Committee: F. H. Stillman, chairman; Walter L. Pierce, George A. Post, Henry Prentiss. House Committee: Thornton N. Motley, chairman; Charles A. Schieren, Jr.; Percy A. Ware, *The Iron Age;* George Howells, Ingersoll-Rand Company; Edward H. Benners, Crown Casting Company. Membership Committee: J. R. Vandyck, chairman; George L. Gillon, Bridgeport Motor Company; Charles B. Crook, Lidgerwood Mfg. Company.

OBITUARY.

WILLIAM GILLIES.

William Gillies, consulting engineer of the Illinois Steel Company, Chicago, died January 20, as the result of a fall on the icy sidewalk near his home. He never



WILLIAM GILLIES.

regained consciousness. He was born in Beith, Ayershire, Scotland, in 1839, and came to the United States when he was 12 years old. He served his apprenticeship in the Michigan Central shops at Detroit, Mich., and was a machinist there until 1876, when he went to Chicago to become foreman of the machine shop of the old North Chicago Rolling Mill Company. In 1880 he was made master mechanic of the works of that company, which in 1889 was merged with the Union and Joliet companies into the Illinois Steel Company. In 1882 he was appointed master mechanic of the South Works of the Illinois Steel Company, holding that position until 1898, when he was promoted to the position of consulting engineer. He was well known by master mechanics and mill officials all over the country. He leaves a widow, three sons and a daughter.

ARNOLD C. SAUNDERS of the firm of M. A. Hanna & Co., Cleveland, Ohio, from 1885 to 1893, and since the latter year at the head of A. C. Saunders & Co., a Cleveland coal and vessel firm, died January 22, aged 55 years. He was president of the Lorain Coal & Dock Company and vice-president of the Johnson Coal & Mining Company. For some years his firm was engaged in the Lake Superior ore trade.

THOMAS REED PICKARD, head of the foundry department of the Brass Foundry & Machine Company, Fort Wayne, Ind., and for 50 years connected with this company, died January 12, aged 79 years. He was born in Cornwall, England, and coming to this country in 1848 served his apprenticeship as molder with C. & J. Cooper & Co., Mt. Vernon, Ohio. Beginning service in 1854 with the Bass Foundry & Machine Company, then known as Cooper, Bass & Co., he was four years later advanced to the position of superintendent, which he occupied in an active capacity for 44 years. For the past few years he retained his connection with the company as consulting superintendent. He leaves four sons.

HENRY L. W. HYDE of Pittsburgh died January 23, after a long illness, at Pinehurst, N. C., whither he had gone in the hope of regaining his health. He was born in England, where his father, Charles Hyde, is a prominent foundryman and brass manufacturer. He went to Pittsburgh a number of years ago and engaged in the steel and iron business. At the time of his death he was associated with his brother, Charles Hyde, and others in the Clearfield Steel & Iron Company, operating a rolling mill at Hyde, near Clearfield, Pa. Mr. Hyde was also one of the owners of the Whitney power plant at Whitney, N. C. He was a member of the Duquesne and Union clubs. He was unmarried, and his brother is his only surviving relative in this country.

PERLEY S. KENNARD, secretary and treasurer of the Cleveland Steel Tool Company, Cleveland, Ohio, died January 23, of pneumonia, after a week's illness, aged 55 years.

EDWARD BUXTON died January 26 at the home of his son, Dr. G. E. Buxton, Providence, R. I., aged 82 years. He was founder in 1850 of the business of the E. Buxton & Son Company, dealer in old material, whose general office is in Worcester, Mass. He retired in 1886, when his son, A. L. D. Buxton, the present head of the company, took over the entire business, to which in 1900 he admitted his four sons.

The Wisconsin Mining Trade School.

The Wisconsin Mining Trade School, established by the State Legislature of 1907, will open its doors at Platteville, Wis., January 27, using the building formerly occupied by the State Normal School. Prof. E. M. Brunswarde, who will be at the head of the school, has had charge of all the work of preparation and installation. The school year will begin in January in order that the two years' course may include two summers. While offering every inducement to the older working miner to take advantage of its educational opportunities, the officers of the school realize that a great institution can only be developed by having a course suitable for young men.

Two months of each summer must be spent in underground labor, and in order to have a broad practical experience, one summer's work will be in metal and the other in coal mines. For the metal mining work the great zinc and lead region of southwest Wisconsin, that lies around Platteville, will be utilized, while within 300 miles radius are the iron ranges of Lake Superior, the copper country of upper Michigan and the lead mines of southeast Missouri. Platteville is also very near to the northern edge of the central bituminous coal region. No mining theory will be taught the students until after the first summer's underground work. Plans are now underway to start a shaft in the campus itself. Considerable time will be devoted to mining laboratory work. The time devoted to work in drilling will not limit itself to teaching manual dexterity in boring, but will aim to give a practical grasp of the principles that underlie efficient hand or machine work.

Andrew M. Fairlie, secretary of the American Brass Founders' Association, which was formed at the Philadelphia meeting of the American Foundrymen's Association in 1907, reports that the membership, which was 50 in July, had increased to 111 in December. It comprises not only brass founders, but also manufacturers of metallic goods, metal producers, aluminum workers, supply men and platers and polishers. The platers and polishers within a year or two may become sufficiently numerous as members of the association to form a separate organization.

Proposed Pig Iron Contract.

The Contract Committee of the Iron Buyers' Association recently formed in the central territory, held a meeting January 22 at the Business Men's Club, Cincinnati, to submit the proposed contract for use of its members in dealing with the furnaces. Members of the Executive Committee of the association were invited and also the representatives of the furnaces. The contract as presented hereunder was discussed in all its phases, each clause being discussed separately:

PIG IRON CONTRACT
Issued from the Offices of
.....
.....

SELLER'S NO.. Date.....
BUYER'S NO..
SOLD TO....
QUANTITY....
GRADE.. (A) By fracture No.....
When pig iron is bought by fracture, the furnace to furnish its analysis of same.
(B) By analysis:
Silicon.
Sulphur.
Manganese.
Phosphorus.
§Graph. Carbon.
§Combined Carbon.
Analysis of each carload or cast to accompany bill of lading or invoice.
PRICE.... $.....per ton (2240 lb.)
.....
F.o.b. Cars.
The price is based on the present tariff freight rate of.....per ton from.....to ..... In case the rate declines buyer to have the benefit; in case the rate advances, buyer to pay the advance.
In case of disputed weight, the buyer to have the privilege of having the iron reweighed by the carrier or public weigher at the nearest practical point, said weight to be final.
PAYMENT.... †Freight cash. Balance, cash 30 days from date of notice by the carrier of arrival of shipment at destination.
¶One per cent. cash discount if paid 10 days from invoice date.
If this lot is divided in delivery, settlement shall be made for each lot as though a separate sale.
Failure to make payment when due shall forfeit buyer's right to further deliveries.
=Failure to make deliveries as per contract shall forfeit seller's right to hold buyer to this contract, and the buyer shall have the right to purchase this grade of iron in the open market and charge any excess over contract price to the seller, during the interruption of deliveries.
SHIPMENT.....

ACCEPTED.. ..... ACCEPTED.....
(Buyer) (Seller)

* If on record at furnace, or if possible.
§ These (carbons) to be eliminated in the revised form.
† Settlement of invoice on 15th of each month for previous month's shipment of iron from furnace, provided iron has been received.
¶ One-half of one per cent. (½ %) discount if paid ten days from date of bill.
= Buyer and seller to have the same right in matter of sale and purchase in open market.

The provisions indicated were mutually agreed upon as best carrying out the purposes of an equitable contract to seller and buyer alike, and a motion put before those present to recommend the approval of the proposed contract, both to the members of the association and to the different furnaces interested, was duly carried. The secretary, William Gugenheim, of the Foos Mfg. Company, Springfield, Ohio, was instructed to have a supply of the revised contracts printed, and send to both the furnaces and the association members; after which it is expected the new form will be generally used in deals between manufacturer and consumer of iron. With the changes indicated the form is expected to be acceptable to furnaces. These changes are indicated in the form and elaborated in the marginal notes.

The meeting was attended by the following members of the Iron Buyers' Association: William Fetzer, president, Fetzer & Co., Middletown, Ohio; Theodore Bollman, Bollman & Wilson Foundry Company, Cincinnati; G. H. Gorman, Davis Sewing Machine Company, Springfield, Ohio; George M. Verity, American Rolling Mills Company, Middletown, Ohio; L. Kahn, Estate Stove Company, Hamilton, Ohio; and the members of the Contract Committee: S. M. Blackburn, chairman, John B. Morris Foundry Company, Cincinnati; C. L. Bauer, Foos Mfg. Company, Springfield, Ohio; P. E. Montanus, Springfield Machine Tool Company, Springfield, Ohio; H. R. Viot, Barney & Smith Car Mfg. Company, Dayton, Ohio. Representatives of practically all the Southern furnaces, as well as Northern, were present, and participated in the discussion.

NEWS OF THE WORKS.

Iron and Steel.

Jefferson Furnace of the Jefferson Furnace Company, at Oak Hill, Ohio, has gone out of blast.

The No. 2 furnace of Joseph E. Thropp at Saxton, Pa., was banked January 23 and will remain idle until a considerable reduction is made in the stock of pig iron on hand.

The McInnes Steel Company, Corry, Pa., has just installed a new portable 100-hp. boiler and a new Espen Lucas crank sawing machine.

The charcoal furnace of the Shelby Iron & Coal Company, at Shelby, Ala., was blown out during the week.

Work is being rushed on the new stack of the Birmingham Coal & Iron Company at Vanderbilt, Ala., which will no doubt be finished by April 1.

General Machinery.

The Houston Armature Works, Houston, Texas, has been incorporated with a capital of $10,000, to manufacture meters, dynamos and electrical appliances. The plant now occupied by the company is of a temporary nature, the purpose being to erect a suitable factory building as soon as arrangements to that end are perfected.

The Titusville Forge Company, Titusville, Pa., has installed oil burning furnaces in its forging department and has also replaced its large annealing furnace with an oil furnace. It is claimed that oil furnaces have proved exceptionally good for annealing purposes, as a more uniform temperature can be maintained. The company is also installing improved machinery in its machine shop

Power Plant Equipment.

The gas engine department of the S. M. Jones Company, Toledo, Ohio, has been taken over by the Rathbun-Jones Engineering Company, Toledo, which has been incorporated with a capital stock of $240,000. In connection with the manufacture of the Rathbun vertical gas engines, which are made in sizes 25 to 600 hp., the company will carry on a general engineering business of power plants. The company is officered as follows: H. W. Ashley, president: G. J. Rathbun, vice-president; Paul P. Prudden, secretary.

The directors of the Vincennes Traction & Light Company, Vincennes, Ind., have authorized an issue of $100,000 in 6 per cent. preferred stock. Among the improvements contemplated are the enlargement of the power house and extension of service to a new factory district.

A 100-hp. boiler is required by the Merchants' & Miners' Transportation Company, Baltimore, Md., for its new building, 50 x 83 ft. The principal part of this building will be used for warehouse purposes and no other equipment will be purchased at present.

Foundries.

The automatic Vending Machine Company, Indianapolis, Ind., manufacturer of automatic vending machines, is in the market for light gray iron and brass castings, small stamped goods, small iron rivets, tempered steel springs, enameling, plating, &c.

Bridges and Buildings.

Recent contracts secured by the Penn Bridge Company, Beaver Falls, Pa., include the structural steel for a foundry building, 100 x 300 ft., for the National Transit Company, Oil City, Pa., about 200 tons, also the steel work covering extensive repairs and for the straightening of a bridge for the Florida East Coast Railroad at Jacksonville, Fla. The company is now shipping the structural material for a steel pier for the Santiago Navy Yard, Santiago, Cuba.

The Central States Bridge Company, Indianapolis, Ind., has secured the contract for a bridge over the Pennsylvania Railroad near Warsaw for the Winona Interurban Railway Company, with headquarters at Warsaw, Ind. The bridge will cost $26,000.

Fires.

The plant of the Cleveland Steel Casting Company, Cleveland, Ohio, was burned January 21, the loss being about $50,000.

The two-story brick building on Rodney street, Brooklyn, N. Y., occupied by the International Cork Company and the Brooklyn Bottle Stopper Company, was destroyed by fire January 23, with a loss of about $50,000.

The foundry of the Hamacek Iron Works, Kewaunee, Wis., was recently destroyed by fire. The loss is placed at $15,000.

The building in Norwich, Conn., occupied by the Norwich Belt Mfg. Company and the Davenport Arms Company, was burned January 27, the loss being about $25,000.

Hardware.

After being closed for a month, during which time some repairs were made, the H. M. Myers plant of the Ames Tool & Shovel Company at Beaver Falls, Pa., has again been put in operation to practically full capacity in all departments.

The annual meeting of the Ideal Fence Company, Adrian, Mich., was held January 13 and officers for the ensuing year were elected, as follows: O. L. Teachout, president; J. V. B. Palmer, vice-president; E. A. Baker, secretary and treasurer; Geo. H. Cook, manager.

At the semiannual meeting of its directors, held January 13, the Moline Plow Company, Moline, Ill., declared its usual dividend. Official denial was given to a rumor that the plant was to be sold. It is now in operation on an eight-hour basis.

With a view to providing means for the expansion of its business, the stockholders of the Smith Improved Lock Nut Company, Inc., Rockford, Ill., will at a meeting to be held early in February consider the question of increasing the capital stock from $60,000 to $100,000. During the past year the company, which manufactures rolled and cut thread track bolts in addition to the Smith improved lock nut, has added a complete bolt department to its plant, and the present and prospective demand for these products seems to warrant a liberal extension in capital to make possible the carrying on of the business on a larger scale.

Kraeuter & Co., Newark, N. J., have just completed a large addition to their drop forging plant, and state that they are now in a position to solicit orders for special drop forgings, no matter how intricate they may be.

The Schatt & Morgan Cutlery Company, Titusville, Pa., has taken possession of the new buildings lately erected, the capacity of the enlarged plant being 2000 dozen pocket knives per week. The company is now employing a larger force than ever before.

The Kanneberg Roofing & Ceiling Company, Canton, Ohio, is now comfortably installed in its new plant, consisting mainly of a large two-story brick building, 50 x 400 ft., of fireproof construction, and equipped with new and up to date machinery. A railroad switch runs the entire length of the factory. The plant also includes a two-story building 40 x 60 ft., in which the company has used its artistic metal ceilings and side walls throughout, covering the building with its own metal shingles for roofing and using its own galvanized rock faced brick for siding. Opportunity has thus been taken to show the company's metal ceilings and side walls as they appear in actual use, as well as its metal shingles and brick siding.

During 1907 the Buchanan Foundry Company, Lebanon, Pa., doubled the size of its foundry building and installed a new power plant, both steam and electricity, and a new core shop with the latest equipment. The railroad siding used by the company is elevated on trestle work. All metal and fuel for cupola is unloaded directly on the charging platform, which is about 40 ft. square. The boiler fuel, sand, brick and other necessary foundry supplies are unloaded in bins underneath and alongside of the railroad track, thus securing material economy in handling raw material. The company's products include sash weights, building plates, templates, cast iron washers, elevator balance weights, and medium and low grade castings.

Miscellaneous.

We are advised that the report that large additions would be made to the new plant of the American Can Company at New Castle, Pa., are untrue. As yet this new plant has not been started, but will probably be put in operation at an early date. There is now being installed at the plant a complete system of sprinkler service, the work being done by the General Fire Extinguisher Company, Warren, Ohio, and a steam heating plant is also being installed by the James M. Merritt Company, New York. It is possible that the American Can Company may put up additional buildings at this plant some time during this year, but this has not been definitely decided.

The Cleveland Cliffs Iron Company, Cleveland, Ohio, contemplates sinking two shafts at its mines, each 14 ft. 10 in. by 10 ft. 10 in. inside dimensions, the shafts to be sunk through sand and gravel. In one shaft it is 104 ft. to the ledge and in the other 107 ft. Concrete shaftings are to be considered. Any company desiring to submit bids to construct these shafts, either by concrete or any other way, should communicate with the company at Ishpeming, Mich.

The Foster Stove Company, Ironton, Ohio, has elected the following officials: H. A. Marting, president; A. C. Lowry, vice-president; W. H. Foster, secretary and treasurer. These officials with E. O. Marting, J. C. Marting, C. H. Hutsinpillar, O. P. Doty and E. E. Horschel comprise the Board of Directors. The plant of the company is idle at present.

George H. Nichol has been appointed receiver for the Anderson Bridge & Scraper Company, Anderson, Ind. The stockholders are the petitioners, the object being to close up the company's affairs that it may go out of business. The assets are double the liabilities.

The R. J. Schwab & Sons Company, Milwaukee, Wis., manufacturers of Gilt Edge house heating furnaces and cement block machinery, plans to move into its new plant in the near future. The building is of reinforced concrete construction, five stories in hight, and situated on Clinton street, between South Pierce and Park streets.

The Pittsburgh Automatic Vise & Tool Company, Pittsburgh, supplied the entire vise equipment for the new machine shops of the United Verde Mining Company at Jerome, Ariz.

The Insley Iron Works, Indianapolis, Ind., has issued $15,000 of preferred stock, thus increasing its capital stock to $40,000.

The Ingram-Richardson Mfg. Company, Beaver Falls, Pa., which makes a specialty of porcelain enameled iron signs, enameled reflectors and refrigerator lining, has completed some extensions to its plant, consisting of two brick buildings, one 60 x 120 ft. and the other 40 x 140 ft., the former being equipped with new furnaces and the latter with mixing and melting apparatus, both of which are now being utilized. These additions give the company an increased capacity of about 50 per cent. in its products.

The Ann Arbor Machine Company, Ann Arbor, Mich., maker of hay presses, at its annual meeting, held January 14, increased the capital stock from $50,000 to $100,000. This action was taken to provide capital adequate for the growing business. The officers of the company are T. S. Langford, president; W. P. Moore, secretary and manager; H. J. Hanson, superintendent.

The General Fireproofing Company, Youngstown, Ohio, has secured a large contract for fireproofing for a court house at San Raphael, Cal. The company recently filled a contract amounting to $70,000 for storage shelving and document filing cases for the new Bowling Green custom house in New York; another of $58,000 for equipment for the offices of the Larkin Soap Company in Buffalo, N. Y; one for cases, steel files and omnibuses for the Chemical National Bank of New York and a fourth for the United States Government. It will be remembered that Congress a few months ago passed a resolution to take out the wood shelving in the library of the clerk of the Senate and put in 8000 shelves of steel. The General Fireproofing Company was awarded the contract for this shelving.

B. N. Rothenberger, Frederick Schoff and D. F. Hershey of Lancaster, and E. L. Garver and M. B. Leeman of Lititz, Pa., have purchased the Yeager-Hunter Stove Works, Royersford, Pa., and will operate the plant under the same name. The plant is equipped with new patterns and has been successfully operated for 25 years. C. G. Yeager, former president of the company, will retire from business. The new officers are: President, E. L. Garver; vice-president, Frederick Schoff; secretary and treasurer, M. B. Leeman.

British Shipbuilding in 1907.—The new shipping turned out at British yards in 1907 amounted to 1,814,722 tons, which compares with 2,002,571 tons in 1906. The total for last year included 37,200 tons of naval vessels, as against 47,100 tons in 1906. The English yards contributed 1,100,246 tons in 1907, the Scotch yards 674,934 tons and the Irish yards 138,542 tons. The English yards showed a decline of 192,000 tons and the Irish yards 11,000 tons, while the Scottish shipbuilders increased their total by 16,000 tons over 1906. The launchings in 1907 numbered 1825 as against 1421 in 1906. The Clyde made a new record, with an output of 619,919 tons last year, as against 598,841 tons in 1906. The Tyne was second, with 336,922 tons last year, a decline of 74,647 tons.

The Nova Scotia Steel & Coal Company produced about 59,000 tons of pig iron in 1907, an increase of 10,000 tons over the previous year. Its steel production was about 71,000 tons, an increase of 20,000 tons. The company has been pushing the development of its submarine iron ore deposits at Bell Island, Newfoundland, adjoining those of the Dominion Iron & Steel Company, and is tunneling under the latter company's holdings which are nearest the island. Estimates of the iron ore contained in the deposits of both companies run as high as 500,000,000 tons.

The Bettendorf Axle Company, Davenport, Iowa, has completed its new machine and blacksmith shop, which has been in course of erection for some months. The company gave a house warming on January 18, which was participated in by upward of 1000 of the employees and members of their families. The new building is 50 x 380 ft., is of steel and brick construction, and has all the modern accessories and conveniences.

Greatest Steel Corporation Earnings.

Total for 1907 Was $160,984,477.

Notwithstanding the heavy reduction in its earnings in the months of November and December, the statement of the United States Steel Corporation for the quarter ending December 31, 1907, shows that the year just completed was the greatest in its history. The total net earnings for the year were $160,984,477, against $156,624,273 in 1906, which had broken all records. The October earnings were the greatest for any one month up to that time.

The quarterly statement of net earnings given below compares the last quarter of 1907 with the last quarter of 1906. The earnings for December, 1907, may be slightly changed on completion of the audit of accounts for the year:

	1907.	1906.
October, net earnings	$17,052,211	$14,984,926
November, net earnings	10,467,253	13,482,464
December, net earnings	5,034,531	13,277,574
Total after deducting all expenses incident to operations, including those for ordinary repairs and maintenance of plants, employees' bonus funds, and interest on bonds and fixed charges of the subsidiary companies	$32,553,995	$41,744,964
Less charges and appropriations for the following:		
Sinking funds on bonds of subsidiary companies	$494,523	522,525
Depreciation and reserve funds (regular provisions)	5,683,275	5,523,849
Special improvement and replacement funds	500,000	1,000,000
	6,677,798	$7,046,374
Net earnings	$25,876,197	$34,698,590
Deduct interest for the quarter on U. S. Steel Corporation bonds outstanding	$5,879,231	$5,688,497
Sinking funds for the quarter on U. S. Steel Corporation bonds—viz.:		
Installments	$1,012,500	$1,012,500
Interest on bonds in sinking funds	295,231	235,965
	7,186,962	$6,936,962
Balance	$18,689,235	$27,761,628
Less charged off for adjustments in sundry accounts	483,529	90,651
	$18,205,706	$27,670,977
Dividend for the quarter on preferred stock, 1¾ per ct.	$6,304,919	$6,304,919
Dividend for the quarter on common stock, ½ per ct.	2,541,513	2,541,513
	8,846,432	$8,846,432
Surplus for the quarter	$9,359,274	$18,824,545
Less appropriated from surplus on account of expenditures made and to be made on authorized appropriations for additional property, new plants, construction and discharge of capital obligations	6,000,000	15,500,000
Balance of surplus for the quarter	$3,359,274	$3,324,545

Reservations for New Construction.

The total of the amounts set aside out of the quarterly earnings in 1907 for additional property and for new construction is $54,000,000, as against $50,000,000 in 1906. By quarters in the past year these amounts were $14,500,000, $18,500,000, $15,000,000 and $6,000,000. Of the $50,000,000 reserved for new property and new work in 1906, $21,500,000 was for the new plant at Gary, Ind. At the end of the second quarter of 1907 enough had been voted to Gary to make a total of $45,000,000 for that object. As $10,000,000 had been set aside for Gary in 1905 and $21,500,000 in 1906, the total for the first half of 1907 was $13,500,000. No definite statement has been made of the Gary proportion of the $21,000,000 reserved for new construction in the last two quarters of last year.

Net Earnings and Surplus.

The annual report of the corporation for 1906 showed a surplus on December 31 of that year of $97,720,714. The statements of the past year have shown the following amounts carried to surplus in the respective quarters, $3,684,576, $3,497,080, $4,911,711 and $3,359,274—total, $15,452,641. While some adjustments are made in the final audit of accounts for the year, which may change this slightly, it would appear that the surplus is now above $110,000,000.

The net earnings for the year 1907, $160,984,477, compare with $156,624,273 in 1906, $119,787,658 in 1905 and $73,176,522 in 1904. The net earnings for the past four years, compared monthly and quarterly, were as follows:

	1907.	1906.	1905.	1904.
January	$12,838,703	$11,856,375	$6,810,847	$2,868,213
February	12,145,815	10,958,275	6,629,463	4,540,673
March	14,137,974	13,819,840	9,585,586	6,036,346
1st qtr.	$39,122,492	$36,634,490	$23,025,896	$13,445,232
April	$14,600,838	$12,581,902	$9,037,925	$6,863,833
May	16,056,832	14,041,601	10,602,187	6,256,518
June	14,846,035	13,501,530	10,665,004	6,370,374
2d qtr.	$45,503,705	$40,125,033	$30,305,116	$19,490,725
July	$13,804,167	$12,242,098	$9,035,168	$6,344,771
August	15,279,173	13,158,860	10,986,901	6,202,957
September	14,720,945	12,713,666	11,218,513	6,226,204
3d qtr.	$43,804,285	$38,114,624	$31,240,582	$18,773,932
October	$17,052,211	$14,984,926	$12,400,306	$7,250,204
November	10,467,253	13,482,464	11,827,215	7,117,418
December	5,034,531	13,277,574	10,988,543	7,009,011
4th qtr.	$32,553,995	$41,744,964	$35,216,064	$21,466,633

The statement of unfilled orders on hand at the close of 1907 compares as follows with previous quarters:

	Tons.		Tons.
December 31, 1907	4,624,553	December 31, 1904	4,696,203
September 30, 1907	6,425,008	September 30, 1904	3,027,436
June 30, 1907	7,603,878	June 30, 1904	3,192,277
March 31, 1907	8,043,858	March 31, 1904	4,136,961
December 31, 1906	8,489,718	December 31, 1903	3,215,123
September 30, 1906	7,936,884	September 30, 1903	3,278,742
June 30, 1906	6,809,589	June 30, 1903	4,666,578
March 31, 1906	7,018,712	March 31, 1903	5,410,719
December 31, 1905	7,605,086	December 31, 1902	5,347,523
September 30, 1905	3,865,377	September 30, 1902	4,843,007
June 30, 1905	4,829,655	June 30, 1902	4,791,993
March 31, 1905	5,597,560		

J. B. Hogg, civil and mining engineer, Connellsville, Pa., has issued a map revised to January, 1908, of the Connellsville coke region and adjacent fields, showing all coke works in southwestern Pennsylvania. This map plots the various railroad lines, and gives the names of the owners of coke ovens on each railroad and its branches. It is so complete that it even includes the coke ovens abandoned by reason of the coal having been worked out. This map will be found of great value by all who are interested in receiving shipments of coke from the Connellsville region.

Charles J. Grist, London, England, has patented a method of hardening steel or steel alloys. In the heating of steel there are certain points or critical periods when the rise of temperature is arrested. By the new process the steel to be treated is heated in a vessel containing mercury to a critical point, which varies for different steels, but is from 200 to 450 degrees C., and then an electric current is applied at about 200 to 500 volts and about 25 amperes. Carbon steel twist drills treated in this manner, it is stated, perform nearly double the amount of work done by untreated drills.

With the opening of spring the Jones & Laughlin Steel Company, Pittsburgh, will launch a new steel towboat for bringing coal from the company's mines in the upper pools of the Monongahela River to its mills and coke works in Pittsburgh. The boat will be of unusual power. It will also be one of the few all-steel boats on the upper rivers, and is intended for the hardest service.

The Charles A. Schieren Company, New York, has been incorporated, with an authorized capital of $1,000,000, under a New York charter, to take over the partnership of the well-known leather belting firm of that name. The directors of the new corporation are Charles A. Schieren, F. A. M. Burrell, Charles A. Schieren, Jr., Arthur Schieren and Harry Victor Schieren.

Pig Iron Production in 1907.

James M. Swank, General Manager of the American Iron and Steel Association, has just published the statistics of pig iron production in the United States in 1907. The total was 25,781,361 gross tons, or somewhat in excess of preliminary estimates, which were based on a less output of charcoal iron in the second half than in the first half, corresponding to the decrease in coke iron production. Charcoal furnaces, however, produced more iron in the second half than in the first half. The following table gives the half yearly production for the past four years in gross tons:

	1904.	1905.	1906.	1907.
First half	8,173,435	11,166,175	12,782,250	13,478,044
Second half	8,323,598	11,826,205	12,524,941	12,303,317
Totals	16,497,033	22,992,380	25,307,191	25,781,361

The production in the first half of 1907 was much the largest for any six months in our history, and promises to stand as a record for some time. The output by States last year was as follows:

Total Production of Pig Iron by States.

States.	Production (Includes spiegeleisen and ferromanganese.) Gross tons of 2240 lb. First half of 1907.	Second half of 1907.	Total for 1907.
Massachusetts, Connecticut	8,746	10,373	19,119
New York	859,125	800,627	1,659,752
New Jersey	195,245	177,944	373,189
Pennsylvania	5,964,884	5,383,665	11,348,549
Maryland	221,145	190,688	411,833
Virginia	260,912	217,859	478,771
Georgia, Texas	26,173	29,652	55,825
Alabama	861,771	824,903	1,686,674
West Virginia	151,643	139,423	291,066
Kentucky	79,013	48,933	127,946
Tennessee	193,371	199,735	393,106
Ohio	2,815,174	2,435,513	5,250,687
Illinois	1,263,258	1,194,510	2,457,768
Indiana, Michigan	197,330	239,177	436,507
Wisconsin, Minnesota	160,045	162,038	322,083
Missouri, Colorado, Oregon, Washington, California	220,209	248,277	468,486
Totals	13,478,044	12,303,317	25,781,361

The production of coke and anthracite pig iron by States was as follows, 145 such furnaces being reported in blast December 31, 1907:

Production of Coke and Anthracite Pig Iron.

States.	First half of 1907.	Second half of 1907.	Total for 1907.
New York	859,125	800,627	1,659,752
New Jersey	195,245	177,944	373,189
Pennsylvania	5,964,264	5,381,996	11,346,260
Maryland	221,145	190,688	411,833
Virginia			
Georgia	281,092	236,003	517,095
Texas			
Alabama	846,034	805,499	1,651,533
West Virginia	151,643	139,423	291,066
Kentucky	78,423	47,561	125,984
Tennessee	193,016	197,590	390,606
Ohio	2,815,174	2,433,088	5,248,262
Illinois	1,263,258	1,194,510	2,457,768
Indiana			
Michigan	158,299	199,969	358,268
Wisconsin			
Minnesota			
Missouri	245,530	266,818	512,348
Colorado			
Totals	13,272,248	12,071,716	25,343,964

The production of charcoal iron by States is shown in the following table. On December 31 the number of active charcoal furnaces was 22, against 25 on June 30:

Production of Charcoal Pig Iron by States.

States.	First half of 1907.	Second half of 1907.	Total for 1907.
Massachusetts			
Connecticut	8,746	10,373	19,119
New York			
Pennsylvania	620	1,669	2,289
Maryland	517	927	1,444
Virginia			
Alabama	15,737	19,404	35,141
Georgia			
Texas			
Kentucky	6,421	14,098	20,519
Tennessee			
Ohio	0	2,425	2,425
Michigan	143,860	151,062	294,922
Wisconsin			
Minnesota			
Oregon	29,895	31,643	61,538
Washington			
California*			
Totals	205,	231,601	437,397

The production of Bessemer and low phosphorus iron in 1907 was 13,231,620 tons, a considerable falling off from the total of 13,840,518 tons of such iron in 1906. The table below shows the production of Bessemer and low phosphorus pig iron by States and by the various districts of Pennsylvania and Ohio:

Production of Bessemer and Low Phosphorus Pig Iron.

States.	First half of 1907.	Second half of 1907.	Total for 1907.
New York	467,143	462,376	929,519
Pennsylvania	(3,135,603)	(2,600,698)	(5,736,301)
Lehigh Valley	64,788	79,694	144,482
Schuylkill Valley	254,443	160,316	414,759
Allegheny County	1,876,784	1,566,957	3,443,741
Shenango Valley	638,495	551,774	1,190,269
Miscellaneous coke	301,093	241,957	543,050
Maryland and Virginia	220,989	200,969	421,958
West Virginia, Tennessee and Kentucky	170,826	153,497	324,323
Ohio	(2,045,577)	(1,665,424)	(3,711,001)
Mahoning Valley	889,668	680,018	1,569,686
Lake counties	602,064	534,851	1,136,915
Hanging Rock bituminous	55,712	32,690	88,402
Miscellaneous bituminous	498,133	417,865	915,998
Illinois	916,089	866,651	1,782,740
Michigan, Wisconsin and Minnesota	76,505	26,734	103,239
Colorado and California	153,146	69,393	222,539
Totals	7,185,878	6,045,742	13,231,620

The production of basic iron last year in contrast with Bessemer, showed an increase over 1906, the totals being 5,375,219 tons and 5,018,674 tons, respectively. By States the production of basic iron is given below:

Production of Basic Pig Iron, Not Including Charcoal Iron.

States.	First half of 1907.	Second half of 1907.	Total for 1907.
New York and New Jersey	114,438	100,759	215,197
Pennsylvania:			
Allegheny County	881,274	930,733	1,812,007
Other counties	943,939	828,462	1,772,401
Virginia and Alabama	250,590	291,666	542,256
Ohio, Indiana, Illinois, Missouri and Colorado	480,895	552,463	1,033,358
Totals	2,671,136	2,704,083	5,375,219

The production of spiegeleisen and ferromanganese was 339,348 tons in 1907, against 305,642 tons in 1906. Pennsylvania made 251,747 tons, and the balance, 87,601 tons, was contributed by New Jersey, Maryland, Illinois and Colorado.

The National Metal Trades Association Meeting.—The new Hotel Astor, New York, will be headquarters for the tenth annual convention of this association, as indicated in the monthly bulletin just issued at its Cincinnati headquarters, and the days of the meeting will be Wednesday and Thursday, March 25 and 26. A special effort is to be made for a large attendance at this meeting, because of the urgent necessity for a careful and weighty consideration of pending problems. The Administrative Council will hold a session immediately preceding the convention, and members are invited and expected to present in writing or otherwise, through the commissioner, any suggestions which in their judgment might benefit the association or better its operation.

The annual dinner of the managers, superintendents and foremen of the Pencoyd Iron Works of the American Bridge Company, Pencoyd, Pa., was held at the Pencoyd Club, Wissahickon, Philadelphia, on the evening of January 18. All the various departments of the works were represented. Addresses were made by J. A. Wadsworth, resident engineer, New York City; Paul L. Wolfel, consulting engineer; James L. Bernard, mechanical engineer; R. W. Bailey, contracting manager; A. C. Funk, manager of the Trenton Works, and a number of others.

The rod mill of the Morgan Spring Company at Struthers, Ohio, which has been closed down for some little time, is expected to go on full this week. The wire and nail mills are expected to start single turn this week.

The Forter-Miller Engineering Works, Hartje Building, Pittsburgh, Pa., has received an order for a gas producer plant to be installed in the Braddock Works of the American Steel & Wire Company.

The Pennsylvania Steel Company now has both its furnaces at Lebanon, Pa., in blast, the furnace which was banked on December 1 having started up in the past week.

The Iron and Metal Trades

The volume of new business which is being placed is still small, and it is only occasionally that evidence is forthcoming of some quickening in the demand. It must be confessed that there is some disappointment over the fact that orders have not yet come out in larger quantity with the steady improvement in the financial situation.

There will be a series of conferences to-morrow in many branches of the trade, which may bring a settlement on some important points, notably that of the price of ore for the coming season. Closely connected with the question of prices on crude and finished materials is that of readjustment of wages. The feeling in the trade is quite general that any lowering of prices, if determined upon, should be so timed that it will bring out confident buying. It hardly looks as though that period had arrived yet.

The market for Southern Pig Iron has for the time being settled rather firmly at $13 for No. 2 Foundry, Birmingham. The strength of the market will be tested, however, by the negotiations now pending for a good sized tonnage by the largest pipe interest, and for about 6000 tons for a Michigan stove manufacturer.

The efforts of Southern makers to market Pig Iron abroad met with their first success this week, when an aggregate of about 4000 tons of Foundry Iron was marketed in Italy.

The low prices on Bar Iron have had a widespread adverse influence, without stimulating business very much. Efforts to put order into chaos are to be made at a special meeting of the Eastern Bar Iron Association this week in this city.

Chicago reports inquiries for Rails from a number of railroads in the West and Southwest, which aggregate about 50,000 tons. There has been a considerable business in Splice Bars and in Spikes from some of the large roads.

Concessions are being made in Plates. The first order for Steel cars, which has been placed for some time, calling for 600 cars, has brought to a Pittsburgh mill 7000 tons of Plates and Shapes.

The Milliken plant has taken the order for 3100 tons for the National City Bank, while the leading interest is the lowest bidder on the Nashville Bridge, involving 3500 tons. The New York Central has called for bids for the second section of the new terminal, 6000 tons, but the first section, involving 4000 tons, has not yet been awarded. It is possible that both may be given out together.

In the lighter lines the most satisfactory reports come from the sheet trade, in which both specifications and new business are coming in better.

From practically every important market come the reports of a decidedly better feeling in Old Material. Offerings of about 6000 tons in Chicago were promptly absorbed, and prices have advanced from 50c. to $1 per ton. In the East a large Steel plant is in the market for 10,000 tons of Steel Melting Scrap. The market is in such shape that consumers must now do careful buying to secure material advantageously.

A leading sales agency has advanced its price for Lake Copper to 14¼c., but in other quarters there is reselling under 14c., some of the offerings coming from consumers. Electrolytic is freely offered at 14c.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date one week, one month and one year previous.

	Jan.29, 1908.	Jan.22, 1908	Dec.24, 1907	Jan.30, 1907
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	$18.25	$18.25	$18.25	[illegible]
Foundry No. 2, Southern, Cincinnati	*16.00*	16.00	16.25	26.00
Foundry No. 2, Local, Chicago	18.00	18.00	18.00	[illegible]
Bessemer, Pittsburgh	*18.90*	18.90	19.40	23.35
Gray Forge, Pittsburgh	*16.90*	16.15	17.90	22.50
Lake Superior Charcoal, Chicago	*22.00*	22.00	23.50	27.00
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	29.00
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.00
Open Hearth Billets, Pittsburgh	*30.40*	30.00	30.00	32.00
Wire Rods, Pittsburgh	**35.00**	35.00	34.00	33.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	**12.50**	12.25	12.00	18.00
Steel Rails, Melting, Phila	**12.00**	12.00	11.50	18.75
Iron Rails, Chicago	**17.00**	16.00	15.00	27.00
Iron Rails, Philadelphia	*16.50*	16.50	17.50	27.50
Car Wheels, Chicago	*18.50*	19.00	20.00	24.50
Car Wheels, Philadelphia	*17.00*	17.00	19.00	23.00
Heavy Steel Scrap, Pittsburgh	**14.00**	12.50	12.50	18.50
Heavy Steel Scrap, Chicago	**12.00**	11.00	10.75	16.00
Heavy Steel Scrap, Philadelphia	**12.00**	12.00	11.50	18.50
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	*1.55*	1.47	1.75	1.93½
Common Iron Bars, Chicago	*1.55*	1.55	1.75	1.81½
Common Iron Bars, Pittsburgh	*1.40*	1.40	1.60	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.70	1.70	1.70	1.80
Skelp, Sheared Steel, Pittsburgh	1.80	1.80	1.80	1.90
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.50	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	2.00	2.00	2.00	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound.	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	14.00	14.00	13.50	24.75
Electrolytic Copper, New York	**14.00**	14.00	13.37½	24.75
Spelter, New York	**4.70**	4.70	4.30	7.00
Spelter, St. Louis	**4.60**	4.55	4.20	6.75
Lead, New York	*3.75*	3.77	3.65	[illegible]
Lead, St. Louis	**3.60**	3.60	3.50	6.10
Tin, New York	**27.80**	27.60	27.00	41.87
Antimony, Hallett, New York	*9.00*	9.00	8.50	24.50
Nickel, New York	[illegible]	[illegible]	[illegible]	[illegible]
Tin Plate, 100 lb., New York	$3.80	$3.80	$3.60	$4.[illegible]

Chicago.

FISHER BUILDING, January 29, 1908.—(*By Telegraph.*)

In the movement toward resumption of activity, Wire and Wire products are taking the same relative position of leadership over other mill products which they occupied before the general slump in October. An encouraging increase, both of specifications and new business, is furnishing tonnage of sufficient volume to [illegible] plants, and the more active operation of those already in commission. Some indication of renewed interest in Standard [illegible] is also [illegible] thing over 50,000 tons. These emanate chiefly from smaller roads in the West and Southwest, and are [illegible] representing imperative needs, which will develop into orders. Nothing, however, is heard of impending purchases by the large trunk lines of important tonnage. More activity is noted in Light Rails, the prices of which are still somewhat irregular, especially on Sections up to 25 lb., owing to the competition of rerolling mills. Railroad Spikes are also in better demand, as is instanced by the greater number of orders recently received, among which is noted one for 4000 kegs. Structural Material is extremely backward in coming out, there having been no noteworthy tonnage closed during [illegible] No. 1 Rail mill. The 8, 9 and 12 in. mills of its Bay View plant started up this week to roll a moderate accumulation of Steel Bar specifications, while at Joliet the Billet, Rod

and Merchant mills have resumed operations. Bar Iron mills are somewhat more active in consequence of an improved demand, but the volume of business offered is as yet insufficient to assure full rolling schedules. A decided reaction in Scrap material has lifted the market from its extreme low level, and prices on practically all grades have advanced. About 6000 tons of Railroad Scrap was disposed of during the week at advanced prices. Another reduction of $1 a ton has been made in Cast Iron Pipe, the demand for which lacks vigor. Bids on 5000 tons of Pipe for St. Paul and Minneapolis will be opened January 31.

Pig Iron.—The market is extremely quiet and featureless. Inquiries continue to come in, but they are generally for small lots, and principally concern deliveries extending through the first half. Many of them are seemingly merely market feelers and are apparently not prompted by actual needs. The entire tonnage placed in this market for the past week or 10 days has been light, demonstrating the fact that melters' stocks are not in urgent need of replenishment. It would seem that the wants of consumers were pretty well covered by recent purchases of low priced Iron, reference to which was made in last week's report, for since the conclusion of that movement, which resulted in the placing of 20,000 to 25,000 tons at around $12, Birmingham, there has been little doing. In the meantime prices appear to have settled rather firmly around $13, Birmingham, for No. 2 Foundry, while Northern furnaces are holding pretty evenly at $18, Chicago, for No. 2. Several of the principal furnace interests are nevertheless adhering, nominally at least, to quotations on a basis of $13.50, Birmingham. At least two sales aggregating 650 tons were made during the present week on this basis. A few inquiries ranging from 500 to 1500 tons are in the market, which are regarded as likely to result in early orders. Values on the whole are practically unchanged. The following prices are for February and March delivery, f.o.b. Chicago:

Lake Superior Charcoal	$22.00 to $22.50
Northern Coke Foundry, No. 1	18.50 to 19.00
Northern Coke Foundry, No. 2	18.00 to 18.50
Northern Coke Foundry, No. 3	17.50 to 18.00
Northern Scotch, No. 1	19.00 to 15.50
Southern Coke, No. 1	17.85 to 18.35
Southern Coke, No. 2	17.35 to 17.85
Southern Coke, No. 3	16.85 to 17.35
Southern Coke, No. 4	16.35 to 16.85
Southern Coke, No. 1 Soft	17.85 to 18.35
Southern Coke, No. 2 Soft	17.35 to 17.85
Southern Gray Forge	15.35 to 15.85
Southern Mottled	15.10 to 15.60
Malleable Bessemer	18.50 to 19.00
Standard Bessemer	20.40 to 20.90
Jackson Co. and Kentucky Silvery, 6 %	22.40 to 22.90
Jackson Co. and Kentucky Silvery, 8 %	24.40 to 24.90
Jackson Co. and Kentucky Silvery, 10 %	26.40 to 26.90

(By Mail.)

Billets and Rods.—The demand for Forging Billets is exceedingly light, and purchases continue to be confined to small lots for immediate consumption. For the occasional small lots being moved prices remain at $33 to $34, Chicago. In consequence of the increasing activity among the Wire mills there is a little better movement in Wire Rods, on which quotations are as follows: Bessemer, $35; Basic, $36; Chain, $37, Pittsburgh.

Rails and Track Supplies.—While the mills are in receipt of no new specifications or orders for Standard Section Rails, other than a few scattered lots of small tonnage, a considerable number of inquiries of a nature that promise orders in the near future have developed. A number of these have been received from small Western and Southwestern roads during the last week, amounting in the aggregate to over 50,000 tons. There is a decided improvement in the demand for Light Rails and Spikes. Of the former, last week's sales included two orders aggregating 1000 tons, about 600 tons of which were for export to Canada. The booking of one order for 4000 kegs of Spikes would indicate that even for maintenance purposes railroads have reached a point where the replenishment of supply stocks is an imperative necessity. Reflecting the improved demand for and stronger feeling in Light Rails, prices are this week revised in accordance with the usual spread of $1 a ton between the different sections, ranging from 25 to 12 lb. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.90c. to 2c., according to delivery; Track Bolts, 2.40c. to 2.50c., base, Square Nuts, and 2.55c. to 2.65c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—New business is extremely backward in coming out, and while new projects are constantly developing that involve a considerable tonnage of Structural Material, very little business is being placed. Closures for the week include 422 tons for the Pacific Mutual Life Insurance Building, Los Angeles, taken by the Llewellyn Iron Works of that city. A contract for 366 tons for the Home Telephone Building, San Francisco, was let by the Geo. A. Fuller Company, general contractor, to Dyer Brothers. A contract for 3500 tons for the construction of a bridge over the Cumberland River at Nashville was secured by the American Bridge Company. The accumulation of tonnage is not yet sufficient to warrant resumption of the Illinois Steel Company's Structural mill, which has been idle for several weeks. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—What few buyers there are in the market are seeking only small lots for present requirements, there being no disposition as yet to contract for forward deliveries. The spread between store and mill prices has been narrowed by a reduction of $2 a ton on the former. Store demand is also small, being restricted to orders of limited tonnage. We quote for shipment from mill as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—The trend toward betterment noted last week has not proved to be strongly progressive, nor can it be said, on the other hand, that the movement has lost ground. Trade, however, continues quiet. Buyers seem content to supply their needs in hand to mouth fashion, and evince no anxiety concerning forward deliveries. Small shipments in fair amount are being made from warehouse stocks in both Black and Galvanized. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 to 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c. Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c. Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—The spread of $4 a ton between Steel and Iron Bars, occasioned by the recent reduction in the price of the latter, is diverting more or less business from the Steel Bar mills. It seems probable that steps will soon be taken to restore the equilibrium between these commodities, but just what action will be taken has not yet been decided. The demand for Iron Bars has improved considerably, but Steel Bars are moving slowly. The Bay View mills of the Illinois Steel Company started up Monday on the 8, 9 and 12 in. mills, and accumulation of specifications has also enabled the Republic Iron & Steel Company to put its Moline mill in operation. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.55c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—Orders continue to represent purchases for actual needs and in the aggregate show a slight improvement. It is apparent that dealers are much more anxious to reduce their stocks than to increase them, and in consequence they are only buying what is necessary to maintain assortments. The competition growing out of a desire to decrease stocks has resulted in a demoralization of prices, which have declined to a point that admits of but little or no profit, on a basis of present mill costs. Dealers assert that uncertainty of future values is largely responsible for these conditions. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 72 to 72½ per cent. on Black Steel Pipe, ¾ to 6 in. About four points advance above these prices is asked for Iron Pipe.

Boiler Tubes.—About the only change observable is a slightly better demand for Locomotive Tubes, orders for which, though not large, are being placed with greater frequency by the railroads. Merchant Tubes are exceedingly dull, both as respects mill and store demand. Mill quotations for future delivery, on the base sizes, are as follows: 2¾ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft.

and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	35	35	35
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2¾ to 3 in.	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—The results of the week indicate a little better feeling among the implement makers, from whom specifications of moderate volume have been received during the week. Otherwise conditions remain unchanged, there being no movement of significance in other directions. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1½ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 54 per cent. off in car lots; 48 per cent., less than car lots, base territory delivery.

Cast Iron Pipe.—Aside from a letting to be held by the town of Minott, N. D., February 3, on 1500 tons of Pipe, no prospective municipal tonnage is reported. There is, however, a somewhat improved demand for small lots ranging from 50 to 100 tons, representing water works extension requirements. Very few sales of, or inquiries for, Gas Pipe are noted; but in view of lower cost occasioned by receding prices, which are this week again reduced $1 a ton, it is believed that considerable tonnage will develop in the near future. We quote, per net ton, Chicago, as follows: Water Pipe, 4-in., $30; 6 to 12 in., $29; 16-in. and up, $28, with $1 extra for Gas Pipe.

Old Material.—The past week's railroad offerings, which amounted to upward of 6000 tons, found a better market than has been experienced for several weeks. It is understood that practically all of this tonnage was sold at prices ranging from 50c. to $1 a ton above last week's quotations. Of No. 1 Wrought on the Chicago, Burlington & Quincy's list, 1300 tons, brought over $12.50; 700 tons of Iron Rails were taken at $17.25, 600 tons of Steel Rails at $13.25. Railroad Malleable sold for $12.25. An offer of $18 a ton on another lot of Iron Rails was declined. These transactions had the effect of strengthening the general market. The rolling mills figured conspicuously among the purchasers, though the bulk of the tonnage was taken by dealers. Melters, too, bought a little more freely, and as a result of the demand from this source No. 1 Cast Scrap is on a level with Pig Iron. We quote, per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$17.00 to $17.50
Old Steel Rails, rerolling	13.00 to 13.50
Old Steel Rails, less than 3 ft.	12.50 to 13.00
Relaying Rails, standard sections, subject to inspection	22.00 to 25.00
Old Car Wheels	18.50 to 19.00
Heavy Melting Steel Scrap	12.00 to 12.50
Frogs, Switches and Guards, cut apart	12.50 to 13.00
Mixed Steel	9.50 to 10.00

The following quotations are per net ton:

Iron Fish Plates	$15.00 to $15.50
Iron Car Axles	16.50 to 17.00
Steel Car Axles	15.50 to 16.00
No. 1 Railroad Wrought	12.25 to 12.75
No. 2 Railroad Wrought	10.75 to 11.25
Railway Springs	11.50 to 12.00
Locomotive Tires, smooth	15.00 to 15.50
No. 1 Dealers' Forge	9.50 to 10.00
Mixed Busheling	8.00 to 8.50
Iron Axle Turnings	7.50 to 8.00
Soft Steel Axle Turnings	7.50 to 8.00
Machine Shop Turnings	7.50 to 8.00
Cast Borings	5.00 to 5.50
Mixed Borings, &c.	5.00 to 5.50
No. 1 Mill	7.50 to 8.00
No. 2 Mill	6.50 to 7.00
No. 1 Boilers, cut to Sheets and Rings	7.50 to 8.00
No. 1 Cast Scrap	13.50 to 14.00
Stove Plate and Light Cast Scrap	12.50 to 12.00
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	10.50 to 11.00
Pipes and Flues	9.00 to 9.50

Metals.—What was last week felt to be the beginning of a freer movement in Metals has not been productive of further developments. Consumers of Copper still adhere to the practice of buying what they need for present consumption, and in consequence orders of from one to five tons predominate, with but few of the latter size being placed. Business in other Metals is correspondingly quiet, and prices are practically unchanged. Old Metals share the general apathy exhibited in new material. We quote as follows: Casting Copper, 14¼c.; Lake, 14.¾c. to 15c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 30c.; small lots, 31½c.; Lead, Desilverized, 4c. to 4.05c., for 50-ton lots; Corroding, 5.15c. to 5.25c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 4.60c.; Cookson's Antimony, 13c., and other grades, 11c. to 11½c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 13½c.; Heavy Copper, 13¼c.; Copper Bottoms, 12c.; Clean Cuttings, 12c.; Red Brass, 12c.; Yellow Brass, 10c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¼c.; Pewter, No. 1, 21c.; Tea Foil, 23c.; Block Tin Pipe, 25c.

Pittsburgh.

PARK BUILDING, January 29, 1908. (*By Telegraph.*)

Pig Iron.—A meeting of the blast furnace interests of the Pittsburgh, Mahoning Valley, Shenango Valley, Wheeling, Columbus, Scottsdale and other nearby districts, was held in the Duquesne Club, Pittsburgh, on Monday, at which practically all agreed to maintain prices for the different grades of Pig Iron on the following basis: Bessemer, $18; Basic, $17; No. 2 Foundry, $17, and Gray Forge, $16, all at Valley furnace, to which a 90c. freight rate to Pittsburgh should be added. J. G. Butler, Jr., of Youngstown, was chairman of the meeting. Reports are current of Bessemer Iron being offered and sold on the basis of $17, Valley furnace, but when these reports are investigated they are found to be untrue. It is stated that not a furnace interest in the Mahoning and Shenango valleys is offering Bessemer Iron as low as $17, at furnace. A meeting of the Ore Association is being held in Cleveland to-day, at which action in regard to Ore prices for this year is expected to be taken. It is regarded as practically certain that last year's prices will be reaffirmed. A report will be sent from this meeting to the general meeting of the Pig Iron and Ore Committee to be held in New York on Thursday, and it is believed that also at that meeting last year's prices on Ore will be reaffirmed. In conformity with the action taken by the furnace interests, at the recent meeting, we quote Bessemer Iron at $18, Basic $17, Northern No. 2 Foundry $17 and Gray Forge $16, all f.o.b. Valley furnace. It is possible that small lots of Pig Iron might be obtained from dealers or from other sources at less, but the Valley furnace interests are quoting these prices on the small inquiries going. There is little active buying in Pig Iron, but the consumption is heavier than the actual output, and stocks are decreasing.

Steel.—We note that there are more inquiries in the market for Billets and Sheet and Tin Bars, and some tonnage on Bars that has been held up is now being specified for, so that more Steel is moving than for some time. We continue to quote Bessemer and Open Hearth Billets at $28, and Sheet and Tin Bars at $29, Pittsburgh.

(*By Mail.*)

Conditions in the Steel trade are showing betterment slowly but steadily. As an instance of this, we can state that the Carnegie Steel Company, which in December was down to about 22 per cent. of its Ingot capacity, is now running very close to 50 per cent. There has been an increase in orders on practically all kinds of Finished Iron and Steel, but as yet they are small and for actual needs. There is not much disposition on the part of the large trade to contract ahead until the situation has further cleared up. The railroads are buying a little more freely, the Denver & Rio Grande having placed an order for 600 steel cars with the Pressed Steel Car Company, while the Louisville & Nashville has recently bought about 2500 tons of Splice Bars from the Carnegie Steel Company and 15,000 kegs of Railroad Spikes from a local maker. Another Southern road is in the market for a similar tonnage in Splice Bars and Spikes, and this business is likely to be placed this week. None of the roads has yet placed orders for its Rails for 1908, and new tonnage is very small. The Pig Iron market continues quiet, but the feeling is growing that prices are pretty close to bottom. With last year's prices on Ore, $17 at furnace for Bessemer Iron, $16 for Northern No. 2, and $15 for Northern Forge, do not leave much margin of profit to some furnaces. Some tonnage held up in Sheet and Tin Bars is coming out, and inquiries for Billets are better. New business in Wire products, Hoops and Bands, Tin Plate and Pipe is showing a steady increase, but other lines, such as Structural Material, Plates, Steel Bars and Sheets, are quiet. There is some inquiry for Furnace Coke on contracts and relatively low prices are being named. We also note a better inquiry for Scrap, and prices have shown betterment.

Ferromanganese.—It is reported that an Eastern Steel company has placed an order for 1500 tons of foreign Ferro for deliveries running through the year. A local consumer has bought about 100 tons of foreign Ferro, April to July delivery, at about $48.50, Pittsburgh. We quote foreign 80 per cent. Ferro in lots up to 100 tons at $48.50 to $49, while for large lots, of 500 tons and over, a slightly lower price might be named.

Muck Bar.—We do not hear of any new inquiries in the market, and with the continued decline in prices of Forge Iron, Muck Bar is weak. We quote best grades of Muck Bar, made from all Pig Iron, nominally at $28 to $29, Pittsburgh.

Skelp.—No new business is offering, and the situation is very quiet. We quote: Grooved Steel Skelp, 1.60c.; Sheared Steel Skelp, 1.70c.; Grooved Iron Skelp, 1.80c., and Sheared Iron Skelp, 1.90c., f.o.b. Pittsburgh.

Rods.—There is not much new business being offered, but we are advised that the market is firm, on the basis of $35 for Bessemer Rods, $36 for Open Hearth, and $37 for Chain Rods, f.o.b. Pittsburgh.

Steel Rails.—The Carnegie Steel Company recently made a shipment of 4000 tons of Standard Sections to a Texas road, and has entered orders in the past week for about 1500 tons of Light Rails. The Louisville & Nashville Railroad recently placed a contract with the Carnegie Steel Company for 2500 tons of Splice Bars, and another Southern road is in the market for a similar tonnage, and also for about 15,000 kegs of Railroad Spikes. None of the large orders for Rails from Northern roads, which have been pending for some time, has yet been placed, but there have been some releases on old orders, which serve to keep the Edgar Thomson mill of the Carnegie Steel Company running to about half capacity. Prices on Light Rails, which are still being shaded $3 to $4 a ton by mills that reroll Rails, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—The 600 Steel cars recently placed with the Pressed Steel Car Company by the Denver & Rio Grande Railroad will require about 7000 tons of Plates and small shapes, which will be furnished by a local mill. The general demand for Plates is quiet and none of the mills is running to more than about 50 per cent. of capacity. Prices are fairly well maintained, but are still being shaded from $1 to $2 a ton by some mills, mostly on the narrow sizes. We quote: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell grade of steel is abandoned.	

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—No large tonnage from the local district has been placed in the past week, and the general condition is quiet. A good many large jobs are held up by the present unsatisfactory money conditions, and also from the fact that in some quarters the opinion prevails that prices on Structural Steel and Steel Bars may be readjusted to a lower basis. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—This is the dull season in the Sheet trade. We note, however, that some tonnage on contracts held up in November and December is now being specified for, showing that jobbers are receiving more orders from consumers. Jobbers are also reassorting their stocks and are placing orders a little more freely. In the absence of any large new business, and the fact that most concerns are operating their mills to less than 50 per cent. capacity, we are advised that prices are firm. We quote: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets $1.75 per square and Galvanized Roofing Sheets, No. 28, $3.10 per square for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—As showing the increase in orders for Tin Plate, we note that the American Sheet & Tin Plate Company is now operating about 60 per cent. of its Tin mill capacity, against 12 per cent. in December. Outside Tin Plate mills are also doing better in the matter of operating, and have a fair tonnage on their books. Reports are that some of the large can companies are not receiving orders for cans which are usually placed about this time, and, in consequence, are not placing orders for Bright Plates. It is the opinion that in March and April there will be a very heavy demand for Tin Plate, and that some consumers that are delaying placing their contracts will have trouble getting deliveries. We are advised that prices on Tin Plate, which went into effect January 6, are being strictly maintained. We quote at $3.70 for 100 lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Bars.—The best that can be said on Iron and Steel Bars is that only a fair tonnage is being placed, but which is far short of being large enough to give the mills full work. It is now generally believed that the recent action of the Bar Iron makers in reducing prices was a mistake, as the reduction does not seem to have stimulated demand to any extent, and, in addition, the lower prices are being shaded. We note that prices on Steel Bars are being maintained, and it is believed will not be reduced. The official price on Iron Bars is 1.40c., Pittsburgh, for Western shipment, and 1.55c. for delivery in the Pittsburgh District, but we are advised that both these prices are being shaded. Steel Bars are firm, at 1.60c., Pittsburgh.

Spelter.—Prices quoted on Spelter for future delivery are firm, but for spot shipments low figures are being made. We quote prime grades of Western Spelter for prompt delivery at 4.40c., St. Louis, equal to 4.52½c., Pittsburgh, while for future delivery about 4.50c., St. Louis, is asked. Actual tonnage being placed is light.

Hoops and Bands.—Since the announcement of the reaffirmation of prices was sent out to the trade by the three leading mills a considerable tonnage has been placed, some of it for delivery all through this year. Shipments by the mils are fairly heavy and conditions are more active than for some time. We quote Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60, base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Spikes.—For the first time in several weeks we can report some buying of Spikes by the railroads, the Louisville & Nashville having placed an order for 15,000 kegs, while the Delaware, Lackawanna & Western is inquiring for 1000 kegs. It is expected that other roads will soon be in the market. The demand for smaller sizes is fair, but none of the mills has much business booked ahead. We quote Railroad Spikes, standard sizes, 9-16 x 5½ in., at $1.80 to $1.85, and the smaller sizes at $1.95 to $2 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—The situation is still quiet, but in the past week there have been some small orders placed by the trade which represent only actual needs. Shafting continues dull, and it is stated that discounts are being shaded to some extent on some of the actual business that is being placed. We quote: Cold Rolled Shafting, 54 per cent. off in large lots and 48 per cent. off in carload lots, delivered in base territory; Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades, and 10c. and upward for special grades.

Merchant Pipe.—We can report a decided increase in new business, while specifications against contracts are coming in more freely. One of the oil companies has recently bought 3 miles of 10-in. Iron Pipe and is inquiring for 10 miles more. We also note that an inquiry is in the market for about 30 miles of 8-in. Steel Pipe. The Pipe mills are running more heavily, and requirements now probably amount to 40 per cent. or more of capacity. Prices on Steel Pipe are firm, but on Iron Pipe are still being shaded. The net discount on Steel Pipe to the large trade on ¾ to 6 in. is 74 and 5 per cent. off list, while on Iron Pipe, ¾ to 2 in., 71 and 5 per cent., and over 2 to 6 in., 70 and 5 per cent. are quoted. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black. %	Galv. %
⅛ to ⅜ in.	65	49
½ in.	67	53
⅝ in.	69	57
¾ to 6 in.	73	63
7 to 12 in.	70	55
Extra Strong, plain ends:		
⅛ to ⅜ in.	58	46
½ to 4 in.	65	53
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

To the large trade all above discounts are subject to 1 point on the base, and 5 per cent. on the net.

Boiler Tubes.—The demand for Railroad Tubes is improving, a fair tonnage having been recently placed, with inquiries in the market from several more roads. We also note a moderate demand for Merchant Tubes, prices on the latter still being shaded to some extent. Discounts on Mer-

chant Tubes for small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ in.	42	47
1¾ to 2¼ in.	42	50
2½ in.	47	61
2¾ to 3 in.	52	65
6 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Coke.—The output of Coke in the Upper and Lower Connellsville regions is showing an increase, due to the starting up by the Frick Coke Company of a number of idle ovens, the Coke being needed for blast furnaces of the Steel Corporation that have recently started. Low prices continue to be made on both Furnace and Foundry Coke, and we note that best grades of Connellsville Furnace Coke are still being offered as low as $1.90, while other grades of Furnace Coke, not rated as high in quality as strictly Connellsville, are offered at $1.75 at oven or lower. Connellsville 72-hr. Foundry Coke is held at about $2.50 a ton at oven, and other grades are offered as low as $2 a ton at oven. There are now 36,158 ovens in the Upper and Lower Connellsville regions, of which 21,689 were out of blast last week and 14,469 were active. The output was 143,838 tons, a decided increase over the previous week.

Iron and Steel Scrap.—We note a decided betterment in the Scrap trade, consumers buying more freely, and prices have improved from 50c. to $1 a ton. Consumers of Scrap realize that prices of this material got very much lower in the recent slump than actual conditions warranted, and with higher prices probable they are now willing to stock up, and more tonnage has been sold in the past two weeks than for some time. We have advanced prices on nearly all grades and now quote as follows: Heavy Steel Scrap, for Pittsburgh, Steubenville or Sharon delivery, $14; No. 1 Cast Scrap, $15.25 to $15.50; Low Phosphorus Melting Stock, $17.50 to $18; Bundled Sheet Scrap, $9.50 to $10; No. 1 Busheling Scrap, $14 to $14.50; No. 2, $12 to $12.50; Cast Iron Borings, $8 to $8.50; Steel Axles, $16; Iron Axles, $20.50 to $21; Rerolling Rails, $14 to $14.50; Old Steel Rails, short pieces for Open Hearth use, $14; Standard Sheet Bar Crop Ends, $15 to $15.50, and Grate Bars, $13 to $13.50. All above prices are per gross ton f.o.b. Pittsburgh. We note sales as follows: 1000 tons Heavy Steel Scrap at $14; 200 tons of Grate Bars, $13.50; 1000 tons Rerolling Rails, $15; 500 tons Cast Iron Borings, $8, and 500 tons No. 1 Cast Scrap, $15.

Bell Brothers, dealers in Iron and Steel Scrap and Metals, have completed and equipped a modern plant at Twenty-seventh street and Allegheny Valley Railroad, Pittsburgh, where the firm will be located after February 1. All machinery in the new plant is electrically driven.

The Schubb & Caplan Scrap Iron & Metal Company, Pittsburgh, has been organized by Elias Schubb, Morris Caplan and C. Ward Eicher, to carry on a general business in Iron and Steel Scrap.

Birmingham.

BIRMINGHAM, ALA., January 27, 1908.

Pig Iron.—The market is not so active as at the time of last report, but is considerably firmer. Sales have been principally to the general foundry trade, which is encouraging in view of the fact that new business in this line has been slow to develop. While lots contracted for have been comparatively small, the aggregate indicates quite an improvement in the demand. Producers who have heretofore been willing to make concessions have apparently booked sufficient tonnage to stiffen their quotations, and it is believed that $13 Iron has entirely disappeared. In fact, the only sale recently reported on this basis was a lot of 500 tons made during the early part of the week, and it is authentically stated that the same brand could not now be had at this price. A small lot for immediate shipment has brought $14, but this sale was made under special conditions, and $13.50 on a No. 2 Foundry basis, f.o.b. Birmingham, with a differential of 50 cents per ton for lower grades, is the market quotation. It is known that one company has disposed of its output for the first quarter, and is not making quotations on deliveries further advanced, while the entire stock on the yards of another interest, which is believed to be the largest single accumulation in the district, has been sold, and the brand is not being offered. It is believed that contracts covering upward of 100,000 tons have been placed with local producers since January 1, and as this is in excess of the available stock by probably 40 per cent., it is highly probably, to say the least, that the lowest level of prices has been reached; especially is this true, in view of the fact that producers are not disposeed to put idle capacity in operation except as order books require it. The output of Basic Iron has recently increased, one of the Tennessee Coal, Iron & Railroad Company's stacks at Ensley having been put in operation after a suspension of about three weeks for repairs. Out of the seven stacks in the district five are now in blast.

Cast Iron Pipe.—The recent developments in the Pig Iron market, together with the improvement in financial conditions as shown by latest clearing house statements, has had a very encouraging effect. The awarding of contracts for Minnesota points during the coming week is believed to be the initative of a period of activity, and as the prices which result will no doubt be a criterion of the market, the lettings are being awaited with interest. There is some idle capacity among local producers, but the lettings by small municipalities and requirements for maintenance work aggregate a significant tonnage, and order books generally are in good condition. We revise nominal quotations as follows, per net ton, f.o.b. cars here: 4 to 6 in., $28; 8 to 12 in., $26; over 12-in., average, $25, with $1 per ton extra for Gas Pipe.

Old Material.—No improvement is to be noted in the condition of the market. There is some demand for Stove Plate and Cast Scrap, but sales are of carloads only, and buyers are still indisposed to take hold other than for actual requirements. None of the mills has resumed operation, and there is apparently no demand whatever for Wrought and Steel Scrap. Revised nominal quotations are as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$21.00 to $21.50
Old Iron Axles	17.50 to 18.00
Old Steel Axles	16.00 to 16.50
Old Car Wheels	20.50 to 21.00
No. 1 Railroad Wrought	16.50 to 17.00
No. 2 Railroad Wrought	12.00 to 12.50
No. 1 Country Wrought	12.50 to 13.00
No. 2 Country Wrought	10.50 to 11.00
Wrought Pipe and Flues	12.50 to 13.00
Railroad Malleable	12.50 to 13.00
No. 1 Steel	13.00 to 13.50
No. 1 Machinery Cast	10.50 to 11.00
Stove Plate and Light Cast	9.50 to 10.00
Cast Borings	6.75 to 7.25

Philadelphia.

PHILADELPHIA, PA., January 28, 1908.

The markets for both crude and finished materials have quieted down to some extent during the past week. The business transacted recently has been confined, in almost every case, to small tonnages to piece out consumers' requirements, there being still no disposition to do any business to speak of for forward delivery. Melters in many cases placed orders for their immediate needs earlier in the month, and are waiting further developments before again placing business. While manufacturers generally feel rather optimistic regarding the future, there is hardly enough new business coming out to keep going plants running on their present basis, which in the majority of cases is somewhere around 50 per cent. of their capacity. Financial matters show a considerable betterment, and while business does not respond very fully at the time, it is believed that with a further financial recovery more confidence will be established in business generally. The railroads, however, which are one of the heaviest factors as far as buying is concerned, show no inclination to come into the market. It is believed by many that until the railroads again become buyers business generally will be more or less restricted.

Pig Iron.—The market has drifted into a rather quiet condition. Buying during the week has been very much scattered. Consumers have for the greater part placed orders for their needs during the next 30 or 60 days and are now rather inclined to await further developments regarding the probable consumption, as well as the price situation, before placing additional orders. Consumption continues light and melters' requirements are, therefore, proportionately less; so that, unless the demand improves, stocks on hand, together with purchases already made, will carry not a few over the first quarter. Business transacted during the past week has been confined almost entirely to the Foundry grades. There has been absolutely no demand for Steel making Irons, as Steel makers have in most cases large tonnages of Iron still due them on purchases made last year, and as plants are running extremely light, the consumption of stocks on hand is not very large. The same condition exists regarding Bar Iron makers. Rolling mills in operation are running at reduced capacities, and the prices now obtained for Bars preclude the use of Pig Iron in their manufacture to a considerable extent. The demand for Pipe Irons has quieted down considerably since the recent heavy purchases, in which Southern Iron was an important factor, and Southern Irons of all grades have again become rather inactive. Virginia Irons have also experienced a falling off in the demand, and while fairly good sales of these Irons, both Foundry and Pipe grades, were made early in the month, the tonnage sold recently has been comparatively small. Prices of Pig Iron appear to be holding firmly, and sellers who have been on the outside have not been making any very extensive sales at prices under the ruling quotations, inasmuch as it appears to be the policy of buyers not to take more Iron than is needed for early consumption, and as a rule the prevailing prices of standard grades are not

considered too high. As we have noted before, sales during the week have been confined to the Foundry grades, the tonnages varying from carload lots for prompt shipment up to lots of several hundred tons for later delivery. A lot of 300 tons of No. 2 X was sold at $18.25 for delivery in March and April, while 600 tons was sold for delivery during the first half, but there is not much disposition shown to purchase for the second quarter, while nothing at all has been heard of for deliveries beyond mid-year. Prices quoted for early delivery in buyers' yards, eastern Pennsylvania and adjoining territory, range about as follows:

No. 2 X Foundry	$18.25 to $18.50
No. 2 Plain	17.75 to 18.00
No. 3 Foundry	17.25 to 17.50
Gray Forge	16.50 to 16.75
Basic	17.25
Low Phosphorus	24.50 to 25.00

Ferromanganese.—The market is extremely quiet. There is practically no buying except in scattered odd lots. Sellers who have stocks on hand quote about $47 to $49, Baltimore, for prompt shipment.

Steel.—There has been a little more inquiry for Steel and makers take a more encouraging view of the situation. The Alan Wood Iron & Steel Company accumulated enough orders to start up the blooming mill at its Ivy Rock plant this week. The Open Hearth furnaces, however, have not yet been started, as a considerable stock of cold Ingots is on hand. The business coming out is individually small, however, and a considerable increase will be necessary to start the plant on the whole. Prices do not show any marked change. Ordinary Rolling Steel for delivery in this territory is quoted at $30.40, while Forging Steel ranges from $32.40 to $33.40, delivered, according to analysis.

Plates.—While there is still more or less irregularity in the inquiry for Steel Plates, the demand is somewhat better. Local interests have taken some pretty fair orders recently for Tank, Boat and Bridge Plates, in certain instances running up to 500 and 600 tons. Mills as a rule are a little better fixed as far as tonnage is concerned, but do not get enough business to enable them to run over half their capacity. The greater proportion of the business coming out is for prompt shipment, consumers not anticipating their needs to any material extent. Prices are being fully maintained and range about as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—Some few additional orders for Structural Material have come out, but the tonnage has not been very heavy. One of the local concerns booked an order for 500 tons for a building in the South. Some small bridge work has also been placed, together with a moderate volume of miscellaneous material. Mills are being operated at 50 to 75 per cent. of their capacity and makers feel more encouraged as to the future. Prices are firm and unchanged, 1.85c. to 2c. being quoted, according to specification.

Bars.—The situation in the Bar Iron trade shows practically no change. Prices are still very much unsettled, although not so much is heard of the extremely low prices previously mentioned. Refined Bar Iron makers are not inclined to take orders under 1.65c., delivered, in this territory, but common Iron Bars can be had at about 1.40c., Eastern mill, while still lower prices are talked of. The Eastern Bar Iron Association will hold a meeting on January 31, when the question of prices will no doubt be fully discussed. Meanwhile the tonnage of new business coming out is not large, and mills that are in operation continue to work at reduced capacities.

Sheets.—The demand does not show much change. Buyers only take sufficient quantities to meet immediate needs, no forward business coming out. Mills, therefore, do not gain much on tonnage and are being operated at about half capacity. Mill shipments are quoted as follows, with a tenth extra for small lots: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.70c.; Nos. 25 to 26, 2.80c.; No. 27, 2.90c.; No. 29, 3c.

Old Material.—There is a little better feeling in the market. Railroad Wrought and Borings and Turnings have been in somewhat better demand, and some few sales of these grades have been announced. Heavy Melting Steel has been the subject of some inquiry, although no heavy tonnages have as yet been sold. A fair tonnage of Low Phosphorus Scrap has been sold at the ruling price, but the other grades have been inactive. We quote nominally for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory, about as follows:

No. 1 Steel Scrap and Crops	$12.00 to $12.50
Low Phosphorus	18.00 to 18.50
Old Steel Axles	18.00 to 18.50
Old Iron Axles	23.00 to 24.00
Old Iron Rails	16.50 to 17.50
Old Car Wheels	17.00 to 17.50
Choice No. 1 R. R. Wrought	15.00 to 15.50
Machinery Cast	15.00 to 15.50
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	10.50 to 11.00
No. 2 Light Iron	8.00 to 8.50
Wrought Turnings	9.00 to 9.50
Stove Plate	12.50 to 13.00
Cast Borings	7.00 to 7.50
Grate Bars	12.00 to 12.50

Coke.—The market has been rather dull. Furnace Coke has been in very light demand, while that for Foundry Coke has also been quiet. Some producers maintain their prices without very extensive sales; others are not so firm, but sales are small owing to the inactivity in the Iron trade. Foundry Coke is held at $2.50 to $2.75 at oven, while Furnace Coke can be done at $1.90 to $2.25 at oven. We quote for delivery in the Philadelphia territory the following range of prices:

Connellsville Furnace Coke	$4.05 to $4.40
Foundry Coke	4.65 to 4.90
Mountain Furnace Coke	3.75 to 4.10
Foundry Coke	4.35 to 4.60

Cincinnati.

CINCINNATI, OHIO, January 29, 1908.—(*By Telegraph.*)

Various incidents of the week suggest improvement and a gradual restoration of confidence, but as yet conditions are not nearly normal. Collections are still slow, although money is getting easier daily. The little buying movement of the week in Coke has encouraged selling agents to feel that the melt is increasing and that more Iron will soon be needed. The largest Pipe interest is negotiating some good sized tonnage, but details are being very carefully guarded. The Stove people are showing a little activity, rolling mills of the central territory are slightly increasing their output, and several new mills are scheduled to start some time in the early spring. Selling agents in the various Steel lines report a little better interest manifest, and some promise of business, but present sales are limited to car lots and smaller. Dealers in Old Material are just beginning to realize that Scrap is any kind of factor in the Iron and Steel manufacturing world, and so some fairly good sales are reported, but at extremely low prices.

Pig Iron.—There is some inquiry for Foundry Iron for prompt shipment and a little movement, but in small lots. Sellers in this section are watching for the result of an inquiry from a Michigan stove manufacturer, who asks for 6000 tons of Analysis Iron, divided about equally between Northern and Southern, for delivery extending through the second, third and fourth quarters. The matter has been put up to the furnaces, which have not as yet quoted beyond July 1. An added tonnage of something like 3000 is available if the price quoted is satisfactory. A sale that is being consummated to-day is one of 400 tons of Malleable for a northern Ohio consumer. The price is said to be close to $17, Ohio furnace. It is known that prominent Pipe interests, other than those concerned in the Massillon and the Philadelphia deal, have negotiated a considerable tonnage of Iron recently and at especially attractive figures. Persistent rumor tells of purchases at $13, and even less, on Southern No. 2 for spot Iron, and that $16.50 and better has been done on the same grade of Northern, but in none of the cases was the tonnage large. Generally speaking, the furnaces in both districts seem to be holding the quoted price remarkably well, at $13 and $16.50 to $17, respectively. While Silicons are quoted on the basis of $21 at furnace for 8 per cent., it is said that this figure has been shaded. Basic at Valley furnace is quoted at $16.50 to $17.50 and Bessemer at $17, Valley furnace. Local foundries are not increasing their melt to any appreciable extent, and inquiry from that quarter is light. The sale is so limited that it cuts no figure in the market. Until the price for the Michigan inquiry of 6000 tons is out, no reliable figures will be obtainable for deliveries extending beyond the first half. For immediate shipment and for February and March and second quarter we quote as follows, the freight being, from the Birmingham District, $3.25, and from the Hanging Rock District, $1.20:

Southern Coke, No. 1	$16.50 to $17.00
Southern Coke, No. 2	16.00 to 16.50
Southern Coke, No. 3	15.50 to 16.00
Southern Coke, No. 4	15.00 to 15.50
Southern Coke, No. 1 Soft	16.50 to 17.00
Southern Coke, No. 2 Soft	16.00 to 16.50
Southern Coke, Gray Forge	14.50 to 15.00
Southern Coke, Mottled	14.00 to 14.50
Ohio Silvery, 8 per cent. Silicon	22.20 to 23.20
Lake Superior Coke, No. 1	18.20 to 18.70
Lake Superior Coke, No. 2	17.70 to 18.20
Lake Superior Coke, No. 3	17.20 to 17.70

Car Wheel Irons.

Standard Southern Wheel	$25.75 to $26.25
Lake Superior Car Wheel	26.50 to 27.00

(By Mail.)

Coke.—There is a little more interest in the Coke market. Some requisitioning on contracts is noted, and the spot shipment is improving, particularly on Foundry grades. The largest local agencies report several orders in prospect, going 100 carloads and over. The range on Connellsville Foundry is about $2.40 to $2.65, at oven; Furnace, $1.75 to $2.25. On Virginia grades, spot and February delivery Foundry is quoted at $2.40 to $2.50; Furnace, $1.75 to $1.85. There is not much contracting being done, and a few instances of shading on spot lots is noted. There is some foundry business going which indicates that the melt is increasing.

Finished Iron and Steel.—Relaxation of prevailing conservatism in banks and renewal of agitation in building enterprises planned prior to October of last year are expected to develop a marked improvement in finished lines soon. Buying is still of the hand to mouth order, but prices are being rigidly adhered to. Salesmen from the large distributing offices report a better feeling abroad, and report some orders placed for tonnages of fair size dependent on rapidity of return to normal conditions. Store prices are unchanged. Dealers quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.75c., half extras; small lots from store, 1.90c., base, half extras; Steel Bars, carload lots, 1.75c., base, half extras; small lots from store, 1.90c., half extras; Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c.; Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c.; Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c.; Blue Annealed Sheets (heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c.; No. 14, carload lots, 2.05c.; small lots from store, 2.40c.; No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.25c.; No. 12, carload lots, 2c.; small lots from store, 2.35c.; Sheets (light), Black, No. 28, carload lots, 2.65c.; Galvanized Sheets, No. 28, carload lots, 3.70c.; Tin Plate, 100-lb. basis, 112 Sheets, 14 x 20, 3.70c., Pittsburgh; Steel Tire, 4-in. or heavier, carload lots, 1.95c., base; Plates, 3-16 in. and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Old Material.—The first opportunity for several weeks to record any kind of interest in the Scrap market is presented this week. There is a little buying, confined chiefly to Melting Steel and Relayers. A good sized tonnage of the latter has been sold by a local dealer for shipment to Mexico and the Pacific Coast. Some metals have been sold for shipment to London also. The machine tool concerns are showing a little more interest in the Old Material market, and a few orders are coming in from the foundries. The following prices are given as about representative of the local market, and are f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$11.00 to $12.00
Cast Borings, net ton	4.00 to 5.00
Steel Turnings, net ton	5.50 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought, net ton	7.00 to 8.00
Old Iron Axles, net ton	14.50 to 15.50
Old Iron Rails, gross ton	14.50 to 15.50
Old Steel Rails, long, gross ton	11.50 to 12.50
Relaying Rails, 56 lb. and up, gross ton	22.00 to 23.00
Old Car Wheels, gross ton	16.00 to 17.00
Low Phosphorus Scrap, gross ton	13.50 to 14.50

Cleveland.

CLEVELAND, OHIO, January 28, 1908.

Iron Ore.—Although the question of Ore prices for the coming season is attracting more attention among consumers, the producers show no inclination to take action. Shippers say that they are getting no inquiries for Ore at present, and that no one will want to buy during the next three months. For that reason they say there is no reason for fixing prices now, and that it would be much better to wait until later when a better forecast can be made regarding activity in the Iron and Steel industries during the year. The majority of the mine operators seem to be in favor of maintaining last year's prices, and a number of merchant furnace interests have expressed themselves as opposed to a reduction in prices for this season. They point to the fact that should a reduction be made, the value of the stock piles they will have on hand at the opening of navigation will be considerably depreciated. Should their furnaces go in blast at an early date, it is estimated that some furnace interests will have enough of last season's Ore to last them until September 1. No new shipping orders for removal of Ore from the docks to the furnace yards are being received, and some small shipping orders on which a few carloads a week have been going forward have been canceled the past week. Nominal Ore prices remain as follows at Lake Erie docks, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.25; Mesaba non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous non-Bessemer, $2.35 to $2.60.

Pig Iron.—The market has taken on a firmer tone as the result of the action of some of the furnace interests in fixing $17 at furnace as the minimum price for No. 2 Northern Foundry Iron for first quarter and first half delivery. A local interest that handles the product of two Valley furnaces, which sold considerable tonnage during the previous two weeks at $16.50 for the first half for No. 2, is holding firmly at $17 at furnace, and announces that it will sell no Iron at a lower price for future delivery. Local furnaces are also holding for better prices, and are not quoting under $17 for No. 2 for outside delivery, as compared with $16.50 a week ago. For local delivery a price of $17.85, delivered, is asked, as compared with $17.25, which has been the ruling quotation for No. 2 for the past few weeks. The active buying movement which was in progress a week ago has disappeared, and but few sales and inquiries are noted. The only sale of any size reported was 1000 tons each of Northern and Southern Iron for first half delivery to a stove interest having a foundry in northern Ohio. This consumer first came in the market with an inquiry for 400 tons for spot shipment, but concluded that the condition of the market warranted making a purchase covering the first half. Other sales have been mostly car lots for immediate needs. Although the price of $17 at furnace is now being maintained for the first half and first quarter, furnaces that have Iron on their stock piles are making a little lower quotation for spot shipment. There are a number of inquiries for Southern Iron in lots of 100 to 300 tons, but very few sales are reported. There is an occasional inquiry for Basic Iron, but a local interest has refused to make quotations, announcing that it is not in the market for business at the prevailing prices. For first quarter and first half we quote, f.o.b. Cleveland:

Bessemer	$18.00
Northern Foundry, No. 1	$17.50 to 18.00
Northern Foundry, No. 2	17.00 to 17.50
Northern Foundry, No. 3	16.50 to 17.00
Southern Foundry, No. 2	17.35 to 17.85
Gray Forge	16.40 to 16.90

Coke.—The slight activity in Foundry Coke a week ago has subsided. We quote Standard 72-hr. Foundry Coke at $2.50 to $2.60, at oven, for prompt shipment and for the first half. We quote Connellsville Furnace Coke at $2 to $2.15, at oven for first half. This price is shaded for prompt shipment.

Finished Iron and Steel.—The volume of new business and specifications on contracts continues to improve very slowly. While the aggregate tonnage that is being placed is still small, yet as compared with the volume of business a month ago the increase is very satisfactory. As a result of greater activity on the part of manufacturers in the metal trades there is an increase in the demand for all kinds of Finished Material, but consumers are buying only in small lots. They wait until they need the material and when they place an order they want quick delivery. Some fairly good orders for Iron Bars have been placed during the week, and good specifications for Steel Bars have come out. Practically no orders for material are coming from the railroads. The two local Bar Iron mills that started up last week are still running, but unless orders improve another shutdown will probably be necessary. The plant of the Otis Steel Company shut down last Saturday, but will start up again in a few days. Some cutting on Bar Iron is reported by Western mills, a price of 1.35c., Pittsburgh, being quoted. The established price of 1.40c., Pittsburgh, or 1.50c., Cleveland, is being maintained by the local mills. In Structural lines there is an inquiry out for 1400 tons of material for grade crossing elimination work that will be started soon by the city of Cleveland and the Baltimore & Ohio Railroad. Several specifications for 100 to 300 tons of Structural Material have been received by mills from local Structural shops during the week. The sale of a few carloads of Forging Billets is reported on the basis of $30, Pittsburgh. There is still a good inquiry for Light Rails, and a number of sales in car lots have been made. The new price of $28 for 25 to 45 lb. sections is being cut by the leading interest about $1 a ton to meet the competition of the mills rerolling Rails, that are asking $25 and $26. We quote Steel Bars at 1.70c., Cleveland, for carload lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼ in. and heavier, 1.80c., base, Cleveland. Mill prices on Sheets, carload lots, Cleveland, are as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Jobbers report a slight improvement in business. Warehouse prices are unchanged. We quote Steel Bars out of stock at 1.90c. to 1.95c., and Iron Bars at 1.80c. Beams and Channels out of stock are 2.10c. to 2.15c., base. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.20c.; Box Annealed, No. 28, 2.90c.; Galvanized, No. 28, 4.05c. Warehouse prices on Boiler Tubes, 2¼ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—Very little, if any, improvement is shown in the demand from consumers. Local mills are buying in very small lots for immediate needs and inquiries

from foundries are very scarce. There is a slightly better feeling in the Scrap market, however, and there is more activity among dealers. A little improvement is noted in the demand for Steel Scrap and, as a result of the covering by dealers who are short, Heavy Melting Steel is firmer. Quotations remain largely nominal. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$11.50 to $12.00
Old Iron Rails	16.00 to 17.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	16.00 to 17.00
Relaying Rails, 50 lb. and over	25.50 to 26.00
Relaying Rails, under 50 lb.	28.00 to 29.00
Heavy Melting Steel	12.00 to 12.50
Railroad Malleable	12.00 to 13.00
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	8.00 to 9.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	4.50 to 5.00
Iron and Steel Turnings and Drillings	7.00 to 8.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	11.00 to 12.00
No. 1 Railroad Wrought	11.00 to 12.00
No. 1 Cast	12.00 to 13.00
Stove Plate	10.50 to 11.00
Bundled Tin Scrap	9.00

New York.

NEW YORK, January 29, 1908.

Pig Iron.—Aside from one lot of upward of 1000 tons of Foundry Iron, of which the bulk went to a Western furnace interest, transactions have been limited to small lots. Buyers do not appear to have much confidence in the market and are holding back. We quote, at tidewater, $18.75 to $19 for No. 1 Northern Foundry; $17.75 to $18.25 for No. 2 Foundry; $17.25 to $17.50 for No. 2 Plain, and $16.75 to $17 for Gray Forge. Alabama Iron is quoted $17.50 to $18 for No. 1 Foundry, and $17 to $17.50 for No. 2 Foundry.

Steel Rails.—The rumor of new business placed by the Buffalo, Rochester & Pittsburgh Road, the tonnage being divided between Bessemer and Open Hearth Rails, lacks confirmation. The Central of New Jersey placed a portion of its tonnage recently, and the D. L. & W. has been mentioned as a buyer, though details are lacking. The Pennsylvania Steel Company has booked 1500 tons of girder rails for the New York City Railway receivers, this company also taking the 500 tons of T Rails placed by the Traction Development Company of Brooklyn.

Structural Material.—Projects for which the money has been available are not halted, apparently, and in New York City a number of buildings are coming forward, while others have reached the books of general contractors. The low prices at which work is being taken continue to be the subject of comment by unsuccessful bidders. On the bridge over the Cumberland River, at Nashville, Tenn., requiring 3500 tons, the American Bridge Company appears to be the low bidder. In New York City the National City Bank Building, 3100 tons, on the old Custom House site, goes to the receivers of Milliken Bros., Inc. The Spiro Building, on West Twenty-first street, a 12-story structure, requiring 1400 tons of Steel, was taken by the Hay Foundry & Machine Company. Included in work projected or on which bids have already gone in are the following: 600 tons for a dormitory and baggage room at Ellis Island, for which the New York State Contracting Company has the general contract; an 18-story office building, for the Improved Property-Holding Company, on Fifth avenue, north of Forty-second street, 600 tons; a 16-story loft building at Broadway and Fourth street, for Philip Braender, 1400 tons; the Sage Memorial Building, at the Troy Polytechnic Institute, 500 tons. The American Bridge Company has been awarded two bridge contracts of 500 tons each by the Nevada County Narrow Gauge Railroad in California and the Chicago, Burlington & Quincy Railroad. The New York Central is asking bids on the second instalment of its Grand Central terminal work, amounting to 6000 tons. The first section of this work, on which bids were taken some time ago, the amount being 4000 tons, has not yet been let. Structural mills are naturally running on light schedules, and the alternation of stopping for the accumulation of specifications and then starting up for brief runs continues. We quote as follows for deliveries at tidewater on mill shipments: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—A great deal of dissatisfaction exists over the recent developments in the Bar Iron trade. Manufacturers generally feel that a serious mistake from the standpoint of salesmanship has been made. The trouble originated in the West, and will probably have to be remedied there before a change for the better can be made in this section. It would not be surprising, however, if the leaders in the recent reduction of price should see a new light and decide to restore prices, at least to some extent. The reduced rates have brought out very little business, as under such circumstances as have recently prevailed buyers hold off, waiting until they can satisfy themselves that bottom has been reached. The Eastern manufacturers generally quote 1.40c., Pittsburgh, or 1.56c., New York, but in some instances this price has been shaded. It is understood, however, that the business taken at very low prices usually carried good extras which would probably bring the actual realized price up to regular quotations. Steel Bars continue to be quoted at 1.60c., Pittsburgh, or 1.76c., tidewater.

Plates.—Business is spasmodic, sales agents reporting a fair run of orders on some days, and very quiet conditions on others. So far this year the orders placed have only been for small quantities. Prices are unchanged, as follows, at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—Inquiries are numerous, but they are usually for small lots, and only come from consumers having requirements which must be supplied early in the spring. Large buyers are so far not coming forward with their specifications for their season's requirements. Manufacturers are looking for a year of fairly satisfactory business, but foundries will be obliged to run on short time until nearer the opening of spring trade. Carload lots of 6 in. are quoted at $26 to $27 per net ton, tidewater.

Old Material.—Some demand is noted for Old Car Wheels, and the general foundry trade is also fairly good. Rolling mill business, however, is of exceedingly small proportions, although it is known that quite a number of mills are really bare of stock and must soon come into the market if they expect to turn out any considerable product. One Steel works is now in the market to purchase a considerable quantity of Melting Scrap, but is offering a price much below dealers' views. Quotations per gross ton, New York City, are as follows:

Old Girder and T Rails for melting	$8.00 to $9.00
Heavy Melting Steel Scrap	8.00 to 9.00
Old Steel Rails, rerolling lengths	10.00 to 11.00
Relaying Rails	15.50 to 16.00
Old Iron Rails	13.00 to 14.00
Standard Hammered Iron Car Axles	15.50 to 16.50
Old Steel Car Axles	13.00 to 14.00
No. 1 Railroad Wrought	10.50 to 11.50
Iron Track Scrap	9.00 to 10.00
No. 1 Yard Wrought, long	10.00 to 10.50
No. 1 Yard Wrought, short	9.50 to 10.00
Light Iron	4.50 to 5.50
Cast Borings	4.00 to 5.00
Wrought Turnings	5.50 to 6.50
Wrought Pipe	8.00 to 8.50
Old Car Wheels	16.00 to 16.50
No. 1 Heavy Cast, broken up	12.50 to 13.00
Stove Plate	11.00 to 11.50
Grate Bars	8.50 to 9.00
Malleable Cast	12.00 to 12.50

Metal Market.

NEW YORK, January 29, 1908.

Pig Tin.—More business was transacted last week than during any preceding week in some months. On Tuesday the total sales aggregated at least 200 tons, largely for spot delivery. Prices are not materially unchanged from a week ago, although there was a sharp advance on Thursday and Friday. The drop on Monday, however, was probably caused by the anticipation of the Banca sale, which took place today and went off at 26.70c., c.i.f. New York. In all about 2600 tons were disposed of, a large amount for this sale. Those conversant with the situation voice the opinion that a large consumer was interested in having this sale go at a high figure. Prices during the week have been as follows:

	Cents.
January 22	27.45
January 23	27.75
January 24	27.85
January 27	27.25 to 27.35
January 28	27.35 to 27.40
January 29	27.80

The increase in the business during the week has made it necessary to revise estimates of deliveries into consumption, and it is now believed that these will aggregate 1700 tons, which are 300 tons in excess of the possible arrivals. This will bring stocks in this country down to a record low figure. At the same time the visible supply all over the world is increasing. London holders of metal do not seem disposed to ship large amounts of metal, for the Minneapolis, due to arrive February 2, will bring but 250 tons. Cargoes of 1000 tons have not been uncommon in the past. Total arrivals are 1225 tons. If the St. George from Singapore reaches port Thursday the month's arrivals will be 1300 tons and the afloats 900. The high price for spot to-day was caused by the small stocks here. The London market is higher than a week ago, at £124 5s. for spot and £125 for futures.

Copper.—The market in some ways is slightly easier. There have been enough resale lots of Lake offered at 13.87½c. to indicate that the 14c. price was not firmly held. Producers, however, continue to ask 14c. for both Lake and Electrolytic. It is probable, however, that a firm bid at 13.80c. for a lot of one or two carloads of Lake would be accepted by the holders who are reselling. There has been some inquiry for Electrolytic, but no business has developed.

It seems [illegible] the United Metal Selling Company should advance its price to 14.25c., which was done Tuesday, the last of the week at Lake. All the [illegible] needed can be had at 14c., and there is very little actual business, either domestic or foreign. Some of these resale lots are offered by consumers, and this lends color to the belief that these interests are not so bare of stocks as was generally supposed. Large users of Copper have declared recently they purchased all the metal needed for several months to come at under 13c. The export situation, which looked dubious a week ago, has improved considerably, the total outgo for the last week being over 9000 tons, which brings the exports for the first 28 days of the month up to 31,162 tons. Buying from Europe is practically at a standstill, as far as consumers are concerned, and speculators are not as anxious purchasers as a month ago. If the offering of Lake under producers' quotations continues, it will undoubtedly break the market. Prices in London are easier than a week ago, at £62 2s. 6d. for spot, and £62 15s. for futures. Best Selected is held at £65 10s. The price of Copper in London to-day is just half the price of Tin.

Pig Lead.—The market is dull and unchanged, with 3.75c. quoted in New York and 3.65c. in St. Louis. Early forward deliveries are held at the same figure, but far futures are unobtainable. Four weeks appears to be the limit for which producers are willing to make sales for future delivery.

Spelter.—The situation in Spelter is mixed. Offerings at low figures have been made, but on attempting to close the contract higher prices were demanded. The price in New York seems to be 4.70c., and the same figures are quoted in St. Louis. It is probable, however, that offers of 4.60c. at the Western point would be accepted.

Ferroalloys. [illegible] easier at $47.50 to $48.50, seaboard. This, however, is only obtainable for reasonably prompt shipment, dealers believing that conditions will materially improve in the near future. The old price of $85 continues for 50 per cent. Ferrosilicon, both foreign and domestic. The higher grade, 75 per cent., commands $127.50.

Antimony.—The large arrivals here continue to excite comment. Prices are unchanged at 9.50c. for Cookson's, 9c. for Hallett's and 8.50c. for Hungarian brands. The market is largely nominal.

Nickel.—The price is unchanged at 45c. for large lots and 50c. to 60c. for smaller quantities.

Tin Plates.—There has been considerable improvement in the demand, and a larger number of mills are in operation. Prices are unchanged, 100 lb. IC Coke Plates being held at $3.89, f.o.b. New York, and $3.70, f.o.b. Pittsburgh. The decline in Europe appears to have been arrested; prices in Swansea are unchanged at 11s. 7½d., in spite of large offerings of German Tin Plate Bars.

Old Metals.—A slight downward revision in the price of Brass Scrap is noted. The market continues dull, but some sales have been made at about the following figures, which represent dealers' selling prices for large lots:

	Cents
Copper, Heavy Cut and Crucible	13.00 to 13.25
Copper, Heavy and Wire	12.50 to 13.00
Copper, Heavy and Bottoms	11.50 to 11.75
Brass, Heavy	10.00 to 10.25
Brass, Light	7.75 to 8.00
Heavy Machine Composition	12.00 to 12.50
Clean Brass Turnings	8.25 to 8.75
Composition Turnings	10.00 to 11.00
Lead, Heavy	3.50
Lead, Tea	3.25
Zinc Scrap	3.25

Iron and Industrial Stocks.

NEW YORK, January 29, 1908.

The market for securities is now believed to be uninfluenced by purely financial conditions. The supply of money is abundant, and from this time forward it is expected that values will be subject to the ordinary influences of trade conditions and business developments. The upward movement seems to have been checked, but prices appear to be fairly sustained. Even adverse occurrences, such as the passing of a local national bank into receivers' hands and the institution of a suit by the Government against the Union Pacific Railroad Company, proved to be without serious effect in depressing prices. The range of prices on active stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 27¾ to 29½, preferred 91⅝ to 93; Car & Foundry common 29¼ to 30⅝, preferred 88½ to 89; Locomotive common 35¾ to 38, preferred 90 to 91; Steel Foundries common 5¾ to 6⅜, preferred 30½ to 31; Cambria Steel 27½ to 28⅝; Colorado Fuel 19¼ to 20½; Pressed Steel common 20½ to 21¾, preferred 77½ to 79; Railway Spring common 26 to 27⅝; Republic common 16¾ to 17½, preferred 69 to 69⅝; Sloss-Sheffield common 39½ to [illegible]; Cast Iron Pipe [illegible] to 69; Can common 5, preferred 49⅞ to 51⅛. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 28, preferred 92, bonds 88⅞; Car & Foundry common 30¼, preferred 88½; Locomotive [illegible] Steel common 21, preferred 78; Railway Spring common 25; Republic common 17, preferred 69; Sloss-Sheffield common 40¾; Cast Iron Pipe common 19½, preferred 67; Can common 5, preferred 50.

Dividends.—The Pressed Steel Car Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable February 26.

The J. G. Brill Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable February 1, and 1 per cent. on the common stock, payable March 14.

The Westinghouse Air Brake Company, Ltd., of London, England, has paid a dividend of 10 per cent. for the six months ended December 31, 1907, and an extra dividend of 5 per cent. for [illegible] year.

The United States Steel Corporation has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable February 29, and ½ per cent. on the common stock, payable March 30.

Factory Mutual Fire Insurance.

A correspondent calls attention as follows to a bill introduced in the New York Legislature which should be opposed by manufacturers interested in mutual fire insurance companies:

"Assembly bill, No. 42, dated January 6, 1908, which has been referred to the Committee on Insurance in the New York State Assembly, is another attempt to tax factory mutual fire insurance companies for the benefit of certain firemen's associations. Similar bills have been before the Legislature for several years, but have been defeated each time by the energetic opposition of policyholders. Because factory mutual companies confine their business to isolated properties and employ restrictions and inspections of the most rigid character, their losses are small, and they are able to return to policyholders dividends averaging something more than 90 per cent. of the total premiums. If this bill becomes a law, and a tax of 1 per cent. on gross premiums is imposed, it will be equivalent to 20 per cent. on the net premiums."

The 1908 Meeting of the Testing Society.—The next annual meeting of the American Society for Testing Materials will be held at the Hotel Traymore, Atlantic City, N. J., June 23-27, 1908. With five days devoted to the meeting, instead of three, as heretofore, there will be no conflict of the sessions of different sections, and the arrangement of the programme will probably be such that a member interested in but one line of the convention's work can attend all the sessions devoted to his group of subjects in two or three consecutive days.

The ninety-fourth meeting of the American Institute of Mining Engineers will be held in New York City, beginning Thursday evening, February 18. The Institute headquarters will be in the foyer of the United Engineering Society Building during Wednesday and Thursday. At the opening session on Tuesday evening an illustrated paper on "Electric Power in Steel Mills" will be presented by David B. Rushmore, Schenectady, N. Y. The Wednesday morning session will be devoted to the "Physics of Steel"—a topic which has been the subject of many fruitful discussions at previous meetings of the Institute. On this occasion it will be considered specially with regard to the structure of steel ingots and their mechanical treatment, as related to the character of finished products, such as forgings, rails, beams, &c. The proceedings of this session will include, besides the continued discussion of Prof. H. M. Howe's paper on "Piping and Segregation in Steel Ingots" and such other pertinent contributions as may be offered, an important paper by James E. Howard, engineer in charge of the testing department at Watertown Arsenal, Watertown, Mass., on the work of that department, and its bearing upon the metallurgical questions involved therein. At other sessions [illegible] manufacturers will be presented.

Correction.—In the article relating to the New York and New Jersey Metal Trades Association on page 283 of our last issue, the name "Slocum & Chase Company" was incorrect. It should have been "Sloan & Chace Mfg. Company." This company manufactures precision machinery, having its plant at Newark, N. J.

Interstate Commerce Commission Decisions.

Maintenance of Rate Reduced after Complaint Filed.—On December 2 it was decided that when a rate is reduced after answer has been made and before hearing, the report disposing of the proceeding shall carry with it an order directing the defendant to maintain that rate as a maximum for not less than two years. On December 6 it was decided that orders in special reparation cases shall include a clause providing that the new rate or regulation upon the basis of which reparation is granted shall be maintained for a period of at least one year. It is now agreed that the two years so required in orders upon formal complaints and the one year in orders in special reparation cases shall run from the date of the order and not from the date when the reduced rate or new regulation became effective.

Delivering Carrier Must Investigate Rate Situation Before Paying Claims.—A delivering carrier cannot accept the authority of a connecting line and thus shield itself from responsibility in paying claims, but must investigate and ascertain the lawful rates and allow the claims or not upon the basis of its own investigations.

Delivering Carrier Must Collect Undercharge.—Even though an undercharge results from an error in billing by the initial carrier or a connection, the delivering carrier must collect the undercharge. In all such cases the legal expense attending its efforts to collect undercharges would seem to be a valid claim against the carrier through whose fault the mistake was made.

Special Understandings Between Shippers and Carriers not Published in Their Tariffs of No Valid Effect.—A shipper at an industrial point had an understanding with the agents of carriers that when he delivered shipments to them consigned to stations at which there were no agents the carriers would so advise him and hold the shipments for further direction. In a given case a carrier neglected to advise him and to hold the shipment, but billed it and sent it forward to a nonagency station as a prepaid shipment. Held, that the shipper must pay the charges and that no understanding of that nature not incorporated in the published tariffs of the carrier will operate to relieve the carrier from the duty of collecting the lawful charges.

Free Carriage of Company Material.—It is not unlawful for a carrier to return its own property free of charges to the manufacturers thereof situated on its own line for exchange or repair.

Through Rate is the Lawful Rate; Combination Rate in Absence of Through Rate.—A through rate from point of origin to destination of a shipment is the lawful rate applicable to that shipment whether the rate be confined to the line of one carrier or be a joint rate applying over the lines of two or more carriers. In the absence of a through rate from point of origin to point of destination of a shipment, the lowest combination of rates applicable via the route over which the shipment moves is the lawful rate for that shipment, except that proportional rates applicable to through shipments or to shipments from or to "beyond" must be used in preference to locals or other rates which may be higher or lower than such proportionals. The proportionals being specifically applicable to through shipments must be used in making up the rates for such shipments on the same principle that the through rate is the lawful rate regardless of lower combination.

Refund of Drayage Charges Caused by Misrouting.—Where a shipment was routed contrary to the express directions of the shipper and the consignee was compelled to move the shipment by dray from the station of that carrier to the destination to which it would have been delivered if properly routed, the carrier may, under the particular circumstances of the case, be authorized by the commission to refund to the shipper the reasonable cost of the drayage.

The Bessemer steel plant of the Wheeling Steel & Iron Company at Wheeling, W. Va., which has been idle for some time, is scheduled to start this week. The company's plate and pipe mills are expected to start next week.

Trade Publications.

Variable Speed Motors.—Northern Electrical Mfg. Company, Madison, Wis. Booklet No. 54. Title, "Some Facts About the Single Voltage Variable Speed System." Claims that this company was the pioneer in building variable speed motors for shunt field control and single voltage when it put out the first one five years ago. Deals with the advantages of the system and its demonstrated success. Illustrations show variable speed motors applied to various machine tools.

Centrifugal Pumps.—American Well Works, Aurora, Ill. Bulletin No. 104. Title, "Modern Practice in American Centrifugal Pump Construction." Describes and explains the centrifugal pump built by this company, which is not a sand pump, but is suitable for farm irrigation, drainage, brewery work, fire pumps for municipal plants and many other places where water is to be elevated.

Power Specialties.—Williams Gauge Company, Pittsburgh, Pa. Pamphlet. Pertains to Williams' auxiliary feed water regulator with safety water column, steam pump governor, steam trap, rotating regrinding gauge cocks and Success automatic water gauge.

Rail Anchors.—Railway Specialty & Supply Company, Chicago, Ill. Bulletin T-1607. Refers to the P. & M. rail anchor, which is claimed to offer the strongest combination of simplicity and efficiency.

Oil Burning Furnaces and Equipment.—W. N. Best American Calorific Company, 11 Broadway, New York City. Catalogue. Size 6 x 9 in.; pages 29. Deals with the company's Calorex oil burning furnaces and equipment, giving illustrations, specifications and descriptions of various types of forge furnaces, bolt and rivet making furnaces, bolt heading furnaces, brazing furnaces, flue welding furnaces and portable furnaces. Calorex burners and oil regulating cocks are referred to separately.

Refrigerating Machinery.—Larson-Baker Ice Machine Company, 1901 Nicholas street, Omaha, Neb. Catalogue. Size 6 x 9 in.; pages 52. Illustrates and describes Larsen ice-making and refrigerating machinery of steam, motor and belt driven types. The advantages of single-acting compressors, and the economy and efficiency of high speed ammonia compressors are set forth. Descriptive matter and diagrams are given of creamery, confectioners', retail butchers', brewery and packing house refrigerating and cooling plants, and an ice-making plant. Useful tables on the subject are included.

Lathes.—Fitchburg Machine Works, Fitchburg, Mass. 1908 catalogue. Size 6 x 9 in.; pages 40. Gives an illustrated description of the company's standard Lo-swing lathe, which will take work from ½ to 3½ in. in diameter and up to 60 in. long, and is claimed to produce rapid, economical and accurate work within its working range. Attention is drawn to those features which give extreme rigidity to the operating parts and ease and accuracy of control under heavy loads. Instructions which relate mainly to details of erecting and caring for the lathe are appended. This lathe was illustrated and described in *The Iron Age*, September 5, 1907.

Punches, Shears and Bending Rolls.—Hilles & Jones Company, Wilmington, Del. Catalogue T. Size 9 x 9 in.; pages 28. Contains illustrations with brief descriptive notes of various styles and combinations of machine tools for working plates, bars and structural shapes; the line including those for punching, coping, shearing, beveling, clipping, straightening, bending and planing.

Water Heaters.—Harrison Safety Boiler Works, Columbia Station, Philadelphia, Pa. Folder entitled "A Brief About Hot Water." Relates particularly to the use of hot water in textile establishments and to its heating by exhaust steam in the Cochrane open feed water heater, which combines the additional functions of a return tank, expansion or muffle tank, oil separator, steam trap, hot well, &c. Also draws attention to the value of the hot process system of water purification for softening hard water which is to be used for dyeing and washing purposes, and for boiler feeding.

Staybolts.—Flannery Bolt Company, 308 Frick Building, Pittsburgh, Pa. Circular. Shows an installation of the Tate flexible staybolt, and contains a testimonial from one of the company's first customers. The bolts are claimed to be now in service on over 90 railroads.

Exhaust Fans.—Emerson Electric Mfg. Company, St. Louis, Mo. Bulletin No. 3504, superseding No. 3503. Gives illustrations, descriptions and specification tables of 12, 18 and 24 in., Davidson blade, and 12 and 18 in. Parker blade Emerson electric exhaust fans for alternating and direct currents.

Locomotive Cranes.—Brown Hoisting Machinery Company, Cleveland, Ohio. Catalogue L. Pertains to Brownhoist locomotive grab-bucket cranes, which afford a simple and efficient means of handling ore, coal, limestone, slag, sand, &c. Views are given of the cranes handling ore from stock piles, gondola cars, &c., and suggest the possibilities attending the use of the equipment. Several testimonial letters and a partial list of iron and steel companies using Brownhoist locomotive cranes are appended.

The Machinery Trade.

NEW YORK, January 29, 1908.

The duration for the week was exceedingly light the past week, and with many houses the amount of business transacted showed a perceptible shrinkage from that of the previous week. A few weeks ago business became more active, and it was thought at that time an impetus had been given trade that meant a gradual improvement, but this expected increase has not developed. On the contrary, orders appear to have become scarcer and the volume of inquiries has fallen off. Aside from the operations of the Standard Oil Company at Bayway, N. J., and the Delaware, Lackawanna & Western Railroad at Scranton, Pa., the carrying out of no large project, requiring the purchase of a considerable amount of machine tools, has come to light. From a reliable source we learn that the Standard Oil Company intends to proceed with construction work rather slowly, and that it will probably be some weeks before the list of tools noted in these columns last week will be closed. Reports from manufacturers who have recently visited their agents in this territory are to the effect that business in other sections of the country is not greater in volume than it is here. Prices on machine tools continue to be maintained by the important manufacturers, and such reductions as have been made have been made by the less important companies.

A joint meeting of the committees appointed from the American Supply and Machinery Manufacturers' Association, the National Supply and Machinery Dealers' Association and the Southern Supply and Machinery Dealers' Association was held at the Jefferson Hotel, Richmond, Va., January 24, to formulate a programme for the joint annual convention of the three associations, to be held in Richmond May 13, 14 and 15. The programme mapped out has many radical departures from the previous meetings held, either jointly or separately, by the organizations, and is expected to eliminate the objectional features attending the work of previous large conventions. The complete programme will be ready for publication early in April, and will be sent to all members of the three associations fully a month before the convention. Matters of vital importance to the trade will be discussed at both the executive sessions of each association, and the joint sessions of the three organizations, and speakers of national reputation will make addresses on important topics. The interest shown in the coming convention is manifested by the large number of reservations already made for rooms in the Jefferson Hotel, where the convention will be held. The committees which met to arrange the programme are as follows: *American Supply and Machinery Manufacturers' Association*—M. W. Mix, Dodge Mfg. Company, Mishawaka, Ind.; E. H. Hargrave, Cincinnati Tool Company, Cincinnati, Ohio; C. F. Aaron, New York Leather Belting Company, New York; F. A. Hall, Yale & Towne Mfg. Company, New York; D. K. Swartwout, Ohio Blower Company, Cleveland, Ohio; W. M. Hood, Lunkenheimer Company, Cincinnati, Ohio; F. D. Mitchell, secretary-treasurer, New York. *National Supply and Machinery Dealers' Association*—George Puchta, Queen City Supply Company, Cincinnati, Ohio; A. T. Anderson, secretary-treasurer, Cleveland, Ohio. *Southern Supply and Machinery Dealers' Association*—J. C. Miller, Miller Supply Company, Huntington, W. Va.; Alvin M. Smith, Smith-Courtney Company, Richmond, Va.; Hunter B. Frischkorn, Hunter B. Frischkorn, Richmond, Va.; Levin Joynes, Southern Railway Supply Company, Richmond, Va.

A movement has been started in Birmingham, Ala., by a number of machinery and iron manufacturers to form a local organization, and with this end in view a meeting of prominent manufacturers is understood to have been held. It is reported that those at the meeting were of the opinion that the association should be formed, and it is said that another meeting will be held shortly at which it is expected a permanent organization will be formed.

J. F. Blanchard & Co., manufacturers of interior fireproofing equipment, who recently built a plant at Border and Review avenues, Long Island City, L. I., are preparing a list of machinery equipment which will include rolling mill equipment and sheet metal working machinery. The plant covers about ½ acre of ground and consists of one and two story structures, and the machinery requirements will be quite extensive. It is said in the trade that the company expects to spend over $10,000.

The National Paper Milk Bottle Company, Pottsdam, N. Y., has inquiries in the trade for special machinery for manufacturing paper milk bottles and paper disks to be used as stoppers.

The New Haven Machine Screw Company, New Haven, Conn., is in the market for automatic screw machines and hand milling machines. The company is experiencing a good demand for its hexagon, fillister or round head cap screws, collar and shoulder screws, &c. It has recently added to its working force and is running its plant 60 hr. per week.

The Southern Power Company, Charlotte, N. C., has been so busy on plans for developing its water power that it has not progressed very rapidly with the plans for its new steam plant. Within the next three or four months, however, the company expects to have plans ready for a 50,000-hp. steam or producer gas plant, the first installation to consist of two 6000-kw. units. This first installation is to supplement the present 75,000 hp. in water powers. The complete installation of the 50,000 hp. is to supplement at low water the additional 100,000 hp. which the company expects to develop within the next few years. W. S. Lee is chief engineer, but communications relative to the steam plant should be addressed to J. W. Fraser, assistant chief engineer.

F. & J. Meyer, 116 Broadway, New York, export merchants, have opened a Mexican office which is under the management of Mauricio Philippe, who has had a wide experience in that country in the machinery and hardware lines. It is the intention of the firm to make a specialty of the introduction and sale of hardware, machinery, tools and supplies in Mexico, and it desires to secure the agency for manufacturers of these lines for that territory.

Chicago Machinery Market.

CHICAGO, ILL., January 28, 1908.

While in some lines of machinery a little better trade has developed within the past week, there has, on the whole, been no notable improvement. Desultory orders continue to come in, but they include no requirements for extensive equipment. Inquiries, however, are growing more numerous, and they are of a nature that give promise of concrete results at an early date. Considering the large number of manufacturing enterprises that were in contemplation during the first half of last year, and which were arrested by adverse financial conditions, it seems but reasonable to expect the revival of many of these projects now that money is becoming easier. Nearly all of these undertakings involved machinery requirements of greater or less extent, and, being basically sound, many of them will doubtless be revived as conditions continue to improve. The fact that railroads, while limiting their purchases in every direction to absolute necessities, are coming more and more frequently into the market for odd tools here and there, would indicate the existence of more extended requirements which under ordinary circumstances would be supplied. Machinery dealers are, therefore, watching developments in this direction with unusual interest, since it is felt that when they again come into the market a great impetus will be given to trade. Inquiries for mining machinery continue to develop, and the outlook for business in the spring is most encouraging. Active preparations are under way in the West for the development of new prospects, and many established mines are contemplating the installation of additional equipment. Notwithstanding the present quietness, there is among machinery dealers generally no abatement of the optimistic feeling regarding the prospects for a reasonably good demand in the near future.

Plans have been made and work begun on a two-story foundry and machine shop to be erected by the Olympic Foundry Company, 2002 A street, Tacoma, Wash. The plant will comprise a foundry, 50 x 80 ft.; pattern shop, 50 x 55 ft.; machine shop, 50 x 55 ft. The foundry will be equipped with one 5-ton and one 20-ton cupola, and a 15-ton electric traveling crane.

The Turner Tool Company and the Universal Tool Company, who suffered a loss from fire on December 25 of last year, at their former location, 215 South Clinton street, Chicago, have moved to 176 South Clinton street, which quarters they jointly occupy.

Plans have been prepared for extensive additions and improvements to the plant of the Spencer Light & Water Works, municipal plant, Spencer, Iowa, which involve the purchase of considerable equipment. The city is now in the market for one alternator of 120 kw., 60-cycle, 3-phase, revolving field, 2300 volts, belt driven, about 550 rev. per min. with exciter and rheostat; one alternator about 50 kw. of the same type, of 2300 volts, belt driven to about 800 rev. per min., with exciter and rheostats. Bids will also be taken on the same equipment with direct connection, engine running at about 250 rev. per min., for the belt driven equipment. A Corliss engine of about 70 hp. will be considered, and for direct connection a high speed engine of the same capacity. One 150-hp. open feed water heater; two boiler feed pumps, one with capacity of 1250 gal. and the other 3100 gal. per hour, the two pumps being preferably coupled, so that both can be driven together either by gear, belt or direct connection to motor or single cylinder steam engine. The Purchasing Committee has also under consideration the installation of a gas producer equipment of from 80 to 100 hp. The plant is managed by R. L. Taylor, with R. T. Turner superintendent.

Geo. F. Halverson, Madison, Wis., has been appointed general sales agent of the Northwestern Steel & Iron Company of Eau Claire, Wis., manufacturer of farm machinery, gasoline engines and concrete machinery.

The Lockport Boiler & Iron Works, Lockport, Ill., re-

cently organized to manufacture steam boilers, heaters, heavy forgings, steam shovel dippers and sheet metal work, contemplates the erection of a new building, work upon which will be begun in the near future. The company is already established in temporary quarters, and has installed equipment which includes steam hammer, overhead drill, lathe and a pair of heavy rolls built in its own shop. An order has been placed with I. N. Phillips Company, Chicago, for a New Doty punch and shear. The officers of the company are: A. L. Saines, president; A. L. Smith, vice-president and general manager; John G. Beck, secretary and treasurer.

New England Machinery Market.

WORCESTER, MASS., January 28, 1908.

Business is improving in those lines of metal industry that are nearest the retailer and the consumer, and the change extends to a certain extent to the other end of the list, the machine tools. Inquiry of a miscellaneous list of manufacturers indicates the accuracy of this statement. The makers of fire arms, razors and other lines of cutlery, machine brushes and miscellaneous metal goods afford the general information that there is a marked accession of orders, not always in a big way, but satisfactory, all things considered. By comparison with December, practically all products are in greater demand, though this statement cannot be considered a strong one, owing to the fact that December was almost flat everywhere and with everybody. The comparison that counts is with the early weeks of January, and on this basis a change for the better has been noted in many lines of manufacturing.

The experience of machinery dealers varies. Some of them are having a nice little spurt of orders for small lots. Others have not been so fortunate. Yet the experience of every dealer in Boston indicates to him that an improvement must be felt in the near future. Inquiries in such considerable numbers can have no other meaning to them. Their reports from machine tool builders whom they represent have been optimistic in some cases, though it must be said that this is not always the case, certain lines not having responded to the slight reaction as well as others. Reports from branches of machinery houses in some other cities are that business has revived with them to a greater extent than in the New England territory. Cancellations have entirely ceased, and occasional instances are reported of orders booked for machinery which had previously been canceled.

The situation is not one easy of analysis in the machinery trade. Experiences are so conflicting that only a very general idea is possible. It is the same to a certain extent in other lines of metal manufacturing. Simultaneously with such published announcements as that of the American Locomotive Company that it will shut down its plant at Providence, R. I., comes pleasanter news like that from Bristol, Conn., that the New Departure Mfg. Company, which makes a large variety of high-class specialties, has gone to a 13-hr. a day schedule in some departments, and is working day and night in the two other departments one of which, the automatic department, has been running day and night for practically three years. European and domestic orders have made this increased production necessary. The Coe Brass Mfg. Company, Torrington, Conn., one of the constituent parts of the American Brass Company, has gone on an 8-hr. day, six days a week, because of increasing business.

The Bath Grinder Company, Fitchburg, Mass., has received a good order for its grinding machines from Japan, together with new domestic orders, and continues to operate on full time with full working force.

Hill, Clarke & Co., Inc., Boston, had their annual gathering of representatives at the Exchange Club, Boston, January 25. All the branch offices were represented, and there were also present as guests a number of New England machine tool builders with whom the house has business connections. In their invitations was included the request that they address the gathering on the best methods of selling their machinery during dull times, and the several hours of after dinner speaking were consequently of unusual interest, as well as a source of mutually valuable education.

Boston is holding its first National Motor Boat and Engine Show in the Mechanics' Building, this week. There is a large number of exhibits, including many of the standard gasoline engines and motor boats, and their various accessories. No machinery is shown, though small tools are included in some of the general exhibits of the dealers. It is the expectation of the management to make of the show an annual fixture, and it is hoped that with so favorable a beginning another year will see represented the tools with which engines and boats are built.

The manufacturers of motor boats and their engines and other equipment state that they have not seriously felt the business depression. Buying continues brisk, and the crowds of visitors at the Boston show would seem to indicate that more business is in sight. The yacht builders have a good

The Herrshoffs of Bristol, R. I., who have been running on short time, have resumed full operation because of new orders. There is considerable demand for power boat machinery for commercial purposes, including fishing craft of many kinds.

The Ajax Mfg. Company, recently organized at Waterbury, Conn., under the laws of that State, will engage in the manufacture of what is known as a machine for clearing metal bars, intended to perform the functions and to replace the old so-called scratching machine. It is claimed for the device that it will result in a large saving in labor and material, as compared to older methods. The company is now having estimates for the manufacture of its machine submitted by local shops. M. J. Byrne, 36 North Main street, Waterbury, is secretary of the company. J. S. Neagle, Waterbury, is also on the board of officers.

It is announced that the Marlboro Electric Machine & Lamp Company, Marlboro, Mass., will remove its business to Central Fall, R. I., because of the inability to secure an adequate amount of female help at Marlboro.

The Waterbury Wire Die Company, Waterbury, Conn., manufacturer of dies for drawing all kinds of wire, has increased its capital stock from $5000 to $25,000. The company has been in existence for about 10 years, during which time the business has so increased that the new capital has become necessary. The new stock was all subscribed for by the original stockholders. The company states that it is not in the market for new equipment.

The Spencer Wire Company, Worcester, Mass., has established a department for the manufacture of music wire in full standard line. The department is located at the Worcester works of the company, where manufacturing has already begun.

The American Writing Paper Company is planning the establishment of a new power plant at Holyoke, Mass., to cost $100,000. The purpose is to supply power to five of the company's large factories in that city, though only three plants will be included at first. The company states that it has made no definite plans for the new power plant, excepting that it will be all steam and will eventually develop from 3000 to 4000 hp.

A dispatch from Quincy, Mass., states that the Fore River Shipbuilding Company has been awarded the contract for building three submarine torpedo boats of the Holland type for the Austrian Government. The material for the boats is on the ground, and the work of assembling the hulls will begin immediately. They will be similar to the Octopus class of American submarines, and will be 105 ft. over all, equipped with two 250-hp. electric engines designed to give a speed of 10 knots submerged. They will have a steaming radius of 1000 miles.

Another submarine contract for New England is that awarded the Lake Torpedo Boat Company, Bridgeport, Conn., by the United States Navy Department for one boat which shall be accepted if it comes up to the Octopus type in efficiency. A portion of the appropriation for submarines was reserved with the idea of giving a boat of another class a chance to remain in the field of competition, and the Lake Company will benefit by the provision.

Cincinnati Machinery Market.

CINCINNATI, OHIO, January 28, 1908.

While there exists among the heads of departments of all large tool manufacturing and other machinery concerns a very commendable form of optimistic expression, which is apt to be mistaken as indicating actual improvement in business, it can be said that in certain lines the improvement is real. Manufacturers of smaller tools, such as electrical drills, grinders and the like, report their establishments, for the most part, running full time and with full forces. In several of the larger plants making specialties of planers, shapers, upright drills and lathes, the time has been increased a little, expert machinists have been re-engaged, and gradually the routine of normal shop discipline restored.

Manufacturers of power equipment are interested in the reports that several large projects outlined for early building when the slump came on are now being revived and will be pushed to completion. One of these is the large building to be erected at Vine and Seventh streets for the Provident Savings Bank & Trust Company. Another is that which contemplates the erection by local capitalists of two large power buildings, one to contain 350,000 and the other 450,000 sq. ft. of floor space, and each to be built in extreme business centers of the city. Arrangements are progressing through the agency of Nicholas P. Smith & Bros., in the Mercantile Library Building. Both buildings will be of concrete.

Machinery salesmen and local dealers report better inquiry, but there is as yet but little buying. The preponderance of inquiry is of a feeling nature. Inquirers, anticipating reductions in prices, are watching for a drop which as yet has not materialized. There is as yet no evidence of cutting in this market, and prices are, so far as can be learned, being rigidly adhered to.

At the annual meeting of the L. & E. Greenwald Company during the week Henry Burkhold was elected president; Alex S. Cunninghame, vice-president, and W. B. George, secretary and treasurer. Ezra G. Greenwald, who retires from the presidency, will become the Eastern representative of the company, with offices in New York. On the new Board of Directors which was increased from five to seven members are: Henry Burkhold, Tom Greenwald, Edward J. Dempsey, George Schott, Alex S. Cunninghame and W. B. George. Arrangements are already under way to expand the business and enlarge the capacity. The Greenwald plant has long been known as the field of engine builders, and is one of the oldest, if not the oldest in the city, making a specialty of that line.

John Meinhardt, a local engraver, has purchased the plant at 2129 Barnard street, which includes a two-story brick factory building, one-story blacksmith shop and lot, 25 x 100 ft., and will install the necessary machinery for a model small brass foundry.

About 20 sheet iron and tin plate men, representatives of the Eave Trough and Conductor Pipe Association, all manufacturers, met at the Hotel Sinton, January 22, to discuss conditions of the trade. H. H. Bishop of Cleveland presided as secretary. It was announced that nothing developed at the meeting that would be of interest at this time. The visitors were given a complimentary dinner at the Business Men's Club in the evening by W. T. Shannon, local representative of the American Sheet & Tin Plate Company.

A very interesting lecture, illustrated with the aid of the stereopticon, was given Saturday night at the Palace Hotel by E. H. Mumford of Philadelphia before members and guests of the Cincinnati Section, Associated Foundry Foremen. Mr. Mumford's subject was "Universal System of Machine Molding."

Local jobbing foundries are slowly but surely regaining lost ground of the late year, and while none expect to see any part of 1908 as busy as the earlier and middle portion of 1907, yet hope to have a steady and profitable melt. Machine tool manufacturers are renewing contracts on the sliding scale basis, and with but slight if any changes from the forms of last year; the proposed uniform contract having been waived, or at least dropped for the time being, as being impracticable at this time.

The largest of the local jobbing foundries is now running [illegible] is about the average. There are some foundries making small castings for novelty works or smaller machinery that have seen but little change in the situation and have maintained a steady run during the depression.

The Vulcan Supply Company is a new enterprise, an outgrowth of the Vulcan Copper Works Company of Cincinnati, with Frank L. Carter, formerly of the Queen City Supply Company, as manager. Catalogues and other information interesting to that business are requested from manufacturers. The five-story building at 120-122 Sycamore street is devoted to the business, which is that of handling mill, factory, mine, contractors' and railroad supplies. The Vulcan Copper Works Company is an old one, and has long been known in the line of building copper apparatus for distilleries and chemical plants.

At the annual meeting of the Smith & Mills Company, held January 22, the old officers were re-elected as follows: Albert S. Smith, president and treasurer; James Mills, vice-president and general manager; James E. Mills, secretary; Ernest Mills, superintendent and manager. The company is a close corporation. Some improvements have been recently completed, conspicuous among which was the fitting up of an annex on the south of the plant for the installation of the planers. The plant is now running on 45 hours' time, with a force of about two-thirds that maintained the greater part of last year.

The Buckeye Pump & Mfg. Company, Columbus, Ohio, which is now installed in its new plant in West Broad street, is running full time and with a large force, and its officials are hopeful of as large or larger business than that of 1907.

It is reported that a company contemplating the location of a large factory for the manufacture of horse shoes is negotiating for the old plant of the Shelby Steel Tube Company on Dorr street, Toledo, Ohio.

Cleveland Machinery Market.

CLEVELAND, OHIO, January 28, 1908.

While general conditions in this city continue to improve slowly, the situation as regards the machine tool market remains practically stationary. In fact, the past week has, if anything, been a little quieter than earlier in the month, when there was more of a demand for single tools. A few sales of small single tools were made during the week, but inquiries are still scarce, and dealers expect that business will be light with them for several weeks to come. The sales and inquiries at present are practically limited to small industrial plants and machine shops.

Among local plants engaged in the manufacture of iron and steel products the situation is daily growing better. While orders are not yet numerous, they show some improvement, and inquiries are a great deal better, indicating a better volume of business in the near future. Some builders of machine tools and machinery are running their plants now at full capacity, and there are very few, if any, that are not running on at least one-half their full capacity. That industrial activity is gradually being resumed is shown by the fact that local manufacturers who are members of the Cleveland Branch of the National Metal Trades Association are altogether putting on from 25 to 30 additional workmen a day, this number representing a net increase, as none are being discharged. Besides employing additional men, a number of plants are employing their old men longer hours than they were a few weeks ago.

A number of local brass plants engaged in the manufacture of plumbers' goods report a decided improvement in the volume of their orders during the past two weeks. Makers of farm tools, who were seriously affected by the industrial depression, are again getting a fair volume of business, orders having improved materially with them, except from the South, where the hesitancy in placing orders indicates that confidence has not yet been fully restored.

Business conditions among builders of heavy machinery and of coal and ore handling plants as yet show little improvement, but it is expected that work will be ordered resumed soon on some large contracts that were held up because of the recent financial stringency.

The Cleveland Punch & Shear Works Company has just received an order from the Standard Oil Company for the entire equipment of machinery for the fabrication of plates and structural shapes at its plant at Elizabeth, N. J. The order is for 10 machines, including punches, shears, rolls, drills, &c. This company has not yet caught up on orders that it received last September. During the past three months it has been running its machine department at full capacity, with the exception of only a few days, when the working time was reduced from 10 to 8 hr. In its punch and die department the company reports that orders are coming in as numerous as ever.

The Brown Hoisting Machinery Company has just received a contract from the Astoria Gas Light & Power Company, New York, for a large coal handling plant. Work on the contract will be started at once. The company is greatly encouraged over the outlook, having received information that work will probably be ordered started soon on some large contracts which it took a few months ago, but which were held up at the time of the financial depression.

The Radio Furnace Company, which was incorporated in Youngstown, Ohio, a short time ago with a capitalization of $100,000, has effected its organization by the election of M. J. Murdock as president; M. M. McGowan, vice-president; E. S. Hilsop, secretary, and Harry Black, treasurer. The company will build a plant to manufacture a furnace invented by M. J. Murdock. The company is looking for a site. It may decide to locate in Warren, Ohio.

The plant of the Thew Automatic Shovel Company, Lorain, Ohio, builder of steam shovels, has kept running at full capacity during the recent industrial depression. The company was well loaded up with orders when the slump came in the fall, and with these and the new business that has come in the company has been able to avoid the necessity of any curtailment in the operation of its plant.

At the annual meeting of the XX Century Heating & Ventilating Company, Akron, Ohio, held recently, John Kerch was elected president; George Maag, vice-president, and P. T. McGuckian, secretary and treasurer. According to the annual report of the treasurer the past year was the most successful in the history of the company.

The Elyria Iron & Steel Company, Elyria, Ohio, is now running its plant at full capacity three days a week. The company reports considerable improvement in inquiries during the present month, and hopes soon to have its plant running on full time.

The Standard Tool Company reports a considerable improvement in orders during the past few days. The company's plant is now running at full capacity.

Foot, Burt & Co., builders of single and multiple spindle drills and bolt cutters, report that they did not receive a single cancellation of an order during the recent depression. Inquiries are improving and their plant is now running five days a week with reduced force.

The city of Cleveland, through W. J. Springborn, president of the Board of Public Service, will receive bids on February 6 for two combination steam and hot air rotary dryers and one rotary steam jacketed percolator for installation in the municipal garbage disposal plant.

At the recent annual meeting of the John F. Byers Machine Company, Ravenna, Ohio, W. S. Krake was re-elected president; Marvin Collins, secretary and treasurer, and I. L. Collins, superintendent. Additions to the company's plant are now nearing completion.

The Illinois Steel Company has just awarded to John W. Seaver, consulting and contracting engineer, Cleveland, the contract for furnishing for the new coke oven plant which it is now erecting at Joliet, three of Mr. Seaver's latest de-

sign of combination coke pushers and coal levelers. These machines are of exceptionally heavy and powerful design, and will embrace several entirely new features in their construction.

Philadelphia Machinery Market.

PHILADELPHIA, PA., January 28, 1908.

The volume of business for machinery and tools, as noted during the past few weeks, about holds its own, but it is difficult to find any increase in the amount of new business coming out. Prospective buyers show no inclination to close up pending propositions, and there is practically nothing at all being offered in the way of new plant equipment. The financial situation shows a decided improvement. The machinery trade, however, is slow to respond, a condition no doubt due to the unsettled state of general business. Industrial plants, particularly those dependent on the railroads for their business, are extremely dull, and have curtailed working forces almost to the minimum. The railroads are practically out of the market. A few inquiries which developed from this source recently have not as yet reached the order stage, and with the decreased traffic which they are reporting not much hope is expressed for an early resumption of buying on their part.

Practically all of the business placed recently has been for single tools. Dealers report sales as irregular and confined largely to the smaller class of equipment. Occasionally the sale of a medium sized lathe, a planer, or a drill press is made, but these are, as a rule, pretty well scattered. Manufacturers do not take on many new orders, and plants, as a rule, are being operated on short time. Efforts are being made to keep the full number of employees at work, and, in order to do this some plants are working alternate shifts, so that at least some time is made by all the employees. The Baldwin Locomotive Works is making further reductions in working hours, and in some departments not much over three days a week are being made. Others, however, are still on four and five days per week, at 8 hr. per day.

Wage reductions are not being heard of to any material extent; particularly because there is but little work to be done, and what little comes in is usually taken at a fair price. Machine tool prices hold fairly well, even in the face of strong competition. The standard tools are not being reduced in price, although it is reported that slight reductions, particularly on the part of some dealers, have been unofficially made on some of the medium and lower grades of tools in order to secure business.

The market for second-hand tools shows a little improvement. Here and there sales have been made of some few tools. Woodworking machinery has been in better demand, but in the regular line of metalworking tools only a moderate business has been done. There has been a little more inquiry in this direction, however, and the trade feels more hopeful regarding the future.

Manufacturers of boilers and engines do not report any material improvement in conditions. Propositions under consideration show no tendency toward closing, and not a great deal of new business has been taken. In the second-hand field there has been a little more activity shown, and sales of a few medium power boilers, engines and pumps have been announced. The business, however, is very much scattered, although there is a little more prospective business in sight.

There have been no new developments in the foundry trade. Orders coming out are comparatively small and cover immediate needs of consumers only. Both iron and steel plants are, for the most part, running irregularly and to a large extent are dependent on daily business. No new tonnage of any size has developed for future delivery. The railroads, locomotive and machine tool builders are not anticipating their requirements, and until conditions generally show signs of improvement it is likely that casting plants will continue to be operated intermittently.

Plans have been completed and estimates invited by Sauer & Hahn, architects, for the erection of a number of new brick and concrete buildings for the Standard Hosiery Company, 1310 to 1326 North Lawrence street. The buildings include a spinning mill, picker house, boiler house, engine house and an office building. The cost of the buildings is estimated at about $100,000, while about $30,000 will be expended for equipment. The plans regarding the latter, however, have not yet been completed.

Assistant Director J. F. Hasskarl of the Department of Wharves and Docks, Philadelphia, has plans in course of preparation for a new pier to be built on the Delaware River front. The pier is to be of concrete and wood, on piling, with a two-story steel and corrugated iron structure on it. It is proposed to locate the offices of the Department on the second floor of the pier. The estimated cost of the pier and superstructure is about $500,000.

Frank Toomey reports a somewhat better demand for second-hand machinery and tools. Boilers and engines are also said to be in better inquiry, and several fair sales have been made in both these lines. Woodworking machine tools have been more active, and some business has also been done in that line. On the whole, the situation looks somewhat more encouraging.

Seymour & Paul A. Davis, 3d, architects, will invite revised bids for the erection of the proposed workshop buildings for the Thaddeus Stevens Industrial School, Lancaster, Pa., previous bids being considered too high. The proposed shop measures 34 x 160 ft. on the ground plan.

Proposals will be received until February 15 by the Lighthouse Engineer, Baltimore, Md., for furnishing materials and all kinds of labor necessary for the completion and delivery of metal work for beacon lights to be installed at La Trappe River, Maryland.

It is understood that the Wilmington & West Chester Traction Company, which will build an electric railroad from Wilmington, Del., to West Chester, Pa., will begin operations as soon as the weather permits on the Wilmington end of the road. The power house for supplying electricity will be erected, it is believed, at Brandywine Summit.

The Energy Elevator Company continues busy. But little falling off in business has been noted by this concern during the past few months, and full forces and full working hours are being maintained, with enough business on the books to continue for some time. Both local and out of town business continues of satisfactory volume. Recent deliveries by the company include a heavy power freight elevator for shipment to Albany, Ore., an electric freight elevator to Shamokin, Pa., a carriage elevator to Yonkers, N. Y., and three hand power freight elevators to North Branch, Mich.

Until February 7 sealed proposals will be received by the Building Committee of the Board of Trustees of the State Hospital for the Insane, Norristown, Pa., for all materials and supplies required for the erection of a building for convalescent men, costing in the aggregate about $60,000. Bids will also be received until February 6 for the same class of materials and work in connection with the erection of a chapel and amusement hall costing about $50,000. Further information regarding the nature of the supplies desired may be obtained from John L. West, steward, State Hospital for the Insane, Norristown, Pa.

Government Purchases.

WASHINGTON, D. C., January 28, 1908.

Sealed proposals will be received until February 25 at Augusta Arsenal, Augusta, Ga., for motor generator sets, motors, air compressor, metal working and wood working machinery, pneumatic hammer, electric and hand cranes, fuel oil furnaces, testing machine, &c.

The Bureau of Supplies and Accounts, Navy Department, Washington, D. C., will receive bids until February 25 for one air compressor outfit, four pneumatic drills, one gap lathe, one pattern maker's lathe, one screw cutting engine lathe, one milling machine, one planer, one sensitive drill press and one radial drill press.

The Isthmian Canal Commission will receive bids until February 17, circular No. 418, for file sharpening machines and other supplies.

The following bids were opened January 20, circular No. 412, for supplies for the Isthmian Canal Commission:

Class 1. One cross compound condensing engine.—Bidder 1, Allis-Chalmers Company, Milwaukee, Wis., $15,300; 5, Ball Engine Company, Philadelphia, $10,500; 24, C. & G. Cooper Company, Mt. Vernon, Ohio, $14,900; 37, G. & W. Mfg. Company, New York, $10,347; 41, General Electric Company, Schenectady, N. Y., $16,400 and $13,000; 69, Minneapolis Steel & Machinery Company, Minneapolis, Minn., $17,532; 70, Motley, Green & Co., New York, $17,174; 85, Providence Engineering Works, New York, $14,400; 109, Westinghouse Electric & Mfg. Company, Pittsburgh, $13,470.

Class 2. One 400-kw. generator.—Bidder 1, Allis-Chalmers Company, Milwaukee, Wis., $6855; 26, Crocker-Wheeler Company, Ampere, N. J., $6600 and $5665; 41, General Electric Company, Schenectady, N. Y., $7200 and $5127; 70, Motley, Green & Co., New York, $7228 and $6170; 109, Westinghouse Electric & Mfg. Company, Pittsburgh, $7095 and $5479; 112, Western Electric Company, New York, $6556.25.

Class 3. One engine-driven exciter.—Bidder 1, Allis-Chalmers Company, Milwaukee, Wis., $1429.50; 13, Buffalo Forge Company, Buffalo, N. Y., $1072; 41, General Electric Company, Schenectady, N. Y., $1245; 76, Northern Electric Mfg. Company, Madison, Wis., $925; 95, B. F. Sturtevant Company, Hyde Park, Mass., $970; 109, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., $1725 and $1656; 112, Western Electric Company, New York, $1098.

Class 7. Thirty sand pumps.—Bidder 30, Drew Machinery Agency, Manchester, N. H., $83.80; 34, Fox, Brow & Co., New York, $48.90; 52, Ingersoll-Rand Company, New York, $48; 67, Manning, Maxwell & Moore, New York, $50.10; 97, Sullivan Machinery Company, New York, $66; 100, Tucker Tool & Machine Company, New York, $51.113; West St. Louis Machine & Tool Company, St. Louis, Mo., $93.

Class 9. One valve reseater.—Bidder 10, W. Bingham Company, Cleveland, Ohio, $73.50; 30, Drew Machinery Agency, Manchester, N. H., $83; 34, Fox Brothers & Co., New York, $76; 56, E. F. Keating Company, New York, $75; 67, Manning, Maxwell & Moore, New York, $75; 70, Motley, Green & Co., New York, $75; 85, Queen City Supply Company, Cincinnati, Ohio, $78; 100, Tucker Tool & Machine Company, New York, $75.

The following bids were opened January 21, circular No. 415 B, for supplies for the Isthmian Canal Commission:

Class 1. Alternating current motors.—Bidder 5, General Electric Company, Schenectady, N. Y., $6439.50; 8, National Electrical Supply Company, Washington, D. C., $1225; 13, Westinghouse Elc. Mfg. & Mfg. Company, Pittsburgh, $900.

Class 2. One direct current motor.—Bidder 5, General Electric Company, Schenectady, N. Y., $93.55; 7, Motley, Green & Co., New York, $115; 8, National Electrical Supply Company, Washington, D. C., $128.11; 11, B. F. Sturtevant Company, Hyde Park, Mass., $107.50; 13, Westinghouse Electric & Mfg. Company, Pittsburgh, $126.25; 14, Western Electric Company, New York, $103.

Class 4. One duplex pump.—Bidder 6, Manning, Maxwell & Moore, New York, $1564; 8, National Electrical Supply Company, Washington, D. C., $1601; 15, Henry R. Worthington, New York, $2327.65.

The following awards have been made for supplies for the navy yards, bids for which were opened January 7:

Atlantic Works, Philadelphia, class 21, one adjustable band saw machine, $3500.

Manning, Maxwell & Moore, New York, class 31, one 20-in. universal milling machine, $660.

Kenworthy Engineering Company, Waterbury, Conn., class 32, one reheating or forging furnace, $2240.

C. H. Wheeler Mfg. Company, Philadelphia, class 91, one surface condenser, $805.

Blake & Knowles Steam Pump Company, New York, class 92, two vertical duplex pumps and two horizontal piston pumps, $1033.

Industrial Education Meeting.

The first annual meeting of the National Society for the Promotion of Industrial Education, held in Chicago January 23-25, was opened by a public dinner given in the banquet hall of the Auditorium Hotel, at which there were present nearly 400 members and guests. The speakers of the evening were Theodore W. Robinson, first vice-president Illinois Steel Company and chairman Illinois State Committee; Dr. Charles W. Eliot, Cambridge, Mass., president Harvard University; James W. Van Cleave, St. Louis, president National Association of Manufacturers, whose addresses were directed to the consideration of "Industrial Education as an Essential Factor in Our National Prosperity," and Dr. Henry S. Prichett, New York City, president Carnegie Foundation for the Advancement of Teaching, and president of the society, who spoke of "The Aims of the National Society for the Promotion of Industrial Education."

The earnest interest manifested by the participants in this movement augurs well for success in the future development of a system that will prove effective in raising the efficiency and effectiveness of handicraft among industrial workers. Present at this meeting and working shoulder to shoulder with the foremost educators of the country were seen men of foremost prominence in industrial affairs and recognized leaders of organized labor, working to a common end in the cause of industrial education.

After a few fitting words of welcome Mr. Robinson read a letter from President Roosevelt expressing regret at his inability to be present, in which he said: "My interest in this cause arises not only out of the important results to be achieved by industrial education, both for the wage earner and the manufacturer, but, more than all else, out of the desire to see the American boy have his best opportunity for development. In the interest, therefore, of the American boy, I welcome the efforts of any society like this to focus public attention upon the question and to suggest practical methods for solving it." Continuing, Mr. Robinson spoke in part as follows:

> The Society for the Promotion of Industrial Education is the organized recognition of a vital defect in the educational system of this country. The ultimate aim of the society is to promote the prosperity and happiness of our coming generations by increasing their collective efficiency. This country has been sleeping the self-complacent sleep of confidence, born of stupendous resources and wonderful inventive genius, but other nations have possessed themselves of our inventions; and Germany, comparatively poor in nature's heritage, is surpassing us in the markets of the world. The industrial education of Europe is making the Old World new, while apathy and obsolete methods are making our New World old. Our educational development has not kept pace with the marvelous changes that have taken place in the last generation, and it is time that we awake if we are to attain our natural destiny. More than 90 per cent. of the youth of our country progress no further than the grammar school, and of these many are destined to become industrial derelicts merely for want of educational encouragement and opportunity.
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> Without disparaging any plan of education which seeks its culmination in the university, it is clear that the necessities of this large majority should be better recognized in our primary schools. The census reports of 1905 show 5,150,427 wage earners. If their average daily earning capacity were increased 25 cents it would amount to over $400,000,000 per year to them, to their employers and to the country. These figures are startling, but are indicative of the material reward which might be expected. While there will be honest differences of opinion as to the best means of giving our boys and girls their educational right, mutual confidence and harmony must prevail in our endeavors and in our deliberations. The movement for which our society stands appeals to considerations broader than selfishness or avarice, and will brook no opposition born of mistaken self-interest or desire for restrictive monopoly. We stand for the fundamental principle of just opportunity for all.

President Eliot in his address suggested that with the introduction of trade school training in grammar schools the compulsory age limit should be raised three or four years. "All trade schools," he said, "should embrace some manual training. The old idea that the Yankee can turn his hand to anything is misleading. He can't. Conditions have changed, and a great variety of occupations existent to-day were unknown 100 years ago. Educational training must of necessity conform to present conditions."

Speaking from the viewpoint of the manufacturer, Mr. Van Cleave declared that our efforts in behalf of industrial education have been too miscellaneous, too isolated, too haphazard. He called attention to the fact that the little kingdom of Bavaria, with a population not much greater than that of New York City, has now 290 trade schools, giving instruction night and day, in 28 trades and crafts, to pupils from the first to the fifth grades, and stated that in this whole country of 85,000,000 people there are fewer trade schools than in that little German kingdom. He also suggested that there should be a commissioner of industrial education as the head of a bureau of one of the administrative departments.

The final address of the evening, delivered by Henry S. Pritchett, was confined principally to a statement of the aims and purposes of the society, in which he emphasized the fact that the problem involved is one to be dealt with in the spirit of industrial peace—not a spirit of industrial war. Referring to the development and progress of industrial training in Germany and elsewhere, he suggested that some of the methods there employed might be profitably borrowed. "If you can't produce a good thing yourself," he asserted, "the next best thing is to know how to borrow it."

Morning, afternoon and evening sessions were held on Friday, the first of which was presided over by Carroll D. Wright, president of Clark College. Different phases of "The Apprenticeship System as a Means of Promoting Industrial Efficiency" were discussed, and valuable suggestions offered by men close in touch with industrial requirements in skilled labor. In the afternoon and evening sessions a number of thoughtful and interesting papers were read upon pertinent topics, which developed spirited discussion. The morning session on Saturday was devoted to the consideration of "The True Ideal of a Public School System That Aims to Benefit All."

At a business meeting held during the closing session the following officers were elected to serve for the ensuing year: Carroll D. Wright, president; Magnus W. Alexander, vice-president; Frederick O. Pratt, treasurer. Managers for three years: Henry S. Pritchett, Everett V. Macy, Frederick P. Fish, Samuel B. Donnelly, Mr. Halsey, Mrs. B. B. Munford, J. Gunby Jordan and Horace E. Deemer.

French manufacturers have complained because the government gave large orders for railroad rolling stock to foreign firms. On behalf of the government it is explained that domestic works have not been able to make the deliveries required. This, the manufacturers say, has been due to the wide fluctuations in the amount of work given out by the government. It is said, for example, that the total purchases of rolling stock in 1904, 1905 and 1906 were £720,000, £3,680,000 and £6,800,000, respectively. It is argued that these wide differences, which had no relation to the amount of traffic, made it impossible for the manufacturers to maintain their plants on a scale permitting of filling orders given on short notice. By contrast the practice in Germany is cited, the government orders there not having varied more than 6 per cent. over a term of years.

HARDWARE

AT this time of year the trade is permitted to see the balance sheets of such companies as publish them for the information of their stockholders and the public. Although brief and condensed, they give an excellent summary of the business for the period to which they relate and indicate in a general way the results of the business in the profits made or the loss suffered. It is, however, safe to say that when the average man glances over such balance sheet or statement of a modern corporation he little realizes the extraordinary amount of careful, painstaking work involved in order to present in a comprehensive manner the vital statistics of a great industry that he may in a few minutes and almost at a glance learn the volume, the results and many of the features of the business concerned. The merchant or manufacturer who is interested in such a financial résume relating to a corporation in which he has only a general or perhaps distant interest, may very appropriately, unless his own methods are already admirable and up to date, compare such summary of a great business representing an enormous investment and multitudinous detail, with the manner in which the accounts of his comparatively small business are kept and the uncertainty and indefiniteness of such balance sheet as he is able to make. It is perhaps safe to say that with the great majority of merchants and manufacturers an improvement in their accounting system would be in order.

An illustration of the tendency among the industrial nations to strengthen their manufacturing interests by legislation is furnished in the modification which has been made in the English patent law. The act relating to this matter while quite clear in its general scope is somewhat vague in regard to the requirements that the articles affected shall be made in Great Britain. The clause governing the matter provides that at any time not less than four years after the date of a patent, and not less than one year after the passing of the act, any person may apply to the comptroller for the revocation of the patent on the ground that the patented article or process is manufactured or carried on exclusively or mainly outside the United Kingdom. Other sections provide means for putting the revocation into effect at once or for postponing it for a period not exceeding 12 months, if the patentee can give satisfactory reasons why the article patented is not manufactured or the process carried on in Great Britain. There is apparently ground for question as to the applicability of the act in cases where a part of the work of manufacture is done outside Great Britain and the work completed within its borders. There is, however, little doubt that the passage of the act indicates a determination on the part of the English to be more strict than heretofore in giving outside inventors the advantage of the protection of their patent laws.

There are evidences already of the alertness of American manufacturers in taking measures to hold the English markets on their patented products. Many of these patents covering important inventions and popular goods are certainly well worth safeguarding, as they are the subject matter of large and profitable trade. The statement is made abroad that a well-known American firm of Razor makers is negotiating for ground near Sheffield on which to erect a plant capable of furnishing employment to between 400 and 500 persons. Another prominent company, which has a well established trade in England and headquarters in London, is reported to have taken steps to establish a factory at Leicester. It may be presumed that others are moving quietly in the same direction, and that the result of the new law will be not so much a limitation of the sale of the goods to which its provisions apply as the establishment on British soil of factories, the principal ownership of which is in the hands of foreigners. However this may be, the change in the law brings up to many of our manufacturers a practical question which must be considered and decided without much delay. There are doubtless cases in which something must be done to protect their English patents, unless they are willing to let them lapse.

Condition of Trade.

The advance of the season and the greatly improved condition in the finances of the country are working together to quicken the movement in commercial channels. The trade, however, responds only gradually and indeed somewhat sluggishly. Many merchants are, of course, still occupied with closing up the affairs and accounts of the past year and getting things in shape for the spring trade, a process which takes a little longer this year than usual on account of the disturbance wrought by the financial stress now so happily past. A gratifying feature of the situation is the caution which is being exercised in regard to credits. Merchants are careful not to purchase as freely as their stocks, light and in some cases broken, might suggest if regarded apart from financial consideration. Merchants wisely look upon a safe policy as the wisest, and many of them are doubtless endeavoring to clear up their indebtedness before incurring more. In pursuing this course the merchants, whether large or small, should have the encouragement of those to whom they look for the supply of their goods, and there should be no attempt to sell more goods than a customer actually needs. The making of collections and paying of debts is thus receiving much attention from the trade, and the result is that there is a good deal of settling up of old accounts and getting financially into a secure position. In the present condition of things when the financial stress has relaxed, it is recognized as the part of wisdom for the mercantile classes to do all in their power to avoid and prevent commercial embarrassment, as recklessness or mismanagement might result in failures which would have an unpleasant effect on the trade as a whole. Looking over the month which is now ending, the change which has taken place in the main features of the market is most gratifying. Apprehensions which then were entertained have been shown to be groundless; the danger of financial trouble has disappeared; money has returned to its usual channels and the finances of the country have in good measure recovered from a very acute disturbance, and there is apparently little unsettling of credits or financial embarrassment among industrial or commercial houses. In this way a foundation has been laid for business, which within a week or two is beginning to show itself in moderate but in slowly increasing volume. While the time has not come in which the trade see their way clear to purchase with former liberality and abandon, there is a gradual resum-

ing of enterprise and effort, and the purchases which are being made are setting the wheels of trade in motion. While they are in volume much below the normal, they make up on the whole a very respectable aggregate. The tone of the market is not strong and a good many minor concessions are being made, especially in heavy goods, but prices in general are pretty well maintained. The situation regarded all in all records a decided improvement, and existing conditions justify the hope that further progress will gradually be made in the direction of a return to something like an average volume of business and at least fairly prosperous conditions. With the better spirit which prevails among business men and the people at large, merchants and manufacturers alike may push their business with renewed hopefulness and courage, endeavoring to make good by energy, enterprise and effort, any falling off in its volume which might otherwise be experienced.

NOTES ON PRICES.

Wire Nails.—The announcement of the manufacturers of Wire products of their decision to maintain prices for spring trade has resulted in calling out a good many orders from the merchants during the week under review. It is evident that many merchants who were waiting for some definite light as to whether or not a reduction in price was to be looked for have been sending in specifications for their immediate needs. The demand being made upon the merchants, whether wholesale or retail, is, however, still of quite moderate proportions, and some stocks, though rather light, are regarded as sufficient for present requirements. The movement of Nails is, however, on the whole as large as could be expected under the circumstances, and indicates a gradual righting of trade conditions and the developments of increased activity. A marked feature of the situation is the regularity which rules in the matter of prices, there being practically no complaint of cutting. Quotations are unchanged, as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

New York.—The local Nail houses have sent notices to the trade stating that the base price of Wire Nails, in small lots at store, commencing February 1, will be $2.40 per keg. In explanation of the advance it is explained that Nails have been sold at lower figures to reduce stocks with the possibility of a reduced mill price in view; also that as manufacturers have reaffirmed previous prices for the spring trade and low priced contracts with mills have expired, an advance in store price is deemed necessary.

Chicago.—With the reaffirmation of prices on Wire products the hesitation on the part of dealers in placing orders has to a large extent disappeared and business is steadily improving. Monetary conditions throughout the West are now practically normal, and indications are strongly favorable to the development of a normal volume of business within the next few weeks. Stocks are low and dealers must have goods for their replenishment, so that when spring approaches there is likely to be an insistent demand for shipments that will necessitate the active operation of all mills. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—Immediately following the announcement by the leading interests that prices on Wire Nails would be maintained a large amount of new business was entered by the mills, and specifications against some contracts that had been held up were sent in, and a considerable tonnage in Wire Nails is now on the books of the mills. This week new demand has been somewhat quieter, but this is probably due to the fact that most buyers sent in their orders at once after the announcement was made that prices would not be reduced. Shipments are fairly heavy and are distributed to nearly all parts of the country, business from the Southwest being larger than from other territory. We are advised that prices are being absolutely maintained, and would not be shaded under any condition. A still larger demand for Wire Nails is anticipated late in March or early in April, when outside building operations are actively resumed. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

Cut Nails.—There is some increase noticeable in the volume of business between the mills and their customers on the one hand and the merchants and the consumers on the other hand. The demand in both branches of the trade is, however, quite moderate, as buyers are in no hurry to fill up their assortments whether for wholesale or retail trade. The decision of the manufacturers of Wire Nails to maintain their prices has had its effect also on Cut Nails resulting in some directions in a slight toning up of the market. On the other hand, some of the mills have been shading prices a little. The production of Cut Nails is being kept down to a very moderate amount, and the market thus escapes the menace of a large accumulation. With occasional exceptions the market is represented in a general way by the quotation of $2.05 on Steel Cut Nails at mill. Iron Nails generally should command about 10 cents more than Steel.

New York.—Local demand is moderate and the market is not regarded strong at quoted prices. No advance has yet been made by Nail houses on Cut Nails to correspond with the toning up in Wire Nail prices. Local jobbers and Nail houses are holding small lots at store at $2.30 base.

Chicago.—Due to the conservative action of the mills in curtailing output, and supported by the firmness of Wire Nails, Cut Nails have suffered no appreciable demoralization, in face of an exceedingly quiet demand. Local jobbers report a light trade consisting of scattered orders for a few kegs at a time. Stocks are fully equal to present requirements. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; steel, to jobbers, in carloads, $2.28; to retailers, $2.33.

Pittsburgh.—We note a fair demand for Cut Nails, and prices are probably being a little better sustained, in sympathy with the firmer feeling on Wire Nails. Demand is only fair and is mostly for small lots for actual needs. Prices continue to be slightly shaded, but not to the extent that prevailed some time ago. We quote Steel Cut Nails at $2 to $2.05, f.o.b. Pittsburgh, for carload lots, and small lots at $2.10, to which freight to destination is added. Iron Cut Nails are being held at about $2.15, at mill.

Barb Wire.—Manufacturers have been making fair shipments of Barb Wire, so that merchants can be in a position to meet the spring trade. While there may be in the minds of some a question as to the length of time that present prices will rule, it is generally recognized that it is wise policy to lay in such a supply of Wire as will enable them to take care of a conservative spring demand. This is the case even where it is anticipated that their sales in this line will be lighter than usual. Shipments by the mills continue to cover increased quantities, and the situation is regarded as gradually clearing. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—A very satisfactory increase in specifications has developed during the past week, and a considerable volume of new business in 60-day orders has also been received. Another encouraging feature is noted in the fact that release orders on held up shipments have been coming in freely, so that it is believed most of the deferred tonnage will have been ordered out early in

February. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—A fair amount of new tonnage has been placed with the mills since the announcement that prices would not be reduced, tonnage from the Southwest being somewhat larger than from other parts of the country. The trade is still disposed to act conservatively in the matter of placing contracts, and indications are that stocks carried by jobbers will be kept down to a minimum for some little time, or until general conditions are more settled. We are advised that regular prices are being firmly maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—The great business in Plain Wire being with manufacturers who use it as a raw material, the character of the demand indicates pretty well how they regard the prospects for the season's business. Viewed in this light it is gratifying to note a decided increase in the volume of orders without, however, as yet a very free purchasing. Some orders are also coming in from the trade who handle limited quantities of Plain Wire. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Chicago.—Due to the same causes and reflecting the same conditions present in other Wire products there is a decidedly better movement in Plain Wire. Makers of Fencing anticipate a reasonably good demand for their product, and now that the stability of values are assured for the spring season they are coming into the market more freely. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—Makers of Fencing and other consumers of Fence Wire have placed orders more freely since the announcement by the leading producers that prices would not be reduced. The mills are in position to make prompt deliveries, owing to the light volume of trade that has prevailed for some time. With the betterment in general conditions it is believed that demand for Fence Wire will steadily improve from this time forward. Prices are firm and are being absolutely maintained. Quotations for base numbers 6 to 9 are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Pump and Cup Leathers.—Attention has been called in these columns to the fact that the Leather market is somewhat lower. This condition has been reflected in quotations on Pump and Cup Leathers, which are now being quoted on the generally accepted list at discounts of from 30 to 30 and 10 per cent., according to quantity and class of trade.

Bolts and Nuts.—The tone of the Carriage and Machine Bolt market continues weak, as manufacturers become more and more desirous of booking business to keep their works at least in partial operation. Stove and Tire Bolts retain the noteworthy firmness which has characterized them for many months.

Tacks.—Quotations on Tacks again show irregularity, due to eagerness for business on the part of some manufacturers. The established base price is being considerably shaded on desirable orders and export orders are being figured especially close.

Strap and T-Hinges and Butts.—Representatives of manufacturers of Wrought Butts, Strap and T-Hinges, &c., state that prices have recently been reaffirmed and they do not expect any changes of consequence during the first half of the year. The market is generally reported as steady, with stocks in the hands of the trade fairly well reduced.

Jack and Safety Chain.—No change is observed in the market for Jack and Safety Chain, which is reported as dull, with concessions of 5 to 7½ per cent. or so on established prices generally obtainable.

Wire Cloth, Poultry Netting, &c.—Some announcement of prices on Screen and Hardware grade Wire Cloth and Poultry Netting for delivery after February 1 is daily expected.

Scissors and Shears.—An excellent tone characterizes the market for Scissors, Shears, &c., prices having recently been reaffirmed by leading manufacturers. Business is in moderate volume, but there seems to be no disposition to stimulate business by concessions from established prices.

Washers.—The market for Iron or Steel Washers is soft, although extreme prices are probably no lower than they have been for some weeks. Quotations based on 86 off list may be taken to represent the market in a general way.

Builders' Hardware.—The Builders' Hardware market still shows the unsettlement occasioned by the readjustment of prices on the part of leading manufacturers reported last week in these columns. Some buyers declare that in many cases the reductions announced do not represent important declines from prices which have actually been obtainable for some time.

Rope.—Demand is not keeping up quite as well as it promised immediately after the first of the year. Manufacturers are, however, making preparations to take care of business as soon as it presents itself, which they anticipate will be in February. During the week values for Manila and Jute Fibers have hardened, while Sisal remains without change. Manufacturers are unwilling to place contract orders at ruling prices. The following quotations fairly represent the market for base sizes: Pure Manila, 11½ cents; B quality grades down to 8½ to 9 cents; Pure Sisal, 8 cents; lower grades Sisal, 7 to 7¼ cents; No. 1 Jute, ¼-in. and up, 7½ cents; No. 2 Jute, 7 cents.

Window Glass.—According to press reports, the glass workers' association, known as the Amalgamated Window Glass Workers of America, has been dissolved by the courts. If this report is true and the decision stands in the courts it will simplify the Window Glass situation from the manufacturers' standpoint, and will probably facilitate the starting the factories by manufacturers. There is otherwise very little of interest in Glass circles, and not enough business to make a market, either in factory shipments or jobbing lots. Prices recommended at the last meeting of the Eastern Window Glass Jobbers' Association, for Greater New York are as follows: Single strength, 90 and 25 per cent.; double strength, 90 and 30 per cent. discount from jobbers' list. These prices are, however, not closely adhered to.

Linseed Oil.—Demand is on the same moderate scale as has characterized the market for some time. There is an inclination on the part of some buyers to place carload orders if it could be done at lower figures than the crushers are now willing to name. Sales are confined for the greater part to small lots for immediate requirements. Prices in five barrel lots are as follows: State and Western Raw, 42 to 43 cents; City Raw, 44 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—Local business has been light during the week, as manufacturers are only purchasing in small quantities on account of the general quiet prevailing in all lines. The New York market is represented by the following quotations: Oil Barrels, 45½ to 55 cents; Machine Made Barrels, 55 to 55½ cents.

The Hardware business at Charleroi, Pa., formerly conducted by Duvall & Gault, has been dissolved, the junior member of the firm retiring from the business, which will now be conducted by David Duvall under his own name.

The store of Deisem & Franks, La Moure, N. D., has been destroyed by fire.

CHICAGO HARDWARE REPORT.

Gradual improvement, more pronounced perhaps in Wire and Wire products, but in some degree noticeable in nearly all Hardware lines, is reported by the trade. The establishment of prices has had the effect of bringing out a considerably increased volume of business in Wire Nails and Fencing Wire, which, as the season advances and consumptive demand increases, can reasonably be expected to grow. Both jobbers and dealers, assured that the mills are now in position to make reasonably prompt deliveries, are ordering only for nearby requirements, and are not disposed to contract as far ahead as has recently been their practice. The effects of this policy, now prevalent in practically all lines of manufacture, are seen in the placing of smaller, but more frequent, orders. Announcement has been made of a readjustment of prices on Builders' Hardware. The new schedule represents changes which in the main are toward lower levels, comprising reductions ranging from 10 to 20 per cent. The greatest reductions are naturally found in articles more largely composed of Copper. Prices on the more staple grades have been but slightly changed, and in a few instances are reaffirmed. Reflecting the sharp recession in values of Pig and Scrap Iron, prices of Sash Weights, Cast Washers and other Cast Iron goods show a weaker tendency. Supported by only a moderate demand Sash Weights are offered at from $23 to $25 a ton. Jobbers express confidence in the development of a demand for spring goods that will exceed the provision so far made for its supply, and in consequence are looking forward to a liberal increase, both in number of orders and volume of business, within the next few weeks. Deliveries of orders held up on account of the recent financial stringency are in some cases being asked for, and manufacturers' representatives are finding a distinct improvement in general conditions that portends a buying movement, which a little later should result in a fairly active and satisfactory business. Heavy Hardware jobbers report a somewhat improved demand for Tire and Spring Steel from carriage and wagon shops, and a better run of sorting up orders from general shops and dealers. Sheets are moving slowly, the demand not having been notably accelerated by the recent reduction of prices.

LINCOLN'S BIRTHDAY IN THE HARDWARE STORE.

LINCOLN'S BIRTHDAY, on February 12, can be made the occasion of helpful special displays and advertising features. The sale should be planned far enough in advance, so that the whole week can be devoted to this effort, as at this season of the year the results are likely to be better if distributed over a number of days instead of being confined to any one. This year Lincoln's Birthday falls on Wednesday. As most local weeklies are published on that day or later in the week, it will be advisable at least to call attention to the sale in the weekly papers of the week before, even if special price items are not mentioned until the week of the sale. The announcements in the daily papers can begin on Friday or Saturday, the 7th or 8th.

Arrange Windows Early.

It is desirable to arrange the special window displays early, and as Saturday is a busy day in many local stores, this work should be accomplished on Thursday or Friday. Window cards should call attention to the fact that the sale is for the week of Lincoln's Birthday, and if it is deemed inadvisable to display special prices thus early, then these price tickets may be added early in the week of the sale. Under ordinary conditions, however, it will pay to display the special prices, as well as the general announcement of the sale well in advance.

Appropriate Features.

As a center piece for the windows a large picture of Lincoln or a bust draped with the national colors will be effective. Small cuts of Lincoln will be equally attractive as corner pieces for the newspaper announcements.

Then to carry out the idea consistently, bear in mind some of Lincoln's early experiences and troubles. The fact that he was a woodman and rail splitter is worth mentioning in the windows upon an especially lettered card, and the same historical fact is good to use as an introduction for the advertisements upon which to hang special prices upon Axes, Saws and other outdoor Tools, which should be good sellers in most localities at this season of the year.

The window displays should be largely devoted to such things as those which are mentioned in the announcements.

In Further Detail.

The plan can well be made to cover many other articles in the Hardware line. Modern Lamps and Lanterns can be shown, with a card calling attention to the fact that the youth of to-day does not need to study by candlelight or the glow of the open fire, and at the same time the moderate prices can be featured. Tea Kettles should carry an announcement to the effect that while the style and shape have not changed to any great extent, nevertheless the appearance, weight and handiness have been greatly improved upon. This fact will be impressed by showing an Iron Tea Kettle in company with the more recent nickel and enamel ware sorts. Contrasts in Cooking Utensils can also be made, both in the windows and in the advertisements, in order that the household buyers as well as the outdoor workers may be interested.

A Menu Idea.

Restaurants in large cities often feature special menus upon such holidays, which are purposely designed as souvenirs and are intended to be kept by those of their patrons who may desire them. The Hardware merchant can get some of these printed with the special prices of his sale at a nominal price. Most printers have books of stock designs for such folders, which are attractive and inexpensive.

Such a souvenir might be called "LINCOLN SALE MENU OF SPECIAL PRICES." These will not only be taken home by customers, but will be talked about among neighbors. If they are ready the week before the sale they should prove in themselves effective announcements of the event. It should be remembered, though, that very few local printers can afford to carry such special cards in stock, and orders should be placed far enough in advance to permit the printer to get them from his supply house.

The same plan can be arranged for Washington's Birthday and other holidays, should the merchant find it inconvenient to start for Lincoln's Birthday. However, two events so near together as Lincoln's and Washington's birthdays should not be handled in exactly the same manner.

ALLEN TURNER, one of the oldest and best known Hardware and Stove merchants of western Pennsylvania, died at the home of his son in Sharpsville, Pa., last week, after an illness of one week. He was born near Warren, Pa., on October 18, 1821, moving to Sharon, Pa., in 1852 and embarking in the above business, which for a number of years was the only one in the town. Later he moved to Kinsman, Ohio, where he engaged in the same line, but only remained a year, opening a similar store at Greenville, Pa., where he continued in active business for over 40 years. He was also interested in manufacturing enterprises, having purchased a rolling mill and a woollen mill at Greenville.

WE are advised by J. W. McManus, secretary, that at the annual convention of the Retail Hardware and Implement Dealers' Association of Texas, held in Dallas during the past week, a resolution was unanimously passed that "the Sims parcel post measure just introduced in Congress is against the interest of every citizen of Texas, be he farmer, mechanic, professional man or merchant."

CLIFFORD A. DUNBAR, a well-known Hardwareman of Evans City, Pa., died at his home, in that city, last week, aged 26 years. He was the active head of the business which had been established by his father, Ambrose Dunbar, who retired several years ago.

RETAIL HARDWARE CONVENTIONS.

During the next two months the following retail Hardware conventions will be held. Where the asterisk appears elaborate plans are being made by the association officials for the accommodation of Hardware exhibits by manufacturers and jobbers.

SOUTH DAKOTA ASSOCIATION,* Aberdeen, February 4-7. Secretary, H. E. Johnson, Redfield.

WISCONSIN ASSOCIATION,* Milwaukee, February 5-7. Secretary, C. A. Peck, Berlin.

CONNECTICUT ASSOCIATION, Meriden, February 10 and 11. Secretary, James de F. Phelps, Windsor Locks.

KENTUCKY ASSOCIATION, Louisville, February 11-13. Secretary, John R. Sower, Frankfort.

NEBRASKA ASSOCIATION,* Lincoln, February 11-14. Secretary, J. Frank Barr, Lincoln.

WEST VIRGINIA ASSOCIATION, Elkins, February 18, 19 and 20. Secretary, Leslie Hawker, Shinnston.

INDIANA ASSOCIATION,* Indianapolis, February 18-21. Secretary, M. L. Corey, Argos.

IOWA ASSOCIATION,* Cedar Rapids, February 18-21. Secretary, A. R. Sale, Mason City.

NEW YORK ASSOCIATION,* Buffalo, February 18-22. Secretary, John B. Foley, Syracuse.

MISSOURI ASSOCIATION, St. Louis, February 24 and 25. Secretary, F. D. Kansteiner, St. Louis.

PENNSYLVANIA ASSOCIATION,* Altoona, February 24, 25 and 26. Secretary, J. E. Digby, McKees Rocks.

OHIO ASSOCIATION,* Columbus, February 25-27. Secretary, Frank A. Bare, Mansfield.

MINNESOTA ASSOCIATION,* St. Paul, February 25-28. Secretary, M. S. Mathews, Guaranty Building, Minneapolis.

ILLINOIS ASSOCIATION,* Peoria, February 26-28. Secretary, L. D. Nish, Elgin.

NEW ENGLAND ASSOCIATION,* Boston, March 11 and 12. Secretary, Charles L. Underhill, Somerville, Mass.

Ohio Hardware Association.

A large postal has just been sent out to the members of the Ohio Hardware Association in which they are encouraged to come to the convention at Columbus, February 25 to 27, and "get new ideas," and by attending the Hardware exhibition "see and study the newest in Hardware lines." It is intimated that the merchant will be "the better, broader and bigger" for it.

New York Hardware Association.

The Hardware exposition, which will be held in connection with the annual meeting of the New York Retail Hardware Association, at Buffalo, N. Y., February 18 to 22, promises to be a very complete representation of Hardware and related lines. The booths, with very few exceptions, have been disposed of and the great variety of goods on display should prove interesting to the large number of merchants who are expected to attend the convention. We are advised that quite a number of Hardwaremen from other States have signified their intention of attending the New York convention.

Indiana Hardware Association.

The Question Box will perhaps be the most conspicuous feature of the proceedings of the Indiana convention at Indianapolis, February 18 to 21. Another noteworthy feature will be an address by Governor Hanly on "State Business Problems." Charles W. Burrows, Cleveland, Ohio, will discuss Parcel Post, and O. B. James, Richland Center, Wis., will read a paper on "Country Store Advertising." S. R. Miles, president of the National Retail Hardware Association, will participate in one of the sessions and will make an address. Spaces in the Hardware exhibition have nearly all been taken, and this feature of the gathering will doubtless receive close attention from visiting Hardwaremen. Not far from 1000 merchants are expected to attend the convention. Since the last meeting nearly 100 new members have come into the association and further accessions are being received daily. In fact it is remarked by Secretary M. L. Corey that "Non-members are getting scarce in Indiana."

West Virginia Hardware Association.

The programme for the meeting of the West Virginia Association, which will be held at Elkins on February 18, 19 and 20, has practically been determined upon. It includes addresses by W. P. Bogardus, Mt. Vernon, ex-president of the National Retail Hardware Association; Col. Morris B. Belknap, Belknap Hardware & Mfg. Company, Louisville, Ky.; C. D. Barbe, Morgantown, and Charles Barklay, Pittsburgh, Pa. Papers on topics of trade interest will also be presented by C. J. Richardson, Marlington and C. S. Davis, Oakland, Md. The Question Box discussion conducted under the efficient leadership of Mr. Bogardus, should prove especially interesting and valuable.

Nebraska Hardware Association.

The four-day convention of the Nebraska Retail Hardware Association at Lincoln will begin on Tuesday, February 11, the scene of the business sessions being at Fraternity Hall, and the Hardware exhibition being given in the Lincoln Auditorium, in the immediate neighborhood. Among the formal papers which will be read at the meeting are: "Association History," by M. L. Hargelroad, Holstein; "Battle for Life with Catalogues," by A. C. Clark, Chicago; "Getting and Holding the Farmers' Trade," by C. B. Diehl, Stratton; "Harness and Saddlery in Connection with the Hardware Business," by N. P. Hanson, Upland; "Local Associations," by H. N. Wineland, University Place; "Taking the Annual Inventory—Improving Our Methods," by President De Vol, Council Bluffs, and "Heating and Ventilating," by H. J. Fueller, Philadelphia, Pa. A special feature of the proceedings will be a discussion of parcel post legislation, which will be opened in an address by W. S. Wright, Omaha, president of the National Hardware Association. The association will be welcomed to the city by Gov. George L. Sheldon and F. W. Brown, mayor of Lincoln. The sessions of the convention will all be held in the afternoon, so that the members will be at liberty to inspect the exhibits by manufacturers and jobbers in the morning and evening. A very attractive programme of entertainment has been prepared, and it is expected that the members will find the social features of the gathering very enjoyable.

South Dakota Hardware Association.

We are advised by H. E. Johnson, Redfield, secretary of the South Dakota Retail Hardware Association, that the coming convention at Aberdeen, February 4 to 7, promises to be a most attractive and successful one with a large and representative attendance of the members. The Hardware exhibition, which will be held in the Aberdeen Auditorium, is relied upon as a big drawing card for merchants, and especially those who have embarked in business during the past year. The exhibit space has been going fast, and it is expected that all the accommodations will have been taken up by the opening of the convention. A special rate of a fare and a third on the certificate plan, good on all railroads in the State, has been secured. Among the addresses which will be made at the convention will be those of Vice-President A. T. Stebbins of the National Retail Hardware Association; Prof. E. F. Ladd, Fargo, N. D., who will discuss "Pure Paints and the Paint Law"; E. J. Mannix, Sioux Falls, who will talk on "Trade Channels"; M. J. Pilkington, Des Moines, Iowa, who recently secured the indictment of a Chicago catalogue house by the Federal Grand Jury on the charge of using the mails with intent to defraud, and who will address the association on the subject of "Retailing of Merchandise a Science," and R. E. Saberson of the Berkley System Company, Sioux City, Iowa. The Question Box will occupy a good deal of time during the convention, as it has been found that the discussion of subjects thus brought up is very instructive and interesting to the members. A few of the questions thus

far submitted are the following: How to Attract the Ladies to a Hardware Store, the Keeping of a Stock Book in a Retail Store, Publicity Advertising, How to Handle Mixed Paints Profitably, the Best Way to Get and Hold the Farmers' Trade, and the Offering of Premiums.

New England Association.

The Executive Committee of the New England Hardware Dealers' Association met at the rooms of the Boston Merchants' Association on the 22d inst. The Hotel Vendome was decided upon as headquarters for the 1908 annual convention, to be held March 11 and 12. Programme plans are being definitely arranged and the annual *Bulletin* of the association, which will be issued about February 20, will contain full particulars. D. Fletcher Barber, Boston, is chairman of the Committee on Exhibits. On March 15, 1893, the association was organized and the convention this year will be something of a reunion, marking the fifteenth anniversary. The membership roll and treasury balance are considerably larger than ever before in the history of the organization.

Illinois Hardware Association.

The Question Box will probably be the most important feature of the annual convention of the Illinois Retail Hardware Association, which will be held at Peoria, February 26 to 28. Special efforts are being made to make the discussion of questions practical and interesting, and the members are invited to send queries to H. G. Cormick, Centralia, or J. T. Noftsker, Rock Island, who have the matter in charge. A good deal of attention will also be devoted to Hardware window display and in this connection a number of prizes are offered for meritorious exhibits. One prize will be offered for the best display made by a Peoria Hardware store during the convention, four additional prizes being offered for photographs of window displays in other towns of the State, graded according to population. The judges in this window display contest will be appointed by the president on the first day of the convention, and the awards will be made during the meeting. So far as addresses at the convention are concerned, arrangements have already been made to secure the presence of Charles W. Burrows, Burrows Publishing Company, Cleveland, Ohio, who will discuss parcel post, and John I. Gibson, Battle Creek, Mich.

A Good Grasp.

THE January number of "Hardware Hints," the bright and up to date house organ issued by Logan-Gregg Hardware Company, Pittsburgh, Pa., bears the unique and striking cover design, reproduced herewith. The illustration with its clever subjoined caption is certainly a graphic method of suggesting the strength of the company in the territory which it covers, indicated by the map printed on the palm of the hand. The causes of the concern's prestige, or, we might say, the elements of its strength as suggested by the design, are indicated by the following phrases printed on the ends of the powerful and wide reaching fingers of the hand: GOOD SERVICE, RELIABLE GOODS, RIGHT PRICES, COMPLETE STOCK, QUICK SHIPMENTS.



All Within Our Grasp.

BUTLER BROS., Chicago, New York, Minneapolis and St. Louis, in their "Our Drummer" catalogue for February, especially invite price comparisons and call attention to Valentines, Easter Goods, Tinware and Enameled Ware specials, and leaders for a 25-cent sale offered at $2.25 per dozen.

PACIFIC COAST HARDWARE ORGANIZATIONS.

THE annual meeting of the Oregon Retail Hardware Association was held in Portland on the 21st and 22d inst. The election of officers resulted in the choice of the following officials for the ensuing year: H. J. Altnow, Woodburn, president; H. C. Garnet, Medford, vice-president, and Frank Dayton, Portland, treasurer. Messrs. Altnow and Dayton were re-elected, Mr. Garnet succeeding E. F. Willis, Banks, as vice-president. A secretary will be chosen later. The Executive Committee chosen comprises E. F. Willis, Banks; W. A. Johnson, The Dalles; Drew Griffin, Eugene, and Frank Spencer, Salem. The members of the association were tendered a banquet at the Portland on Tuesday evening. Governor Chamberlain was among those who attended the banquet, and made a very felicitious address.

Following the meeting of the Oregon Association Hardwaremen interested in the Pacific Federation of Hardware and Implement associations gathered together and placed that organization on a permanent basis. More than a score of merchants from the States of Oregon, Washington and Idaho were present, and announcement was made that California, Utah and Colorado bodies had expressed a desire to join, although not regularly represented at the conference. John Smith, president of the Inland Empire Association, called the meeting to order, explaining the object of the meeting was to dissolve the temporary federation formed last year and establish a new organization. E. W. Evenson, Spokane, Wash., then retired as temporary secretary, receiving a vote of thanks for his effective work in connection with the organization. E. F. Willis, Banks, Ore., was chosen as temporary chairman. A committee was appointed to frame a constitution and by-laws, consisting of John Smith, Walla Walla, Wash.; C. S. Graybill, Nampa; C. W. Stockwell, Portland; R. L. Spiker, Lewiston, Idaho; H. J. Altnow, Woodburn, Ore., and E. W. Evenson, Spokane, Wash. E. F. Willis was formally chosen president of the Federation, and R. L. Spiker, Lewiston, Idaho, and J. F. Cook, Boise, Idaho, vice-presidents. The election of a secretary-treasurer has been deferred until a later date.

Philadelphia Hardware Merchants' & Manufacturers' Association.

At the annual meeting of the Hardware Merchants' and Manufacturers' Association of Philadelphia, held at the association rooms in the Bourse Building in that city, the election of officers for the ensuing year resulted as follows: President, Edward S. Jackson, Miller Lock Company; vice-president, Paul A. Griffiths, Shields & Bros.; secretary-treasurer, T. James Fernley. The following directors were also chosen: William W. Supplee, Supplee Hardware Company; Charles Z. Tryon, Edward K. Tryon Company; Thomas Devlin, Thomas Devlin Mfg. Company; Joseph J. McCaffrey, McCaffrey File Company; A. S. King, National Enameling & Stamping Company; Samuel Disston, Henry Disston & Sons. The association, after referring to the fact that the Philadelphia banks during the recent financial stringency were able and willing to extend to the city's manufacturers and merchants sufficient currency to meet payrolls and other urgent needs, adopted resolutions thanking the Clearing House Association and pledged the manufacturers' and merchants' support. The twenty-second annual banquet of the association will be held at the Bellevue-Stratford on Thursday evening, 30th inst.

WILLIAM SCHWENE, a member of the Schwene Hardware Company, and also of the Schwene Mfg. Company, Ogden, Iowa, was struck by a train on the Chicago & Northwestern Railroad, January 14, receiving injuries from which he died in a few hours. In 1898, Mr. Schwene purchased the Hardware business of Sturtevant & Son, when the Schwene Hardware Company was established. The Schwene Mfg. Company was organized in 1906, and a factory was built for the manufacture of the Apex Coaster Wagon, which was Mr. Schwene's own invention. He was 34 years of age.

Inland Empire Implement and Hardware Association.

THE annual convention of the Inland Empire Implement and Hardware Association was held at Spokane, Wash., on the 15th, 16th and 17th inst., President R. L. Spiker, Lewiston, Idaho, in the chair. Addresses of welcome were delivered by C. Herbert Moore, Mayor of Spokane, and F. E. Goodall, president of the Spokane Chamber of Commerce. The responses to these addresses were made by President Spiker and C. L. Butterfield, Moscow, Idaho, respectively.

The usual question box was a feature of the proceedings. Among the questions which called out considerable discussion were the following: Does it pay to canvas for business? Does it pay to give presents to customers? How should slow accounts be collected? Is it policy to carry a low quality of goods to meet catalogue house competition?

A committee appointed for the purpose of considering the matter of incorporating the association recommended that the president appoint a committee of five, including the secretary and president ex-officio, with full power and authority to proceed to incorporate the association under the name of the Inland Empire Implement and Hardware Association, the word dealers being omitted.

Parcel Post.

The following resolution in regard to parcel post legislation was adopted unanimously:

Whereas, The Inland Empire Implement and Hardware Association, in convention assembled, after considering the proposed changes in our present parcel post as suggested by Postmaster-General Meyer, believe that the best interests of the retail merchand'sing interests of the entire country can best be served by leaving the present postal laws unchanged, but we do most earnestly protest against the present activity of the Postmaster-General in his attempt to secure the passage of his proposed parcel post extension, and respectfully ask that he either be stopped or compelled to extend the franking and printing privilege of his office to those opposed to his suggested plans; be it

Resolved, That we are opposed to any and all changes or proposed changes in our present parcel post, either as to increasing the weight limit or the reduction of the rates thereon. Instead, we ask that the present rate on first-class matter be reduced from 2 cents to 1 cent. This latter change would benefit all alike; the proposed changes would not.

Mutual Fire Insurance Association.

The following officers and directors of the Washington Hardware and Implement Dealers' Fire Insurance Association were elected for the new year, Messrs. Lucas, Scott, Loy and Evenson being re-elected: President, W. P. Lucas, Davenport; vice-president, L. A. Loy, Fairfield; treasurer, E. E. Scott, Oakesdale, and secretary, E. W. Evenson, Spokane, Wash.

The following persons were chosen directors for three years: J. W. Cupples, Downs; F. W. Kaser, Walla Walla; John Raymer, Reardon; W. F. Chalenor, Palouse; L. W. Anderson, Rosalia, and C. L. Butterfield, Moscow, Idaho.

Election of Officers.

The following officers were elected to serve during the ensuing year:

PRESIDENT, John Smith, John Smith Company, Walla Walla, Wash.

FIRST VICE-PRESIDENT, John Raymer, Reardon, Wash.

SECOND VICE-PRESIDENT, I. C. Hattabaugh, Grangeville Implement Company, Grangeville, Idaho.

SECRETARY-TREASURER, E. W. Evenson, Spokane, Wash.

DIRECTORS: T. E. Miller, Nezperce, Idaho; A. T. Johnson, Garfield, Wash.; C. E. Max, Cœur d'Alene, Idaho; G. R. Bradshaw, Ellensburg; S. W. Bier, Lind; Hugh Eaton, Elberton; John Smith, Walla Walla; J. H. Berge, Davenport; E. E. Plough, Wilbur; John Raymer, Reardon; I. C. Hattabaugh, Grangeville, Idaho; A. Z. Wells, Wenatchee; C. I. Butterfield, Moscow, Idaho; E. L. Scott, Oakesdale; W. A. Bell, North Yakima; J. R. Stevenson, Pomeroy; R. L. Spiker, Lewiston, Idaho; C. A. Loy, Fairfield.

Contract Notes.

President Spiker called attention to the fact that in the State of Washington the law required contract notes to be recorded before they become binding and had the effect of chattel mortgages. He also called attention to the fact that the expense of foreclosure was too high, and that in cases where the debt was small the cost was practically prohibitive.

Mr. Miller spoke at some length on the subject of the exemptions to which the debtor was entitled. He said they were unfair and entirely too high. He also said that the requirements in attachment cases were improper, and contended that when action was brought against a debtor the debtor should not be allowed to move his property out of jurisdiction or to dispose of it without first giving a bond to secure the debt sued for.

Mr. Naukervis declared his belief that it ought to be made not only a misdemeanor but a crime for a man to dispose of property for which he had given a contract note. He said that the law permitted merchants to follow the property and take it from whoever might have purchased it from the debtor, but gave no recourse along criminal lines against the debtor selling the property.

In accordance with a resolution adopted the new president was empowered to appoint a committee on legislation to look after these and other matters affecting the interests of merchants.

Harness as a Hardware Line.

A. Z. Wells, Wells & Morris, Wenatchee, Wash., presented a paper on "Harness in a Hardware, Implement and Vehicle Store and My Experience With It." Mr. Wells' tribute to Harness as a profitable and very satisfactory Hardware line was in part as follows:

Five and one-half years ago our firm purchased a Hardware and Implement stock in our splendid little city and immediately added a small line of Harness goods. Our Harness trade from the beginning was fairly compensating, but our Harness not entirely satisfactory, nor were we able to get to the point where we could have it so. The difficulty led us to believe there was a demand for a Harness above the average, and we decided to manufacture it ourselves. We were exceptionally fortunate in securing the services of a young man, a first-class workman, honest and full of ambition, to make our first lot of Harness. He is now the manager of our Harness department, and to him is due a large share of our success.

Our Instructions to Him

when he came with us were to make the very best Harness possible out of first-class stock and good workmanship. His efforts brought increasing cost, but a very much better grade of Harness. We lost many sales at the start, on account of price, but both quality and prices were strictly maintained. By doing a great deal of advertising and hard work we were able to keep him busy, and in a short time add another workman. The trail of the first six months of business did not lead through a path of roses. However, we talked Harness, thought Harness and advertised Harness in every way, finally adopting the idea of a guarantee. This we called the

"Wells & Morris Guarantee,"

and no advertisement ever appeared in reference to our Harness that did not enlarge upon this guarantee, nor would we permit our Harness to leave the store without bearing the stamp, "Made by Wells & Morris," and the purchaser assured that it was guaranteed in every way.

We made our guarantee mean something—mean precisely what it implied—and in doing this we made a reputation not only for our Harness but for our firm that has many times repaid its cost. To-day, the "Wells & Morris Guarantee" is known and recognized all over Chelen, Okanogan and a very large part of Douglas counties. Our Harness sales register, since January 1, 1906, shows the names of 428 satisfied customers, who are using our own make of high grade Harness, and I venture to say at prices in excess of those of any other retail house in the State.

We made and had the reputation for quality, and they knew it and were willing to pay for it. The catalogue houses have not bothered our Harness; our class is too high for them.

We have not nor do we intend to take one penny off the quality of our Harness nor off the price of it. On the contrary, we are turning out a very much better Harness to-day and are selling it at an increased price

than when we began manufacturing. By vigorously and unceasingly advancing our own standard of excellence we have brought friends by the score up the hill toward perfection.

Cream of the Business.

We regard the Harness end as the very cream of our business. It comes with the least effort and expense of any line, and it carries our name to the most remote corners of our trade. Through the unpaid efforts of our satisfied customers our territory is constantly expanding and we have the past year received many orders from trade people we have never seen.

Can I think that Harness Goods have been out of place in our Hardware and Implement store? No, indeed. They have been of the greatest benefit to us. The Harness line has been the entering wedge to some of the very best trade we have to-day.

E. E. Lucas' Address.

E. E. Lucas, Davenport, Wash., read a paper in which he referred to some things which a merchant should avoid if he desired success in business, in part as follows:

One goes into business presumably to make money, and he cannot pay the expenses of conducting his business, support his family, educate his children and lay up something for a rainy day by selling at less than a reasonable profit.

By selling at less than a reasonable profit you are not true to yourself and family.

By cutting a price, to entice a customer from your competitor, you are not doing yourself any good, and are actually robbing your competitor.

Making special prices to people living near another town is nothing but piracy, and if followed until your own trade gets on to it you are sure to reap a just reward.

By allowing your notes and accounts to run longer than they ought you lose your own peace of mind and get into disputes with your wholesale dealer. It is also unfair to your bank to compete with it in this way. A dealer, however, who has money enough to do the banking of his community in this roundabout way should have enough to go into the banking business himself.

Making unconditional guarantees on edged tools will subject you to imposition by people who will, on account of the guarantee, misuse them, and if you do not succeed in getting the wholesaler or manufacturer to replace them it is sure to leave a bad taste in your mouth.

In overbuying you will lose as much money as you will from any of the other leaks in your business. An extra 5 per cent. offered by the specialty man to induce you to order a quantity in excess of your needs may look good at the time, but when you have seen the last of the goods you will see that saving fade away, and with it a good sized loss besides. Business conditions are such in our territory now that goods can be had from the jobbers in much less time than formerly, and they tell us that they are not only willing but glad to carry the stocks.

If you buy a line to keep the salesmen from selling the other fellow, you are sure to be sorry for it. If you don't buy some more the next time, no matter how many you may have left, this same salesman is almost sure to try to load your competitor. This tends to demoralize trade and is apt to cheapen the goods, but it is a point entirely lost sight of by over zealous salesmen.

By doing too much yourself you are too busy to be glad to see your customers, and nothing will queer you sooner than a reputation for being grouchy. This is not an excuse for laziness, for a business man should and must be busy all the time.

J. N. NanKervis' Address.

J. N. Nankervis, Moscow, Idaho, read an interesting and suggestive paper entitled, "What Have You In Your Safe?" from which we make the following extracts:

I presume that fully 95 per cent. of those present here have closed their books for the year 1907, and what have you in your safe to show for your past year's work? I have since we have been meeting here met a great number of merchants, and I regret to state there is not one but has told me he has been satisfied with the amount of business done, but dissatisfied with the results. There are evils in all businesses, I presume, but I know there are evils in the Implement business.

One of the Greatest Evils

we have to contend with is the evil of doing business without considering about satisfactory results. We start in the spring of the year with hope; we anticipate a nice business, and we hope we will have results, but the latter part we do not consider. We go on and the further we go through the year the more anxious we are to do business, without getting down to the vital point of ascertaining whether it will be satisfactory to us or not. When the close of the year comes around it has not been and has not showed profit enough to justify the amount of capital invested or the amount of labor and worry invested in that year.

Percentage Instead of Dollars and Cents.

Another evil we have to contend with is the folly of the Implement dealer considering his profit upon the articles he is selling in dollars and cents instead of on a percentage basis. You do not pick up a Hand Saw and say I will sell that for $1 or $1.50; you do not pick up an Axe and say I will sell that for $1 or $1.75 or $2; you do not pick up a Horse Collar and say I will sell that for $4. You find out the cost, plus your expense, plus a reasonable profit, figure out your freight and so forth. Now that is one of the things that should be eliminated. We do not go down to the bottom; we try to imagine what the results will be, and the consequence is that we fail to see what the profits really are.

We carry too long our supposed profits—our supposed assets—and we have a great lot of assets that, while we are carrying them as assets, they are really liabilities. You may have a note in your safe and you may take a team and send a man out to collect it. There may be a profit of $4 in it, but the profit is entirely eliminated by one livery hire if your collector fails to get it. When a note is two or two and a half years old don't consider it at all; cut it out entirely. Let such notes show up as profit if they are paid. When you have accumulated a lot of old stock don't consider that as you do your new stock; cut it in two; then get right down to what is profit; that's the only successful way; and if you do you will find then you will be making some money and your business will be satisfactory.

Go home and get a big, long lead pencil and a sheet of paper; don't take anybody into your confidence, or any one's word, but get out that ledger of yours, and get out your bills payable book and your note pouch and go over them carefully. Be honest with yourself; care nothing for the world or for anybody, but just figure up in your own mind where you stand.

Other People's Money.

E. M. Brannich, manager of the Studebaker Brothers Mfg. Company's Northwest branch, addressed the convention on the subject of "Other People's Money." We give the following extract from Mr. Brannich's remarks:

There is no class of creditors to-day who can get more credit in proportion to their ability to pay, or in proportion to their means, than the farmers. In fact, many of them are trusted too much for their own good. I myself know of instances where farmers, whose whole worldly possessions consisted of an old broken down Sulky Plow, a Harrow and three or four horses, have been trusted as high as $2500, for farm machinery. In fact, I have known some of them to be trusted as high as $4000, for a threshing outfit, when they did not have money enough to pay the freight. The result was they had to use other people's money. If the crop failed in the particular neighborhood where the threshing outfit was sold, the chances are the manufacturer had to carry that debt over and finally make a loss.

My advice to you is to follow up your collections close, and do not let the other fellow use your money. Do not allow him to stand you off when he sells his wheat and invest the money in another quarter section of land, or put it in some speculation whereby you furnish him the funds.

At the annual meeting of the stockholders of the Simeon L. & George H. Rogers Company, Hartford, Conn., manufacturer of Silver Plated Ware, Charles P. Cooley retired from the office of treasurer on account of ill health. The stockholders and directors elected the following board of officers; President and treasurer, George M. Hallenbeck; vice-president, Edgar F. Waterman; clerk, Harry L. Cram; secretary and assistant treasurer, R. E. Sage; directors, George M. Hallenbeck, Wallingford, Conn.; Harry C. Ney, Farmington, Conn.; P. Henry Woodward, Charles P. Cooley, Edgar F. Waterman, Thomas W. Russell and Charles B. Whiting, all of Hartford.

The Rock Island Hardware Company, Rock Island, Ill., is preparing to move from its present quarters into an adjoining building, which will afford double its present floor space. The company is now under the management of L. Schricker, who is giving special attention to the jobbing trade. Several lines are being added which have not heretofore been carried.

NATIONAL BOARD OF TRADE OPPOSES PARCEL POST AND FAVORS PENNY POSTAGE.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., January 28, 1908.

ONLY the somewhat peculiar parliamentary rule adopted by the National Board of Trade, which requires a two-thirds vote to carry a proposition, prevented the passage of a resolution giving sweeping condemnation to the parcel post projects of the Post Office Department at the board's annual convention, held in this city during the past week. The vote against "any legislation looking to the establishment of a parcel carrying system in connection with the Post Office Department" was 38 to 22, from which it will be seen that a change of two votes in the total of 60 would have carried the resolution, notwithstanding the extraordinary two-thirds rule. The discussion of the parcel post question occupied the board nearly an entire day and brought out some exceedingly interesting comments and criticisms of the Post Office Department's campaign.

A Flood of Resolutions.

No less than nine resolutions relating to the parcel post question, presented by the subordinate bodies included in the membership of the National Board of Trade, were referred to the Postal Committee on the first day of the convention. The Philadelphia Board of Trade indorsed the rural parcel post project, and the plan for reducing the rate on merchandise from 16 to 12 cents, at the same time increasing the weight limit from 4 to 11 lb. The Scranton, Pa., Board of Trade declared its opposition "to any further extension of the postal service in the direction of what is termed parcel post until after 1-cent letter postage shall have been obtained, believing such extension would so increase the postal deficit as to make 1-cent letter postage forever impossible." The Baltimore Board of Trade indorses the Postmaster-General's entire programme in a resolution declaring that the cheap rural rate "is now in practice in 17 foreign countries without discrimination against cities."

The Cleveland Chamber of Commerce and the Nashville Board of Trade presented identical resolutions against the parcel post, declaring that "circumstances in this country in regard to social conditions, length of haul, density of population, lack of monopoly of carriage, improbability of the establishment of a zone system, &c., render an extensive development here of a parcel post carrying system, such as exists in several foreign countries, certain to entail a loss upon the Government of most serious proportions, amounting to scores of millions of dollars for equipment expense and further involving an operating deficit of enormous proportions annually, and this whether the rate be made high or low."

National Hardware Association's Protest.

The National Hardware Association, represented at the convention by T. James Fernley, secretary, presented its protest in the following terse language:

Whereas, The Postmaster-General has announced that he proposes to recommend a parcel post system to Congress;

Resolved, That in the name of the wholesale and retail trade of the country we protest against any character of parcel post

The New York Produce Exchange advocated the Postmaster-General's projects, but the Pittsburgh Chamber of Commerce opposed any reduction except that involved in the compromise proposition providing for the consolidation of third and fourth-class mail matter at the rate of 1 cent for two ounces. The Italian Chamber of Commerce, which for some occult reason holds membership in the National Board of Trade, presented a resolution recommending the Postmaster General's entire programme to the favorable consideration of Congress, declaring that it would undoubtedly "benefit the commercial interests of the people of the United States by giving them a well regulated, quick and cheap service." It is possible that this resolution was intended as a delicate compliment to the Postmaster-General, who formerly served as United States Minister to Rome.

One-Cent Letter Postage

was strongly advocated in a resolution submitted by the National Hardware Association, and was also urged by the Boston Associated Board of Trade, the Boston Merchants' Association, the Cleveland Chamber of Commerce, the Nashville Board of Trade, the Philadelphia Trades League and the Scranton Board of Trade. The penny postage proposition was therefore put forward, not only by those organizations opposed to parcel post, but also by several which favor the Postmaster-General's plans. It goes without saying that the establishment of a parcel post would defer the adoption of penny postage for many years to come, and it is quite possible that had the two propositions been submitted as alternatives several of the organizations advocating the Postmaster-General's programme would have elected to push 1-cent postage rather than parcel post.

The Majority Report.

In order that neither side should have cause for complaint the Committee on Postal Affairs, consisting of nine members, was selected as evenly as possible from among the advocates and opponents of the parcel post project. Its sessions were exceedingly animated, and its members, finding themselves unable to agree, finally submitted two reports, one signed by the majority of five and the other by the minority of four members. The majority report, which embraced an unequivocal rejection of the Postmaster-General's programme, was as follows:

Whereas, Various bills have been introduced into Congress looking to the establishment of a parcel carrying system in connection with our postal service; and

Whereas, The Postmaster-General, influenced doubtless by his life abroad in the diplomatic service, where all conditions are different, has made recommendations in this direction; and

Whereas, The National Board of Trade believes that any bill of this sort would prove harmful to most business interests, large and small, all over the country, and furthermore, that even a conservative bill would prove but an entering wedge to further legislation less conservative in nature and more harmful in operation; therefore be it

Resolved, That the National Board of Trade is opposed to any legislation looking to the establishment of a parcel carrying system in connection with the Post Office Department at this time.

Against Parcel Post

Nearly three hours were spent in discussing this report and the one presented by the minority of the committee. The first vote taken was on the majority report opposing the parcel post, and a call of the roll showed 38 in its favor and 22 against it. Although a large majority of the members present were thus recorded against a parcel post, the vote fell slightly short of two-thirds, and the report was therefore declared "not adopted." The minority report was then taken up for consideration, although it was apparent that it could not be adopted. After some debate the representative of the Philadelphia Board of Trade submitted the following resolution as a compromise:

Resolved, That the National Board of Trade has heard with interest and approval the views of the Postmaster-General looking to an extension of the work of his department, and that it specifically recommends the creation of a parcel post in connection with the rural free delivery at the rate of 5 cents for the first pound and 2 cents for each additional pound, with limitation of weight not to exceed 11 lb.

This resolution was recognized as merely a part of the Postmaster-General's parcel post plans, and but 26 votes in its favor could be mustered. It therefore failed, and the board proceeded to the consideration of other matters.

Notwithstanding the failure of the opponents of a parcel post to secure a two-thirds vote against it, they scored a clean cut victory on the question of penny postage. The resolution presented by the National Hardware Association urging "all trade bodies to co-operate with us in an effort to have a 1-cent letter postage measure adopted," was put through by such an overwhelming *viva voce* vote that a formal roll call was not demanded.

Summing Up the Results

of the discussion of postal affairs, therefore, it appears that the board adopted a penny postage resolution by a practically unanimous vote, and by a vote of 38 to 22 entered a strong protest against the entire parcel post programme of the Post Office Department. Inasmuch as the National Board of Trade at its annual conventions in

the past has almost uniformly favored a domestic parcel post, the action taken at its last meeting is certainly highly significant. The fact should also be borne in mind that the board is made up of commercial bodies representing the large cities, which, of course, do not reflect the sentiment of the rural communities or the views of the small retail merchants of the country.

Half a Century of Rope Making.

UNDER the above title, A. Leschen & Sons Rope Company, St. Louis, Mo., is issuing an attractive catalogue relating to Wire Rope, Wire Rope Fastenings, Sheaves and Pulley Blocks. The book is prefaced with a historical sketch of the company. The business was founded in St. Louis in 1857 by A. Leschen, who in a small way began the manufacture of Hemp or Fiber Rope. The company later began the manufacture of Wire Rope, and to-day its St. Louis plant covers an area of 33 acres. Four branch houses and 28 agencies are now distributing its product. In its progressive growth of half a century there have been but few administrative or other changes in the company. In 1872 Henry Leschen, now president of the corporation, became a partner with his father under the firm name of A. Leschen & Son, and five years later when John A. Leschen, now vice-president, entered the concern, the name was changed to A. Leschen & Sons. The company was incorporated under its present title in 1886. The catalogue contains much valuable information relative to the treatment and adaptability of various forms of Wire Rope to special kinds of service. Numerous illustrations showing the arrangement of strands are supplied, which give a clear idea of Rope construction. There is also an interesting chapter on splices, in which specific directions are furnished for making long running splices that will smoothly join the ends without weakening the rope.

Screen Doors and Window Screens.

THE CONTINENTAL COMPANY, Detroit, Mich., advises us that the business on its books thus far exceeds that of the season of 1906. The different plants are running to their full capacity and 1908, it is expected, will prove a banner year in the sale of medium cost Adjustable Screens and Screen Doors. The company makes a specialty of shipping Screen Doors and Window Screens in collective distribution cars. Merchants can thus take advantage of a considerable saving in freight by purchasing their supply of Screen Doors, Window Screens and Window Screen Frames to be delivered in the company's distribution cars. In order that goods may be shipped in this manner, it is necessary that orders be placed through Hardware jobbers at as early a date as possible and specifications must be in the hands of the various factories represented by the company by February 15 to insure prompt delivery of the goods when wanted.

Catalogue of Stewart Iron Works Company.

THE STEWART IRON WORKS COMPANY, Cincinnati, Ohio, has issued its new catalogue, No. 36-A. It is a book of 120 pages, about 10 x 14 in. in size, and is attractively arranged and printed in two colors, meriting the title of decorative catalogue given it by the company. It shows many designs of Fence and Gates, Lawn and Drinking Fountains, Reservoir Vases, Settees, Tree Guards, Hitching Posts, Window Guards, Stable Fittings, Office and Balcony Railings, &c.

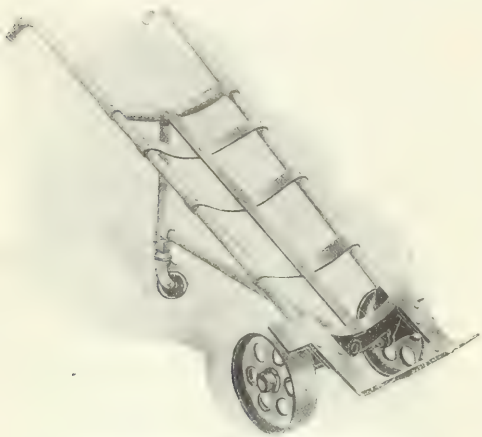
THE J. STEVENS ARMS & TOOL COMPANY, Chicopee Falls, Mass., has prepared a number of attractive full page and half page, magazine size, mortised half-tone electrotypes, featuring hunting scenes. The full page electrotypes are 8 x 5½ in. in size, and the half page, 4 x 5½ in. These plates are intended for use on coated paper only and make a striking showing in illustrating a circular booklet. The mortised space allows room for the advertisement of any merchant who avails himself of these eletrotypes. Provided the Hardware or Sporting Goods merchant will pay transportation charges the company will be glad to send gratis one of these electrotypes to any address.

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Ajax Hand Truck.

The Ajax Foundry & Machine Company, 136 Liberty street, New York, has recently put on the market the Ajax hand truck herewith illustrated. As shown there is a third swivel wheel which sustains the load, removes all weight from the operator's arms and necessitates only a push or pull and guidance of truck. Should progress be prevented by an obstruction the load is at rest until the right of way is clear, and no energy is wasted in sustaining the load. These advantages are obtained without sacrificing any possessed by standard trucks. The truck is made entirely of metal, the yoke, axle, piping and lip being of steel and the cross arm of malleable iron. It is strong, durable, light in weight and of large capacity. The axle turns in the bearings of the yoke, also the wheels upon the axle, which reduces friction to a minimum. The truck can be easily moved forward and backward, also turned around, even while supporting a heavy load. The handles are of such shape and size as to enable the workman to secure a good grip and without danger of the hands slipping. The truck is of a design that



Ajax Hand Truck with Third Wheel Attachment.

permits of making a wide range of sizes and styles. The illustration shows a truck 72 in. long from angle in lip to end of handles; yoke 22 in. wide, including wheel guards, and upper bar 20 in. wide, being about as large as will be regularly made, the sizes running from 72 in. to 48 in. The two large wheels are held on the axle with a collar, affording them good support on both sides. A pin extends through collar and axle. There is nothing extending beyond the rim of the wheels to hit obstructions in passing. The swivel wheel or caster is exceedingly strong, usually 4 in. in diameter by 2½ in. face, and works well even where the surface is uneven. The third wheel fixture complete with clamps is furnished separate, to be affixed to the axle and cross arm of other trucks, old or new, which can be easily and quickly accomplished at trifling cost.

THE ZEPHYR VENTILATOR MFG. COMPANY, INC., Philadelphia, Pa., whose plant is located at Wayne Junction, has completed arrangements for a more rapid production of its patented Zephyr ventilator which was described in these columns some time since, and is now in position to produce 250 ventilators a day. The ventilators are made of heavy cold rolled sheet steel, practically all of the work, except the assembling, being done mechanically. The shearing, punching and pressing is done in a department particularly fitted for that class of work, six heavy machines of different sizes and types being used. Ten operations are required to bring the ventilator up to the point at which the electro plating, which consists of a heavy plating of copper, finished in antique bronze, is done. In the assembling department they are fitted with copper dust-proof screens, tested and packed for shipment. These ventilators are made entirely of metal and the construction work is all completed before the copper plating is done, so that there is no possibility, the company states, of rusting. An automatic drain at the bottom of the ventilator carries off any rain, sleet or snow which may get through the outside screen and makes the ventilator practically self-cleaning. These ventilators are now made in three standard sizes: No. 1, for windows 26 to 32 in. wide; No. 2, for windows 32 to 38 in. wide, and No. 3, for windows 38 to 44 in. wide. For larger windows special sizes are made, while for factory buildings the larger ventilators are made from galvanized iron.

Regal Flue Stop.

The Regal flue stop, here shown, is the product of the Roseland Can & Specialty Company, Rockford, Ill. Its feature is that it is fitted with a fastening, which the company styles neverslip, made of flat spring wire. The fastenings are easily slipped in place, one across the

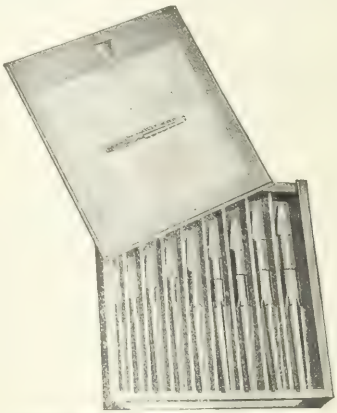


Regal Flue Stop.

other, as shown in the illustration, and make a rigid combination. The Stops are lacquered in brass effect, having center medallions of assorted colors and subjects. They are packed in small boxes measuring 8¼ x 1½ in.

Diamond Bit Stock Reamer Sets in Cases.

The Whitman & Barnes Mfg. Company, Chicago, Ill., and New York, has recently adopted a special form of packing for its Diamond bit stock taper reamers in sets, one set of nine being here illustrated. The boxes in which these reamers are packed are of wood, dovetailed at corners, and have slide covers, the grooved or rounded bottom compartments holding one reamer each of the



Diamond Bit Stock Taper Reamers in Sets.

No. 50 set, ¼, 5-16, ⅜, 7-16, ½, 9-16, ⅝, 11-16 and ¾. Set No. 50 A, similarly made but smaller, holds one reamer each of ¼, 5-16, ⅜, 7-16 and ½ in. diameters, the outer dimensions of each in the order named being 7¾ x 8 x 1½ in., and for the smaller set 7 x 3½ x 1¼ in. The purpose of this arrangement is to provide a neat package for the merchant's shelves and a serviceable case in which the mechanic or user of the tools may keep them conveniently clean and free from dust. The sets are listed respectively $6.80 and $2.85 each, subject to trade discounts.

Wickless Hand Gas Lamp.

The Bridgeport Brass Company, Bridgeport, Conn., and 253 Broadway, New York, whose exclusive export agents are the North American Copper Company, 121 White street, New York, has just put out a new form of hand gas lamp for burning gasoline, here shown reduced size. It requires no chimney, there is said to be no smoke, smell, dirt or danger, and it is recommended by the company as both durable and inexpensive. The lamp has six small vapor jets, and when lighted is a practical hand gas lamp. It gives a clear light, has no wick, is not

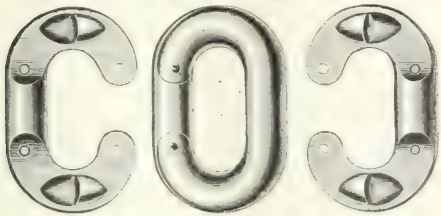


Wickless Hand Gas Lamp for Gasoline

liable to get out of order, and is always ready for instant use. The outside of the lamp does not sweat or get greasy, gas is generated by merely holding a lighted match or taper under the burner, and there is no gas except when the flame vaporizes the liquid as it burns; the light being extinguished in the same way as with any ordinary lamp. The lamp is made entirely of brass, is well finished and packed six in a pasteboard box, a gross to the case. It is especially adapted for export trade, although serviceable anywhere.

The Missing Link.

The Thomas Laughlin Company, Portland, Maine, maker of an extensive line of ship chandlery and marine



The Missing Link

hardware, is offering the chain repair Link, here illustrated. This style of link, made of malleable iron, has been on the market for many years, but the company has lately improved it by making it drop forged and adding an inter-locking lug in the end of the link as shown, thereby, it is said, nearly doubling the strength. The company claims that the link is stronger than chain of the same size and conforming to it, thus making it possible to secure the full strength in a repaired chain with a minimum of delay and expense. In its price-list circular the company gives a table showing the result of government tests on drop forged and malleable links, indicating a superiority of the illustrated Links with lug attachments for which a patent has been allowed.

Kraeuter's Victor Plier No. 305.

The Victor plier, illustrated in the accompanying views, is made by Kraeuter & Co., Newark, N. J. It is 7 in. long and is made of the best steel, such as is used for good side cutting pliers. It is described as a universal

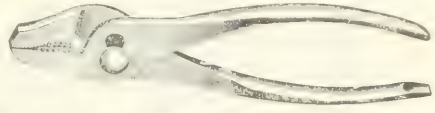


Fig. 1.—Victor Plier, Showing Wire Cutter on Handle Side of Fulcrum.

plier, the upper jaw being built on such lines that it will push anything its entire length or width to the straight jaw, thus giving an unusually strong hold. In taking hold of any taper, three square or parallel, it will adjust itself, and the flat side always lays itself to the straight jaw. It will take in a pipe from ⅜ to 1¼ in. in diameter, and in applying it to pipe the harder the press or

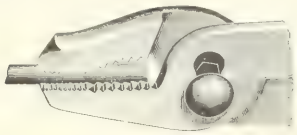


Fig. 2.—Victor Plier Taking a Rod

pull the deeper the plier bites. The claim is made that owing to the position of the teeth the plier will not slip. The wire cutter is removed from the jaw and put on the handle side of the fulcrum (Fig. 1), thus giving increased leverage and making it possible to take hold, with the jaws, of a piece ⅜ in. closer to the fulcrum. The lower part of the straight jaw has a V groove for holding

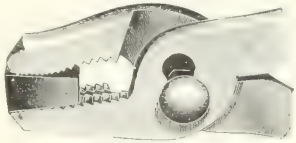


Fig. 3.—Victor Plier Taking a Taper

wire and rods, Fig. 2. The manufacturers state that it will do all the work of a parallel plier and will take all tapers, as shown in Fig. 3, which a parallel plier will not. It is especially recommended for plumbers and steam fitters, as well as all other mechanics. The plier is offered nickel plated or black.

Vaughan & Bushnell Mfg. Company.

Referring to its new catalogue issued, the Vaughan & Bushnell Mfg. Company, Chicago, Ill., calls attention to the fact that it has discontinued making certain lines of partially nickel plated hammers. It also announces that list prices on nickel plated plain face and bell face nail hammers are changed from those given in its 1905 catalogue, these lines being now full nickel plated all over. In ordering reference should be made to the new hammer catalogue and not to the former edition.

THE ANDERSON COUPLING COMPANY, Portland, Conn., is putting on the market the Anderson Turn-More wrench in a 6-in. size, and will follow it with an 8-in. wrench, making the sizes 6, 8 and 10 in. The Simplex Mfg. Company, New York, is the selling agent.

Chain Link Wire Fence.

The chain link woven wire fence, with steel posts, here illustrated, is manufactured and sold by Anchor Post Iron Works, 41 Park row, New York. It is especially designed for inclosing factory and industrial properties, reservoirs, public institutions, and the like. It is practically unclimbable; other advantages to which attention is especially called are its strength, durability,

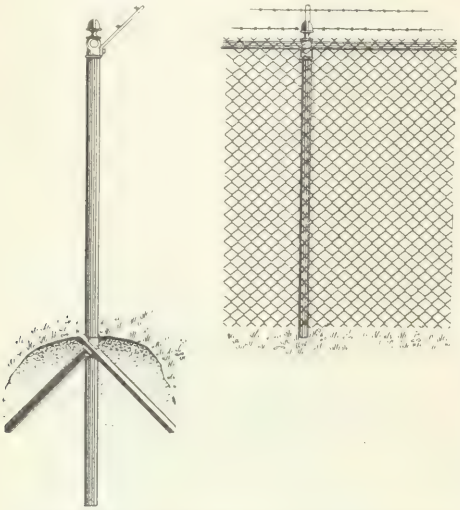


Fig. 1.—Section of Chain Link Wire Fence, with Side View of Post Showing Diagonal Arm on Top and Braces Below the Surface of the Ground.

economy of maintenance, admission of light and air and ease of erection. The posts are U-shaped bars of high carbon steel, galvanized to protect them against the elements. A diagram showing the appearance of the fence and the method of erecting and bracing the posts is given in Fig. 1. The post is driven into the ground, no digging being required, and after it is in position two blades or stakes of angle iron are driven through a socket clamped to the base of the post, thus forming an anchorage, having a considerable spread below the ground line, and securing the post against the action of frost or any strains to which the fence may be subjected. The netting is the particularly new feature of this fence, being made of No. 6 wire of small mesh, about 2 in. in size, linked or woven together as shown in Fig. 2. The successful weaving of wire as heavy as this is referred to by the manufacturer as a noteworthy achievement. The netting, which is made in widths of 6, 7 and 8 ft., is securely stapled to the post and wired to a top rail of 1-in. standard pipe 1⅜-in. outside diameter. Above this are usually placed two or more strands of barbed wire. The netting itself is sharp on top, having no selvage, as shown in the cut, making it unclimbable. Thus it is claimed to fulfill all the requirements of a factory fence.

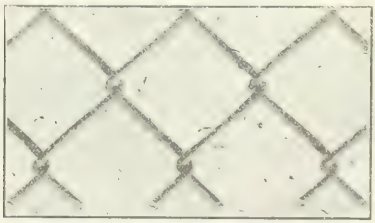


Fig. 2.—Reduced Reproduction of Chain Link Wire Netting. 2-In. Mesh, No. 6 Wire.

Easywork Mop Wringer.

The Burnham Specialty Company, Waterbury, Conn., is placing on the market the mop wringer illustrated in Fig. 1. It is made, the company explains, of the best and most durable material, all the parts except the wooden rollers being iron or steel, galvanized. Being of metal, it will not dry out or fall apart, and boiling water containing disinfectants or chemicals may be used without inconvenience or damage to operator or wringer. Pail and wringer are complete in one article, always ready for use. The bucket is square, with rounded corners, so that it is easy to keep clean. Inside the bucket is a guide which brings the mop against the stationary roller in compact form and makes the wringing effectual. The wringer is described as quick and easy of operation. The rollers are situated at either end of the pail, leaving ample room for access. When it is desired to bring them together to wring out the mop the foot is placed on the treadle, which is forced down to the brace below. When the foot is removed a spring brings the moving roller back to its original position. The treadle brace acts as a support for the bucket and keeps it from upsetting, even though the operator's entire weight be placed upon the treadle. Fig. 2 shows the operation of withdrawing the mop from the bucket. It is drawn upward between the rollers, leaving all water and dirt below the rollers and well below the surface of the bucket. The operator can wring the mop out partially or completely, as desired, by regulating the amount of pressure exerted by his foot upon the treadle.



Fig. 1.—Easywork Mop Wringer.

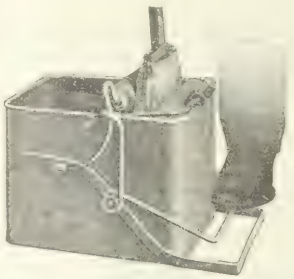


Fig. 2.—Withdrawing Mop from Wringer.

H. S. BROWN, 2788 Marion avenue, New York, has invented a tool for removing rusty or corroded pens from the holder. Most persons who work at a desk have experienced more or less difficulty in this connection, and very often the fingers are cut with the sharp edges of the pen or soiled with rust and ink, necessitating a trip to the lavatory. This clever device has handles like pliers, by closing which the pen is gripped and then drawn out by a small trigger-like lever operated by the forefinger.

Front Rank Gas Burners.

The Haynes-Langenberg Mfg. Company, 4045-4057 Forest Park boulevard, St. Louis, Mo., maker of [illegible]

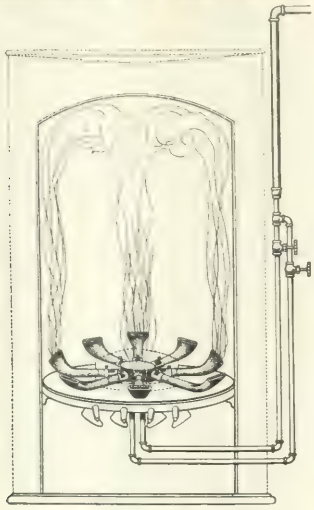


Fig. 1.—Front Rank Gas Burners.



Fig. 2.—Burner Complete.

Front Rank steel furnace is offering the natural gas burners for use in warm air furnaces herewith illustrated. In Fig. 1 the burner is shown as it appears complete in a furnace. The gas supply pipes pass through the ash pit door and connect with the central receiver, which is placed on top of the grate. The central receiver is inclosed in a housing, Fig. 2, through which the arms pass to the sides of the furnace. In Fig. 3 the interior of the central receiver is illustrated, showing the curved partition dividing the receiver into two chambers supplying alternate arms. In mild weather only one supply need be turned on, thus consuming but one-half the gas. Each

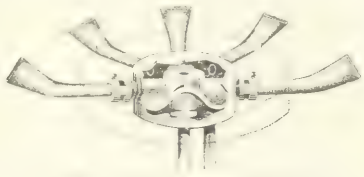


Fig. 3.—Interior of Central Receiver.

arm of the burner has a separate mixer, and each mixer is connected to the central receiver, and is entirely within the housing, causing the air and gas to be heated to the same temperature before passing out through the arms.

New Revolver Bullet No. 360302.

The Ideal Mfg. Company, New Haven, Conn., is offering the bullet here illustrated for short range for use in the Colt's New Army and Smith & Wesson's Military



[illegible] No. 360302.

revolvers. The bullets are very accurate, with 2½ grains of Du Pont's Bull's-Eye smokeless powder. It is claimed that this shape of bullet cuts a large clean hole in the target, thus insuring the marksman his full count.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₩ gal.
Linseed, [illegible]	
Raw	.41 @44
Cotton, Raw	.[illegible]
Cod, Raw	.44 @46
Raw [illegible]	.[illegible]
Lard, Extra Prime, Winter	.[illegible]
Extra No. [illegible]	.[illegible]
No. [illegible]	.[illegible]
Cotton-seed, Crude, f.o.b. mill	.32 @[illegible]
Summer Yellow	.[illegible]
Summer White	.[illegible]
Yellow, Winter	.[illegible]
Sperm, Crude	.[illegible]
Natural White	.[illegible]
Bleached White	.[illegible]
Bleached Winter, Extra	.[illegible]
Menhaden, Brown, Strained	.41 @42
[illegible] Strained	.[illegible]
Northern	.[illegible]
Southern	.[illegible]
Cocoanut, Ceylon	.[illegible]
Ceylon	.[illegible]
Cod, Domestic, Prime	.42 @44
Newfoundland	.[illegible]
Raw Elain	.[illegible]
Saponified	.[illegible]
Olein, Yellow	.[illegible]
Neatsfoot, Pure	.[illegible]
Palm, Lagos	.[illegible]

Mineral Oils—

Black [illegible]	.11 [illegible]
[illegible]	.[illegible]
[illegible]	.[illegible]
[illegible]	.[illegible]
Cylinder, [illegible]	.[illegible]
[illegible]	.[illegible]
Paraffine, [illegible]	.[illegible]
[illegible]	.[illegible]
[illegible]	.[illegible]
Red	.13½@14

Miscellaneous—

Barytes:	
White, Foreign	₩ ton $[illegible] @[illegible]
Mined, Bleached	ton [illegible] @[illegible]
Off color	₩ ton 13.00@16.50
Chalk, [illegible]	.[illegible]
Chalk, Cut, Imp. [illegible]	.[illegible]
Crown Cut, Imp. [illegible]	.[illegible]
China Clay	.[illegible]
Whiting, Commercial	₩ 100 lb .42@ .52
Gold [illegible]	.[illegible]
Ex. Gilders	₩ 10 lb [illegible] .65

Putty, Commercial—

	₩ 100 lb
In bladders	$1.70 @1.85
In [illegible] barrels	1.[illegible] @1.45
In [illegible]	[illegible] @[illegible]
In 100-lb to 50-lb [illegible]	1.50 @1.90

Spirits Turpentine—

	₩ gal.
In Oil bbls	.55 @.55
In flat tins bbls	.55 @.56

Glue—

	₩ lb
Cabinet	.12 @15
Common Bone	.[illegible]
Extra Arabic	.28 @34
Fish, liquid, 50 gal. bbls., per gal.	.[illegible]
[illegible]	.[illegible]
[illegible]	.[illegible]
Fish Skin, White	.[illegible]
Fish Skin, Brown	.[illegible]
Glue, Chinese, Hide	.[illegible] @12
[illegible]	.[illegible]
[illegible]	.[illegible]
[illegible]	.[illegible]
Low Grade	.10 @12
Medium White	.14 @17

Gum Shellac—

	₩ [illegible]
[illegible]	.[illegible]
Bone Dry	.31 @32
[illegible]	.[illegible]
[illegible]	.[illegible]
[illegible]	.[illegible]
A. C. Garnet	.30 @31
[illegible]	.[illegible]
[illegible]	.[illegible]
D. C.	.49 @50
Orange	.[illegible]
[illegible]	.[illegible]

Colors in Oil—

	₩ [illegible]
Black, Lamp [illegible]	.12 @14
Black, [illegible]	.[illegible]
Black, [illegible]	.[illegible] @[illegible]
Black, [illegible]	.[illegible]
Black, [illegible]	.[illegible]
Green, [illegible]	.12 @16
Green, Paris	.[illegible] @24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.—

	₩ lb
Lead, English white, in Oil	.10½@10⅝
Lead, American White:	
Lots of 500 lb or over, in Oil	.@ 6¾
[illegible]	.[illegible]
Lead, White, in oil, 25 lb tin [illegible]	.[illegible]
Lead, White, in oil, [illegible] lb [illegible]	.[illegible]
[illegible]	.[illegible]
Lead, White, in oil, 1 to 5 lb [illegible]	.[illegible]
Lead, Red	.[illegible]
Lead, American. Terms: On lots of 500 lbs. and over 2 per cent. for cash if paid in 10 days	.[illegible]
[illegible]	.[illegible]
[illegible]	.[illegible]
Zinc, American	.[illegible]
Zinc, French:	
[illegible]	.[illegible]
[illegible]	.[illegible]
[illegible]	.[illegible]
Zinc, [illegible]	.[illegible]
Green Seal	.[illegible]
[illegible]	.[illegible]
Zinc, [illegible]	.[illegible]
Red Seal	.[illegible]
[illegible]	.[illegible]
[illegible]	.[illegible]
[illegible]	.[illegible]
[illegible]	.[illegible]

to buyers of 10 bbl. lots of one or mixed [illegible]

Dry Colors

	₩ [illegible]
Black, Drop, English	.5 @15
Black, Ivory	.16 @20
Lamp, Commercial	.[illegible] @[illegible]
Black, [illegible]	.[illegible] @[illegible]
Blue, Chinese	.31 @33
Blue, [illegible]	.[illegible]
Blue, [illegible]	.[illegible]
Brown, Sienna	.[illegible]
Carmine, [illegible]	.[illegible]
Cobalt, Chemical	.[illegible]
Green, Chrome, pure	.17 @25
[illegible]	.[illegible]
[illegible]	.[illegible]
Orange, [illegible]	.[illegible]
[illegible]	.[illegible]
[illegible]	.[illegible]

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓ &
Norris 10%
Zimmerman—See Fasteners, Blind

Window Stop—

Ives' Patent 35%
Tubin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—

Fernald Mfg. Co Burton Anti-Rattlers, ₱ doz. pairs, Nos. 1, 2, 3, 4, $1.00, 5, $0.53.....
Fernald Quick Shifter, ₱ doz. pairs .....$2.00@3.00

Anvils—American—

Eagle Anvils .....₱ lb @8½¢
Hay-Bidden. Wrought.....9½@9¾¢
Trenton .....₱ lb 9½@9¾¢

Imported—

Peter Wright & Sons, ₱ lb., 84 to 349 lb. 11¢, 350 to 699 lb. 11½¢.

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....10%

Augers and Bits—

Cook Double Spur.....75@80%
Jennings' Pat., Bright.....65&10@70%
Black Lip or Bland.....65@65&5
Boring Mach. Augers.....70%
Car Bits, Ram. Taper.....40&10%
Ford's Ratchet Bits.....40&5%
Ft. Washington Auger Co., Conard's 35%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list.....25&10%
No. 50 R. Jennings' list.....50%
Ituscan Stellite .....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Pugh's Jennings' Pattern.....70%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12 in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's Pattern, No. 1, ₱ doz. $26; No. 2, $18 .....40&10%
Ford's, Clark's Pattern.....66⅔&5%
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $36.00 .....60&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut.....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz. .$6.50@7.00
Ames .....25&10%
Universal 20%

Ship Augers and Bits—

Ship Augers.....40&10%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' .....33⅓&7½%
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled.....gro. $2.75@3.00
Unhdled, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. $1@3½¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles—*Iron or Steel*

Concord, Loose Collar...4½@5 C
Concord, Solid Collar...4½@5½ C
No. 1 Common, Loose...3¾@4½ C
No. 1½ Com., Neat Style...4@5 C
No. 2 Solid Collar.....4½@5 C
Half Patent:
Nos. 7, 8, 11 and 12...65@65&10%
Nos. 1½ to 4½.....65@65&10%
Nos. 5 to 6.....70@70&10%
Nos. 13 to 22.....70@70&10%

Boxes, Axle—

Common and Concord, not turned lb., 5½@6¢
Common and Concord, turned. lb., 6@7¢
Half Patent.....lb., 9½@10¢

Bait—Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Connitior Bait.....20&5%

Balances—Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chattillon's:
Light Spg. Balances.....50@50&10%
Straight Balances.....40@40&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb. per lb., —@2½@2¾¢

Trowel—

No 10 Ideal, Nickel Plate..₱ gro. $8.50

Beams, Scale—

Scale Beams.....40%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₱ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ₱ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned.....₱ doz. $1.50

Beaters, Egg—

Holt-Lyon Co.:
Bolt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.....
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 125 Tin'd .....$8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.50

Bellows—

Blacksmith, Standard List..
Split Leather.....60&10@67½%
Grain Leather.....50@50&10%

Hand—

Inch	6	7	8	9	10
Doz.	$5.50	6.00	6.50	7.50	

Net Prices

Molders—

Inch	10	12	14	16
Doz.	$7.50	9.00	12.00	15.00

Bells—Cow—

Ordinary Goods...75&5@75&10&5%
High grade.....70&10@75%
Jerseys .....75&10%
Texas Star.....50%

Door—

Home, R & F Mfg. Co's .....55&10%

Hand—

Polished, Brass.....70&10@70&10%
White Metal.....70&10@70&10%
Nickel Plated.....70&10@70&10%
Sarjeant 60%
Slack's Globe Hand Bells .....33⅓&35%

Miscellaneous—

Farm Bells.....lb., 2¼@2½¢
Church and School.....6½@6¾¢

Belting—Leather—

Extra Heavy, Short Lap..60@65%
Regular Short Lap....60@10@65%
Standard .....70@5%
Light Standard.....
Cut Leather Lacing.....40@10%
Leather Lacing Sides, per sq. ft. 2½¢

Rubber—

Agricultural (Low Grade).....
70@70&5%
Common Standard....70@70&10%
Standard .....70@70&5
Extra .....60@60&10@10%
High Grade.....50@50@50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Spokes 50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden.....75%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.....
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....40%
Embossed 50%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓&5%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):
¾ and smaller .....70&5%
Larger and longer .....65&5
Phila. Eagle, $3.00 list...80@—%
Bolt Ends.....65&5@—%
Machine (cut Thread):
¾ and smaller .....70&5%
Larger and longer.....65&5%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

Inch	3	4	5	6	8
Per doz	$0.80	.85	.75	.90	.95

Cast Iron Spring Foot, Jap'd:

Inch	7	8	10
Per doz.	$1.20	1.75	2.25

Cast Iron Chain, Flat, Japanned:

Inch	6	8	10
Per doz	$1.00	1.40	1.65

Cast Iron Flat Shutter, Jap'd., Brass Knobs:

Inch	6	8	10
Per doz	$1.25	.95	1.25

Wrought Barrel Japd..80@80&10%
Barrel Bronzed.....60@10%
Spring .....70@70@70&10@10%
Shutter .....50@70@70&10@5%
Square Neck .....75@75&10%
Square .....70@70&10%
Ives' Patent Door.....55%
Ives' Wrought Metal 45%

Expansion—

Reliable Mfg. Co .....50&10%
Steward & Romaine Mfg. Co.:
Style No. 1, Double.....
Style No. 2, Single.....55%
Style No. 100 DH, Jam, Single.....50%
Lag Screw 60%

Plow and Stove—

Plow .....65@65@—%
Stove .....85@85@85&5%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec, 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84 ... 80%
Eagle 82½
Shelton Co.:
Tiger Brand, list Dec. 28, '99.....80%
Phila., Eagle, list Oct, 16,1884..82½%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch	1¼	1½	1¾	2
Per doz	$7.80	5.60	6.40	8.00
Inch	2	2¼		
Per doz	$8.65	11.50		

Entertprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes. Mitre—

C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 20&10%, Langdon Acme .....15&10%
Perfection 10%
Seavey 45%

Braces—

Common Ball, American....$1.50
Barber s .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 125, 207 to 411 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat..60&10%

Brackets—

Wrought Steel....70&10@75&10%
Bradley Metal Clasp..80&10@80&10&5%
Griffin & Pressed Steel.....75@75&10%
Taplin Victor Handy Egg Beater Bracket .....₱ doz $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Wire Goods Co.....75%..

Buckets, Galvanized—

M'f'gr's list, price per gross.

	Quart.	*10*	*14*	
Water, Reg	$5.35	28.00	32.00	10&5%
Water, Heavy	7.25	38.00	42.00	
Fire, Rd. Bott.	30.00	31.65	38.65	
Well	37.35	41.35	45.35	

Bull Rings—See *Rings, Bull*

Butts—Brass—

Wrought, List, Oct. 26,'06.53%
Cast Brass Tip Butts 10%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—

Light Narrow, Light Pattern, Loose Joint.....70&5%
Reversible and Broad..70&5%
Loose Joint, Narrow, Light Inside Bind, &c.....70&5%
Back Flaps, Table Chest, &c. Japanned 65%
Light Narrow, Loose Pin .....70&5%
Light Narrow, Ball Tip..60%
Broad .....70&5%
Steeple Tipped.....70%
Ball Tipped.....70%

10&5% List Prices

Cages, Bird—

Hendryx Brass: Series 3000 5000, 1120, net list; 1200 15" ; 200 300, 900 ... 40
Hendryx Brass, Series ... 40
Hendryx Enameled ... 40

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb. ... 4½c
Sharp, 1 prong, per lb. ... 4½c
Bar ... Bright Steel ... 4½c
Lumber Boat ... 4½c
Peraino Boat, ½ lb. 2.00 c. Small ... 4½c

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Eley's B. B. ... $2.15&5c
G. D. ... per M 4.45&2c
F. L. ... per M 4.45&2c
G. E. ... per M 2.45&5c
Musket ... per M 2.45&5c

Primers—

Berdan Primers, $2 per M. 2.00
Primer Sheets and Buttons, 15&10%
All other primers per M $1.50&1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:

32 C. F. ... 10&5%
38 C. F., $7.00 ... 10&5%
22 cal. Rim, $1.50 ... 10&5%
32 cal. Rim, $2.50 ... 10&5%
B. B. Caps, 1 lb. Box, Loaded $1.50
B. B. Shot, Round Ball ... $1.45
Central Fire ... 25%
Target and Sporting Rifle ... 10&5%
Primed Sheets and Buttons ... 15&10%
Rim Fire, Sporting ... 50%
Rim Fire, Military ... 15&5%

Casters—

Bed ... 50&10%
Parlor ... 40%
Philadelphia ... 40%
Ajax Ball Bearing ... 40&10%
Gem Ball Bearing ... 40%
Stem ... 40%
Standard Ball Bearing ... 45%
Yale Double Wheel ... 40%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:
5/16 in. 9.16
3/8 in. 6.75 4.65 4.25 4.22
7/16 in. 5.75 4.65 4.25 4.22
1/2 inch. 4.12
In cask lots, deduct 25c.
Galvanized Coil:
5/16 in. 7.50 6.50
3/8 and 7/16 in. 6.50 5.50
1/2 and 9/16 in. 5.50 5.00

Halter—

Halter Chains ... 60@60&5%
German Pattern Halter Chains, list July 24, '05 ... 60&10%
Covert Mfg. Co. ... 35&5%
Halter ...

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6/8 in., Straight, with ring ... $28.00
6/8 in., Straight, without ring ... $26.00
6/8 in., Straight, with ring ... $32.00
6/8 in., Straight, without ring ... $30.00
NOTE—Add 25 per pair for Hooks, Terret Loops, add per pair for Terret and ... 25c. No. 1 ... 25c per pair for Straight Line.
Eastern Standard Traces, Wagon Chain, &c., 60&10 off list.

Miscellaneous—

Jack Chain, list July 10, '05:
Iron ... 60&10%
Brass ... 60%
Safety and Trimmers' Chain, 60&10
Gal. Pump Chain ...
Covert Mfg. Co.
Breast, Halter, Heel, Boot, Stal ...
Ideal ...
Oneida Community:
American Halter, Dog and K ...
Chains ...
Niagara Dog Leads and K ... Chains ... 45 &5
Wire Goods Co.:
Jack Chain ...
Universal Dog Leaded Chain ... 50

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain ... 60
Pullman:
Bronze Chain, 60% ; Steel Chain ...
Sash Chain Attachments, per set ... 3c
Ammuny Sash Ribbon, per ft ... 3c
Sash Ribbon Attachments per set ... 3c

Chalk—From Jobbers:

Carpenters' Blue ... gro., 50@55c
Carpenters' Red ... 15c
Carpenters' White ... gro. ... 15c

Checks, Door—

Brubaker ... 45%
Dorman, per gro ... $4.00
Russell ... 33½%

Chests, Tool—

American Tool Chest Co.:
Boston ... T ...
Y ...
Cabinet ...
"Farmers', Carpenters', etc., Chests, with Tools ...
Mechanics and Extra ... Chests ...
Tool Cabinets ...
Tool Chests & Cases ... Mfg. Co.:
Tool Chests ...

Chisels—

Socket Framing and Firmer

Standard List ...
Buck Bros. ...
Socket Firmer No. 10 ... 25&7½%
Socket Framing ...
Socket Framing ...
L. & I. J. White Co. ... 25&5

Tanged—

Tanged Firmers ...
Buck Bros. ...
Nos. 191, 181 ... 25%
L. & I. J. White Co. ... 25&5

Cold— lb.

Cold Chisels, good quality ... 15@15c
Cold Chisels, fair quality ... 11@12c
Cold Chasels, ordinary ... 9@10c

Chucks—

Almond Drill Chucks ... 35%
Almond Turret Six Tool Chuck ... 40%
Bonney Patent ... 35%
Emlute ... 35%
Buckeye ... 35%
Jacobs' Drill Chucks ... 35%
Jacobs Pedestal Drill ... 25%
Skinner Patent Chucks:
Independent, Lathe Chucks ...
Universal, Reversible Jaws ... 35%
Combination, Reversible Jaws ... 35%
Drill Chucks, New Model ... 35%
Standard, " 45% Skinner Pat. ...
Independent Drill ...
Planer Chucks ... 20%
Independent ...
Standard Mfg. Co.:
Universal Drill Chuck ... 45
Combination, Nos. 1, 2, 3, 4, 5, 6 ...
Combination, Nos. ...
Scroll ...
Geared Scroll ...
Independent Iron, Nos. 18 and 318 ... 35%
Independent Steel, No. 64 ... 25%
Union Drill, Nos. 000, 00, 100, 101, 200 ... 35%
Union Czar Drill ... 25%
Universal, 12, 12, 16, 17, 13, 14, 15 ... 40%
Universal, No. 15 ...
Iron Face Plate Jaws, Nos. 28, 30, 38 and ... 35%
Steel Face Plate Jaws, Nos. 7 and ... 35%
Westcott Patent Chucks:
Lathe Chucks ... 50%
Little Giant Auxiliary Drill ... 50%
Little Giant Double Grip Drill ... 50%
Little Giant Drill, Improved ... 50%
Oneida Drill ... 50%
Universal Combination Lathe ...
Wolcott ...
National Drill ... 25

Clamps—

Adjustable Hammers' ...
Cabinet Makers', P. S. & W ...
Bench ...
Bench Wire ...
Mortise, H. B. & S. ... 15
Linsman's Swedish Neverturn ... 65%
Wood Screw ... 15&5
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Davis Chemical Co. ...
Jewett Chemical Co. ...

Sidewalk—

Star Socket All Steel, ₱ doz. $1.05 net
Star Shank All Steel, ₱ doz. $1.4 net
W. & K. Shank, All Steel, ₱ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Buster Bros. ...
Fayette R. Plumb ...
L. & I. J. White Co. ...

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each $15.00
Chicago Belt Horse, each $20.00
Stewart's Enclosed Gear Horse, each ... $7.75
Stewart's Patent Sheep Shearing Machine, each ... $2.75
Stewart Enclosed Gear Sheeping Machine, No. 8, each..$9.75

Clips, Axle—

Regular Styles, list July 1, '05, ...

Cloth and Netting, Wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Pump Bibbs, Globe, Kerosene, Bathing, Lawn, Burning, &c. ... 70&7 — 5
Compression Bibbs ... 60&10 — 5

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's ...
Leather Walter B. Stevens & Son's ...

Compasses, Dividers, &c.

Ordinary Grades ...
Wm. Schollhorn Co.:
Excelsior Dividers ...
Ideal Dividers ...

Conductor Pipe,—

L. C. L. Galvanized Gal. Charcoal Copper. Steel. Iron. 14, 16&20 oz.
Eastern:
Jobbing: 70&5%
Western and Southern:
So. Western:

Coolers, Water—

L. & G. Mfg. Co.:
Galvanized, ea $1.35 $2.00 $2.25 $2.90 $3.90
Galvanized, Lined, side handles, Gal. ... 2 3 4 6 8
White Enameled ... 10

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering —

See *Soldering Coppers.*

Cord— Sash—

Braided, Drab ... lb. 45c
Braided, ₱ lb., Drab Cotton, 50c; Linen, 65c; White Cotton to 12, 23c; No. 7, 23½c; No. 6, ...
Cable Laid Italian, lb., No. 18..37c
Common India ... lb., 11@11½c
Patent Russia ... lb ... 20c
Cable Laid Russia ... lb ... 21c
Braided Hemp ... lb ... 17c
Patent India, Twisted ... lb ... 17c
Eddystone, Braided, Nos. 8 to 12, ...
Hercules Cotton Braided, Nos. 7 to ... ₱ gro. ...
Pullman:
Wire Sash Cord ... 18%
Sash Cord Attachments, per doz. 10c
Braided, ₱ lb., Drab Cotton, 50c; Linen, 65c; White Cotton, Massachusetts, White... ₱ lb 40c
Massachusetts, Drab... ₱ lb 45c
Phoenix, White, Nos. 8 to 12, 27c ; Silver Lake, per lb.:
White ... Nos. 8 to 12, 27c
B. Drab, 40c; B. White, 35c ; Braided Hemp ... 27½c
See also Chain and Ribbon.

Wire, Picture—

Best Loop, 1, 1906 ... 9 to —
Hendryx Standard Wire Picture Cord, ... old list, 85&10%
Turner & Stanton Co, Wire Picture ...

Cradles—

Grain ... 40c&12½

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber ... ₱ gro.
White and Purple, Indelible....$7.50
Hotel ...
Giant Lumber, 5¼ in. x 15-16 in. ...
Ibles, $13.00; Blacks ... $10.00
Genuine Soapstone, Metal Workers', ...
Steatite ...

Crooks, Shepherds'—

Pine Mountain Hickory ...
Light ... $5.00

Crow Bars —See *Bars, Crow.*

Cultivators—

Various ... 5

Cutlery, Table—

International Silver Company:
No. 12, Meat Knives, 1847, ₱ doz. $2.50
Star, Eagle, Rogers & Hamilton ...

Cutters— Glass—

Hall ...
Heller ...
Wilson ...

Meat and Food —

Nos. ...

Saw and Kraut —

Hall's Kraut ...
Saw and Kraut Cutters ... 35%
Saw Cutters, 1 Knife ... ₱ doz $3.00
Graters ...

Tobacco—

All Iron, Cheap ...
Lorillard ...
Nos. ... No. ... 40 ...

Diggers, Post Hole, &c —

Disston's:
Iwan's Improved Post Hole Auger ... 40%
Vaughan's ...
Post Hole ...
Post Hole ... ₱ doz. ...
Split Handle Post Hole ... ₱ doz. $7.75
Hole ...
Keystone ...
Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer ... $7.50
No. 2 Post Hole Diggers ... ₱ doz. $4 ...

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Stevens Emery Wheel Dressers ... 35
Stevens Wheel Dresser Cutters ... 35

Drills and Drill Stocks—

Blacksmiths' Common Drilling ... $1.50@$1.75
Barnes ...
Bridgeport ...
Bridgeport P. S. & W. ...
Goodell Automatic Drills 50&10@60&10%
Millers Falls Automatic Drills 50&10%
Ratchet, Curtis & Curtis ... 25%
Ratchet, Parker's ... 40%
Ratchet, Weston's ... 40%
Ratchet, Westcott's, Style H Imp. ... 40%
Ratchet, No. 312 ... 45%
Ratchet, Celebrated ... 40%
Robertson ... P. S. & W. ... 30&5%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00 ... 33½%

Twist Drills—

Bit Stock ... 60&10&10@70%
Taper and Straight Shank ... 60&10&10@60&5

Drivers, Screw—

Screw Driver Bits, per doz. 45@50c
Balsey's Screw Holder and Driver, ₱ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9 ... 50%
Buck Bros.' Screw Driver Bits ... 30%
Cabinet ... 50
Enterprise ... 50
Fray's Hol. Hdle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers ... 40&10%
Gay's Double Action Ratchet ... 35%
Goodell ... 60&5&10
Hollow Handle ... 40
Mayhew's Monarch ... 40%
Millers Falls, Nos. 20 and 21 ... 25&10%
Millers Falls, Nos. 11, 12, 41, 42 ... 15&10%
Sargent & Hardware Co. Screwdriver, Ratchet, Etc., Steel ...
Swan's:
No. 7503 to 7705, 5 in., No. 7343 ... 40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized Gal. Steel.*	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
Central:			
Western and Southern:			
So. Western:			

See also Conductor Pipe and Elbows

Factory shipments, all territories:

Elbows, Stove Pipe—

Emery, Turkish ... 5½ to $6; 5½ to $20; Flour.
Flint ... 7½c 5½c 5½c
Glass ... 7½c 5½c 5½c
10 lb. cans, ... 6½c 6c 4c
Glue, Cabinet ... 8½c 7c 6c
Glue, Iron Barrel ... 10c 10c 8c
Lacquer ... 15c 15c 8c
Lime ... 1 to 3 tons at discount

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Z... 50&10
Ac... 40&10
Ch... 40
Ch... Patent 40

Cord and Weight
Ives and Tam 35

Corrugated—
Acme Corrugated Fa... 35

Faucets—
Cork Lined ..... 50&10&10
Metallic Key, Leather Lined,
..... 50&10&10
Red Cedar ..... 40&10&10&5%
Petroleum ..... 10&10&10&75%
B. & L. B. Co.:
Metal Key ..... 60&10
Star 50
West Lock ..... 50&10
John Sommer's Peerless Tin Key 40
John Sommer's Boss Tin Key 50
John Sommer's Victor Metallic Key ..... 50&5
John Sommer's Unique Metal Key 60
John Sommer's Diamond Lock 40
John Sommer's I X L Cork Lined 50
John Sommer's Rehable Cork Lined ..... 50&10
John Sommer's Chicago Cork Lined 60
John Sommer's O. K. Cork Lined 50
John Sommer's No Brand, Cedar 50
John Sommer's Perfection, Cedar 40
Sol. Measuring:
Enterprise, ₱ doz. $36.00 ..... 40&10%
Lakeside, ₱ doz. $36.00 ..... 40&10%
Saturnal Measuring, ₱ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List Nov. 1, 1899.
Best Brands ..... 70&10@75&10%
Standard Brands ..... 70&10&10%
Lower Grades ..... 75&10&10&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97 ..... $3 1-3@40%

Fixtures, Fire Door—
Alarm Underwriters' Approved 50
Inspection Mfg. Co.:
Universal No. 103, Special, No. 104 ..... $3.75
Fusible Links, No. 96 ..... 50%
Expansion Bolts, No. 107 ..... 60&10%

Grindstone—
Net Prices:

Inch	15	17	19	21
Per doz.	$3.60	$5.40	$7.20	$9.60

P., S. & W. Co. 50%
Simonds Hardware Co. 50%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig Ezy Potato ..... 60&10%
Victor, Manure ..... 60&15&5%
Victor, Manure 66⅔%
Victor, Header 66⅔%
Champion, Hay 65%
Champion, Header 65%
Champion, Manure ..... 60&15&5%
Columbia, Hay ..... 60&20%
Columbia, Manure 70%
Columbia, Spading ..... 70&12½%
Hawkeye Wood Barley 40%
W. & C. Potato Digger ..... 60&10%
Acme Hay ..... 60&20%
Acme Manure, 4 tine ..... 60&10&5%
Dakota Header ..... 60&20%
Jackson Barley ..... 60&20%
Kansas Header 65%
W. & C. Favorite Wood Barley 40%
Plated See Stoms

Frames— Wood Saw—
White, Sg't Bar, per doz. 75@80¢
Red, Sg't Bar, per doz. $1.00@1.25
Red, Dbl. Brace, per doz. $1.40@1.50

Freezers, Ice Cream—
Qt. *1* *2* *3* *4* *6*
Each *$1.25* *$1.60* *$1.90* *$2.20* *$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped .. 3.65
Waterproof Dbl Taped .. 4.40
Waterproof Tpl. Taped .. 5.15

Gates, Molasses and Oil—
Stubbins' Pattern ..... 75@80%

Gauges—
Marking, Mortise, &c. ..... 50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c. ..... 50&50&10%
Disston's Marking Mortise, &c. 67½%
Wire, Brown & Sharpe's 33⅓%
Wire, P., S. & W. Co. 33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.50
Spike, Metal, No. 1, $4.00; 2, $4.50
Nail, Wood Handled, No. 1, $2.50; 2, $2.60
Spike, Wood Handled, No. 1, $4.00; 2, $4.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co. ..... 65@65&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush..
25&10@25&10%
Daniels 40%

Grease, Axle—
Common Grade ..... *gro. $6.00@6.50*
Devoe's Everlasting, 50-lb. packages, 8¢; in boxes, ₱ doz., 1 lb. $1.20, 2 lb. $2.00
Diamond Hard Oil 25%

Griddles, Soapstone—
Pike Mfg. Co. ..... 33⅓&33⅓&10%

Grinders—
Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75, 1A, $2.50, 1B, $3.00 ..... 33⅓%
Alundum Sickle Grinders, each, Nos. 20, $5.00, 20A, $6.00, 20A Combined, $6.50 ..... 50%
Alundum Disc Grinders, each, $2.50 ..... 50%

Grindstones—
Pike Mfg. Co.
Improved Family Grindstones, ₱ inch, ₱ doz. $2.00 ..... 33⅓%
Richards Mfg. Co., Elk and Cycle Ball Bearing, mounted 40

Grips, Nipple—
Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—
Cow Ties ..... 60&65@60&10%
Covert Mfg. Co.:
Web ..... 30&2%
Jute Rope 35%
Sisal Rope 20%
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am Coil and Halters ..... 40@40&5%
Am Cow Ties ..... 45@50%
Niagara Coil Halters ..... 45@50&5%
Niagara Cow Ties ..... 45&5@50&10&5%

Hammers—
Handled Hammers—
Heller's Machinists' ..... 55&10@55&10&5%
Heller's Farriers' ..... 40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Cast Steel 50
Plated ..... 10&10&5
Racine 50
Machinists' revised list ..... 60&5
Blacksmiths' ..... 50&5
Fayette R. Plumb:
A. E. Nail ..... 40&2½@40&12½%
E. S. and B. S. Hand ..... 40&2½@40&5
Machinists' Hammers ..... 60&10&5
Riveting and Tinners' Hammers ..... 40&2½@40&5

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢ ... 80&10
3 to 5 lb., per lb., 40¢ ..... 80&10
Over 5 lb., per lb., 30¢ ..... 80&10
Over 5 lb., per lb., 30¢ ..... 80&10&10%

Handles—
Agricultural Tool Handles
Axe, Hatchet, &c. ..... *60&10@60&10&10%*
Hoe, Rake, &c. *40%*
Fork, Shovel, Spade, &c.:
Long Handles *40%*
D Handles *40%*

Cross-Cut Saw Handles—
Atkins 40%
Champion 50%
Disston 50%

Mechanics' Tool Handles—
Auger, assorted ..... *gro. $3.00@3.50*
Brad Awl ..... *gro. $1.05@1.75*
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory ..... *$2.15@2.40*
Socket Firming, Apple, $1.75@ $1.95; Hickory ..... *$1.60@1.75*
Socket Framing, Hickory, $1.60@$1.75
File, assorted ..... *gro. $1.30@$1.40*
Hammer, Hatchet, &c. 60&10&10@60&10&5%
Hand Saw, Varnished, doz. 80@85¢; Not Varnished ..... *65@75¢*
Plane Handles:
Jack, doz. 80¢; Jack, Bolted 75¢
Fore, doz. 45¢; Fore, Bolted 60¢
Chapin-Stephens Co.:
Carving Tool ..... 30&20&10%
Chisel ..... 60&10&10
File and Awl ..... 60&10&10
Saw and Plane ..... 30&20&10%
Screw Driver ..... 30&20&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 15&5%
Nicholson Simplicity File Handle ..... ₱ doz. $1.25@$1.50
W. A. Zelnicker Supply Co.:
Hammer, ₱ doz., 12 in. ..... $2.00; 14 in. $2.00, 16 in. $2.25; 18 in. $2.50; 20 in. $2.70; 22 in. $3.00; 24 in. $3.30; 26 in. $3.50; 30 in. $3.80.
Sledge, ₱ doz., oval 30 in., $2.80; octagon, 24 in., $3.80; oval 26 in., $4.00, octagon, 36 in., $4.00.
Axe, ₱ doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze, ₱ doz., 36 in., $5.80; 36 in., $7.80.
Pick, ₱ doz. R R 36 in., $8.00; cont. 34 in., $5.80.
Hatchet, ₱ doz., 12 to 14 in., $2.00

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.
Acme Mfg. Co.:
Reliable, Nos. 1 and 2 40
Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Cushion & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 33⅓%
Railroad 30%
Cronk & Carrier Mfg. Co.:
Loose Axle Chain ..... 60&10%
Roller Bearing 50%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00 ..... 60&10%
Roller Bearing, No. 11, $20.00 ..... 60&10
Roller Bearing, Ex. Hy. No. 22, $18.00 ..... 60&10%
Ball Dog, $24.00 ..... 70%
Lane Bros. Co.:
Parlor, Ball Bearing ..... $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion 50%
Barn Door Standard ..... 60&10
Hinged ..... net $6.75
Covered ..... 60&5
Special ..... 70&5
Lawrence Bros.:
Advance ..... 55&1
Clipper ..... 70&5
Chain 60
Cyclone, No. 10 ..... net $7.50
Tandem, No. 50 ..... net $5.40
New York ..... 55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2, 70%; Anti Friction 60%
Hinged Hangers, King Charm 60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 64&5%
Pioneer Wood Track, No. 3 ..... $2.25
Roller B'r'g St'l Track No. 12 ..... $2.00
Roller B'r'g St'l Track No. 13 ..... $3.50
Roller B'r'g, Nos. 39, 41, 45, 70&47½%
Hero, Adj. Track No. 19 ..... 50&10%
Adjustable Track Tandem Trolley Track No. 18 ..... 50&10%
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22 ..... 50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 20, $2.25; No. 121, $2.45; No. 150 ..... $2.50
Safety Underwriters F. D. No. 151 80
Tandem No. 41 2¼ and 3 ..... 60&10%
Place Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 122 ..... 50&10%
Ives' Wood Track No. 1 ..... $2.25
Tapley F. D. No. 21 ..... 5&10
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, No. 37, 38, 39, 41, 43, 44, Sizes 1 and 2 ..... 70&7½%
Anti friction No. 42, No. 44, sizes 2½ and 3 ..... 60%
Hinged Tandem No. 48 ..... 60&5%
Folding Door B. B. Swivel No. 135 ..... 40%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing ..... 50&15&10&5%
Myers' Stayon Hangers 60%

Hangers— Garment—
Pullman Trouser, ₱ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $10.50; Garment Hanger Loops, Round Nickeled, per gro. $7.50
Victor Folding ..... ₱ gro. $9 60

Gate—
Myers' Patent Gate Hangers, ₱ doz. net $4 50

Joist and Timber—
Lane Bros. Co. 30%

Hasps—
Griffin's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, ₱ doz. 60%

Hatchets—
Regular list, first qual. ..... *40&2½&—*
Second quality ..... *50&5&—*

Heaters, Carriage—
Clark No. 5, $1.15; No. 5B, $2.00; No. 5S, $2.35; No. 7D, $3.00; No. 8, $3.25; No. 1, $5.50 ..... 25%
Clark Coal, ₱ doz. $0.75 ..... 20%

Hinges—
Blind and Shutter Hinges
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*1½*	*2*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutter (L. & P., O. S., Acme, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00. No. 3 for Brick, $11.50 ..... 10%
Charles Parker Co. ..... 70&5%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 119, for wood, $9.00, No. 111, for brick, $9.00 ..... 20%
Reading & Gravity 60%
Stanley's Sash Gravity Blind Hinges, No. 1664½, ₱ doz. sets, without screws, $0.95; with screws, $1.25.
Wire Goods Hardware Co.:
O. S., Lull & Porter ..... 75&5%
Acme, Lull & Porter 75
Queen City Reversible 75%
Shepard's Norseass, No. 1 to 65
No. 3 ..... 75&5%
Niagara Gravity Locking, No. 1, 3 & 5 ..... 75&5%
Tip Patent, No. 1 ..... 75&10%
No. 3 ..... 75&5%
Buffalo Gravity Locking, No. 1, 3 & 5 ..... 75&10&5%
Shepard's Double Locking 75
Champion Gravity Locking ..... 75&5%
Pioneer ..... 75&10
Empire 65
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L'Tchs.	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.85*

New England:
With Latch ..... doz. ...@$2.00
Without Latch ..... doz. ...@$1.60
Reversible Self-Closing:
With Latch ..... doz. ...@$1.75
Without Latch ..... doz. ...@$1.35
Western:
With Latch ..... doz. $1.75
Without Latch ..... doz. $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 ..... 70%

Pivot Hinges—
Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—
Holdback, Cast Iron ..... *$6.75@$7.00*
Non-Holdback, Cast Iron ..... *$5.50@$6.75*

J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 40%
Bardsley's Patent Checking 33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor 40%
Bommer Spring Hinges 40
No. 999 Wrot. Steel Hold Back, ₱ gr. $9.00
Chicago Spring Butt Co.:
Cushion Spring Hinges 40%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor 50%
Garden City Engine House 25%
Reform Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 25%
American 30%
Columbia, ₱ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ₱ gr. $12.00
Columbian Hinges ..... 60&10%
Gem, new list 30%
Clover Leaf ..... ₱ gr $12.00
Oxford, new list 30%
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co., Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen ..... ₱ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door 25%
No. 177, Sheet Steel Holdback ..... ₱ gr. $9.00
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓%

Wrought Iron Hinges—
Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges	*50&10%*
Heavy Strap Hinges	*60&5%*
Light T Hinges	*50%*
Heavy T Hinges	*40%*
Extra Hvy. T Hinges	*50&10%*
Hinge Hasps	*33⅓%*
Cor. Heavy Strap	*60&5%*
Cor. Ex. Heavy T	*50&10%*

Extra 10¢½%

Screw Hook and Strap.
6 to 12 in., lb. 3¾¢
14 to 20 in., lb. 3½¢
22 to 36 in., lb. 3¼¢

Screw Hook and Eye:
¾ to 1 inch ..... lb. 6¼¢
1¼ inch ..... lb. 7½¢
1½ inch ..... lb. 8½¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers ..... 30&2%

Hods— Coal—
M'f'gr's list, price per gross.

Inch	*15*	*16*	*17*	*18*
Galv. Open	*$37*	*$39*	*$42*	*$46*
Jap. Open	*36*	*38*	*41*	*45*
Galv. Funnel	*44*	*48*	*52*	*56*
Jap. Funnel	*33*	*36*	*39*	*43*

Extra 10&5%

Masons' Etc.
Cleveland Wire Spring Co.:
Steel Brick, No. 162 ..... each $1.05
Steel Mortar, No. 158 ..... each $1.35

Hoes— Eye—
Scorid and Oval Pattern ..... *60&10@60&10&10%*
Grub, list Feb 28, 1899 ..... *70&10@75&10%*

D. & H. ..... 37 ½
Am. Lock & Hdw. Co.'s All Pol. lethal 60

Handled—

NOTE.—Manufacturers are suffering from the list of September 1, 1904, but many orders are still coming in. Do not order at 1899, or second net prices.

Crane's Wedges, No. 1 50
Star Double Bit 50
Ft. Madison Cutting Hoe 50
Ft. Madison Universal Cultivator Hoe, ½ doz. 7 50
Ft. Madison Mattock Hoes 50
Regular Weight ..... ½ 1 50
Special 1 75
Ft. Madison Sprouting Hoe 50
Ft. Madison Dixie Tobacco Hoe 7 50
Kretsinger's Cut Easy 7 50
Warren Hoe 7 50
W. & C. Hatchet 4 50
B. B. 6 in. Cultivator Hoe 50
B. B., 6½ in. 50
W. & C. Hoe 7 50
W. & C. Lifting Shuttle Hoe 50

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders—Bit—

Angular, ½ doz. $4.30 ..... 45&10

Door—

Bardsley's, Iron, 10 .; Brass and Bronze 50
Lafayette 35
Pullman 50
Richards Mfg. Co.'s No. 1 ..... 1 50
Ready, 10 .; No. 2 50
Grip 50
Superior 50

File and Tool—

Nicholson Fine Holders and File Handles ..... 33⅓&40

Fruit Jar—

Triumph Fruit Jar Holder, ½ gross, $10.80, ½ doz. $1.25

Trace and Rein—

Fernald Double Trace Holder, ½ doz. pairs ..... $....
Dash Rein Holder, ½ doz. pairs, $1....

Hones—Razor—

Pike Mfg. Co., Regular and Smaty, 50 .; German 50

Hooks—Cast Iron—

Bird Cage, Reading 40%
Clothes Line, Reading List 40
Coat and Hat, Reading 40
Coat and Hat, Wrightsville 40
Harness, Reading List ..... 40&10

Wire—

Bell ..... 80 %
Wire Cloth Hooks 50
Bradley Metal Coat Wire, Coat and Hat, Oak 50
Columbian Hdw. & Iron 40
Parker Wire Goods Co., Bing. 75&10%
Iron Clothes 50
Acme 60&10 ; Chief, 70 ; Crown, 75 ; Star, 65 ; Brace, 75 ; Czar Harness, 50&10%

Wrought Iron—

Box, 6 in., per doz., $1.90; 8 in., $1.25; 10 in., $8.50.
Cotton ..... *doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.— See Wrought Goods

Miscellaneous—

Hooks, Bench, see Stops, Bench
Rush, Light, doz., $6.50; Medium, $6.75; Heavy, $7.50
Grass, best, all sizes, per doz. $3.00
Grass, common grades, all sizes, per doz. *$1.50*
Whiffletree ..... *lb. 3¾@4¢*
Hooks and Eyes:
Brass ..... 60&10
Malleable Iron ..... 50&10
Covert Mfg. Co. Gate and Snaffle Hooks 40
Ft. Madison Chain Co. 50
Turner & Stanton Co., Shoulder 50
Peters Edge Tool Works, Inc.
Cary Hdw. & Knife Co., Inc.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾ inch:
Competition ..... *ft. 5¢; doz. 60¢*
Standard ..... *ft. 6¢; doz. 70¢*
Triple Guaranteed ..... *ft. 7½¢; doz. 90¢*
Cotton Garden Hose, Inch:
Low Grade ..... *ft. 5¢; doz. 60¢*
Fair Quality ..... *ft. 7½¢; doz. 90¢*

Irons—Sad—

From 3 to 5 ..... *lb.*
B. B. Sad Irons ..... *lb. 8½@9¢*
Mrs. Potts, cost per set:

Nos.	50	55	60	65
Japan Tops	$0	80	90	95
Tinned Tops	80	85	90	95

New England Pressing ..... *lb.*

Bar and Corner—

Richards Mfg. Co. Bar 50
Corner 50

Pinking—

Pinking Irons ..... *doz. 60¢*

Irons, Soldering

See *Copiers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw ..... 30&2½ Steel 45
Lockport 50

Lane's Steel ..... 30&5%
Smarth & Hemenway Co. 25

Ladder—

Richards Mfg. Co. Ladder Irons 50

Kettles—

Brass, Spun, Plain ..... *20@25%*
Lalance and Gast Iron—See Ware, Hollow

Knives—

Butcher, Kitchen, &c.—

Foster Bros. Butcher 50
Wilkinson Shear & Cutlery Co. 60%

Corn

Columbian Cutlery Co., Wilmot Iron & Knife Co. ..... 60 ,
Wyandotte Mfg. Co. ..... $.. doz.
Dell, $2.75; Alp, Serrated, $2.30; Serrated $2.; Yankee No. 1, $1.50; Yankee No. 2 ..... $....

Drawing—

Standard ..... *75&40@75&10*
C. E. Jennings & Co., Nos. 10 to 16 ..... 50&10
Jennings & Griffin Nos. 11, 12, 13 50
Sears's 50
Walfords 60
L. & J. White ..... 20&5&5

Hay and Straw—

Serrated Edge, per doz. No. 1 $2.75
Iwan's Solid Edge ..... ½ doz. $....
Iwan's Serrated ..... ½ doz. $10.00

Miscellaneous—

Farriers ..... *doz. $3.00@$3.25*
Western ..... ½ doz. $3.00@3.25

Knobs—

Base, 2½ inch, Birch, or Maple, Rubber Tip ..... *gro $1.25@$1.40*
Carriage, Cap, and sizes ..... *gro. $....@....*
Door, Mineral ..... *doz. 65@70¢*
Door, Por. Jap'd ..... *doz. 70@75¢*
Door, Por. Nickel ..... *doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c. 35

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Allith Mfg. Co. Reliable 50
Lucas 25
Myers' Noiseless Step Ladders 50
Reliable Mfg. Co.:
Improved Noiseless, No. 112 ..... 50%
Climax Shelf, No. 113 ..... 50%
Trotter, No. 110 ..... 50%

Ladles, Melting—

L. & G. Mfg. Co. new list 25
P. & W. ..... 40&10
Reading 60

Lanterns—Tubular—

Regular, No. 0 ..... doz. $1.50
Sub Lift, No. 0 ..... doz. $....
Hinge Globe, No. 0 ..... doz. $....
Other Styles ..... *doz. $....@....*

Bull's Eye Police—

Switch ..... *$1.25@1.50*

Latches—Thumb—

Roggin's Latches, with screw..
doz. 55@40¢

Door—

Allith Mfg. Co., Reliable and Alligator, 50%; Reliable Cold Storage, 50%
Clark & Clark Mfg. Co. ..... ½ doz. $....
Richards' Bull Dog, Heavy, No. 25 ..... 50&5%
Richards' Trump, No. 127 ..... $1.50

Leaders, Cattle—

Smooth ..... *doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E. 10

Lines—

Plow Clothes, Nos.	18	19	20
100 feet	$2.50	2.25	2.00
50 feet	$2.00	1.80	1.65

Cotton Clothes Lines:
Solid Braided Chalk, Nos. 0 to 3. 40%
Solid Braided Masons 30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $8.00 ..... 50&5%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50 20
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 20
Clothes Lines, White Cotton: 50 ft., $2.15; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25 20
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and 1
Cotton Line, Wax 1
Shade Cord, Cotton or Linen 20%

Locks—Cabinet—

Cabinet Locks ..... *$2.1..%*

Door Locks, Latches, &c.—

NOTE.—Net Discounts are quoted on these goods.
Corbin Hardware Co. 40
R. & E. Mfg. Co. 40

Padlocks—

R. & E. Mfg. Co. Wrought Steel 1
Brass 1

Sash, &c.—

Iron Pulleys:
Bronze and Brass ..... 55&10
60 ; Iron 60
Whitlock Window Weighing, 40&20%; Robinson Pat. Ventilating Sash Lock 33⅓

Reading Patent Ventilating Lock 5
Reading Sash Locks 60

Machines—Boring—

Corn, Cob, without Augers ..... *$2.50@2.25*
Corn Angers, without Augers ..... *$2.50@2.50*
Swan's Improved ..... 40&10%
Jennings', Nos. 1 and 4 ..... 25&5%
Nos. 2 and 3 25
Stow, Nos. 1 to 3 25
Stow, Nos. 4 to 7 ..... Angular, $....

Corking—

Reisinger Bros. Foot Power ..... ½ doz. $15....

Fence—

Williams' Peerless ..... each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist. 30%
Myers's Hand Hoists, with Iron Beam 30
Myers's Crown, High Speed Chain, Hoist 30

Ice Cutting—

Chandler 12½

Washing

Boss Washer's Sad Iron Co.: Per doz.
Boss No. ..... $....
Boss Rotary $57.00
Champion Rotary Banner No. 1 ..... $57.00
Standard Oscillating ..... $....
Standard Perfection ..... $....
Cincinnati Square Western $33.00
Universal American, Round ..... $....

Mallets—

Hickory ..... *45@50%*
Lignumvitæ ..... *40@50*
Tanners' Hickory and Apple-wood ..... *doz. 45@50 ¢*

Mangers, Stable—

Swett Iron Works 50%

Mats, Door—

Anne Textile Specialty Co. 25
Lustik Steel (W. G. Co.), new list 25

Mattocks—

See Picks and Mattocks.

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co. ..... 25&25
National Grinding Mill ..... 50&10%
Parker's Columbia and Victoria 33⅓
Parker's Box and Side ..... 50&10%
Swift Lever Bros. Co. 60

Motors, Water—

Dayton's Red Devil 35
Lippincott 50

Mowers, Lawn—

NOTE.—Net prices are quoted on these goods.
Champion ..... *All sizes, $12.50@12.75*
Cheap ..... *All sizes, $8.00@12.50*
Better Grade..All sizes, $2.50@4.50

	12	14	16	18
High Grade	$3.50	4.75	5.00	5.25

Coldwell 50
Ideal, Auction 50
Great American Ball Bearing, new list. 70%
Quaker City 70
Pennsylvania 60%
Pennsylvania, Jr. Ball Bearing ..... 50&5
Pennsylvania Golf 50
Pennsylvania Hand ..... 50&5%
Pennsylvania Pony ..... 40&5
Granite State:
Style A, Lawn Wonder 50
Style B, Lawn Wonder 50
Style C, Hand Worked, special list ..... 50&5
Style D, High Wheel, special list 50
Empire 50
Styles M., S., C., K., T. ..... 50&5
Style A, all Steel ..... 60&5
Style B ..... 50&5
Drexel and Gold Coin, special list 40%
Horse ..... 10&5
Pony ..... 10&5
Colt, Horse ..... 40&10
Eagle Horse ..... 40&5
I. X. L. Horse 50

Nails—

Wire Nails and Brads, Miscellaneous ..... *$2.00@2.10*
Cut and Wire. See Trade Report.
Hungarian, Finishing, Upholsterers' &c. See Tacks.

Horse—

Nos.	6	7	8	9	10
Anchor	24	24	20	18	16&5
Coleman	12	12	12	11	11
New Haven	24	24	20	18	16&5
Lancaster	12	12	12	12	12
Western	12	12	12	12	12

Jobbers' Special Brands ..... *per lb. 9@10¢*

Picture—

	12	2	2½	3
Brass H'd	55	55	55	55
Por. Head	*1.10*	*1.10*	*1.10*	.. gro

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: *Off list*
Square, B .....
H .....
Semi-finished .....
Finished .....
Hexagon .....
Emery Paper and Cloth ..... *50&10@50%*

Oakum—

Spun ..... *lb.*
Jute ..... *lb.*
Jute Spun Oakum ..... *2¾@3¢*

Oil Tanks See *Tanks, Oil*

Oilers—

Steel, Copper Plated .....
Coast of Carriage .....
Brass and Copper .....
Zinc .....
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 30%
American Tube & Stamping Co.:
Screw Regular Lengths .....
Raised and Oiler, &c. .....

Openers—Can—*Per doz.*

Sprague, Iron Handle .....
Sprague, Wood Handle .....
Sardine Scissors ..... *$1....@....*
Yankee Can Opener .....
½ doz., net, $0.75; Little Gem, ½ doz., net $0.65

Egg—

Hartman Novelty Prod. Co. .....
Stand Pipes, $1. .....

Packing—

Asbestos Packing, Wick and Rope ..... *20@25¢*

Rubber—

(Fair quality goods.)

Sheet, Cut ..... *Hd 12¢*
Sheet, C. O. S. ..... *Hd 12¢*
Sheet, C. B. S. ..... *Hd 12¢*
Sheet, Pure Gum ..... *per pc*
Sheet, Red ..... *per pc*
Jenkins '96, ½ lb. 80¢ 25

Miscellaneous—

American Packing ..... *lb. 30@40 ¢*
Cotton Packing ..... *lb. 10@25 ¢*
Italian Packing ..... *lb. 30@12½¢*
Jute ..... *lb. 4@ 10¢*
Russia Packing ..... *lb. 50@ ¢*

Pails, Water, Well, &c.—

See *Buckets.*

Pans—Dripping—

Standard List ..... *60&10@60&10%*
Edwards, Royal Base ..... 60&10

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	$0.75	0.80	0.90	1.10	1.50

Refrigerator, Galva.—

Inch	12	14	16	18
Per doz.	$1.75	2.25	2.80	3.15

Paper—Building Paper

Asbestos: *lb.*
Roll Board or Building Felt, 6 lb. to the 100 sq. ft. Single .....
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft. ..... *6¢*
Mill Board, Sheet, 40 x 60 in., 1-32 to ⅛ in. ..... *4@15¢*
Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll .....
Medium weight, 30 lbs. to roll .....
Heavy weight, 40 lbs. to roll .....
Black Water Proof Sheathing 500 sq. ft., 1 ply, 65¢; 2 ply 85¢; 3 ply, $1.10; 4 ply $1.35
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton .....
Red Rope Roofing, 250 sq. ft. per roll *$1.75*

Tarred Paper—

1 ply (roll 400 sq. ft.), ton .....
2 ply, roll .....
3 ply, roll .....
Sheathing .....

Sand and Emery—

Flint .....
Garnet .....
Emery Paper and Cloth ..... *50&10@50%*

Pans—

Lancaster Nail Co.:
Reading Hardware Co.:

Potato—

Sterling ..... ½ doz. $7.00
White Mountain ..... ½ doz. $6.00

Picks and Mattocks—

List, Feb. 28, 1899. 70&10@70&10%
Cronk's Handled Garden Mattock, ½ doz., No. 2, $2.60; No. 3 $2.40.

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass ..... 50@55 & 5 off
Iron, list Nov. 11, '85.. 60@60&10%

Pipe, Cast Iron Soil—
Standard, 25 in. and less
Extra Heavy, same
Fittings, Standard and
75&10@—%

Pipe, Merchant—

	Consumers, Carloads.			
	Steel.		*Iron.*	
	Blk.	*Galv.*	*Blk*	*Galv.*
	%	%	%	%
1/8 in.	67	55	47	37
1/4 in.	68	58	50	41
3/8 in.	68	56	51	41
1/2 in.	72	62	60	50
3/4 to 1 in.	69	57	61	50

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First class 50
Second class 50

Pipe, Stove—

	Per 100 joints.	
	C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	7.75	9.00
7 in., Standard Blue	9.25	10.50
5 in., Royal Blue	7.50	8.50
6 in., Royal Blue	9.25	10.50
7 in., Royal Blue	11.00	12.50
Wyoming Corrugated Co.'s Nested:		
5 in., Uniform Coat	$5.15	$6.40
6 in., Uniform Coat	6.65	8.25
7 in., Uniform Coat	8.05	9.65

Planes and Plane Irons—
Wood Planes—
Bench, first qual. 50%
Bench, second qual. 40%
Molding ..... 25@25&5%
Chapin-Stephens Co.:
Bench, First Quality 20
Bench, Second Quality 40
Molding and Miscellaneous 25
Toy and German 40
Union 60%

Iron Planes—
Chaplin's Iron Planes ..... 50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list
Dec. 12, '06 25
Buck Bros 30
Chapin-Stephens Co 50%
Union 40
L. & I. J. White ..... 20&5@25 &5

Planters, Corn, Hand—
Kohler's Eclipse ..... ₱ doz. $8.00

Plates—
Felloe ..... lb. 4½@4¾¢

Pliers and Nippers—
Button Pliers ..... 70&10@70&5
Gas Burner, per doz. 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe.. 7 8 10 12 in.
$2.00 $2.25 $2.75 $3.50
Acme Nippers ..... 50&5
Cook Bros. Mfg. Co.:
American Button 30%
Improved Button ..... 20&10
Cromax 30
No. 80 Lineman's 30
Stub's Pattern 15%
Combination and others 33⅓
Heller Farriers' Nippers, Pincers and Tools ..... 40&5@10&5%
H. S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard's; Elm City, Paragon, 50%; Lodi, 55%.
Straight Side End and Diagonal Cutting Pliers 50%
Ulrich Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumb and Levels ..... 30&5 &10
Chapin's Iron Brass Cap ..... 30&10
Pocket Levels ..... 30&5 &10
Extension Sights 30
Mahogany Levels ..... 10&10&10
Disston's Plumbs and Levels ..... 60&10%
Disston's Pocket Levels ..... 60&10%
Stanley's Duplex 35%
Wood, Patented 33⅓

Points, Glaziers'—
Cut, and 1 lb. papers ..... lb. 9½¢
1 lb. papers ..... lb. 10 ¢
½ lb. papers ..... lb. 11½¢

Police Goods—
Manufacturers' Lists ..... 25@25&5%
Tower's 25%

Polish—Metal, Etc—
Prestolite Liquid No. 1 (½ pt.) ₱ doz., $3.00; No. 2 (1 qt.) $9.00 40%
Prestoline Paste 60%
George William Hoffman:
[illegible] Paste, 3 oz. [illegible] $4.50;
[illegible] $5.25, 1 lb [illegible] $12.
Barkeepers' Friend Metal Polish, ₱ doz., $1.25.
Barkeepers' Friend Metal Polish, ₱ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ₱ lb 10¢
Black Eagle, Liquid, ½ pt. cans, ₱ doz. 75¢
Black Jack Paste ¼ lb cans, ₱ gr $9.00
Black Kid Paste, 5 lb can..each, $0.65
Laddie Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon's ₱ gr $5.75
Dixon's Pumbago ..... ₱ lb 8¢
Eldredge ..... ₱ gr $2.5
Imp. ₱ gr. $4.50
Japanese ..... ₱ gr. $2.50
Jet Black ..... ₱ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ₱ doz. $1.50

Poppers, Corn—
1 qt. Square..doz. $8.00; gro. $90.00
1 qt. Round..doz. $1.00; gro. $10.00
1½ qt. Square..doz. $1.15; gro. $13.00
2 qt. Square..doz. $1.35; gro. $13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Line Posts, each, 5 ft., 42¢; 5 ft. 4½¢, 6½ ft. 49¢.
Steel Hitching Posts ..... each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled ..... 35&10%
Tinned ..... 30&10%

Powder—
In Canisters:
Duck, 1 lb. ..... *each 15¢*
Fine Sporting, 1 lb. ..... *each 75¢*
Rifle, ½ lb. ..... *each 15¢*
Rifle, 1 lb. ..... *each 25¢*
In Kegs:
12½ lb. kegs *$3.50*
25 lb. kegs *$4.60*
King's Semi-Smokeless:
Keg, ½ lb. $0.50
Half Keg, 1 lb. bulk $0.50
Quarter Keg, 2½ lb. bulk $1.00
Case 24 ½ lb. cans bulk $4.50
Half case (12 lb. cans bulk) $4.50
King's Smokeless: Shot Gun. Rifle.
Keg, 25 lb. bulk $12.50 $15.00
Half Keg (12½ lb. bulk) 6.25 7.75
Quarter Keg (6¼ lb. bulk) 3.25 4.00
Case 24 (1 lb. cans bulk) 14.00 17.00
Half case 12 (1 lb. c. bk) 7.25 8.75

Presses—
Fruit and Jelly—
Enterprise Mfg. Co. ..... 20@25%

Seal Presses—
Merrill's No. 1, ₱ doz. $20.00 ..... 50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclone 50%
Monarch Lever, No. 3, ₱ doz., $12.00 ..... 30 to 40&10%
Merrill's No. 1, Nail Puller, ₱ doz. $2.50 ..... 50%
Pearson No. 1, Cyclone Spike Puller, [illegible] 50
Lane & Bodley Co. Case Lots:
No. [illegible] $5.50
No. [illegible] $5.00
Sawyer Hinkley Co.:
[illegible] 50
Oval [illegible] 50
Single Puller Claw and Diamond [illegible] 60%

Pulleys, Single Wheel—
Inch 1¼ 1¾ 2 3
Awning or Tackle,
doz. ..... *$0.50 .55 .60 1.05*
Hay Fork, Swivel or Solid Eye,
doz. or in. $1.25 1.50 1.75 $1.75
Inch 2 2¼ 2½
Hot House, doz. ..... *$0.65 .85 1.20*
Inch 1¼ 1½ 2
Screw, doz. ..... *$0.16 .19 .25 .30*
Inch 1¾ 2 2¼ 2½
Slide, doz. ..... *$0.55 .50 .55 .60*
Inch 1½ 1¾ 2 2½

Sash Pulleys—
Common Brass; Square or Round End, per doz., 1¾ and 2 in. ..... *17@21c*
Angle Mortise, no Face Plate, per doz., 1¾ and 2 in. ..... *20@21c*
[illegible] ..... [illegible]
American Pulley Co.:
Wrought Steel American Plain [illegible] ..... [illegible]
Wrought Steel Duplex [illegible] ..... [illegible]
Cast Iron, Steel, Nos. 3 and 7 [illegible] ..... [illegible]
Grand Rapids All Steel Noiseless 50%
Nicholson, No. 25, 1¾ in. ..... 20¢
[illegible] ..... 20½¢
[illegible] ..... 15½¢
Star, No. 26, 1¾ in., 19¢; 2 in., 20½¢
Table Blocks—See Blocks.

Pumps—
[illegible] 60%
[illegible] ..... 25&65@75&10%
Wood, Plain, Tubing, &c. 50%
Barnes Dbl. Acting (low list) ..... 25&5%
[illegible] ..... 25&5%
Carpenter, Rotary Drill Pump ..... No
Cook's Rotary 50%
Daisy Spray Pump ..... ₱ doz. $6.50
Flint & Walling's Fast Mail Hand, (low list) 50%
Flint & Walling's Fast Mail, (low list) 50%
Flint & Walling's Tight Top Pit Jet ..... 75&10%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50 ..... 50%
Myers' Pumps (low list) ..... 40&5%
Myers' Deming Pumps 40%
Myers Spray Pumps ..... 40&5%

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No.	[illegible]	[illegible]	[illegible]	[illegible]
	$3.10	*3.70*	*4.35*	*4.95*	*5.60*

Cup Leathers—Per 100:

Inch	[illegible]	[illegible]	[illegible]	[illegible]
	2½	*3*	*3½*	*4*
	$2.50	*2.75*	*3.00*	*3.50*

Punches—
Saddlers' or Drive, good ..... *doz. 50@75¢*
Spring, single tube, good quality *$1.75*
Revolving (4 tubes) ..... *doz. $3.60*
Bemis & Call Co.'s Cast Steel Drive 50
Morgan's Nos. 1AA, 1A, 1B, 3C, 1D, $45 50
Hercules, 1 die, each $5.00 ..... 50%
Niagara Hollow Punches 40
Niagara Solid Punches ..... 35&10%
Wm. Schollhorn Co.:
Eagle and Hand, Bernard, 35%; Paragon, 50%; Lodi 55%
Tinners' Hollow, P., S. & W. Co. 40%
Tinners' Solid, P., S. & W. Co. ₱ doz., $1.40 10

Rail—Barn Door, &c.—
Sliding Door, Painted Iron ..... 2½@2¾¢
Sliding Door, Wrought Brass, 18 in. to 36 ..... 50%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cook Bros.:
Double Braced Steel Rail..₱ ft. 3¼¢
O. N. T. Rail $3.12
Griffin's:
Nos. [illegible] 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ₱ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ₱ 100 ft. $3.45
"L," "T" and "U" rail, 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard Track, ₱ 100 ft. $4.00
Lawrence Bros.:
Nos. [illegible] ₱ 100 ft., $7.50; 1¼ x 3-16 in., $8.75 ..... 55&7½%
Mayhew's:
Hinged Hanger Track, ₱ ft. 11¢
Nos. 5
1 x 3-16 Track 6
Myers' Steam Track 6
Richards' Mfg. Co.:
Common, 1 x 3-16 in., $2.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail ..... 60&10%
Lane's Iron Rail 50%
Gauge Trolley Track, ₱ ft., No. 31, [illegible] 30
No. 50 ..... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $5.25; 46, $3.50; 49, No. 1, $5.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn.... $3.25
Fort Madison Blue Head Lawn.... $2.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor ..... 80&5%
Queen City Lawn, ₱ doz., 20 teeth, $2.85 ..... 50 net
Anticlog Lawn, ₱ doz. $4.00
Mi[illegible] ..... 70&10%
Ideal Steel Garden, ₱ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00 ..... 60%
Kohler's:
Lawn Queen, 20-tooth..₱ doz. $3.15
Lawn Queen, 24-tooth..₱ doz. $3.25
Paragon, 20-tooth..₱ doz. $2.70
Paragon, 24-tooth..₱ doz. $2.75
Steel Garden, 14-tooth..₱ doz. $2.40
Malleable Garden, 14-tooth, ₱ doz. $2.00@2.25

Rasps, Horse—
[illegible] 75%
Heller Bros.' ..... 70&5@70&10&5%
Liverpool Bros.' Gold Medal ..... 70&10@75%
McCaffrey's American Standard ..... 60&10&5%
New Nicholson ..... 70&10@75%
See also Files.

Razors—
Luna Barrel 60%
Fox Razors, ₱ doz. Nos. 12, $20.00; 14, $20.00; No. 82, Platina $30.00 ..... 60% 10%
Red Devil 65%

Reels, Fishing—
Hendryx:
M. 6, Q. 6, A. 6, B. 8, M. 9¾, M. 16, Q. 16, A. 16, B. 16 ..... Rubber.
Perfection Nickeled Pocket 20%
Aluminum German Silv., Bronze 25%
1210 N. 12¼ N. 20%
2003 N. 2½ N., RM. G. 9 ..... 25%
[illegible] N. 3¼ N. 36 PN. 30%
2904 P., 3¾½; 2904 PN., 3¾½; 0924 N., 3¾½; 0904 N., 3¾½; 0902 PN., 3¾½ 35%
986 PN., 3¾½ N. 974 PN. 25%
5046 PN. 20%
Comp. 1[illegible] P., 102 PN., 202 P., 202 PN., 102 PR., 202 PR. 20%
304 P., 304 PN., 00304 P., 00304 PN., 33¼½ 30%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed ..... 55@55&10@10
White Porcelain Enamel ..... 50&10
Solid Brass or Bronze Metal 40%

Revolvers—
Single Action ..... *25¢@$1.00*
Double Action, except 44 cal. *$2.00*
Double Action, 44 caliber *$2.00*
Automatic *$5.00*
Hammerless *$1.50*

Riddles, Hardware Grade
16 in. ..... *per doz. $2.50@$2.75*
17 in. ..... *per doz. $2.75@$3.00*
18 in. ..... *per doz. $3.00@$3.25*

Rings and Ringers—
Bull Rings—

	2	2½	3 inch.
Steel	*$0.70*	*0.75*	*0.80 doz.*
Copper	*$1.10*	*1.25*	*1.65 doz.*

Hog Rings and Ringers—
Hill's Rings, gro. boxes *$4.25*
Hill's Ringers, Gray Iron, doz. ..... *60¢*
Hill's Ringers, Malleable Iron, doz. ..... *80¢*
Blair's Rings ..... *per gro. $3.*
Blair's Ringers ..... *per doz. 75¢*
Brown's Rings ..... *per gro. $5.25*
Brown's Ringers ..... *per doz. 75¢*

Rivets and Burrs—
Copper ..... 50&10@50%
Carriage, Coopers', Tinners', &c.:
Black ..... 50&10%
Metallic Tinned 70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, 23@25¢; Tin boxes, 100 count, 25@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 31@35¢.

Rollers—
Cronk's Stay, No. 50 ..... $1.00
Cronk's Ad. Reversible No. 55, $0.60; No. 56, $0.75; No. 60 ..... $0.75
Lane's Stay 40%
Richards' Stay:
Handy Ad. and Reversible No. 53 75¢
O. K. Ad. and Reversible No. 58 50¢
Lag Screw, Nos. 55 and 57 ..... 50%
Underwriters', Nos. 59, 60 ..... 50%
Favorite, No. 54 ..... 60%

Rope—
Manila, 7-16 in. diam. and larger:
Pure ..... *lb., 11½@12¢*
Sisal, 7-16 in. diam. and larger:
Pure ..... *lb., 8¢*
Sisal, 7-16 in. diam. and larger:
No. 2 quality ..... *lb., 7@7½¢*
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed ..... *lb., 7@7½¢*
Pure ..... *lb., 9¼¢*
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred:
Mixed ..... *lb., 6½@6¾¢*
Pure ..... *lb., 7½¢*
Cotton Rope:
Best, ¼ in. and larger.. 18@20¢
Medium, ¼ in. and larger.. 16@17¢
Common, ¼ in. and larger.. 10¢
In coils, ½¢ advance.
Jute Rope:
Thread, No. 1, ¼ in. & up, lb. 7½@8¢
Thread, No. 2, ¼ in. & up, lb. 7@7½¢

Wire Rope—
Galvanized ..... *37½@2½%*
Plain ..... *45@2½%*

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal 20%

Rules
Boxwood ..... *60@60&10%*
Ivory ..... *35&10@35&10&5%*
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory ..... 25@35&10%
Miscellaneous ..... 50@50&10%
Stephens' Combination 55%
Stationers' ..... 50@50&10%
Kenffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel ..... 33⅓&10%
Lufkin's ..... 50&10%
Lufkin's Lumber ..... 50&10%
Union Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 45
Band ..... 40&10
Rip and Cross Cut 50
Nicholson Cross Cut 50
Hollow Ripping Plates 40
Mill Rip Saws 1
Mulay, Mill and Drag 45
Wood Saws 1
Cosgrove Saw Co 50
Tubular Saws and Frames ..... 50&10
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 50&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth..50%
Band, 2 to 18 in. wide 60%
Band, ¼ to ⅞ 60%
Crosscuts 45
Narrow Crosscuts 50
Mulay, Mill and Drag 50
Framed Woodsaws 25
Woodsaw Blades 25
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 13, 14, 16, d100.. 25%
Hand Saws, Nos. 7, 10, 10½, 3, 1, 2, 4, 6, Combination 30%
Compass, Key Hole, &c. 25%
Butchers' Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 15%
Hand Saws ..... 25&10%
Compass and Key Hole Saws 25%
Framed Wood Saws 25%
Hand Saw Blades 25%
Wood Saw Blades 25%
Miners' Saws:
Butcher Saws ..... 15&10%
Stair Saw Blades ..... 15&10%
Massachusetts Saw Works:
Mill Rip Saws ..... 10&1 &50
Butcher Saws Blades ..... 35&10%
Peace & Richardson's Hand Saws..30%
Simonds':
Circular Saws 15
Crescent Diamond Cross Cut Saws..30%
One Man Cross Cuts ..... 10&15
Gang Mill, Mulay and Drag Saws..45%
Band Saws 50%
Back Saws 25%
Butcher Saws ..... 35&35&7½
Hand Saws ..... 25&5&7½
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. 25@25&7½
Wood Saws ..... 10&7½
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws..... 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A..25%
Disston's:
Climax Blades 25%
Keystone Blades 35%
Hack Saw Frames 35%
Simonds' 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos 175, 180..... 40&7½%
Hack Saws, Nos. 175, 180, complete..... 40&7½%
Goodell's Hack Saw Blades.....40&10%
Griffin's Hack Saw Blades 35
Griffin's Hack Saw Blades...35&6&10%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..30&10&5%
Sterling Hack Saw Machines, each No. 1 $25 No. 2, $30.00..10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%
Whitaker Mfg. Co.:
Narrow Hack Blades 1
Narrow Hack Frames 1
Wide Hack Blades 50
Solocut Hack Blades ..... 50&10

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes, Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20..... 20%
Lester complete, $12 ..... 15&10%
Rogers, complete, $3.50 and $4.00... 15&10%

Scales—

Fairbanks, Chamberlain's..... 50&5&10%
Chatillon's:
Hotch, Platform, ½ oz. to 4 lbs. ..... doz. $5.50
Two Platforms, ½ oz. to 8 lbs ..... doz. $16.00
Union Platform, Plain $1.70@1.90
Union Platform, Stpd. $1.85@2.15
Chatillon's:
Improved 25
Pocket 10
Counter Top Scales 50
The Standard Portables 40%
The Standard R. R. and Wagon ..... 50&10%

Scrapers—

Box, 1 Handle..... doz. $2.00@2.25
Box, 2 Handle..... doz. $2.50@2.80
Ship, Light, $2.00; Heavy, $3.50
Chapin-Stephens Co., Box ..... 20&20&10%
Richards Mfg. Co., Box 40%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1½, $3.50@3.75
Bench, Wood..... 50&10%
Hand, Wood..... 50&10%
Chapin-Stephens Co., Hand 40%

Coach, Lag and Hand Rail—

Lag, Coach Point ..... 50&10%
Coach, Gimlet Point ..... 50&10%
Hand Rail ..... 50&10%

Jack Screws—

Standard List ..... 20&10&7½
Morris, Tasney & Co. ..... 20&10&7½
Swift Iron Works ..... 50&10%

Machine

Cut Thread, Iron, Brass or Bronze:
Flat Head or Round Head..... 50&10%
Fillister Head..... 40&10%
Rolled Thread, F. H. or R. H., Iron ..... 50&10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65&10%

Set and Cap—

Set (Iron) ..... 75&10&7½%
Set (Steel), not advance over Iron ..... 50&10&5%
Set Hd. Cap ..... 50&10&7½%
Hex. Hd. Cap ..... 50&10&7½%
Rd. Hd. Cap ..... 50&7½%
Fillister Hd. Cap ..... 60&7½%

Wood—

List July 23, 1903.
Flat Head, Iron ..... 87½&5@..%
Round Head, Iron ..... 85&5@..%
Flat Head, Brass ..... 80&5@..%
Round Head, Brass ..... 75&5@..%
Flat Head, Bronze ..... 75&5@..%
Round Head, Bronze ..... 70&5@..%
Drive Screws ..... 87½&5@..%

Scroll Saws—

See *Saws, Scroll.*

Scythes— *Per doz.*

Grass, No. 1, Plain.... $6.25@6.75
Clipper, Bronzed Webb. $6.50@7.00
No. 3 Clipper, Pol'd Webb.. $6.75@7.25
No. 6 Clipper and Solid Steel, $7.00@7.50
Bush, Weed and Bramble No. 2 $6.50@7.00
Grain, No. 1..... $8.25@8.75
Bronzed Webb, No. 1.. $8.50@9.00
Nos. 3 and 4 Clipper, Grain.. $8.75@9.25
Solid Steel, No. 6..... $9.25@9.75

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; $18; 3, $12, 4, $9, 5, $7..... 50%
Miller's Falls Adj. Tool Handles, No. 1, $12; No. 4, $12, No. 5, $18..... 50%

Garden Tool Sets—

Ft. Madison Three Flows, Hoe, Rake and Shovel..... ₱ doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 75%
Cannon's Diamond Point, ₱ gro, $12, ... 40&10
Mayhew's ..... ₱ gro $7.00
Snell's Corrugated, Cup Pt..... 40&10%
Snell's Knurled, Cup Pt..... 40&10%
Victor Knurled Cup Pt.... ₱ gro. $7.50

Rivet—

Regular list..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut.... $20.00
No. 5, Mill $30.00
Nos. 10, 11, 95 ..... $15.00
No. 1 Old Style..... $10.00
Special $16.25
Giant Royal Cross Cut..... ₱ doz. $8.00
Royal, Hand..... ₱ doz. $4.80
Taintor Positive..... ₱ doz. $6.75

Shaving—

Fox Shaving Sets, No. 30 .....
₱ doz., net, $24.00
Smith & Hemenway Co.'s..... 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₱ doz $1.50
Mounted Kitchen Sand Stone, ₱ doz $3.50
Natural Grit Carving Knife Hones, ₱ doz $3.00
Quick Cut Emery Carving Knife Hones, ₱ doz..... $1.50
Quick Edge Pocket Knife Hones, ₱ doz..... $2.50

Skate—

Smith & Hemenway Co., Eureka 50%

Shaves, Spoke—

Iron ..... doz. $1.10@1.25
Wood ..... doz. $1.75@2.25
Bailey's (Stanley R. & L. Co.'s) 25
Chapin-Stephens Co ..... 30&20&10%
Goodell's ₱ doz. $9.00..... 15&10%

Shears—

Cast Iron..	7	8	9 in.
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Cheap	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality Jap ..... 70@70&10%
Best quality, Nickel.. 60@60&10%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40&10&5
Hinsdell-Taintor Shears 15
Wilkinson Shear & Cutlery Co.:
Sheep, 1900 list..... 30&10&5%
Grass ..... 50&10%
Horse or Mule..... 50&10%

Tinners' Snips—

Steel Blades..... 20&5@20&5%
Steel Laid Blades..... 40&10@50
Forged Handles, Steel Blades, Berlin 50
Heinisch's Snips 50
Jennings & Griffin Mfg. Co.'s 6 in. 50
Niagara Snips 50
P. S. & W. Forged Handles 50
W. R. W. ..... 40&10%

Pruning Shears—

Crook's Hand Shears 33⅓
Crook's Hand Hatchet Shears 33⅓
Disston's Combined Pruning Hook Saw ₱ doz 5
Disston's Pruning Hook only, ₱ doz. 2
Hart Mfg. Co. ..... 40&10%
Pruning Shears, all grades ..... 40&10%
Columbian Cutlery Co.:
Hedge, Wilcut Brand ..... 60&10
Lawn and Border, Wilcut Brand ..... 60&10%

Sheaves— Sliding Door—

Reading 40%
R. & E. list 15

Sliding Shutter—

Reading list..... 40%
R. & E. list..... 10%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge 65%
Club, Rival, 65&5%; First Quality, 60&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, ... 10%
Union, Leader, Ideal, Rival Grade 5
New Club, Leader, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge 10%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Reliance Grade 5

Shells, Loaded—

Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40
Nitro Club, Smokeless Powders.40&5%
Arrow, Smokeless Powders.40&10&10%
Winchester:
Smokeless Repeater Grade.....40&5%
Smokeless Leader Grade...40&10&10%
Black Powder..... 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.50	$5.10
10 x 14	5.50	6.25
7 x 24	4.75	6.50

Wheeling Corrugating Co.:

Dixie 14 x 20 in.	$4.25	$5.50
Dixie 10 x 14 in.	4.50	6.00
Dixie, 7 x 10 in.	5.00	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg. $4.40
Steel ..... per keg $5.85
Burden's, all sizes..... ₱ keg $4.50

Shot—

25 lb. bag
Drop, up to B..... $1.85
Drop, B and larger..... 2.10
Buck 1.90
Chilled 1.90
Dust 1.90

Shovels and Spades—

Association List, Nov. 15, 1902 40%
Avery Stamping Co. 40

Snow Shovels—

Long Handle..... $3.75@4.50
Wood and Mail, D. Handle $3.75@4.50

Sieves and Sifters—

Hunter's Imitation..... gro. $9.50@10.00
Hunter's Genuine..... per gro. $12.00@12.50

Sifters, Ash—

Acme Ball Bearing Sifter Co. Acme Adjustable Ash Sifter, No. 2, ₱ doz..... $39.00

Sieves, Seamless Metallic

Per dozen.

Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested.... doz. $0.90@0.95
Mesh 20, Nested..... doz. $1.00@1.05
Mesh 24, Nested.... doz. $1.80@1.90

Sinks, Cast Iron—

Painted, Standard list:
12 x 18 50
Barnes' low list:
Nos. 1 to 5 50
Nos. 6 to 8 50
Nos. 9 to 11 50
Nos. 12 to 14 50
Nos. 15 to 17 50
Nos. 18 to 20 50
Nos. 21 to 23 50
Nos. 24 to 26 50
Nos. 27 to 29 50
Nos. 30 to 32 50
Nos. 33 to 35 50
Nos. 36 to 38 50
Nos. 39 to 41 50
Nos. 42 to 44 50
Nos. 45 to 47 50
Nos. 48 to 50 50

Skeins, Wagon—

Collins ..... 70&5%
Sterling ..... 60&5%

Slates, School—

Factory Shipments ..... 50&5&10%
Eureka, Uncercelled Noiseless ..... 60&5 tens
Victor A, Noiseless..60&5 tens &5%

Slaw Cutters — See *Cutters.*

Snaps, Harness

German 1
Covert Mfg. Co.:
Brass 1
Iron 1
Hartman 40%
Jockey 2

Snaths—

Scythe ..... doz. $2.00@2.25

Snips, Tinners— See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality ..... doz. $4.00@6.00
Cheap ..... doz. $2.00@3.00
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton ..... 40&10%
Rogers & Bro., William Rogers, Eagle Brand..... 50&10%
Anchor, Rogers Brand..... 60%
Wm. Rogers & Son..... 40%

Miscellaneous

German Silver..... 60&10&5

Tinned Iron—

Teas ..... per doz. $0.45@0.50
Tubes ..... per gro. $4.00@4.50

Springs— Door—

Barnes' Spring and Check 10%
Corbin, Cabinet ..... 10&5
Corbin, Cast 20%
Parker 10
Reading Co. 10
Star, Cast 10
Triple Coil, 24 in..... ₱ doz $1.10

Carriage, Wagon, &c.—

Plain, and Wider: Per 100 lb.
Spring ..... $3.25@3.50
Half Bright ..... $3.25@3.50
Bright ..... $3.25@3.50
Painted Seat Springs:
Light, 26 in. ..... per pr. $0.35
Light, 28 in. ..... per pr. $0.40

Sprinklers, Lawn—

Ames, Nourse & Mfg. Co.:
Enterprise 50
Peerless, No. 1, ₱ doz $12, No. 2, $15, No. 3, $20 .....

Squares—

Nickel plated. List Jan. 5, 1900.
Steel and Iron ..... 75&10&5%
Rosewood Hdl. Try Squares and Bevels ..... doz. $4.50@5.00
Iron Hdl. Try Squares and Bevels ..... doz. $2.00@2.25
Disston's Try Squares and Bevels.....
Rosewood Handle, ₱ doz. .....
Stock and Bevel..... 15

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@5.50; No. 1, $6.25@6.50
Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade..... doz. $1.25
Tinned Iron..... doz. $0.75@1.25
Iron, Porcelain Lined... doz. $1.75

Staples—

Barbed Bland ..... lb 6@6½¢
Electricians', Association list..
Fence Staples, Plain, $2.15; Galvanized $2.25
Poultry Netting Staples ..... per lb. 3½@3½¢

Steels, Butchers'—

Dick & 50
Foster Bros. 50

Steelyards —

Stocks and Dies

Blacksmiths ..... 50&10%
Curtis Revolving Die Stock 50
Geometric 50
Hartness 50
Landis 50
Merrell 50
Stoners, Cherry—

Stones—Oil, &c.

Arkansas:
Washita Slips, No. 1..... 70¢
Washita Slips, No. 2..... 40¢
India Oil Stones (entire list)..... 33⅓%
Quick Cut and Cumdum Oil Stone, Double Grit..... 40%
Quickcut Emery and Corundum Axe Stone, Double Grit..... 33⅓%
Quickcut Emery Rubbing Bricks..40%
Hindostan No. 1 Rubber ₱ doz. 50
Hindostan No. 1 Small ₱ lb. 10¢
Axe Stones, 100 lb. list 50
Turkey Oil Stones, Extra, 5 to 8 in. 50
Queer Creek Stones 4 to 8 in. 20¢
Queer Creek Slips ..... 40¢
Sand Stone..... 5¢

Scythe Stones—

Fine Mfg. Co., 1901 list:
Black Diamond S. S., ₱ gro. $12.00
Lamoille S. S., ₱ gro. $11.00
White Mountain S. S., ₱ gro. $9.00
Green Mountain S. S., ₱ gro. $6.00
Extra Indian Pond S. S., ₱ gro. $5.00
No. 1 Indian Pond S. S., ₱ gro. $4.00
No. 2 Indian Pond S. S., ₱ gro. $3.00
Leader Red End S. S., ₱ gro. $4.50
Quick Cut Emery....₱ gro. $10.00
Pure Conundrum....₱ gro. $18.00
Crescent.....$7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10.00
Emery Scythe Rifles, 4 Coat, $12.00
Balance of 1904 list 33⅓%.
Electro (Artificial), ₱ gro., $12.00.....33⅓%
Lightning (Artificial), ₱ gro., $18.00.....33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.....₱ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ₱ doz., No. 1, $10.00.....60%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....50@55&10%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Acme Embossed case hts...20&10&10%
Cary's Universal, case hts...20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket.....doz. $1.00
Excelsior Stretcher and Tack Hammer Combined, ₱ doz. $6.00.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan 15, 1902.....30&5%
P., S. & W. Co.....40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ₱ doz.
Sapphire, Cloth, Mahogany.....$ 5.00
Triumph, Fancy Veneers.....6.00
Parlor Queen, Fig. Rosewood..$30.00
Elite, Hungarian Ash.....$ 9.00
Am. Queen, Fig. Mahogany....$27.00
Ideal, Bird's Eye Maple.....$ 10.00
Grand, Rapids, Nickel.....$24.00
Japan.....$ 5.00
Standard, Nickel, $22.00; Japan.$20.00
Crown Jewel, Nickel, $21.00; Jap.$20.00
Crystal, Glass, Tel. Frame.....$36.00
Grand, 17 in. wide.....$36.00
Club, 24 in. wide.....$54.00
Hall, 28 in. wide.....$60.00

NOTE.—Rebates: 50c per dozen on three dozen lots, $1 per dozen on five dozen lots; $2 per dozen on two dozen lots; $2.50 per dozen on twenty-five dozen lots

Tacks, Finishing Nails, &c.

American Carpet Tacks...90&25%
American Cut Tacks.....90&25%
Swedes' Cut Tacks.....90&55%
Swedes' Upholsterers'.....90&55%
Gimp Tacks.....90&25%
Lace Tacks.....90&25%
Trimmers' Tacks.....90&25%
Looking Glass Tacks.....65%
Bill Posters' and Railroad Tacks, 90&40%
Hungarian Nails.....80&10%
Finishing Nails.....70%
Trunk and Clout Nails.....80%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks.....90&10&10&10&10&5%
See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.: Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
120	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin...50@—%
Patent Leather.....25@50&5%
Steel.....$3 1-&5%
Chesterman's.....25@25&5%
Kraftel & Esser Co.:
Paroid Asses Skin.....10&10@50%
Parcite, Duck and Leather.....25&5@35&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Asses' Skin.....40&10&5%
Metallic.....30&30&5%
Patent Bend, Leather....25&5@25&10%
Pocket.....40@40&5%
Steel.....33⅓&35%
Woodman & Edgar:
Chesterman's Metallic, No. 34L, etc.....25%
Chesterman's Steel, No. 1038L, etc.....35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c.....30@33⅓%

Ties, Bale—Steel Wire—

Simple Loop.....80&10&5%
Monitor, Cross Head, &c.70&2½%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Haying—

Myers' Hay Tools.....45%

Miniature—

Smith & Hemenway Co.'s, Davidson, ₱ doz., Nickel Plated, $1.50; Gold Plated.....$2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida.....75&10%
Newhouse.....40@45&5%
Hawley & Norton.....65%
Victor.....75@75&10
Oneida Community Jump.....50%
Hector.....75@75&10

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Hermetic):
No. 1, Rat, ₱ doz., $13.25...$11.50 doz.
No. 3, Rat, ₱ doz., $6.50... $5.75 doz.
No. 3½, Rat, ₱ doz., $3.25... $4.10 doz.
No. 4, Mouse, ₱ doz., $3.85. $3.00 doz.
No. 5, Mouse, ₱ doz., $3.00. $2.25 doz.
Oneida Community:
Out o' Sight, Mouse, ₱ doz....$0.60
Out o' Sight, Rat, ₱ doz..... 1.25
Easy Set, Mouse, ₱ doz..... .35
Easy Set, Rat, ₱ doz..... 1.00
Wood Choker, Rat, 6 doz. holes, .12
Perfect Pie Choker, 5 hole, ₱ doz. traps..... .75

Trowels—

Disston Brick and Pointing.....25%
Disston Plastering.....20%
Disston "Standard Brand" and Garden Trowels.....30&5%
Kohler's Steel Garden Trowels, ₱ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels.....₱ gro. $6.00
Woodrough & McFarlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Boss Co:
New York Pattern.....50&10%
Western Pattern.....60&10%
Handy Trucks.....₱ doz. $16.00
Grocery.....₱ doz. $15.00
McKinney Trucks.....each, net $20.00
Model Stove Trucks.....₱ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.

No.	0	1	2	3
Galvanized.	*$67*	*$79*	*$89*	*$99*

10%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls 25¢@25¢
No. 12, ½ and 1-lb. Rol 8...21¢@23¢
No. 18, ½ and ½-lb. Balls..18¢@20¢
No. 24, ½ and ½-lb. Balls. 17½@19¢
No. 36, ½ and ½-lb. Balls..15¢@16¢
Chalk Line, Cotton Balls.....26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....11@19¢
Cotton Wrapping, 5 Balls to lb., according to quality...15½@23¢
American 2-Ply Hemp, ½ and ½-lb. Balls.....14½@15¢
American 3-Ply Hemp, 1-lb. Balls.....15½@16½¢
India 2-Ply Hemp, ½ and ½-lb. Balls (Spring Twine) 10½@11½¢
India 3-Ply Hemp, 1-lb. Balls 10½@11½¢
India 3-Ply Hemp, 1½-lb. Balls.....
2, 3, 4 and 5-Ply Jute, 1-lb. Balls.....13½@14½¢
Mason Line, Linen, ½-lb. Bls.47¢
No. 2½ Mattress, ¼ and ½-lb. Balls, according to quality. 30@60¢
Wool, 3 to 6 ply....B 9¢; A 10¢

Vises—

Solid Box.....50@50&10%

Parallel—

Athol Machine Co:
Simpson's Adjustable.....40%
Standard.....40%
Amateur.....25%
Columbian Hdw. Co.....40%
Fisher & Norris Double Screw, net, each Nos. 2, $10.50, 3, $16.00; 4, $20.50; 5, $27.00.
Fulton Mach. & Vise Co.:
Reed, Swivel.....25
Star, Solid Jaw.....40
Hollands:
Machinists'.....40&10&5
Keystone.....65&5&5&10
Lewis Tool Co.:
Adjustable Jaw.....50%
Monarch, 50; Solid Jaw.....50%
Massey Vise Co.:
Climber.....40%
Perfect, 15%; Lightning Grip.....15%
Merrill's.....20
Millers Falls Oval Slide Pattern.60&10%
Parker's:
Victor, 20@25%; Regulars.....20@25%
Vulcan's.....40&45
Combination Pipe.....55@60
Prentiss.....20@25
Rock Island.....25%
Snedeker's X. L.....33⅓
Stephens'.....33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ₱ doz., $24.00, 30"; Clamps.....30%
Perfection Saw Clamps, ₱ doz....$4.50
Reading.....60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed.....25
Star.....40
Massey Vise Co.:
Lightning Grip, 15%; Perfect.....15%
Wyman & Gordon's Quick Action, 6 in., $6.00, 9 in., $7.00, 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.
Rock Island Pipe.....25%

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10.....1.25
P. E., 8.....1.50
P. E., 7.....1.50
Ely's B. E., 11 and larger.$1.70@1.75
Ely's P. E., 12 to 20.....$3.00@3.25

Dia. 15

Ware, Hollow—
Cast Iron, Hollow—

Stove Hollow Ware:
Enameled.....45&10%
Ground.....50&5%
Plain or Unground.....60%
Country Hollow Ware, per 100 lbs.....$3.00
White Enameled Ware:
Maslin Kettles.....65&10%
Colored Wares:
Tinned and Turned.....35&10%
Enameled.....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....33⅓
Iron Clad Ware.....70&10
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch.....	*6*	*7*	*8*	*9*
Each.....	*45¢*	*50¢*	*65¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles.....65@65&5%
Avery Kettles.....60%
Porcelained.....5 & 5 & 10
Never Break Spiders and Griddles.....65&5%
Never Break Kettles.....60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone...40@40&10%

Washboards—

Solid Zinc: ₱ doz.
Crescent, family size, bent frame $4.05
Red Star, family size, stationary protector.....$4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$3.55
Cable Cross, family size, stationary protector.....$3.60
Single Zinc Surface:
Solid, family size, open back, perforated.....$3.00
Single Saginaw Globe.....$2.85
Brass Surface:
Brass King, Single Surface, open back.....$4.05
Nickel Plate Surface:
No. 701 Nickel Plate, Single Surface.....$3.60
Glass Surface:
Glass King, Single Surface, open back.....$3.05
Enamel Surface:
Enamel King, Single Surface, ventilated back.....$3.95

Washers—Leather, Axle—

Solid.....90&10%
Patent.....90@90&5%
Coil: ⅞ 1 1¼ 1¾ Inch
11¢. 12¢. 13¢. 15¢. per box

Iron or Steel—

Size bolt....5-16 ⅜ ½ ⅝ ¾
Washers....$5.90 5.00 3.70 3.50 3.30
The above prices are based on $3.50 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Wedges—

Oil Finish.....lb....@3¢

Weights—Hitching—

Covert Mfg. Co.....30&2%

Sash—

Per ton, f.o.b. factory:
Eastern District.....$30.00
Southern Territory.$24.00@25.00
Western and Central Districts.....$25.00@28.50

Wheels, Well—

8 in., $2.25; 10-in., $2.85; 12-in., $3.50; 14-in., $4.80.

Wire and Wire Goods—

Bright and Annealed:

6 to 9	*72¢&10&7½%*
10 to 14	*72½¢&10&10*
15 to 26	*75¢&10&10¢&2½%*
27 to 36	*77½¢&7½%*

Galvanized:

6 to 9	*72½¢&10*
10 to 14	*72½¢&10&5%*
15 to 16	*72½¢&10&5%*
17 to 18	*72½*
19 to 26	*70¢&2½*
27 to 36	*65¢&10&10*

Coppered:

6 to 9	*65¢&10&10%*
10 to 14	*70¢&10&5%*
15 to 18	*65¢&10&10%*
19 to 26	*70¢&2½%*
27 to 36	*72½¢&10&2½*

Tinned:

6 to 18	*67¢&10&10%*
Brass	*17½¢ lb., base*
Copper	*32¢ lb., base*
Cast Steel Wire	*50%*

Spooled Wire—

Annealed and Tinned...70¢&10&10%
Brass and Copper.....60¢&10&10%
Retailers' Assortments, per box, 100 to $2.50

Wire Clothes Line see Lines
Wire Picture Cord see Cord

Bright Wire Goods—

Steel Wire Goods.90&20&10&25%
Brass Wire Goods....90@90&10%
Brass Cup and Shoulder Hooks, 80&15%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80&55¢ 80&10%
Painted Screen Cloth, 100 ft., $1.50
Standard Galv. Hardware Grade: Per 100 sq. ft.

Nos. 2, 2½ & 3 Mesh	*$2.50*
Nos. 4 and 5 Mesh	*$2.75*
No. 8 Mesh	*$3.00*
No. 8 Mesh	*$3.50*

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural.....75@75&10%
Alligator or Crocodile..70¢10@75%
Baxter Pattern S Wrenches..... 70¢55¢70&10%
Drop Forged S.....45@45&5%
Acme.....60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut.....50%
Combination Black.....40&5%
Merrick Pattern.....50
Boardman's.....40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model.40&10&5&5%
Coes', Genuine Hammer Handle.....40&10&5&5%
Coes' "Mechanics'".....40&10&10&5&5%
Donohue's Engineer.....40&10%
Eagle.....70%
Gem Pocket.....50
Hercules.....70%
W. & B. Machinist:
Case lots.....50&5%
Less than case lots.....50%
W. & B. Railroad Special:
Case lots.....50%
Less than case lots.....40&10&5%
Solid Handles, P., S. & W., 50&10%; full cases.....50&10&5%
Stillson.....65%
Uwanta Wrench Co.:
Railroad Special, Iron Handle, 10&10&5%
Other Wrenches.....50%
Vulcan and Agrippa Chain.....50%
Whitaker Machinists':
Case lots.....50&10%
Less than case lots.....50%

Wrought Goods—

Staples, Hooks, &c., list March 6, '02.....90%

Zinc— (*Cask lots at mill.*)

Sheet.....per 100 lb. $7.00

THE IRON AGE

New York, Thursday, February 6, 1908.

A MODERN FACTORY POWER PLANT.

That of the Cleveland Twist Drill Company, Cleveland, Ohio.

One of the best indications of the growth of a manufacturing concern is the amount of power which it requires at different periods of its history for the operation of its works.

For the second time in the past eight years the Cleveland Twist Drill Company, Cleveland, Ohio, has found it necessary to erect a new and larger power plant. The first, completed in 1900, was considered a model for its time and kind and fully commensurate with the demand for some time to come. It was outgrown in a few years, however, and the plant just finished to take its place is one of the most thoroughly modern factory power plants in existence.

The Growth of Power Demand.

A brief survey of the stages in the company's evolution which have led up to the present increase of power may be of interest. In 1888, 14 years after the business was established, about 32 hp., purchased from a neighboring plant, containing a 75-hp. engine, was sufficient. In 1891 the adjoining factory, buildings and power plant entire were acquired. By 1894 the engine was being run at nearly its maximum capacity, and a gas engine was installed to help out in one department. By the summer of 1898 the engine was again so overloaded that an electric motor was resorted to as auxiliary, and this, with current bought from the city lighting company, relieved it of another department. By the following year the need of more power was so pressing that in July, 1899, the first new power plant was begun.

In the construction of this one radical change was made. Formerly all departments of the factory had been driven by belt directly from the engine. The power consumed in running the line and auxiliary shafting which this system necessitated was considerable, and when plans for the new plant were drawn up it was decided to substitute electric power with an induction motor in each department. Power for the motor was generated by a 275-hp. tandem compound engine directly connected to a 150-kw. 220-volt 60-cycle alternator and two Babcock & Wilcox water tube boilers of 153 hp. each, 160 lb. pressure, with chain grate stokers, supplied the steam. This proved sufficient until 1901, when a still further increase was demanded, and another larger tandem compound engine was installed. This one was of 350-hp., and was directly connected to a 200-kw. alternator generating current at the same voltage and periodicity as its predecessor. The extra steam required was supplied by a 260-hp. water tube boiler of the same make and style as the others, and also equipped with Babcock & Wilcox chain grate stokers.

With this addition made, the old engine was shut down to be held as a reserve, which it was expected would be sufficient for any increase in power demand that might occur within the next 15 or 20 years. In only four years, 1905, the old engine had to be started again. The space in the boiler house was then fully occupied so that another boiler could not be accommodated, and those in use were so overtaxed as to compel the installation of induced draft. Appreciating that there would be no further hope of increasing the capacity of the existing equipment it was decided in June, 1906, to build the present 1800-hp. boiler plant, and a contract was let for a 1300-hp. cross compound vertical engine.

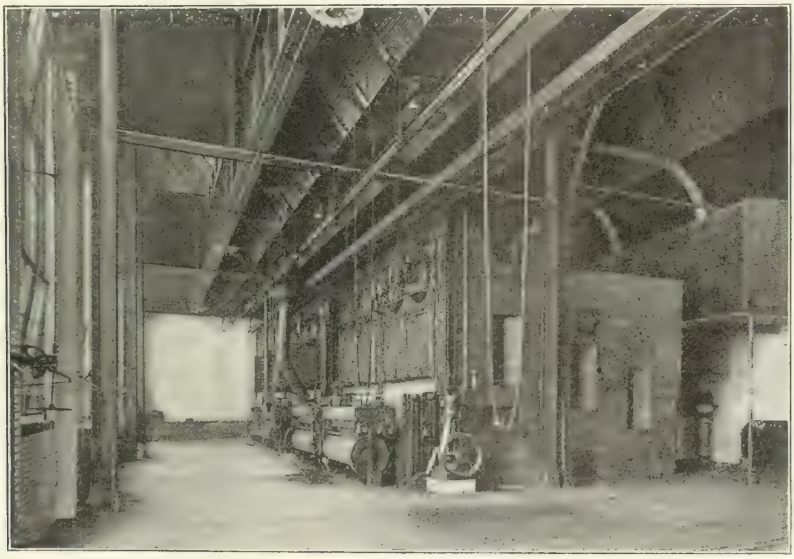


Fig. 1.—View in the Boiler House of the Cleveland Twist Drill Company's New Power Plant.

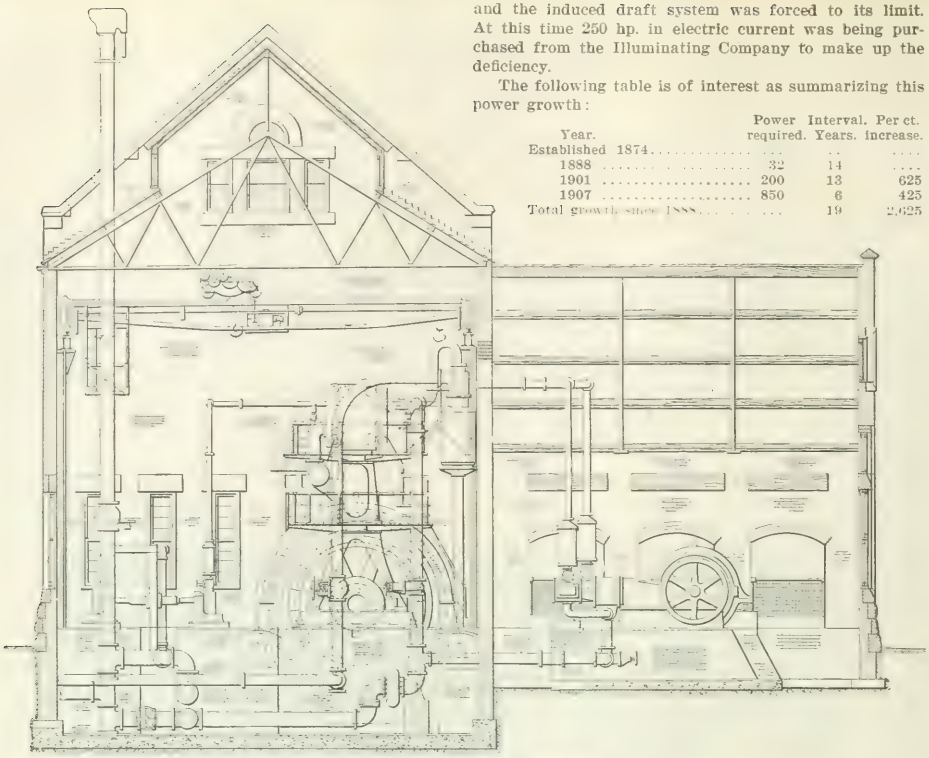
Ground was broken in August last year and none too soon, for in October the old engine failed under its excessive load and went permanently out of commission. As the factory at that time was using about 475 hp. it was necessary to buy current from the Cleveland Elec-

When in March, 1907, a 250-kw. direct current generator directly connected to a 400-hp. four-valve Ball engine was added the immediate need of additional boiler power was still more evident. The new generator was intended for exciting the alternators and operating electric apparatus requiring direct current. With its addition to the plant almost 600 hp. was being taken from the boilers,

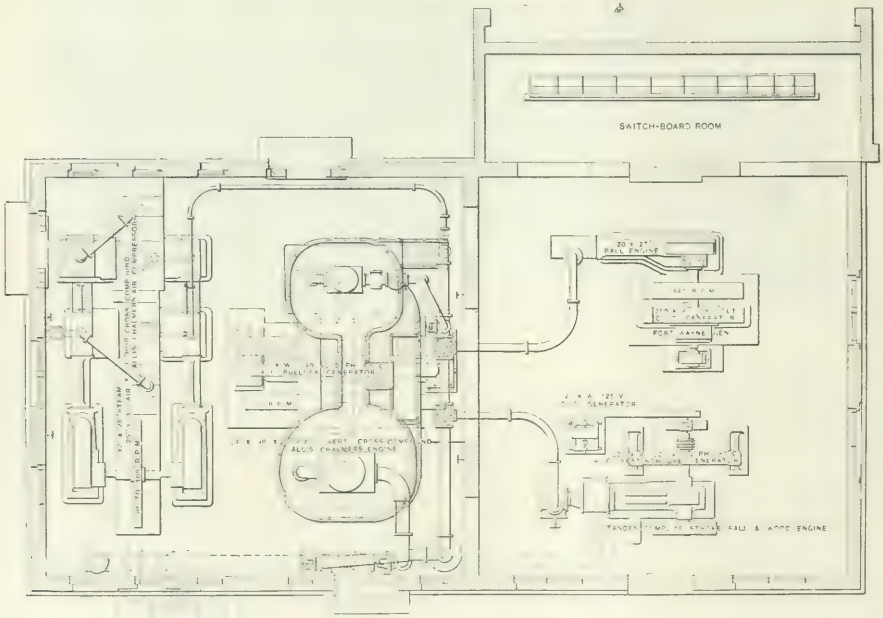
and the induced draft system was forced to its limit. At this time 250 hp. in electric current was being purchased from the Illuminating Company to make up the deficiency.

The following table is of interest as summarizing this power growth:

Year.	Power required.	Interval. Years.	Per ct. increase.
Established 1874	...	..	....
1888	32	14	....
1901	200	13	625
1907	850	6	425
Total growth since 1888	...	19	2,625



LONGITUDINAL SECTION THROUGH ENGINE ROOM



FIRST FLOOR PLAN OF ENGINE ROOM

Fig. 2 Sectional Elevation and Plan of the Engine Room. Showing the Arrangement of the Equipment.

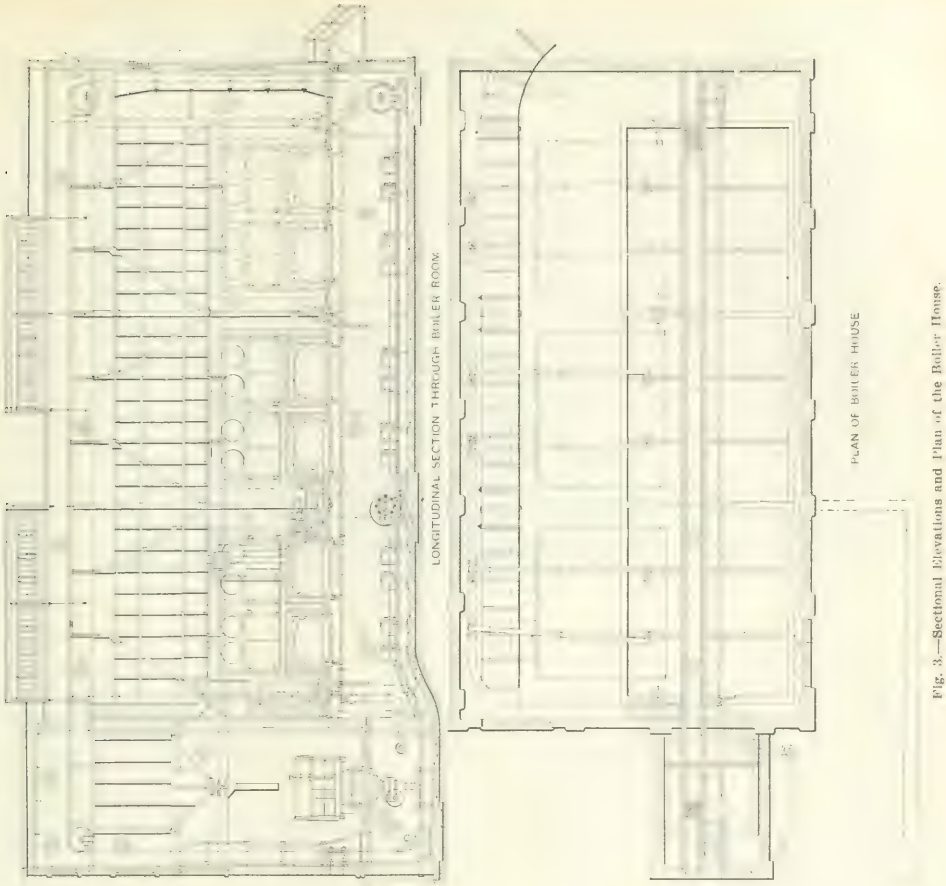
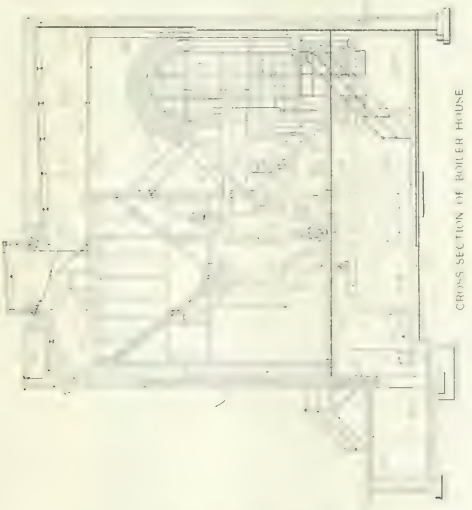


Fig. 3.—Sectional Elevations and Plan of the Boiler House.



The New Power Plant.

The power plant is divided into two separate parts: the engine, generators and air compressor are located in the engine room, Fig. 2, adjoining the main factory buildings, while the boilers, pumps, &c., are located in the boiler house, Fig. 3, which is situated across the railroad track dividing the property. The two buildings are connected by a tunnel through which are carried the steam and water piping, electric wiring, &c., and which also serves as a passageway for factory purposes. The plans show the general layout and the location of the principal parts of the plant, while the various sections show the comparative hights of the buildings.

The steam generating equipment consists of four Babcock & Wilcox vertical header type, water tube boilers of 300 hp. each, and space has been left for later installing an additional battery of two 300-hp. boilers. The boilers are designed for a working steam pressure of 160 lb. Each boiler has a heating surface of 3000 sq. ft. and a grate surface of 64 sq. ft. The grates are of the Chicago chain grate type, as made by the Babcock & Wilcox Company, and are of exceptionally heavy construction.

For operating the stokers there are two vertical engines made by the New York Safety Steam Power Company each of sufficient power to operate all the stokers. These engines are located on the main boiler room floor, where their easy accessibility insures proper care. They are connected by Morse chain drives to a shaft running through the basement, on which are mounted the eccentrics for operating the stokers, as shown in the elevations of the boiler house, Fig. 3, and the effect of the elimination of shafting and belts in the boiler room proper is well indicated in Fig. 1.

A radial brick chimney, 175 ft. high, with a flue 10 ft. in diameter, has been erected independent of the



Fig. 4.—The Conveyor Where It Passes Over the Coal Bunkers.

boiler room, and is connected to the boilers by a steel smoke breeching of ample size, located overhead directly in the rear of the boilers, as shown in Fig. 3.

To provide storage for an ample supply of coal, bunkers have been installed above the boilers having capacity for sufficient coal to operate the plant for a month. The bunkers have their own supporting structure which is entirely independent of the building, consisting of heavy steel columns. The bunkers have concrete floors and walls formed within a framework of steel beams, between the lower flanges of which are sprung corrugated steel arch plates. A very hard wearing surface for the concrete was obtained by the use of granite screenings and neat cement mortar. The coal bunker is provided with two fireproof bulkheads to limit the spread of a fire if one be caused by spontaneous combustion.

The plant operates very satisfactorily with finely crushed or slack coal. To insure the feeding of the proper size of coal to the stokers, a crusher is installed in a pit below the railroad track, on which the coal is delivered. The fuel is received in dump bottom cars, from which it passes through the crusher into a bucket type coal conveyor, and the latter carries the coal directly to the bunkers. The tripping point where the conveyor buckets are dumped as they pass over the bunkers is alterable to distribute the coal at will. This part of the conveyor run is illustrated in Fig. 4. The same conveyor is used for carrying the ashes from the ashpits in the basement

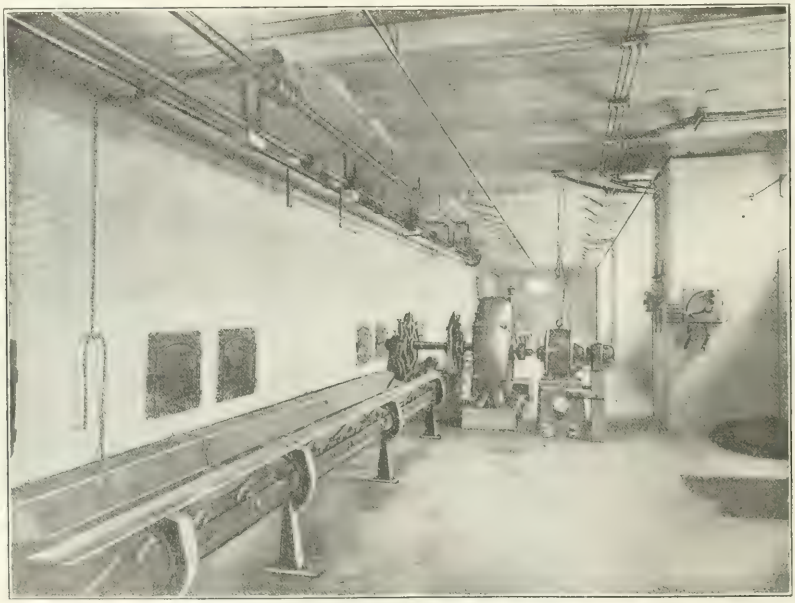


Fig. 5.—The Drive of the Conveyor and the Ash Receiving Part of Its Run.

to a large ash bunker located directly above the railroad track. A portion of the run of the conveyor through the basement and its drive are illustrated in Fig. 5. The complete course of the conveyor is indicated in the drawings of the boiler house given in Fig. 3. Both the coal crusher and conveyor are operated by electric motors, and were furnished and installed by the C. W. Hunt Company, New York.

Two boiler feed pumps are provided, each having ample capacity for feeding all of the boilers. The pumps are located in the rear of the boilers on the main floor. In designing the boiler house particular attention was given to allowing ample working space and good ventilation, both in the main boiler room and the basement. The walls of the boiler room are finished with white enamel brick, the boiler settings are of red pressed brick, and the plant as a whole presents an attractive appearance.

For driving the machinery throughout the factory induction motors are used, operated by two-phase, 220-volt alternating current. Two generating sets furnish the current. The larger or main unit consists of an 800-kw. generator directly connected to a 24 and 38 x 48 in. vertical cross compound noncondensing Corliss engine, operating at a speed of 90 rev. per min. This complete unit was furnished by the Allis-Chalmers Company. A supplementary generator having a capacity of 200 kw. and made by the Westinghouse Electric & Mfg. Company, is directly connected to a Ball & Wood 17 and 29 x 18 in. tandem compound engine running at 200 rev. per min.

In addition to the alternating current furnished by these units, there is also required a considerable amount of direct current, which is supplied at 115 volts and is used for exciting the fields of the alternating current generators, for operating electric cranes and for various other purposes. This current is generated by a 250-kw. Fort Wayne generator, directly connected to a 20 x 27 in. single cylinder four-valve engine operating at 140 rev. per min., made by the Ball Engine Company, Erie, Pa.

Experiments during the past few years have demonstrated that compressed air can be used to great advantage in connection with many of the processes employed by the Cleveland Twist Drill Company. To furnish this compressed air supply an Allis-Chalmers 12 and 20, 20 and 12 x 36 in. horizontal cross compound noncondensing two-stage air compressor, having a capacity of 1300 cu. ft. of air per minute, has been installed in the engine room.

In designing the system of steam piping for this plant the main intent has been to have it as simple as possible, consistent with safety and good working conditions, and to avoid as far as possible all complicated cross connections. While the system is extremely simple, continuous operating and safety are amply provided for by careful design and the use of the best material, such as extra heavy pipe with welded steel flanges, extra heavy valves and fittings, and the use of long sweep bends wherever practical, as well as the use of copper and brass pipe for all boiler feed lines.

The switchboard which controls the current distribution is not only handsome in appearance, but extremely simple and well adapted to the requirements. It is fitted with the most modern and approved instruments, and is located in a separate fireproof room adjoining the engine room.

The engine room is served with an electric traveling crane, so that facilities are at hand for accomplishing repairs in the shortest time, or to allow any changes in the arrangement which may seem desirable, without seriously interfering with the continuous operation of the work.

The entire plant was designed by and erected under the supervision of George S. Rider & Co., consulting engineers, Cleveland, Ohio.

The Ellwood Ivins Tube Works, Oak Lane Station, Philadelphia, Pa., calls attention to a new departure in tool steel. Those who have been boring out solid bars or rods, wasting half or more of the steel in borings and turnings, as well as taking much time to do it, are directed to the advantages of the company's seamless tool steel tubing for such purposes. It is furnished bright, smooth and clean, with no scale on it, and in precisely the required size, inside and out. It can simply be cut to the length desired, tempered, and, as the company says, "the trick's done."

The Midvale Steel Company's Report.

The annual report of the Midvale Steel Company, Philadelphia, covers the operations for the 12 months ending October 31, 1907, and shows the following:

Profits for year after deducting all costs, charges and expenses, including depreciation		$914,929
Dividends paid	$206,250	
Less adjustment value of bar steel	167,122	
		373,372
Balance, surplus, for year		$541,557
Surplus as of October 31, 1906		10,700,385
Total surplus, October 31, 1907		$11,241,942

The net earnings for 10 years, ending October 31, 1898, to 1907, both inclusive, after deducting all costs, charges and expenses, including depreciation, management salaries, commissions and selling expenses, but not taking into account any interest on capital employed in the business, were as follows:

Year.	Net profits.	Year.	Net profits.
1897-98	$526,198	1902-03	$748,488
1898-99	1,291,922	1903-04	918,543
1899-00	1,599,339	1904-05	1,632,339
1900-01	1,282,151	1905-06	962,167
1901-02	1,074,523	1906-07	914,929
Total			$10,950,599

The balance sheet as of October 31, 1907, is as follows: Assets: Land, $248,501; buildings, $2,576,910; plant and machinery, $6,611,061; tools, $519,943; office and miscellaneous equipment, $30,599; patterns, $200,000; total plant, $10,187,014. Worked material, $1,839,456; raw material, $389,132; merchandise, $333,135; coal, $19,654; stores, $45,866; bills and accounts receivable, $982,960; cash, $183,326; total cash assets, $3,793,529; tota. assets, $13,980,543. Liabilities: Capital stock, $750,000; bills payable, $1,200,000; accounts payable, $788,225; sundry commission accounts, $375; surplus, $11,241,942.

The Buffalo Forge Company Fills an Order in Record Time.—On January 10 the Buffalo Forge Company, Buffalo, N. Y., received an inquiry from the Strong, Carlisle & Hammond Company, Cleveland, Ohio, for the best possible shipment of a large electric blower with motor attached. The motor required was of a special speed, and communication with the motor builders developed the fact that they would undertake to ship such a motor in five working days. Allowing for express shipment from the works of the motor builders, the Forge Company promised shipment of the order in 10 days after its receipt. The order came in Saturday, the 11th, the motor was ordered by wire the same date, and it was received by express Thursday, the 16th. In the meantime, patterns had to be changed and castings made for the special subbase to accommodate the motor. This work also involved changes in the drawings. Everything being in readiness the work of assembling was done on Friday and shipment was made Saturday, the 18th, a few hours less than a week after the order came in. This blower has a capacity of 6500 cu. ft. of air per minute at a pressure of 6 oz. per square inch, when operated at normal speed of 1130 rev. per min. Usually from four to six weeks is required for shipment on an outfit of this kind.

Dr. S. C. Dickey, president of the Technical Institute, Indianapolis, was the guest of the Citizens' Industrial Association of St. Louis, January 21, and delivered an address. A movement is under way to establish industrial training in connection with the public schools of St. Louis, beginning with an endowment of $2,000,000. He says his Technical Institute is in better condition than at any time since it was opened in 1903. The student body is the largest and the equipment of the workshops is constantly being enlarged and improved.

Automatic Hinge Pin Heading Machinery.

In recent years the art of cold heading has been so developed that shapes which it was once thought necessary to cast or forge can now be made most economically from cold wire, even when several handlings are necessary. This naturally opens up new fields for cold heading machinery. Experience has demonstrated that a "full automatic" machine is not always desirable or as profitable as one in which the operations are divided for two or more handlings. The kind of goods made and the quality of help employed are also determining factors in many instances, since automatic machinery is most successful when attended by skilled operators.

The article in mind, and the machinery for manufacturing which is to be described, is a ball tipped hinge pin, which consists of two parts, the hinge pin proper, having the collar and ball at the top, and the short ball tip, which goes in the lower end of the hinge. To make this article in its various sizes directly from a coil of wire some expensive though successful mechanical combinations have been designed, but it is a question whether the economy is not in favor of simpler and less costly machinery which can be operated more rapidly and with less attention. A process developed by the E. J. Manville Machine Company, Waterbury, Conn., which has been very satisfactorily employed by its customers to manufacture these pins, uses first a standard open die cold heading machine to make a blank of proper length, having a collar formed near one end, such blanks being produced at a rate of from 80 to 150 per minute, depending on the size of wire used. The principal interest attaches to the automatic machine, illustrated in Fig. 1, by which these collared blanks may be rapidly converted into finished ball tipped pins. It consists of an open die double stroke heading machine, combined with a suitable feeding mechanism, into the hopper of which a quantity of blanks of the form shown at the top in Fig 2 may be thrown promiscuously, and by which they will be selected and started properly down an inclined raceway hanging by their collars; since there is more metal on one side of the collar than on the other they will all hang with the long end down. The blanks in line reach the bottom of the feeding track, from which point they are taken one at a time by a carrier and fingers, which present them in exact position between two gripping dies. These dies when closed form a mold to rigidly hold all of the blank except the short end which is to form the ball, and this projecting portion is compressed into proper shape by two punches, which act upon it. The first is so shaped as to centralize and partially upset the amount of metal required for the ball, as shown by the middle piece in Fig. 2, and the second punch has a hemispherical recess corresponding with that formed in the dies, so that when this punch and the dies are brought firmly together, the ball is perfectly formed, as in the lower piece in Fig. 2. The punches then recede, while the dies open and a mechanical stripper releases the finished blank, so that it drops from the dies by gravity. By this process these pins may be formed at the rate of 60 per minute—that is, when working on a pin suitable for a 3½ or 4 in. hinge.

The machine used is one in which the heading punches are carried on the front end of a reciprocating crank driven gate, but the holder which contains the two punches is movable vertically, and is operated up or down at each alternate revolution of the crank shaft, so that the two punches may work alternately on the blank to be headed, and, when in their respective positions, are automatically locked rigidly to the gate, so as to prevent their dodging or being strained out of accurate alignment with the blank to be headed.

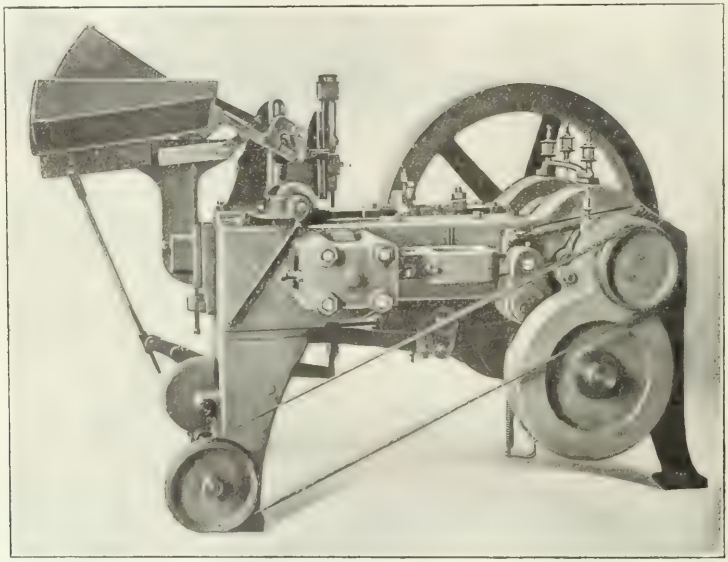


Fig. 1.—An Open-Die Double Stroke Heading Machine for Forming Hinge Pin Heads. Built by the E. J. Manville Machine Company, Waterbury, Conn.

One of the two dies between which the blank is held while being headed is stationary, while the other is attached to a toggle plunger, moved at proper intervals through suitable connections and a bell crank lever by a cam on the lower or cam shaft of the machine. This shaft is geared to make one revolution for each headed pin produced. The cam and bell crank must be powerful, and, therefore, provision is made to relieve the strain if the blank does not fall in proper place between the gripping dies, or is caught between the faces instead of in the groove. When the resistance becomes too great the pressure is relieved by the breaking of a small square cast iron plate, which is easily and quickly replaced after the obstruction is removed.

In the hopper a fan shaped blade, formed with a recess in its upper edge, is pivoted so as to rise and fall through a pile of blanks. During its upward stroke it picks up the few blanks which lie in the proper position in its path, and these are lifted, as before mentioned, by their collar portion. The blanks caught slide

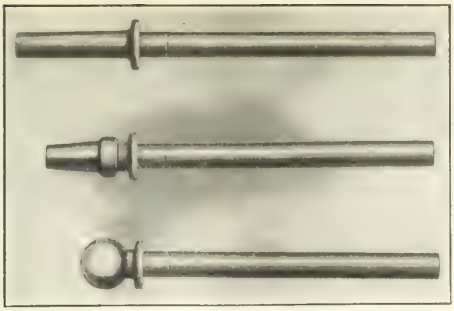
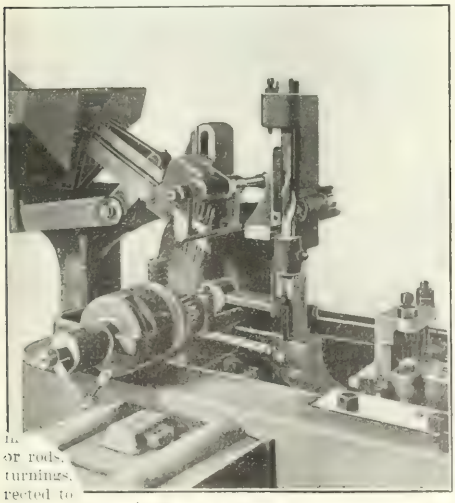


Fig. 2.—The Original Blank and the Two Stages in the Forming of the Ball End of the Hinge Pin.

ward the outlet at the lower end, where they are retarded by a mechanism which permits only such blanks as have their short end uppermost to pass on; those in wrong position are returned to the hopper. This hopper blade is belt driven, so that if choking occurs the belt slips, but it seldom does with this character of blank.

There are several novel points in the mechanism illustrated in Fig. 3 for taking the single blank from the line presented and delivering it between the dies. Instead of the usual custom of bringing the line of blanks around a curve so that the last or lower one lies in a horizontal plane, here a transferring carrier presents itself in a vertical position, adjacent to the lowest blank of the line. The cut-off slide then forces the first blank into a spring recess in the carrier and at the same time positively holds back the blanks following. This carrier then turns through an arc of 90 degrees, and on nearing the lower end of its movement, which brings the blank into a horizontal position, moves sideways a short distance, so that the blank is about over the center of the machine. Here it rests while vertically reciprocating spring fingers pick the blank from the recess of the carrier and raise it sufficiently to allow the carrier to return. These spring fingers, having grasped the blank by the part which is to be formed into a ball, now descend between the dies, where the latter can surround and grip the blank; then the fingers ascend for another blank. The spring fingers are attached to the lower end of a shaft, which is carried by a cam-actuated vertically moved slide, the purpose of which is explained later.

The three stages in the making of the short pin are the same as for the long pin, and are represented by the views in Fig. 2, if cut off at the dotted lines. The short pin from its form has to be handled in a slightly different way. The short blanks, having the collars formed as on the long blanks, on being thrown in the hopper will come up with the long end down, so when they are lined up in the tracks and brought to the delivering point they all have the short end up. By changing the shape and position of the oscillating carrier, the arm of which is suitably lengthened, when a blank is delivered into it and the arm swings down to present the blank to the fingers, it is presented with the collar and short end toward the crank shaft of the machine, instead of toward the hopper. The vertically moving fingers now pick up the blank as before, by the part which is subsequently to form the ball, and lift it from the carrier, but as they descend the vertical shaft which carries them is rotated a half revolution, so that the blank is turned and presented between the dies in the same relative position as the long blank. After the dies grasp it the fingers ascend, turning again through a half revolution, ready to receive the next blank. When handling the long blanks this finger shaft is held against rotation by a set screw, but for the short blanks the screw is removed and a slotted piece is secured to the frame, which surrounds the center portion of the shaft. This is flatted on two opposite sides with a half-turn spiral in its central portion, so that as the shaft is carried up and down through this fixed piece it will be rotated a half revolution during each up and down stroke.



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—A Detail of the Blank Feeding Mechanism.

The Production of Pig Iron in Canada in 1907.

The American Iron and Steel Association has received from the manufacturers the statistics of the production of pig iron in Canada in 1907. The total was 581,146 tons, against 541,957 tons in 1906, an increase of 39,189 tons, or over 7 per cent. In the first half of 1907 the production amounted to 270,100 tons and in the second half to 311,046 tons, an increase of 40,946 tons. Of the total 572,025 tons was made with coke, 8971 tons with charcoal and 150 tons with electricity. The production of pig iron in Canada in the last 14 years is given below:

Years	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1894	44,791	1899	94,077	1904	270,942
1895	37,829	1900	86,090	1905	468,003
1896	60,030	1901	244,976	1906	541,957
1897	53,796	1902	319,557	1907	581,146
1898	68,755	1903	265,418		

The production of basic pig iron was 341,257 tons, against 246,228 tons in 1906, and of Bessemer pig iron 154,910 tons, against 165,609 tons in 1906. Basic pig iron was made in 1907 by four companies owning nine furnaces and Bessemer pig iron by two companies owning three furnaces. The basic and Bessemer pig iron was all made with coke. Canada has not made spiegeleisen or ferromanganese since 1899. On December 31, 1907, Canada had 16 completed furnaces, of which 14 were in blast and 2 were idle. Of the total 13 usually use coke for fuel and 3 use charcoal. In addition 3 coke furnaces upon which work was suspended some time ago were partly erected on December 31.

The Gandy Belting Company, Baltimore, Md., has won a suit in the United States Court for the Northern District of Illinois, Eastern Division, against the Weller Mfg. Company, Chicago, and a decree has been issued perpetually restraining the latter from selling, advertising, offering or announcing for sale, or supplying stitched cotton belting painted or dyed red in imitation of the red stitched cotton belting manufactured by the Gandy Company, accompanied by the word "Gandy" affixed or applied thereto, or used in connection with the sale thereof. It also permanently restrains the Weller Company from in any way using the trademark of the Gandy Company. The practice has grown in recent years among certain manufacturers and dealers of selling all kinds of cheap stitched cotton duck belting, claiming it to be the genuine Gandy belting, and the Gandy Company has been forced to protect the trade against such imposition. Consumers are warned to be particular and see that the belting they buy bears the words "Genuine Gandy" stamped at every 10 ft.

The Emerson Steam Pump.

While a steam pump in the sense that it is operated by steam, the pump herewith illustrated, made by the Emerson Steam Pump Company, Alexandria, Va., bears no resemblance to the machine usually known by that name. It has no pistons, plungers or similar moving parts; in fact, it has no moving parts except the valve and valve mechanism, and although there are two cylinders they are alike in their use, both steam and water being admitted to each instead of being isolated from one another in separate cylinders. The pump operates on the vacuum principle for its suction, and pressure principle for its discharge, being in this respect similar to the usual pump, but there is no interposition of a sliding member or other mechanical part to separate them; the steam and water are substantially in contact, although, as later explained, a layer of air separates them to prevent or diminish the condensation of steam before it is intentionally condensed to create the suction vacuum.

Because rubbing surfaces and constricted passages are eliminated, the pump is able to handle satisfactorily water containing sand or gritty material, and even acids or ingredients tending to produce corrosion. For its capacity it is light in weight, and the ease with which

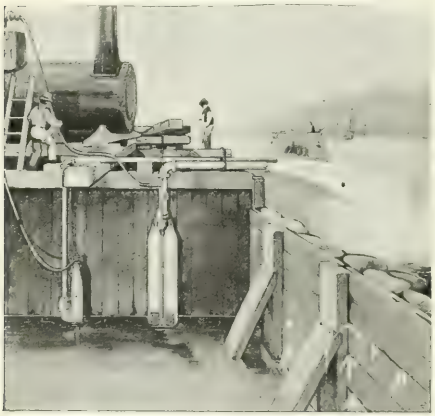


Fig. 1.—A Typical Installation of the Emerson Steam Pump.

it may be handled commends it for use where its position would be frequently shifted, as in the unwatering of cofferdams, caissons, mines, quarries and isolated work of all kinds. Its portability in such a service is indicated in Fig. 1.

The idea of raising water by condensing steam in a chamber and then forcing it to a higher level by the direct pressure of steam on the surface of the water in the same chamber originated with Capt. Thomas Savory, who, in 1698, patented what he called a fire engine. Properly speaking the device was not an engine, but a pump. In operating it one cylinder was filled with steam, the steam valve was closed by the operator and a spray of water was then injected into the steam. The valves were manually operated and an almost continuous stream of water was delivered. As a pumping engine it was used extensively until Newcomen's atmospheric engine displaced it, and then piston pumps first began to come into the field. That the Savory pump was superseded was largely due to the fact that the expansive power of the steam was wasted, and that the steam consumption was therefore enormous. In the Emerson pump there is a saving of at least 25 per cent. in the amount of fuel by using an early steam cut-off, which is made possible by the design of the rotary slide valve steam ports.

The operation will be best understood from Fig. 2, which shows a pictorial section with the parts working. The pump will be seen to consist of two long cigar shaped cylinders, each connected at the bottom through upward opening valves with the suction pipe and also through similar valves with the discharge pipe, as best shown in Fig. 3; thus there are four valves in all. The steam is used twice; first to press down on the surface of the water and expel it through the discharge pipe, then being suddenly condensed by injecting cold water in the upper part of the chamber, vacuum is created which draws in a new charge of water. Obviously the pump would work with only one cylinder, and it is so built (a pump of this kind is also to be seen in Fig. 1), but an advantage accrues from the use of two cylinders in that while one

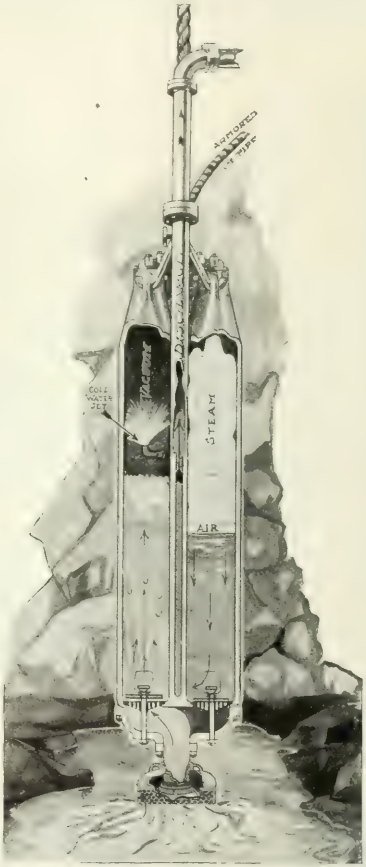


Fig. 2.—A Broken View of the Pump, Showing Its Action.

is drawing in a supply of water the other is discharging, and the otherwise intermittent action of the individual cylinders is converted into a constant flow from the common discharge pipe. The condensing jets of water are supplied by the cylinder at that time discharging, each cylinder in this way serving to condense the steam in its mate.

The form and construction of the pump are also well brought out in Fig. 4, which shows front, side and rear elevations of the pump, illustrating also the piping connections. Simultaneously with the condensation of steam which draws in the water air is admitted through check valves at the upper ends of the cylinders, but in much smaller quantity proportionally than the volume of the water. This air, being heavier than the steam next admitted on the pressure stroke of the cylinder, settles to the surface of the water and thereby separates the steam and water, preventing condensation during the

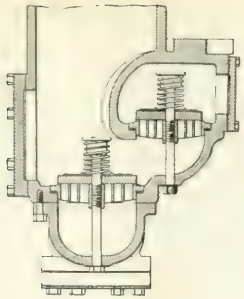


Fig. 3.—Side Sectional Elevation Through the Suction and Discharge Valves.

downward action of the steam. The alternate filling and discharging of the cylinders is so rapid that the walls of the cylinders suffer little change in temperature, and no great amount of condensation is caused by the walls of the cylinder.

The mechanism for controlling the admission of steam alternately to the two cylinders is all incased, so as to be entirely protected from any danger of injury or clogging by dirt or other accumulation. The pump can be operated with entire success when nine-tenths submerged in water. The admission and cut-off valve is a flat rotary valve, which is revolved continuously through reducing gears by a small triple cylinder steam engine located between the two upper ends of the cylinders. The exhaust of this engine empties into the suction pipe of the pump; thus no steam is exhausted to the air, making the pump ideal for underground work, where greasy steam in the air would be a discomfort. It is important that the engine is at the top, and hence no part of it, or of the rotary valve, is ever reached by the material being pumped. The steam chamber above the flat rotary valve is always filled with steam as long as the throttle is open. The rotary valve has an open segment, and as it continually revolves alternately exposes the ports leading to the two cylinders and cuts off the supply before each cylinder is

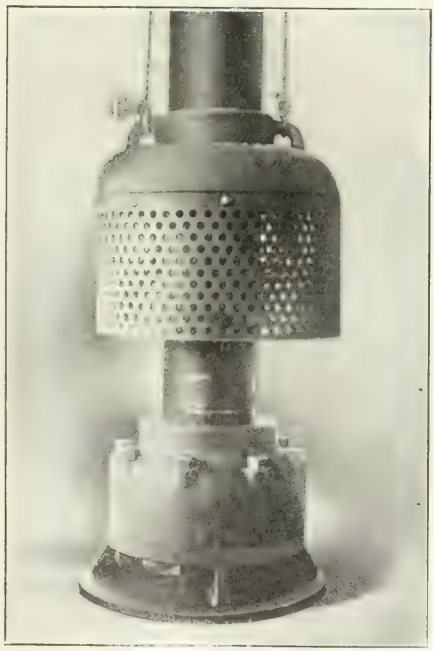


Fig. 5.—The Foot Valve with the Strainer Raised.

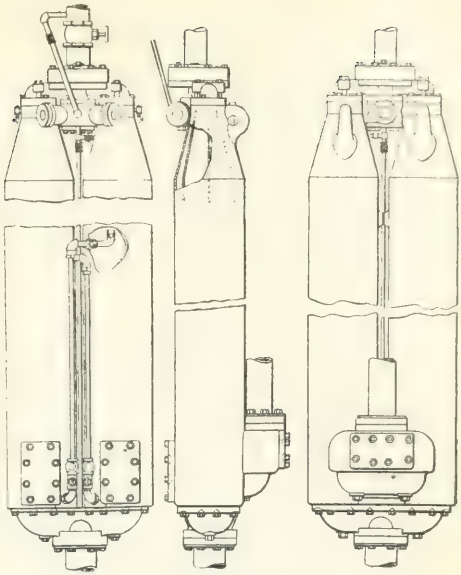


Fig. 4.—Front, Side and Rear Elevations of the Pump.

filled, so that the steam acts expansively until the discharge begins in the other cylinder which injects condensing water in the first. By a throttle valve on the engine supply the speed of the engine may be regulated to give sufficient time to the cycle, as adjusted to the head worked against, so that the full capacity of each cylinder may be utilized in each intermittent filling and discharge. An exact adjustment is not important, since the alternate action of the two cylinders makes the operation continuous. The cylinders, when such might be desirable, may be located at the bottom of the shaft and the steam controlling mechanism at the top of the shaft, or at some distance away from it, without interfering with the automatic efficient running of the apparatus.

In proportion to its capacity the weight of the pump is small. A pump delivering 1200 gal. per minute against a 25-ft. head weighs only 2700 lb. The low weight is possible because the pump has no independent engine for its operation. The weight of such parts is therefore eliminated. It is claimed that the pump will lift three times as much water as any other sinking pump of equal weight, or that can be placed in the same space, and also that it can be had of a capacity four times as great as that of any other pattern of sinking pump. The long drawn out form of the pump is an advantage when it is used in such locations as mine shafts, cofferdams, sumps and caissons. The relatively small amount of space which it takes up is well brought out in Fig. 1.

Concerning the durability of the pump, it is of course evident that grit or foreign matter cannot work any immediate or serious injury to the apparatus, since the water containing such matter never comes into con-

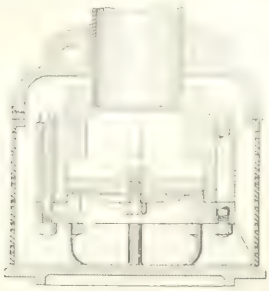
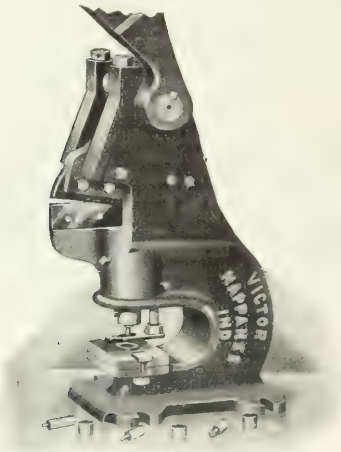


Fig. 6.—Vertical Section of the Foot Valve and Strainer.

tact with anything which moves except the four round rubber valves. In the vicinity of each valve is a hand hole and cover plate, through which access to the valves is possible when they do need attention. It is, of course, necessary to keep large bodies out of the pump cylinders, such as might clog the valves and prevent their proper working. A foot valve and strainer of the form illustrated in Figs. 5 and 6 answers the purpose very satisfactorily. It can be very easily cleaned by lifting with the cords as shown in Fig. 5, when the outside needs only to be scraped or brushed to remove matter that may cling to the perforations. Such grit as could pass through this foot valve or strainer does not come in contact with plungers, pistons, piston rods, glands, stuffing boxes, or other moving parts which it could quickly destroy.

The Victor Hand Punch and Shear.

For general service on light and moderately heavy work, the Nappanee Iron Works, Nappanee, Ind., has brought out a new combination hand punch and shear known as the Victor. A particular feature of convenience is the arrangement of the lever that permits both cutting and punching work to be done either from the front or rear with equal facility. The body is cast in one piece, and the eccentric is made of solid steel with a mortise joint at the top of the thrust having a direct bearing of 1½ in. The shear blades, instead of descending perpendicularly upon the work, are set to make a draw cut. The punches are placed in split sleeves, which are secured in position by a set screw. To insert new punches it is therefore necessary only to loosen the set screw and re-



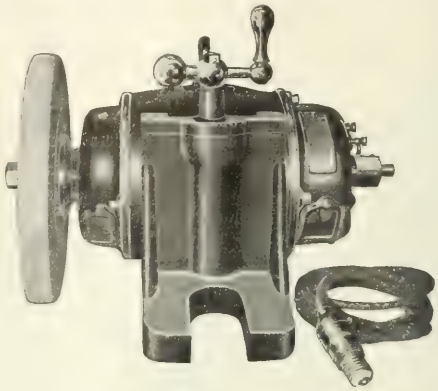
The Victor Combination Hand Punch and Shear Made by the Nappanee Iron Works, Nappanee, Ind.

move the old punch, which may be easily replaced with a piece of drill rod of proper size and length. The die plates are adjustable and can be conveniently removed when changing punches. To provide for wear a gib is placed in the sleeve by means of which the necessary adjustment can be made.

This tool is especially designed and built for use in blacksmith, machine and sheet metal shops requiring a tool of moderate capacity. It is made in two sizes, No. 1 and No. 2; the former has a capacity to shear 3-16-in. flat or ⅜-in. round stock and to punch ¼-in. holes in a 3-16-in. plate to the center of a 6-in. circle. The No. 2, which is especially adapted to tinners' use, will shear 3-16-in. flat or ⅜-in. round stock, and will punch ¼-in. holes in a 3-16-in. plate to the center of a 12-in. circle. The shipping weight of the No. 1 is 100 lb., and its dimensions are 8 in. by 10 in. base by 18 in. high; the No. 2 weighs 135 lb., measures 10 x 14 in. at the base and is 18 in. high.

A New U. S. Portable Electric Grinder.

The portable electrically driven grinder illustrated herewith and manufactured by the United States Electrical Tool Company, Cincinnati, Ohio, is especially adapted for heavy parallel grinding, surface grinding and circular grinding, when used on a lathe, planer or boring mill. It is well suited, for example, for grinding in a lathe large rolls which cannot be handled on the ordinary grinding machine, or for grinding and polishing crank disks or similar parts. Another special feature is its adaptability in grinding between the Vs of an engine lathe, first with an emery wheel and then with a wooden



The 2-Hp. 12-In. Portable Electric Grinder Made by the United States Electrical Tool Company, Cincinnati, Ohio.

wheel faced with leather, to give the finished surface. The emery wheel used is 12 in. diameter by 1¼ in. face, and is claimed to be the largest employed in a tool of this kind and character. The motor is of 2-hp. capacity, of the air cooled type, and has dustproof bearings adjustable for wear. It is operated by direct current obtained through an extension cord with an attaching plug to fit an ordinary electric light socket. The grinder can also be used as a bench grinder and as a universal grinder.

Cement Manufacturers Organize.

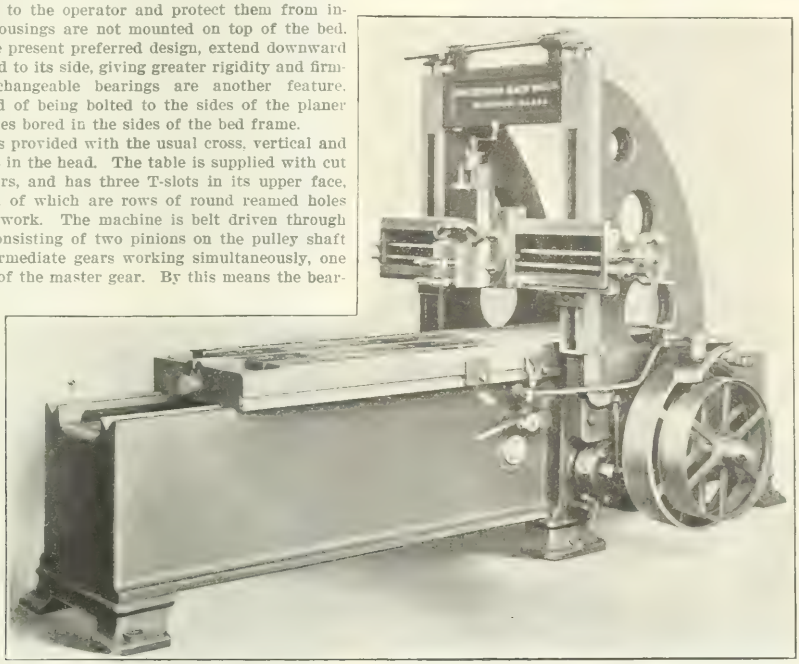
The Association of Licensed Cement Manufacturers was organized in New York January 9 by various important companies in the East and West, all of which have secured licenses under the Hurry and Seaman, Edison, Carpenter, and other patents controlled by the North American Portland Cement Company. The formation of this association terminates protracted patent litigation. A. F. Gerstell, vice-president and general manager of the Alpha Portland Cement Company, is president of the new association; Conrad Miller president of the Dexter Portland Cement Company, is vice-president, and Alfonso De Navarro, vice-president of the Atlas Portland Cement Company, is secretary and general manager.

The purposes of the association include the general betterment of the mechanical and chemical processes used in making cement, the improvement of the quality of cement, dealing with matters of traffic and shipment, and the establishment of an association laboratory for technical tests and experiments. It is understood that all existing and properly equipped cement plants will be granted licenses and admitted to membership. Infringers of the patents above referred to will be rigorously prosecuted. Nearly 70 per cent. of the output of the Portland cement industry in this country is already represented by the association, this being double the annual production in Great Britain, the pioneer Portland cement manufacturing country, equal to the combined output of England and France, and in excess of that of Germany.

The Rockford Planer.

Extending its scope of operations the Rockford Machine Tool Company, Rockford, Ill., whose chief product heretofore has been crank shapers, is bringing out a line of heavy pattern planers, of which the tool here illustrated is the initial machine. More than a year has been spent in developing, perfecting and trying out the planer. While in its general outlines a design common to planer construction has been followed, several features have been introduced which claim attention as departures more or less radical from usual practice. It will be noticed, for instance, that the gears are not exposed, but are located inside of the bed, to secure compactness, remove their menace to the operator and protect them from injury. The housings are not mounted on top of the bed, but, as in the present preferred design, extend downward and are bolted to its side, giving greater rigidity and firmness. Interchangeable bearings are another feature, which instead of being bolted to the sides of the planer are set in holes bored in the sides of the bed frame.

The tool is provided with the usual cross, vertical and angular feeds in the head. The table is supplied with cut rack and gears, and has three T-slots in its upper face, between each of which are rows of round reamed holes for securing work. The machine is belt driven through twin gears consisting of two pinions on the pulley shaft and two intermediate gears working simultaneously, one on each side of the master gear. By this means the bearing surfaces on the most rapid gears and pinions are doubled, with the effect of increasing the power and minimizing wear. A double releasing type of feed friction is used, which, it is claimed, will not wear when operated rapidly, and gives a powerful feed to the tool when taking heavy cuts.



The New Heavy Pattern Planer Built by the Rockford Machine Tool Company, Rockford, Ill.

The planer here illustrated is 24 x 24 in. by 6 ft., and has a cutting speed of 30 ft. per minute, which can be increased, if desired, with a return speed of 95 ft. per minute. A smooth return of the table is effected by a belt shifting device, which shifts one belt ahead of the other. The complete machine weighs 7100 lb.

The Cleveland Foundrymen's Association.—The annual banquet of this society was held at the Hollenden Hotel, on the evening of January 28. W. C. Bruce, the new president of the association, presided. Trade schools were discussed and favored in addresses made by James F. Barker, principal of the new technical high school in Cleveland, and by President Charles S. Howe of the Case School of Applied Science. J. H. Webster, president of the Variety Iron Works, urged that now was the time for foundrymen to return to the 10-hour day. A review of the year's work of the National Founders' Association was made by A. E. McClintock, commissioner of that association, who also spoke of the successful use of molding machines in combating the unjust demands of organized foundry labor. Other short addresses were made by W. D. Sayle, president of the Cleveland Punch & Shear Works Company; L. H. Kittridge, and by J. P. Dawley, attorney for the Cleveland Foundrymen's Association.

The Queen's Run Firebrick Company Expanding.

To meet the constantly increasing demand for its product the Queen's Run Firebrick Company, Lock Haven, Pa., has increased its capital stock from $250,000 to $375,000, for the purpose of building a new plant at Queen's Run, Pa., and is now in the market for the machinery required. The company's present plant at Lock Haven has a capacity of 50,000 hand made brick per day. It is a modern plant, having been entirely rebuilt four years ago. The new plant will be of about the same capacity. Queen's Run is 3 miles west of Lock Haven on the Pennsylvania Railroad. Here the company owns a property consisting of about 5000 acres bordering for 3 miles the north bank of the West Branch of the Susquehanna River. For more than 50 years this territory has been yielding an exceptionally fine quality of high grade fire clay to which is to be attributed the high standard of excellence accorded to Queen's Run fire brick. During the past four or five years the company has extensively and scientifically developed its fire clay deposits so that it is absolutely assured of a supply of both hard and soft clay sufficient for all its requirements for many years.

The main building of the new Queen's Run plant will be 100 x 300 ft., with a machine room extension, a separate building for the power plant, 16 twin kilns, and a storage shed, 60 x 300 ft., with a railroad siding on each side. All the buildings, except the storage shed, will be of steel construction and fireproof. Forty new and substantial houses will be built as homes for employees; also a large boarding house. It is expected that the plans will be completed and contracts let so that building operations may be begun April 1. The equipment of the power plant will consist of two 6 x 16 ft. horizontal tubular boilers, a 200-hp. engine, a 40-hp. engine and 500 light dynamo, feed water heaters, &c. This outfit will not be included in the regular contract.

Storage Racks for Finished Steel.

All metal working concerns have more or less of a stock of bars, wire, plates and shapes, which it is necessary to keep at hand and ready for immediate use. It

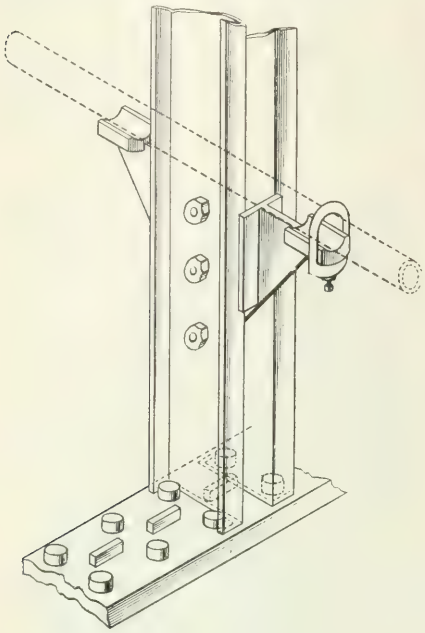


Fig. 1.—The Combination of Floor Plate, Channels and Pipe Bracket Used as a Rack for Coiled Material.

is important that whatever storage system is employed be so designed that the amount of stock of any given size on hand can be determined quickly. To accomplish this and at the same time to utilize the greatest possible

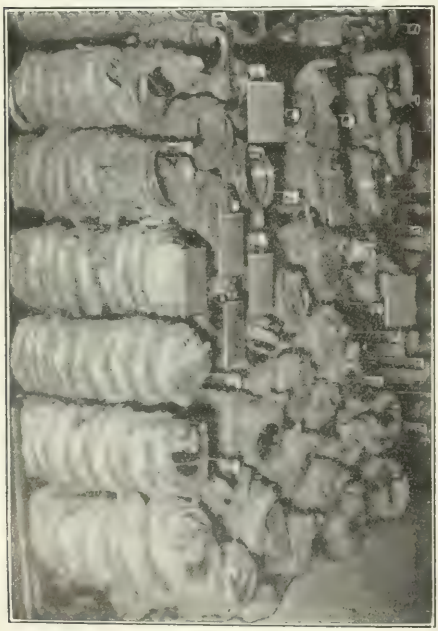


Fig. 2.—Coil Stock on Pipe and Channel Racks.



Fig. 3.—Rack for Extruded Brass Stock.—Brass Links Subdivide Rack Space.

number of cubic feet of the storage space available, is the problem presented. After many years of experience this matter is very satisfactorily handled at the plant of Wyckoff, Seamans & Benedict, Ilion, N. Y., who manufacture the Remington standard typewriter.

The system adopted for storing sheet, bar and coiled



Fig. 4.—Hoist for Putting Heavy Boxes Into Stock.

stock has interesting features. The space on each side of the main center aisle is divided into stalls. Between each pair of stalls two angle irons are fastened to the ceiling, and some special cast iron plates are let into the floor. These plates contain lugs for holding 4-in. channels in place, while in the angle irons holes are punched 3 in. apart, providing for the bolting of the upper ends

of the channels to them. Two channels are placed back to back, and between them at regular intervals suitable bracket castings are bolted. These castings support pieces of 1½ in. extra heavy pipe, which project 3½ ft. on each side. The pipes are fastened to the end of the castings by malleable iron yokes driven on and locked

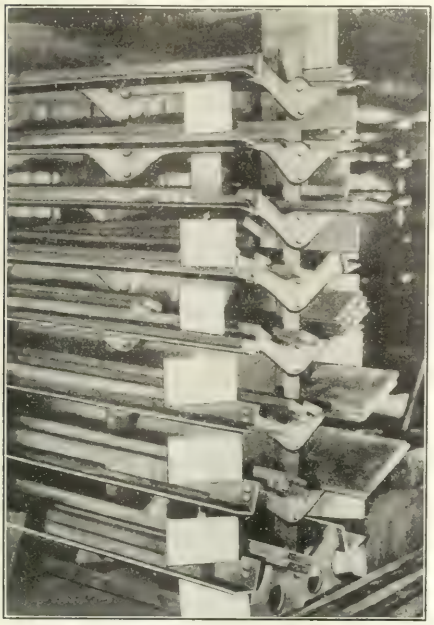


Fig. 5.—Special Rack for Tool Steel, Bar Iron, &c.—An Angle Is Riveted to the End of Each Bracket Arm.

with a set screw. The method of construction is illustrated in Fig. 1.

Coiled stock can be hung on these pipe supports, as shown in Fig. 2, and the pipes themselves can be staggered in such a way as to hang the coils to the best advantage. For dividing the space into bins or compartments for the storage of limited stocks of special bar material, such as extruded brass, the space between two sets of arms may be subdivided by brass links, this arrangement being shown in Fig. 3. A cap is screwed on the outer end of each bar to act as an anchor, preventing bar stock from rolling out over the ends of the supports.

Some of the heavy stock is stored in boxes just as it is received. This device for placing these boxes in the racks is especially noticeable for its convenience. It is shown in Fig. 4. At one end of the racks is an ordinary air hoist, coupled to a cable, which runs continuously over all of the racks. At any point desired a special double hook, carried on a sheave wheel, may be slipped over this cable and then pulled down, and the hook inserted under a box of material which has been run into the space between two racks. The air hoist is controlled by means of a lever, the levers being placed on alternate columns throughout the length of the building. As soon as the hook is placed under the truck the lever is thrown, the hoist takes up the slack cable and raises the box to the desired hight. It is then swung in over the pipe supports, and by reversing the hoist it is lowered to the pipes. This device enables the keeper of

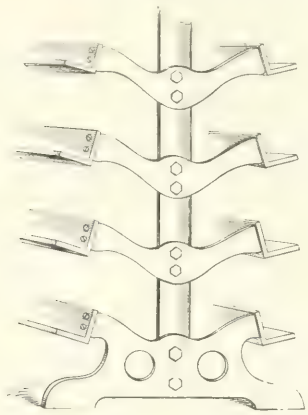


Fig. 6.—End Elevation of Rack for Tool Steel.

the stores to place the heaviest stock at any hight, to the very top of the racks, and utilizes all the space there is. No more men are required for puttinfg the heaviest kind of stock into store than for trucking in and about the factory, and in the case of anything which can be handled with the hook, practically all of the heavy manual labor is cut out.

It will readily be seen that by shifting the channels the pipe supports can be adjusted horizontally; a vertical adjustment is accomplished by shifting the brackets on the channels, hence any desired arrangement of supports can be secured almost at a moment's notice. Very heavy stock is frequently stored on the floor beneath the lowest

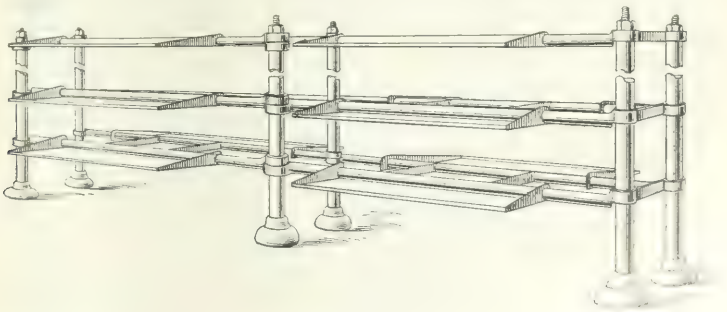


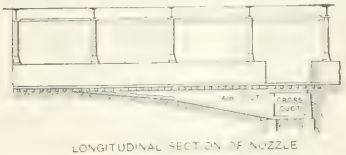
Fig. 7.—Another Style of Rack, with Shelves at the Side for Short Stock.

support. By placing the stock on suitable blocks so that the double pronged hook can be placed under it, the hoist becomes available for loading this stock on trucks.

For the storage of tool steel, bar iron, &c., special racks have been designed. In one style of rack, Figs. 5 and 6, an angle iron is fastened along the entire length of the outside of each shelf to accommodate short stock. In the other style of rack, Fig. 7, which is used mainly for tool steel, a shelf is provided at the side for accommodating short stock. By making it a rule to place all short stock on these outside supports it becomes very easy to take an invoice of the stock on hand. In this factory, however, a bin card record system is employed,

which serves as a perpetual inventory of stock on hand.

A handy method of distinguishing different classes of steel has been adopted. Whenever a shipment of steel is received, before placing in stock it is painted or striped with colors which indicate the character of the steel. One grade of tool steel will be painted red the entire length of the bar, another blue, &c. This makes it impossible for any one familiar with the system in vogue to select the wrong brand of steel for any given tool.



LONGITUDINAL SECTION OF NOZZLE

The contract for the iron work for the new blast furnace to be erected by the Brier Hill Iron & Coal Company, Youngstown, Ohio, to replace the old stack, has been awarded to the William B. Pollock Company, in the same city.

Ventilation of the Washington Terminal Tunnel.

An especially interesting system of ventilating has been applied in the tunnel leading to the new Union Terminal at Washington, D. C. As steam locomotives are operated through this tunnel it was necessary to provide for removing the gas and smoke left by one train before another enters the tunnel. A large volume of air was therefore required, and the problem was complicated in that the ventilation apparatus had to be placed in a very small space and attain high efficiency at low expenditure of power.

At a point about 300 ft. from the terminal portal were constructed two ventilating ducts, each about 5 ft. wide, which were carried along both side walls of the tunnel to the full hight of about 18 ft., with a cross duct under the tracks, as shown in Fig. 1. The space available for the fans was 18 ft. high by 13 ft. wide. The drawings, Fig. 1, show the layout of the ventilating installation, the location of the fans, with respect to the air ducts, and the emplacement.

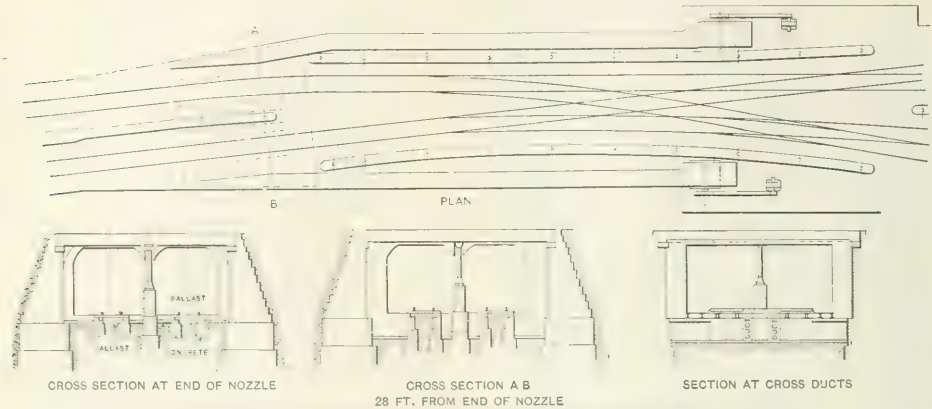


Fig. 1.—Details of the Ventilating Equipment Installed in the Washington Terminal Tunnel.

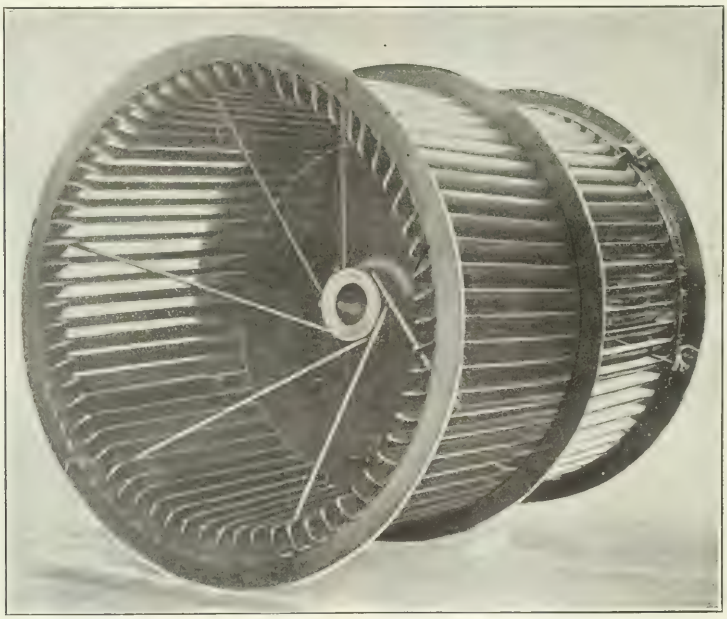


Fig. 2.—The Double Inlet Sirocco Fan Wheel Used in Ventilating the Washington Terminal Tunnel.

The specifications drawn up by the Pennsylvania Railroad Company called for two fans 120 in. in diameter, each capable of delivering 260,000 cu. ft. of air per minute against a pressure of 1½ in. of water. The speed was not to exceed 145 rev. per min., and the power required, 120 hp. The fans are of the Sirocco design, with double inlets, corresponding in dimensions, efficiency, speed and power requirements to the specifications just noted. These fans, driven by electric motors, have now been in use for several weeks, and have satisfactorily performed the duty imposed upon them.

Fans of this design are unique among centrifugal blowers, principally because of the shape, size and number of the blades. It has been found that in all diameters the best results are obtained from 64 blades. It will also be noticed from the view of the wheel, Fig. 2, that the blades are very short radially, being only one-sixteenth of the diameter of the fan. Axially, however, the blades are unusually long, three-fifths of the diameter. The outer edges of the blades are bent forward to a set angle in the direction of rotation, and are very slightly cupped. The inlet and the outlet of the fans are practically equal to the area of the fan itself. The special advantage of the size and shape of the blades is that power absorbing eddies are almost entirely eliminated, and the velocity of the air so greatly accelerated that it actually exceeds the peripheral speed of the blades by as much as 70 per cent. The intake draft of the fan shows practically no variation over its entire area.

For the Washington installation no fan of the ordinary type less than 17 ft. in diameter could be found that would produce the output of air required, and the space available did not permit a fan of this size. In tests of smaller sizes of fans it has been found that a Sirocco centrifugal fan, 30 x 22 x 33 in., delivers 2200 cu. ft. of air per minute more than the fan of ordinary type, 42 x 34 x 39 in. On shipboard, in mines, and in many other installations, this high output, as compared to the space occupied by the fan, is of great importance. The power absorbed by the Sirocco fans is indicated above in the specifications limiting the requirement for a fan capable of delivering 260,000 cu. ft. of air per minute against a 1½-in. pressure to 120 hp.

Heretofore the Sirocco fans have not been manufactured in the United States, but they are now to be made by the Sirocco Engineering Company, New York, of which William C. Redfield, formerly of the J. H. Williams Company, is president; Hugh T. Coulter, for several years manager of the New York branch of the Davidson Company, general manager, and Thomas Brown, chief engineer.

The management of the Alaska-Yukon-Pacific Exposition, which will be held at Seattle, from June 1 to October 15, 1909, has secured the services of Col. Henry E. Dosch of Portland, Ore., as director of the division of exhibits. The exhibits department is being organized, and prospective exhibitors can now receive information in regard to space by applying to Colonel Dosch. Work on the grounds and buildings is progressing. The Manufacturers' Building is well under way and will be the first large exhibit palace finished. It will be about 145 x 445 ft., and, including the galleries, will contain about 80,000 sq. ft. of floor space. Four other large structures—the Auditorium, Fine Arts Palace, Machinery Hall and Agriculture Building—have been started. The grounds are located on the property of the Washington University, a State institution, and after the exposition is over the permanent buildings and others substantially erected will be taken over by the university to be used for educational purposes. The purpose of the exposition is to exploit Alaska and Yukon and the countries bordering on the Pacific Ocean.

About 50 of the former employees of the Stowell Mfg. & Foundry Company, South Milwaukee, Wis., who went on a strike in May, 1906, recently voted to call off the strike, and applied for their positions. Owing to the slackness of work at the present time the company was unable to furnish immediate employment to all of the applicants.

Exports and Imports of Iron and Steel for 1907.

The appearance of the December statistics of our foreign trade, just issued by the Bureau of Statistics of the Department of Commerce and Labor, enables complete figures for the calendar year 1907 to be presented. The report shows that the total value of the exports of iron and steel and manufactures thereof, not including iron ore, for the calendar year was $197,036,781, against $172,555,588 in 1906. The past year, therefore, makes a new high record for our export trade in these lines. The month of December, however, did not compare favorably with the immediately preceding months, as the total for that month was $14,967,869, against $17,051,755 in November and $18,951,198 in October. The exports of commodities for which quantities are given were slightly under those of the previous year, as they aggregate 1,302,525 gross tons, against 1,325,740 tons in the previous year. These exports for December were considerably under those of November. The December figures were 85,999 tons, against 116,308 tons in November, 123,216 tons in October, 115,869 tons in September, 118,941 tons in August and 121,400 tons in July. The following table gives details of the exports of such commodities for December and for the two calendar years 1907 and 1906:

Exports of Iron and Steel.

	December.		Twelve months.	
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
	1907.	1906.	1907.	1906.
Pig iron	3,104	8,265	73,844	83,317
Scrap	702	1,140	25,668	11,742
Bar iron	954	4,765	24,190	56,025
Wire rods	173	46	10,653	5,895
Steel Bars	4,616	2,762	74,464	32,077
Billets, blooms, &c	5,160	6,137	79,991	192,616
Hoop, band, &c	1,343	1,036	8,587	5,405
Steel Rails	20,763	31,157	338,906	328,036
Iron sheets and plates	3,962	1,613	40,651	17,054
Steel sheets and plates	5,191	6,165	82,045	93,646
Tin and terne plates	304	580	10,203	12,082
Structural iron and steel	9,401	9,878	138,442	112,555
Wire	13,570	13,192	161,223	174,014
Cut nails	407	456	6,974	7,568
Wire nails	2,504	2,193	42,189	46,237
All other nails, including tacks	379	782	7,664	5,687
Pipes and fittings	13,466	9,709	176,831	141,784
Totals	85,999	99,876	1,302,525	1,325,740

Turning to the imports, it is found that the total, not including ore, reached a valuation of $38,789,992 in the calendar year 1907, against $34,827,132 in 1906. The bulk of these imports was in the early months of 1907, as the figures for December are only $2,049,560. The December total of imports of commodities for which quantities are given was only 20,255 gross tons, against 35,255 tons in November, 21,223 tons in October, 40,682 tons in September, 51,700 tons in August and 75,406 tons in July. The following table shows the details of the imports of these commodities for December and for the calendar years 1907 and 1906:

Imports of Iron and Steel.

	December.		Twelve months.	
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
	1907.	1906.	1907.	1906.
Pig iron				
Scrap	1,171	712	27,687	19,091
Bar iron	3,892	4,335	39,746	35,793
Rails	201	288	3,752	4,943
Hoop, band, &c	41	32	1,508	10,231
Billets, bars and steel in forms n.e.s.	892	2,198	19,334	21,337
Sheets and plates	231	176	3,748	3,231
Tin and terne plates	1,542	8,043	57,773	56,983
Wire rods	1,270	1,530	17,076	17,799
steel	23	701	2,294	28,573
Totals	20,255	92,427	662,358	577,809

The total imports of iron ore in 1907 were 1,229,168 gross tons, against 1,060,390 tons in 1906 and 845,651 tons in 1905.

Gas Engine Packing Materials.

To make an asbestos packing more pliable and cause it to be pressed more thoroughly into the packing grooves some gas engine makers advise dipping into boiled linseed oil, or even water, before applying it to the cylinder. In many cases this improves the life of a packed joint, but the packing must not be soaked too long or the fibers of asbestos will separate, making the packing useless before it is applied. A coat of flake graphite on one side of the packing enables a cylinder head or valve casing to be removed later without destroying the packing in use; the side of the packing not covered with graphite adheres firmly to the cylinder, while the other side detaches itself easily from the head or valve casing. Special packing materials consisting of asbestos interwoven with wire may prove beneficial in certain cases where a plain packing cannot be made to stand, but they will not serve as a cure of leakage troubles, primarily due to an uneven metal surface. To obtain satisfactory results from any packing, the first requisite is a true surface of the joint to be made tight. Rubber packings in a gas engine can be used only at the open end of a single acting cylinder, where the temperature of the surrounding metal is low enough not to rapidly deteriorate this material. Under no circumstances should packings containing rubber be used in joints in the cylinder or valve casings at the combustion end of the engine.

Rail shipments from Great Britain have not held up in recent years. The total in 1907 was 433,638 tons, as compared with 460,328 tons in 1906, 546,569 tons in 1905, 525,371 tons in 1904 and 604,076 tons in 1903. The Australian demand was good last year, amounting to 100,072 tons, as against 54,649 tons in 1906 and 34,731 tons in 1905, but there was a falling off in exports to India, Canada, South Africa and Argentina. British exports of chairs and metal sleepers for railroad construction have been increasing, the total for 1907 amounting to 91,903 tons, as compared with 73,367 tons in 1906. The principal shipments are to British India, the total taken by that country last year being 44,453 tons.

The Alliance Machine Company's Enlarged Plant.

The additions and improvements to the plant of the Alliance Machine Company, Alliance, Ohio, begun last year, have been completed, and the facilities are now sufficient to manufacture the entire line which the company was organized to engage in six years ago, i. e., electric traveling cranes, rolling mill machinery, steam hammers and hydraulic machinery. Heretofore the building of electric cranes has been largely a specialty to the exclusion of the other products on account of lack of capacity, notwithstanding the large addition made to the plant in 1906. At present it is capable of turning out one traveling crane a day of the average size of 25 tons capacity and a fair output of machinery of the classes before mentioned.

The improvements include a rearrangement in the main building, which now contains the machine, assembling and electrical departments, in close communication with each other, reducing the handling of material. To allow this, one side wall of the original building was removed and a new building erected parallel to it, increasing ground space for the above departments to two acres. Although the building is 218 ft. wide, the difficulty of properly lighting all parts has been very satisfactorily overcome. The two main bays of the building are each 38 ft. high and each is served by a 30-ton traveling crane supplemented by 15-ton high speeds traveling cranes. Jib cranes, and special floor trucks are used in the side and center bays.



Fig. 1.—View in the Main Building of the Alliance Machine Company's Plant at Alliance, Ohio, Showing the Trolley Assembling Floor in the Foreground and Parts of the Machine Shop in the Adjoining Bays and Rear.

In the additional equipment of the machine shop, $100,000 was expended for machine tools of modern type. Most of these are equipped with individual motor drives; a few, however, are belt driven in groups by one motor for each group. In general, the plan has been followed of segregating the planers, lathes, vertical boring mills, horizontal boring machines, milling machines, gear cutters and turret lathes. This is evident to an extent in Fig. 1, which shows the trolley assembling floor with part of the machine shop in the background.

The tool room, shop offices and lavatory are located in the center of the building, where they can be reached from any part of the plant in a minimum average time. One of the main bays and one of the side bays is given over to the assembling department, in which 21 traveling cranes of the average span of 50 ft. can be assembled at the same time and still leave ample space for assembling mill tables, hot beds or other machinery requiring a large floor space. Fig. 2 shows the crane bridge assembling floor.

Although the sides of the plant are largely of ribbed glass and the buildings are quite high, they are comfortably heated by a double fan system delivering a great volume of warm air. Only half of the air is recirculated, the other half of the air being drawn in fresh from outdoors, which keeps the interior well ventilated.

In the power plant a direct connected slow speed engine and generator and 500 hp. of return tubular boilers have been added. The boilers are 25 per cent. longer than the standard of their size and class, with the result that a greatly increased efficiency is secured in their operation. Coal is delivered at the power house so as to be unloaded directly in front of the boilers, either by the dumping of drop bottom cars or shoveling from the cars.

A new fireproof pattern storage building has been built and an up to date system of storing and locating patterns installed. The office building has been enlarged by a two-story addition 30 x 40 ft., to afford more room for the executive, engineering and business offices.

Switches from the Pennsylvania and the Lake Shore & Michigan Southern railroads lead laterally through one end of the building, where loading and unloading can be accomplished with the greatest expedition. Crane girders 120 ft. long have been easily handled to and from cars with the aid of the cranes installed. The shipments average 16 cars weekly. During the time of car shortage, to reduce the number of cars required and to send none out which were not loaded above the minimum weight prescribed by the railroad company, the Alliance Company made a special study of the conditions involved in shipping traveling cranes and devised a system of making up the loads and trains to effect the least waste of car space and capacity. This has been followed out since that time.

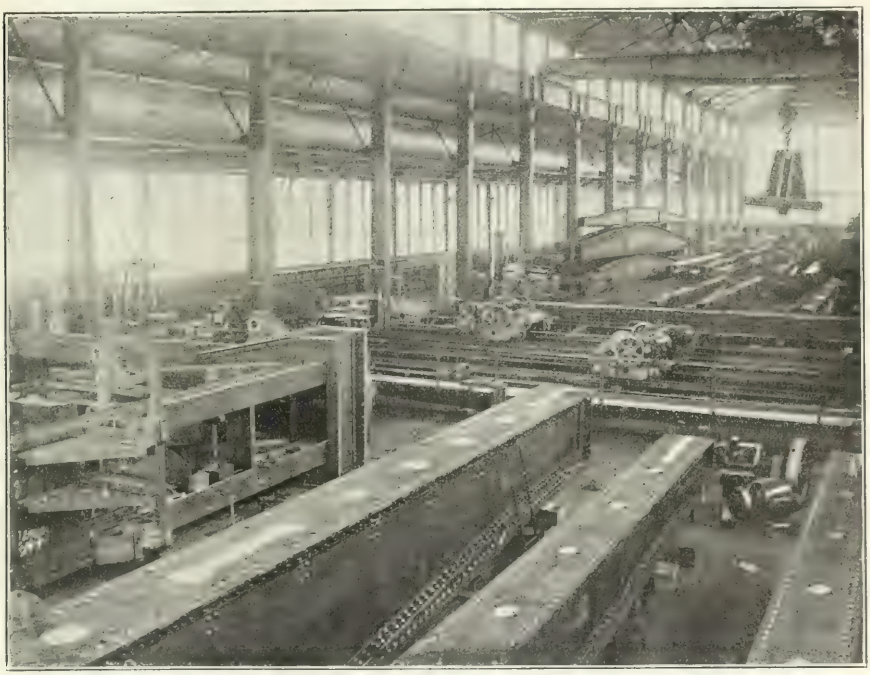


Fig. 2.—The Main Assembling Department in the Alliance Machine Company's Plant. Where the Crane Bridges and Other Large Pieces of Machinery Are Put Together.

The Engineers' Club of Philadelphia.

At the regular meeting of the Engineers' Club of Philadelphia on the evening of February 1, a paper was read by Joseph W. Hunter, Pennsylvania State Highway Commissioner, on "Engineering Problems in Road Construction." The office which he holds was created by an act of Legislature, April 13, 1903. The act appropriated $6,500,000 to be expended in six years in the improvement of State roads. Mr. Hunter's paper deals with some of the difficulties met and overcome by him in organizing and carrying out the stupendous problems he has had to deal with.

The annual election of officers was held January 18, and the officers and directors are now as follows: President, H. W. Spangler; vice-president, W. P. Dallett; vice-president, second, Washington Devereux; vice-president, third, Wm. Easby, Jr.; secretary, H. G. Perring; treasurer, George T. Gwilliam. Directors: J. T. Loomis, Emile G. Perrot, Francis Head, J. W. Ledoux, J. O. Clarke, Henry H. Quimby, Wm. S. Twining, James Christie, H. P. Cochrane, Richard G. Develin, Henry Hess, F. E. Dodge.

Dr. Spangler, the new president, is the first member to have the honor of being twice elected to the office, he having served in that capacity in 1890. He is in charge of the Department of Mechanical Engineering of the University of Pennsylvania.

Pig iron production in Belgium in 1907 was 1,427,640 metric tons, as compared with 1,431,460 tons in 1906. Last year's output was made up as follows: Puddling pig, 226,130 tons; foundry pig, 100,020 tons; steel pig, 1,101,490 tons.

For the Krupp Works at Essen a 4000-ton hydraulic forging press has just been ordered from Davy Brothers, Ltd., Sheffield, England, this firm receiving the contract in competition with German manufacturers.

Recent Improvements in Bury Air Compressors.

BY H. EDSIL BARR.

Air compressors play an important part in industrial economy and are responsible in many cases for the continuous operation of large plants, construction works, &c. For such service the light, slow running and inaccessible machine, built on pump lines, is less suitable than the heavy, rigid compressor designed on steam engine lines and capable of continuous, efficient operation under high pressure and at rapid rotative speed. To reduce the attention, renewals, &c., demanded, the design should embody a liberal use of metal carefully placed, the best materials and workmanship throughout, large wearing surfaces with provisions for copious and uninterrupted lubrication, adjustments on all important bearings of a type easily manipulated by the average operator, metal air valves with removable seats, thorough water jacketing of the air cylinder, particularly the air heads and around valves, a balanced crank shaft and general accessibility.

The accompanying Figs. 1 and 2 show recent designs of 12 and 14 in. stroke single and duplex air compressors, built by the Bury Compressor Company, Erie, Pa., in which it has been the aim to incorporate these essential features. The massiveness and rigidity of these machines is apparent. The frames are of the bored guide type, with heavy duty half box bearings, which are tied into the frame body by heavily ribbed, long sweep housings. The air and steam cylinders are held rigidly in line by the circular, internally flanged yoke, which is provided with large side holes for conveniently reaching the stuffing boxes. The machine proper, frame and cylinders, with attached parts, is secured by through and tap bolts to an unusually deep subbase, which on the two-stage machines includes the intercooler, making the entire outfit self-contained, of permanent alignment and adapted to run as satisfactorily on a good timber cribbing as on a more permanent foundation of concrete or brick.

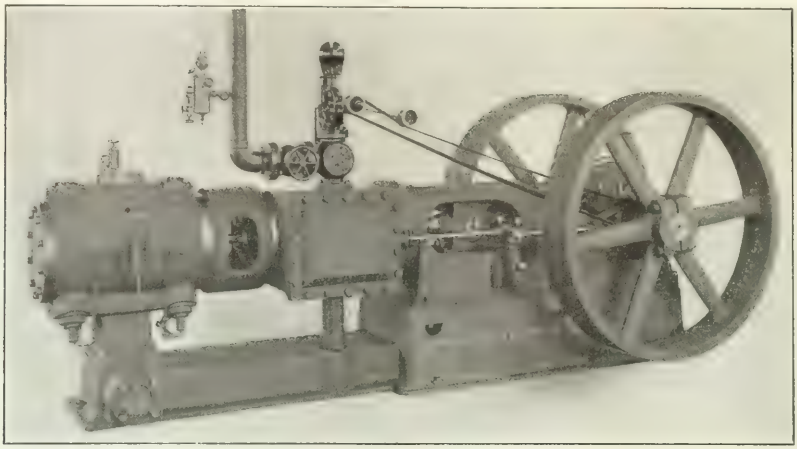


Fig. 1.—The Class B. S. Air Compressor Built by the Bury Compressor Company, Erie, Pa.

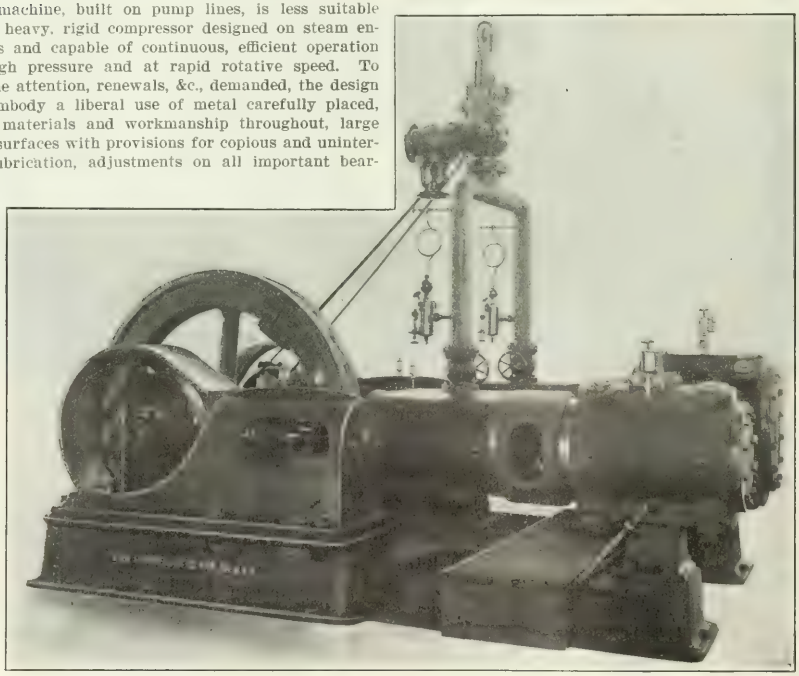


Fig. 2.—The Class C. C. S. Duplex Bury Compressor with Compound Steam and Air Cylinders.

The crank shafts and connecting rods are of forged open hearth steel. The crank of the duplex machines is of the built up type, with balanced disks forced on shaft and held by two keys. The pin is forced in and riveted. The various operations in the building up of this crank are done with a care and precision which makes the completed crank practically as solid and true as if made from one piece. The single crank shaft is slotted from a single forging, the pin and journals are turned with large fillets, and the shaft is fitted with counterweighted disks mounted on the wings of the crank by a special construction, the joints being all machined and no Babbitt or other soft metal likely to loosen from shrinkage used.

The connecting rods have the approved marine crank end and solid crosshead end. The crank end boxes are lined with babbitt and the crosshead boxes are phosphor bronze. All babbitt in the main bearings and connecting rods is poured into dovetailed recesses, after which it is piened thoroughly to overcome shrinkage, and the box is bored to fit the pin or journal. The crosshead is of box form, with adjustable shoes and steel wrist pin drawn in on a continuous taper and securely fastened. The careful construction of all bearings and the methods used to insure perfect alignment make these machines remarkably smooth in operation and of small friction loss.

The steam valve is a balanced, double ported slide type, having very short steam ports, and is well suited to the operation of a compressor or engine, giving economical service with little attention aside from lubrication. The steam cylinders are lagged with asbestos to diminish radiation, and are covered with a heavy polished blue steel jacket. The cranks of the duplex machine are protected by a polished steel guard with heavy angle iron pieces, and the single crank machine may also be so fitted.

The air valves, the vital parts of any compressor, as ordinarily furnished, are of the automatic, direct lift type, with spring closure, operating in guides of a recently improved form, which possess features particularly worthy of attention. The most common form of inlet valve guide is made of brass and screwed into the wall of the cylinder or head. This thread is straight, and, being depended upon to a great extent for tightness, is made a good fit in the tapped hole. The guide is made of brass to prevent its corroding to the cylinder metal in the thread, as it would if it were of iron, but as fully an annoying trouble is experienced by the cylinder oil working in around the thread and becoming carbonized from the heat of compression to an extent which makes it extremely difficult to remove the guide. In some cases which have come under the writer's notice it has been necessary to chip the guide out. Some, knowing the possibility of this trouble, have resorted to removing the guides once a week and cleaning with gasoline. This is effective, but the softer thread of the brass soon wears loose from frequent removal, and few operators will go to this trouble. In fact, often the opportunity is not available.

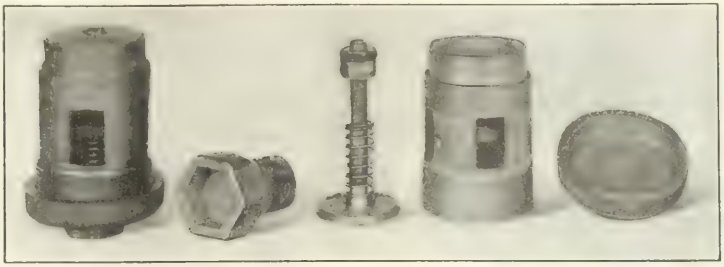


Fig. 3.—The Intake Air Valve, the Wrench for Assembling It, and Its Three Parts Separated.

It becomes advisable, therefore, to avoid the necessity of such attention, and the guide shown in Fig. 3 accomplishes the purpose admirably. The guide and seat are one piece, an iron casting, which screws into the metal of the cylinder in the cool air passage wall only. A little graphite and oil applied when the guide is put in prevent rusting at this point. The portion of the guide entering the cylinder wall is not threaded and is a comparatively free fit, tightness being secured by screwing the guide down on a thin corrugated copper gasket under the shoulder shown. The inside of the guide near the bottom is of hexagonal shape, to be engaged by a special wrench furnished for removing and replacing the guide. The cap, which firmly locks the guide, has a hexagonal projection which fits the same wrench. On the high pressure cylinder of two-stage machines a copper gasket is also placed under the cap, so that the fit in the cylinder is not depended upon for tightness, and the guide can be removed in a fraction of the time ordinarily required.

The discharge valve guide, Fig. 4, screws into the discharge passage wall and rests on a corrugated copper gasket on the cylinder wall. The seat is contained with the guide, avoiding wear on the cylinder, and the seat being removable is readily inspected and the valve ground in without danger of emery entering the cylinder. This is a great improvement over allowing the valve to seat on the cylinder wall, or screwing a separate seat into the cylinder wall. Such a seat persists in working loose under the constant hammering of the valve, and if not noticed at once the thread is destroyed on

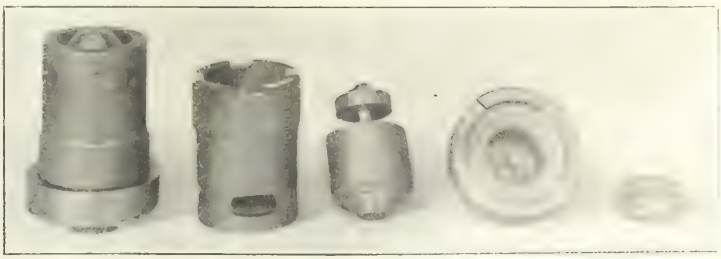


Fig. 4.—The Assembled Discharge Valve and Its Four Parts [illegible]

the seat and sometimes in the cylinder. By a simple device the discharge valves are rendered quiet running and very positive in operation.

The positive inlet valves, furnished on special order only, are placed in the cylinder barrel instead of in the heads, as is usual with this type.

The heads are thus entirely free from mechanism, as shown in Fig. 5, have full cooling area, and being much

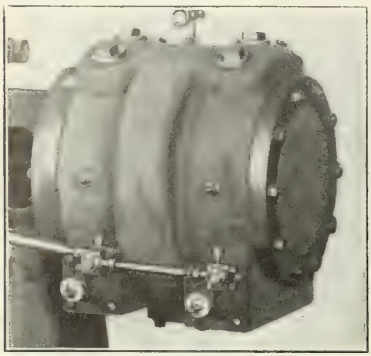


Fig. 5.—The Cylinder of a Class B. S. Compressor with Mechanically Operated Intake Air Valves.

lighter than the usual form are easily removed by one man.

Lubrication is effected by high grade sight feed devices or by force feed or gravity system, as desired.

Rapid Analysis of Dolomite.

BY RANDOLPH BOLLING.*

In blast furnace practice, accurate knowledge of the chemical composition of the flux is important. The composition of each shipment from the quarry must be known in order that proper adjustment of the furnace burden can be made to meet the varying amount of available base contained in the flux and thus keep the chemical composition of the slag well under the control of the superintendent. It often happens in opening up new quarries or from other causes, that blast furnaces receive flux of widely varying composition, and for this reason a sample should be taken from each car. As a single furnace will receive from five to eight cars a day, the rapidity of the analysis of the samples is a matter of some importance. In submitting the following method to blast furnace chemists, it may be stated that the object of the scheme of analysis thus set forth is to avoid the weighing of the several constituents as far as practicable and to make the different determinations by volumetric methods. By a combination of methods this result is reached for all elements usually determined, except silica, as so far no satisfactory volumetric method has been devised for the estimation of that constituent.

Standard Solutions Employed.

A standard solution of potassium permanganate is prepared by dissolving 95 g. of this salt in 30 liters of distilled water, and after the solution has stood a week siphoning it off into an ordinary carboy such as is used in shipping acids, having carefully cleansed the interior before use. A solution thus prepared will be found practically free of MnO_2 and very permanent. The box and packing of the carboy prevent the action of light, especially when the exposed neck is painted with asphaltum paint. The solution can be standardized against chemically pure calcium oxalate, or, which is still better, 0.2 to 0.3 g. of steel drillings, in which the silicon, sulphur, phosphorus, manganese and carbon have been determined and the metallic iron contents accurately known, is weighed into small flasks, usually best to run three, which should check within 0.0002 per cent., solution of the metal being effected in diluted sulphuric acid, 1 to 5. A Bunsen value should present any oxidation of the ferrous sulphate. Permanganate prepared in this way should be almost exactly decinormal, or 1 c. cm., equivalent to 0.0056 metallic iron, or 0.0028 gm. calcium oxide.

Standard Solution Sulphuric Acid.

A carboy is filled with exactly 30 liters of distilled water, to which 210 c. cm. of strong sulphuric acid is added and the contents are well agitated. A pipette is filled with exactly 50 c. cm., and this is transferred to a small beaker, heated to boiling, and a hot solution of barium chloride is added. The precipitate is allowed to settle and filtered on a Gooch crucible and weighed. From this weight the weight of H_2SO_4 in each liter of solution is found. Water is then added to make the volume necessary for a half normal sulphuric acid solution. Each cubic centimeter of this is equivalent to 0.001 gm. of MgO (magnesium oxide).

Method.

One gram of dolomite is now weighed from a well prepared representative sample and mixed with 0.5 g. of anhydrous sodium carbonate in a 30 c. cm. crucible, heated to faint redness over a Bunsen burner and allowed to cool. This treatment decomposes silicates or other minerals insoluble in acids, and after sintering allows of perfect solution in acid. The crucible is placed in a small casserole and about enough hydrochloric acid of 1.10 specific gravity added to cover it and the liquid allowed to evaporate on a water bath of hot plate to dryness. It is redissolved in a little strong hydrochloric acid and then diluted with water and the silica filtered, washed with hot water, ignited in a platinum crucible and weighed. This will be found to be pure SiO_2 and does not require any treatment with hydrofluoric acid. The filtrate is made just alkaline with diluted ammonia and heated to boiling, great care being taken not to get an excess of ammonia, as the magnesium will be precipitated. The iron and aluminum hydrates precipitated are filtered off and washed with hot water, ignited in a platinum crucible, and weighed. One gram of sodium carbonate is added to the oxides and a fusion made over a blast lamp. This fusion is dissolved in diluted hydrochloric acid and reduced with granulated zinc, then titrated with permanganate, the iron calculated to Fe_2O_3 and subtracted from the weight of the combined oxides to find the weight of alumina contained.

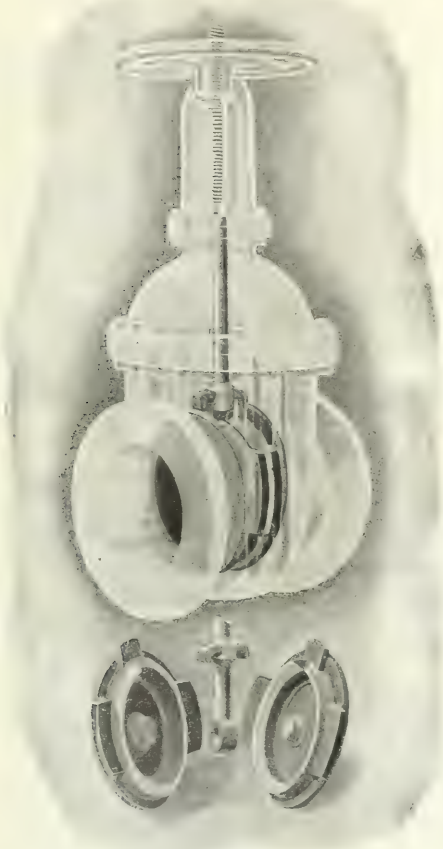
The filtrate from the above separation is heated to boiling in a beaker and the calcium precipitated with a hot saturated solution of ammonium oxalate. After being filtered the precipitate is replaced in the beaker and about 200 c. cm. of hot water is added, with enough diluted sulphuric acid to dissolve all of the calcium oxalate. This is titrated immediately with permanganate and the number of cubic centimeters used multiplied by the CaO value gives the weight of CaO. The filtrate from the above separation, if larger in volume than 1 liter, is evaporated to about this bulk cooled, and sodium ammonium phosphate solution added; then, stirring rapidly, ammonia is added, until the solution is strongly alkaline. This is allowed to stand an hour and filtered and washed with very diluted ammonia—1 part strong ammonia to 20 parts water. The paper containing the ammonia magnesium phosphate is placed on an absorbant plate of plaster of paris in a warm place and as soon as dry is put in a beaker and titrated with half normal sulphuric acid, using methyl orange in alcohol as the indicator. The number of cubic centimeters of standard acid used multiplied by 0.001 gives the weight of magnesia.

The American Tool Works Company, Cincinnati, Ohio, held its annual stockholders' and directors' meeting on January 21. The following officers were elected: Franklin Alter president; J. B. Doan, vice-president and general manager; Robert S. Alter, secretary; Henry Luers, treasurer.

* Chief chemist of the Nova Scotia Steel & Coal Company.

The Best Adjustable Gate Valve.

For high pressure service the patent adjustable gate valve made by the Best Mfg. Company, Pittsburgh, Pa., has certain advantages because of its construction. These center mainly in the adjustable wedge disk shown removed and also in position in the phantom view in the accompanying illustration. It has concave and convex contact on the back which permits equal pressure on the entire face of the disk and insures the valve being



A Phantom View of the Adjustable Gate Valve Made by the Best Mfg. Company, Pittsburgh, Pa., and the Wedge Disks and Holder Removed and Separated.

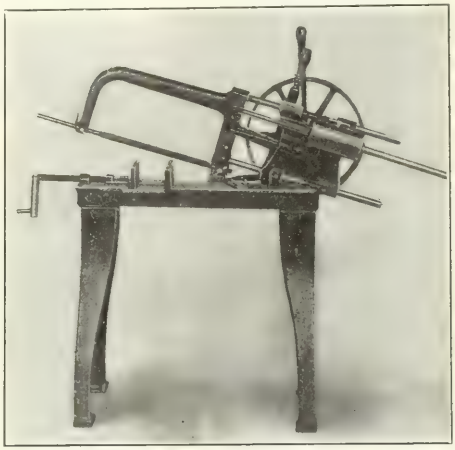
tight when the seat rings are replaced. This can be done without removing the valve from the line, which, with single wedge valves, would be impossible. The wings on the disks are fitted in guides cast in the body, which prevent the disk from sticking in any position or coming in contact with the seat until the valve is intentionally closed. For high pressure steam the stem is usually made of cold rolled steel and the disk holder of cast steel screwed, pinned and riveted to the stem. When the stem and disk holder are desired in one piece they are made of bronze or cast steel on special order.

The disks are suspended by the pins on the inner faces, which fit in an eye of the holder. The wings on the sides of the disks travel in guides in the body of the valve to prevent the disks from riding on the valve seats while they are being raised. This feature is aided by the hooks on the disk holder, which engage the lugs on the top of the disks. Since the concave and convex surfaces on the insides of the disks allow them to adjust themselves to extreme conditions, it is not necessary when refacing or replacing the seat that they be in exactly the same position as they were originally. It is in effect a ball and socket bearing directly back of the seating face, and gives the valve an especially strong construction for one of double disk type, without the use of an excess amount of material. A point on which emphasis is laid is that there are no small parts used in the valve, such as wedge pins, rings, &c.

The valve is made either of outside screw pattern, as illustrated, or with an inside screw. The valves in both patterns are made with screw ends, flange ends and hub ends, in sizes ranging from 2 to 48 in. Up to 12 in. the standard patterns are adapted to a working steam pressure of 125 lb. and a working water pressure of 200 lb. For the 14 to 24 in. sizes the working pressures are, respectively, 100 and 150 lb., and for the 26 to 48 in. sizes 75 to 100 lb. Extra heavy patterns are also made for a 275-lb. working steam pressure and a 400-lb. working water pressure.

A New Napier Power Hack Saw.

The power hack saw machine shown in the illustration differs from the usual design in that the parts are concentrated in the head, including the ways and the mechanism for raising the frame. The crank is concealed in the head casting. This distribution of the parts tends toward greater safety of operation, it is claimed, especially in the raising of the frame, which is accomplished by a vertical lever. A feature is the sliding rod in the outer end of the frame, which permits the use of several sizes of hack saws, the rod being drilled at intervals corresponding to standard saw lengths and a pin provided in the frame to engage the desired hole. The frame is deep, so that the machine takes work 6 in. deep and 5 in. long. It is built by the Napier Saw Machine Works, 119 Liberty street, Springfield, Mass., and is intended to fill the demand for a moderate priced tool of its kind.



A New Power Hack Saw Built by the Napier Saw Machine Works, Springfield, Mass.

At the annual meeting of the stockholders of the Guerber Engineering Company, Bethlehem, Pa., held January 28, the following were elected as members of its Board of Directors: A. N. Cleaver, F. C. Stout, Wm. B. Myers, Chas. M. Dodson, Owen F. Leibert, W. A. Wilbur, Jos. W. Adams, P. A. E. Guerber, J. E. Boatrite. The directors elected the following officers to serve for the ensuing year: President, A. N. Cleaver; vice-president, F. C. Stout; treasurer, Wm. B. Myers; secretary, Franklin H. Brunner; manager, J. E. Boatrite; superintendent, P. A. E. Guerber; superintendent of manufacture, H. R. Walters.

Milling Cutters of High Speed Steel.

At a recent meeting of the Institution of Mechanical Engineers in London, England, Dr. H. T. Ashton of the Royal Arms Factory, Enfield Lock, read a paper on milling cutters. It dealt in part with the difficulties of extending the use of high speed steel to milling cutters of complicated shape, particularly in respect to accurate finish and a good surface, difficulties which, the speaker said, have caused the introduction of high speed steels to be of less benefit to engineers for milling cutters than for any form of cutting tool used. The milling cutter is the most expensive of all the tools used in cutting metals. An important point is the necessity that the cutter have as long a life as possible in actual service, not only to minimize first cost and expense of grinding, but also to keep the output of the machines as continuous and uniform as possible. It was said to be advantageous for obtaining a fine finish to use helical teeth on milling cutters. Hitherto the apparatus employed in sharpening profile cutters for milling machines in repetition work, as in small arms factories, has required skilled labor, but with machines such as those in use at the Enfield factory unskilled labor can be employed, and by standardization of the pitches of the teeth and of their angles the use of these machines has resulted in distinct economy.

The life of some cutters prepared by the methods described in the paper has been extraordinary. One cutter, working in a self- acting, cross milling machine and operating upon the bodies of the service rifle at an average cutting speed of 69 ft. per minute, with a feed of 1¾ in. per minute, and a depth of 0.08 in., and taking a cut of an average width of 1 11-16 in., and ⅞ in. long, has produced 39,170 bodies, and is still good for about half as many more. The steel upon which it operated ran 0.5 to 0.6 per cent. carbon, with an ultimate tensile strength of not less than 35 tons per square inch.

In the discussion it was stated that while with repetition work it pays to make milling cutters of high speed steel, the ordinary shop manager needs to consider whether for his work it is worth while. The experience of Armstrong, Whitworth & Co. was cited as showing that hardening in the open furnace gives as good results as the use of the closed furnace, the important point being the heating, not the cooling. This firm uses high speed cutters for cutting nickel chrome steel at 75 ft. per minute. Attention was called to the fact that high speed steel has guaranteed the high degree of accuracy that makes possible the employment of milling machines where once only planers were used. The requirement has been met that cutters used on pieces that have to be interchangeable should show an amount of wear that is practically negligible.

Valve Grinding.—Inlet and exhaust valves of gas and gasoline engines require occasional grinding to their seats to counteract the destructive effect of the hot gases. The exhaust valve particularly should be taken out and ground about once a month, while the inlet valve, which is not subject to the severe conditions under which the exhaust valve performs its functions, will remain in good working order much longer if the fuel used is properly purified. The exhaust valve if allowed to become leaky will soon burn out, unless attended to promptly. To grind a valve properly requires removing it from the casing. Leaky portions of the seat will be indicated by black oxide points. Both surfaces on the valve and in the casing should be cleaned, and a paste, consisting of a few drops of lubricating oil and a small quantity of fine emery powder, should be applied to the valve seat. Then the valve should be turned to the right and left by means of the most convenient tool, and the valve lifted occasionally to keep grinding material in contact with the surfaces. This operation should be continued until a perfectly even bearing seat is obtained, as indicated by a uniformly dull color of the two surfaces. Before putting the valve together every particle of emery must be removed carefully, by washing the valve seat with a cloth saturated with kerosene or gasoline. Neglect of this may cause emery to be drawn into the cylinder and serious damage result.

The Knight Combined Milling and Drilling Machine.

In shops having limited equipment it is especially desirable that each tool cover as wide a range of work as possible with reasonable speed and accuracy. Combination tools, therefore, are often of advantage. Such a machine is the combined milling and drilling machine shown in Fig. 1 and built by the W. B. Knight Machinery Company, 2019 Lucas avenue, St. Louis, Mo. The tool is essentially a drill press equipped with a T-slotted table

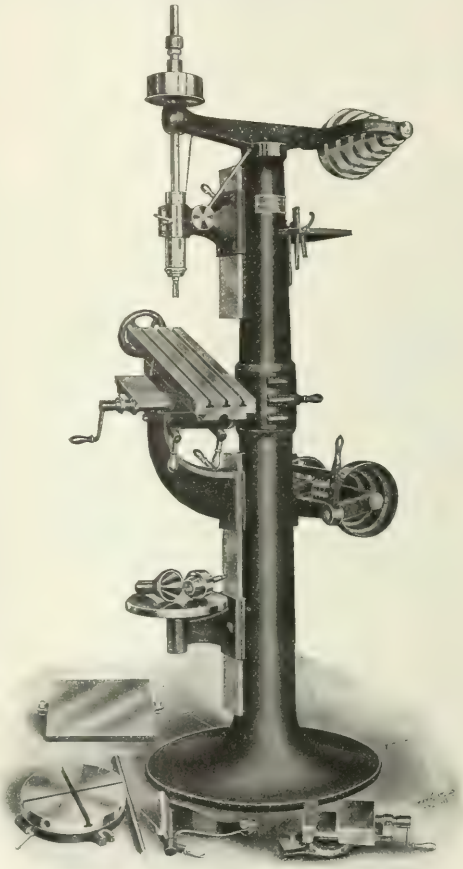


Fig. 1. A Combined Milling and Drilling Machine Built by the W. B. Knight Machinery Company, St. Louis, Mo.

having a hand operated cross and transverse movement, which adapts it for vertical milling work.

Six speed changes are provided by step cone pulleys, which are driven by tight and loose pulleys, 6½ in. in diameter by 1⅞ in. face. To further increase the versatility of the tool, both in drilling and milling, the table is mounted pivotally on a round arm projecting from the main column and is accurately graduated, so that it can be tilted and set at any desired angle. The feed screws regulating the cross and transverse feeds are provided with graduated collars by which correct table adjustments are secured in laying out and doing work.

The spindle runs in an adjustable taper bronze sleeve and is fitted with a ball bearing end thrust. It contains

a No. 7 Brown & Sharpe taper hole to receive end mill cutters and a drill chuck, the latter having a capacity up to 17-32 in. A vertical movement of 3 in. is provided for the spindle, while the head is capable of adjustment in the same direction through a distance of 8½ in. From the center of the spindle to the column the distance is 7 in. The maximum hight of the chuck above the table, which is 6 x 18 in. in size, is 9½ in. The table has cross and transverse travels of 10 in. and 6 in., respectively. A drill chuck, a fully graduated circular attachment 9 in. in diameter, a graduated vise with 4 in. jaws opening 2¼ in., a drill guide and a drill plate, 10 x 11 in., complete the equipment furnished with the machine.

An idea of the range of work that can be accomplished with this tool is presented in the illustrations showing the application of various attachments and adjustments to different operations. The method of milling a segment die by means of the circular attachment is made clear in Fig. 2, while in Fig. 3 the same combination is shown making a peripheral cut on a circular piece. Fig. 4 shows the table tilted at an angle of 45 degrees for milling a V-groove in a block. A somewhat similar but more delicate operation is shown in Fig. 5, where a die block is being milled with the table slightly tilted to give the proper die clearance. A piece of work not infrequent in shop practice is seen in Fig. 6, while Fig. 7 illustrates how a ring of special shape may be milled on the circular attachment.

By using cutters of special shapes many other forms of dies, cams and pieces of irregular shape can be successfully handled. The drilling of holes in a piece whose surface is not at right angles with the drill is facilitated by using the drill guide, which prevents the point of the drill from running. Also where accuracy is desired, as in the drilling of jigs or templets, or where holes are to be accurately spaced and definitely located with respect to each other, it is claimed that the machine fully meets the requirements of the work. The net weight of the tool is 600 lb.

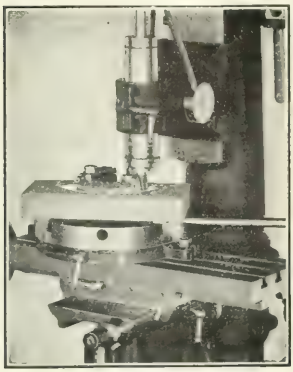


Fig. 2.—Milling a Segment Die on the Circular Attachment.

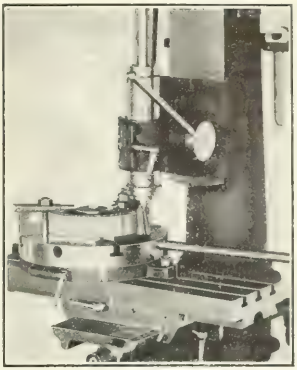


Fig. 3.—Milling the Outside of a Segment on the Circular Attachment.

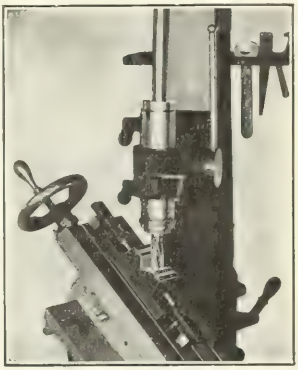


Fig. 4.—Milling a V-Block with the Table Tilted to 45 Degrees.

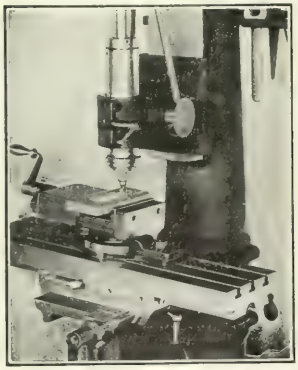


Fig. 5.—Milling a Die Block with the Table Tilted to Give Clearance.

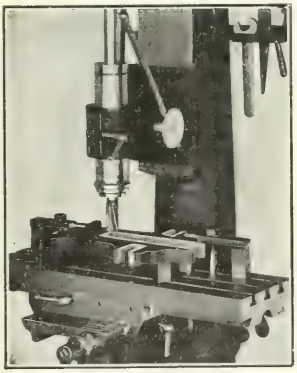


Fig. 6.—Milling the Ways and Face of a Bracket.

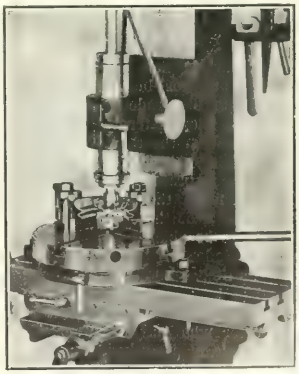


Fig. 7.—Milling a Spacing Slot on the Circular Attachment.

TYPICAL OPERATIONS ON THE KNIGHT COMBINED MILLING AND DRILLING MACHINE.

The American Anti-Accident Association.—This society, which has been organized and has its headquarters at Sharpsville, Pa., is now a working body, with a strong force of interested members. The leading workers of the organization, who conduct its practical labors, are on what is called the Committee of Reference. They note and report all conditions dangerous to public safety, and after due investigation the Executive Board seeks to remedy them. The following is a list of the names of the members and their respective duties: A. L. Bartlette, Public Assemblies; James Byerly, Street Traffic; George D. Devitt, Information on Causes of Accidents; Rev. A. H. Heltman, Church and Religious Interests; Charles Hites, Excavations and Underground Work; George Mahany, Athletics and Sports; Andrew Nickle, Current Accidents and Statistics; Mrs. J. J. Pierce, Educational Work; Jonas J. Pierce, Private and Public Construction; Scott Robinson, Manufacturing Industries; James Rickert, Steam and Electric Transportation; Mrs. M. J. Thompson, Domestic Conditions; E. J. Turner, Legislation, Old and New. Descriptive matter relating to the organization will soon be issued for general distribution. Corresponding or associate members are received from any section of the country, so that any one interested in the movement may become affiliated with it.

Industrial Education.*

The Apprentice System of the New York Central Lines.

BY W. B. RUSSELL, NEW YORK.

Efficient apprentice training is expected not alone to raise the grade of mechanics, and to provide from the ranks the necessary leaders and officers, but also to produce ultimately an organization in which men and officers alike can think intelligently, an organization replete with co-operation and efficiency; with its members bound together by association and by training, an organization fully equipped to meet the increased demands of progress and competition. Our large manufactories and railroads are suffering from a lack of knowledge of their men and the possibilities of these men. Large companies are too apt to go outside for their leading employees simply because they have no means of knowing whom they have in their midst capable of filling the important positions. To train an apprentice and not to make use of him when out of his time is to lose the best results of the effort, and yet but few organizations at the present time are prepared to make intelligent use of graduate apprentices. The bright boy is blamed for leaving at or before the completion of his term, but the fault is largely due to the failure of his employer to appreciate his true value and to make further progress possible. A complete and radical change of policy is needed in most organizations to fit them both to attract and to hold apprentices.

The apprentice system as now organized on the New York Central Lines was inaugurated on March 1, 1906, by J. F. Deems, general superintendent of motive power, although evening schools for apprentices had existed for a number of years at several of the shops. The system here described has the hearty approval of both men and management. It has paid for itself from the start, and has not a particle of philanthropy connected with it.

The General Plan.

provides for shop instruction of the apprentice in the trade and for his instruction in educational subjects allied to his trade during working hours while under pay. A shop instructor teaches the trade in the regular shop and on the regular work. As the majority of the apprentices at each shop are machinists, the shop instructor is preferably an all around machinist giving instruction in the machinist trade, but with sufficient knowledge of the other trades, which may have apprentices, to be able to supervise intelligently apprentices in those trades. If the shop is small he gives only a portion of his time, while in a large shop his entire time is taken and he may require assistants.

The educational classes are taught by a second instructor who may be either a draftsman, an advanced mechanic, or a mechanical engineer. His previous education is of less importance than his ability to explain simple shop problems. The ideal instructor is a man who can look at problems from the standpoint of the apprentice, who can work them out with the apprentice, and who can bring himself to realize and appreciate the difficulties as they present themselves. The educational instructor should spend only a part of his time in teaching, and will be able to keep the educational work closer to company practice and himself in line of promotion in the organization if he at the same time retains a position in the shop or in the drafting room. Where the educational work is sufficient to require the full time of one man, an assistant should be provided and both should give part time to the work.

The fact that the shops of the New York Central Lines are widely separated, necessitated the organization of a central department. C. W. Cross, who was the master mechanic of a large division, was appointed as superintendent of apprentices to have general supervision of the work. The educational features were delegated to the author. The central organization was also desirable to procure uniformity of effort and to prevent waste of time and energy on unprofitable experiments. The plan is now in operation at the nine larger shops of the system, and already includes about 500 apprentices. A uniform set of regulations has been adopted showing the classes of work in the shop and the time allotted to each class. These regulations have been made sufficiently flexible to suit the various conditions in different shops, to insure the prompt movement of all apprentices and yet to allow more rapid movement where special merit warrants. Uniform apprentice certificates are issued at the completion of the regular course which entitle the holder to preference in employment at all shops of the system.

The Shop Work.

All of the work done by the apprentices is a part of the shop output. The shop instructor is present to make each machine run at its best efficiency, even when handled by a green apprentice. The apprentices are still responsible to the foreman as formerly, but the foreman is relieved of the necessity of instructing them and is left free to run his department. The shop instructor passes on applicants for apprenticeship, and in connection with the educational instructor recommends dismissal if unsatisfactory during the first six months. The shop instructor also arranges the changes of work in conference with the foreman. He keeps fully informed of the conditions existing in the various departments of the shop; is in close touch with the foreman and gang bosses; knows when and where the stress of work is heaviest, and in making suggestions and recommendations takes these matters into account. His judgment is accepted by the foreman, and his recommendations followed by the shop superintendent.

Class Room Instruction

is largely individual, as the same class may contain apprentices just starting and others nearly out of their time. Educational ideas have been reversed. The work is so arranged that each apprentice may go as rapidly or as slowly as his ability allows. All principles are handled through shop problems and must have practical bearing. Class work is closely adapted to shop conditions. The problems are worded in the language of the shop. The whole scheme of education is simple and more elementary than usual, although it is made to include many principles of mechanics, strength of materials and steam, usually taught in technical schools. Text books cannot be used directly for apprentice instruction even if suitable books could be found, as the average apprentice has a strong aversion to books. One or two books are now available for reference, but the bulk of this material must be in the form of separate sheets, given out one at a time and arranged to advance gradually. The chief features of the educational work are mechanical drawing, which is made the back bone of the course, and shop problems which includes the other branches. The drawing is arranged to start directly on working drawings of actual machine and locomotive parts and yet to advance so gradually that even a dull boy can make headway. No time is taken for pure theory, and skill in drawing lines and making letters is obtained incidentally while making useful drawings. Blue print sketches are used to assist the instructor, but these are drawn so that they cannot be copied and each sketch leaves more or less to be worked out by the apprentice.

Unique Principles of Instruction.

Mathematical problems, as met with in a shop, are not even divided into arithmetic, algebra and geometry, and apprentices often meet problems so mixed in with facts, and so combined in the practical application of natural laws, that in many cases they do not appear to be mathematical problems at all. Shop problems taken indiscriminately from practice and put before apprentices would result in confusion and failure, but it is possible by a careful selection and adaptation to get together problems clothed in every day language, which are practical and useful and which, though actually classified and to some extent graded, do not show the classification. The terms algebra, arithmetic and mathematics are never used, and the sheets are not divided according to subjects. A run-

* Abstract of a paper presented at the New York meeting (December, 1907) of the American Society of Mechanical Engineers.

ning review is maintained by constantly introducing problems on the ground already covered. Interest is further held by varying the standard of difficulty and mixing the easy and the hard problems as they are apt to come in practice. In getting together these problems, all departments of the railroads and many outside sources of information have been utilized. Company drawings, standards, and records, facts and data from the technical press, suggestions from motive power officers, problems directly from the shop and drafting room, hints from instructors and points picked up in conversation with foremen and mechanics have alike been used. Experimental apparatus is being installed in the schoolroom, so that natural laws may be illustrated, but not necessarily proved, as it is the intelligent use of these laws, and not their proof, which is desired. Models and actual machines are used for illustrations. In gearing, the gears are fitted on to a screw cutting lathe in the schoolroom and revolved as a check to the method of figuring them. Locomotive valve setting is introduced by a thorough course in valve setting on a stationary engine located in the schoolroom and arranged to run by compressed air. Lectures are not well suited for apprentice instruction and when used must be short and must take the form of talks or recitations.

Hours and Progress Reports.

Classes are held from 7 to 9 o'clock in the morning, each apprentice reporting for two mornings a week. The apprentices ring in at the shop and then come to classrooms located on the shop property, where they are under shop discipline. At 9 o'clock they report again in the shop. Compulsory evening classes for apprentices have never been entirely satisfactory, but the plan of holding classes during working hours has been used by the British Admiralty for 60 years with entire success. Home work is expected on the problems.

An elaborate system of reports from both instructors is made to the local shop officers, who forward them to the superintendent of apprentices. These reports show, first, the ability at the trade; second, the disposition and personality of the apprentice, and, third, the standing in class work. The instructors are at all times required to know the standing of each apprentice, thus making examinations unnecessary. Special emphasis is placed on the personal touch maintained between the instructor and the apprentice with a view to determining the type of work or branch of service for which the boy is best suited.

Results of the Experiment.

This movement differs from most efforts to better industrial conditions, in that it starts at the bottom, in marked contrast with the common practice of providing special advantages for the especially bright. The rank and file are not touched by special apprenticeship or special courses at high schools. Industrial education must start lower down the scale, and the genius will be the first to profit by the advantages offered. The problems designed for a boilermaker apprentice have been found quite useful with college graduates and the problems used for apprentice classes have been used with equal success in evening classes for foremen, mechanics and inspectors.

Experience has proved the desirability of keeping boys in direct contact with the shops from the very outset. The immediate and direct results of the apprentice system have been increased output (notwithstanding the four hours per week spent in class), less spoiled work, ability to read drawings, to lay out templates and to make sketches, a better grade of apprentices, increased interest in the work, suggestions of apprentices as to improved methods and tools, draftsmen for company drafting rooms and apprentices fitted for special work as needed. Local officials have everywhere been quick to note the benefits of apprentice training, and are unanimously enthusiastic and interested. One immediate result of the opening of the apprentice schools was the request from foremen and mechanics for educational classes of a similar nature, which resulted in the organization of self-supporting evening classes at seven of the shops taught by the apprentice instructors, using practically the same courses of study as provided for apprentices.

In addition to teaching the apprentice a trade and teaching him to think, it is vitally necessary to aid in the development of his moral character and in his loyalty to the right. These objects do not, from their nature, permit of immediate demonstration of success. They are, however, vastly important and the character side of the problem is, in the long run, the larger side. No apprentice plan can possibly succeed if this part of the problem is not uppermost in the minds of those in charge. Neither the employer nor the community has anything to fear from the right-minded, conscientious man who thinks. Much may be feared from one who is not conscientious and right-minded or one who permits others to do his thinking.

The Stevens Seventh Annual Alumni Dinner.

The seventh annual dinner of the alumni of Stevens Institute was held at the Hotel Astor, New York, on the evening of February 4. Some notable addresses were made, among the speakers being President Alex. C. Humphreys, Dr. H. S. Pritchett, president of the Carnegie Foundation for the Advancement of Teaching; Robert P. Porter, formerly chief of the Census Bureau and now the American representative of the London *Times;* Col. George Harvey, James E. Sague of the New York Public Service Commission, Col. Charles W. Fuller, Prof. George V. Wendell, Ernest H. Peabody and H. V. V. Scheel.

President Humphreys discussed certain practical features, which he urged should be included in the curricula of the schools of engineering. While combating R. T. Crane in his attack on technical and technological education and Andrew Carnegie for his support of engineering education, President Humphreys suggested that there was some occasion for criticism of graduates of schools of technology by reason of their being thrust out from the college doors with little or no instruction on the business side of engineering. He particularly pointed out that it should not be left for the engineer student to learn after graduation by bitter experience that his practice as an engineer should be qualified by considerations of commercial limitations, return on investment and the human agencies to be employed. As a whole his address was an appeal for a broader, but, at the same time, a more practical and more specifically thorough education for the engineer-student; the fundamentals of engineering science to be taught with the greatest thoroughness; the ability to analyze data and to correctly reason therefrom to be cultivated rather than the memorizing of data and formula.

Allis-Chalmers Blowing Engines.—The Allis-Chalmers Company, Milwaukee, Wis., in addition to the 12 gas engine driven blowers it is building for the Carnegie Steel Company's Homestead plant and the new works of the Indiana Steel Company at Gary, Ind., has on its erecting floor at West Allis large vertical steam blowing engines for the Wickwire Steel Company, Tonawanda Iron & Steel Company, Pennsylvania Steel Company and Republic Iron & Steel Company. Between 300 and 400 Allis-Chalmers vertical steam driven blowing engines and nearly as many more of the horizontal type are in operation at various iron and steel producing centers of the United States, a fact which will serve to convey some idea of the present magnitude of the industry in which they are used and the demands that it must of necessity make upon the machinery builders of the country for future equipment.

The first meeting of the Gas Power Section of the American Society of Mechanical Engineers will be held on the evening of February 11, in the Engineering Societies' Building at 29 West Thirty-ninth street, New York. The subjects under discussion will be "Experimental Gas Turbines in France" (with lantern slides), "A Simple Continuous Gas Calorimeter," and "A Gas Engine and Producer Guarantee." Other subjects relating to the question of gas power will also be discussed.

The Corrosion of Wrought Iron and Soft Steel Pipes.*

BY T. N. THOMSON.

The physical properties of wrought iron and steel pipes have been brought to my attention during the past few years, and I have spent considerable time trying to determine whether modern soft steel pipe is really superior or inferior to modern wrought iron pipe for heating and plumbing puposes. The matter was originally brought to my attention by the pipe manufacturers, who stated that we are wrong in supposing that steel pipe is less durable than wrought iron pipe. Indeed, they showed me the results of numerous tests which demonstrated that, as far as corrosion is concerned, the life of wrought iron and the life of soft steel are practically the same when the pipes are subject to the same conditions.

I did not doubt the records of these tests at all, but as they were principally laboratory tests I could not consider them as convincing as the condemnation of steel pipe by steam fitters and contractors. Then we tried to investigate along practical lines. I had not gone far when we found that a peculiar condition of affairs exhibited itself, as follows:

General Opinions of Users of Pipe.

A large proportion of the members of the heating trade denounced steel pipe, because, as they said, "It splits, breaks the teeth of the dies and rusts out too quickly." Contractors who would acknowledge that they carried steel pipe in stock a few years ago could scarcely be found; they invariably all supposed they carried only wrought iron pipe.

2. Engineers and architects very freely specified that "wrought iron pipe (not steel pipe) must be used," &c., their impression being that the increased cost of wrought iron pipe over steel pipe was more than compensated for in the greater period of usefulness of the wrought iron pipe over the steel pipe.

3. Instructors in trade schools, professors in colleges, and even the writers of text books were known to emphasize the supposed fact that steel pipe was not so durable as wrought iron pipe, and that the latter should be used in preference to the former, particularly for underground work.

4. On the other hand, statistics showed that the makers of steel pipe furnished about 80 per cent. of all the welded pipe then used in America. I also found that not only had the makers of steel pipe spent millions of dollars in the development of vast plants, but they they had also made a large number of experiments and tests to determine the relative durability of wrought iron and steel pipes, and that their findings invariably were to the effect that the life of these two materials is about the same when they are subject to equal conditions.

5. Wrought iron pipe and steel pipe resemble each other so closely that many engineers, contractors, architects, and even steam fitters themselves, cannot distinguish a difference. I know this to be a fact, for I have tried a number of high class representatives of these several vocations, and they almost all acknowledged that they could not determine the difference unless they were first to cut and thread the pipes; then those pipes which appear most difficult to thread they would christen steel pipes, while those which appear more easy to thread they would call wrought iron pipes. But this process of determining a difference is not reliable, for it is a fact that a man working with sharp and properly designed dies can thread steel pipe almost as easily as he can thread wrought iron pipe. This was demonstrated by a series of tests I made for the International Correspondence Schools in 1905, full records of which can be found in the 1905-1906 proceedings of this society.

One Method of Collecting Information.

As by far the greater part of the every day work of our students in heating and ventilation is principally the manipulation of welded pipes, we considered this subject of sufficient importance to investigate and try to find something absolutely definite regarding the relative corrosion of modern wrought iron and modern mild steel pipes when both are subject to the same actual working conditions as they occur in practice. With this end in view we commenced by quietly circularizing about 300 heating engineers and contractors, offering a book to each in exchange for a small piece of corroded pipe which had been in service only a few years, we to pay express charges at our end. Each circular letter was accompanied by a sheet with printed questions relating to the history of the sample, and was provided with blank spaces for the answers.

My object in trying to obtain these samples and their histories was to find how many were wrought iron and how many were steel. I expected to find that at least 80 per cent. of the samples of corroded pipe sent to me would be steel, but they were not. Of the samples received, only 10 gave out within four years of service, six of these being steel and four being wrought iron. An examination of these samples showed that uniform corrosion took place in both the wrought iron and the steel pipes.

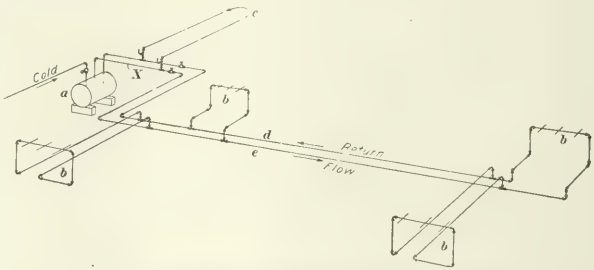


Fig. 1.—Arrangement for Testing Under Service Conditions.

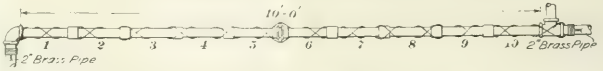


Fig. 2.—The Ten Lengths of Pipe as Used at X, Fig. 1.

Corrosion from Outside.

An excellent example of uniform corrosion of a ⅝-in. black wrought iron underground cold water pipe came from Chicago. It had been in use three years; fully half of the metal was "eaten off" the outside, while the inside was but slightly corroded. There was no pitting present in this sample. Another good example of uniform corrosion was exhibited in a piece of 1½-in. black wrought iron exhaust pipe from power boilers in Tonawanda, N. Y. This had lain in damp soil and ashes four years before giving out. The thickness of this pipe varied from about one-half the original thickness to tissue paper thickness, but no pitting was present. The corrosion was chiefly external, and no doubt was due to the moisture and the ashes. But a better example of uniform corrosion was found in a piece of 2-in. steel pipe from Boston. This pipe was used as a wet return for a direct radiation low pressure heating system, the pressure never exceeding 3 lb. This pipe was put in Febuary, 1904, and was removed March, 1905. The pipe was run on top of a cement floor, over which was a plank floor on which coal was stored. Some of this coal worked down through the wood floor, so that the pipe was partially buried in coal. After each heavy rain some surface water would leak through into the coal bin, so that it is probable the coal around the pipe was continually moist. The pipe was not covered with pipe covering. The corrosion was all external. The inner surface was not corroded in the least.

Three galvanized nipples were received from one party in Newark, N. J. They were reported to have been all taken from the same pipe line, which was used

* Paper, substantially in full, read before the American Society of Heating and Ventilating Engineers, at its January meeting in New York City.

for hot water circulation between a tank and a heater for a house supply of hot water. Two of these nipples were wrought iron and one was steel. They were all pitted to about the same extent.

Deductions from Samples of Pipe.

A study of the samples received from the trade would lead me to assume that (1) both wrought iron and steel pipes which convey steam or hot water will corrode very rapidly when buried underground in wet or damp soil or ashes, the corrosion being principally external; (2) both wrought iron and steel pipes which convey hot water become rapidly corroded if the air and other gases naturally solvent in the water are not permitted to escape from the water previous to its passage through the pipes, as in feed water heater connections and hot water circulation pipes for plumbing purposes, this corrosion being principally internal if the pipes are not buried underground. (3) That the life of either wrought iron or steel pipes subject to both of the aforesaid conditions will be much shorter than if the pipes are subject to only one of them, because the metal will thus become rapidly corroded at both the internal and external surfaces. (I received no samples which show this, neither have I made tests to prove it, but it seems rational to form this opinion at present.) (4) It is not a fact that the destruction of wrought iron pipes is in the form of a uniform corrosion, while the destruction of steel pipes is in the form of pitting; they appear to be on an average nearly alike, with the difference, if any, in favor of steel. Of course no definite conclusion can be drawn from the study of a number of pieces of corroded pipes received from different parts of the country further than the facts we can see in the samples themselves; for instance, the finest sample of uniform corrosion I received was mild steel. It came from Milwaukee, is ¾-in. black steel pipe and is reported to have been used "for heating water in a range boiler for domestic purposes." It was in use two years. The corrosion is practically uniform without a sign of pitting. Part of the original thickness of the metal was corroded from the inside and about two-thirds from the outside. The pipe, which, no doubt, was originally standard weight, is now about 1-16 in. thick at its thickest part and tapers down to tissue paper thinness in several places.

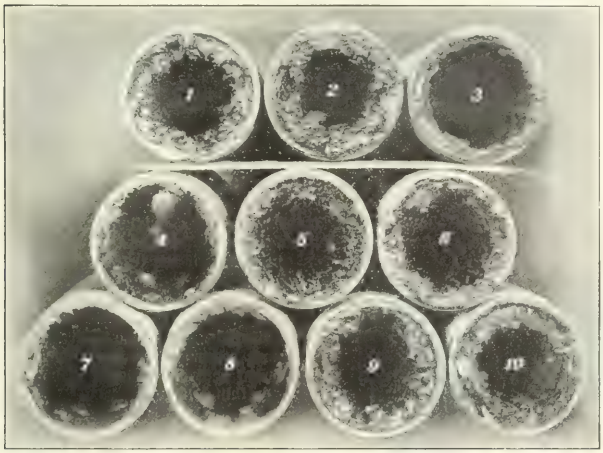


Fig. 3. Rust Formation in Different Pipes.

To secure a record of facts regarding the period of usefulness of steel pipe as compared with wrought iron pipe it is necessary to test a large number of samples of both steel and iron pipes subject to exactly the same conditions, and these conditions must be the same as the conditions of practice.

Comparative Tests Under Service Conditions.

On March 7, 1906, I installed a number of pieces of wrought iron and steel pipe for a corrosion test at the ceiling of the engine room in the I
International Correspondence S
with the object of determining defi
will last as long, or longer, than
by how much. The existing cond

A 100-gal. galvanized iron boiler, a
room, is set horizontally on two cast ir
ported on brick piers, as indicated in Fig.
furnishes hot water to 24 combination c
pressroom sinks, as at *b*, and four slop si
water is heated by a 1-in. brass steam coi
boiler. The water comes from our city mai
a working pressure varying from 85 to 135 lb. i
inch by the gauge. An analysis of the city wa
while the pipes were under test was as follows

TABLE OF ANALYSIS OF WATER.

CO_2 and Organic matter	
Silica	
Iron oxide	
Alumina	
Calcium carbonate	4.1
Magnesium	Trace
Sulphur trioxide	Trace.
Sodium chloride	0.82

This may be classed as ordinary good water and should not affect iron or steel pipes in any extraordinary way.

The water on being heated in the boiler *a* circulates between the boiler and the sink cocks to insure hot water being drawn instantly when a cock is opened. The circulation is from the top of the boiler up through the flow pipe *e* and back through the return pipe *d* to become reheated in the boiler. These pipe lines are all composed of annealed brass pipe tinned both outside and inside and connected with heavy cast brass beaded fittings. A piece of 2-in. pipe 10 ft. long was removed at *x* and replaced with 10 short pieces of 2-in. iron pipe screwed together as shown in Fig. 2.

The temperature of the water as it flows through this pipe varies presumably from about 160 to 212 degrees, and the supply of hot water is maintained day and night all the year around. Owing to the fact that these iron samples were connected to brass pipes, and also because a large number of presses and other printing and bookbinding machinery driven by individual electric motors are used in this building, we wired and cross wired the pipes with copper wire, as shown, connecting the ends with perfect contacts to the brass pipes. This was done under advice from electrical experts to carry any stray current around the samples and thus avoid decomposition. It was thought this precaution would insure a corrosion that would be due to nothing but the ordinary action of the hot water on each sample, and that no sample would be favored in any way. The samples were installed March 7, 1906; were removed March 14, 1907; and were in constant service during that time.

Loss by Weight of Test Specimens.

As soon as they were removed and separated, the ends were photographed (see Fig. 3) to show the rust formation and its thickness. The velocity of the water through the samples was always low; it never was high enough to wash out or dislodge the rust, which, therefore, formed a fairly uniform lining about ¾ in. thick in the black samples. The galvanized samples were not affected this way; they corroded only in spots, which, presumably, were imperfections in the galvanizing.

Before installing the samples we weighed each one separately without the couplings, so that after the rust was all washed out and the samples weighed again the difference in weight indicated the total weight of metal lost by corrosion. Here we found that in the plain pipes 9 13-32 lb. of wrought iron lost 20¾ ounces, while

247⅛ ounces.
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ere we are tempted to
l conclude that as the
this test has lost more
the wrought iron pipe, it
t the wrought iron pipe is
durable. But such a con-
ould be misleading and ab-
the extreme, because the life
e depends not upon the amount
corrosion, but upon the deepest
A certain pipe may lose only
ent. of its weight by corrosion
it begins to leak from some pit-
s, while another pipe may have
: 50 per cent. of its weight by cor-
sion and still be perfectly tight and serviceable. Therefore, it appears evident that in order to determine the relative life of the samples it is necessary to measure the depth of the pittings and base conclusions on these measurements.

With this end in view, we sawed open each sample lengthwise; then an expert in micrometer measurements, a toolmaker accustomed to very fine work, was detailed to measure the depth of the five deepest pittings in each half, making 100 micrometer measurements. It really was only necessary to measure the deepest pitting in each piece, but to locate it by the eye was impossible. By selecting the five which appeared to be the deepest, however, we felt sure that we measured the deepest pitting in each piece. The thickness of the metal under each pitting was first measured by Starrett transfer calipers having sharp points; then a very delicate inside caliper was used to just touch the points of the transfer caliper, and the distance between the points of the inside caliper was measured with a 1-in. micrometer. Each pitting was measured in the same way and by the same person. The measurements recorded here are believed to be correct to within 1-1000 in.

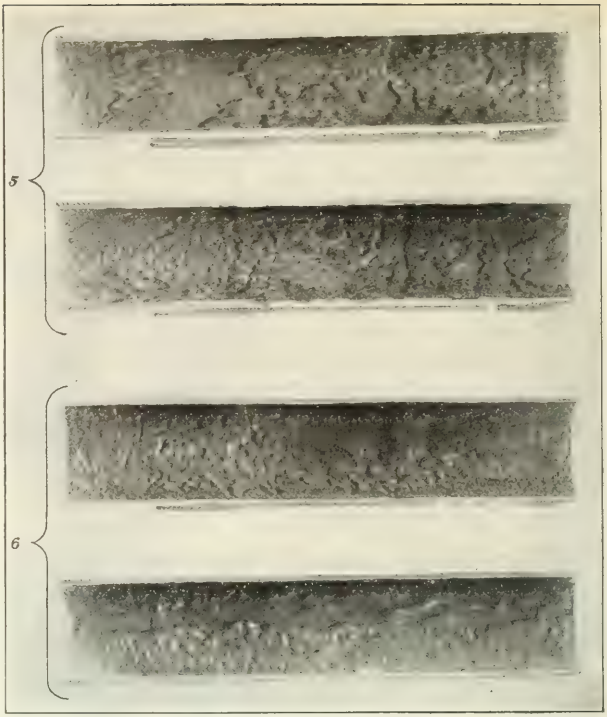


Fig. 4.—Sections of Pipe: 5, Wrought Iron, 780.5 Days; 6, Steel, 780.5 Days.

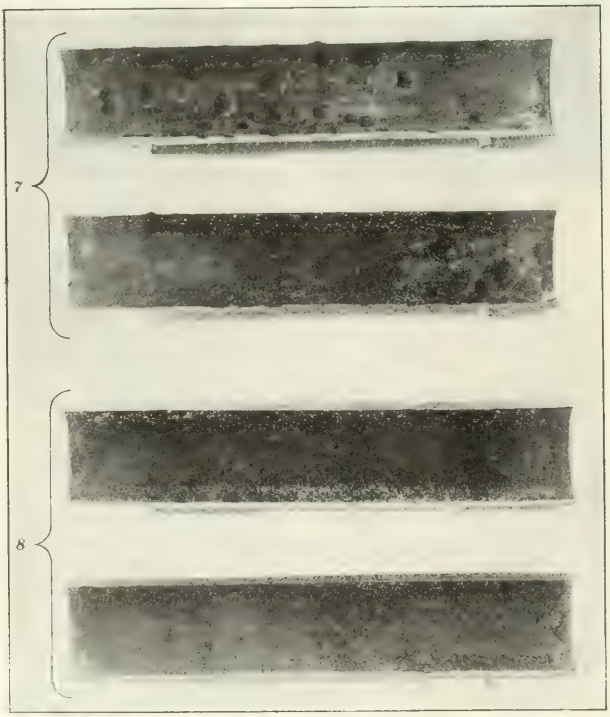


Fig. 5.—Galvanized Pipe: 7, Wrought Iron, 770 Days; 8, Steel, 1162.9 Days.

Figs. 4 and 5 are from photos of some of the samples after they were cut in halves. A close examination will show quite a difference between the corrosion of the steel and the iron.

Summary.

Assuming that corrosion had been continued at the rate which existed during the period of the test, then the different samples would have become corroded through at the end of the number of days given in the accompanying Table II:

DURABILITY OF THE SAMPLES.

Plain Pipe.	Days.
No. 10. Steel pipe	850.4
No. 5. Wrought iron pipe	780.5
No. 6. Steel pipe	780.5
No. 2. Steel pipe	759.7
No. 9. Wrought iron pipe	759.7
No. 1. Wrought iron pipe	686.5
Galvanized Pipe.	
No. 8. Steel pipe	1,162.9
No. 3. Wrought iron pipe	1,162.9
No. 7. Wrought iron pipe	770.0
No. 4. Steel pipe	619.3

The average life of the plain steel pipe samples is 796.9 days, while the average life of the wrought iron samples is 742.2 days, making a difference of 54.7 days in favor of steel. Therefore, a rational deduction to draw from the preceding facts is that plain steel

pipe is more durable than plain wrought iron pipe when used to convey hot water and subject only to internal corrosion. I know that the above summary is not in perfect harmony with the opinions of many engineers and contractors, but I can only record the facts as they are found. I have brought the samples here for inspection and checking if you so desire. If any errors can be discovered either in the method of making the test, obtaining the date, or in the deduction, I shall be pleased to know them.

The New Du Bois Electric Pump.

Electrically driven pumps have many advantages, and for some work are considered more desirable and convenient than steam pumps. This particularly applies where long transmissions of steam would be required and pro-

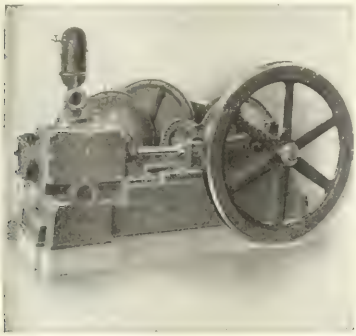


Fig. 1.—A New Motor Driven Pump Built by the Du Bois Iron Works, Du Bois, Pa.

hibitive losses would result from condensation. A motor driven pump can be placed at any distance from the power source and operated with excellent efficiency, as the motor can be operated by either alternating or direct current.

The pump illustrated is simple in design and is driven by the motor through spur gearing. The outfit, two views of which are shown in Figs. 1 and 2, is made by the Du Bois Iron Works, Du Bois, Pa. To give perfect alignment

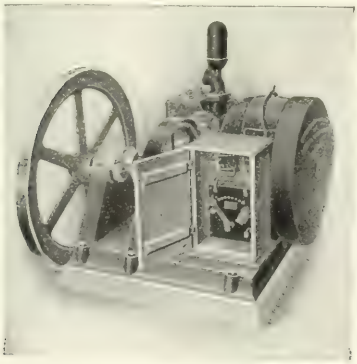


Fig. 2.—End View of the Pump, Showing the Motor Controller.

between the pump and motor, they are mounted on a cast iron base giving a substantial foundation to the main bearings that carry the crank shaft for the balance wheel and main driving gear. The water cylinder used is of the manufacturer's standard type, with all parts readily accessible for inspection.

On the end of the motor shaft is fitted a cut brass pinion, which meshes with the large gear on the intermediate shaft. On the latter is another pinion, which engages the main driving gear on the crank shaft. By this arrangement the proper ratio of speed is secured between the motor and pump for practicability and economy in operation. All gears are protected by heavy iron shields, which can be readily removed when necessary.

The crankshaft is a solid steel forging and the bearings are of babbitt provided with grease cups, which afford continuous lubrication and require but little attention. The connecting rod is forged steel; the cross head end is bored for a bronze bushing, and the crank end is fitted with a bronze box and babbitted. The cross head is cast iron and is designed with broad bearing surfaces and provided with an individual oiler, so that friction at this point is minimized.

DuBois electrically driven outfits can be supplied with constant or variable speed motors of the open or enclosed type. For special mine pumping outfits and where there is considerable dampness, the enclosed motor is used, as it affords complete protection to the armature. The starting device includes a regulating rheostat and a switch for the motor, and is compactly arranged behind the motor, as shown in Fig. 2. It is fully enclosed in a box so that the entire outfit is self-contained and ready for service wherever placed, by simply connecting the electric feed wires, and the pipe connections for the suction and discharge.

A Modern Hardware Factory.

A notable example of the application of the induction motor drive to the solving of power problems in a modern manufacturing establishment is found in the factory of the O. M. Edwards Company, Syracuse, N. Y. This company is an extensive manufacturer of hardware specialties used in both the steam and electric railroad trade, such as window and extension platform trap door fixtures, steel window sash, molding, &c. Formerly the company purchased power from the Syracuse Lighting Company, using 500-volt direct current motors for driving the wood and metal working machinery. It was so well satisfied with electric motor drive that when its factory was enlarged an isolated alternating current plant was installed, together with a complete induction motor equipment.

The generating equipment consists of a Sweet straight line engine directly connected to a 220-volt, 70-kw., 60-cycle, three-phase generator of the revolving field type, built by the General Electric Company, Schenectady, N. Y. The same generator supplies the incandescent lighting.

The motors are of the standard General Electric squirrel cage type, the total capacity installed being a little over 100 hp. The machinery is group driven by motors suspended on platforms from the ceiling. In each shop room the machines are assembled in four groups, a motor in each corner of the room driving a separate line shaft, from which the machines are belt driven. Starting compensators are placed conveniently near the motors.

This factory is modern in every respect. Special attention has been given to the arrangement of machines, with the result that a minimum of time is lost between the different stages in the manufacture of the product. The wiring is all conduit work and adds considerably to the finished appearance of the interior. The entire electrical equipment has been in operation continuously 11 hr. per day for over a year, and it is stated that no operating troubles have been experienced.

A Tidal Power Plant.

Portland, Maine, states that Alfred S. Black, Rockland, Maine, and associates, have bonded both sides of Back Bay, near Portland, with the intention of establishing a tidal power plant capable of developing 25,000 hp. An experimental station at Thomaston, Maine, has been in operation for several years, after designs by William O. Webber, a mechanical engineer of Boston, whose name has been identified with a number of important power projects. The projectors of the plan propose first to establish a 4600-hp. plant at Thomaston, to furnish power to Rockland. The announcement includes the statement that ample capital has been assured by New York interests.

Freight Claims and Overcharges.

BY R. I. ARDREY.

Probably nothing in the whole business world to-day causes more trouble and dissatisfaction than the settlement of freight claims and overcharges. This trouble has been increasing in recent years. Loss and damage and mistakes in rates naturally increase more rapidly than the volume of business, and some of the most progressive railroads show more than a fourfold increase in the past 10 years. Many large systems receive more than 1000 freight claims a day, and many of them have accumulations of more than 50,000 unsettled claims. The average of damage and overcharge claims is about one claim to three cars of freight hauled over a system. Some of the best roads require an average of 60 days to settle a claim after it is received.

Leading railroad men are looking for light on this question. They realize that a congested claim department is a dangerous adjunct of a road, doing more, perhaps, than anything else to promote ill will and legislation. The writer has spent considerable time with leading railroad officials and claim agents, investigating the possibilities of improvement, and suggestions that are offered by these railroad men may be of interest to the shipper who has not given up hope.

Delivering Agent Should Correct Overcharges.

Claim agents and traffic officials agree that overcharges and mistakes in rates should be kept out of the claim department. The delivering agent of the road should be responsible, and should either correct the expense bill before payment or refund the overcharge promptly to the consignee. Where the shipment originates on the delivering road, the agent should have the tariff and make the correction before payment. If it has come from a connecting line, a delivering agent must, of course, have the authority of the other road, if the overcharge is in its advance charges. There is no reason why this authority should not be obtained in a few days, unless the shipment has come a long way, or several roads have participated in the haul. At present, owing to the lax methods of some roads in handling the billing on through shipments which pass over several lines, there are cases where it requires a tedious investigation to locate the mistake and get it corrected. These cases are rare, however, and the delivering agent should be held strictly to account on all ordinary overcharges.

Loss or Damage Claims.

In the good old days when railroads had to make use of every pretext to delay the payment of their small bills, the custom became pretty firmly established of paying loss or damage claims only where it was necessary to obtain the patronage of the shipper or to avoid a lawsuit. Industry in the claim department was exerted only in inventing excuses and methods of tiring out the claimant who was too persistent. It is difficult to change a long established custom. The leading railroads have become prosperous in the past 10 years, and it is no longer necessary for them to dodge their small creditors, but the old custom still lingers in the claim department of many great railroads, and the progressive vice-president who undertakes to reform his road finds it an almost impossible task. The work is so tedious that 100 clerks in a claim department can make but little progress in struggling with an incubus of 50,000 or more of accumulated claims. It is almost impossible to get competent men for the work. The claim department offers little or no opportunity for advancement, and men who want to get on in the world shun it as they would a cemetery or a job as janitor.

Paying Claims on Presentation.

Several Western roads, in an effort to overcome this difficulty and lessen the growing volume of complaints from shippers, have adopted the plan of paying claims "on presentation," when presented by responsible shippers. They of course require that the shipper shall present as complete evidence as possible, including the paid expense bill, with notation by the delivering agent admitting the shortage or damage, together with the report of the consignee and the invoice, or a copy of it. If subsequent investigation shows that the road was not responsible, the shipper who works under this plan must refund the amount paid him.

The Burlington Railroad, which has adopted this plan of paying on presentation, requires a bond from the shipper in which he agrees to refund the amount paid if investigation shows that the road should not have paid it. The Rock Island Lines have also adopted this plan, but do not require any bond, exercising discretion in extending the plan only to shippers who are responsible and whose record shows that they do not present unfounded claims. The Northwestern does offer to pay on presentation, but its claim department shows the high record of paying about 50 per cent. of all local damage claims the day they are received. Local claims represent about half of the total number of loss or damage claims handled by the road, the term "local" in this sense being used to designate shipments from one point to another on the Northwestern system.

The St. Paul Railroad has long enjoyed among shippers the reputation of paying "on presentation," although, in fact, it does not do so. It does not require any bond from shippers for reimbursement, but its claim department has a general understanding with shippers that if subsequent investigation shows that a claim should not have been paid the shipper will refund the amount. It it said that the company has never lost a dollar through the failure of any shipper to repay the money in such cases. The St. Paul system of handling claims has proved so successful and so popular with shippers that it deserves recognition and publicity. To handle claims promptly it is necessary, first of all, to have competent men. No claim agent in charge of the department can handle claims personally, except unusual or difficult cases, or those involving large amounts. Nine-tenths of the claims presented are for small amounts, and it requires a considerable office force to handle them. One simple feature of the St. Paul system disposes of the great mass of claims. The delivering agent, at every station on the road, must make a full report the day of delivery of any shipment in bad order or anything "short or over." These reports go directly to the claim department. When the shipper presents a claim in proper form, with the expense bill showing the agent's acknowledgement of shortage or damage, the report of the consignee and the invoice, the claim agent can verify it at once by the report from the delivering agent, and the claim can usually be disposed of on the spot. Eighty per cent. of local loss or damage claims are paid within a day after they are received.

Overcharge claims on business from connecting lines are handled just as promptly by the St. Paul people. All that is necessary is to check the rate by the tariffs of the connecting line. If the shipper's claim is correct the overcharge is paid at once, without waiting for the authority or concurrence of the connecting line. This plan ought to be followed by all railroads on overcharges which the delivering agent cannot correct. The road which has collected the overcharge should refund it and settle afterward with its connections.

Loss or damage claims on shipments that have been forwarded to other roads are far more difficult to handle on account of the delay in getting acknowledgement from the foreign road. The St. Paul people have found it necessary to employ expert claim men, who go to the foreign line and camp out in its claim department until all claims due to St. Paul shippers have been settled.

New Rule Adopted by Claim Agents.

A leading claim agent has calculated that it takes an average of 12 days to get replies to inquiries which he sends out. Many roads delay for weeks or months to answer inquiries on interline shipments which they have delivered, and some do not reply at all. Until recently no road would permit its delivering agents to answer inquiries from claim departments of other roads. Progressive claim agents, who want to settle promptly with the shippers on their roads, have found it extremely difficult for this reason to get from the foreign delivering

agent the necessary proof of the loss or damage to justify them in paying out the funds of their corporations.

Last fall the progressive roads finally succeeded in getting the Freight Claim Association to adopt a rule which authorizes direct investigation. The claim agent of one road can now write directly to any local agent in the United States for a report of loss or damage. If a reply is not received in 20 days the inquiry is repeated to the claim department of the road, and after 30 days the inquiring road can charge the claim to the delinquent line. This places a 50-day limit on the time necessary to obtain information from a connecting line, and it has resulted in a great improvement in settling "interline" claims. The fact may be of interest to Eastern shippers that it was the influence of Eastern roads which for five years prevented the adoption of this plan. Even the Southern roads favored it.

When all the facts are considered, it is evident that the "pay on presentation" plan should have the united support of commercial shippers. Important Eastern roads raise the objection that it may be technically illegal, but perhaps their counsel have not considered carefully the legal aspects of the present plan of taking the shipper's money by force, in excess of legal rates, and holding it for months or years. Of course the presentation method cannot be extended to occasional shippers, but where a commercial shipper is doing business every day with the railroad it is amply protected. Very, very few commercial shippers present unjust or excessive claims. They are satisfied to get what is justly due them. On overcharge claims the expense bill alone is sufficient proof. Where a package or piece is short, on an L.C.L. shipment, the railroad is entitled to a reasonable time, not more than a week or two, for efforts to find it. On damage claims the invoice, report of consignee and expense bill, with acknowledgment of damage, should be sufficient when presented by a responsible and reputable shipper.

The Warwick Iron & Steel Company's Report.

The balance sheet of the Warwick Iron & Steel Company, Pottstown, Pa., as of December 31, 1907, is as follows, compared with the same date of 1906:

Assets.

	1907.	1906.
Real estate, plant and equipment	$1,795,806.15	$1,782,862.42
Pig iron, raw material and supplies	605,459.14	562,661.20
Cash in bank	116,476.15	111,091.65
Dry air plant	170,566.33	71,205.12
Employees tenant house account	13,693.83	.....
No. 3 furnace	.....	74,319.37
Bills receivable and accounts receivable	548,956.19	443,396.79
Totals	$3,250,957.79	$3,045,536.55

Liabilities.

Capital stock	$1,486,715.00	$1,486,715.00
Mortgage bonds	225,000.00	240,000.00
Profit and loss account, balance, December 31	462,719.30	332,097.50
Pig iron account:		
Earnings for the year	$457,957.40	$315,390.77
Less interest on bonds and borrowed money	25,428.53	22,147.67
Net earnings	432,528.87	$293,243.10
Amount reserved for relining furnaces	112,174.68	97,552.86
Bills payable and accounts payable	531,819.94	595,928.09
Totals	$3,250,957.79	$3,045,536.55

In connection with the balance sheet the directors have submitted to the stockholders the following report for the year ending December 31, 1907:

The total product of pig iron for 1907 was 256,750 tons. This is in excess of any previous year's production, owing to the operation of No. 3 furnace throughout the entire year, and notwithstanding that No. 1 furnace was blown out November 11, having been in operation only 315 days. No. 2 furnace was blown out December 27, operating 361 days. Both No. 1 and No. 2 furnaces were in need of relining, so that advantage was taken of the reduced demand, which set in the latter part of the year, to put the furnaces out of blast, after piling a tonnage of iron sufficient to protect contracts.

The unfilled contracts constitute valuable assets. While shipments have been postponed in consequence of the enforced idleness and greatly reduced consumption of steel mills and foundries, yet we feel assured that the tonnage represented by our orders will ultimately be taken by the purchasers without the necessity of resorting to extreme measures to enforce the deliveries. No contracts have been canceled, nor will any be canceled, except for insolvency on the part of the buyer or other sufficient cause. The Warwick Company is strong in this position, as it filled many contracts during the early part of 1907 at prices below the cost of production, and now that conditions are reversed a consistent policy will be enforced.

The lease of No. 3 furnace and its operation throughout the year proved profitable. The cost of repairs to this furnace has been charged off to profit and loss account, viz., $62,872.86. Profit and loss account has also been charged with an expenditure of $11,310.32, for the rebuilding of trestles with concrete piers and steel superstructures to replace timber. The increase in weight of cars and locomotives rendered these expenditures necessary. The real estate, plant and equipment account has been increased by $12,943.73, representing additions to equipment. The labor conditions in 1907 and the lack of tenant houses in Pottstown brought about the necessity of supplying houses for a portion of our employees. This represents a net expenditure of $13,693.83. Mortgage bonds to the amount of $15,000 were paid and canceled June 1, 1907, thus reducing the outstanding bond issue to $225,000. Semiannual dividends of 3 per cent. each, amounting to a total of $88,897.20, were paid May 15 and November 15, respectively.

Up to January 1, 1908, the total payments on account of the Gayley dry air plant amount to $170,566.33. It was not until the middle of August that the machinery was sufficiently completed to test. The first two weeks were practically devoted to testing the engines, &c. The air supplied to No. 2 furnace was deprived of a large percentage of its moisture commencing with September. It is due to the assistance obtained from the dry air plant that the management was able to keep No. 2 furnace in operation for a longer period than would have been possible without it. The ability to keep No. 2 furnace running from September to December enabled us not only to prevent the cancellation of basic iron orders, but at the same time to make net gains far in excess of any previous four months in the history of the company. The net earnings for the last four months of 1907 represent a large percentage of the total cost of the dry air plant. Dry air was applied to No. 1 furnace for five weeks with beneficial results.

No. 1 furnace has been relined and is ready to be put into operation on short notice, whenever trade conditions will permit. When No. 2 furnace was blown out the brickwork naturally was found to be in bad condition, owing to its prolonged blast. Repairs cannot be completed before April next. It is believed that the credit to relining account will be ample for repairs to both furnaces.

The Charles G. Smith Company.—Owing to the fact that certain officials of the Charles G. Smith Company, 603-604 Park Building, Pittsburgh, dealer in machine tools, machine shop and emery grinding equipment, are actively connected with the Pittsburgh Emery Wheel Company, the report has become current that it is the intention of the Charles G. Smith Company to discontinue the machine tool business. The company states that this report is utterly untrue, and that, on the contrary, it proposes to continue in the machine tool business actively, as before. Considerable annoyance has been caused by the circulation of the rumor, and the company desires its friends in the trade to know that it has no basis in fact.

The Italian Westinghouse Company (Società Italiana Westinghouse) which started operations last year with a capital of $1,000,000, is completing a plant at Vado, near Savona, for the manufacture of equipment for electric roads.

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Southern Pig Iron in Northern Markets.

A representative of a Southern company producing pig iron for the general market writes us as follows:

We were very much interested in reading the editorial, "Price Questions Go Back to Ore," in *The Iron Age* of January 30. It seems to us that too much prominence is given in this article to the competition of Southern furnaces. The whole production last year of Alabama, Kentucky, Tennessee and Virginia was only about 2,400,000 tons, of which Alabama produced about 1,600,000 tons. This represents practically no increase over the past four years, and we are told that about 60 per cent. of this output is consumed in the South itself. The State of New York produces as much iron as Alabama, and Illinois as much as the entire South. We also note that the foreign field is now open to the South again. Our understanding is that there are very few furnaces in blast in the South at the present time, and we do not know of a single new furnace that is under construction south of Mason and Dixon's Line. You can readily see that we do not believe there will be much Southern pig iron in competition with our Northern producers in their territory.

It has been said for several years that Southern iron is growing to be less of a factor, actually and relatively, in Northern markets. There has been an increasing, though slowly increasing, production of steel in the South, and the output of Southern blast furnaces has practically stood still. Usually only general statements on this subject are made, but the inference they carry is that Northern merchant furnaces are having no serious competition except among themselves. This is the view taken by our correspondent. It is true that the amount of Southern foundry iron sent north of the Ohio and the Potomac rivers was not as great last year as in 1903, the year whose statistics were taken as the basis of the prices made by Lake Superior ore sellers for 1904, as referred to last week. Still, it would seem that the letter quoted from above scarcely takes full account of the competition of Southern iron in Northern districts.

Our correspondent compares the pig iron production of New York State with that of Alabama, and that of Illinois with that of the four Southern States that contain practically all the merchant furnaces in that section. Such a comparison does not signify. Leaving out Southern basic iron, of which the moderate percentage available for the market goes to a limited number of Northern buyers, the really comparable tonnages for the States mentioned are those of foundry and forge iron. The production of these grades in New York last year was about 625,000 tons, and in Illinois about 300,000 tons, as against 2,110,984 tons in the four Southern States our correspondent names.

The production of foundry and forge iron in Alabama, Tennessee, Georgia, Texas, Kentucky and Virginia in 1907 was 2,166,809 tons, while the total production of foundry and forge iron in the country last year, eliminating malleable Bessemer, was about 6,000,000 tons. The South thus contributed something over one-third of the total. No accurate data exist as to the Southern consumption of foundry and forge irons made in the six States named. Allowing for the iron taken by cast iron water pipe works, sanitary pipe foundries and by stove works and machinery foundries in the South, there still remains nearly 25 per cent. of the country's output of foundry and forge irons last year that was shipped from Southern furnaces to consumers in the North. In flush times the competitive phase of this movement is not prominent; quite different is the case in years like 1904 and 1908 and in periods of transition, with moderate activity, as in the first half of 1905.

Passing over our correspondent's reference to the foreign movement of Southern pig iron, which has a past, but neither a present nor a future, a word may be said as to the fact, to which he calls attention, that Southern pig iron production has been stationary in recent years. The figures representing in gross tons the production in 1903 and 1907 of the merchant pig iron States in that section make a striking showing:

	1903.	1907.
Alabama	1,561,398	1,686,674
Tennessee	418,368	393,106
Georgia, Texas, North Carolina	87,255	55,825
Virginia	544,034	478,771
Kentucky	102,441	127,946
Total	2,713,496	2,742,322
United States	18,009,252	25,781,361
Bessemer iron from above seven States	30,830	43,382
Southern Basic	267,999	542,256
Foundry and forge from above seven States	2,414,667	2,156,684
Total foundry and forge, including malleable	5,785,957	6,835,174

We have left West Virginia and Maryland out of the account partly because both are dependent on outside sources for ore—so that in that sense their iron industries are not Southern—but more because they are not producers of foundry and forge iron. The significant exhibit of the table is that the Southern States produced less foundry and forge iron in 1907 than in 1903, though the country produced 43 per cent. more of all kinds of pig iron in the former year than in the latter, and 18 per cent. more of pig iron for iron foundries and iron rolling mills. The dwindling of Southern merchant iron as a factor in the Northern trade is emphasized by the table, but as has been shown it is by no means a negligible factor. It must be taken fully into account in any consideration of the price Northern producers of foundry and mill irons are asked to pay for Lake Superior ores.

Alien Workmen and Accident Liability.

The employment of great numbers of immigrants has raised the new and important question under the employers' liability acts of several States as to whether ignorance of the English tongue is a sufficient reason in the eyes of the law to relieve an injured employee of the burden of his own negligence or that of a fellow workman. The question is yet to be decided to the point of established practice; in the several cases so far reported the courts have been inclined to avoid this aspect of plaintiffs' contentions. Sufficient progress has been made, however, to indicate that under certain circumstances the plea of ignorance of English may be sustained. In a New York case the court held that failure to understand English is not the negligence of the master where the work is simple. An Illinois court has decided that the master is not obliged to give warning to a servant in his language unless he knows that the servant does not understand English. The railroad laws of Ohio recognize the existence of this imperfectly qualified element among

workmen by forbidding the employment of certain servants who cannot read, write or speak English. But the question in a large sense has yet to be fought out in its constantly varying aspects until substantial precedent has been established to govern the future conduct of cases in which this element of ignorance is present.

The laws regulating liability for accident to a workman generally agree that when the man is injured through his own negligence his employer is not responsible for damages; and that where an accident results from the negligence of a fellow servant the burden rests upon the fellow servant and not upon the employer. The injured man may recover from his fellow servant, but not from their employer, excepting when the fellow servant is vested with authority, as in the case of a superintendent or foreman. If a foreman should put a man to work on a machine, pointing out its dangers, and the man should be hurt because he did not heed the warning, there would be no liability. In the eyes of the law he had assumed the risk and the fault was his own. These are general principles of law, simply stated, but the new contention of ignorance of English introduces an element of doubt as to whether the workman can be considered to have assumed a risk he did not understand because he had not comprehended the warning; and whether another workman injured through this absence of understanding can be deprived of the right to recover from the employer on the ground of negligence of a fellow servant.

We will presume that a superintendent puts a new man, whom he sees is a foreigner, to work on a press, instructing him in English as to the dangers of the machine and the manner of operating it. The man may seem to understand what he is told; it would be only natural that the newly arrived foreigner should be eager to begin his new work. Yet he may imperfectly understand English. He is injured and the plea is made in his behalf that he cannot be held to have been negligent, because he had no knowledge of his dangers. Likewise, to illustrate the case of the fellow servant, the foreigner may be set to work with others and because of his ignorance cause an accident to another workman. In a case now pending in Massachusetts a certain machine required the services of two men, an operator and an assistant. The latter was absent from the factory and the superintendent put a new man in his place. The operator got his hand caught in a press mechanism, and, realizing his danger, called to his new assistant to throw off the power. The man obeyed intelligently enough. The power was off, but the hand, though uninjured, could not be withdrawn until the die was raised. He called to the assistant, "reverse it," but the man failed to understand his meaning and threw on the power. The hand was crushed beyond all further usefulness. The new man did not understand English. The accident occurred before he had been at work 5 min., and the operator asserted he did not realize that his assistant could not understand his directions. The claim of the plaintiff in an action brought against the employer to recover damages for this accident is that the plea of negligence of a fellow servant could not be maintained because the ignorance of English made it impossible for him to understand directions as to operating the machine, and that consequently negligence rested with the superintendent, who put him to work.

A thorough discussion of the questions involved develops apparently limitless intricacies of law. The general contention, however, is a warning to employers of alien workmen, that they may safeguard their interests by strict precaution against possibilities of similar happenings in their works. The courts may eventually decide that as a principle of law ignorance of English is the misfortune of the workman, and not a reason for negligence on the part of the employer or his agents. In the meantime, however, it would be well to consider the matter as one of grave doubt, and act accordingly. Where a polyglot population constitutes the source of labor supply interpreters should be developed, preferably among the workmen themselves, a course followed in many industrial establishments, not only because of the danger of accidents through failure of understanding, but because a workman must be intelligently instructed in order to do his work well and quickly. Superintendents and foremen should be held strictly to account for this important part of their duties.

Iron Castings and Rolled Steel in 1907.

A contrast between the pig iron statistics for 1907 and those for 1906 is worthy of mention. Whereas the increase in production in 1906 over 1905 was all in steel making pig iron, other irons, indeed, falling somewhat behind, the increase in 1907 over 1906 went to foundry and mill irons, while iron for steel works declined. The significance of the statistics will appear by setting them down in the two classes named. Thus:

	Gross tons.
Net increase in 1906 over 1905	2,314,811
Increase steel making pig iron in 1906 over 1905	2,358,563
Net increase in 1907 over 1906	474,170
Increase foundry and mill pig iron 1907 over 1906	692,817

The inference from the figures is that steel products made a great gain in 1906 over 1905, as official statistics showed to be the case, while the output of iron foundries was substantially the same in the two years. The conclusion derivable in a similar way from the pig iron figures for 1906 and 1907 is that last year the production of steel in the United States fell somewhat below the total of 23,398,136 tons of ingots and castings in 1906 and that iron foundries, including those making malleable castings, made a gain over their outputs for 1906. The American Iron and Steel Association has not yet published its detailed figures classifying the pig iron product of last year, but from the statistics as given out we may make the distinction between steel making irons and those going to the foundry cupola or puddling furnace. A comparison with 1905 and 1906 follows:

	1905.	1906.	1907.
Bessemer and low phosphorus	12,407,116	13,840,518	13,231,620
Basic	4,105,179	5,018,674	5,375,219
Ferro and spiegel	293,976	305,642	339,348
Foundry and high silicon	4,755,288	4,768,011	6,835,174
Malleable Bessemer	635,236	699,701	
Forge, mottled, &c.	795,585	674,645	
	(6,186,109)	(6,142,357)	
Total pig iron	22,992,380	25,307,191	25,781,361

In advance of the compilation of the statistics of steel production for 1907 it may be said, on the basis of the above pig iron comparison, that the Bessemer steel output last year fell off more than the total steel output, while basic pig iron, as it has done every year since the statistics of its production were first separately compiled, in 1897, showed an increase over the preceding year, indicating that basic steel also increased. The Bessemer rail, wrought pipe and sheet and tin plate trades fell off notably in the slump of last November.

The above table well tallies with what is known as to the sudden pinching off of the business of the steel mills in November, and emphasizes the ability of the steel companies to adjust their production quickly to the needs of the market. On the other hand, the business of foundries involves many steps between the placing of contracts for castings and the delivery of the finished product. This accounts in part for the lagging of merchant blast furnaces some weeks behind the steel works

furnaces in the movement of curtailment. In January merchant furnaces were still going out when some of the steel works furnaces that went out in November and December were starting up again.

One factor in the increase in foundry iron production last year, accompanying a decrease in steel making iron, should be mentioned. That is the increase in stocks of pig iron at merchant furnaces. While foundry iron production may be estimated at 450,000 to 500,000 tons more in 1907 than in 1906, the increase in consumption was less. Southern merchant furnaces had stocks at the end of the year which probably exceeded 200,000 tons, and the stocks at Northern merchant furnaces on December 31 were doubtless more than that, the total representing a substantial increase over stocks on hand at the close of 1906.

CORRESPONDENCE.

Excessive Machinery Driving.

To the Editor: The editorial in your issue of January 16, eititled "A Fallacy of Machinery Driving," appeals strongly to me in view of a recent experience I have had, and which I believe has been the experience of others in our line.

I was some time ago requested to call at a customer's factory and examine a machine which was giving trouble. I did so, and while there my attention was called by the treasurer of the company, who is recognized as a successful financial manager, to two or three other machines of heavier type which we had sold them. He commented with great pride on the rapidity at which they were being run, and stated that this was accomplished only after he had been obliged to call the superintendent to account several times. In view of my errand to the factory, it was quite natural for me to inquire further into the matter, and in looking it up I found that, while it was true they were running at from two to three times the speed formerly attained on these machines, the feeds were reduced in the same ratio, resulting in a reduced production, as compared with what would have been accomplished had the correct ratio of speed and feed been maintained, and in addition there was the unnecessary wear to the running parts of the machines, owing to the excessive speed at which the machines were being operated. However, the speed was what the treasurer wanted and the superintendent gave it to him, remarking to the writer at the time that we would have some more "kicks" to look after in the near future.

Upon investigating the complaint that I had been called to the factory for, I found that this tool had also been run away beyond its capacity as to speed, resulting in the heating of some bearings. After a "heart to heart" talk with the treasurer, he was inclined to feel that perhaps after all the superintendent did know something about the speeds that the tools should be operated at. I advised him that if in the future he questioned his superintendent's judgment to take it up with the manufacturers of the particular tool that he wished to know about, before "jacking" speeds up, and I felt quite sure they would be pleased to give him the necessary information, and in the particular case at hand it would only be fair for his company to pay for the parts necessary to put the machine in order.

If the manufacturers were building tools only for high speeds (cutting air) they would have designed them on altogether different principles. When a machine is sold to do a certain class of work the literature describing the machine usually gives the proper speeds at which it should be operated, and it seems that the advice of the manufacturer ought to govern the use of the machine, rather than the man who has had no experience whatever with machinery, or the production department, sometimes called the "speed boss," who in many cases has never had any practical experience in the construction of machine tools, and whose only object it appears is to see the chips fly regardless of how long the machine can continue in operation.

I would be glad to see you continue this work of education further in *The Iron Age*, as it would be of immense service, not only to the manufacturer, but to the poor salesman who is usually the "buffer" in matters of this kind. A MACHINE TOOL DEALER.

Labor Unions Liable for Boycott Damages.

Another heavy blow was dealt the objectionable practices of labor unions by a decision of the Supreme Court of the United States on Monday, February 3, that a boycott which is of such character as to restrain trade is actionable under section 7 of the Sherman antitrust law, which provides for the recovery of threefold damages. The opinion given was a unanimous one and its outcome is likely to be the most serious damage the trade unions have sustained in years, for in its full import it means a union which undertakes a boycott renders every one of its members personally liable for threefold damages to the firm or individual boycotted. Recent weeks have been especially disastrous to labor unions in the overthrow of their court contentions.

The case decided at Washington on Monday was that of Dietrich Loewe & Co., hat manufacturers of Danbury, Conn., against Martin Lawlor and 200 other members of the United Hatters of America.

The United Hatters, with the assistance of the American Federation of Labor, were undertaking to unionize all the hat factories in the country. In 70 of the 82 shops they succeeded. Loewe & Co. were one of the 12 concerns that held out. Thereupon the boycott was declared. The Federation took up the fight and printed the name of the Loewe concern in the "We don't patronize" list in the *Federationist*, the official organ of the Federation. Loewe alleged that he had sustained actual damages to the amount of $80,000, and sued Lawlor and 200 other members for $280,000, under section 7 of the Sherman act, which says:

> Any person who shall be injured in his business or property by any other person or corporation by reason of anything forbidden or declared to be unlawful by this act, may sue therefor in any Circuit Court of the United States in the district in which the defendant resides or is found, without respect to the amount in controversy, and shall recover threefold the damages by him sustained, and the costs of suit with a reasonable attorney's fee.

In making the decision of Monday the Supreme Court remanded the case to the Circuit Court for trial of the action for threefold damages.

The Hamilton Steel & Iron Company, Ltd.

The Hamilton Steel & Iron Company, Ltd., Hamilton, Canada, has issued a circular stating that the directors have incorporated a new company, identically named, with authorized capitalization of $5,000,000, and an agreement has since been entered into with the new company by the directors, which agreement is to be completed by April 30 next, the date of the expiration of the current financial year of the company. The circular states that trustees are to be appointed to receive certificates of shares from the shareholders, and the trustees will issue receipts entitling the holder to "receive a certificate of the new company for the increased number of shares to which he will become entitled." Any dividend that may be declared for the quarter ending April 30 will apply only on the shares of the present company, and will be paid to shareholders as of record at the close of business April 30. We are advised that the matter of stock issue has not yet been decided by the board, but that in any case, if business were of the best, the amount that would be distributed to present shareholders would not exceed two shares for one of the present company. It will be observed that the arrangements thus set forth are somewhat different from the statements made in *The Iron Age* of January 23, which were based on incorrect information.

Second Conference of Iron and Steel Manufacturers.

The second general conference of the leading American iron and steel manufacturers was held in this city on Thursday last. The following statement regarding the meeting has been made by Judge E. H. Gary, chairman of the United States Steel Corporation:

A conference of representative pig iron and iron and steel manufacturers was held on Thursday for the purpose of carefully considering the general condition of the trade and for exchange of views as to the future. Much information was received, and many questions relating to local conditions and particular commodities were discussed. At the close of the deliberations, which occupied the greater part of the day, every manufacturer present gave the opinion that no necessity or reason exists for the reduction of prices at the present time, and that this view should be stated at the large gathering which was expected for the evening. Upon the invitation of the General Advisory Committee heretofore appointed, there were present at the dinner served at the Waldorf-Astoria about 75 gentlemen, as follows, representing the principal manufacturers of iron and steel in this country and including several leading purchasers of these commodities:

MORRIS BACHMAN, president Sharon Steel Hoop Company, Sharon, Pa.
EDWARD BAILEY, president Central Iron & Steel Company, Harrisburg, Pa.
GEORGE BARTOL, manager Otis Steel Company, Ltd., Cleveland, Ohio.
C. W. BRAY, president American Sheet & Tin Plate Company, Pittsburgh, Pa.
E. J. BUFFINGTON, president Illinois Steel Company, Chicago.
J. G. BUTLER, JR., president Bessemer Ore Association, Youngstown, Ohio.
J. A. CAMPBELL, president Youngstown Sheet & Tube Company, Youngstown, Ohio.
E. A. S. CLARKE, president Lackawanna Steel Company, New York.
E. S. COOK, president Warwick Iron & Steel Company, Pottstown, Pa.
DANIEL COOLIDGE, president Lorain Steel Company, Philadelphia.
W. E. COREY, president United States Steel Corporation, New York.
GEORGE G. CRAWFORD, president Tennessee Coal, Iron & Railroad Company, Birmingham, Ala.
H. C. DALTON of Pickands, Mather & Co., Cleveland, Ohio.
CHARLES DEERING, chairman International Harvester Company, Chicago.
W. B. DICKSON, vice-president U. S. Steel Corporation, New York.
A. C. DINKEY, president Carnegie Steel Company, Pittsburgh, Pa.
R. H. EDMONDS, editor *Manufacturers' Record*, Baltimore, Md.
B. F. FACKENTHAL, JR., president Thomas Iron Company, Easton, Pa.
J. A. FARRELL, president United States Steel Products Export Company, New York.
C. C. FELTON, president Penn Steel Company, Philadelphia.
E. H. GARY, chairman United States Steel Corporation, New York.
JAMES GAYLEY, first vice-president United States Steel Corporation, New York.
E. M. HAGAR, president Universal Portland Cement Company, Chicago.
CHARLES HART, president Inland Steel Company, Chicago.
J. A. HATFIELD, president American Bridge Company of New York, New York.
J. H. HOYT, Cleveland, Ohio.
C. R. HUBBARD, president Wheeling Iron & Steel Company, Wheeling, W. Va.
A. F. HUSTON, president Lukens Iron & Steel Company, Coatesville, Pa.
C. N. HUTCHINSON, president Grand Crossing Tack Company, Grand Crossing, Chicago, Ill.
ARCHIBALD JOHNSTON, president Bethlehem Steel Company, South Bethlehem, Pa.
JONATHAN R. JONES, secretary Alan Wood Iron & Steel Company, Conshohocken, Pa.
I. A. KELLEY, president Ashland Steel Company, Ashland, Ky.
WILLIS L. KING, vice-president Jones & Laughlin Steel Company, Pittsburgh, Pa.
CHARLES KIRCHHOFF, editor *The Iron Age*, New York.
G. P. LETCHWORTH, president Pratt & Letchworth Company Buffalo, N. Y.
HON. FRANKLIN D. LOCKE, Buffalo, N. Y.
JAMES LORD, president American Iron & Steel Mfg. Company, Lebanon, Pa.
THOMAS LYNCH, president H. C. Frick Coke Company, Pittsburgh, Pa.
CYRUS H. MCCORMICK, president International Harvester Company, Chicago.
C. H. MCCULLOUGH, vice-president Lackawanna Steel Company, Buffalo, N. Y.
G. G. MCMURTRY, chairman American Sheet & Tin Plate Company, New York.
SAMUEL MATHER, Cleveland, Ohio.
BENJAMIN NICOLL, 59 Wall street, New York.
W. P. PALMER, president American Steel & Wire Company, Cleveland, Ohio.
LEONARD PECKITT, president Empire Steel & Iron Company, Catasauqua, Pa.
JOHN A. PENTON, editor *Iron Trade Review*, Cleveland, Ohio.
GEORGE W. PERKINS, 23 Wall street, New York.
VERYL PRESTON, Eastern Steel Company, New York.
CHARLES A. RATHBONE, Buhl Malleable Company, Detroit, Mich.
J. H. REED, Pittsburgh, Pa.
DAVID REEVES, president Phœnix Iron Company, Philadelphia.
JOHN REIS, assistant president United States Steel Corporation, New York.
FRED. ROEBLING, John A. Roebling's Sons Company, Trenton, N. J.
W. A. ROGERS, Rogers, Brown & Co., Buffalo, N. Y.
WALLACE H. ROWE, president Pittsburgh Steel Company, Pittsburgh, Pa.
W. B. SCHILLER, president National Tube Company, Pittsburgh, Pa.
CHARLES M. SCHWAB, chairman Bethlehem Steel Company, New York.
I. M. SCOTT, president La Belle Iron Works, Steubenville, Ohio.
F. C. SMINK, president Reading Iron Company, Reading, Pa.
POWELL STACKHOUSE, president Cambria Steel Company, Philadelphia.
ALEX. THOMPSON, Inland Steel Company, Chicago.
JOHN A. TOPPING, president Republic Iron & Steel Company, New York.
W. R. WALKER, assistant president United States Steel Corporation, New York.
W. L. WARD, Russell, Birdsall & Ward Bolt & Nut Company, Portchester, N. Y.
GEORGE W. WICKERSHAM, 40 Wall street, New York.
FRANK S. WITHERBEE, Witherbee, Sherman & Co., New York.
F. W. WOOD, president Maryland Steel Company, Sparrows Point, Md.
W. P. WORTH, Worth Brothers Company, Coatesville, Pa.
CHARLES H. ZEHNDER, president Allegheny Ore & Iron Company, New York.
AUGUST ZIESING, president American Bridge Company, Pittsburgh, Pa.

Brief addresses were made by practically every one present, and without exception the opinion was voiced that prevailing prices are fully justified and should not be changed. J. Pierpont Morgan was also present, and made a brief address. While no agreements for the maintenance of prices were made or suggested, it was the expressed belief of all that such maintenance would result in benefit to the manufacturers, to their customers, to the employees and to business interests generally; that stability of prices, if and when reasonable, is desirable; that violent fluctuations, resulting in abnormally high prices when the demand exceeds the supply, and unreasonably low prices when the reverse is true, are to be deplored. It was also remarked that the present disposition to assist one another by the friendly interchange of views rather than a resort to unreasonable and destructive competition, which would ultimately result in the application of the law of the survival of the fittest, is in accordance with the present state of public sentiment.

The meeting afforded a striking illustration of the fact that there can be active, sharp competition in business without necessitating an unfriendly and bitter warfare that in the end must be most injurious to the manufacturers, the purchasing public and to the hundreds of thousands of employees who are dependent upon the success of their employers for work at fair wages.

As to the future, opinions were, without exception, conservatively optimistic. Already there is a marked, though slight, improvement. It is not expected the volume of business will be large in the immediate future, and manufacturers are prepared to meet the circumstances. That the wealth and wonderful resources and recuperative powers of the country will before long bring a restoration of business that will employ all the furnaces and mills to their full capacity is the expectation of the leaders in iron and steel industry.

A feature of importance considered at the meeting of Thursday was the reference to a resolution received from a joint meeting of the Steel Founders' Society and the American Malleable Castings Association, held January 17. Members of these associations are large purchasers of the commodities manufactured and sold by those who

were at the banquet on Thursday evening. The resolution is as follows:

Whereas, The iron and steel industry of this country is an important factor in establishing our business conditions, and the unsettled price of raw materials is a disturbing element, preventing the return of confidence and the employment of hundreds of thousands of operators; be it

Resolved, That we deem it as being for the greatest good of all our industries using pig iron as a basic material that as soon as possible a reasonable minimum price be established and maintained, in order that the product of our many establishments may also reach a fair minimum price.

Similar expressions have been received by many other prominent purchasers of iron and steel.

The New Trade Agreement with France.

Its Significance Not Correctly Reported.

WASHINGTON, D. C., February 4, 1908.—The character and scope of the recently concluded commercial agreement with France apparently are generally misunderstood, judging by the statements regarding it that have appeared in the daily press. It is really favorable to the United States, and our manufacturers and exporters should not miss the opportunity now presented to seek better terms for the admission of their products into France and Algeria and ultimately into other countries. Though referred to in the press as a reciprocity treaty, the new agreement is, in fact, a *modus vivendi*, intended merely as a temporary convention for the maintenance of the status quo pending the negotiation of a more comprehensive agreement to be based on the conclusions of a joint commission, which is specifically provided for. Notwithstanding its limited scope, however, the *modus* provides for the protection of American trade against discriminatory French legislation and secures to certain American products the most favored nation treatment.

Important Features of the Agreement.

The most important features of the new agreement are, first, the conditional clause of Article II, inserted for the protection of American trade with France; and second, the provision of Article III, for the creation of a joint commission to consider the tariff relations of the two countries, with a view to the drafting of a new reciprocity treaty of broad scope. The conditional clause of Article II, which follows the concession of a reduction of 20 per cent. in the duties on French champagnes, as imposed by the Dingley act, is as follows:

But it is expressly understood that this concession may be withdrawn in the discretion of the President of the United States whenever additional duties beyond those now existing and which may be deemed by him unjust to the commerce of the United States shall be imposed by France on products of the United States.

This feature of the agreement is of far reaching consequence, and is based upon a principle heretofore but rarely recognized in international trade conventions. The reservation of the right of the President of the United States to withdraw the concession on French champagnes whenever France adopts new rates of duty that may appear to the President to be unjust to American commerce, operates to protect absolutely the trade of the United States against any such hostile legislation as has long been pending in the French Parliament. For several years measures have been urged in the Chamber of Deputies proposing to increase the existing rates of the French tariff on many products which are chiefly imported from the United States, and the State Department has not seen its way clear to meet these attacks, for it is generally conceded as a principle of international comity that the tariff rates of a country are matters of domestic concern only, provided such rates are impartially levied upon the products of all countries.

Of course, the fact that the United States supplies the greater part of any given commodity imported into France would render American exporters the victims of any material increase in duty. Secretary Root, keenly alive to this feature of the situation, has very shrewdly guarded against such indirectly discriminating legislation by providing that the reduction in the duty on French champagne, which has long been desired by the producers of that article, may be withdrawn "whenever additional duties beyond those now existing," and which may be regarded by the President as unjust to the commerce of the United States, shall be imposed by France on any product of the United States. This feature of the agreement is counted upon to put an end to the agitation in the French Parliament of legislation hostile to American manufactures, for it is now practicable for the President promptly to retaliate in a most effective manner.

The New French Tariff.

The French Government has in course of preparation a project for a new tariff on a basis said to be materially higher than that now in force and having a differential in some cases exceeding 50 per cent. between maximum and minimum rates. Should this new tariff take effect before any further reciprocal trade arrangement is made between France and the United States, it would be entirely competent for the President, in the event that the new schedules imposed burdensome rates on any important American product, to withdraw the 20 per cent. concession on French champagne, a fact that may be counted upon to have a very salutary influence upon the framers of the new tariff.

Perhaps the most important feature of the convention is the provision made therein of the appointment of a joint commission to consider the tariff relations of the two countries. This commission will have unlimited scope in the investigation of existing conditions, not only with respect to customs administrative practice, but also concerning the practicability of reciprocal tariff concessions, and it is among the possibilities that a basis may be reached for the conclusion of a very comprehensive treaty that will accord to nearly all American products the minimum rates of the existing and future French tariff schedules. Although no official announcement has yet been made, it is the best opinion here that in place of appointing a new commission on behalf of the United States the President will revive the so-called North Commission, which recently negotiated a reciprocity agreement with Germany. This commission consisted of S. N. D. North, Director of the Census, chairman; James L. Gerry, chief of the Customs Division of the Treasury Department, and N. I. Stone, tariff expert of the Department of Commerce and Labor. It is understood here that the new commission will sail for France at an early date.

American manufacturers and exporters desiring to make representations to the commission regarding their trade with France should at once prepare memoranda to be forwarded to the chairman of the American commission as soon as the official announcement of its appointment is made. The commissioners will welcome any data concerning American export trade that may be supplied, and obviously it will be of advantage to producers in the United States to afford the commissioners the fullest possible information concerning matters which may come before them in the negotiations now in prospect.

W. L. C.

The Cast Iron Pipe Rebate Case.—In setting aside the conviction of the Camden Iron Works for accepting rebates on shipments of cast iron pipe, the United States Court of Appeals has given a decision that is regarded as having the most important bearing upon the application of the Interstate Commerce law that has been rendered since it was first enacted. The point considered thus settled is that when a shipper makes a contract with a foreign carrier for continuous transportation over lines, either on water or land, both within and without the United States, he can with impunity accept a refund from that carrier upon the total amount of the freight charges paid. The court announces the conclusion that there was no evidence to sustain the conviction of the defendant, and therefore the request for a direction to the jury to render a verdict of not guilty should have been granted.

The Northern Electrical Mfg. Company, Madison, Wis., announces the removal of its St. Paul office from 21 East Fifth street to 516 Endicott Building, St. Paul. T. E. Drohan, former superintendent of the company's shops at Madison, is in charge of the new office.

Canada's Shipbuilding Industry.

TORONTO, February 1, 1908.—Inactivity has for some time been the rule at Ontario shipyards. At the beginning of the year the Collingwood Shipbuilding Company closed down because of a strike following a notice to the men that their wages would be reduced 15 per cent. At a meeting of the directors on January 22 it was decided to reopen the works this week if the necessary labor could be obtained. It is thought that the men will be ready to start on the company's proffered terms. It is said that work is not lacking, as the company has many vessels to repair before the season of navigation begins, a number of scows to build, and the practical certainty of an order to construct a passenger steamer for the Northern Navigation Company. The company employs 450 men, and the cut in wages was decided upon because it appeared hopeless to tender for the building of a large vessel that is to be added to one of the lake fleets if wages cost were kept at its former level. Speaking of the situation, B. M. Smith, the company's manager, had this to say:

> We have never made a dollar, nor has any other company in Canada made money out of shipbuilding. We have had to contend with the free importation of British-built vessels, and with the United States scale of wages. We spent $50,000 in bringing in Scotch and United States shipbuilders and in perfecting our organization, and it is with great reluctance that the decision to close down was reached. We offered to build two steamers for the C. P. R. at cost, plus 5 per cent., in order to retain our organization intact, but they decided they could do better in the old country and bought there.

The Canadian Shipbuilding Company.

It was stated some weeks ago in these columns that the Toronto works of the Canadian Shipbuilding Company had closed down on account of a strike of its machinists, who wanted a 9-hr. day. A fortnight ago there was a meeting of the bondholders and other creditors of the company, and an arrangement was made for the sale of the Toronto works and for the continuing of operations by the company at its Bridgeburg plant on the Niagara River. The money realized from the sale of the Toronto plant—about $175,000—will not suffice for the paying off of the company's indebtedness, but it is understood that the creditors are willing to await the results of the concentration of the manufacturing outfit at Bridgeburg. The Toronto plant had fallen behind the needs of the time. Larger engines are now required than those installed years ago in these works. The company has been finding it necessary to purchase parts of ship machinery, owing to the inability of its Toronto works to turn out those parts. For the making of engines for steamers of 10,000 tons the Toronto plant was entirely inadequate. The company will continue to buy engines and other machinery until a plant on the necessary scale for producing equipment is added to the Bridgeburg works. The Bridgeburg plant is at work, and there appears to be enough to keep it going in the immediate future. A. Berg & Sons, manufacturers of brick machinery, have bought the Toronto site and buildings. The property was originally the Doty Engine Works. About 15 years ago it was purchased by the Bertrams, and the business was afterwards carried on by the Bertram Engine Company. In the middle of 1905 it was bought by the Canadian Shipbuilding Company. The latter company's capital is $1,000,000 and its directors are all prominent capitalists of Toronto. Some very fine passenger steamers have been built there for the Niagara steamship lines and the Ontario & Richelieu Navigation Company. There were rumors of an amalgamation of the Canadian Shipbuilding Company, the Polson Iron Works Company, the Collingwood Shipbuilding Company and the company that proposes to establish a big plant at Fort William, but these have been denied.

Competition in the Coasting Trade.

Canadian shipbuilding interests have agitated for years to obtain from the Dominion Government special consideration for their industry. They asked that all vessels of foreign register be excluded from Canada's coating trade; that a tonnage bounty be paid on the output of Canadian yards, and that the materials of their construction be admitted free of duty. So far the latter two petitions have been denied, but the first has now been granted. By an order in council the Dominion Government last week canceled the privilege of carrying between Canadian ports by vessels of Italy, Germany, the Netherlands, Sweden, Norway, Austria-Hungary, Denmark, Belgium and the Argentine Republic. The order takes effect January 1 next. It puts an end to a privilege enjoyed by Italy since 1873, Germany since 1874, Austria-Hungary since 1876, Denmark since 1877, Belgium since 1879 and the Argentine Republic since 1881. It was by successive orders in council the right of taking part in Canada's domestic traffic was conferred on vessels flying the flags of these several countries. The decline in Canadian shipbuilding, which followed the substitution of steel for timber as the material for frames, rendered it necessary to admit foreign vessels. Norwegian and Swedish vessels had become the most aggressive competitors in the Canadian coast trade. The wages paid to crews on these vessels are very low; the vessels are all vitualed at home for the voyage both ways; they are of a poor class; they are not bound by the same exacting load line laws as Canadian vessels; hence they can carry more cheaply than can Canadian vessels. If a Norwegian vessel engaged in the Canadian coast trade is damaged she can go to a United States yard for repairs and return to the Canadian carrying trade without check. If a Canadian vessel were to go to an American shipyard for repairs she could not return to the Canadian trade without the payment of the duty on the cost of the repairs. Norwegian vessels did a large business in the carrying of coal to Montreal from the Sidney docks of the Dominion Coal Company.

A Bounty.

There is still an expectation that the Dominion Government will grant a bounty on ships built in Canadian yards. Representations in favor of that policy continue to be pressed. Especially insistent is the demand from Nova Scotia. In the last session the Legislature of that province passed a resolution declaring in favor of the Dominion assisting the shipbuilding industry by a substantial tonnage bounty. The province offers aid, and there are standing offers of subsidies from Dartmouth and Sydney for the establishment of shipyards within the bounds of these municipalities. C. A. C. J.

The Strong Steel Foundry Company.

Papers were filed February 1 at Albany, N. Y., for the formation of a new company at Buffalo, N. Y., to manufacture steel castings under the name of Strong Steel Foundry Company. The officers have secured the buildings formerly occupied by the Buffalo Cement Company, at Main and Amherst streets in that city, with railroad switches. Together with the usual line of standard open hearth steel castings, the plant will be equipped for the manufacture of special steels, such as manganese, vanadium, chrome and other grades, to meet the technical requirements of customers. It will have a capacity of 400 tons per month.

The capital stock of the company is $50,000. The officers and directors of the company for the first year are as follows: E. M. Hager, president; Alfred A. Berrick, vice-president; O. H. P. Champlin, secretary and treasurer; E. C. Strong, general manager, and Alvin W. Day. Mr. Strong has been in the steel business for the past 18 years and has been responsible for every pound of steel produced by one of the largest and most successful steel casting plants in the country.

The first five years of operation of the profit sharing plan of the United States Steel Corporation ended with January, and those of its employees who have continuously held the preferred stock purchased when the plan was first announced in 1903 received an extra dividend of 65.4 per cent. from the fund accumulated from the forfeiture of the bonus of $5 per share per annum by those who sold their stock or discontinued payments on it. Including the 7 per cent. dividends received for five years, the stock has returned a total of $125.40 per share, or $42.90 above $82.50, its cost price to the employees.

PERSONAL.

Arthur Reiche of the Arthur Koppel Company, Machesney Building, Pittsburgh, Pa., sails for Europe this week on a combined business and pleasure trip, to be absent about two months.

The Youngstown Car Mfg. Company, Youngstown, Ohio, has added to its sales force Parker Dodge, graduate of the Massachusetts Institute of Technology, who will be located in the Pittsburgh District, with temporary offices at 220 Lewis Building, Pittsburgh, Pa.

Thomas K. Glenn, former vice-president and manager of the Georgia Railway & Electric Company, has accepted the presidency of the Atlanta Steel Company, Atlanta, Ga. The latter company has secured as superintendent Thomas M. Girdler, formerly connected with the Colorado Fuel & Iron Company, before that with the Oliver Iron & Steel Company, and several years ago the London representative of the Buffalo Forge Company.

H. W. Nutt, who for the past year has represented Buell & Mitchell, New York, in Boston, has been appointed district manager for the New England States by the General Fireproofing Company, and will have headquarters at 161 Devonshire street, Boston. He has been assistant general sales agent for the American Steel Hoop Company, secretary of the American Tube & Stamping Company, Bridgeport, Conn., and vice-president of the Superior Steel Company, Pittsburgh.

L. P. Ross has resigned as manager of the Cranberry Furnace Company, Johnson City, Tenn., and gone to Standish, N. Y., where he becomes general manager of the Northern Iron Company. E. P. Ross, who has lately been manager of the Rockhill Furnaces in Pennsylvania, succeeds his brother as manager of the Cranberry Furnace.

At the recent annual meeting of the Buckeye Steel Castings Company, Columbus, Ohio, Frank Rockefeller of Cleveland retired from the presidency, and was succeeded by S. P. Bush, who has been second vice-president and general manager. Mr. Rockefeller was elected second vice-president. Mr. Bush retains the position of general manager.

Owing to his large outside interests, John E. Carnahan has retired from the presidency of the Carnahan Stamping & Enameling Company, Canton, Ohio. Officers elected for the ensuing year at the recent annual meeting are as follows: President, Ed Langenbach; first vice-president; Fred H. Snyder; second vice-president, A. G. Ryley; secretary-treasurer and general manager, R. E. Bebb.

J. W. Duntley, president of the Chicago Pneumatic Tool Company, sailed for Europe on Tuesday, expecting to be back to attend the annual meeting of the company which will occur the last of the month.

James F. Donahue, for some years manager of sales of the New Castle Forge & Bolt Company, New Castle, Pa., has resigned to become Western sales agent for the Russell, Burdsall & Ward Bolt & Nut Company, Port Chester, N. Y., and will have his headquarters in Chicago. Paul McBride, formerly connected with the Pennsylvania Engineering Works at New Castle, succeeds Mr. Donahue as manager of sales of the Forge & Bolt Company.

Homer D. Williams, general superintendent of the Duquesne steel works and blast furnaces of the Carnegie Steel Company at Duquesne, Pa., has been elected president of the Duquesne Trust Company at Duquesne.

Lindon W. Bates has resigned as president and director of the Empire Engineering Corporation, 71 Broadway, New York, and Wm. Barclay Parsons, who has always been one of the directors, has been elected president in his stead.

At the meeting of the Engineers' Committee of the New York Central Railroad Lines, in Buffalo, N. Y., last week, at which the main object of discussion was the section of rail to be ordered this year, the recommendation was made that those lines should make no change in standards of rail sections for 1908. This will enable the lines to place their orders on present standards for this year.

OBITUARY.

SEBASTIAN BRAND, founder and president of the Brand Stove Company, Milwaukee, Wis., died February 1, aged 77 years. He was born in Germany, and came to this country in 1854, locating in Milwaukee. In 1870 he became sole owner of a foundry business, in which he became interested in 1868, and the Brand Stove Company was the outcome. He leaves a daughter, who is the wife of William F. Hyde, present secretary and treasurer of the company.

The iron trade of the entire world will regret to learn of the death of Mrs. ELLEN W. FRITZ, wife of the venerable John Fritz, which occurred at Bethlehem, Pa., January 29. Mr. Fritz is regarded with such affection that his bereavement will evoke a universal expression of profound sympathy.

O. F. NICHOLS, chief engineer of the Department of Bridges, New York City, died February 4, aged 63 years. He was born in Newport, R. I., and was graduated from the Rensselaer Polytechnic Institute in 1868. He was a member of a number of scientific and technical societies and the Engineers' Club. He leaves a widow and two daughters.

THOMAS MELLON, the eminent financier, died at Pittsburgh, February 4, aged 95 years. He was interested in important business interests aside from banking, having been one of the leading men in founding the Aluminum Company of America, the Carborundum Company, the Georgia Bauxite & Mining Company, the J. M. Guffey Petroleum Company, the Gulf Refining Company and the Union Steel Company. The last named is now owned by the United States Steel Corporation.

New Blast Furnace Construction.—The American Iron and Steel Association statistics show that on December 31, 1907, 30 blast furnaces in the United States were in course of erection, 4 furnaces were being rebuilt and 1 furnace was to be revived. Of the building furnaces, 2 were located in New York, 8 in Pennsylvania, 1 in Alabama, 7 in Ohio, 8 in Indiana, 2 in Illinois, 1 in Michigan and 1 in Wisconsin. When completed 29 of these furnaces will use coke or mixed anthracite coal and coke for fuel and 1 will use charcoal. Of the 4 rebuilding furnaces, 3 were in Pennsylvania and 1 was in Alabama. When rebuilt all 4 furnaces will use coke. The furnace to be revived will use charcoal. In addition 6 furnaces were projected and 2 furnaces partly erected on December 31. If built the projected furnaces will use mineral fuel.

The Westinghouse Electric & Mfg. Company has received a contract for two 1000-hp. turbine engines for the Panhandle Lumber Company, Spirit Lake, Iowa; a 750-hp. turbine engine for the Hard Rubber Company, College Point, L. I.; a 1000-hp. turbine engine for a plant in South Manchester, Conn., and a contract from the Armstrong Cork Company for nine electric motors for operating machines in its factory at Lancaster, Pa., having a total of 500 hp., varying from 25 to 100 hp. each.

The Sligo Iron & Steel Company, with plant at Connellsville, Pa., and sales office at Pittsburgh, is rebuilding the two heating furnaces in its 9-in. mill, and is also installing a new electric coal and cinder conveyor and an electric magnet for the handling of material.

The Pittsburgh & Lake Erie Railroad has completed an addition to its car shops at McKees Rocks, Pittsburgh, which will increase the facilities of the road for caring for its equipment.

The Fort Pitt Malleable Iron Company, Pittsburgh, will increase its capital from $150,000 to $300,000, and the Pittsburgh Tube Company will issue $25,000 in bonds.

The Ironton Iron Company, Ironton, Ohio, has increased its capital from $300,000 to $400,000.

More Furnaces Out.

Yet Active Capacity Gains Slightly.

Production in January 1,045,525 Tons.

Pig iron production in January has verified the promise of our statistics for January 1, which indicated that the country had come to a basis of about a million tons a month. The figures below show that the output last month was 1,045,525 gross tons, or about 200,000 tons less than in December, 800,000 tons less than in November, and 1,300,000 tons less than the record made in October. Steel works companies, which made a very drastic reduction in output, have been starting up furnaces in January, while merchant iron companies have put out a number of stacks. The furnaces starting up are of considerably greater caliber than most of those blowing out, so that with but 142 furnaces active on February 1, against 151 January 1, the capacity at work at the beginning of this month was 241,925 tons a week, or about 6800 tons more than at the beginning of the year.

In the diagram below the course of production in the past three months is contrasted graphically with the high level output of the greater part of 1907. The production of coke and anthracite iron in the past four months has been as follows:

	Gross tons.
October	2,336,972
November	1,828,125
December	1,234,279
January	1,045,525

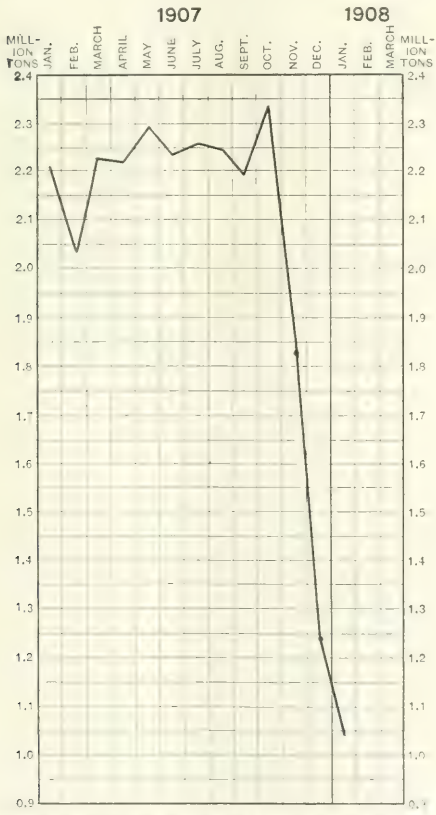


Diagram of Production of Coke and Anthracite Iron in January and in 1907.

January Production.

The table below gives the production of coke and anthracite furnaces in January and the four months preceding:

Monthly Pig Iron Production—Gross Tons.

	Sept. (30 days)	Oct. (31 days)	Nov. (30 days)	Dec. (31 days)	Jan. (31 days)
New York....	150,264	152,710	111,407	86,993	82,962
New Jersey...	32,877	30,574	24,079	22,555	22,447
Lehigh Valley.	68,559	71,936	61,969	54,881	47,538
Schuylkill Val.	53,978	48,543	43,876	37,747	24,002
Lower Susquehanna and Lebanon Val.	59,580	67,286	47,683	31,090	20,323
Pittsburgh Dis.	509,497	533,078	409,024	258,412	305,575
Shenango Val.	144,978	158,315	124,159	76,086	69,149
West. Penn...	133,906	143,078	130,192	105,671	60,355
Md., Va., and Kentucky ...	81,398	86,829	79,293	61,433	30,621
Wheeling Dis.	117,445	134,445	76,014	12,051	0
Mahoning Val.	162,644	180,968	129,334	68,776	64,437
Central and North. Ohio.	164,314	185,422	149,362	84,087	50,375
Hocking Valley and Hanging Rock	32,138	33,843	28,017	15,658	8,404
Mich.,Minn.,Mo., Wis., Colo...	79,112	81,155	59,697	48,950	38,172
Chicago Dis..	212,413	244,645	200,309	148,691	123,191
Alabama	142,766	146,354	118,190	94,810	80,066
Tennessee, Georgia and Texas	37,618	37,791	35,520	26,388	17,908
Totals ...	2,183,487	2,336,972	1,828,125	1,234,279	1,045,525

Capacity Active February 1 and January 1.

The following table gives the weekly capacity of coke and anthracite furnaces in blast February 1 and January 1:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	—February 1.— Number in blast.	Capacity per week.	—January 1.— Number in blast.	Capacity per week.
New York:					
Buffalo 14	6	15,642	6	13,048
Other New York...10	2	3,060	3	3,346
New Jersey..... 8	4	4,603	5	4,977
Spiegel 2	0	0	0	0
Pennsylvania:					
Lehigh Valley.....25	10	9,005	13	10,382
Spiegel 3	2	617	2	658
Schuylkill Valley...14	4	4,539	4	5,182
Spiegel 1	1	882	1	921
Low. Susquehanna. 7	1	2,153	2	2,973
Spiegel 1	0	0	0	0
Lebanon Valley....10	3	2,378	3	2,415
Pittsburgh District.45	27	71,013	26	70,127
Spiegel 3	1	618	1	596
Shenango Valley...20	7	15,920	6	10,740
Western Penn.....27	8	10,850	13	19,516
Maryland 4	1	1,962	1	2,018
Wheeling District....14	0	0	0	0
Ohio:					
Mahoning Valley...18	10	21,740	6	8,748
Central and North. and Michigan....22	6	11,975	6	10,115
Hocking Valley and Hanging Rock...12	5	3,047	5	2,351
Illinois and Indiana..23	11	28,027	11	27,160
Spiegel 2	1	1,162	0	
Minnesota 1	0	0	1	
Wisconsin 6	2	2,750	1	
Missouri 1	0	0	0	
Colorado 6	3	5,120	3	6,817
The South:					
Virginia 23	5	2,877	5	3,741
Kentucky 7	0	0	2	
Alabama 46	15	18,060	16	20,454
Tennessee 18	7			
Georgia and Texas. 3	0			0
Totals.....396	142	241,925	151	235,152

Production of Steel Companies.

The Northern steel companies approached closely in January their output in December, a number of furnaces of such companies having started up since the beginning of the year. Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Republic, Youngstown Sheet & Tube Company, Jones & Laughlin, La Belle, Bethlehem, Calumet, Inland and Colorado companies show the following totals of product month by month. We give separately a statement of the output of spiegeleisen and ferromanganese, which is included for each month in the total production:

Production of Steel Companies.—Gross Tons.

	Pig.—Total production.—			Spiegeleisen and ferromanganese.	
	1906.	1907.	1908.	1907.	1908.
January	1,358,015	1,406,397	638,042	21,477	20,254
February	1,226,760	1,317,323	.....	19,444	.....
March	1,400,395	1,424,827	.....	31,091	.....
April	1,333,591	1,446,788	.....	26,527	.....
May	1,372,423	1,470,080	.....	28,822	.....
June	1,293,437	1,457,230	.....	30,942	.....
July	1,323,291	1,452,557	.....	25,343	.....
August	1,257,485	1,445,085	.....	23,696	.....
September	1,264,380	1,417,153	.....	30,270	.....
October	1,452,200	1,514,521	.....	35,105	.....
November	1,411,350	1,084,114	.....	21,861	.....
December	1,445,528	659,459	.....	19,480	.....

Changes in the Active List.

Among furnaces which went out of blast in January were Zenith in Minnesota, Oxford in New Jersey, one Crane, Macungie and Keystone in the Lehigh Valley, two Eliza and Soho in Allegheny county, two Cambria, Earlston, Emporium and one Saxton in western Pennsylvania, one Paxton in the Susquehanna Valley, Buena Vista in Virginia, Norton in Kentucky, one South Works of the Illinois Steel Company, one Ensley in Alabama (banked).

Among furnaces blown in between January 1 and February 1 were one Carrie, two Edgar Thomson and one Clairton in Allegheny county, one New Castle in the Shenango Valley, Belfont in the Hanging Rock Region, one Calumet and one Joliet in Illinois, one Mayville in Wisconsin, three Ohio and one Haselton in the Mahoning Valley.

The active weekly capacity in coke and anthracite iron has shown the following fluctuations since January 1, 1903:

	Capacity per week.		Capacity per week.
February 1	241,925	July 1	408,617
January 1, 1908	232,652	June 1	443,092
December 1, 1907	347,372	May 1	452,031
November 1	491,436	April 1	439,564
October 1	511,397	March 1	403,157
September 1	507,768	February 1	405,792
August 1	513,471	January 1, 1905	377,879
July 1	528,170	December 1, 1904	357,846
June 1	523,220	November 1	334,249
May 1	524,538	October 1	319,249
April 1	496,456	September 1	291,573
March 1	511,035	August 1	246,092
February 1	492,359	July 1	272,301
January 1, 1907	507,397	June 1	336,107
December 1, 1906	513,860	May 1	368,244
November 1	500,580	April 1	337,257
October 1	469,665	March 1	308,751
September 1	441,426	February 1	273,692
August 1	449,908	January 1, 1904	185,636
July 1	460,570	December 1, 1903	244,156
June 1	472,622	November 1	273,715
May 1	484,031	October 1	353,142
April 1	484,240	September 1	360,197
March 1	479,737	August 1	353,681
February 1	482,156	July 1	384,825
January 1, 1906	463,673	June 1	388,178
December 1, 1905	475,814	May 1	373,496
November 1	460,449	April 1	386,215
October 1	445,498	March 1	347,424
September 1	412,563	February 1	335,239
August 1	410,088	January 1, 1903	346,073

The development of a water power project on the Manistee River is involved in the organization of the Manistee River Power Company, Traverse City, Mich., which was recently incorporated with a capital stock of $1,200,000. The company has secured rights along the river for a distance of 24 miles by the purchase of 10,500 acres. By the installation of a series of dams it is proposed to furnish electrical power for distribution to the cities of Cadillac, Elk Rapids, Charlevoix, Petoskey, Manton and Traverse City, besides a number of smaller towns. The officers of the company are as follows: Dan J. Albertson, president; Lieu P. Haskings, first vice-president; Stephen Lautner, second vice-president; Wm. H. Umlor, secretary; A. W. Bartak, treasurer.

At the meeting of the directors of Sterlingworth Railway Supply Company, Easton, Pa., January 28, the following officers were elected: President, F. W. Coolbaugh; vice-president, Edward Van Orden; treasurer, Clark Cooper; secretary, Kenneth Coolbaugh.

The Toronto Convention of the American Foundrymen's Association.

The Executive Committee of the American Foundrymen's Association has accepted the invitation of the Canadian foundrymen to hold the 1908 convention of the association in Toronto, in the second week of June. The two allied organizations, the Brass Founders' Association and the Foundry Supply Association, will meet at the same time. The Foundry Supply Association will present an exhibit of foundry supplies and equipment at this time, for which extensive preparations are now in hand. In the rooms of the Canadian Manufacturers' Association, Toronto, a meeting was held, January 23, to make preliminary arrangements for the convention. It was called by L. L. Anthes, vice-president of the American Foundrymen's Association, and the different organizations interested in the convention were represented. Those present were L. L. Anthes, Toronto Foundry Company; Richard Moldenke, secretary of the American Foundrymen's Association; H. H. Lane, secretary of the Foundry Supply Association; C. H. Wheaton, Dodge Mfg. Company, Toronto; S. H. Chapman, Ontario Wind Engine & Pump Company, Toronto; E. G. H. Holker, Wilkinson Plough Company, Toronto; David Reid, Canadian Westinghouse Company, Hamilton, Ont.; W. H. Bears, Detroit Foundry Supply Company, Detroit, Mich.; F. W. Moffat and J. K. Moffat, Moffat Stove Company, Weston; J. P. Murray; Ed. Freysing, chairman Toronto Branch Canadian Manufacturers' Association, and J. S. McKinnon, chairman Reception Committee, Canadian Manufacturers' Association, all three representing the Canadian Manufacturers' Association; J. C. Armor, editor *Canadian Machinery*.

Dr. Moldenke, after describing the work of the American Foundrymen's Association, made some suggestions as to the programme for the June convention, and hoped educational features would be given more attention than heretofore. H. M. Lane spoke in the interest of the Foundry Supply Association, saying that it would make a large exhibit of foundry equipment and would be glad to cooperate with Toronto foundrymen in providing entertainment for those attending the convention. Messrs. Moffat, Murray and Freysing referred to the enthusiasm with which the Canadian Manufacturers' Association had taken up the convention project.

L. L. Anthes read letters from prominent manufacturers in Canada promising co-operation. As indicating the interest taken by the Foundry Supply Association in the preparation of exhibits, it was stated that this association spent $12,000 simply for placing and arranging its exhibits at Philadelphia in 1907. Secretary Moldenke estimated that 2000 persons would be present at Toronto. As was the case at Philadelphia, it was decided that entertainment features at Toronto should be confined strictly to members of the American Foundrymen's Association, Foundry Supply Association, Brass Founders' Association and the Associated Foundry Foremen. The Toronto representatives have tendered two buildings for the use of the Foundry Supply Association and an auditorium for the meetings of the foundrymen, the latter being far enough removed from the exhibit buildings so that the meetings will not be disturbed by the noise of machinery. The two places of exhibit are the Process Building and Machinery Hall. The latter is equipped with shafting and both direct and alternating current for power and lighting. Provisions are also to be made for compressed air and water. The Process Building is about 200 ft. distant. Power is available in this building from shafting operated by motors.

Those who desire to exhibit at Toronto are asked to communicate with H. M. Lane, secretary of the Foundry Supply Association, 1924 Prospect avenue, Cleveland. Those who desire to join one of the other associations and attend the convention may communicate with the secretary, Dr. Richard Moldenke, Watchung, N. J., for the American Foundrymen's Association; with A. M. Fairlie, secretary of the Brass Founders' Association, Copper Hill, Tenn., or with F. C. Everitt, J. L. Mott Iron Works, Trenton, N. J., secretary of the Associated Foundry Foremen.

NEWS OF THE WORKS.

Iron and Steel.

The Canonsburg Steel & Iron Works, Canonsburg, Pa., has started up four of its six hot mills after a shutdown of several weeks and with a fair production ahead.

L. W. Searles, general manager of the Embree Iron Company, at Embreeville, Tenn., states that his company blew in its furnace February 1. He thinks the market shows good signs of improvement.

Citico Furnace, at Chattanooga, Tenn., which has been closed down for several weeks for repairs, is to resume operations early this month. The coal mines of the company at Soddy will be opened up at once.

The blast furnace at Rome, Ga., formerly operated by the Rome Furnace Company has been leased by Thos. J. Deane, contractor. In November, 1907, Mr. Deane leased the ore mines belonging to the same company, located at Lyerly, Ga., and consisting of 1800 acres of red fossil ore, which, it is stated, averages 53 per cent. metallic iron. The furnace will be put in good condition as soon as possible. Extensive improvements are contemplated.

The Atikokan Iron Company, which blew out its furnace at Port Arthur, Ont., for the winter on December 13, expects to put it in blast again about May 1.

The furnace of the Ironton Iron Company, Ironton, Ohio, on which construction work has been in progress since June, 1907, will probably be ready for blast in February.

The Ivanhoe Furnace Company, Ivanhoe, Va., was the only maker of Bessemer pig iron in Virginia in 1907.

The Lehigh Iron & Steel Company, Allentown, Pa., is dismantling its No. 2 Furnace, which was abandoned some time ago. The No. 1 Furnace may also be dismantled. Both stacks have been idle for several years.

The No. 1 Furnace of the Pennsylvania Steel Company at Lebanon, Pa., which was banked early in January for repairs, is now in blast. The company's other furnace at Lebanon, which was banked December 1, is now out of blast and will be relined.

In January a number of blast furnaces in the Pittsburgh District were blown out, while some furnaces were started. One of the three stacks of the Carnegie Steel Company at Clairton was blown in January 5, one of the Edgar Thomson stacks on January 10, a second Edgar Thomson on January 20 and one Carrie stack was blown in January 4. One of the five Eliza furnaces of the Jones & Laughlin Steel Company was blown out January 9, and a second Eliza stack was blown out January 22. Soho Furnace of this company was blown out January 9. No. 1 Monongahela Furnace of the National Tube Company, at McKeesport, was started January 10, while No. 4 stack was started January 11.

The blast furnace of the Zenith Furnace Company, Duluth, Minn., was blown out January 24 for relining and repairs.

The Bessemer Rolling Mill of the Tennessee Coal, Iron & Railroad Company at Bessemer, Ala., has resumed operations.

The Gadsden, Ala., furnaces of the Alabama Consolidated Coal & Iron Company are idle. At the Ironaton plant No. 2 furnace went in blast January 7 and No. 1 furnace January 30.

The Belfont Iron Works Company, Ironton, Ohio, put its furnace in blast February 1. It was idle in December and January.

The Wisconsin Steel Company blew in its Furnace A at South Chicago, Ill., January 20, and both furnaces are now in blast.

South Works Furnace E of the Illinois Steel Company blew out January 17, and Furnace I at the Joliet Works blew in January 21.

General Machinery.

The Killing Molding Machine Company, Davenport, Iowa, has bought, and will move its machine shop and foundry into, the plant formerly occupied by the Simplex Washing Machine Company.

The George A. Hogg Iron & Steel Foundry Company, Pittsburgh, has received an order from the Pennsylvania Steel Pulley Company, North Side, Pittsburgh, for a 38-in. squaring shear, and an order from the West Leechburg Steel Company, West Leechburg, Pa., for a 16-in. roll lathe.

For the purpose of securing a new charter permitting the issue of preferred stock the Domestic Gas Company, Little Rock, Ark., has been reincorporated under the name of the Domestic Gas Mfg. Company. The capital stock of the new company is $300,000, divided into 12,000 shares, one-half of which is preferred and one-half common stock. The company is engaged in the manufacture of gas producer equipment, and is officered as follows: H. L. Horton, president; B. P. Dwight, vice-president; Park Heaton, secretary and treasurer; M. Laux, general manager.

The Beaumont Iron Works Company, operating a large foundry and machine shop in Beaumont, Texas, has been placed in the hands of A. B. Brock as receiver.

Frederick P. Bellamy has been appointed receiver for Rossiter, McGovern & Co., New York, dealers in second-hand machinery, making a specialty of electrical equipment. The company has a capital stock of $300,000 and is well known in the machinery trade.

The Webb Machine Works, Monongahela, Pa., and the Capell Fan & Engineering Company, Pittsburgh, were consolidated February 1, under the style of the Webb & Capell Fan & Engineering Company. The Webb Machine Works operates the plant that was formely known as the Monongahela Mfg. Company, and has been enlarged so that 175 additional men are now employed.

Wagner & Schnitzer, Baltimore, Md., whose architectural and ornamental iron works was recently destroyed by fire, is equipping a new plant with modern machinery.

The Sikeston Machine Works, Sikeston, Mo., has incorporated with a capital stock of $4000 to manufacture special machinery and to do general machine repairing. The company has equipped its plant, but will likely need other machines later. Henry I. Cohm is president, and E. A. Cart, secretary and manager.

Power Plant Equipment.

The Huron Cement Company, Alpena, Mich., has let a contract for the installation in its plant of a system of electric lights and power to the Thorne Electric Company, Bay City, Mich. The electrical machinery for the system is being furnished by the Westinghouse Electric & Mfg. Company.

Contracts have been let for a new power house and some machinery equipment for the municipal electric light plant at Waterloo, Wis. Bids are yet open for a steel smokestack and breeching and a 16-ft. flywheel for a Corliss engine. Eugene Porter is the engineer in charge.

The Department of Electric Lighting of Holyoke, Mass., has awarded the contract for four 400-hp. boilers to the Babcock & Wilcox Company, New York, and for the mechanical stokers to the Murphy Iron Works, Detroit, Mich.

A change has been made in the Odlum-Taylor Boiler Company, Memphis, Tenn. R. A. Odlum has resigned and has been succeeded as president by T. K. Riddick. The general management of the company will be in the hands of the former vice-president and secretary, T. Harbert Taylor and Frank O'Connor. One of the specialties of the company is hemispherical bottom water tanks supported on steel towers.

The Kentucky Electric Company, Louisville, Ky., intends to erect a two-story dynamo building to cost about $25,000. Robert E. Hughes is president, and Lewis S. String, chief engineer.

Foundries.

The new Phœnix Foundry & Machine Company, Springfield, Mo., is preparing to extend its plant by the erection of a new foundry, 50 x 87 ft., the equipment for which is already at hand. It is expected that this addition to the works will be ready for operation about May 1.

The Milwaukee Ornamental Metallic Mfg. Company, 216 Lake street, Milwaukee, Wis., at a meeting of its stockholders January 2, decided to increase its capital stock from $1000 to $10,000, and at the same time the title of the company was changed to the Milwaukee Bronze Casting Company. Owing to the rapid growth of its business it has become necessary to enlarge the plant, and to this end a new and modern foundry will be built. The officers are Albert G. Seeboth, president; M. Seeboth, secretary and treasurer; Caspar Reichl, general manager.

The recent reference in these columns to the Bessemer Soil Pipe Company, Bessemer, Ala., was somewhat in error. Only one change was made in the management of the plant on the first of the year, when W. B. Graham was appointed foundry foreman. The plant is being operated under the same management as during the past year, William Ivy of St. Louis, being president. N. O. Nelson of St. Louis is the principal owner.

The Lynchburg Foundry Company, Lynchburg, Va., manufacturer of cast iron pipe, reports quite a revival of business from the interruption caused by the money panic. The works are running full in all departments at present, and business is booked to insure operations up to capacity for three to four months.

The Anniston Foundry & Machine Company, Anniston, Ala., has resumed operations after an idleness of about three months.

The Campbell Mfg. Company has recently been organized and will build a plant at Gadsden, Ala., for the manufacture of plumbers' supplies. Plans have been submitted for the foundry buildings, and work will commence promptly. The authorized capital stock is $50,000, with $35,000 paid in. Otto Agricola of Gadsden was elected president, and R. W. Campbell, who has been in charge of the Coosa Pipe & Foundry Company's plant at Gadsden, was elected vice-president and general manager.

Bridges and Buildings.

The Mankato Mfg. Company, Mankato, Minn., has been awarded a contract, amounting to about $13,000, for furnishing structural steel required in the construction of the Home for Feeble Minded at Chippewa Falls, Wis.

F. L. Heughes & Co., architectural and structural iron works, Rochester, N. Y., have incorporated under the same name, the business to be continued as heretofore under the same management. F. L. Heughes is president; H. C. Peifer, vice-president; L. M. Mills, secretary. These officers, with W. A. Heughes, constitute the Board of Directors.

Fires.

The foundry of C. C. Force & Son, Madison, N. J., was recently damaged $10,000 by fire.

The machine shop of George Thomson, Luzerne, Pa., was burned January 25, the loss being about $8000.

The packing plant of Nelson Morris & Co., Kansas City, Kan., was damaged $100,000 by fire January 28.

The municipal electric light and power plant of Colby, Wis., was recently damaged by fire to the extent of about $4000. No insurance was carried.

The plant of the Canadian Tin Plate & Sheet Steel Company, Morrisburg, Ont., was damaged by fire January 27.

The plant of the Purcellville Foundry Company, Purcellville, Va., was damaged $3000 by fire January 27.

The factory of the Diamond Window Glass Company, Gas City, Ind., was destroyed by fire January 31, the loss being about $50,000.

The plant of the Seneca Chain Company, Kent, Ohio, was damaged $10,000 by fire January 25.

The plant of the Atlantic Compress Company, Americus, Ga., was destroyed by fire February 2.

The plant of the Elnora Foundry & Machine Works, Elnora, Ind., was burned January 27.

The plant of the Eisbury Electric Company, Eisbury, Mo., was destroyed by fire January 31.

The power plant of Van Alen & Co., Northumberland, near Sunbury, Pa., was destroyed by an explosion of a boiler February 3. The loss is estimated at $50,000.

Hardware.

The Superior Mfg. Company, which was established some months ago at Sterling, Ill., for the manufacture of washtubs and washing machines, having outgrown its original quarters, has moved across the river to Rock Falls into a larger plant with improved facilities. The present proprietors of the company are E. W. Aument and K. E. Bills.

The Evan L. Reed Mfg. Company, Sterling, Ill., manufacturer of collapsible metal racks, has by its purchase of the business and patents of the Sterling Specialty Company added a complete line of rat and mouse traps to its list of products.

The fire in the works of the W. H. Davenport Fire Arms Company, Norwich, Conn., January 27, was confined to an annex building in which one department of the business was conducted and which was totally destroyed. The loss is entirely on goods in process and very little on machinery, as the building was devoted chiefly to bench work. The 40 men or more employed in the department have been transferred to the main building and business resumed on the same basis as before the fire. The property destroyed was covered by insurance and the money loss to the company is believed to be small. The fire also seriously damaged the building occupied by the Norwich Belt Mfg. Company.

Miscellaneous.

At a recent meeting of the Board of Directors of the Buck's Stove & Range Company, St. Louis, Mo., the following officers were elected: James W. Van Cleave, president; H. C. Thompson, vice-president; Lee W. Van Cleave, second vice-president and general manager; Jones T. Templeton, secretary; P. A. Pantlin, assistant secretary; Maurice A. Murray, treasurer; Frederic W. Gardner, chairman of the board.

The Muncie Gas Light & Fuel Company, Muncie, Ind., recently suffered a loss by fire which destroyed a one-story brick building, 25 x 40 ft., used for the repair shop and storage of stock supplies. The building will be rebuilt at once.

The Green-Beebe-Weed Company, New York, which was recently incorporated, will not engage in the manufacture of motors, etc., as was reported, but will deal in automobile supplies of every kind. George E. Proctor is president; Livingston Ely, first vice-president; Walter L. Weed, second vice-president; Joseph D. Brockway, 207 Broadway, secretary; John A. Green, treasurer, and H. C. Beebe, assistant treasurer.

The Schreiber Mfg. Company has been incorporated at Hammond, Ind., with $30,000 capital stock, to manufacture agricultural implements. The directors are Ernest G. Schreiber, August E. Jarnecke, Gustave Muenich, Carl E. Bauer and Paul H. Mueller.

The Crawfordsville Wire-Bound Box Company, Crawfordsville, Ind., has increased its capital stock from $20,000 to $40,000.

George P. Keating and Edward R. O'Malley have been appointed receivers for the National Battery Company, Buffalo, N. Y. The assets of the company are said to be far in excess of the liabilities.

The Franco-American Leather Company has secured buildings in Vineland, N. J., containing about 10,000 sq. ft. of floor space, which it will equip with about $40,000 worth of machinery for the manufacture of Krack-Not leather, which is an artificial skin reinforced by cotton textile of great strength and durability. This material cannot be told from leather and has excellent wearing qualities. Arrangements have been made for the coating machines, &c., and the necessary boilers, engines and shafting are installed. The offices will be located at 547 Drexel Building, Philadelphia, and the company will also continue to run its present factory at Quincy, Mass. C. R. de Montlord is president; Albert Touchet, vice-president; C. Willard Carter, secretary; Thomas L. Fenerty, treasurer, and M. F. Coughlin, assistant secretary and treasurer.

Trade Publications.

Vertical Gas Engines.—The Rathbun-Jones Engineering Company, Toledo, Ohio. Pamphlet. Pages 23. Describes a line of double and triple cylinder vertical gas engines manufactured by the company, which was recently organized to succeed the S. M. Jones Company. Constructive features of the machine are illustrated in cutaway and sectional views, which expose the gear and other mechanism. The efficiency of the engine under various loads is shown in a diagrammatic chart, which illustrates the fuel curve taken from shop tests.

Concrete Reinforcement.—Expanded Metal & Corrugated Bar Company, St. Louis, Mo. Catalogue. Size 8½ x 10½ in.; pages 112. Devoted to illustration and description of various styles of corrugated bars for concrete reinforcing, together with drawings and engravings showing the different methods of their application to floors and foundations. It is profusely illustrated with views of concrete buildings completed and under construction. Transverse sections of floors and beams, and pillar plans of reinforcing, show the disposition of this material. Several pages concern reinforced concrete construction in railroad and highway bridges, smokestacks, sewer work and other special forms of construction. Formulas are given for figuring ultimate strength and working stresses and also a number of valuable tables.

Chains, Milling Cutters and Machinery.—The Whitney Mfg. Company, Hartford, Conn. Abbreviated catalogue. Sets forth the company's line in concise but comprehensive form. Under the chain department are included riveted and detachable roller chains and bushing chains and their parts, the Whitney block chains, a new safety connecting link, and the Wizard silent chain. In the miscellaneous department are shown machine keys and key seat cutters for the Woodruff system of keying, and Presto chucks, collets and friction tapping devices. The machine department comprises hand milling machines, water tool grinders, wheel truing device for the tool grinder, upright milling machine vises, arbors and collets for Whitney cutters for Woodruff system of keying, and a fixture used for cutting worm gears on a milling machine.

Tapping, Riveting and Screw Slotting Machinery.—Harvey Hubbell, Inc., Bridgeport, Conn. Catalogue. Size 3¾ x 5½ in.; pages 27. Concerns the company's standard line of tapping machines and illustrates the ¼, ⅜, ½ and ¾ in. sizes (the ½-in. size is also made as a double machine). Riveting machines of ⅛ and 3-16 in. sizes are also illustrated, the former in both bench and pedestal types. The company's screw slotting machine is included. The list of machine screws which the company makes contains a page devoted to cuts showing the different styles of heads, together with points from which the length of screw is measured in order to insure accuracy of understanding in placing orders.

Economy Tie Plates.—Spencer Otis Company, general offices Railway Exchange Building, Chicago. Pamphlet catalogue in paper covers. Illustrates and describes a line of rolled steel tie plates of various patterns. Diagrams are furnished suggesting various methods of punching for right and left hand spiking and to fit the varying conditions of track work.

Feed Water Heaters.—Harrison Safety Boiler Works, Seventeenth street and Allegheny avenue, Philadelphia, Pa. Pamphlet. Title, "What Scale Does to Boilers and What Is Gained by Keeping It Out of Them." Presents information of value to designers, managers and operators of steam boiler plants. The data gathered from various authorities indicates that, by reason of scale, the average boiler plant wastes from 5 to 15 per cent. of the coal consumed, while the loss from boiler cleaning and repairs, loss of service and shortened life is even greater. The hot process of water purification in connection with the Cochrane open feed water heater is the remedy proposed.

Fuel Economizers.—Green Fuel Economizer Company, Matteawan, N. Y. Bulletin No. 113. This is a reprint of a paper read before the New York Railway Club by R. D. Tomlinson, showing by a careful analysis of tests and monthly records that the Green fuel economizers in the Manhattan power station of the Interborough Rapid Transit Company, New York City, are paying a net rate of 30.5 per cent. upon the initial outlay. Illustrations of the economizer and the exterior of the plant are given.

The Iron and Metal Trades

There seems to have been some misapprehension on the point that at recent conferences it was decided to establish Lake Ore prices for the coming season, at the level of the past season. What was done was that the consuming interests represented suggested such action to the sellers of Ore. The latter have not yet decided what course to pursue, but it is possible that they may do so before this week is out.

It is yet too early to expect clear evidence whether buyers will decide to place what orders they have at once, in view of the general disposition of steel makers to maintain prices. So far as they have gone the indications of a buying movement are not encouraging. There is some improvement in the volume of business, but it is slight as yet, and as a matter of fact the markets for finished Iron and Steel have not been seriously tested.

Production of Coke and Anthracite Pig Iron was only 1,045,525 tons in January, as compared with 1,234,279 tons in December, 1,828,125 tons in November and 2,336,972 tons in October. The most rapid restriction took place during that period with the steel furnaces, which fell off from 1,514,000 tons in October to 660,000 tons in December and 638,000 tons in January. The merchant furnaces cut down their production more gradually, dropping from 822,000 tons in October to 744,000 tons in November, to 575,000 tons in December and 407,000 tons in January. Even then, they have quite generally increased their stocks on hand, to judge from partial reports. Recently there has been some blowing in on the part of steel works furnaces, while merchant stacks have been blowing out. The result is that there were active on February 1 142 furnaces with a capacity of 241,925 tons, as compared with 151 furnaces on January 1, with 235,152 weekly capacity.

While the Eastern markets are fairly firm, the furnaces in the Central West are making lower prices and show weakness. In some instances they are underselling local furnaces in tidewater markets. Low figures are reported to have been made on about 9000 tons of Foundry Iron, for delivery during the last three quarters of the year at Detroit, the business having been taken by a local furnace. In central New York, one mill closed a contract for 30,000 tons for delivery during 1908, a New York furnace taking the order.

Chicago reports the appearance in that market of an inquiry for 60,000 tons of Steel Rails emanating from a leading Western road, so that there is now under negotiation in that market upward of 100,000 tons.

Some new business is coming up in Structural material, but fabricators are making low prices on work, in the obvious efforts to keep their shops going.

The Western makers of Iron Bars, at a meeting held at Chicago yesterday, decided to advance the price on Iron Bars to 1.50c., Pittsburgh, for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further West. Following their action, the Eastern Iron Bar makers, at a meeting held to-day, agreed to hold to 1.50c., Pittsburgh, which is equivalent to 1.66c., tidewater. It is hoped that this action will put a stop to the demoralization in the Iron Bar trade, which was seriously affecting collateral industries and was threatening the stability of Steel Bar prices.

The Cast Iron Pipe trade is dull and low prices were made in the lettings of about 4800 tons at Minneapolis and St. Paul.

Klondike Coke has sold as low as $1.70 to $1.75, at oven, and close figures have also been made on standard Connellsville Coke.

Copper is lower, and is now obtainable at 13.62½c. for Electrolytic and 13.75c. for Lake.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Feb. 5, 1908.	Jan. 29, 1908.	Jan. 1, 1908.	Feb. 6, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	$18.25	$18.25	$18.00	$26.50
Foundry No. 2, Southern, Cincinnati	*15.75*	16.00	16.25	26.00
Foundry No. 2, Local, Chicago	*18.00*	18.00	18.50	25.50
Bessemer, Pittsburgh	*17.50*	18.00	19.10	22.85
Gray Forge, Pittsburgh	*16.15*	16.90	17.65	22.35
Lake Superior Charcoal, Chicago	*21.00*	22.00	23.50	27.00
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	29.50
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.00
Open Hearth Billets, Phila	**30.40**	30.40	30.00	33.00
Wire Rods, Pittsburgh	**35.00**	35.00	34.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	**13.00**	12.50	12.00	18.00
Steel Rails, Melting, Phila	**13.50**	12.00	11.50	18.75
Iron Rails, Chicago	**17.00**	17.00	15.00	27.00
Iron Rails, Philadelphia	17.50	16.50	17.50	27.50
Car Wheels, Chicago	*18.50*	18.50	20.00	24.50
Car Wheels, Philadelphia	*17.00*	17.00	19.00	22.50
Heavy Steel Scrap, Pittsburgh	**14.00**	14.00	12.50	18.25
Heavy Steel Scrap, Chicago	**12.50**	12.00	10.75	16.00
Heavy Steel Scrap, Phila	**13.50**	12.00	11.50	18.50
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	*1.65*	1.55	1.75	1.93½
Common Iron Bars, Chicago	*1.65*	1.55	1.75	1.81½
Common Iron Bars, Pittsburgh	*1.50*	1.40	1.60	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.70	1.70	1.70	1.80
Skelp, Sheared Steel, Pittsburgh	1.80	1.80	1.80	1.90
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	*2.40*	2.40	2.50	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	2.00	2.00	2.00	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	**13.75**	14.00	13.62½	25.00
Electrolytic Copper, New York	**13.62½**	14.00	13.50	24.75
Spelter, New York	**4.70**	4.70	4.20	7.00
Spelter, St. Louis	**4.55**	4.60	4.05	6.75
Lead, New York	3.75	3.75	3.75	6.30
Lead, St. Louis	3.60	3.60	3.60	6.10
Tin, New York	**28.60**	27.80	27.25	42.50
Antimony, Hallett, New York	**9.00**	9.00	8.50	25.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb	*$3.89*	$3.89	$4.09	$4.09

Chicago.

FISHER BUILDING, February 5, 1908.—*(By Telegraph.)*

It can hardly be questioned that doubt as to the stability of prices has been a factor of considerable importance in retarding trade movements, and it is therefore [illegible] able to expect that if confidence in the stability of present values were established freer buying would ensue. The decision reached by the various producers, as the result of a conference held last week in New York by the [illegible] mittee and subcommittees appointed [illegible] upon market conditions, to make no [illegible] schedules on Ore, Pig Iron, Steel and Finished products, has in consequence a significant bearing upon this phase of the situation. How far reaching its effects will be cannot be foretold, but its influence [illegible] with interest. The [illegible] for an important tonnage of Standard Section Rails inspires hope of a renewal of activity in this direction. A leading Western road is asking prices on 60,000 tons, and the impression prevails that orders for the entire quantity will be placed in the [illegible] This makes a total of 110,000 tons of [illegible] business that has developed within the past two weeks. There continues to be a moderate increase in the demand for Track Supplies and, because of the meager buying of the last few months, further improvement in this trade is anticipated. No movement of significance in Structural Material is observed. Contracts on which closure is reported for the week amount to 2700 tons, the greater portion of which was for railroad bridge work. All of the finishing mills at the South Works

of the Illinois Steel Company are idle this week, the last to suspend operations being the No. 1 Rail mill. It is likely, however, that the accumulation of specifications will permit an early resumption in some departments. The new Steel Bar mill of the Calumet Steel Company is now practically completed, and expects to start up for its initial run about February 15. The recent spurt of activity in Scrap begins to show signs of lessening. Aside from a fair demand for Melting Steel, consumers are giving but little support to the market.

Pig Iron.—The market is being eagerly scanned by all interests for any signs of returning strength, but so far none of strong promise has developed. In the opinion of closely observant sellers, the majority of consumers have enough Iron due on contracts and in their yards to cover their expected requirements for at least 60 days. No sales of important tonnage are reported for the past week, and it is conservatively estimated that the entire transactions in the market during that period have scarcely exceeded 2000 tons. What business there is seems to be merely for the covering of casting contracts as they are secured, which are apparently not of large extent. Prices are nominally unchanged, with the exception of a decline of $1 in Jackson County and Kentucky Silveries, in which there is practically nothing doing, and Lake Superior Charcoal. There is a singular lack of uniformity in the quotations made by various interests. One prominent selling agency of Northern Iron has fixed its minimum price for No. 2 Foundry at $18.50, Chicago, while another furnace, governed by different conditions as respects analysis and circumstances controlling furnace operations, would probably be willing to accept orders at 50c. to $1 below this price. One sale of 500 tons of Southern Iron for second quarter delivery at $13.25, Birmingham, is reported. On the other hand, $13, Birmingham, is being freely offered for spot Iron en route on track, with a strong intimation that this price would be shaded considerably for second quarter business. Despite the efforts that have been made to harmonize price levels, it is quite apparent that the market views of various producers, both North and South, are by no means in accord. The following prices are for February and March delivery, f.o.b. Chicago:

Lake Superior Charcoal	$21.00 to $22.00
Northern Coke Foundry, No. 1	18.50 to 19.00
Northern Coke Foundry, No. 2	18.00 to 18.50
Northern Coke Foundry, No. 3	17.50 to 18.00
Northern Gray Forge, No. 1	19.00 to 19.50
Southern Coke, No. 1	17.85 to 18.35
Southern Coke, No. 2	17.35 to 17.85
Southern Coke, No. 3	16.85 to 17.35
Southern Coke, No. 4	16.35 to 16.85
Southern Coke, No. 1 Soft	17.85 to 18.35
Southern Coke, No. 2 Soft	17.35 to 17.85
Southern Gray Forge	15.35 to 15.85
Southern Mottled	15.10 to 15.60
Malleable Bessemer	18.50 to 19.00
Standard Bessemer	20.40 to 20.90
Jackson Co. and Kentucky Silvery, 6 %	21.40 to 21.90
Jackson Co. and Kentucky Silvery, 8 %	23.40 to 23.90
Jackson Co. and Kentucky Silvery, 10 %	25.40 to 25.90

(*By Mail.*)

Billets and Rods.—Aside from a few small orders for Axle Billets, which represent requirements for finishing up contracts in hand, there is practically no movement in the market. We continue to quote Forging Billets at $33 to $34, in Chicago. Wire Rods remain firm at the following quotations: Bessemer, $35; Basic, $36; Chain, $37, Pittsburgh.

Rails and Track Supplies.—From recent inquiries received for Standard Section Rails, it may reasonably be expected that orders for significant tonnage will soon begin to develop. In addition to the 50,000 tons under consideration last week, another inquiry for 60,000 tons has been put out by a prominent Western road. All of this tonnage will probably be placed as soon as the roads are able to finance the purchase. Spikes and Bolts continue in moderate demand, but Light Rails are again somewhat neglected. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.90c. to 2c., according to delivery; Track Bolts, 2.40c. to 2.50c., base, Square Nuts, and 2.55c. to 2.65c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—The amount of Structural tonnage booked last week was in the aggregate slightly in excess of that of the week previous, but, at that, the total volume of business is small. Included in the business booked was 1600 tons for miscellaneous railroad work placed by the Chicago, Burlington & Quincy and Chicago & Northwestern with the American Bridge Company, which also secured a contract of 350 tons from Goldfield, Nev., for mine construction work. The St. Paul placed 750 tons of bridge material with the Pennsylvania Steel Company. None of the larger building contracts now pending have been closed, though it is believed that such of these as may have been deferred in the hope of a decline in prices may, in view of the reaffirmation made last week by the mills, now be induced to come into the market. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—Notwithstanding reports to the contrary, the No. 1 and 2 Plate mills of the Illinois Steel Company will not start up this week. Just how soon the accumulation of Plate tonnage will warrant resumption cannot be definitely foretold, but there is some prospect of these mills being started up within the next week or two. The incoming tonnage in new orders and specifications continues light, and includes mainly only scattering requirements arising from unfinished contracts. We quote for shipment from mill as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.08c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in, 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, $0.25c. extra.

Sheets.—While business continues very moderate in volume, it shows steady improvement. Manufacturers seem to be buying a little more freely, but neither they nor the jobbers are asking for more than will take care of current requirements. Mill prices are reported to be firmly held at usual quotations. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 to 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c. Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c. Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—Bar Iron mills report a moderate improvement in bookings, and their schedules are running a little fuller. There is an extremely light demand for Steel Bars, and mills are operating intermittently, as accumulation of specifications permits. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.55c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—It can be said that since the first of the year the business of each week has shown a slight increase over the one preceding, but at that it is yet far below normal. The bookings in new orders at the present time are hardly 25 per cent. of normal. Owing to the severely cold weather of the past week or 10 days, there has been an extremely light demand for Pipe from warehouse stocks. Store prices continue low and irregular, but jobbers express the hope that betterment in this respect will follow the recent reaffirmation of prices. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 72 to 72½ per cent. on Black Steel Pipe, ¾ to 6 in. About four points advance above these prices is asked for Iron Pipe.

Boiler Tubes.—There is very little doing in Merchant Tubes, orders being restricted to immediate needs, which are light. A little more activity is noted in Locomotive Tubes, but the buying seems to be of an emergency character rather than for stock supplies. Mill quotations for future delivery, on the base sizes, are as follows: 2⅜ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft. and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	35	35	35
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2¾ to 3 in.	60	47½	47½
6 in and larger	50	35	..

Merchant Steel.—Manufacturers and jobbers continue to order and specify sparingly, and business is correspondingly quiet. Prices are reported firm in practically all ma-

terial under this head save Shafting, which is occasionally shaded when a moderate concession will secure desirable orders. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1⅛ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 54 per cent. off in car lots; 48 per cent., less than car lots, base territory delivery.

Cast Iron Pipe.—Contracts for 4800 tons were awarded by the cities of St. Paul and Minneapolis. The 1600 tons placed by the former was taken by the Dimmick Pipe Company and the contract for the latter city, 3200 tons, was awarded to the United States Cast Iron Pipe & Foundry Company. No other prospective municipal lettings are reported, and only a very moderate amount of business in miscellaneous orders is being offered. We quote, per net ton, Chicago, as follows: Water Pipe, 4-in., $30; 6 to 12 in., $29; 16-in. and up, $28, with $1 extra for Gas Pipe.

Old Material.—Stocks in the hands of consumers, according to all reports, are unusually low, but there seems to be little buying except for present needs. There has been some inquiry within the past week for Melting Steel, but actual transactions involve only a moderate amount of tonnage. It is essentially a dealers' market, and until more activity develops among mills and melters no heavy demand is expected from these sources. Prices hold firm at the present level, with a slightly stronger tendency on some grades of rolling mill material and Melting Steel. The Great Northern Railroad is this week offering a list of 5000 tons to be closed February 7, in which there are 2000 tons of Iron Rails and 400 tons of Car Wheels. Very few old Car Wheels reach the open market, as they are principally absorbed by the Car Wheel foundries on exchange contracts; in the absence of actual sales reported, quotations are, therefore, only nominal. We quote, per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$17.00 to $17.50
Old Steel Rails, rerolling	13.00 to 13.50
Old Steel Rails, less than 3 ft.	13.00 to 13.50
Relaying Rails, standard sections, subject to inspection	22.00 to 25.00
Old Car Wheels	18.50 to 19.00
Heavy Melting Steel Scrap	12.50 to 13.00
Frogs, Switches and Guards, cut apart	12.75 to 13.25
Mixed Steel	9.50 to 10.00

The following quotations are per net ton:

Iron Fish Plates	$15.00 to $15.50
Iron Car Axles	16.50 to 17.00
Steel Car Axles	15.50 to 16.00
No. 1 Railroad Wrought	12.25 to 12.75
No. 2 Railroad Wrought	10.25 to 10.75
Railway Springs	11.50 to 12.00
Locomotive Tires, smooth	15.00 to 15.50
No. 1 Dealers' Forge	9.75 to 10.25
Mixed Busheling	8.00 to 8.50
Iron Axle Turnings	7.50 to 8.00
Soft Steel Axle Turnings	7.50 to 8.00
Machine Shop Turnings	7.50 to 8.00
Cast Borings	5.00 to 5.50
Mixed Borings, &c.	5.00 to 5.50
No. 1 Mill	7.50 to 8.00
No. 2 Mill	6.50 to 7.00
No. 1 Boilers, cut to Sheets and Rings	7.50 to 8.00
No. 1 Cast Scrap	13.00 to 13.50
Stove Plate and Light Cast Scrap	11.50 to 12.00
Railroad Malleable	11.50 to 12.00
Agricultural Malleable	10.50 to 11.00
Pipes and Flues	9.00 to 9.50

Metals.—As far as demand is concerned, the Metal market throughout is sagging and listless. Few sales of Copper are reported, and such as have been made comprise only small lots for current requirements. Prices hold firm, though without tendency toward advance. Old Metals continue quiet, with no change in prices. We quote as follows: Casting Copper, 14¼c.; Lake, 14¾c. to 15c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 30c.; small lots, 31½c.; Lead, Desilverized, 4c. to 4.05c., for 50-ton lots; Corroding, 5.15c. to 5.25c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 4.60c.; Cookson's Antimony, 13c., and other grades, 11c. to 11½c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 13½c.; Heavy Copper, 13½c.; Copper Bottoms, 12c.; Copper Clips, 12c.; Red Brass, 13c.; Yellow Brass, 10½c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 23c.; Block Tin Pipe, 25c.

Harry E. McCoy, sales agent, 619 Ferguson Building, Pittsburgh, will represent in the Pittsburgh District Alfred Box & Co., Philadelphia, manufacturers of electric and hand power cranes, hoists, &c. Mr. McCoy is also sales agent for the Springfield improved water heater and lime extractor, made to operate with boilers from 50 to 400 hp.

Pittsburgh.

PARK BUILDING, February 5, 1908.—(*By Telegraph.*)

Pig Iron.—Inquiries are more plentiful and sales, while small, are more numerous but at low prices. Foundry Iron seems to be somewhat demoralized, as three or four furnace interests, as stated in mail advices, are competing sharply for such business as is coming up. We note a sale of 500 tons of Northern No. 2 Foundry at $16, 200 tons at $15.75, 100 tons at $16.25 and 300 tons at $15.60, all at Valley furnace. The Iron sold at about $16 has a high reputation in the trade, and consumers are willing to pay 25 to 50 cents a ton more for it, rather than change to another make. We quote the market on Northern No. 2 Foundry at $16 to $16.50, Valley furnace. The official price of $18 at Valley furnace on Bessemer Iron is also being shaded, one or two makers naming as low as $17 at furnace, and we note a sale of 100 tons at that price. We also note a sale of 125 tons of Bessemer with a low sulphur requirement at $18.25, Valley furnace. The official price of Basic Iron is $17 at Valley furnace, but it is being quoted as low as $16. There is very little doing in Northern Gray Forge, and it is being offered as low as $15.25, Valley furnace, or $16.15, Pittsburgh. Southern Forge Iron can be laid down at $15.90, Pittsburgh, so that Northern Forge has to be very close to this price to get any business. The Republic Iron & Steel Company has started its No. 2 furnace at Haselton, and now has two stacks in blast, while Mary Furnace of the Ohio Iron & Steel Company at Lowellville will blow out in a week or 10 days.

Steel.—Producers of Billets and Sheet and Tin Bars report that inquiries are better, and more Steel is being actually sold and specified for than at any time since last October. Prices are unchanged, and we continue to quote Bessemer and Open Hearth Billets at $28, Sheet and Tin Bars at $29 and Forging Billets at $30, Pittsburgh.

(*By Mail.*)

Efforts to maintain uniform prices on Pig Iron are not meeting with much success, there being four or five furnace interests that are not acting in harmony with the others, and are offering their product at considerably less than the fixed prices. These outside furnace interests are offering Bessemer Iron at $17.50, Basic at $16, No. 2 Foundry at the same price and Forge Iron very close to $15, Valley furnace. So little Pig Iron is being sold that these furnaces are able to take nearly all the business offering. The fact that prices on Ore and Steel were reaffirmed last week in New York has not had much local effect as yet, as the demand for practically everything is of a hand to mouth character, and consumers do not seem to be in the mood to place large contracts. There is nothing doing in Rails, but some business is on the tapis and will be given out in a week or two. The demand for Finished Iron and Steel is small, being mostly for actual needs. Some low prices are being made on Coke and a good deal of tonnage has been sold. Scrap is showing betterment in demand and prices are higher, especially on Heavy Steel Scrap, for which dealers are paying $13.75, Pittsburgh, and it has been sold at $14 to $14.25 to consumers. Business in Wire products is moderately active, and the same is true of Tin Plates.

Ferromanganese.—One large importer is offering 80 per cent. foreign Ferro for delivery up to June at $47, Baltimore, equal to $48.90, Pittsburgh. On a firm offer, however, this price would likely be shaded, and we quote foreign 80 per cent. at $48.50 to $49, Pittsburgh.

Muck Bar.—The market is bare of sales, and we quote best grades of Muck Bar, made from all Pig Iron, nominally at $28 to $29, Pittsburgh.

Skelp.—The situation is very quiet, and we do not hear of any new orders being placed. We quote: Grooved Steel Skelp, 1.60c.; Sheared Steel Skelp, 1.70c.; Grooved Iron Skelp, 1.80c., and Sheared Iron Skelp, 1.90c., f.o.b. Pittsburgh.

Rods.—The market is very quiet, but prices are firm on the basis of $35 for Bessemer, $36 for Open Hearth and $37 for Chain Rods, f.o.b. Pittsburgh.

Steel Rails.—The Engineers' Committee of the Pittsburgh & Lake Erie Railroad has recommended that no change be made in standards of Rail section for 1908, and this road will probably place its contract for Rails, about 10,000 tons, with the local mill in the near future. The Norfolk & Western, which some time ago tentatively placed a contract for 10,000 tons of Standard Sections with the Carnegie Steel Company, has finally closed, 6000 tons to be shipped in equal quantities, March to June, and 4000 tons in September and October. The Carnegie Steel Company entered orders last week for 1500 tons of Light Rails. Inquiries for Light Rails are fairly active. Several of the mills that reroll Rails have advanced prices $1 a ton, and now quote at $24 minimum. Regular prices on Light Rails, which are still being shaded about $3 a ton by the mills rerolling Rails, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard

Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Structural Material.—More new business is coming up in the Pittsburgh District and in the West than for some little time. Included in this is a Baltimore & Ohio crossing at Cleveland, to be built by the city, calling for about 1400 tons; a new court house at Youngstown, about 500 tons, and some bridge work, about 600 tons, the latter to be placed this week. None of the fabricating concerns has enough work to operate to full capacity, and, as a result, some low prices are being named on the small tonnage that is coming out. The mills are able to make prompt deliveries. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—No large tonnage is being placed, orders being entirely for small lots and actual needs. All the Plate mills are short of work, and some shading in prices is being done, but this is mostly by mills that do not roll wide sizes. We quote: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell grade of steel is abandoned.	

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Sheets.—Only a fair amount of new business is being placed in Sheets, this being the dull season of the year, and no large business is expected until about April, when the building season will open up and the demand for Roofing Sheets will then show betterment. None of the Sheet mill concerns is operating to full capacity, the leading interest running less than 50 per cent. of its mills. However, prices are being well maintained, and we quote: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—Considerable tonnage is being placed in Roofing Plates by the large trade, that desires to have a full assortment of sizes when spring demand opens up. The Can Association is in session in Cincinnati this week, and practically all the leading Can interests and Tin Plate manufacturers are represented. It is not unlikely that a good many contracts for Bright Plate will be placed at this convention, this having been the case in previous years. We are advised that regular prices are being strictly maintained. We quote at $3.70 for 100 lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days this price being subject to the usual rebate of 5c. per base box in large lots.

Bars.—New tonnage in both Iron and Steel Bars continues relatively small, and none of the mills rolling Iron or Steel Bars is able to operate to full capacity. The spread of $4 a ton in prices between Iron and Steel Bars is diverting some tonnage to the former from customers who formerly used Steel Bars. It is not believed, however, that the makers of Steel Bars will reduce prices in the near future at least. The official price on Iron Bars is 1.40c., Pittsburgh, for Western shipment, and 1.55c. for delivery in the Pittsburgh District, but we are advised that both these prices are being shaded. Steel Bars are firm, at 1.60c., Pittsburgh.

Spelter.—There is only a small inquiry. Prime grades of Western Spelter are sold at about 4.50c., St. Louis, but some of the smelters are quoting as high as 4.60c., St. Louis, equal to 4.72½c., Pittsburgh.

Hoops and Bands.—Most large consumers of both Hoops and Bands have placed contracts for their requirements for this year, the mills practically guaranteeing prices against decline. Shipments are heavier than for some time, and we are advised that prices are being firmly held. We quote Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60, base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Spikes.—No large contracts have been placed by railroads since our last report, but the Southern Railway Company is reported as being in the market for 15,000 kegs. New business is light, and none of the Spike concerns has very much work ahead. We quote Standard sizes of Steel Railroad Spikes at $1.80 to $1.85, but in some cases a lower price has been named in competition with Iron Spikes. The smaller sizes are held at $1.95 to $2 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—Very little new business is being placed, and little tonnage on contracts held up some time ago is coming out. The demand for Shafting is extremely dull and prices are being shaded, carloads having sold as low as 55 and 2½ off, the official prices on Cold Rolled Shafting being 54 per cent. off in large lots and 48 per cent. in carload lots, delivered in base territory. Prices on Merchant Steels are being shaded, but we are advised that inquiries from implement makers are a little better. Nominal quotations are as follows: Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades, and 10c. and upward for special grades.

Merchant Pipe.—A fair amount of new business is being placed, but it is still confined to small lots for actual needs. Not much betterment in the demand for Pipe is expected until April or later, when field operations commence. Prices on Steel Pipe are firm, but on Iron Pipe are still being shaded. The net discount on Steel Pipe to the large trade on ¾ to 6 in. is 74 and 5 per cent. off list, while on Iron Pipe, ¾ to 2 in., 71 and 5 per cent., and over 2 to 6 in., 70 and 5 per cent. are quoted. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black. %	Galv. %
⅛ to ¼ in.	65	49
⅜ in.	67	53
½ in.	69	57
¾ to 6 in.	73	63
7 to 12 in.	70	55
Extra strong, plain ends:		
⅛ to ¾ in.	58	46
½ to 4 in.	65	53
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

To the large trade all above discounts are subject to 1 point on the base, and 5 per cent. on the net.

Boiler Tubes.—The demand for both Merchant and Locomotive Tubes is light, and discounts on Merchant Tubes are still being shaded. Prices on Railroad Tubes are fairly strong, but no large tonnage has been in the market for some little time. Discounts on Merchant Tubes for small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ in.	42	47
1¾ to 2¼ in.	42	59
2½ in.	47	61
2¾ to 3 in.	52	65
6 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Iron and Steel Scrap.—The betterment in the Scrap trade referred to in this report last week still continues, especially in Heavy Steel Scrap, for which there is a fairly active demand, with a rather limited supply. It is stated that some dealers have sold Heavy Steel Scrap short, and are now unable to cover their sales except at a loss. We note sales of 1500 to 2000 tons of Heavy Steel Scrap to dealers at $13.75, Pittsburgh, while sales to consumers have been made at $14 to $14.25, delivered, in the Pittsburgh, Follansbee and Sharon districts. Dealers quote about as follows: Heavy Steel Scrap, for Pittsburgh, Steubenville or Sharon delivery, $14; No. 1 Cast Scrap, $15.25 to $15.50; Low Phosphorus Melting Stock, $17.50 to $18; Bundled Sheet Scrap, $9.50 to $10; No. 1 Busheling Scrap, $14 to $14.50; No. 2, $12 to $12.50; Cast Iron Borings, $8 to $8.50; Steel Axles, $16; Iron Axles, $20.50 to $21; Rerolling Rails, $14 to $14.50; Old Steel Rails, short pieces for Open Hearth use, $14; Standard Sheet Bar Crop Ends, $15 to $15.50, and Grate Bars, $13 to $13.50. All above prices are per gross ton, f.o.b. Pittsburgh:

Coke.—Some low prices have been made on Connellsville and Klondike Coke for spot shipment, sales having been made at $1.70 to $1.75, at oven. On contracts, however, strictly Connellsville Furnace Coke is quoted at $1.90 to $1.95, and

Klondike Coke about $1.85, at oven. Strictly Connellsville 72-hr. Foundry Coke is held at about $2.45, at oven, to consumers, while outside grades are offered as low as $2.25. The Frick Coke Company has started more ovens, and is credited with having had in operation last week 10,943 ovens out of a total of 18,684. It is said that very close to 5000 ovens in the Upper and Lower Connellsville regions have blown in since January 1. The Republic Iron & Steel Company has started 100 ovens at its Republic Works, and intends to start 200 more this week at the same plant. The output of Coke in the Upper and Lower Connellsville regions last week was 208,762 tons, a material increase over the previous week.

Cleveland.

CLEVELAND, OHIO, February 4, 1908.

Iron Ore.—Although last year's Ore prices were reaffirmed at the meeting held in New York last week, the local merchant Ore firms do not regard the matter as definitely settled, and if present plans are followed they will allow the question of prices to remain a open one for the next few weeks. An informal meeting of the shippers was held here last week, previous to the New York meeting. At this meeting the question of prices was discussed, but it is understood that no definite action was taken. While the sentiment of the merchant Ore firms is quite strongly in favor of maintaining last year's prices, they are not disposed to definitely fix prices now, in view of the fact that if prices were established at present they would not expect any buying movement in Ore before April at the earliest. By keeping the matter open for a few weeks they would be in a position to make a slight reduction in prices, should they decide that conditions at that time warranted a reduction. There is no improvement in shipping orders for Ore on the docks, and of the 7,385,000 tons stored there at the close of navigation in December it is estimated that from 6,500,000 to 6,750,000 tons remain untouched. One leading shipper did not ship a pound of Ore in January, and the records of others are not much better. According to estimates of mine operators next season's Ore shipments will not exceed 30,000,000 tons, and some place the amount at 25,000,000 tons. Nominal Ore prices remain as follows at Lake Erie docks, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.25; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—The market is utterly lifeless. Following the decision of the furnace interests to maintain the price of No. 2 Northern Foundry Iron on the basis of $17, Valley furnace there has been hardly a sale, except perhaps a few car lots, and there is an entire absence of inquiries. It is not thought, however, that the action of the furnacemen has had the effect of keeping consumers out of the market, for the same condition prevails as regards Southern Iron, there being no sales or inquiries. The most encouraging sign in the local situation is the fact that shipping orders for this month show considerable improvement over January, and stock piles of furnaces out of blast are disappearing quite rapidly. Some furnaces still in blast are able to ship about two-thirds of their output. The jobbing foundry industry is improving very slowly, and owing to the large amount of Iron carried over from last year on old contracts an active buying movement on the part of the small consumers is not expected for some time. Some doubt is expressed as to whether the furnaces will be able to maintain the established price. Several interests did not participate in the agreement, and it is reported that No. 2 Northern Foundry Iron is being offered at $16, Valley furnace, for prompt shipment. While local furnaces are quoting No. 2 Iron at $17.85 for Cleveland delivery, and on the basis of $17, Valley furnace, for outside shipment, one local interest regards the price as too high for local delivery and would prefer to make a quotation of about $17.25, delivered Cleveland, or $17, at local furnace. Only one sale of any size is reported—600 tons of No. 2 Foundry Iron at $16.90, Toledo furnace. There are no inquiries for Basic Iron. For the first quarter and first half we quote, delivered Cleveland:

Bessemer	$18.90
Northern Foundry No. 1	$17.85 to 18.35
Northern Foundry No. 2	17.35 to 17.85
Northern Foundry No. 3	16.85 to 17.35
Southern Foundry, No. 2	17.35 to 17.85
Gray Forge	16.90

Coke.—The market is very quiet, there being no good inquiries and the only sales reported are a few small lots. Prices remain low. We quote the best grades of Connellsville Furnace Coke at $1.95 to $2, at oven. Other grades can be bought at $1.80. These prices are for first half delivery. We quote 72-hr. Foundry Coke at $2.50 to $2.60, at oven.

Finished Iron and Steel.—Some of the mills are getting fair specifications on contracts, the market showing considerable improvement in this respect over a month ago. The volume of new business is light, however. Orders are quite numerous, but they are for very small lots for immediate needs. There is some belief that the action of the General Committee in reaffirming prices at its meeting in New York last week will have a stimulating effect on the market, although not enough time has elapsed yet to make the effect noticeable. The operation of industrial plants at nearer their normal capacity is an encouraging sign, and leads to the belief that the volume of orders will gradually increase in volume. While some consumers are satisfied with the action in maintaining prices, others are of the opinion that conditions warranted some reductions. The two local Bar Iron mills are shut down this week. They are at present getting a sufficient volume of business to keep them running every other week. There is a slight improvement in the demand for Sheets, but an order for between two and three carloads that was placed during the week caused some lively competition. Bar Iron prices are being cut by some of the Western mills, and there are reports that price concessions are being offered on Sheets. There is practically no inquiry for Plates. Specifications are now coming in in good shape from the agricultural implement plants, and those in this territory are running at about full capacity. There is some demand for Forging Billets in small lots, which are being sold on the basis of $30, Pittsburgh. The demand for Light Rails keeps up fairly well, and the price is being shaded to meet the competition of mills rerolling Rails. The city of Cleveland will receive bids February 12 for 1200 tons of Cast Iron Water Pipe and for 100 tons of special and miscellaneous Castings. A local Steel man representing New York interests is getting figures on from 16,000 to 20,000 tons of Structural Material for the approaches for the Manhattan Bridge in New York, for which it is expected the contract will be closed shortly. We quote Iron Bars at 1.50c., Cleveland; Steel Bars, 1.70c., Cleveland, for carload lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼-in. and heavier, 1.80c., base, Cleveland. We quote Sheets, mill shipments, carload lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. There is no change in warehouse prices. We quote Steel Bars out of stock at 1.90c. to 1.95c., and Iron Bars at 1.80c. Beams and Channels out of stock are 2.10c. to 2.15c., base. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.20c.; Box Annealed, No. 28, 2.90c.; Galvanized, No. 28, 4.05c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—The general feeling among dealers is better, but if there is any improvement in the demand it is very slight. About the only demand is from mills outside of this territory. Local Bar mills are taking a small amount of Scrap on old contracts, and are buying a limited quantity in car lots. They are running every other week and still have considerable Scrap on hand. No inquiries are coming from the foundries. Steel Scrap remains firm, and Borings are slightly stronger. Turnings appear to be the weakest grade of Scrap on the list. The railroad lists this week include 1900 tons to be sold by the Lake Shore & Michigan Southern and 1500 tons by the Pennsylvania Lines West. Quotations are still largely nominal. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$11.50 to $12.00
Old Iron Rails	16.00 to 17.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	16.00 to 17.00
Relaying Rails, 50 lb. and over	25.50 to 26.00
Relaying Rails, under 50 lb.	28.00 to 29.00
Heavy Melting Steel	12.00 to 12.50
Railroad Malleable	12.00 to 13.00
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	8.00 to 9.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	[illegible]
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	[illegible]
No. 1 Railroad Wrought	[illegible]
No. 1 Cast	12.00 to 13.00
Store Plate	10.50 to 11.00
Bundled Tin Scrap	[illegible]

Birmingham.

BIRMINGHAM, ALA., February 3, 1908.

Pig Iron.—The transactions recorded during the week are of such a nature that an opportunity to judge the market properly is not afforded. The former quotation of $13.50 on a No. 2 basis, f.o.b. Birmingham, is generally being firmly adhered to, and no sales are believed to have recently been made at figures under this basis; yet in each case the tonnage has been limited to such an extent that prices received are hardly a criterion of the market. It is to be noted, however, that sales have been fairly well distributed among producers, and in view of the fact that three concerns are practically out of the market for first quarter deliveries, the indications are favorable for a maintenance of prices. The demand from the foundry trade is, no doubt, steadily increasing, as is indicated by the number of inquiries re-

ceived, but purchasers are apparently unwilling to take hold for advanced deliveries, and, as a result, sales have been principally of comparatively small lots for prompt shipment. A Northern concern has recently made inquiry for quotations on about 5000 tons, but no part of it is believed to have been placed. The largest sale made during the week is 2500 tons, for delivery covering the first half. This lot is reported sold on a $13.50 basis, and the aggregate of lots around 500 tons, sold at approximately the same price, is significant. One lot of 500 tons has brought $14, f.o.b. Birmingham, but this was a favorite brand, which usually brings a premium, a small lot of the same brand, running 3 per cent. Silicon, having sold for $15, Birmingham. Gray Forge has sold for $11.25, but it is not believed that a greater differential than 50c. per ton on a No. 2 basis could be done on any other grade. Shipments have been made promptly, and furnace yards are being reduced of their stock in apparently a satisfactory manner, but there are no indications of an immediate increase in production.

Cast Iron Pipe.—It is learned that the tonnage for St. Paul and Minneapolis, Minn., will be furnished by Southern interests. The price at which these contracts were awarded is not made public, but it is understood that exceptionally low figures were reached. The city of Indianapolis, Ind., will open bids on something like 4000 tons of Water Pipe, February 5, and lettings of some consequence for Eastern points are expected in the near future. Orders for small lots are placed frequently, and in view of the recent lettings for Minnesota points, no doubt practically all local capacity will be put in operation. It is to be noted that an adjustment of wages has recently been effected, and the cost of production materially reduced. Nominal quotations on Water Pipe are as follows, per net ton, f.o.b. cars here: 4 to 6 in., $28; 8 to 12 in., $26; over 12 in., average, $25, with $1 per ton extra for Gas Pipe.

Old Material.—Some carload lots of Steel and Wrought, as well as Cast Scrap, have been sold during the week, but the demand for all grades is very light indeed. A number of inquiries are reported, but purchasers are apparently uninterested, except in bargain lots, and each sale has apparently been a market within itself. Nominal quotations only are warranted and we quote as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$21.00 to $21.50
Old Iron Axles	17.50 to 18.00
Old Steel Axles	16.00 to 16.50
Old Car Wheels	20.50 to 21.00
No. 1 Railroad Wrought	16.50 to 17.00
No. 2 Railroad Wrought	12.00 to 12.50
No. 1 Country Wrought	12.50 to 13.00
No. 2 Country Wrought	10.50 to 11.00
Wrought Pipe and Flues	11.50 to 12.00
Railroad Malleable	12.50 to 13.00
No. 1 Steel	13.00 to 13.50
No. 1 Machinery Cast	10.50 to 11.00
Stove Plate and Light Cast	9.50 to 10.00
Cast Borings	6.50 to 7.00

San Francisco.

SAN FRANCISCO, CAL., January 29, 1908.

It is the consensus of opinion in nearly all branches of the Iron and Steel industries represented in this city that conditions have improved since the opening of the year, and that the prospects are good for the future. The conservative attitude of the banks as to loans for building and manufacturing enterprises is about all that prevents another boom in construction and the carrying out of many new enterprises such as cement mills, electric power plants, electric railroads, smelters, paper mills, &c. It is likely, however, that most of the local financial institutions will be very cautious about assisting promoters for several years. Eastern capital will be sought more persistently than ever for the carrying out of new propositions, and in some cases the high rates of interest offered for money for long terms by responsible persons will attract Eastern capital to the Coast. A number of new enterprises in the lines mentioned above will be pushed to completion, the capital having already been secured, while others will languish or be nipped in the bud. A revival of mining and smelting operations in California and Nevada is expected, as it is thought that the violent element in the ranks of labor has been overawed by the general feeling among the intelligent workingmen that it is inadvisable to fight over technicalities at a time when manufacturers and other employers find difficulty in collecting money fast enough to meet pay rolls. Resumption of work at a number of Copper smelters is hoped for. Everything indicates increased prices for oil on the Pacific Coast during the year and the drilling of many new wells.

Structural Materials.—While no large building contracts for Structural Steel have been closed during the past week, there has been an increased demand for small work required by the local concerns which erect Steel for buildings of various classes. As soon as more money can be secured from the banks or Eastern capitalists, more Steel frame buildings will be started, for the architects' offices are now busier than for some time, and there are many inquiries. Many hotels and public buildings are projected in the smaller cities of California and throughout the Coast, some of which will have Steel frames.

Pig Iron.—It cannot be said that local conditions have improved much, as far as the present demand for Pig Iron is concerned, but the new business, present and prospective, at the local foundries and engineering works will exhaust stocks within a month or two. Buyers will probably take advantage of the recent drop in prices East to demand lower prices here, although the charter rates on the vessels which bring Pig Iron from Europe are still comparatively high, and the dealers would not reduce prices if the market was not weak. As small foundries are buying in very small quantities for immediate use and most of the large ones are overstocked, there is not sufficient business to establish quotations. Consequently the prices quoted are only nominal. Several shipments of Pig Iron from Europe, of 200 to 900 tons each, have arrived by sea at this port since January 1. A steamer arrived from China January 21 with 1100 tons of Pig Iron made at Hankow, for which there is a fair demand at prices a little under those of other imported brands. Quotations, ex yard San Francisco, are about as follows:

No. 1 English Foundry	$29.00 to $29.50
No. 1 Scotch Foundry	29.00 to 29.50

Merchant Pipe.—There is only a moderate demand from mill for Merchant Pipe, the jobbers in this market having sufficient stocks for present requirements and not anticipating a rapid improvement in the situation. Discounts on Steel Pipe are about as follows on jobbers' carloads:

	Steel. Black.	Steel. Galv.
⅛ and ¼ in	58.5	42.5
⅜ in	60.5	46.5
½ in	62.5	50.5
¾ to 6 in	66.5	56.5
7 to 12 in	63.5	48.5
Extra strong, plain ends:		
⅛ to ⅜ in	51.5	39.5
½ to 4 in	58.5	46.5
4½ to 8 in	54.5	42.5
Double extra strong, plain ends:		
½ to 8 in	47.5	36.5

Cast Iron Pipe.—While there are many small inquiries for Cast Iron Pipe from municipalities and water companies, no large contracts have been closed of late, and until money is more plentiful none may be expected. The United States Cast Iron Pipe & Foundry Company was the successful bidder on a small lot of Pipe for Hanford, Cal., for use in connection with the water system. Prices are as follows, per net ton, f.o.b. Pacific Coast terminal points: 12-in., $26.50 to $27.50; 6-in., $27 to $28; 4-in. $28 to $29.

Scrap Iron and Steel.—The situation in Scrap Iron and Steel is very dull, and dealers are unwilling to furnish quotations while there is so little demand. They are still buying a little Scrap to add to their large accumulations on which the market is weak in sympathy with Pig Iron. The rolling mills have reduced their output and still have some Scrap Steel on hand, and will not be heavy buyers until there is an improvement in the demand for Bars. Some Scrap is yet to be dug out of the ruins in the burned district, but there is no hurry about it under present circumstances.

Sheets.—Notwithstanding the drop of $4 per ton in Galvanized Steets in the East, the local jobbers, having good stocks on hand and little demand, have shown no disposition to buy in any quantity. Pending the resumption of heavy building operations throughout the city, there will probably not be much activity in Sheets. There is still some demand for Riveted Steel Pipe, however. The Schaw-Batcher Company is running its plant at Sacramento night and day on several contracts for Riveted Pipe, 24 to 36 in. in diameter.

Coke.—The market for Foundry Coke has not developed much additional strength, and prices are a little off as compared with the last report. Australian Coke, such as is used by smelters for treating Ores, is still weaker on account of continued importations in the face of large stocks on hand at a number of smelters, some of which are closed down. With the gradual improvement expected in the mining regions of the Pacific Coast and at the local foundries, a better demand will arise. Since January 1 seven vessels have arrived at this port with foreign Coke aggregating 10,930 tons. Of this, 7415 tons came from Australia, 3015 tons from England and 5500 tons from Belgium. The arrivals of Coal from Australia and Europe at this port have been very heavy during the past three months, stimulated by the increased demand owing to the coming of the battleship squadron from the Atlantic Coast, and there is now more Coal in the harbor than there is storage room for. The great increase in the price of fuel oil in California may help the Coal market somewhat.

The Risdon Iron Works has about a year's work ahead, including the construction of two large gold dredges and other mining work. The repairs on the transport Logan will keep a large force of men busy for several months. This company may also get some of the repair work on the battleships, which are to arrive here early in May.

The Jupiter Steel Company, which has the only Steel

foundry on the Pacific Coast at present, has an increasing demand for repair work from the stamp mills and the gold dredges. An open hearth furnace is in constant operation at the plant, a few miles south of the San Francisco city limits.

According to advices from Port Townsend, Wash., a deal for the sale of the old Irondale Furnace to Eastern capitalists was concluded recently by James A. Moore of Seattle. The consideration was $500,000, and the new owners intend to make great improvements. The names of the purchasers have not been made public. Mr. Moore bought the property 15 months ago and rebuilt the furnace, having it ready for operation August 1 last. After successfully running the plant with charcoal as fuel, it was decided to make a test with Washington Coke. While the output was declared satisfactory on Charcoal, the product of the furnace was practically doubled with Coke, and at the conclusion of the test the furnace was producing nearly 60 tons of No. 1 Pig Iron daily. This satisfied the management that Coke was the most profitable fuel, and marked an epoch in the Iron industry on the Coast, as it demonstrated the high grade of Washington Coke for the manufacture of Iron. Tests made of the Coal show that good results are obtained in coking the output of the Fairfax, Wilkeson and Montezuma mines, which are located south of Tacoma on the Northern Pacific Railroad. The furnace closed down January 12, and will remain closed a few weeks while arrangements are being completed for a permanent supply of Coke.

The banquet of the California Metal Trades Association January 25 proved to be one of the most enjoyable affairs ever given by the association. During the evening the following subjects were discussed: "Metal Industries of the Pacific Coast," "The Coming of the Fleet," "Relation of the Metal Trades to the Rebuilding of San Francisco," "Oregon, Washington and the United Metal Trades Association" and "The Industrial Side of Metal Manufacturing in California." George W. Dickey, who was general manager of the Union Iron Works during the building of the battleship Oregon, resigning two years ago, delivered an address which, in the main, defended the designers of our new war vessels.

Cincinnati.

CINCINNATI, OHIO, February 5, 1908.—(*By Telegraph.*)

It has been a week in which anxious expectancy has had possession of all departments of the Iron and Steel trade, with but few actual transactions, although in a general way it can be said that inquiries are of a character suggesting business development. There is a better feeling among sellers of finished products, and a settled conviction that those who control prices are able to maintain the situation, while in the Pig Iron trade there is a growing demand for spot deliveries which tend to assist in keeping the price at a figure which has successfully combated some tempting offers of the past few days. Some delayed building operations are coming out which will interest sellers of Structural Material, and the contemplated starting of the new Steel mills in Newport about April 1 has developed some interest all along the line. There is plenty of inquiry in the machine tool manufacturing districts, but, as yet, little buying save for absolute requirements, inquirers showing a disposition to await possible reductions in prices, which manufacturers are firm in denying and refusing on the strength of maintained prices on most material and costly labor.

Pig Iron.—The principal topic of interest among sellers the first two days of the current week was the Detroit inquiry mentioned last week, in which stove manufacturers asked for a large tonnage extending over the last three quarters. This was to have been settled on Monday, but it is understood late to-day that the negotiation of about 7000 tons has only just been arranged, and with a local Michigan furnace interest and a price which will figure on a parity of $12.50, Birmingham. It is understood the purchase is on an analysis basis, and at a competitive price based on the existing agreement. The proper mixture is obtained by the combination of Northern Foundry with a Southern High Phosphorus Silvery. The Detroit concern was quoted a price of $13, Birmingham, on the first half, with $13.50 on the last half for this tonnage of Southern Iron exclusively, and there was a figure of $12.50, Birmingham, quoted covering the three quarters, it is understood, and refused. Delivery on this purchase is to commence April 1. Another Detroit inquiry for 1500 tons of Southern Iron for early delivery has been withdrawn. While the price of $13.50 for Southern No. 2 is freely quoted, and some furnace representatives are naming that as their rock bottom price, there is some Iron going at $13 and some spot shipments to choice consumers are talked of at $12.50, Birmingham. Two sales of 300 tons each to northern Ohio and southwestern Indiana stove makers, respectively, are reported at $13, Birmingham, for first half delivery. As nearly as one can approximate the price, the range for the first half therefore is $12.50 to $13.50 on Southern Iron and about $16.50 to $17 on Northern No. 2. Although the Pipe makers, who have taken about three-fourths of the Foundry Iron sold since the first of the year, are supposed to have filled their requirements, there are said to be some Eastern manufacturers negotiating for large tonnages. Local sales agents do not feel that the Detroit purchase will have any appreciable effect in fixing the market for the last half, nor do they feel that the furnaces will show any less reluctance to quote on the fag end of the year at this time. There is an inquiry from an Ohio melter for 500 tons of Southern No. 2 analysis Iron for second quarter delivery. It is understood that the Ohio melter whose requirements were for about 5000 tons of Basic has temporarily abandoned his quest, because of the great difference in price between the parties interested. Few furnaces are quoting on low grade Irons, each transaction being considered separately. The quotation of $21, at furnace, is made on 8 per cent. Silicon, but it is said to have been shaded 50c. on tonnages of any size. For immediate delivery and balance of first half we quote, f.o.b. Cincinnati, as follows, the freight rates being from Birmingham $3.25 and from the Hanging Rock District $1.20:

Southern Coke, No. 1	$16.25 to $16.75
Southern Coke, No. 2	15.75 to 16.25
Southern Coke, No. 3	15.25 to 15.75
Southern Coke, No. 4	14.75 to 15.25
Southern Coke, No. 1 Soft	16.25 to 16.75
Southern Coke, No. 2 Soft	15.75 to 16.25
Southern Coke, Gray Forge	14.25 to 14.75
Southern Coke, Mottled	13.75 to 14.25
Ohio Silvery, 8 per cent. Silicon	21.70 to 22.20
Lake Superior Coke, No. 1	17.70 to 18.20
Lake Superior Coke, No. 2	17.20 to 17.70
Lake Superior Coke, No. 3	16.70 to 17.20
Standard Southern Car Wheel	25.25 to 25.75
Lake Superior Car Wheel	23.50 to 24.00

(*By Wire.*)

Coke.—There is a little more interest in spot Foundry Coke. Consumers have allowed stocks to run so low that hurry shipments are frequently noted, and prices are being fairly well maintained. Connellsville Foundry is quotable at $2.35 to $2.75, at oven, although the bulk of the business is going at about $2.50, and where purchasers have not been exacting in their requirements this figure has been shaded to $2.25, it is claimed. For spot shipment Furnace Cokes of the various standard fields are quoted at about the same price, $1.75, at oven.

Finished Iron and Steel.—Jobbers find much satisfaction in the printed reports of the result of the meeting of the general committee and sub-committees in New York City last week. Store prices on both Iron and Steel remain unchanged, and the general opinion of dealers here is that little if anything was gained by the Bar Iron makers in reducing prices. Although buying from hand to mouth has been the practice for several months, and in most quarters is still of that character, an occasional stimulus is felt in the action of some optimistic consumer whose faith is backed up with orders. One dealer here to-day sold his first carload for four months (Iron Bars) to an old customer, whose orders were uniformly in carload lots, but who has been buying in the meantime as it was needed from day to day. Dealers quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.55c., with half extras; small lots from store, 1.90c., base, one-half extras; Steel Bars, carload lots, 1.75c., base, half extras; small lots from store, 1.90c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼ in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c. Blue Annealed Sheets (heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.25c. No. 12, carload lots, 2c.; small lots from store, 2.35c. Sheets (light), Black No. 28, carload lots, 2.65c.; Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. or heavier, carload lots, 1.95c., base. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Old Material.—Scrap dealers with undiminished faith in the future continue to buy and unload in their yards. There has been a little buying from rolling mills, and last week saw a very fair shipment of Relayers to Southwestern and Western points. One sale of 400 tons of Railroad Wrought, No. 1, for consumption in a mill in this district brought about $13 gross ton, delivered. There is some interest in Heavy Melting Steel at about $12 gross ton. One local dealer has an immense stock of Metal Scrap which he believes is a valuable asset at present prices. The following prices are given as about representative of this market to-day, and are f.o.b. Cincinnati:

[illegible]	[illegible]
Cast Borings, net ton	4.00 to 5.00
[illegible]	[illegible]
[illegible]	[illegible]
Burnt Cast and Wrought, net ton	7.00 to 8.00
[illegible]	[illegible]
[illegible]	[illegible]
Old Steel Rails, long, gross ton	11.50 to 12.50
Relaying Rails, 56 lb. and up, gross ton	22.00 to 23.00
Old Car Wheels, gross ton	16.00 to 17.00
Low Phosphorus Scrap, gross ton	13.50 to 14.50

Philadelphia.

PHILADELPHIA, PA., February 4, 1908.

Buying in almost every direction is still being confined to moderate tonnages for prompt shipment. Consumers show no disposition to purchase for forward delivery. The result of the New York meetings of the various Iron and Steel committees last week in determining to maintain prices has, it is believed, strengthened the position of producers considerably. The outside interests are hardly as strong as they were, and the feeling prevails that they will have no effect on the market, even by offerings under the established prices. In the foundry and machine tool trades new orders are scarce and plants are all being operated on a restricted basis. In the majority of cases 50 per cent. represents the average amount of business being done, but production in some instances is as low as 30 to 35 per cent. In some directions, however, slight improvements have been noted during the past week or two, and plants which have been operated at the lower rate were able to increase their output up to 50 per cent. of their capacity. Notwithstanding the inactive condition of immediate business, the trade feels hopeful regarding the future, and while no exceedingly large buying is anticipated, it is believed that a moderate amount of week to week buying will continue to be done.

Pig Iron.—Generally speaking, the market for Pig Iron is dull. Sales are almost entirely confined to small lots, which in the aggregate, however, amount to a pretty fair tonnage. Buying was held up to some extent pending the outcome of the meetings of the Iron and Steel committees. But now that prices of Ore and Pig Iron have been reaffirmed, the trade expects that a somewhat better buying movement will again set in. Consumers, however, are not likely to buy very extensively under the existing conditions of general business, and it is more than probable that the present method of buying small quantities from week to week will prevail, particularly inasmuch as orders for finished products come out rather irregularly. The position of the Pig Iron producers is, if anything, somewhat stronger. Production is being held down somewhere near the level of consumption. The leading interests are firmly maintaining established prices, although one or two outside interests are still offering Iron under the ruling quotations. Sales by such producers have usually not been very large, although in one case a sale of 1000 tons of No. 2 X Foundry, for delivery during the first half, was reported at from 50 to 75c. a ton under ruling prices. Buying is still largely confined to Foundry grades. The Pipe interests have bought further moderate tonnages, both of Northern and Southern Irons, and are still in the market for some fair sized lots. Outside of these interests the sales of Southern Iron have been comparatively small and have been held pretty close to $13.50, Birmingham, for No. 2. The buying of Virginia Irons has quieted down and few sales are reported. The greater proportion of sales of Pig Iron recently made has been in quantities ranging from carloads up to a few hundred tons, the delivery in nearly every instance being for the first quarter. Prices in practically all transactions have been on the basis of $18.25 to $18.50 for No. 2 X Foundry, delivered in this territory. Some little business has been done for the second quarter, but nothing to speak of has been sold for delivery beyond that period. Forge Iron has been in a little better demand. Sales, however, are mostly in 100-ton lots, for early delivery, at from $16.50 to $16.75, delivered. Practically nothing new has come out in the way of Steel making Irons. One melter in this territory, however, has ordered shipments of Basic Iron, bought last year, resumed, on which deliveries had been held up for several months. Some light sales of Low Phosphorus Iron have been made for prompt shipment at figures equal to about $25, delivered in this teritrory. A little more inquiry is also to be noted for misfit Low Phosphorus Iron, but no sales are reported. Quotations for early delivery in buyers' yards, eastern Pennsylvania and adjoining territory, range about as follows:

No. 2 X Foundry	$18.25 to $18.50
No. 2 Plain	17.75 to 18.00
No. 3 Foundry	17.25 to 17.50
Gray Forge	16.50 to 16.75
Basic	17.25
Low Phosphorus	24.00 to 25.00

Ferromanganese.—The volume of new business is small, users of large quantities having their needs pretty well covered. Offerings vary in tonnage and price, and quotations range from $47 to $49, Baltimore, for prompt shipment.

Steel.—There has been but little change in the demand. The Alan Wood Iron & Steel Company continues to operate its blooming mill, as reported last week, and has enough orders on hand to keep that department running the present week. New specifications are not coming out very satisfactorily, however, and the volume of strictly new business is extremely small. Prices continue unchanged. Ordinary Rolling Steel for delivery in this territory is quoted at $30.40, while Forging Steel ranges from $32.40 to $33.40, according to analysis.

Plates.—A little more uniform demand for Plates is reported, although the individual orders are mostly for moderate tonnages. Mills, however, report gains in their production for January over December, in some cases as much as 25 per cent. being noted. Business placed recently is largely for prompt delivery, buyers showing no disposition as yet to purchase for their future requirements. Prices are being firmly maintained and range as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼ in. and heavier. The following extras apply:

	The following Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—There has been a little more activity shown in the demand for Structural Material, and while the greater proportion of the business taken has been for small tonnages of a miscellaneous character, one sale of 2000 tons has been made for delivery during the second and third quarter. Mills continue fairly well occupied, but are not yet running to anything like their full capacity. Prices continue to be firmly maintained, 1.85c. to 2c. being quoted, according to specification.

Sheets.—Mills continue to get enough new specifications to enable them to run at about half capacity. The demand shows some improvement, although the business being placed is practically all for prompt shipment. Prices remain unchanged, mill shipments being quoted as follows, with a tenth extra added for small lots: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.70c.; Nos. 25 to 26, 2.80c.; No. 27, 2.90c.; No. 29, 3c.

Old Material.—There is a distinctly better feeling. Buying in some grades has improved, and while the individual sales have not been large as a rule, the aggregate tonnage amounts to considerable. Sales of Heavy Melting Steel have been made to several mills, the aggregate of which will equal nearly 10,000 tons, at prices ranging between $13 and $14, delivered. Rolling mills have bought moderate quantities of Railroad Wrought, Turnings and Borings, and prices on these grades show more firmness. We quote for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory, about as follows:

No. 1 Steel Scrap and Crops	$13.50 to $14.00
Low Phosphorus	18.00 to 18.50
Old Steel Axles	18.00 to 18.50
Old Iron Axles	23.00 to 24.00
Old Iron Rails	17.50 to 18.00
Old Car Wheels	17.00 to 17.50
Choice No. 1 R. R. Wrought	15.00 to 15.50
Machinery Cast	15.00 to 15.50
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	11.00 to 11.50
No. 2 Light Iron	8.00 to 8.50
Wrought Turnings	9.00 to 9.50
Stove Plate	12.50 to 13.00
Cast Borings	8.00 to 8.50
Grate Bars	12.00 to 12.50

Coke.—No particular improvement is to be noted in the demand. Sales of both Foundry and Furnace grades have been light and prices show practically no change. Foundry Coke is quoted at from $2.50 to $2.75, at oven, while Furnace Coke ranges from $1.90 to $2.25. We quote for delivery in Philadelphia territory the following range of prices:

Connellsville Furnace Coke	$4.05 to $4.40
Foundry Coke	4.65 to 4.90
Mountain Furnace Coke	3.75 to 4.10
Foundry Coke	4.35 to 4.60

At the annual meeting of the Portsmouth Forge, Portsmouth, N. H., January 15, the company was reorganized with the election of J. W. Sederquist, Boston, as president; Wallace Hackett, Portsmouth, vice-president; C. Herbert Morton, Boston, treasurer and manager, and J. R. Prescott, clerk, these officers and William F. McCarthy, Boston, constituting the Board of Directors. Mr. Sederquist is a Boston steel merchant; Mr. Hackett is Mayor of Portsmouth; Mr. Morton was formerly with the steel and iron house of William H. Perry Company, Boston; Mr. Prescott is with the Smith & Anthony Company, Boston, and Mr. McCarthy is manager of the Boston office of the Prentiss Tool & Supply Company. The company is putting in new machinery and its working capital is being increased. The products are engine, marine, crusher and armature shafts, piston rods, connecting rods, bending rolls, locomotive forgings, axles and miscellaneous forgings of wrought iron and steel. The business was formerly located at Nashua, N. H.

New York.

NEW YORK, February 5, 1908.

Pig Iron.—The market has been quiet and steady, the majority of sellers in this district holding quite steadily to established prices. Production is declining, there being no inducement to take the risk of stocking much Iron with receding costs and a moderately high level of values. One of the leading Cast Iron Pipe interests is testing the market for a good tonnage. We quote, at tidewater, $18.75 to $19 for No. 1 Northern Foundry; $17.75 to $18.25 for No. 2 Foundry, $17.25 to $17.50 for No. 2 Plain, and $16.75 to $17 for Gray Forge. Alabama Iron is quoted $17.50 to $18 for No. 1 Foundry and $17 to $17.50 for No. 2 Foundry.

Steel Rails.—An order for 1000 tons has been taken by Pittsburgh for an extension to a coal company's trackage. For the Panama Railroad a 750-ton contract has been booked by an Eastern mill. Business in Angle Bars has been good. So far as the larger requirements of the railroads for 1908 are concerned, the situation is devoid of any tangible development.

Structural Material.—Rather more local business has been figured on in the past week than in the latter part of January, but estimates sent in seem to do little more than swell the volume of projects hung up, and about which nothing definite can be learned. On about 8000 tons of pier shed construction awarded by the City of New York some months ago specifications are at last coming to the mill. The bids recently called for by the New York Central for the Grand Central terminal do not represent any new tonnage, but mean a revision of bids on the first section of the work, the present expectation being to buy less than the 4000 tons at first figured on, and at the same time to secure lower prices in view of the sharper competition now in evidence. Bridge work is a small factor in current estimates. In the past week the American Bridge Company was awarded a small bridge for the Great Northern, and there is yet some small tonnage to be awarded by the New Haven and the Erie. On the Pacific Coast a number of buildings are pending, including particularly that of the Royal Insurance Company at San Francisco, and some work at Seattle. The Steel for the Pacific Mutual Life Insurance Company, at Los Angeles, goes to a firm in that city, and the fabrication of 400 tons of steel for the Home Telephone Company Building, San Francisco, goes to a contracting firm there. It remains to be seen what effect the decision of the Steel interests to maintain prices will have upon the prices named in the bids of fabricating companies, which in a good many instances lately have been construed as signifying an expectation of a lower basis for Steel. We continue to quote as follows for tidewater deliveries on shipments from mills: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—Business in both Iron and Steel Bars has been light. The low prices quoted on Iron Bars not having brought out the business which had been expected, a special meeting of the Eastern Bar Iron Association was held in this city to-day for the purpose of considering trade conditions, and the price was advanced to 1.50c., Pittsburgh, or 1.66c., tidewater. Steel Bars are held at 1.60c., Pittsburgh, or 1.76c., tidewater.

Plates.—The local demand is still confined to small lots, but these have been a little more numerous of late. Prices are unchanged, as follows, at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—Conditions look much better than two or three weeks ago. More orders are being placed, and in a few instances have called for quite a fair tonnage, so that the buying is gradually coming up to expectations for this season. It is observed that some of the shrewdest buyers are now coming in the market. The local gas company is about to purchase 4000 tons. Competition is exceedingly sharp, and quite low prices are made on orders of sufficient size to be attractive. The feeling obtains that those who are taking advantage of present conditions may probably do better than by waiting until later in the season. Carload lots of 6-in. are to be had at $25 to $25.50 per net ton at tidewater, although some makers ask $2 per ton more.

Old Material.—More business is being done, but orders are not calling for any large quantity. The foundries are buying a little more freely, but efforts are naturally being made to force prices still lower. Those in need of foundry stock are not quick to close negotiations, but shop around considerably. Stove Plate seems completely neglected, the demand running to Heavy Cast and Old Car Wheels. Some of the Steel works are beginning to take in shipments on contracts which had been held up for some time, and this causes dealers to make purchases of Heavy Melting Steel Scrap in considerable quantities to cover the requirements thus called for by their contracts. Rolling mills are buying very little in this market, but the hope is entertained that after the meeting of the Eastern Bar Iron manufacturers in this city to-day more activity may result as a consequence of whatever action is taken. Quotations per gross ton, New York City, are as follows:

[illegible]	[illegible]
Heavy Melting Steel Scrap	[illegible]
Old Steel Rails, rerolling lengths	10.00 to 11.00
Relaying Rails	15.00 to 16.00
Old Iron Rails	13.00 to 14.00
Standard Iron Car Axles	15.50 to 16.50
Old Steel Car Axles	13.00 to 14.00
No. 1 Railroad Wrought	10.50 to 11.50
Iron Track Scrap	9.00 to 10.00
No. 1 Yard Wrought, long	10.00 to 10.50
No. 1 Yard Wrought, short	9.50 to 10.00
Light Iron	4.50 to 5.50
Cast Borings	4.00 to 5.00
Wrought Turnings	5.50 to 6.50
Wrought Pipe	8.00 to 8.50
Old Car Wheels	16.00 to 16.50
No. 1 Heavy Cast, broken up	12.50 to 13.00
Stove Plate	11.00 to 11.50
Grate Bars	8.50 to 9.00
Malleable Cast	12.00 to 12.50

Metal Market.

NEW YORK, February 5, 1908.

Pig Tin.—Business dwindled this week to almost insignificant proportions. The effect of the Banca sale was to put the market on a slightly higher level, but otherwise the interest of the week converged in the wide advance in London February 4. That market went up £4 10s. Three different explanations are given for this advance, one being that the bears were running to cover and so advanced the market. Another was that there was a good legitimate demand in Europe, and the market advanced on its own merits. The third explanation was that a leading London operator, who had purchased largely at the Banca sale, was advancing the market to unload. This last rumor seems to be more generally accepted than any other, and there is a remarkable lack of confidence in the present level of prices. The price changes during the week have been as follows:

	Cents.
January 29	27.80 to 27.90
January 30	27.75 to 27.85
January 31	27.85 to 28.00
February 3	28.05 to 28.20
February 4	28.90 to 29.00
February 5	28.60

The January 31 statistics as compiled by C. Mayer of the New York Metal Exchange were more favorable to holders of metal than had been anticipated, but nevertheless there was so little life in the market that they had little or no effect. Deliveries into consumption were figured as 1500 tons, which was less than the preliminary estimates, and as the arrivals at Atlantic ports were only 1232 tons stocks were drawn upon to the extent of 268 tons, making the stock in the United States just that much smaller than at the end of December, or 826 tons on January 31. The total shipments from the Straits were large, amounting to 5218 tons; the visible supply throughout the world, therefore, increased to 14,986 tons, nearly 3000 tons larger than the end of December and 1500 tons larger than a year ago. Of course, the large Banca sale had considerable effect on these statistics. The London market to-day is irregular, and closes lower at £128 15s. for spot and £129 for futures. Sales in London were unusually large, amounting to 1100 tons. The arrivals so far this month amounted to 360 tons, and there are afloat for American ports 2025 tons.

Copper.—The gradual easing in price which has been noted the last two weeks is more manifest. Resale lots of Lake, which were offered a week ago at 13.75c., have not been purchased and are still hanging over the market. Quotations for Lake must therefore be revised to 13.75c. to 14c. It is probable that concessions under this price could be effected on a firm offer. Outside lots of Electrolytic can be done as low as 13.62½c., and it is probable that this price would be shaded to foreign consumers and possibly domestic. Casting Copper is nominal at 13.37½c. In fact, the entire Copper market is so nearly nominal that it is impossible to make quotations with any degree of accuracy. Foreign buying has not been in evidence for 10 days and domestic business is at a standstill. Producers are adhering to their own quotations, some of them asking as high as 14.25c. for Electrolytic, but of course no business has been effected at that level. Conflicting reports regarding the amount of business and stock of Copper in the Naugatuck Valley only tend to confuse purchasers. The total shipment of Copper from Atlantic ports during January was 33,000 tons. Exports since February 1 have been 1068 tons. Prices in London are practically unchanged from a week ago at £62 for spot and £62 10s. for futures.

Waterbury Average.—The Waterbury average for January was 14c.

Pig Lead.—While it is believed that a good consuming demand will be in evidence with the opening of spring, the market now is very dull but steady. Lead can be had in New York at 3.75c. to 3.80c. The price in St. Louis is un-

changed at 3.65c. There seems to be no demand and no business, but it is impossible to obtain quotations for future delivery.

Spelter.—Resale lots purchased at lower figures are coming on the market, and tend to make conditions irregular. Spelter can be had in New York at 4.70c. to 4.75c., and in St. Louis at 4.55c. to 4.60c. It is believed, however, that stray lots in New York could be had at slight concessions, probably about the same as at Western points.

Antimony.—The market is dull and unchanged. Cookson's is held at 9.50c., Hallett's at 9c. and Hungarian brands 8.50c.

Nickel.—Large lots continue to be held at 45c., and smaller quantities at 55c. to 60c.

Tin Plate.—There appears to be a steady demand for Tin Plate, amounting to more than half the capacity of the mills. Another encouraging feature is the advance this week in Swansea of 1½d. on Welsh Tin Plate, which is now held at 11s. 9d. Domestic prices are unchanged, and for 100-lb. IC. Coke Plates $3.89 is asked, f.o.b. New York, and $3.70, f.o.b. Pittsburgh.

Ferroalloys.—A slightly better inquiry has developed for 50 per cent. Ferrosilicon, although the price is unchanged at $85 at seaboard for imported, and the same at manufacturers' works for domestic. Unchanged prices continue to be quoted of Ferromanganese at $47.50 to $48.50, seaboard, but it is rumored that slightly lower figures have been accepted. This, however, lacks confirmation. The question of higher duties for some of the special and high priced Ferroalloys is again coming to the front.

Old Metals.—Despite lower prices for Ingot Copper there has been no change in the price of Old Metals. There is a fair foreign demand, and this is bolstering up the market to a considerable extent. Stocks in dealers' hands are low. Dealers' selling prices are unchanged from last week as follows:

	Cents
Copper, Heavy Cut and Crucible	13.00 to 13.25
Copper, Heavy and Wire	12.50 to 13.00
Copper, Heavy and Bottoms	11.50 to 11.75
Brass, Heavy	10.00 to 10.25
Brass, Light	7.75 to 8.00
Heavy Machine Composition	12.00 to 12.50
Clean Brass Turnings	8.25 to 8.75
Composition Turnings	10.00 to 11.00
Lead, Heavy	3.50
Lead, Tea	3.25
Zinc Scrap	3.25

Iron and Industrial Stocks.

NEW YORK, February 5, 1908.

The stock market was quite severely depressed on Saturday and Monday, as a result of the pessimism caused by the special message of the President of the United States. Some recovery took place on Tuesday. The range of prices on active stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 27⅝ to 28¾, preferred 91⅝ to 93¾; Car & Foundry common 29½ to 30¼, preferred 88¾ to 89; Locomotive common 36½ to 38, preferred 90½ to 91; Cambria Steel 27 to 28¼, ex-dividend; Colorado Fuel 18½ to 20; Crucible Steel common 5¼ to 5⅜, preferred 36¾ to 37¾; Pressed Steel common 20 to 21, preferred 75¾ to 78; Railway Spring common 25 to 25½; Republic common 16½ to 17, preferred 68 to 68½; Sloss-Sheffield common 39½ to 40; Cast Iron Pipe common 19¼ to 19½, preferred 66 to 68; Can common 4¾, preferred 49½ to 49¾. It will be observed that the foregoing figures include quotations on Crucible Steel. These had not been available for some time, owing to the closing of the Pittsburgh Stock Exchange, which resumed operations in the past week. Last transactions up to 1.30 p.m. to-day were made at the following prices: United States Steel common 28⅛, preferred 91⅜, bonds 88¼; Car and Foundry common 28¾, preferred 89; Locomotive common 36½, preferred 88½; Colorado Fuel 18½; Pressed Steel common 20¼, preferred 75¾; Railway Spring common 25; Republic common 16½, preferred 68; Sloss-Sheffield common 39½; Cast Iron Pipe common 19½, preferred 66; Can common 5; preferred 49⅞.

The American Can Company reports the following record breaking earnings for the year ended December 31:

		Changes.
Net earnings	$3,246,827	Inc. $712,460
Total deductions	594,435	Inc. 173,489
Net profits	$2,652,392	Inc. $538,971
Dividend	515,416	—
Surplus	$2,136,976	Inc. $538,971

It is stated that the Nernst Lamp Company, one of the subsidiary interests of the Westinghouse Electric & Mfg. Company, has obtained the signatures of 99 per cent. of the creditors to the readjustment plan permitting the discharge of the receivers. The assets of the company, it is stated, are five times the liabilities.

The Pressed Steel Car Company, Pittsburgh, last week paid out of earnings the seventh annual installment, amounting to $500,000, on its original note issue of $5,000,000. This leaves $1,500,000 to be paid during the next three years.

Dividends.—The American Radiator Company, Chicago, Ill., has declared the regular quarterly dividend of 1 per cent. and an extra dividend of 2 per cent. on the common stock, payable March 31; also the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable February 15.

The Standard Sanitary Mfg. Company, Pittsburgh, has declared and paid quarterly dividends of 1¾ per cent. on the preferred and 1 per cent. on the common stock.

Tests of Full Size Columns of Carbon Stee and Nickel Steel.

Some tests of full size compression members have been recently carried out by J. A. L. Waddell, consulting engineer, Kansas City, Mo., The object of the investigation was to ascertain the value of nickel steel for bridges. The carbon steel columns were built of railroad bridge steel, which complied substantially with the specification, "steel having an ultimate strength between 60,000 and 70,000 per square inch, and an elastic limit of not less than 35,000 lb." The nickel steel was of approximately the following composition:

	Per cent.		Per cent.
Nickel	3.5	Sulphur	0.03
Carbon	0.38	Phosphorus	0.015
Manganese	0.75	Silicon	0.05

It had an ultimate strength between 100.000 and 115,000 lb. per square inch, and an elastic limit of not less than 60,000 lb. The material was rolled by the Carnegie Steel Company, and was made up in the American Bridge Company's shops at Ambridge. The testing work was carried out by G. C. Saunders, under Mr. Waddell's immediate direction, on the 2,160.000-lb. hydraulic testing machine of the Phœnix Iron Company, at Phœnixville, Pa.

All the columns were of the pin ended type. They were composed of two built channels, each consisting of two 3 x 3 x ⅜ in. angles and one 12 x ⅜ in. plate, connected at the ends by batten plates, and laced with 2½ x ⅜ in bars. The lengths between centers of the pins were 10 ft. for the short struts and 30 ft. for the long ones. The results are given in the following tables:

Short Nickel Steel Columns.

Strut No.	Elastic limit. Pounds.	Ultimate stress. Pounds.
1	53,700	68,500
2	[illegible]	68,500
3	51,800	69,200
Average	52,800	68,700

Short Carbon Steel Columns.

Strut No.	Elastic limit. Pounds.	Ultimate stress. Pounds.
1	29,600	38,900
2	29,600	39,800
3	27,200	38,900
Average	28,800	39,200

Long Nickel Steel Columns.

Strut No.	Elastic limit. Pounds.	Ultimate stress. Pounds.
1	39,800	44,400
2	32,500	47,200
3	[illegible]	42,500
Average	41,200	44,700

Long Carbon Steel Columns.

Strut No.	Elastic limit. Pounds.	Ultimate stress. Pounds.
1	[illegible]	29,600
2	22,200	32,400
3	20,400	29,600
Average	21,300	30,500

The tests are a contribution to the need felt by the engineering profession for a thorough set of experiments on full size columns. From a metallurgical standpoint, they admirably illustrate the superiority of nickel steel for structural purposes. G. B. W.

The John A. Roebling's Sons Company, Trenton, N. J., suffered a severe loss by fire on Wednesday. Two large buildings of the Trenton plant were destroyed. One was the wire rope shop and the other the woodworking shop. The company has an entirely new plant, recently completed, which is located a short distance from Trenton.

The Machinery Trade.

NEW YORK, February 5, 1908.

With few exceptions machinery houses in this district report an increased number of inquiries the past week, and as a consequence they feel considerably encouraged over the outlook for the immediate future, believing, as many do, that these inquiries mark the beginning of an improvement in the demand for machinery that will gradually increase. Practically all the inquiries are for small lots, and while they are slow in closing they come from so many sources as to indicate a gradual restoration of confidence, which, it is hoped, will lead to a buying movement on the part of the larger interests. Aside from the increase in inquiries there was no material improvement in business, which was rather light. It is believed that the strict adherance to the retrenchment policy by the railroads and larger corporations and the hesitancy of others to go ahead with construction work already planned are obstacles which will have to be removed before trade shall become normal.

Inquiries in the power equipment line now in the market are larger than they have been in some months, and people in that branch of the trade are considerably encouraged over the outlook. There are some big propositions now before the heavy engine builders, some of which are from Mexico and Canada. The inquiries from this country cover a general line of power equipment for plants of various sizes and for a varied line of industries. Some of them are propositions which have come up before and which have been put off from time to time, but the majority are new inquiries which it is hoped will result in business.

At a meeting of the Textile Supply Dealers' Association held in Washington, D. C., January 29, it was unanimously decided to hold the next meeting May 13, 14 and 15, at the time of the joint meeting of the Southern Supply and Machinery Dealers' Association, the National Supply and Machinery Dealers' Association and the American Supply and Machinery Manufacturers' Association, to be held at Richmond, Va.

Important Sugar Mill Equipment Order.

One of the largest contracts for sugar mill equipment let in this country for a long time has been awarded to the Fulton Foundry & Machine Company, Atlanta, Ga., by Leon G. Leroy, Havana, for the Jucarao & Moron Sugar & Land Company of Cuba. The Fulton Foundry & Machine Company has been given the order for two large sugar refining plants to be located on the company's property in Cuba, and the entire contract, it is understood, will amount to about $1,000,000. Although the Fulton Foundry & Machine Company will build a large part of the equipment, including a 6-ft. Pratt crusher and a 34-in. Pratt mill, 6 ft. long, as well as three large Corliss engines to operate the first of the two sugar stations, it is understood that the completion of the contract will necessitate considerable machinery purchases, which will probably include boilers, conveying machinery, power plant accessories and the like. Work on the proposed plants, it is understood, will be begun shortly. The placing of this contract at this time is something of a surprise to many who are familiar with the sugar machinery business, as the usual time for purchasing equipment in this line is during March and April. The crop in Cuba this year it not all that might be expected, sugar men say, and consequently the trade in general did not look for any great amount of purchasing. This buying movement, it is thought, will give confidence to other plantation owners and may result in some additional business.

Contracts will be let on or about February 12 by the Curtin-Ruggles Company, 39 Cortlandt street, New York, for the building and equipment for a large cement plant to be built at Wampum, Pa., for the Crescent Portland Cement Company. The plant, which has been designed by the Curtin-Ruggles Company, will be modern in every respect, and the engineers have designed and specified the best in the way of up to date cement making equipment. The power plant inquiries, which are now in the market, will be about 3000 hp., and electrical power will be developed. The Curtin-Ruggles Company will install some of its own special cement machinery, but there is much to be bought in addition to that. The requirements will include three 750-kw. units, boilers to match, conveying machinery, grinders and a general line of all that goes to make a first-class cement making plant. It is stated that work on the construction of the buildings will be begun as soon as the contracts are let.

The Mexican Central Railroad, which maintains an office at 25 Broad street, New York, has been purchasing considerable machinery of late for shop changes and additions being made in the company's system. The company is enlarging its machine shops at Aguascalientes. It is expected that these shops are to be used for most of the repair and construction work of the company's system, and the work of converting a number of the company's engines from coal burners to oil burners is being done there. The company intends to convert nearly all of its engines into the oil burning type, it is understood.

The new erecting shop which the New York Central Railroad is to build at West Albany, N. Y., will be about 70 x 420 ft. and about 60 ft. in hight. The company also plans to erect a large machine shop at that place. It is reported that the railroad has recently secured additional property at Lyons, N. Y., as a site for a new repair shop.

Felix F. Wiener of the International Electric & Engineering Company, New York, has gone to Europe to acquaint himself with the new type of beam shears, unbreakable punches and other specialties which the company intends to introduce in this country this spring.

Considerable business has been placed in this territory of late from the South, a large part of the buying being done by Texan oil interests. Some important inquiries for pumping material have come from that territory, among them being requests for bids on equipment for the Enterprise & Texas Company, Beaumont, Texas, which recently let a contract to L. R. Davis, Houston, Texas, for laying 22 miles of pipe. The company will supervise the installation of its pumping plant, and the inquiries, it is understood, cover that material.

O. R. Whitney, 39-41 Cortlandt street, New York, has inquiries in the trade for a large second-hand outside packed plunger steam pump, 20 to 24 in. cylinder, 9 or 10 in. plunger; a standard gauge steam shovel, ¾ to 1 yard, and a steam driven air compressor capable of delivering 400 ft. of air per minute against a 100-lb. pressure.

The city secretary of Dallas, Texas, will receive bids until Mach 3 for a 10,000,000-gal. high service vertical triple expansion condensing crank and flywheel pump. Specifications are on file in the office of the city secretary, copies of which will be furnished upon application.

But one bid was received January 21 at the State Department of Public Works, Albany, N. Y., for contract No. 9 for barge canal work, which covers that portion of the Erie Canal east of Eagle Harbor. The bid was submitted by the Lake Erie Dredging Company, Buffalo, N. Y., and amounted to $796,269, as against the State Engineer's estimate of $724,014.

The annual report of the State Water Supply Commission submitted to the Legislature is interesting in view of the large horsepower available in New York State, excluding that of the Niagara and St. Lawrence rivers. It is stated that with the proper storage of their flood waters the rivers of New York are capable of furnishing about 1,000,000 hp. for industrial purposes. Particular attention is given to the Sancandaga River as a source of power, and it states that with a dam at Conklinville 50,000 hp. can be produced. It also states that the construction of a storage dam at Portageville, on the Genesee River, would produce 32,000 hp., increasing by 14,000 hp. that now developed at Rochester. Reference is also made to the possibilities of the Racquette River as a source of power.

Contracts will be let on February 19, at the office of the President of the Borough of Brooklyn, Borough Hall, Brooklyn, for considerable road machinery and road making material to be used in that borough. The requirements include one oil sprinkler, three tar melting and gravel heating trucks, three road machines with extra sets of blades, one wheel scraper and two drag scrapers, two steam rollers and six asphalt trucks.

The Salisbury & Spencer Railroad, Salisbury, N. C., is planning to construct a substation for which contracts will be placed within the next two months. Three 1000-kw. transformers have been purchased from the Westinghouse Electric & Mfg. Company, Pittsburgh, and are now being tested. Additional purchases will include pumps, an overhead traveling crane, chain hoist, &c. Communications should be addressed to J. W. Fraser, Southern Power Company, Charlotte, N. C.

Chicago Machinery Market.

CHICAGO, February 5, 1908.

The encouragement afforded by an appreciable gain in the volume of machinery trade that developed about the middle of the month has hardly been sustained by continued progress in this direction. While no ground has, perhaps, been lost, orders for the past week have certainly not grown more plentiful, nor has there been any general increase in the aggregate of sales. In practically all machinery lines the experience is the same, no one being favored in a marked degree above another. That there are wants to be supplied no one doubts, and the withholding of orders can no longer be charged exclusively to the tightness of money. As a restrictive influence, this feature of the situation has, to a large extent, been eliminated in the West, except perhaps with respect to the financing of large enterprises requiring the sale of securities. It is pretty clear that not a few

buyers are hesitating to come into the market because of a belief that lower prices will prevail in the near future. They are doubtless confirmed in this belief by observing the downward trend of raw material prices. In reply to a customer who, on this account, decided to defer purchase of tools for which he was negotiating, a machine tool dealer pointed out the fact, allowing for the maximum decline of metal in the machines involved, the difference in price would not amount to more than four per cent. of the cost of the machine. In all forms of machinery, therefore, in which labor is the predominating cost factor, it seems unlikely that there will be any considerable reduction of prices as long as the present wage schedules are maintained. This, however, does not alter the fact that there exists a widespread conviction among buyers that there will sooner or later be a marked reduction in values, and in accordance with this belief they are confining their purchases to imperative needs.

Very little new work is being taken by the boiler shops, and what activity there is in this line concerns chiefly the finishing up of existing contracts. Engine builders are finding a moderate demand for small units, but contracts involving engines of large horsepower are by no means plentiful. Rumors are heard of renewed activity in some projects for which considerable machinery in motive power and machine tools will be needed, but there is no authentic evidence of any of the deferred tool lists, heretofore on the market, re-appearing at an early date.

The South Halsted Street Iron Works, 2607-2627 South Halsted street, Chicago, manufacturer of architectural iron work, is preparing plans for the construction of a new steel erecting shop, 125 x 398 ft., the total cost of which will be approximately $65,000. The equipment yet to be purchased for this addition to the plant will include punches, shears and riveting machines. Orders have already been placed for two 15-ton Pawling & Harnischfeger electric traveling cranes.

For the purpose of increasing its shop equipment the Southwestern Iron Company, Guthrie, Okla., has increased its capital stock from $50,000 to $100,000.

The Northwestern Machinery Company, Minot, No. Dak., of which John Elliott, J. E. Murphy and L. Lee are proprietors, is preparing to establish a machine and boiler shop with an automobile garage at that place. A site with suitable trackage facilities has been secured, upon which a shop building, 40 x 80 ft., will be erected. A part of the equipment has already been secured, but the company is now in the market for a few second-hand tools, including one 36-in. radial drill; one 30 x 30 in. by 12-ft. planer, and one lathe 32 in. by 16 ft.

The Washington Iron Works Company, Seattle, Wash., founder, machinist and boiler maker, has been reincorporated under the title of the Washington Iron Works, and its capital stock increased from $100,000 to $500,000. The reorganization, however, involves no change of ownership or management. In order to take care of its increasing business, the company has planned the construction of a boiler shop, 80 x 200 ft., work upon which has already been begun. There will, however, be no additions made to the equipment of the shop until the latter part of the present year.

The City of Ortonville, Minn., is considering the purchase of new equipment for its electric light plant, which would include a 30-kw. alternating generator and engine, and possibly a tubular boiler. No definite decision, however, has yet been reached regarding the purchase of this machinery. The superintendent is J. F. Zwiener.

Extensive changes in the plant of the Citizens' Light & Ice Company, Crochett, Texas, are in contemplation, which include the possible adoption of a three or five wire direct current system. If it is decided to use a five wire system the company will install steam turbines; if the three wire system is chosen the installation of a gas producer plant will be considered. The company is also taking prices on a 25-hp. Corliss engine for direct connection to a No. 10 Wolfe Linde ice compressor. W. H. Brown is manager of the plant.

The water department of Elgin, Ill., has asked for an appropriation to purchase a boiler or boilers of 200 to 250 hp. capacity, also $7000 for pipe extension. Final action upon this request will not be had until March 1. R. R. Parkin is superintendent in charge of this department.

J. A. Pilling, formerly of the Pilling Air Engine Company, Detroit, Mich., has incorporated his business under the name of the J. L. Pilling Company, 319 West Sixty-third street, Chicago, Ill. The company manufactures compressed air and electric appliances. J. L. Pilling is president; David White, vice-president, and M. M. Pilling, secretary and treasurer.

The United Steel Company, Canton, Ohio, has just secured a contract from a Detroit automobile manufacturer for 2000 tons of vanadium steel. It is said to be the largest order for vanadium steel ever placed in the United States.

Cleveland Machinery Market.

CLEVELAND, OHIO, February 4, 1908.

Business with the local machine tool dealers during the past week has shown a little improvement over the previous week. The aggregate sales were slightly larger and inquiries were better. The buying, however, was in small lots, the largest order being for four or five small tools, and most of the sales being of second-hand tools. The orders are all coming from small concerns, mostly machine and repair shops, and are all for small tools, the demand being mostly for drills, lathes, shapers and planers in small sizes. Scarcely an inquiry is coming from large plants engaged in the metal industry. Taking the month as a whole, dealers report that their aggregate sales of machine tools during January were slightly better than those of December.

There is lively competition among dealers to secure what business appears, and some dealers are cutting prices to get the orders when there are inquiries for tools of which they have a good sized stock. This price cutting, however, seems to be only on tools in which dealers are slightly overstocked as the result of cancellations of orders several weeks ago, after the tools were shipped by the builders. Most dealers have succeeded in reducing their stocks during the past month, so that they are not carrying more than a fair stock at the present time.

The supply of second-hand tools in this territory is either rather limited at present or the owners are not making efforts to place them on the market. Owing to the good demand for used tools dealers are quickly picking up those that are offered at good prices, but do not have to keep them in stock many days before finding purchasers.

Machine tool dealers are not of the same mind regarding the outlook for the next few weeks. While some think that there will be a steady but slow improvement, others are of the opinion that when the requirements of the small shops are supplied there will be a dull period for a few weeks, until general conditions improve sufficient to cause large industrial plants to come into the market for new equipment. There were some good inquiries out for machinery and tools for new plants and enlargements before the recent period of depression, but, as yet, nothing further has been heard from the prospective purchasers.

General conditions continue to grow better, and there is more confidence regarding the future. Builders of machinery and manufacturers in various lines report some improvement in both orders and inquiries, and the majority of local industrial plants are gradually increasing their working forces. Builders of motors and other small electrical apparatus report considerable improvement in their orders during the past two or three weeks.

The Burke Machinery Company, Cleveland, Ohio, announces an advance in price of $10 on its Nos. 1 and 2 millers. When the company placed its Nos. 3 and 4 milling machines on the market it charged $20 per machine for the overhanging arm over and above the price of the Nos. 1 and 2 millers, with the intention of ultimately raising the price of the latter machines, which it has now done, the new price going into effect February 1. On the Nos. 2 and 4 millers the prices have been raised $5, as knockouts are now included in the regular equipment of the machines. They will be manufactured, however, without knockouts if desired, and in this case an allowance of $5 will be made for each machine. A reduction in the list price of drill presses has been made, and they will be subject to the regular discount instead of carrying a regular net price. An additional discount of 10 per cent. will be made on these machines when they are taken in dozen lots, either of one kind or assorted. The price of the vertical milling attachment has been raised to $40, and the countershaft for the company's D tapping machine has been raised to $12. The company has just completed a new two-spindle automatic milling machine, similar to its regular two-spindle miller, with the exception that the knee raises, reverses and lowers automatically. It is especially adapted for typewriter factories and similar work. The rotary cutting off saw on which the company has been working for some time is about ready for the market, and it expects to be able to make delivery of this tool about February 15. This saw has a capacity of 3-in. round or 5-in. I-beams or 9-in. flat stock, is equipped with power friction feed, automatic knockouts and has a large clamping table. The company will follow this machine with a larger size, which will cut 5½-in. round x 12-in. long or a 12-in. I-beam.

The Ferro Machine & Foundry Company, Cleveland, has added $150,000 to its capital stock. The increase is to provide more working capital, no additions to the plant being contemplated. The company reports an increase in orders for two-cycle marine engines, and its machine shop is running at full capacity. The foundry end of the plant, from which the greater part of the product goes to automobile builders, is now running at one-half capacity, but much improvement is reported in orders and inquiries to this department.

The Cleveland Die & Mfg. Company has been incorpo-

rated with a capital stock of $10,000 to take over and enlarge the business of the Academy Mfg. Company, a partnership manufacturing specialties at 1276 West Fourth street. The company has effected its organization by the election of the following officers: President, J. C. Theberath; vice-president, E. E. Merkel; secretary, William F. Kees; treasurer, G. J. Brown. The company will make a specialty of screw thread rolling dies. Some new machinery may be added to the plant in a short time.

The Kelley Island Lime & Transportation Company has placed a contract with the Allis-Chalmers Company for the installation of a large rock crushing plant at Clarence, N. Y. The installation will include rock crushing apparatus, motors, transmission machinery, &c. Work on the new plant will be started at once, and it is expected to have the plant in operation early in the spring.

It is expected that the Youngstown Sheet & Tube Company, which has decided to go ahead with its construction work at Youngstown, Ohio, will award the contract early this week for 19 cranes, for which proposals were received some time ago, and probably for considerable other machinery equipment.

During the recent period of depression the plant of the Alliance Machine Company, Alliance, Ohio, has continued to run night and day without a single man being laid off. Although new orders have been scarce during the past three months the company still has enough work on hand to keep its plant in full operation for the next six months.

At the request of President W. A. Clapp of the Board of Public Affairs, Cuyahoga Falls, Ohio, the Council of that village has taken up the question of providing an entire new equipment for its electric light plant to cost about $15,000. It is proposed to install a series of alternating current regulators and transformers, a 300-hp. engine, two 60-cycle, 2200-volt generators, new service transformers, &c.

The Ohio Blower Company, Cleveland, manufacturer of exhaust heads, ventilators, blowers, &c., has increased its capital stock from $25,000 to $50,000, to provide more working capital and as a preliminary to the erection of a new plant. The company has as yet, however, made no definite plans regarding the erection of a plant.

The Imperial Electric Company, Akron, Ohio, has been incorporated with a capital stock of $180,000, to take over the property of the Akron Electrical Company. No additions to the plant are planned. The incorporators are E. E. Andrews, R. E. Inskeep, William Weaver, W. C. Hall and A. C. Linzee.

The Canton Mfg. Company, Canton, Ohio, has elected the old directors and officers for the ensuing year. The officers are: President and treasurer, A. T. Stone; vice-president, C. L. Hunter; secretary, M. F. Taylor; superintendent, L. B. Sharpnack. A dividend of 7 per cent. was declared on the preferred stock. The company has enough orders on hand to keep it busy until early spring.

With an authorized capital stock of $25,000 the Marion Tool & Specialty Company, Marion, Ohio, has been incorporated by E. L. Coddington, F. E. Disbennett, A. M. Peoples, R. S. Atkinson and Walter Bolander.

The Williams Test Clamp Company, Cleveland, has been incorporated with a capital stock of $10,000 by J. H. Williams, F. P. Thomas, E. P. Salberg, F. P. Ayer and W. L. Cary, Jr. The company intends to place on the market a tool for telephone repairs.

Philadelphia Machinery Market.

PHILADELPHIA, PA., February 4, 1908.

The past week has brought out a greater variety of inquiries for machinery and tools than has been experienced for some little time. Prospective buyers appear, to some extent, to be at least willing to consider the question of making purchases, which in itself is considered an encouraging feature, even if purchases are not promptly made. For the last month or so their disposition has been rather to avoid any discussion on the subject of possible purchases of tools, but with the return of more normal conditions in financial matters a number of those who were previously considering the question of placing orders have shown an inclination to get in touch with the market. Inquiries have been pretty well confined to single tools, but here and there fair lots required to carry out certain plans of work are being inquired for. No large lists, however, have made their appearance, and until conditions generally show some indications of betterment not a great deal of improvement in this direction is expected. The sales have been pretty largely confined to dealers, and in nearly every case deliveries can be made from stock, as supplies now on dealers' floors or in their warehouses are, as a rule, quite large. No buying has developed as yet on the part of the railroads, and while it is expected that some scattered buying will come from this source before a great while, nothing of any magnitude is anticipated, in view of the unsatisfactory condition of general business.

Manufacturers report orders coming in as considerably scattered, although here and there some fair business, largely in the nature of special tools, has been booked. Generally speaking, however, the volume of new business is hardly sufficient to keep plants going even at the restricted rate of operation. The greater number of the plants continue operating at about half their capacity; some few are able to run about three-quarters full, while a few are unable to get enough business to enable them to do much over one-third the capacity at which they were working for the greater portion of last year.

Export business in this territory has been light. What has been done has been confined largely to tools of a special character.

Secondhand tools and machinery continue in moderate demand. Some dealers report a fair volume of business, largely in tools of the smaller class, while others have found trade more quiet. Secondhand boilers and engines are not in very active demand. Sales are considerably scattered and appear to be confined to equipment of moderate powers.

While there has been no general change in the foundry situation, there has been a little spotty improvement in some directions. The majority of both the gray iron and steel casting plants are running on greatly reduced tonnages. Buyers still continue to place their orders in a hand to mouth fashion, and show no disposition to anticipate their requirements.

The warden of the New Jersey Hospital for the Insane, Trenton, N. J., has recommended that an electric light plant be installed at a cost of about $20,000. He has also asked for an appropriation of $2500 for the drilling of new wells for an increased water supply.

The American Pulley Company notes a slight increase in the volume of business transacted in January, compared with the previous month. The foreign demand for all wrought steel pulleys shows some increase. Orders are not large, but undoubtedly they have increased in number. Domestic trade does not show any great variation. Orders are being received in fair numbers, but the tendency is toward small quantities.

Ballinger & Perrot, engineers and architects, have awarded to the Philip Haibach Contracting Company of this city, the contract for the erection of an office and manufacturing building at Sepviva and Adams streets. The new building will be 60 x 158 ft., five stories, and of fireproof construction throughout.

Bids have been opened by Acting Director Knight, of the Department of Public Works, Philadelphia, for furnishing four water tube boilers and a chimney for the Torresdale filter plant. The following bids, which were ordered scheduled, were made: For the boilers—West End Heating Company, $35,339; Edgemoor Iron Works, $31,885; Heine Safety Boiler Company, $32,700; Babcock & Wilcox Company, $36,461; D'Olier Engineering Company, $32,886; E. Keeler Company, $35,288. For the chimney—H. R. Heinecke & Co., $3775; Heine Chimney Company $6271; M. W. Kellogg, $6710; Custodis Chimney Company, $7350.

The Standard Pressed Steel Company notes a material increase in foreign orders. Canada is taking quite a number of pressed steel shaft hangers, while orders, covering several hundred hangers each, have been received from Holland, France and Belgium. One order for 350 hangers has been booked from parties in Vienna. Domestic trade is somewhat scattered, although there is more disposition noted to place business, particularly in New England and the Middle West. The plant is fairly well occupied and the outlook for the future is considered more encouraging.

New England Machinery Market.

WORCESTER, MASS., February 4, 1908.

January's sales of the dealers totaled rather more than had been expected. One dealer ventured the statement that if February will show 15 per cent. gain over January there will be little cause for dissatisfaction with the volume of orders, but the month has not started vigorously. What business there is consists of small lots, mostly single tools. Hill, Clarke & Co. report that they have disposed of nearly all of the lot of second-hand tools mentioned last week. All of the 14 Lodge & Shipley lathes have been sold, and nine Milwaukee millers. Of a total of 33 machines only three are left. The machine tool builders report little improvement in business bookings. Inquiries are numerous enough, but few orders are being placed.

President Fred. L. Eberhardt of the National Machine Tool Builders' Association has sent a letter to each member and to each machine tool dealer, asking for an opinion of the business situation as it applies to the machinery trade. The consensus of opinion as gathered from numerous answers received, is that the outlook is distinctly favorable, and that there should be a decided change for the better between now

and March 1. The inquiry was a comprehensive one, embracing the machine tool trade generally throughout the country, and including the branch offices of the machinery dealers and the outcome is one worthy of serious attention.

Manufacturing in New England appears to be picking up in a great many lines. Reports are frequently received of establishments that are starting up again, or increasing working hours or working force or both. Practically all the change that is made is in the direction of increased production.

The Woodward & Powell Planer Company, Worcester, Mass., has elected Edward M. Woodward, Jr., vice-president and director, filling vacancies resulting from the retirement of A. M. Powell. Mr. Woodward is the son of Edward M. Woodward, the president, treasurer and principal owner of the business. John W. Robinson continues as secretary, the three officers constituting the Board of Directors.

The Worcester Fire Extinguisher Company, manufacturer of automatic sprinkler systems, has taken space in the Lombard factory building in this city, and will occupy it for its pipe works. The plant of the Independent Fire Extinguisher Company, which the Worcester company purchased some time ago, will be moved to Worcester. The Arch street factory will remain as it is, only the pipe department being located in the Lombard building.

The receiver of the Berkshire Motor Car Company, Pittsfield, Mass., states that there is excellent prospect of the sale of the company's plant and business on February 15, to which date the sale has been postponed.

Clarence G. Garrigus, New Britain, Conn., and W. L. Barrett, Bristol, Conn., are to establish a new business for the manufacture of special machinery, chain and wire forming machinery, machinery for the cutting and forming of sheet metal, and automatic machinery for all other purposes, including one or two machines upon which Mr. Garrigus is taking out patents, and concerning which he is not ready to make announcement. The plan is to organize a corporation with $50,000 capital stock of which $25,000 will be available in the beginning, the amount being already pledged. The name of the company will probably be the C. G. Garrigus Machine Company, and Mr. Garrigus will be president and general manager of the business, though these details are not definitely decided. A site has been purchased for a new shop, between Riverside avenue and the New York, New Haven & Hartford Railroad, at Bristol. The building will be 40 x 150 ft., and two stories, of brick, heavy mill construction. Temporary quarters have been taken in Mr. Barrett's shop at Bristol, where work will be taken until spring, when the new shop will be available. It will be equipped with the best of machine tools and otherwise have modern facilities for the work. Mr. Garrigus has resigned his position with Landers, Frary & Clark, New Britain, where he has been mechanical superintendent of their factories for six years, in charge of designing, building and buying of all machinery and tools used in the works. For four years previous to that time he operated a machine shop of his own at Waterville, Conn., now conducted by the Rowbottom Machine Company.

The Morgan Construction Company, Worcester, Mass., is in the market for a low-priced swaging machine, the specification including the statement that no other will be considered.

The Vulcan Tool Mfg. Company, Quincy, Mass., announces that it has succeeded to the business formerly conducted by the Alexander Clark Company and the Gifford-Pinel Company, and will manufacture iron and steel tools in great variety. The specialties will be all kinds of tools required in the quarry and stone trade, and tools adapted for the contracting trade, including high grade picks, special sewer tools and tools for structural steel work.

The announcement is made that the Stanley shops of the General Electric Company at Great Barrington, Mass., have been permanently closed, and their products will hereafter be manufactured at other plants of the company.

Cincinnati Machinery Market.

CINCINNATI, OHIO, February 4, 1908.

Hopefulness is at this time the most conspicuous factor in the local machinery situation. Orders are not coming in anything like normal volume, although there are some sales of single tools, and it is to be noted that there is practically no trouble in making immediate deliveries in any of the standard lines. There is but one of the larger establishments devoted to manufacture of these standard tools shut down absolutely, and it is announced that the annual inventory will be taken during the two weeks' interval. Others are running on an average of 40 hr. a week, with one-third to three-fourths of their usual forces, and in a few rare cases shops have weathered the strain of the last quarter of 1907 and so far in 1908 with no diminution of hours or employees. Reports indicate that the wood working machinery lines have been first to post notices of reduction in wages, and these have not been serious so far, although there is a feeling that a general wage reduction is coming in the not distant future. An encouraging sentiment is voiced by representatives of the larger tool making establishments, who are arranging for the usual representation and display at important summer meetings of car and machinery men in the East.

Several heads of large machine tool manufacturing companies are in the field among their agency representatives at various points in this country, taking note of conditions and getting a line on future possibilities. Word from these gentlemen is anxiously awaited in local manufacturing circles. Their investigations are bound to be of great value in the trade, and their conclusions will have great weight in determining shop personnel and practice for the rest of the year.

The mails of most tool manufacturers, particularly the past two or three weeks, have contained many inquiries and some tentative orders, based on the outlook. That there is a genuine demand based on a real need for machines is apparent, and that a good buying movement is in abeyance, which only needs the stimulus of returning confidence to unfold and develop, is a conviction with nine-tenths of the machine tool manufacturers.

In the line of ice manufacturing machinery, there is considerable activity, and the same can be said of smaller and medium sized units in electric power generating machinery. A local company has just shipped to a mining district in Minnesota a 300-kw. generator for installation in a large camp on the lines of the Northern Pacific, and this was in addition to an order for three shipped during January to the same point. Salesmen are figuring on several nice orders for power equipment for installation in Western mining districts during the spring and summer. Among the dealers there is still a dearth of orders, and only what might be designated as bargains are moving. Inquiries based on future conditions in money and trade centers are plentiful.

Machinery men are interested in the convention which is in session here this week, consisting of representative men of three separate organizations: The National Canners' Association, the Canning Machinery and Supplies' Association, and the National Canned Goods and Dried Fruit Brokers' Association. A splendid exhibit of canning machinery and modern method is made in the machinery section at Music Hall.

George W. McCumming and E. J. Tully are delegates from Cincinnati to the convention in Chicago of the National Builders' Supply Association. They expect to secure the 1909 meeting for Cincinnati.

The Sanitary Can Company, Indianapolis, Ind., has purchased two Curtis turbines of about 150 kw. each for installation in its plant.

For the new building of the Young Men's Christian Association in Indianapolis, Ind., some engines and generators are under specification. E. L. Phillips of 45 Broadway, New York, is the consulting engineer.

There is to be noted a slight improvement in the conditions at the jobbing foundries; the melt is increasing, and some business held up the late months of 1907 is going.

In the line of punch and shear machinery there is a marked increase in inquiry and some business. The Cincinnati Punch & Shear Company is engaged on some special machinery for parties perfecting new types of machinery or patented articles. A small order is for the Interborough Rapid Transit Company, New York; another is an order for boiler shop equipment and comes from the New Bedford Boiler Company, New Bedford, Mass.

In summing up conditions existent in this machine tool manufacturing center, one finds: First, all plants running save one, which is idle for two weeks, during which the annual inventory will be taken; second, an average of 36 to 40 hr. per week time, with forces ranging from one-half to two-thirds normal; third, collections somewhat slow; a few have no complaints to make, but the majority incline to the belief that they might be much better; fourth, no openly announced cut in prices of tools: on the contrary, an expressed determination from leaders to fight such a sentiment or any indication of it from whatever source.

The new plant of the Elmwood Castings Company, Elmwood, Ohio, a suburb of Cincinnati, has been started, the initial heat being reported as very successful. The new company is a corporation with a capital of $100,000, James E. Stacy being president and S. W. Spear vice-president and general manager. It will manufacture iron castings of a general character.

Government Purchases.

WASHINGTON, D. C., February 4, 1908.

The Isthmian Canal Commission will receive bids until February 24, circular No. 421, for a locomotive coaling crane, and other supplies.

The Superintendent of Prisons, Washington, D. C., will receive bids until February 28 for an ice making or re-

frigerating machine with ammonia condenser, for the United States Penitentiary at Atlanta, Ga.

The Isthmian Canal Commission will soon ask bids for four vertical boiler feed pumps, four horizontal boiler feed pumps, two horizontal boiler pumps, one belt driven, angle drive, 12-in. throat, single punching and shearing machine, to punch 1⅛-in. hole in ⅞-in. steel plate, and to shear ⅞-in. steel plate.

The following bids were opened January 27, circular No. 413, for supplies for the Isthmian Canal Commission:

Class 1.—Twelve rock drills and parts—Bidder 3, Boston Woven Hose & Rubber Company, Cambridge, Mass., item 3, $516 and $246; 5, Compressed Air Machinery Company, San Francisco, Cal., $5532; 6, Chicago Pneumatic Tool Company, New York, $5023.60; 16, Ingersoll Rand Company, New York, $4789.60; 21, Motley, Green & Co., New York, item 3, $196; 23, McKiernan Drill Company, New York, $4046; 25, New York Belting & Packing Company, New York, item 3, $300.80 and $336.80; 26, New York Flexible Metallic Hose & Tubing Company, New York, item 3, $424; 28, Sullivan Machinery Company, Chicago, $4764.88 and $4930; 34, Wood Drill Works, Paterson, N. J., $3475.68 and $3369.68; 37, United & Globe Rubber Mfg. Companies, Trenton, N. J., item 3, $336 and $360.

Class 2.—One upright drill press—Bidder 2, Baird Machinery Company, Pittsburgh, $107 and $391; 5, Compressed Air Machinery Company, San Francisco, Cal., $140; 8, Fox Bros. & Co., New York, $424; 18, Manning, Maxwell & Moore, New York, $82.61; 21, Motley, Green & Co., New York, $515.15; 24, Niles-Bement-Pond Company, New York, $99 and $115; 28, C. I. Patterson Company, New Orleans, La., $565; 32, Vermilye & Power, New York, $405 and $78.

The following bids were opened January 28, for machinery for the navy yards:

Class 1.—One lathe—Bidder 25, Bethlehem Steel Company, South Bethlehem, Pa., $6250; 68, Compressed Air Machinery Company, San Francisco, Cal., $5225; 99, Garvin Machine Company, New York, $5118 and $5103; 133, I. H. Johnson, Jr., Company, Philadelphia, $7096; 184, Niles-Bement-Pond Company, New York, $6700 and $8100.

Class 2.—Two lathes—Bidder 68, Compressed Air Machinery Company, San Francisco, Cal., $2884; 99, Garvin Machine Company, New York, $2890 and $2910; 108, Henshaw-Bulkley Company, San Francisco, Cal., $3020 and $3252; 184, Niles-Bement-Pond Company, New York, $3920, $3590 and $3390; 188, Pacific Tool & Supply Company, San Francisco, Cal., $3760; 297, Harron, Rickard & McCone, San Francisco, Cal., $3350.

Class 3.—One slotter—Bidder 108, Henshaw-Buckley Company, San Francisco, Cal., $3330; 174, Manning, Maxwell & Moore, New York, $3505; 175, Newton Machine Tool Works, Philadelphia, $2490; 184, Niles-Bement-Pond Company, New York, $3095; 227, William Sellers & Co., Philadelphia, $2835.

Class 4.—One boring and drilling machine—Bidder 108, Henshaw-Buckley Company, San Francisco, Cal., $2685 and $3735; 149, Lunkenheimer Company, Cincinnati, Ohio, $3995; 174, Manning, Maxwell & Moore, New York, $3415; 184, Niles-Bement-Pond Company, New York, $3900; 188, Pacific Tool & Supply Company, San Francisco, Cal., $3750; 196, Prentiss Tool & Supply Company, New York, $3395.

Class 171.—Two Pratt & Whitney thread milling machines—Bidder 191, Pratt & Whitney Company, Hartford, Conn., $1976.

Class 181.—One planer—Bidder 184, Niles-Bement-Pond Company, New York, $6000 and $4940; 196, Prentiss Tool & Supply Company, New York, $7095 and $7942; 227, William Sellers & Company, Philadelphia, $6000.

Class 182.—One slotter—Bidder 86, Fairbanks Company, New York, $1222.70; 91, Fox Bros. & Co., New York, $994 and $1079; 174, Manning, Maxwell & Moore, New York, $1085; 175, Newton Machine Tool Works, Philadelphia, $910; 184, Niles-Bement-Pond Company, New York, $938 and $1618; 227, William Sellers & Co., Philadelphia, $1045 and $1445; 288, Excelsior Equipment Company, Pittsburgh, Pa., $2595.

Class 183.—One shaper—Bidder 127, Jones & Lamson Machine Company, Springfield, Vt., $1305; 191, Pratt & Whitney Company, Hartford, Conn., $1534.

Class 184.—Two bolt heading, upsetting and forging machines—Bidder 91, Fox Bros. & Co., New York, $1474; 104, R. W. Geldart, New York, $1448.74; 113, Hartman Company, Philadelphia, $715 and $4516; 174, Manning, Maxwell & Moore, New York, $4500 and $4550; 260, Vandyck-Churchill Company, New York, $4500; 266, Williams, White & Co., Moline, Ill., $4649.

Class 185.—One plate bending rolls—Bidder 25, Bethlehem Steel Company, South Bethlehem, Pa., $1495; 29, Bertsch & Co., Cambridge City, Ind., $920; 70, Cleveland Punch & Shear Works, Cleveland, Ohio, $1110; 76, Drew Machinery Agency, Manchester, N. H., $810; 91, Fox Bros. & Co., New York, $1194; 94, Frevert Machinery Company, New York, $784 and $874; 114, Hilles & Jones Company, Wilmington, Del., $645 and $895; 196, Prentiss Tool & Supply Company, New York, $1218; 227, William Sellers & Co., Philadelphia, $1625; 260, Vandyck-Churchill Company, New York, $845; 267, Wickes Bros., Saginaw, Mich., $722.91.

Class 186.—One single end combined punching and shearing machine—Bidder 25, Bethlehem Steel Works, South Bethlehem, Pa., $2865; 70, Cleveland Punch & Shear Works, Cleveland, Ohio, $2070; 114, Hilles & Jones Company, Wilmington, Del., $2340; 147, Long & Allstater Company, Hamilton, Ohio, $2915; 184, Niles-Bement-Pond Company, New York, $2900; 197, Henry Pels & Co., New York, $3200; 227, William Sellers & Co., Philadelphia, $3790; 247, Toledo Machine & Tool Company, Toledo, Ohio, $3700; 260, Vandyck-Churchill Company, New York, $2745; 266, Williams, White & Co., Moline, Ill., $225; 267, Wickes Bros., Saginaw, Mich., $2397.63.

Class 187.—One horizontal punching machine—Bidder 70, Cleveland Punch & Shear Works, Cleveland, Ohio, $1270; 114, Hilles & Jones Company, Wilmington, Del., $1575; 147, Long & Allstater Company, Hamilton, Ohio, $1294; 184, Niles-Bement-Pond Company, New York, $1650; 227, William Sellers & Co., Philadelphia, $2130; 247, Toledo Machine & Tool Company, Toledo, Ohio, $2400; 260, Vandyck-Churchill Company, New York, $1360; 266, Williams, White & Co., Moline, Ill., $1460; 267, Wickes Bros., Saginaw, Mich., $1636.22.

Class 188.—One hydraulic duplex steam pump—Bidder 19, Buffalo Forge Company, Buffalo, N. Y., $1250; 25, Bethlehem Steel Company, South Bethlehem, Pa., $2155; 30, Brooklyn Forge & Supply Company, Brooklyn, N. Y., $1400; 57, Central Metal & Supply Company, Baltimore, Md., $1500; 77, D'Olier Engineering Company, Philadelphia, $1750; 91, Fox Bros. & Co., New York, $1474; 104, R. W. Geldart, New York, $1448.74; 113, Hartman Company, Philadelphia, $715.44; 166, Motley, Green & Co., New York, $3066 and $1527; 174, Manning, Maxwell & Moore, New York, $1676.92; 274, Warren Steam Pump Company, New York, $1225; 277, Henry R. Worthington, New York, $1488 and $1733; 288, Excelsior Equipment Company, Pittsburgh, $1920.

Under bids opened December 10 for supplies for the navy yards, the Prentiss Tool & Supply Company, New York, has been awarded class 12, one vertical drilling machine, $142.55.

The following awards have been made for supplies for the navy yards, bids for which were opened January 7:

Crane Company, Chicago, class 1, one No. 4 improved pipe threading machine, $799.20.

Birdsboro Steel Foundry & Machine Company, Birdsboro, Pa., class 11, one metal cold saw, $857.

Under bids opened January 2 for supplies for the navy yards, the Chicago Pneumatic Tool Company, New York, has been awarded class 11, three pipe bending machines, $300.

The following awards have been made for supplies for the navy yards, bids for which were opened January 14:

W. H. Foster Company, New York, class 71, one universal grinder, $650; class 91, one horizontal spindle milling machine, $3750.

Gleason Works, Rochester, N. Y., class 81, one 36-in. automatic beveled gear planer, $2485.

Williamson Bros. Company, Philadelphia, class 92, one surface condenser, $1075.

Mosher Water Tube Boiler Company, New York, class 93, two water tube boilers, $3900.

E. W. Bliss Company, Brooklyn, N. Y., class 212, five air compressors, $15,000.

The following awards have been made for supplies for the Isthmian Canal Commission, bids for which were opened January 21, circular No. 415B:

General Electric Company, Schenectady, N. Y., class 1, alternating current motors, $649.50; class 2, one direct current motor, $92.55.

Manning, Maxwell & Moore, New York, class 4, one duplex pump, $1564.

The Utica Drop Forge & Tool Company.

With appropriate ceremonies the new plant of the Utica Drop Forge & Tool Company, Utica, N. Y., was formally opened February 1, when addresses were made by Mayor Wheeler, W. Pierrepont White, president; Joseph Acroyd, H. K. Kelleman, vice-president and superintendent, and L. P. Smith, general agent. The company was organized in 1895 for the manufacture of nippers and pliers, and from that time has continued under the direction of W. Pierrepont White as president. As the business expanded additional buildings were built and new machinery installed, until the increase became so great that it necessitated the erection of an entirely new plant of enlarged capacity.

It was decided that manufacturing could be carried on with more facility and better economy in one structure, and consequently a building was erected covering an acre of floor space. The new building is of irregular shape, being 300 ft. long on one side and 272 ft. on the other, and 136 ft. wide. The main part of the building is occupied by the machine shop, 136 x 192 ft., with forge and hardening shop, 69 x 136 ft., adjoining. On the opposite of the machine shop from the forging shop is the inspecting room, 34 x 51 ft.; shipping room, offices, drafting room, &c. In one corner of the machine shop next to the forge shop is a tumbling room, 20 x 25 ft. The plant is equipped with modern machinery electrically driven, and is served by an industrial railroad, with electric engine and cars capable of hauling 50 tons. Light is provided by saw-tooth roof, and modern apparatus for heating and ventilating the building has been installed. Excellent shipping facilities are furnished by the New York Central Railroad and the [illegible]

Safety for Life and Labor.—On Tuesday evening, February 11, a meeting will be held at the Cooper Union, New York, under the auspices of the American Museum of Safety Devices [illegible] preside. Carroll D. Wright, former United States Commissioner of Labor, will speak on "Economic Waste of Accidents;" Rabbi Stephen S. Wise on "The Ethical Aspects," Alfred J. Bolton on "Labor's Interest in the Prevention of Accidents," Rev. Percy S. Grant on "The Sacredness of Human Life," Dr. Josiah Strong, president of the American Institute of Social Service, on "The Perils of Peace and of War," and Dr. W. H. Tolman, director of the Museum of Safety Devices, on "Museums of Safety and Accident Prevention."

HARDWARE

FOLLOWING the example of many great commercial organizations, it will be quite proper for the State Hardware associations to put themselves on record as favoring a revision of the Sherman Anti-Trust law. The law as it stands gives evidence of being a bungling piece of legislation, and the effect of it as interpreted by the courts is to make illegal every agreement between two parties in regard to the prices at which the commodities to which the agreement relates shall be sold or the quantities in which they shall be manufactured. Such agreements, because they are in legal phrase "in restraint of trade," are forbidden. If the manufacturers in any given line should get together and agree to maintain certain prices on their products they would be violators of the law. If a merchant should purchase goods, agreeing not to sell them for less than a stipulated price, this would be in restraint of trade and illegal. If in the same town two merchants should agree upon a price at which they would hold certain staple articles they also would be laying themselves open to the severe penalties which are permitted under the Sherman Anti-Trust law. More than this, the right is claimed by those charged with the responsibility of executing the law, of seizing in transit goods passing from one State to another, if they are tainted by any such agreement in restraint of trade. If the law were enforced in all cases it would without question unsettle commerce and industry and paralyze trade relations, and if the letter of the law were carried out there would be all the evils of absolutely unrestricted competition. Aiming to limit the evils of trade combinations, and there is need that the public be protected against them, the Sherman law and the amendments to it make the practical mistake of recognizing no difference between reasonable and unreasonable agreements. The associations of jobbers and manufacturers in Hardware and other lines have asked for a revision or repeal of the law, and it is quite in order for the representatives of the retail trade to take similar action, especially calling for a modification of the law, which when it ceases to be a dead letter becomes mischievous and disturbing to legitimate business interests.

Circumstances have recently provided a strong argument to discourage the demand on the part of jobbers and others for private brand goods. The argument is not new, but market conditions have lately been such as to give it added force. Cancellations have not, fortunately, been a marked feature of the period of business reaction and slackened demand through which we have been passing, but they, of course, have occurred or at least have been attempted with greater frequency than heretofore, as a result of unforeseen conditions, such as reduced sales, temporary financial stringency, necessity for retrenchment, and the like. Where he is handling a manufacturer's regular goods which have a broad market position it is usually easy for a buyer to cancel a portion or even all of his order if he finds that he has overestimated his requirements. Manufacturers are disposed to accommodate customers in this way, rather than overload them with stock which might ultimately result in a forced sale of the manufacturer's goods at low prices. If, however, goods are ordered to be made on a slight variation in pattern or finish, or even merely to carry the purchaser's private brand, the manufacturer not only loses his incentive to protect the purchaser, but he also is cut off from the opportunity to dispose of the goods elsewhere. Thus it rarely happens that an order for special brand goods can be cancelled or even cut down, and this is often a special hardship in view of the fact that in consenting to furnish such goods a manufacturer is naturally inclined to require that the buyer take the largest possible quantity. Of course, a special brand order can sometimes be modified before work in the factory has begun, but as a rule the buyer does not discover the changed conditions until it is too late. Indeed, it is often surprising to find how quickly such an order has been carried beyond the possibility of cancellation, especially in times like these, when manufacturers are desirous of good sized contracts to keep their plants in operation. This question, which has been in good measure lost sight of during the last two or three years of activity and expansion, is now recurring here and there with peculiar and in some cases rather unpleasant force.

Condition of Trade.

With the entrance on February there is some increase in the volume of business. The jobbers report a good many orders from their traveling salesmen, who are now out in good force, and the orders in some cases are fairly liberal. For the most part they are of moderate size and carefully assorted, with a good proportion of spring goods. Mechanics' Tools and Builders' Hardware are in only moderate request, as in most sections prospects for building in the near future are not especially promising. Manufacturers report that the jobbers are replenishing their stocks quite generally, but the orders indicate a good deal of care in their make up and an evident desire not to purchase more than can readily be paid for or than the trade in the near future will absorb. In the present state of the market there is opportunity for the wholesale houses to emphasize the usefulness of their services in carrying stocks, from which the retail merchants can draw in such quantities, often small quantities, as their business requires. There is certainly in the retail trade more of a disposition now than usual of late to look for prompt shipments from the parties from whom goods are purchased, whether manufacturers or jobbers. This conservative hand to mouth buying is just now apparently more in favor than the more aggressive policy of purchasing liberally and covering wants for some time to come. A somewhat similar condition prevails in the relations of the manufacturer and his jobbing customers, who are expecting him to carry the stock and be in readiness to ship goods on call. For this or other reason the orders which manufacturers are receiving from the jobbers are certainly of considerably less volume than usual. While this method of doing business entails a good deal of trouble and some additional expense it has certain advantages, prominent among which is its safety, so far as the financial side of the matter is concerned.

Chicago.

A decision of interest to Hardware dealers was reached last week by the manufacturers of Wire Cloth, when it was determined to advance the prices announced at the beginning of the season, in November, 5 cents per 100 sq. ft., making the price of Painted Screen Cloth $1.35 per 100 sq. ft. to the retail trade. By this action prices are restored to a level of those effective last year. The

recent reaffirmation of Wire prices doubtless had an influential bearing upon the Wire Cloth situation, and was, perhaps, directly responsible for the adoption of the new price schedule just announced. Except in Wire Nails and Wire Fencing, trade continues sluggish, there being no noticeable increase in the volume of business moving outside of Wire Products. Biting cold weather and heavy snowstorms that have prevailed for the past week throughout the West and Northwest were, at least, not favorable to the acceleration of trade, though ordinarily business is not appreciably effected by such incidental changes. The market, however, is at present extremely sensitive and susceptible to influences that under stronger conditions would pass unnoticed. In spite of the lightness of current demand there is everywhere present a feeling of conservative optimism in the outcome. In the opinion of well informed jobbers, there is good reason to expect a gradual development of activity that will result in a spring trade of fairly satisfactory volume. How far the question of values is effective in retarding the placing of orders is hard to determine. It is noticeable, however, that where prices have been definitely and firmly established for a given period, as in the case of Wire Products, orders are coming in much more freely. This would indicate that in the majority of lines it is not so much a matter of the altitude of prices, as doubt of their maintenance at present levels, that causes hesitancy. During the month of February many of the retail dealers in Middle Western States will be in attendance at the various Hardware association conventions, where they will have an opportunity to confer and exchange views as to the situation, with helpful results.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—The average traveling salesman's conversation at present is largely made up of categorical questions about like this: "How has business been with you since the first of the year?" "What do you think of the outlook?" "Our president told me to ask you specially what you thought of trade prospects for this spring" (this last is more than flattering), and more of the same kind, till one might think "Why, I am Sir Oracle," unless he have better sense. Be it said to the credit of the trade he generally has.

Trade since the first of the year has shown but moderate vitality, certainly no snap or vigor. The volume from dealers and smaller buyers in the country has been increasing slowly week by week, but we look for no really heavy business until the railroads get in better shape and come into the market as buyers—the princely buyers that they are when times are flush. Just at present they are effecting the most rigid economies, not to say of the cheese paring variety. We hear stories of this enforced, somewhat irrational economy in all departments, especially that of repairs. In the case of one road which has heretofore kept a fair stocked lumber yard for speedy repairs of its freight cars, not a single stick is now to be seen, and such repairs as are absolutely necessary are made of strips taken from castaway dry goods boxes, and any odds and ends that might be picked up in the yards near the track. Locomotives are left standing in the roundhouse for want of a Head Light, an Oil Cup, or possibly a few Bolts. Still the trains are running every day, and no train runs without a certain amount of wear and tear, and even if the passengers are wearing their old clothes, according to the observation of Mr. Gates, there comes a time when it does not pay to get quite so threadbare as the followers of Coxey's army, for instance, even if it does give one a reputation for solvency.

This reminds the writer of an experience he had in Chicago a good many years ago. When making straight from the train to the Sherman House, he met "Long John" Wentworth in the lobby. Mr. W. proposed breakfast forthwith, and loath to lose such good company I said to him, "Just as soon as I can put on a clean shirt I will be with you." "Do not stop for that," said Mr. Wentworth. "If you put on a clean shirt in this town people will be wanting to borrow money of you. Come on just as you are and you will save yourself a lot of bother." The only difference is that the problem with the railroads now is to know what kind of shirt to put on that people will lend them money. As soon as that comes about we shall have a booming business again.

The most study must be put on the expense account and how to reduce it proportionately to the present income of the road month by month. This same problem is confronting other people in business, manufacturers and jobbers as well. Every one is naturally averse to reducing the wages paid labor. Nothing is so disturbing all along the line, no step so unwillingly taken but we do expect to get the work done by fewer people, the selection being made on the basis of efficiency. It is a time for selection of help, whether in the office, or in the warehouse, or in the shop, and those who retain their jobs may take it as a recognition of their superiority over those who were weeded out. That some were held while others had to leave surely bears an unmistakable witness to ability and worth. The armies of the unemployed might largely be classed in times like these as the armies of the inefficient—namely, those who in contest with their fellow men in the same walks of life in the same vocations could not produce the standard results. Either they were lacking in physical ability or willingness to use what they had, or their movements of brain and muscle were sluggish, and they simply failed to turn out product.

The larger cities are thronged with people who have read the various methods devised by the altruistic for amelioration of their condition. These people come from the country and small towns. As soon as spring farming begins their services will be most grateful to the farmer and from that until their harvest time. We never hear of surplus labor on farms. Meanwhile, we must look after them as best we can. Our Wayfarers' Lodge at the office of our Organized Charities is a very busy, popular place.

So far we have had a most mild and open weather. There has been no interruption in navigation of the Ohio River, only one or two days which might be called cold. A small fire in the wage earners' cooking Stove when the thermometer is in the 40's or 50's will, besides performing its ordinary function, warm the entire family. This is certainly fortunate this season owing to the reduced earnings. Nearly all the factories here are running only on part time, some as few as three days in the week, and the whistle blows for hours short enough to suit the most exacting walking delegate.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—We are glad to be able to say that we have had a gradual improvement in business since January 1. January will show an increase of more than 50 per cent. over December, but will not be up to the usual January business. One feature of the situation which has been quite satisfactory is that the falling off of business has not demoralized either the manufacturers or jobbers, and prices seem to be well maintained.

Some of the foundries, mills, factories, &c., which shut down in November on account of the panic, have within the past two weeks resumed operation. This, of course, is a great benefit to the local retail trade.

Since our banks have all resumed cash payments and are loaning money to legitimate enterprises, we hear but little talk of the panic, which has completely subsided; but it has given our people a scare and has reminded them that a little conservatism is well, and for these reasons the spring trade is a little slow in opening up. Collections are about up to the usual standard.

Cleveland.

THE W. BINGHAM COMPANY.—The rising tide of prosperity is indicated by many people of both small and large means taking out their money from its hiding or hoarding place and replacing it in the banks, from which source it is getting into general circulation. Easier times are being experienced all over the country. The business of the savings banks is unusually large and money is plentiful, and prosperity seems assured.

Redistribution of railroad stocks into the hands of small holders will have an excellent effect; perhaps there

will not be so much of an incentive for some of the agitators in our Legislatures to try to have stringent and unnecessary laws passed, thereby curtailing the much needed expansion of railroad systems all over the country. People are finding out that not enough profound thought and common sense have been given to matters of this kind, and it is just possible where so many people are financially interested they will see to it that drastic laws will not be allowed to pass unnoticed when introduced.

Money is plentiful in this section, and many merchants are discounting their bills in advance of the required time, and quite a few who have purchased goods for future shipment are now asking how much extra discount they will be allowed if they pay at once. These signs all point to return of confidence, which, as we all know, is the keystone of all business. Considering the time of year, also the trouble all have experienced in monetary affairs, we have no reason to complain about our present business status. Business is daily improving and the industrial situation is clearing up.

We have sold a number of complete new stocks to parties embarking in the Hardware business at different points in the adjoining States. This goes to show that many parties expect to have a good business in the future and are not afraid to embark in new enterprises under present circumstances and prices.

Quite a number of changes have been announced by some of the leading manufacturers; not reductions for the most part, but simply revisions. No strenuous or radical changes in prices have been nor, do we think, will be made. Manufacturers are rather holding matters level and showing good sense in not reducing prices, which would only tend to demoralize business.

Orders that we are receiving are well assorted, and quite a number of Mechanics' Tools are included, indicating that the artisan is at work or expects to be in the near future.

On the whole the situation is quite hopeful, and the outlook is bright in spite of the adverse times we have passed through, and the Presidential campaign, which is before us, which is not at all alluring to the business man; but the country is in good and splendid hands and we believe that things are working out to our mutual benefit all around.

St. Louis.

NORVELL SHAPLEIGH HARDWARE COMPANY.—January has come and gone. Business was not quite up to last year, but it was better than we expected. We have more salesmen this year than we had last, and are covering a larger territory. Therefore the business we have obtained has cost us more money. Nevertheless we have managed to keep our house force good and busy throughout the month.

The very mild winter up to February 1 has, of course, had a bad effect upon sales of Stoves, Skates, Sleds and other winter goods. On the other hand, the cold weather has not interfered with building and outdoor work. So where we have lost in one direction we have gained in another.

The writer recently attended the meeting of the Texas Hardware Association in Dallas. On the train going down he met a man in the Tie business. This gentleman remarked that timber lands had been held at such high prices and labor had been so high he had almost been driven out of business, but recently on account of the financial flurry and the decline in the price of lumber he had been able to pick up a number of pieces of good Tie timber land at reasonable prices. He was also able to get all the labor he wanted at fair figures. Therefore he had put a large gang of men at work, was getting out Ties and selling them to the railroads at a fair profit.

On the way back from Dallas the conductor on the train showed the writer the blue prints of a very nice 10-room frame house. He remarked as lumber was now cheaper than it had been for several years past and as labor was plentiful and also cheap he had decided to build himself a nice home.

We merely speak of these two instances as indicating that a recession in the very high prices of lumber and also of labor in the South will not be without its good effect upon business.

The Texas convention was quite interesting. The writer had not visited Dallas for a number of years, and was much impressed with the evidence on all sides of solid and substantial improvement. Dallas has her skyscrapers also. It used to be an old joke here in St. Louis that whenever one of the local papers ran out of matter they simply filled in names and dates, and gave a glowing account of a murder in Texas. A wild Western flavor was supposed to hang around a Texan. When he appeared on the stage it was with a slouch hat, Prince Albert coat, pants in boots and a snake tie, not to mention a protuberance in the vicinity of his hip pocket slightly suggestive of a 45 Colt's. If such characters were ever indigenous to the soil of Texas times must have changed.

Texas has "gone dry." The writer drank so much Apollinaris at this convention that he felt like the stuttering man who was brought before the police magistrate. The court attempted to talk with the prisoner, but the man sizzled and stuttered so his answers were unintelligible. Finally His Honor asked the policeman what the prisoner was charged with. "Soda water, I guess," was the reply.

While we have attended a good many retail conventions we never visited one where the merchants seemed to be more interested, where they were more courteous, or where they stuck more closely to the business in hand.

Hardwaremen seem to be about the same all over this broad land. With the exception of an occasional Southern savor in the tone of their voices, you would have imagined you were attending a Hardware convention in Indiana or Iowa.

They went on record solid against the proposed parcel post. Telegrams were sent to the President of the United States, to Postmaster-General Meyer, and to all the Senators and Congressmen from Texas, emphatically opposing the present Parcel Post bill before Congress.

The Texas Hardware Association deserves the support of all the Hardware merchants in Texas. It also seems to me it would be wise for them to become affiliated with the National Retail Hardware Association.

We are glad to note that the large producers of Nails and Wire have decided to maintain prices. We are sure this will have a beneficial effect upon trade. We also note advances on Wire Cloth and Poultry Netting. Such action must clearly indicate to the country that the large manufacturers are not very much worried about the present outlook.

Therefore we trust when our friend, the conductor, builds his new house with low priced lumber and low priced labor he will have to buy some high priced Hardware to trim it up.

A very pleasant, well managed banquet was tendered the convention delegates and their guests at the Columbia Club. Several eloquent speakers enlivened the occasion. Col. Bill Sterrett, who is now running for Congress, made some characteristic remarks on the subject of the Hardwareman. He stated he went to a convention and listened to an article on "How to Sell Unsalable Goods." "Now," said the Colonel, "if goods are unsalable how can you sell them, and if you can sell them why are they unsalable?" The Colonel does not understand the "inside workings" of the Hardware trade, and therefore we must excuse him for some of his criticisms of the papers that were read.

Times have been pretty hard in Texas. Collections have been somewhat slow. We suggest to our manufacturing friends they keep their special salesmen, selling one gross lots at an extra five, out of Texas until the merchants can recuperate. In the meantime the jobbers will do their best to take care of the needs of their Texas friends.

Baltimore.

CARLIN & FULTON.—Since our last letter there seems to be some improvement in business, the expected advance which has now occurred in Poultry, Netting and Wire Cloth having stimulated buying in those lines, and the actual necessities of the trade requiring filling in orders every day; still, buying is done very conservative-

ly, and will continue so until money circulates more freely.

The extreme dullness in the lumber and mining districts have thrown many out of employment, making trade correspondingly dull in those sections, but it is to be hoped that now the farmers throughout the country will be able to secure labor more easily than has been the case for some time. In fact, it had become a serious question for the agricultural sections as to how to replace labor which had been taken from the fields for work in the mines and saw mills and lumber camps and in railroad construction.

The stability of prices has been remarkable, especially when we consider the decreased demand throughout the entire country. This, of course, is accounted for by the curtailed production, and also by the fact that with but few exceptions manufactured Hardware had never been advanced to any extreme figures. We hope that as the spring approaches the depleted stocks throughout the country will soon need replenishing and that business will spring up in a satisfactory manner even if not to the volume of the last year or two.

New Orleans.

WOODWARD, WIGHT & CO.—There has been a slight improvement in general trade conditions here during the past two weeks. The people have been ordering a little more freely, and ordering a little more than they actually had to have, but only a very little. The country merchants are forcing their customers to pay up and settle whenever they can possibly do so, and are restricting the amount of credit business that they expect to do in the year 1908.

The banks in this section are following the policy of giving legitimate aid to the people in a legitimate business, but insisting that the man who has been spreading out in the last two or three years shall reduce his business by a reasonable amount to make it in harmony with the general reduction that the country will probably see until after the next election.

The Hardware merchants, the manufacturers and the producers of the South are in good shape, and there is going to be no trouble about collecting bills sold to people in this section of the country, except that for the next two or three months they may, in some instances, be 15 to 30 days slower than they have been in times past.

One effect that this little slowing up is going to have is to show the real value of the jobbers as marketers of goods. In a great many lines that the jobbers handle in the South there has been no real profit in the last five years, except through the advance in the value of the stock of goods they had on hand. In other words, a large part of the profits of all of us in these last four or five years have been made through buying the goods when prices were low, and selling them out on an advancing market, and the real difference between what the goods could be bought for at the time of the sale and the price at which they were sold was not enough to pay the cost of the jobber doing business. This was on lines of goods where the manufacturer sold direct to the user, also in carload lots, and without perhaps realizing it the maker cutting the margins for the jobber down so low that in the end, on an even market, the jobbing trade would be eliminated.

The question now is whether the manufacturer who, intentionally or unintentionally, has held the jobbers' margin down so low, wants to distribute the goods in carload lots himself, and to be forced, as on a declining market he will be forced, to practically distribute the goods in less than carload lots, through the jobbers gradually dropping out certain lines in which the margin of profit does not pay the actual cost of handling, and what we are now going to see is what is the real value of the jobbing trade at present. There are certain lines in which the jobber has no business, and which he should not be in, but there are other definite lines, like Bar Iron, Pipe, Light Sheets and various other goods of that character, which large consumers can buy in carload quantities, and in which there is really not a fair margin of profit left to cover the actual handling cost. These goods, unless the competition with the manufacturer is lessened, will ultimately be thrown on the manufacturer to distribute, except what the jobber sells in a very small way in his own immediate neighborhood and in very small quantities.

It is a question that will be really for the manufacturers to decide, and on their decision will rest whether in the times of more or less dull trade that are approaching, they, the manufacturers, carry the majority of the stock and carry the credit risk, or whether the jobbers take this off their hands in return for a fair and decent profit on the lines.

Portland, Oregon.

FAILING, HAINES & MCCALMAN.—When we of this section of the country read of the hard times in the East we are thankful that we are so far away from the center of disturbance. In the Portland District business conditions continue to be remarkably favorable, compared to those in the rest of the country. Our business in Portland is not rushing, and, while the money stringency still affects us to a certain degree, we believe that with the exception of business directly dependent upon lumbering all lines of business are approximately up to the mark set to this time last year. Reports from other houses in our line and in other lines here go to show that business is showing signs of a decided increase in volume shortly. Such falling off of business as we have had in this territory, aside from those affected by the disturbance in lumber, was almost entirely due to merchants who wished to play safe, being frightened by the financial stringency and attendant troubles. These men are now regaining their confidence in the future of this section of the country and are now compelled to reorder largely to fill up their stocks, which they have allowed to run down in anticipation of hard times.

Collections are as yet not all that we could desire. They are in general a little slower than at this time last year. One or two houses, however, have informed us that their collections are even better than at this time last year.

The outlook for future business here is very bright. Locally, the building permits so far this year have in number exceeded those of the same period last year. There are not so many large buildings in contemplation, but there are a great many more small houses, both for rent and for occupation by the owners. Similar reports come from a large portion of the territory tributary to Portland. Of course, it it too early as yet to obtain any reliable information about crops, but conditions look as favorable as they ever do at this season of the year.

From the newspapers we learn that there is a disposition on the part of the Northern Pacific and the Great Northern to make a compromise on the lumber tariff, which is now waiting the decision of the Interstate Commerce Commission. Should a compromise in any way satisfactory to the lumbermen be put into effect there would undoubtedly be a great revival of business in a territory largely tributary to Portland. However, this is all supposition, and nothing will probably be known for some time as to the results of the conference which we are told is now being held on the Sound.

Omaha.

LEE-GLASS-ANDRESSEN HAR[illegible] market, including other jobbing centers located on the Missouri River, presents no new or particularly interesting features since our last report. Business in all lines is steadily improving, and, although the volume of sales for January may not equal that of a year ago, still there is a very fair amount of business doing, considering the general cautiousness influenced somewhat by the recent financial fia co. There seems to be plenty of money throughout this Western country with any amount of productions yet to be marketed, so that conditions may be quoted as very favorable.

We have had an exceedingly mild winter so far, and it appears not unlikely that some rough and ugly weather will develop before the advent of spring. If such should be the case it may exert a depressing effect on business for the time being.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—The various changes in the weather during the past 10 days—a heavy snow storm, followed by much colder weather, and from that to raw weather and rain—has no doubt had some effect upon retail sales. Notwithstanding that, however, orders have improved from various sections adjacent to this city. This was no doubt largely owing to the improved financial condition of the banks throughout the country, which have increased over $300,000,000, no doubt largely owing to the fact that cash which had been withdrawn has in many sections been redeposited. Consequently general bank balances at present show remarkably good improvement.

It was recently stated by President Roosevelt, in the Senate and House of Representatives: "There is no nation so absolutely sure of ultimate success as ours of masterful energy, not cast down by fear of failure, but upheld by the confidential hope of ultimate triumph." Some manufacturers (outside of Hardware) state that orders in hand within the last 40 days were held back, but recently have been largely reinstated, and consequently workmen temporarily laid off have now been largely called back. In one instance it is reported that owing to the holding back of orders one manufacturer closed his entire works of 800 employees for a short time, but these works started up on the 3d inst., with 700 employees.

There has been some fear recently on the part of some retail merchants that prices may decline in order to increase their orders, but it has recently been published that at a conference of 75 manufacturers (and purchasers of steel) every manufacturer present expressed the opinion that neither necessity nor reason exists for the reduction of prices at the present time; that prevailing prices are fully justified and should not be changed; that stability is reasonable and desirable. It is a well-known fact that the present Wall Street prices have nothing to do with the selling prices of the various manufactured products. The wages paid by both manufacturers and persons engaged in the trade have no doubt aided in the largely increased trade of the last few years.

Now, where are we? "There is always a safe place in the heart of a storm," and "the pendulum is sure to swing back." The panics of 1857, 1873 and 1893 arose largely from financial conditions. In 1893 the financial condition of our Government largely caused the trouble, which continued for over one year. It was stated by several persons who supplied the Government at that time that the Government was six months behind in payments for goods purchased, and issuing bonds to relieve them was essential, while in October, 1907, the general surplus of the Government was greater than the actual deficit of 1906. Beyond that the large agricultural products of our country, cotton and other supplies, are yet largely to be sold. This, of course, will bring money into various locations almost over the entire country, and it is now considered by bankers and Clearing House associations that the financial difficulties are about over. The daily paper publications have in many instances caused fright and distress to people throughout the country, which has brought about in many instances a slowing down of business, as well as delay in payments.

NOTES ON PRICES.

Wire Nails.—As compared with general conditions ruling in the entire Steel trade, manufacturers regard present conditions as being quite satisfactory. The announcement made by the leading interests, some time since, that prices for the spring trade would be maintained, restored confidence, and a fairly large volume of business has been booked by the mills, and requirements are being anticipated by buyers for some time in advance. A disposition is noticed on the part of buyers to carry larger stocks than they have since last fall. Specifications on old contracts which were held up are gradually being received by the mills, and a moderate volume of new business is being received. Quotations are unchanged, as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

New York.—The notices that the local Nail houses sent to the trade stating that the base price of Wire Nails, in small lots from store, commencing February 1, would be $2.40 per keg, brought in orders for various quantities of Nails previous to that date. Since the first of the month, however, the demand has been comparatively light. The market is apparently in good condition, as sellers seem desirous of maintaining the new price. The local quotation for small lots at store is $2.40 base.

Chicago.—As an indication of the satisfactory progress of trade in Wire products, it is stated that as against the daily sales average of the American Steel & Wire Company for December of 2000 tons, it has grown since the middle of January, when prices were reaffirmed, to nearly 5000 tons, which is not far from normal. Wire Nail shipments are increasing and new business is coming in at a fairly satisfactory rate. Specifications are coming out in sufficient volume to gradually quicken mill activities. Both mills of the leading interest at Joliet are now in operation. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—Present conditions in the Wire Nail trade are referred to by the manufacturers as being quite satisfactory, when compared with general conditions existing in the whole Steel trade. Since the announcement by the leading interests that prices for spring trade would be absolutely maintained, a good volume of business has been placed, and buyers are anticipating their requirements for some time ahead, and are disposed to carry larger stocks than before the announcement was made. Shipments by the mills are heavier than at any time since last October, and there has been a general distribution of Nails throughout the country. Buying from the Southwest is referred to as being particularly heavy, and we are advised that prices, as agreed upon by the manufacturers, are being strictly maintained. Specifications against old contracts that were held up when the slump came are now coming out. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

Cut Nails.—Cut Nail mills are continuing the policy of restricting output as much as possible, to prevent the accumulation of large stocks. Some mills which have not yet started up expect to begin operations in the near future, as they have contract orders which will justify a start. The demand for immediate shipments is light, but shows an improvement over former months. The market is slightly firmer in tone, but irregularity in price is not entirely eliminated from the situation. With occasional exceptions the market is represented in a general way by the quotation of $2.05 on Steel Cut Nails at mill. Iron Nails generally should command about 10 cents more than Steel.

New York.—Previous to the sending of notices to the trade, by the local Nail houses, that, commencing with February 1, the base price would be $2.30, base, for small lots at store, prices had ranged from $2.25 to $2.30, base. The notices brought in some orders, previous to the first of the month at the lowest price. As far as can be learned, the $2.30, base, price per keg has been maintained since the first of the month, for small lots at store.

Chicago.—With building operations sharply checked by cold weather, and car shops running light, there is but little outlet for Cut Nails at present. Business is extremely quiet, being limited to occasional orders of small lots to cover emergency needs. Jobbers report little irregularity in prices, due chiefly to the fact that the character of business offered demands no concession. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; steel, to jobbers, in carloads, $2.28; to retailers, $2.33.

Pittsburgh.—The demand for Cut Nails continues

quiet, but is larger at this time than in any period since last October. The Cut Nail mills are following out the policy of restricting output as much as possible, and this has largely prevented heavy stocks being accumulated, which always act as a menace on the market. Buyers are disposed to cover only for actual needs, and are not placing orders for Nails in any large quantities. Prices are slightly firmer in tone, but are still being shaded by some mills. We quote Steel Cut Nails at $2 to $2.05, f.o.b. Pittsburgh, for carload lots, and small lots at $2.10, to which freight to destination is added. Iron Cut Nails are being held at about $2.15, at mill.

Barb Wire.—Buyers are generally placing orders for spring requirements, since the price has been established for the season. The demand includes specifications which were held up and some new business, so that mill shipments are heavier than for some time. It is understood that prices are being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—Since the price has been established for the season buyers have shown no hesitancy in placing orders for requirements covering this period. In consequence a fair amount of new business has been placed, and shipments are now going forward to the Southwest to supply the spring trade, which will soon open in that section. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The volume of business being received by the mills, consisting of specifications against old contracts which were held up and also in new orders, is larger than for some time. The large trade is more disposed to take in Barb Wire for stock in order to meet spring demands, and is placing orders more freely than at any time in the last three months. Shipments by the mills are heavier, and we are advised that prices are being strictly maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—Fence manufacturers are showing their confidence in a prospective fair demand for their output by placing orders for Wire. While orders are not as large as last year there is a disposition to carry heavier stocks than for some time. The belief that there will not be the difficulty in securing prompt shipments on later orders for Wire may have an influence in limiting the size of first contracts. Business is regarded as satisfactory under present conditions, and prices are said to be maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Chicago.—Dealers generally anticipate a fair demand for Fencing, and manufacturers are placing orders more conservatively, of course, than in recent years, but with a view of supplying a demand of reasonable proportions. The fact, too, that there is every prospect of being able to secure prompt shipment on supplemental orders has a tendency to limit the volume of initial contracts. Business on the whole is much improved, and is regarded as highly satisfactory under the circumstances. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—There has been a large increase in volume of business being placed with the mills, this coming from specifications on contracts held up some time ago, and also in new orders, with the result that the mills are entering more tonnage and are making larger shipments than for some time. Makers of Fencing anticipate a fair demand for their product, though probably not as heavy as last year, and are disposed to carry larger stocks of Fence Wire than for some time. We are advised that prices, as reaffirmed by manufacturers early in January, are being strictly maintained. Quotations for base numbers 6 to 9 are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Picks and Mattocks.—Leading manufacturers of Picks and Mattocks acting in concert have announced a change in their standard list prices on Picks and heavy Hoes, which they state was made to secure greater uniformity. It will be observed that the new lists are considerably higher than those previously ruling. Discounts remain about the same, the market being represented in a general way by a discount of 70, 10 and 5 per cent. The new lists, which are dated January 23, are as follows:

Railroad or Clay Picks.

	Per doz.		Per doz.
Adze Eye, 4 to 5 lb.	$13.00	Adze Eye, 7 to 8 lb.	$16.00
" " 5 to 6 lb.	14.00	" " 8 to 9 lb.	18.00
" " 6 to 7 lb.	15.00	" " 9 to 10 lb.	20.00

Straight wts.	4 lb.	5 lb.	6 lb.	7 lb.	8 lb.	9 lb.	10 lb.
	$13.00	$13.50	$14.50	$15.50	$17.00	$19.00	$21.00

Hunt Eye same list price as Adze Eye.
Ore Picks and Rock Picks same list price as Railroad Picks.

Contractors' Picks.

All styles of point.

	Per doz.		Per doz.
Weight 7 lb.	$18.50	Weight 9 lb.	$21.50
" 7½ lb.	19.00	" 9½ lb.	22.50
" 8 lb.	19.50	" 10 lb.	23.50
" 8½ lb.	20.50		

Stone and Quarry Picks.

	Per doz.		Per doz.
5 to 6 lb.	$16.50	7 to 8 lb.	$18.50
6 to 7 lb.	17.50	8 to 9 lb.	19.50

Hazel Hoes.

Width of blade, 6 in. ..... per doz., $16.00

Arcomac Hoes.

Light weight, width of blade 6 in. ..... per doz., $16.00
" " width of blade 6½ in. ..... per doz., 17.00
" " width of blade 7 in. ..... per doz., 18.00

Grub Hoes

	Per doz.		Per doz.
Western Pattern:		Baltimore Pattern:	
No. 0, 3 lb.	$12.50	No. 1, 3½ lb.	$13.00
No. 1, 3½ lb.	13.00	No. 2, 4½ lb.	14.00
No. 2, 4 lb.	13.50	No. 3, 5 lb.	15.00
No. 3, 4½ lb.	14.00	No. 4, 5¾ lb.	16.00

Rope.—Buying has been of the hand-to-mouth variety, but manufacturers notice an improved tone to the market and anticipate an increased demand during the month. Collections are reported as improving. Prices remain about the same as for some time and there is not enough business to justify an advance, even if it was considered advisable. High quality Manila Fiber is higher in price than usual, as compared with cheaper grades, and this keeps up the price of the best quality of Manila Rope. The following quotations fairly represent the market for base sizes: Pure Manila, 11½ cents; B quality grades down to 8½ to 9 cents; Pure Sisal, 8 cents; lower grades Sisal, 7 to 7¼ cents; No. 1 Jute, ¼-in. and up, 7½ cents; No. 2 Jute, 7 cents.

Window Glass.—Immediately after the order of the court dissolving the union known as the Amalgamated Window Glass Workers of America, a new organization was formed, to be known as the National Window Glass Workers. The statement was made that business would be conducted as before, except that the new constitution and by-laws would be free from any criticism by court. There has been a slight increase in the production of hand operated factories, and some of the heretofore idle factories are reported as making an effort to resume operations. Owing to the lack of demand it does not seem a favorable time to increase Window Glass production to any considerable extent. Prices recommended at the last meeting of the Eastern Window Glass Jobbers' Association, for Greater New York, are as follows: Single strength, 90 and 25 per cent.; double strength, 90 and 30 per cent. discount from jobbers' list. These prices are, however, not closely adhered to.

Axes.—There are indications that leading manufacturers of Axes will postpone the announcement of quotations for next season's business until an unusually late date. Jobbers' stocks are said to be heavy, as the weather has been unfavorable for the free movement of these goods. The situation has been carefully studied by producers, who have recently held several conferences in an effort to decide on the most intelligent method of marketing their next season's product, and it is believed that more or less harmony of action may be expected. At all events it is quite positively, though not officially stated, that Axes will be no lower, inasmuch as they have have been sold very close to cost for the past two years, and there has been no reduction in that respect.

Poultry Netting.—Manufacturers of Galvanized Poultry Netting have announced their prices for delivery after February 1, which show an advance of 2½ per cent. over the quotations made at the opening of the season.

Wire Cloth.—The expected announcement of the price of Screen Wire Cloth for delivery after February 1 shows an advance on the Painted and Galvanized varieties of 5 cents per 100 sq. ft., making the market to the retail trade $1.35 per 100 sq. ft. Hardware grade Cloth, which it will be remembered was radically reduced in price at the opening of the season, has been advanced 25 cents per 100 sq. ft., and is now quoted to the retail trade as follows:

Nos. 2, 2½ and 3 mesh	$2.75 per 100 sq. ft.
Nos. 4 and 5	3.00 per 100 sq. ft.
No. 6	3.25 per 100 sq. ft.
No. 8	3.75 per 100 sq. ft.

It remains to be seen whether these prices will be maintained by jobbers, who are doubtless stocked with Cloth purchased on a better basis.

Traps.—The Oneida Community, Oneida, N. Y., has announced a change in list prices on the Jump Pattern Traps which it controls. These goods have heretofore been sold on a special list, but from now on will take the regular list for Newhouse and Oneida Pattern Traps. The old No. 2 Single Spring Jump Traps will hereafter be stamped No. 1½ and the old No. 2½ will be stamped No. 2.

Squares.—Sharp competition continues to characterize the market for Steel Squares, which are now being sold by manufacturers at the lowest prices which have been reached in the present movement. The market may be represented in a general way by a discount of 80 per cent., but additional concessions are readily obtainable by close buyers.

Paris Green.—Manufacturers of Paris Green have not announced prices for 1908, and will probably not do so until nearer the time when orders are usually placed. The ingredients entering into the composition of Green are alluded to as being about the same prices as last season, which, it will be recollected, were unusually high. There is no way of determining, at this time, whether any considerable quantity of Paris Green was carried over by wholesale or retail merchants.

Linseed Oil.—The demand continues light for small lots, as the cold weather has interfered with outside work. Some carload orders have been booked for March delivery, but there is little activity in this direction. It is understood that carload orders for out of town Raw Oil have been sold at 41 to 42 cents, according to seller. Prices in five barrel lots are as follows: State and Western Raw, 42 to 43 cents; City Raw, 44 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—The demand is confined to small lots on a steady market. Quotations are about ½ cent above those of last week. The New York market is represented by the following quotations: Oil Barrels, 45½ to 55 cents; Machine Made Barrels, 55 to 55½ cents.

Newton Wetzel, Hill City, Kan., has sold his Hardware, Stove, Implement, Paint and Sporting Goods business to Rowe & Sperry.

Johnson & Feiring, Galesville, Wis., have sold their general Hardware business to Smithe & Kidder.

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RETAIL HARDWARE CONVENTIONS.

During the next few weeks the following retail Hardware conventions will be held. Where the asterisk appears elaborate plans are being made by the association officials for the accommodation of Hardware exhibits by manufacturers and jobbers.

SOUTH DAKOTA ASSOCIATION,* Aberdeen, February 4-7. Secretary, H. E. Johnson, Redfield.

WISCONSIN ASSOCIATION,* Milwaukee, February 5-7. Secretary, C. A. Peck, Berlin.

CONNECTICUT ASSOCIATION, Meriden, February 10 and 11. Secretary, James de F. Phelps, Windsor Locks.

KENTUCKY ASSOCIATION, Louisville, February 11-13. Secretary, John R. Sower, Frankfort.

NEBRASKA ASSOCIATION,* Lincoln, February 11-14. Secretary, J. Frank Barr, Lincoln.

WEST VIRGINIA ASSOCIATION, Elkins, February 18, 19 and 20. Secretary, Leslie Hawker, Shinnston.

INDIANA ASSOCIATION,* Indianapolis, February 18-21. Secretary, M. L. Corey, Argos.

IOWA ASSOCIATION,* Cedar Rapids, February 18-21. Secretary, A. R. Sale, Mason City.

NEW YORK ASSOCIATION,* Buffalo, February 18-22. Secretary, John B. Foley, Syracuse.

MISSOURI ASSOCIATION, St. Louis, February 24 and 25. Secretary, F. D. Kansteiner, St. Louis.

PENNSYLVANIA ASSOCIATION, Cambridge Springs, March 3, 4 and 5. Secretary, J. E. Digby, McKees Rocks.

OHIO ASSOCIATION,* Columbus, February 25-27. Secretary, Frank A. Bare, Mansfield.

MINNESOTA ASSOCIATION,* St. Paul, February 25-28. Secretary, M. S. Mathews, Guaranty Building, Minneapolis.

ILLINOIS ASSOCIATION,* Peoria, February 26-28. Secretary, L. D. Nish, Elgin.

NEW ENGLAND ASSOCIATION,* Boston, March 11 and 12. Secretary, Charles L. Underhill, Somerville, Mass.

Pennsylvania Hardware Association.

It has been decided to change the place of meeting and the date of the convention of the Pennsylvania Retail Hardware Association. The gathering will take place at Cambridge Springs instead of Altoona, as originally determined, and the dates selected are March 3, 4 and 5. The Hotel Ryder will be the headquarters of the association and the sessions of the convention also will be held there.

Connecticut Hardware Association.

The programme for the fifth annual meeting of the Connecticut Hardware Association has been issued. At the opening session on the afternoon of the 10th inst., addresses will be made by A. H. Abbe, New Britain, member of the Executive Committee of the National Retail Hardware Association; F. Alexander Chandler, Boston, president of the New England Retail Hardware Association, and others. A discussion of topics brought up through the Question Box will also be a feature of this session. In the evening a theater party will be given. On Tuesday forenoon the closing session will be held. At the close of this session a reception to the Governor and other guests will be given in the Winthrop Hotel parlors. Subsequently the annual dinner will be enjoyed, addresses being made by the Governor, the mayor of Meriden and prominent members of the trade. A feature of the dinner will be singing by the Connecticut Hardware Glee Club. The headquarters of the association will be at the Winthrop Hotel and the business sessions will be held at the Colonial Club.

THE C. J. ROOT COMPANY, Bristol, Conn., manufacturer of Wrought Brass Hinges, Counting Machines and Specialties, has held its first annual meeting since its organization to take over the business of the late C. J. Root. The officers elected are as follows: President, Carlyle F. Barnes; treasurer, John T. Chidsey; directors, these officers and M. D. Edgerton, Willis H. Bacon and Frederick N. Manross. The company is making no change in its lines at the present time.

Death of Isaac Nash.

ISAAC NASH, proprietor of Peter Wright & Sons, Dudley, England, died at his residence, The Beeches, Oldswinford, January 16, in his sixty-fourth year. Mr. Nash was exceedingly prominent in many ways, both in public life and in his business capacity. He was the son of Isaac Nash, founder of the Belbroughton mills, producing Scythes and edge cutting Tools, and as a young man went to Australia, where he was engaged in mercantile pursuits. He returned to England about 1880, after which he bought the works known as the Stourbridge forge, and at the death of his father, in 1887, acquired also the Wollaston mills, at the same time succeeding with his brother to the ownership of the Belbroughton mills. Mr. Nash likewise purchased the Spade and Shovel business of Fussels, a Somerset firm of note, and subsequently took over the Spade and Shovel department of Wood, Aston & Co. Later, the business of Peter Wright & Sons, manufacturers of Anvils and Vises, was acquired, for which goods, with the original Waldron Scythes, &c., Wiebusch & Hilger, New York City, are representatives in the United States. Mr. Nash was also, for a time, owner of a Lock making business at Wolverhampton. In dealing with his employees Mr. Nash always displayed great courtesy and patience, and it is said had never been involved in a labor dispute, which is attributed largely to the justice displayed toward his men.

Mr. Nash was active in local government, as County Councillor and Justice of the Peace, and was identified with the Episcopal Church, of which he was a warden. He was actively interested in public instruction and instrumental when chairman of the council, a position he held for five years, in obtaining from Andrew Carnegie some thousands of pounds sterling for a free public library in Stourbridge, Mr. Nash individually purchasing the property on which the free library and technical schools now stand, until the town authorities could take the site off his hands on the same advantageous terms on which it was bought.

Worth Butcher Knives.

THE SUPPLEE HARDWARE COMPANY, Philadelphia, which has had the sole American agency for the Worth Butcher Knives, manufactured by H. Worth & Sons, Sheffield, England, for 20 years, calls particular attention to the fact that these Knives are made in the old-fashioned way by hand hammering, thus incorporating in their manufacture the individual skill of experienced workmen, which is not obtained by the more modern method of stamping out the blades and forging them under a trip hammer. It is stated that the blades have a balance and "hang" to them which is peculiarly their own, and the quality of the steel and temper is emphasized. The handles of the Worth Knives are of rosewood, secured by heavy brass saw screws, making them impervious to the effects of hot water, and at the same time giving them a very handsome appearance. The Butcher Knives, in sizes ranging from 5 to 14 in., as well as Skinning and Sticking Knives, are carried in stock, and as the Supplee Company is now able to obtain a better supply of these goods than heretofore, it is in a position to make satisfactory arrangements with merchants to handle this high grade line of Butcher Knives.

Lalance & Grosjean Mfg. Company's Fire.

THE quarters occupied by the Lalance & Grosjean Mfg. Company, at 19-21 Cliff street, New York, were entirely burned out on the 31st ult. The company had occupied these premises for upward of 30 years, for a considerable period solely for office and salesroom purposes, in the latter respect carrying only lines of samples. All books, papers and records of importance were saved from the fire, and so far as its effect on the company's business is concerned it is simply an inconvenience. A temporary office has been equipped at 56-58 Fulton street, corner of Cliff. The company has arranged for a permanent location, to be occupied about March 1, having taken a floor in the new Barclay building, Broadway and Duane street, which will be fitted up as an office, with sample and sales rooms accompaniment.

TRADE ITEMS.

THE HARTFORD HARDWARE ASSOCIATION, Hartford, Conn., held its annual meeting and banquet at the Hotel Garde, January 30, with a large attendance. Col. William E. Cone was re-elected president, and Capt. George I. Clapp was elected secretary. A. H. Abbe, New Britain, president of the State Business Men's Association, led the list of speakers, who were introduced by President Cone, as toastmaster. The others to respond were J. C. Bidwell, F. S. Bidwell, M. B. Dennison, H. H. Ensworth, A. I. Hoscall, Irving C. Treat, R. C. Witte, F. W. White, H. S. Wooley, W. D. Williams and Secretary Clapp. Several of the gentlemen present have been in the Hardware business for over 35 years and their reminiscences were of unusual interest.

WITH the opening of the year the Ralph Brown Company, San Francisco, Cal., sent out a very interesting booklet entitled "By the Way," and purporting to be "Just a little after-dinner talk to you personally—as one friend to another." The booklet, which was distributed to about 600 of the company's customers, gives a short history of the business. In connection with the closing paragraph of the booklet a memorandum appeared of the total amount of each customer's business with the company for the past year, a blank space being left for what the business might amount to in 1908. We are advised that as a result of figuring up the year's business it is found that notwithstanding the difficult times during the closing three months of the past year the company made a very satisfactory profit on the total business of the year.

PRITCHARD-STRONG COMPANY, Rochester, N. Y., whose Uncle Obediah has become a familiar character in the trade, has created Brother Bill, a jolly looking mechanic, to advertise its line of Metal Ware specialties. With a sample order, a life size lithograhped cut out is furnished, which will hold a real dinner pail in a remarkably natural way. When shown in the window the figure should have the Pail in his hand with a real workingman's lunch—sandwiches, eggs, pie, &c.—in the different compartments of a Prisco Dinner Pail lying in front of him, also a few masons', carpenters' or plumbers' Tools. The company has issued a large illustrated folder stating "Brother Bill's Proposition" on a sample order.

THE BERNARD GLOEKLER COMPANY, Pittsburgh, Pa., has issued some attractive illustrated cards calling attention to its faciliities for furnishing complete kitchen equipments for hotels, clubs, public institutions, and the like. The company makes a specialty of these equipments in connection with the Butchers' Tools, Machines, Fixtures and Supplies, Refrigerators, Cold Storage Plants, Cooking Apparatus and Allied Specialties which it manufactures.

THE INDIANA RETAIL MERCHANTS' ASSOCIATION, said to have 11,000 members, at the conclusion of its recent annual meeting at Terre Haute passed a resolution condemning parcel post measures unequivocally and opposing the plan proposed by Postmaster-General Meyer, on the ground that it would be too costly for the Government.

THE PIONEER IRON & STEEL COMPANY, Kansas City, Mo., manufacturers' agent, has been appointed direct representative for the Southwest of J. C. Pearson Company, Boston, manufacturer of cement coated Nails, and Kirk-Latty Mfg. Company, Cleveland, manufacturer of Bolts, Nuts, &c.

ON the 23d ult., fire totally destroyed the old established plant of Charles W. Force & Son, Madison Iron Works, Madison, N. J. A new building, to serve as a temporary shop and office, is now under construction. The firm's collection of trade literature was consumed and copies of new catalogues, discount sheets, &c., are requested.

AN attractively printed booklet has been issued in honor of the seventy-fifth anniversary of the George Krause Hardware Company, Lebanon, Pa. The booklet contains an interesting sketch of the history of the house, presenting portraits of John D. Krause, the founder, and George Krause, his son, who died about two years since, after more than 56 years of active business life. Illustrations are also given of Lebanon as it appeared in 1833, of the store in which the the business was established, of the enlarged premises as in 1849 and 1856, together with views of the establishment as it exists to-day. From the modest beginning with a 10 x 12 room with 6 ft. of shelving and a 6-ft. counter, the business has developed into one of the largest and best equipped in eastern Pennsylvania. The company's operations cover six counties in the State, distributing Builders' and General Hardware, Furnace, Mill, Railroad, Machine Shop and Plumbing Supplies, Wood and Willow Ware, Sporting Goods, Ammunition, &c. The large building at present occupied was erected in 1888 and is furnished with all modern facilities and especially adapted for the requirements of the business.

SKATES AND SLEIGH BELLS.

"WELL," remarked the seasoned merchant, as he gazed at a window display of Skates and Sleigh Bells, "there's a window full of chance."

The new clerk looked at him inquiringly, for he had expected a word of commendation upon the display.

"Oh, yes, the display is all right—fine," continued the merchant, anticipating the clerk's inquiry, "but it won't sell Skates and it won't sell Sleigh Bells—not this weather. Don't you see it's raining? Nothing but rain and mud all winter, and here it is nearly the first of February."

"We've got an investment there," he continued; "yes, and it's going to *stay* invested till next winter or longer, or I'll miss my guess. Worse than fireworks, those things are."

"But we did finely with them last year," ventured the clerk.

"Sure!" exclaimed the merchant. "Froze up stiff at Thanksgivin' last year, and staid frozen till April—lots of snow, too. Couldn't get enough of them then! Ran out of Skate sizes in January; jobbers didn't have them; makers couldn't turn them out; could have sold this lot six times over *then*. But—well, that's just what I was saying, worse than fireworks—one year can't get enough, the next year tie up all the money you put into them."

"Don't you think we'd sell some of these if we cut prices?" inquired the clerk.

"No!" replied the merchant, explosively; "they don't want Skates and Sleigh Bells when there isn't any snow and ice. If the snow and ice come, they'll pay fair prices for them. There's nothing to do but *keep* them. That's all there is to it."

"But," persisted the clerk, "in your experience in the business haven't you found any way to overcome this uncertainty?"

"Thirty years at it," replied the merchant; "know the business from A to Z, but I've never yet learned how to prophesy the weather. You can't tell much more about the sales of Skates and Sleigh Bells than you can about the date of your own death. I confess that I don't even know how to buy Skates and Sleigh Bells. The one thing I've learned is *buy light*—that brings me to the point I want to impress on you. Last year you wanted to duplicate late in the season. Then last summer you wanted to buy heavy for this year because last winter was good. As a matter of fact, all we've got invested is right there in the window—*and this season that's too much*. I'd rather miss a few sales at the end of a good season—being already sold out—than to carry over a heavy load of dead capital. Put that in your pipe and smoke it!"

Holloway & Fowler, Fremont, Neb., have completed improvements in their store, which provide 1800 sq. ft. of additional floor space. The warehouse at the rear of the retail store has been reconstructed, and is finished with 4-in. cement floors. While principally a wholesale and retail Hardware house the firm has developed a large plumbing and heating trade, which is rapidly being extended.

J. R. Wear has bought out the Hardware business of M. D. Gonder, Kinsley, Kan.

PHILADELPHIA HARDWARE MERCHANTS' AND MANUFACTURERS' ASSOCIATION.

MEMBERS and guests to the number of nearly 200 gathered at the Bellevue-Stratford Hotel, in Philadelphia, on Thursday evening, January 30, to attend the twenty-second annual banquet of the Hardware Merchants' and Manufacturers' Association of that city. Previous to the banquet, President-elect Edward S. Jackson and Vice-President-elect Paul A. Griffith, Secretary-Treasurer T. James Fernley, together with the past presidents of the association, held a reception in the parlors of the hotel.

The banquet was served in the Clover Room, which was tastefully decorated with national, State and city colors. The speakers' table, which was elevated, was profusely decorated with flowers and Hardware; while the other tables, which were at right angles to the speakers' table, were decorated in a similar manner. Roses, carnations and cosmos predominated in the floral decorations.

The association had as its principal guests Hon. John E. Reyburn, Mayor of Philadelphia, who responded to the toast "Our City"; Rev. Robert Ellis Thompson, S. T. D., who addressed the gathering on "The Hardness of Hardware"; Michael J. Ryan, who replied to the toast "Our State"; Rev. John R. Davies, D. D., who spoke on "The World's Unrest"; and Hon. J. Hampton Moore, who made an address on "Our Inland Waterways." Among others who sat at the speakers' table were the following: President Edward S. Jackson, Vice-President Paul A. Griffith, Secretary T. James Fernley; ex-presidents William W. Supplee, Thomas Devlin, Hugh McCaffrey and Samuel Disston, ex-Mayor John Weaver, F. D. Mitchell, secretary, American Hardware Manufacturers' Association, H. B. Lupton, Pittsburgh, Charles W. Asbury, president, American Hardware Manufacturers' Association, Samuel F. Wilson, Alex. W. Stanley, William B. Riley, Joseph M. Rogers, John W. Wilkins, Jr., Frederick E. Underhill, Ellicot Fischer and N. B. Kelly.

After proceeding to the banquet hall, those assembled were called to order by T. James Fernley. Dr. John R. Davies, chaplain of the association, invoked divine blessing. William W. Supplee then introduced the president-



EDWARD S. JACKSON, President.

elect, Edward S. Jackson, who delivered a felicitous welcome to the assembled guests.

At the close of the banquet President Jackson, who served as toastmaster, called upon Rev. Robert Ellis Thompson, S. T. D., president of the faculty of the Central High School, Philadelphia, who made an interesting address on "The Hardness of Hardware." Michael J. Ryan responded in an eloquent manner to the toast "Our State." Rev. John R. Davies, D. D., followed, and in speaking on the toast "The World's Unrest," called particular attention to the growing hostility of the Orient to foreign goods, particularly China, India and Japan. Oriental countries were, he said, steadily pushing out the foreigner and his wares and developing their own resources. Hon. J. Hampton Moore spoke on the subject, "Our Inland Waterways," and referred to the commercial advantage to be obtained by the improvement of the present system of inland waterways along the Eastern coast. In the Middle West, he said, there was a concerted effort to obtain the recognition of the Government to the proposed deepening of the Mississippi River chan-



PAUL A. GRIFFITH, Vice-President.

nel, and the East should combine and organize so as to assert its rights to a share of the development of these national improvements. Mayor Reyburn responded to the toast, "Our City," touching on matters of local interest in an entertaining manner. During the banquet musical selections, largely in the vein of the topical songs of the day, were rendered by the Bellevue-Stratford Orchestra, those assembled joining in the choruses.

Garden implements, Hardware specialties and tools, which added largely to the artistic decorations of the banquet tables, were furnished by the following manufacturers: American Fork & Hoe Company, Garden Implements; Baeder, Adamson & Co., Match Safes; Henry Disston & Sons, Saws, Screw Drivers, &c.; Enterprise Mfg. Company, Food Choppers and Coffee Grinders; Germantown Tool Works, Hammers; Liveright Brothers, Manicure Files; Miller Lock Company, Padlocks; McCaffrey File Company, Manicure Files in leather cases; North Bros. Mfg. Company, miniature Screw Drivers; National Enameling & Stamping Company, Enameled Kettles; C. T. Ham Mfg. Company, Lanterns.

The committee having charge of the arrangements for the banquet consisted of Edward S. Jackson, chairman; A. S. King, Walter E. Devlin, Joseph J. McCaffrey, Arthur K. Liveright, Charles Z. Tryon, Harry C. Disston and T. James Fernley, who were generally complimented for their efforts in making the twenty-second annual banquet one of the most successful that has ever been held by the association.

THE WIRE GOODS COMPANY, Worcester, Mass., has issued a pocket edition of its new catalogue intended for general distribution among merchants, so that each clerk having use for a copy may have one of his own for ready reference in his dealings with customers or in making up orders for new goods. The original catalogue, to which reference was made in our issue October 24, goes into very full details of sizes and prices of Wire Goods, giving a great deal of information valuable to handlers of Wire Hardware, Kitchen Wire Goods, Wire Nails, Tacks and Staples. The pocket edition is a complete reproduction of the larger volume, with 240 pages, but reduced in size from 8½ by 11½ in. to 4½ by 6 in. It is planned to issue a discount sheet of the same size. The new edition is bound in telephone cover stock, which has much durability under severe handling. The company will be pleased to send as many copies as desired to firms who are interested.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

UNITED TRUCK SCALE COMPANY, Toledo, Ohio: Circular illustrating and describing Truck Scales for various purposes and giving testimonials.

CLINTON E. HOBBS, Boston, Mass.: Illustrated catalogue C, containing price-lists, tables, &c., of Chain, Chain Hoists and Appliances.

WM. H. HASKELL MFG. COMPANY, Pawtucket, R. I.: Illustrated price-list of Diamond Expansion Bolts, Shields, Toggles, &c., for which the company is agent.

COOPER & MCKEE, Brooklyn, N. Y.: Handsome catalogue illustrating and describing in great detail the company's elaborate line of Opalite Glass Lined Refrigerators for all purposes.

CHAS. R. MORSE MFG. COMPANY, Chicago: Booklet referring to Morse Rotary Wage Table for figuring payrolls and labor costs.

STANDARD VARNISH WORKS, 29 Broadway, New York: Catalogue of S. V. W. insulating specialties, containing valuable information and tables; also descriptive catalogue of house finishes and price-lists of Carriage and Auto Car Varnishes.

D. F. JONES MFG. COMPANY, Gananoque, Ont.: 1908 illustrated price-list of Shovels, Spades, Scoops, Draining Tools, &c.

VAUGHAN & BUSHNELL MFG. COMPANY, Chicago: Special catalogue of Eagle brand Hammers for 1908, with new list prices on nickel plated Plain Face and Bell Face Nail Hammers.

HEMP & Co., St. Louis, Mo.: Illustrated catalogue of Patent Lock Stove Pipe, Elbows, Sheet Metal Goods and Japanned Ware Specialties.

CHICAGO WIRE CHAIR COMPANY, Chicago: Illustrated catalogue covering an extensive line of Wire Chairs, Stools, Tables, &c.

ARROW CAN COMPANY, 35 Warren street, New York: Eight page illustrated folder circular of Ash, Garbage, Waste and Oil Cans in various styles and sizes, some for the most exacting service.

GENEVA CUTLERY COMPANY, Geneva, N. Y., represented by Henry Berkele, 43 Leonard street, New York: Catalogue of 36 pages, illustrating Razors and Cutlery Specialties, including Razor Blanks for barber supply and cutlery trade, Handles in facsimile colors, &c.

GLOBE VISE & TRUCK COMPANY, Grand Dapids, Mich.: Catalogue, 16 pages, relating to a special line of Quick Acting Wood Workers' Bench Vises; also an illustrated poster describing Ball Bearing Trucks, suitable for factory and warehouse use.

CINCINNATI HORSE SHOE & IRON COMPANY, Cincinnati, Ohio: Illustrated catalogue of Horse and Mule Shoes.

ARLINGTON MFG. COMPANY, Canton, Ohio: Catalogue of technical Paints for all purposes, especially for the use of railroad companies, structural builders, contractors, manufacturers and industrial plants, and for protecting wood, steel or galvanized work.

TERRELL'S EQUIPMENT COMPANY, Grand Rapids, Mich.: Illustrated catalogue with price-list of factory equipment, such as Racks, Shelving, Bins, Trucks, Waste Cans and Sheet Metal Goods.

GLAZIER STOVE COMPANY, Chelsea, Mich.: Illustrated catalogue of Brightest and Best Steel Ranges, Oil and Gasoline Stoves and Ovens.

SHELBY SPRING HINGE COMPANY, Shelby, Ohio: Catalogue No. 14, containing illustrations and price-lists of a varied line of Builders' Hardware and Hardware specialties, including Shelby Chief Double Acting Floor Hinges, Ball Bearing Spring Hinges, Push Plates, Drawer Pulls, Sash Lifts, Cupboard Turns, Sash Locks, Barrel Bolts, Screen Door Hinges, Wire Coat and Hat Hooks, Cast Wardrobe Hooks, &c.

HOLMQUIST & Co., Chicago: Folder No. 14, referring to Holmquist Curtain Stretchers.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM PATTON-YATES HARDWARE COMPANY, Omaha, Neb., which has been incorporated with a capital of $10,000, to conduct a retail business.

FROM BOYES-BECK HARDWARE COMPANY, Caldwell, Idaho, in which G. A. Beck has recently purchased an interest.

FROM W. S. WOOLSEY, who has engaged in the Hardware, Stove, Implement, Paint and Sporting Goods business, at Dalton, Neb.

FROM N. W. BRAMMEL, Ozawkie, Kan., who will open a general Hardware store about April 1, and will put in an entirely new stock and fixtures.

FROM SWANK & SON, Brunswick, Md., who have opened a new Hardware, Stove and House Furnishing Goods store.

FROM HALL & BRUHN, who have embarked in the Hardware, Stove, Paint, Sporting Goods and Furniture business, at Wilbur, Wash.

FROM ZAPF HARDWARE & FURNITURE COMPANY, Astoria, Ore., which has succeeded to the business of Henry Zapf.

FROM F. W. HINSEY, Murray, Iowa, who is building a store at Moffitt, N. Dak., where he will open up in the Hardware, Stove, Tinware and Paint business about February 15.

FROM KLUG BROS. & NEUMAN, Pierce, Neb., who have purchased the Hardware, Stove, Implement, Paint and Sporting Goods business of Leo Gishpert.

FROM JOHN RAWLING, Scranton, Pa., who is rapidly developing the Hardware department of his Sporting Goods business.

FROM CASON, MONK & Co., Nacogdoches, Texas, whose Hardware, Stove, Implement, Vehicle, Supply and Machinery establishment was slightly damaged recently by fire.

FROM UNION HARDWARE COMPANY, which has recently been organized to conduct a retail business at Hope, Ark.

FROM W. A. DEAN, North Newark, N. J., who handles Hardware, Tinware, Paints, &c.

FROM C. W. STITES, who has acquired the Hardware, Implement and Paint business of J. L. Mabie, Independence, Iowa.

FROM FINCHER-NORRIS HARDWARE COMPANY, Covington, Ga., which has bought the bankrupt stock of Covington Hardware Company and will at once begin active business.

FROM E. B. HORSMAN & SON, who have opened a new Hardware, Stove, Paint and Sporting Goods store at Vancouver, B. C.

DEMING COMPANY, Salem, Ohio: Illustrated catalogue, 1908, of Spray Pumps, Nozzles and Appliances for various uses.

A New Parcel Post Measure.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., February 4, 1908.

An effort is being made in Congress to line up the minority, which includes practically all the Southern representation in the House, in favor of a new bill providing for a parcel post on rural routes, which has just been presented by Representative Griggs, of Georgia. There is no evidence that the Post Office Department is interested in this movement, and the Griggs bill differs materially from the Sims measure, which is understood to have been drafted at the Postmaster-General's direction; nevertheless, there is reason to believe that the department would accept the Griggs plan—certainly if it were offered as an experimental project—and retailers in all lines should follow developments with close attention.

The Griggs Bill.

The bill as presented by Mr. Griggs provides as follows:

Be it enacted, &c., that, beginning July 1, 1908, there shall be a parcel post limited to 12 lb. on every rural route in the United States. Said parcel post shall be confined exclusively to the rural route upon which the parcel originates and its rural connections, and shall not extend beyond said route upon which it originates and routes with which said route connects directly without the intervention of railroad mail service, star route, messenger or any other form of mail service.

Sec. 2. That the rate of postage on such packages shall be 5 cents for packages weighing not more than 3 lb., 7 cents for packages weighing not more than 5 lb., 10 cents for packages weighing more than 5 and not more than 8 lb., and 15 cents for all packages weighing more than 8 and not more than 12 lb.

More Radical Than the Sims Bill.

It will be noted that this bill is much more radical than that heretofore presented by Representative Sims, which has the Post Office Department's indorsement. The proposed cheap merchandise service is given the same limitations as applied to rural routes emanating from a single office, but in the matter of rates a much lower scale is specified. The Postmaster-General's plan is to charge 5 cents for the first pound and 2 cents for each additional pound up to 11 lb., making a maximum rate of 25 cents for the largest parcel eligible to transportation in the mails. Mr. Griggs, however, would have the service transport a 3-lb. parcel for 5 cents and a 12-lb. parcel for 15 cents. This would mean a rate on packages of merchandise of maximum size of only 1¼ cents per pound. Such a rate would be far less remunerative than that proposed in the Sims bill, not only because of the lower schedules of charges, but because it is fair to assume that the handling of merchandise on rural routes would be so stimulated as to require costly additional equipment and possibly a largely increased force of carriers.

A standard rural route is approximately 24 miles in length and serves not less than 100 families. The average carrier under existing conditions is just about able to perform the service, according to the schedules prepared by the Post Office Department, but resignations are constantly being received from those who find the service laborious, and readers of *The Iron Age* are familiar with the campaign that has been on foot for several years to secure an increase in the pay of carriers, which Congress in 1904 raised from $720 to $900. It goes without saying that any material increase in mail matter to be handled, especially if it partook of the nature of an express business involving the handling of large numbers of packages, would promptly result in the demoralization of the rural service and would force a reorganization on a far more costly scale than that now existing. The assertion that the revenues would increase proportionately with the expense is unsupported by figures or other convincing data, and even if it were true, it is difficult to see how any benefit would accrue from a project that would tend merely to keep the residents of rural communities away from the local retail stores.

In the "Interest" of the Local Merchant.

A rather ingenious argument is being used among Southern members of Congress in support of the Griggs bill. It is asserted that for several years the mail order houses have made large gains in the South and have secured connections with manufacturing concerns in that section, with a view to making short haul shipments direct from factory to consumer. The necessity for counteracting this movement is emphasized, and it is urged that "something must be done for the local retailer" to help him in his fight against his big competitor. The Griggs proposition is put forward as providing the relief "demanded" by the small merchant. Of course, it will be conceded that the statement regarding the activity of the mail order business in Southern territory is true, but it is equally true that the passage of the Griggs bill would simply afford these big concerns an opportunity to distribute their wares at far less cost than at present, while the retailers of the South, who cannot afford to pay postage on their current sales, no matter how low the rate may be, would find themselves at a much greater disadvantage than at present.

The Directory Scheme.

The scheme of the mail order houses to lobby through a bill under which they would be enabled to secure the names and addresses of all patrons of rural routes on the plea of compiling directories, has attracted much attention throughout the country, not only among retailers but among up to date manufacturers, who appreciate the necessity of protecting their customers against discriminatory legislation. President John H. Hanan of the National Boot and Shoe Association has taken up the cudgel against this bill, and has addressed a letter to every member of his association, in which he urges them to communicate with Congressmen and secure their opposition to the bill.

The National Association of Retail Druggists and several organizations in the tobacco trade have taken the matter up, and petitions, memorials and personal letters in opposition to this bill have already begun to pour in upon Senators and Representatives.

National and Pennsylvania Mutual Fire Insurance Companies.

At the annual meeting of the directors of the National Hardware Mutual Fire Insurance Company, held at the Fort Pitt Hotel, Pittsburgh, Pa., January 22, at which a full Board of Directors was present, the following officers were unanimously elected: C. H. Miller, Huntingdon, Pa., president and treasurer; W. P. Bogardus, Mt. Vernon, Ohio, vice-president; W. P. Lewis, New Albany, Ind., secretary.

On the following day, at the same time and place, the directors of the Hardware Mutual Fire Association of Pennsylvania also met and elected the following officers: C. H. Miller, Huntingdon, Pa., president; George V. Thompson, Mt. Jewett, Pa., vice-president; George W. Hackett, Sunbury, Pa., treasurer; W. P. Lewis, New Albany, Ind., secretary.

Mr. Lewis in assuming the duties of secretary of these two companies has removed to their established home office in Huntingdon, Pa., and has assumed the active management. Mr. Lewis was the first president of the National Retail Hardware Association and has twice been president of the Retail Hardware Association of the State of Indiana. He is widely and favorably known and is admirably equipped for the duties upon which he has entered. Mr. Lewis intends to devote his entire time to furthering the interests of the two companies and will attend a number of the State Hardware conventions soon to be held.

THE WATERLOO HARDWARE COMPANY, Waterloo, Iowa, besides making a specialty of the manufacture of United States Rural Mail Boxes, is gradually expanding its Hardware trade in a wholesale way.

Texas Retail Hardware and Implement Association.

THE tenth annual convention of the Retail Dealers' Hardware and Implement Association of Texas was held at Dallas on January 21, 22 and 23. The meeting was an exceptionally interesting and successful one, and was well attended. The convention was called to order on the morning of the 21st inst, by the president, W. A. Spangler, Bonham, who introduced in turn Mayor Hay of Dallas and H. S. Keating, representing the Dallas Implement, Machinery and Vehicle Club, who welcomed the Hardwaremen to the city in felicitous addresses.

Mr. McCullough's Address.

An interesting address was delivered by Mr. McCullough, representing the National Wagon Manufacturers' Association. After referring to the benefit secured by means of organized effort, he spoke in part as follows:

I would like, however, to correct an impression that has for some time prevailed with some people, that the principal use commercial organizations are put to is to increase profits by advancing prices, and this charge has been laid at the door of our association, because manufacturers, both in and out of our organization, have found it necessary because of increasing cost to make changes in their prices. Let me say frankly that we recognized some time ago that one of the greatest menaces to our line of trade was unintelligent competition, if you please—the fellow who kept

No Account of His Costs

and who made his prices on what he heard some one else was doing, the man who cut the quality of his goods in order to cut his prices, or who gave eternity of time, believing that the volume of business meant success. We have been working on this class for some time with fairly satisfactory results, but we got these results in a different way than many supposed—not by binding agreements or penalties, or any other sort of force, but simply appealing to them to learn their cost in detail, and, when necessary, showing them how to do it. You can get equally satisfactory returns in your own line if you will try it, for it is no fiction that more business men throw away profits by ignorance than by willfulness.

The Increased Price of Wagons.

In considering the increase in price of Wagons during the past year, and the fact that Implements have not increased in price much within the same period, the fact seems to be overlooked that the construction of Implements has changed very materially from a combination of wood and iron to one almost entirely or iron and steel, while the Wagon contains more wood than ever before; consequently, with an advance of over 100 per cent. in the cost of good hardwood during the past 10 years and the required investment of double the amount of capital necessary to carry it for seasoning, it does not require much of a scholar to account for every dollar's increase, to say nothing of the advanced cost of doing business in all lines.

No one can find fault with the manufacturer or the retailer who makes a study of his costs and demands prices that will net him a fair profit, but even all Wagon manufacturers do not profit by the efforts made in their behalf, for during the past few years an output of over 25,000 Wagons has been taken off the market by failures, and the fundamental reason of it was the manufacturers' lack of cost knowledge.

Selling Terms.

Just a word now as to selling terms, which is the subject demanding the attention of business men all over the country, especially in lines allied to the Implement and Vehicle business, because you and we have been a little more reckless about it than most any one else. It would be amusing if it had not such a serious side. Here stands the manufacturer, who must pay cash for everything that goes into his wares, while over there stands a consumer, who gets cash for everything he sells; still he does not pay cash except for luxuries or when some catalogue house offers him what he considers a bargain. Over $53,000,000 of his money went into the bank account of one of these mail order houses in 12 months, or an increase of over 25 per cent. over its previous statement, and there are many other mail order houses. Of course, this is not all for Implements, Vehicles or Hardware, but enough of it was to bring some of these goods to Texas.

Encourage Cash Patrons

We cannot change a time giving custom established when the State started to a cash business at a single leap, but we can come nearer meeting this direct sales competition if we talk the merit of goods more strongly and give those who can pay the cash the greatest possible advantage for their money.

It is not my purpose to tell you what terms you should make, nor to ask you to suggest terms for the manufacturers or jobbers, but simply that we are all three on an old time style basis, and if we do not change to more modern methods there will be an evolution one of these days that may land us high and dry. We are trying to perform double duty as merchant and banker, but we will succeed better if we get out of the banking business and turn our capital oftener.

I have no fixed set of terms to present to you for the Wagon manufacturers. There has been no agreement in this matter, nor on any other, but each manufacturer will present to his trade the best terms he feels able to make, and you will no doubt find them different in some cases than heretofore.

Co-operation Desirable.

As a general proposition it is felt by most manufacturers that all Wagons shipped during any current year should be paid for out of that year's crops, and that the due dates on all shipments should be arranged accordingly. They believe also that in all lines allied to Implements making necessary changes at the same time little, if any, trade disturbance can result, and therefore we hope you will co-operate in this effort to raise the whole Implement line a notch higher this year. Every economy of this kind will be felt in the matter of prices, and with the absolutely free and unrestricted competition that exists to-day you are insured getting the benefit of it. I trust you will make no mistake in judging the spirit in which the manufacturers present these matters to you to-day. It is in no sense one of dictation, but rather an explanation of the conditions we are absolutely forced to meet, and while these conditions perhaps have not been pressed upon you to the extent that they have upon us, it is only a question of time when they will reach you, and we are here to-day to suggest co-operation in applying a remedy that will benefit us both, not any more ourselves than it will you.

There is a very strong reason why terms should be shortened, that is that it puts the control of one's own business in one's own hands rather than in the hands of one's competitors, and as independence is valued by every man, these changes are a long step in that direction.

I leave these suggestions with you for what they are worth, but I desire to assure you that in working out these problems you will have the co-operation of the manufacturers and jobbers, whose purpose will be to make it as easy as possible, for they realize fully the desirability of doing these things in a manner that will not disturb trade conditions. But, nevertheless, certain changes are imperative, and the sooner we take hold of them and make them the sooner the task is finished; and as already stated, it is done by co-operation easier for all concerned, and the benefits will be equally divided.

Address of Newell Sanders.

The address of Newell Sanders, president of the National Association of Agricultural Implement and Vehicle Manufacturers, with its plea for co-operation between merchants and manufacturers, was listened to with much interest. Mr. Sanders spoke in part as follows:

The National Association of Agricultural Implement and Vehicle Manufacturers sends me here to bear you greetings for the coming year. I come to renew the friendship that has existed between your association and ours, and to express our strengthened belief in the wisdom of your associating yourselves together. I am here to give you fresh assurances of our good will and our sincere desire to co-operate with you in whatever is to your benefit as well as to our own. In this connection I wish to call your attention to the fact that next to your own association your greatest safety lies in our association. Every time we enroll a new member we add to the list of manufacturers who will do business exclusively through you and who will defend you against all comers. We have not changed our purpose in the least of recognizing you and of using you as the sole medium for the sale and distribution of the Implements and Vehicles we make.

It is also my pleasant duty to express to you our appreciation of your loyalty to us and of your strenuous work during the past year. We are not forgetful of the way you have vouched for our skill in design, our honesty in construction, and our intention to put full value into the goods. You have in most cases protected us against imposition. You have encouraged the timid buyer, have interested and educated the farmer, and you have shown him the cheapness of machines as compared with human labor and human life, which has all been to our advantage as well as to your own. You have made things go, and I here gratefully acknowledge the service.

Cost of Business Conduct.

We ask you to continue your endeavors to get all your members into ways of counting the cost of doing business, so as to insure themselves a profit and to reduce our risk in selling to them, and that they in every way endeavor to reduce their expenses and our expenses of conducting business. All they save for us will be saved for them finally. We are asking the dealers in all the States to help prevent unfriendly and unfair legislation to manufacturers living outside of the State. We especially ask this of you, Texas dealers, for our association has been obliged to spend thousands of dollars on account of a suit now pending in this State in which many of our members are interested, and in which much money will yet have to be spent in order to test the constitutionality of the law. We ask you to close up your sales when you deliver the goods, because by so doing there will be less complaint coming back to you and to us. We ask you to more than ever protect us against unfair claims for repairs. We ask that you treat fairly the inquiries sent you by such manufacturers.

Turning from Dangers Within to Dangers Without

we find what should be our chief work and concern for the coming year. It has been the custom for us to give you long time and for you in turn to give the farmer long time; but a cash system has been coming. Manufacturers formerly got long time on material for which they are now compelled to pay cash. They have been trying to stand this by borrowing large sums of money, but within the last few months borrowing has been difficult and high rates of interest had to be paid. So the shortening of time given on sales is imperative.

Then the cash system is coming from another direction—cash sales to the farmer by mail order houses. This may not be so serious yet in Texas as in the States further north, where it is coming very fast. It has brought prices to the farmer, and these prices will have to be met. I do not overlook the fact that there are many good reasons why the farmer should buy of the home dealer instead of a mail order house, but the question of prices will generally govern his actions. The only way to meet this new form of competition is for all of us

To Get Nearer to a Cash Basis.

Such farmers as pay cash to catalogue houses can also pay cash to you. If they were to pay you cash you could in turn pay us cash. It is true farmers cannot always pay cash, but in such cases there is a convenient equivalent, which is an interest bearing note. Just now it is difficult to use such notes, but generally it can be done. The concensus of opinion among manufacturers is that 1 per cent. a month is about the proper cash discount. This, for the average time given on Implements, will in most cases make up the difference between the time price you have been giving and the cash price, including freight given by catalogue houses. On the cash or interest plan the uniform retail price system which is so much deviled can be maintained. We dislike to speak of such an unpleasant alternative, but we are face to face with such conditions, that unless you can sell for nearer cash and buy for nearer cash at a lower figure, you are in danger of not being able to control the business, and we, in order to get it, will have to seek other channels for marketing our goods. It will take some time to bring about this new cash system, but it is high time that the beginning be made. We pledge you to most hearty co-operation, and we have full confidence in your being equal to the emergency.

Mr. Spangler's Presidential Address.

The annual address of W. A. Spangler, president, was terse and suggestive. We give the following extracts from it:

I am pleased to be able to state a fact that all now know, and that is that the obnoxious Occupation Tax law has been repealed, and from this time on that source of drain on the business of this State will be stopped. While other organizations and men have helped in the repeal of this law, the real success is due entirely to the labors of this association. We claim the right to say that the benefit that will accrue to the trade is due to us.

Landlord's Liens.

I desire to reiterate what was said by our former president, Mr. Penick, relative to the landlord's lien in his address last year, and to urge on our members and our Legislative Committee the importance of trying to have some changes made for the merchant's benefit in that general line. I believe that good will come to the general business of the country and that no one will be hurt.

Peddlers' Tax.

As you know, we tried to have a peddlers' tax law enacted at the last meeting of the State Legislature. We were not successful in this, but I hope the matter will receive your careful consideration. The facts justify us in demanding some action in this matter. I believe that we can leave the matter in the hands of our Legislative Committee, providing each and every member of this association will do his part when the time arrives.

The Pistol Law.

I desire to simply mention the passage of the Pistol law by our last Legislature. That law will be tested by the courts of our State, and I feel confident that it will be found to be unconstitutional; if not, then we will try to get some modification of the law, so that it will not give the catalogue houses and the mail order houses all the advantages in the State. Broadly speaking, while I do not care much personally about the law or its enforcement, yet it is of great interest to many of our members, and as we are out for the good of the many and for every member, I am willing to fight the battle when it affects any one or all alike. Under the workings of this law the number of pistols that are sold in the State will not be greatly diminished, and it is just that much taken from the general trade and given to outsiders that pay no taxes to keep up the State.

Formation of Local Clubs.

I believe that if it is at all possible we should have local clubs in every county in the State. It will bring the dealers more nearly together and help in many ways. Wherever these clubs have been tried they have been found to do good work.

Membership Certificate.

I also believe that we should have a certificate of membership, and that when a new firm or dealer becomes a member of this association, he should be issued this certificate and received into our association with a vote and with some signs that we are glad to have him as a member. This certificate of membership should be framed and hung in the office so as to tell every man that enters the same that we are not ashamed of our present company.

Parcel Post.

The parcel post and the catalogue house business are so closely allied that they may be said to be twin sisters. In fighting one we fight the other. No man can hope to do a successful business when both of these stray dogs are allowed to run loose at large. Every member of this association, as well as every dealer, whether a member or not, should get good and wideawake on the importance of this matter, and get to work. I believe that the association can do no better work than to begin plans for fighting the parcel post to a finish right now.

Trade Ethics.

I believe that our members have been loyal to the maxim of trade ethics between the jobbers and the manufacturers, and I think we are therefore in a good position and condition to demand true trade ethics by all jobbers and manufacturers. I do not hold that we are the only people that have rights, but I do claim that when we have acted justly then we are in fine shape to claim justice and not before.

Express Rates.

I am fully convinced that better express rates are being given to catalogue houses than the average business man can get. There is great need of work to make all rates equal. I hope [illegible] may go on record, with a view to the Federation taking this matter up and helping in the matter.

Secretary McManus' Report.

The report of J. W. McManus, secretary-treasurer of the association, was a voluminous one and covered many subjects of interest to the members. The report was the fourth annual contribution of Mr. McManus and was as follows, in part:

The retrospect shows a gratifying increase in our membership. In this connection I wish your attention called to the debt of gratitude we owe to certain of our brethren who, in spite of the press of their personal business, have made enthusiastic efforts, by writing letters and in other ways, to interest outside dealers in the association. It is just such loyal enthusiasm as this that

should be felt by every individual member. May not one of us ever slip an opportunity for speaking a good word for our good organization; on the contrary, if an opportunity does not present itself, let us make one. This is the spirit that will insure for the association increase in numbers and increase in beneficial power.

Insurance Exchange.

The first year of a concern, like that of a baby, is always fraught with perils and difficulties. It is with pleasure that I announce that our Insurance Exchange now a thriving infant and needs but the continued and increased support of our members to nourish it speedily into vigorous adulthood. This, however, it must have. Unfortunately, some of our people have been waiting to see if the exchange proved a success before subscribing to it. It would be just as reasonable to wait to see if a child were going to live before feeding it. However, these hesitating ones are now left without excuse for longer withholding their support, for the exchange has a record of nearly $200,000 insurance written in less than a year.

The exchange offers them superior inducements, and under right conditions they will be quick to recognize it and join the association in order to avail themselves of these privileges, if for no other reason. If, however, they see the exchange stunted in its growth by a lack of faith and support on the part of the very organization of which it is a part, we cannot altogether blame them if they do not manifest confidence and interest in it.

Parcel Post.

We are all familiar with the parcel post scheme which is being so strenuously pushed by Postmaster-General Meyer. If it is carried into effect the result will be so disastrous to the dealers that many of them will actually be forced out of business. In the face of this serious danger it is supremely necessary that we should form ourselves into an impregnable wall of adamantine opposition. Let our watchword be "Unity" and "Determination," and we shall win; otherwise, it is altogether probable that we shall fail.

Local Clubs.

One of the most effective lines of work that suggests itself to me for the coming year is the organization of county clubs. When men of identical interests get together in a social way and talk over their successes and failures, their mistakes, and what they have learned by them, they come to understand both their business and each other more thoroughly. Again, these clubs can be made effective recruiting stations for the association. Dealers who are not members coming in contact with those who are will see more and more the advantages to be derived from a connection with our organization; this in proportion, of course, to the zeal of said members in talking up the association.

Classification of Merchants.

Another subject of great importance is the proper classification of dealers. Sometimes a professed dealer, on being invited by one of our solicitors to join the association, states that he cannot do so, as he is not really a dealer in Hardware, Implements or Vehicles. If he says this merely as an excuse for not joining, he does it to his injury, for the reports of our solicitors are made public, information based on them being given out to the jobbers, commercial agencies, &c.

If any of our members discovers that a dealer is announcing himself, by his letterheads and otherwise, to be in the regular Hardware, Implement or Vehicle trade, when he is not entitled to recognition as such, he should first mention the matter to the dealer himself, and then call the attention of the commercial agencies to it, that they may classify him correctly. Members should also notify the information bureaus when such a case is found. Jobbers and manufacturers who really desire to protect the retail trade are sometimes deceived by such pretences, and thus led into selling to those who are actually nothing more than consumers. If constant vigilance were exercised along this line there would be fewer attempts made to secure wholesale prices unfairly.

Information Bureau.

I wish to make an earnest appeal to all members who have not already done so to avail themselves of the privileges of the information bureau. We should be very careful that we do not give any of our patronage to those jobbers and manufacturers who fail anywhere to protect the interests of the retail dealer. It is not fair to outselves to do this, and it is not fair to those jobbers and manufacturers who protect our interests. In order that we may make no mistakes in this direction we need to keep in close touch with the information bureau.

Association Solicitors.

Another subject of importance to which I wish to call your attention is that of our traveling men. Too often they send in discouraging reports, having been unable to secure business because of indifference or a spirit of postponement on the part of those whom they have approached. If you are not a member, and our solicitor asks you to join the association, do not put him off by saying that you will come in at the convention. Even if you have not the ready cash for fees and dues, make out your application with the promise to pay later; this will encourage the agent and make us feel that it has been worth while to send him out. Your promise to come in at the convention is necessarily indefinite, however good your intentions, for everything in this world is uncertain, and when convention time rolls 'round you may be for some reason unable to attend, and the temptation to postpone joining still longer will be strong.

On the other hand, if you are a member, and our man calls on you to talk about the exchange, do not content yourself with the excuse that you have no expirations near. By the time you have a policy about to expire the chances are that you will have forgotten to give the exchange your business, and the local insurance agent will get it—perhaps renewing the policy during your absence, you having neglected to advise him that you intended to place it elsewhere. We have been trying to impress upon our people the fact that we accept applications for insurance to be written many months later. We *want* them; they are an earnest of the support of our members.

Trade Journals, Their Value and Influence.

Beyond question the most successful tradesman is he who takes advantage of every opportunity to learn more about his line of business and the modes of handling it. This is the reason why so much emphasis needs to be laid on the importance of attending our yearly convention; but it is not enough for the dealer to depend upon the stock of new ideas he lays in on such occasions. A convention comes only once a year, but there are being issued weekly and monthly publications that are intended to keep the dealer posted regarding the latest trade conditions and developments, and it is money in his pocket to subscribe to a good number of these and read them when they come. He should also have his employees take them home and read them thoroughly.

A great deal is said about being "up to now," and that little phrase is pithy and significant. The world moves faster than it used to, and the way to succeed the fact and move along with it, perhaps it would be better to say. It is easy for a dealer to regard his store complacently, and believe that it lacks nothing in the way of goods and wise methods of arranging and disposing of them; but if he will read the trade papers he will soon see that some of his business brethren with fertile brains have inaugurated superior systems which it will be to his advantage to imitate. Under the searchlight of comparison defects will quickly be detected and remedies supplied. Again, these periodicals furnish food for thought by keeping the dealer continually face to face with the existing problems and impending evils that confront the merchant. If he ponders this well he will be prepared on an occasion like this to discuss them intelligently and crystalize his conclusions into wise and decisive action.

Furthermore, the dealer needs the trade periodicals to keep him informed as to the work that is being done by his own and other associations. There is nothing like plenty of information on these points to maintain enthusiasm in a member and inspire him to better efforts. It cheers him up when he is inclined to be discouraged and feel as though he was fighting the battle all alone. We are all familiar with the old saying, "In unity there is strength," and we recognize its great truth; it seems to me that we might invent another and equally true one: "In comradeship there is encouragement."

Canvasser Question.

It is plain that the solution of the canvasser question lies with the dealers themselves. By refusing to accept the services of canvassers they can make it unprofitable to the manufacturers to employ them. This step has been taken in some places and is an example that ought to be followed by dealers everywhere.

Warranty on Vehicles.

There are several matters on which we have cause to congratulate ourselves. One of these concerns the Vehicle warranty. The Carriage Builders' National Association at their convention 15 months ago passed a resolution favoring its discontinuance and appointing this subject for special consideration at their next annual meeting. When they met last October, so far from proceeding to carry out the plan outlined, they ignored it entirely. This triumph is due to united and vigorous protest that went up from the dealers at their various conventions and is a demonstration of the importance and power of an assembly like this.

Discount on Repairs.

Another item of success is the concession of 5 per cent. discount on parts and repairs, secured from the Interna-

tional Harvester Company by the National Federation at its last convention. This in a large measure nullifies the injury to the trade of excessive express charges. The best way to deal with any evil, however, is to remove it; counterbalancing it should be regarded as merely a form of temporary relief. There is no reason why the express companies should reap unreasonable profits, and the matter of restricting them in this particular should be laid before Congress for its prompt consideration.

Windmills and Threshers.

The question of having standing committees on Windmills and Threshers has been discussed to some extent heretofore, and I would recommend that before this convention passes into history such committees be established. I would also recommend that a Standing Joint Committee composed of five members of our association and five from the Dallas Implement and Vehicle Club be appointed to confer upon any questions that may arise concerning the interests of members of either organization.

Manual and Directory.

It is to be hoped that every one who receives a copy of our manual and directory will read same carefully and then keep it where it will not get misplaced. We justly take great pride in this our annual publication, and strive to make it better each year than it was the year before. Its purpose is just what it always has been, only a little stronger and surer. It is valuable as a reference book, containing as it does a list of the members of the association, our constitution and by-laws, a full report of the convention proceedings, our insurance plan, and other information of interest and benefit. In this connection I wish to speak a word for the firms which advertise in its pages. They help us by their patronage, and we ought to help them by ours, giving them the preference over firms that have not placed their advertisements with us.

Association Emblem.

The question of an association emblem has been touched upon at several of our previous conventions. As our organization becomes financially stronger we expect to be able to furnish this to our members; meanwhile, I would suggest that each have printed on his letter head the words "Member of the Retail Dealers' Hardware and Implement Association of Texas." This will have a salutary influence upon the dealer himself by continually reminding him of his membership, with its responsibilities and privileges, and will thus increase his pride in it. The jobbers and manufacturers who receive letters bearing this significant announcement will be more deeply impressed with the importance of the association. Also dealers who are not members will gradually find themselves desiring the right to print those words on their letter heads; so the adoption of this plan will prove beneficial in every way.

Retailing of Goods by Jobbers and Manufacturers.

We ought to make still more emphatic the stand we have previously taken protesting against the manufacturers and jobbers trespassing on the rights of the retail trade. When they realize that we have a keen eye on them and have no intention of relaxing our demand for just treatment, they will respect our interests and keep within their own proper spheres.

The Harvester Committee's Report.

The report of the Harvester Committee was presented by W. N. Jackson, and was as follows:

So far as the International Harvester Company of America is concerned, it is a thing of the past in Texas, as on the 12th day of August, 1907, it cancelled all contracts in Texas and withdrew from the State, which we think was a hard blow, both to the dealers and the farmers, as this company had been very lenient with its customers through the hard years in the wheat growing section, and had extended them accommodations by carrying the farmer's notes for him in those trying times.

The Texas Harvester Company, which was organized to do a jobbing business in Texas, will handle the International Harvester Company's machines, &c., and will still continue to make commission contracts on repairs, and they have agreed through their manager, J. M. Johnston, to allow 40 per cent. discount off 1908 pricelist as commission, which we regard very fair and equitable. This company is formed by Texas men with Texas money, and we think it should have the loyal support of all Texas dealers, as your committee finds them willing to do all in their power to benefit the dealer in the retail trade.

As regards the canvasser problem, will say when the trade demands it they will furnish the agent, the canvasser, and will pay his salary, and the local agent will bear the other expenses necessary. This matter, however, is left entirely with the local agent. We would recommend that under the conditions now existing the Harvester Committee be discharged, as in our judgment we will no longer need one.

Report of Freight Committee.

James R. Adams, chairman of the Freight Committee, presented an able and interesting report, from which we make the following excerpts:

To the Freight Committee there are at least two perplexing problems—i. e., the one of rates, the other of expedition, neither of which we have been able in any measure to solve and come to you with the bare statement of conditions as they are, with the hope that this body may find itself able to assist in their solution. Texas is no longer a pioneer country either from the standpoint of business transacted or the ability of the railroads, if they will do it, to give us quick transit at a reasonable rate. By comparison it at once becomes apparent to any thinking business man that there is an appalling and a discriminating, as well as an unaccountable difference in the rates south of St. Louis and east of the same point. The difference amounts approximately to 60 per cent., a difference which is entirely out of proportion, if, in fact, there should be any difference at all.

A Comparison of Rates.

For instance, on the same classification from St. Louis to Tyler, a distance of 592 miles, the rate on Implements, carload lots, is 74 cents per 100 lb., while from Chicago to Kansas City, 458 miles, the rate is 30 cents; Indianapolis to St. Louis, 240 miles, the rate is 13½ cents; Buffalo to St. Louis, 741 miles, the rate is 22 cents; Chicago to New Orleans, 923 miles, the rate is 33 cents.

Take another classification. On Axes, Pittsburgh to St. Louis, 621 miles, the rate is 27½ cents per 100 lb., while from St. Louis to Dallas, 679 miles, the rate is 79 cents per 100 lb. On Stoves, Pittsburgh to East St. Louis, 22½ cents per 100 lb.; St. Louis to Dallas, 678 miles, the rate is 79 cents per 100 lb. Pig iron is $7.28 per gross ton from St. Louis to Sherman, 668 miles; Pittsburgh to St. Louis, 621 miles, the rate is $3.30 per gross ton. The rate on coke from St. Louis to Paris is $4 per ton, distance 571 miles. On the same commodity from Connersville, a distance of 960 miles, the rate is only $2.80 per gross ton.

The above are carload rates. Less than carload rates, Cleveland to Sandusky, 190 miles, Nails go at 13½ cents per 100 lb. In Texas, the same distance, the rate is 65 cents. Cincinnati to Connersville, 128 miles, Buggies go at 24 cents per 100 lb. In Texas the same commodity and the same distance, the rate is 79 cents per 100 lb. Does this not look unreasonable and unjust? So through the whole category of classification and distances, by minute comparison, we find

The Same Relative Astonishing Difference in the Rates,

as herein before suggested. If there is any reasonable, satisfactory reason for this apparent discrimination, it should be forthcoming, and it is up to the railroads and transportation companies to render such explanation as will convince us that we are being dealt with, at least, reasonably fair. On the other hand, if they are unable to meet this demand, we should "do business," and seek to secure such a readjustment of these rates to Texas common points as will not deprive Texas merchants of their natural, legal and business rights, and as will not likewise give their competitors any due advantage or preference. This proposition demands and should have the immediate and active attention of this association.

Belated Transportation.

Now, to the question of expedition. There is no doubt but that the transportation companies are unduly careless in this matter. When it requires 32 days for the railroads to transport a carload of freight from Connersville, Ind., to Tyler, 23 days from St. Louis to Tyler and 38 days to get a car of Screen Doors from Malvern, Ark., to Tyler, there is a manifest negligence somewhere; and this negligence, in almost every instance, operates to the detriment of the shipper, since his stock in trade, which is his working capital, is frequently tied up for more than 30 days, cannot be reached and handled during that time by any one save the transportation companies, and they fail and refuse to do it. Why should the shippers be expected to sit quietly by and not protest at such conditions, when there can be no tenable excuse offered therefor? What good business sense is manifested in rolling stock so manipulated that its transportation business earns but $50 per month per car, when if the same car were handled with reasonable expedition it could be made to earn $150 per month?

This matter, as well as the question of rates, demands the immediate attention of this association and should have it. Our association is not now and never has been in the attitude of fighting the transportation companies;

on the other hand, we have, with the minimum amount of complaint, endured much and suffered long. We have come to the period in the business history of Texas when there must be "something doing."

There can be no consistency in the excuse that the higher rate to Texas points is due to a dearth of business, while at the same time they tell you that the reason they cannot get your freight to you more expeditiously is because they are worked beyond their capacity. There can be no consistency in the excuse that the reason they cannot handle your freight more expeditiously is because they are worked beyond their working facilities, while at the same time, with such enormous business, they persistently ravish us with a rate that is to us almost suicidal.

Committee on Heavy Hardware.

The following report of the Committee on Heavy Hardware was rendered by its chairman, D. K. Cason:

Your committee on Heavy Hardware beg to report that during the year no formal complaints of any kind from any member of the association, as to jobbers entering the territory, and taking or offering to take business from consumers or other than regular dealers. This is the one matter that, as we understand, was to be given our attention. We regret to advise, however, that a certain Texas jobber has in the past few days made shipments into a certain locality to a consumer, and we are pleased to advise that this matter will be promptly laid before the Grievance Committee for their attention.

Convention Committees.

The following committees, to act during the convention, were appointed by President Spangler:

NOMINATIONS: R. L. Penick, Joe E. Johnston, T. H. Jones.
FINANCE AND AUDITING: J. H. Hancock, R. W. Harris, H. C. Meyer.
MEMBERSHIP: B. J. Williams, Chas. F. Welland, Milton Patillo.
RESOLUTIONS: J. R. Cole, J. R. Adams, J. D. Carroll, G. H. Collins.
CONFERENCE: W. N. Jackson, A. M. Lewis, Jno. O. Turner.

Landlord's Lien.

Considerable discussion was had on the question of the landlord's lien, and Messrs. Collins, Schow, Risien, Boydston, Adams, Myers, Cason, Erwin and Jackson addressed the convention, explaining their views of the law. The impression seemed to prevail that the law was reasonably satisfactory. Mr. Cason said:

I believe the law is as nearly right as we can possibly make it. I don't believe it is good judgment to raise a number of legislative questions unless we are thoroughly convinced that we can better the conditions. I think when anybody takes an account he does it with his eyes wide open. It is a religious principle with me to make the men who work for me to pay their debts. I would discharge the best man in my employ if he refused to pay his debts, and they all know it. I am sometimes asked by our jewelry friend if so and so is a good man. I say, "Why, yes; I guess so. What does he want?" The reply will be, "He wants a $250 diamond." I say, "If he has the money to pay for it, all right, but otherwise he should not have it." The thing to do before opening these accounts with a tenant is to go to the landlord and say, "This man wants an advance, and I wish to know whether you will indorse the account." If the landlord does not indorse the account, and if the tenant has not some other way to secure us, then we do not take that account. I follow this as a rule and follow it as far as I can, and if I neglect to follow it I am apt to suffer. I think that if we were a little more careful in our credits we would do a safer and more profitable business. I don't believe we can by any legislation change the landlord system of the State.

President Spangler closed the discussion with the following remarks:

I think you had better get security for your debt if you can. If I am sharper than the other fellow and get my pay, I ought to have it. That is the proposition with me. The next proposition is, the sooner we cut out the man that we do not know anything about in a business way the better it will be for us, and for all other business men. We are only one branch of business men. If a man comes up to me for credit and I ask him if he has any backing, and he says he has no backing, then I say I do not want your trade. The Hardware dealers want to know that they are going to get their money. If I sell something that I am not going to get the money for, then I cannot pay the man that I get the goods from. We must secure ourselves against all of these contingencies, the landlord's lien, and everything. I think the landlord's lien gives a whole lot of chances for collusion, and is calculated to cause trouble to other business men. But, in a majority of instances, if you will go to the landlord at the right time and in the right way, not after the debtor has got away, but at the time you are going to sell goods to the tenant and talk to him in a friendly and straightforward way about the situation, you will generally have the landlord on your side.

How to Present Goods to the Public.

A paper on the subject, "How to Present Our Goods to the Trade," by S. K. Kennerly, was in part as follows:

This is a subject that I have studied for nearly a quarter of a century in Texas, and yet for all these years of experience I feel incapable of handling it with any degree of satisfaction even to myself.

First, I would arrange to have our stores properly filled with goods, no wide empty spaces greeting the eyes of would-be purchasers. To make a favorable impression on the passing public, and to make people pause, gaze, enter and buy, it is necessary to have system in the arrangement of our goods.

Our Show Windows

must be clean and the goods displayed to the best possible advantage. Inside the stores each department should contain the articles for which it was reserved. If a customer enters and calls for a Coffee Pot pilot him to the Tinware department; if a Pocket Knife, the Cutlery showcase, and his selection is soon made. If goods are in their proper places we can be prompt, and quick service means time saved to ourselves and also to our customer, and this gives him a very high regard for our business methods. The best pay customers do not have time to wait while we hunt under the counters or go through all the bins to find a 10-in. Plow Share. Prompt service and quick sales bear the best per cent. of profit.

So Arrange the Show case

that the farmer's boy will yearn for a Pocket Knife or a Fishing Line and Reel, and his daughter be filled with desire to possess a pair of bright, sharp Scissors shown therein. In other words, have the goods speak for themselves and make their own appeal to the people, while you stand ready to help the customer make up his mind if he hesitates.

But first, last and all the time

Be Honest and Truthful

in the presentation of every article for sale. Buy the articles that are suited best to the trade; represent them to be just what they are, no more, no less; sell them for a reasonable and just profit. If we know a Wagon Bed to be made of cottonwood, do not claim it to be poplar; but we can explain that the scarcity of poplar makes the use of the next best, which is cottonwood. This plan will bring to us the respect of the business world and the confidence of our fellow citizen, for no falsifier ever escaped his just punishment. I do not mean by the above to parade or advertise the bad points of our goods, but I do mean that we should never overrate them. And, moreover, we

Should Not Make Too Strong a Guarantee

on any article that we sell. The goods are just what they are, and we can stand by them only as such. If we attempt to do otherwise we lose our profits and the confidence of our customers. Man is a cautious animal, afraid of what he does not see and does not understand. If he buys an article upon which we have put an extra guarantee, and said article proves unworthy, if no other loss, we have lost his confidence, and ever afterward he doubts our veracity and suspects our business integrity.

Leaders.

Another thing, I have never been a strong believer in the theory that a merchant should cut the entire profit out of one branch of his business to boost up the other. Let each article bear its proportionate part of the profit, according to the number of times it is turned over during the year. In all retail businesses special articles are used as leaders. Care must be taken not to spend too much time on these leaders. People know we have them, and let the leaders take care of themselves, while we work on a more profitable branch of our business. Profit is what counts in business, and the persistent efforts to push leaders to the neglect of the more profitable branches will surely find us at inventory time with the balance on the wrong side of the ledger.

Firmness in Pricing.

Further, if an article is worth a dollar, say so with the firmness that will carry conviction to your customer. Do not get frightened and sacrifice the profit if he threatens to go elsewhere for cheaper goods. Admit that cheaper goods can be found for less money. That is, admit that inferior goods for less money can be found, but not cheaper; for no good article was ever made that

was not patterned after on a cheaper scale. It is far better for our customers to say of us, "I paid a tall price for it, but it was worth what I paid," than to say, "I gave but little for it, and it was not worth that little." The holdfast customers are the ones that can buy the best goods.

Never Gauge Your Customer's Pocketbook

by your own, for nearly all of us have a streak of stinginess in our nature, and our streak of stinginess might prompt us to buy a $25 Stove for our wife, when our customer would prefer a $50 Range for his bride. So present the best goods first, and then scale down. Charge a reasonable profit, and leave it to the judgment of the customer, and you will scarcely ever miss a sale.

It is sometimes necessary to sell an article below cost, but it is not always necessary or good judgment to impart this to the customer. Offer it to him at a certain price, and he naturally thinks that price covers some profit for yourself. If you should tell him the price was below cost he would not believe you, or would get suspicious of the goods. People are often suspicious where there is no just cause for suspicion.

When the Ladies Enter the Store

for a box of Tacks, detain them at the showcase and show them the new styles in Percolators, the new designs in Enameled Ware and such other things as are necessary in the kitchen. All good housekeepers recognize the value of such articles, and are glad to buy, and more glad to buy from the man who is thoughtful, courteous and interested in selling his wares.

Make friends with the people, not only for the sake of selling goods, but also for the joy of good fellowship. The goods will sell themselves to those who like and trust us.

Following Mr. Kennerly's address the topic was submitted for discussion by the president, who called attention to one point made by Mr. Kennerly, to the effect that the merchants should commence up and scale down. The president asked "How many of you commence down and scale up." In response, Mr. Jackson spoke as follows:

That is a matter of difference of opinion. In making sales of any kind, I think it depends a good deal on the judgment of the salesman and sizing his customer up. If you told one customer that you wanted to sell his bride a $60 Range, you might scare him so bad that he would not buy anything, while at the same time you might show him a $16 Stove and make a sale at once. You must know your customer. Whenever you take a lady customer in to show her anything, no matter what kind of girl she is or where raised, she likes pretty things and she likes to be shown pretty things that you may know that it is impossible for her to buy; but you flatter her vanity if you show her pretty things, even if they are out of her reach. If it is a lady customer commence on the highest price first; if it is a man customer, show him what he wants, or you could commence on the lowest price first, depending on circumstances.

Getting People Into the Store.

The president then submitted as a topic for discussion the question as to "How are you going to get your man into the store?" He said that one of the points made in Mr. Kennerly's paper was that the merchants should have their windows nicely decorated. He happened to be in a place not long ago and noticed in a merchant's show window which was arranged very attractively, that he had some Clothes Pins exhibited—some three dozen for a quarter, some for 10 cents a dozen straight and some at other prices. He thought it a good plan to make goods talk for themselves by having them displayed in an effective way.

Continuing the discussion, Mr. Meyer made the following remarks:

No man passes by my door but what I give him a hand shake or a salutation, and no one comes into my store but I meet him with a cordial hand shake and a smile. I have different clerks to wait on different trade. There are some people I cannot sell, but some of my clerks can, and I size them up as they come in and turn them over to the right man, and if the clerk fails with him, then I take him. I have been in the trade 30 years, but I cannot always size a man up as to whether he wants a $50 Range or a $15 Stove. I make my store as attractive as I can. If I am tired I sit down at my front door and no man passes there without getting a kind word from me. I believe in attending to the details of the office, but if you will pay more attention to the details in front you will have better success.

Mr. Collins said:

As to display in the store and around about the store, that is essential to the success of any business; so much so, that in fixing up my store as to furniture and fixtures and the means of presenting my stock to the public, I have spent possibly $2500 or $3000. It embraces every department of the business and it has always proved very profitable to me. I have a place for everything in my store, and I have every particular thing in its place, and have it so cared for that time does not affect it one way or the other. I carry Hardware and furniture, and if a lady comes in my store for anything, say furniture, I never price the furniture at the start, but simply carry her around through the stock and watch her very carefully, and I will soon note the character of her taste, and by the time she gets through looking I have about sized up what she wants. I always find out whether she is purchasing to fit up her own home or whether she is buying things for a rented home, and if she is buying for her own permanent home then it is better to show her the best articles. But if it is a temporary home, nine times out of ten it is a mistake to show her the best stuff, at first at least. In other words, it is better to fall in line with her necessities and carry her to the goods that would be practical and sensible for her to buy. For instance, if she starts in by looking at stoves, and if she stops in front of a range and seems interested, that gives you the opportunity to discuss the range; but if she passes by something that she is not able to buy, then you can commence at the bottom and range up. Ordinarily I would start at the top if she was buying supplies for a permanent home.

Do You Advertise, and How?

This was the topic assigned to J. E. Johnston, whose paper was in part as follows:

I believe in judicious advertising, and it is one of the best investments that a merchant can make. An advertisement should be twofold in character. First, and most important, is to establish the reputation of the house. When you have done this you have reached one of the goals of success. There are very few people who like to trade with a firm which has no established reputation. It may be true that bargain prices offered at times to catch the trade will be appealing, but there will always be a suspicion that all is not as represented. I find it much easier to keep a customer than to gain a new one, because we make it a rule to see that our customers are satisfied, though at times we may suffer loss to satisfy them. One displeased customer can do more harm in a week than all the profit you could make out of him in a year.

Confidence Is One of the Chief Assets

of every well established business. Destroy this and your road to fame will be rocky indeed. The local business man cannot afford to make false and misleading statements like some of the pirates in distant States, who sell their goods on misleading representations, "fully guaranteed," subject to the conditions on the other side unknown to us. We must come in contact, face to face, with our customer, while the other fellow is immune and cannot be reached except by an epistle in the hands of Uncle Sam.

I try to make a confidant of all of my customers, and in this way I find out a good many things of interest to me. One of the chief arguments of the catalogue house is that they can save the customer money on any article from a pin cushion to a threshing machine, knowing as they do that when they touch a man's pocketbook they have hit him in a tender place.

In order to make this convincing, they quote prices on some standard articles that will be a clincher. They know if they can make a customer believe that you have been charging him too much that he will not come to see you. If you gain the confidence of your customers, as you should, you will have a chance to contradict this impression, for I truly believe that, with the exception of a few articles which are put out as a bait, there is not a dealer in Texas who cannot

Meet the Prices of These Houses

and make a nice profit, class and grade of goods considered. We are doing it, and in many instances make a better profit than on staple and high grade goods. We do not represent the goods as standard or high grade, for we have to meet these people again, but we can tell them that we believe the goods are worth the money asked for them, and most of our customers buying this class of goods have been pleased, while others have come back and traded them to us for a better grade.

Don't Knock Your Competitor.

Another good way to advertise your business is, don't knock your neighbor. Sell your goods on their merits and not on the demerits of your friend across the street,

or maybe in some other town. Remember you cannot do it all and he also has a right to live, and perhaps a family to feed also. The golden maxim will help you to "render unto Cæsar the things that are Cæsar's, and unto God the things that are God's," and you will find your journey through life much happier.

I advertise through the press and by circular letters. To my regular customers I believe the latter more effective, because I can say to several hundred people at a cost of little postage and a few hours' time what it would take me many days to say to them individually, if I had a chance to do so; besides, with this circular letter you can send a small folder describing some article that you wish to call their attention to.

The catalogue houses realize the value of this kind of advertising, for they do more of it than any other class. They never let up when they get a man's name; they keep after him, and if we, as local dealers, don't do something to counteract it they will land him, and we will not be at the landing either.

The man who believes he can get business without expense or effort is sure to be disappointed, as well as the man who sells his goods without a profit in order to down his competitor. Merit and not prices is the best medium to use in getting trade. The man who buys a thing because it is cheap usually wakes up to the fact that he has bought a cheap article.

Be Honest in All Your Statements.

If you are selling something that you cannot recommend, say so. It is better to tell your customer than to let him find it out and tell you about it.

Courteous treatment is another good way to advertise. See that every one, no matter the color or the nationality, is kindly treated, and don't be afraid to use the little words "thank you," for the man who spends his money with you does so voluntarily, and this much he has a right to expect.

Make it a duty to give any information you can when called upon, for we all have to get our information from each other, and none of us know it all, for many a time a word fitly spoken will prove to be apples of gold in pictures of silver.

Merchants' Relations with Each Other.

M. H. McKoy had for the subject of his paper "Relations of Dealers in the Same Town to One Another." Mr. McKoy's paper was as follows, in part:

We take it for granted that you and the other dealers of your town are all on good terms; that each of you want to make better merchants of yourselves and a better town for all of you, and that you included this in your resolutions for the promising new year, 1908. However, if we are mistaken, if this condition does not exist at your town, if neither of you are doing your duty, if you are day by day neglecting opportunities, if you are having trouble with your competitors, you without cost can help the matter very greatly by looking into the mirror of justice. Quietly sit down and look yourself squarely in the face and ask yourself the question, "Have you done everything possible to make bad matters better?" Make a note of every item you can think of in the past six months that you have done that you should not have done; examine the records and see if you have neglected an opportunity to do your full duty toward your competitors. After all, possibly, the other fellow is not to be watched with so much scrutiny. Turn the eye of criticism upon yourself; watch and see that you do not overstep your rights. Be careful that you do not commit the same or worse deed than the one you are accusing your neighbor of.

We would like to suggest a few things for you to do and not to do, if you would better existing conditions and have easier sailing. Some of these few things we would like to emphasize. Get better acquainted with one another. Be friendly, social, courteous, compromising and businesslike. Visit occasionally, and talk to one another about your affairs. Co-operate with one another, for in this great good can be accomplished in many ways.

Buying Together.

Many times, even in small local shipments, you can buy together even different brands and save half the freight, and especially so when you make up car lots from the same city. When you are temporarily out of some certain article, talk with one another, but be careful and don't let this become burdensome. If your competitor carries some certain line that you do not carry at all, use your efforts to help him sell it. When your customer calls for such goods tell him where he will find them, and hold the trade in your town.

Get the Association Idea,

each of you using your combined efforts in the same direction and for the same ends, and you can and will accomplish many things, whereas as an individual it will be an utter impossibility. If, for any reason, you have a grievance, don't lose a meal or have a nightmare about it, but go like a man to the offender in a gentlemanly businesslike way and cooly and deliberately tell him so, and after a little explanation on the part of both of you you will be better friends, and no doubt have a satisfactory adjustment. Never join your customer in speaking ill or finding fault with another dealer. You will have your hands full keeping the same fellow from talking of you in the same manner; change the conversation. Do not do or say things in public that are calculated to antagonize. Do not say things about other dealers that you would not have them hear, for they will hear it, and the story will have grown by the time it gets to them.

Don't Write Your Advertisement

in a way calculated to throw slurs at some certain dealer, for such is a waste of money, and often times the other fellow gets the benefit. Don't talk evasively or in a half-promising way to a traveling salesman, to keep him from seeing another dealer; if you cannot handle the proposition let the other fellow have it. Don't be overanxious to get the other fellow's customers; sometimes he has some that he wants you to have, and, besides, there are some in your territory that neither of you have; the catalogue houses and other houses have them. Use your efforts in this direction.

Don't Decry the Defects or Faults

of other dealers or their wares to a customer; talk only the merits, the points of advantage, mechanical construction, ease of operation, of your own goods, and you will be busy.

Don't Pry Into Another Dealer's Affairs,

through a traveling salesman, as he is a friend of both of you. Don't bother or talk about the other fellow's unwise credit sales and ultimate losses, but make fewer mistakes yourself.

Don't try to buy the same brands of goods your competitor has in order to have the same thing at a little less price; get something different and better, if possible, that will bring as good a profit and will give your business individuality.

Don't always try to see if you can sell for a little less than the other fellow, but get as good a price, at least, and your profits will look better at the end of the year.

Don't try to make it appear that you are a little bit the biggest merchant by placing a larger order than the other fellow, because the bills are harder to pay. Never get the idea that you are the "whole cheese," for the other dealers and the neighborhood will always accord you the right of being a part of the hoop only.

S. Norvell's Address.

S. Norvell, president of the Norvell-Shapleigh Hardware Company, St. Louis, was present at the convention and made an able and interesting address on the subject of parcel post. He was greeted with prolonged applause at the close and was given a standing vote of thanks. Mr. Norvell's address will be given a place in a later issue.

Other Papers.

Other papers read during the convention were: "Keeping Stock," by H. C. Meyer; "Getting Unsalable Goods Out of Your House," by D. K. Cason, and "The Traveling Salesman and His Duty to His Customer," by Charles Weiland, the publication of which is deferred until later.

Election of Officers.

The officers chosen to direct the affairs of the association during the ensuing year are as follows:

PRESIDENT, O. E. Schow, Clifton.
VICE-PRESIDENT, J. R. Cole, Sherman.
SECRETARY-TREASURER, J. W. McManus, Dallas.

Diabolo?

Parker Brothers, Inc., Salem, Mass., and Fuller Building, New York, whose product is also marketed by Von Lengerke & Detmold, 349 Fifth avenue, New York, to the retail trade, have recently begun the manufacture of the indoor and outdoor game, Diabolo, originally brought out in France, and for which Parker Brothers have exclusive rights in the United States. Diabolo, so named by Fry, the noted English cricketer, is the reconstitution of a similar game practised for ages, it is said, in China, and a century ago in France, in a crude way, the present invention being developed and patented by Gustave Philippart, a French civil engineer. Diabolo is variously alluded to as a spool, ball, bobbin or double top, which spins, accomplished by the union of two cones accurately

balanced and having rubber rims and caps at each end. It is spun, thrown and caught by means of a silken or other cord attached to the ends of two wands or sticks. When expertness is acquired it can be played at long distances by teams of two, four and six players, like tennis, ball, &c., preferably on a tennis court, but requiring under such circumstances more skill and greater athletic effort. Skilful players are said to be able to throw the Diabolo 40 to 45 meters (135 to 150 ft.) in the air, catching it on the cord fastened to the ends of the two handled sticks, as it descends. Practice will soon enable the novice to master the rudiments of the game, but expert play requires months of practice, as in other similar sports, with the advantage that it can be played in modified form indoors any time, the soft rubber caps and light weight



Fig. 1.—Two Views of the Diabolo.

giving its use a wide range. Diabolo is played by placing the spool on the ground, when the player lifts the right wand, thus causing the Diabolo to rise and begin to rotate or spin. In order to maintain the balance of the spool the spinning movement must be accentuated, the player striving to keep the two wands parallel to the axis of the spool. The Diabolo is approximately 2¾ in. long, 2½ in. diameter of rubber at ends, weighs 3 oz. and has in the finer grades celluloid cones, each with a circular hole which causes the Diabolo to hum at a speed of about 3000 revolutions per minute. The cones are connected by a finely adjusted brass center, mechanically accurate to the thousandth of an inch, it is said, which is necessary to insure a proper balance in expert play. The first effort of a player is to learn to rotate the Diabolo, learning

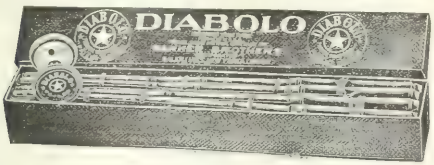


Fig. 2.—The Diabolo Set Complete.

to toss it as expertness is acquired. The rubber ends and light weight permit of a somewhat restricted use in the house, gymnasium, club, armory, &c., out of doors obviously allowing of a wider range of play. The intrinsic value of the game is largely in the dexterity it requires, training of eyes, mind and body and the possibilities of development and manipulation varying with the individual and faculty of origination. While team play affords more excitement and adds zest, an individual can benefit his entire body in a healthful exercise without undue exertion. Full instructions, thoroughly illustrated, accompany each set, of which there are a number of styles, each set being in an individual box, one of which is shown complete in Fig. 2.

TERRELL'S EQUIPMENT COMPANY, Grand Rapids, Mich., manufacturer of steel shelving, bins, trucks and sheet metal specialties, has recently designed two new steel bin racks. One, for light articles, styled No. 1014 R, is 124½ in. long, 60 in. high and 16 in. deep, containing 60 compartments measuring 12 x 15 in. The other, for heavy articles, is styled No. B R—A, and is 84¾ in. long, 80 in. high and 24 in. deep, with bins measuring 25½ x 23¾ in. All racks are shipped knocked down, but are easily assembled. The company also calls attention to its line of lockers.

White Mop Wringer.

The White Mop Wringer Company, Fultonville, N. Y., is putting on the market a new wringer, the feature of which is that, except for the wood handle by which it is operated, it is made entirely of malleable iron, instead of



White Malleable Iron Mop Wringer.

sheet iron, so that it will not rust out. The wringer is constructed on the same general principles as the rest of the White line, and bears the usual warrant and guarantee of satisfaction. It is made in janitors' size, Nos. 7 and 8, the former designed for round and the latter for flat mops.

Boss Step Ladder.

The Boss ladder here shown is a recent addition to the line of R. W. Whitehurst Company, Norfolk, Va. It is made of lowland cypress, which is straight grain,

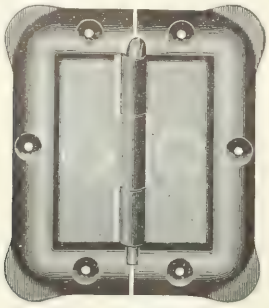


Boss Ladder.

strong and light; pine was found to be a little heavy. Every step is braced, as shown in the cut, preventing side motion, and the legs are also strong and well braced. The ladder is put together with screws, and is offered in natural wood finish in 3, 4, 5, 6, 7, 8, 10 and 12 ft. lengths. Pail rests are furnished on 6 ft. and over.

Hercules Steel Spring Hinge.

The accompanying illustration shows the new model of the Hercules steel spring hinge, as it is now made by Cleveland Lock Company, Cleveland, Ohio, having a much larger flat bearing surface than before. The hinge is referred to as one of the largest on the market, being 3¼ x 3⅜ in. in size, and made on complete new dies. The springs are made of spring steel wire, especially manufactured for the purpose. The hinge is light in weight, will not break from a slight rap with a hammer

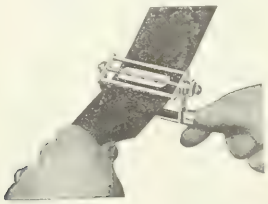


Improved Hercules Steel Spring Hinge.

and can be screwed down on an uneven surface without injury. The finish is said to be especially good, with the surface free from irregularity, lumps, &c. Hinges are packed 1 gross to the case, 1 dozen pairs to the box.

Gaylor Automatic Stropper.

L. B. Gaylor, Allston, Mass., is offering the device here illustrated for sharpening the blades of safety razors. On account of their moderate cost the usual practice with such blades is to discard them after they have been dulled by use. With this stropper it is claimed that they can be easily and quickly sharpened and made as good as new, not only once but many times. This, of course, effects a great economy in the cost of blades. In using the stropper, after the strop leather has been put in proper condition, the blade should be put in position where it is secured by a sliding pin. The leather is then passed through, as shown in the illustration, and the stropper moved quickly up and down, bearing on lightly as in stropping an ordinary razor. After some 20 strokes the blade should be reversed and the process repeated. A blade can be stropped keen, it is said, in

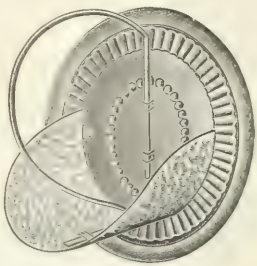


Gaylor Automatic Stropper.

about 2 min. No skill is required so far as operation is concerned, since the action of the stropper is entirely automatic. The stropper is put up in a neat box 7 in. long by 2½ in. wide, which also contains a horse hide strop of best quality. It is also furnished in a smaller box without the strop.

Wagner Flue Stop.

An improved device known as the No. 65 scoop flue stop, herewith illustrated, is a article that has been added to the line of hardware specialties made by the Wagner Mfg. Company, Cedar Falls, Iowa. The circular cover is made of gold lacquered tin ornamentally embossed, and is firmly held in position by a loop wire spring fitted to the back of the cover. An effective feature of the cover provided to guard against the spilling of soot and ashes on removal is the scoop attached to the back, which is inserted in the flue hole. This is made of

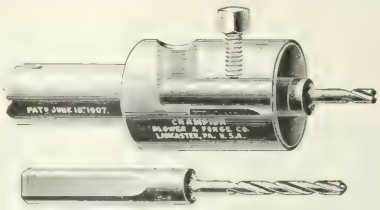


Wagner Flue Stop.

galvanized iron, and not only holds deposits of soot, ashes and dust, but also catches creosote, which often leaks out of the flue hole, marring the walls. The stops are not only effective in their operation, but are neatly finished and do not detract from the appearance of the wall. They come packed one dozen in a box.

Champion Neverslip Drill Chuck.

To eliminate trouble in holding the drill bit, the Champion Blower & Forge Company, Lancaster, Pa., is now furnishing the Champion Neverslip drill chuck, here illustrated, on all Champion drills without extra charge.



Champion Neverslip Drill Chuck.

This invention is a square shoulder in the chuck, which permanently meets the flat side milled on drill bit shanks now regularly offered by drill bit manufacturers. It is explained that the square shoulder takes all the strain from the set screw since the square shoulder in the chuck in connection with the flat side shank of the drill bit holds the bit as firmly as the combined strength of the solid metal of both shank and chuck. The chuck is recommended to users of drills on the ground that it enables the drill to do truer work and practically doubles the life of the drill bit.

Aqua Waterproof Leather Belting.

The Shultz Belting Company, St. Louis, Mo., whose New York office is at 111 Chambers street, is featuring its line of Aqua waterproof belting. Although made of leather, the company states that the belt is proved by tests to be absolutely waterproof, steamproof, oilproof and acid fumeproof. It is also asserted that it is not affected by extreme heat or cold or by sudden radical changes in temperature. The fibers are said to be more dense than oak tanned belt, making it exceedingly strong and practically without stretch. It is also said to transmit a maximum of power, as the surface is such that it does not slip, but hugs the pulley, even conforming to slight inequalities that some belting will not touch. It is especially recommended for paper mills, bleacheries, dye houses, laundries, hat factories, automatic screw machines and other drives where the belt is exposed to water, oil, steam, acid fumes, &c.; also for a drive that

crosses from one building to another where it can be used with equally good results without building a waterproof, air tight inclosure for it.

Gaba's Sash Retainer and Anti-Rattler.

The Patterson Tool & Supply Company, Dayton, Ohio, is putting on the market Gaba's patent sash retainer and anti-rattler for car windows, views of which are here given. Fig. 1 is a front view of a window equipped with the device, with sash partly raised; Fig. 2 shows the lock and tooth bar, and Fig. 3 is an enlarged view of sash, tooth bar and lock. The latter indicates how it is applied to the sash, its wedging power and the automatic wedge at the top of the sash, which holds it as firmly as the one at the bottom, making the sash rigid. The device is said to be a positive anti-rattler, dust, water and air proof, holding the sash any hight desired and locking automatically when it is left either up or down. It is held against the outer strip so tight that it will hold the

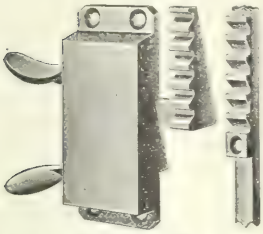


Fig. 2.—Lock and Section of Lock Strip or Ratchet.



Fig. 1.—Window Partly Raised, Equipped with Gaba's Sash Retainer and Anti-Rattler.

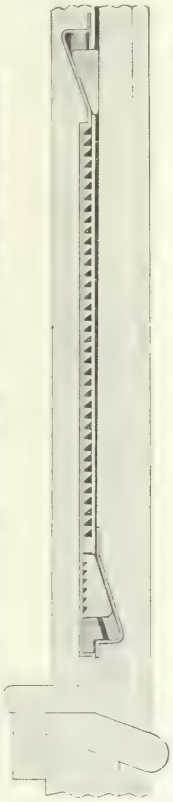
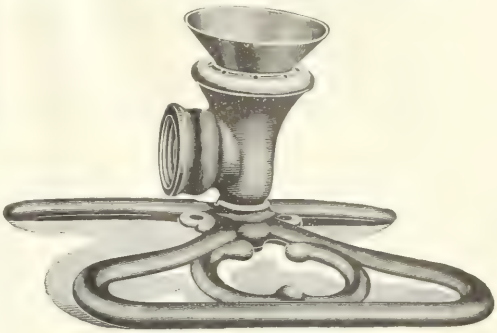


Fig. 3.—Side View (Enlarged) of Sash, Showing How the Lock Strip is Applied.

finest of tissue paper. It does away with the weather strips on the outer side, which are an expense each year. The retainer is so adjusted that it can have 3-16 in. play on all sides if so desired, allowing sash to work easy at all times under any and all exposures of weather. It is impossible to drop the sash, for as soon as the lock is released with the hands the weight of sash takes all labor away from the lock spring. The heavier the sash the better the results obtained from the retainer. The lock can be applied to any car without the expense of new sash or strips. It is very convenient to the traveler, for he can have any desired ventilation, from 1-16 in. to full hight of window. The retainer is a neat fixture, there being no ratchet exposed to mar the beauty of the car or to obstruct the cleaning of it, everything being hid behind the strip except the lock.

Rain-Bow Lawn Sprinkler.

The Turner & Seymour Mfg. Company, Torrington, Conn., is now offering its Rain-Bow lawn sprinkler, mounted on a sled, as shown in the accompanying illustration. In 1907 it was made with a spike only. The



Rain-Bow Lawn Sprinkler.

hight of the Sprinkler is 3⅝ in., and the top has a spread of 2⅛ in. The runners are 6½ in. long. The spreader and top are of thick brass. The sled has rounded corners to prevent its tipping, and is made so that cords may be attached to draw it about. There is said to be nothing about it to rust or wear out. Under high pressure it throws a spray covering an area of 35 to 40 ft. in diameter. It will also work well under low pressure and, the company claims, will not flood the lawn or wash the earth from the roots of the grass.

Unique Fruit and Vegetable Pitter.

The Mosteller Mfg. Company, Chicago, offers the Unique fruit and vegetable pitter illustrated herewith. It is made of non-corrosive metal, and all parts are said to be strong and easily accessible for cleaning. In use the point of the Pitter is placed below the eye or pit to be removed and inserted the required depth; then the

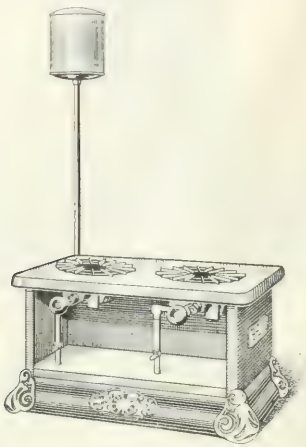


Unique Fruit and Vegetable Pitter.

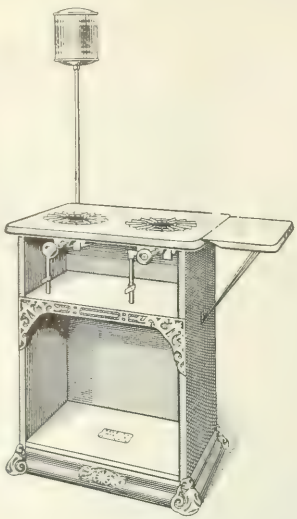
lever is pressed down with the thumb. After removing the pit the thumb slips off the lever and the reaction of the knife will discharge the contents. It is explained that pineapples should be peeled before the pits are removed. The utensil is recommended as a cheap and practical article for hotel, restaurant, or household use, in pitting pineapples, removing specks from potatoes, apples and other fruits and vegetables, and for testing cheese and other products.

One Minute Stove.

The Novelty Mfg. Company, Jackson, Mich., ma[ker] of an extensive line of oil stoves, has perfected [a spring] now putting on the market the One Minute stov[e] derives its name from the fact that it can be lig[hted] the flame brought to a full head in 1 min. The[y] the result of exhaustive experiments to mix air [with] generated from kerosene oil to produce the [most] amount of heat at the lowest cost. It burns a blue flame, but eliminates wicks, asbestos rings, perforated rings, chimneys, &c. It is said to be absolutely odorless. The flame is controlled by a needle valve similar to that used in gasoline stoves. When the valve is open the gas is permitted to enter the combustion chamber directly under the burner cap, together with a sufficient amount of air to create perfect combustion. Denatured alcohol is used in lighting the burner, and it is estimated that 1 gal. is sufficient to operate the burner for one year. This is commended as being low in price, obtainable at every point in the United States, and free from odor. The stoves are furnished in five styles, three juniors and two seniors, each illustrated herewith in the two-burner size. The No. 72 stove is 12 in. high and has a 15 x 22 in. top. Its weight is 24 lb.; shipping weight, crated, 33 lb. The No. 74 stove is 30 in. high and has a



One Minute Stove, Junior, No. 72.



One Minute Stove, Senior, No. 74.

18 x 25 in. top, with 7 x 15 in. side shelf. Its weight is 37 lb.; shipping weight, crated, 60 lb.

Dixon's Gem Eraser.

The Joseph Dixon Crucible Company, Jersey City, N. J., is offering a new erasive rubber styled the Gem. It has been perfected as a result of much experimenting and experience, and is made of the best material. Although pink in color, it does not leave a trace of color on any surface. It is described as a soft, flexible eraser that feels good in the hand and quickly removes pencil marks without injury to the writing surface. Its texture is pliable and velvety, and there are no gritty constituents which would dig into the paper; before doing so it is claimed that the rubber itself will yield. It is especially recommended for draftsmen, and is particularly adapted for cleaning up drawings.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, State and Western, raw	11 @12
City, Boiled	12 @
City, Raw	11 @
Raw, Calcutta, in bbls	07 @
Lard, Prime, Winter	68 @72
Extra No. 1	51 @53
No. 1	49 @52
Cotton-seed, Crude, f.o.b. mill	31 @31½
Summer Yellow, prime	40 @41
Summer Winter	42 @
Yellow Winter	45 @
Sperm, Crude	60 @
Natural Winter	75 @
Bleached Winter	75 @76
Bleached Winter, Extra	@
Tallow, Prime	59 @61
Whale, Crude	35 @36
Natural Winter	40 @
Bleached Winter	49 @51
Extra Bleached Winter	55 @54
Menhaden, Brown, Strained	41 @42
Light Strained	41 @42
Neatsfoot	@
Southern	37 @
Cocoanut, Ceylon	₱ lb @
Cochin	₱ lb @ 8¾
Cod, Domestic, Prime	@
Newfoundland	41 @36
Red, Plain	40 @42
Soya	₱ lb @
Olive, Yellow	@
Neatsfoot, Prime	@
Palm, Lagos	₱ lb @ @15

Mineral Oils—

	₱ gal.
Paraffine, 32 gravity	12 @
30 gravity	12½ @
Summer	@
Crinoline, light, Filtered	10 @11
Dark, Filtered	08 @
Paraffine, 800-807 sp. gravity	11 @11½
823 sp. gravity	11½ @
883 sp. gravity	11 @11½
Red	12½ @14

Miscellaneous—

Barytes:	
White, Foreign	₱ ton $18.50@20.50
Amer. Blanc Fixe, No. 1	₱ ton 19 00@20 00
Off color	₱ ton 13 00@16 00
Chalk, in bulk	₱ ton 3.00@ 3.40
China Clay, Imported	₱ ton 11.50@18.00
Cobalt Oxide	₱ 100 lb 2.50@ 2.60
Whiting, Commercial	₱ 100 lb .42@ .52
Gilders	₱ 100 lb .55@ .60
Ex. Gilders	₱ 100 lb 63@ .65

Putty, Commercial—

	₱ 100 lb
In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.45
In 1 lb tins	.00 @2.05
In 1½ to 5 lb cans	1 50 @1 90

Spirits Turpentine—

	₱ gal.
In oil bbls	51 @52½
In medium bbls	54@55

Glue—

	₱ lb.
Cabinet	12 @15
Chemical Bone	7½@ 8
Extra White	18 @21
Fish, liquid, 50 gal. bbls., per gallon	60 @ 70
Foot Stock, White	12 @14
Foot Stock, Brown	11 @11
German Common Hide	10 @12
German Hide	12 @18
French	13 @16
Irish	13 @16
Low Grade	10 @12
Medium White	14 @17

Gum Shellac—

	₱ lb.
Bleached, Commercial	25 @26
Bone Dry	31 @32
Button	40 @50
Diamond I	17 @18
Lac, Orange	30 @35
A. C. Garnet	29 @31
G. A. L.	22 @22
K. D. Extra	26 @27
D. C.	40 @50
Octagon, B	38 @40
T. N.	25 @26
V. S. O.	47 @48

Colors in Oil—

	₱ lb.
Black, Lamp Black	12 @14
Bone, Commercial	06 @06
Bone, Ivory	32 @36
Bone, Ultramarine	12 @
Brown, Vandyke	11 @14
Green, Chrome	12 @16
Green, Paris	@24
Siennas, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

White Lead, Zinc, &c.—

	₱ lb.
Lead, English white, in Oil	10¾@10¾
Lead, American White:	
Lots of 500 lb. or more in Oil	@ 6½
Lots less than 500 lb. in Oil	@ 7½
Lead White in oil, 25 lb tin pails	@ 7¾
Lead White, in oil, 12½ lb tin pails	@ 7¾
Lead White, in oil, 1 to 5 lb assorted tins	@ 8¾
Lead, American, Strictly Pure, White, in 500 lbs. and over 2% for cash if paid in 15 days from date of invoice	@ 6½
Zinc, American, dry	5½@ 5½
Zinc, French:	
Antwerp, Red Seal, dry	8¼
Antwerp, Green Seal, dry	10½
Paris, Red Seal, dry	8¾
Paris, Green Seal, dry	10¾
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over	12¾@13¾
Lots of less than 1 ton	13¾@14¾
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over	11¾@12¾
Lots of less than 1 ton	11¾@12¾

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	₱ lb.
Black, Carbon	6½@10
Black, Drop, American	5½@ 8

	₱ lb.
Black, Drop, English	5 @15
Black, Ivory	16 @
Lamp, commercial	4 @
Blue, Celestial	4 @
Blue, Chinese	21 @
Blue, Prussian	20 @
Blue, Ultramarine	3½@12
Brown, Spanish	½@ 1
Carmine, No. 40	$3.10@3
Green, Chrome, ordinary	3½@ 5
Green, Chrome, pure	17 @2
Lead, Red, 1½ lbs., kegs	@ 6
Litharge, bbls., ½ bbls., kegs	@ 6
Ocher, American	₱ ton $8.50@16
American Golden	2½@ 3
French	1½@ 2
French Golden	3 @ 4
Orange Mineral, English	10 @11
French	11½@12
German	10 @11
American	8½@ 9
Red Indian, English	4½@ 6
American	3 @ 5
Red, Turkey, English	4 @10
Red, Tuscan English	7 @16
Red Venetian, Amer	₱ 100 lb $1.50@1
English	₱ 100 lb $1.15@1
Sienna, Italian, Burnt and Powdered	3 @ 9
Italian, Raw, Powdered	3 @ 7
American, Raw	1½@ 2
American Burnt and Pow'd	1½@ 2
Talc, French	₱ ton $18.00@25
American	₱ ton 15.00@20
Terra, Alba, French	₱ 100 lb .90@1
English	₱ 100 lb $3.0 1
American	₱ 100 lb, No. 1 .75@
American	₱ 100 lb, No. 2 .60@
Umber, Turk, Ext. & Pow	2½@ 4
Turk, Raw and Powdered	2½@ 4
Burnt, American	1½@ 2
Raw, American	1½@ 2
Yellow Chrome, Pure	13 @15
Vermilion, American Lead	7 @
Quicksilver, bulk	65 @
Quicksilver, bags	@
English, Imported	65 @
Chinese	$0.90@1

Current Hardware Prices.

General Goods.—In the following quotations Gen[illegible] Goods—that is, those which are made by more than [illegible] or [illegible] behind manufacturer—are printed in *Italics*, and the prices m[illegible] unless otherwise stated, represent those current in the [illegible] ket as obtainable by the fair retail Hardware trade, whe[illegible] from manufacturers or jobbers. Very small orders [illegible] broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓%
Sutton's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ₱ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ₱ doz. pairs .....$2.00@$3.00

Anvils—American—

Eagle Anvils.....₱ lb @8½¢
Hay-Budden, Wrought.....9½@9¾¢
Trenton .....₱ lb 9¼@9¾¢

Imported—

Swedish Solid Steel Stock, Superior, ₱ lb.....11@12¢
Peter Wright & Sons, ₱ lb, 51 to 340 lb., 11¢; 550 to 600 lb., 11½¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....

Augers and Bits—

Com. Double Spur.....75%@75&10%
Jennings' Pat. Bright.....60&10%
Black Lip or Blued.....60&10%
Boring.....70
Car Bits, Irwin, twist.....50&10%
Ford's Auger and Car Bits.....40%
Ft. Washington Auger Co., Conard's 35
Forstner Pat. Auger Bits.....35
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, ₱ doz. $2.50
No. 30, R. Jennings' list.....55
Russell Jennings .....25&10&2½%
L. Huguenin Car Bits.....15
Mayhew's Patent Bits.....45
Pugh's Black.....
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings Bits.....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's Pattern, No. 1, ₱ doz. $2.50
No. 2, $3.00
Ford's, Conard's Pattern.....35%
C. E. Jennings & Co.'s Steel Lip.....35
Lavigne Pat., small size, $2.50; large size, $3.00.....
Snell's 40%

Gimlet Bits—

Per gro.
Common Dble. Cut.....$4.00@3.25
German Pattern, Nos. 1 to 10, $1.75; 11 to 18, $5.75

Hollow Augers—

Bonney Pat., per doz. .....$6.50@7.00
Ames 40%
Universal 30%

Ship Augers and Bits—

Ship Augers.....
Ford's .....35&25%
C. E. Jennings & Co.:
L'Hommedieu 6
Watrous .....35%&7½
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles— *Iron or Steel*

Concord, Loose Collar..4½@5 c
Concord, Solid Collar...4¾@5¼ c
No. 1 Common, Loose.....5¾@4¼c
No. 1 Com. Arch Style.....4¾@5 c
No. 2 Solid Collar.....4½@5 c
Half Patent:
Nos. 7, 8, 11 and 12...65@65&10%
Nos. 13 to 14.....65@65&10%
Nos. 15 to 18.....70@70&10%
Nos. 19 to 22.....70@70&10%

Boxes, Axle—

Common and Concord, not turned lb., 5@6¢
Common and Concord, turned, lb., 6@7¢
Half Patent.....lb., 9½@10¢

Bait— Fishing—

Hendrixs:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances— Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....50&5%
Straight Balances.....40@45%
Circular Balances.....35%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb..... per lb., —@2½@2¾¢

Towel—

No 10 Ideal, Nickel Plate..₱ gro. $8.50

Beams, Scale—

Scale Beams.....40%
Chatillon's No. 1.....30%
Chatillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No 12 Wire Coppered ₱ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ₱ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned..₱ doz. $1.35

Beaters, Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.35; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dozer, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.50

Bellows—

Blacksmith, Standard List..
Split Leather.....60&10@65&10%
Grain Leather.....50@50&10%

Hand—

Inch..	6	7	8	9	10
Doz..	$5.00	5.50	6.00	6.50	7.50

Net Prices.

Molders—

Inch..	10	12	14	16
Doz..	$7.50	9.00	11.00	15.00

Bells— Cow—

Ordinary Goods...75@75&10&2½%
High grade.....70@70&10&2½%
Jersey .....75&10%
Texas Star.....50%

Door—

Home, R. & E. Mfg. Co.'s.....55&10%

Hand—

Polished, Brass.....
White Metal.....50&10&2½%
Nickel Plated.....
Swiss .....
Case's Globe Hand Bells.....30%

Miscellaneous—

Farm [illegible].....lb., 2¼@2½¢
Church and School.....60@60&5%

Belting— Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard .....70&5
Light Standard.....75
Cut Leather Lacing.....40&10%
Leather Lacing Sides, per sq. ft. 24½¢

Rubber—

Agricultural (Low Grade).....
73@75&5%
Common Standard....70@70&5%
Standard .....70@75&5%
Extra .....60&5@60&10%
High Grade.....60&5@60&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list:
Chain, Parts, Spokes.....50
Tubes 60

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden.....75@75&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Thumb Latch.....50
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....40%
Embossed .....

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Kenfield & Esser Co.....33&5%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread) [illegible] and smaller.....—
Larger and longer.....—
Phila. Eagle, $3.00 list...80@—%
Taplin Lundy.....60&10%
Machine (Cut Thread):
[illegible] and smaller.....67½@—
Larger and longer.....67½@—

Door and Shutter—

Cast Iron Barrel, Japanned, Bronze Brass Knob
Inch.....
Per doz. $1.
Cast Iron Spring Foot, Jap'd:
Inch.....
Per doz. $1.2
Cast Iron Chain Flat, Japanned:
Inch.....6
Per doz. $1.
Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch.....6
Per doz. $1.
Wrought Barrel Japd..80@80&10%
Barrel Bronzed.....60&10%
Spring .....70&10%
Square Head.....70&10%
Square Neck.....75@75&10%
Spring .....70&10&10%
Iron Barrel Door.....55%
Iron Wrought Metal.....45%

Expansion—

Richards Mfg. Co.....50&10%
Smith & Egge Mfg. Co.
No. 1 Double.....55
No. 1 Single.....
Style No. 100, Dbl. Jaw, Single..50%
Lag Screw.....60%

Plow and Stove—

Plow .....60@65@—%
Stove .....80@85@85&5%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99....80%
Phila., Eagle, list Oct. 16,1884..82½%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch.....	1¼	1½	1¾	2
Per doz...	$4.80	5.60	6.40	8.00
Inch.....	2¼	2½		
Per doz...	$8.65	11.50		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....
Lyndon Iron Co., Lyndon, Vt., Improved.....
Lane's Lancaster.....
Acme .....
Perfection .....
Seaver 45

Braces—

Common Ball, American....$1.50
Barber's .....
Fray's Genuine Spanish.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat....50%
Millers Falls Drill Brace.....55&15%
P., S. & W. Co., Peck's Pat..60&10%

Brackets—

Wrought Steel.....70@[illegible]
Bradley Metal Clasp..80&10@80&10&5%
Griffin's Pressed Steel.....75@75&10%
Griffin's Folding Brackets.....70&10%
Taplin Victor Handy Egg Beater Bracket .....₱ doz. $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Wire Goods Co.....75%

Buckets, Galvanized—

M'f'gr's list, price per gross. Cart. 120 lbs.

Water, Reg...	25.35	28.60	32.00
Wide			
Fire, Rd. Btm.	32.00	35.65	38.65
Wide			

Bull Rings—See *Rings, Bull*

Butts— Brass—

Wrought, High List, Oct. 26,'06..55%

Cast Iron—

Fast Joint, Broad....40&10%@50%
Fast Joint, Narrow...40&10%@50%
Loose Joint.....70&10%@75%
Loose Pin.....70&10@75%
Pin [illegible].....70@75%
Parliament Butts.....70&10&5%

Wrought Steel—

Light [illegible].....
Reversible and Broad..70&5%
Loose Joint, Narrow, Light [illegible].....
Back Flap, Table Chest [illegible]
Japanned.
Light Narrow, Loose Pin, [illegible].....
Light Narrow, Ball Tip.....
Broad .....40@45
Steeple Tipped.....70%
Ball Tipped.....70%

Cages, Bird—

Hendrix Brass: Series 3000 5000, 1100, net list; 1200 15°; 200, 300, 900 ..... 30%
Hendrix Bronze: Series 700, 800, 900 ..... 25%
Hendrix Enameled 25%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb. ..... 4½@4¾c
Sharp, 1 prong, per lb. ..... 4½@4¾c
Bigness Blunt 1¼c; Sharp 1½c
Lauter, Blunt, 1¼c; Sharp 1½c
Perkins, Blunt, ¾ lb., 5.50c; Sharp 4.15c

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Ely's E. B. ..... 60@55%
G. D. ..... per M 35@35c
F. L. ..... per M 40@42c
G. E. ..... per M 40@50c
Musket ..... per M 60@65c

Primers—

Berdan Primers, $2 per M. ..... 20@5%
Primer Shells and Bullets. ..... 15@10%
All other primers per M. ..... $1.52@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:
32 C. F., $5.50 ..... 10@5%
38 C. F., $7.00 ..... 10@5%
32 cal. Rim, $1.50 ..... 10@5%
32 cal. Rim, $2.75 ..... 10@5%
B. B. Caps, Con. Ball, Sieyd. $1.90
B. B. Caps, Round Ball. $1.49
Central Fire 65%
Target and Sporting Rifle. ..... 15@5%
Primed Shells and Bullets. ..... 15@10%
Rim Fire, Sporting 60%
Rim Fire, Military ..... 15@5%

Casters—

Bed ..... 65@10%
Plate ..... 60@5%
Philadelphia ..... 70@10%
Ame, Ball Bearing 50%
Gem (Roller Bearing) ..... 75@6@15@5
Steel Gem 20
Standard, Ball Bearing 45%
Yale (Double Wheel) low list.. 10@10%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:
3/16 ..... 7c 7/16 ..... 6c 9/16
5/16 ..... 7c 1/2 ..... 6c 5/8
3/8 ..... 6½c 9/16 ..... 6c 3/4 and 7/8 inch
Special sizes, prices on application.
In cask lots, deduct 50c
German Coil. ..... 60@60&5%
German Pattern Coil:
6 0 to 1 ..... 70@5@70&10%
1 and 1 ..... 60@60&5%
2 and 2 ..... 50@50&5%

Halter—

Halter Chains ..... 60@60&5%
German Pattern Halter Chains,
list July 97. ..... 60@60&5%
Covert Mfg. Co.
Halter ..... 35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6/8 ..... Straight, with ring, $28.00
6/8 ..... Straight, with ring, $29.00
6/8 ..... 3-2, Straight, with ring, $32.00
6/8 ..... 1-2, Straight, with ring, $35.00
NOTE—Add 2c per pair for Horse Trace Chains, add per pair for Nos. and 3; 5c; No. 1, 6c; No. 0, 8c for use of Straight Hame.
Eastern Standard Traces, Wagon Chain, &c. ..... 60@10@60&10%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron ..... 60&10%
Brass 60%
Safety and Plumbers' Chain, 60@10
Gal. Pump Chain....lb., 4½@5%
Covert Mfg. Co.
Breast, Halter, Heel, Rein, Stal
Iron 40%
Oneida Community:
American Halter, Dog and Kennel Chains ..... 55&5@40
Niagara Dog Leads and Kennel Chains ..... 45@50&5%
Wire Cloth Co.:
Dog Chain 70%
Universal Link Jointed Chain..... 50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain 60%
Pullman:
Bronze Chain, 60%; Steel Chain 60&10%
Sash Chain Attachments, per set, 8c
Adjustable Sash Ribbon, per 100 ft ..... $1.25@$3.00
Sash Ribbon Attachments, per set, 8c

Chalk—(From Jobbers.)

Carpenters' Blue....gro., 50@55c
Carpenters' Red....gro., 45@50c
Carpenters' White....gro., 40@45c

Checks, Door—

Bard-ley's 45%
Pullman, per gro $3.00
Rowain 33⅓%

Chests, Tool—

American Tool Chest Co.:
Boss Chests with Tools 50%
Youths' Chests with Tools 25%
Gentlemen's Chests with Tools. 25%
Farmers', Carpenters,' etc., Chests, with Tools 20%
Machinists' and Pipe Fitters' Chests, Empty 45%
Tinners' Chests 15%
C. H. Jennings & Co.'s Machinists' Tool Chests 7½%

Chisels—

Socket Framing and Firmer

Standard List 50%
Buck Bros.
C. H. Jennings & Co.
Socket Firmer No. 10 .....
Socket Framing No. 15 .....
Sargent & Co.
L. & I. J. White Co. ..... 33⅓&5%

Tanged—

Tanged Firmers ..... 50&10@35%
Buck Bros. 30%
C. H. Jennings & Co. Nos. 191, 181, 25%
L. & I. J. White Co. ..... 25&5%

Cold— lb.

Cold Chisels, good quality. ..... 13@15¢
Cold Chisels, fair quality. ..... 11@18¢
Cold Chisels, ordinary... ..... 9@10¢

Chucks—

Almond Drill Chucks 35%
Almond Turret Six-Tool Chuck..... 40%
Board Pat., round ..... 35&5%
Empire 25
Blacksmiths' 25%
Jacobs' Drill Chucks 40%
Pratt's Positive Drive 25%
Skinner Patent Chucks:
Independent Lathe Chucks 35%
Universal, Plain Jaws 25%
Combination, Reversible Jaws..... 35%
Drill Chucks, New Model, 25%; Standard, 45%; Skinner Pat. 25%; Positive Drive 10%
Planer Chucks 20%
Face Plate Jaws 35%
Standard Tool Co.:
Improved Drill Chuck 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21 ..... 35%
Scroll Combination, Nos. 83 and 84 ..... 35%
Geared Scroll, Nos. 33, 34 and 35..35%
Independent Iron, Nos. 18 and 318.35%
Independent Steel, No. 68 ..... 25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104 ..... 35%
Union Czar Drill 40%
Universal, 11, 12, 16, 17, 13, 14, 15..40%
Universal, No. 42 ..... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50 ..... 35%
Steel Face Plate Jaws, Nos. 70 and 72 ..... 50%
Westcott Patent Chucks:
Lathe Chucks 50%
Little Giant Auxiliary Drill..... 50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved..... 50%
Oneida Drill 50%
Scroll Combination Lathe..... 50%
Whitney Mfg. Co.:
Nut and Drill 25%

Clamps—

Adjustable, Hammers'.....20@20&5%
Carriage Makers', P., S. & W. Co. ..... 50&10%
Beer's Pat. ..... 33⅓&10
Myers' Hip 15
Lineman's, Sargent, Notegrum.....
Handy Worker Hammers' ..... 40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable.....50%
Iwan's Champion, Stationary..... 40%

Sidewalk—

Star Socket, All Steel, ¾ doz. $4.05 net
Star Sidewalk All Steel, ¾ doz. $3.24 net
Star Sidewalk All Steel, ¾ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Buck Bros. 30%
Fayette R. Plumb 30%
L. & I. J. White Co. 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each.$20.00
Stewart's Enclosed Gear Horse, each $6.75
Stewart's Patent Sheep Shearing Machine, each..... $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75

Clips, Axle—

Regular Styles, list July 1, '05, 50&10@10%

Cloth and Netting, Wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c. ..... 70@—%
Compression Bibbs. 60&10@—%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list 40%
Leather, Walter B. Stevens & Son's list 40%

Compasses, Dividers, &c.

Ordinary Goods...... 70@10@75%
Wm. Schollhorn Co.:
Excelsior Dividers 60%
Lodi Dividers ..... 70&10%

Conductor Pipe,—

L. C. L. to Dealers:

	Galvanized		
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
7x9	50&17½%		45%
Central:			
7x9	55%		45%
Western and Southern:			
6x8	50&21½%		40&5%
So. Western			
6x8	45&5%		40&21½%

Terms, 60 days; 2% cash 10 days. *Factory shipments generally delivered.*
See also Eave Troughs.

Coolers, Water—

	L.	&	G.	Mfg.	Co.:				
Gal.				2	3	4	6	8	
Galvanized, ea.				$1.85	$2.00	$2.25	$2.80	$3.90	
Galvanized, Lined, side handles, Gal.				2	3	4	6	8	
Each				$1.95	$2.15	$2.40	$3.00	$4.15	
White Enameled									10%
Agate Lined									10%

Coopers' Tools—

See *Tools, Coopers'.*

Coopers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 24@27¢; lighter than 3 lb. to pair...... 26@29¢

Cord— Sash—

Braided, Drab..... lb. 35¢
Braided, White, Com., Nos. 8 to 12, 20c; No. 7, 23½c; No. 6, 31½c. In lots of 12 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India..... lb., 11@11½c
Cotton Sash Cord, Tw'ted.18@20¢
Patent Russia..... lb.. 20¢
Cable Laid Russia..... lb.. 21¢
India Hemp, Br'd'd..... lb.. 21¢
India Laid Twisted.. lb. 13@14¢
Patent India, Twisted... lb.. 17¢
Pearl Braided cotton, No. 6, 22c; 22½c; No. 7, 26½c; Nos. 8 to 12, 26¢
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 30¢
Harmony Cable Laid Italian, Nos. 7 to 10..... ¾ lb 23 ¢
Pullman:
Wire Sash Cord..... 18%
Sash Cord Attachments, per doz.10¢
Samson, Nos. 8 to 12:
Braided, ¾ lb., Drab Cotton, 58¢; Italian Hemp, 40¢@ 50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord..... 50¢
Massachusetts, White..... ¾ lb 50¢
Phoenix, Drab, Nos. 8 to 12..... ¾ lb 45¢
Phoenix, White, Nos. 8 to 12, 27¢;
Silver Lake, per lb.:
A, Drab, 42¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen.....57½¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1905..... 90@—%
Hendryx Standard Wire Picture Cord, gold link ..... 55&10%
Turner & Stanton Co. Wire Picture Cord ..... 55&10%

Cradles—

Grain ..... 40@12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but larger prices made by jobbers
Zelnicker's Lumber, ¾ gro.
White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.50
Giant Lumber, 5¾ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks.....$10.00
Genuine Soapstone, Metal Workers', 5 in. x ¾ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3/16, $2.50; 5 x 1¼ x 3-16..... $3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $5.50; Light $5.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden 50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847..¾ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor ..... ¾ doz. $3.00
Wm. Rogers & Son..... ¾ doz. $2.60

Cutters— Glass—

H. H. Mayhew Co..... 40%
Red Devil..... 60%
Pt. Mfg. Co..... 4
Woodward 50%

Meat and Food—

American 30%
Nos. ... 401 402 403 404 405 406 407
Each ... $5 $7 $10 $12 $25 $50 $60
Enterprise:
Nos. ... 5 10 12 22 32
Each ... $2 $3 $2.75 $4.50 $6 25@25&7½%
No. 202 $1.50 ..... 40&7½%
P. S. & W. Co.:
Dipper's ..... ¾ doz. 33⅓%
Nos... 1 2 3 4
... $14.00 $17.00 $19.00 $20.00
Ideal ..... 50@10&5%
Hubs ..... 60&10&5%
Little Giant..... ¾ doz 40&5%
Nos. 2-5 320 322 220 222
... $35.00 $48.00 $44.00 $72.00 $88.00
New Triumph No. 605. ¾ doz. $24.00.. 10&10%
Rueswin Food, No. 1, $24.00; No. 2, $27.00 ..... 45&10@%
..... $15.00 ..... $18.00
Enterprise Beef Shavers..... 25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters..... 35%
Corn Graters..... 50%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....¾ doz. $3.00
Combined Slaw Cutter and Corn Grater ..... ¾ doz. $4.00

Tobacco—

All Iron, Cheap..doz. $4.25@$4.50
Enterprise ..... 25@30%
National, ¾ doz., No. 1, $21; No. 2, $18 ..... 40%

Diggers, Post Hole, &c.—

Disston's:
Rapid, ¾ doz., $24.00..... 25%
Sampson, ¾ doz., $34.00..... 25%
Iwan's Imp'ved Post Hole Auger..40%
Vaughan Pattern Post Hole Augers, ¾ doz., $7.00
Perfection Post Hole Diggers, ¾ doz. $8.75
Split Handle Post Hole Diggers, ¾ doz., $7.75
Hercules Pattern, ¾ doz..... $10.00
Kohler's, ¾ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer..... $7.50
Never-Break Post Hole Diggers, ¾ doz., $24.00..... 60%

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers.....35%
Sterling Vise Wheel Dresser Cutters..35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines ..... $1.50@$1.75
Breast, Peck Falls..... 15&10%
Breast, P., S. & W..... 33⅓%
Goodell Automatic Drills.50&10@60&10%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Barnes & Curtis..... 25%
Ratchet, Parker's..... 40%
Ratchet, Weston's..... 40%
Ratchet, Weston's, Style H, Improved 40%
Ratchet, No. 012..... 40%
Ratchet, Celebrated..... 40%
Ratchet, Whitney's, P., S. & W. Co. ..... 50&5%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00..... 33⅓%

Twist Drills—

Bit Stock..... 60@10@10%
Taper and Straight Shank..... 60@10@60@10&5%

Drivers, Screw—

Screw D'ver Bits, per doz. ..... 45@50¢
Balsey's Screw Holder and Driver, ¾ doz., 2¼-in., $6; 4-in., $7.50; 6-in. $9 ..... 50%
Buck Bros.' Screw Driver Bits..... 30%
Champion 50%
Disston's 70%
Fray's Rol. Hdle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers....40&10%
Gage's Double Action Ratchet 35%
Goodell's Auto..... 65@65&10%
Mayhew's Black Handle..... 40%
Mayhew's Monarch..... 40%
Millers Falls, Nos. 20 and 21 ..25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
Smith & Egginton Co., Nevertorn, 66⅔%; Elmora, 60%; Star, 30&10%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized*		
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
7x9	60&10%		45%
Central:			
7x9	65%		45%
Western and Southern:			
7x9	60&5%		40&5%
So. Western:			
7x9	55&21½%		42½%

Terms,—2% for cash. *Factory shipments generally delivered.*
Note.—Lower prices are made in some sections.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories: Galv. Steel and Galv. C. I. Standard Gauge....85@85&10%

No. 26	5%
No. 24	25%
No. 22	10%
Copper	50&10%

Elbows, Stove Pipe—

Edwards, Standard Blue.....40&10&10%
Edwards, Royal Blue.....40&10&10%
Reeves, Dover, one piece..... 40&10%

Emery, Turkish—

	4 to 46:	*5½ to 220:*	*Flour.*
Kegs.....lb. 5 ¢	5½¢	5½¢	
½ Kegs....lb. 5½ ¢	5¾¢	5¾¢	
¼ Kegs....lb. 5½¢	6¢	6¢	
10-lb. cans,			
10 in case....6½¢	7¢	6¢	
10-lb. cans, less than 10....10 ¢	10¢	8¢	
Less quantity..10 ¢	10¢	8¢	

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's ..... 50&10
Wahling ..... 10&5
Upson's Patent 40

Cord and Weight—
Ives and Titan 33⅓%

Corrugated—
Acme Corrugated Fasteners 70

Faucets—
Cork Lined ..... 50&10&60
Metallic Key, Leather Lined,
Red Cedar ..... 50&10&10&5%
Petroleum ..... 70&10&75%
B. & L. B. Co.:
Metal Key ..... 60&10
Star 60
West Lock ..... 50&10
John Sommer's Peerless Tin Key 40
John Sommer's Boss Tin Key 60
John Sommer's Victor Mill Key ..... 50&10
John Sommer's Duplex Metal Key 60
John Sommer's Diamond Lock 40
John Sommer's Star Lined 50
John Sommer's Reliable Cork Lined ..... 50&10
John Sommer's Chicago Cork Lined 60
John Sommer's O. K. Cork Lined 60
John Sommer's No Brand, Cedar 50
John Sommer's Perfection, Cedar 40
Self Measuring:
Enterprise, ₱ doz. $36.00 ..... 40&10
Lane's, ₱ doz. $36.00 ..... 40&10
National Measuring, ₱ doz. $36.40 10

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List Nov. 1, 1899.
Best Brands ..... 70&10&75&10%
Standard Brands ..... 70&10&10%
Lower Grades ..... 75&10&10&10%

Imported -
Stubs' Tapers, Stubs' list, July 24, '97 ..... 33 1-3&40%

Fixtures, Fire Door—
Allith Underwriters' Approved 50%
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 ..... $3.75
Fusible Links, No. 96 ..... 60%
Expansion Bolts, No. ..... 60&10%

Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.60*	*$5.85*	*$7.15*	*$9.65*

P., S. & W. Co. 25
Reading Hardware Co. 60%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1899, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig Ezy Potato ..... 60&10%
Victor, Hay ..... 60&10&10%
Victor, Manure 66⅔
Victor, Header 65
Champion, Hay 66⅔
Champion, Header 65
Champion, Manure ..... 60&10&10%
Columbia, Hay ..... 60&10%
Columbia, Manure 60
Columbia, Spading ..... 70&12½
Hawkeye Wood Barley 40
W. & C. Potato Digger ..... 60&10
Acme, Hay ..... 60&10%
Acme Manure, 4 tine ..... 60&10&5%
Dakota Header ..... 60&20%
Jackson Steel Barley ..... 60&20%
Kansas 65
W. & C. Favorite Wood Barley 40%
Plated.—See Spoons.

Frames— Wood Saw—
White, S'g't Bar, per doz. 75@80¢
Red, S'g't Bar, per doz. $1.00@1.25
Red, Dbl. Brace, per doz. $1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*3*	*5*	*4*	*6*
Each	*$1.25*	*$1.60*	*$1.90*	*$2.20*	*$2.50*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—*See Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp $2.75
Cotton 3.20
Waterproof Soft Taped .. 3.65
Waterproof Dbl. Taped .. 4.50
Waterproof Tpl. Taped .. 5.15

Gates, Molasses and Oil—
Stebbins' Pattern ..... 75&10&10%

Gauges—
Marking, Mortise, &c. 50&10&10%
Chapin-Stephens Co.:
Marking, Mortise, &c. ..... 50&5&10%
Disston's Marking, Mortise, &c. 67½
Wire, Brown & Sharpe's 33⅓
Wire, Morse's 25
Wire, P. S. & W. Co. 33⅓

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1. $2.00; 2. $2.50
Spike, Metal, No. 1. $4.00; 2. $4.50
Nail, Wood Handled, No. 1, $2.50; 2. $2.60
Spike, Wood Handled, No. 1, $4.50; 2. $4.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co. ..... 65@65&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush.. 25&10@50%
Elwell's 40

Grease, Axle—
Common Grade.....gro. $6.00@6.50
Dixon's Everlasting, 10-lb pails, ea. 50¢; in boxes, ₱ doz., 1 lb, $1.20; 2 lb $2.40
Hemmet Hard Oil 25

Griddles, Soapstone—
Pike Mfg. Co. ..... 33⅓@33⅓&10%

Grinders—
Bissal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50, 1, $5.00 50
Alundum Sickle Grinders, each, Nos. 20, $6.00; 30A, $6.00; 3, Combined, $6.50 50
Alundum Disc Grinders, each, $2.50 ..... 50%

Grindstones—
Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., $2.00 ..... 33⅓%
Richards Mfg. Co., Elk and Cycle, Ball Bearing, mounted 40%

Grips, Nipple—
Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—
Cow Ties ..... 60&5@60&10%
Covert Mfg. Co.:
Web ..... 30&2%
Jute Rope 35
Sisal Rope 20
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am. Cow and Halters ..... 40@40&5%
Am. Cow Ties ..... 45@60
Niagara Coil and Halters ..... 45&50&5%
Niagara Cow Ties ..... 45&5@50&10&5%

Hammers—
Handled Hammers—
Heller's Machinists' ..... 55&1 ⅛5&10&5%
Heller's Farriers' ..... 55&1 ⅛5&10&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel 50%
Farriers ..... 10&10&5
Riveting 60
Machinists', revised list ..... 66⅔&5
Blacksmiths' ..... 50&5
Fayette R. Plumb:
A, B, Nail ..... 40&2½&10&5%
Edge and B. S. Hatchet & Adze 40
Machinists' Hammers 40
Riveting and Tinners' ..... 40&2½&10%

Heavy Hammers and Sledges—
Under 3 lb., per lb., 20¢.
3 to 5 lb., per lb., 18¢.
Over 5 lb., per lb., 16¢.
Over 5 lb., per lb., 20¢, and Up.

Handles—
Agricultural Tool Handles
Hoe, Rake, &c. 40%
Fork, Shovel, Spade, &c.:
Long Handles 40%
D Handles 40%

Cross-Cut Saw Handles—
Adkins 40%
Champion 50
Disston's 50%

Mechanics' Tool Handles—
Auger, assorted.....gro. $1.65@1.75
Brad Awl.....gro. $1.65@1.75
Chisel Handles, Ash'd, per gro.:
Tang or Firmer, Apple, $2.40@ $2.65; Hickory.....$2.70@2.90
Socket Firming, Apple, $1.75@ $1.90; Hickory.....$1.90@2.15
Socket Framing, Hickory, $1.60@1.75
File, assorted.....gro. $1.30@1.40
Hammer, Hatchet, &c. 60&10&10&5%
Hand Saw, Varnished, &c. 80&85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz. 80¢; Jack, Bolted 75¢
Fore, doz. 85¢; Fore, Bolted 90¢
Chapin-Stephens Co.:
Carving Tools 50
Cold Chisel 50
File and Tool 50
Screw Drivers 50
Miller, Falls Adj. and Ratchet 50
Hand Saw 50
Nicholson Simplicity File Handle 50
W. A. Zelnicker Supply Co.:
Hammer, ₱ doz. $2.00
14 in., $2.00; 16 in., $2.30; 18 in., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.90
Sledge, ₱ doz., oval, 30 in., $4.50; oval, 36 in., $5.00; 36 in. $1.00 ..... $4.90
Axe, ₱ doz., 28 to 24 in., $7.60
Adze, ₱ doz., 26 in., $7.80; 28 in., $7.80
Pick, ₱ doz., R R ..... $8.00; coal, 34 in., $5.80.
Hatchet, ₱ doz., 12 to 14 in., $2.00.

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without Track and Parlor Door Hangers per Double with track, &c.
Allith Mfg. Co.:
Reliable Nos. 1 and 2; Allith No. 3; Allith Adjustable No. 6; Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25%
Ornamental 35
Box Twin 25
Chisholm & Moore Mfg. Co.:
Roadside Car Door 50
Elevator 30
Railroad 50
Cronk & Carrier Mfg. Co.:
Loose ..... 70&10
Roller Bearing ..... 70&10
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00 ..... 60&10%
Roller Bearing, No. 11, $15.00 60
Roller Bearing, Ex. Hy No. ..... 60&10%
Ball Dog, $24.00 70
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.05
Barn Door, Standard ..... 60&10
Hinged ..... per $4.8
Covered ..... 60&25%
Special ..... 50&10%
Lawrence Bros.:
Advance ..... 55&10%
Concealed 50
Clipper, No. 75 ..... 60&10%
Crown 50
Cyclone, No. 40 ..... net $6.50
Tandem, No. 50 ..... net $7.50
New York ..... 50&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2 ..... 70%
Anti-Friction 60%
Hinged Hangers, King Charm 60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5
Pioneer Wood Track, No. 3 ..... $2.25
Roller Brg. St'l Track No. 12 ..... $2.50
Roller Brg. St'l Track No. 13 ..... $2.50
Roller Brg., Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19 ..... 50&10%
Adjustable Track Tandem Trolley Track No. 16 ..... 50&10%
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22 ..... 50&5%
Trolley B. B., No. 11, $1.25; F. D. No. 120, $2.25, No. 121, $2.45; No. 150 ..... $2.50
Safety Underwriters F. D. No. 101 50
Tandem No. 41 2½ and 3 60&10
Palace, Adjustable Track No. 122 ..... 50&5%
Royal, Adjustable Track No. 125 ..... 50&10%
Ives' Wood Track No. 1 ..... $2.25
Trolley B. B. No. 27, $1.45; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2 70&7½%
Anti-friction No. 1, No. 11 sizes 2½ and 3 ..... 60%
Hinged Tandem 60%
Folding Door B. B. Swivel No. 105 50
Taylor & Boggs F'y Co.'s King, per 1 Door Hanging 50&10&5%
Myers' Steel Hangers 60%

Hangers— Garment—
Pullman Trouser, ₱ gro., 1 pair Flat Aluminum, ₱ gro., 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Shirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $10.50; Garment Hanger Loops, Round Nickeled, per gro. $3.50
Victor Folding ..... ₱ gro. $9.60

Gate—
Myers' Patent Gate Hangers, ₱ doz. net $4.50

Joist and Timber—
Lane Bros. Co. 30%

Hasps—
Griffin's Security Hasp ..... 50&10
McKinnon's Patent Hasp, ₱ doz. 6

Hatchets—
Regular list, first qual. ..... 25&10—
Second quality ..... 50&10—

Heaters, Carriage—
Clark No. 5, $1.75; No. 10, $2.25; No. 15, $2.75; No. 20, $3.25; No. 25, $3.75; No. 30, $4.25; No. 7F, $3.25; No. 1, $2.50 ..... 25%
Clark Coal, ₱ doz. $2.50

Hinges—
Blind and Shutter Hinges
Surface Gravity Locking Blind: (Victor; National; 1868 O. P. Norwalk; Clark's Tip; Buffalo.)
No. 1 2 3
Doz. pair $0.75 1.35 2.70
Mortise .....
Mortise .....
No. 1 2 3
Doz. pair $0.75 1.35 2.70
Mortise Reversible Shutter (Buffalo, &c.):
No. 1 2 3
Doz. pair ..... $0.70 .65 .60
Strap and Hinge ..... Blind Fastener
No. 1 2 3 Wood, $9.00; No. 3, Iron
Brick, $11.50 ..... 10%
Cabinet Parlor Co. ..... 70&5%
Lehigh Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 1, for wood, $9.00; No. 111, for iron 5
Reversible 5%
Stanley Steel Gravity Blind Hinges, No. 1 ..... Wrought
No. 2 ..... Wrought
No. 3 ..... Wrought
Q. & E. Lock 75
Acme, Lull & Porter 75%
Q. & E. 75%
Shepard's Noiseless, Nos. 60, 65, 70 75
Niagara Gravity Locking, Nos. 1, 2 & 3 ..... 75&10%
Tip Pat'n, No. 1 ..... 75&10%
2 75
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 70&10&5%
Shepard's Double Locking 75%
Champion Gravity Locking ..... 75&5
Pfotzer ..... 75&10
Empire 65%
W. H. Cone Mortise Shutter Hinging, No. 2 ..... 60&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L'tches.	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.35*

New England:
With Latch.....doz. ...@$2.00
Without Latch...doz. ...@$1.60
Reversible Self-Closing:
With Latch.....doz. ...@$1.75
Without Latch...doz. ...@$1.55
Western:
With Latch.....doz. $1.75
Without Latch.....doz. $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches. Hinges only or Latches only, Nos. 1, 2 or 3 ..... 70%

Pivot Hinges—
Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—
Holdbrok, Cast Iron...$6.75@$7.00
Non Headbrok, Cast Iron $6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Morise Spring Hinges 40%
Bardsley's Patent Checking 33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor 40%
Bommer Spring Hinges 40
No. 999 Wrot. Steel Hold Back, ₱ gr. $9
Chicago Spring Butt Co.:
Chicago Spring Hinges 50
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor 50%
Chicago City Engine House 25%
Reed 25
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 25
American 30%
Columbia, ₱ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ₱ gr. $12.00
Columbian Hinges ..... 60&10%
Ornamental 30
Concealed Blind ..... ₱ gr. $5
Oxford Screw Hinges 30
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co., Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 30
Shelby Spring Hinge Co.:
Regular Spring Hinges 50
Screen Door 50
Chief Ball Bearing Floor Hinge 50
Ball Bearing Door 50
No. 777, Sheet Steel Holdb'k, ₱ gr. pr. $9.00
Superior Spring Hinge Co. 50
Superior Floor Hinges 33⅓%

Wrought Iron Hinges—
Strap and T Hinges, &c., list December 20, 1904:
Light T 70
Heavy T 70
Light T 70
Heavy T 70
Light T 70
Heavy T 70
Screw Hook and Strap ..... 70&10%
Screw Hook 70
Strap 70
Screw Hook 70
Strap 70

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers ..... 30&2%

Hods— Coal—
M'f'g's list, price per gross.

Inch	*15*	*16*	*17*	*18*
Galv. open	*$5.00*	*$5.50*	*$6.25*	*$6.75*
Painted	*3.50*	*3.75*	*4.25*	*4.50*
Coal Hammer	*2.50*	*2.75*	*3.00*	*3.25*
Lap Handle	*3.25*	*3.50*	*3.75*	*4.00*

Masons' Etc.
Cleveland Wire Spring Co.:
Steel Brick, No. 162 ..... each $1.05
Steel Mortar, No. 158 ..... each $1.35

Hoes— Eye—
Scovil and Oval Pattern ..... 60&10@60&10&10%

Grub, list Feb. 23, 1899 ..... 70&10@75&10%

Extra &10% often given.

D. & H. Scroll.....27½%
Am. Fork & Hoe Co. (Scovil Patterns).....60%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1901, but many jobbers are still using list of August 1, 1899, or scaling at net prices.

Crane's Weeding, No. 1, $2.00; No. 2, $2.50
Bear Double Bit.....$3.20
Ft. Madison Cotton Hoe.....70&10&10%
Ft. Madison Crescent Cultivator Hoe.....70&10%
Ft. " " doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....per doz. 40&5%
Junior Size.....per doz. $4.00
Ft. Madison Sprouting Hoe, per doz.....60&10%
Ft. Madison Dixie Tobacco Hoe.....75&10&10%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&5%
B. B. 6 in., Cultivator Hoe.....$3.40
B. B., 6½ in.....$3.50
Acme Weeding.....per doz., net, $4.35
W. & C. Liming Shuttle Hoe, per doz.$5.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, per doz. $24.00.....45&10%

Door—

Bardsley's, Iron, 40%; Brass and Bronze.....5%
Empire.....50%
Pullman.....35%
Richards Mfg. Co.: No. 116, Everready, 45%; Nos. 118, 119, Sure Grip.....50%
Superior.....33⅓%

File and Tool—

Nicholson File Holders and File Handles.....33⅓&40%

Fruit Jar—

Triumph Fruit Jar Holder, per gross, $10.80, per doz.....$1.25

Trace and Rein—

Fernald Double Trace Holder, per doz. pairs.....$1.25
Dash Rein Holder, per doz. pairs..$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German.....33⅓%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Coat and Hat, Reading.....45&20%
Coat and Hat, Wrightsville.....60&5%
Harness, Reading List.....40%

Wire—

Belt.....80%
Wire C. & H. Hooks.....75% —%
Bradley Metal Clasp Wire, Coat and Hat, Sackett.....70&10%
Columbian Hdw. Co., Gem.....70&5%
Parker Wire Goods Co., King.....70&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—
See Wrought Goods

Miscellaneous—

Hooks, Bench, see Stops, Bench
Bush, Light, doz., $6.00; Medium, $6.75; Heavy, $7.50
Grapes, best, all sizes, per doz.....$1.50
Grapes, common grades, all sizes, per doz.....$1.50
Wardrobe.....lb. 5%@6¢
Hooks and Eyes:
Brass.....6 Solid 10
Malleable Iron.....Japanned 10
Screw, Mfg. Co. Gate and Scuttle Hooks.....40%
Ft. Madison Cut-Easy Corn Hoe.....75%
Tiller & Stanton's Corn Cutter, Solid.....per doz. $3.25 net
Solid.....per doz. $4.25 net
Sandwich.....50&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Complexion.....ft. 5¢@6¢
Apex Guaranteed.....ft. 8¢@9¢
Apex Guaranteed.....ft. 10¢@11¢
Cotton Garden, ¾-in., coupled:
Lion Grade.....ft. 8¢@9¢
Fair Quality.....ft. 10¢@11¢

Irons—Sad—

Three 4 to 10.....lb. 3½@3¾¢
B. B. Sad Irons.....lb. 3½@3¾¢
Mrs. Potts', sets per set:

Nos.	50	55	60	65
Jap'd Tops	.83	80	93	91
Tinned Tops	.88	85	98	95

New England Pressing.lb. 3½@4¢

Bar and Corner—

Reading Mfg. Co., Bar.....65&10%
Corner.....60

Pinking—

Pinking Irons.....doz. 60¢

Irons, Soldering

See *Copiers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lumbert.....50%

Lake's Steel.....30&5%
Richards Tiger Steel, No. 100.....50&10%
Smith & Hemenway Co.'s.....25%

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60%
Wilmington Acme, per doz. $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....80%
C. E. Jennings & Co., Nos. 45, 46, 25&2½%
Jennings & Griffin, Nos. 41, 42, 66⅔&2½%
Swan's.....66⅔@70%
Watrous.....16⅔%
L. & J. White.....20&5@25%

Hay and Straw—

Serrated Edge, per doz. $3.50@3.75
Iwan's Sickle Edge.....per doz. $9.50
Iwan's Serrated.....per doz. $10.00

Miscellaneous—

Farriers'.....doz. $3.00@3.25
Wostenholm's.....per doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber Tip.....gro. $1.25@$1.40
Carriage, Jap., all sizes.....gro. 40@45¢
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel.doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders.....30%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....20%
P. S. & W.....40&10%
Reading.....60%

Lanterns—Tubular—

Regular, No. 0.....doz. $3.35@4.50
Side Lift, No. 0.....doz. $3.00@4.75
Hinge Globe, No. 0.doz. $4.60@4.75
Other Styles.....4@40&10%

Bull's Eye Police—

5-inch.....$4.25@4.50

Latches— Thumb—

Roggin's Latches, with screw...doz. 35@40¢

Door—

Allith Mfg. Co., Reliable and Alligator, 50%; Reliable Cold Storage, 50%
Crane & Carrier Mfg. Co., No. 101, per doz. $2.30
Richards' Bull Dog, Heavy, No. 50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....doz. 50¢; large, 60¢
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pump.—*

Lifters, Transom—

R. & L.....10%

Lines—

Wire Clothes, Nos. 18	*19*	*20*
100 feet	*2.25*	*2.00*
75 feet	*1.80*	*1.65*

Samson Cordage Works:
Small Braided Chain, Nos. 0 to 3 .40
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....per gr. 20%
Masons' Lines, Shade Cord, &c.: White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines, Wringer.....20%
Shade Cord, Cotton or Linen....20%

Locks— Cabinet—

Cabinet Locks.....33⅓ & 5

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....10

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—

Iron Pattern:
Bronze and Brass, 55&5%; Crescent, 60%; Iron, 60%; Window Ventilating, 40&20%; Robinson Pat. Ventilating Sash Lock, 33⅓%.

Pullman Patent Ventilating Lock..35%
Reading Sash Locks.....40%

Machines—Boring—

Com. Up'r, without Augers.
$2.00@2.25
Com. Angl'r, without Augers.
$2.25@2.50
Swan's Improved.....40&10%
Jennings', Nos. 1 and 4.....25&7½%
Millers Falls.....5 75
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Invincible Hand Power.....per doz. $18.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoists with Lock Brake.....25%
Moore's Cyclone, High Speed Chain Hoist.....25%

Ice Cutting—

Chandler's.....12½%

Washing

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rotary	57.00
Champion Rotary Banner No. 1	57.00
Standard Champion No. 1	50.00
Standard Perfection	57.00
Cincinnati Square Western	33.00
Uneeda American, Round	33.00

Mallets—

Hickory.....45@45@50%
Lignumvitæ.....45@50@50%
Tinners' Hickory and Applewood.....doz. 45@50@50%

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Acme Flexible Steel.....50%
Elastic Steel (W. G. Co.), new list.50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....20@25%
National (set up).....30%
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side.....50&10%
Swift, Lane Bros. Co.....50%

Motors, Water—

Divine's Red Devil.....30%
Lippincott's.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; 12-in., $2.10, etc.
Cheap, 10-in., $2.25; 12-in., $2.45, etc.
Better Grade, 10-in., $3.00; 12-in., $3.25, etc.

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*
Continental				60%
Great American				70
Great American Ball B'r'g, new list				70
Quaker City				70
Pennsylvania				60
Pennsylvania, Jr., Ball Bearing,				50&10%
Pennsylvania Golf				50%
Pennsylvania Horse				33⅓&5%
Pennsylvania Pony				40&5%
Granite State:				
Style A, Low Wheel				70
Style B, Low Wheel				70
Style C, High Wheel, spcl. list				70&10%
Style D, High Wheel, spcl. list				70%
Phinedelphia:				
Styles M., S., C., K., T				70&10&5%
Style A, all Steel				60&10&5%
Style B, High Wheel				40 & 5
Drexel and Gold Coin, special list				40%
Reese				40&5%
Pony				10&5%
36-in. Horse				30&10%
Eagle Horse				30&5%
L. X. L. Horse				50

Nails—

Wire Nails and Brads. Miscellaneous.....See Last Page
Cut and Wire.....See Trade Report.
Hungarian, Finishing, Upholsterers' &c. See Tacks.

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	40&5%
Coleman	13	12	12	11	11	net
New Haven	23	21	20	19	18	40&5%
Livingston	19	18	17	16	16	10%
Western						per lb. 3¢

Jobbers' Special Brands.....per lb. 9@10¢

Picture—

	1½	*2*	*2½*	*3*	*4*	*5*	*in.*
Brass H'd	*.45*	*.55*	*.60*	*.70*	*..*	*..*	*gro*
Por. Head	*..*	*1.10*	*1.10*	*1.10*	*..*	*..*	*gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: Off list.
Square, Blank or Tapped.4.80¢
Hexagon, Blank or Tapped.5.10¢
Square, Blk., C., T. & R.....5.10¢
Hexagon, Blk., C., T. & R.5.70¢
Hot Pressed:
Square, Blank.....5.70¢
Hexagon, Blank.....5.60¢
Square, Tapped.....7.10¢
Hexagon, Tapped.....6.00¢

Oakum—

Best.....lb., 6½¢
U. S. Navy.....lb., 6¢
Navy.....lb., 5¢
Plumbers' Spun Oakum..2¾@3¢

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated.....75%
Chase or Paragon:
Brass and Copper.....50&10%
Zinc.....65&10%
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70&10%
Railroad Oilers, &c.....60&60&10%

Openers— Can— *Per doz.*

Sprague, Iron Handle.....30@35¢
Sprague, Wood Handle.....35@40¢
Sardine Scissors.....$1.75@$3.00
Yankee Can and Bottle Opener, per doz. net, $0.75; Little Gem, per doz., net.....$0.65

Egg—

Hartigan Nickel Plate, per doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope.....20@25¢

Rubber—

(Fair quality goods.)

Sheet, C. I.....11@12¢
Sheet, C. O. S.....11@12¢
Sheet, C. B. S.....12@13¢
Sheet, Pure Gum.....40@45¢
Sheet, Red.....40@50¢
Jenkins' '96, per lb. 80¢.....25%

Miscellaneous—

American Packing..lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@12½¢
Jute.....lb. 4@ 4½¢
Russia Packing.....lb. 8@11 ¢

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.....65&7½@70%
Edwards, Royal Blue.....65&7½%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos: lb.
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.3½@5¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.....6¢
Mill Board, Sheet, 40 x 40 in., 1-32 to ¼ in.....3@5¢
Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll .....58@70¢
Medium weight, 30 lbs. to roll .....68@70¢
Heavy weight, 40 lbs. to roll .....75@78¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to roll.....$3.50
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—

1 ply (roll 400 sq. ft.), ton.....$3.50@$3.60
2 ply, roll 168 sq. ft.....67¢
3 ply, roll 108 sq. ft.....88¢
Slater's Felt (roll 500 sq. ft.).80¢

Sand and Emery—

Flint Paper and Cloth.50&10%—%
Garnet Paper and Cloth.....25%
Emery Paper and Cloth..50&10&10%

Parers— Apple—

Goodell Co.:
Family Bay State.....per doz. $13.00
Improved Bay State.....per doz. $10.00
New Light.....per doz. $7.50
Turn Table.....per doz. $9.00
White Mountain.....per doz. $5.00
Bonanza Improved.....each, $7.50
Dandy.....each $10.00
Eureka Improved.....each $20.00
New Century.....each $20.00
Ranger.....each $25.00
Livingston Nail Co.:
Daisy.....per doz. $4.00
Little Star.....per doz. $5.00
Rocking Table.....per doz. $6.20
Reading Hardware Co.:
Advance.....per doz. $4.70
Baldwin.....per doz. $4.00
Reading.....per doz. $3.25
Reading 78.....per doz. $6.25

Potato—

Saratoga.....per doz. $7.00
White Mountain.....per doz. $6.00

Picks and Mattocks—

List, Feb. 23, 1899. 70&10@70&10@65%
Cronk's Handled Garden Mattock, per doz., No. 2, $2.60; No. 3, $5.40.

Pinking Irons—
See Irons, Pinking.

Pins, Escutcheon—
Brass .....50% 50&10%
Iron, list Nov. 11, '05...60% 60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in.....60% 10% —%
Extra Heavy, 2-6 in.....50% 10% —%
Fittings, Standard and Extra-H....
.....55% 10% —%

Pipe, Merchant—

	Consumers, Steel. Blk.	Galv.	Carloads. Iron. Blk.	Galv.
	%	%	%	%
⅛ & ¼ in...	65	48	57	41
⅜ in.....	66	52	59	44
½ in.....	68	56	61	49
¾ to 6 in....	72	62	66	56
7 to 12 in....	69	54	61	46

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
Firstclass 82%
Second-class 85%

Pipe, Stove—

Edwards' Nested:	Per 100 joints C. L.	L. C. L.
5 in., Standard Blue...	$6.25	$7.25
6 in., Standard Blue....	6.75	7.75
7 in., Standard Blue....	7.75	8.75
5 in., Royal Blue.....	7.00	8.00
6 in., Royal Blue.....	7.50	8.50
7 in., Royal Blue.....	8.50	9.50
Wheeling Corrugating Co.:	Nested:	
5 in., Uniform Color..	$6.15	$7.15
6 in., Uniform Color..	6.65	7.65
7 in., Uniform Color..	7.65	8.65

Planes and Plane Irons—
Wood Planes—
Bench, first qual....30% 10&10%
Bench, second qual....40% 10&10%
Molding .....25% 12&5&10%
Chapin-Stephens Co.:
Bench, First Quality..... 30%
Bench, Second Quality..... 35%
Molding and Miscellaneous... 50%
Toy and Germat..... 50%
Union 60%

Iron Planes—
Chaplin's Iron Planes.....50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06..... 25%
Buck Brothers..... 30%
Chapin-Stephens Co..... 25%
Union 50%
L. & I. J. White.....20&5&25%

Planters, Corn, Hand—
Kohler's Eclipse.....per doz. $8.00

Plates—
Felloe .....lb. 4@4½¢

Pliers and Nippers—
Button Pliers....75% 7&10&5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.

Gas Pipe...	7	8	10	12 in.
	$2.00	$2.25	$2.75	$3.50

Acme Nippers .....50&5%
Cronk & Carter Mfg. Co.:
American Button..... 80%
Improved Button..... 75&10%
Cronks 60%
No. 80 Lineman's 60%
Stub's Pattern..... 45%
Combination and others..... 33⅓%
Heller's Farriers' Nippers, Pincers and Tools..... 40&5&10&5%
Ives & Smith Tinners Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 5" Flm City, 35%; Paragon, 50"; Lodi ....
Stevens Side, End and Diagonal Cutting Pliers..... 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds..... 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels ..... 30&10%
Chapin's Imp. Brass Cap Level ..... 40&10%
Pocket Levels ..... 30&10%
Extension Sights..... 30&10&10%
Machinists' Levels..... 40&10&10%
Disston's Plumbs and Levels....60&10%
Disston's Pocket Levels..... 60&10%
Stanley's Duplex..... 35%
Weeks' Extension..... 33⅓%

Points, Glaziers'—
Bulk and 1-lb. papers...lb. 9½¢
½-lb. papers..... lb. 10 ¢
¼-lb. papers..... lb. 10½¢

Police Goods—
Manufacturers' Lists...25@25&5%
Tower's 25%

Polish—Metal, Etc—
Prestolene Liquid, No. 1 (4 qt.) per doz. $3.00, No. 2 (1 qt.) $9.00 40%
Prestolene Paste 50%

George Wenham Hoffman
U. S. Metal Polish Paste, 3 oz. boxes, ¾ doz. 5.c.; ¼ro $4.50, ½ lb boxes, ¾ doz. $4.25, 1 lb boxes, ¾ doz. $2.25.
U. S. Liquid, 8 oz. cans, ¾ doz., $4.25.
Silversmiths' Friend Metal Polish, ¾ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ¾ lb 15¢
Black Eagle, Liquid, ½ pt. cans, ¾ doz. 75¢
Black Jack Paste, ¾ lb cans, ¾ gr. $9.00
Black Kid Paste, 5 lb cans... each, $0.65
Ladd's Black Beauty Liquid, per 100 tins..... $6.75
Joseph Dixon's, ¾ gr. $5.75.....10%
Dixon's Plumbago..... ¾ lb 8¢
Fireside ..... ¾ gr. $5.50
Grem, ¾ gr. $4.50..... 10%
Japanese ..... ¾ gr. $3.50
Jet Black..... ¾ gr. $3.50
Peerless Iron Enamel, 10 oz. cans... ¾ doz. $1.50

Poppers, Corn—
1 qt. Square...doz. $0.80; gro. $8.75
1 qt. Round...doz. $0.90; gro. $10.00
1½ qt. Square...doz. $1.00; gro. $11.00
2 qt. Square...doz. $1.25; gro. $13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled .....35&10%
Tinned .....30&10%

Powder—
In Canisters:
Duck, 1 lb.....each 15¢
Fine Sporting, 1 lb.....each 75¢
Rifle, ½ lb.....each 15¢
Rifle, 1 lb.....each 25¢
In Kegs:
12½ lb. kegs.....$3.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk)..... $6.50
Half Keg (12½ lb bulk)..... 3.50
Quarter Keg (6¼ lb bulk)..... 1.90
Case 24 (1 lb cans bulk)..... 8.50
Half case (1 lb cans bulk)..... 4.50
King's Smokeless Shot Gun, Rifle, Keg (25 lb bulk)..... $12.00 $15.00
Half Keg (12½ lb bulk)... 6.25 7.75
Quarter Keg (6¼ lb bulk)... 3.25 4.00
Case 24 (1 lb cans bulk)... 11.00 17.00
Half case 12 (1 lb c. bk)... 7.25 8.75

Presses—
Fruit and Jelly—
Enterprise Mfg. Co.....20@25%

Seal Presses—
Morrill's No. 1, ¾ doz., $20.00.....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 50%
Miller's Falls, No. 3, ¾ doz., $12.00..... 33⅓&10%
Morrill's No. 1, Nail Puller, ¾ doz., $20.00 ..... 60%
Pearson No. 1, Cyclone Spike Puller, each $30.00..... 50%
The Scranton Co., Case Lots:
No. 1B (large)..... $5.50
No. 3B (small)..... 5.00
Smith & Hemenway Co.:
Diamond B..... 70%
Giant 50%
Staple Pullers, Utica and Davison 60%

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., 4 in., $1.25, 5 in., $1.55				
Inch	2	2½	2¾	
Hot House, doz.	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz.	$0.16	.19	.25	.30
Inch	1¾	2	2¼	2½
Side, doz.	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in.....17@20¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in.....20@21¢
Acme No. 25 1¾ in., 19c.; 2 in., 21c.
American Pulley Co.:
Wrought Steel, American Pulley Axle..... 50&5%
Wrought Steel, Eagle..... 15%
Fox-Au-Steel, Nos. 3 and 7, 2 in.... ¾ doz. $2.50
Grand Rapids All Steel Noiseless, 2 in..... 20%
Niagara, No. 20, 1¾ in., 19c.; 2 in., 20c.
No. 26, Tr... 1¾ in., 19c.; 2 in., 20c.
Star, No. 20, 1¾ in., 19c.; 2 in., 20c.
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout .....75&5@75&5%
Wood Pumps, Tubing, &c.....50%
Barnes Dry Stone Well Co.
Barnes Pulley Lines
Contractors' Rubber Diaphragm Pump Co.
Dairy Spray Pump ..... ¾ doz. $6.00

Pitt & Walling's Fast Mail Hand... list.....
Flint & Walling's Fast Mail Hose...
Flint & Walling's Tight Top Pitcher...
National Specialty Mfg. Co., Measuring Nos. 2, 3, 4, 5, $6.0...
Myers' Hand...
Myers' Power...
Myers' Spray Pump...

Pump Leathers—
Plunger and Valve Leathers—Per gro.:
No.... 1 ... 2 ... 3 ... 4 ... 5 ... 6
Cup Leathers—Per Inch... 2½ ... 3 ... 3½ ... 4 ... 4½ ... 5 ... 6
$3.00 ... 3.60 ... 4.20 ... 4.80 ... 5.40 ... 6.00 ... 12.00

Punches—
Saddlers' or Drive, good.....doz. 50@75¢
Spring, single tube, good quality.....$1.75
Revolving (4 tubes)....doz. $3.50
Bemis & Call Co.'s Cast Steel Drive 50
Merrill's Nos. 1A, 1A, 1B, 16C, 1D, $15.00..... 50%
Hercules, 1 die, each $5.00..... 50%
Niagara Hollow Punches..... 50%
Niagara Solid Punches..... 55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35%; Paragon, 50%; Lodi..... 55%
Tinners' Hollow, P., S. & W. Co. 40%
Tinners' Solid, P., S. & W. Co., ¾ doz., $1.44..... 40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron.... 2½@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb., 36¢..... 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..¾ ft. 3¼¢
O. N. T. Rail..... $4.10
Grim's:
XXX, ¾ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ¾ doz. ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ¾ 100 ft. $3.45
O. N. T., ¾ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in..... ¾ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ¾ 100 ft., $7.50; 1¼ x 3-16 in., $8.75..... 55&5%
McKinney's:
Hinged Hanger Track, ¾ ft., 11¢, 1 x 3-16 Track..... 50%
Myers' Stayon Track..... 50%
Richards' Mfg. Co.:
Common, 1 x 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail....60&10%
Lag-screw Rail, No. 65..... 55%
Gauge Trolley Track, ¾ ft., No. 31, 3c.; No. 32, 14c.; No. 33, 23c
No. 50..... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor..... 80&25%
Queen City Lawn, ¾ doz., 20 teeth, $2.85; 24, $3.00..... net
Anthology Lawn, ¾ doz..... net
Malleable Garden..... 70&10
Ideal Steel Garden, ¾ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00..... 80%
Kohler's:
Lawn Queen, 20-tooth.... ¾ doz. $3.15
Lawn Queen, 24-tooth.... ¾ doz. $3.25
Paragon, 20-tooth..... ¾ doz. $2.70
Paragon, 24-tooth..... ¾ doz. $2.70
Steel Garden, 14-tooth.... ¾ doz. $2.40
Malleable Garden, 14-tooth, ¾ doz. $...

Rasps, Horse—
Disston's 75%
Heller Bros. 70%
Liverright Bros.' Gold Medal.70&10@75%
McCaffrey's American Standard...
New Nicholson.....
See also Files.

Razors—
Liana Barber 60%
Fox Razors, ¾ N... ¾ Plate...
N... $2.25; N... ¾ Plate...
$2.50
Red Dwarf...

Reels, Fishing—
Hendryx:
M... Q... A... B... M... M...
Q... A... B... M...
Aluminum German Silv... Bronze 25%
2901 P... 3314% ... 2901 PN ... 3314% ... 0924 N...
2901 P... 3314% ... 2901 PN ...
... 25%
5009 PN ... 5009 N ... 20%
Compromise ... 190 PR ... 290 PR ... 290 P...
304 P ... 304 PN ... 30304 P ... 30304 PN ... 30...

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed.....
Solid Brass or Bronze Metal..50%

Revolvers—
Single Action..... 25% ...
Double Action, except 44 cal...$2.00
Double Action, 44 caliber.....$2.00
Target..... $4.00
Bunt..... $4.00

Riddles, Hardware Grade
16 in..... per doz. $2.5...$2.75
17 in..... per doz. $2.75...$3.00
18 in..... per doz. $3 and $3.25

Rings and Ringers—Bull Rings—

	2	2½	3 inch.
Steel	$0.50	0.75	0.90 doz.
Copper	$1.10	1.25	1.50 doz.

Hog Rings and Ringers—
Hill's Rings, gro. boxes.....$3.25
Hill's Ringers, Gray Iron, doz..60¢
Hill's Ringers, Malleable Iron, doz......
Blair's Rings..... per doz. .....
Blair's Ringers..... per doz.75¢
Brown's Rings..... per gro. $2.25
Brown's Ringers....per doz.75¢

Rivets and Burrs—
Copper .....
Carriage, Coopers', Tinners, &c.: Black .....70&10%
Metallic Tinned.....70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, 23@25¢; Tin boxes, 100 count, 20@22¢.
Tubular, per doz. boxes, 50 count, 20@22¢; 100 count, 18@20¢.

Rollers—
Cronk's Stay, No. 50.....$1.00
Cronk's Reversible, No. 55, $0.60; No. 56, $0.75; No. 60.....$0.75
Lane's Stay 60%
Richards Mfg.:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57..... 50%
Underwriters', Nos. 59, 60..... 50%
Favorite, No. 54..... 60%

Rope—
Manila, 7-16 in. diam. and larger: Pure.....lb. 14½¢ net
Sisal, 7-16 in. diam. and larger: Pure.....lb. ...
Sisal, 7-16 in. diam. and under: No. 2 quality.....lb. ...
Sisal, Jute, Hide and Bass Ropes, Medium and Coarse: Mixed.....lb. 7½@8¢
Pure.....lb. 9¼¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred: Mixed.....lb. 6½@6¾¢
Pure.....lb. ...
Cotton Rope: Best, ¼-in. and larger...18@20¢
Medium, ¼-in. and larger.16@17¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope: Thread, No. 1, ¼-in. & up, lb. ...
Thread, No. 2, ¼-in. & up, lb. ...

Wire Rope—
Galvanized.....37½@40%
Plain.....35@...

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal..... 20%

Rules
Boxwood.....
Ivory.....
Chapin-Stephens Co.:
B...
F...
...
...

Saws—

Atkins:
Circular 45
Band ..... 50@50&10
Butcher Saws 50
Cross Cutting 35
One-Man Cross Cut 40
Narrow Cross Cut 50
Hand Rip and Panel ..... 50&10
Mitre Box and Compasses 40
Mulay, Mill and Drag 45
Wood Saws ..... 40&10
Chapin-Stephens Co.:
Turning Saws and Frames ..... 30@30&10
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30@30&10
Disston's:
Circular, Solid and Ins'ted Tooth 50
Band, 2 to 18 in. wide 60
Band ¾ to 1¼ 60
Crosscuts 45
Narrow Crosscuts 50
Mulay, Mill and Drag 50
Framed Woodsaws 25
Woodsaw Blades 25
Woodsaw Rods, Tinned 15
Hand Saws, Nos. 12, 99, 9, 16, 61 50
148, 120, 76, 77, 8 50
Hand Saws, 7, 107, 107½, 3, 1, 0, 00, Combination 30
Compass, Key Hole, &c 25
Butcher Saws and Blades 30
C. E. Jennings & Co.'s:
Back Saws ..... 10@
Butcher Saws ..... 5&@
Compass and Key Hole Saws ..... 30&5
Framed Wood Saws 30
Hand Saws 30
Wood Saw Blades ..... 30@40
Millers Falls:
Butcher Saws ..... 15&10
Star Saw Blades ..... 15&10
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&5
Butcher Saws Blades ..... 35@40
Peace & Richardson's Hand Saws 30
Simonds':
Circular Saws 45
Crescent Ground Cross Cut Saws 50
One Man Cross Cut ..... 40&10
Gang Mill, Mulay and Drag Saws 45
Band Saws 50
Back Saws ..... 25@35&5
Butcher Saws ..... 35@35&7½
Hand Saws ..... 25@35&5
Hand Saws, Bay State Brand 35
Compass, Key Hole, &c ..... 25@35&7½
Wood Saws ..... 40&7½
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 60

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A ..25%
Disston's:
Concave Blades 25
Keystone Blades 35
Hack Saw Frames 30
Simonds' Hack Saws 35
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 30
Hack Saws, Nos. 175, 180, complete, 40&7½
Goodell's Hack Saw Blades ..... 10&10
Griffin's Hack Saw Frames ..... 35&10&10
Griffin's Hack Saw Blades ..... 35&5&10
Star Hack Saws and Blades ..... 15&10
Sterling Hack Saw Blades ..... 30&10&5
Sterling Hack Saw Frames ..... 30&10&10
Stubbs' Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00 ..10%
Victor Hack Saw Blades 20
Victor Hack Saw Frames 40
Whitaker Mfg. Co.:
Nutmeg Hack Blades 10
National Hack Frames ..... 30&5
National Power Blades ..... 30&10

Scroll—

Barnes, No. 7, $15 25
Barnes Scroll Saw Blades 40
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 20
Foot Power Machine ..... 15&10
Rogers, complete, $3.50 and $4.00 ..... 15&10

Scales—

Fairbanks, Turnbull's ..... 50@5&10%
Computing:
Hatch, Platform, ½ oz. to 1 lbs. ..... doz. $3.50
Two Platforms, ½ oz. to 1 lbs. ..... doz. $16.00
Union Platforms, Plain $1.70@1.90
Union Platforms, Stpl'd $1.80@2.15
Chatillons:
Bench 25
Counter 10
Grocers' Trip Scales 50
Standard Portables 40%
The Standard R. R. and Wagon ..... 50&5
Toledo ..... 50&5

Scrapers—

Boss, 1 Handle ..... doz. $2.00@2.25
Boss, 2 Handle ..... doz. $2.50@2.60
Ship ..... Light, $2.00; Heavy, $3.50
Chapin-Stephens Co., Boss ..30@30&10%
Richard Mfg. Co., Boss 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1½, $3.50@3.75
Bench, Wood ..... 2.50@2.65%
Hand, Wood ..... 70@70&10%
Chapin-Stephens Co., Hand ..... A A A
Coach, Lag and Hand Rail
Lag, Cone Point ..... 75@70&10
Coach, Gimlet Point ..... 75@70&10
Hand Rail ..... 70@60%

Jack Screws—

Sampson's List ..... 70@10@75
Sawyer Spring Vise Co. ..... 20&10&5
Swett Iron Works ..... 70@75

Machine—

Cut Thread, Iron, Brass or Bronze:
Flat Head or Round Head, 50@5&10%
Fillister Head ..... 40@40&10%
Rolled Thread, F. H or R. H., Iron ..... 75@10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65@10%

Set and Cap—

Set (Iron) ..... 75@10@7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70@10@7½
Hex. Hd. Cap ..... 70@10@7½
Rd. Hd. Cap ..... 50@7½%
Fillister Hd. Cap ..... 60@7½%

Wood—

List July 23, 1903.
Flat Head, Iron ..... 87½@5@..%
Round Head, Iron ..... 85@5@..%
Flat Head, Brass ..... 90@5@..%
Round Head, Brass ..... 87½@5@..%
Flat Head, Bronze ..... 75@5@..%
Round Head, Bronze ..... 82½@5@..%
Drive Screws ..... 87½@5@..%

Scroll Saws—

See *Saws, Scroll.*

Scythes— *Per doz.*

Grass, No. 1, Plain ....$6.25@6.75
Clipper, Bronzed Webb..$6.50@7.00
No. 3 Clipper, Pol'd Webb..
$6.75@7.25
No. 6 Clipper and Solid Steel, $7.00@7.50
Bush, Weed and Bramble, No. 2 $6.50@7.00
Grain, No. 1 ..... $8.25@8.75
Bronzed Webb, No. 1..$8.50@9.00
Nos. 3 and 4 Clipper, Grain.. $8.75@9.25
Solid Steel, No. 6 ..... $9.25@9.75

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $15; 3, $18; 4, $21; 5, $30 ..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18..20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 37½
Cannon's Diamond Point, per gro. $12, 40&10%
Mayhew's ..... per gro $ 90
Snell's Corrugated, Cup Pt....40&10%
Snell's Knurled, Cup Pt....40&10%
Victor Knurled Cup Pt....per gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Tri-umph 30%
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut....$20.60
No. 5, Mill $4.80
Nos. 11, 11, 95 ..... $15.60
No. 1 Old Style $14.00
Special $16.25
Original Cross Cut ..... per doz. $8.00
Royal, Hand ..... per doz. $4.50
Taintor Positive ..... per doz $6.75

Shaving—

Fox Shaving Sets, No. 30 .....
per doz., net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, per doz. $1.50
Mounted Kitchen Sand Stone, per doz. $1.50
Natural Grit Carving Knife Hones, per doz. $3.00
Quick Cut Emery Carving Knife Hones, per doz. $1.50
Quick Edge Pocket Knife Hones, per doz $2.50

50%

Skate—

Smith & Hemenway Co., Eureka..50%

Shaves, Spoke—

Iron ..... doz. $1.25
Wood ..... doz. $2.00
Barnes's (series R & L C 4
Chapin Stephens Co. ..... 30@30&5
Goodell's, per doz. $3.00 ..... 15&10%

Shears—

Cast Iron..	7	8	9 in.
Best	$15.00	18.00	20.00 gro.
Good ...	$13.00	15.00	17.00 gro.
Cheap ..	$5.00	6.00	7.00 gro.

Straight Trimmers, &c.:
Best quality Jap. ..... 70@70&10%
Best quality, Nickel..60@60&10%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40@40&5
Hammel's Tailors Shears 10%
Wilkinson Shear & Cutlery Co.:
Sheep, 1900 list ..... 30&10&5%
Grass ..... 30&10
Horse or Mule ..... 50&10%

Tinners' Snips—

Steel Blades ..... 20@5@20&10%
Steel Laid Blades ..... 40@10@5%
Forged Handles, Steel Blades, Berlin 50%
Heinisch's Snips 40
Jennings & Griffin Mfg. Co.'s 6½ to 10 in. ..... 33⅓&7½
Nigent's 15
P. S. & W. Forged Handles 25
W. R. W. ..... 10&10%

Pruning Shears—

Cronk's Hand Shears ..... 33⅓&7½
Cronk's Wood Handle Shears ..... 33⅓&7½
Disston's Combined Pruning Hook and Saw, per doz $18.00 ..... 25%
Disston's Pruning Hook only, per doz. $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
P. S. & W. Co.'s ..... 10&10%
Columbian Cutlery Co.:
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand, ... 60&10%

Sheaves— Sliding Door—

Reading 40%
R. & E. list 15%

Sliding Shutter—

Reading list 40%
R. & E. list 10%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge ..... 65&10%
Club, Rival, 65&5%; First Quality, 60&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, 25&5%
Union, League, 12 and 12 gauge; Rival Grade ..... 20&5%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%

Shells, Loaded—

Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade ..... 40@45%
Loaded with Smokeless Powder, high grade ..... 40@10@10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40
Nitro Club, Smokeless Powders.40&5%
Arrow, Smokeless Powders.40&10&10%
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Leader Grade ..... 40&10&10%
Black Powder 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 14	4.75	6.50
Wheeling Corrugating Co.:		
Dixie, 14 x 20 in	$4.25	$5.50
Dixie, 10 x 14 in	4.50	6.00
Dixie, 7 x 10 in	5.00	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg $4.10
Steel ..... per keg $3.85
Borden's, all sizes ..... per keg $3.90

Shot—

25 lb. bag
Drop, up to B $1.85
Drop, B and larger 2.10
Buck 2.10
Cartridge 2.25
Dust 2.00

Shovels and Spades—

Association List, Nov. 15, 1902..40%
Avery Stamping Co. 45

Snow Shovels—

Long Handle ..... $4.25@4.50
Wood and Malt. D. Handle ..... $4.75@4.90

Sieves and Sifters—

Hunter's Imitation ..... gro. $9.50@10.00
Hunter's Genuine ..... per gro. $12.00@12.50

— Sifters, Ash—

Acme Ball Bearing Sifter Co., Acme Automatic Ash Sifter (cash, $6.75) ..... per doz. $70.00

Sieves, Seamless Metallic

	Per dozen.			
Mesh	14	16	18	20
Iron Wire	$1.05	1.05	1.10	1.20
Tinned Wire	$1.15	1.15	1.20	1.30

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... doz. $0.90@0.95
Mesh 20, Nested ..... doz. $1.00@1.05
Mesh 24, Nested ..... doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:
12 x 12 to 22 x 36 in 60%
20 x 30 to 24 x 50 in 50%
24 x 40 to 24 x 120 in 30%
Barnes' Low list 40%
Up to and including 24 x 36 in. 70&5
20 x 30 to 24 x 50 in. 45%

NOTE.—There is no uniformity in list prices of sink dishers.

Skeins, Wagon—

Cast Iron ..... 70@75&10%
Steel ..... 40@45%

Slates, School—

Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless .. 60@65 less
Victor A, Noiseless .60@4 less @5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%
High Grade, 40%; Trojan 40%
Jockey 25%

Snaths—

Scythe ..... 55@60%

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—
Good Quality ..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton ..... 50&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Wm. Rogers Mfg. Co.'s Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous

German Silver ..... 60@60&5%

Tinned Iron—

Teas ..... per gro. 50@ 55¢
Tables ..... per gro. $0.90@ $1.00

Springs— Door—

Bardsley's Spring and Check 40%
Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman (Coil) 35%
Reliance (Coil) ..... 40&10%
Star (Coil) 30%
Torrey's Rod, 39 in. ..... per doz. $1.10

Carriage, Wagon, &c.—

1¼ in. and Wider: Per 100 lb.
Black ..... $4.75@5.00
Half Bright ..... $4.75@5.00
Bright ..... $5.25@5.50
Painted Seat Springs:
1½ x 2 x 26 ..... per pr. 49@52¢
1½ x 3 x 28 ..... per pr. 73@77¢

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; National, per doz. $12.00
Enterprise ..... 20@20&10%
Philadelphia No. 1, per doz. $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated..} List Jan. 5, 1900.
Steel and Iron..} 75&10@80&5
Rosewood Hdl. Try Squares and T-Bevels ..... 60@10@10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40@10@40@10%
Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel 15%

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.25
Iron, Porcelain Lined ..... doz. $1.75

Staples—

Barbed Bind ..... 75@50&5@10%
Electrogalvanized ..... 50@10@5@5%
Fence Staples, Plain, $2.15; Galvanized $2.45
Poultry Netting Staples ..... per lb. 3½@3¾¢

Steels, Butchers'—

Dick's 30%
Foster Bros. 30%

Steelyards— .... 30@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates 25%
Greene's 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plates 25%

Stoners, Cherry—

Enterprise ..... 25@10%

Stones—Oil, &c.

Pike Mfg. Co., 1907 list: per lb.
Arkansas St. No. 1, 5½ in. as ..$2.80
Arkansas St. No. 1, 5½ to 8 in $3.50
Arkansas Slips No. 1 ..... $4.00
Lily White Washita, 4 to 8 in. 60¢
Rosy Red Washita, 4 to 8 in. 60¢
Washita St., Extra, 4 to 8 in. 50¢
Washita St., No. 1, 4 to 8 in. 40¢
Washita St., No. 2, 4 to 8 in. 25¢
Lily White Slips ..... 90¢
Rosy Red Slips ..... 90¢
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 70¢
Washita Slips, No. 2 ..... 40¢
India Oil Stones (entire list) 33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit 40%
Quickcut Emery and Corundum Axe Stone, Double Grit 33⅓%
Quickcut Emery Rubbing Bricks. 40%
Hindostan No. 1, R'g'lar ..per lb. 8¢
Hindostan No. 1, Small..per lb 10¢
Axe Stones (all kinds) 33⅓%
Turkey Oil Stones, Extra..5 to 8 in. ..... per lb 80¢
Queer Creek Stones, 4 to 8 in. 20¢
Queer Creek Slips ..... 40¢
Sand Stone ..... 6¢

Scythe Stones—

Pike Mfg. Co., 1901 list:
Black Diamond S. S. ₰ gro. $12.00
Lamoille S. S. ₰ gro. $11.00
White Mountain S. S. ₰ gro. $9.00
Green Mountain S. S. ₰ gro. $6.00
Extra Indian Pond S. S. ₰ gro. $7.00
No. 1 Indian Pond S. S. ₰ gro. $7.00
No. 2 Indian Pond S. S. ₰ gro. $4.50
Leader Red End S. S. ₰ gro. $4.50
Quick Cut Emery... ₰ gro. $10.80
Pure Corundum..... ₰ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8.00
Emery Scythe Rifles, 3 Coat, $10.00
Emery Scythe Rifles, 4 Coat, $12.00
Balance of 1904 list 33⅓%.
Electro (Artificial). ₰ gro.
$12.00 .....
Lightning (Artificial. ₰ gro.
$18.00 .....

Stoppers, Bottle—

Victor Bottle Stoppers..... ₰ gro. $9.00

Stops— Bench—

Miners' Falls.....15&10%
Morrill's, ₰ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....50&50&10%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Acme Embossed, case lots.....20&10&10
Cary's Universal, case lots.....20&10&10

Stretchers, Carpet—

Cast Iron, Steel Points, doz.
.....60&10&10%
Socket .....doz. $1.00
Excelsior Stretcher and Tack Hammer Combined, ₰ doz. $6.00.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&5%
National Specialty Co., list Jan. 1, 1904.....33⅓%
P., S. & W. Co.....40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ₰ doz.
Sweetheart, Cretonne Mahogany.....$ 7.75
Triumph, Mahogany 9.00
Parlor Queen, Fig. Rosewood..$30.00
Easter, Hungarian Ash .....
Am. Queen, Fig. Mahogany....$27.00
Imperial, Fine Maple $25.00
Grand Rapids, Nickel, $21 .....
Japan .....
Standard, No. 51, $22 .....
Grand Jewel, Nickel, $21.00, Japan
Crystal, Glass Top.....$36.00
Grand, 17 in. wide.....
Cadet, 21 in. wide.....
Hall, 25 in. wide.....

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five dozen lots; $2 per dozen on ten dozen lots; $2.50 per dozen on twenty five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks...9@25
American Cut Tacks.....
Bright Cut Tacks.....
Brads' Upholstery.....
Gimp Tacks.....
Lace Tacks.....
Trimmers' Tacks.....
Looking Glass Tacks
Bill Posters' and Railroad Tacks, ...and 5%
Hungarian Nails.....
Finishing Nails.....
Trunk and Clout Nails.....

NOTE.—The above prices are for Net Weights.

Miscellaneous—

Double Pointed Tacks
.....Carpet 60&10&10&5%

See also Nails, Wire

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
5	$2.25	$3.00
10	$3.50	$4.00
15	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather.....25@50&5%
Steel .....
Chesterman's .....25@25&5%

Kenyon & Eyer Co.:
Paper, Asses' Skin .....
Paper, Linen, Bound and Unbound .....

Metallic and Steel, list, 35@35&5%; Pocket, 35@35&5%

Lufkin's:
Asses' Skin.....40&10&10%
Metallic .....
Patent Bend Leather .....
Pocket .....
Steel .....

Wiebusch & Hilger:
Chesterman's Metallic No. 34, ...
Chesterman's Steel, No. 1938E, ...35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs $3.75@$4.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c..... ₰ doz. $3.75

Ties, Bale—Steel Wire—

Single Loop..... ₰ doz. 65
Monitor, Cross Head, &c. ₰ doz. 90

Tinners' Shears, &c.—

See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices

Tire Benders, Upsetters, &c.

See Benders and Upsetters, Tire.

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Haying—

Myers' Hay Tools.....45%

Miniature—

Smith & Hemenway Co.'s, Davidson, ₰ doz., Nickel Plated $12.00, Gold Plated.....$2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simonds' Improved.....35%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@$12.00
Harper, Champion or Paragon, doz. $1.25@$1.40; gro. $13.00@$15.50

Game—

Imitation Oneida.....75&10%
Newhouse .....40@40&—
Hawley & Norton.....65%
Victor .....75@75&10%
Oneida Community Jump.....50%
Hecker .....75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85@90¢

Marty French Rat and Mouse Traps
(Genuine):
No. 1, Rat, ₰ doz., $13.25..$11.50 doz.
No. 3, Rat, ₰ doz., $6.50... $5.75 doz.
No. 2½, Rat, ₰ doz., $5.25.. $4.70 doz.
No. 4, Mouse, ₰ doz., $3.85. $3.00 doz.
No. 5, Mouse, ₰ doz., $3.00. $2.25 doz.
Oneida Communal:
Out o' Sight, Mouse, ₰ doz.....$0.60
Out o' Sight, Rat, ₰ doz..... 1.25
Easy Set, Mouse, ₰ doz..... .35
Easy Set, Rat, ₰ doz..... 1.00
Wood Choker, Rat, ₰ doz. holes. .12
Premier Tin Choker, 5 hole, ₰ doz. traps..... .75

Trowels—

Disston Brick and Pointing.....25%
Disston Plastering.....20%
Disston "Standard Brand" and Garden Trowels.....30%
Kohler's Steel Garden Trowels, ₰ gro., 5 in., $4.80; 8 in., $6.00.....
Never-Break Steel Garden Trowels..
₰ gro. $6.00
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern.....50&10%
Western Pattern.....60&10%
Handy Trucks .....net $16.00
Grocery .....₰ doz. $15.00
McKinney Trucks.....each, net $10.00
Sack Stove Trucks.....₰ doz. $15.00

Tubs, Wash—

M'f'gr's list, price per gross.
No. 0 1 2 3
Galvanized 867 839 889 889 1065

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½ lb. Balls 24@25¢
No. 12, ¼ and ½ lb. Ball 8..21@2—
No. 18, ¼ and ½ lb. Ball 18@—
No. 24, ¼ and ½ -lb. Balls.....
.....
No. 36, ¼ and ½ lb. Balls 17@19¢
Chalk Line, Cotton .....
Balls .....26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz. .....11@19¢
Cotton Wrapping, 6 Ply, 1 lb. according to quality...15½@23¢
American 2 Ply Hemp, ¼ and ½ lb. Balls.....17@17¢
American 3-Ply Hemp, ¼ and ½ Balls .....15@16¢
Bale and 2 Ply Hemp, ¼ and ½ Balls (Spring Twine) 15@16¢
Indian 2-Ply Hemp, ¼ and ½ .....
.....19@21¢
India 3-Ply Hemp, ¼ and ½ .....17¢
.....
2, 3, 4 and 5-Ply Jute, ¼ and ½ Balls .....
Mason Line, Linen, ½-lb. Bls.17¢
No. 36, Mattress .....
Balls, according to quality.
.....
Wool, 3 to 6 ply... B 9¢.

Vises—

Solid Box.....50@50&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard 40
Machinist 40
Columbian Hdw. Co. 40
Fisher & Norris Double Screw, net, each No. 2, $16.50; 4, $20.50; 5, $27.00.....
Fulton Mach. & Vise Co.:
Reed 25
Star, Steel Jaw.....40
Hollands:
Machinist .....40&5
Combination .....60&10
Lewis Tool Co.:
Adjustable Jaw 30
Monarch, 50; Steel Jaw .....
Massey Vise Co.:
Cylinder 40
Perfect, 15%; Lightning Grip.....15%
Morgan 30
Millers Falls Oval Slide Pattern 60&10
Parker's:
Victor, 20@25%; Regulars.....20@25%
Vulcan's .....40@45
Combination Pipe .....50@
Peerless .....
Reed 25
Rock Island .....
Stockbridge's 40%
Stephens' 33⅓

Saw Filers—

Disston's D 3 Clamp and Guide, ₰ doz., $24.00, 30%; Clamps.....30
Perfection Saw Clamps, ₰ doz.....$4.50
Reading 65

Wood Workers—

Fulton Mach. & Vise Co.:
Reed 25
Star 40
Massey Vise Co.:
Lightning Grip, 15%; Perfect.....15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 11 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870 40%.....
Rock Island Pipe.....25

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E. 11 up...$1.00
P. E. 9 and 10.....1.25
P. E., 8.....1.50
P. E., 7.....1.50
Ely's B. E., 11 and larger.$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Dis. 17½

Ware, Hollow—Cast Iron, Hollow—

Stove Holloware:
Lipped .....½d to
Grooved .....3@6½
Plain or Ungrooved.....6@
Country Hollow Ware, per 100 lbs. $3.00
White Enameled Ware:
Muskin Kettles.....65@1—
Covered Wares:
Tinned and Turned.....35&10%
Enameled .....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nutting Steel Ware.....50%
Iron Clad Ware.....50%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Each	7	8	9
	45¢	50¢	65¢	65¢

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60
Peerless .....5 & 10%&5%
Never Break Spiders and Griddles .....65&5
Never Break Kettles .....
Sure Stick Spiders and Griddles.65&5
Solid Steel Kettles.....60

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc:
Crescent, family size, bent frame $1.05
Rapid .....
Double Zinc Surface:
Single .....
Glass .....
Single Surface:
Single .....
Glass .....
Nickel Plate Surface:
Single .....
Glass .....
Glass Surface:
Single $3.95
Metal King, Single Surface, vertical $3.95

Washers—Leather, Axle—

Solid .....
Patent .....
Coil: ..... per box
1½ in. 12 ..... per box

Iron or Steel—

Size bolt.....
Washers....$5.40 4.50 3.20 3.00 2.80
The above prices are per keg of 200 lbs.
$6.00 off list.
In lots less than one keg add ½c per lb.; 5-lb. boxes add 5c to list.

Cast Washers—

Over ½ inch, barrel lots per lb. 1¾@2¢

Wedges—

Oil Finish.....lb., ..@3¢

Weights—Hitching—

Covert Mfg. Co.....30&2%

Sash—

Per ton, f.o.b. factory:
Eastern District .....
Southern Territory .....
Western and Central States Districts .....$24.00@27.00

Wheels, Weil—

8 in., $2.25; 10 in., $2.85; 12-in., $3.50; 14-in., $4.50.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....72½&10&5%
10 to 18.....72½&10&10%
19 to 26.....75&10&10%
27 to 36.....77½&10&12½%
Galvanized:
6 to 9.....72½&10&5%
10 to 14.....72½&10&5%
15 to 18.....72½&10&5%
19 to 26.....72½&10&5%
27 to 36.....75&10&12½%
Coppered:
6 to 9.....65&10&10%
10 to 14.....65&10&10%
15 to 18.....65&10&10%
19 to 26.....65&10&12½%
27 to 36.....65&10&12½%
Tinned
6 to 18.....67&10&10%
Brass .....72½@ lb. base
Copper .....32¢ lb., base
Cast Steel Wire.....50%

Spooled Wire—

Annealed and Tinned, Coppered, Brass and Copper.....
Retailers' Assortments, per box. .....

Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods.....
Brass Wire Goods.....90@90&10%
Brass Cup and Shoulder Hooks .....50&15%

Wire Cloth and Netting—

Galvanized Poultry Netting, ...80&5@80&10%
Painted Screen Cloth, 100 ft., $1.30
Standard Gale Hardware Grade: Per 150 sq. ft.
Nos. 2, 3, 4 and 5 Mesh.....$ 2.50
Nos. 6 and 7 Mesh.....2.75
No. 6 Mesh.....$3.00
No. 8 Mesh.....$3.50

Wire, Barb—*See Trade Report*

Wrenches—

Screwdriver .....75@75&10%
Alligator or Crocodile..70&10&75%
Baxter Pattern S Wrenches... .....50&5%
Drop Forged S..... .....
Nut .....
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Pipe .....
Steel Handle .....
Combination .....
Merrick .....
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... .....10&10&5&5%
Case .....
Case lots.....
Solid Handles, P., S. & W., 50&10%
Quanta Wrench Co.:
Single .....
Double .....
Whitaker Machinists':
Single .....
Double .....

Wrought Goods—

Staples, Hooks, &c., list March 15, 1902.....90%

Zinc—*(Cask lots at —¢)*

Sheet.....per 100 lb. $7.00

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:
1 to 1½ in. round and square ... ₰ lb 2.00¢
1 to 4 in. x ⅛ to 1 in. ... ₰ lb 2.00¢
1 to 4 in. x ¼ to 5-16 ... ₰ lb 2.20¢
Rods—⅜ and 11-16 round and square ... ₰ lb 2.20¢

Angles:
Cts ₰ lb
3 in. x ¼ in. and larger ... 2.40¢
(except 3½ in. and 4 x ¼) 2.50¢
2 in. x 3-16 in. and ⅛ in. ... 2.65¢
1½ to 2½ in. x ⅛ in. ... 2.45¢
1½ to 2¼ in. x 3-16 in. and thicker ... 2.40¢
1 to 1¼ in. x 3-16 in. ... 2.45¢
1 to 1¼ x ⅛ in. ... 2.50¢
3 x ⅛ in. ... 2.65¢
3 x ¼ in. ... 2.75¢
⅝ x ⅛ in. ... 3.40¢
⅛ x 3-32 in. ... 4.30¢

Tees:
1 in. ... 2.75¢
1¼ in. ... 2.35¢
1½ to 2½ in. ... 2.45¢
3 in. and larger ... 2.50¢
Beams ... 2.40¢
Channels, 3 in. and larger ... 2.40¢
Bands—1½ to 6 x 3-16 to No. 8 ... 2.45¢
"Burden's Best" Iron, base price ... 3.30¢
Burden's "H. B. & S." Iron, base price ... 3.10¢
"Universal" ... 3.10¢
Norway Bars ... 3.50¢
Norway Shapes ... 3.80¢

Merchant Steel from Store—

per lb
Bessemer Machinery ... 2.10¢
Toe Calk, Tire and Sleigh Shoe ... 2.50@3.00¢
Best Cast Steel, base price in small lots ... 7¢

Sheets from Store—

B'ack	One Pass, C.R. Soft Steel.	R. G. Cleaned.
No. 14	₰ lb 2.85	2.90¢
Nos. 18 to 21	₰ lb 2.95	3.10¢
No. 27	₰ lb 3.15	3.40¢
No. 28	₰ lb 3.20	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment, W. Dewees wood ... ₰ lb 11¾@14¾¢
Patent Planished ... ₰ lb A, 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16 ... ₰ lb 3.15¢
Nos. 22 to 24 ... ₰ lb 3.35¢
No. 27 ... ₰ lb 4.10¢
No. 28 ... ₰ lb 4.25¢
No. 20 and lighter 36 inches wide, 25¢ higher.

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:
IC, 14 x 20 ... $6.40
IX, 14 x 20 ... 7.65

A. Charcoal:
IC, 14 x 20 ... $5.45
IX, 14 x 20 ... 6.55

American Coke Plates—Bessemer-
IC, 14 x 20 ... 107 lb ... $4.00
IX, 14 x 20 ... 5.45

American Terne Plates—
IC, 20 x 28 with an 8 lb. coating ... $8.60
IX, 20 x 28 with an 8 lb. coating ... 10.60

Seamless Brass Tubes—

List December 4, 1905. Base price 20 ¢

Brass Tubes, Iron Pipe Sizes—

List December 4, 1905. Base price 20¢

Copper Tubes—

List December 4, 1905. Base price 23¢

Brazed Brass Tubes—

List June 6, 1898. 23½¢ ₰ lb

High Brass Rods—

16½¢ ₰ lb

Roll and Sheet Brass—

List June 6, 1898. 16¼¢ ₰ lb

METALS—

Tin—

Straits Pig ... ₰ lb 29 @30 ¢

Copper—

Lake Ingot ... ₰ lb 15 @15½¢
Electrolytic ... ₰ lb 14¾@15¼¢
Casting ... ₰ lb 14½@15 ¢

Sheet Copper Hot Rolled, 16 oz. ... ₰ lb 18@..¢
" " " 14 " ... " " 19@.. ¢
Sheet Copper Cold Rolled, 1¢ ₰ lb advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, 1¢ advance over Cold Rolled.
Sheet Copper Polished over 20 in. wide, 2¢ advance over Cold Rolled.
Bottoms, Pits and Flats ... ₰ lb 23¢ basis
Planished Copper, 1¢ ₰ lb more than Polished.

Spelter—

Western ... ₰ lb 5½@6 ¢

Zinc.

No. 9, base, casks, ₰ lb 7.50¢ | Open ... ₰ lb 8.00¢

Lead.

American Pig ... ₰ lb 4½@5 ¢
Bar ... ₰ lb 5½@6 ¢

Solder.

½ & ½, guaranteed ... ₰ lb 20@20 2 1-4¢
No. 1 ... ₰ lb 18½@19¼¢
Refined ... ₰ lb 16½@17 ¢
Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ... ₰ lb ..@12¢
Hallletts ... @11¢
Other Brands ... @10¢

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:
Small lots ... 38¢
100-lb lots ... 36¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy and Wire	₰ lb 11.50@12.00¢
Copper, Light and Bottoms	₰ lb 10.75@11.00¢
Brass, Heavy	₰ lb 8.50@9.00¢
Heavy Machine Composition	₰ lb 9.50@10.00¢
Clean Brass Turnings	₰ lb 7.50@8.00¢
Composition Turnings	₰ lb 9.25@10.50¢
Lead, Heavy	₰ lb ....@ 3.25¢
Tea Lead	₰ lb ....@ 3.00¢
Zinc Scrap	₰ lb ....@ 3.00¢
No. 1 Yard Wrought, Long	$ 8.50@ 9.00
No. 1 Yard Wrought, Short	$ 8.00@ 8.50
Wrought Pipe	$ 6.50@ 7.25
No. 1 Machinery Cast	$11.00@11.50
Stove Plate	$ 9.50@10.00

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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THE IRON AGE

New York, Thursday, February 13, 1908.

The Vanguard Gasoline Locomotive.

Following the successful operation of gasoline motors in railroad inspection cars of various types, it was natural to turn attention to the adaptation of this form of motive power to locomotives designed for special service in terminal switch yards of railroads, or for handling cars about industrial plants. A concrete example of development in this direction is furnished in the Vanguard locomotive built by the Milwaukee Locomotive Mfg. Company, North Milwaukee, Wis., and illustrated in Fig. 1 herewith. After a four months' test of continuous service in switching heavy freight cars singly and in trains over the indifferent tracks usually found in private yards with an 8-ton Vanguard locomotive the company is now prepared to furnish similar equipment for general work of like character. It is stated that in this test, which included electric railroad extension work of stringing trolley wires, the locomotive, though working at times 15 hr. a day, was not in the repair shop during the entire period. The chief advantages claimed for the machine are low operating expense, moderate cost of maintenance and freedom from smoke and sparks. It is always ready for service at a moment's notice, is operated by one man, consumes no fuel except when work is being done and all parts are interchangeable and accessible.

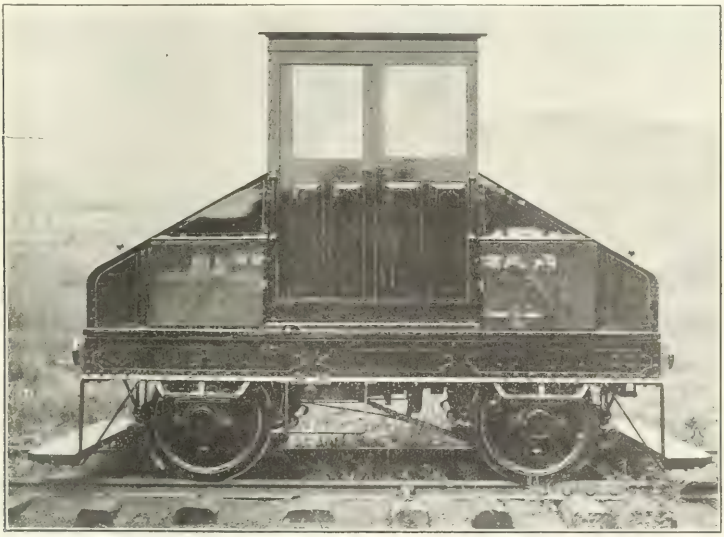


Fig. 1.—The Vanguard Gasoline Locomotive Built by the Milwaukee Locomotive Mfg. Company, North Milwaukee, Wis.

The motive power is furnished by a four-cylinder, four-cycle water cooled engine which, in the model A here illustrated, is of 50 hp.; engines up to 100 hp. are supplied when required. The engine and transmission gear are mounted on a frame suspended from three bearings on the main frame. This arrangement is designed to provide a degree of flexibility necessary to insure the mechanism against injury from sudden shocks incident to switching work or derailment accidents. A transverse leaf spring pivotally connected at its center to the front or left end of the inner frame, as shown in Fig. 2, forms one point of support for this member; the other two consist of trunion bearings on opposite sides of the main frame.

The engine is located at the forward end of the suspension frame and carries a flywheel with an extension hub socketed to receive the squared end of the main driving shaft. A coupling connection is thus provided that permits the shaft to slide forward and back enough to alternately engage and release the cup and cone friction clutches through which the forward and reverse motions are obtained. This movement is controlled by a reverse lever pivoted to the shaft, by which the clutch cones are alternately thrown in or out of gear. The friction cups are mounted on the opposite ends of a loose sleeve and have attached to their bases bevel pinions which mesh a bevel gear on the transverse chain shaft. On this shaft are two sprocket wheels carrying Whitney roller chains, one leading to the front and the other to the rear axle. The chain shaft, being nearly in line with the trunion bearings of the intermediate frame, preserves the tension of the transmission chains, notwithstanding the vibration imparted to the frame by unavoidable jars and jolts.

Axle bearing boxes of special design are bolted to brackets attached to the side bars of the main frame, and contain bearings of bronze and antifriction metal which are made transversely oval to adjust the axle alignment to uneven track. The bearing is held from rotating in its box by a pin extending through the upper bearing section of the box into the lower bearing, and a slotted opening is provided in the latter to compensate for the rocking movement of the axle.

The locomotive is geared for three speed changes on both reverse and forward motion, 2, 8 and 15 miles, respectively. Steel tired cast iron wheels are used, and hand lever brakes are provided for all four wheels, the arrangement of which is clearly shown in Fig. 2. The gears are of forged steel cut and case hardened, and the car has a wheel base of 7 ft. and is equipped with M. C. B. automatic couplers.

The company is at present engaged in building a locomotive of similar type suitable for passenger and freight traffic on spur lines. This machine is designed to haul a heavy passenger coach at a speed of 30 miles an hour or to handle a train of 10 loaded freight cars. In the opinion of the designers this type of locomotive is preferable to and more effective than an equivalent installation of motive power in a passenger coach. Such equipment can, however, be furnished if desired. The passenger motor

now under construction will be furnished with air brakes and a small electric generator.

The Canadian Bounties on Lead.

The Dominion statute under which bounties are paid on lead will expire June 13. Representatives of the Associated Boards of Trade of British Columbia have already been in Ottawa urging that the bounty law shall be continued for another period of five years, and that the new act shall be so framed as to admit of the payment of bounties until the price of pig lead in the London market reaches £18 a ton of 2240 lb.

Bounties on lead have been paid since 1899. Up to the end of the fiscal year 1906 the total disbursements to the lead miners of British Columbia were $770,848. These payments were made under three different enactments, and it was not until the act of 1903 that there was any connection between the bounties and the price of lead in London.

The second of the bounty acts, that of 1901, provided for tonnage bounties on a sliding scale. The rate for 1902 was to be $5 a ton; 1903, $4; 1904, $3; 1905, $2, and 1906, $1, but, as has frequently happened in connection with bounty enactments of Canada, the act of 1901 did not run out its time limit, which was fixed for June, 1907. The act of 1901 was repealed in 1903, and replaced by an act which provided that the bounty should be at the rate of 75 cents per 100 lb., and that in no year should the total payments exceed $500,000. There was, moreover, inserted in this act a clause which provided that when the standard price of lead in London exceeded £12 10s. per ton the bounty on lead should be reduced by the amount of such excess. The result of this provision was that there were no bounty payments during the fiscal year 1907, when 47,508,471 lb. of lead was produced in Canada.

The lead miners now regard this provision as a hardship on the industry, and the Nelson Board of Trade has passed a resolution, which has since been adopted by other British Columbia Boards of Trade, urging that bounties shall be paid until the price of lead in the London market is at £18 a ton. The ground for this change in the bounty law is that when the act of 1903 was passed machinery, supplies and labor cost less than they do at the present time, and that in 1903 there was a market for zinc in the United States. Under present conditions it is argued there is no market in the United States for this by-product of the lead mines, and for mines where the silver percentage is low the whole of the profit must come from lead. It is claimed also there is no profit in lead when the London price is below £18, and that even with lead at £18 Canadians get less for their lead than American producers under the Dingley tariff.

During the eight years in which these bounties have been paid 135 mines have participated in them. In 1906, when the total payments aggregated $90,196, the two largest payments were $46,512 and $25,792. These were to the St. Eugene mine and the Sullivan mine. The St. Eugene mine was paid in respect of 15,599,350 lb. of smelted lead and 4,391,137 lb. of unsmelted. The payments to the Sullivan mine were for 5,908,409 lb. of smelted lead and 3,839,542 lb. of unsmelted. Only 11 of the payments to mines exceeded $900, and in some cases the payments were less than $5. In the year in which the act of 1903 went into operation the total payments increased from $4380 in 1903, the last year in which the act of 1901 was in force, to $195,627. The following year the amount reached $330,645, the largest sum ever paid out in respect of lead bounties. The upward movement in the price of lead, however, soon began to affect the payments, which in 1906 fell to $90,000, while in 1907 there were no payments of bounties in respect of lead.

The Canadian Government has been paying bounties for a variety of industrial products from as far back as 1883. No bounty law is ever for a longer period than five years, but nearly every bounty law that has been on the Dominion statute book has been renewed by Parliament when the term of enactment expired. With a Dominion general election due in the autumn of this year there is every likelihood that the Government will respond to the pressure of the mining interests of British Columbia, and continue the lead bounties for another five years.

E. P.

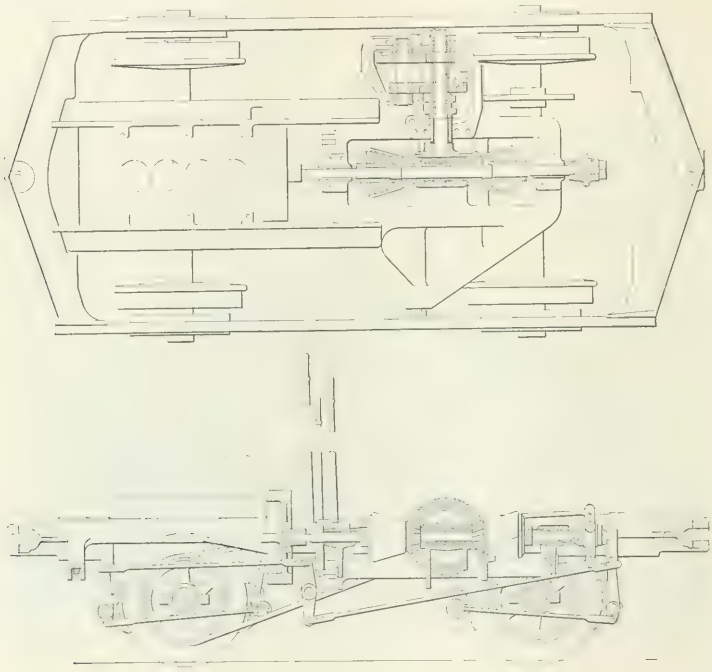


Fig. 2.—Plan and Elevation of the Truck of the Vanguard Gasoline Locomotive.

The Westinghouse Improved Post Brake.

An improved brake, specially designed for motors in rolling mill service, is a recent product of the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. This, designated as the Westinghouse post brake type S. P., is of the solenoid post type, and is described as simple in construction, liberal in design and effective in operation. As shown in Fig. 1, its principal members are a brake wheel A, and two friction shoes B, which are mounted within a structural frame C supported by a steel base G, being controlled by a heavy steel spring O, and a solenoid in a cast steel frame F, which completely incloses the coil. The brake is built entirely of cast iron and steel. Cast iron is used in the wheel and shoes, where its better wearing qualities and cheapness of renewal make it preferable. The shoes and wheel are operated prefectly dry, and cast iron is found also to be the best for metallic surfaces unlubricated. The wear on the wheel is about one-sixteenth of that of the shoe. The maintenance cost is low, and all repair parts are easily made in any repair shop. The open construction permits easy inspection of all parts.

The shoes are clamped to the wheel during the braking period by the steel spring, and are released by the solenoid. The connecting rod H of the latter carries adjustable stop nuts K, which contact with the pin P, and, acting against the compression member D, place the member E in tension, pulling the brake shoes away from the wheel. The full force of the brake is applied at the moment of contact between the shoes and the wheel, and as soon as contact is made the spring ceases to contract. Therefore the braking force never exceeds normal, and the stress on the brake parts and motor shaft is much less than is the case with ordinary brakes. Likewise, the load is stopped in a much shorter time. To do away with the hammer blow effect experienced in other types of brakes, the plunger is provided with lost motion to permit of overtravel. There is practically nothing in connection with the brake to get out of order, and the only attention needed is an occasional adjustment of the screw J to take up the play due to the wear of the shoes or of the screw I to regulate the clearance. All parts needing adjustment are easily accessible. No lubrication of either shoes or wheel is required.

In the design of the brake special attention has been

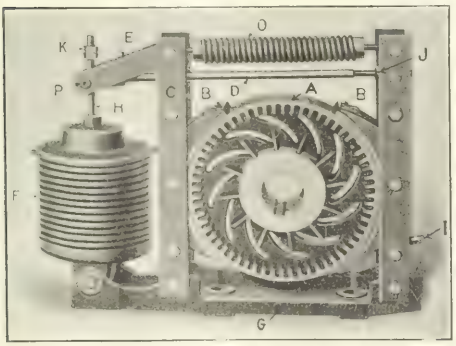


Fig. 1.—The Westinghouse Type S. P. Post Brake for Motors in Rolling Mill Service.

paid to heating tendencies, and ample provision made to counteract their effect. The rim of the wheel is corrugated on the under side for the double purpose of increasing its strength and giving the maximum radiating surface. The arms are numerous and curved to permit an expansion of the rim due to heating, without producing undue stresses in the arms or rim. On each side of the arms and extending from the hub are vanes, which produce a current of air directed against the corrugations inside the rim while the wheel is running. This increases the radiation of heat generated and keeps the heat away from the motor bearings.

The shoes are of cast iron with a solid thick face to permit long wear. On the rear of the shoe is a series of narrow ribs, which strengthen it and increase the radiating surface. In operation the shoe is free to turn on a pivot and find a true seat on the wheel. The pressure against the wheel is thus uniformly distributed and unusual wear in any one part of the shoe is prevented.

The magnet is of cast steel, the frame completely inclosing the coil. It is pivoted at the base which prevents any tendency to bind as it follows the wear of the shoe. The coil may be either series or shunt wound for a direct

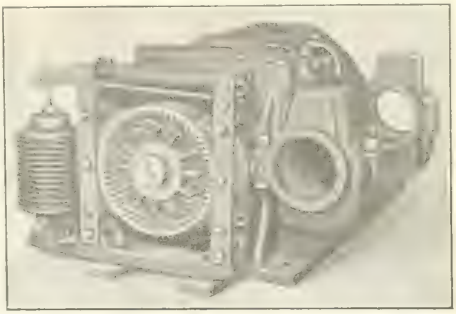


Fig. 2.—The Type S. P. Brake Attached to a Westinghouse Mill Motor.

current circuit of 110, 220 or 500 volts. The series winding is preferable to the shunt due to its quicker action, and is considered as standard. The series coils will release the brake at 0.6 of the full load current of the motor, and will hold it open at 0.1 full load current.

The brake is secured to the motor by brackets, as in Fig. 2, which may be made integral with the motor frame when so specified. This arrangement is strongly recommended as it precludes all possibility of the brake getting out of alignment. These brakes are at present made in five sizes for 25, 50, 75, 100 and 150 hp. motors, and may be applied to any type of motor used in mill or crane service.

The Malleable Castings Industry.

The production of malleable iron castings in the United States in 1907, as ascertained by the *Foundry*, amounted to 969,399 tons. No similar statistics have been gathered in other years. It is estimated, however, that the producing capacity is now about 1,300,000 tons a year, as against 875,000 tons in 1903—an increase of about 50 per cent. The net increase in the number of malleable foundries since 1903 is found to be 15, the number of new plants being 17, and of abandoned plants 2. The statistics just gathered show that 13 new plants have been put in operation since July 1, 1906. At present there are 131 malleable foundries in the United States. Ohio and Illinois lead with 21 each; New York and Pennsylvania have 16 each; Wisconsin has 12, Connecticut 11, Michigan 8, Indiana 6, New Jersey 4, Massachusetts 3, Missouri 2 and Alabama, Delaware, Iowa, Kentucky, Maryland, Minnesota, New Hampshire, Rhode Island, Tennessee, Washington and West Virginia 1 each. The number of air furnaces in use at malleable foundries is 369, and of open hearth furnaces 21. In addition 42 cupolas are used for melting iron entering into malleable castings.

The H. W. Johns-Manville Company, in accordance with its usual custom, held a convention of its branch managers in New York, from January 29 to February 1. The managers of the various branches of the company throughout the United States were present at the meeting, and a general discussion of its business affairs took place. As a fitting wind up of the convention a banquet was given to the managers at the Union League Club on the evening of January 31. The convention was pronounced a decided success by all present.

The Logemann Hydraulic Wheel Press.

Owing to the variations in size of shafts and bores of cast iron wheels used in the construction of mowers and reapers, there is an ever present liability of breaking the wheels in pressing them on, unless the pressure is under perfect control and can be graduated to meet changing degrees of resistance. The hydraulic press illustrated in Fig. 1 was designed and constructed by Logemann Brothers, Milwaukee, Wis., especially for such work and has been installed in a large mower and reaper plant, where it is handling up to 800 wheels per day.

Due to worn reamers or hard spots in castings, the wheel bores are sometimes a trifle small or the shafts on which they are to be pressed are not infrequently either slightly oversize or not of uniform diameter; thus when a tight fit is encountered added pressure is required to force the wheel on. This might be necessary only for an inch or so of plunger travel, after which the fit becoming normal a lower pressure suffices. If, however, the mechanism is driven by an unregulated force a quick decrease of resistance would result in driving the wheel forward with such speed as to render a break in the main mower frame casting extremely likely. To obviate this difficulty the triple compound pressure pump, which operates this press is arranged to automatically respond to the requirements of service at either high or low pressure. Being delicately adjusted and under automatic control sudden and severe stresses likely to result in breakage are prevented.

The pump unit, as shown in Fig. 2, comprises three high and three low pressure cylinders set tandem on a low cast iron base, the plungers of which are driven from three cranks, 120 degrees apart, on the driving shaft. The mechanism by which automatic control is effected consists of a special ram ⅝ in. in diameter in direct connection with the discharge part of the low pressure cylinders. When the pressure is raised to a given point it depresses a short fulcrum lever attached to the ram, which in turn unseats the suction valve in each of the low pressure cylinders. Suction being thus cut off in them the entire load is transferred to the high pressure end, which increases the power but decreases the travel speed of the main press ram. As soon as the resistance is relaxed and the full measure of power thus exerted is no longer required the ram is forced upward by a counterweight, thereby reseating the valves. Suction being thus restored in the low pressure cylinders the load is again thrown on the entire pump. By proper adjustment of the counterweight the automatic relief valve can be set to operate at any pressure desired up to the maximum capacity, which with the high pressure plungers operating detached can, it is claimed, safely reach 2000 lb.

In pressing on wheels of the kind and under circumstances above referred to the pump is generally run with the six plungers in action, but when a tight shaft is encountered the problem of dealing with it is effectually solved by the arrangement described. The same mechanism may be adapted to other kinds of press work with equally good results.

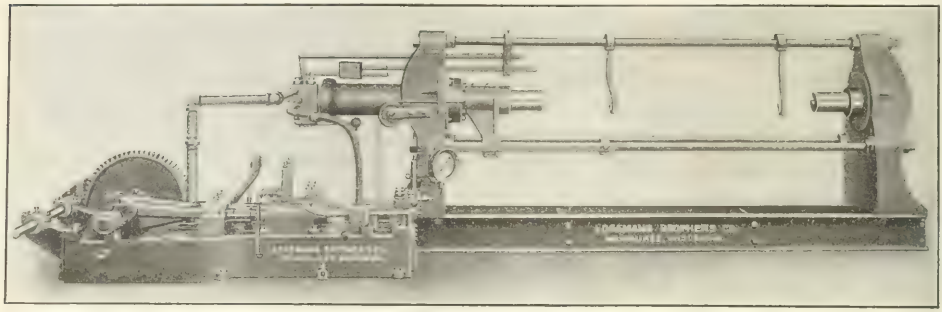


Fig. 1.—The Logemann Hydraulic Wheel Press with Self Contained Operating Pump.

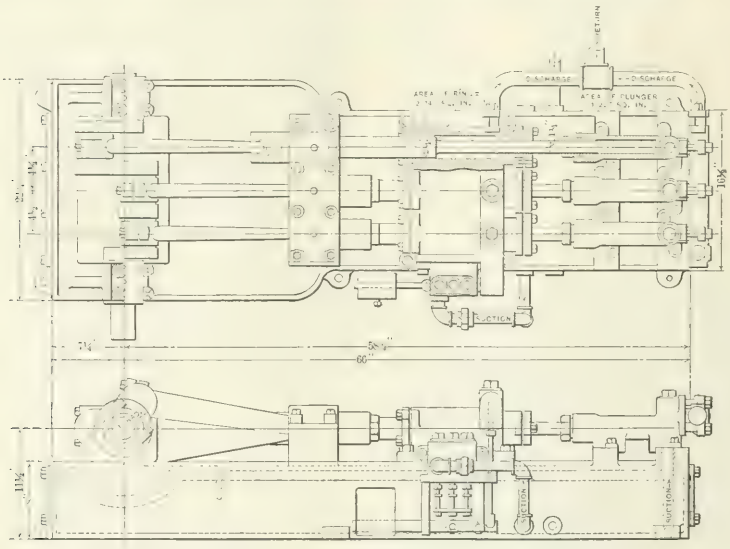


Fig. 2.—Details of the Triplex Pump Unit.

Tariff Revision Far in the Future.

WASHINGTON, D. C., February 11, 1908.—The outlook concerning the revision of the tariff has materially clarified in the past few days, and certain propositions can now be stated with a fair degree of positiveness. Recent developments warrant the following statements:

1. None of the rates of the present tariff will be changed at this session of Congress.
2. The initial steps looking to a comprehensive overhauling of the Dingley law will be taken at the short session next winter, with the ultimate object of framing maximum and minimum schedules.
3. Congress will not authorize a tariff commission to cooperate in the work of revising the Dingley act.
4. The customs administrative laws will not be amended at this session and probably not in advance of the coming general revision of the tariff.

More than a score of bills proposing various changes in the existing tariff schedules have been introduced during the present session and are now before the Ways and Means Committee. They will not be acted upon at this session, however, and it is now regarded as improbable that this committee will even make a favorable report upon the bill reducing the duties on Philippine products which passed the House in the last Congress, only to be smothered by the Senate Committee on the Philippines.

Revision Planned for 1909.

The statement that Congress next winter will lay the foundation for the comprehensive revision of the tariff is based upon authoritative declarations made the past week by Speaker Cannon and by Chairman Payne of the Ways and Means Committee. The Speaker for some time past has advised his intimate friends and political lieutenants that in his opinion the tariff would be revised by the next Congress, and this statement was repeated at a hearing given a few days ago to a delegation representing the National Association of Manufacturers, the National Grange and other organizations, who came to Washington to urge the so called Beveridge tariff commission bill. At the same hearing Mr. Payne made a more definite and specific statement than the Speaker concerning the work to be done next winter. In this connection Mr. Payne said:

I think the signs of the times are that next winter this Congress will undertake a revision of the tariff. Shall we get our working information at first hand from the producers themselves, or shall we content ourselves with getting it second-hand from a body of men appointed as a tariff investgation commission? From what I have seen of the formation of tariff bills—and I have been 18 years a member of the Ways and Means Committee, and for the last nine years its chairman—I should by all means seek it at first hand.

Subsequently, in a speech on the floor of the House, Mr. Payne gave it as his opinion that Congress next winter would start the machinery in motion for the revision of the Dingley act, but was careful not to state that a new tariff law would be passed before the end of the present Congress. The present plans of the Congressional leaders involve the passage of a joint resolution at the short session next winter authorizing the Ways and Means and Finance committees to sit during the Congressional recess beginning on March 4, 1909, for the purpose of gathering data to be used as the basis for a new tariff.

Maximum and Minimum Schedules.

The prospect that the next tariff act will be framed in accordance with the maximum and minimum principle which underlies the tariffs of the leading European counties is decidedly interesting. Its exact significance, however, will be misunderstood unless the specific plans of the leaders now advocating it are kept in mind. During the recent discussion of the Beveridge Tariff Commission bill, Speaker Cannon put this question to the delegation:

Do I understand that you favor on the part of the United States an even tariff with every other country in the world, except that we shall enforce our maximum tariff against such countries as discriminate against our exports—that you favor a minimum and maximum tariff, with that application?

Certain members of the delegation answered the Speaker's question in the affirmative, whereupon he declared that "that is precisely the kind of a tariff I believe in myself." Chairman Payne of the Ways and Means Committee subsequently described his own attitude with regard to maximum and minimum schedules as follows:

My position is that when it shall be best for the interests of the American people to undertake a revision of the tariff, that is the time when I shall favor a revision, and I should urge a minimum and maximum tariff, coupled with the existing law empowering the United States to make trade agreements with other countries; and I would follow France, Germany and Russia in the provision that the minimum tariff should afford a fair protection to home products.

The decision of the Congressional leaders not to appoint a tariff commission to aid in the revision of the Dingley act was a foregone conclusion, notwithstanding the strong effort made by advocates of the project to secure its favorable consideration. The Ways and Means Committee refused to give a hearing on the plan, and the conference subsequently arranged with Speaker Cannon and Chairman Payne by the promoters of the Beveridge bill was intended merely as a personal courtesy to the delegates who attended it.

The Senate Finance Committee has decided not to undertake the amendments of the customs administrative laws at the present session, and has been moved to its decision partly by the opposition that has developed to the amendment of section 7 of the act of June 10, 1890, as recommended by the Secretary of State, in pursuance of the recently concluded reciprocal trade arrangement with Germany. The President a few days ago transmitted this agreement to the Senate, together with the text of the proposed changes in section 7, and, after an animated discussion in executive session, the papers were all referred to the Finance Committee. As the favorable action by Congress upon the recommendations of the Secretary of State is not a condition of the maintenance of the German-American agreement, the failure of the Finance Committee to take up the customs administrative act is not regarded as of great importance, especially as it has been intimated by the Senate leaders that the administrative statutes will be very carefully revised in connection with the overhauling of the tariff schedules.

Whether the House will take action at this session with respect to the customs administrative laws has not yet been decided. As heretofore stated in this correspondence, the Ways and Means Committee had intended to take up the question immediately after disposing of the Philippine tariff bill, but the delay in the consideration of that measure and the present uncertainty as to whether it will come up at all have disarranged the committee's plans. Chairman Payne a few days ago introduced a very comprehensive bill for the amendment of the act of June 10, 1890. Whether this subject is taken up at this time or at some later date, this measure will no doubt serve as the basis for the proposed revision.

W. L. C.

The International Adding Machine Company, Cleveland, has been organized with a capitalization of $50,000 as a preliminary to the formation of a $1,000,000 corporation, which, it is announced, will incorporate later to erect a plant for the manufacture of an adding machine upon which the company controls patents. The principal promoters of the company are N. I. Dryfoos, president of the National Woolen Company, Cleveland, and S. B. Newman of the Calculus Company, Cleveland. The company has not yet selected a location for its plant. It is announced that a plant costing from $200,000 to $300,000 will be erected, and that about $100,000 worth of machinery equipment will be required.

The January production of the Northern Iron Company's furnace at Port Henry, N. Y., averaged over 196 tons daily, which is the largest yield in the history of the plant. The entire output was sold, together with about 700 tons of additional pig iron on hand. The company has a stock of between 7000 and 8000 tons of pig iron on hand.

The Oil Well Supply Company, Oswego, N. Y., is to increase the capacity of its power plant by the erection of a new power house and the installation of a modern water wheel of 400 hp., moving into the new building its Corliss engine to be used as an auxiliary at low water.

An Interesting Coal Handling Plant.

BY CHARLES M. RIPLEY, NEW YORK.

The J. M. Gilchrist's Sons Company, Allegheny, Pa., is just completing an improved coal handling, screening and storage plant on the bank of the Allegheny River in Pittsburgh. The coal barges are towed from the Monongahela bituminous district, coal being brought from mines of both the thick and thin veins, and distances of from 10 to 45 miles away from Pittsburgh. It is not generally understood that Pittsburgh is favored with such great coal deposits so near by, but this and the cheapness of river transportation have added greatly to the industrial prosperity of the Pittsburgh District. In this connection it is interesting to note the very low expense of coal handling in this neighborhood. Coal in considerable amounts can be transported 2000 miles to New Orleans, via the Ohio and the Mississippi rivers, at the same expense that will be required to ship the same amount by rail to Cleveland, Ohio, a distance of less than 150 miles.

The equipment for the plant under discussion operates as follows: A two-yard Hayward class E clam shell bucket is used to take the coal from the flats or barges and dumps it into a hopper 70 ft. above the river bed. From this hopper it is diverted either to the right or to the left by a swinging apron, according to its quality. From the apron the coal passes down one or the other inclined screen, each of which has two different sizes of mesh. These two screens are arranged in the shape of a letter A, and the coal is discharged just to the right or left of the apex, according to its quality. The tailings fall at once through the screen into the middle bin, while the nut size does not fall through until the next larger screen is reached further down the decline. The lump size will find its way to the farthest bin, falling over the lower edge of the screen, there being no mesh through which it passes.

The equipment is duplicated on either side as far as storage facilities are concerned, with the exception that the bin for the nut size is omitted on one side. Thus it is seen that this plant unloads, dumps, divides into two qualities, and further divides one of these qualities into two sizes, and the other quality into three sizes, all in one operation. Gates are arranged at such frequent intervals that six or seven wagons can be filled at the same time.

The Carlin Machinery & Supply Company, Allegheny, Pa., were kind enough to furnish the following information in regard to the mechanical equipment of this plant. A 50-hp. 10½ x 12 in. double cylinder triple drum, Lambert hoisting engine is installed on an elevated platform 33 ft. above the average level of the river. This platform is erected on 20 piles, between 12 and 15 in. in diameter, and driven to hard pan. Concrete was placed around all the piles at the bottom up to a hight of 2 ft. above the water to add greater stiffness.

A three-drum engine was used so that one drum could be used for changing the reach of the boom, one for raising the clam shell bucket, and one for opening and closing the bucket. An interesting feature of this type of Lambert engine is that the closing drum of the engine has the foot brake placed on the end opposite to that at which the friction clutch is applied. The clutch creates some heat, and if the brake were on the same end the increased heat of the tube would cause considerable trouble, owing to the drums cracking from unequal expansion. This trouble has been entirely overcome, as the amount of frictional heat generated on either end is practically balanced.

A 7-hp. single cylinder Dake double geared reversible engine is used for slinging the derrick through an angle of 180 degrees over a circle whose diameter is practically 120 ft. Thus the coal is swung from the barge in the river to the hopper on the shore. The operating cable is a ¾-in. Leschen flattened strand wire rope made of crucible steel. It is so constructed that a great number of wires in each strand are at all times exposed for wear, and presents in external appearance a smooth or comparatively smooth surface even while new. Thus from the start the wear is light upon any one individual wire, since it is distributed over six or seven wires in each strand, instead of being borne by the one outside wire as in the older types of steel rope. It is claimed that the slightly greater cost of this type of rope will be offset by the replacements being less frequently necessary than with the ordinary type of rope.

An unusual obstacle encountered in designing this plant was the restricted harbor line, which allowed a space of only 15 x 30 ft. for the foundations of the hoisting engine and derrick. Obviously, in a space of this size it is impossible to locate all the stiff legs of the derrick. Fig. 1 herewith shows the ingenuity displayed by anchoring one stiff leg on the same platform with the engine, and the other two on the structure containing the storage bins on the river bank. Thus it happens that one of these stiff legs must be a tension member as the coal is being lifted from the barge, and later a compression member as the 2-yard bucket is swung into position over the hopper.

As the engineer stands by his operating levers he has full view of the barge and the hopper during the complete

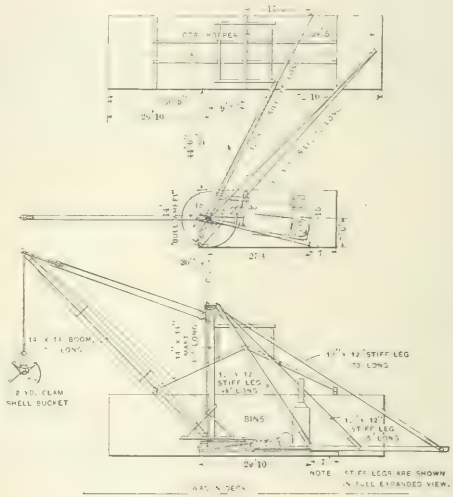


Fig. 1.—The Derrick Hoist for Raising the Coal from the Barges.

cycle of operations. All of the levers are brought to the quadrant stand and some of them can be operated either by foot or by hand, thus increasing the ease of operation. This is important since it is expected that this plant will be operated almost continuously, and handle about 12,000 bushels of coal per day. The expense for this work, aside from the fuel of the hoisting engine, is as follows: One engineer, $3; two men in the flat or barge, $2 each, and one fireman $1 per day. Thus with this total labor expense of $8 per day the cost of hoisting 70 ft., classifying into two different qualities and five different sizes is only 66 cents per 1000 bushels.

The boom of the derrick is 70 ft. long, and owing to the large size of the clam shell bucket the mast is made 16 x 16 in. Where the gudgeon pin is attached to the mast a steel channel is let in the front of the mast timber, and the channel is further strengthened by ¾-in. steel plate inserted between the channel and the timber to prevent the crushing of the wood. At the foot of the mast the derrick base casting is unusually heavy and is in two parts. That for receiving the mast permits all ropes to pass through it, and between the mast and the boom, so that no sheave mortices are required in the mast, and the number of sheaves is thereby lessened. The knee or boom seat is bolted to the derrick base, which allows the boom to be taken down without disturbing the mast. The derrick base has a bearing 11 in. in diameter, with a

6-in. diameter opening for the three cables, so that there is no possibility of the cables touching the sides and wearing themselves unnecessarily.

The diameter of the drum is such that it takes more than one revolution for the link chain to close the bucket. After one turn of the two stranded link chain, it is then converted to a single strand, and the single strand coils between the two laps of the double strand. Thus the drum remains the same diameter, but takes the necessary amount of chain without losing power.

The engine was placed 33 ft. above the river, to provide against damage from a flood such as occurred last year. But this hight is not too great for practical use, because the catheads on the hoisting engine are used to shift the position of the 4400-bus. barges to and from their unloading position in the river.

The details of the coal storage plant are shown in Fig. 2, together with the hopper, the diverting damper, or apron, and the two screens arranged in the shape of an A. This storage plant is at such a hight that teams can drive up to the coal chutes and can be loaded from above, while

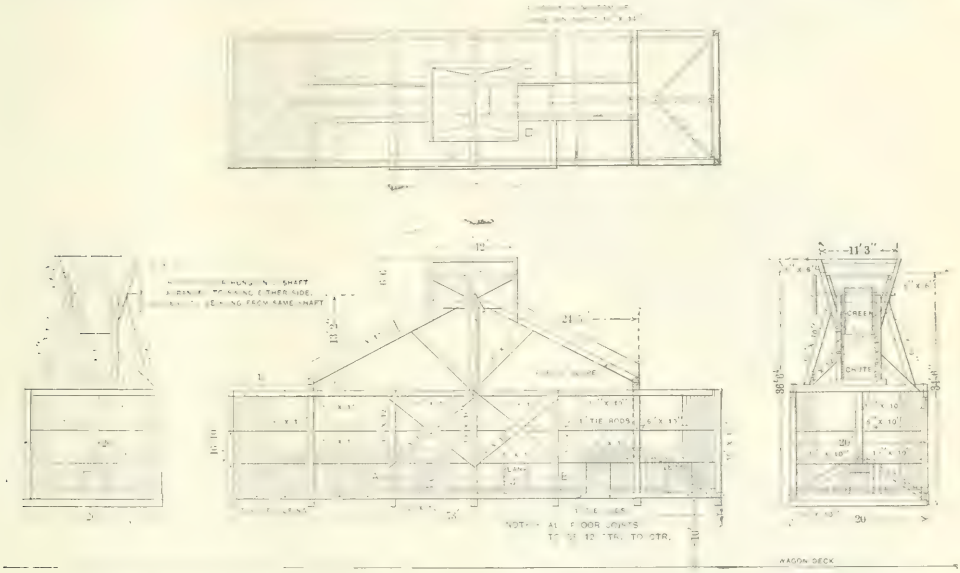


Fig. 2.—Plan and End and Side Elevations of the Coal Storage, Showing the Screening and Sorting Provisions.

they themselves are on the street level. Heretofore a team of horses, with the extra assistance of a hoisting engine, were needed to haul each wagon on a long incline roadway 33 ft. up the river bank to the street level. The old 400-ft. float, wide enough for two teams abreast (part of the old coal handling system), involved constant repairs, incessant pumping, and the heavy rental demanded by the city of Allegheny. All these objections and expenses are done away with by this new installation.

New Publications.

Electrocraft.—Illustrated List of Approved Electrical Fittings and Revised National Electrical Code. Size, 5¼ x 7½ in.: pages, 389. Compiled and published by Electrocraft Publishing Company, Detroit, Mich. Price, 50 cents.

This is the second edition of the work which was originally intended to be issued annually. Hereafter it will be published quarterly on account of the need of more frequent revisions. It is declared to be the only complete illustrated list of electrical fittings approved by the Underwriters' National Electric Association for use under the rules and regulations of the National Board of Fire Underwriters. Besides the list of the approved fittings, it includes a new feature in the publication of the revised National Electrical Code, with drawings illustrating the application of many of its rules. In general, each electrical article or fixture used in the electrical trades has below its picture the name of the maker or firm from which it may be secured. A classified index of material at the front gives manufacturers' names and pages on which the articles sought will be found.

Men Who Sell Things, by Walter D. Moody. Pages, 295; 5 x 7¼ in. Published by A. C. McClurg & Co., Chicago.

"This book," as the author expresses it, "is an attempt to specify the qualifications necessary to the making of a successful salesman, and the reasons for so many failures in the greatest profession on earth, the profession of salesmanship." It is written from a viewpoint of the author's observations and experiences of over 20 years as a salesman, European buyer, sales manager, and, finally, employer. In an analysis of what constitutes the most essential elements of sucessful salesmanship, "pure grit" is given rank as one of the most important, for the reason that therein lies the power to do a good honest day's work; and intelligent, energetic, industrious application is held to be a *sine qua non*—the foundation of all successful effort. Special emphasis is laid upon the necessity of specializing effort, singleness of purpose being declared one of the predominating features of successful salesmanship. A sharp distinction is drawn between the order taker, the man without intelligent initiative, and the tactful, wide awake salesman, who realizes that effective salesmanship involves a comprehensive knowledge of human nature as well as of goods. The book throughout reflects a spirit of optimistic ambition and confident enthusiasm, which are the arms and armor of a salesman.

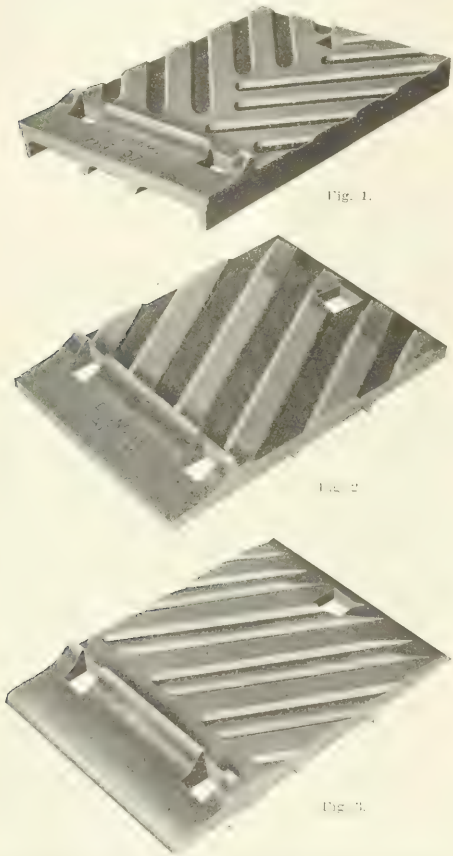
The Rotary Internal Combustion Engine Company, 30 Lawrence street, Newark, N. J., incorporated with a capital stock of $200,000, will shortly place on the market its rotary internal combustion engines. Oscar Anderson is president; John Hokenson, vice-president, and Moritz Hoffmann, secretary.

The Virginia Iron, Coal & Coke Company, Bristol, Va., has resumed operations at its Crescent rolling mills, which have been closed down for two months.

The Economy Tie Plates.

Increased speed and heavier loads are constantly exacting higher grade track material, both in quality and weight, and railroad maintenance of way departments are being pushed to keep abreast of traffic requirements. Because of the growing scarcity of new tie material there is an ever increasing need of economy in its use, which naturally suggests measures for increasing the life of ties. In recent years the introduction of tie plates has not only contributed to this end, but has also added to the general strength and reliability of track construction.

Three new patterns of tie plates, shown in the accompanying illustrations, are being manufactured and introduced by the Spencer Otis Company, which has general offices in the Railway Exchange Building, Chicago, and branch offices in Omaha and New York. These, known as the Economy tie plates, are made of rolled steel, and are designed to combine maximum strength with minimum weight, together with convenience in readjustment and increased adhesion to the tie.



Three Patterns of the Economy Tie Plates Made by the Spencer Otis Company, Chicago.

Fig. 1 illustrates the four-flange tie plate, which is rolled in nominal lengths of 8, 8½ and 9 in. by 5 in. wide and 5-16, ⅜ and ½ in. thick. They are also furnished in 6-in. widths by 8 and 9 in. long. Fig. 2 shows a pattern with diagonal ribs having lateral holding flanges on the under surface. This plate is made in the same lengths as that of Fig. 1, in widths of 6, 6½, 7, 8 and 8½ in. by ⅜, 7-16 and ½ in. thick. Fig. 3 is a plate of an entirely new design, having alternate flat and round ribs or corrugations rolled in its upper surface with a flat bearing surface on the tie except for the reinforcement under the shoulder. The latter is designed to prevent buckling and to furnish additional strength at the point where it is most needed. This plate is furnished in the same sizes as that of Fig. 2.

All of the plates are provided with flanges or shoulders on the rail bearing surface, which serve the double purpose of keeping the rail from shifting laterally and protecting the spike from the shearing action of the rail. It is claimed that the use of this shoulder permits reducing the number of spikes used 33 to 50 per cent. Punched as shown in these illustrations the plates may be used for either right or left hand spiking. They can, however, be punched in accordance with specifications furnished to meet the requirements of any road or for the various rail sections used.

The Gas Engine's Probable Future.

In an address on the above subject, delivered before the Engineers' Society of Pennsylvania, February 6, 1908, the retiring president, Sumner B. Ely, accounted for the greater development of the gas engine abroad, by the conditions there being the reverse of those here—fuel is scarce and labor cheap. He mentioned particularly the notable installations in Germany which have demonstrated that in point of reliability the gas engine now compares favorably with the steam engine. The gas engine has a high thermodynamic efficiency, and in spite of the heat wasted in jacket water and the exhaust there still remains an excellent commercial efficiency. The speaker considered it safe to say that in average practice a gas engine will require about one-half as much fuel as a steam engine.

The most serious disadvantage of the gas engine was declared to be its inflexibility in the matter of loading. The maximum efficiency is at maximum load, consequently gas engines are generally sold with very little overload margin, and they cannot be depended upon for very good efficiency at below 80 or 85 per cent. of their full load. Here the steam engine is superior, since it will operate with excellent economy over a relatively wide range of load, both above and below its normal load.

An objection often raised against the gas engine to which the speaker attached little importance is the difficulty of reversing it, since satisfactory clutches are available for very large as well as small power. He believed that the more general use of gas engines depends above all else upon the ability to produce suitable gas for operating them. It has been established that gas engines are successful mechanically; that blast furnace gas can be properly cleaned; that natural gas can be used, and gas made from coke or anthracite coal, but the speaker maintained that there is not yet an altogether satisfactory gas producer for bituminous coal. Since bituminous coal is by far the most abundant, he holds no hope for the very general adoption of gas engines until such a producer appears. The difficulty is the cleaning of the gas sufficiently to prevent deposits on the gas engine cylinder walls without the use of such complicated apparatus, that it is often necessary to market a by-product to obtain commercial results, which generally debars the small plant. Mr. Ely anticipated that before many years gas engines will be producing a brake horsepower on 1 lb. of bituminous slack coal, from a simple and efficient producer. but did not concede that the steam engine will ever be entirely replaced.

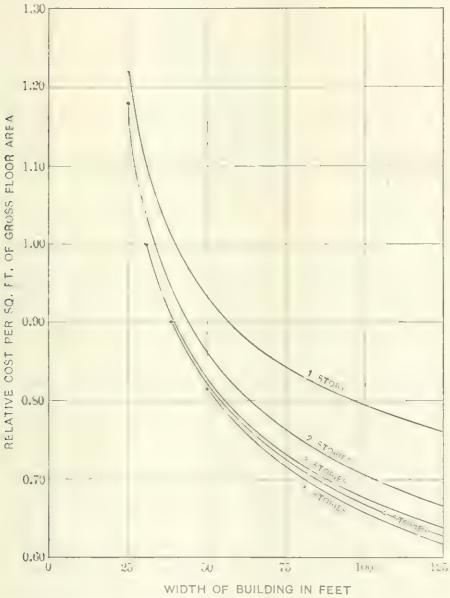
The G. Drouvé Company, Bridgeport, Conn., at the annual meeting of its directors, held February 3, elected G. Drouvé, president and treasurer, and William V. Dee, secretary. Mr. Dee, who recently resigned from the *Railway Age* to take an interest in the company, has been appointed general sales manager. The company manufactures the Anti-Pluvius skylight, of which 125,000 sq. ft. has been installed on the Hoboken terminal of the Delaware, Lackawanna & Western Railroad, and the Lovell window operating device, now used in the shops of the New York Central at Harmon, N. Y.; Delaware, Lackawanna & Western, at Scranton, Pa., and a number of others; also the Drouvé ventilator, drying stove, &c.

The Cost of Building Construction.

While the cost of buildings for manufacturing purposes must of necessity vary with their design and locality, certain fundamental relations exist between different types, which, if known, are of great assistance in the planning of new plants. To a very great extent these relations, although generally determinable by calculation, are intentionally or otherwise the professional and trade secrets respectively of the architect and the contractor. True it may be that conditions frequently give but little latitude for choice in design or construction, but just as truly the owner seldom finds available information which aside from the ideas of his individual architect will enable him to judge independently of relative costs.

The Relation of Floor Space to Hight of Building.

A generous contribution to the general dearth of public knowledge of this subject has been made by Charles T. Main, well known as a mill engineer and architect of wide experience. In his paper on the "Approximate



The Influence of Width and Hight on the Cost of a Building 300 Ft. Long, of Ordinary Mill Construction.

Cost of Mill Buildings" his discussion refers solely to ordinary mill construction with brick walls and heavy timbered floors and roof. In this paper he showed as one of his conclusions that in a building of this type the minimum cost per square foot is practically reached with a four-story structure. The relation is somewhat affected by the length of the building as well as by its width and hight. A three-story building is slightly more expensive, while a one-story building is obviously the most costly. From the data presented by Mr. Main, in a number of diagrams, the accompanying individual set of curves has been prepared to show the relative cost per square foot of gross floor space for different hights of a typical building 300 ft. long, of different widths. From this it is at once apparent that the difference between the costs for three, four and five story buildings is so slight as to exert but a secondary influence in determining the hight of a building. In fact, the hight may be determined by other factors, principal among which will naturally be the available ground area and the ground rent or fixed charges thereon.

The Cost of Elevation of Material

is sometimes regarded as a factor requiring consideration. But calculation will at once show the infinitesimal power expenditure for this purpose required even in the largest plant. Suppose the weight to be lifted in the course of a year through a distance of 15 ft. to be 100,000 tons, the work done will be equivalent to 3,000,000,000 ft.-lb. If this work were performed continuously during 300 working days of 10 hr. each, the work per minute would be 1667 ft.-lb., which is equal to only 0.05 hp. On a basis cost of $30 annually per horsepower, this would represent the insignificant sum of $1.50 actually expended for this purpose during the entire year. The real cost of elevation is manifestly in the equipment and its maintenance. It is evident that the equipment provided for a two-story building will serve additional stories with but slight increase in the cost of construction. Of course where under the modern conditions of transportation by traveling cranes the multistoried building is not permissible without excessive waste in hight, the nominal single-story construction must prevail. But this, as in the case of the gallery type of machine shop, may be in effect a two-story shop throughout about two-thirds of its width.

Roughly speaking, if the cost per square foot of floor in such a building is 1, it will be about 1.25 in a similar design of one-story only, and from 0.8 to 0.9 in a three-story building approaching it in structural design.

Light from Roof or Sides.

The saw tooth or monitor systems of lighting have considerable effect upon the cost of a single-story or gallery type building as compared with one of several stories where side lighting must be depended upon. Generally speaking, for adequate lighting from the sides the hight of the stories must increase with the width of the building. The windows should run up as near the ceiling as possible. Distribution of light will be greatly improved by the use of ribbed glass, or, better still, by prismatic glass, but the latter is decidedly objectionable if subjected to the direct rays of the sun. Windows running down to the floor have but little effect upon the general lighting where lines of machines run close to the walls and cut off the light which might otherwise be diffused.

While window area may be less expensive than wall surface, it necessarily increases the cost of heating. An ordinary window is generally classed as having about four times the transmiting power of a 16-in. wall. In other words, on this basis it would require, roughly speaking, about four times the heat for a building entirely of glass as compared with one having solid 16-in. walls. Of course, the heat penetrating effect of the sun in the case of the transparent glass would greatly modify this relation.

After all is said and done, the manufacturer requires, above all, the building best suited for the manufacture of his particular product. Its construction may or may not conform to the most economical type, but if it is such as to insure the production of the maximum profit it is certainly warranted.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, has recently placed some large contracts for equipment to be used in extensions to its plant. A large part of this work was held up in November when the depression care, but it will now go forward. Work will commence at once on a new galvanizing plant, a large warehouse, two pipe mills and other new construction, which will involve an outlay of $300,000 or more. Some work has been done right along on the two blast furnaces being built by the company, and they are expected to be ready for blast in April or May. When these furnaces are finished it is the intention to start work on two more.

The Smooth-On Mfg. Company, manufacturer of Smooth-On iron cements, 572-574 Communipaw avenue, Jersey City, N. J., has opened branch offices at 61-69 North Jefferson street, Chicago, Ill.; 20 Sacramento street, San Francisco, Cal., and 8 White street, Moorfields, London, E. C., England. The company has just issued a pamphlet entitled "History," which narrates the story of the different Smooth-On cements.

Autogenous Welding.

BY W. I. REICH, PITTSBURGH, PA.

In the last year several autogenous welding equipments were installed in this country which operate with more or less success, and the process promises to become as useful here as in Europe.

Electric arc welding is the oldest autogenous welding process. It was introduced by Bernardos about 12 years ago. At present it is only successfully used for repairing steel castings. The joint is only about 40 per cent. as strong as the stock; however, it is quite satisfactory for carrying the magnetic lines in cast steel frames of electric machinery. Direct current of about 200 to 1000 amperes at about 60 to 100 volts is generally employed, depending on the size of the arc. The carbon electrode is usually chosen as the negative pole, to prevent the excessive carbonizing of the joint. For medium heavy castings about 500 amperes at 100 volts is required, which represents 50 kw. Assuming a kilowatt-hour to cost 3 cents, the expense for current consumed will amount per hour to $1.50. The best practice is to provide a storage battery in parallel with the line, which will take care of the high peak, in starting the arc. The operating expenses can be reduced by using a small generator, storing up the energy in the storage battery.

Oxy-hydrogen autogenous welding was introduced in France about 10 years ago, and is even now used very successfully on light sheets, where the hydrogen is made as a by-product, as in electrolytic works. Hydrogen can be made by decomposing calcium hydride with water. This is a very simple method, but for the present is not commercial, since the chemical is too expensive. The oxy-hydrogen welding process is rather expensive and only suitable for sheet metal up to ⅛ in. thick. The joint is very good, its tensile strength being about 95 per cent. of the stock.

Oxy-acetylene autogenous welding was first applied in France about six years ago and forced out very nearly all of the old welding methods. The process is not expensive in first cost and operation. The fuel in this case is acetylene, which costs about 0.7 to 0.8 cent per cubic foot.

For producing oxygen there are several methods. The

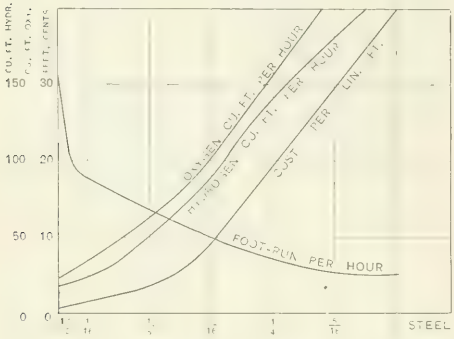


Fig. 1.—Curves of Cost and Gas Consumption for the Oxy-Hydrogen Welding Process.

electrolytic process is used extensively in Europe, in which acidulated water is decomposed by an electric current into oxygen and hydrogen. The cost in current is 12 kw. hr. per 100 cu. ft. of the decomposed gas. At 3 cents per kilowatt-hour 100 cu. ft. of gas mixture costs 36 cents and contains 33 1-3 cu. ft. of oxygen and 66 2-3 cu. ft. of hydrogen. The cost of installing and maintaining this process is very high, which makes it only suitable for large works.

Oxygen can be produced very cheaply by the fractional distillation of liquid air. The gas by this process can be sold at a good profit for 2 cents per cubic foot. It contains small traces of nitrogen, but is quite satisfactory for all practical purposes. The process requires an expensive installation of compressors and condensers, hence is only applicable in large central stations, from which the oxygen can be shipped in steel tanks at a pressure of 1500 lb. per square inch.

For smaller installations the most practical method is to produce oxygen from chemicals. It can be made from barium oxide, potassium chlorate or calcium chlorate, at a rate of about 2 cents and less per cubic foot. The cost of installing and maintaining such a plant is low.

Fig. 1 shows curves of the cost and the gas consumption with the oxy-hydrogen welding process. In this the cost per cubic foot of hydrogen is assumed to be 0.5 cent and of oxygen 2 cents. The diagram indicates how rapid-

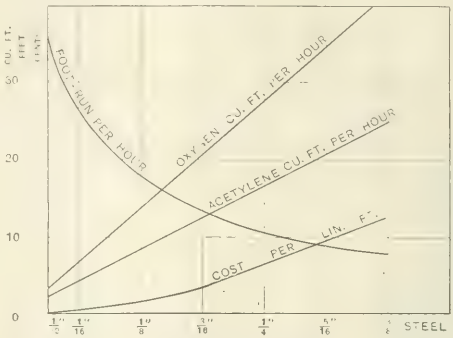


Fig. 2.—Curves of Cost and Gas Consumption for the Oxy-Acetylene Welding Process.

ly the cost per lineal foot of welded joint will increase with the thickness.

Fig. 2 shows the same curves for the oxy-acetylene welding process. In this the cost per cubic foot of acetylene is assumed to be 0.8 cent and of oxygen 2 cents. This process is better adapted commercially for medium heavy plate work, and where there is a large variety of work.

For very heavy plates and large output the water gas welding process can be used successfully. Such an installation is only suitable for large works producing at least 50,000 cu. ft. of gas per day. This process is not commercial for plates thinner than ¼ in., and is most economical for steel plates between ⅜ and ¾ in. thick. It does not belong to the autogenous welding methods, since mechanical means have to be employed to unite the metals.

There is a large field for the autogenous welding process, and its success depends entirely on the cost of the gases. No doubt the cost of hydrogen will be considerably reduced as soon as the electrolytic works take the trouble to collect the gas, and the price of carbide and its product, acetylene, will be reduced in a few years, since the carbide patents have only a short time to run. With a larger consumption of oxygen this gas, too, will become cheaper. It is used extensively in the arts—*e. g.*, in blast furnaces and for bleaching, for submarine service and for medical purposes.

With the wider adoption of autogenous welding will come a new era in the art of metal construction; the riveted joint will be largely displaced by a seamless joint in boilers, tanks, blast furnaces and gas flues, water pipes, and wherever a high efficiency of joint is most desirable.

The Craig Shipbuilding Company, Long Beach, Cal., is building a complete shipbuilding plant. The buildings to be erected consist of a structural iron shop, 46 x 177 ft.; power house, 40 x 48 ft.; mold loft, 40 x 208 ft.; foundry, 88 x 97 ft., and brick machine shop, 90 x 128 ft. The work on these buildings is rapidly progressing, a part of the machinery is on the grounds ready for installation, and the company expects to be ready to start up about March 1.

The Westinghouse Machine Company, Pittsburgh, has received an order from the Duquesne Steel Foundry Company, Kendall Station, Pa., for a 19 x 22 in. vertical gas engine.

The Standard Roller Bearing Hanger Box.

The roller bearing hanger box which is now being put on the market by the Standard Roller Bearing Company, Philadelphia, Pa., is made in all commercial sizes from 5-16 in. shaft up. It is interchangeable with any existing hanger having universal adjustment, such as is shown in Fig. 1, and it is the intention later to make them interchangeable with any size hanger, whether it has universal adjustment or not.

The parted view, Fig. 2, shows clearly the construction of the hanger box. A hardened steel sleeve is first placed on the shaft, so that the rollers will run on a hardened and ground surface. The rollers themselves are

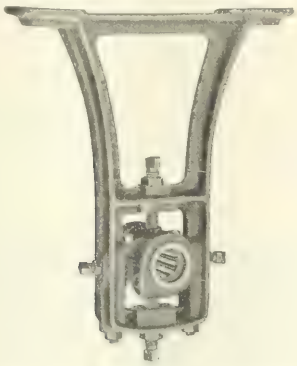


Fig. 1.—A Shaft Hanger Equipped with Standard Roller Bearing Box.

fitted in a cage with a ball at the end of each roller to take the end thrust. The boxes themselves are hardened and ground so that the rollers on both top and bottom run on hardened and ground surfaces. This reduces the friction at any one point, which would occur if a ball were used instead of a roller. The hanger boxes are very easily applied, and it is claimed have given entire satisfaction in every place where they have been installed.

Some interesting tests have recently been made in the Standard Roller Bearing Company's testing laboratory, using a Golden dynamometer similar to the one at Purdue University. These tests show that the frictional horsepower for the roller bearings is independent of the speed and independent of the load on the bearing, within certain limits. They also show that with a light load on the

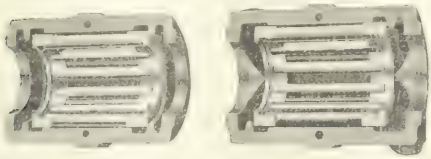


Fig. 2.—The Two Halves of the Roller Bearing Hanger Box Made by the Standard Roller Bearing Company, Philadelphia, Pa.

bearing the frictional horsepower is proportional to the revolutions per minute and with more load increases rapidly with the speed.

These laboratory tests were followed by tests made in the shop under the same conditions as would be found in machine shops generally. The tests extended over a month and were made on a 2 7-16 in. main shaft 110 ft. long, running at a speed of 220 rev. per min. and supported by 14 hanger boxes. In the first test all countershaft belts were on and a saw, a cutting off machine and two wizzers were being driven. With babbitt boxes the average horsepower required for the drive was 6.163 hp. and with roller bearing boxes 4.9637 hp., making the saving for the latter 20 per cent. In the second test the countershaft belts were on, but no work was being done. The average power required was in this case 4.263 hp. for the babbitt boxes and 3.2887 hp. for the roller bearing boxes, or a saving with the roller bearings of 22.3 per cent. In the third test all belts were off, except the driving belt from the motor, and 1.825 hp. was consumed with babbitt boxes and 0.8378 hp. with roller bearing boxes, which therefore showed a saving of 54.76 per cent.

Since making the foregoing tests the same hanger boxes have been tested in two large industrial establishments of Philadelphia. In one a saving in power required of over 31¼ per cent. was effected, and in the other 40 per cent. In view of the large number of extraordinary laboratory tests which have recently been reported, it is interesting to know the results which can be obtained in every day use by the installation of roller bearings in shafting hanger boxes.

Hollow Staybolts.

BY JOHN HICKEY, SALT LAKE CITY

Having been troubled with broken staybolts on several mountain engines, due to variation of pressure followed by extremes of temperature several times a day, the writer had some hollow staybolts placed on surfaces giving the most trouble from broken bolts. As the solid staybolts and those having drilled telltales were removed, they were replaced by hollow ones. After about a year of this practice it was noticed that the staybolt work at the short run terminals was very materially reduced. Prior to this, the life of the solid staybolt with telltale drilling was between five and nine months, depending on location in staying, while after this time, a little over a year, there was no record of a single hollow bolt being broken, although located mostly in what was considered the breaking zone. Longer periods of experience with the hollow bolt developed equally good results, its endurance being remarkable under the severe conditions existing.

The self-warning principle of the hollow staybolt is highly appreciated by those directly in touch with the power generator. Eliminating the hammer tests, together with the feeling that no dangerous number can be broken without compelling attention, is regarded as a very satisfactory condition. It is well known that the strength of wrought iron decreases after reaching 350 degrees F. Moderately high firebox temperature causes a solid staybolt to reach the depreciative heat, this being one of the causes which shortens its life. With the hollow staybolts in service a streamlet of cool air passes through each bolt to the furnace, thus holding the metal at a lower temperature, furnishing both strength and endurance that cannot be obtained with the use of the highest possible grade of iron in the solid staybolt. The greater endurance of the inner ends of the hollow bolts, as compared with solid ones, is very noticeable. This is due to the in rushing air through the hollow bolts cooling the ends of the bolts and reducing the waste of the iron due to the high heat of the fire.

It is said that a few have closed the center holes at the inner ends of the hollow staybolts with a couple of blows of the hammer, claiming the entrance of too much cold air. This practice, the writer is certain, should be discouraged. In order to obtain full benefits from the hollow bolts, the air should be permitted to pass through the ⅛-in. hole to the fire. This will hold the staybolt to lower temperature, add to its strength and flexibility, cause greater endurance to the inner ends, and while aiding combustion will add noticeably to the efficiency of the furnace. It will further afford a double advantage for the detection of breakages should any occur, as the annular hole passes entirely through the bolt and failure at any point will immediately make itself known.

Hollow staybolts with both ends open will never stop up, as the current of air passing through them always keeps the holes free from sediment. Furthermore, the hollow bolt saves material and time in application and renewals, and also prevents injury to sheets in making renewals, as the operator has a central hole for his drill to follow.

New Central Metal Working Tools.

Two sheet metal working tools, recently designed and constructed by the Central Machine & Metal Company, Moline, Ill., are here illustrated. Fig. 1 represents what is styled the D-Q (double quick) folder, which is described as a strongly built and durable machine. It is provided with a heavy locking bar and drop folding leaf, the former being operated by connected cam levers on top and the latter by a hand lever at the left of the machine. Single lock edges ⅜ or ½ in. wide, or double lock

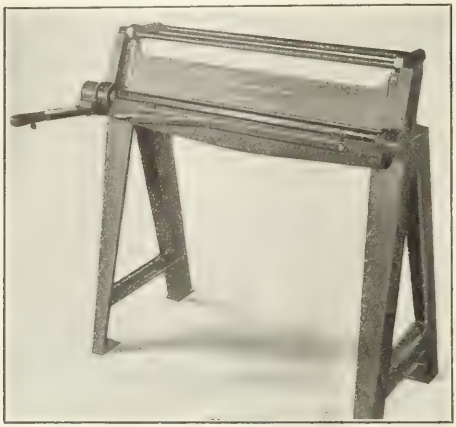


Fig. 1.—The D. Q. Folder Built by the Central Machine & Metal Company, Moline, Ill.

edges of the same size can be formed with this tool on sheets of 24 gauge and lighter, 30 in. wide and narrower. Double lock edges may be formed without releasing hold of the folding lever, which by its quick double action sets the pin gauges for double lock edges. Convenience and rapidity of operation are the objects aimed at in the design of this machine, and a great increase in the effective speed of folding double cross lock

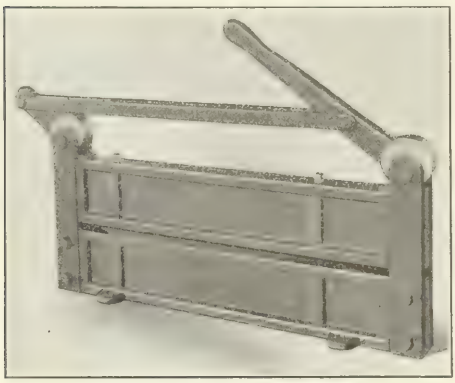


Fig. 2.—The Central Cross-Lock Seamer.

edges is claimed for it. The folder is mounted on heavy cast iron legs, provided with holes in the feet to fasten it securely to the floor.

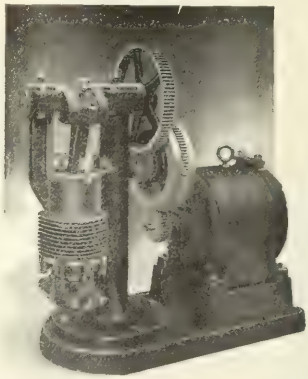
Fig. 2 illustrates a newly designed machine for making cross lock seams. It is operated by connected cam levers and is provided with automatic pin gauges. The machine has a capacity for making ⅜ and ½ in. double lock seams on sheets No. 24 gauge and lighter, in widths up to and including 30 in.

The company since its organization about 10 months ago has devoted its energies to the designing, developing and manufacture of special dies, tools and stampings, and the above machines are representative of its progress in developing modern metal working machines.

The Spacke Motor Driven Air Compressor.

Air compressors of small capacity and simple construction are often of service in machine shops, foundries and other plants for operating light hoists and other tools, where the total supply of compressed air required is moderate. The motor driven compressor here illustrated, which is included in a line of such equipment made by the F. W. Spacke Machine Company, Indianapolis, Ind., is designed to meet these requirements. It is compactly assembled with the compressor and motor mounted on the same base and can be set up and operated without providing an expensive foundation. The particular features of improvement that are claimed to result in increased efficiency are the separate and easily accessible valves, and very small cylinder clearances. The latter are regarded as especially essential to the successful operation of small compressor units, but are not always provided.

Proper speed reduction from the motor drive is obtained through a train of gears meshing with a rawhide pinion on the motor shaft. These compressors are built in capacities ranging from 3 to 30 cu. ft. of free air per



A Small Motor Driven Air Compressor Made by the F. W. Spacke Machine Company, Indianapolis, Ind.

minute, for either belt or motor drive, and are supplied with air or water cooled cylinders as desired.

Manufacturing plants engaged in iron and steel and sheet metal lines in Canton, Ohio, are rapidly recovering from the effects of the recent depression, and many of them are now running at about their normal capacity. The plant of the United Steel Company started up last week, after a shutdown of several weeks, and now has a good volume of orders on hand. The plants of the Timken Roller Bearing Axle Company and of the Carnahan Tin Plate & Sheet Company, which have been shut down, have also started up. The new plant of the Schuil Steel Castings Company has started up, the first heat having been run off last week. The plant of the Canton-Hughes Pump Company is now running at about its full capacity. The Republic Stamping Company reports that it is running its plant with its full force 12 hr. per day, and that it is behind on its orders.

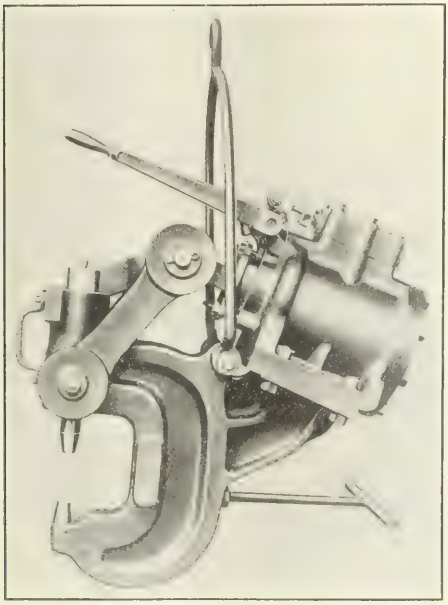
Owing to the growth of the business of Wickes Brothers, it has been deemed desirable to separate the business of the company. The boiler department has, therefore, been organized as an independent company under the name of Wickes Boiler Company, with a capital of $500,000, and with main office and works at Saginaw, Mich. The ownership and management of the new company remain substantially as before the formation of the new corporation.

A New Albree Portable Compression Riveter.

Where the work is heavier than the tools it saves time and increases convenience if the tools are brought to the work and in the assembling of structural members this is generally the case, making a portable riveter especially desirable. The hydraulic riveter is not practical for this service, on account of the difficulty of providing flexible high pressure water lines and carrying away the exhaust water.

An air driven machine, similar to the one illustrated herewith and built by the Chester B. Albree Iron Works Company, Allegheny, Pa., is admirably adapted for this work, as the air is conveyed to it by a rubber hose and exhausted directly to the atmosphere.

It will be noticed that a comparatively small cylinder is used, the necessary pressure being obtained by the toggle leverage shown, and as the rivet is driven by



A Portable Compression Riveter Made by the Chester B. Albree Iron Works Company, Allegheny, Pa.

one squeeze the number of rivets the machine can drive is practically unlimited. Therefore the amount of riveting that can be done is merely a question of getting the machine from one rivet to the next, in other words, the cost of riveting is almost entirely the cost of moving the machine. The riveter illustrated has a 6-in. reach, will drive a ⅞-in. rivet, and weighs 850 lb. When desired this machine may be equipped with the maker's universal bail, which will hold it suspended in any position.

As an example of what has been done with such a machine under favorable circumstances there is reported an astonishing record—12,000 rivets driven in 10 hours. The work was a long plate girder and the machine was suspended from a trolley on an overhead runway. The operator, with practice, had become expert in moving the machine from one rivet to the next, the spacing being equal, and several heater boys keeping the holes ahead of the machine full of hot rivets. The rivets were ¾-in. diameter and were driven hot and the dies were replaced by cool ones at given intervals.

The next best performance on record was 10,000 rivets in 10 hours, under very similar conditions. These figures, of course, are merely of interest to show what has actually been done. The type of work, of course, is all-important. On boiler work, where the rivet must be steam tight and well driven, no such record could possibly be made.

Portable riveters have a wide range in practise and seem to be growing in favor.

Flexible Metal Belt Lacing.

What is described as a radical departure in metal belt lacing is represented in the accompanying illustrations, which show a device recently patented and now manufactured by the Flexible Steel Lacing Company, 71 West Jackson boulevard, Chicago. Flexibility, strength and ease of application are the features of merit particularly emphasized in connection with this fastening.



Fig. 1. A Started and Finished Application of the Belt Lacing Made by the Flexible Steel Lacing Company, Chicago.

Application is made by first dropping the sections of lacing together in the position shown on the end of a belt section in Fig. 1. The prongs of each section are then pressed into the belt and, being firmly driven in, are tightly clinched. The lacing engages both sides of the belt equally and throws the strain upon the hinge in the direct line of the pull. This lacing is referred to as suitable for leather, rubber or textile belts and is furnished in boxes containing assorted sizes. No. 2 flexible steel lacing is designed for single leather, rubber or textile belting not over 7-32 in. thick; No. 4 is suitable for medium double leather and textile belting not over ⅜ in. thick. The former is made with longer prongs on one side of the belt than the other while the latter is made with alternate short and long prongs, as shown in Fig. 2.

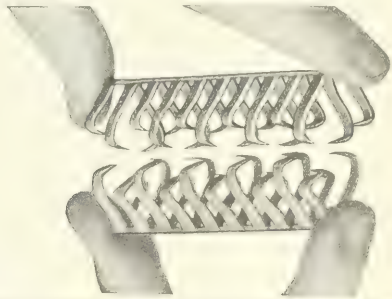


Fig. 2. The Two Parts of the No. 4 Flexible Steel Lacing Separated.

An Exposition of Safety Devices.—Announcement has just been made that an exposition of two months will be held early in April in New York, under the auspices of the American Museum of Safety Devices and Industrial Hygiene, for showing the best methods of safeguarding workmen and protecting the general public. The exhibits will consist of safety devices, protected machinery in actual operation, models and photographs. During the exposition illustrated lectures by engineers will explain industrial conditions and hazardous occupations and the most approved methods of safety. Believing that many accidents are preventable and to stimulate further invention, three gold medals are offered for the best safety device in the field of transportation, mining, motor vehicles and motor boats. Two prizes of $100 each, one for the best essay on "The Economic Waste Due to Accidents," the other on "The Economic Waste Due to Occupational Diseases," are offered. The chairman of the Committee of Direction is Charles Kirchhoff, and of the Committee of Exhibits, Prof. F. R. Hutton. There will be no charge for space. All inquiries and applications for space should be made to Dr. W. H. Tolman, at the Museum, 231 West Thirty-ninth street, New York City.

National Labor Legislation.

Important Measures Coming Up in Congress.

WASHINGTON, D. C., February 11, 1908.—Employers are deeply interested in recent developments in Congress resulting chiefly from the action of the United States Supreme Court in declaring unconstitutional several so-called "labor" laws. These decisions have greatly incensed the labor leaders, who have promptly brought pressure to bear upon Congress to secure the passage not only of statutes intended to close the gaps pointed out by the court, but also of laws granting special privileges to workingmen. Energetic action will be necessary to prevent the enactment of one or more of these examples of vicious class legislation, especially as the President's recent message is a direct attempt to commit his party to the support of some of the most flagrant.

The wrath of the labor leaders is due especially to the decisions of the United States Supreme Court in the case of the employers' liability law and the so-called Erdmann act, which made it unlawful for a common carrier to discharge an employee because of his membership in a union. The labor lobbyists have haunted the corridors of the Capitol and frequently visited the White House since they were handed down. Under this pressure a number of extreme "labor" measures have been brought forward the past week.

The House Committee on Interstate and Foreign Commerce has agreed to report the so-called Townsend bill, which provides for the investigation of labor controversies "concerning wages, hours of labor or conditions of employment" between an employer and his employees "by reason of which the transportation of the mails or the free and regular movement of commerce among the States is, in the judgment of the President of the United States, interrupted or directly affected." The President may appoint a commission to investigate and ascertain the facts in the case and to make a report to him which he is authorized to make public or to transmit to Congress with recommendations for legislation. The commission is to be empowered to administer oaths, require the attendance and testimony of witnesses, and the production of books and papers, and is authorized to invoke the aid of the United States courts in the event of the resistance of either party. This bill has been strongly opposed by the railroads, which, of course, are the corporations aimed at. The labor leaders are much elated over their success with this measure, as they believe that in many instances railroad companies can be forced to make concessions to labor, rather than submit to a detailed investigation of their books and papers by a commission and the publication of the findings, not to mention the possibility of adverse legislation by Congress.

The Gompers Eight Hour Bill Again.

Readers of *The Iron Age* will remember the protracted campaigns in the Fifty-sixth, Fifty-seventh and Fifty-eighth Congresses to secure the passage of a law designed to compel private manufacturers having Government contracts or subcontracts to put their plants on an 8-hr. basis. The original bill, drawn by Representative Gardner of New Jersey, with the collaboration of President Gompers of the American Federation of Labor, passed the House on several occasions, but was never forced through the Senate. In the Fifty-ninth Congress no consideration whatever was given to the proposition.

Within the past few days Mr. Gardner has been appealed to by the labor leaders and has presented in the House a measure containing the general provision of the old Gardner-Gompers bill, but combining also certain features drafted by the late Senator McComas as chairman of the Senate Committee on Education and Labor. It provides that every such contract shall stipulate a penalty "of $5 for each laborer or mechanic for every calendar day in which he shall be required or permitted to labor more than 8 hr. upon such work." Mr. Gardner's bill has been referred to the House Committee on Labor, of which he is chairman, and efforts will be made to force the committee to give hearings, to begin at an early date.

A New Antiinjunction Bill.

Next in importance to the 8-hr. bill is a measure introduced by Senator Beveridge of Indiana. This bill is designed to deprive the courts of the power to grant injunctions in labor disputes except under conditions which would render a restraining order of no value whatever to the applicant, as every manufacturer who has had experience with strikes involving violence knows that a temporary injunction to be of service must be promptly issued, and often without knowledge on the part of the applicant concerning the identity of the parties sought to be restrained. The bill is as follows:

> That no temporary injunction or temporary restraining order shall be issued without notice by any court of the United States in controversies between employers and employees, and all such temporary injunctions and temporary restraining orders shall be heard by the court issuing the same within a reasonable time, not to exceed seven days from the date when said temporary injunction or temporary restraining order is issued; provided, that said court, upon agreement of parties or at the application of the defendant, may postpone said hearing to a later date than said seven days, in the discretion of the court; provided further, that nothing herein contained shall be held to authorize the issuing of a restraining order or an injunction in any case in which the same is not authorized by existing law.

The House Judiciary Committee struggled with the anti-injunction problem for four years, and in the closing days of the Fifty-eighth and Fifty-ninth Congresses postponed the pending bills indefinitely after hearings which fully developed the grave dangers that would ensue should the courts be deprived of any of their present powers to prevent injury to property pending the settlement of a controversy. An important consideration with the committee was the question of the constitutionality of a provision depriving the courts of the power to issue injunctions in labor disputes only, thereby clearly discriminating as between different classes of applicants for relief. Senator Beveridge's bill has been referred to the Senate Committee on the Judiciary, and a vigorous campaign for its passage is under way, which is supported by the President in his recent message.

Jury Trials for Contempt.

With a view to relieving labor leaders, and especially the managers of strikes and boycotts, from liability to summary punishment for contempt of court, due to the violation of injunctions and restraining orders, an extraordinary measure has been introduced in the House by Representative Sabath of Illinois. The bill not only provides that all persons charged with contempt, not committed in the actual presence of a judge, shall be granted a trial by jury but deprives the judge who has issued a preliminary writ of the right of sitting in the trial.

It is understood that the incentive for the presentation of this bill at this time is the broad and comprehensive injunction granted by Justice Gould in the Supreme Court of the District of Columbia against the officers of the American Federation of Labor in the boycott case brought by the Buck's Stove & Range Company. Despite the restraining order issued in this case, the organ of the Federation continues to call attention to the fact that organized labor is arrayed against the stove company and, in the opinion of many lawyers here, the publishers of the organ have rendered themselves liable to punishment for contempt.

The decision of the United States Supreme Court to the effect that the employers' liability act is unconstitutional has resulted in the introduction by Senator Knox of Pennsylvania of a bill so drawn as to bring its provisions within the constitutional powers of Congress. This bill is understood to have been drafted in the Department of Justice and is now before the Senate Judiciary Committee. While strictly limited to carriers engaged in interstate commerce, all the drastic features of the original statute have been preserved. It goes without saying that should it pass, and be sustained by the courts, it will at once be seized upon as a model for State legislation which would deal directly with the liability of private corporations.

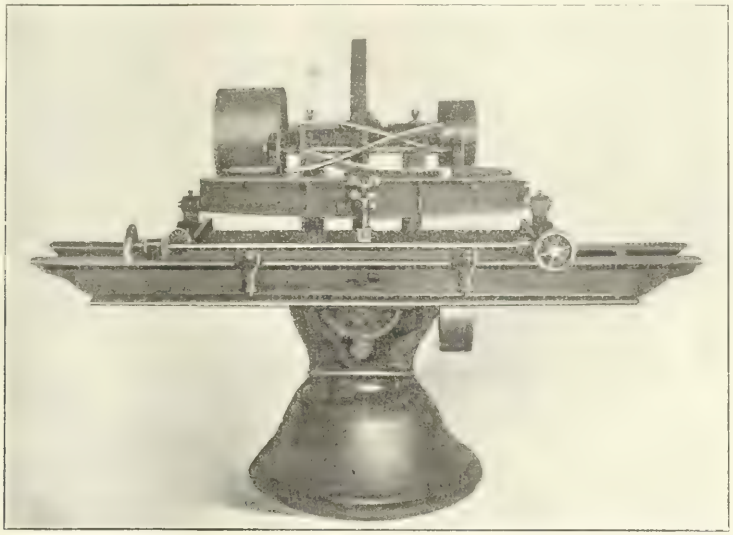
W. L. C.

The Pennsylvania Engineering Works, New Castle, Pa., builder of blast furnaces and general steel plate construction, has elected Edward King president and treasurer; Edwin N. Ohl, vice-president; Charles L. Baldwin, secretary, and Edward W. Beadel, general manager.

The New American Automatic Knife Grinder.

The automatic knife grinding machine shown in the illustration is a new type recently put on the market by the American Twist Drill Company, Laconia, N. H. It is designed for rapid accurate grinding of knives for many purposes, and is built in various sizes for grinding knives from 2 to 96 in. long, or two or more knives the combined lengths of which come within the capacity of the knife bar.

Mechanically the tool is of simple construction. The grinding wheel is mounted on the main pulley shaft, which also carries a pulley driving the feeding mechanism through three pulleys on a secondary shaft, as shown in the engraving, these working in conjunction with gearing to reverse and move the table. The central pulley is loose; the belt is shifted from one tight pulley to the other by the action of the table dogs to give the different directions of table travel. One of the tight pulleys is mounted on the shaft, the other on a long sleeve, and each operates a bevel pinion, the two engaging a large bevel gear at opposite ends of its diameter, so that the two motions imparted are in opposite directions.



A New Automatic Knife Grinder Built by the American Twist Drill Company, Laconia, N. H.

All the shafts, including the grinder spindle, are steel, with long bearings. The bearings of the main spindle are made in halves and require no adjustment as the wheel wears down. The grinding wheel turns toward the operator at 230 rev. per min. Iron center wheels of the company's own manufacture are furnished, which, it is claimed, are capable of cutting rapidly and keeping cool when running dry, obviating the necessity of using water, pumps, &c. When the wheel wears out the center may be recovered. The machines are built in seven sizes to accommodate knives of 24, 30, 36, 50, 60, 80 and 96 in., respectively.

In the illustration the grinder is shown with lawn mower blades mounted on a special fixture for grinding, the work being driven by belt and pulley in the opposite direction from the grinding wheel, and traveling back and forth until the grinding is finished.

Lake Commerce and the New Sault Lock.—The address of President Wm. Livingstone at the recent annual meeting of the Lake Carriers' Association at Detroit called attention to the likelihood that the new Davis lock at Sault Ste. Marie, for which Congress has appropriated $6,200,000, will be urgently needed before it can be completed. It is estimated that the construction of the Davis lock and its approaches will require five years. The capacity of the Weitzell, Poe and Canadian locks under ordinary conditions is estimated at 75,000,000 tons per annum, and the traffic last year amounted to approximately 60,000,000 tons. A 25 per cent. increase before the completion of the Davis lock is quite within the probabilities. The suggestion is already made that a bill be introduced in the next Congress providing for a fourth American canal. The Davis lock will be 1350 ft. long and 80 ft. wide, with a least depth of 24.5 ft. below extreme low water, and will have a capacity of 50,000,000 tons in the season of navigation. The upper approach to this lock will be an independent canal 300 ft. wide, so arranged as to provide entrance to a fourth lock when it is needed.

The Milwaukee Metal Trades and Foundry Association.

The third annual meeting of this association was held at the Hotel Pfister, Milwaukee, Wis., on the evening of January 30. S. L. G. Knox, Bucyrus Company, was elected president; George Forgeot, Allis-Chalmers Company, vice-president; Hugo Froelich, Speich Stove & Repair Company, treasurer; W. J. Fairbairn, secretary; directors for three years, Gen. Otto H. Falk, Falk Mfg. Company, and E. J. Kearney, Kearney & Trecker. The report of Secretary Fairbairn showed a year of pronounced activity, and gave in detail the work that had been done at the various shops, dealing particularly with the strike conditions which prevailed during the year. The banquet following the meeting was quite an elaborate affair. General Falk, the retiring president, was toastmaster, and in an opening address announced that the molders' strike, which had been menacing business for nearly two years, was over. He also expressed the opinion that general business conditions would continue to improve, and that there was already an upward movement which was very noticeable. He reported that, largely as a result of the efforts of the Milwaukee Metal Trades and Foundry Association, conditions in the shops of the various members were very satisfactory from a labor standpoint, and that in many instances wages had been advanced in the past year. The newly elected president, Mr. Knox, thanked the association for his election, and expressed the same general belief that business conditions would improve in every way. The regular programme of toasts was as follows: "The New Immigration," by Kent K. Kennan of Milwaukee; "The Imminent Future of America," by Prof. Edw. A. Ross of the State University, Madison, Wis., and "As Our Foreign Friends See Us," by Harry Soady. Among the guests was A. E. McClintock, commissioner of the National Founders' Association.

British Trade with Canada.

Commissioner Grigg's Suggestions for Its Increase.

A report on the conditions and prospects of British trade in Canada has been made recently to the Board of Trade of London by Richard Grigg, special commissioner of the Advisory Committee on Commercial Intelligence. Mr. Grigg went to Canada in September, 1906, and completed his work there in May, 1907. The report has evidently been published after due deliberation. From a summary of the commissioner's conclusions the following has been condensed:

Advantages of the United States.

1. The geographical position of Canada is evidently a severe handicap to British trade with the Dominion, and a great advantage to the manufacturers and merchants of the United States. The distances from the industrial centers of the United States to the Canadian markets are comparatively short; the time occupied in transit is therefore much less, and the charges for freight correspondingly small; there is great rapidity, ease and cheapness of business communication, and, most important perhaps of all, there is the fact that the social and economic conditions of two adjacent countries present so many resemblances that the manufacturers of the United States can almost regard the Dominion as being in many of its requirements only an extension of their own home market, and, therefore, as not calling for any specialized lines or methods of production, such as British manufacturers would in many cases have to undertake in order to secure any considerable Canadian trade.

2. These advantages accruing to the United States from the geographical position of Canada are so great that it is inevitable that a proportion of the Canadian trade should fall to that country. On the other hand, the United Kingdom is Canada's principal customer, with the result that there is a large tonnage moving eastward and providing comparatively low freights for that tonnage on its return to the west. British products enjoy preference, both in good will and tariff, but it is obvious that the first of these factors, in a business subject to close competition, cannot do more than turn an even, or nearly even, scale. A preference, however, amounting to a reduction of one-third of the duty, is of undoubted value to British imports, given equal skill and energy in business conduct. The statistics appear to show that the establishment of preferential treatment for British goods has to a considerable degree checked the previous decline in the hold of the British manufacturer upon the Canadian market, though some portion of the credit for this result must be ascribed to the awakening of the British manufacturer to the need of more vigorous action.

Canadian Competition and American Investments.

3. It is important to observe that the Canadian home manufacturer is now becoming a serious competitor alike with the United Kingdom and the United States. The output is increasing rapidly; the efficiency of the Canadian works is rising fast; the industrial resources of the country are great; the tariff policy of Canada is largely directed toward the maintenance and promotion of home industry, and it may not unfairly or unreasonably be assumed that before many years have passed the most serious competitor with the United Kingdom in the Canadian market will be Canada itself. The Americans have both obtained controlling interests in works in Canada and built branch factories to an important extent. I suggest that British manufacturers should consider the placing of branch factories there. Such a course would not only gratify Canadians and so enlarge sales, but it would give manufacturers a more intimate acquaintance with the market than anything else could do, and enable them to maintain stocks there more easily. Estimates of American capital invested in Montreal alone vary from $25,000,000 to $75,000,000. Inquiries are said to have been made by the Illinois Manufacturers' Association, the result of which shows that 122 of the leading concerns in the United States have established branch plants in Canada. I have a list of no less than 36 manufacturing firms in Hamilton alone, of which I am assured a substantial part of the capital (and in some cases all) is contributed from United States sources. One constantly hears that the British investor is slow, and that as a consequence the business is done by the American. There has been a very large and rapid increase in the American investments in Canada, and this will continue unless the development of British interest in Canadian enterprises proceeds at a more rapid pace than at present.

What British Manufacturers Should Do.

4. Though the problem is a difficult one, much could be done to enable British traders to strengthen their hold and even increase it upon the Canadian market, and the following suggestions are made:

a. Efforts should be made to promote and encourage facilities for quick and cheap transportation and communication. A large part of Canada's trade undoubtedly goes to the United States, not because of the superiority of the United States products, but because the goods required can be obtained more rapidly and promptly from that country than from the United Kingdom. A cheapening of telegraphic communication is also desirable.

b. British manufacturers should study Canadian conditions for themselves, and not depend so much as they have done in the past upon merchants or agents. They must follow the example of their American and German competitors in entering as much as possible into direct communication with Canadian buyers.

c. The British manufacturer must either visit the market himself—and this is the most desirable course—or he must select the very best men obtainable to meet and fight the American commercial travelers on their own lines. He must be prepared to carry on the cultivation of the market, with a small gain (possibly even with a loss) for some considerable time.

d. The British manufacturer must cater for the Canadian demand and produce the goods that are required by Canada. Canadian buyers know what they want, and if British manufacturers will not meet them they will turn elsewhere. British manufacturers produce commodities which are sometimes too good for the particular market.

e. A point of importance is the question of standards, particularly in iron and steel. Canada has adopted American standards; engineers and architects are familiar with them, and British manufacturers must adopt for goods destined for that market the same standards also. To this may be added the adoption for business with Canada of Canadian currency and weights and measures, which are similar to those of the United States.

f. Catalogues should be fuller and more detailed; weights and measures should be those of Canada, and prices should be specified always either in Canadian currency or in that and sterling. With respect to advertising, greater care appears to be desirable in the selection of journals and papers in which advertisements are inserted, and Canadian advice should be taken on this subject. It is hoped that the recent postal changes may do something to promote the circulation of English trade and other journals, where hitherto the United States publications had the field very largely to themselves. These changes include a reduction on newspapers, magazines and trade journals from the United Kingdom from 1d. for 4 oz. (the old rate) to 1d. for 16 oz., and came into operation May 1, 1907, while on May 8, 1907, an amendment to the Canadian-United States convention made the charge from the United States 1 cent for each 4 oz. or fraction of 4 oz. A remarkable result is shown in the quantity of printed matter received from the United Kingdom direct by Canadian steamers. In June, 1906, the number of newspaper sacks received at Winnipeg was 191, and in 1907, for the same month, 798 bags—an increase of 318 per cent. At London, Ont., the increase was 306 per cent.; at Toronto 184 per cent.; at Ottawa, 197 per cent.; at Montreal, 235 per cent.; at Medicine Hat and Nelson, 181 per cent.; at Calgary and Vancouver, 272 per cent. The increase of mail bags via New York, although very considerable, was not so large.

g. The adoption of the methods employed by United States manufacturers and their agents to keep acquainted with the standing financial position of Canadian firms may well be recommended to English traders, since it may enable the latter to meet (more than they have done in the past) Canadian wishes in respect to terms of credit, &c.

British Board of Trade Representatives on the Ground.

5. There is undoubtedly a need for what may be called national trade representation in Canada. There can be no question as to the substantial services rendered to United States trade by the Consuls scattered throughout Canada; at present the United Kingdom is totally without any such representation. The appointment of British Consuls, in the ordinary sense of the term, in Canada is obviously unnecessary. What is generally felt to be desirable is the appointment of competent commercial representatives, who, not having to deal with much of the ordinary work of consuls, would have the more time to devote to the trade interests of the country which they represent. The appointment of commercial correspondents, as now contemplated by the Board of Trade, is welcomed as an important step in the right direction. It is also highly desirable that all possible steps should be taken to enable the industrial and commercial organizations of the United Kingdom and Canada to keep acquainted with the general economic and trade conditions which prevail in the two countries. The Canadian boards of trade—the equivalent of the United Kingdom chambers of commerce—are kept well supplied by the United States Government with its publications, and thus have constantly exhibited before them the spectacle of the commercial and industrial greatness of the United States, whereas, from the United Kingdom they receive practically nothing. A wider distribution in the Dominion of British publications relating to trade and commerce (both official and other), and of Canadian publications in this country, would be extremely beneficial.

Federal Supervision of Manufacturing Corporations.

WASHINGTON, D. C., February 11, 1908.—The pressure brought to bear upon Congress by the administration for the enactment of laws providing for the Federal supervision of manufacturing corporations doing an interstate business has resulted in the presentation of two measures intended as the bases of national incorporation laws. One of these bills has been presented in the Senate by Senator Nelson, a leading member of the Judiciary Committee, while the other has been offered in the House by Representative Mann of Illinois, a prominent member of the Committee on Interstate and Foreign Commerce. These bills are now before the Judiciary committees of the two houses, and will be taken up for consideration at an early date.

Federal License Plan.

Representative Mann's bill provides for the registration and licensing of all corporations doing an interstate or foreign business. The provisions of the bill are not compulsory, but certain advantages held out therein are counted upon to induce the great majority of concerns doing an interstate business to take out Federal licenses and submit to the proposed measure of supervision.

Section 1 of this bill provides that any corporation doing interstate or foreign commerce may apply to the Commissioner of Corporations to be registered in the Bureau of Corporations in the Department of Commerce and Labor, and shall accompany the application with a duly certified copy of its charter and by-laws, and a statement of its financial condition. Before finally passing upon the application for registry the commissioner may address inquiries to the corporation or its officers in relation to any matter connected with its transactions, and may himself, or by some person designated by him in writing, visit the corporation and thoroughly examine its affairs and ascertain its financial condition, its ability to fulfill its obligations, &c. If the commissioner shall find that the corporation is in good financial condition and carrying on a legal business, then it shall be admitted to registry.

By section 2 every corporation admitted to registry is required to furnish an annual statement under oath showing its condition, and in addition the commissioner may at any time require such information as he may desire to be furnished him. Section 3 provides that at least once in three years, and as much oftener as he may deem it necessary, the commissioner or some person designated by him as examiner, shall visit each corporation admitted to registry and thoroughly inspect and examine its affairs and ascertain its financial condition.

The fourth section of the bill is modeled on the law governing the Comptroller of the Currency in the supervision of national banks which may be found in an unsound condition, and provides that whenever it shall appear to the commissioner that any corporation admitted to registry is in an unsound condition, or is doing an illegal business, it shall be his duty to order it to make good its financial condition or desist from its illegal business, and in case of failure to comply within the time prescribed, the commissioner may cancel the registry, and the reason therefor, and the order of cancellation, are to be entered of record in the Bureau of Corporations and made public.

Under the terms of another section, corporations admitted to registry shall, before or at the time of issuing any new stocks, bonds, debentures, or other evidences of indebtedness, file with the commissioner the resolutions of its directors or Governing Board authorizing such issuance, &c. Section 7 makes it illegal for a corporation, the registration certificate of which shall have been canceled for any reason, to advertise or make any use of such certificate, and any corporation violating this provision of the law may be denied the use of the mails.

It is understood that this measure has been submitted to the Bureau of Corporations and approved thereby, and that when it is taken up by the House Judiciary Committee the officials of the Department of Commerce and Labor will urge its enactment.

The Nelson Bill.

The bill introduced by Senator Nelson is a far more elaborate measure than the Mann bill and follows closely the lines of a measure presented in the House in the last Congress by Representative Palmer of Pennsylvania. It is intended as the basis of a law to be known as the Federal Incorporation act, and is intended to apply to such corporations doing an interstate business as may be organized thereunder, or, if already in existence, as may be reorganized to conform to its provisions. Practically every form of corporate activity is regulated by the bill. The publication of false or misleading statements concerning the condition of a registered corporation is made a criminal offense punishable by both fine and imprisonment. Each company incorporated under the proposed law will be required to pay to the United States Treasury 2 per cent. on its gross earnings in lieu of all taxes on its franchise and personal property, but the real estate of the company is made subject to taxation in and pursuant to the laws of the State or Territory or district in which it is situated.

The Nelson bill is generally regarded as too radical a measure to be made the subject of favorable action at the present time. Senator Nelson, who will be remembered as the author of the statute creating the Bureau of Corporations, is understood to be willing to accept the Mann bill as a substitute for his own measure, a fact which lends much additional importance to the provisions of the House bill. W. L. C.

Robert W. Hunt & Co. have established their St. Louis office, which is in charge of C. W. Gennet, Jr., at 1445 Syndicate Trust Building. They have arranged to locate their chemical and cement laboratory in the same building.

The Philadelphia Foundrymen's Association.

Business was deferred at the 174th regular meeting of the Philadelphia Foundrymen's Association on the evening of February 5, and in its place a triparty novelty dinner was given in honor of the New England and Pittsburgh Foundrymen's associations. A large delegation was in attendance from these associations, while as special guests the association had many of the representatives of the iron, coal and coke producing companies who had been in conference with the weight committees of the different foundrymen's associations at the Bellevue-Stratford Hotel during the greater part of the day.

The dinner was served in the banquet room of the Manufacturers' Club, which was tastefully decorated. Covers were laid for 125 members and guests. Early in the evening a reception was held in the club parlors. The principal novel features of the dinner was that the service was performed by members of the Entertainment Committee, who wore the customary chefs' caps and aprons. Another feature was a printed programme in the form of a booklet, embodying the menu, lists of officers and songs with a personal flavor, specially written for the occasion.

President Devlin welcomed the members and guests in a graceful address, and announced that Howard Evans, secretary of the association, would serve as toastmaster. At the close of the dinner the toastmaster most felicitously introduced the various speakers, among whom were W. A. Viall, vice-president of the New England Foundrymen's Association; Herbert E. Fields, president of the Pittsburgh Foundrymen's Association; John Birkinbine, Henry A. Carpenter, past president of the New England Foundrymen's Association; J. A. Penton, editor of the *Iron Trade Review;* H. L. Haldeman, B. M. Shaw, William J. Breen, J. G. Miller, P. D. Wanner, E. H. Mumford and Wm. S Hallowell. Trade conditions were touched upon by some of the speakers, allusion being frequently made to the effort to maintain prices and to prevent dangerous demoralization in business. The question of prices of raw materials was also freely discussed by some of the speakers, and Mr. Hallowell in the course of his remarks offered the following resolution, which was unanimously adopted:

Resolved, That it is the sense of the Philadelphia Foundrymen's Association that we recommend to the manufacturers of pig iron that they take united action for the purpose of establishing a minimum rate for certain standard grades of pig iron, at fixed delivery points, so that foundrymen may rely on the basis established for the purchase of their supply.

During the evening music was furnished by Harpzell's orchestra, while vocal selections were rendered by Ernest Dupille.

The committee of the Philadelphia Foundrymen's Association which had charge of the dinner and acted as carvers and servers to the members and guests was as follows: J. H. Sheeler, Sheeler-Hemsher Company, chairman; A. A. Miller, *The Iron Age*, secretary; Thomas M. Eynon, Eynon-Evans Mfg. Company; Edgar S. Cook, Warwick Iron & Steel Company; W. H. Ridgway, C. Ridgway & Son Company; H. L. Haldeman, Pulaski Iron Company; James S. Stirling, Hilles & Jones Company; E. H. Mumford, E. H. Mumford Company; Arthur Simonson, Tropenas Steel Company; Josiah Thompson, J. Thompson & Co.; H. L. Tripple, Fairbanks Company; Frank Krug, Joseph Dixon Crucible Company; Thomas Devlin, Thomas Devlin Mfg. Company; Howard Evans, J. W. Paxson Company.

The Future Gas Engine.—Discussing the probable line of development of the gas engine and the type likely to be the standard 25 years hence, *Power* says that some radical departures from present practice are inevitable. "The proposition to use a combustion chamber external to the engine, in which products of combustion are mixed with and tempered by steam, sounds attractive, but your thermodynamic investigator holds up his hands in horror at the idea of such a hybrid scheme, not to mention the difficulties of its practical application. No matter what the working cycle may be, compression of the combustion supporting air is indispensable to efficient combustion. Having gone thus far, it is logical to prescribe compression by means of a separate machine, in order that the engine mechanism may do only the class of work for which it is best adapted. Combustion at constant pressure during a variable portion of the stroke and expansion during the remainder, as in part of the Diesel cycle, looks attractive, but the introduction of the charge into the cylinder involves several knotty problems."

Percentages of Pounds to a Ton.

Tables for Office Convenience in Calculating Prices of Odd Pounds.

(*With Supplement.*)

The accompanying tables were made up by R. D. Jenkins of the Domhoff & Joyce Company, Cincinnati, Ohio. They will be found useful by those who handle pig iron and other commodities sold by the gross ton. They are practically complete tables of decimals of a ton for odd numbers of pounds. The decimals are given for both the 2240 and 2268 pound ton.

The Bristol Water Level Gauge.

It is often advantageous in hydraulic engineering to automatically register the fluctuations in hight of water in head and tail races, rivers, reservoirs, canals, sewers, forebays, &c. Many devices have been used for this purpose, but in practice troubles have resulted from mechanical complexity, difficulty of installation and the effect of cold weather on the apparatus. These objections have been overcome, it is claimed, in the Bristol water level gauge by using air pressure for transmitting the motion. A double bell casting is located permanently at the lowest point to which the water will fall. Between the halves of the bell a diaphragm of thin sheet rubber is placed, so that the water pressure below compresses the air above; this pressure being transmitted through a flexible copper tube to a recording instrument of the same general form and appearance as the familiar Bristol recording pressure gauges. It is seen, therefore, that all moving parts have been eliminated except the rubber diaphragm, which is permanently located below the freezing point in the water. The recorder may be located at any convenient distance from the water, and can be equipped with either daily or weekly charts of almost any capacity. These recording gauges have also been developed for registering the depth or volume of oil in storage tanks. They are made by the Bristol Company, Waterbury, Conn., and are described in its new bulletin, No. 69.

The Wayne Iron Company's Mining Operations.

The Wayne Iron Company, in which a number of Cleveland men are interested, will soon begin the stripping of some ore property which it controls in Wayne County, New York, with the view of placing ore on the market the coming season. The company has acquired about 600 acres of ore land, and it is estimated that the property will produce from 3,500,000 to 4,000,000 tons of ore. The company expects to be able to get out 1000 tons per day. The property is located about 75 miles from Buffalo, and it is the intention to sell the output to Buffalo, Tonawanda and Hamilton, Ont., furnaces and to some of the Eastern furnaces. The ore runs about 45 per cent. in iron, is non-Bessemer and high in silicon, and furnace tests have shown it to be largely self-fluxing, owing to a high percentage of lime. It contains no manganese and practically no alumina, and it is claimed that it will require no treatment for handling at the furnaces. As the earth capping varies from only 6 to 30 ft. in depth, the property can be opened up cheaply. The Cleveland men most prominently interested in the mining company are Capt. J. H. Bartow, Capt. John Mitchell, W. H. Becker and John A. Donaldson.

POUNDS IN PERCENTAGES OF A TON.

TON OF 2240 POUNDS.

Lbs.	Per Cent.	Lbs.	Per Cent.	Lbs.	Per Cent.	Lbs.	Per Cent.	Lbs.	Per Cent.	Lbs.	Per Cent.	Lbs.	Per Cent.	Lbs.	Per Cent.	Lbs.	Per Cent.
4	0.17	228	10.2	452	20.2	676	30.2	**900**	40.2	1124	50.2	1348	60.2	1572	70.2	1796	80.2	2020	90.2
8	0.35	232	10.35	456	20.35	680	30.35	904	40.35	1128	50.35	1352	60.35	1576	70.35	**1800**	80.35	2024	90.35
12	0.5	236	10.5	460	20.5	684	30.5	908	40.5	1132	50.5	1356	60.5	1580	70.5	1804	80.5	2028	90.5
16	0.7	240	10.7	464	20.7	688	30.7	912	40.7	1136	50.7	1360	60.7	1584	70.7	1808	80.7	2032	90.7
20	0.9	244	10.9	468	20.9	692	30.9	916	40.9	1140	50.9	1364	60.9	1588	70.9	1812	80.9	2036	90.9
24	1.1	248	11.1	472	21.1	696	31.1	920	41.1	1144	51.1	1368	61.1	1592	71.1	1816	81.1	2040	91.1
28	1.25	252	11.25	476	21.25	**700**	31.25	924	41.25	1148	51.25	1372	61.25	1596	71.25	1820	81.25	2044	91.25
32	1.4	256	11.4	480	21.4	704	31.4	928	41.4	1152	51.4	1376	61.4	**1600**	71.4	1824	81.4	2048	91.4
36	1.6	260	11.6	484	21.6	708	31.6	932	41.6	1156	51.6	1380	61.6	1604	71.6	1828	81.6	2052	91.6
40	1.8	264	11.8	488	21.8	712	31.8	936	41.8	1160	51.8	1384	61.8	1608	71.8	1832	81.8	2056	91.8
44	2.0	268	12.0	492	22.0	716	32.0	940	42.0	1164	52.0	1388	62.0	1612	72.0	1836	82.0	2060	92.0
48	2.15	272	12.15	496	22.15	720	32.15	944	42.15	1168	52.15	1392	62.15	1616	72.15	1840	82.15	2064	92.15
52	2.3	276	12.3	**500**	22.3	724	32.3	948	42.3	1172	52.3	1396	62.3	1620	72.3	1844	82.3	2068	92.3
56	2.5	280	12.5	504	22.5	728	32.5	952	42.5	1176	52.5	**1400**	62.5	1624	72.5	1848	82.5	2072	92.5
60	2.7	284	12.7	508	22.7	732	32.7	956	42.7	1180	52.7	1404	62.7	1628	72.7	1852	82.7	2076	92.7
64	2.85	288	12.85	512	22.85	736	32.85	960	42.85	1184	52.85	1408	62.85	1632	72.85	1856	82.85	2080	92.85
68	3.0	292	13.0	516	23.0	740	33.0	964	43.0	1188	53.0	1412	63.0	1636	73.0	1860	83.0	2084	93.0
72	3.2	296	13.2	520	23.2	744	33.2	968	43.2	1192	53.2	1416	63.2	1640	73.2	1864	83.2	2088	93.2
76	3.4	**300**	13.4	524	23.4	748	33.4	972	43.4	1196	53.4	1420	63.4	1644	73.4	1868	83.4	2092	93.4
80	3.6	304	13.6	528	23.6	752	33.6	976	43.6	**1200**	53.6	1424	63.6	1648	73.6	1872	83.6	2096	93.6
84	3.75	308	13.75	532	23.75	756	33.75	980	43.75	1204	53.75	1428	63.75	1652	73.75	1876	83.75	**2100**	93.75
88	3.9	312	13.9	536	23.9	760	33.9	984	43.9	1208	53.9	1432	63.9	1656	73.9	1880	83.9	2104	93.9
92	4.1	316	14.1	540	24.1	764	34.1	988	44.1	1212	54.1	1436	64.1	1660	74.1	1884	84.1	2108	94.1
96	4.3	320	14.3	544	24.3	768	34.3	992	44.3	1216	54.3	1440	64.3	1664	74.3	1888	84.3	2112	94.3
100	4.45	324	14.45	548	24.45	772	34.45	996	44.45	1220	54.45	1444	64.45	1668	74.45	1892	84.45	2116	94.45
104	4.6	328	14.6	552	24.6	776	34.6	**1000**	44.6	1224	54.6	1448	64.6	1672	74.6	1896	84.6	2120	94.6
108	4.8	332	14.8	556	24.8	780	34.8	1004	44.8	1228	54.8	1452	64.8	1676	74.8	**1900**	84.8	2124	94.8
112	5.0	336	15.0	560	25.0	784	35.0	1008	45.0	1232	55.0	1456	65.0	1680	75.0	1904	85.0	2128	95.0
116	5.2	340	15.2	564	25.2	788	35.2	1012	45.2	1236	55.2	1460	65.2	1684	75.2	1908	85.2	2132	95.2
120	5.35	344	15.35	568	25.35	792	35.35	1016	45.35	1240	55.35	1464	65.35	1688	75.35	1912	85.35	2136	95.35
124	5.5	348	15.5	572	25.5	796	35.5	1020	45.5	1244	55.5	1468	65.5	1692	75.5	1916	85.5	2140	95.5
128	5.7	352	15.7	576	25.7	**800**	35.7	1024	45.7	1248	55.7	1472	65.7	1696	75.7	1920	85.7	2144	95.7
132	5.9	356	15.9	580	25.9	804	35.9	1028	45.9	1252	55.9	1476	65.9	**1700**	75.9	1924	85.9	2148	95.9
136	6.1	360	16.1	584	26.1	808	36.1	1032	46.1	1256	56.1	1480	66.1	1704	76.1	1928	86.1	2152	96.1
140	6.25	364	16.25	588	26.25	812	36.25	1036	46.25	1260	56.25	1484	66.25	1708	76.25	1932	86.25	2156	96.25
144	6.4	368	16.4	592	26.4	816	36.4	1040	46.4	1264	56.4	1488	66.4	1712	76.4	1936	86.4	2160	96.4
148	6.6	372	16.6	596	26.6	820	36.6	1044	46.6	1268	56.6	1492	66.6	1716	76.6	1940	86.6	2164	96.6
152	6.8	376	16.8	**600**	26.8	824	36.8	1048	46.8	1272	56.8	1496	66.8	1720	76.8	1944	86.8	2168	96.8
156	7.0	380	17.0	604	27.0	828	37.0	1052	47.0	1276	57.0	**1500**	67.0	1724	77.0	1948	87.0	2172	97.0
160	7.1	384	17.1	608	27.1	832	37.1	1056	47.1	1280	57.1	1504	67.1	1728	77.1	1952	87.1	2176	97.1
164	7.3	388	17.3	612	27.3	836	37.3	1060	47.3	1284	57.3	1508	67.3	1732	77.3	1956	87.3	2180	97.3
168	7.5	392	17.5	616	27.5	840	37.5	1064	47.5	1288	57.5	1512	67.5	1736	77.5	1960	87.5	2184	97.5
172	7.7	396	17.7	620	27.7	844	37.7	1068	47.7	1292	57.7	1516	67.7	1740	77.7	1964	87.7	2188	97.7
176	7.85	**400**	17.85	624	27.85	848	37.85	1072	47.85	1296	57.85	1520	67.85	1744	77.85	1968	87.85	2192	97.85
180	8.0	404	18.0	628	28.0	852	38.0	1076	48.0	**1300**	58.0	1524	68.0	1748	78.0	1972	88.0	2196	98.0
184	8.2	408	18.2	632	28.2	856	38.2	1080	48.2	1304	58.2	1528	68.2	1752	78.2	1976	88.2	**2200**	98.2
188	8.4	412	18.4	636	28.4	860	38.4	1084	48.4	1308	58.4	1532	68.4	1756	78.4	1980	88.4	2204	98.4
192	8.6	416	18.6	640	28.6	864	38.6	1088	48.6	1312	58.6	1536	68.6	1760	78.6	1984	88.6	2208	98.6
196	8.75	420	18.75	644	28.75	868	38.75	1092	48.75	1316	58.75	1540	68.75	1764	78.75	1988	88.75	2212	98.75
200	8.9	424	18.9	648	28.9	872	38.9	1096	48.9	1320	58.9	1544	68.9	1768	78.9	1992	88.9	2216	98.9
204	9.1	428	19.1	652	29.1	876	39.1	**1100**	49.1	1324	59.1	1548	69.1	1772	79.1	1996	89.1	2220	99.1
208	9.3	432	19.3	656	29.3	880	39.3	1104	49.3	1328	59.3	1552	69.3	1776	79.3	**2000**	89.3	2224	99.3
212	9.5	436	19.5	660	29.5	884	39.5	1108	49.5	1332	59.5	1556	69.5	1780	79.5	2004	89.5	2228	99.5
216	9.65	440	19.65	564	29.65	888	39.65	1112	49.65	1336	59.65	1560	69.65	1784	79.65	2008	89.65	2232	99.65
220	9.8	444	19.8	668	29.8	892	39.8	1116	49.8	1340	59.8	1564	69.8	1788	79.8	2012	89.8	2236	99.8
224	10.0	448	20.0	672	30.0	896	40.0	1120	50.0	1344	60.0	1568	70.0	1792	80.0	2016	90.0	2240	100.00

POUNDS IN PERCENTAGES OF A TON.

TON OF 2268 POUNDS.

Lbs.	Per Cent.	Lbs.	Per Cent.	Lbs.	Per Cent.	Lbs.	Per Cent.	Lbs.	Per Cent.	Lbs.	Per Cent.	Lbs.	Per Cent.	Lbs.	Per Cent.	Lbs.	Per Cent.
4	0.2	232	10.2	456	20.1	680	30.0	908	40.0	1136	50.1	1360	60.0	1588	70.0	1816	80.1	2044	90.1
8	0.4	236	10.4	460	20.3	684	30.2	912	40.2	1140	50.3	1364	60.1	1592	70.2	1820	80.25	2048	90.3
12	0.5	240	10.6	464	20.5	688	30.4	916	40.4	1144	50.4	1368	60.3	1596	70.4	1824	80.4	2052	90.5
16	0.7	244	10.8	468	20.6	692	30.6	920	40.6	1148	50.6	1372	60.5	**1600**	70.55	1828	80.6	2056	90.65
20	0.9	248	10.9	472	20.8	696	30.7	924	40.7	1152	50.8	1376	60.7	1604	70.7	1832	80.8	2060	90.8
24	1.1	252	11.1	476	21.0	**700**	30.9	928	40.9	1156	51.0	1380	60.85	1608	70.9	1836	80.95	2064	91.0
28	1.2	256	11.3	480	21.2	704	31.0	932	41.1	1160	51.15	1384	61.0	1612	71.1	1840	81.1	2068	91.2
32	1.4	260	11.5	484	21.3	708	31.2	936	41.3	1164	51.3	1388	61.2	1616	71.25	1844	81.3	2072	91.4
36	1.6	264	11.6	488	21.5	712	31.4	940	41.45	1168	51.5	1392	61.4	1620	71.4	1848	81.5	2076	91.5
40	1.8	268	11.8	492	21.7	716	31.6	944	41.6	1172	51.7	1396	61.55	1624	71.6	1852	81.7	2080	91.7
44	1.9	272	12.0	496	21.9	720	31.7	948	41.8	1176	51.85	**1400**	61.7	1628	71.8	1856	81.8	2084	91.9
48	2.1	276	12.2	**500**	22.0	724	31.9	952	42.0	1180	52.0	1404	61.9	1632	72.0	1860	82.0	2088	92.1
52	2.3	280	12.3	504	22.2	728	32.1	956	42.15	1184	52.2	1408	62.1	1636	72.1	1864	82.2	2092	92.2
56	2.5	284	12.5	508	22.4	732	32.3	960	42.3	1188	52.4	1412	62.3	1640	72.3	1868	82.4	2096	92.4
60	2.6	288	12.7	512	22.6	736	32.45	964	42.5	1192	52.6	1416	62.4	1644	72.5	1872	82.5	**2100**	92.6
64	2.8	292	12.9	516	22.75	740	32.6	968	42.7	1196	52.7	1420	62.6	1648	72.7	1876	82.7	2104	92.8
68	3.0	296	13.05	520	22.9	744	32.8	972	42.85	**1200**	52.9	1424	62.8	1652	72.8	1880	82.9	2108	92.95
72	3.2	**300**	13.2	524	23.1	748	33.0	976	43.0	1204	53.1	1428	63.0	1656	73.0	1884	83.1	2112	93.1
76	3.3	304	13.4	528	23.3	752	33.2	980	43.2	1208	53.3	1432	63.1	1660	73.2	1888	83.25	2116	93.3
80	3.5	308	13.6	532	23.45	756	33.3	984	43.4	1212	53.4	1436	63.3	1664	73.4	1892	83.4	2120	93.5
84	3.7	312	13.8	536	23.6	760	33.5	988	43.6	1216	53.6	1440	63.5	1668	73.55	1896	83.6	2124	93.65
88	3.9	316	13.9	540	23.8	764	33.7	992	43.7	1220	53.8	1444	63.7	1672	73.7	**1900**	83.8	2128	93.8
92	4.1	320	14.1	544	24.0	768	33.9	986	43.9	1224	54.0	1448	63.85	1676	73.9	1904	83.95	2132	94.0
96	4.2	324	14.3	548	24.2	772	34.0	**1000**	44.1	1228	54.15	1452	64.0	1680	74.1	1908	84.1	2136	94.2
100	4.4	328	14.5	552	24.3	776	34.2	1004	44.3	1232	54.3	1456	64.2	1684	74.25	1912	84.3	2140	94.35
104	4.6	332	14.6	556	24.5	780	34.4	1008	44.4	1236	54.5	1460	64.4	1688	74.4	1916	84.5	2144	94.5
108	4.8	336	14.8	560	24.7	784	34.6	1012	44.6	1240	54.7	1464	64.55	1692	74.6	1920	84.65	2148	94.7
112	4.9	340	15.0	564	24.9	788	34.7	1016	44.8	1244	54.85	1468	64.7	1696	74.8	1924	84.8	2152	94.9
116	5.1	344	15.2	568	25.0	792	34.9	1020	45.0	1248	55.0	1472	64.9	**1700**	75.0	1928	85.0	2156	95.1
120	5.3	348	15.3	572	25.2	796	35.1	1024	45.15	1252	55.2	1476	65.1	1704	75.1	1932	85.2	2160	95.2
124	5.5	352	15.5	576	25.4	**800**	35.3	1028	45.3	1256	55.4	1480	65.25	1708	75.3	1936	85.4	2164	95.4
128	5.6	356	15.7	580	25.6	804	35.4	1032	45.5	1260	55.55	1484	65.4	1712	75.5	1940	85.5	2168	95.6
132	5.8	360	15.9	584	25.75	808	35.6	1036	45.7	1264	55.7	1488	65.6	1716	75.7	1944	85.7	2172	95.8
136	6.0	364	16.05	588	25.9	812	35.8	1040	45.85	1268	55.9	1492	65.8	1720	75.8	1948	85.9	2176	95.9
140	6.2	368	16.2	592	26.1	816	36.0	1044	46.0	1272	56.1	1496	66.0	1724	76.0	1952	86.1	2180	96.1
144	6.3	372	16.4	596	26.3	820	36.15	1048	46.2	1276	56.3	**1500**	66.1	1728	76.2	1956	86.2	2184	96.3
148	6.5	376	16.6	**600**	26.45	824	36.3	1052	46.4	1280	56.4	1504	66.3	1732	76.4	1960	86.4	2188	96.5
152	6.7	380	16.75	604	26.6	828	36.5	1056	46.6	1284	56.6	1508	66.5	1736	76.5	1964	86.6	2192	96.65
156	6.9	384	16.9	608	26.8	832	36.7	1060	46.7	1288	56.8	1512	66.7	1740	76.7	1968	86.8	2196	96.8
160	7.0	388	17.1	612	27.0	836	36.9	1064	46.9	1292	57.0	1516	66.8	1744	76.9	1972	86.95	**2200**	97.0
164	7.2	392	17.3	616	27.2	840	37.0	1068	47.1	1296	57.1	1520	67.0	1748	77.1	1976	87.1	2204	97.2
168	7.4	396	17.5	620	27.3	844	37.2	1072	47.3	**1300**	57.3	1524	67.2	1752	77.25	1980	87.3	2208	97.35
172	7.6	**400**	17.6	624	27.5	848	37.4	1076	47.4	1304	57.5	1528	67.4	1756	77.4	1984	87.5	2212	97.5
176	7.8	404	17.8	628	27.7	852	37.6	1080	47.6	1308	57.7	1532	67.55	1760	77.6	1988	87.65	2216	97.7
180	7.9	408	18.0	632	27.9	856	37.7	1084	47.8	1312	57.85	1536	67.7	1764	77.8	1992	87.8	2220	97.9
184	8.1	412	18.2	636	28.0	860	37.9	1088	48.0	1316	58.0	1540	67.9	1768	77.95	1996	88.0	2224	98.1
188	8.3	416	18.3	640	28.2	864	38.1	1092	48.15	1320	58.2	1544	68.1	1772	78.1	**2000**	88.2	2228	98.2
192	8.5	420	18.5	644	28.4	868	38.3	1096	48.3	1324	58.4	1548	68.25	1776	78.3	2004	88.4	2232	98.4
196	8.6	424	18.7	648	28.6	872	38.4	**1100**	48.5	1328	58.55	1552	68.4	1780	78.5	2008	88.5	2236	98.6
200	8.8	428	18.9	652	28.75	876	38.6	1104	48.7	1332	58.7	1556	68.6	1784	78.7	2012	88.7	2240	98.8
204	9.0	432	19.05	656	28.9	880	38.8	1108	48.85	1336	58.9	1560	68.8	1788	78.8	2016	88.9	2244	98.95
208	9.2	436	19.2	660	29.1	884	39.0	1112	49.0	1340	59.1	1564	69.0	1792	79.0	2020	89.1	2248	99.1
212	9.35	440	19.4	664	29.3	888	39.15	1116	49.2	1344	59.3	1568	69.1	1796	79.2	2024	89.2	2252	99.3
216	9.5	444	19.6	668	29.45	892	39.3	1120	49.4	1348	59.4	1572	69.3	**1800**	79.4	2028	89.4	2256	99.5
220	9.7	448	19.75	672	29.6	896	39.5	1124	49.55	1352	59.6	1576	69.5	1804	79.5	2032	89.6	2260	99.7
224	9.9	452	19.9	676	29.8	**900**	39.7	1128	49.7	1356	59.8	1580	69.7	1808	79.7	2036	89.8	2264	99.85
228	10.05	454	20.0	678	29.9	904	39.9	1132	49.9	1358	59.9	1584	69.8	1812	79.9	2040	89 95	2268	100.00

The Philadelphia Weight Conference.

Foundrymen Meet Pig Iron, Coke and Railroad Interests.

An invitation was extended by the New England Foundrymen's Weight Committee to producers and shippers of pig iron, coal and coke to meet and, in a friendly spirit, consider means as how best to overcome discrepancies in the delivery weight of these crude materials. In accordance with this invitation a conference between the representatives of the New England, Philadelphia and Pittsburgh foundrymen's associations, the producers and the transportation companies was held at the Bellevue-Stratford Hotel, Philadelphia, Pa., February 5. Stanley G. Flagg, Jr., president of the American Foundrymen's Association, called the meeting to order shortly after 10 o'clock, welcoming those in attendance and expressing the hope that their deliberations would result in the adoption of some method by which the differences in the weight matter might be adjusted to the mutual satisfaction of those interested. On motion of W. A. Viall, secretary of the Brown & Sharpe Mfg. Company, Henry A. Carpenter of Providence, R. I., was elected as the chairman of the conference. Wm. J. Breen, secretary of the Weight Committee of the New England Foundrymen's Association, was elected secretary. Mr. Carpenter then addressed the conference as follows:

Chairman Carpenter's Address.

You are all sufficiently familiar with the purpose for which we are called together, and without endeavoring to outline the case from the foundrymen's standpoint, it will be my desire to hear from the different interests which are represented here, with the object that after all sides of the question have been discussed by parties directly interested it will be possible to agree upon some resolution establishing a method which will eliminate to a large extent the friction which now exists between buyers, sellers and transportation companies.

If I should attempt to read the reports that have been made by the original committee appointed by the New England Foundrymen's Association, or to pick out of the letters received many which have a bearing on this particular subject, it would consume the rest of the day, and it seems as though this could be left out, as I think it is thoroughly understood, and will be agreed to by every one here, that the foundrymen have sufficient cause to complain.

As foundrymen we feel that the iron and coke producers are as a rule large corporations. This also applies in a greater degree to the transportation companies, and, as is almost always the case, the small individual foundrymen, after having brought cases to the attention of these large corporations and having been turned down or ignored, feels as though he was powerless to do anything. I am a firm believer in organization and its results. When organizations are properly handled they are usually beneficial, and there is some doubt that if our New England Foundrymen's Association had not taken the initiative this subject might not have been brought up and this meeting called.

I firmly believe that at this meeting the very fact of our being together and allowing the representatives of the small foundrymen to come in contact and become personally acquainted with the representatives of these larger corporations will tend to do much toward straightening out difficulties of the nature we have under consideration when they arise, and I am in hope that ways and means will be suggested which will eliminate to a large extent, as stated before, the frequent occurrence of shortages.

In the majority of the letters which the committee has received from foundrymen it seems to be a universal complain that they are compelled to buy their coke with railroad weights at point of shipment governing, and it would seem that the very least we could accomplish would be to establish a method of weighing which would prove accurate and agree upon payments according to weights at point of delivery. Some of the communications we receive speak harshly of the producers as well as the railroads, and indicate that after a foundryman has instituted regular methods and appliances for checking the receipts of his raw materials the shortages have been reduced and even done away with.

I do not believe, as a rule, that this opinion is coincided in by foundrymen in general. I am sure that your chairman has no such idea, but our correspondence indicates that methods in some localities at point of shipment are lax; in some cases that the tare weight as indicated on cars is incorrect. It is often the case that cars are weighed without being uncoupled, while [illegible] other instances, where the load is transferred during shipment, that the course pursued is lax and inadequate. In many cases our records would indicate that when a foundryman asks for his rights that he meets at times with scant courtesy on the part of the transportation companies and from the sellers as well.

The New England Weight Committee's Efforts.

The chairman called upon J. L. Anthony, chairman of the New England Weight Committee, for an outline of that committee's labors. Mr. Anthony responded as follows:

This committee was appointed in March, 1907, to ascertain, if possible, if consignments of pig iron and coke to New England arrived at destination with loss of more or less material than billed by the shippers, and where shortage was found, were the consignees fully reimbursed. The committee, after careful investigation, became convinced that many consumers throughout New England had suffered considerable loss through not having received the full amount of the material billed, particularly pig iron coming by rail and water from the South.

Convincing proof of shortages of any magnitude in consignments of pig iron shipped by rail in box cars was rare, while shipments in open cars were frequently found short, especially during the latter part of 1906 and the early months of 1907. Shortages of coke appeared very prevalent, amounting in many instances to nearly 2 per cent. on large shipments covering a considerable period.

General dissatisfaction was found to exist among consignees on account of the difficulty experienced in collecting claims for shortage. No uniform method of procedure on the part of consignees was found operative that would establish a claim that either shipper or carrier would willingly entertain. Claims made on the shippers were usually met with the assumption on their part that their weights were correct and the shortage must be due to loss in the hands of the carrier. The delivering transportation company usually questioned the accuracy of the shippers' or the consignees' weights or shifted the responsibility to their connections.

The question was, therefore, taken up with the shippers and delivery carriers, requesting a statement from each which would enlighten this committee as to what they required of the consignee to establish a claim of shortage for which they would assume responsibility. This brought from the pig iron shippers a concise description of their methods of and equipment for weighing, as evidence of the care taken to insure accuracy, and also the statement that the carriers accepted their weights for the billing, and if any part of the iron did not arrive at destination it must have been lost in transit while in the hands of the carrier.

From the coke shippers we learn that cars of coke are generally weighed by the initial railroad, coupled together and run over track scales, often miles from the ovens where loaded, and the marked tare weight on the cars is used in calculating the net. They usually took the position that as the railroad weighs the coke it was evident that if the destination weights did not agree with the original weights material had either been lost in transit or improperly weighed, conditions over which they had no control.

The replies of shippers generally imply that consignees should look to transportation companies for reimbursement. No definite statement being obtained from the carriers regarding their position, it was decided to request a conference with the shippers and carriers for the friendly discussion of this question. This suggestion or request was received with favor in nearly every case, and the conference has accordingly been called by this committee at this time and place.

The Situation as to Pittsburgh and Philadelphia.

Herbert E. Field, president of the Pittsburgh Foundrymen's Association, represented that organization at the conference, and said that he represented both shippers and consumers, as a number of both classes are members of that association. He had received a large amount of data on both sides of the question, which could be presented in full if the conference desired. Shortages were far greater on pig iron in the Pittsburgh District than they were on coke, and he would like to see the conference adopt some plan by which these differences in shipping and delivery weights could be overcome. A system of restricted check weighing might accomplish something, but rather than go into details at the time, he would consider it a better plan to discuss the different subjects as they arose during the conference.

The Weight Committee of the Philadelphia Foundrymen's Association reported through its secretary, A. A. Miller, that the matter had been fully discussed in the meetings of the association and by personal interviews with foundrymen. Discrepancies in pig iron weights, it

was found, did exist in this territory, and while all rail and short haul deliveries usually come through satisfactorily, those dependent on mixed or rail and water shipment are to a great extent unsatisfactory. On the coke question reports varied. Some consumers did not weigh the material on arrival, while others after a period of weighing discontinued it and assumed that shortages would average up with the overweights. Statistics in instances showed that small losses, which were disregarded, were the usual result when records on coke weights were kept.

Coke First Taken Up.

The question of the shortage on delivered weight of coke was first taken up by the conference, and the discussion covered practically the entire morning session. It was asked if any definite percentage could be fixed for loss of weight due to evaporation of moisture in transit, rough handling or any other usual cause. Shipments weighed by responsible parties showed unquestionably from the foundrymen's standpoint that shortages did exist, and it was asked that the transportation companies explain if possible why discrepancies between the shipped and delivered weight should not be eliminated. Coke purchases, it was said, were made under agreement which definitely stated that weights by the railroad at scales nearest the ovens should govern the basis of settlement for the coke, so that the purchasers had no redress from the coke producers, notwithstanding the fact that the delivered weight was short; but not only were they made to assume the burden of loss of material, but they were also compelled to pay the freight on material they did not receive, and in the case of coke the freight to New England points exceeded the actual cost of the coke at the ovens.

The representatives of the railroad interests in turn explained the care with which shipments of coke were weighed, it being stated that this matter had been given the most careful attention. Their scales were the best to be had, self-registering, so as to preclude human error. Scales were frequently and regularly tested and checked, and every possible effort made to keep them correct. The weights made were for the purpose of fixing the basis of their freight accounts, and if the shippers of coke saw fit to make these weights the basis of settlement between themselves and the purchasers of coke it was something beyond their control. Offers were made by several of the railroad interests to take a committee of foundrymen to their weighing points in the coke regions, and there to show them the methods followed and the care exercised in arriving at absolutely correct weights.

Railroads Do Not Admit Discrepancies in Coke.

Efforts were made by the representatives of the foundrymen to have the railroad interests explain what would constitute a valid claim on which the railroads would be willing to settle for shortages, but without result, as the latter interest would not admit that any discrepancies in the weights existed, as it was claimed that no better system than was used by themselves had yet been brought out, and until there was they were willing to stand on their own weights. Discrepancies of a few hundred pounds, it was said, were possible on different scales and could not be termed a shortage, but on heavy tonnages, where errors were obvious, settlement was always made as rapidly as possible. Coke cars, it was said, were not cleaned either by consumer, shipper or by the transportation companies, and loss in weight from the dust or coke breeze accumulating in the cars was not infrequent. Some consumers used this material for purposes around the plant, under boilers, &c., but as a rule it was usually disregarded.

The question was asked by W. S. Hallowell, "Will the coke producers accept, as the billing price of coke, the net weight of such coke obtained by weighing on reliable scales located nearest to the point of delivery," which brought out considerable discussion. The railroad interest contended that to adopt such a method would change the entire system of the railroad, inasmuch as weighing yards or points would have to be established all over the country and the business of the railroads would be hampered to such an extent as to make it impossible. The morning session adjourned during the discussion of a further resolution, as follows:

Whereas, There are discrepancies between the shipping and out turn weights of coke and pig iron;

Resolved, That the initial, intermediate and delivering transportation companies be requested to appoint a committee to meet with a committee of representative foundrymen to settle upon a plan that will entitle the consignee to make a claim that will be approved by the transportation companies.

The railroad interests objected to the wording of the resolution.

Pig Iron Weights.

The afternoon session of the conference was called to order by the chairman at 2.30 o'clock, and discussion opened on the resolution presented at the close of the morning session. Action was deferred, however, to permit a discussion of shortages pertaining to pig iron weights, which had not been taken up to any extent during the opening session. A representative from Boston, Mass., explained his company's method of weighing, stating that it was its practice to weigh incoming materials on a regularly tested track scale, by a representative of the railroad and the company jointly, and the weight thus obtained sworn to, but said that this did not appear to be considered a valid claim for shortage, as it was the custom of the railroad to refer the matter back to the originating road, which usually stood firmly on its original weight.

Pig iron producers said that they used every precaution in the weighing of pig iron at their furnaces, check and double checks being in some cases used. The best appliances were used for weighing; scales were frequently tested, in many instances by railroad test cars, and the railroads themselves were willing to accept their weights to base their freight charges. Under ordinary conditions an error of 1 per cent. between shipper's and receiver's scales was possible, and statements were made which brought out under and over weights amounting to between 1 and 2 per cent. on the year's pig iron receipts.

Rail shipments were not as liable to error, it was said, as were rail and water shipments; in fact, statements were made where Southern iron, shipped in box cars which were sealed, as is the custom in some parts of the South, arrived at their New England destinations with the seals intact and consequently without loss, while iron shipped in open cars frequently showed a loss in weight on arrival at their destination. The loss on mixed, or rail and water, shipments was said to be the greatest. In explanation of this apparent discrepancy a representative of one of the water transportation companies explained the care it exercised in keeping the shipments separated at receiving points, in transit and at delivery points. Pigs were identified by paint marks and in some instances counted, but the latter case was not considered reliable, owing to the fact that pigs might be broken by handling in transit. Moderate discrepancies, it was contended were frequently due to the loss of sandage, while the inaccuracy of weighing by short drafts, which was the usual method of weighing in many instances, was frequently a cause of a large part of the shortage in weight claimed.

In the interest of the foundrymen it was said that efforts had been repeatedly made to have the steamship companies install scales at the docks, even at the expense of the foundrymen, but this, it was said by the steamship companies, was impossible owing to the lack of facilities to install large scales at the docks, and which would also greatly interfere with the rapid handling of freight as is required in the conduct of their business.

An Acceptable Resolution.

After some further discussion of a general nature the following committee was, on motion, appointed by the chairman to draft a resolution which would be acceptable to the various interests represented: W. A. Viall, Brown & Sharpe Mfg. Company, Providence, R. I.; R. H. Large, coal freight agent Pennsylvania Railroad, Philadelphia; C. S. Hoskins, Merchants' & Miners' Transportation Company, Baltimore; L. E. Walters, Clare Coke Company Pittsburgh; H. L. Haldeman, Pulaski Iron Company, Pulaski, Va.; John O. Henshaw, N. S. Bartlett & Co.,

Boston, Mass. This committee, after deliberation, presented a resolution, which after amendment was passed as follows:

Resolved, That a committee be appointed by the chairman, consisting of representatives of the consignors, transportation companies and consignees, to consider the question of discrepancies between shipping and out turned weights on pig iron and coke, and report back in writing to the chairman of this conference.

Owing to the inability to obtain some of the names of transportation companies not represented at the meeting, but who on account of their geographical location are interested in this matter and should be represented on the committee, the chairman deferred appointment of the committee until a later date.

The conference extended a vote of thanks to the presiding officer, immediately after which adjournment followed. The following members of the various foundrymen's weight committees and representatives of the transportation companies and the shippers were in attendance at the conference:

Walter Wood, R. D. Wood & Co.
Stanley G. Flagg, Jr., Stanley G. Flagg Company.
J. S. Stillman, Empire Steel & Iron Company.
W. H. Stanford, Tennessee Coal, Iron & Railroad Company.
Edgar S. Cook, Warwick Iron & Steel Company.
B. F. Fackenthal, Jr., Thomas Iron Company.
J. G. Miller, Adrian Furnace Company.
Ledyard Heckscher, Richard Heckscher Sons Company.
W. W. Hearne, Alabama Consolidated Coal & Iron Company.
Lawrence E. Walters, Clare Coke Company.
J. A. Bradbury, district manager Southern Weighing & Inspection Bureau, Birmingham, Ala.
R. W. Davis, freight traffic manager Buffalo, Rochester & Pittsburgh Railway Company.
C. S. Hoskins, Merchants' & Miners' Transportation Company, Baltimore & Ohio Railroad Company.
W. S. Battle, Jr., general claim agent Norfolk & Western Railway Company.
J. L. Anthony, Weir Stove Company.
William J. Breen, H. W. Adams & Son, Inc.
W. A. Viall, Brown & Sharpe Mfg. Company.
A. N. Abbe, American Hardware Corporation.
Henry A. Carpenter, General Fire Extinguisher Company.
Leonard Peckett, Empire Steel & Iron Company.
Jno. O. Henshaw, N. S. Bartlett & Co.
J. B. Wadsworth, Corrigan, McKinney & Co.
R. S. Lackey, Allegheny Ore & Iron Company.
Philip E. Wright, Thomas Iron Company.
Theo. F. Lips, Merchants' & Miners' Transportation Company, Baltimore & Ohio.
O. W. Mason, Midland Steel Company.
C. F. Lamb, general agent Southern Railway Company.
T. W. Roberts, Jamison Coal & Coke Company.
S. G. Cargill, Low Moor Iron Company.
C. H. Newcomb, Crocker Bros. and Rockhill Furnace Company.
Warren W. Baker, Carnegie Steel Company.
August A. Miller, *The Iron Age*, Philadelphia.
J. B. Halloway, N. S. Bartlett & Co.
H. E. Bear, S. G. Flagg & Co.
Bartlett M Shaw, Walker & Pratt Mfg. Co.
Jno. A. Penton, *Iron Trade Review*.
C. A. Swope, Eastern freight agent, Louisville & Nashville Railroad Company.
Abel Mishler, Davis Coal & Coke Company.
R. H. Large, coal freight agent, Pennsylvania Railroad.
Edward H. Bell, freight traffic department, New York Central & Hudson River Railroad.
Wm. T. Shepard, [illegible] Iron & Steel Company and Punxsutawney Iron Company.
Horace L. Haldeman, Pulaski Iron Company
W. H. Hunt, Wm. Adams Foundry Company.
Wm. S. Hallowell, Harrison Safety Boiler Works.
Robt. C. Wright, general freight agent, Pennsylvania Railroad.
F. E. Herriman, Central Lines, New York.
E. B. Crosley, coal freight agent, Pennsylvania & Reading Railway.
L. E. Snively, commercial agent, Delaware, Lackawanna & Western Railroad.
A. R. [illegible], [illegible] freight agent, Cleveland & Pittsburgh Railway Company.
H. M. Matthews, Baltimore & Ohio Railroad.
Hugh Kennedy, Buffalo & Susquehanna Iron Company.
H. E. Field, Mackintosh-Hemphill & Co.
Geo. W. French, J. J. Mohr & Co.
G. K. Mohr, J. J. Mohr & Co.
Thos. M. Eynon, Eynon-Evans Mfg. Company.

After an investigation of the coal resources of the Philippines, Government geologists report that a large vein probably crosses the entire group of islands; it has been clearly traced in one vicinity for fully 25 miles. The coal is found to be a uniformly good bituminous. Mine workings which had been extensively operated by the Spaniards were discovered.

Fuels for Gas and Gasoline Engines.

BY AMOS HARDY.

Gasoline.

The specific gravity of gasoline and the time required to volatilize it affect the running of the engine, as well as the ease with which it can be started, especially in a cold climate. A simple test for volatility consists in moistening the hand with it and noting the time it takes to evaporate. Stove gasoline, commercially known as 74 test, which is commonly used in engines, evaporates in about 7 to 10 sec., leaving the surface of the hand perfectly dry. Gasoline of 60 degrees Baumé requires from ¼ to ½ min. to evaporate. If there is any greasy residue left on the hand the fuel is not fit for use in the ordinary gasoline engine.

The instrument used to test the specific gravity of gasoline, the hydrometer, consists of a glass tube closed at both ends, containing a quantity of mercury, with a bulb at the bottom and having a degree graduation known as the Baumé scale.

Liquid fuels of lower specific gravity, down to 56 degrees may be used successfully in the ordinary gasoline engine, although it may become necessary to heat the air before it is brought into contact with the fuel. This can be done readily by inclosing the exhaust pipe with a sheet iron cylinder 1 to 2 in. larger in diameter than the pipe, and connecting the air supply pipe to this cylinder. For starting the engine on low grade fuels when it is cold, it may be necessary to use gasoline for a few minutes, until the engine has warmed up sufficiently to allow the heavier fuel to be vaporized. The design of the fuel admission device may have considerable effect on the way in which a low grade fuel can be used. A number of gasoline engines as now built can use 56 degree-distillate, even for starting at moderate temperature, without the necessity of heating the air.

Illuminating Gas.

When using illuminating gas, owing to the uniform quality and steady pressure with which it is usually supplied, few difficulties encountered in the operation of a gas engine may properly be blamed on the fuel. It must be remembered, however, that to obtain the best results of which the engine is capable, the adjustment of the amount of gas and air in an engine depends on the heating value of the gas in each locality. The engine may have been adjusted properly in this respect in the factory, but when set up under different conditions and using a fuel different from that with which it was tested, the proportions of gas and air may have to be varied. This can usually be accomplished by means of the gas cock or throttle on the engine. The opening in the plug of this cock must be large enough to admit a sufficient supply of gas at the lowest pressure during the day, with the cock fully opened. Slight fluctuations in pressure are not liable to affect the running of an engine to any great extent, as the pressure regulator in the supply pipe, or the rubber bag, take care of such variations in pressure.

Natural Gas.

Few gas engine factories have natural gas available, and the engines are therefore tested with illuminating gas, which usually contains only about two-thirds of the heat value of natural gas. Therefore an engine adjusted for artificial gas must be differently adjusted for the richer fuel. As it requires only 12 to 15 cu. ft. of natural gas to produce 1 hp. per hour, as against 18 to 20 cu. ft. of illuminating gas, the gas supply must be reduced 25 to 33 1-3 per cent. Without this change of adjustment the power developed would be considerably less than it should be, owing to the excess of gas in the mixture.

A mixture of air and natural gas also burns more sluggishly than a mixture containing illuminating gas. This necessitates a different adjustment of the igniter. The proper point of ignition—that is the position of the crankshaft at which the electrodes separate and produce the igniting spark—will be found to be about 4 to 6 degrees earlier than is suitable for illuminating gas.

THE IRON AGE

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Legislative Control of Business.

Radical laws are often nullified by the courts because in conflict with the written constitution, but once a law has been sustained by the courts they are bound to enforce it forever, regardless of changes that may occur in the conditions that led to its enactment. Few laws are repealed, and each year a large addition is made to the accumulation of generations. In the United States the popular demand for more and more laws must be obeyed by Congress, 46 legislatures, the various commissions and boards which exercise legislative powers, and the multitude of municipal bodies which have local jurisdiction. In recent years law making has taken the direction of regulating the minute affairs of business, and it is difficult to foresee the outcome.

The great railroad president goes about in fear and trembling, not knowing at what moment the hand of the law may beckon him to account for some act in which he was innocent of wrong intent; and the same fear haunts all his employees, from traffic managers and superintendents down to the station agent who works for $40 per month. Laws which regulate the physical movement of traffic as well as the rates and financial affairs of a railroad have become so complex that it is impossible for the official or employee to know in all cases whether his acts are proper or unlawful. Experience and business ability offer no assurance that an act is right, and even an expert lawyer cannot tell in many cases what a court might decide in the interpretation of recent laws which it is physically impossible to obey.

The manufacturer is confronted with a multitude of laws which regulate the amount of smoke his chimney may emit, the conditions under which his men may work, and the manner in which he shall or shall not fix the prices of his products. All of these requirements, many of them necessary and salutary, are coupled with varying penalties of fines or imprisonment. The manufacturer must furthermore master the impossible by knowing the lawful rates on every article that he receives or ships, under dire penalties if he pays more or less than the complex and often invisible schedules which have been clothed with the sanctity of law. The merchant, in the same manner, is hedged about by laws and restrictions, which in the State of Texas have made it a felony if he deals in the products of a mysterious class of corporations that for all he knows may include the majority or all of the manufacturers whose goods he sells. The maker of food products may have his reputation blasted in a day by the summary seizure of his goods by Government officials on technical charges, where he has earnestly sought to obey the law. The packer has fallen so far from popular favor that he is not permitted to sell his products until they have been "inspected and passed" by representatives of the law.

The scope and severity of laws to regulate business affairs have vastly increased within a few years, and if the growth of legislation continues it will be a comparatively short time until every man who conducts an industry or business will be technically, at least, a law breaker. Even now few companies carrying on a manufacturing business of any magnitude can comply literally with all the requirements of legislation. The majority of the men who make laws to regulate business affairs have had little or no experience in bearing the responsibility of industrial or commercial undertakings, and scarce one in a hundred of the masters of the ballot knows what will be the ultimate effect of the laws they demand.

When the English Parliament found itself in possession of the power to regulate the business affairs of an entire nation it prescribed the most minute laws to fix wages, the prices of grain and other commodities, and the ordinary methods of business, and the failure of one law only led to more stringent measures. Wages advanced in defiance of these laws, and the prices of commodities showed little inclination to obey legislative decrees; but for five centuries Parliament continued to fulminate on the ordinary affairs of business. Meantime England remained in a commercial and industrial rank inferior to that of Holland and the petty republics of Italy, and it was not until the mass of feudal legislation had reached the stage of decay that the English people were able to assert themselves in the world's trade. In the course of six centuries Parliament made the discovery that business affairs largely regulate themselves, in obedience to the desire of the majority of business men for fair dealing.

In the United States the wave of regulation and reform has reached a new hight. It is yet to be seen whether with it has come a permanent subsidence of the foundations on which industry and trade have been built up. Undeniably government supervision is to be a larger factor in business than it has been, but it seems equally certain that much that has gone on the statute books in the past three years will disappear under the sifting out process of the courts. Fortunately the judiciary is still of co-ordinate rank with the legislative and the executive branches of our Government, and the Constitution may still be invoked with confidence to stay the execution of legislation born of the prevalent hysteria.

The Consumption of Structural Steel.

The production of structural shapes in the United States in 1906 reached a total of 2,118,772 gross tons, a marked advance upon the output of 1905, which was 1,660,519 tons. The gain of 27.5 per cent. was greater than that in any other line of finished material, the increase of all forms of rolled products being 16 per cent. For 1904 the total of structural steel was 949,146 tons, for 1903 it was 1,095,813 tons, and for 1902 and 1901 it was 1,300,326 and 1,013,150 tons respectively. Thus in 1906 the business in structural shapes was double the average for the four years immediately preceding 1905. It is worthy of note that 1906 was the first year in which our production of structural shapes exceeded that of wire rods, representing the great wire and wire nail industry.

which has been in the past 15 years so strong a prop of the steel trade of the country.

The growth of the fabricating interests of the United States has been marked in the past three years, and the figures for 1907, when they are collected, will doubtless show that the imposing total of 1906 has been exceeded. For example, the American Bridge Company turned out 650,000 tons of fabricated work in 1907, against 577,000 tons in 1906. New firms have engaged in the business of bridge building and the erection of steel structures since 1904, and in the same period the capacity of many large established companies has been increased. Last year and in 1906 not only was a large amount of bridge work done in connection with new railroad building and the replacement of old bridges by stronger structures to carry the heavier trains, but all over the country construction work was actively prosecuted on commercial, manufacturing and public buildings. In spite of maximum prices for labor and for practically every kind of building material except steel, the movement reached unprecedented proportions, so widespread was the feeling that the foundations of the country's prosperity were not to be seriously shaken, even though some slackening of the pace might naturally be expected.

While no exact statistics are at hand, reliable estimates put the present capacity of fabricating works in the United States at about 2,200,000 tons, no account being taken of the considerable number of metal working plants in which the occasional job of preparing a few beams, angles or channels for use in construction is but incidental. It is to be considered that the above estimate of capacity includes work involving plates and bars as well as shapes. On the other hand, not all the total of structural steel shapes produced in 1906—2,118,772 tons—passed through fitting shops, a considerable tonnage of angles and channels being devoted to other than railroad and architectural uses, as, for example, the building of steel cars, agricultural implements and various forms of machinery.

A development of the past year was the increased use of beams in place of riveted work, with a resulting economy of production and increase of output. This tendency is likely to be more marked this year as the volume of business diminishes. The new structural section now rolled at Bethlehem will also contribute to the increasing use of plain material in steel cage buildings.

The New British Companies and Partnership Acts.

At a time when corporate management in the United States is under fire, the business interests of Great Britain are expressing satisfaction over the passage by Parliament of the so-called Companies and Partnership acts. The latter is already in force, the former to become operative in July. A synopsis of their provisions is contained in a recent number of *Engineering*, whose deductions would indicate that the English laws governing corporations and partnerships have been so perfected that our own national government or the legislatures of the several States might find in them some inspiration for changes in the American corporation system. The opinion is expressed "that, much as the Companies act of 1900 has done to promote trade, much more would have been done had the intention of the legislature to protect the public been more effectively expressed. It is to this end chiefly that the new Companies act is directed. But it does much more than to safeguard the investor; it may be said, in effect, to so revolutionize the law relating to joint stock enterprise as to make this form of trading and employing capital not only more businesslike but vastly more popular."

While the two acts are distinct, one applying to "companies," or corporations, to use the American equivalent, and the other to partnerships, they both deal with combinations of individuals in business enterprises along similar lines. Even the partnership referred to is not unlike a corporation in the responsibility of its members, for to it is extended the principle of limited liability in somewhat the same manner as in the limited partnerships provided for in the statutes of some of our States.

The Companies act divides corporations into three classes. The first is the company which issues a prospectus to the public, the prospectus being compulsory and having a very different meaning from that of the promoters of American corporations, for it must set forth truthfully all facts that would assist the public in its decision as to the investment. The second class of companies does not have to issue a prospectus, but in lieu of it the company is bound, before allotment, to file a statement with the Registrar. This statement is intended to stop effectually the game of the fraudulent company promoter, for it must contain all the particulars that the cautious investor requires, such as the nature and extent of the interest of every director in the promotion or in the property proposed to be acquired by the company and the amount of the commission paid or payable for procuring subscriptions for any shares or debentures of the company. It is further provided that all companies registered under the act must have balance sheets, with reports of auditors signed by the directors and filed for the examination of preference shareholders and debenture holders. This is considered a very important concession to investors. Among other new provisions is one that the certificates of shares must be ready for delivery on demand within two months after allotment. A company's expansion is encouraged by the act which allows money to be raised for buildings, works, machinery, &c., and the company may pay interest on so much of said share capital as is paid up and charge the interest to capital, not exceeding 4 per cent., providing the sanction of the Board of Trade is first obtained, a proviso offering greater security to the public. Another section makes the provision that a mortgage on debentures or uncalled capital, or any other mortgage, which if executed by an individual would require registration, must be registered by a company within 21 days, or it will be void against the liquidator or any creditor.

American corporations will be interested in a provision of the new act that foreign companies doing business and having premises in Great Britain, and using the title "limited," will be required to file a statement of particulars of their constitution with the English registrar.

Perhaps the most revolutionary part of the new Companies act is that which applies to the third class of corporations, the private companies. A private company, after July next, will have its members limited to 50, and it will restrict the transfer of its shares and will not invite public subscription. Under the existing law, private companies cannot have less than seven members, but the new act allows the formation of a limited liability company consisting of two members only. A private company of two members and up to 50 is not, like the public company, obliged to issue a prospectus or statement, since it is prohibited from selling shares to the public or from allowing the unrestricted transfer of its shares. "The small private company with its limited liability of all of

its members is likely to be very popular with those floating small concerns," says *Engineering*, "and under this act an immense amount of capital ought to be released for the use of enterprising manufacturers and traders."

Under the Partnership act a limited partnership, in a sense a fourth type of corporation, may be set up in any business except banking, with any number of partners up to 20, and in banking up to 10 partners. There must be at least one general partner whose liability to the creditors of the concern is unlimited, while limited partners are only liable to the amount of their investment. The limited partner or partners must not take an active part in the business; but they may advise, and they, or their auditor, will have access to the books. Thus the "sleeping partner," the English synonym for "silent partner," is induced to invest in business with a general partner without being at his mercy, as heretofore, or running the risk of losing his all. A limited partnership, unlike a private limited liability company, must deliver to the Registrar a statement, signed by the partners, giving full information for the benefit of creditors as to each partner, the amount of his interest, the duration of the partnership, &c. And any person may examine these particulars at the office of the Registrar, where also an index of all limited partnerships shall be kept. A small private limited liability company, even when there are only two members, must have "Limited" after its title, so that in giving credit the public will know that the liability of every member of the company is limited to the amount of his investment. In the case of a limited partnership, on the other hand, the use of the word "limited" is not required. But for the protection of creditors the registration of the statement of particulars is compulsory, and further, the provision is made that no limited partner shall withdraw any of his capital without being liable for the firm's debts to the extent of the sum withdrawn. Another feature of the new law is that the limited partnership cannot be dissolved by notice from the limited partner, nor by lunacy, bankruptcy nor death. The limited partner may assign his interest, but only with the consent of the general partners. Any business differences are outside the control of the limited partners, but can be settled by a majority of the general partners when there are more than two.

Economy in Handling Raw Materials at Shipping Ports.

Studying the movement of traffic through large shipping ports impels the conclusion that many of the methods of handling raw materials and merchandise in bulk could be greatly improved. The labor cost of transferring products between ships and cars is an important consideration, but in some respects the time spent in loading and unloading vessels means more. A vessel's charter often costs $200 to $300 per day and the ship's operation $1000 a day. When unloading by hand a vessel may be docked over 24 hr., where, with mechanical means, the cargo could be discharged in a few hours.

Great progress has been made in the economical handling of grain and ore in the most important shipping centers, but the general problem of transshipping raw material has only begun to be appreciated by engineers. This is not surprising, for developing railroad systems has absorbed attention to the neglect of the avoidable minor losses in handling materials and bulk products. Docks and terminals are a part in railroad work, but the specific problems of material handling deserve wide engineering attention.

Electricity is reducing manual labor at such shipping ports as New Orleans, Galveston and Mobile. The varying hight of the water at all seaboard ports increases the cost of discharging cargoes by imposing an enormous amount of hand work at present. Economical handling cannot be secured without eliminating much of this hand labor, handicapped as it is by the varying angularity of the runways between the ship and shore at different stages of the tide. The slowness of hand labor multiplies its expense. An advance is the use of electrically driven conveyors in the larger ships, some being adapted to unload general cargoes and others special cargoes, like bananas, rice, sugar, &c. The power required per conveyor need not exceed 15 or 20 hp. for a large range of work. The bridging by machinery of the gap between ship and car is a great advantage. The run may be only 100 or 200 ft., but this is sufficient to reduce the labor required in some cases 50 per cent., to say nothing of the time saved. Coal handling has been well worked out in the larger seaports, but still it may occasionally be seen handled in sacks by laborers, where machine methods should be in operation.

As long as selection and distribution of cargoes are necessary, hand labor cannot be entirely avoided, but without doubt large economies might be effected by eliminating the heavier manual handlings, even though the distance covered may be short. The entire shipping and mercantile world would profit by economical and rapid machine loading in place of laborious and slow methods of transfer at all shipping points, where the volume of traffic justifies the investment in the necessary equipment.

CORRESPONDENCE.

The Corrosion of Iron and Steel Pipes.

To the Editor: I have read with interest T. N. Thompson's paper on "The Corrosion of Wrought Iron and Soft Steel Pipes," as published in *The Iron Age* of February 6. I should like to call attention to the fact that Mr. Thompson's conclusion that steel pipe will last 54.7 days longer than wrought iron pipe is based on his erroneous assumption that the corrosions of both metals would have continued at the same ratio at which they started. A large number of tests made by other experimenters have proved that the corrosion of iron and steel is very irregular and erratic.

Professor Howe, in his paper on the corrosion of iron and steel, read before the American Society of Testing Materials (Vol. 6, p. 158), gives some very plausible theories as to why corrosion is not uniformly progressive. We also have made numerous laboratory tests in this direction with different solutions, such as distilled water, hydrant water, salt water, crude oil, &c., but do not wish to burden you with a list of them, as the results were so irregular as to be of no practical value. Sometimes the iron sample would corrode faster than the steel at the beginning of the test, and on the net comparison of the same samples left in the same solution several months later, it would show the steel to have corroded very much more than the iron, and vice versa; so we have come to the conclusion that laboratory tests are entirely too short in time and do not conform to actual conditions, so that they are an entirely unreliable guide to base calculations on as to the life of these metals under service conditions.

As Mr. Hartshorne stated before the American Institute of Mining Engineers, Washington meeting, 1905: "The only way this question can ever be settled, it seems to me, is by the collation of as many examples from actual practice as possible, preferably those in which iron and steel are used side by side under the same conditions."

Fortunately, we have an abundance of evidence based on actual experience which does not leave any doubt in most minds as to which metal is the most durable. For

instance: Where on account of the oil giving out, iron and steel casing was removed from many wells in the same field after seven years' use; and again, when on account of the gas giving out, two parallel pipe lines were taken up, each 25 miles long, the iron pipe after 18 years and the steel pipe after 11 years burial in practically the same soil and with the same kind of gas having passed through both, the condition of these pipes did not require expert micrometer measurements to demonstrate the superior durability of wrought iron.

I do not wish to take up too much room by citing more of these practical demonstrations, but those who desire further information on this subject can procure a pamphlet, "Court of Actual Experience," issued by the Reading Iron Company, Reading, Pa., by simply asking for it. GEO. SCHUHMANN.

READING, PA., February 8, 1908.

The Flohr Addition to Bessemer Basic Charges.

An innovation in the carrying out of a Bessemer basic heat, says *Engineering*, is being brought forward by J. Flohr, steel works manager at Rodingen, Luxembourg. It has been adopted by the Dudelange and the Ougrée-Marihaye works and by the Rheinische Stahlwerke, Duisburg. The Flohr process, it is claimed, does away with the disadvantages attendant upon the use of lime or scrap additions. Lime thickens the slag and retards its power of absorption of phosphoric acid; moreover, a viscous slag retains iron particles readily, thus leading to a loss of metal, and the addition of scrap is conducive to a higher cost for the steel. The process is patented in Europe.

Toward the end of the decarburizing period, or later, he adds to the bath a compound, made preferably in the shape of pressed briquettes, and formed of iron oxides, hammer cinder, or rolling mill scale, with slacked lime as a binding medium. The briquettes have a rapid and intensive effect on the metal bath, and upon their addition an after blow of only a few seconds suffices to complete the operation. An addition of manganese ore to the briquettes proves advantageous in certain conditions, as it increases the liquidity of the slag, and thereby facilitates dephosphoration. The analysis of a suitable cinder or scale is the following:

	Per cent.		Per cent.
Fine granulated iron	1	Ferrous oxide	53.06
Ferric oxide	40.23	Water	6

This is sifted and ground with quicklime. The calcium oxide combines with the water in the scale to form Ca $(OH)_2$ with the development of heat. By the addition of slacked lime to the mixture, the required percentage of hydrate of lime is obtained. On being stored for a short time the compound increases much in temperature and dries. After standing for 3 hr. it shows the following analysis:

	Per cent.		Per cent.
Fine granulated iron	1.1	Water	4.82
Ferric oxide	30.55	CO_2	0.6
Ferrous oxide	47.96		

After standing still longer—about three days—the compound is pulverulent, and the analysis shows:

	Per cent.		Per cent.
Fine granulated iron	1.06	Lime (CaO)	9.89
Ferric oxide	31.40	Water	4.16
Ferrous oxide	44.70	CO_2	0.68

When, after a longer time, the transformation of calcium oxide into hydrate of lime is completed, briquettes are made of the compound, a press being used for this purpose. The specific weight of the briquettes depends upon the pressure exerted, but it has to be high enough to allow them to sink through the layer of slag in the converter, and to come in contact with the metal bath. In the Dudelange Steel Works, it is stated, a pressure of 80 atmospheres is worked to. In order to render the briquettes less fragile they are dried in the open, or, preferably, in an oven. The analysis of the briquettes thus dried shows that the percentage of CO_2—which in the compound amounted to about 0.65 per cent.—has risen to 1.3, thus tending to prove that in the hardening of the briquettes the occurrence is similar to that in the case of ordinary mortar exposed to the action of the atmosphere. As compared with the compound in a loose state, the proportions of ferric and ferrous oxides do not vary to a great extent. The briquettes contain:

Ferric oxide	33.90
Ferrous oxide	[illegible]

The briquettes are thrown into the converter by hand or by a mechanical device when, by inspection of the flame, the charge is deemed to be ready for the addition, and the slag liquid enough to allow them to reach the metal bath. The quantity added depends upon the conditions of working ruling at the time. All steel makers are perfectly aware that very great variations constantly occur in the anaylsis of pig iron used for steel making, and that the charge frequently becomes undesirably hot, which circumstances tend to increase the cost price of the steel, to increase also the waste by burning and the consumption of lime, and to reduce the value of the slag. In some cases it is necessary, in order to keep the price for raw material as low as possible, to work with a comparatively very low grade pig iron, containing probably a high percentage of silicon, the reduction of which in the converter leads to a greatly increased heat of the charge, which is unfavorable to dephosphorization. In such cases the rapid cooling down of the charge by the addition of briquettes is found specially advantageous.

German Pig Iron Production in 1907.

The production of pig iron in Germany and Luxemburg in 1907 was 13,045,760 metric tons, which compares with 12,473,067 tons in 1906 and 10,987,623 tons in 1905. The product was distributed as follows in the past two years:

	1907. Metric tons.	1906. Metric tons.
Foundry pig iron	2,259,116	2,190,084
Bessemer pig iron	471,355	482,740
Basic pig iron	8,494,226	8,097,554
Ferro and spiegel	1,034,050	904,573
Forge pig iron	786,113	854,536

The exports of iron and steel from Germany in 1907 amounted to 3,452,402 tons, as against 3,674,222 tons in 1906. The imports last year were 813,349 tons, against 699,980 tons in 1906. The principal items in the export and import movements in the two years are given below:

	Metric tons. 1907.	Metric tons. 1906.
Imports.		
Pig iron	443,624	409,083
Scrap	164,105	123,345
Plates	34,941	15,456
Bars	74,756	33,531
Tinplates	43,085	38,012
Exports.		
Pig iron	275,170	479,772
Scrap	120,596	136,660
Blooms, billets, &c.	227,332	366,359
Joists, tees and angles	441,032	478,049
Wire	196,581	217,418
Rails	417,694	369,269
Sleepers and fastenings	206,440	165,047
Railroad axles, wheels, &c.	74,788	
Bars	352,243	
Wrought tubes	89,695	71,504
Plates and sheets	268,992	207,246
Galvanized wire, &c.		109,943
Wire nails		67,240

It will be seen that the increase in imports in 1907 was chiefly in pig iron and scrap. Plates had the largest percentage increase. In the export statement pig iron and semifinished steel show a considerable diminution, while finished products increased about 100,000 tons over 1906.

A large concrete dam 50 ft. high, 400 ft. long and containing 24,000 cu. yd. of concrete, has just been completed after four months' work for the La Crosse Water Power Company, Hatfield, Wis. The dam is for a hydro-electric plant of 16,000 hp. capacity, which will distribute current over a radius of 90 miles. J. G. White & Co. are the contractors.

Vanadium in Cast Iron.

An Investigation by the American Foundrymen's Association.

Dr. Richard Moldenke, secretary of the American Foundrymen's Association, has just published in the transactions of the association the results of a series of tests he conducted, to determine to what extent vanadium can be used advantageously in the iron foundry. It is fortunate that the American Foundrymen's Association has a secretary who can conduct such an investigation, and what has been done in the present instance suggests that, with adequate support from the foundry interests of the country, other original work might be prosecuted. We give below practically in full Dr. Moldenke's vanadium report:

By the use of vanadium in steel the elestic limit is increased without an impairment of the ductility of the steel—that is, an exceedingly strong steel is obtained, with its softness still remaining. Coupled with these most valuable properties is another, and that is the extreme resistance to deterioration when the metal is subjected to severe and continued strains in service. Vanadium steel is nonfatiguing, and, therefore, an ideal railroad and rolling mill metal. It is but natural that attention should be drawn to the use of vanadium in the foundry. The very first casting which might be benefited is the car wheel. Next would come the various kinds of rolls, then alkali pots, pump parts, &c.—wherever strains are heavy and oft repeated, either direct tension and compression alternately and in cases where castings are subjected to shock or great variations in temperature.

In order to learn something of the effects of vanadium on cast iron a series of tests was conducted, using melted scrapped car wheels for white iron and a good machinery pig iron for a variety of gray iron. A ferrovanadium carrying high carbon was selected because it melted at a lower temperature and would also be cheaper for the foundryman. Varying proportions were added to the ladle full of molten metal, first in lump form, and, as this did not give satisfaction with the small quantities of iron used at a time, the alloy was powdered before using.

Inasmuch as vanadium, besides being a great strengthener, is also a powerful deoxidizing agent, and the increase in strength obtained by its use might be attributed to the purification of the iron only, a further series of tests was included in which the ladle was first treated with 80 per cent. ferromanganese in sufficient quantity to add 0.5 per cent. of manganese, and then the ferrovanadium. In order to obtain some light on the deoxidizing power of vanadium a set of tests was also made with burnt metal, the results of which are given in the tables below.

Test Bars and Equipment.

The test bars were of the regulation kind, as prescribed by the American Society for Testing Materials—namely, 1¼ in. round, cast on end, and in dried molds. At first the molds were rammed up in the usual way in snap flasks, and the shells arranged to allow setting up and pouring the molds on end. The slightly varying diameters of the bars resulting, however, brought about a better method. Fairly heavy perforated metal sheets were cut to size and riveted up. A bottom was provided in similar manner. A little sand was rammed in the bottom, the pattern placed, rammed up and withdrawn by a spiral upward movement. The molds were then baked and afterward poured. Striking the mold would drop the sand and test bar out, and another mold could then be made. Some 40 of these perforated flasks were rammed up and dried for every run, and things went very smoothly. The cupola was a small one, specially made for the tests, 22 in. inside the lining. The tuyeres were pretty close to the bottom, as but little iron was to be held at a time. A Sturtevant fan supplied the air, power being obtained from a small gasoline engine. The cupola was but 3 ft. high above the spout, and was charged without difficulty. The coke bed was brought to red heat quickly and the iron came out very hot, especially as a high coke ratio is necessary with a small cupola. The test bars, dumped when cold, were only brushed and then broken transversely on a 5000-lb. Riehle testing machine. As there were quite a lot of tests, and many of the bars varied slightly in diameter from the standard, the breaking weights were all recalculated from the modulus of rupture back to the standard 1¼-in. test bar. This, while not correct in its strictest sense, for cast iron is not homogeneous and does not follow the rules applicable to steel, nevertheless gives a fair comparison of the general effects of the alloy addition.

Table I.

Burnt iron, gray (burnt grate bars, stove iron, &c.). No vanadium added.

Number of bar.	Broke at pounds.	Deflection, inches.	Modulus of rupture, pounds per square inch.
1	1,500	0.105	29,410
2	1,380	0.100	27,080
3	1,060	0.070	20,720
4	1,020	0.100	19,020
5	1,600	0.085	31,290
Average	1,310	0.090	25,500
Analysis of No. 2: Si, 2.13; S, 0.094; P, 0.638; Mn., 0.35.			
0.05 per cent. vanadium added (lump).			
6	2,430	0.100	47,550
7	2,200	0.100	43,030
8	2,020	0.100	39,570
Average	2,220	0.100	43,380
Analysis of No. 7: Si, 2.03; S, 0.095; Mn, 0.37.			

Table II.

Burnt iron, white. No vanadium added.

Number of bar.	Broke at pounds.	Deflection, inches.	Modulus of rupture, pounds per square inch.
9	1,400	0.045	27,480
10	1,480	0.050	28,870
11	1,440	0.050	28,170
Average	1,440	0.050	28,170
Analysis of No. 11: Si, 0.41; S, 0.146; P, 0.423; Mn, 0.43.			
0.50 Mn and 0.05 vanadium (lump) added.			
12	1,740	0.060	34,080
13	1,650	0.050	32,300
14	1,940	0.050	38,070
15	1,940	0.050	38,070
16	1,910	0.060	37,380
17	1,680	0.050	32,840
18	1,880	0.050	36,830
19	2,140	0.060	41,780
20	1,910	0.055	37,930
21	1,780	0.065	34,770
22	2,170	0.050	42,470
23	2,160	0.060	42,190
Average	1,910	0.055	37,400
Analysis of No. 16: Mn, 0.65.			

Table III.

Machinery iron, gray. Melted pig iron with no scrap. No vanadium added.

Number of bar.	Broke at pounds.	Deflection, inches.	Modulus of rupture, pounds per square inch.
24	1,980	0.095	38,670
25	2,210	0.100	43,220
26	2,230	0.080	43,550
27	1,660	0.120	32,440
28	1,820	0.140	35,540
Average	1,980	0.105	38,680
Analysis of No. 24: Si, 2.72; S, 0.065; P, 0.668; Mn, 0.54.			
0.05 vanadium (lump) added.			
29	1,970	0.120	38,450
30	2,360	0.110	46,150
31	1,880	0.115	36,850
32	1,960	0.090	38,330
33	2,160	0.090	42,240
Average	2,070	0.105	40,410
0.10 vanadium (lump) added.			
34	2,180	0.120	42,550
35	2,150	0.115	42,080
36	1,730	0.105	33,930
37	1,930	0.110	37,820
38	1,830	0.115	35,810
39	1,990	0.120	38,950
40	1,670	0.135	32,640
41	2,420	0.140	48,380
42	1,900	0.125	37,100
43	2,550	0.100	42,470
44	2,570	0.130	50,250
45	2,280	0.120	44,670
46	2,850	0.110	55,640
47	1,960	0.105	38,250
48	2,050	0.105	40,180

Number of bar.	Broke at pounds.	Deflection, inches.	Modulus of rupture, pounds per square inch.
49	2,320	0.105	49,290
50	2,390	0.100	50,850
51	2,380	0.100	44,670
52	2,250	0.115	43,980
Average	2,200	0.115	42,600
0.15 vanadium (lump) added.			
53	2,800	0.140	54,800
54	2,940	0.115	57,410
55	2,680	0.125	52,330
56	2,560	0.140	50,070
Average	2,740	0.130	53,750
0.50 Mn and no vanadium added.			
57	2,070	0.100	40,400
58	1,910	0.100	37,360
59	1,920	0.100	37,470
Average	1,970	0.100	38,410
0.05 vanadium (ground) added.			
60	1,940	0.100	37,930
61	1,980	0.100	38,760
62	2,110	0.100	41,230
63	1,900	0.095	37,110
64	1,970	0.100	38,470
Average	1,980	0.100	38,700
Analysis of No. 61: Mn, 0.54; V, 0.33.			
0.50 Mn and 0.05 vanadium (ground) added.			
65	2,210	0.110	43,290
66	2,120	0.100	41,500
67	2,110	0.100	41,230
68	2,100	0.100	41,090
Average	2,130	0.100	41,780
Analysis of No. 66: Mn, 0.66; V, 0.25.			
0.10 vanadium (ground) added.			
69	2,240	0.090	43,830
70	2,400	0.095	46,810
71	2,500	0.095	48,770
72	2,410	0.090	47,140
73	2,310	0.090	45,080
Average	2,372	0.090	46,320
Analysis of No. 70: Mn, 0.59; V, 0.36.			
0.50 Mn and 0.10 vanadium (ground) added.			
74	2,440	0.110	47,760
75	2,520	0.120	49,340
76	2,640	0.120	51,670
Average	2,530	0.120	49,590
Analysis of No. 75: Mn, 0.59; V, 0.25.			
0.15 vanadium (ground) added.			
77	2,320	0.100	45,350
78	2,330	0.100	45,490
79	2,250	0.100	43,980
80	2,450	0.100	47,960
81	2,430	0.100	47,550
Average	2,360	0.100	46,070
Analysis of No. 78: Mn, 0.56; V, 0.27.			

Table IV.

Remelted car wheels, white. No pig iron. No vanadium added.

Number of bar.	Broke at pounds.	Deflection, inches.	Modulus of rupture, pounds per square inch.
82	1,420	0.040	27,760
83	1,550	0.050	30,220
84	1,470	0.045	28,720
85	1,710	0.050	33,420
86	1,200	0.050	20,390
Average	1,470	0.050	28,100
Analysis of No. 82: Si, 0.60; S, 0.122; P, 0.399; Mn, 0.38.			
Analysis of No. 85: Si, 0.53; S, 0.138; P, 0.374; Mn, 0.44.			
0.05 vanadium (lump) added.			
87	2,750	0.050	53,750
88	1,880	0.050	36,730
89	2,000	0.050	39,030
90	1,960	0.055	38,340
91	2,350	0.050	39,990
Average	2,190	0.050	41,570
0.10 vanadium (lump) added.			
92	1,980	0.050	38,750
93	2,100	0.050	41,090
94	2,040	0.040	39,850
95	2,170	0.050	42,440
96	2,050	0.050	40,090
97	1,910	0.040	37,350
98	2,080	0.050	40,680
Average	2,050	0.050	39,750
0.15 vanadium (lump) added.			
99	2,100	0.075	41,090
100	2,300	0.050	44,810
101	2,570	0.080	50,300
102	2,360	0.050	46,180
103	2,020	0.055	39,440
104	2,410	0.050	47,140
105	2,130	0.050	23,570
106	2,220	0.060	43,290
Average	2,264	0.060	44,480
0.50 Mn and no vanadium added.			
107	3,060	0.070	59,860
108	2,700	0.070	52,840
109	2,590	0.070	50,560
110	2,810	0.075	55,030
Average	2,790	0.070	54,570
0.05 vanadium (ground) added.			
111	3,030	0.060	59,260
112	3,010	0.065	58,860
113	3,020	0.060	59,070
114	2,950	0.060	57,690
115	3,040	0.065	59,460
116	3,060	0.060	59,850
Average	3,020	0.060	59,030
Analysis of No. 113: Si, 0.45; S, 0.096; P, 0.423; Mn, 0.40; V, 0.36.			
0.50 Mn and 0.05 vanadium (ground) added.			
117	2,980	0.080	58,270
118	2,950	0.080	57,720
119	3,020	0.090	59,090
120	3,090	0.090	60,470
121	2,770	0.075	54,280
122	2,990	0.095	58,410
Average	2,970	0.090	58,040
Analysis of No. 117: Si, 0.66; S, 0.110; P, 0.591; Mn, 1.15; V, 0.25.			
0.10 vanadium (ground) added.			
123	2,870	0.060	56,130
124	2,640	0.050	51,630
125	2,910	0.060	56,910
Average	2,800	0.055	54,890
Analysis of No. 123: Si, 0.45; S, 0.119; P, 0.414; Mn, 0.50; V, 0.31.			
0.50 Mn and 0.10 vanadium (ground) added.			
126	2,950	0.090	57,720
127	3,060	0.100	59,780
128	2,970	0.100	57,990
129	3,130	0.080	61,160
Average	3,030	0.090	59,220
Analysis of No. 128: Si, 0.53; S, 0.084; P, 0.431; Mn, 0.74; V, 0.27.			
0.15 vanadium (ground) added.			
130	3,460	0.075	67,670
131	2,700	0.065	52,800
132	2,570	0.060	50,260
133	3,040	0.070	59,310
134	3,250	0.075	63,560
135	2,700	0.060	52,800
Average	2,950	0.070	59,230
Analysis of No. 133: Si, 0.42; S, 0.112; P, 0.417; Mn, 0.40; V, 0.45.			
0.50 Mn and 0.15 vanadium (ground) added.			
136	4,020	0.090	78,620
137	3,940	0.100	77,050
138	3,960	0.080	77,440
139	3,860	0.080	75,490
140	3,740	0.120	73,070
141	4,000	0.100	78,230
Average	3,920	0.095	76,650
Analysis of No. 137: Si, 0.50; S, 0.081; P, 0.374; Mn, 0.54; V, 0.22.			

Comments on the Results.

The analyses were for the most part [illegible] which the powdered alloy was used, as these tests were most satisfactory. All tests, however, are given as they seem to confirm the belief that the addition to the strength of the metal is a well founded one. The vanadium alloy used contained

Vanadium	14.67
Carbon	[illegible]
Silicon	[illegible]

While the vanadium content is comparatively low, this is a very good alloy for foundry purposes, as cast iron is already high in carbon, and the silicon is too small to cut an appreciable figure in the results. While the attempt was made to get as nearly 0.05, 0.10 and 0.15 vanadium into the ladles of metal as possible, the analyses show that for the bars selected (as nearly the average for strength as possible) as much as two or three times actually remained after casting. This is due first to the impossibility of accurately weighing out in the small space of time available to prevent undue cooling of the metal, most of the time dealing with less metal in the ladle than expected or arranged for. Then, with the small quantities tried,

the chances for irregular distribution were very great. A foundry with 5 or 10 ton ladles would give a better opportunity. Finally there is the uncertainty of how much or little vanadium is oxidized. The very best results with both manganese and vanadium show very little of the latter remaining.

The results, however, are sufficient to strongly recommend the new alloy to the consideration of foundrymen. If but a part of the resistance to deterioration found by adding vanadium to steel should be proven by service trials to exist in cast iron, then on the score of safety to human life alone, the metal belongs in every car wheel. A still better method would be to use a more powerful deoxidizer than manganese and add the vanadium on top of it.

The results shown in the tables speak for themselves, and the averages tallied off for each table show a remarkable progression of values. To increase the breaking strength of a test bar from 2000 up to 2500 for gray iron, and 1500 up to 3900 for white iron is sufficient to warrant further investigation on the part of every foundryman who has special problems in strength to master, and this part of the investigations is therefore given to the foundry public at this time, rather than to wait for the further tests still on the programme. It is expected to continue the investigations on vanadium in cast iron further, making provision to keep the ladle with melted iron heated up for a fairly long period, so that better mixing of the alloy may result, and hence more accurate results can be obtained.

Italian Laborers in the United States.

Italy, Austria-Hungary and the Slavic countries of Eastern Europe are at the present time the principal sources of the unskilled labor supply of the United States, more than two-thirds of all the immigrants now entering the country coming from these countries. Italy contributes about one-fourth and Austria-Hungary and the Slavic countries of Eastern Europe something over two-fifths of our immigrants. The distribution, employment and manner of living of these immigrants, with special reference to their assimilation into American industrial life, is the subject of a study by Frank J. Sheridan in Bulletin 72 of the Bureau of Labor of the Department of Commerce and Labor.

Contracting companies engaged in railroad construction and similar undertakings employ men of various nationalities. The work is usually carried on where there are no accommodations for boarding and lodging the workmen. A boarding camp is as much a necessity for a contracting company as the picks, shovels and machinery for doing the work. A fixed charge is made for the boarding and lodging per week of each man. At the common table the unskilled immigrant laborers of all European nationalities, excepting the Italian, come into close personal contact with their first Americanizing influences. The Swede, Norwegian, Finlander, German and Slav rub elbows for the first time with the American born and foreign born of the English speaking races at the eating tables of the boarding shanty, and there get their knowledge of the common language.

Italian Laborers Live Separately.

In the lumber camps, the coal mines and the railroad camps this getting together, amalgamation and assimilation go on every day. The Italian laborers, however, are not brought into contact with these Americanizing influences, rude as they may be. In all cases the railroad and contracting companies find it necessary to provide separately for the Italian laborers. It is usually made one of the conditions of employment of Italian laborers that a commissary be established at the labor camp for the sale of the articles of food preferred by them, each man eating and cooking in such fashion as may suit him. Unlike other races they do not select a cook from among their number or otherwise to furnish meals at a common table.

The padrone encourages this method on account of the profits he realizes from the sale of the food. Through this system he keeps in touch with his countrymen and can control their movements and employment. When work ceases at one point and with one employer he can transfer them to another and make a profit in the fee for each man. The Italian laborer himself insists upon the commissary system because he can live much cheaper in this way.

Cost of Usual Board and Lodging.

The Slavic and Hungarian laborers, when the work is of a permanent character, prefer to form groups of 20 or 30 men, procure a house or shanty, and live on the co-operative plan. They insist on a much greater variety of food than the Italians, and fresh and salt meats are regarded as essential parts of their bills of fare. Under such an arrangement the cost of supplies and board ranges from $10 to $11 a month. In the absence of opportunity for co-operative living they live at the boarding camps at the same cost as others. Many cases are found where they live, according to the American fashion, and pay $12 a month for board and lodging.

Investigation of the records of a large contracting company engaged on railroad construction and employing many laborers of various nationalities, as well as Italians, shows that the actual cost to the company of groceries, provisions and payment for cooks, waiters, fuel, light, &c., at its boarding camps for a given period was 19 cents a meal, or $3.99 a week for each man. The men were charged $18 a month for board and lodging.

Italian Monthly Expenses.

The Italians at the camps of the company lived mostly on macaroni, sausage, cheese, sardines and bread. Macaroni and bread were the staples, the sausage, sardines and cheese being used very sparingly. The average monthly expense of the Italian laborer was as follows:

25 1½-lb. loaves of bread, at 8 cents	$2.00
30 lb. of macaroni, at 7 cents	2.10
Sausage, sardines and cheese	1.50
Lard	.30
Total for food	$5.90

Most of the Italians, in addition to the above, spent an average of $3 per month for beer, cheap cigars or tobacco, which, with the expense of $1 per month for shanty rent, brings the total cost of living per man to $9.90 per month.

An examination of the records of three railroad systems in New York, Pennsylvania and New Jersey for 1905 and 1906 gives accurate record of the earnings and the total cost of living of large numbers of Italian laborers employed on these railroads and living under the usual commissary system. The average earnings per man for a representative month in 1906 for 89 gangs, numbering 1530 men, were $37.07. The cost of all food was $5.30 and of rent of shanty and sundries $1.49, or a total of $6.79, leaving a surplus of $30.28.

The Italian laborers are said to save more money at the same wage rate than any other class of European laborers in the United States. The thrift of the Italian is indicated by his method of living. The amount of his savings is indicated to some extent by the money orders sent from this country to Italy. The total amount of money orders sent in 1906 to all countries was $62,435,343, and of this $36,798,562, or 58.9 per cent., went to Italy and the Slavic countries. The total amount of these money orders sent to Italy was $16,239,134, while the amount sent to Austria-Hungary and Russia was $20,559,428, the number of natives of those countries in the United States being about double those from Italy.

A horizontal tubular boiler in the Kern River Oil Field, Cal., exploded October 19, 1907, and made a remarkable flight of 1220 ft. In so doing it cleared the top of a derrick 74 ft. high. The boiler was of 70-hp. size, and weighed about 5 tons. As usual the fireman insisted that the gauge showed plenty of water in the boiler, and the cause of the explosion seems to be inexplicable.

Asbestos in the form of waterproof slates is reported to have been placed on the market by a Munich manufacturer. In building construction it obviates the use of wooden laths, and it makes an excellent electric insulator.

PERSONAL.

Robert Wuest, commissioner of the National Metal Trades' Association, has returned from a three months' trip abroad.

H. H. Stambaugh, secretary of the Brier Hill Iron & Coal Company, Youngstown, Ohio, sailed last week for a three months' absence in Europe.

Charles M. Schwab, chairman of the Bethlehem Steel Corporation, and Archibald Johnston, president of the Bethlehem Steel Company, sailed for Europe Saturday.

John S. Hawkridge of Hawkridge Brothers, Boston, proprietors of Hawk brand steel, and sole New England agents for the Halcomb Steel Company, Syracuse, N. Y., and J. J. Dean of Cape Ann Tool Company, Pigeon Cove, Mass., accompanied by their families, have started on a two months' sojourn in California.

Axel Sahlin of Julian Kennedy, Sahlin & Co., Ltd., London, England, recently sailed for India, in connection with construction work on the proposed plant of the Tata Iron & Steel Company, Ltd., for which the above firm has been appointed consulting engineer.

James T. Hayden, for over 22 years superintendent of the Crane Company's brass department, Chicago, Ill., has retired from that position, but remains with the company in another capacity. Previous to going with the Crane Company Mr. Hayden had been employed 14 years in his first position, in charge of brass foundry operations.

The Monarch Emery & Corundum Wheel Company, Camden, N. J., announces that it has appointed Charles A. Bacmeister its Western representative, with headquarters in Chicago. He has had extensive experience in the grinding wheel field.

S. A. Williams, Jr., who has been sales and traffic manager of the Atlas Car & Mfg. Company and the Atlas Bolt & Screw Company, Cleveland, Ohio, has been placed in charge of the Chicago office of the two companies as sales manager. He will look after the interests of the two companies in Chicago and the Northwest. His office is 905 Plymouth Building, Chicago.

Ralph P. Zint, formerly assistant general manager of sales for the Republic Iron & Steel Company at Pittsburgh, has been installed as manager of sales at Chicago, succeeding J. E. Hubbert, who has been transferred to a similar position in the company's St. Louis office.

Joseph B. Sessions, son of William E. Sessions, president of the Sessions Foundry Company, Bristol, Conn., who has been assistant secretary of the company, has been elected vice-president. Arthur F. Woodford, for many years superintendent of the bench work, or small castings department, has been elected secretary, to take effect March 1. The present secretary, George M. Eggleston, who has held the office for 10 years, will retire from active business March 1, and will spend much of his time the next few years in travel.

The Andrews Steel Company.—The new plant of the Andrews Steel Company, Newport, Ky., will manufacture acid and basic open hearth steel ingots, blooms, billets, slabs, sheet and tin bars and forging billets. A large portion of the output will be consumed by the Newport Rolling Mill Company, which is owned by the same interests. Some of the daily papers erroneously reported the Newport Rolling Mill Company to have suffered by fire last week. Charles H. Sloan of Vandegrift, Pa., has been made general superintendent of the Andrews steel plant, and is now on the ground to assist in the work of preparation for starting the new mills on or about April 15. He was formerly district manager of the American Sheet & Tin Plate Company's operations in the Kiskiminetas Valley, which includes plants at Leechburg, Hyde Park, Saltsburg and Vandegrift, the last named containing 11 open hearth furnaces and 39 sheet mills. Mr. Sloan continues in the same class of work with which he has been identified for the past 15 years.

The American Can Company's Report.

The net earnings of the American Can Company for the year ending December 31, 1907, were printed in *The Iron Age* of last week on page 460. President W. T. Graham's report to the stockholders is as follows:

"While the earnings for the year are the largest ever made they are not as much as the business promised prior to the financial troubles of last fall and the partial paralysis of business that followed. Sales in November and December fell off heavily, as compared with previous months of the year and the same months in former years, and a heavy loss was occasioned by depreciation in inventory value of materials. Before determining net earnings—$3,246,827.55, as stated—$395,658.55 was written down from cost on tin plates, metals, other materials and products, and questionable accounts aggregating $113,926.43 were charged to profit and loss, so that inventory and receivables, as stated, are as clean assets as rigid scrutiny can make them.

"There has been expended during the year in the completion of new factories at New Orleans, Savannah and New Castle, rebuilding those destroyed by fire at San Francisco and St. Paul and in enlarging the capacity of others, $956,926.63, but due to the sale of unused properties for $128,909.75 and a liberal write off for depreciation, investment in fixed property—namely, plants, real estate and new construction and improvements—has only increased by $147,929.68, a small sum, as compared with increase in manufacturing facilities and the advantage of distribution from three new locations. After paying dividends for the year and for extensions as stated, $552,477.19 has been added to working capital from profits.

"The products of the company are widely distributed and of a character that do not enjoy extraordinary activity in boom periods or suffer the reverse in times of depression, and, notwithstanding the fact that sales for November and December fell off, and were not up to normal in January, 1908, due to the financial situation, there is evidence of improvement, and it is reasonable to look for a fair business in 1908, without regard to the prospects in other lines of manufacture."

The balance sheet, as of December 31, 1907, is as follows:

Assets.

Plants, real estate, patents, &c.	$73,965,162.25
New construction and improvements	7,096,458.54
Other investment items	1,523,518.63
Cash	967,193.22
Accounts and bills receivable	2,122,207.36
Materials and products inventory	4,764,872.28
Total	$88,439,412.38

Liabilities.

Capital stock	$82,466,600.00
Preferred	$41,233,300
Common	41,233,300
Bills and accounts payable	637,772.58
Dividend payable January 2, 1908	515,416.25
Contingent funds	[illegible]
Surplus	[illegible]
Total	[illegible]

The Japanese International Exposition.—Aoyama, one of the highest and most beautiful parts of Tokio, has been chosen as the site for the Grand Exhibition of Japan, to be held from April 1 to October 30, 1912. The exhibition grounds will cover a total area of about 290 acres. A road about 480 ft. in width will be built, connecting the Aoyama parade ground and the imperial property, near by. Thus far a number of nations have sent their approval of the exhibition to the Japanese Government. The exhibition is to be held, not for the purpose of commemorating any historical event, but to show to the world the development and progress of Japan. The government has planned to spend $5,000,000 from the national treasury, and it is expected that the various provinces and municipalities will appropriate $5,000,000 more to the exhibition. The city of Tokio will contribute $2,500,000 as its share.

New Pennsylvania Railroad Specifications for Rails.

In connection with the placing of orders for 55,000 tons of rails in the past week for delivery in 1908, the Pennsylvania Railroad Company issued a statement referring to some of the features of its new specifications. One of these to which the company's statement does not refer is the requirement of a drop test of a piece of rail from 4 to 6 ft. long, one such test being made from each blow of Bessemer steel. The steel manufacturers' latest specifications for Bessemer rails provide that "one drop may be made on a piece of rail not less than 4 ft. and not more than 6 ft. long, selected from each blow of steel." The steel manufacturers' specification differs also in providing for alternative tests, in case a rail breaks under the drop test, and for the acceptance of all the rails from the blow, in case two other rails from the same blow as the original rail stand the drop test. The principal departure in the new Pennsylvania Railroad specification is the new section, which in general differs from the American Society of Civil Engineers' sections in having a thicker web and in providing for practically the same amount of metal in the flange as in the head. Further the question of discard is treated broadly, in line with the position of the Pennsylvania experts that the manufacturers' practice is not so great a concern as that he produce sound rails. The statement of the railroad company is as follows:

The Pennsylvania Railroad Company to-day (February 6) placed definite orders with steel manufacturers for 55,000 tons of rails to be delivered during 1908. These, in addition to 30,000 tons left over from 1907, will give the company 85,000 tons for use this year. These rails will be rolled under entirely new specifications. In view of the increasing severity of road service and the recognized necessity for developing an improved steel rail, the Pennsylvania Railroad has been conducting for some months an exhaustive examination of the entire art and practice of rail manufacture. A committee of experts, representing not only the railroad but two of the important steel manufacturers, was appointed by the Pennsylvania System last summer to make a special study of the subject. The experiments undertaken were probably unprecedented in their completeness and in the importance of the scientific data which they supplied. The new rail sections are believed to be a distinct improvement upon those hitherto in use on the Pennsylvania System.

Most important of the features of the new specifications is placing more upon the manufacturer the responsibility for the character of the rail produced. The company recognizes that it is merely a purchaser, not a manufacturer. Considerable latitude is, therefore, to be allowed in the methods of manufacture utilized, so long as the result is a sound rail. The company has devised tests of a character so exacting that it is made very much to the interest of the manufacturers to discard all material of the soundness of which there is any doubt.

No specification, for example, is made as to the amount which shall be sheared from the end of the bloom formed from the top of the ingot. The problem of a proper discard has been discussed very freely by the different societies which have been considering rail specifications. Various percentages have been proposed, a discard of 25 per cent. having the greatest number of advocates. The Pennsylvania Railroad feels, however, that in the present state of the art, at any rate, the responsibility for a proper discard should be left with the manufacturer.

The new specifications also provide that rails shall be free from "injurious" mechanical defects and flaws. This differs from the old specifications in that no attempt has been made to describe the particular defects or flaws that will cause the rejection of rails. It is not considered wise to attempt to classify in the specifications the relative importance of defects, but it is specified that no rails will be accepted that contain defects or flaws which in any way impair their strength.

The methods to be used in testing the new rails are very elaborate and comprehensive. To still further strengthen the practice of the company and to insure that whatever future changes are made shall be based upon accurate data, a system has been devised whereby the history of all rails purchased by the company shall be fully recorded. In order that for this purpose it may be possible to identify the part of the ingot from which particular rails were made, the new specifications require, in addition to the usual marking, that a letter shall be stamped on each rail to indicate its position in the ingot. To compile and consider the company's experience with rails, a special committee is to keep continually in thorough touch with the art, and is expected to supply the company with data that will enable it to secure the best rails which, at the time of any order, it is possible to manufacture.

In placing its orders, the Pennsylvania Railroad invites the steel manufacturers to undertake to fill part of the allotment with rails made by the open hearth process. It is desired to ascertain more clearly the actual differences in service as between the open hearth and the Bessemer product.

OBITUARY.

WILLIAM J. SEATON, JR., second vice-president of the C. W. Hunt Company, West New Brighton, New York, died at his home at Clifton, Staten Island, January 18 from typhoid fever at the early age of 36 years. Seventeen years ago he entered the employ of the C. W. Hunt Company as office boy, but his exceptional abilities soon gained for him the recognition they deserved, and promotion followed as a matter of course, so that at the time of his death he had risen to be an important officer. His name was associated with many of the large contracts carried out by the company in recent years.

CYRUS A. TAFT, Whitinsville, Mass., for many years head of the Whitins Machine Works, manufacturer of textile machinery, died February 6. He was the son of Gustavus Taft, who was head of the Whitin Machine Works before him, and after graduating at Amherst College entered the employ of the company and rapidly advanced until he became the controlling factor.

OBRIN S. WERNTZ, treasurer of the National-Acme Mfg. Company, Cleveland, Ohio, since its organization, died February 6, aged 32 years. He was born in Canal Fulton, Ohio, removed to Cleveland early in life, and his first position was with the National Screw & Tack Company, remaining until the organization of the National-Acme Mfg. Company. He was only ill for about one month, having been last at the office on January 4. He leaves a widow and a young son.

ALBERT FRANKLIN KNIGHT, Providence, R. I., manager of the Providence Machinery Exchange, died February 4, aged 54 years. He was a native of East Greenwich, R. I. He was prominent in the cotton manufacturing business until eight years ago, when the Machinery Exchange was organized, and he became its manager. He leaves a widow, a son and two daughters.

ALVIN C. SEYMOUR, Warren, R. I., an inventor, who had been connected with the management of machinery manufacturing plants, died February 3, aged 59 years. He was born in Barrington, R. I., and learned the trade of blacksmith, and for 20 years conducted a carriage building and machine forging business at Fall River, Mass. He became manager of the Chace Elevator Works, Warren, and subsequently was with the Providence Steam Engine Company, Providence, and with the American Cable Way Company, Fall River. He leaves a widow and one son.

A new coal field is being opened up near the coast of California, between San Francisco and Los Angeles, which is expected to have an important effect on the fuel supply conditions in that State. Unlike most beds in the State, which are lignitic in character, this one is an 18-ft. seam of semibituminous coal. It is expected that several hundred tons of coal per day will soon be produced by these mines, and about 1½ miles of gangways have been opened up.

The Lake Ore Movement in 1908.

A Marked Reduction from Last Year.

DULUTH, MINN., February 8.—While no schedules of intended ore shipments for the coming season have been made out by mining companies or railroads, there is every reason now to anticipate a decrease of not far from 20 to 25 per cent. from 1907. Some independent shippers are cutting down 50 per cent. and the Steel Corporation will move at least 15 per cent. less. Vessel men are not looking for a large movement down the lakes before the middle of June, and fully expect labor troubles in the spring. Matters in this connection are now under discussion and may be settled during the coming week. With less ore to be moved than last year, more shipping in which to transport it, and a fairly long season, there will be a tendency toward lower rates that will be hard to overcome, and vessel men will be forced to curtail costs, the main item of which is wages.

Active Winter Stripping at Mesaba Mines.

A great deal of winter development in surface mines is being carried on along the Mesaba Range, especially at the centers of Virginia, Eveleth, Hibbing and Coleraine. At Virginia the Oliver Iron Mining Company has a large tonnage in the Norman mine, the lease of which expires in a very few years. The fee owners have been unwilling to renew it at any terms the company cares to accept. There are some 6,000,000 tons of ore in the deposit, which must be taken off at the rate of about 2,000,000 tons a year, and this will make the Virginia group one of the chief centers of Mesaba activity the coming year. The Republic Iron & Steel Company will strip some of its small underground properties at Virginia, notably the Union. This mine was opened as an underground proposition, though there is but 40 ft. of surface over the ore. This company's old Franklin mine, adjoining, is well worked out, but some ore has been found in the bottom of the old mine and more may be. The Commodore, also an old underground mine, finally stripped for larger and more economical operations, mined the past year nearly 500,000 tons, its best record, but the changed conditions will affect the amount materially this year. In the Hibbing District stripping at the Sellers and adjacent properties continues on an elaborate scale. The work of stripping proceeds at Coleraine also, with the utmost vigor, and the amount of earth moved monthly is astonishing. At Eveleth work is running less rapidly, and is about over till spring. Many stripping jobs have been stopped on account of cold weather.

Moving Rivers Over Mines.

At the Loretto mine, where the channel of the Sturgeon River is being changed to permit the mining of ore up to the river bed, the mining inspector has ordered all mine operations stopped till the river is removed, in fear of another Mansfield disaster, where the river above broke into the mine and drowned the men like rats in a trap. At the Loretto, at the time of a recent inspection of underground workings, the levels had caved from the sixth up to the second, the latter being but 120 ft. from the bed of the river, while the character of much of the ground hanging between the cave and the river bed was unknown. The work of changing the course of the river will take six months or more. Another river to be moved is the Michigamme, at the new mining town of Gwinn, where the Cleveland-Cliffs Iron Company is opening its Smith and other mines. A concrete shaft has been sunk by the Foundation Company of New York through quicksands and the river silt, but it has been decided that to make mining reasonably economical it will be advisable to shift the river.

A Noteworthy Steel Lined Shaft.

At Ludington C, the new vertical steel lined shaft of the Chapin mine, Menominee range, the Oliver Iron Mining Company is installing a very fine hoist, a first motion duplex reversing Corliss of exceedingly heavy construction. The cylinder is 34 x 72 in. and runs [illegible] rev. per min. The drum is 12 ft. in diameter and 10-ft. face, giving a winding speed of 1800 ft. per minute. The depth of the shaft is 1522 ft. Skips will have capacity for 7 tons of load, and each will weigh, empty, 1 ton. The cable will be round wire 1.38 in. in diameter. The old hoist will be utilized at the Norris mine, Ironwood, Mich. This C shaft is one of the finest in the lake region. It is four-compartment, measuring 10.4 x 21.3 ft., with two-skip compartments, each 5 x 6 ft.; one pump compartment 10.4 x 11.1 ft., and one cageway 5 x 10.4 ft. The pump compartment was designed to contain a large Cornish pump ladderway, pipes and counterweight. The shaft is especially interesting as showing the application of steel lining to large compartments. It will be noted that the dividing members of two of the compartments are over 10 ft. long, requiring material of much greater weight than if they were only 5 or 6 ft. long. For the long timbers 6-in. 12.25-lb. I-beams are used throughout. In the construction of this shaft it was necessary, on account of the size of the plates, to handle the sets in halves, which were connected underground. This shaft has been three years in construction, and should be handling ore in large quantity the coming season.

The Chicago & Northwestern road is tearing down and replacing its old ore dock at Ashland, intending to have a higher and more commodious structure. The new dock will be 70 ft. high from water line to deck, 50 ft. wide and of about 42,000 tons storage capacity. Timbers taken from it will be saved and used in the construction of a coal handling pier alongside. The steel ore dock of the Duluth & Iron Range road at its Lake Superior terminal is proceeding steadily, and will be ready in ample time for the needs of the road.

W. G. La Rue of Duluth has been working since last summer in the district lying between Republic, on the Marquette range, and the Crystal Falls section of the Menominee. This is in the Michigamme Valley, some 10 or 12 miles north of Crystal Falls. It is understood that ore has been cut at shallow depths. On account of a generally heavy drift overburden the region has been left unprospected until now.

Work on the Menominee Range.

Corrigan, McKinney & Co. are pushing exploration in the district around Crystal Falls, and have three drills working in that stretch of territory running from the Tobin to the Kimball mines. Some ore has been found at a considerable depth, and the results have been encouraging for further exploration. This company will drill lands owned by the Donovan estate, near Crystal Falls. Indeed there is a very active time in the Menominee sections, and many options have recently been taken and many drill operations are planned, in addition to those now under way. Near Iron River the Verona Iron Company is sinking a shaft on ground drilled in the past 18 months and will go to 200 ft. before drifting. The Florence Iron Company has taken lands just northeast of Iron River, and both these properties look as though they might make mines. The Huron Mining Company, which is exploring near the old Armenia mine, has found ore and will develop it. This ore was found in a drift about 40 ft. below the bottom of the old shaft.

A New Option on Section 30.

Another chapter has been started in the history of the famous Section 30-63-11, on the Vermillion Range. Some months ago the Shagawa Iron Company, holding an option for lease from the fee owners, dropped its work and abandoned the property, but negotiations for a renewal of the option at more moderate terms have now been concluded, and the company will resume exploration soon. The new option prolongs exploration by two years, drops all demands for a large cash bonus to be paid for the lease, and reduces the required output to a maximum of 300,000 tons, after a term of years. The royalty is now made 75 cents a ton. It is stated that ample ore is proved and ready for mining to maintain a considerable output for some years. So far in the exploration of this property, the work being confined to one 40-acre tract, all parties must have spent about $250,000, in addition to $1,000,000 or more for litigation and similar expenses.

D. E. W.

NEWS OF THE WORKS.

Iron and Steel.

At a recent meeting of stockholders of the Standard Gauge Steel Company, Beaver Falls, Pa., manufacturer of finished steel specialties, the following directors were elected: John Beavan, H. F. Dinger, J. W. Forbes, Alexander Gilliland, William Moltrup, Stephen Moltrup, Abram Rasner and J. M. Reed. The directors organized by electing the following officers: A. Rasner, president; Stephen Moltrup, vice-president and manager; H. F. Dinger, treasurer; J. A. B. Patterson, secretary; William Moltrup, assistant secretary.

The Northumberland Iron & Nail Works, Northumberland, Pa., has not yet completed plans for making repairs to the part of its plant which was wrecked by an explosion of a boiler. The building covering the furnaces was blown down and three furnaces were more or less damaged, but practically no machinery was destroyed.

The Helcomb Steel Company, Syracuse, N. Y., has increased its capital stock from $1,500,000 to $1,750,000.

Furnace A of the Wisconsin Steel Company, South Chicago, Ill., was banked from January 2 to January 19. It was blown out last week.

General Machinery.

The Livingston Manor Machine Works, Livingston Manor, N. Y., will erect a building 20 x 30 ft. for general repair work. A specialty will be made of automobile repairs, and in addition a small line of supplies will be carried. W. D. Wakeman is manager.

The Second-Hand Electric Machinery Company, Kansas City, Mo., has been incorporated with a capital stock of $10,000 to buy, sell and rent generators, motors, lamps, transformers, meters, switchboards, &c. The incorporators are E. R. Royer, R. B. Coleman and G. B. Wandling.

The Parker Machine Company, Buffalo, N. Y., has increased its capital stock from $400,000 to $450,000.

Foundries.

Press reports that the plant of the Duquesne Steel Foundry Company at Kendall Station, near Pittsburgh, had resumed operations with a large amount of work ahead are untrue. This plant is closed down at present, but was recently in operation for a short time working off an accumulation of orders. Under normal conditions the company employs about 500 men.

The Price-Evans Foundry Company, Chattanooga, Tenn., architectural iron works and specialties, contemplates building an addition to its main foundry, 60 x 110 ft. The addition, which is contingent on the closing of a street at the end of the company's property, will be of steel and brick construction, and will necessitate the expenditure of about $4000.

The Dimmick Pipe Company, Birmingham, Ala., has suspended operation for necessary repairs to the casting pits. It is reported that this work will be completed during the coming week and operation resumed in all departments.

The Decatur Car Wheel Company of Birmingham, Ala., has resumed operations after a short suspension for repairs to equipment.

Power Plant Equipment.

The Borough of Park Ridge, N. J., will receive bids until February 17 for improving the electric light plant, including the installation of a 30-kw. gasoline driven direct connected unit.

The Board of Public Works of Oakland, Cal., will receive bids until March 18 for the construction of a salt water pumping plant.

At a recent meeting the citizens of Kewaunee, Wis., voted to establish a municipal electric light plant, and a committee has been appointed to investigate the cost of constructing a plant. Thos. Konop is secretary of the Lighting Committee.

The New York Trust Company, New York, will act as trustee and transfer agent for a new issue of $200,000 of bonds recently authorized by the Boise Gas Light Company, Ltd., Boise, Idaho. These bonds will be used to retire old bonds that were never issued, and the remainder of the proceeds will be used for the extension, improvement and re-equipment of the plant.

Fires.

The ore separator of the Delaware & Hudson Company at Lyon Mountain, N. Y., which supplies Standish Furnace with iron ore concentrates, was badly damaged by fire February 7.

The repair shops of the Baltimore & Ohio Railroad, Mount Clare, Baltimore, Md., were damaged $25,000 by fire January 31.

The machine shops of the South & Western Railroad at Johnson City, Tenn., were destroyed by fire February 3, the loss being about $30,000.

The plant of the Licking Rolling Mill Company, Covington, Ky., was destroyed by fire February 5, the loss being about $100,000.

The plant of the Ontario Powder Works, Tweed, Ont., was destroyed by an explosion February 4.

The plant of the Industrial Machine Company, Cleveland, Ohio, was destroyed by a fire that swept through the block occupied by the company, February 6. Some of the machinery may not be a total loss.

The plant of the Wholley Boiler Works, Pawtucket, R. I., was burned February 5, with a loss of $40,000.

Hardware.

The Leader Fence Machine Company, St. Charles, Ill., having been purchased by H. L. Fahrney and J. H. Keith, has been reorganized and incorporated under the name of the Leader Fence Company.

The capital stock of the North Dakota Metal Culvert Company, Fargo, N. D., has been increased from $50,000 to $100,000.

Miscellaneous.

The Printers' Type Foundry, Louisville, Ky., has been incorporated with a capital stock of $5000 to deal in printers and binders' machinery and supplies. The officers are Robert N. Krieger, president; Herman J. Wanner, secretary and treasurer.

The municipal government of the city of Evansville, Ind., has approved a proposition for the construction of a filtration plant, bids upon which will probably be asked about the middle of March or the first of April. The expenditure contemplated for this improvement will be about $200,000. J. W. Peck is superintendent of the Water Works Department.

The business of the bankrupt Racine Babcock Fire Extinguisher Company, Racine, Wis., has been acquired by George L. Buck, and will be continued in connection with the Racine Iron & Wire Works Company, with which it is incorporated.

Other Years of Declining Pig Iron Production.

In the pig iron market review for the past week sent out from the Philadelphia office of Rogers, Brown & Co. occurs the following reference to the records of off years in pig iron production—that is, the exceptional years in which less pig iron was made than in the immediately preceding years respectively.

It is interesting to look over the figures and note what may be expected if we are to rely upon precedent. In the past 35 years there have been only nine calendar years in which production of pig iron in the United States was less than in the year before, as follows:

In 1875 production was 84 per cent. of that of the previous year.
In 1876 production was 92 per cent. of that of the previous year.
In 1884 production was 83 per cent. of that of the previous year.
In 1885 production was 99 per cent. of that of the previous year.
In 1891 production was 90 per cent. of that of the previous year.
In 1893 production was 77 per cent. of that of the previous year.
In 1894 production was 93 per cent. of that of the previous year.
In 1896 production was 91 per cent. of that of the previous year.
In 1904 production was 92 per cent. of that of the previous year.

The year 1893 shows the greatest shrinkage over its predecessor, and yet its production was 77 per cent. of the output of 1892. In the nine years of decreased production taken together the production averaged 89 per cent. of that for the previous year. The production of 1907 was 25,781,361 tons. If 1908 shows a shrinkage similar to that of 1893 the output should be 19,851,648 tons. If this year follows the average of decline of the nine other years of shrinkage the production should be 22,945,411 tons. The country at large is presumed to be in vastly better financial condition than in 1893, and the use of the average figure would seem to be justified.

The British Iron Market.—Reports at the end of January indicated a slight sentimental improvement in the British iron trade, though the quietness of the market contrasted sharply with the buoyancy and activity prevailing in the first month of 1907. Cleveland pig iron warrants sold as low as 47s. 6d. in the last week of January this year, while Cleveland No. 3 iron sold by makers brought close to 48 shillings. The hematite pig iron market continues depressed, and there is little prospect of early betterment. Stocks of Cleveland pig iron in public stores on January 30 were 100,138 tons, as compared with 512,200 tons at the end of January, 1907. In the finished material market the prospect of a strike at shipyards has been an unfavorable influence. Rails are in a somewhat better demand than other classes of products. In general makers are disposed to maintain prices at the reduced figures reached earlier in the year for angles, plates and bars.

Trade Publications.

Special Goods. William A. Locke, 100 William street, New York City. Pamphlet. Devoted to special goods and small machine parts of brass, copper, steel or iron. All work being special, no catalogue is issued, but a tab-indexed card is inclosed bearing the name William A. Locke and its index guide, "Special Goods."

Valves. Jenkins Bros., 71 John street, New York City. Pamphlet. Relates to extra heavy valves for pressures from 150 to 300 lb., and gives illustrations of brass globe, angle, check and Y or blow-off valves, and iron body globe and angle valves, together with prices and dimensions.

Hand Shapers. Burke Machinery Company, Cleveland, Ohio. Circulars. One for insertion in binder deals with the Maltener hand shaper and two-spindle miller, which was described and illustrated in *The Iron Age*, August 1, 1907, and the other shows a surface grinder, a pump and a Baker-Resek saw, patterns and castings for the manufacture of which are for sale by the company.

Suction Gas Producers.—Wile Power Gas Company, Rochester, N. Y. Catalogue A, section 3. Describes and illustrates the company's types A and B suction gas producers, their operation and construction, characteristics, the fuels used, and their parts. The type A producers are made in 35 to 150 hp. sizes, and the type B in 200 to 500 hp. sizes.

Punches. Geo. F. Marchant, Lake and Elizabeth streets, Chicago, Ill. Leaflet. Entitled "A Sermon on Punches." States the merits of New Process punches and gives a list of a few concerns using them.

Electrical Equipment.—Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. Circulars for insertion in binder, as follows: No. 1017 (revised edition), alternating current potential regulators; No. 1059, electric motor vehicle equipments; No. 1084, Westinghouse series alternating arc light system; No. 1099 (revised edition), type R direct current motors for constant speed service; No. 1102-A, direct current multiple arc lamps for 110 and 220 volts; No. 1110 (revised edition), Westinghouse catenary line construction; No. 1122, standard three-point railroad diverter; No. 1124 (revised edition), No. 121-A railroad motors for direct current service; No. 1128 (revised edition), small power motors for alternating and direct current circuits; No. 1130 (revised edition), electrostatic voltmeters; No. 1140, small generating sets, type S-B generators and Acme engines; No. 1141, small direct current generating sets, A B C engines and type S generators; No 1142, machine tool controllers for direct current single-voltage circuits; No. 1143, regulating and reversing controllers for direct current motors in crane, hoisting and similar service; No. 1144, direct current mill motors; No. 1145, Westinghouse metallic flame arc lamp; No. 1146, type E electrolytic lightning arresters, and No. 1148, Cooper-Hewitt mercury rectifiers.

Electric Motors.—B. F. Sturtevant Company, Hyde Park, Mass. Two bulletins. No. 144 gives an illustrated description and dimension tables of eight-pole type electric motors, and No. 147 deals similarly with electric motors of bi-polar and four-pole types.

Ammonia Fittings and Supplies.—York Mfg. Company, York, Pa. Second edition, fitting catalogue. Size 6 x 9 in.; pages 128. Devoted to the company's line of ice-making and refrigerating supplies, of which illustrations, specifications and dimension tables are given. The products listed include globe, angle, tee, expansion and check valves, ammonia tees, crosses, elbows, flanges, couplings, unions, return bends, expansion joints, headers, freezing tanks, special fittings, condensers, brine coolers, receivers, oil separators, hoists, cans and can fillers, agitators, air compressors, engines, boilers, &c. Some 14 pages of tables and special information and a complete index are appended.

Hammers and Engines.—Parker Hoist & Machine Company, 971 North Francisco avenue, Chicago, Ill. Pamphlet. Pertains mainly to Harthorn helve hammers, which are made in four types, A, B, C and D, these having 25, 40, 60 and 80 lb. hammers. The company's gasoline engine is also illustrated, and the advantages claimed for it are enumerated.

Thermit.—Goldschmidt Thermit Company, 90 West street, New York City. Pamphlet. Describes various applications of Thermit in foundry practice, and states that the chief value of it in such work consists in the fact that the high heat of 5400 degrees F. can be applied anywhere and without apparatus of any kind, to increase the temperature of iron and steel and facilitate the introduction of other refractory metals which it is desired to alloy with the metal for special purposes.

High Pressure Blowers. B. F. Sturtevant Company, Hyde Park, Mass. Bulletin No. 152. Contains an illustrated description of the single impeller blower, which is claimed to be the only blower of this type without internal contact. Sectional diagrams are used to make clear the explanation given of the operation. The company is also distributing with its compliments its February issue of the Sturtevant daily cupola record, which it will be glad to send to foundries desiring copies for preserving a monthly record of the performance of their cupolas.

Iron and Industrial Stocks.

NEW YORK, February 11, 1908.

The depressing influence of the President's message was felt with even greater effect in the past week, especially after the belief became general that it had chilled many indications of gradually returning confidence in business circles. Prices drooped steadily, and on Monday of this week stocks were poured out in considerable volume, causing prices to recede quite materially. The range of prices on active industrial stocks from Thursday of last week to Monday of the present week was as follows: United States Steel common 26½ to 28, preferred 89⅛ to 91½; Car & Foundry common 26⅞ to 28⅝; Locomotive common 32½ to 36, ex-dividend, preferred 87½ to 88½; Steel Foundries common 5 to 5½, preferred 29 to 30½; Cambria Steel 27⅜ to 28; Colorado Fuel 16⅞ to 18⅛; Crucible Steel 4¾ to 5¼, preferred 35⅝ to 37; Pressed Steel common 17¼ to 20, preferred 69⅞ to 75; Railway Spring common 23¾ to 24⅞; Republic common 15 to 16¼, preferred 67 to 68; Sloss-Sheffield common 37 to 38¼; Cast Iron Pipe common 19 to 20, preferred 64 to 68½; Can common 4¼ to 4⅜, preferred 49 to 49½. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 27⅜, preferred 90½; Car & Foundry common 27, preferred 86½; Locomotive common 32¾, preferred 87½; Colorado Fuel 16½; Pressed Steel common 18, preferred 70; Railway Spring common 23¾; Republic common 15, preferred 67; Sloss-Sheffield common 37; Cast Iron Pipe common 19, preferred 63½; Can common 4¼, preferred 46¾.

The special meeting of the stockholders of the American Steel Foundries, called for February 8, was adjourned until March 14, in compliance with the temporary injunction granted by Vice Chancellor Howell of New Jersey. The order granted by the Vice Chancellor requires the Steel Foundries to show cause why the proposed refinancing plan should not be enjoined. Suit was brought by a holder of preferred stock. E. H. Gary, chairman of the United States Steel Corporation, who is a heavy holder of preferred and common stock of the company, presided. In a short speech he said that the complainants in the court proceedings misunderstood the refinancing plan. A circular giving further information would be sent to every stockholder in a few days. The complainants, he added, appeared to be under the misapprehension that the directors were more interested in the preferred than in the common stock, but the contrary was true.

Dividends.—The Niles-Bement-Pond Company has declared a semiannual dividend of 3 per cent. on the common stock, payable 1½ per cent. March 20 and 1½ per cent. June 20; also the regular quarterly dividend of 1½ per cent. on the preferred stock, payable February.

The Pratt & Whitney Company has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable February 15.

The Keystone Driller Company, Beaver Falls, Pa., has declared a dividend of 10 per cent.

National Metallurgic Company Receivership.—At Pittsburgh, February 8, in United States District Court, Charles D. Thompson, Montclair, N. J., and Frank A. Berthold, New York, were appointed ancillary receivers in the Western District of Pennsylvania for the National Metallurgic Company, a New Jersey corporation, with New York offices at 43 Exchange place. The company has an uncompleted plant at Aspinwall, near Pittsburgh, for the conversion of fine iron ores and flue dust into nodules, after the process patented by Tom Cobb King. The company's nodulizing plant on Newark Bay, New Jersey, which has three rotary kilns, was recently placed in the hands of the same receivers. Messrs. Thompson and Berthold are also receivers for the Newfoundland Syndicate, 43 Exchange place, New York, of which the Pilley's Island Pyrites Company is a subsidiary. The latter company has been mining iron pyrites at Pilley's Island, Newfoundland, and shipping to various sulphuric acid works at Atlantic Coast points. The cinder from these works was afterward nodulized at the Newark Bay plant. The liabilities of the Pilley's Island Pyrite Company are $1,000,000, of which $250,000 is mortgage indebtedness and $500,000 is a liability to the Newfoundland Syndicate.

A 24,000-hp. steam turbine, which is probably the most powerful turbine for stationary service yet ordered, is reported to be under construction at the Mannheim Works of Brown, Boveri & Cie., for the Krupp steel works and blast furnace plant at Rheinhausen.

The Iron and Metal Trades

The Ore firms at Cleveland, who find their market largely among the merchant blast furnaces of Ohio and Pennsylvania, have fallen in with the general movement of producers of Pig Iron and Steel. The decision reached at Friday's meeting at Cleveland that no reduction from last year's prices is advisable for 1908 marks a departure in the Lake Ore trade. Ore buying was not expected to follow it, and time must be given for any effect of the action to appear farther down the line. That it will be an off year in Ore is a foregone conclusion, and thus the hunt by consumers for other than lake sources of supply may not be vigorous. At present Lake Superior Ores are being turned into Pig Iron at about 40 per cent. of the rate at which they came down the lakes last year. Not a few furnaces have Ore in their yards or on dock at Lake Erie sufficient to last them into next fall.

Apart from the Ore meeting interest has centered this week in a conference of Pig Iron producers of the Central West and the Chicago District, held at Cleveland Saturday. The previous effort in this territory to maintain a stable market had not been successful. Some of the causes of irregularity have now been removed, and the furnace companies expect the action of the Ore men to be of some avail in holding prices on a $17 Valley basis for No. 2 Foundry Iron. Reports of price cutting in Central territory, both on Northern and Southern Pig Iron have been rife of late, but new business actually showed a shrinkage from the January rate. The fact that stocks increased somewhat last month, with production of non-Steel making Irons less than 40 per cent. of the usual is significant.

Southern makers have of late received less than their usual percentage of orders in Foundry and Forge grades. All Pig Iron markets have been dull, in fact. In the East Pipe makers have been buyers on a moderate scale, as they have been at intervals for some time.

The Pennsylvania Railroad's Rail order for 1908 has been placed, 55,000 tons being distributed among four mills. The question of discard is not a factor. The mills are asked to furnish some Open Hearth Rails on this order, but none is now prepared to do this, though the Steel Corporation expects to roll such Rails at Gary in September. Two Rail contracts for about 60,000 tons each are about closed, and other roads are expected soon to fall in line. In Light Rails the mills have done a surprising business.

In general, finished lines have shown some improvement upon January, even though slight, and January in turn was better than December. Consumers of important products into which Iron and Steel enter are yet to pass on prices, which thus far have not been seriously tested.

The Wire and Tin Plate trades still lead in activity. Of the latter product important consumers predict a consumption in 1908 not far from that of last year.

Wrought Pipe mills have found it necessary to increase their active capacity. The Lorain, Ohio, plant of the Steel Corporation, has started up in the past week.

Railroad bridge work in the West amounting to 7500 tons has been booked, but current business is less than 25 per cent. of the fabricating capacity of the country.

Considerable buying of Cast Iron Pipe is reported, about a normal business for February being done. New Britain opened bids this week on 8000 tons and 4000 tons will be wanted for Cuba. Indianapolis, Ind., has just bought 4000 tons.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Feb. 12, 1908.	Feb. 5, 1908.	Jan. 8, 1908.	Feb. 13, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	$18.25	$18.25	$18.25	$26.00
Foundry No. 2, Southern, Cincinnati	*15.75*	15.75	16.25	26.00
Foundry No. 2, Local, Chicago	18.00	18.00	18.00	25.50
Bessemer, Pittsburgh	*17.90*	17.90	18.90	22.85
Gray Forge, Pittsburgh	*16.00*	16.15	17.40	22.25
Lake Superior Charcoal, Chicago	*21.50*	21.00	22.50	27.00
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	29.50
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.00
Open Hearth Billets, Phila	**30.40**	30.40	30.00	33.00
Wire Rods, Pittsburgh	**35.00**	35.00	34.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	**13.00**	13.00	12.00	18.00
Steel Rails, Melting, Phila	**14.00**	13.50	11.50	18.75
Iron Rails, Chicago	**17.50**	17.00	15.00	25.00
Iron Rails, Philadelphia	**18.00**	17.50	16.50	27.50
Car Wheels, Chicago	*18.50*	18.50	19.00	23.50
Car Wheels, Philadelphia	*17.00*	17.00	19.00	23.00
Heavy Steel Scrap, Pittsburgh	14.00	14.00	....	18.00
Heavy Steel Scrap, Chicago	**12.50**	12.50	10.75	16.00
Heavy Steel Scrap, Philadelphia	**14.00**	13.50	11.50	18.50
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	*1.65*	1.65	1.75	1.93½
Common Iron Bars, Chicago	*1.65*	1.65	1.75	1.81½
Common Iron Bars, Pittsburgh	*1.50*	1.50	1.60	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.70	1.70	1.70	1.85
Skelp, Sheared Steel, Pittsburgh	1.80	1.80	1.80	1.95
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	2.00	2.00	2.00	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	*13.87½*	13.75	13.87½	25.12½
Electrolytic Copper, New York	*13.87½*	13.62½	13.75	24.87½
Spelter, New York	4.90	4.70	4.40	7.00
Spelter, St. Louis	4.75	4.55	4.27½	7.80
Lead, New York	3.75	3.75	3.65	6.30
Lead, St. Louis	3.75	3.60	3.60	6.10
Tin, New York	29.50	28.60	26.75	42.40
Antimony, Hallett, New York	9.00	9.00	8.75	25.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, February 11, 1908.—(*By Telegraph.*)

Structural Material and Bar Iron hold the lead over other mill product in point of tonnage closed. Contracts for nearly 7500 tons of the former have been placed, the majority of it being for railroad bridge work, and there are in addition about 2400 tons of similar specifications now in the market for figures. The Structural mill of the Illinois Steel Company will be started up next week to roll the specifications that have accumulated during the several weeks it has been idle. A considerable tonnage of Bar Iron was booked preceding the advance of $2 a ton agreed upon last week by the Western Bar Iron interests. Specifications against these orders, if generously furnished, will suffice to keep the mills more actively engaged than they have been. New business in Steel Bars, Tubular Goods, Plates and Sheets is coming in slowly, though in all lines slight improvement is noted. The starting up this week of the Sheared Plate mill, Slabbing mill and five Open Hearth furnaces at the South Works of the Illinois Steel Company marks the renewal of activity at that plant, the finishing departments of which have all been closed since about the middle of January. How long they will continue in operation will depend on business developments. Bids are being taken this week on 6500 tons of Cast Iron Pipe for water plants by various municipalities, besides which there is more inquiry for Gas Pipe, the demand for which has been extremely quiet. Notwithstanding the absence of a consumptive demand, prices of Scrap material hold firm, with a tendency toward advance on mill grades.

Railroad offerings are light, mostly [illegible] being taken principally by dealers.

Pig Iron.—Aside from three or four inquiries for amounts ranging from 1000 to 1500 tons, apparently put out as market feelers, the developments of the past week furnished no semblance of activity in Pig Iron. The few sales reported comprise carload or slightly larger lots at prices ranging from $13 to $13.50, Birmingham, for No. 2 Foundry, and $18 to $18.50, Chicago, for No. 2 Northern. One lot of 300 tons No. 1 Foundry was placed by a Northern furnace at $18.50, Chicago. Rumors are heard of Southern No. 2 being offered at $12.50, Birmingham, but they are unconfirmed. The fact is that there is not enough business in sight to tempt producers to depart far from their established prices. Some of the leading furnaces continue to quote $13.50, Birmingham, but few sales are being made above $13, except on preferred brands. The question of a reduction of Southern freight rates on Pig Iron is up for consideration, and it is understood that the railroads are actively investigating the claims put forward by shippers in behalf of a revision of tariffs. A report purporting to be authoritative to the effect that the idle stack of the Federal Furnace Company would be blown in this week is wholly without foundation. No date has been fixed for its resumption. The following prices are for February and March delivery, f.o.b. Chicago:

Lake Superior, Charcoal	$21.50 to $22.00
Northern Coke Foundry No. 1	18.50 to 19.00
Northern Coke Foundry, No. 2	18.00 to 18.50
Northern Coke Foundry, No. 3	17.50 to 18.00
Northern Scotch, No. 1	19.00 to 19.50
Southern Coke, No. 1	17.85 to 18.35
Southern Coke, No. 2	17.35 to 17.85
Southern Coke, No. 3	16.85 to 17.35
Southern Coke, No. 4	16.35 to 16.85
Southern Coke, No. 1 Soft	17.85 to 18.35
Southern Coke, No. 2 Soft	17.35 to 17.85
Southern Gray Forge	15.85 to 16.35
Southern Mottled	15.10 to 15.60
Malleable Bessemer	18.50 to 19.00
Standard Bessemer	20.40 to 20.90
Jackson Co. and Kentucky Silvery, 6%	21.40 to 21.90
Jackson Co. and Kentucky Silvery, 8%	23.40 to 23.90
Jackson Co. and Kentucky Silvery, 10%	25.40 to 25.90

Billets and Rods.—The demand for Steel is limited to incidental orders for current requirements, and the market seems to be barren of inquiries that would indicate interest on the part of consumers in forward tonnage. On the very moderate tonnage of Forging Billets moving prices are reported to be firm at $33 to $34, Chicago. Wire Rods remain unchanged at the following quotations: Bessemer, $35; Basic, $36; Chain, $37, Pittsburgh.

Rails and Track Supplies.—Inquiries comprising a moderate tonnage have come into the market, the character of which seems to portend the development of some business from electrical lines, logging roads, and the smaller railroad interests. It seems quite probable also that the round lots of Standard Section Rails recently noted in this report as in the market, will be placed before long. An order for 1200 tons of High T-Sections for street railroad work has been booked by the Pennsylvania Steel Company. The demand for Light Rails continues quiet, with more or less irregularity in prices, due to the competition of rerolling mills. A little better inquiry for Track Fastenings is noted. We quote as follows: Angle Bars, accompanying Rail orders. 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.90c. to 2c., according to delivery: Track Bolts, 2.40c. to 2.50c., base, Square Nuts, and 2.55c. to 2.65c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—Considerable improvement is noted in the aggregate tonnage booked by the various interests during the week. Building projects are still backward, and but little business has developed from this source, the majority of tonnage coming from the railroads for the construction of bridges. A contract for 3000 tons for the rebuilding of the Mississippi River bridge at Clinton, Iowa, was placed by the Chicago & Northwestern Railway with the Pennsylvania Steel Company. Contracts were placed for 2500 tons by the Chicago, Milwaukee & St. Paul with the McClintic-Marshall Construction Company for bridges along the line of its new Pacific Coast extension. Other contracts aggregating 1100 tons of bridge Material are being placed to-day by the same road, and the Wisconsin Steel Bridge Company has also been awarded a contract for 125 tons. Besides some Material for highway bridges, the American Bridge Company has within a week received specifications from the railroad for 700 tons, and an order for 200 tons for a public building in Jackson County, Mo. Bids have been asked on 1400 tons to be used by the Chicago & Northwestern Railway for the construction of a bridge over the Platte River, also an additional 1000 tons for new bridge work on the Western lines of the Chicago, Milwaukee & St. Paul. The Structural mill of the Illinois Steel Company, which has been idle for several weeks, is scheduled for resumption next week, enough specifications having accumulated in the meantime to warrant its starting up. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—Orders continue to be restricted to small lots for present consumption. The development of new projects carrying any considerable tonnage of Plates is extremely slow, and the movement of store stocks is of such a tardy nature that jobbers are not inclined to contract ahead for more tonnage than is actually needed to maintain moderate assortments. After a period of idleness lasting several weeks the Sheared Plate mill of the Illinois Steel Company starts up to-day, and to supply it with material the Slabbing mill and five Open Hearth furnaces will be put in operation. We quote for shipment from mill as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, $0.25c. extra.

Sheets.—The needs of the trade are seemingly fully supplied by the hand to mouth orders which constitute the bulk of the business coming to the mills. Both manufacturers and jobbers are buying very conservatively, with little disposition to anticipate the future development of trade. The local mill continues in operation, but is not being run to full capacity. Notwithstanding the pressure of present conditions, prices are reported to be well maintained by the mills. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 to 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c. Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c. Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—The Bar Iron mills report a decided increase in the amount of tonnage booked within the past week or 10 days, and it is stated that the aggregate was greater than the combined business of the previous 60 days. This spurt of activity doubtless resulted from an anticipation of the advance of $2 a ton announced last week by the Western Bar Iron interests, by which the price was raised from 1.55c. to 1.65c., Chicago. Specifications are being offered in moderate volume, which has, however, not increased sufficiently to permit the uninterrupted operation of the mills. Specifications for Steel Bars are coming in slowly, and but few of the Western mills are now running. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—The best that can be said of the situation in Tubular Goods is that business is slowly increasing. Each week shows a slight advance over the preceding one, but when measured in tonnage the gains made are not particularly significant. The recent re-establishment of prices has developed a little stronger tone, and as soon as weather conditions improve a better demand is looked for. Store prices continue relatively low and irregular. It is likely, however, that the existing demoralization of store prices will soon be corrected by the establishment of a better understanding between jobbers. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 72 to 72½ per cent. on Black Steel Pipe, ¾ to 6 in. About four points advance above these prices is asked for Iron Pipe.

Boiler Tubes.—Reflecting the prevailing inactivity in [illegible] There is only a moderate demand for Merchant Tubes. Jobbers' stocks are supplying a large part of the incidental requirements of boiler makers, which consist of small lots for specific use. Orders for Locomotive Tubes are strictly limited to the imperative needs

of the [illegible] Manufacturers. Mill quotations for future delivery, on the base sizes, are as follows: 2⅜ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1¼ in.	55	35	35
1½ to 2 in.	50	35	35
2½ in.	52½	35	35
2½ to 3 in.	60	47½	47½
6 in. and larger	50	35	...

Merchant Steel.—Specifications on held up contracts are coming in a little more freely, especially on Tire Steel from the vehicle industries. To a limited extent similar improvement is noted in the demand from implement makers, though trade as a whole is only moderate. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1¼ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1½ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 54 per cent. off in car lots; 48 per cent., less than car lots, base territory delivery.

Cast Iron Pipe.—Among the municipalities now in the market for a fair sized tonnage of Water Pipe are Cleveland, Ohio, 1200 tons; Detroit, Mich., 1200 tons, to be let February 18; Toronto, Canada, 4000 tons, and Berrien Springs, Mich., 300 tons. At a letting of 1600 tons last week at Winnipeg, Man., the Stanton Iron Works bid of $70,839 was the lowest. There is a little more inquiry for Pipe from gas plants, with some prospective business of good tonnage in sight for the near future. We quote, per net ton, Chicago, as follows: Water Pipe, 4-in., $30; 6 to 12 in., $29; 16-in. and up, $28, with $1 extra for Gas Pipe.

Old Material—So far as prices are concerned, the market remains practically stationary. In its present condition only the stimulus of demand from consumers is needed to raise the level of values all along the line. Of the 8500 tons of railroad material that came into the market last week, nearly all, it is understood, was taken by dealers who are storing and holding it for better prices. About the only tonnage taken by consuming interests was purchased by the rolling mills, but the entire transactions of this character involved but a moderate amount of material. Included in these sales was one lot of 300 tons of Iron Car Axles at $18, while No. 1 Wrought brought a little over $12.50. Included in the railroad lists to be offered this week are 2340 tons from the Wabash, in which there are 1400 tons of Rerolling Rails and 450 tons from the Wisconsin Central. There is very little demand for Cast Scrap, but Melting Steel is more active and holds firm at current quotations. We quote, per gross ton, f.o.b. Chicago, as follows:

[illegible]	$17.50 to $18.50
[illegible]	13.00 to 14.00
[illegible]	13.00 to 14.00
Relaying Rails, standard sections, subject to inspection	22.00 to 25.00
Old Car Wheels	18.50 to 19.50
Heavy Melting Steel Scrap	12.50 to 13.50
Frogs, Switches and Guards, cut apart	12.25 to 13.25
Mixed Steel Scrap	9.50 to 10.50

The following quotations are per net ton:

[illegible]	$15.00 to $16.00
[illegible]	17.00 to 18.00
Steel Car Axles	16.00 to 17.00
No. 1 Railroad Wrought	12.50 to 13.50
No. 2 Railroad Wrought	10.25 to 11.25
Railway Springs	11.50 to 12.50
Locomotive Tires, smooth	15.00 to 16.00
No. 1 Dealers' Forge	9.75 to 10.75
Mixed Railroading	8.00 to 9.00
[illegible]	7.50 to 8.25
[illegible]	7.50 to 8.25
Machine Shop Turnings	7.25 to 8.25
Cast Borings	5.00 to 6.00
Mixed Borings, &c	5.00 to 6.00
No. 1 Mill	7.50 to 8.50
No. 2 Mill	6.50 to 7.50
No. 1 Boilers, cut to Sheets and Rings	7.50 to 8.50
No. 1 Cast Scrap	13.00 to 14.00
Stove Plate and Light Cast Scrap	11.50 to 12.50
Railroad Malleable	11.25 to 12.25
[illegible]	10.50 to 11.50
[illegible]	9.00 to 10.00

Metals.—Under the pressure of continued inactivity there has been a slight recession in Copper prices. Even the largest users are buying only small lots for immediate use, and even carload orders are quite infrequent. Spelter is somewhat more active, and has advanced about ¼c. All other metals hold pretty evenly, with no marked increase in demand. We quote as follows: Casting Copper, 14c.; Lake, 14½c. to 14¾c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 30c.; small lots, 31½c.; Lead, Desilverized, 4c. to 4.05c., for 50-ton lots; Corroding, 5.15c. to 5.25c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 4.85c.; Cookson's Antimony, 13c., and other grades, 11c. to 11½c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 13½c.; Heavy Copper, 13½c.; Copper Bottoms, 12c.; Copper Clips, 12c.; Red Brass, 13c.; Yellow Brass, 10½c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 23c.; Block Tin Pipe, 25c.

Philadelphia.

PHILADELPHIA, PA., February 10, 1908.

The placing of orders for 55,000 tons of Steel Rails, by the Pennsylvania Railroad, which are to be rolled under entirely new specifications, is announced. These, with the 30,000 tons left over from last year, will give that road 85,000 tons of Rails for use during the present year. The order was for repairs and replacements only, and does not cover any extensions or improvements. The company has reserved the right to increase the present order if improved conditions during the year warrant such action. The order was divided as follows: United States Steel Corporation, 27,500 tons, of which 14,500 tons will be supplied by the Edgar Thomson Works, and 13,000 tons by the Illinois Steel Company; 11,550 tons each to the Maryland Steel Company and the Cambria Steel Company, and 4400 tons to the Lackawanna Steel Company. An important conference bearing on the question of short delivery weights, in which the Pig Iron and Coke producers were jointly interested with the consumers of these crude materials, was held in this city during the past week, when the weight committees of the New England, Philadelphia and Pittsburgh Foundrymen's associations and the representatives of producers and transportation companies met and discussed the question of shortages in the delivered weights of those materials, and which resulted in the appointment of a committee composed of representatives of the several interests, who will take up this important question and endeavor to suggest some method of overcoming this difficulty. At a later meeting of the Local Foundrymen's Association a resolution was unanimously passed recommending that Pig Iron producers unite and establish a minimum price for delivery of Pig Iron at certain fixed points, so that they would have a basis on which they could make their purchases, which action illustrates pretty clearly the position taken by the foundry interests on the question of fixed prices.

Pig Iron.—New business comes out rather slowly, and the market shows practically no change. Buying is still confined to small quantities for early delivery, and the demand has been almost entirely confined to the Foundry grades. With production showing a further decline during the month of January, and prices being firmly held by the leading interests, the producers feel that they have the situation pretty well in hand. Outside interests do not appear to be pushing the market as strongly as they were, and it is believed by some that they have pretty nearly taken as much tonnage as they want at the price. At the same time buyers are pursuing a conservative policy, and will not, as a rule, place orders for forward delivery, or for any greater tonnage than they have orders in sight. The Pipe interests which have been active buyers in the past few weeks have quieted down for the time, and while they will no doubt require more tonnage to take care of the business on hand, they do not seem to be in any hurry to place further orders. Southern Iron, as far as sales in this territory are concerned, has been inactive, as have also the Virginia Irons. Sales have been largely confined to Nos. 2 X and 2 Plain Foundry Irons. A little No. 1 Foundry has been sold. The greater proportion of orders taken recently are for lots under 100 tons, with a few scattered ones for 200 and 300 tons. Prices are being firmly maintained. No. 2 X Foundry is held at $18.25, delivered, as a minimum price, with No. 2 Plain at $17.75 to $18 for delivery in this territory. The demand for Forge Iron has again fallen off, the business reported in this grade having been extremely light. Prices, however, are strong at $16.50 to $16.75, delivered. Steel making Irons show no indications of activity. Basic Iron melters have their requirements pretty well covered, and are not in the market at the time. A little better inquiry, however, is to be noted for Low Phosphorus Iron, particularly misfit grades, but no business covering any large tonnage has been done. We quote for early delivery in buyers' yards, eastern Pennsylvania and adjoining territory, the following range of prices:

[illegible]	$18.25 to $18.50
No. 2 Plain	17.75 to 18.00
No. 3 Foundry	17.25 to 17.50
Gray Forge	16.50 to 16.75
[illegible]	17.25
Low Phosphorus	24.00 to 25.00

Ferromanganese.—The demand continues very light and sales have been confined entirely to broken and small lots. Buyers of large tonnages are out of the market in this territory. Quotations for prompt shipment range from $47 to $49, Baltimore.

Steel.—New business does not come out very rapidly, although specifications on old orders are more numerous, and makers feel encouraged as to the general situation. The blooming mill of the Alan Wood Iron & Steel Company has again been shut down, but that company will light up two

or three Open Hearth furnaces this week in order to make some grades of Steel on which its stock of ingots has become depleted. Prices are [illegible] Steel for delivery in this territory is quoted at $30.00, while Forging Steel ranges from $32.00 to $33.00, according to analysis.

Plates.—There has been a better demand and makers are feeling more cheerful regarding future business. One mill reports orders during the past week as the best they have had in any week for several months past. Boiler and Bridge Plates seem to be in the most active demand, although quite a large share of the orders taken is for material of a miscellaneous character, and mills are reported as gaining somewhat on their production. The greater proportion of the business taken, however, is for prompt shipment. Prices are unchanged and range as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Tanks	2.05	2.10
Marine	2.25	2.30
Locomotive Fire Box Steel	2.35	2.40

The above are base prices for ¼-in. and heavier. The following Extra per 100 lb. apply:	
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—A fair volume of orders continues to come out, and mills get about the same proportion of work from week to week. Large propositions are scarce, and the major portion of the business taken is made up of small and miscellaneous lots. Some small bridge and boat orders have been placed recently, but nothing new of any size has developed in the building line. Prices continue to be quoted at 1.85c. to 2c., according to specifications.

Sheets.—Business continues to be largely of a hand to mouth character, and mills continue to run at about half capacity only. No business for future delivery is being received. We quote prices for mill shipments, with a tenth extra for small lots, as follows: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.70c.; Nos. 25 to 26, 2.80c.; No. 27, 2.90c.; No. 28, 3c.

Bars.—The situation in the Bar Iron market has again assumed definite shape. The low prices which prevailed during the past two weeks did not bring out any great amount of business, and selling prices were down to a point at which some mills could take orders only at a loss. Prices for Refined Iron Bars have now been fixed at 1.50c., Pittsburgh, or 1.65c., delivered in Philadelphia territory, which makers say will be firmly held, and all lower quotations have been withdrawn. The demand, however, is light, and not much new business comes out, although it is believed that as soon as the trade is satisfied that the new base will be held, it will come into the market more freely.

Old Material.—The situation in the Old Material markets continues to improve, and prices are stronger all along the line and in some cases show a decided advance. Heavy Melting Steel has been sold in moderate tonnages at $14, delivered. Railroad Wrought, Turnings and Borings continue to be taken in medium sized lots, and prices of these materials have advanced about 50c. a ton. We quote for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory, about as follows:

No. 1 Steel Scrap and Crops	$14.00 to $14.50
Low Phosphorus	18.00 to 18.50
Old Steel Axles	18.00 to 18.50
Old Iron Axles	23.00 to 24.00
Old Iron Rails	18.00 to 19.00
Old Car Wheels	17.00 to 17.50
Choice No. 1 R. R. Wrought	15.50 to 16.00
Machinery Cast	15.00 to 15.50
Wrought Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	8.50 to 9.00
Wrought Turnings	10.00 to 10.50
Skelp Crate	13.50 to 13.75
Cast Borings	8.50 to 9.00
Steel Ba[illegible]	[illegible] to 17.00

Coke.—The demand for Coke continues light. Foundries are not using Coke very heavily, and consumption at some of the furnaces has stopped entirely. Sales, therefore, have been extremely small, and prices for prompt coke are, if anything, somewhat weaker. Foundry Coke is quoted at $2.25 to $2.75, at oven, while Furnace Coke ranges from $1.85 to $2.25, at oven. We quote for delivery in the Philadelphia territory the following range of prices:

Connellsville Furnace Coke	$4.05 to $4.50
Connellsville Foundry Coke	[illegible] to [illegible]
Virginia Furnace Coke	[illegible] to [illegible]
Foundry Coke	4.10 to 4.60

An ice breaking car ferry for winter service is being built to operate on the St. Lawrence River between Prescott, Canada, and Ogdensburg, N. Y.

Pittsburgh.

PARK BUILDING, Tuesday, February 12, 1908. [illegible]

Pig Iron. Sentiment this week [illegible] be stronger as the result of the meeting of furnace interests held in Cleveland last Saturday, but when it comes down to actual sales as low prices are being made as at any time in the last two months or more. The furnace interests at the meeting agreed to hold Bessemer Iron at $18, No. 2 Foundry at $17, and Basic at $17, all at Valley furnace; but on the other hand, Bessemer Iron is being offered from $17 up to $17.50 at furnace. No. 2 Foundry is quite freely offered at $16 or less at furnace, and Basic at $16, with a probability that this price could be shaded on a firm offer. We noted a sale of 200 tons of Bessemer Iron at $16.85 at furnace, 100 tons at $17, 150 tons at the same price, and 50 tons at $17.10 at furnace. A large consumer is reported to have bought upward of 5000 tons of Malleable Bessemer at a low price and for extended delivery. We do not know of any sales of Northern Foundry which we quote at $16 to $16.25 Pittsburgh.

Steel.—The market is quiet, and there are no large inquiries. A serious accident has occurred at the Sheet Bar mill of the Youngstown Sheet & Tube Company, which will disable it for a short time. We quote Bessemer and Open Hearth Billets nominally at $28, Sheet and Tin Bars at $29 and Forging Billets $30, Pittsburgh.

Ferromanganese.—Owing to the large falling off in consumption of Ferro, due to the idleness of so many Steel plants, prices are weak and somewhat lower. About two weeks ago foreign Ferro sold on the basis of $46, Baltimore, or $47.95, Pittsburgh, but in the last few days from 75 to 100 tons of foreign 80 per cent. Ferro has been sold on the basis of about $47, Pittsburgh.

(By Mail.)

An important meeting of the Ore interests was held in Cleveland on Friday, February 7, at which all the leading Ore producers were represented, with the exception of one, with the result that 1907 prices on Ore were reaffirmed for this year. The interest that was not present at the meeting later agreed to maintain prices. Some of the furnaces have sold Pig Iron in the belief that Ore would be reduced, and it is now claimed that the prices at which this Iron was sold were below the actual cost of making it, based on present prices of Ore. The Ore meeting was followed by a meeting of the furnace interests, on Saturday, representatives of furnaces being present from the Pittsburgh and nearby districts. The action taken by the Ore producers in maintaining prices for this year was thoroughly discussed by the furnace men, with the result that new prices were agreed upon, these being $18, Valley furnace, for Bessemer; $17 for No. 2 Foundry, and $16.50 for Northern Forge. These are all Valley prices, the rate to Pittsburgh being 90c. a ton. It is stated that the Pig Iron market is now decidedly firmer and that some low prices sent out last week have since been withdrawn. There are still some lots of Bessemer Iron, Foundry and Forge that are being offered by dealers at lower prices than were agreed upon by the furnaces, but the aggregate is very small. The future of the market will depend largely on whether the furnace interests maintain the prices agreed upon, but it is stated that a determined effort will be made to hold the market on the different grades of Pig Iron on the basis noted above. New business in Finished Iron and Steel is showing a slight increase, but buying is still in small lots and for [illegible] needs. A slightly better demand for Coke is reported, and prices are a shade firmer. The Scrap market is still holding quite firm, and the actual tonnage [illegible] some time.

Muck Bar.—We do not hear of any new business, and we continue to quote [illegible] Pig Iron, nominally at $28 to $29, Pittsburgh.

Ferromanganese.—A local Steel interest is reported to have bought 500 tons of foreign Ferro for forward delivery. We quote foreign 80 per cent. in large lots for extended delivery at $48 [illegible] Pittsburgh.

Rods.—Although the demand is light, prices are firm, and we quote Bessemer Rods at $35, Open Hearth $36 and Chain Rods $37, f.o.b. Pittsburgh.

Skelp.—Owing to quiet conditions in the Pipe trade practically no new orders for Skelp are being placed. We quote: Grooved Steel Skelp, 1.60c.; Sheared Steel Skelp, 1.70c.; Grooved Iron Skelp, 1.80c., and Sheared Iron Skelp, 1.90c., f.o.b. Pittsburgh.

Steel Rails. [illegible] market for 60,000 tons of Standard Sections. Actual tonnage in Standard Sections taken by the Carnegie Steel Company in the past week includes 4000 tons for the Pittsburgh [illegible] 1000 tons for an Eastern coal company. It develops that the actual tonnage of Light Rails sold by the Carnegie Steel

Company in the first six weeks of this year was twice as large as the quantity sold by that company in the last six months of 1907. The company booked in the past week about 1400 tons. Regular prices on Light Rails, which are still being shaded about $3 a ton by the mills rerolling Rails, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—New business does not show much betterment, but is very light and for small lots only. The tonnage in Plates going to the Steel car concerns still continues fairly heavy, but this will show a decided falling off very soon, unless some orders are quickly placed for Steel cars. A large Steel car plant in Allegheny is now practically closed in all departments, owing to lack of orders. There is some price cutting being done, but as yet it is confined mostly to the narrow sizes. Regular prices are as follows: We quote: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼ in. to and including 3 16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell grade of steel is abandoned.	

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to Gauge of Tank, Ship or Bridge quality.

Structural Material.—A moderate demand is noted, but any work being placed consists mostly of jobs that cannot be held back any longer. Very little large new work is coming up, and the outlook in the Structural trade is only fair. The McClintic-Marshall Construction Company has taken about 2000 tons of viaduct and girder work for the Chicago, Milwaukee & St. Paul, and is now turning out material for the New York City piers, for which a contract was secured last fall, and which involves about 13,000 tons. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—There is some slight improvement in the demand for both Black and Galvanized Sheets, but new business is largely for more current requirements. It is believed that early in March there will be a material improvement, as the trade will likely commence to buy Roofing Sheets in order to have stocks on hand when the building season opens up. It is stated that prices are in the main being held. We quote: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—Larger orders are being placed in both Bright and Roofing Plates, particularly the latter, than for some time, and the mills are entering more new business than at any time since the depression of last October started. It is stated that some large contracts were placed for Bright Plate by canning interests that attended the convention of the Can Association in Cincinnati last week. It has been estimated that the consumption of Tin Plate this year will hardly be as heavy as last year, particularly in Roofing Plates, owing to the general business depression, which has hung up a large amount of building work. We are advised that prices are being held, and the outlook for the Tin Plate trade is regarded as fairly satisfactory. We quote at $3.70 for 100 lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Bars.—The recent action of the Eastern and Western makers of Iron Bars in advancing prices is expected to remove the demoralization that has existed in prices of Iron Bars for the past three or four weeks. The previous reduction in prices of Iron Bars was regarded by the trade as a serious mistake, and the putting up of the price again indicates that the mills have come to the same conclusion. New business in both Iron and Steel Bars is only fair, but is much better than in December, and larger than in the early part of January. The Republic Iron & Steel Company, the leading Western maker of Iron Bars, and also a large producer of Steel Bars, is running its Bar mills to between 40 and 50 per cent. of capacity. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further West. Steel Bars remain very firm, at 1.60c., Pittsburgh.

Spelter.—The market is somewhat erratic and there is a wide range in quotations. Some sellers are naming as low as 4.40c., St. Louis, while others ask 4.50c. and 4.55c., St. Louis, to which a freight rate of 12½c., Pittsburgh, should be added.

Hoops and Bands.—Practically no orders are being placed, consumers having covered their requirements practically a year ahead, very shortly after the mills reaffirmed prices. Specifications against these contracts are coming in at a fairly satisfactory rate. We quote Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60, base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Spikes.—Very little new business is being placed, but it is said that two or three of the railroads will soon be in the market with inquiries for a large tonnage. We quote Standard sizes of Steel Railroad Spikes at $1.80 to $1.85, but in some cases a lower price has been named in competition with Iron Spikes. The smaller sizes are held at $1.95 to $2 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—This trade continues very quiet. New orders being placed are only for small lots and actual needs. Prices are being shaded to some extent, especially in Shafting, which is being offered as low as 55 and 2½ per cent. off in large lots, the regular discount being 54 per cent. off. Implement makers are buying sparingly, believing that prices will be lower. We quote nominally: Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades, and 10c. and upward for special grades.

Merchant Pipe.—Some of the oil and gas companies are in the market for a fairly large tonnage of Pipe, but are offering extended terms of payment, mostly by notes, and for this reason it is uncertain whether this business will actually develop. The Youngstown Sheet & Tube Company has taken in the past month three or four contracts for genuine Iron Pipe for shipment to the Panama Canal, and calling for 500 to 1000 tons each. The mills have guaranteed prices on both Iron and Steel Pipe against decline to April 1, and this has resulted in the large trade placing orders more freely. Leading Pipe mills are now operating to 50 and 60 per cent. of capacity, this being much larger than in December and January. The Youngstown Sheet & Tube Company has issued a new card on both Iron and Steel Pipe, prices on Iron Pipe being in all cases two points higher than on Steel Pipe. Net discounts on Steel Pipe to the large trade on ⅜ to 6 in. remain at 74 and 5 per cent. off list, while on Iron Pipe, the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black. %	Galv. %
⅛ to ¼ in.	65	49
⅜ in.	67	53
½ in.	69	57
⅝ to 6 in.	73	63
7 to 12 in.	70	55
Extra strong, plain ends:		
⅛ to ⅜ in.	58	46
½ to 4 in.	65	53
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

The new discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
⅛ and ¼ in.	63	49
⅜ in.	65	51
½ in.	67	55
¾ to 6 in.	71	61
7 to 12 in.	68	53
Extra strong, plain ends:		
⅛ to ⅜ in.	56	44
½ to 4 in.	63	51
4½ to 8 in.	59	47
Double extra strong, plain ends:		
½ to 8 in.	52	41

Boiler Tubes.—There is a little more activity in Locomotive Tubes, but buying is mostly in small lots for actual needs, and this also applies to Merchant Tubes. Prices continue to be shaded more or less, even on the small amount of new business that is being placed. Discounts on Mer-

chant Tubes for small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in.	42	47
1¾ to 2¼ in.	42	59
2½ in.	47	61
2¾ to 5 in.	52	65
6 to 15 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Iron and Steel Scrap.—The Pennsylvania Railroad sold last week a fairly large tonnage of Scrap, on which the average prices obtained were somewhat higher than on its January sale. Included in the sales were 1500 tons of Heavy Steel Scrap, for which dealers paid $13.75 to $14, and about the same tonnage of Rerolling Rails which brought the same prices. The Scrap trade is referred to by dealers as being in better condition now, as regards demand, than at any time since the slump started, last October. We note that prices on all kinds of Scrap are firm, dealers quoting about as follows: Heavy Steel Scrap, for Pittsburgh, Steubenville or Sharon delivery, $14; No. 1 Cast Scrap, $15.25 to $15.50; Low Phosphorus Melting Stock, $17.50 to $18; Bundled Sheet Scrap, $9.50 to $10; No. 1 Busheling Scrap, $14 to $14.50; No. 2, $12 to $12.50; Cast Iron Borings, $8 to $8.50; Steel Axles, $16; Iron Axles, $20.50 to $21; Rerolling Rails, $14 to $14.50; Old Steel Rails, short pieces for Open Hearth use, $14; Standard Sheet Bar Crop Ends, $15 to $15.50, and Grate Bars, $13 to $13.50. All above prices are per gross ton, f.o.b. Pittsburgh:

Coke.—There is a fair amount of inquiry for Furnace Coke. It is believed that prices have about reached the bottom, and will show improvement from this time forward. We quote strictly Connellsville Furnace Coke for spot delivery at $1.90 to $1.95, while other grades are offered at $1.75 to $1.85, at oven. Strictly Connellsville 72-hr. Foundry Coke continues to be held at $2.40 to $2.45, at oven, while other grades are offered as low as $2.25, at oven. The output of Coke continue to increase, the Upper and Lower Connellsville regions having made last week 215,560 tons, an increase over the previous week of nearly 7000 tons.

Cleveland.

CLEVELAND, OHIO, February 10, 1908.

Iron Ore.—Last year's Ore prices were informally reaffirmed for this season at a meeting held at the Hollenden Hotel last Friday, attended by representatives of the leading Merchant Ore firms of this city. President William E. Corey of the United States Steel Corporation attended the meeting. While some of the shippers have thought it useless to take any definite action regarding Ore prices at the present time, they felt disposed to comply with the wishes of a large share of the furnace interests that action in maintaining prices be taken without further delay. Conditions were discussed at some length, and the general feeling was that it would be better to maintain last season's prices. Some shippers say that they would rather leave the Ore in the ground than sell it at lower prices, and the fact that wages on the Iron ranges are higher than ever before, and have not been reduced during the present winter, making the cost of production greater, was used as an argument in maintaining prices. While all the shippers were not represented at the meeting, the largest were, and the decision is regarded as final, as far as it relates to the principal producers. Some Ore for 1908 delivery may be sold at prices lower than those that prevailed last season, but the amount will probably be small. The reaffirming of last season's prices is not expected to have any effect on the market. It is not believed that there will any buying movement of importance before April. Some of the shippers have already notified their customers that all the Ore they will sell this season will be at last season's prices. In view of the large falling off that is expected in shipments during the coming season practically all the shippers have greatly reduced the winter output of their mines. Shipping orders from the docks as yet show no improvement. We quote Ore prices, as follows, at Lake Erie docks for 1908 delivery, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.25; Mesaba non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous non-Bessemer, $2.35 to $2.60.

Pig Iron.—As the outcome of a meeting of the blast furnace interests engaged in the manufacture of Foundry Pig Iron in the Middle West, held at the Union Club in this city last Saturday, a new agreement fixing the price of Northern Foundry Iron will be announced in two or three days. The meeting is said to have been more largely attended than any similar meeting of Foundry Iron producers in this territory. There were between 50 and 60 men present, representing furnaces in the Valleys, Pittsburgh, Buffalo, Cincinnati, Chicago and Milwaukee districts. With two exceptions all the furnaces in the territory were represented, and it is believed that the two not represented will adopt prices to conform to the agreement. The session lasted all day. The general sentiment of the meeting was that Iron had been sold below the cost of production and that steps should be taken to insure a fair profit for the producers and maintain more stable prices. The melt is believed to be considerably larger than a few weeks ago, and the feeling was expressed that there will be a gradual improvement from now on. The recent agreement fixing $17, Valley furnace, as the basis for No. 2 Foundry Iron, which fell to pieces in a few days, was discussed at some length, and some unsatisfactory features in that agreement, which caused it to fail, were pointed out. The matter of preparing a new agreement was left to a committee of seven, of which Frank B. Richards of Cleveland is chairman. The committee has prepared a report and the prices named will go into effect, probably the latter part of the week, as soon as the furnace interests receive the report. It is understood that the agreement is similar, with certain modifications, to the one recently adopted, fixing $17, Valley furnace, as the price for No. 2 Foundry Iron. Modifications have been adopted to suit the interests that objected to the former agreement. Until the new agreement goes into effect, on its receipt by the furnace interests, the price of $17, Valley furnace, for No. 2 Iron will prevail. The market has been quiet, and no sales are reported except a few small lots. Some fairly good inquiries have developed, however. There is one inquiry from a local consumer for 500 tons of Foundry Iron, and another for 500 to 1000 tons of Foundry Iron from an implement maker for spot shipment to an Eastern plant. For the first quarter and first half we quote, delivered, Cleveland:

Bessemer	$17.90 to $18.40
Northern Foundry No. 1	17.85 to 18.35
Northern Foundry, No. 2	17.35 to 18.35
Northern Foundry No. 3	16.85 to 17.35
Southern Foundry, No. 2	17.35 to 18.35
Gray Forge	16.90

Coke.—The market is very quiet, and inquiries are scarce. Prices remain about stationary. We quote the best grades of Connellsville Furnace Coke at $1.85 to $2, at oven, for spot shipment. We quote 72-hr. Foundry Coke at $2.50 to $2.60, at oven.

Old Material.—A little more activity is noted, this being mainly due to the fact that some mills are asking for deliveries on Scrap bought late last year. To fill these orders dealers are buying of each other, paying slightly better prices than the mills would be willing to pay if they were placing new orders now. Borings are in fairly good demand, there being some inquiry from Pittsburgh dealers, who are offering about $7.50 per gross ton, f.o.b. Cleveland. Local mills are buying very little Scrap, and that for immediate needs. Although the market has not improved much the general feeling is better. Quotations are still largely nominal. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$11.50 to $12.00
Old Iron Rails	16.00 to 17.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	16.00 to 17.00
Relaying Rails, 50 lb. and over	25.50 to 26.00
Relaying Rails, under 50 lb.	28.00 to 29.00
Heavy Melting Steel	12.00 to 12.50
Railroad Malleable	12.00 to 13.00
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	8.00 to 9.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 6.00
Iron and Steel Turnings and Drillings	7.00 to 8.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	11.00 to 12.00
No. 1 Railroad Wrought	11.00 to 12.00
No. 1 Cast	12.00 to 13.00
Stove Plate	10.50 to 11.00
Bundled Tin Scrap	9.00

Finished Iron and Steel.—The market shows some improvement as the result of the gradual betterment in general conditions and the action of leading producers in deciding to maintain prices. While current orders are not much better, specifications have been coming in in very satisfactory shape during the week, mostly for Bars, Shapes, and Plates. In Structural Material there are a number of inquiries for lots ranging from 50 to 100 tons. Some new orders are being placed for Iron Bars, and both of the local Bar mills are running this week. There is some demand for Forging Billets in small lots, which are being sold on the basis of $30, Pittsburgh. During the week the Great Lakes Engineering Company placed orders for three Steel Drill Scows, each of which will take about 150 tons, mostly Structural. The boats were projected some time ago, but the award of the contracts was held up for several months. The Steel for two of the boats will be furnished by the Republic Construction Company, Cleveland. The Interstate Engineering Company, Cleveland, has the other contract. Local jobbers have decided to make no advance in the store price of Bar Iron, their price remaining the same as before the recent $2 per ton advance. To move more quickly large stocks of Steel Bars local jobbers have reduced the store price from 1.90c. and 1.95c. to 1.85c. On mill orders we quote Iron Bars at 1.60c., Cleveland; Steel Bars, 1.70c., Cleveland, for carload lots, half extras; Beams and Channels, 1.80c., base,

Cleveland, and Plates, ¼-in. and heavier, 1.80c., base, Cleveland. We quote Sheets, mill shipments, carload lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. We quote Steel Bars out of stock at 1.85c., and Iron Bars at 1.80c. Beams and Channels out of stock are 2.10c. to 2.15c., base. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.20c.; Box Annealed, No. 28, 2.90c.; Galvanized, No. 28, 4.05c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Cincinnati.

CINCINNATI, OHIO, February 11, 1908.—(*By Telegraph.*)

Awaiting developments best expresses the situation in a general market way in this territory to-day. There is no apparent improvement in the situation with respect to finished products save, perhaps, that manufacturers of electrical equipment are feeling less than the rest the stagnation, and there is some demand for Structural Material. In other lines the inquiries and acts of the consumer give the impression that he is not going to invest save at a speculative figure, and the figures of the buyer and the seller are still quite far apart. Such buying as is going is of small tonnage, for immediate shipment, and there is practically no disposition shown to contract for forward delivery. Machine tool manufacturers seem to be holding firmly to established prices, and all plants are being operated on an economical basis. The foundry melt is still very much off, probably not more than one-third of what may be termed normal. There are rumors flying about involving furnaces in both Northern and Southern districts, and the break in the stock market of to-day adds its quota of interest to those predicting breaks in Pig Iron prices. The feeling here is that the New York and Cleveland meetings have done much to steady a very critical and unstable condition, and the rumor of pending breaks in prevailing prices is not accepted with any degree of credibility by the rank and file of the trade, considering the restricted production in both crude and finished lines, and the sold up condition of most of the large interests.

Pig Iron.—In the absence of transactions, and delving about to discover the reason for loss of several late contracts of good size, some selling agencies are turning up what appears to be evidence of price slaughter. However true this may be, certain it is that the market to-day presents more complexities than for a long time. In the face of six positive statements that the price of standard brands of Southern No. 2 is fixed unalterably at $13.50, there is good reason for the statement that $13 is being done, and it is asserted that this price has been and is being shaded. A leading Southern interest which has less than one-third of its furnaces in blast and some 50,000 or 60,000 tons of Iron on its yards is credited with having made a break in prices within the past few days. It now announces that every pound of Iron in its yards is all sold up either on contract or provided for otherwise. Another Southern interest, which has been credited with shading prices and does not, nor has ever, joined any combination, states through its local representative that no Iron has been sold by it at less than $13, Birmingham, for three weeks. A local office was interested in the sale of about 5000 tons of Malleable to a Pittsburgh concern for May delivery at about $16, Valley furnace. A sale expected to be placed to-day is a lot of 700 tons, graded in Nos. 1, 2 and 3 Foundry, for shipment one-third prompt, one-third in July, and one-third in November, to be used by a Michigan manufacturer of implements. A Michigan manufacturer of automobiles is out with an inquiry for No. 2 Foundry, but announces that the purchase will not be closed for 30 days. Reluctance to quote for last half requirements is as marked as a week ago, but sellers agree as a rule that a basis of $13.50, Birmingham, for Southern No. 2, and $17, Hanging Rock furnace, for Northern No. 2, would be acceptable to furnace interests in both districts. Local foundry interests are not buying. A leading Ohio stove interest is out with an inquiry for 100 tons of No. 2 Foundry for prompt shipment. There has been some movement in Silicon Irons, and $20 for 8 per cent. is said to have been shaded somewhat. For immediate delivery and for balance of first half we quote, f.o.b. Cincinnati, as follows, the freight rates being $3.25, $1.80 and $1.20, from the Birmingham, Valley and Hanging Rock districts, respectively:

Southern Coke, No. 1	$16.25 to $16.75
Southern Coke, No. 2	15.75 to 16.25
Southern Coke, No. 3	15.25 to 15.75
Southern Coke, No. 4	14.75 to 15.25
Southern Coke, No. 1 Soft	16.25 to 16.75
Southern Coke, No. 2 Soft	15.75 to 16.25
Southern Coke, Gray Forge	14.25 to 14.75
Southern Coke, Mottled	13.75 to 14.25
Ohio Silvery, 8 per cent. Silicon	21.20 to 21.70
Lake Superior Coke, No. 1	17.70 to 18.20
Lake Superior Coke, No. 2	17.20 to 17.70
Lake Superior Coke, No. 3	16.70 to 17.20
Standard Southern Car Wheel	25.25 to 25.75
Lake Superior Car Wheel	24.50 to 25.00

(*By Mail.*)

Coke.—There is a steady sale of Coke, mostly, however, in small lots, and largely of better Foundry grades. Some contracting is being done, and for standard grades the price covering the three-quarters is about $2.50, at oven. The range on Connellsville Foundry is a trifle broader and is quotable at from $2.25 to $2.75, at oven; Furnace, $1.75 to $2, although the top price is said to have been shaded to about $1.90. Various standard makes of Virginia Cokes are selling at $2.50 to $2.75, at oven, for Foundry and $2.30 to $2.40 for Furnace. Other grades of Foundry are selling at $2.25 to $2.50 and Furnace at about $1.75.

Finished Iron and Steel.—As one of the principal store interests remarks, "the trade is sitting back and waiting." Buying is still for actual requirements, and there is nothing of consequence moving save perhaps some fairly good sized tonnages of Structural Material. There is no change in prices, and the best posted dealers express the belief that no reductions may be looked for; on the contrary, that there may be a little stiffening in prices ere long as a result of the New York and Cleveland meetings. Dealers quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.55c., with half extras; small lots from store, 1.90c., base, one-half extras; Steel Bars, carload lots, 1.75c., base, half extras; small lots from store, 1.90c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼ in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c. Blue Annealed Sheets (heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.25c. No. 12, carload lots, 2c.; small lots from store, 2.35c. Sheets (light), Black No. 28, carload lots, 2.65c.; Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. or heavier, carload lots, 1.95c., base. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Old Material.—Local Scrap dealers may be denominated as "bullish." While there is scarcely any discernible improvement in inquiry and demand over last week, those who have been heavy buyers of Scrap during the four or five months of depression believe the tedium of the long wait is about broken, and that a comparatively early resumption of business is indicated. There are some very good inquiries on hand from foreign trade. The promised starting soon of some new Steel mills is accepted as an encouraging sign. The following prices are quoted as fairly representative of the market to-day and are f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$11.00 to $12.00
Cast Borings, net ton	4.00 to 5.00
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought, net ton	7.00 to 8.00
Old Iron Axles, net ton	14.50 to 15.50
Old Iron Rails, gross ton	14.50 to 15.50
Old Steel Rails, long, gross ton	11.50 to 12.50
Relaying Rails, 56 lb. and up, gross ton	22.00 to 23.00
Old Car Wheels, gross ton	16.00 to 17.00
Low Phosphorus Scrap, gross ton	13.50 to 14.50

Birmingham.

BIRMINGHAM, ALA., February 8, 1908.

Pig Iron.—Notwithstanding the fact that buyers manifest a disposition to enter the market only for actual requirements, the aggregate of sales for the week is indicative of a steady increase in the demand. Recent sales have been confined to lots ranging from 100 to 500 tons, for prompt shipment; consequently it cannot be definitely stated just what price coould be had on a round tonnage for advanced delivery, but the quotation of $13.50, f.o.b. Birmingham, is being adhered to, and sales reported indicate the maintenance of such a basis. An offer for 1000 tons at $13 per ton is known to have recently been refused. The inquiry from a Michigan concern, previously reported, for upward of 5000 tons, has not resulted in a sale, and it is understood that quotations were made on a basis of $13.50, Birmingham delivery; however, the analysis specified was such that the order could be filled by probably only one concern in the district. Some bargain Iron is being offered, principally off grades, and a lot of something like 400 tons has sold at figures around $13, but the tonnage offered is limited and prices received cannot be considered a criterion of market prices. The result of recent meetings at New York and Cleveland has been awaited with much interest by both producers and consumers and a marked improvement in trade conditions is indicated; yet there is evidence that purchasers will be disposed to pursue a conservative policy as to negotiations until the improvement in general conditions is more material, and increased proportions of tonnage engaged are expected to be slow to develop. Products are apparently satisfied with the present output as compared with the nature of the demand, and it is believed that production is now closely adjusted to order book requirements. It is to be noted that only 11 merchant furnaces in the entire district

are in operation, and an increase in the number is not expected before March 1, at least.

Cast Iron Pipe.—Specifications to cover approximately 8000 tons of Water Pipe for the city of New Britain, Conn., have been submitted, and bids will be opened February 11. It is also reported that some thing like 4000 tons of 42-in. Pipe is soon to be placed for Cuban points, as well as some lots for points along the Pacific Coast and Mexico. The United States Cast Iron Pipe & Foundry Company is reported as being the successful bidder on 4000 tons for Indianapolis, Ind., but the price received cannot be ascertained. Order books of local producers are now in good shape, and in one instance quotations on forward deliveries are being made with some reluctance. Nominal quotations on Water Pipe are as follows, per net ton, f.o.b. cars here: 4 to 6 in., $28; 8 to 12 in., $26; over 12-in. average, $25, with $1 per ton extra for Gas Pipe.

Old Material.—The aggregate of sales for the week is considerably in excess of that reported for some weeks previous, and a more cheerful tone in the market is apparent. Sales have been very much on the hand-to-mouth order, and prices received have been at variance; but, taken as a whole, there is a slight improvement in conditions and dealers are encouraged. We revise nominal quotations as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$18.00 to $18.50
Old Iron Axles	16.50 to 17.00
Old Steel Axles	15.50 to 16.00
Old Car Wheels	18.50 to 19.00
No. 1 Railroad Wrought	13.50 to 14.00
No. 2 Railroad Wrought	10.50 to 11.00
No. 1 Country Wrought	12.50 to 13.00
No. 2 Country Wrought	10.50 to 11.00
Wrought Pipe and Flues	10.50 to 11.00
Railroad Malleable	12.50 to 13.00
No. 1 Steel	13.00 to 13.50
No. 1 Machinery Cast	10.50 to 11.00
Stove Plate and Light Cast	9.50 to 10.00
Cast Borings	6.00 to 6.50

The Coal Trade.

BY [illegible], NEW YORK.

There has recently been a much better tone to the trade. The severe weather of February has helped along to that end, for numerous steam generating plants have been run at full pressure, and the general trend of manufacturing establishments is toward the greater use of fuel—greater than was the situation three weeks ago. The railroads are carrying more fuel than they did in January; that was the ebb, so far as Coal trade conditions are concerned, within recent times. It is one of the notable features that in January the Pennsylvania Railroad carried only about three-quarters of the tonnage that it moved in the same month last year.

Another interesting trade feature is the greater demand for the slack of the Bituminous mines, which is now quoted in some instances as high as 75c. a ton at the mines, even on yearly contracts. This development and the heavy demand for the smaller sizes of Anthracite, generally known as the steam sizes, show that there is a better use of Coals for these purposes, as stated above. It is known that many of the Soft Coal mines are not running over four days a week, and this helps the situation from the producers' point of view. Anthracite has been doing a full business, for the January returns show 5,618,339 tons shipped, which is much ahead of last year, while the average January shipment for five years previous was 5,043,160 tons, which should mean a full supply of all the various sizes.

The Bituminous Coal trade has had some relief owing to the clearing up of accumulated stocks at tidewater. The curtailment of production which the large operators have enforced is directly responsible for the consumption of a great portion of the stock on hand. When the market becomes active again, the central Pennsylvania operators will be able to supply plenty of Coal by reason of the fact that they have much Soft Coal at the mines waiting for shipment, and they will be able to secure ample facilities for bringing their production to tidewater points. The bargain counter prices, however, have about disappeared.

At tidewater Pea Coal is still reported short, but the demand is not so great for this as it was, and a surplus of it would not surprise any one. Buckwheat has fallen, and individual Coal that was held at $2.45 and upward a week ago is now down to $2.25 and not finding a ready market at that. Rice is also more easy, and prices have declined a little on this size. Barley is a drug, and practically no price induces business. At no time during the summer could this size be purchased at anywhere near the figures now prevailing on this size.

Soft Coal has continued to improve gradually. At present there is scarcely any cheap Coal on the docks. Considerable Coal was being forced for sale at sacrifice prices a week ago, and this moved it off quite rapidly. At South Amboy the number of cars standing average about 1200, but there is little or no Coal now being sacrificed. Shippers are only sending down what they can move on contracts, and there is, therefore, no amount of surplus Coal held on hand. The Port Reading situation is also in good shape. The surplus was cleaned up at this dock a week or more ago, and at this time prices are fairly good for shipment. At St. George there is still a little demurrage Coal to be moved, which is offered at $2.15, f.o.b. This should be cleaned out shortly, and the market will no doubt show a considerable improvement, in the way of price at least. New York prices on Soft Coal may be quoted as follows:

[illegible]	[illegible]
High grade, three-quarter lump	3.20 to 3.25
High grade gas, run of mine	3.00 to 3.10
Best Miller vein [illegible]	[illegible]
Good Miller and Moshannon [illegible]	[illegible]
Best Somerset	2.70 to 2.80
Ordinary Somerset	2.65 to 2.70
Fairmont [illegible]	[illegible]
Fairmont [illegible]	[illegible]
Odds and ends to relieve embargoes, &c.	2.30 to 2.50

Line Bituminous rates are as follows:

Pennsylvania Railroad Coals.

Georges Creek	$2.00 to $2.25
Best Miller vein	1.40 to 1.60
Good Miller and Moshannon	1.15 to 1.20
Best gas coal, three quarter lump	1.30 to 1.40
Best gas coal, run of mine	1.20 to 1.30
Best gas coal, slack	.45 to .65
Ordinary Clearfield	1.10 to 1.15
Ordinary Latrobe	1.00 to 1.10

[illegible] Coals.

Georges Creek	$2.00 to $2.25
Best Somerset	1.25 to 1.30
Somerset	1.10 to 1.15
West Virginia Freeport	1.00 to 1.05
Fairmont District, three-quarter lump	1.00 to 1.10
Fairmont District, run of mine	.90 to 1.00
Fairmont District, slack	.45 to .50

At least some portion of the Anthracite trade is discussing new Coal year topics. The question whether there shall be the usual reduction of 50c. per ton at the beginning of the Coal year is the most important. In the West the opinion is strong among the dealers, and it has been rather openly expressed in the last two weeks, that there should be no reduction in price on April 1. Certain representatives of the largest and the smallest shipping companies have favored a reduction, but the others have thought it unwise to change the course which has been followed for so many years.

Metal Market.

NEW YORK, February 11, 1908.

Pig Tin.—The shortage in Tin is becoming more and more acute, and sharp premiums are demanded and paid for spot stocks. On Monday, in spite of a drop of £2 since Friday in London, the market advanced 30 to 35 points here. On Thursday and Friday of last week there was an active business, and on Saturday a few transactions were effected, which is unusual. Buying seems to be coming from both can makers and Tin Plate manufacturers. The following is the range of prices for the past week:

	Cents.
February 5	28.50
February 6	28.85
February 7	28.80
February 9	29.00
February 10	29.10 to 29.15
February 11	29.50 to 29.60

Arrivals since the first of the month have been small, amounting to but 405 tons. There are afloat for American ports 2000 tons, and the only important vessel coming in the near future is the Massachusetts, which is due to arrive February 19, with 850 tons. This boat will, of course, materially relieve the situation, but the question is what consumers are to do until Tin from this vessel is unloaded. There are two possible solutions, either Tin can be shipped by fast steamer from Southampton, or the leading consuming interest may see fit to put some of its stock in the market and so relieve the situation. This has been done in the past, but it seems unlikely that during a period of low prices, such as this, the same strenuous effort will be made to keep the market in due bounds as was made when Tin was selling 10c. to 15c. per lb. higher. Inquiries were in the market on Monday for more Tin than could be supplied at the price. The low price of the week in London was made February 10, Tin closing at £127 15s. for spot and £128 for futures. The London market closed firm to-day at £129 10s. for spot and £129 5s. for futures, with sales of 400 tons spot and 1000 tons futures.

Copper.—A gradual declining tendency is noted, but business is so dull that it is almost impossible to secure any confirmation of prices. In a general way Lake can be had at 13.37½c. to 13.62½c.; Electrolytic at 13.25½c. to 13.50c., and Casting at 13.12½c. to 13.37½c. These prices, however, are not being quoted by producers, but there is so much resale Copper in the market that it is believed consumers can secure metal at these figures. At times like these the market is extremely sensitive to disquieting rumors, and two at least have appeared this week, one being of a sale of fair tonnage at concessions but within the quoted range, and another that an important producing interest has given orders to meet the market. Whether these are true or not remains to be seen, but they have undoubtedly had some effect on sentiment. Domestic consumers are buying practically nothing, and foreign buyers are likewise looking for

lower prices. A further decline in the London market took place on Monday, prices going down to £59 7s. 6d. for spot and £59 15s. for futures. Since then, however, they have recovered slightly and close to-day at £59 10s. spot and £59 17s. 6d. futures, with spot sales 400 tons and futures 1000 tons. Exports are small, amounting to but 5122 tons since February 1. L. Vogelstein & Co., American agents for Aron Hirsch & Son, Halberstadt, Germany, figure the German consumption of Copper during the year 1907 at 119,552 tons, being a decrease of but 3 tons as compared with the year 1906. Of this consumption 103,630 tons were imported from the United States.

Pig Lead.—The market is quiet and dull, but continues firm, and Lead can be had in New York at 3.75c. The same price, however, has been paid in St. Louis for good brands, and there is nothing offered there under 3.75c. This means that the New York and St. Louis markets are on the same basis.

Spelter.—Prices advanced somewhat sharply on Saturday, and it looked as though a boom was on, 4.90c. being paid for spot Spelter in New York and 4.75c. in St. Louis. The principal reason for this sharp advance was the withdrawal of prices by one of the leading producers, coupled with the rumor that it would hereafter base its prices on those prevailing for Ore, which would be equal to 5.15c., New York. Of course, no Spelter can be sold at the present time at that level, but better business is hoped for.

Antimony.—The market continues dull and unchanged. Cookson's being held at 9.50c., Hallett's at 9c., and Hungarian brands at 8.50c.

Nickel.—Prices are without change, at 45c. for large lots and 55c. to 60c. for smaller quantities.

Tin Plates.—Some improvement in the domestic demand for Tin Plates is noted. The encouragement given to the Tin Plate trade by an advance of 1½d. in Swansea last week on Welsh Tin Plates continues. The advance now amounts to nearly a shilling on Oil Plates, and there has been a very good business transacted. Welsh Tin Plate makers are considerably more optimistic regarding the outlook. Domestic prices continue unchanged, at $3.89, f.o.b. New York, for 100-lb. IC Coke Plates, and $3.70, f.o.b. Pittsburgh.

Ferroalloys.—The resale lots which have been hanging over the market, which were offered by some of the large electrical consumers, have apparently disappeared, and prices are on a more stable basis, although practically unchanged from a week ago. For 50 per cent. Ferrosilicon $85 is asked and paid. There is an inquiry in the market this week from the Carnegie Steel Company, which has been the first important Steel inquiry for some time. Unchanged prices continue to be quoted on Ferromanganese—$47.50 to $48.50.

Old Metals.—The continued decline in the price of Ingot Copper has had no effect on the price of Old Metals. It has been frequently pointed out that in times of a low market like these manufacturing concerns which accumulate Scrap prefer to keep their supplies until better prices can be realized, consequently there is little coming on the market. On the other hand, some concerns are running so close that they prefer to buy Scrap Metal, if only at a slight concession from Ingot Copper. Shipments abroad continue to have a stimulating effect on the market. Stocks in dealers' hands continue low, and, as stated above, their selling prices are unchanged from last week, as follows:

	Cents.
Copper, Heavy Cut and Crucible	13.00 to 13.25
Copper, Heavy and Wire	12.50 to 13.00
Copper, Heavy and Bottoms	11.50 to 11.75
Brass, Heavy	10.00 to 10.25
Brass, Light	7.75 to 8.00
Heavy Machine Composition	12.00 to 12.50
Clean Brass Turnings	8.25 to 8.75
Composition Turnings	10.00 to 11.00
Lead, Heavy	3.50
Lead, Tea	3.25
Zinc Scrap	3.25

New York.

NEW YORK, February 11, 1908.

Pig Iron.—Foundry grades are inactive, and little has been done in Basic, makers of which are generally maintaining $17.25, f.o.b. eastern Pennsylvania mill. A Cast Iron Pipe company has taken some No. 4 and Forge Pig in the past week, one lot amounting to 3000 tons. The maintenance of prices appears to be general, and Eastern producers are restricting their output to the extent of avoiding any increase in stocks. We continue quotations at tidewater as follows: No. 1 Northern Foundry, $18.75 to $19; No. 2 Foundry, $17.75 to $18.25; No. 2 Plain, $17.25 to $17.50; Gray Forge, $16.75 to $17. On Southern Iron we quote $17.50 to $18 for No. 1 Foundry and $17 to $17.50 for No. 2 Foundry.

Steel Rails.—The Pennsylvania Railroad Company's order for 1908 placed in the past few days amounts to 55,000 tons, in addition to 30,000 tons carried over from last year, which the mills are now rolling. The Steel Corporation receives 27,500 tons, or half the order, the remainder going to the Pennsylvania and Cambria companies and the Lackawanna Steel Company. The Erie Railroad's order for 60,000 tons is about closed. The Carnegie Steel Company has booked 4000 tons for the Pittsburgh & Lake Erie, and an additional tonnage will be placed later. Two other lots, 1000 and 1500 tons, were also closed at Pittsburgh. The Panama Canal Commission is in the market for 2200 tons of 70-lb. Rails and 20,000 four-hole Angle Bars.

Structural Material.—Railroad bridge work has been rather more active of late, though the sharp competition for the relatively small tonnage coming out indicates that bidders are sacrificing profit to keep wheels turning. Most of the orders are for the West and Northwest. The Chicago Junction Railroad placed 1150 tons with the Wisconsin Bridge Company, and the St. Louis & San Francisco has contracted for 2200 tons. The Chicago & Northwestern's recent bridge orders amount to nearly 3000 tons, and the C. M. & St. P. closed for upward of 3000 tons. The Royal Insurance Company Building at San Francisco, 450 tons, has finally been closed, the contract going to the American Bridge Company. In New York City two school buildings, requiring about 1300 tons, are to be erected at once, and much other school work is waiting on the providing of funds. In New York City, according to the head of a large construction company, 150,000 workmen in the building trades are idle, and the same authority puts the number of such workers idle throughout the country at 700,000. On mill shipments the following prices prevail for tidewater deliveries: Beams, Channels, Angles and Zees, 1.80c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—It is understood that considerable business was booked by the Iron Bar mills prior to the advance in price on February 5. Some orders have also been booked at the new price, as buyers have been somewhat impressed by the rapid change of front shown by the manufacturers. Eastern Bar mills are therefore more generally getting into operation, and those which have been running are assured of being able to continue for some little time. Iron Bars are quoted at 1.50c., Pittsburgh, or 1.60c., tidewater, and Steel Bars at 1.60c., Pittsburgh, or 1.76c., tidewater.

Plates.—Inquiries appear to show some improvement, but purchases are still indicative of a hand-to-mouth business. Prices are maintained as follows, at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—The past week has witnessed the closing of a considerably larger volume of business than any previous week for some months. Buyers are more generally in the market, and the volume of orders placed represents about the normal trade for this month. Bids on about 8000 tons of 24-in. for New Britain, Conn., will be opened to-day. Foundrymen are vigorously seeking business, and every order is the subject of sharp competition. Carload lots of 6-in. are available at $25 to $25.50, per net ton, at tidewater, although some makers name higher prices as their minimum.

Old Material.—The Foundry business is picking up to some extent. Cheap material in this line is not so plentiful, and prices consequently show a slight advance on Cast Scrap of all kinds. A few items in rolling mill material are in better demand as a result of the starting up of more of the Eastern Bar mills. A better demand is noted for Relaying Rails, and bargains are not so numerous as they have been. While the market looks better generally, yet it is observed that much of the demand for rolling mill stock and Steel Scrap comes from dealers who are filling orders taken some time ago. Not much demand has appeared directly from the mills and Steel works. The continuance of activity in the Scrap market will therefore depend on the ability of the large consumers to keep their works in operation. Conditions, however, are regarded as somewhat encouraging, and dealers are taking a more hopeful view of the future. Quotations, per gross ton, New York City, are as follows:

Old Girder and T Rails for melting	$8.50 to $9.50
Heavy Melting Steel Scrap	8.50 to 9.50
Old Steel Rails, rerolling lengths	10.00 to 11.00
Relaying Rails	17.50 to 18.50
Old Iron Rails	13.00 to 14.00
Standard Hammered Iron Car Axles	15.50 to 16.50
Old Steel Car Axles	13.00 to 14.00
No. 1 Railroad Wrought	11.00 to 12.00
Iron Track Scrap	9.00 to 10.00
No. 1 Yard Wrought, long	10.50 to 11.50
No. 1 Yard Wrought, short	9.50 to 10.00
Light Iron	4.50 to 5.50
Cast Borings	4.00 to 5.00
Wrought Turnings	5.50 to 6.50
Wrought Pipe	8.50 to 9.50
Old Car Wheels	17.00 to 18.00
No. 1 Heavy Cast, broken up	13.00 to 13.50
Stove Plate	11.50 to 12.00
Grate Bars	9.00 to 9.50
Locomotive Grate Bars	10.00 to 11.00
Malleable Cast	12.50 to 13.00

The American Railway Association's report February 6 showed 375,000 idle cars, against a shortage of 104,226 cars on February 6 last year.

The Basic Open Hearth Steel Process.*

BY ACHILLE BOSSER.

There is no old iron or steel which is not suitable for charging into the open hearth furnace, provided it is free from copper and from tin. The only materials which would introduce harmful elements are those applied to the surface of steel and iron; for instance, in tinning or coating with lead or zinc. The choice of the pig iron which is to constitute the other part of the charge depends not alone on the quality of the steel demanded by consumers, but also on a variety of economic considerations.

The Character of the Product Governs the Choice of the Pig Iron.

If it is the intention to produce high grade steel, and if the oxidation is not to be carried too far, recourse will be had to gray or mottled pig iron. The high percentage of silicon in the former will favor the refining process, and at the same time protect the iron against harmful oxidation. When it is the object to produce extra soft or hard steels which are subject to vigorous tests, then it will be usually advantageous to employ pure pig iron like Bessemer.

For the manufacture of ordinary mild steel, when the construction of the furnaces and their handling are adapted to the circumstances and assure a complete dephosphorization, it is advantageous to take phosphoric pig iron, since the difference in price between Bessemer and phosphoric iron favors the lattter. Thus the works which produce pig iron for the basic Bessemer generally utilize for their open hearth purposes basic Bessemer pig iron cast during stoppages or on Sundays, or grades of iron obtained from less expensive ores which contain from 0.15 to 0.80 per cent. of phosphorus; that is to say, iron too impure for the acid Bessemer and too low in phosphorus for the basic Bessemer process. Into pig iron of this character only that quantity of phosphorus is introduced which is brought by the ore without making any additions in the blast furnaces of phosphoric slags which ordinarily would be indispensable in order to produce pig iron for the basic Bessemer process. In order to utilize pig iron of this character with success it is evident that it is necessary to have oper. hearth furnaces which heat well, because the quantity of slag is large and is fused with difficulty.

The basic open hearth furnace permits of the use of pig iron of any phosphorus contents, provided that a sufficient quantity of lime is charged and provided that the operation is carried on until complete dephosphorization is attained. Generally, however, the phosphorus contents of the charge is made as low as possible. Any increase in the percentage of phosphorus brings with it the lengthening of the time for refining, increases the outlay for fuel and promotes the oxidation of the bath, which must afterward be counteracted by a larger addition of ferromanganese or of spiegel. Besides, large masses of cinder impair the quality of the steel. Therefore, as a matter of principle, open hearth charges are avoided which have a high percentage of phosphorus, and it is frequently advantageous not to go beyond 0.6 phosphorus.

The Ratio of Scrap to Pig Iron.

The ratio between the weight of the charge of pig iron and that of old material or scrap varies within very wide limits, depending above all upon the materials which the steel manager has at his disposal. It may happen, as the result of technical considerations and of local conditions, that the manager will find it advantageous to employ a charge carrying more pig iron and less scrap without, however, allowing the final product to contain more carbon, silicon or manganese. Thus the mixture may sometimes carry as much as 90 per cent. of scrap. This is the case with open hearth furnaces, which have been built as appendages to large Bessemer or basic Bessemer steel plants, and are intended to be used for the remelting of the scrap made. In the case of works having an abundance of pig iron the old materials constitute from one-half to three-quarters of the charge. Those works, on the contrary, that must buy pig iron in the open market should base their operations on the relative price of pig iron and old materials and fix the ratio with the aim of cutting down the length of the operation and securing minimum cost per ton of steel produced.

The charge should therefore be regulated in such a way that the operation involves the minimum of cost, both as to fuel and as to raw materials. With materials low in phosphorus, the weight of the pig iron which enters the charge has little influence from the point of view of the time required for the operation, because it is always possible to introduce oxidizing materials in proper quantities. Pure pig iron which carries silicon refines rapidly owing to the high temperature obtained by the combustion of the silicon and to the increase in the affinity of carbon to oxygen which a higher temperature brings about. It is not the same when pig iron high in phosphorus is treated. The operation, which in itself is prolonged, becomes still more extended when the percentage of pig iron in the charge is exaggerated and goes beyond that quantity needed to protect the metal against oxidation during the melting period. It will be seen, therefore, that the composition of a charge of a basic open hearth furnace varies within wide limits. [The author here cites a number of charges of several European works.]

Chemical Reactions.

The refining operation in the open hearth furnace consists essentially in the gradual elimination of the carbon, silicon, manganese and phosphorus, which is brought about by exposing the charge during several hours to the oxidizing action of the atmosphere and of the slag.

The oxidation of the different elements in the charge begins during the melting, so that the initial bath has a chemical composition very different from the average composition at the time of the charging of the materials. The melting goes on more rapidly the quicker the furnace is charged by mechanical methods and the better the furnace heats. The melting temperature of the different materials composing the charge is not the same. The higher they are in carbon the lower is the temperature required. Of the materials used, it is the pig iron which is first melted and which, trickling through the charge, undergoes the oxidizing action most. Its impurities are oxidized and protect the iron against too rapid oxidation, which would make a great part of it enter the slag.

The initial percentage of silicon in the charge should be moderate in the case of a basic lining. Silicon corrodes actively, the silica which is the result of its combustion attacking the hearth quickly. According to the quality of steel to be made, and in order to avoid as much as possible a rapid wear of the dolomite lining, it is desirable to approach as closely as possible a charge averaging 0.40 per cent. of silicon, with 0.80 as the maximum. The oxidation of silicon begins as soon as the pig iron melts, but it is partial only if the temperature of the furnace is high. It is carbon that then absorbs the greater part of the oxygen.

A low temperature, that is to say, slow melting, increases the oxidation of silicon, iron and manganese. The silica produced, being strongly acid, saturates the ferrous and manganous oxides formed in the bath before the lime additions have entered into the slag, so that silicates of iron and of manganese are formed. The latter pass into the slag. As the reactions develop the slag not only dissolves the lime additions, but there are formed, in the vicinity of the metallic charge which melts more rapidly, pockets containing liquid metal which dissolve the dolomitic lining, forming silicate of lime and of magnesia. The silica content of the slag, therefore, diminishes as the operation proceeds, while that of lime and of magnesia increases. As the result of these slags rich in bases, the affinity of silicon for oxygen is notably increased, and it is found that after the bath has been decarburated only traces of silicon remain in the bath. The addition of ore also contributes toward oxidizing the silicon contained in the charge, while the final addition of ferromanganese or of spiegel may finally reduce the silica

* From the *Revue Universelle des Mines et de Métallurgie*, July, 1907.

in the slag and increase the percentage of silicon in the metallic bath.

Manganese.

Since the product of the oxidation of the manganese contained in the metallic charge is a powerful base, which is formed in the presence of acid slag, there is produced an antagonistic action, and the formation of manganous oxide may be sufficiently interfered with to force the manganese to remain in the bath. While in the acid furnace the elimination of manganese excited by the presence of acid slag is very active, the basic lining, on the contrary, favors its retention, even under the influence of an oxidizing atmosphere or of additions of oxidizing materials, like ore or scale. The high temperature at which the open hearth operation is carried out favors the affinity of carbon for oxygen, forcing it to secure all oxidizing effects and to protect the manganese as long as the bath contains carbon. A part of the manganous oxide, which does not find any silica for its saturation, and which is formed at the expense of oxide of iron, is reduced by the carbon, the manganese re-entering the bath. The manganese, therefore, is an ozidizing agent in the bath, and the facility with which its oxides are reduced assures to it an important part in the refining of the metal.

When there is present a notable percentage of manganese in the initial charge it is not a rare occurrence to find 0.25 per cent. and even more in the metal when the carbon has been reduced below 0.1 per cent. It remains in the metal until the end of the refining process, and even after the dephosphorization. The presence of manganese in the charge is useful from several points of view. It protects the iron against oxidation, and, therefore, prevents the metal from absorbing protoxide of iron or from becoming hot short. If this element did not exist in the charge, or was in it only in a small percentage, so that the oxidization of iron would not be limited, then there would be the danger that the metal would be overoxidized. It would then become necessary to carry it back to its normal composition by large additions of iron high in silicon, carbon and manganese to the detriment of the quality of the metal, and at the expense of delaying the operation.

Manganese possesses valuable properties. It furnishes a fluid slag, and a slag containing manganese favors desulphurization. Although the presence of manganese in the charge is indispensable, and has an important action on the oxidation and desulphurization of the metal, it would be, nevertheless, disadvantageous to have an excess, since its effect is to slow down the heat. The best plan is to try to secure a charge carrying from 0.85 to 1.4 per cent. of manganese, the percentage being dependent upon the quality of the steel required and the method of charging. By charging mechanically the melting is accelerated, carbon burning rapidly, as compared with the silicon and manganese, so that the original percentage of the latter in the charge may be less than if the charging is done by hand. When the pig iron and the scrap available do not make it possible to arrange for a charge containing manganese within these limits there may be added ferromanganese or spiegel in amounts adequate to arrive at the required percentage of manganese.

Decarbonization.

The oxidation of carbon takes place in the presence of silicon and manganese at the outstart of the melting. Its elimination in the form of carbon oxide is the more rapid the higher the temperature of the furnace and the more oxidizing the atmosphere. An almost neutral atmosphere or one containing only a slight excess of oxygen retards its elimination. On the other hand, too poor a gas or an excess of air may lead to too rapid a lowering of the carbon. When all the metallic materials (pig iron and scrap) and all the basic materials (lime, dolomite and oxide of iron) have been melted, then the bath is oxidized through the intermediary of the slag. At this moment the metallic bath must still contain enough carbon in order to "work"—that is to say, in order that the carbonic oxide in escaping may create a boiling action, which aids the transmission of heat between the furnace and the metal through the intermediary of the slag. Immediately after the melting the surface of the metallic bath is still in direct contact with the flame. The fusion of the steel scrap has formed a good deal of oxide of iron, a part of which combines either with the silica or with phosphoric acid, forming a cinder which is very rich in protoxide of iron and which floats on the surface of the metal.

From this moment on, the metal is withdrawn from the action of the gas which can no longer act upon it except through the intermediary of the slag—that is to say, it is then that the latter becomes the vehicle of the oxygen. The oxidation of the impurities in the metal is carried out by the intermediary of the iron and manganese oxides in this slag, which are brought into it by the addition of ore or are formed by the oxidation of the metal through the medium of the gaseous atmosphere in the furnace itself. From the moment when the layer of slag covers the surface of the bath two intermediaries exist between oxygen and the impurities—the slag itself and ferrous oxide. When the slag begins to cover the metal the elimination of carbon is delayed until the slag becomes sufficiently basic to be overoxidized. A slag which is not sufficiently fluid—that is to say, contains a good deal of alumina, magnesia or lime and only small quantities of metallic oxides—isolates the bath from the flame, and as a consequence retards the decarbonization. In this case it does not suffice, in order to bring about a rapid defining, to regulate the admission of air and of gas to the furnace but it is necessary in order to make the decarbonization more active to make oxidizing additions.

Very often recourse is had to rich ores low in sulphur, but as it is sometimes difficult to procure them they are replaced by rolling mill or hammer scale. These additions increase the surface of contact between the carbon and aid in its elimination. The oxidation of the carbon is made manifest by the boiling, which is produced by bubbles of carbonic oxide escaping from the molten metal. A part of the iron of these additions is reduced and enters the bath. The waste is always proportional to the quantity of slag furnished by the oxidizing agent added. The more pig iron is used in the charge the greater will be the energy with which the refining is carried through and the more important will become the addition of oxidizing agents. When the boiling of the bath has ceased or has moderated the decarbonization approaches its end.

In order to reduce to the strictly necessary amount the final additions of ferromanganese or of spiegel, and to lessen the time required for refining, several methods of decarbonization are employed. The decarbonization is carried to the extreme or the operation is stopped at the point approximately needed for the carbon contents aimed at. The heat may be stopped when the decarbonization is still incomplete; that is to say, when the carbon content is at the point aimed at. This can be done as well on an acid as on a basic hearth, provided the product is a steel high in carbon and has been made from low phosphorus pig. The stopping of the decarbonization at the points aimed at in the final product either without or with dephosphorization is sometimes done when mild or special mild steel is to be made. Then the refining is carried on until the carbon and the manganese have been eliminated entirely, their absence being characterized by the fact that the metal does not harden.

It is easier to work exactly to complete decarbonizing than otherwise, but for the production of semihard or hard steels, particularly when low phosphorus pig iron is used, this practice is costly. The additions must be increased in quantity, both for the sake of obtaining the necessary hardness and in order to counteract a pronounced oxidation. The practice of stopping the decarbonizing operation at a given point is less frequently employed when phosphoric pig iron is used. Contrary to the opinion held by certain metallurgists, it is possible, however, to manufacture certain steels of medium or high hardness by this process. As a matter of fact, it is possible in a basic furnace to stop the reducing action of carbon on phosphoric acid by sufficiently basic slag, and to

completely carry off phosphorus before the carbon has been eliminated.

When the pig iron to be treated is low in carbon, or when the proportion entering the charge must be small, that is to say, when the carbon content in the bath is too low to make sure of its working well after the bath has been melted, it is possible to substitute additions of coke for the carbon or for pig iron containing carbon. Since there are losses of carbon due to its passing directly into the slag, the carbon contents in the initial bath must be higher than in the pig and scrap process. These losses are lessened by a preliminary mixing of the coke with iron turnings, which are placed on the bottom of the hearth and are covered with scrap or other refining materials. When a partial substitution of coke for pig iron is adopted, it is necessary to use such a quantity of ground coke that the calculated contents of carbon in the mixture of coke and of iron is higher by two-thirds than the contents in the ordinary method of operation. The length of the operation is somewhat increased, but the result may be regarded as satisfactory both from the point of view of the quality of the steel and of its cost.

Desulphurization.

Sulphur is a harmful element which should be kept out of the charge altogether whenever technical conditions permit it. Whenever possible, the pig iron should not have more than 0.1 per cent. of sulphur. This element may be eliminated on the basic hearth, and particularly when running with liquid metal, but this practice is expensive and by reason of the serious difficulties which sulphur may cause in the steel works it is better to eliminate it in the blast furnace. Sulphur and oxygen are the formidable enemies from the point of view of the working qualities of the steel. They are to be feared more particularly when both of them are present simultaneously and because oxygen adds its influence to that of sulphur.

With 0.1 per cent. of sulphur the steel is short at cherry red heat, but it forges well at a welding heat. Therefore it often occurs that a steel works sample forged rapidly to a test bar does not present any cracks, although when the steel is rolled into shapes, that is to say, finished at a lower temperature, it falls into pieces in the rolls. Extra mild steel, which is always somewhat oxidized, is more particularly subject to cracks than ordinary mild steel. Therefore high sulphur iron should not in any case be used in the manufacture of extra mild steel. While for extra mild (welding) steels sulphur must be excluded entirely, and a percentage beyond 0.5 of manganese becomes harmful, this percentage of manganese on the contrary helps ordinary mild and semi-hard steel containing sulphur to an amount exceeding a limit ordinarily admitted (0.05 per cent.), when obtained for example by treating pig iron under special circumstances which is too high in sulphur. In this case the pernicious influence of sulphur is considerably reduced by adding exaggerated quantities of manganese before the end of the refining operation.

There is not a single process of desulphurization, so far known, which will permit the elimination of sulphur in the open hearth furnace to advantage and with the certainty possible in the case of phosphorus. Reference may be made to the desulphurizing processes of Rollet, Massenez, Werner, Saniter and others, which in spite of their merits do not offer adequate advantages and are not safe enough in order to justify continuous acceptance in practice. Not one of them has really offered a working solution.

On a basic lining the method of desulphurization which is most used consists in the formation of a slag containing 10 to 12 per cent. of silica, 3 to 4 per cent. of iron and 60 per cent. of lime. After getting rid of this first slag, which with the sulphur carries off also a considerable proportion of the phosphorus, a second slag is made which takes care of the dephosphorization proper. It is with this second slag kept at the desired composition that the operation is carried to a close. The elimination of sulphur is most marked the higher the initial bath was in sulphur and the higher the percentage of manganese in the material charged. In this method of desulphurization the sulphur is eliminated, not by oxidation, but by simple displacement by lime and magnesia.

The manganese decomposes the sulphide of iron as well as the oxide, and the sulphide of manganese, which is but little soluble, separates on account of its low density, passing away with the slag. By providing for a special slag for the desulphurization, it is possible under favorable conditions to carry away 80 to 85 per cent. of the sulphur in the initial charge. Manganese ores introduced into the slag are also good desulphurizers, but on account of the large quantity of slag which it is necessary to melt, the operation is much delayed, since this slag is naturally pasty, it is necessary in order to give it the desired fluidity to add fluorspar, the quantity going as high as 15 per cent. of the limestone. Fluorspar is costly and has the tendency to cut out the lining, and therefore shortens the life of the furnace. In practice, therefore, it is best not to rely too much on this process of desulphurization, nor to use sulphuric pig iron merely for the sake of economy. On account of the serious difficulties which sulphur may cause, and from which the steel works must suffer, it is best to rely upon the blast furnace to eliminate the sulphur. The use of the mixer has no other aid but to complete the action, and, really, the desulphurization in the open hearth will never be more than a makeshift.

The New Middle West Pig Iron Contract.

Secretary William Gugenheim of the Iron Buyers' Association, Springfield, Ohio, is now receiving replies from members and those interested in various ways in the manufacture and utilization of pig iron, in answer to circular letter No. 3, recently sent out. When these replies have all been received a final meeting will be called by the Contract Committee, which will be attended by the sellers to settle any objectionable points. The contract form as revised will then be put up by the association for adoption. The revised form as presented for approval is the same as published in *The Iron Age* of January 30, with slight changes. Settlements of invoices are on the 20th of each month instead of the 15th, as printed, and interpreting the last paragraph literally, the new form reads as follows:

Failure to make shipments as per contract shall forfeit seller's right to holding buyer to this contract, and the buyer shall have the right to purchase this grade of iron in the open market and charge any excess over contract price to the seller during the interruption of shipments. Failure to take shipments as per contract shall entitle the seller to dispose of the iron in open market and charge buyer the difference.

Interruptions of deliveries are subject to strikes, fires, floods and the acts of Providence.

The paragraphs given herewith have constituted the chief cause of contention between buyer and seller, and now that both sides have made concessions it is expected that the signing of an agreement between the association and the furnaces is a matter for early consummation.

The New Brunswick Iron Company, owning iron ore deposits at Lepreaux, N. S., has given a lease of the property to the Dominion Iron & Steel Company, Sydney, N. S. Development operations are to be started at once. It is said that the lease is for 80 years, and is on a basis of 25 cents royalty to be paid the New Brunswick Iron Company on every ton of ore taken. The property is located on the New Brunswick Southern Railway, close to the Bay of Fundy.

The Iron Molders' Unions of Minneapolis and St. Paul, Minn., have declared off unconditionally the strike inaugurated in those cities May 1, 1906. These strikes involved approximately 300 union molders and coremakers. The national molders' organization withdrew its support from its members and ceased paying strike benefits in January of this year.

The Machinery Trade.

NEW YORK, February 11, 1908.

Following the increase in inquiries of the previous week the demand for machinery the past week was better than it has been for some time. While the business transacted consisted of orders for small lots, these were not only more numerous, but in some cases covered a large amount of equipment. Inquiries were also more plentiful than they have been. The increase in inquiries to an extent indicates an upward trend to trade, and merchants generally feel much encouraged over the brighter aspect given to business by the larger demand developed since our last report. An especially significant feature was the increased demand for the products of one large manufacturer, the purchase of whose products is usually followed by machine tool purchases. Practically the entire business was received from the small plants, the larger interests having not yet come into the market to any extent. The tendency of the smaller buyers to come into the market more freely is helping to restore confidence, and it is hoped that they will be followed shortly by the more important interests. The railroads are doing but little buying and are sending out no substantial lists. The Chicago & Northwestern Railroad has sent out inquiries for a few machines.

Not for some time has the Navy Department issued a circular covering so many machine tools as that just sent out, the bids to be opened March 3 and 10. The circular covers over 50 machine tools, a great portion of them for the Eastern navy yards. The machines specified on the circular are printed in another column.

Machinery houses have been expecting every week to receive a substantial list of machinery requirements from the Delaware, Lackawanna & Western Railroad for its new shops at Scranton, Pa., and it has been generally reported in the trade that such a list has been prepared. These reports are not quite correct, the company intending to make no very large purchases of machinery within the near future. We are officially informed that the company does not expect to have its machine shop at Scranton ready for use until some time in 1910, and will, of course, not be in the market for machinery to equip the shop so far in advance of the completion of the building. The railroad expects, however, to be in the market some time this year for such machinery as it may need to equip its new foundry and blacksmith shop under construction and which should be completed in the fall, but the machinery for these two buildings will probably not aggregate any great amount. The foundry will be 120 x 400 ft. and the blacksmith shop 125 x 300 ft. From the sizes of these buildings it is evident that considerable additional equipment from that already bought will be installed, but they will not necessitate the purchase of a substantial lot of machine tools.

The Intercolonial Railroad of Canada will receive bids until February 15 for a 21 years' lease of its shops at Moncton, N. B. The leasing of these shops is of interest to the trade, owing to the fact that a movement is on foot to convert the shops into a car wheel manufacturing plant, and if this project goes through it is probable that considerable new equipment will be installed. Each tender must be accompanied by a certified check for $10,000, to be held by the Department of Railways and Canals in the case of the successful bidder until such time as the lessee has duly installed on the premises machinery in value to the sum covered by the check.

The New York Central Railroad has some inquiries in the market covering equipment for its new tank shop at West Albany, N. Y. The inquiries, it is understood, cover principally conveying machinery and machine shop accessories. The company is building at West Albany a one and two story boiler house, 125 x 129 ft. Manufacturers of power plant equipment will be interested in the projection of a new station at 149th street and Park avenue by the New York Central Railroad. The property needed for the undertaking has been secured, and it is understood that as soon as the rights can be secured from the Board of Estimate work on the new station will be begun.

From reliable reports it is evident that Edwin S. Cramp of Philadelphia and associates intend to go ahead with the building of their proposed ship repair plant at Norfolk, Va., where they recently purchased considerable property. The Cramp Dry Dock Company has been incorporated, with a capital stock of $100,000, and it is understood that plans have been completed for the plant, to include three marine railways, six large buildings and smaller structures. There is to be constructed a two-story machine shop, 60 x 290 ft.; woodworking plant, two stories, 40 x 80 ft., and two other buildings, 30 x 40 ft. each.

It is understood that the Hudson Companies, 111 Broadway, New York, has some inquiries out for blowers and other ventilating equipment to be used in its tunnels and stations. It is not known how extensive these purchases will be, but it is said in the trade that there will be some good sized requirements.

The Standard Oil Company has not as yet purchased the power equipment for the large plant the company is constructing at Bayway, near Elizabeth, N. J. Specifications have not been issued to the trade as yet, but the plant, it is understood, will be a large one, the building in which it will be installed being 100 x 200 ft. and three stories in hight.

The recent fire at the plant of the John A. Roebling & Sons Company, Trenton, N. J., has caused considerable comment in the trade, where it is reported that the company will have to buy considerable new equipment to replace that which was burned. It is understood that the destroyed portion of the plant will be rebuilt, and it will not be surprising to see the company come into the market shortly for new machinery.

The application of the Long Acre Electric Light & Power Company, New York, to the Public Service Commission for permission to issue $10,000,000 of preferred stock and $50,000,000 in bonds indicates that the company intends to go ahead with its power project, which was outlined in these columns some time ago and which has been held in abeyance. The company states in its application that the new preferred stock and bonds are to be used for retiring the present issue of bonds, acquiring property on which to erect power houses and substations, constructing power houses and substations, &c. The company has a small plant in operation at Forty-seventh street and Second avenue, and some time ago contracted with the American & British Mfg. Company, Providence, R. I., for the principal equipment for a large power plant. Edgar Van Etten is president and John C. Sheehan vice-president.

The Micmac Gold Mining Company, 2 Rector street, New York, has announced its intention of erecting a power plant to develop power for its mines near Bridgewater, N. S. The plant will be a hydro-electric plant to develop about 400 hp., and arrangements will be made to develop additional power as the work progresses. The company will spend about $50,000, it is understood, and the equipment will include two water wheels, two generators, motors, turbine pumps, electric hoists and the necessary equipment for a transformer station. The company will also come into the market later on for some additional mining equipment, including drills and other tools. The work will necessitate the construction of a dam 200 ft. long and 15 ft. high.

Inquiries covering power equipment to develop about 1500 hp. have been placed in the trade by the Didier-March Company, Perth Amboy, N. J. This company is erecting a terra cotta plant at that place, 140 x 165 ft.

The State Department of Public Works has rejected the bid of the Lake Erie Dredging Company, Buffalo, N. Y., for Barge Canal contract No. 9, as it exceeded the State Engineer's estimate. It is probable that the contract will be readvertised.

Chicago Machinery Market.

CHICAGO, ILL., February 11, 1908.

Trade in machine tools continues quiet, though some dealers report a number of unpretentious orders that aggregate a moderate volume of business. It is evident that manufacturing industries are restricting their purchases of new tool equipment to such machines as are indispensable to present operation, and wants of this character are, under existing conditions, not extensive. There are, however, many small shops throughout the Middle West that are still fairly well supplied with work, and it is from these sources that a large portion of the business moving is supplied. Their orders are, of course, individually small, rarely exceeding a tool or two, but it comprises a trade that is eagerly sought by the machine tool interests. No lists including a considerable number of tools have appeared in the market for some time, but it is expected that one of considerable size will be submitted within a week or two by the Chicago Board of Education. This will comprise the equipment required for the Lake High School and will amount to approximately $18,000.

There are quite a number of inquiries in the market for small power plant equipment, among which the requirements for electrical machinery and apparatus predominate. Bids are being asked on equipment for the extension and improvement of municipal electric light and water plants by a considerable number of towns and cities, but not a few of those reported to be contemplating expenditures for such improvements are, upon investigation, found to be holding their plans in abeyance.

Quarles & Quarles, Salmon, Idaho, proprietors of the local electric light plant, are planning improvements that will require the addition of a new 120-kw. three-phase 60-cycle alternator to their equipment. This addition will be used for furnishing day service for heating and power purposes, and power for mines in the near vicinity of Salmon.

The city of Lafayette, Ind., has under consideration a plan for the installation of an electric light and power plant in connection with its water works system. An estimate of the proposed improvement has been drawn by Prof. J. W.

Esterline of Purdue University, which includes a suitable building and the purchase and installation of boiler, engine and necessary electrical equipment. The expenditure contemplated under this estimate is approximately $54,000.

The Rockport Water Works Company, Rockport, Ind., A. H. Kennedy, manager, is investigating gas engines and gas producers with a view to installing motive power equipment of this kind in the plant. A capacity of from 60 to 100 hp. is desired, with a type of producer using bituminous coal. The engine will be required to drive a three-phase belt generator.

The question of adding a new generator to the equipment of the municipal electric light plant of Brainard, Minn., is under consideration by the City Council, which has, as yet, not acted upon the proposition.

Bids will be received by A. B. Wood, care New Orleans Sewerage Company, New Orleans, La., on March 1, for the construction of a new municipal electric light plant to be established at Lecompte, La. The estimated cost of the plant is placed at $10,000.

The State Board of Control, St. Paul, Minn., will receive bids on February 15 for the construction of water works at the new State prison, Stillwater, Minn. The amount to be invested in this project is placed at $15,000.

The Public Lighting Commission of Detroit, Mich., has submitted an estimate of $64,000 to the Board of Estimates for one new 2000-kw. turbo-unit, with condenser, air circulating and feed pumps, and all necessary apparatus, to be installed in the electric light plant.

The Platteville Electric Light & Power Company, Platteville, Wis., states that some time during the coming summer the company expects to purchase additional power plant machinery. G. H. Kordenat is manager.

The city of Cashton, Wis., has in contemplation the erection of a new city hall and the installation of an electric light plant. At a recent election a $15,000 issue of bonds was voted for this purpose, but owing to some irregularity was subsequently held void. The proposition will be resubmitted at an early date.

Philadelphia Machinery Market.

PHILADELPHIA, PA., February 11, 1908.

More disposition is being shown by the prospective buyer to consider the question of tools, but there is little probability that much buying will be done at the time. Idle tools are to be noted in shops in nearly all the various industries, and until these tools are again employed it is unlikely that new purchases of equipment will be made. Sales which have been recently made are restricted to single tool propositions—in many cases for a tool of a certain character which is needed by the buyer to do certain classes of work for which he is not already equipped. On the whole, therefore, the trade does not expect to see buying conditions change very greatly during the first half of the year, unless there is a resumption of business generally before that time; a moderate volume of business, however, is expected to come out, largely along the same lines as has been the case during the past few weeks.

Inquiries in the local market have not been very numerous on the whole, and in some lines they have been rather few and far between. No large propositions have come before the trade, most of the inquiries being for single tools of the smaller class. A little more business is reported by some builders of special tools, but even in this line new business is hard to start. Manufacturers of machine tools report business rather irregular, and of a day to day character. For some classes of work orders have been a little more plentiful, although individually small, while in other cases there is almost a complete cessation of new orders. Plants in almost every case are being operated on short time and with reduced forces, and 50 per cent. will probably represent about the average working capacity of manufacturers' plants. Practically no business is being received from the railroads, and under existing conditions but little is expected to come out until the railroad situation improves. Prices of machine tools as a rule are being firmly held, except in some unimportant lines. Costs of production have not decreased, the slight decline in raw materials being more than offset by the increased cost of fixed charges against the smaller productions. Competition, however, is sharp, and manufacturers and dealers are keeping in very close touch with every possible or probable buyer.

But little improvement is to be noted in the demand for export. Practically nothing has come out in this territory in the way of standard tools, while inquiry for special tools has also declined. Those transacting an established trade abroad in power transmission specialties report a fair number of orders, but individually they are not very large.

The demand for second-hand machinery and tools shows no appreciable change. Some business is being done, but it is pretty well scattered, and covers a wide range. Boilers and engines, both new and second-hand, have not been in strong demand. A few sales of equipment of medium powers have been reported, but the aggregate volume of business done has not been large.

With the foundry interests some little improvement is to be noted here and there, but generally they are not able to get enough orders to run them more than three or four days a week, and in some cases less. Consumers of both steel and gray iron castings are placing orders in an irregular manner, dependent on their own orders, which have not been very extensive, and practically nothing has been done in the way of contracting for future requirements.

Plans for improvement in connection with the elevation of the Ninth street tracks of the Philadelphia & Reading Railway were posted for estimates by Lynch Brothers, on Saturday. Two groups of fireproof buildings are included, one at the coal pocket yard, between Berks and Norris streets, and the other, a car cleaning yard, at Huntingdon street.

The City Clerk of Atlantic City, N. J., will receive bids until February 24 for furnishing about 300 lighting standards of different types. Blue prints and specifications will be exhibited at the office of the City Engineer, Room 622, Bartlett Building, Atlantic City, or at the office of Carrere & Hastings, architects, 225 Fifth avenue, New York City, where blank proposals may also be obtained.

It is understood that the Philadelphia & Reading Railway Company has decided to make Allentown, Pa., the northern terminal of its North Penn Railroad, at which point the Central Railroad of New Jersey is making extensive yard improvements. It is said that in addition to a new bridge over the Lehigh River a roundhouse and repair shop will be erected at the above point.

The Earle Gear & Machine Company has completed the construction of its new plant at Stenton and Wyoming avenues, and is now moving its office and plant equipment from the old quarters, at 141 Oxford street, this city, to the new location.

The Fischer Machine Company, manufacturer of special tools and equipment, reports an improvement in conditions. Orders have recently been booked for several large special machines, which enables the company to keep its plant going at close to full capacity.

New England Machinery Market.

WORCESTER, MASS., February 11, 1908.

Manufacturing business continues to show signs of revival. The change is gradual, but in many lines it is apparent that the upward curve has begun. The machine tool trade has not felt a reaction to any important extent. Reports from dealers and builders reveal a continuation of conditions as they have existed for several weeks. Some machinery is being sold, and inquiries promise a better business. Several supply houses report increasing sales to manufacturers.

The Blake & Johnson Company, Waterbury, Conn., machine builder and manufacturer of screw machine and other specialties, is planning to start work on its new plant as soon as the frost is out of the ground in the spring, and it is hoped that the works will be ready for occupancy this year. The company owns a large tract of land very desirably located for its transportation facilities, and the plans call for large buildings. Two plants are now operated in the heart of the city. The company has just increased the amount of its capital stock from $30,000 to $120,000. No funds were derived from the sale of new stock. The company has been working under its old charter granted in 1852, with capitalization of $30,000, the par value being $25 a share. In order to bring this up to a modern basis par was increased to $100, this ratio bringing the capital stock to $120,000. The increase is balanced by the enlargement of the plant and the growth of the business during the more than half a century of the existence of the charter.

The Gillette Safety Razor Company, Boston, Mass., is making extensive additions to its manufacturing facilities, and has been compelled to contract with a Woonsocket concern for the use of a portion of its equipment for the manufacture of new machinery. Owing to the fact that the company is establishing large foreign factories in Leicester, England; Nogent, France; Berlin, Germany, and Montreal, Canada, it has been necessary to obtain an unusually large amount of new equipment at this time, and the machine shop at the works of the company, South Boston, employing 120 men, is up to its extreme capacity, making it compulsory to do outside work under the direction of the company's inspectors.

The reorganization of the Knox Automobile Company, Springfield, Mass., has been completed, and the business will be resumed on a substantial basis, with the preferred stockholders in control. Charles L. Goodhue is president and treasurer; William E. Wright, vice-president; Charles H. Beckwith, secretary, and Albert E. Smith, assistant treasurer. The directors are Alfred N. Mayo, who has been acting as trustee, Mr. Goodhue, Mr. Beckwith and Peter Murray, all of Springfield, and C. E. Whitney, Hartford, representing the preferred stockholders, and William E. Wright,

Springfield; W. H. Chase, Leominster, Mass.; H. J. Greenwood, Gardner, Mass., and H. W. Cutler, North Wilbraham, Mass., representing the common stockholders. The company states that it will build the Knox waterless pleasure cars and motor trucks, and the same machines in water cooled.

The W. H. Page Boiler Company, Norwich, Conn., is preparing its plant, which was partially destroyed by fire recently, so that manufacturing may be resumed in the near future. The necessary new equipment has been practically secured, the company states, and repairs and other work are being rushed so that a full force may be employed at the earliest possible date. The use of this plant, however, bids fair to be but temporary, at best, for the company is building large works at Meadville, Pa., and when it is finished manufacturing operations will be concentrated there. The company manufacture heaters for house use. It makes the statement that its January production equalled that of the same month of 1907, and would have been 25 per cent. larger had it not been for the fire.

The automobile trade appears to be more hopeful than has been the case for the few months past. New business is surpassing expectations, it is said, and the slump may not be so pronounced as had been anticipated. The automobile show held at Providence, R. I., last week was a most successful one, indicating great interest in the machine, and that at Boston in March promises to exceed all efforts of its predecessors.

The City Plate Ice Company, Hartford, Conn., is receiving estimates for the equipment of an artificial ice plant of large capacity. The work of erecting the plant will begin as soon as a decision upon equipment has been reached.

The Waterbury Clock Company, Waterbury, Conn., is revising plans for new works to be erected in that city, including a five-story factory building and a boiler and engine house.

The works of the General Electric Company, Pittsfield, Mass., have resumed operations. According to a dispatch from that city some of the departments will run on a 55 hr. schedule and others 45 hr. for the present. About 2000 hands are employed.

Cleveland Machinery Market.

CLEVELAND, OHIO, February 11, 1908.

The past week has brought out very little in the way of new business for the machine tool dealers. In fact orders so far this month are not showing up as well as they did during the greater part of January. A few sales were made to small machine shops, but they were mostly small, single tools, and usually second-hand ones. The demands of this class of trade seems to be pretty well satisfied for the present. Some inquiries are coming in, but they are not sufficient in volume to give much encouragement regarding market conditions during the next few weeks. Many buyers are of the opinion that there will be a reduction in prices of machine tools in the spring, but it is not believed that the expectation of lower prices is having much effect on the market at present. Dealers point to the fact that if a customer really needs a tool now he cannot afford to wait three months for it in the hope of getting it at a reduction of 5 or 10 per cent. from present prices. Now and then a dealer is informed by a customer that if conditions continue to grow more favorable during the next few weeks he will reinstate an order that was canceled late last year, but as yet none of these canceled orders has been renewed. While conditions are growing better in manufacturing lines, few plants are being operated as yet at their normal capacity, and as long as some of the machines in metal trade shops remain idle the managers will not come in the market for more machine tool equipment. Although prices are being pretty well maintained, some dealers are making concessions to move tools on which they are overstocked.

The plants of the most of the machine tool builders are busy and some of them are running at full capacity, but the latter are those that were fortunate enough to have a volume of orders on hand before the recent slump, and have not suffered much from cancellations. Many of the tool builders report an improvement in inquiries, but new orders are still scarce.

There is considerable improvement in the demand for cranes. The fact that the Youngstown Sheet & Tube Company has decided to go ahead with work on its new furnaces and mills, which was suspended in the fall, and the resumption of other suspended work is expected to encourage others to go ahead with construction work, and to have a stimulating effect on the crane and heavy machinery market. An improvement is noted in the demand for industrial cars and other equipment for mining operations in Mexico, some good sized orders having just been placed by Mexican mining companies that do not appear to have been seriously affected by the recent depression.

Bolt manufacturers report considerable improvement in their orders, but their business is as yet far from normal. Dealers in mill supplies report business light. Most of the orders that are being placed are small.

The Morgan Engineering Company, Alliance, Ohio, received an order last week for 11 cranes, to be built for the Youngstown Sheet & Tube Company. The latter company had an inquiry out for 19 cranes about three months ago, but the placing of the order was delayed because work on its large extensions was temporarily suspended. Most of the cranes will be of special design for pipe handling purposes. The company expects to deliver the cranes in about 90 days. During the week the Morgan Engineering Company also received orders for two 50-ton cranes from the Indiana Steel Company, Gary, Ind.; one 40-ton crane, Yampa Smelting Company, Salt Lake City, and two steam drop hammers, Ford Motor Company, Detroit. The company has recently received a number of other good inquiries, and reports that the outlook for the year is good. The plant of the company is being run at nearly its full capacity.

Additional details regarding the contract for cranes placed by Julian Kennedy, consulting engineer for the Youngstown Sheet & Tube Company, Youngstown, Ohio, with the Alliance Machine Company, Alliance, Ohio, show that this company is to furnish the three largest cranes. Two are 80-ton cranes, with 89-ft. span, being six motor patented four girder ladle cranes, with 25-ton auxiliary trolleys; the bridges are to be equipped with series parallel drives. One is a 30-ton, 92-ft. span four motor crane with five ton auxiliary hoist. All motors of 25 hp. and over are to be of the mill type, while all controllers over 50-hp. are to be of the magnetic type.

The Atlas Car & Mfg. Company has just received some good sized orders for industrial cars, and with a number of other inquiries that have come in recently it expects to close other contracts in a short time. The new orders include a large one for center bottom dump ore cars for an ore road in Mexico, and another for gable bottom dump cars. The company has also received an order from a smelting company for a number of electrically driven scale charging cars and for some concentrate cars, electrically driven. A few days ago the company made a good sized shipment of slag cars to Mexico. With the orders and inquiries on hand the outlook for a good volume of business during the year is satisfactory to this company.

The new plant of the Snyder Electric Mfg. Company, Canal Dover, Ohio, is nearing completion, and will be ready for operation in about six weeks. The company has elected the following officers: President, S. Toomey; vice-president, Theodore Peter; secretary and treasurer, Charles H. Horn; general manager, Ed Snyder.

The Standard Clutch Company, Sidney, Ohio, recently organized with a capital stock of $30,000, it is announced, will soon begin the erection of a foundry. The company has effected its organization by the election of the following officers: Judge E. L. Hoskins, president; W. P. Harmony, vice-president; James Van Riper, secretary, and Oliver Forrar, treasurer.

As a result of the growth of its business the Standard Tool Company, Cleveland, has increased its capital stock from $750,000 to $1,000,000. The company's plant will be greatly enlarged about April 1 by the occupancy of large buildings adjoining which are now occupied by the Standard Welding Company. The latter company will move into its new plant about that time.

The Kent Machine Company, Kent, Ohio, recently organized to manufacture concrete mixers, cement block machines, &c., has placed orders for several thousand dollars' worth of machinery equipment. The company will occupy the plant formerly occupied by the Kent Mfg. Company, which recently moved to Franklin, Pa.

The Runyon Concrete Machinery Company, which recently moved from Cleveland to Canal Dover, Ohio, where some of the local people became financially interested, has elected the following officers: President, H. E. Gresham; vice-president, O. M. Himes; secretary, H. W. Streb; treasurer, S. L. Holmes. The officers, with C. M. Runyon, A. W. Krumbar and F. Smith, constitute the Board of Directors.

Cincinnati Machinery Market.

CINCINNATI, OHIO, February 11, 1908.

There is little, if any, change for the better in the local machinery market. Inquiry is a little more pronounced, and if anything actual sales are a little better than earlier in the month. The situation is more noticeable to the sales agencies, most of which have done considerable business, comparatively speaking, although there are no large bills being sold, such as lots of a half dozen or more machines. Those sales which have been made are, for the most part, single tools and to concerns whose shops are temporarily closed down, to replace worn or out of date types. Some sales have been made of special machinery, and there have been some good sales made of medium and smaller sized units in power generating machinery for Western and Southern installa-

tions. There have been also some fairly good sales of second hand machinery. Concerns manufacturing pattern making lathes report some business, and there has been a little activity in milling machines. The Chicago, Milwaukee & St. Paul is accredited with a few scattering purchases in this field of lathes and similar tools.

Constructing engineers are figuring on several hundred thousand dollars' worth of building in municipal fields, bonds for this class of security being in active demand and easily floated at this time.

The machine tool manufacturers alone see little improvement or prospects for any business of consequence for the immediate future. Such buying as is coming out is restricted to single tools and for immediate requirements, the dealers being almost entirely inactive. The conservative element of local manufacturers is discussing very recent articles in the daily newspapers and deploring the tendency of the writers to sensationalism. An article published in a Saturday paper would tend to suggest a big purchase of tools by European parties, and as this sort of thing is being most carefully scrutinized by hundreds of big manufacturers, not alone here, but elsewhere, the moral effect of such a publication, which was intended doubtless by the writer to throw out the meaning that prices were being rigidly maintained, is apt to have a diametrically opposite effect. As a matter of fact, the sale referred to was made and the price was maintained, but the incident was merely one of regular occurrence, or, at least, frequent occurrence in the daily business life of the tool manufacturing concern in question, and was not of enough consequence to warrant such sensational printed comment. That inquiries for tools are accompanied by requests for material reductions in price and offers of business at discounts ranging from 10 to 13 per cent. off the net list is true, but so far but one hint of a cut having been made and traced to the firm in question is officially denied by the head of the business, and local competitors, whose business it was to investigate the matter for the benefit of the trade, do him the honor to acknowledge it officially. Canadian interests using American tools have been in evidence during the week, and some offers of business have been made to local tool makers provided something like 13 per cent. discount was allowed. A case in point was two 30-in. lathes for immediate shipment. The concern to which the business was offered at the sacrifice refused it. The consensus of opinion among those who are naturally most interested in the maintenance of prices and the state of trade is that the very slight volume of business offered at this time is under loyal price maintenance, and to make price concessions on such insignificant demand would be exceedingly bad business [illegible].

George E. Eliot, chief chemist at the plant of the Lunkenheimer Company, will speak Tuesday evening, February 11, before the Stationary Engineer's Club of Cincinnati. His subject is "Corrosion in Steam Plants."

Everything is in readiness for operation of the new foundry plant recently established at Westerville, Ohio, by Harry T. Hance and associates. The machinery from the Hance foundry in Plain City was taken to Westerville and installed in the shop of the old Westerville foundry, and an eight-ton cupola with latest improvements purchased.

The following officers were elected at the meeting of the Machinery and Supplies Association, which met in annual convention with the National Canners' Association, at the Sinton Hotel the past week: President, E. M. Lang, Jr., Portland, Me.; vice-president, George Cobb, Detroit, Mich.; secretary, John Staff, Terre Haute, Ind.; treasurer, Thomas Scott, Cadiz, Ohio; directors, E. M. Lang, G. A. Suydam, Chicago; Theodore Cobb, Detroit; Maurice B. Ayres, Salem, N. J.; H. W. Phelps, New York; P. A. J. Wethill, Chicago. The next meeting, if an exposition is determined on, will be in Chicago; if not, it will come again to Cincinnati.

Government Purchases.

WASHINGTON, D. C., February 11, 1908.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until March 3 for the following machinery for the Eastern navy yards:

One 15-ton electric traveling crane, one 25-ton electric traveling crane, two 200-hp. boilers, one motor driven band log sawmill equipment, one bolt cutter, one motor driven sensitive drill, one 60-in. radial drill, one sensitive drill, one motor driven emery grinder, one water tool grinder, one twist drill grinder, one toolroom lathe, two back geared engine lathes, two screw cutting engine lathes, one patternmakers' lathe, one motor driven extension gap lathe, one motor driven screw cutting lathe, three motor driven engine lathes, one motor driven crank shaft lathe, one boring and turning mill, one motor driven toolroom shaping machine, one motor driven milling machine, one motor driven universal milling machine, one motor driven chisel mortising machine, one motor driven tool grinding and shaping machine, one upsetting, forging and bolt heading machine, motor driven; one 30-in. planer, one drilling, boring and milling machine, one 18-in. universal milling machine, one 18-in. plain milling machine, one motor driven concrete mixing machine, one motor driven vertical drilling machine, one pipe threading and cutting machine, one 18-in. grinding machine, six duplex pumps, one motor driven power feed drill press, three vertical drill presses, one motor driven timber planer, one motor driven combination band resaw and rip saw, one 16-in. post shaper, one automatic cut-off saw, one 10-in. slotter.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until March 10 for one locomotive crane, two 10-ton electric traveling cranes, one motor driven milling machine, 16 hand pumps and other supplies for the Western navy yards.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until February 25 for two 20-hp. electric motors, two 7½-hp. motors with panel equipment and other supplies.

The Isthmian Canal Commission will receive bids until March 2, Circular No. 423, for pumps, punching and shearing machine and other supplies.

The Bureau of Navigation, Navy Departemnt, Washington, will receive bids until March 19 for power plant equipment at the naval training station, Great Lakes, near North Chicago, Ill.

Bids will be received by the paymaster-general of the navy, Washington, until February 25, for two horizontal tubular boilers for the Portsmouth Navy Yard.

The following bids were opened Febraury 4 for supplies for the navy yards:

Class 1, one steel plate double exhaust fan.—Bidder 5, American Blower Company, New York, $275; 8, American Blower Company, Detroit, Mich., $254.40; 39, Buffalo Forge Company, Buffalo, N. Y., $216.75; 41, Drew Machinery Agency, Manchester, N. H., $261.45 and $315.30; 65, Green Fuel Economizer Company, New York, $212 and $273; 68, Harron, Rickard & McCone, San Francisco, Cal., $252.38; 69, Henshaw-Bulkley Company, San Francisco, Cal., $301.10; 159, B. F. Sturtevant Company, Hyde Park, Mass., $368.80; 201, Excelsior Equipment Company, Pittsburgh, Pa., $286.50.

Class 51, one rotary blower.—Bidder 18, Brewster Engineering Company, Hoboken, N. J., $590; 69, Henshaw-Bulkley Company, San Francisco, Cal., $736; 132, Piqua Blower Company, Piqua, Ohio, $599; 139, P. H. & F. M. Roots, New York, $747; 168, Speakman Pipe & Supply Company, Wilmington, Del., $457.

Class 73, six automatic motor hoists—Bidder 35, Chicago Pneumatic Tool Company, New York, $1250 42, Detroit Hoisting Machine Company, Detroit, Mich., $1236; 63, Richard H. Grey, East Oakland, Cal., $1500; 68, Harron-Rickard & McCone, San Francisco, Cal., $1459.24; 87, Ingersoll-Rand Company, New York, $1459.24; 166, South Park Mfg. Company, Port Huron, Mich., $1301.20; 183, Weir & Craig Mfg. Company, Chicago, $1090.

Class 121, one portable electric post grinder and one portable electric hand or breast drill—Bidder 35, Chicago Pneumatic Tool Company, New York, $114; 37, James Clark, Jr., Electric Company, Louisville, Ky., $110; 52, Frevert Machinery Company, New York, $128; 57, R. W. Geldart, New York, $97.48; 70, Hisey-Wolf Machine Company, Cincinnati, Ohio, $137; 97, Knox & Bro., New York, $130; 107, Manning, Maxwell & Moore, New York, $137; 109, Motley-Green & Co., New York, $137; 110, Montgomery & Co., New York, $137; 122, National Electrical Supply Company, Washington, D. C., $130; 144, J. B. Roache, Brooklyn, N. Y., $137; 160, Sherman-Brown-Clements Company, New York, $137; 201, Excelsior Equipment Company, Pittsburgh, Pa., $126.50.

Class 226, three motors and one steel split pulley—Bidder 56, General Electric Company, Schenectady, N. Y., $399.40; 127, Ole K. Olsen, New Orleans, La., $565; 181, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., $452; 182, Western Electric Company, New York, $472.

In the issue of February 6, opening of January 28 for machinery for the navy yards, the names and amounts of the bidders in class 184, two bolt heading, upsetting and forging machines, were incorrectly given. The following are the bids received for this class: Bidder 12, Ajax Mfg. Company, Cleveland, Ohio, $4692; 86, Fairbanks Company, New York, $4026; 91, Fox Brothers & Co., New York, $4098; 94, Frevert Machinery Company, New York, $4016; 174, Manning, Maxwell & Moore, New York, $4500 and $4550; 260, Vandyck-Churchill Company, New York, $4500; 266, Williams, White & Co., Moline, Ill., $4640.

The following awards have been made for supplies for the Isthmian Canal Commission for equipping a repair shop at Gatun, bids for which were opened January 27:

Manning, Maxwell & Moore, New York, item 1, one 18-in. engine lathe, $606; item 2, one 24-in. shaper, $585; item 3, one 34-in. upright drill, $291; item 5, one 14-in. duplex emery grinder, $84.

Niles-Bement-Pond Company, New York, item 4, one 48-in. grindstone, $120; item 6, blacksmith equipment, $110; item 7, line shafting and hangers, $40.

General Electric Company, Schenectady, N. Y., item 8, one 120-hp. motor, $296.

Under bids opened January 28 for machinery for the navy yards, the Cleveland Punch & Shear Works, Cleveland, Ohio, has been awarded class 196, one single end combined punching and shearing machine, $2070; class 187, one horizontal punching machine, $1270.

Under bids opened January 6, Circular No. 408, for supplies for the Isthmian Canal Commission, Manning, Maxwell & Moore, New York, have been awarded class 19, one vertical boring and turning mill, $1615.70.

The following awards have been made for machinery for the navy yards, bids for which were opened January 2:

Queen City Punch & Shear Company, Cincinnati, Ohio, class 71, one power punch, $285.

Henshaw-Bulkley Company, San Francisco, Cal., class 73, one groover, one double steaming machine and one hand bending [illegible]

HARDWARE

WE invite the attention of our readers to the letter addressed to *The Iron Age* by Postmaster-General Meyer, which is given on another page, together with the draft of a bill which represents his plan for a parcel post on the rural routes. It will be seen that this plan of the Department is in some respects different from that proposed by Representative Sims of Tennessee, the text of whose bill on this subject was given in these columns January 16, with comments, to which Mr. Meyer's letter is a reply. In view of his statements it will be seen that this bill, while closely resembling the Department's project, does not represent it in all details, notably in the provision relating to the remuneration of the carriers. According to the measure proposed by the Tennessee Congressman, the compensation of the rural carriers would be increased to the extent of all receipts for such parcel post service on their respective routes, not to exceed $300 to each carrier, while the Postmaster-General would leave the profit of such business to the Department, in the expectation that the increased revenue would help to make the rural service self-sustaining. We take pleasure in emphasizing this point, so that the plan of the Postmaster-General may be correctly apprehended. While the Depatment's bill is thus free from one of the minor objections brought against it, there are several weighty considerations which must occur to those who carefully look into the feasibility and desirability of the project. It may be proper here briefly to refer to some of them.

While the Postmaster-General commends his plan because in his judgment it will be of service to the merchants in the towns from which the rural routes emanate, it should be noted that with substantial unanimity these merchants are opposed to the project, as promising to give them very little help, likely to be used to a far greater extent by their troublesome competitors, the catalogue houses, and in many ways militating against the business interests of the towns and villages. Local merchants certainly do not desire a rural parcel post. One reason for this might be found in the fact that under existing regulations they are permitted to avail themselves of the service of the carriers in delivering merchandise, a service of which they can frequently make use advantageously as they are often able to secure the delivery of parcels as a matter of accommodation, frequently without pay or for a very slight and nominal fee. All this would, of course, be shut down upon if the proposed rural service went into effect, as all mailable packages carried would then need to be mailed at the regular established rates. The parcel post would thus be more expensive to its patrons than the voluntary service now permitted.

While the Postmaster-General is undoubtedly sincere in the desire to prevent this proposed rural delivery from being used by the catalogue houses, it is questionable if it will be possible to keep them from being the principal beneficiaries of it. Even if the provision which aims to limit the service to the merchants in the town and the residents along the route should escape evasion by the ingenious outside shippers, and if it should be sustained by the courts when attacked on account of its unconstitutionality as class legislation, there remains the objection that if the law were enacted it might readily and naturally be amended so as to open the door wide and give neighboring villages and distant cities the facilities of the rural parcel post. There is certainly reason to apprehend that sooner or later the catalogues and wares of the great mail order houses would find their way into the mails.

It is a mistake to suppose that the present equipment of the rural carriers would be adequate if the transportation of merchandise were added to their duties. Among the mailable articles, with the increased bulk and weight permitted under the proposed law, would be such goods as Coal Hods, Tinware, Tubs, Chairs, Snow Shovels, and many other bulky wares. If the business should amount to anything worth mentioning the familiar sulky or buggy would need to give place to a more substantial and capacious wagon. The carrier in the West referred to in recent daily papers who makes a round trip once a week, and in these winter days on snow shoes, carrying on an average 35 lb. of mail matter on his back, suggests the changes in equipment and method which would be necessary on many a route if the parcel post on rural routes went into effect. The expense of giving a new outfit to even a fraction of the 38,000 rural carriers would at the outset make a very respectable addition to the already handsome deficit of the Postoffice Department.

In addition to these incidental disadvantages which are inseparable from the establishment and operation of a rural parcel post, there is the fundamental objection that the carriage of merchandise is not within the province of the Government, and may much better be left to individual enterprise. This is especially the case, as it would be impossible to find a logical stopping place if the Government is to go into the business of transportation. There is no reason why the proposed limit of 11 lb. should not be extended to 25 lb., or 1000 lb., or more. If it is in order to carry Coal Scuttles and Ash Cans, why not also flour and coal? If the service is established on the rural routes where some peculiar difficulties are to be encountered, why should it not be extended to the country as a whole, permitting the shipping of merchandise of large or small bulk through the machinery of the Post Office Department? This is indeed proposed by some of the advocates of a parcel post, but we do not believe that the country is ready for such radical measures. Nor would it be favored by Postmaster-General Meyer, who is conspicuous for ability and fair-mindedness in the administration of his great department. It should, however, be remembered that the arguments for a parcel post apply with equal force to a merchandise post, and,

indeed, the turning over to the Government of the transportation interests of the country.

Condition of Trade.

There is a general agreement that each week is now recording an increase in the volume of business from the merchants, large and small, throughout the country. While not yet at all equalling the transactions usual at this season the movement is gratifying and full of promise as indicating that the commercial classes generally are actively resuming operations and getting in shape, prudently and conservatively it may be, to take care of the requirements of their customers. There is thus a gradual recovery from the shock given the whole country by the acute financial trouble which developed in October, one result of which has been to check the extravagance and liberality of expenditure which had much to do with causing the sudden reaction. The economy practiced, while the only wise policy for the individual, necessarily results in a diminished volume of business all along the line. In carrying out this policy the merchants of the country are buying cautiously for the replenishment of their stocks, and at the same time endeavoring to diminish in all reasonable ways the cost of doing business. This course pursued by the people generally and the merchants of the country while keeping down the volume of trade, is promoting a rapid return to healthful conditions, and giving a solid basis for renewed prosperity. While this condition is in a general way characteristic of the country at large, there are many sections in which the disturbance of business is much less severe than in others. This is notably the case in the agricultural sections. Merchants situated in such territory will naturally be much less affected by the depression, and will be justified in being more liberal and enterprising in the conduct of their business. It is, indeed, the part of wisdom for each merchant and manufacturer to look carefully and impartially at the conditions which affect and promise to affect his trade, and to act accordingly, making preparations for a large or small volume of business, according to the indications. With the prevailing conservatism there is a special call for energy and hard work to make the best of the opportunities which present themselves, and to transact a good volume of business and realize a profit even when this is a matter of more difficulty than usual. The market gives some indications of weakness, as manufacturers are in need of orders to keep their plants occupied, but on the whole prices are fairly well maintained. To this end the conservatism manifested by the large producers of the raw material contributes much. There is evidence of the increasing abundance of money, and collections are becoming steadily easier.

NOTES ON PRICES.

Wire Nails.—The amount of new business now coming to the mills is moderate in volume, but regarded by the manufacturers as quite satisfactory in comparison with the light tonnage which is being placed in other lines. The Wire Nail manufacturers are certainly taking care of a larger volume of business than at any time since last fall. The announcement by the manufacturers early in January that no change would be made in prices for the spring trade undoubtedly had a beneficial effect, as is seen by the orders which were placed and upon which shipments are now being made. Quotations are unchanged, as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days.

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

New York.—A slight improvement is noticed in the movement of Wire Nails in small lots at store. December was the dullest month of 1907 in the local market, but January showed a moderate increase. In consideration of the comparatively light business the regular price is being remarkably well maintained. The local quotation for small lots at store is $2.40 base.

Chicago.—Recovery has been more marked, and has proceeded more rapidly in Wire goods than in any other of the iron and steel products. Orders and specifications continue to come forward in fairly good volume, and though buyers are not anticipating their wants as far in advance as was the case last year, yet contracts covering anticipated requirements for the early spring trade are being pretty freely made. The mills are now in position to execute orders promptly, and the vexatious delay of shipments which were a conspicuous feature of business a few months ago are no longer experienced. Prices hold firm, no irregularity being reported. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—Manufacturers of Wire Nails still regard the present condition in this trade as very satisfactory, when compared with the depression and light tonnage being placed in other lines. It is conceded on all sides that the action of the American Steel & Wire Company and the Pittsburgh Steel Company in notifying the trade early in last month that prices on Wire products would not be reduced, but would be absolutely maintained was a wise one, resulting as it did in the trade placing some fairly heavy orders on which shipments are now going forward. New business now being received is of moderate volume, and the Wire Nail mills have more tonnage on their books at this time than in any period since last November. We are advised that regular prices are being absolutely maintained. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

Cut Nails.—The meeting of the Eastern Cut Nail Association will be held on the 14th inst., too late for making a report of the result this week. Manufacturers are still restricting output as much as possible to keep stocks within the limits of actual demand, which is light and for small lots. The market is irregular under these conditions, and some mills are reported as shading regular quotations considerably. With some exceptions the market is represented in a general way by the quotation of $2.05 on Steel Cut Nails at mill. Iron Nails generally should command about 10 cents more than Steel.

New York.—Demand is recognized as being moderate, but slightly improved over that of December of last year. Quotations are on the basis of $2.30 per keg, for small lots at store.

Chicago.—Cut Nails have not shared to any great extent the improved demand noted in Wire Nails, and trade continues quiet. No effort is being made by the mills to crowd their product on an unwilling market and for this reason values hold reasonably steady. Business locally is confined to small pickup orders for current requirements, there being but little buying for prospective demand. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; steel, to jobbers, in carloads, $2.28; to retailers, $2.33.

Pittsburgh.—New business in Cut Nails is extremely quiet, orders placed being for small lots and actual needs. The Cut Nail manufacturers find it necessary to continue their policy of still restricting output as much as possible, in order to meet actual demand. Prices still continue to be shaded, and it is claimed Cut Nails have recently sold

at about $1.90 at mill. We quote Steel Cut Nails at $2 to $2.05, f.o.b. Pittsburgh, for carload lots, and small lots at $2.10, to which freight to destination is added. Iron Cut Nails are being held at about $2.15, at mill.

Barb Wire.—The anticipated spring demand is being provided for by the large trade, which is showing a disposition to stock up more freely. Quite heavy shipments have recently been made to the Southwest, where spring demand will soon commence. Shipments are also being made by the mills to other sections of the country to provide for the expected requirements. The mills regard the outlook for Barb Wire as promising. Regular prices are well maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—New business of fair proportions and specifications on held up contracts combine to furnish a volume that under present conditions is regarded as quite satisfactory. The mills are busier now with shipments than at any time since trade began to fall off last year. The near approach of the open season in the South is stimulating the demand from that section, and the Northern trade is ordering more freely for later shipment. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The large trade continues to place orders quite freely for Barb Wire to cover the expected spring demand, shipments on which are now going forward from the mills. The spring trade in the Southwest will open very soon, and shipments to that territory recently have been quite heavy. Jobbers are disposed to take in material more freely, and the outlook for Barb Wire is regarded by the mills as very promising. We are advised that regular prices are being absolutely maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—The mills are in a position to make fairly prompt shipments, which are now going forward, covering new orders and specifications on contracts. While manufacturers have not expected as heavy demand as they had last year, they regard the situation as satisfactory in view of general conditions. The market is reported as being well maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Chicago.—Fence manufacturers are preparing for a fairly active trade, and while ordering conservatively, are freely placing orders for such tonnage of Wire as they will require for the next 60 to 90 days at least. There is apparently no disposition to overestimate the prospective demand for fencing, but at the same time the opinion prevails that the prosperous condition of farming communities warrant the expectation of a fairly good business. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—While the amount of new tonnage being placed at the present time in Plain Wire is not as large as at this time last year, it is regarded by the mills as very satisfactory in view of the general dull condition in other lines. The mills are able to make fairly prompt deliveries, and shipments going forward on new orders and specifications against contracts are fairly heavy. Makers of Fence Wire advise us that regular prices are being absolutely held. Quotations for base numbers 6 to 9 are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Binder Twine.—The International Harvester Company announced prices on Binder Twine, January 22, the schedule for small lots being as follows: Sisal and Standard, 8½ cents; Manila (600-ft.), 11¼ cents, and Pure Manila, 13 cents. About 10 days later the Plymouth Cordage Company announced a schedule of prices in which Sisal and Standard prices were placed ¼-cent. per pound less than those made by the Harvester Company. The last named company then gave notice of ¼-cent reduction on Sisal and Standard, these being the same prices made by the Plymouth Company. The Plymouth Company's prices on Manila grades are the same as those announced by the Harvester Company except that it includes a 550-ft. Standard Manila at 9¾ cents. Western prices, delivered at Chicago, Milwaukee, Peoria, St. Louis and other central distributing points, are now reported to be as follows, for small lots, with carload lots ¼ cent less; five ton lots, ⅛ cent. less, central delivery, fall terms:

	Cents per pound.
Sisal	8¼
Standard	8¼
Standard Manila (550 ft.)	9¾
Manila (600 ft.)	11¼
Pure Manila	13

It is the custom of manufacturers, in view of the extra transportation, to add ¼-cent for Twine sold f.o.b. Northwestern and Missouri River distributing points. These prices are lower than those of last season, and places carload lots of Sisal and Standard Twine at 8 cents per pound. In 1907 the Harvester Company announced prices on January 14 and in 1906, on March 1.

Screen Doors and Window Screens.—The directors of The Continental Company held a special meeting at Detroit, Mich., February 6, to consider the trade situation relating to Screen Doors and Window Screens. The recent advance in the price of Wire Cloth taking effect February 1 was discussed, but it was decided that no advance be made on Screen Doors and Window Screens at this time, but that the time be extended from February 15 to March 1 for receiving orders for collective distribution cars. It is necessary that all orders and specifications be sent in promptly through the jobbers, so that goods may be made up and ready for shipment as soon after March 1 as possible, and may reach the retail merchants in time for the opening of the season, which is only a few weeks off.

Twist Drills.—Reports touching on a recent conference of leading Twist Drill manufacturers are to the effect that most of them are still enjoying a moderate volume of business and are not disposed to make material concessions in prices. Slight irregularities, however, are reported here and there, and there is keen competition among smaller producers for the business open to their brands.

Rope.—Reports as to demand vary with different manufacturers, some reporting business equal in volume to that of last February, while with others it does not quite reach that mark. This month is not one in which an active business is expected. Under these conditions prices show a tendency to yield a little, though manufacturers are generally working up Fiber which was purchased at higher prices than those now obtainable. Quotations are as follows, for base sizes: Pure Manila, 11 to 11¼ cents; B quality grades down to 8 to 9 cents; Pure Sisal, 7¾ to 8 cents; lower grades Sisal, 6¾ to 7 cents; No. 1 Jute, ¼-in. and up, 7½ cents; No. 2 Jute, 7 cents.

Window Glass.—Production of Window Glass has increased slightly, and it is anticipated that additional factories will gradually get to work. It is reported, however, that differences between the various classes of workmen, interfere with factories obtaining the necessary operators. A statement is made to the effect that a limited number of manufacturers, at a recently held meeting, decided that future machine made Glass prices would be met by them. Demand continues limited. Prices recommended at the last meeting of the Eastern Window Glass Jobbers' Association, for Greater New York, are as

follows: Single strength, 90 and 25 per cent.; double strength, 90 and 30 per cent. discount from jobbers' list. These price are, however, not closely adhered to.

Linseed Oil.—In the face of an exceedingly moderate demand for Oil, the Flax Seed market continues high and the Oil market quite strong. Stocks of Oil carried by large consumers and by the mills are comparatively low for this season. Business is restricted to actual necessities, which are light, and sellers do not seem disposed to make concessions in price to stimulate buying. Prices in five-barrel lots are as follows: State and Western Raw, 42 cents; City Raw, 44 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—The local market is featureless and demand light. Buyers are not purchasing large quantities owing to the uncertainty of the stability of market, as prices have eased off about ½ cent since last week. The New York market is represented by the following quotations: Oil Barrels, 54 to 54½ cents; Machine Made Barrels, 54½ to 55 cents.

Sash Cord.—As stated in a former issue, the market for Sash Cord has steadied and nearly all manufacturers are now maintaining the price recently established. The present market to the retail trade may be fairly represented by a quotation of 23 to 23½ cents per pound, base.

Wrought Goods.—The price of Hooks and Staples and other articles usually referred to as Wrought Goods does not seem to have been affected by the reactionary tendency now observed in many lines. These goods, however, have been sold so close that there is little room for concessions with raw material at its present level. The market may be represented in a general way by a discount of 85 and 10 and 10 per cent.

Lawn Mowers.—Much of next season's business in Lawn Mowers has been booked at prices which are fairly uniform, according to grade, and on the whole satisfactory to the manufacturers. The differentials for size are pretty well adhered to, and this has been a feature of the market, since many makers of Mowers have enforced them this season. The present scale of prices may be represented in a general way by a quotation on the cheapest Mowers of $2 for the 10-in. size, with an advance of 10 cents for each increase in size. Better grades are from $2.50 up, with a differential of 15 to 25 cents for size.

Bolts, Nuts, &c.—There has been a further softening of the market on Bolts, Nuts and allied lines. Some works are almost without business to keep them going, as a result of absence of orders from interests which are usually large consumers of these goods. On the part of the Hardware trade purchases are light.

Conductor Pipe, Elbows, &c.—The market for Conductor Pipe, Gutter, Elbows, Shoes, &c., is without features of novelty, continuing to exhibit the irregularity which has prevailed for some time. In the East conditions are not so bad, but in the West there is much irregularity, so that it is difficult to give quotations which would fairly represent the market as a whole. Hopes are expressed that the situation will soon clear, and improvement may be brought about at any time by a renewal of the understanding among the more important manufacturers, some of whom are making active efforts with this end in view.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM MILLIKEN-BUCHANAN HARDWARE COMPANY, which will soon open up a general Hardware, Implement and Vehicle store at Fort Worth, Texas. The company's present address is 1200 Granger street.

FROM SHAMBAUGH HARDWARE COMPANY, Shambaugh, Iowa, G. H. Stipe, proprietor, which has opened up with a new stock of Shelf Hardware, Stoves, Implements, Paints, &c.

FROM SMITH-BROWN HARDWARE COMPANY, [illegible], has purchased the Hardware business of J. D. Sentell, Mangum, Okla.

RETAIL HARDWARE CONVENTIONS.

During the next few weeks the following retail Hardware conventions will be held. Where the asterisk appears elaborate plans are being made by the association officials for the accommodation of Hardware exhibits by manufacturers and jobbers.

NEBRASKA ASSOCIATION,* Lincoln, February 11-14. Secretary, J. Frank Barr, Lincoln.

WEST VIRGINIA ASSOCIATION, Elkins, February 18, 19 and 20. Secretary, Leslie Hawker, Shinnston.

INDIANA ASSOCIATION,* Indianapolis, February 18-21. Secretary, M. L. Corey, Argus.

IOWA ASSOCIATION,* Cedar Rapids, February 18-21. Secretary, A. R. Sale, Mason City.

NEW YORK ASSOCIATION,* Buffalo, February 18-22. Secretary, John B. Foley, Syracuse.

OHIO ASSOCIATION,* Columbus, February 25-27. Secretary, Frank A. Bare, Mansfield.

MINNESOTA ASSOCIATION,* St. Paul, February 25-28. Secretary, M. S. Mathews, Guaranty Building, Minneapolis.

ILLINOIS ASSOCIATION,* Peoria, February 26-28. Secretary, L. D. Nish, Elgin.

MISSOURI ASSOCIATION, St. Louis, February 27 and 28. Secretary, F. D. Kansteiner, St. Louis.

PENNSYLVANIA ASSOCIATION, Cambridge Springs, March 3, 4 and 5. Secretary, J. E. Digby, McKees Rocks.

NEW ENGLAND ASSOCIATION,* Boston, March 11 and 12. Secretary, Charles L. Underhill, Somerville, Mass.

Missouri Hardware Association.

Notice has been issued of a change in the dates of the annual meeting of the Missouri Retail Hardware Association. The convention will be held in St. Louis, as heretofore announced, but the dates will be February 27 and 28 instead of February 24 and 25, as previously intended.

Ohio Hardware Association.

Frank A. Bare, secretary of the Ohio Hardware Association, advises us that all the indications point to a larger attendance at the approaching annual convention that at any former meeting. The past two weeks have brought quite a number of accessions to the membership. No formal papers will be read during the meeting, the different sessions of the convention being devoted entirely to the consideration and discussion of topics brought up through the medium of the Question Box.

Minnesota Hardware Association.

The programme for the meeting of the Minnesota Retail Hardware Association has just been determined, and an unusually interesting and instructive series of sessions is promised. Among the special papers and addresses will be the following: "Special Sales and Bargain Days," by H. L. Chaffee; "Heating and Ventilating," by H. J. Fueller; "Business Methods in a Hardware Store," by W. H. Stepnek, and "Effective Advertising," by A. S. Saberson, Berkley System Company. There will also be an address by Governor Johnson of Minnesota, and the address of welcome to St. Paul will be delivered by Mayor R. A. Smith. Addresses on the subject of insurance will be made by John A. Hartigan, Insurance Commissioner of Minnesota, and by John J. Lee, Jr., who will discuss "Bookkeeping and Fire Law Adjustments." Secretary M. L. Corey of the National Association will address the convention on parcel post, and National Vice-President A. T. Stebbins will have something to say on the progress and development of the national body. Ex-President H. F. Emery of the North Dakota Association will tell something about the work accomplished, and in prospect by his association. Question Box matters, as usual, at the Minnesota meeting will come up for attention and discussion at each of the business sessions. An elaborate programme of entertainment has also been completed.

Connecticut Hardware Association.

THE Connecticut Hardware Association held its annual convention at the Colonial Club, Meriden, on Monday and Tuesday, 10th and 11th inst. The opening session Monday afternoon was largely attended for the first day, a good proportion of the membership being represented. Besides the routine of the business meeting, which included the election of Eli C. Birdsey, Meriden, as president, there were interesting discussions in executive session of pertinent trade topics, special attention being given the catalogue house question.

President Irving C. Treat announced the following committees to serve during the convention:

RESOLUTIONS: George Bassett, New Haven; L. L. Rosenberg, New Haven; R. E. Page, Hartford.

NOMINATIONS: C. G. Agard, Tarrington; A. H. Abbe, New Britain; F. M. West, Bridgeport.

LEGISLATION: Eli C. Birdsey, Meriden; A. H. Abbe, New Britain; F. D. Jordan, Willimantic; F. H. Smith, Middletown; F. L. Leighton, New Haven; A. R. Jones, Danbury.

QUESTION BOX: W. A. Church, Derby; R. G. Church, Meriden; H. L. Mills, New Britain; J. E. Hubbell, Norwalk; J. M. Page, Naugatuck.

President's Address.

After the reading of the minutes by Recording Secretary James De F. Phelps, President Treat read his annual address, as follows, in part:

When you made me the executive head of this association, one year ago, I did not find myself the captain of a sinking ship. Everything was healthy and in perfect order. No reforms were needed. I should liked to have found the opportunity to make the association three times as large, but our organization has been ably managed ever since it came into existence, and the best I could hope to do was to keep it headed up to the wind, with all on board working with enthusiasm and accord, just as I found it.

The past year, while not a record breaker, has been a year of satisfactory progress. The directors have been called together twice, and there have been four meetings of the Advisory Committee. The special committees appointed to look after the eastern and western sections of the State, have, with the assistance of the executive officers, succeeded in adding 12 firms to the membership roll.

At this time I want to say a word about the fire insurance advantages offered by the Hardware mutuals. To every one who avails himself of this insurance there is a clear saving of from 30 to 40 per cent., and I cannot, for the life of me, see why we are not all profiting by it. Every one who has had a fire will tell you that he has received an adjustment that was perfect satisfactory.

You all know that some of the manufacturers dispose of their seconds to dealers in second-hand goods, and others who are beyond the pale of the legitimate Hardware dealers. We are cut out of an item that rightfully belongs to us, and it seems to me that we should urge these manufacturers to put their seconds up at auction in some of the large auction houses in New York, and thus give everybody an opportunity to obtain a share of them under fair conditions.

Vice-President Eli C. Birdsey, who occupied the chair during the reading of the president's address, spoke warmly of the excellent and energetic work which has been done during the year by Mr. Treat.

Report of Secretary Phelps.

Secretary Phelps' report was in part as follows:

The year 1907 can properly be classed as an aggressive one, as far as the work of your officers is concerned, for headed by a man for your president in whose make-up are the essentials that go to make a leader, and whose main idea has been to strengthen this organization by having every Hardware dealer in this State on our membership roll if possible, you can readily understand that there has been little left undone along this line. Success has crowned our efforts, and we would venture to assert that no State has a larger percentage of its Hardware merchants as members of its State organization.

Am pleased to note more interest in the insurance feature of our association. Only members of their State Hardware associations are eligible for Hardware mutual insurance, and our members are now reaping the benefit, a benefit that does not fail to prove itself one to every merchant. There are some to whom the social feature of association life does not appeal. For them we are sorry, for I believe the social element of association work to be the one that does us the most good in the getting together, the giving up to others some of the knowledge we have gained by experience and otherwise, and in turn gleaning from them the same sort of thing. We eliminate to more or less extent some of the selfishness in all of us; we the more readily understand that this life is a give and take game, not one sided.

We get away from our business, forget the humdrum and go back with a few new ideas, renewed, let us hope, with the spirit that should govern all good Hardware-



ELI C. BIRDSEY,
President.



F. T. TERRY.
First Vice-President.



J. DE F. PHELPS,
Recording Secretary.

men, that of fighting the battle hard but honorable, honorable with a large capital H. I believe that our attendance at our several meetings surely tends to make all of us broader minded men and better men, bringing us nearer the goal that should be the ambition of every good Hardware merchant to reach, that of being identified with a class worthy of being in the front rank with any body of men on God's footstool. That this should be the ambition of the Hardware fraternity is not strange, for what calling is there in the business world that demands more hard preparation, conscientious work in order to be successful than that of the Hardware merchant? Hence it is not strange that in the hard grind, training to be right up to the minute and necessary refining, that the product should be fully up to and in many cases above the average.

The reports of Financial Secretary F. A. Farrar and Treasurer Lewis B. Crosby showed the finances of the association to be in excellent condition.

F. T. Terry, Ansonia, made the report for the Grievance Committee, which dealt with the sale of "seconds" by manufacturers to pawnbrokers, and the discussion that followed was along this line.

A letter was received from President S. R. Miles of the National Retail Hardware Association, containing valuable suggestions as to topics for discussion at the convention and work to be done during the year.

New Officers.

The Committee on Nominations, making its report through Charles G. Agard, chairman, submitted the following ticket of officers, who were unanimously elected:

PRESIDENT, Eli C. Birdsey, Meriden.

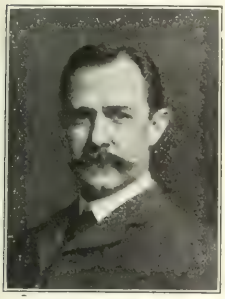
FIRST VICE-PRESIDENT, Frank T. Terry, Ansonia.

SECOND VICE-PRESIDENT, F. D. Jordan, Willimantic.
RECORDING SECRETARY, James De F. Phelps, Windsor Locks.
FINANCIAL SECRETARY, F. A. Farrar, South Manchester.
TREASURER, Herbert L. Mills, New Britain.
DIRECTORS, to succeed F. D. Jordan, for three years' term, expiring 1910, Lewis D. Crosby, New London. For three years, George Fuller, Canaan; R. C. Lightbourn, New Haven; Charles S. Templeton, Waterbury; D. N. Clark, Shelton.

Secretary James De F. Phelps was elected to represent the association at the convention of the National Association at St. Louis.

A. H. Abbe's Address.

A. H. Abbe, New Britain, acted as representative of National President Mills, being chosen because of his



I. C. TREAT,
Ex-President.



F. A. FARRAR,
Financial Secretary.

membership in the wholesale and retail joint committee of the National Association. He took up the subject of parcel post legislation, referring to the original movement, when many assisted it in ignorance of its real workings in business. The bill proposed by Postmaster-General Meyer does not promise serious results in itself, perhaps, said Mr. Abbe. But it would be the beginning of a movement which would have no end until the system had become universal. Although there is assurance that no parcel post legislation will be enacted by the present Congress, there should be no diminution of association efforts in opposition. Parcel post would not drive the merchant out of business, but it would seriously affect him. His profits would be cut and it would be strenuous competition. Mr. Abbe referred to another bill which has been introduced in Congress, providing that postmasters shall not furnish lists of names of persons receiving mail at their offices, provided that to any person, firm or corporation, who may make affidavit before any postmaster that such person, firm or corporation is compiling a directory for public use from such list of names, postmasters may furnish such lists upon the payment of a sufficient sum of money for the expense of copying names, not to exceed $5 per 1000 names. Mr. Abbe suggested that this bill bears earmarks of the work of catalogue houses. He asked that the bill and the matter of parcel post be referred to the Committee on Resolutions, which was done.

Other Addresses.

President F. Alexander Chandler of the New England Hardware Dealers' Association was present as a guest and spoke briefly of association work, especially as it relates to combating parcel post. He called attention to an effort now being made in the Massachusetts Legislature to secure an indorsement of this measure, and stated that everything possible would be done to combat the movement.

Secretary Charles L. Underhill of the New England Association was also a guest. He spoke of the value to business man in entering politics, in order that measures inimical to his interests may be intelligently and effectively combated. Mr. Underhill is a member of the Massachusetts Legislature, and clerk of the Committee on Federal Relations, before which the parcel post matter will be heard, and he has arranged the date of the hearing for March 12, when the annual convention of the New England Association will be in session. This will insure a large attendance of Hardware men at the hearing.

New York Hardware Association.

The official programme for the meeting of the New York State Retail Hardware Association has just been issued. Among those who will address the convention at different sessions will be S. R. Miles, president of the National Retail Hardware Association: H. J. Fueller, Abram Cox Stove Company, Philadelphia, whose subject will be "Specialization in Hardware Business;" E. W. Heath, Heath & Milligan Mfg. Company, Chicago, on "An Honest Paint Law;" E. J. Cornish, Carter White Lead Company, Chicago, on "Lead Pigments," and R. R. Williams, *The Iron Age*, and George B. Bradford, *Hardware*, New York City. The morning session on the 21st will be exclusively devoted to the discussion of topics suggested by the Question Box. Among subjects already recommended for discussion at this session are the following:

Shall the scope of our association be extended to include in our membership retail Implement dealers, who have stores and warehouses and conduct their business in a legitimate manner?

Shall this association favor a "Pure" Paint law? If so, what requirements are necessary to protect merchants and consumers and at the same time be perfectly fair to the manufacturer?

Shall this association favor an amendment to the law regulating license to peddlers, so that a State license shall be abolished and the licensing of peddlers be governed entirely by local laws of cities, incorporated villages and towns?

Methods of handling small accounts.

Saving cash discounts on goods that have not arrived when bill falls due.

In what way can merchants avoid contributing to fairs, programme advertising, church book advertising and many other petty calls for money that merchants are subject to?

The Question Box will be placed in the convention hall, and it is the earnest desire of the officers that it be freely used by the members for such queries as occur to them.

Circulars have been issued giving particulars as to hotel accommodations, railroad rates, &c. A special rate of one and one-third the regular fare for the round trip has been arranged for on the certificate plan on all roads in the Trunk Line Association.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

ROBERT MURPHY & SONS, Ayer, Mass.; Dame, Stoddard & Co., Boston, selling agents: Illustrated catalogue covering an extensive line of Mechanics' Cutlery and fine Steel Implements, including Shoe and Rubber Knives, Oyster and Clam Knives, Carpet Knives, Sloyd Knives, Banana Knives, Paper Hangers' Knives, Cork Screws, &c.

STRATTON LEVEL COMPANY, Greenfield, Mass., successor to Stratton Bros.: Catalogue F, illustrating and listing an extensive line of Spirit Levels.

IDEAL MFG. COMPANY, Detroit, Mich.: Illustrated catalogue, No. 13, of Gas Stoves and Ranges, Hot Plates, Broilers and Water Heaters, Plumbers' Supplies, Closet Combinations, Soil Pipe and Fittings and Iron, Brass and Aluminum Castings.

LAWRENCE BROS., Sterling, Ill.: 1908 catalogue illustrating and listing an extensive line of Barn and Parlor Door Hangers, Wrought Steel Butts, Strap and T Hinges and Hardware specialties. The catalogue shows many recent additions to the company's line, and will be sent to any in the trade who desire it.

H. J. FROST & Co., 90 Chambers street, New York: Illustrated catalogue covering an extensive line of Fishing Tackle.

LETTER FROM THE POSTMASTER-GENERAL.

As correcting some misapprehensions in regard to the project of the Post Office Department for a parcel post on the rural routes we take pleasure in giving the following letter from the Postmaster-General, to which further reference is made in our editorial columns:

To the Editor: An article in *The Iron Age*, issue of January 16, on the subject of a bill "providing for the establishment of a system of local rural parcel post," which you state was drafted in this Department and introduced by Representative Sims of Tennessee, has been brought to my attention.

Evidently this article has been written under a serious misapprehension. In order that you may be informed of what the Department has recommended for the extension of the parcel post I am sending you:

1. A copy of a proposed bill "To provide a rural delivery parcel post for merchandise and other articles mailed on rural delivery routes and for other purposes." This, you will observe, represents a very different measure from that you have quoted in your magazine.

2. A copy of the last annual report of the Department. Especial attention is invited to pages 9 to 11.

You will note from the copy of the bill which is inclosed that there is no intention of turning over "all receipts for such parcel post service, not to exceed $300 per annum, to each carrier." On the contrary, I invite your attention to the following which is taken verbatim from the annual report:

. . . "A special parcel post on rural routes will facilitate consumption and thereby increase the business of the country merchant. Increased trade for the country merchant means increased orders for those from whom he purchases his supplies. A further fact is that the increased cancellations will advance automatically the salaries of the postmasters of fourth-class offices. The remaining revenue derived from the parcel post on the rural routes will be clear gain and will go far toward making the rural service in time self-sustaining."

You intimate that the special rate for the local parcel post on rural routes will eventually apply to the entire postal service. The impossibility of this is apparent when attention is directed to the cost of railroad transportation, which has no part in the former service. About $45,000,000 was paid last year for mail transportation and $6,000,000 for postal cars.

As to the contention that has been made in some quarters, and which you refer to indirectly, that the large mail order houses would, under the proposed law, utilize the special parcel post on rural routes through distributing offices: The Department will recommend a provision (contained in the inclosed tentative draft of a bill) which will prevent any such use of the routes. It should also be borne in mind that even in the absence of such a specific prohibition any systematic attempt upon the part of a mail order house to thus deliver its wares would necessitate the employment of many thousands of local representatives. The catalogues of these concerns show pretty plainly that they attribute their success, in large measure, to their remarkably low selling expense, and that the absence of any sort of agent is the principal feature of their argument in accounting for the supposedly low prices of their goods.

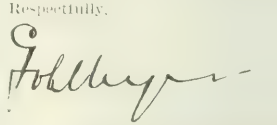
It is hard to see where any appreciable advantage would accrue to the patrons of the rural routes by permitting books and other printed matter to be distributed at the special local rate. Should they be included, only such publications as had their regular place of business on a rural route or at the post office thereof could be carried, and they could be delivered only to the patrons of a route or routes within a very confined area who could be directly served by rural carriers.

The Department is advocating the establishment of a special local parcel post on rural routes because of its ability to render the service proposed with incalculable benefit to the patrons of the routes, and at a profit to itself. There is no sound reason why our rural population should be denied the facilities which can be so readily afforded. But there is every reason why the Department should do all in its power to utilize the machinery at its command. There are more than 38,000 rural routes thoroughly equipped and covered by carriers already employed. Approximately 15,000,000 of people are served on these routes, a fact which effectively illustrates the vast possibilities of the rural service, if made use of to its full capacity. As to the financial aspect of the matter, it has been estimated that if but three packages of the minimum weight were handled each trip on the rural routes now established the resulting revenue, even at the low rates recommended, would more than wipe out the present postal deficit.

Letters and petitions of individuals and associations from every section of the country, heartily indorsing the measures for the extension of the parcel post which the Department is advocating, have been received. The policy of furnishing full information upon request has been followed, and every argument, not founded upon strictly selfish grounds, advanced by the opponents of the proposed extension has been answered.

Since you have, although no doubt unintentionally, misstated the Department's position as to a number of important particulars in connection with its recommendations, I trust you will perceive the justice of informing your readers of its real views, as expressed herein.

Believe me, Respectfully,



BILL RECOMMENDED BY THE POST OFFICE DEPARTMENT.

Below is the text of the bill referred to in the above letter of the Postmaster-General. It is of interest as embodying the Department's recommendations in official and definite form:

A BILL

To Provide a Rural Delivery Parcel Post for Merchandise and Other Articles Mailed on Rural Delivery Routes and for Other Purposes.

Be it enacted by the Senate and House of Representatives of the United States in Congress assembled:

That the Postaster-General is authorized, under such regulations as he may prescribe, to establish a domestic rural parcel post at special rates of postage, for the delivery on rural delivery routes of foodstuffs (including groceries, provisions, meats, fruits and vegetables), dry goods, drugs, books and other merchandise, unless the same shall be unmailable under this act or any other act as hereby amended.

Sec. 2. That such special rates of postage on such parcels of merchandise shall be five cents for the first pound and two cents for each additional pound or fractional part thereof, and on parcels weighing less than one pound, as follows: Two ounces or less, one cent; over two ounces and not exceeding four ounces, two cents; over four ounces and not exceeding eight ounces, three cents; over eight ounces and not exceeding twelve ounces, four cents, and over twelve ounces and not exceeding one pound, five cents: *Provided*, That such postage shall be prepaid by ordinary postage stamps affixed to such parcels, and that the character of such matter shall be indicated by the words, "Rural Parcel Post," stamped on each of such parcels by the postmaster or rural carrier receiving it, *Provided further*, That the establishment of such rural parcel post and special postage rates shall not in any wise affect the mailing of or postage rate on packages of third and fourth class matter, except within the limitations stated, *And Provided further*, That nothing herein contained shall be taken as authorizing the acceptance or delivery at the special rates of postage herein provided of any parcel offered by any person acting as agent or representative, upon commission or otherwise, for any person or company not resident on such rural delivery route, *And Provided further*, That only such parcels shall be received for delivery at the special rates of postage herein provided as are offered by bona fide merchants or dealers whose regular places of business are on rural delivery routes covered by this act, in the ordinary and regular course of their business, and by residents on such routes in their individual capacity.

Sec. 3. That parcels covered by said special postage rates and deliverable by said rural parcel post under this act shall not exceed eleven pounds in weight, three feet six inches in length, or six feet in length and girth combined, and such parcels shall conform to the Postal Laws

and Regulations concerning mailability, except as they are modified by this act and regulations promulgated in pursuance thereof.

Sec. 4. That perishable articles of food, submitted for mailing under said rural delivery parcel post, shall not be accepted by postmasters or rural delivery carriers more than three hours before the departure of the mail, and then only at the risk of the sender, and the postmaster or rural carrier shall stamp or note on any such parcels the time of acceptance and of transmittal, and the words, "At the sender's risk."

Sec. 5. That the provisions of this act shall apply only to parcels mailed on and addressed to rural delivery routes, as follows:

(1) From the post office or station from which one or more rural delivery routes emanate to any intermediate post office or to any patron on any of said routes emanating from said post office or station, and supplied by rural carrier.

(2) From any intermediate post office on any rural delivery route to the post office or station from which said route emanates or to any intermediate post office or to any patron on that or any other rural route emanating from said post office or station, and supplied by rural carrier.

(3) From any patron on any rural delivery route to the post office or station from which said route emanates, or to any patron or intermediate post office on that or any other rural delivery route emanating from said post office or station, and supplied by rural carrier, *Provided*, That in all cases where, under this act, parcels are mailed at a post office on a rural route which emanates from a station of such post office, such parcels shall be offered for mailing at such station; and in all cases where parcels mailed under this act are addressed to a post office on a rural route terminating at a station of such post office, such parcels shall be delivered to addressees at such station, and in the latter case addressees shall call or send for such parcels.

Sec. 6. That the proviso in the act of April 28, 1904, ch. 1759 (33 Stats. 440), relative to the transportation of merchandise by rural carriers for patrons, is hereby repealed.

Sec. 7. That seeds, cuttings, bulbs, roots, scions, and plants when mailed under this act, shall be chargeable with the postage rates and subject to the limit of weight herein provided.

Sec. 8. That all provisions of law applicable to the third and fourth classes of mail matter, and all provisions of law applicable generally to mail matter, and not inconsistent with the provisions of this act, are hereby extended and made applicable to matter of like character mailable under this act, *Provided*, That matter so mailable shall be subject to the rates of postage and the limitation of weight herein provided.

TWO MORE PARCEL POST PROPOSITIONS.

[FROM OUR SPECIAL CORRESPONDENT]

WASHINGTON, D. C., February 11, 1908.

THE most extraordinary propositions yet brought forward by the so-called postal reformers have just been presented in the House by Representative Henry of Connecticut, the author of the original parcel post bill. In view of the preposterous character of these measures it is not surprising that Mr. Henry should disclaim their authorship, which he does by indorsing them "By request;" but the fact that he is willing to present them is evidence that he sympathizes with the principle which underlies them and under the rules of "Congressional courtesy" precludes him from any attempt to discredit them.

A Sweeping Proposition.

The first of these bills involves the sweeping proposition that all existing rates of postage, with the exception of that applying to newspapers, periodicals, &c., when issued by their publishers, shall be wiped out and that a flat rate of 1 cent, for each 2 oz., or 8 cents per pound, shall be substituted. This will include letters, postal cards, printed matter of all sorts and every kind of merchandise. The text of the bill is as follows:

Be it enacted, &c., That the first, second and fourth classes of mail matter be, and are hereby consolidated with a rate of 1 cent per each 2 ozs. or fraction thereof.

Sec. 2. This act shall take effect on the approval thereof.

It is doubtful if the author or the introducer of this measure has given any consideration to its practical effect upon the revenues. In the consolidation of third and fourth class matter alone it would cost the Government several millions annually, while the cut in letter postage from 2 cents per ounce to 1 cent for 2 oz. would cause a loss of not less than $50,000,000, to put it at a very conservative figure. The advocates of penny postage have never gone beyond proposing a rate of 1 cent per ounce, while the more conservative promoters of this project have suggested a rate of 1 cent per ½ oz., which would include the average business or personal letter and would cause but a small reduction in the total revenues because of the extent to which the use of the mails would be stimulated by the reduced rate. It is hardly necessary to say that this bill will not receive serious consideration at the hands of the Post Office Committee.

Another Absurdity.

Mr. Henry's second measure is absolutely unique in form, if not in principle. It is intended as a substitute for the pending bills providing a rural parcel post. The text is as follows:

Be it enacted, &c., That mail matter of all kinds shall be transported, house to house and between the houses and the post office or post offices, on each of the different rural routes of the United States on the following conditions:

Parcels up to the dimensions of one-eighth the ordinary suit-case, 3 x 6 x 12 in., or similar cubic contents, 1 cent.

Larger parcels, up to one-half the ordinary suit-case, 6 x 12 x 12 in., 5 cents.

Larger parcels up to a full suit-case, 6 x 12 x 24 in., or to the dimensions of a peach basket, 10 cents.

No parcel shall be over 25 lb. in weight or over 6 ft. in length.

No carrier shall be obliged to carry a load of ove. 800 lb.

Sec. 2. This act shall go into effect July 1, 1908.

This bill, which appears to be designed to catch the vote of the traveling men and fruit growers, judging by the standards upon which it is based, entirely ignores the weight limit of parcels, except that a maximum of 25 lb. is prescribed. Notwithstanding the absurd features of this measure, it is a fair exponent of the principle upon which the rural route bills are based—namely, the loading down of the carriers with merchandise which neither the Government nor any private concern could afford to handle at the rates proposed. Assuming that a rural carrier in his daily round could secure the maximum load of 800 lb., its distribution over a 25-mile route would produce a revenue of only $3.20.

The Appropriation Bill.

The House Post Office Committee has concluded the hearings on the annual post office appropriation bill and has completed a preliminary schedule of the allotments for the coming fiscal year. The total appropriations carried by the bill will exceed by about $8,000,000 the cost of the service during the current year. Assuming, however, that no important changes are made in the existing postal regulations, the revenues of the service may be counted upon to show a proportionate growth, and there appears to be no danger of any material increase in the annual deficit. Thus far the committee has given no consideration to the pending parcel post measures, but they will be taken up when the review of the recently concluded hearings is begun. The Postmaster-General and the First Assistant advocated the reduction from 16 to 12 cents in the general merchandise rate, a cheap parcel post as outlined in the Sims bill, and a post check currency system as provided for in the bill drafted by the special commission of the Post Office Department having the matter in charge.

Postal Commission's Preliminary Report.

The Joint Congressional Postal Commission, which for nearly a year has been engaged upon an investigation of the business methods of the Post Office Department, has presented a preliminary report to Congress. The commission suggests a number of sweeping reforms, including the abolition of the offices of the four assistant postmasters-general and the appointment in their stead of a single executive officer under the protection of the civil service, who shall manage the postal affairs of the country under the general direction of the Postmaster-General. The commission also recommends that the postal service be geographically divided into several grand divisions, with a headquarters in each, with a view to the economical handling of supplies and to the more expeditious transaction of the public business. The commission will file a final report in the course of the next 60 days.

A WASHINGTON'S BIRTHDAY SALE.

A Practical Suggestion from a Retail Merchant in Regard to the Stimulation of Trade During Washington's Birthday Week.

THE following communication has been received from a Hardware merchant, and its suggestion for the possible increase of trade during one of the usually dull weeks of February should be welcomed by other men in the business:

To the Editor: Your frequent reference in recent issues to special sales and special efforts within the store to increase local interest, bringing more trade, has suggested to me a plan which I believe from past experience in a limited way may prove effective during the week of Washington's Birthday, and I give it to you herewith for what it is worth. If you regard it as worthy I should be glad to see it published in the columns of *The Iron Age* for the benefit of other merchants.

A Progressive Butcher's Idea.

Some 10 or 12 years ago there was in our town a butcher who appealed to the best trade of the neighborhood and who made every possible effort to maintain the highest standard in his line of business, even going so far as to employ delivery schemes, one of which was to deliver his meats in individual agateware pans, which were cleaned after each delivery, and which did away with the use of the customary brown wrapping paper.

His Washington's Birthday Plan.

One year the idea occurred to him that it might attract much attention and comment if he were to decorate his shop in a special way on the occasion of Washington's Birthday. No sooner had he thought of the plan than he set about to put it into operation, and the result was so satisfactory that he repeated it on each successive Washington's Birthday for a number of years.

It was nothing more nor less than an arrangement of whole hogs, halves of beef, legs of lamb, strings of sausages, open kits of lard and whatever else might have been a part of his trade, all climaxed with a decoration consisting of large pictures of Washington, with garlands, wreathes and rosettes of colored paper, real and artificial flowers pinned upon the meat and draped profusely about the shop. As his shop was finished in marble, mirrors and plate glass, it was one of the show shops of the town, and this little additional effort always brought out the town folk as well as the people from surrounding territory.

Legs of Lamb versus Hardware Articles.

If such unattractive and prosaic things as legs of lamb and halves of beef can be so arranged as to attract attention and comment and bring new faces into the store, as well as bring old ones back, why then cannot the more varied line handled by the Hardware merchant be manipulated even to better advantage?

The Hardware merchant has at his disposal one of the chief articles used in a scheme for Washington's Birthday decoration, namely, Hatchets. He can make an effective window background by the use of different kinds of Axes and Hatchets. Such a display can in some instances be carried through the entire main aisle of the store, with occasional pictures of "The Father of His Country."

Advertising the Event.

Advertisements for the event should carry out the same spirit. A border of Hatchets can be obtained from most any engraver, or a small cut of a Hatchet can be used as a corner piece for each of the advertisements. As this holiday for 1908 falls on Saturday, the special event can be arranged either to begin or end on that date, and can be continued successfully throughout an entire week. The announcements in the papers should be bold, and should always carry, together with the paragraphs concerning the special event, as many items of a special nature as the merchant feels that he can afford to put forward.

Souvenir Suggestions.

Hatchet pins made of inexpensive metal and enameled can be obtained at a very nominal price if the merchant sees fit to give away a souvenir as an additional attraction. Some stores use for this purpose the cardboard Hatchets, such as will be found in many candy stores. If the event is carefully planned, well executed and thoroughly advertised it is almost certain to prove profitable to the merchant, and will be looked forward to from year to year by the public in his locality.

Last Year's Experience.

We tried it last year in our store in a small way by employing a special window display, such as I have suggested, and an arrangement of merchandise ticketed at special prices for that week only.

The results were so gratifying that for this year we have planned the event upon a very general scale, and will carry the scheme of decoration throughout the entire main floor of the store. We may arrange to give out souvenirs to all persons who visit the store during this week. If the souvenirs are used we will probably not confine them to persons making purchases, but will give them out without any restriction.

Cherry Tree Window Display.

We have procured two small wild cherry trees which we shall use in the foreground of the window, showing one standing and one lying down as though it had just been chopped down. For the floor of the window we shall use green tissue paper, folded and sheared to give the effect of grass. We have procured a quantity of artificial white flowers and a few artificial green leaves which will be tied upon both trees. These we obtained from a local milliner who loaned them to us in return for the courtesy of placing a card to the effect that the floral part of the decoration was furnished by him, in a prominent place in the display.

Colonial Hardware.

We expect that this feature, combined with a well arranged merchandise display, will attract far more attention than our more modest display made for the same event last year. Of course we shall use display cards explaining the idea, and we expect further to combine with the modern merchandise some rare pieces of old Colonial Hardware which have been loaned to us for exhibition on this occasion.

We are coming more and more to believe firmly in the effectiveness of such efforts as this, and the activity of Hardware merchants in this direction we feel certain will soon rival that of any other line of business.

WESTERN NEW YORK.

ARCHER, COMBS & WINTERS COMPANY is the name of a new corporation at Portland, Ore., which will job Automobile Accessories, Fishing Tackle and Sporting Goods. The members of this firm have a wide acquaintance with the trade in Oregon, Washington and Idaho, having been connected with similar lines in a wholesale way for a number of years. They control a number of lines for the above mentioned territory as manufacturers' agents.

THE JOHN B. VARICK COMPANY, Manchester, N. H., has secured the order for the $6000 silver service to be presented by the State of New Hampshire to its namesake battleship. The fact is of interest in connection with the well defined tendency among Hardware merchants to give attention to fancy ware and art metal goods.

P. T. COFFIELD & SON, manufacturers of the Coffield Power Washing Machine, have moved their office and showroom from 602 Fifth avenue to 415 Sixth avenue, Pittsburgh, where they have secured larger quarters, which will allow them to carry a full line of their Washing Machines and show them to good advantage.

South Dakota Retail Hardware Association.

THE third annual convention of the South Dakota Retail Hardware Association was held in Aberdeen, February 4, 5 and 6. The mornings were given over to the exhibitors in the auditorium and the sessions were held in the afternoons. The attendance at the convention was quite large and great interest was manifested by the members. The National Association was represented by Vice-President A. T. Stebbins, Rochester, Minn., who delivered an interesting address on Wednesday.

Aberdeen, the convention city, proved itself a most hospitable host. On Thursday evening the Commercial Club handsomely entertained the members at their club rooms.

Captain J. H. Hauser, on behalf of the mayor, welcomed the members to Aberdeen, A. W. Barber, Mitchell, responding on behalf of the association.

Address of President Hawkins.

E. D. Hawkins, Vermillion, president of the association, announced that it had been decided to eliminate the annual presidential address, as the secretary's report, giving as it did a full review of the work during the year, seemed to make any formal address from the president unnecessary. Mr. Hawkins, however, addressed the convention as follows, in part:



F. L. PIXLEY.



E. D. HAWKINS.



B. G. WATTSON.



W. J. PILKINGTON.

There has come about in the last few years a great change in the *personnel* of the Hardware business. A Hardware dealer can no longer buy goods carelessly, throw them on his shelves in a careless way and wait on his customers in a careless way and succeed. The man who desires to succeed in the Hardware business must be a man that looks carefully into the details of the business. He must be careful in buying, careful in selling, careful in the arrangement of his store, careful in advertising and careful in everything. Now the thing that has brought this about is probably what we have been counting on as one of our great competitors, or, putting it stronger, one of the great enemies to our business. We must admit that this in a large measure has compelled the Hardware dealer of to-day to do his business on business principles.

The Hardware dealer of to-day is a man who attends conventions. He is a man who reads trade papers. And right here I want to take the liberty to say that there is no other influence to-day that is doing as much good as the trade papers. For instance, our own Hardware paper here in the State, the *Hardware Trade* of Minneapolis, *The Iron Age* and various others. All of these papers will do much toward the improvement of our business if we as retailers will read them through and study them.

Advertising the Great Need.

It seems to me that the great need of the Hardware merchant to-day is advertising, and he must do it in many ways. He must be courteous. He should be courteous to the man of whom he buys his goods, to his customers, to his clerks, and he must be ready and willing at all times to adjust difficulties that may arise to the mutual satisfaction of all concerned, all of which is very essential in the improvement of his business.

Confidence.

One thing a Hardware dealer should have above all, and that is confidence, and if he has confidence in his business he must have confidence in the times; he must not be a pessimist, but an optimist. He must believe that times are going to be better instead of worse. I believe that instead of talking against the times, the Hardware man of to-day feels and talks to his customers that things are on the upward climb; the worst is past and that we will have a prosperous year coming.

Exchange System.

I would like to see an exchange system if it can be done, and I believe it can be. For instance, a dealer had an overstock of goods in certain lines. By simply notifying the secretary, the secretary could probably find some one of our members who would want those goods. I would advocate this for the reason that when a man is overstocked there are chances that he will cut the price in order to reduce his stock. I believe this exchange system could be worked to advantage.

Secretary-Treasurer's Report.

The report of J. E. Johnson, Redfield, secretary-treasurer, was in part as follows:

When I assumed the office of secretary at Mitchell last year, immediately upon my return home I laid plans for a campaign for new members, and this campaign was kept up until the middle of June. To carry this work to a successful issue I enlisted in our cause the Hardware salesmen of the State, knowing that they could do more by personal talks with the dealers than any amount of correspondence sent out from my office, as they were on the ground all the time. Several of these gentlemen rendered most excellent service, for which I am duly thankful.

At the close of this campaign our books showed 34 new members for our association. I had hoped to reach the 50 mark, but had to content myself with the above number. During the time this campaign for new members was carried on I had in hand the publication of the *Official Gazette*, copy of which you have all received. Considerable delay was encountered in getting out this book, as it was our maiden effort in a work of this character, and much of this can be avoided this year, as I have profited by experience. Most of this delay, however, was beyond the power of either myself or the publisher of the book to prevent.

Meeting at Minneapolis.

On September 4 your president and secretary attended a joint meeting in Minneapolis with the jobbers of the Northwest. Representatives from Wisconsin, Iowa, Minnesota and North and South Dakota retail Hardware associations were present, and several subjects of importance to Hardware dealers of these States were up for discussion. The indiscriminate selling of Hardware by the jobbers to all classes of trade in towns where there are good stocks of Hardware was pointed out to them as working an injustice on the Hardware dealer, and a very satisfactory agreement was reached with the jobbers present so that this class of selling would be reduced to a minimum.

An extremely heavy volume of correspondence has been handled by the secretary's office the past year, as you will note by the amount of postage bills. Hardly a day passed but what several letters were received from various parts of the country asking for information concerning our association, our members and the work we are doing. This class of correspondence took a great deal of time, but will bear fruit in the future.

Complaints.

I have received but few complaints from the dealers over the State, even in reply to my letters of August 8,

which asked for complaints along a certain line. This condition is most gratifying, not only to the dealer, but to the manufacturer and jobber as well.

Mutual Insurance.

I have received letters from a number of the dealers at various times, asking about Hardware insurance and where to place their policies. With our sister associations giving their members insurance for 50 cents on a dollar, the time is not far distant when this subject should receive the serious consideration of this association.

Convention Dates.

Early in the fall I entered into correspondence with the secretaries of the Minnesota, Iowa, Nebraska and North Dakota Hardware associations regarding the forming of a convention and exhibit circuit and a satisfactory schedule of dates was arranged, and our date was approved by your Executive Committee at its meeting at Mitchell in August. This circuit was formed with the view of doing away with conflicting convention dates in adjoining States, and it is unfortunate for us that Wisconsin set their date the same as ours, as several exhibitors who had reserved space at Milwaukee wanted to come to our convention, but were unable to do so. It is hoped that this conflict can be avoided another year.

Over 100 New Stocks in South Dakota.

The past year has shown a wonderful increase in the number of Hardware stores in the State. Over 100 new stocks have been put in, and it has been with a good deal of difficulty that I have kept my mailing list up to date.

Financial Statement.

The receipts for the year were $740 and the disbursements $713.10, making a balance of $26.90, and with $278.44 in the hands of the treasurer at the close of the last convention, there is now $305.34 on hand and all accounts paid.

Prof. E. F. Ladd's Address.

Prof. E. F. Ladd of Fargo, N. D., made an elaborate address on "Pure Paints and Paint Laws," in which he touched on the kinds of pigments used in Paints, mail order house Paints, the North Dakota Paint law, the desirability of national Paint legislation, and the Paint tests which are being conducted at the North Dakota Experiment Station. Professor Ladd believed that a national law should be enacted at this session of Congress. He said that a bill of this sort, if passed by the National Legislature, while it might not be as strong as the North Dakota law, would go far toward controlling the sale of Paints and making them what the manufacturers represented them to be. It would offer protection to the retailers against the sale of catalogue house Paints and would tend to drive that class of Paints out of the market.

Convention Committees.

The president appointed the following committees:

NOMINATIONS: Dean Gross, Yankton; H. K. Odell, Montrose; T. A. Strickland, Beresford; L. J. Endbus, Waubaseka; F. J. Pelan, Montrose; Geo. H. Shull, Aberdeen; J. W. Chase, Parker.

RESOLUTIONS: E. R. Gregory, Alexandria; W. A. Barber, Mitchell; J. L. Jarvis, Brookings; O. K. Berg, Lily; O. P. Anderson, Clear Lake; H. W. Lemme, Ashton; C. A. McArthur, Aberdeen.

A. T. Stebbins' Address.

A. T. Stebbins, Rochester, Minn., vice-president of the National Retail Hardware Association, extended greetings from the national body and congratulated the South Dakota organization on the success they had attained during the past year. He spoke at some length on the importance of organization. He said that merchants were just beginning to realize the necessity of organizing that they might combat their worst enemies, the mail order houses, and eliminate to a certain extent, at least, a competition which might eventually ruin their business. He said that while they did not expect to eliminate the catalogue houses, they could restrain them from [illegible]

Mr. Stebbins also referred to the parcel post question. He said that if it had not been for the retail Hardware associations the parcel post bill would have been on the statute of the United States Government today. He had no doubt but what the parcel post bill would be defeated at the present session of Congress, but he believed that Postmaster-General Meyer would continue his aggressiveness, and the people should therefore be alive to the occasion at all times and watch every move made in that direction.

He also mentioned the subject of good roads. He believed this question was of vital importance to the commercial interests of towns and should be seriously considered. This was one of the most effective ways to reach the farmer and gain his friendship, as the farmer would have less inconvenience in bringing his produce to market and would realize that the merchant, after all, had his interest at heart. In this way the merchant could also head off a great many orders for the catalogue houses.

Retailing of Merchandise a Science.

W. J. Pilkington, Des Moines, Iowa, delivered an address on the subject of "The Retailing of Merchandise a Science." Mr. Pilkington said in part:

Have you ever wondered, have you ever thought, why you are in the retail business? Here are a bunch of merchants. Why are you merchants? How did you come to be a merchant? How did it happen that you preferred to be a merchant rather than a doctor, a preacher, a lawyer, or a mason? Are you a merchant because you are adapted to that business and are you a merchant because you were schooled in it? Or did you just happen to be in the retail business simply because you got a job as a clerk and gradually developed into a merchant, or was it because of looking for a soft snap?

The man who is a professor in a college has educated himself for that line of work. The man who is in any profession has educated himself for that and he has done, at least, thinking to begin with, so as to educate himself for that business. Now, then, if you are not in the retail business because you are adapted to it, because you like it, then why are you in it? I say this to you, that if the retailing of merchandise is not a science it isn't anything. If the business that you spend your life in isn't science it isn't anything.

The Only Way the Retail World

will ever get on the basis it should be is to understand that it has a scientific principle and is a science that will yield to rules and regulations. The time is going to come when a man will be educated to be a retail merchant, and that is what he ought to be. There are underlying principles having to do with the retail business that ought to be studied just the same as any other course in any school.

Is There Any Science in Buying?

Did you ever stop to think and wonder if you are using any rule in buying? What is the first thing that comes up, or should come up, in the buying of goods? Economy: the economic condition of the country. There is a scientific rule that every man who buys a dollar's worth of goods should reckon with. What I mean is this: The condition of the community in which you live, the condition of the whole United States, should be taken into consideration. Do you remember what happened last November? Do you remember the flurry that passed all over the country? Did it have anything to do with the buying? Well, I guess it did, and with selling, too.

Now, that is what I mean by the studying of economic conditions in the purchasing of goods. It is your business to know how many bushels of wheat your county raised last year; how many bushels of oats; how many pounds of pork. In other words, what was the income of the people in your county last year? Upon that you must base your buying, or the first thing you'll know you will be overstocked.

Mr. Pilkington went on and pointed out various other scientific principles which formed the basis of retail merchandising. He urged the necessity of learning the art of ad. writing; that advertising without prices, without a little story of the goods advertised, was not worth the paper it was on. The selection of clerks was also an important feature. The character of a man should always be taken into consideration before hiring him as a clerk.

Mutual Fire Insurance.

It was determined at the convention that the Executive Committee should make a thorough investigation of the matter of establishing a mutual fire insurance company under the auspices of the association, the report of the results of their investigation to be presented at the next annual meeting of the association.

Election of Officers.

The [illegible] elected to serve during the ensuing year:

PRESIDENT, L. J. Gregory, Aberdeen.
FIRST VICE-PRESIDENT, F. I. Pixley, Montrose.
SECOND VICE-PRESIDENT, George V. Ayer, Deadwood.
SECRETARY, J. L. Johnson, Redfield.
TREASURER, E. G. Watson, Chamberlain.
EXECUTIVE COMMITTEE, F. D. Hawkins, Vermillion; W. A. Barber, Mitchell; O. P. Anderson, Colton; J. L. Jarvis, Brookings; B. E. Tibbets, Clark; C. A. McArthur, Aberdeen; D. D. Gross, Yankton.

The following were appointed members of the Legislative Committee: Geo. V. Ayer, Deadwood; F. I. Pixley, Montrose; Fred S. Rowe, Fort Pierre.

The president and secretary were decided upon as delegates to the national convention.

Resolutions.

Among the resolutions adopted by the [illegible] were the following:

Whereas, The South Dakota Retail Hardware Association, in convention assembled observed the evil effects resulting from the sale of adulterated and lombranded Paints and Oils and the need for national protection;

Resolved, That we commend the efforts being made to secure sound legislation, and we indorse the Marshall Paint bill now before the National Congress and urge upon our members of the House and Senate to use every honorable means to secure its enactment into a law; and be it further

Resolved, That our secretary be instructed to furnish copies of this resolution to our Congressmen and Senators, also to the Hon. T. F. Marshall, member of Congress.

Whereas, The parcel post is un-American and not applicable in large and sparsely settled countries; be it

Resolved, That we urge vigorous opposition to this law, but would recommend a reduction on first-class postage rate.

Whereas, We believe bill H. R. 13,447, amending Section 549 of the postal laws of the United States is unjust, unfair and against the best interests of our association; be it

Resolved, That our Senators and Representatives be requested to use all honorable means in repealing this law.

Resolved, That we request that as soon as possible the jobbers shall eliminate from their customers all but regular Hardware dealers, and that they will refrain from entering into or maintaining retail Hardware stores.

Resolved, That it is the judgment of this committee that our State and country officials should make a large appropriation for the building of good roads in our State.

Resolved, That we are in favor of the national law prohibiting false advertising and misrepresentation of our respective lines of goods, believing that justice is the foundation of prosperity.

R. E. Saberson of the Berkley System Company, Sioux City, Iowa, spoke at some length on the question of catalogue house competition. Mr. Saberson pointed out how the mail order houses were gradually expanding, and how by the system of advertising furnished by his company their development might be checked.

Invitations were received from the commercial clubs of Yankton and Huron to hold the next convention in their cities. Huron was selected.

The Hardware & Woodenware Mfg. Company Receivership.

BY an order of the United States Circuit Court, in the Southern District of New York, Nicholas H. Colwell has been appointed receiver of the Hardware & Woodenware Mfg. Company, 826-828 Broadway, New York, and applications have been made for the appointment of ancillary receivers in all the States in which the properties of the company are located. The receiver is informed that this action has been taken for the purpose of protecting the interests of the creditors and stockholders pending the adoption of a plan by all parties in interest intended to provide for the payment of the liabilities of the company and the successful continuance of its business. Pursuant to the orders of the United States Circuit Court the business will be continued as nearly as possible as heretofore by the receivers, with no unnecessary changes in its organization or employees or in the methods of its business. Orders may be sent to the receiver, either at the main office of the company, 826-828 Broadway, New York, or to the receiver at the various [illegible] orders, we are informed, will receive prompt and satisfactory attention. The 15 constituent companies composing the Hardware & Woodenware Mfg. Company are located in eight States, in only one of which has a co-receiver been appointed with Mr. Colwell. It is Mr. Colwell's purpose to conduct the receivership with as little expense to the stockholders as possible.

Death of Albert M. Graves.

ALBERT M. GRAVES, secretary of Hibbard, Spencer, Bartlett & Co., Chicago, died at French Lick, Ind., on the 2nd inst. Mr. Graves was born at Sunderland, Mass., in 1848. He came to Chicago at an early age and engaged to work for Field, Palmer & Leiter, but did not long continue in the dry goods line. On August 10, 1867, he began work for Hibbard & Spencer as an invoice clerk. After two or three years' work in the house he was sent out on the road to represent the firm in Wisconsin and northern Michigan. Successful from the start, he rapidly increased the business from the territory which he covered. At that time only two men were traveling for Hibbard & Spencer—A. D. Lamb and Mr. Graves—but the



ALBERT M. GRAVES.

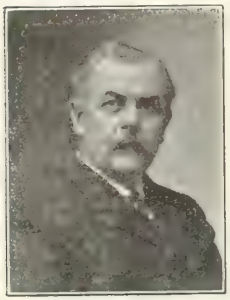
number was steadily increased until Mr. Graves was called into the house to assist in the direction of this force, which he continued to do until the day of his death. He was intensely interested in the young men employed by the house, particularly those who aspired to become salesmen, and was ever ready to help them along in every possible way. Mr. Graves was one of the hardest of workers, and being methodical and orderly he accomplished things. Painstaking, tactful and persevering in whatever capacity he served, his work was always characterized by thoroughness. So devoted to his business was he that much of the time that most men give to sport and recreation he employed in the advancement of the firm's and his own interest.

Genial in manner, he had a pleasant word for every one and was ever ready to respond to the needs of those less fortunate than himself. Of boundless energy and recognized ability, he rapidly advanced in the company's favor and was finally made secretary. Mr. Graves' devotion to his family, his friends, his church and to his business interests were well known, and in his death the company has lost one who had been in its service for over 40 years and who had always worked energetically, loyally and capably for its best interests.

The Hardware, Stove, Tin and Paint store of M. J. Gallagher, Wheaton, Kan., has been destroyed by fire.

Wisconsin Retail Hardware Association.

AN attendance gratifying in numbers and enthusiasm, coupled with encouraging reports of growth and progress, combined to make the twelfth annual convention of the Wisconsin Retail Hardware Association, held in Milwaukee, February 5-7, one of notable interest. Signally favored by a succession of able executive officers and fortunate in the uninterrupted service of a well qualified and energetic secretary, whose tenure of office dates from the beginning of the organization, the Wisconsin body has won and still retains a position of commanding importance among the foremost retail Hardware associations. Some years, it is true, have shown more rapid advancement than others, but at all times the movement has been one of unfaltering progress. Accessions to its membership during the past year were somewhat less than in the year previous, the number for the latter period being 43, but after deducting losses by death, which it is to be regretted were the largest in the history of the organization, and lapses through retirement from business, there is still left a safe margin of gain. From an original membership of 40, 25 of which are still actively connected with the organization, the number has grown so that this year the association has enrolled upon its roster 645 names of members in good standing.



JAMES MURPHY,
President.

Following a generally favored precedent established at the last convention business sessions were held only in the forenoon, leaving the members free in the afternoon to visit the exhibits of merchants and manufacturers, which were displayed in two spacious halls of the Public Service Building, on the upper floor of which the convention hall was located. The popular interest manifested in this feature of the convention by both delegates and exhibitors was attested by the crowds that filled the halls from the opening to the closing hour, and by the fact that practically all the available space provided by the association was engaged and occupied. Included in the well arranged programme provided for the convention were a number of addresses and business talks upon topics of pertinent interest, which commanded marked attention and evoked lively discussion; moreover, there were not lacking those contributions in a lighter vein, which added zest to the proceedings.

President Kornely's Address.

Succeeding the call to order of the opening session by President J. Kornely on Wednesday morning the convention joined in singing "America," after which Richard B. Watrous, secretary of the Citizens' Business League, delivered a brief, but hearty message of welcome in behalf of that organization and the citizens of Milwaukee. This was supplemented by similar sentiments voiced by Louis Weiss, president Milwaukee Retail Hardware Association, who extended an invitation to the delegates to attend a theater party at the Davidson in the evening as guests of the local association. Having acknowledged these courtesies by fitting responses President Kornely delivered his annual address, the keynote of which was unceasing vigilance in guarding against the establishment of rules and practices inimical to the Hardware trade. The Hardware trade journals were commended for their serviceable and efficient efforts in behalf of association work, and the membership was recommended to acknowledge their beneficial influence by a liberal support. Among the experiences of the year which were referred to as pointing the need of alert activity were the passage of the Binder Twine bill and the defeat of a bill prohibiting gas companies from selling Gas Stoves to consumers, by the Wisconsin Legislature, the action in both cases having been the result of efforts made by the Retail Hardware and many other associations. Attention was directed to certain defects in transportation facilities that apparently contribute to needless delay of shipments, and suitable action directed toward the elimination of such difficulties was suggested.

Secretary's Report.

In presenting his twelfth annual report Secretary-Treasurer C. A. Peck, while noting some diminution in the ratio of new members received since the last report, declared that, as an effective force for the promotion of its aims and purposes, the association was stronger to-day than at any period in its history. This was ascribed to the fact that more of the members had become actively engaged in furthering the interests of the organization within the past 12 months than in any previous year of its existence. Following a suggestion for the appointment of a committee to draft suitable resolutions in memory of the six members claimed by death since the last meeting, other features of interest were taken up in the report, which continued as follows:

I would also recommend that you take some action in regard to empowering our Committee on Legislation to act, and make some provision for paying them for services rendered, wherever necessary. We have not paid as much attention to that feature of our work in the past as we might profitably have done.

We have taken in since our last meeting adjourned 43 members, and at the last meeting 37 were added to our rolls, although some of these were successors to previous members. We have to-day 645 on the rolls who have paid their dues up to date.

I sent out some 700 notices in regard to protesting against the use of freight cars for billboards, and with the combined efforts of the different State associations we were successful in having the evil cured, so that to-day you see no freight cars passing your station so labeled. During the fall I sent out about 2000 letters and appeals in regard to parcel post legislation, and from reports received, several of which are on file in our office, I think the powers that be thought the Hardware dealers were not dying to have any legislation along that line.



HENRY F. KRUEGER,
Vice president.



C. A. PECK,
Secretary.

Our financial exhibit shows that since the last meeting we have received for dues $1262, plus $28.30 received for interest, and $2886.28 of surplus on hand, making a total of $4367.33, which includes $190.75 received on account of programmes. To the present assets on hand of $2865.43 there will be added one-half of the net proceeds of our exhibition feature, the amount of which at this writing is unknown.

Convention Committees.

Announcement of the following committees appointed to serve during the convention was made by President Kornely:

AUDITING—James Montgomery, Wausau; F. Rossman, Beaver Dam; B. W. Walter, South Milwaukee.

LEGISLATION: L. M. Nash, Grand Rapids; Mr. Reed; A. C. Page, West Bend; D. & P. Kusel, Watertown.
SUBSISTENCE: William Noll, Marshfield; Mr. Kostitke, Wauwatosa; C. A. Gorder, Waukesha.
PRESS: J. W. Jones, Racine; C. B. Warner, Burlington; Fred Herrinbrueck, Milwaukee.
QUESTION BOX: P. L. McNamara, Janesville; John Hess, Antigo; C. A. Bewley, Kenosha.
GRIEVANCES: L. B. Wenstein, Plymouth; Louis Weiss, Milwaukee; J. J. Hanett, Appleton; Mr. Kruse, Sheboygan; A. H. Pratt, Baraboo.
RESOLUTIONS: F. J. McPherson, Oshkosh; Mr. Gross, Stevens Point; Mr. Kearns, Port Washington; Simon Fink, Milwaukee; E. Yeitgen, Manitowoc; H. C. Schofield, Sturgeon Bay; M. Hansen, Scandinavia.
SERGEANT-AT-ARMS: August Schupinski, Milwaukee.

Mutual Fire Insurance.

Several interesting talks on the benefits of mutual fire insurance were given, in the course of which policy holders were advised to carefully observe the contract conditions upon which their insurance is based. Attention was called to the necessity of protecting the salvage in case of a loss, and the procedure to be followed in filing proofs of loss for adjustment were explained in detail. By way of emphasizing the policy requirements the following pertinent questions were propounded by Secretary Peck:

How many present know that any change of ownership without immediate notice to the company or its agent invalidates a policy; that a mortgage put upon property insured does the same thing; that if they are using a



J. KORNELY.



J. W. JONES.

firepot burning gasoline without a special permit therefor recovery in case of loss is forfeited; that the same result follows the acceptance of other insurance without consent; likewise the use of acetylene lights or the carrying of more than 25 lb. of gunpowder without a special permit; that the insured is required to furnish proofs of loss, which, by the way, it is difficult to do in case annual inventories are not taken and stock account of purchase and sales are not kept; whether policy is written at other than the board rate; or if manufacturing is allowed after 10 o'clock at night; if alterations taking more than 15 days' time are allowed without special permit; if the keeping of fireworks on the premises is prohibited, and that notification of change of title and ownership are invariably required?

Freight Transportation.

Under the topic of "Some Flies in Our Ointment," John M. Callahan, freight agent, Chicago & Northwestern Railway, at Milwaukee, discussed the relations of shipper and carrier in the transportation of freight. Prefacing his address with a couple of narratives, the humor and application of which were keenly enjoyed by the audience, Mr. Callahan, speaking from his experience as a railroad man, told his hearers how the movement of freight might be expedited and much of the annoying delay, commonly incident to the settlement of claims against the railroads for damages and shortage of consignments, might be avoided. Touching these questions he said:

We find that many claims are presented with nothing to substantiate the correctness of the claim. This necessitates the return of the claim to the claimant for further information or evidence, which means a delay in the settlement of the claim. I have to say that, in my opinion, if claimants would furnish the following papers and information, claims could be much more promptly investigated and adjusted:

1. A bill stating the amount of claim, date of shipment, and, if known, the cause of the damage or loss.

2. The bill of the person who made the repairs, if claim is for the cost of repairs to property damaged in transit.

3. A copy of the account sales for property sold, if claim is for property shipped to be sold on commission or otherwise, and upon reaching destination was sold.

4. The original paid freight bill for the charges on the shipment.

5. The original bill of lading for the shipment, if one was issued.

6. The original invoice, or a certified copy of it, if the claim is for the value of merchandise lost or damaged in transit.

7. Attach any correspondence which claimants may have with other parties interested in the shipment, showing where and how the loss or damage occurred and its extent.

The above papers and information should be transmitted to the railroad agent, who will forward the papers to the general claim agent for adjustment. If the shipment came over more than one line, always attach the shipping ticket or bill of lading, as it will enable the delivering line to make settlement promptly; it will not be necessary to forward the papers to connecting line, where the claim is beyond a question of dispute, as it will be paid promptly and then passed on to connecting lines.

Marking of Freight.

Another very important question, which I believe should be brought to your attention, is the proper marking of freight. This question appears to have been lost sight of by many shippers, but I am of the opinion that the subject is of too much importance to be allowed to pass by unnoticed. It is, indeed, of greater concern and importance to railroads and its patrons than has been realized. This subject naturally resolves itself into "what are the rules governing the handling of package freight." They require that each and every piece of less than carload freight must be plainly marked with all the necessary information to transport shipment through to destination, even if separated from the way bill. The rules of all transportation companies are practically uniform on this proposition, yet it has been a difficult matter for us to secure the hearty co-operation of all shippers on this point.

We should work for uniformity in the observance of the rules laid down by the transportation people, and insist that each package of freight must be plainly marked, consignee's name to be written in full, name of city or town, and the State. This would insure its proper delivery, even if the railroad way bill becomes separated from the freight, for if the freight is fully and properly marked it can go forward without billing. If it bears only the initial and reaches its final destination with such marking, the receiving agent may not be able to make delivery or ascertain to whom the freight belongs.

Delays Due to the Improper Marking of Packages

often cause the loss of a good customer. How then can we avoid these unnecessary and vexatious delays? First, it is highly important that all old marks be removed from boxes or packages that you are to send out, and see to it that the stencil or marking pot is used in every instance, writing out the name in full, "John Smith, Milwaukee, Wis." If the shipment is for residence delivery in a large city, always be careful to write in the street and number, as there are nearly always several persons of the same name in the same city. Street and number being shown, delivery will be made to the proper person.

We also receive shipments where tags only are used on barrels and boxes. I would urge you to discontinue this practice for the reason that in placing one box on top of another the tag may be torn off and by the time it reaches the point to which it is destined there may be no tag or address on the box. If the system of marking as suggested is observed the trials and troubles of all concerned will be very materially reduced. Every shipper should so organize the business transacted with the railroad companies as to get the very best results. Many firms have a systematic manner of ordering and loading cars, keeping a car record as carefully as their bank account, while others leave the placing of cars at their industries in the hands of switchmen, and, as a result, they do not get the service which they expect and have not requested in proper form.

As to Recent National Laws Enacted,

it seems to me that very likely railroad companies will in the working out of the problem find that these laws

impose fewer hardships than were generally expected, and also that some of their provisions will be found protective. The demand that all accounts of transportation companies shall be uniformly kept, subject to examination by representatives of the Federal Government will be regarded as a protection and a benefit, rather than a matter of complaint. This will give the public a statement which will show a road to be in good condition with an attractive balance of earnings, if it is actually in that condition. The investor will be in position to know the truth, and can say the statement is correct; it has been audited and proved by the Federal Government's authorized representative. No railroad should, it appears to me, object to this kind of regulation.

Paper on Trade Getting.

Since the commerce of the world is carried on chiefly for the pecuniary profit to be gained thereby, the success achieved in any other line of business depends to a large extent on "Trade Getting." Consideration of the methods best calculated to accomplish this result with a proper regard for the rights of others engaged in a like pursuit formed the theme of a thoughtful address delivered by J. W. Jones, Racine, Wis. Some of the suggestions offered by the speaker are embodied in the following extract from his paper:

One of the most important factors in trade getting is to gain the confidence of the people in your community, which you can positively do by honest dealing and you can retain it as well by following the same practice. Well arranged and cleanly kept show windows, changed at least twice a month, with prices marked in plain figures, create a good impression with the people that travel by your place of business. The same policy should be adhered to all through the store; the better you display your goods the more you will sell and trade getting becomes a simple matter.

Have one price on the same article for all, discriminating only in quantities. Special sales for cash only, at different times, honestly conducted, is another good medium for getting new trade, but great care should be exercised in offering the best article possible for the money involved.

Render your bills and statements monthly to all credit customers, so that they may know at all times to what extent they are obligated to you, and you will find it to be one of the best trade getting mediums you can exercise, as well as profitable to yourselves.

By following these suggestions closely you will find that your business will increase and that trade getting is practically solved. And, finally, it never gets you any trade to criticise your competitors. At this day and age we have all we can do to attend to our own business. Remember it is your goods as well as yourself that you want to advertise and not your competitor.

Business Methods in the Store.

In a well considered and practical paper on "Business Methods," H. F. Krueger, Neenah, Wis., outlined methods for the conduct of a retail Hardware business, which in his own experience have been productive of good results in expediting transactions, minimizing errors and checking wasteful loss. A thorough knowledge of the quality and uses of each article handled was emphasized and an organized system of instruction for clerks and salesmen was recommended. Illustrating his method of handling orders and accounts, a complete set of blanks, marking cards and tags of various sorts and sizes were exhibited and the use of each explained. Many of the members availed themselves of the opportunity offered to examine these blanks, which in the light of explanation given regarding their use and adaptability to the average retail Hardware business were studied with much interest.

Resolutions.

Among the resolutions adopted were the following:

Resolved, That it is the sense of this convention that we discourage in every way we can the giving away of premiums of standard articles with soap, baking powder, &c., and that we appeal to the manufacturers for their hearty co-operation.

Resolved, That the president of this association appoint at an early date a strong legislative committee to look after matters affecting our interests, this committee to be reimbursed for actual expenses incurred.

Resolved, That this association is opposed to the adoption of House bill No. 13,477, relating to post offices and post roads. (This proposed legislation referred to lists of persons receiving mail at post offices upon payment of expenses of copying same.)

Resolved, That we favor the proposed bill introduced by the National Advertisers' Association regarding fraudulent advertising.

Resolved, That this association disapprove the action of the Greater Milwaukee Association in recommending the passage of parcel post bill.

Resolved, That the secretary of this association present at each annual convention a list of those who have retired from the Hardware business, so that desirable ones may be elected honorary members of this association.

CURRENCY LEGISLATION

Whereas, The President of the United States in his message to the Sixtieth Congress urged the need of immediate action by Congress in the matter of currency legislation; and

Whereas, We believe that the President is right in his opinion that there is need for some immediate action by Congress in the matter of legislation to relieve the present financial stringency, as well as to restore confidence and to prevent if possible the recurrence of such strained conditions in business as now exists; and

Whereas, It is the opinion of our best and most conservative business men that such action is necessary for the permanent prosperity of the West; therefore, be it

Resolved, That our representatives in Congress and United States Senators are hereby urged to take prompt action with a view to having enacted as soon as possible such financial legislation as may be most expedient to remedy the present financial stringency, and to prevent, if possible, the recurrence of such business conditions as have been in existence during the past 90 days, and to restore as quickly as possible the confidence of the people in our great and prosperous country.

Election of Officers.

The following officers were elected for the ensuing year:

PRESIDENT, James Murphy, Racine.
VICE-PRESIDENT, Henry F. Krueger, Neenah.
SECRETARY-TREASURER, C. A. Peck, Berlin.

Charles Pflugradt, Milwaukee, and I. B. Wensink, Plymouth, were chosen members of the Executive Committee to succeed E. M. Ramm and A. H. Kleberg.

The following delegates to the national convention at St. Louis were selected: President James Murphy, Vice-President Henry F. Krueger, Secretary-Treasurer C. A. Peck, R. R. Murdock, Beloit; Emil Teitgen, Manitowoc; H. C. Scofield, Sturgeon Bay; John Hessel, Antigo.

National Officers Present.

Among the distinguished guests of the convention were several officers of the National Retail Hardware Association and others prominently connected with and interested in the work of the association. Of the former there were present M. L. Corey, secretary, Charles H. Williams, second vice-president, and H. L. McNamara, treasurer; included among the latter were L. Lindenberg, representing the Mutual Fire Insurance Company of the Iowa Association; W. H. Bennett, Chicago, and R. R. Williams of *The Iron Age*, all of whom made brief addresses at one of the sessions.

Entertainment.

Arrangements for the entertainment of members and guests of the convention were, as in former years, liberally planned and happily carried out by those having them in charge. Besides the courtesies individually extended by the retail, jobbing and manufacturing interests connected with the Hardware trade, through which many of those in attendance were afforded an opportunity of visiting points of interest, the convention was collectively entertained on Wednesday evening by a theater party given by the local retail association, and on Thursday evening in a similar manner by the jobbers and manufacturers of Milwaukee. Over 750 persons were present on each occasion, and their appreciation of the entertainment offered was freely demonstrated.

Manufacturers and Jobbers Present.

A-B POLISH COMPANY, Chicago: Polishes. Represented by G. L. Burlingame and A. P. Christena.

ADRIAN WIRE FENCE COMPANY, Adrian, Mich.: Wire Fence. Represented by John Westrick.

ÆTNA POWDER COMPANY, Chicago: Powder and Dynamite. Represented by George A. Allen and W. J. Austin.

AMERICAN POWDER MILLS, Boston, Mass., and Chicago: "Dead Shot" Smokeless Powder. Represented by R. R. Barber and R. W. Clancy.

AMERICAN STEEL & WIRE COMPANY, Chicago: Woven Wire Fence. Represented by E. J. Smith, Grant Phillips, L. Harter and J. W. Meaker.

AUTOMATIC DAMPER COMPANY, Milwaukee, Wis.: Automatic Specialties and Star Ball Bearing Pulleys. Represented by A. B. Ferdinand.

BANY & HADLEY MFG. COMPANY, Delphos, Ohio: "Bany" Washing Machines. Represented by B. F. Hadley.

BRAND STOVE COMPANY, Milwaukee, Wis.: Stoves, Ranges and Furnaces. Represented by Matt J. Feaney and William T. Griffith.

BENDER MFG. COMPANY, Milwaukee, Wis.: Household Specialties. Represented by C. J. Robertson.

CARBORUNDUM COMPANY, Niagara Falls, N. Y.: Sharpening Stones and Knife Stones. Represented by B. L. Cohen, George N. Allen and W. R. Embleton.

CHICAGO VARNISH COMPANY, Chicago: Paints and Varnishes. Represented by F. P. Rudinger, W. M. Dressler and Henry B. Cowap.

CLAUS AUTOMATIC GAS COCK COMPANY, Milwaukee, Wis.: Gas Stove Cocks and Valves. Represented by E. L. Claus.

CONSOLIDATED SHEET METAL WORKS, Milwaukee, Wis.: Fireproof Windows and Doors, Skylights, Cornices, &c. Represented by Fred Bogenberger, Jr.

CREAM CITY ROOFING & PAINT MFG. COMPANY, Milwaukee, Wis.: King Brand Roofings and Paints. Represented by F. M. Johnson, C. A. Minton and F. M. Perkins.

DAIN MFG. COMPANY, Ottumwa, Iowa: Hay Machinery. Represented by F. M. Gardner.

DE LAVAL SEPARATOR COMPANY, Chicago: Cream Separators. Represented by H. S. McMariners and B. J. Evans.

ENNO DORESTAN & SON COMPANY, Milwaukee, Wis.: Mixed Paints. Represented by J. Hppert.

DOVER MFG. COMPANY, Canal Dover, Ohio: Asbestos Sad Irons. Represented by W. D. Anderson.

ENGINEERING & SUPPLY COMPANY, Milwaukee: Farming Implements. Represented by C. H. Barker and Fred W. Mahneke.

FERDINAND DIECKMANN COMPANY, Cincinnati and Brighton, Ohio: One-Piece Conductor Elbows. Represented by Ferdinand Dieckmann, Otto Dieckmann and Edward H. Hoffeld.

FOLLANSBEE BROS. COMPANY, Milwaukee and Pittsburgh: Tin Plate and Sheets, Conductor Pipe, Furnace Pipe, Fittings, &c. Represented by Edwin G. Fisher.

J. B. FORD COMPANY, Wyandotte, Mich.: Dairyman's Cleaner and Cleanser. Represented by E. R. Hansen.

FOSTER-MUNGER COMPANY, Chicago, Ill.: Doors, Blinds and Glazed Sash. Represented by J. J. Eells.

FOX MFG. COMPANY, Milwaukee, Wis.: Metal Shears and Floor Scrapers. Represented by E. M. Clark.

WM. FRANKFURTH HARDWARE COMPANY, Milwaukee, Wis.: Jobber of General Hardware.

FROST, CLARK & CO., Chicago: Water Heaters and Kerosene Incandescent Burners. Represented by A. W. Holmes.

FULLER-WARREN COMPANY, Milwaukee, Wis.: Stewart Stoves and Ranges. Represented by H. S. Crane and Chas. W. Holmes.

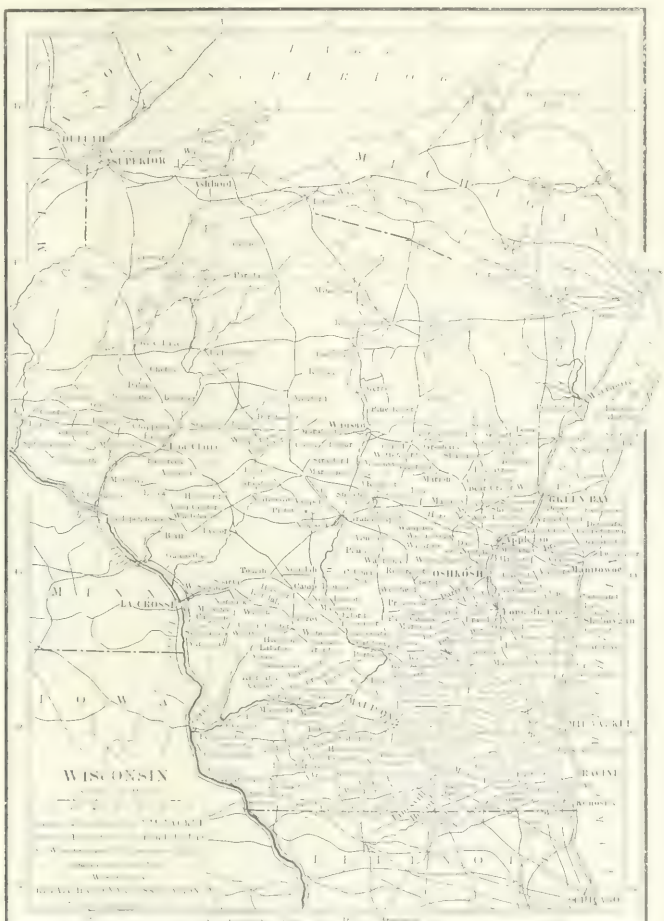
GLASSTOCK BROS. MFG. COMPANY, Muncie, Ind.: Baby Jumpers, Baby Walkers, Wood and Steel Hand Cars. Represented by John J. Doan.

GOODYEAR RUBBER COMPANY, Milwaukee: Rubber Hose. Represented by Walter W. Wallis and J. F. Ford.

PHILIP GROSS HARDWARE COMPANY, Milwaukee: Represented by H. M. Gay.

HARPER, SELNER & JOYS, Milwaukee: Manufacturers' Agents. Cutlery, Mica and Hardware Specialties. Represented by H. J. Joy and R. P. Spencer.

HARTAN COOLER COMPANY, New Britain, Conn.: Steel Registers. Represented by H. M. Hine.



Railroad Association Map of Wisconsin

HASTINGS & ANDERSON, Milwaukee: Mossberg Wrenches.

HAWKEYE INCUBATOR COMPANY, Newton, Iowa: "One Minute" Washers. Represented by T. W. C. Anderson.

HECHT & ZUNMACH, Milwaukee: Paints. Represented by Walter Zunmach.

JOHNSON & FIELD MFG. COMPANY, Racine, Wis.: Farm and [illegible] Johnson and W. L. Dutton.

JOHNSON SERVICE COMPANY, Milwaukee, Wis.: Thermometers, Hygrometers, Barometers, &c. Represented by O. L. Voigt.

JOINTLESS REFRIGERATOR MFG. COMPANY, Milwaukee: Refrigerators. Represented by Wm. Von Baumbach and O. S. Lewis.

LAWRENCE BROTHERS, Sterling, Ill.: Builders' Hardware. Represented by [illegible]

LENNOX FURNACE COMPANY, Marshalltown, Iowa: Represented by J. M. Veech and W. G. Healz.

A. J. LINDEMANN & HOVERSON COMPANY, Milwaukee: Lindemann Stoves and Ranges and Sheet Metal Goods. Represented by [illegible]

LUTHER BROS. MFG. COMPANY, Milwaukee: Tool Grinders. Represented by Ed Clark.

LYONS SPECIALTY COMPANY, Lyons, Iowa: Petersen Steel Barn Door Latch and Holder. Represented by Wm. Petersen.

MAJESTIC FURNACE & FOUNDRY COMPANY, Huntington, Ind.: Majestic Coal Chute. Represented by H. F. Zent.

MARLIN-FIRE ARMS COMPANY, New Haven, Conn.: Firearms and Ammunition. Represented by Charles Porter.

A. D. MEYER, Milwaukee, Wis.: Manufacturers' Agent, Stoves and Heaters.

MICHIGAN WASHING MACHINE COMPANY, Muskegon, Mich.: Washing Machines. Represented by G. E. Harding.

MILWAUKEE CORRUGATING COMPANY, Milwaukee, Wis.: Sheet Metal Roofing, Steel Ceilings, Conductor Pipe Elbows, Cornices, &c. Represented by Louis Kuehn, J. K. Davies, C. H. Krebs, J. L. Bantz, A. P. Roberts and H. J. Herzog.

MILWAUKEE STOVE & HEATER COMPANY, Milwaukee: Stoves, Ranges, Boilers, Radiators, Furnaces, Registers and Stove Dealers' Specialties. Represented by W. J. Breese, C. J. Seager, W. L. Powell and H. J. Beckerle.

BENJAMIN MOORE & Co., New York and Chicago: Muresco Wall Wall and Ceiling Paints. Represented by C. J. Scribner and C. S. Brink.

L. J. MUELLER FURNACE COMPANY, Milwaukee: Mueller Furnaces and Boilers. Represented by L. J. Mueller, Jr., G. C Mueller, N. B. Garnsey and J. H. Benny.

NEW MFG. COMPANY, Canton, Ohio: Haying Tools and Hardware Specialties. Represented by J. M. Mobley, Charles Domer and H. S. Nunamaker.

OHIO VARNISH COMPANY, Cleveland, Ohio: Varnishes. Represented by W. H. Ansell.

OHLERKING & SMITH, Chicago, Ill.: Perfect Faucet Cushions. Represented by J. H. Ohlerking.

ONEIDA COMMUNITY, Ltd., Oneida, N. Y.: Game Traps, Chains, &c. Represented by Frank H. Primo and W. J. Scanlon.

E. L. PARMENTER, Milwaukee: Safety Teeter Rocker. Represented by Ed. Klaus.

PATEK BROTHERS, Milwaukee: Paints and Varnishes. Represented by Norton A. Roos, W. H. P. McElwee, J. A. Magill, J. K. Fox and F. P. Jacka.

JAMES E. PATTON COMPANY, Milwaukee, Wis.: Paints. Represented by L. W. Bowman, C. F. Ehle, Sam Swartz and Henry Benz.

PECH-HAMRE MFG. COMPANY, Berlin, Wis.: Metal Specialties, Mail Boxes, Latches and Automatic Trucks. Represented by Fred R. Peck.

PITTSBURGH STEEL COMPANY, Pittsburgh: Fence. Represented by W. F. McNamara.

JOHN PRITZLAFF HARDWARE COMPANY, Milwaukee: Hardware Represented by Geo. Davies and J. H. Marschalck.

QUAKER CITY RUBBER COMPANY, Chicago: Hose and Rubber Goods. Represented by J. B. Freye, Milwaukee.

REPUBLIC METALWARE COMPANY, Buffalo, N. Y.: Savory Roasters. Represented by James E. Harper.

JACOB RETTERER, Chicago, Ill.: Stoves, Ranges and Furnaces. Represented by Wm. O. Retterer.

REVERE RUBBER COMPANY, Boston and Chicago: Garden Hose. Represented by S. F. Denny and A. F. Wilcox.

ROCK ISLAND TOOL COMPANY, Rock Island, Ill.: Vises. Represented by C. E. Shields.

ROYAL SPRING COMPANY, Clinton, Iowa: Fly Killers. Represented by Carroll E. Armstrong.

R. J. SCHWAB & SONS COMPANY, Milwaukee: Schwab Side Wall Registers.

SHARPLES SEPARATOR COMPANY, West Chester, Pa.: Chicago: Cream Separators. Represented by Z. L. Wright and A. G. Kessler.

SPEICH STOVE REPAIR COMPANY, Milwaukee, Wis.: Stove Repairs, Stoves, Ranges and Furnaces, Builders' and Plumbers' Cast Specialties. Represented by R. A. Boers, M. H. Hinz, W. H. Nehls, Albert Speich and Robert Bourse.

STANLEY WORKS, New Britain, Conn.: Builders' Hardware. Represented by H. M. Libe.

STOWELL MFG. COMPANY, Jersey City, N. J.: Concrete, Cork, Asbestos and Gravel Roofings, Metal Paint, Roof Coating, Roof Cement, &c. Represented by W. B. Stowell.

STOWELL MFG. & FOUNDRY COMPANY, South Milwaukee: Wall Registers, Hay Tools, Door Hangers and Vises. Represented by R. A. Nourse, W. A. Coffman and R. E. Evans.

STRAKER & MERRILL, Minneapolis, Minn.: Agents Estate Stoves and Ranges and Gas Appliances. Represented by W. W. Strayer and W. L. Nesbitt.

THATCHER FURNACE COMPANY, Chicago: Furnaces, Steam and Water Heaters. Represented by R. C. Cook.

TWENTIETH CENTURY HEATING & VENTILATING COMPANY, Akron, Ohio: Furnaces, Steam and Hot Water Boilers. Represented by E. L. Jaynes and R. M. Clark.

VERMONT FARM MACHINE COMPANY, Bellows Falls, Vt.: United States Cream Separators. Represented by F. H. Bush.

VOSS BROS. MFG. COMPANY, Davenport, Iowa: Washing Machines. Represented by W. H. Voss, Arthur Clifford and C. F. Ficks

WAHLE FOUNDRY & MACHINE WORKS, Davenport, Iowa: Washing Machines. Represented by Herman H. Wahle.

WESTERN BROKERAGE COMPANY, Milwaukee, Wis.: Washing Machines, Metal Window Screens and Hardware Specialties. Represented by Geo. H. Kusel and H. I. Weber.

WHITE LILY MFG. COMPANY, Davenport, Iowa: Washing Machines. Represented by Sam White, A. F. Victor and A. Ruhling.

WINCHESTER REPEATING ARMS COMPANY, New Haven, Conn.: Firearms and ammunition. Represented by F. H. Siefken.

WISCONSIN FOUNDRY & STEEL WORKS, Milwaukee, Wis.: Stoves. Represented by John Jungers, Robert Koeppe and Jos. Lubach

WIXSON BROS. COMPANY, Milwaukee: Jobber, Stoves, Ranges, Paints and Hardware Specialties. Represented by Albion F. Wixson, W. W. Wixson and Earl M. Wixson.

ASSOCIATION MAP OF WISCONSIN.

We give herewith a map of Wisconsin just prepared, which indicates how completely the association covers the State. All of the towns designated, comprising practically every place of consequence in the State, are represented in the association by one or more members. The organization also includes a few merchants located in Michigan. The membership of the association now comprises nearly 650 merchants in good standing with dues paid up to date, a record which is noteworthy and creditable.

Herwig & Briggs have bought the Hardware, Stove, Sporting Goods and Furniture business of Joseph Wozab, Humboldt, Neb.

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North Dakota Retail Hardware Association.

THE twelfth annual convention of the North Dakota Retail Hardware Association was held in the Commercial Club rooms at Fargo, on January 28, 29 and 30. From every standpoint this was undoubtedly one of the most successful conventions ever held by the association. The spirit of enthusiasm and earnestness prevailed throughout. It probably was the most largely attended convention of any the association has yet held. When the convention was called to order on Wednesday morning, the hall was filled, even the standing room being encroached upon. The Hotel Metropolis was the headquarters, and it was filled to the limit. The overflow found its way to the Waldorf, which was also fully occupied. The members were much pleased at having the opportunity of meeting and shaking hands with their Governor, Hon. John Burke, who delivered a very interesting speech on Wednesday.

Convention Committees.

The following convention committees were appointed by President Emery:

TRANSPORTATION: Hulbert Harrington, Fargo; J. H. McCullom, Hope.

NOMINATIONS: A. J. Smith, Carrington; H. T. Helgeson, Milton; H. D. Warner, Westhope.

RESOLUTIONS: G. W. Wolbert, Bismarck; G. A. Dahle, Carpio; J. A. White, Edgeley.

BY LAWS: H. A. Moe, Churches Ferry; W. R. McIntosh, Bottineau; E. E. Elliott, Sanborn; H. F. Emery, Fargo; C. N. Barnes, Grand Forks.



W. R. McINTOSH, President.

Secretary's Annual Report.

The annual report of C. N. Barnes, Grand Forks, secretary of the association, was as follows, in part:

As many of you no doubt recall, this association was organized in Grand Forks, September, 1897, with a charter membership of 23. Each succeeding year we have been able to increase the number, keeping it at all times, I believe, the largest in percentage of any of the Hardware associations in the United States. By largest I mean that we have the greatest percentage of all Hardware merchants in the State of any of the different Hardware associations.

Irregular Practices.

At the last annual meeting of this association it was voted to have your secretary keep the membership advised of all irregularities on the part of jobbers and manufacturers that were reported to him and he was unable to adjust. I have endeavored to carry out these instructions, and would be pleased to learn what has been done after receiving the information by the individual members during the year toward aiding this work.

Information Bulletin.

When it was decided to furnish our members with information of this character we then had to decide on the best method of conveying it to our membership. Your Executive Committee, after considering various methods, decided to issue what has been styled an "Information Bulletin," sending them at such intervals as conditions warranted. Since our meeting held last March we have mailed eight different issues, all of which have gone to our members, with the exception of the last two, which have been sent to all Hardware merchants in the State. I should like to know if this method of placing information before our members is satisfactory, and if so if it is your wish to continue same in the future.

Domestic Parcel Post.

I would dislike very much to believe that there were any of our members at this time who have not written their Senators and Congressmen urging their support in the defeat of any parcel post bill that may come up, but if there should be let me again emphasize the necessity of keeping the matter continuously and thoroughly agitated. It seems to be the general impression that there is but little chance of anything being done toward the passage of such a bill during the present Congress, but I can assure you that those favoring such a measure are awake at all times and working all avenues possible to obtain support for their bills.

Lack of Co-operation.

I regret to be again compelled to make mention of an apparent lack of co-operation given your secretary in the work of his office, where specific assistance is asked for at frequent intervals throughout the year. For a very good illustration, will say that during the month of December I sent a printed sheet containing the names of the Hardware merchants of North Dakota to all whose names appeared on this list. I specifically asked in a letter accompanying the list that each one receiving same examine and correct it, returning as promptly as possible.

Up to the present time I have received just five out of 450 mailed, which naturally causes me to feel that I am not always given the co-operation entitled. I make mention of this instance in the most friendly spirit, and for no other purpose than that of trying to impress upon you that your promptness in replying to all communications sent from this office aids very materially in our work and saves the association a large amount of money expended each year for postage and stationery.

Hardware Mutual Insurance.

During one of the sessions of this convention we are to be favored with an address from C. F. Ladner, who is at the head of one of the most successful business enterprises in the country, and who by his conservative business judgment and that of his associates has built up an institution that every Hardware merchant looks to with great pride. This institution is the Hardware Dealers' Mutual Fire Insurance Company of Minnesota. It was organized a few years ago, and each year since its organization it has been able to save to the members of the different Hardware associations of the country a large percentage of the charges made for insurance by the old line companies, and in addition has set aside a portion of its savings each year as a surplus fund. Their latest statement shows considerably over $100,000 placed in that fund, and in addition to this accumulation they are able to refund on all policies maturing in 1908 50 per cent. of the old line rates.

There are other mutual Hardware insurance companies showing excellent statements at this time. The Wisconsin for 1906 is also refunding 50 per cent.; the Iowa, 45 per cent. The Nebraska and National both make good showings, but not having their latest statements I cannot submit exact figures to you.

In all probability you all know that none but Hardware merchants who are members of the Hardware Association in the State where they reside are permitted to insure in these companies. It appears to me that those Hardware merchants in North Dakota who are not members of our association are not taking advantage of the opportunity that is afforded them of saving 50 per cent. on their insurance by identifying themselves with us. To those of our members that are not carrying mutual insurance it would seem as though they, too, were not keeping their insurance account down to the minimum possible, as it could be reduced very materially if a portion of their insurance was carried with some of the Hardware mutual companies.

Governor Burke on Transportation and Navigation.

Governor John Burke of North Dakota, delivered a strong address, in which he referred at some length to the question of transportation and navigation. He said that this was one of the greatest questions before the people of the country to-day, and especially the people of North Dakota, because in that State they raised so much that they did not need and needed so much that they did not raise. He suggested the improvement of waterways—that the Red River of the North be made navigable from Canada, and that reservoirs be built along the banks of the Missouri River to take care of the overflow of water in the spring, as the banks of that river were very low. The reservoirs, he suggested, could be used for the purpose of irrigating trees, which might eventually be planted by the Government in case a forest reserve was made.

C. F. Ladner's Address.

C. F. Ladner, St. Cloud, Minn., president of the Retail Hardware Mutual Fire Insurance Company of Min-

nesota, made a brief address. One of the points made by Mr. Ladner was in regard to the co-operation of organizations representing different lines of trade, in regard to which he spoke as follows:

One thing I would like to impress upon your minds which I think we are a little slack on and that is that we should get in closer touch with other organizations of this nature. Now you have in this State an Implement dealers' association, a coal dealers' association and grocers' association. Each one works along similar lines to ours, but we do not get together and work jointly. I believe that if some plan was evolved, either by this association or one of the others, by which delegates could be selected by each of the associations for the purpose of meeting to discuss various problems, a great deal more could be accomplished than can be accomplished as individual associations.

Professor Ladd on Paint Tests.

Prof. E. F. Ladd, State Dairy and Food Commissioner of North Dakota, prefaced his address by stating that he favored national Paint legislation and that such a bill had been prepared by Representative Marshall of North Dakota. He said he still stood for the North Dakota law as enacted, and that he had not changed his views in regard to it. Mr. Ladd spoke in part as follows:

From 70,000,000 to 80,000,000 gal. of Paint are annually produced in the United States. This means an annual outlay to the people of this country of not less than $100,000,000 for Paints as protective and decorative coats. The cost of applying this material is not less to the public than another $100,000,000, and if poor material is employed the cost of further deterioration of the buildings cannot well be estimated.



C. N. BARNES,
Secretary.



H. F. EMERY,
Treasurer.

Is not then the study of Paints a subject worthy of careful consideration? It is also of importance for the further reason that we need a more accurate knowledge of the relative value of the various Paint pigments, and the various combinations of the same, as well as a more definite acquaintance with the properties of the vehicle employed. To what extent shall volatile driers be used and what is the effect of water in Paints in their wearing quality? We also need a more careful study of the physical and chemical properties of Paint, and how these properties affect the wearing quality.

Why Do Paints

"crack, "alligator," "buckle," "peel" or "go crazy," &c.? Scores of such questions present themselves for our consideration, and, if we examine Paint literature, confusion and not satisfaction results therefrom, largely because conclusions have been based upon theories rather than proven facts.

Sabin says: "Most of the failures of lead and zinc Paints are due to the use of these volatile thinners. (Referring to benzine and turpentine.) A good japan drier is what he would recommend, but many of these are made with rosin in place of resin, and rosin is an injury to the durability of any Paint. Again, boiled linseed oil not unfrequently contains similar inferior driers used in its preparation. If no false or misleading statements were made with regard to the composition of the Paints themselves, it will be seen that there are many important questions that need to be investigated for the benefit of the public at large. Such investigations can best be made at our experiment stations where, already, there exist facilities for conducting accurate investigation upon Paints in both the laboratory, on buildings and upon properly constructed test fences.

In 1906 the North Dakota experiment station began, in connection with the laboratory tests on Paint, a series of practical painting tests, carried out upon substantially constructed test fences. These fences have been repeatedly described and are familiar to many of my hearers who have seen them. Each test section contains approximately 25 sq. ft. upon each side of the fence; one side being two types of clapboards, the other two types of plain boards, placed like the clapboards horizontally upon the fence and with an 18-in. space beween the fence and the ground.

In the First Paint Tests.

Paints were employed as found upon the market. Among these there are to be found old Dutch process white lead, a sublimed lead, three types of lead and zinc Paints, a sublimed lead and zinc Paint, a lead and zinc Paint containing lime and silica, a Colorado zinc lead white combined with white lead and 10 to 20 per cent. of inert fillers; a white lead and zinc Paint containing 10 per cent. of lime, and magnesia as a silicate. There was one Paint containing 15 per cent. of water and 16 per cent. of benzine, with 30 per cent. of filler; a catalogue house Paint containing 24 per cent. of water, 4 per cent. of benzine and 51 per cent. of filler. We have white lead without any white lead in them; catalogue houses' Paint having 44 per cent. of water and benzine, no white lead at all, and 70 per cent. of make-weight or fillers combined with zinc. There was also a zinc and barytes Paint.

It will thus be observed that we have in this test a wide range of commercial Paints. In each case the Paints were applied by a competent, practical painter of large experience, and after the manner specified by the manufacturers in their descriptive literature. There will be found in our forthcoming report a detailed statement with regard to this experiment, showing the composition of the Paints, and the wearing properties up to the fall of 1907, or, practically one year after their application. We believe that these results will prove of great interest and value, and another year I am sure will demonstrate to the public something of the relative merits of the various Paints which were being sold in North Dakota prior to the enactment of the Paint law. Some of the Paints are wearing well, others are going "crazy," "alligatoring," while some are peeling badly, all under the same conditions, thus indicating a difference in value, not only as decorative coats for buildings but for protective purposes as well.

Inasmuch as the Paints have been applied only one year it is neither possible nor fair to draw very general conclusions regarding their relative merits. One Paint may show up well as first painting, but prove very bad for painting over a second time. In such cases we may blame the Paint last used, while in reality the Paint employed the first time may be the one at fault. On the other hand, the Paint may wear well the first year and then later begin to show its bad effects. It is very evident, however, from the results thus far that some of the Paints employed are more than worthless.

What is the cause of trouble in the foregoing experiments? Is the bad condition due to the 16 parts of water or the 28 parts of benzine in the vehicle, or is it due to the 70 parts of inert (?) lime, clay, barytes and silica with the absence of white lead? The real cause must be determined after more careful and extended investigations of the various causes for deterioration of Paints as now found on the market.

Experiments and Observations Thus Far Made

among the consumers of Paint have shown that the public are not demanding poor Paint, and since the exposures manufacturers have very materially changed their formulas during the past 18 months. The North Dakota law has undoubtedly had an influence in bringing about these changes, and, as our experiments would indicate, all to the advantage of the consumer.

During the winter of 1906-1907 plans were made for a most extensive and comprehensive series of Paint tests. In these tests white lead was to be tested along with specially prepared Paints, made under the direction of the National Paint Manufacturers' Association of the United States. This association, in addition to the donation of specially prepared Paints, also financially aided in enlarging the field of experiments, as did also the National White Lead Company. For this special work 18 Paints were prepared by and under direction of the National Paint Manufacturers' Association of the United States, and in these several tests it is to be assumed that the formulas have been prepared to represent the ideas of the several manufacturers in the association. They certainly represent a wide range of difference, but in the light of some claims set up by well-known authorities modifications may be found desirable after we learn the effects in the present combinations. The several formulas will be published during the present year as a bulle-

tin, and it will be impossible to discuss them at the present time in detail.

The Chief Purposes of Our Experiments

for the year have been to test out the North Dakota idea, and to determine whether all pigments are of like value in Paints and as the basis for Paints. The substitution of a small proportion of some other pigment in place of white lead and zinc oxide may be successfully made, but that any one of them may successfully take the place of good white lead has been seriously questioned by competent authorities. Certainly the extensive employment of benzine and water in place of good oil in the thinner has not been shown to be defensible.

At the close of the address, President Miles, of the National Association, asked the following question of Professor Ladd:

Is it possible to make a point of strictly pure Carbonate of Lead, Zinc, Linseed Oil and the necessary Dryer that will remain in solution and not get hard in the bottom of the Can; or in other words, to make a Paint that will prove satisfactory to the dealer selling the Paint and at the same time prove satisfactory to the consumer? If it is true that that condition will come about, would it be advisable, and in the interests of the handlers of Paint, as well as the consumers, to permit the use of Flax, which might be determined as not detrimental to the quality of the Paint in order to insure that Paint being in a salable condition at all times and used to the best advantage by the consumer?

Professor Ladd replied as follows:

There have been for years on the market several Paints that are made wholly of White Lead and Zinc. The manufacturers had several lines of these Paints, some of which have been on sale in North Dakota. In their best line they used nothing but the best White Lead and Zinc, and I have never heard any complaint on those Paints. There are some Paints made of White Lead and Zinc that settle so as to form a hard mass in the bottom of the can. Now, we haven't had any of those Paints, but I have seen them, and whether it is due to the process of manufacture or whether it is something which cannot be overcome I am not prepared to say until we have made further experiments; but I do not see any reason why there should be any necessity for the addition of a new product to keep them in suspension.

Address of National President Miles.

S. R. Miles, Mason City, Iowa, president of the National Association, in his address referred at some length to the work of the national organization, what it was doing and how it was benefitting the retailers at large. He also suggested that apparently a great many retailers, even officers of various associations, evidently felt relieved of any further responsibility along the line of conferences, interviews and work with the manufacturer and jobber since the national had been formed. This, he said, was a great mistake. While the National Association could carry out a great many things which could not be accomplished by the State organizations, working alone, nevertheless the State associations had questions that applied to their particular State and locality which could be handled by them with much better results than by the National. The National Association could only accomplish results when backed up in their efforts by the individual State organizations. He complimented the North Dakota Association on its promptness and willingness to respond to the call of the National officers for assistance, which had been greatly appreciated.

Mr. Miles also touched upon the question of parcel post. He said in investigating and discussing the subject he had been impressed with the unfairness on the part of the people behind this movement in asking the public at large to support a proposition which would unquestionably cost the Government millions of dollars each year. Should a parcel post be installed, the postal deficit would amount to about one-fifth of the Government's total income. He could not see wherein Postmaster-General Meyer had yet advanced any substantial reasons why the United States should have a parcel post and wherein the country would be benefitted by such a move.

Independence in Business.

N. A. Burdick, credit man for the Hall-Robertson Hardware Company, Fargo, read a paper on the subject of "Independence in Business, or Standing on Your Own Basis." We make the following extracts from the paper:

In the early stages of development of a new section of country, liberal terms and liberal credit are important elements in its upbuilding, and have certainly been potent factors in the business growth of North Dakota. I believe it is a natural result of the rapid progress made that the custom should change in regard to the handling of credits, not merely between jobber and dealer, but between all the various branches of buisness where long credits have prevailed.

Long Terms Have Been a Serious Load

to a great proportion of the retail trade, and have naturally extended to the jobbers who supplied them. Recent events seem to show that the time is ripe for a readjustment of this, and that the business of the future will be done more nearly on the basis of regular terms, as is done in older sections.

Each year shows an increasing number of merchants who discount or pay their bills when due, and to them it will mean no disturbance of their ordinary customs. To the merchant whose business is conducted with a moderate amount of capital, and is built up largely on long time credits, the change may seem to present some difficulty, but that it can be done, and that the result is worth the effort, I am sure can be attested by a large number of those present. All substantial and permanent success is a matter of slow growth. Sometimes we forget it and in the desire to forge ahead more rapidly fall a victim to overexpansion, of which we have heard so much recently, and which is almost invariably followed by a more or less painful contraction.

The Strongest Lesson to My Mind in Present Conditions

is that we must plan our business not so much on the outside assistance we can get as on the financial resources that we personally control. In adjusting our affairs to these conditions some will naturally lag by the wayside, causing hardship to the individual, but the general result will be of benefit to the business interests.

Naturally, the change suggested will take time, but the more rapidly we can accommodate ourselves to it the more quickly will business move forward in its accustomed way, with present inconvenience soon a memory of the past.

The Starting Point for a Change

of the kind mentioned would naturally be with the consumer. It has been more or less a common practice to allow accounts to run, using the money which should have been paid to the retailer for the purpose of acquiring more land or expansion in some other direction. You have most of you undoubtedly had experience in this direction sufficiently often to appreciate the wisdom of working to a basis where your customers will give their accounts first consideration, leaving new ventures to be cared for after debts have been paid. Discouraging the long carrying of accounts may curtail business to some extent where the capital invested is limited, but it appears to me it will be beneficial in the way of lessening chance of overexpansion and possible failure, and making such business as is done more profitable and satisfactory in every way.

The Tendency Nowadays in Business Is Toward Specialization,

and it has been pretty thoroughly demonstrated that it is not only advisable but necessary in order to get satisfactory results. Many a man scatters his business in a variety of lines, dividing his ability, energy and finances among two or three widely different enterprises, with the result that all are liable to suffer from lack of the close attention necessary to make a successful business under present day competitive methods. To illustrate: A great many merchants also conduct farming operations or other business that requires time and attention, and in a great many cases one or the other must suffer, and in all probability both. If the man of ordinary means decides to build up a mercantile business I believe his time and financial strength should all be used in that direction. The conditions under which business must be done require it, and I believe too many irons in the fire are a common source of trouble in many instances.

The average man may be a good merchant or a good farmer or hotel man, but it is hardly likely that he will make a success of all of them at the same time, and I believe he should confine his attention and financial resources to one in order to get the best results.

As I said before, changes in methods of doing business take time, and naturally mean some inconvenience, before we can adjust ourselves to them, but I believe each one should face the problem as he finds it, with a determination that his business affairs will be so shaped as to relieve him of the burden of carried over accounts and put him in position where he is standing on his own basis and dependent on no one for more than the ordinary courtesies which are a part of such affairs. It strikes me that

One Element of Danger Which Is Often Overlooked,

and which often brings disappointment that might be avoided is this: Often too little consideration is given to the possibilities and needs of a business before it is launched or the yearly campaign is mapped out. In other

words, too few merchants consider just what amount of business they may expect from their territory, just how large a stock is required to handle it, what yearly profits may be reasonably expected and what expense such a business will stand, and then govern themselves accordingly.

You can probably call to mind cases where new stores with liberal stocks were opened in localities already well supplied, which with extravagant expense accounts and ill advised credits have resulted in the failure which might have been avoided by proper consideration at the start.

The Business of the Future Will Probably Be Done Along Closer Lines

than heretofore. The extension of accounts will be materially lessened from what has been the practice in the past. To the man who has reached the point where he discounts his bills and whose accounts are closely collected each year, congratulations are due. To the merchant who has struggled with the evil of long carried accounts with limited resources, let us hope that by careful buying, giving credit customers to understand that accounts must be taken care of at a fixed date not too far distant, keeping necessary expenses as low as possible and avoiding the unnecessary, he will be freed from many of the annoyances of the past and find business a pleasure instead of a burden.

Mr. Burdick, on behalf of the company, extended an invitation to the members to visit its establishment, and after adjournment on Thursday morning many of the members made an inspection of the company's building.

Effective Advertising.

In connection with a paper on the subject of "Effective Advertising," R. E. Saberson of the Berkley System Company described the company's scheme of furnishing advertising matter to the merchant. He said that the company was prepared to furnish syndicated circulars, 500 of which would cost $1.50, representing a material reduction, as compared with the expense of getting them out by each individual merchant. Each merchant using the service could send to the company's central office his mailing list, where it could be set up on machines, so that when his circulars were printed they could be run through the folding and addressing machines and made all ready for mailing without the use of an envelope. The circulars could be mailed from the central office or by the retailer himself in his home town. A different series of goods, according to the season, were advertised each month. This, it was stated, not only saves the merchant the expense of buying a large number of electrotypes, but also saves him the trouble of preparing advertising, as well as the folding and addressing work. The advertising in the circular might also be run in the home paper or a zinc etching reproduction of the entire circular might be furnished at small cost.

Next Meeting at Bismarck.

The association received invitations from the Commercial Club at Bismarck, from the Mayor and Commercial Club of Grand Forks, and from the Mayor and Commercial Club at Fargo, to hold their next convention at those places. After some discussion, Bismarck was chosen as the next convention city.

Election of Officers.

The election of officers resulted as follows:

PRESIDENT, W. R. McIntosh, Bottineau.
FIRST VICE-PRESIDENT, G. W. Wolbert, Bismarck.
SECOND VICE-PRESIDENT, P. Fugelso, Minot.
SECRETARY, C. N. Barnes, Grand Forks.
TREASURER, H. F. Emery, Fargo.

I. A. Bjelde, Mayville and H. W. Moe, Churches Ferry, were elected members of the Executive Committee with the president, first vice-president, secretary and treasurer.

A. J. Smith, Carrington, and J. S. Cole, Lisbon, were elected delegates to the National convention.

Resolutions.

Among the resolutions adopted were the following:

Whereas, Under the present laws of the United States, the President of the United States has the power to set aside certain lands as forest reserve, and

Whereas, There is in this State a large section of land along the Little Missouri River known as "the bad lands," and

Whereas, This land cannot generally be used as farming land, and it had, not many years past, a good lot of timber which has since been destroyed for use of settlers on adjoining agricultural lands; be it

Resolved, That we request our members of Congress to see the President of the United States and the chief of the Bureau of Forestry of the United States and call their attention to these facts, and see if they will not set aside these lands for forest reserve in North Dakota.

Whereas, There is a national Congress for the improvement of our natural waterways, and

Whereas, This means an eventual saving for our State of North Dakota of many millions of dollars in the future, and

Whereas, We have two navigable rivers now under the control of the United States Government; be it

Resolved, That we most heartily endorse the purposes of this Congress for waterway improvements and to earnestly request our members of Congress to work at all times for such measures, and particularly for the improvement of the Red River of the North.

Whereas, There is an organized effort made by a few merchants in the large cities of the East to secure the passage by Congress of a parcel post measure, and

Whereas, Such organizations have only in mind the financial gain that would come direct to them and take no notice of the great additional cost this would incur to the already heavy deficit in the postoffice department, and

Whereas, Such a measure is absolutely against all the known laws of business for the merchants of the smaller cities of our country and can have no benefit to the farming communities of this country; therefore, be it

Resolved, That we do not believe in the passage of such a measure by any Congress, and we urge each member of Congress to use his utmost endeavors to defeat the passage of any such measure, and be it further

Resolved, That we do favor heartily and as being in line with the policy of our Government in doing the greatest good for the greatest number—that our members of Congress work consistently for the passage of 1-cent letter postage in the interest of the masses.

Whereas, It has been demonstrated by Prof. E. F. Ladd at our State Agricultural College that the people of this State have been buying water and dirt for lead, tonic and linseed oil, and

Whereas, Our Representative in Congress, Thos. F. Marshall, has introduced a bill in Congress for a national paint law, be it

Resolved, That we heartily endorse and favor the passage of such a bill, and that a copy of this be sent to each member of Congress from North Dakota, and that they each be asked to work for the passage of such a bill at this session of Congress.

Convention Notes.

On Monday evening the officers of the association were handsomely entertained by T. J. Duffy, Chicago, and John Antoine, Chicago, representatives of the Germer Stove Company, at their parlors in the Waldorf Hotel.

C. D. Britton, Northwestern sales manager for the Malleable Steel Range Company, South Bend, Ind., gave a supper on Tuesday evening at the Commercial Club rooms to a number of his friends and patrons among the members.

There was not much sightseeing as the cold weather, which had just set in before the convention opened, kept the delegates pretty well confined to their hotels when not in the convention hall. The thermometer registered 25 below on Tuesday morning.

On Wednesday evening the association gave an entertainment at the Grand. An excellent vaudeville programme was carried out. After the show those present marched in a body to the Commercial Club rooms, where they had been invited to a "smoker" by the Commercial Club. There was no lack of entertainment, and the members and other visitors had the pleasure of hearing another speech from Governor Burke.

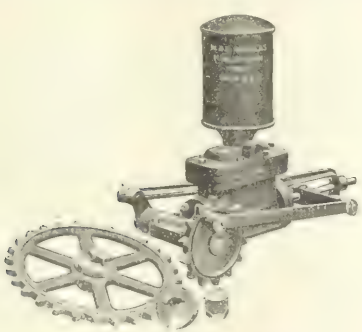
Sheet Metal Boat Patterns.

No great degree of skill is required for the actual construction of small pleasure and hunting boats made of sheet metal, but it often happens that persons capable of doing such work are unfamiliar with the art of designing such craft. H. F. Thompson, Decorah, Iowa, in addition to the manufacture of galvanized iron boats, is giving particular attention to the furnishing of patterns by the use of which it is said that even an amateur workman can easily lay out and construct a safe, durable and serviceable boat. The designs furnished embrace a number of models, including canoes, family rowboats and propeller launches. It is stated by the designer that no special tools are required in the building of such boats, work being easily done with shears, rivet set, punch, saw, hammer and soldering outfit; such tools, in fact, as are always at hand in the ordinary shop departments of hardware stores or tin shops. Because of their lightness and portability, and for reason that they do not crack and require calking as do wooden boats, there is in almost every locality a demand for sheet metal boats. From the same set of patterns a boat can be built of galvanized iron in gauges from No. 16 to No. 22, and the design includes air chambers which guard against sinking from accidental puncture. Photographic prints and blue prints from drawings are included with patterns, showing the details of construction and material used and the manner of its as-

semblage. Notwithstanding the lightness of construction the use of power propellers is entirely feasible, and the designer is now offering patterns for a launch 20 ft. in length by 58 in. beam, designated as model G, with a carrying capacity from 9 to 12 persons. Three hundred pounds of steel are required for the construction of this model, which can be driven at a speed of 7½ to 12 miles an hour by 3 to 8 hp. motors. Mr. Thompson is prepared to furnish suitable gasoline engines or motors from 1½ to 25 hp. It would seem that hardware dealers and metal workers might profitably turn their attention to the building of metal boats, since work of this character would naturally develop at a season of the year when business in other lines is usually slack.

The Douglas Power Wagon Sprayer.

The pumping device shown in the illustration is designed as a handy apparatus for spraying or house service, either as a part of a gasoline engine outfit or driven from a wagon, from which latter combination it receives its name. In such use the large sprocket is mounted on the wagon wheel for a chain drive. With a gasoline engine the large sprocket is mounted on the crankshaft and the small sprocket is used to drive it direct from the engine. It is a stout little pump, with large air barrel that will work under pressure and without trouble, because the mechanism is equipped with a special compensating device in the cross head which prevents the breaking of the side



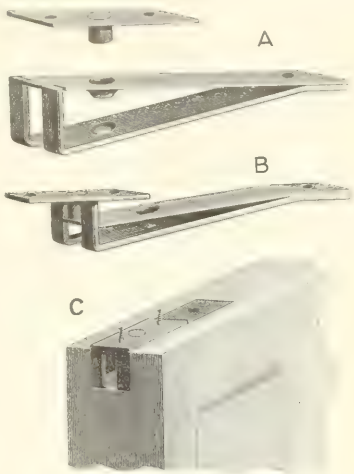
rods in case one pitman should get a lead on the other. The pump has a 2½-in. bore, 5-in. stroke; suction, 1-in. iron pipe and discharge ¾-in. iron pipe or hose, as preferred. It is manufactured by W. & B. Douglas, Middletown, Conn.

Emerson Electric Mfg. Company.

The Emerson Electric Mfg. Company, St. Louis, Mo., manufacturer of Emerson and Trojan alternating current fan motors, is offering for the season of 1908 an extensive variety comprising some 14 types of desk, ceiling and column fans suitable for 60 cycle current. All these operate on the induction principle, with brushes or commutators. They have armatures of the squirrel cage type, without insulated windings of any description. As a result they are said to operate perfectly year after year without the renewal of any part and without other attention than ordinary oiling.

Spring Pivot for Door Top.

The Standard Mfg. Company, Shelby, Ohio, is offering a new spring pivot for top of door which is used in connection with their Champion and Standard double acting spring floor hinges. With this spring pivot applied to a door the same can be set in place or taken down in a very short time. Parts marked A, here shown, illustrate the two parts composing the pivot; the upper one being the pivot pin which is placed in the head jamb of the door frame and the lower, the spring and socket which are fixed into the top corner of the door. The portion of the illustration marked B shows how the two parts are coupled together when hanging a door. The spring is pressed down to admit the pivot pin through the slot at the edge of the door, and when the pin comes

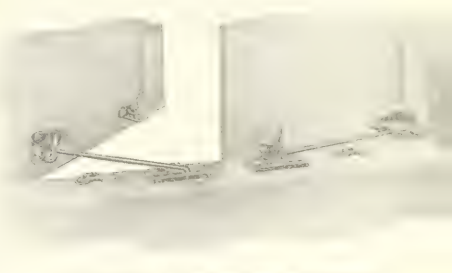


Spring Pivot for Door Top.

opposite the hole in the spring part it will enter and the spring go back to its normal position as shown in cut marked C.

Zimmermann's All Steel Shutter Fastener.

G. F. S. Zimmermann & Co., Frederick, Md., are manufacturing the shutter fastener shown in the accompanying illustration. A casement window adjuster of similar design is also offered which has sill plates flush with the sill. All parts are made of the best pressed steel, which is referred to as superior to cast iron in appearance and durability. The hook end of the rod is smooth for the hand to grasp and pear-shaped, so that it cannot jump from the sill plate. It has a double lock which will lock the shutter securely when slightly ajar and also when entirely closed. A shutter that becomes sagged or warped or covered with ice, so that it will not close tightly, can be firmly locked in its partly opened position without any readjustment of the parts. The lock bracket has a special



Zimmermann's All Steel Shutter Fastener.

shelf to carry the end of the brace rod and insure it locking. Brace rods are marked right and left on the under side to avoid confusion of parts, and the sill plate are so made that they cannot be put on backward. It is claimed for the device that it holds the blind open and bows at any angle, that it can be locked from without as well as within, that it does not interfere with the installation of fly screens, and that it can be attached to any hinged shutter that opens outward. It is made in any

finish or length of bar, and is recommended for bay windows, outside blinds, casement sashes, iron shutters and fire shutters.

Linolite System of Electric Lighting.

H. W. Johns-Manville Company, 100 William street, New York, has just put out a new system of electric incandescent lighting, which in the trade will be known as Linolite, a section view of the fixture being given herewith. Although incandescent lamps have progressed greatly radical changes have not been made in shape since their introduction. This system employs a long, tubular lamp in which the filament reaches from end to end. As the lamps are connected end to end they form a continuous line of light, suggestive of the name. The source of light being continuous the illumination is uniformly distributed and the alternate bright and dark spots, characteristic of lighting with bulb lamps, are eliminated. The lamps are arranged in a semicircular reflector, which is made up in lengths required up to and including 10 ft. The position of the lamp relative to the reflector is such that the filament is located uniformly throughout its length in the focus of the reflector and thus a maximum of reflecting efficiency is obtained. Tests have shown, it is said, that the illumination secured from Linolite is much greater than from any ordinary bulb lamp. Another advantage of this system is the small space required. The entire reflector is only 2¼ in. wide and 1 in. deep, outer dimensions, so that it readily lends itself to emplacement in show windows, showcases, &c., and back of window frames or fillets, in such manner that the fixture will be practically invisible and the source of light screened entirely from the eye of the spectator, a common criticism of systems using bulb lamps for illumination being that the observer is often dazzled by the light from the lamps themselves. Fig. 2 shows the distribution of luminous intensity of Linolite, as compared with an ordinary 16 c. p. lamp in its end on position, both having the same size and length of filament and consuming the same current. This curve is referred to by the company as a certified test made by the city and guilds of London Institute, London, England. The block curve shows the candle power in and direction of the bulb lamp, while the dotted curve shows the corresponding values of the candle power of Linolite. The assertion is made that while the illumination given by the bulb lamp immediately in front is 7 to 8 c. p., that of Linolite is over 40 c. p., and the illumination from Linolite is, in fact, in every direction in front of the fixture much greater than that from the ordinary lamp. Linolite is particularly adapted for lighting show windows and cases, pictures, signs, desks, &c.; also for theatrical stage lighting, and the outlining of buildings for ornamental and display purposes. An important application of it is in the illumination of room interiors by reflected light, in which instance Linolite is placed above the cornices near the ceiling, from which the light is reflected.

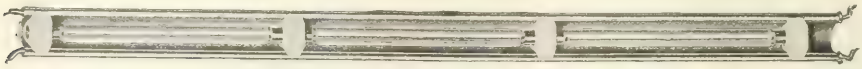


Fig. 1.—Section of Linolite, Showing Arrangement of Lamps in Reflector.

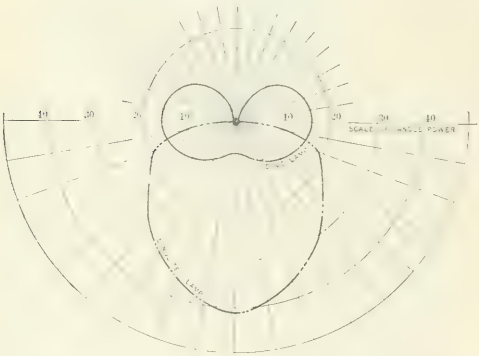


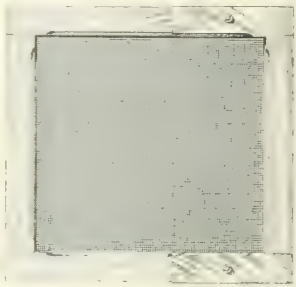
Fig. 2.—Polar Curves of Candle Power of 16 c.p. Bulb and 16 c.p. Linolite Lamps.

Ideal Mfg. Company.

The Ideal Mfg. Company, New Haven, Conn., has issued a new handbook, No. 18, which refers to numerous improvements and changes in the company's products. Additions include reloading tools, molds, &c., for the company's new metal gas check bullets for high power rifles of different models and new designs of short range bullets for the .38 Colt's New Army and Smith & Wesson Military Revolvers. Improvements are shown and described for the Armory reloading outfit, new "Lightning" De-Capper for Krag and New Springfield shells, new Micrometer Sight Gauge for model 1901 peep sight. Primer tables, bullet tables and tables of velocity, trajectory and penetration have been revised and brought up to date. Another feature of this catalogue is that with the illustration and description of each bullet, general information is given as to what particular arm it is for, and the quantities of the various powders, high and low power smokeless, as well as black, that may be used, and much other valuable information for shooters of rifles, pistols and shotguns. A copy will be sent to all who send in their name and address, together with six cents in stamps.

Worthington Adjustable Lift Screen.

The Worthington Roller Screen Company, Baltimore, Md., is putting on the market the adjustable lift screen here shown. It is made of highly finished hard wood, golden oak or imitation mahogany. The cloth is a specially treated linen mesh and consequently rustless and not affected by salt air. While the cloth is exceptionally durable, the construction of the screen is such that it can easily be recovered. The adjustment is simple and enables a person to screen his house quickly and economically without the aid of a carpenter. There are only four sizes for a merchant to carry, as they are adjustable to any width from 22 to 46 in.



Worthington Adjustable Lift Screen.

Good Form Closet Sets.

In the line of wardrobe closet sets manufactured by the Chicago Form Company, Chicago, are embraced the articles here illustrated. Fig. 1 shows a trousers hanger arranged with flexible clamps designed for perfect adjustment to the surface of the fabric. The clamps have a



Fig. 1.—Trousers Hanger.



Fig. 2.—Coat Hanger. ...

slight outward turn at the end to avoid creasing at the edges and are bowed at the center to allow for the extra thickness of the hem at the seam. Fig. 2 represents a coat hanger adaptable to any size coat or jacket. It is made of pressed steel, nickel plated or enameled, and may be compactly folded for packing. It is also provided with shoulder plates which conform to the shape of the shoulder. The shoe rail, shown in Fig. 3, is designed for the convenient disposition of shoes. It is intended for attachment to the inside of the closet door or elsewhere, and is provided with raised points on the upper edge, which hold the shoes from being jarred from their position. The shoe rail here shown holds three pairs of shoes, and is jointed at the center in such a manner that it may be easily folded.

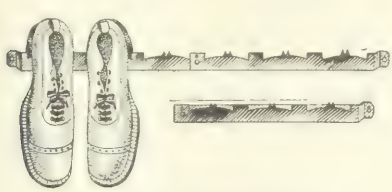
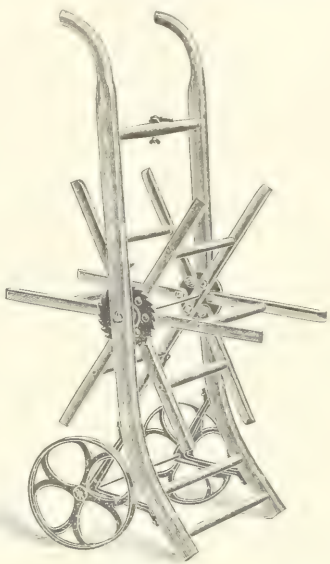


Fig. 3.—Shoe Rail, Open and Folded.

Boss Hose Reel.

The R. W. Whitehurst Company, Norfolk, Va., has added to its line of hose heels the one shown in the accompanying illustration. It is substantially constructed of oak and has two coats of paint and one of varnish. The wheels are 10 in. in diameter and roll easily. It weighs 20 lb. and holds from 100 to 150 ft. of hose. Besides its strength, the advantage of the reel, to which attention is especially called, is that it has no cross handle and thus occupies a minimum of space. It can be set in a narrow hall, and there is nothing sticking out to knock against.



Boss Hose Reel.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, Strictly Pure, Raw	.42
City, Boiled	.44
City, Raw	.41 @ .42
Raw, Calcutta, in Bbls	.—
Lard, Prime, Winter	.—
Extra No. 1	.—
No. 1	.42
Cotton-seed, Crude, f.o.b. mill	.31 @31½
Summer Yellow	.—
Summer White	.—
Yellow Winter	.—
Sperm, Crude	.—
Natural Winter	.—
Bleached Winter	.—
Bleached Winter, Extra	.—
Tallow, Prime	.—
Whale, Crude	.—
Natural Winter	.—
Bleached Winter	.—
Extra Bleached Winter	.—
Menhaden, Brown, Strained	.41 @42
Light Strained	.42
Natural	.—
Southern	.37 @.—
Cocoanut, Ceylon	.—
Ceylon	.—
Cod, Domestic, Pale	.—
Natural Bleached	.—
Red, Extra	.—
Saffron Oil	.—
Olive, Yellow	.—
Neatsfoot, Prime	.—
Palm, Lagos	.— @.15

Mineral Oils—

	₱ gal.
Black, Strained	.—
Red	.—
28 gravity	.14
Summer	.—
Cylinder, light steam	.—
Dark, Filtered	.—
Paraffine, 32° gravity	.—
30° gravity	.—
28° gravity	.11½
Red	.12½

Miscellaneous—

	₱ ton
Barytes: White, Foreign	$18.50@21.50
Amer. floated	19.00@20.00
Off color	13.00@16.50
Chalk, in bulk	.—
Cream Case, Imported	.—
Cobalt Oxide	.—
Whiting, Commercial	.42@ .52
Gilders'	.—
Ex. Gilders'	.60@ .65

Putty, Commercial—₱ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.45
In 1 lb. to 5 lb. cans	2.65 @2.75
In 12½ to 50 lb. cans	1.50 @1.90

Spirits Turpentine—₱ gal.

In Oil Bbls	.55 @.—
In machine bbls	.55 @.—

Glue—

	₱ lb.
Cabinet	.12 @15
Common Brown	.—
Extra White	.— @.—
Fish, Bound, 50 gal. bbls., per gal.	.— @1.20
Foot Stock, White	.12 @14
Foot Stock, Brown	.—
Glucose, Chicago Bbls	.—
Glucose, Bbls	.—
Hoof	.—
Hide	.—
Low Grade	.11 @.12
Medium White	.14 @17

Gum Shellac—₱ lb.

Bleached, Commercial	.—
Bleached, Dry	.—
Garnet	.—
Diamond	.—
Orange	.—
A. C. Garnet	.—
G. A.	.—
Regular	.—
D. C.	.49 @50
Orange, E.	.—
T.	.—
W. S. O.	.—

Colors in Oil—

	₱ lb.
Black, Lamp Black	.12 @14
Blue, Cobalt	.—
Blue, Prussian	.06
Blue, Ultramarine	.—
Brown, Vandyke	.11
Green, Chrome	.12 @16
Green, Paris	.@24
Sienna, Raw	.11
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.—

	₱ lb.
Lead, English white, in Oil	.10½@10⅝
Lead, American White:	
Lots of 500 lb. and over in Oil	.—
Lots less than 500 lb. in Oil	.@ 7¼
Lead, White in Oil, 25 lb. tin Pails	.—
Lead, White in Oil, 12 lb. tin Pails	.—
Lead, White in Oil, 1 to 5 lb. tin Pails	.—
Lead, American, Ground in Oil, 500 lbs. and over 2% for cash if paid in 15 days from date of invoice.	.—
Zinc, American, dry	.5¾@ 6¾
Zinc, French:	
American Red Seal, dry	.—
Antwerp, Green Seal, dry	.10½
Paste in Oil	.—
Dry	.—
Zinc, V. M. French, in Pails Oil:	
Green Seal:	
Lots of 1 ton and over	.12¾@13¾
Lots of less than 1 ton	.13¾@13¾
Zinc, V. M. French, in Pails Oil:	
Red Seal:	
Lots of 1 ton and over	.—
Lots of less than 1 ton	.11¾@12¾
Deduction from list prices of colored lead grades, 12½; 25 bbls., 2½; 50 bbls., 4%.	

Dry Colors—

	₱ lb.
Black, Drop, English	5 @15
Black, Ivory	16 @.20
Lamp, commercial	4 @ 6
Blue, Cobalt	4 @ 6
Blue, Cobalt	.—
Blue, Prussian	.—
Blue, Ultramarine	3½@15
Brown, Spanish	.— 1
Carmine, No. 40	$3.10@3.25
Green, Chrome, ordinary	3½@ 5
Green, Chrome, pure	.17 @25
Lake, Red, Madder, crimson	.—
Lake, Red, Madder, scarlet	.—
Other American	₱ ton, $8.— 16.—
American Gilders'	.—
French	1½@ 2
Ochre, American, Yellow	.—
Ochre, American, Yellow, Medium	.—
French	.—
Ochre, French, Yellow	.—
Ochre, French, Yellow, Medium	.—
Red, Indian	.—
Red, Venetian, American	₱ 100 lb. $0.50@1.25
Red, Venetian, French	.—
Sienna, Italian, Burnt and Raw	.—
Sienna, Raw	.—
American Burnt and Pow'd.	1½@ 2
Talc, French	₱ ton $18.00@25.00
Talc, American	.—
Terra Alba, French	.—
Flour	.—
American	.—
Umber, Turkey, Raw, & Pow.	2½@ 3
Umber, Turkey, Raw and Powdered	2½@ 3
Umber, Vandyke	.—
Raw	.—
Yellow Chrome, Pure	.13 @15
Yellow, American, Lemon	.—
Orange	.—
Orange, Deep	.—
Orange, Pale	.—
Ochre	.—

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓&5%
North's 10%
Zimmerman's See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ₰ doz. pairs, Nos. 1, 2, 3, 4, $1.00, 5, $1.50.
Fernald Quick Shifter, ₰ doz. pairs.....$2.00@3.00

Anvils—American—

Eagle Anvils.....₰ lb (@8½¢
Hay-Budden, Wrought.....9½@9¾¢
Trenton.....₰ lb 9½@9¾¢

Imported—

Swedish Solid Steel Stock, Superior, ₰ lb.....10@10½¢
Peter Wright & Sons, ₰ lb, 84 to 349 lb. 11¢; 350 to 699 lb. 11½¢.

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Linnstein Nail Co.....10%

Augers and Bits—

Iowa Double Spur.....75@80%
Jennings' Path Bright.65&10@70%
Black Lip or Blued.....65&10@65%
Boring Mach. Augers.....70%
Car Bits, Ream. Twist.....40&10%
Ford's Auger Bits.....40&5%
Ft. Washington Auger Co., Canada's.....35%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.'s
No. 10 ext. lip, R. Jennings' list, No. 30, R. Jennings' list.....50%
Ratchet Bits.....25&10&2½%
Lit machine Car Bits.....15
Mayhew's Countersink Bits.....45%
Pugh's Bits.....70%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills— See *Drills, Twist.*

Expansive Bits—

Clark's, 1 to No. 3, ₰ doz. $26
Ne[illegible].....[illegible]
Ford's Cranks Pattern.....
Jennings' & Co.'s Steel Pat. 25
Lavigne Pat., small size, $18.00; large size, $26.00.....60&10%
Sawyer's 60%

Gimlet Bits— *Per gro.*

Common Dble. Cut.....$3.00@3.25
German Pattern, Nos. 1 to 10, $3.75; 11 to 13, $5.75

Hollow Augers—

Bonner's Pat., per doz. $6.50@7.00
Ames.....25&10%
Ives'.....20%

Ship Augers and Bits—

Ship Augers.....40&10%
Porter's .....33⅓&5%
C. Jennings & Co.'s:
L. H. machine bits 6%
Ware's .....33⅓&7½
Snell's 40%

Awl Hafts— See *Handles, Mechanics' Tool.*

Awls—

Bag Awls:
Handled.....gro. $2.75@3.00
Unhdled. Shldrd...gro.63¢@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 51@54¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $4.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets— See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles— *Iron or Steel*

Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar..4½@5½¢
No. 1 Common, Loose...3¾@4¼¢
No. 1½ Com., New Style..4@4½ ¢
No. 2 Solid Collar.....4½@5 ¢
Half Patent:
Nos. 7, 8, 11 and 12..65@65&10%
Nos. 13 to 14.....65@65&10%
Nos. 15 to 18.....70@70&10%
Nos. 19 to 22.....70@70&10%

Boxes, Axle—

Common and Concord, not turned lb., 5@6¢
Common and Concord, turned, lb., 6@7¢
Half Patent.....lb., 9½@10¢

Bait— Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances— Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chattillon's:
Light Spg. Balances.....50&5&10%
Straight Balances.....10&10&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb.... per lb., —@2½@2¾¢

Towel -

No 10 Ideal, Nickel Plate..₰ gro. $8.50

Beams, Scale—

Scale Beams.....40%
Chattillon's No. 1.....30
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₰ doz. $0.80; Tinned.....$[illegible]
No. 11 Wire Coppered ₰ doz. $1.15; Tinned.....$[illegible]
No. 10 Wire Tinned.....₰ doz. $1.50

Beaters, Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.80; No. C, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dasher, per gro., No. 60, $6.00; No. 75, $6.50; No. 125, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.50

Bellows—

Blacksmiths', Standard List..
Split Leather.....60&10@65%
Grain Leather.....50@50&10%

Hand—

Inch.. 6 7 8 9 10
Doz.. $5.50 5.50 6.00 6.50 7.50

Molders—

Inch.. 9 12 15 16
Doz.. $7.50 9.00 12.00 15.00

Bells— Cow—

Ordinary Goods...75&5@75&10&5%
High Grade.....70&10@75%
Jersey .....75&10%
Texas Star.....50%

Door—

Home, R. & E. Mfg. Co.'s.....55&10%

Hand—

Polished Brass.....70&10@75%
Wheel Metal.....60&10@60&10&5%
Nickel Plated.....50@55%
Swiss.....50@55%
Cote's Globe Hand Bells.....33⅓@35

Miscellaneous—

Farm Bells.....lb., 2¼@2½¢
Church and School.....60@60&5%

Belting— Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard .....70&5%
Light Standard.....75%
Cut Leather Lacing.....40&10%
Leather Lacing Sides, per sq. ft. 2½¢

Rubber—

Agricultural (Low Grade).....
70&10&5&5%
Common Standard....70@70&10%
Standard .....70@70&5%
Extra .....60&5@60&10%
High Grade.....50&5@50&10%

Bench Stops— See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Sprokets 50
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden.....55&5&5%
L. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lathes Patent Automatic Lock and Runner 50%
See also *Machines, Hoisting.*

Boards, Stove—

Paper and Wood Lined.....40%
Unlined 50%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....63⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):
Cut thread.....[illegible]
Larger and longer.....[illegible]
Plain Taper, &c.....[illegible]
Bolt Ends.....65&5%
Machine (Cut Thread):
Cut thread.....[illegible]
Larger and longer.....[illegible]

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Ends.
Inch 3 4 5 6 8
Per doz. $0.50 .55 .65 .80 1.00
Cast Iron Spring Foot, Jap'd:
Inch 6 8 10
Per doz. $1.2 1.5 2.25
Cast Iron Chain, Flat, Japanned:
Inch..... 6 8 10
Per doz. $1.00 1.40 1.65
Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch..... 6 8 10
Per doz. .....$ .75 .95 1.25
Wrought Barrel Japd..80@80&10%
Barrel Bronzed.....60&10%
Spring .....70&10@70&10%
Shutter .....50&10@50&10%
Square Neck.....75@75&10%
Square .....70&10@70&10%
Ives' Patent Door.....55%
Ives' Wrought Metal 45%

Expansion—

Richards Mfg. Co. .....5&10
Stewart & Bronson Mfg. Co.:
Style No. 1, Double 55
Style No. 2 55
Style No. 1½ Dbl. Jaw Spring 55
Lag Screw.....60

Plow and Stove—

Plow .....65&5@—%
Stove .....55@85&5%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84..80%
Eagle Phila., list Oct. 16, '84...82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84...80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99...80%
Phila., Eagle, list Oct. 16, 1883..82½%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:
Inch..... 1¼ 1½ 1¾ 2
Per doz....$7.80 5.60 6.40 8.00
Inch 2¼ 2½
Per doz.....$8.65 11.50
Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 24x12 .....Langdon Ayme .....15&10%
Perfection 40%
Seaver 45%

Braces—

Common Ball, American....$1.50
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 81, $1 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet 60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat..60&10%

Brackets—

Wrought Steel.....70&10@75&10%
Bradley & Clamp.....80&10@80&10&5%
Griffin's Pressed Steel.....75@75&10%
Griffin's Folding Brackets.....70&10%
Taplin, Victor Hands Egg Beater Bracket .....₰ doz $1.50

Bright Wire Goods— See *Wire and Wire Goods.*

Broilers—

Kelsey's Mfg. Co. .....75&20%
Wire Goods Co. 75%

Buckets, Galvanized— *M'f'g'r's list, price per gross. In quarts.*

Water, Reg...$5.35 28.00 32.00
Water, Heavy.....[illegible] 32.00
Fire, Rd. Btm.$2.00 $4.65 38.65
Well 37.35 41.35 45.35

10&5%

Bull Rings— See *Rings, Bull*

Butts— Brass—

Wrought, High List, Oct. 26,'06.55%
Cast Brass, Thebaut's.....40%

Cast Iron—

Fast Joint, Broad...40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—

Light Narrow, Light Pin, reversible.....70@75%
Reversible and Broad 70@75
Loose Joint, Narrow, Light Inside Blind 70%
Back Flaps, Table Chest.65% Japanned
Light Narrow, Loose Pin, Japanned .....10@15
Light Narrow, Ball Tip...60%
Broad .....70@75%
Steeple Tinned.....70%
Ball Tipped.....70%

Extra 10@—

Cages, Bird—

Hendrys Brass: Series 3000, 5000, 7000, net list, 1200, 1500, 200, 300, 500 5
Hendrys Brass, Series 750, 800 .....
Hendrys Enamel 5

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb. 4½@4¾
Sharp, 1 prong, per lb. 4½@4¾
Bors: Blunt, 1 prong, 4½@4¾; Sharp, 1 prong, 4½@4¾; Lindsay Blunt, 2 prong, 4½@4¾; Sharp, 2 prong, 4½@4¾
Perkins: Blunt, per lb. 3.65¢; Sharp, 4.15¢

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Eley's E. B. ..... 82@35¢
G. D. ..... *per M* 3.40@3.50
F. L. ..... *per M* 4.00@4.50
G. E. ..... *per M* 4.00@4.50
Musket ..... *per M* 62@63¢

Primers—

Berdan Primers, $8 per M. 20@5%
Primer Shells and Bullets. 15@40%
All other primers per M. $1.52@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:
32 C. F., $5.50 ..... 10@5%
38 C. F., $7.00 ..... 10@5%
22 cal. Rim, $1.50 ..... 10@5%
32 cal. Rim, $2.75 ..... 10@5%
B. B. Caps, Can. Ball, Swed. $1.90
B. B. Caps, Round Ball $1.40
Central Fire 25%
Target and Sporting Rifle ..... 15@5%
Primed Shells and Bullets. 15@40%
Rim Fire, Sporting 50%
Rim Fire, Military ..... 15@5%

Casters—

Bed ..... 65@10
Plate ..... 60@5
Philadelphia 40
Ajax Ball Bearing 45
Gem Roller Bearing 45
Steel Gem 45
Standard Ball Bearing 45
Yale (Double Wheel, Low list) 40

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:
3/16 ..... 7c 7/16 ..... 7c 9/16 ..... 6c
5/8 ..... 6c 11/16 ..... 6c 3/4 ..... 6c
13/16 ..... 6c 7/8 ..... 6c 15/16 ..... 6c
1 ..... 6c
In cask lots, deduct 25c.
German Coil 6½
German Pattern Coil:
3/16 ..... 7c 7/16 ..... 7c 9/16 ..... 6c
5/8 and heavier 6c
4, 5 and 6 ..... 6c

Halter—

Halter Chains ..... 6 and 7½
German Pattern Halter Chains, list July 24, '05 ..... 6 and 7½
Ideal Mfg. Co.:
Halter ..... 35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6/8 ..... 6/9 ..... 6/10 ..... 6/11 ..... 6/12 .....
6/13 ..... 6/14 ..... 6/15 ..... 6/16 ..... 6/17 .....
6/18 ..... 6/19 ..... 6/20 ..... 6/21 ..... 6/22 .....
6/23 ..... 6/24 ..... 6/25 ..... 6/26 ..... 6/27 .....
6/28 ..... 6/29 ..... 6/30 ..... 6/31 ..... 6/32 .....
6/33 ..... 6/34 ..... 6/35 ..... 6/36 ..... 6/37 .....
6/38 ..... 6/39 ..... 6/40 ..... 6/41 ..... 6/42 .....
6/43 ..... 6/44 ..... 6/45 ..... 6/46 ..... 6/47 .....
6/48 .....
Note— [illegible]
Eastern Standard Traces, Wagon [illegible]

Miscellaneous—

Jack Chains, list July 1, '05:
Brass ..... 60&5
Brass ..... 60&5
Safety and Plumbers' Chain, ... 5@10
Sad. Pump Chains ..... 60&5
Sash Chain: [illegible]
Brass, Bevel, Heel, Rope, Steel Rope 1
Oneida Community:
American Hame, Dog and Key ..... 60&5
Niagara Dog Leads and Key Rings ..... 60&5
Wire Cloth 7
Iron Hames 60
Universal Pin Jointed Chain 50

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain 60
Pullman:
Bronze Chain, 60"; Steel Chain 60
Sash Chain Attachments, per set ..... 5¢
Aluminoy Sash Ribbon, per ft. ..... 5¢ per set
Sash Ribbon Attachments, per set ..... 8¢

Chalk—From Jobbers:

Carpenters' Blue 5
Carpenters' Red 5
Carpenters' White 5

Checks, Door—

Barrett's 45
Pullman, per cro ..... 45&5%
Russell 33⅓%

Chests, Tool—

American Tool Chest Co.:
[illegible] 1
Youths' Chests, with Tools, Complete 5
Farmers', Carpenters,' etc., Chests, with Tools 1
Machinists' and Pipe Fitters' Chests, Empty 1
Tool Cabinets 1
Wood Working Machines 1
Tool Chests 1

Chisels—

Socket Framing and Firmer

Standard List 60
Buck Bros. 60
C. E. Jennings & Co.:
Socket Firmer No. 10 ..... 25&7½%
Socket Framing, No. 15 30
Swan 60
L. & I. J. White Co. ..... 30&5

Tanged—

Tanged Firmers ..... 30&5@35%
Buck Bros. 30
C. E. Jennings & Co. Nos. 191, 181, 25
L. & I. J. White Co. ..... 25&5%

Cold— *lb.*

Cold Chisels, good quality. 15@15¢
Cold Chisels, fair quality. 11@12¢
Cold Chisels, ordinary... 9@10¢

Chucks—

Almond Drill Chucks 35%
Almond Turret Six-Tool Chuck 40
Independent Pat., each $5.00 ..... 30&5
Empire 25
Blacksmiths' 25
Jacobs' Drill Chucks 35
Planer Chucks 25
Skinner Patent Chucks:
Independent Lathe Chucks 30
Universal, Receding Jaws 30
Combination, Reversible Jaws
Drill Chucks, New Model, Standard, 45 Skinner Pat., 25%, Positive Drive 20%
Planer Chucks 20%
Face Plate Jaws 35%
Standard Tool Co.:
Improved Drill Chuck 45%

Cider Mills—

Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 9 40
Combination, No. 21 30
Screw Combination, Nos. 83 and 84 40
Geared Scroll, Nos. 83 and 84 40
Independent Iron, Nos. 18 and 318 35
Independent Iron, No. 61 25
Union Drill, Nos. 99, 99, 100, 101, 102, 103, 104 40
Union Crab Drill 40
Universal, 11, 12, 16, 17, 1, 11, 15 40
Universal, No. 42 35
Iron Face Plate Jaws, Nos. 28, 30, 88 and 89 35
Steel Face Plate Jaws, Nos. 70 and 72 30
Westcott Patent Chucks:
Lathe Chucks 50
Little Giant Auxiliary Drill 50
Little Giant Double Grip Drill 50
Little Giant Drill, Improved 50
Oneida Drill 50
Scroll Combination Lathe 50
Whitaker Mfg. Co.:
No. 1 Drill 25

Clamps—

Adjustable Hammers' ..... 25&5
Carriage Makers', P., S. & W. Co. ..... 50&10%
Pattern Makers' 40
Metal Pipe 40
Lineman's Swedish Neverturn 25%
Wood Working Hammers 40
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable 50%
Iwan's Champion, Stationary 40%

Sidewalk—

Star Socket, All Steel, per doz. $4.05 net
Star Shank, All Steel, per doz. $3.24 net
Wall Scraper, per doz.:
7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros. 30%
Favorite R. Plumb 30
L. & I. J. White Co. 30

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Horse, each $15.00
Chicago Belt Horse, each $20.00
Stewart's Enclosed Gear Horse, each $6.75
Stewart's Patent Sheep Shearing Machine, each $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75

Clips, Axle—

Regular Styles, list July 1, '05. ..... 50&10%

Cloth and Netting, Wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Bushing, Lupton, Bushing &c. ..... 70@—%
Compression Bibbs and Cocks ..... —%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list 40%
Leather Walter B. Stevens & Son's ..... —

Compasses, Dividers, &c.

Ordinary Grade ..... 70@70&75
Wm. Schollhorn Co.:
Bricklayers' Dividers 60
Lead Dividers 75

Conductor Pipe,—

L. C. L. to Dealers:
Galvanized
Galv. Steel. *Charcoal Iron.* *Copper. 14, 16&17 oz.*
Eastern:
[illegible]
Central:
[illegible]
Western and Southern:
Sheathing [illegible]
So. Western
[illegible]
Terms, 60 days; 2% cash in 10 days. Part box shipments generally declined.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:
Gal. 3 4 6 8
Galvanized, ea. $1.85 $2.00 $2.25 $2.90 $3.90
Galvanized, Lined, side handles, Gal. 5 6 8
Each $1.95 $2.10 $2.40 $3.00 $4.15
Water Bottle, lined ..... lb.
Acme Lined ..... lb.

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 24@25¢; lighter than 3 lb. to pair ..... 24@29¢

Cord— Sash—

Braided, Drab ..... lb. 35¢
Braided, White, Com., Nos. 8 to 12, 26¢; No. 7, 28¢; No. 6, 30¢. In lots of 12 docs. or more, 1 cent less per pound.
Cable Laid Italian, lb., No. 18..87¢
Italian, lb., Nos. 18, 25¢; 8, 22¢
Common India ..... lb., 11@11½¢
Cotton Sash Cord, Tu Test ..... 18@21¢
Patent Russia ..... lb. ..20¢
Cable Laid Russia ..... lb. ..21¢
India Hemp, Br'd'd ..... lb. ..21¢
India Hemp, Twisted ..... lb. 13@14¢
Paint India, Twisted ..... lb. 17¢
Peer, Braided ..... No. 6, 8, 10, 25½c; No. 7, 25½c; Nos. 8 to 12, 26c
Edgestone, Braided ..... Nos. 8 to 12, 25½c; 26c; 27½c
Harmony Cable Laid Italian, Nos. 7 to 12 ..... lb. 23¢
Pullman:
Wire Sash Cord 18%
Sash Cord Attachments, per doz. 10¢
Samson, Nos. 8 to 12:
Braided, per lb., Drab Cotton, 55¢; Italian Hemp, 40¢ & 50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord ..... 50¢
Massachusetts, White ..... lb 40¢
Massachusetts, Drab ..... lb 45¢
Phoenix, White, Nos. 8 to 12, 27¢; 15%
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen ..... 57½¢
See also Chain and Ribbon.

Wire, Picture—

List July 1, 1906 ..... 90&5
Hendrys Standard Wire Picture Cord, ... off list 85&10%
Turner & Stanton Co. Wire Picture Cord ..... 85&10%

Cradles—

Grain ..... 40@42½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but generally made by jobbers.
Zelnicker's Lumber, per gro. White and Purple, Indelible $7.50
Buck Bros.:
Giant Lumber, 5¾ in. x 15-16 in. [illegible]
[illegible]
Genuine Soapstone, Metal Workers', 5 in. x ¾ in. Round, $2.50; 5 in. x [illegible]

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $5.50; [illegible]

Crow Bars—See *Bars, Crow.*

Cultivators—

Wire Goods 50

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, per doz. $3.50
Star, Eagle, Rogers & Hamilton [illegible]
Wm. Rogers & Son 50

Cutters— Glass—

H. H. Mayhew Co. 40%
[illegible]
[illegible]
Wheeler 50

Meat and Food—

Arcade 50
Enterprise:
[illegible]
Each ..... $2 $3 $2.75 $1.50 $6 25@25&7½%
[illegible]
P. S. & W. Co.:
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
Food No. 1, $4 ..... 15&5
[illegible] $15.00 $18.00
Enterprise Beef Shavers ..... 25@30

Slaw and Kraut—

Hand [illegible] 50
Cabbage [illegible] 50
Corn Graters 30
Nappers, per doz., $4 50
J. M. Mast Mfg. Co.:
[illegible]
Combined Slaw Cutter and Corn Grater 35

Tobacco—

All Iron, Cheap ..... doz. $4.25@$4.50
Enterprise 50
National, per doz., No. 1, $21; No. 2, $18 ..... 40%

Diggers, Post Hole, &c.—

Disston's:
Ratchet $4 50
Nappers, per doz., $4 50
Iwan's Imp'ved Post Hole Auger..40%
Vaughan Pattern Post Hole Augers, [illegible]
Perfection Post Hole Digger, doz. $8.75
Split Handle Post Hole Diggers, per doz. 50
Hercules Pattern, per doz. $10.00
Kohler's, per doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer $7.50
Never-Break Post Hole Diggers, per doz., $24 50

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers 35%
Sterling Wheel Dresser Cutters 35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines ..... $1.50@$1.75
Buck Bros. 30
Bridgeport Mfg. Co. 40
Goodell Automatic Drills ..... 50&10@60&10%
Millers Falls Automatic Drills ..... 33⅓&10%
Ratchet, Curtis & Curtis 35%
Ratchet, Parker's 40%
Ratchet, Weston's 40%
Ratchet, Weston's, Style H Improved 40%
Ratchet, No. 912 ..... 40%
Ratchet, Celebrated 40%
Ratchet, Whitney's, P., S. & W. 40%
Whitney's Hand Drill, No. 1, $ [illegible]
Adjustable, No. 10, $12.00 ..... 33⅓%

Twist Drills—

Bit Stock ..... 60@10&10@70%
Taper and Straight Shank ..... 60@10&10@10&5%

Drivers, Screw—

Screw Driver Bits, per doz. 45@50¢
Balsey's Screw Holder and Driver, per doz., 2½-in., $6; 4-in., $7.50; 6-in. 50
Buck Bros.' Screw Driver Bits 30
Champion 50
Dandy 50
Fray's Hol. H'dle Sets, No. 3, $12 50
Ford's Brace Screw Drivers ..... 40&10%
Gay's Double Action Ratchet 35%
Goodell's [illegible]
Mayhew's Black Handle 40
Mayhew's Monarch 40%
Millers Falls, Nos. 20 and 21 ..... 25&10%
Millers Falls, Nos. 11, 12, 41, 42 ..... 15&10%
Studley & Hollow Steel Screw Driver [illegible]
Swan 50
Nos. 7563 to 7565, N. [illegible]

Eave Trough, Galvanized—

Tin Plate [illegible]
Galv. Steel. *Charcoal Iron.* *Copper. 14, 16&17 oz.*
Eastern:
[illegible]
Central:
[illegible]
Western and Southern:
[illegible]
Terms [illegible]
Note—Lower for some sections.
See also Conductor Pipe and Elbows

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Iron
Nos. 24 [illegible]
Nos. 26 [illegible]
Nos. 28 [illegible]
Nos. 29 [illegible]
Copper [illegible]

Elbows, Stove Pipe—

Edwards, Standard Blue ..... 40&10&10%
[illegible]

Emery, Turkish—

	4 to 6 lb. cans	54 to 60 lb. cans	Flour.
Kegs	[illegible]	[illegible]	8½¢
½ Kegs	[illegible]	9¾¢	9¾¢
¼ Kegs	[illegible]	10¢	10¢
In cases	6¾¢	7¢	6¢
10-lb. cans, less than 10	10¢	10¢	9¢
Less quantity	12¢	12¢	12¢

NOTE—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's ..... 70&10
Weidner's ..... 70&10
Upson's Patent 40%

Cord and Weight—

Ives and Titan 33⅓%

Corrugated—

Acme Corrugated Fasteners 70%

Faucets—

Cork Lined ..... 50&10&10%
Metallic Seat, Leather Lined, not rated 70%
Red Cedar ..... 70&5&10&10%
Petroleum ..... 70&10&10&75%
B. & L. B. Co.: ..... 60&10%
Metal Key 60%
Star ..... 50&10%
West Lock 40%
John Sommer's Fortress Tin Key 50%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Mt. Key 50&10%
John Sommer's Duplex Metal Key..60&10%
John Sommer's Diamond Lock 40%
John Sommer's I X L Cork Lined..60%
John Sommer's Reliable Cork Lined..50&10%
John Sommer's Chicago Cork Lined..60%
John Sommer's O. K. Cork Lined..60%
John Sommer's No Brand, Cedar..40%
John Sommer's Perfection, Cedar..40%
Self Measuring:
Enterprise, ₱ doz. $36.00 ..... 40&10%
Lane's, ₱ doz. $36.00 ..... 40&10%
National Measuring, ₱ doz. $36.40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List Nov. 1, 1899.
Best Brands ..... 70&10&10&75&10%
Standard Brands ..... 70&10&10%
Lower Grades ..... 70&10&10&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 ..... 33 1-3&40&10%

Fixtures, Fire Door—

Allith Underwriters' Approved 50%
Richards-Mfg. Co.:
Universal, No. 103; Special, No. 104 75
Fusible Links, No. 96 ..... 80%
Expansion Bolts, No. 107 ..... 60&10%

Grindstone—

Net Prices:

Inch	15	17	19	21
Per doz.	$3.00	3.75	4.50	5.75

P., S. & W. Co. 25
Reading Hardware Co. 60%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig Ezy Potato ..... 60&10%
Victor, Hay ..... 60&15&2½%
Victor, Manure 60%
Victor, Header 60%
Champion, Hay 60%
Champion, Header 65%
Champion, Manure ..... 60&15&2½%
Columbia, Hay ..... 60&20%
Columbia, Manure 70%
Columbia, Spading ..... 70&12½%
Hawkeye Wood Barley ..... 60&10%
W. & C. Potato Digger ..... 60&10%
Acme Hay ..... 60&10%
Acme Manure, 4 tine ..... 60&10&5%
Dakota Header 60%
Jackson, Wood Barley ..... 60&20%
Kansas Header 65%
W. & C. Favorite Wood Barley 40%
Plated.—See Spoons.

Frames— Wood Saw—

White, S'g't Bar, per doz. 75¢@80¢
Red, S'g't Bar, per doz. $1.00@1.25
Red, Dbl. Brace, per doz. $1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	$1.25	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp	$2.75
Cotton	3.20
Waterproof Sgl. Taped.	3.65
Waterproof Dbl. Taped.	4.40
Waterproof Tpl. Taped..	5.15

} 25%

} 10&10%

Gates, Molasses and Oil—

Stebbins' Pattern ..... 75@80%

Gauges—

Marking, Mortise, &c. ..... 50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c. ..... 50&50&10%
Disston's Marking, Mortise, &c. 67½%
Wire, Brown & Sharpe's 33⅓%
Wire, Stub's 25%
Wire, P. S. & W. Co. 33⅓%

Gimlets— Single Cut—

Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.80; 2, $2.60
Spike, Wood Handled, No. 1, $3.00; 2, $3.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co. ..... 65&65&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush.. *25&10@50%*
Elwell's 40%

Grease, Axle—

Common Grade....gro. $6.00@6.50
Dixon's Everlasting, 10-lb pails, each. 80¢; in boxes, ₱ doz., 1 lb. $1.20, 2 lb. $2.00
Helmet Hard Oil 25%

Griddles, Soapstone—

Pike Mfg. Co. ..... 33⅓&33⅓&10%

Grinders—

Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75, 1A, $2.50, 10, $5.00 ..... 30%
Alundum Sickle Grinders, each, Nos. 20 $5.00, 20A, $6.00, 20A Combined, $6.50 30
Alundum Disc Grinders, each, $2.50 ..... 30%

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., $2.00 ..... 33⅓%
Richards Mfg. Co., Eli and Cycle Ball Bearing, mounted 40%

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... 60&5@60&10%
Covert Mfg. Co.:
Web ..... 30&2%
Jute Rope 35
Sisal Rope 20
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am. Coil and Halters ..... 40@10&5%
Am. Cow Ties ..... 45&60%
Niagara Coil and Halters ..... 45&50&5%
Niagara Cow Ties ..... 45&55@50&10&5%

Hammers—
Handled Hammers—

Heller's Machinists' ..... 55&10 55&10&5%
Heller's Carpenters' ..... 40&5&10&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel 50%
Hammers ..... 10&10&5%
Riveting 50%
Machinists', revised list ..... 66⅔&5
Blacksmiths ..... 5&5
Loetle R. Thumb.
A. E. Nail ..... 40&2½&10&12½%
Eng. and B. S. Hand ..... 40&10&5%
Machinists' Hammers ..... 60&60&10%
Riveting and Tinners' ..... 40&7½@40&12½&5%

Heavy Hammers and Sledges—

Under 3 lb., per lb. ..... 8¢
3 to 5 lb., per lb. ..... 8¢
Over 5 lb., per lb. ..... 8¢
Over 5 lb., per lb., del'd ..... 10¢

Handles—
Agricultural Tool Handles

Axe, Hatchet, &c. ..... 60&10&5&10%
Hoe, Rake, &c. 40%
Fork, Spade, &c.
Long Handles 40%
D Handles 40%

Cross-Cut Saw Handles—

Atkins 33⅓%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—

Auger, assorted...gro. $3.00@$3.50
Cant Axe ..... gro. $1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory ..... $2.15@$2.40
Socket Firming, Apple, $1.75@ $1.85; Hickory ..... $1.60@$1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted ..... gro. $1.30@$1.40
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz. 80¢@85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz. 80¢; Jack, Bolted 75¢
Fore, doz. 45¢; Fore, Bolted 90¢
Chapin-Stephens Co.:
Carving Tools ..... 60&10%
Chisel ..... 60&10%
File and Awl ..... 60&10&5%
Saw and Plane ..... 60&10&10%
Screw Driver ..... 60&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 17&10%
Nicholson Simplicity File Handle 50%
W. A. Zelnicker Supply Co.:
Hammer, ₱ doz., 12 in. $2.00; 14 in. $2.00; 16 in. $2.20; 18 in., $2.50; 20 in., $2.70; 22 in. $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, ₱ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe, ₱ doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze, ₱ doz., 36 in., $5.80; 36 in. $7.80.
Pick, ₱ doz., R. R. 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ₱ doz., 12 to 14 in., $2.00.
} 60%

Hangers—

NOTE—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track.
Allith Mfg. Co.:
Rubber, No. 1 and 2 ..... 50%
Allith Adjustable, No. 6; Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60&2½%
Roller Bearing ..... 70&2½%
Griffin Mfg. Co.:
Self Adjusting, No. 10 ..... $12.00 &10%
Roller Bearing, No. 11, $15.00, 6&10%
Roller Bearing, Ex. Hy. No. 22, $18.00 ..... 60&10%
Ball Bearing, $24.00 ..... 70%
Lane Bros. Co.:
Parlor, Ball Bearing, Standard, No. 15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard ..... 60&10%
Hinged ..... net $6.08
Covered ..... 60&5%
Special ..... 70&5%
Lawrence Bros.:
Advance ..... 55&10%
Cleveland 50%
Clipper, No. 75 ..... 60%
Crown ..... 55&10%
Cyclone, No. 40 ..... net $7.50
Tabletop, No. 50 ..... net $7.50
New York ..... 55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2..70%
Anti-Friction 60%
Hinged Hangers, King Charm..60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, ... 60&5%
Pioneer Wood Track, No. 3 $2.25
Roller B'r'g St'l Track No. 12 $2.20
Roller B'r'g St'l Track No. 13 $2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16..... 50&10%
Seal, Steel Track No. 8..... $2.20
Auto Adj. Track No. 22.—50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 18, $2.25; No. 121, $2.45; No. 15 ..... $1.50
Safety Underwriters F. D. No. 101 ..... 50%
Tandem No. 41, 2½ and 3 ..... 60&10%
Plate, Adjustable Track, No. 132 ..... 50&5%
Royal, Adjustable Track No. 122 ..... 50&5%
Ives Wood Track No. 1..... $2.25
Trevor U. Ives No. 2 ..... 40%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2..70&7½%
Anti-Friction, No. 42, ... 60%
Sizes 2½ and 3 ..... 60%
Hinged Tandem No. 48..... 60&5%
Folding Door B. B. Swivel No. 135 ..... 40%
Taylor & Boggis Fty Co's Kidney Roller Bearing 50&15&10&5%
Myers' Stagon Hangers 60%

} Extra 10% often given.

Hangers— Garment—

Pullman Trouser, ₱ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $10.50; Garment Hanger Loops, Round Nickeled, per gro. $10.50
Victor Folding ..... ₱ gro. $9.60

Gate—

Myers' Patent Gate Hangers, ₱ doz. net $4.50

Joist and Timber—

Lane Bros. Co. 30%

Hasps—

Griffin's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, ₱ doz. ..60%

Hatchets—

Regular list, first qual. ..... 60&10%
Second quality ..... 50&10%

Heaters, Carriage—

Clark, No. 5, $1.15; No. 5B, $2.00; No. 3, $2.25; No. 4, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50 ..... 25%
Clark Coal, ₱ doz., $0.75 ..... 20%

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind: (Victor; National, 1908 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	$0.75	1.35	2.70

Mortise Shutter: (L. & P., O. S., Acme, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	$0.70	.65	.60	.55

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	$0.70	.65	.60

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Charles Parker Co. ..... 70&75%
Parker Wire Goods Co. 70%
Hyle & Benjamin Automatic Blind Hinges 20%

Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00 ..... 20%
Reading's Gravity 60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ₱ doz. sets, without screws, $1.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter ..... 75&5%
Acme, Lull & Porter 75
Queen City Reversible 75%
Shepard's Noiseless, Nos. 60 to 55 ..... 75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&5%
Tip Pat'n, No. 1 ..... 75&10%
No. 3 ..... 75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 70&10&5%
Shepard's Double Locking 75%
Champion Gravity Locking ..... 75&5%
Pioneer ..... 75&15
Empire 65%
W. W. Co.'s Mortise Gravity Locking, No. 2 ..... 60&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.			3
Hinges with L't'chs.	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	.35

New England:

With Latch	*doz.*	@$2.00
Without Latch	*doz.*	@$1.60

Reversible Self-Closing:

With Latch	*doz.*	@$1.75
Without Latch	*doz.*	@$1.35

Western:

With Latch	*doz.*	$1.75
Without Latch	*doz.*	$1.15

Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 ..... 70%

Pivot Hinges—

Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—

Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, Cast Iron $6.50@$6.75

J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 40%
Bardsley's Patent Checking 33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor 40%
Bommer Spring Hinges 40%
No. 999 Wrot. Steel Hold Back, ₱ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor ..50%
Garden City Engine House 25%
Keene's Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 25
American 30%
Columbia, ₱ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ₱ gr. $12.00
Columbia Spring Hinges ..... 60&10%
Gem, new list 30%
Clover Leaf ..... ₱ gr. $12.00
Oxford, new list 30
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co., Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door..... ₱ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door 25%
No. 777, Steel Steel Holdback, ₱ gr. pr. $9.00
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓%

} Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges	50&10%
Heavy Strap Hinges	60&5%
Light T Hinges	50%
Heavy T Hinges	40%
Extra Hvy. T Hinges	50&10%
Hinge Hasps	33⅓%
Cor. Heavy Strap	60&5%
Cor. Ex. Heavy T	50&10%

} Extra 10&7½%

Screw Hook and Strap.	*6 to 12 in. lb.*	3¾¢
	14 to 20 in. lb.	3¼¢
	22 to 36 in. lb.	3¼¢

Screw Hook and Eye:

¾ to 1 inch ..... *lb.*	6¼¢
⅝ inch ..... *lb.*	7¼¢
½ inch ..... *lb.*	8¼¢

} 10&5%

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers ..30&2%

Hods— Coal—

Mf'gr's list, price per gross.

Inch	15	16	17	18
Galv. Open	$35	$39	$42	$46
Jap. Open	26	28	31	35
Galv. Funnel	51	58	52	56
Jap. Funnel	33	30	50	45

} 10&5%

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick, No. 162 ..... each $1.05
Steel Mortar, No. 158 ..... each $1.35

Hoes— Eye—

Scroll and Oval Pattern..... 60&10%@60&10&10%
Grub, list Feb. 28, 1900 ..... 70&10&75&10%

D. & H. Scroll 37½%
Am. Fork & Hoe Co. (Seneca Falls Pat. Rest) 60%

Handled—

NOTE—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Crane's Weeding, No. 1 $2.75, No. 2 $2.50
Star Double Bit $3.50
Ft. Madison Cotton Hoe ..... 75&10&5%
Ft. Madison Crescent Cultivator Hoe, ₰ doz. ..... 70&10%
Ft. Madison Mattock Hoes ..... 75&10%
Ft. Madison Scuffle Hoes, ₰ doz. net $4.35
Ft. Madison Sprouting Hoe, ₰ doz. net $4.35
Ft. Madison Dixie Tobacco Hoe ..... 75&10&5%
Kretsinger's Cut Easy ..... 75&10&5%
Warren Hoes ..... 45&10%
A. & L. Hoes ..... 75&10%
B. B. 6 in., Cultivator Hoe $3.40
B. B., ₰ doz. net $4.35
Acme Weeding Hoe, ₰ doz. net $4.35
W. & C. Diving Shuttle Hoe $3.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Augusar, ₰ doz. $24.00 ..... 45&10%

Door—

Barkley's, Iron, Brass and Bronze 50%
Eagle 50%
Ellsworth 35%
Fuchman 50%
Reading's Mfg. Co., Everready, Nos. 118, 119, Sure Grip 50%
Superior 33⅓%

File and Tool—

Nicholson File Holders and File Handles ..... 33⅓&40%

Fruit Jar—

Triumph Fruit Jar Holder, ₰ gross, $16.80; ₰ doz. $1.25

Trace and Rein—

Fernald Double Trace Holder, ₰ doz. pairs $1.25
Dash Rein Holder, ₰ doz. pairs $1.25

Hones—Razor—

Pike Mfg. Co., Bogart and Swaty, Sr., Germain 50%

Hooks—Cast Iron—

Bird Cage, Reading 40%
Clothes Line, Reading List 50%
Coat and Hat, Reading ..... 45&50%
Coat and Hat, Wrightsville 40%
Harness, Reading List 40%

Wire—

Bell 80%
Ware C. & H. Hooks 50%
Bradley Metal Clasp Wire, Coat and Hat, Reading ..... 70&10%
Columbian Hdw. Co., Gem ..... 70&5%
Parker Wire Goods Co., King ..... 70&10%
Ware Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.90; 8 in., $1.25; 10 in., $3.50.
Cotton ..... *doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Brace, see Stops; Bench Rush, Light, doz., $6.20; Medium, $8.25; Heavy, $9.65
Grass, best, all sizes, per doz. $3.00
Grass, common grades, all sizes, per doz *$1.30*
Rushbrace ..... *lb. 35¢@60¢*
Hooks and Eyes:
Brass ..... *6 @6&10%*
Malleable Iron ..... *6 @6&10%*
Coates Mfg. Co. Gate and Scuttle Hooks 40%
Ft. Madison Cast Iron Gate Hooks, ₰ doz. $3.25 net
Turner & Stanton Co. Gate and Shutter 50%
Corn Husk, See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition ..... *ft. 7¢@ 6¢*
Alpha Guaranteed ..... *ft. 8¢@ 9¢*
Alpha Guaranteed ..... *ft. 10¢@11¢*
Cotton Garden, Extra, complete ..... *ft. 8¢@ 9¢*
Low Grade ..... *ft. 8¢@ 9¢*
Fine Quality ..... *ft. 10¢@11¢*

Irons— Sad—

From ¼ to 10 ..... *lb. 3½@4¢*
B. B. Sad Irons ..... *lb. 6¢*
Mrs. Potts', cents per set:
Nos. 50 55 60 65
Japed Tops 88 86 93 97
Third Tops 88 86 93 97
New England Pressing ..... *lb. 6½¢*

Bar and Corner—

Richards Mfg. Co. Bar, Corner 40%

Pinking—

Pinking Irons ..... *doz. 60¢*

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Ewert Mfg. Co.:
Auto Screw ..... 30&2%; Steel, 45%
Quick 50%
Lane's Steel ..... 20&5
Richards Tiger Steel, No. 130 ..... 50&10%
Smith & Hemenway Co.'s 25%

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Kettles—

Brass, Spun, Plain ..... *20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros. Butcher & 30%
Wilkinson Shear & Cutlery Co.....60%

Corn—

Columbian Cutter Co., Wilcut Brass Knives and Handles 60%
Wilcox & Ashe ₰ doz. $1.65; Dead, $2.35; Adj. Serrated, $2.35; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List 50%
C. E. Jennings & Co., Nos. 1 to 7 ..... 25%
Jennings & Griffin, Nos. 1 to 7, Nos. 8 to 12 ..... 50%
Swan's 50%
Watrous 16⅔%
L. & I. J. White ..... 20&50&25

Hay and Straw—

Serrated Edge, per doz. Standard 7.75
Iwan's Straw Edge ..... ₰ doz. $4.50
Iwan's Serrated ..... ₰ doz. $13.00

Miscellaneous—

Farriers' ..... *doz. $3.00@3.25*
Westenholm's ..... ₰ doz. $3.00@3.25

Knobs—

Base, 2½ inch, Birch, or Maple, Rubber Tip ..... *gro. $1.25@$1.40*
Carriage, Jap., all sizes ..... *gro. 40¢@45¢*
Door, Mineral ..... *doz. 65¢@70¢*
Door, Por. Jap'd ..... *doz. 70¢@75¢*
Door, Por. Nickel ..... *doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—

See *Belting, Leather.*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable 50%
Lane's Store 25%
Myers Noiseless Store Ladders 50%
Richards Mfg. Co.:
Improved Noiseless, No. 112 ..... 50%
Camax Shelf, No. 113 ..... 50%
Trolley, No. 130 ..... 50%

Ladles, Melting—

L. & G. Mfg. Co. (new list) 20%
P. S. & W. ..... 40&10%
Reading 60%

Lanterns—Tubular—

Regular, No. 0 ..... *doz. 3.75@4.50*
Rods, all, No. 0 ..... *doz. 3.75@4.25*
Hinge Globe, No. 0 doz. 3.60@4.75
Other Styles ..... *doz. 4.00@4.75*

Bull's Eye Police—

3 inch ..... *$4.50@4.75*

Latches— Thumb—

Roggin's Latches, with screw..
doz. 35¢@40¢

Door—

Allith Mfg. Co., Reliable and Alligator, 50%; Reliable Cold Storage, 50%
Cross & Carrier Mfg. Co. No. ..... ₰ doz. $2.20
Richards' Bull Dog, Heavy, No. 125 ..... 50&5%
Richards' Trump, No. 127 ..... $1.50

Leaders, Cattle—

Small ..... *doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps.*

Lifters, Transom—

R. & E. 10%

Lines—

Hop, Clothes, Nos. 18 19 20
100 feet *$2.50 2.25 2.00*
75 feet *$2.19 1.80 1.65*
Schiedt Cordage Works:
Solid Braided Chalk, No. 0 to 3..40%
Solid Braided Masons', No. 0 to 3..30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ..... ₰ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.00; No. 4½, $4.50 ..... 20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 ..... 20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft. $5.25 ..... 20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines 40%
Clothes Lines, White Cotton 20%
Shade Cord, Cotton or Linen 20%

Locks— Cabinet—

Cabinet Locks *33⅓%*

Door Locks, Latches, &c.—

NOTE—Net Prices are very often made on these goods.
Reading Hardware Co. 40%
R. & E. Mfg. Co. 40%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass ..... 75&5%

Sash, &c.—

Ives' Patent:
Bronze and Brass, 55&5%; Crescent, 60%; Iron, 60%; Window Ventilating, 40&20%; Robinson Pat. Ventilating Sash Lock, 20%
Pullman Patent Ventilating Lock..35%
Reading Sash Locks 40%

Machines—Boring—

Com. Up'rt, without Augers,
$2.00@2.25
Com. Angl'r, without Augers,
$2.25@2.50
Swan's Improved ..... 40&10%
Jennings, Nos. 1 and 14 ..... 5%
Miscellaneous 5%
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Invincible Hand Power, ₰ doz. $18.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist..30%
Moore's Hand Hoist, with Lock Brake 30%
Moore's Cyclone, High Speed Chain Hoist 30%

Ice Cutting—

Chandler's 12½%

Washing

Boss Washing Machine Co.: Per doz
Boss No. 1 ..... $30
Boss Rotary $37.00
Champion Rotary Banner No. 1..$57.00
Standard Champion No. 1 ..... $50.00
Standard Perfection $35
Cincinnati Suface Washer $30
Uncle American, Round $30.00

Mallets—

Hickory ..... *45&5%@50%*
Lignumvitæ ..... *40&5%@50%*
Tinners' Hickory and Apple-wood ..... *doz. 45&5%@50%*

Mangers, Stable—

Swett Iron Works 50%

Mats, Door—

Ames Iron Mat Shoe 50
Lane's Steel Wire Co., new list..30

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co. ..... 20@25%
National cot Jan. 1, 1908 ..... 50%
Parker's Columbia and Victoria..33⅓%
Landers Iron and Steel ..... 30&5%
Swift Lane Bros. Co. 50%

Motors, Water—

Divine's Red Devil 30%
Lippincott's 50%

Mowers, Lawn—

NOTE—Net prices are generally quoted
Cheapest, 10-in., $2.00; 12-in., $2.10, etc.
Cheap, 10-in., $2.25; 12-in., $2.45, etc.
Better Grade, 10-in., $3.00; 12-in., $3.25, etc.

	12	14	16	18 in.
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*
Continental				60%
Great American				70%
Great American Ball Bear'g, new list				70%
Quaker City				70%
Pennsylvania				60%
Pennsylvania, Jr., Ball Bearing, 5 in.				50%
Pennsylvania Golf				50%
Pennsylvania Horse				30&5%
Pennsylvania Pony				40&5%
Granite State:				
Style A, Iaw Wheel				70%
Style B, Low Wheel				70%
Style C, High Wheel				70%
Style D, High Wheel, spcl. list				70%
Pioneer Lawn:				
Styles M., S., C., K., T.				70&10&5%
Style A, all Steel				60&10&5%
Style L, Horse Mower				50%
Drexel and Gold Coin, special list				40%
Horse				40&5%
Pony				30&5%
36-in., Horse				30&10%
Eagle Horse				30&5%
I. X. L. Horse				50%

Nails—

Wire Nails and Brads, Miscellaneous ..... *50%@55% adl*
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	25	20	20	19	18	...40&5%
Globe	20	18	17	16	15	...net
New Haven	23	21	20	19	18	...40&5%
Livingston	19	18	17	16	16	...30
Western						₰ lb 8¢

Jobbers' Special Brands ..... *per lb. 9¢@10¢*

Picture—

	lb.	2	2½	3	in.
Brass H'd	*45*	*55*	*60*	*70*	*...*
Por. Head	*...*	*1.10*	*1.10*	*1.10*	*.. gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: *Off list*
Square, Blank or Tapped .....
Hexagon, Blank or Tapped .....
Semi-finished, C. P. & R. .....
Hexagon, Blank, C. P. & R. .....
Hot Pressed:
Square, Blank .....
Hexagon, Blank .....
Square, Tapped .....
Hexagon, Tapped .....

Oakum—

Tarred ..... *lb. 6½¢*
U. S. Navy ..... *lb. 8¢*
Navy ..... *lb. 7¢*
Blanchard's Spun Oakum ..... *8½¢*

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated *75%*
Cause of Paraguay:
Brass and Copper ..... *50&10%*
Zinc ..... *60&10%*
Malleable, Hammers' Improved, Nos. 11, 12 and 13 .....
Malleable Iron Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Brass Brush Oilers .....
Richard Oilers, &c. .....

Openers— Can— *Per doz.*

Sprague, Iron Handle ..... *.30@.35¢*
Sprague, Wood Handle ..... *.50¢*
Sterling Scissors ..... *$1.75@$3.00*
Yankee Can and Bottle Openers, ₰ doz., net, $0.75; Little Gem, ₰ doz. net ..... .50

Egg—

Harrison Nickel Plate, ₰ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope ..... *20@45¢*

Rubber—

(Fair quality goods.)

Sheet, C. I. ..... *11@12¢*
Sheet, C. O. S. ..... *11@12¢*
Sheet, C. B. S. ..... *12@13¢*
Sheet, Pure Gum ..... *30@35¢*
Sheet, Red ..... *40@50¢*
Jenkins' '96, ₰ lb. ..... 80¢

Miscellaneous—

American Packing ..... *lb. 7@10 ¢*
Cotton Packing ..... *lb. 16@25 ¢*
Italian Packing ..... *lb. 9@12½¢*
Jute ..... *lb. 4½@5¢*
Russia Packing ..... *lb. 9@11 ¢*

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List ..... *65&5%@65&10%*
Edwards, Royal Blue ..... 65&10%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.55*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos: *lb.*
Roll Board or Building Felt, 6 lbs. to 100 lb., per 100 sq. ft. ..... *3½@5¢*
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft. ..... *6¢*
Mill Board, Sheet, 40 x 40 in., 1-32 to ⅛ in. ..... *3@5¢*
Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll ..... *$0.75@.80*
Medium weight, 30 lbs. to roll ..... *.90@1.00*
Heavy weight, 40 lbs. to roll ..... *1.20@1.30*
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton *$17.50*
Red Rope Roofing, 250 sq. ft. per roll *$1.75*

Tarred Paper—

1 ply (roll 400 sq. ft.), ton ..... *$13.00@$15.00*
2 ply, roll 108 sq. ft. ..... *.65¢*
3 ply, roll 108 sq. ft. ..... *.88¢*
Slater's Felt (roll 500 sq. ft.) ..... *.80¢*

Sand and Emery—

Flint Paper and Cloth.50&10@—%
Garnet Paper and Cloth ..... *.22¢*
Emery Paper and Cl'h..50&10@60%

Parers— Apple—

Goodell Co.:
Family Bay State ..... ₰ doz. $15.00
Improved Bay State $36.00
New Lightning ..... net
Corn Tool ..... net
White Mountain ..... net
Daisy ..... net
Boss ..... net
Reading ..... net
Livingston Nail Co.:
Improved ..... net
Lightning ..... net
Boss ..... net
Reading Hardware Co.:
Automatic $4.00
Boss $4.00
Reading $4.00
Reading Jr. $3.00

Potato—

Saratoga ..... ₰ doz. $7.00
White Mountain ..... ₰ doz. $6.00

Picks and Mattocks—

Ewert Mfg. Co.:
Crown Hollow Ground Garden Mattock, ₰ doz., No. 2, $2.60; No. 3, $6.40.

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass ..... 50@55&10%
Iron, list Nov. 11, '85 ..60@60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in .....60@65&10—%
Extra Heavy, 2-6 in .....70@70 —%
Fittings, Standard and Heavy, 75@70% —%

Pipe, Merchant—

	Consumers, Carloads. Steel.		*Iron.*	
	Blk.	*Galv.*	*Blk.*	*Galv.*
	%	%	%	%
⅛ & ¼ in...	63	48	57	41
⅜ in.....	66	52	59	41
½ in.....	68	56	61	46
¾ to 6 in....	72	62	66	56
7 to 12 in....	69	54	61	46

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
Perfection 82%
Second class 85%

Pipe, Stove—

	Per 100 joints.	
Edwards' Nested:	C. L.	L. C. L.
5 in., Standard Blue....	$6.25	$7.25
6 in., Standard Blue....	6.75	7.75
7 in., Standard Blue....	7.75	8.75
5 in., Royal Blue.....	7.00	8.00
6 in., Royal Blue.....	7.50	8.50
7 in., Royal Blue.....	8.50	9.50
Wheeling Corrugating Co., Nested:		
5 in., Uniform Color..	6.15	7.15
6 in., Uniform Color..	6.65	7.65
7 in., Uniform Color..	7.65	8.65

Planes and Plane Irons—
Wood Planes—
Bench, first qual. ....30@35&10%
Bench, second qual. ....25@25&10%
Molding .....
Chapin-Stephens Co.:
Bench, First Quality..... 30
Bench, Second Quality..... 35
Molding and Miscellaneous..... 30
Toy and German..... 60%
Union .....

Iron Planes—
Chaplin's Iron Planes..... 50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list
Dec. 12, '06..... 25%
Buck Bros..... 30%
Chapin-Stephens Co..... 50%
Union 60%
L. & I. J. White..... 20&5&25%

Planters, Corn, Hand—
Kohler's Eclipse..... ₰ doz. $8.00

Plates—
Lithic ..... lb. 4@4½¢

Pliers and Nippers—
Button Pliers ....75%/50/7.5&10&5%
Gas Burner, per doz., 5 in., $1.25 at $1.40, 6 in., $1.45 at $1.50.
Gas Pipe ..... 7 in. 10 12 in.
$2.25 $2.25 $2.75 $3.50
Acme Nippers ..... 5%&5
Clark & Comer Mfg Co.:
American Lineman..... 50
Improved Button..... 60
Cronk's 50
No. 80 Linemen's..... 50
Stub's Pattern..... 45
Combination and 4 other styles..... 50
Heller Lineman, Nos. 1 to 5 inclusive, and Tool..... 50
J. P. & W. Tinners' Cutting Nip-pers..... 50%
Lists .....
Wm. Schlueter Co.:
Barrel, Iron City..... 25
Barrel, Lion..... 50
Pattern, Side, End and Diagonal Cut..... 50%
Long Pattern.....
Tinners' Snip & Tool Co.:
Pliers and Nippers, all kinds..... 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels..... 2 ½ 3 ½ 4
Chapin-Stephens Brass Co.:
Plumb Levels..... 30 ½ 40
Extension Sights..... 40@40&10%
Machinists' Levels..... 40@40&10%
Disston's Plumbs and Levels..... 60&10%
Disston's Pocket Levels..... 60&10%
Stanley's Duplex..... 33⅓%
Universal .....

Points, Glaziers'—
Diamond and 14lb. papers... lb. 9½¢
Other papers..... lb. 10¢
Tin points..... lb. 10½¢

Police Goods—
Manufacturers' Lists... 25@25&5%
Union 25%

Polish—Metal, Etc—
Peerless Liquid No. 1 (½ pt.) ₰ doz. $2.00 No. 2 (1 qt.) $9.00 40%
Prestolite Paste 60%

George William Hofman:
U. S. Metal Polish Paste, 3 oz. boxes, ₰ doz. 50¢; gro. $4.50; ½ lb. boxes, ₰ doz. $1.25; 1 lb. boxes, ₰ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₰ doz., $1.25.
Buffalo Friend Metal Polish, ₰ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans ₰ lb 10¢
Black Eagle, Liquid, ½ pt cans, ₰ doz. 75¢
Brass Jack Paste, ¾ lb cans, ₰ gr $9.00
Black Kid Paste, 5 lb can, each, $6.65
Ladd's Black Beauty Liquid, per 100 tins..... $6.75
Joseph Dixon's, ₰ gr. $5.75..... 10%
Dixon's Plumbago..... ₰ lb 8¢
Fireside ..... ₰ gr $2.50
Gem, ₰ gr. $4.50..... 10%
Japanese ..... ₰ gr. $2.50
Jet Black ..... ₰ gr $3.50
Peerless Iron Enamel, 10 oz cans, ₰ doz. $1.50

Poppers, Corn—
1 qt. Square...doz. $0.80; gro. $8.75
1 qt. Round...doz. $0.90; gro. $10.00
1½ qt. Square...doz. $1.00; gro. $11.00
2 qt. Square...doz. $1.25; gro. $13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts..... each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled ..... 35&10%
Tinned ..... 30&10%

Powder—
In Canisters:
Duck, 1 lb..... each 45¢
Fine Sporting, 1 lb..... each 75¢
Rifle, ½ lb..... each 45¢
Rifle, 1 lb..... each 85¢
In Kegs:
12½ lb. kegs..... $3.50
25 lb. kegs..... $4.50
King's Semi-Smokeless:
Keg (25 lb bulk)..... $6.50
Half Keg (12½ lb bulk)..... $3.50
Quarter Keg (6¼ lb bulk)..... $1.90
Case 24 (1 lb cans bulk)..... $8.50
Half case 12 (1 lb cans bulk)..... $4.50
King's Smokeless: Shot Gun. Rifle.
Keg (25 lb bulk)..... $15.00 $15.00
Half Keg (12½ lb bulk)... 8.25 7.75
Quarter Keg (6¼ lb bulk).. 4.75 4.00
Case 24 (1 lb cans bulk)... 17.00 17.00
Half case 12 (1 lb c. bk)... 7.25 8.75

Presses—
Fruit and Jelly—
Enterprise Mfg Co ..... 20@25%

Seal Presses—
Morrill's No. 1, ₰ doz., $20.00..... 50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Clark's 50%
Maydole's Nos. 3, ₰ doz., $12..... 50%
Morrill's No. 1, Nail Puller, ₰ doz., $20.00..... 50%
Pearson No. 1, Cyclone Spike Puller, each .....
The Scranton Co. Case Lots:
No. 1 ..... $5.50
No. 3B (small)..... $5.00
Diamond Claw Co 50
Diamond B..... 50%
Staple Pullers, Union and Peck..... 60

Pull-ys, Single Wheel—

Inch	1½	1¾	2	3
Ancony, or Tackle				
doz.	$.45	.55	.60	1.05
Hay Fork Swivel or Solid Eye.				
doz.	1 in., $1.25;	1½ in., $1.55		
Inch	2	2½	2½	
Hot House, doz.	$.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz.	$0.40	.45	.50	
Inch	1¼	1½	2	2½
Side, doz.	$0.35	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz. 1¾ and 2 in...... 17½¢
Auger Mortise no Face Plate per doz., 1¾ and 2 in...... 20@21¢
Ajax Mfg Co.:
American Puller Co:
Wrought Steel, Anvil on Pivot Axle.....
Wrought Steel, Eagle..... 17@20¢
1 5-8 Steel, Nos. 3 and 4, ₰ doz. .....
Grand Rapids All Steel No. 1 Screw..... 50
Niagara, No. 25, 1¾ in. 20¢ .....
Ideal, No. 25, 1¾ in., 14½¢ .....
No. 26, Troy, 1¾ in., 14½¢ .....
Star, No. 26, 1¾ in., 14½¢ .....
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Sucker Spout ..... 75&50&75&10%
Wood Pumps, Tubing, &c..... 50%
Barnes Dbl. Acting (low list)..... 40&50
Barnes Sgl. 50
Contractors' Rubber Diaphragm No. B. & L. Block Co..... 50
Daisy Spray Pump..... ₰ doz. $6.50
Flint & Walling's Fast Mail Hand, low list..... 50
Flint & Walling's Fast Mail (new list)..... 50
Flint & Walling's Tight Top Pitcher..... 75%
National Specialty Mfg Co Measuring Nos. 2 $6.00, 3 $5.50..... 30
Myers' Power Pumps..... 40&5
Myers Style P Pumps..... 40&5

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No......	*1*	*2*	*3*	*4*
Common Grade	*5.00*	*6.00*	*7.00*	*8.00*

Cup Leathers, Per Inch:

Inch.....	*3*	*3½*	*4*	*5*
Common Grade	*7.00*	*9.00*	*12.00*	

Punches—
Saddlers' or Drive, good..... doz. 50¢@75¢
Spring, single tube, good qual...... $1.75
Revolving (4 tubes)..... doz. $3.50
Bemis & Call Co.'s Cast Steel Drive. 50¢
Morrill's Nos. 1, 1A, 1B, 1C, 1D, $15.00..... 50%
Hercules, 1 die, each $5.00..... 50%
Niagara Hollow Punches..... 40%
Niagara Solid Punches..... 35&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard..... 35%
Paragon, Set, Lodi..... 35%
Tinners' Hollow, P., S. & W. Co.. 40%
Tinners' Solid, P., S. & W. Co.. ₰ doz., $1.41..... 40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron..... 2½@2½&5¢
Sliding Door, Wrought Brass, 1⅜ in., lb., 36¢..... 30%
Allith Mfg Co.: Reliable Hanger Track..... 50%
Chase Co.:
Double Braced Steel Rail..₰ ft. 5½¢
O. N. T. Rail..... $3.12
Griffin:
Rail, ₰ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ₰ ft. 1 x 3-16 in., $7.50; 1¼ x 3-16 in., $4.50.
Jones:
Hilltop Track, ₰ 100 ft $3.45
O. N. T., ₰ 100 ft 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.50..... ₰ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ₰ 100 ft., $7.50; 1¼ x 3-16 in., $8.75..... 35&5%
M. Kenney:
Hinged Hanger Track, ₰ ft., 11c. 60&5%
1 x 3-16 Track..... 55&5%
Myers' Stayon Track..... 60&5%
Richards' Mfg. Co.:
Barn Door, 6 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10
Lag Screw Rail, No. 63..... 50%
Gauge Trolley Track, ₰ ft., No. 31, 14 in. No. 33, 20¢
No. 50..... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
North.—Many goods are sold at net prices.
Fort Madison Red Head Lawn.... $3.25
Fort Madison Blue Head Lawn.. $.75
Cronk's:
Steel Garden: Champion, 75%; Ideal, Star, Victor..... 30%
Queen City Lawn, ₰ doz., 20 teeth, $2.85; 24, $3.00..... $1.00
Anticlog Lawn, ₰ doz..... 1.40
Ideal Steel Grass, ₰ doz. 12 teeth, $15.00; 14, $16.00; 16, $18.00..... 80%
Kemp's:
Lawn Queen, 20-tooth..₰ doz. $3.15
Lawn Queen, 22-tooth..₰ doz. $3.45
Lawn Queen, 24-tooth..₰ doz. $3.75
Lawn Queen, 26-tooth..₰ doz. $4.05
Lawn Queen, 28-tooth..₰ doz. $4.35
Manhattan Garden, 14-tooth, ₰ doz $2.40
Manhattan Garden, 16-tooth, ₰ doz $2.60

Rasps, Horse—
Disston & Sons..... 75%
Heller Bros. Co.:
Fox Rasps, Nos. 42, 950 00; 43, 44, 45, 46, 47, 48, 49, 82, Platina ..... 35¢
Nos. 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 83, 84, 85, 86, 87, 88, 89, 90,

Saws—

Atkins' 45
Circular ..... 5&10
Band ..... 5&10
Butcher 5
Cross Cuts 5
Hack 5
Nurserymen's 5
Hand 5
Mitre 5
Mortising 5
Pruning 5
Chester Saw Co.:
Tobacco Saws and Frames 5
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 5&10
Disston, H.:
Circular Saws and Inserted Teeth 5
Band, 2 to 18 in. wide 50
Band, 1 in. 6
Butcher 5
Compass 5
Narrow Circular 5
Nursery 5
Pruning 5
Tinned Web 5
Woodsaw Blades 5
Web Saw Nos. 1, 2, 3 5
Hack Saws, Nos. 12, 20, 9, 16, 40 5
No. 12 25
Hand Saws, Nos. 7, 107, 13, 2, 1 50
Nos. 5, Cabinet 50
Compass Keyhole & 25
Butcher Saws and Blades 5
C. E. Jennings & Co.'s:
Back Saws 5
Butcher Saws 5
Compass and Key Hole Saws 5
Pruning 5
Tinned Web 5
Wood Saw Blades 5
Miners' Tools:
Butcher Saws ..... 15&10
Web Saws ..... 15&10
Massachusetts Saw Works:
Victor Butcher Saws ..... 5&10
Butcher Saw Blades ..... 5&10
Peace & Richards Hand Saws 5
Simonds:
Circular Saws 5
Crescent Cut Cross Cut Saws 50
Crescent Cross Cut ..... 10&10
Gang Mill, Mulay and Drag Saws 15%
Band Saws 5
Hack Saws 5
Butcher Saws 5
Hand Saws 5
Hand Saws, Bay State Brand 5
Compass, Key Hole, &c. ..... 25&5
Web Saws ..... 5&10
Wood Saws 5
Warner, Madden & Clemson Mfg. Co.'s:
Cross Cut Saws 50

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A 25%
Disston's:
Genuine Blades 25
Keystone Blades 35
Hack Saw Frames 35
Simonds' File Co. 35
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 ..... 4 and 5 ea.
Hack Saws, Nos. 175, 180, complete ..... 4 and 5 ea.
Goodell's Hack Saw Blades ..... 40&10%
Goodell's Hack Saw Frames ..... 35&5&10%
Griffin Hack Saw Blades ..... 35&5&10%
Star Hack Saws and Blades ..... 30&10&5%
Sterling Hack Saw Blades ..... 30&10&10%
Sterling Hack Saw Frames ..... 30&10&10%
Stevens Power Hack Saw Machine, each No. 1, $25 ..... No. 2, $30.00 ..... 10%
Victor Hack Saw Blades 25
Victor Hack Saw Frames 40
Whitaker Mfg. Co. 10
National Hand Blades 10
National Hand Frames 10
National Power Blades 10

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00 ..... 15&10%

Scales—

Family, Turnbull's ..... 5@5&10%
Counter:
Hatch, Platform, ½ oz. to 4 lbs. ..... doz. $5.50
Two Platforms, ½ oz. to 8 lbs. ..... doz. $16.0
Union Platform, Plain ..... $1.70@1.90
Union Platform, Steel ..... $1.50@2.75
Chatillon's:
Fairy 10
Favorite 10
Grocers' Trip 10
The Standard Portables 40
The Standard R. R. and Warehouse 10

Scrapers—

Boz, 1 Handle ..... doz. $2.00@2.25
Boz, 2 Handle ..... doz. $2.50@2.60
Boz, Light, $2.00; Heavy $1.50
Chapin-Stephens Co., Box ..... 25&10%
Richards Mfg. Co., Box 25

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@ 3.75; 1½, $4.50@5.75
Bench, Wood ..... 20@20&10%
Hand, Wood ..... 5&10@5&10%
Chapin-Stephens Co., Hand 5

Coach, Lag and Hand Rail—

Lag, Com. Point ..... 5@5&10%
Coach, Gimlet Point ..... 75&10&5%
Hand Rail ..... 5@5&10%

Jack Screws—

Standard Last ..... 25@10@5%
Millers Falls ..... 5%&10
Swett Iron Works 10%

Machine—

Cut Thread, Iron, Brass or Bronze:
Flat Head or Round Head ..... 50@5&10%
Fillister Head ..... 10@10&10%
Iron ..... 10&5%
F. H. or R. H. Brass ..... 5&10%
8 to 15 ..... 5&10%

Set and Cap—

Set (Iron) ..... 75&10&5%
Set (Steel), not advance over Iron 25%
Set, Hex. Cap ..... 70&10&5%
Iron Hd. Cap ..... 70&10&5%
Brass Hd. Cap ..... 50&5%
Flanged Hd. Cap ..... 60&5%

Wood—

List July 23, 1900.
Flat Head, Iron ..... 85&5&10
Round Head, Iron ..... 85&5&10
Flat Head, Brass ..... 85&5
Round Head, Brass ..... 85&5
Flat Head, Bronze ..... 85&5
Round Head, Bronze ..... 85&5
Drive Screws ..... 85&5&10

Scroll Saws—

See *Saws, Scroll.*

Scythes—

Per doz.
Grass, No. 1, Plain ..... $6.25@6.75
Clipper, Bronzed Webb ..... $6.50@7.00
Clipper, Polished Webb ..... $6.75@7.25
No. 6 Clipper and Solid Steel ..... $7.00@7.50
Bush, Weed and Bramble, No. 1 ..... $6.50@7.00
Grain, No. 1 ..... $8.25@8.75
Bronzed Webb, No. 1 ..... $8.50@9.00
Nos. 3 and 4 Clipper, Grain ..... $8.75@9.25
Solid Steel, No. 6 ..... $9.25@9.75

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $10; 3, $12, 4, $9; 5, $7 ..... 50%
Millers Falls Adj. Tool Handles No. 1, $12. No. 4 $12. No. 5, $18 ..... 40%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... per doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 25
Cannuck's Diamond Point, per gro. $12 ..... 40&10
Mayhew's ..... per gro $9.00
Snell's Corrugated, Cup Pt. ..... 40&10%
Snell's Knurled, Cup Pt. ..... 40&10%
Victor Knurled Cup Pt. ..... per gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40
Disston's Star, Monarch and Triumph 30
Morrill's No. 1 ..... $15.30
Nos. 3 and 4, Cross Cut $20.60
No. 5, Mill $30.00
Nos. 12, 13, 35 ..... $16.80
No. 1 Old Style $20.00
Special $16.25
Giant Regal Cross Cut ..... per doz. $8.00
Royal, Hand ..... per doz. $4.50
Taintor Positive ..... per doz. $6.75

Shaving—

Fox Shaving Sets, No. 30 ..... per doz. net, $21.00
Smith & Hemenway Co. 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, per doz. $1.50
Mounted Kitchen Sand Stone, per doz. $1.50
Natural Grit Carving Knife Hones, per doz. $3.00
Quick Edge Emery Carving Knife Hones, per doz. $1.50
Quick Edge Pocket Knife Hones, per doz. $2.50

Skate—

Smith & Hemenway Co., Eureka 50%

Shaves, Spoke—

Iron ..... doz. $1.25
Wood ..... doz. $2.00
Russell, Symmes & L. Co. 45
Chapin-Stephens Co. ..... 30&10&5%
Richards Mfg. Co., per doz. $9.00 ..... 15&10%

Shears—

Cast Iron	*7*	*8*	*9 in.*
Best	*$16.00*	*18.00*	*$0.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Cheap	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality Jap ..... 70@70&10%
Best quality, Nickel ..... 60@60&10%
Tailors' Shears ..... 40@40&10
Acme Cast Shears ..... 40&10%
Wilkinson Tailors' Shears 10%
Wilkinson Shear & Cutlery Co.:
Sheep, 1900, list ..... 30&10&5%
Grass ..... 20&10%
Horse & Mule 10
J. Wiss & Sons Co.:
Best Quality Japed 60
Best Quality Nickeled 50
Tailors' 40

Tinners' Snips—

Steel Blades ..... 20&5%@20&10%
Steel Laid Blades ..... 10&10@10&5%
Forged Handles, Steel Blades, Berlin 50%
Heinisch 50
Iron & Steel Mfg. Co. 5
Kayser 5
Newton & Wood 5
Pexto S. A. W. Forged Handles 5
Pexto W. R. W. ..... 5&10
Stewart 5
Wiss 25

Pruning Shears—

Cronk's Hand Shears 5
Griggs & Wood Bros. 5
Disston's Combined Pruning Hook and Saw 5
Disston's Pruning Hook only, per doz. 25
John T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
Saw & Cutter ..... 10&10%
Columbian Cutlery Co.:
Hedge Wire Brand ..... 60&10%
Lawn and Border Wilcut Brand ..... 60&10%

Sheaves— Sliding Door—

Reading 40
R. & E. list 15%

Sliding Shutter—

Reading list 40%
R. & E. list 10%

Shells—Shells, Empty—

Brass Shell Empty:
Climax, Rival & Gauge ..... 65&10
Club, Rival, 65&5%; First Quality, 60&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge ..... 25&5%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader ..... 25&5%
Union League, 12 and 16 gauge 30
New Rapid, Heavy, 10, 12, 14, 16 and 20 gauge, Acme 14, 16 and 20 gauge ..... 30&10
Challenge Metallic, 10, 12, 16 and 20 gauge, League, Union 14, 16 and 20 gauge, Repeater Grade 20%

Shells, Loaded—

Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Smokeless Powder 40
Nitro Club, Smokeless Powders ..... 40&5%
Arrow, Smokeless Powders ..... 40&10&10%
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Leader Grade ..... 40&10&10%
Black Powder 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 20	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20 in.	$4.25	$5.50
Dixie, 10 x 14 in.	4.50	6.00
Dixie, 7 x 20 in.	5.00	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg $3 10
Steel ..... per keg $3.85
Burden's, all sizes ..... per keg $3.90

Shot—

25-lb. bag
Drop, up to B $1.85
Drop, B and larger 2.10
Buck 2.40
Chilled 2.40
Dust 2.80

Shovels and Spades—

Association List, Nov. 15, 1902. 40%
Avery Stamping Co. 40%

Snow Shovels—

Long Handle ..... $2.25@$3.50
Wood and Mall, D. Handle. $3.75@$4.00

Sieves and Sifters—

Hunter's Imitation ..... gro. $9.50@10.00
Hunter's Genuine ..... per gro. $12.00@12.50

Sifters, Ash—

Acme Ball Bearing Sifters, Acme Adjustable Ash Sifter, each $ $30.00

Sieves, Seamless Metallic

	Per dozen.—			
Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... doz. $1.00@1.05
Mesh 20, Nested ..... doz. $1.00@1.05
Mesh 24, Nested ..... doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:
12 x 18 to 22 x 36 in 60%
20 x 40 to 24 x 50 in 50%
22 x 44 to 24 x 120 in 40%
Parmelee Iron Sinks:
12 x 18 to 18 x 30 in 45
20 x 36 to 24 x 50 in 40
NOTE—There is not entire uniformity in sinks and lips of sinks.

Skeins, Wagon—

Cast Iron ..... 70@75&10%
Steel ..... 40@45%

Slates, School—

Factory Shipments.
"D" Slates ..... 50&10&10%
Eureka, Unexcelled Noiseless. 60
Victor A, Noiseless ..... 60&4 tens &5%

Slaw Cutters

See Cutters.

Snaps, Harness

German ..... 4@4&10%
Corbin Mfg. Co. 5
Dorman Yankee ..... Yankee
Hall 5
H. S. Co. 5
Jones 5

Snaths—

Scythe ..... 5@10%

Snips, Tinners

See Shears.

Spoons and Forks—

Silver Plated—

Good Quality ..... 50&10&5%
Cheap ..... 60@60&10%
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Bro. ..... 40&10
Rogers & Bro., William Rogers Eagle Brand ..... 50&10%
Anchor Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous

German Silver ..... 60@60&5%

Tinned Iron—

Tags ..... per gro. 60@75¢
Tubes ..... per gro. Special $1.00

Springs— Door—

Bardsley's Spring and Check 40%
Chicago ..... 45&10%
Lyon 10
Pullman (Coil) 35%
Reliance (Coil) ..... 40&10%
Star (Coil) 30
Torrey Coil, 23 in. ..... per doz $1.10

Carriage, Wagon, &c.—

1¼ in. and Wider: Per 100 lb.
Black ..... $4.75@$5.00
Half Bright ..... $4.75@$5.00
Bright ..... $5.25@$5.50
Painted Seat Springs:
1¼ x 2 x 26 ..... per pr. 49@52¢
1¼ x 3 x 28 ..... per pr. 75@77¢

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Champion, 17 in. ..... Japanese, 17 in. ..... Na-Co-Mo, 17 in. ..... per doz. $12.00
Enterprise ..... 25@30%
Philadelphia No. 1, per doz. $12. No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated ..... { List Jan. 5, 1900.
Steel and Iron 50%
Rosewood Hdl. Try Square and T-Bevel ..... 60&10&10&10%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@10&10%
Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel 15%

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.25
Iron, Porcelain Lined ..... doz. $1.75

Staples—

Barbed Bland ..... 50&10&5&10%
Electricians ..... 50&10&10&5%
Fence Staples, Plain, $2.15; Galvanized $2.45
Poultry Netting Staples ..... per lb. 3½@3½¢

Steels, Butchers'—

Dick's 30%
Foster Bros. 30%

Steelyards — ....30@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%
Curtis Reversible Ratchet Die Stock 25%
Derby Screw Plates 25
Drummond 25
Lightning Screw Plate 25%
Little Giant 25
Reece's New Screw Plates 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones—Oil, &c.

Pike Mfg. Co., 100 list:
Arkansas St. No. 1, 3 to 5½ in. ..... per doz. $
Arkansas St. No. 1, 5½ to 8 in. ..... $
Arkansas Slips No. 1 ..... $1.00
Lily White Washita, 4 to 8 in. ..... per doz.
Rosy Red Washita, 4 to 8 in. ..... per doz.
Washita St., Extra, 4 to 8 in. ..... per doz.
Washita St., No. 1 ..... per doz.
Washita St., No. 2, 4 to 8 in. ..... per doz.
Lily White Slips ..... per doz.
Rose Red Slips ..... per doz.
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 70¢
Washita Slips, No. 2 ..... 40¢
Indian Oil Stones (entire list) 33½%
Quincy Emery and Corundum Oil Stone, Double Grit 40%
Quickcut Emery and Corundum Axe Stone, Double Grit ..... 40&10%
Quincy Emery Rubbing Bricks 40%
Hindostan No. 1, Regular ..... 8¢
Hindostan No. 1 Small ..... per lb 10¢
Axe Stones, all kinds 33½%
Turkey Oil Stones, Extra, 5 to 8 in. ..... per lb 80¢
Queer Creek Stones, 4 to 8 in. ..... 20¢
Queer Creek Slips ..... 40¢
Sand Stone ..... 6¢

Scythe Stones—

The Mfg. Co., 1901 list:
Black Diamond S. S. ... gro. $12.00
Lumoine S. S. ... gro $11.00
White Mountain S. S. ... gro. $9.00
Green Mountain S. S. ... gro. $6.00
Extra Indian Pond S. S. ... gro. $4.50
No. 1 Indian Pond S. S. ... gro. $3.00
Leader Red End S. S. ... gro. $4.50
Quick Cut Emers. ... gro. $10.80
Pure Corundum ... gro. $16.00
Crescent ... $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%.
Electro (Artificial), ... gro.
$12.00 ... 33⅓%
Lightning (Artificial), ... gro.
$18.00 ... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers ... gro. $9.00

Stops— Bench—

Millers Falls ... 15&10%
Morrill's, doz. No. 1, $10.00 ... 50%
Morrill's, No. 2, $12.50 ... 50&10%

Door—

Chapin-Stephens Co. ... 50@50&10%

Plane—

Chapin-Stephens Co. ... 20%

Straps— Box—

Acme Embossed, case lots 24X12X13 ...
Carr's Universal, case lots ... 30&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket ... doz. $1.00
Excelsior Stretcher and Tack Hammer Combined, ... doz. $6.00 ... 20%

Stuffers, Sausage—

Enterprise Mfg. Co. ... 25@25&7½%
National Specialty Co., list Jan. 1, 1902 ... 30&5%
P., S. & W. Co. ... 40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ... doz.
Santiago Crotch Mahogany ... $6.00
Triumph Pansy Veneer ... $4.00
Parlor Queen, Fig. Rosewood ... $3.00
Parlor Queen, Mahogany ... $2.50
Am. Queen, Fig. Mahogany ... $2.00
Ideal, Bird's Eye Maple ... $2.00
Grand Rapids, Natural ... $2.00
Japan ... $1.50
Standard, Nickel, $2.00; Japan ... $1.50
Crown Jewel, Nickel, $2.00; Japan ... $1.50
Crystal, Grass Top ... $1.00
Grand, 12 in. wide ... $6.00
Chief, 24 in. wide ... $5.00
Hall, 28 in. wide ... $6.00

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks ... 90&25%
American Cut Tacks ... 90&25%
Swedes' Cut Tacks ... 90&25%
Swedes' Upholsterers' ... 90&25%
Gimp Tacks ... 90&25%
Lace Tacks ... 90&25%
Trimmers' Tacks ... 90&25%
Looking Glass Tacks ... 65%
Bill Posters' and Railroad Tacks, 90&40%
Hungarian Nails ... 80&10%
Finishing Nails ... 70%
Tinned and Clout Nails ... 80%

NOTE.—The above prices are for straight Weights.

Miscellaneous—

Double Pointed Tacks ... 90&10&10&10&5%

See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:		
Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ... 50@—%
Patent Leather ... 25@50&5%
Steel ... 33⅓&5%
Chesterman's ... 25@25&5%
Keuffel & Esser Co.:
Linen ... 40&10&5%
Leather, Buck and Leather ... 50&5%
Metallic and Steel, lower list, 35@38&5%; Pocket, 35@35&5%.
Lufkin:
Asses' Skin ... 40&10@50%
Metallic ... 30@30&5%
Patent Bend, Leather ... 25&5@25&10%
Tape ... 40@40&5%
Steel ... 33⅓&35%
Wrightson & Hilger:
Chesterman's Metallic, No. 34L, 36L ... 25%
Chesterman's Steel, No. 1998L ... 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger ... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c. ... 30&33⅓%

Ties, Bale—Steel Wire—

Single Loop ... 80&10&5%
Monitor, Cross Head, &c. 70&25%

Tinners' Shears, &c.—

See *Shears, Tinners'*, &c.

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White ... 20@20&5%

Haying—

Myers' Hay Tools ... 45%

Miniature—

Smith & Hemenway Co.'s, Davidson, ... doz., Nickel Plated, $1.50; Gold Plated ... $2.00

Saw—

Atkins' Cross Cut Saw Tools ... 35&5%
Simonds, Improved ... 33⅓%
Simonds' Crescent ... 25%

Ship—

L. & I. J. White ... 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro. ... $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Owidal ... 75&10%
Newhouse ... 40&10&5%
Hawley & Norton ... 75&75&10%
Victor ... 75&75&10%
Oneida Community Jump ... 60%
Hector ... 72@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes ... 12c
Mouse, Round or Square Wire, doz. 35c@90c
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ... doz., $13.25-$11.50 doz.
No. 1, Rat, ... doz., $8.75 doz.
No. 2, Rat, ... doz., $4.50 doz.
No. 3, Mouse, ... doz., $3.50 doz.
No. 4, Mouse, ... doz., $2.25 doz.
Oneida Community:
Hunter's Special Mouse ... doz. ...$0.60
Out Sized Rat ... doz. ... 1.25
Extra Size Mouse ... doz. ... .75
Extra Size Rat ... doz. ... 1.00
Wood Choker Rat, ... doz. holes, .12
Premier Tin Chokers, 5 hole, ... doz. holes ... .75

Trowels—

Disston Brick and Pointing ... 25%
Disston Plastering ... 25%
Disston "Standard Brand" and Garden Trowels ... 30%
Kohler's Steel Garden Trowels, ... gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels, ... gro. $6.00
Woodrough & McParlin, Plastering, 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern ... 50&10%
Western Pattern ... 60&10%
Handy Trucks ... doz. $16.00
Grocery ... doz. $15.00
McKinney Trucks ... each, net $10.00
Model Store Trucks ... doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.

No.	0	1	2	3
Galvanized	$67	$79	$89	$99

Add 5%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls ... 20@22c
No. 12, ½ and ½-lb. Balls ... 21@22c
No. 18, ¼ and ½-lb. Balls ... 18@20c
No. 24, ¼ and ½-lb. Balls ... 17½@19c
No. 36, ¼ and ½-lb. Balls ... 17@19¢
Chalk Line, Cotton ... Balls ... 26@31c
Cotton Mops, 6, 9, 12 and 15 ply to doz. ... 11@19c
Cotton Wrapping Balls to lb., according to quality ... 15½@23c
American 3-Ply Hemp, ¼ and ½-lb. Balls ... 14½@15½c
American 3-Ply Hemp, 1 lb. Balls ... 15½@16½c
Indian 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) ... 10½@11½c
India 3-Ply Hemp, 1-lb. Balls ... 10¼@11½c
India 3-Ply Hemp, 1½-lb. Balls ... 10½@11½c
9, 6, 4 and 3-Ply Jute ... Balls ... 7½@11½c
Mason Line, Linen, ½-lb. Bls. 17c
No. 36, Mattress, ¼ and ½-lb. Balls, according to quality, 20@60c
Wool, 3 to 6 ply ... B 9c; A 10c

Vises—

Solid Box ... 50@50&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable ... 40%
Standard ... 40%
Amateur ... 25%
Columbian Hdw. Co. ... 40%
Fisher & Norton Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00.
Fulton Mach. & Vise Co.:
Reed Swivel ... 25%
Star Swivel Jaw ... 40%
Hollands:
Monarch ... 40&5%
Mascot ... 65&10%
Lewis Tool Co.:
Adjustable Jaw ... 50%
Monarch Quick Lever Jaw ... 50%
Mason Vise Co.:
Combiner ... 40%
Perfect, 15 ... 15
Lightning Grip ... 20
Mattison's Adjustable Pattern 60&10%
Parallel:
Victor, 20@25%; Regulars ... 20@25%
Williams ... 40&45
Combination Pipe ... 50&10%
Prentiss ... 40%
Rock Island ... 25
Sneddiker's X L ... 33⅓%
Stephens' ... 33⅓%

Saw Filers—

Disston's D 8 Champion Guide, ... doz., $24.00, 20% Clamps ... 30%
Perfection Saw Clamps, ... doz. $4.50 ... 60%
Reading ... 60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed ... 25%
Star ... 40%
Mason Vise Co.:
Lightning Grip, 15; Perfect ... 15%
Williams & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.50; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe ... 60@60&5%
Masset's Quick Action Pipe ... 40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 95 ... 75%
Rock Island Pipe ... 25%

Wads—*Price per M.*

B. E., 11 up ... 60¢
B. E., 9 and 10 ... 70¢
B. E., 8 ... 80¢
B. E., 7 ... 80¢
P. E., 11 up ... $1.00
P. E., 9 and 10 ... 1.25
P. E., 8 ... 1.50
P. E., 7 ... 1.50
Ely's B. E., 11 and larger $1.70@1.75
Ely's P. E., 12 to 20 ... $3.00@3.25

Ware, Hollow— Cast Iron, Hollow—

Store Hollow Ware:
Enameled ... 45&10%
Ground ... 50&5%
Plain or Unground ... 60%
Country Hollow Ware, per 100 lbs ... $3.00
White Enameled Ware:
Muslin Kettles ... 65&10%
Covered Wares:
Tinned and Turned ... 35&10%
Enameled ... 45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware ... 33⅓%
Iron Clad Ware ... 70&10%
Lava and Volcanic, Enameled ... 40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles ... 65@65&5%
Avery Kettles ... 60%
Porcelained ... 5&5&5&10%
Never Break Spiders and Griddles ... 65&5%
Never Break Kettles ... 60%
Solid Steel Spiders and Griddles, 65&5%
Solid Steel Kettles ... 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone ... 40@40&10%

Washboards—

Solid Zinc:	... doz.
Crescent, family size, bent frame	$4.05
Red Star, family size, stationary	$4.55
Perfect	$4.55
Double Zinc Surface:	
Saginaw Globe, family size, stationary protector	$3.55
Cable Cross, family size, stationary	$3.60
Single Zinc Surface:	
Naumkeag, family size, open back, perforated	$3.00
Single Saginaw Globe	$2.85
Brass Surface:	
Brass King, Single Surface, open back	$4.95
Nickel Plate Surface:	
No. 1901 Nickel Plate, Single Surface	$3.60
Glass Surface:	
Glass King, Single Surface, open back	$3.95
Enamel Surface:	
Enamel King, Single Surface, ventilated back	$3.95

Washers—Leather, Axle—

Solid ... 90@90&10%
Patent ... 90@90&5%
Coil: ¾, 1, 1¼, 1½, Inch. 9c, 10c, 11c, 14c, per box

Iron or Steel—

Size bolt, ... 5/16, ⅜, ½, ⅝, ¾
Washers, ... $5.50, 4.50, 3.20, 3.00, 2.80
The above prices are based on $6.00 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots, ... per lb. 1¾@2¢

Wedges—

Oil Finish ... lb., .. @3¢

Weights—Hitching—

Covert Mfg. Co. ... 30&2%

Sash—

Per ton, f.o.b. factory:
Eastern District ... $25.00@$28.00
Southern Territory ... $25.00
Western and Central Districts ... $27.00@$27.50

Wheels, Well—

8-in., $2.25; 10-in., $2.85; 12-in., $3.36; 14-in., $4.80.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 ... 72½@70½%
10 to 18 ... 72½@70½%
19 to 26 ... 75½@70½&2½%
27 to 36 ... 77½@72½%
Galvanized.
6 to 9 ... 72½@70½%
10 to 14 ... 72½@70½%
15 to 16 ... 72½@70½%
17 to 18 ... 72½%
19 to 26 ... 70&5@2½%
27 to 36 ... 65&10@10%
Copper:
6 to 9 ... 65&10@10%
10 to 14 ... 70&10@5%
15 to 18 ... 65&10@10%
19 to 26 ... 70@65&2½%
27 to 36 ... 72½@65&2½%
Tinned
6 to 18 ... 67½@70&10%
Brass ... 17½¢ lb., base
Copper ... 34¢ lb., base
Cast Steel Wire ... 50%

Spooled Wire

Annealed and Tinned ... 75@70&10%
Brass and Copper ... 60@70&10%
Retailers' Assortments, per box. $2.10@$2.40

Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods ... 50@47
Brass Wire Goods ... 90@90&10%
Brass Cup and Shoulder Hooks, 80&45%

Wire Cloth and Netting—

Galvanized Poultry Netting, ... 80@75@70&2½%
Painted Screen Cloth, 100 ft., $1.35
Standard Galv. Hardware Grade: Per 100 sq. ft.
Nos. 2, 3 and 4 Mesh ... $2.75
Nos. 5 and 6 Mesh ... $2.00
No. 6 Mesh ... $1.75
No. 8 Mesh ... $1.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ... 75@75&10%
Alligator or Crocodile ... 70&10@75%
Baxter Pattern S Wrenches ... 70&5@70&10%
Drop Forged S ... 45@45&5%
Acme ... 60&10%
Alligator Pattern, 70%; Bull Dog ... 70%
Bemis & Calls:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%; ... 50%
Steel Handle Nut ... 50%
Combination Black ... 40&5%
Merrick Pattern ... 50%
Boardman ... 40%
Coes' Genuine Knife Hdl. ... 40&10&5&5%
Coes' Genuine Steel Hdl. ... 40&10&5&5%
Coes' Genuine Key Model ... 40&10&5&5%
Coes', Genuine Hammer Handle ... 40&10&5&5%
Coes' "Mechanics'" ... 40&10&10&5&5%
Donohue's Engineer ... 40&10%
Eagle ... 70%
Gem Pocket ... 40%
Hercules ... 70%
W. B. Machinist: ... 50&5%
Case lots ... 50%
Less than case lots ... 50%
W. & B. Railroad Special: ... 50%
Case lots ... 40&10&5%
Less than case lots ... 50%
Solid Handles, P. S. & W. ... 50&10%
Full case ... 5%
Stillson ... 65%
Lewis Wrench Co.:
Railroad Special, Iron Handle, Patent ... 50%
Other Wrenches ... 50%
Vulcan and Advance Chain ... 50%
Whitaker Machinists': ... 50%
Case lots ... 5%
Less ... 50%

Wrought Goods—

Staples, Hooks, &c., list March 15, '02 ... 50@10&10%

Zinc— (*Cask lots at mill.*)

Sheet ... per 100 lb., $7.00

THE IRON AGE

New York, Thursday, February 20, 1908.

The Andrews Steel Company's Plant.

Specially Equipped for Rolling Sheet Bars and Billets.

The new plant, which will soon be ready for operation, of the Andrews Steel Company, at Newport, Ky., might be termed a model special product mill. It was installed for the purpose of economically producing sheet bars and billets, but the sheet bars will constitute the special product, and billets will only be made as a side issue. The sheet bars are rolled without reheating after the ingot leaves the soaking pit, and when the mill is in full operation it is conservatively estimated that it will produce 300 tons of sheet bars per turn.

The layout of the entire plant is shown in the plan, Fig. 2, and was the work of the United Engineering & Foundry Company, Pittsburgh, Pa., which company also designed and built the rolling and handling apparatus illustrated in the accompanying engravings. The erection of the plant was in charge of William Andrews. Theodore Nielander, of the Andrews Steel Company, superintended the erecting of the machinery, and the open hearth furnaces were designed and built by Mr. Morgan, also of the Andrews Steel Company. The officers of the company are J. A. Andrews, president; Joseph B. Andrews, vice-president; William N. Andrews, secretary, and A. L. Andrews, treasurer.

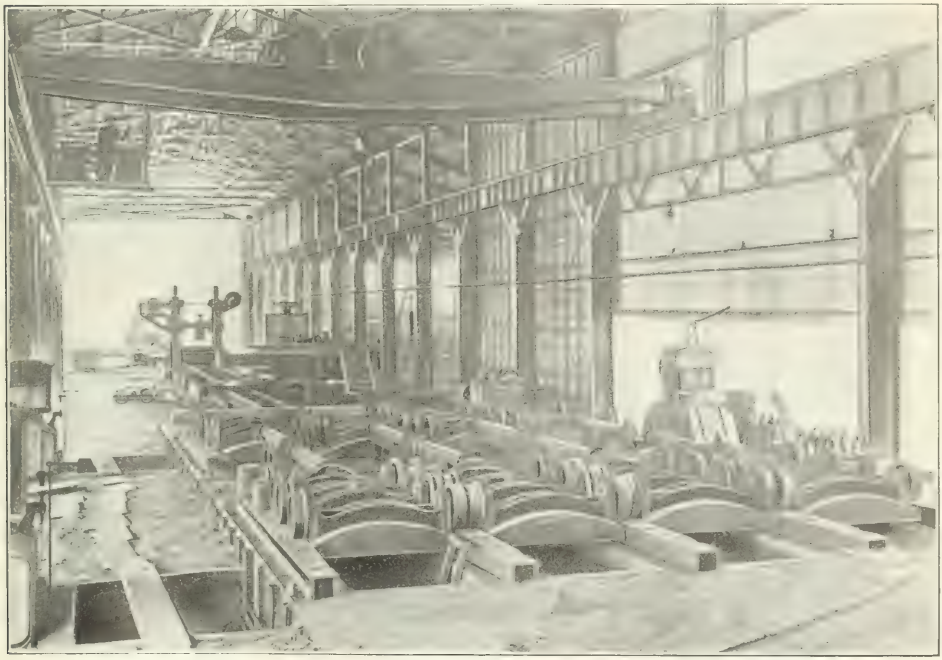


Fig. 1. The Soaking Pits and 34-In. Blooming Mill in the Andrews Steel Company's Plant at Newport, Ky.

The Sequence of Operations.

The steel is cast from the three 50-ton open hearth furnaces into ingots about 18 x 20 in., which are stripped by a Morgan Engineering Company's stripping crane, after which they are taken to the two pit furnaces shown in Fig. 1. Each furnace has four pits, each capable of containing eight ingots. The soaking pit crane delivers the reheated ingots to the blooming mill table, which carries them to the 34-in. blooming mill, and the latter is arranged to roll them into billets or suitable shapes for the sheet bar mill. The blooming mill can be seen in the distance in Fig. 1, and Fig. 3 shows a closer view of the mill and tables. The mill is equipped with an improved Kennedy manipulator, and is driven by a 46 x 60 in. double reversing engine.

After leaving the blooming mill the blooms are sheared by a 10 x 10 in. bloom shear to the desired lengths, and are either passed on to the sheet bar mill or pushed off the loading table to be shipped as billets. The shear, and also the skids and truck used when making billets, are shown in Fig. 4. The bloom shear is equipped with a drawback and tilting table, specially designed, which enables crop ends to be easily disposed of and facilitates handling the sheared blooms.

Leaving the shear, the billets are carried by tables to the sheet bar mill, in which the method of handling is somewhat unique and is completely covered by patents. The sheet bar mill has two stands of 24-in. diameter rolls, Figs. 5 and 6, driven by a 46 x 60 in. single cylinder engine. The roughing stand is three-high, while the finishing stand has two-high chilled rolls. The billet enters the bottom pass of the roughing stand, and as it passes through the rolls it raises a switch, Fig. 6, which drops after the billet has passed, and the billet, being caught by the pinch rolls just beyond the switch, is forced back

and up along the switch so as to enter the succeeding top pass. This is repeated as many times as desired, and on the final pass the bar enters a Y-shaped chute on the approach side, Fig. 5, which carries it over under the pinch rolls on the approach side of the mill and back up the other leg of the Y and into the finishing rolls. Only one pass is made in the finishing rolls, which are plain chilled rolls, intended mainly to give surface to the bar.

Leaving the finishing pass, the bar passes out along

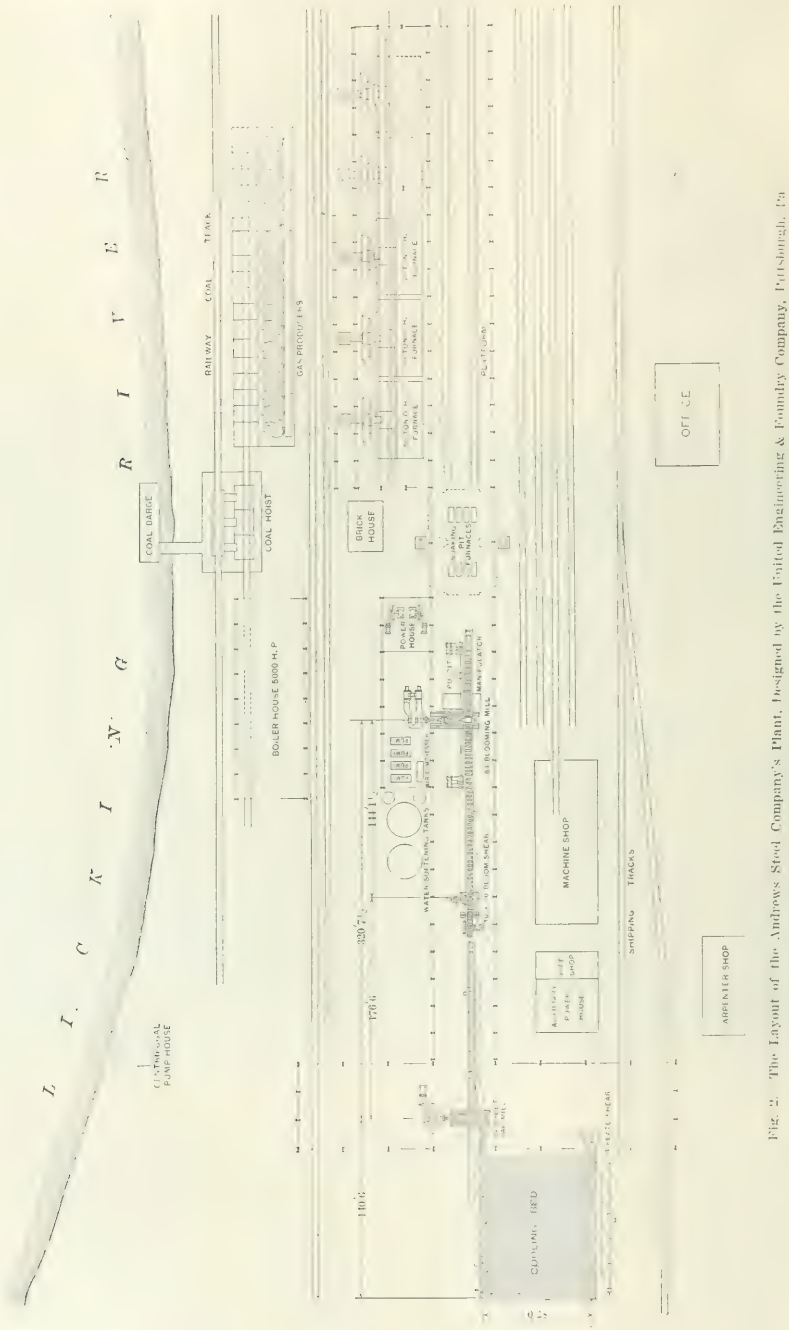


Fig. 2. The Layout of the Andrews Steel Company's Plant, Designed by the United Engineering & Foundry Company, Pittsburgh, Pa.

along the stem of the Y. The direction of rotation of these pinch rollers is reversible, and when a piece leaves the mill it is run in a direction to draw the end of the piece back until it drops off a ledge near the center of the Y, after which the rolls are reversed and force the bar the cooling bed table to the cooling bed, shown in Fig. 7, and after cooling the bar arrives at the sheet bar shear table, where it is sheared into the required lengths by a 54-in. plate shear. This is arranged to take three or four bars at a time, so as to enable it to keep up with

the mill. It is located under the crane runway, which also commands the shipping tracks and gives ready means for loading.

Other Features of the Plant.

The plant is equipped with 12 Duff double gas producers, hand fired, which supply the three open hearth furnaces and also the soaking pits. Provision is made for increasing the number of producers to 18 or more and adding two 50-ton furnaces. Coal is received by rail or river, and is conveyed from cars or barge to a crusher, from which it is delivered, by special handling apparatus, to three bins, provision being made to store various qualities of coal in separate bins, as desired. These bins deliver the coal to larrys on a track on the same level with the feed hoppers of the producers, and also at sufficient elevation to deliver the coal by gravity to the stokers in the boiler house. The coal handling apparatus was designed by the Jeffrey Mfg. Company, Columbus, Ohio. Beyond the end of the hot bed there is formed a natural reservoir, to which water is pumped from the Licking River by a centrifugal pump.

The water for the boilers is softened and purified by a We-fu-go system of 3750-hp. capacity, furnished by the Wm. B. Scaife & Sons Company, Pittsburgh, Pa. The function of this apparatus is to purify the water from the Licking River, which at times contains considerable acid



Fig. 3. The 34-In. Blooming Mill and Tables.

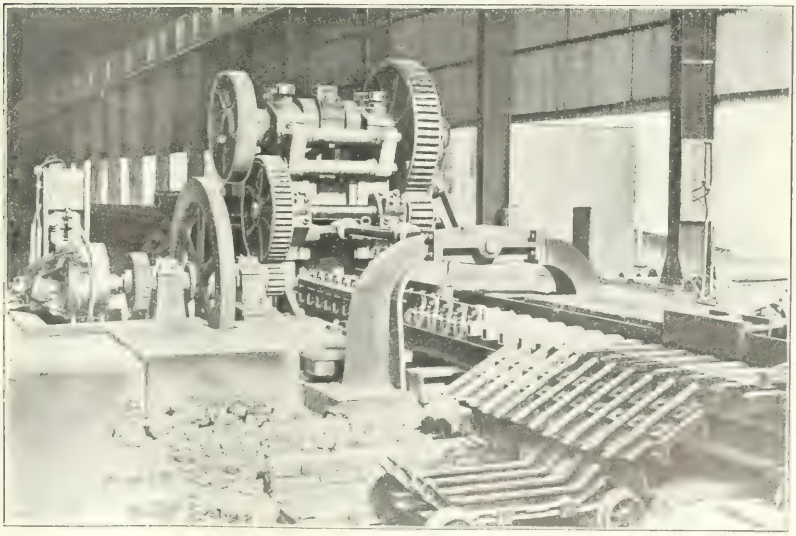


Fig. 4. The 10 x 10-In. Bloom Shear.

as well as much scale forming matter. The system consists essentially of two large treating tanks 24 ft. in diameter by 20 ft. high, equipped with a mechanical stirring device operated by an electric motor. Floating outlet pipes supply the water to mechanical gravity filters, from which it flows to the heater. The entire system is arranged to be operated from the ground, which makes it convenient and reduces the amount of attention required.

The pumping plant consists of two 12 and 20 x 14 x 24 in. compound duplex plunger supply pumps, which take the water from the reservoir and deliver it at the mill; two 22 and 36½ x 10 x 36 in. compound hydraulic duplex pressure pumps for supplying a hydraulic pressure of 500 lb. throughout the mill, and two 12 and 20 x 10 x 24 in. compound duplex plunger boiler feed pumps. All of these were supplied by the Wilson-Snyder Company, Pittsburgh, Pa.

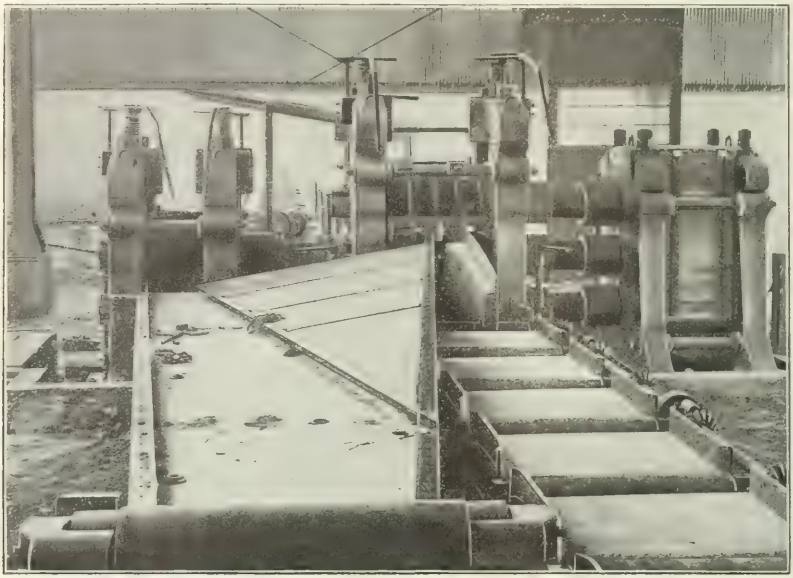


Fig. 5.—The Approach Side of the 24-In. Sheet Bar Mill.

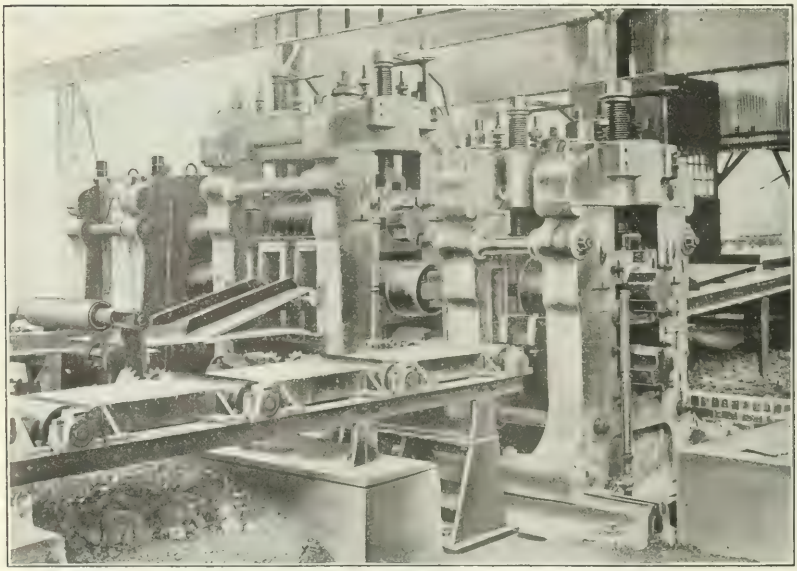


Fig. 6.—The Delivery Side of the 24-In. Sheet Bar Mill.

The exports of domestic merchandise from the United States in the month of January attained a total value of $206,211,835, which is only about $900,000 less than the exports for December, which were the largest on record. The imports for the month were only $85,698,704, the lowest since July, 1905. The excess of exports over imports was the enormous sum of $120,513,131. The condition of our international trade is shown by these figures to be exceedingly satisfactory for this country.

Bounty and Rebate Asked for Canadian Shipbuilding.

TORONTO, February 15, 1908.—The question of aiding the shipbuilding industry was brought up in the House of Commons February 11. The subject under discussion was the building of a government icebreaker in England. The member for Simcoe, the constituency in which the Collingwood Shipbuilding Company's works are located, seized the opportunity to point out that the shipbuilding industry of the country is suffering from the policy which permits ships to go to United States yards for repairs and to return to their Canadian routes absolutely free of duty. To have Canadian shipping, he contended, Canadian produce must be carried in Canadian bottoms. Without discriminating against Great Britain, the Canadian Government could, he said, undertake to rebate the duty on every part that goes into every ship built or repaired in Canadian yards. Had that policy been followed, the contract for building the icebreaker for Northumberland Straits would not, in his opinion, have gone out of Canada. Shipbuilding, he maintained, is the only industry in the country that is not protected. Being a supporter, and not an opponent, of the Government, his remarks on the subject could not be prompted by any desire to express censure. He went so far as to say that he would favor the payment of a bounty.

Several other members spoke, including three from the Maritime Provinces and three from Ontario. All were in favor of a bounty and of the exemption from duty of articles used in shipbuilding. Reference was made to the backwardness of the industry in Canada. The member for South York, Ontario, urged the Government to be generous to the industry. A fair field for Canadian builders would, he said, attract great works from the United Kingdom. As a matter of fact, one great British concern has had representatives looking over the situation here quite recently, to report on the advantages for the establishment of works. But the British builders want a tonnage bounty. The member for South York said that the ocean vessels of the Canadian Pacific line and those of lines that are to run in connection with the Grand Trunk Pacific should be built in Canadian yards. The Minister of Customs replied by pointing to the fact that something had recently been done for the benefit of Canadian builders, namely, the cancelling of the coasting trade privileges enjoyed by vessels of several foreign countries. No leaning toward or from the bounty proposal or the rebate proposal was indicated in his speech. At a time when a great outcry is being raised against the iron and steel industries, the Government may be less disposed than ever to offer premiums to shipbuilders. Some weeks ago when the Minister of Public Works was in Collingwood, the case for a shipbuilding bounty was strongly pressed upon his attention. His answer was sympathetic, but non-committal.

C. A. C. J.

Welding Copper and Brass to Steel.

The Colonial Steel Company, Pittsburgh, has perfected a process of welding copper and brass to steel.

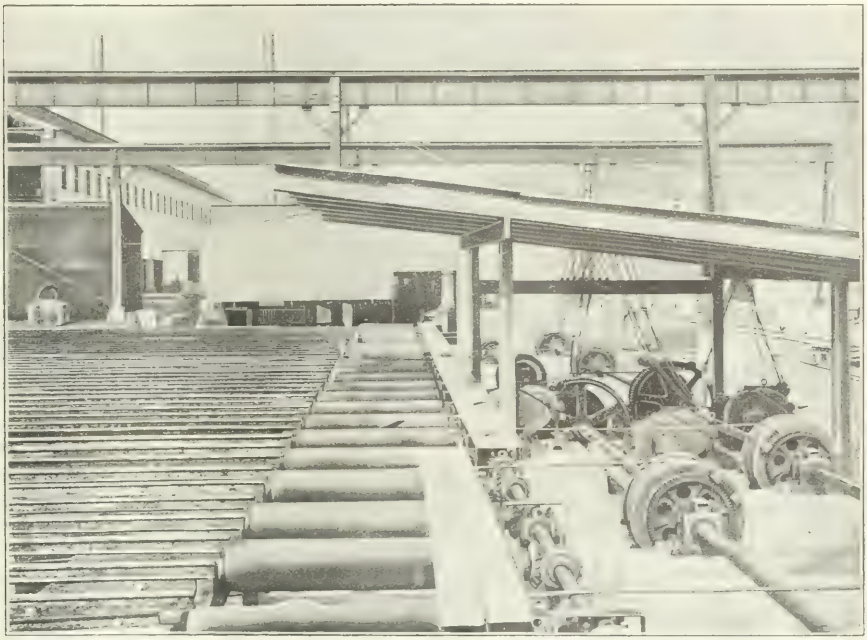


Fig. 7.—The Cooling Bed and Table at the Andrews Steel Company's Plant.

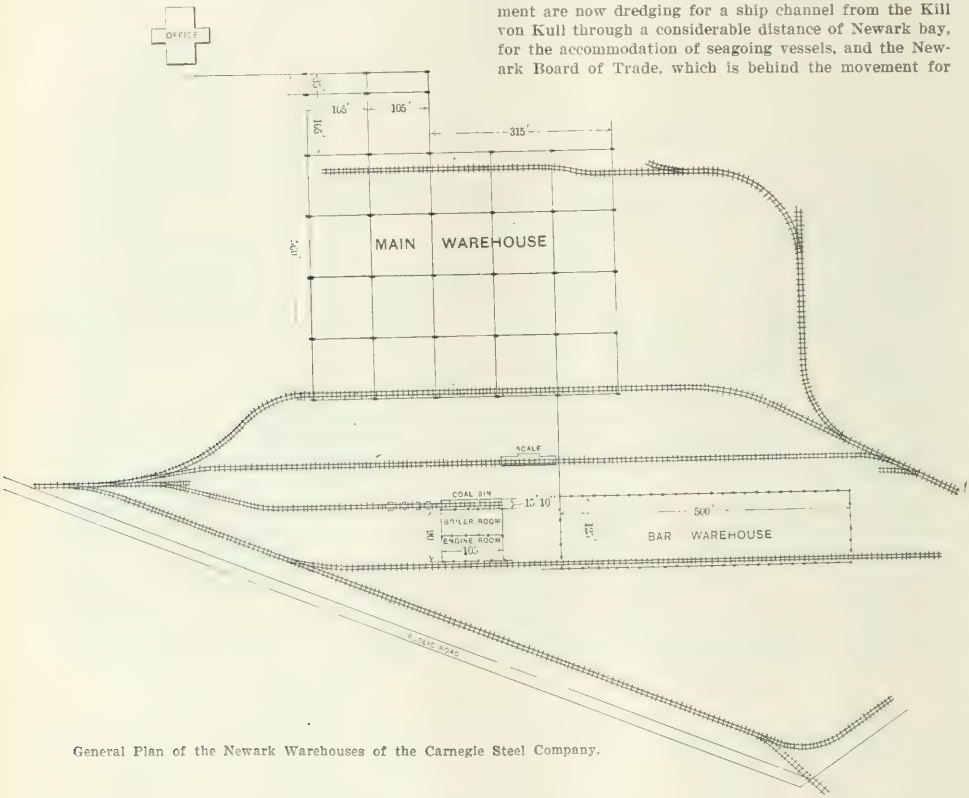
The company states that in the last six months, since it has begun to develop this process, it has never failed to make a perfect weld of either metal to the steel, and it is to-day making sheets with copper on one or both sides, sheets with copper on one side and brass on the other, brass on one or both sides, or brass and copper on the same side, divided in layers if necessary.

The process consists in taking a billet of steel and welding thereon a piece of copper or brass of the proportionate thickness which it is to bear to the sheet when finished. After welding the billet is heated and rolled in the same manner that copper or brass sheets would be rolled. The proof of the welding is made positive by the fact that the two metals roll uniformly, bearing the relative proportion in which they started in the billet. The copper and brass may vary in thickness, according to the uses desired by the consumer, and this does not affect the quality of the welding process. The combination product can be made for stamping and drawing, and has more rigidity than can possibly be given to ordinary brass or copper. It has much more strength and can be adapted for such purposes as rods or tubing made from strips, and is especially adapted for making brass bedsteads. It is protected by letters patent.

The Carnegie Steel Company's Newark Warehouses.

The Largest Plant in the World for the Storage of Structural and Merchant Steel.

The largest warehouses in the world for the storage of structural and merchant steel have been completed at Newark, N. J., by the Carnegie Steel Company, and the two buildings comprising the company's storage facilities are being stocked with material. The location of the plant, so adjacent to New York, it being only about 13 miles by rail from the country's metropolis, is an important point to consumers in the Manhattan territory, enabling them, as it will, to obtain quick deliveries on structural and merchant steel in particularly large quantities. Its importance to the export trade will be immediately appreciated when it is understood that the plant is located adjacent to the Waverly yards of the Pennsylvania Railroad, one of the largest freight yards in the East, and within easy switching distance of the Elizabeth branch of the Central Railroad of New Jersey. As yet the company only has switch connections with the Pennsylvania Railroad's lines, but this will enable it to make deliveries within two hours under favorable conditions to steamers in and around New York harbor, reaching the immense Bush Terminal docks and freight yards at Brooklyn and the large freight terminal of the Pennsylvania Railroad at tidewater at Greenville, N. J., on New York bay. The railroad company is constructing immense freight yards at that point, with a view to making it a large terminal for the handling of incoming and outgoing freight delivered to and from extensive docks there. Through the steel company's connections with the Waverly freight yards, an almost direct run of a few miles only will be required to deliver material from the warehouse to steamers.



General Plan of the Newark Warehouses of the Carnegie Steel Company.

Advantages of the Location.

The company's plant is located in the Waverly section of Newark, nearly on Newark bay, and it is evident that much thought was given to the selection of an advantageous site for the plant, as it is probable that before long the work of dredging the bay, now under way, will be extended to a point opposite the warehouses. A movement is now on foot in the city of Newark for the construction of municipal docks near Waverly for the loading of seagoing vessels, the Board of Works of that city having been authorized by the Common Council to have preliminary surveys made, with estimates as to the cost of the work. Contractors engaged by the Government are now dredging for a ship channel from the Kill von Kull through a considerable distance of Newark bay, for the accommodation of seagoing vessels, and the Newark Board of Trade, which is behind the movement for municipal docks, is working through its representatives at Washington for a further extension of the channel. If this movement should result successfully, as those concerned believe it will, the company will be able to load material for export on seagoing vessels from docks adjoining its property.

The company will be able to meet the demands for steel in the Manhattan territory in a better manner than ever before, and one of the principal reasons for building the plant was because of the fact that considerable trouble has been experienced in filling orders for immediate delivery. It frequently happens that urgent requests come for good sized quantities of structural material needed to make hurried repairs or additions, and provisions have been made at the plant for cutting to size and fabricating in cases where the exact sized material demanded is not in stock, although arrangements are being made for carrying a good line of standard sizes. About everything in the way of merchant steel will be stocked in the com-

pany's bar warehouse, including all sizes of merchant bar and a full line of concrete reinforcing equipment. The company's real estate holdings, as can be seen by the accompanying general plan of its property cause of its immensity. It is an irregularly shaped building and its size can be best described with the statement that it is composed of five bays, all 105 ft. wide, and two of which are 560 ft. long and three 420 ft. long, making it



Interior View of the Main Warehouse.



Interior View of the Bar Warehouse, Showing the Method of Storing Merchant Bars.

and buildings, give ample room for future extensions, and all of the buildings have been constructed with that view.

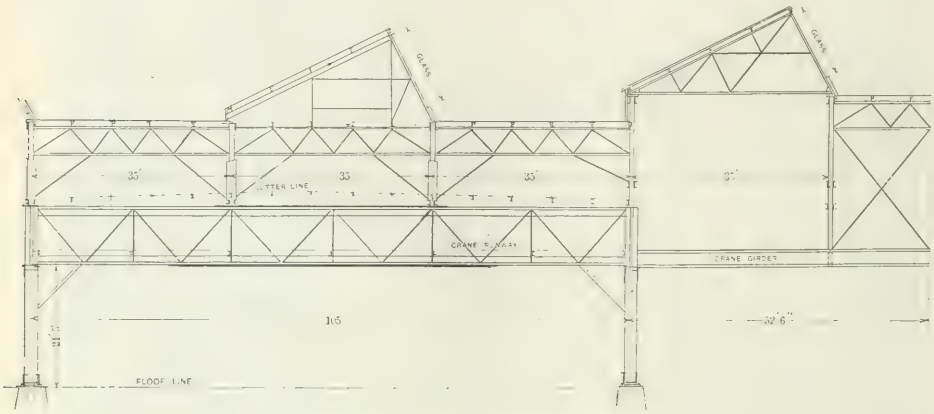
Description of the Plant.

The plant consists of a main warehouse, bar warehouse, power house and an office building. The main warehouse is the most impressive of the structures be- possible at a future time to convert it into a square structure with the addition of 140 ft. to the three short bays. The building is 32 ft. high to the under side of the bottom chords of trusses, and is composed of a steel framework covered with corrugated galvanized steel sheathing. There are 14 interior columns each 105 ft. apart, which

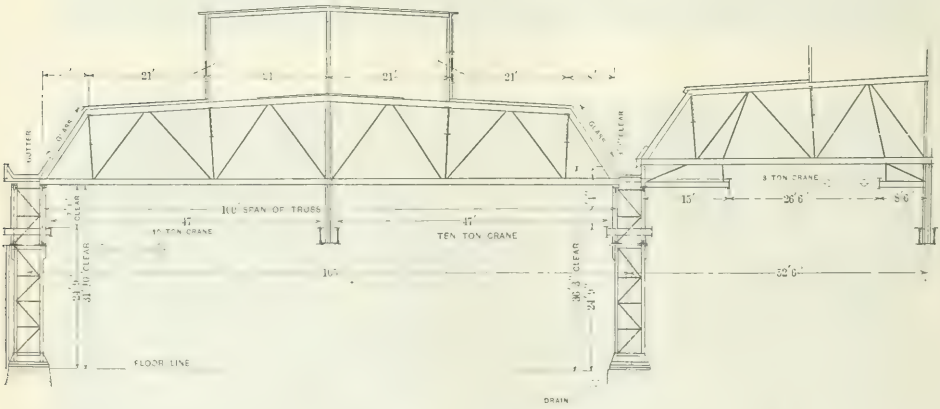
divide the entire area into 22 perfect squares, each 105 x 105 ft., and additions can be made on all sides without detracting from the architectural value of the building.

A reference to the general plan will show that the building is supported by remarkably few columns and the arrangement of the overhead girders and crane runways, as shown in the cross section, is such that an interior view of the building impresses the visitor with the fact that there is an unusual amount of open space in the structure. The building is covered by a saw tooth roof, which illustrates a new feature in saw tooth construction. The inclined surface of each tooth section, instead of being flat, is made to slope from the center to conform to the general shape of the roof proper. There are two 10-ton cranes of the standard type, made by the Alliance Machine Company, Alliance, Ohio, in each of the five bays, and provisions have been made in all of the bays for runways for 3-ton cranes, and at one end of the two long bays, where the fabricating department is located, four 3-ton Alliance cranes are now in commission.

The fabricating equipment, to which there is ample room for additions when necessity arises, which it is expected will not be long, includes a high speed cold saw of special design which is capable of cutting a 24-in. beam in 30 sec. This machine is operated by a 125-hp. Westinghouse motor and is fed by a motor driven roll table 315 ft. long. It has a belt speed of 8000 ft. per minute. A gag press capable of straightening 24-in. beams in vertical section, made by the Cleveland Punch & Shear Works Company, is located near the saw, and there are two interchangeable coping and punching machines of a new type made by R. S. Newbold & Son Company, Norristown, Pa. These machines are equipped with knives for coping and punching beams up to a 24-in. section, and they are provided with adjustable dies and punches, so that any spacing down to 2½ in. centers as a minimum can be had. The design of the machine is such that it is not necessary to reverse, the beam or piece being coped when one end is finished. A 48-in. gap punch fitted with shear knives, made by the same company, is included in the shop equipment. This machine is capable of punching two 1-in. holes through a 1-in. plate. Three 20-in. gap punches and shears capable of punching two 1-in. holes through the same size plate, and one 8 x 8 x 1¼ in. angle shear, mounted on turntable, are also included in the equipment. Railroad tracks of the standard gauge extend the length of the structure on each side.



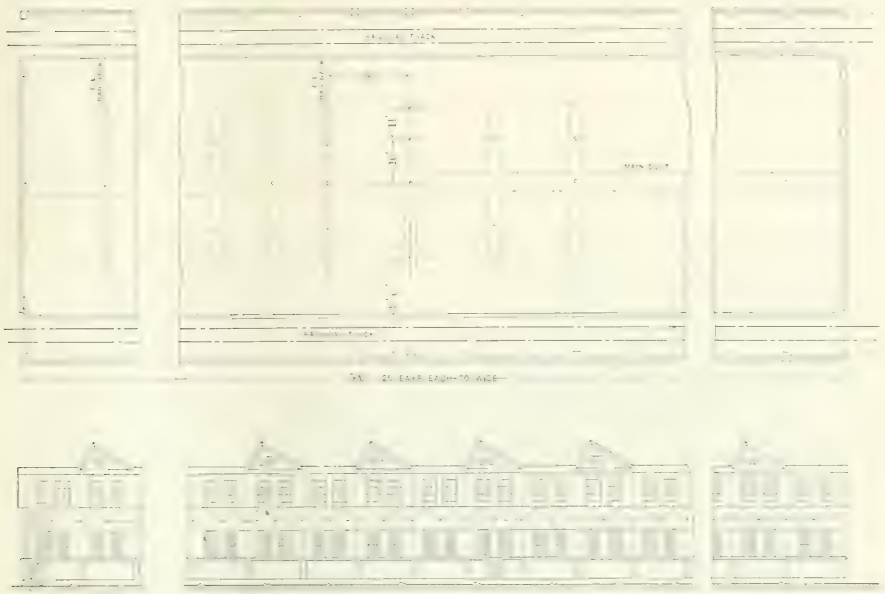
Longitudinal Section of the Main Warehouse.



Transverse Section of the Main Warehouse.

The bar warehouse is 125 x 500 ft. in size and 28 ft. high, and is composed of 25 bays each 20 ft. wide. The building is on a concrete foundation and has a steel framework, the exterior being covered with metal lath, cement plaster and concrete. The roof is similar to that of the main building. Extending the full length of the interior on each side are depressed railroad tracks. Racks are provided for the stacking of merchant steel. A large part of this building is given over to the storing of export material, and equipment for properly bundling and labeling is located at one end. The illustration of the interior of the building shows the manner in which the bars are stacked, the section depicted being the export end of the structure. It has been found that the material stored in this building can be best handled by hand,

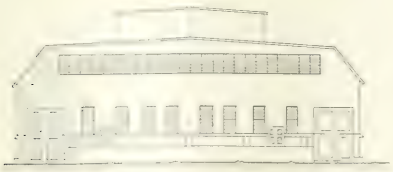
and consequently there is no crane equipment in the structure. The power house, a cross section of which is shown, is 90 x 105 ft. in size and is divided into five bays, each 21 ft. wide. The construction of the building is similar to that of the bar warehouse, excepting the roof, as can be seen in the cross section shown. The power equipment consists of a Buckeye cross compound, noncondensing engine, with an economical range from 520 to 640 hp., and an overload capacity of 860 hp. There is a Bury compressor, with a capacity of 550 ft. of free air per minute, under 100 lb. pressure and a Westinghouse generator of about 700 hp. capacity. The coal bins, as shown in the cross section mentioned above, are 15 ft. wide and can be replenished from an inclined track way running above.



Side Elevation and Floor Plan of the Bar Warehouse.

The Office Arrangement.

The office building is about 50 x 100 ft. with entrances at the front and back. It is a two-story structure, about 21 ft. high, and is equipped with kitchen and dining room accommodations for officers and visitors. A telegraph and telephone office is to be located on the upper floor and below the ground line will be located a vault, the same size of the building, which is to be used for filing purposes. The building is a model one in every respect.



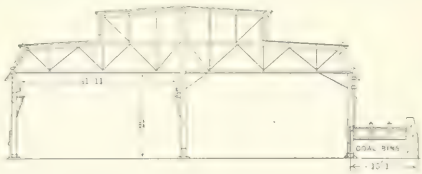
End Elevation of the Bar Warehouse.

It has a structural steel frame and is fireproof throughout and so arranged that a large clerical force can be amply accommodated.

The amount of structural steel used in the buildings aggregates 4620 tons, divided as follows: Main warehouse, 3750; bar warehouse, 650; power house, 115, and office building, 105. It is interesting to note the unusual amount of structural steel used in the office building when the size of the structure is taken into consideration. It is highly probable that there are few buildings of the kind so rigidly constructed.

The completion of the plant within the time alloted to the engineers in charge of the construction work was a somewhat unusual engineering feat, when it is remembered that conditions that prevailed last summer as regard getting delivery on material and equipment were not advantageous. All the work was done under the supervision of the company's engineers.

Ground was broken for the buildings on April 1 last and they were declared completed at the end of October. Since then the work of installing the machinery equipment has gone on rapidly and the plant is now ready for business and material is being stored there. John C. Neale, assistant general manager of sales and structural engineer of the Carnegie Steel Company, was in charge of the construction work, with Edwin A. Amaden and Howard C. Hays as his chief assistants. To these three men the credit for carrying out the work successfully is largely due, and it should be said that in addition to constructing the building a large amount of excavating and filling had to be done. Mr. Neale has given up his connection with the plant and returned to Pittsburgh to keep in closer touch with his position as assistant general manager of sales for the company, and the warehouses are now in charge of Mr. Amaden as general superintendent, with Mr. Hayes as his assistant.



Sectional Elevation of the Power House.

The St. Louis & San Francisco Railroad estimates the cost of hauling coal for its own locomotives at 3 mills per ton-mile, and 8 cents per ton for the labor of handling it.

Cuba Lowers Sugar Machinery Duties.

HAVANA, February 10, 1908. Provisional Governor Magoon has issued a decree, to come into force March 1 and to continue till further notice, altering the duties payable at entry into the island on machinery. In future, machinery and apparatus, complete, for the manufacture of sugar and aguardiente shall only pay a duty of 10 per cent. ad valorem. Further machinery and apparatus or the parts thereof, which are applicable to other branches of agriculture, but are imported with the intention to make them auxiliary to other machinery for the manufacture of sugar and aguardiente, shall pay only a duty of 10 per cent. ad valorem.

This decree applies to bricks used in building, and also to all the material for the construction and the repairs of the permanent ways of plantation railroads and such necessary adjuncts as semaphores, &c. It does not apply to rolling stock of the railroads, but it does apply to carts for the use of the sugar "centrals." All articles imported under the provisions of this decree must be bought by planters and erected, constructed or installed within such time as the Secretary of Hacienda may determine.

In the event of any articles imported with the benefits of this decree passing to the possession of another person or being applied to any other use than the manufacture of sugar or aguardiente, then the purchaser or user must pay the full amount of the duty on such articles from the date of their importation.

This decree is the result of the agitation of the Liga Agraria, which body has again and again pointed out to the government that prohibitive duties stood in the way of the reconstruction of many centrals according to modern requirements and prevented the building of the plantation railroads which are so necessary for the transport of the cane from fields to the "ingenio." It is expected that the decree will be in force for about a year, which is the limit of time asked for by the planters in their petition. P.

The Pittsburgh Valve & Fittings Company has given up its general offices in the Frick Building, Pittsburgh, and these are now at Barberton, Ohio, where the works are located.

A Special Niles-Bement-Pond Shaper.

A heavy special motor driven shaping machine, designed particularly for such work as shaping out the pod ends of heavy rolls for rolling mill use, was recently built by the Bement-Miles plant, Philadelphia, Pa., of the Niles-Bement-Pond Company, and is illustrated herewith. Fig. 1 is a general view of the operating side and Figs. 2 and 3 are front and rear views, respectively. The machine is portable, being readily handled by an overhead crane and is intended to be mounted on a floor plate, to which it can be bolted, and on which the rolls to be machined may also be mounted on vee blocks, the pod ends being presented toward the machine.

A number of features are to be found in this machine, which are unusual in shaper construction. The cutter bar is extremely heavy, owing to the nature of the work to be performed and has on its cross rail face two swivel planer heads with automatic cross, vertical and angular feeds. The swiveling of the heads is by the usual hand

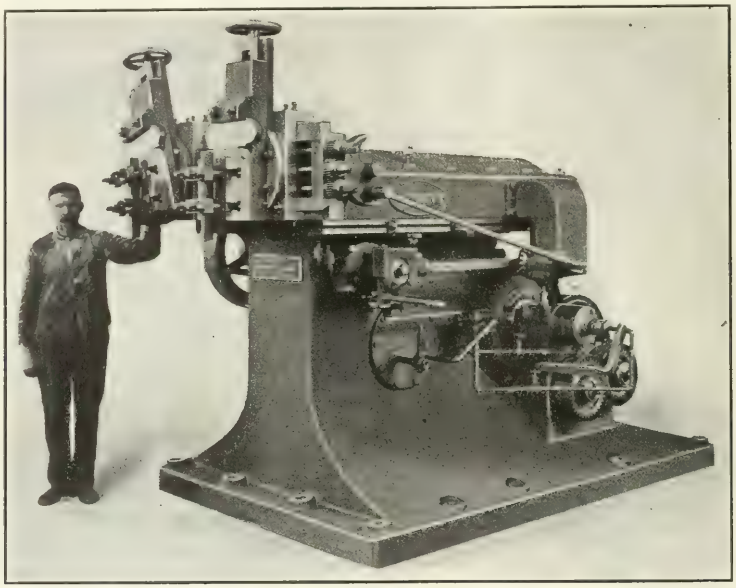


Fig. 1.—The New Heavy Double Head 24 In. Shaper Built by the Bement-Miles Works of the Niles-Bement-Pond Company.

means, that is, by loosening the bolts and moving the heads to the desired position. The reciprocating motion is by a rack on the cutter bar and a train of gearing with which is connected a pair of pneumatic clutches of the builder's multiple disc type.

The motor, pneumatic clutch and principal driving gears are located at the back of the machine, as shown in Fig. 3. The motor is of 20 hp. capacity and variable speed type, and is directly attached, making the machine self-contained. It drives the clutch gears through a pinion and intermediate gear. Air to the pneumatic clutch is supplied from a storage tank 15 x 20 in., cast as part of the bed. This is connected to the ordinary shop compressed air service and delivers air through a hollow shaft and the base of a bearing box to the different sides of the clutch. The driving power is transmitted from a pinion on the clutch shaft through intermediate gears, to a gear on a shaft, which extends through the bed of the machine and carries the bull gear which meshes the cutter bar rack. This shaft terminates in a connection on the opposite side of the machine, with the drive of the feed mechanism. This revolves a square shaft which through bevel gears revolves a slotted crank. The latter gives an adjustable amount of oscillation to a sectional gear on the cross rail head of the machine, which oper-

ates the feeds in the same general way as it is done in the usual planer heads.

The heads have a cross traverse of 27 in., at a maximum rate of feed of ½ in. per stroke. The vertical traverse of the tool slides is 15 in., and the maximum feed per stroke, 0.4 in. The stroke of the ram on shapers intended for finishing pads is 24 in., but they may be made of longer stroke by increasing the length of the cutter bar. The cutting speeds of the machine range from 20 to 35 ft. per minute, while the return speeds, through quick reversing gears, vary from 62 to 77½ ft. per minute. The ranges of speed, as given, are based on a 25 per cent. speed variation in the motor. The manual control of the stroke of the ram is through the starting lever near the feedbox, which directs the supply of air to the pneumatic clutch. After the adjustments are made and the machine is started, as the cutter bar moves forward or backward, adjustable dogs on its edge engage a bar, which is connected to the valve controlling the air to the clutch.

The machine is built extremely rigid throughout

The work is being done by the Pittsburgh Construction Company, and will be rushed to completion.

The Dearborn Drug & Chemical Works.

Robert F. Carr and several of his associates in the Dearborn Drug & Chemical Works, Chicago, have purchased the holdings of the estate of the late Wm. H. Edgar, who died two years ago, and the following officers have been elected: Robert F. Carr, president and general manager; Wm. B. McVicker, vice-president and Eastern manager; Grant W. Spear, vice-president; George R. Carr, vice-president; J. D. Purcell, assistant general manager; W. A. Converse, assistant secretary and chemical director; R. R. Browning, assistant treasurer; A. E. Carpenter, superintendent.

C. M. Eddy's holdings were also taken over, he desiring to devote all of his time to his personal business interests.

Robert F. Carr, graduate in chemistry from the University of Illinois, became connected with the Dearborn Company very soon after it was organized, for the past 10 years has been vice-president and general manager, and during most of that time, especially the last few years, has been actively in charge of the business and organization. Wm. B. McVicker has been connected with the company for 13 years. G. W. Spear has been one of the vice-presidents of the company for five years. George R. Carr has been connected with the company since he graduated from the University of Illinois in chemistry in 1901, and has occupied the position of assistant general manager for the past four years. W. A. Converse has been in charge of the laboratories for the past 12 years. He has been secretary of the Chicago section of the American Chemical Society for a long period. A. E. Carpenter has had charge of the manufacturing department for many years, and is the oldest employee in the service of the company.

The preparations manufactured by the Dearborn Company for the treatment of boiler waters, both in stationary and railroad service, are widely used. The scientific methods originated by the company's laboratories of treating each water individually, as per requirements after analysis, has made it possible for Dearborn preparations to give the highest efficiency with all classes of boiler feed supplies.

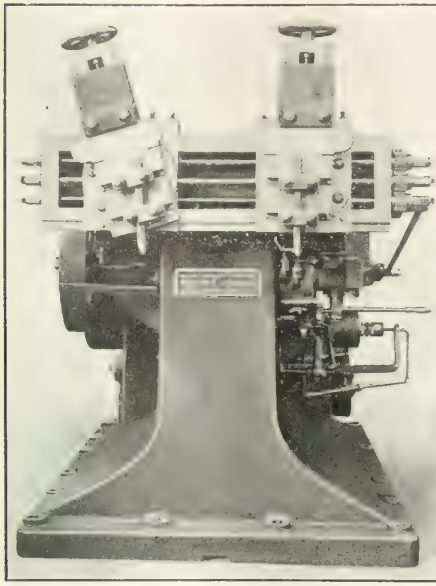


Fig. 2.—Front View of the Shaper, Showing the Planer Type of Cross Rail.

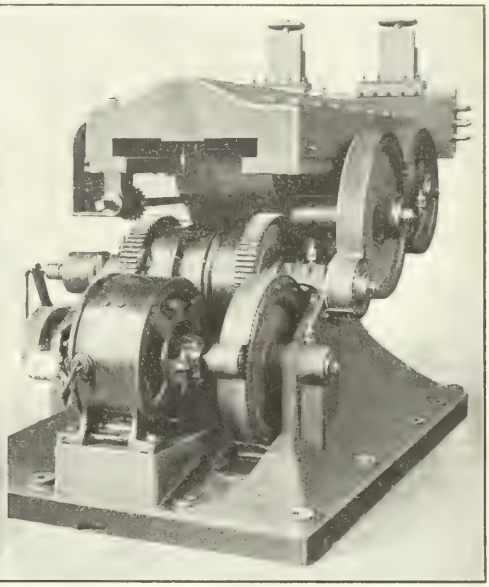


Fig. 3.—Rear View, Showing the Driving Motor and Pneumatic Clutches.

The gears are of grey iron cut from the solid, while the rack and pinion are of steel. Bronze bearings are used and oil is supplied to the bearings by the usual oil cups. The machine weighs about 30,000 lb., and occupies a floor space 8 x 13 ft.

The Lucas Pump Company, manufacturers of power pumps, Dayton, Ohio, has recently opened a branch office at Chicago, located in room 740, Monadnock Building. This office will have charge of the sale of Lucas pumps in the following territory: Illinois, Wisconsin, Minnesota, Iowa, eastern half of Missouri and eastern half of Nebraska.

The Petroleum Iron Works Company, Sharon, Pa., builder of blast furnaces, tanks and steel plate construction, has received an order from the Youngstown Sheet & Tube Company for 20 62 in. by 120 ft. smoke stacks.

The steel plant of the Tennessee Coal, Iron & Railroad Company at Ensley, Ala., is in full operation in all departments, and new records for the rail and blooming mills have recently been established. The construction of a new rail mill at this plant has been commenced.

Sixteen Ways to Lose a Casting.

BY WILBER R. TILDEN.*

No molder saves all his castings, but some lose far less than others. The man who has so trained his imagination as to be able to anticipate trouble in every mold and take preventive measures is the one who saves his work. In an order for a large number of like castings it is allowable to sacrifice a few to find out the best way of making the rest, and this is commonly done, but it is not good business and does not pay in a job shop.

The collection of castings illustrated herewith indicate some of the most prevalent defects which are encountered, though there are many others, and an exhaustive treatment of the subject would occupy a whole volume. Aside from the novelty of the collection, sixteen poor castings from the same pattern, each affords an instructive study. They are a hard looking lot of castings, but in justice to the molders, it should be explained that most of them are the work of freshmen students having a total molding experience of 8 hr., and some were made with deliberate intent to produce a given defect. In reviewing the various causes and effects, it is to be observed that the same cause may contribute to several imperfections, and one defect at different times may be due to various causes. The causes which resulted in losing these castings could all have been avoided. The pattern from which these castings were molded is that of a small I-beam 18 in. long, 5 in. wide, with web and flanges averaging ½ in. thick. The casting weighs about 33 lb. normally, though there is a very marked variation in weight between the 16 different ones.

General Causes of Bad Castings.

From the design, size and nature of this casting it can be seen that many common casting defects would not occur in this particular one. An improper mixture of iron in the cupola, *i. e.*, a wrong proportioning of the elements composing the metal to suit the nature of the casting to be made, sometimes results in castings too hard to be machined, or too soft for strength, and from the same causes some will shrink too much and others not enough. Sometimes sulphur or some other element in the coke combines with the mixture and produces unanticipated results. Various defects result from the charging and melting. A very common cause of defective castings is the design of the piece. If, for example, there is unequal distribution of thicknesses of metal, unequal contraction occurs during the cooling, causing warp, shrinkage cracks and internal strains. These are especially likely in pulleys and flywheels if the designer takes no account of these tendencies, but computes the dimensions from strength considerations only. Many castings from poorly designed patterns can be saved by special arrangements for retarding the cooling of the thinner sections.

Large, heavy castings present opportunities for imperfections not found in small light ones, such as internal or external shrink holes. These are avoided by providing ample risers, judicious churning and feeding. Another cause for defects in heavy castings is the drying of the suspended cope sand from the heat of the rising metal in the mold during the pouring. The sand becomes loosened, falls down on the surface iron and causes dirty face and scabs. This action is called drawing down of the cope, and sometimes can be avoided by careful gaggering, suitable form and position of the cope bars, clay wash on the gaggers and bars, and nails in the bars. A common preventive is to plug the risers until the iron is near to the cope; this produces compression of air and gases in the mold sufficient to hold the sand, but not enough to force gas into the metal and produce blowholes.

Poor patternmaking often contributes to bad results. These are due to the necessity of hand mending in the mold, owing to absence of draft, &c. Ill-fitting cores and core prints, necessitating filing of the cores, have bad tendencies. One of the most aggravating defects in cores from a machine shop point of view, and one to which unfortunately is given too little concern by some molders, is eccentricity of holes due to the core being out of center. Many imperfections, attributable to the cores, are due to improper venting or no venting. Then sometimes castings will blow where cores are vented and the molder has failed to take the vent away from the cores. There being no cores in the castings illustrated, there were no defects from that source.

The 16 Defects Illustrated.

For first consideration those defects due to opposite faults have been selected, such as too soft and too hard ramming of the mold, too much and too little weight on the cope, too dull and too sharp iron. A loose coped pattern is used, shown at A in the engraving. It is parted on one side of the web and is fitted with dowel pins in the usual manner. A sound casting from this pattern is illustrated by B. This weighs 33 lb.

Strain.—The casting C is strained all over. All dimensions are increased and the whole casting is distorted to a remarkable degree. The web averages 1 in. thick instead of ½ in. Soft ramming is the only apparent cause, though the cope might have been extra deep, causing excessive pressure of liquid due to the static head. It is difficult to see how with a mold soft enough to compress to this extent the sand could stay in place at all. Strains usually occur in the form of isolated swellings due to soft places in the mold, instead of all over like this one. This casting weighs 42 lb., which is 27 per cent. overweight.

Another type of strain is that shown by the casting D, and was due to soft ramming and pressure of iron. The most noticeable strain is the irregular fin cast upon one end and resembling a fungus growth. This casting was molded in the ordinary way, then ended up and poured through the end of the flask like a brass casting. The increased head and the consequent accelerating pressure were more than the sand at the lower end of the column could resist. The metal crept into the parting and the sand kept giving way, allowing the growth to extend. Prospects were bright for a run out, but the metal froze in time to avoid that catastrophe. It can be observed that this abnormal fin has one flat face, showing that the straining nearly all took place on one side; that was the nowel side. Another feature of the casting is the increased area of cross section toward the lower end. This indicates that deep molds should always be rammed hardest at the lower end to avoid strains. This casting was 15 per cent. overweight.

The freak casting E was cast under conditions identically the same as in that of casting C, but with different effect. Here the lifting pressure exerted upon the rectangular block of sand hanging in the mold from the cope caused this block to dislodge the sand immediately over it and between the cope bars. Then as the iron kept coming the sand started to rise until the molder observed it; he stopped pouring after it had risen about 2 in. This provided 2 in. of extra thickness for the web and made the fantastic looking fin around the casting which is observable in our illustration. This casting weighs 42 lb., 27 per cent. overweight.

Blow Holes.—The effect of hard ramming is equally as inimical as that of soft ramming. The former is much more common as the tendency of inexperienced molders is toward this extreme. The air which occupies the empty mold and the gases which begin to generate immediately the hot metal enters, must get out to make room for the metal. In small molds, molding sand rammed to the proper density is sufficiently porous to allow the gases to escape. Nearly all poor castings resulting from hard ramming are due to the unsuccessful efforts of these gases to escape.

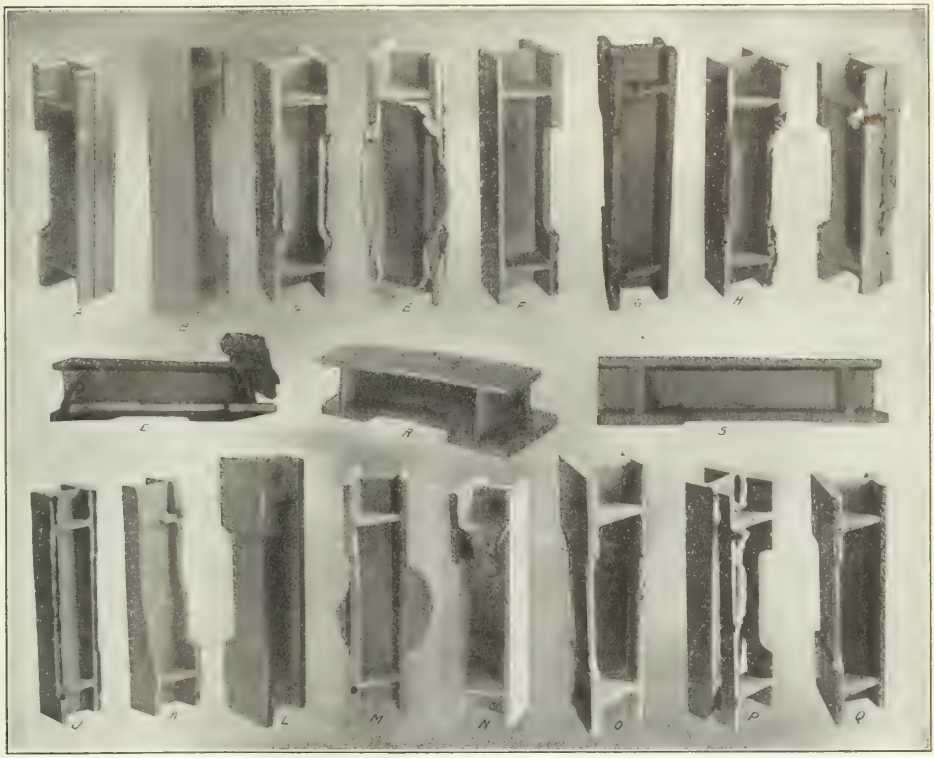
Casting F is perfect except for a single large blow hole. This bubble of gas was probably formed at some place at the bottom of the mold, where the sand was so dense that the gas could not escape downward and so forced its way up through the iron, only to be imprisoned where again the sand refused to release it. Remaining there, the iron froze around it, leaving a smooth round bottomed hole as seen in the illustration. In casting G, a blow hole is evident, which was formed in precisely the same manner. The bubble reaching its place of imprisonment found the sand not so dense as in the mold of casting

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F, so commenced slowly to crowd out under pressure. Had the metal remained fluid long enough, the gas would have been forced out, but having solidified, the blow hole resulted as seen, with its bottom pushed up convexly.

Sometimes the casting is apparently sound, but when the surface iron is machined off, blow holes are uncovered. This is caused from one of two reasons; either the gas started up through the iron when the latter was near the solidification point and failed to reach the top, thus becoming imprisoned, or the cope sand was too moist. In the latter case, were the sand porous enough to allow the generated steam to pass out readily, then the iron scale would immediately chill, and any gases arising through the iron would come to this chilled scale and there become imprisoned. On the other hand, if the from some corner of the mold which has not been properly secured by nails, soldiers or other agents, when a bunch would occur where the sand washed away. In casting H, no bunches are apparent on the bottom side, showing that the dirt either was left in the mold, or what is more probable, was washed in from the gate. An example of a wash which produced the bunch and no dirt holes is given by casting D. This, as has been stated, was poured on end, and the washout was at the upper end, so that the dirt floated up and out of the mold into the sprue.

Offset.—Close examination of casting G discloses the fact that the cope and nowel did not fit. This is a purely mechanical fault, for which there are several possible explanations. The cope might have belonged to another



Eighteen Castings from the Same Pattern, A, All Defective Except B, from the Following Causes: C—Strain; D—Strain and Wash; E—Rise; F—Blowhole; G—Offset, Blowholes and Dirt; H—Dirt; I—Crush; J—Run Out and Bleed; K—Cold Shut; L—Iron Too Hot; M—External Drop; N and O—Internal Drops; P—Poured Short; Q—Cold Shot; R—Warped; and S—Scabs.

cope sand were both wet and dense the iron would not lie quietly against it, but kick away, and remain agitated until solidified. This would make an irregular surface on the casting. The causes of blow holes are many. Sand without sea coal will blow with ordinary ramming, where sea coal facing against the pattern may sometimes be rammed very hard and not blow. A vent wire against the pattern will sometimes be responsible for just what its office was to prevent, if iron enters the vent hole and congeals there, sealing the vent. A rusty nail head or gagger will make blow holes because the iron will not lie quietly against them. An accumulation of small ones is termed honeycomb.

Dirt.—Dirt holes and blow holes are often confused. The presence of any loose sand in the mold will cause an imperfect casting. The casting H has a combination of both. The dirt defect predominates, as is evident by the rough and irregular bottom of the holes. These almost always occur in the top of the mold, owing to the buoyancy of the [illegible]. This sand is usually washed away

nowel, or more probably one dowel pin might have gone out of commission, and the molder rammed the cope out of place. Another possible cause might have been something wrong with the flask pins. Whatever the trouble, carelessness of the molder was fundamentally responsible.

Crush.—The danger from overweighting the cope is remote, provided the flask parts fit perfectly. As is usually the case with wood flasks, the reverse is true. If there is not even contact between cope and nowel when the cope is rammed, then it is readily understood that if after the pattern is drawn, the mold closed and contact is forced by either clamps or weights the sand must yield. The casting I shows this. The cope of its mold was weighted or clamped so heavily that the vertical walls of sand were forced or collapsed inwardly. The illustration shows the lines where the sand broke away. On the reverse side this is equally evident, but in no place was the crush sufficient to cause any sand to fall into the mold. There is a noticeable difference in the thickness

of the flanges of this casting and casting C. This one weighs 30 lb., or 9 per cent. under normal.

Runout.—Too little weight or insufficient clamping produced the bad casting J. The mold had been full once, but the lifting strain of the liquid metal was greater than the weight of the cope and weights to resist. The cope lifted slightly and the metal started to run out. The lift was so slight that the iron froze before it had emptied down to the parting. A small example of a bleed can be noticed at one end of J, where the form of the casting is perfect, but only the scale exists. This had solidified before the runout started. In all, 9 lb. escaped, making the casting that much under weight.

Coldshut.—In pouring casting K the iron was too dull. It had not fluidity to fill the mold so left the casting incomplete; 10 lb. under weight. The coldshuts are evident all over it, showing that the thick metal from the gate started away in different directions. These various streams were not hot enough to amalgamate, and left the lines and creases. This casting would be very easily broken. Coldshuts are also caused by use of too strong facing sand.

Fused Sand.—When the iron is too hot the sand adhering to the casting fuses with the iron. Casting L was covered with a coating of sand which refused to pickle off, hence it is presumed it is fused on. This could be rubbed smooth, but it would be very destructive to the tools if it was attempted to machine it.

Drop Out.—The casting M is almost self-explanatory. The fins on either side are about 1 in. thick next the casting. One was very much larger, but had to be sacrificed to the overzealousness of a snagger. The causes of drops are several, but poor judgment and carelessness are usually to blame. In this case, a judicious use of gaggers, nails, clay wash, &c., would have prevented it. Soft ramming was partly responsible, but ignoring the causes it would seem that a molder must indeed be dull who could allow such amount of sand to fall out on the ground when he inverted his cope, then close it and not know that it had happened.

Drop In.—N and O are front and back views of the same casting. The cause of the drop might have been the same as in casting M, the only difference being that this drop occurred in closing the mold. The molder should have asked some one to watch while he was closing the mold, then if doubt existed he should have removed the cope and satisfied himself.

Poured Short.—Casting P is in two parts which fit one another, and the cause of the separation is evident. The molder erroneously thought his ladle contained enough metal, so began the pouring. When he got back with more and filled the mold up a coldshut occurred and the casting parted. It is well known that if even a brief interval elapses between stopping the flow and starting again there is danger of getting this result either in whole or in part.

Cold Shot.—Cold shot and coldshut are often confused. The latter has been discussed and the former is illustrated by casting Q. Cold shots are small globular particles of metal formed by the metal splashing and spattering in different directions. These chill and run into the lower pockets of the mold. The iron following covers them but does not amalgamate with them. These are liable to be hard and prevent possibility of machining. To get this result the sprue probably led directly down on the web, the iron was dull and the man in pouring allowed it to dribble in instead of filling the basin and forcing it in.

Warp.—A warped or curved casting occurs from one of two causes: want of symmetry in design of sectional parts and consequent unequal contraction in cooling, or the dumping out of the casting while soft and allowing it to sag. The former is sometimes called "camber" and has been discussed in the introduction. The latter is illustrated by casting R.

Scab.—This important subject has been left to the last because it is the most difficult to explain, there being so many theories held by different authorities as to the nature of scabs and the action which produces them. They are very obstinate as well as aggravating, since it is almost impossible to avoid them in some forms of castings. Small scabs are to be seen on casting S. They are uncommon in small castings, so it is impossible to find any very marked example from the pattern at hand. These particular scabs were probably due to excessive moisture in the sand under the scab, since they are on the nowel side. When on the cope they are from a different cause, being located where the molder would naturally swab his mold to prevent the corners washing away. The metal could not lie still upon such places on account of steam generating in the sand below and passing up through the iron, since it could not go down and out. This steam carries away particles of sand which float up, exposing more moist sand, generating more steam and producing, consequently, more agitation. This process continues until the moisture is all exhausted or until the iron solidifies. Dirt and blowholes are likely to be on the cope side, and dirt and holes under the scab, the first from sand and gas which passed up before the iron froze, and the second from sand and gas which were present up to the time of solidification. The iron taking the place of the sand which wore away, formed these rough and uneven projections. When chipped off dirt and holes are almost always under them. Any existing condition by which the iron will not lie quietly at any point is likely to produce scabs. Cope scabs are caused by the so-called drawing down of the cope which has been discussed. These only exist on large castings. Sometimes skin drying is necessary. When this fails dry sand copes are resorted to. Even dry sand and loam molds will sometimes scab from the same cause.

The Automobile Industry.

Statistics recently compiled by the Association of Licensed Automobile Manufacturers show that the total value of American made automobiles for 1907 was $105,669,572. This represents 52,302 cars manufactured during the year. Of these, all but 5000 were gasoline vehicles, the smaller number being divided between steam and electric machines. In 1904 the value of the automobile output of the United States factories was $26,645,064, and a steady increase has been noticeable for every year. It is estimated that 58,000 employees were engaged last year in the various factories, while the capital employed was more than $94,000,000.

As in many other manufacturing products, there is an indirect investment, which is closely allied to vehicle manufacture. This includes such products as tires, rims, lamps, speedometers, drop forgings, &c. Close estimation shows that there are 29,000 men employed in this indirect manufacture, with a total capital of $36,700,000. Unlike many other manufactured products, the sales end of the automobile industry is exceedingly expensive. At the close of the year 1907 there were 2151 sales and garage establishments employing 21,500 persons, with a capital of $57,500,000. Not including the manufacture of motor cycles or the sale of supplies and accessories, the total estimation is: Value of product sold, $105,669,572; total capital employed, $171,448,769; number of employees involved, 108,500.

The Pennsylvania Railroad Company made public an official report received February 13 on the state of the work on the East River tunnels in New York. This shows that at the present rate of progress the four tubes now being excavated under the East River from New York City to Long Island will meet within the next three months. One of the tunnels will be excavated and iron lined this month; two in March and the last in April or May. It will take some time after that for caulking and lining with concrete.

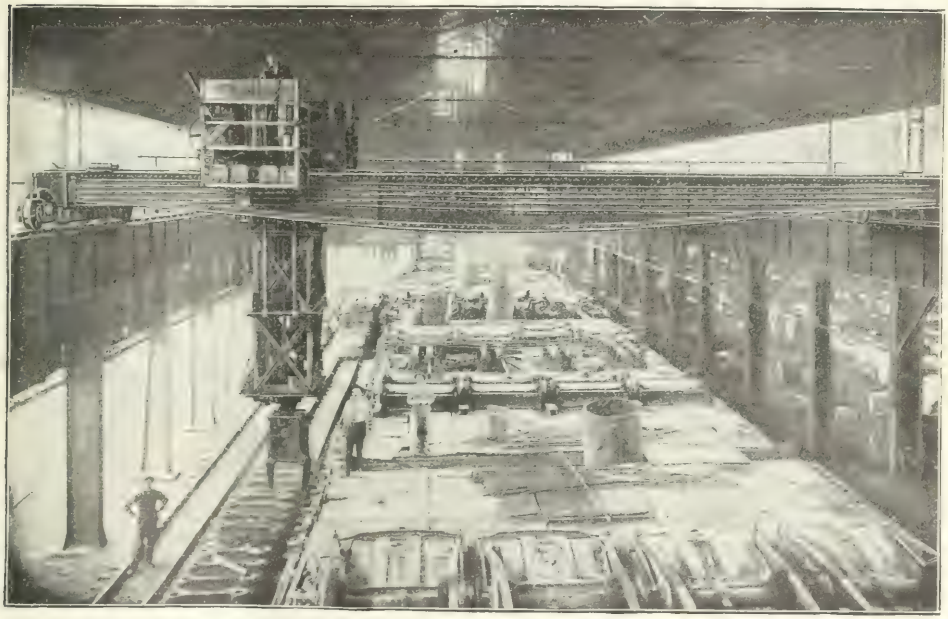
Alden & Harlow, architects of Pittsburgh, have received the contract for designing the branch library building in the Homewood District, Pittsburgh, for the building of which Andrew Carnegie has donated $150,000. It is a notable fact that Alden & Harlow have secured all the designing contracts of the Carnegie library system in the Pittsburgh District for 18 years.

The Alliance Vertical Charging and Drawing Crane.

All the advantages of the high type charging and drawing crane built by the Alliance Machine Company, Alliance, Ohio, are found in the company's latest design of vertical charging and drawing crane or soaking pit crane. It has a further advantage in that the crane requires but little more head room than the standard traveling cranes; in fact, the crane illustrated herewith was designed for use in an existing building of the Republic Iron & Steel Company's plant at Youngstown, Ohio, arranged to suit soaking pit cranes of the chain hoist type. The great advantage secured by the use of soaking pit cranes of the stiff legged or charging bar type is that the grappling tongs are secured to the lower end of the solid charging bar, and cannot sway from side to side as in the chain type of crane, and thus the operator has perfect and accurate control of the movements of the tongs and is able to do a greater amount of work than is possible with the chain type of crane, besides dispensing with the services of a second man on the soaking pit floor.

Probably no cranes around a steel plant are called upon to perform more constant service, or get more severe usage, than the cranes used over the soaking pits. Furthermore, a delay caused by the cranes means not only holding the ingots in the soaking pits, but the shutting down of the mill until the cranes are repaired. These facts were considered in the design of this crane, and it is constructed accordingly. Generally speaking, it is built along the lines of the company's standard traveling cranes, in that all working parts are accessible, all bearings are capped and tongued and grooved, and bored in proper alignment with each other, and are lined with substantial bronze bushings made in halves, and all gears are of steel. No cast iron is used in the crane, all of the members being either structural steel, steel castings or bronze. The motors for the hoist, bridge and trolley are of the mill type. The bridge is built with extra heavy and wide box girders to provide ample lateral stability. It is firmly secured to cast steel end carriages in such a manner that the crane cannot get out of square with the runways. The trolley on the crane illustrated is of the structural steel box section built up type (in cases where the customer prefers the all steel casting construction is used), and is provided with a dependent guide frame provided with ways in which the solid charging bar or tongs carrying frame is guided. This frame is hoisted and lowered by a 50-hp. motor geared to the hoisting drum located on the top of the trolley frame; wire ropes lead from this drum around the tongs carrying frame and back up to the trolley frame, where they are connected to an automatic takeup device which prevents the unwinding of the rope from the drum when the tongs come in contact with the ingot before the hoisting motor is completely stopped.

The crane has five motions, the hoisting and lowering of the tongs, the opening and closing of the tongs, the rotating of the tongs, the traveling of the trolley and the traveling of the bridge. Each of these motions is operated by an independent reversible motor from controllers in the operator's cage, which is attached to an extension on the crane trolley. This extension passes out over one of the bridge girders so as to allow the operator a clear view of the soaking pits and ingots therein and still be far enough away from the pits to suffer as little from their heat as possible.



A 100-Ton Type 75-Ton Vertical Charging and Drawing Crane Installed in the Republic Iron & Steel Company's Soaking Pit Building, Youngstown, Ohio, by the Alliance Machine Company, Alliance, Ohio.

As an example of the rapidity with which this crane can be used, the machine illustrated has charged and drawn 60 ingots in one hour; this includes the delivering of the ingots to the charging buggy and the picking up of cold ingots from the ingot cars.

Contrary to rumors which have been circulated, the New York, New Haven & Hartford Railroad Company declares that its electric service has been entirely successful, that it has not turned its system over to the Westinghouse Company and that there is and has been no dispute or dissatisfaction over the payment of its obligations to the latter company. The railroad is now operating 20 locomotives between New York and Port Chester and 22 between New York and Stamford. The Westinghouse Company joins in refuting the rumors.

Canada's Aggravating Bounties.

TORONTO, February 16, 1908.—As the expenditure account of bounties swells into a larger aggregate, the popularity of this mode of assisting industry declines. Recent events to turn critical attention upon the bounty system are the trebling of the capital of the Hamilton Steel & Iron Company, the announcement of the total bounty payments for 1907, the litigation between the Dominion Iron & Steel Company and the Dominion Coal Company, and the agitation by silver lead mining interests in British Columbia to have the basis of the lead bounty changed in their favor. The action of the Hamilton Steel & Iron Company has roused the *Weekly Sun*, an influential organ of agricultural opinion published in this city, to a renewal of its campaign against the bounties. The paper points out that in the last eight years the company received bounty payments amounting to about the same sum as its former capitalization. Several other newspapers have taken up the *Sun's* cause against the bounties, and the discussion in the country press is likely to influence voters in the next general election. In the calendar year 1907 the iron and steel bounties paid amounted to $2,215,295, and were distributed as follows:

	On pig iron.	On steel.
Dominion Steel	$313,573.42	$497,212.07
Hamilton Iron	121,422.26	102,124.04
Nova Scotia Steel & Coal	63,343.25	115,867.08
Canada Iron Furnace Company	13,850.09	.....
Canada Iron Furnace Company (Midland)	32,577.79	.....
John McDougall & Co.	5,200.93	.....
Londonderry Iron & Mfg. Company, Ltd.	43,534.61	.....
Algoma Steel Company, Ltd.	177,570.16	378,698.73
Deseronto Iron Company, Ltd.	4,487.00	.....
Atikokan Iron Company, Ltd.	17,210.46	.....
Electric Reduction Company	235.20	.....
Lake Superior Iron & Steel Company	.....	5,719.68
Ontario Iron & Steel Company	.....	251.77

Besides the bounties on pig iron and steel ingots, the Dominion Iron & Steel Company received $412,417 on its output of wire rods, making its receipts of bounty money in 1907 amount to $1,223,202. In no former year of its history did the company's bounties aggregate so great a sum. For that matter, indeed, the iron and steel bounty payments as a whole were greater than in any former year. In the last 12 years the money distributed by the Dominion Government in iron and steel bounties amounted to $10,509,221. This does not include the payments on account of the lead, crude petroleum and manila fiber bounties, which aggregate about $2,000,000 from the time of their inception to the present. C. A. C. J.

The Des Moines Bridge & Iron Works, Des Moines, Iowa, has increased its capital stock from $250,000 to $375,000; $50,000 of the new stock being 6 per cent. cumulative preferred.

Remarkable Factory Construction.

BY C. M. RIPLEY, NEW YORK.

An interesting piece of factory construction has just been completed at Passaic, N. J., for the Pantasote Leather Company. The factory floor space was doubled in less than three months and the ground space occupied was increased only approximately 65 per cent., without adding stories to existing buildings. The work was partially carried out by replacing a one-story wing of the old structure by an entirely new building two stories high. This was accomplished in addition to the complete wrecking and removing of that portion of the old building enveloped, without interfering with the operation of the machinery contained in the replaced part. The contractor, the Salmond Brothers Company, Arlington, N. J., deserves credit not only for the speed with which it added 42,000 sq. ft. of floor space, but for the ingenuity displayed in enveloping the 65 x 85 ft. wing of the old factory by the two-story modern brick structure covering three times the ground space of the old wing. This work was carried on and completed in 80 days, entirely effacing the old structure, while the machinery therein was in continual operation. A view of the completed work is shown in Fig. 1, and the diagram, Fig. 2, shows roughly the old and the new parts of the factory.



Fig. 1.—The Pantasote Leather Company's Factory at Passaic, N. J., Showing the New Building at the Right, Which Enveloped the Old Wing.

The wing of the old factory which was enveloped by the new was known as the embossing mill, and contained four 10-ton machines for embossing the pantasote to give it the appearance of leather. On September 26 the contractor was admitted to the mill with the understanding that the machines must be kept running continually, with the exception of Saturdays and Sundays, and a two-day shutdown. During this short time six reinforced concrete piers 6½ ft. square were sunk 14 ft. deep and the necessary excavation made inside of sheet piling to furnish new foundations, partly under the embossing machines, for the columns of the heavier two-story structure being erected. Also in this brief shutdown the contractor, by an ingenious and original scheme, supported the heavy 4-in. line shafting supplying power to the embossing machines, by means of vertical struts and cross timbers which held the shaft hangers firmly in their original place after the roof of the old factory had been torn away.

On Monday, September 29, the mill was again running at full capacity and the forms for constructing the concrete girders and the second floor were put up in five days more. In the succeeding four days the second floor concrete was laid over a surface 68 x 140 ft. In a total of 14 days after the contractor was admitted to the embossing mill the roof of the second story was being constructed, and on October 26, just one month after starting this portion of the work, the roof was completely fin-



Fig. 2.—Diagram Showing the Old and New Parts.

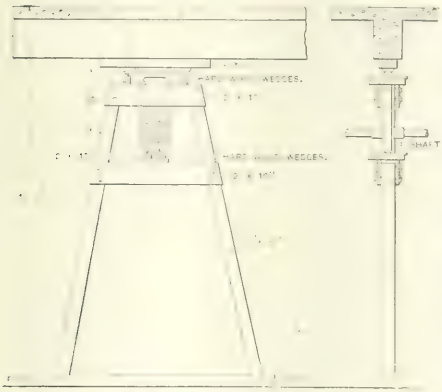


Fig. 3.—Manner of Supporting Line Shafting During Construction Work.

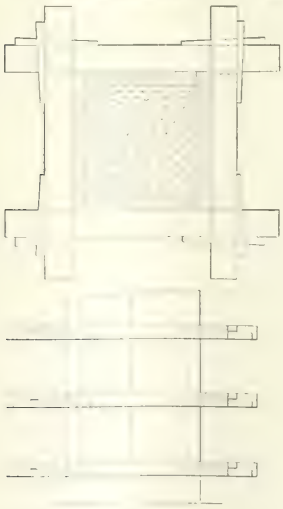


Fig. 4.—Wedge System of Holding the Concrete Column Forms.

ished, including a monitor skylight. On November 2, six days later, the interior was finished and new machinery being installed.

The substitution of the new building for the old was effected without moving the machines, without lengthening or shortening a single belt, and without disarranging the previously existing layout of the embossing machines, line shafting or any other apparatus. The new building, therefore, had to be built to suit the machinery, reversing the general order of installing the machinery in accordance with the lines of the factory interior. Fig. 3 shows the method adopted for supporting the line shafting while the old roof was being torn away. No head room was allowed and provision had to be made for the wooden forms in which the reinforced concrete girders and roof were to be molded. The wooden pads to which the hangers were later to be bolted were made to serve as part of the bottom of the wooden false work upholding the wet concrete, which, when set, would support the hangers through the pads, and the floor girder was made deep enough to support the hanger in exactly its old position after the new building was completed.

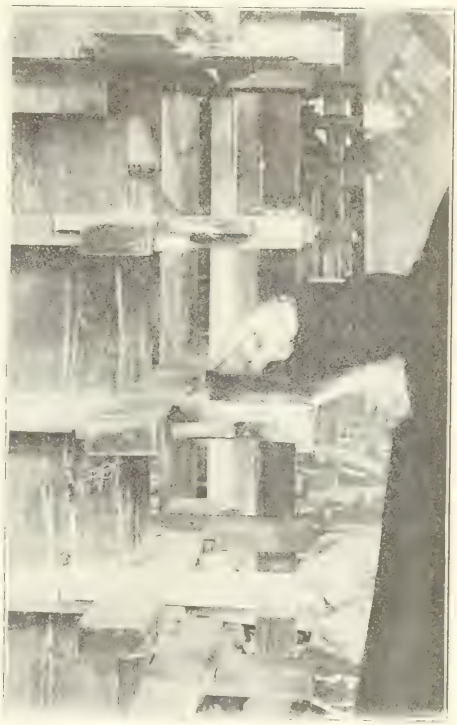


Fig. 5.—View Showing the Scheme of Fig. 4 as Applied.

Another interesting part in the concrete work was the method of holding the forms for the columns. Fig. 4 gives an elevation of a portion of a column and a horizontal section which well indicates the scheme. It is also shown photographically by Fig. 5. The forms for a complete column were held in place with close joints without the use of any nails, excepting an occasional small one to prevent the shifting of a wedge. An important advantage of this construction method is that the salvage from the lumber is practically 100 per cent. Since the small nails are merely used as tacks and only partially driven in place they can easily be withdrawn from the wedges, and these in turn can be removed for use again. The entire false work can be removed from the concrete column, after sufficiently set, and the boards are in perfect shape, neither pierced nor split by nails, nor damaged by extracting them. There were 56 columns on which this method of clamping the forms was adopted.

The architect of the new building was Charles B. Waterhouse, Passaic, N. J.

The Scott Method of Sintering Fine Ores.

The problem of putting fine iron ores and flue dust from blast furnaces into such shape as to make them suitable for charging into the furnace has been a subject of investigation and experiment ever since hard ores began to be at a premium. The utilization of flue dust in particular has not had serious attention owing to the almost prohibitive cost of installing the equipment. James Scott, general superintendent of Lucy and Isabella furnaces of the Carnegie Steel Company, has for some time been at work in this direction, and has perfected plans embodying his ideas as to the proper method of sintering fine ores and flue dust.

Blast furnacemen are familiar with the style of clinker found in the bottom of the combustion chambers of hot blast stoves. The dust carried over and partly fused in the burning gas as it travels along with the draft, comes in contact with other particles in a like condition; these adhering to one another and becoming too heavy for the current of ascending gases drop to the bottom of the gas chamber of the stove, whence they are removed. That this same operation could be duplicated in a specially constructed apparatus appealed to Mr. Scott. As the result of his experiments a process has been developed and patents have now been granted covering respectively a method of sintering ores and apparatus for doing the work.

In brief the method consists in dropping finely divided ore or flue dust in a shower through a furnace chamber into which burners project in annular series, the heat being so regulated that the dust will be partly fused and sintered in its fall. The burners provide annular sheets of flame at different levels, through which the showering ore must drop.

In Mr. Scott's patent on a method of sintering ores the form of apparatus illustrated is that of which a sectional side elevation is shown in Fig. 1. Fig. 2 is a horizontal section on the line A A' of Fig. 1. The cylindrical furnace chamber *a* is of steel with a refractory lining. It has an annular series of outlet openings *b* near its lower end for the products of combustion. These are drawn into the annular chamber *c*, from which a pipe leads to the stack. This stack passes through a drying chamber, *d*, into which the flue dust is fed by a conveyor and chute. The conveyor may lead as shown from a hopper having a screen, the hopper being underneath the track on which the cars of flue dust are placed. The screen stops any coke or large lumps. At the top of the furnace is a plate, *h*, in which are perforations registering with corresponding ones in a slide, the latter being reciprocated by an eccentric rod. Thus the flow of the fine ore into the furnace is regulated. Blast furnace gas is fed to the bustle pipe, *m*, while hot blast from the furnace hot main is supplied through the pipe *n*. The powdered coke in the flue dust assists in the agglomerating action of the gases. From each of the bustle pipes branches a series of feed pipes, *o* and *p*, supplying several sets of burners, *r*. Valves as shown are employed to control the supply of gas and air so that it is possible to regulate the sheets of flame at the different levels. The bottom of the furnace is formed by a hopper plate with an opening in which are the corrugated rollers *s*. These turn in opposite directions and compact the partly fused material into lumps as it is fed out. Below is a water bosh, *t*, equipped with a conveyor. The small lumps of sintered material are thus cooled and conveyed to a car, which takes them to the blast furnace.

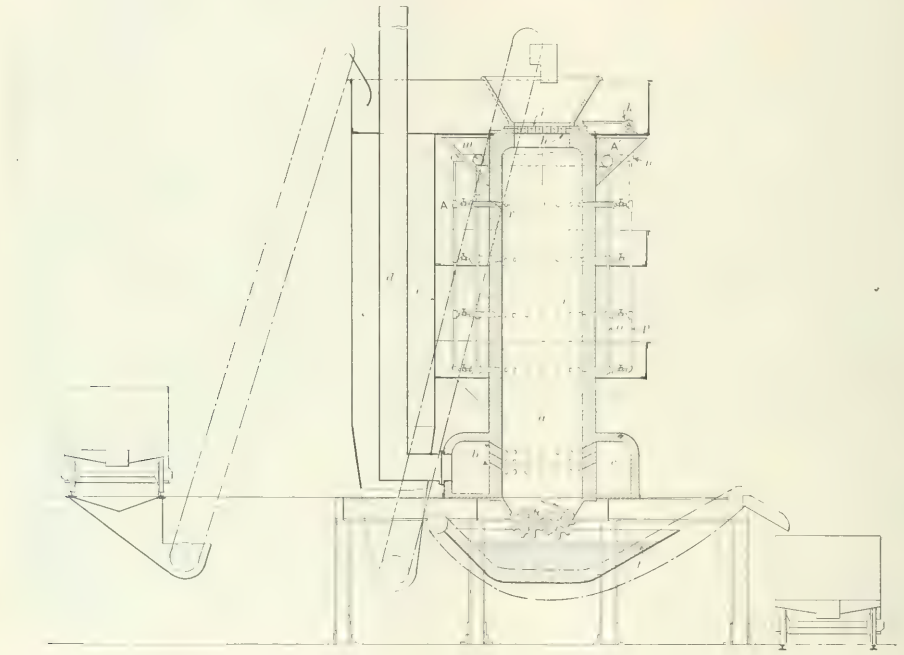


Fig. 1.—The Scott Method of Sintering Blast Furnace Flue Dust.

In another patent, dealing more specifically with the apparatus for carrying out his process, Mr. Scott covers the form of construction shown in Fig. 3. Underneath the hopper at the top of the furnace is a preliminary heating chamber, which rests on another similar chamber. In both chambers are conical baffles to retard the downward movement of the flue dust so that it may absorb as much heat as possible before reaching the main chamber of the furnace, where agglomeration takes place. The retarding and preliminary heating chambers are intended to produce the same results that would be obtained were the main shaft of the furnace of a correspondingly increased hight; that is, the dust in passing through the sheets of flame, dropping from the increased hight, would absorb the same amount of heat as it receives in the retarding chambers. These chambers reduce the hight of the furnace materially. The advan-

tages claimed for the process are economy in first cost of installation, economy in fuel, automatic operation and the minimizing of impurities in the product, owing to the

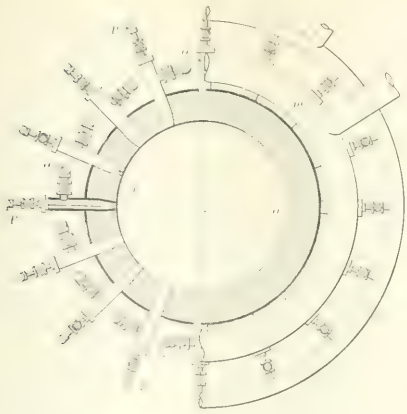


Fig. 2.—Section on the Line A-A', Fig. 1.

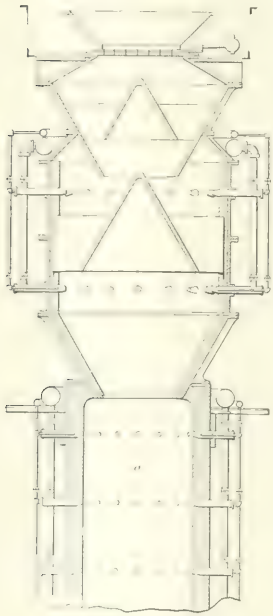


Fig. 3.—Upper Portion of Sintering Furnace with Superposed Chambers Provided with Conical Baffles.

fact that nothing is added to the dust before feeding it to the furnace.

The Standard Scale & Supply Company, Pittsburgh, has received a Mexican contract for two of its large railroad scales. This company has arranged to have the South British Trading Company, Ltd., London, England, act as its agent in the British Empire, and to carry a stock of scales to supply English customers. It has also recently arranged to be represented in Portland, Ore., and Seattle, Wash., at which points stocks of its scales will be carried to take care of Pacific Coast trade. Other agencies are located at Wichita, Kan., and Memphis, Tenn. The Standard Scale & Supply Company enjoyed a good trade in 1907 and is steadily increasing its business.

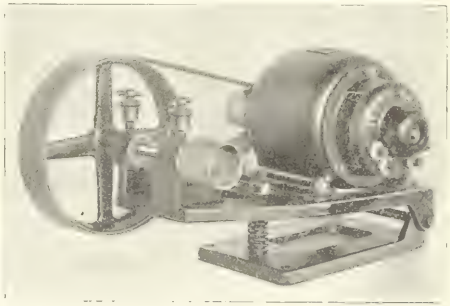
A C-W Motor with Spring Base Countershaft.

An ingenious and simple device for tightening the driving belt from an electric motor has been perfected by the Crocker-Wheeler Company, Ampere, N. J., and is shown in the accompanying illustration. It consists of a countershaft and a simple and effectual belt tightener. Though designed for the peculiar requirements of linotype machines, it can be used to advantage with any machinery requiring slow speed drive.

The device consists of a cast iron base on which are mounted the motor and countershaft. The base is pivoted at one end to a subbase, and belt tension is produced by an adjustable nut at the other end. A spring is provided to support the movable base if the belt breaks. The belt between the motor and the countershaft is tightened in the usual way by shifting the motor on the movable base with the aid of an adjusting screw.

This device is more effective than a simple idler. Not only does it keep tension on the belt, but by the use of the countershaft a great difference between sizes of driving and driven pulleys is avoided, and the belt therefore makes contact with a greater arc of the driving pulley, with consequent absence of slip.

The motor is of the Crocker-Wheeler L type, made in sizes from 1-20 to 5 hp. It is of a neat and compact design, making it specially suitable for application to small tools, printing presses, pumps and all kinds of light ma-



A ½-Hp. Crocker-Wheeler Motor with Spring Base Countershaft.

chinery. By means of simple covers for the openings in the frame, the motor is easily rendered dust and moisture-proof, in cases where an open type of motor would be out of the question.

The Weathering of Coal.—Treating of this subject, bulletin No. 17 of the Engineering Experiment Station of the University of Illinois, by S. W. Parr and N. D. Hamilton, has just been issued. It relates to the weathering of coal and losses in fuel values which accompany storage under various conditions. The information heretofore available concerning the behavior of coal in storage is exceedingly meager. The results of tests, as outlined in this bulletin, add materially to the stock of such information, and open a way for a better understanding of matters pertaining to weathering, spontaneous combustion, and other difficulties which attend the storage of coal in large masses. Deterioration has been studied with samples maintained in the open air, under cover at varying temperatures, in air-tight containers, and in the submerged conditions.

The firm of E. F. Jones & Co., Birmingham, Ala., with offices in the Brown-Marx Building in that city, has been organized by E. F. Jones, formerly vice-president and general manager of the Southern Steel Company. The firm is prepared to bid on the installation of conveying machinery of all kinds, locomotive and traveling cranes, stationary and hoisting engines, pumps, stokers, tanks and structural steel work. It has secured the accounts for the Southern territory of a number of the leading manufacturers of this class of equipment.

The Follansbee Brothers Company.

From Tin Plate Jobbing to Manufacturing.

One of the oldest and best known sheet and tin plate concerns in the country is the Follansbee Brothers Company, Pittsburgh. This company in natural succession has grown from firms which have been engaged in the sheet and tin plate trades for nearly a century. The business was originally established in Pittsburgh by the Parks, was later known as Park, Scott & Co., afterward changed to James B. Scott & Co., and upon the death of James B. Scott was organized into the present corporation, whose officers have directed the affairs of the company and its predecessors continuously for 30 years.

Large warehouses and offices on Second avenue, Pittsburgh, were occupied for many years, but having outgrown these quarters the company built its present warehouses and offices on the corner of Third avenue and Liberty street. From the inception of the original firm up to 1896, the house bought its entire supply of sheets, tin plate and tinners' supplies in the open market. From 1896 to 1904 a tinning or dipping plant was operated, manufacturing high grade roofing tin, for which the black plate was purchased.

Decision to Build Rolling Mills.

For several years prior to 1904, the company had realized that in order to secure a regular supply of the high grade sheets and tin plate it required, it would be advisable to build its own sheet and tin plate mills. When a decision to do so was definitely reached, the officers of the company after a long search selected a location on the Ohio River, in the Pittsburgh District, on the Wheeling branch of the Panhandle Railroad, as offering the best natural advantages. There were purchased 236 acres, of which 40 acres were set aside for the sheet and tin plate mills, the balance being devoted to sites for homes for employees and for other manufacturing plants that might be attracted.

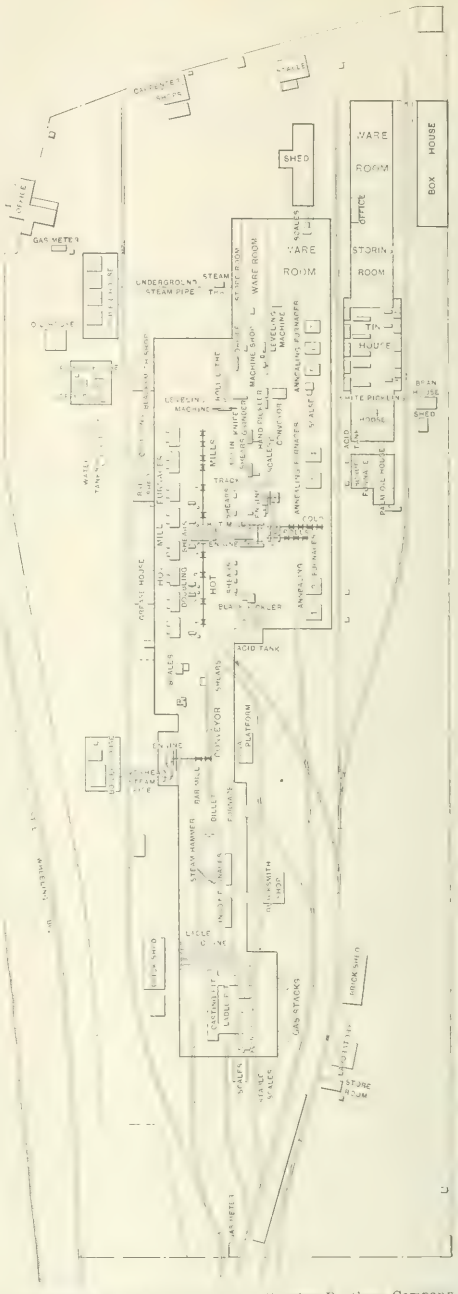
The new site was named Follansbee in honor of the members the the company of that name, and late in 1903 the erection was begun of modern sheet and tin plate mills which were completed and put in operation in September, 1904. A description of this portion of the plant appeared in *The Iron Age* of September 1, 1904. The sheet mill plant contains two hot mills and the tin mill plant six mills, and there are seven stands of cold mills. The output of the sheet mills is mainly used for deep stamping and other special purposes, requiring a very high quality of sheets. The product of the tin mills is largely high grade bright charcoal and roofing plates, such as Scott's Extra Coated roofing plates and other brands which the company has been putting on the market for some years, and which have won a high reputation in the trade.

From the character of the products thus made it will be seen that a high and uniform quality of steel is required. The company found much trouble in promptly securing a regular supply of such steel, and a short time after the completion of the rolling mills decided to build its own steel plant.

While the mills were being built in 1904 the company was fortunate in securing the services of William Banfield to superintend the erection of the plant. He was made general manager and a director in the company. Mr. Banfield is a pioneer manufacturer of sheets and tin plate, having in his boyhood worked in mills in Wales. He came to the United States with his father, who was engaged to manage the first tin mill built in this country, which was in 1872 at the plant of Rogers & Burchfield, Leechburg, Pa. William Banfield in the course of time became a member of the firm of Wallace, Banfield & Co., Ltd., operating sheet and tin mills at Irondale, Ohio, which were absorbed by the American Tin Plate Company, afterward serving as district manager for the American Sheet & Tin Plate Company for several years.

The Open Hearth Steel Plant.

In the erection of the open hearth plant, the company decided to make some radical departures from ordinary methods. The main object was to secure steel of the highest quality, large production being a secondary consideration. It was decided to build two furnaces of the basic type and of only 30 tons capacity each. It was also



Arrangement of the Works of the Follansbee Brothers Company.

decided to use the bottom pour method in casting ingots, as by this method it is claimed that a much better and cleaner grade of steel is secured. The ground plan herewith shown gives a clear idea of the layout of the steel plant and the sheet and tin plate mills with their auxiliary departments.

The fuel used in the open hearth furnaces is natur

gas, which produces a product lower in sulphur than when the furnaces are coal fired. These furnaces were built by the company under the direct supervision of Mr. Banfield, and are served by a 2-ton floor charging and drawing machine, built by the Alliance Machine Company, Alliance, Ohio. They are further equipped with Velte valves, made by the Velte Foundry & Machine Company, Pittsburgh, the waste gases being discharged through two steel stacks 125 ft. high and 4 ft. in diameter.

Ingots Hammered Instead of Rolled.

A radical departure in methods used by the company is that the ingots instead of being rolled are hammered into blooms. After the open hearth furnaces are tapped in ladles the molten steel is cast in ingots about 10 in. square and 5 ft. long. After being reheated the ingots are put under an 8-ton hammer, built by the Chambersburg Engineering Works and are reduced to the size of 6 in. square. This hammer can reduce a 10-in. square ingot 3 in. in one blow. After being reduced to proper size the ingot is cut into suitable lengths and weights for rolling into tin plate bars.

The bar mill has two stands of 22-in., two high mills, overhead trolleys being used to convey the pieces from the heating furnaces to the stand. The steel is given five passes in the roughing or breaking down train and four passes in the finishing train. After being reduced to the desired weight of bars for the sheets required the pieces are sheared into proper lengths. The shear was built by the United Engineering & Foundry Company, and is located at the finishing end of the bar mill. After being sheared the bars fall into a bucket, which is immersed in water to cool them and remove the scale This bucket is then picked up by a Pawling & Harnischfeger 20-ton crane, and the bars are dumped on the floor, after which they are put on skids and conveyed to the hot mills.

The main building of the steel works is 50 x 400 ft., having a lean-to, 50 x 140 ft., which contains the two open hearth furnaces, the balance of the building containing the reheating furnaces, the hammer, bar mill and other equipment. The building is commanded by a 40-ton Alliance Machine Company ladle crane, with 10-ton auxiliary hoist. In this building is also a 10-ton Pawling & Harnischfeger crane for conveying the ingots from the casting pit to the furnaces for reheating. The bar mill is driven by a 32 x 54 in. direct drive engine, built by the Bass Foundry & Machine Works, Fort Wayne, Ind.

The plant has its own switch connections with the Pennsylvania lines, the pig iron, scrap and other material being delivered on its own tracks alongside the open hearth building and stored until needed. A narrow gauge track runs the entire length of the storage yard. On this track the charging boxes are loaded, then drawn to the open hearth furnaces, and, after being unloaded, are returned for reloading. Some splendid results are being obtained in the open hearth department, each of the two furnaces having recently made as high as 15 heats in a week, or about 900 tons of steel from both. The entire output of the open hearth steel plant has hitherto been used in the finishing mills, but owing to the increased tonnage now being secured the company expects to have several hundred tons of steel per month to sell in the shape of billets or tin plate bars.

The Pennsylvania Railroad Company's Numerous Shareholders.

Some idea of the importance of the net earnings of the railroads to a large number of people may be gathered from figures compiled to January 1, 1908, showing that on that date the shareholders in the Pennsylvania Railroad Company numbered 57,226, an increase of 16,370 for the year 1907. During the year the average holding decreased from 150 to 110 shares. The number of women stockholders increased from 19,282 to 26,471, while the number of European investors in the stock grew from 7753 on December 31, 1906, to 9440 one year later. The increase in total holders for the month of December, 1907, was 1831.

A compilation has also been made which shows that in the companies controlled and directed by the Pennsylvania Railroad Company there are for the lines east of Pittsburgh 11,111 shareholders and in those west of Pittsburgh 9682, making a total of 20,793 in all the subsidiary companies. A few hundred of these holders represent the Pennsylvania Railroad proper, but approximately 20,000 are entirely independent stockholders. These, added to the 57,226 investors in the parent company, make a total of more than 77,000 investors who look to the profits of the Pennsylvania Railroad System for a whole or a part of their income. The income which is paid to these 77,000 people must come from the surplus earnings of the companies, for none of the thousands of bondholders, scattered all over the world, and to whom the companies are pledged to pay various fixed percentages, is included in this compilation.

The Coal Industry in 1907.

A production of between 450,000,000 and 460,000,000 net tons of coal in the United States in 1907 is indicated by the returns received thus far by the United States Geological Survey, or an increase of about 10 per cent. over the record breaking output of 1906, according to E. W. Parker, coal expert and chief statistician of the survey.

The most notable increase was made in the production of Pennsylvania anthracite, in which a gain of over 20 per cent. was recorded, if the shipments reported by the Bureau of Anthracite Coal Statistics may be accepted as indicative of the total production; and as the shipments amounted to more than 85 per cent. of the total production, such an assumption is not unreasonable. The shipments of anthracite in 1907 amounted to 67,109,393 gross tons, as against 55,696,595 gross tons in 1906. This would indicate a total production for the year of approximately 76,366,000 gross tons, or about 85,840,000 net tons.

An interesting feature in connection with the production of anthracite in 1907 was the lack of any effect on the trade from the panic which occurred in October and continued until the end of the year. Not only did the shipments of anthracite continue throughout this period practically without interruption, but the records show that the shipments for November were larger than those of any other November in the history of the trade, while those for October were the largest recorded for any single month in the last four years. This condition illustrates the extent to which anthracite has been eliminated from industrial uses and shows that practically the entire production is consumed for domestic purposes.

The production of bituminous coal cannot be estimated as closely as that of anthracite, for unfortunately there is no such reliable method of arriving at the total; but letters received by the survey from a number of the larger operators and from State officials indicate that the output of bituminous coal in 1907 exceeded that of the previous year by 7 to 10 per cent. The increases were rather unevenly distributed and were influenced by several causes. In the Eastern States, where large quantities of bituminous coal are used in coke making and for other industrial purposes, the trade felt heavily the financial stress of the last three months of the year, and locally this effect was so pronounced that increases recorded during the first nine months were to a large extent wiped out. Had it not been for this disturbance in financial circles the production of bituminous coal in 1907 would probably have shown an increase almost comparable with the gain in anthracite production. It is almost certain that the increase would have amounted to about 15 per cent., the total output being between 390,000,000 and 400,000,000 tons. As it is, the output will probably be about 25,000,000 tons short of that figure.

The Independent Pneumatic Tool Company has moved its branch office from room 1210 to room 1426 Farmers' Bank Building, Pittsburgh, which will give it larger quarters.

THE IRON AGE

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Blood Relations and Trade Relations with Canada.

It seems hard for British manufacturers to give up the idea that a considerable percentage of the Canadian trade is theirs by right of consanguinity. It is natural that a decline in Canadian imports of British goods should arouse concern and inquiry, particularly in view of the marked preference in Canadian tariff rates, designed to replace German and American shipments into Canada by British. But what British manufacturers appear unable to appreciate is that in the natural order of things Canada's trade will drift away from them, much of it never to return. No harm and some good will come of sending special commissioners to Canada to find out why things are as they are, but this will not change very much the practical aspects of the problem. Price and quality of goods and ability to secure what is wanted with reasonable promptness are the important factors determining the destination of trade. There are other considerations, chief of which perhaps is the human element—the cultivation of the customer, including all those attentions to his orders and his correspondence that avoid the frictions and smooth down the rough places as only acquaintance and close relations can. Proximity is a powerful aid in such cultivation, and nature has done so much to further trade between Canada and the United States that the British manufacturer must do double duty against the handicap of weeks for mails and transport, as compared with days where business is done with the United States. The fact that German manufacturers, in spite of the preference in duties in favor of Great Britain, are getting business in Canada in competition with British sellers suggests, however, that geography is by no means a controlling factor.

The report of Richard Grigg, special commissioner for the British Board of Trade, to investigate British-Canadian trade conditions, was summarized in these columns last week. Mr. Grigg spent nearly nine months in Canada studying the problem. He found Canadians surprised that, in spite of the manifest advantages of preference in tariff and good will, British manufacturers had not been able to get more business from Canada. The commissioner said plainly in his report that his countrymen could do more business in Canada if they went to more trouble and spent more money. The old time way of handling business through merchants and agents, Mr. Grigg points out, will not do when Americans and Germans, too, are dealing directly with Canadian consumers. The intelligent and effective work done by their competitors in going after Canadian trade is the point which Mr. Grigg especially brings home to British manufacturers. The travelers from concerns in the United States "have a more detailed technical knowledge of the products they sell than the ordinary British traveler, who is in the main a merchant's traveler, and not in close contact with the manufacturing processes." Another criticism in the report is similar to one that our consuls have made of American manufacturers in their efforts to get foreign business—that the British manufacturer does not adapt his product to the demands of the trade in the various sections of Canada.

Whether the various things will be done which Mr. Grigg recommends to British manufacturers as a means of increasing their hold on the Canadian market is a question. The Board of Trade has already decided to appoint correspondents in Canada to furnish trade information to its Intelligence Department. But what seems to be lacking is not so much information as action—action on new lines. And there is the rub. The complacency with which the increase in total exports from Great Britain in the past two years is regarded, and the imposing total of such exports when compared with those of other countries stand in the way of any extraordinary measures to win a larger place in the Canadian trade. Much may be read between the lines in this comment of a well-known British iron master on Great Britain's position in international trade: "We buy goods abroad because we cannot produce them so conveniently or at all here. And, having bought, the others must take our goods in payment whether they like it or not."

But the chief obstacle to securing a greater share of Canadian trade for British manufacturers is the fact that Canadians have determined to capture a greater share of their home trade for themselves.

Pig Iron Prices and Market Quotations.

The peculiar conditions now existing in the pig iron trade in the Central West have led to some criticism by producers of pig iron of prices given in our reports. The consistent course of *The Iron Age* from its earliest days to endeavor to give reliable information as to movements of the markets on pig iron and finished products has led many large consumers to base the prices of important contracts, both for the purchase and sale of materials, on our weekly trade reports. While it is gratifying to us to learn of a steady increase in the number of such contracts, as evidence of faith in the fairness and correctness of our reports, a responsibility is thus imposed which makes it absolutely necessary for us to report conditions precisely as we find them. In times of normal trade, when the demand for pig iron is about equal to the supply and transactions are frequent, there is little, if any, difference between the seller and his customer in making a settlement at our quotations for deliveries of pig iron for stated periods. In times of depression, such as we have had since last October, with a steadily declining pig iron market, and when actual sales are rare, it sometimes happens that the seller of material at prices governed by market quotations has an entirely different opinion from that of the buyer as to what constitutes actual sales and whether the few transactions really establish a market price. A case in point is that of Bessemer pig iron in the Pittsburgh and nearby districts, in which recently a difference of $1 a ton prevailed between the ideas of the two parties to contracts based on the quoted price of this material.

The furnace operators of these districts held several meetings that were not attended by all the pig iron pro-

ducers, and at these meetings it was agreed to sustain the price of $18 at Mahoning or Shenango Valley furnaces as the minimum for standard Bessemer iron. However, enough furnace capacity was unrepresented, and therefore not bound by the action of those who attended the meetings, to practically fill the very light demand for Bessemer and other grades of pig iron which has characterized the market for the past four months. The furnacemen thus unbound by any agreement have elected to sell Bessemer iron at a lower price, and sales, while infrequent and small, have been made on the basis of $17, at furnace, and in an extreme case at even $16.75. A recent contract for malleable Bessemer, taken by two or three furnace interests, was placed at less than $16, at Valley furnace, and for extended delivery. While the efforts of the furnace interests to hold prices of pig iron at a point that will allow a fair profit are commendable, yet if they are not successful, and consumers are able to buy iron at lower prices, it seems clear that the prices at which actual sales are thus effected legitimately make the market.

Cash Payments for Pig Iron.

During the past six months the blast furnacemen of the country have felt the shortage of money in a way to which they have not been accustomed for many years. They seem to think that in this respect they have had a heavier burden than fell to the lot of most business men. Yet, as a matter of fact, manufacturers in scores of lines have been in a worse situation as far as ready money is concerned. The head of a large implement concern in the Middle West was heard to complain bitterly some days ago of the fact that pig iron was practically on a cash basis, saying that it had reached this desirable position far in advance of such a possibility for the makers of finished goods. The makers of pig iron by a joint agreement as to form of contract, by harmony of interests and by co-operation, have eliminated the old-fashioned way in which iron was sold, so that to-day the great bulk of all the product of merchant furnaces is sold for payment within 30 days from date of shipment. Many men still in business remember when a year's time was not unusual. Later on six months was considered a very satisfactory settlement. To-day the consumer is occasionally allowed to give his note for four months, but never for a longer period, and there are many furnaces that refuse to quote to time buyers at all and insist on limiting their sales entirely to the consumers who pay in cash.

There has been a tremendous effort within the last three or four years by iron manufacturers to put their business on a strictly cash basis. In the Middle West a proposal is now being considered by a number of the furnaces to allow an attractive discount for payment within 10 days from date of invoice. This will be large enough really to mean that the consumer who does not take advantage of it will be obliged to pay a penalty in consequence.

As for the melters of iron, while undoubtedly in a general way they receive returns from their goods sooner than they used to, they have not been able to come anywhere near a cash basis. They themselves are obliged to pay for their raw materials and their labor in cash. Agricultural implements are not paid for within six months from the time they are shipped. Cash settlements will not average anything like as well as this. There are many makers of machinery who are able to get percentages of what is due them as they ship their goods, but who are obliged to wait anywhere from 6 to 12 months for a full settlement. Makers of agricultural implements feel that they are the most abused people in the matter of credits in the country, but probably they would change their views if they were privileged to see the settlements made by the railroads of the country with car builders. Railroads are so impersonal and direct responsibility is so divided that it is practically impossible to dun them, and to-day they have the well earned reputation of being the worst settlers, as far as time is concerned, in the land. They have absolutely no compunctions about it. Even the ironmasters who sell such of the railroads as use pig iron in their shops have not in all cases been able to enforce their 30-day contracts. As one of them said recently, the railroads pay when they get ready and "they get ready mighty slowly." It would be well worth while for railroad officials to consider how shortsighted is their policy of wearing out the patience of those from whom they buy. In these days, when so many hands are against the railroads, it would seem the part of wisdom to work for the good opinion of so important an element in the business and shipping world as those who manufacture what the railroads buy. No better beginning could be made in such a campaign for friends than for the railroads to reform their notorious habit of neglecting their bills.

No element in business is fraught with graver danger than that of giving long time credit, and in this country there is no reason why long time credit should be given. The nearer we can come to doing business on a prompt cash basis the more certain it is that American industry will be on a stable foundation.

Concentrating the Navy Yards.

Congressman Lilley of the House Committee on Naval Affairs has devised a plan for concentrating the navy yards by abolishing those that are no longer important. His purpose is to secure a more economical administration and at the same time one that would be no less efficient. He argues that some of the yards are no longer contributing their share in maintaining the navy, and are consequently no longer worth retaining. While it is unlikely that any immediate effort will be made to carry out such a recommendation, and while it is certain that the attempt would surely meet with strong opposition because of the demands of constituencies in sections of country where the less useful yards are located, still the question is one worthy of consideration, especially in the appropriation of funds. In the trade the concentration of the yards would mean a serious loss to dealers and representatives in some sections and a gain to those of other sections, for the Navy Department is a good customer for iron and steel, machinery, and a limitless variety of supplies.

Presuming that the abolishing of certain naval stations would not conflict with the strategic efficiency of the warships of the nation, there can be little doubt that theoretically the plan of concentration would prove a saving of money. For instance, the yards at Boston and Portsmouth are close together on the North Atlantic seaboard. Their administration would be cheaper if they were consolidated, and other great items of overhead expense would be radically diminished if the one yard should be increased in size to afford facilities equal to the two as they now exist. If two manufacturing plants of size and importance corresponding to these yards and similarly located were privately owned it is very doubtful if both would be retained. Probably new construction

would be confined to the one, with the purpose of eventually abandoning the other. The matter of fortifications enters into the question, for in time of war no possibility must exist of the capture or destruction by the enemy of a navy yard and the ships at its piers and in its docks. The one perfectly protected yard would be of greater value probably than two, one of which was pregnable.

In some of the navy yards there is an atmosphere of partial decay. The older buildings are massive and imposing in a picturesque way, but they lack the elements which go to make up the home of a modern manufacturing establishment, and a navy yard should be considered as nothing more than a group of workshops. There has been a great advance in equipment of recent years and a more business like administration has had its important effect for the better in many ways. Nevertheless, if the navy yards were to pass into the hands of private enterprise, which was to operate them in caring for the ships of the navy, great changes would be made as the initial step, in order that they might earn satisfactory dividends for their owners. Concentration would doubtless be one of the first important changes. It may be argued that if this would be the best policy for the private owner it should likewise be the best for the national Government; providing, of course, that there exists no reason for retaining the less important yards as places of refuge for repairs and equipment in time of hostilities. This side of the question is one for the experts of the navy, who should decide it from the standpoint of efficiency of the fleets. Economy does not always consist in not spending money. Perhaps the solution of the question will be the establishment of entirely new yards, ideally located to meet the new conditions of naval affairs, such as will come with the opening to commerce of the Panama Canal. New yards would be equipped from one end to the other with the latest and best of everything needed for the work of caring for the enormously costly and exceedingly intricate modern warship.

British Iron Trade Outlook.

While the British iron market continues in an unsatisfactory condition and the feeling in the trade is pessimistic a few items of improvement were noted in the pig iron trade in the first 10 days of February. Blast furnace firms are curtailing output. In the Middlesbrough District 78 furnaces were active on February 6, as compared with 80 on January 30. On February 7, 1907, the number active in this district was 90. In Scotland 74 furnaces were in blast on February 7, the same number as on January 31, as against 92 on February, 1907. In the Cumberland District 23 furnaces were active on February 1, as compared with 24 on January 25, 1908, and 33 on February 2, 1907. The pig iron stocks in Connal's stores, Middlesbrough, increased about 11,000 tons in January, the total at the end of the month being 100,527 tons. In the first week in February, due to the curtailment of production, the stocks in stores decreased about 3400 tons. The exports of pig iron from the Cleveland District in January were 101,286 tons, the largest total for that month in the history of the trade, with the exception of January, 1907, when the shipments were 140,148 tons. Reports have been current in the Cleveland pig iron trade of two large orders, one for Italy and one for Germany, being placed with Alabama pig iron producers at low prices. This has caused expectation of further American competition. The price of Cleveland warrants, which had fallen to 47s. 4½d. at the end of January, rose to 48s. 4d. the first week in February. An improved inquiry for Cleveland pig iron made its appearance in the early part of this month. Consumers appear to be running rather short of iron, and hand to mouth buying is likely to be the order for some time.

In the finished material markets the strike in the shipbuilding trade and the probability that shipyards on the Northeast Coast will all soon be closed have been important factors. The market for steel making iron is materially affected unfavorably. The demand for manufactured iron and steel is of small proportions, and the shipyard situation gives no very encouraging outlook. Steel rails are now quoted at £6 2s. 6d., or about 12 shillings less than at the corresponding time last year. The demand is only moderate.

New York Meeting of Mining Engineers.

The ninety-fourth meeting of the American Institute of Mining Engineers is being held this week at the United Engineering Society Building, New York. The opening session, presided over by Prof. Henry M. Howe, was held in the auditorium at 29 West Thirty-ninth street, Tuesday evening. The secretary, Dr. R. W. Raymond, in a brief address on "Swedenborg and Humboldt, Mining Engineers," presented some interesting facts not commonly known concerning these illustrious characters, and in the same connection spoke briefly of Theodore Koerner and Martin Luther. The portraits of all four have recently been placed on the walls of the society's headquarters. Luther was referred to as a miner's son and as himself a worker at the forge of his brother. The speaker considered Emanuel Swedenborg in many respects the foremost of all mining engineers and metallurgists. He gave interestingly an account of his meeting with Alexander Von Humboldt a short time before the latter's death.

David B. Rushmore, General Electric Company, Schenectady, N. Y., gave an address, accompanied by lantern slides, on "Electric Power in Steel Mills." The views had to do with iron mining, ore unloading and blast furnace operation as well as rolling mill work, the purpose being to show to what an extent electrical equipment is now in use in the iron and steel industries. It was stated that turbine blowers are now in course of development for blast furnaces, so that in time no necessity will exist for the use of reciprocating apparatus, power being furnished at furnaces and connected rolling mills by turbines and by electric motors. The speaker emphasized the economic possibilities of low pressure turbines, which he believes would especially commend themselves to steel manufacturers in times of depression. He looked for early recognition of the economies to be gained by putting the low pressure turbine on the exhaust side of the steam engine. Illustrations were given of electric equipment for reversing mills, consisting of direct current generators and alternating current motors. Important installations already made were shown, consisting of the Ilgner set for rolling mills, identical with that which has been used both in Europe and this country for mine hoisting.

Mr. Rushmore introduced his associate Mr. Hawley, who carried the discussion further by describing the classes of electrical installations for rolling mill work. For reversing mills the Ilgner system is the only one in use, and it is highly efficient, though its first cost is great. For nonreversing mills two classes of apparatus are in use—single speed and variable speed—induction motors being employed in both cases. Interesting diagrams were presented giving details of torque and load for the various passes, beginning with the ingot and running through all the diminutions of section in the elongation of the piece.

The session of Wednesday morning was devoted to the physics of steel, the proceedings including beside a continued discussion of Prof. H. M. Howe's paper on "Piping and Segregation in Steel Ingots," presented at a previous meeting, a paper by James E. Howard, engineer in charge of testing at the Watertown Arsenal, Watertown, Mass., on the work of that department. The purpose of the discussion of this paper at the present meeting was to secure suggestions from metallurgical chemists and engineers as to the best procedure in the investigation of ingot structure and other questions relating to the physics of steel. A large appropriation has been made by Congress for the work in this line to be carried out at Watertown Arsenal.

The Pressed Steel Car Company's Report.

The annual report of the Pressed Steel Car Company submits a balance sheet as of December 31, 1907, which compares with that of the previous year as follows:

Assets.

	1907.	1906.
Properties and franchises	$26,853,093.23	$25,818,622.27
Additions and betterments	267,922.30	1,384,470.96
	$27,121,015.53	$27,203,093.23
Less depreciation charged off	365,000.00	350,000.00
	$26,756,015.53	$26,853,093.23
Securities owned	2,538,553.62	2,488,553.62
Taxes and insurance not accrued	35,204.76	49,402.48
Current assets:		
Accounts receivable	$4,172,653.13	$1,973,047.87
Stock of materials on hand	3,500,153.58	4,079,815.57
Cash in banks	1,733,486.62	2,065,578.59
	$9,406,293.33	$9,018,442.03
Totals	$38,736,067.24	$38,409,491.36

Liabilities.

Capital stock—Common	$12,500,000.00	$12,500,000.00
Capital stock—Preferred	12,500,000.00	12,500,000.00
	$25,000,000.00	$25,000,000.00
First mortgage gold notes, payable $500,000 annually	2,000,000.00	2,500,000.00
Purchase money mortgage, McKees Rocks plant	235,000.00	235,000.00
Purchase money mortgage, Allegheny plant, 4 per cent	75,000.00	75,000.00
	$310,000.00	$310,000.00
Current liabilities:		
Accounts payable	$3,770,610.87	$5,381,119.12
Bills payable	800,000.00	
Accrued salaries and wages	176,725.52	201,763.28
Accrued interest	46,401.43	52,199.63
Accrued preferred dividends	218,750.00	218,750.00
	$5,012,487.82	$5,853,832.03
Surplus	$4,745,659.33	$2,588,775.15
Profits for year	2,907,920.09	3,381,884.18
	$7,653,579.42	$5,970,659.33
Deduct depreciation and renewals	$365,000.00	$350,000.00
Deduct dividends on preferred stock	875,000.00	875,000.00
	$1,240,000.00	$1,225,000.00
	$6,413,579.42	$4,745,659.33
Totals	$38,736,067.24	$38,409,491.36

From the accompanying statement by President Hoffstot the following extracts are taken:

During the year ending December 31, 1907, the gross sales of the company were $36,443,304.05, and after making liberal charges on account of renewals and up-keep of plant and machinery, the net profits were $2,907,920.09. These profits are entirely the result of operation, as no dividends were received from the subsidiary companies in which the company is interested, as these companies needed their earnings, as well as their working capital, in their business.

During the month of March work at both of the company's plants was entirely stopped for several days, owing to an unprecedented rise in the Ohio River, the greatest flood since the year 1832, interfering with our operations to such an extent that several weeks elapsed before normal output was attained. The damage to machinery and appliances caused by the high water required extraordinary repairs to most all of the machines, while in some instances they had to be entirely rebuilt. The expense of doing all this was charged to our operating cost.

The percentage of profit realized this year was not as great as in some previous years, due in some measure to the flood above referred to, but more largely to the payment of higher wages during the first half of the year, and to the quality of labor obtainable, it being impossible to secure out of the newer foreign population, from which we had to choose, such workmen as would measure up to as high standards as those which formerly came to this district.

Redeeming Features of Slackened Demand.

The slowing down of business, bringing with it diminution of profits, has some redeeming features, in that it modifies the attitude of labor by reason of its adjusting wages on lines proportionate to cost of production and the volume of business; such adjustment can be accomplished only when the supply of labor exceeds the demand —one of the direct results of a decrease in the volume of business. During the last six months our labor costs have been substantially reduced; at the same time there has been no diminution in efficiency. The net result, from the standpoint of cost of production, is that cars built in the latter part of the year, while labor was adjusting itself to existing conditions, were constructed at a lower cost than those built prior to the decrease of business when the demand for labor equaled or exceeded the supply.

Another feature resulting from the slowing down we are now experiencing is that during times of business depression, extra attention is stimulated and devoted not only to the reduction of cost, but also to economical improvement and development along new lines; so that while deploring the existing business conditions, some benefits accrue therefrom, and pursuing these we are bending our energies to the end that by enforced economies in labor, construction and development, we will arrive at a cost of production which will create and restore a normal demand for the company's product. We are relentlessly following this policy rather than to attempt artificially to maintain what under the existing business conditions would be unsubstantial and unreal prices. We believe that the policy sometimes adopted of attempting to maintain the same prices during periods of depression as those which existed in prosperous times, and declining to recognize existing conditions, retards rather than helps the speedy return of normal business. It is only when the demand is as great or greater than capacity that full operation and consequently fair prices can be obtained. We believe that the policy such as we recommend is the speedier way of accomplishing the desired end, namely, obtaining sufficient business to operate the company's plants to their fullest capacity.

We had in hand at the close of the year quite a number of unfilled orders which assured us of considerable income during the early months of 1908, but, for the future, business in volume depends largely upon financial conditions, as no matter how prudent it may appear to be for railroads to anticipate future necessities of traffic, it is a well-known fact that they rarely purchase equipment when that which they already have is not completely in use.

Steel Passenger Car Department.

The work of this branch of the company's business is of increasing importance. During the past year a number of all-steel cars for use on subway and elevated railroads have been constructed, and these cars are in successful operation. Among other orders on hand is one for steel passenger coaches for one of the largest trunk lines. These cars will be turned out and operated early in 1908. However, as indicated in former reports, this all-steel passenger car work is of such a pioneer nature that it cannot yet be relied upon as a fixed source of revenue. Nevertheless, it is confidently expected that these cars will in a short time be standard for passenger travel in this country. This end will not be reached promptly unless the existing antagonistic public sentiment toward railroads should change.

If it could be that public opinion in its estimation of railroads and their securities would not be misled by demagogism, ill-considered legislation and unfounded criticism, such a changed attitude, bringing with it as it would new confidence in railroad securities, would enable all railroads to offer the best equipment and the safest operation, and in our views would speedily result in a replacement of the old type of wooden cars with fireproof steel cars, thus eliminating to a very great extent the danger to life from fire, collision or by derailment. But notwithstanding our strong belief in the future of this particular branch of the business, this department has been so arranged that in the absence of orders for

fireproof passenger cars requiring a full capacity of the department, we are able to turn out in this department semifireproof and wooden passenger cars.

Subsidiary Companies.

The Western Steel Car & Foundry Company has operated the Joliet plant a considerable portion of the year with profit, and since it installed there in 1906 some very valuable machinery which this company would not now care to acquire, it has been deemed advisable to continue the lease.

During the past year car wheels continued to sell at a price out of proportion to the cost of pig iron and coke to such an extent that the Pennsylvania Car Wheel Company earned less than in former years. Notwithstanding this decrease of earnings and the charges for depreciation and wheel guaranties, there was a balance of earnings which was added to working capital. A proper charge against profit and loss was made to cover possible depreciation in inventory.

The Canada Car Company, Ltd., is in successful operation, with a good output on both freight and passenger cars, and shows substantial earnings. The existing financial conditions, however, have not warranted the making of provisions for plant extensions, nor providing additional working capital. In this latter connection we would say that by reason of the rigorous climate and the limited period of the year in which navigation is open, and the interruption of freight movement by reason of the climatic conditions, it is necessary to have a greater proportion of working capital for this plant than for a plant situated in a less rigorous climate. For these reasons dividends upon the preferred stock of this company, which are cumulative, have not been made, but it is confidently believed that our holdings of stock of this company will soon be a direct source of revenue and profit.

The operation of the Pennsylvania Malleable Company's plant has been satisfactory during the year and substantial improvements have been made on the property in the way of a fireproof building for storing patterns, replacing nonfireproofing with fireproofing construction on certain parts of the works, rehabilitating and strengthening the electric department. The malleable department has been in continuous operation.

The car wheel department which is represented by the Central Car Wheel Company showed no profit, due to the cause affecting the car wheel business in general, but it is hoped with a readjustment in values of raw material that the operation of this works will in the future show profit.

The officers of the company for the ensuing year are as follows: President, F. N. Hoffstot, 24 Broad street, New York; vice-president, J. W. Friend, Pittsburgh; second vice-president, O. C. Gayley, New York; secretary, Adrian H. Larkin, New York; assistant secretary, J. H. Regan, New York; assistant treasurer, J. M. Lambing, Pittsburgh; auditor, S. E. Moore, Pittsburgh. Executive Committee, F. N. Hoffstot, James A. Blair and Adrian H. Larkin.

The New England Foundrymen's Association.

At the monthly meeting of the New England Foundrymen's Association, held at the Exchange Club, Boston, February 12, the Committee on Shortages of Pig Iron and Coke, through J. L. Anthony, its chairman, submitted a report of the proceedings of the recent conference at Philadelphia. Vice-President W. A. Viall told of the tri-party novelty dinner given by the Philadelphia Foundrymen's Association, and offered a resolution extending a vote of thanks to the Philadelphia Association, together with hearty congratulations for the successful entertainment and the personal hospitality and friendship that existed. The resolution was unanimously adopted. The Waterbury Castings Company, Waterbury, Conn., was elected to membership. President Henry F. Arnold was in the chair.

After dinner Hugh Kennedy, general manager of the Buffalo & Susquehanna Iron Company, gave a most interesting illustrated talk, describing the operation of blast furnaces using Northern ores. It was announced that George N. Jeppson, assistant superintendent of the works of the Norton Company, Worcester, Mass., would address the March meeting of the association on "The Abrasive Wheel and Its Application to Foundry Work."

Customs Decisions.

Stamped Steel Shapes.

It was decided, February 7, by the Board of United States General Appraisers, that teapots, pitchers, handles, spouts, &c., which have been stamped from sheets of steel and then spun into shape or form, or otherwise manipulated to produce completed articles or parts thereof, are not dutiable as "stamped shapes," but, by reason of the work bestowed on the articles subsequent to their stamping, have been changed into completed articles and parts. It is therefore held that the articles are dutiable as manufactures of metal at the rate of 45 per cent., instead of at the specific rates provided for shapes. It was shown by the evidence that the articles need but the process of enameling to convert them into the enameled steel ware of commerce. General Appraiser Fischer, in overruling the contention of the importer, the Cleveland Stamping & Tool Company, remarks:

> If an article after it has been advanced by processes of manufacture to the completed form is still to be considered as a stamped shape and nothing more, then it might just as reasonably be argued that such articles, if enameled, could also be regarded as nothing more than the stamped shape, in the absence of special provision for the enameled steel ware of commerce.

A Scrap Iron Case.

A decision has been handed down reaffirming a former ruling of the board regarding the classification of old refuse iron, which was claimed by O. G. Hempstead & Son, Philadelphia, to be dutiable at 10 per cent. as "old junk." Instead, the Government's return of $4 per ton as "scrap iron" is upheld.

The Proposed Fee on Protests.

Importers and their attorneys are much disturbed at the suggestion contained in the last report of Secretary Cortelyou proposing that Congress amend the Customs Administrative act so that a fee of $5 may be charged litigants. He cites the fact that during the last fiscal year more than 87,000 protests were filed with the General Board, this being an increase of 20,000 within a year, and holds that many of the protests are "frivolous" and would not be filed were a fee exacted. It is the Secretary's idea that the fee should be returned in case the importers win finally. The importers and their legal representatives characterize the Secretary's recommendation as a "notable departure from justice." It is insisted by the protestants that the right to challenge an incorrect classification should not carry with it the requirement that a monetary consideration be charged.

Is Canadian Electricity Dutiable?

Whether electricity is a dutiable product is a question soon to come before the Board of United States General Appraisers and the Federal courts for determination. There is no provision in the present revenue law for electricity, and while the tariff contains a so-called "similitude" clause, as well as a section covering unenumerated unmanufactured and manufactured articles, these provisions apparently do not, or were not, intended to cover power and light. It appears that various American producers of electricity in the neighborhood of Buffalo have taken exception to the competition of the Niagara Falls Electric Power Company, a corporation having a generating plant on the Canadian side. It is claimed by the American electric power companies that the foreign product should be held dutiable under some paragraph of the tariff. Several years ago the question came before the Treasury Department for determination whether natural gas produced in Canada and conveyed by pipe into the United States was dutiable. At that time the Government decided that the gas was a "crude mineral" within the meaning of that term as used in the tariff, and thus free of duty. It is expected, however, that the question of the dutiability of electricity will have to be passed upon judicially.

The Gas Power Section of the A. S. M. E.

The first to organize under the new provision for professional sections of the American Society of Mechanical Engineers is the Gas Power Section, which held its first meeting Tuesday evening, February 11, 1908. It was the desire of those interested in this subject to organize that led to the appointing of a committee to consider the advisability of such sections, what their relations should be to the parent society, and to suggest rules for their conduct. This committee, consisting of Prof. F. R. Hutton, Prof. R. H. Fernald, Dr. A. D. Humphreys, F. W. Taylor and H. H. Supplee, decided that the sections should be restricted only enough to safeguard the interests of all concerned, and, therefore, suggested broad local self-government. The resolutions adopted provide that professional sections shall consist of honorary members, members, associates and juniors of the American Society of Mechanical Engineers, and others who may desire to unite as affiliates; that the latter shall pay $5 annual dues, entitling them to present and discuss papers, and receive the monthly *Proceedings* of the society; that sections may be formed to consider any engineering, scientific or professional topic if enough members of the parent society desire it; that the meetings shall be conducted in accordance with the constitution, by-laws and rules of the parent society, but shall not be considered as meetings of the society as a whole; that the Executive Committee of a section shall consist of five members of the society, who shall appoint the committees of the sections, and that each section shall have its own secretary in a measure responsible to the secretary of the society.

Prof. C. E. Lucke, presiding, explained the measures that had been taken to organize the Gas Power Section, of which he has been chosen chairman, and H. H. Supplee secretary, and presented a paper on

A Simple Continuous Gas Calorimeter.

The speaker likened a gas calorimeter to a coal calorimeter in function, but explained that unlike the latter it should be continuous and automatic in its operation. No such instrument is yet on sale, nor has the description of any been published except in patent records. By means of lantern slides existing experimental calorimeters were described. The defects of these were discussed and the speaker's means of correcting them. The principal objections are that the instruments, however successful in test work, are not commercial, either because they are not continuous or are too expensive or too complicated. The speaker showed his method of setting up the apparatus and making it automatic and recording and indicating. In place of thermometers, pyrometers with thermo couples can be substituted and continuous records made. The discussion of the paper was participated in by S. B. Daugherty, who referred to a patent of his which was the first, he believed, on displacement apparatus for a calorimeter. A. A. Cary described a simple way of roughly measuring the calorific value of gas by judging from the luminosity of a flame supplied by the gas.

The next paper was one on

Gas Turbines

by H. H. Supplee, and consisted of a brief review, illustrated by lantern slides, of apparatus, mostly experimental, which is in operation abroad.

The G. E. Gasoline Railroad Car.

The General Electric Company had been asked to present some report on an interesting gasoline engine driven railroad passenger car, which has been built and tested at the Schenectady Works. Complete data on this car was not available, but Henri G. Chatain, engineer in the gas engine department of the General Electric Company, gave an informal description of the car. The engine has eight 8 x 7 in. cylinders mounted in pairs, arranged in V pattern. It is of 125 hp. capacity, weighs 3900 lb., and develops 1 brake horsepower per hour on 1 pint of gasoline. The car is 50 ft. long, seats 46 people, and can maintain indefinitely a speed slightly over 55 miles an hour. The engine is directly connected to a generator separately excited from a small generator on the same shaft. The control of speed is effected by changing the potential of the generator. Series parallel control is also used in connection with the two motors which drive the axles. The complete car weighs 31½ tons. The engine is started, after being barred over the dead center, by shooting a cartridge in a breech block placed in one of the cylinders. About 300 grains of black powder to the charge is used and shows no evidence of injuring the cylinder walls.

Another paper presented by Professor Lucke was on the subject of

Gas Engine and Producer Guarantees.

He quoted from a number of old contracts, and without criticising their form, showed their lack of definiteness. Standard forms, he considered, should be adopted, which would be fair to all makes and to the purchasers. The discussion indicated the general appreciation of the need of such standard guarantees, and a motion was adopted that a committee be appointed by the chair to draft a proposed standard and that the section use its influence to have these adopted by builders of gas engines and producers. In so doing it was the opinion that the section would be performing a valuable service to the gas power industry at the very outset of its existence.

Labor Notes.

Three officers of Typographical Union No. 6, New York City, commonly known as "Big Six," received jail sentences of 20 days each and were fined $250 each in the Supreme Court last week. Two other members were fined $100 each. These punishments are for violating an injunction issued one year ago restraining the members of the union from interfering with or intimidating men who had taken the places of strikers in the printing shops represented in the Typothetæ. The report of the referee in the case cited instances of threats, assaults and intimidation by union men. The referee held that the officers of the union were culpable for failing to warn the members and that the mere reading of the injunction at a meeting attended by few members did not fulfill the duty of the officers to convey to all members the whole purport of the court's order.

Statistics compiled by the New York State Labor Bureau show that on January 1 out of 66,120 members of 92 representative labor organizations in New York City, 22,627, or 34 per cent., were idle. The percentages of idle members of the same unions at the beginning of preceding years were 12.8 for 1907, 6.7 for 1906 and 17.8 for 1904. Over 90 per cent. of those idle January 1 reported lack of work as the cause. At a meeting of representatives of 200 labor unions held in New York last week reports as to the number of unemployed workers in New York were received. From these it was computed that about 175,000 workers in the city were idle. It was given out by the meeting that from 50 to 60 per cent. of the mechanics of the city were out of work.

At New Orleans, La., 72 persons, representing all classes of labor employed on the river front, and composing a union known as the Dock and Cotton Council, were indicted last week by the United States Grand Jury on the charge of conspiring to restrain trade in violation of the Sherman anti-trust law. The indictments followed the refusal of the Dock and Cotton Council to permit the Coal Wheelers' Union to coal the steamer Habil. The owner signed the union agreement, had his vessel coaled and then put the case in the hands of the United States District Attorney.

The strike committee of the union molders at Dayton, Ohio, has sent notices to local foundrymen of the calling off of the strike started last year in seven foundries. The issue was that of union recognition and 300 molders and coremakers went out. The foundries have been running quite successfully as open shops and no arrangements have been made with the Iron Molders' Union.

OBITUARY.

J. K. BOUGHER.

J. K. Bougher, president of the J. W. Paxson Company, Philadelphia, Pa., died February 12, 1908, at Palm Beach, Fla., aged 68 years. He was well known in the foundry trade as one of the originators of that company. His early life was passed in the shipping trade, on the Delaware River and its tributaries, but he also served in the Union Army in the Civil War. While still a young man he formed, together with J. W. Paxson, the firm of Paxson & Co., miners and shippers of molding sand, which business grew to the manufacture of general foundry supplies. Mr. Bougher was prominently connected with a large number of industrial enterprises and in addition to the Paxson Company was president of the Lumberton Sand Company, the Welsh Mountain Mining & Kaolin Mfg. Company and the Burlington County Traction Company. He was a director of the Kensington National Bank, Philadelphia, served as director in a



J. K. BOUGHER.

number of other institutions, and was a member of the Union League, Manufacturers' and Columbia clubs. He leaves a widow and six children.

PATRICK KENNEDY, a prominent foundryman of Baltimore, Md., died, February 9, after a long illness. He was born in Ireland and came to this country when a boy, locating in Philadelphia, where he served an apprenticeship as a molder. He removed to Baltimore 19 years ago, purchased a foundry and gradually built up the extensive business now conducted by the P. Kennedy Foundry Company. He also established the Baltimore Malleable Iron & Steel Casting Company, whose plant joins the Kennedy foundry. It is stated that during the entire time in which he has been engaged as an employer he never had a strike. He leaves a widow, two sons and three daughters.

PHILIP ELEY, inventor of fire hydrants and tapping machines, died, February 13, at Bayonne, N. J., aged 68 years. He leaves a widow, five sons and a daughter.

JOHN C. KUPFERLE, manufacturer of plumbers' supplies and hardware specialties, St. Louis, Mo., died, February 7, after an illness of more than one year. He was born in Cincinnati, September 2, 1836, and went to St. Louis 51 years ago, where he established an iron foundry. During the Civil War he manufactured great quantities of saddlery hardware, bayonet tips and other articles for military purposes, together with supplies for gunboats for the contracting firm of McCord & Beck, and later produced a great deal of material for Captain Eads, the engineer who designed and built the St. Louis bridge over the Mississippi. At the time of his death he was sole owner of the foundry bearing his name at Second and Mound streets. An illustrated biographical sketch of Mr. Kupferle was published in *The Iron Age* of June 27, 1907. He leaves a widow and six children.

THEODORE SMITH, president of the Theodore Smith & Sons Company, operating iron works in Jersey City, N. J., died, February 11, aged 73 years. He founded the business which bears his name in 1865. His company built several of the dredging machines used in the first work on the Panama Canal. He leaves a widow and three sons.

WILLARD A. GRAY, chief engineer of the Milwaukee plant of the American Bridge Company, died suddenly, February 11, following an attack of grip, aged 41 years. He was born at Bloomington, Ill. His father was a former chief engineer of the Chicago & Alton Railroad, with which the son was employed for a time after his graduation from the University of Illinois. He moved to Milwaukee in 1898 and became connected with the Milwaukee Iron & Bridge Company, which later was absorbed by the American Bridge Company. He leaves a widow and five children.

PETER BROWN, a retired furnace builder and iron manufacturer, died at Allentown, Pa., February 3, aged 83 years. He built many blast furnaces in Pennsylvania, New York and New Jersey.

Court Upholds a Concerted Lockout.

In the Supreme Court, New York City, February 18, a decision was given against the Thompson-Starrett Company in an action it had brought against the Building Trades Employers' Association of New York. The Brotherhood of Carpenters had repudiated its agreement with the Employers' Association and its members had gone on a strike. The Board of Governors of the association declared a lockout against the union carpenters. As a member of the association, the Thompson-Starrett Company discharged all members of the Brotherhood of Carpenters in its employ in the fall of 1904, but on January 15, 1905, contrary to the decision of the Board of Governors, it began re-employing members of the Brotherhood. The Employers' Association decided that the company had violated its membership agreement and had forfeited the bonds given when it joined the association. The company brought suit to recover the amount of the bonds.

The court held that the purpose of the formation of the association was to meet by the very methods subsequently employed, such a contingency as led to the passing of the resolutions for a general lockout of unfriendly unions, and hence that the action of the Board of Governors was in accord with its constitution. The court considered that if the Thompson-Starrett Company had availed itself of the employment bureau of the association it would have secured all the men it needed, and, therefore, competition was not restricted. The purpose of the agreement was to prevent the disastrous delays that might be produced by labor organizations in the absence of such an agreement by employers, and to cure the hazardous situation which confronted the company before it joined the association. The act of becoming a member being in itself lawful and directly related to the corporate powers of the company, the court held that it did not transcend its powers when it subscribed to the constitution. It was further held that the resolution passed by the Board of Governors was not necessarily against public policy, and that the bond was enforceable.

Smooth-On asbestos sheet packing is a new product of the Smooth-On Mfg. Company, Jersey City, N. J., which is made by treating asbestos woven metallic cloth with Smooth-On iron cement. This packing is described as strong and pliable and capable of withstanding high temperatures and pressures, making it valuable for packing joints in gasoline engines and superheated steam pipes. When the flange faces are rough or uneven it is recommended tht they be coated with Smooth-On elastic cement before making the joint. The packing is made in rolls 10 yd. long, 40 in. wide and 1-16 in. thick. The average weight per square yard is 5 lb.

PERSONAL.

At a recent meeting of the directors of the Capitol Lock-Nut & Washer Company, Columbus, Ohio, William Singleton was elected secretary and treasurer. He is well known in the iron and steel circles of the Central West.

W. P. Snyder, president of the Shenango Furnace Company, Pittsburgh, has gone to his winter home at Palm Beach, Fla., to remain several months.

James Scott, general superintendent of the Lucy furnaces of the Carnegie Steel Company, Pittsburgh, has gone to Mexico on a business and pleasure trip.

T. L. Livermore, vice-president of the Calumet & Hecla Mining Company, sailed February 15 for a two months' visit to Europe.

A. H. Swartz, formerly connected with the Carnegie Steel Company's and Republic Iron & Steel Company's plants, at Youngstown, Ohio, and having a wide acquaintance among operators of power plants throughout the country, has taken a position on the selling force of the Rust Boiler Company, Pittsburgh, Pa.

Louis H. Abenheimer, Pacific Coast manager for the Arthur Koppel Company, has returned to his offices in the Chronicle Building in San Francisco, after spending two weeks in the East on business connected with the company.

R. W. Martindale, Pacific Coast manager for the United States Cast Iron Pipe & Foundry Company, recently returned to San Francisco after visiting Chicago on important business.

E. J. Schneider, Pacific Coast sales agent for the American Bridge Company, has returned to his office in the Crocker Building in San Francisco after an Eastern trip.

Hugh Dewart has resigned as secretary of the Executive Committee and assistant treasurer of the Republic Iron & Steel Company and is now connected with the Mohican Company, New York.

John Fritz has been elected a member of the Board of Trustees of Lehigh University, South Bethlehem, Pa., and has accepted the position. His universally recognized high standing among the engineers of the country makes this addition to the board of such an important technical institution eminently fitting.

Sanderson & Porter, engineers, 52 William street, New York, announce that Wynn Meredith has been admitted as a member of the firm and will take charge of its Western office, Union Trust Building, San Francisco.

J. C. Maben, president of the Sloss-Sheffield Steel & Iron Company, Birmingham, Ala., sailed on Tuesday for a brief European trip.

After an absence of over six years from the iron and steel trade, James V. Umberger has connected himself with the Swedish Iron and Steel Corporation, importer of Swedish tool steel, charcoal bar iron and specialties, 16 Exchange Place, New York, as office manager.

Charles H. Domhoff, president and treasurer of the Domhoff & Joyce Company, Cincinnati, since the organization of that company, has resigned and retires from active work after 37 years' connection with the pig iron commission business in Cincinnati. John Sargent succeeds Mr. Domhoff as president and treasurer, E. C. Humphreys is vice-president, and C. H. Jenkins is secretary and assistant treasurer. All have been with the Domhoff & Joyce Company for years. Mr. Domhoff is still a member of the Board of Directors.

Lester G. French has been appointed editor of the monthly *Proceedings* of the American Society of Mechanical Engineers and of its *Transactions*, which are published annually. Mr. French was for nine years editor of *Machinery*, New York, and in the past year has been associated with his father, O. L. French, in the publishing business at Brattleboro, Vt. Under his conduct it is the expectation to expand and develop the publications of the society.

Philip J. Nash, who is both a technical and practical man, with long experience in the industrial railroad business, has taken charge of the sales department in Chicago of the Ernst Wiener Company, New York. The Chicago offices are located at 863 Monadnock Building.

Charles L. Huston of the Lukens Iron & Steel Company, Coatesville, Pa., addressed the Mining and Metallurgical Section of the Franklin Institute, Philadelphia, on the evening of February 13, on "Practical Experiments in Steel," with special reference to segregation and its relation to plate specifications, illustrating his remarks by means of charts and microphotographs.

NEWS OF THE WORKS.

Iron and Steel.

D. Lamond & Son, Ferguson Building, Pittsburgh, builders of blast furnaces and sole agents for the C. H. Foote patented firebrick stoves, have completed the erection of four 20 x 90 ft. Foote stoves at the new blast furnace being erected by the Woodward Iron Company, Woodward, Ala., which will likely be ready for blast in about 90 days.

The Dover Forge & Iron Company, Canal Dover, Ohio, has re-elected the following officers: A. J. Krantz, president; James Rees, vice-president: Joseph A. Krantz, secretary and treasurer.

Mary Furnace of the Ohio Iron & Steel Company at Lowellville, Ohio, will be blown out in the next week or 10 days.

Cherry Valley Furnace at Leetonia, Ohio, and Fannie Furnace at West Middlesex, Pa., of the United Iron & Steel Company, Pittsburgh, are being relined.

The Youngstown Steel Company, operating a blast furnace at Youngstown, Ohio, has elected the following officers: E. L. Ford, president and general manager; Paul Jones, vice-president, and John Stambaugh, secretary and treasurer. The directors are E. L. Ford, Paul Jones, H. H. Stambaugh, George Tod and John Stambaugh.

The No. 4 furnace of the Sloss-Sheffield Steel & Iron Company, at North Birmingham, Ala., will be blown in the coming week.

General Machinery.

The Buettner & Shelburne Machine Company, Sullivan, Ind., will move its plant to Terre Haute, Ind., in about four to six weeks. The new building to be occupied by the company at Terre Haute has been completed and boilers installed, and the plant is in readiness for the installation of the machinery.

The Webb Machine Works and the Capell Fan & Engineering Company, Monongahela, Pa., were consolidated February 1 under the style of the Capell Fan & Engineering Company.

The Rathbone Molding Machine Company, Detroit, Mich., has incorporated with an authorized capital stock of $100,000, and has taken over the molding machine business previously conducted by John A. Rathbone. The manufacture and sale of the Rathbone multiple molding machine will be continued.

The C. B. Ford Company, Richmond, Va., engineer and machinist, is in the market for a hoisting engine.

Dewey Brothers, Goldsboro, N. C., operating a foundry and woodworking plant, have incorporated with a capital stock of $100,000 and will enlarge the plant as soon as business improves. C. Dewey is president; Thomas A. Dewey, secretary and treasurer, and George S. Dewey, general manager.

It is understood that the South & Western Railroad, Johnson City, Tenn., will rebuild its machine shop at Carnegie, which was recently destroyed by fire.

L. O. Koven & Brother, 50 Cliff street, New York, manufacturers of high pressure galvanized range boilers, opened their new machine shop on Hope street, Jersey City, N. J., February 8. The building is of mill construction, five stories high, and is to be equipped with modern machinery for the class of work which they do, and in addition a general machine shop business will be conducted. Electric power has been installed for lighting and for driving tools, as have also wrought iron pneumatic tubes to which pneumatic tools can be attached. The building has an area of 21,000 sq. ft. The ground floor is used for storage purposes, and on the first floor, which will be used for erecting purposes, are the heavy machines. The second floor contains the machinery of medium weight, and on this floor are the toolroom, laboratory, &c. The third floor is also used for machinery, and on the fourth floor are the drafting rooms, office of the chief engineer and a private office.

The Richmond Forging Corporation, Richmond, Va., has recently added a 30-in. by 16-ft. lathe, installed an I-beam overhead trolley system and doubled its fuel oil storage capacity. Its trade has not been especially affected by the money panic in amount of work in hand. A considerable amount of correspondence is now being received as to new contracts, and general indications are that the works will be running before long to their full capacity, as they have for several years past. The company has a contract with a Philadelphia house for the manufacture of various kinds of tools for foreign trade.

Power Plant Equipment.

The Power Specialty Company, 111 Broadway, New York, manufacturer of the Foster patent steam superheater, has secured among recent contracts the following, covering installation of this superheater in the boilers indicated: Home Electric Light & Steam Heating Company, Tyrone, Pa., 840 hp. in Stirling boilers; Torresdale filtration plant, Philadelphia, second order, 900 hp. in Heine boilers; Western Clock Mfg. Company, La Salle, Ill., second order, 300 hp. in return tubular boilers; Bernheimer & Schwartz Brewing Company, New York, 1900 hp. in Heine boilers; Garden City Company, Garden City, L. I., 200 hp. in return tubular boilers; National Sugar Refining Company, Yonkers, N. Y., 1134 hp. in Babcock & Wilcox boilers. It has also sold Foster superheaters of the independently fired type to the New Jersey Zinc Company, University of West Virginia, Abendroth & Root Mfg. Company, and Seacoast Canning Company. This latter company has within the past year equipped seven of its plants with Foster superheaters, the same being installed in return tubular type of boilers.

The Mayfield Water & Light Company, Mayfield, Ky., is arranging to rebuild its electric system and will also lay about six miles of cast iron water mains.

A committee has been appointed by the City Council of Eveleth, Minn., to investigate and report upon the advisability of installing an electric light plant. Thus far no definite plans have been developed.

The Amarillo Street Railway Company, Amarillo, Texas, will install an electric light and power plant, for which considerable equipment will be required. H. A. Nobles is president.

The City Council of Nashville, Tenn., is considering the enlargement of the electric light plant.

The Missouri Water, Light & Traction Company, Nevada, Mo., has received bids and will let contracts within the next few days for boilers and other power plant equipment amounting to about $6000.

The Manley Jail Works, Dalton, Ga., is in the market for a 100-hp. stationary boiler with 60-ft. stack. Delivery is not required before April 1.

Foundries.

The New Process Casting & Metal Company has been organized at Memphis, Tenn., with a capital stock of $50,000, and will do a general metal, foundry and machine business. H. G. Underwood, H. B. White, W. S. Brian, D. S. Rice and A. W. Ketchum are the incorporators.

The Avondale Stove & Foundry Company, Birmingham, Ala., has resumed operations after an idleness of three months.

The Dimmick Pipe Company, Birmingham, Ala., has resumed operations after a suspension of one week.

The Beggs Pipe & Foundry Company, Birmingham, Ala., has resumed operations after an idleness of four months or more.

Bridges and Buildings.

Wm. Farris & Brothers, 204 Diamond Bank Building, Pittsburgh, have received an order from the County Court of Mineral County, W. Va., for the concrete foundation work and steel superstructures for four highway bridges to be erected near Keyser, W. Va., also an order from the Pocahontas County Court for one highway bridge to be erected near Marlinton, W. Va. The steel work for the latter job is being furnished by the Bellefontaine Bridge & Steel Company, Bellefontaine, Ohio. A highway bridge and some steel for repair work for Brooke County, near Bethany College, W. Va., were recently shipped by the Jones & Laughlin Steel Company, while a small highway bridge intended for Berkley County, near Martinsburg, W. Va., was recently furnished by the Carnegie Steel Company.

The Penn Bridge Company, Beaver Falls, Pa., has received a contract for the erection of a steel bridge at Sybertsville, Pa., to cost $10,997

The National Iron & Wire Company, Cleveland, Ohio, has been awarded the contract for the ornamental iron work for the new Technical High School that is being erected in Cleveland. The contract will amount to about $14,000.

Fires.

The iron foundry of the Hedden Iron Construction Company, Bloomfield, N. J., was destroyed by fire February 11, the loss being about $10,000. It is understood that the building, 75 x 100 ft., will be rebuilt as quickly as possible.

The plant of the National Drain & Tile Company, Summitville, Ill., was burned February 9, the loss being about $20,000.

The plant of the Southern Car Company, High Point, N. C., was burned February 9. The loss is placed at $50,000.

The power house of A. C. Hope, Cartersville, Ind., was destroyed by fire February 7, the loss being about $20,000.

The machine shop of the Vesta Coal Company, near Coal Center, Pa., was burned February 9, the loss being about $3000.

The shipyard of John A. Albertson & Co. and the ship joining factory of Gilbert Fanning & Son, Greenport, L. I., were burned February 14, the combined loss being about $8000.

The plant of the Danvers Iron Works, Danvers, Mass., was burned February 11, with a loss of about $10,000.

The factory of the National Tool & Axe Works, Three Rivers, Quebec, was burned February 7, the loss being about $5000.

The tube mill of the Coatesville Rolling Mill Company, Coatesville, Pa., was damaged $10,000 by fire February 8.

Hardware.

The Crawfordsville Wire & Nail Company, Crawfordsville, Ind., has increased its capital stock from $100,000 to $150,000. The officers are as follows: W. P. Herron, president and treasurer; I. A. Detchon, vice-president; C. D. Voris, secretary and general manager.

The Cohasset Hardware Mfg. Company, Cohasset, Minn., has secured a franchise from the municipality for the establishment of an electric light plant, which is now under construction.

The Jennings, Hall, Sperry Company, Wallingford, Conn., has been organized to manufacture a slicing machine that will slice boiled ham and any other meat. The president of the company is J. C. Hall, the patentee; A. B. Jennings, the treasurer, is superintendent of the Jennings & Griffen Company, and J. L. Sperry, the secretary, has had 20 years' experience on the road. The factory at Wallingford has been equipped for present needs. It is claimed for the slicing machine that while selling at a low price it will slice ham, a meat which has defied the cheaper appliances for the purpose, it is claimed.

Adolph Kastor of Adolph Kastor & Bros., 109 Duane street, New York, manufacturers and importers of cutlery, and who own the Camillus Cutlery Company, Camillus, N. Y., has just returned from Camillus, where he has given directions to start up at once full time and six days a week. For the past two months the factory has been operated on a 45-hr. per week schedule.

Miscellaneous.

The Blaw Collapsible Steel Centering Company, Westinghouse Building, Pittsburgh, has received an order from the T. B. Jones Company, St. Louis, for steel centering work on a large contract for sewerage, which the latter has secured at Louisville, Ky.

P. P. Mast & Co., Springfield, Ohio, manufacturers of agricultural implements, have been placed in the hands of a receiver. The assets are said to greatly exceed the liabilities, which are placed at $400,000.

The McAllester Portland Cement Company, McAllester, Okla., is planning to construct a 1250-bbl. Portland cement plant, the land for which has been secured. The plant will cover about 10 acres, and the company plans to spend about $75,000 for the erection of the buildings and $300,000 for the mechanical equipment. The company has been temporarily organized by the election of C. N. Gould, president; A. C. Farmer, vice-president; H. E. Swan, secretary and treasurer, and J. F. Riley, treasurer.

Press reports of the damage done by fire at the plant of the Standard Galvanizing Company at West Pittsburgh, Pa., were very largely exaggerated, the only damage done being to the roof and which did not exceed $2000. This will be repaired at once, and the company will resume operations in a few days, and there will be practically no time lost in filling orders.

The annual meeting of stockholders of the Standard Steel Car Company was held in its offices in the Frick Building, Pittsburgh, last week, at which the former officers and directors were re-elected, as follows: J. M. Hansen, president; J. B. Brady, vice-president; Wm. Bierman, secretary, and T. H. Gillespie, treasurer, who together with the following constitute the Board of Directors: A. W., R. B. and W. L. Mellon, and Henry Aiken.

The Pittsburgh Roofing & Supply Company, Pittsburgh, will change from a partnership to a corporation, and application has been made for a Pennsylvania charter. The company will act as Pittsburgh District representative for the Vulcanite Roofing Company. William S. Wills, Charles W. Walters and S. G. Byrnes compose the company.

The Pennsylvania Royal Lamp Company has opened offices in the Wabash Building, Pittsburgh, and will put on the market the Royal flaming arc lamp. James R. Dodworth is president and Frank B. Ward is general manager.

The Pennsylvania Railroad has adopted economies since the falling off in business in the latter part of 1907 which cut nearly $1,500,000 from its expenses for January. The working time of the men in all departments has been reduced so as to keep regular employees on the payrolls. To avoid discharging men who are in line to participate in the road's pension system, many of the younger men are being transferred from the regular to the extra class. In the shops hours are being cut down 25 to 40 per cent. The total of idle cars on the system is 77,000, and about 400 locomotives are laid up. To bring repair bills to the minimum, cars are being taken from the idle list to replace such as are damaged enough to require overhauling, and these last will be kept out of commission until business revives.

The Iron and Metal Trades

Reports of further conferences of Steel manufacturers in New York this week have no more substance than the fact that the general sales managers of the subsidiaries of the Steel Corporation are holding their regular monthly meeting. The reviews of the situation, as developed by the meeting, show how the trade is settling down to the conditions that must prevail while industry is under siege by politics. It is scarcely worth the attempt to differentiate one week from another when the gradations of improvement are so fine as at present. Here and there evidences of enlarging consumption appear, and naturally the most is made of symptoms ordinarily neglected.

Pig Iron markets are uniformly dull, though in one district inquiry from stove manufacturers and elsewhere continuing scattered buying by pipe foundries are noted. The elaborate scheme of delivered prices adopted by Central Western furnaces is yet to be tried out. Variations from it to the extent of 25 cents are heard of in the Chicago District. A Chicago steel interest is reported to have bought 5000 tons of Basic Pig Iron at $17.50 delivered. In the Mahoning and Shenango valleys Pig Iron shipments are estimated to equal furnace output, leaving stocks substantially as they are.

The proposal to bring Southern Pig Iron producers into closer co-operation with those of the East and Central West has gone as far as an appointment for a meeting at Birmingham. One important Alabama interest has not been willing thus far to enter into such an arrangement, and without this company the plan would probably not be carried out. No exports of Southern Pig Iron have been reported since the recent trial shipment to Genoa. At current prices abroad such business would net $10 to $10.25, Birmingham, for No. 2 Foundry Iron, which is not attractive under present costs.

Cast Iron Pipe, both in its activity this month and in its prospects, probably comes nearer to normal than any other product. The history of other times of depression is repeating itself in this trade. At Syracuse, N. Y., about 15,000 tons will be awarded in the coming month, and various municipalities are planning work for this year. San Francisco's high pressure salt water system for fire protection will call for an outlay of $3,000,000 for Pipe, extending over several years. At Los Angeles a new water supply project will be carried out, and other Coast cities are soon to be buyers of Pipe.

Finished Steel lines show some betterment. The Steel Corporation is now operating nearly 50 per cent. of its rolling capacity, and two more of its blast furnaces were started in the past week. Plate and Structural mills are worst off at the moment, while some increase is noted in Tubes. On the question of price maintenance sentiment of a large percentage of consuming interests in various lines is represented as supporting the stand of the manufacturers.

Rail business is still held back, and much of this year's tonnage is certain to be late in coming on the books. Estimates of the total range from 45 to 60 per cent. of last year's, the former figure coming from the manufacturing side, while the latter represents the view of leading railroad interests.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Feb.19, 1908.	Feb.12, 1908.	Jan.15, 1908.	Feb.20, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	$18.25	$18.25	$18.25	$25.50
Foundry No. 2, Southern, Cincinnati	*15.75*	15.75	16.25	26.00
Foundry No. 2, Local, Chicago	*17.75*	18.00	18.00	25.50
Bessemer, Pittsburgh	*17.90*	17.90	18.90	22.85
Gray Forge, Pittsburgh	*15.90*	16.00	16.90	21.85
Lake Superior Charcoal, Chicago	*21.00*	21.00	22.50	27.00
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	29.50
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.00
Open Hearth Billets, Phila.	**30.40**	30.40	30.00	33.00
Wire Rods, Pittsburgh	**35.00**	35.00	34.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	**13.00**	13.00	12.00	18.00
Steel Rails, Melting, Phila.	**15.00**	14.00	11.50	19.50
Iron Rails, Chicago	**17.00**	17.50	15.00	25.00
Iron Rails, Philadelphia	**18.00**	18.00	16.50	27.50
Car Wheels, Chicago	*15.00*	18.50	19.00	23.00
Car Wheels, Philadelphia	*16.50*	17.00	19.00	23.25
Heavy Steel Scrap, Pittsburgh	**13.75**	14.00	12.50	18.00
Heavy Steel Scrap, Chicago	**12.50**	12.50	10.75	15.50
Heavy Steel Scrap, Phila.	**15.00**	14.00	11.50	19.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	*1.65*	1.65	1.75	1.93½
Common Iron Bars, Chicago	**1.65**	1.65	1.55	1.81½
Common Iron Bars, Pittsburgh	**1.50**	1.50	1.40	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.70	1.70	1.70	1.85
Skelp, Sheared Steel, Pittsburgh	1.80	1.80	1.80	1.95
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	2.00	2.00	2.00	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	*12.87½*	13.37½	14.00	25.12½
Electrolytic Copper, New York	*12.62½*	13.37½	13.87½	24.87½
Spelter, New York	**4.75**	4.90	4.70	7.00
Spelter, St. Louis	**4.80**	4.75	4.60	6.80
Lead, New York	3.75	3.75	3.75	6.30
Lead, St. Louis	**3.65**	3.75	3.60	6.10
Tin, New York	**28.15**	29.50	27.75	41.85
Antimony, Hallett, New York	**9.00**	9.00	8.75	25.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, February 19, 1908. (By Telegraph.)

In practically all lines of finished material new business is developing very slowly, and during the past week but little if any gain has been made in the rate of improvement. The railroads, which normally supply a large portion of the mill tonnage, are placing orders for no more material than is absolutely required for immediate use, and until these interests begin to purchase more liberally the market will lack the support necessary to give it strong impetus. During the interval in which the No. 1 Rail mill of the Illinois Steel Company has been idle enough specifications have accumulated to warrant starting up, and its operation was resumed on Monday. How long it will continue will depend upon the amount of new business that may be received in the immediate future. The Structural mill was started at the same time, and its activity is contingent upon the same conditions. New Structural work taken by fabricators is of light tonnage, and consists principally of railroad bridges. There is a notable absence of new contracts for building structures. At a meeting held in Baltimore last week by the representatives of the American Bridge Company, the opinion was unanimously expressed that a reduction of prices of Structural material would at this time result in no increase in orders. Fabricating work is being done on exceedingly low margins, and it was the general belief that no reasonable reduction from present mill prices of Structural material would influence investments. The demand for Plates, Pipe and Steel Bars continues light, and only a very moderate

amount of Bar Iron business has been booked at the new price of 1.65c., Chicago. While last week's developments in Pig Iron showed a little more activity than in recent weeks, there has on the whole been no appreciable change in general conditions. There is a good deal of uniformity in nominal quotations, which, however, do not represent the actual selling prices. Trade in Scrap Iron is largely confined to dealers, there being but little demand from consumers.

Pig Iron.—Some of the inquiries referred to in last week's report have developed into orders, and what in the present condition of trade is regarded as a fairly good business is included in the week's transactions. Three or four lots of around 1000 tons, one of which was for Basic, and taken by a local interest, were booked, besides some scattering lots ranging from 100 to 500 tons. Considerable reticence is observed among the sellers as to the amount and nature of tonnage taken, but from the best information obtainable it is conservatively estimated that sales in this market for the past week represent an aggregate of more than 5000 tons. There are no indications pointing toward a closer agreement as to prices among the various furnaces than has heretofore existed, but $13.50, Birmingham, is still being maintained by the principal Southern furnaces as the quotation on No. 2 Foundry. There are persistent rumors of sales at around $12.50, but no definite evidence of such transactions is available. In the absence of trustworthy information to the contrary, we continue to hold $13, Birmingham, as representing the general market level. It is apparent this week that $18, Chicago, for No. 2 Northern, is not being maintained. The Northern market is under considerable pressure from the continued operation of certain stacks, whose output is being added to the surplus of unabsorbed stocks. The price of No. 2 Northern is, therefore, reduced 25c. a ton. While there is seemingly no marked increase in foundry operations, a little better feeling is shown by the fact that forwarding orders on held up shipments are somewhat more frequent. What improvement there is seems to be mainly among the outside melters, those depending upon the railroads for business continuing to run very light. The following prices are for February and March delivery, f.o.b. Chicago:

Lake Superior Charcoal	$21.50 to $22.00
Northern Coke Foundry, No. 1	18.25 to 18.75
Northern Coke Foundry, No. 2	17.75 to 18.25
Northern Coke Foundry, No. 3	17.25 to 17.75
Northern Scotch, No. 1	19.00 to 19.50
Southern Coke, No. 1	17.85 to 18.35
Southern Coke, No. 2	17.35 to 17.85
Southern Coke, No. 3	16.85 to 17.35
Southern Coke, No. 4	16.35 to 16.85
Southern Coke, No. 1 Soft	17.85 to 18.35
Southern Coke, No. 2 Soft	17.35 to 17.85
Southern Gray Forge	15.35 to 15.85
Southern Mottled	15.10 to 15.60
Malleable Bessemer	18.50 to 19.00
Standard Bessemer	20.40 to 20.90
Jackson Co. and Kentucky Silvery, 6 %	20.40 to 20.90
Jackson Co. and Kentucky Silvery, 8 %	22.40 to 22.90
Jackson Co. and Kentucky Silvery, 10 %	24.40 to 24.90

(*By Mail.*)

Billets and Rods.—Orders for Billets continue to be few in number and of small tonnage, indicating that consumers are buying only for actual needs. In the absence of any sales of consequence we continue to quote Forging Billets at $33 to $34, Chicago, which prices are reported to be firmly maintained. The demand for Wire Rods is fair and prices hold firmly at the following quotations: Bessemer, $35; Basic, $36; Chain, $37, Pittsburgh.

Rails and Track Supplies.—No new inquiries for Standard Section Rails of considerable size have appeared in the market during the past week. The only business of this kind reported is comprised of a few small orders for maintenance purposes. A few inquiries have been received from electric lines for Rails to be used for contemplated extension, the largest of which amounted to 1500 tons. There is but little activity in Light Rails, the prices of which are somewhat demoralized. The regular prices here quoted are being strongly shaded; concessions of $3 to $4 a ton have been made, and even lower prices are hinted at. Track Supplies are moving slowly, the policy of the railroads still being to buy for current requirements only. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.90c. to 2c., according to delivery; Track Bolts, 2.40c. to 2.50c., base, Square Nuts, and 2.55c. to 2.65c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—The past week has not been at all prolific in the development of Structural tonnage. A number of large building projects that seemed on the point of closure several weeks ago are still holding back, although there is no disposition shown to abandon the projects. In the new business that has come into the market for figures within the past few days are 1500 tons of bridge material required by the Chicago & North Western Railway; 300 tons to be used in the building of a line of high voltage transmission towers, and 700 tons for a warehouse to be erected by W. W. Goodwin, Kansas City. A moderate amount of tonnage, comprised of small contracts, has been taken by the fabricating shops, but on the whole transactions were somewhat lighter than for several weeks past. The Structural mill of the Illinois Steel Company was put in operation Monday for the purpose of taking care of accumulated specifications and stock orders. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—New business shows but little, if any, acceleration, orders being mainly for small lots required for immediate use. The demand for Universal Plates is a little better than for Sheared, though in either line the aggregate tonnage is small. While the actual demand from warehouse stocks is only moderate, inquiries are reported to be better, including some for lots of fair tonnage from the boiler shops. Mill prices are pretty evenly maintained except by a few of the smaller mills, which on narrow Plates within their capacity are reported to be shading regular prices from $1 to $2 a ton. We quote for shipment from mill as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, $0.25c. extra.

Sheets.—While it cannot be said there has been any appreciable gain in the amount of business offered during the week, there is a moderately good demand for both Black and Galvanized Sheets, especially of the lighter gauges used for roofing. Very few buyers are contracting ahead for tonnage, but are ordering in small amounts and more frequently. At the meeting held by the independent interests last week it was generally agreed that a recession in prices at this time would be rather detrimental than otherwise to all interests concerned, and it was, therefore, decided to maintain current schedules for the present at least. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 to 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c. Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c. Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bar Iron.—Following the active buying that preceded the advance of $2 a ton made by the Bar Iron interests two weeks ago, only a moderate amount of business has been booked at the new price. Specifications against these recent contracts have not begun to come in in any considerable volume, and the mills continue to run only intermittently, being operated about one-half time. Both new business and specifications for Steel Bars are light, though slight improvement is noted. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—The gain for the past week in new business was not pronounced, but encouragement is offered in the fact that there is a gain, however slight. No large orders are being placed, either by manufacturers or jobbers, all interests being content to supply their needs in a hand to mouth fashion. Some of the large jobbers are disposed to stiffen up prices, which, on store business, have been badly demoralized. As a result the leading distributors have made advances from one-half to one point over the extreme discounts that have recently been offered. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 72 to 72½ per cent. on Black Steel Pipe, ¾ to 6 in. About four points advance above these prices is asked for Iron Pipe.

Boiler Tubes.—Business is principally confined to small orders to supply immediate needs. A somewhat better movement is reported from warehouse stocks, which, coupled with more active inquiry, indicates a moderate improvement of conditions among the boiler shops. Both mill and store prices are reported to be evenly maintained. Mill quotations for future delivery, on the base sizes, are as follows: 2¾ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2¼ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	35	35	35
1¾ to 2¼ in.	30	35	35
2½ in.	32½	35	35
2¾ to 3 in.	60	47½	47½
3½ in. and larger	50	35	...

Merchant Steel.—There is very little movement in the lines comprised under this head. Specifications of only moderate volume are being offered on miscellaneous shapes. Prices on Shafting continue irregular, and regular discounts are being shaded from 5 to 10 per cent., but even these concessions have little effect in stimulating buying. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1⅛ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 54 per cent. off in car lots; 48 per cent., less than car lots, base territory delivery.

Cast Iron Pipe.—Of the pending business noted in last report, the 1200 tons let at Cleveland, Ohio, was taken by the United States Cast Iron Pipe & Foundry Company; a contract for 1500 tons was also let at Indianapolis to the Lynchburg Foundry Company. The city of Detroit, Mich., will this week let 1200 tons and South Bend, Ind., 700 tons. Foundrymen are of the opinion that a good deal of business is being held back in the hope of a further reduction of prices. It is, therefore, believed that a more settled state of values would stimulate buying. We quote, per net ton, Chicago, as follows: Water Pipe, 4-in., $30; 6 to 12 in., $29; 16-in. and up, $28, with $1 extra for Gas Pipe.

Old Material.—The demand from the consuming trade continues very light. Neither the mills nor melters are disposed to take on much tonnage, and what trade there is, therefore, is principally among the dealers. Under the circumstances the market is not regarded as firmly intrenched at its present level, but, on the other hand, there is as yet no definite evidence of an actual recession in price. A better demand from consumers is needed, however, to insure the maintenance of present prices. While there is some divergence of opinion among dealers upon the question of values, the majority of transactions indicate a fair degree of firmness at prices quoted. In consequence of the reduced operations of the car wheel foundries, more Old Wheels are coming on to the open market than has been the case for some months, and lower prices are the result. But, at that, few lots of considerable tonnage are being sold, since the offers made have not proved attractive to the roads. On Old Wheels $16 has been done recently, but it is doubtful if takers could be found for much tonnage at that price. No. 1 Cast holds pretty firmly at around $13, and sales have been made within a week at an advance of 50c. a ton over this price. We quote, per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$17.00 to $17.50
Old Steel Rails, relaying	13.00 to 13.50
Old Steel Rails, less than 3 ft.	13.00 to 13.50
Relaying Rails, standard sections, subject to inspection	22.00 to 23.00
Old Car Wheels	15.00 to 15.50
Heavy Melting Steel Scrap	12.50 to 13.00
Frogs, Switches and Guards, cut apart	12.25 to 12.75
Mixed Steel	9.50 to 10.00

The following quotations are per net ton:

Iron Fish Plates	$17.00 to $17.50
Iron Car Axles	16.75 to 17.25
Steel Car Axles	15.50 to 16.00
No. 1 Railroad Wrought	12.50 to 13.00
No. 2 Railroad Wrought	10.25 to 10.75
Railway Springs	11.50 to 12.00
Locomotive Tires, smooth	15.00 to 15.50
No. 1 Dealers' Forge	9.75 to 10.25
Mixed Busheling	8.00 to 8.50
Iron Axle Turnings	7.25 to 7.75
Soft Steel Axle Turnings	7.25 to 7.75
Machine Shop Turnings	7.25 to 7.75
Cast Borings	5.00 to 5.50
Mixed Borings, &c	5.00 to 5.50
No. 1 Mill	7.50 to 8.00
No. 2 Mill	6.50 to 7.00
No. 1 Boilers, cut to Sheets and Rings	7.50 to 8.00
No. 1 Cast Scrap	13.00 to 13.50
Stove Plate and Light Cast Scrap	11.25 to 11.75
Railroad Malleable	11.25 to 11.75
Agricultural Malleable	10.50 to 11.00
Pipes and Flues	9.00 to 9.50

Metals.—With the exception of Spelter, which has moved up about 30c. per 100 lb., and a slight advance in Pig Tin, the entire list of Metals is unchanged in price. A little better inquiry for Copper has developed and a few more orders are coming out, but they cover only small lots needed for work in hand. Though not as yet reflected in an actual decline the general trend of the market is toward further weakness. We quote as follows: Casting Copper, 14c.; Lake, 14½c. to 14¾c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 32c.; small lots, 31½c.; Lead, Desilverized, 4c. to 4.05c., for 50-ton lots; Corroding, 5.15c. to 5.25c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5.15c.; Cookson's Antimony, 13c., and other grades, 11c. to 11½c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 13½c.; Heavy Copper, 13½c.; Copper Bottoms, 12c.; Copper Clips, 12c.; Red Brass, 13c.; Yellow Brass, 10½c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 23c.; Block Tin Pipe, 25c.

Charles L. Miner has resigned from the management of the Chicago office of Matthew, Addy & Co., and is now connected with the pig iron sales department of Pickands, Brown & Co. E. T. Axner succeeds him as manager of the Chicago office of Matthew, Addy & Co., with offices in the Rookery Building.

Philadelphia.

PHILADELPHIA, PA., February 18, 1908.

Buying in crude materials has been very light, but a little improvement is to be noted in the demand for some lines of finished products. Sentimentally, the situation in the Iron and Steel trades is somewhat better, but the tendency on the part of the buyer is still strongly conservative, and purchases are almost entirely in small lots for early shipment. While a little more confidence is expressed in the resumption of business in the near future, mills at the time find it difficult to get enough new orders to enable them to run much over 50 or 60 per cent. of their capacity. A waiting policy prevails in practically all markets, and will probably continue until there is some more definite showing for the better.

Pig Iron.—The Pig Iron market, on the whole, has been rather inactive. The buying movement which set in several weeks ago has apparently closed, as consumers have in many cases covered for their immediate needs. With the extremely small amount of new orders coming out, particularly in the foundry trades, the disposition to buy only from hand to mouth becomes more strongly apparent. There is some little inquiry for small lots, coming out from day to day, but in almost every instance the tonnage has been small and the delivery prompt, which would indicate that supplies in melters' yards were small. The Cast Iron Pipe interests have been taking some little iron, mostly, however, in lots of a few hundred tons, usually of such brands and grades required to mix with those of their recent larger purchases. One inquiry for 1500 tons of Pipe Iron has come out, on which Southern makers are quoting. Virginia Irons have been rather quiet, but furnaces are shipping more Iron on old orders. Standard grades are being pretty firmly held at $18.25 to $18.50 for No. 2 X and $17.75 to $18 for No. 2 Plain, delivered in this territory, but producers who have large stocks could probably be induced to shade a little for good tonnages for prompt shipment. A little new business has developed in the Steel making Irons. A small lot of several hundred tons of Basic was sold for prompt shipment at $17.25, delivered, while one Steel mill bought 1000 tons of off-grade Bessemer Iron for delivery during the next three months. Low Phosphorus Iron has been quiet, no sales being reported during the past week. Forge Iron has been rather dull. Sales have been scattered and run in small tonnages, usually for prompt shipment, at prices ranging from $16.50 to $16.75. Prices on all the various grades of Pig Iron are being firmly maintained by the leading Eastern producers. Efforts have been made to break through the established figures in a number of cases, but without success. Outside interests continue to take a little business at slightly lower figures, but the tonnage is said to be so small as to be no factor in the market. We quote for early delivery in buyers' yards, eastern Pennsylvania and nearby territory, the following range of prices:

No. 2 X Foundry	[illegible]
No. 2 Plain	[illegible]
No. 3 Foundry	[illegible]
Gray Forge	16.50 to 16.75
Basic	[illegible]
Low Phosphorus	24.00 to 25.00

Ferromanganese.—The amount of new business coming out is extremely small. Several sales of carload and less than carload lots have been made recently, but no business is being done in large tonnages. Quotations are unchanged, and range from $47 to $49, Baltimore.

Steel.—There is not much change in the situation. Orders are not being received very freely, although specifications on old contracts enable mills to run irregularly. The blooming mill of the Alan Wood Iron & Steel Company has again been started up, as were also three open hearth furnaces. Prices are being fully maintained. Ordinary Steel is quoted at $30.40 for delivery in this territory, while

Forging Steel ranges from $32.40 to $33.40, according to analysis.

Plates.—Business continues fairly good, but is somewhat irregular. Orders on some days run up to pretty nice tonnages, while on others they fall to almost nothing. On the whole, however, mills are able to hold the gains made recently, and in some instances show a slight increase. The feeling, therefore, is quite cheerful, and it is believed that business will continue to increase, although it may be slow. Buying is largely for prompt shipment, not much tendency being shown on the part of consumers to place orders for future needs. Prices are being firmly maintained, quotations ranging as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Boiler and Box Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
[illegible]	2.05	2.10
Marine	2.25	2.30
[illegible] Steel	2.5	2.40

The following base prices for [illegible] are subject to the following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
Nos. 9 to 11, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—A little more inquiry has developed for Structural Material. Several fairly good sized building propositions are being estimated upon and some smaller buildings, requiring in the neighborhood of 500 tons each, have been placed. Orders are reported as running a little larger individually, and enough tonnage has come out to maintain fully the present rate of production for a time. Some additional bridge and boat inquiries are before the trade. Prices are unchanged, 1.85c. to 2c. being quoted, according to specifications.

Sheets.—A little more business has developed, but not enough to enable mills to increase their output to any extent. Orders are small and mainly for prompt shipment. Practically nothing for future delivery is coming out. Prices are unchanged. We quote the following prices for mill shipments, with a tenth extra for small lots: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.70c.; Nos. 25 to 26, 2.80c.; No. 27, 2.90c.; No. 28, 3c.

Bars.—There have been no further developments in the Bar Iron market. The demand is rather quiet, consumers in a number of instances having placed orders for their immediate needs some weeks ago, when prices were down. But little business is being taken, however, at the present basis of prices, which are being firmly maintained at 1.65c., delivered at Philadelphia and nearby points.

Old Material.—The market for Old Material is largely on a speculative basis, and prices in most of the grades have again been marked up by the dealers. Steel mills are not willing to pay the prices asked for Heavy Melting Steel and are not buying to any extent. Some small sales of the more active grades have been made at higher figures than quoted last week, in lots ranging from 100 to 250 tons, for prompt shipment. We quote, for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory, about the following range of prices:

No. 1 Steel Scrap and Crops	$15.00 to $15.50
Low Phosphorus	18.00 to 18.50
Old Steel Axles	18.00 to 18.50
Old Iron Axles	23.00 to 24.00
Old Iron Rails	18.00 to 19.00
Old Car Wheels	16.50 to 17.50
Choice No. 1 R. R. Wrought	16.75 to 17.00
Machinery Cast	15.00 to 15.50
Wrought Iron Pipe	12.00 to 12.50
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	10.50 to 11.00
Stove Plate	13.25 to 13.75
Cast Borings	8.50 to 9.00
Grate Bars	12.00 to 13.00

Coke.—Some small tonnages have been sold in Foundry Coke, but the demand for Furnace Coke has been light. Prices show no material change, although some grades of Furnace Coke for prompt delivery can be had at somewhat lower figures. Furnace Coke is quoted at $1.75 to $2.25, at oven, while Foundry Coke ranges from $2.25 to $2.75, at oven. We quote for delivery in the Philadelphia territory, the following range of prices:

Connellsville Furnace Coke	$4.00 to $4.50
Foundry Coke	4.50 to 5.00
Mountain Furnace Coke	3.70 to 4.10
Foundry Coke	4.10 to 4.60

J. C. Moyer, who for some five years was with the firm of J. K. Dimmick & Co., has opened offices in the Pennsylvania Building, room 311, where, under the name of Moyer & Co., a general business in Iron, Steel, Coal and Coke will be conducted.

San Francisco.

SAN FRANCISCO, February 12, 1908.

Structural Material.—There has not been a good demand for Structural Steel in large lots in the past few weeks, although there has been a slight increase in inquiries. The architects, however, have a considerable amount of work in plan which will result in some good orders for Steel as soon as money loosens up a little more. The Smith Rice Company, which has about completed the erection of the Steel frame for the First Federal Trust Company's 14-story building on the corner of Post and Montgomery streets, has taken a contract for the erection of the Structural Steel and Iron for Alice P. Sullivan's building, on the southeast corner of Sutter street and Grant avenue. Shipments of the limited quantities of Structural Steel now coming by rail are arriving on schedule time, and there are no complaints on the score of delays. The Hardware interests, however, are making an effort to have a change made in the present ruling which enables the 75-cent rate on Structural Steel applied to Builders' Hardware and various items of Iron and Steel that are now placed in the same car with Structural Steel. If this were not permitted much more Hardware, &c., would be purchased on the coast.

Pig Iron.—The large foundries and engineering works are still overstocked with Pig Iron, and the smaller concerns buy only in small lots for their immediate requirement. Importers have ample stocks on hand for the present needs of the coast. The arrivals of Pig Iron from Europe by sea have been light during the past month, and there is but little afloat at the present time for this port. The year will probably be a prosperous one in California and all over the coast, but no particular increase in the demand for Pig Iron is expected for several months to come. A great deal of repair work will probably be done in San Francisco and at the Mare Island Navy Yard on the vessels of the coming battleship squadron while it remains here, but very few castings will be required. A British ship arrived at this port yesterday with 1370 tons of Pig Iron from Newcastle, England. Prices are about as follows, ex yard San Francisco: No. 1 English Foundry, $28 to $29 per ton.

Cast Iron Pipe.—The outlook for the present year is said to be quite favorable, and there are some good inquiries for Cast Iron Pipe, but the volume of business will not be very heavy for the next month or two. The recent heavy rains have had a good effect upon the crops throughout the State of California. All concerns requiring large quantities of water, such as electric power companies, mining companies and water companies, have been benefited, and new extensions will be pushed wherever money can be secured for the purpose. A number of municipalities all over the coast are contemplating water works improvements requiring the use of Cast Iron Pipe during the present year. The Owens River water project for the future supply of the city of Los Angeles will be carried out notwithstanding some little delays occasioned by the financial stringency. A suit brought against the commission which has charge of the work was recently decided against the obstructionists. The proposed high pressure salt water system for fire protection, for which an appropriation of $5,000,000 has been provided in the municipal budget of San Francisco, will require an expenditure of $3,000,000 for special heavy Cast Iron Pipe. According to the plans prepared the sizes range from 24 in. in diameter down to 6 in. Cast Steel fittings and valves and fire hydrants for this service will cost about $1,000,000. Heavy duty pumps are to be installed to pump salt water from the Bay into a reservoir on one of the high hills west of the city, furnishing a heavy pressure for fire purposes. The money required will be raised by the sale of the forthcoming municipal bond issue. It will take several years to complete the entire system, but a start in the way of laying mains will be made as soon as possible in the interests of lowering the excessive insurance rates that are now paid. Prices of Cast Iron Pipe, f.o.b. cars here, are now about as follows: 4-in., $39.50; 6, 8, 10 and 12-in., $38.50.

Merchant Pipe.—Only small orders for immediate use are being placed, and but little improvement in the demand for Merchant Pipe has been noted. Discounts on Steel Pipe are about as follows on jobbers' carloads:

⅛ and ¼ in.	58.5	42.5
⅜ in.	60.5	46.5
½ in.	62.5	50.5
¾ to 6 in.	66.5	50.5
7 to 12 in.	66.5	48.5
Extra strong plain ends:		
½ to 3 in.	51.5	39.5
½ to 4 in.	58.5	46.5
4½ to 8 in.	54.5	42.5
Double extra strong plain ends:		
½ to 8 in.	47.5	36.5

Coke.—There is little Coke arriving from foreign ports just now, but there are still large accumulations of stock from the cargoes that arrived earlier in the winter. Consumption has been small, owing to inactivity at many of the local foundries and at the smelters in the interior. The Selby smelter at Selby, Contra Costa County, is still a large consumer of Coke, however. This company's new shot tower,

a Steel frame structure about 160 ft. in hight, has just been completed in place of the one that was destroyed by the great fire in San Francisco. A big stock of Coke, mostly from Australia, is on hand at this company's plant.

Mining Supplies.—There is yet serious depression in some districts, and credits are watched very closely by manufacturers' agents, owing to poor collections and the financial weakness shown by many concerns of supposedly great monetary resources. Nevertheless, conditions are slowly improving, and some good inquiries are reported. Sales do not always follow, however. The Arthur Koppel Company recently took a good contract to manufacture 200 special mining cars for the Queen Copper Company, which will be used in connection with the mining operations at Douglas, Ariz. In some of the Nevada districts there is quite a revival of business, although the departure of the troops causes a little uneasiness around Goldfield. Representatives of the American Smelting & Refining Company have announced that they are now prepared to take all Goldfield Ores offered up to $100 in value and pay cash therefor, while on Ores running higher they will pay $100 cash and the remainder in 45 days. Encouraged by this new ruling, several mines are preparing to start up.

The latest promotion rumor on Steel plants for the Pacific Coast is that one has been promised for San Diego County by a company of Pittsburgh capitalists. They contemplate Otay as the location of the project, according to A. B. Lindsay, a local realty dealer. The proposition includes blast furnaces, Steel works and rolling mills.

Northern advices say that McInnis & Harrington were the successful bidders on the construction of the Government water system at Seward, Alaska. The work consists of building a concrete reservoir, laying about 15 miles of Pipe, &c.

The Iron Trades Council of San Francisco has appointed a committee consisting of J. W. Sweeney, J. I. Nolan and E. H. Mizner to interview property owners and capitalists to urge them to give preference to local industries when ordering materials for new buildings. This policy is taken to assist the unemployed, and also provide more business for local manufacturers and work for the thousands of artisans affiliated with the Iron trade.

The Atlantic & Pacific Mfg. Company, to do a general machinery, manufacturing and construction business, has been incorporated in Los Angeles, with a capital of $50,000. The directors are W. H. Logan, J. H. Wilson, H. H. Hudson, R. Hastings and H. G. Feraud.

Pittsburgh.

PARK BUILDING, Pittsburgh, Pa., February 19, 1908.—(*By Telegraph.*)

Pig Iron.—The Pig Iron market continues very quiet, and only small lots for prompt shipment are being sold. Inquiries are possibly a little better, and three or four concerns are asking prices on 3000 to 4000 tons of Bessemer, Malleable Bessemer and Basic for March and April delivery, but none of this business has been closed. It is said that shipments of Pig Iron from the two valleys are about as large as the output, so that stocks are not increasing. Grace Furnace of the Brier Hill Iron & Coal Company, blew out February 13. The furnace of the Stewart Iron Company, Ltd., of Sharon, which has been shut down for some time, will blow in next week. Mary Furnace of the Ohio Iron & Steel Company, at Lowellville, has gone out. The Shenango Furnace Company has blown out its No. 1 stack and started up No. 3, which will give it an output of 300 to 350 tons of Bessemer Iron per day. We quote Bessemer Iron at $17, Basic at $16, Northern No. 2 Foundry $16 to $16.25, and Northern Forge at $15, all at Valley furnace, the freight rate to Pittsburgh being 90 cents. A Chicago Steel interest is reported to have bought 5000 tons of Basic from a nearby furnace at $17.15, at furnace, or $17.50, delivered at buyer's works.

Steel.—The market is practically lifeless, and no tonnage in Billets, Sheet Bars or Tin Bars of any moment is changing hands. We quote Bessemer and Open Hearth Billets nominally at $28, Sheet and Tin Bars at $29 and Forging Billets $30, Pittsburgh.

Spelter.—We note a sale of 200 tons of prime grades of Western Spelter for March and April shipment at 4.70c., East St. Louis.

As a result of the meeting of the blast furnace interests, held in Cleveland, Ohio, February 8, delivered prices on Northern No. 2 Foundry Iron of $17 have been adopted for leading consuming points, including Chicago, Buffalo, Cleveland, Detroit, Youngstown, Erie, Toledo and Pittsburgh. The agreement provides that all blast furnaces making No. 2 Foundry have the privilege of selling it at a delivered price of $17 at any of the above points, and in addition are allowed a switching charge ranging from 25 cents to 75 cents a ton. These prices were also adopted for Malleable Bessemer Iron. The price of $17, Pittsburgh, on Malleable Bessemer for No. 2 Foundry means that Valley furnaces would have to sell at $16.10 at furnace, the freight rate to Pittsburgh being 90 cents. No schedule was adopted for Bessemer Iron, which is still readily obtainable at $17, Valley furnace, or $17.90, Pittsburgh. Basic Iron can be bought at about $16, Valley, or $16.90, Pittsburgh. Conditions in the Steel trade are very quiet, but it is stated that the regular price of $28, Pittsburgh, for Bessemer and Open Hearth Billets is being held. Tonnage in Finished Iron and Steel, while a little larger than in January, is still confined to small lots, and represents probably 40 per cent. of the capacity of the mills. It is the general impression that the first six months of this year in the Steel trade will be quiet, but that conditions will show a material improvement in the last half.

Ferromanganese.—The low prices ruling for Ferro are bringing out some business, and we note a sale of 75 to 100 tons of foreign 80 per cent. Ferro at about $45, Baltimore, or $46.95, Pittsburgh. We quote foreign 80 per cent. Ferro at $47, Pittsburgh, for large lots, and about $47.50 for small lots.

Muck Bar.—No new business is being placed, and we continue the nominal quotation of $28, Pittsburgh, for best grades of Muck Bar made from all Pig Iron. If any business was offering, probably this price would be shaded.

Skelp.—In the absence of transactions, we repeat former quotations as follows: Grooved Steel Skelp, 1.60c.; Sheared Steel Skelp, 1.70c.; Grooved Iron Skelp, 1.80c., and Sheared Iron Skelp, 1.90c., f.o.b. Pittsburgh.

Rods.—We continue to quote Bessemer Rods at $35, Open Hearth $36, and Chain Rods $37, f.o.b. Pittsburgh. Not enough new business is being offered to test the market.

Steel Rails.—Outside of two or three orders for 500-ton lots and less quantities, nothing has been done in Standard Sections. The Carnegie Steel Company has taken about 1400 tons of Light Rails, the demand for these being fairly active. Regular prices on Light Rails, which are still being shaded $2 to $3 a ton by the mills rerolling Rails, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—Only one of the leading Steel car interests continues to take out any considerable tonnage of Plates, the other two having about finished up all their orders for cars and are now practically shut down in all departments. The Standard Oil Company continues to specify for a considerable tonnage in Plates, but the demand from the general trade is very dull and is only for small lots for actual needs. In fact, not enough new business is being placed to test the market thoroughly. Some cutting in prices is still being done, but it is mostly on the narrow sizes. We quote: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼ in. to and including 3/16 in. Plates at thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches containing straight taper Plates varying not more than 4 in. in width, at ends narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Tank Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell grade of [illegible] is also quoted	

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh. With all Eastern rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—A fair amount of new work is in sight, but it is mostly small contracts, and is very slow in coming out. Financial conditions are such that money cannot be had at reasonable rates to carry on large projects. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—A well attended meeting of the Sheet Steel interests was held in the Hotel Lincoln, Pittsburgh, February 13, at which present prices on both Black and Galvanized Sheets were unanimously reaffirmed. We are advised that the demand for Galvanized Sheets is fairly active but for Black and Roofing Sheets is quiet. We quote: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos.

25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Bars.—Mills rolling Iron Bars report a slight increase in orders, but in Steel Bars the demand is very light, being for small lots for actual needs. As a whole, however, the business taken so far this month in both Iron and Steel Bars is showing betterment over January. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further West. Steel Bars remain very firm, at 1.60c., Pittsburgh.

Tin Plate.—Orders for a moderate amount are being placed, but as yet the expected buying movement in Bright Plates by the canning interests has not developed. Most of the Tin Plate mills are able to run to about 50 per cent. of capacity, and new business so far this month has been slightly heavier than in January. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Spelter.—Demand for Spelter has been more active in the past week or 10 days, and several fairly large inquiries are in the market. Prices are higher than a week ago. Leading East St. Louis smelters are quoting on the basis of 4.70c. to 4.75c., St. Louis, equal to 4.82½c. to 4.85c., Pittsburgh. A sale of 50 tons is reported on the basis of 4.70c., East St. Louis.

Hoops and Bands.—No new business is being placed, the large trade having covered its requirements early in January, when the manufacturers reaffirmed prices and practically guaranteed them against decline. Specifications against contracts are coming in at a fairly satisfactory rate. We quote Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60, base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Railroad Spikes.—This trade continues dull, very few new orders being placed, and all the makers of Spikes are running to light capacity, with little tonnage on their books. We continue to quote standard sizes of Steel Railroad Spikes at $1.80 to $1.85, but sometimes this price is shaded slightly to meet competition in Iron Spikes. Prices on smaller sizes are fairly firm on the basis of $1.95 to $2 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—Several mills report that specifications on Tire Steel from vehicle makers are coming in a little better, and there is also a slight improvement in buying on several other lines. However, the situation as a whole is quiet, and none of the mills has much business ahead, all running to about half capacity or less. Prices on Shafting continue somewhat erratic, 55 and 2½ per cent. being quoted on carloads and larger lots. The general trade believes that prices will be lower, and is buying only in small lots for actual needs. Nominal prices are as follows: Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades, and 10c. and upward for special grades.

Merchant Pipe.—The tonnage of new business so far this month shows a decided improvement over January, and represents about 50 per cent., or possibly a little less, of the capacity of the mills. No large orders are going, the trade buying mostly for actual needs and in small lots. We are advised that prices on both Steel and Iron Pipe are being firmly maintained, and while all the mills are badly in need of more tonnage, there is no disposition to cut prices to get it. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 74 and 5 per cent. off list, while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel.	
	Black.	Galv.
	%	%
¼ to ⅛ in.	65	49
⅜ to ½ in.	67	53
⅝ in.	69	57
¾ to 6 in.	73	63
7 to 12 in.	70	55
Extra strong, plain ends:		
⅛ to ⅜ in.	58	46
½ to 4 in.	65	53
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

The new discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
	%	%
⅛ and ¼ in.	63	49
⅜ in.	65	51
½ in.	67	55
¾ to 6 in.	71	61
7 to 12 in.	68	53
Extra strong, plain ends:		
⅛ to ⅜ in.	56	44
½ to 4 in.	63	51
4½ to 8 in.	59	47
Double extra strong, plain ends:		
½ to 8 in.	52	41

Boiler Tubes.—Compared with January, the tonnage of new work taken so far this month is showing decided betterment, but orders continue to be mostly for small lots and actual needs. Prices are still somewhat uneven. Discounts on Merchant Tubes for small lots, on which an extra 5 per cent. is allowed in carloads are as follows:

Boiler Tubes.

	Iron.	Steel.
	%	%
1 to 1½ in.	42	47
1¾ to 2¾ in.	42	59
2½ in.	47	61
2¾ to 5 in.	52	65
6 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Coke.—The blowing in of some more blast furnaces this month by the United States Steel Corporation has resulted in the Frick Coke Company starting up more ovens, while some of the other operators are also running to larger capacity than for some time. Prices on Coke continue low, due to the competition for business that is coming up. Strictly Connellsville Furnace Coke for prompt delivery is sold at $1.85 to $1.90, while outside makes are offered at $1.70 to $1.75 a ton at oven. Prices on strictly Connellsville 72-hr. Foundry Coke run from $2.40 to $2.45 at oven, with considerably lower prices being made on outside Coke. The output of the Upper and Lower Connellsville regions last week was 185,375 tons.

Iron and Steel Scrap.—The demand for Scrap between dealers is not quite so active as it has been. Owing to the shutting down of the Steel plants at Steubenville and Sharon, large consumers are not taking in as much Scrap as they did some time ago. An embargo on Scrap has been on at the La Belle Iron Works, at Steuvenville, Ohio, for several weeks. The demand for Low Phosphorus Melting Stock is active, and prices are better, and the same is true of Standard Sheet Bar Crop Ends, which have gone up fully $2 a ton over the prices of a month ago. Last week the Norfolk & Western Railroad sold 1000 to 1200 tons of miscellaneous Scrap, for which relatively high prices were obtained. One dealer bid as high as $13.80, Pittsburgh, for Heavy Steel Scrap, and did not get it. The Baltimore & Ohio Scrap list closes February 19, and involves quite a tonnage. There has been no material change in prices, but the tone of the Scrap market is perhaps slightly easier. Dealers quote about as follows: Heavy Steel Scrap for Pittsburgh, Steubenville or Sharon delivery, $13.75 to $14; No. 1 Cast Scrap, $15.25 to $15.50; Low Phosphorus Melting Stock, $17.50 to $18; Bundled Sheet Scrap, $10 to $10.25; No. 1 Busheling Scrap, $14 to $14.25; No. 2, $12 to $12.25; Cast Iron Borings, $8 to $8.50. Rerolling Rails are in better demand, and prices are higher. We quote these at $14.50 to $15. Steel Axles are $16 to $16.25; Old Steel Rails, short pieces for Open Hearth use, $13.75 to $14; Sheet Bar Crop Ends, $17 to $17.50; Steel Axles, $16 to $16.25; Iron Axles, $20 to $20.50, and Grate Bars, $13 to $13.25. We note sales as follows: 500 to 600 tons of Heavy Steel Scrap at $14, Pittsburgh; 1000 tons of Low Phosphorus Melting Stock at $17.50, Sharon, Pa., and 500 tons of Rerolling Rails at $14.50, delivered, Huntington, W. Va. All prices quoted above on Scrap are per gross ton, f.o.b. Pittsbrugh, unless otherwise stated.

Birmingham.

BIRMINGHAM, ALA., February 17, 1908.

Pig Iron.—The market is very quiet, and no evidence is offered that the improvement recently predicted has materialized. Some inquiries are reported and the aggregate of tonnage to be placed reaches fair proportions, but there is usually a difference of from 50c. to $1 per ton between the parties, and the sales that have resulted are comparatively insignificant. Producers generally display an attitude of independence, and quotations are being maintained, but the fact remains that purchasers are believed to be willing to engage tonnage only for actual requirements, even if concessions were made, and it is probable that a bona fide offer for a round tonnage would result in some shading. The current reports of recent sales at from $12.50 to $13 per ton are without confirmation, except in the case of bargain Iron. It is true that some forced sales have been made by one concern at a reduction, but it is not believed that a lower basis than $12.75 was reached, and the tonnage offered is now practically cleaned up. The principal sale recently

reported is a lot of 200 tons. This was sold on a basis of $13.50, f.o.b. Birmingham, and a number of carloads and 100-ton lots have brought the same price. Charcoal Iron has sold during the week at $22, f.o.b. furnace. A steady improvement in the foundry trade is indicated by the number of requests received for prompt shipment of tonnage engaged, and smaller concerns that are believed to be well sold up for first quarter deliveries have experienced some trouble in making shipments as early as desired. Production will be increased the coming week by the blowing in of one of the Sloss-Sheffield, Steel & Iron Company's furnaces, and the new stack of the Birmingham Coal & Iron Company, at Vanderbilt, Ala., will be blown in about April 1. The latter addition will only increase the total output about 100 tons per day, as the furnace now in operation at Vanderbilt will be blown out.

Cast Iron Pipe.—The principal letting reported during the week is a lot of 1500 tons for the city of Topeka, Kan. This contract was awarded the American Cast Iron Pipe Company, Birmingham, Ala., and it is believed that quotations were maintained. No new lettings are reported, but indications are favorable for further developments in the East and Northwest, and specifications for Cuban points are expected at an early date. The aggregate of tonnage now in sight is very attractive, and producers anticipate a period of activity. We quote Water Pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., $28; 8 to 12 in., $26; over 12-in., average $25, with $1 per ton extra for Gas Pipe. On large municipal contracts these prices are probably shaded.

Old Material.—Transactions recorded during the week are not indicative of further improvement in market conditions. Some sales have been made, but the increase recently noted in consumption has had no material effect, and the demand for all grades is very light. Purchasers appear to be principally interested in bargain lots, and wide differences are noted in prices offered and quotations. We quote nominally as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$18.00 to $18.50
Old Iron Axles	16.50 to 17.00
Old Steel Axles	15.50 to 16.00
Old Car Wheels	18.50 to 19.00
No. 1 Railroad Wrought	13.50 to 14.00
No. 2 Railroad Wrought	10.50 to 11.00
No. 1 Country Wrought	12.50 to 13.00
No. 2 Country Wrought	10.50 to 11.00
Wrought Pipe and Flues	10.50 to 11.00
Railroad Malleable	12.50 to 13.00
No. 1 Steel	12.00 to 12.50
No. 1 Machinery Cast	10.50 to 11.00
Stove Plate and Light Cast	9.50 to 10.00
Cast Borings	6.00 to 6.50

Cleveland.

CLEVELAND, OHIO, February 18, 1908.

Iron Ore.—As was expected, the reaffirmation of last year's Ore prices has not yet led to a buying movement. Merchant Ore firms are making no efforts to make sales and are receiving no inquiries from the furnace interests. A matter that is attracting more attention among the Ore shippers at the present time than the sales of this season's Ore is the disposal of the large amount of last year's Ore that is still on the docks. Shipping orders show a slight improvement this month over January, but the present movement of Ore from the open docks to the furnaces is estimated to be not over 10 per cent. as large as at this time a year ago. The shipments by the Steel Corporation are considerable better than that, however. Some of the Ore firms have written to the furnaces that purchased the Ore asking them to hurry up shipments so that some dock space will be available at the opening of navigation. With more favorable weather coming on during the coming month for the shipment of Ore, it is believed that furnaces will make efforts to get considerable of their Ore moved from the docks to their stock piles. It is estimated that the Lake Erie docks have storage capacity for about 9,000,000 tons, and the amount still on the docks is thought to be fully 6,500,000 tons, so that dock space will be rather scarce at the opening of navigation unless the shipments show large improvement during the next two months. None of the Ore firms will make efforts to get an early start in shipping Ore down the lakes after the opening of navigation. It is believed that there will be no trouble in getting down all the Ore that is required even if a late start is made. The Ore men and vessel owners have not yet taken up the transportation question, and it will probably be several weeks before any chartering is done. We quote Ore prices *as* follows, at Lake Erie docks, for 1908 delivery, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.25; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—A readjustment in prices of Northern Foundry Iron has been prepared by the committee named at the meeting of the furnace interests of the Central West, held in this city recently. At the meeting it was decided to maintain the price of $17, Valley furnace, for No. 2 Foundry Iron, but the committee was empowered to make certain modifications in the old agreement which was unsatisfactory to many of the furnace interests. The committee has adopted a plan under which the delivered price is on the basis of $17 plus the freight rate from the nearest furnace. For example, the delivered price at a point nearest the Cleveland furnaces, to which the freight rate is 45 cents from Cleveland, is $17.45. For delivery in some cities a special rate has been named. Cleveland has been given a special rate of $17.35, delivered. Under this agreement the local furnaces are to charge that price for local delivery, and Valley furnaces can make deliveries at the same price in this city, but to compete with the local furnaces on an equal price basis they are forced to absorb the 90-cent freight rate, making their net price $16.45, Valley furnace, for Cleveland delivery. With $17. at furnace, as the basis, the delivered price for the majority of Northern Ohio points will range from about $17.45 to $17.85, and furnaces will get the maximum net price of $17. at furnace, for shipments in their immediate territory. To compete in price with furnaces in adjoining territory, their prices at furnace will have to go somewhat below $17. There is already a difference of opinion as to whether the new agreement will be lived up to. Among the larger interests there is a belief that it is a satisfactory arrangement all round, but the agreement has as yet to stand the test of the market. During the past 10 days following the Cleveland conference there has been no activity in the market. The only sale of importance noted is that of 1000 tons of No. 2 Northern Foundry Iron to a jobbing foundry in Michigan for second and third quarter delivery at $17, Toledo furnace. There is an inquiry from a Southern Ohio consumer for 1000 tons of Foundry Iron. A local interest reports a fair demand from Eastern consumers for small lots for spot shipment, having made a number of sales during the week at $16.50 to $17, New York furnace, for No. 2 Foundry. For the first quarter and first half we quote, delivered, Cleveland:

Bessemer	$17.90 to $18.90
Northern Foundry, No. 1	17.85
Northern Foundry, No. 2	17.35
Northern Foundry, No. 3	16.85
Southern Foundry, No. 2	17.35 to 17.85
Gray Forge	16.90

Coke.—The market is weak, and there is little inquiry for either Furnace or Foundry Coke. We quote the best grades of Connellsville Furnace Coke at $1.80 to $2, at oven, for spot shipment, but some grades are said to have been offered at $1.75 and under. Foundry Coke is held nominally at $2.50 to $2.75, at oven.

Finished Iron and Steel.—In some lines the market has shown considerable improvement. Specifications are coming in somewhat better and current orders and inquiries are more numerous, although all orders that are being placed are for small tonnages. The Bar market remains quiet. Consumers of Bar Iron bought for their early requirements before the recent advance in price and few new orders are being booked. Local mills continue to get enough orders for Bars to keep them running about half time. There is little demand for Steel Bars, but during the past few days some inquiries have developed for concrete construction work. The demand for Plates is light, although there is an improvement in inquiries for small lots. The market is weak, and some of the smaller Plate mills are shading prices $2 per ton. There is some improvement in inquiries for Structural Material from Structural shops and Bridge builders, but only small lots are wanted and the consumers ask for quick delivery. Bids will be received soon for the new West Side Market House, Cleveland, which will require about 800 tons. A leading interest closed a contract during the week for 1000 tons of Light Rails for future delivery to a coal mining concern, and booked some other small orders for immediate delivery. The price of $28 per ton for 25 to 45 lb. Sections is being shaded about $1 per ton to meet the competition of rerolling mills. The sale of 500 tons of Standard Sections to a local Frog and Crossing company is also noted. The demand for Sheets is light, and some price cutting is reported. Competition among jobbers in their efforts to reduce large stocks of Sheets has resulted in the reduction of the warehouse price. Jobbers report some improvement in mill and warehouse orders. On mill shipments we quote Iron Bars at 1.60c., Cleveland; Steel Bars, 1.70c., Cleveland, for carload lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼-in. and heavier, 1.80c., base, Cleveland. We quote Sheets, mill shipments, carload lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. We quote Steel Bars out of stock at 1.80c., and Iron Bars at 1.80c. Beams and Channels out of stock are 2.10c. to 2.15c., base. Revised warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.80c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—The slight improvement in the market that was noted for a week or two has disappeared, and the past week has been extremely dull. Mills are still buying from hand to mouth, and as they are running on one-half

or less of their capacity and have some Scrap on hand, their demands are very light. The immediate wants of mills outside of this territory seem to have been supplied. The market shows a tendency toward further weakness, although prices, which are largely nominal, remain practically unchanged. Owing to mills being idle, dealers are unable to get shipping orders on some Scrap sold at higher prices than those now prevailing. Railroad Wrought is slightly firmer. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$11.50 to $12.00
Old Iron Rails	16.00 to 17.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	16.00 to 17.00
Relaying Rails, 50 lb. and over	25.50 to 26.00
Relaying Rails, under 50 lb	28.00 to 29.00
Heavy Melting Steel	12.00 to 12.50
Railroad Malleable	12.00 to 13.00
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	8.00 to 9.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 6.00
Iron and Steel Turnings and Drillings	7.00 to 8.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	11.00 to 12.00
No. 1 Railroad Wrought	12.00 to 12.50
No. 1 Cast	12.00 to 13.00
Stove Plate	10.50 to 11.00
Bundled Tin Scrap	9.00

Cincinnati.

CINCINNATI, OHIO, February 19, 1908.—(*By Telegraph.*)

Trade in Iron and Steel circles exhibits some complex phases. Business ranges from bad to fair, with conditions favoring the stores that carry miscellaneous items and selling small lots. In finished lines it is undeniably better, although the tool manufacturers find comparatively little to enthuse over, and are still running on short time and with decreased forces. The foundry melt is still very much off, and jobbing concerns are not looking for much relief before fall. Some plans now in the early stages are being formulated for moving the accumulated stock of tools and machinery for which there was such a general demand during the middle and earlier portions of last year. Fertile minds among the manufacturers are devising schemes for introducing their tools in hitherto unexplored territory and interesting new customers. The proposed new contract form of the Iron Buyers' Association is not meeting with much favor from the selling side, even in its revised form. Furnacemen and agents are now writing their opinions to Secretary William Gugenheim, Springfield, Ohio.

Pig Iron.—Transactions are still few and far between, eliminating the occasional closure of an order by a Pipe concern or stove manufacturer at bargain figures. Rumors of quiet negotiating at prices lower than the minimum market figure continue to circulate. Talk of $12 Southern Iron and less than $16 at Northern furnace is common, the while furnaces making standard brands quote firmly $13.50 and $17, respectively. The local concern mentioned last week as requiring some 3500 tons of Basic has bought 1500 tons of Bessemer and 2000 tons of Basic, deliveries to commence the middle of March. The price on the Basic was about $17, delivered, and the product is from Virginia. It is a little off in analysis, but the result will be obtained by mixing with a Northern Basic. The Bessemer will come from a Northern furnace, and the price was a little under $17, at furnace. An inquiry is out from St. Louis for 10,000 tons of Basic, 2500 tons a month for four months, deliveries to commence April 1. Another inquiry from a southern Indiana consumer asks for 1000 tons of Gray Forge, early delivery. While furnaces directly in the Birmingham District are credited with a very commendable maintenance of the quoted prices, there is talk of some shading by others, particularly on No. 4 Foundry and Forge. There is said to be an accumulation of these grades, and that some shading inducements will be made by furnacemen to move them is not unreasonable nor improbable. Furnaces are still reluctant to quote on second half requirements, of which there are not enough, either in volume or number of inquiries, to interest owners of furnaces out of blast. The Princess Furnace, at Glen Wilton, Va., blew in last Thursday. This furnace has been making about 65 tons a day of Foundry Iron. There are said to be some complications over the order of late last year which made the minimum carload of Pig Iron 25 tons north of the Ohio River. South of the river it is 20 tons. There is no trouble in making shipments. For immediate delivery and for balance of first quarter we quote as follows, the freight rates being $3.25, $1.80 and $1.20, from the Birmingham, Valley and Hanging Rock districts, respectively:

Southern Coke, No. 1	$16.25 to $16.75
Southern Coke, No. 2	15.75 to 16.25
Southern Coke, No. 3	15.25 to 15.75
Southern Coke, No. 4	14.75 to 15.25
Southern Coke, No. 1 Soft	16.25 to 16.75
Southern Coke, No. 2 Soft	15.75 to 16.25
Southern Coke, Gray Forge	14.25 to 14.75
Southern Coke, Mottled	13.75 to 14.25
Ohio Silvery, 8 per cent. Silicon	21.20 to 21.70
Lake Superior Coke, No. 1	17.70 to 18.20
Lake Superior Coke, No. 2	17.20 to 17.70
Lake Superior Coke, No. 3	16.70 to 17.20
Standard Southern Car Wheel	25.25 to 25.75
Lake Superior Car Wheel	23.50 to 24.00

(*By Mail.*)

Coke.—Reports from ovens indicate a little increase in production, but the demand cannot be said to have reached a stage that could be denominated other than fair. There is no change in prices; deliveries are prompt, and selling agents are working to get forward orders on books. The foundry melt is still practically nil. Connellsville Foundry Coke is selling at a range of about $2.25 to $2.75, at oven, the top price being reached on some specially select grades. There appears to be no demand as yet for the last half, and no prices are obtainable other than the vague answer that $2 should about represent the Furnace Coke figure.

Finished Iron and Steel.—There are some scattering specifications coming out, and the larger stores find a little steady increase in business, although it is not yet what it should be by any means. What some sellers denominate as "hurry up" orders are being received from the machine shops on Bar Iron; and because of the generally depleted condition of stocks at all these establishments, some fairly nice business in less than carload lots is going. There is some demand for Angles. Dealers quote f.o.b. Cincinnati as follows: Iron Bars, carload lots, 1.65c., with half extras; small lots from store, 1.90c., base, one-half extra. Steel Bars, carload lots, 1.75c., base, half extras; small lots from store, 1.90c., base, half-extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c. Blue Annealed Sheets (heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.25c. No. 12, carload lots, 2c.; small lots from store, 2.35c. Sheets (light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c., base. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Old Material.—It is still a buyers' market, with the buyers proceeding very cautiously. There is no trouble to make deliveries on practically any item. Dealers do not look for any material improvement in the situation before the election. Prices as nearly representative of the situation as can be secured are as follows, and are f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$11.00 to $12.00
Cast Borings, net ton	4.00 to 5.00
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought, net ton	7.00 to 8.00
Old Iron Axles, net ton	14.50 to 15.50
Old Iron Rails, gross ton	14.50 to 15.50
Old Steel Rails, long, gross ton	11.50 to 12.50
Relaying Rails, 56 lb. and up, gross ton	22.00 to 23.00
Old Car Wheels, gross ton	16.00 to 17.00
Low Phosphorus Scrap, gross ton	13.50 to 14.50

The German Iron Market.

BERLIN, February 6, 1908.

The evidences of declining prosperity in the German Iron industry are growing more abundant and convincing from week to week. For above two months the news from the trade has been nearly all of the same tenor, showing most unmistakably that the high tide of prosperity is ebbing. Nothing has demonstrated this more palpably than the December returns of the Steel Works Syndicate. The shipments of Steel during that month dropped to 81,706 metric tone, which compares with 142,008 tons for December, 1906. The December movement was the lightest recorded since the syndicate was organized. The shrinkage in the shipments of Structural Shapes was still more striking, having reached only 58,279 tons, as compared with 131,873 tons in December, 1906. Only in Steel Rails and Ties was the month's business satisfactory. The shipments of these amounted to 219,530 tons, which is the highest ever reached, except for November. The movement in December, 1906, was 175,144 tons.

The Syndicate's December Report.

The comments of the syndicate on the course of business are not of a confident character. In respect to half rolled material, it is mentioned, indeed, that buyers had abandoned their waiting attitude, since sales were opened for the current quarter. Nevertheless, the report admits that some customers are refusing to make new engagements before their old orders have been worked off, while others are buying very cautiously in view of the difficulty of forming a judgment upon the business situation. In regard to Structural Material, the syndicate says that the uncertainties of the money and the market situation are having a paralyzing effect upon building operations, and this is forcing consumers sharply to curtail their takings. Dealers, too, are holding back their orders for Beams in the expectation of

getting cheaper prices later on. The syndicate, however, asserts that, after having cut prices by 10 marks about the middle of December, no further reduction is to be looked for now. The foreign Structural business is also referred to as highly unsatisfactory. In England increased competition has been felt owing to the prostration of business in the shipbuilding trade, which has caused the rolling mills to turn their attention more to general Structural Shapes, and in Holland, Denmark and Sweden the dearness of money is restricting building operations just as it is in Germany. Business with Turkey, the Balkan countries, Italy and particularly Norway, is better than with the other countries named. On the whole, however, the syndicate does not look for good foreign business in the Structural line until money rates have again reached their normal level.

Business in Steel Rails remains generally satisfactory, but even here the syndicate has to admit that some sections of the trade have begun to show less promising developments. The good business seems to be confined to T-Rails, in which some foreign orders have also been received; but in Grooved Rails business is quieter. Street railroad projects, it is mentioned, are being held up through the dearness of money. In the foreign trade, moreover, the Germans are meeting sharper competition from American, Belgian and English Rails, and it is also said that Belgian and, latterly, American competition is having a depressing effect upon prices.

The General Market.

Trade reports during January show that there has been no increase in shipments. The volume of orders taken for half rolled material during the month is stated to have been very light, and it is added that the export business in this specialty has grown worse and worse. Under these circumstances it is asserted that the syndicate is disposed to reopen the question of a further reduction of prices. Some of the mills in south Germany are represented as favoring another cut. Contracts with the railroads of all the German States for Rails and Ties have now been closed, and the quantities taken were larger than hitherto.

Pig Iron was the one section of the Iron trade which remained longest exempt from the effects of the changed business situation. The high water mark of production, day for day, was reached in November, but a turn in the tide was observed in December, and the make for that month was, for the first time in many years, less than November. The month's output was 1,106,000 metric tons, as compared with 1,112,000 tons in November, and 1,069,000 tons in December, 1906. The total for the year was 13,045,760 tons, which compares with 12,478,067 tons in 1906.

The Pig Iron Trade Drooping.

The turn in the tide in the Pig Iron market is best shown by developments since December. At the beginning of the year the Cologne *Gazette* stated that the total amount of orders for Pig with the Rhenish-Westphalian Syndicate was only 173,000 tons, as compared with 953,000 tons at the beginning of 1907. It is also admitted that orders have been coming in very slowly since the beginning of the year. Buyers are disposed to hold back and see if they cannot get easier prices later. Meanwhile they are taking only the most necessary amounts to meet present requirements. The amount of Pig Iron produced in January is not yet known, but it is likely to show a considerable reduction, inasmuch as a number of furnaces have been reported as blown out since the beginning of the year. The imports of Iron Ores in January clearly reflect the slowing up of production, these having amounted to only 177,600 tons, against 306,900 tons in January, 1907.

The Luxemburg Syndicate has decided to maintain for the current quarter the 40 per cent. curtailment of production previously put into force, and it was expected that the great Rhenish-Westphalian Syndicate would also vote a reduction, but this has not been done. The 25 per cent. reduction of output by the Siegerland Syndicate at the beginning of the year turned out to be insufficient, and according to last reports a further restriction of 10 per cent. was ordered. The Iron mines in that region have recently made a reduction in Ore prices in the hope that cheaper Ores would stimulate the furnaces to greater activity. The mines in the Luxemburg-Lorraine District dismissed a considerable number of miners in January, and a still larger number lost their places at the beginning of this month. In several mines work has been entirely suspended.

The general news from the Iron trade is not favorable. There are many reports of restriction in the make of goods and in the number of men employed. This applies also to the Coal trade, and particularly to the Coke business. Foreign workmen are being got rid of in order to leave employment enough for native labor.

Wilkes-Barre, Pa., in a public demonstration under the auspices of the Wyoming Valley Historical Association and Geological Society, celebrated on February 11 the one hundredth anniversary of the first use of anthracite coal by Judge Jesse Fellow. He was referred to as the real founder of the anthracite coal business. The address was made by John W. Jordan, [illegible] of the Pennsylvania Historical Society.

Metal Market.

NEW YORK, February 19, 1908.

Pig Tin.—The arrival of the Massachusetts early Tuesday morning was a surprise to holders of Tin, for it brought 850 tons, and was a day ahead of time. Premiums of around 1½c. had been demanded for spot Tin for a week, and this was cut in half Tuesday, although it will be impossible to deliver Tin from this vessel until late this afternoon. To-day the remaining premium disappeared. The range of prices during the week have been as follows:

	Cents.
February 13	[illegible]
February 14	29.90
February 15	[illegible]
February 17	29.80
February 18	[illegible]
February 19	28.15 to 28.25

Buying, although not brisk for spot, has been more liberal, and in spite of the short month, with two holidays, deliveries into consumption will probably reach 2000 tons. The arrivals so far this month are 1440 tons, and the afloats 2487 tons. Stocks appear to be accumulating abroad, and the London market closed dull, at £126 10s., for spot, and £125 10s., for futures.

Copper.—The falling off in exports, first noticed a month ago, was the warning of lower prices, which have already forced quotations down nearly 1½ cents, and to-day, with Lake obtainable at 12.87½c., Electrolytic at 12.62½c., and Casting at 12.37½c., prices bid fair to go lower. Foreign buying has been at a standstill for at least a week, and domestic consumers have not been in the market as active buyers for a much longer time. While producers are not making free offerings at the above prices, there are a number who are sellers, and although the attitude of the leading producer is as much of a mystery as ever it is believed that tenders at around the above prices would be accepted. The exports for the month are small, amounting to but 11,813 tons. In spite of the small business and declining prices, the silver lining of the cloud is already appearing in the form of inquiries from abroad, and competent and conservative Copper men feel certain that on recessions to around 12c., for Electrolytic, if not at slightly higher prices, there will be a fair buying movement. It is only just, in this connection, to point out again that the cost of producing Copper is declining and the fall in prices may not be arrested at so near the former low level as now seems probable. The heavy transactions on the London Exchange, which have been the feature of that market for 10 days continue, and to-day's turn over amounts to 2300 tons. Prices are lower, at £56 12s. 6d. for spot, and £56 17s. 6d. for futures.

Ferroalloys.—The market is dull and featureless. Prices are without change at $85 for 50 per cent. Ferrosilicon, and $47.50 to $48.50 for 80 per cent. Ferromanganese.

Pig Lead.—The market is dull and quiet, but firm in New York, where prices are unchanged at 3.75c. for large lots. In St. Louis the market is a little easier, shipments being held at 3.65c. The London market closes at the lowest figure of the year, £14.

Spelter.—The continual offering of resale lots in New York at 4.75c., or five points under the St. Louis market, indicates a light demand, as otherwise they would be quickly snapped up. St. Louis prices are nominal at 4.80c., and shipments of Spelter from the West are quoted at 4.90c., but of course no business is closed at that figure.

Antimony.—No change has occurred in this market, and prices are nominal, Cookson's being held at 9.50c., Hallett's at 9c. and outside brands at 8.50c.

Nickel.—Unchanged prices of 45c. for ton lots and 50c. to 60c. for small quantities continue.

Tin Plate.—Improvement continues in the shape of an increasing demand, both at home and abroad, and a further advance of 1½d. in Welsh Tin Plates, at Swansea, bringing that price to 12s. 1½d. Domestic prices are unchanged at $3.89, f.o.b. New York, and $3.70, f.o.b. Pittsburgh, for 100-lb. IC Coke Plates.

Old Metals.—The severe decline in the price of Copper has caused a general revision in prices of Old Metals. Heavy Copper is down 1c. from last week's prices, and other Scrap in proportion. Stocks are at a low point, as accumulators of Scrap are not anxious to dispose of their metal at these low figures. The foreign demand has been too large to be filled by dealers in this country. Dealers' selling prices are largely nominal as follows:

	Cents.
Copper, Heavy Cut and Crucible	12.00 to 12.50
Copper, Heavy and Wire	11.50 to 12.00
Copper, Heavy and Bottoms	11.00 to 11.25
[illegible]	[illegible]
[illegible]	[illegible]
Heavy Machine Composition	11.50 to 12.00
Clean Brass Turnings	8.00 to 8.50
Composition Turnings	9.50 to 10.50
Lead, Heavy	[illegible]
Lead, Tea	[illegible]
Zinc, Scrap	[illegible]

New York.

NEW YORK, February 19, 1908.

Pig Iron.—Beyond some inquiry from Stove foundries in New York State and a few orders from Pipe foundries the market has little worth mentioning. The smallness of the movement is made the basis of expectations of the future, as it is argued that consumption has not shrunk in proportion to orders. Some melters still have moderate stocks on hand, and considerable Iron remains to be taken out on old contracts. We quote, at tidewater, as follows: No. 1 Northern Foundry, $18.75 to $19; No. 2 Foundry, $17.75 to $18.50; No. 2 Plain, $17.25 to $17.75; Gray Forge, $16.75 to $17.25. Southern Irons are $17.50 to $18 for No. 1 Foundry, and $17 to $17.50 for No. 2 Foundry.

Steel Rails.—Large business is still withheld. At Pittsburgh 1000 tons of Standard Sections were sold in the past week. Exports are light.

Structural Material.—The American Bridge Company has taken 1400 tons of crossing work to be erected over the Baltimore & Ohio tracks at Clark avenue, Cleveland, Ohio, and the contract for the Steel for the D. L. & W. Railroad shop building at Scranton, Pa., 400 tons goes to J. B. & J. M. Cornell. In New York new projects come forward slowly. The New Haven Road is asking bids on 1000 tons, the second portion of its requirements for the new viaduct at Providence, R. I. The Structural mills have had much reduced running schedules since the beginning of the year, and prospects are not bright. We quote as follows on mill shipments, tidewater deliveries: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—It is estimated that the Eastern Bar mills are running to about 30 per cent. of their capacity. This is much better than during the extreme depression of December, and the gradual increase in the demand gives hopes of better conditions as spring approaches. Prices are unchanged, at 1.50c., Pittsburgh, or 1.66c., tidewater, for Iron Bars, and 1.60c., Pittsburgh, or 1.76c., tidewater, for Steel Bars.

Plates.—The closing of locomotive shops in this district curtails still further the local consumption of Plates. The current demand is confined to small lots for repair work, with only an occasional order for new construction of a limited character. Prices are firmly held, as follows, for standard sizes of Plates, at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Old Material.—The local market is considerably better. Quite a number of rolling mills and Steel works in eastern Pennsylvania have gradually reduced their stocks of Scrap, and it looks as if at least part of them will be obliged to enter the market before March 1 for such grades as they use. Up to the present time most of the recent sales of Scrap have been made to brokers who booked orders last fall, and were held off for three or four months in shipping on such contracts. This applies particularly to Steel Scrap. In numerous instances these brokers are offering higher prices than consumers. Quotations, per gross ton New York City, are as follows:

Old Girder and T-Rails for melting	$9.50 to $10.50
Heavy Melting Steel Scrap	9.50 to 10.50
Old Steel Rails, rerolling lengths	11.00 to 12.00
Relaying Rails	18.50 to 19.50
Old Iron Rails	14.00 to 15.00
Standard Hammered Iron Car Axles	16.50 to 17.50
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	12.00 to 13.00
Iron Track Scrap	10.00 to 11.00
No. 1 Yard Wrought, long	11.00 to 12.00
No. 1 Yard Wrought, short	10.00 to 11.00
Light Iron	5.00 to 6.00
Cast Borings	4.50 to 5.50
Wrought Turnings	6.00 to 7.00
Wrought Pipe	9.00 to 10.00
Old Car Wheels	17.50 to 18.50
No. 1 Heavy Cast, broken up	14.00 to 15.00
Stove Plate	12.00 to 12.50
Grate Bars	10.00 to 10.50
Locomotive Grate Bars	10.50 to 11.50
Malleable Cast	13.00 to 14.00

Cast Iron Pipe.—The low prices now being made are probably the dominating cause for the increase in business now experienced in this locality. The orders recently placed or now pending cover quite a large tonnage. Among the contracts awarded during the week are the following: 400 tons for Yonkers, N. Y., at $23.90, delivered; 1000 tons for Newark, N. J., at $23.65, for 4 to 6 in., and $23.20 for 12 to 20 in., delivered, with 2½c. per lb. for specials; 200 tons for Schenectady, N. Y., at $23.85, for 6's and 8's, and $24.85 for 4's, delivered; 300 tons for Brewster, N. Y., for 4's to 8's, at $25, delivered. New Britain, Conn., has opened bids for 8000 tons, on which the lowest price named was $24.60, delivered, but the actual award of the contract was to await the placing of bonds, which is expected to be accomplished very shortly. The Consolidated Gas Company of this city has opened bids on 4000 tons, and the Standard Oil Company on 2000 tons for delivery at Elizabeth, N. J. It is understood that Syracuse, N. Y., will place a contract for 15,000 tons within a month or so. The city of Boston opens bids to-day for 1000 tons. Foundries making deliveries in this vicinity are now much better supplied with work than some time ago, and it is possible that buyers may soon find prices somewhat firmer. The belief is current that some of the low prices named have been made by founders who expect to get Pig Iron at less than present prices by the time named for delivery of the Pipe. Carload lots of 6 in. are to be had at $25 to $25.50 per net ton, at tidewater, but not from all makers, as some are asking higher prices.

Iron and Industrial Stocks.

NEW YORK, February 19, 1908.

Prices of Iron and Steel stocks have held up remarkably well in view of the depressing effects on the general stock market of the Government suits instituted against some prominent railroad companies for alleged rebating. The stock of the United States Steel Corporation has been conspicuous for its firmness. The railroad equipment stocks have been somewhat affected by the reports of reduced railroad earnings and absence of demand for rolling stock. The range of prices on active industrial stocks from Thursday of last week to Tuesday of this week has been as follows: United States Steel common 27⅛ to 28⅝, preferred 90⅝ to 93½; Car & Foundry common 25½ to 27⅛, preferred 84¾ to 87; Locomotive common 32½ to 34, preferred 88 to 88¼; Steel Foundries common 4½, preferred 26⅛ to 27½; Cambria Steel 27⅛ to 28; Colorado Fuel 16⅛ to 18¼; Crucible Steel common 4 to 4½, preferred 33 to 34½; Pressed Steel common 17¾ to 19¼, preferred 70 to 72; Republic common 15 to 15¾, preferred 66 to 67; Sloss-Sheffield common 38 to 39, preferred 90; Cast Iron Pipe common 19, preferred 66; Can common 4¼, preferred 46 to 47. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 27⅞, preferred 91⅝, bonds 88; Car & Foundry common 26⅛, preferred 84¾; Locomotive common 33, preferred 88¼; Colorado Fuel 16¼; Pressed Steel common 18¼, preferred 70; Railway Spring common 23¾; Republic common 15, preferred 66; Sloss-Sheffield common 40⅞; Cast Iron Pipe common 19, preferred 63½; Can common 4⅛, preferred 45½.

The Chicago Pneumatic Tool Company's net profits for the year ending December 31, 1907, deducting interest, were $730,878, against $886,550 in 1906. The surplus, after allowances for sinking fund, dividends, depreciation, &c., was $314,221, and the total surplus is now $1,008,076, against $878,410 at the close of 1906.

Dividends.—The Barney & Smith Car Company has declared a quarterly dividend of 2 per cent. on the preferred stock, payable March 22.

The Sloss-Sheffield Steel & Iron Company has declared a quarterly dividend of 1¼ per cent. on the common stock, payable March 2.

The Ohio Supreme Court in a decision given last week declared void all the indictments against the so-called bridge trust in Ohio. The indictments were found under the Valentine law. The Supreme Court holds them void on the ground of indefiniteness, as they simply charge that the persons mentioned were engaged in a policy in restraint of trade from March, 1903, to March, 1906, without specifying any particular violations of the law.

The annual meeting of the stockholders of the Warwick Iron & Steel Company was held in the company's offices, Girard Building, Philadelphia, Pa., February 18. The following directors were elected: Edgar S. Cook, William H. Shelmerdine, William S. Pilling, Frederick W. Tunnell, F. H. Bachman, Philip Doerr and G. E. Schlegelmilch. On the next day the directors met for organization and elected the following officers for the ensuing year: President, Edgar S. Cook; vice-president, Philip Doerr; secretary-treasurer, H. F. Hallman.

The John A. Roebling's Sons Company, Trenton, N. J., intends to rebuild its rope shop which was recently destroyed by fire, the construction of the buildings and machinery to be carried on by the company's engineering and construction force. The boilers and engines have been arranged for.

We are officially advised that the improvements and additions under way by the Youngstown Sheet & Tube Company, Youngstown, Ohio, consist of three pipe mills with a large pipe warehouse, galvanizing plant, &c., and that this new construction will cost $500,000 or more.

The Machinery Trade.

NEW YORK, February 19, 1908.

In the first month of the year it was predicted that trade would gradually increase as spring approached, and these predictions appear to have been correct, judging from the slow but gradual improvement in the demand for machinery that has developed within the past few weeks. While there have been but few good sized inquiries received and practically no large orders placed in this district since the opening of February, the business transacted has been of sufficient volume to indicate an upward tendency. The activity of the smaller buyers has made the trade more confident that the larger interests will shortly come into the market, particularly the railroads, many of whom are known to be in need of large quantities of machine tools. Officials of several large railroad systems recently stated that they would soon be forced to make extensive purchases of mechanical equipment. Orders and inquiries during the past week, with few exceptions, covered small lots and varied but little in volume from that of the previous week. Inquiries have been sent out by the leading engineering interest for machinery for a project which will require approximately 50,000 hp. of equipment. In the West important machinery lists have been sent out by the Lake High Manual Training School, Chicago, and the St. Louis Refrigerator Car Company, St. Louis, Mo. These lists are printed in another column.

The Standard Oil Company is gradually buying the equipment for its new plant at Bayway, N. J., an extensive list of which it issued some time ago. While the orders placed were small, they are of considerable importance in view of the large amount of machinery required for that plant.

The New York Central Railroad has asked for bids on one 42-in. vertical tire boring and turning mill, motor driven; one 42-in. heavy pattern upright drill; one No. 2 fan blower; one No. 4 turret head power bolt cutter, belt driven, and one 16 in. x 4 ft. patent head motor driven engine lathe.

Charles D. Force & Son, Madison, N. J., operating the Madison Iron Works, whose plant was recently destroyed by fire, intend to rebuild, and will require about the same class of machinery as that destroyed. While complete plans have not been determined, the machinery to be installed will include a 25-hp. horizontal engine, 22 in. by 10 to 12 ft. engine lathe, ¾ to 1½ in. bolt cutter, 20 to 22 in. upright drill press, two sensitive drills, two double emery wheel grinders for 14-in. wheels, shears for cutting up to 1¼-in. square bar iron and a 40 or 50 lb. trip hammer.

The usual steel foundry equipment, including electric motors, electric crane, sand grinder, air compressor, emery wheel stand, oil pump, drill, ladles, cars, &c., will be required by the Strong Steel Foundry Company, which was recently incorporated at Buffalo, N. Y., with a capital stock of $50,000. The company has secured the buildings formerly occupied by the Buffalo Cement Company at Main and Amherst streets, which it will equip for the manufacture of special steels, such as manganese, vanadium, chrome and other grades to meet the technical requirements of customers, together with a line of standard open hearth steel castings. The plant will have a capacity of 400 tons per month. E. C. Strong, who has been in the steel business for the past 18 years, is general manager, and O. H. P. Champlin, 242 Depew avenue, secretary and treasurer.

A large amount of machinery equipment will probably be needed for fitting out the new mechanical laboratory of the Rensselaer Polytechnic Institute, at Troy, N. Y., the money for which was donated by Mrs. Russell Sage several months ago. The general contract for building construction has been awarded to James Stewart & Co., 135 Broadway, New York, and it is understood that the machine tool purchasing will be done by a member of the college faculty. It is said in the trade that no arrangements have been made as yet for the machinery purchasing, and it is thought that before long a good sized list of equipment will come before the trade. The building, which is to be given up entirely to mechanics, will be a three story and basement structure, 80 x 270 ft.

It is understood that a project to build a hydro-electric power plant on the Tennessee River, 12 miles below Chattanooga, Tenn., by the Chattanooga-Tennessee Power Company, for which John Bogart, 16 Exchange place, New York, is consulting engineer, will be carried out as soon as possible. Reference was made to the plans of the company several months ago in these columns, but since then there were some developments which held the project up. Besides affording manufacturers in the vicinity of Chattanooga an opportunity to obtain power at a low rate, the plant will result in improving the navigation facilities of the river in that vicinity. The construction of the plant will necessitate the building of a dam 1200 ft. long and about 60 ft. high. A power plant, 60 x 320 ft., will be erected, and arrangements are to be made for the installing of 14 units each of 4000 hp. Ten units are to be installed at first, and others are to be added as needs arise. A substation will be built near Chattanooga, and a transmission line more than 12 miles in length will be built. Some time ago preliminary work was begun on the plant, but it was abandoned for a time, and the contract for continuing the construction work has been transferred to the Wilson & Baillie Mfg. Company, 85 Ninth street, New York.

The Seay-Dillars Hardware Company, Blackstone, Va., is in the market for a 220-hp. automatic steam engine.

A large amount of machinery equipment will probably be bought before long by the municipality of Oswego, N. Y., for a pumping plant and city water system, which is to be constructed at an expense of $250,000. The firm of Herring & Fuller, 170 Broadway, New York, has been retained as consulting engineer on the project, and Charles E. Snyder, who can be addressed at City Hall, Oswego, N. Y., is the city engineer.

The Goose Creek Railway & Power Mfg. Company, Jesup, Ga., will incorporate with a capital stock of $250,000, to build a 3000-hp. electric plant, work on which will be started shortly. No machinery has been purchased as yet. D. G. Ziegler of Columbia, S. C., is the engineer in charge.

The Superintendent of Public Works, Albany, N. Y., will receive bids until March 10 for contract No. 9, covering work on the Erie Canal.

Business Changes.

The Public Utilities Commission, having found it necessary to take the buildings occupied by Patterson, Gottfried & Hunter, dealers in machinery, metals, hardware, tools and supplies, for so many years at Centre and Walker streets, New York, in order to build the new subway loop, the company has acquired the six story and basement building at 211-215 Centre street and 147-151 Lafayette street, which it will occupy about June 1. This building extends through the entire block, is within a few hundred feet of the present store, and on account of its location and size will afford much greater facilities. Extensive alterations already commenced on the new building will make it one of the finest and best equipped stores of its kind in the country, and with increased facilites the company will carry a larger variety and increase its stocks in all departments.

Catalogues Wanted.—The Lancaster Machine & Knife Works, Lancaster, N. Y., desires catalogues from manufacturers of machinery and iron and wood working tools.

Chicago Machinery Market.

CHICAGO, ILL., February 18, 1908.

While there is, on the whole, some improvement apparent in the general volume of business moving in machinery lines, the actual increase of sales has not been significantly large in any particular division of the market. It should be borne in mind, however, that the demand for machinery throughout the West, and especially in the territory of, and beyond, the Mississippi Valley has at no time receded to so low an ebb as was reached in some other sections of the country. It is, therefore, likely that the recovery in business elsewhere will appear relatively greater than it does in this market. At the same time it can safely be said to be steadily, if slowly, advancing. A moderate number of orders for machine tools are being received, but they continue to be individually small, embracing in most cases the wants of the smaller shops and factories. Here and there a few tools have been taken by the larger plants, and a few tools were bought during the past week by one of the Western railroads. Orders from the latter sources, however, cover only incidental requirements, there being no disposition among the railroads to buy any more new equipment than is imperatively required. Inquiries for shop equipment are growing more plentiful and are of a character that lends strong hope for better activity as the season advances. There is an encouraging increase in the development of plans which contemplate power plant extension and improvements. This is notably the case as respects municipal electric light, power and water work installations. Inquiries of a tentative nature are also being made by mining interests in the West and in Mexico that foreshadow important orders that are likely to come into the market from these sources a little later on. A careful review of the situation, taking into account present and prospective conditions, tends to encourage the prevalent belief in the early development of a reasonably good trade in practically all lines.

Two Important Machine Tool Lists.

The following list of tools for the Lake High Manual Training School, Chicago, has just been issued for bids by the Board of Education:

Six 16 in. by 6 ft. motor driven geared head lathes, each

lathe equipped with a 5 to 1 variable speed motor, motor to be controlled by hand wheel on apron; six 14 in. by 6 ft. motor driven geared head lathes, each lathe equipped with a 3 to 1 variable speed motor, motor to be controlled by a hand wheel on apron; one 18 in. by 10 ft. motor driven geared head lathe, equipped with a 3 to 1 variable speed motor, motor to be controlled by a hand wheel on apron; one 18 in. by 8 ft. motor driven geared head lathe equipped with a 3 to 1 variable speed motor, motor to be controlled by a hand wheel on apron; one No. 2 universal milling machine, motor driven, equipped with 5 to 1 Lincoln variable speed motor arranged for all extra attachments, and to be equipped with all power feeds; one 6½-in. slotting machine, equipped with variable speed motor and power feeds in all directions; one 20-in. motor driven wet grinder, complete with motor; one style W wet drill grinder, with splash pan and motor, complete; one motor driven double spindle centering machine, complete with all necessary equipment; one No. 13½ motor driven power metal saw, with all necessary equipment; two 12-in. motor head stock speed lathes, taking 24 in. between centers; one 12-in. universal disk grinder, complete; one three-spindle high speed ball bearing drill press, complete with motor; one No. 2 universal motor driven grinding machine, with motors self-contained on the machine, machine to be equipped with magnetic chuck, internal grinding fixture; one motor driven hand drill to hold drills from 0 to ½ in., two speeds, complete with motor; one center grinder, complete with motor; one automatic trueing attachment for Cleveland grindstone; one 16-in. motor driven crank shaper, equipped with a 3 to 1 variable speed motor, with dynamic brake machine, to be arranged for automatic down angular and circular feeds.

The following list of machinery has been issued by the St. Louis Refrigerator Car Company, St. Louis, Mo., comprising equipment required for installation in its car repair shops: One car sill planer, suitable for planing four sides up to 20 in. wide and 16 in. deep; one horizontal automatic hollow chisel mortising machine for working timbers up to 16 in. square and mortising up to 3 in. square and 12 in. deep; one vertical car boring machine for timbers up to 16 in. square and boring up to 3 in. in diameter, and to be fitted with four vertical and two adjustable spindles and 15-ft. traveling table; one automatic band saw, 20-in. guide to table and 40-in. saw blade to column; one rip saw for saws up to 36 in. in diameter; one cut-off saw with capacity of cutting up to 14 x 16 in., with table 10 ft. long; one car wheel boring machine, up to 33 in. in diameter on tread and equipped with lifting crane; one hydraulic car wheel press for wheels up to 33 in. in diameter on tread and 200 tons capacity; one single axle lathe, equipped with lifting crane; one single punch and shear, punching capacity 2¼-in. hole in 1¼-in. steel, to shear 2¾-in. round and 1¼ x 8 in. bars, throat depth 24 in.; one double bolt cutter for threading and tapping ⅜ to 1½ in., and equipped with pump; one vertical pump for drilling holes 0 to 2 in., and to center of 24 in., length from spindle to table 35 in., from spindle to base 50 in.; two emery wheels, 2 in. wide, 16 in. in diameter; one grindstone, 8 in. wide and 4 or 5 ft. in diameter; one fan for supplying air to three forges. The emery wheels, grindstone and fan are to be arranged for one motor. Individual motor drive, unless otherwise noted, will be used for each machine; a direct current motor of suitable horsepower to be furnished with each one.

The Department of Public Works, Oakland, Cal., will erect a pumping plant on the western shore of Lake Merritt, on a site known as the Willows, for a salt water high pressure fire system, and bids will be received until March 18 for the following pumping machinery: Two gas engines, two centrifugal pumps geared to the engines, one auxiliary gas engine, one auxiliary pump and motor, one air compressor, one accumulator, air, fuel, auxiliary fuel and lubricating oil tanks, piping and valves, gauges and tools. The capacity of the plant with both pumps in operation will be 2000 gal. of salt water per minute, against 200 lb. pressure per square inch at the pump discharge opening. Copies of specifications and other information will be supplied upon application by Walter B. Fawcett, secretary of the Board of Public works. Frederick C. Turner is City Engineer.

An ordinance authorizing an appropriation of $35,000 to be used for the reconstruction of the boiler house and equipment at Station No. 2, Bissell's Point, has been introduced in the Municipal Assembly of the city of St. Louis, Mo. The present equipment is of old type and low pressure. In order to comply with the smoke prevention law and gain economy in the operation of the station the city intends to take out half of the present boiler equipment and install four modern high pressure boilers, with Roney stokers and Foster superheaters. Ben C. Adkins is Water Commissioner.

The Denison Electric Light Company, Denison, Iowa, which pumps water for the city, will be compelled in the near future to increase its pumping capacity, and will be obliged to go about 1000 ft. from the power house for water supply. The company is considering the installation of an electric motor driven triplex pump, and will probably build a pumping station some time this year. Information on this subject will be appreciated by N. J. Wheeler, manager of the company.

The Mineral Hill Consolidated Copper Company, 1017 Farmers Bank Building, Pittsburgh, Pa., will erect in the near future a 100-ton concentrating plant and small electric light plant at Tucson, Ariz. The company's properties are in the Pima Mining District, Pima County, Ariz.

The California Barrel Company, Arcata, Cal., is contemplating enlarging its present plant and expects to install additional machinery. The question of operating the entire machinery of the plant by electric power is under consideration, and experiments are now being made with that end in view.

Bids will be received until April 15 on equipment for improvements contemplated by the Lake County Electric Power Company, Lakeport, Cal. The material required for these improvements include 8 miles of pipe for natural gas transmission, 300-kw. gas engines and 60-cycle three-phase 2400-volt generators. Wire for 16 miles of 1700-volt transmission lines will also be required. Geo. P. Lowe is general manager.

The City Water & Light Plant, Hillsboro, Ore., is considering the advisability of installing a new plant consisting of three-phase, 2300-volt, direct connected generators, compound engines, and return tubular boilers of 150 lb. pressure capacity. A definite decision regarding this installation has not yet been reached. Albert S. Hall is superintendent.

The Ottawa Mfg. Company, Ottawa, Kan., manufacturer of windmills and towers, intends to carry on a jobbing business in pumps, pump cylinders, water valves, &c., in connection with its manufacturing business, and desires to get into communication with manufacturers of this class of equipment.

Cincinnati Machinery Market.

CINCINNATI, OHIO, February 18, 1908.

Slight, but none the less encouraging, evidences of slow return to normal conditions in the machinery manufacturing line are both seen and felt. Conservatism is still the dominant factor, but there is a growing disposition to carry out in a limited way some of the big plans outlined last fall for consummation in the spring of 1908. A fair illustration of this sentiment is furnished in the determination just fixed by the financial interests back of the Provident Savings Bank & Trust Company to go ahead with the building of their skyscraper at Seventh and Vine streets, and to make it eight stories, with special elaboration of details, but reducing the original estimated cost on a building of 15 stories. There are no large plans outlined by the machine tool manufacturing concerns; the energies of managers having been given over when the slump of October came to getting the best returns from enlarged working forces, and the reducing of time and payrolls to normal, and then to fit the changed conditions. Conservatively, the conditions show about two-thirds normal in the way of forces and output, the normal being not the records of the middle of 1907, but that of a few former years.

Eastern capital, working harmoniously with the interests back of the Union Gas & Electric Company of Cincinnati, is figuring on the establishment of a central heating plant for the city and suburbs. Steam heat will be supplied to residents and factories, the same as water and gas.

President Thomas P. Egan of the J. A. Fay & Egan Company, manufacturer of woodworking machinery, who was recently elected president of the Cincinnati Chamber of Commerce, has just returned from a Southern trip, and as a result of his jaunt will interest the local commercial and manufacturing organizations in a scheme to invite and entertain Southern interests, with a view to closer business relations. Mr. Egan believes that Cincinnati manufactured articles in the line of machinery and tools are not as thoroughly known and advertised in the South as they might be.

Through the instrumentality of the Industrial Bureau of Cincinnati a new industry is to be added here. John Christianson, Chas. A. Stub and S. J. Sorenson, former residents of Philadelphia and who were identified with the Hugo Billgram shop for the manufacture of bevel gears, have moved to Cincinnati, and in conjunction with local capitalists, will establish the Ohio Bevel Gear Company, with headquarters in the Wright Building in Opera place. Heretofore the greater part of the bevel gear work for high grade machine tools produced in Cincinnati was turned out in Philadelphia at the Billgram shops. By the Billgram patent process, for which the right to use has been purchased, gears are cut theoretically correct and without the use of templets or form cutters.

The Tool Steel Motor Gear & Pinion Company, recently organized and established in a new factory in Carthage, is rapidly getting in shape for business. C. E. Sawtelle, who

was prominent in the organization of the company, has resigned his position as manager of the Cincinnati office of the Postal Telegraph Company, and will be the sales director of the new company.

The business conducted for years in Dayton, Ohio, by W. Foglesong as manufacturer of horse collar machinery, power hammers, &c., has been reorganized as the Foglesong Machine Company, and is now located at 123-129 South Ringold street, Dayton. The manufacturing of the Foglesong machines, power hammers, &c., will be continued, and a line of special and automatic machines has been added. Some new and improved machinery will be installed.

Edward D. White and Joseph F. McDevitt of Louisville, Ky., have bought the business of the Stitzell Stove Company at 1011 West Broadway, in that city, and will enlarge and improve the plant and business. They will purchase some new machinery, such as cranes and heavy punch and shear tools.

E. E. Greenwald, retiring president of the I. & E. Greenwald Company, Cincinnati, was given a complimentary dinner at the Bismarck Cafe on the evening of February 10 by officers and employees of that company. He has gone to New York to open an Eastern office for the company.

The Trades Extension Committee of the Business Men's Club is formulating plans for attracting business to Cincinnati. J. C. Hobart of the Triumph Electric & Mfg. Company is chairman.

Advices from Newark, Ohio, tell of an order from Germany for several carloads of clover hullers, manufactured by the Newark Machine Company, which is now running with a full force of men and on full time.

Elwood, Ind., manufacturers, who organized the effort to add other factories, report that the fund has reached nearly $25,000. The money is raised by what is known as "the 1 per cent. factory fund."

Philadelphia Machinery Market.

PHILADELPHIA, PA., February 18, 1908.

Manufacturers and dealers who have canvassed the market pretty thoroughly recently report but little new business, and note that manufacturing plants generally have been booking few fresh orders. Under the circumstances, therefore, not a great deal can be expected in the way of buying new equipment until these plants succeed in taking on more business. In many cases plants are being operated at graetly reduced capacities and with largely decreased forces; some still have considerable old work on their books, but others are rapidly cleaning these orders up and new business comes out slowly. The smaller establishments are in better shape in this respect than are the larger ones, but little work is necessary to keep such plants going and an occasional order would mean full time in the small plant, where the same amount of business would be of no particular value to the larger one. Under the existing conditions the building of new plants, not already provided for, is practically at a standstill, and the business, which under ordinary circumstances, would come from this source is entirely absent. The railroads in this territory have not yet developed into buyers, and from what we can learn are not likely to place orders for anything beyond what is absolutely necessary.

Such machine tool business as comes out is pretty generally scattered, and is confined almost entirely to the smaller class. Orders as a rule are confined to single tools, although one dealer took an order for a small equipment for a revenue cutter. Inquiries are hardly as numerous as they were. In some cases the market is being tested on prices, but the leading tool builders are maintaining quotations pretty firmly. Competition, however, is sharp, and it is reported that concessions have been made on some of the medium grade tools. The belief is pretty generally expressed that no great volume of business could be had under existing circumstances if prices were lowered, and therefore it is believed that the best interests of the trade would be served by making no reductions at the present time.

The demand for second-hand tools and machinery continues dull. Sales are light and pretty well scattered as far as this class of equipment is concerned. Transactions are mainly in the smaller class of tools, for both wood and metal working. The second-hand boiler and engine trade is also rather inactive, and the total volume of business done has been small.

The foundry trades continue unchanged. Orders come out somewhat irregularly and are unusually small, covering only immediate needs of customers. Jobbing foundries, dependent on daily business, are running but two or three heats a week, while some of the larger concerns find its difficult to do much better. Steel casting plants find themselves in about the same situation, as very little business for forward delivery is to be had.

The Philadelphia Supply and Machinery Dealers' Association will hold its annual meeting February 19, when the election of officers for the ensuing year will take place. The annual banquet of the association will be held some time the coming month. Frank Clouds of Powell, Clouds & Co., is secretary-treasurer of the organization.

Architects Sauer & Hahn, who prepared the plans for a group of new buildings for the Standard Hosiery Company, have awarded the contract for their erection to A. Raymond Raff. The plant and equipment will, it is estimated, cost close to $200,000.

The Philadelphia Roll & Machine Company continues moderately active. The plant is in operation five days a week. A fair volume of business is still on the books, although new orders are somewhat scattered. Owing to the inactivity on the part of the rolling mills, the demand for sand cast and chilled rolls has not been as heavy as formerly, but a good miscellaneous business for charcoal iron castings continues to be received.

Bids were opened in the United States Engineers' Office, Witherspoon Building, February 15, for the construction of a suction dredge to be built for the Government, for use in Galveston harbor. The lowest bid was that of the Maryland Steel Company, Baltimore, Md., which proposes to furnish the dredge in nine months at a cost of $357,500. Among the other bidders were the Fore River Shipbuilding Company, Quincy, Mass.; New York Shipbuilding Company, Camden, N. J.; Newport News Shipbuilding & Dry Dock Company, Newport News, Va., and Wm. Cramp Ship & Engine Building Company of this city. Bids ranged from $357,500, by the Maryland Steel Company, up to $499,500, by the Cramp Company.

The Baldwin Locomotive Works has taken on some little new business, mostly for single engines and repair work. While there is a little more inquiry from some of the railroads, there is no disposition to place orders at to-day's prices. The outlook is considered somewhat better, however, and it is expected that some further business will develop in the course of the next month or so. At present the Baldwin Works has 8000 employees on the pay roll, averaging about three days a week at eight hours a day, as compared with 20,000 on full time at the same period last year.

The Department of Public Works, Bureau of Water, city of Philadelphia, will receive proposals under contract No. 138 for additional pumping engines for the Roxboro and Belmont pumping stations. Specifications, drawings and blank forms for proposals can be obtained from the office of the Chief of the Bureau, room 790 A, City Hall. Bids will be received until March 3.

Cleveland Machinery Market.

CLEVELAND, OHIO, February 18, 1908.

While inquiries are somewhat better, the local machine tool market shows no improvement. Sales are still confined almost exclusively to single small tools. The fact that inquiries are better is something of an encouragement to dealers, who are inclined to believe that business will be better in the next few weeks. While sales in the past month have been largely to small repair shops and a large share of inquiries are still coming from the same class of buyers, it is noted that quite a few inquiries are now coming from manufacturing interests. Business with many concerns has improved sufficiently to cause the managers to think about their future requirements in the machine tool line, and they say, in making the inquiries, that should business continue to improve as they expect it to, they will be in the market before long for some additional equipment. Among the new inquiries that came out during the week were two from industrial plants that have under consideration the establishment of repair shops. One of the inquiries is for about $7000 worth of tools, and the other for about $5000 worth. The lists include lathes, planers, drills, shapers, &c. There is a fair demand for milling machines, and buyers are as yet unable to secure prompt deliveries on some sizes.

While general price cutting is not being indulged in, dealers are making some small concessions, such as the freight charges, to land an order. This is more particularly true where the dealer has the tool wanted on the floor of his stockroom and is anxious to reduce his stock. There is a fair inquiry for second-hand tools, but the supply at present is somewhat limited. Dealers say that plenty are being offered, but they are not buying many because the owners are holding them at too high prices.

The Lake Shore & Michigan Southern Railroad had a good sized list of machinery requirements out before the recent financial depression, but it is reported now that the railroad will make no purchases of machinery before summer at the earliest, and that probably the original list will be revised and cut down.

With the machine tool and machinery builders the situation has not changed to any extent, although inquiries are

somewhat better. In most manufacturing industries the output is being slowly increased, but the majority of them still have plenty of idle tools. Manufacturers of twist drills report considerable improvement in their orders from jobbers during the past week. Builders of pneumatic tools report no improvement in the demand, both inquiries and orders being very scarce. Crane builders are getting some orders for small single cranes from small shops, but their volume of new business is limited.

The Cleveland office of the Waterbury Farrel Foundry & Machine Company, which is the sole selling agent for the Rodd automatic nut tapping machine, built at Kent, Ohio, by the Falls Rivet & Machine Company, has recently introduced them in Europe and is booking quite a few orders for foreign customers. In addition the company has sold 150 of these machines in this country in the past two years. The Waterbury Farrel Foundry & Machine Company recently received a good sized order from the Mexican Government for machines for the mint in Mexico City. This company is now building 16 cartridge machines for the National Cartridge Company, to be installed in the company's new plant at Belleville, Ill.

The Marion Tool & Specialty Company, Marion, Ohio, which was recently organized, will manufacture ratchet and combination wrenches, ratchet drills, vises, molders' bellows, sprocket chains, mail boxes, barn door hangers, &c. W. W. Radcliffe is president; Walter Bolander, vice-president; F. E. Disbennett, treasurer, and O. A. Parr, secretary.

Efforts are being made in Akron, Ohio, to secure capital for the organization of a $200,000 company to erect a plant for the manufacture of a new rotary engine invented by William M. Hoffman, Buffalo, N. Y. It is proposed to move the plant, now located in Buffalo, to Akron.

Sealed proposals will be received by the Board of Managers of the Ohio State Reformatory, Mansfield, Ohio, until March 18, for furnishing and erecting complete an ice making and refrigerating plant of 10 tons capacity. Further information can be obtained from Jacob Reinhardt, steward of the reformatory.

At a recent meeting of the directors of the Dean Electric Company, Elyria, Ohio, A. E. Barker tendered his resignation as sales manager. The following officers were elected: S. B. Rawson, president; W. W. Dean, A. E. Barker and Max Koehler, vice-presidents; A. G. Dean, secretary and treasurer.

Repair work has been rushed on the plant of the Seneca Chain Company, Kent, Ohio, which was recently damaged by fire, and all departments of the plant are now in operation.

Work on the new plant of the Skelly Mfg. Company, Canal Dover, Ohio, which has been suspended for some time, will be resumed at once. The company will manufacture telephone supplies.

The People's Electric Light & Power Company, Leetonia, Ohio, capitalized at $15,000, has been incorporated by A. E. Green, A. J. Thompson, J. M. Garfield, E. J. Blandin and F. H. Ginn of Cleveland.

The Fulton Machine Company, Canal Fulton, Ohio, has increased its capital stock from $10,000 to $20,000.

The village of Newton Falls, Ohio, has under consideration the question of installing a new water works system. A vote will be taken on February 24 on the matter of issuing $20,000 in bonds for that purpose.

Leo H. Marx, formerly of Fishel & Marks, Cleveland, Ohio, and Samuel Jacobson of East Chicago, Ind., announce that they have formed a partnership as Marx & Jacobson in the Scrap Iron and Metal business, and have located at Holton avenue and the Cleveland & Pittsburgh Railroad.

New England Machinery Market.

WORCESTER, MASS., February 18, 1908.

An important influx of inquiries characterizes the machinery trade, accompanied by some orders. Lots sold are mostly small, and second-hand tools figure prominently in the volume of business. Dealers continue to express optimistic opinions as to the future, anticipating a fair business. Outside of the machine tool business and its kindred lines, manufacturing in New England is on the gain. Inquiry of a large number of manufacturers in widely diversified lines has brought out the almost universal statement that an improvement in orders has been noted, together with indications that the improvement will increase from now on.

The National Supply and Machinery Dealers' Association has sent to its members an interesting letter, advising the maintenance of prices, a recommendation that seems almost unnecessary, so general has been the attitude of the trade in this respect. The letter states, in part: "It may be interesting to give you the benefit of some recent information gained from manufacturers of various lines handled by members of our association. It is the general opinion that financial conditions are constantly improving and confidence is being restored. It is also conceded that the demand for goods of all kinds has materially fallen off, but increased demand is apparent in some lines since January 1. But with it all the information received regarding prices is very interesting. The prevailing opinion is that it is best not to reduce prices, believing that it will not increase the demand for goods. It seems to be general to reduce production instead of prices. Owing to extreme advances in cost of material and labor, which has also advanced prices of many items, it is also a fact that many manufacturers have not been able to secure the advances they should. Therefore, at times like the present, if there should be any decline in the cost of labor and material, many manufacturers feel that this should be their opportunity for increased profit, to which they are entitled. Other manufacturers state positively they will not change the present prices. Some manufacturers also express fears that there may be some who have large stocks and are not strong financially, and may therefore weaken at times like the present and cut prices. The above are facts, and do they not apply equally to the dealers and jobbers, who are the selling department of the manufacturers? We are all agreed that our profits are not sufficient compensation for the amount of continuous and strenuous application required and the necessary risk. This, therefore, is a most opportune time to eliminate some of the bad things and improve conditions. Cutting prices will not bring additional business, and in such few lines where reductions do occur let us not give it all to the buyers. A small reduction is sufficient, and in many instances not necessary at all. This has already been proved in many instances. Any reduction usually serves as a wedge for further concessions and frequently postpones the sale. It is the buyer's business to get reductions in prices if possible. You and your competitors have many kindred interests, especially the local houses. If you will buy from your competitors some of their surplus stocks, or exchange with them, they will do so with you, and in that manner reduce the stocks of all. In some cities this is being done very successfully. Furthermore, if you have any surplus stocks which you wish to call to the attention of members, kindly notify our secretary, who will cheerfully give the same prompt attention."

The United Shoe Machinery Company has been buying machinery for the equipment of a new plant which the company is to establish in England, an undertaking necessary because of the new British patent law which makes compulsory the working of patents in that country in order to secure protection under them.

The Automatic Cashier Company, Hartford, Conn., has increased its capital stock, and is to move its business to a suburb of the city, where a factory building has been secured for its uses.

The C. C. Garrigus Machine Company, Bristol, Conn., which has begun the manufacture of special and automatic machinery, has purchased much of the machinery required for the immediate future, but states that it will be in the market some time within the next few months for a 42-in. planer and a lathe to turn 48 in. As has been stated in *The Iron Age*, the company is to erect a new shop at Bristol in the spring, on land already acquired for the purpose. Clarence C. Garrigus, until recently at the head of the mechanical department of Landers, Frary & Clark, New Britain, Conn., states that the policy of the company will be to add tools as they may be needed, and not to issue any list of equipment which will be required for the business when the larger quarters will be available. The company is working toward the development of a new machine, the invention of Mr. Garrigus. The business is temporarily located in the shop of W. L. Barrett.

The Pratt & Whitney Company, Hartford, Conn., is running full time in some departments and 50 hr. a week in others, with practically a full force of men. The company reports an accession of new business.

Clayton Bros., Inc., Bristol, Conn., manufacturer of shears, has purchased land on Broad street in that place, and proposes to erect a modern plant on the premises, though when work will begin has not been determined, all depending upon the condition of business, which, by the bye, has been improving with this company. Rumor has had it that the business was to merge with that of the Northampton Cutlery Company, Northampton, Mass., and that the plant of the latter was to be moved to Bristol. There is no truth whatever in the report, which was doubtless founded upon the fact that there are affiliations in the ownership of the two companies.

The business of Draper & Hall, Middletown, Conn., manufacturers of dies, punches, automatic machinery and printers' supplies, has been incorporated in Connecticut as the Draper & Hall Company. While the business will remain much the same as formerly, increased attention will be given the manufacture of special machinery of all descriptions. The present shops will answer the company's purposes for the present.

The Hartford Auto Parts Company, Hartford, Conn., manufacturer of automobile parts, has increased its capital stock in order to add to the equipment of its factory and to increase its output. The company has no intention of increasing its plant at present, as there is ample room for extension of the business.

Government Purchases.

WASHINGTON, D. C., February 18, 1908.

The Bureau of Yards and Docks, Navy Department, Washington, will soon ask bids for two 450-hp. high pressure water tube boilers, with superheaters.

The following bids were received February 6, circular No. 415, for supplies for the Isthmian Canal Commission:

Class 1. Boiler room equipment.

Item 1. Six 500-hp. water tube boilers—Bidder 1, Abendroth & Root Mfg. Company, Newburgh, N. Y., $31,777.32; alternate item 1, 8 boilers, $42,369.76. 2, Central Metal & Supply Company, Baltimore, Md., $48,000, alternate $64,000; 3, D'Olier Engineering Company, Philadelphia, $33,050, alternate $44,010; 5, A. D. Granger Company, New York, $41,940, alternate $55,920; 8, Motley, Greene & Co., New York, $34,993, alternate $46,578; 12, Heine Safety Boiler Company, Philadelphia, $30,423, alternate $40,530; 13, Babcock & Wilcox Company, New York, $34,934, $32,900 and $40,074, alternate $46,578, $43,339 and $53,430.

Item 4. Two duplex boiler feed pumps—Bidder 1, Abendroth & Root Mfg. Company, Newburgh, N. Y., $1035; 2, Central Metal & Supply Company, Baltimore, Md., $1200; 3, D'Olier Engineering Company, Philadelphia, $1150; 5, A. D. Granger Company, New York, $1125; 8, Motley, Green & Co., New York, $1475; 12, Heine Safety Boiler Company, Philadelphia, $1441; 13, Babcock & Wilcox Company, New York, $1485.

Item 5. One vertical water tube feed water heater—Bidder 1, Abendroth & Root Mfg. Company, Newburgh, N. Y., $1175; 2, Central Metal & Supply Company, Baltimore, Md., $1000; 3, D'Olier Engineering Company, Philadelphia, $950; 5, A. D. Granger Company, New York, $1125; 8, Motley, Green & Co., New York, $890; 12, Heine Safety Boiler Company, Philadelphia, $898; 13, Babcock & Wilcox Company, New York, $893.

Item 6. One fuel economizer—Bidder 1, Abendroth & Root Mfg. Company, Newburgh, N. Y., $7260; 2, Central Metal & Supply Company, Baltimore, Md., $7000; 3, D'Olier Engineering Company, Philadelphia, $6000; 5, A. D. Granger Company, New York, $8775; 8, Motley, Green & Co., New York, $5770; 12, Heine Safety Boiler Company, Philadelphia, $6169; 13, Babcock & Wilcox Company, New York, $5983.

Item 7. One induced draft centrifugal fan and engine—Bidder 1, Abendroth & Root Mfg. Company, Newburgh, N. Y., $1280; 2, Central Metal & Supply Company, Baltimore, Md., $1400; 3, D'Olier Engineering Company, Philadelphia, $1250; 5, A. D. Granger Company, New York, $1560; 8, Motley, Green & Co., New York, $1220; 9, National Blower Works, Milwaukee, Wis., $1340; 12, Heine Safety Boiler Company, Philadelphia, $1173; 13, Babcock & Wilcox Company, New York, $1274.

The following bids were opened February 10, circular No. 416, for supplies for the Isthmian Canal Commission:

Class 4. One screw cutting lathe and one lathe chuck—Bidder 2, American Tool Works Company, Cincinnati, Ohio, $510 and $593; 4, Baird Machinery Company, Pittsburgh, Pa., $734; 12, Vandyck-Churchill Company, New York, $690; 19, Fairbanks Company, New York, $692; 22, Frevert Machinery Company, New York, $578; 37, Manning, Maxwell & Moore, New York, $686.75; 39, Motley, Green & Co., New York, $697.50; 42, Niles-Bement-Pond Company, New York, $683 and $643; 47, Rahn-Carpenter Company, Cincinnati, Ohio, $605.

The following bids were opened February 11 for supplies for the navy yards:

Class 21. One woodworking machine—Bidder 175, Oliver Machinery Company, New York, $3100 and $3790.

The following awards have been made for supplies for the navy yards, bids for which were opened January 28:

Niles-Bement-Pond Company, New York, class 181, one planer, $6000.

Pratt & Whitney Company, Hartford, Conn., class 171, two Pratt & Whitney thread milling machines, $1976.

Newton Machine Tool Works, Philadelphia, class 182, one slotter, $910.

Jones & Lamson Machine Company, Springfield, Vt., class 183, one lathe, $1305.

Frevert Machinery Company, New York, class 184, two bolt heading, upsetting and forging machines, $4016.

Hilles & Jones Company, Wilmington, Del., class 185, one plate bending rolls, $645.

Warren Steam Pump Company, New York, class 188, one hydraulic duplex steam pump, $1225.

The Franklin Institute's Reception.—The Board of Managers of the Franklin Institute, Philadelphia, held an informal reception at the institute on the evening of February 14. Dr. Persifor Frazer made an address on "The Franklin Institute. Its Services and Deserts." The project of a new building for the institute, to be located on the new Parkway, was particularly referred to, and it was announced that $220,000 had already been subscribed, this amount being independent of the Franklin Fund and the value of the present institute buildings. As the proposed structure would cost a very much greater sum, however, than is now available, a considerable amount of money will still have to be raised before the hopes of the members can be realized. An elaborate display of models, photographs, drawings, &c., a large part of which were the work of the students in the various departments, was made in the reading and school rooms of the institute. President Walton Clark, Vice-Presidents Washington Jones, James M. Dodge and Henry Howson and other members of the officers and Board of Managers constituted the Reception Committee.

The American Iron & Steel Mfg. Company's Report.

The eighth annual report of the American Iron & Steel Mfg. Company, Lebanon, Pa., presents a balance sheet as of December 31, 1907, which compares with the previous year's showing as follows:

	1907.	1906.
Assets.		
Cash	$1,278,706.56	$460,936.92
Bills receivable	22,709.12	3,584.58
Accounts receivable, net	693,522.43	1,038,491.01
Inventory at cost prices	1,441,592.37	1,647,835.89
Insur. and taxes—unexpired value.	11,581.84	12,240.94
Total current assets	$3,448,112.32	$3,163,089.34
Real estate, plants and equipments.	$5,336,685.65	$5,031,360.31
Less reserve to provide for depreciation	734,000.00	665,500.00
Total fixed assets	$4,602,685.65	$4,365,860.31
Total assets	$8,050,797.97	$7,528,949.65
Liabilities.		
Wages accrued, not due	$20,116.32	$82,995.41
Accounts payable	3,382.26	277,734.44
Total current liabilities	$23,498.58	$360,729.85
Preferred stock	$3,000,000.00	$3,000,000.00
Common stock	2,550,000.00	2,550,000.00
Undivided profits at this date, subject to the payment of dividends on preferred and common stock, authorized but payable January 1	2,477,299.39	1,618,219.80
	$8,027,299.39	$7,168,219.80
Total liabilities	$8,050,797.97	$7,528,949.65

Arthur Brock, chairman of the Board of Directors, makes the following statement:

"The statement of the company's finances for the year ending December 31, 1907, herewith presented, shows an accumulation of cash due in part to the profitable operations of the company during the year, and in part to the reduction of stocks of both manufactured products and raw material. The sum of $305,325.34 has been expended for betterments and additions, and has increased the capacity, efficiency and economy of the plants. The new office building has been completed and is now occupied, and the old office building is being advantageously utilized by the manufacturing departments. The reserve fund to provide for depreciation has been increased $68,500, and all buildings and machinery have been kept to the highest standard. All the plants of the company have been equipped with most modern apparatus for protection against fire, and all are covered by fire insurance at favorable rates."

The directors for 1908 are as follows: Arthur Brock, chairman; Edward Bailey, Horace Brock, Edw. R. Coleman, Thomas Evans, W. C. Freeman, H. H. Light, James Lord, H. M. M. Richards, J. H. Sternbergh and H. M. Sternbergh.

Executive officers: James Lord, president; John Penn Brock, vice-president; H. M. M. Richards, treasurer; D. G. Scott, secretary, all at Lebanon, Pa. Executive Committee: Arthur Brock, Horace Brock, Edward R. Coleman and W. C. Freeman.

The Youngstown Car Mfg. Company, Youngstown, Ohio, manufacturer of steel cars for industrial purposes, has recently completed the delivery of 100 steel charging box cars and three of the largest skip cars ever made for blast furnace work for the Ohio works of the Carnegie Steel Company. The car company has also nearly completed four ore scale cars for the same steel company, and is now working on an order from the United States Government for 40 W-shape steel cable cars for use in the San Francisco Navy Yard.

The important British shipbuilding establishment of Sir James Laing & Sons has suspended. The yards at Sunderland and Deptford employed 5000 men. The firm had built liners for the Peninsular and Oriental and Cunard companies as well as several men-of-war. A scheme of reconstruction is to be submitted to the creditors at an early date.

HARDWARE

We commend to the careful attention of the trade and of the public the article on another page in regard to the special privileges which catalogue houses are enjoying in connection with the transportation of their goods. To what extent the practices thus referred to are contrary to the letter of the laws relating to the railroads is a question into which it is not necessary at this time to enter, but they are certainly contrary to the spirit and intent of the legislation which aims to secure equal privileges for shippers. The importance of these facts thus brought out by *The Iron Age* have not heretofore been recognized by the opponents of the retail mail order business and call for consideration and action by the associations of merchants who are endeavoring to safeguard the interests of the trade.

All those interested in the foreign trade of this country will learn with great satisfaction that the larger exporting firms of this city have at last taken a step in the right direction, by forming the American Exporters' and Importers' Association. This organization should become an institution of influence and materially aid in benefiting the manufacturing industries of our country, and increasing our export trade, which is apparently on the threshold of large development. This promising branch of American industry and commerce needs, however, regulation, organization and a proper understanding between the various interests to bring about the desired expansion and especially securing co-operation between export houses and the multitude of manufacturers who are desirous of increasing their foreign trade.

Our manufacturers and jobbers have a thorough knowledge of their home markets, and have long since combined for proper protection, and well understand their respective relations to each other. The relative position of the manufacturer with the exporter and importer is, however, at present undefined, and through the want of proper and harmonious working together many inconveniences and hindrances are encountered. While there is some similarity between jobber and exporter in their relation to the manufacturer, the exporter is probably as necessary for the promotion of the manufacturer's interests in foreign lands as is the jobber in the domestic market. How most efficiently to serve the manufacturers in marketing their goods abroad is one of the principal problems before the association just formed. One of the chief objects of the association will be to establish on the broadest possible lines a proper understanding and harmony among themselves, so as to treat their large interests with equity and judgment, and at the same time to establish closer relationships with the various industrial and manufacturing organizations, and with individual manufacturers, with a view to discussing and adopting measures which will promote their mutual interests, stimulating foreign demand and securing harmonious co-operation and understanding between the exporters and manufacturers.

Considerable sums of money are now practically thrown away by the manufacturers through their use of wrong methods in seeking foreign business. Much of this fruitless expense can undoubtedly be saved and many vexatious situations and conditions avoided by a closer alliance between exporter and manufacturer. Much distrust may also be eliminated, and the object sought by both parties promoted by intelligent and concerted action. Many factors and conditions govern trade in other countries which must be learned and taken into account, but united action will undoubtedly result in greatly improving the present situation. In its efforts to accomplish something in this direction the association, the announcement of whose formation is given in another column, will have the best wishes of the trade, and the developments of its plans will be awaited with interest in the hope that much may be accomplished for the increase of our foreign business.

Condition of Trade.

The week which has passed since our last report, taken all in all, has doubtless witnessed an increase in the volume of business which has not, however, attained as yet its normal proportions as compared with recent Februarys. The demand which is made upon the manufacturers by the jobbers is with very few exceptions for such goods as are needed at once to replenish stocks where this is necessary to take care of current business or business which is counted sure to come in the near future. This policy, which is characteristic of the wholesale trade is to some extent followed also by the retail merchants, but it is not pursued quite so generally or consistently by the retail distributors. Goods which are called for by the railroads are as a rule peculiarly quiet and it is still the case that the mainly agricultural sections are less affected by the existing depression. There are indications that the influence of the scarcity of money which was so pronounced in the closing months of the year is still felt among the farmers whose trade with the catalogue houses has undoubtedly fallen off very materially, with the result that these mail order concerns have become exceedingly cautious in the purchase of goods. It appears that the farmers, desiring to hold on to the cash which they have, are discontinuing in many cases from dealings with the catalogue houses which call for cash with the order, and are supplying their needs from the local merchants, from whom they can obtain credit! In this way the late financial stringency seems to bear fruit to the advantage of the retail merchants who would, however, under the circumstances, do well to be careful of their credits and prompt in their collections. A good many minor changes in price are recorded from day to day, but the principal lines are for the most part held pretty generally, without important concessions in the regular price. In many lines, however, even fair sized orders would test the actual strength of the market and very likely develop lower quotations. Money is more plentiful and collections as a rule give no ground for complaint. The fact that commercial houses generally are standing up well against the strain to which they the have been subjected is a matter for congratulation. Credits, however, continue to be carefully scrutinized.

Chicago.

With the advance of the season the demand for Hardware is increasing, with no feverish haste or nervous activity to be sure, but in a steady, safe and conservative way that augurs well for permanent gain. Recent inter-

views with a large number of Western retail and some wholesale merchants confirm the general reports of soundness of trade conditions in the great agricultural region of the Middle West. Merchants in and west of the Missouri River Valley from whom expressions were obtained reported almost without exception a satisfactory volume of business, and were practically unanimous in the belief that the coming season will develop a normal amount of business. All, however, admitted that, with the exception of Nails and Wire, they were limiting their purchases to nearby requirements; a policy seemingly dictated more by a distrust of the maintenance of present price levels than other considerations. In the opinion of a prominent Western jobber the only contingency of serious importance in the future outlook, so far as consumptive demand in States of the West and Northwest is concerned, is that involved in the outcome of prospective crops. If within the next 60 or 90 days indications give promise of an abundant yield the effect, it is believed, will be to assure a wholly normal demand for goods. Fence salesmen generally report a pretty satisfactory trade, and Nails and other Wire goods, though not up to the high mark of last year, are moving in fairly good volume. In the larger cities, and especially those having large manufacturing industries, consumption has been reduced by the enforced idleness of workers, but a gradual resumption of activities is under way, and continued improvement in this respect is to be reasonably expected.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—The most striking feature of the general situation in the Hardware line at this time is the quiet strength with which the market is being held.

Those merchants who were in business in other days will remember in times of panic and business recession the undignified scramble for business, the fierce competition for orders, with the resultant demoralization of prices.

Twenty-five years ago in all lines there were many weak and independent manufacturers. Such a thing as working along the same lines for their mutual protection and for the common interest was almost unknown. Every manufacturer was like Ishmael—his hand was against every man and every man's hand was against him.

In those days we surely had free and unrestricted competition. What were the results? Failures, receiverships, lost fortunes, unhappiness and misery. Not only were there such things, but the fierce competition led to short weights, short counts, cuts in sizes and other crooked business methods.

When some manufacturers were threatened with ruin they attempted to make a profit in any way they could. Other manufacturers were compelled to meet this class of competition. The hunger for business led to the breaking down of all trade channels. Manufacturers sold not only to jobbers but went direct to the retail trade. Jobbers sold not only to retailers but sought business direct from consumers. Would any of us to-day be glad to see such conditions?

Is it not a fact that we would to-day be confronted by just such conditions were it not for the great changes that have taken place in the last quarter of a century in the ideas of manufacturers as to common sense and intelligent methods in the sale and distribution of their goods? The people of this country have howled at trusts and combinations, but, as a matter of fact, as we review the situation, have not these so-called trusts and combinations been a great factor in preventing widespread disaster in the trade at this time?

The cool judgment of the business men of the country is crystallizing around the fact that there are ills following free and indiscriminate competition, which are far worse than those following combinations. The idea is crystallizing that more real unhappiness is caused by unrestricted and inhuman competition than by the trusts. The Sherman Anti-Trust law is recognized as being an unbalanced and deformed measure that needs straightening.

For the first time in the history of the Hardware trade we see the interesting spectacle of manufacturers facing a recession in business by a proportionate reduction in the output of their factories. They realize to cut prices will not increase the volume of trade. They appreciate it is better economics to shift the law of supply and demand to production of goods than to break the market by producing more than the country can possibly consume.

Louisville.

BELKNAP HARDWARE & MFG COMPANY.—Business is still going at a moderate gait. There is no sign of enthusiastic recuperation anywhere except in occasional inspired articles in the daily papers. People are loath to embark in new enterprises. Money is held in the banks, both city and country, and in very sizable wads in the pockets of the farmer and that of the small capitalist. It is almost a universal desire that on the part of those who are not blessed with inordinate riches to carry what they have about their persons. The display of money seems to be gauged by them much as a patent of nobility. It certainly has its attractions for the outsiders, who are always willing to undertake the problem of long division with the fortunate possessor, even if it be confined to cigars or the more liquid refreshment.

After a period of stringency there is always a desire manifested to play with money a while before putting it to actual use. It has an artificial value for the time being, something akin to black tulips or shorthorn cattle or tule lands, then it settles down to a figure equivalent to that of the interest rate of the safer class of bonds. Then investment begins again and undertakings are made which promise to yield more than ordinary absolutely safe rate of interest. It is the interval between these two periods which is the trying time for those who are in business. The expense account based on prosperous business is out of all reason for lean years, and a readjustment of numbers and sometimes salaries has to be made. It is a disagreeable task, ofttimes misunderstood, but absolutely necessary for the health of a going concern.

We have just had a few days' session of the Kentucky Retail Hardware Association at the Galt House, which will doubtless be reported in the usual full and first-class style in the columns of *The Iron Age*. One hundred and sixteen merchants were catalogued as being present. Discussions were of practical character, and a happy conclusion was reached in the shape of a banquet at the Galt House on the evening of Thursday, the 13th, at which Harry S. Perkins, treasurer of the Belknap Hardware & Mfg. Company, presided. There was a notable lack of elaborate displays at the meeting this year. Conditions were such as to forbid lavish expenditures in this shape, and the concertizing was reduced to a couple of phonographs in the parlor. Be it said to their credit, they were the best of their kind and not at all suggestive. The bars were only those of the music score itself. Possibly this is just as well, as these diversions are ofttimes a detraction from what is strictly business and what is aimed at by a serious, sober lot of thoughtful men.

The river is still at a fine boating stage, the warm rains and the thermometer at 60 and over has caused the ice floes to disappear. We are fairly headed toward spring, if we can believe the thermometer and the song birds.

The rate on mercantile paper seems to have settled down to a reasonably comfortable figure. The brokers are again offering their services to the borrowers. The rates asked in November and December look absurd enough now, and the renewals effected under stress are still bearing a heavy burden of discount. This much must have been proven to the lenders, viz., that Hardware trade paper was a better investment than any stock or bond on the list on a declining market. While these latter shrank and shrank until the dividends for years could not atone for the decline, Hardware notes were paid at par, and worth it all the time, and the lender got his own with usury. Let the lenders remember this in future when they are tempted to exact 8 per cent. or more.

Since writing the above we have had a downpour of rain, and this great river of ours has begun to rise at

the modest rate of a foot per hour. A 9-ft. stage sounds ridiculous enough. Unless we can get the mercury down in the tube closer to the bulb we may look for a flood, with all its trying features—flood, mud and destruction.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—The business and financial situation in this part of the country seem to be about the same as when we made our last report to you. The majority of traveling salesmen are on the road, and are having a fairly good business. The country merchants of the South seem to be in pretty good shape, and while they are inclined to keep their stocks reasonably well assorted, at the same time they are not buying very liberally, and orders are for small quantities —smaller than they have been for some years.

The best trade is coming from the agricultural section of the country, as the farmers and planters are in the best shape and have more money than any other class of people. The mining industries are still pretty flat. Most all of the coal, iron and phosphate mines in the South are either closed down or are running on a reduced scale, and the manufacturing plants are also curtailed considerably.

The lumber industry in the South is a big item, and this has been very dull for some months. We understand quite a number of the lumber mills will resume March 1. This will be of great benefit to the South, as the lumber industry puts a great deal of money into circulation.

Collections are about as good as could be expected. The majority of the country merchants are trying to pay their bills promptly; some of them are really unable to pay and are asking for time, and are not being pressed, while possibly some few may be taking advantage of the situation and not endeavoring to meet their obligations promptly.

New Orleans.

WOODWARD, WIGHT & CO.—The past two weeks have been a copy of the two weeks previous to them, with a steady volume of orders—small, but enough to keep the forces in this city going, and enough from the buyer's point of view, to carry him for a short distance of time ahead, but nothing in the way of large sized orders, and, of course, nothing in the way of any speculative buying. Stocks in jobbers' hands all over this Southern country are in very good shape; that is, there are no heavy stocks and just enough to keep the goods moving and replace from the factories.

The sugar situation has not been a good one. Last year turned out to be an unfortunate one for the sugar producers, as their product came on the market in the very hardest part of the hard times, when there was no money available anywhere, and as a consequence the product was bought by the American Sugar Refining Company at a very much lower price than raw sugars could have been imported from Europe or from Cuba. There was a difference at one time of from ¼ to ½ cent according to the grades, between the prices at which the Louisiana sugar planters were selling their sugars, based on New York deliveries, and the prices at which the European or Cuban article of a similar grade could be bought. The crop, however, was a fairly good sized one, and while the result is very hard on the planter in that he has worked for the whole year and got practically nothing out of it, at the same time he has not, as a class, been forced to go into debt through his losses.

The rice crop was fairly good—not anywhere near as good as cotton, but better than sugar.

As for cotton itself, we still have a good deal of it in country towns that has not as yet come to market, and have got what we used to consider a very good price for it. Our cotton planters have improved their methods of producing, improved their farms and improved their Tools to a tremendous extent in the last two or three years. Most of them own bank stocks in the local banks that are scattered through our cotton country, and as a whole they are in very good shape.

The lumber people are waiting on the demand from the corn and wheat sections. The yards up there which distribute the output, are supposed to be pretty well bare of stock, and it is just a question of what the farmer is going to do in the way of repairing his fences, barns and buildings and putting up new ones, if any, that is going to determine the situation. The present prices that the saw mills are getting, based on any sort of a value for their raw material, are, to say the least, unproductive, and are as low, it is believed, as lumber can possibly go. The only thing against that point of view is the almost absolute lack of demand at present, but the bareness of the yards in the North, and the fact that the farmers must make their repairs in the next four months and the yards must buy within the next 60 days, more than counterbalances this. Our saw mills are like our cotton people. They have had years—eight of them now—of tremendous prosperity, at prices higher than any of us thought they were going to get to, and the saw mill practice and the logging practice has made great strides in the last five or six years and a short let down if the demand picks up in the next 60 days, will really be to their advantage in that they will be able to get more returns out of their labor than they have been able to get in the last two or three years.

We all down here look for a good, quiet, peaceful year in Louisiana, Alabama, Mississippi and eastern Texas, with a good, but not large amount of business, and a pick up as soon as the election is out of the way, either by being settled in November or settled by everybody seeing how it is going to turn out earlier than that time.

Cleveland.

THE W. BINGHAM COMPANY.—While orders are not as large as formerly at this season of the year, still there is a much better demand both by mail and through our traveling salesmen than we had reason to expect. There has been a general feeling that prices would be decidedly lower, and the best policy to pursue would be to curtail buying.

Now that the currency famine that so affected business during November and December is practically over, trade is beginning to assume its normal condition. As manufacturers' stocks are light, the retail merchants recognize the necessity of keeping their stocks well assorted, and while not buying largely they are buying frequently.

The consumers' trade, owing to the conservative manner in which the jobbers are now placing orders, is not as active as the present conditions warrant. At the same time, taking everything into consideration, business as a whole so far in 1908 is fully as good as ought to be expected. And now that the iron and steel men have come to an understanding as regards future prices, we look forward to an increased demand for all kinds of goods.

Collections have been much better than we had reason to believe they would be, and we look forward in a short time to the general resumption of business, not the activity of last year, but believe that as soon as these conditions are thoroughly understood and the consumers realize that there will be no great shrinkage in prices, business will settle into its normal condition.

We trust that we may not be disappointed, as the manufacturers' agents claim that business is brightening up in all sections of the country, and predict that 1908, as a whole, will be a prosperous year.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—Trade conditions are much the same as when our last was written. The winter has been an open one, not favorable for the sale of coal, heavy dry goods, clothing, furs or any heavy winter wear, and the same applies to some extent to a few lines of Hardware. But the demand for Hardware generally has been about normal and, as we are now in what we may consider the last half of winter, the more active trade should soon set in.

Jobbers have been putting their stocks into shape, in which they probably find some difficulty in certain lines, owing to low stocks in hands of manufacturers. With favorable weather trade should become fairly active in early March, and the present prospects in the Northwest are for a normal trade.

Prices are holding firm in most lines. The action of the Wire and Nail manufacturers and of the manufactur-

ers of Guns and Revolvers, and also of some other lines of staple goods in maintaining prices has had a very healthy effect, and has done much to steady the market. The probability now is that prices for some time ahead will not show much change. It is to be hoped that manufacturers, who, as yet, may not have found orders coming in as freely as expected, will not try to create the demand for their goods by reducing prices.

The demand will come as soon as the conditions of trade favor, and cutting prices will permanently relieve neither the situation nor the demoralizer. There can be no doubt of improvement in the general situation, and we may expect a fairly active trade at least in most sections as the season advances.

Portland, Oregon.

FAILING, HAINES & MCCALMAN.—As the weeks pass and we are able to look back and obtain a clearer view of the financial crisis through which we have just passed, we believe that the country as a whole has reason to be thankful that the crisis came when it did, rather than deferred until a later period, when results would no doubt have been far more serious and far reaching than they have been. The necessary conservatism in business, due to the financial crisis, is proving to be a blessing, even if in disguise, and business conditions are improving rapidly, but upon a more conservative basis, due to the fact that a large part of speculative business has been abandoned for the present, and, we believe, for some time to come.

There is a very decided improvement in conditions since our last letter. This is especially true in the selling of goods, and collections are coming in more freely than they have been for the last three months. In addition to this, the jobbing houses are now beginning to replenish stocks, and traveling men who are going through the territory report a far greater volume of sales than they had reason to expect.

There are but few serious disturbances in the iron and steel markets, and these are mostly on such lines as are not well controlled by the manufacturers. There seems to be no adequate reason for some reductions which have been made, inasmuch as such reductions are in nearly all instances too great to allow for a proper margin between the cost of the raw material and the finished product. We hope that these disturbances will soon disappear, and, although prices will be upon a lower margin generally than last year, yet there seems to be no reason why there should be any very marked declines at this time.

Building permits for the month of January, 1908, show an increase over those of January, 1907, and there seems to be a well formed opinion that we will have a very busy year in the erection of buildings, particularly of the dwelling house class. There may be some falling off in the construction of large office buildings, but even now some are under construction.

Considerable interest is manifested in the entrance into Portland of the new railroad down the north bank of the Columbia River. This will open up a large territory to our jobbing trade, and will, of course, influence a large number of settlers to come during the year to other parts of our territory, and we believe that our population will show a decided increase at the end of another year.

Up to the present time the political situation has not seemed to receive very much consideration, and except for what discussion there may be in the newspapers very little is heard concerning national matters.

Taking it altogether, conditions are good and constantly getting better, and we trust that our experience may be that of the rest of the country as well.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—The business conditions during January and February of this year are unique, in that there has been no previous depression which makes a satisfactory medium of comparison. Nothing ever happened before that was quite parallel to the present smashup. To use a railroad simile, the wreck should be by all odds the greatest we have ever had, for the reason that we were running at a much higher speed and with heavier equipment. In previous smashups the roadbed and rolling stock had depreciated, and the passengers were in no wise surprised to find themselves in a wreck. In the October disaster business was riding in palace cars on a six-track road, apparently ballasted with the thickest bed of "rocks," and with the latest scientific devices to prevent a collision. Then something happened, and the reports of what it was are so conflicting that the general public has not yet made up its mind. Some think that the bankers' car, which was in the head of the train, threw overboard a number of passengers, and that these unfortunates became tangled up in the running gear, throwing the train off the track, while still another report comes from the aforesaid car that somebody placed a big "stick" on the track; and so it goes. It is said that in the multitude of counsellors there is wisdom, and there undoubtedly is; but to find the wisdom just at present is rather perplexing.

Local business is good by comparison if you go back far enough for the basis. Perhaps a feeling of thankfulness for so much as there is, instead of grumbling because the phenomenal figures of last year are not repeated, would be wise for us all. One of the cheering elements in the situation is the small number of failures in the Hardware fraternity, and the willingness of most retail merchants to keep their stocks well assorted by frequent purchases.

Our local mills have been increasing their forces, and while many of them are not running on full time, or with full numbers, yet there is a perceptible increase in the number employed.

This city is, perhaps, more fortunate than some others because of the large amount of public work at present under way. The Market street subway is employing both day and night shifts, and the new Parkway boulevard and the elevation of the Reading Railroad tracks, as well as a number of other smaller enterprises, have given employment to a large number of men during the unusually open winter that is now nearing a close.

NOTES ON PRICES.

Wire Nails.—Consumers, as a rule, are not anticipating their requirements as far ahead as last year, while the retail trade is purchasing in a conservative manner, rather underestimating than overestimating requirements. Business received by the mills, compared with other lines of products, is regarded as satisfactory, and is attributed largely to the assurance that prices would be no lower for the spring trade. New business and specifications on contract orders have given the mills a fairly large tonnage. The tone of the market is firm, as a result of adherence to regular quotations. Quotations are unchanged, as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

New York.—The local demand is confined to orders for unusually small lots at store, indicating that merchants' requirements are light. Considering the comparatively limited business, the regular price is being remarkably well maintained. The local quotation for small lots at store is $2.40, base.

Chicago.—As compared with other lines of mill products the demand for Wire Nails is highly satisfactory, and even independently considered the results that have followed the practical guaranteeing of prices over a given period are by no means disappointing. A fair amount of new business is being booked and specifications against recent contracts are being offered in reasonable volume. The retail trade is buying somewhat more conservatively than last year, being disposed to underestimate rather than overestimate requirements. Prices are reported to be maintained with absolute firmness. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—A fairly large volume of new business in

Wire Nails is being placed, consisting both of new orders and specifications against contracts, but as a rule consumers do not seem disposed to anticipate requirements for as far a period ahead as they did last year. The mills are able to make quite prompt deliveries and the trade is getting its orders filled and shipped promptly. Regular prices are being maintained by the mills and the tone of the market is firm. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers..... $2.05
Carload lots, to retail merchants..... 2.10

Cut Nails.—Quotations, on the basis of $2.05 for Steel Cut Nails, at mill, were reaffirmed at the meeting of the Eastern Cut Nail Association, held last week. The demand at the mills is light, and manufacturers are making efforts to prevent stocks from accumulating, which would act as a menace to the market. Notwithstanding the efforts to sustain regular quotations, reports indicate that orders have been accepted by some mills below $2, base. Regular quotations are on the basis of $2.05 per keg, at mill. Iron Nails generally should command about 10 cents more than Steel.

New York.—The demand is light, and for small lots, as but little work is being done in this neighborhood requiring the use of Cut Nails. Quotations are on the basis of $2.30 per keg, for small lots, at store.

Chicago.—Locally there is practically no demand for Cut Nails. Building operations and car construction, which constitute the chief outlet in this market for these goods, are exceedingly quiet, and in consequence orders are confined to scattered lots of a few kegs each. There is, indeed, too little business offered to induce a shading of prices, which are accordingly pretty regular. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; Steel, to jobbers, in carloads, $2.28; to retailers, $2.33.

Pittsburgh.—Existing prices on Cut Nails were reaffirmed at the meeting of the Cut Nail Association held last week. The mills continue to restrict output very materially, and are making every effort to prevent accumulation of stocks which always act as a menace to the market. Prices on Steel Cut Nails continue uneven, recent business having been taken as low as $1.90, at mill. We quote Steel Cut Nails at $2 to $2.05, f.o.b. Pittsburgh, for carload lots, and small lots at $2.10, to which freight to destination is added. Iron Cut Nails are being held at about $2.15, at mill.

Barb Wire.—From the South a fairly active demand for Barb Wire is reported, in anticipation of spring trade. Though more conservative in its purchases, the retail trade is represented as anticipating nearly a normal consumptive demand. Shipments are heavier from mills, which also have a heavier tonnage on their books than at any time since last fall. Regular prices are well maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—The prospective demand for Fence Wire has encouraged wholesale buyers to anticipate a good spring trade, for which they are ordering with reasonable liberality. Salesmen representing the principal interest say that the retail trade, though more conservative in its purchases, expresses confidence in a nearly normal consumptive demand. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—A fairly active demand for Barb Wire is coming in from the South, in anticipation of the opening of spring trade, and it is believed the Northern trade will soon commence to place orders more freely. The mills have more tonnage in Barb Wire on their books now than at any time since last October, and shipments are also heavier. The tone of the market is firm, but prices are unchanged. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—The demand is moderate from the mills, though in excess of that for the past few months. A fairly large consumption of Plain Wire is expected, but of course not so great as last year. The market is reported as being well maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots..... $1.90
Retailers, carload lots..... 1.95

Chicago.—While the demand for Plain Wire is not particularly conspicuous in volume, yet it is regarded as quite satisfactory under present conditions, since it contrasts favorably with the inactivity in other mill products. Manufacturers feel assured that there is small likelihood of a repetition of delay in shipments, such as occurred from the over congestion of mill capacities last year, and are consequently not extending their purchases to provide for requirements so far in advance. Established prices are being firmly held. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—A moderate amount of new business is being placed by Fence manufacturers, and specifications against contracts are coming in quite freely, with the result that tonnage on the books and shipments by the mills are heavier now than at any time since the depression in trade started last October. The mills anticipate a fairly large spring trade in Plain Wire, but not so heavy as last year. We are advised that regular prices are being strictly maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots..... $1.90
Retailers, carload lots..... 1.95

Rope.—Trade conditions remain practically unchanged in this market, but some regard indications as justifying the impression that an improved demand will materialize a little later in the season. Quotations are as follows, for base sizes: Pure Manila, 11 to 11¼ cents; B quality grades down to 8 to 9 cents; Pure Sisal, 7¾ to 8 cents; lower grades Sisal, 6¾ to 7 cents; No. 1 Jute, ¼-in. and up, 7½ cents; No. 2 Jute, 7 cents.

Window Glass.—There is a reported improvement in the demand upon factories, by jobbers, for Window Glass, in view of the approach of spring, coupled with the belief that there will be a market for an increased quantity of Glass during the coming season. Buying from factories is said to be at materially advanced prices. On the other hand, it is known that some factories which are in need of money, are offering Glass at comparatively low figures. It is estimated that the hand operated capacity now in operation is between 400 and 500 pots, and that by March 1 this capacity will be nearly doubled. Machine made Glass factories are also preparing to increase their output. The minimum prices recommended by the Eastern Window Glass Jobbers' Association are as follows: Single strength, 90 and 25 per cent.; double strength, 90 and 30 per cent. discount from jobbers' list. These prices are, however, not closely adhered to.

Linseed Oil.—The demand continues for small lots, as crushers' prices are too high to be attractive to carload buyers. Requirements for jobbing lots are moderate. The price on City Raw has been reduced 1 cent per gallon. State and Western Raw is held at 41 to 42 cents. Prices in five-barrel lots are as follows: State and Western Raw, 41 to 42 cents; City Raw, 43 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—A weak market in Savannah has been reflected in the New York demand this week. Large consumers have held off, and sales have been only for small quantities. Local prices have declined about 3 cents per gallon. The New York market is represented

by the following quotations: Oil Barrels, 50½ to 51 cents; Machine Made Barrels, 51 to 51½ cents.

Coil Chain.—The market for Coil Chain, which has not been in good condition for some time, continues weak in tone, and in one quarter and another especially low quotations are reported from time to time. There is reason to believe, however, that some manufacturers whose prices are under the market could not make satisfactory deliveries. A conference scheduled for later in the month may have a beneficial effect on the situation.

Agricultural Wrenches.—The price of Agricultural Wrenches has recently shown weakness, and manufacturers are now making quotations 10 per cent. or more below those previously ruling. The market may be represented in a general way by a discount of 80 per cent.

Brazed Tubing.—Price List No. 7, dated January 27, relating to extras over the base prices of Brazed Tubing in brass, copper and bronze, has been promulgated. The base prices are not affected, but many changes have been made in the extras, both in the way of reductions and advances. The general tendency has been to reduce the extras on the smaller diameters and thinner gauges, and to advance the price per pound in the extras on the larger diameters and thicker gauges. This will, doubtless, exert a tendency to discourage the use of large size and heavy gauge Brazed Tubes in favor of Seamless Tubes in this category.

Increased Freight Charge on Export Shipments.

THE Eastern railroad companies have decided to impose new charges upon less than carload shipments for export, which, it is said, will in effect increase the freight rate from 30 to 40 per cent. The executive officials of the railroads have decided that after March 1 next the roads will no longer absorb lighterage charges on less than carload lots, as at present, but will require a separate bill of lading for every consignment of merchandise for foreign shipment, making, we are advised, an increase of 20 per cent. in the fifth class rate between New York and Chicago. In addition to the increased rate shippers will be required to pay 3 cents per 100 lb. for lighterage, with a minimum of $9 per consignment. In most instances freight breaking bulk at New York for trans-shipment in less than carloads to various countries abroad necessitates five or six different deliveries to ship. By the present arrangement, a car containing mixed lots would be lightered free up to and including 5 lots, with one additional delivery to dock or depot of one or more lots to be put aboard by the consignee at his own expense. The reason given is that it is no longer legal to give free lighterage unless it is performed for all.

A. W. NELSON, who has for many years been connected with some of the foremost woodworking machinery interests in the country, has recently been employed by the Continental Company, Detroit, Mich., as a factory inspector. His principal duty will be to inspect the mode of operation at the different factories whose goods are handled by the Continental Company, with the idea of standardizing all of the different lines, both as to pattern, quality and finish. He will spend two or three weeks at each factory, watching the operations from the lumber yard, through all the machining departments, operating departments, the finishing and painting and even the crating and loading the goods, so as to bring each of the lines up to the highest standard of quality and finish. The best features of each factory will be adopted by the other factories, so as to bring the goods up to a uniform quality.

THE PLANTERS' MFG. COMPANY, maker of Sash Cord, Clothes Lines, Cotton Rope, &c., Anniston, Ala., has purchased the plant and good will of the Rhode Island Cordage Company, Providence, R. I.

J. TOWNSEND'S SONS, Rome, N. Y., recently had their Hardware stock damaged as a result of fire in an adjoining building.

PRIVILEGES OF CATALOGUE AND MAIL ORDER HOUSES.

MANY of the large catalogue and mail order houses have been built up by special privileges and favors which they have obtained from the railroads and express companies. This fact is plainly apparent to any one who will investigate their relations with the carriers, and it is acknowledged by practical railroad men who, for obvious reasons, do not want to be quoted. It is an open secret that the catalogue houses have not made as much money in the past year and have not grown as rapidly as a few years ago. The principal reason for this check in their growth is that the Hepburn law and the rulings of the Interstate Commerce Commission have cut off many of their important privileges, and others have been stopped by the railroads in response to protests from associations of retail merchants who were the victims of discrimination.

Rebates Paid by the Railroads.

The railroads even now are allowing a rebate of 5 cents per 100 on freight which they receive from certain mail order houses, and it is impossible to say how much more they may have allowed in years gone by. The carriers are trying to stop the payment of the present allowance, but it is apparently made in a legal form, and the roads which oppose it have not yet succeeded in abolishing it. They would undoubtedly welcome any support which they might receive from associations of Hardware and other retail merchants, and the question may be found worthy of investigation by these associations.

This 5-cent rebate is not paid directly by the railroad to the mail order house. It is paid, out of the through tariff rate, to the switching road which performs the equivalent of drayage service. The switching road takes a large number of small shipments from the platform at the warehouse of the catalogue concern, loads them into cars, switches them five or ten miles to the "out" freight houses of the various roads, and delivers the goods there without a penny of expense to the shipper. The railroad which receives the freight for shipment pays the expense by the allowance to the switching road. This practice, while it may not be an illegal rebate, is a

Direct Discrimination Against the Hardware Merchant

and other retailers. They have to pay the full freight rates on their shipments, and drayage expense besides. It was formerly the practice of the railroads in many large cities to add "drayage" to their freight bills, and collect it from the consignee as "advance charges" on the shipment. In other cities the wholesalers have added it to the invoice on each shipment. Even where neither of these customs is followed, the merchant must, nevertheless, pay the drayage expense. It is a part of the expense of the wholesale merchant in carrying on his business, and it amounts to so large a figure that he must provide for it in his prices.

The railroads are therefore discriminating against the merchant by "absorbing" in the rate on catalogue house shipments the equivalent of the drayage expense which the merchant must pay on his shipments. It is a rule universally enforced by the railroads, on less than carload shipments, to make the shipper deliver the goods at his own expense for drayage at their "out" freight houses. No railroad would dream of paying drayage bills for a shipper, because this would be a direct violation of the law.

A Recent Case Shows How Particular the Railroads

and the Interstate Commerce Commission [illegible] this point. It was formerly a custom of the railroads, in crowded terminals in large cities, to furnish men who assisted the shipper or consignee in loading or unloading cars on team tracks. The railroads gained a double advantage by furnishing this "assistaance," as it helped to keep their team tracks clear, and it also protected them against damage claims which might result from improper loading by careless draymen. The Interstate Commerce Commission, however, decided that this practice was illegal, and both the Eastern and Western roads have

adopted rules to stop it. It would seem as though it is equally illegal for a railroad to furnish "assistance" to the catalogue house, in its competition with the retail merchant, by absorbing in the rate a charge which the merchant must bear on his shipments.

Other Valuable Privileges.

Every one is familiar with the "pay no money" advertising with which some of the mail order houses have flooded the country. In connection with this business, the railroads allow privileges to the catalogue house which discriminate seriously against the merchant. The customer does not pay for the goods until after they arrive at his station and he has examined them and found them satisfactory. On business of this kind the railroad performs a special service and incurs risks of a troublesome kind, for which it receives no compensation. The shipment is carried at the same rate as ordinary freight on which the railroad does not render any special service nor incur any of the risks of an "order" bill of lading.

The railroad must "bill" the shipment in a special manner to guard against delivery before it is paid for. An "order" bill of lading is issued to the catalogue house, which sends the document to a bank at destination, with a sight draft attached to it. When the customer pays the draft he gets the bill of lading with which he obtains the delivery of the shipment. Railroad agents often make mistakes by delivering shipments of this kind before they are paid for, in which case the railroad is liable for the goods. There are far more "claims" presented against railroads on this class of shipments than on ordinary freight on which the railroad does not accept this peculiar responsibility.

In Most Cases the Railroad Allows the Consignee the Privilege

of coming to the station and opening up the package for examination, before he pays the draft or obtains the bill of lading. This is a privilege for which no charge is made. The consignee will often refuse the shipment for a little scratch or blemish which he would pass unnoticed if he had paid for the goods in advance, and this gives the mail order house a legal basis for a damage claim against the railroad. Enormous sums have been paid by the carriers in damage claims of this character. The strict rules adopted by the railroads last year for crating Buggies grew out of the heavy claims they had to pay on mail order shipments. In cases where a reduction in price, to be collected as a claim from the railroad, will not persuade the farmer to accept the shipment, the Western railroads allow the goods to be returned at half rates. The Eastern roads do not make this half rate on returned shipments, but the Western lines have a rule permitting any goods to be returned at half rate "for repairs," and this rule has been stretched to cover the return of any mail order shipments that have been refused.

The mail order shipper will of course claim that it is only a trivial service which the railroad performs in issuing an "order" bill of lading, and that they have as much right to it as the man who ships a car of grain or cotton. On carload shipments, however, the freight revenue is large enough to cover the risk and the service. On small catalogue shipments the road may only receive 25 or 50 cents for the entire service. For a similar service on carload shipments the privilege of "reconsigning," the railroads have recently put in tariffs which charge all the way from $2 to $7, although the carrier incurs no risk in allowing a change of destination, or a change in the name of the consignee, and the clerical work involved is no greater than the issuing of an "order" bill of lading on a 25-cent shipment of mail order stuff.

There Is a Fair Prospect That if This Matter Were Brought to the Attention

of the right officials of the railroads they would be willing to relieve themselves of a lot of trouble and damage claims by discontinuing the practice of issuing "order" bills of lading on less than carload shipments; or they would at least make a charge for the service if they continue it. The Interstate Commerce Commission has taken the position in many similar cases that the railroads must make a charge for any special service which they perform in handling a shipment of any kind. On these small C. O. D. shipments the carriers have at least twice the trouble and the risk that they have on ordinary shipments consigned to a merchant, and it is a clear case of discrimination against the merchant if they continue this service without charging for it.

Many Privileges Have Been Withdrawn.

The Elkins and Hepburn laws have strengthened the hands of the railroads in dealing with greedy institutions like the mail order houses, where their privileges have not been actually made unlawful. A railroad agent is no longer permitted to act as commission agent for the mail order people, and most of the roads have stopped the practice of shipping out catalogues in bulk, to be distributed by the agent. The express companies are not allowed to use the railroad agent for this work of distributing catalogues, and the Hepburn law, in making them common carriers, compels them to charge their full tariff rates on all catalogue house business. The Eastern roads have been sustained by the Interstate Commerce Commission in cutting off the forwarding agencies which gave the mail order people carload rates on small shipments, and it is only a question of time when the Western roads will adopt the same rule. When all these special privileges of the catalogue houses have been abolished, it will not be difficult for the retail merchant to compete with them on fair and equal terms.

THE AMERICAN EXPORTERS' AND IMPORTERS' ASSOCIATION.

THE American Exporters' and Importers' Association, New York, after years of preliminary consideration by far sighted export merchants, although organized May 23, 1907, when a number of leading export houses signified an intention to join such an organization is just beginning to accomplish the purposes for which it was created. Permanent quarters have been established in the Whitehall Building, in lower New York, readily accessible to the export trade, superseding the temporary offices in the New York Produce Exchange Building. The appointment of important committees will soon be made.

The necessity for a closer trade alliance on generous lines having mutual regard for vested interests in so far as many diverse industrial enterprises can be harmonized has long been apparent to practical men whose business perspective reaches farther than local or immediate conditions, and whose vision recognizes the possibilities attainable by intelligent treatment of a sensitive subject.

What the Association Seeks.

In such movements, usually, there are obstacles, not insuperable, but which nevertheless demand the exercise of discretion and tact, based largely on a willingness to regard the Golden Rule. Obviously some of these difficulties have been surmounted, and the fact that a start has been made by representative, responsible houses is cause for gratulation. The constructive minds in this enterprise possessed of the advantage of long and wide experience have in view an enduring organization founded on sound business practice, equable and fair, which it is intended shall be mutually beneficial alike to themselves, the manufacturers, the foreigner and important but relatively subsidiary interests. Unquestionably unjust or unfair treatment injuriously affecting the interests of constituent members, regardless of its source, will be construed as proper cause for association action, but the prime object sought is to foster, develop and enlarge American trade abroad for the legitimate profit that can be gained.

Reasons for Organization.

In this age of large transactions business methods must keep in close touch with conditions and with increased transportation on sea and land, intricate customs tariffs and decisions, license laws, national and local laws affecting trade, commercial treaties, credits, business failures, and countless conditions that will occur to practical

business men who are continually being confronted with strange, perplexing problems, more comprehensive treatment is demanded than is possible of attainment by any single house no matter how wide its field.

In the matter of credits, for example, the deserving can best be accommodated and the unscrupulous coped with by helpful co-operation and the accumulation, concentration and interchange of recorded information, under proper safeguards, through the medium of a well conducted and compact organization, that in some measure at least is in a position to serve as a clearing house. Such a system would be helpful in determining the extension of credits to foreign houses by keeping such accommodation within safe limits, or, in any event, put the seller on guard and prompt such verification or confirmation as the situation required.

Objects as Defined in By-Laws.

The objects of the association as defined in the by-laws are as follows:

It shall be the object of this association to foster and promote the export and import trade of America, and to encourage the trade and commercial interests of its members; to establish and maintain greater uniformity and certainty in the customs and commercial usages; to acquire, preserve and disseminate valuable business information, and to promote a more enlarged and friendly intercourse between its members and other branches of trade and transportation; to negotiate and adjust differences that may arise, and generally to develop and extend the volume of American export and import trade.

A Legitimate Ambition.

The coercion of members in or out of the association or of producing interests, or interference in the conduct of any concern's business is unthought of, but it proposed to smooth out misconstructions and misunderstandings, correct abuses that often exist and should have no place in honorable, legitimate business, and by working loyally, harmoniously and sympathetically among each other and with maker and consumer advance the business in a dignified way commensurate with its rapidly growing importance for the betterment of all concerned.

Formation of Trade Committees.

It is neither the intention or desire to admit to the privileges of the association all who claim to do a foreign business, into or out of the country; rather to combine in one body the representative and responsible houses. One of the plans is the organization of Trade Committees to represent and promote the interests of the members of the association with the different markets of the world and which shall be elected in such number as may be desired. Each of these Trade Committees will consist of a chairman and two additional members, who will be chosen at each annual meeting of the association and hold office for one year; the president, vice-president and treasurer being ineligible for election as chairman of any such Trade Committee.

Each Trade Committee will have supervision of a prescribed territory, handling every question that pertains to its particular market, with as many Trade Committees as divisions of territory are created, one committee, for instance, exercising jurisdiction in South Africa, another in Australasia, another in the West Indies or Central America, and the numerous sub-divisions suggested by experience, thereby obviating confusion in relation to any particular territory.

Arbitration Committee.

An Arbitration Committee is also provided for in the organic law, to consist of five members, chosen annually, to hear and decide all disputes arising between members of the association, which may be submitted to it and the decision of the Arbitration Committee will be final and binding upon all parties concerned.

Judicious Treatment of Credits.

Naturally the question of credits is of prime importance. With the accumulated information in the association's possession it will be in a position to counsel wisely and advise concerning the extension of accommodations, if requested, by which deserving and responsible houses will benefit, with corresponding restrictions, according to sound business usages in the cases of irresponsible merchants. Valuable knowledge of such character is the result of long, actual experience, and often of personal contact and familiarity with local conditions and the concentration of information covering widely separated territory is best accomplished in a large way through organized effort. Such questions are complex at best and can be most carefully handled by concentrating the knowledge and experience of houses well organized and long in the trade.

Bureau of Information.

One of the departments contemplated is a bureau of information, properly organized and guarded for the transmission of facts of value to the manufacturer, bearing on the peculiarities of near or remote markets, seasonable and salable goods, samples for duplication, how and when to ship, freight rates, remittances, credits and the endless detail impossible except when done on broad lines. Disputes and conflict of interests between exporters, for instance, and transportation systems can best be determined by such a central body, in which delicate, intricate or vexatious trade questions requiring painstaking treatment can be threshed out in committee or by the organization as a whole and uttered as the official conclusion of a competent, responsible body.

Developing New and Larger Markets.

The functions of export commission houses are in the main to receive and execute orders from foreign merchants, and while there has been and will be more or less effective work in introducing new goods and creating or discovering new markets, it is a fact that successful export houses have welcomed the assistance, and in some instances suggested business campaigns by manufacturers whose lines and financial standing warrant the sending abroad of their own qualified expert representatives to specialize and introduce goods, and concerning which only a specialist could make satisfactory progress. Only salesmen so grounded in each particular line are qualified to effectively push them in competition with European products longer in the field and marketed by trained representatives. It has been repeatedly conceded that once American manufactures are well introduced and established abroad they invariably maintain their hold at anything like a parity with foreign competition if care is taken to keep up the supply, but the main hindrance is in securing first orders.

Increased Business That Follows Successful Introduction.

The experienced exporter knows full well that after this stage of the business has been successfully accomplished and the tide of business directed this way he will naturally receive his proportion of the business that follows. It is in such ways and others that it is hoped to make this association beneficial, not alone to its own membership, but as a necessary outgrowth of bettered conditions to the various interwoven interests inseparable from the exportation and importation of goods. While there is no pretence of organizing an association for the benefit of interests outside the membership, such interests must necessarily profit in a multitude of ways as the volume of business grows. While there is exported more in value from the United States than by any other nation, the foreign trade of industrial products of this country is yet in its infancy, and the men who are pointing the way to expansion of trade abroad are deserving of support.

Officers and Members of the Association.

The following houses so far have been enrolled as members of the association:

Arkell & Douglass.
American Trading Company.
Bowring & Co.
R. W. Cameron & Co.
E. F. Darrell & Co.
J. Frank Dunham.
D. A. De Lima & Co.
Guiterman, Rosenfeld & Co.
[illegible] & Co.
A. D. Hitch & Co.
Kunhardt & Co.
Leaycraft & Co.
[illegible] & Co.
Mailler & Quereau.
Markt & Co., Ltd.
Markt & Struller Company.
Melchoir, Armstrong & Dessau.
Henry W. Peabody & Co.
William E. Peck & Co.
Strong & Trowbridge Company.

The officers of the association are as follows:

PRESIDENT, Gustave Vintschger, Markt & Co. and Markt & Struller Company.

VICE-PRESIDENT, William H. Douglass, Arkell & Douglass.

TREASURER, William E. Peck, William E. Peck & Co.

SECRETARY, George F. Trowbridge, Strong & Trowbridge Company.

Kentucky Retail Hardware and Stove Association.

LEADEN skies and frequent showers marked the eighth annual convention of the Kentucky Retail Hardware and Stove Dealers' Association in the Galt House, Louisville, February 11, 12 and 13, but the conditions outside only served to heighten and emphasize within the cheery welcome that awaited members and visitors to the center of Bourbon hospitality. A very large proportion of the members of the association were present. Louisville continues to be acceptable as a central meeting place, and the convention of 1909 will be held, as were its predecessors for five years, in that city.

An interesting incident of the meeting and showing the readiness with which a substantial welcome is offered in blue grassdom, was the springing of a proposition at one of the sessions to bring the 1909 National Retail



J. E. GRUBBS.



GEO. A. CUBBAGE.

Hardware Association meeting to Louisville, and the reading of a strong letter from the Commercial Club at the annual banquet promising the hearty co-operation of all of Louisville's best commercial interests toward that end.

Because of a sudden attack of grip Mayor James F. Grinstead was unable to welcome the members at the opening session on Tuesday afternoon, so after prayer by the Rev. Dr. John Newton Prestage, Col. Marshall Bullitt of the City Board of Public Safety gave them a hearty welcome, and in the name of the association, ex-President J. C. Frederick, Owensboro, referred to by his affectionate fellow members as "he of the low voice and silver tongue," painted a beautiful word picture of thanks and appreciation.

President Read's Address.

After the opening amenities had been concluded, President John W. Read, Hodgenville, delivered his annual address, referring to Parcel Post measures, the syndicate buying evil, the necessity of closely watching legislation affecting the trade, notably a bill repealing the homestead laws and changing the attachment law, and urging co-operation with the mutual Hardware fire association companies. President Read said in part:

The year 1907 has come and gone, with all its opportunities, and it is not out of place to say that it has been a most wonderful year in some respects. You will all remember that it started out with bright prospects for a successful business, then slight clouds began to appear upon its horizon; they became more dense as the fall approached, and the year closed with the worst financial storm that it has ever been my experience to encounter. But with all my anxiety for my own business welfare, I want to assure you that I scanned the papers closely for any misfortune that might have befallen any of our members, and as each succeeding day passed and no one gave up the fight, how proud I felt that the Hardware profession had weathered the storm, and we all passed safely through. While it may have bent some of us I am proud that it broke none of us, and that we are all here once more to advise and counsel for the future.

The Parcel Post Bill

of Postmaster-General Meyer has created more discussion than any question that has been sprung upon the American people for years. You no doubt will have some very able addresses on this question by members who are competent to discuss it, but in all the articles I have read by parties who favor the bill, there is one peculiar feature I cannot understand, and that is the unfairness with which they state their proposition and the comparisons they make. If I were the only man the parcel post bill would injure I would waive my interest, or if the Hardware dealers were the only dealers it would injure I would favor its passage, because the number then benefited would exceed the number injured, but this is not the case, and I hope to see the bill defeated, and by a combined effort of the business men of the country I believe it will be defeated.

Legislation.

I know our Legislative Committee will pardon me for calling your attention to the effort that is now being made by the merchants of this State to secure the passage of a bill repealing our homestead laws and changing our attachment laws. I consider this a wise move and one that will prove beneficial to every dealer in the State. I hope that the members of this association felt interested enough to sign these petitions and that our committee will render all the assistance in their power to this movement.

Mutual Insurance.

I would feel that I had neglected my duty as president of this association if I omitted to mention the benefits derived by insuring your property in our Hardware mutual fire insurance companies. This is one privilege you enjoy by being a member of the Kentucky Retail Hardware and Stove Association, and a privilege that nets you handsome dividends on amounts invested. If you are not carrying a policy in these companies, make an investigation at once, and see how much you will save. These companies are in the hands of competent men, men of honor and integrity, men that will guard your interest. I hope to see every member interested in the question of fire insurance.

Convention Committees.

President Read announced the convention committees as follows:

LEGISLATIVE: B. J. Durham, Danville; J. S. Ogden, Ashland; J. W. Mahan, Lawrenceburg.

BY-LAWS AND CONSTITUTION: Geo. A. Cubbage, Leitchfield; Jno. C. Frederick, Owensboro; Paul Wagner, Louisville.

NOMINATING: U. S. Shacklett, Fulton; Jos. C. Kirchdorfer, Louisville; Wm. Lockbridge, Mayfield.

RESOLUTIONS: N. T. Benton, Winchester; Chas. Somers, Louisville; W. J. Fischer, Newport.

GRIEVANCE: J. E. Grubbs, Winchester; Geo. A. Cubbage, Leitchfield; A. Steitler, Owensboro.



J. M. STONE.



A. STEITLER, JR.

PRESS: Geo. Dehler, Louisville; Chas. Staruble, Louisville; J. H. Farley, Louisville.

TRANSPORTATION: B. H. Cook, Jr., Belknap Hardware & Mfg. Company, Louisville; Harry Pfingst, Robinson Bros. & Co., Louisville; Geo. Miner, Fischer-Leaf Company, Louisville.

Two Prices: One Cash, One Credit.

U. S. Shacklett, Fulton, discussed the subject presented under the head, "Two Prices: One Cash, One Credit." "Necessity," said he, "is the mother of invention," and for three or four years he had found it necessary to have two distinct prices, cash and credit. He found that giving a little discount for cash proved

attractive to his customers. In the closing of accounts he had a rule by which he takes a note for any amount from $5 up. This rule is inflexible, and the only alternative is cash, which, according to his experience, was forthcoming in nine cases out of ten. "To fight the catalogue house," said Mr. Shacklett, "you can meet the competition only by this method—the cash discount." Small accounts ran for 30 days, at the end of which time cash was required, or the alternative, a note with interest. "The secret of the whole thing," said Mr. Shacklett in summing up, "is that your customer will pay for his goods before he will commit himself to a note, no matter how small."

Wm. Lochridge of Mayfield also talked interestingly on this subject, being an advocate of Mr. Shacklett's ideas on the note question.

M. L. Corey, national secretary, told of the methods of settlement of accounts in Indiana and advocated the note plan, but was afraid that any method which fixed a higher price for goods purchased on time settlements might injure the business.

Guaranteeing Tools.

"Do You Guarantee Tools? If So, How Do You Make the Guarantee Good?" was the subject of a paper by Joseph C. Kirchdorfer, Louisville. The conclusion to be reached from Mr. Kirchdorfer's arguments was that if the tool is of low grade, never guarantee it to a customer; if high grade, guarantee it, stipulating proper treatment, and defining what is proper treatment. His advice was to use the word guarantee as little as possible.

J. S. Ogden, Ashland; U. S. Shacklett and George Dehler, Jr., Louisville, also discussed the question, and the burden of their remarks was, talk guarantee as little as possible; never offer it till asked for.

President Read told of some experiences with edge tools in the way of guarantees. He had had but two Razors returned in 12 years. He had never made a claim on his jobber because of these alleged defects, and they had been disposed of at a special discount. Mr. Read had had to replace but one Saw in 12 years. "The point is," Mr. Read said, "be careful what you say about an article; if you know it, don't hesitate to guarantee it, if a guarantee is asked; and if you are called upon to make good, do so, and charge the loss to advertising account."

Other speakers on this topic were J. M. Stone, Sturgis; J. L. Malin, Chicago, and George A. Cubbage, Leitchfield.

Five and Ten Cent Counters.

"Do 5-Cent and 10-Cent Counters Add to the Hardware Business?" was the topic for discussion which George A. Cubbage, Leitchfield, was assigned to lead. Mr. Cubbage began by noting that he could not talk on the subject from actual experience, as he had never had such a department in his store. He believed that the department might be all right, if there was not sufficient stock of the regular kind to fill up the store; but if the space could be utilized for standard goods, he would not regard it as a profitable feature.

City Sales Manager Schlueter of the Belknap Hardware & Mfg. Company, talked from the point of view of the salesman. He advised meeting the competition of department stores and 5 and 10 cent trade with their own weapons. He said that 5 and 10 cent counters in Hardware stores could be made a splendid drawing card, particularly for women, and the fair sex, concluded Mr. Schlueter, rather set the pace in trading.

George Dehler, Jr., believed that the same space could be used to better advantage, and was therefore opposed to the 5 and 10 cent counters. J. W. Mahan, Lawrenceburg, believed the idea a good and profitable one.

National Secretary Corey told of a friend's establishment of a 5, 10 and 25 cent counter. He hired a particularly bright and attractive girl, placed her in charge, and put it up to her to make good or retire. The innovation is now in its third year, and the proprietor believes it one of the most successful ventures of his entire career.

President Read said that the question was, after all, a purely local one, and depended on local conditions; but advised all members to try it and report their success.

Breaking in Clerks.

"Is It Best to Have Green Boys and Break Them in or Hire Competent Men?" the topic assigned to J. E. Grubbs, Winchester, developed much discussion, and brought out a number of valuable experiences. Mr. Grubbs believes thoroughly in the idea of taking the right sort of youthful material and molding it to the needs. He thought the average store proprietor spent too much time with his books and papers, and devoted too little to the store and its visitors. The latter furnished valuable opportunities for the development of talent from green material.

Mr. Shacklett advocated the breaking in theory, and told of how he found some splendid Hardware talent lurking under the tanned skin of several school boys. B. J. Durham, Danville, demurred on the green boy question. He believed that frequently overconfidence in a youth under training might lose many sales. He maintained that sales of any importance should never be intrusted at any stage to other than experienced salesmen.

John M. Stone was loyal to the youth; and then he told of how he earned his first spurs in business by hitching up the billy goat and dressing the kids of the town storekeeper. Summing up, Mr. Stone believed that to give the boys a chance was a duty the storekeeper owed the youth of the country.

Collecting Claims Against Railroads.

The discussion on "What Is the Best System of Collecting Claims Against Railroad Companies for Damaged and Lost Merchandise?" was led by J. S. Ogden, Ashland. Mr. Ogden suggested the following course of procedure: First get the original bill of lading; then note the exact damage. Have the statement signed by the proper railroad official; see that all the details are given in this first statement; act promptly and courteously, and do not make the charge or damage exorbitant or unreasonable. Make your bill fair and file this or a certified copy with the official. If no action is taken after a reasonable time bring the matter up again courteously but firmly. In other words, follow it up closely. Under this sort of procedure Mr. Ogden's firm had had all claims settled promptly and to their entire satisfaction.

Discussion brought out that there were different requirements on the part of railroads in different localities. Some agents were more and some less exacting in their demands. The point was made that tactful treatment of the proper official in a social and trade way usually insured equitable treatment. Mr. Shacklett believed that the railroads are gradually eliminating red tape measures. Some of them, he believed, were paying claims properly attested on demand. On this subject Mr. Shacklett recommended reading an article on the subject in a recent issue of *The Iron Age*. Remarks were made also by Mr. Stone, Mr. Frederick, who believed that the railroads should be made to pay some kind of damage for loss sustained by the merchant; Mr. Ogden, Mr. Sower, who advocated the taking up of claims against the railroads by the consignor in each instance, and others.

Repeal of Exemption Law.

President J. O. Carter of the Retail Merchants' Protective Association, told of the origin and progress of work on House Bill No. 150, which has been introduced in the House and stands for the repeal of the Kentucky exemption law as it now stands. The amount involved under the present law is about $1750; the new law limits the exemption to about $500. Mr. Carter noted that some hard work had been done in the interest of the new law and that it was now about ready for passage. It was voted to contribute towards the expense of the campaign which is being carried on to pass the bill.

Mr. Corey's Address.

M. L. Corey, secretary of the National Retail Hardware Association, addressed the gathering on "What the National Retail Hardware Association Is Doing for the

Retailers." Mr. Corey began by announcing that every business man owes it to himself and his business to get such laws as would give him a fighting chance. He referred to the Parcel Post bills and characterized as unfair the acts of the Postmaster-General and the Post Office Department in pushing the matter under Government frankage and influence. Mr. Corey cited numerous instances to show that the cost of the innovation will be borne by the retailers of the country. He believed this character of class legislation would exercise a strong precedent for other and possibly still more pernicious legislation later. He urged members to write strong letters of protest to their respective Congressmen. As evidence of the strength and influence of the National Association, Mr. Corey recalled the work of the association in fighting freight car advertising—the painting of advertising signs on box cars. As a result all advertising has been ordered off freight cars by the transportation companies. Mr. Corey closed with a strong plea for co-operation of members against the bill.

Restricted or Resale Prices.

"Do You Favor Restricted or Resale Prices Adopted by Manufacturers to Control the Price at Which Their Goods Are Sold by the Retail Merchants?" the subject assigned to George B. Simpson, Sturgis, who was absent, was presented for discussion by Mr. Ogden, Ashland, who believed that some manufacturers had overdone it. Mr. Frederick believed it to be a good thing, but felt that he would like to see the retail jobber made to stick to it too. He was willing that all specialties should be governed by a restricted price, provided the manufacturer fixes it so that there's something in it for the retailer, too.

Reports of Secretary and Treasurer.

The report of the secretary, Jno. R. Sower, Frankfort, was very brief, and referred principally to the voluminous amount of matter relating to the association work sent out during the year. Mr. Sower prefaced his report with the announcement that the close of the current administration would mark his retirement from further official duties. He has efficiently filled the post of secretary for the past four years.

The report of Treasurer A. Steitler, Jr., Owensboro, showed that the association was in sound financial condition.

Election of Officers.

The following officials were elected:

PRESIDENT, J. E. Grubbs, Winchester.

FIRST VICE-PRESIDENT, George A. Cubbage, Leitchfield.

SECOND VICE-PRESIDENT, B. J. Durham, Danville.

SECRETARY, J. M. Stone, Sturgis.

TREASURER, A. Steitler, Jr., Owensboro.

NATIONAL DELEGATES: John W. Read, Hodgenville; J. M. Stone, Sturgis.

ALTERNATES: J. E. Grubbs, Winchester; Paul Wagner, Louisville.

The closing session of the convention was given over to miscellaneous matters and the installation of the new officers. President-elect Grubbs briefly outlined the plans for the coming year, which contemplated an increased membership and hard work for desired legislation.

B. J. Durham reported for those who attended the meeting of the National Association in Boston last year, recalled some pleasures of the occasion, and referred members to the reports of the proceedings as published in *The Iron Age*.

In the absence of S. Norvell of the Norvell-Shapleigh Hardware Company, St. Louis, who was down for an address on "The Catalogue House," H. M. Owsley, a representative of the company, spoke briefly on the ethics of the Hardware profession. "Just anybody can't be a Hardwareman," said Mr. Owsley. "He must of necessity be a good judge of human nature; he must be of a high order of intelligence; he must be square. In 20 years there are very few black marks against the Hardware profession." He believed in careful education of the clerk. He would give each one a department and make him responsible for it. He argued for concentration and against too great a variety of lines.

Mr. Shacklett offered for consideration a new law making it a misdemeanor to sell, give away, or otherwise dispose of, or to conceal personal property that is held under a written contract or a personal contract of conditional sale when the title remains in the seller until the part of the consideration remaining unpaid is paid, with the intention of depriving the seller of the same, or of its proceeds, and to provide for the punishment of the offense. The penalty suggested is the county jail for not more than six months, with a fine of not more than $50, or both.

President Grubbs named Messrs. Ogden, Shacklett and Rubel a committee to co-operate with him, with a view to increasing the membership of the organization.

An interesting address on "Heating and Ventilation" was delivered by H. J. Fueller, secretary of the Abram Cox Stove Company, Philadelphia. Mr. Fueller referred to the various forms of heating, and endorsed the hot air system as the most efficacious.

The Banquet.

A splendid banquet at the Galt House marked the close of a very interesting and instructive convention. Harry S. Perkins of the Belknap Hardware & Mfg. Company, toastmaster, in a cordial greeting and some cleverly conceived and happy hits introduced Judge R. C. Kinkead, who was present as the official representative of Mayor Grinstead. Judge Kinkead's humor was infectious, and started the ball rolling that developed some of the splendid talent for after dinner talking for which Kentucky as a commonwealth is famous. F. M. Gettys, president of the National Association of Credit Men, in his talk on the purposes and accomplishments of the credit men, presented some very interesting facts. "The present national bankruptcy law owes its existence," said Mr. Gettys, "to the credit men. This law has been of especial service during the depression. Now we have one way to administer insolvent estates; we used to have forty-six." Mr. Gettys explained at length the advantages of the information and adjustment bureaus, and closed with the observation: "Honesty is greater than any policy."

C. F. Huhlein of B. F. Avery & Sons, Louisville, was introduced by Toastmaster Perkins as "the man who has predicted that Louisville will some time have a population of 2,000,000." Mr. Huhlein was in a particularly happy mood. He recalled the days of the Grindstones on the sidewalk and the grime on the windows, and gave a view of the Hardwareman's Utopia. The place on the programme of toasts to have been filled by S. Norvell of the Norvell-Shapleigh Hardware Company, was given to the Rev. Dr. W. Francis Irwin, who made a most delightful address. Remarks were also made by P. H. Callaghan of the Louisville Varnish Company, by Ex-Presidents Read and Frederick and President-Elect Grubbs.

Convention Notes.

At the banquet every diner found at his place a pretty little red pail marked with the compliments of Stratton & Terstegge Company, Louisville.

A theatre party at the new Mary Anderson constituted the diversion for Thursday evening.

A vote taken during the convention showed that about 20 per cent. of the membership represented at the meeting carried insurance in the Hardware Mutual Fire Insurance companies.

B. F. Cook, in charge of the Kentucky sales department of the Belknap Hardware & Mfg. Company, made a splendid entertainer at the Belknap headquarters in the Galt House during the convention. Mr. Cook had a fine line of Blue Grass and Blue Ribbon Range specialties, and showed also the new Belknap Harness.

The visitors to Louisville during the convention found a call at the mammoth establishment of the Belknap Hardware & Mfg. Company, across the street from the headquarters, a most pleasant incident of their stay. The very large new concrete and steel warehouse of the company has just been completed and adds to the imposing appearance of the Belknap plant, which now provides 22 acres of floor space, the new building alone containing nearly 350,000 sq. ft. of floor space. The various buildings of the company are connected by a complete modern system of pneumatic tube service, and communication is also afforded by a system of underground tun-

nels. The company will put on the market, March 1, a new Enameled Ware of high quality, which they have named "Rubeo."

Several very handsome displays were made on the second floor of the Galt House by the following manufacturers: James Clark, Jr., Electrical Company, Belknap Hardware & Mfg. Company, Columbia Phonograph Company, Louisville; Dover Mfg. Company, Asbestos Sad Irons, Canal Dover, Ohio; Pittsburgh Steel Company, Pittsburgh; Winchester Repeating Arms Company, New Haven, Conn.; Peters Arms & Sporting Goods Company, Cincinnati; Ætna Powder Company, Ætna, Ohio; Globe Stove & Range Company, Kokomo, Ind.; Union Metallic Cartridge Company, Bridgeport, Conn., and Remington Arms Company, New York City.

CONNECTICUT HARDWARE ASSOCIATION.

IN our last issue we reported most of the proceedings of the annual meeting of the Connecticut Hardware Association at Meriden on the 10th and 11th inst. The annual banquet was held in the Winthrop Hotel with a large attendance of members and their guests. President Birdsey proved a most entertaining toastmaster. Governor Rollin S. Woodruff of Connecticut, head of the Hardware house of C. S. Mersick & Co., New Haven, was a guest of honor, and made an interesting address on the value of association work. He told of the condition in his trade before organization and co-operation were instituted. His own house had considered certain competitors to be "the limit." It finally occurred to the Governor that he would like to see his competitors all together, and he invited the steel and iron and blacksmith supply people to dine with him at New Haven. None knew why they were asked, but they all accepted. There were men who had been in the trade together for 20 years who had never met. They became acquainted that day and organized the Western New England Iron and Hardware Association. The results have been most beneficial. If a competitor makes a price too low a merchant can go to him and say, "Here, Bill, what did you do that for? Don't you know there was nothing in it at that price?" And the answer may be, "Yes; but I didn't do it. The fellow lied," and you believe him. If he did do it he admits it. This sort of understanding means many dollars. It has a strong bearing on business credits. In the iron and steel business we have accounts on our books that haven't been balanced for 20 years. The blacksmith or other customer comes in and pays $10 or $25 on an account of $100 or so, but it is never balanced. We get together occasionally and ask, "What does this man owe you?" and one may answer $300, and another $400, and yet another $50, and we learn more about the man's business condition than he knows himself. Mayor Thomas L. Reilly of Meriden greeted the members, A. H. Abbe spoke for the National Association, and there were remarks by W. H. Lyon, manager of the Charles Parker Company; George J. Bassett and Rev. Robert A. Ashworth.

The Question Box brought out considerable general discussion on the part of those present. L. B. Crosby read the question "Whether it is wise to enter into controversy with a good customer over a small amount if the customer is wrong, but believes he or she is right." Mr. Crosby's own experience has been that these controversies do not pay, but are apt to be expensive in loss of customers. Secretary Phelps thought that this side of relations with customers required wise discrimination and quick decision. If a merchant gets into the habit of making concessions customers are the first to find it out and some of them take advantage of it. On the other hand, if the merchant shows a consistent stiffness in his business principles, maintaining his own self-respect and treating all customers alike, this, too, is quickly realized by his trade and has important influence in their relations.

George J. Bassett read the question: "Why don't more of the best Hardware stores put price tickets on goods displayed in windows?" He gave it as his opinion that a principle reason is that to so mark goods requires time, and time is valuable in a Hardware store. Mr. Bassett's house follows the policy of putting on many price tags, and he believes it pays to do so, not only for special prices, but for all goods shown in the windows. It attracts trade.

L. L. Rosenberg related his experience with a special sale of Graniteware, which he displayed with the sign, "Any one of these articles 10 cents," for two days previous to the day of sale. He had such a crowd that it was necessary to call in the police to restore order and the sale was stopped. He believes the Hardware trade could use the special sale to advantage.

W. P. Lewis, Huntington, Pa., secretary of the Hardware Mutual Fire Association of Pennsylvania and of the National Hardware Mutual Fire Insurance Company, read an interesting paper on his companies and their methods and policies, which was followed by a discussion in which a number of members participated. It was stated that 31 out of the 75 members of the Connecticut Association hold policies in the mutual companies.

Mr. Lewis explained, in answer to questions, that the fact that the mutual companies were not licensed to do business in Connecticut, as required by statute, did not in any way affect the status of a policy. In the very remote contingency of a policy holder bringing suit to recover on a policy he might have to sue in the home State of the company, but otherwise there is no effect upon the holder of a policy. A mutual company, unlicensed to do business in Connecticut, cannot send an agent into the State to solicit business, but the company can enter the State to advance its cause.

NEW YORK HARDWARE ASSOCIATION.

THE sixth annual convention of the New York State Retail Hardware Association is now in session at Buffalo. The opening session on Tuesday afternoon was quite largely attended, although members are continually arriving. President Mattison, after calling the convention to order, introduced the Mayor of the city, Hon. J. N. Adam, who cordially welcomed the members and other visitors, extending the hospitalities of the city. Mr. Mattison then read his annual address, outlining briefly the programme as prepared, referring to parcel post and other questions, and dwelling largely on what interested him most, the association, emphasizing the cultivation of confidence in each other.

He was followed by George F. Bradford of *Hardware*, whose subject was "Hardware Trade Journalism, What It Has Accomplished and What It Should Accomplish." The next address, on "An Honest Paint Law," was to have been delivered by E. W. Heath, but owing to illness the subject was assigned to George B. Heckel, secretary of the Paint Grinders' Association of the United States. Mr. Heckel was, however, called suddenly to New Orleans, and his paper was read by A. C. Britton, assistant manager of the Buffalo Oil, Paint & Varnish Company. This led to an interesting discussion in which several interesting letters from F. W. Devoe & C. T. Raynolds Company and John W. Masury & Son were read.

C. E. Wethey, chairman of the Organization Committee then brought up the question of incorporating the association, reading an extended opinion from a corporation lawyer, prepared by request, in which the advantages and disadvantages were enumerated. After some discussion on a resolution, it was unanimously voted to incorporate the association under the laws of New York, and the directors were called upon to meet immediately after adjournment to take the necessary legal steps, which in due form were sent to Albany, in charge of an attorney, Tuesday night, so that the formality could be consummated while the convention is in session.

John G. Ferres, Johnstown, second vice-president, then addressed the meeting on the question of "Shall This Association Favor a Pure Paint Law In This State." There was some discussion on this proposition, but no action was asked or desired at the time, as it was deemed best to think it over well, for intelligent action at a later session. The convention then adjourned for the day and the directors immediately met to perfect the legal documents relating to incorporation.

Parcel Post Measures in the Senate.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., February 18, 1908.

THE Postmaster-General's campaign for the extension of what he denominates "the existing parcel post" and for the creation of a cheap rural parcel post has been transferred from the House to the Senate. It has been decided that none of the bills heretofore introduced in the House is wholly satisfactory, in view of the sharp criticism they have already invoked, and it has also become apparent that the hostility of the House Post Office Committee and of the Speaker to all these projects will make it exceedingly difficult to secure a favorable report upon them at the south end of the Capitol. It has therefore been decided to begin work in the Senate, and with that object in view Senator Burnham of New Hampshire has been induced to present the Postmaster-General's bill, the text of which, together with the official indorsement thereof, was published in *The Iron Age* of last week. On the same day the Postmaster-General's second project —namely, the reduction in the general merchandise rate from 16 to 12 cents and the extension of the weight limit to 11 lb., was introduced in the form of a Senate bill by Senator Kean of New Jersey. Senator Burnham's measure will be known as S. 5122, while that of Senator Kean is S. 5115. Both bills have been referred to the Senate Committee on Post Offices and Post Roads.

Senator Kean's Bill,

presented at the Postmaster-General's request, provides as follows:

Be it enacted, &c., That parcels of merchandise or other matter not embraced in the first, second or third class of mail matter, and not exceeding 11 lb. in weight, shall, subject to the provisions of existing law governing matter of the fourth class, except as hereby amended, be admitted to the mails as such matter at the following rates of postage: One oz., 1 cent; over 1 oz. and not exceeding 3 oz., 2 cents; over 3 oz. and not exceeding 4 oz., 3 cents; over 4 oz. and not exceeding 5 oz., 4 cents; over 5 oz. and not exceeding 6 oz., 5 cents; over 6 oz. and not exceeding 8 oz., 6 cents; over 8 oz. and not exceeding 12 oz., 9 cents., and over 12 oz. and not exceeding 16 oz., 12 cents.

A Fallacious Argument.

The only argument that has ever been advanced in favor of the Kean bill, reducing the general postage rate on merchandise from 16 to 12 cents, and increasing the weight limit from 4 to 11 lb., is that it will bring our domestic system into harmony with the international parcel post. This point has been made by the Postmaster-General on numerous occasions and has been utilized with a view to arousing public sentiment against what he has described as a discrimination against users of the domestic mails. As a matter of fact, this argument is a network of fallacies which would be fully exposed if the advocates of this measure would tell the whole truth regarding the international parcel post. The fact is that the leading European countries refuse to recognize the 11-lb. weight limit, but maintain a limit closely approximating that of the domestic mails of the United States—namely, 2 kg., or 4.4 lb., being the nearest round metric equivalent to a flat 4 lb. For a number of years Germany recognized the 11-lb. limit, but two or three years ago changed to 2 kg. The countries with which we have arrangements recognizing the 11-lb. limit are of minor commercial importance, and the general tendency of the commercial world is to cut down to the 2-kg. basis rather than to increase the limit.

As to the proposed 12-cent rate on merchandise, it is strongly urged that we ought not to insist upon a higher domestic charge than that fixed by the international parcel post system. It has often been pointed out that international postal systems are largely a matter of comity and courtesy and are not adjusted on a paying basis, especially with reference to merchandise. The fact that the international parcel post rate does not pay is one of the reasons why the leading European countries insist upon a 2-kg. limit. There are two reasons why it has been continued; one is that the enormous rate on letter mail heretofore maintained has produced a total revenue that wiped out the merchandise deficit, and the other is that this deficit is smaller than might be expected, for the reason that although international parcels are carried at 12 cents per pound, the full unit rate of 12 cents is levied upon every pound or fraction thereof. In other words, while a domestic parcel weighing 17 ounces can be transmitted from Porto Rico to the Philippine Islands for 17 cents, the same parcel shipped from New York to London costs 24 cents. It will thus be seen that if international parcels average 1½ lb. each, they would pay exactly the same rate as is paid on domestic parcels.

The Postmaster-General's Rural Parcel Post Bill

as presented by Senator Burnham, is being examined in Congress with considerable interest, not altogether unmixed with amusement. The second section is regarded as absolutely unique in the literature of postal regulation, and as both unconstitutional and unenforceable. In view of the manifold criticisms based upon the practical certainty that under the Sims and other bills the mail order houses would utilize the proposed cheap rural parcel post for the distribution of their catalogues and wares shipped by freight to post offices from which rural routes radiate, the Postmaster-General has sought to cut off this patronage by two provisos which read as follows:

Provided further, That nothing herein contained shall be taken as authorizing the acceptance or delivery at the special rates of postage herein provided of any parcel offered by any person acting as agent or representative, upon commission or otherwise, for any person or company not resident on such rural delivery route; *and provided further*, That only such parcels shall be received for delivery at the special rates of postage herein provided as are offered by bona fide merchants or dealers whose regular places of business are on rural delivery routes covered by this act, in the ordinary and regular course of their business, and by residents on such routes in their individual capacity.

Some Queries.

Taking up the first proviso, it is interesting to inquire upon what sort of evidence a local postmaster or a rural carrier would refuse to accept a parcel offered him should he suspect that the person making such offer was "acting as agent or representative, upon commission or otherwise, for any person or company not resident on such rural delivery route." Would he take the word of the party tendering the shipment or would he insist upon an affidavit or other documentary evidence? In the event that there was a question of doubt would the parcel be refused? Inasmuch as the bill is wholly without administrative provisions and provides no penalties for the infraction of its terms, would persons evading its provisions be liable to punishment of any kind, or would carriers and postmasters—who naturally would be desirous of developing this branch of the postal service as much as possible—be liable to penalties other than removal if they should make mistakes in classifying their patrons as well as the mail matter received by them? Under the present system a person desiring to mail a package of merchandise in a country post office after the closing of the local office either at night or on a holiday, may deposit it through an opening in the door of the office expressly provided for the purpose, but it is obvious that under the requirements of this measure every package would have to be tendered in person and during regular office hours.

The second proviso above quoted presents some commercial problems that stagger the intellect. Parcels may be received only when offered by "bona fide merchants or dealers whose regular place of business are on rural routes," and "in the ordinary and regular course of their business." How would the local postmaster in the most conscientious endeavor to carry out this provision of law discriminate between one small merchant who offered his own goods for transportation and another small dealer whose offerings consisted in part of the goods of a mail order concern shipped to him by freight for distribution? Every local merchant is to some extent "the agent or representative upon commission or otherwise" of a greater or smaller number of manufacturers or jobbers, some of whom carry on a business so like that of a mail order house as to make it rather difficult to draw the line. In a few cases local merchants have become the recognized agents of mail order houses and handle their

goods on the basis of their catalogues, giving the buyer the additional advantage of inspection before acceptance. This is now a very small business in the aggregate, but will the Postmaster-General say that such goods would be excluded when offered by a bona fide local merchant? Would an attempt be made to discriminate between the goods which a small local merchant purchased at wholesale on his own risk and sold at retail in the usual manner and those which he might take on consignment and sell on commission?

Sound Business Judgment Lacking.

Of course it is impossible to more than scratch the surface of the possibilities of this absurd project in the limited space here afforded, but the grotesque results of the Department's efforts to meet the legitimate criticisms of its plans constitute a sufficient commentary upon the utter impracticability of this scheme. It is to be regretted that they also indicate that in the zeal to carry out a project conceived in absolute ignorance of modern retail merchandizing methods the Department officials are no longer guided by the sound business judgment which the public assumes is brought to bear upon all current postal problems.

Probable Attitude of the Courts.

It is a question whether the Postmaster-General and his aides have considered the possible consequences of the enactment of the bill introduced by Senator Burnham after it has run the gauntlet of the courts. It is the opinion of the best lawyers here that the discrimination between parties offering mail matter under exactly the same conditions and tendering exactly the same rates of postage, would invalidate the two provisos above quoted. Some of them believe the courts would therefore declare the entire act invalid, but the majority are of the opinion that the discrimination only would be held to be invalid and that the rates specified would be opened by judicial construction to all comers, including, of course, the local agent of the mail order house. Should this latter expectation be realized, as is extremely probable, the retail merchants of the country would find themselves the victims of a colossal administrative blunder which it might take years to rectify, if, indeed, Congress could ever be moved to restore the former order of things. It goes without saying that a decision of the court eliminating the discrimination in the Burnham bill would be the signal for the beginning of such a legislative campaign as the halls of Congress have never witnessed for the extension of the cheap merchandise rate of the rural routes to the entire postal service. The denial by the courts of the right of Congress to discriminate between patrons of rural routes would constitute a powerful argument against the exclusion of 70,000,000 people from the benefits conferred on 15,000,000 by Postmaster-General Meyer's quixotic measure.

RETAIL HARDWARE CONVENTIONS.

During the next five months the following retail Hardware conventions will be held. Where the asterisk appears elaborate plans are being made by the association officials for the accommodation of Hardware exhibits by manufacturers and jobbers.

INDIANA ASSOCIATION,* Indianapolis, February 18-21. Secretary, M. L. Corey, Argos.

IOWA ASSOCIATION,* Cedar Rapids, February 18-21. Secretary, A. R. Sale, Mason City.

NEW YORK ASSOCIATION,* Buffalo, February 18-22. Secretary, John B. Foley, Syracuse.

COLORADO ASSOCIATION, Denver, February 20, 21, 22. Secretary, Adolph Unfug, Walsenburg.

OHIO ASSOCIATION,* Columbus, February 25-27. Secretary, Frank A. Bare, Mansfield.

MINNESOTA ASSOCIATION,* St. Paul, February 25-28. Secretary, M. S. Mathews, Guaranty Building, Minneapolis.

ILLINOIS ASSOCIATION,* Peoria, February 26-28. Secretary, L. D. Nish, Elgin.

MISSOURI ASSOCIATION, St. Louis, February 27 and 28. Secretary, F. D. Kansteiner, St. Louis.

PENNSYLVANIA ASSOCIATION, Cambridge Springs, March 3, 4 and 5. Secretary, J. E. Digby, McKees Rocks.

NEW ENGLAND ASSOCIATION,* Boston, March 11 and 12. Secretary, Charles L. Underhill, Somerville, Mass.

CALIFORNIA ASSOCIATION, Oakland, March 18, 19, 20. Secretary, Frank B. Dickson, San Francisco.

NATIONAL ASSOCIATION, St. Louis, March 24, 25, 26.

MISSISSIPPI ASSOCIATION, Greenwood, May 11 and 12. Secretary, John E. Sommers, Clarksdale.

GEORGIA ASSOCIATION, Indian Springs, May 19, 20, 21. Secretary, Gary Vinson, Waynesboro.

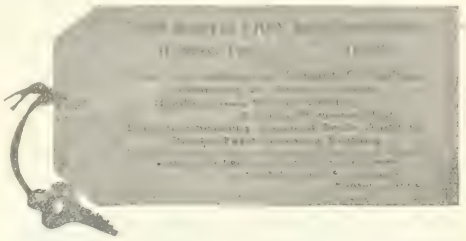
ALABAMA ASSOCIATION, Montgomery, May 28, 29. Secretary, L. G. Smith, Ensley.

CAROLINAS ASSOCIATION, Wrightsville Beach, N. C., July 8, 9, 10. Secretary, Paul W. McLure, Greenwood, S. C.

MICHIGAN ASSOCIATION, Detroit, August 13, 14, 15. Secretary, A. J. Scott, Marine City.

Ohio Hardware Association.

The unique tag reproduced herewith in reduced size has been sent out by the Ohio Hardware Association to the merchants of the State, members and nonmembers. The face of the tag bears the declaration, "The Key to



the Situation." It will be observed that the tag gives information in regard to the convention and the Hardware exhibition. It will be noted that free telephone service over all Bell lines from 6 p.m. to 9 a.m. will be furnished to those attending the convention.

Missouri Hardware Association.

The programme of the Missouri Retail Hardware Association, whose meeting will be held in St. Louis, February 27 and 28, shows that formal addresses will be delivered by S. Norvell, Norvell-Shapleigh Hardware Company; W. D. Simmons, Simmons Hardware Company, and Alexander Witte, Witte Hardware Company, St. Louis; by E. W. Bush, Evansville, Ind., ex-president of the National Retail Hardware Association, and by President Miles or Secretary Corey of the National Retail Hardware Association. In addition there will be "talks" on Paint by Harvey Kent of the Kent & Purdy Paint Company; on White Lead by a representative of the National Lead Company, and on Oil by Charles W. Blow of the American Linseed Company. The Question Box, which is expected to prove a very attractive feature of the programme, will be conducted under the efficient leadership of Fred. W. Neudorff, St. Joseph, former secretary of the association.

Illinois Hardware Association.

The Illinois Retail Hardware Association has issued a folder relating to the convention, which will be held on February 26, 27 and 28 at Peoria, the business sessions being held at Schnelbacher's Hall and the Hardware exhibition at the Coliseum. It presents portraits of the officers and also of the Reception Committee, comprising 25 members, and a map of Peoria, showing the location of the convention hall, Coliseum and railroad depots. It also sets forth the programme for the meeting. The Question Box will be the feature of the convention, and will be given a place at all the sessions. It will be in charge of H. G. Cormick, Centralia, and John T. Noftsker, Rock Island. Addresses are announced by Charles W. Burrows, Cleveland, Ohio, on "Postal Fallacies and Their Effect Upon the Country;" by H. L. McNamara, Janesville, Wis., treasurer, on the work of the National Retail Hardware Association; by John I. Gibson, Battle Creek, Mich., on "What a Business Men's Association Can Do," and by H. W. Beegle, Coulter-Beegle Company, Chicago, on "The Merchant's Aids—the Clerk, the Window." An interesting feature of the convention will be the window dressing contest. Free telephone service over all Bell lines in Illinois will be furnished every day of the convention.

Ontario Retail Hardware and Stove Association.

THE third annual convention of the Ontario Retail Hardware and Stove Dealers' Association was held at Toronto on February 12 and 13, the attendance being about 85 out of a membership of nearly 250. The snow blockades prevented an even larger attendance, although at no previous gathering had there been over 50 delegates present. Organized in April, 1906, the association is only 22 months old. The work was first taken up by the Hardwaremen in the towns of from 1000 to 5000. The larger firms in the large cities held aloof until very recently, but at this convention they attended in fair numbers, their presence being taken advantage of by electing several to important offices. The new officers are representative of both the large cities and the smaller towns. The funds of the organization are in good shape, the membership is speadily increasing, and the enthusiasm growing, and from every standpoint the association seems to have gained sufficient strength to insure its permanency.

The Question Box.

The strong feature of this year's convention was the "Question Box," conducted by Porter A. Wright, Holly, Mich., first vice-president of the Michigan Retail Hardware Association. At each of the three sessions of the



J. R. HAMBLY.
President.



WESTON WRIGLEY.
Secretary.

convention the box was opened after the regular business had been completed, and, under Mr. Wright's efficient leadership, about 30 practical questions were discussed at considerable length. Several related to the cash system of doing business, a strong movement in this direction existing amongst Canadian Hardwaremen, many delegates telling of their experience and urging others to adopt the cash system. Mr. Wright was enthusiastic over the high standard maintained in the discussion, stating that he had never listened to so interesting a "Question Box" discussion during his connection with the Hardware association movement.

Executive Committee's Report.

The Executive Committee reported as follows regarding the various matters receiving their attention during the year:

TRADE GRIEVANCES.—Less than a dozen complaints of unfair selling have been received against manufacturers and jobbers during the year, and only one or two of these have been important.

COLLECTION DEPARTMENT.—This branch of the association work has been very successful, and about 70 members are now using the service to good advantage.

MUTUAL FIRE INSURANCE.—Some progress can be reported in this work. A definite plan will likely be worked out shortly, the result of which will mean large savings to members on their fire insurance premiums.

LEGISLATION.—The Executive Committee has been on its guard against unfavorable legislation in both Dominion and Provincial Houses and has given consideration to several laws. This convention should again place itself on record against the enactment of a parcel post C. O. D. law, against the unfair features of the proposed "Co-operative act," and once more urge the amendment of the Division Court act in respect to the collection of accounts by garnishment.

WHITE LEAD MARKING.—Much correspondence has been carried on between the association and the various manufacturers of White Lead, with the aim in view of discontinuing the marking of a second grade Lead as "No. 1." From the replies received we hope to receive favorable consideration to our request.

CARTAGE CHARGES, &c.—No progress can be reported in the matter of inducing jobbers to abolish cartage charges. Your Executive Committee has stood firm on this question, but the jobbers have declined to change existing conditions. In the matter of stamping the weight on parcels of freight, the Wholesale Hardware Association has also declined to act favorably on our suggestion, claiming that this is unnecessary. Another suggestion sent the Wire Nail Association suggesting a revision of the Wire Nail list has also been considered unfavorably by that association.

ENAMEL WARE SECONDS.—Correspondence with the Department of Trade and Commerce, Ottawa, has shown that no assistance can be expected from the Dominion Government in the prevention of the marketing of inferior goods without distinguishing marks until an act in Parliament is passed.

ORGANIZATION.—During the year a start has been made toward district organizations. This plan of getting the Hardwaremen in the various districts together should be pushed during the coming year and district conventions called during the summer or fall in several of the most central points in eastern, northern and western Ontario.

Secretary's Report.

After a report had been read showing the association to have received $464 during the year, with disbursements of $450, Secretary Wrigley, Toronto, read the following report:

As the report of the Executive Committee contains an outline of the work done during the year, only a brief reference will be made to the work of the secretary's office. The collection department has entailed a lot of work, but its success has warranted the effort. Practical evidence of the effectiveness of the letters has been made evident by the receipt of many letters by the secretary from delinquents inclosing checks in settlement of accounts or making promises to pay in a given time. Roughly speaking, about 5000 parcels, letters and post cards were mailed by the secretary during the year.

The Association Has Gained in Influence and Membership

during the past year. Manufacturers, jobbers and travelers now recognize the association as past the experimental stage and a power for the good of the trade generally. Retailers also are showing by their applications for membership that they, too, in increasing numbers, are realizing their duty to the organization. A year ago our books showed 150 members enrolled; to-day, after crossing off 14 names of firms gone out of business, burned out, withdrawn, &c., we have nearly 250 members. Of last year's 150, about 80 were secured by the personal solicitation of organizers. This year only 30 were secured in this way. Experience shows that members who join voluntarily by mail are far more useful members than those who have to be "talked in" by an organizer.

The extension of membership in the future should come largely as a result of the formation of district associations. The coming year should see more active work done in this direction than in the past.

Merchant's Lists of Prices.

In connection with this work it might be pointed out that as a result of some quiet but effective work, an amendment to the criminal code is likely to be made at the present session of Parliament, making it legal for merchants to arrange reasonable lists of prices for their self-protection.

The Matter of a Dominion Association.

A year ago it was hoped that a Dominion Retail Hardware Association could be formed, but circumstances during the past year have not been favorable to pushing this work. Our sister association in western Canada has become disorganized and no convention is likely to be held in Winnipeg this winter. British Columbia has an association, while Nova Scotia has not yet been able to complete an organization. The trouble in western Canada has been due to two causes, it is understood. In the first place, three large provinces have been too large to include in one organization. Manitoba, Saskatchewan and Alberta will probably reorganize provincially. Secondly, an attempt was made to arrange prices from the central headquarters. Experience has shown that our provincial association is acting wisely in leaving

prices entirely alone. By developing good feeling among the trade, by giving results sufficient to make it worth while for Hardwaremen to belong to the association, and by encouraging the organization of district bodies (where prices can be dealt with if the Criminal Code is amended), the Ontario Association seems to be on safe ground.

The secretary had the pleasure of attending the Detroit convention of the Michigan Retail Hardware Association last August, and learned many things while there. We are fortunate in having with us at this convention a return visitor in the person of Vice-President Wright of that association. We should benefit by his presence and his organization's longer experience. Members who can spare the time would also benefit by attending the sixth annual convention of the New York Retail Hardware Association in Buffalo next week, February 18 to 22.

Travelers as Members

Probably the most interesting discussion of the convention was on a motion that travelers be admitted to associate membership for an annual fee of $1. Mr. Wright of Michigan told of how the travelers were the chief boosters of the association in his State, and strongly urged their admission. Several delegates, however, held that the travelers were held up to join too many organizations, and they shouldn't be held up by the Retail Association. It was also contended that as the trevelers were the employees of the jobbers and manufacturers they could hardly attend retail conventions as free agents. Opinion was very evenly divided, and a motion to leave the matter on the table for a year was finally carried.

Election of Officers.

The following officers were elected for the ensuing year:

PRESIDENT, J. R. Hambly, Barrie.
FIRST VICE-PRESIDENT, D. Brocklebank, Arthur.
SECOND VICE-PRESIDENT, A. Ballantyne, Brantford.
TREASURER, John Caslor, Toronto.
SECRETARY, Weston Wrigley, Toronto.
EXECUTIVE COMMITTEE: D. Cinnamon, Lindsay; R. C. Chown, Belleville; J. R. McMillan, Guelph; J. Walton Peart, St. Mary's; W. G. Scott, Mt. Forest, and W. H. Richardson, Essex.
AUDITORS: W. Peacock and C. F. Morehouse, Toronto.

The Mutual Fire Insurance Committee reported that while Canadian laws are unfavorable to the formation of a mutual company, the committee expected to be able to report a plan of profit sharing insurance shortly. The Constitution and Resolutions committees also made interesting reports.

Hamilton, Ont., was chosen as the next convention place, an invitation having been received from the jobbers and manufacturers of that city to meet there in 1909.

On Wednesday evening H. S. Howland, Sons & Co., Toronto, entertained the members of the association and a number of other guests at a complimentary dinner, which was very much enjoyed.

G. H. Clark, Niagara Falls, together with the secretary and treasurer, were authorized to represent the Ontario Association at the convention of the New York State Retail Hardware Association at Buffalo, February 18 to 22.

The Perkins Hardware Company, Youngstown, Ohio, has been organized to conduct a general Hardware and roofing business. The concern has purchased a site at West Federal and Jefferson streets, and as soon as plans are completed will award contracts for the erection of a modern two-story building. John R. Perkins is president of the company and general manager of the Hardware department. George R. Perkins is vice-president, and Joseph R. Perkins, secretary, treasurer and general manager of the roofing department.

Nebraska Retail Hardware Association.

IN planning the programme and making arrangements for the seventh annual convention of the Nebraska Retail Hardware Association, held at Lincoln, February 11-14, inclusive, it was the aim of those charged with these duties to make this meeting one of the most interesting and profitable in the life of the organization; and it may be truly said that the efforts directed to this end were rewarded by the most complete success. The enthusiasm inspired by numbers was supplied by an attendance of nearly 500, composed of active and associate members and guests, and a judicious commingling of social, business and trade exhibit features served to fill each hour of the four days' meeting with pleasurable interest. How rapidly the association movement is gaining ground in the West is indicated by the growth of the Nebraska Association, which in the seven years of its existence has risen from a modest few to an enrolled membership that, with a gain of 85 new members, admitted during the year, now totals 407.



DAN KAVANAUGH

The proceedings of the convention were limited to sessions held only in the afternoon of each day in a commodious hall of the Fraternity Building, the mornings being devoted to an inspection of the wares displayed by manufacturers in the Auditorium, half a block disant. The wisdom of thus dividing the time between the regular business of the convention and the exhibit feature, which is becoming an important adjunct of these meetings, is manifest in the fuller attendance and undivided attention of members at the business sessions, secured under this plan. Not only was the hall, having a seating capacity of about 400 persons, well filled at each session, but the lively interest aroused in the proceedings was indicated by the close attention paid to speakers and the freedom with which those present participated in the discussion of questions presented for general consideration.

It was freely conceded that at no previous gathering of the association had its members and guests enjoyed more bountiful hospitality and generous entertainment than was provided individually and collectively by the citizens of Lincoln.

Welcomed by Governor and Mayor.

The first session of the convention was opened on Tuesday afternoon with an invocation delivered by Rev. I. F. Roach, D. D., of Lincoln, following which George L. Sheldon, Governor of Nebraska, was introduced by President Frank Hacker. In a felicitous address the Governor proffered, in behalf of the city, a most cordial welcome to the visiting members of the association for whose organized aims and purposes he expressed warm approval; and in conclusion he invited the delegates to meet him and his family at a reception to be given for that purpose in the evening at the executive mansion. Greetings were also extended by Mayor T. W. Brown. These addresses were responded to, in behalf of the active members by F. C. Harrington, Pawnee City, and for the associate and honorary members by W. W. Walton, Denver, Col.

President Hacker's Address.

Succeeding this exchange of courtesies the real work of the convention was begun by the delivery of the president's annual address. Expressing his gratification at the large attendance present, which included so many new members, Mr. Hacker voiced the belief that these conventions had been of inestimable value to those who had attended them in unifying interests and softening the bit-

terness of competition. "It is one of the chief efforts of our association," he declared, "to bring dealers closer together and make them friends. It is not organized for the purpose of raising prices, but, on the contrary, it has for its object the promotion of conditions best calculated to conserve the best interests of merchant and consumer alike. Here we get expressions of experience that has contributed to the success of Hardwaremen and of the best and most economical systems of handling the retail Hardware business. We are also afforded an opportunity of seeing the excellent exhibits of Hardware supplied and arranged by enterprising up to date jobbers and manufacturers. I, for one, would not wish to miss seeing the splendid exhibits of Hardware here displayed in the Auditorium; they are placed there for your inspection by men who are not afraid to show their wares. The year just passed has been one of stirring events, which finally culminated in a financial crisis, which seriously affected business interests in every section of the country. We of the West can congratulate ourselves that we have felt its effects more lightly than the merchants of the East and have come through it all in excellent condition."

Convention Committees.

The following convention committees were appointed by the president:

RESOLUTIONS: S. A. Sanderson, Lincoln; J. C. Cornell, Ord; J. E. Kriedler, Fullerton.

NOMINATIONS: N. Roberts, Omaha; Max Uhlig, Holdrege; Mr. Henke, Grand Island.

CONSTITUTION AND BY LAWS: H. M. Wineland, University Place; L. A. Higgins, Harvard; Roy Bodison, Kearney.

National Convention Reports.

Entertaining and instructive reports of the last national convention were made by delegates Nathan Roberts, Omaha, and Dan Kavanaugh, Fairbury. Mr. Roberts, who was elected a member of the Executive Committee by that body at the meeting in Boston, reviewed the work of that convention, and urged upon his hearers the necessity of loyal support to the National Association. Mr. Kavanaugh told of an excursion taken by a party of delegates to the Boston convention, of which he was a member, through the New Britain factories, in-



J. FRANK BARR.



F. W. ARNDT.

cluding those of Landers, Frary & Clark, P. & F. Corbin, Russell & Erwin Mfg. Company, Corbin Cabinet Lock Company, Corbin Screw Corporation, Stanley Works, Stanley Rule & Level Company and Humason & Beckley Mfg. Company, which, with other interests, comprised the greatest Hardware manufacturing center in the world.

Secretary's Report.

There was a ring of optimistic confidence in the secretary's report, which was fully justified by the results shown to have been achieved during the year. Not only was the fact of a large increase in membership set forth, but it was also demonstrated that, as a body, the association is growing more and more cohesive, and is stead-

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ily becoming a more effective force in the accomplishment of the objects for which it was created. The satisfactory experience attending the holding of Hardware exhibitions under the direction of the association, as was done last year at Omaha, was the subject of favorable comment. The following extracts are made from the report:

It was the first experience we had of holding a Hardware exhibition under our own direction, which was in many ways a very attractive feature, but we learned that to have both the convention and the exhibits going on at the same time was the only unsatisfactory feature, as it was like trying to see everything going on in a two-ring circus at the same time. We decided, therefore, this year to extend the time of the convention from three to four days, and, closing the exhibit hall at 1 o'clock, devote the afternoons exclusively to convention work.

Late in the summer our attention was directed to the advocacy by the Postmaster-General of what seemed to us an unwise schedule of parcel post, and I immediately appealed to our members to write the Postmaster-General opposing the measure, to which I have had very liberal response. The widespread objection to this measure voiced in this way and other ways has apparently borne fruit, and the prospects of its passage at this time seem extremely remote if not wholly out of question.

Catalogue house competition, we are glad to say, has seen its high water mark, and although the problem is an ever present one, requiring constant vigilance, signs of an ebb in the popularity of mail order business are not lacking.

As an indication that your secretary has been busy in the use of the mails, it may be stated that reference to our records shows the posting of over 14,500 pieces of mail, and since January 1 a circular letter has been sent each week to every dealer in the State, calling attention to some item of interest in connection with this convention.

W. S. Wright on Parcel Post.

The discussion of parcel post by W. S. Wright, president of the National Hardware Association, commanded the full and undivided attention of the audience. Prefacing his address with some facts relative to the vast resources of the State, he asked if it was realized by his listeners that the value of the Nebraska corn crop was equal to the total gold production of the United States including Alaska; that its live stock and dairy products equal the gold production of the entire world, and that



FRANK HACKER



H. J. HALL.

the value of its eggs exceeded that of all the gold and silver mines of Colorado? Continuing, he spoke, in part, as follows:

The proposition that I am to take up with you this afternoon is the parcel post. I was very glad indeed, as an evidence of growth, to see the position taken by your executive officers. So far as we are individually concerned, of course, if any proposition affects your business you are opposed to it; if it affects mine, I am opposed to it. But when it comes to a national proposition I say to you if the catalogue houses' method of distributing goods is shown to be more economical, more practical and better than the present method in time it is going to prevail, and you can't stop it. If, on the other hand, your methods are the best they will prevail. We know that the distribution of goods from the manufacturer to the jobber and from the jobber to the retailer is the best method of distribution and will ultimately develop and prevail to a greater extent than it does to-day. Consequently, on the parcel post proposition, I put it to you on the broad question of general interests

How Will It Affect the Country?

That is the proposition we are interested in. If parcel post will tend, as we know it will, to eliminate the development and growth of the small towns and rural communities, and increase, as we know it will, the congestion of population at large centers, we know that it is a bad thing for the country; and on that proposition we are opposed to the parcel post. Where do you get your men from such as we want in our business, and who will be called upon to run this association very soon? Do you look for them in the congested centers of Chicago or New York, or around on the farms? Wherever those men come from we do get those who have stamina, and the education that is necessary to make them helpful men around your store. On that point my idea is now and has always been that, while there has been a great deal of talk about the protection of American labor and the need of a high tariff to enable us to pay a higher scale of wages than the European countries pay, what we need more than anything else, what we need more than



A. F. MEYER.



M. A. HARGELROAD.

any protection of labor, is the protection of the small town of the rural community and the small merchant against the tendency to drag them into large centers. That is what would benefit us more than anything else.

Any Proposition That Tends to Centralize Population

at large centers is detrimental to the country. I believe as some one has said that the power of the Government should be exercised in building up strong centers of civic life in the country towns and villages where trade and industry can be so safeguarded so that it cannot be drawn into the maelstrom of confusion created by great cities. This then is the broad policy on which parcel post should be objected to. For, if there is anything on earth that will tend to injure the rural community, to build up and develop congested centers and centralize trade in the large markets of the country; to injure and tear down the small town, thus affecting not only the country merchants but the country editor, country doctor, lawyer, banker and the farmer likewise—if there is anything in the world that will do these things more effectually than another it is the success of the parcel post proposition. Therefore, so far as I am concerned, I am dead against the parcel post, not so much because it will affect my business or yours, but because it will affect the interests of the country at large in which we are all interested.

Merchant as a Mail Order House Agent.

The Postmaster-General says in behalf of his measure that the country merchant can adjust himself to suit the changed conditions; that in Germany, where he is acquainted with the conditions, that the country merchant does not try to carry any goods, but acts as an agent for the mail order houses. This suggests to you that if you are put out of business that you can go to work for the catalogue houses on a commission basis, and I would suggest that application should be filed early because there are many who will want the jobs. This nation has always been opposed to a subsidy. Yet here is a proposition that is a great deal worse. It says that every local merchant shall be put out of business for the benefit of the catalogue houses; that these houses shall distribute the goods all over this country. Is there anything fair about that? If there is we are willing to stand for it. If not, we should oppose it to the whole extent of our ability, and so long as we have strength and energy enough to say anything against it.

Getting and Holding the Farmer's Trade

a subject of practical interest to a large majority of the dealers present, was discussed in an able address delivered by C. B. Diehl, Stratton, which was in part as follows:

"The Man With the Hoe" has been immortalized in the verse of the poet, and much has been said about the fillers of the soil and their lives, ideals and manners which lead the people who are unacquainted with the men whose lots are cast in the country to think of them as a class different in mind and thought from their brothers whose lives have been spent in the city. This is a mistaken idea; the farmer is often possessed of as high ideals, lofty ambitions, and as keen an appreciation of all that is beautiful in art or nature as the man whose clothes are tailor made and whose finger nails are polished. This being true, the first step in securing and keeping the farmer's trade is to treat each man as a gentleman; try to make each customer feel that he has



H. M. WINELAND.



E. S. HAYHURST.

found a friend, one who is interested in him and all that concerns his best welfare.

As Long as You Tell a Farmer the Truth

he will believe in you, but if you deceive him once, his confidence is destroyed, in which case he either goes elsewhere for his goods or eternally watches and suspects you, which is as bad, if not worse, as he communicates his distrust by action if not by words to other prospective buyers in the store.

Always Remember a Customer's Name

and use it when addressing him, whenever you chance to meet him. Meet a man on his own ground; if he is dignified, show him that you, too, have a proper amount of self-esteem. One can be genial and sociable and at the same time dignified and self-contained, and need leave no impression of personal inquisitiveness, or that any selfish interest prompts his politeness.

Cultivate a Spirit That Will Enable You

to take a healthy, sound and cheerful view of the improvements going on in the country; be interested in the new barn or new house that is being built, even though you may not have sold any of the material that is being used in its construction; ask about the progress made by their schools and the social life of their neighborhood. In this age advertising is considered a strong factor in getting people into one's place of business.

Use Your Home Paper;

describe your goods, and extend a cordial invitation to people to come and inspect for themselves. Then when they come see that your goods are exactly what you advertised them to be; no sailing under false colors that they are clean and well kept, and displayed to the best advantage possible.

Mark Your Goods in Plain Figures,

and have strictly one price for all, and behind the counter have a clerk whose pleasure it is to give them prices and show them the goods, seeking always to please the personal taste of the buyer. Customers like to be waited upon by the owner of the store whenever possible, so one must not be afraid of good hard personal work.

Treat the farmer like a business man, and do not forget that just as your time is part of your capital, the man with whom you are dealing is also a busy man. After your prospect has become a purchaser, if he cares to waste time talking that is his affair, then give him as much of your time as your judgment dictates.

Association Is the Only Thing

that will bridge the difference of understanding between the farmer and the merchant. Many merchants have come to realize this and have offered special inducements to get the men from the country to come to town, and in numerous places the people of the town have clubbed together and contributed to the establishment of rest rooms and clubrooms. Here the wives of the farmers rest and make themselves comfortable; they can be made to feel that this room belongs to them, that here they can enjoy a social visit with friends; can care for their children; leave their wraps and purchases, and can then go upon the street in full possession of all their self-esteem, not feeling that they wear the badge of their country environment in their loads of heavy wraps and packages which they would otherwise be carrying. Then as they would come in closer touch with city ways their wants would spread over a wider range of goods and they would become better customers. They would enjoy their trips to town instead of dreading them.

This Is the Hardest Blow the Mail Order Houses

can receive. Different sections of the country require special ways and means to reach the customers, but there are some things which are always essential. One must always stand ready to support all movements that tend to establish good roads, to keep the telephones in good general repair and to recognize the public good in spite of personal advantages. If your store is in or near a foreign settlement, endeavor to have at least one clerk whose nationality is the same as your patrons. They will be proud of him and seek to advance him by patronizing your store. Look out for the small buyer. Geology teaches us that solid rocks are made by compacting particles. Make even the small purchaser feel that you are as delighted to get his patronage as a university student is to get money from home.

Don't Talk Trouble or Hard Times;

don't try to make people believe that you are selling goods so low that you are losing money. Be optimistic; strive to look and appear prosperous; keep your mind upon the future, never be blinded by the present, however bright it may seem, nor be completely downcast because a shadow may at present obscure the business world's sun. Let us accept a personal creed, and let it be known that it is our belief that humanity is advancing; that there is progress in human life and in human affairs, and that as sure as God lives the future will be better than the present or the past.

Hardware and Harness.

A paper on "Harness in Connection With the Hardware Business" was read by N. P. Hanson, Upland. From the questions brought out by the suggestions offered, it was evident that many of the merchants had an active interest in the subject. The paper is given as follows:

In these days, when all general stores are carrying many lines of goods properly classed as Hardware, every up to date Hardware merchant is looking for some ar-



C. B. DIEHL



SEWALL A. SANDERSON

ticle that he can add to his stock, in order to maintain his volume of business without materially increasing his selling expenses, and Harness fits in very nicely with Hardware. The most desirable way to handle the Harness business in connection with Hardware depends largely on the size of the town and local conditions. In a place where there are one or more good exclusive Harness shops, I believe a satisfactory business may be often done by buying all Harness readymade from a reliable manufacturer.

Be Sure Especially That the Team Harness You Handle

is first class, for your future reputation for selling good Harness rests on the quality of the heavy work Harness you sell. The margin of profit is smaller on the heavy work Harness than on anything else in the Harness line, but if it stands the heavy test it is subjected to, your customers will speak well of your Harness, and it will lead to business on more profitable goods. Our firm has employed a Harness maker for the past 13 years, and we make nearly all of the Harness we sell.

Where Practicable Keep a Harness Maker;

it is the most satisfactory and profitable method, as the repair work and sale of extra parts pay better than selling new Harness. Buy the very best of leather only, and make as good a set of Harness as it is possible to put up. We place the strongest guarantee on our Harness, and if it fails to prove just as represented, we always make it good without question. A fair and liberal policy in this respect is the most profitable, and our expense in making our guarantee good has been very small indeed. In order to make a price in competition with catalogue houses, we buy a few sets of low priced Harness and sell them as such.

The Ability to Make Good Harness Economically

all depends on the ability of the Harness maker as a cutter and workman, for in the Harness business, as everywhere else, the best man is the only cheap man. Light driving Harness and Saddles yield a better profit than the heavy Harness, and the sale of Strapwork, extra parts in Hardware and Leather Halters, Collars, Sweat Pads, Robes, Blankets, Fly Nets and the numerous other items belonging to the Harness and Saddlery lines, can all be sold at a paying profit. I consider Harness and Saddlery a desirable addition to any Hardware business.

Association History.

Speaking upon "Association History," M. L. Hargelroad, Holstein, detailed in a reminiscent way the events connected with the calling of the first convention at Hastings, and recounted the struggles experienced by the association in its early efforts toward progress. He reminded the assembly of the benefits which he at that time said would come to the individual members and jobbers from joining the association, and pointed to the results that have since been accomplished as justifying his prophecy. Referring specifically, as an illustration, to a particular benefit now enjoyed through the agency of the association, he cited the fact that his insurance premium, which in the old line companies would have amounted to $180, cost but $100 in the mutual company, and, he observed, "I never felt safer under old line insurance, which costs so much more to carry, than I do under that of our own company, which keeps our money in Nebraska."

Other Addresses and Papers.

Other addresses delivered and papers read before the convention were: "Taking the Annual Inventory—Improving Our Methods," by P. C. De Vol, Council Bluffs, president of the Iowa Retail Hardware Association: "Heating and Ventilating," by H. J. Fueller, Philadelphia, Pa., and "The Retailing of Merchandise a Science," by M. J. Pilkington, Des Moines, Iowa. H. M. Wineland, University Place, also gave a talk on the subject of "Local Associations; Their Benefit, and How to Maintain Them."

Considerable time was devoted to the Question Box, which was in charge of A. T. Stebbins, Rochester, Minn., vice-president of the National Association. Under his skillful leadership every moment of the time was occupied in the discussion of questions propounded.

New Officers.

Pursuant to the report of the Nominating Committee the following officers were elected for the following year:

PRESIDENT, Dan Kavanaugh, Fairbury.
FIRST VICE-PRESIDENT, Robert McAllister, Grand Island.
SECOND VICE-PRESIDENT, F. W. Arndt, Blair.
THIRD VICE-PRESIDENT, W. C. Klein, Milford.
SECRETARY, J. Frank Barr, Lincoln.
TREASURER, H. J. Hall, Lincoln.
EXECUTIVE COMMITTEE (the two members first named were elected to succeed retiring officials): Alex. F. Meyer, Hastings; M. A. Hargelroad, Holstein; E. S. Hayhurst, Loup City.

Being entitled to six delegates to the convention of the National Retail Hardware Association, it was decided to send the full quota, the following representatives being selected in addition to the president and secretary: Nathan Roberts, Omaha; Max Uhlig, Holdrege; Morris Hussie, Omaha; Geo. R. Wycoff, Madison.

Entertainment.

Availing themselves of Governor Sheldon's invitation, a large number of the members, many of whom were accompanied by their wives, attended the reception held on Tuesday evening at the Executive Mansion, where they were cordially received by the Governor and his family. Following the formal reception, while refreshments were being served, the Governor and his wife mingled informally with their guests, all of whom pronounced the occasion a most pleasant one. The ladies of the convention were entertained at a reception given at the home of Mrs. F. E. Lahr on Wednesday afternoon and at a theater party in the evening.

A banquet given on Thursday evening at the Lincoln Hotel, at which nearly 300 members and guests were seated, was a pronounced success and was keenly enjoyed by every one present. The menu was ostensibly composed exclusively of Hardware. Under the tactful direction of Toastmaster Sewall A. Sanderson, toasts were responded to by Governor Geo. L. Sheldon, Mayor Francis W. Brown, W. S. Wright, G. H. McDonald, P. C. DeVol, A. T. Stebbins, Prof. E. H. Barbour and A. L. Gale.

Manufacturers' Exhibits.

The manufacturers represented at the convention were as follows:

AMERICAN STEEL & WIRE COMPANY, Chicago: Wire Fence. Represented by L. W. Garoutte and Park B. Garoutte.
J. P. A. ANDERSON & SON COMPANY, Madrid, Iowa: "Anderson" Lightning Protectors. Represented by Kull Brothers, Oakland, Neb.
E. C. ATKINS & Co., Inc., Indianapolis, Ind.: Saws. Represented by T. F. Barbour, P. L. Edwin and S. M. Perrigo.
BERKLEY SYSTEM COMPANY, Sioux City, Iowa: Retail Hardware Advertising System. Represented by Saberson Bros.
BUCHTEL & NORRIS, Lincoln, Neb.: Representing Malleable Steel Range Company, South Bend, Ind.: Gem City Stove Mfg. Company, Quincy, Ill.; and Chicago Stove Works, Chicago, Ill.
CARBORUNDUM COMPANY, Niagara Falls, N. Y.: Abrasive Wheels, Sharpening Stones, Carborundum Paper and Cloth. Represented by W. R. Embleton and George N. Allen.
COMSTOCK-CASTLE STOVE COMPANY, Quincy, Ill.: Economy Stoves and Ranges. Represented by A. D. Benway Company, Lincoln, Neb.
DE LAVAL SEPARATOR COMPANY, Chicago: Cream Separators. Represented by W. E. Rundall.
DETROIT VAPOR STOVE COMPANY, Detroit, Mich.: Vapor Stoves for gasoline or alcohol. Represented by L. D. Meyers.
DOVER MFG. COMPANY, Canal Dover, Ohio: Asbestos Sad Irons. Represented by M. H. Snyder.
EUREKA MFG. COMPANY, Lincoln, Neb.: Wonder Grain Graders. Represented by A. J. Cochran.
EXCELSIOR STOVE & MFG. COMPANY, Quincy, Ill.: National Stoves and Ranges. Represented by W. J. Fisher, J. W. Payton and H. J. Dilbrough.
J. B. FORD COMPANY, Wyandotte, Mich.: Dairyman's Cleaner and Cleanser. Represented by Charles Lowitz.
GREEN FOUNDRY & FURNACE WORKS, Des Moines, Iowa: Furnaces. Represented by M. B. [illegible] and W. J. Briggs.
GRISWOLD SEED COMPANY, Lincoln, [illegible]: Garden and Field Seeds. Represented by Q. A. Dungan and G. A. Chambers.
HALL-BENEDICT MFG. COMPANY, Montezello, Iowa: Safety Hoist Blocks and Wire Stretcher. Represented by R. L. Keyser.
HART & COOLEY COMPANY, New Britain, Conn.: Steel Registers. Represented by A. I. Grocock.
HERRICK REFRIGERATOR COMPANY, Waterloo, Iowa: Refrigerators. Represented by T. H. Smith.
HOOVEN & ALLISON COMPANY, Omaha, Neb.: Binder Twine, Rope and Commercial Twine. Represented by G. N. Branham and M. H. Gibbs.
IDEAL LIGHTING COMPANY, Davenport, Iowa: Water Power Gasoline Gas Systems. Represented by Sam T. White.
KEASBEY & MATTISON COMPANY, Ambler, Pa.: Magnesia, Magamite, Asbestos and Woolen Felt Coverings, &c. Represented by J. H. Brown, Jr.
F. D. KEES MFG. COMPANY, Beatrice, Neb.: Hardware Specialties and Ankle Braces. Represented by F. D. Kees.
LASHER MFG. COMPANY, Davenport, Iowa: Kitchen Specialties. Represented by E. C. Greeley.
LENNOX FURNACE COMPANY, Marshalltown, Iowa: Soldering Furnaces. Represented by N. W. Lundy.
LINCOLN ADJUSTABLE CRANK COMPANY, Lincoln, Neb.: Patented [illegible]. Represented by [illegible].
LINCOLN PAINT & COLOR COMPANY, Lincoln, Neb.: Paints. Represented by Eugene Waugh, Paul Lauer and Clark Lauer.
MARSHALL OIL COMPANY, Lincoln, Neb.: Oils and Stock Dip. Represented by B. E. Pickering and F. W. Rodman.
MARLIN FIRE ARMS COMPANY, New Haven, Conn.: Rifles, Shotguns, &c. Represented by Charles Porter.
[illegible] Neb.: Glass and Paints. Represented by J. B. Reinhardt and D. K. Gillispie.
MONARCH MFG. COMPANY, Council Bluffs, Iowa: Sunlight and Monarch Oils and Grease.
NEBRASKA HARDWARE COMPANY, Lincoln, Neb.: Hardware and Stoves. Represented by John Ferkeison.
NEBRASKA SEED COMPANY, Omaha, Neb.: Grain and Seed Cleaners. Represented by Henry G. Windhelm.
NEY MFG. COMPANY, Canton, Ohio: Haying Tools and Hardware Specialties. Represented by J. M. Mobley and H. W. Anthony.

ONEIDA COMMUNAL, Ltd., Oneida, N. Y.: Game Traps, Chains, &c. Represented by Frank H. Primo and A. E. Clark.
PATTERSON-SARGENT COMPANY, New York and Chicago: Paints and Varnishes. Represented by W. W. Walton.
PAXTON & GALLAGHER COMPANY, Omaha, Neb.: Wholesale Hardware. Represented by J. M. Lewis.
PETERS CARTRIDGE COMPANY, Cincinnati, Ohio: Ammunition. Represented by A. H. Hardy.
PITTSBURGH STEEL COMPANY, Pittsburgh, Pa.: Wire Fences. Represented by John H. Harberg and A. D. Ellsworth.
PRICE-HAMILTON-SCHONG COMPANY, Rochester, N. Y.: Prisco Lanterns and Metal Ware. Represented by Will T. Richards.
QUINCY STOVE COMPANY, Quincy, Ill.: Stoves. Represented by A. F. Haig.
REMINGTON ARMS COMPANY, Ilion, N. Y.: Firearms, &c. Represented by M. F. Sharp, Rush Razee and K. E. Willis.
RINGEN STOVE COMPANY, St. Louis, Mo.: Quick Meal Stoves. Represented by E. L. McBride.
ST. PAUL ROOFING, CORNICE & ORNAMENT COMPANY, St. Paul, Minn.: Architectural Sheet Metal Work. Represented by W. A. Wittbecker.
W. C. SHINN, Lincoln, Neb.: Copper Cable Lightning Rods. Represented by C. M. Loomis.
SPRAGUE FOUNDRY & MFG. COMPANY, Council Bluffs, Iowa: Underfeed Furnaces. Represented by R. L. Sprague and W. J. Lanterwasser.
STANLEY WORKS, New Britain, Conn.: Butts, Hinges, Bolts. Builders' Hardware, &c. Represented by A. L. Grocock.
UNITED STATES REGISTER COMPANY, Ltd., Battle Creek, Mich., and the JONES REGISTER COMPANY, Toronto, Ont.: Jone Registers and Ventilators. Represented by A. O. Jones and C. E. Slack.
VERMONT FARM MACHINE COMPANY, Bellows Falls, Vt.: Cream Separators. Represented by J. C. Griffis and H. B. White.
VICTOR MFG. COMPANY, Leavenworth, Kan.: Washing Machines. Represented by Geo. W. Fleming, F. J. Tallant and J. I. Goodwin.
VOSS BROS. MFG. COMPANY, Davenport, Iowa: Ocean Wave and Eagle Washers. Represented by W. H. Voss and Arthur Clifford.
WAGNER MFG. COMPANY, Cedar Falls, Iowa: Steel Hand Sleds. Represented by J. H. Pitnam.
WAHLE FOUNDRY & MACHINE WORKS, Davenport, Iowa: Washing Machines. Represented by Anton Nielsen.
WATHENA WASHER COMPANY, Oakland, Neb.: Washing Machines. Represented by Frank W. Ruilman, C. W. Force, V. L. Fried, A. L. Newman and C. E. Anderson.
WESTERN GLASS & PAINT COMPANY, Lincoln, Neb.: Paints. Represented by T. R. Whiting and Geo. W. Davis.
WESTERN NOVELTY WORKS, Alexandria, Neb.: Patented Kitchen Sinks. Represented by E. N. Aerill, T. C. Day and T. R. Armstrong.
WHITE LILY WASHER COMPANY, Davenport, Iowa: Washing Machines. Represented by Sam T. White.
WISE FURNACE COMPANY, Akron, Ohio: Furnaces. Represented by W. G. Burks.
WRIGHT WASHING MACHINE COMPANY, Axtell, Kan.: Washing Machines. Represented by C. J. Harris.
YOUNG MFG. COMPANY, Shenandoah, Iowa: Two Thumb Husking Gloves and Mittens. Represented by C. E. Young.

Referred to Our Readers.

WE shall value any advices with which our readers may be good enough to favor us in reply to the following inquiry as to an efficient method of handling narrow Leather and Rubber Belting:

We should like very much if you would ask for information through the columns of your paper as to what is the most satisfactory manner which your readers find for handling narrow Leather and Rubber Belting, where they sell cut lengths off the rolls.

We have not yet found anything that just exactly suits us, and it is the easiest work in the world to "pi" a roll of, for instance, 1-in. Leather Belting, if the clerk attempts to handle it on a reel.

There is undoubtedly a good solution of this problem, and we would like to get the benefit of the experience of some of your readers, and believe there are other dealers who will be just as glad to know it.

TOOLS & SUPPLIES.

LEWIS H. DURLAND, for nearly 38 years one of the leading business men of Watkins and Schuyler County, N. Y., died on the 28th ult. Mr. Durland was born in Newburg, December 9, 1832. From February, 1852, until December, 1869, he was connected with the Erie Railway Company, and subsequently for a short period was employed by the Michigan Southern Railway. In September, 1870, he located in Watkins, engaging in the Hardware business. His first partner was William Lathrop, and subsequently George S. Coon was given an interest in the business. For some years the firm has been known as L. H. Durland, Son & Co., the son being Charles M. Durland, who became a member of the firm on the death of Mr. Smith. Mr. Durland was for many years a trustee of the Watkins Baptist Church, and was also a prominent Mason. For a quarter of a century he was trustee of Cook Academy, and also held the position of supervisor of the town of Dix for three terms and trustee of the village of Watkins for six years.

THE SENECA CHAIN COMPANY, Kent, Ohio, which had a slight fire recently, states that the damaged belting has been replaced and everything is in running order again. The fire caused but little inconvenience.

Motor Boat and Sportsman's Show.

THE Motor Boat and Sportsman's Show, the fourteenth annual exhibit, will open Thursday evening, February 20, and continue to March 7, inclusive, in the Madison Square Garden, New York City. Among the features will be water sports, school boy rifle shooting, fly casting, home trainer bicycle racing and kindred events. There will be a Lake Placid forestry exhibit, from Lake Placid, N. Y.; exhibits from Long Island, animals, birds and game fish from Maine; mounted animals from the Crown Land's Department of New Brunswick, Canada, with camp and fishing scenes, a log cabin, canoes, shoe packs, paddles and sledge for drawing captured game, and a number of live animals. Other exhibits will come from Virginia, Georgia and New England, including a fish exhibit from the Waramaug hatcheries, at New Preston, Conn., together with a salt water fishery exhibit from New Jersey, representing the fishery industry of the New Jersey coast. Africa will be represented by a collection of lion, tiger, leopard and other skins and a group of horned heads. From India there will be a unique display of East Indian goods and implements wholly aboriginal in construction. North American Indians will be typified by native Navajos and Seminoles, with blankets and baskets, and Mexican Aztecs with silver trinkets.

The Garden will be decorated in evergreens of the fir, spruce, pine and hemlock from Northern woods. A fly casting tournament is scheduled for every afternoon and evening of the 15 days of the show. At the Fourth avenue end will be a large swimming lake, reserved exclusively for water sports, under the auspices of a swimming club and the United States Volunteer Life Saving Corps. The pupils of a military institute will give battalion and squad drills with rifles, as well as an exhibition of club swinging and dumb bell exercises. Bicycles and Motor Cycles will be shown, and a series of home trainer bicycle races on an elevated platform given. To foster rifle shooting among the youth, there will be a school boy rifle shoot, which will be open to elementary, military and high schools, under the auspices of the Junior Branch of the National Sportsman's Association. Of interest to all sportsmen will be the Camp Outfits, Tents, Guns, Rods, Reels, Flies, Snowshoes, Creels, Packbags, Golf, Baseball, Cricket, Tennis, Football, Basket Ball, Canoes, Paddles, Skiffs, Rowboats, Portable Houses, &c.

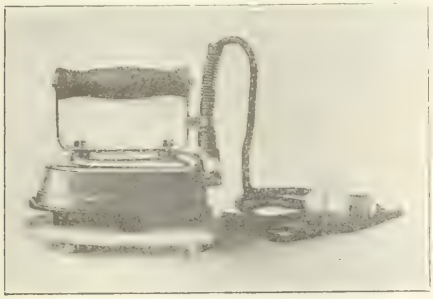
Motor Boats and Engines will occupy a leading position in the show, the exhibitors including the Stamford Motor Company, Palmer Bros., Powell Engine Corporation, Hildreth Mfg. Company, Sintz-Walling Company, Mianus Motor Works, J. P. Fitzpatrick, Roberts Motor Company, William Laurier, D. M. Tuttle Company, Ferro Foundry & Machine Company, W. E. Mullins, Hy. C. Squires Son, Gray Motor Company, Geo. H. Terry Company, Michigan Steel Boat Company and Detroit Boat Company. Ice Boat Flyers will be shown, and also Capt. Nat Roe's new motor scooter, shaped like an ordinary small cat boat, 40 ft. overall, and equipped with a 20-hp. motor.

Death of George Alvin Smith.

GEORGE ALVIN SMITH, a prominent citizen of Richmond, Va., and president of the Smith & Courtney Company, dealing in machinery and supplies, of which he was the founder, died at his home in that city on the 11th inst. Mr. Smith had been in poor health for some time past, and on Sunday, 9th inst., suffered a stroke of paralysis, from the effects of which he never recovered. Mr. Smith was in the sixty-fifth year of his age, was a native of Richmond, and from his earliest manhood was deeply interested in everything that contributed to the growth and development of the city. Mr. Smith served with distinction in the Confederate Army and lost his left arm in the battle of Fredericksburg. He was an active member of All Saints Episcopal Church, and was held in very high esteem by all who knew him.

The Westinghouse Electrically Heated Sad Iron.

The Westinghouse [illegible] & Mfg. Company, Pittsburgh, Pa., is now placing on the market the electrically heated sad iron shown herewith. In form the iron differs only from an ordinary iron in its more symmetrical and attractive appearance and in being provided with terminals and a flexible cord through which the current



The Westinghouse Electrically Heated Sad Iron.

is transmitted. Its heating mechanism, which is entirely concealed, keeps the iron at the proper temperature at a minimum consumption of current. It consists of a flat insulated resistance strip clamped by hydraulic pressure between two flat iron plates, forming a solid heating element of high thermal conductivity and having a large heat storage capacity. The heat is evenly distributed over the entire bottom of the iron, the edges and point being practically the same temperature as the middle of the bottom. A nonconducting element is used between the top of the iron and the heating unit. This construction results in the top of the iron being cooler than its face. The heating unit is hermetically sealed in its insulation, and cannot therefore deteriorate any faster than the iron, as it is not subject to the oxidizing effects caused by contact with air. The iron is very simple, and there is nothing to get out of order or to require renewal. The electrical construction is so simple and durable that there is no reason, it is stated, why it should not last as long as the iron itself. The terminals are protected by a solid metal guard, and the cord leading from them is securely anchored by a clamp on the handle of the iron. A wire spring which surrounds the cord at this point prevents any sharp bends. A separable plug is provided by which the iron can be connected to any convenient lamp socket without twisting. A small spring attached to the cord takes up all slack and so keeps it from dragging on the clothes or getting in the way of the operator. The polishing surface of the iron is of highly polished cast iron, found by experience to be the most satisfactory surface for the purpose. The upper portions of the iron have a burnished nickel plate surface. The handle is of ebonized wood, heatproof and unbreakable. A heatproof stand, upon which the iron should be set when not in use, is provided with every iron. The irons are made to suit all commercial lighting circuits, and can be used on either alternating or direct current with equally satisfactory results.

Hold 'Em Rat Traps.

The Worcester Wire Novelty Company, Canton, Ohio, is calling attention to several improvements in its Hold 'Em rat traps, [illegible] metal ribs, pointed wires extending below the tilt and safety doors operated from the top. The company claims to be putting on the market a better trap than last year, although at a lower price.

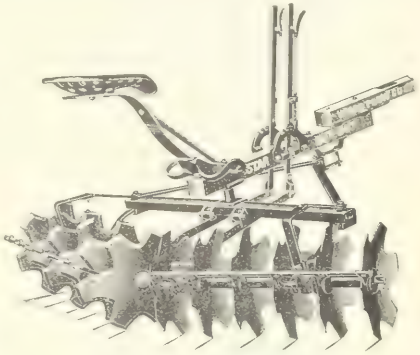
Schield & Corson, Waterloo, Iowa, Hardware merchants, will dissolve partnership on March 1 and the business will be continued under the name of the Schield Hardware Company.

The Andrew B. Hendryx Company.

The Andrew B. Hendryx Company, New Haven, Conn., has issued its thirty-second annual catalogue, referring to bird and animal cages and cage specialties, chain, including curb, safe or register, ladder, sprocket, plumbers', safety, and jack chain and wire picture cord. The book is attractive in get up, and an effort has been made to simplify it, thus making it easier for customers to order goods. Among the additions to the company's line may be noted an adjustable solid brass stand for the No. 6000 globe bird cage; a bright tin nested squirrel cage which may be shipped in quantities at much less than the usual freight charges on this class of goods, and a new series of bird cages which are white enameled trimmed with gold and are being featured for the Easter trade.

Star Harrow with Cut Out Disks.

The Wiard Plow Company, Batavia, N. Y., is offering the Star disk harrow illustrated herewith. It is made with solid or cut out disks, the latter style being considered especially desirable by farmers in some sections. It is also offered with long pole or with fore trucks, the latter feature avoiding any possibility of weight or strain on the horses' necks, and also facilitating short turns. The whole machine is said to be substantially constructed and excellently finished with every modern improvement and convenience, so that it is calculated to be operated with ease for man and team.



Star Harrow with Cut Out Disks.

Gem Cement Tools.

The Kramer Bros. Foundry Company, Dayton, Ohio, represented in New York by Warner & Haviland, 49 Warren street, has added materially to its lines of Gem cement tools, both in variety and shape as well as in additional sizes of styles previously catalogued. Catalogue No. 5, 48 pages, illustrates and describes a comprehensive line which includes various styles and sizes of edgers, jointers, groovers, angle, gutter, curb and cutter tools, wall jointers, pointers, beaders, tampers and radius tools, name stamp, imprint, driveway, spaced line and ribbon rollers, corrugating tools, clamps, curb and gutter forms, driveway impression frames, name plates, letters and figures. Most of the goods are made both in nickel plated iron and polished bronze, the difference in list being as one to two.

The Racine Boat Company, Racine, Wis., and 68 Broad street, New York, has issued an illustrated 40-page descriptive catalogue of gasoline and steam launches, sailing yachts, row boats, canoes, fishing and hunting boats, together with gasoline, kerosene and steam engines and steam boilers. A feature of the company's product is a line of high speed racing boats, 30, 32 and 32 ft. long, [illegible] 5 ft., and 5 ft., with motors 20, 60 and 90 hp. respectively, having a guaranteed speed of 15, 20 and 25 miles per hour.

Warren Washboard Company.

The Warren Washboard Company, Erie, Pa., with New York office at 97 Warren street, has begun the manufacture of a fine line of washboards for laundry use, which, it is said, can be sold at a substantial reduction from prices of other manufacturers. In the group made either with fine or coarse crimp and wide head or protector, according to preference, are double laundry, medium laundry, extra family and family styles. Another style still lower in price, is the single family washboard. The company is in a position to care promptly for all the business that may offer and quotations will be given at either address.

Universal Rotary Razor Sharpener.

Battey & Hull, West End avenue and Sixty-seventh street, New York, have recently put on the market the Universal rotary razor sharpener, here illustrated. It is substantially made and the steel metal parts are polished and nickeled. There is a drum or cylinder of sheet steel, around which is stretched equal lengths of canvas and leather stropping material, one beginning where the other ends, so that a start can be made with a few strokes on the canvas and a finish on the leather, or leather only if desired. Ordinary razor blades are stropped by inserting in holder, which is a fixed part of the machine, while any of the various wafer blades are slipped first into a secondary holder of thin metal, which in turn is placed in the larger holder, safety blades of the Star type being held in the same manner as the regular standard razor. With each sharpener there are three secondary holders, so made as to cover a wide range of safety blades of the wafer type. On one side of the machine there is a screw which adjusts the tension of the blade so as to obtain any degree of friction in operation. On the other side there is a small handle, by means of which the blade in sharpening is moved around the circumference of the drum. A simple arrangement of gear automatically reverses the blade before it commences to move in either direction, so that there is no likelihood of cutting the strop. The angle of the blade to the strop is adjusted by means of a thumbscrew, which permits the blade holder to be moved higher or lower, there being a play of ¼ in., so that any size of blade can be accommodated and the correct angle at the edge secured. The point is made that owing to the round stropping surface the tendency in the stropping operation is to slightly concave the cutting edge instead of rounding or turning it, and that by getting the proper tension no skill is necessary in stropping. One of the holders is made especially for Gillette blades, and has two holes in it, there being suitable holders for the various other kinds of safety razors having thin blades. The extreme stropping surface is about 14 in. in length by 1¾ in. in width. The drum is 4¾ in. in diameter, and the handle is detachable by unscrewing it, so that the sharpener can be packed in a double pasteboard box 5 x 5 x 3 in. The extreme length, including handle, is 9¾ in., the handle proper being about 4¾ in. long.



Universal Rotary Razor Stropper, as in Use.

Unique Ice Cream Scraper.

The Unique ice cream scraper here shown is made by the Mosteller Mfg. Company, 5 West Madison street, Chicago. When attached to the rim of a can with the thumb screw as indicated in the illustration, the scraper projects so that the ice cream disher may be scraped off and left even full, making the service accurate but not wasteful from the point of view of the dispenser. The device is easily attached or detached, durable and easily cleaned.



Unique Ice Cream Scraper.

Brohard Toggle Bolts.

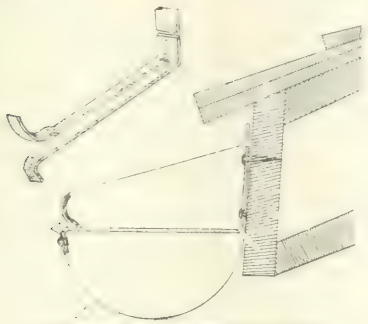
Warner & Haviland, 49 Warren street, New York, are manufacturers' agents for the sale of the Brohard expansion bolt cases and Brohard toggle bolts, made by the Brohard Company, Philadelphia, Pa. The toggle bolts are a more recent addition to the line and are made regularly in 3-16 and ¼ in. diameters, in lengths of 3, 3½, 4, 5, 5½ and 6 in. The purpose of this device is for use in anchoring fixtures of any kind to a wall or partition having an open space at the back, necessitating the drilling or cutting of a hole only as large as the greatest diameter of the square nut at the back, when the nut end with a two-way grooved sheet steel piece with hole in center, through which the bolt passes is turned parallel with the bolt and pushed through the hole. Once through, the grooved piece or brace turns by gravitation nearly upright, so that the threaded rod can be screwed the desired length when the bracket or fixture is placed in position and the slotted head turned up tight with a screw driver. There is a small curved clothespin like wire which serves the temporary purpose of keeping control of the bolt, so that it cannot fall inside by chance before being properly fastened. The bolts are suitable for countless purposes, but particularly for fastening electrical fixtures, telephone cabinets, plumbers' fixtures, for insulating uses and carpenters' work in connection with floor jambs, concrete construction, telegraph work, &c.

The Coffield Power Washing Machine.

P. T. Coffield & Son, 415 Sixth Avenue, Pittsburgh, Pa., manufacture the Coffield power washer for family use, the washer being operated by a small motor attached to the machine, driven by city water pressure. The water is conveyed to the motor by rubber hose from the bibb in the laundry or kitchen sink. The speed of the machine is regulated to suit any material by opening or closing the faucet, washing the finest lace curtains or heaviest double blankets with equal ease and without damaging the most delicate fabric, it is stated.

Ideal Eave Trough.

A new eave trough in connection with which there is a shield forming an inclined upper face or cover, so that leaves and débris generally cannot reach the trough from the roof, has been put on the market by the Cassens Mfg. Company, Edwardsville, Ill. The body of the trough, as indicated in the accompanying illustration, is made in the usual semitubular form, with its rear wall

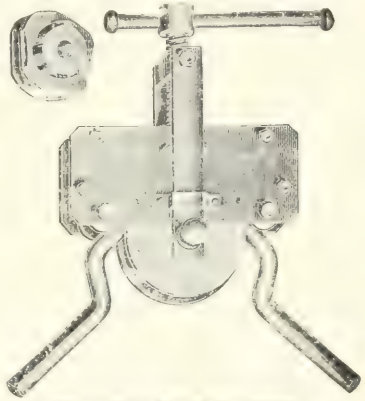


[illegible] Ideal Covered Eave Trough.

extending upward. The inclined protecting shield is connected to the extending portion, while its other edge curves downward, terminating within the outer wall of the trough, as indicated, and leaving a relatively narrow space for the entrance of water running from the roof. The trough, however, is guaranteed by the company to take care of 125 to 180 gal. of water per running foot in an hour, and the flow of water into the trough naturally takes place without regard to how hard it may be raining. It is evident in such a construction that the trough practically excludes all leaves, sand, snow and the like, prevents birds from building their nests within the trough, thereby avoiding any clogging of the trough and rusting, which follows the presence of water, and assures cistern water of maximum purity. Though perhaps not the most important feature, it will not even catch the small boy's rubber ball. Another feature is that water collecting in the trough, or snow clogging it up, will not freeze in cold weather like an open gutter. In case of sleet the slitlike opening, about ⅛ in. wide, is apt to close up almost at the beginning of the storm. When thawing weather sets in and the sun strikes the metal cover, it is found that the ice on it melts and the entrance automatically opens, even before the water runs from the roof. The cover is made detachable, so that the gutter may be painted at any time without removing the trough from the building.

Pipe Bending Machine.

Schuchardt & Schutte, 136 Liberty street, New York, are putting on this market, made by them abroad, the pipe bending machine here illustrated. It has a capacity for all sizes of pipe up to 1 in., inclusive, and no filling of pipe in the process of bending is necessary. It is also unnecessary to fasten the machine to any stationary support in using it. On the reverse side of machine, as shown, there is a set screw that holds the pin for roller rod to permit of quickly taking it out as frequently as is necessary to change the large lower roll. The machine



Schuchardt & Schutte Pipe Bender.

is made entirely of steel, has a lower roll with 1⅛-in. groove and is 6 in. in diameter. The pressure screw with square thread is 1⅛ in. in diameter; lever, 16½ in. long; side steel plates, ¼ in. thick, and the entire machine weighs 33 lb.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₰ gal.
[illegible]	[illegible]
Bleached Winter, Extra	@...
Menhaden, Brown, Strained	.41 @42

Mineral Oils—

[illegible]	
tert	.13 @13½
[illegible]	
Red	.13½@14

Miscellaneous—

Barytes:	
Western, Ground	₰ ton $18.50@20.50
Amber, Ground	₰ ton 19.00@25.00
Off color	₰ ton 13.00@16.50
[illegible]	
Whiting, Commercial	₰ 100 lb .42@ .52
[illegible]	₰ lb .60@ .65

Putty, Commercial—₰ 100 lb

In bladders	$1.70 @1.85
In [illegible] tubs	1.80 @1.95
[illegible]	.65 @.80
[illegible]	1.50 @1.80

Spirits Turpentine—₰ gal.

[illegible]	52@53
In machine bbls	.53 @53½

Glue—

	₰ lb
Cabinet	.12 @15
[illegible]	.14
[illegible] bbls. [illegible] gal.	
[illegible]	
German Common Hide	.10 @12
German Hide	.12 @18
[illegible]	.10
Low Grade	.10 @12
Medium White	.14 @17

Gum Shellac—

	₰ lb
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
V. S. O	.47 @48

Colors in Oil—

	₰ lb
Black, Lampblack	.12 @14
Black, Ivory	.16 @20
Blue, Prussian	.25 @26
Blue, Ultramarine	.1...
Brown, Vandyke	.11 @...
Green, Chrome	.12 @16
Green, Paris	.[illegible]
Sienna, Raw	.[illegible]
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.—

	₰ lb
Lead, English white in Oil	.[illegible]
Lead, American White:	
[illegible]	
[illegible]	
Lead, White, in oil	.[illegible]
Lead, White, in oil, 12½ lb tin [illegible]	
Lead, White, in oil, 1 to 5 lb [illegible]	
Lead, American. Terms: On lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice.	
[illegible]	
Zinc, French:	
[illegible]	
Paris, Red Seal, dry	.8½
[illegible]	
Zinc, V. M. French, in Poppy Oil: [illegible]	
[illegible]	
Zinc, V. M. French, in Poppy Oil: Red Seal:	
[illegible]	
[illegible]	

Dry Colors—

	₰ lb
[illegible]	.6½@10
Black, Drop, American	.3½@ 8
Black, Drop, English	.5 @15
Black, Ivory	.16 @20
Lamp, commercial	.4 @ 6
Blue, Celestial	.4 @ 6
[illegible]	
Blue, Prussian	.29 @31
[illegible]	
Brown Spanish	.[illegible]
Carmine, No. 40	.[illegible]
Green, Chrome, ordinary	.3½@
Green, Chrome, pure	.17 @25
[illegible]	
[illegible]	
Ocher, American	.₰ ton $8.50@16.00
American Golden	.2½@ 3½
[illegible]	
Foreign Golden	.3 @ 4
Orange Mineral, English	.10 @11
[illegible]	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
Sienna, Italian, Burnt and [illegible]	
[illegible]	
American, Raw	.2½@ 3
American, Burnt	.3 @ 4
Talc, French	.₰ ton $18.00@25.00
[illegible]	
Terra Alba, French	.[illegible]
English	.[illegible]
American	.[illegible] .40
American	.[illegible] .55
Umber, Turkey, Raw and Burnt	.[illegible]
Umber, Turkey, Burnt	.[illegible]
Raw, American	.1½@ 2
Vandyke Brown, Burnt	.[illegible]
Vermilion, American, Low	.[illegible]
[illegible]	
Vermilion, Imported	.65 @70
[illegible]	
English, Imported	.65 @70
[illegible]	.1.00@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol *@*. Thus 33⅓ *@* 33⅓ & 10 signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓&
North's 10
Zimmerman's—See Fasteners, Blind

Window Stop—

Ives' Patent 35%
Taplin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—

Fernald Mfg. Co. Button Anti-Rattlers, ₱ doz pairs, Nos. 1, $.75; 2, $.90; 3, $1.20; 5, $1.80.
Fernald Quick Shifter, ₱ doz pairs .....$1.20@$3.60

Anvils—American—

Eagle Anvils .....₱ lb .08½ ¢
Hay-Budden, Wrought .....9½@10 ¢
Trenton .....₱ lb 9½@10 ¢

Imported—

Sandvik, Solid Steel Steps, Suppl. ₱ lb .....Import
Peter Wright & Sons, ₱ lb, 81 to 336 lb. 11¢, 337 to 560 lb. 11½¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....10

Augers and Bits—

Com. Double Spur .....75@80%
Jennings' Pat., Wrought.....30&10@70%
Black Lip or Blued .....60@65
Boring Mach. Augers 70
Car Bits, Ext. Twist .....40&10
Ford's Auger and Bit Co.: Ford's Auger Bits, Ford's Auger Co., Cincinnati 35
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list 35%
No. 30, R. Jennings' list 50
Russell Jennings' .....35&10&5
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45
Pugh's Black.....70
Pugh's Jennings' Pattern.....35
Snell's Auger Bits.....60%
Snell's Bell Hanger Bits 60
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Clark's, Cleveland, No. 1, ₱ doz $26
No. 2 .....$18
Ford's, Clark's Pattern.....65%&5%
Ford Jennings' Pattern 50%
Lavigne Pat., small size, $18.00; large size, $26.00.....60&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$6.50@7.00
Ames .....20&10
Ustick 20%

Ship Augers and Bits—

Ship Augers.....40&10%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L. H. Ingersoll's .....6"
Watrous' .....33⅓&7½
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdld., Shldered...gro.63¢@66¢
Unhandled, Patent...gro.66@70¢
Peg Awls:
Unhandled, Patent..gro.31@34¢
Unhdld., Shldered..gro.65@70¢
Scratch Awls:
Handled, Com....gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz
First Quality .....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality .....$7.50@17.50
Second Quality.....$6.50@16.75

Axle Grease—

See *Grease, Axle*

Axles - *Iron or Steel*

Concord, Loose Collar...4½@5 ¢
Concord, Solid Collar .....5 ¢
No. 1 Common, Loose .....4½@5 ¢
No. 1½ Com., Non Sol. .....5 ¢
No. 2 Solid Collar.....4½@5 ¢
Half Patent:
Nos. 8, 9, 10 and 11 .....6 ¢
Nos. 12 to 14 .....6@6½ ¢
Nos. 15 to 18 .....6½@7 ¢
Nos. 19 to 22.....7@7½ ¢

Boxes, Axle—

Common and Concord, not turned .....lb., 5@6¢
Common and Concord, turned .....lb., 6@7¢
Half Patent.....lb., 9½@10¢

Bait— Fishing -

Hendrix:
A Bait.....20
B Bait.....25
Competitor Bait.....20&5%

Balances— Sash—

Caldwell new list.....50%
Pullman .....30&10&60

Spring—

Spring Balances .....50&10@60%
Chatillon's:
Level Size Balances .....50 & 10%
Steel Beam Scales .....Import
Circular Balances .....&1
Large Dial 35%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb.....per lb. .....@2½@2¾¢

Towel -

No. 10 Ideal, Nickel Plate ₱ gro $8.50

Beams, Scale—

Scale Beams 40%
Chattillon's No. 1.....30%
Chattillon's No. 2 .....40%

Beaters, Carpet—

Hollow Cast:
No. 12 Wire Coppered ₱ doz $1.80; Tinned .....$ .85
No. 11 Wire Coppered ₱ doz $1.15; Tinned $1.20
No. 10 Wire Tinned ₱ doz $1.30

Beaters, Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Tinned, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dasher, per gro., No. 6, $6.00; No. 75, $6.50; No. 100, $7.00; No. 150, Tin, $8.50; No. 150, Hotel, $15; No. 150, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 200, Tumbler Tin'd, $9.50; No. 500 Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.: T. & S. Dasher.....$0.50

Bellows

Blacksmith, Standard List.
Split Leather.....6@6 10%
Grain Leather.....6@6 10%

Hand—

Inch.....6 7 8 9 10
Doz...$5.50 6.00 6.50 7.00 7.50

Molders—

Inch.....12 14 16 18
Doz.....$7.50 8.00 10.00 12.00

Bells— Cow—

Ordinary Goods .....75&50&75&10&20%
High grade .....70&10@75&10%
Jervis 75%
Texas Star 50%

Door—

Home, R. & B. Co.:

Hand—

Dumbbell Bell .....
Brass Model .....
Nickel Plated .....
Steel .....
Cross Gate Hand Bell .....

Miscellaneous—

Farm Bells.....lb., 2¼@2½¢
Church and School.....lb., 3¢

Belting— Leather—

Extra Heavy Short Lap...60@65%
Regular Short Lap....60@10@65%
Standard .....70&5%
Light Standard .....
Cut Leather Lacings.....@10¢
Leather Lacing Sides, per sq. ft .....@1¢

Rubber—

Agricultural (Low Grade)....
.....70@75&5
Common Standard....70@70&10%
Standard .....70&5%
Linen .....@10¢
Hose & Suction .....50&10@60&10

Bench Stops—

See Stops, Bench

Benders and Upsetters, Tire—

Green Road Tire Benders and Upsetters $9

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list:
Chains, Pedal Sprockets 50
Tires 60

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Cornelius Hoisting .....
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Guard .....
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined 40
Iron .....

Boards, Wash—

See Washboards

Bobs, Plumb—

Keuffel & Esser Co. 60%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):
Cut Thread .....
Square .....
Plain Eagle .....
Head Lugs .....55&10
Cut Thread .....
Square .....
Large Size .....

Door and Shutter—

Cast Iron, Japanned:
Round .....
Flat .....
Inch.....6 8 10
Per doz.....$ .75 1.00 1.25
Cast Iron Spring, Foot, Jap'd.
Inch.....6 8 10
Per doz.....$ .75 1.00 1.25
Cast Iron Chain, Flat, Japanned:
Inch.....6 8 10
Per doz.....$ .75 1.00 1.25
Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch.....6 8 10
Per doz.....$ .75 1.00 1.25
Wrought Barrel, Japanned:
Barrel .....
Spring .....
Shutter .....
Square Nose .....
Screws .....
Iron Patent Door .....
Iron Wrought Mortise .....

Expansion—

Empire Mfg. Co. .....
Lane & Bodley Co. .....
Morse Twist Drill & Machine Co. .....
Standard Tool Co. .....
Stearns, F. W. .....
Union Mfg. Co. .....
Universal Expansion Bit Co. .....

Plow and Stove—

Pfaff .....Grade's —%
Shultz .....S. & S. 5&5%

Tire—

Common Iron.....80%
Norway Iron.....80 -
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Frankan Moore Co.:
Norway Phila., list Oct. 16, '84..80%
Eagle Phila., list Oct. 16, 84....82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec 28, '99 80
Norway Phila., list Oct. 16, 1884 .....82½
Eagle 82½
Shaw Co.:
Last Bird, list Dec 28, '99 80
Phila., Eagle, list Oct. 16, 1884 .....82½
Union Nut Co.:
Tire Bolts.....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:
Inch.....1 1¼ 1½ 2
Per doz.....$ .50 .60 .80 1.00
Inch.....2 2½ 3
Per doz.....$ .85 1.00 1.50
Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each 25

Boxes, Mitre—

C. E. Jennings & Co.:
Langdon Nos. 1 to 4 .....
Langdon Nos. 1 to 4, Adjustable .....
Acme 75
Perfection .....
Stearns .....

Braces—

Common Ball, American....$1.50
Barber's .....50&10&10@60&10
Fray's Genuine Spofford's 60
Fray's No. 70 to 120, 81 to 133, 207 to 414 60
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat. .....
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat. 60&10%

Brackets

Wrought Steel .....70&10@75&10%
Bradley Metal Clasp..80&10@85&10&5%
Griffin's Pressed Steel.....75@75&10%
.....
Parlor Vapor Hardy Bag Beater Bracket .....₱ doz $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Wire Goods Co.....75%

Buckets, Galvanized—

M'f'gr's list, price per gross.

	Quart	10	12	14
Water Pail	$2.75	Steel Cased		
Flaring Pail	$3.00	3.50		
Fire Rd. Bucket	$2.00	3.65	4.65	5.65
Well	3.35	4.35	5.35	

Bull Rings -See *Rings, Bull*

Butts— Brass—

Wrought, High List, Oct. 26,'06.57%
Cast Brass, Tiebout's 40%

Cast Iron—

Fast Joint, Broad.....40&10@50%
Fast Joint, Narrow....40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@77½
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—

Peddle:
Light Narrow, Light Broad .....70&5%
Light Narrow, Loose Pin .....70&5%
Light Narrow, Ball Tip .....70&5%
Broad .....70&5%
Steeple, Pinned 70%
Pat. Tipped 70%

Cages, Bird—

Hendrix Brass, Series 500, 5000, 1500, net list, 1200 15%, 200 30%, 500 ...

Hendrix Brass, Series 700, 800 & 1000 ...

Hendrix Enameled ...

Calipers—*See Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb. ...

Sharp, 1 prong, per lb. ...

Barrel Blunt, per lb. ...

Leather Blunt, per lb. ...

Screw Blunt, per lb. ...

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Eley's E. B ...

G. D. ... per M

E. L. ... per M

G. E. ... per M

Musket ... per M

Primers—

Berdan Primers, per M ...

Primer Shells and Barrels ...

All other primers per M ...

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:

32 C. F. ...

38 C. F. ...

22 cal. Rim ...

32 cal. Rim ...

B. B. Caps, Gun Bbl., Swgd. ...

B. B. Caps, Round Ball ...

Central Fire ...

Lunged Sporting Rifle ...

Primed Shells and Bullets ...

Rim Fire, Sporting ...

Rim Fire, Military ...

Casters—

Bed ...

Plate ...

Philadelphia ...

Ware Ball Bearing ...

Ware Roller Bearing ...

Star Ball Bearing ...

Star Roller Bearing ...

Yale Double Wheel, Ball Bearing ...

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link.

3/16 ... *7/16* ... *1/2* ... *9/16*

5/8 ... *11/16* ... *3/4* ... *13/16*

7/8 ... *15/16* ... *1* ... *1 1/16*

1 1/8 ... *1 3/16* ... *1 1/4* ... *1 5/16*

1 3/8 ... *1 7/16* ... *1 1/2* ...

Short link, deduct 25c

Common Grade ...

German Pattern Coil:

6-0 to 1 ... *70&5%*

1 1/16 to 1 3/8 ... *60&10%*

1 7/16 to 1 5/8 ... *60&5%*

1 5/8 and up ... *60&5%*

Halter—

Halter Chains ... *60&10%*

German Pattern Halter Chains, list July 24, '97 ... *60&10%*

Covert Mfg Co.

Halter ... *35&5%*

Cow Ties—

See Halters and Ties.

Trace, Wagon, &c.—

Traces, Western Standard. Per pr.

6 ... 3/4, Straight, with ring ...

6 ... 1, Straight, with ring ...

6 1/2 ... 1 1/4, Straight, with ring ...

6 1/2 ... 1 1/2, Straight, with ring ...

NOTE.—Add 5c per pair for Hooks. Terret Hooks, per pair for 1 1/4 and 1 1/2 in. Loops, No. 1 Terret or Straight Link.

Eastern Standard Traces, Wagon Chains, &c. ... 60&10 off list prices.

Miscellaneous—

Jack Chain, list July 10, '93:

Iron ... *60&10%*

Brass ... *60%*

Safety and Plumbers' Chain ... *60&10*

Gal. Pump Chain ...

Logging Chain ...

Breast Harness Hook, Rein, Strain ...

Ideal Compensating ...

American Hame Dog and Ring ...

Snaps ...

Stanley Dog Leads and Leather Chains ... *15&5&5*

Wire Goods Co.:

Dog ... *70%*

Log ... *50%*

Chain and Ribbon, Sash—

Cotton Community ...

Steel Chain ... *60*

Pelham ...

Bronze Chain & Steel Chain ...

Sash Chain Attachments per set ...

Clamps, Sash Ribbon per ...

Pair ... *$1.25&25%*

Sash Ribbon Attachments per set ...

Chalk—*See Crayons, Lubricating.*

Carpenters' Blue, doz. ... *50c&55c*

Carpenters' Red, doz. ... *15c&20c*

Carpenters' White, doz. ... *10c&15c*

Checks, Door—

Bird's ... *45%*

Pullman, per doz ... *$6.00*

Reversible ... *33⅓%*

Chests, Tool—

American Tool Chest Co.:

Boy's Chests with Tools ...

Youths' Chests with Tools ...

Gentlemen's Chests, with Tools ... *25%*

Farmers', Carpenters,' etc., Chests, with Tools ... *25*

Machinists and Pipe Fitters Chests, Empty ... *15*

Tool Cabinets ... *25*

Cornell Manufacturing Co.:

Tool Chest ... *75%*

Chisels—

Socket Framing and Firmer—

Standard List ... *50*

Buck Bros. ...

Cie Bros. ...

Jennings & Co.:

Socket Firmer No. 10 ... *25%*

Socket Framing No. 15 ... *25&7½*

Swan's ...

L. & I. J. White Co. ... *30&5%*

Tanged—

Tanged Firmers ... *50&5&5%*

Buck Bros. ...

R. Jennings & Co. Nos. 191, 181 ... *25%*

L. & I. J. White Co. ... *25&5%*

Cold—

lb.

Cold Chisels, good quality ... *13@15¢*

Cold Chisels, fair quality ... *11@13¢*

Cold Chisels, ordinary ... *9@10¢*

Chucks—

Almond Drill Chucks ... *35%*

Almond Turret Six-Tool Chuck ... *40%*

Beaver Pat., each ... *$5.00* ... *35&5%*

Empire ... *25*

Blacksmiths' ... *25*

Jacobs Drill Chucks ... *35%*

Pratt's Positive Drive ... *25%*

Skinner Patent Chucks:

Independent Lathe Chucks ... *35*

Universal, Reversible Jaws ... *35*

Combination, Reversible Jaws ... *35%*

Drill Chucks, New Model ... *25*

Standard, 45 Skinner Pat., 25 Drive ... *10*

Planer Chuck ... *30%*

Face Plate Jaws ... *35%*

Standard Tool Co.:

Improved Drill Chuck ... *45%*

Union Mfg. Co.:

Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21 ... *35%*

Scroll Combination, Nos. 83 and 84 ... *30%*

Geared Scroll, Nos. 33, 34 and 35 ... *35*

Independent Iron, Nos. 18 and 318 ... *35%*

Independent Steel, No. 64 ... *35%*

Union Steel, Nos. 000, 00, 100, 101, 102, 103, 104 ... *35%*

Union Czar Drill ... *25*

Universal, No. 12, Ft. 14, 15 ... *35*

Universal, No. 42 ... *35*

Iron Face Plate Jaws, Nos. 28, 30, 48 and 50 ... *35*

Steel Face Plate Jaws, Nos. 70 and 72 ... *30%*

Westcott Patent Chucks:

Lathe Chucks ... *50%*

Little Giant Rotary Drill ... *50%*

Little Giant Double Grip Drill ... *50%*

Little Giant Drill, Improved ... *50%*

Oneida Chuck ... *50%*

Scroll Combination Lathe ... *50%*

Whitaker Mfg. Co.:

National Drill ... *25%*

Clamps—

Adjustable Hammers' ... *20&20&5%*

Carriage Makers', P., S. & W. Co. ... *50&10%*

Iron Bound ... *35&10%*

Myers' Hay Rack ... *15*

Lineman's Swedish Neverturn ... *65*

Quick Workers Hammers ... *40&10%*

Saw Clamps, see Vises, Saw Filers'

Cleaners, Drain—

Iwan's Champion, Adjustable ... *50%*

Iwan's Champion, Stationary ... *40%*

Sidewalk—

Star Socket. All Steel. ... *$ doz. $4.05 net*

Star Shank. All Steel. ... *$ doz. $3.24 net*

W. & C. Shank All Steel. ... *$ doz. 7½ in., $3.09; 8 in., $3.25*

Cleavers, Butchers'—

Lister Bros. ... *30%*

Payne R. ... *30%*

L. & I. J. White Co. ... *30%*

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:

1902 Chicago Horse, each ... *$10.75*

20th Century Horse, each ... *$5.00*

Lightning Belt Horse, each ... *$15.00*

Chicago Belt Horse, each ... *$20.00*

Stewart's Enclosed Gear Horse, each ... *$8.75*

Stewart's Patent Sheep Shearing Machine, each ... *$12.75*

Stewart Enclosed Gear Shearing Machine, No. 8, each ... *$9.75*

Clips, Axle—

Bowker Stables, list July 1, '95 ... *50&10&10&5%*

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—

Hardware list:

Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c. ... *70&10&5%*

Compression Bibbs, Goodyear ... *70%*

Coffee Mills—

See Mills, Coffee.

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list ...

Leather, Walter B. Stevens & Son's list ...

Compasses, Dividers, &c.

Combination Dividers ... *70&10&10&5%*

Wm. Scholl horn Co.:

Excelsior Dividers ... *60%*

Lock Dividers ... *75&5%*

Conductor Pipe,—

L. C. L. to Dealers:

Galvanized

Galv. Steel.	*Charcoal Iron.*	*Copper 14, 16&20 oz.*
Eastern:		
70	*50&17½*	
Central:		
70	*55*	
Western and Southern:		
60&10		
So. Western		
60&10		

Terms, 60 day, 2% cash. 6 months factory shipments guaranteed, discounted.

See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:

Galvanized Iron, 5 gal. ... *$2.50*

Galvanized Iron, 6 gal. ... *$2.75*

Galvanized Iron, 8 gal. ... *$3.00*

Galvanized Iron, 10 gal. ... *$3.50*

Galvanized Iron, 12 gal. ... *$4.00*

Galvanized Iron, 14 gal. ... *$4.50*

Galvanized Iron, 16 gal. ... *$5.00*

Galvanized Iron, 18 gal. ... *$7.50*

Galvanized Iron, 20 gal. ...

Galvanized Iron, 25 gal. ...

Galvanized Iron, 30 gal. ...

Galvanized Iron, 40 gal. ...

Galvanized Iron, 50 gal. ...

Galvanized Iron, 60 gal. ...

Galvanized Iron, 70 gal. ...

Galvanized Iron, 80 gal. ...

Galvanized Iron, 100 gal. ...

Galvanized Iron, 120 gal. ...

Galvanized Iron, 150 gal. ...

Galvanized Iron, 200 gal. ...

Galvanized Iron, 250 gal. ...

Galvanized Iron, 300 gal. ...

Galvanized Iron, 400 gal. ...

Galvanized Iron, 500 gal. ...

Galvanized Iron, 600 gal. ...

Galvanized Iron, 700 gal. ...

Galvanized Iron, 800 gal. ...

Galvanized Iron, 900 gal. ...

Galvanized Iron, 1000 gal. ...

Galvanized Iron, 1200 gal. ...

Galvanized Iron, 1500 gal. ...

Galvanized Iron, 2000 gal. ...

Galvanized Iron, 3000 gal. ...

Galvanized Iron, 4000 gal. ...

Galvanized Iron, 5000 gal. ...

Vaste Lined ...

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 25@25¢. Lighter than 3 lb. to pair ... *20@20¢*

Cord—Sash—

Braided, Drab ... *lb. 55¢*

Braided White, Com. Nos 8 to 12, 25¢; No. 5, 33⅓¢; No. 6, 30¢; Silver Lake Russia ... *lb. 42¢*

Braided White, Com. Nos 8 to 12, 1 cord each per pound.

Cable Laid Italian, lb., No. 18 ... *37¢*

Italian, lb., 1, No. 18, 25¢; lb. 2 ...

Common India ... *lb., No. 11* ...

Cotton Sash Cord, Twisted ... *18@20¢*

Patent Russia ... *lb.* ... *30¢*

Cable Laid Russia ... *lb.* ... *32¢*

India Hemp, Br'd'd ... *lb.* ... *21¢*

India Hemp, Twisted ... *lb.* ... *13@14¢*

Patent India, Twisted ... *lb.* ... *17¢*

Pearl Braided cotton, No. 6 ... lb. 25¢; No. 7, 26¢; Nos. 8 to 12, 26¢, 27¢; No. 6, 26¢; No. 7, 26¢; No. 8, 27¢; No. 9, 28¢; No. 10, 29¢; No. 12, 30¢.

Lightning, Braided, Nos. 8 to 12, 25¢; 7, 26¢; 6, 27¢.

Harmony Cable Laid Italian, Nos. 7 to 10 ... lb. 23¢

Pullman:

Wire Sash Cord ... *10%*

Sash Cord Attachments, per doz. *10¢*

Samson, Nos. 6 to 12:

Braided, lb., Drab Cotton 55¢, Italian Hemp 43¢@50¢; Linen, 65¢; White Cotton 50¢@55¢; Spun Cord ... 35¢

Massachusetts, White ... lb. 40¢

Massachusetts, Drab ... lb. 43¢

Phoenix, White, Nos. 8 to 12, 27¢.

Silver Lake, per lb.:

A, Drab, 35¢; A, White, 40¢.

B, Drab, 19¢; B, White, 22¢.

Italian Hemp, 14¢; Linen, 57½¢

See also Chain and Ribbon

Wire, Picture—

List July 19, 1906 ... *90&10—%*

Hoban's Standard Wire Picture Cord, old list, 85&10%

Turner & Stanton Co, Wire Picture Cord ...

Cradles—

Grain ... *40&12½%*

Crayons—

White Round Crayons, Cases, 100 gro., $6.50&$7.50 at factory, but lower prices made by jobbers

Zelnicker's Lumber.

White and Purple, Indelible ... $7.50

Blue, Red, Green, Yellow and Purple, Indelible, 86¢ ... Black, 54¢

Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indelible, $14.00 ... Black, 7½¢

Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round $3.00; ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3/16 ... $4.00

Crooks, Shepherds'—

Fort Madison per doz. Hook ... $2.00

Lloyd ... $2.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden ... *50%*

Cutlery, Table—

International Silver Company:

No. 12, M. 1 in. Knives, 1847 Rogers, $2.50; Star, Elite, Rogers & Hamilton and Amer., $2.50; Wm. Rogers & Son, $2.50

Cutters—Glass—

H. H. Mathews Co. ...

R. J. Dodd ...

H. Mc. ...

Wm. Hoard ...

Meat and Food—

Arnot ...

Nos. ...

Dixon ...

Nos. ...

Enterprise ...

Nos. ...

Ideal ...

Nos. ...

Ideal ...

Nos. ...

New Triumph, No. 6 ... $1.50

Nos. ...

Raewin Feed No. 1, $24.00; No. 2, $22.00 ... *45&10&10*

Nos. ... $15.00 ... $12.00

Enterprise Beef Shavers ... *25&30%*

Slaw and Kraut—

Helm Dipper ...

Slaw and Kraut Cutters ... 35

Cabbage ...

Mc. Mann ...

Slaw Cutters. J. Knife ... $ doz. $3.

Combined Slaw Cutter and Corn Grater ... $ doz. $4

Tobacco—

All Iron, Cheap ... *doz. $4.25@$4.5*

Enterprise ...

Nos. ...

$18 ...

Diggers, Post Hole, &c.—

Disston's:

Rapid, $ doz., $24.00 ... 25

Samson, $ doz., $34.00 ... 25

Iowa Improved Post Hole ...

Vaughan Ladder Post ...

Perfection Post Hole Diggers, $ doz. ... $7.

Split Hair Post Hole Diggers, $ doz. ... $7.

Hercules Patent, per doz. ...

Kohler's, $ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $8.00; Rival, $8.50; Pioneer ... $7.

Newest Prize Post Hole Diggers, $ doz. ... $4.

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing*

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers ...

Sterling Wheel Dresser Cutters ... 35

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines ... *$1.50@$1.7*

Barnes, Miles ...

Bro. ... & W. ...

Goodell Automatic Drills, 50&10@60&10%

Morris Lane Automatic Drills, 50&10%

Ratchet, Hartley & Curtis ...

Ratchet, Parker's ... 40

Ratchet, Western's ... 40

Ratchet, Weston's, Style H Improved ... 40

Ratchet, No. 012 ... 40

Ratchet, Celebrated ... 40

Ratchet, Whitney's, P., S. & W., ... 50&

Whitney's Hand Drill, No. 1, $10.00; Adjustable No. 13 ... 50

Twist Drills—

Bit Stock ... *60&10&10@70%*

Taper and Straight Shank ... *60&10%&10&10&5%*

Drivers, Screw—

Screw Driver Bits, per doz. ... *35&10%*

Balsey's Screw Holder and Driver, $ doz., 2½-in., $6; 4-in., $7.50; 6-in. ...

Buck Bros.' Screw Driver Bits ... 30

Champion ...

Goodell's ... 50

Frary Biol H'dle Sets, No. 3, $12. 50

Ford's Brace Screw Drivers ... 40&10%

Gay's Double Action Ratchet ...

Goodell's Auto ... 65@65&10%

Maydole's Ratchet Handle ... 40

Mayhew's Monarch ... 40%

Millers Falls, Nos. 20 and 21 ... 25&10%

Millers Falls Nos. 11, 12, 41, 42 ... 15&10%

Smith & Hemenway Co., Neverturn, 66⅔%; Elmora, 60%; Star, ...

Swan's ...

Nos. 7365 to 7368, 50%; No. 7540, ... 40&10%

Eave Trough, Galvanized—

Territory I. C. L. Galvanized

Galv. Steel.	*Charcoal Iron.*	*Copper 14, 16&20 oz.*
Eastern:		
70&5	*60&10*	
Central:		
70&5%	*65%*	
Western and Southern:		
70	*60&5*	*50&5*
So. Western:		
70&5	*60&5*	*50&5*

Terms, 2% for cash. Factory shipments promptly delivered.

Note.—Lower prices are made on some sections.

See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory ship points, all territories: Galv. Steel and Galv. Cast

No. 26	
No. 24	
No. 22	
Copper	

Elbows, Stove Pipe—

Enterprise ...

Ideal ...

Nos. ...

Emery, Turkish—

	¼ lb.	*½ lb.*
	$6:	*$220: Flour.*
Extra	*10 ¢*	*15 ¢* *15½ ¢*
½ Extra	*9 ¢*	*13½ ¢* *13½ ¢*
Flour	*7 ¢*	*11½ ¢* *11½ ¢*
No. 1	*6 ¢*	*9½ ¢* *9½ ¢*
No. 1½	*5 ¢*	*7½ ¢* *7½ ¢*
No. 2	*4 ¢*	*6 ¢* *6 ¢*
No. 3	*3 ¢*	*4 ¢* *4 ¢*
No. 4	*2 ¢*	*3 ¢* *3 ¢*
No. 5	*1½ ¢*	*2 ¢* *2 ¢*
No. 6	*1 ¢*	*1½ ¢* *1½ ¢*
No. 7	*½ ¢*	*1 ¢* *1 ¢*
No. 8	*½ ¢*	*½ ¢* *½ ¢*
No. 9	*½ ¢*	*½ ¢* *½ ¢*
No. 10	*½ ¢*	*½ ¢* *½ ¢*
No. 11	*½ ¢*	*½ ¢* *½ ¢*
No. 12	*½ ¢*	*½ ¢* *½ ¢*
No. 13	*½ ¢*	*½ ¢* *½ ¢*
No. 14	*½ ¢*	*½ ¢* *½ ¢*
No. 15	*½ ¢*	*½ ¢* *½ ¢*
No. 16	*½ ¢*	*½ ¢* *½ ¢*
No. 17	*½ ¢*	*½ ¢* *½ ¢*
No. 18	*½ ¢*	*½ ¢* *½ ¢*
No. 19	*½ ¢*	*½ ¢* *½ ¢*
No. 20	*½ ¢*	*½ ¢* *½ ¢*
No. 21	*½ ¢*	*½ ¢* *½ ¢*
No. 22	*½ ¢*	*½ ¢* *½ ¢*
No. 23	*½ ¢*	*½ ¢* *½ ¢*
No. 24	*½ ¢*	*½ ¢* *½ ¢*
No. 25	*½ ¢*	*½ ¢* *½ ¢*
No. 26	*½ ¢*	*½ ¢* *½ ¢*
No. 27	*½ ¢*	*½ ¢* *½ ¢*
No. 28	*½ ¢*	*½ ¢* *½ ¢*
No. 29	*½ ¢*	*½ ¢* *½ ¢*
No. 30	*½ ¢*	*½ ¢* *½ ¢*
No. 31	*½ ¢*	*½ ¢* *½ ¢*
No. 32	*½ ¢*	*½ ¢* *½ ¢*
No. 33	*½ ¢*	*½ ¢* *½ ¢*
No. 34	*½ ¢*	*½ ¢* *½ ¢*
No. 35	*½ ¢*	*½ ¢* *½ ¢*
No. 36	*½ ¢*	*½ ¢* *½ ¢*
No. 37	*½ ¢*	*½ ¢* *½ ¢*
No. 38	*½ ¢*	*½ ¢* *½ ¢*
No. 39	*½ ¢*	*½ ¢* *½ ¢*
No. 40	*½ ¢*	*½ ¢* *½ ¢*
No. 41	*½ ¢*	*½ ¢* *½ ¢*
No. 42	*½ ¢*	*½ ¢* *½ ¢*
No. 43	*½ ¢*	*½ ¢* *½ ¢*
No. 44	*½ ¢*	*½ ¢* *½ ¢*
No. 45	*½ ¢*	*½ ¢* *½ ¢*
No. 46	*½ ¢*	*½ ¢* *½ ¢*
No. 47	*½ ¢*	*½ ¢* *½ ¢*
No. 48	*½ ¢*	*½ ¢* *½ ¢*
No. 49	*½ ¢*	*½ ¢* *½ ¢*
No. 50	*½ ¢*	*½ ¢* *½ ¢*
No. 51	*½ ¢*	*½ ¢* *½ ¢*
No. 52	*½ ¢*	*½ ¢* *½ ¢*
No. 53	*½ ¢*	*½ ¢* *½ ¢*
No. 54	*½ ¢*	*½ ¢* *½ ¢*
No. 55	*½ ¢*	*½ ¢* *½ ¢*
No. 56	*½ ¢*	*½ ¢* *½ ¢*
No. 57	*½ ¢*	*½ ¢* *½ ¢*
No. 58	*½ ¢*	*½ ¢* *½ ¢*
No. 59	*½ ¢*	*½ ¢* *½ ¢*
No. 60	*½ ¢*	*½ ¢* *½ ¢*
No. 61	*½ ¢*	*½ ¢* *½ ¢*
No. 62	*½ ¢*	*½ ¢* *½ ¢*
No. 63	*½ ¢*	*½ ¢* *½ ¢*
No. 64	*½ ¢*	*½ ¢* *½ ¢*
No. 65	*½ ¢*	*½ ¢* *½ ¢*
No. 66	*½ ¢*	*½ ¢* *½ ¢*
No. 67	*½ ¢*	*½ ¢* *½ ¢*
No. 68	*½ ¢*	*½ ¢* *½ ¢*
No. 69	*½ ¢*	*½ ¢* *½ ¢*
No. 70	*½ ¢*	*½ ¢* *½ ¢*
No. 71	*½ ¢*	*½ ¢* *½ ¢*
No. 72	*½ ¢*	*½ ¢* *½ ¢*
No. 73	*½ ¢*	*½ ¢* *½ ¢*
No. 74	*½ ¢*	*½ ¢* *½ ¢*
No. 75	*½ ¢*	*½ ¢* *½ ¢*
No. 76	*½ ¢*	*½ ¢* *½ ¢*
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No. 78	*½ ¢*	*½ ¢* *½ ¢*
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No. 80	*½ ¢*	*½ ¢* *½ ¢*
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No. 91	*½ ¢*	*½ ¢* *½ ¢*
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No. 110	*½ ¢*	*½ ¢* *½ ¢*
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No. 115	*½ ¢*	*½ ¢* *½ ¢*
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No. 147	*½ ¢*	*½ ¢* *½ ¢*
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No. 166	*½ ¢*	*½ ¢* *½ ¢*
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No. 189	*½ ¢*	*½ ¢* *½ ¢*
No. 190	*½ ¢*	*½ ¢* *½ ¢*
No. 191	*½ ¢*	*½ ¢* *½ ¢*
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No. 198	*½ ¢*	*½ ¢* *½ ¢*
No. 199	*½ ¢*	*½ ¢* *½ ¢*
No. 200	*½ ¢*	*½ ¢* *½ ¢*
No. 201	*½ ¢*	*½ ¢* *½ ¢*
No. 202	*½ ¢*	*½ ¢* *½ ¢*
No. 203	*½ ¢*	*½ ¢* *½ ¢*
No. 204	*½ ¢*	*½ ¢* *½ ¢*
No. 205	*½ ¢*	*½ ¢* *½ ¢*
No. 206	*½ ¢*	*½ ¢* *½ ¢*
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No. 210	*½ ¢*	*½ ¢* *½ ¢*
No. 211	*½ ¢*	*½ ¢* *½ ¢*
No. 212	*½ ¢*	*½ ¢* *½ ¢*
No. 213	*½ ¢*	*½ ¢* *½ ¢*
No. 214	*½ ¢*	*½ ¢* *½ ¢*
No. 215	*½ ¢*	*½ ¢* *½ ¢*
No. 216	*½ ¢*	*½ ¢* *½ ¢*
No. 217	*½ ¢*	*½ ¢* *½ ¢*
No. 218	*½ ¢*	*½ ¢* *½ ¢*
No. 219	*½ ¢*	*½ ¢* *½ ¢*
No. 220	*½ ¢*	*½ ¢* *½ ¢*
No. 221	*½ ¢*	*½ ¢* *½ ¢*
No. 222	*½ ¢*	*½ ¢* *½ ¢*
No. 223	*½ ¢*	*½ ¢* *½ ¢*
No. 224	*½ ¢*	*½ ¢* *½ ¢*
No. 225	*½ ¢*	*½ ¢* *½ ¢*
No. 226	*½ ¢*	*½ ¢* *½ ¢*
No. 227	*½ ¢*	*½ ¢* *½ ¢*
No. 228	*½ ¢*	*½ ¢* *½ ¢*
No. 229	*½ ¢*	*½ ¢* *½ ¢*
*

Fasteners, Blind—

Zuck Fasteners ..... 50&10%
Wilkins' 10%
Upson's Patents 40%

Cord and Weight—

Ives and Pelton 33⅓%

Corrugated—

Acme Corrugated Fasteners 50%

Faucets—

Cork Lined ..... 5 to 6@60%
Metallic Keg, Leather Lined, per doz. 2.50
Red Cedar ..... 40&50% 40&10&2%
Petroleum ..... 70&10&7½%
P. & L. B. Co.:
Metal Key ..... 60&10%
Star 60%
West Lock ..... 55&10%
John Sommer's Peerless Tin Keg 40%
John Sommer's Boss Tin Keg 50%
John Sommer's Victor Mt. Key ..... 50&10%
John Sommer's Duplex Metal Key 60%
John Sommer's Diamond Lock 40%
John Sommer's I. X. L. Cork Lined 50%
John Sommer's Reliable Cork Lined ..... 50&10%
John Sommer's Chicago Cork Lined 60%
John Sommer's O. K. Cork Lined 50%
John Sommer's No Brand, Cedar 50%
John Sommer's Perfection, Cedar 40%
Self Measuring
Enterprise, ₱ doz. $6.00 ..... 40&10%
Lane's, ₱ doz. $36.00 ..... 40&10%
National Measuring, ₱ doz. $36. 40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List Nov. 1, 1899.

Best Brands ..... 70&10&7.5&10%
Standard Brands ..... 75&10&7.5&10%
Lower Grade ..... 75&10&7.5&10%

Imported

Stubs' Tapers, Stubs' list, July 24, '97 ..... 33 1-3&40%

Fixtures, Fire Door—

Allith Underwriters' Approved 50%
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 ..... $3.75
Fusible Links, No. 96 ..... 60%
Expansion Bolts, No. 137 ..... 60&10%

Grindstone—

Net Prices:

Inch	15	17	19	21
Per doz.	$3.60	3.85	4.15	4.65

P., S. & W. Co. 25
Reading Hardware Co. 60%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.— Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Em Potato ..... 60&10%
Victor, Ideal ..... 60&15&2½%
Victor, Manure 66⅔%
Victor, Header 65%
Champion, Hay 66⅔%
Champion, Header 65%
Champion, Manure ..... 60&15&2½%
Columbia, Hay ..... 60&20%
Columbia, Manure 60%
Columbia, Spading ..... 70&12½%
Hawkeye Wood Barley 40
W. & C. Potato Digger ..... 60&10%
Acme Hay ..... 60&20%
Acme Manure, 4 tine ..... 60&10&5%
Dakota Header ..... 60&20%
Jackson Wood Barley ..... 60&20%
Kansas Header 65%
W. & C. Favorite Wood Barley 40%
Plated.—See Spoons.

Frames— Wood Saw—

White, S'g't Bar, per doz. 75¢@80¢
Red, S'g't Bar, per doz. $1.00@1.25
Red, Dbl. Brace, per doz. $1.40@1.50

Freezers, Ice Cream—

Qt. 6
Each $1.25 $1.60 $1.90 $2.20 $2.80

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped.. 3.65
Waterproof Dbl. Taped.. 4.40
Waterproof Tpl. Taped.. 5.15

10&2½%

Gates, Molasses and Oil—

Stebbins' Pattern ..... 75@80%

Gauges—

Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c. ..... 50&50&10%
Disston's Marking, Mortise, &c.. 67½%
Wire, Brown & Sharpe's 33⅓%
Wire, Morse's 25%
Wire, P., S. & W. Co. 33⅓%

Gimlets— Single Cut—

Numbered assortments, per gro.

Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $3.30; 2, $3.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co. ..... 60&65&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush.. 25&10&50%
Elwell's 10%

Grease, Axle—

Common Grade....gro. $6.00@6.50
Dixon's Everlasting, 10-lb pails, 80¢; in boxes, ₱ doz., 1 lb. $1.20, 2 lb. $2.00
Helmet Hard Oil 25%

Griddles, Soapstone—

Pike Mfg. Co. ..... 33⅓&33⅓&10%

Grinders—

Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 ..... 30%
Alundum Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A, Combined, $6.50 ..... 50%
Alundum Disc Grinders, each, $2.50 ..... 30%

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., $2.00 ..... 33⅓%
Richards Mfg. Co.: Elt and Cycle Ball Bearing, mounted 40%

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... 60&5@60&10%
Covert Mfg. Co.:
Web ..... 30&2%
Jute Rope 35%
Sisal Rope 25%
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am. Coil and Halters ..... 40@10&5%
Am. Cow Ties ..... 45&50%
Niagara Coil and Halters..45@50&5%
Niagara Cow Ties ..... 45&5@50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists'...55&10@55&10&5%
Heller's Farriers'..... 40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel 50%
Farriers ..... 40&10&5%
Riveting 50%
Machinists' (revised list ..... 66⅔&5%
Blacksmiths' ..... 50&5
Fayette R. Plumb:
A. E. Nail ..... 40&2½@40&12½%
Eng. and B. S. Hand..50&10&5@60&5%
Machinists' & Gunmiths'.... 60@60&10%
Rivet and Tinners'.40&7½@40&12½&5%

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢...40¢10%
3 to 5 lb., per lb., per cwt. ..... 80&10%
Over 5 lb., per lb., 30¢ .....
Over 5 lb., per lb., 30¢..80&10¢10%

Handles—

Agricultural Tool Handles

Hoe, Rake, &c. ..... 60¢10%@60¢10&5%
Hoe, Rake, &c. 40%
Fork, Shovel, Spade, &c.:
Long Handles 40%
D Handles 40%

Cross-Cut Saw Handles—

Atkins 40%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—

Auger, assorted...gro. $3.00@$3.50
Brad Awl ..... gro. $1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory, $2.15@2.40
Socket Firming, Apple, $1.75@ $1.95; Hickory...$1.60@$1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, &c. 60¢10%@60¢10&5%
Hand Saw, Varnished, doz. 80¢85¢; Not Varnished.. .65@75¢
Plane Handles:
Jack, doz. 80¢; Jack, Bolted 75¢
Fore, doz. 45¢; Fore, Bolted 90¢
Chapin-Stephens Co.:
Carving Tool ..... 30&30&10%
Chisel ..... 60&60&10%
File and Awl ..... 60@60&10%
Saw and Plane ..... 30@30&10%
Screw Driver ..... 30@30&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 15&10%
Nicholson Simplicity File Handle.... ₱ gro. $0.85@$1.50
J. L. Osgood:
Indestructible File and Tool ₱ gro. No. 1, $8.00; No. 2, $8.50; No. 3, $9.00; No. 4, $9.50; No. 5, $10.00 ..... gro. lots 10%
W. A. Zelnicker Supply Co.:
Hammer, ₱ doz., 12 in. $2.00; 14 in. $3.00, 16 in. $3.75, 18 in. $2.50; 20 in. $3.75, 22 in. $3.00; 24 in. $3.30; 26 in. $3.50; 30 in., $3.80.
Sledge, ₱ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 26 in. $4.00; octagon, 36 in., $4.00.
Axe, ₱ doz., 28 to 34 in., $5.60; 36 in., $5.84.
Adze, ₱ doz., 36 in., $5.80; 36 in. $7.80.
Pick, ₱ doz., R. R. 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ₱ doz., 12 to 14 in., $2.00.

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.

Acme Mfg. Co.:
Reliable, Nos. 1 and 2; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60&2½%
Roller Bearing ..... 70&2½%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, 60&10%
Roller Bearing, Ex. Hy No. 22, $18.00 ..... 60&10%
Ball Dog, $24.00 ..... 10%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard..... 60&10%
Hinged ..... net $6.08
Covered ..... 60&5%
Special ..... 70&5%
Lawrence Bros.:
Advance ..... 55&10%
Cleveland ..... 70&7½%
Clipper, No. 75 20
Crown ..... 55&10
Cyclone, No. 10 ..... net $6.50
Tandem, No. 50 ..... net $5.50
New York ..... 55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2.70%
Anti-Friction 60%
Hinged Hangers, King Charm..60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g Stl Track No. 13..$2.50
Roller B'r'g Stl Track No. 13..$2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track, Tandem Trolley Track No. 16..... 50&10%
Seal, Steel Track No. 8..... $2.25
Auto Adj. Track No. 22.—50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150 ..... $2.50
Safety Underwriters F. D. No. 101 ..... 50&10%
Tandem No. 44..2½ and 3 60&10%
Palace, Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 122 ..... 50&10%
Ives' Wood Track No. 1..... $2.25
Trolley B. D. No. 20..... 50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3 ..... 60%
Hinged Tandem No. 48...65&5%
Folding Door B. B. Swivel No. 135 ..... 40%
Taylor & Boggis Fty Co.'s Kidder & Roller Bearing 50&15&10&5%
Myers' Stayin Hangers 60%

Hangers— Garment—

Pullman Trouser, ₱ gro., 1 pair Flat Aluminum, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro. $10.50; Garment Hanger Loops, Round Nickeled, per gro. $10.50
Victor Folding ..... ₱ gro. $9.60

Gate—

Myers' Patent Gate Hangers, ₱ doz. net $4.50

Joist and Timber—

Lane Bros. Co. 30%

Hasps—

Griffin's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, ₱ doz..60%

Hatchets—

Regular list, first qual. 40&2½%—
Second quality ..... 50&5%—

Heaters, Carriage—

Clark No. 5 $1.15; No. 5B, $2.00; No. 3 $2.25; No. 3D $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50 ..... 25%
Clark Coal, ₱ doz., $9.75 ..... 20%

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind: (Victor; National: 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	2	3	5
Doz. pair	$0.75	1.35	2.70	

Mortise Shutter: (L. & P., O. S., Acme, &c.)

No.	1	1½	2	2½
Doz. pair	$0.70	.65	.60	.55

Mortise Reversible Shutter (Buffalo, &c.):

No.	1	1½	2
Doz. pair	$0.70	.65	.60

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Charles Parker Co. ..... 70&75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00 ..... 20%
Reading's Gravity 60%
Stanley's Steel Gravity Blind Hinges, No. 1647's, ₱ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter ..... 75&5%
Acme, Lull & Porter 75%
Queen City Reversible 75%
Shepard's Noiseless, Nos. 60, 50, 55 ..... 75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&5%
Tip Pat'n, No. 1 ..... 75&10%
No. 3 ..... 75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 70&10&5%
Shepard's Double Locking 75%
Champion Gravity Locking ..... 75&5%
Pioneer ..... 75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with L't'chs.	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	.35

New England:
With Latch....doz. ...@$2.00
Without Latch...doz. ...@$1.60
Reversible Self-Closing:
With Latch....doz. ...@$1.75
Without Latch...doz. ...@$1.35
Western:
With Latch ..... doz. $1.75
Without Latch ..... doz. $1.15
Wrightsville Hardware Co.: Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 ..... 70%

Pivot Hinges—

Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—

Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, Cast Iron $6.50@$6.75

J. Bardsley:
Bardsley's Non-Checking Mortise Spring Hinges 60%
Bardsley's Patent Checking..33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor..40%
Bommer Spring Hinges 40%
No. 999 Wrot. Steel Hold Back, ₱ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges.....50%
Chicago (Ball Bearing) Floor..50%
Garden City Engine House..... 25%
Keene's Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 25%
American 30%
Columbia, ₱ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ₱ gr. $12.00
Columbian Hinges..... 60&10%
Gem, new list 30%
Clover Leaf ..... ₱ gr $12.00
Oxford, new list 30%
Floor Spring Hinges..... 65&10%
Lawson Mfg. Co., Matchless..... 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye Steel Holdback Screen Door..... ₱ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door 25%
No. 777, Sheet Steel Holdb'k, ₱ gr. $9.00
Superior Spring Hinge Co.:
Superior Floor Hinges..... 33⅓%

Extra 10%, often given on most of these Hinges

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges..50&10%
Heavy Strap Hinges..60&5%
Light T Hinges 50%
Heavy T Hinges 40%
Extra Hvy. T Hinges 50&10%
Hinge Hasps 33⅓%
Cav. Heavy Strap ..... 60&5%
Cav. Ex. Heavy T..50&10%

Extra 10@7½%

Screw Hook and Strap,

6 to 12 in.	lb. 8¾¢
14 to 20 in.	lb. 8¼¢
22 to 36 in.	lb. 8¼¢

Screw Hook and Eye:

¾ to 1 inch	lb. 6¼¢
⅝ inch	lb. 7¼¢
½ inch	lb. 8¼¢

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—

M'f'gr's list, price per gross.

Inch	15	16	17	18
Galv. Open	$35	$39	$42	$46
Jap. Open	26	28	31	35
Galv. Funnel	48	48	52	56
Jap. Funnel	33	36	39	43

10&5%

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick, No. 162 ..... each $1.05
Steel Mortar, No. 158 ..... each $1.35

Hoes— Eye—

Scovil and Oval Pattern ..... 60&10@60&10&10%
Grub, list Feb. 28, 1899 ..... 70&10@75&10%

D. & H. Scroll 25%
Am. Fork & Hoe Co. (Scroll Pattern) 60%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but among them are still many lists of August 1, 1899, or setting at net prices.

Cronk's Weeding, No. 1, $2.50; No. 2, $2.50
Star Double Bit $4.50
1 in. Madison Cotton Hoe ..... 50&10&10
1 ½ Madison Crescent Cultivator Hoe, ₱ doz. ..... 70&10
Ft. Madison Middle Hoes: .....
Regular Weight ..... ₱ doz. 40&5
Junior Size ..... ₱ doz. net $1.00
Ft. Madison Sprouting Hoe, ₱ doz. ..... 60&5
Ft. Madison Dixie Tobacco Hoe ..... 75&10&5%
Kretsinger's Cut Easy ..... 75&10
Warrior ..... 75&10
W. & C. Rainbow ..... 75&5
B. B. 6 in. Cultivator Hoe $3.40
B. B., 6½ in. $3.60
Acme Weeding ..... ₱ doz. net $1.35
W. & C. L'tning Shuffle Hoe, ₱ doz. $5.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Vaughan, ₱ doz. $4 ..... 45&10%

Door—

Bardsley's, Iron, 10 in., Brass and Bronze 50%
Lincoln 50%
Pullman 35%
Richards Mfg. Co.'s No. 16, Everlasting, No. 1, Iron Door Gong 33⅓%
Superior 33⅓%

File and Tool—

Nicholson File Holders and File Handles ..... 33⅓&10%

Fruit Jar—

Triumph Fruit Jar Holder, ₱ gross, $1.80, ₱ doz. $1.25

Trace and Rein—

Fernald Double Trace Holder, ₱ doz. pairs $1.25
Dash Rein Holder, ₱ doz. pairs, $1.25

Hones—Razor—

Pine Mfg. Co., Belgian and Swaty, 3 in., German 50%

Hooks—Cast Iron—

Bird Cage, Reading 40%
Clothes Line, Reading List 40%
Coat and Hat, Reading ..... 45&10%
Coat and Hat, Wrightsville 60%
Harness, Reading List 40%

Wire—

Bell 80%
Wire Cloth, Hooks 70%
Brassey Metal Casp. Wire, Coat and Hat, Saco 60%
Columbian Hdw. Co., Gem ..... 70&10%
Parker Wire Goods Co., King ..... 70&10%
Wire Goods Co.: .....
Acme, 60&10%; Chief, 70%; Crown, 75%; Cadet, 65%; Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton ..... *doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.— See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz. $5.00
Grass, common grades, all sizes, per doz. *$1.50*
Whiffletree ..... *lb. 5%@6¢*
Hooks and Eyes:
Brass ..... *60@60&10%*
Malleable Iron ..... *70@70&10%*
Cornell Mfg. Co. Gate and Scuttle Hooks 40%
Ft. Madison Cut Easy Corn Hooks ..... ₱ doz. $3.25 net
Turner & Stanton Co. Cup and Shoulder ..... 33&10%
Beach Hooks, see Beach Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾ inch:
Competition ..... *ft. 5½ 6¢*
Alpha Guaranteed ..... *ft. 8½ 9¢*
Alpha Guaranteed ..... *ft. 10½ 11¢*
Cotton Garden, ¾ in., coupled:
Low Grade ..... *ft. 8½ 9¢*
Fair Quality ..... *ft. 10½ 11¢*

Irons— Sad—

From ¼ to 10 ..... *lb. 3@3½¢*
B. B. Sad Irons ..... *lb. 3½@3¾¢*
Mrs. Potts', cents per set:

Nickel Tops	85	90	93	97
Tinned Tops	85	85	93	97

New England Pressing lb 3½@4¼¢

Bar and Corner—

Richards Mfg. Co., Bar ..... 60&10
Corner 60

Pinking—

Pinking Irons ..... *doz. 60¢*

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw ..... 30&3%; Steel 45%
Lockport 50%
Lane's Steel ..... 30&5%
Richards Tiger Steel, No. 130, 50&10%
Smith & Hemenway Co.'s 25%

Ladder—

Richards Mfg. Co., Ladder Jacks, 50%

Kettles—

Brass, Spun, Plain ..... *20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros. Butcher & 30%
Wilkinson Shear & Cutlery Co. 60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks 60%
Wilcutt Mfg. Co., Handles $2.50
Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15

Drawing—

Standard List *80%*
C. E. Jennings & Co., Nos. 45, 46, 25&5%
Jennings & Gridin, Nos. 41, 42, 60&10%
Swan's 60%
Watrous 60%
L. & I. J. White ..... 25&5&5%

Hay and Straw—

Serrated Edge, per doz. $5.50@7.75
Ball's Steel Bale ..... ₱ doz. $2.50
Iwan's Serrated ..... ₱ doz. $10.00

Miscellaneous—

Farriers' ..... *doz. $3.00@3.25*
Westenhoim's ..... ₱ doz. $3.00@3.25

Knobs—

Base, 2½ inch, Birch, or Maple, Rubber Tip ..... *gro. $1.25@$1.40*
Carriage, Jap., all sizes ..... *gro. 30@35¢*
Door, Mineral ..... *doz. 65@70¢*
Door, Por. Jap'd ..... *doz. 70@75¢*
Door, Por. Nickel ..... *doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable 50%
Lane's Store 25%
Myers' Noiseless Store Ladders 50%
Richards Mfg. Co.:
Improved Noiseless, No. 112 ..... 50%
Climax Shelf, No. 113 ..... 50%
Trolley, No. 109 ..... 50%

Ladles, Melting—

L. & G. Mfg. Co. (low list) 20
P. S. & W. ..... 40&10
Reading 60%

Lanterns—Tubular—

Regular, No. 0 ..... *doz. $3.45@4.50*
Side Lift, No. 0 ..... *doz. $4.60@4.75*
Hinge Globe, No. 0 ..... *doz. $4.60@4.75*
Other Styles ..... *40@50@10%*

Bull's Eye Police—

3 inch ..... *$4.25@4.50*

Latches— Thumb—

Roggin's Latches, with screw..
doz. 35@40¢

Door—

Allith Mfg. Co., Reliable and Alligator, 50%; Reliable Cold Storage, 50%
Cook & Cartier Mfg. Co. 50%
₱ doz. $2.00
Richards' Bull Dog, Heavy, No. 150 ..... 50&5%
Richards' Trump, No. 127 ..... $1.50

Leaders, Cattle—

Small ..... *doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E 10%

Lines—

Wire Clothes, Nos. 18 19 20
100 feet *$2.50 2.25 2.00*
75 feet *$2.10 1.80 1.65*
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'..... 30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ..... ₱ gr. 20%
Masons' Lines, Shade Cord, Solid White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.25; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50 ..... 20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 ..... 20%
Clothes Lines, White Cotton: 50 ft., $2.75, 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00, 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25 ..... 20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines 40%
Of Blue Lines, White Cotton 25%
Shade Cord, Cotton or Linen 20%

Locks— Cabinet—

Cabinet Locks *33⅓%*

Door Locks, Latches, &c.

NOTE.—Net prices are very often made on these goods.
Reading Hardware Co. 40%
R. & E. Mfg. Co. 10%

Padlocks

R. & E. Mfg. Co. Wrought Steel and Brass ..... 75&5%

Sash, &c.—

Iver Patent:
Bronze and Brass 50&5; Crescent 60; Iron 60; Window Weights, inc. 10&20; Rope, Pat. Vents, Parting Sash Lock, 25%
Pullman Patent Ventilating Lock..35
Reading Sash Locks 40

Machines—Boring—

Com. Upr't, without Augers.
$2.00@2.20
Com. Upr't, without Augers.
$2.25@2.50
Swan's Improved ..... 40&10%
Jennings', Nos. 1 and 1 ..... 20&5
Miners' Low 25
Shiffler, Upright, $2.65; Angular, $3.20

Corking—

Reisinger Invincible Hand Power.....
₱ doz. $48.00

Fence—

Williams' Fence Machines ..... each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist..30%
Moore's Hand Hoist, with Link Brake 30%
Moore's Cyclone, High Speed Chain Hoist 25

Ice Cutting—

Chandler's 12½

Washing

Boss Washing Machine Co.: Per doz.
Boss No. $36
Boss Rotary $57.00
Champion Rotary Banner No. 1..$57.00
Standard Champion No. 1 ..... $57.00
Standard Perfection No. 1 ..... $57.00
Cincinnati Square Western $36.00
Uneeda American, Round $36.00

Mallets—

Hickory ..... *45@50%*
Lignumvitæ ..... *45@50%*
Tanners' Hickory and Apple wood ..... *doz. 45@50%*

Mangers, Stable—

Swett Iron Works 50%

Mats, Door—

Acme Flexible Sheet 50
Eagle Steel (W. L. Co.), new list 50

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co. ..... 20&25
National Grist Co. 25
Parker's Columbia and Victoria..33⅓
Parker's Boss and Sidney ..... 50&10
Smith, Lane Bros. Co. 40

Motors, Water—

Divine's Red Devil 30%
Lippincott's 30

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10 in., $3.00; 12 in., $3.40, etc.
Cheap, 10 in., $3.25; 12 in., $3.75, etc.
Better Grade, 10 in., $3.00; 12 in., $3.25, etc.

	12	14	16	18 in.
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*
Continental				
Great American				
Great American Ball B'r'g, new list				
Quaker City				
Pennsylvania				
Pennsylvania, Jr., Ball Bearing				

50&10&5%
Pennsylvania Golf 50%
Pennsylvania Horse ..... 50&5%
Pennsylvania Pony ..... 40&5
Granite State:
Style A, Low Wheel 70
Style B, Low Wheel 70
Style C, High Wheel, spcl. list..70&10%
Style D, High Wheel, spcl. list..70%
Philadelphia:
Styles M., S., O., K., T. ..70&10&5%
Style A, all Steel ..... 60&10&5%
Style B, High Wheel 50%
Drexel and Gold Coin, special list 40%
Horse ..... 40&5
Pony ..... 30&5
36-in. Horse ..... 30&10%
Eagle Horse ..... 30&5%
I. X. L. Horse 50%

Nails—

Wire Nails and Brads, Miscellaneous ..... *$2.00@$2.10@¢*
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsters' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	22	21	20	19	18	..40&5%
Coleman	23	21	20	19	18	net
New Haven	23	21	20	19	18	..40&5%
Livingston	19	18	17	16	16	
Western						₱ b. $ c.

Jobbers' Special Brands.....
per lb. 9@10¢

Picture—

	2	2½	3	*in.*
Brass H'd	*.55*	*.60*	*.70*	*cts.*
Por. Head	*1.10*	*1.10*	*1.10*	*gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: Off list.
Square, Blank or Tapped ..... *4 Off*
Hexagon, Blank or Tapped ..... *5 Off*
Semi-Finished, C. J. & R. ..... *5 Off*
Hexagon, Pol., C. J. & R. ..... *5 Off*
Hot Pressed:
Square, Blank ..... *5 Off*
Hexagon, Blank ..... *5 Off*
Square, Tapped ..... *5 Off*
Hexagon, Tapped ..... *6 Off*

Oakum—

Best ..... *lb. 6¢*
Navy ..... *lb. 6¢*
Plumbers' Spun Oakum ..... *lb. 8¢*

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated *75*
Chase or Paragon:
Brass and Copper ..... *50@10*
Zinc ..... *40@10*
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans ..... 50&10
Railroad Oilers, &c. ..... 60&10&10

Openers— Can— *Per doz.*

Sprague, Iron Handle ..... *30@35¢*
Sprague, Wood Handle ..... *40¢*
Sardine Scissors ..... *$1.25@$4.00*
Yankee Can and Bale Openers, ₱ doz., net, $0.75; Little Gem, ₱ doz., net $0.65

Egg—

Hartigan Nickel Plate, ₱ doz., $2.00; Silver Plate, $4 ..... 50%

Packing—

Asbestos Packing, Wick and Rope ..... *20@25¢*

Rubber—

(Fair quality goods.)

Sheet, C. I. ..... *11@12¢*
Sheet, C. O. S. ..... *11@12¢*
Sheet, C. B. S. ..... *12@13¢*
Sheet, Pure Gum ..... *40@45¢*
Sheet, Red ..... *40@50¢*
Jenkins' '96, ₱ lb. 80¢ 25%

Miscellaneous—

American Packing ..... *lb. 70@1¢*
Cotton Packing ..... *lb. 16@25¢*
Indian Packing ..... *lb. 20@25¢*
Jute ..... *lb. 14¢*
Russia Packing ..... *lb. 80@1¢*

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List ..... *65&7½@70%*
Edwards, Royal Blue ..... 65&7½%

Fry—

Common Lipped:
Nos. *1 2 3 4 5*
Per doz. *$0.75 0.80 0.90 1.10 1.45*

Refrigerator, Galva.—

Inch *12 14 16 18*
Per doz. *$1.75 2.25 2.80 3.15*

Paper—Building Paper

Asbestos: *lb*
Roll Board or Building Felt 6 to 50 lb., per 100 sq. ft. ..... *3@3½¢*
Roll Board or Building Felt 3-32 inch, 45 to 60 lb., per 100 sq. ft. ..... *8¢*
Mill Board, Sheet, 40 x 40 in., 1-32 to ⅛ in. ..... *10@12¢*
Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll *$1.50*
Medium weight, 30 lbs. to roll *$1.75*
Heavy weight, 40 lbs. to roll *$2.00*
Black Water Proof Sheathing 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.05; 4 ply, $1.25
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton *$3.50*
Red Rope Roofing, 250 sq. ft. per roll *$1.75*

Tarred Paper—

1 ply (roll 400 sq. ft.), ton ..... *$30.00@35.00*
2 ply, roll 108 sq. ft. ..... *65¢*
3 ply, roll 108 sq. ft. ..... *90¢*
Slater's Felt (roll 500 sq. ft.)..80¢

Sand and Emery—

Flint Paper and Cloth..50@60%
Garnet Paper and Cloth *25%*
Emery Paper and Cl'th..50&10@60%

Parers— Apple—

Goodell Co.:
Daniel B. ..... $
Daniel B. Seale ..... $
Ideal ..... $
Tin ..... $
Wood ..... $
Boston ..... $
Daniel ..... $
New Century ..... each $20.00
Reading ..... $

Livingston Nail Co.:
Dixie ..... $
Little Star ..... ₱ doz. $5.00
Tip Top ..... $

Reading Hardware Co.:
Admire ..... $
Bradley ..... $
Reading ..... $
Reading ..... $

Potato—

Saratoga ..... ₱ doz. $7.00
White Mountain ..... ₱ doz. $8.00

Picks and Mattocks—

List ..... *75@80%*
Cronk's Handled Garden Mattock ₱ doz., No. 2, $2.60; No. 3, $6.40.

Pinking Irons—
See Irons, Pinking.

Pins, Escutcheon—
Brass .....50@5@10%
Iron, list Nov. 11, '85. 60@10@10%

Pipe, Cast Iron Soil—
Standard, 2-6 in......60@10%
Extra Heavy, 2-6 in......70@10%
Extra, Standard and Heavy, 7 to 12 in......—%

Pipe, Merchant—
Consumers, Carloads. Steel. Iron.

	Blk.	Galv.	Blk.	Galv.
	%		%	
⅛ & ¼ in..	65	48	57	41
⅜ in.....	70	52	59	41
½ in.....	66	56	61	49
¾ to 1 in..	72	62	66	56
1 to 12 in..	74	64	61	46

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 8 to 24 in., f.o.b. factory:
First-class 82%
Second-class 85%

Pipe, Stove—

	Per 100 joints.	
Edwards' Nested:	C. L.	L. C. L.
5 in., Standard Blue.	$6.25	$7.25
6 in., Standard Blue.	6.75	7.75
7 in., Standard Blue	7.50	8.50
5 in., Royal Blue....	7.00	8.00
6 in., Royal Rate....	7.50	8.50
7 in., Royal Blue....	8.50	9.50
Wheeling Corrugating Co., Nested:		
5 in., Uniform Color	$6.15	$7.15
6 in., Uniform Color	6.65	7.65
7 in., Uniform Color	7.60	8.65

Planes and Plane Irons—
Wood Planes—
Bench, first quality .....30%@30@10%
Bench, second quality .....40@40@10%
Molding .....25@25@10%
Chapin-Stephens Co.:
Bench, First Quality 30%
Bench, Second Quality.....40%
Molding and Miscellaneous.....25%
Toy and Gurmaz.....30%
Union 60%

Iron Planes—
Chaplin's Iron Planes.....50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list
Dec. 24, '06. .....25%
Buck Bros. 30%
Chapin-Stephens Co. .....
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse .....¥ doz $8.00

Plates—
Felloe .....lb. 4@4¼¢

Pliers and Nippers—
Button Pliers....75@70@75@10@5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe. 7 8 10 12-in.
$2.00 $2.25 $2.75 $3.50
Acme Nippers .....50&5%
Cronk & Carter Mfg. Co.:
Automatic Button.....80%
Improved Button.....75&10%
Cronk's 60%
No. 80 Linemen's.....50%
Stub's Pattern.....45%
Combination and others 33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&5@10&15&5%
P. S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 35%; Elm City, 35%; Paragon, 50%; Lodi, 55%.
Swedish Side, End and Diagonal Cutting Pliers.....80%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels.....20@20@10%
Chapin-Ins. Brass Cor.....10@10@10%
Pocket Levels.....20@20@10%
Extension Sights.....10@10@10%
Mortar Levels.....10@10@10%
Disston's Plumbs and Levels.....60&10%
Disston's Pocket Levels.....60&10%
Stanley's Duplex 35%
Woods' Extension 33⅓%

Points, Glaziers'—
Bulk and 1lb. papers...lb. 9¼@
5 lb. papers.....lb. 10¢
1 lb. papers.....lb. 10½@

Police Goods—
Manufacturers' Lists... 25@25&5%
Tower's 25%

Polish—Metal, Etc—
Prestoline Liquid No. 1 (½ pt.) ¥ doz. $3.00; No. 2 (1 qu.), $9.00 40%
Prestoline Paste.....60%
George William Hoffman:
Lion Metal Polish Paste, 3 oz boxes, per doz. 50¢; gro $4.20; ½ lb boxes, ¥ doz $1.25; 1 lb boxes ¥ doz $2.25.
Lion Liquid, 8 oz. cans, ¥ doz., $1.25.
Bitreeper- Friend Metal Polish, ¥ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ¥ lb 10¢
Black Eagle, Liquid, ½ pt cans, ¥ doz 75¢
Black Jack Paste ¾ lb cans, ¥ gr $6.00
Black Kid Paste 3 lb cans, each $2.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon's, ¥ gr $5.75..... 10¢
Diana Plumbago ..... ¥ lb 8¢
Fireside ..... ¥ gr. $2.50
Gem, ¥ gr. $1.50..... 10¢
Japanese ..... ¥ gr. $3.50
Jet Black..... ¥ gr $3.50
Peerless Iron Enamel, 10 oz cans, ¥ doz $1.50

Poppers, Corn—
1 qt. Square...doz $6.50; gro $78.00
1 qt. Round...doz $6.00; gro $70.00
½ qt. Square...doz $5.00; gro $57.00
2 qt. Square...doz $12.25; gro $13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled .....35&10%
Tinned .....30&10%

Powder—
In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½ lb.....each 15¢
Rifle, 1 lb.....each 25¢
In Kegs:
12½ lb. kegs.....$3.50
25 lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk)..... $6.50
Half Keg (12½ lb bulk..... $3.50
Quarter Keg (6¼ lb bulk $1.90
Case 24 (1 lb cans bulk)..... $8.50
Half case (1 lb cans bulk)..... $4.50
King's Smokeless: Shot Gun Rifle.
Keg (25 lb bulk)..... $12.00 $15.00
Half Keg (12½ lb bulk) 6.25 7.75
Quarter Keg (6¼ lb bulk). 3.25 4.00
Case 24 (1 lb cans bulk). 14.00 17.00
Half case 12 (1 lb c. bk). 7.25 8.75

Presses—
Fruit and Jelly—
Enterprise Mfg. Co. .....20@25%

Seal Presses—
Morrill's No. 1, ¥ doz., $20.00.....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 50%
Miller's Falls, No. 3, ¥ doz., $12.00..... 33⅓&10%
Morrill's No. 1, Nail Puller, doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00..... 50%
The Stanton Co., Case Lots:
No. 2B large..... $5.50
No. 3B (small)..... $5.00
Smith, A. Mfg. Co.:
Diamond B..... 70%
Giant 50%
Staple Pullers, Utica and Davis 60%

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle,				
doz.	$0.40	.55	.60	1.05
Hay Fork, Nickel or Solid Eye.				
doz.,	4 in.,	$1.25;	5 in.,	$1.55
Inch	2	2¼	2½	
Hot House, doz	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz.	$0.16	.19	.23	.30
Inch	1½	2	2¼	2½
Side, doz.	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in. .....17½@2¢
Auger Mortise, no Face Plate per doz 1¾ and 2 in. .....20½@21¢
2½ in. N. 25¢; 3 in. 30¢; 2 in. 20¢
American Pulley Co.:
Wrought Steel American Plate ..... 50&1
Wrought Steel Eagle ..... 17½&2
Fox-All-Steel, No. 3 and 4 2 in. ¥ doz. 60
Grand Rapids All Steel Noiseless 50
Niagara, No. 25 1¾ in., 19¢; 2 in. ..... 20¢
No. 26 Tray 1¾ in. 19¢; 2 in. ..... 20¢
Star, No. 26, 1¾ in. 19¢; 2 in. 20¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Force, Spout .....25&5@75&10%
Wood Pumps, Tubing, &c. 50%
Barnes Drill Automatic Bird ..... 40&5%
Barnes Portable Steam ..... 25&10%
Contractors' Rubber Diaphragm No. 8, R. & L. Rubber Co. 50
Daisy Spray Pump..... ¥ doz. $6.50
Flint & Walling's, Fast Mail Hand, (low list)..... 50%
Flint & Walling's Fast Mail Power, list) 50%
Flint & Walling's Tight Top Pitcher, ... 25&10%
National Specialty Mfg. Co., Measuring Nos. 2, $6.00; 3, $5.50 ..... 20%
Myers' Pumps (low list) 40%
Myers' Power Pumps 40%
Myers' Spray Pumps ..... 40&5

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No.....	1	2	3	4	5
	$5.00	6.00	7.00	8.00	
Cup Leathers —Per doz.					
Inch.....	2½	3	3½	4	5
	$5.00	7.00	9.00	12.00	

Punches—
Saddlers' or Drive, good..... doz. 50¢@75¢
Spring, single tube, good quality $1.75
Revolving (4 tubes)....doz. $3.50
Bemis & Call Co.'s Cast Steel Drive 50%
Morrill's Nos. 1AA, 1A, 1B, C, D, $15 ..... 50%
Hercules, 1 die, each $5.00..... 50%
Niagara Hollow Punches..... 40%
Niagara Solid Punches ..... 35&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35%; Paragon, 50%; Lodi..... 55%
Tinners' Hollow, P., S. & W. Co..40%
Tinners' Solid, P., S. & W. Co., ¥ doz., $1.44 ..... 40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron.... 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢ 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..¥ ft. 21¢
O. N. T. Rail..... $3.12
Griffin's:
XXX, ¥ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hangrr, ¥ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ¥ 100 ft $3.45
O. N. T., ¥ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in ..... ¥ 100 ft $4.00
Lawrence Bros.:
1 x 3-16 in. ¥ 100 ft., $7.50; 1¼ x 3-16 in., $8.75..... 35&7½%
McKenney's:
Hinged Hanger Track, ¥ ft. 11¢; 60&5
1 x 3-16 Track..... 55&7½%
Myers' Stayon Track..... 60&5%
Richards' Mfg. Co.:
Common, 1 x 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¾ x 3-16, $3.50.
Spec. Shaped Hanger Rail...60&10%
Lag Screw Rail, No. 65 ..... 50%
Gauge Trolley Track, ¥ ft., No. 31, 7/8 in., No. 32, 1¢; No. 33, 2¢.
No. 50..... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Cronk's:
Steel Garden; Champion, 75%; Ideal, 80%; Victor..... 80&25%
Queen, City Lawn, ¥ doz., 20 teeth, $2.65; 24, $3.00..... net
Antiquq Lawn, ¥ doz..... $1.00
Malleable Garden ..... 70&10%
Ideal Steel Garden, ¥ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00..... 80%
Kohler's:
Lawn Queen, 20-tooth....¥ doz. $3.15
Lawn Queen, 24-tooth....¥ doz. $3.25
Paragon, 20-tooth..... ¥ doz. $2.50
Paragon, 24-tooth..... ¥ doz. $2.75
Steel Garden, 14-tooth....¥ doz. $2.40
Malleable Garden, 14-tooth, ¥ doz. $2.00@2.25

Rasps, Horse—
Disston's 75%
Heller Bros. ..... 70&10@75%
Liveright Bros.' Gold Medal 70&10@75%
McCaffrey's American Standard ..... 60&10&5%
New Nicholson..... 70&10@75%
See also Files.

Razors—
Lamb Barber 60%
Fox Razors ¥ doz. No. 42, $9.00; No. 44 $20.00, No. 82, Platina, $25.00 ..... 33⅓&10%
Red Devil..... 65%

Reels, Fishing—
Hendryx:
M 5 Q 6 A 5 P 6 M 9¼ M 16, Q 16 A 12 B 12 4098 Rubber, Papulo, Nickeled P. pulo 20%
Aluminum, German Silv. Bronze 25%
1240 N. 1244 N. 20%
3004 P. 3 P. 4 P. RM. G. 9 ..... 25%
4 N. 6 PN. 24 N. 26 PN. 20%
2004 P. 3312 P. 2004 PN. 3312 N. 0002 N. 3314 P. 3004 N. 3314 N. 0002 PN. 3314 PN. 002 N. 3315 N. 25%
986 PN. 3006 N. 974 PN. 25%
3006 PN. 3006 N. 974 PN. 25%
Pennfield No. 102 P. 102 PN. 202 P. 202 PN. 102 PR. 202 PR. 20%
304 P. 304 PN. 00304 P. 00304 PN. 3314

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed .....70@70@10%
White Porcelain Enamel..50@10%
Solid Brass or Bronze Metal..4@%

Revolvers—
Single Action.....85¢@$1.00
Double Action, except 44 cal. $2.00
Double Action, 44 caliber... $2.00
Automatic $5.00
Hammerless $7.50

Riddles, Hardware Grade
16 in......*per doz.* $2.50@$2.75
17 in.....*per doz.* $2.75@$3.00
18 in.....*per doz.* $3.00@$3.25

Rings and Ringers—
Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.10	1.25	1.65 doz.

Hog Rings and Ringers—
Hill's Rings, gro. boxes....$4.25
Hill's Ringers, Gray Iron, doz..80¢
Hill's Ringers, Malleable Iron, doz..80¢
Blair's Rings .....per doz.
Blair's Ringers.....per doz.75¢
Brown's Rings.....per gro.$7.25
Brown's Ringers....per doz.75¢

Rivets and Burrs—
Copper 50%
Carriage, Coopers, Tinners, &c.:
Black .....70&10%
Metallic Tinned.....70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, paste-board boxes, 50 count, 23@25¢;
Tin boxes, 100 count, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; *100 count,* 51@58¢.

Rollers—
Cronk's Stay, No. 50..... $1.00
Cronk's Brinkerhoff No. 55, $0.80
No. 56, $0.75; No. 60..... $0.75
Lane's Stay..... 40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57..... 50%
Underwriters', Nos. 59, 60..... 50%
Favorite, No. 54..... 60%

Rope—
Manila, 7-16 in. diam. and larger:
Pure .....lb., 11½@ 12¢
Sisal, 7-16 in. diam. and larger:
Pure .....lb., 9¢
Sisal, 7-16 in. diam. and under:
No. 2 quality.....lb., 7½@7¾¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed .....lb., 7½@7¾¢
Pure .....lb., 8¾¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred:
Mixed .....lb., 6¼@6¾¢
Pure .....lb., 7¼¢
Cotton Rope:
Best, ¼-in. and larger...18@21¢
*Medium, ¼-in. and larger.*16@17¢
Common, ¼-in. and larger...10¢
In coils, ¼¢ advance.
Jute Rope:
Thread, No. 1, ¼-in. & up, lb., 21½@ 8¢
Thread, No. 2, ¼-in. & up, lb., 7¢@ 7½¢

Wire Rope—
Galvanized .....37½@21½%
Plain .....45¢@21½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal..... 20%

Rules
Boxwood .....60@60&10%
Ivory .....35¢10@35¢10&5%
Chapin-Stephens Co.:
Boxwood 60%
Pittsfield 40%
Ivory ..... 25@25&10%
Miscellaneous ..... 50@50&10%
Stephens' Combination..... 55%
Stationers' ..... 50@50&10%
Kenffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel..... 33⅓&10%
Lufkin's Steel ..... 50&10%
Lufkin's Lumber..... 50&10%
Union Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Advance:
Circular 45
Band ..... 40&10
Butcher Saws 30
Cross Cuts 30
Cut Off Cross Cut 1
Narrow Cross Cut 50
Hand Rip & Cut Panel ..... 35&5
Miter Box Saws Complete 1
Mitre Mfg. and Press 1
Wood Saws 40
Coping Saw Frames 1
Pruning Saws and Blades 1
Reciprocating Saw & Stabbing Wire 1
Sterling Kitchen Saws ..... 40&10&5
Discount:
Extra Fine Ground and Tested Teeth 5
Band 2 to 18 in. wide 60
Band 1 in. wide 50
Cross Cut 15
Narrow Crosscuts 50
Mason Saws and Drag 50
Framed Wood Saws 25
Wooden Handles 15
Wood Rods Turned 15
Hand Saws, Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46,

Scythe Stones—

Pike Mfg. Co., 1901 list:
Black Diamond S. S. ₰ gro. $12 00
Lamoille S. S. ₰ gro. $11.00
White Mountain S. S. ₰ gro. $9.00
Green Mountain S. S. ₰ gro. $6.00
Extra Hollow Pond S. S. ₰ gro. $7.50
No. 1 Indian Pond S. S. ₰ gro. $7.00
No. 2 Indian Pond S. S. ₰ gro. $4.50
Leader Red Bend S. S. ₰ gro. $4.50
Brick Cut Emery.... ₰ gro. $10.00
Pike Corundum.... ₰ gro. $15.00
Crescent.... ₰ gro. $7.00
Emery Scythe Rifles, 2 Coat, ₰ gro. $8.00
Emery Scythe Rifles, 3 Coat, ₰ gro. $10.00
Emery Scythe Rifles, 4 Coat, ₰ gro. $12.00
Balance of 1901 list 33⅓%
Electro (Artificial), ₰ gro. $12.00
Lancelaug (Artificial), ₰ gro. $18.00 ..... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers..... ₰ gro. $9.00

Stops— Bench—

Millers Falls..... 15&1
Morrills, ₰ doz. N. ... $1.00 50
Morrill's, No. 2, $12.50..... 50

Door—

Chapin Stephens' ..... &c.

Plane—

Chapin-Stephens' 20%

Straps— Box—

Acme Embossed, case lots.... 20&10&10%
Cary's Universal, case lots.... 20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket..... doz. $1.50
Excelsior Stretcher and Tack Hammer Combined, ₰ doz. $6.00..... 20%

Stuffers, Sausage—

Enterprise Mfg. Co..... 25@25&7½%
National Specialty Co., list Jan. 1, 1902..... 30&5%
P., S. & W. Co..... 40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ₰ doz.
Sidewalk, Cedar Mahogany ... $36.00
Triumph, Fancy Veneers ... $33.00
Parlor Queen, Fig, Rosewood... $30.00
Ente, Hungarian Ash..... $27.00
Am. Queen, Fig, Mahogany ... $27.00
Bissell, Bird's Eye Maple ... $25.00
Grand Rapids, Stained ... $24.00
Japan ... $22.00
Standard, Nickel ... $21.00
Crown, Jewel, Nickel, $21.00, Japan $19.00
Crystal, Glass Top ... $36.00
Grand, 17 in. wide ... $54.00
Club, 21 in. wide ... $54.00
Hall, 25 in. wide ... $60.00

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five dozen lots; $2 per dozen on ten dozen lots; $2.50 per dozen on twenty five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks.. 90@25%
American Cut Tacks..... 90@25%
Swedes' Cut Tacks..... 90@25%
Swedes' Upholsterers'.... 90@85%
Gimp Tacks..... 90@35%
Lace Tacks..... 90@35%
Trimmers' Tacks..... 90@25%
Looking Glass Tacks.... 60%
Bill Posters' and Railroad Tacks, 90&40%
Hungarian Nails..... 80&10%
Finishing Nails..... 70%
Trunk and Clout Nails..... 80%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks 90&10@90&10&10&5%

See also Nails, Wire

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
20	$2.75	$3.00
60	$3.50	$4.00
120	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ... 50@—%
Patent Leather..... 25@40&5%
Steel..... $3 1-3@5%
Chesterman's..... 25@25&5%
Kendall & Esser Co.:
Enamel, No. 5½..... 40&10&5%
Enamel, Pocket and Leather ... 2 & 5 & 10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Asses' Skin..... 40&10@50%
Metallic..... 30@30&5%
Patent Bend, Leather.... 25&5@25&10%
Pocket..... 40&10&5%
Steel..... 30&10%
Wiebel, J. & Hilger:
Chesterman's Metallic No. 341, ... 25%
Chesterman's Steel No. 1938I, ... 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c..... 30@33⅓%

Ties, Bale—Steel Wire—

Single Loop..... 80&10&5%
Monitor, Cross Head; &c. 70&2½%

Tinners' Shears, &c.—

See Shears, Tinners', &c.

Tinware—

Stamped Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White..... 20@20&5%

Haying -

Myers' Hay Tools..... 45%

Miniature—

Smith & Hemenway Co.'s, Davidson, ₰ doz., Nickel Plated, $1.50; Gold Plated..... $2.00

Saw—

Atkins' Cross Cut Saw Tools.... 35&5%
Simonds' Inspired..... 30%
Simonds' Crescent..... 25%

Ship—

L. & I. J. White..... 25%

Transom Lifters—

See Lifters, Transom.

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro..... $11.50@$12.00
Harper, Champion or Paragon, doz. $1.25@$1.40; gro. $13.00@$13.50

Game—

Imitation Quail..... 75&10%
Newhouse ..... 40&10%
Hawley & Norton..... 65%
Victor ..... 75@75&10%
Oneida Community Jump..... 50%
Hector ..... 75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ₰ doz., $13.25..$11.50 doz.
No. 2, Rat, ₰ doz., $6.50.....$5.75 doz.
No. 3, Rat, ₰ doz., $5.25..$4.70 doz.
No. 4, Mouse, ₰ doz. $3.50 doz.
No. 5, Mouse, ₰ doz., $3.00. $2.25 doz.
Oneida Community:
Out o' Sight, Mouse, ₰ doz....$0.60
Out o' Sight, Rat, ₰ doz.... 1.25
Easy Set Mouse, ₰ doz.... 1.50
Easy Set Rat, ₰ doz.... 1.50
Wood Choker, Rat, ₰ doz. holes. .12
Peerless Rat Chokers, ₰ doz. .75
doz. traps.....

Dia. 15

Trowels—

Disston Brick and Pointing..... 25%
Disston Plastering..... 20%
Disston " Standard Brand " and Garden Trowels..... 30%
Kohler & Steel Garden Trowels, ₰ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels..
gro. $6.00
Woodrough & McParlin, Plasterers' 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern..... 50&10%
Western Pattern..... 60&10%
Handy Trucks..... ₰ doz. $16.00
Grocers' ..... ₰ doz. $15.00
McKinney Trucks..... each, net $10.00
Model Stove Trucks..... ₰ doz. $18.50

Tubs, Wash—

M'f'g'r's list, price per gross.
No. 0 1 2 3
Galvanized 80 85 90 100 lbs.

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½ lb. Balls 24@25¢
No. 12, ¼ and ½ lb. Balls 21@22¢
No. 18, ¼ and ½ lb. Balls 18@20¢
No. 24, ¼ and ½ lb. Balls 15@16¢
No. 36, ¼ and ½ lb. Balls 17@19¢
Chalk Line, Cotton 9@10¢
Balls..... 20@21¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz..... 11@19¢
Cotton Wrapping, 5 Balls to lb., according to quality... 15½@23¢
American 2-Ply Hemp, ¼ and ½-lb. Balls..... 14½@15½¢
American 3 Ply Hemp, 1-lb. Balls..... 15½@16½¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) 10½@11½¢
India 3-Ply Hemp, 1-lb. Balls, 10½@11½¢
India 3-Ply Hemp, 1½-lb. Balls, 10@11¢
2, 3, 4 and 5-Ply Jute Balls..... 13½@17½¢
Mason Line, Linen, ½-lb. Bls. 47¢
No. 24, Mattress, ¼ and ½-lb. Balls, according to quality, 9@10¢
Wool, 3 to 6 ply.... B 9¢; A 10¢

Vises—

Solid Box..... 50@50&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable 40%
Standard 40
Amateur 25
Columbian Hdw. Co. 40%
Fisher & Norris Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00.
Fulton Mach. & Vise Co.:
Reed, Swivel..... 25%
Star, Solid Jaw..... 40%
Hollands':
Machinists' ..... 40@40&5%
Keystone ..... 60&5%
Lewis Tool Co.:
Adjustable Jaw..... 30%
Monarch, 50 & Solid Jaw 50
Massey Vise Co.:
Clincher 40
Perfect, 15%; Lightning Grip.... 15%
Merrill's 50
Millers Falls Oval Slide Pattern. 60&10%
Parker's:
Victor, 20@25%; Regulars..... 20@25%
Vulcan's ..... 44@45
Combination Pipe..... 55@60
Prentiss ..... 40@65
Rock Island 25%
Snedeker's X. L. 33⅓
Stephens' 33⅓

Saw Filers—

Disston's D 2 Clamp and Guide, ₰ doz., $24.00, 30", Clamps..... 30%
Perfection Saw Clamps, ₰ doz.... $4.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed 25%
Star 40
Massey Vise Co.:
Lightning Grip, 15%; Perfect..... 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe..... 40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.
Rock Island Pipe..... 25%

Wads— *Price per M.*

B. E., 11 up..... 60¢	
B. E., 9 and 10..... 70¢	
B. E., 8..... 80¢	
B. E., 7..... 80¢	
P. E., 11 up..... $1.00	
P. E., 9 and 10..... 1.25	
P. E., 8..... 1.50	
P. E., 7..... 1.50	
Ely's B. E., 11 and larger. $1.70@1.75	
Ely's P. E., 12 to 20.... $3.00@3.25	

Ware, Hollow— Cast Iron, Hollow—

Stove Hollow Ware:
Enameled..... 45&10%
Ground..... 50&5%
Plain or Unground..... 60%
Country Hollow Ware, per 100 lbs..... $3.00
White Enameled Ware:
Maslin Kettles..... 65&10%
Colored Wares:
Tinned and Turned.... 35&10%
Enameled..... 45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware..... 33⅓%
Iron Clad Ware..... 70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch.....	6	7	8	9
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles..... 60%
Porcelained ..... 5 & 5 & 5 & R
Never Break Spiders and Griddles.. 65%
Never Break Kettles..... 60%
Solid Steel Spiders and Griddles. 65&5%
Solid Steel Kettles..... 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ₰ doz.
Crescent, family size, bent frame $4.05
Red Star, family size, stationary protector $4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $3.55
Cataract, family size, stationary protector..... $3.60
Single Zinc Surface:
Naiad, family size, open back, perforated $2.50
Single Saginaw Globe..... $2.85
Brass Surface:
Brass King, Single Surface, open back $4.05
Nickel Plate Surface:
No. 1001 Nickel Plate Single Surface $3.60
Glass Surface:
Glass King, Single Surface, open back $3.95
Enamel Surface:
Enamel King, Single Surface, ventilated back..... $3.95

Washers—Leather, Axle—

Solid..... 90@90&10%
Patent..... 90@90&5%
Coil: ⅞ 1 1⅛ 1¼ inch
9c. 10c. 11c. 17c. per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers... $5.50 4.50 3.50 3.00 2.80
The above prices are based on $6.00 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add 1½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1⅝@2¢

Wedges—

Oil Finish..... lb., .@3¢

Weights—Hitching—

Covert Mfg. Co..... 30&2

Sash—

Per ton, f.o.b. factory:
Eastern District.. $25.00@$28.00
Southern Territory..... $25.00
Western and Central Districts ..... $24.00@$27.50

Wheels, Well—

Size. $2.25; 10-in., $2.85; 12-in., $3.36; 14-in., $4.80.

Wire and Wire Goods—

Bright and Annealed:
6 to 9..... 72½&10&7½%
10 to 14..... 72½&10&10%
15 to 16..... 75&10&10&2½%
17 to 26..... 77½&10&7½%
Galvanized:
6 to 9..... 72½&10%
10 to 14..... 72½&10&5%
15 to 16..... 72½&10&5%
17 to 18..... 72½%
19 to 26..... 75&5&2½%
27 to 36..... 65&10&10%
Coppered:
6 to 9..... 65&10&10%
10 to 14..... 70&10&5%
15 to 18..... 65&10&10&10%
19 to 26..... 70&5&2½%
27 to 36..... 72½&10&2½%
Tinned:
6 to 18..... 67&10&10%
Brass ..... 17½¢ lb., base
Copper ..... 32¢ lb., base
Cast Steel Wire..... 50%

Spooled Wire—

Annealed and Tinned.. 70&10&10%
Brass and Copper..... 80&10&10%
Retailers' Assortments, per box, $2.10@$2.40

Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods..... 90@25%
Brass Wire Goods.... 90@90&10%
Brass Cup and Shoulder Hooks, 80&15%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80&2½@80&7½%
Painted Screen Cloth, 100 ft., $1.35
Standard Galv. Hardware Grade: Per 100 sq. ft.
Nos. 2, 2½ & 3 Mesh..... $2.75
Nos. 4 and 5 Mesh..... $3.00
No. 6 Mesh..... $3.25
No. 8 Mesh..... $3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ..... 75@75&10%
Alligator or Crocodile.. 70&10@75%
Baxter Pattern S Wrenches... 70&5&10&10%
Drop Forged S..... 45@45&5%
Acme ..... 60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Stars, Handle Nut..... 50%
Combination Black..... 40&5%
Merrick Pattern..... 50
Boorman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' " Mechanics ' "..40&10&10&5&5%
Donohue's Engineer..... 40&5%
Eagle 70%
Gem Pocket..... 30%
Hercules 70%
W. & B. Machinist:
Case lots..... 50&5%
Less than case lots..... 50%
W. & B. Railroad Special:
Case lots..... 50%
Less than case lots..... 40&10&5%
Solid Handles, P., S. & W., 50&10%; full cases..... 50&10&5%
Stillson 65%
Unwata Wrench Co.:
Railroad Special, Iron Handle, 40&10&5%
Other Wrenches..... 50%
Vulean and Acrippa Chain..... 50
Whitaker Machinists':
Case lots..... 50&10%
Less than case lots..... 50

Wrought Goods—

Staples, Hooks, &c., list March 17, '02..... 85&10&10%

Zinc— *(Cask lots at mill.)*

Sheet..... per 100 lb. $7.00

THE IRON AGE

New York, Thursday, February 27, 1908.

The Krupp Works at Rheinhausen.

Blast Furnaces, Coke Ovens, Bessemer and Open Hearth Steel Works, Two Blooming and Six Finishing Mills.

(With Supplement.)

One the left bank of the Rhine, opposite the town of Duisburg-Hochfeld, the firm of Friedrich Krupp of Essen, Germany, acquired a large tract of land in the early '90s, in order to build a modern steel plant. The works at Essen, established near the outcrop of the Ruhr coal basin, had gradually devoted itself more particularly to war material, and the equipment for merchant material, rails, &c., had been allowed to become antiquated. With large iron ore interests in Spain and elsewhere, while considerable quantities were drawn from other foreign ore deposits, the location on the Rhine permitted the assembling of materials at low cost. The plant at Rheinhausen was visited in 1906 by members of the Iron and Steel Institute, but the first complete technical account of it was not published until October, 1907, in *Stahl und Eisen*. We are indebted to that excellent journal for the facts given below and the accompanying illustrations.

The building of the works occupied three periods. From 1896 to 1898 three blast furnaces of 400 cu. m. capacity were built, together with the harbor and pumping plant. During 1903 to 1905 three additional blast furnaces were constructed, each of 600 cu. m. capacity, followed by a steel plant and rolling mill and the accessory shops. A fourth blast furnace of 600 cu. m. capacity was put up in 1906. The plant, therefore, now consists of seven blast furnaces, with a capacity of about 700,000 tons of pig iron per annum, a basic Bessemer steel plant with four 25-ton converters, a basic open hearth plant with two 25-ton furnaces completed and two of 35 tons planned and a rolling mill with two blooming and six finishing trains. The three older furnaces produced mainly Bessemer pig of different grades for the consumption of the firm in the steel plant at Essen and other plants like the Gruson Works near Madgeburg, the Germania Shipyards, the Annen Steel plant and the Sayner works. The four new blast furnaces exclusively serve the adjacent steel plant.

Docks and Ore Unloaders.

Parallel to the central line of the blast furnaces a harbor has been built, with a total length of 600 m., in order to accommodate the ore ships, and from its docks the products of the plant are loaded to be shipped by water. During the summer the depth of water in the harbor averages 4.77 m. The width of the harbor measured on the bottom is 60 m. The side nearest to the blast furnaces is lined with masonry for a length of about 470 m. For the handling of the ships there is a tug having a 250-hp. engine, capable of hauling boats with a load of 1000 tons.

The discharge of ore is taken care of by eight unloaders (shown in Fig. 1), four of which were built in the United States, this having been the first installation of cranes of this type in Germany. The bridges have an inclined track. Four other unloaders were built in Germany, all of them having a span of 61.23 m. Under ordinary circumstances they deliver the ore into pockets located in front of the furnaces, but they can also serve tracks from the ships. They can also load ore from the ore pockets and from the ore storage yards into cars on standard tracks, which are parallel to the harbor wall. Along the eastern wall of the harbor on the side opposite to the blast furnaces are two unloading tracks, on which runs an electrically driven swing crane of 5 tons capacity.

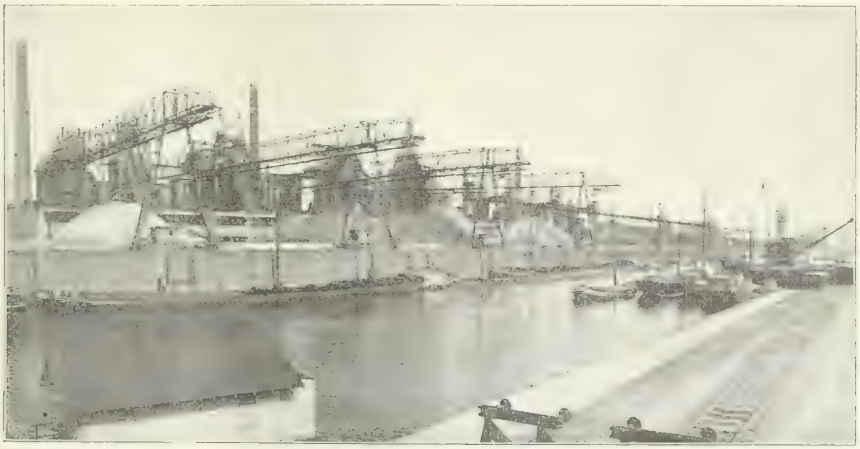


Fig. 1.—View of Harbor and Blast Furnaces.

The annual consumption of ore amounts to about 1,600,000 tons. These ores are drawn partly from the mines owned by the company on the Lahn River, in the Siegen District, and the Westerwald, in Lorraine, and in the north of Spain. A part of the supply is produced in Sweden and in Spain and there are also added to the burden cinder drawn from the firm's own works and from other sources. About one-half of the total quantity of ore, say 800,000 tons, is brought to the works by water, the other half being received by rail. The limestone re-

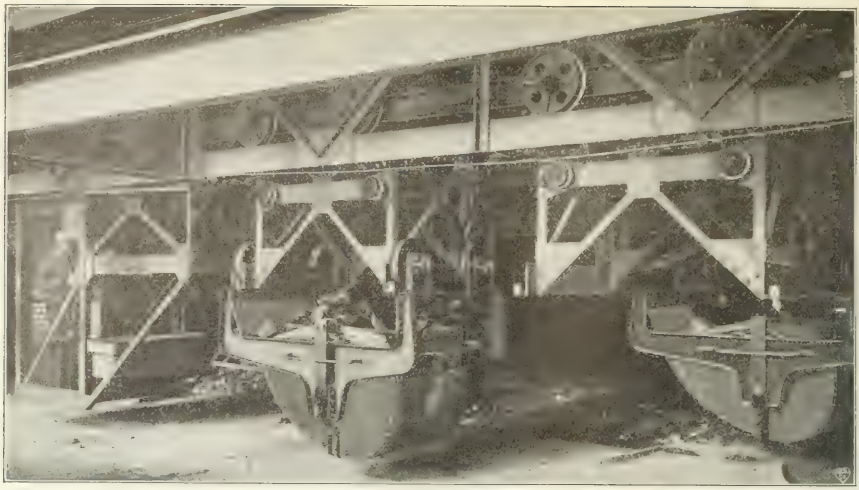


Fig. 2.—Ore Buckets and Locomotive for Conveying Them to Foot of Inclined Hoist.

quired amounts to about 220,000 tons per annum, which is obtained by rail from the firm's quarries in the Anger Valley. The annual consumption of coke is about 760,000 tons, of which the adjoining coke plant furnishes 190,000 tons, while the balance is principally drawn by rail from the collieries of the firm. The raw material for the blast furnaces is put into stock, from which it is conveyed to the older furnaces by charging cars and to the newer furnaces by suspended roads (Figs. 2 and 3). In the case of the older furnaces the old Parry system with bell and in the newer furnaces the double Parry system is employed.

Blast Furnaces and Gas Washers.

The older furnaces have a hight of 28 m., while the new furnaces are 31 m. high. The old furnaces have eight tuyeres of 20 cm. diameter, and the new ones 12 tuyeres of 22 cm. diameter. The iron is cast into beds in the case of the old furnaces, while the iron for the basic Bessemer steel plant is conveyed in liquid form to the mixers, except Sunday metal, which is cast in beds. The cinder is either transported in liquid form or is allowed to chill in blocks. So far as there is a demand the cinder is granulated.

The old furnaces have four Cowper hot blast stoves, each 31 m. high and 6 m. in diameter, while the new furnaces are equipped with five Cowper stoves 34¼ m. high and 6½ m. in diameter. The waste gases first flow through a preliminary cleaner, each furnace having two, one at the left and one at the right. At the older furnaces this preliminary cleaner consists of four stand pipes in series 2½ m. in diameter in the clear, which dip into a water seal. The three furnaces are supplied with a dust catcher, consisting of a large cylindrical drum 6½ m. in diameter and a system of stand pipes 3 m. in diameter in the clear, arranged in series behind it. The dust catcher and stand pipes are so placed that the dust

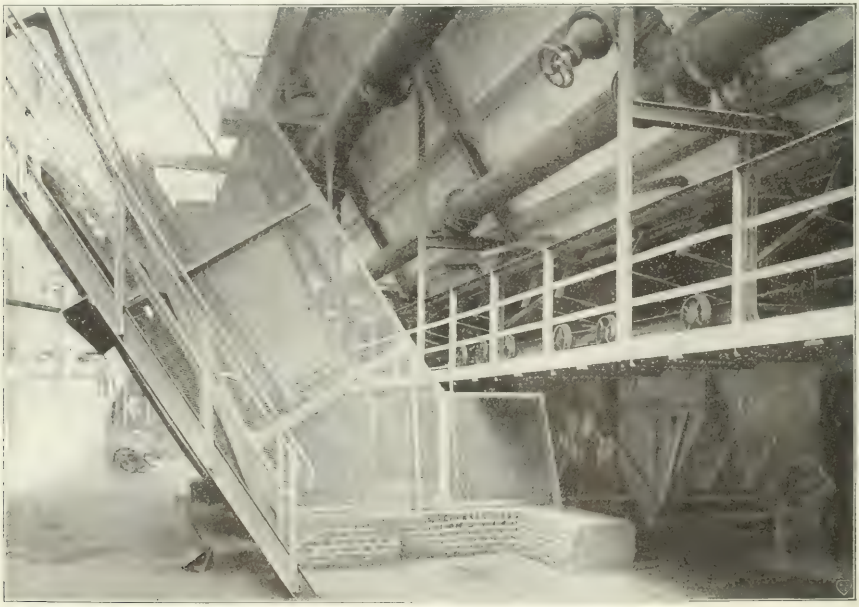


Fig. 3.—Coke Bucket and Pocket at Inclined Hoist.

may be easily removed from below. The last furnace built, No. 7, has two dust catchers, one behind the other, 6½ m. in diameter. The gas leaves the dust catchers with a percentage of dust equal to 5 to 10 gr. per cu. m. and enters a general line of pipe with which all furnaces are connected. This main pipe conducts the gases to wet cleaning plants, three of which are distributed along the line of the blast furnaces. One of the plants is shown in

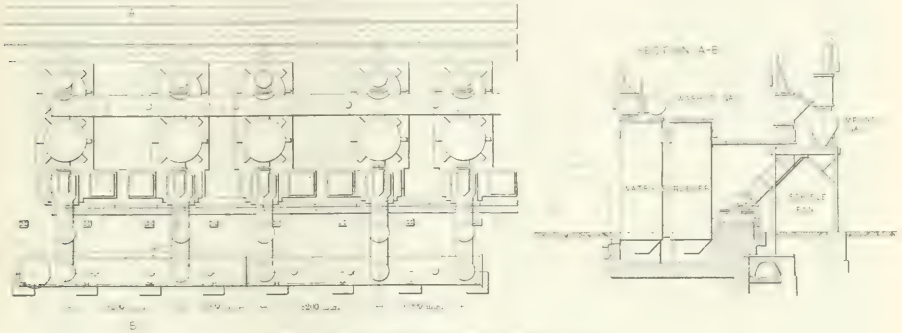


Fig. 4. Plan and Section of Gas Washing Plant.

Figs. 4 and 5. They consist of a series of centrifugal fans with water injections. For each cubic meter of gas about 1 m. of water is required and a purification is reached from 5 to 10 gr. of dust per cu. m. in the furnace gas down to 0.3 to 0.7 gr. per cu. m. in the cleaned gas. This gas is partly employed to heat the boilers and hot blast stoves, and a part of it is conveyed to the second series of gas washers attached to the engine houses, where it is employed for driving gas motors after having been subjected to a second cleaning. The latter is carried out exactly the same way, centrifugal fans with water injection being employed. The gas leaves the second cleaning plant with a dust content of 0.02 to 0.08 gr. per cu. m. and is employed to drive the gas engines for the blowing engines, the electric central station and the rolling mills.

The waste water of the different gas washing plants is collected and clarified in ponds having a total area of about 6500 sq. m. The clarification is carried on in two ways: the first series of ponds serves to settle the coarser parts, working alternately, this operation taking about an hour. The water then flows into the main clarifying ponds in which it remains for 5 hours.

Coke Ovens and Briquetting Plant.

Adjacent to the blast furnaces is a coke plant consisting of two groups of 60 ovens, having a capacity of 750 tons per day. The ovens have a total length of 10.25 m., a hight in the clear of 2.1 m. and an average width in the clear of 530 mm. The time required for coking is about 30 hr. The coal is delivered by rail into a pit holding 200 tons. From this two bucket elevators convey the coal to a tower having a capacity of 500 tons. The coal is discharged into cars which deliver into ovens from above. The coke pushing machines and the entire machinery for the coal towers is driven by electric motors.

The coke oven gases are handled in a by-product plant for the recovery of tar and ammonia, the latter being converted into sulphate of ammonia. Later on a benzole factory is to be built. That part of the gases from the coke ovens which is not needed for coking is used under boilers or may also be added to the blast furnace gas. The waste heat of the coke ovens is delivered to groups of 10 double flue boilers of 90 sq. m. heating surface. One of these groups is heated with coke oven gas and the other with blast furnace gas. The steam, as is the case with all the other boilers at the works, has a pressure of 9½ atmospheres and is heated to 300 degrees Celsius by a



Fig. 5. Gas Washing Between Furnaces 6 and 7.

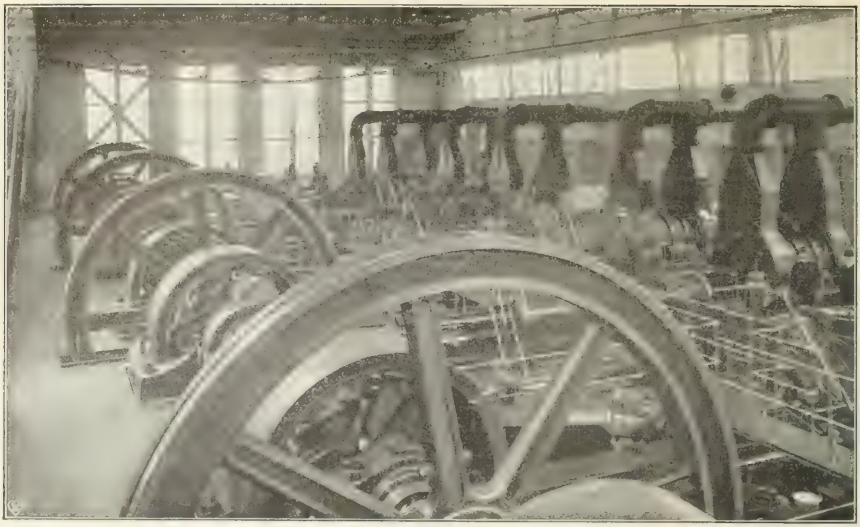


Fig. 6.—Gas Blowing Engine House No. 2.

superheater. Provision has been made for a third group of 60 ovens, a further group of 10 boilers and a second coke and coal tower.

A briquetting plant has been put down to utilize the flue dust and the fine ores. It has a capacity of 40,000 briquettes in 24 hr., equal to a total of 50,000 tons per annum. The system is that of Doctor Schumacher. There are two mixing drums, two presses and three hardening boilers. The same plant may also be used for producing the same number of slag brick from melted slag, either with a slight addition of lime or without any addition whatever.

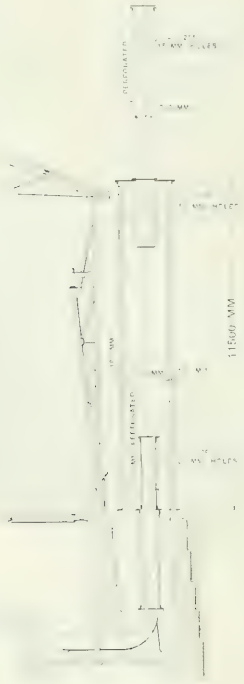


Fig. 7.—Muffler for Gas Engine Exhaust.

The Gas Engines.

To supply the blast for the furnaces in operation there are now 14 double gas blowing engines of approximately 1000 cu. m. capacity per minute and four vertical steam blowing engines, each of 840 cu. m. per min. Six of the gas blowing engines are built on the four cycle system and eight on the two cycle system. The engines are located in five gas engine houses. One of these houses is shown in Fig. 6. Four of the engines are of the Koerting two cycle type. The normal pressure is 0.75 atmosphere and the maximum 1½ atmospheres. A special appliance has been adopted in order to muffle the exhaust, which at first created some difficulties. The system is shown in Fig. 7, and consists of vertical boilers into which the waste gases from the gas cylinders enter from below. They have an opportunity to come to rest and then escape through the pipe suspended in the boiler from above. This arrangement has worked exceedingly well.

A compressor plant is provided for each of the gas blowing plants, which provides the necessary pressure for starting the engines. The compressor has a capacity of 50 cu. m. of air at the inlet valve when it is running at a speed of 215 rev. and delivering compressed air at 25 atmospheres.

An electric central station for power and light, Fig. 8, furnishes a current at 525 volt pressure for the whole plant and for the houses of officers and workmen. There are two drynamos of 205 kw. and six of 680 kw., which are all directly coupled to blast furnace gas engines. The first named are driven by double acting, single cylinder, four cycle motors of 3000 effective horsepower at 150 rev. per min. Four large generators are coupled with double acting tandem four cycle motors and two large generators are driven by two Oechelhäuser engines. The six large gas engines furnish normally 1000 hp. each, running at 100 rev. per min. A 15-ton traveling crane is operated for the installation of the machinery. Three compressors mounted along the wall and driven by electric motors through belting are provided for starting the gas engines.

Mixers and Basic Bessemer Converters.

The pig iron produced by the furnaces is delivered by steam locomotive in cars carrying 30 to 35 tons to the mixer at the basic Bessemer steel plant. The cars are weighed and by an hydraulic elevator are conveyed to the upper platform where an electric locomotive takes care of unloading in the mixer house. The ladle cars are tilted by a motor located under the ladle and their contents emptied into the mixer. There are two rolling

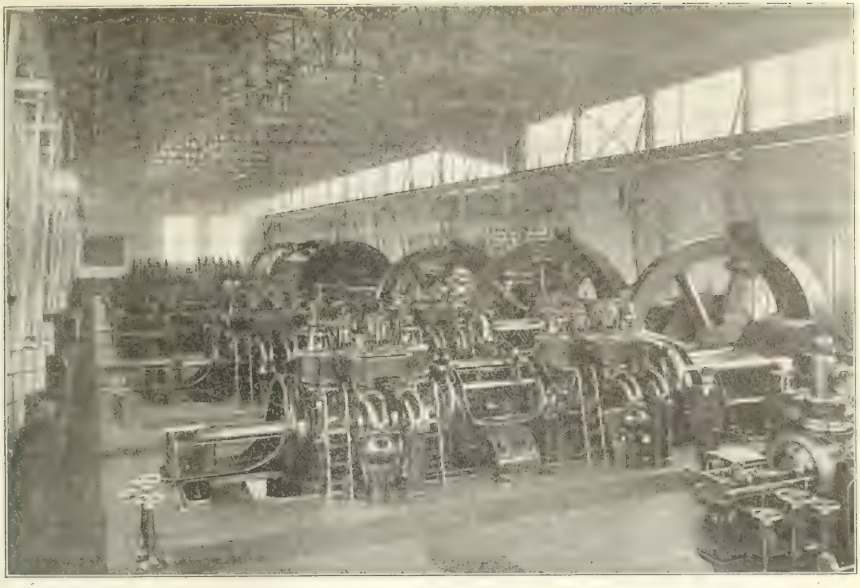


Fig. 8.—Electric Central Station.

mixers each of 500 tons capacity, which may be tilted either hydraulically or electrically. In the beginning of the week both mixers are in operation, since they can be charged full with the iron made on Sundays. The balance of the Sunday iron is cast into pigs in a pig bed located south of the mixer plant. For the remelting of the latter two cupolas are provided, which may deliver directly into the mixer. The small amount of Sunday iron which cannot be taken care of in the mixers is remelted in the blast furnace, so that the cupola plant at the present time is very little used. By employing it, however, it would be possible to increase considerably the capacity of the steel plant with the aid of purchased pig.

The mixer slag is tipped into a slag car through a special nozzle and is conveyed to the blast furnaces for reworking. The iron from the mixers is hauled by an electric locomotive to the basic steel plant, is weighed and is directly tipped into the converters. The four converters, each of 25 tons capacity, are located in a straight line in a building 24.5 m. wide which contains besides the converter platform a platform for charging scrap and limestone, these being connected by two elevators. One of the elevators is used for handling scrap and the other for ferromanganese and spiegeleisen, while the burnt lime is brought to the steel works by elevated road from the warehouse and is discharged into the converters through funnels. The heating of the ferromanganese is

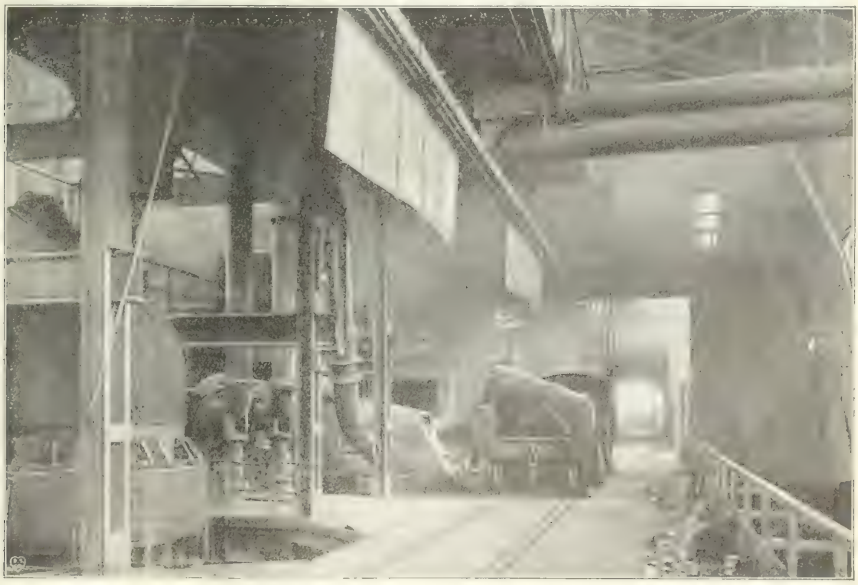


Fig. 9.—Charging a Converter.

done on the limestone platform in a reverberatory furnace.

For melting the spiegeleisen there are two cupolas. The arrangement is such that the spiegeleisen after the converter slag has been poured off is brought to the converters in small ladle cars and is tilted into them (Fig. 9). The spiegeleisen may also be charged in the ladle. The ladle is on a casting car operated both electrically and hydraulically, which takes the steel to the cast house, where it is cast into ingots of 4 to 5 tons weight. The cast house is 54.4 m. long and consists of two parts of 20 and 16 m. span, respectively. In the main span are two 15-ton ingot traveling cranes for handling the molds, stripping and transporting the ingots from the long casting pit, while in the other span is a 12-ton electric crane for loading the ingots which are to be shipped and which are cast in a smaller pit and handled by an 8-ton electric rotating crane. The casting pits are shown in Fig. 10.

In the dolomite plant the material is broken in a crusher to the required size and is burnt in two cupolas. The burnt dolomite is ground in two Chili mills. Pre-

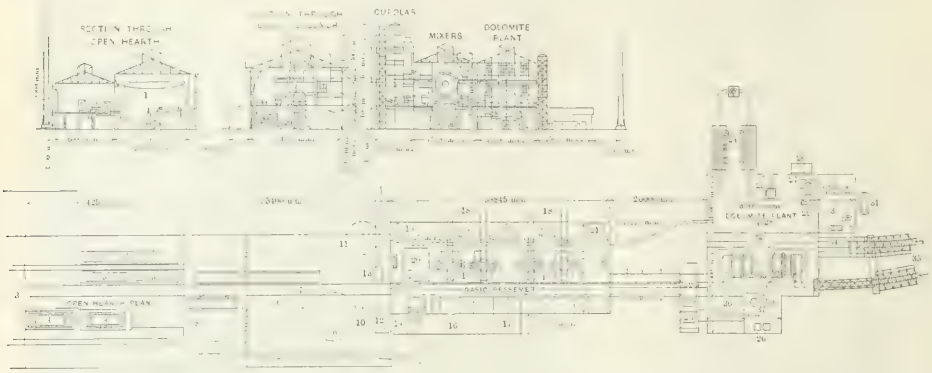


Fig. 10.—Steel Plant with Mixer and Dolomite Plant.—1, 50-Ton Traveling Crane; 2, 5-Ton Traveling Crane; 3, Extension of Open Hearth Plant; 4, 25-Ton Open Hearth Furnaces; 5, Casting Pits; 6, Cast House; 7, Casting Pit Track; 8, 8-Ton Crane; 9, Ladle Repair; 10, 12-Ton Crane; 11, 2-Ton Crane; 12, Stopper Drying Oven; 13, Slag Lifting Table; 14, Motor Room; 15, 25-Ton Elevator; 16, Repair Shop; 17, Pulpit; 18, Cinder Track; 19, 25-Ton Converter; 20, Spiegel Furnace; 21, 10-Ton Elevator; 22, Scale; 23, Pouring Platform; 24, Bottom Oven; 25, Bottom Stamping Machine; 26, Elevator; 27, Chili Mill; 28, Brick Press; 29, Mixing Machine; 30, Machinery Room; 31, Tar Boiler; 32, Mixer Plant; 33, 500-Ton Mixer; 34, Ladle Elevator; 35, Elevated Track from Blast Furnaces; 36, Ladle Car House; 37, Cupolas.

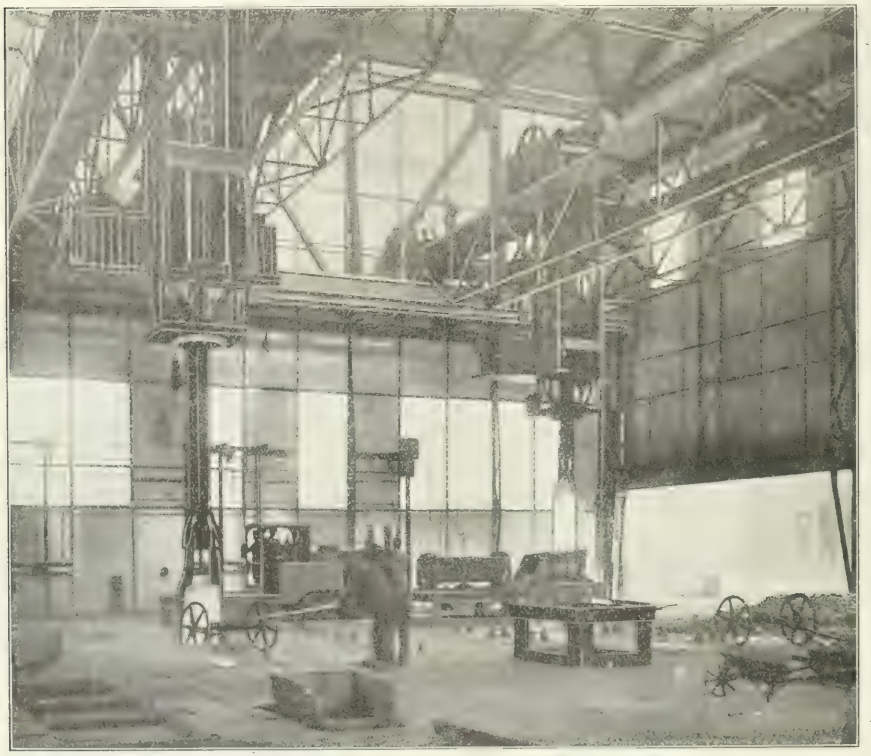
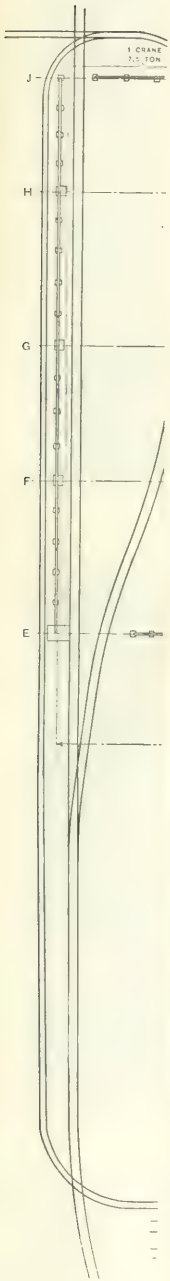
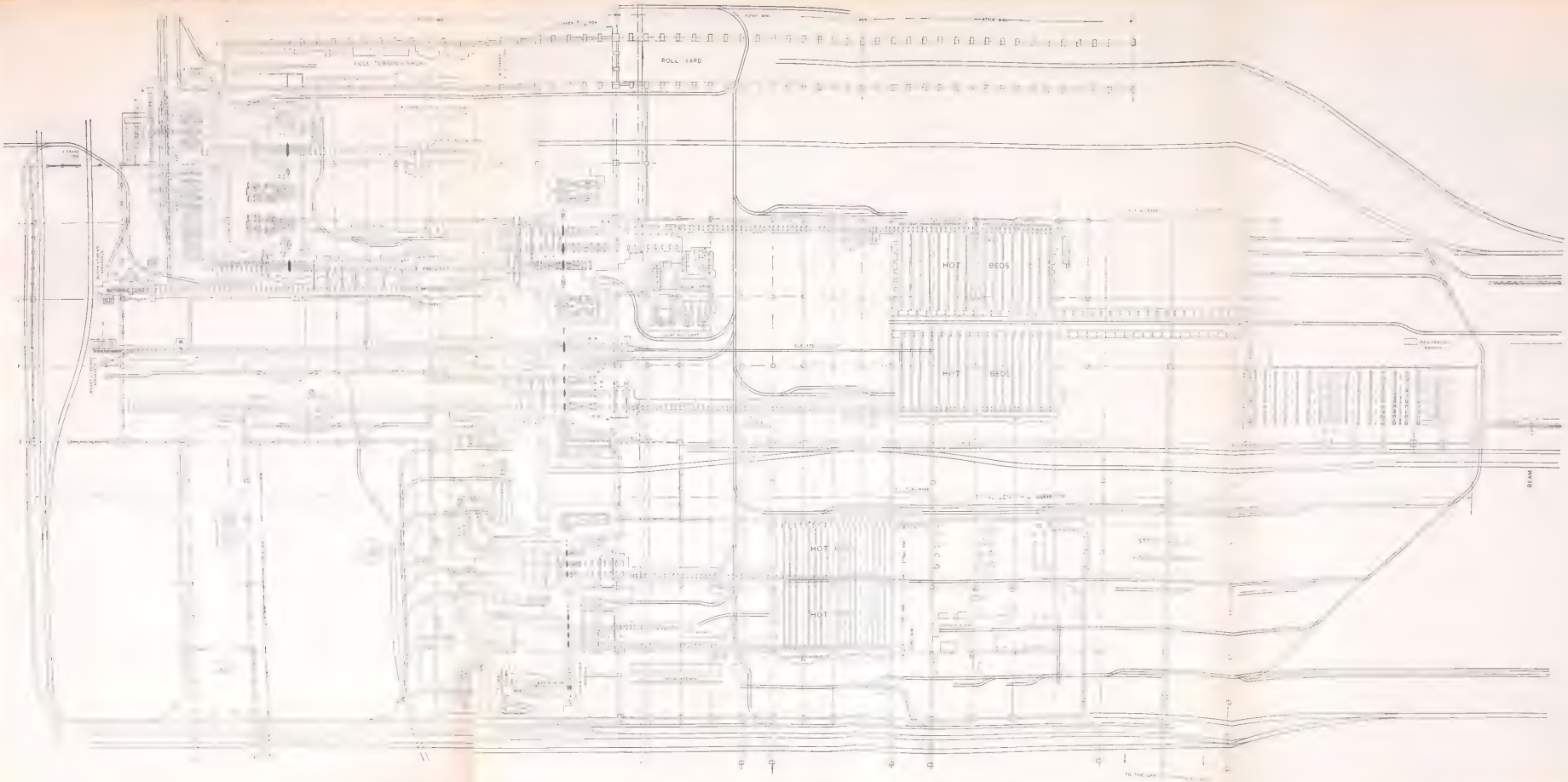


Fig. 11.—Pit Building with Ingot Charging and Drawing Cranes.


1 CRANE
7.5 TON
J
H
G
F
E



GENERAL ARRANGEMENT OF ROLLING MILLS OF THE KRUPP WORKS AT RHEINHAUSEN, GERMANY

pared tar is added and the mass put into a steam heated mixer. The converter bottoms are stamped up from the dolomite so prepared in a Versen machine. Converter brick are made in a 500-ton hydraulic press.

The ladle cinder is dropped into a car placed upon a hydraulically operated elevator and is conveyed to the blast furnaces, while the changing of the ladles is performed by an electric 12-ton jib crane. The drying of the stoppers is done in a special furnace.

Open Hearth Furnaces.

Immediately adjoining the cast house is the open hearth plant, built for experimental purposes in 1900. It is now being extended and is being provided with a new producer plant. In the older part are two 25-ton furnaces and in the new part a 35-ton furnace is to be built, to be followed later by another of the same size. It is the purpose after starting this new furnace gradually to abandon the old ones and add the space to the cast house, with the idea of increasing the basic Bessemer output. The furnaces may be charged with liquid metal or by a traveling crane with scrap. Scrap charging machines are contemplated for the extension of the open hearth plant. It is possible, furthermore, to charge the furnaces with metal which has been blown in the converters.

The ingots, chiefly basic Bessemer steel, weighing 4 to 5 tons, are taken while hot by a narrow gauge steam locomotive to the pit shop of the rolling mills (Fig. 11) and there are put by two electric 7.5-ton traveling cranes into Gjers pits, there being 40 unheated pits and 32 heated pits for heating cooled ingots.

The ingot cranes lift the heated ingots from the pits



Fig. 12.—850-Mm. Reversing Three-High Train.

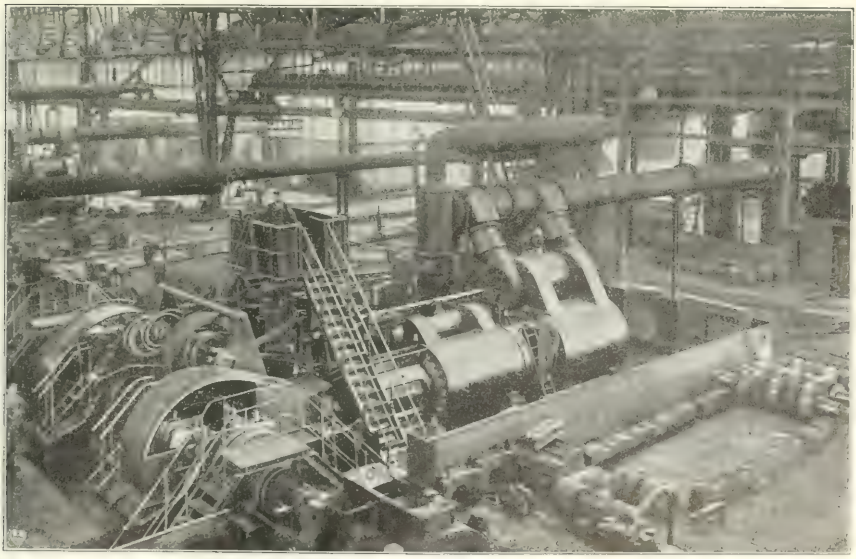


Fig. 13.—Reversing Engine of 850-Mm. Train.

and place them upon the hydraulically operated tippers of the electrically driven rollers of two blooming mills. These are reversing mills of 1150 mm. diameter of rolls and 2800 mm. length of rolls and are driven by twin tandem reversing steam engines through 1 to 2.5 gearing, each having a maximum power of 7000 hp. The exhaust is used for heating the boiler feed water.

The Finishing Mills.

The 620 mm. ingots are rolled to 100 x 400 mm. blooms or to billets of about 110 mm. square, and after being sheared by steam hydraulic shears having a capacity up to 400 mm. and 260 mm. are delivered by rollers to the eastern section for shipment or they are rolled down to a range from 300 mm. to 150 mm. and forwarded by electrically driven rollers to the 850-mm. three-high train, Fig. 12. There they are rolled down to heavy rails, to beams up to section 50 of the German standard sections and channels up to No. 30 of the German standard sections. In order to roll larger sections the plan is to add later in connection with the second blooming mill a 950-mm. two-high reversing train. All of the finishing trains are placed side by side in a straight line in a building which is provided with a 40-ton and a 15-ton traveling crane for changing rolls. The 850 mm. three-high train is driven by a twin tandem reversing steam engine of 16,000 hp. (Fig. 13) provided with central condensation. The train, besides the three working stands on one side of the engine, has a two-high stand on the other side for rolling billets. The delivery rollers of the two-high set are provided with two saws and a shear for shearing the billets. In front of and behind the first stand of the 850-mm. train are hydraulically operated tables. The second and third stands are provided with electrically operated rollers on the roller's side and hydraulically operated tables on the catcher's side. The handling across the mill is done by dragging. Two saws on the delivery rollers cut the stock and thence the product goes to the straighteners and to stock or to cars.

In series with the two-high stand of the 850 mm. train are a 700-mm. three-high train, a 525-mm. three-high, a 420-mm. meter three-high with 550 mm. breaking down train and a double 300-mm. reversing train with 450 mm.

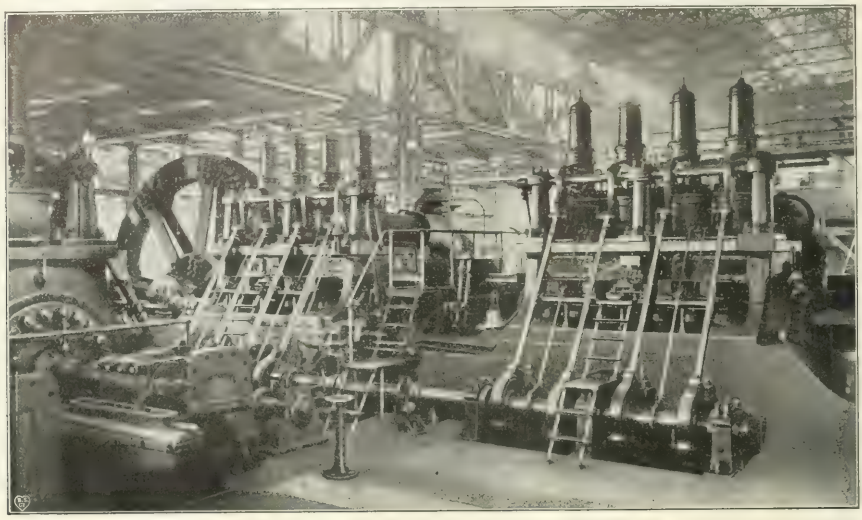


Fig. 14.—Rolling Mill Gas Engine for 700-Mm. Train.

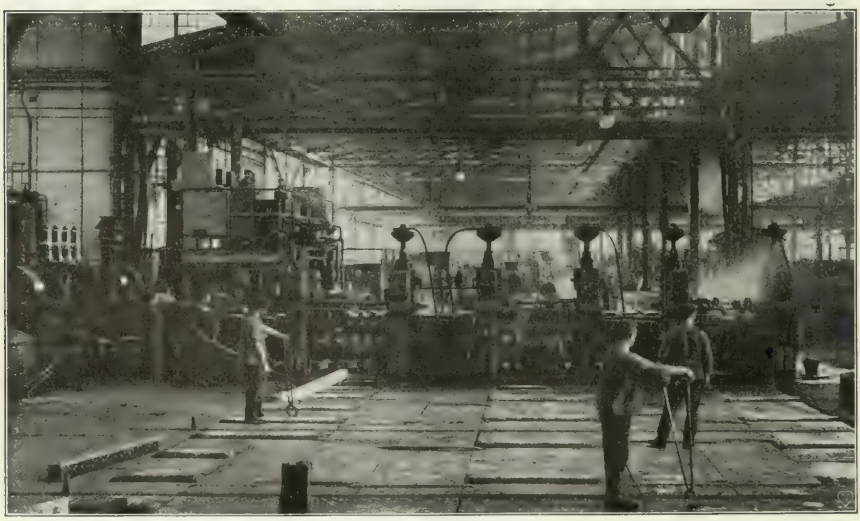


Fig. 15.—525-Mm. Three-High Train.

preliminary train. A continuous mill is being built.

The 700-mm. train has one gear housing and three stands and is driven by a three cylinder, double acting, four cycle gas engine of 3700 hp. (Fig. 14). The bloomed material cut to length on a hydraulic shear is supplied by a 4-ton electric traveling crane and is rolled in the same heat into shapes, rails, angle bars or ties. All the three stands are supplied with electrically driven rollers on the roller's side and by hydraulic tables on the catcher's side.

The blooms for the 525 mm. three-high train (Fig. 15) and the other smaller trains are sheared by the smaller steam hydraulic shear and are conveyed by a 3-ton electric traveling crane to the heating furnaces before they are rolled. The 525 mm. three-high train and the 550 and 400 mm. preliminary trains are driven by double acting tandem four cycle gas engines of 1500 hp. All of the rolling mill gas engines were built by Krupp. The 420-mm. three-high train and the 300-mm. double two-high train are driven by the gas engines of the corresponding preliminary trains through rope drives. The products of the 525-mm., 420-mm. and 300-mm. trains, which consist of light rails, ties, shapes and bars, are conveyed by electrically driven rollers to the saws and hot beds.

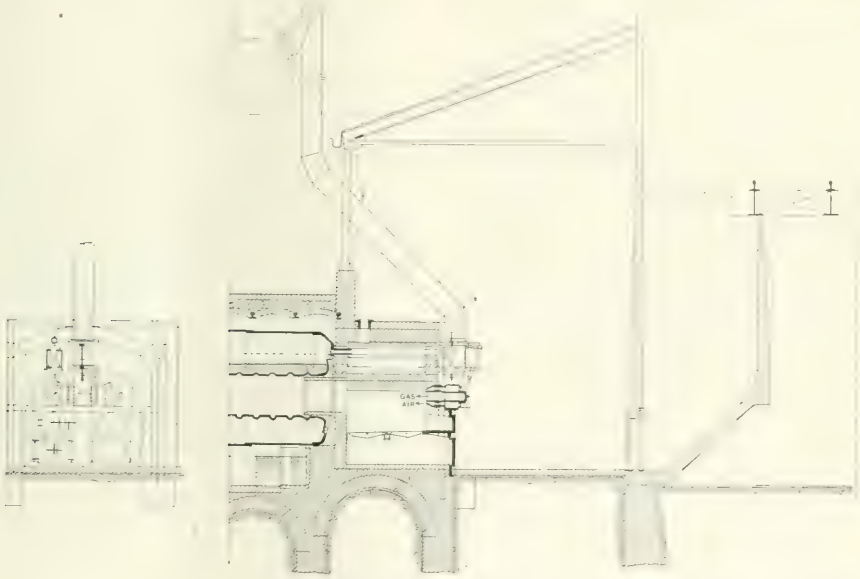


Fig. 16.—Firing Rolling Mill Boilers with Blast Furnace Gas.

The Steam Plant.

The blast for the steel plant is furnished by a horizontal compound steam blowing engine capable of delivering 900 cu. m. per min. at 2 to 2½ atmospheres at 65 rev. per min. A second blowing engine of like capacity is in reserve. The steam plant consists of three groups of 10 boilers each, of 87 sq. m. heating surface, located at the blast furnaces; two groups of 10 boilers of 90 sq. m. heating surface at the coke plant and two groups of 12 boilers each at the rolling mill—a total of 74 boilers, with a heating surface of 6570 sq. m. The design of the boilers at the rolling mill is shown in Fig. 16. The blast furnace gas is introduced through tuyeres surrounded by an annular space through which the necessary air enters. The quantities of gas and air may be readily regulated.

General.

The works are supplied with an elaborate pumping plant, with a foundry, repair shop and testing and chemical laboratories. The workmen have a volunteer fire department. The Krupp Company has provided at the Rheinhausen plant a workmen's village which contains 165 three-room, 230 four-room, 30 five-room and 11 six-room cottages. Unmarried workmen are provided for in three sleeping houses, with a total of 530 beds, a large dining house serving them. At the present time there are about 4500 workmen and 400 officials.

Drawbacks on Cast Pipe and Copper Nickel Wire.—The Treasury Department's regulations of February 12, 1903, establishing a rate for the allowance of drawback on cast iron water pipe manufactured in part from imported pig iron have been extended, so far as applicable, to cover the exportation of similar pipe and other cast iron castings manufactured by the Cetnral Foundry Company, New York City, with foundries at Baltimore, Md., and Newark, N. J., with the use of imported pig iron. In liquidation, the quantity of imported pig iron which may be taken as the basis for the allowance of drawback shall not exceed the net weight of imported pig iron contained in the exported articles, as shown by an abstract of manufacturers' record to be filed with each drawback entry, plus 4.21 per cent. of such net weight to compensate for loss incurred in manufacture. On the exportation of copper nickel wire manufactured by the Driver-Harris Wire Company, Harrison, N. J., wholly with the use of imported copper nickel alloy bars, the quantity of copper nickel alloy which may be taken as the basis for the allowance of drawback shall be the net weight of the copper nickel alloy wire exported.

The Pittsburgh Automatic Vise & Tool Company, Pittsburgh, Pa., has been awarded the contract for the complete bench equipment for vises for the new Schoen Steel Wheel Company's plant at Newlay, Yorkshire, England. This order was placed after a very severe and thorough test made by the Schoen Steel Wheel Company at its plant at McKees Rocks, Pa., where the Pittsburgh high speed vise proved to the English management its right to the contract. The company reports that it is otherwise enjoying a very heavy business in the sale of vises to English users.

The Vanadium Alloys Company, 25 Broad street, New York, has printed in pamphlet form for distribution Dr. Richard Moldenke's report of his investigations of the use of vanadium in cast iron.

The New Iron Mines of French Lorraine

Great interest has been taken by iron and steel companies in France, Belgium and Germany in the iron ore deposits in Lorraine, on which development work has been in progress in the past three years. Discoveries of rich mines have been made in the districts near the Franco-German frontier included between Longwy and Conflans-Jarny. In 1906 the output from the French portion of the new district reached 3,100,000 tons, and it is estimated that over 4,000,000 tons was mined in 1907. The center of the district is the town of Briey. In the acquisition of iron ore property in this district there has been sharp competition between French and German steel companies, and strong Belgian interests have also been represented on the ground in exploratory work. A correspondent of the London *Times* gives interesting particulars of the developments thus far, which indicate that the Lorraine deposits are yet to become an important factor in iron manufacture on the Continent. Extracts from this account are given below:

The Ores Partly Self-Fluxing.

The starting point of this rapid advancement of a region almost unknown seven years ago, from the industrial point of view, was the desire of the ironmasters of Lorraine, who work the silicious ores of Longwy and the country round Nancy, to discover a supply of richer and more calcareous ores, so as to enable them to obtain for their blast furnaces a more fusible and readily worked product. By means of previous explorations it had been ascertained, as far back as 1881, that excellent ores existed in the vicinity of Briey, but the difficulty of raising them, due chiefly to the presence of considerable volumes of water in the strata, caused the idea of working these deposits to be abandoned. About the year 1900 fresh trials were undertaken by Messrs. de Wendel, which resulted in proving the exceptional richness of this district. The ores of Briey, like those generally prevalent in Lorraine, are rich in phosphorus, and they contain 40 per cent. of iron, and from 8 to 16 per cent. of lime. The ferruginous strata of Lorraine comprise a number of different beds, among them the so-called green, black, brown, gray and red beds of ironstone, together with ferruginous limestones. The deposit chiefly worked is that termed the gray bed, but sometimes the red bed is also extracted. The thickness of the gray ore often reaches from 20 ft. to 26 ft., but the depth of this ore beneath the surface is frequently very considerable, and in the eastern part of the basin the depth is at times as much as 820 ft.

The principal concessions actually being worked are those at Joeuf, belonging to Messrs. de Wendel, which are already of ancient date, and those at Homècourt, the property of the Marine Furnaces & Steel Works Company, which latter raised during 1906 1,029,267 tons of ores. The depth of these workings is over 300 ft. The Furnaces & Steel Works Company at Pont-à-Mousson extracted 912,210 tons from two pits sunk by them at Auboué by means of the congelation process, and the Moutiers Company obtained ores in that vicinity to the extent of 483,000 tons. Throughout the entire southern portion of the district, which is now being vigorously opened up, great activity prevails. A rich concession covering some 2000 acres in the neighborhood of Conflans is about to be worked, and Messrs. Schneider of Le Creusot are proposing to commence operations on their concession near Jarny. To the north of Briey, in the so-called Landres region, exploratory work is being pushed with feverish speed. Ten new mines are either at work or in course of being opened out, belonging to the Pont-à-Mousson Iron Works, the Longwy Steel Works, the North & East Iron Company, to Messrs. de Wendel and other firms. The area of the concessions already secured in the Briey District is upward of 74,000 acres.

French and German Interests Conflict.

The sudden growth of an industrial center of such dimensions in immediate proximity to the frontier has given rise to very serious problems, one of which is the question of coal supply. France is very deficient in coal, and the disparity between the native production and consumption of coal is becoming more marked every year. It now reaches an annual total of 17,000,000 tons. French Lorraine obtains the greater part of its fuel at the present time from the German Saar basin, and, looking to the difficulties interposed by the German Government in the way of the export of its coal, it is evident that at any moment grave perils might thus be caused to the French metallurgical industry. Added to this, the German market for coal is under the direction of the Colliery Syndicate, whose director is also the head of the Metallurgical Syndicate, which is as much as to say that any day the French metallurgical works might be placed entirely at the mercy of the German metallurgists. It is quite impossible to employ usefully in France the redundant ores which the Briey basin is now pouring forth upon the iron market, and the bulk of these ores will certainly have to be exported.

From another aspect these rich deposits are greatly coveted by German manufacturers, who are themselves deficient in ores for the supply of their vast iron works, and, notwithstanding the operation of the French law, which only permits mineral concessions to be granted to native owners, a certain number of concessions have, by means of second-hand transactions, been retransferred to German firms. This fact has aroused considerable adverse public feeling in France; and in reality, seeing that the Briey ore deposits lie close to the Franco-German frontier, the matter is not devoid of gravity, and might one day give rise to serious friction in the political relations between the two countries.

In this connection it is not forgotten that when the boundary between the two countries was being delimited in 1871, the German Commission was accompanied by a geological expert, who was called upon to examine the character of the formations in the subsoil, and that by the treaty of Frankfort the frontier line of Lorraine was fixed in such a way as to reserve for Germany the ferruginous basis as it was at that time known. The reason that the country around Briey remained French was due to the insufficiency of the trial sinkings which had been carried out at that period.

Transportation and Labor.

The Eastern Railway Company has improved the means of transport between Briey and the points where the ores are being used. It has come to an arrangement with the Northern Railway Company to facilitate the working over the two lines, to lessen the cost of transport, to facilitate the dispatch of coal from the collieries in the north of France and from England, and to render possible the export of the ores to Belgium and England. In consequence of these measures various improvements have been made in the railroad between Dunkirk, Lille, Charleville and Longwy, and vast sidings have been constructed in the vicinity of Charleville.

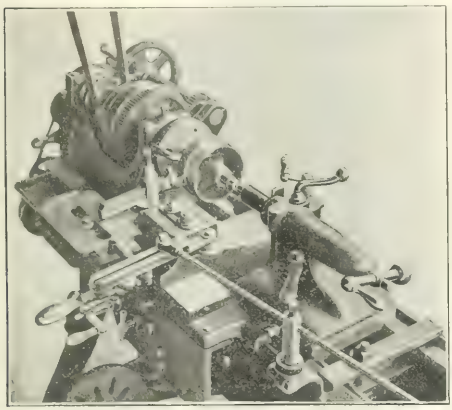
Another very important question is that of the supply of labor. The country around Briey has hitherto been a purely agricultural district, and very sparsely populated. It was, therefore, not possible to obtain the necessary work people on the spot, and the labor is recruited mainly by the employment of Italian immigrants. Workmen's towns are being created to accommodate these newcomers and a marvelous commercial activity is being manifested throughout the country. In short, the Province of Lorraine, which already constituted one of the most flourishing industrial centers of France, with its blast furnaces at Longwy, Villerupt and Nancy is now taking a fresh start of greatly increased importance and with a remarkable degree of rapidity. A veritable transformation is taking place at the present time which involves every part of the district.

The riches of these new Lorraine ore deposits and the more complete use of the abundant water power in our mountain regions are the two most important facts in the recent economic history of France.

The New England Cotton Manufacturers at a meeting in Boston February 24 unanimously decided that it is necessary to continue the curtailment of production for an indefinite period. For three months nearly all the mills in New England have been running on three-quarter time.

The Mossberg Forming Attachment for Lathes.

The engine lathe attachment illustrated is designed for producing formed work, more particularly for crowning pulleys. It can be easily applied to a lathe and thereafter attached and detached very quickly as required. It is so constructed as to be secured to the carriage of an ordinary lathe in the same position and the same manner as the tool post. Only one former is required in crowning a pulley. The attachment was not designed to take the place of or in any way to compete with the special machines that automatically or semi-automatically produce pulleys in large quantities. But in many factories pulleys are still crowned by setting over the tailstock of an engine lathe, and in others the work is done by the use of formers employed in conjunction with taper attachments. The maker of the new attachment, the Mossberg Wrench Company, Central Falls, R. I., intends it to meet the needs of these shops and others where large numbers of pulleys are made, but not enough to warrant the purchase of more expensive special tools for the work. Its application to a lathe does not destroy the usefulness of the machine for other purposes, but merely extends its field by making it capable of rapidly producing work of its kind of excellent quality. Besides a special usefulness in the manufacture of pulleys the attachment may be arranged for other formed work, and to the production of short tapers, such as friction clutch members. It is not claimed that the attachment is universal, but that it appreciably extends the scope of an engine lathe, and possesses the distinct advantage of not requiring permanent attachment to the machine; it can be interchangeably used by a number of lathes. Another advantage is that it requires no special arbors.



A Forming Attachment for Lathes, as Applied to the Crowning of Pulleys, Made by the Mossberg Wrench Company, Central Falls, R. I.

The attachment is secured to the tool post seat of the lathe carriage in the standard T slot there provided by two bolts. The tool post with its tool is carried at the left of the carriage on a slide, movable transversely. To this slide is secured a roll which enters a formed slot in a second slide having a longitudinal movement. If the latter slide remains stationary and the tool is fed longitudinally, as in turning the face of a pulley, the roll will follow the formed slot and impart to the tool an in and out movement producing a contour on the work corresponding to the form of the slot. The path of travel of the tool, which is the form it cuts, may be modified by moving the slotted slide concurrently with the travel of the tool. If this slide is moved in the same direction as the tool the crown cut will be flatter or of less curvature than if the slide were stationary and the roll simply followed the form, while if the slide is moved in the opposite direction to the travel of the tool the crown will be of greater curvature.

The variation in degree of curvature of the crown is obtained by the action of a lever pivoted to the fixture and connected with the slotted slide by a link and also by a tie rod to some stationary member, such as the bracket shown, secured to the ways of the lathe near the tailstock. It is preferable to secure the bracket to the tailstock permanently, where it can usually remain when the attachment is not in use, without interfering with other work. The lever has a T slot in which the adjacent end of the tie rod may be clamped at different distances from the pivot on the fixture. The point of connection of the tie rod becomes the fulcrum of the lever. When it is between the connection to the lathe carriage and the slotted slide, the tool and slide move in opposite directions when the feed is in action, thus causing the tool to cut an abrupt crown. When the tie rod is secured at a point directly over the connection to the link which extends to the slotted slide, there is no movement of the latter and the tool cuts a crown of the same curvature as the formed slot. When the tie rod is secured still further forward on the lever the slotted slide and the tool move in the same direction and a crown is cut flatter than the form of the slot.

An important feature of the attachment is its adjustable relation to the work as held on the arbor. With a fixed former, as in the usual taper attachment, each pulley must be located in exact relation to the tool, according to the position of the former, necessitating the use of shoulder or nut arbors. With this attachment the pulley may be located anywhere on the arbor, and when it is placed in the lathe the set screw holding the tie rod to the stationary bracket is loosened and the lathe carriage shifted until the point of the tool is midway of the pulley's face; then, by means of a handle on the outer end of the lever, the slotted slide is adjusted so that the roll is midway of the former slot and the tail rod set screw is tightened. Work is begun by shifting the carriage to start the tool at one edge of the pulley's face.

On some formed work, especially where the formed surface is at an abrupt angle with the turning axis, this attachment has the advantage that a less abrupt inclination in the form may be employed by causing the form to travel faster. As an example in the Mossberg Wrench Company's own work a form is used in which the tool point must cut a surface having a curve approximately a parabola. The lathe tool would not follow the abrupt portion of the curve if controlled by the usual former, but by making the former slot longer with the same lateral deflection the required curve can be readily produced by imparting to the slotted slide a rate of travel faster than that of the tool and in the same direction.

The McWane Pipe Works, Lynchburg, Va., and New York City, in its monthly *Pipe Parley* for February says: "The strong undertone we mentioned last month went still further 'under' about the first week in January in a big cut in prices both East and West." The company publishes each month a memorandum book for the month, which has been found to be quite a convenience by many customers. In connection with the February issue an illustrated circular was distributed giving information relative to the McWane meter box for sidewalk setting. This is a cast iron box for water meters, and is intended to be so arranged as to be always accessible to the official charged with reading, inspecting or repairing such meters. The company has just completed 5000 of these meter boxes for the city of Washington, D. C., which is said to be the largest contract of its kind ever awarded.

The Chicago Brass Company has purchased for its plant at Kenosha, Wis., two heavy Allis-Chalmers compound rolling mill engines of the horizontal vertical type, each having cylinders 28 in. and 56 in. by 48 in. stroke. These will operate non-condensing at 150 lb. pressure, and are designed to develop their maximum capacity at a speed of 120 rev. per min. Installation of the units is expected to be made in very quick time, as the purchaser's plant is equipped with trackage, traveling cranes and every modern appliance for handling heavy material of this kind.

Customs Decisions.

The Duty on Ferro Alloys.

The Board of United States General Appraisers has completed the taking of testimony in a case of great interest to steel manufacturers. It concerns the proper duty on ferrochrome, ferrotungsten and ferrovanadium. The Government assessed these for duty at 20 per cent. ad valorem, as unwrought metals, but the importers claim that they are not unwrought metals and should be dutiable at $4 a ton, because they assimilate to ferromanganese, which is provided for in the tariff at that rate. Ferromanganese is worth only about $50 or $60 a ton, but as the value of ferrovanadium runs up to $4000 a ton and over, it will be seen that a duty of $4 is relatively very small. The Government is determined to sustain its exaction of duty, although the case has been before the United States courts several times, and each time the Government has been defeated. On the other hand, the steel manufacturers are anxious to have the duty as low as possible upon these alloys, because they are so largely used in making special steels.

The cases recently tried before the General Appraisers were bitterly contested. Several importers were interested in them, but the active fight was made by the Midvale Steel Company, represented by Thomas Leaming and William M. Stewart, Jr., of Philadelphia. The Government was represented by Martin T. Baldwin, assistant solicitor of customs; Everit Brown, special counsel for the Treasury Department, and Charles Fuller, another special counsel. The active conduct of the trial was left in the hands of Mr. Stewart and Mr. Brown for the respective sides. The testimony presented was extensive and involved a close examination into the uses of these articles in the manufacture of steel. Briefs will be submitted to the Board of Appraisers by counsel on both sides, and it is expected that a decision will be rendered very shortly. It is also understood that, which ever way the decision may be, the case will be litigated through the Federal courts until finally the Supreme Court will undoubtedly be reached. The Government insists that these ferros are unwrought metals and therefore that they cannot be classified for duty by any vague resemblances to other articles, but that even if these articles are not unwrought metals, still they do not assimilate to ferromanganese sufficiently to warrant their classification at $4 per ton.

Carding Machinery.

Classifying officers of customs have been notified that the Treasury Department has accepted the recent decision of the United States Circuit Court in the case of the Government against Evan Arthur Leigh of Boston, with reference to carding machines. The machines were imported with the necessary card clothing and forwarded in a knockdown condition, packed in cases. It was held by the Government representatives that the machines themselves should be assessed at 45 per cent., the rate applicable to manufactures of metal, while the card clothing was held dutiable at 45 cents per square foot. The importer, whose case has been regarded as a test, objected to the dual duty, and alleged that the machines are to be deemed entireties for the purpose of assessing duty. Under this interpretation of the tariff the machines pay duty merely at 45 per cent., as manufactures of metal. This classification the Treasury now concedes. Hereafter all importations of carding machines with the cloth on will be admitted at the single rate of duty.

An International Flying Machine Competition.—With the object of promoting aerial navigation Dr. Gans of Garmisch, near Munich, who is the chairman of the airship section of the Bavarian Automobile Club, has offered a prize of 10,000 marks ($2380) to be awarded to a flying machine, between May 1 and October 1, 1908, during the Munich Exhibition. Competitors of any nationality are eligible for this prize. The prize will be awarded to the aeronaut who, starting from the ground, succeeds in flying or remaining suspended in the air above the space assigned to him for the purpose, for 10 min., and in landing within that area after the 10 min. have elapsed. Balloons or flying machines fitted with balloons are not eligible for competition. Intending competitors must enroll their names on the list in the office of the Sports Committee of the Exhibition, "Munich, 1908," and send a description of their flying machine, accompanied by a photograph or sketch, and pay an entrance fee. Further details may be had by applying to the office of the Sports Committee of the Exhibition, "Munich, 1908," 10 Neuhauserstrasse, Munich, Germany.

The Waterbury-Farrel Screw Head Slotter.

The automatic slotting machine shown in the illustrations is designed for cutting the slots in the heads of screws. In designing this machine its builder, the Waterbury Farrel Foundry & Machine Company, Waterbury, Conn., had for its main object a large output of accurate

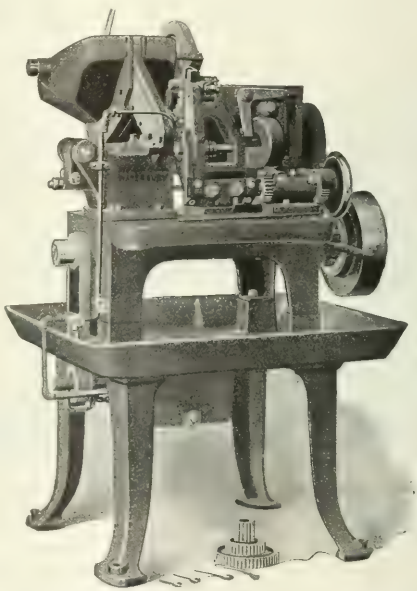


Fig. 1.—A New Automatic Screw Slotting Machine Built by the Waterbury-Farrel Foundry & Machine Company, Waterbury, Conn.

work at a rapid rate of production, and special attention was paid to rigidity. The rated capacity is for screws from 3-16 to ⅜ in. in diameter up to 2½ in. long, of which the number slotted per minute is 35 of the 3-16 in. size, 30 of the ¼-in. and 21 of the ⅜-in. size. On shallow slots or on brass blanks these speeds may be exceeded. The machine constitutes an addition to the company's line of cold process bolt and nut machinery.

The action of the machine will be understood from the general view, Fig. 1, and the end and side elevations given in Fig. 2. The blanks are automatically taken from the hopper and presented in proper position in front of the saw by a toggle carrier slide. Here the blank is gripped securely between a die and the carrier slide during the slotting operation. The saw spindle is mounted on a swinging bracket which is strongly braced and guided to prevent chattering. When changing dies the bracket is disconnected and swung over to the front. The machine is provided with a clip shaver, to cut off the burr that forms on the head when the saw becomes dull, which consists of a cutting off tool that passes under the head of the blank just as the saw returns.

The machine is driven by a friction clutch pulley and extra sets of change gears are furnished to obtain a wide range in the number of blanks slotted per minute, thus enabling different sizes and kinds of screws to be accommodated. An oil pump furnishes a uniform flow of oil over the work, which thoroughly lubricates the saw,

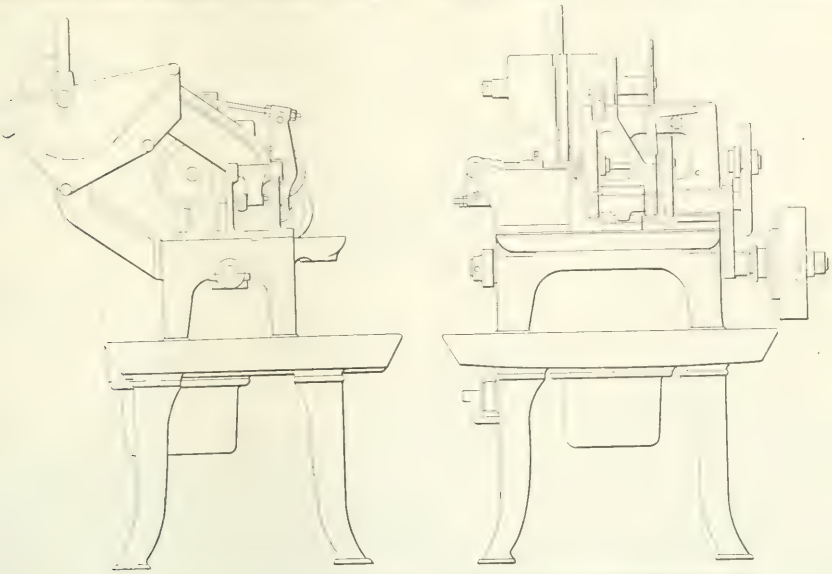


Fig. 2. End and Side Elevations of the Waterbury-Farrel Automatic Screw Slotting Machine.

while a suitable guard removes chips, dirt and other foreign matter from the saw and keeps the dies and work clean. A pan beneath the machine catches the oil, which is returned through a strainer to a tank, to be used repeatedly.

These slotters may be mounted in groups, as shown in Fig. 3, in varying number, as desired, the common practice being to group six machines above a long table, which also forms the drip pan. In this case the group is driven by a single 24-in. pulley, with 5½ in. face, running at 330 rev. per min. For the single machine a 2¾ x 12 in. pulley is employed, running at the same speed as in the group arrangement, at which speed the cam shaft may be operated at 12, 21, 30 or 41 rev. per min. and the saw spindle at 180 or 720 rev. per min. The diameter of the saw is 3¾ in. The single machine occupies a floor space of 41 x 44 in., is 59½ in. high over all and weighs 1240 lb. The group of six machines, arranged as a unit, occupies a space of 44 in. x 19 ft. 10 in. and weighs 7540 lb. All important wearing parts are made of the best materials and the machine is carefully fitted throughout.

A Peat Coal Plant in New England.—E. Curtis McKenney of Saugus, Mass., after several years of experimental work, has perfected a process for making from peat a solid, hard fuel, which is claimed to burn freely with light draft, producing intense heat and leaving a residue of light ash of about 7 per cent. This new fuel, which is called peat coal, is said to leave no clinkers, cinders or soot, does not disintegrate, and emits very little smoke and no offensive gases. For some time an experimental plant has been operated, and plans have been completed for the erection of a plant capable of turning out from 50 to 75 tons of manufactured product per day, at Lynnfield, Mass., by the Franklin Peat Coal Company, 26 Hawley street, Boston, which has been organized to put the new fuel on the market. It is expected that the new process will enable the company to use the extensive peat bogs of New England. E. Curtis McKenney is president; William E. Ludden, vice-president; Charles E. Robinson, secretary, and George N. March, treasurer.

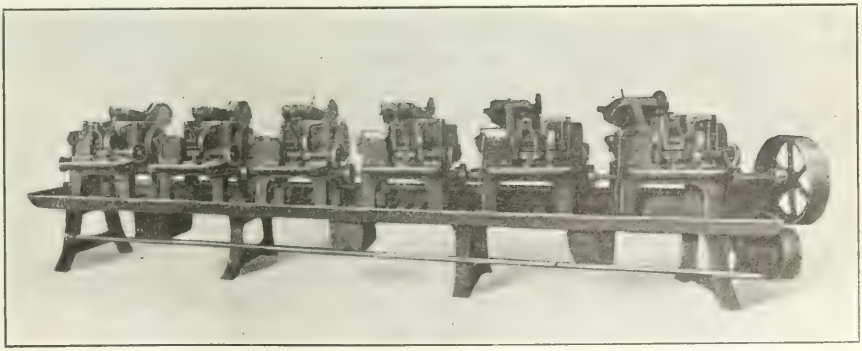


Fig. 3. A Group of Six Screw Slotting Machines Mounted as a Unit with Gear Motor Drive.

The records of the ocean steamboat companies show that in the first 45 days of 1908 87,443 steerage passengers left the United States, while the number of immigrants was only 22,839. In the corresponding period of 1907 the number of immigrants was 56,832, or about two and a half times as many.

The Quality of Lehigh River Water.

During the last year hydrologists of the United States Geological Survey have been making a study of the quality of the water of Lehigh River, Pennsylvania. The chief purpose of this work is to determine the nature and extent of the variations in the character of the water at different seasons of the year and its suitability for use by manufactories and for domestic purposes. At the same time the studies made show what minerals are dissolved from the soils of the Lehigh Valley and the quantity of each.

Samples of the river water have been collected from day to day at South Bethlehem and shipped to the Survey's laboratory at Washington, D. C., where chemists have submitted it to critical analysis. These studies are still unfinished, but many conclusions regarding the stream have been reached. It is shown, for example, that each year about 270,000 tons of dissolved minerals are carried past South Bethlehem. Of this quantity 10.2 per cent. is silica, the chief constituent of sand and of most rocks; more than 15 per cent. is calcium, washed into the stream as sulphate and carbonate of lime; nearly 6 per cent. is magnesium; nearly 8 per cent. is sodium, one of the constituents of common salt; only 1 per cent. is iron. The grand total of the minerals borne by the stream is made up of the metals named, carried in combination as sulphates, carbonates, chlorides and nitrates. The sulphate compounds are the chief constituents, amounting to about 116,000 tons a year; the carbonates are next in rank, aggregating about 86,000 tons a year.

These quantities seem great, but it must be remembered that the materials are washed into the stream from a large area. For each acre of ground that the river drains it bears away only 1¾ lb. of minerals daily.

The great quantity of sulphate compounds indicates a large amount of drainage from coal mines, and this has a very undesirable effect on the water for most industrial uses, making it harder and much more likely to form scale in boilers and less suitable for the textile industries and for general domestic purposes. Nevertheless it is still soft as compared with waters of the Middle West, and, after filtration to remove the excessive turbidity at flood stages of the river, it can be used successfully in nearly all industries that require large volumes of water.

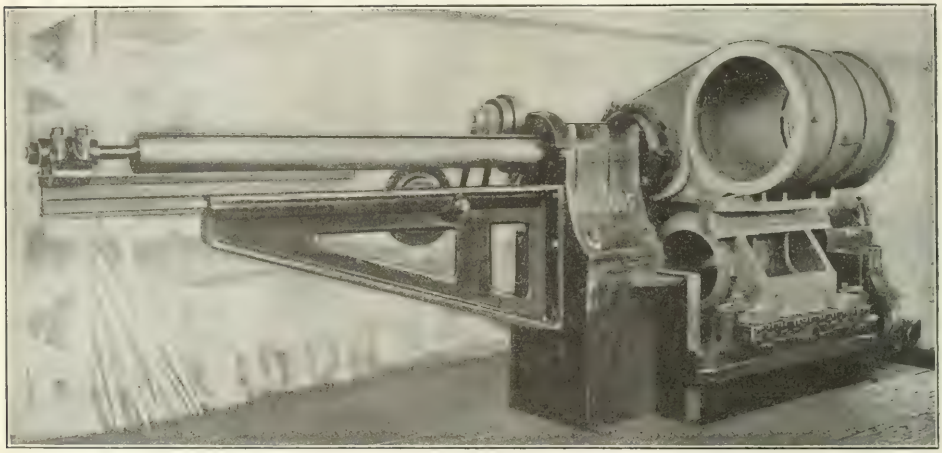
Shipments of coal and coke originating on the lines of the Pennsylvania Railroad east of Pittsburgh and Erie, for the week ending February 15, aggregated 925,698 tons, an increase of 222,573 tons over the previous week. This was the first evidence of improvement in that direction since the beginning of the year.

Boring Multiple Cylinders.

BY E. J. MCKERNAN.*

The usual locomotive cylinder boring machine has a horizontal spindle and a table permitting of no adjustment at all or only lateral adjustment. With these machines of the old design much time is consumed in properly setting the cylinder so that the boring bar will strike the true center, and high speeds and rapid cutting are not obtained. These disadvantages are magnified when cylinder castings having two or more cylindrical chambers are to be bored and faced, because the work has to be reset and the cylinders and valve chambers (where piston valves are used) must be exactly parallel with each other. If the cylinders are out of parallel the working of the engine throws great strain upon the guides with consequent detrimental effect on the machinery, causing undue wear, strain and trouble.

The machines of the old single bar type, designed when simple slide valve cylinders of not more than 18 or 20 in. diameter prevailed on locomotives, were adapted for use with the slow speed carbon steel tools, which were the most efficient at that time. The mechanism of these machines was simple, but the cast iron driving and feed gears were weak and drove the tools at an unprofitably slow speed. Later, when tool steels of greater cutting capacity and speed were introduced attempts to use them efficiently in boring machines of this class would result in stripping the gears or otherwise injuring the machine.



The Jacobs Rapid Universal Locomotive Cylinder Boring Machine.

With advances in locomotive construction represented by engines having piston valves and often compound cylinders of the Vauclain type, or four-cylinder balanced compound type, the insufficiency of the old boring machines was still further emphasized. One manufacturer produced a three-spindle machine, which required only one setting of the work and insured the parallel boring of all cylinders and chambers, and while this possessed a number of advantages for certain classes of work, the single bar machine is still considered superior for general railroad shop use. The single bar has less gearing, is simpler, and is consequently easier to maintain. On account of the fewer parts the single bar machine requires less power, which can be obtained from a small motor. Where there are some advantages in boring three chambers at once it has been found in practice that chatter in one tool is transmitted to the other tools, causing a rough finish in all bores. It is apparent that this is obviated in the single bar machine.

Recently there have been built several heavy, rigid single bar machines, with powerful boring bars capable of driving the cutting tools to their full capacity. Accurate

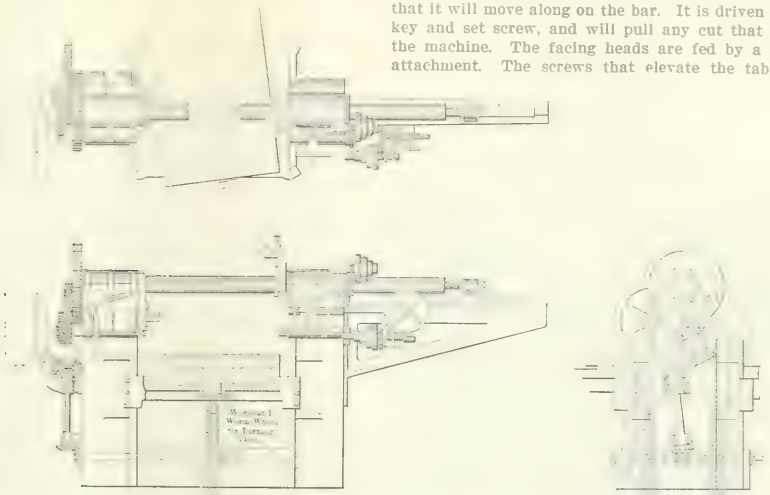
* Tool expert, Atchison, Topeka & Santa Fé Railway System.

setting of the work, which is especially desirable in connection with multiple cylinders, is accomplished by providing a table having both lateral and vertical motion, and these machines produce excellent work. But most of them thus far constructed are heavy ponderous affairs, expensive for the metal in them alone, and they do not have the needed wide range for all classes of locomotive cylinder boring.

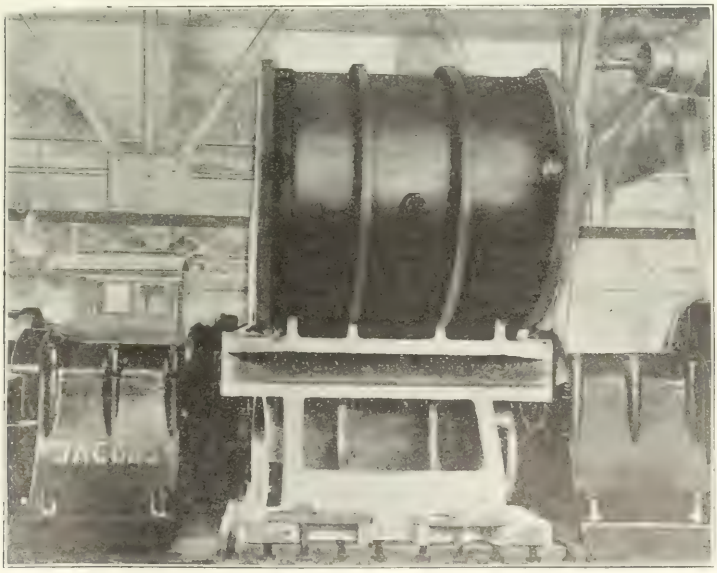
At the Topeka shops of the Santa Fé a cylinder boring machine, illustrated herewith, has been built, which answers all the requirements for boring cylinders for all classes of compound engines. This machine is also adapted to bore cylinders on engines which have one cylinder or chamber at an angle to the others. All cylinders or chambers may be bored at one clamping of the cylinder by the mere raising or lowering of the table. This table has an elevating movement of 37 in. and a cross travel of 35 in. The table, which has the cross travel movement, has also a swiveling movement of 15 degrees. This machine is direct motor driven. The table is raised or lowered by power from the main motor through bevel gears and clutches, handled from the operator's side of the machine. All the mechanism is of modern design and is strong and durable, all gears being made from good gray iron, and all bushings of phosphor bronze. The boring bar is 7 in. in diameter, and is made from open hearth steel, and is fed through the cylinder by a spur gear and rack, which makes it rigid in operation and gives a smooth bore.

One of the facing heads on the machine is made so that it will move along on the bar. It is driven by a 1-in. key and set screw, and will pull any cut that is put on the machine. The facing heads are fed by a star feed attachment. The screws that elevate the table are of soft steel, are 5½ in. in diameter and ¾-in. pitch. The screws are perpendicular to the boring bar, which contributes to rigidity. The total weight of the machine is about 15 tons, and it occupies a floor space of 223 sq. ft., having an extreme length of 21 ft. and an overall width of 11 ft.

This machine is capable of boring a three-chamber compound cylinder in 15 hr., where it used to take 26 to 28 hr., or a simple cylinder in 3 hr., where it formerly



Top and Side Views of the Table, Showing the Worm Gear Swiveling Arrangement for Boring Inclined Cylinders.

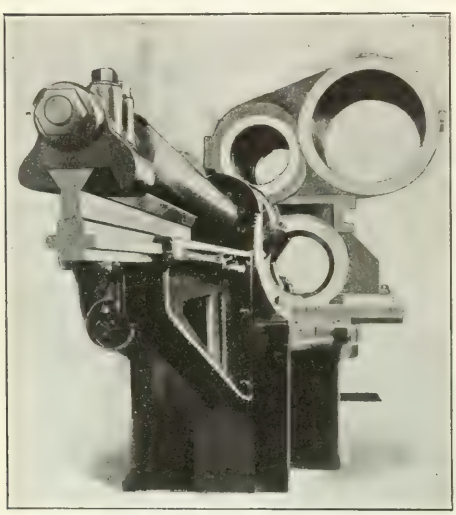


Cylinder in Straight Position on the Table, with the High-Pressure Inclined Cylinder at the Bottom.

took 8 to 10 hr. In the latter case the saving in time represents over $1500 per year in operator's wages alone, and the machine capacity is increased from 375 to 1000 cylinders per year. The increase in output of three-chamber compound cylinders is about 77 per cent.

If a machine which bores only one chamber of a locomotive cylinder casting at one time is to compete successfully with one which can bore three chambers simultaneously it must not only bore rapidly, but must be so constructed that only one setting will be required to bring the chambers into position to bore. This has been attained in the machine described, since after a cylinder has been lined up and clamped on the table any of the chambers may be brought exactly into position for boring, and it is impossible to bore two chambers out of parallel except by intention.

A machine of this design has been in operation some time at the Topeka shops of the Atchison, Topeka & Santa Fé Railway Company, proving satisfactory, both in its convenience in handling and in the lower produc-



The Casting Set with the Inclined Cylinder Parallel to the Boring Bar and the Low Pressure Cylinder and Valve Chamber Out of Parallel.

tion cost. The Tool & Railway Specialty Mfg. Company, Atchison, Kan., has made arrangements to place machines of this type on the market. From its designer the tool is known as the Jacobs boring machine.

The Fore River Shipbuilding Company's Report.

The comparative balance sheet of the Fore River Shipbuilding Company, Quincy, Mass., for the years ending December 31, 1907, and 1906, is as follows:

Assets.

	1907.	1906.
Real estate, buildings, &c.	$2,300,361.19	$2,101,984.00
Machinery, equipment, &c.	1,270,642.41	1,159,239.95
Additions to plant	49,986.51	312,757.97
Patterns and drawings	.....	110,714.87
Investments	24,762.37	30,960.00
	$3,645,752.48	$3,715,656.79
Less depreciation	120,000.00	120,000.00
Totals	$3,525,752.48	$3,595,656.79
Current assets:		
Reserve accounts receivable	$143,956.97	$167,054.53
Unearned insurance	17,822.51	15,326.38
Unearned taxes	8,222.24	1,181.40
Accrued interest	8,170.81	.....
Work in process	430,716.22	737,922.27
Material on hand	306,895.28	266,457.03
Accounts receivable	307,874.38	140,269.30
Cash on hand	281,262.20	404,935.37
	$1,504,920.61	$1,733,146.28
Grand totals	$5,030,673.09	$5,328,803.07

Liabilities.

Preferred stock	$2,400,000.00	$2,400,000.00
Common stock	2,400,000.00	2,400,000.00
	$4,800,000.00	$4,800,000.00
Current liabilities:		
Accounts payable reserve	$65,120.58	$47,082.99
Unearned rentals	6,750.00	9,750.00
Advance payments on contract	.....	52,766.78
Accounts payable	132,585.42	150,103.63
	$204,456.00	$259,703.40
Turbine development reserve	.....	200,000.00
Surplus	26,217.09	69,099.67
	$26,217.09	$269,099.67
Grand totals	$5,030,673.09	$5,328,803.07

In his accompanying report to the stockholders, President Francis T. Bowles says:

"Additions to the plant and machinery were made during the year to the amount of $50,000, including an extension of 112 ft. to the machine shop to provide much needed additional facilities in that department. All items of repairs and maintenance have been charged to expense. There are no notes payable and the present accounts payable are only current bills in process of accounting. The cash receipts for the year amounted to $5,354,697.18.

"The following vessels were under construction December 31, 1907: Battleship North Dakota; scout cruisers Birmingham and Salem; seven submarine boats; one 11,000-ton steel collier, Melrose, since delivered; one steel freight steamer, Altamaha, ready for delivery; four steel light vessels, Nos. 90 to 93, inclusive; one steel harbor tug, since delivered. During the year the battleship Vermont, the freight and passenger steamer Creole, two steel freight steamers Ocmulgee and Ossabaw, two 11,000-ton steel colliers, Everett and Malden, four submarine boats and one steel harbor lighter have been completed and delivered.

"The average number of employees for the year was 3340. The force at present employed is 3045. There have been only trifling labor troubles during the year, but much difficulty in securing competent mechanics, resulting in a labor movement of over 8000 during the year.

"The company's turbine development has made substantial progress, but has necessitated the expenditure of the reserve for that purpose and brought about in addition the loss in surplus of $43,000.

"Our first Curtis turbine steamer, the Creole, now running on the line with gratifying results, presented on account of the moderate speed of 15 to 16 knots and other circumstances the most difficult conditions to make a good showing for the turbine. The single mechanical difficulty encountered in its turbines has been overcome and was a minor one so far as the merits of the turbine are concerned. We had in this vessel the usual experience on all turbine development in trying several designs of screw propellers before a fairly satisfactory one was obtained."

The officers elected for the ensuing year are as follows: Francis T. Bowles, president; F. C. Dumaine, vice-president; H. G. Smith, manager; J. A. Sedgwick, treasurer; Samuel T. MacQuarrie, clerk.

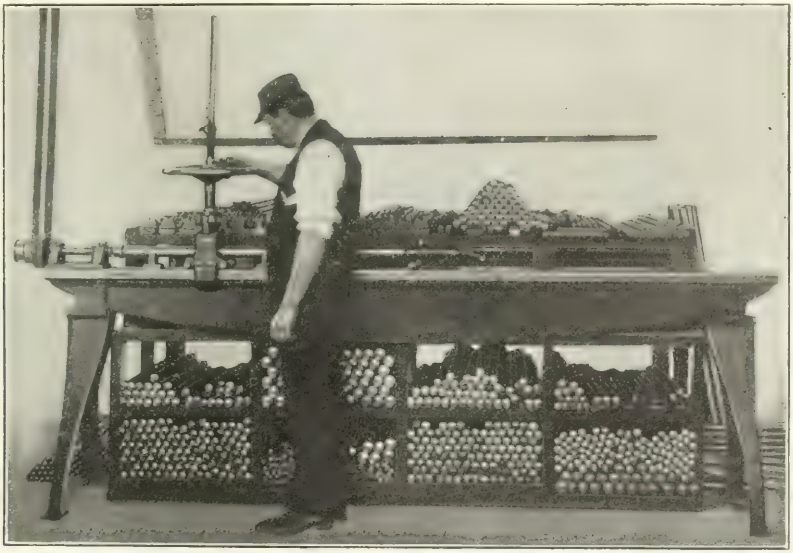
The American Bridge Company, 42 Broadway, New York, has arranged to occupy its new offices in the Hudson Terminal, 30 Church street, April 20. The entire eleventh, twelfth and thirteenth floors will be occupied as the New York offices of the following subsidiaries of the United States Steel Corporation in addition to the general offices of the bridge company: Carnegie Steel Company, American Steel & Wire Company, American Sheet & Tin Plate Company, Lorain Steel Company, National Tube Company and Steel Products Export Company.

A systematic campaign in the interest of better treatment of railroads in the South has been started at Knoxville, Tenn. The Manufacturers' and Producers' Association has passed resolutions against adverse legislation toward railroads and other corporations so that business may be resumed and development continued.

The Rockford Straightening Machine.

A machine for straightening shafts or similar work, which is a new product of the Rockford Drilling Machine Company, Rockford, Ill., successor to the B. F. Barnes Company, is shown in the accompanying engraving. The headstock spindle runs continuously and the center, which is inserted in the spindle in the usual way, carries a sliding collar. To the outer face of this collar is fitted a leather disk which contacts with the work under the influence of four coiled springs behind the collar, providing a friction drive.

For each size of shaft or spindle to be straightened separate supporting blocks are furnished, having semi-cylindrical recesses exactly fitting the work when the center of the latter is about 1-16 to 3-32 in. below the center of the spindle. Moving the handle of the tailstock to extend the tail center brings both centers to place and lifts the work from the supporting blocks, pressing it against the leather frictional surface of the collar on the headstock center. The tailstock center is



A Machine for Straightening Shafts and Spindles, Built by the Rockford Drilling Machine Company, Rockford, Ill.

then fastened by a clamp handle and the work revolved, enabling the operator to chalkmark the high places. Loosening the tailstock lever allows the tailstock center to be slid back permitting the work to fall on the blocks. The supporting blocks slide easily from place to place, are quickly adjustable and can be readily brought to the points desired between which the bend lies.

The carriage which supports the press screw, or straightening screw, runs on rolls, and is quickly and easily shifted on the bed to the point where the work is out of true. On the straightening screw is a revolving index plate which indicates the travel of the screw, and if in straightening a piece of work the first application of the screw is not sufficient, a guide is afforded for the second or more succeeding applications. This screw has a fine thread, so that the large hand wheel is capable of exerting all the pressure that is generally necessary to straighten a piece, but on heavier work the ratchet lever may be swung down, giving a more powerful leverage to straighten any piece within the capacity of the machine. The bed is very rigid and is able to support any work up to a reasonable size. The machine takes 8 ft. between centers.

This machine is used for all straightening work in the builder's shop; no straightening is ever done between lathe centers. Frequently it would take half a day to straighten a long shaft or spindle in the old way between centers of an engine lathe, but one man, who soon becomes skilful at the work, giving only a small part of his time to such jobs, does all the straightening at present.

Portland Cement Production in 1907.

The Portland cement producers of the United States have replied so promptly to the statistical inquiries addressed to them by the United States Geological Survey that it is now possible to make a very close estimate of the Portland cement production for the calendar year 1907. Edwin C. Eckel, who is in charge of the statistical work on cement for the Survey, has accordingly prepared the following statement:

Returns have been received from 87 plants, representing over 95 per cent. of the Portland cement production of the United States. As the 10 plants which have not yet replied include only two large producers, it is possible to make a fairly accurate estimate of the total cement production of 1907. The returns so far received indicate that the total output of Portland cement in the United States in the calendar year 1907 was approximately 48,000,000 barrels. This should be compared with an output of 46,463,424 barrels in 1906, and of 35,246,812 barrels in 1905.

Though the production of 1907 shows an increase over that of 1906, it is slight as compared with past annual gains in the cement industry, indicating that the Portland cement production of the United States has now reached a stage in its development where it is directly and promptly affected by general business depression.

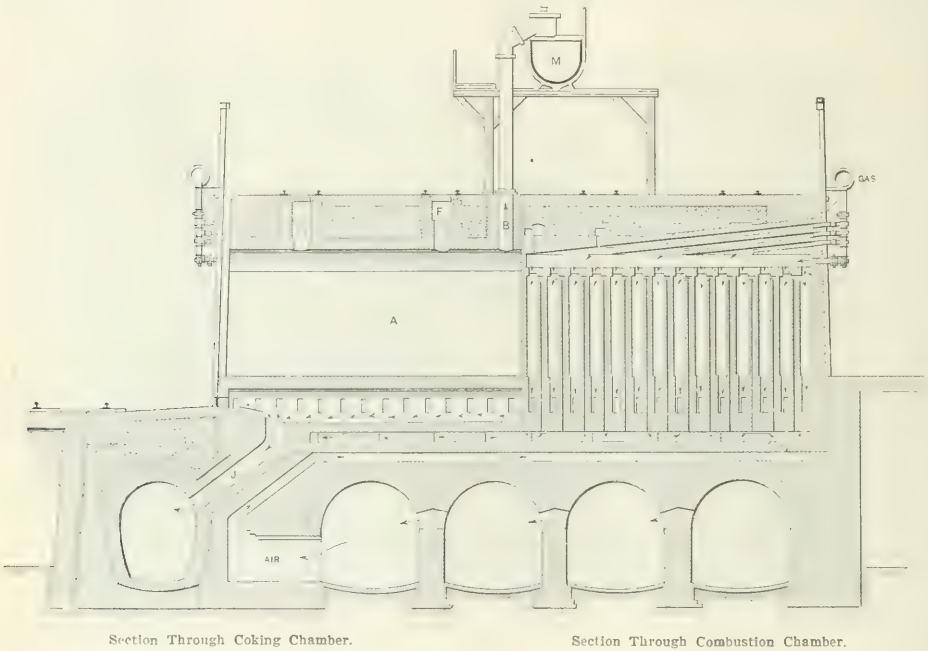
Three aeroplanes, instead of one, will be contracted for by the Signal Corps of the United States army. This decision has been reached by the Board of Ordnance and Fortification and approved by Secretary Taft as a result of the recent competition between inventors. The successful bidders, with their prices and time of delivery, are: Wright Brothers, Dayton, Ohio, $25,000, delivery in 200 days; A. M. Herring, New York City, $20,000, 180 days; J. F. Scott, Chicago, Ill., $1000, 185 days. The board has only $25 to apply on the aeroplanes, but it is expected that the remainder will be voted by Congress. The surprise bid was that of Mr. Scott, who, through patriotism for his country, agreed to build a satisfactory machine that will fly for the mere cost of material. Of 41 bids which were received these three were the only ones that followed the Signal Corps specifications.

The Von Bauer Coke Oven System.

Arrangements are being made for the construction in the United States of a battery of the latest type of the Von Bauer retort coke ovens with recovery of by-products —the first of these ovens to be built in this country, though there is at Sydney, Nova Scotia, an installation of the earlier Von Bauer type. An essential feature of the system is a construction avoiding reversals in the currents of products of combustion and of preheated air, so that violent changes in temperature, affecting both the product and the oven construction, are prevented. The current of the products of combustion is continuously downward and simultaneously in all flues. Another departure from the more familiar forms of by-product ovens is in dispensing with elaborate regenerators.

The latest improvement upon the Von Bauer oven is embodied in the construction shown in Figs. 1 and 2. In the earlier type the general operation was the same; coal being charged through the opening F into the coking chamber A, and the generated gases rising through the stand pipes B into the gas main M leading to the by-product plant for the extraction of tar, ammonia and benzole. The purified gases were returned through the end main shown. Longitudinal mixing and distributing flues for the gases were provided with special individual connections between these and the gas main. The gases passed downward from these mixing and distributing flues, entering the combustion chambers at the top and meeting the highly preheated air. The gases of combustion were then drawn down and collected in flues located under the coking chambers and discharged through the connecting flue J into the main flue, to be either further used in boiler furnaces or finally discharged through a chimney.

The more recent oven, as illustrated, has a better arrangement for supplying gas to the distributing flues in the upper part of the oven. It omits the internal adjusting tiles first used, and substitutes for them, through inclined passages, an independent, direct gas supply to different parts of the flue, controlled by valves, all located immediately opposite the upper parts of the partition walls, easily accessible on both sides of the ovens, and their action observable through peepholes. Where it is necessary to widen the ovens toward the discharge end, to provide for the expansion of the coal, the extra heat necessary for the larger body of coal in the wider part of the oven can thus be supplied by proper control of the conduits supplying gas to the combustion chambers. Another improvement in this latest construction is in the preheating of the air for combustion, the ducts under the main combustion flue of the ovens being lengthened. The air for combustion is taken from the spaces under the ovens formed by the large foundation arches. These arches serve for the preliminary heating of the air supply, as well as for the cooling of the oven foundations. This arrangement confines the required openings in the sides of a battery of ovens to those necessary for charging and discharging a coking chamber by machinery and in the top to those for the admission of coal, in the case of hand charging, and for the necessary gas take-offs.



Section Through Coking Chamber. Section Through Combustion Chamber.

Fig. 1.—The Coke Oven System of Theodor von Bauer.

From the distributing ducts below, in which the air is treated to about 1000 deg. Fahr. it rises through special uptakes molded in the material forming the walls of the coking and combustion chambers, extracting heat from these walls and increasing its own temperature to about 1920 deg. Fahr. It is then introduced through separate openings into each individual combustion chamber. This method of preheating the air without generators or separate recuperators has proved successful, the air being heated in a simple and economical manner, while a greater yield of surplus gas results. The highly preheated air gives complete combustion, and the resulting high temperature in the combustion chamber is produced at and below the surface of the coal charge in the coking chamber. At the same time, as the gases of combustion have a downward course, the superheating of the upper parts of the coking chambers is prevented, as well as any decomposition of the gases in the coking chamber before their passage through the standpipe B into the collecting main. The design and construction of the coking chambers is such as to prevent the escape of any gases from them into the combustion chambers.

The average coking period is from 24 to 26 hr., which would represent a yearly capacity of about 180,000 tons

of blast furnace coke from a battery of 100 ovens. The yield of surplus gas is from 45 to 50 per cent., according to the kind of coal used. While the flue gases, because of their short travel, have a high temperature, it has been demonstrated that in the regular operation of the Von Bauer coke oven the transmission of heat from the walls of the coking chambers to the coal in the coking chamber is gradually reduced toward the end of the coking period, and that the layer of coke nearest the heated wall becomes hotter in proportion to the advance of the coking process toward the center of the charge of coal. In the last third of the coking period it has been found that the heating of the coking chambers can be dispensed with. The lifting and lowering of the doors is accomplished through a special hoisting apparatus by which the doors of one battery can be operated from one place, it being only necessary to attach a chain to any door and operate the controlling valve of the hoisting apparatus.

Among the advantages of these ovens the following are emphasized by the inventor: It is not necessary to

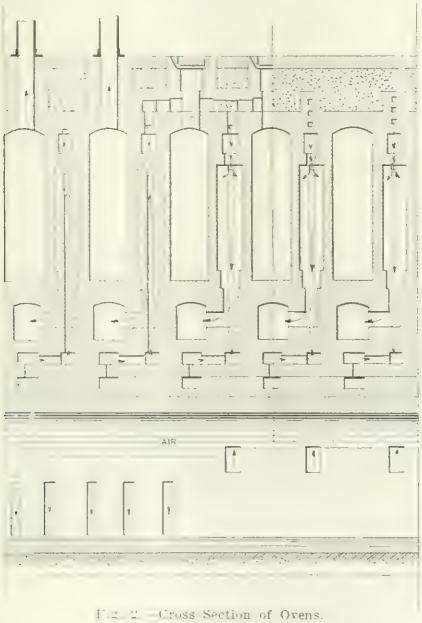


Fig. 2.—Cross Section of Ovens.

enter hot ducts to regulate tuyeres, all controlling valves of the fuel gas supply being on the outside of the ovens above the floor line. Deterioration in the lower part of the oven is avoided by the omission of gas distributing flues in this part, so that the temperature is reduced to a minimum. The partition walls are strong, and are tied in a transverse direction by partitions extending from top to bottom. The point of entrance of the preheated air into the combustion chambers is at such a level that the temperature of the upper part of the oven walls is not high enough for decomposition of the generated gases. The yield of surplus gas is increased by the proper heating of the oven walls in a downward direction simultaneously in all combustion flues. By the elimination of all internal dampers and flue walls in the newest construction of the oven the melting or destruction of interior adjusting tiles is avoided. Construction cost is kept down by the absence of complicated foundations and regenerators. Much surplus heat is available for boilers and other purposes, as there is no preheating of air required for combustion in large generators. The introduction of small vertical flues between the combustion flues in the walls of the oven chambers is a simple method of preheating the air required for combustion. The Von Bauer ovens can be converted from a direct fire to an indirect fire operating system and vice versa without any interruption in the operation of the ovens and without affecting the quantity or quality of the product. In one instance the change from one system to the other for a battery of 60 ovens was accomplished in eight hours.

The Von Bauer patents are controlled in the United States and Canada by the Berlin Anhaltische Maschinenbau A. G.; Frederick J. Mayer, the well-known gas expert of Baltimore, and David B. Carse, 12 Broadway, New York. In Europe they are controlled by the Gesellschaft für Erbauung von Hüttenwerksanlagen, Duesseldorf, Germany, which is affiliated with the Berlin company named above, the latter company being prominent in the construction of gas works and by product plants. The Duesseldorf company is now building a steel works with a battery of Von Bauer ovens for the North German Lloyd interests. A late design of these ovens has been built at Ilseder and 60 additional ovens were recently ordered for this plant. An older type is in use at the Krupp Hanover collieries, and there is a similar installation at Sydney, Nova Scotia.

The Schieren Fortieth Anniversary.

The celebration of the fortieth anniversary of the leather belting business of Chas. A. Schieren & Co. this year calls attention to the fact that this concern is one of the oldest in the business in this country. It was started by Chas. A. Schieren in 1868, shortly after the close of the civil war. The firm is marking this epoch in its history by becoming a corporation. Hereafter it will be the Chas. A. Schieren Company. The business will be owned and carried on by those who have been partners in the old firm, Chas. A. Schieren being president, F. A. M. Burrell vice-president, Chas. A. Schieren, Jr., treasurer, and H. V. Schieren secretary.

The growth of Mr. Schieren's business has been steady and rapid. At the outset he had a small shop at 90 Gold street, New York, with only two employees. Later the old Schieren Building, at the corner of Cliff and Ferry streets, diagonally opposite to the company's present building, was occupied and a few years after the concern acquired its own tannery at Bristol, Tenn. The continued expansion of its trade made a large addition to the tannery necessary, and gradually also branches of the house were established in all the important leather centers throughout the country. A European branch was opened at Hamburg, Germany, and agencies and representatives of the firm were located in all parts of the world.

A few years ago the old New York headquarters had become inadequate, and ground was acquired and the present Schieren Building erected. A year ago a ten-story addition to this structure was completed. The new Schieren Building is 10 stories in hight and has nearly 5 acres of floor space. It is in outward appearance a substantial office building, but is in every way adapted to modern manufacturing purposes.

Chas. A. Schieren, Jr., in commenting recently on the growth of the business, said: "Advertising undoubtedly has been responsible in large measure for the continual expansion of our markets. We have been large users of space in the trade papers always, and have in addition thoroughly acquainted belting users everywhere with our products by the use of our own printed matter. Our salesmen all over the country have followed up the impression this created. The chain of argument has thus been complete, and it has resulted in an immense growth in our list of customers. The same methods are being followed in our foreign trade."

The Southwestern Machinery & Supply Company, 303 Grant Building, Los Angeles, Cal., recently organized for the purpose of representing manufacturers of machinery and supplies, is under the management of Charles L. Michod, who has been in the same business at St. Louis and Havana, Cuba, for the past five years. The president of the company is J. Wallace, 42 Broadway, New York, and Theodore G. Finley of Los Angeles, is vice-president and treasurer. Southern Nevada, Arizona and southern California will be the principal territory covered, but considerable Mexican trade is also anticipated.

A Long Cleveland Open-Side Planer.

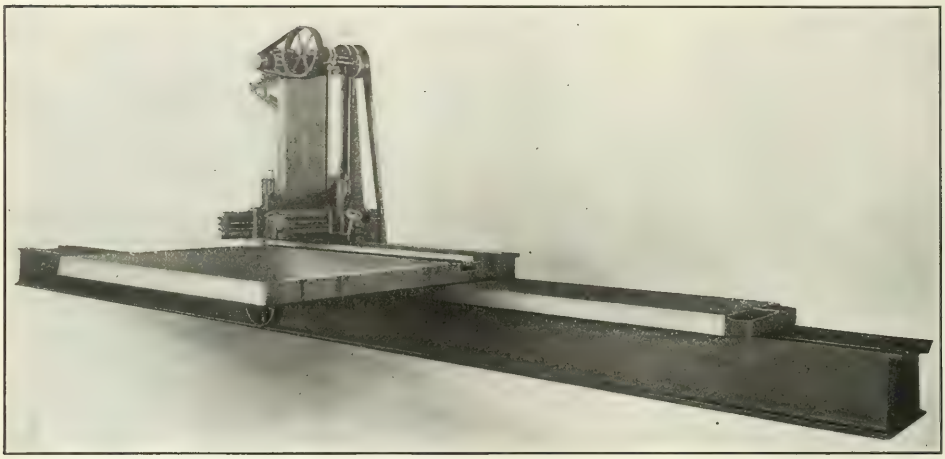
The longest machine tool casting ever made, it is believed, is the one which forms the bed of the planer herewith illustrated and recently completed by the Cleveland Planer Works, Cleveland, Ohio. The piece of work shown on the planer is another example of a difficult job successfully accomplished by the foundry. Both castings were made by the Johnson & Jennings Foundry Company, Cleveland, Ohio.

The bed was cast in one piece not only to test the capacity of the foundry but also to demonstrate the amount of vertical curvature necessary in the mold to secure a straight bed when cold with an iron of a certain analysis. So near were these calculations correct that when cold and supported in a neutral position the bed was straight within ¼ in. vertically and ⅛ in. horizontally. The insignificant percentage of error is appreciated when it is known that the bed is 52 ft. long, 45 in. wide and 27 in. high. It was cast closed on the upper side with the exception of the opening for the bull gear and on the lower side the only openings were one opposite the column base and holes 6 ft. apart large enough to permit removing the cores. The walls are 1½ in. thick and the cross partitions 1¾ in. thick and about 30 in. apart. The casting weighs approximately 52,000 lb. and is practically without a blemish. It is sufficiently hard to afford a good wearing slide for the table. Proportionately the same accuracy was maintained in making beds varying from 15 to 30 ft. long.

The plate shown on the table in process of machining is a base for a floor boring mill, and was true within ¼ in. in any direction and weighs approximately 22,000 lb. It is 12 ft. square and 9 in. deep, thoroughly ribbed and braced, and would have required a very large planer to machine it had not an open side planer been used. The planer, being a 60-in. machine, allowed the work to overhang the platen on the column side about 8 in. and the table being 54 in. wide the plate balanced within 2 tons.

The table on this planer is 31 ft. long and the Vs are 36 in. apart center to center. The rack has an 8-in. face and teeth of 2½ pitch. All gears and the rack are steel. The fitting of this platen was so well done that the reversing belt needed only to be shifted about ¼ in. on the tight pulley to reverse the platen at full speed, which is about two and three-quarter times faster than the cutting speed, which is 25 ft. per minute. The belt speeds are 1600 and 4400 ft. per minute, respectively. The motor is a 20-hp. induction type. The column of this machine is 60 in. wide and 30 in. deep and at the lower side is fastened with 20 1¼-in. bolts and doweled with 1¾ in. pins. The base to which the column is bolted is cast integral with the bed up to the level of the Vs.

As an indication of what this machine is capable of doing it is deserving of mention that the plate shown on the machine was planed in 26 hr. on the top and bottom. Four settings were necessary and the shape of the slide required both sides to be undercut.



A 60-In. Cleveland Open-Side Planer with a Bed 52 Ft. Long, Handling a Plate 12 Ft. Square, Weighing 22,000 Lb.

A Large Steam Piping Contract.

The Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, has secured one of the largest complete piping contracts ever placed in the Pittsburgh District. It comprises the piping installation in the new open hearth steel plant being built by the Pittsburgh Steel Company at Monessen, Pa. It includes all the steam piping running from 24 in. down, the exhaust piping running from 72 in. down, and the main water piping for the plant, 30 in. and smaller. There are to be installed 15 500-hp. Sterling boilers, three large mill engines and three cross compound electric generator engines, together with necessary pumps for feed water and mill supply. The plant will have eight open hearth furnaces and 51 gas producers.

The pipe has been ordered for the most up to date construction, being specially designed by the Garrett-Cromwell Engineering Company, Cleveland. In this contract the Pittsburgh Valve, Foundry & Construction Company will install all its own make of valves, separators, exhaust relief valves and other specialties. It is pushing the work as fast as possible, as the open hearth steel plant is under contract to be ready for operation early in June.

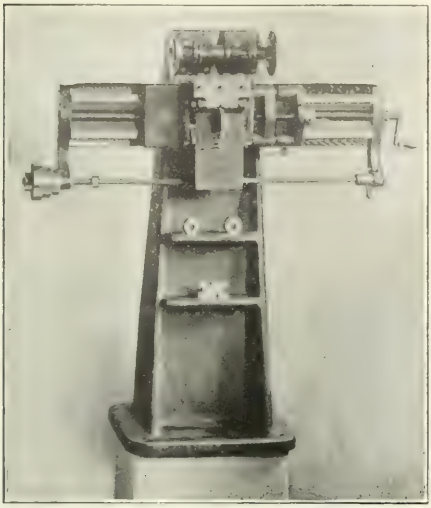
The Pittsburgh Coal Company's Earnings.—Following is a statement of earnings of the Pittsburgh Coal Company for December, 1907, and for the whole year 1907, compared with the same periods in 1906:

	December, 1907.	Decrease.
Gross earnings	$282,099.98	$233,314.67
Less reserve for depletion of coal lands	41,322.31	16,507.08
Less reserve for depreciation of plants and equipments	77,220.38	35,630.20
Less interest on first mortgage bonds	88,250.00	7,713.14
Net earnings	$75,307.29	$173,464.25
	Year 1907.	Decrease.
Gross earnings	$5,731,983.28	*$434,859.95
Less reserve for depletion of coal lands	725,937.22	17,083.03
Less reserve for depreciation of plants and equipments	964,809.27	229,285.15
Less interest on first mortgage bonds	1,082,643.88	84,596.75
Net earnings	$2,958,592.91	*$765,824.88

* Increase.

The New Waltham Gauge Grinder.

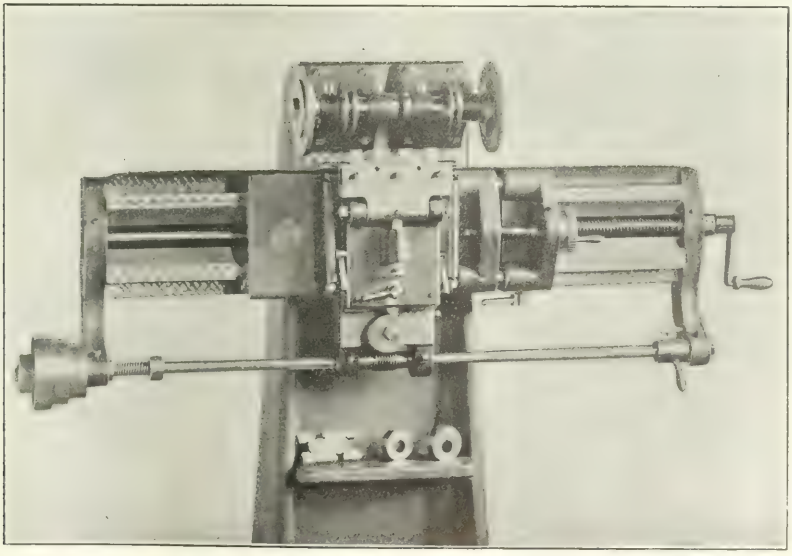
The machine shown is designed for grinding gauges where exactness is required. It was built originally for Wyckoff, Seamans & Benedict, but the maker, the Waltham Machine Works, Waltham, Mass., proposes to place it on the market. The gauges are first rough ground by the use of a corundum or other abrasive wheel carried on the right hand head. When the work has been reduced to nearly the required size the work carrying slide is quickly moved by the crank at the right of the cross rail to a position for contact with the diamond charged lap carried on the left head. The drives of the two heads are by separate belts.



The Gauge Grinding Machine Built by the Waltham Machine Works, Waltham, Mass.

An important feature of the machine is the provision made to prevent "bell-mouthing" of the work. This is effected by a specially cut cam, which is of the usual heart shape, but with its pitch increased at the high and low points, by which means the work is carried by the grinding laps at a greater speed at each end of the stroke. Fine adjustment for depth of cut is obtained by the graduated hand wheel at the right of the workslide.

When it is necessary to measure or remove the work the holder can be swung forward to an angle of about 45 degrees. A spring holds it in place against stops at the back when in position for grinding. An adjustment is provided for altering the position of the vertical slide so that gauges of different widths may be ground. A clutch controlled by the lever at the right of the lower driving shaft permits the stopping of the work without stopping the countershaft. The spindles, bearings and other working parts are of hardened steel. Several cams with different degrees of throw are furnished.



A Larger View of the Head of the Waltham Gauge Grinder.

Iron Ore Production in 1907.

The statistical work of the United States Geological Survey on the iron ore production for 1907 is sufficiently advanced to justify a preliminary estimate on the total amount of iron ore produced in the United States during the last year. Returns have so far been received from producers known to represent about half the output of the country, and these returns indicate that the total production for the year will fall between 52,000,000 and 54,000,000 gross tons. The total production in 1905 was 42,526,163 tons; that of 1906 was 47,749,728 tons. A total production of 53,000,000 tons in 1907 would amount to an increase of about 11 per cent. over the production of 1906. This gain was very unevenly distributed among the several producing districts. The Lake Superior District seems to show an increase of about 15 per cent.; the Southern District shows an increase of only 4 per cent.; and the Northern or Northeastern District gains 8 per cent. The Western District figures are as yet very incomplete, but appear to show little or no gain over 1906.

As the estimates are based on incomplete returns they are subject to correction, but whatever the corrections may be, final returns will show that the production of iron ore during 1907 was largely in excess of its consumption. The amount of ore held in stock at the close of the year at mines, ore docks and other receiving points is probably the largest in the history of the iron trade.

The Kilbourne & Jacobs Mfg. Company, Columbus, Ohio, has received a large order for steel road scrapers for shipment to Warsaw, Poland. In the past few weeks the company has received several other good foreign orders.

The American-Ball Angle-Compound Steam Engine.

A new and interesting type of high speed engine has been designed by F. H. Ball and his son, F. C. Ball, of the American Engine Company, Bound Brook, N. J., which is known as the Angle-Compound engine. It is the contention of the designers that on a high speed engine a complicated valve gear, even if very efficient, has the serious disadvantages of increased cost of maintenance and greater liability of interrupted service, and that where high efficiency is desired a much better plan is to use a compound engine of simple design because it is vastly more economical of steam than any simple engine. The Duplex-Compound engine is in this line of development, and now this later engine is another step in the same direction.

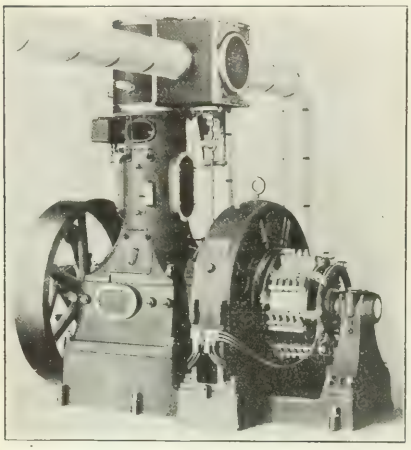
The general plan of combining a horizontal engine and a vertical engine so that both shall work on the same crank pin is not new. There are examples of this in the large engines installed in the traction power houses of New York City, but the many desirable features of this arrangement for high speed engines of the single valve gear type do not seem to have been appreciated.

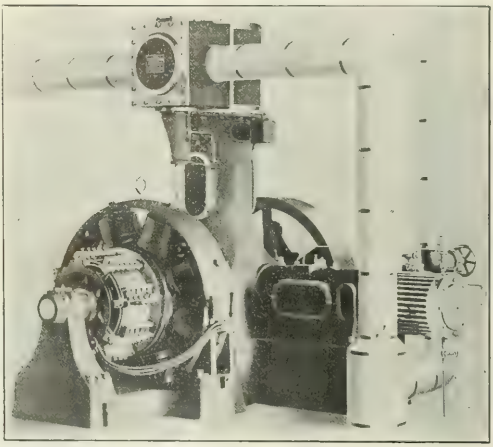
In reciprocating engines the question of counterbalancing becomes more important the higher the speed, and it is a common mistake to think that such engines may be counterbalanced so that the inertia thrusts are neutralized. A counterweight attached to the heel of a crank merely transfers the unbalanced thrust from the plane of the reciprocating parts into a plane at right angles to it. Thus in a locomotive the counterweight in the driving wheel simply transfers the unbalanced thrust to a vertical plane. Recent experiments with a locomotive testing equipment have shown that at high speeds this vertical thrust becomes so great that when the counterweight passes over the shaft the wheels, with the weight of the engine on them, are actually lifted clear of the track. A horizontal engine, with the inertia thrust of its reciprocating parts transferred into a vertical plane will not rock on its foundation, and therefore seems to be balanced. It is the usual practice to counterbalance the largest part of the horizontal thrust in this way.

It is evident that by combining a horizontal and vertical engine on the same crank pin, the total horizontal thrust may be neutralized by counterbalancing, and when the counterweight is in a vertical plane it is opposed by the reciprocating parts of the vertical engine, so that at four points of the stroke a perfect balance is realized, and between these four points there is no position of the crank where there is any appreciable unbalanced condition.

In the Angle-Compound engine herewith illustrated, the conditions for perfect balance are brought about by making the low pressure piston a very light, conically shaped, steel structure of about the same weight as the ordinary cast iron piston in the high pressure cylinder. The low pressure engine is made the vertical engine because it is thought desirable to have the larger piston supported vertically on its rod rather than to slide on the walls of a horizontal cylinder.

By referring to the two views of the engine, it will be seen that the high pressure valve is driven by the usual valve gear and shaft governor, and the low pressure valve by an eccentric which is inclosed in an oil tight casing and connected with the oil circulating system of the engine. From this eccentric a rod drives direct to the low pressure valve stem, which is guided by a crosshead carried in guides as shown, and the crosshead and guides are also included in the oil circulating system. The latter is similar to that commonly used on the American-Ball engines, except that the oil is pumped directly to the gravity storage tank on the low pressure frame which is kept constantly overflowing by the supply delivered to it from the pump. A double stuffing box on the valve stem and bulkheads and stuffing boxes on both piston rods prevent the water drip from mingling with the oil of the circulating system. The water drip from all these stuffing boxes is carried off by concealed piping.





Two Views of the American-Ball Angle-Compound Steam Engine, a Combined Vertical and Horizontal High-Speed Automatic Engine Built by the American Engine Company, Bound Brook, N. J.

A new departure has been made in the arrangement of the crosshead and guides, which are of the bored type. It will be noticed that the crosshead is a single piece without the usual adjusting shoes, while the guides are made adjustable. These guides are carried in bored seats, and a projection from the back of the guide fits between the supports, so as to resist end thrust. One of the guides is secured to the support by screws, and is only adjustable by means of shims, but the other has a pair of screws at each support to provide for delicate adjustments, and the guide is securely held against these adjusting screws by a bolt that locks the adjustment securely when set up. The crank pin is double the usual length, and the connecting rods are placed side by side on this double length pin.

The builder claims that this type of engine runs more smoothly and with much less strain and shock than any other form of high speed engine, because of its perfect balance and because it has four impulses on the crank at each revolution instead of two. One of these engines of 160 hp. 11-in. stroke, running about 300 rev. per min., direct connected to a generator, was recently installed in the company's own power plant. This engine has no special foundation, except the concrete floor of the building and no foundation bolts. A full length pencil stood on its end on the horizontal cylinder and on the vertical

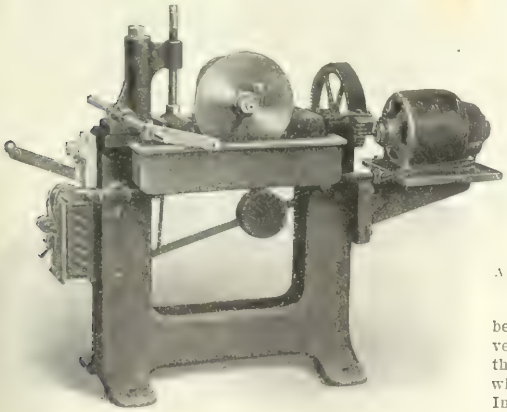
cylinder did not tip over even with a fluctuating load on the engine, showing a remarkable lack of vibration.

The floor space required by this engine is very small, since two engines of the same power are accommodated in substantially the space of one horizontal engine of half their combined power. The cost of the foundation is correspondingly smaller, and the perfect balancing of the engine simplifies the foundation problem; where concrete floors are used, no further foundation is ordinarily required.

For large powers these engines, combined in pairs with the generator or belt wheel between them make an exceedingly compact unit. In these combinations the engines are used as double compounds when run noncondensing, or where condensing water is available, as four-cylinder triple expansion engines. In the latter case one horizontal engine is the high pressure, the other horizontal the intermediate pressure and the two vertical engines combined are the low pressure engine, thus giving a large area of low pressure piston without using any pistons of very large diameter. Since the normal speed of an engine of this kind is high, the cost of the generator, and the amount of floor space are both greatly reduced. The engines are built singly or in combinations for capacities from 80 to 1000 hp.

A Small Burr Motor-Driven Cold Saw.

The engraving herewith shows an application of motor drive to the No. 1 cold saw manufactured by John T. Burr & Son, 433 Kent avenue, Brooklyn, N. Y., similar to the one of belt driven type described in *The Iron Age*, May 16, 1907. It is adapted to cutting off bar stock, pipe, &c., of all sizes up to 3½ in. in diameter. The machine uses a saw blade 10 in. in diameter, which is fed to the work by gravity; the feed is adjustable by altering the position of the weight on the lever shown. The driving



A Motor Driven No. 1 Cold Saw Built by John T. Burr & Son, Brooklyn, N. Y.

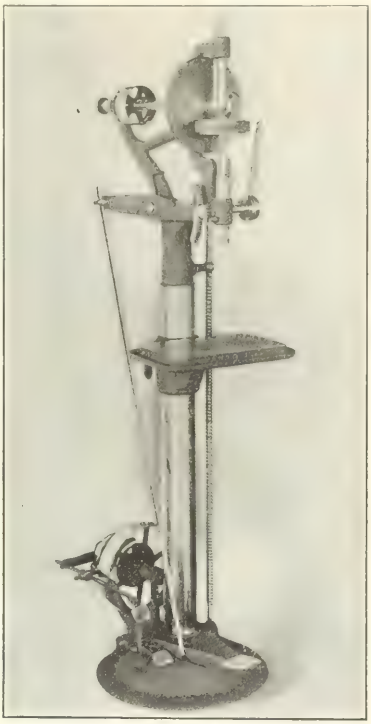
mechanism consists of a steel worm carried in a bracket on the carriage, a hobbed worm wheel and steel pinions.

The machine is driven by a ½-hp. constant speed motor running at about 2000 rev. per min., connected to the splined worm shaft by a rawhide pinion and a cut iron spur gear. All of the gears are covered, and the starting box and switch are conveniently placed at the working end of the machine. Either a direct current or an alternating current motor can be furnished.

The Joseph Joseph Bros. Company, Cincinnati, dealer in scrap metal, has taken the large manufacturing building at Worcester, Mass., formerly occupied by the Wheelock Engine Company, and will establish a branch on the premises. The New York, New Haven & Hartford Railroad has placed spur tracks in the yard. The Worcester establishment will be the assembling and shipping point for scrap metal purchased through New England. J. H. Crosby, Boston, has been made local manager.

A New Barnes Friction Disk Drill.

An addition to the line of friction disk drills manufactured by the W. F. & John Barnes Company, Rockford, Ill., shown in the engraving, is a combined hand and foot lever feeding machine. Among its more important features are that the speed of the drill spindle can



A Combined Foot and Hand Feed Friction Disk Drill Built by the W. F. & John Barnes Company, Rockford, Ill.

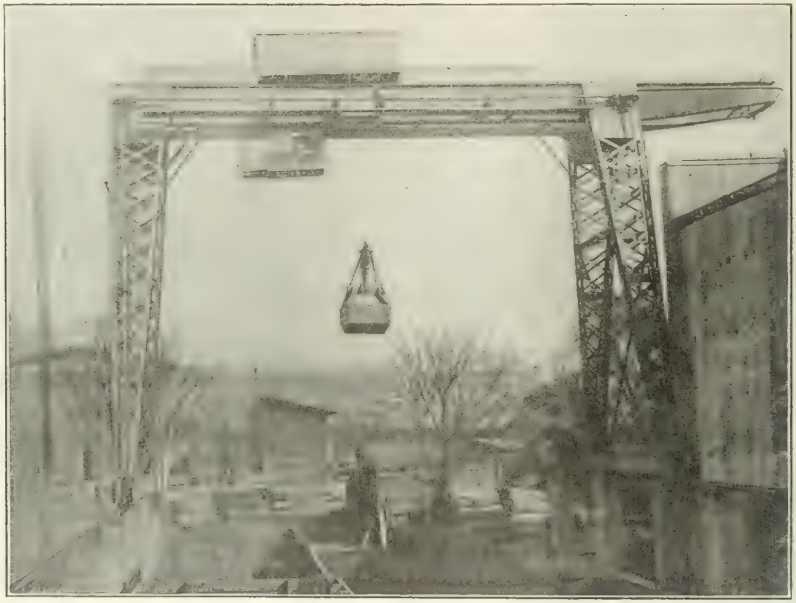
be increased or diminished instantly, or the motion reversed without stopping the machine or shifting belts, this being accomplished by sliding the driven friction wheel from, toward or past the center of the driving disk. In this way more or less driving power can be applied to the drill spindle, as the size of the drills or the nature of the work may demand. The feed lever is provided with a sensitive adjustment, which in connection with the control which the operator has over the speed and power makes it possible to use the smallest drills with the least danger of breaking them. By a conveniently located hand screw the platen or table can be moved rapidly on the column and clamped firmly at any desired hight.

The machine will drill holes up to 5-16 in. in diameter to the center of a 10-in. circle. The greatest distance from the base of the drill to the spindle is 48 in., and the greatest hight from the platen to the spindle is 36 in. The distance from the column to the spindle is 5 in., and the diameter of the column 3½ in. The spindle is ¾ in. in diameter, and has a vertical travel of 4 in. The table is 10 x 14 in. in area. The tight and loose pulleys are 5 x 2 in., and are intended to run at a speed of 350 rev. per min., at which the speed of the spindle may be varied from 0 to 1600 rev. per min. The floor space required by the machine is 22 x 18 in., its hight over all is 56 in., and it weighs 170 lb.

A Gantry Crane Coal Handling System.

The Dayton Citizens' Electric Company, Dayton, Ohio, has recently completed a modern power plant for supplying light, heat and power to the business and residence sections of the city. A district steam heating system is operated during the winter season by using the exhaust steam for heating, and the distribution covers an area having a radius of about one and one-half miles from the plant. The building is 60 x 128 ft., of reinforced concrete with brick veneering on the front. A basement is provided for the condensing apparatus, which is to be used during the summer months when no heat is sold.

In the design of the plant provision was made for installing eight 500-hp. Stirling boilers, although the actual number in use at the present time is four. These supply the steam for two 1000-kw. Westinghouse-Parsons steam turbines. The breeching for the boilers is carried downward to a flue which runs lengthwise of the building, and the load the operator can fill the bucket and discharge the load without extra help. The advantages claimed for this system are the low cost and ease of handling material, low cost of installation and maintenance due to size and small number of working parts and large area served.



The Coal Handling Gantry Crane Installed for the Dayton Citizens' Electric Company by the Cleveland Crane & Car Company.

the top of which is level with the floor of the engine room. Thence the gases are conducted to the reinforced concrete chimney, which is 12 ft. in diameter inside and 180 ft. high. This chimney is of ample capacity to provide for an equipment of four times the present installation.

The layout of the plant, the design of the building and the erection were under the charge of John Bronton. The contractor for the building and the underground work was the Abbott-Gamble Company, New York. The American District Steam Company furnished the equipment for the steam heating system.

In an effort to get away from the multiplicity of detail incident to the putting in of a pivoted bucket system, a coal handling gantry crane with grab bucket, illustrated in the view herewith, was designed and built by the Cleveland Crane & Car Company, Wickliffe, Ohio. The runway for the gantry crane was raised about 8 ft. from the ground, which allowed a storage capacity of about 2000 tons of coal in addition to the 200 tons in the bunkers. By means of the gantry crane and grab bucket, coal can be unloaded directly from the cars into the bunkers, or can be taken from the car and deposited in the storage yard, to be rehandled at a future date when it becomes necessary to convey it to the bunkers. The entire operation is conducted by one man. By traveling with

The Foundry Exhibit at Toronto.—The Executive Committee of the Foundry Supply Association, which is preparing for an extensive exhibit of foundry equipment at the Toronto convention of the American Foundrymen's Association June 8-12, will meet at the King Edward Hotel, Toronto, on Monday, March 2. The Toronto exhibit will be the third of its kind. That at Cleveland in 1906 covered 25,000 sq. ft. of floor space, and represented 300 tons. At Philadelphia last year 45,000 ft. of floor space was occupied, and the exhibit represented nearly 500 tons of equipment and supplies. At Toronto 121,000 sq. ft. of floor area will be available. The secretary, H. M. Lane, 1924 Prospect avenue, Cleveland, Ohio, notes that nearly all the orders thus far received have been for more space than was used last year, the indications being that the exhibit at Toronto will surpass those that have preceded it. In addition to the most complete representation of molding machines and sand handling equipment yet seen, it is probable that molten nonferrous metals will be available for casting, and one firm is figuring on supplying the molding machines with molten iron.

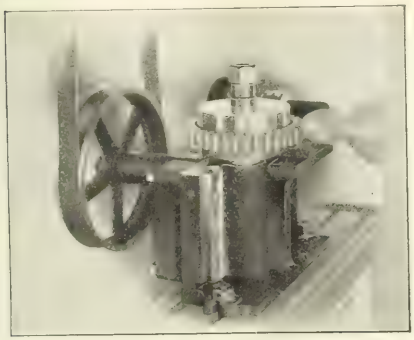
A bill providing for the creation of a Bureau of Mines will be reported to the House of Representatives at Washington at an early date. The only question undecided by the committee having the bill in charge is whether the bureau shall be under the jurisdiction of the Secretary of Commerce and Labor or the Secretary of the Interior.

At Toronto, Ont., a writ was issued February 13 for the foreclosure of a mortgage for $51,299 against E. Helen Currie, Major John A. Currie and the Northern Iron & Steel Company, Collingwood, Ont. The action was taken by Howard K. Wood of New York and is the last step in litigation in which this company has become involved.

The "Long-Arm" Automatic Tooth Chamfering Attachment.

The automatic tooth chamfering attachment for milling machines, herewith illustrated, derives its name not from any feature in the device itself, but from the company which is placing it on the market, the "Long-Arm" System Company, Cleveland, Ohio. This name was chosen when the company was organized to manufacture safety, electric watertight power doors and hatches for ships, which, being controlled from one point, as the ship's bridge, are in effect handled by a "long arm." Like many another article now on the market, the chamfering attachment grew out of a need in the designer's own shop. Gears enter largely into the principal product, many of which require chamfered or rounded teeth. Since there appeared to be no thoroughly satisfactory device sold for such work, this attachment was designed, and is now manufactured as a side line.

The attachment is adapted to be mounted on the table of a small milling machine and is used to chamfer the ends of the teeth of gears which enter into sliding gear transmissions such as are used in automobiles and often in the speed and feed mechanisms of machine tools. It is claimed to produce a surface of such uniform contour and smooth finish that any further finish is unnecessary. After the work is set up and the cutter and work are adjusted it is not necessary to stop the machine, even to substitute new blanks, while duplicate gears are worked upon. The attachment will chamfer gears of from 2 in. to 9½ in. pitch diameters, and of 4 to 10 diametrial pitch. When run at the intended speeds about 12 teeth per minute can be chamfered or rounded. The contour of the chamfering may be changed by using special cams or special cutters or both.



A Milling Machine Attachment for Chamfering the Ends of Gear Teeth, Made by the "Long-Arm" System Company, Cleveland, Ohio.

The frame of the attachment is cast iron, is of strong cross section and to it all of the parts of the complete attachment are secured. Two slots are provided for the bolts clamping the attachment to the milling machine table. No tongue fitting the table T slot is necessary for its proper alignment. The bracket is securely fastened to the side of the frame and the principal driving mechanism is held in it. This consists of the main driving shaft with pulley and pinion attached, cam spindle with cam and cam gear attached and engaging with the driving pinion and the rocker arm carrying the intermediate gear connecting the cam gear with the worm driving gear. The worm is of hardened steel of the required pitch, to properly engage with the work to be chamfered. Worms of different pitches are required for different pitch gears, but one worm will drive all gears of one pitch and any number of teeth within the range of the attachment.

The worm slide is adjustable to and from the work spindle and is clamped to the frame in the required position. The worm shaft is carried in this slide and means are provided for taking up wear or lost motion. The work slide is fitted to the frame and its vertical movement is controlled by the cam and cam roll. It also has means for taking up wear. The cam roll pins are secured to the back of the work slide. The work spindle is of hardened steel and is ⅞ in. in diameter. To it the work is fitted either directly or with bushings. The cam is of hardened steel and has a cam roll groove cut in its face. It is securely fastened to the cam gear, its periphery fitting into a bored recess in the frame, which gives an additional support to the cam shaft and increases its stiffness. Only one cam is regularly furnished with the attachment, this being designed to give a semicircular shape to the chamfered ends of the gear teeth. The cam roll is of hardened steel and is placed on the upper cam roll pin when working on the top, or on the lower cam roll pin when working on the bottom of the gear teeth. The cam roll may be easily changed from one to the other cam roll pin by moving the work slide.

The cutters usually furnished with the attachment are double end cutters, having bodies ½ in. in diameter, and are held in the milling machine spindle by a collet. With the attachment is furnished a countershaft having tight and loose pulleys, and a driving pulley and an idler pulley for taking up the slack of the belt. The countershaft is intended to run at a speed of about 72 rev. per min., which gives a speed of 40 rev. per min. to the driving shaft of the attachment, and the milling machine spindle should run at about 900 rev. per min. The intermediate and worm driving gears of the attachment are protected with a cover. The attachment weighs about 80 lb. and the countershaft about 90 lb.

The procedure in using the attachment is as follows: It is first clamped to the table of the milling machine by the two T-bolts, then the cutter is secured in the machine spindle. This cutter is set central with the work spindle on the attachment by moving the table adjusting screws. The table is then locked against longitudinal movement and moved laterally from the cutter, and is centered and located at the proper hight to engage with the worm by suitable bushings which fit the work spindle. The gear is then clamped in position by a nut. The setting being completed, the worm slide is pushed forward until the worm enters the teeth of the gear to a depth sufficient to prevent back lash and still permit the rotation of the worm and gears. In this position the worm slide is secured by clamping bolts and the intermediate gear is thrown out of engagement with the worm driving gear. If it is desired to chamfer the top of the gear teeth, the cam roll is placed on the upper cam roll pin, and the pulley is rotated by hand until the highest point of travel of the work is reached; then the table is elevated to the approximate hight required and is moved toward the column until the end of the cutter is at the root or bottom of the gear teeth, when the transverse table stop is set. The cutter is next centrally located in the space between two gear teeth by rotating the worm by hand, and the intermediate gear is brought into proper mesh with the worm driving gear and secured in this position. Finally the table is lowered and power is applied to the milling machine and attachment; then the table is gradually raised until the cut is made to the desired depth to give the required chamfer, and the vertical table stop is set in this position, or the knee is clamped to the column. The work now proceeds automatically until all teeth of the gear have been chamfered. In setting up to chamfer the bottom of the gear teeth the adjustment is made when the worm slide is at the lowest point of its travel, the cam roll being placed on the lower cam roll pin.

The Boston Gear Works, Norfolk Downs, Mass., has about completed the new addition to its factory, and is installing new machinery. The new building gives the company 50 per cent. more floor space, a total of 34,000 sq. ft., and a capacity of 150 machines, including 50 automatics. The company has one of the largest plants devoted entirely to gear work in the country, and is in a position to execute orders promptly for all kinds of gearing—spur gears up to 10 ft. diameter, worm gears up to 8 ft. diameter, spiral gears, any ratio, automatic turning work up to 16 in. diameter, and small brass and model work of every description. The company has a large list of standard stock gears.

New Publications.

The Story of Iron and Steel. By Joseph Russell Smith. Pages, 196; 16 mo. Illustrations, 14. Publishers, D. Appleton & Co., New York. Cloth, 75 cents, net.

The author is assistant professor of industry in the Wharton School of Finance, University of Pennsylvania, and he refers to the book as the outgrowth of courses in American industry. It is the latest to be published of the Appleton Library of Useful Stories. The effort has been to enable "an intelligent person to grasp the essence of the complex technical phenomena of iron and steel making without even having to meet technical terms." The book has the faults of any attempt to put in form for popular consumption the facts about a great industry that has a voluminous technical literature contributed by chemists, metallurgists and civil, mechanical, electrical and mining engineers. The "story" might well have been confined to the historical and economic aspects of the subject, but the author has essayed to popularize the technics of iron and steel manufacture. So far as an engaging style could do it he has made the book interesting, and for the most part has conveyed as adequate a notion of what iron and steel making involves as his readers will want. There is a difference between the kind of descriptive writing with which the magazines have made us familiar and the accurate setting down of the prosaic facts of a complex industrial development. The author of the former must often write roundly and make bulk rather than qualified statements, and sometimes this is at the expense of the facts. It is misleading, for example, to speak of "an ore containing one pound of phosphorus to a thousand pounds of iron" as "practically useless unless some means can be devised to get rid of the phosphorus." That cuts the ground from under the foundry, the puddling furnace and the iron rolling mill at a single stroke.

Again, in differentiating between Bessemer and open hearth steel, popular writing falls into very loose and inaccurate statements like the following: "For such pieces as railroad iron or structural girders a small flaw which might be fatal to an engine boiler would make little difference, and, therefore, the cheaper Bessemer steel has been steadily used." In his chapter on the formation of the United States Steel Corporation, Mr. Smith has followed the lines of magazine and newspaper articles in explaining how the consolidation came about. It is only the natural confusion of one not intimately connected with the status of the steel industry that makes the Carnegie Steel Company and the Federal Steel Company merely purveyors of half-finished steel for the manufacturers of finished forms before the day of the large consolidation. The author has the large vision of the popular prophets concerning iron and steel. He sees the day of the elimination of independent producers and the supremacy of the Steel Corporation, due to the early exhaustion of the ore supplies of the former. The scene is dramatic: "Here, then, lies a possible future supremacy in which the trust will stand virtually alone as its rivals die one after another beside their exhausted ore pits." Similarly, the author sees the coming supremacy of the electric furnace in a revolution which will inferentially put the blast furnace on the scrap heap.

But the things to find fault with in Mr. Smith's book, considering its aim and the place it is to fill, are the exceptions. It is quite worth the time of the general reader.

The "Ironmonger" Metal Market Year Book. 4 x 6½ in.; 74 pages. Published by the *Ironmonger*, 42 Cannon street, London, England. Price, 2s. 6d.

Last year's edition of this statistical manual of the iron and metal trades was called the "Metal Market Handbook." A new name has been chosen for the second year's publication, and the features of the book have been added to, making it a very useful compendium of information on developments in 1907. Not only are prices and movements of the metals in British markets given for last year, but also statistics of pig iron production in the United States and Germany, and for the latter country the deliveries, month by month, of the various classes of material shipped by the Steel Works Syndicate. For Great Britain full tables are furnished showing the range of prices over a term of years, and for last year by months and in some cases by days. Pig iron warrant statistics are given in detail, also prices of makers' iron in the various districts month by month. The volume is both convenient and valuable.

The Standard Chain Company's Report.

The Standard Chain Company, Pittsburgh, Pa., has made public the following condensed balance sheet as of December 31, 1907:

Assets.

Cost of property		$1,131,353.32
Company's capital stock and first mortgage sinking fund bonds, pledged as collateral with trustees for the bondholders		84,707.14
Company's first mortgage six per cent. sinking fund gold bonds pledged as collateral to loans		77,000.00
John C. Schmidt, trustee, shares of the company's capital stock purchased at cost		9,615.00
Investments in shares of the capital stock of the Standard Chain Company of Canada, Ltd.		27,800.00
Cash on hand and in bank		21,139.84
Accounts and notes receivable		216,899.08
Inventory of raw material, supplies, material in process, finished product, &c., as furnished by the company		384,043.64
Total		$1,952,558.02

Liabilities.

Preferred stock outstanding	$515,700.00	
Common stock outstanding	284,871.43	
		$800,571.43
First mortgage six per cent. sinking fund gold bonds outstanding		545,000.00
Notes and accounts payable		233,018.85
Accrued wages		11,570.38
Accrued interest and taxes		14,022.26
Unpaid dividends		8,427.57
Reserve for depreciation		25,000.00
Surplus		314,947.53
Total		$1,952,558.02
Net income from operation for the year ending December 31, 1907, after charging bond interest	$143,185.80	
Less amount set aside as a reserve for depreciation	15,000.00	
		$128,185.80
Less four quarterly dividends of 1¾ per cent. on preferred stock		32,817.75
Net increase from all sources carried to surplus		$95,368.05

Ball Bearings on Fans.—Some time ago the Massachusetts Fan Company, Watertown, Mass., began the use of ball bearings on its large fans. Friction was thereby materially reduced, and the pollution of the air by the oil escaping from bearings avoided. It is now stated that this company is about ready to place on the market a complete line of smaller steel plate fans equipped with ball bearings. The success of these fans will certainly mark a distinct advance in fan blower practice, for both personal attention and the continuous use of oil will be avoided, while the power required will be materially reduced.

At the annual meeting of the Wellman-Seaver-Morgan Company, Cleveland, Ohio, held February 18, the old officers and directors were re-elected. The financial reports that were made regarding the past year's business were very satisfactory. The company has considerable work on hand and reports an improvement in inquiries in the past week or two. While none of the inquiries calls for a large amount of work, they are considered good.

The report of the Nova Scotia Steel & Coal Company, Ltd., New Glasgow, Nova Scotia, for the calendar year 1907 shows profits of $944,791. The deductions are $266,886 for interest on bonds, $274,428 for depreciation, sinking fund, &c., $82,400 for 8 per cent. preferred dividend and $299,256 for 6 per cent. common dividend. The balance for surplus was $21,821, as against $385,458 for 1906, when no dividend was paid on common stock.

Iron Mines Held on Short Leases.

Active Work at Such Properties Planned for 1908.

DULUTH, MINN., February 20, 1908.—Since the settlement of the question of lake ore prices for the coming year there has been some slight gossip as to production and shipments, but the subject is of little interest just now. The Pittsburgh Steamship Company (Steel Corporation) is understood to say that if it handles more than 50 per cent. of its tonnage of 1907 it will be satisfied; but this would seem a pessimistic estimate, for 50 per cent. of its usual tonnage would mean but about 33 per cent. of the usual Oliver Iron Mining Company shipments. It must always be borne in mind that the Oliver Company has large and important minimums at certain mines, and that some of these mines are held on short leases, making it imperative that the minimums, and as much more as possible, be taken out each year. An attempt will be made this year to handle some ore from the Canisteo lands, on the west end of the Mesaba range, where the minimums are heavy, and the permanent washery is soon to be erected. A site has been chosen and all preliminary details are closed up. This washery will handle up to 10,000 tons a day ultimately. This does not mean that the entire capacity will be erected at once or in the coming year.

Quietness on the Cascade Range.

The present winter is especially quiet at some outlying locations on the lake ranges. Those districts that have been under the incubus of a lean, silicous or high phosphorus ore, where mining costs are not low, and whose ore the furnaces do not hunger for, are very quiet. The Palmer District of the Cascade range is one of these, and there is nothing doing at its mines or explorations. A large amount of work has been done there the past year or two by a syndicate in which Messrs. Longyear and Bennett of Minneapolis are interested. The Oliver Iron Mining Company has the Moore mine there, which had a short season last year, with no shipments. It has a good equipment and is capable of a large tonnage produced at exceptionally low costs. At the Empire, a new mine, the ore body has been stripped, but when this contract expired a few days ago work was stopped, and will not resume until spring at the earliest. The Star West, of Corrigan, McKinney & Co., is idle, and is likely to remain quiet a considerable time. This mine has a well planned equipment and is able to ship heavily. Explorations there last year proved the existence of good ore at depth, which was the one question upon which the Cascade range has always been in doubt.

The Overhead Stripping Plant Abandoned.

It will be recalled that four years ago the Chicago engineering firm of Hoover & Mason undertook experiments at the Grant mine of the Jones & Laughlin Steel Company with a great overhead grab bucket designed for stripping and ore mining. The experiment has been continued until quite recently, never successfully, and always at high costs. The total expenditure probably reaches half a million dollars. Success might have come under other conditions and where the material to be handled was not so refractory in character. But for Mesaba range stripping the machinery adopted was too rigid in nature, the conditions too hard, and the costs of operation and repairs too severe. The experiment has important results bearing on the general method of moving material under such conditions, and the engineering public is to be congratulated that it was made, and by a firm able to carry it forward thoroughly. The mining company is now arranging to strip the Grant by steam shovel and prepare for mining open pit by shovel at the earliest opportunity. The overburden at the Grant covers an area of some 15 acres to the average depth of about 80 ft., and will require several years. The clam shell device was a 25-ton capacity grab bucket hung from steel cables suspended between towers, each 150 ft. high, and traversing tracks on either side of the proposed pit, some 1100 ft. apart. The bucket with load weighed nearly 50 tons, and was to be moved along the cables for dumping outside the pit. The plant, it will be seen, was designed for tremendous work. It was most carefully built, and the electrical appliances were most elaborate. The plant will be wrecked and removed. So far there is nothing equaling the steam shovel of standard size and design for the removal of overburden or the mining of ore in place on the Mesaba range, and this in spite of the well-known deficiencies of the shovel from an economical standpoint.

Activity on Michigan Ranges.

Operations on the Swanzey range, where the Cleveland-Cliffs Iron Company is opening several mines, will be on a large scale the coming season. This company has been sinking a concrete shaft at one of its new mines, and is now engaged in moving the Escanaba River from too close proximity to the mines. The river bed is largely quicksand, and the removal is prompted by the hope that less water will be pumped than would be the case if the river were left running within 75 ft. of the Smith shaft. The task of removal is greater than the company anticipated, on account of the amount of sand in the bed of the stream, and it will be some time before it is accomplished. At the same location the Oliver Iron Mining Company's Stegmiller property will be worked with a good deal of vigor this year. New and larger equipment is being placed in the mine, which is to be deepened and opened with additional drifts, &c. It is now down 300 ft. This company will drill extensively in the same neighborhood on a tract lying between two of the Cleveland-Cliffs properties. This may result in a fifth mine at Gwinn, as the new town is called.

Near the west side of Iron County, Menominee range, the season is opening auspiciously. The Oliver Company, Pickands, Mather & Co., Corrigan, McKinney & Co., the Pewabic people, the Brule Mining Company, the Buffalo & Susquehanna interests and the Huron, Spring Valley and Florence Mining companies are all at work there, with very encouraging prospects on their newer developments. Many private prospectors and explorers are also working in the hope of finding something worth selling. The Baker will be added to the shipping lists this year by Corrigan, McKinney & Co., and two more, the Tully and Blair, may also be small shippers. A mine now known as the Buckholz will probably ship some ore for Pickands, Mather & Co., while the Mineral Mining Company will have three properties, two of quite good size, instead of two small ones, as now. The Brule Mining Company will have one, possibly two, new mines in operation there before the close of the year. Half a dozen more may be in the lists this year.

The Crystal Falls region is also doing quite well. More exploration is now under way in that section than this time last year, in spite of general dullness in the trade.

The Oliver Iron Mining Company has taken a block of lands in the Baraboo District, which it will probably explore shortly. The shipments from this district were larger in 1907 than in any previous year.

Efforts of the Minnesota Steel Company, the United States Steel Corporation subsidiary, which is to erect a steel works at Duluth, for a bridge to permit it to cross the St. Louis River and connect with a belt line around the head of Lake Superior, have been successful.

The Iron and Steel Institute will hold its annual general meeting at the Institution of Civil Engineers, Great George street, London, S. W., on Thursday and Friday, May 14 and 15, 1908. The annual dinner will be held, under the presidency of Sir Hugh Bell, Bart., in the grand hall of the Hotel Cecil, May 14. The autumn meeting will be held in Middlesbrough on September 29 and following days. The council will shortly proceed to award Carnegie research scholarships, and candidates must apply before February 29. The awards will be announced at the general meeting. In order to be included in the voting list at the general meeting, applications from candidates for membership of the institute must be received at the office of the institute, 28 Victoria street, London, S. W., not later than March 24.

THE IRON AGE

Established in 1855.

New York, Thursday, February 27, 1908.

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Improvement of the Cast Iron Car Wheel.

The cast iron car wheel manufacturers have long been regarded, or perhaps have regarded themselves, as the successors of an ancient people who were required to make bricks without straw. It has been the staple complaint of the manufacturers of chilled wheels that the railroads made the purchase of wheels a purely commercial transaction, the lowest bid taking the business. The manufacturers have urged that it is impossible to make such improvements in quality as the railroads have demanded, and have contracts awarded solely on the basis of cheapness. This contention does not lose sight of the fact that tests have been prescribed which wheels must pass if they are accepted. There are demands of service which cannot be represented by the drop and thermal tests, which decide whether a batch of wheels shall be accepted. The 100,000-lb. car and the violent and long continued braking of heavy trains in mountain country have put the cast iron wheel to service tests which the best is none too good to withstand. The redesigning of the wheel, with the thickening of flanges and changing the coning of the tread, has done something, but more and more is heard of the failure of cast iron wheels, and more frequently is the opinion given railroad sanction that under cars of high capacity resort must be had to the steel wheel. The *Railroad Gazette*, while convinced that it has not yet been definitely shown what is the matter with the cast iron wheel, so that intelligent effort may be made for its future improvement, points out that the conditions are not to be mistaken:

> Probably nobody will deny that the case is serious. That a cure is not yet in sight is evidenced by the large and increasing percentage of steel wheels that are being put under high capacity cars. It is not reasonable to suppose that railroad managers would buy steel wheels for this purpose if, by an advance in price, they could obtain a cast iron wheel to meet their requirements. It is not a case of obtaining business through advertising the superiority of their equipment, nor would these same managers consider for a moment a proposition to put steel wheels under 60,000-lb. cars. They simply feel that traffic demands have outgrown the capacity of the cast iron wheel, and they are obliged to use steel just as they did years ago in passenger cars and engine truck wheels. . . . It is quite safe to predict that until the cast iron wheel is improved along the lines of positive information, the use of its rival, the steel wheel, will continue to increase, and the steel wheel will be placed under a larger and larger proportion of the high capacity freight cars of the country.

The case is not one of a direct issue between the steel wheel and the cast iron wheel as between fit and unfit. Our contemporary suggests that so far as the chilled wheel is concerned, there is a large unexplored field particularly as regards differences in hardness of chill, internal stresses, effect of brakeshoe action, and the effect of varying temperatures in pouring. Experimentation with steel has increased vastly in recent years the certainty with which results may be counted upon in all engineering work in which it is used. Yet it is safe to say that the studies of the past year in the effect upon the reliability of rail steel, of varying treatment in mill and in track, have yielded more of practical value to the railroads and the steel companies than was developed in a half dozen previous years. Car wheel manufacturers and users have not as great an incentive as the steel manufacturers and steel consumers to enter minutely into an expensive investigation. Car wheel founders have no such accumulated resources as have made possible the maintenance of the technical staffs of the leading steel companies and the splendid results of laboratory work on steel on both sides of the water. But the cast iron wheel interests and the railroads working together might do much in defining the respective fields of cast iron and steel wheels. Both have a great stake in the solution of the questions now overhanging the use of the chilled wheel. There has been a long campaign of assertion and counter assertion, and just now the tendency seems stronger than ever to emphasize the shortcomings of the cast iron wheel. What is needed is such a thoroughgoing investigation of the conditions of manufacture and service as has helped to clear up the situation in steel rails.

Indirect Manufacturing Expense.

It is an unfortunate and somewhat ill-considered use of words that has accustomed us to the terms "productive and nonproductive" expense. Some managers have a way of harping in most uncomfortable fashion upon the nonproductive element in the plant. To the individual who as clerk, designer or foreman, feels the vital importance of his work in the success of the business, this becomes peculiarly irritating. It becomes doubly so when he is called to account, either individually or collectively, for failure to maintain a certain standard of profits. Certainly the cost of raw material, and of the service of "nonproductive" salesmen are equally important factors; and yet many a relatively irresponsible employee has been subjected to just such ill-considered and unfair criticism, largely through a strange lack of comprehension of conditions, and likewise of human nature, upon the part of manager or owner.

Could the use of the terms "creative" and "noncreative" be properly limited they would far better express the relations existing between the men and the work they do. Though far more accurate in their expression of relationship, the terms "direct" and "indirect" must still be strictly limited in definition to be clearly understood. At all events they do not in the very words suggest a contrast in value of services or of responsibility for success.

Without much chance for confusion or misunderstanding, direct expense may be defined as that which is incurred by direct operation upon the product by which its form, character, use or appearance is changed. This naturally includes all the processes of the foundry and shop, even including painting and slushing. Whether it may also be made to include packing and other similar operations must to a certain extent be determined by circumstances. By elimination, the term "indirect" expense is readily defined as all that is not direct. This naturally includes as principal items all fixed charges, such as rent or interest on investment, depreciation, taxes, power, light, water, &c., the expense of labor and material for

maintenance, and of supervision and general care. But indirect manufacturing expense, which is an element in the cost of production, should be carefully distinguished and separated from the marketing expense as represented by salaries for administration, correspondence, selling, accounting, publicity and the like. The confusion of these two factors has in the past led to much misunderstanding, with attendant injustice to one or both of the departments represented thereby. As a basis for the application of overhead charges or burden, these terms all have their value.

Reference is sometimes made to the "visible" and the "invisible" expense; the terms are self-defining. In one of its simplest forms the visible is transformed into the invisible when the short-sighted manager reduces his clerical force below the actual requirements, and consciously or unconsciously throws part of the work on to shopmen, foremen or superintendents. Here it may be distributed among many, taking from each a little of his time, which in the aggregate, both of duration and cost, is likely to exceed by far that of the clerk. Like the ostrich with his head in the sand, the controlling spirit under such conditions appears to feel satisfied with results simply because he cannot see the expense, although it is there just the same.

How one will haggle over the price of a purchase, will scrutinize it with the utmost care, weigh it and measure it, and check it by every known means. How loosely, on the other hand, will one attempt to measure the product of labor. When it is on a day labor basis the mere opinion of foreman or superintendent is usually accepted in determining the rate of pay which from minimum to maximum efficiency represents a variation seldom exceeding 25 to 33 1-3 per cent.

While price and premium and bonus systems assist materially in establishing a more substantial basis of comparison, still they inherently lack the opportunity for measurement by an external standard. We may reasonably hope that, in course of time, such standards may be generally established for the complicated operations of the machine shop as they are already maintained in fundamental industries and simple operations.

Happily in this is a token that modern methods are rapidly educating the manufacturer to exercise better judgment, and enabling him to reveal the hitherto invisible, largely through specialization and concentration of effort. Compare with the improved method of pattern numbering and classification the old and unfortunately still existent custom of sending a shopman, usually the foreman, and possibly the superintendent, to help find patterns in the loft. In the former case the direct control of the patterns is by one relatively inexpensive individual with a card index at his elbow; in the latter, dependence must be placed in a fallible memory.

With such modern systems, with cost keeping methods up to and too often past the limit, it may with apparent reason be claimed that we have already revealed enough of the heretofore unseen to keep us busy. Certainly we are daily approaching more closely to an accurate measure of the true value of individual labor; we are beginning to realize that it is better to concentrate expense and see it, than to scatter and thereby hide it.

A more tender regard for the rights of stockholders is exhibited in Canada than in this country. The Canadian Board of Investigation, created for the purpose of assisting in the adjustment of disputes between labor and capital, has promulgated the official opinion that the employees of a railroad company "are not entitled to be compensated at the sole expense of people who have invested their money and who would in return be deprived of their means of livelihood. The public should bear their share." It says that betterment of railroad facilities, now so generally demanded, "can only be obtained where the parties asked to advance the money can see some possibility of return for the advance." This appears to be sound doctrine, equally applicable on this side of the border.

Workmen's Production in Dull Times.

Many manufacturers have found that their volume of production has not decreased correspondingly with the reduction in working forces. The experience has proved the same under both the daily wage and piece work systems of employment. The scarcity of work has prompted men to put forth their best efforts, and the result has been greater efficiency in both their own labor and in the tools which they operate. Under the hourly wage system the natural incentive has been to make individual labor more valuable to the employer. Under piece work the operative has been impelled not only by this same consideration, but also by the desire to obtain increased production and consequently a larger income.

This is a secondary development of the industrial depression. In its beginning a tendency developed to work slowly in order to prolong employment, to make work in hand endure as long as possible, so that the time of an ultimate laying off or discharge might be indefinitely delayed. A natural transition has been to better effort on the part of workmen, as they see that this will be more likely to help them to retain their positions. Restrictions of unions have become less conspicuous. The piece worker has given less attention to the regulation of the volume of his product—a usual adjunct of this system of wages—the effort being to secure the maximum of earnings without endangering the piece price. The independence of labor, which in some cases amounted to arrogance, has also largely vanished in the desire to retain employment. The result of all this is a measure of production out of proportion to the number of hands employed when compared with the time when full working forces were employed.

Probably there is nothing unusual in this condition, yet lessons may be learned that can perhaps be applied when manufacturing business again resumes full activity. It is certain that a great deal of unused or undeveloped latent energy exists when works are running at a strain in order to produce a maximum of product in a minimum of time. It was a common statement when business was rushing that plants were not being operated on an economical basis. This was partially due to the existence of makeshift methods and appliances that could not be avoided, because so great a demand had not been anticipated and, therefore, had not been provided against. Combined with inadequacy of works, as compared with the demand, was the nerve racking striving to keep up with promised deliveries. In the light of recent experience it would seem that the unwillingness of a certain element of labor also played a very important part in the lack of economical production. Workmen knew that their places could not be filled easily, and some of them took advantage of the fact in determining the amount of work they should do.

Now is the time to prepare for the resumption of business on a large scale. The lessons of money lost, of net earnings reduced, may be studied to advantage. Equipment that could not be obtained in the market when it was most needed should be secured, if doing so

would not conflict with good business practice. At all events everything in the manufacturing plant should be put in first rate condition. As important as anything is the consideration of labor conditions, not as they exist for the plant to-day, but as they should exist in prosperous times. The effort should be made to retain as far as possible the excellent results wrought through the agency of adversity. If labor has been tyrannical under prosperity it is not perhaps impossible to guard against a repetition of so full an indulgence of the trait. A laborer is worthy of his hire, but his employer is worthy of the best work of the laborer under all conditions. Something has been radically wrong if a manufacturing establishment employing 100 men is now producing close to its output when twice the force was at work.

Shop records of merit are maintained in some works, and it has been suggested that such a record would mark the steady, energetic, ambitious man, who should be given preference when curtailment becomes necessary. The knowledge of the existence of the system would have its effect in busy times, it is believed. In small establishments the personal equation of each man is known but in large works this intimate knowledge is lost as heads of departments change, unless it is put on record.

An interesting and important side of the present greater efficiency of workmen is the effect it will have on cost records. In the most efficient cost systems a card gives the time and cost of each operation on each part of a machine or other product for every lot that goes through the works. Comparison is always possible. A variation in cost between lots is watched for and quickly noted and investigated. New records are now being made, reducing cost because less time is required and less cost entailed, time and wage combining to make a lower figure. The same is true of piece work. Apart from the inestimable value of such records in the cost system, they give an excellent line on what individual men are doing under the varying conditions of industry.

De Lamater Iron Works Veterans.

The Associated Veterans of the De Lamater Iron Works held their fourth annual dinner at the Hotel Knickerbocker, New York, Friday evening, February 21. The officers of the association are the following: President, Alexander Miller; treasurer, W. M. Parker; secretary, J. V. Ireland. Advisory Committee: H. F. J. Porter and H. B. Roelker. The association is composed of the following persons who were connected with the old De Lamater Iron Works at some time in the career of that well-known New York company, which was organized in 1849 and gave up business in 1889. Nearly all are engaged in engineering work or manufacturing in New York: L. A. Bevan, A. DeBonneville, Jas. Craig, Alex. Cruickshank, Frank Creelman, O. R. De Lamater, Jno. Ferguson, M. Fogarty, A. B. Frenzel, F. A. Halsey, Frederick Hulberg, E. S. Innet, J. V. Ireland, D. M. Junk, Alex. A. Kennedy, Thos. J. McCabe, Geo. W. McLarty, Wm. A. McNab, Alex. Miller, W. S. Miller, Jno. A. Moran, W. M. Parker, H. F. J. Porter, Wm. Prellwitz, A. H. Raynal, T. J. Rider, Jno. N. Robins, Geo. H. Robinson, H. B. Roelker, R. P. C. Sanderson, Jno. Shields, Chas. Van Wagenen, Chas. F. Warren.

The souvenir of the dinner of 1908 consisted of a miniature gold screw propeller wheel, suspended from a bar bearing the legend "Veterans." The appropriateness of this use of the propeller wheel lay in the fact that its inventor, Ericsson, was for many years connected with the De Lamater Iron Works.

The A. S. M. E. March Meeting.—The next monthly meeting of the American Society of Mechanical Engineers will be held Tuesday evening, March 10, at 8.15 o'clock, in the Engineering Societies Building, New York. Dr. Charles P. Steinmetz, member of the society, past president of the American Institute of Electrical Engineers, and professor of electrical engineering, Union University, will deliver an address on "The Steam Path of the Steam Turbine."

The Traffic Club of Philadelphia.

At a meeting held in the Bourse, Philadelphia, on December 17 last, the Traffic Club of Philadelphia was organized and committees were appointed to complete some of the details. A meeting of the club will be held for the perfection of plans for future work on the evening of March 3 in the assembly room of the Bourse. A notice to that effect has been sent out by W. H. Heulings, Jr., secretary of the J. G. Brill Company, who is temporary chairman, and I. Elkin Nathans, special agent of the Pennsylvania Railroad, who is temporary secretary. The printed matter issued in behalf of the club shows a long list of Philadelphia manufacturing and commercial houses and local representatives of railroad companies participating in this organization. The nominations for permanent officers, all being residents of Philadelphia, are as follows:

President, Robert S. Perry, president Harrison Brothers & Co. Vice-Presidents—J. W. Rawle, assistant general manager J. G. Brill Company; Powell Evans, president Merchant & Evans Company; F. A. Bedford, division traffic manager American Bridge Company; Edward Knight, member of Biddle Hardware Company; W. A. Sproull, freight agent Cambria Steel Company. Secretary, Henry C. Trumbower, treasurer John Wyeth & Brother. Treasurer, H. S. Bonner, general sales agent Haines, Jones & Cadbury Company. Historian, C. W. Summerfield, secretary Merchants' & Travelers' Association. Board of Directors—N. B. Kelly, secretary Trades League (chairman); J. H. Sinex, president Garrett-Buchanan Company; Edwin F. Sellers, traffic manager Harrison Brothers & Co.; Theodore F. Sage, traffic manager Phœnix Iron & Bridge Company; Charles Bowden, traffic manager Pennsylvania Salt Mfg. Company; W. H. Wilshire, manager Consolidation Coal Company; W. L. Maize, purchasing agent Philadelphia Rapid Transit Company; George J. Lincoln, commercial agent Chicago, Milwaukee & St. Paul Railway; John B. DeFriest, general agent Union Pacific Railroad.

The Southern Steel Company's Affairs.

W. H. Hassinger and John E. Morris, Birmingham, Ala., and T. Stonewall Kyle of Gadsden, Ala., have been elected by the creditors as trustees of the property of the Southern Steel Company. The receivers surrendered the management to the trustees February 20. James T. Woodard, Robert B. Van Cortlandt, Walter T. Rosen, Franklin Q. Brown, Otto T. Barnard, Cornelius Vanderbilt and W. P. G. Harding are named as a reorganization committee. This committee has addressed a circular to holders of first mortgage bonds and collateral trust notes saying that in view of the default on the interest on various securities of the company and the cessation of operations at its plants, with the imminent possibility of disintegration of the properties, the committee has been formed for the protection of the holders of bonds and notes, and to prepare a plan of reorganization.

A petition was filed in January at Birmingham for the return of certain properties in Alabama to the possession of the Lacey-Buek Iron Company, from which the Southern Steel Company acquired them. A similar petition was filed at Chattanooga in which the trustee under a mortgage securing $600,000 bonds of the Chattanooga Iron & Coal Company, and that company itself prayed for the possession of the properties of the company now held by the Southern Steel Company.

The Locke Regulator Company, Salem, Mass., has again been successful in sustaining its right to manufacture the Locke engine stop, this time before the United States Circuit Court of Appeals. The decree of the lower court was affirmed "with costs."

Metallurgical Session of the Mining Engineers.*

Discussions on the Coming Investigation of Steel and on Segregation.

The Wednesday morning session of the New York meeting of the American Institute of Mining Engineers, February 19, 1908, was devoted to subjects of metallurgical interest. The first paper was on "The Work of the Testing Department of the Watertown Arsenal in Its Relation to the Metallurgy of Steel," by James E. Howard, engineer of tests, Watertown, Mass.

The Watertown Investigation of Steel.

Mr. Howard indicated the scope of the tests to be made, quoting from the programme as approved by the Chief of Ordnance, U. S. A. The first item of the inquiry is ingot metal, open hearth, Bessemer and crucible —fluid compressed and uncompressed. While questions of chemical composition, segregation, piping and the grosser cavities have frequently been given attention, defects of continuity of structure, which manifest themselves in the working of the metal and at the final stages cause distrust of the finished forging, have generally been neglected. The chief feature to be taken into consideration at the time the metal is in the ingot state is believed to be that of structural soundness and continuity. Evidence seems to show that structural discontinuity in the ingot is not corrected in the subsequent forging operations. If the direction of the stresses in the subsequent tests is in the direction of the flow caused by the various operations the defects may pass unnoticed. Their presence is revealed, however, by the application of stresses applied normally to the lines of structural discontinuity. The question of streaks has been much discussed. It is believed these streaks have their origin in the ingot and are due to lines of structural unsoundness. In the case of steel rails, for example, structoral continuity of the metal is highly important.

The second item in the inquiry includes blooms, billets and rolled and hammered shapes from ingots, including finished products of all kinds. Working temperatures, reductions in the rolls or under the hammer and the number of passes in the rolls should be ascertained. In addition to the question of the influence of temperature on final properties is the question how much or how little work at a given temperature is essential to attain maximum tensile strength and the display of those other features which accompany the tensile test.

Mr. Howard asked that the members of the American Institute of Mining Engineers indicate the specific tests which, in their judgment, should be made in the contemplated examination of ingots and rolled shapes. Two committees are contemplated, one on structural members and the other on metallurgical matters. The latter is composed of Major C. L'H. Ruggles and James E. Howard, Watertown Arsenal; William R. Webster, Prof. Edgar Marburg and Dr. Chas. B. Dudley; S. M. Vauclain, Baldwin Locomotive Works; E. F. Kenney, Cambria Steel Company; F. W. Wood, Maryland Steel Company; A. A. Stevenson, Standard Steel Works.

As part of the discussion of this paper there were offered the views expressed by those who attended a meeting, held in the council room of the American Institute of Mining Engineers September 24, 1907, to consider appropriate subjects for investigation at the Watertown Arsenal laboratory, with the money which had been appropriated by the Government for such purposes.

Suggested Lines of Investigation.

R. W. Mahon of the New York Central lines proposed an investigation of the cause of shelling of the tread of locomotive tires, and the best composition to prevent shelling; whether or nor 700 to 850 degrees C. are the best temperatures at which to anneal steel castings, and what is the best temperature at which to anneal vanadium steel castings; a thorough investigation of the question of homogeneity in steel plates as rolled from ingots and as rolled from blooms; the best method of shaping and annealing steel axles; the effect upon the value of the finished product of each of the modifications at present in considerable use in this country, and the effect of repeated annealing?

A. A. Stevenson of the Standard Steel Works, a member of the committee, invited to co-operate with the Watertown laboratory, referred to his remarks made at the meeting mentioned.

Views of Steel Manufacturers.

A written discussion offered by Charles L. Huston of the Lukens Iron & Steel Company, Coatesville, Pa., explained that variation in yield point, elongation and reduction of area may be produced by the manner of heating and by manipulating in the rolls, and also by the proportions of the test pieces. Speaking of transverse tests, he said he could vary the proportions of a test piece and the conditions of testing so as to get any results called for within limitations, and that it is the same with ingots if it is known what they are furnished for. He suggested that in addition to the proposed division of grades, as open hearth, Bessemer and crucible steel, they should be carefully divided into mild steel, steels of medium carbon and steels high in carbon, as well as the different alloy steels, on account of their very different action in cooling and solidifying from the molten state, which action largely affects the question of chemical uniformity, as well as of structural continuity. He anticipates that little effect will be observed in the final product from work done at the higher temperatures above the point of recalescence, as the work done at these temperatures does not permanently affect the structure of the steel to a great degree. He indorsed the use of a softer range of steel for boiler and structural work in the belief that a closer factor of safety could then be used. He considered that in practice, instead of allowing pressures or stresses in proportion to the actual minimum tensile strength obtained, which introduces a temptation to use just as hard a steel as can be passed under the inspection and thus avoids the use of great thickness to carry heavier stresses, results would be better if the reverse were done by establishing the unit stresses in the finished structure and then specifying the range of tensile strength for steel which would be allowed to stand these unit stresses. For instance, given a unit stress of 12,000 lb. per square inch, permit the use of steel anywhere between 50,000 and 60,000 lb. per square inch, provided it has a ductility represented by 1,500,000 divided by the tensile strength in pounds. This would encourage the use of soft steel for the same work, and the writer believed would result in much greater safety to the traveling public.

F. N. Speller of the National Tube Company agreed with a view that had also been taken by Mr. Stevenson, that all inquiries into the origin of the defects in steel should go back of the ingot, starting with the metal from the blast furnace and giving due regard to its composition, treatment, refining, ladle reaction, oxidation, &c. For example, in manufacturing soft steel sufficient ferromanganese may be added to deoxidize the metal, and by a good reaction in the ladle flush out the steel, so that the oxides formed are practically all absorbed by the slag. A slight change in the relative proportions of silicon, manganese, or other elements in the pig iron may alter conditions entirely, giving a ladle cinder incapable of absorbing the product of the oxidation from the steel, and resulting in more or less trouble all through the process. Yet in this case the chemical composition and structure of the ingot may be normal. The steel, however, is liable to develop defects under subsequent mechanical treatment. The fact that lines of weakness are developed under stresses applied transversely to the rolling does not necessarily prove the metal to have been structurally unsound in the ingot. To his mind it is more often evidence of lack of lateral work. In the National Tube Company's experience with

* The discussions herein abstracted will be revised by their authors and printed in the Transactions of the American Institute of Mining Engineers.

soft Bessemer steel in welded pipes most, if not all, structural defects in ingots are overcome by proper treatment in rolling.

Experiences with Rail Steel.

J. P. Snow of the Boston & Maine Railroad cited recent experiments with crescent breaks in rails, which would seem to furnish ideal fields for investigation. Rigid road beds and the very cold winter of 1906, 1907 were responsible for an unprecedented number of breaks, mostly base fractures of the crescent type. He defined and described two classes of flaws, gas seams and rolling flaws, and where they are found. He showed samples of failed rails with portions cut and polished. Gas seams he attributed to gas bubbles in the ingot, and rolling flaws to cracks, tears or folds in the surface of the ingot or bloom. Of a number of photographs he passed around one was of a piece of an ingot badly affected with gas holes, another showed the same piece forged on all sides under a drop hammer, and a third the same cleaned up in a planer and cut into two pieces. Two other photographs were the same exhibited by Mr. Huston to the American Society of Testing Materials, June, 1906, which represented the best practice in low carbon open hearth steel boiler plates. He believed that it would be desirable for the Watertown laboratory to try to trace flaws (gas seams and rolling flaws) to their origin. Openings in low carbon steels will weld up during rolling much better than those in high carbon steels, but for rails comparatively high carbon steel is necessary. If gas holes cannot be welded in this grade of steel, ingots must be cast so that they will not be formed. Slow teeming at proper temperatures may suffice, sink heads producing fluid compression may be resorted to; recharging with silicon as advocated by Sandberg may help; but it is hoped that some way will be found to manufacture rails substantially free from manifest flaws, which are proved to have led to such excessive breakage in the recent past.

A written discussion on Mr. Howard's paper submitted by Charles S. Churchill of the Norfolk & Western Railroad, advanced the opinion that the most needed thing is more definite information on the different methods of rolling steel from ingot to bloom and from bloom to finished shape. For example, what are the characteristic differences between blooms of steel rolled from the ingot with a reduction of 38½ sq. in. per pass in seven passes during 1¼ min., and with a reduction of 27.7 sq. in. per pass in 13 passes during 2¼ min.; and what are the respective characteristic differences between finished steel rolled from the bloom to finished shapes of the same size with a reduction of 7.4 sq. in. per pass in 11 passes during 1¾ min., and with a reduction of 4.7 sq. in. per pass in 11 passes during 3¾ min., with some delay in each case before the final pass, sufficient to make the temperature of the finished steel the same in both cases, the bloom in the second instance being reheated before rolling. In the first investigation one important matter would be the determination, as far as practicable, of the relative amount of welding that has taken place in the segregated portion of the ingot—that is, the upper half.

Discussion on Segregation in Steel Ingots.

The remainder of the forenoon was taken up with discussion of Prof. H. M. Howe's paper on "Piping and Segregation in Steel Ingots," presented at a previous meeting.

Written comment on this subject from P. H. Dudley of the New York Central Lines dealt with the difficulties of differentiating between reliable and unreliable data on variable methods of manufacture, chemical composition of the alloys of steel, mediocre practice, and that of the highest state of the art. Modern practice and large outputs in Bessemer steel have reversed the effects of the time element by cutting short the chemical reactions of the recarburizer and the elimination of the oxidation product before teeming; but a check has been given to the shrinkage of hot to cold metal by charging the ingots into furnaces after teeming. Thus there has been a reduction in the number of true pipes in rails. Segregation is more harmful in large ingots kept in vertical position than in small ingots placed in horizontal furnaces. Other defects of ingot structure are due to entrained slag, oxides and gas, particularly at the junctions of the columnar structure in the corners of the mold and the upper parts of the ingots. Some causes for failure of rails, as the flow of metal in the bearing surfaces of the head, mashing of the ends and the flaking of the metal from the upper corners of the head are due to insufficient cubic or volume elasticity of the metal to receive, sustain and distribute the passing wheel effects to the rest of the section. The difficulty may be due to the low grade of metal or entrained slag and oxides or other impurities in an intended high grade of metal from the chemical composition. Concerning specifications he stated that even if the same chemical composition is required the product will not be the same from any mill in the country because different ores, different size and shape of ingots, different systems of rolling and treatment modify the product either for wear of the rails or their safety as girders. Mills, he declares, which make five or six rails per ingot and cut the blooms into two parts and roll into two and three rail lengths produce a safer product as a girder than those that roll five and six lengths as a single bar and afterward cut to rail lengths. The writer's experience confirmed to an extent what had been said of the advantage of casting each ingot with the large end up; there is also the advantage that it permits more of the impurities to escape from the setting steel without being caught in the corners of the columnar structure.

The writer had found the most important essential for making sound ingots to be allowing more time for recarburizing either in the converter or ladle before teeming. Professor Howe did not distinguish between high and low carbon steel. Steels from 10 to 15 points carbon usually rise in the ingot, and do not form pipes, and it is necessary to cast such metal in bottle mouthed molds and cap them to prevent overflowing. Increasing the carbon makes the tendency more pronounced to form a pipe from what is usually considered shrinkage of the metal, unless other methods are used to obviate it. Teeming with a small size nozzle is also conducive to sound ingots and freedom from pipes and seams. The segregation of the ingot, while more or less associated with the piping of the upper part, may be also quite independent. Rails manufactured of the sections and specifications of the writer have shown comparatively few pipes after years of service. The opportunity for the metalloids to segregate and rise to the top of the ingot is not as favorable in the horizontal furnace as when the ingots are charged directly into vertical furnaces. The segregation was not as marked in the high carbon steels as it is now with ingots which are kept in vertical position from the teeming to the blooming. The general experience of teeming shows that in small ingots which set quickly the segregation is limited. The work done by the writer between 1890 and 1900, when cupola metal was used and care taken in the composition shows by actual experience in the track that sound ingots have been made in which piping is the least of their defects. This can be repeated in larger ingots with the advanced metallurgical knowledge of to-day. Mention was made of 95-lb. rails high in carbon and low in phosphorus, made from 14-in. ingots in 1891 and 1892 for the Boston & Albany, and 75-lb. rails for the Mohawk & Malone railroads. Most of these are still in the track. The heats after being carburized in the converter were poured and remained in the ladle five to six minutes to allow the chemical reaction and the escape of oxidation products before teeming the ingots, which were stripped, then thrown down in the pits and charged into horizontal furnaces for equalizing the heat before blooming. The blooms were cropped until sound steel was obtained, then chipped under the steam hammer, and again charged into horizontal furnaces for reheating and finally rolled into rails in 11 passes. They were finished between 950 and 1000 degrees C., as nearly as could be measured by copper ball and water pyrometer. Rolling the rails cold for wear must not be at the expense of their safety as girders. Commencing in 1893 Scranton rails were marked A, B and C for the top, middle and bottom rails from the ingots. The A rails showed that occasionally there was gas entrained slag and other impurities at the junctions of the columnar structure. The B and C rails hardly showed, after many years of

service, any breaking down of the inside running edge of the rail, either upon curves or tangents. The fractures of these rails in the track even under heavy traffic have been slight, and but few more have occurred in the A than in the B and C rails. Some of the upper ends of the A rails have crushed or worn slightly faster than the other portions of the rail under heavy traffic. Imperfections were mostly in A rails. There is often a well defined central core, which is not as readily seen in the B rail, and only rarely noticed in the C rail. The practice of marking rails, the writer believed, will soon be required of every mill. It has been done by the Lackawanna Steel Company since 1893. The segregation is pronounced in large ingots, particularly from vertical furnaces, and often included slag is found in the bearing surface of the head, which spreads laterally under the moving wheels and produces a split head, while there is scarcely a trace of pipe in the web. Large stubby ingots result in less split heads from segregation and entrained slag than small long ones. In Mr. Dudley's opinion the shortening of the time in the Bessemer department from recarburizing to teeming, has contributed to the inferior product of the large outputs of Bessemer rails. The segregation in the long ingots particularly when the phosphorus is at 0.1 is a serious matter for our present service of high speed trains; but the wear is a good deal better from high carbon low phosphorus rails. The corners of the mold at one mill have been made of larger radius, and this has helped some to relieve the columnar structure in the corner of much entrained slag and imperfections formerly found in the corners of small radii; but the shape of the molds does not permit of the escape of a very large amount of slag and impurities under rapid teeming. Steel made by the basic open hearth process in which proper time is allowed for the escape of the oxidation product has proved exceptionally tough and free from included slag. Apparently it is well adapted not only for a slow rate of wear, but safety in the sections as girders. The writer thought it safe to say from present studies that ingot structure will improve more in the next year than it has in the past decade.

Professor Howe continuing the discussion of the paper explained why there is more segregation in large ingots than in small ones. He also exhibited carbon iron diagrams of a number of different sized ingots poured from the same ladle. Rapid fluctuation in the amount of segregation is particularly noticeable near the top of the ingot. He believed that the idea must be abandoned that large size is the chief cause of segregation; quantities of large and small ingots will average about the same in segregation, though individual cases may vary a great deal. The main points impressed by the speaker were that landlocking lessens segregation, that quiet favors landlocking that slow cooling favors quiet, and that large size favors slow cooling.

H. W. Hixon, metallurgical manager of the Mohn Nickel Company, Ontario, believed that the open hearth process gives better rails because it has time to get rid of the included gases, and the electric process still better because there are no included gases. He recommended putting the steel in a reservoir to let the gases escape before putting it in the ladle. Dr. R. W. Raymond spoke of the Héroult furnace which he had seen in Germany, and the remarkably high grade steel produced from it, attributing the quality largely to the fact that the steel in its molten condition remains in the furnace a long enough time for the gases to escape.

A. A. Stevenson spoke of high carbon steel, or steel having 0.60 to 0.70 per cent. of carbon, and the experience had with it in respect to segregation, &c. In one case an ingot was poured out before it was entirely solidified to see what took place in the cooling. Segregation is of little moment, in this speaker's opinion, if enough of the top of the ingot is discarded. In his experience he had not found what was previously referred to as onion skin freezing; that is, the solidification of the ingot by concentric lamina, but only the pine tree crystal form. Protected molds, he averred, show less pipe in the ingot. Casting ingots with the large end up has been practiced for the last 15 years with the open hearth process, not the Bessemer, and the company with which he is connected uses no ingot extractor, but simply dumps the ingots out. Casting ingots small end up made no observable difference in the length of the pipe.

Professor Campbell of Columbia University stated that he had found by the microscope that shelling is due to small particles of slag or included gases, and contradicted the old belief that the temperature does not make much difference in finishing. The amount of reduction in the rolls also has much to do with the character of the product.

At the afternoon session of Wednesday the first paper was by Thomas H. Leggett on the subject "Present Mining Conditions on the Rand, South Africa." This was followed by remarks by J. H. C. James of the Institute of Mininig and Metallurgical Engineers, who has recently been in the Rand. A paper was presented in extract by the secretary, submitted by T. Lane Carter, on "The Chinese on the Rand."

A Canadian Briquetting Plant.

Edward W. Parker, Washington, D. C., in a brief paper presented data concerning a briquetting plant at Bankhead, Alberta, Canada, operated by the Bankhead Mines, Ltd. The original plan called for two units of 10 tons capacity per hour each. The second of these is now being installed. The coal is anthracite, more friable than the Pennsylvania anthracite and therefore making more dust. This was thrown away formerly, but now goes to the dust bin and is utilized. The coal analyzes 0.5 per cent. moisture, 8 per cent. ash, 83.5 per cent. fixed carbon and 8 per cent. volatile matter. In the briquetting process pitch is introduced by means of an atomizer. The output with both units operated will be about 16,000 tons a month and the briquettes sell at $4 a ton at the plant.

In the discussion on the paper, W. H. Blauvelt answered a question concerning the Semet-Solvay briquetting plant at Detroit, Mich. Coke breeze and pitch are used. As the coke breeze supply is limited, some anthracite is mixed with it. A nearly smokeless briquette is required since the briquettes come in competition with anthracite. The speaker referred to the way in which briquetting had made available for fuel the lignites and semi-lignites of the far West. When briquetted they no longer break down and the result is a good fuel. In the experience of his company with briquetting in various districts it has been found that large briquettes are desirable where they are to be used for making steam. For the domestic trade small briquettes are made on a rotary press. As many as seven plants are now operated for the manufacture of small briquettes for domestic use and for locomotive firing.

James Douglas remarked that binder would be extremely expensive for lignites, not being available locally. This led to a question concerning by-product coke ovens and Mr. Blauvelt said that while it was easy to sell coke from by-product ovens in the West, there was no market for tar. Mr. Douglas spoke of the Santa Fé as the only road in the Far West that imports creosote. If by-product ovens could be put up in that section he thought the tar could be sold to the railroads, but questioned if the farmers were yet educated to the use of sulphate of ammonia. Replying to a question as to the cost of manufacturing briquettes, Mr. Blauvelt said that it ranged from 60 to 80 cents a ton for briquetting, to which should be added the cost of 8 per cent. of pitch at $6 to $8 a ton. This would mean a total cost for briquettes, including pitch, of from $1 to $1.60, according to the locality and amount of output.

Prof. H. M. Howe took the floor for a few moments to sum up the points brought out in the discussion of his paper on segregation.

The last feature of the afternoon was the making of paraffin ingots in a wooden model, to demonstrate what can be done in the compression of semi-liquid steel ingots in larger apparatus. The inventor, N. Lilienberg, Philadelphia, manipulated the model and explained its principle. A description of his apparatus was printed in the *Journal* of the Franklin Institute for February, 1908.

At the session of Wednesday evening interesting data were presented by Joseph A. Holmes, Washington, D. C., on recent coal mine disasters in the United States.

Election of Officers.

At the annual business session held Tuesday morning, February 18, the following officers were elected: President, John Hays Hammond; vice-presidents of the council, J. Parke Channing, New York; John B. Farish, Denver, Col.; F. W. Denton, Painesdale, Mich.; members of the council, Joseph H. Shockley, Goldfield, Nev.; C. R. Corning, New York; R. V. Norris, Wilkes-Barre, Pa. The three directors whose terms expired this month were re-elected, namely, James Douglas, James F. Kemp and Albert R. Ledoux, all of New York. The secretary of the council, Dr. R. W. Raymond, was re-elected.

The Empire Steel & Iron Company's Report.

From President Leonard Peckitt's report to the stockholders of the Empire Steel & Iron Company we take the following:

The directors have been successful in placing the finances of the company in such condition as to insure the carrying out of an important beginning of plans long in contemplation with regard to a radical improvement of the properties. Not only was this accomplished without increasing our indebtedness, and without asking the stockholders to subscribe additional capital, but the financial obligations have been reduced and our working capital materially increased.

The management reports that on account of a lack of funds to finance the Alleghany Ore & Iron Company, operating furnaces and mines in Virginia, our investment in that company was rendering no return, and this largely influenced the directors in arriving at a decision to sell the stock held in our treasury. The sale of this stock on a favorable basis was only made possible by virtue of that company's extensive ore lands, and our position as the largest holder of stock could only have been rendered valuable by adding considerable capital to the investment, which the condition of this company by no means warranted.

From the standpoint of earnings the past year was by far the most successful since the organization of the company. The following is a statement of business for the year ending December 31, 1907:

Total net earnings from operations (including dividends and interest on securities in treasury)	$602,402.75
Deduct allowance for improvements, permanent repairs, depreciation of mining properties, &c.	85,146.60
Net profit for year	$517,256.15

The following charges were made against the profits as shown above:

Depreciation in values of raw material and pig iron stocks, December 31, 1907	$59,735.62
Sinking fund for bad debts	9,804.32
Dividends on preferred stock	150,000.00

After closing the books, therefore, at the end of the year, there is shown a surplus of more than $1,000,000.

The full dividend of 6 per cent. on the preferred stock was paid and the directors considered carefully the advisability of making a payment on the accumulated dividends, which now amount to 18 per cent., but in view of the conditions existing in the money market toward the close of the year, rendering collections exceedingly difficult, and also in view of the necessity of carrying a large stock of material at the furnaces, it was deemed wise to retain this money in the business until the return of more normal conditions. Furthermore, it should be borne in mind that this surplus was created for the purpose of providing funds to carry on the improvements at the furnaces and mines, and also to allow adequate working capital for conducting a large business. By applying the available funds to this work, in our opinion, the returns will in a few years be much greater, and meanwhile there is every reason to believe that dividends can be maintained on a liberal basis. By paying the back dividends gradually the entire obligation to the preferred stockholders can ultimately be cancelled without the necessity for funding the present deferred payments and without depriving the company of money needed for purposes previously set forth in this report.

We submit for comparison the following statement of the result of business year by year since this company was incorporated, the first year covering a period of nine months:

Year.	Tons pig iron made.	Tons ore mined, New Jersey mines.	Net earnings.	Dividends.
1899	150,481	8,416	$320,666.30	$81,595.31
1900	201,847	40,637	244,523.85	106,395.00
1901	185,990	83,414	85,271.52	71,043.00
1902	186,485	59,179	203,087.37	75,000.00
1903	245,513*	107,905	308,651.02	75,000.00
1904	163,202	111,375	88,154.16	75,000.00
1905	172,763	93,568	91,511.96	75,000.00
1906	205,477	131,740	300,695.07	112,500.00
1907	234,538	146,253	517,256.15	150,000.00
Totals	1,746,296	782,487	$2,159,817.40	$821,533.31

* Two additional furnaces operated under lease.

From this it will be seen that in all important respects the results during the past year have surpassed all previous records, and it might be interesting to note that our profits from all sources have amounted to $2.20 per ton of iron produced.

In a statement of this kind it is difficult for us to make a comprehensive report on the outlook at the mines in New Jersey, but you will see that the tonnage of magnetic ore mined exceeds that of all previous years. Looking toward continuous development in the future we have had a magnometric and geological survey made on both properties, and the results have been highly encouraging.

Last year the directors authorized an expenditure of money sufficient to erect at Mount Hope a modern central power station and separating plant, equipped with crushers, screens, rolls and magnetic separators, together with the necessary storage bins and facilities for handling 600 tons daily. The method heretofore in use in the preparation of this ore involved the system of what is known as "hand-cobbing," which is expensive and unsatisfactory. By mechanical separation the ore can be put on cars at a much lower cost and will contain a higher percentage of metallic iron; for instance, the average metallic contents of the ore shipped from Mount Hope at present is about 59 per cent., whereas, with the system that we are now installing, the ore will average 63 to 65 per cent. in iron. The machinery is now being installed, and it is our expectation to have the plant in full operation by July 1.

In the early months of the year very high prices were obtained for pig iron, and contracts for large tonnages were made, extending well into the year. There was every indication of a continuance of these conditions until the early fall, when signs of financial troubles became apparent, and, thereafter, within a short time, the demand was reduced to a minimum, prices rapidly declined, and a large number of the consumers who had purchased iron under contract found themselves unable to accept shipments in accordance with agreement. This necessitated our blowing out one furnace after another, until only two stacks out of eight are at present in blast, the monthly product of which is about 5000 tons of iron. The combined annual capacity is approximately 250,000 tons.

The properties of the company at this time consist of three furnaces at Catasauqua, Pa.; two furnaces at Reading, Pa.; one furnace at Topton, Pa.; one furnace at Macungie, Pa.; one furnace and 2400 acres of land at Oxford, N. J., together with mineral rights on about 8000 acres additional; 1700 acres of land at Mount Hope, N. J.; 115 acres of land at Pine Island, N. Y., containing a large body of limestone.

The following is a condensed balance sheet taken upon closing the books December 31, 1907.

Assets.

Real estate, plants and machinery		$2,996,009.60
Stocks and bonds		1,001,607.00
Cash in bank	$230,325.71	
Notes receivable	450,100.00	
Accounts receivable	217,691.55	
Inventories—Pig iron	183,684.67	
Raw material	256,361.05	
Supplies	77,391.37	
		1,415,554.35
Total		$5,413,170.95

Liabilities.

Capital stock—Preferred	$2,500,000.00	
Common	1,254,770.00	
		$3,754,770.00
Accounts payable	207,536.16	
Bills payable	134,543.75	
Payrolls	24,312.76	
Dividend No. 18, payable January 2, 1908	75,000.00	
		441,392.67
Fund for depreciation and bad debts		84,356.95
Profit and loss		1,132,651.33
Total		$5,413,170.95

It is impossible for us to make any predictions as to the business for the present year, but in closing this report, we wish to say that in our opinion this company and the iron and steel trade in general owe a debt of gratitude to Judge E. H. Gary and his associates in the United States Steel Corporation for the influence which they have recently exerted in an effort to prevent what might otherwise have been a complete demoralization in the iron and steel business of the country. Experience oft repeated has evidenced the untold damage caused to business in general by endeavoring to force sales of iron in times of depression. The continuation of operations in the face of adverse conditions and the consequent cutting of prices have never resulted in good to any branch of the business, and we commend heartily the wisdom of the plan for all interests, both buying and selling, to join their efforts toward maintaining prices of iron and steel products on a fair basis.

Heavy Rolling Mill Machinery.

An Unusual Shipment Inspected at Pittsburgh.

The United Engineering & Foundry Company, Pittsburgh, is furnishing some heavy equipment for the new plant of the Indiana Steel Company at Gary, Ind., and the La Belle Iron Works at Steubenville, Ohio. Having it ready for shipment, the company sent out invitations last week to members of the Engineers' Society of western Pennsylvania and also to superintendents of steel works and rolling mills in the Pittsburgh District to assemble at the Frank-Kneeland department at Fifty-fourth street and Allegheny Valley Railroad Tuesday evening, February 25, and view this machinery. The invitation was largely accepted, over 250 persons being present. This equipment is noteworthy for its massive size, and it has some special features, of which some details will be of interest.

Indiana Steel Company Rail Mill Lifting Tables.

The visitors were first shown the tables to be used at the three-high blooming mill of the Indiana Steel Company's rail mill. The ingot, after leaving the soaking pits, passes through four stands of 40-in. two-high blooming mills, set tandem, so that it passes directly from stand No. 1 to stand No. 2, and so on. After leaving the fourth stand it comes on to the adjacent lifting table and is delivered to the three-high blooming mill. The billet reaching the blooming mill is approximately 15 x 15 in. and weighs about 8000 lb. In designing the tables the limiting features were to reduce the total depth as much as possible, on account of avoiding deep pits, which might approach too close to the water level, and to maintain as light and strong as possible the lifting portion, with the idea of increasing the rapidity of action. The table is lifted by a 250-hp. Westinghouse electric motor, designed for very heavy torque and geared to a crank shaft which operates the tables through link and bell crank motion. As the scale from the rolling will be very heavy, the operating mechanism was not placed beneath the table, but an extension by an arrangement of shafts with rockers was provided. Four bearings were used, two supporting the weight of the table and two taking the thrust of the lifting arrangement on each rock shaft. To avoid the necessity of absolute alignment of the four bearings, the Oldham couplings were introduced between the two sets of bearings, giving the effect of a universal joint, and at the same time maintains great mechanical strength.

As the table is to operate very rapidly a thorough balancing device is necessary in order that the motor may start and stop quickly. Two hydraulic cylinders were attached to the rock shafts, through levers and links, the cylinders receiving their pressure from a tank partly full of water and partly full of air at about 500 lb. pressure. The tanks are large enough to be entirely filled with air at 100 lb. pressure, and then pumped up with water to 500 lb. pressure when the tables are down. When the table rises the tanks are so proportioned that the pressure falls to about 300 lb. per square in. The cylinders are large enough to overbalance the tables about 25 per cent., with 500 lb. pressure on the rams, and with a drop of pressure to 300 lb. per square inch the tables are about 25 per cent. underbalanced. Thus when the motor starts to lift the table is overbalanced and there is a large excess of torque, tending to accelerate the motion of the table. When the table approaches the top position the balance is decreased so that there is an excess of torque tending to stop the table. On the down motion the underbalance assists in accelerating the tables, and at the bottom the overbalance assists in stopping them. It is expected that the tables will rise through their 40 in. travel in about 2 sec. On the end of the motor shaft is attached a Cutler-Hammer disk brake, so arranged that as soon as the power is cut off the motor the brake takes hold.

The first design contemplated a weight balance swinging on an arm, so arranged that the leverage of the weight increased as the table fell, but on account of the enormous moving masses it became evident the inertia effect of this large weight, as well as its bulk, would be very objectionable, and it was decided to change to the air hydraulic method.

The billet is delivered to the mill by the entry table, and after the first pass is received on the delivery table in such a position that when the table rises a set of fingers turns it over and transfers it in position for the first top pass. This manipulation is accomplished by the motion of the table through a system of bell cranks and links, and a large weight at the side of the table. These bell cranks might have been connected directly to the foundation instead of to the weight, but the weight is used as a safety device in case any part of the mechanism is caught, in which case the weight will lift free of its support and avoid damage to the tables. The tables now being in the upper position the piece goes through the second pass, and is delivered to the entering table over a set of fingers, supported on the foundation, which turn it as the table falls and transfers it ready for the third pass. This operation is repeated for the fourth and fifth passes, after which the billet is delivered to the shear tables, and on to the succeeding stands of the 28-in. rail mill. The tables do not rise in a straight line, as in the ordinary practice with lifting tables, but in an arc of a circle described by the rocker arms beneath the table.

The bearing pressure used in the entire design was less than 300 lb. per sq. in. In the rock shaft bases are large cavities to receive wooden blocks which act as bumpers in case any of the links break and allow the tables to fall. The table does not strike these bumpers in ordinary action, but clears them by about 2 in.

Each table is driven by a 50-hp. Westinghouse mill type motor, resting on the line shaft and a spring suspension. The overall length of the tables from center to center of end rollers is 74 ft., and the overall width from end to end of the bases is about 30 ft. The tables stand from the bottom of the base to the top of the hand rail about 18 ft., and the total weight of tables and motor complete, is about 1,500,000 lb.; that of the lifting portion is about 250,000 lb.

The 30 by 72 Inch Plate Mill and Tables for LaBelle Iron Works.

The plate mill and tables designed for the La Belle Iron Works, Steubenville, Ohio, are of the usual type, but embody a number of features of interest. The body of the top and bottom rolls is 30 x 72 in., chilled, and the length over all is 10 ft. 11 in. The middle roll is 18 in. in diameter, chilled. The middle roll is raised and low-

ered by hydraulic cylinders placed on the side of the housings, which operate the roll through balance arms, the balance arms being connected by rock shafts and levers for equalizing the lift. The top roll is counterbalanced by means of weights, which are placed outside the roll pit and connected by means of rock shafts and arms. This is done to allow easy access to the weights and a clear scale pit under the rolls. The screwdown is operated by a 50-hp. Westinghouse motor, provided with slip gear and magnetic brake. The screwdown motor operates the screws through worm and wheel. The screws are adjusted relative to each other for alignment of rolls by means of a clutch on the end of the screwdown shaft, which can be disengaged, allowing one screw to be moved independent of the other. The indicator is of the drum type, carried on top of the screw and indicates to 1-1000 in. in plate thickness.

The roll housings are cast steel, and are provided with an idler roller on the entering side, and with rest bars and stripper guides on the delivery side of both bottom and top passes. Horns are provided on the sides of the housings for carrying a sling to facilitate changing the rolls. The intermediate and vibrating spindles are 8 ft. long. The pinion housings and pinions are cast steel, the latter being 25 in. in pitch diameter by about 40 in. face. The roll housings are provided with brackets for holding a piano rest, for turning the rolls in place and when doing this the rolls are driven by a slow motion device.

The mill is served by two tilting tables 28 ft. long. The table rollers are 13 in. in diameter by 2 ft. 6 in. long, with shafts cast in. Outside the bearings on the end of the roller shafts are disks the same diameter as the rollers, and the backs of the miters also have disks the same diameter as the rollers cast on them. This is the method usually adopted in plate mills to get a narrow table placed up near the rolls and at the same time support a plate as wide as the rolls at the edges. Each side shaft is operated by a 50-hp. Westinghouse railroad type motor. The speed of these shafts is equalized by having one roller on each table geared to both line shafts. Instead of pivoting the table on a shaft it is carried on a segmental shoe resting on the pivot base, so as to obtain an exceedingly large bearing surface, the pressure being about 50 lb. per square inch. This separator also carries the motors, which are located about on the center of oscillation of the table. The tables are lifted by a hydraulic cylinder and are counterbalanced by weights.

A unique feature is the connection between the struts which operate the table and the table girders. This consists of a large cast iron ball, carried in a babbitted seat in the table girders. It allows the tables to vibrate without throwing the connection out of alignment and serves as a means of adjusting the elevation of the table. When erected with the mill the tables will have an over-all length of 61 ft. The total weight is about 200,000 lb, and the weight of the mill 550,000 lb.

The twin tubes of the Hudson & Manhattan Railroad Company under the Hudson River between New York and Hoboken were formally opened on Tuesday, February 25, and the Hudson Companies, which constructed the tubes, publicly turned over the property to the operating company. The Governors of New York and New Jersey took part in the opening ceremonies, and President Roosevelt participated by touching a button in the White House, which was electrically connected with the railroad system's power, and so started the first subaqueous train from New York to New Jersey.

The Westinghouse Electric & Mfg. Company, Pittsburgh, has received an order from the Nevada-California Power Company of Goldfield, for two 2000 hp. electric generators and the necessary apparatus required in fitting up a modern power house. The power generated will be used in gold mines of the Goldfield and Tonapah districts.

Canada Suspends the Iron Ore Royalty.

TORONTO, February 22, 1908.—By an order-in-Council which has just been passed by the Dominion Government the royalty on the product of iron mines held under patent from the Crown is suspended for 20 years. The royalty is itself the creation of an order-in-Council, passed in 1903. In that it is provided that the patent for a mining location on Dominion lands outside of the Yukon Territory shall reserve to the Crown forever a royalty not exceeding 2½ per cent. of the sales of the product of the location. The present order excepts iron from this requirement during the period from the first of January last to the first of January, 1928. In the Provinces of Manitoba, Saskatchewan and Alberta, in the Districts of Ungava, Keewatin, MacKenzie and Franklin, and in the Territory of Yukon the public lands are under the jurisdiction of the Dominion Government, and when they are referred to as "Crown" lands, it is meant that they are subject to that government. Crown lands in other parts of Canada are at the absolute disposal of the Provinces in which they lie. There are certain negligible exceptions to this, such as Indian lands in the Provinces, these being under Dominion control because the Indians on reserves themselves are.

In the vast extent of Canadian territory kept in the control of the Dominion Government tracts variously mineralized have been discovered. Thus, in Alberta, there are extensive coal fields whose resources are being developed, and in regions further north natural gas is known to abound. In Ungava and Keewatin the explorers of the geological survey have found great iron deposits. The expansion of the country's railroad system and the spread of settlement are leading to fresh discoveries and bringing within the zone of enterprise mineral areas that were out of range before. In particular the construction of the Grand Trunk Pacific Railway has opened new fields to the miner. Closely following on the surveyors of that transcontinental line came parties of the geological survey. As a matter of fact, long before the railroad was thought of the Survey had collected a great fund of information about the country to be traversed, and by arranging this information in a single volume the government was able to show that there were probably great abundance and variety of raw material throughout the latitude over which it was proposed to build the road. As the time for the completion of the road and for the beginning of its operation approaches, the government probably sees that the royalty would retard the development of iron mines along the line. So far from discouraging the utilization of the country's iron deposits it has been the policy of the government to stimulate the iron industry by bounties and high duties. By waiving the royalty it shows liberality like that of the Ontario Government, which exempts from its mineral tax iron ore that is treated in Canadian furnaces.

In his testimony before a special committee of the Senate last year, A. P. Low, Director of the Geological Survey, said that a belt of iron-bearing rock, probably 100 miles long and from 200 to 300 miles wide, was traced in Ungava, and that, in the future, Labrador peninsula will furnish a large supply of iron ore. These areas are, of course, far from the Grand Trunk Pacific, but that railroad will form a spinal column from which branch lines will be thrown out, like ribs, into the country it passes over. The Ontario Government's Temiskaming & Northern Ontario Railway will eventually reach James Bay, and afford an outlet for ore and other products in the region tributary to Hudson Bay.

C. A. C. J.

Stack No. 2 of the Dunbar Furnace Company, Dunbar, Pa., for 14 consecutive days ending February 22, achieved the low average consumption of 1976 lb. of coke per ton of pig iron, the iron averaging about 2 per cent. silicon and 0.029 sulphur. This furnace uses Dunbar by-product coke, which is made in Semet-Solvay ovens located at the plant.

PERSONAL.

Archibald Replogle, formerly assistant superintendent of the Cambria Forge Company, Johnstown, Pa., has been made general manager to succeed Frank Trabold, resigned. The company manufactures railroad, automobile and general forgings.

The Massachusetts Fan Company, Watertown, Mass., which has heretofore maintained branch offices in Boston, New York, Pittsburgh and Cleveland, is now extending its representation through the medium of resident engineers. Cuthbert Schaefer, with offices at First National Bank Building, Chicago, and John J. Dwyer, American National Bank Building, St. Paul, will cover the respective territories of which these cities are the natural centers. Both men have already had extended experience in the blower business. They will constitute a material addition to the staff of the company.

W. E. Dodds has resigned as manager of the steam engine department of the Allis-Chalmers Company, Milwaukee, Wis. He had held the position for many years, both under the old Edward P. Allis Company and under the consolidated companies. Before becoming identified with other business interests he will spend some time in travel.

Edward Johnson of Columbus, Ohio, has been elected president of the Lorain Coal & Dock Company, Cleveland, to fill the vacancy caused by the recent death of A. C. Saunders.

Washington A. Roebling, Trenton, N. J., has been appointed by Governor Fort of New Jersey as one of the managers of the State Geological Survey.

A. C. Dinkey, president of the Carnegie Steel Company, Pittsburgh, has been elected a director in the Mellon National Bank in that city. Wm. H. Donner, formerly president of the Union Steel Company, taken over by the United States Steel Corporation several years ago, has been elected a director in the same bank.

Roland Carlberla of the Chemical Department of Columbia University read a paper on the "Manufacture of Ferrochrome in the Electric Furnace" at the meeting of the Society of Chemical Industry, New York Section, at the Chemists' Club, 108 West Fifty-fifth street, New York, on the evening of February 21.

Morris Bachman, president of the Sharon Steel Hoop Company, Sharon, Pa., has sailed for Europe on a two months' pleasure trip.

Robert P. Bainbridge, assistant superintendent of the Bessemer steel plants of the Carnegie Steel Company, at Mingo Junction and Bellaire, has resigned, effective March 1, on account of ill health.

Major C. D. Rhodes, formerly sales agent of the Lackawanna Steel Company, at Cleveland, Ohio, who has been seriously ill in a New York hospital for several weeks, has been removed to his home at Sharon, Pa.

C. M. Schwab, chairman of the Bethlehem Steel Corporation, and Archibald Johnston, president of the Bethlehem Steel Company, are expected to return from Europe this week.

The Jacobson Machine Mfg. Company, Warren, Pa., has recently established a Southern office at 676 Marietta street, Atlanta, Ga., where it will carry a full stock of its line of gas and gasoline engines and a stock of repair parts. This business will be in charge of C. R. Morrison, who has for some time been the company's traveling representative in the Southern States. This company is one of the concerns engaged in the manufacturing of gas and gasoline engines that has not experienced any slack-up in the orders received nor volume of business done. It reports having laid off no men nor reduced wages, but is running full capacity, with orders booked at present sufficient to keep the plant going at full capacity for nearly two months. The company's Southern trade has been built up at a very rapid rate during the past year.

OBITUARY.

ERNEST CADY, Hartford, Conn., former Lieutenant-Governor of Connecticut, and one of the founders of the Pratt & Cady Company, died suddenly February 16, aged 65 years. He was a native of Stafford, Conn., and was educated in the public schools and at Worcester Academy, Worcester, Mass. When 16 years old he became a clerk in a store at Stafford, leaving it to serve in the navy. Returning to that town after the Civil War, he conducted a store as a member of the firm of Beebe & Cady. After some further mercantile experience in Norwich he went to Hartford and with R. N. and F. A. Pratt organized the Steam Appliance Company, whose specialties were manufactured for the company by the Pratt & Whitney Company. Four years later the business was reorganized under the name of the Pratt & Cady Company, which has grown to be a large and important establishment, manufacturing valves, hydrants and similar products. Mr. Cady retired from the business 10 years ago. He was a director of the National Machine Company, was for several years president of the Eastern Consolidated Oil Company, and was a trustee of the Society for Savings. He was a member of the Hartford Club. He was elected Lieutenant-Governor of Connecticut in 1892. He leaves one son, Ernest H. Cady.

WILHELM HILDENBRAND, a well-known civil engineer, died in New York City February 21, aged about 63 years. He was born in Germany, received his education at the Karlsruhe Polytechnic and came to America about 1867, his first connection being with the New York Central Railroad. He was long employed on the construction of the Brooklyn Bridge, his name appearing on the bronze tablet on the New York tower of that structure. He built the rack railroad up Pike's Peak, rebuilt the Cincinnati-Covington suspension bridge, without interrupting traffic for more than an hour at any time, and built bridges at Port Jervis, N. Y.; Wheeling, W. Va.; at Dingman's, over the Delaware River; a suspension bridge at Mapimi, Mexico, and the cables for the Williamsburg Bridge over the East River.

ROBERT W. HAMILTON died at Pittsfield, Mass., February 11, aged 82 years. He was perhaps the oldest hydraulic engineer in this country. For a number of years he was a resident of Milwaukee and was the builder of the first pumping engine for the Milwaukee waterworks system, which was a very large compound beam pumping engine installed 34 years ago and which is still in operation. At that time it was one of the largest and best engines of its kind in the country, having a capacity of 16,000,000 gal. a day. For the four years from 1870 to 1874, he was superintendent of the old Edward P. Allis Company plant. He returned to the East and was active in the construction of pumping engines until 15 years ago, when he retired from business. He leaves three sons.

ROBERT H. BRYON, for many years manager of the architectural department of the J. L. Mott Iron Works, New York, died February 21, aged 51 years. He was a native of New York City and designed much of the fancy iron work for the company by which he was employed.

LEWIS H. TAYLOR, founder of the Taylor Iron & Steel Works, died at High Bridge, N. J., February 18, aged 97 years.

JAMES POWELL, president of the Wm. Powell Company, Cincinnati, Ohio, died February 25 at his residence in Avondale. He had been confined to his bed for nearly a year. He was one of the organizers of the National Association of Manufacturers, a founder and former governor of the Manufacturers' Club of Cincinnati, a member of the Queen City Club, a past Grand Master of Odd Fellows, and a leader in Baptist Church circles. He was born in Ghent, Belgium, in 1832, and went to Cincinnati when quite young. He engaged in the general machinery business, building up the Union Brass Works. He leaves one son and two daughters.

The machine shop connected with the Carnegie Technical Schools in Pittsburgh has been equipped with a full line of iron working tools of modern design.

NEWS OF THE WORKS.

Iron and Steel.

The blast furnace of the Stewart Iron Company, Ltd., at Sharon, Pa., which has been idle for about three months for relining and repairs, has been blown in again.

At present the Cambria Steel Company is operating only three of its eight blast furnaces at Johnstown, Pa.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, has recently received some Government orders of fair size for galvanized sheets and pipe.

Misleading reports have been printed in the daily papers concerning the Woodstock Iron Works Corporation, which was recently incorporated with a capital stock of $500,000. This new company is simply a change in the organization of the Woodstock Iron & Steel Corporation in order to facilitate the handling of the business, the stockholders in the new company remaining the same as in the old.

John T. Jones, Iron Mountain, Mich., and associates are now constructing a plant under the Jones patents to utilize the low grade ores of the Menominee Range, which are not of commercial value at present. Experimental work, which has been conducted for some time, having proved satisfactory, work was started on a plant which will take four or five months to complete. The furnace is designed to manufacture wrought iron direct from the ore, thus saving one process. If this is successfully accomplished it is claimed it will open a practically unlimited iron ore field, as there are many large deposits of lean ore in both the Menominee and Marquette ranges.

The furnace of the Central Iron & Coal Company at Holt, Ala., has been put in operation after an idleness of three months for repairs.

General Machinery.

The Lehighton Foundry & Machine Company, Lehighton, Pa., and the Bath Foundry & Machine Company, Bath, Pa., have been combined under the name of the Carbon Foundry & Machine Company, which was recently organized. The two plants will be combined and operated at Bath. L. M. Balliet of Lehighton is president, and Charles I. Berlin of Bath, secretary.

The Chester B. Albree Iron Works, North Side, Pittsburgh, manufacturer of pneumatic machinery, forgings, bridge railings, &c., has shipped one of its 10 ft. 6 in. gap riveters of heavy construction to the Isthmian Canal Commission, at Canal Zone, Panama, and has received a contract for 1125 ft. of its Bridgeport style of bridge railing for the First avenue viaduct of the Chicago, Milwaukee & St. Paul Railroad at Milwaukee, Wis.

The South & Western Railroad shops, which were recently burned in Carnegie, Tenn., will not be rebuilt on the old site. The Johnson City Foundry & Machine Works will be used at present. This property belongs to the South & Western Railroad, but it had been leased to G. W. Sitton. Additional machinery will be installed, and the men who have been unemployed for a few days will soon resume work.

Power Plant Equipment.

Leo Robinson, Borough Clerk, Mendham, N. J., will receive bids until March 13 for the construction of a water works system.

The Board of Commissioners of Rockingham, N. C., will receive bids until February 27 for building part of the water works plant, water tower, pumping station and reservoir. Bids for the machinery will be asked for later.

The State Board of Agriculture, Indianapolis, Ind., will receive bids for the equipment of an independent electric light plant on the fair grounds.

A special committee has been appointed to secure plans and specifications for a new lighting plant for Richmond, Va.

H. S. Pell, secretary and general manager of the Niles Boiler Company, Niles, Ohio, has been appointed its receiver on petition of W. A. Thomas, president. Trouble in making collections and pressure of certain creditors for payment of their bills are given as the reason for this action. The company manufacturers castings, stokers, heavy plate work and boilers.

The American Engine Company reports that the increased business consequent upon the manufacture of its new engines (Angle-Compound) has necessitated a large addition to its plant at Bound Brook, N. J., where even in these quiet times it has for some weeks been running both day and night shifts.

The Louisville Traction Company, Louisville, Ky., is to appropriate $200,000 for improvements to its power plant and road. This money is to be used to pay for the equipment now being installed, which includes one 3000-kw. Parsons steam turbine, two 500-hp. Babcock & Wilcox boilers with chain grate stokers, one substation to contain three 1000-kw. rotary converters, transformers, switchboard, &c.

Foundries.

The installation of electric rammers at the plant of the United States Cast Iron Pipe & Foundry Company, at Anniston, Ala., has been completed and all departments are ready for operation. The Bessemer plant has suspended operation and no statement is made as to resumption.

The Sheffield Casting & Mfg. Company, Sheffield, Ala., has resumed operation after a suspension of some months.

The Purcellville Foundry Company, Purcellville, Va., intends to rebuild its foundry as soon as weather will permit, but has not yet prepared plans. The new plant will not require much in the way of equipment, but the company would like to correspond with manufacturers of iron flasks.

A meeting of the stockholders of the Buffalo Crucible Casting Company, Buffalo, N. Y., will be held March 6, for the purpose of voting upon a proposition to dissolve the corporation.

Fires.

The plant of the Friend Paper Company, West Carrollton, Ohio, was damaged $25,000 by fire February 19.

The cabinet and chair factory of E. B. Jordan & Co., Brooklyn, N. Y., was burned February 22, the loss being about $150,000.

The roundhouse and machine shop of the Central New England Railroad, at Fishkill Landing, N. Y., were burned February 13, the loss being about $50,000.

Hardware.

The annual meeting of stockholders of the New Castle Forge & Bolt Company, New Castle, Pa., was held last week, at which the following officers were elected: C. J. Kirk, president; E. W. Beadel, vice-president; E. E. Whitaker, treasurer, and Paul McBride, secretary. These officers with E. J. Norman, Martin T. F. Morehead, George Greer, R. C. Patterson and George L. Patterson make up the Board of Directors.

Hubbard & Co., Pittsburgh, manufacturers of shovels, spades, scoops and railroad tools, have received a large contract from the Isthmian Canal Commission for shovels and laborers' tools.

The Steel Car Forge Company, Frick Building, Pittsburgh, an identified interest of the Standard Steel Car Company, and which for several years has confined its product exclusively to the manufacture of car forgings and special forgings, has enlarged its capacity in the past year and is now preparing to fill orders for all sizes of machine and carriage bolts, nuts and rivets.

The Tutbill Spring Company, Chicago, has won out in the strike of its hand fitters which was called December 3 for the purpose of preventing work being done by machines. The strike was called off on February 18 without any concession on the part of the company, which will take the old men back only as needed.

Miscellaneous.

The Stanford Steel Range Company, Norfolk, Va., incorporated with a capital stock of $100,000, has completed its plant and is now manufacturing the Stanford patent double oven steel range. The company purchased the foundry of the Pocahontas Iron Works and also the plant of the Sheffield Company and combined the two at Norfolk. Having the complete equipment of both companies, it will need only such machinery as will be necessary to increase the output from time to time. George T. Tilley is president; C. T. Robinson, vice-president, and J. P. Jackson, secretary.

Plans have been completed for a new building, 83 x 108 ft., for the Berger Bros. Company, Philadelphia, Pa.

R. G. Wright & Co., Buffalo, N. Y., sheet iron workers and manufacturers of oil tanks, &c., have purchased a site, 52 x 198 ft., at 128 Swan street, where they will erect a three-story brick factory.

The Flour City Ornamental Iron Works, Minneapolis, Minn., has increased its capital stock to $250,000. William Burns, who has been associated with the company two years, has been elected vice-president.

Twenty thousand acres of valuable iron ore property in Blount County, Tenn., have been leased by the La Follette Coal, Iron & Railway Company, and that corporation now has a force of men prospecting over the different deposits. The ore will be hauled to the furnace at La Follette.

The S. Keighley Metal Ceiling & Mfg. Company, Pittsburgh, manufacturer of Keighley lock-joint metal ceilings, has received an order for 200 squares of this ceiling for two barrack buildings at Fort Niagara, N. Y. The company has recently completed the Calahan warehouse, at Youngstown, Ohio, calling for 400 squares; also a convent school at St. Marys, Pa., with 150 squares of lock-joint ceilings.

The Union Radiator Company, general offices and works at Johnstown, Pa., and manufacturer of Concord radiators, has recently added to its plant a new assembling room, 50 x 110 ft., which is equipped with complete hydraulic testing apparatus for use in assembling and testing its radiators before shipping. This new addition increases the assembling capacity about 20,000 ft. of radiation per day. This company is arranging to manufacture a line of single and five-column plain patterns of radiators, made in all hights, together with a new slip nipple wall radiator made in four hights, both plain and ornamental. To make room for these new lines of product the company will build a new addition to its foundry, in which new machinery and appliances will be installed. These additions will give an increased foundry capacity of about 2500 sq. ft. of radiation per day.

The Iron and Metal Trades

Rail business has come out in an encouraging way in the past week. The Great Northern has placed 20,000 tons with the United States Steel Corporation, 15,000 tons with the Lackawanna Steel Company and 10,000 tons with the Pennsylvania Steel Company. A minor portion of the tonnage is Open Hearth Rails. The Pennsylvania Steel Company has taken the Atlantic Coast Line's order for 8000 tons to be rolled at Sparrows' Point, and the Ontario & Western has bought 3100 tons from the Lackawanna Steel Company. In addition, two Eastern mills have booked considerable tonnage, the greater part of it being Open Hearth Rails.

Generally speaking, finished lines apart from Rails give a better account of themselves this week. The Steel trade suffered more acutely than the Pig Iron trade in the October collapse, and now the conditions as to relative activity are reversed.

The United States Steel Corporation, from operating only 28 per cent. of its rolling capacity just following the panic, has now come up to 51 per cent. Its officers have reckoned on practically a 50 per cent. average in the first half of the year and an advance in the second half to, say, 75 per cent. While few of the Steel companies have yet reached 50 per cent., there has been an increase in working forces at a number of mills in the past week. It is yet difficult to measure how much more this means than the working off of accumulated orders, though naturally spring business should soon add some momentum. Railroad financing will have much to do in determining the market of the next few months.

The lighter finished lines still lead in activity, but in Structural Material February makes a better showing than January. The current bookings of fabricating plants represent from 25 to 30 per cent. of capacity. For the Beaver River bridge of the Pittsburgh & Lake Erie Railroad, 8000 tons, bids will soon be taken, and the 16,000 tons of Steel for the approach to the Manhattan Bridge is about to be let. In New York City, a 2000-ton contract was let for a new theatre, while a number of railroad bridge contracts, varying from 250 to 1400 tons, have been taken. In the East three vessels are being figured on that will require 5000 to 6000 tons of Plates and Shapes.

Reports of lower prices on Steel Billets in the Pittsburgh District seem to be based on recent conversion arrangements, made possible by the now considerable spread between Bessemer Pig Iron and the usual market price for Steel. In the Chicago District competition over a 500-ton order for Forging Billets brought out a variation of $2 a ton in bids.

Manufacturers of Forgings are meeting in New York this week, and steps may be taken to check the demoralization which has appeared in that market lately.

The Foundry Pig Iron trade is practically at a standstill. What further tonnage the Pipe makers have picked up has been largely cheap Southern Iron, reports of cutting in that section still coming out. The fact that practically all stocks at merchant furnaces are sold does not signify, with the melt of Foundry Iron ranging from 20 to 50 per cent. of last year's average. A pending sale of 2000 tons of Malleable Pig Iron in Ohio brought out prices around $16.50. An inquiry is up for 10,000 tons of Basic Iron for St. Louis, and there is another for 5000 tons, besides several for 1000 tons.

The Copper market has shown more activity this week and lower prices, 12¼c. having been reached on buying for both domestic and foreign account.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Feb.26, 1908.	Feb.19, 1908.	Jan.22, 1908	Feb.27, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	$18.25	$18.25	$18.25	$25.50
Foundry No. 2, Southern, Cincinnati	*15.75*	15.75	16.00	26.00
Foundry No. 2, Local, Chicago	*17.50*	17.75	18.00	25.50
Bessemer, Pittsburgh	*17.90*	17.90	18.90	22.85
Gray Forge, Pittsburgh	*15.90*	15.90	16.15	21.85
Lake Superior Charcoal, Chicago	*21.50*	21.50*	22.00	27.00

* The price of $21 printed last week was a typographical error.

BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	29.50
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.00
Open Hearth Billets, Phila	**30.40**	30.40	30.00	33.00
Wire Rods, Chicago	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	**13.00**	13.00	12.25	18.00
Steel Rails, Melting, Phila	**14.50**	15.00	12.00	19.50
Iron Rails, Chicago	**17.00**	17.00	16.00	25.00
Iron Rails, Philadelphia	**18.00**	18.00	16.50	27.00
Car Wheels, Chicago	*15.75*	15.00	19.00	23.00
Car Wheels, Philadelphia	*16.00*	16.50	17.00	23.25
Heavy Steel Scrap, Pittsburgh	**13.75**	13.75	12.50	18.00
Heavy Steel Scrap, Chicago	**12.50**	12.50	11.00	15.50
Heavy Steel Scrap, Phila	**14.50**	15.00	12.00	19.00

FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	**1.65**	1.65	1.47	1.93½
Common Iron Bars, Chicago	**1.65**	1.65	1.55	1.81½
Common Iron Bars, Pittsburgh	**1.50**	1.50	1.40	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.70	1.70	1.70	1.85
Skelp, Sheared Steel, Pittsburgh	1.80	1.80	1.80	1.95

SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	2.00	2.00	2.00	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45

METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	*12.62½*	12.87½	14.00	25.12½
Electrolytic Copper, New York	*12.50*	12.62½	14.00	24.87½
Spelter, New York	**4.75**	4.75	4.70	7.00
Spelter, St. Louis	**4.75**	4.80	4.55	6.77½
Lead, New York	3.75	3.75	3.75	6.35
Lead, St. Louis	**3.65**	3.65	3.60	6.10
Tin, New York	**28.70**	28.15	27.60	41.90
Antimony, Hallett, New York	9.00	9.00	9.00	24.50
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, February 26, 1908.—(*By Telegraph.*)

The occasional spurts of improvement that appear from week to week in the various departments of finished material can hardly be taken as indicative of a permanent change in the general pulse of trade, nor on the other hand as the intervening periods of moderate reaction significant of permanent recession. The fact, therefore, that business in mill products has shown a sagging tendency the last few days is not of material importance touching general conditions. Business as a whole for the current month will probably show a gain over January, but is moving forward very slowly in all lines. Prices in the main are being adhered to with reasonable regularity on finished and semifinished material, though recent developments indicate that the regular schedule on Billets is not being uniformly maintained by all producers. The feature of the week in market transactions was the placing of 10,000 tons of Standard Section Rails by the Great Northern Railway, the tonnage being equally divided between the Pennsylvania Steel and Illinois Steel companies. The remainder of the 50,000 tons comprising this road's requirements will probably be awarded in the near future. Only a small amount of Structural Material was secured by fabricators during the week. Railroad bridge work continues to supply the principal tonnage included in such contracts. Only a very moderate amount of new business in Plates, Bars and Merchant Pipe is coming out. Both jobbers and consumers are limiting purchases to actual present requirements. The Pig Iron market is extremely quiet. Notwithstanding the sharp reduction in output, nearly every

merchant furnace in operation is piling the greater part of its product.

Pig Iron.—Not only has the tonnage sold within the past week been extremely light, but inquiries of a positive nature are few, the largest reported being less than 1000 tons. Prices on Southern Iron have settled pretty uniformly to $13, Birmingham, for No. 2 Foundry, for such business as is being offered. It is probable that this figure might be shaded if tempting tonnage was offered, though a number of the leading interests insist that their extreme limit is $13. There has been a gradual narrowing of the spread between Northern and Southern Iron, until now they are very nearly at a parity. Quotations on Northern No. 2 Foundry are this week reduced to $17.50, Chicago, which is practically in agreement with the basis of $17, plus switching charges suggested at the recent meeting of Northern furnacemen at Cleveland. It is evident that consumers are placing orders only for such tonnage as is required to cover casting contracts in hand and are not disposed to provide for anticipated wants. Conditions on either side of the market have developed no noteworthy change either as to present demand or future outlook. The following prices are for February and March delivery, f.o.b. Chicago:

Lake Superior Charcoal	$21.50 to $22.00
Northern Coke Foundry, No. 1	18.00 to 18.50
Northern Coke Foundry, No. 2	17.50 to 18.00
Northern Coke Foundry, No. 3	17.00 to 17.50
Northern Scotch, No. 1	18.50 to 19.00
Northern Coke, No. 1	17.85 to 18.35
Southern Coke, No. 2	17.35 to 17.85
Southern Coke, No. 3	16.85 to 17.35
Southern Coke, No. 4	16.35 to 16.85
Southern Coke, No. 1 Soft	17.85 to 18.35
Southern Coke, No. 2 Soft	17.35 to 17.85
Southern Gray Forge	15.35 to 15.85
Southern Mottled	15.10 to 15.60
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	19.40 to 19.90
Jackson Co. and Kentucky Silvery, 6 %	20.40 to 20.90
Jackson Co. and Kentucky Silvery, 8 %	22.40 to 22.90
Jackson Co. and Kentucky Silvery, 10 %	24.40 to 24.90

(By Mail.)

Billets and Rods.—Orders for Forging Billets are being restricted to small lots, which are also few in number. Recent negotiations have developed the fact that a strict maintenance of the official price schedule is not being closely observed by all producers. Regular prices, which are reported as being firmly maintained by the principal producers, are quoted at $33 to $34, Chicago, for Forging Billets. No sales of considerable tonnage of Wire Rods have developed, and prices are being evenly held at the following quotations: Bessemer, $35; Basic, $36; Chain, $37, all at Pittsburgh.

Rails and Track Supplies.—A transaction, of significant importance at this time, is comprised in an order for 10,000 tons of Rails placed last week by the Great Northern Railroad with the Pennsylvania Steel Company. This is the first installment of the 60,000 tons on which this road has been negotiating for prices during the past few weeks. Specifications for the 10,000 tons placed call for 5000 tons of Bessemer Rails, which will be rolled by the Maryland mills and 5000 tons of Open Hearth, which will be furnished by the Steelton plant of the Pennsylvania Steel Company. The 1200 tons of High T Section Rails taken two weeks ago by the Pennsylvania Steel Company for the Twin City Traction Company, St. Paul and Minneapolis, were also Open Hearth Rails. Orders for Track Supplies continue to be of small volume, and there is but little doing in Light Rails, the prices of which show a good deal of unevenness; cuts of $3 to $4 a ton are not infrequent, being induced largely by competition from the Rerolling mills. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.90c. to 2c., according to delivery; Track Bolts, 2.40c. to 2.50c., base, Square Nuts, and 2.55c. to 2.65c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—The business of the past week shows very little improvement in the amount of tonnage booked by fabricators, or in orders and specifications received by the mills. If maintained at its present average throughout the month, the business taken by the American Bridge Company for February will aggregate about one-third of its capacity. Most of the tonnage offered continues to come from the railroads in the form of bridge material. Last week's totals, which were very light, include 500 tons placed by the Chicago, Milwaukee & St. Paul Railroad, for four spans over the Missoula River, taken by the Worden-Allen Company, Milwaukee, Wis., and 500 tons for a drawbridge placed by the same road; also 500 tons for a viaduct at Topeka, the general contract for which was taken by the A. N. Blodgett Construction Company, Kansas City. Very little tonnage is forthcoming from building structure projects, there being no closures reported this week including tonnage of notable size. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—The demand continues sluggish, and is very closely confined to small orders, for prompt shipment. Emergency jobs calling for small quantities of material constitute the bulk of requirements arising in boiler shops; and other Plate users, such as car shops, are running light, and ordering sparingly. A fair amount of pick-up business is being supplied by the jobbers from warehouse stocks. Prices on narrow Plates continue to be cut to the extent of from $1 to $2 per ton by a few of the smaller mills. We quote, for shipment from mill, as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, $0.25c. extra.

Sheets.—There is not much gain to be reported in the amount of new business offered, but, at the same time, the market seems to be safely holding its own. The demand for the heavier gauges of Black Sheets from store is moderately good, and inquiries of an encouraging nature are coming to the mills for Galvanized and Light Sheets for roofing. We are advised that prices both from mill and store are being well maintained. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 to 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c. Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bar Iron.—Specifications against contract sales of Bar Iron made prior to the late advance show a slight improvement, but are not sufficient to keep the mills engaged at anything like full capacity. Very little new business is developing for either Iron or Steel Bars, and a great part of the rolling capacity of Western mills is this week idle. The 8 in., 9 in. and 21 in. mills of the Illinois Steel Company's Bay View plant were started to-day to turn out what orders are on hand. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—The margin of improvement in the volume of new business is not significantly large, but at the same time each week's tonnage shows a little gain over the preceding one. The consumption is naturally restricted to a considerable extent by unfavorable weather conditions, and a better movement in Tubular goods is looked for with the coming of open weather. The cutting of prices by jobbers on shipments from store stocks continue to be an unsatisfactory feature of this trade. Mill quotations are reported to be firmly held on Steel Pipe, but there is more or less irregularity in Iron Pipe. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 72 to 72½ per cent. on Black Steel Pipe, ¾ to 6 in. About four points advance above these prices is asked for Iron Pipe.

Boiler Tubes.—There is no buying of consequence for forward requirement, and orders for current needs, though perhaps somewhat greater in number, are usually for small lots. Very few shipments are being made directly from the mills, most of the wants in Merchant Tubes being supplied from store stocks. While in the main prices are fairly well maintained, some unevenness is reported. Mill quotations for future delivery, on the base sizes, are as follows: 2⅜ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1¼ in.	.55	35	35
1¾ to 2¼ in.	.50	35	35
2½ in.	.52½	35	35
2¾ to 5 in.	.60	47½	47½
6 in. and larger	.50	35	..

Merchant Steel.—Quietness continues to characterize the movement of Tire sizes and miscellaneous Shapes. Specifications from implement makers and manufacturers are increasing very slowly, while the demand from jobbers includes only filling in orders. Shafting discounts are still unsettled and irregular and recognized quotations are being liberally shaded. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1½ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¾c. to 8c., and still higher prices are asked on special grades. Shafting, 54 per cent. off in car lots; 48 per cent., less than car lots, base territory delivery.

Cast Iron Pipe.—Included in last week's lettings were 2650 tons awarded by the city of Detroit to the American Car & Foundry Company, and 700 tons let by the city of South Bend, Ind., were taken by the American Cast Iron Pipe & Foundry Company. Among the lettings now in sight which will come up for closure in the near future are 300 tons, readvertised by Rockford, Ill., and 200 tons by Elyria, Ohio. Routine orders for the incidental requirements of maintenance are coming in more liberally, and the prices offered in recent competitive bids show a tendency toward greater firmness. We quote, per net ton, Chicago, as follows: Water Pipe, 4-in., $30; 6 to 12 in., $29; 16-in. and up, $28, with $1 extra for Gas Pipe.

Old Material.—The transfers of tonnage for the past week have been too few and unimportant to furnish a clear criterion as to price levels. Neither dealers nor consumers are active buyers, and something near akin to a deadlock has resulted from the indifference which characterizes both sides of the market. With no extensive stocks ahead the mills are buying very conservatively, taking only such lots as can be picked up at a bargain. Dealers, on the other hand, are not disposed to let go of their holdings at sacrifice prices, and in consequence there is often a wide spread between the prices asked by the seller and offered by the buyer. On a round lot of high grade Relaying Rails, now in the market subject to close inspection, offers range from $19.50 to $21.50 without acceptance as yet. The market was not called upon to absorb any railroad material last week, but the Burlington Railroad is this week offering a list of 3740 tons, 2350 tons of which is Iron Scrap.

Old Iron Rails	$17.00 to $17.50
Old Steel Rails, rerolling	13.00 to 13.50
Old Steel Rails, less than 3 ft.	13.00 to 13.50
Relaying Rails, standard sections, subject to inspection	22.00 to 23.00
Old Car Wheels	15.75 to 16.25
Heavy Melting Steel Scrap	12.50 to 13.00
Frogs, Switches and Guards, cut apart.	12.25 to 12.75
Mixed Steel	9.50 to 10.00

The following quotations are per net ton:

Iron Fish Plates	$15.00 to $15.50
Iron Car Axles	17.00 to 17.50
Steel Car Axles	15.50 to 16.00
No. 1 Railroad Wrought	12.50 to 13.00
No. 2 Railroad Wrought	11.50 to 12.00
Railway Springs	11.50 to 12.00
Locomotive Tires, smooth	15.00 to 15.50
No. 1 Dealers' Forge	9.75 to 10.25
Mixed Busheling	8.00 to 8.50
Iron Axle Turnings	7.00 to 7.50
Soft Steel Axle Turnings	7.00 to 7.50
Machine Shop Turnings	7.00 to 7.50
Cast Borings	5.00 to 5.50
Mixed Borings, &c.	5.00 to 5.50
No. 1 Mill	7.50 to 8.00
No. 2 Mill	6.50 to 7.00
No. 1 Boilers, Cut to Sheets and Rings.	7.50 to 8.00
No. 1 Cast Scrap	13.00 to 13.50
Stove Plate and Light Cast Scrap	11.25 to 11.75
Railroad Malleable	11.25 to 11.75
Agricultural Malleable	10.50 to 11.00
Pipes and Flues	9.00 to 9.50

Metals.—Copper holds fairly even as to price, and several carload sales have helped to strengthen a healthy demand. As a rule, however, consumers are not anticipating their wants, but are satisfied to buy small lots as the need arises. Old Metals are extremely quiet, and on some grades slightly lower. We quote as follows: Casting Copper, 13¼c.; Lake, 14 to 14¼c., in car lots for prompt shipment; small lots, ⅛c. higher; Pig Tin, car lots, 32c.; small lots, 31½c.; Lead, Desilverized, 4c. to 4.05c., for 50-ton lots; Corroding, 5.15c. to 5.25c., for 50-ton lots; in car lots, 2½c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 13c., and other grades, 11c. to 11½c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 13c.; Heavy Copper, 13½c.; Copper Bottoms, 11c.; Copper Clips, 11c.; Red Brass, 12¾c.; Yellow Brass, 10½c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 23c.; Block Tin Pipe, 25c.

Pittsburgh.

PARK BUILDING, February 26, 1908.—(*By Telegraph.*)

Pig Iron.—Some inquiries are in the market for fair sized lots of Bessemer, Basic and Foundry Iron, but the ideas of furnacemen and consumers on prices are far apart, and nothing has been done. Only small lots of Pig Iron, for prompt shipment, are being sold, and we note sales as follows: One hundred tons of chill cast Bessemer Iron at $18; 125 tons of standard Bessemer at $17, 100 tons at $17, and 100 tons at $16.90; about 200 tons of Northern No. 2 Foundry at $15.85 to $16; 1000 tons of Basic at $15.90, and about 75 tons of Northern Forge at $15, all at Valley furnace. We quote Standard Bessemer Iron at $17, Basic at $15.90 to $16, Northern No. 2 Foundry at $16, and Northern Forge at $15, all at Valley furnace.

Steel.—The market on Steel is being disturbed to some extent by the fact that several contracts have recently been made between Pig Iron dealers and Steel works by which the dealers put Bessemer and Basic Iron into the Steel plants, and have it turned into Blooms and Billets on a conversion deal. The Steel is then sold in the open market at $1 to $2 less than regular prices. However, very little of this has been done, and a full range of sizes cannot be furnished. Regular prices on Bessemer and Open Hearth Billets remain at $28, Forging Billets $30, while Sheet and Tin Bars under the recent readjustment in prices are now $29.50 for Pittsburgh, Sharon, Steubenville and other nearby points of delivery.

(*By Mail.*)

General conditions in the Steel trade are showing slight betterment in some directions, but the improvement is slow and probably will be for some time. Some of the Steel plants in the Pittsburgh District are running a little better, the leading companies operating to about 50 per cent. of their Ingot capacity. The Steel plant of the Youngstown Sheet & Tube Company is off this week, but is scheduled to start Sunday night, March 1. The Edgar Thomson Rail mills, Nos. 1 and 2, were down last week, and are idle this week, but will be started next Sunday night. Pig Iron inquiries continue to be for small lots for early shipment, and while there is some inquiry for deliveries as far ahead as June, very little, if any, actual tonnage has been closed, the ideas of buyers and sellers being wide apart. Some consumers of Pig Iron have the idea that they can buy metal at practically their own prices, but when they send out inquiries they usually find that furnaces either refuse to quote or else ask higher prices than such buyers are willing to pay. Bessemer Iron continues to be offered in small lots for prompt delivery at $17, Valley furnace, or a shade under, while the official price of Northern No. 2 Foundry is $17, delivered in the Pittsburgh District, with a 25c. switching charge. Northern Forge Iron can be bought readily at $15, Valley furnace, or $15.90, Pittsburgh, but we do not hear of any tonnage being sold. A readjustment has been made in prices of Sheet Bars for delivery in the Pittsburgh and adjacent districts, the price of $29.50, delivered, having been fixed by four of the leading Steel mills for Pittsburgh, Youngstown, Canonsburg, Martins Ferry, Niles, Sharon, Steubenville, Wheeling, Washington, McKeesport and Canton delivery. Practically all of the Sheet and Tin Plate mills that buy Sheet Bars in the open market are located in the above cities, and it was at the request of several mills located near local Steel mills that could deliver Sheet Bars on a switching charge of 15c., who objected to paying the $1 freight from Pittsburgh to the valleys that the change was made. The new price means an advance in Sheet Bars of 50c. a ton to consumers in the Pittsburgh District. In Finished Iron and Steel conditions are very quiet, with not much probability of early improvement. The bulk of the movement in Finished Products at present is in Tin Plate, Tubular Goods and Wire Products, the demand for which at present is fairly active. Current reports of cutting in prices on Steel Billets probably emanate from the fact that three or four Steel plants have recently made conversion deals with dealers in Pig Iron, by which they take in Bessemer or Basic Iron at a certain price, and then roll this into Billets, which are sold in the open market at $2 to $3 a ton under the regular price. One local mill recently took a contract for 1000 tons of 6 x 6 in. Blooms, running high in carbon and manganese, which were furnished to the buyer at less than the regular price. The low prices ruling for Basic and Bessemer Iron, and the wide spread between these prices and the official prices on Steel, make it possible for dealers to arrange such contracts with Steel mills that have capacity for rolling certain sizes of Billets. There is a fair movement of material in the Scrap market, but Coke continues dull and neglected and prices are low.

Ferromanganese.—The market is rather dull, and prices are weak. Prime grades of foreign 80 per cent. Ferro are freely offered at $45, Baltimore, or $46.95, Pittsburgh, and possibly on a large tonnage for extended delivery this price might be shaded. Small lots are sold at $47 to $47.50, Pittsburgh.

Skelp.—There is no inquiry, and the Skelp mills are very short of work. Prices are weak, but in the absence of actual sales we continue to quote nominally as follows: Grooved Steel Skelp, 1.60c.; Sheared Steel Skelp, 1.70c.; Grooved Iron Skelp, 1.80c., and Sheared Iron Skelp, 1.90c., f.o.b. Pittsburgh.

Muck Bar.—The market is dull and neglected, and we quote best grades of Muck Bar, nominally, at $27.50 to $28, Pittsburgh. We have not heard of any actual sales in this district for some time.

Rods.—The leading producer continues to quote Bessemer Rods at $35, Open Hearth $36, and Chain Rods $37, f.o.b. Pittsburgh. Little new tonnage is being offered, with the exception of Chain Rods, for which there is a fair demand.

Steel Rails.—The Edgar Thomson Rail mills, Nos. 1 and 2 of the Carnegie Steel Company, which were down last week, and are still idle this week, are scheduled to start on Sunday night, March 1. The Isthmian Canal Commission is in the market for 2500 tons of 70-lb. Rails, bids for which will close on March 16. The Cumberland & Pennsylvania, a coal railroad, has placed 500 tons of Standard Sections with the Carnegie Steel Company. While negotiations are still on with some of the leading roads, no actual tonnage has been placed, but some business is expected in the near future. It is not believed that new Rail tonnage this year will exceed 1,500,000 tons, and it may be somewhat less. Some export inquiries are in the market, but are not far enough along to refer to definitely. Very low prices continue to be made by mills that re-roll Rails, Light Sections having been sold as low as $23 to $24, at mill. We are advised that one of the mills located in Central Ohio, and which re-rolls Rails, has recently advanced its prices $1 to $2 a ton, depending on Sections. Regular prices on Light Rails, which are still being shaded $3 to $4 a ton by the mills re-rolling Rails, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—Orders are only for small lots for actual needs, the market being bare of any large tonnage. Latest reports indicate that at present there are about 345,000 idle freight cars in the country, and this slack will have to be taken up and a demand for more cars come before the railroads are likely to place any orders for cars. Indications are that the Plate trade will be dull for the next two or three months. None of the Plate mills is operating to more than 50 per cent. of capacity, if that. Some shading in prices is being done on Plates, but not enough tonnage is coming up to test the market seriously. We quote: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell grade of steel is abandoned.	

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—Some work has been closed up recently, and inquiries are reported as a little better. The American Bridge Company has taken 1500 tons for the Clarke avenue crossing at Cleveland, placed jointly by the Baltimore & Ohio and the city; also 500 tons of bridge work for the Chicago & Northwestern. So far this month the American Bridge Company has taken about 20,000 tons of Steel, a much better record than in January. The McClintic-Marshall Construction Company has taken 1400 tons of bridge work for the Chicago & Northwestern, which includes 46 spans of deck plate girders; 500 tons of bridge work for an Eastern railroad, and 2500 tons of bridge work for the Chicago, Milwaukee & St. Paul. The Pittsburgh & Lake Erie Railroad has prepared plans for its new Steel bridge at Beaver, Pa., involving about 8000 tons, and bids on this work will be asked for in a short time. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—Mills report a slight increase in the demand for Black Sheets, while new tonnage in Galvanized is fairly heavy. The American Sheet & Tin Plate Company and some of the other Sheet makers are slowly increasing their active Sheet capacity. Prices on the whole are being maintained, but in some cases slight concessions are made by the mills, absorbing part of the freight to points of delivery. Regular prices are as follows: We quote: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Bars.—Only a moderate amount of tonnage is being placed in Iron and Steel Bars, orders being mostly for small lots and actual needs. Practically all the mills rolling Iron and Steel Bars are operating on only about half time or less, while specifications against contracts are coming in rather slowly. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further West. Steel Bars remain very firm, at 1.60c., Pittsburgh.

Tin Plate.—There is a moderate increase in new business in both Bright and Roofing Plates, and, as a result, the American Sheet & Tin Plate Company is now operating 165 of its 242 Tin mills. The American Works at Elwood, Ind., containing 12 Tin mills, was started last week. Some of the independent Tin Plate concerns are operating nearly full, while others are running to about half capacity. We are advised that regular prices are being firmly maintained. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Spelter.—The demand is rather light, but prices are fairly strong, and we quote prime grades of Western Spelter at 4.70c. to 4.72½c., East St. Louis, equal to 4.82½c. and 4.85c., Pittsburgh.

Hoops and Bands.—Specifications against contracts placed by consumers early in January are coming in at a fairly satisfactory rate, but no new business of any moment is being placed. We quote Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60, base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Railroad Spikes.—The demand continues light, the railroads being practically out of the market as buyers. We continue to quote standard sizes of Steel Railroad Spikes at $1.80 to $1.85, but this price is shaded slightly to meet competition in Iron Spikes. Prices on smaller sizes are fairly firm, on the basis of $1.95 to $2 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—The volume of new business is small, and concessions in prices offered by the mills do not stimulate buying. Prices on Shafting continue to be shaded from 5 to 10 per cent., carload lots being offered at 55 and 2½ per cent. off the list. We quote, nominally, as follows: Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades, and 10c. and upward for special grades.

Merchant Pipe.—A moderate amount of new business is being placed, but it still represents actual needs of consumers, and is only for small lots. The Pipe mills as a whole are operating to possibly 50 per cent. of capacity, and it is a question whether a reduction in prices would stimulate buying. Products of the Pipe mills are not affected seriously by lack of buying on the part of railroads, and it would seem that the demand for Pipe should be better than it is. Consumers are buying only for actual needs. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 74 and 5 per cent. off list, while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black. %	Galv. %
⅛ to ¼ in.	65	49
⅜ in.	67	53
½ in.	69	57
¾ to 6 in.	73	63
7 to 12 in.	70	55
Extra strong, plain ends:		
⅛ to ⅜ in.	58	46
½ to 4 in.	65	53
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

The new discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
	%	%
⅛ and ¼ in.	63	51
⅜ in.	65	51
½ in.	67	55
¾ to 6 in.	71	63
7 to 12 in.	68	53
Extra strong, plain ends:		
⅛ to ⅜ in.	56	44
½ to 4 in.	63	51
4½ to 8 in.	59	47
Double extra strong, plain ends:		
½ to 8 in.	52	41

Boiler Tubes.—The demand is only fair and is confined to small orders for actual needs. The railroads are not buying Boiler Tubes to any extent, and the demand from this source will likely be dull for some time. Prices continue to be shaded more or less. Discounts on Merchant Tubes for small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ in.	42	47
1¾ to 2¼ in.	42	59
2½ in.	47	61
2¾ to 3 in.	52	65
6 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Iron and Steel Scrap.—A leading consumer of Steel Scrap, out of the market for some time as a buyer, has recently bought a round tonnage, while another Steel interest is said to be quietly in the market for 3000 to 4000 tons of Scrap, which it expects to close this week. The tone of the Scrap market is firm, and more material is moving than for some time, one concern reporting that its shipments of Scrap so far this month have been in excess of both December and January. Dealers quote about as follows: Heavy Steel Scrap for Pittsburgh, Steubenville or Sharon delivery, $13.75 to $14; No. 1 Cast Scrap, $15.25 to $15.50; Low Phosphorus Melting Stock, $17.50 to $18; Bundled Sheet Scrap, $10 to $10.25; No. 1 Busheling Scrap, $13 to $13.25; No. 2, $10.50 to $10.75; Cast Iron Borings, $8 to $8.50. Rerolling Rails are $14.50 to $15; Steel Axles, $16 to $16.25; Old Steel Rails, short pieces for Open Hearth use, $13.75 to $14; Sheet Bar Crop Ends, $17 to $17.50; Steel Axles, $16 to $16.25; Iron Axles, $20 to $20.50, and Grate Bars, $13 to $13.25. We note sales as follows: 100 tons of Old Car Wheels at $16; 100 tons of Low Phosphorus Scrap at $16.90, delivered at Sharon, Pa.; 100 tons of Machine Shop Turnings at $9.25, Valley delivery; 100 tons of Railroad Wrought Scrap at $17, and 100 tons of Locomotive Tires, smooth, at about $17.50, Pittsburgh; 300 tons of Sheet Bar Crop Ends at about $17, Pittsburgh, and 1000 tons of Heavy Steel Scrap at $14, Pittsburgh.

Coke.—New demand for both Furnace and Foundry Coke is very quiet, and prices do not show any betterment. A Cleveland furnace interest has bought four cars of Furnace Coke per day for March delivery on the basis of $1.70 at oven. Strictly Connellsville Furnace Coke for spot delivery is still held at $1.80 to $1.85, while other outside grades are $1.70 to $1.75 at oven. Connellsville 72-hr. Foundry Coke is held at $2.25 to $2.40 at oven, while outside makes are quoted at somewhat lower prices.

Birmingham.

BIRMINGHAM, ALA., February 24, 1908.

Pig Iron.—Sales recorded during the week aggregate a comparatively small tonnage, but the total of sales for the month is believed to be in excess of that for three months past, and producers are apparently satisfied, general conditions considered. Inquiries are more numerous, and the activity noted in the Cast Iron Pipe market is encouraging. Requests have recently been made by leading Pipe interests for quotations on approximately 5000 tons, and indications favor further developments in this line. The demand for prompt deliveries of Pig Iron, although the tonnage engaged is usually limited, is steady, and resumption of shipments against old contracts is frequently reported. Notwithstanding the fact that the change in base of Northern quotations is indicative of a reduction in price of Southern grades, such an effect has not resulted, and the schedule of $13.50, f.o.b. Birmingham, is being adhered to. Numerous reports are rife as to cutting, $12.50 to $13 having been mentioned as representative of such prices, but the details of any transactions at figures under $13.50 are so meager that a statement to that effect is not warranted. A lot of 400 tons of Gray Forge for delivery covering the second quarter has sold for $11.50, Birmingham, which indicates a reduction, but the concern making the sale adheres to $13.50 for No. 2, and, it is believed, would not make a greater differential than 50c. per ton on this basis other than for Gray Forge. The sale of 200 tons of higher grades is reported at $13.50, Birmingham, and High Silicon Iron has recently brought a premium. Production has been further increased during the week, and 13 merchant furnaces are now in operation in the State. Out of seven Basic furnaces, five are in blast.

Cast Iron Pipe.—Among the new lettings now in sight the most significant are 3000 tons Gas Pipe for the city of Washington, D. C., and 3000 tons Water Pipe for Victoria, B. C. Prices are still unsettled, and developments in the Pig Iron market are being awaited with interest. It is understood that the lowest figures for years have recently been reached as the result of sharp competition for Water Pipe contracts. We quote nominally as follows for Water Pipe, per net ton, f.o.b. cars here: 4 to 6 in., $28; 8 to 12 in., $26; over 12 in., average $25, with $1 per ton extra for Gas Pipe. On large municipal contracts these prices are probably shaded.

Old Material.—The condition of the market is unchanged despite the increase in consumption. Inquiries are more numerous, but the demand continues to be met with carload lots and purchasers are still indisposed to negotiate for advanced deliveries. Dealers are conservative as to stock accumulations, and, like consumers, are interested only in bargain lots. Prices are at variance, but the business reported does not warrant a revision of quotations, and we quote nominally as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$18.00 to $18.50
Old Iron Axles	16.50 to 17.00
Old Steel Axles	15.50 to 16.00
Old Car Wheels	18.50 to 19.00
No. 1 Railroad Wrought	13.50 to 14.00
No. 2 Railroad Wrought	10.50 to 11.00
No. 1 Country Wrought	12.50 to 13.00
No. 2 Country Wrought	10.50 to 11.00
Wrought Pipe and Flues	10.50 to 11.00
Railroad Malleable	12.50 to 13.00
No. 1 Steel	12.00 to 12.50
No. 1 Machinery Cast	10.50 to 11.00
Stove Plate and Light Cast	9.50 to 10.00
Cast Borings	6.00 to 6.50

Philadelphia.

PHILADELPHIA, PA., February 25, 1908.

There has been a slow, gradual improvement in some branches of the trade. Small gains in production have been made in certain cases, while others have been just able to hold their own, which is considered by some as a favorable condition, inasmuch as it shows that there has been no retrograde movement. Under existing conditions it is expected that the rate of improvement will be moderate, at least until consumers begin to take on new business more rapidly than they have recently been doing. The railroads, which are a most important factor in the Iron and Steel trades, are still out of the market, and until they, together with the larger industrial concerns, become more active buyers, business will no doubt continue somewhat sluggish. Locomotive builders, machine tool manufacturers and Iron and Steel foundries, who are dependent to a large extent, both directly and indirectly on the railroad business, feel the falling off in that demand very severely and until they begin to pick up orders, they will not be very extensive buyers of crude or finished materials.

Pig Iron.—Buying continues on a moderate scale, consumers maintaining their policy to purchase only enough Iron to meet their immediate requirements. That stocks in buyers' yards are low, however, is evidenced by the desire for prompt shipment that usually accompanies orders. On the whole, however, the aggregate tonnage is considered very fair under existing conditions, and it was brought out at the monthly meeting of the Eastern Pennsylvania Pig Iron Association last week that orders for the current month are about equal to those of the previous one; that there is no increase in the tonnage of Pig Iron on the furnace banks, and that prices for the various grades of Pig Iron are being fully maintained by the members of the association and other leading interests. Producers, therefore, are pretty well satisfied with the situation and express a belief that there will be a moderate increase in buying in the near future. Sales continue to be largely restricted to the Foundry grade. The individual tonnages taken are as a rule small, by far the greater proportion being of lots less than 100 tons. Occasionally a sale of several hundred tons is made, but they are not numerous. Prices continue unchanged, $18.25 to $18.50, delivered, being the range for No. 2 X Foundry. Pipe foundries continue to take small lots of Pipe-making Irons, and one interest is reported to have made a further purchase of 1000 tons of Southern Iron. Outside interests are not believed to be making any extensive sales, the slight concession in prices not being considered sufficient inducement by some melters to change from the brands of Iron they have been accustomed to use. Forge Irons have been in light demand. Scattered sales of small lots are reported at the established figures, $16.50 to $16.75, delivered, mostly for prompt shipment. Mills are not actively engaged, and their requirements are therefore not heavy. There is practically no demand for Steel-making Irons. Steel makers are still covered for some time ahead as far as their requirements for Basic Iron are concerned, and no new business has developed during the past week for Low Phosphorus Pig. Prices on all grades of Iron are being firmly held at the established figures by the leading producers. Prospective buyers have felt the market in a number of instances, but

meet with no success in their efforts to get lower figures. We quote for early delivery in buyers' yards, eastern Pennsylvania and nearby territory, the following range of prices:

No. 2 X Foundry	$18.25 to $18.50
No. 2 Plain	17.75 to 18.00
No. 3 Foundry	17.25 to 17.50
Gray Forge	16.50 to 16.75
Basic	17.25
Low Phosphorus	24.00 to 25.00

Ferromanganese.—There has been a little more demand for Ferro, and a few scattered sales of 50 and 100 ton lots, for prompt shipment, have been made. Prices range from $45 to $47, Baltimore, although probably less could be done for round tonnages, for which, however, there is practically no demand at the time.

Steel.—Some little improvement is to be noted in the demand for Steel. Orders have been booked for small lots ranging from 50 to 100 tons, while there has been some feeling of the market for larger tonnages. Efforts have been made to break the present price, but, so far as we can learn, this has not been done in this territory. Quotations for local delivery are being maintained at $30.40 for ordinary Rolling Steel, with Forging Steel at $32.40 to $33.40, according to analysis.

Plates.—There has not been much change in the demand. Orders come out irregularly, but on the average make a pretty fair tonnage. One order covering nearly 1000 tons of Plates was booked by one of the Eastern mills. As a rule, however, purchases run more in the neighborhood of 100 tons. Quite a little Bridge Material has been taken recently, as has also a small amount of Locomotive Steel. Mills continue to operate at between 50 and 60 per cent., but business is largely for early delivery. Prices are being fully maintained, quotations for delivery in this territory ranging as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G	.15
No. 9, B. W. G	.25
Plates over 100 to 110 in	.05
Plates over 110 to 115 in	.10
Plates over 115 to 120 in	.15
Plates over 120 to 125 in	.25
Plates over 125 to 130 in	.50
Plates over 130 in	1.00

Structural Material.—A fair volume of business continues to come out. The demand, however, is mainly for small and miscellaneous lots. Several smaller building propositions and a few bridges of the smaller class have been before the trade, and some of this work is expected to develop into orders in the near future. Mills have in some cases made slight gains in production, and Structural Material makers, on the whole, feel more encouraged by the outlook. Prices continue unchanged, 1.85c. to 2c. being quoted, according to specifications.

Sheets.—Mills have gained slightly in tonnage, but the business placed has been made up almost entirely of small lots for early delivery. Buyers still withhold orders for future delivery, preferring under existing circumstances to cover their needs only as fast as they book new business. Prices continued to be firmly maintained, quotations being as follows for mill shipments, with a tenth extra for small lots: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.70c.; Nos. 25 to 26, 2.80c.; No. 27, 2.90c.; No. 28, 3c.

Bars.—The situation in the Bar Iron market shows but little variation. Buying has been on a very moderate scale and has been confined almost entirely to consumers' requirements for immed'ate use. Rolling mills are not fully occupied, and continue in most instances to run irregularly. Prices of Refined Iron Bars are being pretty firmly maintained at the new base, 1.65c., delivered in Philadelphia and adjoining territory.

Coke.—The demand for all grades of Coke has been quiet. Sales continue small, and are largely for prompt delivery, at unchanged prices. Furnace Coke continues to be quoted at $1.75 to $2.25, at oven, while Foundry Coke ranges from $2.25 to $2.75, at oven. We quote the following range of prices, for delivery in the Philadelphia territory:

Connellsville Furnace Coke	$4.00 to $4.50
Foundry Coke	4.50 to 5.00
Mountain Furnace Coke	3.70 to 4.10
Foundry Coke	4.10 to 4.60

Old Material.—The market is in a rather unsettled condition. Buyers' and sellers' ideas differ materially as to the prices of some grades of Scrap. Steel melters as a rule are not willing to pay over $13.50 for Heavy Melting Steel, and would no doubt take a fair tonnage at those figures, but dealers in this territory hold firmly at $14.50 to $15, at which latter figures sales of small tonnages have been made for early delivery. One thousand tons of Low Phosphorus Scrap was sold during the week at 50c. above last week's quotation. Rolling mills continue to take small tonnages of No. 1 Wrought Iron Scrap at full prices. We quote, for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory the following range of prices:

No. 1 Steel Scrap and Crops	$14.50 to $15.50
Low Phosphorus	18.50 to 19.00
Old Steel Axles	18.00 to 18.50
Old Iron Axles	23.00 to 24.00
Old Iron Rails	18.00 to 19.00
Old Car Wheels	16.00 to 17.00
Choice No. 1 R. R. Wrought	16.50 to 17.00
Machinery Cast	15.00 to 15.50
Wrought Iron Pipe	12.00 to 12.50
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	10.00 to 10.50
Stove Plate	13.00 to 13.50
Cast Borings	8.50 to 9.00
Grate Bars	12.00 to 13.00

Cincinnati.

CINCINNATI, OHIO, February 26, 1908.—(*By Telegraph.*)

There is no disposition manifested to force buying in any of the various branches of the Iron and Steel industry by ill advised cutting of prices, so far as can be ascertained in this field, and there is consequently little going in actual transactions. Some fairly good sized contracts for Coke extending over the year suggest improvement in the melt, and there have been some rush orders for Foundry Cokes in small lots for prompt shipment which indicates that the foundries have about exhausted supplies on yards. Confidence in the future is the best asset in evidence at the plants of the Old Material dealers, aside from their tremendous stocks. Prices in some few lines of Scrap have stiffened a little, but in the main there is not enough doing to establish a market. While not much is heard from the Stove manufacturers since the early year, when some heavy purchases were made of Iron, salesmen and dealers in territory contiguous to the South all report good prospects, and the belief is general that the Stove makers will see little difference in their output.

Pig Iron.—A characteristic of the present market seems to be the movement in small lots, contracting for any forward period being a rarity, and showing unmistakably the feeling of uncertainty that exists among the larger manufacturers. There has been some buying on the part of Pipe makers, but the impression prevails that negotiations have been conducted under cover and direct with furnaces that had accumulations of stocks in yard, and who were tempted to move them at slightly shaded figures. The new basing prices recently inaugurated for the use of furnaces in the Northern districts are giving salesmen considerable trouble, it is thought, and the general opinion seems to be that they are not as effective as expected. Competition has been very keen in recent negotiations, and it is not generally believed that the basing price of $17 has been very closely observed. A sale which is expected to be closed to-day on about 2000 tons of Malleable for second and third quarter delivery to a central Ohio manufacturer has been very closely contested, and it is said the price is around $16.50. A Detroit melter asks for bids on 500 tons of Standard Foundry. Other Michigan concerns want lots of from 300 to 500 tons for prompt delivery. A Kentucky stove concern wants 500 tons of Stove-making Irons, and there is some inquiry for Bessemer from Steel-making concerns. Reports of a sale of 500 tons of Southern No. 2 Foundry as low as $12.25, Birmingham, are persistent, but this is probably an Iron high in sulphur. There seems to be a little irregularity in the prices on 8 per cent. Silicon, quotations ranging from $18 to $20, although a case in point where an Ohio Silvery brand was under consideration analyzed between 7 and 8 per cent. the furnace refused a price of $18.30. Low grades have furnished some food for argument during the week, and rumors are heard of some No. 4 Foundry and Forge going as low as $11 and $10.50, respectively. So far as can be ascertained, the makers of standard brands in the Birmingham District are maintaining the agreed price of $13.50, and the full range for the balance of the first and up to the beginning of the third quarter is $13 to $13.50. For immediate delivery and balance of first half we quote as follows, freight rates being $3.25, $1.80 and $1.20 from the Birmingham, Valley and Hanging Rock districts, respectively.

Southern Coke, No. 1	$16.25 to $16.75
Southern Coke, No. 2	15.75 to 16.25
Southern Coke, No. 3	15.25 to 15.75
Southern Coke, No. 4	14.75 to 15.25
Southern Coke, No. 1 Soft	16.25 to 16.75
Southern Coke, No. 2 Soft	15.75 to 16.25
Southern Coke, Gray Forge	14.25 to 14.75
Southern Coke, Mottled	13.75 to 14.25
Ohio Silvery, 8 per cent. Silicon	20.20 to 20.70
Lake Superior Coke, No. 1	17.70 to 18.20
Lake Superior Coke, No. 2	17.20 to 17.70
Lake Superior Coke, No. 3	16.70 to 17.20
Standard Southern Car Wheel	25.25 to 25.75
Lake Superior Car Wheel	23.50 to 24.00

(*By Mail.*)

Coke.—Deliveries are still progressing on contracts made last year, and at a higher figure, but mostly on requirements,

which are not large at this time; and the continued inactivity of furnaces and foundries makes the future beyond July 1 extremely problematical. There is some spot Coke going at about an average of $2.40, at oven, for Connellsville and standard Virginia grades. Agencies are willing to contract at $2.50, covering requirements for the balance of the year. There is considerable uncertainty about Furnace brands. The spot price for best grades is about $1.90 to $2.15, at oven. Best Virginia grades of Foundry Coke range from $2.25 to $2.50; Furnace, $1.75 to $2.15, at oven.

Finished Iron and Steel.—Prices are being well maintained at stores. Such business as is coming out is still of the hand to mouth order, and there appears no reason to believe that any immediate improvement is at hand. Dealers quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.65c., with half extras; small lots from store, 1.90c., base, one-half extras. Steel Bars, carload lots, 1.75c., base, half extras; small lots from store, 1.90c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c. Blue Annealed Sheets (heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.25c. No. 12, carload lots, 2c.; small lots from store, 2.35c. Sheets (light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c., base. Plates, 3-16, and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Old Material.—The larger dealers still denominate the situation a "buyer's market," and deny that there is any suggestion of prices stiffening here, as in some other localities. There is no activity in any line of Scrap; the mills are not buying, and negotiations between dealers are not considered as having any weight in making prices. The market here is about as follows, prices being f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$11.00 to $12.00
Cast Borings, net ton	4.50 to 5.00
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	15.00 to 16.00
Old Iron Rails, gross ton	14.00 to 15.00
Old Steel Rails, long, gross ton	11.50 to 12.50
Relaying Rails 56 lb. and up, gross ton	22.00 to 23.00
Old Car Wheels, gross ton	15.00 to 16.00
Low Phosphorus Scrap, gross ton	13.50 to 14.50

Cleveland.

CLEVELAND, OHIO, February 25, 1908.

Iron Ore.—The only development of importance has been quite an increase in orders for shipment of Ore from the docks to the furnaces. Some of the orders result from the starting up of two or three merchant stacks that have been idle for some time. There are no inquiries coming in for 1908 Ore, and none is expected for some time. There are few furnace interests that will not have enough 1907 Ore to last them until late in the summer. Under the circumstances Ore firms are making no efforts to make sales. Operations on the Ore ranges are going on at about the same rate as in the early part of the winter. The output at most of the mines has been reduced to about 60 per cent. of what was being mined during the winter a year ago. Practically no chartering of vessel tonnage for the coming season has been done yet by shippers. The opening of navigation will doubtless be later than usual, and vessel men are looking for a rather light season. We quote Ore prices as follows, at Lake Erie docks, for 1908 delivery, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.25; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—The market continues lifeless. A limited tonnage of Northern Foundry Iron has been sold at $17, at furnace, for No. 2 Foundry, for delivery in the territory of the selling furnace, the price fixed in the recent agreement being adhered to. That consumers have been willing to place orders on the price basis encourages furnace interests to believe that the agreement will hold, but the buying and the inquiries have been so light that the new arrangement has not yet been given much of a test. There are a few small inquiries out, the largest being for 300 tons. The sale of 350 tons of No. 2 Foundry at $17, Toledo furnace, is reported, and a local furnace reports the sales of some small lots at $16.50 and $16.75, at western Pennsylvania and New York furnaces. While some furnaces report no improvement in shipping orders one local furnace is shipping about 25 per cent. more Iron than a month ago. Little local demand is expected for Foundry Iron before April, as the majority of local consumers have enough Iron coming on old contracts to last them for several weeks. In addition to an inquiry for 10,000 tons of Basic Iron from St. Louis noted last week there is another inquiry from the same territory for 5000 tons, and several other inquiries for 1000 ton lots of Basic Iron. A Dayton concern that has an inquiry out for 2000 tons of Malleable Iron will probably close a contract early this week. There is but little inquiry for Southern Iron. One more furnace will be added to the idle stacks in northern Ohio. Furnace B of Pickands, Mather & Co., Toledo, will go out of blast in a day or two. This furnace has been on Malleable Iron for several months, with the exception of about two weeks past, when it has been producing Foundry Iron. For the first quarter and first half we quote, delivered, Cleveland:

Bessemer	$18.00
Northern Foundry, No. 1	17.85
Northern Foundry, No. 2	17.35
Northern Foundry, No. 3	16.85
Southern Foundry, No. 3	$16.85 to 17.35
Gray Forge	15.90 to 16.40

Coke.—The market is quiet and prices continue low. There is some demand for Foundry Coke in small lots, but no sales of Furnace Coke are reported. We quote Connellsville Furnace Coke for spot shipment at $1.85, at oven. There are reports, however, of considerably lower prices. Quotations on Connellsville 72-hr. Foundry Coke range from $2.25 to $2.60, sales being reported at $2.40]

Finished Iron and Steel.—Buying is limited to small lots for immediate shipment. Consumers want delivery on current orders as quickly as possible. While there are a large number of these small orders, the aggregate quantity is light. The tonnage sold in the present month will show some increase, perhaps 25 per cent., over any month since October. Some shipments on specifications that were given last fall and were later held up are now being ordered. Practically no new contracts are being placed. Local Bar Iron mills continue to run on about half time. The Plate situation shows no improvement, there being practically no inquiry. The price is being shaded $2 a ton by some of the smaller Plate mills. The demand for Sheets is almost as light as for Plates, and the price is being shaded. The price of Steel Bars is being firmly maintained, but there are rumors of cutting in Iron Bars. Billets are firm, and there is some demand in car lots for Forging and Rerolling Billets. We quote the former at $30, and the latter at $28, Pittsburgh. One or two mills report some fairly good specifications for Structural Material from Structural shops and Bridge companies. Specifications were received during the week for 700 tons of material for a bridge at Morgantown, W. Va. There are three or four inquiries in the market, aggregating about 1500 tons, for Light Rails for coal mines. The leading interest that has been shading the price to meet the competition of rerolling mills is now holding firmly to $28 for 25 to 45 lb. sections. A slight reduction has been made in the previously established price of Bolts and Nuts. The old price was not adhered to, and the new price is slightly higher than the price at which many of the manufacturers have recently been taking orders. The demand for Bolts and Nuts shows some improvement. Some good sized specifications for Plates and Structural Material are being received from the lake shipbuilders. We quote Iron Bars at 1.60c., Cleveland; Steel Bars, 1.70c., Cleveland, for carload lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼-in. and heavier, 1.80c., base, Cleveland. We quote Sheets, mill shipments, carload lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. We quote Steel Bars from warehouse at 1.80c., and Iron Bars at 1.80c. Beams and Channels out of stock are 2.10c. to 2.15c., base. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—About the only activity is the trading between dealers which is only in limited volume. Consumers are taking little Scrap, buying only what they need for immediate use. In spite of the fact that the market shows no improvement there is somewhat of a better feeling among dealers. Prices remain about stationary. Quotations are still mainly nominal, but there is no indication of further weakness. There is no indication of an early increase in the demand from mills in this territory. The only railroad list out this week is about 500 tons to be sold by the Nickel Plate. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	16.00 to 17.00
Old Iron Rails	16.00 to 17.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	16.00 to 17.00
Relaying Rails, 50 lb. and over	22.00 to 23.00
Heavy Melting Steel	12.00 to 12.50
Railroad Malleable	12.00 to 13.00
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	8.00 to 9.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	7.00 to 8.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	11.00 to 12.00
No. 1 Railroad Wrought	12.50 to 13.00
No. 1 Cast	12.00 to 13.00
Stove Plate	10.50 to 11.00
Bundled Tin Scrap	8.00 to 9.00

Metal Market.

NEW YORK, February 26, 1908.

Pig Tin.—Business during the week ending February 22 was good; it was, in fact, by far the best week in the Tin trade since the October panic. Although higher prices came from London, these were brought about by the good demand from consumers here; that is, the incentive for the advance came from the good American buying. This week, however, business has dwindled to small proportions, possibly because of rapid advance in prices, but more probably because the needs of consumers have been satisfied. It is estimated that between 800 and 1000 tons of Tin were sold during the week. Shipments from London were obtainable at concessions of from 10 to 35 points below daily prices, which ranged as follows:

	Cents.
February 19	28.20
February 20	28.45
February 21	29.20
February 24	29.10
February 25	28.90
February 26	28.70

It will probably be necessary again to revise estimates of deliveries into consumption. At present, however, there is a wide difference of opinion regarding deliveries, some placing them as low as 2000 tons, while others think that possibly 2500 tons may be nearer the correct figure. Should the latter guess prove correct, it will leave stocks at the end of the month the smallest in years, for arrivals amount to but 1922 tons so far, and there are afloat 2212 tons, of which but a small amount will make this month's delivery. The London market closes easier, at £128 15s., for spot, and £128 5s. for futures.

Copper.—The low level of prices in the present movement was reached on Wednesday and Thursday of last week, when a leading selling interest sold some metal to domestic dealers and foreign speculators at prices around 12.25c. Wall Street reports to the contrary notwithstanding, the tonnage disposed of was not as large as 60,000,000 to 80,000,000 lb., nor was the price 13c. Quotations are largely nominal, producers asking 13c. for Lake and Electrolytic, but consumers are unwilling to bid higher than a range of 12.50c. to 12.75c. for Electrolytic and 12.50c. to 12.87½c. for Lake. Lake is more nearly on a parity with Electrolytic than for several years, because foreign consumers absolutely refuse to pay premiums for this kind of Copper, and there is too little buying from domestic melters to make a market. In fact, at present the price is more or less of a secondary consideration with producers who are more concerned in getting rid of the metal than of getting ⅛c. or ¼c. more per pound. There continues to be considerable cutting of prices abroad, due to the stocks held by second hands, which were purchased low down. Exports have picked up considerably during the week, amounting to 18,532 tons so far this month, but even at this rate the accumulation of metal here is not being reduced. The London market closes at £58 12s. 6d. for spot and £58 for futures. Best Selected is held at £62.

Ferroalloys.—The market continues dull. Prices are largely nominal, $85 being asked for 50 per cent. Ferrosilicon, and $47.50 to $48.50 for 80 per cent. Ferromanganese.

Pig Lead.—Some rumors of price cutting are current, but it is difficult to confirm these. The general market is dull and unchanged, 3.75c. being asked in New York. The St. Louis market is unchanged, at 3.65c. Prices in London continue to decline, and another new low record has been set this week, at £13 17s. 6d.

Spelter.—A single carload of Spelter was sold on Tuesday at 4.70c. While such a small lot does not make the market, it shows that the continual cutting under producers' quotations is bound to have some effect. The general asking price for Prime Western brands is 4.75c. to 4.80c., both in New York and St. Louis.

Antimony.—The market is unchanged; continuing very dull with prices nominal. Cookson's is held at 9.50c., Hallett's at 9c. and outside brands at 8.50c.

Nickel.—Prices are without change at 45c. for ton lots and 50c. to 60c. for small quantities.

Old Metals.—The demand for Old Metals from dealers is fair; in fact, some classes of Scrap are rather scarce. Dealers' selling prices are practically unchanged from those of a week ago, as follows:

	Cents.
Copper, Heavy Cut and Crucible	12.25 to 12.50
Copper, Heavy and Wire	11.75 to 12.00
Copper, Heavy and Bottoms	11.00 to 11.25
Brass, Heavy	9.50 to 9.75
Brass, Light	7.00 to 7.50
Heavy Machine Composition	11.50 to 12.00
Clean Brass Turnings	8.00 to 8.50
Composition Turnings	9.50 to 10.50
Lead, Heavy	3.60
Lead, Tea	3.35
Zinc Scrap	3.50

Tin Plate.—The Tin Plate trade continues to be the bright spot. Further improvement has been noted this week in the starting up of idle mills, and the demand at present probably exceeds 50 per cent. of the producing capacity. Prices are unchanged at $3.89, f.o.b. New York, and $3.70, f.o.b. Pittsburgh, for 100 lb. IC Coke Plates. Welsh Tin Plates are 1½d. lower, at 12s. in Swansea.

New York.

NEW YORK, February 26, 1908.

Pig Iron.—Southern furnaces seem to have taken most of the small business lately offered, where consumers were located at or near seaboard, so as to take advantage of the lower prices quoted from that section. Foundries farther inland have, for the most part, supplied their limited needs with their customary Eastern brands at the prices recently maintained for such Irons. Demand is very light. We quote, at tidewater, as follows: No. 1 Northern Foundry, $18.75 to $19; No. 2 Foundry, $17.75 to $18.50; No. 2 Plain, $17.25 to $17.75; Gray Forge, $16.75 to $17.25. Southern Irons are $17.50 to $18 for No. 1 Foundry, and $17 to $17.50 for No. 2 Foundry.

Steel Rails.—An active Rail market has developed in the past week, gauging activity by present standards. The Great Northern Railroad has placed 45,000 tons of the 60,000 tons on which it has figured recently for 1908—the Steel Corporation taking 20,000 tons, the Lackawanna Steel Company 15,000 tons, and the Pennsylvania Steel Company 10,000 tons. Of the last named contract 5000 tons is Open Hearth Rails. The Ontario & Western has ordered 3100 tons, which will be rolled at Buffalo, and the Atlantic Coast Line 8000 tons, to be rolled at Sparrow's Point.

Structural Material.—The American Bridge Company has taken the largest local contract of the week—2000 tons, for the new theater to occupy the block bounded by Sixty-second and Sixty-third streets, Broadway, and Central Park West. The Pennsylvania Railroad has contracted for 250 tons of bridge work, and the Erie has taken a small tonnage. The Steel for the Manhattan Bridge approach, 16,000 tons, is likely to be let soon by the general contractor, J. C. Rodgers, after a long delay by the city in closing for this work. Financial considerations promise to be a controlling factor in Structural operations for some time. We quote as follows on mill shipments, tidewater deliveries: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—A moderate amount of business is reported, with active mills not as yet running to their full capacity, while quite a number of the Eastern Bar mills still continue idle. Prices are held at 1.50c., Pittsburgh, or 1.66c., tidewater, for Iron Bars, and 1.60c., Pittsburgh, or 1.76c., tidewater, for Steel Bars.

Plates.—The local demand consists almost exclusively of small lots for repair work. Prices are firmly held as follows for standard sizes of Plates at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Old Material.—Foundry stock has been rather dull and all grades in this line are cheaper, with quotations reduced 50c. per ton. Rolling mill stock and Steel Scrap are about holding their own in this market, with the only demand for Steel coming from brokers who had been held up for deliveries on contracts for the past three months. The stocks of all kinds, in storage yards and on consumers' premises in this vicinity, are less now than for a long series of years at this season. The railroads are producing much less Scrap than usual because of their diminished amount of traffic, less repairs being made. It is confidently believed that if the manufacturing end of the Iron trade should improve the demand for Scrap would almost immediately show a decided betterment. Quotations per gross ton, New York City, are as follows:

Old Girder and T Rails for melting	$9.50 to $10.50
Heavy Melting Steel Scrap	9.50 to 10.50
Old Steel Rails, rerolling lengths	11.00 to 12.00
Relaying Rails	18.50 to 19.50
Old Iron Rails	14.00 to 15.00
Standard Hammered Iron Car Axles	16.50 to 17.50
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	12.00 to 13.00
Iron Track Scrap	10.00 to 11.00
No. 1 Yard Wrought, long	11.00 to 12.00
No. 1 Yard Wrought, short	10.00 to 11.00
Light Iron	5.00 to 6.00
Cast Borings	4.50 to 5.50
Wrought Turnings	6.00 to 7.00
Wrought Pipe	9.00 to 10.00
Old Car Wheels	17.50 to 18.50
No. 1 Heavy Cast, broken up	13.50 to 14.50
Stove Plate	11.50 to 12.50
Grate Bars	9.50 to 10.50
Locomotive Grate Bars	10.00 to 11.00
Malleable Cast	12.00 to 13.00

Cast Iron Pipe.—Springfield, Mass., opened bids on 2200 tons on Monday. A purchase of Pipe for Hoboken, N. J., amounting to 1900 tons, was made last week. The contractors who bought secured the Pipe laying job last August, but waited until now to purchase the Pipe and are under-

stood to have saved about $9 per ton. Not so much business has been done the past week as in the previous week, but the demand has been quite good for small lots and a little more confidence is now shown in values, as manufacturers appear less disposed to compete sharply for such work as is coming up. Carload lots of 6-in. are to be had at $25 to $25.50 per net ton, at tidewater.

The Coal Movement Improving.

BY F. L. SAWARD, NEW YORK.

The railroad movement of Coal tonnage shows an improvement, and that is the best indication of a change in the industrial situation that one could ask for. In January the falling off was as great as 25 per cent. in some cases, and the most recent returns show a decline of but 17½ per cent., as against the same weeks of last year, which is surely a change toward better things, and if there be a lopping off of 10 points from this by May 1 it will be gratifying, indeed.

Prices on some grades of Soft Coal are steadier than they were, as the demurrage Coal has been disposed of. In short, one may say that the situation along the coast line is on the mend, taking it as a whole. Baltimore is moving a fairly good tonnage. Little spot Coal is wanted, however, and prices are low for what is to be had. Business at Lambert Point, Norfolk and Newport News is light as compared with what it should be, and except for a few shippers it amounts to nothing. Mines in the New River and Pocahontas regions are working but two days a week, and this takes care of the orders in good shape. Shippers in those regions are not inclined to force their Coals on the market, however, and this helps out in getting a fair return for the Coal shipped.

The Providence situation has been cleared up, and there is no demurrage Coal standing around at present. The bargain counter offers are now a thing of the past, but will, no doubt, be the topic of conversation for a long time to come. New Haven is reported to be still a dull market. The railroad company is still holding off shipments as much as possible, trying to use up the large quantities delivered recently. This situation will be improved shortly, however, and a better situation will no doubt be reported a week hence.

The New England situation is looking a little better, a few orders having been placed for new shipments, but the volume has been very light as yet. Boston is taking in most of the shipments now being made, Coal being applied on contract business, as a rule. Little tonnage has as yet been ordered to Portland, Portsmouth or Providence. The railroad companies in the East are all taking in shipments, but the volume is kept down materially on one class or another, so that the total is much less than normally. A great cleaning up of stocks is now in progress among all the consumers, and when the market does show an improvement it should be fairly steady.

At New York the great volume of cheap Coal has been cleaned up, and the bargains to be had to-day are almost entirely confined to the higher grades of Coal, many of which can be had at or near the basis of $1 at the mines. These are being gradually picked up, and if there is any increase in business it will be but a short time before higher prices will be realized for these grades, as they naturally can command business over ordinary grades at the same prices. Philadelphia tidewater business is still dead, there being a very small demand there from the piers at this time. Line business in that section is fair, however, and prices are equal to those prevailing in any market. Coals known in that section are enjoying a very fair business. Prices are about as follows:

Georges Creek	$3.20 to $3.25
High grade, three-quarter lump	3.10 to 3.20
High grade gas, run of mine	3.00 to 3.10
Best Miller vein coals	2.75 to 2.85
Good Miller and Moshannon	2.60 to 2.65
Best Somerset	2.70 to 2.80
Ordinary Somerset	2.60 to 2.65
Fairmont, three-quarter	2.85 to 3.00
Fairmont, run of mine	2.80 to 2.85
Odds and ends to relieve embargoes, &c.	2.40 to 2.50

Line Bituminous rates are as follows:

Pennsylvania Railroad Coals.

Georges Creek	$2.00 to $2.00
Best Miller vein	1.40 to 1.50
Good Miller and Moshannon	1.15 to 1.25
Best gas coal, three-quarter lump	1.30 to 1.40
Best gas coal, run of mine	1.20 to 1.30
Best gas coal, slack	.70 to .80
Ordinary Clearfield	1.10 to 1.15
Ordinary Latrobe	1.00 to 1.10

Baltimore & Ohio Coals.

Georges Creek	$2.00 to $2.05
Best Somerset	1.25 to 1.30
Somerset	1.10 to 1.25
West Virginia Freeport	1.00 to 1.10
Fairmont District, three-quarter lump	1.00 to 1.10
Fairmont District, run of mine	.90 to 1.00
Fairmont District, slack	.60 to .75

Anthracite Steam Coals, at tide, may be reported on as follows: Pea is still short in most cases, but has eased up considerably. Buckwheat is not the great drug that it was. It is still difficult to move the cheaper grades at Port Reading at any decent price, but the better grades are getting scarce again. Rice is still short, but the demand is not sufficiently active to advance prices. Some bargains are still to be had. Barley is hard to move. This size has been a drug for the past four months, and the cheaper classes have been sold continually at figures that could not show any returns to the shipper. The line trade has improved in accordance with the situation at tidewater. A week or two ago prices had declined to about April prices on some Coals, but the increased demand has caused a gradual advance again, until full circular is being maintained.

Iron and Industrial Stocks.

NEW YORK, February 26, 1908.

The stock market has been rather quiet for the greater part of the week. Some strength was manifested on Thursday and Friday, but any gains then made were lost in a slight reaction on Monday, which in some cases progressed a little further on Tuesday. The iron and steel stocks were adversely affected by rumors emanating from Pittsburgh of the cutting of prices on some steel products, but these rumors were not confirmed. The range of prices on active stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 27¾ to 29, preferred 91 to 93¼; Car & Foundry common 26 to 26⅞; Locomotive common 31⅜ to 35, preferred 89½ to 89¾; Steel Foundries common 5 to 5½, preferred 27½ to 29¼; Colorado Fuel 16 to 17⅝; Cambria Steel 27⅜ to 27½; Crucible Steel common 4¼ to 4¾, preferred 33 to 33½; Pressed Steel common 18½ to 19¾, preferred 70 to 71; Republic common 15¼ to 16, preferred 65¾ to 67½; Sloss-Sheffield common 40 to 42, preferred 92; Cast Iron Pipe common 18¾ to 19½, preferred 63½ to 64; Can common 4, preferred 45½ to 46¼. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 28¼, preferred 91⅜, bonds 87⅞; Car & Foundry common 26⅛, preferred 84¾; Locomotive common 32, preferred 89; Colorado Fuel 16¼; Pressed Steel common 19½, preferred 71; Railway Spring common 24; Republic common 15¾, preferred 66¼; Sloss-Sheffield common 39⅝; Cast Iron Pipe common 18¾, preferred 64; Can common 4⅛, preferred 45½.

Dividends.—The Republic Iron & Steel Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable April 1.

The Nova Scotia Steel & Coal Company has declared a quarterly dividend of 2 per cent. on the preferred stock and 1½ per cent. on the common stock, payable April 15.

The International Silver Company has declared a quarterly dividend of 1 per cent. on the preferred stock, payable April 1.

The National Lead Company has declared the regular quarterly dividend of 1¼ per cent. on the common stock, payable April 1; also 1¾ per cent. on the preferred stock, payable March 16.

The General Electric Company has declared the regular quarterly dividend of 2 per cent., payable April 15.

The Robins New Conveyor Company, which has recently incorporated, will be operated under the management of Thomas Robins, who founded the Robins Conveying Belt Company in 1885 until March, 1907, when the management passed into other hands. The position of chief engineer in the new company is filled by C. Kemble Baldwin, who has served in the Robins Conveying Belt Company in the same capacity for the last seven years. The offices of the company are at 38 W Colony Building, Chicago.

The annual meeting and dinner of the Cincinnati Metal Trades Association will be held Thursday evening, March 5, at the Business Men's Club. The feature of the evening will be an address on "The West Indies and the Panama Canal," by James A. Green of Matthew Addy & Co. Officers will be elected.

The Lackawanna Steel Company's Report.

President E. A. S. Clarke's comments on the results of the trade of 1907 are in part as follows:

It is with no small satisfaction that your directors report the company as being, in the period of acute depression marking the close of the year, in strong financial and physical condition. The first nine months of 1907 gave opportunity for operating all of the various properties to their full extent, but the last quarter saw them entirely closed down or operating on a greatly reduced basis. All of the properties are in excellent physical condition.

The additional blast furnace at Buffalo, mentioned in last year's report, was completed and put in blast on February 13, 1907, establishing a world's record for rapid construction. It has since that time produced 156,305 gross tons of pig iron. The No. 8 mill, which produces small billets and sheet bars, was completed and put in operation during the month of October.

The company received during 1907 from mines which it owns or in which it is interested 1,941,376 gross tons of iron ore, and produced a total of 788,784 gross tons of coke and 1,008,588 gross tons of pig iron and spiegeleisen. It also produced 852,055 gross tons of Bessemer ingots and 425,789 gross tons of open hearth ingots, making a total of 1,277,844 tons of steel ingots. Shipments of product were as follows, all in gross tons, the figures for the year 1906 being given for comparison:

	1906.	1907.
Standard rails	556,755	523,200
Light rails	47,868	48,777
Angle bars, fittings, &c.	43,639	33,510
Structural shapes	121,407	141,455
Plates	95,244	113,969
Merchant steel products	52,401	61,343
Slabs, billets and blooms	17,078	*61,157
Pig iron and miscellaneous	34,655	8,289
Totals	969,047	991,700

* Including 3502 tons sheet bars and small billets.

Orders on the books at the close of 1907 amounted to 203,741 gross tons, a decrease of 71.2 per cent. from the corresponding figure for 1906. Delivery on these orders has been largely suspended, pending improved financial conditions. The low priced contracts mentioned in last year's report as having affected the earnings of the year 1906 have been substantially worked out, and the prices received during 1907 represent fairly the market conditions of that year.

It has seemed wise to the directors, owing to general financial and trade conditions, not to consider the declaration of any dividend on the stock, although the earnings would otherwise have warranted it.

The profit and loss account for the year ending December 31, 1907, makes the following showing:

Gross sales and earnings		$33,011,410.43
Less manufacturing cost and operating expenses	26,388,013.35	
Net income from manufacturing and operating		$6,623,397.08
Dividends on investments in companies not controlled, &c.		607,660.83
Total income		$7,231,057.91
Deduct administrative and general expenses, taxes, commercial discount, &c.		799,604.36
Net earnings for year		$6,431,453.55
Less appropriations for sinking funds and exhaustion of minerals	$449,791.28	
For depreciation and accruing renewals	1,282,189.43	
		1,731,980.71
Balance		$4,699,472.84
Deduct interest, rentals and royalties		2,255,626.68
Surplus income for the year, carried to balance sheet		$2,443,846.16

The consolidated balance sheet, including subsidiary companies, as of December 31, is as follows:

Assets.

	1907.	1906.
Properties, real estate, plant, &c.	$49,278,880	$49,278,880
Additional property acquired and constructed in 1907	11,336,186	.....
Investments in ore companies	5,032,321	5,289,800
Discount, commercial organization expenses, &c.	2,350,621	2,332,531
Deferred charges to operation	44,951	84,318
Amount in hands of trustees	130,435	251,850
Inventories	10,322,289	8,517,668
Accounts receivable	922,443	848,426
Advanced payment for material and supplies	.....	104,498
Customers' accounts	4,373,811	5,719,818
Notes receivable	593,892	358,198
Cash	1,337,346	658,252
Totals	$85,723,177	$73,444,259

Liabilities.

Capital stock (outstanding)	$34,721,400	$34,721,400
Stock of Lackawanna Iron & Steel Company not held	28,600	28,600
Funded debt	*39,904,000	27,725,000
Accounts payable and payrolls	2,970,313	4,780,044
Bills payable	144,469	2,000,000
Taxes accrued	64,117	52,334
Interest accrued	489,543	440,751
Sinking and reserve funds	2,837,971	1,577,213
Profit and loss surplus	4,562,763	2,118,917
Totals	$85,723,177	$73,444,259

* Includes $16,500,000 notes.

The Riehle Special Vertical Hydraulic Tensile Testing Machine.

A special United States standard vertical hydraulic testing machine, built in capacities of from 100,000 to 600,000 lb., has been designed particularly for steel mills by the Riehlé Bros. Testing Machine Company, Philadelphia, Pa. It is arranged for tensile specimens only, and with the use of proper wedge grips will test round, square, flat or octagonal specimens. The straining mechanism consists of a pulling head connected by tension rods to the ram of a hydraulic cylinder located under the base of the machine. The pressure of the cylinder is furnished by a hydraulic power pump, which is directly connected through gearing to a variable speed electric motor. The pulling head is operated in both directions by hydraulic pressure.

The weighing mechanism consists of a weighing head and a main lever supported on columns, so that the load is taken by the main lever in the line of direct tension of the specimen. From the main lever the load is transmitted through intermediate levers to the weighing beam. Provision for receiving the recoil is made in such a manner that the base of the machine absorbs it. The machine is controlled by one valve conveniently placed so that the operator can easily control the motion of the pulling head and the registering of the strain upon the weighing beam. It is furnished with the Riehlé dial screw beam, with all the weights up to the maximum marked on the beam. The marks on the beam are made by increments of 10,000 lb., and the readings on the dial go down to 100 lb. For export the beam is made to register in metric weights. The operator moves the poise on the beam by a hand wheel, which is geared to the screw on the beam, and as the screw is turned it propels the poise backward and forward at will.

This is the largest and heaviest testing machine made for steel mill testing laboratories, and is claimed to be very sensitive and accurate, simple in design, massive in construction, and, withal, easy to operate and control. The extreme hight of the machine above the floor is 8 ft. 10 in., the extreme width above the floor, not including the weighing beam is 5 ft. 3 in., the extreme length is 9 ft. 2 in., and the weight is 30,000 lb. The variable speed electric motor allows for a wide range of speed control, and renders it especially desirable for commercial testing of tensile specimens. This machine can be designed to be operated by a power hydraulic pump, or an accumulator.

The Machinery Trade.

NEW YORK, February 26, 1908.

In some lines of machinery equipment there was a decided improvement in the demand the past week. While this was not the case with the machine tool trade, that branch also experienced an increase, though light, in both orders and inquiries. The equipment for which the demand was considerably more active covered machines for power plant installations, particularly air compressors. A leading manufacturer received orders the past week for air compressors about equal to its present capacity, and in addition received a good volume of inquiries. These orders and inquiries, which covered many machines of the largest size, indicate a better demand for machine tools. Dealers in machine tools report a little improvement in business, and feel somewhat encouraged over the small but noticeable increase in inquiries. Since the first of the month an upward tendency has been apparent, and the slight improvement of the past week has created a more optimistic feeling as to the future.

The spring meeting of the National Machine Tool Builders' Association will be held at Atlantic City, N. J., on Tuesday and Wednesday, May 19 and 20. The selection of these dates for the meeting will make it convenient for those to attend who expect to attend the joint meetings of the American Supply and Machinery Manufacturers' Association, the National Supply and Machinery Dealers' Association and the Southern Supply and Machinery Dealers' Association, to be held at Norfolk, Va., May 13, 14 and 15.

Orders for Large India Iron Works Soon to be Placed

The plans for the large plant to be erected in India by the Tata Iron & Steel Company, Ltd., of Bombay, India, under the supervision of Charles P. Perin, who has offices in this city in the United States Express Company's Building, 2 Rector street, have been about completed, and we are informed that the buying for the big plant will soon be done. Although Mr. Perin will supervise these details, the contracts will be placed, it is understood, from the Pittsburgh office of the Julian Kennedy-Sahlin Company, Ltd., of London, England. This company is affiliated with the engineering firm of Julian Kennedy of Pittsburgh, and some of the engineering details are being worked out in the latter city, as is indicated by inquiries made in the trade along certain lines with a view to arranging for bids. The business to be placed, it is understood, amounts to about $7,000,000, and the equipment will include blast furnaces, open hearth steel furnaces, rolling mills, coke ovens and a general line of equipment for the manufacture of pig iron, steel rails, plates, bars, &c. At first two blast furnaces of about 200 tons capacity, several basic open hearth furnaces, a blooming mill, rail mill, beam mill and three merchant bar mills will be erected. Additions will be made to the plant according to future demands. Although the business will probably be placed from this country, American manufacturers will have to compete with English and German firms for the trade, as it is announced that equipment will be bought in any of these countries where the orders can be placed most advantageously.

The Lackawanna Steel Company has inquiries out for a 10-ton crane, with 25-ft. span, for its plant at Buffalo, N. Y.

The power equipment, inquiries for which were mentioned last week as having been sent to the trade by a prominent engineering interest, is to be purchased by the Westinghouse Machine Company. Included in the requirements is power equipment aggregating 30,000 boiler hp., of which one-half is to be attached to gas engine equipment. It is thought by some people in the trade that the machinery is intended for the large power house projected by the Pennsylvania Railroad, to be built in connection with its proposed terminal at Harrison, N. J. This plan has been on foot for several years, but was abandoned for a time. The fact that the tunnels under the Hudson River are nearly completed gives strength to the rumor that the railroad company has decided to go ahead with its plans. It is considered a significant fact that no information is available as to who the machinery is intended for or where it is to be delivered, and all bidders are required to give prices f.o.b. cars at their works.

Notwithstanding the fact that the Delaware, Lackawanna & Western Railroad has decided not to equip the large machine shop contemplated for Scranton until 1910, the company is going ahead with its blacksmith shop and foundry. The former building will be 125 x 300 ft., and it is said in the trade that a list for equipping that structure can be expected shortly. This list, however, will not include much in the machine tool line, but will call for a considerable assortment of the usual blacksmith shop machinery. It is understood that the cranes recently closed for with Manning, Maxwell & Moore will be installed in the foundry and some equipment now in use at Scranton will be put there, so the purchasing for that building will not aggregate a large sum. This seems to be about the only railroad purchasing of any size in view, and machinery men state that not for at least three years past have the inquiries from that source been so scarce. It is stated, however, that some of the roads must necessarily come into the market before long, at least for repair equipment to take the place of worn out machinery.

It is understood that at a meeting of the stockholders of the Southern Car Company, High Point, N. C., held last week, it was decided to rebuild the shops which were recently destroyed by fire. The damage done by the fire was rather heavy, and it is probable that the company will have to purchase considerable new machinery to replace that which was destroyed.

The Nairn Linoleum Company, Kearny, N. J., is installing an addition to its power plant of about 2000 hp., and the equipment is being purchased by W. S. Barstow & Co., engineers, 50 Pine street, New York. Mr. Taylor of that company is in charge of the buying, and contracts have been let for Babcock & Wilcox boilers and Westinghouse electrical equipment. The engine contract, it is understood, has not been closed, and there is considerable in the way of power accessories to be bought. W. S. Barstow & Co. have been placing considerable business in the trade of late, principally in the way of power equipment.

Thomas L. Barret of Donigan & Barret, Louisville, Ky., is interested in a project to establish a small rivet plant and would like to have information and prices on the installation of equipment, the cost and maintenance of a plant, &c.

The Frevert Machinery Company, 18 Dey street, New York, which represents a number of well-known manufacturers of machine tools, has lately received an order for a small lot of machine tools for the manufacture of a new rotary engine in this city.

The fine shop equipment of the Newcomb Motor Works at 378 Jackson avenue, Long Island City, which have been advertised for sale in the trade, has been closed out to the J. J. McCabe Company, 14 Dey street, New York. The equipment includes a good line of first-class machine tools, some of which are practically new.

But one bid was received at the State Department of Public Works, Albany, N. Y., February 18, for the completion of the work on Barge Canal contract No. 17, which was originally held by the Schofield Company, but was rescinded last October when that company went into bankruptcy. The bid received was from Alexander Murdock, Baltimore, Md., and was about $24,000 over the original contract price.

Business Changes.

The genaral offices of the International Steam Pump Company and its subsidiaries—Henry R. Worthington, George F. Blake Mfg. Company, Knowles Steam Pump Works, Laidlaw-Dunn-Gordon Company, Clayton Air Compressor Works, Snow Steam Pump Works, Holly Mfg. Company, Dean Steam Pump Company—have been moved from 114 Liberty street to 115 Broadway, New York. The repair shops of the subsidiary companies have been moved to 44 Trinity place, where a complete line of repair parts of the standard pumps will be kept in stock. A full equipment to make necessary repairs has been installed.

Chicago Machinery Market.

CHICAGO, ILL., February 25, 1908.

The most favorable feature observed in the machinery market is, perhaps, noted in the degree of interest manifested in the number of inquiries that continue to come in. Considering the abatement of activity in manufacturing plants during recent months, there has all along been an amount of inquiry for equipment quite out of proportion to the actual business closed. Some of the machine tool dealers say that orders are now beginning to develop from negotiations begun a month or more ago, but these transactions generally cover individual tools or small equipment, and rarely include orders of notable size. Quite a number of small shops have been organized throughout the West and a fair amount of business is coming from these sources. Occasional sales of high class tools are also being made to the larger interests, who are seeking to minimize costs of production by the introduction of more efficient machines. While improvement is slow, better progress is confidently expected as the season advances, and the early spring months should show a marked increase of trade in all machinery lines.

The Fort Smith Well Drill Mfg. Company, Fort Smith, Ark., has been reorganized and incorporated with a capital stock of $25,000, this action being taken for the purpose of putting the company in position to better handle its rapidly increasing business. Among the new equipment that will be required in the near future are a lathe and power hammer. If good second-hand machines can be found they will be purchased to supply this need. The officers of the company are: S. L. Johnson, president; S. T. Rowe, vice-president; F. E. Gilmore, secretary and treasurer.

Among the recent shipments of equipment made by the Northern Engineering Works, Detroit, Mich., are a 15-ton.

40-ft. span Northern traveling crane, furnished to the Ironton Iron Company, and a Newton cupola of 5 tons per hour capacity for the Woburn Iron Foundry Company, Woburn, Mass.

The Nickerson-MacFarlane Machinery Company, Tacoma, Wash., has been incorporated with a capital of $15,000, and for the equipment of its plant is now in the market for two 72 in. by 18 ft. return tubular boilers, with a pressure capacity of 125 lb. A 60-ft. smoke stack, 50 in. in diameter, will also be required.

The Prineville Light & Water Company, Prineville, Ore., is arranging for the installation of a 2000-hp. generating station at Lava Falls, 6 miles south of Bend. A transmission line 50 miles long will be built and two 1000-hp. alternating current generators will be required. Construction work is to begin within the next two months and the plant is to be completed within a year. The manager of the company is H. V. Gates.

A. C. Merritt, engineer of the Andrews Light & Power Company, Salmon, Idaho, advises that the installation of a hydro-electric plant for lighting and power is under contemplation by that company, for the equipment of which generators, water turbines and other material will be needed.

The installation of an electric light plant is being contemplated by Louis Miller, Arcadia, Mo., who has also decided to increase the capacity of his ice plant.

The purchase of some additional equipment is contemplated for the municipal electric light plant of Springfield, Ill. The amount to be expended for this purpose is estimated at $5000, but the actual requirements will not be determined until the annual appropriation is made. This matter will be passed upon in the near future.

Cleveland Machinery Market.

CLEVELAND, OHIO, February 25, 1908.

The most encouraging feature of the machinery market is that inquiries show some improvement, and some of these inquiries are coming from larger manufacturing plants that have not been in the market for any tools during the past few months. Business conditions with these latter companies have improved enough to warrant them to put in tools that are needed, but the purchase of which has been delayed pending an improvement in the industrial situation. These inquiries are mostly for two or three tools. While about all the buying during the past few weeks has been of small tools, in the new inquiries that are now coming in there is more call for larger tools. As to actual sales it cannot be said that business has improved during the past week, but dealers regard the situation as looking somewhat better.

As far as the large local plants are concerned, the automobile industry has shown considerable improvement during the past week or two. Some of the builders who have been holding off waiting for an improvement in industrial conditions are now operating their plants at fuller capacity and have placed belated orders for automobile parts. As a result makers of the various parts now have more work on hand than they have had for several months. The annual automobile show that was held in this city during the past week proved very satisfactory in every way and gave considerable encouragement to manufacturers. Not only was the attendance very large, but a very satisfactory number of orders were booked by the sales agents for the various machines. Dealers expect some buying of machine tools by the automobile builders in the next few months.

While the demand for heavy machinery for coal and ore handling and for mines shows but little, if any, improvement, builders of this kind of machinery report considerable improvement in inquiries for their smaller machinery. Builders of tanks and other heavy plate work report that the volume of new business is still very light.

While jobbing foundries report a slight temporary improvement in their orders, their business is still far from satisfactory. The strong competition to get the small available volume of orders has resulted in considerable price cutting, and few foundries are being operated at more than half their full capacity. No cut has been made in molders' wages, but there has been some readjustment in piece work.

The erection of the new foundry of the Bay View Foundry Company, Sandusky, Ohio, which was held up late last fall, will now be rushed to completion. Bids for the machinery equipment will be received in the next two weeks by the Osborn Engineering Company of this city, which prepared the plans. The company is in the market for a 15-ton electric traveling crane, two gas engines, sand blast, tumbling barrels and other foundry equipment.

The Snyder Electrical Mfg. Company, Canal Dover, Ohio, which was recently incorporated with a capital stock of $25,000, will have its new plant ready for operation in a short time. The products will include dynamos, generators and other electrical machinery, exhaust fans, &c. Most of the machinery equipment has been purchased, but the company is now in the market for two punch presses and a power hack saw.

Although it doubled the capacity of its plant six months ago the Warren City Boiler Works, Warren, Ohio, has been able to keep running at full capacity night and day until about two weeks ago. The plant is now being operated with 80 per cent. of its day force.

At the annual meeting of the Berger Mfg. Company, Canton, Ohio, held last week, the following officers were elected for the ensuing year: Ed. A. Langenbach, president and general manager; Fred Snyder of Massillon, first vice-president; R. H. Yancey, second vice-president; C. A. Irwin, secretary and general superintendent; Frank A. Schwertner, treasurer, and C. W. Kreig, assistant treasurer and auditor. The only change made was the creation of the office of second vice-president. The officers compose the Board of Directors. The financial report for the past year was very satisfactory. Prospects for the coming year's business, considering present conditions, were declared to be quite encouraging.

The Electrical Repair & Construction Company, Cleveland, which has been engaged in business under that name, has been incorporated, with a capital stock of $10,000, by Edward Snyder and others.

With a capitalization of $20,000, the Wood County Fence Company, Bowling Green, Ohio, has been incorporated by A. H. Jones, Charles F. Schuler, W. W. Miller, T. D. Straser and L. M. Wonder.

The Enterprise Electrical Company, Warren, Ohio, has been organized, with a capital stock of $25,000, and will take over the business of the Peerless Transformer Company. For the present it will manufacture only transformers, but later will probably branch out in other lines of the electrical manufacturing business. The officers of the new company are R. A. Cobb, president; C. B. McCurdy, vice-president; N. A. Cobb, secretary; F. P. McBerty, treasurer.

The National Refined Iron Horseshoe Company, Toledo, Ohio, has been incorporated, with a capital stock of $10,000, by James Austin, Jr., W. E. Cordill, John Schlatter, H. J. Leary and A. F. Hanson. The company has secured a plant on Dorr street for the manufacture of horseshoes.

The Village Council of Dresden, Ohio, is considering the construction of a water works system. The installation of a plant to cost about $25,000 is proposed.

The Standard Stamping Company, Marysville, Ohio, has increased its capital stock from $70,000 to $100,000.

The Burton & Johnson Company, machinist, Cleveland, has been incorporated, with a capital stock of $10,000, by C. G. Burton, N. A. Johnson and others.

Cincinnati Machinery Market.

CINCINNATI, OHIO, February 25, 1908.

Present conditions and future possibilities are variously estimated by those most interested in this manufacturing district. Along some lines the spirit of optimism and confidence is so pronounced that owners of large tool plants affect to believe that a comparatively early return to normal business conditions is presaged in the increase in volume of inquiries, the placing of some good orders by the dealers and the reports that railroads are making specifications. In the line of milling machines particularly there seems to be a marked improvement. One large company here regards the transactions of the past 10 days or so of sufficient importance to suggest a resumption of operations in every department and on full time within three or four weeks. Working time in this plant ranges now from 43 to 55 hours per week. Machines have been shipped recently to New York, Syracuse, Buffalo, the New England States and Canada. In the line of lathes, drills, shapers, &c., some companies report inquiries better, but in the main the improvement in sales is not so marked.

During the early weeks of the new year, and while the effects of the depression were most severely felt, a number of the larger tool manufacturers have utilized the time to good advantage in making minor improvements and overhauling and cleaning up departments which were badly in need of attention. As a result the greater part of the tool manufacturing interests are in excellent shape for a business revival, the beneficial results of which will be appreciated first by the shrewd ones who have paved the way by judicious advertising of favorite types and the placing of attractive catalogues and circular work in the hands of those who will need the machinery.

Comparatively little demand marks the condition of business with the second-hand dealers, such machinery as is sold now being of the smaller lines of tools and parts to replace worn out features. There is not enough improvement in the situation at the jobbing foundries to be worthy of qualification.

A number of manufacturers in other parts of the country seem to find Cincinnati's location and advantages sufficiently attractive to warrant investigation. In two instances re-

cently, through the co-operation and assistance of the Industrial Bureau, companies have decided to make the city their headquarters. One of these the Ohio Bevel Gear Company, formerly of Philadelphia, was mentioned last week. The other is the Avon Street Foundry of Rockford, Ill., which manufactures cone pulleys by a special process. Several trips were made to Cincinnati by Samuel Griffith and J. W. Crist of this company and, with the assistance of Secretary W. L. Finch of the Industrial Bureau, decided upon the plant of the Andrew Messmer Company in Patterson street as a base of operations, taking a lease for a term of years. Both companies will furnish their own capital. The company manufacturing the cone pulleys finds a good demand in Cincinnati for its product, and also in Cleveland, Pittsburgh and other cities of the Central West. In the beginning of operations, approximately March 1, it will employ 35 men. The Messmer plant has been used largely in the interests of the Cincinnati Milling Machine Company and latterly, during the preparation of its new foundry in Oakley, was the base of operations for experimental work.

The annual meeting of the J. A. Fay & Egan Company, manufacturer of woodworking machinery, was held February 18. Directors were elected as follows: Thomas P. Egan, S. P. Egan, J. Bruce, Joseph Rawson, L. G. Robinson, C. P. Egan, Rudolph Kleybolte, A. A. Faber and F. T. Egan. Thomas P. Egan was re-elected president; S. P. Egan, first vice-president; F. T. Egan, second vice-president; W. M. Green, secretary, and A. A. Fater, treasurer. The directors declared a dividend of 1¾ per cent. on both preferred and common stocks. The secretary's report indicated that the company has done the largest business of its existence in the fiscal year just closed.

The Osborne & Sexton Machinery Company, Columbus, incorporated early in the year, has located a branch office in Cincinnati and will establish one also in Seattle, Wash. The last named office is to be an important one in the distribution of the company's products on the coast and for export to the Orient. The company handles woodworking machinery, engines and power generating equipment. The Columbus headquarters are at 243-245 North Front street.

The Highland Iron Works Company, Terre Haute, Ind., has instituted a four days' run per week, and announces through Secretary William M. Myers that an early resumption of work in all departments and on full time is a possibility.

A message from the Dayton Motor Car Company, Dayton, Ohio, which was damaged by fire a few days ago, indicates that the damage was greatly exaggerated. The loss was confined almost wholly to unfinished bodies, trimming, &c. The fire started in the trimming room.

E. C. Entwisle, chief engineer of the Lorain Steel Company, Johnstown, Pa., lectured before the Engineers' Club of Cincinnati Wednesday night on "Special Track Work and Its Manufacture." At the next meeting of the Engineers, March 19, J. P. Bouscaren of the city engineering staff will lecture on "Track Elevation and Subways."

The Stewart-Holland Company has been incorporated in Covington, Ky., with a capital stock of $2500, to buy and sell iron fencing. The incorporators are C. L. Holland, Robert Stewart and M. H. McLean.

E. M. Frank of Jeffersonville, Ind., and Pearl Bogue and T. W. Overman of Monon, Ind., have secured for the American Car & Foundry Company near Jeffersonville several thousand acres of land by option, upon which the company will prospect for oil and gas.

The tube plant of the Mark Mfg. Company at Zanesville, Ohio, is now in operation.

Arrangements are under way for an early beginning of operations at the new plant of the Ohio Lock & Nut Company in East Columbus, Ohio. Installation of machinery is now about completed. The company manufactures standard bolts, nuts and washers, and also a patent lock nut which was formerly made in a plant at Lancaster, Ohio.

Operations have been resumed at the plant of the Ralston Steel Car Company in East Columbus, Ohio, with a force of 900 men. During the short period of inactivity new engines were installed, and some extensive repairs made.

Philadelphia Machinery Market.

PHILADELPHIA, PA., February 25, 1908.

While there have been a few more inquiries before the trade, the actual volume of machinery business closed shows no appreciable increase. Practically every branch of the trade is quiet, and it is reported difficult to get prospective buyers to place orders. Competition for what little business is going is pretty sharp, and the trade generally is giving close attention to all possible purchases of equipment. Prices on the better grades of tools are said to be firm, but on some of the less well known grades it is reported that concessions are being made. The railroads, which are important buyers in the machine tool trade under ordinary circumstances, show no disposition to enter the market, and probably will not be extensive purchasers of any large equipment until the general situation assumes more definite shape.

Manufacturers find no change in the situation. Orders coming in are pretty well scattered, and are confined almost entirely to the smaller classes of tools. Occasionally an order will come out for a tool of medium size, but as a rule these are pretty scarce. A little more activity is to be noted in the demand for special tools of some characters. Electric cranes have been in better demand, and several medium sized orders have been placed, while the inquiries are sufficient to lead manufacturers to believe that more business of this character will be placed before a great while. Single tool orders continue the feature of the market. Occasionally an order for two or three tools has been booked by some manufacturer or dealer, but such orders are few and far apart. Plants continue to operate on a very conservative basis, in some cases production not being over 30 per cent., the smaller plants being if anything the more fully occupied.

The export trade continues quiet. Practically no new business in the way of standard machine tools has developed, although there have been a few scattered orders for special equipment. Those transacting an established trade abroad, particularly in machinery specialties, report business hardly as active as it was this time last month.

The demand for second-hand machinery continues dull and featureless. Sales have been largely of a minor character and cover a varied range of tools. Not a great deal of improvement is looked for until the general situation shows signs of improvement. The same condition is to be noted in the demand for second-hand boilers and engines. There is some little business being placed, but on the whole the amount is far below the average. Several small projects have been closed up, but there is no business of any size, either in old or new equipment.

The foundry trade continues dull. In some cases inquiries are reported a little more active, but they do not develop into business very satisfactorily. Plants are still running irregularly, and dependent almost entirely on day to day orders. Some plants are still able to run four and five days a week; others, however, are unable to do more than three days on an average. Business for forward delivery is scarce, consumers in almost every case placing orders for only enough castings to meet their immediate requirements.

The Philadelphia Supply & Machinery Dealers' Association held its annual meeting, February 19. Routine business was transacted, and the following officers were re-elected for the ensuing year: President, Alfred M. Maddock, Maddock & Co.; vice-president, W. E. Shipley, W. E. Shipley Company; secretary-treasurer, Frank Clouds, Powell, Clouds & Co. It was decided to hold the annual banquet of the association on March 19, and the following committee was appointed to make the necessary arrangements: F. C. Spaulding, A. M. Maddock, W. E. Shipley and Frank Clouds.

The Philadelphia Mint has asked for an appropriation of $40,000 for the construction of two coal bunkers and mechanical appliances for use in connection therewith. Congress appropriated $20,000 for this purpose last year, but proposals were considerably higher than this amount, and action was deferred pending further legislation by Congress.

It is stated that the revised plans of A. F. Lackey, Harbor Engineer, Baltimore, Md., have been approved by the Board of Awards, for the construction of the proposed new piers, Nos. 4, 5, and 6 in that city. By the new plans, pier No. 4 will have a slip 70 ft. wide at the south end. The same pier will be widened to have a driveway of 42 ft. The bulkhead on pier No. 5 has been reduced to 515 ft. Pier No. 6 will be 530 ft. wide at the south end and will slope to a width of 90 ft. at the north end. The bridges across Canton and Eastern avenues will be removed, and Jones Falls will be dredged to a depth of 20 ft. The new piers will be constructed entirely of concrete and steel, and the cost will be about $800,000.

Plans have been completed by Heacock & Hokanson, architects, for a new five-story steel and slow burning construction warehouse, 83 x 106 ft., to be built for Berger Bros., at 106-114 Bread street. Bids for the building are now being taken.

Pottsville, Pa., will take action, at a special election in the near future, on the matter of constructing a $300,000 sewage filtration system, which has been recommended by the Inspectors of the State Board of Health.

Ballinger & Perrott, architects and engineers, have been commissioned to prepare plans and specifications for a large addition to the plant of the Duplan Silk Company, Hazleton, Pa. The proposed building is to have a frontage of 200 ft. and a depth of 300 ft., part one and part two stories high. The present power plant of the company will be extended, as will also the heating arrangements, which will be done, it is understood, by the blower system.

J. E. & A. L. Pennock, contractors, have plans, by E. W. Deane, Boston, Mass., for a two-story fibre mill, 127 x 213 ft., to be erected for the Diamond State Fibre Company, Wilmington, Del., at Bridgeport, Pa. The structure is to be of steel, concrete and brick construction.

New England Machinery Market.

WORCESTER, MASS., February 25, 1908.

Numerous inquiries and some sales are the salient features of the machinery market. The dealers and their salesmen are exceedingly busy seeking new business, especially in looking into the wants of those who have inquired as to machinery. A few good orders have been booked, not for large amounts of machinery, but netting totals very grateful to the fortunate dealers. Second-hand machinery is in better demand than new, and there is an abundance of desirable tools for those who are not particular about securing new equipment.

The entire equipment of the American Roller Bearing Company, South Framingham, Mass., will be disposed of by the receiver, F. B. Hill, through the agency of the Prentiss Tool & Supply Company, Boston. The list is an unusual one, comprising a notable array of machinery of the best makes. Besides the standard machine tools of more common types there is a fine list of automatics, grinders, and special machinery. The grinders include Brown & Sharpe, Cincinnati, and Walker universal grinders, and Pratt & Whitney and Rivett special grinders. Among the automatics are two Jones & Lamson, Bardons & Oliver, Gridley, Pratt & Whitney, and Windsor and Pierson screw machines.

Machinery auctions held last week realized better prices than would be expected at this time, the dealers being the chief buyers of machine tools. In the equipment of the Hutchings-Votey Organ Company, Cambridge, Mass., which was disposed of under the hammer, was a considerable number of woodworking machines, which brought fair figures, the buyers including organ builders, who secured machinery for their own works.

The naval torpedo factory at Newport, R. I., has been completed and turned over to the Government. It is equipped to manufacture 50 18-in. torpedoes annually, but space is furnished to increase this capacity to 250 to 300 torpedoes. It is anticipated that it will be only a short time before the increase will be made, for it is well understood that the navy has a constantly increasing need of torpedoes, and difficulty has been found in procuring them in the market. The increase in equipment will be large when the greater production is decided upon. The factory will begin operations about April 1.

Charles E. House & Sons, Brooklyn, manufacturers of piano supplies, have acquired the Sunnyside mill property at Unionville, Conn., and will establish their factory on the premises.

The business of the Commonwealth Machine Company, Worcester, Mass., manufacturer of sheet metal working machinery, is to be wound up, owing to the death of the managing head of the company, H. M. Smith. The company builds a new line of machines specially designed for cornice work. The machine tools, patent rights, patterns and drawings will be sold.

The Worcester Injector & Valve Company, manufacturer of steam and railroad supplies, and the Dodge-Sander Company, manufacturer of steam and electric railroad supplies, have established a factory at 11 Union street, Worcester, Mass. N. B. Dodge is president and George H. Scott treasurer of the Worcester Injector & Valve Company, and Mr. Scott is manager of the Dodge-Sander Company.

The O. H. Jones Company, Hartford, Conn., manufacturer of plumbers' supplies, has increased its capitalization from $10,000 to $25,000, the new funds to be used for increasing the business and for the purchase of the building which is occupied for the business.

The textile industry, which is always a factor in the machine tool trade, and more important in the supply trade, promises to do some new building this season. In Torrington, Conn., the Warrenton Woolen Company has plans for an entirely new plant, consisting of a main factory, 79 x 330 ft., and two stories; boiler house, 45 x 60 ft.; besides large storage buildings. The buildings will have steam heat, automatic sprinklers and two freight elevators. The total cost will be $150,000. The West End Thread Company, Millbury, Mass., will erect additions consisting of a two-story mill, 60 x 110 ft.; two-story reeling building, 40 x 60 ft., and dye and bleach house. The Colored Worsted Mills, Providence, R. I., will build an addition. The Pine Tree Worsted Company, Putnam, Conn., whose mills were burned recently, will rebuild.

A dispatch from Bridgeport, Conn., states that the Electric Cable Company of that city, whose plant was damaged to the extent of $70,000 last week, will rebuild immediately. One large building was destroyed.

It is stated that 99 per cent. of the claims against the Westinghouse Machine Company of Pittsburgh have been deposited in accordance with the plans of the Reorganization Committee, and that the plant will soon be taken out of the receivers' hands.

Government Purchases.

WASHINGTON, D. C., February 25, 1908.

The Isthmian Canal Commission will receive bids until March 16, circular No. 426, for pumps, tubular boilers and other supplies.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until March 28 for two boilers for the navy yard at Bremerton, Wash.

The following bids were opened February 18, circular No. 414, for supplies for the Isthmian Canal Commission:

Class 1, two cable railways—Bidder 1, Exeter Machine Works, Exeter, N. H., $31,500; 3, Arthur Koppel, New York, cars only, $7500; 4, Meade Morrison Mfg. Company, New York, $67,300; alternate proposition on bidder's specifications, $51,400; 5, Wonham-Magor Engineering Works, New York, $28,696; 8, Guaranty Construction Company, New York, $34,480; 12, Atlantic Gulf & Pacific Company, New York, $64,650; 14, Bergen Point Iron Works, New York, $29,174; alternate proposition, $28,990; 15, New Jersey Foundry & Machine Company, New York, $51,400; for Koppel car, $49,150, or for certain specified changes, $48,500.

Class 2, eight duplex cableways—Bidder 2, S. Flory Mfg. Company, Bangor, Pa., $574,900; 7, Brown Hoisting Machinery Company, Cleveland, Ohio, $1,155,000; 9, New York Cableway & Engineering Company, New York, bid A, for Johnson bucket and no motors for towers, $399,975; B, for Johnson bucket and extra motors with 2000 ft. of chain, $420,690; C, for Johnson bucket and motors with 3200 ft. of chain, $436,895; D, for Johnson bucket with motors and drive wheels for towers only, $430,500; E, with Johnson bucket and motors with all drive wheels, $458,750; F, with Hayward or Browning bucket without motors, $420,200; G, Hayward or Browning bucket with extra motors and 2000 ft. of fixed chain, $440,890; H, for Hayward or Browning bucket, extra motors and 3200 ft. of fixed chain, $457,095; I, Hayward or Browning bucket with extra motors and driving wheels for locking towers on locks only, $450,700; J, for Hayward or Browning bucket, extra motors, and drive wheels for all towers, $478,950; 10, Lambert Hoisting Engine Company, Newark, N. Y., regular specifications, $418,264; bidder's specifications, $423,264 and $425,264; 11, Lidgerwood Mfg. Company, New York, in accordance with various specifications and plans submitted, $386,507, $397,601, $361,821, or $369,700; 13, Balanced Cable Crane Company, New York, $275,000 for 16 balanced cableways; for 12 with one-load carriages and four with two-load carriages, add $32,000.

The following awards have been made for supplies for the Isthmian Canal Commission under opening of January 20, circular No. 412:

Ingersoll-Rand Company, New York, class 7, 30 sand pumps, $48.

W. Bingham Company, Cleveland, Ohio, class 9, one valve reseater, $73.50.

The Hensbaw-Bulkley Company, San Francisco, Cal., has been awarded class 72, one motor driven emery grinder, $310, under opening of January 22 for machinery for the navy yards.

The following awards have been made for supplies for the Isthmian Canal Commission, bids for which were opened December 6, circular No. 402:

Henry R. Worthington, New York, class 2, two 500-gal. pumps, $1210.24.

Manning, Maxwell & Moore, New York, class 4, one portable riveter, $749.90; class 6, three pneumatic motors, $418.86.

Ingersoll-Rand Company, New York, class 5, six pneumatic riveters, $1100.

The Oliver Machinery Company, New York, has been awarded class 21, one woodworking machine, $3100, under opening of February 11 for supplies for the navy yards.

The following awards have been made for supplies for the navy yards, bids for which were opened February 4:

Brewster Engineering Company, Hoboken, N. J., class 51, one rotary blower, $590.

R. W. Geldart, New York, class 121, one portable electric post grinder and one portable electric hand or breast drill, $97.48.

Trade Publications.

Motor Driven Apparatus.—Emerson Electric Mfg. Company, St. Louis, Mo. Reference supplement to the Emerson Monthly. Contains a classified index of manufacturers or dealers in motor driven outfits equipped with Emerson motors, including blowers, pumps, grinders, portable electric tools, sewing machines, washing machines and an extensive list of small apparatus to the drive of which electric motors are adapted.

Pressure Recorders.—Crosby Steam Gauge & Valve Company, 16 Dey street, New York. February issue of the *Crosby*. Contains an illustrated description of the Crosby pressure recorder and the Crosby combined pressure recorder and gauge. Both are adapted to measure the pressure of any fluid, and a special form is made for pressures either above or below the atmosphere.

Smoke Preventers.—The Pittsburgh Automatic Smoke Preventer Company, 1105 Keystone Building, Pittsburgh, Pa. Pamphlet. Refers to the improved Western smoke preventer, which is claimed to insure perfect combustion, abate smoke 95 per cent., and decrease a fuel bill 10 per cent. Some testimonial letters are included.

Rail Chairs.—T. H. Symington Company, Calvert Building, Baltimore, Md. Leaflet. Contains illustrations and a brief description of the Gilchrist plain and reinforced rail chairs, which are simple and efficient devices for securely adjusting steel rails to concrete work.

Power Plants.—Ridgway Dynamo & Engine Company, Ridgway, Pa. Bulletin No. 18. Presents illustrations of installations of the company's engines and generators.

Production of Bessemer Steel Ingots and Rails in 1907.

As indicated by the pig iron statistics heretofore published, the production of Bessemer steel in 1907 was less than that of 1906. Of the total decrease of 608,281 gross tons, 403,633 tons, or about two-thirds, was in Bessemer steel rails. The American Iron and Steel Association has just completed the compilation of the returns from steel manufacturers, representing the production of Bessemer steel ingots and castings in the United States in 1907; also of Bessemer steel rails rolled by the producers of Bessemer steel ingots.

Ingots and Castings.

The total production of Bessemer steel ingots and castings in 1907 was 11,667,549 gross tons, against 12,275,830 tons in 1906, a decrease of 608,281 tons. The production in 1906 was the largest in our history. The following table gives the production of Bessemer steel ingots and castings in the last six years. Of the total production in 1907 about 33,300 tons was steel castings, as against 32,601 tons in 1906, 22,103 tons in 1905, and 16,051 tons in 1904.

Years.	Gross tons.	Years.	Gross tons.
1902	9,138,363	1905	10,941,375
1903	8,592,829	1906	12,275,830
1904	7,859,140	1907	11,667,549

Below is given, by States, the production of Bessemer steel ingots and castings, in gross tons, since 1904:

	1904.	1905.	1906.	1907.
Pennsylvania	3,464,650	4,491,445	4,827,725	4,351,841
Ohio	2,050,115	3,131,149	3,769,913	3,636,679
Illinois	1,257,190	1,651,250	1,684,772	1,723,073
Other States	1,087,185	1,667,531	1,993,420	1,955,956
Totals	7,859,140	10,941,375	12,275,830	11,667,549

In addition to the States named in the table Massachusetts, Connecticut, New York, New Jersey, Delaware, Maryland, District of Columbia, Virginia, West Virginia, Kentucky, Michigan, Wisconsin, Minnesota, Missouri, Colorado and Oregon made steel ingots or castings in 1907 by the standard Bessemer process or by modified Bessemer processes.

Bessemer Rails.

The production of all kinds of Bessemer steel rails by the makers of Bessemer steel ingots in 1907 was 3,302,009 gross tons, against 3,705,642 tons in 1906, a decrease of 403,633 tons. The maximum production of Bessemer steel rails was reached in 1906. The following table gives the production by States of Bessemer steel rails by the producers of Bessemer steel ingots in the last four years. Included in the figures for 1907 are 145,601 tons of rerolled or renewed rails rolled by companies which manufacture Bessemer ingots:

	1904.	1905.	1906.	1907.
Pennsylvania	801,057	1,095,154	1,298,409	1,093,932
Other States	1,283,031	2,040,575	2,407,233	2,208,077
Totals	2,084,688	3,135,729	3,705,642	3,302,009

The following table separates the production of rails weighing 45 lb. and less than 85 lb. to the yard from those weighing less than 45 lb. and over 85 lb. Bessemer rails rolled by companies which do not make Bessemer ingots are not included:

	Under 45 lb.	45 lb. and less than 85 lb.	85 lb. and over.	Total.
Pennsylvania	125,829	560,730	407,373	1,093,932
Other States	98,159	823,760	1,286,158	2,208,077
Totals	223,988	1,384,490	1,693,531	3,302,009

The total production of rails in 1907 will include rails made from open hearth steel, rails rolled from purchased blooms, crop ends, and seconds, rails rerolled or renewed by nonproducers of steel ingots, and iron rails. The total from these sources in 1906 amounted to 272,245 tons, of which 186,413 tons were open hearth steel rails. 85,817 tons were Bessemer rails rolled by nonproducers of Bessemer ingots, and 15 tons were iron rails. For 1907 the total from these sources amounted to about 335,000 tons, of which fully 250,000 tons is open hearth rails, making the total rail production for that year about 3,637,000 tons, against an ascertained total of 3,977,887 tons in 1906.

American Implement Makers to Benefit by the Franco-Canadian Treaty.

TORONTO, February 24, 1908.—In the Canadian House of Commons, on February 20, Mr. Zimmerman, one of the members for the city of Hamilton, made a statement concerning an effect of the commercial treaty that has been negotiated between France and Canada. He said that the International Harvester Company, at whose Hamilton works 1800 men are employed, was so much impressed with the trade possibilities of the treaty that the heads of its export department had come from Illinois to look into the advantages their Canadian center has to offer as a base of operations for foreign business. As a result, he said, they had practically decided that the whole of their export trade with France, now amounting to more than $2,000,000 per annum, shall hereafter be attended to by the Canadian works. Mr. Zimmerman added that this would probably cause a doubling of the capacity of the Hamilton plant.

Agricultural machinery is one of the classes of Canadian articles to which the treaty extends the privileges of the French minimum tariff. Even with the duties on these products at the high rates of the French general tariff, Canadian manufacturers of agricultural implements thought the French market worth cultivating.

The privilege of the French minimum tariff is not the only advantage that an American implement plant manufacturing for export would enjoy in Canada. While Canada is not a large producer of the iron and steel required as material for the manufacture of implements, the Canadian tariff law offers extremely favorable terms for the special benefit of makers of harvesters and mowers and parts thereof. Rolled iron, rolled steel and pig iron, when imported for the manufacture in Canada of mowing machines, reapers, harvesters, binders and attachments for binders, are favored with a drawback of 99 per cent. of the duty. The heading of Schedule B and the language of Section 10 of the Customs Administrative act, 1907, are sometimes misunderstood, the expressions "for home consumption" and "for consumption in Canada" being erroneously supposed to apply to the manufactured product, whereas they refer to the imported material. Imported iron and steel manufactured into harvesters and mowers in Canadian works are consumed in Canada, and this utilization entitles the Canadian manufacturer to a refund of 99 per cent. of the duty. The mowers and harvesters themselves may or may not be "consumed" in Canada. The payment of the drawback is in no way conditional upon what market they are sold in. Formerly the drawback was payable only upon imported materials whose Canadian manufactured product was exported.

For the further facilitating of trade between Canada and France, the Dominion Government proposes to subsidize a steamship line, to operate directly between French and Canadian ports. A resolution providing for the payment of $100,000 a year to such a line was recently tabled in the House of Commons by the Minister of Marine and Fisheries. This is to be the amount of the annual subsidy if 18 round voyages are made per year. If that number of voyages is exceeded, the subsidy is to be proportionately increased. The privileges of the treaty, it may be necessary to remind readers, are for the most part restricted to merchandise shipped directly from one of the contracting countries to the other. This feature of the treaty is not approved in Ontario, where mercantile interests place a premium on haste. Some protests have been made by Ontario interests against the elimination of New York as an intermediary in the trade between France and Canada, holding that the greater frequency of the steamship communications between France and the United States metropolis is of advantage when dispatch is an element of importance in the business. At all events, direct steamship service is to be established between France and Canada as a requirement of the treaty, and the benefit of that service will be an additional attraction to the American implement manufacturers with works in Canada.

C. A. C. J.

HARDWARE

AN illustration of the association movement on what may be regarded as ideal lines is furnished in the case of a Western Hardwareman who has what may be termed a fourfold association relationship, which doubtless finds parallel in other States and many another retail Hardware house. The merchant in question is one of the many who are represented by the National Retail Hardware Association, and is thus brought into a wide if somewhat vague and general identification with the association movement in its broadest scope. This may be termed his association relationship number one.

This connection with the National Association is obtained through his membership in a State association, in whose meetings he participates as an alert and interested delegate, receiving and giving suggestions and thus contributing to the success of the gathering. The value of such meetings, even though held only annually, is regarded by him as justifying his absence for several days from his regular responsibilities to which he returns with new ideas, a broader outlook and renewed enthusiasm and intelligence. This is his association relationship number two.

At this point the organization activity of many loyal members of State associations ceases. Their own State organization is the only form of association work in which they participate. The merchant in question is not content to let the good work stop at this point, but catching the spirit of fraternity and co-operation which is pretty sure to give good results wherever found, he is a leading member of a local get-together movement with which the various merchants of his town are connected, in an effort to promote the general trade interests of their community, and to take measures of one kind or another in which they work together for the advancement of their common interests. In the case in point there is a monthly meeting which conducted in the spirit of mutual regard and co-operation is said to yield practical results even more important than the annual State convention, with its flourishing of trumpets, extended programme and unquestioned usefulness. The small, unheralded and practically unknown gatherings of the local organization are said to have a direct bearing on the saving and making of many a dollar—taking no account of the introduction of the more genial and kindly spirit which accompanies close personal contact with the merchants of the town. This is association relationship number three.

The fourth field for getting together is within the boundaries of the individual store. This is not usually accomplished by a formal organization, and is without written constitution. There is, however, the dividing of the business into certain departments and the recognition of the leading men in the establishment who are charged with more or less definite responsibilities. A conference is held monthly, semimonthly or weekly, as may seem to be desirable, with a view to eliciting suggestions and securing the intelligent interest and help of many and sometimes all of the employees in the store. It is found in experience that the lessons in salesmanship, for example, which are given probably by the proprietor or by one of his experienced men, are suggestive and helpful, while the opportunity given to the humblest member of the force to criticise and suggest brings out many a good idea—as for example when the boy who delivers goods proposed to make a note of the houses he saw which needed painting, so that circulars and printed matter might be sent them and perhaps more definite attention given them as prospective buyers. This is association relationship number four.

While the merchant whose experience is touched upon in the preceding paragraph is a loyal association man as regards both the national and State and local associations, he is quite frank in saying that this store association is the most useful to them all. It cultivates a spirit and an intelligence of co-operation which contributes directly to the profit making of the business. Indeed, it may, perhaps, be put down as true, without reflecting in any way on the usefulness of the State and National Association, that the individual work in one's own establishment and the closer related affiliation of all the merchants in the town is worth more in practical results than the more conspicuous and ostentatious work of the greater organizations. After all, is not one of the great benefits of the national and State associations the encouragement of detailed and practical businesslike effort in the field in which the merchant lives and in the store in which theories are tested, where the suggestions and enthusiasms of the great gathering are put into practice and their worth ascertained?

Not many merchants are permitted to attend the meetings of the National Association, which is made up of comparatively few members from the various States; the annual meetings of the State associations will soon be over, not to recur for another year; but the opportunity for work along similar lines in the community and in each store is constantly offered. In this field, the most important of all, there may be a continual and very profitable application of the association idea.

Condition of Trade.

During the month now drawing to a close many merchants, especially in the Western States, have had their attention diverted from their usual business for a few days at least by their attendance on the annual meetings of their State associations. Meanwhile, it may be assumed that their establishments, which presumably are well ordered and in a position to run successfully in the absence of their principals, were continuing to distribute goods, thus meeting the demand, large or small, in their several communities. In some sections trade has been somewhat interfered with by the weather, and especially the unusually severe snowstorms which have prevailed in some States, and by floods which have caused some inconvenience and damage. With the advance of the season there is on the whole a gradual enlargement in the movement of Hardware. The increase in the number of orders received by manufacturers and jobbers is quite noticeable, but these orders are in many cases for limited quantities, and indicate that a conservative stocking-up process is going on, especial care being taken not to buy beyond requirements. The success which is attending the efforts of the larger interests to keep up prices on Nails and Wire, and on the staple commodities

in the line of raw material, is gratifying and tends to give the market a good degree of steadiness. There are, however, in many minor lines not a few concessions little by little being made on current orders, as prices in general show a softening tendency. It should, however, be remembered that there are many lines which stand up firmly, the manufacturers not finding any reason for changing their prices, especially as in the present condition of things a reduction would not be likely to induce purchases. A good many factories are accordingly pursuing a conservative and it might almost be called a waiting policy, as they recognize the wisdom of refraining from forcing their goods on a reluctant market, and are continuing to take care of such business as comes to them or is obtained by them without undue solicitation or material cutting of price. Meanwhile the trade is working off any surplus stocks and getting along with small and carefully assorted supplies of goods, thus making real progress toward a healthy demand when general conditions justify it. In many parts of the country, especially in farming communities, the volume of business gives little ground for complaint. A good proportion of current orders received by manufacturers and jobbers relate to goods which are for farmers' use, including such commodities as Poultry Netting, Fencing, Agricultural Tools, Handles, &c. Mechanics' Tools generally are in much less demand, but for some staple lines there is a fairly steady call. Heavy Hardware and goods used in public works and railroads are in much less request, and in these lines the market feels the existing depression much more than in the lighter and finer articles. One principal cause, indeed, of the sluggishness of business is the fact that the railroads are holding aloof under the pressure of greatly lessened business, uncertainty as to the course of legislation and the manner in which their interests will be affected by the application of legal measures for their control. Among the favorable features of the situation is the apparent soundness of commercial houses, as indicated in the few failures reported. There seems to be reason to hope that most Hardware concerns are on a safe financial basis, and that the after results of the panic will not be discerned in the serious embarrassment of Hardware merchants or manufacturers. Another exceedingly favorable feature, which has an important bearing on the future commercial and financial condition of the country as a whole is the great volume of our recent and current exports, securing the advantage of a notable trade balance, which should contribute greatly to the prosperity of the country. Collections are in most cases reported by both manufacturers and jobbers to be reasonably satisfactory, giving little ground for complaint, and the financial situation generally shows evidence of gradual and substantial improvement. Taken all in all, February has chronicled real progress in the direction of a resumption of normal conditions, and hopes are freely expressed that the year may be on the whole fairly prosperous.

Chicago.

Those who are inclined to contrast the present quiet state of trade with the phenomenal activity of a year ago find, of course, but little encouragement in the situation. At the same time it will be recalled how in the midst of the crowding rush of business of that period there was an ominous shaking of heads and a serious questioning of the soundness of conditions giving rise to such a demand, coupled with the prediction that it could not last. Now that the prophesied reaction has come and swung the pendulum far to the other extreme, it seems only reasonable, in the light of past experience, to expect that it will gradually settle back to an even beat representing something nearer a healthy normal. Naturally this point will not be reached at one clean sweep, nor will it probably be approached without some temporary checks in its onward progress yet, on the whole, there will be advance instead of retrogression. What increase there may have been in the general volume of business for the past week has not been of marked proportions in any line. A fair amount of orders for staple goods are coming in, but the policy of restricting purchases to small lots for immediate consumption is being closely adhered to by all buyers. While prices in some lines show a softening tendency and in others are more or less irregular, it is indeed a source of surprise that under the pressure of protracted dullness they are not wholly demoralized. As a matter of fact, the market, as a whole, holds reasonably firm, with scarcely more fluctuation than is ordinarily seen in values at any time. Weather conditions during the greater part of the present month have not been favorable to the moving of retail stocks, and since buying for replenishment is largely of the hand to mouth order, the effect is more strongly reflected in the jobbing trade than would otherwise be the case. Many of the retail merchants, too, are now in attendance at the various State Hardware association conventions. With the opening of the coming month a better movement is looked for all along the line.

NOTES ON PRICES.

Wire Nails.—The necessity for large stocks in the hands of jobbers and retail merchants is not as imperative as last year, both on account of general trade conditions and of the prospect of prompt shipments from mills. Consequently the trade is pursuing a conservative course and not anticipating requirements to any great extent. New business and contract specifications are being received in fair volume by manufacturers, while a larger demand is looked for later in the season. The market is firm at regular prices. Quotations are unchanged, as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

New York.—The improvement in demand which manifested itself in the early part of the present month has fallen off, and there is now little more than an assorting up of stocks. Regular prices are remarkably well maintained considering the comparatively limited demand. The local quotation for small lots at store is $2.40.

Chicago.—Both in new business and specifications against contracts business continues to come forward in reasonably good volume. Due to changed conditions, both as respects consumptive demand and more especially the present availability of prompt shipments, dealers are not providing for their wants as far ahead as was the case last year. At the same time there seems to be a great deal of confidence in the development of a good consumptive demand when the season is fairly open. Prices continue firm at regular quotations. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—A fair amount of new tonnage is being placed with the mills, while specifications against contracts are being received at a satisfactory rate. However, the trade is not anticipating its requirements as far ahead as last year, being inclined to pursue a conservative course in the matter of carrying stocks. There is no doubt but that the action of the mills early in January in practically guaranteeing prices on Wire Nails against decline, has resulted in a much larger volume of business than otherwise would have been the case. The tone of the market is firm, and we are advised that regular prices are being maintained. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....$2.05
Carload lots to retail merchants..... 2.10

Cut Nails.—Market conditions have not shown much improvement since the reaffirming of prices by the Cut Nail Association. A comparatively small volume of business is being placed with mills, and concessions from regular quotations are frequently made. Regular quotations are on the basis of $2.05 per keg, at mill. Iron Nails generally should command about 10 cents more than Steel.

New York.—The local situation is similar to that in Wire Nails, though more pronounced. There appears to be little work under way, which requires the use of Cut Nails. Quotations are on the basis of $2.30 per keg for small lots, at store.

Chicago.—The demand for Cut Nails continues very light, and jobbers' stocks are moving slowly. It is becoming evident that prices are not being maintained in the face of offered business. One firm offers on even small lots 10 cents per keg below the regular price. There is, however, no disposition to tempt trade by open quotations at cut prices. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; Steel, to jobbers, in carloads, $2.28; to retailers, $2.33.

Pittsburgh.—The fact that the Cut Nail mills at their recent meeting reaffirmed prices, has not as yet stimulated demand to any extent, which continues light and for small lots. Hardly enough new business is being offered to test the market, but prices are still being shaded to some extent on most of the few orders that are being placed. We quote Steel Cut Nails at $2 to $2.05, f.o.b. Pittsburgh, for carload lots, and small lots at $2.10, to which freight to destination is added. Iron Cut Nails are being held at about $2.15, at mill.

Barb Wire.—There is a gradual increase in the tonnage being shipped from mills, and this is expected to grow larger with the addition of new business from the West and Northwest. Mills are able to make fairly prompt shipments, and prices remain firm, and without change. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—It is expected that the present fairly active demand from the South will soon be reinforced by a greater volume from the West and Northwest. Shipments are gradually growing heavier, and by the time spring opens they bid fair to become nearly normal. Prices continue firm, without change. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Only a fair amount of new tonnage is being placed, the trade not being disposed to buy as heavily as at this time last year. Shipments by the mills are fairly heavy, and they are able to make quite prompt deliveries. The market is firm, our advices being that prices are absolutely maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—The feeling that the consumptive demand will not be as heavy as it was last year is leading the trade to purchase in a conservative manner, and not to anticipate requirements as far ahead. The market is well maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots.....$1.90
Retailers, carload lots..... 1.95

Chicago.—The outlook for a reasonably satisfactory Fence trade is far from discouraging, and Fence manufacturers are, in consequence, making preparations in a conservative way to supply it. They are placing some new business and are specifying with a fair degree of liberality against contracts. Mill shipments are increasing and show marked improvement over those of recent months. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—New demand for Plain Wire from Fence manufacturers is heavier now than at any time since last fall. The trade is not anticipating its requirements as far ahead as at this time last year, and is not buying as heavily, believing that consumption will be less than it was last year, which was an exceptionally good year in all branches of the Wire trade. We are advised that regular prices are being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots.....$1.90
Retailers, carload lots..... 1.95

Chisels.—The Chisel market gives evidence of more or less irregularity, and some comparatively low prices are being announced.

Twist Drills.—The manufacturers of Twist Drills have been in conference and are taking under consideration the desirability of revising the list prices, with a view to correcting inequalities.

Carriage Bolts, Nuts, &c.—There seems to be a disposition among the manufacturers of Carriage Bolts, Nuts, &c., to check the tendency toward lower prices which has characterized the market for the past month or two. As a result some higher prices than those recently obtainable have been announced, and other quotations are being withdrawn.

Copper Products.—There has been within the past week a further recession in the price of Copper Products generally, including Brass and Copper Tubing, Sheets, Rods, Wire, Copper Rivets and Burrs, Soldering Irons, &c.

Double Pointed Tacks.—Competition between manufacturers and the existing indisposition of the trade to purchase freely has led to the announcement of lower prices on Double Pointed Tacks, the market on which is referred to as in a rather unsatisfactory condition.

Tacks.—Manufacturers are endeavoring to correct the tendency toward irregular and lower quotations which has characterized the Tack market during the past few weeks. It remains to be seen what success will attend their efforts.

Heavy Strap and T Hinges.—The manufacturers of Strap and T Hinges adopted on February 10 new list prices on Heavy Strap and Extra Heavy T Hinges, quoting all sizes per dozen pairs instead of per pound. Inasmuch as the list prices given below are based upon the average weight and the discounts continue unchanged, the net is about as heretofore. The revised list as given below is subject to the following base discounts, Heavy Strap, 60 and 5 per cent.; Extra Heavy T, 50 and 10 per cent., with additional discounts of about 10 and 7½ per cent.:

Heavy Strap.—Per Doz. Prs.

Inch	4	5	6	8	10	12	14	16
Plain Steel	1.60	2.15	2.80	4.50	6.80	10.40	12.20	14.00
Japanned	1.75	2.35	3.10	4.95	7.50	11.45	13.40	15.40
Galvanized	2.85	4.25	6.40	10.25	15.50	23.50	25.70	29.50
Galv. Brass Pin	3.30	5.00	7.80	12.35	19.00	27.50	30.40	34.30

Extra Heavy T.—Per Doz. Prs.

Inch.	4	5	6	8	10	12	14	16
Plain Steel	1.80	2.45	3.00	5.00	7.40	10.70	11.80	12.60
Japanned	2.00	2.70	3.30	5.50	8.15	11.75	13.00	13.85
Galvanized	3.20	4.65	6.00	10.00	14.25	21.20	23.00	24.50
Galv. Brass Pin	3.90	6.00	8.50	13.50	19.00	28.00	30.00	31.50

Corrugated Heavy Strap.—Per Doz. Prs.

Inch.	4	5	6	8	10	12
Plain Steel	1.60	2.15	2.80	4.50	6.80	10.40
Japanned	1.75	2.35	3.10	4.95	7.50	11.45
Galvanized	2.85	4.25	6.40	10.25	15.50	23.50
Galvanized, Brass Pin	3.30	5.00	7.80	12.35	19.00	27.50

Corrugated Extra Heavy T.—Per Doz. Prs.

Inch.	4	5	6	8	10
Plain Steel	1.80	2.45	3.00	5.00	7.40
Japanned	2.00	2.70	3.30	5.50	8.15
Galvanized	3.20	4.65	6.00	10.00	14.25
Galvanized, Brass Pin	3.90	6.00	8.50	13.50	19.00

Rope.—Business continues moderate in volume, with expectations of an improved demand later in the season. Prices are somewhat irregular, and to some extent depend upon the anxiety of sellers to exchange stocks for available funds. An impression prevails among some in the trade that Fiber values will continue to decline, resulting in correspondingly lower prices for Cordage. This idea is based on the assumption that prices for raw material has been too high for some time. The following quotations, for base sizes, fairly represent the market: Pure Manila, 11 to 11½ cents; B quality grades down to 8 to 9½ cents; Pure Sisal, 7¾ to 8 cents; lower grades Sisal, 6¾ to 7 cents; No. 1 Jute, ¼-in. and up, 7½ cents; No. 2 Jute, 7 cents.

Window Glass.—The addition to the number of Window Glass factories which have been in operation is the only feature of special interest in the situation. Recently there seems to have been no regular factory price, each manufacturer making quotations according to his necessity for cash. Local demand is exceedingly light. The minimum prices recommended by the Eastern Window Glass Jobbers' Association are as follows: Single strength, 90 and 25 per cent.; double strength, 90 and 30 per cent. discount from jobbers' list. These prices are, however, not closely adhered to.

Linseed Oil.—The impression prevails in the minds of some in the trade that stocks of Oil in the hands of consumers and merchants are low throughout the entire country, and that this is also true of the crushers. Upon this basis it is reasoned that a good spring demand would possibly sustain present quotations and that it might cause a slight advance. A more general belief appears to be that prices will be lower. Demand in this market is confined to small lots. Local quotations are as follows: In five-barrel lots, State and Western Raw, 41 to 42 cents; City Raw, 43 to 44 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—Light receipts and a better demand at Southern points has strengthened the local market. Demand from manufacturing consumers is light, as the result of general trade conditions, and requirements are only for current needs. The market is more steady and prices a little higher. The New York market is represented by the following quotations: Oil Barrels, 51 to 51½ cents; Machine Made Barrels, 51½ to 52 cents.

OHIO HARDWARE ASSOCIATION.

(By Telegraph.)

THE fourteenth annual convention of the Ohio Hardware Association is now in session in Columbus. While it is impossible thus early to make an accurate estimate of the attendance, it is safe to say that in point of numbers as in other respects, this convention marks the highest point yet attained in this or any similar organization. Officers and members are filled with enthusiasm, especially the former, whose untiring efforts have been crowned with such substantial success.

The public accommodations of the capital city, which have been ample on previous occasions, have to-night proved inadequate to meet the demands made upon them, but the Committee of Arrangements, never unprepared, has met the exigency by producing a list of rooms which can be had in boarding and private houses.

The Hardware show is pronounced to be the most effective and elaborate that has ever been held, the scheme of uniformity in the design and decoration of the booths being an emphatic success, not only in enhancing the beauty of the general effect, but especially in its convenience and economy for the exhibitors, of whom there are over 150.

In spite of a heavy rain the opening session this afternoon was said to be the largest ever held by the association, completely filling the spacious auditorium. It was naturally an occasion of enthusiasm, congratulation and reminiscence, but considerable time was also given to business discussions suggested by the question box. This evening there is a theater party, the entire house being reserved for the Hardware men, their ladies and guests.

The Marshall Pure Paint Law.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., February 25, 1908.

AN important measure has been introduced in the House of Representatives by Congressman Marshall of North Dakota, designed as the basis for a federal pure Paint law. The bill differs widely, both in form and substance, from the only measure ever before presented in Congress dealing with the same subject, and which was also introduced by Mr. Marshall in the closing days of the last Congress. The original bill, which was admittedly crude in form and drastic in effect, followed closely the lines of the national pure food and drug law and prohibited the interstate transportation of Paints composed of any materials other than pure linseed oil, carbonate of lead, oxide of zinc, turpentine, Japan dryer and pure colors. This category of favored ingredients was taken from the text of the North Dakota law, which requires Paints containing any other ingredients to be so labeled as to show the kind and percentage of raw materials used. It will be noted that while the North Dakota law discriminates against Paints containing other than the six statutory ingredients to the extent of requiring them to be labeled, the original Marshall bill, as introduced in the last Congress, absolutely forbade the interstate transportation of Paints which under the State law could have been freely transported, bought and sold if appropriately marked.

Result of Conference.

During the last Congressional recess Mr. Marshall received many representations from prominent Paint manufacturers, dealers and others regarding the proper scope of federal Paint legislation, and early in the present Congress he held conferences with representatives of the National Paint, Oil and Varnish Association, the International Association of Master House Painters and Decorators and other trade organizations, as the result of which he decided that the proper function of a national pure Paint law was to require all articles sold as Paints to be plainly labeled so as to disclose their exact character, and especially the quantity and proportion of each ingredient employed. He also decided that certain forms of mislabeling might properly be treated as adulteration for the purpose of a federal law. Upon this basis he has drawn the comprehensive bill just introduced.

The jurisdiction of the Federal Government over this subject is twofold: First, with regard to interstate shipments, which it controls absolutely under the interstate commerce provisions of the Constitution, and, second, concerning the manufacture and sale within the Territories, the District of Columbia and the insular possessions of the United States, over all of which Congress exercises the same police powers as are exercised in the States by their respective legislatures. The first section of the bill, which is based upon the police powers of the Federal Government, makes it unlawful for any person to manufacture within any Territory any Paint, Turpentine or Linseed Oil which is adulterated or unlabeled within the meaning of the act, and violation of this provision is made punishable by fine or imprisonment, or both, with increased penalties for subsequent convictions.

The terms of section 2 are important in that they constitute the chief prohibition embodied in the measure and deal with the entire subject of interstate transportation. This section is as follows:

Sec. 2. That the introduction into any State or Territory or the District of Columbia, or from any foreign country, or shipment to any foreign country of any Paint, Turpentine and Linseed Oil which is adulterated or unlabeled, within the meaning of this act, is hereby prohibited; and any person who shall ship or deliver for shipment from any State or Territory or the District of Columbia to any other State or Territory or the District of Columbia, or to a foreign country, or who shall receive in any State or Territory or the District of Columbia from any other State or Territory or the District of Columbia, or foreign country, and having so received, shall deliver, in original unbroken packages, for pay or otherwise, or offer to deliver to

any other person, any such article so adulterated or unlabeled within the meaning of this act, or any person who shall sell or offer for sale in the District of Columbia or the Territories of the United States any such adulterated or unlabeled articles, or export or offer to export the same to any foreign country, shall be guilty of a misdemeanor, and for such offense be fined not exceeding two hundred dollars for the first offense, and upon conviction for each subsequent offense not exceeding three hundred dollars, or be imprisoned not exceeding one year, or both, in the discretion of the court;

Provided, That any Paint, Turpentine and Linseed Oil shall not be deemed adulterated or require to be labeled within the provisions of this act when intended for exportation to foreign countries and when not in conflict with the laws of the foreign country to which intended to be shipped, but if any of said articles shall in fact be sold or offered for sale for domestic use or consumption, then this proviso shall not operate as an exemption from any of the other provisions of this act.

And provided further, That nothing in this act shall prohibit a manufacturer of Paint, Turpentine or Linseed Oil to sell upon a written contract, to a consumer, for use only on products of his own manufacture goods unlabeled as to their ingredients, but bearing conspicuously the printed statement that they are made in accordance with a private formula; provided that no Paint, Turpentine or Linseed Oil, made in accordance with a private formula, under a written contract, shall be sold by the consignee or used upon any buildings.

Board for Making Rules and Regulations.

By the third section of the bill a board is constituted, composed of the Secretaries of the Treasury, Agriculture, and Commerce and Labor, to make uniform rules and regulations for carrying out the provisions of the act, including the collection and examination of Paint, Turpentine and Linseed Oil manufactured or offered for sale in any Territory over which the United States has jurisdiction or which shall be offered for sale in unbroken packages in any State other than that in which they shall have been respectively manufactured or produced, or which shall be received from any foreign country or intended for shipment to any foreign country.

Examination and Hearings.

Section 4 outlines the procedure for the examination of specimens and for hearings to be granted to manufacturers whose goods may be called into question. This important feature of the law is as follows:

Sec. 4. That the examinations of such specimens shall be made in the Bureau of Chemistry of the Department of Agriculture, or under the direction and supervision of such bureau, for the purpose of determining from such examinations whether such articles are adulterated or misbranded within the meaning of this act; and if it shall appear from any such examination that any of such specimens is adulterated or improperly labeled, within the meaning of this act, the Secretary of Agriculture shall cause notice thereof to be given to the party from whom such sample was obtained. And any party so notified shall be given an opportunity to be heard, under such rules and regulations as may be prescribed as aforesaid, and if it appears that any of the provisions of this act have been violated by such party, then the Secretary of Agriculture shall at once certify the facts to the proper United States district attorney, with a copy of the results of the analysis or the examination of such article duly authenticated by the analyst or officer making such examination, under the oath of such officer. After judgment of the court, notice shall be given by publication in such manner as may be prescribed by the rules and regulations aforesaid.

By the terms of section 5 it is made the duty of each district attorney to whom the Secretary of Agriculture shall report any violation of this act to cause appropriate proceeding to be commenced and prosecuted in the proper courts of the United States for the enforcement of the penalties by law provided.

Definitions.

Sections 6, 7 and 8 contain the definitions laid down in the act and prescribe the character of the labels to be used on all Paints eligible to interstate transportation. The text of these sections is as follows:

Sec. 6. The term "Paint" as used in this act shall include all pigments, dry or in any kind of Oil, or any substance or compound used or intended for use in Paint, paste or semipaste Paint, and liquid or mixed Paint ready for use. The product "Linseed Oil" is defined to be the Oil obtained from the seeds of the flax plant, Linum Usitatissimum L. The product "Turpentine" is defined to be the light Oil obtained from coniferous trees.

Sec. 7. That for the purpose of this act an article shall be deemed to be adulterated.

a. If any substance be present, other than those mentioned on the label, which cheapens or debases its character or increases its weight or volume without a corresponding increase in value.

b. If any of the materials contained in the article be of inferior quality.

c. If any substance has been substituted, in whole or in part, for any ingredient claimed to be present.

Sec. 8. There shall be shown clearly and distinctly upon the face label and in the English language:

a. The name and residence of the manufacturer of the Paint, or of the distributor thereof, or of the party for whom the same is manufactured.

b. There shall be shown in case of Dry Colors, Colors ground in oil, Paste or Semi-Paste Paint, the true net weight; and in all ready-mixed or ready-for-use Paints the true measure in gallons or part thereof.

c. There shall be shown the name, and, with substantial accuracy, the percentage of each ingredient, both solid and liquid, contained therein.

d. When other than chemically pure Colors are used the percentage composition thereof shall also be shown, or when Varnish, Japan or other driers are used, the composition of the same shall be shown.

That for the purposes of this act an article shall be deemed to be improperly labeled:

First. If it be an imitation of or offered for sale under the name of another article.

Second. If the contents of the package as originally put up shall have been removed, in whole or in part, and other contents shall have been placed in such package, or if the package fails to bear a statement on the label of the quantity or proportion of each ingredient contained therein.

Third. If in package form, and the contents are not stated plainly and correctly in terms of net weight or measure on the outside of the package.

Fourth. If the package containing it or its label shall bear any statement, design or device, regarding the ingredients or the substances contained therein, which statement, design or device shall be false or misleading in any particular.

An Important Feature of the Proposed Law Is Embodied

in section 9, which exempts from prosecution any dealer "when he can establish a guaranty signed, by the wholesaler, jobber, manufacturer or other party residing in the United States from whom he purchases such article, to the effect that the same is not adulterated or improperly labeled within the meaning of this act." Such guaranty to afford protection must contain the name and address of the party or parties making the sale of the articles to the dealer, and such parties are thereby made amenable to the prosecutions, fines and other penalties which otherwise would attach to the dealer.

Seizure and Forfeiture.

Section 10 of the bill should have the very careful attention of all dealers, for the reason that it subjects improperly labeled Paints to seizure and forfeiture, notwithstanding the fact that the dealer in whose possession they are found may have taken every possible precaution to determine the legitimate character of the products purchased by him. This provision of the bill follows closely a similar feature of the national pure food and drug law, the validity of which is now being tested in the courts. It is obvious that if the Paint bill should become a law with this provision embodied therein dealers would be obliged to protect themselves by securing special guarantees from manufacturers or jobbers in addition to those provided in section 9 above quoted. Section 10 of the bill is as follows:

Sec. 10. That any Paint, Turpentine or Linseed Oil that is adulterated or improperly labeled within the meaning of this act, and is being transported from one State, Territory, District or insular possession to another for sale, or, having been transported, remains unloaded, unsold or in original unbroken packages, or if it be sold or offered for sale in the District of Columbia, or the Territories, or insular possessions of the United States, or if it be imported from a foreign country for sale, or if it is intended for export to a foreign country, shall be liable to be proceeded against in any district court of the United States within the district where the same is found, and seized for confiscation by a process of libel for condemnation. And if such article is condemned as being adulterated or improperly labeled within the meaning of this act, the same shall be disposed of by destruction or sale, as the said court may direct, and the proceeds thereof, if sold, less the legal costs and charges, shall be paid into the Treasury of the United States, but such goods shall not be sold in any jurisdiction contrary to the provisions of this act or the laws of that jurisdiction.

Provided, however, that upon the payment of the costs of such libel proceedings and the execution and delivery of good and sufficient bond to the effect that such articles shall not be sold or otherwise disposed of contrary to the provisions of this act or the laws of any State, Territory, District, or insular possession, the court may by order direct that such articles be delivered to the owner thereof. The proceedings of such libel cases shall conform, as near as may be, to the proceedings in admiralty, except that either party may demand trial by jury of any issue of fact joined in any such case, and all such proceedings shall be at the suit of and in the name of the United States.

Under the terms of section 11 the Secretary of the Treasury, upon the request of the Secretary of Agriculture, may at any time take samples from importations of

Paint, Turpentine and Linseed Oil, and if such goods are found to be adulterated or misbranded within the meaning of the law their delivery to the consignee may be forbidden and their re-exportation required.

Section 12 defines the term "Territory" to include the insular possessions of the United States, and the word "person" to include corporations, companies, societies and associations. By the terms of section 13 the proposed law becomes effective six months from the date of its passage and approval.

Offered as a Basis for Legislation.

This measure has been referred to the House Committee on Interstate and Foreign Commerce, to which Mr. Marshall intends to apply at an early date for a series of hearings. He desires it understood that his bill, which has the approval of the Paint experts who were instrumental in securing the enactment of the North Dakota law, and of Prof. H. W. Wiley, Chief of the Bureau of Chemistry of the Department of Agriculture, is not put forward as a perfected measure, the provisions of which he is disposed to insist upon, but is offered merely as a basis for legislation. Manufacturers and dealers who desire to make representations to the House committee before the bill is acted upon will have ample opportunity to do so, and advance notice of such hearings will be given in this correspondence.

West Virginia Retail Hardware Association.

ALTHOUGH still in the swaddling clothes' division among State retail Hardware organizations, West Virginia has much cause for felicitation anent the second annual convention, which was held at Elkins, February 18, 19 and 20. The men of Hardware received a right royal welcome through the hospitable mayor, Dr. A. M. Fredlock, who in his opening address made some happy hits on the profession and qualified the conventional key of open sesame by denominating his a "pass key" which would not be needed because the "latch string" was always out for the association members. The headquarters were at the Hotel Randolph, where a number of manufacturers and jobbers had comprehensive exhibits. A feature of the meeting was the friendly exchange of ideas and the hearty co-operation of the traveling salesmen whom President-elect Frye organized into "a boosting division," each salesman a committee of one to bring in two or more new members during the coming year. The active membership is now nearly 100, with about 50 honorary members, traveling salesmen. The funds are in fine condition through the conservative management of Secretary-Treasurer Leslie Hawker, whose salary was doubled in recognition of his efforts.

Convention Committees.

The president appointed the following committees to act during the convention:

NOMINATIONS: C. S. Davis, Oakland, Md.; E. C. Linger, Elkins; W. J. Corrick, Parsons.

AUDITING: A. J. Iles, Mannington; J. M. Walker, Wellsburg; W. A. Vance, Clarksburg.

RESOLUTIONS: C. D. Barbe, Morgantown; F. R. Clelland, Fairmont; T. B. Frye, Keyser.

The President's Address.

President C. D. Kyle in his annual address made a strong plea for the utilization in daily business life of those qualities which could best be summarized in the simple and homely phrase "Live and let live." He advocated friendly and social intercourse among competitors. Taking the thought "buying together," he made the point that by bunching small local shipments merchants could frequently save one-half the freight, especially in carload lots. He deprecated the practice of attacking rival firms in advertisements, slurring competitors to visiting salesmen, using unfair methods to get trade away from other merchants. Among "don'ts" relative to the retail business, Mr. Kyle enumerated the following:

Don't try to buy the same brands your competitor carries—get something different and possibly better.

Don't be constantly worrying yourself for a basis upon which to cut your competitor's price on an article.

Don't allow your vanity to run away with your business sense by overbuying in order to make somebody believe you're the biggest merchant.

Parcel Post.

President Kyle then took up the Parcel Post question, which he ably discussed at some length, pointing out the objections and disadvantages connected with it. Concluding his argument, he said:

It may be well to ask, Who is it who has petitioned for the parcel post mail? It is not the farmer, for he has never petitioned for anything. It is not the people as a whole, they would be asking for a favor to a small class, and which would be directly against their own interests. Certainly no such petition has gone in from the country merchants or the retail trade, or the country in general. It comes down to the fact then, that the parcel post would benefit nobody but the mail order or the catalogue houses, many of whom are doing business on a basis of misrepresentation. And whatever would go to the benefit of the catalogue houses would react in direct ratio against the best interests of the farmers and decidedly against the interests of the country merchant. The parcel post is a direct threat against the welfare of the country towns.

Secretary Hawker's Report.

Leslie Hawker presented an interesting and suggestive report as secretary, from which we make the following extracts:

Complaints have been very few the past year and we believe all that have been reported have been adjusted satisfactorily to the complaining party. However, we believe the greatest menace that confronts the retailer in most localities and one which has frequently been called



T. B. FRYE.



C. D. KYLE.

to our notice in an informal way, although not in the form of a complaint, is the practice of many of the local jobbers selling general stores, grocery stores or to consumers direct. Many of these jobbers are refused membership in the National Hardware Association, yet they secure jobbers' prices on a great many articles which the retailers cannot do, thus giving them an advantage, which many of them use to the detriment of legitimate retail merchants. If such sales were confined to goods that were to be resold it would be a different proposition, but many times the goods pass from the jobber direct to the consumer and are billed to some one in business, but not handled by him at all, and little if any profit is added, thus placing the wholesale price in the hands of the consumer.

We are sorry to say that this happens many times when the jobber has full knowledge of the affair. We consider this a serious question and one the convention should carefully consider. We have no suggestions to make, but believe it should be the policy of the association to refrain from any action that would savor of a boycott.

Members Taking Up Mutual Insurance.

We are gratified to note that some of our members are laying aside their spurious objections and prejudices to mutual insurance and are availing themselves of the advantages it offers to members of associations, and we believe this will be a means of stimulating interest and membership in the association. A year ago we had but

one or two members carrying mutual insurance, while to-day we have a number, and others are expecting to take out mutual insurance when their present old line policies expire.

That much good has been accomplished by the various associations is undisputed, but there remains yet a great work to be done. The best interests of the retailer demand that the parcel post measure now before Congress shall be defeated, and that 1-cent letter postage be instituted instead. Unscrupulous jobbers should be restricted either in buying or in their selling, and numerous other matters demand our attention in the near future. These improved conditions can be obtained only if at all by a large earnest and enthusiastic membership, not only willing to accept benefits and conditions already secured, but one that will co-operate and assist in demanding that their interests be protected. Then does it not behoove every member of this association to



W. A. VANCE.



F. R. CLELLAND.

prosecute more vigorously our campaign for new members for "United we stand, divided we fall."

Our increase in membership the last year has not been what it might have been, nor what your secretary really expected, yet we can show a liberal increase from 44 regular members last year to 61 regular and 33 honorary members to-day, and we believe the interest and appreciation of the association is more than keeping pace with the increase in membership. We have a possible membership of about 250 regular members in the State and adjacent territory, while we now have only 61 merchants associated with the organization. We therefore suggest that you designate or appoint some one as a solicitor to visit the various merchants of the State who are not already members of the association and explain the policy of association to them carefully, and believe that in this manner we would have a membership of 150 before next meeting.

We are also of the opinion that we should have a committee on legislation, whose duty it would be to correspond with other commercial bodies and ascertain what they are doing or have done, and to agitate and assist in developing legislation that would be of interest and advantage to the association and retail merchants. It might be well to empower them to secure legal advice at their discretion and to report to the next meeting of this association the advisability of incorporating this association.

Col. Morris Belknap's Address.

The afternoon session of the second day was opened by Col. Morris Belknap of the Belknap Hardware & Mfg. Company, Louisville, Ky., who discussed "Claims: Their Justification and Abuse, and the Best Methods of Handling." Colonel Belknap prefaced his talk with a cordial invitation to members to stop over in Louisville en route to the national convention in St. Louis in March, and visit the company's establishment.

Mr. Belknap called attention to the increased expense incurred in the treatment of claims due to the way in which they were often presented. A reduction of this expense would be effected if the claimant would supply the seller with the following information:

1. Date of invoice.
2. Item.
3. Amount involved.
4. Nature of claim.
5. Error and responsibility.
6. Proposed disposition and settlement.

Inasmuch as these points are applicable to the claims made in any branch of business, there is good reason to urge merchants to adopt a regular form of claim sheet, with proper space left for each one of these questions. This would suggest to the buyer the necessity for filling them all in and giving the seller the necessary information that he wants for the adjustment of the claim. "There should be as much uniformity observed in writing out a claim as in writing a check," said Mr. Belknap. The speaker then reviewed the great difficulty which any adjuster experiences in answering some dozen or two assorted letters in regard to claims and saying the right thing to each correspondent, and urged that all claims should be made with a cool, dispassionate statement of the facts and free from any display of temper, which so often jeopardizes a valuable business connection.

Losses in Transit.

In regard to losses in transit Mr. Belknap spoke as follows:

I now come to perhaps the most complicated of all claims and one requiring the co-operation of the buyer and seller. I refer to losses in transit, which in the past few years have undoubtedly been very large. Some of these we as jobbers have been responsible for. The added cost of packing has induced us to economize in the matter of boxes, possibly to an unwise extent, and the strength of the package has not been sufficient to deliver the contents to the consignee in first-class order. But there is not a well ordered house in the country that has not this subject seriously under consideration. This brings us to the subject of

Goods That Are Abstracted in Transit.

So expert have become the thieves in opening boxes and extracting therefrom whatever they can lay their hands on, it is very difficult for a merchant upon receipt to convince himself that the goods were not left out at point of shipment. A good deal of this work is evidently done by men who are expert packers and know how to replace the straw and excelsior in the boxes which they have opened so as not to excite suspicion. When the goods arrive at destination perhaps a cleat nailed across the corner may be the only thing to suggest that the box might have been tampered with.

As many houses, when they find they have packed goods in a weak box, adopt this method of reinforcing it, it is not improbable the customer would think it is in its original shape. The use of coated nails, soldered bands and other protective measures, while all good in their way, do not completely secure them, and there needs to grow up in the business community a determination to



MORRIS B. BELKNAP.



LESLIE HAWKER.

prosecute to the limit of the law any men that are captured in this nefarious practice. A small assessment on various associations of the mercantile world to prosecute and land in the penitentiary railroad thieves would be a good investment.

It is very difficult to induce the buyer to believe that in spite of the checks and counterchecks, the extracted goods have been actually put in the box, and of course the seller from his knowledge of the way goods are very often unpacked at destination, realizes that the chances for abstraction there are not at the minimum. Ofter he has seen a clerk in a country store start to unpack a box. He has no sooner ripped off the top and removed the packing material than a customer comes in, calling him perhaps to go down into the cellar or out into a warehouse to get some trifling article. During all that time the box lies subject to the depredations of whoever can lay his hands on any of the contents. This picture comes up before the adjuster as he reads the letter which hints in no unmistakable terms to him that the house must have some very dishonest men in its own employ.

Certain developments have proved beyond a question that the amount of thievery in transit has been far in excess of what we conceived. Train crews have been known to stop whole freight trains in deserted parts of the country, and to some farm house in the neighborhood carried off the contents of cases that they have opened as the train approached the robbers' den. We shudder to think of all the claims that have been based upon such proceedings. There is but one adequate remedy, and that is the severest sort of punishment.

Another Class of Claims

The speaker next called attention to the class of claims arising from an effort on the part of buyer and seller to get together on a line of goods, so as to have them sell at a certain price, and in doing so sacrificing the quality beyond what is justifiable. Undoubtedly much material furnished to the trade proves unsatisfactory, and forms the basis of a claim, where the seller finds out his mistake. There should be really in this class of cases no claim, for the matter was fully understood between buyer and seller, and yet such transactions are frequently the source of some of the most bitterly fought claims.

Mr. Bogardus on Systematic Business Methods.

A very practical and suggestive address was made by W. P. Bogardus, Mt. Vernon, Ohio, former president of the National Association. Mr. Bogardus was warmly received by the members and spoke as follows, in part:

The natural tendency in all of us is to take life easy. There are very few people who go into business simply for the sake of being in business. To earn a living and to make money that will enable us to purchase the things we desire, are the prime motives for undertaking the work that is necessary to do in order to carry on a successful business.

Some men measure success by the amount of money they make; some by the amount of goods they handle, regardless of profit; others by the amount of ease they have as they pass through life. This latter class are content to buy a stock of goods and then sit down and wait for customers to come in and buy. They are satisfied with the meager results of a bare living.

But Success Should Mean More

than all these. The ability to get good profits, to build up a large business and to inaugurate a thorough system, together with the will and ability to be helpful to others, makes a combination that to me is the ideal American business man. With the increased competition and the smaller profits in business, we have been compelled to change from the loose methods of the past to a more exact system, that we might better know our true condition.

And the basis of all our knowledge of our business must come through the yearly invoice. We cannot tell what we have until we take an inventory. When we add the amount of our sales for the year to the inventory and subtract from that the last year's inventory added to the amount of purchases for the year, we have our gross profit. But this will not be all. We will want to know where our profit is.

An Illustration.

For example, suppose we have $10,000 to be used in business. To have that on interest would bring us, say $600, without taking much of our time. Suppose we put in our time at $1200 per year. That would give us $1800 for our money and time for the year.

Now suppose we put that $10,000 in business, and we sell, say, $25,000 worth of goods. If we net a 10 per cent. profit on our sales we have $2500. The difference between this last amount and the $1800 that we received from selling our time and the interest on the $10,000 is $700. That should be money in bank or in some investment we know about.

How many of us can show at the end of the year the net profits of our business in money? If we cannot, where has it gone to? Have we made our invoice too high, or have we failed to keep our records straight? It is results we are after when we go into business.

If Our Business Is Not Paying,

the sooner we know it the sooner we can get into something else that we hope will pay. To continue in a losing business means ultimate ruin. When we buy goods we are careful to get the goods that we think will suit our trade. When we get them marked and on our shelves, we use all our endeavors to get the public to come and patronize us. And when we get the money for the goods, we toss it into a drawer and at night gather it up and put it in our pocket or safe, and consider the matter closed.

If we have clerks we do not know whether we are getting all we should have or not. Mark you, I do not want to say that clerks are dishonest, for I do not believe that there is one in a hundred that is dishonest. But what I want to say is that perhaps mistakes have been made in making change during the day, as we are all liable to do. How are you going to tell who is at fault?

If You Have No System

it is impossible to tell. And the lesson that should come from every mistake is lost, because the mistake cannot be brought home to the one who made it. It is a general fact that on such a day a mistake was made, but who made it does not appear. Each one in the store will say, "I did not make it," and so the guilty one, unconscious of his shortcomings, continues his careless methods, to the injury of the business.

Perhaps the proprietor of the store has made the mistake; he is not proof against making them. It would be a great comfort to the clerks to know it if he had, and it would help the proprietor to be more merciful in his criticism of the clerks. It is easy for the proprietor to go to the money drawer and take some money out and forget about it, and with the ordinary money drawer it is impossible to detect the shortage.

So it seems to me that we should devise some method so that when money is put in the drawer a record is made, and when it is taken out a further record is made of the transaction. Then if mistakes are made they can be detected. But even with this arrangement you cannot place the mistake on the person who made it.

The Final Solution of This Question

comes when each clerk has a drawer of his own. Then if his account does not show up right at the close of business the blame can be placed where it belongs. The knowledge that mistakes will be discovered will have a tendency to make all connected with the store more careful. Do not imagine for a moment that any system will make honest employees. Honesty is inbred. But precautions will help sometimes to brace some sorely tempted employee, and it is the duty of every employer to help those in his employ to be good, honest and upright.

A Simple Method.

I saw a simple method the other day that was inexpensive, and still answered the purpose—a money drawer with a desk top setting on the counter. In the top of the desk was an opening possibly 6 in. square covered with plate glass, with a slot in the glass running across the opening ½ in. wide. Under the glass was a roll of paper that moved forward a space every time the drawer was opened. The paper was divided into columns of cash, charge, received on account and paid out. Every transaction in the store was recorded through the slot on the paper.

At the close of business for the day the proprietor opens the drawer and takes from the roll as much of the paper as has been used, and has a complete record of the day's business. From this paper he posts into his ledger the record of the day, and puts aside the paper as his original entry of the various charges made. To those who hesitate because of the expense, some cheap method like I have just described can be inaugurated.

Modern Methods of BookKeeping Tend Toward as Little Recopying

as possible. I have found a day book ledger very satisfactory. The debit side of the ledger is wide, so that several items can be entered on one line. Then when an itemized account is called for there is but one book to look over. The slips from the register are used to verify the account, and are preserved as the original entries in case a dispute should arise over an account. With such a simplified system the danger from mistakes from transcribing is very much lessened.

The Only Success in Business Worth Having

is brought about by dealing honestly with your customers. In that way a confidence is inspired that is an asset that cannot be measured by money. While the personality of your help has a good deal to do with your success, yet I have never seen a business go into a decline because the help was changed, if the business had been conducted so as to win the confidence of the consuming public.

The Buyer of the Present Day Is Appealed to

through his eyes. A great many articles are purchased because they are seen. So the windows become effective methods of advertising. The appeal to the eye is very efficient, especially in the case of new goods. The sampling of goods on the outside of boxes on the shelves are silent but continuous advertisements. The necessity of advertising is being made more manifest every day. The illustrated catalogues with which the country is flooded have increased the knowledge of the public. To meet this knowledge, and to supply the greater wants, it becomes us to study the needs of our trade and to supply them as

far as practicable. When we get this knowledge it is up to us to let the public know what we have.

The well dressed windows, the attractively arranged store, the obliging clerks, are all advertisements, but they do not become effective until the customer comes in contact with them. The customer must come to the store before his interest becomes excited. What means can we use to draw him to the store? There are many ways to do it, but to me the most effective way is to advertise in your local papers.

The Question Box.

The Question Box was under the supervision of former National President Bogardus. Under his leadership the discussion of the various topics brought up was spirited and interesting. Among the queries propounded and discussed were the following:

1. On what basis do you figure percentage of profit, on cost or selling price?
2. Where is the best place in the store for your office?
3. How can the retail man compete with the small jobber, who pretends to sell to the consumer at the jobber's price?
4. What should the retail merchant do with the jobber or manufacturer that sells to you and then goes out and hunts up the general store, little tin shop, &c., and takes their orders?
5. Should Hardware and Paint jobbers sell to department stores?
6. Should the retail Hardware merchants support a concern that poses as a wholesale house and at the same time maintains a retail store?
7. Can combination buying be done successfully to save money?

Election of Officers.

The following officers were elected to serve for the ensuing year:

PRESIDENT, T. B. Frye, Keyser.
FIRST VICE-PRESIDENT, W. A. Vance, Clarksburg.
SECOND VICE-PRESIDENT, Robert Smith, Ronceverte.
SECRETARY-TREASURER, Leslie Hawker, Shinnston.
EXECUTIVE COMMITTEE: F. R. Clelland, Fairmont; J. M. Walker, Wellsburg; A. J. Hess, Mannington.

The Executive Committee was empowered to appoint a subcommittee on Legislation, and this committee consists of F. S. Byrer, Philippi; W. H. Miller, Parsons; Bert Bradford, Pennsboro.

Other Papers and Addresses.

Among other addresses made and papers read at the convention were those of C. S. Davis, J. M. Davis & Son, Oakland, Md., who contributed a suggestive paper under the title of "Annual Greetings;" James F. Ball, Barrett Mfg. Company, Allegheny, Pa., on "The Buyer's Attitude Toward the Salesman;" W. B. Lockett, Kelly Axe Mfg. Company, Charleston, W. Va., on "Organization;" Charles Barkley, representing Hibbard, Spencer, Bartlett & Co., Chicago, on "Competition and the Man;" C. D. Barbe, Morgantown, W. Va., on "Why Hardwaremen Should Be Members of the West Virginia Association," and by Mr. Gill of the Hanna Paint Mfg. Company, Columbus, Ohio, on "How Can Dealers Encourage the Sale of Paint?" Mr. Gill gave some splendid advice on color combinations, the moving of slow sale goods, the dressing of the show window and how to advertise to get the best results.

Manufacturers and Jobbers in Attendance.

Manufacturers and jobbers represented at the convention were as follows:

E. C. ATKINS & CO., INC., Indianapolis, Ind.: Saws. Represented by J. O. Tate.
AMERICAN STEEL & WIRE COMPANY, New York: Wire Fence. Represented by S. N. Lippincott.
BARRETT MFG. COMPANY, New York: Represented by J. F. Ball.
BELKNAP HARDWARE & MFG. COMPANY, Louisville: Represented by J. B. Summers.
BILLINGS CHAPIN COMPANY, Cleveland, Ohio: Paints and Varnishes. Represented by William Hamilton and A. E. Youmans.
PHILIP CAREY MFG. COMPANY, Lockland, Ohio: Asbestos Roofing and Covering. Represented by Harry Clayton.
FAIRMONT WALL PLASTER COMPANY, Fairmont, W. Va.: Represented by Will T. Black.
GILLESPIE VARNISH COMPANY, Newark, N. J.: Represented by I. M. Hoffman.
HANNA PAINT MFG. COMPANY, Columbus, Ohio: Represented by N. Hoher.
HIBBARD, SPENCER, BARTLETT & CO., Chicago: Represented by Chas. Barkley and S. Farrow.
KELLY AXE MFG. COMPANY, Charleston, W. Va.: Represented by W. B. Lockett.
J. C. LINDSAY HARDWARE COMPANY, Pittsburgh: Represented by J. A. Drennan.
LOGAN-GREGG HARDWARE COMPANY, Pittsburgh: Represented by J. F. Leachman.
H. W. JOHNS-MANVILLE COMPANY, New York: Represented by E. F. Fuller.
MCINTOSH HARDWARE CORPORATION, Cleveland, Ohio: Represented by Homer E. Drane.
NATIONAL LEAD & OIL COMPANY, Pittsburgh: Represented by H. M. Brown.
NATIONAL CASH REGISTER COMPANY, Dayton, Ohio: Cash Registers. Represented by J. H. Sweeney.
T. H. NEVINS COMPANY, Pittsburgh: Represented by A. B. Cox.
PITTSBURGH PLATE GLASS COMPANY, Pittsburgh: Represented by G. Thomas Harper.
PITTSBURGH PAINT SUPPLY COMPANY, Pittsburgh: Represented by Wilbur C. Laughlin.
PETERS ARMS & SPORTING GOODS COMPANY, Cincinnati: Represented by Wm. M. Locke.
PITTSBURGH STEEL COMPANY, Pittsburgh: Wire Fences. Represented by R. C. Greph.
ROBESON CUTLERY COMPANY, Rochester, N. Y.: Represented by D. A. Jack.
ROCHESTER STAMPING COMPANY, Rochester, N. Y.: Represented by D. A. Jack.
VAN CAMP HARDWARE & IRON COMPANY, Indianapolis: Represented by E. C. Rector.
GEORGE WORTHINGTON COMPANY, Cleveland: Hardware. Represented by J. B. Knapp.

Convention Notes.

The West Virginia Association will send but one regular delegate to the national meeting in St. Louis this year. By vote it was determined that this honor should go to Secretary-Treasurer Leslie Hawker. Retiring President Kyle was elected to be the alternate.

Among the queries in the Question Box was one: "Would It Add to the Interest of the Meetings to Invite the Ladies?" The question was answered in the affirmative. It is accordingly expected that the fair sex will be represented at the next convention.

Considerable discussion resulted from a proposition to offer a first and second prize to the traveling man bringing in the most members during the coming year. The proposition was vetoed by the traveling men themselves, who protested sufficient loyalty to the organization to go out and work for memberships without hope of pecuniary reward.

Secretary Leslie Hawker has in preparation a booklet giving an account of the Elkins meeting, with other interesting data to members, which he will mail to all members and send out to prospective ones as well.

Charleston and Huntington competed for the honor of holding the 1909 convention. After several brilliant addresses made in their behalf had been made Charleston was selected.

MINNESOTA HARDWARE ASSOCIATION.

(*By Telegraph.*)

THE Minnesota Retail Hardware Association began its twelfth annual convention at St. Paul in the fine new Auditorium admirably adapted to such occasions, Tuesday afternoon, with an actual attendance of about 450, which it is believed will be largely augmented Wednesday and the remaining convention days. The weather is mild and clear. The total membership last year was 752 and the net actual increase of 52 makes the active membership to date 804. The Minnesota Association is thus the second largest retail State Hardware association in the country, Illinois taking first place.

The directors had a session in the morning and after disposing of some routine matters in the afternoon the first session began. The welcome to St. Paul was extended by Louis Betz, representing the mayor, who was out of the city. The response was made by A. T. Stebbins, former president of the association and now vice-president of the National Association. The various committees were announced by the president, Julius Schmidt, who then delivered his annual address. Among other matters touched upon by Mr. Schmidt were the mail order business, mutual fire insurance, Hardware exhibition and the waterways project to connect Duluth by canal with the head waters of the Mississippi.

Secretary Mathews, in his annual report, sketched the events of the year, and after reciting favorable conditions in membership and a summary of the finances, observed that there were only two grievances at present unsettled.

A telegram from R. R. Williams, Hardware editor of *The Iron Age*, was read, sending greetings and expressing regret at being unable to be present.

A recess of 10 minutes was then announced to permit the selection of nine members of the Nominating Committee, to be chosen according to Congressional districts.

M. L. Corey, secretary of the National Association, made an impromptu address on the parcel post question which bristled with suggestions of practical value.

An hour or more was then spent in discussion of queries brought up through the Question Box, which was nearly full. This part of the proceedings was in charge of A. T. Stebbins.

The meeting then adjourned until Wednesday, when the more important work will begin. Tuesday evening an entertainment was given in the Auditorium consisting of music by an orchestra of 32 ladies, with occasional vocal selections by a male quartette.

New York State Retail Hardware Association.

A VERY large and gratifying proportion of the members were present at the annual convention of the New York State Retail Hardware Association, at Buffalo, last week, and the meeting was a success in all respects. Much spirit and enthusiasm characterized the different sessions, and the deliberations and discussions were interesting and helpful. The organization has reason to congratulate itself on the appearance and ability of its personnel, commercially and socially, composed as it is of men who are abundantly qualified to represent the retail Hardware interests of the Empire State. The Hardware exhibition was a fine one and received much attention from the members, manufacturers expressing themselves as much pleased with the business results.

In our last issue reference was made to the proceedings of the opening session on Tuesday afternoon. At the Wednesday afternoon session the annual reports of Secretary John B. Foley and Treasurer F. E. Pelton



J. H. BRADISH



L. G. MATTISON.

were read. A. E. Towne, chairman of the Finance Committee, also rendered his report.

On Thursday S. R. Miles, president of the National Retail Hardware Association, made an able address, in which he referred to the present aspect of many trade questions calling for intelligent solution. The parcel post measure now before Congress was given a good deal of consideration, and, while the speaker believed that the passage of any such law was improbable this year, it was desirable that the opposition should be alive and energetic in antagonizing the proposition of a domestic parcel post.

R. R. Williams, Hardware editor of *The Iron Age*, addressed the convention on Thursday afternoon on various phases of the Hardware association movement.

A. E. Towne, chairman of the committee, submitted a number of resolutions which were unanimously adopted. They had reference to the amendment of the Penal Code of New York State in relation to the sale of Firearms and Ammunition, parcel post legislation, pure Paint laws, &c.

PRESIDENT MATTISON'S ADDRESS.

President Mattison, in his annual address, after some preliminary remarks, devoted himself to the subject of association, on which interesting theme he spoke as follows:

Two men may pass each other on the street almost every day for weeks or months or even years and not recognize or speak to each other. Each may have an instinctive dislike for the other. The dress or walk or some peculiarity of one may offend the sensibilities of the other.

If one should read in the morning paper that the other had got into financial difficulties he would not be surprised, for he would reason that there always seemed something strange about the other, and distrust would follow very naturally.

Some day they meet in an office of a mutual acquaintance. Through courtesy they are polite in their conversation, and they part, each feeling a little more agreeable toward the other. They meet again and warm up a little more toward each other. More meetings and confidences are exchanged, and soon a strong bond of friendship connects them. Now, should one of them read in the morning paper that the other was in financial difficulties, he would be very much surprised and be inclined to discredit the announcement.

The Influence of Association

has wrought this change. It has changed the hearts of two men from cold distrust to warm sympathy and confidence. The influence of such association is not likely to stop with the two men. It will be felt in their families and in the community in which they live, which means that the sum total of good has been increased in the city, State and nation.

The power of our association, which we term fraternalism, means more to our association than anything else. The Programme Committee might arrange for a splendid array of talent and do everything in its power for a highly interesting meeting. But if each one of our members felt that not one of the other members cared whether he came or not, and if he did not care whether he should see or visit with any of the other members, one of the hotel bedrooms would be large enough for our meeting.

Power of Love in Business Affairs.

At a banquet given our association in this city three years ago, our friend, R. R. Williams, said in substance that the motive that makes us labor and work on day after day is the love in our hearts for our homes and dear ones.

Back in the centuries there lived One who devoted His life to the uplifting of man. None ever looked into the needs of the human heart more keenly or studied more closely the forces necessary to the betterment of human existence, and near the end of His life He summed up His message in the teaching that the greatest power in this world is love.

I venture to say something to-day about this power as applied to business. Let the love in the hearts of every one present to-day be turned to hate, and in less than 30 min. we would probably be at each others' throats, no matter how keen our business instinct or how great our business experience.

This power should be prominent in all business transactions.

This country has highly developed its business acumen, analyzing business propositions and problems with marvelous shrewdness. But has man's love of fairness to his fellowman been developed to the same degree? These qualifications should go hand in hand, if we expect to avoid labor troubles and put commercial life on a solid foundation for the future.

Confidence Is a Quality of Love.

Confidence is only induced by a kindly and charitable feeling. Cold indifference produces only distrust. Not



J. B. FOLEY



only must we have more confidence in our fellow competitor, but we must make him know and feel that we trust him more fully. A man will be more honest in his dealing if he feels that his neighbor believes him honest. If he thinks that he is looked upon as a rascal, he will be likely to prove to his associates that their estimate is well founded.

When I was a lad at home I was sent to a neighboring village for a few weeks' stay. One day while there some of the women folk found me in the pantry and immediately accused me of stealing doughnuts.

That night after supper a council of war was held with the head of the family over my case. But he came down flat-footed, and held his position, which was that

he did not believe a word of it, because I was not that kind of a boy. That settled it.

I cannot extract the regulation moral out of this tale, for I did steal the doughnuts. But I have been ashamed to look a doughnut squarely in the eye since. Where once I was blind I now could see that I was not expected to be that kind of a boy.

It is among the possibilities that I might have been a horse thief long before this time if that man had not said that I was not that kind of a boy.

The old maxim, "Familiarity breeds contempt" probably came from a diseased mind, and should have no force among fair minded men. It should read, "Familiarity breeds increased respect and admiration."

As Hardware merchants we have a license to stand well in our communities. Jealousy of our competitors does not improve our standing, nor assist in elevating others.

Some of my ancestors of the past and also some of yours, were the so-called barbarians, and perhaps no more crafty and cruel people ever lived. One of my ancestors, after noticing that one of your ancestors was very thrifty in the accumulation of wealth, which consisted of goats and wives, clothed himself with his tiger-skin, took his war club and went in search of the envied one, and when found, he promptly knocked the head off his enemy and appropriated his goats and wives as his own. And our ancestral uncles, cousins and aunts rose up from behind their respective rocks and trees and applauded.

I See My Brother Hardwareman Down the Street,

by close application to business and good judgment, having a good trade and apparently making a little money. Green-eyed jealousy takes possession of me and I commence a system of cutting prices and of writing adver-



J. G. FERRES.



L. J. ERNST.

tisements full of insidious deceit; every chance that I get to say something to his disadvantage, I do so. If in time I can see his business gradually falling away or see a change in the dress or expression of countenance in him or his family, I say, "Just wait. I'll fetch him in time."

How much better am I than my Barbarian ancestor? How much has been done to advance the cause of true civilization? When the words "Give every man a square deal" were spoken, the man who uttered them was not down on all fours. Neither is the merchant who says, "I will deal fairly with my competitor." Both men are standing erect in the image of God, breathing the atmosphere of love and power from above.

It is perfect idiocy to think that to be good business men we have to root in the mud. We want power! Every one wants power! If we wish to have more power in our business, in our communities and among men, we can have it just to the degree that we reach out the hand of fellowship to our neighbor and with honesty in our hearts say, "My brother."

HARDWARE MUTUAL FIRE INSURANCE.

Following was the admirable address of W. P. Lewis, Huntingdon, Pa., on Hardware mutual fire insurance:

It gives me unfeigned pleasure to address this convention. It is announced that I am to represent the interests of the two Hardware mutual fire insurance companies, the National Hardware Mutual and the Pennsylvania Hardware Mutual, both with home offices at Huntingdon, Pa. This is primarily the object of my visit to Buffalo to-day. I shall shortly revert to this text and stick to it. But for a moment permit me to digress and suggest that we take a

Brief View of the Great Movement,

which increasing in power as the years pass, spreading and developing in almost every State in the Union, looking to the harmonizing of those interests which manufacture, assemble and distribute Hardware products and is broader than a consideration of the insurance feature only.

We have had opportunity to study questions from the point of view of the jobber, the traveling man and the retailer; you will note that I said "study," not "solve." This movement is now and always has been one of profound interest to me and it should hold a similar interest for every retailer in New York and elsewhere. You are a unit in the community, county, State and country in which you dwell. You are particularly a unit in the department of Hardware commerce. When severe and adverse conditions press too hard you may feel a sense of helplessness in defense. Singly your suggestions and requests pass quietly, yea speedily, to the realm of forgotten things, but when 10,000 Hardwaremen suggest some better way and request that the better way be considered, quickly a conference is called, and I have known of many better ways being adopted. Your name on the list counted.

Any Hardware Man Who Ignores His State Association,

who declines to do his part in this great movement to establish a reign of fair profits and fair competition, is certainly untrue to his own best interests and his association. This is an era of development. Possibly you have not realized the fact that the most powerful retail organization in the country to-day is the National Retail Hardware Association, of which you are a part. They have aroused the manufacturers to action, they have stirred the jobber to deep thought, they have demanded protection and a fair profit and they are getting it. They have made the movement educational, lessons in window dressing, methods of collecting and keeping accounts, of stock taking and stock keeping, of buying, selling, price marking, percentage of profits and salesmanship, all this is the heritage of a membership. They are also watching legislation in the interests of the retailer, they are publishing a trade paper of interest and force, and they have organized mutual fire insurance companies, which are operated on the sanest, soundest and safest mutual insurance principal that can be formulated. This statement is not accepted by certain members of this association. In scanning the policy records of our companies I find that out of a total of 331 of your revised list of members we have 117 names only who hold policies in one or both of our companies. This leaves 214 members who do not recognize the advantages of mutual fire insurance as promulgated in the by-laws of these two companies.

In Presenting the Claims of These Two Companies

for your confidence and patronage, we will likely say little that is new to most of you, and absolutely nothing that has not been discussed and considered time and time again, but always resulting in the final verdict that no better plan can be formulated for mutual fire insurance:

1. A class risk, Hardware stock only.
2. Hardwaremen, generally speaking, are fine moral hazards. (I refer here of course to the moral fire hazard only.)
3. Scattered risks.
4. Limited policies.

So much for the theory. What of the active outworking of the plan?

The Pennsylvania Company will be six years old in the fall of 1908, the National Company five years old at the same time. There has never been a time thus far when either company hesitated a moment in paying a loss. We are growing, and it is in the power of the retail Hardwaremen of the country to build up a mutual insurance company that will give better protection than any form of insurance in existence.

The Most Serious Thing That Can Be Said Against Us

is that we are young, but we are overcoming that objection rapidly. It may be that our method of operating is not plain to some members, and that they do not understand how, when we are mutual and paying back to the policy holders our profits, where are increase and strength, or what is the same, our surplus in cash comes from. We do not pay back all the profits. One-third of the profits is placed to the credit of the guarantee fund, two-thirds of the profits are paid back to the policy holders. This guarantee fund is invested and is interest bearing. Our operating expenses are nominal. It is no far cry for us to expect the income from our investments to pay all operating expenses. I will go further, it is possible that not only all operating expenses but a share of the losses can be met out of the income from our investments. Our operating expenses are not apt to increase greatly, and with large, broad, enthusiastic cooperation by all noninsurance members who are now doing nothing for us or for themselves, our income from investments would grow apace visibly. Let us take a look at the

Methods and Habits of the Stock Companies.

Let us note closely the basis on which so many members place their unquestioning confidence. Let us see to what extent their lines of action differ from ours, and also let us see in what degree they are superior.

First. The stock companies have a capital, that is true; usually, however, it is a comparatively small capital, but whether small or large, if 20 per cent. of that capital stock is encroached upon—that is to say, used for paying losses—the State of Pennsylvania would at once place them in the hands of a receiver. Not many of them are placed in receiver's hands, therefore not many of them encroach upon their capital stock for paying losses, and therefore the capital stock is not in the remotest degree the source from which they secure funds to liquidate losses or operating expenses; it does not operate at all as a bulwark of stability.

Second.—Where, then, do they get the money with which to meet losses and operating expenses? From the premiums they charge on risks, from that source and that source alone, except of course they have income from investments. They pay losses out of the premiums collected. That's what we do. They pay partly operating expenses out of income for investment. That's what we do. We have eliminated capital stock as a factor in paying losses and thus far we appear to operate along the same lines, but at this point there is a wide divergence. It is for you to judge in whose favor this divergence as an insurance principle leans.

(*a*). If you Hardware men insure in a stock company you are co-insured with millinery, drugs, groceries, jewelry, dry-goods, hats and caps, boots and shoes, clothing, furniture and carpets, confectionery, livery stables, feather foundries and powder works. All of these equally hazardous, and most of them far more hazardous than Hardware stocks. Your rate is figured from an average based on just such risks. You pay whatever rate the stock companies make it, and at the end of the year you get nothing.

(*b*). If you insure in the National and Pennsylvania Hardware Mutuals, you are co-insured with Hardware men only, with risks, rates, amount of policies all somewhat similar to your own. 'Tis a well balanced business proposition, and at the end of the year you receive 66 2-3 per cent. of whatever profit has been made, and these profits have been very consequential.

Relative Financial Strength.

At this point I am willing to rest the case on the question as to which method or principle of insurance is most favorable to the policy holder. So far we have dealt only with comparisons of methods employed by stock and Hardware mutual fire insurance companies. Nothing has yet been said concerning their relative financial strength, and as this point is the one on which the hoary headed prejudice of 100 years is based, we desire to discuss it. In handling a matter so important as this I do not want to talk loosely, for the statement I make here and now, and which we propose to prove from the records, is:

First.—That for every $1000 of insurance in force our Hardware mutuals have twice as much cash on hand as the stock companies.

Second.—That for every $1 of assets held by the stock companies they have $151 at risk, while for every $1 of assets in our companies we have less than $70 at risk. Or, to state it in another way, the assets of our Hardware mutual companies, in proportion to our insurance in force, are double the amount of assets held by the stock companies in proportion to their insurance in force. We will admit but one qualification to the foregoing statements; that is, that this is a record of all the stock fire insurance companies chartered in the State of Pennsylvania. Whether or no these ratios would be maintained in every State I leave to your judgment; we have not had time to get all the facts.

We wish it understood that the national and Pennsylvania companies are here for business. We want every Hardwareman in New York, through all the East, to have his name on our policy records. But these two companies will never feel that the object of their existence has been attained until the time shall come when it will be universally recognized that these companies are one of the most prominent, visible evidences of the constructive genius of the Hardware association. When it shall be recognized that the Hardware associations have been fully able to defend themselves against the autocratic attitude of stock companies, have been able to plan, organize companies, develop, maintain and place them on a basis that shall endure for all time, their permanence is at once a boon to future generations and a monument to the magnificent spirit of the Hardware associations.

Election of Officers.

The newly elected officers chosen to conduct the affairs of the association for the ensuing year are as follows:

PRESIDENT, John Holley Bradish, Batavia.
FIRST VICE-PRESIDENT, C. J. Elderfield, Niagara Falls.
SECOND VICE-PRESIDENT, Frederick M. Young, Gloversville.
SECRETARY, John B. Foley, Syracuse.
TREASURER, F. E. Pelton, Herkimer.
DIRECTORS: C. P. Sherwood, White Plains, Charles E. Wethey, Pt. Byron; W. D. Ganey, Auburn; A. F. Miller, Olean; T. W. Stevens, Oneonta; L. J. Ernst, Rochester; George W. Rockwell, Horseheads; W. J. Hoyt, Wellsville; Charles J. Fix, Buffalo; J. F. Williams, Baldwinsville; L. G. Mattison, Newark; J. G. Ferres, Johnstown; A. E. Towne, Saratoga Springs; A. R. Grant, Syracuse; Charles W. Young, Elmira.

A board of 15 directors was chosen, instead of nine as heretofore, with a view to better representing the different sections of the State.

The delegates chosen to attend the convention of the National Retail Hardware Association, at St. Louis, March 24, 25 and 26, are as follows: L. G. Mattison, retiring president; John B. Foley, secretary; John G. Ferres, director; Louis J. Ernst, director, and John Holley Bradish, the new president.

Question Box.

The morning session of Friday was devoted to a discussion of Question Box topics, on which there was an interesting running discussion, participated in quite generally by the members of whom there was a good attendance. The Question Box was in charge of John G. Ferres. Among the topics treated were the licensing of pedlers with references to the laws as passed by local boards. Various methods of exercising a proper supervision over them were described, in one instance a local official being given an honorarium of a few dollars a year to add this function to other regular duties, which in practice had proved satisfactory.

Another topic was that of handling small accounts. Some kept a special ledger, while others referred to the watchfulness necessary in these matters. In some instances small accounts were discouraging, and in larger ones for Stoves, Ranges, Plows, Implements, &c., it was found helpful to name a specific time for such payments and a few days before maturity to spur the debtor up with a reminder of the obligation, instead of allowing it to run indefinitely. Getting a large proportion of cash at time of purchase was urged so as to leave as little unpaid as possible.

The question of contributing to church fairs, hospitals, ball games, theatres, fire companies, associations, &c., developed a good deal of discussion. Most of the speakers were antagonistic to the practice, but it nevertheless found some able defenders.

Entertainment.

The banquet on Thursday night was given in the large assembly rooms of the Iroquois Hotel, both of which were necessary to accommodate the 254 persons, including a number of ladies, who were present. Across the end of one of the two connecting rooms was the speakers' and guest table, other long tables at right angles being occupied by the main body of guests.

Richard R. Williams, Hardware editor of *The Iron Age*, who acted as toastmaster, dwelt felicitously on the fitness and desirability of having the ladies present, and urged that in the future this feature of convention gatherings be observed by the members who were urged to bring their wives and daughters to the convention. The *menu* was an excellent one and well served, an orchestra and the Lyric Quartette rendering selections of instrumental and vocal music. The list of speakers included S. R. Miles, president of the National Retail Hardware Association; Hon. William H. Hotchkiss of Buffalo, who delivered a scholarly and witty address on "Bankruptcy," sketching mainly the ancient laws and culling from the past some literary gems concerning bankruptcy which were both instructive and amusing; E. J. Cornish, president of the Carter White Lead Company of Chicago, whose response to "Pure Paint Legislation" bristled with information and witticisms, and Councilman Alfred H.

Burt of Buffalo, whose remarks in reply to the toast "Profit and Cost" were much enjoyed.

The smoker given by the manufacturers and jobbers of Buffalo Wednesday night at the Ellicott Club was a most enjoyable occasion, the large assembly room being crowded to its utmost capacity. The company was steated at round tables in groups of six. A very fine vaudeville entertainment was presented, the performance beginning about 9 o'clock and lasting until after 1. A pamphlet containing the words of many popular songs was given each guest and at intervals the songs were sung in chorus. Refreshments were served during an intermission, which divided the function into two parts.

As the smoker was obviously confined to the men, a theater party was provided for the ladies, who were entertained at the leading Buffalo theater.

H. J. Fueller's Address.

H. J. Fueller, secretary of the Abram Cox Stove Company, made an interesting address on the subject of "Specialization in the Hardware Business." Attention was drawn to the importance of heating and ventilation on scientific principles rather than the rule o'thumb, making it plain that all merchants who wanted to know how to properly install Furnaces and accompanying systems of ventilation would be cheerfully supplied by manufacturers with adequate information. Mr. Fueller also discussed in a lucid and interesting manner the question of how to make the tin shop profitable.

CONVENTION NOTES.

E. J. Cornish of the Carter White Lead Company, Chicago, delivered a very interesting and elaborate address on paint legislation, which will be given a place in a later issue.

An interesting feature of the convention was a voting contest conducted by L. & I. T. White Company, Buffalo, who offered a prize for the most popular man at the convention. The genial secretary, John B. Foley, Syracuse, was selected, he having received about 240 votes. The gift was a leatherette case, about 40 in. square, with hinged cover, lined top and bottom with white broadcloth, on which rested in a circle a fine set of Carpenters' Chisels, in the center of which was a small family Cleaver.

Secretary Foley stated that in the two years which have elapsed since February, 1906, there had been an increase of 89 in the membership, and at present the total was 341, and that the honorary memberships, first authorized two years ago, aggregated 283.

The choice of a meeting place for the next annual gathering is in the hands of the Board of Directors. Rochester is bidding for the honor, and Albany is also being talked of. The desire seems to be to have the meeting place as centrally located as possible, so as best to serve the convenience of the greatest number.

THE HARDWARE EXHIBITION.

The exhibit of merchandise exhibited in the ample auditorium of the convention hall was exceptionally large and complete. Following is a list of the exhibitors:

ACME LEAD & COLOR WORKS, Detroit, Mich.
ADAMITE ABRASIVE COMPANY, North Tonawanda, N. Y.
ALLEN & POLLOCK, Buffalo, N. Y.
AMERICAN STEEL & WIRE COMPANY, New York City.
E. C. ATKINS & CO., Indianapolis, Ind.
ATLANTIC STAMPING COMPANY, Rochester, N. Y.
BARRETT MFG. COMPANY, New York.
HERMANN BOKER & CO., New York
BOSTON BELTING COMPANY, Boston, Mass.
BUFFALO CO-OPERATIVE STOVE COMPANY, Buffalo, N. Y.
BUFFALO FORGE COMPANY, Buffalo, N. Y.
BUFFALO WHOLESALE HARDWARE COMPANY, Buffalo, N. Y.
BUTLER & JOHNSON, Syracuse, N. Y.
CARBORUNDUM COMPANY, Niagara Falls, N. Y.
PHILLIP CAREY MFG. COMPANY, Lockland, Ohio.
CARTER WHITE LEAD COMPANY, Chicago, Ill.
COLDWELL LAWN MOWER COMPANY, Newburgh, N. Y.
COLONIAL WORKS, Syracuse, N. Y.
CO-OPERATIVE STOVE COMPANY, Rochester, N. Y.
CORBIN CABINET LOCK COMPANY, New York.
DETROIT WHITE LEAD WORKS, Buffalo, N. Y.
F. W. DEVOE & C. T. REYNOLDS COMPANY, New York.
FERDINAND DIECKMANN, Cincinnati, Ohio.
GUS DOLAN, Rochester, N. Y.
DOVER MFG. COMPANY, Canal Dover, Ohio.
DU PONT POWDER COMPANY, New York.
ESTATE OF P. D. BECKWITH, Dowagiac, Mich.

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LANDERS, FRARY & CLARK, New Britain, Conn.
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LAWRENCE BROS., Sterling, Ill.
LIBBY, HARLOW & CO., Boston, Mass.
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SARGENT & CO., New York.
WM. SCHLICHTEN COMPANY, New Haven, Conn.
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SILL STOVE WORKS, Rochester, N. Y.
SIMONDS MFG. COMPANY, Fitchburg, Mass.
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UNITED ROOFING & MFG. COMPANY, Philadelphia, Pa.
WEED & CO., Buffalo, N. Y.
J. & L. J. WHITE COMPANY, Buffalo, N. Y.
WHITE LILY WASHER COMPANY, Toledo, Ohio.
WILKINSON MFG. COMPANY, Binghamton, N. Y.
WINCHESTER REPEATING ARMS COMPANY, New Haven, Conn.
YALE & TOWNE MFG. COMPANY, New York.

DEATH OF THOMAS S. LAUGHLIN.

Thomas S. Laughlin, Portland, Maine, head of the Thomas Laughlin Company, manufacturer of marine hardware, died suddenly February 15, aged 65 years. He was the son of Thomas Laughlin and was born at St. Stephens, N. B. When he was a little boy his parents moved to Pembroke, Maine. Learning the shipsmith's trade he moved to Portland and started a small business of his own, and in 1860 his father joined him and the house of Thomas Laughlin & Co. was established. The business grew, and finally the present site was occupied, and the works have since been enlarged from time to time until they constitute one of the most important in the country for the manufacture of marine hardware. Upon the death of the father the business was incorporated as the Thomas Laughlin Company, with Thomas S. Laughlin as president. Mr. Laughlin was an unusual type of man in many ways. Successful as a business man, he was an earnest student of political economy and was known as an authority on the subject. He was deeply interested in the cause of prohibition, and was active in the movement which is one of the foundations of the present system of government of Maine. He was very active in philanthropic affairs, and was a director of the Associated Charities of Portland. His charities took many forms of usefulness. He was a director of the Portland Public Library, was prominent as a Mason and was an Odd Fellow. Though a member of no church, he was active in church work. His wife, whom he married early in life, survives him, together with a son, Walter J. Laughlin, and a daughter.

James R. Noss has recently completed a new building, 25 x 60 ft., with brick veneer finish, at Aliquippa, Pa., and it is now being stocked with a line of Hardware, Cutlery and House Furnishing Goods, to supply the demands of that growing town.

AMERICAN HARDWARE CORPORATION.

At the annual meetings of the constituent companies of the American Hardware Corporation, New Britain, Conn., held last week, a number of changes were made in the personnel of the various companies. Philip Corbin, who for over 50 years has been president of P. & F. Corbin, and has been president of the Corbin Cabinet Lock Company ever since its formation, has felt it incumbent upon himself to retire from these positions. He will, however, still retain his position as president of the American Hardware Corporation, which controls in every way the policy and destinies of all the subsidiary companies.

The following is a list of the officials of the different constituent companies:

P. & F. Corbin.

PRESIDENT, Charles H. Parsons.
FIRST VICE-PRESIDENT, Charles E. Wetmore.
SECOND VICE-PRESIDENT, Charles B. Parsons.
SECRETARY, A. N. Abbe.
TREASURER, Charles E. Wetmore.
ASSISTANT TREASURER, F. L. Prior.
DIRECTORS: Philip Corbin, Charles H. Parsons, Charles E. Wetmore, Charles Glover, Charles M. Jarvis, A. N. Abbe, C. B. Parsons.

Russell & Erwin Mfg. Company.

PRESIDENT, Howard S. Hart.
VICE-PRESIDENT, Benjamin A. Hawley.
TREASURER, Isaac D. Russell.
ASSISTANT TREASURER, John H. Van Newkirk.
SECRETARY, Theodore E. Smith.
DIRECTORS: Andrew J. Sloper, Frank L. Hungerford, Charles E. Mitchell, Howard S. Hart, Benjamin A. Hawley, Isaac D. Russell, Philip Corbin, Charles M. Jarvis, Joel H. Van Newkirk.

Corbin Screw Corporation.

PRESIDENT, Charles Glover.
VICE-PRESIDENT, Clarence A. Earl.
TREASURER, Theodore E. Smith.
SECRETARY, William J. Surre.
DIRECTORS: Philip Corbin, Charles M. Jarvis, Charles Glover, Howard S. Hart, Theodore E. Smith, Charles H. Parsons, B. A. Hawley, C. A. Earl, W. J. Surre.

Corbin Cabinet Lock Company.

PRESIDENT, C. H. Baldwin.
VICE-PRESIDENT W. H. Booth.
TREASURER, C. H. Baldwin.
SECRETARY, W. H. Booth.
ASSISTANT SECRETARY, J. H. Latham.
ASSISTANT TREASURER, C. A. Blair.
DIRECTORS: Philip Corbin, Charles M. Jarvis, Charles Glover, Darius Miller, W. H. Booth, C. H. Baldwin, D. O. Macquarrie of Chicago and George F. Taylor of New York.

Corbin Motor Vehicle Corporation.

PRESIDENT, H. S. Hart.
VICE-PRESIDENT AND TREASURER, Max S. Hart.
ASSISTANT TREASURER AND SECRETARY, B. B. Bassette.
DIRECTORS: Philip Corbin, Charles M. Jarvis, Howard S. Hart, Charles Glover, Paul P. Wilcox, Max S. Hart, Andrew J. Sloper, Robert C. Mitchell, B. B. Bassette.

Chas. H. Parsons, the new president of P. & F. Corbin, has been with the company since 1873. He has maintained a personal relationship with the large customers of the company, and is one of the best known of New Britain's manufacturers. Carlisle H. Baldwin, the new president of the Corbin Cabinet Lock Company, has been identified with the company since 1899, having previously for a number of years been with the Eagle Lock Company.

The next annual convention of the Southern Hardware Jobbers' Association will be held at Hot Springs, Ark., on June 9-12. C. E. Kersey, Richmond, Va., is secretary-treasurer of the association.

Wilson Hardware Company, Wilson, N. C., has been incorporated with a capital of $25,000, to conduct a retail business in general Hardware and allied lines.

C. H. Allen, Seneca, Mich., has sold his store and stock of Hardware and Implements to W. C. Hart, who will continue the business.

Iowa Retail Hardware Association.

ON the opening day of the tenth annual convention of the Iowa Retail Hardware Association the State was visited by a young blizzard, a fierce, blocking snowstorm that effectually impeded all forms of transportation for some hours. Many on their way to Cedar Rapids were so much delayed that they were unable to attend the opening session Tuesday afternoon, while others found it advisable not to leave home until the storm was over and traffic had returned to something like normal conditions. But any one who believes that the heaviest storm of a northern Iowa winter can check their enthusiasm or seriously reduce their attendance does not know the loyalty and energy of the Iowa Hardwaremen. On the second day there were close to 500 merchants registered, and over that number attended the Wednesday and Thursday sessions. Many representatives of manufacturers were also present in connec-



P. C. DE VOL.



J. F. DOTY.

tion with the Hardware show, and there were large delegations from the jobbing houses that work the State. All united in pronouncing Cedar Rapids

An Ideal Convention City,

affording a good hall for the meetings, splendid quarters for the Hardware exhibition and ample hotel accommodations of a high order. Unstinted praise and appreciation were expressed for the tireless and unselfish work of the local members, particularly George T. Gadd, J. M. Martinek and W. H. Stepanek, upon whom the arduous work of preparation devolved. No less important in contributing to the success of the convention were the enthusiasm and well directed efforts of the officers and directors of the association, all of whom were on the ground early and spared no pains which could contribute to the pleasure of the members and guests of the association and the success of every feature of the programme. In its president, P. C. De Vol, the association has a dignified, conscientious and clear thinking presiding officer, whose re-election at the closing session was a well merited recognition of his ability.

The Programme

was unusually long, occupying four days, but was wisely arranged with a view to variety, each day's time being divided between the exhibits, to which the mornings were given up; the formal meetings, which were held afternoons, and entertainment features in the evening. The exhibit hall was closed during the business sessions, which many of the manufacturing and jobbing representatives availed themselves of the opportunity to attend. All meetings were open except the executive session at which the Question Box was taken up. The latter was a feature of great interest, to which one whole afternoon was devoted. It was under the able direction of a committee, who made careful preparation in advance, and was presided over by L. C. Abbott, Marshalltown, who led the discussions with a personal magnetism, wit and clear headed business intelligence which contributed largely to their freedom and value.

Question Box.

Following is a list of the more important questions taken up:

1. Should retailers handle the goods of manufacturers selling catalogue houses, and how should they be influenced by the attitude of jobbers on this question?
2. Is it feasible for association members to conduct a co-operative buying organization?
3. How shall we induce religious and fraternal papers to discontinue running illegitimate advertisements of mail order concerns?
4. Would it be practicable to establish through the association a sort of clearing house for overstock, unsalable goods, &c.?
5. Is the present freight rate on Wire Fence a just one?
6. What is the experience of members with different lighting systems?
7. Ought the present law regarding outlawed accounts to be revised?
8. Is substitution, so called, dishonorable and to be classed with counterfeiting?
9. Is it wise to carry cheap articles which can be sold low enough to meet the catalogue house price?
10. What is the best way to collect slow accounts?

Association Clearing House.

On all these questions valuable and practical ideas were brought out, many members taking the floor to give suggestions and experiences. Perhaps the most novel and interesting proposal was the establishment of a sort of association clearing house, and this will undoubtedly be given a trial. All merchants are sometimes overstocked with certain lines which they could dispose of to other merchants in the State who need to buy at terms favorable to both. Similarly retailers often find themselves with a stock of articles unsalable in their locality, which a merchant in another place could readily dispose of. It is proposed that the association try to find means of bringing together buyers and sellers of such goods, and the idea seems to be a highly valuable and practicable method of increasing the advantages of association membership.

Address of S. R. Miles.

Iowa is especially proud of the fact that one of her sons is this year president of the National Retail Hardware Association—S. R. Miles, Mason City. Although called to other States by the duties of his office, Mr.



S. R. MILES.



A. R. SALE.

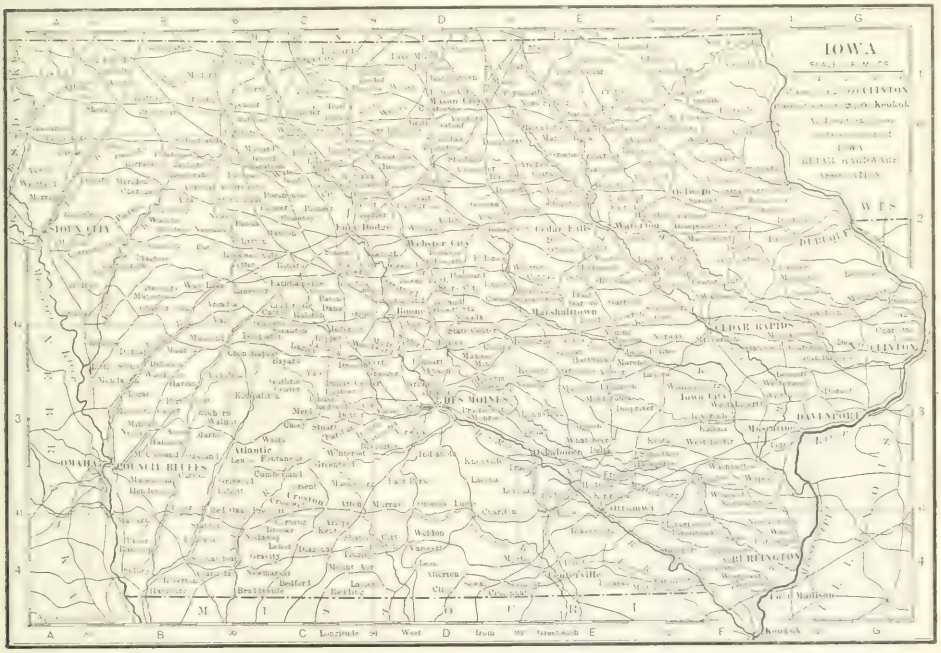
Miles was present at the opening session of his own State Association and made an able, though informal, address, touching on many matters of national importance. Mr. Miles is a man whom the Iowa Association delights to honor, and his presence and his address were greatly appreciated. After a few remarks of a personal nature in his usual happy vein, Mr. Miles referred to the Iowa Mutual Insurance Company, reviewing the history of its organization and its subsequent successful operation until last year, when it was influential in securing the passage of better mutual insurance laws by the State Legis-

lature. Then, touching on national questions, Mr. Miles said in part:

The National Association during the past few months, and I might say during the past two or three years, has been working along lines in which it has been able to interest not only the officers of the association, but I am glad to say all, or a very large part of, the membership of the association have responded splendidly when they have been called upon. During the past few months, particularly, we have had to do with the question of parcel post.

Hardwaremen's Opposition to Parcel Post.

It is gratifying in a way to every Hardware merchant to have word come to us from Washington, D. C., that the Hardware people are the only people in the country that are doing good work along this line. This is not true; there are a number of other splendid associations that have been doing splendid work along this line, but we seem to have been selected out as a special target by the Post Office Department for censure and criticism of the work we have been doing.



Hardware Association Map of Iowa.—The Towns Represented Contain One or More Members of the Association.

Unfairness of the General Press.

No one who has been a student of this kind at all can help but be impressed with the evident unfairness with which we have been treated by the press of the country, by the newspaper press, by the magazines and periodicals and by the farm papers. You have seen it in print repeatedly, no doubt. I have. I have been told the same thing, that we were opposing parcel post because we did not understand the subject—we didn't know what we were opposing. But if you have seen in any publication of any character, anywhere, at any time, an intelligent discussion of the parcel post, you have seen something that has not come to my notice. It would seem to me that if we are opposing this parcel post movement inaugurated by the Postmaster-General, and apparently with success, that there would be some attempt on the part of those various publications to conduct a campaign for education. But this does not seem to be their disposition. I don't know why. I say I *don't* know why. I rather think I *do*. I rather think *you* do. They tell us we are opposing it, as well, from selfish motives, motives that are entirely selfish.

Postmaster-General Answered No Arguments.

The Postmaster-General, in a letter to *The Iron Age* on the 13th inst., takes occasion to say that he has answered every criticism to the parcel post that was not based on entirely selfish basis. Not having answered any of the criticisms, we must take it that the Postmaster-General himself considers the opposition we have been putting up to be based entirely upon selfish grounds. Well, I don't know but I am willing to stand for that charge. I am willing to be accused of being selfish. I think that anything that affects my business—my own personal business—any legislation that will in any way affect my business, will affect likewise the business of every retail merchant of the country. So that I believe in opposing any measure, from what you may term, if you will, an entirely selfish motive, if I can at the same time be working in the interest of the people that are engaged in the same class of business that I am engaged in, with that thought in mind I am entirely willing that the Postmaster-General or any one else call me selfish in my opposition to parcel post.

They tell us we are selfish. I believe that that charge can be reasonably made against the press of the country. They are paying for the carrying of their publications through the mails 1 cent a pound. Figures in the Post Office Department will show it is costing 8 cents. In other words, they are receiving 7 cents a pound on every pound of their matter that goes through the mails. It is very possible that they have no right to say that is a selfish reason for favoring a parcel post.

Interest of the Farm Journals.

The farm journals of the country are another class of publications that have been accusing the retail merchants of the country of opposing the parcel post for selfish motives. You take the average farm publication of the country and if your eyesight is good, making it possible for you to read the print that you will find in all the farm journals, I think you will find a very good reason for their favoring a parcel post. Take their advertising columns all the way through, and the advertising is made up of more than 90 per cent. from people who are doing a mail order business, and it is little wonder that the publications of that class are favoring the parcel post.

Campaign of Education.

We do not believe it is fair to the people of this country to enact a parcel post law until the people have been given an opportunity to study. Now we want you to hold on in this movement and wait a while until we have been given an opportunity to put all of the facts in relation to a parcel post before the entire people of the country. There is not any question but what if there are more good reasons why this country should have a domestic parcel post than there are reasons why we should not have it we are going to have it. It does not

make any difference how much opposition is made to the project from any source any time. But I do not believe a careful and close study of the situation will convince the average citizen that there is a demand for a parcel post in this country.

Relations with Manufacturers and Jobbers.

The general work of the National Retail Hardware Association has been progressing along lines somewhat similar to those that have been pursued during the past several years. We succeeded last year for the first time in being recognized by the American Hardware Manufacturers' Association in their convention. We were asked to appear upon their programme. We did so. We take it that this has been brought about—this recognition by the manufacturers and this recognition by the jobbers of the country— has been brought about by methods of work which could not be questioned in any way, by methods that have tended to build up the business of the members of the National Retail Hardware Association, but not tear down the business of our competitors. It has taken us a long time to convince the jobber and manufacturer that we were sincere in our efforts along this line, but we finally succeeded in doing so, and it is said everywhere by people who are judges that nothing of the kind in trade organization has ever been witnessed in this country as the situation now between the retailer, the jobber and the manufacturing Hardware interests of the entire country. We are working in harmony; we are getting splendid results.

Building Up, Not Tearing Down.

These results have been along the line of building up, as I said before, our individual business, and not tearing down the business of the competitors. I do not believe it can be said at this time by the local press—I do not know whether they have any representatives here or not; but too often in large, flaring headlines has it been said that the principal work and discussion of the association was to devise ways and means of breaking down the catalogue houses of the country. That is not true. The



From Left to Right—C. L. Burch, W. J. Konvalinka, Sam T. White and P. C. De Vol.

THE HEAVY HARDWARE QUARTETTE.

retail associations and the National Retail Hardware Association have not worked with that thought in view at all, but only with the idea in mind of building up their own business, and these new methods that have sprung up in recent years, if they should spring up by the wayside, it is simply a matter of evolution in business, and cannot be charged to tearing down or breaking down any competition, with that sole view in mind.

Your association here has been builded from nothing to more than 800 members at the present time, not along selfish lines, not along lines of opposition to your competitors, but with the sole thought in view of building up by every means possible.

President De Vol's Address.

The annual address of President De Vol was an interesting and able presentation of the matters to which it related. We give the following extracts from it:

We have much to pride ourselves on and to be thankful for in the work that has been done in the last 10 years. It has made great progress along the line of advancement, not only to the association as an organization, but to every member that constitutes its membership. We are to-day better merchants in every sense of the word than we were 10 years ago. We have learned the lesson well that our competitor has just as good a right to live and prosper as we have, and instead of trying to do all we can to outdo him by the cutting of profits, we have also learned the fact that we might profit by getting a little of his experience in a business way; and this is one of the great reasons you are here to-day, and I hope when you have stayed with us and listened to the discussions and talks to be given at this convention that you will go home with a much clearer idea of how you can better your business in some way that you may show a better profit at the end of the year 1908.

Retail Hardware Organization a Power.

Reviewing the work of the past year, I would like to mention the fact that it was one of the most active years that we have had in association work, and the retail Hardware merchants are to-day the best organized and most powerful of any of the trade organizations. We have accomplished more and done more good for the retail trade of the country than any other class of men have accomplished, and why is this? Because we have conducted our association affairs in a careful and conservative manner, doing all things in a businesslike way, using our best judgment and making very few mistakes, and the consequences are that we have been growing in strength until to-day we are looked to and considered the leaders in all matters of legislation that are for the interest of the retail trade of the country.

I had the pleasure of attending a conference on trusts and combines in Chicago in October last, and the results of that meeting will be shown in the resolutions and recommendations that have been brought before this session of Congress, which, it carried out, will eliminate most of the evils that have caused the unjust attacks on legitimate corporations and labor. They will curb the power of illegitimate capital and labor organizations; and the time is not far away when the business interests of this country will not be hampered in their progress and foreign and local capitalists will not be so skeptical about making investments in this country as they have been during the past year. Our growth and prosperity will continue on safe and business like laws instead of the uncertain laws that we have had to contend against and which tended to encourage a feeling of unrest that has encircled the American people in the past few years.

Confidence in the Future.

While the financial trouble was felt by a great many of us during the month of November, conditions improved wonderfully in the month of December, and we feel to-day that we are on a better footing and a sounder foundation than we were a year ago, and there is no doubt in my mind that 1908 will be the best year that we have had in the last five or six years. We might compare these experiences we have just gone through with the shaking of a large apple tree to remove the rotten apples, leaving the tree with nothing but good, sound apples on its limbs. We will be better off for the experience, and business will be conducted in the future with more care and by more conservative methods than it has been in the past year.

Merchants Should Take Interest in Politics.

I would like to suggest right here that it will be to our advantage as retail merchants of the country to go into politics more than we have in the past. If we will interest ourselves in this direction we can do more good for the retail trade of the country than by any other method. Make yourselves known and use your influence in political matters, and when the time comes when you want legislation in some matter that will be of interest to the retail trade of the country you will be in line to act and get what we want and need to better our conditions. The work will be much easier than if you show an indifference toward politics and do not take the interest you should in them. Do not get the habit of interesting yourself so closely in your business that you do not know what the rest of the world is doing. It will do you good to get out of your own business life occasionally and see what is going on outside of the store.

Insurance Feature Attracts Members.

The insurance feature of our association has been of the greatest assistance to us in obtaining new members and retaining those that we have. We are doing a large insurance business among the retail trade, and it is very gratifying to the retail merchant when at the end of the year he receives through the mail a rebate check of 40 per cent. for the insurance he carried in the Iowa Retail Mutual Insurance Association, which more than pays his membership in the Retail Hardware Association and leaves him a balance on the right side of the ledger.

This insurance feature is a business proposition that should have your most careful attention. It is good, conservative, reasonable insurance at a very low rate, which will more than pay you for the trouble of joining the association, and if any of you have a dealer in your city that is not a member of this association, you would confer a great favor on the officers of the insurance asso-

ciation if you will recommend to this dealer the advantage you have experienced by carrying our insurance.

Mr. DeVol also sketched the organization and progress of the association during the 10 years of its existance, expressed appreciation of the splendid showing made by the Hardware exhibitors, referred to the movement in opposition to the establishment of a parcel post by the Government and the work of the national association in this regard, and also commended the efficient work of Secretary Sale and the directors and members of the Executive Committee during the past year.

Secretary's Report.

The report of the association's indefatigable secretary, A. R. Sale, Mason City, was a very interesting and comprehensive document, touching on current matters, which command the attention and require the efforts of the organization, as well as recounting the labors and results of the year. The report showed that the association had a total enrollment to February 15 of 747. One hundred and eighty-seven new members were added during the year, but 65 went out of business, leaving a net gain in membership of 122.

N. A. Gladding on Salesmanship.

N. A. Gladding, E. C. Atkins & Co., Indianapolis, was present as the guest of the association, having consented to speak on "Salesmanship," a subject which from his own wide experience and from his well recognized ability as a leader of salesmen, he is well qualified to discuss. Mr. Gladding's address was characteristically pointed and witty, and also commanded attention for its keen insight into character and thorough, practical knowledge of the subject. In the course of his remarks, he said:

Of late years an unusual amount of interest has been manifested in the study of the art of salesmanship, so much so that quite a number of magazines and pamphlets are now being regularly published which are devoted to this subject. These journals are full of "ginger talks" and "pepper talks," and all other kinds of talk, many of which are well seasoned with the salt of common sense and the spice of interest; in fact, there has been so much said and written on this question that it doesn't seem possible that anything more could be thought of. I believe that all these talks and magazine articles should be productive of an untold amount of good, even to the old war horses on the road and in the store, as well as to the new and budding "knight of the grip," or the ambitious young clerk behind the counter, provided they are able to use sufficient discernment to apply the good things that are brought out in such lessons to themselves. Then again, we have those who consider salesmanship such an exact science that they have established schools for the teaching of the psychological, moral and physical sides of the question, upon the theory, I suppose, that this science can be inculcated into the minds of would-be salesmen in such a way as to guarantee them success.

I am not here to decry any of these agencies, because I believe there is much good to be gathered therefrom by any man who takes advantage of them, and who, as I said before, can apply the teachings to his own case.

You know, it is a good deal like the man who sits in church on Sunday and hears the minister get after all the church members who are not "toeing the mark" in one way or another. He thinks what the preacher says is all right, and he can point out to you without any trouble the other fellow to whom it applies.

But I believe in education. It is a good thing for any one in any calling—the more of it the better if it is well considered and along the right lines.

The Vital Spark.

This is an age of specializing, and the calling of the salesman has grown to be almost if not a profession, consequently, a thorough study of the fine points of salesmanship can do no harm, even to the oldest man or to the one who thinks he knows the most about it. But, while these things are true, yet to be perfectly frank with you, in my humble opinion, with all the theoretical education on the subject of selling goods that a man may secure, if he has not the "vital spark"—that something indefinable which is born within—then I do not believe that he will ever become what can be called a real salesman of the first quality.

A man may go through college and take a special course at a divinity school, so that he understands all the dogmas and tenets of theology, and yet he may be the very poorest stick of a preacher, and could never convert a lost sheep. Another may take the most thorough course in medicine that it is possible for a man to secure, and yet when it comes to putting his knowledge into practice as a physician be a flat failure. Again, some men may study law and know all of Blackstone and many law books by heart and yet not be able to win a case. It is easy to discern the difference between the person who simply plays the piano or the violin or any other instrument and the real artist whose touch is a revelation, and can make you hear the birds singing and the rain pattering on the roof or the thunder roll. Some people—most of us, I imagine—might take lessons in painting from the best masters for years and years and then never be able to paint a picture worth looking at. Who will say, therefore, that the true artist or the true genius is not born with what we call the "vital spark" within him? I believe it is the same with salesmanship as with all other professions, the theoretical education will not hurt, but it will help the natural born salesman.

Theory is all right in its place, but, after all, the best method of education in selling goods is experience, or, in other words, the theory without the experience will not accomplish anything in this line of work. It is behind the counter and on the road where we rub up against human nature and can study it to advantage.

You have two men in your store, both equally intelligent and with the same opportunities of learning your business; both equally in earnest, and yet one of them can outsell the other many times over.

Two Drummers Will Call on You

to sell their wares; from one of them you like to purchase, the other not. Why is this? In my opinion it is because the successful clerk or salesman has that something within him that attracts and magnetizes the customer. He "gets next" to people without himself just knowing how he does it. It comes natural, that's all. He is the man who can get rid of any old stock at a fair price. You don't have to put him at the bargain counter. Bargain counters don't need salesmen; anybody can wrap up goods when they sell themselves, and the customer picks out what he wants without assistance. I would not attempt in such a short talk to give all the attributes that I think that a salesman should have.

A Few Necessary Qualifications.

From a business experience covering 31 years of active work in trying to learn how to sell goods myself, and during which time I have watched the careers of many a successful salesman, I have never seen two of them that approached a customer in exactly the same way. I will, however, mention a few qualities that I think a man should possess to be successful. In the first place, to quote Paul, "He should know how to be all things to all men." He should have a love for his work. A man who shirks or who is careless or indifferent cannot expect to amount to much. Earnestness and enthusiasm are very essential.

He should have confidence in, coupled with a high regard for, his employers; fully acquainted and in sympathy will all of their policies. A man is doing himself and his firm an injustice if he remains in their employ when he is continually criticising their methods or when he does not agree with their policy. I do not mean by this that he should not make suggestions. The employer or sales manager should always welcome and invite suggestions and in that way help to develop the best, &c.

He should make a special study of all the goods he is trying to sell, thereby having a theoretical if not a practical knowledge of the purposes for which they are made.

He should learn thoroughly all of the important talking points as to the quality of the article presented, and then be able to properly impart such information in a convincing manner to the customer.

Courage is a very important qualification in a salesman. The courage born of confidence in the merits of his goods and of his house, and which can give him "backbone" to stand up for the proper price against the shrewdness of the buyer. He should also try to know the comparative specifications and qualities of his goods with those of his competitors, so as not to be caught up on any of these points.

To the above should be added the three P's—namely, patience, persistence and perspicacity. These three virtues, together with tact and discretion, are among the most prominent that are inborn in the successful salesman.

Another quality that it would not do to overlook is geniality. I do not remember ever seeing or hearing of a man who was cross or crabbed, grouchy or sour, who ever made a success in selling goods. The man who is "sore" at himself or his house better go to laying bricks or something else besides trying to sell goods.

Address of W. S. Wright.

The association was fortunate in having as its guest during one day of the convention W. S. Wright, Omaha, president of the National Hardware Association. Mr. Wright

is very popular in Iowa, and was warmly received. In a short and characteristic address, happily combining humor and serious thought, Mr. Wright said, in part:

I want to extend to you as a body the greeting of the National Hardware Association. The National Hardware Association is always interested in the development of retail associations. We are working in very close harmony with them all, particularly through the catalogue house committee.

Loyalty to the Association.

I think you will appreciate the fact that your officers have put in a large amount of work, and that it is not only your privilege, but your duty, to be loyal to them and to assist them in every means possible by you to build up the most perfect organization to bring the largest results it is possible to accomplish. You cannot get those results without the active co-operation of every member, and when you do that you want in addition to see that every Hardware dealer is a member of that organization. If you have a competitor, I don't know how you can do him more good, and indirectly do yourciation.

Right on that proposition I was talking with a man not long ago about the business in his town and how much money he made. "Well," he says, "I didn't do as much as I did last year, but the trouble is I have a competitor, and I don't think he is worth $500 more now than he was last year, and it makes it pretty hard to build up a business and make money under those circumstances," and he says: "How would you suggest that I get him in line?" I says, "I don't know any other way to do than have him join the association."

Helping Others We Help Ourselves.

If you get hold of him in that way, you certainly will get results, but that is the best way we can get results, as when we are working for the benefit of others, we are developing our own prosperity just to the same extent that we are benefiting the other fellow. You cannot help the other fellow without you help yourself, and if you take hold with the idea of helping the other fellow, you really will be surprised at the results you will get for yourself.

Good Ideas on the Parcel Post Question.

I want to make a few suggestions in regard to this Parcel Post proposition. I know that Mr. Burrows has thoroughly covered the matter. It should not be made a narrow proposition or you should not stand on the proposition that it will injure your business. If we take the proposition that it will injure our business, that is not a good proposition at all because that is a strong argument on the other side; but if we can take the point that it will be an injury to the entire country, I believe we will stand stronger than if we make it an individual proposition. I think that if the Parcel Post proposition is a good proposition for everybody except the Hardware dealer, that it is a good proposition for the country, because the retail dealer, comparatively speaking, is a small proposition compared with the entire community, and if it is going to benefit the entire community and only injure the retailer and jobber—but we don't think that.

We oppose it because we think it is a bad thing for the country. I have an idea that ultimately some great proposition will develop by which we may take up the idea and make it a proposition on which the retailer, jobber, farmer, manufacturer and all classes can stand alike, and you don't want to oppose the Parcel Post because the farmer favors it, because that will create a friction between you and your customer But if some plan can be devised by which on that proposition we can enlist the support not only of the retailer, the jobber and the manufacturer, but the farmer alike, then I think the results will be very beneficial to us and we can work it out on lines that will give results.

How to Conduct a Country Hardwaro Store

was the subject of an interesting and practical paper by G. A. Bieber, Ft. Atkinson. Mr. Bieber said that writing papers was not in his line, but that he had responded to the committee's request to introduce the subject in order to draw out ideas from the other members present. In this he was successful, and considerable valuable discussion was evoked, especially in regard to the importance and efficacy of persistency in following up over due accounts. Portions of Mr. Bieber's address are given below:

We began 18 years ago to try the experiment of running a Hardware store, and are still at work, trying to improve our system, for it does not suit us in all particulars yet. However, we have managed to exist and have our share of the things that seem worth while from our standpoint.

In carrying on our work, we aim to clean up our stock and begin our annual invoice on January 2 each year. The winter months are busy with shop work, preparing for the summer months. We make a constant study of our customers' wants for the future, and then when we have discovered them, keep right after them until they have been supplied.

We Study the Markets Closely,

and all the various methods of buying goods, giving especial attention to combination buying of heavy goods in carload lots, getting best freights and lowest discounts in this way.

We Pay Cash for All Purchases,

for we find it cheaper to borrow money of the bank and take our cash discounts than to pay the long price for time. The man with the cash always finds the bottom market price.

One Side Line That We Find Makes Good Money

for the country Hardware man is scrap-iron, rags and metals. This feature of our business gives handsome returns for the money invested. We find in selling the general stock, it is a good plan to make

A Special Drive on Some Particular Thing

and keep everlastingly at it on our leader. We boost Stoves from August 15 to Dec. 1. Every month and season has its goods for these special efforts.

Fraternizing with the Farmers.

We find it pays to go out among our farmer friends and have a quiet friendly chat with them, especially when you find he needs something that runs into money. We don't try to push a sale then, but talk matters over about the crops, his farm and live stock. When he will soon thaw out and broach the subject himself. This gives us our opportunity to present our views on what he wants. We tell him then, "When you get ready to buy, come in and see us." This course hardly ever fails to bring him to your place for his goods. He reasons that the other fellows don't care enough about his trade to call on him about it.

In Handling Our Credits.

which are a necessary part of a country Hardware store, we send out statements about January 15, and ask for settlement by cash or note. This meets with a quick response, and everything is closed up for a new start.

These people who are always talking about a cash business do not know much about country trade. It is not necessary to lose many accounts. We have not charged off $300 in 18 years of business. This you will see is a very small percentage, when you consider that every January finds $3000 to $5000 outstanding.

We usually cut that amount down to $600 or $800 by March 1, and we close them all up by October 1.

Parcel Post.

This very live question received its full share of attention at the hands of the convention, being treated with some fullness by the president and secretary in their annual addresses, as well as by President Miles of the National Association, whose remarks are quoted elsewhere. The main address on the subject was presented by C. W. Burrows, Cleveland, Ohio, whose position on this question, founded on an exhaustive knowledge of the facts and statistics is well known. Mr. Burrows' splendid address was listened to with the closest attention and was received with great appreciation. The subject was also touched upon by President Wright of the National Hardware Association, whose intelligent and far sighted views are reported in another column. The association adopted the following resolutions:

Resolved, That we unanimously oppose any legislation favorable to an extension of the parcel post law, as recommended by the Postmaster General as it would be an enormous expense to our Government and is entirely unfavorable to the commercial interests of our country.

Resolved, That we are favorable to a postal law reducing the present rates on first-class mail matter to 1 cent per ounce, and would recommend that such a law be passed by Congress and at as early a date as possible.

Heating and Ventilation.

H. J. Fueller of the Abram Cox Stove Company, Philadelphia, was present by invitation and gave an interesting address on the subject of "Heating and Ventilation." After touching on various practical aspects of the subject from the merchant's point of view, Mr. Fueller went on to discuss the importance of the proper ventilation of homes. He declared himself a partisan of the warm air method of heating on the ground that it was the most sanitary, healthful and strictly in accordance with natural and hygienic laws. He argued that laws should be enacted providing for inspection of the ventilation in

buildings and homes, and said that in his opinion a proper regard for these matters would bring about a decided lessening of ill health and particularly of tubercular disease. Hardwaremen, he asserted, have a great opportunity to follow up this line of work with profit to themselves and benefit to the community.

Business Methods in a Hardware Store.

A very interesting and suggestive paper was read by W. H. Stepanek, Cedar Rapids, under the title of "Business Methods in a Hardware Store." Mr. Stepanek has devised a system which he refers to as very complete and satisfactory, and which has been thoroughly tested during a period of 10 years in his own establishment, and announced his intention of issuing it in book form for the benefit of his brother merchants.

Convention Committees.

The following committees were announced by President De Vol:

RESOLUTIONS: F. R. Currie, Mason City; C. F. Schmidt, Marshalltown; W. F. Baumgardner, Dubuque; L. H. Kurtz, Des Moines.
NOMINATIONS: L. C. Abbott, Marshalltown; H. S. Vincent, Fort Dodge; L. H. Kurtz, Des Moines; C. S. Barger, Albion; C. R. Keating, Mount Ayr.
AUDITING: L. Lindenberg, Dubuque; C. E. Haas, Le Mars; L. R. Bailey, Mason City.
EXHIBITS: J. F. Doty, West Liberty; C. E. Haas, Le Mars; Geo. T. Gadd, Cedar Rapids.
QUESTION BOX: L. C. Abbott, Marshalltown; F. R. Currie, Mason City; F. P. Marvin, Grinnell.
PRESS: L. Lindenberg, Dubuque; E. C. Barbour, Fort Madison; A. R. Sale, Mason City.

The genial and popular J. M. Martinek, who acted as sergeant-at-arms, was always at work, and made himself personally responsible for everybody's comfort.

The Business Man in Politics

was the subject of an able address by F. F. Jones, Villisca, a member of the association and a State Senator. This is a subject which has received increasing attention from wise merchants in recent years and in the Hardware trade it is apparent that retailers are taking a much greater interest in their local politics as they realize the importance of having a positive influence which they can exert for or against legislation that affects their interests. Mr. Jones brought out with clearness and force many weighty considerations in connection with his subject, and was listened to with close attention.

Mutual Insurance Association.

The annual meeting of the Iowa Hardware Mutual Insurance Association was held Wednesday afternoon, before the regular convention session. In the absence of President Miles, the meeting was presided over by Vice-President L. Lindenberg, Dubuque. The annual report of the secretary-treasurer was read by Mr. Sale, who told of the important work which had been done during the year, particularly as regards legislative protection to the insured, and declared that practically all the mutual bodies in the State were now operating on the lines of the Hardware body. He also gave figures showing the splendid volume of business which the association is doing, both in the State and outside of it and the particularly encouraging growth in new business written since the first of the year. C. S. Barger, Albion; L. H. Kurtz, Des Moines, and C. E. Haas, Le Mars, were elected to fill vacancies in the Insurance Association Board, from the sixth, seventh and eleventh districts, respectively.

Officers for 1908.

Following is a complete list of the association officers for the ensuing year:

PRESIDENT, P. C. De Vol, Council Bluffs.
VICE-PRESIDENT, J. F. Doty, West Liberty.
SECRETARY-TREASURER, A. R. Sale, Mason City.
EXECUTIVE COMMITTEE: P. C. De Vol, Council Bluffs; L. C. Abbott, Marshalltown; H. S. Vincent, Fort Dodge.
DIRECTORS:
District No. 1, A. C. Barbour, Ft. Madison.
District No. 2, J. F. Doty, West Liberty.
District No. 3, Thos. Larson, Eldora.
District No. 4, J. J. Sobelik, Cresco.
District No. 5, L. C. Abbott, Marshalltown.
District No. 6, Geo. Haw, Jr., Ottumwa.
District No. 7, C. T. Gadd, Des Moines.
District No. 8, F. P. Bolinger, Afton.
District No. 9, P. C. De Vol, Council Bluffs.
District No. 10, H. S. Vincent, Ft. Dodge.
District No. 11, C. E. Haas, Le Mars.

Entertainment.

The special entertainment feature of the convention was a theatre party arranged for Wednesday evening and tendered by the Cedar Rapids Hardware merchants. The regular vaudeville programme was supplemented by several specialties introduced for the occasion which were received with storms of applause by the guests, who entirely filled the house. The principal feature of the evening and that which met with the most enthusiastic reception was the work of the *heavy* Hardware quartette, composed of P. C. De Vol, Sam T. White, W. J. Konvalinka and C. L. Burch, the combined weight of the aggregation being exactly 1010 lb. If the music rendered was not as heavy as the quartette, it was entirely satisfactory to the auditors and was received with cheers.

Convention Notes.

Besides hearing the heavy Hardware quartette, referred to above, the convention was favored at its daily sessions with a couple of selections by an excellent male quartette, which gave much pleasure.

Sincere regret was felt that A. T. Stebbins of Minnesota vice-president of the National Retail Hardware Association, was unable to make connections so as to be present and address the convention, as he was scheduled to do.

An interesting and suggestive address was delivered by R. E. Saberson of the Berkeley System Company, Sioux City, Iowa, on the subject of advertising. Mr. Saberson represents a house which is preparing advertising matter for retail merchants, with the special object of meeting catalogue house competition. The service is endorsed by many who have tried it.

H. S. Vincent, Ft. Dodge, ex-president of the association and one of its most popular and active members, read an entertaining report of the National Retail Hardware convention held in Boston last June. The Iowa Association is justly proud of the prominence of its delegation to that convention.

At the closing session of the convention it was arranged to hold a traveling men's hour, at which salesmen were especially invited to be present and participate in discussing matters of mutual interest. Unfortunately, owing to the fact that this was one of the last items on the programme, few stayed to attend it, a fact which was regretted by the members. It was arranged to give this feature a more prominent position next year and appoint a committee from the traveling men to assist in preparing for it.

Many availed themselves of the invitation of the Iowa Radiator Company and the Iowa Windmill & Pump Company to visit their factories in Cedar Rapids.

At the Thursday session of the convention, following the address of Mr. Gladding, H. B. Gordon, Norvell-Shapleigh Hardware Company, St. Louis, was introduced and gave the members an interesting informal talk on the organization of a jobbing house and methods of carrying on a jobbing business. Mr. Gordon made some valuable suggestions to the retailers relative to their correspondence with wholesalers which, if followed, would prove convenient and time saving for both. The Norvell-Shapleigh Hardware Company occupied a booth at the exhibit, where, in addition to Mr. Gordon, C. O. Janssen, G. T. Bourne, Z. L. Brewer and F. L. Hormel were on hand to meet their customers.

Among the many representatives of jobbing houses present the following were noted: Trout Hardware Company, Chicago, represented by G. W. Trout and F. E. Gardner; Drake Hardware Company, Burlington, Iowa, represented by S. H. Jones, G. A. Ray, N. G. Ballyntine and D. R. Ziegler; Brown-Hurley Hardware Company, Des Moines, represented by W. S. Brown, J. E. Shearer and B. G. McCarn; Cutler Hardware Company, Waterloo, Iowa, and Haw & Simmons, Ottumwa, Iowa.

The United States Stamping Company, Moundsville, W. Va., represented by J. W. Sleight, had an exhibit of Blue and White Enamelware in a room at the Montrose.

The Simmons Hardware Company, St. Louis, occupied a suite at the Montrose Hotel, where F. J. Wachter, H. B. Christy, H. M. White and George Parmenter, the company's representatives, received many friends and displayed a handsome line of samples.

Several manufacturers were represented in Cedar Rapids who secured no space in the Hardware Show. Among these may be mentioned F. E. Myers & Bro.,

Ashland, Ohio; Parry Mfg. Company, Indianapolis, Ind.; Warren Paint Company; Peabody Buggy Company, Fostoria, Ohio; Lowe Bros. Company, Dayton, Ohio; American Wringer Company, New York; Marshalltown Trowel Company, Marshalltown, and Klauer Mfg. Company, Des Moines, Iowa.

The Hardware Show.

The Hardware Show was an emphatic success, being splendidly managed and completely filling the large auditorium secured for its accommodation. The exhibits were numerous, handsome and varied, and attended by able representatives. After the first day the hall was thronged, both morning and evening, but was wisely closed afternoons, to avoid interfering with convention sessions. Following is a complete list of the exhibits and the representatives in charge.

E. C. ATKINS & CO., Indianapolis, Ind.: Saws and Saw Tools, Trowels, Files, &c. Represented by A. A. Teel, T. F. Barbour, P. L. Edwin and S. M. Perrigo.

AMERICAN STEEL & WIRE COMPANY, Chicago: American and Elwood Fence. Represented by R. A. Beak, T. H. Fuller, E. M. Ryan and L. P. Rider.

AUER REGISTER COMPANY, Cleveland, Ohio: Auer Side Wall and Modern Steel Floor Registers. Represented by D. J. Metzger.

BERKLEY SYSTEM COMPANY, Sioux City, Iowa: Merchants' cooperative system of meeting catalogue house competition. Represented by R. E. Saberson and F. L. Brownlee.

BLACKSTONE MFG. COMPANY, Jamestown N. Y.: Blackstone Rotary and Low and High Pressure Motor Washing Machines. Represented by D. P. Hicks.

BROWNIE ICE SKATE COMPANY, Webster City, Iowa: Brownie Skates. Represented by B. R. Brown.

CARBORUNDUM COMPANY, Niagara Falls, N. Y.: Sharpening Stones, &c. Represented by W. R. Embleton and H. A. Eaton.

CEDAR RAPIDS FOUNDRY & MACHINE COMPANY, Cedar Rapids, Iowa: Economy Furnaces. Represented by T. Newcomb.

CHANDLER PUMP COMPANY, Cedar Rapids, Iowa: Large exhibit of an extensive line of Pumps, &c., Iowa Radiator Company's Steam and Hot Water Boilers and Stover Mfg. Company's Windmills and Feed Mills.

COLUMBIAN HARDWARE COMPANY, Cleveland, Ohio: Tubo Steel Registers, Columbian Floor Hinge and Screen Door Fixin's. Represented by L. A. Wood and C. F. Hunter.

DAIRY QUEEN CHURN COMPANY, Monmouth, Ill.: Churns. Represented by S. R. Doris.

DENNING WIRE & FENCE COMPANY, Cedar Rapids, Iowa: Denning Fence, Gates, Barb Wire, &c. Represented by L. L. Barnum.

DES MOINES MFG. & SUPPLY COMPANY, Des Moines, Iowa: Pressure Tanks and Water Supply Systems, New Life Heating Boilers and Mac Warm Air Furnaces. Represented by J. C. Huntoon.

C. DE WITT WAGNER, Cedar Rapids, Iowa: Wagner Elbow Shears. Represented by C. De W. Wagner.

DOVER MFG. COMPANY, Canal Dover, Ohio: Asbestos Sad Irons. Represented by M. H. Snyder.

E. I. DU PONT DE NEMOURS POWDER COMPANY, Wilmington, Del.: Advertising exhibit.

EXCELSIOR STOVE & MFG. COMPANY, Quincy, Ill.: National Stoves and Ranges, Leonard Refrigerators and Reliable Gasoline Stoves. Represented by W. J. Fisher, R. B. Styles, R. L. Houck and H. D. Walker.

FULLER-WARREN COMPANY, Milwaukee, Wis.: Stoves, Ranges and Heaters. Represented by J. L. Potter, W. B. Barney and G. C. Barney.

GABEL MFG. COMPANY, Hawkeye, Iowa: Gabel's Twentieth Century Pig Forceps. Represented by Chas. Gabel, F. A. Daudel and W. A. Hathaway.

GLASCOCK BROS. MFG. COMPANY, Muncie, Ind.: Glascock Racers, Baby Jumpers and Walkers, &c. Represented by J. W. Glascock.

GLOBE MFG. COMPANY, Perry, Iowa: Quicker Yet Washer. Represented by J. C. Bryan.

GLOBE STOVE & RANGE COMPANY, Kokomo, Ind.: Globe Stoves and Ranges. Represented by J. A. Hutchings and E. E. Raymer.

GREEN FOUNDRY & FURNACE WORKS, Des Moines, Iowa: Furnaces. Represented by F. O. Green, M. Breed and C. H. Burch.

HALL-BENEDICT MFG. COMPANY, Monticello, Iowa: Steel Safety Hoists and Steel Tackle Wire Stretcher. Represented by M. D. Kehoe.

HART & COOLEY COMPANY, New Britain, Conn.: Wrought Steel Registers, Lockers, &c. Represented by A. I. Grocock.

HAWKES FLAT IRON COMPANY, Chicago: Comfort Self-Heating Gasoline Flat Iron. Represented by F. M. Hawkes.

HAWKEYE INCUBATOR COMPANY, Newton, Iowa: One Minute Washer and Lever Churn. Represented by F. Payne and A. W. Jackson.

HUNT, HELM, FERRIS & CO., Harvard, Ill.: Hay Carriers, Hangers and Hardware Specialties. Represented by G. H. Chapman.

IDEAL LIGHTING COMPANY, Davenport, Iowa: Gasoline gas lighting system in full operation. Represented by H. Walther and F. Lee.

F. C. JOHNSON, Stillman Valley, Ill.: Axle Grease, Harness Dressing, &c. Represented by F. C. Johnson.

KEITH FURNACE COMPANY, Des Moines, Iowa.: Monitor Furnaces and Registers. Represented by B. R. Pranke and Geo. Willsie.

KELLY AXE MFG. COMPANY, Charleston, W. Va.: Axes, Hatchets and Scythes. Represented by J. P. Kelly and H. D. Wilkes.

KOSTLAN MFG. COMPANY, Traer, Iowa: Washing Machines. Represented by F. Kostlan.

LENNOX FURNACE COMPANY, Marshalltown, Iowa: Torrid Zone Furnaces. Represented by F. J. Kiesel, T. I. Wasson and J. W. Zuck.

LOETSCHER-RYAN MFG. COMPANY, Dubuque, Iowa: Sad Irons, Registers, Dampers, Anvils and Hardware Specialties. Represented by E. R. Calvert and E. J. Ryan.

N. W. LUNDY, Marshalltown, Iowa: Lundy Double Blast Soldering Furnace. Represented by N. W. Lundy.

LYONS SPECIALTY COMPANY, Lyons, Iowa: Mail Boxes, Petersen Barn Door Latches, Handy Hog Waterer, Young's Strainer Cut Off and Bull Blinds. Represented by W. Petersen.

MCCASKEY REGISTER COMPANY, Alliance, Ohio: McCaskey Account Registers. Represented by B. P. Robinson and R. A. Green.

MAHER & SON, Preston, Iowa: Lightning Rods. Represented by J. J. Maher.

MAJESTIC MFG. COMPANY, St. Louis, Mo.: Majestic Ranges. Represented by A. Collins.

MALLEABLE STEEL RANGE MFG. COMPANY, South Bend, Ind. Represented by H. C. Fowler and R. E. Adams.

MARLIN FIRE ARMS COMPANY, New Haven, Conn.: Rifles and Shot Guns. Represented by Chas. Porter.

MARSHALLTOWN DROP FORGE COMPANY, Marshalltown, Iowa: Wrenches and Combination Tools. Represented by J. W. Lodwick.

MILWAUKEE CORRUGATING COMPANY, Milwaukee, Wis.: Steel Ceilings, Conductor Pipe, Eaves Trough, Elbows, Kuehn's Korrect Kutoff and One-Piece Miter. Represented by C. Phillips, W. Horn and P. E. Sauerwein.

MINNEAPOLIS HEAT REGULATOR COMPANY, Minneapolis, Minn.: Minneapolis Heat Regulator. Represented by L. A. Norton.

NEWTON DISC PLOW COMPANY, Newton, Iowa: Newton Disc Plows. Represented by J. W. Watson.

NEY MFG. COMPANY, Canton, Ohio: Hay Tools, Hangers and Hardware Specialties. Represented by L. Stern and J. M. Mobley.

OHIO VARNISH COMPANY, Cleveland, Ohio: Chi-Namel Varnishes and Finishes and self-graining process. Represented by G. C. Powers.

ONEIDA COMMUNITY, Oneida, N. Y.: Community Silverware. Traps and Chain. Represented by W. E. Scanlan and J. C. Gibson.

OSMUNDSON SPADE MFG. COMPANY, Perry, Iowa: Buffalo Staple Puller, One Minute Post Hole Digger and Tiling Spades. Represented by H. Osmundson.

PARSONS HAWKEYE MFG. COMPANY, Newton, Iowa: Grain Grader, Washing Machine and Hog Waterer. Represented by C. C. Long.

PERRY MFG. COMPANY, Perry, Iowa: Apex Coaster Wagon, with runner attachment, and Stamped Steel Specialties. Represented by E. M. Heule.

PITTSBURGH STEEL COMPANY, Pittsburgh: Pittsburgh Perfect Fence. Represented by W. D. Ellsworth and C. A. Cochrane.

PRITCHARD-STRONG COMPANY, Rochester, N. Y.: Prisco Lanterns and Money-Back Metalware. Represented by W. T. Richards.

JOHN PRITZLAFF HARDWARE COMPANY, Milwaukee, Wis. Represented by Frank Hughes, W. J. Konvalinka, N. B. Carpenter, J. Gruenwald and O. E. Wynne.

ROBERTS HEATING & VENTILATING COMPANY, Minneapolis, Minn.: Storm King Special Furnaces. Represented by G. A. Anderson.

ROCK ISLAND TOOL COMPANY, Rock Island, Ill.: Vises. Represented by A. S. Lindeblad and C. E. Shields.

ST. PAUL ROOFING, CORNICE & ORNAMENT COMPANY, St. Paul, Minn.: Steel Ceilings and Roofing and Coat-Roid Rubber Roofing. Represented by V. M. Smith.

STANDARD OIL COMPANY, Chicago: New Perfection Wick Blue Flame Oil Stoves, Perfection Heaters and Rayo Lamps. Represented by W. J. Houlton and S. A. Sergeant.

STANLEY WORKS, New Britain, Conn.: Wrought Steel Butts, Hinges, &c. Represented by A. I. Grocock.

STOWELL MFG. & FOUNDRY COMPANY, Milwaukee, Wis.: Registers, Hay Tools, Hangers and Hardware Specialties. Represented by W. A. Coffman.

STURGES & BURN MFG. COMPANY, Chicago: Milk Cans, Dairy Pails and Jack Frost Freezers. Represented by C. E. Holmes.

THATCHER FURNACE COMPANY, Chicago: Boilers and Furnaces. Represented by R. C. Cook and S. E. McLaughlin.

THOMPSON BROS. & CO., Newton, Iowa: Speed Washer. Represented by F. E. and J. C. Thompson.

UNITED STATES REGISTER COMPANY, Battle Creek, Mich.: Jones Side Wall Registers. Represented by A. O. Jones.

VERMONT FARM MACHINE COMPANY, Bellows Falls, Vt.: United States Cream Separator. Represented by T. F. Tierney and N. A. Ellegard.

VICTOR MFG. COMPANY, Leavenworth, Kan.: Washing Machines, Wringers and Ironing Boards. Represented by F. J. Tallant, G. W. Fleming and W. A. Thompson.

VOSS BROS. MFG. COMPANY, Davenport, Iowa: Washing Machines. Represented by W. H. Voss and A. Clifford.

WAHLE FOUNDRY & MACHINE WORKS, Davenport, Iowa: Snowball Rotary and Quick Action Lever Washers. Represented by A. Nielsen.

WATERLOO REGISTER COMPANY, Waterloo, Iowa: Waterloo Side Wall Registers, with vapor pan: Favorite Side Wall Registers, Wall Cold Air Faces, Semi-Steel Floor Registers and Cast Faces and No-Rivet Damper Clips. Represented by J. O. Knox.

WESTERN ROOFING & SUPPLY COMPANY, Chicago: Carey's Roofing, Pipe Coverings and Asbestos Goods. Represented by R. B. Murdock.

WHITE LILY WASHER COMPANY, Davenport, Iowa: Washing Machines and Gasoline Engine. Represented by S. T. White, B. L. Schmidt, J. C. Foss and Ted Rosche.

THE HARTFORD MACHINE SCREW COMPANY, Hartford, Conn., announces that it has opened a New York City office and warehouse at 88-90 Walker street, with P. B. Genger as manager. Mr. Genger was formerly sales manager for Patterson, Gottfried & Hunter, Ltd., New York. The Hartford Machine Screw Company will carry at its New York establishment a complete stock of Set and Cap Screws, Taper Pins, Finished and Case Hardened Nuts, and practically all other goods shown in its catalogue.

THE LUTHE HARDWARE COMPANY, Des Moines, Iowa, wholesale Hardware, has increased its capital from $100,000 to $300,000 in order to provide for the large expansion which has taken place in its business.

THE COLUMBIAN HARDWARE COMPANY, Cleveland, Ohio, is distributing a unique advertising novelty, called the "Annual Pay Envelope," in which attention is called to its various products.

Indiana Retail Hardware Association.

BACKED by a membership unwaveringly strong in support of its aims and purposes, and constant in all efforts for the widening of its scope and power, the Indiana Retail Hardware Association confidently expects each of its successive meetings to excel in interest and importance its predecessor. It was therefore but the realization of a looked for result that the ninth annual convention of this body, held at Indianapolis, February 18-21, was in no respect disappointing. In the face of a blizzard of wind and snow that raged all day Tuesday, impeding trains and making travel difficult and unpleasant, the convention opened with a good attendance, which on Wednesday had grown to record breaking numbers. At that session about 750 persons, of whom nearly 100 found standing room only, were packed in the assembly room of the Denison Hotel, where the business meetings of the convention were held. It may be observed that the entire audience was comprised exclusively of associate and active members and others deeply interested in association work, a fact which in itself bespeaks the appealing force and power of the principles underlying this movement. The increasing popularity of the Question Box is everywhere apparent, and was notably emphasized at the Indiana Convention when, toward the close of the session on Thursday, a suggestion of adjournment was met by a motion to continue the Question Box half an hour longer, which prevailed. With the addition of somewhat more than 150 new members gained in the past year, the Indiana association now has enrolled nearly 80 per cent. of the Hardware firms doing business in the State.

The Hardware Exhibition.

Whatever objectionable features may have attended the earlier attempts at holding trade exhibits in conjunction with its conventions have been overcome since the association has undertaken the management of these displays. The orderly manner with which they are conducted is a source of gratification to all concerned, and adds much to their interest and profit. In deference to the wishes of the organization all exhibits were shown at Tomlinson Hall, in spaces provided by the management, none being installed in hotel rooms or other places, as has been done heretofore. The displays were highly creditable to manufacturers and the association, both as respects the quality and variety of goods exhibited, and their artistic arrangement.

All available space on the floor and in the galleries of the hall were occupied and prior to and succeeding the business meetings of the convention, which were held in the afternoons only, there was a constant stream of visitors circulating through the building. Admission was limited to members and exhibitors, and the crowding and confusion attendant upon admission of the general public was thus avoided. This and other thoughtful provisions for the comfort, convenience and pleasure of visitors and exhibitors was due to the able and untiring efforts of the Committee on Exhibits, composed of Charles E. Hall, Albert De Prez and Otto E. Lang; to these gentlemen belongs the credit for one of the most successfully conducted Hardware exhibits ever shown in connection with the annual meetings of the association.

President Frame's Address.

In his annual address President Frame referred to the encouraging progress made by the association during the year, and expressed the hope that even the small minority of Indiana Hardware men yet outside of the organization would at no distant day be included in its membership. High appreciation of the Hardware exhibits was expressed, and it was urged that they should not only be carefully examined, but that wherever possible the manufacturers represented should receive the substantial encouragement of business patronage. Continuing, the president spoke, in part, as follows:

Another year has passed into history and to us perhaps it has been quite the same as many others, yet some things have happened to the experiences of the year that have helped us in our endeavor to make the world and ourselves better. We have all taken our annual inventory, and while the balance is on the right side, I feel safe in saying this balance is not as large as we felt it ought to be. Looking back over the year let us mark the spots where we have been weak. If our bills receivable are more than they should be, why not make

A Firm Resolution to Be Better Collectors?

How many of us lose discounts by being lax with our collection? I am not going to ask how many have outstanding accounts for Binder Twine, Wire Fence and other staples, that we should have had our money for, for the reason that it would be embarrassing. I am afraid that as a rule we are not good collectors. Our business has suffered in the last 90 days from fear—fear as to what might result from conditions that existed in money centers; but at this time the most skeptical has been assured that the country as a whole is as sound as a dollar. And as factories that have been closed, some entirely and others working only half time, are resuming their usual activities, we have every reason to look for business soon to be up to its former standard.

How to Get Customers in Our Store.

how to sell them and get them to come back again, are questions that concerns us most at this time. In every town and city there are department stores which continually strive to attract our customers by advertising very cheap articles in the Hardware line at exceedingly low prices. While these stores have sold some goods people generally have too much good sense to go to a store the second time to trade when they were sold a polished cast tool for solid steel, and told that it was as good as they could buy anywhere. When a man is sick, he naturally goes to a physician and not to a drug store for a prescription, and it should be our endeavor to impress it upon our people that the place to get what they want in the general Hardware lines is at the Hardware store.

We Are Specialists,

professional men, so to speak, and we should be thoroughly posted in our line, familiar with all the new things and be in a position to show our goods in such a manner that it will be an easy matter to convince our customer that he can get what he needs at our store much better than at a lumber yard or any other place.

Buy good goods, get enthusiastic on the quality, talk them to your customer the way the traveling man did who sold them to you; learn all you can about how they are manufactured, tell your customer all you know about them—he'll listen. This will give him confidence in your ability and judgment and you are sure to see him back in your store when he wants to buy again.

You cannot make a good customer by selling a cheap article. Besides, good goods always pay a better profit than poor ones. We have printed on our stationery as a motto, "There is nothing too good for our customers."

Season Goods Orders.

It is now the general custom to place our orders for seasonable goods quite a long time before we need them. With a few items this is advisable, but to the extent that it is now practiced, my opinion is that it is a mistake. The jobber is the natural distributor from the factory to the retailer and it is his business to have the goods in stock when the demand comes. The quantities we buy for the year are usually based on the amount that was sold the year previous.

Having placed our orders with the jobber early, usually for factory shipment, if an extraordinary demand springs up like that, for instance, of Clipping Machines last year, our jobber's stock is soon exhausted. Mr. Jobber has figured that his trade had bought about all they would use and naturally had not stocked up much on these goods, with the result that we had a very hard time to get our orders filled and frequently lost sales on this account. We are asked to take goods into our store often two to four months before they are needed, and we must run the risk of fire and frequently a loss by a change in price.

The Natural Mission of the Jobber

is to carry such stocks of seasonable goods in season as to be able to fill orders for his trade under ordinary conditions, and his facilities and ability as a jobber should enable him to do so. We, on our part, cannot sell customers out of season, and until some one can show us how to sell Poultry Netting, Screen Wire, Ice Cream Freezers and Scythes in December, and Axes, Cross Cut Saws, Skates and Tank Heaters in July, I am of the opin-

ion that it would be better for us, as well as our friend the jobber, to get our goods in season when we want them, than to try to anticipate our wants so far in advance.

Suggestions in Regard to Meeting of National Body.

When J. L. Fulton, a delegate to the national convention at Boston, was called upon for his report he appeared on the platform with a roll of manuscript which may be conservatively estimated at 300 pages. A voice from the audience cried, "Don't read it; we'll take your word for it." It proved, however, to be the official report, but the one which Mr. Fulton read proved to be a most interesting description of the incidents leading up to and including the work of the convention. It concluded with the following summary, which will be found to embody some pertinent suggestions:

In reviewing the work of the convention I am constrained to express the criticism that its work, while containing much instructive and stimulating matter, was not all that it might or should have been. In my opinion it would have been more profitable, considering the national scope of the gathering, to have spent more time in the consideration and discussion of broader questions of the policy in the work of the national body; the extension of its usefulness to the constituent associations, such as devising and improving the methods of association work, and of extending their influence and increasing their activities.

It Should Be the Province of the National Body

to thoroughly discuss and thresh out those problems and determine on a clearcut and definite policy to recommend to the several State associations. The national conventions are the best and only practical time for the State secretaries to get together. They should have more hours set aside for their especial purpose. It has always seemed to me that they have not devoted sufficient time to the discussion of their special work, to bring out the best that could be developed for the good of their constituents.

The National Association should be the clearing house of the State conventions; a board of directors, so to speak, composed of the strongest and ablest business talent that can be gathered from the several States. In my opinion there should be

A Better System of Representation to the National Meetings

adopted by the State associations; one that will insure stronger and more effective work as the years go by. In reviewing the work of the several national conventions that I have attended, I was naturally impressed with the influence and effectiveness of those States whose delegates were made up of men who had been intrusted with the mission year after year. They came with the problems of the convention well in hand. They had given time and mind unselfishly to study the needs of the organization. They debated and disposed of propositions from the standpoint of predeliberation and preparedness.

These Leaders in Thought and Action

have been sent to the convention in the past largely as the result of good judgment and appreciation on the part of their constituents, without any system or rule in such matters, but there is always in the air, and quite right, too, a feeling that the honors should be distributed, and in order to both satisfy this laudable and proper sentiment, and to perpetuate the strength and effectiveness of the delegations of the national convention, I suggest some system that will produce this desirable result. I make the suggestion that the president, first vice-president and secretary shall, by reason of their office, be delegates for three years in succession, and that the balance of the delegation be chosen to serve two years. Some such plan as this would insure a reasonably experienced delegation. It would be an incentive to the delegate to prepare himself for the important and serious business mission with which he is honored.

More Time Should Be Devoted to Business.

I have but one other mild criticism to express. There was too much diversion in the splendid list of entertainments that had been provided. I frankly confess that I accepted and enjoyed them as much as anybody else, but I honestly think there should be less of such features and more time devoted to the business for which we are convened. The entertainments were generous, excellently planned and executed, and thoroughly enjoyed by all participants, and the New England Association will long be remembered by the delegates for its splendid hospitality.



From Left to Right: Albert De Prez, Committee on Exhibits; Charles E. Hall, Treasurer; M. L. Corey, Secretary; C. B. Frame, Ex-President; Fred W. Bartholomew, First Vice-President; Walter B. Creed, President.

Governor Hanly on Prison and Reformatory Labor.

A conspicuous feature of the proceedings on Wednesday was an address delivered by Governor Frank J. Hanly upon "State Business Problems." The subject matter of this address relates to the difficulties encountered by the State in furnishing employment for the inmates of its penal institutions. It will be recalled that two years ago the manufacture of Binder Twine was begun at the State penitentiary, Michigan City, Ind., and the product has hitherto been sold direct to the consumers at prices that would not admit a profit for the merchant. This matter has been the subject of conference between the State officials and those of the associations at several meetings held during the year. The questions involved were fully and frankly discussed in a spirit of fairness and due regard for the equities and interests of all concerned, with the result that a harmonious understanding of the situation was finally evolved. It was therefore the purpose of the Governor to present before the members of the association the conditions confronting

the administration in its efforts to harmonize the business interests of the State with the measures provided for the humane care of convicts in the penitentiary. After reviewing the complex conditions of modern life which have placed upon the State the burden of caring for a large number of helpless persons, including the insane and helpless boys and girls, together with a prison population of more than 1200, he spoke in substance as follows:

Indiana takes just pride to-day in the character of her State penal institutions. They have been removed from the influence of partisan politics and the work accomplished in this direction has been the subject and attention of favorable comment in every State in the Union. The cost of their maintenance and administration, amounting to $3,000,000, is the price you pay for altruistic work in behalf of the helpless and criminal classes. The question arises

What Shall We Do with the Boys in the Reformatory and the Men in the State Prison?

In endeavoring to provide employment for this population we have on the one side free labor, which is justly sensitive of the encroachment of such competition in production, and on the other hand we have the hard headed business men, like yourselves, who fear that the operation of prison factories may be detrimental to your interests. It is obvious, however, that the State cannot keep its prisoners in idleness.

It would not in the first place be a good business proposition to do so, since it would add greatly to the amount you are already paying for their support. There is, however, another side to this question, which to my mind is of paramount importance, and one which I feel will appeal to you with striking force. I refer to the indisputable fact that imprisonment without employment means insanity. What citizen is there among you who would be willing to take the responsibility for the establishment of a prison system that, through enforced idleness, would deliberately expose convicts to the horrors of such a fate. Naturally you turn with abhorrence from any such suggestion.

Moreover, there could be no economic gain from such a course. There is, as you know, a chance for the reformation of these unfortunates if at the end of their sentence they can be restored to the community sound in mind and body; but if driven to insanity through enforced idleness they become a permanent charge upon the community; and the tax upon you for the support of these institutions must, under such circumstances, grow larger and larger.

Looking at the Matter from Another Point of View,

say, for instance, that a boy in early life with no element of viciousness or criminality in his nature, through unfortunate associations or environment, makes a mistake, commits some act that is construed as an infraction of the law, and under sentence therefor serves a term in the State reformatory. I submit to you in all fairness as men, is not that boy entitled to be so treated at the hands of the State that he may have an opportunity to be a better rather than a worse man at the expiration of his term? And you know that he cannot have this opportunity if kept in confinement without work. I take it therefore that the question is not debatable and you will all agree with me that

Some Means Must Be Found to Furnish Work to Inmates

of our State prison and reformatory that will keep them actively employed. The question therefore arises: What shall these men do? It is plainly seen in view of modern industrial conditions that such employment must be found as will bring them into competition with free labor as little as possible. Working along this line we have established trade schools in the reformatories where the boys are taught reading, writing, arithmetic, manual skill and, better than all else, are instructed in the higher concepts of citizenship. As a result of these efforts I am glad to say that 60 per cent. of those discharged go out and regain honorable and useful places in society.

In Seeking Some Avenue of Employment

for the prisoners in the Michigan City penitentiary we found that no Binding Twine was manufactured in the State of Indiana, and because this product promised little competition with the free labor of our State, it seemed advantageous to establish the plant. The question before the administration has been whether or not this product would find a market in Indiana. I recognize the fact that you are business men and that out of the profits of your business you must live, but I am conscious that in your loyalty, before you are Hardwaremen you are citizens of Indiana. As such citizens, therefore, do you not owe something to the effort we are making to find employment for the inmates of our prison?

Last year we sold a large part of our product to the farmer direct, but in marketing it in this manner we soon found how sensitive you were through the communications we received from Hardwaremen all over the State. You said to me, "Our interests are directly involved. We don't ask unfair things, but we do ask that the product of this plant shall be handled through regular trade channels." This seemed fair to me, and so I am here to say to you now that this year, if you take this product, you may have it on a basis of profit that will justify you in handling it. I want you to remember that I do not lose sight of the business proposition involved in this matter. I know you will buy where you buy the cheapest, quality considered, but I put it to you as loyal citizens that you owe an obligation to the State of Indiana

To Buy Our Product if You Find It Equal

in price and quality to that of other twines offered in the market. Examine it and see for yourselves how it compares with other twines. It is not fair, however, to take the word of the representatives of large corporations outside of the State as to its quality. But they say it is prison made. Yes, that is true; but go back to the moral question. Here is an opportunity to give 200 men employment that will not compete with free labor in Indiana. Our factiry must go on: there is no choice. We are relying upon your support; but if it is denied us we will be compelled to go back to our former plan and sell direct to the farmer. We are not insensible to the conditions of competition and to the best of our ability we will endeavor to meet competitive prices, quality for quality, and think we will be able to do it.

In conclusion the Governor read a letter written to the trade by an outside manufacturer of Binder Twine which contained a number of statements derogatory to the prison product which were emphatically declared to be untrue. He also referred to a subterfuge which he charged had been used to discredit the prison Twine and which he characterized as unworthy of any man who enjoyed the privilege of citizenship. It was stated that an instance had been discovered where a bale of prison Twine had been purchased, the contents taken out and replaced with Twine of poorer quality, which was then exploited as prison Twine. In order to ascertain the sense of the convention as to their willingness to handle the output of the prison factory the members were asked for an expression, which showed an overwhelming majority in favor of the proposition.

Report of Secretary Corey.

In submitting his eighth consecutive annual report Secretary M. L. Corey stated that in two matters of vital importance to the welfare of the organization the developments of the past year had been most gratifying. These related to the substantial increase that had been made in its financial and numerical strength. The treasury balance was referred to as probably the largest ever reported by any State Hardware association, while more members had been added to the roster than in any former year of the association's existence. The body is now represented by members in 290 towns in the State, of which Indianapolis leads, with a membership of 24; Terre Haute sceond, with 12; Muncie follows, with 9; while 16 others have not less than 5. The following extracts are taken from the report, which throughout was characteristfcally practical and instructive:

It is the opinion of your secretary that the Hardware show in connection with our larger conventions is a permanent affair. There is too much genuine advantage, both to dealer and manufacturer, for it to be considered as temporary. No article or line will ever become so firmly established with the trade that its manufacturers can afford to ignore such a chance of showing their product, and especially any changes or improvement. No advertising will ever prove more effective than actual demonstration and personal explanations to the men who sell the goods. That these exhibits are appreciated by our members is clearly shown by the ever increasing attendance at our annual meetings.

The Exhibit Feature Is Gradually Working Toward a Business Basis

and more orders are being placed than formerly. We certainly believe it will pay any Hardware dealer well to visit each exhibit; make yourself known and have a talk with the man in charge. Get all the trade information and business pointers you can, and if you see anything you think would be of advantage to add to your stock, buy a sample. It lies entirely in your hands to make these Hardware exhibits a huge success. I do not

believe the Indiana Association will ever again consent to allow exhibits in our hotel headquarters. We, therefore, urge you, as loyal members, to discountenance any attempt in this direction. It is also unfair to allow representatives of houses making no exhibits to claim your attention and attempt to sell competing lines, when they discover you are interested in some particular display. Last year there was some complaint made by exhibitors, and we feel it is only necessary to mention the matter at this time.

Hardware Mutual Fire Insurance.

There has been a great gain this year in the amount of Hardware mutual fire insurance carried by our members, at the same time we do not know of a serious loss. The Wisconsin secretary informs me they have now $204,000 in risks in Indiana. Minnesota has $700,000 insurance in our State, and both these companies are paying 50 per cent. rebate. The National and Iowa have perhaps $300,000 more, making about $1,250,000 that the old line companies have lost by their own greed and discrimination against Indiana Hardware men. There is no question about your having the right to buy mutual insurance outside our State, although we are informed that statements have been made by interested parties to the contrary. Neither is there any doubt that you will secure an honest adjustment in case of loss. Minnesota tried to get admitted legally into our State, but the absurd provision in our insurance laws that requires $100,000 in notes, and will not consider the same amount in cash as an equivalent, prevented.

Permanent Association Emblem.

The benefit of adopting a uniform association button or emblem by our affiliated State organizations has often been mentioned. Indiana is the first State to try the experiment, and the triangle button you have received is intended to be worn during the entire year as a constant reminder that you stand for progress and fair business methods. At least 80 per cent. of the Hardware firms in Indiana now belong to our association, and if we all wear the button our strength will be continually impressed upon those who are inclined to trespass upon our business or territory. Other States can use this same button by simply changing the name of the State in the bottom link. The initials in center stand for the National Retail Hardware Association, if not the best and strongest, it certainly is one of the best retail organizations the world has ever seen.

The Trade Press.

The Hardware trade is particularly fortunate in being represented by progressive, wide awake journals, and our associations owe much of their strength and success to these faithful champions. No one knows better than your secretary the constant demands upon your time and attention that come from your business, but we also feel that the successful merchant in these days needs every assistance he can secure and every new idea should be considered with a view of making some improvement in your store methods. The trade papers are full of suggestions and experiences; read them carefully, take time to do it, for it will pay. The *National Hardware Bulletin* has grown and developed into a Hoosier office, and under Hoosier care. It is your property, and aims to promote and uphold association principles and doctrines. We hope and believe you read it carefully and approve its course. It is full of the get-together spirit, and ready at all times to work for your best interests. Several of our members have subscribed for their clerks, and say it pays. We accept such subscriptions on the membership club basis of 50 cents each.

Parcel Post.

Never before, to my knowledge, has any department official so boldly and persistently used the Government machinery to manufacture favorable sentiment and force legislation as has Mr. Meyer, our present Postmaster-General, in his efforts to secure a domestic parcel post. Bill after bill has been introduced; the newspapers are full of one-sided argument evidently sent out by paid contributors who stand close to the head of the postal department. In order to quiet the protests of retail merchants they now claim that the mail order houses are opposed to a parcel post.

The latest efforts are being concentrated on the Meyer rural parcel post scheme, and the new bills are worded to overcome the claim that catalogue houses could collect in one shipment a large number of packages and forward same to some agent who could send them out by rural post at the low rate. It is now proposed to limit the rural parcel post strictly to the merchants and people in a town where a route starts and the farmers living on said route. I think Mr. Meyer estimates that if each carrier handles three rural parcel post packages a day that the income will wipe out the present postal deficit.

If this is true who will pay the $7,000,000 postage on these packages. Naturally the man who orders the goods ought to do it, but bear in mind that postage must be paid by the sender, and you who deal with farmers realize how difficult it would be to charge and collect such an item. I venture it would not be a year before nearly every dealer would find it necessary to advertise free delivery of all rural orders, and thus the entire postal deficit would be saddled upon the already overburdened retail merchant. If this bill contained a provision that the party ordering goods by rural post should pay the postage on same, I think the demand for it would suddenly cease.

This is not all—official reports show that the post-office box renters paid last year $3,556,801. When it is considered that the farmer and the large city residents have free house to house delivery, that this amount is over $800,000 more than the entire receipts from third and fourth class matter, it looks like the small town dealers and their friends are being treated as E. Z. marks by the postal department. Now comes a new notice that April 1, 1908, box rent will be again advanced about 33 1-3 per cent. You that have been paying $1.80 must pay $2.40. We wonder if this is to pay us back for daring to raise our voice in protest against a parcel post? The real fight is still to come. It may not be this term of Congress, but there is too much financial advantage in a domestic parcel post for the mail order men and their allies to cease their efforts.

Question Box.

Under the direction of Secretary Corey, the time devoted to the Question Box proved to be one of the most enthusiastic periods of the meeting. Among those presented were the following:

1. *How many favor the practice of making net prices rather than quoting by list and discount?*

Out of the entire assembly only two expressed themselves as favoring net prices, an overwhelming majority being in favor of discounts. It was claimed by several speakers that the use of net prices involved too much detail, which made it difficult to keep track of costs.

2. *Would it not be better to have catalogues uniform in size?*

Upon the desirability of uniformity in this respect there was no disagreement, but it seems to be impossible of accomplishment, because of the wide diversity of ideas that prevail among manufacturers regarding this matter. One member suggested that the best alternative was found in a systematic arrangement for filing catalogues, and said that one of the best investments he ever made was for a file in which he has arranged upwards of 2000 different catalogues, any one of which can be referred to instantly.

3. *Is it better to hire experienced help or take inexperienced young men and develop them?*

This question aroused lively discussion, which brought out opinions on both sides, backed by experience. A few believed that it paid best to let the other fellow do the training and then hire a finished product. The majority, however, held that in the long run the contrary policy would yield the best results. As one member expressed it, "it is always better to have new men growing up in your business and becoming conversant with your methods of doing business, so that the gaps in your working force may be filled from the inside rather than the outside."

4. *How can we prevent show windows from frosting in winter?*

This brought out a good many suggestions of expedients that are familiar to the trade such as the use of electric fans, coating glass with glycerine and various devices for creating a circulation of air to absorb the moisture. One member told of a method employed for this purpose, which consisted of enclosing a space in the basement directly under the window and boring holes through the floor, thus establishing a constant circulation of air in an inexpensive way.

Resolutions.

Among the resolutions adopted were the following:

Resolved, That we urge the members of the House and Senate to use every legitimate means for the enactment of a law to reduce the postage on first-class mail matter to 1 cent per ounce or fraction thereof; and that we recommend the revision of regulations covering second-class mail matter so that said class may be made to pay the cost of its carriage instead of being carried at the expense of the profit derived from first-class mail matter.

Resolved, That the secretary be instructed to take such action as he deems best in his judgment to defeat any bill or measure relating to parcel post.

Whereas, The Sherman Anti-Trust law in its present form is too drastic and too radical in that it may be interpreted to apply to any form of agreement, and is in its effect mischievous, vicious and wholly unfair and inequitable when applied to many of the commonest forms of agreement; be it

Resolved, That we petition our several State representatives in the national Congress to so revise and modify the terms of the law that it may recognize the difference betwen reasonable and unreasonable, between fair and unfair agreements; that it may not, when put in effect, work mischief upon legitimate and honest business interests.

Resolved, That we are in favor of the passage of a law prohibiting misleading advertisements of our respective lines of goods, believing that justice is the foundation of prosperity.

Other Addresses.

Addresses were delivered by Charles W. Burrows, Cleveland, Ohio, on "Parcel Post," in which the legislation proposed for its extension was carefully reviewed, and the harmful effects that might be reasonably expected from it pointed out; and by Geo. H. Maxwell, Chicago, Ill., who, under the topic of "Solidarity of the Community," explained how the development of country towns and communities is a matter of equal interest to both farmers and merchants. He held that the village life and the citizenship developed by it constitute the only hope of perpetuity for the free institutions of this country, and that the most grave and serious dangers now menacing its future result from the overgrowth of our great cities and the subsequent degeneration of the average citizen of the nation.

A very interesting and instructive talk was also given by Thos. McMillen on the "A. B. C. of Advertising," the three essential principles of which he declared to be "personality, service and goods."

Convention Committees.

The Convention committees appointed by the president were composed as follows:

RESOLUTIONS: O. L. Torbet, W. A. Shipley, Elmer Nichols.
AUDITING: Will Weir, J. Rimstedt.
NOMINATING: E. P. Schenk, Wm. B. Harrah, E. L. Wagner, A. F. Brown, Rufus Dooley, O. O. Carpenter, D. N. Hury, Harry Magee, W. H. Hubbard, Leonard Laird, Milo J. Thomas, Geo. P. Ross, A. Reichenbach.

Officers for 1908.

Upon presentation of the Nominating Committee's report the candidates named therein for officers and delegates to the national convention to serve during the ensuing year were unanimously elected, as follows:

PRESIDENT, W. B. Creed, New Albany.
FIRST VICE-PRESIDENT, Fred Bartholomew, Michigan City.
SECOND VICE-PRESIDENT, M. W. Coate, Kokomo.
SECRETARY, M. L. Corey, Argos.
TREASURER, Charles E. Hall, Indianapolis.
EXECUTIVE COMMITTEE: W. B. Creed, New Albany; Fred Bartholomew, Michigan City; M. W. Coate, Kokomo; Harvey Trueblood, Herman Bohls, La Fayette.

DELEGATES TO NATIONAL ASSOCIATION were chosen as follows: Cullum Ott, Rockville; H. R. Culbertson, Auburn; Wm. Hunter, Versailles; H. G. May, Shirley; I. J. Gardner, Scottsburg; M. L. Lewis, Marion; A. Reichenbach, Huntington.

Convention Notes.

S. R. Miles, president of the National Association, was prevented from filling his place on the programme by the heavy snowstorm which delayed his train for several hours. Arriving late Wednesday evening he was compelled to continue his journey without stopping in order to reach Buffalo in time for his engagement at the New York convention.

The Wisconsin and Illinois associations were represented by Secretary C. A. Peck of the former, and President T. J. Mathews and Secretary L. N. Nish of the latter, all of whom favored the assembly with brief, but entertaining talks.

Music was furnished at the exhibition hall by an orchestra, and no detail that could contribute to the pleasure of members and guests of the convention was overlooked by the Entertainment Committee, to whose painstaking care and systematic plans are due the success of these features.

A complimentary dinner given on Thursday evening at the Denison Hotel, by President-elect W. B. Creed to the retiring president and brother officers, was a most enjoyable affair, and was made the occasion of launching the new administration upon its course with cordial wishes for the success it will surely win.

As guests of the association over 750 persons attended a theater party given on Wednesday evening at the Park Theater. Hoes, Rakes, Shovels, Lawn Mowers and other Hardware articles, with which the sides of the stage was decorated, gave a realistic touch to the rural character of the play and were at the same time indicative of the trade interests of the appreciative audience which comfortably filled the house.

Exhibits and Exhibitors.

Following is a list of the exhibiting manufacturers at the Indiana convention, with their representatives:

ACME WASHING MACHINE COMPANY, Columbus, Ohio: Acme Washing Machines. Represented by F. E. Jack and C. L. Brandon.
ADRIAN WIRE FENCE COMPANY, Adrian, Mich.: Wire Fence. Represented by E. S. Ferguson, G. W. McPike and Don H. C. Bowen.
AJAX CONDUCTOR & MFG. COMPANY, Chicago, Ill.: Lightning Conductors. Represented by W. F. Lennen, L. E. Samuels and W. H. McCullough.
ALLITH MFG. COMPANY, Chicago, Ill.: Door Hangers and Hardware Specialties. Represented by Irving A. Sibley, Jr., and Willis D. Remsenson.
AMERICAN STEEL & WIRE COMPANY, Chicago: Woven Wire Fence. Represented by Ira L. Sawin, John M. Thomas, John J. Moylan, Jas. A. Boyd and John W. Meaker, Jr.
E. C. ATKINS & Co., Inc., Indianapolis, Ind.: Saws. Represented by Frank Wells and G. W. Dunnington.
BANY & HADLEY MFG. COMPANY, Delphos, Ohio: Washing Machines. Represented by B. F. Hadley.
K. G. BARTLEY, Chicago, manufacturers' agent: Cutlery, Builders' Hardware, Cement Tools, &c.
J. A. & W. BIRD & CO., Chicago, Ill.: "Rex Flintkote" Roofings. Represented by E. E. Davis.
BRUCE-SHERWOOD AGENCY, Indianapolis, Ind.: Manufacturers' agents.
A. BURDSAL COMPANY, Indianapolis, Ind. Represented by Granville G. Allen, W. W. Stemm, T. H. Carter, Harry Reed, Marshall Moore and R. D. Sanders.
CANADIAN CORDAGE & MFG. COMPANY, LTD., Peterborough, Ontario, Can.: Binder Twine. Represented by Geo. N. Foresman.
CARBORUNDUM COMPANY, Niagara Falls, N. Y.: Abrasive Wheels, Sharpening Stones, Carborundum Paper and Cloth. Represented by Geo. N. Allen, Geo. E. Dresser and F. E. Gridley.
CATTARAUGUS COMPANY, Little Valley, N. Y.: Cutlery. Represented by W. B. TenBrook.
CHADBORN & COLDWELL MFG. COMPANY, Newburgh, N. Y.: Horse and Hand Lawn Mowers. Represented by H. H. Wallis.
COLDWELL LAWN MOWER COMPANY, Chicago, Ill.: Lawn Mowers. Represented by J. T. Bullen and E. B. Standert.
COLE CARRIAGE COMPANY, Indianapolis, Ind.: Vehicles. Represented by S. S. Helms.
COFFEYVILLE IMPLEMENT & MFG. COMPANY, Coffeyville, Kan.
COLUMBIA HARNESS COMPANY, Indianapolis, Ind.: Harness, Whips and Dusters. Represented by M. Martin.
COLUMBIAN HARDWARE COMPANY, Cleveland, Ohio: "Tubo" Registers, Door Hinges, &c. Represented by F. W. Wood and J. E. Stenger.
COMPRESSED AIR WONDER WASHER COMPANY, Shelbyville, Ind.: Washing Machines. Represented by F. D. Churchill.
CONWAY STEEL RANGE COMPANY, Bellevue, Ohio: Steel Ranges and Cook Stoves. Represented by J. D. Conway and L. E. Smith.
COULTER-BEEGLE COMPANY, Chicago, Ill.
CRAWFORDSVILLE TANK COMPANY, Crawfordsville, Ind.: Troughs and Tanks. Represented by J. Q. Clarke.
DAIRY CREAM SEPARATOR COMPANY, Lebanon, Ind.: Cream Separators. Represented by Richard D. Voorhees.
DE LAVAL SEPARATOR COMPANY, Chicago, Ill.: Cream Separators. Represented by T. E. McClean, Jas. H. Hilfiker and Elihu Scott.
DES MOINES INCUBATOR COMPANY, Des Moines, Iowa: Incubators and Brooders. Represented by A. P. Glenn and J. M. Harris.
FERDINAND DIECKMANN COMPANY, Cincinnati, Ohio: Conductor Elbows. Represented by Otto Dieckmann.
DODD & STRUTHERS, Des Moines, Iowa: Copper Cable Lightning Rods. Represented by Charles Dausman and Geo. Wessels.
DOVER MFG. COMPANY, Canal Dover, Ohio: Asbestos Sad Irons. Represented by Charles T. Johnson, J. W. Muckley and A. S. Riley.
DUPLEX SASH LOCK COMPANY, Shelbyville, Ind. Represented by Wm. Lipps.
DURANT-DORT CARRIAGE COMPANY, Flint, Mich., and Indianapolis, Ind.: Vehicles. Represented by A. E. Hazel, J. D. Marshfield and J. C. Moore.
ELWOOD LAWN MOWER MFG. COMPANY, Elwood, Ind.: "Hoosier" Ball Bearing Mowers. Represented by E. C. Heck.
EMPIRE CREAM SEPARATOR COMPANY, Bloomfield, N. J., and Chicago, Ill.: Cream Separators. Represented by W. P. Sheperd and C. P. Roudebush.
EXER-KETCH NOVELTY COMPANY, Indianapolis, Ind.
FRANK J. ENGER, Cincinnati, Ohio: Buggies. Represented by John W. Corya.
ENGINEERING & SUPPLY COMPANY, Milwaukee, Wis.: "Brett" Grain Saver. Represented by C. H. Barker, E. B. Arnold and J. H. Spurcher.
FEHRING CARRIAGE COMPANY, Columbus, Ind.: Vehicles. Represented by Lynn Fehring.
FOREST CITY PAINT & VARNISH COMPANY, Cleveland, Ohio: Paints and Varnishes.
FRAZER STOVE COMPANY, Indianapolis, Ind.: Stoves.
JOSEPH GARDNER, Indianapolis, Ind.: Gasoline Soldering Furnace.
GIBSON AUTOMOBILE COMPANY, Indianapolis, Ind.: Automobile Repairs. Represented by B. W. Twyman.
GLASCOCK BROS. MFG. COMPANY, Muncie, Ind.: Baby Jumpers and Go Carts. Represented by C. L. Bender.
GLOBE STOVE & RANGE COMPANY, Kokomo, Ind.: Stoves and Ranges. Represented by S. B. Purvis, J. C. Patton, Frank Hughes, Charles Horsman and Thos. Flanigan.
HANNA PAINT MFG. COMPANY, Columbus, Ohio: Floor Paints. Represented by Lilly & Stalnaker.
HARPER BUGGY COMPANY, Columbia City, Ind.: Buggies. Represented by Jas. B. Kaler.
HAWKEYE INCUBATOR COMPANY, Newton, Iowa: "One Minute" Washing Machines. Represented by Bem V. Walter.
H. T. HEARSEY VEHICLE COMPANY, Indianapolis, Ind.: Vehicles. Represented by F. I. Willis, W. B. Dean and E. A. Grover.
HOKE MFG. COMPANY, Frankfort, Ind.: Leverless Riding Cultivators. Represented by J. A. Cutler, F. S. Coulter, J. S. Hoke and A. B. Swartz.
HOLLIDAY & WYON COMPANY, Indianapolis, Ind.
IDEAL CONCRETE MACHINERY COMPANY, South Bend, Ind.: Concrete Machines.

ILLINOIS IMPLEMENT COMPANY, Peoria, Ill.: "Auto" Tongue Trucks. Represented by E. M. Haines.

INDEPENDENT WHIP COMPANY, Westfield, Mass.: "Corabone" Whips. Represented by Frank Swain.

INDIANA HARNESS COMPANY, Columbus, Ind.: Harness. Represented by L. J. Weiser.

INDIANAPOLIS CORRUGATING COMPANY, Indianapolis, Ind. Represented by F. M. Bowers and J. Q. A. McClurg.

INDIANAPOLIS PAINT & COLOR COMPANY, Indianapolis, Ind.: Paints. Represented by S. L. Bassett, Jos. Catherwood, C. L. Davis, J. M. Reinacker and Geo. C. Stacey.

INDIANAPOLIS SADDLERY COMPANY, Indianapolis, Ind.: Harness, Horse Collars and Strap Work. Represented by R. H. Montgomery and Robert Spillman.

INTERNATIONAL HARVESTER COMPANY, Chicago: Wagons, Cream Separators, Twine, &c. Represented by D. R. Sheldon, T. B. Lacey, G. A. Johnson, A. C. Atherton and F. W. Haskell.

JANESVILLE MACHINE COMPANY, Indianapolis, Ind. Represented by R. C. Craig.

JEWEL CARRIAGE COMPANY, Carthage, Ohio: Carriages and Wagons. Represented by Watt Meridith and W. C. Ewing.

JOHNSON-WOODBRIDGE COMPANY, Indianapolis, Ind.: Glass, Paints, Oils and Brushes. Represented by Sam C. Thalls.

JOHNSTON HARVESTER COMPANY, Batavia, N. Y.: Farm Implements. Represented by W. D. Long, D. B. Ford and E. L. Moor.

JONES SELF MEASURING PUMP COMPANY, Marion, Ind.: Pumps. Represented by I. L. Ayres.

KOKOMO STEEL & WIRE COMPANY, Kokomo, Ind.: Wire Fence. Represented by R. J. Barber and S. W. Jarvis.

E. M. KRAMER COMPANY, Paxton, Ill.: Implements. Represented by E. D. M. Haines.

LAMB WIRE FENCE COMPANY, Adrian, Mich.: Woven Wire Fence. Represented by S. H. Swift.

LANDERS, FRARY & CLARK, New Britain, Conn.: Bread Maker and Coffee Percolator. Represented by L. L. Redick and W. E. Eastman.

LASHER MFG. COMPANY, Davenport, Iowa: Kitchen Utensils. Represented by E. C. Greeley.

LAWRENCE BROTHERS, Sterling, Ill.: Barn Door Hangers, Hinges and Butts. Represented by W. J. Gilbert.

LAYMAN-CAREY COMPANY, Indianapolis, Ind.: Jobber of Hardware. Represented by J. T. Layman, T. D. Layman, C. A. Pearson, C. P. Aten, A. Gottomiller, Wm. Bailey, Geo. Schaub and B. B. Bolinger.

LENNOX FURNACE COMPANY, Marshalltown, Iowa: "Torrid Zone" Furnaces. Represented by S. P. Britt and W. J. Heald.

LOWE BROTHERS COMPANY, Dayton, Ohio; New York and Chicago: Paints and Varnishes. Represented by Edward S. Blanchard and W. O. Zehring.

MARTIN-SENOUR COMPANY, Chicago, Ill.: Paints and Varnishes. Represented by O. H. A. Gocke and Frank Sommers.

MARTINSVILLE BUGGY COMPANY, Martinsville, Ind.: Buggies. Represented by P. C. Morgan.

MAY & FIEBEGER, Akron, Ohio.

J. S. MCDANIEL, Lebanon, Ind.: "Mack's" Wonder Washer. Represented by J. S. McDaniel.

MCFARLAN CARRIAGE COMPANY, Connersville, Ind.: Vehicles. Represented by W. F. Orpurt.

F. MEYER & BRO. COMPANY, Peoria, Ill.: "Handy" Furnace Pipe and Fittings. Represented by Charles Uhlig.

MICHIGAN WIRE FENCE COMPANY, Adrian, Mich.: Fencing. Represented by R. T. Peebles.

MIDDLETOWN FURNITURE COMPANY, Middletown, Ind.: Washing Machines. Represented by J. T. Burk.

MIER CARRIAGE & BUGGY COMPANY, Ligonier, Ind.: Vehicles. Represented by J. W. Rodgers and I. M. Baum.

MILLER HARNESS COMPANY, Champaign, Ill. Represented by R. G. Richardson.

MUNSON LIGHTNING CONDUCTOR COMPANY, Indianapolis, Ind.: Copper Tubular Lightning Conductors. Represented by A. J. Munson and C. F. McVey.

NAPPANEE IRON WORKS, Nappanee, Ind.: Punches and Shears. Represented by J. W. Roshrough.

NATIONAL CABLE & MFG. COMPANY, Niles, Mich. Represented by M. G. Mitchell, J. M. York and J. T. Morgan.

NATIONAL STOVE COMPANY, Div., American Stove Company, Lorain, Ohio: Gas Ranges. Represented by J. A. Alexander and T. J. Moran.

NEVER-BREAK RANGE COMPANY, St. Louis, Mo.: Ranges. Represented by G. F. Jackson and J. B. Owens.

NEY MFG. COMPANY, Canton, Ohio: Haying Tools. Represented by A. M. True and I. N. Kinney.

NORTHERN OHIO BLANKET MILLS, Cleveland, Ohio: Horse Blankets and Carriage Robes. Represented by C. D. Remington.

OHIO BASKET COMPANY, West Liberty, Ohio: Corn and Feed Baskets. Represented by S. C. Black.

OHIO VARNISH COMPANY, Cleveland, Ohio: Varnishes. Represented by J. E. Tyler.

OLIVER MACHINERY COMPANY, Grand Rapids, Mich.: "Oliver" Bench Clamps.

OMAHA LIGHTNING ROD & ELECTRIC COMPANY, Omaha, Neb.: Lightning Rods. Represented by T. B. Adams and Daisy B. Adams.

ONEIDA COMMUNITY, LTD., Oneida, N. Y.: Silverware, Traps, Iron Chains, &c. Represented by Frank H. Primo and Alfred Clark.

PARRY MFG. COMPANY, Indianapolis, Ind.: Buggies. Represented by Mr. Gough, Mr. Webb and Mr. McFarland.

PARSONS HAWKEYE MFG. COMPANY, Newton, Iowa.: Washers. Represented by Parsons Band Cutter & Self Feeder Company, Indianapolis, Ind

PEOPLE'S DIRECT SUPPLY COMPANY, Du Bois, Pa.: Porch Swings. Represented by Dole Hamilton.

PEORIA DRILL & SEEDER COMPANY, Peoria, Ill.: Seeding Machinery. Represented by J. M. Newtson.

PETALUMA INCUBATOR COMPANY, Petaluma, Cal., and Indianapolis, Ind.: Incubators and Brooders. Represented by A. M. Williams and R. A. Pierson.

PITTSBURGH PLATE GLASS COMPANY, Cincinnati Branch: Patton's Sun-Proof Paints. Represented by E. C. Dann, W. J. Dermody and E. W. Keisker.

PITTSBURGH STEEL COMPANY, Pittsburgh, Pa.: Wire Fences. Represented by E. S. Jordan, C. D. James and G. W. Fisher.

RACINE-SATTLEY COMPANY, Racine, Wis.: Agricultural Implements. Represented by Indianapolis branch.

ROBESON CUTLERY COMPANY, Rochester, N. Y.: Cutlery.

ROCHESTER STAMPING COMPANY, Rochester, N. Y.

ROSS CARRIAGE MFG. COMPANY, Union City, Ind. Represented by W. H. Winsted.

ROYAL SPRING COMPANY, Clinton, Iowa: "Royal Spring" Fly Killer. Represented by Carroll E. Armstrong.

ST. LOUIS CORDAGE COMPANY, St. Louis, Mo.: Rope and Binder Twine. Represented by Will Cumback.

SARGENT PAINT & COLOR COMPANY, Indianapolis, Ind.: Paints. Represented by Harry Alsop and W. F. O'Brien.

D. M. SECHLER CARRIAGE COMPANY, Moline, Ill.: Vehicles.

SECURITY LIGHTNING ROD COMPANY, Burlington, Wis.: Lightning Rods. Represented by C. F. Beardsley and L. G. Rickerd.

SEIDEL BUGGY COMPANY, Richmond, Ind.: Buggies and Wagons. Represented by Geo. E. Seidel and Arthur C. Hill.

SHARPLES SEPARATOR COMPANY, Chicago, Ill.: Cream Separators. Represented by W. E. Strowhuver and J. D. Woodruff.

SHELBYVILLE FILLER & COLOR COMPANY, Shelbyville, Ind.: Fillers, Stains and Colors. Represented by Harry De Prez, George Otto and John Reinbuset.

SHELBY SPRING HINGE COMPANY, Shelby, Ohio: Hinges. Represented by L. D. Malone and R. E. Murray.

SMITH MFG. COMPANY, Chicago, Ill.: Cream Separators and Gasoline Engines. Represented by D. H. Smith and J. D. Hobson.

SOUTHERN SEED COMPANY, Indianapolis, Ind.: Seeds. Represented by J. H. Spencer and O. J. Gudghe.

SPRING STEEL FENCE & WIRE COMPANY, Anderson, Ind.: Woven Wire Fence. Represented by W. F. Ashby, M. Reed and G. J. Derthed.

STANDARD METAL COMPANY, Indianapolis, Ind.: Tin Plate, Sheet Iron and Metals. Represented by W. M. Husbands and Joseph F. Jewar.

STANDARD LIGHTING COMPANY, Cleveland, Ohio: Gas Ranges. Represented by T. J. Moran and J. A. Alexander.

STAVER CARRIAGE COMPANY, Chicago, Ill.: Farm Wagons. Represented by W. W. Yager.

SUPERIOR DRILL COMPANY, Springfield, Ohio: "Superior" Disk Drills. Represented by W. Allison Scott, A. B. Barnard and O. F. Clevenger.

TANNER & CO., Indianapolis, Ind.: Tin Plate, Sheet Iron and Metals. Represented by J. C. Henley, N. P. Apgar and Geo. Sommer.

R. N. THOMAS, Shenandoah, Iowa: Corn Huskers. Represented by J. N. Skaggs.

VAN CAMP HARDWARE & IRON COMPANY, Indianapolis, Ind. Represented by M. H. Lewis, W. R. Walden and Charles Catlin.

VEHICLE APRON & HOOD COMPANY, Columbus, Ohio; Horse Covers. Represented by Wm. Bradford.

VERMONT FARM MACHINE COMPANY, Bellows Falls, Vt.: "United States" Cream Separators and Dairy Specialties. Represented by J. A. Hurley.

WAHLE FOUNDRY & MACHINE WORKS, Davenport, Iowa: "Snowball" Washing Machines. Represented by Herman H. Wahle.

WHITE LILY WASHER COMPANY, Davenport, Iowa, and Toledo, Ohio: Washing Machines. Represented by A. F. Victor and A. Ruhling.

WHITESIDE WHEEL COMPANY, Indianapolis, Ind.: "Ste-el-astic" Wheels. Represented by H. C. Churchman and J. F. Lugenbel.

WINTER & HILL, Indianapolis, Ind.: Implements. Manufacturers' agents.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price list in this column.

ROCKWELL MFG. COMPANY, Malvern, Ark.: Illustrated catalogue of high quality Screen Goods, including Screen Doors, adjustable Window Screens, knocked down Frames and made to order work.

BUCHER & GIBBS PLOW COMPANY, Canton, Ohio: Illustrated catalogue, No. 108, of Plows, Harrows, Land Rollers, Cultivators, &c.

CHAMPION SAFETY LOCK COMPANY, Geneva, Ohio: Large and artistic catalogue covering a handsome line of Builders' Hardware, including Push Plates, Chest Handles, Spring Hinges, Door Pulls, Sash Locks and Lifts, Drawer Pulls, Mortise Door Bolts, Cupboard Turns and Catches, &c.

NEW YORK HOUSE FURNISHING GOODS COMPANY, 93 Reade street, New York: Illustrated circulars referring to Dangler Gas Cookers, Diamond Nozzles, Wilson Bread Toasters, &c.

SPILLERT & SPRINGER, 106 Chambers street, New York: Circular illustrating Plush and Morocco Cases, Sample Rolls, &c.

ROCK ISLAND TOOL COMPANY, Rock Island, Ill.: Pamphlet catalogue D, 37 pages, devoted to a line of Automatic Swivel Type Vises of various patterns in connection with Portable Iron Tool and Vise Stands. The illustrations include views of the Tools complete, and in addition show the disassembled parts, each of which is numbered for convenience in ordering repairs.

IDEAL MFG. COMPANY, Detroit, Mich.: Pamphlet catalogue No. 13, illustrating an extensive line of Gas Stoves and Ranges. Particular attention is directed to the Ideal Patent Centrifugal Burner and the Ideal Safety Oven Lighter. The Ideal Independent Gas Water Heater is also shown, together with a few plumbing specialties.

GOODELL-PRATT COMPANY, Greenfield, Mass.: Supplement to No. 8 catalogue, illustrating the complete Massachusetts Tool Company line, for which it will hereafter

act as exclusive sales agent; in fact, it is the Precision Tool department of the Goodell Pratt Company. The line includes Calipers, Micrometers, Steel Rules and Straight Edges, Gauges, Protractors, Dividers, &c.

De Kalb Fence Company, De Kalb, Ill.: A series of post cards containing artistic photographs of farm scenes, including views of Fences made of De Kalb Field, Hog and Poultry Wire.

Flexible Steel Lacing Company, Chicago: Illustrated price-list with cards, testimonials, &c., referring to Flexible Steel Belt Lacing.

Rock Island Tool Company, Rock Island, Ill.: Illustrated Catalogue D referring to Vises, Repair Parts, &c.

C. J. Root Company, Bristol, Conn.: Illustrated catalogue for 1908 referring to Counting Machines for various purposes.

Whitman & Barnes Mfg. Company, Chicago: Catalogue No. 66, a handy pocket edition, referring to Diamond Twist Drills, Reamers, Wrenches, Cotters, &c.; also Catalogue No. 67 referring to Economy and Norka High Speed Drills and Chucks.

A MODEL SHOW WINDOW IN A FACTORY.

THE immense value of attractive window displays has been proved by the Wire Goods Company, Worcester, Mass., by means of a model window erected in one of the company's factory rooms and the application of results of studies carried on therein to the windows and counters of customers. The model window is 15 ft. long, 8 ft. deep and 10 ft. high. It is framed in black, and the background is of the same somber shade, that contrasts may be well defined. It was originally built for the purpose of displaying the company's line of Wire Hardware and Kitchen Wire Goods to the company's salesmen at a convention of representatives to better their knowledge of means of increasing sales. An expert window dresser arranged some of the displays, and employees of the company arranged others. The idea has now been carried by the company into the windows and stores of its customers. Sales by the manufacturer's customers, where the line has been featured in window and counter displays, have proved that an enormous impetus may be given in this manner, a fact that few enterprising merchants would doubt for a moment.

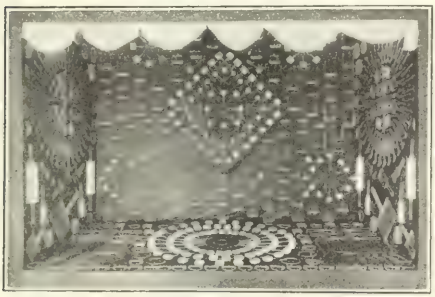


Fig. 1.—Interesting Conventional Design of Wire Goods

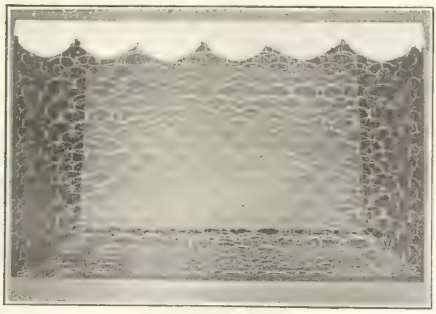


Fig. 2.—Interior Woodwork Devoted to Garment Hangers.

It will be noted that Wire Goods permit of interesting conventional design. Fig. 1 shows an instance of this. The central motif is the circular design of Soap Holders on the floor, flanked with a miscellaneous but symmetrical arrangement of Tea Pot Stands, Meat Rests, Kitchen Forks and Sad Iron Stands. The rear panel has as its central design a tilted square of Soap Holders, with an assortment of Soap Brackets as fillers. The designs of the side panels are alike, being composed of Kitchen Forks, Tea Pot Stands and Sad Iron Stands, with a line of Broilers beneath to fill in the space. Such a window on the street end of a store could not help but attract attention. Beneath is the truth: "Most people are inveterate, unconscious window gazers."



Fig. 3.—Harmonious Arrangement of a Large Variety of Wire Goods.

The same window arrangement, with a curtain of Garment Hangers next the glass was also made. From the street the vision of the window gazer must pass the skeleton of Wire Hangers before they can take in the remainder of the display. The tinge of novelty must have its effect in attracting attention.



Fig. 4.—How Counter Displays May Be Arranged.

In Fig. 2 the entire window is devoted to Garment Hangers, arranged in a series of curtains, impressive in number. Yet the approximate value of the goods shown, reckoned in price to the merchant is but $25, while the cost of the goods shown in Fig. 1 is $30.

In Fig. 3 there is not the same attempt to produce dominating features in design in the way of large figures, but there is a harmonious arrangement of a great deal of goods. The art of displaying this class of goods in store interiors has been studied in the same room with the model window, one idea of such an arrangement being shown in Fig. 4.

In connection with the company's efforts in creating an interest in window display on the part of its customers a pamphlet entitled "Display Suggestions" has been issued, containing halftones showing different ideas of arrangement, together with a synopsis of the goods included in each design.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM GEO. C. HANSON, Portland, Ore., who has succeeded Caister & Hanson in the Hardware, Stove, Paint and Sporting Goods business.

FROM PERKINS HARDWARE & ROOFING COMPANY, Youngstown, Ohio, which is planning to build a new store, 40 x 85 ft.

FROM JERRARD & COVINGTON, Bemidji, Minn., successors to Jerrard Plumbing Company, who will handle Shelf Hardware, Stoves, Paints and Sporting Goods in addition to doing plumbing and heating.

FROM ROCKLAND HARDWARE COMPANY, Rockland, Maine, whose store and stock of Hardware, Stoves, Paints and Sporting Goods was recently damaged by fire to the extent of about $7000.

FROM SANDOZ & BARTA, Verdigris, Neb., who have succeeded to the Hardware, Stove, Implement, Paint and Vehicle business of Schmidt & Sandoz.

FROM NORTHERN HARDWARE COMPANY, Petoskey, Mich., which has been reorganized with a number of new stockholders, and will be managed by W. P. B. Wachtel.

FROM ALLEN-MOSS HARDWARE COMPANY, Henderson, N. C., which has been incorporated with an authorized capital of $25,000 by S. H. Allen, G. B. Allen and W. E. Moss.

FROM CHARLES J. KIMBALL, JR., Green Bay, Wis., who has bought the business of A. Kimball Hardware Company, which recently effected a satisfactory settlement with its creditors.

FROM LEHMAN HARDWARE & IMPLEMENT COMPANY, Newton, Kan., which was recently burned out, with a loss on building of $15,000 and on stock of $35,000. Both were about two-thirds covered by insurance. A new store building and large warehouse are now under way, which will give the company one of the finest Hardware and Implement establishments in its section.

FROM NEFF HARDWARE COMPANY, Wheeling, W. Va., handling General and Builders' Hardware at wholesale and retail. E. W. S. Neff, for 11 years traveling salesman with the Ott-Heiskel Hardware Company, Wheeling, has recently started this business.

FROM A. T. STEWART HARDWARE COMPANY, 105 East Lake street, Chicago, Ill., handling Shelf Hardware, Sporting and Athletic Goods, &c., at wholesale.

FROM E. H. SCOTT, who has recently purchased the general Hardware and Farm Implement business of J. H. Wagner in Ischua, N. Y.

FROM W. O. HARDWARE COMPANY, San Francisco, Cal., which has moved into its own new store on Sixteenth, Market and Noe streets. The company will be pleased to receive catalogues relating to Stoves, Household Goods, general Hardware, Paints, Oils, Glass, &c. The new building is the largest Hardware store in that part of the city, and a $10,000 stock will be carried.

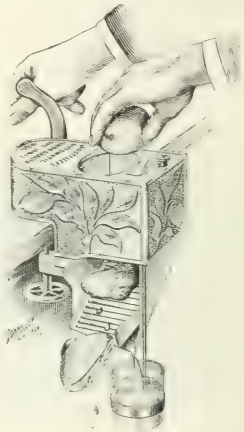
Misco Anti-Friction Metal.

The Milwaukee Tack Company, Milwaukee, Wis., has arranged to handle the entire output of the Milwaukee Smelting Company, whose metals are put out under the brand Misco Anti-Friction Metal, as illustrated herewith. Besides its regular brands, the company is prepared to furnish any special brand of babbitt or bearing metal that may be desired for use or sale.

MISCO ANTI FRICTION METAL

Mosteller Automatic Lemon Squeezer.

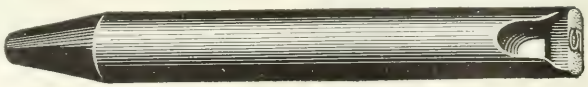
The Mosteller Mfg. Company, 5 West Madison street, Chicago, is offering the automatic lemon squeezer here illustrated. It consists of knife, squeezer and strainer all combined, every part being accessible and easily detached or adjusted. There are no bearings in contact with the acid, no wood which might sour and no springs. The machine is represented as being strong, durable, sanitary and ornamental. Pressure blocks are adjusted with rubber cushions, so as to be adapted to large or small fruit, getting the juice with one movement of the lever without any of the bitter parts of the peel. This, together with pulp and seeds, is ejected without handling, and the juice is strained into the proper receptacle. It is only necessary to drop a whole or half lemon, lime or orange into the box, pull the lever and the machine does the squeezing. The maker claims that it will effect a large saving in lemon bills.



The Mosteller Automatic Lemon Squeezer.

The Buchanan Foundry Company's Sash Weights.

The Buchanan Foundry Company, Lebanon, Pa., is offering the new style sash weight shown herewith. The diameter of the weights is uniform throughout and the ends taper so the weights pass each other in the box. The weight of each casting is plainly marked on the end of each by raised Arabic figures. This is done by means of a dry sand core and is a feature that will be protected by patent. The weights are referred to as being round and true, with no lumps or fins, and when piled in bins, with the eye end out, the sizes desired are easily selected.



The Buchanan Foundry Company's Sash Weights.

Hydro-Pneumatic Low Down Pumps.

In Figs. 1 and 2 are shown two of the types of hydro-pneumatic low down pumps put on the market by F. E. Myers & Bro., Ashland, Ohio. The pumps are precisely alike, except in the application of power, Fig. 1 showing the usual construction and Fig. 2 illustrating the patent

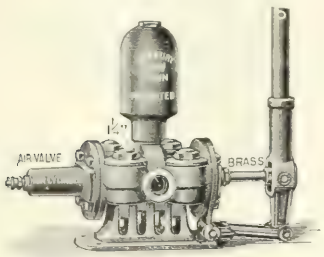


Fig. 1.—Myers Hydro-Pneumatic Century Low Down Pump, No. 286A.

ratchet head applied to the horizontal pump. The pump shown in Fig. 2 is also furnished without the air valve. It has been demonstrated, it is explained, that the ratchet movement under the same pressure will operate with from 25 to 40 per cent. less power, or a 3-in. pump with ratchet movement can be operated just as easily as a 2½-in. cylinder pump with the lever movement. The pumps are equipped with brass valve seats, rubber faced valves and brass covered piston rod, and are especially designed to operate in connection with the hydro-pneumatic cylinder for pumping air. The pumps are made with liberal flanges, strongly built in all parts for heavy usage and tested under pressure before leaving the fac-

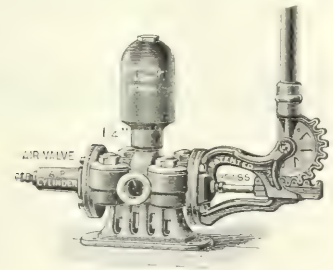


Fig. 2.—Myers Hydro-Pneumatic Cog Gear Century Low Down Pump, No. R286A.

tory. The brass lining, which is removable, extends out flush with the head of the cylinder and is concave at the ends, so that the plunger can be readily removed and easily replaced, without the difficulty in getting same to register. The suction and discharge valves are all accessible by removing individual caps, which gives the operator free access to all the valves without disturbing either the suction or discharge pipe, or making it necessary to remove any of the parts except the cap referred to. The air cylinder, 1¼ in. in diameter, is brass lined and has an independent plunger and air valve, so that the pumping of air does not in any way affect the water capacity of the pump, or in other words, the air pump is distinctly an individual feature, having its own plunger and check valve. The air is forced into the body of the pump and conveyed through the discharge pipe into the pressure tank, and is so arranged that by turning the cap on the valve the operator can pump air as well as water, or by a reverse turn of the cap discontinue the air supply. These pumps are adapted to filling high pressure tanks as used in private water works systems for town and farm residences, as shown in Fig. 3. The pressure tank is placed in the basement of the building, where the water will not freeze, and the weight will not cause any damage to the timbers of the house. The pump is piped to the cistern or spring. The discharge pipe is connected direct to the tank, using a check valve on the pipe between the pump and the tank to retain the pressure in the latter. The water being pumped directly into the tank compresses the air, which in turn serves as a reserve power to drive the water to any part of the house through

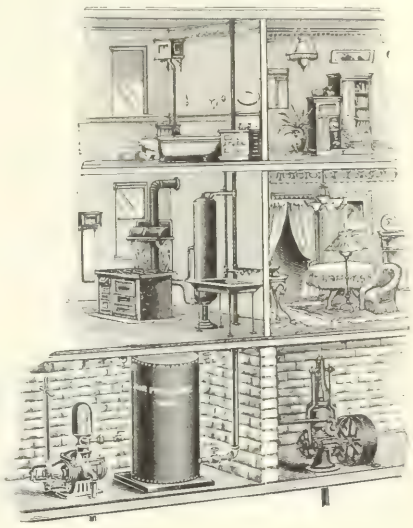
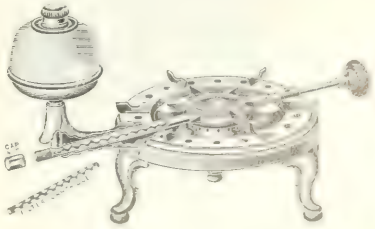


Fig. 3.—Water Works System in Private House.

the pipes placed for this purpose. The pump shown at the lower right hand corner of Fig. 3 is the firm's bulldozer working head, which is used in connection with its hydro-pneumatic cylinder for deep wells. The pump shown at the lower left hand corner is a hand horizontal pump for shallow wells or cisterns. The company also makes a power bulldozer pump of the horizontal type, which is used for shallow wells. The two pumps are intended to indicate the use for either shallow or deep wells.

The Manning-Bowman Alcohol Gas Stove.

Manning, Bowman & Co., Meriden, Conn., have added to their line of stoves a denatured alcohol gas stove, of the

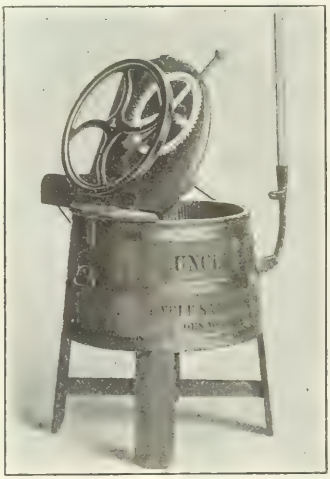


single burner type, which is shown in the accompanying illustration. The alcohol in the font feeds to the filter tube, in which is a cartridge of asbestos. The cartridge acts as a filter for the fuel, and also serves to regulate the flow of alcohol to the burner. In starting the lamp, free flow of fuel to the space around the burner is given by means of the valve handle, enough being admitted so that when ignited it heats up the burner, converting its

contents into alcohol gas, which is soon burning, and which continues to manufacture its gas without further assistance. The resultant heat, it is stated, is three times that of the regular chafing dish lamp, yet the burner may be regulated to a simmering flame. The flame has no odor nor smoke. The stove is made with both double and single burner, and is nickeled. With its complete outfit, consisting of chafing dish, saucepan, coffee percolator, cutlet dish, tea kettle, toaster and tea pot a complete dinner may be prepared on the dining table.

Uncle Sam Washing Machine.

Under the trade name of Uncle Sam, the Uncle Sam Washer Company, Des Moines, Iowa, is manufacturing the hand lever washing machine here illustrated. The distinctive features claimed for the washer are its ease of operation and the simplicity of its mechanism. All of the working parts are mounted on or attached to the cover, thereby relieving the bottom of the tub from strain. Motion is obtained through a set of gears driven by a vertical lever attached to the side of the tub. The momentum of the drive is maintained by a flywheel mounted on the main shaft above the gears. A single pull or push of the lever is sufficient to produce several revolutions of the flywheel, and when full speed has been obtained but little power is required to keep it in



Uncle Sam Washing Machine.

motion. When it is desired to reduce the weight of the washer for convenience in moving, the flywheel can be easily removed. All bearings are easily accessible for oiling and can be reached without the necessity of tipping the tub. When the cover is raised the hinges are subjected to no strain because of the support furnished by the flywheel, which rests on a projecting shelf at the rear. The tub is corrugated on the inner sides, and is furnished with stake legs of Louisiana red cypress.

New Stratton Levels.

The accompanying illustrations represent new levels added to the line manufactured by Stratton Level Company, successor to Stratton Brothers, Greenfield, Mass. The carpenters' radial level, shown in Fig. 1, is designed for defining grades, pitches, skew backs, batter work or projections and diamond work, where accurate measurements are required. The level is simple and easily adjusted, either in degrees or in 16th parts of an inch to the foot departure from plumb or level. All parts are interchangeable and easily reached. The level is made in 26, 28, and 30 in. lengths. A lower priced level, No. 25, is made with the same attachment; also a level for masons' use, No. 9, with the same attachment, in 36 and 42 in. lengths. Fig. 2 represents a new line of Dandy levels, the one shown having adjustable level and plumb, brass end plates, mahogany finish, low cut side views and brass top plates. Cheaper grades of this level include Nos. 45, 50 and 55. The company has the exclusive agency in America for Wood's patent Cat's Eye level vial, shown in Fig. 3. It is an imported glass, the air bubble appearing like a cat's eye when reading; the liquid being yellow and the glass green. The combination is said to insure quick and accurate reading under all conditions, and is most easily distinguished in light and shade. The glasses are being used at present in the company's No. 1E and No. 4 levels. The level shown in Fig. 4 is distinctive in shape as well as a distinctively new line for the company. It has a heavy brass top plate, adjustable level and is 6 in. in length, and is full finished and not dipped. It can be used as a pocket level by mechanics, and being slotted it may be used on a square as a plumb. It is also adapted to the use of amateurs and in the household.

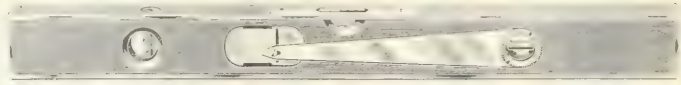


Fig. 1.—Carpenter's Radial Level No. 1F.



Fig. 2.—The Dandy Level No. 40.



Fig. 3.—Cat's Eye Level Vial.

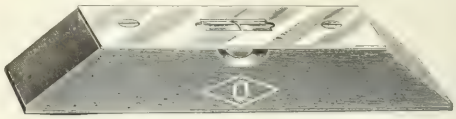


Fig. 4.—The Diamond Q Level.

H & R Target Grip.

The Harrington & Richardson Arms Company, Worcester, Mass., has put on the market a target grip for revolvers, resulting in a combination of a medium priced revolver with a perfect, full grip. The extension hard rubber stock is fitted to the frame, and by having the regular stocks (furnished extra) can be exchanged for pocket use. The target grip can be furnished on the company's Automatic, Police Automatic, Premier, Police Premier, Double Actions, Models 1904, 1905, 1906, and the Hammerless 38 caliber. It will soon be ready for the Hammerless 32 caliber.

Chicago Automatic Mouse and Rat Trap.

The Edwards-Hine Company, Grand Rapids, Mich., makes the self-acting mouse and rat trap illustrated herewith. Fig. 1 shows the exterior and Fig. 2 is a sectional view, indicating the method of operation. The rodent entering the trap causes the door to close, so that it must go forward up the wire covered passage to the balanced funnel. Once on the funnel the animal is by its own weight thrown into a tank of water. The movement of the funnel at the same time reopens the door and thus resets the trap. It is urged in favor of the trap that it catches continually, requires no looking after, mice are not frightened away by seeing the struggles of captured ones or by smelling their dead bodies, and it is economical, as the first cost is the only outlay.

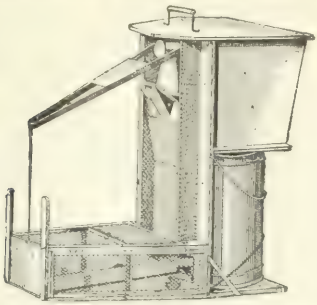


Fig. 1.—Chicago Automatic Mouse and Rat Trap.

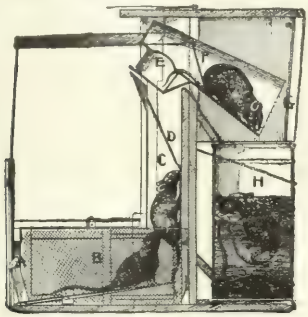
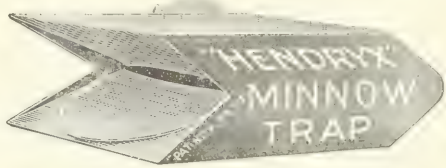


Fig. 2.—Sectional View of Trap in Operation.

The Hendryx Minnow Trap.

The A. B. Hendryx Company, New Haven, Conn., is offering the minnow trap shown herewith. It is constructed of galvanized iron and galvanized iron wire. A piece of galvanized iron extends across the top of the trap, under the wire, affording a place for the minnows to hide. A portion of a circular galvanized iron door is seen on the opposite side of the trap. This is hung on a pivot and covers a circular opening through which the hand may be passed to remove the imprisoned minnows. In the V-shaped opening in front is a bail by which the trap is carried. The trap is designed to be placed in the deepest part of a pool in a small stream, and can be used with or without bait.



The Hendryx Minnow Trap.

THE SHERWOOD METAL WORKING COMPANY, Syracuse, N. Y., has issued an illustrated catalogue devoted to all-metal frame adjustable window screens. These are designed to take the place of wooden screens for windows and are arranged to be used either under the lower sash or as permanent outside screens, in the latter case the screens being removed without disturbing the fastenings.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, State and Western	
Raw	@41
City, Boiled	44 @45
City, Raw	42 @44
Raw, Calcutta, in bbls	53 @
Lard, Prime, Winter	68 @75
Extra No. 1	51 @53
No. 1	47 @52
Cottonseed, Crude, f.o.b. mill	29 @29½
Summer Yellow, prime	39 @39½
Summer White	43 @43½
Yellow Winter	40 @42½
Sperm, Crude	75 @
Natural Winter	74 @
Bleached Winter	75 @
Bleached Winter, Extra	@
Tallow, Prime	58 @60
Whale, Crude	36 @
Natural Winter	40 @48
Bleached Winter	49 @51
Extra Bleached Winter	50 @
Menhaden, Brown, Strained	41 @42
Light Strained	41 @42
Northern	@
Southern	37 @
Cocoanut, Ceylon	6½ @ 7
Ceylon	8 @ 8¼
Cod, Domestic, Prime	42 @43
Newfoundland	44 @45
Red, Elaine	@
Saponified	5½ @ 6
Olive, Yellow	@
Neatsfoot, Prime	@58
Palm, Lagos	@15

Mineral Oils—

	₱ gal.
Black 29 gravity, 27@30 cold test	@
29 gravity, 15 cold test	13½@14
Summer	@
Colorless, light filtered	@
Dark, filtered	18 @19
Paraffine, 900 sp. gravity	@15
900 sp. gravity	13½@14
880 sp. gravity	@
Red	12½@14

Miscellaneous—

Barytes,	
White, Foreign	₱ ton $18.50@20.50
American, Ground	₱ ton 19.00@20.00
Off color	₱ ton 13.00@16.50
Chalk, in bulk	₱ ton 3.00@3.40
China Clay, Imported	₱ ton 11.50@15.00
Cobalt, Oxide	₱ 100 lb. 1.45@2.60
Whiting, Commercial	₱ 100 lb. 42@ .72
Gilders	₱ 100 lb. .55@ .60
Ex. Gilders	₱ 100 lb. .60@ .65

Putty, Commercial—₱ 100 lb

In bladders	$1.70 @1.85
In kits or tubs	1.20 @1.35
In 1 lb to 5 lb cans	2.05 @2.35
In 12½ to 50 lb cans	1.53 @1.90

Spirits Turpentine—₱ gal.

In oil bbls	50 @50½
In machine bbls	50½ @51

Glue—

	₱ lb
Cabinet	12 @15
Common Brown	9 @11
Extra White	18 @24
Fish, liquid, 50 gal. bbls., per gal.	60 @1.20
Foot, Stock, White	12 @15
Foot Stock, Brown	9 @11
German Common Hide	10 @12
German Hide	12 @18
French	13 @19
Irish	12 @16
Low Grade	10 @12
Medium White	14 @17

Gum Shellac—

	₱ lb
Bleached Commercial	24 @25
Bone Dry	@
Button	17 @
Diamond I	17 @
Lime Orange	@
A. C. Garnet	27 @
G. A. L.	22 @
Kala Button	@
D. C.	15 @
Octagon B	22 @
T. N.	24 @25
V. S. O.	17 @18

Colors in Oil—

	₱ lb
Black, Lampblack	12 @14
Blue, Chinese	@16
Blue, Prussian	32 @36
Blue, Ultramarine	12 @16
Brown, Vandyke	11 @14
Green, Chrome	12 @16
Green, Paris	@24
Siennas, Raw	12 @13
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, English white in oil	10½@10⅝
Lead, American White:	
Lots of 500 lb or over, in oil	@ 6½
Lots less than 500 lb, in oil	@ 7
Lead, White, in oil, 25 lb tin pails	@ 7½
Lead, White, in oil, 12½ lb tin pails	@
Lead, White, in oil, 1 to 5 lb	@
Lead, American. Terms: On lots of 500 lb, 4 months; on lots of 100 to 499 lb, 3 months; on lots of 25 to 99 lb, 2 months; on lots of 5 to 24 lb, 1 month; on lots of 1 to 4 lb, cash.	
Zinc, American, Dry	@
Zinc, French	@
Antwerp, Red Seal, dry	@
Antwerp, Green Seal, dry	10½ @
Paris White	@
Pure	@
Zinc, W. M. French, in Poppy Oil, Green Seal	@
Lots of 500 lb or over, in oil	@
Lots less than 500 lb, in oil	@
Zinc, W. M. French, in Poppy Oil, Red Seal	@
Lots of 500 lb or over, in oil	@
Lots less than 500 lb, in oil	@
Zinc, American, Red Seal, dry	@
Zinc, American, Green Seal, dry	@
Zinc, American, Paris White	@
Zinc, American, Pure	@
Zinc, American, Lead free, in oil	@
Zinc, American, Lead free, dry	@
Zinc, American, Lead free, in oil, grades, 1%, 25 bbls., 2%; 50 bbls., 4%	@

Dry Colors—

	₱ lb
Black, Drop	6@10
Blues, American	@

	₱ lb
Black Drop, English	5 @15
Black, Ivory	16 @20
Lamp, commercial	4 @ 6
Blue, Celestial	4 @ 6
Blue, Chinese	@
Blue, Prussian	@
Blue, Ultramarine	@15
Brown, Spanish	@ 1
Carmine, No. 40	$3.00@3.25
Green, Chrome, ordinary	3½@ 5
Green, Chrome, pure	17 @25
Lead, Red, bbls., ½ bbls., kegs	@ 6¾
Lampblack	@
Ochre, American, ₱ 100 lb	@
American, Golden	@
French	@
French, Lemon	@
Oxide, Metallic	@
Paris, Red	@
Orange	@
American	@
French	@
Vermilion, English	@
Vermilion, American	@
Vermilion, Chinese	@
Vermilion, American, No. 1	@
Vermilion, American, No. 2	@
Vermilion, English	@
Vermilion, American	@
Vermilion, Chinese	@
Yellow, Chrome	@
Yellow, Lemon	@
Yellow, Naples	@
American ₱ 100 lb, No. 2	.60@ .65
American, Light	@
American, Medium	@
American, Dark	@
Yellow, Ochre, French	@
Yellow, Ochre, American	@
Yellow, Mineral	@
Yellow, Orange Mineral	@
Orange Chrome	@
Orange Chrome, Lemon	@
Orange Chrome, Medium	@
Orange Chrome, Dark	@
Orange Mineral	@
Orange Mineral, Lemon	@
Orange Mineral, Medium	@
Orange Mineral, Dark

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓%
Nott's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—

Ferland Mfg. Co. Burton Anti-Rattlers, doz. pairs, Nos. 1, $0.75, 2, $0.60, 4, $1.00; 5, $0.50.
Ferland Quick Shifter, ℔ doz. pairs .....$2.00@$3.00

Anvils—American—

Eagle Anvils.....℔ lb @8½ ¢
Hay-Budden, Wrought.....9½@9¾ ¢
Trenton .....℔ lb 9½@9¾ ¢

Imported—

Swedish Solid Steel Sisco, Superior, ℔ lb .....10c@10½c
Peter Wright & Sons, ℔ lb, 84 to 349 lb. 11¢, 350 to 600 lb. 11½ ¢.

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....10%

Augers and Bits—

Com. Double Spur.....75@80%
Ironmaster Path., bright, 65&10@70%
Black Lip or Blued...65@66&5
Barrel Mod. Augers.....70%
Full Coil, 12-in. Twist.....40&10%
Irwin Auger and Car Bits.....40&5%
Ft. Washington Auger Co., Canada 45%
Forstner Flat Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, 25&5%
No. 30, R. Jennings' list.....50%
Russell Jennings.....25&10&2½%
L. Hommedieu Car Bits.....15%
Mayher's Countersunk Bits.....45%
Pugh's Black.....20%
Pugh's Jennings Pattern.....35%
Snell's Auger Bits.....60%
Snell's Ball Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's Cuttets, No. 1, ℔ doz $28; No. 2, $36 .....60&10%
Ford's, Clark's Pattern.....66⅔&5%
C. E. Jennings & Co., Steer's Pat...25%
Lavigne Pat., small size, $18.00; large size, $36.00 .....60&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz...$6.50@7.00
Ames .....25&10%
Universal 20%

Ship Augers and Bits—

Ship Augers.....40&10%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L. Hommedieu's 6%
Watrous' .....33⅓&7½
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdld, Shldered...gro.65@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdld, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com ..gro. $2.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes

Single Bit, base weights: Per doz
First Quality .....$1.75@3.00
Second Quality .....$1.25@1.50
Double Bit, base weights:
First Quality .....$7.00@7.50
Second Quality .....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles— *Iron or Steel*

Concord, Loose Collar...4½@5 ¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose....3¾@4¼¢
No. 1½ Com., New Style..4½@5 c
No. 2 Solid Collar.....4½@5 ¢
Half Patent.
Nos. 7, 8, 11 and 12..65@65&10%
Nos. 13 to 14.....65@65&10%
Nos. 15 to 18.....70@70&10%
Nos. 19 to 22.....70@70&10%

Boxes, Axle—

Common and Concord, not turned lb., 5@6¢
Common and Concord, turned. lb., 6@7¢
Half Patent.....lb., 9½@10¢

Bait— Fishing—

Hendryx:
A Bait.....20%
B Bait.....20%
Competitor Bait.....20&5%

Balances— Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chattillon's:
Light Spg. Balances.....50@50&10%
Straight Balances.....40@40&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb..... per lb., —@2½@2¾c

Towel—

No 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—

Scale Beams.....40%
Chattilon's No. 1.....50%
Chattilon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No 12 Wire Coppered ℔ doz. $0.80; Tinned.....$0.85
No. 11 Wire Coppered ℔ doz. $1.15; Tinned.....$1.20
No. 10 Wire Tinned.....℔ doz. $1.50

Beaters, Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200 Tumbler, $8.50; No. 202 Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.50

Bellows—

Blacksmith, Standard List..
Split Leather.....60&10@65%
Grain Leather.....50@50&10%

Hand—

Inch....6 7 8 9 10
Doz...$5.00 5.50 6.00 6.50 7.50

Molders—

Inch....10 12 14 16
Doz...$7.50 9.00 12.00 15.00

Bells— Cow—

Ordinary Goods...75&5@75&10&5%
High grade.....70&10@75%
Jersey .....75&10%
Texas Star.....50%

Door—

Home, R. & E. Mfg. Co's.....55&10%

Hand—

Polished Brass.....50&10@55%
White Metal.....50&10&5%
Nickel Plated.....50%
Novice 50%
Cone's Globe Hand Bells.....33⅓&5%

Miscellaneous—

Farm Bells.....lb., 2¼@2½¢
Church and School....6@6&5%

Belting— Leather—

Extra Heavy, Short Lap..65&5%
Regular Short Lap....60&10&5%
Standard .....70&5%
Light Standard.....75%
Cut Leather Lacing.....50&10%
Leather Lacing Sides, per sq. ft. 2½¢

Rubber—

Agricultural (Low Grade)..... 75@75&5%
Common Standard....70@70&10%
Standard .....70@70&5%
Extra .....60@60&10@10%
High Grade.....50&5@50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Spokes.....50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden.....75%@75&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....40%
Embossed 50%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):
⅝ × ¾ and smaller...70@70&5%
Larger and longer.....65&10%
Phila. Eagle, $3.00 list...80@—%
Bolt Ends.....65@65&5—%
Machine (Cut Thread):
⅜ × ½ and smaller...70@70&10%
Larger and longer.....65@70&5%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:
Inch....3 4 5 6 8
Per doz..$0.30 .35 .45 .60 .80
Cast Iron Spring Foot, Jap'd:
Inch.....6 8 10
Per doz.....$1.20 1.50 2.25
Cast Iron Chain, Flat, Japanned:
Inch.....6 8 10
Per doz.....$1.00 1.40 1.65
Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch.....6 8 10
Per doz.....$0.75 .95 1.25
Wrought Barrel Japd..80@80&10%
Barrel Bronzed.....80&10%
Spring .....70&10@70&10%
Shutter .....50&5@70&10&5%
Square Neck.....75@75&10%
Square .....70&10&10%
Ives' Patent Door.....55%
Ives' Wrought Metal.....45%

Expansion—

Richards Mfg. Co.....50&10%
Stewart & Remaine Mfg. Co.
Style No. 13, Double.....55%
Style No. 1, Single.....55%
Style No. 100, Dbl. Tap, Single.....55%
Tap, Screw.....65%

Plow and Stove—

Plow .....65&5@—%
Stove .....85@85&5%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Ellipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct. '84.....80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99....80%
Phila. Eagle, list Oct. 16,1884 .82½%
Union Nut Co.:
Tire Bolts.....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch	*1½*	*1¾*	*2*
Per doz.	*$5.50*	*5.60*	*6.40 8.00*
Inch		*2¼*	*2½*
Per doz.			*$8.65 11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 20&10 Langdon Arme .....15&10%
Perfection 40%
Seavey 45%

Braces—

Common Ball, American.....$1.50
Barber's .....50&10&10&10&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 413 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Ball Bearer.....70%
P., S. & W. Co., Peck's Pat..60&10%

Brackets—

Wrought Steel.....70&10@75&10%
Bradley Metal Clasp .83&10&10&10&5%
Griffin's Pressed Steel.....75@75&10%
Griffin's Folding Bracket.....70&10%
Taplin Victor Handy Egg Beater Bracket .....℔ doz. $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kalbourne Mfg. Co .....75&20%
Wire Goods Co.....75%

Buckets, Galvanized—

Mf'gr's list, price per gross.

Quart	*10*	*12*	*14*	
Water, Red	*23.35*	*28.00*	*32.00*	10&5%
Water, Hvy.	*43.00*	*46.00*	*52.00*	
Fire, Rd. Btm	*32.00*	*37.65*	*38.65*	
Well	*57.35*	*41.85*	*45.85*	

Bull Rings—See *Rings, Bull*

Butts— Brass—

Wrought, High List, Oct. 20&10&5%
Cast Brass, Tiebutts 40%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow....40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—

Fancy Light Narrow, Light Reversible .....70&5%
Reversible and Broad..70&5%
Loose Joint, Narrow, Light
Inside Bbnd, &c.....70%
Back Flaps, Table Chest..65%
Japanned
Light Narrow, Loose Pin, 30&5%
Light Narrow, Ball Tip.....70%
Broad .....40&5%
Staple Tipped.....70%
Ball Tipped.....70%

Extra 10@—

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900 ..... 30%
Hendryx Bronze, Series 700, 800 ..... 30%
Hendryx Enameled 35%

Calipers—*See Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb., 4½@4¾¢
Sharp, 1 prong, per lb., 4½@4¾¢
Burke's, Blunt, 4¾¢; Sharp, 4¾¢
Lautier, Blunt, 4¾¢; Sharp, 4¾¢
Perkins, Blunt, ℔ lb., 5¾¢; Sharp, 4.15¢

Can Openers—

See Openers, Can.

Caps, Percussion—

Eley's E. B ..... 52@55¢
G. D ..... per M 54@55¢
E. L ..... per M 40@42¢
G. E ..... per M 48@50¢
Musket ..... per M 62@63¢

Primers—

Berdan Primers, $2 per M ..... 20¢5%
Primer Shells and Bullets ..... 15¢10%
All other primers per M ..... $1.52@1.60

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

Blank Cartridges:

32 C. F., $5.50 ..... 10¢5%
38 C. F., $7.00 ..... 10¢5%
22 cal. Rim, $1.50 ..... 10¢5%
32 cal. Rim, $2.75 ..... 10¢5%
B. B. Caps, Rim, Ball, Sheyd. $1.90
B. B. Caps, Round Ball $1.40
Central Fire 25%
Target and Sporting Rifle ..... 15¢5%
Primed Shells and Bullets ..... 15¢10%
All other primers per M 50%
Rim Fire, Military ..... 15¢5%

Casters—

Bed ..... 65¢10%
Plate ..... 60¢5%
Philadelphia ..... 70¢10%
Ball Bearing .....
Gem Roller Bearing .....
Steel Gem .....
Standard Ball Bearing 45%
Yale (Double Wheel): Low list, 40¢10%

Cattle Leaders—

See Leaders, Cattle.

Chain, Proof Coil—

American Coil, Straight Link:

3-16	1/4	5-16	7-16	1/2	9/16
$8.65	6.05	4.90	4.25	4.15	4.10
5/8	3/4	7/8 to 1	1⅛ to 1¼ inch.		
$4.05	3.95	3.90	3.90		

In cash lots, deduct 25¢.

German Coil ..... 60%60&5%
German Pattern Coil:
6-0 to 1 ..... 70¢5%70¢10%
2 and 3 ..... 60¢10%60¢10&5%
4, 5 and 6 ..... 50¢10¢10¢10&5%

Halter—

Halter Chains ..... 60%60&7%
German Pattern Halter Chains, list July 24, '97 ..... 60¢10&5%
Covert Mfg. Co.
Halter ..... 35&5%

Cow Ties—

See Halters and Ties.

Trace, Wagon, &c.—

Traces, Western Standard. 100 pr.
6½—6 3, Straight, with rung $25.00
6½—6 2, Straight, with rung $29.00
6½—8 2, Straight, with rung $32.00
6½—10 2, Straight, with rung $37.00

NOTE—Add 20¢ per pair for Hooks. Twist Traces, add per pair for Nos. 2 and 3, 2½; No. 1, 5¢; No. 0, 4¢ to price of Straight Link.

Eastern Standard Traces, Wagon Chain, &c. ..... 60¢10%60¢10&5%

Miscellaneous—

Jack Chain, list July 10, '93.
Iron ..... 60¢10%
Brass 60%
Safety and Plumbers' Chain ..... 60¢10%
Gal. Pump Chain ..... lb., 4½¢5%
Covert Mfg. Co.
Breast, Halter, Heel, Rein, Stall Iron 40%
Oneida Community:
American Halter, Dog and Kennel Chains ..... 60&10%
Niagara Dog Leads and Kennel Chains ..... 45¢5&5%
Wire Goods Co.:
Dog Combs 70%
Iron Dip, Jointed Chains 50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain 60%
Peerless:
Bronze Chain, 60%; Steel Chain ..... 60&10%
Sash Chain Attachments, per set, 8¢
Aluminum Sash Ribbon, per 100 ft. ..... $1.25&$3.00
Sash Ribbon Attachments, per set, 8¢

Chalk—(From Jobbers.)

Carpenters' Blue ..... gro., 50@55¢
Carpenters' Red ..... gro., 45@47½¢
Carpenters' White ..... gro., 40@45¢

Checks, Door—

Perfection 45%
Dollman, per gro. $81.00
Russwin 35%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests with Tools 20
Youths' Chests with Tools 25
Gentlemen's Chests, with Tools 30
Farmers', Carpenters', etc., Chests, with Tools 40
Machinists' and Pipe Fitters' Chests, Empty 45
Tool Cabinets 50
C. F. Lamonds & Co.'s Mechanics' Tool Chests 50

Chisels—

Socket Framing and Firmer

Standard List 80%
Buck Bros. 30
C. E. Jennings & Co.:
Socket Firmer No. 10 ..... 25&7½%
Socket Framing No. 15 ..... 25&7½%
Swan's 60%
L. & I. J. White Co. ..... 30&10&5%

Tanged—

Tanged Firmers ..... 30¢5@35%
Buck Bros.
Jennings & Co.: Nos. 191, 181, 25%
L. & I. J. White Co. ..... 25&5%

Cold— lb.

Cold Chisels, good quality ..... 13@15¢
Cold Chisels, fair quality ..... 11@12¢
Cold Chisels, ordinary ..... 9@10¢

Chucks—

Almond Drill Chucks 35%
Almond Turret Six-Tool Chuck 40%
Jacob Pat. each $5.00 ..... 35&5%
Empire 25%
Ratcheffes 35%
Jacobs' Drill Chucks 35%
Ivers' Positive Drive 25%
Star Drill Chucks:
Independent Lathe Chucks 35%
Universal, Reversible Jaws 35%
Combination, Reversible Jaws 35%
Drill Chucks, New Model 25%
Starrett 15 Starrett Pat. 25 Positive Drive 10%
Planer Chucks 30%
Face Plate Chucks 35%
Standard Lathe Chuck .....
Improved Drill Chuck 45%
Cronin Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21 ..... 35%
Set Jl Combination, Nos. 23 and 24 .....
Geared Scroll, Nos. 33, 34 and 35 ..... 25%
Independent Iron, Nos. 18 and 318 ..... 35%
Independent Steel, No. 64 ..... 25%
Union Drill, Nos. 600, 00, 100, 102, 105, 104 ..... 35%
Union Czar Drill 25%
Universal, 11, 12, 16, 17, 13, 14, 15 ..... 40%
Universal, No. 44 ..... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50 .....
Steel Face Plate Jaws, Nos. 70 and 72 ..... 30%
Westcott Patent Chucks:
Lathe Chucks 50%
Little Giant Auxiliary Drill 50%
Little Giant Double Grip Drill 50%
Little Giant Drill, Improved 50%
Oneida Drill 50%
Sewell Combination Lathe 50%
Whitaker Mfg. Co.:
National Drill 25%

Clamps—

Adjustable, Hammers' ..... 20@20&5%
Carriage Makers', P., S. & W. Co. ..... 50&10%
Besly, Parallel ..... 33⅓&10%
Myers' Hay Rack 45%
Lineman's Swedish Neverturn 65%
Wood Workers, Hammers ..... 40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable 50%
Iwan's Champion, Stationary 40%

Sidewalk—

Star Socket All Steel ℔ doz $4.05 net
Star Swivel Steel ℔ doz $3.24 net
W. & C. Shank, All Steel, ℔ doz., 3⅛ in., $2.30, 5 in. $3.25

Cleavers, Butchers'—

Baxter Bros. 30%
Fayette R. Plumb 30%
L. & I. J. White Co. 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each $15.00
Chicago Belt Horse, each $20.00
Stewart's Enclosed Gear Horse, each $8.75
Stewart's Patent Sheep Shearing Machine, each $12.75
Stewart Enclosed Gear Shearing Machine, each..$9.75

Clips, Axle—

Ewart Stamped, list July 1, '95 ..... 50¢10&7½%

Cloth and Netting, Wire—

See Wire, &c.

Cocks, Brass—

Hardware List
Plain Bibb, Gate, Kerosene, Racking, Liquor, Bottling, &c. ..... 70@—%
Compression Bibb, 60¢10% —%

Coffee Mills—

See Mills, Coffee.

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's .....
Leather Walter B. Stevens & Son's .....

Compasses, Dividers, &c.

Ordinary Goods ..... 70¢10@75%
Wm. Schollhorn Co.:
Excelsior Dividers 60%
Lodi Dividers ..... 70&10%

Conductor Pipe,—

L. C. L. to Dealers:

	Galvanized		
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
7&5%	50¢10%2		47
Central:			
7&5%	55		47
Western and Southern:			
6&10	42½		42½
So. Western:			
6&5%	50¢10%		50¢10%

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.

See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:

	1	2	3	4	5
Galvanized	$1.50	$2.00	$2.25	$2.50	$3.00
Galvanized, Lined, side handles, Gal.	1	2	3	4	5
Each	$3.00	$3.25	$3.50	$3.75	$4.15
White Enameled					10
Agate Lined					10

Coopers' Tools—

See Tools, Coopers'.

Coopers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier ..... 23@25¢; *lighter than 3 lbs. to pair* ..... 26@29¢

Cord— Sash—

Braided, Drab ..... lb. 35¢
Braided, White, Com.: Nos. 8 to 12, 25¢; Nos. 5, 6&6½¢; Nos. 3, 4&4½¢; *in lots of 12 doz. or over, 1 cent less per pound.*
Cable Laid Italian, lb., No. 18.. 87¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common Indian ..... lb., 11@11½¢
Cotton Sash Cord, Unbleached ..... 20¢
Patent Russian ..... lb., 20¢
Cable Laid Russian ..... lb., 21¢
India Hemp, Braided ..... lb., 24¢
India Hemp, Twisted ..... lb., 18&11¢
Patent India, Twisted ..... lb., 17¢
Peer, Braided ..... No. 6 to 8, 25¢; 9 to 12, 26¢
Peerless, Braided, Nos. 8 to 12, 25¢; 6, 26½¢; 5, 27½¢.
Harris Cable Laid Italian, Nos. 7 to 10 ..... ℔ lb. 25¢
Pullman:
Wire Sash Cord 10%
Sash Cord Attachments, per doz. 10¢
Samson, Nos. 5 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spun Cord ..... 50¢
Massachusetts, White..℔ lb 40¢
Massachusetts, Drab ..... ℔ lb 45¢
Phoenix, White, Nos. 6 to 12, 27¢
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 43¢; B, White, 38¢; Italian Hemp, 40¢; Linen, 57½¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906 ..... 90@—%
Hendrick Standard Wire Picture Cord, old list, 85&10%
Turner & Stanton Co. Wire Picture Cord ..... 80&10%

Cradles—

Grain ..... 40¢12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber.
White and Purple, Indelible..$7.50
Blue, Red, Green, Yellow and Black $4.50
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indelible, $14.00; Black $10.00
Genuine Soapstone, Metal Workers', 5 in. x ¾ in. Round, $2.50; 5 in. x 1¼ in. Square $1.25; 5 x 1½ x 2 1/16 $2.50, 5 x 1¼ x 3 1/16 ..... $3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $5.50; Light ..... $5.

Crow Bars—*See Bars, Crow*

Cultivators—

Victor Garden 50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ℔ doz. $3.50
Star Extra Rogers & Hamilton and Silver $2.5
Wm. Rogers & Son $2.5

Cutters— Glass—

H. B. Mathews Co. .....
R. I. Tool Co. .....
H. Mc. .....
W. Tarrel .....

Meat and Food—

Enterprise Beef Shavers ..... 25&10%

Slaw and Kraut—

Henry Disston & Sons:
Saw and Kraut 35%
Saw Set 20%
J. M. Mac Mfg. Co.:
Slaw Cutters, 1 Knife..℔ doz. $3.00
Combined Slaw Cutter and Corn Grater $4.00

Tobacco—

All Iron, Cheap ..... doz. $4.50@$5.50
Enterprise .....
National, ℔ doz. $5
$18 .....

Diggers, Post Hole, &c.—

Disston's:
Rapid, ℔ doz., $24 ..... 25%
Samson, ℔ doz., $34.00 .....
Iwan's Improved Post Hole Auger.. 10%
Vaughan Patterns, Post Hole .....
Perfection Post Hole Digger, ℔ doz. .....
Split Handle Post Hole Digger, ℔ doz. .....
Hercules Pattern, ℔ doz. $10.00
Kohler's, ℔ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Reliable, $8.50; Pioneer $7.50
Nester Post Hole Diggers, ℔ doz., $24.00 .....

Dividers—*See Compasses*

Drawing Knives—

See Knives, Drawing

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers 35%
Sterling Wheel Dresser Cutters 35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines ..... $1.50@$1.75
Breast, Miners' Pat. .....
Breast, P., S. & W. .....
Goodell Automatic Drills..50&10@60&10%
Ratchet, Automatic Drill ..... A 12
Ratchet, Curtis & Curtis 25%
Ratchet, Parker's 40%
Ratchet, Weston's 45%
Ratchet, Weston's, Style H Improved 40%
Ratchet, No. 012 ..... 40%
Ratchet, Celebrated 40%
Ratchet, Whitney's, P., S. & W. .....
Whitney's Hand Drill, No. 1 ..... 50&5%
Adjustable, No. 19 ..... 30%

Twist Drills—

Bit Stock ..... 60¢10¢10@70%
Taper and Straight Shank ..... 60¢10¢60¢10¢5%

Drivers, Screw—

Screw Driver Bits, per doz. ..... 45¢10¢
Balsey's Screw Holder and Driver, ℔ doz., No. 5, 4 in., $7.50; No. 6, 6 in., $9 ..... 50%
Buck Bros.' Screw Driver Bits..... 30%
Champion .....
Diamond .....
Fray's Hol. Hdle Sets, No. 3, $12.50
Ford's Brace Screw Drivers. 40&10%
Kidd's Screw Driver Handles .....
Goodell's Auto..... 65¢65&10%
Mayhew's Brace Handle .....
Mayhew's Monarch 40%
Millers Falls, Nos. 1, 2, 3 ..... 20%
Millers Falls, Nos. 11, 12, 41, 42 ..... 15&10%
Smith & Hemenway Co., Neverturn, 66⅔; Elm'ra, 60% ..... 50&5%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, ... 40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized*	
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
7&5%	60¢10%		47
Central:			
7&10%	65		45
Western and Southern:			
7&5%	60&5		50
So. Western:			
7&10%	55¢10%		55¢10%

Terms,—2% for cash. Factory shipments generally delivered.

Note—Lower prices made by jobbers.

See also Conductor Pipe and Elbows.

Elbows and Shoes

Factory shipments, all territories:

No. 26	45
No. 25	45
No. 24	45
Copper	45

Elbows, Stove Pipe—

Edwards, Royal Blue ..... 10¢5&10%
Edwards, Royal Blue .....

Emery, Turkish—

	5 to 10 lb. cans.	50 to 220: Flour.
Kegs	7½¢	5½¢
½ Kegs	8	5¾¢
¼ Kegs	8½¢	6
10 lb. cans.		
10 in case	8½¢	7
10 lb. cans, less than 10	9	8
Less quantity	10	9

NOTE—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice

—See Squeezers, Lemon.

Fasteners, Blind—

Z ..... 50&10%
Wonder 40
Upson's Patents 40

Cord and Weight—

Iron and Tinned 33⅓

Corrugated—

Acme Corrugated Fasteners 75

Faucets—

Cork Lined ..... 50&10&60%
Metallic Key, Leather Lined,
Red Cedar ..... 70&10%
Petroleum ..... 70&10%
B. & L. B. Co.:
Metal Key ..... 60&10%
Star 60
West L. & ..... 55&10
John Sommer's Peerless Tin Key 40
John Sommer's Iron Tin Key 40
John Sommer's Victor Mill Key ..... 50&10
John Sommer's Duplex Metal Key 60
John Sommer's Duplex Leather 40
John Sommer's Metal Lined 60
John Sommer's Reliable Cork Lined ..... 50&10%
John Sommer's Chicago Cork Lined 60%
John Sommer's K. K. Cork Lined 50
John Sommer's No Brand, Cedar 50
John Sommer's Perfection, Cedar 40%
Self Measuring
Enterprise, ₱ doz $36.00 ..... 40&10%
Lance's, ₱ doz $36.00 ..... 40&10%
National Measuring, ₱ doz. $36.40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List Nov. 1, 1899.

Best Brands ..... 70&10%&75&10%
Standard Brands ..... 75&10%&80%
Lower Grade ..... 75&10%&80&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, 97 ..... 35 1-3&40%

Fixtures, Fire Door—

Allith Underwriters' Approved 50%
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 55
Pushbie Links, No. 96 50
Expansion Bolts, No 107 ..... 60&10%

Grindstone—

Net Prices:

Inch	15	17	19	21
Per doz.	$3.60	3.85	4.15	4.65

P. S. & W. Co 25
Reading Hardware Co 60%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato ..... 60&10%
Victor, Hay ..... 60&15&2½%
Victor, Manure 66⅔%
Victor, Ladder 66⅔
Champion, Hay 66⅔%
Champion, Header 66⅔%
Champion, Manure ..... 60&15&2½%
Columbia, Hay ..... 60&20%
Columbia, Manure 70%
Columbia, Spading ..... 70&12½%
Lawseye Wood Barley 40%
W. & C. Potato Digger ..... 60&10%
Acme Hay ..... 60&20%
Acme Manure, 4 tine ..... 60&10&5%
Dakota Header ..... 60&20%
Jackson Steel Barley ..... 60&20%
Kansas Header 65%
W. & C. Waverly Wood Barley 40%
Plated.—See Spoons.

Frames— Wood Saw—

White, S'g't Bar, per doz. 75@80¢
Red, S'g't Bar, per doz. $1.00@1.25
Red, Dbl. Brace, per doz. $1.40@1.50

Freezers, Ice Cream—

Qt.	1	2	3	4	6
Each	$1.25	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp	$2.75
Cotton	3.20
Waterproof Sgl. Taped	3.65
Waterproof Dbl. Taped	4.40
Waterproof Tpl. Taped	5.15

Extra 5¢ per 1000 ft.

Gates, Molasses and Oil—

Stebbins' Pattern ..... 75@80%

Gauges—

Marking, Mortise, &c. ..... 50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c ..... 50&50&10%
Disston's Marking, Mortise, &c 67½%
Wire, Brown & Sharpe's 33⅓%
Wire, Morse's 25
Wire, P., S. & W. Co 33⅓%

Gimlets— Single Cut—

Numbered assortments, per gro.

Nail, Metal, No. 1 ..... $2.00; 2. $2.30
Spike, Metal, No. 1 ..... $4.00; 2. $4.30
Nail, Wood Handled, No. 1 ..... $2.30; 2. $2.60
Spike, Wood Handled, No. 1 ..... $4.30; 2. $4.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co ..... 65@65&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush ..... 25¢&10@50%

Etwell's 40%

Grease, Axle—

Common Grade ..... *gro. $6.00@6.50*
Dixon's Everlasting light pails, ea 85¢; in boxes, ₱ doz., 1 lb. $1.20, 2 lb. $2.00
Hornet Hard Oil 25

Griddles, Soapstone—

Pike Mfg. Co ..... 33⅓&33⅓&10%

Grinders—

Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 0, 1, 1A $2.50, 10
$5.00 ..... 30%
Alundum Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A Combined, $6.50 30
Alundum Disc Grinders, each, $2.50 ..... 30%

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., $2.00 ..... 33⅓%
Richards Mfg. Co., Bi and Cycle Ball Bearing mounted 40

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... 60&5@60&10%
Covert Mfg. Co.:
Web ..... 30&2%
Jute Rope 35%
Sisal Rope 35%
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am. Cord and Halters ..... 40@40&5%
Am. Cow Ties ..... 45@50%
Niagara Coil and Halters ..... 45@50&5%
Niagara Cow Ties ..... 45&5@50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists' ..... 55&10@55&10&5%
Heller's Farriers' ..... 40&5@40&10&5%
Royce, Seth & Wilcox Co.:
Crucible Steel 50
Farriers ..... 10&10&5
Riveting 50
Machinists', revised list ..... 60&5%
Blacksmiths' ..... 50&5
Fayette R. Plumb:
A, E Nail ..... 40&2½&40&12½%
Eng. and B. S. Hand ..... 50&10&5&60&5%
Machinists' Hammers ..... 60@60&10%
Rivet and Tinners' ..... 40&12½&40&12½&5%

Heavy Hammers and Sledges—

Under 3 lb., per lb. ..... 50¢...50&10%
3 to 5 lb., per lb. ..... 50¢...80&10%
Over 5 lb., per lb. ..... 30¢...80&10%
Over 5 lb., per lb. ..... 30¢...80&10&10%

Handles—

Agricultural Tool Handles—

Fork, Hay, &c. ..... 60&10@60&10&5%
Hoe, Rake, &c. 40%
Fork, Shovel, Spade, &c.:
Long Handles 40%
D Handles 40%

Cross-Cut Saw Handles—

Atkins' 40%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—

Auger, assorted ..... *gro. $3.00@$3.50*
Brad Awl ..... *gro. $1.65@$1.75*
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory ..... *$2.15@2.40*
Socket Firming, Apple, $1.75@ $1.95; Hickory ..... *$1.60@$1.75*
Socket Framing, Hickory,
$1.60@$1.75
File, assorted ..... *gro. $1.30@$1.40*
Hammer, Hatchet, &c.
60¢&10@60¢&10&5%
Hand Saw, Varnished, doz. 80&85¢; Not Varnished ..... *45@75¢*
Plane Handles:
Jack, doz. 80¢; Jack, Bolted 75¢
Fore, doz. $1.54; Fore, Bolted 90¢
Chapin-Stephens Co.:
Carring Tool ..... 30&30&10%
Chisel ..... 60&60&10%
File and Awl ..... 60&60&10%
Saw and Plane ..... 30&30&10%
Screw Driver ..... 30@30&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 15&10%
Nicholson Simplicity File Handle ₱ gro. $0.85@$1.50

J. L. Osgood:
Indestructible File and Tool ₱ gro., No. 00, No. 2 to 10, No. 3, $9.00; No. 4, $9.50, No. 5, $10.00 ..... gro. lots 10%

W. A. Zelnicker Supply Co.:
Hammer, ₱ doz. 12 in $2.00
14 in., $2.00; 16 in., $2.30; 18 in., $2.50; 20 in., $2.70; 22 in. $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, ₱ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval 36 in., $4.00; octagon, 36 in., $4.00.
Axe ₱ doz. 28 to 34 in., $5.60; 36 in., $5.80.
Adze, ₱ doz., 36 in., $5.80; 36 in., $7.80.
Pick, ₱ doz., R. R., 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ₱ doz., 12 to 14 in., $2.00.

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable, Nos. 1 and 2; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door 50%

Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 65&2½%
Roller Bearing ..... 75&2½%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00 ..... 60&10%
Roller Bearing, No. 11, $15.00, 60&10%
Roller Bearing, Ex. Hy No. 22, $18.00 ..... 60&10%
Bull Dog, $24.00 ..... 70%
Lane Bros. Co.:
Parlor, Ball Bearing, Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard ..... 60&10%
Hinged ..... net 50
Covered ..... 60&5
Special ..... 70&5
Lawrence Bros.:
Advance ..... 55&10%
Cleveland ..... 70&10%
Clipper, No. 75 ..... 60%
Crown ..... 55&10%
Cyclone, No. 40 ..... net $9.00
Tandem, No. 50 ..... net $7.50
New York ..... 55&10
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2 ..... 70%
Anti-Friction 60
Hinged Hangers, King Charm 60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3 ..... $2.25
Roller B'r'g St'l Track, No. 12 ..... $2.20
Roller B'r'g St'l Track, No. 13 ..... $2.50
Roller B'r'g, Nos. 39, 41, 43, 50&7½%
Hero, Adj. Track, No. 19 ..... 50&10%
Adjustable Track Tandem Trolley Track, No. 16 ..... 50&10%
Seal, Steel Track, No. 8 ..... $2.25
Auto Adj., No. 22 ..... 50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150 ..... $2.50
Safety Underwriters F. D. No. 101 50
Tandem No. 44, 2½ and 3 ..... 60&10%
Palace, Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track, No. 122 ..... 50&10%
Ives' Wood Track No. 1 ..... $2.25
Trolley D. No. 29 ..... 50&10
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2, 70&7½%
Anti-Friction, No. 42; No. 44, sizes 2½ and 3 ..... 60%
Hinged Tandem No. 48 ..... 60&5%
Folding Door B. B. Swivel No. 135 ..... 40%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing ..... 50&15&10&5%
Myers' Stayon Hangers 60%

Hangers— Garment—

Pullman Trouser, ₱ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $9.00; Garment Clamp Rods, Round Nickeled, per gro. $10.50; Garment Hanger Loops, Round Nickeled, per gro $10.50
Victor Folding ..... ₱ gro. $9 80

Gate—

Myers' Patent Gate Hangers, ₱ doz. net $4.80

Joist and Timber—

Lane Bros. Co 30%

Hasps—

Griffin's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, ₱ doz. 60%

Hatchets—

Regular list, first qual. ..... *40&2½&@—*
Second quality ..... *50&5%@—*

Heaters, Carriage—

Clark, No. 5 $1.15; No. 5B, $2.00; No. 3 $2.25; No. 3D $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50 ..... 25%
Clark Coal, ₱ doz., $0.75 ..... 20%

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind:
(Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	3	5
Doz. pair	$0.75	1.35	2.70

Mortise Shutter:
(L. & P., O. S., Acme, &c.)

No.	1	1½	2	2½
Doz. pair	$0.70	.65	.60	.55

Mortise Reversible Shutter (Buffalo, &c.):

No.	1	1½	2
Doz. pair	$0.70	.65	.60

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Charles Parker Co ..... 70&75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%

Extra 5&10% often given.

Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00 ..... 20%
Reading Hardware 60%
Stanley's Steel Gravity Blind Hinges, No. 164½, ₱ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter ..... 75&5%
Acme, Lull & Porter 75
Queen City Reversible 75%
Shepard's Noiseless, Nos. 60, 65, 55 ..... 75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&5%
Tip Pat'n, No. 1 ..... 75&10%
No. 3 ..... 75&5%
Buffalo Gravity Locking, Nos. 3 & 5 ..... 70&5 &3
Shepard's Double Locking 75%
Champion Gravity Locking ..... 75&5%
Pioneer ..... 75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with L't'chs.	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	.85

New England:

With Latch	doz.	@$2.00
Without Latch	doz.	@$1.60

Reversible Self-Closing:

With Latch	doz.	@$1.75
Without Latch	doz.	@$1.35

Western.:

With Latch	doz.	$1.75
Without Latch	doz.	$1.15

Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 ..... 70%

Pivot Hinges—

Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—

Holdback, Cast Iron ..... *$6.75@$7.00*
Non-Holdback, Cast Iron ..... *$6.50@$6.75*

J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 40%
Bardsley's Patent Checking 33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor 40%
Bommer Spring Hinges 40%
No. 999 Wrot, Steel Hold Back, ₱ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor 50%
Gardner City Engine House 50%
Keene's Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Malleable 25%
American 30%
Columbia, ₱ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ₱ gr. $12.00
Columbian Hinges ..... 60&10%
Gem, new list 30%
Clover Leaf ..... ₱ gr. $12.00
Oxford, new list 30%
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co., Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door ..... ₱ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door 25%
No. 777, Sheet Steel Holdb'k, ₱ gr. pr $9.00
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓%

Extra 10% often given on most of these Hinges

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges	50&10%
Heavy Strap Hinges	60&5%
Light T Hinges	50%
Heavy T Hinges	40%
Extra Heavy T Hinges	50&10%
Hinge Hasps	33⅓%
Cor. Heavy Strap	60&5%
Cor. Ex. Heavy T	50&10%

Extra 10&7½%

Screw Hook and Strap,
6 to 12 in., lb. 3½¢
14 to 20 in., lb. 3¼¢
22 to 36 in., lb. 3½¢

Screw Hook and Eye:
⅜ to 1 inch ..... *lb. 6½¢*
1¼ inch ..... *lb. 7½¢*
1½ inch ..... *lb. 8½¢*

Extra 10&7½%

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers ..... 30&2%

Hods— Coal—

M'f'gr's list, price per gross.

Inch	15	16	17	18
Galv. Open	$3.35	$39	$42	$46
Jap. Open	26	28	31	35
Galv. Funnel	43	48	52	56
Jap. Funnel	33	36	39	43

10&5%

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick, No. 162 ..... each $1.05
Steel Mortar, No. 158 ..... each $1.35

Hoes— Eye—

Scovil and Oval Pattern ..... *60¢&10@60¢&10%*
Grub, list Feb. 28, 1899 ..... *70¢&10@75¢&10%*

D. & H. S. 25%
Am. Fork & Hoe Co. (Seven Pat. Hdle) ..... 60 j.

Handled—

NOTE — Manufacturers are selling from the list of September 1, 1904, but during season they shall recognize the goods being sold at net prices.

Cook's Wrenches, No. 1 Set, No. 2 Set, Star Double Bit..... $ 20
Ft. Madison Cotton Hoe..... 5&10%
Ft. Madison Crescent Cultivator Hoe, ₱ doz..... 5&10%
Ft. Madison Matt & Hoe, ₱ doz..... 5&10%
Regular Weight ..... ₱ doz. $4.25
Dandy ..... ₱ doz. $4.75
Ft. Madison Sprouting Hoe, ₱ doz..... 5&10%
Ft. Madison Diamond Hoe, ₱ doz..... 5&10%
Kratsinger's Cut Easy..... 5&10%
Warren Hoe..... 5&10%
B. & B. 6 in. Cultivator Hoe..... 5&10%
B. B., 6 in. ..... ₱ doz. $4.25
Acme Weeders ..... ₱ doz. net, $1.65
W. & C. Little Giant Handle Hoe, ₱ doz. $2.50

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ₱ doz. $24.00 ..... 45&10%

Door—

Bardsley's, Iron, ₱ doz.; Brass and Bronze 50%
Empire 50%
Pullman 50%
Reynolds Mfg. Co.'s, No. 127, Ever Ready, Iron, No. 128, Iron, Safety Grip 50%
Superior 33⅓%

File and Tool—

Nicholson File Holders and File Handles ..... 33⅓&10%

Fruit Jar—

Triumph Fruit Jar Holder, ₱ gross, $10.50; ₱ doz. $1.25

Trace and Rein—

Fernald Double Trace Holder, ₱ doz. pairs $1.25
Dash Rein Holder, ₱ doz. pairs..$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50¢; German 50%

Hooks—Cast Iron—

Bird Cage, Reading..... 40%
Clothes Line, Reading Iron..... 40%
Coat and Hat, Reading ..... 45&10%
Coat and Hat, Wrightsville..... 60&5
Harness, Reading List..... 40%

Wire—

Belt 80%
Wire Goods, Bench Hooks 70%
Bradley Metal Clasp Wire, Coat and Hat, 70&10; Ceiling ..... 70&10
Columbian Hdw. Co., Gem..... 70&10
Parker Wire Goods Co., King..70&10%
White Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.90; 8 in., $1.25; 10 in., $8.50.
Cotton ..... *doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.— See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz..$1.00
Grass, common grades, all sizes per doz *$1.50*
Whiffletree ..... *lb. 5¾@6¢*
Hooks and Eyes:
Brass ..... 60&10&5%
Malleable Iron..... 70&10&10%
Covert Mfg. Co. Gate and Seattle Hooks 40%
Ft. Madison Cut-Easy Corn Hooks ..... ₱ doz. $3.25 net
Turner & Stanton Co. Cup and Shoulder ..... 30&10
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾ inch:
Competition ..... *ft. 5½ 6¢*
3 ply Guaranteed..... *ft. 8¢ 9¢*
Apple Guaranteed..... *ft 11@11¢*
Cotton Garden, 50ft., coupled
Low Grade..... *ft 8¢ 9¢*
Fair Quality..... *ft 10@11¢*

Irons— Sad—

From ¼ to 10..... *lb 3½@3¾¢*
B. B. Sad Irons..... *lb. 3¼@3½¢*
Mrs. Potts', cents per set:

Nos.	50	55	60	65
Japed Tops	85	90	95	97
Tinned Tops	90	85	98	95

New England Pressing..lb 3¼@4¢

Bar and Corner—

Richards Mfg. Co. Bar..... 60&10%
Corner 60

Pinking—

Pinking Irons..... *doz.60¢*

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw..... 30&2%; Steel, 45%
Lockport 50%
Lake's Steel 50%
Richards Paper Stock No. 139, 50&
Smith & Hemenway Co's..... 25

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Kettles—

Brass, Spun, Plain..... *20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Ideal Butcher Knives 50%
Wilkinson Sheet & Cutlery Co.... 60

Corn—

Columbian Cutlery Co., Wilmot Brand Knives and Hooks 60
Wilkinson Sheet & Cutlery Co.:
Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10, Yankee No. 1, $1.55; Yankee No. 2, $1.15.

Drawing—

Standard List.....
C. E. Jennings & Co., Nos. 41, 42, 43 .....
Jennings & Griffin, Nos. 41, 42, 43 .....
Swan's .....
Wilcox .....
L. & I. J. White..... 25&30%

Hay and Straw—

Serrated Edge, per doz...... *$3.75*
Iwan's Straw Edge..... $3.00
Iwan's Serrated..... ₱ doz. $10.00

Miscellaneous—

Farriers' ..... *doz. $3.00@3.25*
Wilkinson's ..... ₱ doz $3.00@3.25

Knobs—

Bass, 2½ inch, Birch, or Maple, Rubber Tip..... *gro $1.25@$1.40*
Carriage, Jap., all sizes..... *gro. 40@45¢*
Door, Mineral..... *doz. 65@70¢*
Door, Por. Jap'd..... *doz. 70@75¢*
Door, Por. Nickel..... *doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable..... 50%
Lane's Store 45
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112..... 50%
Climax Shelf, No. 113..... 50%
Trolley, No. 110..... 50%

Ladles, Melting—

L. & G. Mfg. Co. (see list 25
P. S. & W..... 40&10%
Reading 60%

Lanterns—Tubular—

Regular, No. 0..... *doz. $3.35@4.50*
Side Lift, No. 0..... *doz. $4.75*
Hinge Globe, No. 0..*doz. $4.60@4.75*
Other Styles..... *prop'd @10*

Bull's Eye Police—

8-inch..... *$3.25@3.50*

Latches— Thumb—

Roggin's Latches, with screw..
..... *doz. 55@40¢*

Door—

Allith Mfg. Co., Reliable and Alligator, 50...; Reliable Coal Storage, 40; Crook & Carrier Mfg. Co.....
₱ doz $2.50
Richards' Bull Dog, Heavy, No. 125 ..... 50&5%
Richards' Trump, No. 127..... $1.50

Leaders, Cattle—

Small..... *doz. 50¢; large, 60¢*
Covert Mfg. Co. Lead
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E. 10%

Lines—

Wire Clothes, Nos. 18 19 20
100 feet..... *$2.50 2.25 2.00*
75 feet..... *$2.10 1.80 1.65*
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'..... 30%
Silver Lake Braided Chalk, Nos. $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50..... 20% ₱ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½ $4.50..... 20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50..... 20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25..... 20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines 1
Clothes Lines, White Cotton 1
Shade Cord, Cotton or Linen..... 20%

Locks— Cabinet—

Cabinet Locks ..... 50&10%

Door Locks, Latches, &c

NOTE—Net Prices are very often made on these goods.
Reading Hardware Co..... 1
R. & E. Mfg. 1

Padlocks—

R. & E. Mfg. Co., Wrought Steel and Brass ..... 50&5%

Sash, &c.

Iress' Patent:
Bronze and Brass 75&5; Cocoanut 60; Iron 65; Window Ventilating, 40&20%; Robinson Pat. Ventilating Sash Lock, 33⅓%.
Pelham Patent Ventilating Lock ..
Reading Sash Locks 40

Machines—Boring—

Com. Duplex, bolthead chasers..
..... *$2 @12.50*
Com. Another, bolthead chasers..
..... *$2.25@12.50*
Swan's Improved..... 40&10%
Jennings', Nos. 1 and 4..... 25&5%
Stock, Upright 30
Stock, Universal 30

Corking—

Rosenger Invincible Hand Power ..... ₱ doz. $12.00

Fence—

Williams' Fence Machines.....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist ..
Myers' Hand Hoists, with Iron Beam .....
Myers' Chain, High Speed Chain Hoist .....

Ice Cutting—

Chandler's 12½%

Washing

Boss Washing Machine Co.: Per doz.
Boss No. 1..... $5.00
Boss Rotary 6.00
Champion Rotary Banner No. 1..$7.00
Standard Champion No. 1..... $9.00
Standard Perfection..... $7.00
Champion Square Washboard 3.00
Uncle Sam Rub-a-Dub, Round..... 3.00

Mallets—

Hickory ..... *45@55@50*
Lignumvitæ ..... *40@45@50*
Tinners' Hickory and Apple wood ..... *doz. 45@50@50*

Mangers, Stable—

Sweet Hoo Works 50%

Mats, Door—

Acme Excelsior Steel 50
Eastic Steel (W. G. Co.), new list..50

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co..... 20@25
National (see list) 25
Parker's Arcade and Victoria..... 25
Parker's Boy and Side ..... 50&5
Swift, Lake Erie, Co. .....

Motors, Water—

Dimmes Red Devil..... 30
Lippincott's 30

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; 12-in., $2.10, cheap
Cheap, 10-in., $2.25; 12-in., $2.45, etc.
Better Grade, 10-in., $3.00; 12-in., $3.25, etc.

	12	*14*	*16*	*18-in.*
High Grade...	*$4.50*	*4.75*	*5.00*	*5.25*
Continental.....				60%
Great American.....				70%
Great American Ball Bearing, new list				70
Quaker City.....				70
Pennsylvania				60
Pennsylvania, Jr., Ball Bearing, 50&10%				
Pennsylvania Golf.....				50%
Pennsylvania Horse.....				30&10%
Pennsylvania Pony.....				40&5%
Granite State:				
Style A, Low Wheel.....				70%
Style B, High Wheel				70
Style C, High Wheel, spcl. list..				70&10%
Style D, High Wheel, spcl. list..70%				
Philadelphia:				
Styles M., S., C., K., T...70&10&5%				
Style A, all Steel.....				60&10&5
Style E, High Wheel.....				40&5
Drexel and Gold Coin, special list.40%				
Horse				40&5
Pony				40&5
36-in., Horse.....				30&10%
Eagle Horse				30&5
I. X. L., Horse.....				50%

Nails—

Wire Nails and Brads, Miscellaneous ..... *87½@87½@net*
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos	6	7	8	9	10	
Anchor	22	21	20	19	18	40&5%
C. Seaman	21	20	19	18	17	40&5
New Haven	22	21	20	19	18	40&5
Livingston	19	18	17	16	15	40&5
Western						₱ M.

Jobbers' Special Brands.....
per 15,000 list

Picture—

	No.	*2*	*2½*	*3*	*in.*
Brass Head					*gro*
Por. Head...	*1.10*	*1.10*	*1.10*		*.. gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: *Off list.*
Square, Blk., C., T. & R..*5.10¢*
Hexagon, Blk., C., T. & R.5.70¢
Hot Pressed:
Square, Blk. ..... *5.70¢*
Hexagon, Blank ..... *5.60¢*
Square, Tapped ..... *6.10¢*
Hexagon, Tapped ..... *6.00¢*

Oakum

Best ..... *6¾¢*
Chip ..... *5¢*
Caulking ..... *5¢*

Oil Tanks

Oilers—

Steel, Copper Plated.....
Cast or Tin.....
Brass and Copper.....
Tin.....
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans..... 50&10&10%
Monarch .....
Monarch Lever .....
Rochester .....

Openers— Can— *Per doz.*

Sprague, Iron Handle.....
Sprague, Wood Handle..*.35¢ net*
Sardine Scissors..... *$1.75 net*
Yankee .....
₱ doz., net, $0.75; Little Gem, ₱ doz., net..... $0.65

Eyes

Hartigan Nickel Plate, ₱ doz., $2.00; Silver Plate, $1.00.

Packing—

Asbestos Packing, Wick and Rope ..... *20@25¢*

Rubber—

(Fair q'ality goods.)
Sheet, C. L...... *11@12¢*
Sheet, C. O. S...... *11@12¢*
Sheet, C. B. S...... *12@13¢*
Sheet, Pure Gum..... *20¢*
Sheet, Red ..... *40¢*
Jenkins' '96, ₱ lb. 80¢..... 25%

Miscellaneous—

American Packing... *lb. 70@10 ¢*
Cotton Packing..... *lb. 16@25 ¢*
Italian Packing..... *lb. 9@12½¢*
Jute ..... *4@5¢*
Russia Packing..... *lb. 8@11 ¢*

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List..... *65&5%@70%*
Edwards, Royal Blue..... *65&5%@70%*

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz..	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz....	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos: *lb.*
Roll Board or Building Felt, 6 to 50 lb., per 100 sq. ft.3½@5¢
Roll Board or Building Felt, 55 to 80 lb., per 100 sq. ft...... *6¢*
Mill Board, Sheet, 40 x 40 in., 1-32 to 1/8 in...... *3@5¢*
Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll..... *45@75¢*
Medium weight, 30 lbs. to roll..... *50@70¢*
Heavy weight, 40 lbs. to roll..... *70@85¢*
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25
Deafening Felt, 9, 6 and 3½ sq ft. to lb. ton..... *$7.50*
Red Rope Roofing, 250 sq. ft. per roll..... *$1.75*

Tarred Paper—

1 ply (roll 400 sq. ft.), ton.....
$3.400@$3.80
2 ply, roll 128 sq. ft.....
3 ply, roll 128 sq. ft.....
Slater's Felt (roll 500 sq. ft.) .80¢

Sand and Emery—

Flint Paper and Cloth.5¢@10¢—%
Garnet Paper and Cloth.....
Emery Paper and Cloth.....

Parers— Apple—

Gem .....
Universal .....
Climax .....
Ideal .....
Bonanza, Improved..... each $7.50
Livingston Nail Co.:
Little Star..... ₱ doz. $5.50
Reading Hardware Co.:
A $4
B 5
B 1 6
B 2 7
B 3 8

Potato—

Saratoga ..... ₱ doz $7.00
White Mountain..... ₱ doz. $6.00

Picks and Mattocks—

List.....
Cook's, Hardied, Garden, Mattock, ..
No. 1 $2.60 No. 2 $2.40 No. 3 $2.40

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass .....50@50&10%
Iron, list Nov. 11, '85 ..60@60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in......60&10@—%
Extra Heavy, 2-6 in...70&10@—%
Fittings, Standard and Heavy.....75&10@—%

Pipe, Merchant—

	Consumers, Carloads. Steel. Blk.	Galv.	Iron. Blk.	Galv.
	%	%	%	%
⅛ & ¼ in...	65	48	57	41
⅜ in.....	66	52	59	44
½ in.....	68	56	61	49
¾ to 6 in....	72	62	66	56
7 to 12 in....	69	54	61	46

Pipe, Vitrified Sewer—
Carload lots
Standard Pipe and Fittings, 8 to 24 in., f.o.b. factory:
First-class 82%
Second-class 85%

Pipe, Stove—

	Per 100 joints. C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue	$6.25	$ 7.25
6 in., Standard Blue	7.75	8.75
7 in., Standard Blue	7.00	8.00
5 in., Royal Blue	7.00	8.50
6 in., Royal Blue	7.50	9.50
7 in., Royal Blue	8.50	9.50
Wheeling Corrugating Co.: Nested:		
5 in., Uniform Color	$6.15	$ 7.15
6 in., Uniform Color	6.65	7.65
7 in., Uniform Color	7.65	8.65

Planes and Plane Irons—
Wood Planes—
Bench, first qual.....30@30&10%
Bench, second qual.....30@30&10%
Molding .....25@25&10%
Cooper Stephens Co.:
Bench, First Quality 30%
Bench, Second Quality.....40%
Molding and Miscellaneous.....25%
Toy and German.....30%
Union 60%

Iron Planes -
Chaplin's Iron Planes.....50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06.....25%
Buck Bros. 30%
Chapin-Stephens Co.....25%
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse .....₩ doz. $8.00

Plates—
Felloe .....lb. 4@4½¢

Pliers and Nippers -
Button Pliers...75&5@75&10&5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe

7	8	10	12 in.
$2.00	$2.25	$2.75	$3.50

Acme Nippers .....50&5%
Cronk & Carrier Mfg. Co.:
American Button.....80%
Improved Button.....75&10%
Clinch 60%
No. 80 Linemen's.....50%
Stub's Pattern.....45%
Combination and others.....33⅓%
Heller Bros.' Nippers, Pincers and Tools.....40&5&10&10&5%
P., S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 35%; Elm City, 35%; Paragon, 50%; Lodi, 55%
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels .....30&10&10%
Chalk Line Reels, Brass Cor. .....30&10&10%
Pocket Levels .....30&10&10%
Extension Sights .....30&10&10%
Mortising Levels .....30&10&10%
Disston's Plumbs and Levels.....60&10%
Disston Pocket Levels .....60&10%
Stanley's Duplex 35%
Woods' Extension 33⅓%

Points, Glaziers'—
Bulk and 1-lb. papers...lb. 9½¢
½ lb. papers.....lb. 10 ¢
¼ lb. papers.....lb. 10½¢

Police Goods—
Manufacturers' Lists... 25@25&5%
Tower's 25%

Polish—Metal, Etc—
Prestolene Liquid, No. 1 (¼ pt.) ₩ doz. $3.00; No. 2 (1 qu.), ₩ doz. $9.00
Prestolene Paste 40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₩ doz. 50¢; ₩ gro. $4.50; ½ lb. boxes, ₩ doz. $1.25; 1 lb. boxes, ₩ doz. $2.25
U. S. Liquid, 8 oz. cans, ₩ doz., $1.25.
Bainbridges' Friend Metal Polish, ₩ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ₩ lb 10¢
Black Eagle, Liquid, ½ pt cans, ₩ doz. 75¢
Black Jack Paste, ¾ lb cans, ₩ gr. $9.00
Black Kid Paste, 5 lb can each, $0.65
Ladd's Black Beauty Liquid, per 100 lbs $6.75
Joseph Dixon's, ₩ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ₩ gr. $2.50
Pireside 10%
Prem, ₩ gr. $4.50 ..... 10%
Japanese ..... ₩ gr. $3.50
Jet Black ..... ₩ gr. $3.50
Peerless Iron Enamel, 10 oz. cans, ₩ doz. $1.50

Poppers, Corn—
1 qt. Square...doz. $0.80; gro. $8.75
1 qt. Round...doz. $0.90; gro. $10.00
1 qt. Square...doz. $1.00; gro. $11.00
2 qt. Square...doz. $1.25; gro. $13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled .....35&10%
Tinned .....30&10%

Powder—
In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb.....each 75¢
Rifle, ½ lb.....each 15¢
Rifle, 1 lb.....each 25¢
In Kegs:
12½ lb. kegs.....$3.50
25 lb. kegs.....$4.50
King's Semi Smokeless:
Keg (25 lb. bulk).....$6.50
Half Keg (12½ lb. bulk).....$3.50
Quarter Keg (6¼ lb. bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.90
King's Smokeless ..... Shot Gun. Rifle.
Keg (25 lb bulk).....$12.00 $15.00
Half Keg (12½ lb bulk).. 6.25 7.75
Quarter Keg (6¼ lb bulk).. 3.25 4.00
Case 24 (1 lb cans bulk).. 14.00 17.00
Half case 12 (1 lb c. bk).. 7.25 8.75

Presses—
Fruit and Jelly—
Enterprise Mfg Co .....20@25%

Seal Presses—
Morrill's No. 1, ₩ doz., $20.00.....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 50%
Miller's Falls, No. 3, ₩ doz., $12.00.....33⅓&10%
Morrill's No. 1, Nail Puller, ₩ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 .....50%
The Scranton Co., Case Lots:
No. 2½, nail puncher.....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B.....70%
Giant 50%
Staple Pullers, Utica and Davison 60%

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.50	.45	.60	1.05
Hay Fork, Swivel or Solid Eye doz., 4 in., $1.25; 5 in., $1.55				
Inch		2	2¼	2½
Hot House, doz	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz	$0.25	.30	.55	0.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame: Square or Round End, per doz, 1¾ and 2 in ..... 17@20¢
Auger Mortise, no Face Plate per doz, 1¾ and 2 in.....20@21¢
Ames No. 25, 1¾ in., face 2 in.. 23½¢
American Pulley Co.:
Wrought Steel American Plain Axle .....50&10%
Wrought Steel, Eagle..... 17½10¢
Fox-All-Steel, Nos. 3 and 7 ..... ₩ doz. 50¢
Grand Rapids All Steel Noiseless..50%
Niagara, No. 25, 1¾ in., 19¢; 2 in., 20½¢
No. 26 Trov, 1¾ in., 18½¢; 2 in., 16½¢
Star, No. 26, 1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout .....75&5@75&10%
Wood Pumps, Tubing, &c......50%
Barnes Pitcher Spout (low list).....75&10%
Barnes Pitcher Spout .....75&10%
Contractors' Rubber Diaphragm No. 6 Pump .....₩ doz. $6.50
Daisy Spray Pump .....₩ doz. $6.50
Flint & Walling's Fast Mail Hand, (low list).....50%
Flint & Walling's Fast Mail Hand, list 50%
Flint & Walling's Tight Top Pitcher, list .....75&10%
National Specialty Mfg Co Measuring, Nos. 2, $6.00, 3 $5.50..... 30%
Myers' Pumps (low list) ..... 10&5%
Myers' Power Pumps ..... 10&5%
Myers' Spray Pumps ..... 10&5%

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No.	1	2	3	4
	$5.00	6.00	7.00	8.00

Cup Leathers—Per 100:

Inch	2½	3	3½	4
	$5.00	7.00	9.00	12.00

Punches—
Saddlers' or Drive, good.....doz. 50@75¢
Spring, single tube, good quality.....$1.75
Revolving (4 tubes)....doz. $3.50
Bemis & Call Co.'s Cast Steel Drive 50%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00..... 50%
Hercules, 4 dz. each $5.00..... 50%
Niagara Hollow Punches..... 40%
Niagara Solid Punches..... 55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35%; Paragon, 50%; Lodi..... 55%
Tinners' Hollow, P., S. & W. Co..40%
Tinners' Solid, P., S. & W. Co.. 8% doz., $1.44..... 40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron.... 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., 1b., 36¢ 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..₩ ft. 3¼¢
O. N. T. Rail..... $3.12
Griffin's:
xxx, ₩ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ₩ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ₩ 100 ft $3.45
O. N. T., ₩ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in ..... ₩ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ₩ 100 ft., $7.50; 1¼ x 3-16 in., $8.75..... 55&1½%
McKinney's:
Hinged Hanger Track, ₩ ft., 11¢, 60&5%
1 x 3-16 Track..... 55&5%
Myers' Stayon Track..... 60&5%
Richards' Mfg. Co.:
Common, 1 x 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65..... 50%
Gauge Trolley Track, ₩ ft., No. 31, 2½ in., No. 32, 1¼ in., No. 33, 20¢ 60&10%
No. 50..... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor..... 80&5%
Queen City Lawn, ₩ doz., 20 teeth, $2.85; 24 teeth, $3.00..... net
Anticlog Lawn, ₩ doz..... $4.00
Malleable Garden..... 70&10%
Ideal Steel Garden, ₩ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00..... 80%
Kohler's:
Lawn Queen, 20-tooth..₩ doz. $3.15
Lawn Queen, 24-tooth..₩ doz. $3.25
Paragon, 20-tooth..... ₩ doz. $2.70
Paragon, 24-tooth..... ₩ doz. $2.75
Steel Garden, 14-tooth..₩ doz. $2.40
Malleable Garden, 14-tooth, ₩ doz. $2.00@2.25

Rasps, Horse—
Disston's 75%
Heller Bros.' ..... 70&10%
Liverpool Bros.' Gold Medal..70&10@75%
McCaffrey's American Standard ..... 60&10&5%
New Nicholson..... 70&10@75%
See also Files.

Razors—
Liana Bo-rasic..... 60%
Fox Razors, ₩ doz., No. 42, $9.00; No. 41 $20.00, No. 82, Platina, $25.00 } 10 & 2½%
Red Devil..... 65%

Reels, Fishing—
Hendrex
M 5, Q 6, A 6, B 6, M 9¼, M 16, Q 10, A 10, B 10, 4008 Rubber, Pumpkin Nickeled Pupulo 20%
Aluminum German Silv., Bronze 25%
1240 N, 124 N..... 20%
2002 N, 2 N, 6 RM, G 9..... 25%
4 N, 6 PN, 24 N, 26 PN..... 20%
2901 P., 3314 P., 2904 PN, 3314 P., 0092 N., 3314 P., 00981 N., 3314 P., 002904 PN., 3314 P., 002 N., 3314 P., 986 PN., 2901 N., 974 PN..... 25%
5009 PN., 5009 P..... 20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PD, 202 PD..... 20%
304 P, 304 PN, 00304 P, 00304 PN, 3314 P., 3314 PN..... 25%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed .....70% & 70&10%
White Porcelain Enamel..50&10%
Solid Brass or Bronze Metal..40%

Revolvers—
Single Action.....$5@$10.00
Double Action, except 44 cal...$2.00
Double Action, 44 caliber.....$2.00
Automatic $3.00
Hammerless $3.50

Riddles, Hardware Grade
16 in.....per doz. $2.50@$2.75
17 in.....per doz. $2.75@$3.00
18 in.....per doz. $3.00@$3.25

Rings and Ringers—
Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.10	1.25	1.65 doz.

Hog Rings and Ringers—
Hill's Rings, gro. boxes.....$3.45
Hill's Ringers, Gray Iron, doz..60¢
Hill's Ringers, Malleable Iron, doz..80¢
Blair's Rings .....per gro. $3.45
Blair's Ringers.....per doz. 75¢
Brown's Rings.....per gro. $3.25
Brown's Ringers....per doz. 75¢

Rivets and Burrs—
Copper 50%
Carriage, Coopers', Tinners, &c.: Black .....70&10%
Metallic Tinned.....70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, 23@25¢; Tin boxes, 100 count, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—
Cronk's Stay, No. 50..... $1.00
Cronk's Bankirupt, No. 55, $0.60; No. 56, $0.75; No. 60..... $0.75
Lane's Stay..... 40%
Richards' Stay:
Handy Adj. and Reversible No 53 75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57..... 50%
Underwriters', Nos. 59, 60..... 50%
Favorite, No. 54..... 60%

Rope—
Manila, 7-16 in. diam. and larger Pure.....lb., 12½@12¢
Sisal, 7-16 in. diam. and larger. Pure .....lb., 8¢
Sisal, 7-16 in. diam. and under. No. 2 quality.....lb., 7@7¼¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse. Mixed .....lb., 7@7¼¢
Pure .....lb., 9¼¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred Mixed.....lb., 6½@6¾¢
Pure .....lb., 7¼¢
Cotton Rope. Best, ¼-in. and larger...18@20¢
Medium, ¼-in. and larger.16@17¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope. Thread, No. 1, ¼-in. & up, lb. ..... 7½@8¢
Thread, No. 2, ¼-in. & up, lb. ..... 7@7½¢

Wire Rope—
Galvanized .....37½&2½%
Plain .....45&2½%

Ropes, Hammock—
Corset Mfg Co.:
Jute, 35%; Sisal..... 20%

Rules
Boxwood .....60@60&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood..... 60%
Flexifold..... 40%
Ivory..... 25@25&10%
Miscellaneous..... 50&10&10%
Stevens' Combination..... 55%
Stationers'..... 50@50&10%
Keuffel & Esser Co.:
Folding, Wood..... 35&10%
Folding, Steel..... 23½&10%
Lufkin's Steel..... 50&10%
Lufkin's Lumber..... 50&10%
Union Nut Co.:
Boxwood..... 60%60&10%
Ivory..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers—
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 45
Band ..... 50 & 50&10
Butcher Saws 50
Cross Cuts 50
One-Man Cross Cut 40%
Narrow Cross Cut 50
Hand, Rip and Panel Saws 50
Miter Box and Compass 40
Mulay, Mill and Drag 15
Wood Saws ..... 10 & 10
Saw-Sets 50
Turning Saws and Frames ..... 50 & 10
Diamond Saw & Stamping Works—
Sterling Kitchen Saws ..... 25 & 10 & 10 & 5
Disston's:
Circular, Solid and Inserted Teeth 50
Band, 2 to 18 in. wide 60
Band, 1 to 1¼ 50
Cross-cuts 45
Narrow Crosscuts 50
Mulay, Mill and Drag 50
Framed Woodsaws 25
Woodsaw Blades 35
Woodsaw Rods, Tinned 15
Hand Saw, No. 12, 22, 9, 16, 4th 50
10, 12, 7/6, 8 ..... 25%
Hand Saws, Nos. 7, 10/, 13/72, 3, 1, 3, 00 ..... Continuation 35%
Compass Saws 50
Butcher Saws and Blades 35
E. Jennings & Co.'s—
Back Saws 10
Butcher Saws ..... 20 & 5
Compass and Key Hole Saws ..... 20 & 5
Framed Wood Saws ..... 20 & 5
Hand Saws 12½
Wood Saw Blades ..... 20 & 5
Millers Falls:
Butcher Saws ..... 15 & 10%
Star Saw Blades ..... 15 & 10
Massachusetts Saw Works:
Victor Kitchen Saws ..... 10 & 10 & 5
Butcher Saws Blades ..... 15 & 10
Peace & Richardson's Hand Saws 30%
Simonds:
Circular Saws 45
Crescent Ground Cross Cut Saws 50
Cross Cut ..... 40 & 10
Gang Mill, Mulay and Drag Saws 15
Hand Saws 50
Back Saws ..... 25 & 25 & 5
Butcher Saws ..... 35 & 35 & 5
Hand Saws ..... 35 & 25 & 5
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. ..... 25 & 25 & 5
Wood Saws ..... 40 & 5
Wheeler, Madden & Clemson Mfg. Co's Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A 25%
Disston's:
Concave Blades 25%
Keystone Blades 35
Hack Saw Frames 30%
Simonds File Co. 35%
E. E. Jennings & Co.'s—
Hack Saw Frames, Nos. 175, 180 ..... 40 & 7½%
Hack Saws, Nos. 175, 180, complete, 4 for ..... 40 & 10
Goodell's Hack Saw Blades ..... 40 & 10
Griffin's Hack Saw Frames ..... 35 & 5 & 10
Griffin's Hack Saw Blades ..... 35 & 5 & 10 & 2
Star Hack Saws and Blades ..... 15 & 10
Sterling Hack Saw Blades ..... 30 & 10 & 5
Sterling Hack Saw Frames ..... 30 & 10 & 10
Sterling Power Hack Saw Machine, each, No. 2, $30.00 ..... 10%
Victor Hack Saw Blades 20
Victor Hack Saw Frames 40%
Whitaker Mfg. Co.:
National Hand Blades 40%
National Hand Frames 50
National Power Blades ..... 30 & 10

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18 ..... 10%
with boring attachment, $20 ..... 20%
Lester complete, $10.50 ..... 15 & 10%
Rogers, complete, $3.50 and $6.00 ..... 15 & 10%

Scales—

Canada Turnbull's ..... 50 & 5 & 10%
Computer:
Hatch, Platform, ½ oz. to ¼ lbs. ..... doz. $5.50
Two Platforms, ½ oz. to 8 lbs. ..... doz. $16.0
Union Platform, Plain $1.70 & 1.90
Union Platform, Stpd. $1.35 @ 2.15
Chatillon's:
Eureka 50
Favorite 40
Grocers' Tea Scales 50
The Standard Portables 10%
The Standard R. R. and Wagon ..... 50 & 10

Scrapers—

Box, 1 Handle ..... doz. $2.00 @ $ 25
Box, 2 Handle ..... doz. $2.50 @ $ 60
Ship Light, $2.00; Heavy, $1.50
Chapin-Stephens Co. Box ..... 30 & 10 & 10
Richard-Mfg. Co. Box ..... 30 & 10

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1½, $3.50@3.75
Bench, Wood ..... 2 & 2 & 10
Hand, Wood ..... 70 & 10 & 10 & 10
Chapin-Stephens Co., Hand ..... 70 & 10 & 10

Coach, Lag and Hand Rail—

Lag, Cone Point ..... 75 & 10 & 10
Coach, Gimlet Point ..... 75 & 10 & 5
Hand Rail ..... 70 & 10 & 10

Jack Screws—

Standard, List ..... 70 & 10 & 10 & 5
Millers Falls ..... 50 & 10 & 10
Swett Iron Works ..... 70 & 5

Machine—

Cut Thread, Iron, Brass or Bronze—
Flat Head or Round Head, 50 & 10 & 10%
Fillister Head ..... 40 & 10 & 10%
Rolled Thread, F. H. or R. H., Iron ..... 75 & 10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65 & 10%

Set and Cap—

Set (Iron) ..... 75 & 10 & 2½
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70 & 10 & 2½
Hex. Hd. Cap ..... 70 & 10 & 2½
Fin. Hd. Cap ..... 50 & 2½
Flat Sunk Hd. Cap ..... 60 & 10 & 2½

Wood—

List July 21, 1905.
Flat Head, Iron ..... 85 & 5 & 10
Round Head, Iron ..... 85 & 5 & 10
Flat Head, Brass ..... 80 & 5 & 10
Round Head, Brass ..... 75 & 5 & 10
Flat Head, Bronze ..... 75 & 5 & 10
Round Head, Bronze ..... 75 & 5 & 10
Drive Screws ..... 87½ & 5 & 10

Scroll Saws—

See Saws, Scroll.

Scythes—

Per doz.

Grass, No. 1, Plain ..... $6.25 @ 6.75
Clipper, Bronzed Webb ..... $6.50 @ 7.00
No. 3 Clipper, Pol'd Webb ..... $6.75 @ 7.25
No. 6 Clipper and Solid Steel ..... $7.00 @ 7.50
Bush, Weed and Bramble, No. 8 ..... $6.50 @ 7.00
Grain, No. 1 ..... $8.25 @ 8.75
Bronzed Webb, No. 1 ..... $8.50 @ 9.00
Nos. 3 and 4 Clipper, Grain ..... $8.75 @ 9.25
Solid Steel, No. 6 ..... $9.25 @ 9.75

Seeders, Raisin—

Enterprise ..... 25 & 10%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, 5" 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18 ..... 20 & 10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ₩ doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50 @ 3.75
Buck Bros. 50%
Cannon's Diamond Point, ₩ gro, $12 ..... 40 & 10
Mayhew's ..... ₩ gro $4.00
Snell's Corrugated, Cup Pt. ..... 40 & 10%
Snells Knurled, Cup Pt. ..... 40 & 10
Victor Knurled Cup Pt. ..... ₩ gro. $7.50

Rivet—

Regular list ..... 75 @ 75 & 10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Morrill's, No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut $20.60
No. 5, Mill $30.00
Nos. 10, 11, 95 ..... $15.00
No. 1 Old Style $10.00
Special $16.25
Grant Royal Cross Cut ..... ₩ doz. $8.00
Royal, Hand ..... ₩ doz. $4.50
Tamitor Positive ..... ₩ doz $6.75

Shaving—

Box Shaving Sets, No. 30 ..... ₩ doz. net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₩ doz $1.50
Mounted Kitchen Sand Stone, ₩ doz $1.50
Natural Grit Carving Knife Hones, ₩ doz $3.00
Quick Cut Emery Carving Knife Hones, ₩ doz $1.50
Quick Edge Pocket Knife Hones, ₩ doz $2.50

Skate—

Smith & Hemenway Co., Eureka 50%

Shaves, Spoke—

Iron ..... doz. $1.25
Wood ..... doz. $2.00
Hamden Spoke R. & I. Co. 50
Chapin-Stephens Co. ..... 30 & 10 & 10%
Goodell's, ₩ doz. $9.00 ..... 15 & 10%

Shears—

Cast Iron..	7	8	9 in.
Best	$16.00	18.00	20.00 gro.
Good	$13.00	15.00	17.00 gro.
Cheap	$5.00	6.00	7.00 gro.

Straight Trimmers, &c.:
Best quality Jap ..... 70 & 10 & 10%
Best quality, Nickel ..... 60 & 10 & 10%
Tailors' Shears ..... 40 & 10 & 5
Ames Cast Shears ..... 40 & 10 & 5
Universal Tailor's Shears 50
Wilkinson Shear & Cutlery Co.:
Sheep, 1900 list ..... 30 & 10 & 5%
Grass ..... 10 & 10
Horse or Mule 5
J. Wiss & Sons Co.:
Best Quality Jap 50
Best Quality, Nickel 25
Tailors' 25

Tinners' Snips—

Steel Blades ..... 20 & 5 & 10 & 10%
Steel Laid Blades ..... 40 & 10 & 5 & 10%
Forged Handles, Steel Blades, Berlin 50%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s 6's to 14 in. ..... 33⅓ & 5%
Newton's Snips 40%
P., S. & W. Forged Handles, 25%; R W ..... 40 & 10%
J. Wiss & Sons 25
Wood Handle Snips 25

Pruning Shears—

Cook's Hat Shears 33⅓
Cook's Wire Hedge Shears 33⅓
Disston's Combined Pruning Hook and Saw, per doz. $2 25
Disston's Pruning Hook only, ₩ doz. $1.50 25
Jos. T. Hoyt's Mfg. Co.:
Pruning Shears, all grades 40%
Lopping Shears ..... 10 & 10%
Columbian Cutlery Co.:
Hedge, Wilcut Brand ..... 60 & 10%
Lawn and Border, Wilcut Brand ..... 60 & 10%

Sheaves— Sliding Door—

Reading 40%
R. & E. list 15%

Sliding Shutter—

Reading list 40%
R. & E. list 10%

Shells—Shells, Empty—

Brass Shells, Empty
Climax, 10 and 12 gauge ..... 65 & 10%
Club, Rival, 65 & 5%; First Quality ..... 60 & 5%

Paper Shells, Empty
New Rapid, 10, 12, 16 and 20 gauge, 25 & 10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge, Leader grade ..... 25 & 5%
Union, League, 12 and 12 gauge; Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 25 & 5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade 20%

Shells, Loaded—

Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade ..... 40 & 5%
Loaded with Smokeless Powder, high grade ..... 40 & 10 & 10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40%
Nitro Club, Smokeless Powders ..... 40 & 5%
Arrow, Smokeless Powders ..... 40 & 10 & 10%
Winchester:
Smokeless Repeater Grade ..... 40 & 5%
Smokeless Leader Grade ..... 40 & 10 & 10%
Black Powder 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20 in.	$4.25	$5.50
Dixie, 10 x 14 in.	4.50	6.00
Dixie, 7 x 10 in.	5.00	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg. $4.10
Steel ..... per keg. $3.85
Burden's, all sizes ..... ₩ keg $3.90

Shot—

25 lb. bag

Drop, up to B $1.85
Drop, B and larger 2.10
Buck 2.10
Chilled 2.10
Dust 2.10

Shovels and Spades—

Association List, Nov. 15, 1902 ..... 40%
Avery Stamping Co. 40%

Snow Shovels—

Long Handle ..... $3.25 @ $3.50
Wood and Mall, D. Handle ..... $3.75 @ $4.00

Sieves and Sifters—

Hunter's Imitation ..... gro $4.50 @ 6.00
Hunter's Genuine ..... per gro. $12.00 @ 12.50

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme ..... Automatic Ash ..... Sifter ..... Ball ..... Bearing

Sieves, Seamless Metallic

—Per dozen—

Mesh	14	16	20	2
Iron Wire	$1.05	1.05	1.05	1.05
Tinned Wire	$1.45	1.45	1.60	1.60

Sieves, Wooden Rim—

Nested, 1, 11 and 12 Inch
Mesh 18, Nested ..... doz. $0.90 @ 0.95
Mesh 20, Nested ..... doz. $1.00 @ 1.05
Mesh 24, Nested ..... doz. $1.10 @ 1.15

Sinks, Cast Iron—

Painted, Standard list:

[illegible]	60%
[illegible]	60%
[illegible]	60%

Scythe Stones—

Pine Mfg. Co., Ind. list:
Black Diamond S. S. ⅌ gro. $12.00
Indicator S. S. ⅌ gro. $11.50
White Mountain S. S. ⅌ gro. $9.00
Green Mountain S. S. ⅌ gro. $8.00
Extra Indian Pond S. S. ⅌ gro. $7.50
S. Indian Pond S. S. ⅌ gro. $6.00
N. 2 Indian Pond S. S. ⅌ gro. $4.50
Leader Red End S. S. ⅌ gro. $4.50
Quick Cut Emery..... ⅌ gro. $12.00
Pure Corundum..... ⅌ gro. $18.00
Crescent..... $7.00
Emery Scythe Rifles, 2 Coat. $8
Emery Scythe Rifles, 3 Coat. $10
Emery Scythe Rifles, 4 Coat. $12
Balance of 1904 list 33⅓%.
Electro (Artificial)..... ⅌ gro.,
$12.00..... 33⅓%
Lightning (Artificial)..... ⅌ gro.,
$18.00..... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers..... ⅌ gro. $9.00

Stops— Bench—

Millers Falls..... 15&10%
Morrill's, ⅌ doz., No. 1, $10.00..... 50%
Morrill's, No. 2, $12.50..... 50%

Door—

Chapin-Stephens Co..... 50&50&10%

Plane—

Chapin-Stephens Co..... 20%

Straps— Box—

Acme Embossed, case lots. 20&10&10%
Cary's Universal, case lots..... 20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket..... doz. $1.60
Excelsior Stretcher and Tack Hammer Combined, ⅌ doz. $6.00..... 20%

Stuffers, Sausage—

Enterprise Mfg Co..... 25@25&7½%
National Specialty Co., list Jan. 1, 1902..... 45&5%
P., S. & W. Co..... 40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ⅌ doz.
Superba, Crotch Mahogany.... $6.00
Triumph, Fancy Veneers..... $24.00
Parlor, Queen, Fig. Rosewood.. $30.00
Elite, Hungarian Ash..... $30.00
Am. Queen, Fig. Mahogany.... $27.00
Ideal, Bird's-Eye Maple..... $25.00
Grand Rapids, Natural..... $24.00
Japan..... $22.00
Standard, Nickel, $22.00; Japan $20.00
Crown Jewel, Nickel, $21.00; Jap. $19.00
Crystal, Nickel, Top..... $36.00
Grand, 17 in. wide..... $36.00
Cut, 21 in. wide..... $54.00
Hall, 28 in. wide..... $60.00

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five dozen lots; $2 per dozen on ten dozen lots; $2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks.. .90@25%
American Cut Tacks..... .90@25
Swedes' Cut Tacks..... .90@25
Swedes' Upholsterers'.... .90@25
Lace Tacks..... .90@35
Lace Tacks..... .90@35
Trimmers' Tacks..... .90@25
Looking Glass Tacks..... .65%
Bill Posters' and Railroad Tacks, 90@40%
Hungarian Nails..... .80@10
Finishing Nails..... .70%
Trunk and Clout Nails..... .80%

NOTE. The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks..... 90@10&90@10&10&5%
See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Freud Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
120	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin . .60@——%
Patent Leather..... .25@30&65%
Steel..... .$1.85&5%
Chesterman's..... .25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin..... 40&10&50%
Favorite, Duck and Leather..... 20&10&35&5%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Asses' Skin..... 40&10&50%
Metallic..... 30@30&5%
Patent Bend, Leather.... 25&5@25&10%
Pocket..... 40@40&5%
Steel..... 33⅓@35%
Weisbrod & Hilger:
Chain, enamel, Metallic, No. 34L, etc..... 25%
Chesterman's Steel, No. 1938L..... 35%

Teeth, Harrow—

Steel Harrow Teeth plain or headed, ⅝-inch and larger... per 100 lbs. $3.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c..... 50@50&10%

Ties, Bale—Steel Wire—

Single Loop..... 50@10&5
Monitor, Cross Head, &c. 70@2½%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White..... 20@20&5%

Haying—

Myers' Hay Tools..... 45%.

Miniature—

Smith & Hemenway Co.'s, Davidson, ⅌ doz., Nickel Plated, $1.50; Gold Plated..... $2.00

Saw—

Atkins' Cross Cut Saw Tools.... 35&5%
Simonds' Improved..... 33⅓%
Simonds' Crescent..... 25%

Ship—

L. & I. J. White..... 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.... $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida..... 75&10%
Newhouse..... 40&10&5%
Hawley & Norton..... 65%
Victor..... 75@75&10%
Hoenda Community Jump..... 50%
Hector..... 75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire. doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine)
No. 1, Rat, ⅌ doz., $13.25..$11.50 doz.
No. 3, Rat, ⅌ doz., $6.50... $5.75 doz.
No. 3½, Rat, ⅌ doz., $5.25. $4.70 doz.
No. 4, Mouse, ⅌ doz., $3.85. $3.00 doz.
No. 5, Mouse, ⅌ doz., $3.00. $2.25 doz.
Oneida Community:
Out o' Sight, Mouse, ⅌ doz.... 55
Out o' Sight, Rat, ⅌ doz..... 1.25
Easy Set, Mouse, ⅌ doz..... .60
Easy Set, Rat, ⅌ doz..... 1.30
Wood Choker, Rat, 6 doz. holes. .12
Primer Plus Choker, 5 hole, ⅌ doz. traps..... .75

Trowels—

Disston Brick and Pointing..... 25%
Disston Plastering..... 20%
Disston "Standard Brand" and Garden Trowels..... 30%
Kohler's Steel Garden Trowels, ⅌ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels.. ⅌ gro. $6.00
Woodrough & McParlin, Plasterung. 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern..... 50&10%
Western Pattern..... 60&10%
Handy Trucks..... ⅌ doz. $16.00
Grocery..... ⅌ doz. $15.00
McKinney Trucks..... each, net $10.00
Model Stove Trucks..... ⅌ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.
No. 1 2 3
Galvanized 867 870 880 890 10&5%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls 22@23¢
No. 12, ¼ and ½-lb. Balls 21@24¢
No. 18, ¼ and ½-lb. Balls 19@20¢
No. 24, ¼ and ½-lb. Balls 17½@19¢
No. 36, ¼ and ½-lb. Balls 17@19¢
Chalk Line, Cotton ½-lb. Balls..... 26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz..... 11@19¢
Cotton Wrapping, 5 Balls to lb., according to quality... 15½@23¢
American 2 Ply Hemp, ¼ and ½-lb. Balls..... 14½@15½¢
American 3-Ply Hemp, 1-lb. Balls..... 15½@16½¢
India 2 Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) 10½@11½¢
India 3-Ply Hemp, 1-lb. Balls. 10½@11½¢
India 3-Ply Hemp, 1½-lb. Balls. 10@11¢
9, 8, ¼ and 5-Ply Jute ½-lb. Balls..... 13½@14½¢
Mason Line, Linen, ½-lb. Bls. 47c
No. 9 Mattress, ¼ and ½-lb. Balls, according to quality. 30@50¢
Wool, 3 to 6 ply.... B 9¢: A 10¢

Vises—

Solid Box..... 50@50&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable..... 40%
Standard..... 40%
Amateur..... 25
Columbian Hdw. Co..... 40%
Fisher & Norris Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4, $26.50; 5, $27.00.
Fulton Mach. & Vise Co.:
Reed, Swivel..... 25
Star, Solid Jaw..... 40%
Hall:
Machinists'..... 1 1&5
Knockout..... 1&5
Lewis Tool Co.:
Adjustable Jaw..... 30
Monarch, 50; Solid Jaw..... 50%
Massey Vise Co.:
Catcher..... 40
Perfect, 15", Lightning Grip..... 15%
Merrill's..... 20
Millers Falls Oval Slide Pattern 60&10%
Parker's:
Victor, 20@25%; Regulars..... 20@25%
Vulcan's..... 1 1&5
Combination Pipe..... 55&60
Peerless..... 20@25
Rock Island..... 25%
Snedikers X L..... 33⅓
Stephens'..... 33⅓%

Saw Filers—

Disston's D 8 Clamp and Guide, ⅌ doz., $24.00, 30%; Clamps..... 30%.
Perfection Saw Clamps, ⅌ doz.... $4.50
Reading..... 30%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed..... 25%
Star..... 40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect..... 15%
Wyman & Gordon's Quick Action, 6 in., $6.00, 9 in., $7.00, 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe..... 40%
Parker's Combination Pipe:
87 Series, 60&5%; 187 Series, 60&5%; No. 870 40%.
Rock Island Pipe..... 25%.

Wads—*Price per M.*

B. E., 11 up..... .60¢
B. E., 9 and 10..... .70¢
B. E., 8..... .80¢
B. E., 7..... .80¢
P. E., 11 up..... $1.00
P. E., 9 and 10..... 1.25
P. E., 8..... 1.50
P. E., 7..... 1.50
Ely's B. E., 11 and larger $1.70@1.75
Ely's P. E., 12 to 20.... $3.00@3.25

Dis. 2%

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled..... 45&10%
Ground..... 50&5
Plain or Unground..... 60%
Country Hollow Ware, per 100 lbs..... $3.00
White Enameled Ware:
Maslin Kettles..... 65&10%
Covered Wares.
Tinned and Turned..... 35&10%
Enameled..... 45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware..... 33⅓
Iron Clad Ware..... 70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8
Each	*45¢*	*50¢*	*65¢*	*85¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles..... 60%
Porcelained..... 5&5@5&10.
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles..... 60%
Sond Steel Spiders and Griddles.65&5%
Solid Steel Kettles..... 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Sobd Zinc ⅌ doz.
Crescent, family size, bent frame $4.05
Best Star tinned zinc, stationary bottom..... $4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector..... $3.55
Cable Cross, family size, stationary or loose..... $3.60
Simp Zinc Surface:
Naiad family size, open back, perforated..... $3.00
Single Saginaw Globe..... $2.85
Brass Surface:
Brass King, Single Surface, open back..... $4.05
Nickel Plate Surface:
No. 1001 Nickel Plate Single Surface..... $7.60
Glass Surface:
Glass King, Single Surface, open back..... $3.95
Enamel Surface:
Enamel King, Single Surface, ventilated back..... $3.95

Washers—Leather, Axle—

Solid..... 90@90&10%
Patent..... 90@90&5%
Coil: ⅞ 1 1⅛ 1¼ Inch
90c. 1oc. 11c. 12c. per box

Iron or Steel—

Size bolt.... 5/16 ⅜ ½ ⅝ ¾
Washers.... $5.50 3.50 3.20 3.00 2.80
The above prices are based on $6.00 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Wedges—

Oil Finish..... lb., ..@3¢

Weights—Hitching—

Covert Mfg. Co..... 30&2%

Sash—

Per ton, f.o.b. factory:
Eastern District.. $25.00@28.00
Southern Territory..... $25.00
Western and Central Districts ..... $27.00@27.50

Wheels, Well—

8-in., $2.22; 10-in., $2.82; 12-in., $3.36; 14-in., $3.80.

Wire and Wire Goods—

Bright and Annealed:
6 to 9..... 72&10&7½%
10 to 18..... 72½&10&10%
19 to 26..... 75&10&10&2½%
27 to 36..... 77½&10&7½%
Galvanized.
6 to 9..... 72½&10%
10 to 14..... 72½&10&10&5%
15 to 16..... 72½&10&10&5%
17 to 18..... 72½%
19 to 26..... 70&5&2½%
27 to 36..... 65&10&10%
Coppered
6 to 9..... 65&10&10%
10 to 14..... 70&10&5%
15 to 18..... 65&10&10&10%
19 to 26..... 70&5&2½%
27 to 36..... 72½&10&2½%
Tinned
6 to 18..... 67&10&10%
Brass ..... 17½¢ lb., base
Copper ..... 32¢ lb., base
Cast Steel Wire..... 50%

Spooled Wire—

Annealed and Tinned..70&10&10%
Brass and Copper..... 60&10&10%
Retailers' Assortments, per box. $2.10@$2.40

Wire Clothes Line see Lines.
Wire Picture Cord. see Cord.

Bright Wire Goods—

Steel Wire Goods..... 90&55%
Brass Wire Goods.... 90@90&10%
Brass Cup and Shoulder Hooks, 80&15%

Wire Cloth and Netting—

Galvanized Poultry Netting, 50&2%&2½%
Painted Screen Cloth, 100 ft., $1.35
Standard Galv. Hardware Grade: Per 100 sq. ft.
Nos. 2, 2½ & 3 Mesh..... $2.75
Nos. 4 and 5 Mesh..... $3.00
No. 6 Mesh..... $3.25
No. 7 Mesh..... $3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural..... 80%
Alligator or Crocodile.. 70&10@75%
Baxter Pattern & Wrenches... 70&5@70&10%
Drop Forged S..... 45@45&5%
Acme..... 60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut..... 50%
Combination Black..... 40&5%
Merrick Pattern..... 50%
Boardman's..... 40%
Coes' Combination Knife Hdl..40&10&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"..... 40&10&10&5&5%
Donohue's Engineer..... 40&10%
Eagle..... 70%
Gem Pocket..... 70%
Hercules..... 40%
W. & B. Machinist:
Case lots..... 50&5%
Less than case lots..... 50%
W. & B. Railroad Special:
Case lots..... 50%
Less than case lots..... 40&10&5%
Solid Handle, P., S. & W., 50&10%; full cases..... 50&10&5%
Stillson..... 65%
Uwanta Wrench Co.:
Railroad Special, Iron Handle 40&10&5%
Other Wrenches..... 50%
Vulcan and Actippa Chain..... 50
Whitaker Machinists':
Case lots..... 50&10
Less than case lots..... 50

Wrought Goods—

Staples, Hooks, &c., list March 25, '02..... 85&10&10%

Zinc—*(Cask lots at mill.)*

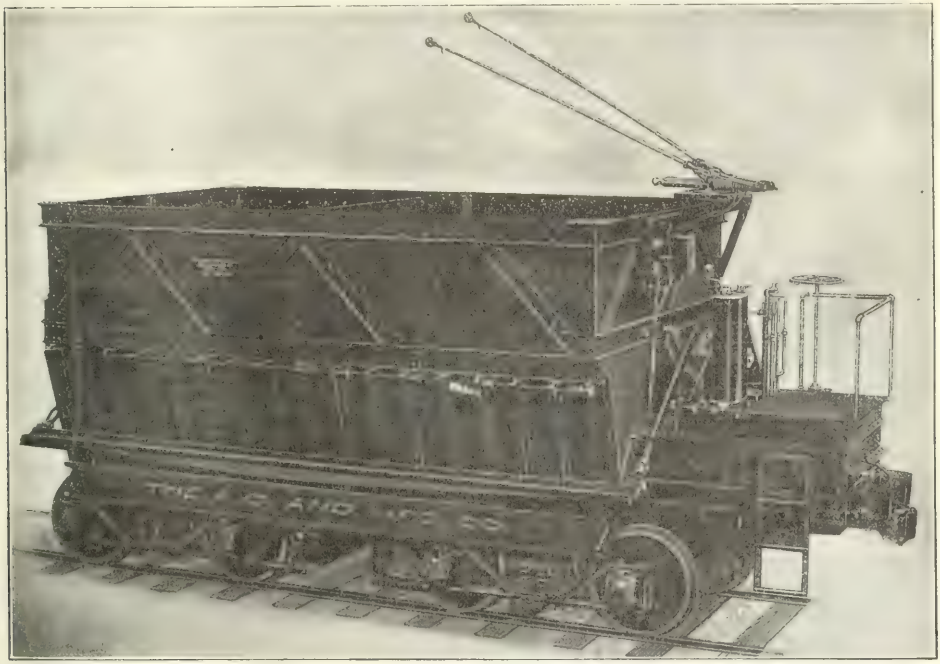
Sheet..... per 100 lb. $7.00

THE IRON AGE

New York, Thursday, March 5, 1908.

The Atlas Electric Ore Car.

The large quantities of ore consumed daily by modern blast furnaces call for enormous storage capacities and economical and durable apparatus for transferring the ore from the stock piles to the furnaces. A car for the latter purpose, which is operated by a novel combination of electric and air power, is herewith illustrated. It was built by the Atlas Car & Mfg. Company, Cleveland, Ohio, for the Richard Hecksher & Sons Company, Swedeland, Pa., one of the pioneer furnace companies of the East, on the recommendation of Frank C. Roberts & Co., Philadelphia, Pa., who had charge of modernizing the above furnaces.



A 50-Ton Ore Car with Electric Motive Power and Compressed Air Door and Brake Operating Mechanism, Built by the Atlas Car & Mfg. Company, Cleveland, Ohio.

The car is built of structural material, and large factors of safety were allowed throughout to insure rigidity and strength for the rough usage these cars are subject to. The bottoms are reinforced to withstand the impact of a load of 6 tons falling 20 ft., being loaded from a traveling bridge carrying a large clam shell bucket. False bottoms are used to allow for wear, and they are easily renewable. Because the material is of a sticky nature, especially in wet weather, the angle of the bottom is greater than 50 degrees, and no material can lodge or stick to the car when the load is being discharged.

The car shown is designed to carry a load of 40 to 60 tons, and when making a round trip every three or four minutes can handle 600 tons per hour, or 6000 tons in a working day of 10 hr. This can easily be accomplished, owing to the high power of the motors and the speed at which the doors can be opened and closed and the car operated. The tonnage handled is largely governed by the rate of loadings. The car when not in its regular use is employed as a switching engine, doing the work of a 50-ton locomotive with ease.

Over the drawheads the car is 25 ft. 6 in. long, the hight from the top of the rail to the top of the loading point is 10 ft. 4 in., and the width, over all, is 10 ft. 6 in. The maximum capacity is 1000 cu. ft., or 125,000 lb., and the normal load 100,000 lb. The operator stands on one end of the car, where all levers and handles are conveniently accessible for rapid operation. The doors are manipulated by admitting air to a vertical cylinder placed underneath the platform, as shown in the line drawing. The piston in this cylinder is connected with a rod carrying a rack at its upper end, which meshes with a gear on the main operating shaft. This shaft extends from end to end of the car beneath the apex of the gable bottom, where it is protected from grit and dirt. Two rocker arms at each end of this shaft have their outer ends pivoted to links connecting with the swinging edges of the two doors. At the closed position of the doors the inner ends of the links are carried beyond the center at each side, thereby relieving the strain on the shaft and bearings, making a direct pull through the centers and locking with a toggle effect. The shaft is supported by large bearings at each side of the rocker arms. A take up for wear on the outer end of the connecting links can be adjusted so that the doors can always be made to close tight.

To open or close the doors the operator turns the handle of a special valve which has an indicator to show its position. By shifting the handle in one direction air is admitted to the bottom of the piston, and at the same time air is held as a cushion at the top of the piston. In this way the load can be emptied gradually or instantly as desired. In the same way the doors can be gradually closed by shifting the handle in the opposite direction. The door operating cylinder is of special design. Owing to the slow movement special hydraulic packing is used in the piston to insure against loss of air. Both heads

are equipped with safety valves to prevent injury to the head or stuffing box by carelessness of the operator, and oil and drip valves are placed in the heads to drain the cylinder in frosty weather. All pipes are provided with unions, so as to be readily removable for making repairs.

As heretofore stated, the car can be used as a switching engine, consequently great strength is given to the frames to withstand shocks, and the drawheads and draft rigging are made of malleable iron and steel castings.

The electrical equipment on this car is an important feature, owing to the severe use and constant work to be performed. On each truck a No. 93 Westinghouse railway motor is attached, wound for 500 volts direct current. The driving wheels are ground to equal circumferential measurements to insure the maximum tractive effort. The axles are of hammered iron 6½ in. in diameter, with 5½ x 10 in. journals and special bronze bearings.

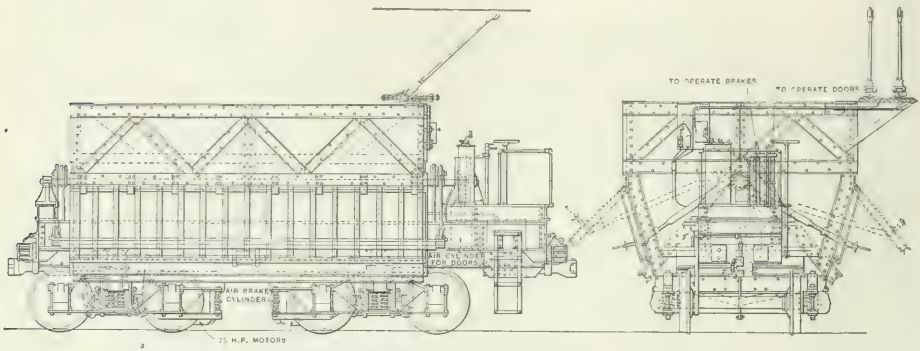
For the full control of the car sensitive air brakes are provided, as well as emergency hand brakes. A separate motor for driving the compressor which supplies air to the brake and door operating cylinders is located under the platform and is easily accessible for oiling or repairing. The compressor is of duplex type, and has an automatic controller to regulate the air pressure in the reservoir; the reservoir is extra large on account of the double duty of maintaining a supply for the door opening device, as well as the brakes.

The controller for the axle motors is of standard reversible inclosed drum type, and there are also provided a lightning arrester, an automatic circuit breaker, a whistle, a cutout switch, and the necessary resistance. The wiring is heavily insulated; all main cables are placed in indurated hose and where the wiring is connected to the motors special terminal pieces are applied. A lamp on the platform enables the operator to see the pressure gauge and various levers, when working in dark places. By standing on a step the motorman can see over the top of the car when switching cars and running backward.

Two trolley poles are used since a ground return is not feasible in the furnace yard. The return current is carried through the secondary trolley. A pentagonal trolley can be used which takes care of itself on curves and crossings, and when reversing the direction of travel. As the car is to be run in all conditions of weather, a special electric heater is applied to the bottom in winter, which is used to keep the ore from freezing to the lining of car.

Should one motor be disabled it may be cut out and the other used alone, each being large enough to take care of the service. The operator need not be a skilled mechanic; any careful workman can easily handle the car as all levers are marked and a diagram is attached to each showing its use.

The use of this car is not confined to blast furnaces, it is quite as serviceable around smelters or other industrial plants, where large quantities of coarse material are to be transported. As a means of shunting or transferring cars, either loaded or in trains when not in its regular use, the car is economical and is always ready and accessible. The Atlas Car & Mfg. Company is now building this type of car with an automatic weighing device so that accurate records of the amounts of material carried can be kept, and also manufactures a full line of standard and narrow gauge electric cars for all services.



Side and End Elevations of the Atlas Electric Ore Car.

Coal Consumed in Reheating Steel Ingots.

The cost of reheating Bessemer and open hearth ingots varies, inasmuch as the charging of Bessemer ingots to the soaking pits is usually continuous, whereas, in open hearth practice there is often an interval of several hours, during which no ingots are being charged. When the open hearth furnaces are pouring, the ingots naturally crowd the soaking pits, several heats of steel being delivered at the same time. All this steel cannot be charged hot in the furnace, and for this reason a considerable quantity of the ingots are cold before being charged, with a consequent increase in the amount of heat required to bring them to working temperature. The average output and fuel consumption of the pit furnaces, based upon above varying conditions, as determined by the S. R. Smythe Company, Pittsburgh, are as follows:

Capacity of one four-hole soaking pit furnace for 24 hr., using producer gas, 170 tons, operating with part hot and part cold ingots. Operating with all hot ingots, the capacity is 220 tons. The coal consumed per ton of steel in reheating part hot and part cold ingots ranges from 300 to 500 lb. For reheating all hot ingots the coal consumption varies from 200 to 250 lb. The coal under consideration is average Pennsylvania or West Virginia bituminous run of mine gas coal, the average analysis of which is shown in the following table, together with that of the gas produced from it:

Analysis of Coal.

	Per cent.		Per cent.
Moisture	1.19	Ash	6.26
Volatile matter	36.05	Sulphur	0.74
Fixed carbon	55.76		

Analysis of Gas.

	Per cent.		Per cent.
Hydrogen, H	11.41	Carbon monoxide, CO	22.98
Oxygen, O	0.08	Carbon dioxide, CO_2	4.04
Carbohydrates	3.61	Nitrogen, N	57.88

The Jones & Laughlin Steel Company is roofing all the buildings of its new plant at Aliquippa, Pa., with Bonanza reinforced concrete roofing tile, manufactured by the Hunkins-Willis Lime & Cement Company, St. Louis, Mo. The United States Steel Corporation is using the same roofing for the buildings of its great works at Gary, Ind., and will have there a total of about 29,000 squares. The Pittsburgh Plate Glass Company has now more than 20 acres of Bonanza roofing at Crystal City, Mo., and has contracted to use the same roofing for all the buildings of its immense plant to be erected at Kokomo, Ind. This tile is specially adapted for use on factories or other buildings where roofs are subject to deterioration from steam, smoke, acid fumes, &c.

Copper, in the judgment of President Daniel Guggenheim of the American Smelting & Refining Company, has taken the place of iron as a barometer of the business situation.

Gisholt Turret Lathe Work.

The following description of methods for finishing pistons and piston rings, furnished by the Gisholt Machine Company, Madison, Wis., may be taken as a continuation of the general subject of machining gas engine parts in a turret lathe, begun in *The Iron Age*, January 30, 1908, under the same title as above, which described two methods of finishing flywheels, one involving only one operation, and the other two operations.

Fig. 1 herewith shows a gas engine piston, which, it will be observed, has a ring for chucking purposes cast on the closed end. The ring is about 1¼ in. long, and its diameter is but a trifle less than that of the piston itself. The piston *a* is first held with special hard chuck jaws *b*, and the open end is rough-bored with the cutter *c* in the bar *d*, the latter being held in a drill holder and supported in the drill support close to the work. Then

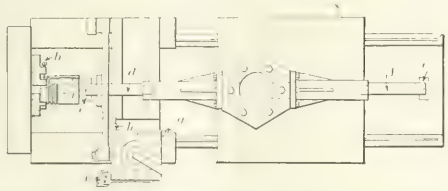


Fig. 1.—A Method of Finishing a Gas Engine Piston in a Gisholt Turret Lathe.

with the cutter *e* held in the bar *f* the piece is finish-bored in a similar manner. The drill support is then turned back on its hinge out of the way, and the piston is rough-turned with the tool *g* in the turret tool post (this tool is not shown in its working position); and next finish-turned with the tool *h*. The grooves for the piston rings are then cut with the gang tool *i* in the tool-post, the latter being swung through an angle of 90 degrees to bring the tool *i* into position.

For the second operation the piece is reversed, and is held in soft jaws which have been substituted for the jaws *b* and are bored to the outside diameter of the piston. The chucking ring is then cut off and the end of the piston is faced. If the crank pin hole is also to be finished, another operation is necessary; a self-center-

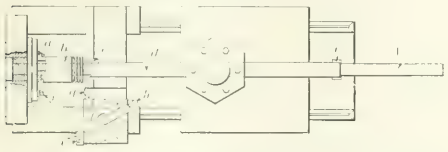


Fig. 2.—A Method of Forming Piston Rings in a Gisholt Turret Lathe.

ing chuck-plate and other boring tools are required, but are not shown in the illustration.

The forming of piston rings is illustrated in Fig. 2, which shows a cylindrical cast iron piece *b* with three lugs *a*, cast on one end, so arranged that the piece may be held in a three-jawed scroll chuck. This cylindrical piece is about 10 in. long and where the rings are to be concentric inside and out the standard jaws suffice. The piece is rough-bored, with the cutter *c* in the bar *d*, after which it is finish-bored with the cutter *e* in the bar *f*. While taking the cut each bar is supported in a bushing in the chuck. The periphery of the piece is rough-turned with the tool *g* held in the turret tool post. This is done while rough-boring with the cutter *c* in the bar *d*. After the periphery is rough-turned and the hole is finished, the turret tool-post is revolved sufficiently to bring the finishing cutter *c* into action and the periphery is finished; then the tool-post is again revolved so as to bring cutters *i* into action, and four rings are cut off, nearly simultaneously, the first cutter being set a little in advance of the next one, and so on.

When the bore of the piston ring is not concentric with the periphery the cylindrical piece *b* is first bolted to a sliding chuckplate *j*, and the periphery is rough-turned with the tool *g* in the tool-post. It is then finished to size with the tool *h* in the tool-post. Then the sliding chuck plate carrying the work is moved over a distance equal to the eccentricity desired and the piece is rough-bored with the cutter *c* in the bar *d* and the hole is finished with the cutter *c* in the bar *f*. The turret tool-post is then revolved, the cutters *i* brought into play and the rings cut off as before.

It will be evident that this gives a far greater output of rings than is possible by finishing them in the usual way on engine lathes. The faces of the rings may be finished in another operation, if desired, or they may be ground.

A Copper and Brass Institute Proposed.

A movement has been started in England to form a Copper and Brass Institute to stimulate scientific research regarding nonferrous metals. The following information has been received relative to the action taken at a preliminary meeting:

A meeting of copper and brass manufacturers, engineers and others was held in Manchester, England, on February 13. W. H. Johnson of Richard Johnson, Clapham & Morris, Ltd., Manchester, was elected chairman. It was unanimously resolved to form a Copper and Brass Institute. The impetus to this movement was given by a letter from W. H. A. Robertson of Bedford, which appeared in *Engineering* on January 24.

The objects of the institute are similar to those of the well-known Iron and Steel Institute, as follows: 1. To afford a means of communication between members of the trades in question bearing upon their respective manufactures, excluding all questions connected with wages and trade regulation. 2. To arrange periodical meetings for the purpose of discussing practical and scientific subjects relating to the manufacture, working up and use of the nonferrous metals.

It is not the intention of the founders to limit the institute to the copper and brass trades, but to include all those connected with the commercially important nonferrous metals and their alloys, as lead, zinc, tin, aluminum, nickel, silver, gold, platinum, &c. In order to obtain a much wider and fuller discussion than was possible at the preliminary meeting, and to define the constitution and method of procedure of the institute, it is proposed to hold a meeting in the Midland Hotel, Manchester, on March 10.

A similar movement in the United States last year resulted in the formation of the American Brass Founders' Association, which includes not only founders, but all manufacturers who work the nonferrous metals. The London *Iron and Coal Trades Review* says that the papers and discussions of the British Foundrymen's Association have been to too great an extent of an academic character, and that in general the practical study of metallurgy has been largely neglected by the various technical associations in Great Britain. It adds: "Papers are forthcoming in large numbers from college professors, but it is only occasionally that the suggestions made in these papers can be applied by the practical man. Where practical work on novel lines has been carried out, we are far too much disposed in this country to keep the results a profound secret, and while this continues to be the case, technical progress can never be as rapid as it is in the United States and Germany, where this practice does not exist to anything like the same extent."

The greatest store of gold ever accumulated is now in the Treasury of the United States. On February 26 it passed the $1,000,000,000 mark, establishing an epoch. Of course, only a part of this gold belongs to the Government, as $829,651,869 was held in trust for private owners, against which gold certificates have been issued and are in circulation as currency. Of the remainder, $150,000,000 is in the greenback reserve fund.

Overcharges on Through Shipments.

Reform Needed in Billing Over Connecting Lines.

BY R. L. ARDREY.

Many large industries, especially those handling heavy products or materials, sell their goods either delivered or with freight prepaid. Where these shipments traverse several connecting lines a large percentage of the freight bills are overcharged. Even when the consignee holds a bill of lading which shows that the freight has been prepaid in full, there are often additional charges which the delivering road insists upon collecting. On short hauls, or where there is a considerable tonnage of this class passing over one route, there is not much trouble, but houses which distribute their product over a wide territory in this manner have a large amount of their capital tied up in overcharges, which they have great difficulty in collecting from the railroads.

A member of the Interstate Commerce Commission, in correspondence regarding a case of this kind, could give the shipper no comfort, excepting to say that it is a misdemeanor, subject to a fine of $5000, for a delivering agent to collect more than the lawful rate on a shipment. Every important railroad in the country commits this misdemeanor thousands of times in the course of a month's business, but no shipper wants to take advantage of so drastic a penalty for the mere mistakes of the clerks who handle the billing. It may be, however, that this penalty, which is provided in the Interstate Commerce law, will impel the railroads to adopt a more accurate system in handling their freight accounts.

The "Through Waybill" a Remedy.

Shippers who have investigated the question of overcharges on through traffic believe that at least 90 per cent. of the trouble could be obviated if the railroads would accept the "through waybill" method of handling freight which passes over several roads, on a through rate. The through waybill goes with the car, from initial point to destination, and carries on its face the through rate and the explanation of any additional charges which may have accrued. The agent at destination makes out the expense bill for the amount of the through rate which appears on the waybill, and itemizes any additional charges. The division of the rate is handled by the freight auditing departments of the roads participating in the haul.

Leading railroad and auditing officials believe in this method of handling through freight, and they have been trying to get it adopted. Several progressive railroads have followed this method for years in their interchange of business, but they have found it very difficult to secure the general adoption of the plan by their connecting lines. It may be that, by a little wholesome agitation, large shipping interests could assist in getting recognition for this method.

The Trouble Comes from Rebilling.

The prevailing method of handling through shipments is to bill the car from junction to junction. The agent at point of shipment makes out a waybill which only goes as far as the junction point where the car is delivered to the connecting line. The junction agent of the connecting line makes a new waybill, or "rebills" the car, entering on his waybill as "advance charges" the amount which has been billed to him as the revenue of the initial line. Each road turns in its waybill to its auditing department. The junction agent pays in cash the advance charges on all cars that he receives. As a rule the agents at junction points make weekly settlements on their interchange of traffic, but in many cases a delivering line requires cash on delivery on each car.

On long hauls cars are often rebilled half a dozen time or more, and it is natural that there should be many overcharges. The junction billing clerk will be more likely to make a mistake in favor of his road than to undercharge a car, because tissue copies of all his bills go to the auditing department of his road. The through rate should be carried forward on the waybill, but this is often omitted, and after a car has been rebilled several times the billing clerk has nothing to guide him but the advance charges. When the shipment reaches destination the final waybill may show that the delivering road has charged the correct rate, but the advance charges represent money which it has actually paid out on receipt of the car, and the local agent would rather have the consignee present a claim than to attempt to get the billing corrected himself.

On a large percentage of through shipments the local agent at destination does not know where the car came from. The initial point, the through rate and other important information have been omitted, and the last waybill does not even show what intermediate lines have handled the shipment. The consignee must pay the amount shown in the billing, and send the expense bill to the shipper, and it often takes several months to trace the shipment, locate the error and get it corrected.

Complexities in the Division of Rates.

There are many complexities in the division of rates on through business which confuse the billing clerk and multiply his errors. In some cases the road has a proportional tariff, or receives a definite number and fraction of cents per 100 lb. on a through haul. In other cases the through rate is divided on a percentage basis. There are many bridge tolls and other arbitrary charges or deductions. The Missouri River bridge toll of 5 cents per 100 lb. is charged on thousands of cars that never get within 100 miles of the Missouri, and the Oakland ferry toll and similar charges are counted as arbitraries on traffic that never reaches the point on which the charge is based. The lighterage charge at New York is too bewildering a subject to discuss. All these arbitrary charges, proportions and percentages must be figured on through traffic, and it is a wonder that overcharges are not a greater nuisance than they are under the junction system of billing.

The through waybill leaves to the auditing departments of the roads the settlement of all these complications. There are no advance charges to accumulate at each junction, as a lien on the shipment. The consignee pays the through rate, which appears on the waybill, and the auditors settle all differences in dividing the amount thus received. The junction agents merely send "passing" reports to their auditors and have nothing to do with the billing, except on some Eastern lines where settlements are still made weekly by junction agents, on a modified form of through billing.

A Relic of Past Conditions.

The junction method of billing originated in the dark age of railroad traffic, when it covered a multitude of sins. In those days the initial line made the rate to conform with existing relations between the shipper and the railroad, and to meet competition. "Paper" tariffs were not always followed in making actual rates, and it became a habit with railroad employees and local agents to follow the billing implicitly in the matter of charges, without any regard to printed tariffs. No change could be made in the charges shown in the billing without the authority of the initial carrier, and this long established custom or habit is more sacred to the billing clerks of the railroads than the law enacted by Congress.

The initial carrier no longer enjoys the right to quote or make rates which differ from the published tariffs. The published through rate is now law, which must be obeyed by both shippers and carriers. The billing, which was once regarded as the only guide to be followed in figuring freight bills, has become a mere subordinate detail. The old custom, however, cannot be changed in a day. Most of the railroads continue to base their freight bills on the accumulation of advance charges, which have been billed against the car from junction to junction, and settled by the junction agents.

The Central Freight Association has recently taken a step which clears away one obstacle in the way of the modern method of joint or overhead billing. The railroads in this association, which cover the territory east of Chicago and north of the Ohio River, have decided that in the future they will not advance money against a car, in settlements between roads, for anything excepting lawful freight charges.

While this new rule was under discussion a case came

up which shows that the railroads themselves, as well as the shippers, have trouble with overcharges. A shipment was refused in Michigan on which the last road had paid out $4000 in advance charges, and it took 60 days of vigorous investigation to find where the car came from and to obtain a detailed statement of the $4000 of charges so the trouble could be located. The shipment had come from Mexico, and the freight bill included customs duties, fees and various other complications, covering money which had been advanced by the connecting lines. It would seem as though shippers would be justified in following the policy which the railroads themselves have adopted, of refusing to pay more than the lawful rates.

Lowest Freight Rates.

How Shippers and Receivers Can Get Them.

BY A SHIPPER.

A remarkably increased effort is being manifested by shippers and receivers of freight in the question of obtaining from carriers the most efficient service at the least cost. Because of this interest and study many merchants have obtained information that enables them to reduce their freight accounts.

How Important Savings May Be Made.

It is a fact that many shippers and most receivers of freight give no thought to routing. Unless the shipper pays the freight, he rarely considers that it is to his interest to offset what some competitor may be accomplishing by having a very thorough knowledge of what route will save his customers the greatest amount of freight. Yet the largest shippers employ their own traffic managers, an important duty of whom it is to know the most advantageous route to select for each shipment. Railroad companies are supposed to bill freight via the route most favorable to the consignee, but the fact remains that the carrier protects its interest and that of its allied lines, and the burden of knowing the cheapest route must rest with the shipper or receiver. Many merchants have not considered this question, but, upon having attention called to it, those who investigate have usually found it possible to effect some saving.

The majority of receivers of freight pay their freight bills without any thought as to overcharges. Recent inquiry developed the fact that a very large retail house always burns its freight bills a short time after the freight is received, without any investigation or audit. Traffic managers for business houses and traffic bureaus know that a large percentage of the rates used are incorrect. This is often due to purely clerical errors by freight billing clerks, who frequently depend upon memory for rates, but another overcharge is that made in pro-rates. A carload of merchandise was recently shipped and billed at the regular quoted through rate of 23 cents per 100 lb. The merchant's traffic manager found by using the rates of the several roads over which the car traveled that the total rates figured only 19 cents. A claim was entered for this overcharge of 4 cents per 100 lb., and it will have to be refunded, as the Interstate Commerce Commission has ruled to that effect in a similar case. A traffic manager holding an important position states that at least 25 per cent. of the claims he makes on railroad companies are because of incorrect rates.

Classification Should Be Carefully Looked After.

Another common error made by railroad billing clerks is in regard to classification. Depending upon memory is one cause, but the most frequent errors are made by billers incorrectly selecting an item in the classification which they consider covers the article shipped. Every shipper and receiver of freight should obtain an official classification book from his railroad company and make a study of it. This is necessary in order to know how to pack and describe each shipment on bills of lading so as to obtain the most favorable class, and not fail to enter separately the weight of each article that is subject to a different class. The packing of freight is very important, as it controls the classification to a very large degree. Slight changes in packing frequently effect considerable saving in the class and rates.

It is possible, though difficult, to bring about changes in the classification. Recently an article having a large sale was changed from first to third class without any change in the packing. This change was accomplished by manufacturers combining their efforts and insisting for some months that a first class rate was unjust and inconsistent. Later the manufacturers sent a representative to appear before the Classification Committee, and by the aid of photographs convinced the committee that the article, as packed for shipment, was entitled to the lower class.

Average Shippers Have Little Knowledge About Rates

Considerable publicity has been given the matter of rates by the enactment of recent laws and the investigation of well-known shippers. Nevertheless, this is a matter about which the average shipper has little knowledge and fails to comprehend the fine points. Jobbers frequently complain that competitors at some principal point are able to ship into a certain territory at a rate as low or lower than they are able to obtain for a much shorter distance, and they do not understand it. In most instances this is accomplished by what are known as exceptions to the official classification. All large railroad companies issue exception sheets, although this fact is unknown to many shippers. These exception sheets name articles that the carrier and its allied lines will accept at a lower rate or class than named in the regularly distributed tariffs or classifications. These sheets are properly filed so as to meet all legal requirements, but their existence is known only to certain shippers and such others as may accidentally learn of them.

The exception sheet of one of the large Eastern railroads, for instance, enters axes, in boxes, L. C. L., at fourth class, while the official classification is third class. The same exception sheet enters bolts, in boxes or kegs, at fifth class; and iron bars and many other iron and steel articles, L. C. L., at fifth class. The official classification is fourth class.

Actual Instances Cited.

A hardware jobber recently called his shipping clerk's attention to the fact that a manufacturer was making shipments for a distance of 400 miles and obtaining a rate as low as the jobber could obtain for less than 200 miles. Investigations showed that exception sheets were in use by the carrier of the manufacturer's shipments, which enabled him to obtain a low rate. In another case the exception sheets of a prominent railroad give an estimated weight on certain articles which is lower than the actual weight that is supposed to apply under the official classification.

Special commodity rates are quite generally known to apply to bulky freight, such as grain, coal, sand, stone, &c., but it is not generally known that commodity rates are issued between certain points on manufactured articles. These rates are filed as the law requires, and are used for all shippers forwarding the same class of freight in that territory. A manufacturer located in a small town on one railroad influences the issuing of a commodity rate on his product. A competitor at another point in the same State pays the regular and of course a higher rate, and, as a rule, knows nothing about the existence of commodity rates. These rates are not for general distribution even among freight agents, and are filed only at the points where the freight originates. In this way the rate is known only by the legal authorities, the shipper and the railroad employees at that point. The law is complied with by filing the rate with the Interstate Commerce Commission 30 days before it is used and having tariffs on file at the railroad office from which shipments are made.

Transportation is one of the momentous questions of the present day merchant and should receive from him sufficient attention to enable him to acquire the knowledge that will result in his reducing his freight account to the minimum.

The New Gorton Cutting-Off Machine.

When an altogether new principle is introduced in a machine that has gradually developed into a more or less standard form, usually some time is required to perfect it, and such has been the case with the innovation in cutting-off machines illustrated herewith. The idea of turning a saw blade inside out, so to speak, putting the teeth on the inside of a circle instead of the outside, first occurred to the inventor, George Gorton, over 20 years ago, but the scheme offered no real advantage at that time. Solid saw blades of the old type could be driven to the full capacity that their material allowed, but the high speed steels now available, transfer the output limiting factor to the driving mechanism. Vibration and chatter result if certain speeds or feeds are exceeded, because of the leverage of the work over the saw driving gear, in the present established arrangement.

The latest machines built by the Geo. Gorton Machine Company, Madison, Wis., have been evolved during four or five years of experimental designing, building and testing, and are claimed to overcome entirely the tendency of the blade to vibrate; as a consequence a cutting feed or saw advance of 3 in. per min. can now be maintained on regular commercial open hearth steel bars of 4 in. diameter and over. When operating on 6-in. open hearth steel bars at a saw advance of 4 in. per min., severing the bar in 1½ min., it is stated that no vibration is noticeable in any part of the machine, although the 6-in. machine illustrated herewith weighs only 7000 lb. The best record on equivalent work performed by a machine of the ordinary type weighing 20,000 to 25,000 lb. is reported to be 6 min. The line drawing, Fig. 1, compares the dimensions of the working features of machines of corresponding capacity employing the old and the new principles, and illustrates the contention that the latter provides a saw drive nine times as powerful as that of any ordinary design of cutting-off saw. The saw blade being supported around its entire periph-

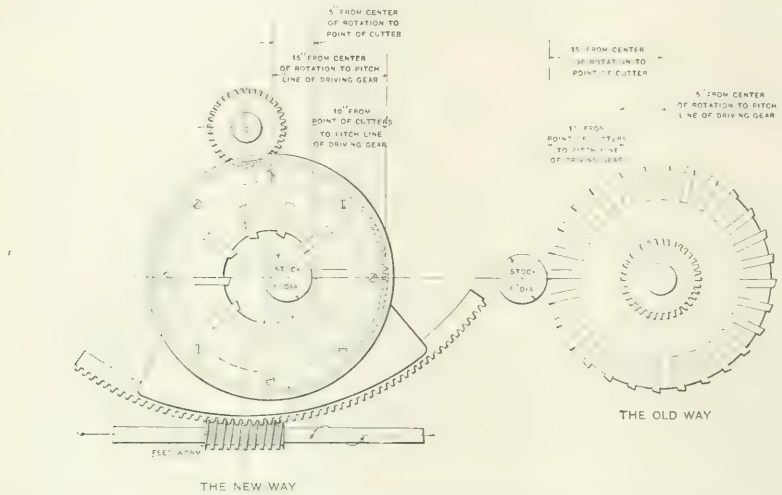


Fig. 1.—Diagram Comparing the Leverages of the Driving to the Cutting Power of Saws Built on the Old and New Principles.

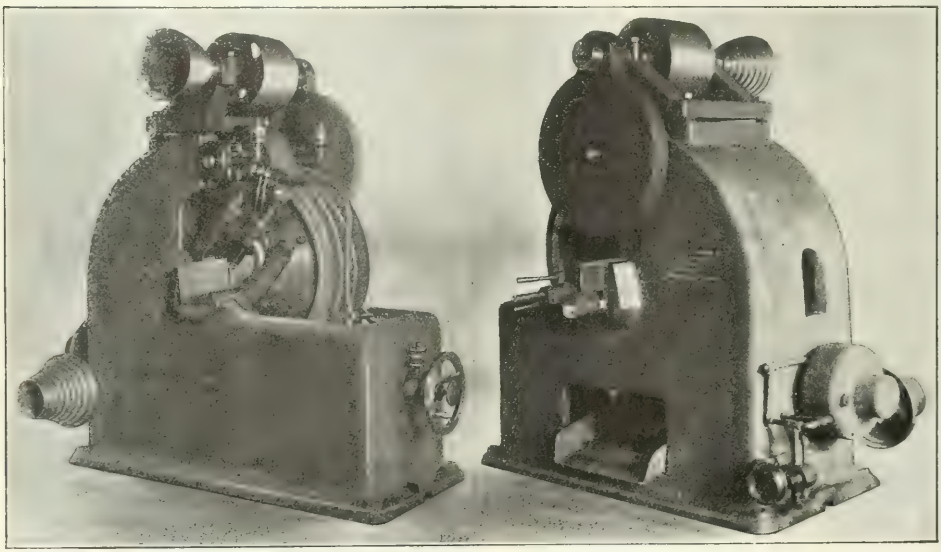


Fig. 2.—Diametrically Opposite Views of the No. 2-A Cutting-Off Machine Built by the Geo. Gorton Machine Company, Madison, Wis.

ery, has no tendency to buckle or shake, and the inserted teeth being on the inside of the blade are more rigidly supported and less likely to work out than those in the common form of blade.

The feed mechanism gives a 2 to 1 leverage over the saw, further aiding materially in its smooth running. The blade is supported by a frame which carries a 90-degree segment of a worm gear operated by a large worm running in oil. This worm is mounted on a hollow shaft, which may be driven at the forward end by a large hand wheel or at the rear end by a smaller worm connected with a friction clutch operated by a push rod ending in the smaller wheel, shown at the center of the large hand wheel, in Fig. 2. By means of the hand wheel the saw frame may be quickly raised, as in Fig. 3, to give access to the cutters. Six speeds for power feeding are provided in geometrical progression; these on the 6-in. machine are capable of severing a 6-in. bar at rates varying from 1½ to 5¼ min., when the saw teeth are revolving at a speed of 75 ft. per min., and are thoroughly lubricated with a compound of water, lard oil, soda and soap.

The main driving pulley is 14 in. in diameter by 10 in. face, and runs at 350 rev. per min. When severing a 6-in. open hearth steel bar in 1½ min., 18 hp. is required for the driving. All gears are of large size, and are cut from the solid. The main saw driving pinion is a steel forging integral with the shaft. Special attention has been given to lubrication throughout, and all bearings are protected from grit, and all gears are fully inclosed. The bearings of the saw drum are immersed in oil, and all other bearings including the feed works are ring oiling. The saw frame being hung on trunnions from above, is out of the reach of grit, which so often shows its effect in badly cut ways in the ordinary sawing machines.

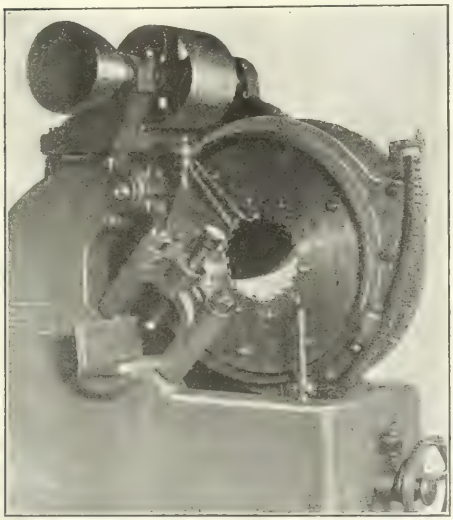


Fig. 3.—The Gorton Saw Blade Elevated to Give Access to the Inserted Steel Cutters.

Effort has been made to produce a tool capable of hard service at high efficiency, as nearly as possible fool proof, and so capable of being operated by unskilled labor. The base is a strong one-piece casting heavily ribbed, and webbed across the entire bottom, which forms a large water pan. An opening is provided at the rear for removing chips, which settle and slide down a chip screen to an outside pan. A geared pump circulates water or saw lubricant through a system of piping. Three stock supports are furnished provided with rollers to enable heavy bar stock to be placed on the supports by a crane and readily passed through the machine. An adjustable gauge which may be swung over when not required, guides the setting of the work for cutting to exact lengths.

The length of the 6-in. machine overall is 84 in., the width 56 in., and the hight 78 in. With the automatic feed release in action 6-in. round or square stock may be cut, and by back feeding 2 in. by hand and then throwing in the power feed, it is possible to sever 8-in. round stock. The net weight of the machine illustrated is 7000 lb. It can be furnished either for belt-drive or for electric-drive by a directly connected motor. Other sizes will soon be ready for the market, including 4-in., 9-in., and 12½-in. machines, weighing from 5000 to 25,000 lb.

The Brady Brass Company Wins Its Alloy Suit.

The United States Circuit Court of Appeals for the Third District has reversed the Federal Court for the District of New Jersey in the suit of the Ajax Metal Company against the Brady Brass Company, Daniel H. Brady of New York, president, and finds that the patent upon which infringement was claimed is invalid. This case had been in the courts since 1903, and was argued on appeal in December last in Philadelphia for the defendant corporation by Judge Morgan J. O'Brien, before the full bench of the appellate tribunal.

This result is regarded as of unusual importance and interest to the entire metal world. Owing to the legal points involved and the important questions disposed of, it is considered as on a parity with the noted Goodyear rubber cases and calculated to attract equally widespread attention from men engaged in the metal trade as well as patent lawyers and all who have occasion to use journal bearings and engine castings.

The Ajax Metal Company set up the claim that it had invented and patented an alloy capable of holding up within itself more lead than had been previously possible without the use of nickel, and had thus produced a bearing consisting of less than 7 per cent. of tin and more than 20 per cent. of lead and the balance copper. The validity of the patent was sustained by the trial court, but has just been reversed upon appeal.

The opinion of the appellate court by Judge George Gray, in passing upon the claims of the plaintiff, says that "the patent is for a product and not for a process. There is no claim for any particular method of combining the constituents of this alloy, and the specification only states the ordinary foundry practice, well known and recognized by those skilled in the art."

Discussing the metallurgical features, the court says that points upon which the Ajax Company bases its claim for novelty of invention were all known and well understood by the trade long before the application for patent. The written opinions and the evidence of distinguished experts like Dr. Charles B. Dudley of the Pennsylvania Railroad; Prof. John W. Langley, a graduate of Harvard; Dr. Charles F. Chandler and Dr. Joseph W. Richards, who were witnesses in the case, are quoted to confirm the main point, that the alloy in question was not patentable as it "differed in degree and not in kind" from that which had been on the market for a long time.

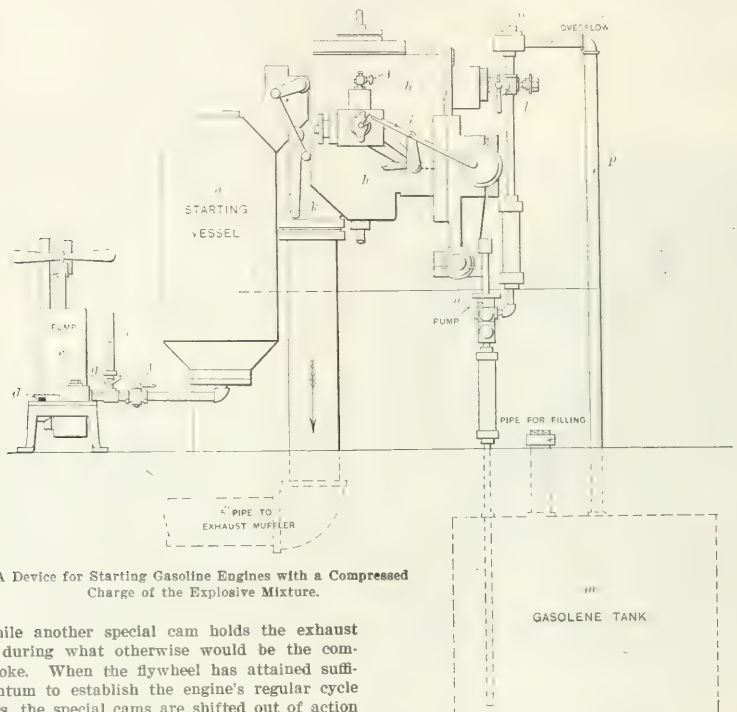
Concerning the Ajax claim that it had discovered a "critical point," so-called, in copper-tin alloys, the court quotes the testimony of Dr. Albert Sauveur, a witness for the Ajax Company, to show that this "critical point" was known at least three years prior to the application for the patent in litigation "by all students who have conducted the necessary experiments." Finally, the opinion, after a careful and thorough discussion of all the features, says:

"A mere difference in the proportions of the constituents of an alloy, however useful the result may be, does not entitle the originator to the monopoly of a patent, in the absence of other circumstances than those here disclosed. Being of the opinion that the patent in suit is invalid, it is unnecessary to consider other grounds of defense, though we may be permitted to say that the prior public use set up in the answer of the defendant seems to us to have been sustained by the testimony. The decree of the court below is therefore reversed."

Starting Gasoline Engines.

BY WALTER IRVING.

Small gas and gasoline engines may readily be started by turning the flywheel by hand, if the compression is reduced temporarily by opening a small relief cock, or by holding the exhaust valve open during part of the compression stroke. Large engines, after once being put in operation, usually are subsequently started by air compressed during the running of the engine by an air pump directly attached to or driven by the engine. The compressed air is stored in a tank until it is needed after the next succeeding shutdown, when it is admitted into the engine cylinder through a special valve whose operation is controlled by a sliding cam on the 2 to 1 shaft. During the first part of both suction and expansion strokes this valve admits compressed air to the cylinder, while another special cam holds the exhaust valve open during what otherwise would be the compression stroke. When the flywheel has attained sufficient momentum to establish the engine's regular cycle of operations the special cams are shifted out of action and the combustible mixture is admitted to the cylinder and exploded in the usual manner. As a rule, compressed air starters are applied to but one cylinder of a multicylinder engine, the other cylinders taking up their work after the engine has been run a few revolutions on compressed air.



A Device for Starting Gasoline Engines with a Compressed Charge of the Explosive Mixture.

The accompanying engraving shows a starter as applied to an Otto gasoline engine. It consists of a reservoir or starting vessel *a*, connected between the engine *b* and a hand pump *c*. A small quantity of gasoline is poured into the starting pump *c*, through the plug *d*, so that when the pump is operated a mixture of fuel and air passes through the reservoir *a* to the engine cylinder. Before attempting to ignite this mixture in the engine cylinder, it is customary to test it in the testing tube *e*. The cock *f*, between the hand pump *c* and the reservoir *a*, is closed, and the cock *g* at the foot of the testing tube *e* is opened; the upper end of the testing tube is covered with the hand and a few strokes are given to the pump to fill the tube with the mixture; then the cock *g* is closed, the hand removed from the mouth of the testing tube and the mixture quickly lighted with a burning candle or match. If the mixture is properly proportioned it will burn rapidly, giving a fairly sharp report as it burns down the tube, but if it burns slowly, giving a weak report, the mixture is not properly proportioned. The proportions of the mixture of air and gasoline may be changed by adjusting a brass set screw in the top of the starting pump barrel.

Having made the necessary adjustments to secure a good combustible mixture, the engine may be prepared for starting by turning the flywheel until the crank is in its starting position, slightly above the inner dead center, and with the piston at the beginning of the expansion stroke. To facilitate starting, the time of ignition is retarded by turning the handle *h*, so as to lower the igniter blade *i*. The cylinder relief cock *j* is opened, and by raising the hand lever *k* the starting valve between the reservoir *a* and the engine cylinder is also opened. With the cock *f* open and the cock *g* closed, about 10 strokes are given to the hand pump to force into the cylinder enough of the mixture to drive out through the relief cock *j* any air or dead gases. The cock *j* is then closed, and after giving 10 more strokes to the pump, the valve controlling the passage between the reservoir *a* and the engine cylinder is closed. The pressure within the reservoir is then increased by giving about 20 strokes to the pump, the lever arm of which is lengthened so as to increase its leverage.

When the switch of the igniting circuit is closed and the gasoline fuel valve *l* opened, the engine is ready for starting. Opening the valve operated by the lever *k* allows the high pressure mixture to rush from the reservoir *a* into the cylinder, forcing the piston outward until it reaches the point at which ignition takes place, and the explosion produces a powerful impulse which imparts to the flywheel sufficient momentum to carry it over the next compression stroke. Immediately after the first explosion the valve between the reservoir and the cylinder is closed by pushing down the lever *k*, so that the succeeding charge is drawn in, compressed and exploded in the regular way, and as the speed of the engine increases the time of ignition is advanced by turning the handle *h* so as to raise the igniter blade *i* until it occupies its normal position.

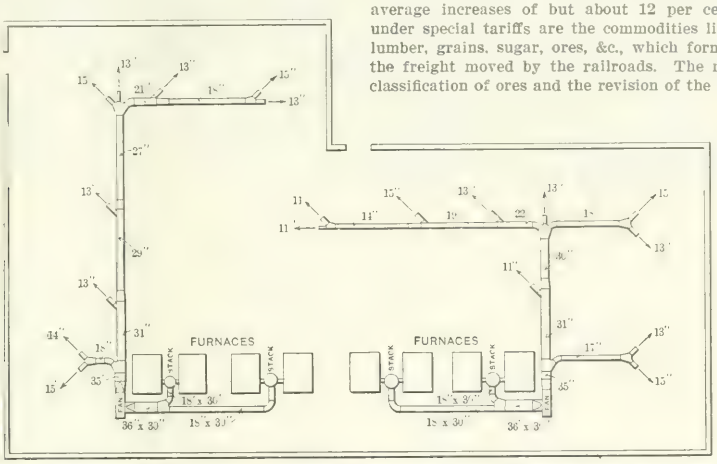
The required supply of gasoline is pumped from the tank *m* by a pump *n*, which is driven by an eccentric on

the cam shaft and which lifts the gasoline to the cup *o*. From this cup the liquid flows to the gasoline inlet valve or spray nozzle at *l*, and the overflow returns through the pipe *p* to the underground supply tank *m* beneath the engine room floor.

Utilization of Waste Heat for Warming Buildings.

A unique method of utilizing waste heat from the stacks in the enameling room of the Carnahan Stamping & Enameling Company, Canton, Ohio, is employed in an installation recently made by the Massachusetts Fan Company, Watertown, Mass. The building is a one-story structure about 180 ft. long by 120 ft. wide and 14 ft. high from the floor to the bottom of the beams. The roof is of the modern saw tooth type.

The work carried on is that of enameling graniteware, the process being briefly as follows: The articles to be enameled are first cleaned, then dipped and placed on racks distributed about the room. Here they are exposed to the air long enough to be thoroughly dried, and are then put in ovens to bake. It is therefore imperative that the air in the enameling room have a relatively low humidity, and be hot enough to produce rapid drying. There must also be positive means of carrying away the vapors given off by the drying enamel. In a word, there must be vigorous artificial circulation of the heated air.



Plan of the Equipment Installed in the Carnahan Stamping & Enameling Company, Canton, Ohio, by the Massachusetts Fan Company, for Utilizing the Waste Heat of Drying Ovens for Warming the Building.

In the illustration of the heating arrangement are shown eight furnaces or so-called ovens of the reverberatory type arranged in two groups. Each stack carries the discharged gases from a pair of furnaces, and is fitted with an outside concentric pipe which serves admirably for a hot air heater. Cool air enters this annular space from above and is withdrawn from the jacket near the bottom by suction pipes leading to a fan. Two fans are provided. From the outlet of each a system of overhead distributing pipes extends over that portion of the room devoted to the dipping and drying of the ware. The outlets, situated at suitable distances from the walls, according to the exposure, discharge against the cold surfaces. The heated air cooled by contact passes down and across the trays of drying ware and circulates throughout the building, a part being drawn back through the jackets to the fans and redistributed.

The equipment includes two regular Massachusetts Fan Company's 90-in. exhausters supported upon elevated platforms. Motive power is furnished by direct connected motors running at a speed sufficient to produce a change of air in 10 min. guaranteed to be maintained at a temperature of 80 degrees F. The layout, although simple, has been very effective in producing the desired results. The system was designed to give a discharge velocity of 2000 to 3000 ft. per minute, according to the fan speed. This velocity is rapidly dissipated above head level, but it insures positive circulation.

The economy of this novel means of heating is self-evident. It is well known that the cost of moving air is only a portion of that necessary to heat it. In this instance a large part of the heat from the flue gases which would otherwise escape by the stacks is utilized and made effective in heating the building and drying the enameled products of the company. The recirculation of the air is another factor in the economy.

Advance in Freight Rates in Mexico.

United States Consul W. D. Shaughnessy, writing from Aguascalientes, states that increases are to be made in freight rates on the Mexico railroads, concerning which he sends the following newspaper notice:

"The changes will result in an increase in the freight rates on the specified commodities averaging about 12 per cent. The railroads desired average increases of about 20 per cent., but the government commission allowed average increases of but about 12 per cent. Included under special tariffs are the commodities like coal, coke, lumber, grains, sugar, ores, &c., which form the bulk of the freight moved by the railroads. The matter of the classification of ores and the revision of the special tariffs covering ores has been referred to a subcommittee for consideration.

"While apparently large, it is asserted by experts that the increases granted in special commodity tariffs in reality will be so small as not to be noticeable by either the shipper or the consumer. In the case, for instance, of grains, the increase will be so small that it will amount to but a fraction of a cent on the bushel. These increases, however, while not being a burden either on the consumer or shipper, it is asserted, will result in the material enlargement of the revenues of the railroads and provide them with the funds for the construction of needed improvements.

"The railroads have insisted that increases in rates are necessary, for the reason that the cost of labor and of materials has increased from 60 to 150 per cent. since the revision of rates in 1900. The fact that only two or three times in their history have the principal railroads of Mexico been able to meet their fixed charges is also pointed to by the representatives of the railroads as the reason for the enlargement of the revenues of the railroads by increases in rates."

The Cleveland Branch of the National Metal Trades Association has under consideration the question of sending a permanent representative to South America to work for the extension of the sales of its members in that part of the world. The matter will be discussed, and perhaps some definite action taken, at the annual meeting and banquet of the association at the Hollenden Hotel, March 5.

The Corning Pipe Corrugating Machine.

A machine which corrugates, grooves and crimps sheet metal pipe in one operation has been developed by the Corning Mfg. Company, Corning, N. Y. Figs. 1 and 2 are two general views of the machine, which show the relative position of the parts of the machine before and after the corrugating process, and Fig. 3 shows some of the principal parts of the machine removed. In designing it was the object to secure a simple and economical machine capable of turning out square, round and corrugated conductor pipe as fast as two men can operate it and to include a method of corrugating, which will prevent injury to the coating on the inside of the pipe and thereby prevent the rusting of the latter, which is practically sure to occur in a short time where the protective coating has been broken in any way. The machine was invented by E. R. Stasch of the Corning Mfg. Company.

In Fig. 1 the machine is shown ready to receive the pipe. This pipe, already edged and formed, is placed around the rod extending from the corrugating head in the foreground to the head block toward the rear end of the machine. In being placed around the rod the edges of the pipe are caught together, and the pipe is supported by a holder or support at the head block, which support works in the fingers or projections of the head block. The head block and its fingers are better shown in Fig. 3. The pipe is then corrugated by means of the corrugating head and a mandrel which is held centrally with respect to the head. The corrugating head and the mandrel travel together, while the pipe is held stationary. The mandrel is fixed to one end of the rod, and the rod and corrugating head are both a part of the traveling carriage, which, as indicated, is driven by spur gears meshing a rack which extends along each side of the carriage.

When the pipe has been put into the machine and the lever shown is turned, the corrugating head and mandrel travel together over the pipe, which is locked in the process. At the beginning of the operation the crimper which is at the near end of the machine, as shown in Fig. 1, and which is mounted on a peculiar form of carriage, is brought forward to clutch the end of the pipe, while the corrugator and the mandrel continue to travel toward the head block. The function of the crimper, which is also shown in Fig. 3, is to force the end of the pipe inward to the proper taper and to hold the pipe until it is withdrawn, unless the pipe is released at the other end of the machine. The pipe supporter at the head block is provided with springs, which are placed so that they come between the fingers at the head block and butt against the head block, and with the impact of the corrugating head and the mandrel the springs are released and the pipe supporter is shoved through the head block, freeing this end of the finished pipe, which needs then only to be drawn from the crimper, though as a matter of fact it falls from the crimper almost from its own weight.

While the operator lays the completed pipe away and takes up another length to be corrugated, the working parts of the machine are run back to the positions shown

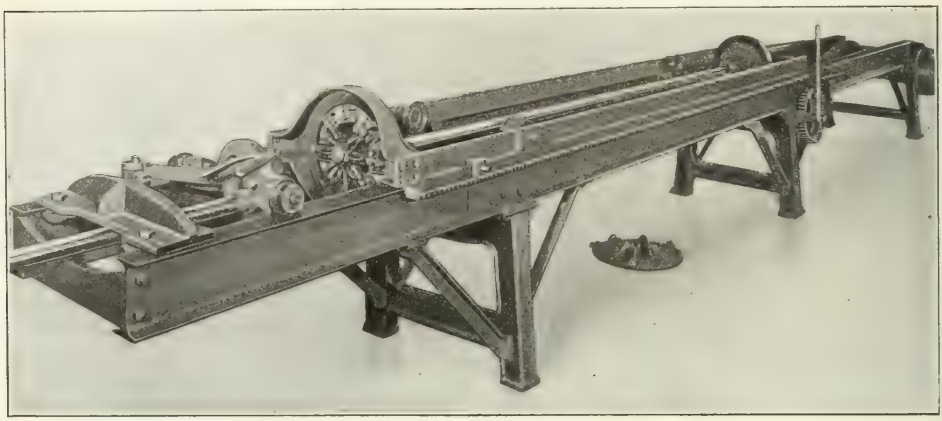


Fig. 1.—The Pipe Corrugating Machine Built by the Corning Mfg. Company, Corning, N. Y., Prepared to Receive a Pipe.

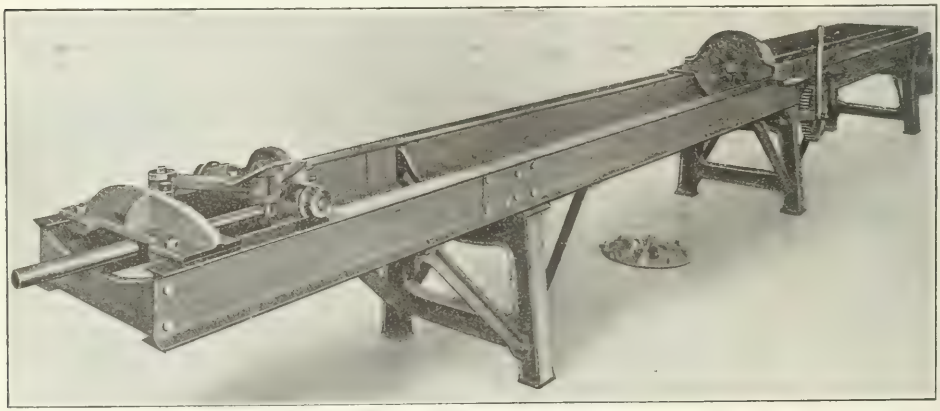


Fig. 2.—The Same Machine After the Corrugating of a Piece of Pipe Has Been Completed.

in Fig. 1, ready for the insertion of the next pipe. The mandrel, shown in Fig. 3, is 8 in. long, and has two sets of rollers 3 in. apart, and the corrugator, also shown in Fig. 3, works between these two sets of rollers. It is claimed that the work produced by the machine is not stretched, scratched or twisted, that the corrugations are uniform, and that the lock is perfect with the coating uninjured. With this machine a new design of conductor which will expand ⅝ in. on each side without bursting is also made.

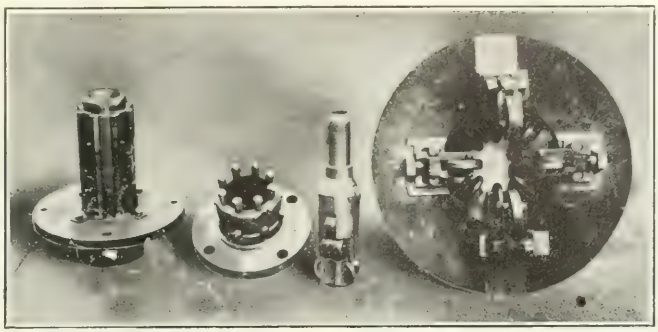


Fig. 3.—The Head Block, Crimper, Mandrel and Corrugating Head of the Corning Pipe Corrugating Machine.

Niagara Falls Power Conditions.

NIAGARA FALLS, February 29, 1908.—Congressman Porter has introduced a bill in the National House of Representatives permitting the Lower River Power Company to divert not more than 40,000 cu. ft. of water per second from that section of the Niagara River at the whirlpool rapids for power purposes. Although this proposed diversion would have no effect on the scenic glory of the falls of Niagara, it has again brought the Niagara power question to the attention of Congress and the public. The American Civic Association has asked President Roosevelt and others to favor extending the provisions of the Burton act for an additional period of 10 years, but this does not meet with favor here at Niagara. This act brought the revocable power permits into existence, relating both to the development as well as the transmission of electrical power, the latter from Canada. All these steps injured industrial Niagara to a very great degree. While the scenic feature was in no way endangered, public sentiment that was false was created, and so far as industry is concerned Niagara Falls has practically been at a standstill ever since the Burton bill became law.

Negotiations are under way for a treaty between Great Britain and the United States, which, with the consent of the Dominion of Canada, is expected to develop an international understanding as to the extent of the diversion of the waters of the Niagara River at Niagara Falls for power purposes. This treaty is suggested and advocated in the Burton bill, but the fact is that the Canadians never have been friendly to such a treaty. While the United States may be talking with Great Britain and the Dominion in regard to the provisions of the proposed treaty, the government of the Province of Ontario is firmly supporting a municipal league movement for the wide distribution of electrical energy from Niagara. It is the provincial government that directs the commissioners of Victoria Park, which property is the site of the Canadian Niagara power development, and it is history that when the Dominion government in the '80s had the opportunity to develop a national park on the Canadian side at Niagara it did not deem the preservation of the locality or falls of sufficient importance to avail itself of the rights under a bill that was passed at that time, but it left Ontario to act in the matter, thus, it would seem, practically renouncing its supposed federal rights. The Victoria Park commissioners were quick to see a tremendous revenue possibility in the Niagara possession, and every power franchise they granted had the string of revenue attached to it. Their receipts from this source are now over $60,000 a year, while the power companies have expended about $17,000,000 in the erection of their plants. Many Canadian municipalities have adopted by-laws favorable to securing Niagara power, so that the power movement in Canada is one of great strength and vigor, while, on the New York side, owing to the Burton act, things are dead.

Still another feature that enters into the Niagara power question is the action of the Niagara Scenic Commission appointed by Secretary Taft. This commission has been reviewing the possibilities of improving the scenic features of the Niagara gorge at the upper end and has reported a plan which advocates the extension, by State or nation, of the reservation to the end of the gorge, a distance of 7 miles from the falls. The project is that a strip of land should be acquired all along the river bank in order that the cliff may be skirted by a belt of forest trees, all factories to be moved from the face of the cliff, as also all other structures, while at the scene of a power development, such as that of the Niagara Falls Hydraulic Power & Mfg. Company, the penstocks should be concealed in tunnels driven through the rock, instead of being exposed as now on the river bank. Congressman Porter will have strong support from this western New York section in opposing the Burton bill. Those who know Niagara best feel that there is ample water for a tremendous power development without in any way lessening the scenic glory of the cataract.

O. E. D.

The Ship Canal Lock at Buffalo.—Bids for the construction of the walls and coffer dam for the ship canal lock in Black Rock harbor, Buffalo, will be opened at the United States Engineers' office in the Federal Building in that city March 14. The specifications provide for lock walls each 817 ft. long, 22 ft. wide at the base, 53 ft. high, and 8 ft. wide at the top. The distance between the walls will be 70 ft. The sills for the upper gate space will be 111 ft. long, for the intermediate gate space 55½ ft. long, and for the lower gate space 111½ ft. long. The coffer dam inclosing the lock while under construction will be 947 ft. long and 260 ft. wide, formed of two parallel walls of interlocking sheet steel piling, 30 ft. apart, with cross walls at intervals of 30 ft., driven to bed rock, 42 ft. below water level. It is estimated that 6910 tons of steel piling will be required for the coffer dam work. The Government engineers' estimate of the cost of the lock walls and coffer dam is $1,100,000, and an additional $600,000 will be required for the building of the lock gates and the machinery to operate them, not included in the present specifications. The total estimated cost of building the Black Rock Harbor ship canal, about two miles in length, including the lock, is $4,500,000. The channel is to be 23 ft. in depth and over 200 ft. in width.

The A. Leschen & Sons Rope Company, St. Louis, Mo., manufacturer of Hercules wire rope and aerial wire rope tramways, has moved its Denver office and warehouse to 1649 and 1651 Wazee street.

A New Gould & Eberhardt Shaper Attachment.

As an attachment to their line of High Duty shapers, Gould & Eberhardt, Newark, N. J., are putting on the market a new hand cross feed for the knee, operable from the front of the machine. This new front cross feed is intended principally for toolroom and die work, where the job requires operating the down and cross feeds simultaneously to follow a given outline.

A comparison of the illustrations shows better than words could describe the advantage in operating convenience secured. Figs. 1 and 2 show the alternative contortions between which the operator must choose to manipulate both the vertical and cross feeds simultaneously and still keep an eye on the line. The new front cross feed, which the manufacturers have designated as "The Natural Way," is shown in Fig. 3. It is claimed that it not only enables the workman to turn out better and more accurate work, but also permits him to assume a less fatiguing position at the machine.

The device is extremely simple, as Fig. 4 indicates. The nut which travels on the cross feed screw and moves the knee slide laterally carries a bevel gear meshing another on a short horizontal shaft on the inside of the hollow box shaped knee or table, projecting toward the front. The outer end of this shaft is squared to receive the crank handle, which is interchangeable in application between this shaft and the squared end of the screw itself at the right side of the shaper, as usually arranged. This addition to the shaper improvements put out by Gould & Eberhardt is patented and controlled by them.

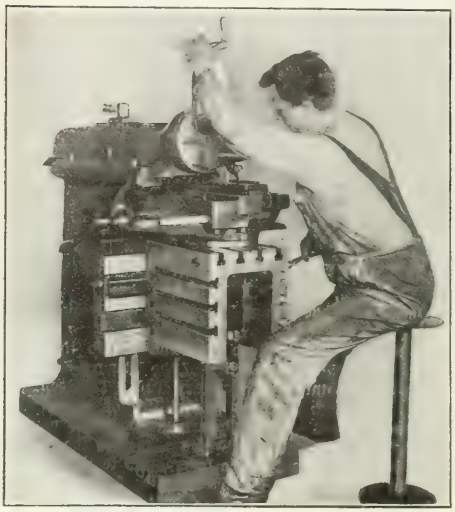


Fig. 1.

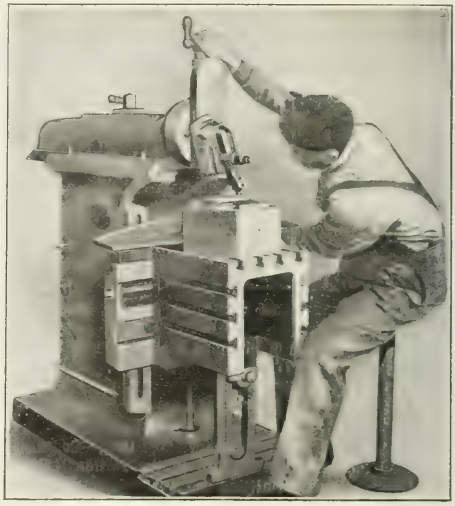


Fig. 2.

The Operator's Choice of Positions When Manipulating the Down and Cross Feeds of an Ordinary Shaper Simultaneously.

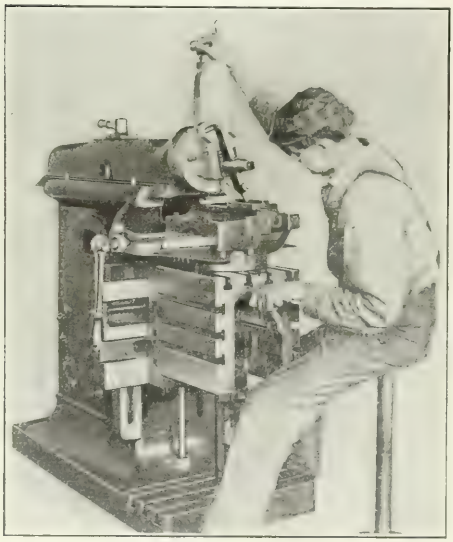


Fig. 3.—The More Convenient Position Possible with the New Front Cross Feed.

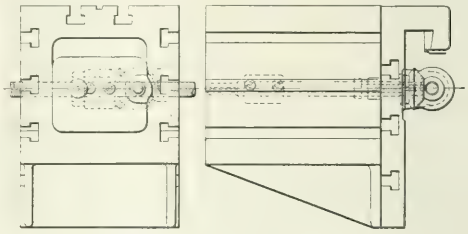


Fig. 4.—End and Side Views of a Shaper Knee, Showing the Gould & Eberhardt Front Cross Feed Applied.

The Associated Foundry Foremen of Chicago will hold their second annual exhibit of foundry and pattern shop equipment in the Engineering Building of the Lewis Institute, Chicago, March 5 to 7, 1908. The exhibits include 15 molding machines, core room and pattern makers' machines, pneumatic riddles and hammers, and oil and gas furnaces. The makers of molding machines will have demonstrators present and heats will be poured daily from the cupola of the engineering school. A number of addresses will be made and a cinematograph demonstration will be given of the French system of universal molding machines. The work of the foundry of the Winona Technical School, Indianapolis, Ind., will be illustrated by stereopticon. The Associated Foundry Foremen of Chicago and vicinity formed their organization in October, 1903. The present active membership is 105.

The Collin Pressure Regulating Valve.

The valve illustrated is known as the Collin steam pressure regulating valve and is made by the Ohio Brass Company, Mansfield, Ohio. Among the special points claimed for it are that the main piston valve will not become cut; that in operation it floats, balanced by pressure, its action not being restricted by a spring; that the auxiliary valve which controls the main valve is out of the path of initial steam thus escaping scale and chips, and that all valves can be removed without disturbing the diaphragm. The diaphragm can be removed while the valve is under pressure, and since no dash pot is used the corroding and sticking of such a member is avoided. Fig. 1 is an exterior view of one side of the valve; Fig. 2 a longitudinal vertical section looking from the opposite side, and Fig. 3 a transverse vertical section.

The operation of the valve will be understood from the two sectional views. Steam enters the valve chamber B, but is divided by the splitter I in such a way as to divert it from impact on the main valve and its stem, thus equalizing its force on all sides. The splitter is essential to the perfect balancing of the main valve in action and prevents the velocity head from affecting its operation. The pressures in the valve chambers B and C are equalized by the passage of steam through a small drilled hole in the main piston K. The main valve is therefore held shut by a force equal to the difference in pressure between the inlet and outlet on an area equal to that of the main valve port. The spring case T carries the regulating spring U, which forces the diaphragm S upward against the pressure of the service or outlet side of the valve. The controlling valve chamber F connects with the main valve chamber C through the drilled regulating port H, and contains the controlling valve G, which is held on its seat O by the steam pressure and the spring P. The controlling valve is also in contact with the diaphragm S.

As soon as the pressure on the service side starts to drop, the spring U forces the controlling valve G from its seat O, thus allowing the steam in the chamber C to pass through the regulating port H to the controlling valve chamber F and the outlet E. The pressure in the chamber C is thereby reduced below that in B, which causes the piston to lift the main valve and permit steam in greater volume to pass to the service side. As soon as the pressure on the service side is restored, the diaphragm forces back the regulating spring and permits the controlling valve to seat, whereupon the pressure in the chamber C builds up and the main valve J gradually closes. The only steam reaching the controlling valve is that which passes through the small drilled hole in the main piston, and therefore this valve is not likely to be affected by dirt or scale.

Below the main valve J guide wings M extend through the cushion chamber D and carry the supplementary piston L, which enters the port N when the valve is closed. When the main valve J opens it lifts beyond a point where steam cutting can occur before the supplementary piston L opens its port N. This prevents cutting of the main valve and its seat. In closing, the supplementary piston L enters the port N, checking the flow of steam and permitting the main valve J to come to its seat against a steam cushion formed by high pressure steam in the chamber D. The main valve actually floats, opening or closing at the slightest change of pressure above the piston.

The regulating spring U is adjusted to give the required outlet pressure by turning the adjusting screw V with one end of the key X. The other end of the key is then inserted in the lock shield W, which is provided with a differential thread, and when this shield is turned the screw is locked in its adjusted position.

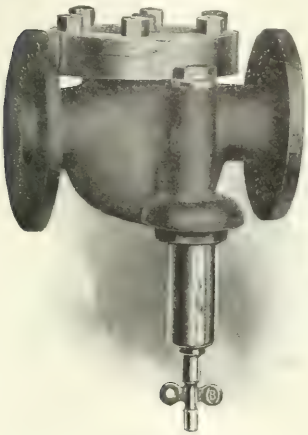


Fig. 1.—Exterior.

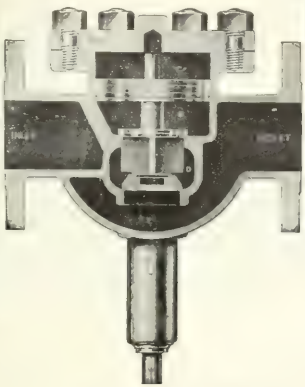


Fig. 2.—Longitudinal Section.

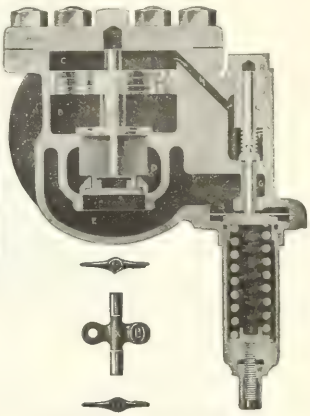


Fig. 3.—Transverse Section.

The Collin Steam Pressure Regulating Valve, Made by the Ohio Brass Company, Mansfield, Ohio.

The Westinghouse Machine Company's Condition.—The business of the Westinghouse Machine Company in February continued to show the most encouraging signs of improvement. In the closing week quite a number of excellent orders were received in the various departments. There is, as a result, much greater activity in the shops at East Pittsburgh. On a recent day unusually large shipments were sent from the works on export delivery, including several large steam engines. One of these shipments, consisting of five 125 hp. compound engines, was consigned to Takata & Co., the Japanese agents of the Westinghouse Companies in Tokio, for delivery to a manufacturing plant in Canton, China. Another compound engine of 500 hp. capacity, also included in this shipment, was consigned to the same firm for delivery to the Southern Japanese Railway Company of Kaisha, Japan. The receivers of the company report very encouraging progress with the plan of rehabilitation, and it is now expected that its affairs will again be in the control of the stockholders within a few days.

The American Bridge Company of New York has brought out an elaborate quarto souvenir of 55 pages, devoted to views and descriptions of typical railroad and highway bridges built by this company. The bridges shown vary in size from the Williamsburg Bridge over the East River, between New York and Brooklyn, weighing 30,336,000 lb. down to a plate girder span weighing 365,000 lb. Both in massiveness and in the style of construction there is a wide range in the structures illustrated. In each case a full page plate is devoted to a bridge, and the photographs have been reproduced with admirable clearness of detail. The volume is not only highly artistic, but constitutes a valuable record of late achievement in American bridge engineering.

The Carr Contracting Car Wheel Chill.

B. M. Carr, superintendent of the machinery department of the Dickson Car Wheel Company, Houston, Texas, has invented a new form of contracting car wheel chill for the manufacture of various sizes of car wheels. Many railroads specify that their wheels be made in contracting chills, and one design of that form of chill has been in general use for a number of years. The expensiveness of this chill has led to a good deal of experimental work looking to the devising of something as effective at a less cost. The difficulties Mr. Carr sought to overcome are thus summarized in a statement of experience with the chill commonly used: After this chill has been cast and bored to the proper diameter of the wheel, it is necessary to place it on a special machine or on saws, for the purpose of cutting the segments, which are 98 slots in a chill for a 33-in. wheel. The operation takes from 7 to 10 days, and this delay is one of the objectionable features. Each floor in the foundry is equipped with about 25 chills. It requires one chill to each wheel each day. The capacity of the foundries is from 150 to 1000 wheels daily in these plants, and some of them exceed 1000 wheels a day. The life of the contracting chills proves to be short where the iron is soft, so that it can be machined readily. If the castings are made hard, so as to add to the life of the chill, it takes longer to machine them. The objection to sawing the segments is that it exposes the grain of the iron, and in a short time the hot iron will attack the chill and burn the slots out, making bad places on the tread of the wheel, which it is impossible to grind out. Further, the sawing of these slots often relieves the strain in the iron, and after the hot metal is poured the chill gets out of round.

The new chill was designed to be manufactured with a minimum of machine work, so that it would retain its shape by the holding of the parts in proper relation, and at the same time provide means for venting the gases of the wheel mold. Fig. 1 gives a plan view; Fig. 2 a horizontal section, and Figs. 3 and 4 are perspective views of a pair of the segments which make up the Carr chill. There is an inner portion and an outer portion of the chill. The former consists of a series of cast iron segments arranged in pairs, and the latter is cast around the segments as explained below.

The right and left segments *a* and *b* constitute a pair, with flat abutting faces *c*. At the back of the pair of segments is an upright extension in the form of a dovetail, consisting of sections *d*, belonging, respectively, to the two segments. The abutting faces of the dovetail sections are provided with upright recesses *e*, which make a socket for the drag pin. There is at the back of each of these dovetails and extending across its central portion a transverse dovetail *f*. The outer faces *g* of each pair of segments have the upwardly tapered recesses *h* which with corresponding recesses in the outer faces of adjacent pairs make upward vent conduits as indicated in Fig. 2. The segments are thus arranged in sets with dovetail sockets *i* formed between the dovetails of the pairs. These faces also have upper and lower flanges *k*, as well as upright flanges *l*, which consitute bearings from 1-64 to 1-32 in. thick, and serve to hold the adjacent walls apart. Thus the channels *m* are formed, which communicate with the recesses *h* and thus permit the escape of gases from the mold. When the segments have been arranged to make a circle, the outer ring *n* is cast, so as to inclose the transverse dovetails *f* and interlock with the upright dovetails *d*, the metal flowing into the dovetail socket *i* and producing dovetails *o*. The segments are thus effectively held in position. The inner face of the chill is then bored out, and this operation, besides truing the inner face, takes away the flanges *l*, leaving the channels *m* opening through the inner face of the chill. The wheel is then cast in the ordinary way. The channels *m*, while allowing the escape of gases, leave but small marks on the face of the wheel, and these can be readily ground off.

No core work is required in the construction of the chill, and it is not necessary to saw the segments. As but two styles of segments are required, they can be cheaply produced on molding machines, and subsequent machine work is reduced to a minimum. It has been found that owing to the even distribution of the strain this chill retains its shape, and thus uniformly produces a wheel that is round. The provision of numerous sockets permits of using the drag pins at different points, and there is also the advantage that these sockets afford additional vent for gases. Usually car wheel contracting

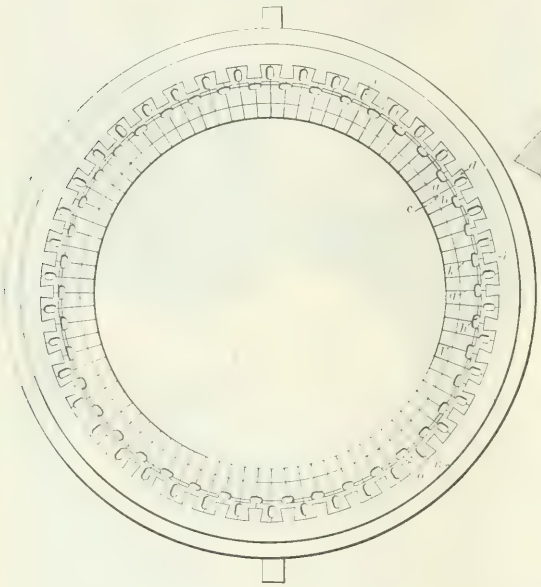


Fig. 1.—Plan View.

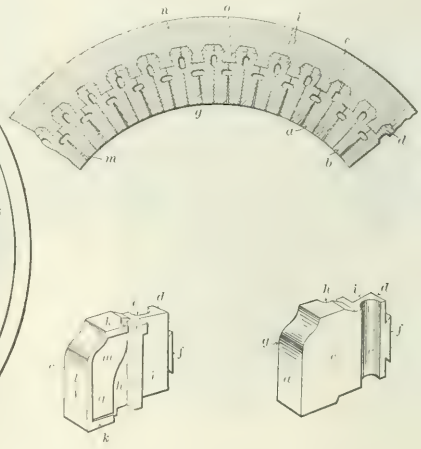


Fig. 2.—Horizontal Section Through a Portion of the Chill.

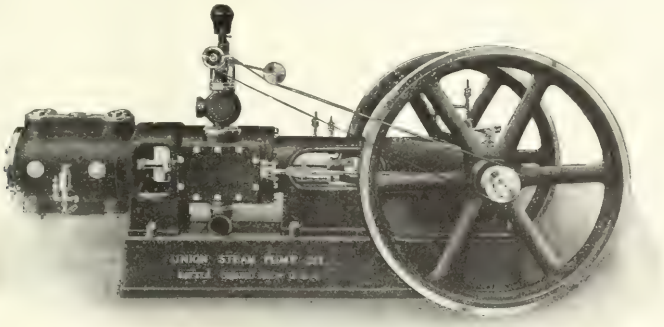
Figs. 3 and 4.—A Pair of Segments.

THE CARR CONTRACTING CAR WHEEL CHILL.

chills have their projecting sections spaced apart throughout their width. These spaces being generally as large as 3-32 in. allow hot iron to flow into them, with the result that the chill is eventually warped. In the Carr chill the spaces are but 1-32 in., and do not extend the entire width of the section. The flanges *k* serve to prevent lateral displacement of the sections under the strains set up in the casting operation, and thus the life of the chill is prolonged.

A New Union Air Compressor.

A steam driven flywheel air compressor of the latest design built by the Union Steam Pump Company, Battle Creek, Mich., is shown in the accompanying engraving. With the improvements which have been added and the less desirable features discarded it is now claimed to represent the best practice in compressor construction. The engine frame has bored crosshead guides. The connecting rod is of steel. All bearings are readily accessible and conveniently adjustable to take up wear. The valve gear on the steam driven end is directly connected to the eccentric, no offset connections being necessary. The steam cylinder is made either with a plain slide valve or the Meyer cutoff valve. The air cylinder has



The Latest Steam-Driven Air Compressor Built by the Union Steam Pump Company, Battle Creek, Mich.

a water jacket extending entirely around the cylinder, and both heads are also water jacketed.

The air valves are the vertical lift poppet valve type. Special attention has been paid to preventing the valves from getting into the cylinder in case of breakage of the springs, &c. The suction valves are solid steel forgings without welds and without removable nuts. They are held in place in such a manner that they cannot get out of place unless the threaded cap covering them is removed from the outside; even if the spring should wear out entirely, and even if the valve seat should be excessively worn, the suction valve cannot enter the cylinder. The discharge valves are made of pressed steel and are guided by the valve seat itself. All these valves are readily accessible. Each one may be removed independently without disturbing heads, piping or any other part of the pump than the valve parts themselves. Clearance has been reduced as much as possible so as to increase the capacity of the machine and at the same time increase its efficiency.

These machines are thoroughly tested before being painted, and the finish put on is of a high grade, the machines being filled, rubbed down and painted with four or five coats of paint and enamel.

One of the objections which has often been advanced regarding the use of a fan system of drying paper and like materials has been the possibility of oil from the bearings being drawn in by the passing air and eventually deposited on the material. This objection is entirely overcome in the installation now being made for the Otsego Coated Paper Company, Otsego, Mich. This apparatus which is to be used for drying coated paper on one side consists of the familiar combination of steel plate fan blower and steam heater, through which the air is drawn. The fan, however, is provided with ball bearings which are both oilless and frictionless, requiring no attention and avoiding all possibility of soiling the paper across which the air is discharged. The apparatus was built by the Massachusetts Fan Company, Watertown, Mass., the bearings being of the well proved type manufactured by the Chapman Double Ball Bearing Company.

The Railroad Committee of the Mississippi Senate has reported adversely on all bills submitted with the view of regulating passenger and freight rates on the railroads doing business in the State. The chairman says that the committee thought the railroads had all they could do these panicky times without being bothered by laws telling them what to charge for hauling people around over the country, and that such matters should be left to the Railroad Commission anyhow. The sentiment of the Legislature is that the railroads should be encouraged instead of hampered.

The Empire Steel & Iron Company, Catasauqua, Pa., has elected the following officers for the coming year: President, Leonard Peckitt; vice-president, James W. Fuller; secretary and treasurer, James S. Stillman; assistant treasurer, Henry S. Hart. Executive Committee—Leonard Peckitt, James W. Fuller, Elverton R. Chapman, Arthur A. Fowler, Junius S. Morgan. Directors—Leonard Peckitt, Elverton R. Chapman, James W. Fuller, Arthur A. Fowler, Junius S. Morgan, Frank M. Jeffery, Archer H. Brown, D. B. Meacham, J. I. Healey.

The United States furnishes about one-third of the machinery used in Mexico in the manufacture of cotton goods, the remaining two-thirds, as now employed, coming from England and Germany. The bleaching, dyeing and printing establishments are usually of modern construction and equipped with all up to date appliances. Owing to the extension of electric power in nearly every portion of the country, electricity is coming more and more into general use and is gradually supplanting steam and water as a motive power for cotton manufacturing.

The Electric Boat Company, Quincy, Mass., has been allowed the benefit of drawback on exports of gasoline engines manufactured in part with the use of imported steel crank-shafts. The Treasury Department's regulations provide that the number of steel crank-shafts which may be taken as a basis for the allowance of drawback shall be that declared in the drawback entry, after official verification of exported quantities.

The annual statement of the Union Switch & Signal Company of Pittsburgh, compares favorably with that of the previous year. Net profits for 1907 were $1,024,842, or a little more than 40 per cent. on the capital. Net profits in 1906 were $1,055,332.

Making Basic Iron with High Sulphur Coke.

BY RANDOLPH BOLLING, SYDNEY MINES, NOVA SCOTIA.

The maximum per cent. of sulphur in metallurgical coke for blast furnace practice, when the furnace is making basic iron for the open hearth, appears to be a subject on which considerable divergence of opinion exists among blast furnace men. Are the high sulphur cokes an undesirable fuel for the blast furnace that is run on basic iron?

When this question is put to a blast furnace superintendent accustomed to using coke made from low sulphur coals from Virginia, West Virginia, Pennsylvania and Kentucky the answer undoubtedly would be "yes,' because he has been using low sulphur coke and had no experience with any other. This is natural. Others, however, have had a different experience.

Experience of Dominion Iron & Steel Company.

The past summer at Sydney, Nova Scotia, a great lawsuit was tried, the parties involved being the Dominion Iron & Steel Company and the Dominion Coal Company, two of the biggest concerns in the Dominion of Canada in the steel and coal business, respectively. The trial lasted about three weeks, and the legal expert and other costs are said to have neared the $500,000 mark. The writer, who was chemist for another steel company in the Sydney District, was employed on the staff of metallurgists and blast furnace experts on the steel company's side, and had the pleasure of hearing the testimony, which was about 1000 pages "evaporated to dryness," if a chemical expression may be permitted, and was substantially as follows:

The steel company got all its coal from the Dominion Coal Company. It was run of mine coal, and was run over a picking belt before being delivered to railroad cars for shipment to the coal washer of the steel company. The average analysis gave sulphur 2.16 per cent., ash 6.50 per cent., and after going through the washer the sulphur was reduced to 1.68 per cent. and ash to 3.97 per cent. The coal was satisfactory, even if it did make a coke carrying 1.50 per cent. sulphur, the blast furnaces having no difficulty in making almost all casts within basic iron limits on sulphur. But in November, 1906, the coal company commenced sending in trainloads of coal from a new pit it had opened on the Phalen seam, which seam produced the coal that caused all the trouble and hard feeling. Briefly, it was mostly slate and pyrites, with some pure coal remarkably high in organic sulphur. After running it over the Campbell bumping tables in the washer and coking it in Otto-Hoffman by-product coke ovens, the coke pushed carried 4 per cent. of sulphur on the average. The chemist of the steel company, A. P. Scott, testified on the witness stand that the blast furnaces could use coke carrying 1.75 per cent. of sulphur and still make basic iron for the open hearth department, but could not make suitable iron with coke over 1.75 per cent. Mr. Harbord, the celebrated English expert on steel, testified that the limit in England was 1.50 per cent., and Mr. Foote, formerly superintendent of blast furnaces for the Illinois Steel Company, and with a lifetime experience in blast furnace work, testified that he regarded 1 per cent. as about the limit of sulphur for blast furnace coke.

It appears from the testimony given in this trial that we can use coke with up to 1.75 per cent. sulphur from the experience of the Dominion Iron & Steel Company operating four modern blast furnaces. The writer recalls that when he was blast furnace chemist in Tennessee in 1904 he had positive instructions not to pass coke carrying over 1 per cent. of sulphur, as this was considered the very highest percentage that the furnaces would stand.

The Slag Test.

Most experts appear to harp strongly on the volume of slag as an indicator of the amount of sulphur the furnace can stand to make basic iron. Lately the writer has investigated this phase of the problem at the new furnace designed by Frank C. Roberts, Philadelphia, for the Nova Scotia Steel & Coal Company, Ltd., at Sydney Mines, Nova Scotia. This is undoubtedly the most modern blast furnace in Canada, no expense having been spared to equip the plant with the very latest improvements. The ore used is from Wabana, Belle Isle, a small island seven miles off the Newfoundland coast, and a complete analysis of it is as follows:

	Dried at 212 degrees.	Natural state.
Moisture	2.07	2.07
Metallic iron	52.68	51.62
Silica	7.30	7.14
Alumina	3.29	3.21
Lime	4.30	4.21
Magnesia	1.48	1.44
Phosphorus	0.95	0.94
Manganese	0.37	0.36
Sulphur	0.019	0.018
Combined water	7.16	7.00
Vanadium	Trace.	...

The limestone and coke analyzed as follows, dried at 212 degrees:

	Lime-stone.	Coke ash.
Moisture	None.	8.00
Metallic iron	0.49	2.52
Silica	3.90	1.84
Alumina	1.02	1.88
Lime	50.83	0.44
Magnesia	1.04	0.27
Sulphur	0.001	1.40

Proximate analysis of coke.

Moisture	8.00
Volatile and combined matter	2.26
Fixed carbon	89.74
Ash	8.00
Sulphur	1.46

The material consumed in 24 hr. by this furnace on an average comprises: Coke, 250 tons; limestone, 95 tons; ore, 382 tons. The output is 200 tons of basic iron, averaging: Silicon, 0.80 to 1.36 per cent.; sulphur, 0.03 to 0.06, and manganese, 0.50, with phosphorus, 1.60 to 1.85. The furnace makes 121.70 tons of slag in 24 hr., having an average analysis as follows:

Silica	24.30	Magnesia	2.80
Alumina	14.70	Sulphur	2.90
Lime	55.20		

The slag volume is therefore 121 to 200, or about 1.2 parts slag to 2 parts of iron. The furnace slag easily assimilates the sulphur in the coke under normal conditions, and if the hearth temperature should decrease it behaves like any other furnace and makes white iron carrying 0.22 per cent. of sulphur.

A Higher Sulphur Limit Warranted.

From these facts I think we should correct our ideas regarding the effects of high sulphur coke and change our specifications, making a higher limit than that to which we have been accustomed. This will not debar coke that formally was considered too high in sulphur, and I think we can safely place the limit at 1.75 per cent. This might be considered quite high to place on the percentage of sulphur in coke, but experience in this district has been that the blast furnaces, if in good working order, with carefully adjusted burden and a uniform grade of coke, can easily take care of coke containing over 2 per cent. of sulphur.

An examination of the analyses of the raw material discloses the fact that the remarkable assimilation of sulphur by the slag cannot be attributed to the manganese present in the charge, which it will be noticed is very low. From personal observation as blast furnace superintendent for the Virginia Iron, Coal & Coke Company, the writer fails to see that this furnace behaves differently from the furnaces in Virginia operating with a minimum of total sulphur contents in the charge. At the Buena Vista furnace the analyses of raw materials were as follows in the year 1902:

Ore (Oriskany), dried at 212°.

Metallic iron	48.80	Magnesia	0.16
Silica	15.97	Lime	0.02
Metallic manganese	2.27	Zinc oxide	1.02
Alumina	1.66	Sulphur	0.003
Phosphorus	0.13	Combined water	9.54

Dolomite analysis.

Carbon dioxide	46.17
Lime	30.19
Magnesia	20.30
Silica	2.64
Oxide of iron and alumina	0.70

Wise County Coke, Toms Creek. Ash analysis.

Silica	49.40
Alumina	31.91
Ferric oxide	8.58
Lime	4.75
Magnesia	3.20

Proximate coke analysis, dried at 212°.	
Moisture	1.10
Volatile and condensed matter	2.76
Fixed carbon	82.26
Ash	13.88
Sulphur	0.58

Slag analysis.	
Silica	43.14
Alumina	8.60
Lime	28.52
Magnesia	18.89
Sulphur	0.29

Oxygen ratio:
SiO_2, 8½; CaO, 6; MgO, 5½; Al_2O_3, 1.

The pig iron from the Buena Vista furnace, when running on basic, carried on an average: Silicon, 0.40 to 0.90 per cent.; sulphur, 0.008 to 0.05; manganese, 2.79 to 3.10, and phosphorus, 0.26 to 0.30. Even with the low sulphur coke this furnace when working badly produced white iron of about the same analysis as the Sydney furnaces, with a much higher sulphur content in their coke. A comparison of these figures appears to show that blast furnace slags have a high chemical affinity for sulphur with or without manganese in the charge, and that the slag is capable of carrying off a comparatively high percentage of sulphur present in the charge, provided, of course, that we have a sufficiently basic slag to deal with it. This experimental proof would seem to indicate that in judging high sulphur cokes for our blast furnaces we should not be governed by merely theoretical conclusions. I consider that the question of chemical analysis of the pig iron produced lies entirely with the expertness of the furnace superintendent, regardless of the sulphur contents of the coke up to 2 per cent.

The Slag Volume

appears to play a very small part in the removal of sulphur present in the coke. Compare the slag analyses of two furnaces, one using very low sulphur coke and the other a high sulphur. In the Virginia furnace slag, the volume was so great and the sulphur so low in the coke that the percentage of sulphur in the slag was only 0.20, and besides this the beneficial effect of the high manganese content of the ore could be relied on to assist in carrying off the sulphur. With the Sydney furnace the slag carried between 2 and 3 per cent. of sulphur, and the ore carried only traces of manganese. And owing to the small slag volume of the latter, the iron in the furnace was at all times in contact with a slag carrying a rich sulphur content. Some experiments were tried in using a limestone dolomite mixture at the Nova Scotia Steel & Coal Company's furnace, using 50 per cent. of each mineral. The slag produced was of the following composition:

Silica	27.20	Magnesia	8.00
Alumina	15.80	Sulphur	3.02
Lime	45.92		

This change did not appear to make any appreciable difference in the analysis of the pig iron, which continued to carry sulphur well within basic limits. The only advantage gained by using the mixed mineral flux appeared to be the ease in which the extremely basic slag flowed from the slag notch during periods when the furnace was running on low silicon basic and was not very hot. The losses in ferrous oxide were about the same as with the Virginia furnaces, namely, 0.29 to 0.86 per cent., and the high alumina did not change conditions. Another point to reckon with in this district is the physical properties of the coke made from unstamped coal in retort ovens, as compared with the coke made in the beehive oven of the Virginia District. The latter possesses a far greater resistance to dissolution by CO_2 and crushing strength than the former. American blast furnace men find the old traditions regarding blast furnace practice considerably altered by their experience in this district.

A New Tube Mill.—The Parkesburg Iron Company, Parkesburg, Pa., manufacturer of high grade boiler tube skelp iron, is building a tube mill to contain one bending and two welding furnaces, and has arranged plans so that two additional welding furnaces can be erected at another time. The plant, which will be constructed for the manufacture of tubes up to and including 6 in., will consist of a main building, 85 x 475 ft., boiler house, 49 x 75 ft., and a power house, 40 x 100 ft., in which will be installed five gas producers. All the machinery will be electrically driven with 220 volt direct current motors. The mill is to be located where it will be necessary to fill, the excavations to be only very slight, and the entire furnace construction, with the exception of the foundations, will be above the present ground level. The work is being done as rapidly as possible, and the company is ready to begin concrete work as soon as the weather will permit. Contracts for the building and equipment have all been let. The Phoenix Iron Company, Phoenixville, Pa., has the contract for the main building and roof of power and engine house; S. R. Smythe Company, Pittsburgh, Pa., gas producers, furnace stacks, &c.; United Engineering & Foundry Company, Pittsburgh, machinery, motors, &c.; Westinghouse Electric & Mfg. Company, Pittsburgh, generator and light plant; William Sellers & Co., Inc., Philadelphia, cranes. Buckeye cross compound engine and Maxin boiler will be installed.

The Duty on Iron Teapots of Antique Appearance.

The United States General Appraisers February 18 handed down a decision, in part as follows, in the matter of protest of Morimura Brothers against the assessment of duty by the Collector of Customs at the port of New York:

"The merchandise in question consists of certain vessels of cast iron in the form of teapots having wrought iron handles and bronze covers. The outside of the bodies of the pots has been subjected to some process which has given an appearance of antiquity for the purpose, no doubt, of making the articles salable as curios or house ornaments. The interior surfaces of the pots are in such condition as would, in our opinion, render them unfit for use either in the kitchen or on the table. Duty was assessed on these articles at the rate of 45 per cent. under paragraph 193, tariff act of 1897, as 'articles or wares not specially provided for, composed wholly of metal,' and they are claimed to be dutiable properly either under paragraph 148, at the rate of eight-tenths of a cent per pound, as 'cast iron vessels,' or under paragraph 150, at the rate of 2 cents per pound, as 'cast hollow ware.'

"The term 'hollow ware' has been construed by the Treasury Department, this board, and the courts to mean cast iron kitchen ware. . . . . It may be noted that the interior of these pots has not been coated, glazed, or tinned, so as to render them fit for use as utensils for the kitchen; and in view of this it is a question whether they could be considered 'hollow ware' in the sense intended by paragraph 150. The term as used in said paragraph implies an article made of iron by the casting process, and which is intended to be and is in fact complete and ready for use as kitchen ware.

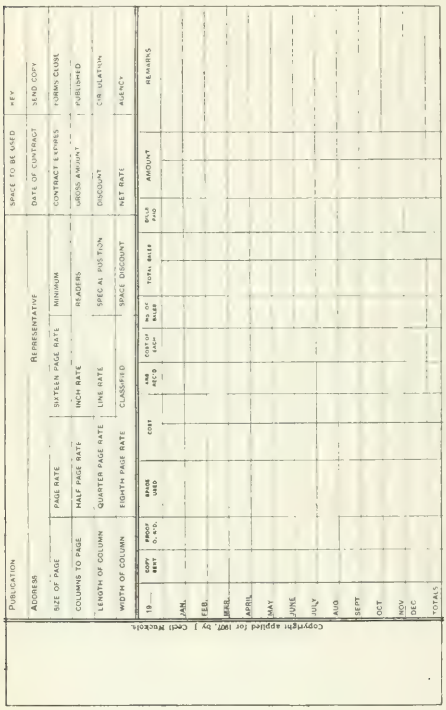
"So here these articles, not being completed household utensils, if even they were ever ultimately intended for that use, would not be sought by dealers or users of kitchen articles or wares, but by dealers or collectors of ornaments or curios. With reference to importers' claim under paragraph 148 we have to note, not that the articles are incomplete, but that they are provided with certain added parts and have had work bestowed upon them which in our opinion would exclude such teapots from the provision for 'cast iron vessels.' . . . . As imported the teapots have wrought iron handles and expensive bronze covers, and in that form they are no longer 'cast iron vessels,' but articles partly made by the casting process.

"While a mere incidental or auxiliary part of an article will not be allowed to control its classification, we must certainly distinguish in principle where the added parts, the wrought iron handle, the bronze cover, the antique appearance imparted by some process not in evidence, all are of sufficient importance to remove the article from the category of cast iron vessels. We hold that these imitations of antique teapots are properly dutiable under paragraph 193, as assessed, as 'articles or wares not specially provided for, composed wholly of metal.' The protest is overruled on all grounds and the decision of the collector affirmed.

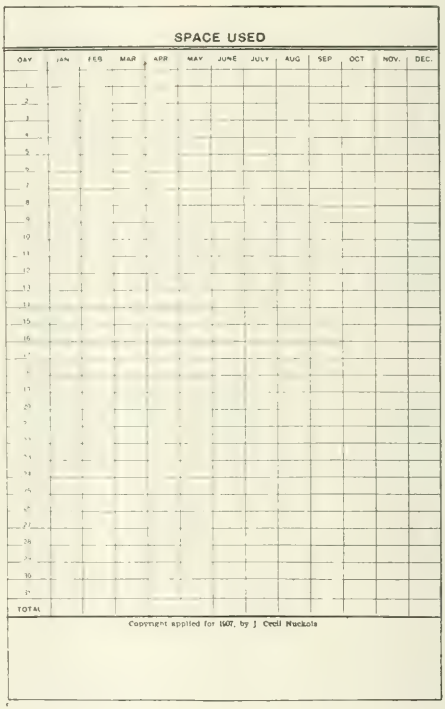
Keeping Track of Advertising.

BY J. CECIL NUCKOLS.*

It seems to be the prevailing opinion that an advertising department consists merely of a pot of ink, a pen, a pile of paper and a man with an endless flow of words. However well this describes the average, the fact remains that the well organized advertising department is much more business like than is generally believed. In no other department of a business is system more needed than here, and nowhere does system play so important a part as in the advertising department run on modern lines. To the casual observer, the many records and forms in such a department may seem to be only so much red tape, but generally all these forms are essential to a complete knowledge of just what is being accomplished. This article will not touch on the organization question, but will endeavor to show a simple, compact and concise way to keep track of advertising, taking for granted that the department has been organized, the selling plans adopted and the time arrived to place advertisements in the papers.



Form I.—Actual Size, 5 x 8 In.



Form I-b.—Reverse Side of Form I.

KEEPING TRACK OF ADVERTISING.

Form I is an admirable one for keeping an absolute record of advertising in any publication (daily, weekly, monthly or any other) for a period of 12 months. The reverse side of Form I is shown in Form I-b. On this should be entered the amount of space the advertisement occupies in each issue of any particular paper. It is a good plan to key each advertisement—that is, insert in it something that will identify any replies that are received from it. Some advertisers put different street or box numbers in their advertisements as keys, but this is impractical where the firm is a large and well-known one, because but very few of those who answer the advertisement will take the trouble to put in the street or box number. A better scheme, assuming that a company is advertising to send a catalogue on request, is to place in its advertisement, for example: "Ask for catalogue A-40" or "B-40," assigning to each paper a key letter, and in nearly every instance the inquirer will give both the letter and number when writing. In this way a complete check is afforded on where the advertisement was seen.

Each inquiry should be credited to the proper publication on Form II. In this form the spaces at the top of each column are purposely left blank. These are to be filled in, with the month in which the advertisement appears in the publication, using one sheet for each paper. Each sheet of Form II covers a period of six months.

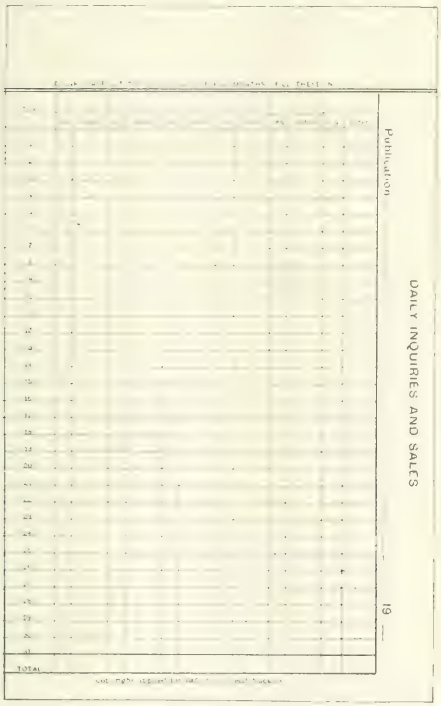
So much for inquiries. Inquiries are good. Very good. They show whether the advertisement is being read or not. But orders are better. To arrive at a conclusion of what publications are of value to the advertiser, the latter must have some system for knowing just where to credit the orders that are received. Here is an example showing how this may be done: A concern is advertising in a certain publication offering to send its large catalogue free. It has assigned the letter B, for instance, to that publication as a key. John Johnson & Co. write on December 10 for the catalogue, and by referring to the letter it is found that they ask for catalogue 4-B or 5-B or whatever number the catalogue is known by. Now, by referring to the list of keys, it will be seen which publication B is the key for. On Form II this is entered in the column for December under "Inq." (Inquiries), opposite the date, 10.

To complete the record forms Form III is an excellent one for the average business. One of these blanks is made out for John Johnson & Co., and the key (B) is put down in the correct space at the upper right hand corner, and also the date, December 10, in the "Inquiry Received" space. For sake of illustration: Suppose on December 20 John Johnson & Co. send an order amount-

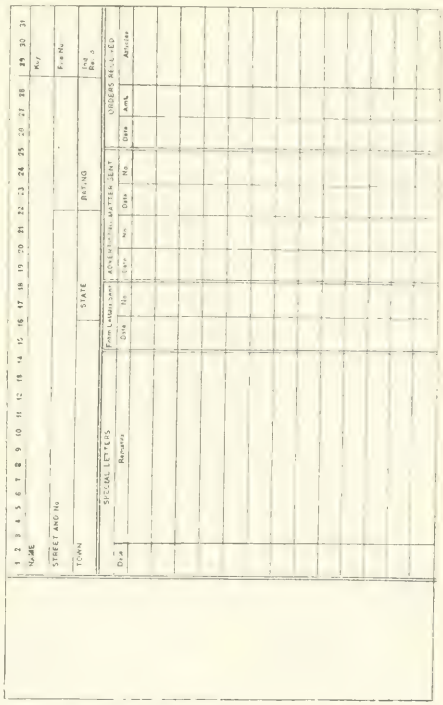
* Advertising manager of the S. Obermayer Company and the Cincinnati Electrical Tool Company, Cincinnati, Ohio.

ing to $75. When this order is entered on Form III it will be seen that the key is "B." Now, credit this amount $75 to the corresponding publication on Form I-b in the order column opposite the date the order was received. Credit has now been given where credit is due, and by simply having a file clerk keep up this system a company can tell any time at a glance just what amount of business in dollars and cents it is getting from a given publication.

In actual use these forms * will afford a complete record of all advertising—what pays and what does not. By using Form II and a system of keying for all other advertising matter, such as circular letters, folders, cards, &c., it can be shown just what results are obtained in this



Form II.—5 x 8 In.—Reverse Side Blank.



Form III.—5 x 8 In.—Alike on Both Sides.

KEEPING TRACK OF ADVERTISING.

direction. The author has found the loose leaf system superior to and cheaper than the card index.

A Motor Drive Meets an Emergency.—That motor drive in an emergency may relieve an otherwise discomfiting situation is instanced in the following: A large Ohio paper mill recently ordered several engine type generators from the Northern Electrical Mfg. Company, Madison, Wis., and through an oversight failed to specify who should mount the armature on the engine shaft. In consequence neither the engine builder nor the dynamo manufacturer provided for so doing, and it was not discovered until after the erecting operation had been begun. Then, since no jobbing shop in the vicinity was in position to do the work in which a force fit of about 150 tons was required, the Northern Electrical Mfg. Company shipped from its works one of its motor-driven hydraulic presses with the necessary rigging for pressing the armature on the shaft. A small generator was set up to furnish the current, and the job was completed speedily. Had not the portable motor-driven outfit been available considerable delay and expense would have been occasioned by shipping the armature and shaft to the engine builder's factory for mounting.

* Further information regarding the cost of these forms, the necessary binders, &c., may be had by communicating with the author.

A Sterling Polishing Room Exhaust System.

A number of complete refuse removing exhaust systems have recently been installed in the plant of the Underwood Typewriter Company, Hartford, Conn., by the Sterling Blower & Pipe Mfg. Company, Hartford, Conn. By them all parts of the factory are perfectly ventilated while the refuse is removed to collecting points.

The system for removing the dust from the polishing and buffing wheels is particularly worthy of notice. It is well known that the dust from such wheels is injurious to the lungs, but with the exhaust system installed it is so thoroughly removed that girls can now safely work at the wheels, even though more delicate and less rugged than the men formerly employed. This is an especial advantage, since girls can do this work more satisfactorily than men, being quicker and more deft in handling small and intricate pieces of work. At the same time there is a reduction in the labor expense and the floors do not have to be swept so frequently. The exhaust draws the refuse directly from the wheels and the absence of this dust and lint diminishes the fire risk to a large extent.

The hoods surrounding the wheels are provided with a trap or settling chamber which prevents grease from entering the pipes with the possibility of clogging them, and also catches any piece of work accidentally dropped into the hood, instead of allowing it to be carried through the discharge with the refuse. This system also prevents the dust from getting into the bearings of the machinery and thus decreases their wear and retards their depreciation. In many cases where an exhaust system is applied to machinery on which precious metals are worked, the value of the metal dust saved in a short time equals the total cost of installing the system.

THE IRON AGE

Established in 1855.

New York, Thursday, March 5, 1908.

Entered at the New York Post Office, as Second Class Mail Matter.

DAVID WILLIAMS COMPANY, - - - - - - PUBLISHER
14-16 PARK PLACE, NEW YORK

DAVID WILLIAMS, - - - - - PRESIDENT
CHARLES KIRCHHOFF, - - - - - VICE-PRESIDENT
RICHARD R. WILLIAMS, - - - - - TREASURER
GEO. W. COPE, - - - - - SECRETARY

CHARLES KIRCHHOFF, - - - - - - - }
GEO. W. COPE, - - - - - - - - - } EDITORS.
A. I. FINDLEY, - - - - - - - - - }
RICHARD R. WILLIAMS, - - - - - - - HARDWARE EDITOR.

Bessemer Steel and Railroad Demand.

That the sudden falling off of Bessemer steel production in the United States at the end of October was due to the collapse not only of new railroad buying, but also of specifying by the railroads on the contracts they had entered into, is shown plainly in the Bessemer steel statistics for last year. As given in our last issue they represent a decline of 608,281 tons from the Bessemer ingot production of 1906—11,667,549 tons, against 12,275,830 tons—while Bessemer rails declined by 404,450 tons, or from 3,791,459 to 3,387,009 tons. Just as happened in 1903, the Bessemer steel production of last year fell off from that of the preceding year, while pig iron production increased. It was the tenth time in 40 years that the Bessemer steel output in any year fell below that of the previous year. In causing two-thirds of the falling off in Bessemer steel last year rails quite exceeded their natural share, for they have contributed less than 30 per cent. of the Bessemer product in the past four years. If other Bessemer rolled material had shown a corresponding shrinkage, due to the panic and the departure of confidence, we should have had last year a falling off of about 1,350,000 tons instead of 608,000 tons from the ingot production of 1906.

At first sight, therefore, the ability of the railroads to affect unfavorably the steel industry by a cessation of track construction and track replacement might not appear as great as is ordinarily supposed. But the Bessemer steel statistics do not show fully the changing fortunes of the railroads of the country in the way that is sometimes asserted. The open hearth statistics, while they do not have the ups and downs of the Bessemer, for reasons frequently pointed out, have been an index in recent years of an important portion of the railroad demand upon the steel industry. Locomotive and car building and railroad bridges called last year for a tonnage in plates, shapes, bars and steel castings that, with 250,000 tons of open hearth rails, is not far short of the Bessemer tonnage taken by the railroads in 1907. It is therefore less true than at any time that, as remarked in one of the current comments on the Bessemer steel statistics for 1907, the Bessemer producers are likely to feel the effects of depression in iron and steel more strongly than open hearth steel makers, "because so large a proportion of the Bessemer steel produced is used for conversion into rails."

The effect of the panic of 1893 on rail production, like that of the panic of last year, was more marked than was its effect upon the total tonnage of Bessemer steel. Thus, in the five years preceding 1893, Bessemer rails were 46 per cent. of the total Bessemer tonnage; in the five years of depression beginning with 1893 they were 30 per cent. of the Bessemer total. It is the increase in the uses of Bessemer steel in other forms, as has been often pointed out, that compensates for the losses due to the sudden paralysis of railroad buying. This fact is made plain in the table below, in which the figures are given for five-year intervals from 1880 to 1900, and later year by year:

Production of Bessemer Ingots and Steel Rails in the United States.—Gross Tons.

	Bessemer ingots.	Bessemer rails.	Per cent. rails.
1880	1,074,261	852,196	79
1885	1,519,430	959,471	63
1890	3,688,871	1,867,837	50
1895	4,909,128	1,299,628	26
1900	6,684,770	2,383,654	35
1901	8,713,302	2,870,816	33
1902	9,138,363	2,935,392	32
1903	8,592,829	2,946,756	34
1904	7,859,140	2,137,957	27
1905	10,941,375	3,192,347	29
1906	12,275,830	3,791,459	31
1907	11,667,549	3,387,009*	29

* Estimating rails rolled by companies which do not manufacture Bessemer ingots at 85,000 tons, as in 1906.

As examples of the change that is making rails so much less of a dependence of the Bessemer works, the figures for two sets of the above years are conspicuous. In 1905, the Bessemer ingot production was over 3,000,000 tons greater than in 1904, while the rail production increased only about 1,000,000 tons, or one-third as much. In 1901 the Bessemer ingot production was 2,000,000 tons more than in 1900, but less than one-fourth of the increase went to rails. It would seem from the record of the past 10 years that rails normally take up not far from 30 per cent. of the Bessemer tonnage. As open hearth rails come into use this percentage may be reduced somewhat, but the decline on that account will not be rapid.

Every time of depression emphasizes the fact that the heavy lines suffer most. Since Bessemer steel is the base of the great wire industry, and so largely also of the sheet, tin plate and wrought pipe trades, while bars continue to be to a very considerable extent a product of the converter, the Bessemer works still assert their importance even when the railroads have been seriously crippled in buying power.

Barometers of Trade.

The opinion that "copper has taken the place formerly held by steel and iron as the index of business conditions" was expressed last week by a leading figure in the metal trade of the country. If sensational ascents and descents in prices are the basis of such a title, possibly it may rest temporarily with copper. But in the light of the history made by that metal in the past 18 months it would seem that the average captain of industry must prefer something more stable, at least with longer swings between low and high. If copper consumption is to become the measure of industrial activity, the metal must have broader minded treatment from those who market it largely. But ruling out market pyrotechnics, the curves representing copper production and steel production have the same general trend, and both in turn must conform broadly to the dips and elevations of the curve of the country's farm products. The matter of sensitiveness to approaching changes is so largely psychologic—so much a question of credit and confidence—that it can scarcely be claimed for one commodity rather than another. The condition of each has the relation of both cause and effect to the others, the highly

organized state of modern business making the injury of one important trade the concern of another. In the case of iron, universality of use must continue to give it an importance that is not minimized by seeming sensitiveness of other barometers to the shifting surface current of the winds of trade.

The Sherman Act Should Be Amended.

The movement to amend the Sherman act so that its prohibitive provisions shall not apply to contracts permitted at common law merits the warm support of business interests. Practical experience has shown that a strict interpretation of the law may act to the injury of business, especially in preventing price agreements which have been so very helpful in maintaining fair margins of profit and the consequent greater welfare of both the employer and the men who are carried on his payroll. The present period affords a striking example of this. In a market that possesses many of the characteristics which, during similar experiences in the past, have effected a wholesale cutting of prices, little if any inclination has been shown to seek business by sharp reductions of list prices on finished products. The business associations of the country, at the risk of being penalized, have succeeded in putting various lines of manufacture on a basis of friendly relations, so that trade is robbed of its old tendency to consider competitors as enemies, and each house works for the welfare of the whole until ruinous competition has largely disappeared. It may be argued that price agreements can be made that will work to the injury of the public, especially with the necessities of life, but it is also true, usually, that where prices become abnormally high corrective influences begin to work automatically. In manufacturing, too, high prices breed new competition. They have been tried and generally found unprofitable in the long run. The best policy, and that pursued in manufacturing trades where the effort is made to maintain something like a uniform rate without infringing upon the laws, is to make a price that will yield a reasonable margin of profit, but one large enough so that in a period of years it will average with the losses of lean times to give a fair return on the investment.

Congressman Charles G. Washburn of Massachusetts, in a recent speech in behalf of the proposed Sherman act amendment, referring to the Supreme Court decision of 1897 that a contract illegal under that act includes all combinations in restraint of trade whether they are such as are held legal or illegal at common law, and whether the restraint imposed is reasonable or unreasonable, said: "It became impossible, therefore, for manufacturers and others safely to enter into any agreement, however reasonable, for the maintenance of prices, and hence they were driven to the conclusion that if they could not combine they must unite; in other words, it being illegal for A, B, and C to agree together to maintain prices for their products, they were compelled to consolidate their interests to get the protection they needed." This sentiment is extending. The feeling exists that the act as it now stands operates against its own purpose in more ways than one. A recent convention of wholesale grocers voiced a popular sentiment when it resolved that "if a legal construction of the anti-trust laws embodies a prohibition of co-operation among merchants, said laws are fundamentally wrong in their conception, enactment and operation and require amendment."

A wave of anti-trust legislation has swept the country, State after State having passed laws intended to protect the public, but, in reality, many times working against the good of the people. Industries, in fact, business interests generally, have been so hedged about with statutory restrictions that in some States the simplest agreement between business houses becomes a violation of the law. The point of absurdity has been reached in not a few instances. Practically every one in business has been branded as a transgressor against the laws of State or country, because business could not be carried on otherwise.

Probably the Sherman act was the basis of most of these laws; but its provisions have been distorted and extended in various ways until they have become even more obnoxious. If the Sherman act was amended as suggested, to conform with the requirements of legitimate business, by adopting the common law definition of a contract, much good would be accomplished not only directly but also indirectly in the influence on the legislatures of the various States, in their attitude toward existing and proposed legislation. Co-operation in business between competing interests is one of the most potent of beneficent influences. The lack of it took prices to ruinous depths during other serious depressions. Its presence has permitted works to continue manufacturing which otherwise would have been closed; has given employment to many men who would otherwise have been idle, and will operate not only to avoid the tediously slow return to old prices when business shall resume, but to reduce the degree of decrease in the market price of labor. It does not mean that prices will necessarily remain at their highest level, nor that manufacturers will always do business at a profit, nor that labor will pass through a period of dull trade without a fall in wages. But with legitimate understandings as to prices, even indefinite as they must be in the face of existing laws, prices will not seek so low a level, nor will plants operate at so serious a loss while business is dull, nor should labor see wages decline so seriously.

The Compulsory Working of Patents.

The United States is now about the only important nation which does not include the compulsory working clause in its patent laws. The amendment that applies the principle to the British law, which was printed in some detail in *The Iron Age* of November 14, became operative January 1; the Continental nations have long since adopted the policy, and it is an essential feature of the Canadian law. The invention of an American is protected by an unworked patent in his own country only; the invention of a foreigner may be protected in the United States if unworked, but not in his own country. He may manufacture under it in Germany, for instance, and ship his product to the United States, where his patent prohibits an American competitor from employing the invention. But the American, while protected at home, must share his invention with the foreigner abroad, or else establish works in that other country and work the patent himself. Consequently there is logic in the contention that the patent laws of the United States should be amended to include the same provisions as to compulsory workings in this country of patents of foreign inventors. Along the same lines is the other important element of foreign patent laws, that all shall be worked, no matter who the patentee may be. This would hit at a practice, especially common with builders of textile machinery, of securing patents, usually by purchase, and locking them up, which prevents their use by others, though they remain unworked by their owners, constituting a custom considered by many to be a violation of the spirit of the patent laws, though in no way illegal as the statutes stand to-day.

Without going into the more intimate details of the laws of other countries, they provide that after a certain period of time following the issuance of a patent it may be revoked on the ground that the patented article or process is manufactured or carried on exclusively or mainly outside of the country issuing the patent. As a consequence, the owner of an American patent must either establish works in the country, or have work done for him there, or else conform to the usual provision of the law by advertising to dispose of licenses to manufacture under the patent, and to sell such right if the offer be accepted. With a great majority of patents this advertising is considered as rather a matter of routine, no customer coming forward to take advantage of the offer. It is understood that in some countries prohibitive prices may be placed on the patent. On the other hand, important inventions usually mean the establishment of foreign plants or the sale of shop rights, which bring a good deal of profit to the purchasers. The new British law contains the important provision that the license to manufacture under a patent shall be given at a reasonable figure. There is no doubt that the existence of the compulsory working clause in foreign patent laws has resulted in the establishment of important branches of American manufacturing establishments in other countries, Canada being a notable example of this. It is only fair to presume that the same principle embodied in the patent laws of the United States would work to the advantage of the country in this as well as other ways.

The system is perfectly fair and entirely logical. A patent law is designed for a dual purpose; first, the object of stimulating invention by protecting the fruits of the brain of the inventor, and second, the broader function of benefiting industry and through it the nation. But the United States, under its present laws, gives to the foreign inventor a standing equal to that of the citizen, protecting for him a device or process which during the long life of a patent may never be employed to enrich the nation by a single dollar. So long as the home country of this foreigner does not similarly protect the invention of an American, the reciprocal relation is one-sided and contrary to the laws of economics. To take a concrete example, an Englishman may invent a machine and patent it in the United States, and no American can make use of it if it be against the wish of its inventor or owner. In the meanwhile it may be employed in England to manufacture goods that are shipped to America to compete with American goods, or into foreign markets where, because of the work of the machine, there may be an important selling advantage over competing American products. On the other hand, a machine invented by an American and patented in England must be manufactured and employed in that country. This is not because the laws of Great Britain and other countries are unjust; the fault rests with the American laws, which are too reasonable, as compared with those of other nations.

The other side of the compulsory working of a patent is that of Government protection of an invention which may never be used, though its value be important, because it may be thought the best policy for its owner to suppress it. The compulsory working of a patent eliminates the practice. The owner of the invention may resort to secrecy, avoiding the Patent Office, but this leaves open the chance that another may hit upon the same idea.

Generally speaking, a strong sentiment is developing that our own patent laws should be changed to conform with the practice of other countries, enabling the American manufacturer to secure a license to use the patented ideas of a foreigner, or compel the latter to employ it in this country, thus adding to productive wealth. The same amendment would include the industrial use of all American patents, if they are worth using, under the penalty of nullification. Opposition would probably be restricted to foreign interests and their representatives here, and to those individuals whose welfare is served by the existence of idle patents.

Copper Production and Prices.

Attempting to forecast future events in light of the past is sometimes dangerous, but nevertheless it affords a valuable basis for drawing some deductions, and in the copper trade statistics are so meager that little ground is afforded to base short range prophesies. The annual production of copper in the United States has shown a decrease, compared with the previous year, but five times since the industry became an important one. When the ups and downs of trade are considered, and even in view of the decrease in make of pig iron in good years and bad, this may be deemed remarkable. The statement recently made that pig iron has ceased to be the trade barometer and copper is now a truer index of general conditions gains force when comparisons are made of decreases in copper production with general trade movements.

The five years in which copper production has shown a decrease were 1872, 1886, 1893, 1901 and 1907. In none of these years, except possibly in 1907, was the falling off more than 5 per cent., and in every instance production increased considerably the next year. While it is true that recovery was slower after the panic of 1893 than after any preceding panic the depression was also more severe. In the following table the production of copper, according to the United States Geological Survey reports, is given for each year preceding a year of decline and for the two succeeding years. The high and low prices received for lake ingot copper are also given, and a compilation is made showing the output in percentage of the preceding boom year:

Year.	U. S. production.	Percentage production compared with boom year.	Price, cents. High.	Price, cents. Low.
1871	13,000	..	27	21.25
1872	12,500	96	44	27.12½
1873	15,500	119	35	21.00
1874	17,500	135	25	19.00
1885	74,052	..	11.50	9.80
1886	70,430	95	12.12½	10.00
1887	81,017	109	17.75	9.95
1888	101,054	136	17.8	15.85
1892	154,018	..	12.37½	10.50
1893	147,033	95	12.50	9.60
1894	158,120	103	10.25	9.00
1895	169,917	110	12.75	9.25
1896	205,384	133	11.75	9.75
1900	270,588	..	17.25	16.00
1901	268,782	99	17.00	12.87½
1902	294,423	109	13.00	10.87½
1903	311,627	115	15.00	12.00
1904	362,739	134	15.25	12.25
1906	409,375	..	23.06	17.93
1907	387,000 (est.)	..	25.37½	13.50
1908	422,000 (est.)	..	....	....

The production in the four periods previous to 1907 follow so nearly the same general laws that one is almost tempted to speculate on the production in 1907 and 1908. If it may be assumed that the same conditions will repeat themselves, it is found that 95 per cent. of 409,000 tons produced in 1906 gives 387,000 tons in 1907, which seems somewhat high, but not unreasonable in light of what is already known. Tempting fate still further, one finds that the same percentage of increase that occurred in 1894 would give a production of 422,000 tons in 1908. The recovery in 1894 was slower than on the two preceding and one succeeding instance; so if the percentage of 1887 and 1902 be used, it gives an estimated production of 445,000 tons in 1908. This exceeds but little the conservative estimates of to-day, and with the re-

opening of the Anaconda mine and the Washoe smelter this week, may prove too low.

The price question is fully as interesting; for the high levels were reached either in the year of the decreased supply or the one preceding, and the low levels continued for at least one and in most cases during the two years of recuperation. Is the future for copper producers, users and manufacturers to follow along the same lines as during other periods of depression, and is production to increase steadily and the price to hover around 14 cents for the next year or two?

The Western Coal Situation.

INDIANAPOLIS, IND., February 29, 1908.—The joint committee of the coal operators and miners of the central competitive field—Indiana, Illinois, Ohio and western Pennsylvania—has adjourned sine die, not having come to an agreement to call a joint conference of the operators and miners of the field to establish a wage agreement for the next year, or two years, as was the custom until abandoned two years ago. It was the fourth effort the joint committee had made in the last four months to agree on a call for a joint interstate wage conference. The miners' represenatives at this last conference voted to issue a call, and the Indiana operators voted with them, but the operators' representatives from Ohio, Illinois and western Pennsylvania opposed the proposition. They gave as their reason that the Illinois operators and miners were at present in conference; that it would be advisable to await the outcome of this before entering into a general conference, and that there are also local matters to be considered in Ohio and Pennsylvania before the general situation should be taken up in conference. Some of the operators were of the opinion that business conditions in the country are such as to make it a bad time to enter into any contract for the future operation of the coal properties of the country.

There was no indication at the committee conferences that operators propose to ask a reduction in wages. Some of them privately said that a reduction would not be to the benefit of operators, as the large users of coal would demand the benefit of any concessions in wages by reductions in the price of coal that would more than offset any apparent advantage to the operating interests. President John Mitchell of the miners' organization intimated to the operators that they could not get a settlement of State and local questions by impeding efforts to get an agreement in the whole competitive field.

Following the action of the joint committee a call was sent out to the miners to reconvene in Indianapolis, March 12. This will be a continuation of the nineteenth annual convention of the United Mine Workers, which recently met in this city. The two apparent duties of the coming convention will be to decide upon what action shall be taken on the expiration of the present wage contracts, March 31, and to agree on the new demands to be made if the mines are to be continued in operation after April 1. A motion at the committee conference to extend the present contract to April 30 and keep the mines in operation until local differences could be settled before proceeding to an interstate basis was defeated. The miners said this would be equivalent to setting a wage scale for the month of April, and the committee had no power to do this. The miners in convention will probably act on this proposal to keep the mines in operation until further efforts have been made to get a joint interstate wage basis. The convention may also decide to issue a call for a joint wage conference, leaving it for those operators to attend who desire to do so.

Representatives of the operators and miners of Michigan, Oklahoma, Missouri, Kansas, Texas and Arkansas were in Indianapolis during the committee conference, but were not permitted to take part in it. With the operators and miners of West Virginia, central Pennsylvania and Kentucky they are all interested in any argument made in the central competitive field, as in making a settlement in their respective localities they have to take into consideration the wage basis and other conditions with their competitors in the central field.

Notwithstanding the failure to re-establish friendly official relations between the two great bodies of operators and miners, the conditions, it is believed, do not favor a strike in the soft coal fields April 1, although this has formerly been one of the ways in which miners have enforced their wage demands.

A British Locomotive Plant for Montreal.

Special cablegrams from London of a recent date to the Montreal and Toronto newspapers report that the Beyer-Peacock Locomotive Company, Manchester, England, has acquired land in the neighborhood of Montreal and is about to establish a locomotive factory there. The announcement is significant, for at the present time it is possible to count on the fingers of one hand the British manufacturing firms that have established works in Canada. Not more than one or two of these concerns are in the iron and steel industry. The most prominent of the British plants now in Canada are not in the iron and steel industries. They comprise a soap factory, which is an offshoot of a British company having its home plant near Birkenhead, and a glass beveling works, which has sprung from a large and long established glass factory at St. Helen's, in Lancashire..

In the middle forties of the last century, when the expediency of a national policy was first being discussed in the Parliament of the United Provinces of Quebec and Ontario, Isaac Buchanan, the Scotch-Canadian of Hamilton, who was then the most prominent and persistent advocate of protection, repeatedly declared that he had information from England that if Canada would inpose duties in favor of home industries numerous English manufacturers were ready to set up branch establishments in Ontario and Quebec. Canada has now been on a protective basis since 1858, with duties in favor of home products frequently increased since the first national policy tariff was then adopted. Since 1883 $15,000,000 or $16,000,000 has been paid out in bounties to aid the iron and steel and some half dozen other favored industries. Yet, notwithstanding all this direct and indirect largesse, and the further fact that both political parties have been committed to protection since 1897, there is to-day less British capital in Canadian industrial concerns under direct British management than there was in the half century that preceded confederation in 1867. In those years mining in Cape Breton was exclusively in the hands of a British corporation with a royal charter. The small furnaces then at work in Nova Scotia, New Brunswick and Ontario were in British hands, and so were the small rolling mills then in existence at Hamilton and Toronto. Nearly all these undertakings failed of financial success, and as they passed out of British hands, or, as in the case of the small blast furnaces in New Brunswick and Ontario, were abandoned, no other British capitalists went into Canadian manufacturing enterprises.

British Opposition to Canadian Protection.

One remarkable fact about the present absence of British capital and British management in the iron and steel industry of Canada is that from 1878 to 1887 it was the English and Scotch iron and steel manufacturers who were most persistent in their protests to the Colonial Office in London and in the British Parliament against the policy of high protection that was developed in Canada between 1858 and 1887. The textile industries of England and Scotland were hit by the high duties of the early national policy tariffs, but while Lancashire cotton mill owners in 1881 bitterly complained to Sir John Macdonald, it was only the iron and steel men of England and Scotland who went to the Colonial Office in London with a protest of threatened retaliation in the House of Commons.

It was not more practicable in those days than it is now for England to retaliate in its tariff against Canada. But the iron and steel men in 1887 urged that Great Britain should withhold a pending subsidy to a Canadian line of steamers from British Columbia to the Orient until the iron and steel duties in the Dominion tariff were reduced. The reason why British iron and

steel men have not sought to get inside the breastworks of the Canadian tariff by establishing branch plants in Canada may have been that British plants have never long lacked orders. Another probable reason is that, as regards participation in the $12,000,000 of bounties bestowed on the iron and steel industry of Canada since 1883, British iron and steel men have been anticipated by American promoters, and to a small degree, as is the case at Hamilton, by Canadians who were on the spot. The inherent business conservatism so characteristic of England offers another reason for this backwardness, while still another is the indisposition of British works superintendents to attempt to handle a class of labor with which they are altogether unfamiliar. Notwithstanding labor difficulties, there is a good deal of team work in most English industrial plants. Both superintendents and men are less migratory than they are in the United States and Canada. In England, men, superintendents and foremen, as well as the rank and file of workmen, often spend the whole of their working lives in the employ of one concern, and such conditions, while pleasant and satisfactory in some aspects, obviously unfit superintendents and foremen from successfully handling men with whose habits and ways of thought they the entirely unfamiliar. E. P.

A Patent Law Amendment.

An Important Change Proposed.

WASHINGTON, D. C., March 3, 1908.—A bill of far-reaching importance to the manufacturers of the country has been introduced in the House by Chairman Currier of the Committee on Patents. It provides for the amendment of the patent laws so as to require all patents to be actually worked in the United States within four years, in default of which they may be declared invalid upon the application of any person properly made to the Commissioner of Patents. The Patent Committee will give hearings on this bill in the near future, and the date thereof will probably be announced the coming week. Mr. Currier's extraordinary measure is presented in the form of an amendment to section 4886, Revised Statutes. This section now reads as follows:

Sec. 4886. That any person who has invented or discovered any new and useful art, machine, manufacture or composition of matter, or any new and useful improvement thereof, not known or used by others in this country, and not patented or described in any printed publication in this or any foreign country before his invention or discovery thereof, and not in public use or on sale for more than two years prior to his application, unless the same is proved to have been abandoned, may, upon payment of the fees required by law, and other due proceeding had, obtain a patent therefor.

Mr. Currier proposes to add to this section the following proviso:

Provided, that at any time not less than four years after the date of a patent and not less than one year after the passage of this act, any person may apply to the Commissioner of Patents for the revocation of the patent on the ground that the patented article or process is manufactured or carried on exclusively or mainly outside the United States or its territorial possessions.

The Commissioner of Patents shall consider the application, and if after inquiry he is satisfied that the allegations contained therein are correct, then, subject to the provisions of this section, and unless the patentee proves that the patented article or process is manufactured or carried on to an adequate extent in the United States or its territorial possessions, or gives satisfactory reasons why the article or process is not so manufactured or carried on, the Commissioner of Patents may make an order revoking the patent either (*a*) forthwith, or (*b*) after such reasonable interval as may be specified in the order, unless in the meantime it is shown to his satisfaction that the patented article or process is manufactured or carried on within the United States or its territorial possessions to an adequate extent.

If within the time limited in the order the patented article or process is not manufactured or carried on within the United States or its territorial possessions to an adequate extent, but the patentee gives satisfactory reasons why it is not so manufactured or carried on, the Commissioner of Patents may extend the period mentioned in the previous order for such period not exceeding 12 months as may be specified in the subsequent order. Provided further, that any order or decision of the Commissioner of Patents on a proceeding for the revocation of a patent under this section shall be subject to an appeal to the Supreme Court of the District of Columbia sitting in banc. Provided further, that no such order or decision shall be made which is at variance with any treaty, convention, arrangement or engagement with any foreign country.

Object of the Proposed Modification.

In explanation of the purpose of this bill Mr. Currier states that he has been much impressed as the result of investigations he has made as chairman of the Patent Committee with which he regards as abuses that have arisen under the United States Patent laws, and which he proposes to correct by bringing these statutes into line with the English patent system as recently modified with the same object in view. The British Government within the past year has adopted an amendment to the patent laws which requires the working of a patent within four years to preserve its validity and a similar provision has also been incorporated in the Canadian law.

Mr. Currier's investigations have convinced him that the protection afforded by the present patent laws is being improperly utilized in two important classes of cases; 1, Those in which foreign owners secure protection for their products in the United States solely for the purpose of systematically exploiting the American market with goods made abroad by cheap labor, selling such goods in this country at prices far greater than can be realized for them in the country in which they are made; and, 2, those in which important discoveries and inventions made by Americans and patented in this country are locked up indefinitely by firms and corporations which purchase them solely for the purpose of perpetuating their own monopolies, thus depriving the public of the benefits it would derive if such inventions were commercially developed and utilized within a reasonable length of time.

It goes without saying that there will be much opposition to Mr. Currier's measure. Patent attorneys as a class will attack it vigorously, and many inventors and patent owners will join in the opposition. One argument that will be used against it is the injustice that would be suffered by the inventors, who in many cases would be forced to dispose of their inventions for a very small consideration to prevent the invalidating of their patents under the proposed law. Mr. Currier has already received notice that a large number of patent experts, inventors, &c., desire to appear before the committee against his bill, and it is probable that several days will be devoted to the hearings. W. L. C.

New Publications.

Machine Design. A Manual of Practical Instruction in the Art of Creating Machinery for Specific Purposes. By Charles L. Griffin, S.B. Size, 7 x 9¾ in.; pages, 181. Published by the American School of Correspondence, Chicago, Ill. Price, $1.50.

This is one of a series of handbooks which the publisher has prepared, treating not so much of the theoretical as of the practical side of the subjects, the purpose being to place them within the understanding of those who have not had the advantages of an extensive education, as the machinist, draftsman, mechanic and engine man, so that they may increase their knowledge by self-instruction. This volume pertains to machine design and includes many hints essential to efficiency in the operation and care of machines, and the increase of output. The main heads under which the text is divided are: Principles and method, application to a practical case, classification of machinery, and design of component parts of machinery.

Negotiations are in progress for the sale of the plant of the Morgan Spring Company at Struthers, Ohio, to the Youngstown Sheet & Tube Company, Youngstown, Ohio. The latter has a long time contract with the Morgan Spring Company to furnish it with Bessemer billets, which are rolled into wire rods for making wire and nails. Negotiations have reached such a point that in all probability the Struthers plant will be taken over by the Youngstown Company early in April. J. A. Campbell, president of the latter company, will be away on a vacation the entire month of March and on his return, about April 1, it is expected the deal will be concluded. The sale will not include nor affect in any way the Morgan Spring Company's parent works at Worcester, Mass.

Lake Mining Operations Curtailed.

DULUTH, MINN., March 1, 1908.—The following statement has been made by representatives of the ore mining firm of Corrigan, McKinney & Co., which is the chief miner in the Crystal Falls District and is also operating on the Mesaba and Gogebic ranges: "There are more than 20,000,000 tons of ore on lower lake docks at the present time, left over from last season's shipments. It is officially stated that the amount is 16,000,000 tons, but we have inside information as to the greater figures. Should all the furnaces using Lake Superior ore, that are now idle, be blown in at the opening of navigation it would require only about 20,000,000 tons of additional lake shipments to supply them for the coming year, or till navigation opens in 1909. This means that all ore above that total shipped this season will be for reserves ahead, and will be put in stock at furnaces or held at lower lake ports till required. For that reason the product of the mines of the Lake District will be cut in half this year. Forces must be reduced materially at once."

Sweeping Reductions in Mining Forces.

In accordance with this statement, Corrigan, McKinney & Co. have begun a sweeping reduction of men and will cut out unmarried miners at all their mines in all districts, and employ married men only half time for the present. How long this condition will continue remains to be seen. The mere fact that it has been inaugurated by this firm is no sign that it will continue for any great length of time or that others will follow it. Indeed, it is well known that other mining and consuming companies do not take so pessimistic a view of the situation as this statement would indicate, and that the general curtailment will not be so drastic as this one.

Continuing, the statement says: "Our furnaces have been making iron since last October for stock, and shipments to consumers have been almost nothing. Their product is now all stacked up in furnace yards and there is no immediate prospect of either selling or shipping it forward on sales that were made before the present condition began. We have not sold a pound of ore as yet for next summer's delivery, and we understand that other producers are in the same situation."

This firm is among the leading merchant producers and ore sellers of the lake region. With its high grade Bessemer mines on the Mesaba, from which a very large tonnage can be won, and its Gogebic and Menominee properties, all good producers, it is in an enviable situation so far as selling what the consumer requires. The statement further says: "We shall so arrange our work that there will be no need, so far as we are concerned, of any married men leaving the districts where we are prominently identified, nor will we discharge any single men who are the support of widowed mothers and families. We have been doing a very large amount of exploration, especially in the Crystal Falls District, near the Tobin and other of our mines. All drills but two will be stopped at once; explorations will wait. Developments in newly acquired and unproved properties will be affected, but work will be maintained on some of these on a larger scale than in the shipping mines."

As the result of this policy the number of men at work in the Crystal Falls District has been reduced to some 700, a reduction of about 1000 men. It is probable that not many of the companies will approximate a similar reduction, but all will reduce forces considerably.

Mischievous Developments in Labor Circles.

As an aftermath of the labor troubles on the ranges last summer, when the Western Federation of Miners attempted to show its strength here, there are being circulated some of the most vicious and rabid anarchistic documents that ever came out of a printing office. These are mostly from the upper Michigan copper country, and are issued there by Finn societies. There is nothing in the way of violence and rapine these papers do not urge.

Steps should at once be taken by the authorities to stop the circulation of such papers. For while the Western Federation was broken here last year, there are dissatisfied and lawless individuals still left, in most of the range towns, who cannot fail to become inflamed to almost any deeds after a course of reading of these papers. The diminished employment in the iron districts, the probable lateness of the lake season of navigation, and the weakness of organized labor in the region, will prevent any general strike, but sporadic instances of intimidation, violence, dynamiting and bloodshed may, perhaps, be looked for occasionally.

The Persistence of Ore Deposits

of the Lake Superior region is well evidenced by the Jackson mine, which was the original find of the region, and from which ore has been taken almost continuously for the past 60 years. Recently the Cleveland-Cliffs Iron Company has been developing the property again and has reopened it on a considerable scale, so that it will doubtless be a producer for many years. It has mined about 4,000,000 tons of ore, and the development, up to the new work, had not proceeded beneath the 400-ft. level. Of course, most of the new ore has not been in the old lenses at their former points of attack, but the very fact that new lenses have been opened, and that the older ones, deeper, longer and wider than before known, have been opened, is most significant. This has been the history, however, of all the four old ranges of Lake Superior.

Readers of current information on Lake Superior ore mining are aware of the very recent changes in sentiment concerning the Gogebic, and of the significant deep work being done there, where shafts are now going down to 3000 ft., to find lenses that are not even known to exist, but whose presence is well understood. The same change is taking place on the Menominee and there have been finds on the Vermillion during the past year that add wonderfully to the possibilities of the few mines of that section.

Deep Work on the Mesaba Not Promising.

What can be said of the possibilities of deep work on the Mesaba is, it is unpleasant to say, quite of another color. There the underlying quartzites are, instead of nearly vertical, quite flat, and it is a bold man indeed who will drive into that footwall in search of any ore on the other side of it, or infolded. Some rather ignorant comment has been published of late taking a contrary view of the case and presaging from finds in old and apparently worked out mines of the Mesaba, that there might be new depths and new geological ideas for the existence of additional ores there. But these are all based on an entire lack of knowledge of the situation, both as to the condition of the mines that were classed as worked out and as to the geological conditions surrounding the district.

It is no unusual matter for a Mesaba explorer to find salable ore covering a large tract that had been previously and unsuccessfully drilled. In the operations of the writer hereof, he has twice found a considerable tonnage on such lands. One of these tracts had been drilled no less than three times. But there had come a change in the merchantable standards, so that when ore was found in a deep hole it gave encouragement to proceed, which had been lacking to prior explorers, or for some other reason the ore found by the later comer had been disregarded by the former. With the Mesaba thoroughly drilled to quartzite from the feather edge of the ore bearing formation southward to the limit, there is little chance for or hope of more.

The Cleveland-Cliffs Iron Company at its new Gwinn operations is proceeding rapidly in the erection of houses and the establishment of mines and an ideal mining community. Not far from 100 dwellings are either under way or planned for early construction, with the company and other parties building many other structures, for churches, clubs, hospitals and stores. D. E. W.

The New Jersey Briquetting Company, whose plant in Brooklyn, N. Y., discontinued operations in April, 1906, is now quite well along with the construction of its new plant at Perth Amboy, N. J. The main building and pitch melting house are up, and some of the machinery from the Brooklyn plant has been put in place. Work is now going forward on the tracks and bins. The Zwoyer Fuel Company's process is employed. The capacity of the plant will be about 8000 tons of briquettes per month.

Drawbacks Paid in 1907.

Why the Drawback System Fails to Grow.

WASHINGTON, D. C., February 29, 1908.—Despite the extraordinary efforts made by the customs officials of the Treasury Department to provide workable regulations for the benefit of manufacturers desiring to extend their foreign trade, the annual report of the Bureau of Statistics of the Department of Commerce and Labor for the fiscal year 1907, shows an important decline in the amount of drawbocks paid, the total for the year being less than that for either 1906 or 1905. The aggregate refunds of duty on raw materials imported for use in the manufacture of goods subsequently exported during 1907 amounted to $5,445,150 as compared with $5,831,124 in 1906 and $5,806,475 in 1905. A significant comparison may be made with the total exports of manufactures which rose from $686,023,169 in 1906 to $740,123,451 in 1907. Thus, while there was a gain in 1907 of $54,100,282, or 12.7 per cent., in the total exports of manufactures, there was a loss of $385,974, or 6.6 per cent., in the total drawbacks paid.

Drawbacks Compared with Exports.

The total drawbacks paid during the past six years, as compared with contemporaneous exports of manufactures are shown in the following table:

Fiscal year.	Drawbacks paid.	Total exports of manufactures.
1902	$4,917,662	$453,864,851
1903	5,058,862	467,898,377
1904	4,809,808	523,319,979
1905	5,806,475	611,425,574
1906	5,831,124	686,023,169
1907	5,445,150	740,123,451

In the above table the figures showing the exports of manufactures are compiled on the basis of the classification adopted a year ago by the Bureau of Statistics and include "manufactures for further use in manufacturing" and "manufactures ready for consumption," but do not include foodstuffs in any form.

Cause of the Decline.

Treasury experts have examined these figures with much interest for the purpose of discovering the reasons for this downward movement in the total drawbacks paid. They are inclined to believe that the principal reason is the same as that which controlled the movement to some extent in 1906, which showed an insignificant gain of less than one-half of 1 per cent. over 1905, namely, that the heavy domestic demand absorbed large quantities of products formerly exported. A more specific and more tangibly supported reason is the fact that during 1907 the exporters of petroleum continued to find it to their advantage to use large quantities of domestic tin plates with benefit to the special price allowed by the American manufacturers to those who would otherwise have purchased Welsh plates. It is not denied, however, that there is a third cause for the decline, which was quite as potent during 1907 as in any previous year, namely, the cost of meeting the requirements of the Treasury Department under current drawback regulations. This statement should not be taken as a criticism of the present administration of the drawback law, which is notably liberal considering the restrictions embodied in the statute, but it is a fact that many manufacturers who, during periods of industrial depression, made a very earnest effort to extend their export trade by taking advantage of the drawback law, found the expense so great that when the domestic demand for their products showed signs of revival they felt compelled to abandon the drawback system.

No class of exports has received as much consideration at the hands of the customs officials in the matter of the framing of practicable drawback regulations as have manufactures of steel and other metals. The fact that these products are chiefly made in large plants, controlled by reputable corporations under conditions which make governmental supervision comparatively easy, has rendered it possible to relax the regulations materially without endangering the revenue. Under the regulations thus provided, many million dollars' worth of locomotives, steel rails, structural iron and steel, billets, ingots and blooms, pipes and fittings, tin cans, &c., have been exported. Thus during 1907 the drawbacks paid on the metal schedule made a very creditable showing if proper allowance is made for the effect of the special price on tin plates above referred to. The following table shows the refunds on each class of metal products in 1907 as compared with 1906:

Drawbacks on Metal Products.

	1907.	1906.
Aluminum	$64,670	$44,534
Cars, railroad	13,275	30,746
Electric cable	37,625	22,413
Electrical instruments	12,367	7,492
Bar iron and steel	1,654	314
Billets, ingots and blooms	246	23,733
Castings	4,437	1,274
Forgings, bolts, nuts and spikes	5,654	5,791
Steel hoops	.....	34
Locomotives	43,769	106,444
Boilers	2,818	1,330
*Parts of engines	.....	1,805
All other machinery	4,876	14,767
Nails and spikes	12,874	18,722
Pipes and fittings	13,052	65,818
Steel rails	85,518	204,418
Saws and saw plates	3,630	2,172
Steel plates and sheets	45,441	2,139
Structural iron and steel	223,516	191,832
Wire, and manufactures of	22,124	9,567
All other manufactures of iron and steel	20,012	8,117
Pig lead	1,543	2,227
Lead pipe	7,536	2,447
Lead sheets and shot	13,314	35,954
All other manufactures of lead	25,774	11,929
Metals not otherwise specified	.....	12,192
Tin cans	1,536,133	1,808,956
Other tin manufactures	39,935	37,112

* Included with boilers in 1907.

It will be noted that two-thirds of the decline in the total drawbacks paid during 1907 is accounted for in the reduced amount credited to exports of tin cans. This decline is emphasized by the fact that in 1905 the drawback on tin cans amounted to $2,273,240. In 1904 it was only $1,646,263. The drawbacks paid in 1907 covered 45,966,483 cans, as compared with 74,000,000 cans in 1906 and 78,570,000 cans in 1905. The cans exported with benefit of drawback were used to a considerable extent for other purposes than as petroleum containers.

The decline in the drawbacks paid on locomotives in 1907 is explained by the experts on the ground that the heavy domestic demand served to reduce the actual exports during the year, and it is asserted that under the present complete system of drawback allowances few, if any, locomotives are exported without benefit of the official refunds. While the current depression in the transportation business in the United States is shared to some extent abroad, it is predicted that the exports of locomotives during the fiscal year ending June 30, next, will show a considerable increase.

The reduction in the drawbacks paid on steel rails is also accounted for on the ground of the heavy domestic demand during the fiscal year 1907. The gain in the refunds on structural iron and steel, amounting to more than $30,000, was due to several large foreign contracts secured by American bridge builders for whose benefit a very complete drawback system has been devised.

Efforts to Amend Drawback Law.

Throughout the past year an effort, stubbornly contested by the so-called stand-pat element in Congress, has been made to liberalize the drawback law as found in Section 30 of the Dingley act. The movement to modernize this important feature of the tariff act, which was happily described by the late President McKinley as "the safety valve to the protective policy," has had for its immediate object the passage of a series of bills pending in the last Congress and reintroduced at the present session by Representative Lovering, of Massachusetts. These bills provide for the allowance of drawback claims in cases where the technical requirements of the term "manufacture" as construed by the United States Supreme Court cannot fully be met, although the spirit of the law is complied with; allow claims on the substitution principle where the foreign material in the finished product is not capable of identification, but where evidence is adduced that at least an equal quantity has actually been imported and traced to the manufacturer's

plant; permit goods to be consumed on shipboard with benefit of drawback the same as if exported; allow rebate of internal revenue tax on goods withdrawn from bonded warehouses and used on shipboard; and permit drawbacks to be paid on imported covering used on exported American goods.

It would seem to require little more than a glance at the provisions of the Lovering bills to convince any fair-minded Legislator that the drawback section of the tariff law is greatly in need of amendment to bring it into line with the best modern business practice, especially if there be kept in mind the vital necessity of increasing the foreign outlet for our surplus products. Nevertheless, the passage of these measures has been resisted by the opponents of general tariff revision on the ground that the only safe policy for the maintenance of the present schedules is to refuse consideration for any measure which may propose a modification of the act, even though it be limited to its administrative features. The friends of drawback legislation have presented the very sound contention that the amendment of the drawback law along rational lines would go a long ways toward reconciling exporting manufacturers to the high rates of the Dingley act, and would thus serve to decrease the pressure upon Congress for a general overhauling of the tariff schedules. At this writing, however, little hope is entertained that the drawback laws will be revised in advance of the framing of a new and comprehensive tariff bill, which it now seems probable will be undertaken early in the next Congress. W. L. C.

Acetylene Rules Modified.

Acetylene Now Regarded as a Common Illuminant.

The rules formulated by the National Board of Fire Underwriters for the acetylene industry have hitherto required outside installation of acetylene generators, and while, as a matter of fact, in by far the largest part of the United States this rule has not been insisted upon in certain limited sections it has been rigidly enforced.

The existence of a rule prohibiting the installation of an acetylene generator in an insured building was a constant menace and handicap to the industry, and its enforcement in some sections and not in others placed insurance companies in the inconsistent position of insuring property in one State under conditions which it would not accept in another. An investigation by the National Board as to the exact condition of the industry disclosed the fact that, in those sections where inside installation had been permitted, acetylene was proving itself to be a safer illuminant than those which it replaced. Regarding this investigation, the International Acetylene Association, Chicago, says:

The Action of the Underwriters.

The National Board of Fire Underwriters, at its Executive Committee meeting on January 30, 1908, held in New York City, after considering the various favorable reports submitted to it by its various committees, amended the rules covering the installation and use of acetylene generators, by striking out such words as prohibited inside installation under all conditions and substituted the following: "Generators, especially in closely built up districts, should preferably be placed outside of insured buildings in generator houses constructed and located in compliance with Rule 9."

It will be seen at once that, while the National Board recommends outside installation as being ideal in place of the absolute prohibition, the rules now mean that in all outlaying districts generators may be placed inside, but in closely built up districts it recommended outside installation as its preference.

Even where outside installation is preferred, the rule regarding construction of generator houses has been modified, and where such houses formerly had to be fireproof, constructed of brick and located as far as practicable from other buildings, such houses may now be located adjoining an insured building and fireproof construction is not required. It will be seen that the above modifications are radical, and are a most favorable indication of the fact that inventive genius and a close adherence to the rules of the National Board of Fire Underwriters have received a deserved recognition.

All Insurance Requirements Met.

The acetylene industry has been subject to the rules of the National Board from its inception, and has loyally endeavored to meet all insurance requirements not only in letter, but in spirit. The result has been a vast expansion of the industry, and a growing safety of the illuminant until the above modifications were deemed warranted by the National Board. The investigations, which were set on foot for the purpose of ascertaining facts brought forth the conclusion that, in view of the fact that the number of acetylene generators installed inside of buildings had very largely increased in the past few years, while, at the same time, the fire records seemed to show that the number of fires ascribed to such installations had, if anything, decreased, the rules of the National Board covering the construction and installation of acetylene apparatus had apparently safeguarded the hazard to a very great extent.

The fact was demonstrated that acetylene illumination generally replaces methods which entail an equal, if not a greater, hazard. Consideration was given to the fact that outside installation of acetylene generators was frequently impracticable on account of climatic conditions. The facts disclosed by the investigation made a modification of the rules inevitable, and it was agreed that the time had arrived when the rule as to outside installation might be properly modified, so that it would recommend outside location as being the ideal location, yet permitting under proper restrictions the location of the generator inside of an insured building.

Rules Not Mandatory.

The rules of the National Board are not mandatory, and in some sections of the country the rule regarding outside installation was not followed, but in certain sections of the country, notably New England, suburban Philadelphia and the Southeastern States, this rule was enforced. Some manufacturers of generators were, therefore, brought into competition with inferior generators which had not the approval of the National Board of Fire Underwriters, and as both the permitted generator and the unpermitted generator must be put outside if the rule was enforced, the competition was of such a nature that the manufacturer of a first-class generator had difficulty in surviving.

The modification of the rule will undoubtedly give a distinct advantage to the manufacturer of a permitted generator, and will draw the industry into closer alliance and loyal adherence to the excellent rules of the National Board. This relief and additional advantage to the manufacturer of a good generator mean undoubtedly the practical elimination of what is known in the trade as the "tin can generator," which, by the way, it is authoritatively stated has been the cause of 85 per cent. of the troubles which have arisen from the use of acetylene.

If the industry understands clearly the tremendous advantage which will accrue to it from a most careful and painstaking adherence to the requirements of the underwriters, it will benefit in the future from the supervision of the National Board as it has in the past. It is creditable that those who are pushing the acetylene industry have been big enough to realize the advantages of laying a broad foundation on quality by accepting the suggestions of the insurance engineers, and the rapid advance of acetylene as an illuminant is largely due to the intelligence with which they have grasped the subject.

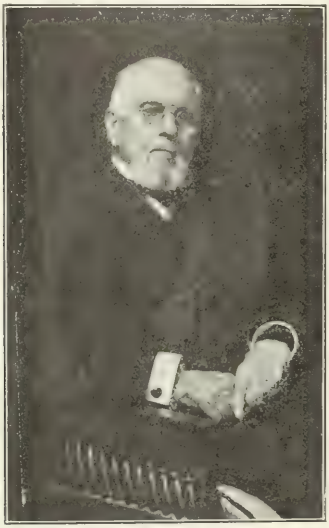
The annual meeting of stockholders of the Wheeling Steel & Iron Company was recently held at Wheeling, W. Va. President C. R. Hubbard presented a financial statement for the year 1907, showing that the net earnings of the company were about $1,220,000, a decrease over the previous year, due partly to the damage to the plant by the flood last March, and partly to the business depression of the closing months of the year.

OBITUARY.

LEWIS H. TAYLOR.

Lewis Hazelius Taylor, honorary president of the Taylor Iron & Steel Company, died at High Bridge, N. J., February 18. He was born there in the house in which his grandfather lived and where his father was born. On January 29 he had celebrated the ninety-seventh anniversary of his birth, retaining until a few weeks before his death remarkable bodily health and vigor of mind.

Mr. Taylor was president of the Taylor Iron Works from its organization in 1868 until it was merged into the Taylor Iron & Steel Company in 1891, and he was the first president of the latter company, serving until 1905, making his term of office in all 36 years. Since 1891 the Taylor Iron & Steel Company has manufactured manganese steel under exclusive patent rights in America from Robert A. Hadfield of Sheffield, England. Associated with his father, and active in the reorganization of



LEWIS H. TAYLOR.

the company, was his eldest son, the late William J. Taylor, an engineer of distinguished ability and inventor of the Taylor gas producer and the Taylor fused steel tired wheel.

The passing of Lewis H. Taylor removes a figure unique in any circle and honored in many, a gentleman of the old school and an enthusiastic advocate of modern methods for progress in business and community life. He recalled the days of stage coach travel and freight service by wagon, and in middle life assisted his friend, E. C. Knight, and others in building a rival railroad to that of the Pennsylvania between Philadelphia and New York, when the famous "frog war" resulted in victory for the Delaware & Bound Brook Railroad, now a part of the Reading interests.

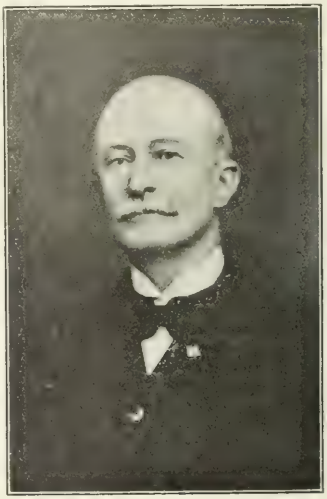
The venerable president of the Taylor Company was born during Madison's Administration, in 1811, while the company of which he was so long the highest official and its predecessors made ammunition for every war from the Revolution to the Spanish-American war in Cuba. He was educated by private tutors at home, later studying under the care of his uncle, Ernest Lewis Hazelius, superintendent of Hartwick Seminary, New York. During his long life he retained the keenest interest in all outdoor sports, taking part in them himself, hunting, fishing and camping until within recent years. During the '49 gold fever, he traveled with his brother George to California by way of the Isthmus of Panama. The brothers engaged in the foundation work of building the city of San Francisco, furnishing lumber for the great wharves. These were destroyed by fire, rebuilt and again saw ruin in the earthquake and fire of 1906.

Among those connected with the Taylor Company during his presidency were his son William J. Taylor, his son-in-law, Oliver W. Chrystie; James H. Walker, E. C. Knight, John Brown, Jesse T. Lines, Col. James Moore, George Richards, Luther C. Voorhees, S. P. Raber, W. G. Neilson, W. B. Middleton, Robert A. Hadfield, Dr. Henry M. Howe, Robert E. Jennings, T. F. Budlong, Henry D. Hibbard, Sidney Dillon Ripley, Walter Gaston, Howard E. White, Edgar S. Cook, Dr. Alex. C. Humphreys and two grandsons, Percival Chrystie and Knox Taylor.

Mr. Taylor was held in warm affection and the highest esteem by his employees and fellow townsmen, contributing generously to the cause of education and the work of the church. Of his eight children three are now living, Lewis H. Taylor, Jr., of Philadelphia, bearing his father's name.

GEORGE A. SMITH.

George A. Smith, president of the Smith-Courtney Company, Richmond, Va., died February 11, aged 64 years. He was widely known in the supply trade of the South, having established this line in Richmond in 1872. He was, in fact, commonly recognized as the father of the supply business in the Southern States. A great many of the supply houses in the South are at the present



GEORGE A. SMITH.

time managed by men who gained their first knowledge of the business through association with Mr. Smith. He served in the Confederate army, and lost his left arm at Fredericksburg. After recovering from this he served on the staff of Jefferson Davis until the close of the war. His strongest characteristics were unswerving honesty and thorough sincerity. He leaves a widow and five children.

JOHN LONG, superintendent for many years of the local plant of the United States Cast Iron Pipe & Foundry Company, died at Louisville, Ky., February 18, aged 82 years. He was born in Pittsburgh and was a brother of the late Dennis Long, who started the manufacture of cast iron pipe at Louisville. He leaves a widow.

WILLIAM A. WASHBURNE, New York rail sales agent for the Cambria Steel Company, died at his country home in Salisbury, Conn., February 26, after an illness of nearly two months, although he did not cease visiting his office at 71 Broadway, New York, until about a week prior to his death. An operation was performed February 23, but the disease was too firmly seated to permit recovery. Mr. Washburne had represented the Cambria Steel Company and its predecessor, the Cambria Iron

Company, for a period of about 14 years. Prior to this he was connected for several years with the rail department of the New York sales office of the Pennsylvania Steel Company. He leaves a widow and one daughter.

TOM COBB KING died at East Orange, N. J., February 27. He had been well known in the iron industry for the past 15 years. For a time he was engaged in blast furnace operation in the South and later in the Pittsburgh District. In recent years he worked on the problem of flue dust utilization and developed a process for nodulizing fine ores and flue dust, which was acquired by the National Metallurgic Company, a plant being built by the company near Newark, N. J., for the manufacture of iron ore nodules from pyrite cinder. Mr. King also brought out several other inventions in connection with mining machinery and metallurgical processes. He was born at Marion, Ala., in 1865, a son of Porter King, a colonel in the Confederate Army. He graduated at Howard College in Alabama. Mr. King was a member of the Iron and Steel Institute and the American Institute of Mining Engineers. His widow and a son survive him.

BENJAMIN S. WOODWARD, Hartford, Conn., formerly head of the business of Woodward & Rogers, died February 25, aged 55 years. He was a native of Hartford. Trained as a mechanic, he was for some years with the Pratt & Whitney Company. Twenty-five years ago he went to Russia to superintend the construction of torpedo boats, and upon his return three years later became superintendent of the Dwight Slate Machine Company, Hartford. Then he organized the firm of Woodward & Rogers, and the sensitive drill of their make won a wide reputation. Five years ago the business was absorbed by the National Machine Company, and Mr. Woodward went to the Whitney Mfg. Company and remained in its employ until his death. He leaves a widow, two sons and a daughter.

EDWARD G. BURNHAM, Bridgeport, Conn., founder and until recently president of the Eaton, Cole & Burnham Company, died February 28, aged 80 years. He was a native of Springfield, Mass., and went to Bridgeport in the early '60's to establish the firm of Belknap & Burnham. In 1874 the name was changed to the Eaton, Cole & Burnham Company. The business grew rapidly from a small beginning to a position of much importance in its line, with a great modern plant for the manufacture of valves, fittings, &c. A change in ownership of the business took place several years ago. Mr. Burnham disposing of his interests. He was prominent in the affairs of his city, was a director of the City National Bank, served as State Senator and was a member of the Bridge Commission and Board of Public Works. He leaves one son, William E. Burnham, and two daughters.

GEORGE M. CLARK, Haddam, Conn., president of the Cutaway Harrow Company, died March 2, aged 75 years. He was a native of Haddam, and as a boy went to Savannah, Ga., with his parents. He was forced to go to work immediately owing to the death of his father. In 1855 he returned to Connecticut, locating at Stonington, and later entered the employ of the Meriden Cutlery Company, Meriden, Conn., where among other work he designed a new factory and was the superintendent of its construction. In 1867 he began, with his brothers, the manufacture of agricultural implements, and soon afterward established the Cutaway Harrow Company. He was prominent in public affairs and was a member of the constitutional convention. He leaves a widow and two daughters.

JAMES H. OLIVER, the famous plow manufacturer, died at South Bend, Ind., March 2, aged 84 years, after a year's illness. He was born at Roxburgh, Scotland. In 1836 his family came to this country and settled at Geneva, N. Y. He worked on a farm for a time and then went to Indiana, where he became a mill worker. He soon accumulated enough money to set up in business for himself in a small way. After building up a good business he began experimenting to produce a chilled steel plow, which others, after repeated trials, had declared an impossibility. Mr. Oliver was successful, however, and almost immediately the demand became so great that he had to enlarge his plant. It has never ceased to grow and is now the largest in the world. His son, Joseph D. Oliver, will succeed him as president of the Oliver Chilled Plow Company.

Trade Publications.

Gas Engines.—Lazier Gas Engine Company, 190 Main street, Buffalo, N. Y. Catalogue and blue prints. These are inserted in a folder and pertain to the Lazier vertical single-cylinder gas engines, which are designed to operate on illuminating, natural and producer gas. The seven blue prints are 7½ x 10½ in., and show front, end, cross sectional and dissected side views of the engines, and a dissected view of the igniters. The reverse sides contain keys to the numbered parts on the facing blue prints and description of the construction and operation. The catalogue besides giving exterior and interior views and a description of the engine deals with the economy of the gas engine, and by data and tables compares the actual costs of developing 100 hp. with the various practical prime movers now available. This engine was illustrated and described in *The Iron Age*, April 18, 1907.

Indicators and Turbines.—General Electric Company, Schenectady, N. Y. Bulletins. No. 4533 pertains to the company's several sizes of Wright demand indicators, which are stated to have been extensively adopted in determinating load factor, the maximum output of generators, transformers, feeders, &c. Bulletin No. 4534, superseding No. 4445, is devoted to Curtis horizontal shaft type steam turbine sets up to 300 kw. capacity, for both direct and alternating current. The turbines can be arranged to operate either noncondensing or condensing, those built for condensing service being suitable for noncondensing work in case of necessity.

Phosphor Copper.—R. F. Lang, manufacturer's agent, 31-33 Broadway, New York. Pamphlet. A description of the merits of phosphor copper and a list of the advantages of Royal phosphor copper when used in making brass castings. It is especially desirable for use in connection with scrap copper and obviates blow holes and turns out more perfect castings at a lower cost with this material than with the use of tin. It is valuable as a deoxidizing agent. A list of the representative concerns now using this material is given, which includes some of the largest brass foundries and scrap copper users of the country.

Norway and Swedish Iron.—Arthur C. Harvey Company, 374-394 Congress street, Boston, Mass. Leaflet. Gives list of quantities of each size of squares, rounds, half rounds, ovals, half ovals and flats on hand for immediate shipment February 1. States that a large supply of blooms is also carried in stock.

Gate Valves.—Jenkins Bros., 71 John street, New York City. Supplement superseding pages 70 and 71 of the company's 1907 catalogue. Gives illustrations, descriptions and tables of sizes and prices of extra heavy gate valves for 250 lb. working pressure, and medium pressure gate valves for 150 lb. working pressure.

Ornamental Iron and Bronze.—Flour City Ornamental Iron Works, Minneapolis, Minn. Pamphlet. Illustrates some of the company's latest work, including gates, doors, stairways, elevator inclosures, counter rails, lamp standards, &c. A list of contracts recently completed and in course of construction is given.

Motors.—Electro-Dynamic Company, Hanover Bank Building, New York. Pamphlet. Pertains to Inter-Pole variable speed motors, which are made in sizes from ¼ to 150 hp. The illustrations show these motors applied to various types of machine tools.

Lathes.—R. K. Le Blond Machine Tool Company, Cincinnati, Ohio. Catalogue. Size 6 x 9 in.; pages 97. Contains a general description of Le Blond lathes, which are manufactured in two general styles, the belt feed or standard machine, and the quick-change gear type. Illustrations, descriptions of principal parts and dimensions are given of 14, 16, 18, 20, 22, 24, 27, 30 and 32 in. standard engine lathes, and of quick-change lathes of the same sizes. A 32-36 in. triple geared quick-change lathe, high speed engine and roughing lathes, stud, gap, interchangeable turret, special turret, and combination turret lathes, and several types of motor-driven machines are treated similarly. The company's tool posts, rests, translating gears, coarse threading attachment and friction countershaft are separately dealt with. A reference table to a foundation diagram, directions for erecting Le Blond lathes, prices, code words and sizes of combination or independent chucks, and a telegraphic code complete the contents of the book.

Pumps.—Allentown Rolling Mills, Allentown, Pa. Pump data bulletin No. 19. Refers to the Aldrich horizontal quintuplex electric pumps of pot chamber design and four-bearing pattern. Ranges of operation for the various sizes of these pumps are given in tabular form.

Blast Furnace Construction.—William B. Pollock Company, Youngstown, Ohio. Supplement No. 9 to the company's general book of views of blast furnaces which it has recently built. The photographs in this issue are of the No. 8 blast furnace of the Cambria Steel Company, Johnstown, Pa.

Gain in Pig Iron Output.

Steel Works Furnaces Increase.

A Falling Off in Merchant Furnace Product.

February, with 29 days, exceeded the January output of pig iron. Our statistics show that the product of coke and anthracite iron was 1,079,721 tons last month, against 1,045,250 tons in January—a daily rate of 37,232 tons in February and of 33,718 tons in January. The comparison of capacity active March 1 with that active one month previous is more striking. More furnaces blew in than blew out last month and the average capacity of those resuming was greater than that of the furnaces stopping. The weekly capacity of 150 coke and anthracite furnaces active March 1 was 267,437 tons, as against 241,925 tons a week for the 142 furnaces blowing on February 1. Some of the furnaces reduced their production in February by banking for a few days or by slowing their engines. Thus March opens with a prospect of nearly a 10 per cent. increase over February.

The steel works furnaces are responsible for all the increase last month, and more, since the merchant furnaces fell off from their January rate of production. In February the steel works made an average of 24,514 tons of pig iron a day, against 20,582 tons a day in January. The merchant furnaces made 12,717 tons a day last month against 13,136 tons a day in January.

The table below gives the production of coke and anthracite furnaces in February and the four months preceding:

Monthly Pig Iron Production. Gross Tons.

	Oct. (31 days)	Nov. (30 days)	Dec. (31 days)	Jan. (31 days)	Feb. (29 days)
New York	152,710	111,407	86,996	82,962	65,567
New Jersey	30,574	24,079	22,555	22,447	19,880
Lehigh Valley	71,936	61,969	54,881	47,538	39,879
Schuylkill	48,543	43,876	37,747	24,002	22,338
Lower Susquehanna and Lebanon Val.	67,286	47,683	31,090	20,323	19,363
Pittsburgh Dis.	533,078	409,024	258,412	304,521	326,378
Shenango Val.	158,315	124,159	76,086	69,149	69,666
West. Penn.	143,078	130,192	105,671	60,355	51,119
Md., Va., and Kentucky	86,829	79,293	61,433	30,621	27,775
Wheeling Dis.	134,445	76,014	12,051	0	12,961
Mahoning Val.	180,968	129,334	68,776	64,437	93,432
Central and North. Ohio.	185,422	149,362	84,087	52,297	74,184
Hocking Valley and Hanging Rock	33,843	28,017	15,658	8,404	12,440
Mich., Minn., Mo., Wis., Colo.	81,155	59,697	48,950	38,172	36,129
Chicago Dis.	244,645	200,309	148,691	120,874	99,289
Alabama	146,354	118,190	94,810	81,541	91,209
Tennessee, Georgia and Texas	37,791	35,520	26,388	17,607	18,112
Totals	2,336,972	1,828,125	1,234,279	1,045,250	1,079,721

Production of Steel Companies.

Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Republic, Youngstown Sheet & Tube Company, Jones & Laughlin, La Belle, Bethlehem, Calumet, Inland and Colorado companies show the following totals of product month by month. We give separately a statement of the output of spiegeleisen and ferromanganese, which is included for each month in the total production:

Product of Steel Companies. Gross Tons.

	Pig.—Total production.— 1906.	1907.	1908.	Spiegeleisen and ferromanganese. 1907.	1908.
January	1,358,015	1,406,397	638,042	21,477	20,254
February	1,226,760	1,317,923	710,908	19,444	9,402
March	1,400,395	1,424,827	.....	31,091	.....
April	1,333,591	1,446,788	.....	26,527	.....
May	1,372,423	1,470,080	.....	28,822	.....
June	1,293,437	1,457,230	.....	30,942	.....
July	1,323,391	1,452,557	.....	25,343	.....
August	1,257,485	1,445,685	.....	23,696	.....
September	1,264,380	1,417,153	.....	30,270	.....
October	1,452,200	1,514,521	.....	35,105	.....
November	1,411,350	1,084,114	.....	21,861	.....
December	1,445,528	659,459	.....	19,480	.....

Capacity Active March 1 and February 1.

The following tables give the weekly capacity of coke and anthracite furnaces in blast March 1 and February 1:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	March 1. Number in blast.	March 1. Capacity per week.	February 1. Number in blast.	February 1. Capacity per week.
New York:					
Buffalo	14	5	9,785	6	15,642
Other New York	10	2	2,920	2	3,060
New Jersey	8	4	4,798	4	4,603
Spiegel	2	0	0	0	0
Pennsylvania:					
Lehigh Valley	25	9	9,220	10	9,005
Spiegel	3	1	145	2	617
Schuylkill Valley	14	4	4,692	4	4,539
Spiegel	1	1	702	1	882
Low. Susquehanna	7	1	2,010	1	2,153
Spiegel	1	0	0	0	0
Lebanon Valley	10	3	2,659	3	2,378
Pittsburgh Dist.	45	27	75,047	27	71,013
Spiegel	3	1	624	1	618
Shenango Valley	20	7	18,344	7	15,920
West. Penn.	27	9	15,680	7	10,850
Maryland	4	1	1,931	1	1,962
Wheeling Dist.	14	2	3,850	0	0
Ohio:					
Mahoning Valley	18	10	23,996	10	21,740
Central and North. and Michigan	22	8	18,787	6	11,975
Hocking Valley and Hanging Rock	12	6	4,620	5	3,047
Illinois and Indiana	23	12	27,003	11	28,027
Spiegel	2	0	0	1	1,162
Minnesota	1	0	0	0	0
Wisconsin	6	2	2,425	2	2,750
Missouri	1	0	0	0	0
Colorado	6	3	5,831	3	5,120
The South:					
Virginia	23	7	4,885	5	2,877
Kentucky	7	1	710	0	0
Alabama	46	18	23,175	15	18,060
Tennessee	18	6	3,598	8	3,925
Georgia and Texas.	3	0	0	0	0
Totals	396	150	267,437	142	241,925

A Record of Active Capacity.

The active weekly capacity in coke and anthracite iron has shown the following fluctuations since January 1, 1903:

	Capacity per week.		Capacity per week.
March 1	267,437	July 1	408,617
February 1	241,925	June 1	443,092
January 1, 1908	232,652	May 1	452,031
December 1, 1907	347,372	April 1	439,564
November 1	491,436	March 1	403,157
October 1	511,397	February 1	405,792
September 1	507,768	January 1, 1905	377,879
August 1	513,471	December 1, 1904	357,846
July 1	528,170	November 1	334,249
June 1	523,220	October 1	319,249
May 1	524,538	September 1	291,573
April 1	496,456	August 1	246,092
March 1	511,035	July 1	272,301
February 1	492,359	June 1	336,107
January 1, 1907	507,397	May 1	368,244
December 1, 1906	513,860	April 1	337,257
November 1	500,580	March 1	308,751
October 1	469,665	February 1	273,692
September 1	441,426	January 1, 1904	185,636
August 1	449,908	December 1, 1903	244,156
July 1	460,570	November 1	273,715
June 1	472,622	October 1	353,142
May 1	484,031	September 1	360,197
April 1	484,240	August 1	353,681
March 1	479,737	July 1	384,825
February 1	482,156	June 1	388,178
January 1, 1906	463,673	May 1	373,496
December 1, 1905	475,814	April 1	386,215
November 1	460,449	March 1	347,424
October 1	445,468	February 1	335,239
September 1	412,563	January 1, 1903	346,073
August 1	410,088		

Changes in the Active List.

The list of furnaces that have blown out since our last report or that were banked in February and remained so on March 1 includes one Lackawanna at Buffalo, one Palmerton in the Lehigh Valley, one Edgar Thomson in Allegheny County, Colonial in western Pennsylvania, Sharpsville in the Shenango Valley, one Toledo in northern Ohio, one Calumet in the Chicago District, Brier Hill and Mary in the Mahoning Valley, and Warner and Helen in Tennessee.

Among furnaces blown in between February 1 and March 1 are one Eliza in Allegheny County, Stewart in

the Shenango Valley, two Cambria and Nittany in western Pennsylvania, Princess and Low Moor in Virginia, one La Belle and Top Mill in the Wheeling District, Norton in Kentucky, one Joliet in Illinois. Marting in the Hanging Rock District, one Central and two Lorain in northern Ohio, two Haselton in the Mahoning Valley, and Central, one Pioneer and one Sloss in Alabama. In the Shenango Valley No. 3 Shenango was blown in and No. 1 was blown out.

Central and South American Notes.

SAN JUAN, C. A., February 17, 1908.—Whatever rumors may be abroad, the truth is that Central America is at peace to-day, and this is greatly due to the recent conference at Washington. New enterprises are springing up, and railroad building has taken on fresh activity. Quite a number of Americans are looking about for investments now in these countries. Among other projects, the Belize & Guatemala Railroad is again being put forward, and there is hope that British and American capital may be interested in this line, which will surely open up a very rich mahogany, rubber and coffee country. The port of Belize, on the Caribbean Sea, will be the eastern terminus. It will run through Coban, Salamá, and the Sierras, to Guatemala, and reach the Pacific Ocean at two points, San José and, later, Champerico.

Honduras stocks and bonds have recently gone up in the London market, and this gives color to the report that a British syndicate is negotiating for the Tegucigalpa Railroad. Since peace has become general throughout the land most of the gold and silver mines have resumed work, and the exports of bullion from the San Juan mines are as large as ever. Several cargoes of mining machinery have been received at the Pacific ports the last few weeks.

At Barranquilla, on the Caribbean Sea, a concession has been granted by the government for an electric railroad line. The equipment is to come from the United States. Several steamboats, of the Mississippi type, are now being built for the Magdalena River, which is the great waterway to the interior of Colombia. In fact, the richest portion of the country, including the capital, Bogota, and the Cauca, are entirely isolated for want of railroads. The government is trying to interest foreign investors, for the purpose of building a line from Cartagena or Barranquilla to the capital, and another from Buenaventura on the Pacific Coast to the Andes. Between these two lines the business centers will be reached, and most of the mining, cattle and mahogany country will be tapped.

The Trasandine Railroad is being pushed, notwithstanding the crisis in Chile. The branch lines to Jujuy and Tucuman are well under way. Over 3000 men are working on the San Juan line.

The custom houses of Montevideo, Fray Bentos and other ports show receipts which are several millions ahead of the last fiscal year. During the next 90 days the Fray Bentos & Montevideo Railroad will be started. It is understood that bids have been invited from the United States and Great Britain for rails, cars and general equipment.

The Santos Port Company has obtained a loan of £3,500,000 for the building of breakwaters, dredging and general upbuilding of this important harbor on the Atlantic.

The President of Brazil has taken a great interest in the Sorocabona Railroad, usually known as the Northwestern of Brazil. A good portion of the line is now built, and a number of locomotives and cars, with general material, are now expected from New York and Philadelphia. Many of the engineers and principal employees on this line are from America. A large number of German and Italian immigrants are settling this new northwestern section, and several towns have already sprung up. The business is mostly in the hands of thrifty Germans, though much of the agricultural machinery is American. In the back country a number of gold, tin and diamond prospects have been opened, and two gold mills have already been ordered from an American firm.

One of the last decrees signed by the President of Brazil deals with the dredging and improvement of the port of Rio Grande do Sul. That city, Pelotas and Santa Catherina form the principal ports of the southern section of the country. The exports are mostly wool, cattle, hides and tallow, the imports being largely from Germany, though hardware and machinery from the United States are often found in the larger shops. It is here that 250,000 Germans have found a rich country, with an ideal climate, and before long it will be one of the very richest sections of Latin America. It would help American trade with this section if the American-Brazilian liners were to touch at the above mentioned ports.

There is no doubt that reciprocity is the entering wedge by which we may expect to get a just share of the $600,000,000 which constitute the yearly business of the 20 odd republics and countries of Spanish America. With the recent diplomatic visit of Mr. Root, and the more recent one of our battleships, it looks as if reciprocity in trade ought to have a fair hearing now, on both sides. C.

NEWS OF THE WORKS.

Iron and Steel.

The No. 3 blast furnace of the Republic Iron & Steel Company at Hazelton, Ohio, was blown in February 20. The Hall Furnace of this company, at Sharon, Pa., will be blown in this week. The No. 2 furnace at Thomas, Ala., is expected to go in next week. The No. 3 furnace at Thomas will probably go out for relining in the latter part of March, and the No. 1 furnace will then be blown in to take its place.

We are advised that there is no truth in the report that the United States Steel Corporation will acquire the old National Tube Works, at Helena, Ala. The plant has been idle for a number of years.

Operations have been suspended at the rolling mill of the Tennessee Coal, Iron & Railroad Company at Bessemer, Ala., for an indefinite period.

The report is not correct that the Birmingham Coal & Iron Company, Birmingham, Ala., is to erect another furnace at Vanderbilt, a short distance from Birmingham. The company's new furnace at that point is now nearing completion, and thus far no definite arrangements have been made nor has an appropriation been secured as yet for the building of another stack.

On February 10 the rolling mill and machine shop building of the Danvers Iron Works, Danversport, Mass., were entirely destroyed by fire, the loss being between $50,000 and $60,000. As plans for rebuilding have not been completed details are not yet available. The plant is controlled by the Sylvester Company, 70 Kilby street, Boston, Mass.

No. 1 furnace of the New Jersey Zinc Company at Palmerton, Pa., went out of blast February 22.

The Colonial Iron Company, Riddlesburg, Pa., blew out its one active furnace February 16.

The furnace of the Nittany Iron Company, Bellefonte, Pa., was blown in February 18.

The Princess Furnace Company, Glen Wilton, Va., blew in its furnace February 12, after it had been out for two months for repairs.

The Victoria Furnace, Goshen, Va., which is now being relined, will be blown in at an early date.

McKeefrey Furnace, Leetonia, Ohio, was banked from February 12 to March 2.

Warner Furnace, Cumberland Postoffice, Tenn., was blown out February 25.

The furnace of the Marting Iron & Steel Company, Ironton, Ohio, was blown in March 1, having been idle since December 24.

Helen Furnace of the Red River Furnace Company, Clarksville, Tenn., was blown out last week and will be idle for the next 60 days.

Hamilton Furnace of the Hanging Rock Iron Company, Hanging Rock, Ohio, which has been out of blast for several months, will probably be blown in about June 1.

The Lackawanna Steel Company, which had two of its seven furnaces at Buffalo in blast during February, banked one of these, the No. 7 furnace, February 29.

The furnace of the Norton Iron Works, Ashland, Ky., was blown in February 24. It had been idle since January 8.

General Machinery.

The American Locomotive Company intends to erect another building at its plant at Schenectady, N. Y., but will not start work of construction until business improves.

Wilber Emery, who has for several years maintained his office in Oberlin, Ohio, but whose machines have been built under contract by the J. Morton Poole Company, Wilmington,

Del., has moved his office to the latter city, where the machines will continue to be built by contract. Mr. Emery's specialty is the manufacture of barbed wire machines, in which a good trade has been built up in the past few years in Australia, England and Germany, as well as in this country, where many of the prominent mills have been supplied. Special barbed wire machines for companies which wish to make other than the standard forms of barbed wire, as well as special machines of allied classes, are also designed and built.

The granting of a franchise for extension of tracks has secured for the city of South Bend, Ind., from the Chicago, South Bend & Northern Indiana Traction Company, the proposed establishment in that city of the car barns and repair shops for the company's entire system, including the interurban and city lines in South Bend, Mishawaka, Elkhart, Goshen, New Carlisle, Laporte and Michigan City. The investment in buildings and plant will be $25,000.

A. V. Kaiser & Co., dealers in railroad and contractors' equipment, Drexel Building, Philadelphia, Pa., are in the market for a second-hand model No. 91 Marion steam shovel, in first-class condition.

The N. P. Pratt Laboratory, Atlanta, Ga., has secured contracts for the erection of buildings and installation of machinery for several large sugar mills in Cuba, amounting to about $1,000,000. Part of the work has been sublet to the Fulton Foundry & Machine Works, Atlanta, which the N. P. Pratt Laboratory owns and operates.

Power Plant Equipment.

C. H. Richardson, Mayor of Montezuma, Ga., will receive bids until April 1 for a municipal water power system and complete pumping station.

Bids will be received until March 24, at the office of the City Clerk, Montreal, Canada, for a 12,000,000-gal. steam pump for the low level pumping station.

The Commercial Club of Crawfordsville, Ind., is at the head of a campaign to induce the City Council to make improvements to the municipal lighting and power plant, which the city has outgrown.

City officers of Lafayette, Ind., have just completed a tour of the cities of the State, inspecting the light and power plants, with a view to establishing a municipal lighting and power plant in Lafayette in connection with the water works.

The town of Paoli, Ind., has purchased the local light plant and has sold $8000 of bonds to obtain funds with which to secure additional equipment.

Plans have not yet been developed by the Kansas City, Mexico & Orient Railroad, Kansas City, Mo., for building its proposed power plant on the Fuerte River and the details of the project will not be completed for some time.

Foundries.

The Campbell Mfg. Company, Gadsden, Ala., recently organized with a capital stock of $50,000, has purchased the machinery for equipping its new plant. The plant, which will manufacture pipe fittings, &c., is to consist of four buildings, 100 x 250 ft., 50 x 80 ft., 40 x 60 ft. and 20 x 40 ft., and will be operated by electricity.

The plant of the Southern Pipe & Foundry Company, at North Birmingham, Ala., has been put in operation, after an idleness of four months.

The American Cast Iron Pipe Company, Birmingham, Ala., reports that despite the general business depression of the country its business has not been affected. During January the company made and shipped more pipe than during any one month of 1907. At present it is well supplied with orders and it is installing a new department, which will considerably increase the output. J. R. McWane, who was formerly connected with the Lynchburg Foundry & Pipe Works, Lynchburg, Va., has been elected vice-president of the company.

Fires.

On February 29 fire ruined the $80,000 stock of the Sioux City Iron Company, Sioux City, Iowa, and badly damaged the building.

The plant of the National Sulphur Works, Brooklyn, N. Y., was destroyed by fire February 29, the loss being placed at about $25,000. The plant was about 100 ft. square.

The car barn of the New York City Railway Company at Second avenue and Ninety-sixth street, New York, was destroyed by fire February 29, together with a large number of cars, the total loss being about $1,000,000.

The paint factory of George W. Grote & Co., 430-436 East 102d street, New York, was destroyed by fire February 29, the loss being about $100,000.

The transformer plant of the Ellwood Power Company, Ellwood City, Pa., was damaged $30,000 by fire March 1. It is stated that some valuable machinery was destroyed.

The roundhouse and machine shop of the Northern Pacific Railroad, at Jamestown, N. D., were damaged $20,000 by fire February 26.

Hardware.

Wilcox, Crittenden & Co., Inc., Middletown, Conn., whose authorized capital stock is $300,000, have increased their paid in capital stock from $250,000 to $275,000. The company has within the past few months erected a number of new buildings, the largest of which is of concrete construction, 434 ft. long. The other buildings include a large concrete power house, new brick office building and concrete building for patterns. The new galvanizing department has been in operation for about three months.

The Steel Socket Shaft End Company, Cleveland, Ohio, manufacturer of splice joint double tube steel socket shaft ends, has more than doubled the capacity of its plant to keep up with its increasing orders. The company claims to be the originator of these ends for repairing broken shafts.

Miscellaneous.

The American Emery Wheel Works, Providence, R. I., has recently installed various grinding machines, so that it is now prepared to do any kind of grinding, hand or automatically. The object in installing the grinding department was to make actual tests under the same conditions as the wheels are used in the customers' shops. The company's large stock of over 150,000 finished wheels enables it to select different grades for testing purposes and to determine the best wheel for any particular operation. The company reports a better demand in February for its emery and corundum wheels than in January.

Very little equipment was damaged at the recent fire at the plant of the Friend Paper Company, West Carrollton, Ohio, the principal damage being in pipe, shafting, &c., and orders for replacing this have been given. The engine and boiler were not damaged.

In the recent note in these columns concerning the Dean Electric Company, Elyria, Ohio, manufacturer of telephone apparatus, the name of the treasurer was stated incorrectly. A. G. Bean is treasurer and general manager.

The welding business heretofore conducted by the Morton Iron Works at Brooklyn, N. Y., has been incorporated under the name of the American Welding Company, with headquarters at Carbondale, Pa., where the business will be hereafter conducted on a much larger scale. The company is prepared to furnish any cylindrical construction of seamless welded steel plate in which the riveting seam is objectionable.

The H. L. Dixon Company, Pittsburgh, has completed its new plant at Rosslyn, near Carnegie, Pa., which is now in operation, and which enables the company to manufacture and to take contracts for complete glasshouse equipment of all kinds.

The Noblesville Gas & Improvement Company, Noblesville, Ind., will issue $100,000 in bonds to obtain money to build an artificial gas plant, to cost from $60,000 to $75,000. C. R. Heath is president.

The Eskbank Iron Works, Australia's only blast furnace enterprise, has already changed hands, says a special correspondent. Financial difficulties are the cause. Our correspondent adds: "William Sandford, who has worked single handed for 20 years to get this industry established, is surely one of our most far-seeing and patriotic men, filled with the best patriotism of all—that of doing things. But, when success has seemed absolutely assured, he has had to hand over his labors to men able to command more capital, C. & G. Hoskins, a well-known and well liked firm of iron founders."

In the article in *The Iron Age* of February 27, describing the Krupp Works at Rheinhausen, Germany, the statement referring to the quantity of water used in gas washing should have read: "For each cubic meter of gas about 1 liter of water is required." The inspection of this plant, which is spoken of in the same article, was on the visit of the American Institute of Mining Engineers to Germany in the summer of 1906, following the joint meeting of that organization and the Iron and Steel Institute in London.

The estimate by the Director of the Mint of the gold produced in the United States last year is $89,620,399, against $94,393,800 in 1906. The output of gold from the Transvaal in 1907, according to the London journal *South Africa*, aggregated $133,360,292, against $119,618,507 in 1906, and $61,265,575 in 1903.

The Geo. A. Hogg Iron & Steel Foundry Company, Pittsburgh, has received an order from Schuchardt & Schutte, Vienna, Austria, for a 43-in. roll lathe, and an order from the Pennsylvania Steel Pulley Company, Allegheny, Pa., for four pulley grinding machines.

The Iron and Metal Trades

Through the courtesy of the makers of Pig Iron *The Iron Age* is in the position to announce, on an unusually early date, the statistics of the production for February. The make of that month was 1,079,721 tons, or at the rate of 37,232 tons per day, as compared with 1,045,250 tons in January, or at the daily rate of 33,718 tons, thus showing an increase. An analysis of the figures in detail shows that the Steel works furnaces made 710,908 tons in February, against 638,042 tons in January, an increase to 24,514 tons daily from 20,582 tons in January. It is worthy of note that the production of the merchant furnaces declined from 13,136 tons daily in January to 12,717 tons daily in February, and yet from very general, though not complete, returns, there are indications of an accumulation of some stocks. We entered the month with a total of 150 furnaces in blast, having a weekly capacity of 267,437 tons, as compared with 142 furnaces in blast on February 1, with a weekly estimated output of 241,925 tons.

There is a slight improvement in the volume of business from week to week, but the aggregate gain is small. The trade is watching the efforts to keep prices of Pig Iron on a fair level, with a good deal of sympathetic interest, but it is somewhat difficult from the fact that the markets have not been seriously tested by transactions of magnitude, to judge what the outcome will be. Some larger transactions have been effected with Cast Iron Pipe shops, the bulk of them with Southern furnaces not associated with the efforts of the majority. In these cases concessions have been granted, and the same is true of one 5000-ton lot sold by an outside central Pennsylvania furnace. On what small business in Foundry Irons for prompt delivery is going schedule prices are being generally obtained. There is very little inquiry for Steel making Irons East or West, and only a moderate demand for low phosphorus Pig.

Deliveries on old high priced contracts for Foundry Iron are still going on, and in some instances the quantities due are cut down to be replaced with Iron at the present level.

No larger sales of Steel Rails have been effected. It is learned, however, that one mill not heretofore mentioned participated in the Great Northern business to the extent of 5000 tons, and that the same mill, which rolls Open Hearth Rails exclusively, secured 2500 tons from a Coal road.

It is estimated that during February the leading Bridge building interest took a total of 20,000 tons of orders, and that the other shops together booked upward of 30,000 tons. Nearly all the principal districts report a fair amount of moderate sized contracts for Structural Material, and some good orders for bridges are coming up. It is expected that the material for the La Salle Hotel in Chicago, calling for about 8000 tons, will soon be placed. For the New Haven viaduct at Providence about 2500 tons are soon to be let.

The lighter lines are doing fairly well. Two interests are in the market for from 125 to 150 miles of Line Pipe, but the conditions imposed do not make it desirable business.

Old material has weakened again. Among the sales is one lot of 5000 tons of heavy melting scrap to an Eastern Pennsylvania steel plant.

The action of the Amalgamated Company in starting the Butte mines is interpreted as meaning that "holding the umbrella" was growing tiresome. It has had an adverse effect upon the price of the metal, which is being urgently offered for export as the line of least resistance. Apparently the sellers are not willing to offer quite as cheaply to the home consumers.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Mar 4, 1908.	Feb 26, 1908.	Feb 5, 1908.	Mar 6, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	$18.25	$18.25	$18.25	$25.25
Foundry No. 2, Northern, Cincinnati	15.75	15.75	15.75	23.00
Foundry No. 2, Local, Chicago	17.50	17.50	18.00	24.00
Bessemer, Pittsburgh	17.90	17.90	17.90	22.85
Gray Forge, Pittsburgh	15.90	15.90	16.35	21.85
Lake Superior Charcoal, Chicago	21.50	21.50	21.50	27.00
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	29.00
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.00
Open Hearth Billets, Phila	30.40	30.40	30.40	33.00
Wire Rods, Pittsburgh	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	*12.25*	13.00	13.00	18.00
Steel Rails, Melting, Phila	**14.00**	14.50	13.50	19.50
Iron Rails, Chicago	*16.00*	17.00	17.00	25.00
Iron Rails, Philadelphia	**18.00**	18.00	17.50	27.00
Car Wheels, Chicago	*15.00*	15.75	18.50	23.50
Car Wheels, Philadelphia	*16.00*	16.00	17.00	23.25
Heavy Steel Scrap, Pittsburgh	*13.75*	13.75	14.00	18.00
Heavy Steel Scrap, Chicago	*11.50*	12.50	12.50	16.00
Heavy Steel Scrap, Philadelphia	**14.00**	14.50	13.50	19.00
FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.65	1.65	1.65	1.93½
Common Iron Bars, Chicago	1.65	1.65	1.65	1.81½
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.70	1.70	1.70	1.90
Skelp, Sheared Steel, Pittsburgh	1.80	1.80	1.80	2.00
SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	*1.90*	2.00	2.00	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	*12.50*	12.62½	13.75	25.25
Electrolytic Copper, New York	*12.37½*	12.50	13.62½	25.25
Spelter, New York	**4.75**	4.75	4.70	6.95
Spelter, St. Louis	**4.60**	4.75	4.55	6.80
Lead, New York	3.75	3.75	3.75	6.35
Lead, St. Louis	3.60	3.65	3.60	6.10
Tin, New York	**30.25**	28.70	28.60	41.90
Antimony, Hallett, New York	9.00	9.00	9.00	23.50
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.80	$3.80	$3.80	$4.09

Chicago.

FISHER BUILDING, March 4, 1908. (By Telegraph.)

As a source of market activity the railroads, as in the case last week, still hold a leading place, but under present conditions no great acceleration is required to gain this position for any of the various mill products. In addition to 6000 tons of Rail specifications from a Western road, the Illinois Steel Company has booked orders for 2000 tons of Spikes and 1300 kegs of Track Bolts. [illegible] vance over the business in these lines for any previous week this year. Included in prospective business of this character is the inquiry of the Great Northern Railroad for 13,000 kegs of Spikes, which will probably prove an early supplement to recent bookings of Track Supplies. With specifications in hand and those that will be furnished on the 20,000-ton order placed last week by the Great Northern, the standard Rail mill at the South Works of the Illinois Steel Company now running is likely to continue in operation indefinitely. The Structural mill of this plant is also running on specifications. [illegible] principal tonnage was in bridge structures, which amounted in all to about 7000 tons. Plates, Bars and Merchant Pipe are gaining ground but slowly, the demand for all being restricted to the actual needs of present consumption. Only a [illegible] Bar mill capacity in this district, probably not more than 20 per cent. of the whole, is in operation this week. While specifications on Iron Bars show slight improvement Steel Bar business is coming out slowly. The Scrap market, yielding to the softening tendency of protracted dullness, has broken to the extent of 50c. to $1 a ton.

A late sale of Car Wheels, at $14.50, is reported, and Wrought Scrap is weak at the current quotation.

Pig Iron.—The tonnage of all sales made in this market during the past week is extremely light. Most of the inquiries that have come in are for small lots, from a carload to 200 and 300 tons. Some of larger tonnage are reported, but they generally represent seekers for substantial reductions from ruling prices, and not Iron that must be purchased for present or nearby requirements. There is no business being offered that would tempt strong concessions from the accepted basis of $13, Birmingham, for Southern No. 2 Foundry, and $17.50, Chicago, for No. 2 Northern. A large portion of the very moderate sales made are not of a strictly competitive nature, but are placed with respect to brands and trade relations without much price shopping. Under the circumstances, therefore, the market is not subjected to the strain of a decision test. No confirmation can be found for the rumored offers of Iron at $12.50, Birmingham, and lower, but there are a good many consumers who profess belief in the subsidence of values to this or lower levels. Few, if any, of the melting interests are in urgent need of Iron, and are therefore in position to await developments, which most of them are doing. The only Iron moving is, in few words, what is actually needed for current requirements. The following prices are for March delivery, f.o.b. Chicago:

Lake Superior Charcoal	$21.50 to $22.00
Northern Coke Foundry, No. 1	18.00 to 18.50
Northern Coke Foundry, No. 2	17.50 to 18.00
Northern Coke Foundry, No. 3	17.00 to 17.50
Northern Scotch, No. 1	18.50 to 19.00
Southern Coke, No. 1	17.85 to 18.35
Southern Coke, No. 2	17.35 to 17.85
Southern Coke, No. 3	16.85 to 17.35
Southern Coke, No. 4	16.35 to 16.85
Southern Coke, No. 1 Soft	17.85 to 18.35
Southern Coke, No. 2 Soft	17.35 to 17.85
Southern Gray Forge	15.35 to 15.85
Southern Mottled	15.10 to 15.60
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	19.40 to 19.90
Jackson Co. and Kentucky Silvery, 6 %	20.40 to 20.90
Jackson Co. and Kentucky Silvery, 8 %	22.40 to 22.90
Jackson Co. and Kentucky Silvery, 10 %	24.40 to 24.90

Metals.—A better feeling prevails in the market, due mainly to a noticeable increase in both the number and volume of orders developing from the inquiries received. Copper is a trifle weaker, but Spelter, though not advanced, is firmer in tone. Buying for immediate consumption continues to be the rule in all metals. We quote as follows: Casting Copper, 13c.; Lake, 13¾c. to 14c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 32c.; small lots, 31½c.; Lead, Desilverized, 3.95c. to 4c., for 50-ton lots; Corroding, 5.15c. to 5.25c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 13c., and other grades, 11c. to 11½c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 11c.; Copper Clips, 11c.; Red Brass, 12¼c.; Yellow Brass, 10¼c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 23c.; Block Tin Pipe, 25c.

(*By Mail.*)

Billets and Rods.—Only a few small lots of less than 100 tons each are reported in the week's transactions on Forging Billets. We are advised that these sales were made at regular prices, which continue to be held at $33 to $34, Chicago. On the moderate amount of business being offered in Wire Rods the following prices are evenly maintained at the following quotations: Bessemer, $35; Basic, $36; Chain, $37, all at Pittsburgh.

Rails and Track Supplies.—As a result of securing 20,000 tons of the Great Northern Rail order placed last week, No. 1 mill of the Illinois Steel Company is assured of tonnage sufficient to keep it in operation for six to eight weeks, since it is understood that shipments are to begin as early as possible. Specifications for 6000 tons from another road have also been received this week. There has been an encouraging increase in orders and inquiries for Railroad Spikes, Bolts and Splice Bars. Among the orders placed were 3000 tons of Spikes, 1300 kegs of Bolts and a fair amount of Splice Bars. Of the inquiries in the market the most important is that of the Great Northern Railroad, for 13,000 kegs of Spikes, which it is believed will be placed without delay, as it is understood that early delivery is required. The fact that most of the orders placed for track material are accompanied with request for prompt shipment is indicative of depleted stocks and urgent needs. Light Rails are only moderately active, and prices continue to be cut from $3 to $5 a ton on Rerollers. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.90c. to 2c., according to delivery; Track Bolts, 2.40c. to 2.50c., base, Square Nuts, and 2.55c. to 2.65c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—While none of the large projects on which plans seem to have been matured are coming into the market, there is nevertheless considerable tonnage developing from various structures of moderate size. The tonnage booked by the American Bridge Company last week, amounting to 14,500 tons, was practically equal to its normal rate of production. The Modern Steel Construction Company, Milwaukee, was awarded a contract for an addition to the Wisconsin State Capitol, involving 915 tons, the contract price being $51,932. An order for 750 tons placed by the Manufacturers' Railway Company, St. Louis, for the construction of viaducts, was secured by the Cambria Steel Company. Construction plans are developing a little more freely, especially in bridges. The aggregate of these received during the week amounts to nearly 7000 tons. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—Both new business and specifications are coming in very slowly, and while there is, perhaps, some improvement on the whole, it is not notably strong. Jobbers report only a moderate amount of business, and except on narrow Plates, which a few mills are willing to shade from $1 to $2 a ton, prices continue firm and unchanged. We quote, for shipment from mill, as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—The Sheet mills of the Inland Steel Company are all in operation and moderate gains are noted in the amount of tonnage being booked. Jobbers report a fair run of orders, individually small and of a character that indicates buying for immediate consumption. Prices continue firm, and there is seemingly no effort on the part of producers or jobbers to induce increased activity by price concessions. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 to 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c. Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—Whatever improvement there is in the demand for Bars is of very moderate proportions, and the mills continue to run intermittently for a few days at a time as the slow accumulations of specifications permit. New business in Iron Bars is limited to occasional orders of small tonnage, but specifications on recent contracts are coming out a little more freely, and in most cases prompt shipment is desired. The Sylvan mills of the Republic Iron & Steel Company at Moline were started up the middle of last week, and will probably continue in operation through a greater part of the present week. The Tudor mills of this company at East St. Louis, also the East Chicago mills, are at present idle. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—With no large orders from the jobbing interests, or other sources, the demand for Merchant Pipe continues to be restricted to moderate requirements for the replenishment of broken stocks. In spite of the low prices that have developed through sharp competition among distributers, the demand from store stocks continues quiet and inactive. While mill quotations on Steel Pipe remain firm and unchanged, there is still a good deal of irregularity in store prices. On the relatively small volume of Iron Pipe consumed in this market prices have receded from 1 to 2 points. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point

on the base. From store, in small lots, Chicago jobbers quote 72 to 72½ per cent. on Black Steel Pipe, ⅜ to 6 in. From 2 to 3 points above these prices is asked for Iron Pipe.

Boiler Tubes.—Continued inactivity marks the movement of Merchant Tubes, and the railroads still adhere to the policy of buying such small lots of Locomotive Tubes as are imperatively required for the maintenance of motive power equipment. Store trade in Merchant Tubes, reflecting the curtailment of operations in Boiler shops, is extremely light, although prices are reported to hold reasonably firm and even, except on Locomotive Tubes, in which some shading of prices is rumored. Mill quotations for future delivery, on the base sizes, are as follows: 2⅜ to 5 in., in carload lots. Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

Size.	Steel.	Iron.	Seamless
1 to 1¼ in.	55	35	35
1½ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2¾ to 5 in.	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—No movement has developed that can be construed as a distinct quickening of demand for any of the lines comprised under this head. Very few specifications against old contracts are coming in from the implement makers, and not much new business can reasonably be expected from this source for the remainder of the season. A few scattering orders of small lots of Tire stock continue to come from jobbers and wagon makers. Regular discounts on Shafting are being shaded from 5 to 10 per cent. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1⅛ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 54 per cent. off in car lots; 48 per cent., less than car lots, base territory delivery.

Old Material.—With practically no demand from consumers, and dealers loath to add to their accumulating stock piles, the market has sagged under the unsupported load. The lack of sales on many grades makes it difficult to establish exact price levels, but that there has been a decided shrinkage of values all along the line, ranging from 25c. to $1 a ton, and in a few instances even more, is not questioned. In view of general market conditions it is, indeed, remarkable that the recent sharp advance should have been maintained as long as it has. Firm in the belief of substantial reductions, the mills are not buying speculatively at present prices. At the same time they and other consumers are picking up such small lots as are required for present needs at current quotations. Fairly good prices were realized on the material offered last week by the Burlington Railroad, with the exception of Iron Rails, on which all tenders were declined save for one carload. Under present conditions the three lists, aggregating more than 10,000 tons, which will come on the market this week, will tax its absorbent powers severely. This tonnage is distributed as follows: Great Northern, 7500 tons; Chicago & Northwestern, 1000 tons, and Erie tonnage not named. We quote per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$16.00 to $16.50
Old Steel Rails, rerolling	12.25 to 12.75
Old Steel Rails, less than 3 ft.	12.25 to 12.75
Relaying Rails, standard sections, subject to inspection	22.00 to 23.00
Old Car Wheels	15.50 to 16.00
Heavy Melting Steel Scrap	11.50 to 12.00
Frogs, Switches and Guards, cut apart	11.75 to 12.25
Mixed Steel	9.00 to 9.50

The following quotations are per net ton:

Iron Fish Plates	$14.00 to $14.50
Iron Angles	16.25 to 16.75
Steel Car Axles	14.75 to 15.25
No. 1 Railroad Wrought	11.50 to 12.00
No. 2 Railroad Wrought	10.50 to 11.00
Railway Springs	10.75 to 11.25
Locomotive Tires, smooth	14.25 to 15.25
No. 1 Dealers' Forge	9.50 to 10.00
Mixed Bushelling	7.75 to 8.25
Iron Axle Turnings	7.25 to 7.50
Soft Steel Axle Turnings	6.75 to 7.25
Machine Shop Turnings	6.75 to 7.25
Cast Borings	4.75 to 5.25
Mixed Borings, &c.	4.75 to 5.25
No. 1 Mill	7.00 to 7.50
No. 2 Mill	6.00 to 6.50
No. 1 Boilers, cut to Sheets and Rings	7.00 to 7.50
No. 1 Cast Scrap	12.00 to 13.00
Stove Plate and Light Cast Scrap	10.50 to 11.00
Railroad Malleable	10.00 to 10.50
Agricultural Malleable	9.50 to 10.00
Pipes and Flues	8.50 to 9.00

Cast Iron Pipe.—Founders have in prospect quite a number of small lettings of Water and Gas Pipe, most of which have developed within the past week or 10 days. An aggregate of about 4000 tons is included in these requirements, which range from 150 to 800 tons. Among them are 700 tons of Water Pipe for Waukesha, Wis., and 700 tons for Grand Rapids, Mich. The results of recent competition give small encouragement to the hope of a stronger tendency toward the maintenance of prices, which was thought to be developing. Lack of faith in the stability of Pig Iron values is regarded as responsible for some offers, which seem to be based on a discount of the future market. We continue to quote per net ton, Chicago, as follows: Water Pipe, 4-in., $30; 6 to 12 in., $29; 16-in. and up, $28, with $1 extra for Gas Pipe.

Pittsburgh.

PARK BUILDING, March 4, 1908.—(*By Telegraph.*)

Pig Iron.—Inquiries are better than they have been for some time, but ideas of furnaces and consumers as to prices are still very far apart. The output of Pig Iron in the Mahoning and Shenango valleys is down now to about 1000 tons a day, but, in spite of this small production, stocks at the merchant furnaces are reported as being about 75,000 tons. Only small lots are being sold, and the market does not show any improvement in prices. We quote Standard Bessemer Iron at $17, Northern No. 2 Foundry, at $15.75 to $16, and Gray Forge at about $15, all at Valley furnace, to which 90 cents freight for Pittsburgh delivery should be added.

Steel.—Inquiries for Sheet and Tin Bars are better, and the Bar capacity of the Carnegie Steel Company is now more fully employed than for some time. Specifications on regular contracts are coming in quite freely. There is not much doing in Billets, and it is strongly denied that any of the regular sellers of Billets are cutting prices. Some small Steel concerns have made conversion deals and have furnished small lots of Billets at $1 to $2 a ton under regular prices. We continue to quote Bessemer and Open Hearth Billets at $28, Sheet and Tin Bars at $29.50, and Forging Billets at $30, for delivery in Pittsburgh and nearby districts.

(*By Mail.*)

Reports are conflicting, some in the trade stating that inquiries are much better and the tone of the market is more cheerful, while from other sources comes the statement that the last week or 10 days in February were the quietest since December. On the whole, however, new business and specifications against contracts in February were better than in January, and indications for March are fairly good. With the return of weather permitting outdoor operations there should be a larger demand for materials entering into buildings, and this will no doubt come. The Structural and Plate trades are quiet, but there is a fair movement in Sheets, Tin Plate, Pipe and Wire products. The Pig Iron market continues dull. Sand cast Bessemer Iron is still quoted at $17, Valley furnace, while two or three small lots of chilled Bessemer Iron have sold at $18, at furnace. Foundry Iron is weaker, Northern No. 2 being offered as low as $15.75 to $16, at furnace. Very little is being done in Steel Billets, but there is a fair movement in Sheet and Tin Bars, and the capacity of the Carnegie Steel Company on these is fairly well employed. It is strongly denied that regular sellers of Billets and Bars are cutting the market. There is practically no demand for Furnace or Foundry Coke, but a fair tonnage in Scrap is moving, and the market is reasonably firm.

Ferromanganese.—There is practically no new demand for Ferro and a good deal is being offered, with the result that prices are a shade easier. We quote best grades of foreign 80 per cent. at $44.50 to $45, Baltimore, the freight to Pittsburgh being $1.95 a ton.

Skelp.—We have not heard of any sales in this market for a long time. We quote nominally as follows: Grooved Steel Skelp, 1.60c.; Sheared Steel Skelp, 1.70c.; Grooved Iron Skelp, 1.80c., and Sheared Iron Skelp, 1.90c., f.o.b. Pittsburgh.

Muck Bar.—In the absence of actual sales on which to base prices, we quote best grades of Muck Bar nominally at $27 to $28, Pittsburgh.

Rods.—Some business is being done in Chain Rods, but demand from the Wire interests is quiet. Regular prices are $35 for Bessemer, $36 for Open Hearth and $37 for Chain Rods, f.o.b. Pittsburgh.

Steel Rails.—Nos. 1 and 2 Rail mills at the Edgar Thomson plant, which were idle for about two weeks, started up last Sunday night and have a good schedule ahead for

next week. These mills are working to about 50 to 60 per cent. of capacity. The Carnegie Steel Company took a contract this week for 600 tons of Standard Sections for a traction road, about 1000 tons of Light Rails, and is filling some fair sized orders for Rails for export, which are helping out considerably in the present dull condition of domestic business. Regular prices on Light Rails, which are still being shaded $3 to $4 a ton by the mills re-rolling Rails, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—The demand is light, being only for small orders for prompt shipment. Plates and other Shapes for Steel car construction are very dull, only one of the Steel car companies being fairly busy, but will clean up its orders this month. Narrow sizes of Plates are being shaded $1 to $2 a ton, but, as a whole, prices are being fairly well maintained. We quote: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼ in. to and including 3 16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell grade of steel is abandoned.	

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—Inquiries are light. The material for the new buildings of the Youngstown Sheet & Tube Company, about 660 tons, was placed with the Pittsburgh Steel Construction Company. The American Bridge Company took a contract for a county bridge between Webster and Donora, Pa., about 1200 tons. Low prices are being made by fabricators on the small amount of work that is coming out. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—The demand for Corrugated Sheets for building purposes is increasing, but new business in Black and Galvanized is light. Regular prices are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Iron and Steel Bars.—Orders are few and small, while specifications against contracts are only fair. None of the Bar mills is able to run to more than 35 to 40 per cent. of capacity, and some are doing even less. A moderate tonnage in Iron Bars was placed prior to the advance, and consumers are specifying against these contracts, but are not disposed to buy more. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further West. Steel Bars remain very firm at 1.60c., Pittsburgh.

Tin Plate.—Indications in the last few days are that some business in Bright Plate will soon be placed by the can manufacturers, and with the return of good weather, permitting outdoor building operations, the demand for Terne Plate should also show material betterment. It is estimated that from 50 to 55 per cent. of the Tin Plate capacity is active at present. It is believed, however, that later on there will be a very heavy demand, and consumers who have delayed placing their contracts may have trouble in getting prompt deliveries. Regular prices are being firmly maintained. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Spelter.—The demand continues light, but prices are fairly strong and have been about stationary for several weeks past. We quote prime grades of Western Spelter at 4.65c. to 4.70c., East St. Louis, to which 12½c. freight to Pittsburgh should be added.

Hoops and Bands.—No new business is reported, but consumers are specifying fairly liberally against contracts made early in January at the time prices were guaranteed against decline by the mills. We quote Steel Hoops at $2, base, full Hoop card extras: Steel Bands, $1.60, base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Railroad Spikes.—Very little buying is being done, especially by the railroads. Consumers of the smaller sizes are placing orders only for small lots and for actual needs. We quote Standard sizes of Steel Railroad Spikes at $1.80, but this price is occasionally shaded in competition with Iron Spikes. Prices on the smaller sizes range from $1.85 to $1.90 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—This market continues very quiet, but several of the leading makers advise us that specifications against contracts in February were better than in January, and shipments last month were larger than in the preceding month. Implement makers are specifying more freely, but the general trade is placing orders only for such tonnage as is actually needed. Regular prices on Cold Rolled Shafting are 54 per cent. off in carloads and 48 in less than carloads, but these prices are shaded, carload lots being offered at 55 and 2½ per cent. off the list. We quote, nominally, as follows: Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades, and 10c. and upward for special grades.

Pipes and Tubes.—Two of the leading oil companies are in the market for 125 to 150 miles of Line Pipe, ranging in size from 4 to 12 in., but terms of payment offered are 3, 6, 9 and 12 month notes, which are not satisfactory, but as soon as this work can be financed the Pipe will be bought. It is stated that stocks in hands of jobbers are only about 25 per cent. of what they usually are, and while some of them are still inclined to go slow a few are buying quite liberally, believing that in a short time the demand for Pipe will be heavy and large stocks desirable. General buying is in small lots for actual needs. Prices are being firmly held, there being no disposition on the part of the mills to cut prices to get business. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 75 and 5 per cent. off list, while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black. %	Galv. %
⅛ to ¼ in.	65	49
⅜ in.	67	53
½ in.	69	57
¾ to 6 in.	73	63
7 to 12 in.	70	55
Extra strong, plain ends:		
⅛ to ¾ in.	58	46
⅛ to 4 in.	65	53
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

Discounts on Genuine Iron Pipe are as follows:

	Black. %	Galv. %
⅛ and ¼ in.	63	..
⅜ in.	65	51
½ in.	67	55
¾ to 6 in.	71	61
7 to 12 in.	68	53
Extra strong, plain ends:		
⅛ to ⅜ in.	56	44
⅛ to 4 in.	63	51
4½ to 8 in.	59	47
Double extra strong, plain ends:		
½ to 8 in.	52	41

Boiler Tubes.—New business being placed with the mills is light and is only for small lots. The demand from railroads is lacking, and the general trade is quiet. Prices are somewhat uneven, but hardly enough is doing to test the market.

Iron and Steel Scrap.—A fair amount of material is moving, one leading consumer of Steel Scrap having bought in the past two or three weeks from 3000 to 4000 tons. Prices are fairly strong, but with the recent advance in nearly all kinds of Steel Scrap consumers decided to go slow in making purchases until it was shown that the higher prices would hold. Prices are practically unchanged, dealers quoting about as follows: Heavy Steel Scrap for Pittsburgh, Steubenville or Sharon delivery, $13.75 to $14; No. 1 Cast Scrap, $15.25 to $15.50; Low Phosphorus Melting Stock, $17.50 to $18; Bundled Sheet Scrap, $10 to $10.25; No. 1 Busheling Scrap, $13 to $13.25; No. 2, $10.50 to $10.75; Cast Iron Borings, $8 to $8.50. Rerolling Rails are $14.50 to $15; Steel Axles, $16 to $16.25; Old Steel Rails, short

pieces for Open Hearth use, $13.75 to $14; Sheet Bar Crop Ends, $17 to $17.50; Steel Axles, $16 to $16.25; Iron Axles, $20 to $20.50, and Grate Bars, $13 to $13.25. We note sales of upward of 1000 tons of Heavy Steel Scrap at about $14, Pittsburgh; 250 tons of Sheet Bar Crop Ends at about $16.75, and some 300 tons of No. 1 Railroad Wrought Scrap at about $17, Pittsburgh.

Coke.—There are practically no inquiries, but occasionally some Furnace Coke for spot shipment is sold, usually at low prices. Strictly Connellsville Furnace Coke for prompt delivery is held at about $1.80 to $1.85, while Klondike Coke, which is practically as high in quality as genuine Connellsville, can be obtained at $1.70 to $1.75 at oven. Best grades of 72-hr. Connellsville Foundry Coke are held at $2.25 to $2.40 to consumers. Main Line and other grades of Furnace Coke are offered as low as $1.60, and Foundry at $2.10 to $2.15, at oven. Out of 36,493 ovens in the Upper and Lower Connellsville regions, 17,869 were in blast last week, and 18,624 were idle. The output was 180,948 tons, which is considerably less than half the capacity of these two regions.

G. P. Bassett, Jr., dealer in Pig Iron and Coke, Commonwealth Building, Pittsburgh, has been appointed selling agent in the Pittsburgh District for the Upson Scotch and Samson strong Foundry Pig Iron made by the blast furnace of the Upson Nut Company, Cleveland, Ohio.

The general offices of the Union Drawn Steel Company have been moved from Seventh avenue and Third street to 401 Seventh avenue, Beaver Falls, Pa., where the company has secured the entire first floor, which permits it to handle its business to better advantage.

Philadelphia.

PHILADELPHIA, PA., March 3, 1908.

Slight improvements are to be noted in some directions, but the week to week gains are small. Business in the month of February showed as a rule some improvement over that of the previous month, while compared with that during the closing months of last year a decided increase is shown in volume. The trade generally takes a hopeful view of the situation, particularly inasmuch as the recent gains made in production are being held, and it is believed that, with the usual opening of spring buying, further moderate gains in the volume of new business will be made. Makers of finished and semifinished materials, while continuing to get a fair amount of business, do not seem able to get beyond 50 per cent. of their productive capacity. Consumers in practically every direction continue buying on the hand to mouth basis, which policy will likely be maintained until business generally shows some definite signs of betterment.

Pig Iron.—The market has been rather inactive, but inquiries for some grades, particularly Foundry Iron, have been a little more numerous. In several instances foundries which have held up deliveries for some little time are reported to be ordering shipments forward and in some cases a considerable tonnage of old contract Iron is now being taken. Foundries are also reporting more inquiries for castings, and it is expected that with the opening of the spring building operations there will be a better demand, and a consequent improvement in the foundry trade. The Pipe interests continue to take small tonnages of Pipe making Irons, but have pretty well covered for their larger requirements. Sales continue as a rule to be confined to small tonnages, buyers taking only sufficient quantities to cover their early requirements, and in almost every case prompt shipment is desired. Car loads and lots of 50 to 100 tons cover about the general run of sales, with an occasional order for 200 to 500 tons. When, however, the larger tonnages are sold they generally cover deliveries for the remainder of the first half of the year. No difficulty is experienced by sellers in obtaining the established price for the various grades of Iron. Foundrymen generally are willing to pay $18.25 to $18.50 for the established grades of No. 2X Foundry, but frequently feel the market pretty thoroughly before placing business, to satisfy themselves that the basis is being held. While there have been no sales of Forge Irons to speak of, there has been a little more inquiry. A buyer for 500 tons is in the market, while others are asking for prices for smaller tonnages. The usual price has been $16.50 to $16.75, delivered. There is nothing whatever being done in Basic Iron, most of the Steel mills having their requirements pretty well covered on this grade of Iron, although some of the smaller mills are expected to come into the market before a great while. There is a little more inquiry for Low Phosphorus Iron, one interest being in the market for about 1000 tons. Some inquiry has also developed for misfit Low Phosphorus, but no sales have been reported recently. Generally speaking, producers of Pig Iron are fairly well satisfied, under the existing conditions, with the tonnages on their books. Some furnaces are better fixed, as far as orders are concerned, than they were last month, and it is said that while the slow improvement in buying is hardly noticeable from week to week, there is enough to bring about a better feeling in the situation on the whole. Prices continue to be firmly maintained by the leading producers at the established basis, and we quote the following range for delivery in buyers' yards, during the first half, eastern Pennsylvania and adjoining territory:

No. 2 X Foundry	$18.25 to $18.50
No. 2 Plain	17.75 to 18.00
No. 3 Foundry	17.25 to 17.50
Gray Forge	16.50 to 16.75
Basic	15.75 to 16.00
Low Phosphorus	24.00 to 24.50

Ferromanganese.—Sales have been extremely light and confined to small and broken lots for early shipment. Prices are practically unchanged, $45 to $47, Baltimore, being quoted for small tonnages. No business in large tonnages is being offered at the time.

Steel.—The demand for Steel is hardly as strong as it was a few weeks ago. Orders are not very plentiful and are mostly confined to carloads and lots of a few hundred tons, which in the aggregate are hardly sufficient to keep mills in operation, even on reduced output. Prices are unchanged. For local delivery $30.40 is quoted for ordinary Rolling Steel, with Forging Steel at $32.40 to $33.40, according to analysis.

Plates.—Plate mills continue to maintain production at about 50 per cent. of capacity. Orders come out fairly well, but are confined to small tonnages for prompt delivery. Some little locomotive and bridge material has come out, but business as a rule is of a miscellaneous character. Quotations are fully maintained, the following range of prices being named for delivery in this territory:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.50
Locomotive Firebox Steel	2.75	3.00

The above are base prices for ¼ in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16 in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—A moderate improvement continues to be noted in the demand. Orders for the greater part are confined to small tonnages, although several fair sized propositions are under consideration. The Tropenas Steel Company closed a contract during the week for its new foundry building at New Castle, Del., which will require a few hundred tons of Shapes. Several other small sized propositions requiring from 75 to 150 tons have also been recently placed. A fair quantity of miscellaneous business is being taken by the mills, which continue to operate at about 60 per cent. of their capacity. Prices continue to be fully maintained, 1.85c. to 2c. being quoted, according to specification.

Sheets.—The demand continues fairly even, and while mills hold their recent gains, no further improvement was to be noted in the past week. Orders are mostly for small lots for prompt delivery, there being absolutely no tendency on the part of buyers to anticipate their needs. Prices continue practically unchanged, the following range being quoted for mill shipments, with a tenth extra for small lots: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Old Material.—The market continues to show a downward tendency. Some mills have bought small tonnages of Heavy Melting Steel at about $14.50. Others, however, still refuse to make purchases at anything above $13.50. The situation as far as this grade of material is concerned is quite complex, and the market is now practically at a standstill again. Opinions of dealers differ as to the outcome. There is a fair demand for Railroad Wrought, and several small lots have been sold. The other grades continue rather inactive. We quote for prompt delivery in buyers' yards, eastern Pennsylvania and nearby territory about the following range of prices:

No. 1 [illegible]	[illegible]
Low [illegible]	[illegible]
Old [illegible]	[illegible]
Old [illegible] A	[illegible]
Old [illegible] B	[illegible]
Old [illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
No. 1 [illegible]	[illegible]
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	9.75 to 10.25
[illegible]	12.00 to 12.50
Cast Borings	8.25 to 8.75
Grate Bars	12.00 to 13.00

Bars.—There is no change in the market for Iron Bars. Business continues somewhat scattered and mills are still operating irregularly and at reduced output. Prices appear

to be fully maintained and Refined Iron Bars continue to be quoted at 1.65c., delivered in Philadelphia and adjoining territory.

Coke.—There has been some little business done in contract Coke, but the tonnage has not been large. Under existing conditions requirements are small and the amount of business done is consequently light. Prices are practically unchanged. Furnace Coke is quoted at $1.75 to $2.25 at oven, while Foundry Coke commands from $2.25 to $2.75 at oven. We quote the following range of prices for delivery in the Philadelphia territory:

Connellsville Furnace Coke	$4.00 to $4.50
Foundry Coke	4.50 to 5.00
Mountain Furnace Coke	3.70 to 4.10
Foundry Coke	4.10 to 4.60

A. P. Witteman & Co. have been obliged by the growth of their business to separate their offices from their warehouse. They have engaged a suite of offices on the twelfth floor of the Fidelity Mutual Life Building, 112 to 116 North Broad street, Philadelphia. In a suitable building elsewhere they carry a full stock of Burgess high speed steel, tool steel, special carbon and alloy steels, &c. Their offices will also be the Philadelphia sales offices of the Chester Forging & Engineering Company, of which Mr. Witteman is president. The firm is also selling agent for the steel castings manufactured by the Chester Steel Castings Company.

Cleveland.

CLEVELAND, OHIO, March 3, 1908.

Iron Ore.—The first inquiry for 1908 Ores has come into the market. It is for 5000 to 10,000 tons of Siliceous Bessemer. The movement from the docks is improving slightly. Lake vesselmen are planning a late start in navigation. As Ore shipments are not expected to be over 60 per cent. of what they were last year, shippers say that if the boats do not start until June they can bring down all the Ore that will be needed this year. No conferences have as yet been arranged to fix the wages of men employed on the boats. There seems to be no disposition to hasten the settlement of the wage question. It is believed that the firms that operate their own boats will need very little outside vessel tonnage, so that chartering will be light. Thirty new vessels, with a carrying capacity of 204,700 tons on a single trip, will be launched by the Great Lakes transportation companies before the opening of navigation. Of these, 26 are bulk freighters. This year's vessel output will add to the carrying capacity of the lake fleet 4,094,000 tons for the season of eight months, averaging 20 trips for each boat. We quote Ore prices as follows, at Lake Erie docks, for 1908 delivery, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.20; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—The only sales reported during the week were a few very small lots, mostly car lots. There are two inquiries in the market, each for 1000 tons of No. 2 Northern Foundry Iron for delivery to jobbing foundries in the Central West in the next 90 days, and another inquiry for 300 tons of Northern Foundry Iron. These are the only inquiries of any size reported. One or two additional merchant furnaces may go out of blast unless the demand improves in the next few weeks. One local furnace reports considerable improvement in shipments on contracts in February, as compared with January, but the majority of the furnace interests notice no improvement, and stock piles of furnaces still in blast are continuing to grow. High priced Iron on last year's contracts is being taken very slowly, and it is expected that it will be several months before some of these contracts will be cleaned up. Some of the consumers are dividing up their Iron, taking one-half of that bought last year at $22, and higher, per ton, and the other half at the present market price. Some of the furnaces willingly allow their customers to even up prices somewhat in this way, but are not permitting the cancellation of contracts. So far, the recently adopted price of $17, at furnace, for delivery in the immediate territory is being maintained, but there has not been enough buying the past two or three weeks to test the market thoroughly. The jobbing foundry situation shows little if any improvement, so that the melt in this territory is not being increased materially. There are no further inquiries for Basic Iron. No sales of Southern Iron are reported, and the only inquiries that are coming in are a very few for small lots. For prompt shipment and second quarter we quote delivered, Cleveland, as follows:

Bessemer	$17.90
Northern Foundry, No. 1	17.85
Northern Foundry, No. 2	17.35
Northern Foundry, No. 3	16.85
Southern Foundry, No. 2	$16.85 to 17.35
Gray Forge	15.90 to 16.40

Coke.—The market shows no improvement, and inquiries are very scarce. Prices remain weak. We quote Connellsville Furnace Coke for spot shipment at $1.80 to $1.85, at oven, and Connellsville 72-hr. Foundry Coke at $2.25 to $2.60, at oven.

Finished Iron and Steel.—While some of the mills are getting quite a few small orders for immediate shipment, the aggregate volume of business does not appear to show any improvement. The policy of buying only for immediate needs is still being followed by consumers. Some specifications on contracts are coming in but only for limited amounts. The small tonnage that is being placed is not sufficient to encourage price cutting, but some concessions are being made on Sheets and Light Plates. Local warehouses report a larger volume of orders for material out of stock in February than in January, but their mill orders have not increased to any appreciable extent. New orders for Iron and Steel Bars are very light. Local Bar Iron mills continue to get enough specifications to allow them to run on about half time. The Plate situation shows no improvement, there being practically no demand. In Structural Material there are quite a few small inquiries, but no additional work requiring a large tonnage is in sight. Bids were received last week for the new West Side market house, Cleveland, the lowest bid for the Steel work being submitted by the National Iron & Wire Company, Cleveland. The building will require about 750 tons of Structural Material. The general contract for the new court house at Youngstown, Ohio, was awarded last week. This building will require about 750 tons of Structural Material. The matter of making an addition to a local store building, projected last fall but held up because of the financial stringency, has again been taken under consideration, and work may soon be started. The contemplated improvement will require about 800 tons of Structural Material. There is a fair demand for Light Rails for coal mines, but purchasers are buying less than car lots, only what they want for immediate use. There are inquiries in the market for about 800 tons of Standard Sections for Ohio traction lines, and some of this tonnage may be placed soon. We quote Iron Bars at 1.60c., Cleveland; Steel Bars, 1.70c., Cleveland, for car lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼-in. and heavier, 1.80c., base, Cleveland. We quote Sheets, mill shipments, carload lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. The warehouse price on Steel Bars is 1.80c., and on Iron Bars, 1.80c. Beams and Channels out of stock are 2.10c. to 2.15c., base. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in. are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—The market shows no improvement, and looks, if anything, a little weaker. Local mills are buying nothing, and inquiries from outside this territory are very few. Practically the only activity is a limited volume of trading between dealers. Heavy Melting Steel is slightly weaker. There is some inquiry for Busheling, and the sale of a small tonnage of No. 1 is reported at $11.50. The Erie Railroad has a list out for sale this week, the tonnage not being given. Quotations are still largely nominal. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$11.50 to $12.00
Old Iron Rails	16.00 to 17.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	16.50 to 17.00
Relaying Rails, 50 lb. and up	22.00 to 23.00
Heavy Melting Steel	11.50 to 12.00
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	8.00 to 9.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	7.00 to 8.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	11.00 to 11.50
No. 1 Railroad Wrought	12.50 to 13.00
No. 1 Cast	12.00 to 13.00
Stove Plate	10.50 to 11.00
Bundled Tin Scrap	8.00 to 9.00

Birmingham.

BIRMINGHAM, ALA., February 29, 1908.

Pig Iron.—Within the week efforts of leading producers to maintain prices have proved futile and a reduction of 50c. per ton has been suffered. Favorite brands, which are believed to be well sold for first half deliveries, are being held at figures around $13.50, but with this exception the schedule of $13, Birmingham, is established. A lot of 500 tons for delivery within 60 days has been sold on this basis and a number of carload lots have brought the same price, but the market is weak, with a decided tendency on the part of smaller interests to shade quotations. An inquiry from a district where Northern competition was likely to result is known to have had a quotation of $12. Birmingham, for No. 2, and lower grades have been offered at a differential

of 50c. per ton on this basis, yet details of any sale consummated at such prices cannot be obtained. Recent inquiries from Pipe interests have resulted in no sale, although indications favor a material increase in their requirements, and an anticipation of lower prices is manifested. The demand from the general foundry trade is light, and no encouragement is offered for immediate improvement. Various theories are advanced as to the ultimate level to be reached by prices of Foundry Iron, and notwithstanding the fact that producers claim prices now existing to be close to cost of production, the general impression is that a further decline will be suffered. A basis of $10, Birmingham, has been mentioned as a probable goal, but when the present low rate of production is taken into consideration it seems that producers have the situation well in hand. Shipments are usually equal to the output of furnaces, and the stock that has accumulated on furnace yards, so far, is comparatively insignificant. With the exception of the Birmingham Coal & Iron Company's new stack at Vanderbilt, Ala., which will be put in blast about April 1, there are no indications of an increase in production.

Cast Iron Pipe.—Despite the reduction in Pig Iron quotations, prices of Water Pipe are firmer, and new business recently developed is believed to be sufficient to warrant an effort toward their maintenance. Specifications have been received during the week to cover approximately 15,000 tons for Eastern points, and the aggregate of tonnage now in sight for points in Oregon is attractive. Developments in the proposed improvements at San Francisco are being watched with interest, as an expenditure there of $3,000,000 for Water Pipe is expected. Local production is considerably below normal, but stocks are being depleted in an apparently satisfactory manner, and all plants will no doubt be in operation in the near future. We quote nominally as follows for Water Pipe, per net ton, f.o.b. cars here: 4 in. to 6 in., $28; 8 in. to 12 in., $26; over 12 in., average, $25, with $1 per ton extra for Gas Pipe.

Old Material.—Sales for the week are believed to be in excess of the aggregate for the week previous, but the demand has been such that an opportunity to judge the market properly is not offered. Transactions have been principally on the hand to mouth order, and the increase in consumption is apparently without a salutary effect. We quote nominally as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$18.00 to $18.50
Old Iron Axles	16.50 to 17.00
Old Steel Axles	15.50 to 16.00
Old Car Wheels	18.50 to 19.00
No. 1 Railroad Wrought	13.50 to 14.00
No. 2 Railroad Wrought	10.50 to 11.00
No. 1 Country Wrought	12.50 to 13.00
No. 2 Country Wrought	9.50 to 10.00
Wrought Pipe and Flues	10.50 to 11.00
Railroad Malleable	12.50 to 13.00
No. 1 Steel	12.00 to 12.50
No. 1 Machinery Cast	10.50 to 11.00
Stove Plate and Light Cast	9.50 to 10.00
Cast Borings	6.00 to 6.50

Cincinnati.

CINCINNATI, OHIO, March 4, 1908.—(*By Telegraph.*)

While to the casual observer and even the occasional buyer of crude or finished product, business appears to be much the same, under the surface there is a feeling that affairs are gradually shaping themselves for the better. Requisitioning on contracts both for Coke and Iron are features of the week just closed, and there is a very respectable movement of both, although in small tonnages. There has been some buying by both the pipe and stove interests, and with sellers of finished material there is a generally universal feeling manifest that a turn for the better is indicated, and soon. Only the Scrap dealers can be regarded as still subjects of the unusual market depression, and with this class there is not much hope for the immediate future. Some visitors to the Iron producing districts recently have estimated the stocks of Pig Iron on furnace yards on March 1, and these figures credit the Alabama and Virginia Districts with 200,000 tons, and the Hanging Rock and Valley districts with 150,000 tons. Taking the normal consumption of Iron by the United States Cast Iron Pipe & Foundry Company, 500,000 tons annually as a basis, conservative authorities claim that with any kind of general improvement in conditions prices have reached their minimum limit, considering conditions of stocks and present producing capacity.

Pig Iron.—In the aggregate the tonnage represented as moving the past week is not large, but individual transactions and inquiries suggest a better feeling. The jobbing foundries are still out of the market, but the miscellaneous manufacturers have come into the field with some fairly good orders. A number of Michigan automobile concerns are also in the market for quantities ranging from 200 to 500 tons of Nos. 2 and 3 Foundry, also 6, 7 and 8 per cent. Silicon for Softeners. The Malleable inquiry mentioned last week resulted in the purchase of 2000 tons for delivery extending over the second and third quarters, at a price of about $15.75, at furnace. A Michigan manufacturer of wheelbarrows has bought a car or so of No. 1 Foundry, to use with a purchase of 700 tons of recent date, and a Michigan agricultural interest has bought to-day 500 tons of Iron to analyze about No. 2. Another sale of No. 4 Foundry, about 200 tons, is recorded at $11.50, at furnace. There is an inquiry for 500 tons of 4 per cent. Silicon. There seems to be a more general observance of a fixed price on the Southern product, on a basis of $12.50 to $13, for No. 2, and it is not believed that the lower figure is being shaded much. There appears to be a little wider range in the price for Northern, and this range is about $16 to $17. The inquiry for Steel making Irons is not so pronounced as during the earlier and middle part of February. A central Ohio melter, whose inquiry for Basic has been out for several weeks, has purchased, it is said, and at a price under $16, at furnace. For immediate delivery and remainder of first half we quote f.o.b. Cincinnati, as follows, the freight rate being $3.25, $1.80, and $1.20, from the Birmingham, Valley and Hanging Rock districts, respectively:

Southern Coke, No. 1	$16.25 to $16.75
Southern Coke, No. 2	15.75 to 16.25
Southern Coke, No. 3	15.25 to 15.75
Southern Coke, No. 4	14.75 to 15.25
Southern Coke, No. 1 Soft	16.25 to 16.75
Southern Coke, No. 2 Soft	15.75 to 16.25
Southern Coke, Gray Forge	14.25 to 14.75
Southern Coke, Mottled	13.75 to 14.25
Ohio Silvery, 8 per cent. Silicon	20.20 to 20.70
Lake Superior Coke, No. 1	17.70 to 18.20
Lake Superior Coke, No. 2	17.20 to 17.70
Lake Superior Coke, No. 3	16.70 to 17.20
Standard Southern Car Wheel	24.25 to 24.75
Lake Superior Car Wheel	23.00 to 23.50

(*By Mail.*)

Coke.—Requisitions are more plentiful on old contracts, and there is some Foundry Coke moving, which indicates that the melt is improving. There is no change in prices nor, indeed, in the general situation. Connellsville Furnace Coke is not active at a price around $1.85 at oven, and there is talk of some shading of the same brands of Foundry at $2.40, although for some special purposes a select quality has brought $2.60 and over. Virginia grades of Foundry range from $2.25 to $2.50 and Furnace $1.75 to $2 at oven.

Finished Iron and Steel.—There is no change in the situation at stores, but some dealers are hopeful of better things soon, from the nature of the orders that are coming out in small lots which are most invariably "hurry" ones. There are some few carload lots of Bars moving and some Sheets. No disposition is shown to cut store prices, and there is practically no inquiry from sources that would require deliveries in car lots. Dealers quote f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.65c., with half extras; small lots from store, 1.90c., base, one-half extras. Steel Bars, carload lots, 1.75c., base, half extras; small lots from store, 1.90c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c. Blue Annealed Sheets (heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.25c. No. 12, carload lots, 2c.; small lots from store, 2.35c. Sheets (light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c., base. Plates, 3-16, and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Old Material.—Reports of disturbances in the St. Louis District tend to make the local Scrap market regulators more pessimistic, and a still further reduction in prices is freely predicted by the larger dealers. Mills are not buying, and what little is being moved is not of enough consequence to make a market. No early relief is anticipated. The local market is about as follows, f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	[illegible]
Cast Borings, net ton	[illegible]
Steel Turnings, net ton	[illegible]
No. 1 Cast Scrap, net ton	[illegible]
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles	[illegible]
Old Iron Rails, gross ton	14.00 to 15.00
Old Steel Rails, long, gross ton	11.50 to 12.50
Relaying Rails, 56 lb. and up, gross ton	22.00 to 23.00
Old Car Wheels	[illegible]
Low Phosphorus	[illegible]

The Robert Field Company, First National Bank Building, Cincinnati, dealer in Pig Iron, was placed in the hands of a receiver March 3. The application was made by the president, Robert Field, who says the conditions of the past six months, coupled with the carrying of suspended accounts, made it impossible to meet maturing obligations. O. L. Layne, cashier of the company, is receiver. The claim is made that the company is solvent, and will pay out satisfactorily. Assets, as given, are in excess of $110,000, with liabilities not in excess of $85,000. It is stated at the office of the company that there will be no change in the selling force.

San Francisco.

SAN FRANCISCO, CAL., February 26, 1908.

Structural Steel.—February has been a good month in the building construction line, although dullness still prevails in the metal trades. Rapid progress has been made in the erection of Steel on a number of large structures. No new contracts for Structural Steel have been reported this week, however. Rail shipments are coming through in rapid time and car shortages are now unknown. Local agents for Eastern Steel manufacturers would like to see more orders placed, but they are having some good inquiries from architects who are busy designing fine new buildings. Some of these buildings, however, will not be erected until the banks adopt a more liberal policy on loans for building purposes. Reinforced concrete construction is the exception rather than the rule just now, but it is possible that more buildings will be erected of that type of construction when the season is more advanced.

Pig Iron.—Importations from Europe by sea at this port are about as usual. Several vessels now afloat are bringing Pig Iron. The local demand is still comparatively light, as the foundries are not taking many large contracts at present. There is a prospect, however, that business will improve considerably as soon as the financial situation mends enough to warrant the placing of large contracts. The bark Bretagne has just arrived at this port from Newcastle-on-Tyne with 1000 tons of Pig Iron consigned to a local wholesaler, and also 6181 pieces of Bar Iron, &c. Scotch Pig Iron is quoted in this market at about $28 to $29 per ton. Chinese Pig Iron is selling at about $27.

Cast Iron Pipe.—The demand for Cast Iron Pipe has improved and several good inquiries are reported by the San Francisco agents of the large Eastern manufacturers. The United States Cast Iron Pipe & Foundry Company has taken several small orders for Pipe for municipalities and manufacturing companies, and is making estimates on others. This company is furnishing 100 tons of Cast Pipe for the water works system put in by the C. A. Smith Lumber Company in connection with the water supply for its sawmill at Marshfield, Ore., which will soon operate with a capacity of 250,000 ft. per day. The Trustees of Porterville, Cal., have sold city water bonds in the sum of $50,000 and extensive improvements will be made requiring Cast Iron Pipe. Ten miles of water mains will be laid immediately at Monte Vista by Emil Firth, who has let the contract for the work. The water works and irrigation plant will cost $75,000. At a recent meeting of the Common Council it was resolved that immediate steps be taken to replace the Water Pipes on all the streets of Gilroy, Cal., with larger and better Pipe. A number of bids were received by the City Clerk of Sacramento for Cast Iron Pipe. It is a moderate sized contract. The sizes of Pipe are 12, 11 and 6 in. Prices of Cast Iron Pipe are as follows per net ton, f.o.b. Pacific Coast terminal points: 4-in., $39; 6, 8, 10 and 12 in., $38.

Merchant Pipe.—Jobbers in this market are buying Steel Pipe in only limited quantities, and are disinclined to increase their stocks until local conditions show more improvement. Discounts on Steel Pipe are about as follows on jobbers' carloads:

	%	%
¼ and ⅜ in.	58.5	42.5
½ in.	60.5	48.5
⅝ in.	62.5	50.5
¾ to 6 in.	66.5	56.5
7 to 12 in.	63.5	48.5
Extra strong plain ends:		
¼ to ⅜ in.	51.5	39.5
½ to 4 in.	58.5	46.5
4½ to 8 in.	54.5	42.5
Double extra strong, plain ends:		
½ to 8 in.	47.5	36.5

Mining Supplies.—The outlook is improving in the principal mining districts of the Pacific Coast, although the recent depression in Copper was a disappointment to those interested in that metal. Several new smelter projects are on foot. The prospects are unfavorable for the carrying out of the project for the installation of a large smelter for Copper and the precious metals by the Guggenheims on the Peninsula, about 10 miles south of San Francisco. The company has expended more than $750,000 on the erection of several Steel buildings and in the purchase of materials, but the more influential citizens of the territory surrounding this ideal site have made very strong efforts to suppress the project, owing to their fears that the smelter fumes would destroy trees and vegetation for miles around the locality. Owing to the proximity of the site to a large body of water it is unlikely that much if any damage would result from the fumes, but the opposition will probably prevent the operation of an industry that would have furnished employment to 6000 men and brought many steamships to San Francisco with Ores for reduction. There is some improvement in the demand for Iron and Steel for use in the mining districts. This includes castings for repair work and stamps, dies, &c., for stamp mills. The Goldfield Consolidated Mining Company, Goldfield, Nev., has closed a contract with the Allis-Chalmers Company for a complete mining mill plant, including numerous induction motors, stamp battery, concentrators, &c. There will be 100 stamps and the entire plant is to be electrically driven. The cost of the new installation will be nearly $200,000.

Iron and Steel Scrap.—The local demand for Iron and Steel Scrap has been light of late, only limited quantities being taken by the foundries and rolling mills. Very little Scrap is being taken out of the ruins in the burned district at present. Prices are weaker, in sympathy with Pig Iron, and it is probable that in large lots Steel Scrap, cut up, could be purchased at about $8 to $9 per net ton.

Coke.—Receipts of Coke from foreign ports have been light this month, but stocks on hand are sufficient to meet the normal demand for some time. Coke is in better demand than Pig Iron, as it is used by many smelters on the Coast as well as in foundries. The production of Coke on the Coast will be stimulated by the resumption of operations by the blast furnace which will produce Pig Iron at Irondale, a suburb of Port Townsend, Wash. A shipment of 1572 tons of English Foundry Coke arrived this week per bark Bretagne, and the barkentine Andromeda arrived to-day with 890 tons of Smelter Coke from Newcastle, Australia.

There are plenty of inquiries for heavy dredges, &c., for mining, but the manufacturers have been turning down temporarily a number of such inquiries owing to the uncertainty as to the dates when payment can be guaranteed. Some of the smelters have started up and others are preparing to follow suit. A new smelter is to be erected in Arizona.

Shipbuilding is very quiet at the Union Iron Works, there being no new vessels on the ways; but business is fair in the mining department, with better prospects for the future.

Railroad building, which has been comparatively quiet for a few months, is picking up again slowly. The Western Pacific is pushing its construction work, and will have trains running from Oakland to points in the Sacramento River Valley this summer.

Iron and Industrial Stocks.

NEW YORK, March 4, 1908.

The stock market has been exceedingly quiet, the daily transactions showing as small a volume of business as the dull days of midsummer. Fluctuations have been narrow, as prices have been quite well sustained. The United States Steel Corporation stocks have been notably strong. The range of prices on active stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 28¼ to 29⅜, preferred 91⅞ to 93⅛; Car & Foundry common 26½ to 27⅝; Locomotive common 31¾ to 33⅛, preferred 90; Steel Foundries common 5½ to 5¾, preferred 29 to 30; Cambria Steel 27⅝ to 27¾; Colorado Fuel 16 to 17; Crucible Steel common 4¾ to 5½, preferred 34¼ to 37; Pressed Steel common 19¼ to 20½, preferred 70½ to 72; Republic common 15¼ to 15⅝, preferred 65 to 66⅛; Cast Iron Pipe common 18¾ to 19⅜, preferred 63⅜ to 64; Can common 4¼ to 4⅝, preferred 45⅞ to 46½. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 29⅛, preferred 92⅝, bonds 88; Car & Foundry common 27, preferred 84¼; Locomotive common 33, preferred 90½; Colorado Fuel 16¼; Pressed Steel common 19¾, preferred 71; Railway Spring common 24; Republic common 15½, preferred 66; Sloss-Sheffield common 41; Cast Iron Pipe common 19, preferred 64; Can common 4⅝, preferred 46.

Dividends.—The Cambria Iron Company has declared a dividend of 2 per cent., payable April 1.

The American Smelting & Refining Company has declared a quarterly dividend of 1 per cent. on the common stock, payable April 15, and the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable April 1.

The Railway Steel Spring Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable March 29.

The Standard Specialty & Tube Company, New Brighton, Pa., manufacturer of plain, colored and decorated collapsible tubes and metal specialties, is installing a Waterbury Farrel Foundry & Machine Company's roll and several other smaller machines, which will increase its capacity about 40 per cent. The Standard Company is meeting with success in the sale of such tubes, which are being used for a variety of purposes, such as pastes, paints, colors, printing inks, &c.

For half an hour on work day afternoons, from 5.40 to 6.10, passengers come into the Manhattan terminal of the Brooklyn Bridge at the rate of 1000 a minute. Even with recent improvements in the train service, it is still the most congested passenger terminal in the world.

New York.

NEW YORK, March 4, 1908.

Pig Iron.—The market is very quiet, so far as Foundry Irons are concerned, but generally speaking is steady as to prices for what small lots are required. A sharp cut is reported to have been made by an outside furnace on a lot of 5000 tons of Iron for a Cast Iron Pipe shop. We quote, at tidewater, as follows: No. 1 Northern Foundry, $18.75 to $19; No. 2 Foundry, $17.75 to $18.25; No. 2 Plain, $17.25 to $17.50; Gray Forge, $16.50 to $16.75. Southern Irons are $17.50 to $18 for No. 1 Foundry, and $16.75 to $17.50 for No. 2 Foundry.

Steel Rails.—It has been a light week so far as new business goes; the mills, furthermore, have had far fewer specifications on rail contracts than they could wish. No early deliveries are wanted on any of the business recently placed. It is understood that the Great Northern orders amounted to 50,000 tons, 5000 tons of Open Hearth Rails in addition to the 45,000 tons to three companies mentioned last week going to the Bethlehem Steel Company. The Lackawanna order, to which some recent reference has been made, was placed last fall, and was for 7500 tons of Bessemer Rails, to be rolled at Buffalo. It is stated that about 2500 tons of Open Hearth Rails were placed by this road with an eastern Pennsylvania mill. For a plantation railroad in Cuba about 1500 tons of 40-lb. rails will be taken in the near future.

Structural Material.—Indications are that March will prove a better month for the fabricating works than February. The American Bridge Company closed 20,000 tons last month, and finds good promise of a total of about 30,000 tons in March. Outside fabricating companies, under sharply competitive conditions, appear to have closed more than 30,000 tons in the past month. The New Haven Road has called for bids on the remainder of its Providence viaduct, about 2500 tons being required. At Coney Island a new hospital is to be built, which will take 400 to 500 tons of Steel. The general contract for the La Salle Hotel, Chicago, has been taken by a New York firm, but the 8000 tons of Steel for this building has not yet been placed. At Seattle, Wash., a 1200-ton building contract is pending. Money more than the price of Steel appears to be the dominant factor in the building situation at present. We quote prices unchanged, as follows, on mill shipments, tidewater delivery: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—The Eastern Bar Iron mills are still far from running on full time. Some of the smaller mills, whose operators booked a great deal of business at the time that prices were cut, are running practically to full capacity, others to possibly 50 per cent. of their usual output, and others to only about 25 or 30 per cent. Some of the largest mills are among those running on short time. Current business is light from the standpoint of the mills, but it is believed that some of the trade usually going to mills is now being secured by dealers who placed contracts with mills at low prices and are now able to realize a profit in this way. As the bolt and nut trade is fairly active, the consumption of Bar Iron in that quarter is taking a good part of the production of some important mills. Prices are maintained at 1.50c., Pittsburgh, or 1.66c., tidewater, on Bar Iron, and 1.60c., Pittsburgh, or 1.76c., tidewater, on Steel Bars.

Plates.—The local demand shows little indication of an early improvement. Better conditions are hardly to be expected until local consumers of Plates are favored with more business. It is stated that boiler shops in this vicinity which had been able in three previous panics to continue in operation are now closed, showing that the present depression is the most severe for at least half a century. Prices continue to be firmly held as follows on standard sizes of Plates at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—For some time the buying in this line has appeared in waves, and for the past week or so the trade has experienced one of the intervening periods of dullness. About the only transactions reported were in carload lots or a little larger. No lettings of importance are in sight at present. It is rather confidently believed that prices on large lots have touched bottom with Pig Iron at its current cost. Carload lots of 6 in. are quoted at $25 to $25.50 per net ton, at tidewater.

Old Material.—General conditions are unsatisfactory. Some little movement is reported in Steel Scrap, Rolling Mill stock and Old Car Wheels, but the demand directly from consumers is possibly lighter than for the preceding week or two. The buyers of Steel Scrap are still mainly dealers who are purchasing to fill old contracts, but occasionally a good lot is bought by a consumer when prices quoted prove attractive. A sale of 5000 tons to an eastern Pennsylvania Steel works is reported. Relaying Rails are neglected, some of the recent inquiries which encouraged holders having proved to come from parties who desired to purchase either on credit or on other unsatisfactory terms. Quotations, per gross ton, New York City, are as follows:

[illegible]	[illegible]
Heavy Melting Steel Scrap	9.50 to 10.50
Old Steel Rails, rerolling lengths	11.00 to 12.00
Relaying Rails	18.50 to 19.50
Old Iron Rails	14.00 to 15.00
Standard Hammered Iron Car Axles	16.50 to 17.50
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	12.00 to 13.00
Iron Rail Scrap	[illegible]
No. 1 Yard Wrought, long	11.00 to 12.00
No. 1 Yard Wrought, short	10.00 to 11.00
Light Iron	5.00 to 6.00
Cast Borings	4.50 to 5.50
Wrought Turnings	6.00 to 7.00
Wrought Pipe	9.00 to 10.00
Old Car Wheels	17.50 to 18.50
No. 1 Heavy Cast, broken up	13.50 to 14.50
Stove Plate	11.50 to 12.50
Grate Bars	9.50 to 10.50
Locomotive Grate Bars	10.00 to 11.00
Malleable Cast	11.50 to 12.50

Metal Market.

NEW YORK, March 4, 1908.

Pig Tin.—The return to more normal conditions in manufacturing is well shown by the Tin deliveries. During February deliveries into consumption aggregated 2400 tons. This compares with 1500 tons in January and 1200 tons in December. An increase of 100 per cent. in Tin consumption within the short space of 60 days shows that great gains have been made since the practical stagnation of business during October and November. It should be remembered, too, that February was a short month. The statistics of the movements of Tin as compiled by C. Mayer, secretary of the New York Metal Exchange, show that the arrivals at Atlantic ports were but 1917 tons. Consequently stocks were drawn upon to the extent of 500 tons, leaving stocks in this country on February 29 at 343 tons, the smallest in the history of the American Tin Plate trade. Imports of Tin since January 1 amount to 3150 tons, a falling off of over 2500 tons, compared with 1907. The total visible supply throughout the world on February 29 was 14,760 tons, a decrease of 200 tons compared with the end of January, but an increase of 1800 tons compared with the same time last year. The feature of the week has been the scarcity of spot Tin; since Friday there has been but one 5-ton lot in the market and that was held at 30c. Needless to say, the business of the week, which was of fair volume, consisted largely of Tin in transit and early shipment from London. Never has spot Tin been so scarce. Price changes during the week are largely nominal and for 5-ton lots of spot the range was as follows:

	Cents.
February 22	[illegible]
February 27	28.70 to 28.85
February 28	29.50
February 29	*30.00
March 2	*30.00
March 3	*30.00
March 4	30.25 to 30.50

* Nominal, asked for spot.

The shortage made itself felt February 28, when the price advanced sharply on light demand. On that day metal due to arrive March 12 was sold at 28.87½c. How acute was the demand is shown by four different prices which prevailed March 3, when spot was nominally held at 30c.; Tin from a boat due to-day at 29c.; from a boat due March 9 at 28.75c., and from a still later boat at 28.60c. Two mail steamers are bringing Tin, and the Minnesota sailing to-day from London carries 1045 tons. In all 3197 tons are afloat, of which 2200 tons will arrive this month. The arrivals so far are 940 tons, and the metal continues very scarce. A rapid advance in London to-day carried the price to the highest figure of the year, £136 for spot and £133 5s. for futures. The Dutch Government's announcement that the subsequent Banca sales this year would each be reduced about 300 tons, or 1600 tons in all, was the cause of this excited advance. New York prices participated in the upward movement, and the high price of the year was reached to-day at 30.25c.

Copper.—The reopening of the Anaconda mine, the restarting of the Washoe smelter, and the belief that some of the Greene properties will soon resume operations had two opposite and contrary effects. One party advanced the opinion that it indicated an increased consumption was in sight and possibly higher prices. Another theory advanced was that when the flood of metal began to come from this smelter, amounting to 15,000,000 lb. a month, prices must give way. This seems the more reasonable assumption, especially with the fact that new properties have opened or will open in Utah, and Shasta County, Cal., this year, which will add to the United States producing capacity upward of 100,000,000 lb. Prices are already weaker. On Tuesday a large American firm was urgently offering Copper in Europe at £58 7s. 6d., equivalent to 12½c., New York. To-day there are several sellers there at £58, c.f.f. Some American consumers were in the market last week offering

12½c., but refused to make a firm offer at that figure. They are under the impression that they will be able to secure metal at 12¼c. or 12c. in the near future. Consumption here appears to be about 50 per cent. of last year's high record in the Brass and allied trades, but Wire drawers are operating to a much smaller extent. That consumption will pick up during the last half is the belief of many, but little hope is entertained for much higher prices. More sales were made during the week for foreign delivery, mostly, however, for the distant future. Exports during February were 24,640 tons, and the total exports this year are 57,659 tons, as compared with 26,213 tons during the first two months of 1907. Imports during January were 7300 tons, compared with 10,700 tons in the same month last year. Quotations are more or less nominal, at 12.50c. to 12.75c. for Lake, and 12.37½c to 12.75c. for Electrolytic. The inside prices are those which prevail for export orders. In London £56 12s. 6d. is asked for spot, and £57 5s. for futures.

Waterbury Average.—The Waterbury average for February was 13.25.

Pig Lead.—A little cutting prevails, but prices are not shaded over five points. General prices from first hands are unchanged at 3.75c., New York, and 3.65c., St. Louis. Another new low record has been established in London at £13 12s. 6d.

Ferroalloys.—Some business has been taken at $85 for 60 per cent. Ferrosilicon. Ferromanganese is dull at $47.50 to $48.50.

Spelter.—Prices are easier at 4.75c., New York, and 4.60c., St. Louis. Business is very light.

Antimony.—Dullness continues, and prices are unchanged. Cookson's is held at 9.50c., Hallett's at 9c. and outside brands at 8.50c.

Tin Plate.—Improvement continues, as shown by an increase of 100 per cent. in the consumption of Pig Tin and the operation of about 70 per cent. of the leading interest's Tin Plate mills. Prices are firm at $3.80, New York, and $3.70, Pittsburgh, for 100 lb. IC Coke Plates.

Old Metals.—Prices have broken away from the Ingot Copper market. The demand is light; dealers' selling prices being slightly easier, as follows:

	Cents.
Copper, Heavy Cut and Crucible	12.00 to 12.25
Copper, Heavy and Wire	11.75 to 12.00
Copper, Light and Bottoms	11.00 to 11.25
Brass, Heavy	9.50 to 9.75
Brass, Light	7.00 to 7.50
Heavy Machine Composition	11.50 to 12.00
Clean Brass Turnings	8.00 to 8.25
Composition Turnings	9.00 to 10.00
Lead, Heavy	3.50
Lead, Tea	3.25
Zinc Scrap	3.50

Brandeis, Goldschmidt & Co., 18-19 Fenchurch street, London, E. C., and 59 William street, New York City, announce that Lucian Nachmann, a member of the firm, having transferred his activity to the London office, they have given Paul Koning the management of the New York office.

The Continuous Zinc Furnace Company.—The Continuous Zinc Furnace Company, Hartford, Conn., has been organized under a Connecticut charter, with an authorized capital stock of $125,000, to develop a process for the reduction of zinc from the ore in large units in electric furnace. Woolsey McA. Johnson, Hartford, is the president; Ephraim Williams, New York, vice-president, and Jarvis McA. Johnson, Hartford, secretary and treasurer. The president of the company, who is the inventor of the new process, is well known as an expert on the metallurgy of zinc, and has had a wide experience in spelter plants and as a consulting engineer. Incidental to the practice of his specialty he has had the opportunity to inspect the mines of most of the zinc regions of North America. He has been experimenting for some time in developing the process, and is now building an experimental plant at Hartford to test out on a large scale a theoretical conception that has already been tried successfully in the laboratory.

The Executive Committee of the Cincinnati Metal Trades Association met J. M. Hibbard of Chicago and M. K. Bowman of New York, both members of the Executive Council of the National Metal Trades Association, at the Business Men's Club, Cincinnati, on March 2, and conferred on the revised constitution of the National Association to be submitted at the New York convention, March 25. The principal change affects the membership clause, eligibility now being not confined to local associations, but admitting scattered plants about the country.

PERSONAL.

J. Stephen Jeans, editor of the *Iron and Coal Trades Review*, London, recently resigned as secretary of the British Iron Trade Association, after 30 years of efficient service. Mr. Jeans' many friends in the United States will regret to learn that ill health was the reason for his retirement from the above work. Mr. Jeans is spending the winter on the Continent and is reported to be making progress toward recovery.

Frederick H. Eaton, president of the American Car & Foundry Company, has been elected a director in the Seaboard National Bank, New York.

The American Smelting & Refining Company announces that E. A. Behr has succeeded Thomas J. Phillips as agent of that company for the sale of pig lead. Mr. Phillips resigned to enter into other business. Mr. Behr was formerly connected with L. Vogelstein & Co., New York.

David Hunt, Jr., general sales manager of the Warner & Swasey Company, Cleveland, Ohio, sailed February 29 for a three months' trip through England and the Continent.

Julian V. Wright, Cincinnati, Ohio, has resigned as assistant commissioner of the National Metal Trades Association.

S. W. Hubbard, manager of sales at Cleveland, Ohio, for Rogers, Brown & Co., recently sailed from New York for a Mediterranean trip.

Louis F. Fieser of the pig iron firm of Fieser & Bentley, Columbus, Ohio, sailed February 29 for a three months' visit to Europe.

Fred. W. Wood, president of the Maryland Steel Company, Sparrow's Point, Md., has returned from a trip to Cuba, where he visited the iron mines of the Spanish-American Iron Company at Daiquiri and at Mayari.

Director Vehling, manager of the steel works at Rothe Erde, Aix-la-Chapelle, is now in this country. He was until recently connected with the great steel plant at Homécourt, France.

Frank H. Buhl, a well-known former steel manufacturer of Sharon, Pa., has gone to Europe.

E. A. Bayrd, for 25 years manager of the St. Louis office of Matthew Addy & Co., has retired with an ample competence to enjoy a well earned leisure. The St. Louis office is now in charge of William C. Arpe, with August C. Schumann, Ralph Switzer and A. B. Champion as assistants.

The Builders' Exchange of Baltimore, Md., has, through a committee appointed for that purpose, presented to the councils of that city a revised building code for the erection of all classes of work in that city. H. D. Bush, vice-president and manager of the Baltimore Bridge Company, was prominently connected with this work, particularly with the part pertaining to steel and reinforced concrete work.

William Lodge of the Lodge & Shipley Company, Cincinnati, has had a conference with officials at the Brooklyn Navy Yard on matters connected with the manufacture of steel projectiles. Cincinnati concerns desire to manufacture these as well as the machinery with which they are made, much of such machinery having been sold by them to the Government.

The William B. Pollock Company, Youngstown, Ohio, recently made a shipment of 28 hot metal cars of 40 tons capacity each to the Duquesne Works of the Carnegie Steel Company. These are said to be the largest cars now in use for such service.

The second of the four Pennsylvania Railroad tubes under the East River, which will link Long Island with New York City, was broken through and the headings were connected on Tuesday. The third will be broken through this month, and the last probably in April.

Engineering Specifications.

Suggestions for Their Improvement.

BY WALTER S. TIMMIS.*

Specification writing is a branch of education to which engineering colleges have given very little attention, although it is undoubtedly one of the most important parts of the engineer's work. Good specifications are the result of many mistakes and omissions properly rectified; they are also the result of a systematic compilation of these mistakes and the careful collating of the details necessary for the complete installation of either individual or groups of apparatus. The writer of good specifications must have an intimate knowledge not only of every item specified, but the progressive steps in the installation of every detail connected therewith. As a preliminary it is essential to know the various makes and styles of the apparatus on the market, and to this end it is desirable to have a convenient catalogue library, with a suitable index. Catalogues on similar subjects should be kept together, preferably in a box with a hinged cover, such as is found in the daily report section of any of the sectional cabinets.

Another aid to complete and accurate specifications is a card index, arranged under proper subject headings, for preserving useful information, including the omissions and mistakes formerly made and to be guarded against in the future. This card index can be made of ever increasing value by adding memoranda of one's own experience and that of others. Thus under the various subjects, such as pipework, valves, lubricators, drips, traps, &c., all the details of an installation may be noted and made use of when preparing specifications.

The trouble with most specifications is that they lack proper sequence and are also faulty in detail. They do not specifically call for the small particulars, nor do they state the method of their installation. The result is a very wide variation in the estimates received, and when a very low bidder gets the work the general clauses regarding quality do not sufficiently protect, either the consulting engineer or the owner, against the introduction of imperfect material and poor installation. Perhaps the best way to secure a complete specification is to give it a proper sequence; for instance, suppose it is desired to write a complete specification for a power plant, this would be conveniently arranged in a number of separate specifications, starting with the boilers and terminating with the lighting fixtures, taking in such subjects as Boilers and Flue Connections, Chimney, Engines, Generators, Steam Piping and Accessories, Switchboard and Connections, Power and Light Distribution and Lighting Fixtures.

Subdivision of Specifications.

It will be found of advantage to divide the specifications for a complete power plant into separate specifications, each complete in itself, so that a copy may go to each of the manufacturers and trades concerned, for by this separation either individual estimates can be obtained by the engineer, or, if a general contract be awarded, the contractor can segregate the various items and obtain intelligent bids from his subcontractors.

In a general way the type of boilers, engines, generators and other parts of the apparatus will be decided when the drawings are prepared. This being done, it is well to make a general synopsis of the necessary specifications as outlined above; then to take each of these individual specifications and write a synopsis of the subjects included and to be covered in proper sequence, so that when each of the minor subjects are treated it is more than probable that all of the detail and the problems connected with the specification will be rounded out and the result will be satisfactory. For example, in a set of specifications for Steam Heating, Steam Piping, Boiler Connections, Auxiliaries, &c., this specification could be written under the following headings:

(*a*) High Pressure Mains from Boilers to Engines, Pumps, Steam Supply for Manufacturing Purposes and Injectors.

(*b*) Low Pressure Connections for Engines, Pumps and Power Plant, Exhaust Head.

(*c*) High and Low Pressure Drips, Traps and Connections.

(*d*) Notes as to Pipe Work, Hangers, Sleeves, Gaskets, &c.

(*e*) Feed Water Heater, Pump Governors, Oil Separator.

(*f*) Boiler Connections, Ejector, Blow-off Tank.

(*g*) Damper Regulator.

(*h*) Pumps: Boiler Feed, Sump, Blow-off Tank, House (and Connections).

(*j*) Heating System, Radiators, Risers and Returns, Relief Connections.

(*k*) Separators and Reducing Valve, Valves.

(*l*) Vacuum System and Pumps, Gauge Board.

(*m*) Pipe Covering and Painting of Pipes and Radiators.

(*n*) Blow-off Tank Pit.

(*o*) Guarantees.

Then each one of these subjects can be written upon in detail and followed to its logical conclusion, and it will be found that little or nothing has been omitted in the specification.

Introductions to Specifications.

The preamble to the specification should have a clause similar to the following, which will be referred to hereinafter.

> The contractor is referred to the general clauses accompanying all specifications for work in this building, prepared by ————, Consulting Engineer, which will be made a part of any contract made under these specifications.

It should also have a clause under the heading of Scope, which should give in a general way the intent of the specifications; such a paragraph is copied herewith from a specification:

> *Scope.*—The intent of these specifications and the accompanying drawings is to describe and provide for the furnishing of all items of labor, material and equipment that may be required for the installation within the premises referred to of a complete system of high and low pressure steam piping, steam pumps, steam auxiliaries, heating system, &c., all as more fully hereinafter set forth.
>
> The work to be performed under these specifications will extend from the boilers to the various engines, pumps and other steam apparatus in the engine and boiler rooms; a complete system of low pressure heating, together with a vacuum system all as more fully set forth and described under the following headings.

After the paragraph on scope the various subheadings, *a*, *b*, *c*, &c., are then entered in the specification and afterward written upon under each of the items in their proper order.

Another illustration of the preliminary portion of a specification is given herewith to illustrate what has been spoken of:

> Specification covering
> Switchboard, Wiring System for Power & Light
> to be installed in the
>
> ————————
>
> West 23rd St.
> New York City.
> Prepared by
>
> ————————
>
> Consulting Engineer,
> New York City.
>
> The contractor is referred to the general clauses accompanying all specifications for work in this building, prepared by ————, Consulting Engineer, which will be made a part of any contract made under these specifications.
>
> *Scope.*—This specification is intended to cover every item of labor and material which may be required for the installation of a complete modern switchboard with connections, separate systems of power and lighting distribution with distributing panels and switches; sundry lighting and power branch circuits and lighting fixtures all as more fully hereinafter set forth and described. The generator installation will consist of two 150-kw., one 100-kw. and one 50-kw. 240 to 250 volt direct current generators, direct connected sets and a balancing motor generator of 7½ kw. capacity. Power distribution will be by a two-wire system of 240 volts and lighting by a three-wire system at 120 volts. The work required under these specifications will be more conveniently described as follows:
>
> (*a*) Connections from Generators and Balancer Set to Switchboard.
>
> (*b*) Switchboard and Instruments.
>
> (*c*) System of Power Feeders.
>
> (*d*) System of Lighting Feeders.
>
> (*e*) Panel Boards and Switches.

* Consulting engineer, New York City.

(f) Power Branch Circuits.
(g) Lighting Branch Circuits.
(h) Lighting Fixtures.

The average specification has a very large preamble of general conditions which are in no way uniform, most of these general conditions are the result of legal controversy and are therefore an effort to avoid a repetition of the same; the American Institute of Architects, together with the National Association of Builders, have agreed upon a basis for most of these general conditions in the form of a uniform contract, but so far the engineers have not solved this problem, but it is highly desirable that the engineers should have a similar form of contract which will form the basis of an equitable contract as between the owner and the contractor. However, in addition to a uniform contract, it is necessary to have as a preamble to each specification a set of general conditions which can be regularly printed and filled in for each specification, as may be required; a form of general clauses is suggested as given herewith:

A Proposed Standard for Specifications.

General Clauses Governing all Contracts for the

Installed under the specifications Prepared by

Consulting Engineer,
New York.

Premises.—The structure will be located at East Twenty-fourth street. It will be of skeleton steel construction with steel columns, steel beams and girders, and with terra cotta tile or reinforced concrete floors. On top of the concrete slabs covering the floor will be sleepers and ash concrete fill, upon which will be laid a single maple floor 1⅛ in. thick.

Scope.—The intent of these specifications is to describe and provide for the furnishing of all items of labor, material and equipment that may be necessary for the complete installation of the material and equipment called for in the annexed specification.

Definitions and General Conditions.—The word "Owner" as herein used refers to ———— of New York City.

The word "Engineer" refers to ————, Consulting Engineer, New York.

The word "Contractor" refers to the party to whom the contract is awarded.

The contractor shall comply with all State laws and city ordinances, and shall be liable for all penalties incurred through the acts or omissions of himself, or his agents or employees, and for all damage to life, limb and property that may be brought about through any negligence on the part of himself or his agents or employees during the erection of the work contemplated in the specifications.

The contractor shall furnish all necessary materials and labor and provide all necessary and proper tools, scaffolding and other equipment necessary to the proper installation of the work herein specified.

Should the owner at any time during the progress of the work contemplate further specifications requiring any alterations, deviation, additions or omissions from the specifications herein, he shall be at liberty to do so, and the same shall in no way affect or make void any contract made on these specifications, but will be added to or deducted from the amount of the contract as the case may be by a fair and reasonable valuation.

The contractor will be required to make good at his own cost and expense any work or material furnished by him which shall prove to be defective within one year from date of installation. The contractor will not deviate from the terms of these specifications unless permission covering any such deviations shall be given in writing by the engineer. Every detail of the work shall be completely finished before being tendered to the engineer for final test and acceptance.

Payments on account of contract sum will only be made against certificates of the engineer.

No certificate given, nor any payment made on account of the contract sum for work furnished and erected at the building, shall be construed as an acceptance of any work or materials which may subsequently be found to be defective.

No claims covering payment for extra work will be allowed unless the work referred to therein shall have been definitely ordered in writing by the owner or the engineer.

All the materials furnished and the work executed under the terms of this specification are to be the best of their respective kinds; all work and material must be in accordance with the requirements of the Fire Insurance Exchange, city departments and all other authorities having jurisdiction over such work.

All materials herein specified are to be furnished and erected by this contractor, in ample time, so as not to delay other portions of the building.

The contractor shall obtain any necessary permits required in connection with the work, and upon completion of his work shall obtain and deliver to the owner the necessary certificates from the authorities having jurisdiction over such work. He shall pay the required fees incident to the procurement of such certificates.

The contractor shall furnish to the engineer a complete set of working drawings showing the detail and arrangement of the parts, and before proceeding with the work the said drawings shall meet with the approval of the engineer in every respect.

The contractor shall not deviate from the terms of these specifications unless he first confers with the engineer and secures his written permission for such deviation.

Should the contractor at any time during the progress of the work to be done under these specifications, refuse or neglect to supply a sufficiency of materials or workmen, the owner shall have the power to provide materials and workmen after three days' notice in writing being given to finish the work on said contract, and the expense shall be deducted from the amount of the contract.

Should any dispute arise respecting the true construction or meaning of the drawings or specifications, or should the drawings and specifications not agree, the same shall be decided by the engineer and his decision shall be final and conclusive.

The contractor is to employ only first-class mechanics, who are members in good standing of their respective trades unions.

The contractor will render the owner free and harmless from all suits which may be brought on the alleged infringement of any patented mechanism, material or device which may be used under this contract.

The owner will not in any manner be answerable or accountable for any loss or damage that may happen to the work called for in these specifications or any part or parts thereof, or for any of the tools or devices used by the contractor in finishing and completing the work called for under these specifications (loss or damage by fire excepted).

The Quebec Bridge Report.—The report of the royal commission appointed to investigate the collapse of the Quebec bridge was presented to the Minister of Railways at Quebec last week and will be laid before Parliament. It is reported that the commission finds the failure of the bridge to have been due not to any defect in material or construction but to a defect in design. It is held that in a structure greater than any ever attempted of its type the usual working formulas as to weight and strain required considerable modification, whereas the calculations applicable to ordinary bridges were followed without change. The construction, the report says, was carried out with great care, but the weight of the central span was too great for the support provided in the anchor spans.

Territory covered by the Pittsburgh Car Service Association reports 122,130 cars handled by 19 different railroads in the month of January, 1908, against 220,654 cars in January, 1907, a reduction of 98,524 cars, or 44 per cent. This reduction is due to the closing of many industrial plants and the decreased production of coke plants and coal mines.

The Wisconsin Engine Company, Corliss, Wis., manufacturer of Corliss steam engines, gas engines, pumping engines, air and gas compressors, has established a branch in Atlanta, Ga., with offices and rooms in the Candler Building. Julius M. Dashiell has been appointed sales manager.

The Machinery Trade.

NEW YORK, March 4, 1908.

The activity in the machinery trade seems to be largely confined to power plant equipment, several fair sized power projects having come up the past week, on the equipment of one of which certain houses in this district are now submitting quotations. It has been noticeable for the past few weeks that the demand for power equipment was better, and it was expected that the improvement would be reflected in the machine tool trade. While there was a slightly better demand for machine tools the last weeks of February, the past week experienced a reaction, business having again receded to a lower level. Both manufacturers and dealers report a quiet trade, with no important specifications from the larger interests. The inquiries received were not very numerous, and appear to cover future requirements rather than immediate needs, consequently closings are slow and the volume of orders restricted. With practically no exception manufacturers and dealers report a better business in February than the two previous months, and while the opening of March has not been so favorable, it is hoped that the approach of spring will exert a favorable influence, and that this month's business will show a considerable gain.

In the item in this column last week concerning the spring meeting of the National Machine Tool Builders' Association, which is to be held at Atlantic City, N. J., May 19 and 20, an error was made in the name of the city in which are to be held the joint meetings of the American Supply and Machinery Manufacturers' Association, the National Supply and Machinery Dealers' Association and the Southern Supply and Machinery Dealers' Association. The joint meetings of the latter three associations will be held at the Jefferson Hotel, Richmond, Va., on May 13, 14 and 15.

A number of representatives of prominent manufacturers of railroad and power plant equipment in this city have formed a new organization for the purpose of promoting friendship among the members and their friends. The organization is intended more for social purposes than for business, and is to give two large dinners each year, one in the winter and one in the summer. The organization, which has been named the Lyres Club, held its first dinner February 28, at the Old Chop House in Cedar street, which was well attended by the members and their friends. The members of the club include H. C. Evans, Lorain Steel Company; W. P. Pressinger, Chicago Pneumatic Tool Company; George H. Gillon, Watson-Stillman Company; F. E. Green, Westinghouse Air Brake Company; D. W. Pye, Safety Car Heating & Lighting Company; Frank Randall, Allis-Chalmers Company; W. Magowan, American Brake Shoe & Foundry Company; J. D. Sawyer, American Locomotive Company; J. E. Meek, H. W. Johns-Manville Company; Scott Hayes, Railway Steel Spring Company; F. W. Trawick, General Electric Company.

New Shops for Norfolk & Southern Railroad.

The Norfolk & Southern Railroad Company is having plans prepared for a system of railroad shops to be built at Chocowinity, N. C. Several engineers are at work on the plans, and it is estimated that the total cost of building and equipping the shops will amount to $300,000. F. S. Gannon, president of the company, has an office at 37 Wall street, New York, but most of the other offices and the operating departments are located at Norfolk, Va. It is stated that it will be several weeks before the buying will be done, and the company's engineers have only a general idea as to what the equipment may be.

In view of the large number and different kinds of machines that will be purchased by the Rensselaer Polytechnic Institute, Troy, N. Y., for equipping its new mechanical department, the trade is following the matter closely, and some of the houses are in correspondence with the Institute concerning the equipment that will be required. No list of the various machines that will be purchased has been prepared, but Arthur M. Greene, Jr., of the Department of Mechanical Engineering, is understood to have the matter in hand with several companies which are in a position to supply the necessary tools. The general contract for building construction has been awarded to James Stewart & Co., New York, and the building will be a three-story and basement structure, 80 x 270 ft. As this building is to be given up entirely to mechanics a great deal of equipment will be required.

The American Locomotive Company has inquiries in the market for a 50-ton crane for the Brooks Works at Dunkirk, N. Y.

William Gardam & Son, Inc., 45-51 Rose street, New York, have purchased a site at Arlington, N. J., on which they will erect a building for the growing needs of their business. The company, which manufactures single and multiple spindle sensitive drills, adjustable multiple spindle drills, adjustable gang drills and special machinery, expects to move its manufacturing business to Arlington as soon as possible, and will make use of a building already on the property, which was formerly occupied by the Hoyt Metal Company. As soon as possible work on the new building will be begun. The company's new property is 100 x 200 ft., and an Erie Railroad siding is extended to the premises. The company will locate its office in the New York machinery district and will maintain a shop in New York for its jobbing department.

The Hallett Iron Works, Chicago, Ill., manufacturer of telegraph and telephone construction material and tools, is in the market for a pair of rolls and housing for rolling down scrap iron which is not more than 24 in. in width and ¾ to ½ in. thick. The company wishes to roll the scrap down to No. 10 gauge.

The Standard Oil Company has purchased the equipment on the extensive list which was printed in these columns some time ago. Orders were scattered among the various houses in this city, and it is understood that no one company received a very large share. These machine tools are intended for the company's new plant at Bayway, N. J., for the equipment of which it is generally understood a good deal of additional machinery will be purchased. The operations at that point are to be extensive, and as yet but little machine tool equipment has been purchased.

Cambria Steel Company's Power Requirements.

One of the most important developments in the trade the past week was the announcement that the Cambria Steel Company, Philadelphia, Pa., has asked bids for equipment for a large power plant at the company's mines. It is understood that the equipment is to include a good sized air compressor plant, and indications point to early purchases being made. It is stated that in addition to the regular power equipment, such as boilers, engines, &c., some traveling cranes are to be installed.

The Granite Mfg. Company, Marble Falls, Texas, incorporated with a capital stock of $500,000, is to develop 12,000 hp. at Marble Falls, Texas, by the construction of a dam across the Colorado River, plans for which have been drawn by Dwight F. Horton of Houston, Texas, who is designing and constructing engineer. At the present time the company will install 4000 kw. of equipment, for which it will require four 1000-kw. units, alternating current, with accessories; four 1500-hp. water wheels, complete; flue pipe, sluice gates, &c. The power will be used at Marble Falls and transmitted to Austin and surrounding towns within a radius of 75 miles. The dam will be constructed of reinforced concrete and will be 36 ft. high and 1400 ft. long. The officers of the company are W. W. Majors, president; G. W. Voires, vice-president and general manager, and George Philip Jones, secretary.

Important contracts for hydraulic equipment will probably be placed within the next month or two by the York Haven Water & Power Company, York Haven, Pa., which intends to install this year 10,000 additional horsepower normal capacity, with an overload rating equivalent to 15,000 hp. The company's present 10,000 hp. capacity has been contracted for, and foundations for the 10 additional units are about ready. It is the intention to add 300 ft. to the power house for the protection of the 10 units. Of the equipment to be installed, some of the contracts have been awarded.

The Kennedy Electric Company, German Valley, N. J., has inquiries in the trade for power equipment for a good sized plant, to be erected at that place. Emil Podlesak, 30 King street, Morristown, N. J., is the company's engineer.

S. J. Aronsohn, Morris and Grand streets, Paterson, N. J., is purchasing machinery for a silk mill, and has placed an order with McClave, Rimmer & Co., 90 West street, New York, for a 200-hp. Ridgway engine and dynamo.

Catalogues Wanted.—Edward G. Spitz, 244 West Fifty-second street, New York, desires catalogues of all classes of machine tools and general foundry equipment, with a view to making connections for selling American machinery in Europe.

Cleveland Machinery Market.

CLEVELAND, OHIO, March 3, 1908.

A slight improvement is noticed in inquiries, but otherwise the machine tool market remains about the same as a week ago. Dealers are getting quite a few orders, but they are all for single, or at the most two, tools. Practically all the buying is being done by small industrial plants and new concerns that are starting small machine and repair shops. Orders are not being placed until tools are actually needed, so that when a dealer makes a sale quick delivery is demanded. While inquiries are somewhat more numerous, they are about all for single tools. Purchasers, as a rule, are looking for low priced tools, and a large proportion of them

are glad to get second-hand tools provided they can find what they want. Second-hand tools are as yet by no means plentiful. Dealers are not looking for much improvement in the present limited volume of business for some time.

Tool builders are finding little change in the situation. The volume of inquiries has improved, but buyers are slow in placing orders. The majority of industrial plants engaged in the manufacture of iron and steel products are still running at limited capacity, and many of them are taking advantage of the dull spell to repair their machinery and overhaul their plants, so that they will be ready for operation at maximum capacity when conditions warrant.

Local builders of sugar making machinery have received a fair volume of inquiries for machinery for plant additions and repairs for the coming season, but as yet have taken no orders. Manufacturers of twist drills report an improvement in orders, but the orders that are coming in are for small lots. Business has not improved materially with the crane builders, although they are taking some orders for single cranes for small shops. The demand for locomotive cranes is light. There is an improvement in the demand for industrial cars. The foundry situation shows little if any improvement. As yet few local jobbing foundries are running at more than half their capacity.

Engineering firms report very little work on hand in the line of preparing plans for new plants. Some new companies have been incorporated for the purpose of erecting and operating new industrial plants, but the promoters claim that it is difficult to get capital interested in their enterprises at the present time.

The American Brass Mfg. Company, now located at 715 Woodland Avenue, has just let the contract for the erection of a new plant at Forty-ninth street and Luther avenue. The plant will consist of two main buildings, one two stories high, 40 x 110 ft., containing the finishing department, and a foundry 35 x 134 ft. The company will soon be in the market for a 60-hp. gas engine and for considerable other equipment. The new plant, which will be ready for occupancy about August 1, will be up to date in every particular and will give the company more than double its present capacity. The company manufactures a complete line of plumbers' brass goods.

The Great Lakes Dredge & Dock Company will soon begin the erection of a machine, boiler, blacksmith, structural iron and carpenter repair shop in Cleveland. The company is in the market for several new or second-hand machine tools, including shapers, bolt machines, planers, &c. The company's office is at 1630 Williamson Building, Cleveland.

The Rickersberg Brass Company, which was recently incorporated, with a capital stock of $50,000, by E. Rickersberg and others, has awarded the contract for the erection of a plant at Thirty-seventh street and Perkins avenue. The plant will be 80 x 250 ft. Practically all the equipment has been purchased. The company will manufacture plumbers' supplies.

The Rocky River Water, Light & Power Company, Rocky River, a suburb of Cleveland, has increased its capital stock from $100,000 to $250,000. The company is planning the installation of a lighting system in that village.

The village of Newton Falls, Ohio, last week voted an issue of $20,000 in bonds to be used for erecting a water works system. Bids will be advertised for as soon as the preliminary plans are prepared.

The Brown Hoisting Machinery Company during the past few days has secured a contract for building a 5-ton bridge for the Michigan Alkali Company, Detroit, for handling limestone. The company has also taken a good sized contract for work at the plant of the Shenango Furnace Company, Sharpsville, Pa. The contract is largely for bins, furnace hoists and larries.

The Pioneer Cereal Company, whose plant at Canal Fulton, Ohio, was recently destroyed by fire, has purchased property in Akron formerly occupied by the Akron Soap Company. A large building on the property will be refitted at once and equipped with modern machinery. A power plant will also be built.

The Canton Art Metal Company, Canton, Ohio, has increased its capital stock from $200,000 to $400,000. The increase was made to take care of the large increase in business during the past two years.

The Cleveland Wrought Washer Company, which recently erected a new plant on West Fifty-eighth street, has increased its capital stock from $25,000 to $35,000 to provide more working capital. The company reports that orders are coming in quite satisfactorily.

During January the Seneca Chain Company turned out 344,000 lb. of chain at its Mansfield, Ohio, plant. The company has been engaged in turning out lighter weight chain at this plant since it was built several months ago, but now heavy iron and steel chain is being made. Both of the forge shops of the Mansfield plant of the company are now running.

The Canton-Hughes Pump Company, Canton, Ohio, has received an order from the Isthmian Canal Commission for two large pumps for use on the Panama Canal. The company is now operating its plant on full time, with almost as large a force as was employed before the financial depression. Officers state that indications point to a large volume of business this year.

Cincinnati Machinery Market.

CINCINNATI, OHIO, March 3, 1908.

There is plenty of argument with a multiplicity of ideas on the existing situation and what should be done to stimulate trade in the tool manufacturing lines, but if one would be strictly conscientious he san say only that there is precious little if any improvement in the situation. Only in a few isolated cases are there any manufacturers of machinery who are running full time with a full force; there are two or three of these, but in the main reduced time and smaller forces are the rule. Those making specialties in the tool line are having little trouble in keeping their forces engaged, and some are actually experiencing a demand about equal to that of the middle and part of the third quarter of 1907. The president of one company states that business with him is from 60 to 70 per cent. of that of this time last year, which, considering the extensive demand at that time, makes the present record not far from a reasonably normal period.

Two important events which will be participated in by the men of the machinery and tool making lines here soon are the dinner and meeting of the Cincinnati Metal Trades Association on Thursday evening, March 5, at the Business Men's Club, and the meeting and dinner of the Manufacturers' Club at the Queen City Club, March 9. E. H. Hargrave of the Cincinnati Machine Tool Company is chairman of the Entertainment Committee of the last named organization, and is arranging the list of speakers and entertainers. Mr. Hargrave has always believed that Cincinnati products should find a natural market in the South American countries, and has familiarized himself with conditions in those countries in several personal visits and investigation through other channels. Largely through his interest and agitation of the matter local manufacturers have come over to his views, and are with him on his various projects and ideas for trade expansion in the tropics. Although local papers have carried references to the interest manifested in this matter and have erroneously said that an excursion party would be made up to leave here about August 15, such a party is in contemplation and a trip of six weeks or two months, taking in all the larger points, will be made later. The weather conditions of the tropical countries would make a trip of this kind inadvisable earlier than November. President H. T. Atkins of the Manufacturers' Club is an enthusiast on this matter, as is also Frank B. Wiborg of the Ault & Wiborg Company, printing ink manufacturer. The committee named by President Atkins of the Manufacturers' Club is made up as follows: E. H. Hargrave, chairman, Cincinnati Machine Tool Company; A. G. Brunsman of the Anchor Buggy Company, Joseph Homan of the Homan Mfg. Company and Murray Shipley of the Lodge & Shipley Machine Tool Company. This committee will undoubtedly have something interesting to report at the Queen City Club meeting.

There is some scattering business coming out in the way of lathes, upright drills, shapers, &c., but as a rule manufacturers are running very conservatively. Milling machine manufacturers find the times a trifle better, and some of these are approximately on their usual run and time.

Dealers are still backward about placing orders. Such tools as are being sold are for absolute necessities. The second-hand dealers report practically no improvement in that line.

Foundries are still very much off in the melt. A few jobbing foundries which are equipped to make heavy castings are quite busy on bases for large ice manufacturing machinery.

Foreign inquiry is not up to the usual standard at this time, except in the line of agricultural and special machinery.

Edward Miller, S. O. Holder, Alva Latham, R. C. Ewick and Florian Engler have incorporated at Columbus, Ohio, the Columbus Buckeye Tool & Supply Company, with a capital stock of $30,000.

It is reported that the foundry and other departments of the Dover Mfg. Company's plant in Canal Dover, Ohio, have resumed on a nearly normal basis.

The American Cash Register Company has been incorporated at Columbus, Ohio, with a capital stock of $1,000,000, to take over the business of the Hallwood Cash Register Company.

Considerable progress has been made on the project mentioned in *The Iron Age* a few weeks ago in connection with the new horseshoe manufacturing company in Toledo, Ohio. The old Shelby tube plant, containing 10 acres of ground and a number of factory buildings, will be transferred to the National Refined Iron & Horse Shoe Company, made up largely of Eastern capitalists. The capital stock is $600,000, and Guy Major is president and W. C. Brewer secretary. The factory buildings will be remodeled to suit the needs of the new company.

New England Machinery Market.

WORCESTER, MASS., March 3, 1908.

A decidedly better feeling exists throughout New England, though there are still spots where the statement would not apply. General manufacturing has shown improvement, in some cases being a return to normal demand. The textile and shoe trades are notably more prosperous, which has a reflected beneficial effect on metal lines. The automobile builders throughout the country are feeling the need of more vigorous effort to fill the demand for their vehicles, and the numerous works which manufacture for the automobile trade are faring equally well. It is believed that the automobile will be a more important factor industrially this season than had been anticipated. It is certain that those houses that have business relations with the automobile builders are feeling strongly encouraged over the outlook. The machine tool builders generally report improvement in orders, though as yet the change is not considerable. Inquiries continue numerous. The dealers are doing some business, and look for better.

The brass business of the Naugatuck Valley has made no important improvement, excepting in some of the manufacturing lines, where specialties are not generally affected by a depression. The brass mills are operating on reduced time and with reduced working forces, and the same is true of many of those concerns that are large users of the products of the mills. But there are gleams of brightening influences. Many manufacturers of brass goods found their February totals more satisfactory than those of December and January. The increase is not much, but it is something worth taking into account in sizing up the immediate future. While the general opinion in this as well as in most other branches of the metal industry has come to be that no really good business is to be expected before the autumn, still there is expectation that a gradual gain in many lines will exert a beneficial influence on spring conditions.

The H. P. Townsend Mfg. Company, Hartford, Conn., has been incorporated in Connecticut, with an authorized capital stock of $50,000 to manufacture a new riveting machine. The shop will be operated in conjunction with that of the Phoenix Mfg. Company, 32 Union place. The incorporators are Charles M. Joslyn, George H. Gilman and Harry P. Townsend, all of Hartford, though Mr. Townsend, who is the inventor of the machine, and for whom the company is named, is now consulting engineer of the works of the E. J. Manville Machine Company, Waterbury, Conn.

The new building of the Waterbury Clock Company, Waterbury, Conn., will be 40 x 176 ft., and five stories.

In the process of reorganizing the Pope Mfg. Company, Hartford, Conn., the effort is being made to dispose of all the plants with the exception of those at Hartford, Westfield, Mass., and Hagarstown, Md. The Hartford works will build automobiles, the Westfield factory the bicycles that bear the company's name, while the Hagarstown plant will be devoted to the manufacture of bicycles for those who wish to give them a name of their own. The Syracuse works have been sold to the E. C. Stearns Company, and the Rambler works at Chicago to Thomas B. Jeffrey & Co., who operate the Rambler works, at Kenosha, Wis., for the manufacture of the automobile of that name. The firm formerly owned the Chicago factory. Negotiations are on, it is said, for the sale of the Toledo plant, and the others will be disposed of if possible.

F. C. Thornely, Providence, R. I., until recently head of the Bullard Automatic Wrench Company, has associated himself with the Builders' Iron Foundry of that city.

The number of manufacturing establishments that are resuming normal or better than normal production is increasing. The Colt's Patent Fire Arms Mfg. Company, Hartford, Conn., has found it advisable to return to the former schedule of six days a week, owing to the general improvement in trade conditions. The Blakeslee Forging Company, Plantsville, Conn., manufacturer of drop forgings and carriage hardware, is running its factory three hours overtime for three days a week, making a 68-hour week, the change being necessary because of a very unusual volume of orders. The Miller Bros. Cutlery Company, Meriden, Conn., manufacturer of pocket cutlery, ink erasers and steel pens, has been operating on full time continuously during the depression, and as some of the departments have got behind on their orders a 12-hr. a day schedule has been adopted for them, to continue for the present.

The New England Watch Company, Waterbury, Conn., has voted to increase its capital stock from $750,000 to $1,000,000.

The Electric Cable Company, Bridgeport, Conn., allusion to whose fire was printed last week, states that the main building and power plant were completely destroyed. The loss is covered by insurance, and as soon as this is adjusted the company will be prepared to increase its former capacity considerably. At the time of the fire the works were running full and the loss was a serious inconvenience. Sufficient manufacturing space was left, however, so that with the assistance of friends orders in hand were taken care of.

The Francis Willey Company, Barre, Mass., manufacturer of textile goods, is planning the erection of a hydraulic power plant to furnish electric light and power for its mills. The work of building a new dam at what is known as the Powder Mill Pond will begin as soon as possible.

The stockholders of the Union Drop Forging Company, Easthampton, Mass., have not decided whether the plant recently destroyed by fire shall be rebuilt and the business continued. In case an affirmative decision is arrived at it is probable that there will be a reorganization of the business.

Philadelphia Machinery Market.

PHILADELPHIA, PA., March 3, 1908.

The past month was not a very satisfactory one, viewed from the point of sales. Buying was comparatively light, and in some instances less than the previous month. Gains in sales, however, are to be noted in some cases over the closing months of last year. Sales during the week have been light, but while not much new business has developed, the trade anticipates a moderate improvement in buying in the early spring months. Sales departments keep actively after every inquiry and there is sharp competition for every order that is being placed. Notwithstanding the scarcity of business, makers and sellers of the better grades of tools hold prices very firmly. On some of the less well known makes of tools, however, there is some cutting of prices reported, although as a rule they are pretty carefully covered.

The amount of new business coming to manufacturers is not very extensive. One of the local concerns booked an order for a large and very heavy tool during the past week, but orders of this character are scarce. The greater part of the new business is confined to the medium and smaller classes, and even these are usually in single tool lots. Inquiries are not as numerous as they were several weeks ago, and such as do develop are largely of a class that do not produce orders very rapidly. Railroad business is practically out of the market, and not a great deal is expected from that source until general conditions show some improvement.

There has been a little more activity in the foreign market. Tool builders finding domestic conditions quiet are turning their attention to another outlet for their products, and markets in other countries are actively being sought. While business in the standard line of machine tools has not yet developed to any material extent, more demand is to be noted for some classes of special tools, and several makers have taken orders for various classes of equipment and tools. Manufacturers in some of the various specialties who have an established trade abroad report considerable improvement in the number and volume of the orders recently received.

A little improvement is to be noted in the demand for second-hand tools and equipment. Under the present conditions of the general trade, purchasers endeavor to supply their needs at the smallest possible outlay, and naturally turn to the second-hand machinery field to cover their requirements, if possible. As a result, sales of second-hand equipment show some gain, and sales cover a variety of tools, mostly, however, of the medium and smaller classes. The demand for second-hand boilers and engines does not show much change. Some scattered sales have been made, but the business is largely confined to the smaller and medium horse powers.

Not much change is to be noted in the foundry trades. While there has been some little increase in the demand, the business is largely for prompt delivery, and is slow in developing into orders. Users of castings of all classes are not inclined to place business for forward delivery even at price concessions, and foundries have, therefore, not made any very extensive gains in tonnage. Jobbing foundries are only moderately engaged, and must depend largely on day to day orders to keep their plants in operation. Both gray iron and steel casting plants, as a rule, do not average over three or four days' work a week, and with reduced forces at that.

The William Steele & Sons Company submitted the lowest bid on the extensive improvements of the Philadelphia & Reading Railroad in connection with the elevation of its tracks at Tenth and Berks streets. This improvement, as mentioned previously in these columns, includes a coal pocket, trestles, stables and office building. The amount of the bid was $239,900. The lowest bid on the work to be done at Broad and Huntingdon streets, which includes a car cleaning yard, sheds, &c., was made by Edward Fay & Sons, who propose to do the work for $36,500. The award of the contracts will be announced at an early date.

It is understood that the Bucks County Railway Company, at Newtown, Pa., has bought the Newtown Electric Light & Power Company, and will make extensive improvements on the power house located at that point.

The Raymond Concrete Pile Company, New York City, has opened a branch office in the Arcade Building, Fifteenth and Chestnut streets, this city, in charge of Percy H. Wilson, to efficiently care for the marked increase in its business.

Plans and specifications have been prepared by Philip H. Johnson, architect, on which proposals will be received until March 16, for the building and equipping of a House of Detention at Nos. 2133 to 2141 Arch street, for the city of Philadelphia. Bids will be received by the County Commissioners, rooms 130-138, City Hall; but plans and specifications may be obtained from the architect, rooms 1824 and 1825 Land Title Building.

The E. H. Mumford Company, manufacturer of foundry molding machines, will move its offices from 1315 Race street and Seventeenth and Callowhill streets, about March 5 to 1223-1225 Spring street, at which location it has acquired a manufacturing building, 38 x 76 ft., which will be given over to offices, drawing rooms and display rooms for its varied line of molding machines and foundry equipment. The company will erect at the rear of the new quarters a steel and corrugated iron demonstration building, 19 ft. 6 in. by 19 ft. 9 in., with an ell 18 ft. by 8 ft. 10 in., which will be equipped along the lines of a foundry, having dirt floor, &c., which will be used to show the working of the different machines practically under working conditions. Hydraulic and compressed air equipment will be installed, so that both vibrator and stripping plate effects can be shown in combination. A full line of machines showing the Universal system of machine molding, as introduced in this country last year by Ph. Bonvillian and E. Ronceray of Paris, France, will be shown in the demonstration department. The Mumford Company reports business fairly good and improving steadily during February, shipments exceeding the total for the three previous months. Sales have been largely of standard stock machines, mostly in single lots or pairs for both domestic and export account. Among the latter were two split pattern machines for shipment to England for use in the English Government service.

The Standard Pressed Steel Company reports a material increase in business in the past month. The demand, however, has been largely for export, the improvement in the domestic trade being very light. Recent export orders for this company's pressed steel shaft hangers include one for 400 hangers from Belgium, another for 200 from Germany and one for 200 from Spain. Domestic business is largely of a hand to mouth character, although one pretty fair order has been taken from a concern on the Pacific Coast. This company continues to operate its plant at about two-thirds capacity, and the outlook is favorable for a continuation of about this volume of business.

The Tropenas Steel Company has broken ground for its new steel casting plant at New Castle, Del. The contract for the erection of the main foundry building has been let to the McClintic-Marshall Construction Company, who will go ahead with the work at once. A portion of the equipment of the plant has also been contracted for. The Shaw Electric Crane Company has the order for a 10-ton electric traveling crane and an order for two blowers, motor driven, has been placed with the P. H. & F. M. Roots Company. Bids are now being taken for the erection of an office building, but the machine tool equipment will not be taken up, we are informed, for several months.

Government Purchases.

WASHINGTON, D. C., March 3, 1908.

The Isthmian Canal Commission will soon ask bids for a number of sheet metal working machines.

The following bids were opened February 24, Circular No. 421, for supplies for the Isthmian Canal Commission:

Class 1. One 15-ton locomotive coaling crane—Bidder 13, Brown Hoisting Machinery Company, Cleveland, Ohio, $8465; 14, Browning Engineering Company, Cleveland, Ohio, $6525; $7450, $6725; 45, Industrial Works, Bay City, Mich., $6535; 57, McMyler Mfg. Company, Cleveland, Ohio, $8200; 84, Shaw-Seaver-Morgan Company, Cleveland, Ohio, $6208; 89, Well American Hoist & Derrick Company, St. Paul, Minn., $7129; 85, Interstate Engineering Company, Bedford, Ohio, $7495.

The following bids were opened February 25 for machinery for the navy yards:

Class 1. One extension gap lathe—Bidder 86, Harron-Rickard & McCone, San Francisco, Cal., $2441, $1732.80, $2086.90; 87, Henshaw, Bulkley & Co., San Francisco, Cal., $2775; 131, Niles-Bement-Pond Company, New York, $1799 and $2097; 210, Prevert Machinery Company, New York, $2500.

Class 2. One toolroom lathe—Bidder 30, Compressed Air Machinery Company, San Francisco, Cal., $2108.80; 86, Harron, Rickard & McCone, San Francisco, Cal., $1205.05; 87, Henshaw, Bulkley & Co., San Francisco, Cal., $1212; 131, Niles-Bement-Pond Company, New York, $1119; 144, Pacific Tool & Supply Company, San Francisco, Cal., $1025; 150, Pratt & Whitney Company, Hartford, Conn., $1292.

Class 3. One toolroom shaping machine—Bidder 30, Compressed Air Machinery Company, San Francisco, Cal., $2931; 86, Harron, Rickard & McCone, San Francisco, Cal., $927, $921 and $874; 87, Henshaw, Bulkley & Co., San Francisco, Cal., $1078 and $1246; 144, Pacific Tool & Supply Company, San Francisco, Cal., $700; 146, Pedrick & Johnson Machine Company, Pawtucket, R. I., $797.50.

Class 4. One power feed drill press—Bidder 30, Compressed Air Machinery Company, San Francisco, Cal., $2936; 86, Harron, Rickard & McCone, San Francisco, Cal., $874.50; 87, Henshaw, Bulkley & Co., San Francisco, Cal., $615.50; 114, Manning, Maxwell & Moore, New York, $761; 131, Niles-Bement-Pond Company, New York, $578; 210, Frevert Machinery Company, New York, $808.

Class 5. One sensitive drill—Bidder 30, Compressed Air Machinery Company, San Francisco, Cal., $109.50; 44, Joseph Clark, Jr., Electric Company, Louisville, Ky., $159.50.

Class 6. One emery grinder—Bidder 44, Joseph Clark, Jr., Electric Company, Louisville, Ky., $159; 86, Harron, Rickard & McCone, San Francisco, Cal., $370.80; 114, Manning, Maxwell & Moore, New York, $250 and $270; 135, Northern Electrical Mfg. Company, Madison, Wis., $462; 160, Ransom Company, Oshkosh, Wis., $270 and $250; 210, Frevert Machinery Company, New York, $362.

Class 61. Six chipping hammers—Bidder 1, Chester B. Albree Iron Works Company, Pittsburgh, Pa., $270; 19, Berger & Carter Company, San Francisco, Cal., $284.23; E. W. Bliss Company, Brooklyn, N. Y., $213.50; 52, Chicago Pneumatic Tool Company, New York, $240; 55, Dayton Pneumatic Tool Company, Dayton, Ohio, $200; 93, Helwig Mfg. Company, St. Paul, Minn., $200; 101, Independent Pneumatic Tool Company, Chicago, Ill., $171; 102, Ingersoll-Rand Company, New York, $153.90; 140, Joshua Oldham & Sons Company, Frankford, Pa., $156; 151, J. W. Paxson Company, Philadelphia, Pa., $470; 177, Standard Railway Equipment Company, St. Louis, Mo., $264; 209, Excelsior Equipment Company, Pittsburgh, Pa., $342.

Class 62. Four pneumatic screen shakers—Bidder 19, Berger & Carter Company, San Francisco, Cal., $258; 52, Chicago Pneumatic Tool Company, New York, $180; 151, J. W. Paxson Company, Philadelphia, Pa., $304; 209, Excelsior Equipment Company, Pittsburgh, Pa., $228.

Class 63. Four pneumatic drills—Bidder 19, Berger & Carter Company, San Francisco, Cal., $299; 52, Chicago Pneumatic Tool Company, New York, $242; 101, Independent Pneumatic Tool Company, Chicago, Ill., $203; 102, Ingersoll-Rand Company, New York, $298.05 and $266; 151, J. W. Paxson Company, Philadelphia, Pa., $415; 209, Excelsior Equipment Company, Pittsburgh, Pa., $380.

Class 72. One gap lathe—Bidder 114, Manning, Maxwell & Moore, New York, $491; 131, Niles-Bement-Pond Company, New York, $484 and $491; 143, Prentiss Tool & Supply Company, New York, $675; 181, Tucker Tool & Machine Company, New York, $1029; 210, Frevert Machinery Company, New York, $1024.

Class 73. One pattern maker's lathe—Bidder 7, Atlantic Works, Philadelphia, Pa., $475; 8, American Wood Working Machinery Company, Rochester, N. Y., $420; 68, Fairbanks Company, New York, $634; 70, J. A. Fay & Egan Company, New York, $432.30; 94, Hill, Clarke & Co., Boston, Mass., $475; 137, Oliver Machinery Company, New York, $277; 143, Prentiss Tool & Supply Company, New York, $303; 184, Thomas & Lowe Mfg. Company, Providence, R. I., $335; 209, Excelsior Equipment Company, Pittsburgh, Pa., $364; 210, Frevert Machinery Company, New York, $318.

Class 74. One geared screw cutting engine lathe—Bidder 24, Baird Machinery Company, Pittsburgh, Pa., $777; 68, Fairbanks Company, New York, $505; 94, Hill, Clarke & Co., Boston, Mass., $475; 95, Hendey Machine Company, Torrington, Conn., $557; 131, Niles-Bement-Pond Company, New York, $436; 143, Prentiss Tool & Supply Company, New York, $491 and $554; 181, Tucker Tool & Machine Company, New York, $440.

Class 75. One planer—Bidder 24, Baird Machinery Company, Pittsburgh, Pa., $1120; 68, Fairbanks Company, New York, $805; 94, Hill, Clarke & Co., Boston, Mass., $950; 131, Niles-Bement-Pond Company, New York, $1060 and $787; 143, Prentiss Tool & Supply Company, New York, $974; 172, William Sellers Company, Philadelphia, Pa., $999 and $1335; 181, Tucker Tool & Machine Company, New York, $899; 209, Excelsior Equipment Company, Pittsburgh, Pa., $1035; 210, Frevert Machinery Company, New York, $973.

Class 76. One universal milling machine—Bidder 25, Becker-Brainard Milling Machine Company, Hyde Park, Mass., $775; 68, Fairbanks Company, New York, $792 and $795; 95, Hendey Machine Company, Torrington, Conn., $668; 131, Niles-Bement-Pond Company, New York, $665 and $825; 143, Prentiss Tool & Supply Company, New York, $785; 181, Tucker Tool & Machine Company, New York, $765.

Class 77. One sensitive drill press—Bidder 24, Baird Machinery Company, Pittsburgh, Pa., $58.50 and $65; 68, Fairbanks Company, New York, $60; 131, Niles-Bement-Pond Company, New York, $48; 143, Prentiss Tool & Supply Company, New York, $61.50; 181, Tucker Tool & Machine Company, New York, $52; 209, Excelsior Equipment Company, Pittsburgh, Pa., $60 and $65; 210, Frevert Machinery Company, New York, $52 and $60.

Class 78. One radial drill press—Bidder 24, Baird Machinery Company, Pittsburgh, Pa., $1180; 68, Fairbanks Company, New York, $493; 94, Hill, Clarke & Co., Boston, Mass., $500; 124, J. B. Morris Foundry Company, Cincinnati, Ohio, $492; 143, Prentiss Tool & Supply Company, New York, $549 and $634; 181, Tucker Tool & Machine Company, New York, $482; 209, Excelsior Equipment Company, Pittsburgh, Pa., $525 and $560; 210, Frevert Machinery Company, New York, $458.

Class 194. Two electric motors—Bidder 74, General Electric Company, Schenectady, N. Y., $702; 191, Western Electric Company, New York, $940; 193, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., $660.50.

Class 212. One 30-h.p. motors—Bidder 44, Joseph Clark, Jr., Electric Company, Louisville, Ky., $798; 64, Electro Dynamic Company, Bayonne, N. J., $1113.50; 132, National Electrical Supply Company, Washington, D. C., $728; 135, Northern Electrical Mfg. Company, Madison, Wis., $847; 166, Sprague Electric Company, New York, $1030; 191, Western Electric Company, New York, $510; 193, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., $932; 229, B. F. Sturtevant Company, Hyde Park, Mass., $614.

Under bids opened January 27, Circular No. 413, for supplies for the Isthmian Canal Commission, the Baird Machinery Company, Pittsburgh, Pa., has been awarded class 2, one upright drill press, $391.

The following awards have been made for supplies for the Isthmian Canal Commission, under opening of January 6, Circular No. 408:

Buffalo Forge Company, Buffalo, N. Y., class 16, one single noncondensing engine, $1065.

Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., class 17, one engine type revolving field generator, $1324.

Under opening of January 2, for machinery for the navy yards, class 61, 20 motors, will be readvertised, and class 141, one metal saw machine, has been canceled.

HARDWARE

THERE is a good deal of difference in the various retail Hardware associations in the manner in which the larger and more enterprising houses are regarded. In some there is a tendency to look with suspicion on merchants who in connection with a fine retail business are doing something as local jobbers, transacting a wholesale business in a small way in their city or in the surrounding country. In more than one association such houses are made to feel so uncomfortable that they realize that they are not wanted, and keep aloof from it. There is sometimes indeed, under the circumstances, no other course open before them. The fact that they are not identified with the association is, however, a serious loss to the organization, diminishing its influence and tending to bring upon it the stigma of being made up of only the smaller and weaker retailers. The association certainly is impoverished by pursuing such a policy, whether those advocating and carrying it out are actuated by a small minded envy or jealousy of the larger merchants, and are reluctant to be foreshadowed by their greater prominence, or are simply governed by some mistaken view of the aim and spirit of the association movement. It may indeed be that a subserviency to the interests of the larger jobbing houses, which is noticeable in some sections, has something to do with the turning of the cold shoulder upon merchants, who while predominantly retail, are perhaps following in the footsteps of most jobbing houses, developing from an exclusively retail to a combined retail and wholesale trade, with the possibility that one of these fine days they may give up their retail departments entirely.

So far from putting on the membership of the associations the brand of littleness, these larger and leading retail houses should be given the heartiest kind of a welcome, and their identification with the movement secured. Their names widely known will give character to the association as a whole, and in a certain way tend to improve the standing of every member in it. The fact that they are growing and successful is an evidence of their ability, and the association should have, if it be possible, the benefit of their counsel and experience. As merchants of extensive business relations and comparatively large buyers they naturally obtain lower prices on their purchases than do the general run of small Hardwaremen, and some of them are undoubtedly on the classified lists of manufacturers, getting prices which closely approximate those at which exclusive jobbers buy. While their presence in the association has no direct bearing on the grading of their fellow members, their names in the lists of the association should make it easier for other merchants to obtain close prices when their business transactions at all justify it. That association is certainly to be congratulated in which the strong and growing houses, gradually broadening into larger fields, are recognized as representing the ideal type of retail Hardware distribution.

Condition of Trade.

Merchants, wholesale and retail, who found February business equal to that of last year, were decidedly the exception, as their customers have as a rule been cautious in buying, confining their purchases to goods actually required without delay. There was, however, a marked improvement over January conditions. March is keeping up the good work, and the month opens with more frequent orders covering a larger assortment and a greater volume of goods. There is, however, no disposition to buy in excess of immediate needs. The carrying out of this policy is made the easier because there is practically no delay now experienced in the execution of orders, as manufacturers and jobbers are generally in a position to ship promptly. The present condition of things works in some ways to the direct advantage of the jobbers, as the smaller merchants naturally turn to them as their source of supply, sending them orders for goods in small quantities, which if purchased in larger quantities would be bought from the manufacturers direct. The position of the jobber with a good assortment of Hardware as a nearby distributer is thus strengthened, provided his stock is such as to enable him to make very prompt deliveries. On the other hand, the fact that manufacturers are in need of business tends to cause them in not a few instances to go to the smaller merchants. On the whole, however, the usefulness of the jobber and his indispensableness as a distributer of Hardware is emphasized at this time. Prices continue with a downward tendency, there being a good many slight concessions here and there, together with some more substantial declines. Wire Nails and Wire keep remarkably steady and not a few leading lines are firmly maintained in prices. Manufacturers are wisely conservative about making open reductions in quotations, but sometimes the presence of a good order induces concessions. In some lines where there is an apparent agreement to hold up prices, back orders, which a few months ago were lost sight of, are discovered and made the basis for more favorable terms than are now regularly obtainable. The desirability of keeping the market from giving way too much in the matter of price is recognized and there is a most commendable disposition on the part of manufacturers to work in harmony, in some cases refraining from pushing goods on the market when this course would seem to be the natural one to pursue if their interests alone were considered. The trade is thus reaping the advantage of the spirit of co-operation and a readiness to work together, which is evident in the growth of the association movement as well as in the more friendly relationships which characterize trade.

Philadelphia.

as they exist in our own business to-day, we are glad to say that a decided improvement has taken place, noticeably from the agricultural sections. To be sure, no great rush has been in full blast, such as was the case this time last year, but the demand for goods seems to be gradually increasing, and for a larger variety.

The present condition of affairs throughout the country is certainly enigmatic. Through our representatives we learn that from some sections of the country business is about on a par with the same period last year, while

from other sections, where one would suppose like conditions would prevail, comes the plaint, "Poor business," indicating that the late unpleasantness has been felt more acutely in some sections than in others. However, time generally heals all ills that we are heir to and will no doubt straighten out the present business situation, and we feel that in the near future normal business conditions will have returned.

We are and always have been optimistic on the business situation, yet we feel that we have been at the same time conservative, and we really cannot see anything that would change our views. Stocks generally through the country are small and must be replenished, hence we feel that sooner or later these wants must come to the market. We do not anticipate much decline in prices, although we note a few minor changes.

The Presidential year, which has always been looked upon as a setback to trade, we think is becoming more and more discounted every four years, and while a great many people enthuse and argue as to the merits and demerits of the various candidates, yet business apparently goes on about the same.

Cleveland.

THE W. BINGHAM COMPANY.—Business conditions are about as they were when we wrote you our last letter. Conditions are better than we could naturally expect, considering what the business world has gone through during the past 90 days. Orders are coming in fairly well, and the most encouraging sign is that there has been very little demoralization in prices notwithstanding the curtailment of business.

We look forward to a good spring trade, as we know that stocks are light with retailers all over the country, not only from the reports of our salesmen, but from the frequency of orders coming to us. We are extremely hopeful for the future, as we do not believe that a country like ours, with its 80,000,000 people, can let its industries stand idle for any long period. All our people have to be clothed, fed and housed, and will need all kinds of goods to supply their wants.

We look forward with optimism, and firmly believe that an early resumption of good trade conditions can readily be brought about if each and every one would stop talking "hard times" and feel some degree of confidence for the current year.

Baltimore.

CARLIN & FULTON.—During the month just ended business has been done only by hard work, and the house that can say its sales have aggregated those of a year ago is an exception.

All the bad weather of the winter seemed to be crowded into the four weeks of February, making the country roads almost impassable and giving the solons of our Legislature, now in session, a strong argument for the passage of a proposed "good road" law, to be paid for by a bond issue, the interest of which is to be partly paid through a higher tax on the mercantile interests in the shape of an increased graded traders' license, depending upon the amount of stock carried, this being in addition to the regular State and city taxes on the same goods. We are experiencing the general antagonism or jealousies existing in most States between the interests of the large cities and those of the rural sections, and unfortunately our representation in the Legislature is small and entirely disproportioned to the population, and we see no way of increasing it.

This city is now spending, and will continue to spend, many millions of dollars for a sewerage system, new docks, improvement of streets, new school buildings, new parks and other municipal improvements, depending upon its ability to market its bonds, or, as we call them, city stock, at satisfactory figures. A large amount will be offered this month, and if taken up will enable the city to continue the works already begun and give employment to a large number of men who are anxiously awaiting the results.

Considering the unwillingness of the trade generally to purchase goods in excess of actual necessities, it is remarkable to see how prices have generally been sustained, indicating no great surplus of stock in the hands of the manufacturers. The general argument is that lower prices would do nothing toward increasing the demand, which is no doubt the case. The every day consumption of this country is something immense and every day's necessities help to deplete existing stocks, and unless there is an absolute stagnation of all industries throughout the country we will find that the hand to mouth purchases which are going on every day will aggregate more than we anticipate, and gradually the buying public will find no reason for not carrying stocks of goods sufficient to satisfy a legitimate and inevitable demand. There is a great difference between purchasing for absolute and undoubted requirements and buying or speculating with a view to probable advance in values.

New Orleans.

WOODWARD, WIGHT & CO.—Conditions down here have not changed materially since our previous letter, except that the carnival is now on, and this year the jobbers all have plenty of time to give to it, while usually they do not. There is a notable diminution, however, in the throng of Northern visitors that usually come down for this festival, and while the hotels are full and it is difficult to get rooms, yet at the same time the streets are not as badly congested as they usually are, and the restaurants complain that so far there has been less business from the carnival than in any previous year for a long time. The Gulf Coast winter resorts are also running comparatively light, and last year was a bad year with them owing to the open winter up North.

It is still betwixt and between seasons with all of us down here now, and all we can do is to patiently wait and see how the spring trade will open up and what prospects there are for good crops the coming year. If the wheat and corn crops and the oats and hay crops are good, and the prospects for cotton, sugar and rice are good down here, there will be a steady demand and steady employment for practically every one in this section, although those in the building trades will probably have to undergo a bad year with us, no matter what the agricultural outlook may be.

We have no unemployed labor here like there is in some of the other cities of the country at present, and while jobs are scarce and hard to get, and not as remunerative as they have been for the workmen in the past, yet at the same time there is enough work in the country to keep labor busy all the time, and, in fact, we are trying hard in many of our parishes to bring immigration of the right class down here.

While there is no surplus of rough, unskilled labor in the city, or only a very small one if any, there is no room for our receiving any large number of unemployed from other cities, which we came near having on account of a canard being sent out to St. Louis, New York and other cities stating that there were positions for 10,000 men here in the building trades. This was contradicted promptly, however, so that there were no bad effects from it. An increase in rough labor and of skilled labor for the building trades of several thousand men would have a very bad effect here.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—To a tourist in France a friend characterized his own impressions of a certain spot in that delightful country as "A perfect bowl of sunshine." Alluring, wasn't it? It cheers a fellow up just to imagine what it may be, and the effect on the mind is quite the opposite of that produced by close reading of financial sections of New York newspapers. Many of such articles are written too soon after the writer has encountered one or more of his friends who know more about the stock market conditions than they do about the affairs of the 80,000,000 (or more) of people in the country, who give stocks and bonds little more than passing thought. It's the financial condition of the 80,000,000 (or more) people of the country, rather than of the remaining 10,000,000 (or less) who determine what the future shall be.

One writer tells us there are too many captains of industry. This is quite the most distressing thing we have heard, because we have, all of us, been taught that "there is always room at the top." The "top rung of the ladder," as a phrase, has stirred the imaginations and ambitions of many a youngster, who but for it would have been much less of a man than he actually developed into. It may be that some of the captains have been captains long enough and are now to be retired on half pay—or less—and in the place of them we have to have a new crop, developed through circumstances and midst conditions that will make them less sensitive to criticism than their predecessors, and they will probably deserve less than some of them. Some time must elapse before mere success will be applauded as it has been. For a time, at least, we won't spoil the new captains by saying too many nice things about them. After which we shall very properly proceed to bestow what we have withheld. It is quite impossible to refrain from expressing admiration for men who do and dare, and who achieve success for themselves and others interested with them.

There are those who report "a fine business," but it is fair to say that, in most cases, such an expression is merely "a habit of speech" acquired during the past 10 years. However, such expressions will "come in handy" again—perhaps soon. Who knows? The more or less prevalent idea that the country needs a rest is probably correct. It does not follow that there will necessarily be less industry, but there will be less striving after the impossible, and for that reason there will be less occasion to retrace steps and undo some of the things that will have been done. There won't be quite so much fruitless work.

The railroad companies still report large numbers of cars out of commission because of lack of need for them, but we hear no report as to the proportion of these cars that would be in use daily if the railroad companies were continuing construction and other similar work for themselves, such as double tracking, improving their road beds, building bridges, new terminals, side tracks, general repairs, &c. The number of cars so used under normal conditions must be large. The railroad companies report that this sort of work is now practically at a standstill. This being true, inasmuch as their own freight is carried at a dead loss, the revenue per ton per mile for all freight carried must be the largest the railroads have ever enjoyed (?).

It is perhaps unfair to use the word "enjoyed," as railroad men do not seem to be enjoying anything just at present. One railroad is reported as running its freight cars on the passenger tracks rather than repair those ordinarily used for freight only. If this be true, it must be one of the larger roads, for smaller ones have but single tracks. Outside of the railroads and lines of business not directly influenced by the plans of the railroad managers the signs are more hopeful.

One firm of architects in Louisville reports more prospects and more orders for sketches for apartment houses and other buildings than they have ever had at one time heretofore. Others tell us of similar reports from certain other cities. We hear from many sources that contractors, large and small, are very active in exploiting the idea that now is the time to build. Well directed efforts along this line will bear fruit. It is just this sort of thing that actually starts business again. Indeed, it should be borne in mind that for two months, November and December, practically no new plans were laid. This in itself accounts for some of the reduction in business.

We would all probably be very much encouraged if we knew to what extent plans for new work had been formulated and determined upon since January 1, but not yet sufficiently under way to be in evidence through the actual placing of orders, employment of labor or otherwise.

Our exports have steadily increased from $127,000,000 in August to $206,000,000 in January, while our imports have in the same period decreased from $125,000,000 to $85,000,000. The total trade balance in favor of the United States amounted to about $430,000,000. It will take records very different from these to make a prolonged depression possible.

The closing of each day finds the stocks in the hands of the retailers and jobbers smaller than 24 hr. earlier, and it's only a question of time when, barring crop failures, the average value of each order must be materially increased. Could we have had this increase during the past week our business would have been highly satisfactory.

Once every four years, between January 1 and November, it is difficult for most writers to express themselves on business affairs without showing some political bias, and when we read financial and trade reports this should be borne in mind.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—February has developed no new features, especially peculiar to itself, in the field of traffic covered by the Trans-Missouri region. Business continues to show an improvement right along, but, although it is not expected to equal the volume transacted for the same period last year, still, everything considered, the current volume is satisfactory.

The time when spring business will be the leading feature of the condition of trade is approaching, and both jobbers and retailers feel confident that an active period will develop as soon as the winter season shows signs of departure.

The country tributary may be reported as continuing in a prosperous condition, and as long as there is a fair amount of business in sight, backed by favorable climatic as well as financial conditions, everything points to a reasonable and satisfactory spring trade.

Portland, Oregon.

FAILING, HAINES & MCCALMAN.—Since our last letter nothing of note or particular interest has occurred in our territory. The resumption of business has been very marked, and there is constant growth as each day passes. While the retail business in the city itself is not up to normal (thus cutting down the jobbing business within the city), the country trade is showing considerable activity and our country orders are fully up to normal. There are no marked disturbances in the market, the jobbers showing a willingness to maintain prices and make a profit rather than to cut prices indiscriminately without receiving any benefit.

The only trouble we are having with reduced prices comes from jobbers outside of our own territory, particularly those in the Middle States, and it is somewhat worthy of notice that your correspondent from the Middle States reports the same feeling among the jobbers there as we have to report here. We are glad to know that they are not cutting in their own territory, and trust that in course of time they may become educated sufficiently to appreciate the "other fellow's" position.

The rate at which building permits are being issued in this city is a very favorable omen for the Hardware business, and a very proper rebuke to those who have expected to see all industries demoralized and everything at a standstill. It demonstrates more and more fully that the panic was not a business panic, but a financial one.

Our farmers are preparing for their spring crops with just as much energy as ever, and we may confidently expect a very large wheat acreage for the coming season. February will probably be the record month for shipment of wheat from Portland, and we confidently expect when the season is over that Portland will have shipped more wheat than ever before and more than any other port on the Pacific Coast, and perhaps as much as any other two ports combined. The prospects for business in Oregon for this year are certainly good, and we believe that no State has a brighter outlook.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—We are now in the midst of the spring trade and have a better opportunity to compare conditions in 1908 with those of 1907 than we have heretofore had. It was the opinion of a great many that when the spring trade was fully opened we would find it quite satisfactory. While there has

been a perceptible improvement right along since January 1, and while trade is better now than it has been at any time since the financial trouble in the fall, at the same time it is not good. People are disposed to economize in all walks of life, and buyers, both wholesale and retail, have taken notice and are governing themselves accordingly.

While we are unable to see any reason why trade should not be good, we are at the same time compelled to admit that it is not up to the standard of former years. The goods being purchased by the retailers cover a very fair assortment, but the quantities are unusually small.

Prices seem to be pretty well maintained. The makers of Wire and Nails have undoubtedly conferred a great favor upon the Hardware trade of the country by maintaining the prices of those commodities. The fact that a price of $13.50 per ton for No. 2 Foundry Iron is being strictly maintained in the Birmingham District has given a great deal of confidence to buyers of Hardware.

Collections are fairly good. We are looking for some further improvement in general trade conditions, but it will come too late to give us a good spring business.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—The jobbers of St. Louis have had the pleasure this week of meeting the retail merchants who have come here to attend the sessions of the Missouri Hardware Association. There was also a committee from the National Retail Hardware Association, who came to St. Louis to make arrangements for the meeting of the National in St. Louis the latter part of March.

The writer has had chats with a large number of retail Hardware men this week. Naturally the leading topic of conversation was the outlook for business. None of these dealers complained very much of business, and we were surprised to have several say that their sales for January and February were actually ahead of last year. It is evident Missouri, except in the Joplin mining district, has not suffered seriously as a result of the recent financial disturbances.

Of course all of us, both retail merchants and jobbers, "orated." What a great crop of orators and after-dinner speakers the association idea is developing! And what stories! Where do they all come from? Who manufactures them? They are passed along from mouth to mouth. It would be interesting to trace some of these stories back to their sources.

We have other ambitions than to be placed upon the bench with the other members of the Ananias Club. Nevertheless, we have the courage to say our business for February, in dollars and cents, was equal to last year. Our city business fell off. We find our best business coming from the medium size and small towns. The recession in business seems to have been greatest in those places where there are manufacturers, machine shops and in mining districts—places where men working for wages have been laid off.

The farmer still seems to be master of the situation. He is the most independent man in the world. His crops grow while he sleeps. He sells everything for cash and buys everything on credit. The Government prints books and maps and sends them to him gratis. The Government makes experiments in raising various crops on various kinds of land, and gives him the benefit without cost. He has the rural free delivery, for which he pays 25 cents, while the rest of the citizens of the country pay the other 75 cents of the $1 it costs. Now the farmer is to have parcel post, and if it causes a deficit of $100,000,000 a year what is the difference. The country is rich and the farmer is its petted child.

No, that is wrong. The Government takes care of two classes of its citizens—the farmer and the Wall street operator. The merchants in between the two extremes must wriggle along the best they know how. There is no kind, paternal government for them.

It is, however, a source of surprise to me that the farmer will stand for the tariff. He never seems to have waked up on this subject. He does not realize how much he is paying in indirect taxation. Probably he does not often go to Europe, and returning have to dig down for 60 per cent. on a few presents he is bringing home. I wonder how many free traders have been made on the piers of New York liners.

What an edifying sight it is to see the contents of the trunks of your prominent fellow citizens and citizenesses exposed to the curious gaze of the vulgar! How our hearts swell with patriotism and pride as we steam into New York Harbor and realize we are once more in "the land of the free and the home of the brave!" But how rapidly this patriotic enthusiasm ebbs when the custom house officials treat us, our wives and our daughters like a lot of thieves and pickpockets!

If trunks must be searched why cannot some arrangements be made so they could be searched on the steamer before landing? Cannot the Government afford to have custom house inspectors on large steamships just as it has postal clerks on trains? This having people lined up on the open piers in all kinds of weather while their trunks are being examined is a barbarism that should not be tolerated by any civilized and self-respecting nation. Do we ever go through this ordeal without feeling that the custom house officer is one of the relics of the feudal ages?

The great American farmer is ignorant of the "inside" workings of the tariff. If he only knew, would he stand for it? Well, I guess not!

Others have their troubles. A friend of mine, who is a distiller, tells me his trade has quit buying because it is afraid of local option. Recently we sold a new stock of Hardware to an ex-liquor dealer in a town that had gone dry. We have before heard whisky salesmen say they sold "Hardware." Therefore is it not a natural step from a wet business to a dry one? In the meantime the liquor interests seem to be considerably worked up. Jes' so! Jes' so!

NOTES ON PRICES.

Wire Nails.—There is evidence of conservatism, both in the placing of new business and sending specifications to the mills on contract orders, in accord with trade requirements. This conservatism is relative, being compared with the liberality with which orders were placed and specifications were forwarded last year. A slight increase in demand is noted as the season progresses, and a tone of marked firmness is reported amounting to a maintenance of regular prices. Quotations are unchanged, as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

New York.—Wire Nails in small lots at store are moving in moderate quantities. Nail houses are represented as maintaining regular prices, but it is reported that jobbing houses sometimes shade prices when Hardware is also sold. Regular quotations are on the basis of $2.40 for small lots at store.

Chicago.—New business continues to develop in a moderate way, and is expected to increase when the weather becomes more favorable to building operations and outdoor construction work. Specifications against contracts already placed are being furnished in good volume, and shipments from the mills are going forward promptly. A general tone of firmness characterizes prices. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—A fair amount of new business is being placed, but jobbers are not disposed to buy as liberally or as far ahead as they did last year, with the result that new business is lighter than at this time a year ago. Specifications against contracts are coming in at a fairly satisfactory rate, and it is believed that as spring permits building operations the demand will quickly show betterment. The market is firm. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....$2.05
Carload lots, to retail merchants..... 2.10

Cut Nails.—Limited demand is having an unfavorable effect upon regular quotations as recommended at the last meeting of the Cut Nail Association, although the mills are still restricting output as nearly as possible to compare with demand. According to reports, concessions of 10 cents per keg from the following price are more or less general. Regular quotations are on the basis of $2.05 per keg, at mill. Iron Nails generally should command about 10 cents more than Steel.

New York.—The maintainance of the price of Cut Nails in the local market is subject to the same exceptions as with Wire Nails. Demand is light. Quotations are on the basis of $2.30 per keg for small lots, at store.

Chicago.—There is practically no improvement in either the demand or other market conditions governing the Cut Nail trade. What business is moving is subject to price concessions of about 10 cents a keg both on mill and store shipments. The local demand is even more sluggish than that from outside territory, but it nowhere approaches a fair degree of activity. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; Steel, to jobbers, in carloads, $2.28; to retailers, $2.33.

Pittsburgh.—A very small volume of new business is being placed and concessions in prices are being made even on the small orders that are coming out. The Cut Nail mills are still pursuing the policy of cutting down output to prevent accumulation of stocks. We quote Steel Cut Nails at $1.90 to $1.95, f.o.b. Pittsburgh, for carload lots, and about $2 for small lots, to which freight to point of delivery is added. Iron Cut Nails are about $2.05 at maker's mill.

Barb Wire.—Increased demand from the South, with requests for prompt shipments in some instances, is regarded as indicative of a prospective good business from the West and Northwest as soon as weather conditions are such as to permit outdoor work in Fence building. Prices are reported as being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—Activity in mill shipments is growing, and it is noticed that specifications from Southern territory are frequently accompanied with requests for rush shipment. The advance of the season there is bringing out a consumptive demand not yet so marked further north. In addition to a satisfactory volume of specifications, a fair amount of new business continues to develop. Prices are reported to be firm at current quotations. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The demand from the South for Barb Wire has been fairly active for some time, and with the return of good weather, permitting farmers to build fences, the demand from the West and Northwest will quickly show betterment. Prices are firm but unchanged, and the mills are able to make prompt deliveries. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—The demand has not reached the proportions which it is anticipated will be in evidence later in the season. Mill shipments are regarded as being as large in volume as present conditions warrant. The market is firm at unchanged prices. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots.....$1.90
Retailers, carload lots..... 1.95

Chicago.—The prospects for a reasonably good demand for fencing are encourging, and manufacturers are preparing for a fair amount of trade. Wire contracts are being placed with a good deal of conservatism, but shipments from the mills are of good volume, considering present conditions. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—A moderate amount of new business is being placed, but the large trade is not buying as heavily as it did at this time last year. Shipments by the mills are fairly large and it is believed that with the return of favorable weather the demand for Plain Wire from the Fence manufacturers will soon be materially larger. Prices are unchanged and the tone of the market is firm. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots.....$1.90
Retailers, carload lots..... 1.95

Rope.—During the early portion of the week there was enough of an increase in inquiries to indicate that the trade is taking more of an interest in Cordage and is thinking of assorting up stocks. Actual demand is comparatively moderate, and with the continued decline in values of Manila and Sisal Fibers, there is no inducement for buyers to purchase Cordage in large quantities, nor to place contract orders at present prices. This condition contributes toward weakening the market. The following quotations, for base sizes, fairly represent the market: Pure Manila, 11 to 11½ cents; B quality grades down to 8 to 9½ cents; Pure Sisal, 7¾ to 8 cents; lower grades Sisal, 6¾ to 7 cents; No. 1 Jute, ¼-in. and up, 7½ cents; No. 2 Jute, 7 cents.

Binder Twine.—Business has been fairly active since prices were announced on Twine, as both manufacturers and jobbers generally have been making efforts to take orders. The price of Sisal Fiber is somewhat lower than when Twine prices were made, but this has not had any effect upon the prices of Twine. The decline of Fiber prices has introduced some uncertainty as to the future prices of Twine. Twine prices were based as usual upon the average price paid for Fiber since September of the previous year, and unless considerable Fiber can be bought at present or lower prices, Twine values are not likely to be affected. Quotations are as follows: Western prices, with deliveries at Chicago, Milwaukee, Peoria, St. Louis and other central distributing points, for small lots, with carload lots ¼ cent less; five ton lots, ⅛ cent less, central delivery, fall terms:

	Cents per pound.
Sisal	8¼
Standard	8¾
Standard Manila (550 ft	9¾
Manila (600 ft	11¾
Pure Manila	12

Unidentified Twine, said to be rejections, is reported as being offered from ¼ to ½ cent under schedule prices.

Forstner Bits.—The Progressive Mfg. Company, Torrington, Conn., manufacturers of the Forstner Brace and Machine Bits, has recently issued revised list prices on these goods. A material reduction has been made in the list of the larger Bits in sizes from 1½ to 2 in., inclusive, in view of improved methods of production. The revised list is given below and is subject to the discount of 25 per cent.:

[illegible]

Per set 6 Brace Bits, 3-8, 4-8, 5-8, 6-8, 7-8, 8-8.....$4.50
Per set 6 Machine Bits, 3-8, 4-8, 5-8, 6-8, 7-8, 8-8..... 5.75
Per set 9 Brace Bits, 3-8 to 11-8 in 8ths, in neat case.... 7.50
Per set 9 Machine Bits, 3-8 to 11-8 in 8ths, in neat case.. 9.25
Per set 11 Brace Bits, 3-8 to 8-8 in 16ths, in neat case.... 8.50
Per set 11 Machine Bits, 3-8 to 8-8 in 16ths, in neat case. 10.50
Per set 17 Brace Bits, 1-4 to 11-8 in 16ths, in neat case.. 14.50
Per set 17 Machine Bits, 1-4 to 11-8 in 16ths, in neat case. 17.50
Sets of 17 do not contain 1 3-16 and 1 5-16 in. sizes.

[illegible] Brace Bits

Assorted lengths and widths, price, per dozen..... $2.00

Copper Products.—The market for Copper and Brass materials is still stagnant, although some improvement is noticeable, due possibly to the various lower base prices made at intervals in the last two weeks. The latest changes are Sheet Copper, 17 cents, base; Copper Bottoms, Pits and Flats, 21 cents, base, made February 27. Soldering Coppers in 300-lb. lots and over were reduced to 19 cents, base; Sheet Brass, 14¼ cents, base; Brass Wire, 15¾ cents, base; Brass Rods, 14½ cents, base, and Brazed Brass Tubing, 20¾ cents, base, on February 24. Shortly before these changes Bare Copper Wire declined to 14½ cents, base; Seamless Copper Tubes to 21 cents, base, and Seamless Brass Tubes to 18 cents, base. The ordinary price on Copper Rivets and Bars is 50 and 10 and 7½ per cent. discount from list, and Copper Bars only 30 and 5 per cent. discount.

Axes.—Manufacturers have been unusually backward in making quotations on Axes for the season opening, but business is now being actively solicited from the larger trade, and the price may be said to be established on about the same basis as a year ago. Axes have not moved well on account of the open winter, as well as the difficulty in financing lumbering operations, and stocks in the hands of the trade are said to be unusually large for this time of year.

Sash Weights.—In a few sections quotations on Sash Weights are irregular, but taking the country as a whole the market shows some improvement, due perhaps to the stiffening up of Scrap, which has recently advanced about $1 per ton. Stocks of Weights in the hands of the trade are said to be very light, and with any improvement in building operations it is believed that good orders will have to be placed.

Stove Boards.—A new price-list and discount sheet has been issued by the leading interest in the manufacture of Stove Boards. The list represents an important advance, but this is largely counteracted by the change in discount, which is, of course, decidedly higher.

Sandpaper.—Sandpaper manufacturers are unusually busy, considering the dullness in other lines. The market is characterized by steadiness and regularity. Interests formerly acting independently are now maintaining established prices.

Window Glass.—It is now estimated that hand-operating Glass factories with a total capacity of about 1400 pots are in a condition to make Glass, but that considerably less than a normal output is being made. It is calculated that the demand for Glass is only about one-third of what is usually expected at this season. The largest producer of machine made Glass is understood to have claimed that it is able to sell all the Glass it is producing, and while this statement may not be questioned, it is undeniably a fact that demand from factory for both kinds of Glass is comparatively small. Local demand is also exceedingly light. The minimum prices recommended by the Eastern Window Glass Jobbers' Association are as follows: Single strength, 90 and 25 per cent.; double strength, 90 and 30 per cent. discount from jobbers' list. These prices are, however, not closely adhered to.

White Lead in Oil.—The demand for White Lead in Oil continues limited, but is regarded as about normal for the season. Buyers are pursuing a conservative course owing to the uncertainty of the liberality with which customers will order later. Stocks in merchants' hands are regarded as being somewhat low, and with the possibility of an increased demand the market holds firm at former prices. Quotations for the best brands are on the basis of 6¾ to 7¼ cents per pound, according to quantity.

Linseed Oil.—The demand at this point is confined almost entirely to small lots. There appears to be no inducement to even large consumers to buy beyond their immediate requirements. Local quotations are as follows: In five-barrel lots, State and Western Raw, 41 to 42 cents; City Raw, 43 to 44 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—Demand is light and of a hand to mouth character. The belief that the new crop will bring about lower prices is having some effect upon buyers. The Savannah market is steady and prices at this point as a result are about 2 cents per gallon higher than a week ago. The New York market is represented by the following quotations: Oil Barrels, 53 to 53½ cents; Machine Made Barrels, 53½ to 54 cents.

J. L. Osgood.—J. L. Osgood, Buffalo, N. Y., announces the following list prices on Osgood's patent Indestructible File and Tool Handles:

Per gross.		Per gross.
No. 1	$8.00	No. 4 $9.50
No. 2	8.50	No. 5 10.00
No. 3	9.00	

On less than gross lots assorted, these Handles are sold at net list prices; on 1 to 10 gross lots, however, there is a quantity discount of 10 per cent.

Hickory Handles.—A new price-list on Hickory Handles for Axes, Picks, Sledges, &c., has lately been sent out, under date of February 1. It represents a revision of prices, so that all classes of Handles can be sold at the same discount, and has been adopted by all leading manufacturers. Grades are to be according to standards adopted by the Hickory Handle Manufacturers' Association, September 10, 1904. Following is the list, in which manufacturers mention a discount to the retail trade of 70 per cent.

Turned Hickory Axe Handles.
Market and N. N. Y. Patterns.

Axle Handles:	Extra.	Excit.	No. 1.	No. 2.	No. 3.
36, 34, 32 and 30 in., per doz	9.80	7.60	4.90	3.70	2.90
Boys' 28 and 26 in., per doz	6.80	5.80	3.90	2.80	...
38-in., single and double bit, per doz.	10.70	8.30	5.60	4.10	3.20
40-in., single and double bit, per doz.	11.80	9.40	5.90	4.30	3.50
42-in., single and double bit, per doz.	12.80	10.00	6.40	4.50	3.60
44-in., single and double bit, per doz.	14.40	11.00	7.00	5.00	3.80
Straight 30 to **36** in., per doz	9.80	7.60	4.80	3.50	2.80
Double bitted, 30 to **36** in., per doz.	9.80	7.60	4.90	3.20	2.80

Hand Shaved Hickory Axe Handles.

Octagon and Oval Hand Shaved, single and double bit. Axle Handles:	XXX	XX	X
36, 34, 32 and 30 in., plain end, per doz	10.80	8.60	6.50
38-in., plain end, per doz	11.40	9.10	7.00
40-in., plain end, per doz	12.70	10.10	7.70
42-in., plain end, per doz	14.20	11.50	8.60
44-in., plain end, per doz	15.60	12.50	9.60
36 and 34 in., scroll end, per doz	11.50	9.40	7.20
36-in., Straight Lumberman's, per doz	10.80	8.60	6.50
38-in., Straight Lumberman's, per doz	11.40	9.10	7.00
Broad Axe Handles, per doz			$8.60

	Extra.	Excir.	No. 1.	No. 2.
Adze, House Carpenter, Ship and R. R., 36, **34** and 32 in	10.10	8.60	5.60	3.90
Post Maul Handles, 30-36 in	8.20	7.00	4.90	3.50

Turned Hickory Pick Handles.
Surface or R. R., Mattock and Miners'.

Pick Handles:	Extra.	Excir.	No. 1.	No. 2.	No. 3.
Surface or R. R., 36-in., per doz	11.50	9.10	7.70	4.40	3.70
Drifting, 32, **34** and 36 in., per doz	9.80	5.80	4.90	...	...
Poll, 32, **34** and 36 in., per doz	9.80	5.80	4.90	...	...
Coal Miners' Small Eye, 3 x ⅝, 34, per doz	7.90	6.20	3.60	...	...
Coal Miners', Medium Eye, 3 x ¾, 34, per doz	7.90	6.20	3.60	...	...
Coal Miners', Large Eye, 3½ x ⅞, 34, per doz	7.90	6.20	3.60	...	...
Grub Hoe Handles, 36-in., per doz	11.50	9.10	7.70	4.40	3.70

Hand Shaved Pick, add 80 cents per dozen to above prices.

Turned Sledge, Tool and Maul Handles.

Sledge, Tool or Maul. Length.	24-in.	28 in.	32 in.	36 in.	38-in.	40-in.	42-in.
Extra, per doz	4.00	5.00	5.60	6.70	7.20	7.80	8.40
No. 1, per doz	2.80	3.20	3.70	4.60	4.80	5.00	5.60
No. 2, per doz	1.80	2.20	2.50	2.80	3.00	3.70	4.30

Hand Shaved Sledge, add 60 cents per dozen to above prices.

Turned Hammer and Hatchet Handles.

Length, inches.	11	12	13	14	15	16	17	18	19	20	22	24
Machinists' Hammer, per doz	1.60	1.60	1.60	1.60	1.60	1.75	1.75	2.00	2.25	2.25	2.50	2.80
Blacksmiths' Hammer, per doz	1.60	1.60	1.60	1.60	1.60	1.75	1.75	2.00	2.25	2.25	2.50	2.80
Riveting Hammer, per doz	1.60	1.60	1.60	1.60	1.60	1.75	1.75	2.00	2.25	2.25	2.50	2.80
Hammer, A. E. & R. E., per doz	..	1.60	1.60	1.70	1.70	...	...	...	...	...	...	...
Hatchet, Bread or Bench, per doz	..	...	...	...	...	1.90	2.00	2.25	2.80	2.80	...	...
Hatchet, Shingling, per doz	..	1.60	1.60	1.70	1.70	...	...	...	...	...	...	...

Second Growth Hand Shaved Axe Handles.

	30 to 36 in.	38 in.	40 in.	42 in.	44 in.
Single and double bit Octagon and Oval, Plain and Scroll End, per doz	12.00	13.00	16.30	17.80	19.20

Second Growth Pick and Adze Handles.

	30 in.	32 in.	34 in.	36 in.
Octagon and Oval.				
Drift Pick, per doz	12.00	12.00	12.00	12.00
Poll Pick, per doz	12.00	12.00	12.00	12.00
Coal Pick, per doz	10.60	10.60	10.60	10.60
R. R. Pick, per doz	...	...	...	13.90
Adze, R. R., Ship and Carpt., per doz.	...	12.00	12.00	12.00

Second Growth Sledge, Tool and Maul Handles.

Octagon and Oval.

	24 in.	28 & 30 in.	32 & 34 in.	36 in.	38 in.	40 in.	42 in.
Per dozen	5.30	6.50	7.00	7.90	8.90	9.60	10.60

Price-Lists, Circulars, Etc.

TUDOR MFG. COMPANY, Taunton, Mass.: Part Catalogue No. 4 referring to Bay State Wrenches and other tools.

UNITED STATES REGISTER COMPANY, Battle Creek, Mich.: Booklet, entitled "Catalogue House Competition," and advertising Jones' Registers and Ventilators.

GIFFORD-WOOD COMPANY, Arlington, Mass.: Illustrated catalogue covering an extensive line of Ice and Ice Cutting Tools and Machinery.

BUTLER BROS., Chicago, Minneapolis and St. Louis: Spring issue of "Our Drummer" catalogue, referring especially to seasonable lines and specialties, including Home Furnishing Goods, Bicycles, Fishing Tackle and outdoor Athletic Goods.

KELLY-HOW-THOMSON COMPANY, Duluth, Minn.: 1908 illustrated catalogue of Hickory Harness, Collars and Saddlery Hardware.

WABASH SCREEN DOOR COMPANY, Commercial National Bank Building, Chicago, Ill.: Catalogue, season 1908, devoted to Wabash Stove Boards.

SNELL MFG. COMPANY, Fiskdale, Mass.: Catalogue and price-list of Snell's Solid Center Auger, Car and Machine Bits, Ring Augers and Boring Machine Augers.

METAL STAMPING COMPANY, Jackson, Mich.: Catalogue illustrating cylinder shaped White Frost Refrigerators and Ice Chests in a variety of sizes.

AITCHISON PERFORATING COMPANY, 305 Dearborn street, Chicago, Ill.: Catalogue illustrating a large variety of Perforated Sheets. The company's dies cover over 600 sizes and shapes of perforations, and it is prepared to galvanize sheets after perforating them.

KEYSTONE MFG. COMPANY, Buffalo, N. Y.: Circular price-lists illustrating Drilling Post or "Old Man," Giant Reversible Ratchet, Socket Wrench and Railroad Track Wrench.

AMERICAN GAS MACHINE COMPANY, Albert Lea, Minn.: Catalogue No. 13, relating to the Hanson and American Lighting Systems, Cold Process Gas Machines, Hollow Wire Systems, Gasoline Lamps, &c.

J. STEVENS ARMS & TOOL COMPANY, Chicopee Falls, Mass.: Pamphlet illustrating the following Rifles: Little Scout, No. 14; Stevens-Maynard, Jr., No. 15; Crack Shot, No. 16; Favorite; Little Krag, No. 65; Ideal, No. 44, and Repeating Gallery, No. 80.

HARRINGTON & RICHARDSON ARMS COMPANY, Worcester, Mass.: An interesting pamphlet on the "Use and Abuse of the Revolver."

A. J. PHILLIPS COMPANY, Fenton, Mich.: Catalogue and price-list of custom made Fly Screens, including Door, Window and Porch Screens, covering all requirements.

A NEW [illegible] ware merchants in southern California. In every case the swindler purchased a Bed Pan, tendering in payment a check considerably in excess of the cost of the article. The nature of the purchase and the smooth explanation of the stranger were such as to disarm suspicion, and he got upward of $10 cash from each of three firms in one town on the same day. The victims show the right spirit in reporting the trick, in the hope of protecting the trade elsewhere.

THE JAMESTOWN EXPOSITION has awarded a gold medal to the J. Stevens Arms & Tool Company, Chicopee Falls, Mass., on the company's Stevens' Rifles, Pistols and Shotguns.

Second Growth Hatchet and Hammer Handles.

	Length. 12	13	14	15	16	17	18	19	20	22	24
Hatchet, Shingling, per doz	2.30	2.30	2.30	2.30	...	...	...	...	...	...	...
Hatchet, Broad or Bench, per doz	...	...	...	...	2.50	2.80	3.40	3.80	4.10	...	...
Machinists' Hammer, per doz	2.30	2.30	2.30	2.30	2.50	2.80	2.80	3.20	3.20	4.10	5.30
Blacksmiths' Hammer, per doz	2.30	2.30	2.30	2.30	2.50	2.80	2.80	3.20	3.20	4.10	5.30
Riveting Hammer, per doz	2.30	2.30	2.30	2.30	2.50	2.80	2.80	3.20	3.20	4.10	5.30
A. E. & R. E., per doz	2.30	2.30	2.30	2.30	...	...	...	...	...	...	...

New England Retail Hardware Association.

THE sixteenth annual convention of the New England Hardware Dealers' Association will be held next week, 11th and 12th inst., at the Hotel Vendome, Boston. On Wednesday a session of the Executive Committee will be held, and also a business session of the association, during which reports of officers and committees will be received. Thursday morning will be devoted to the Question Box, and addresses by W. P. Lewis, Huntingdon, Pa., on "Mutual Fire Insurance," and A. H. Abbe, New Britain, Conn., representing the National Retail Hardware Association. In the afternoon addresses are on the programme from S. A. Bigelow, Boston, ex-president of the National Hardware Association, on "Our Mutual interests"; by Hon. Lloyd E. Chamberlain, president Massachusetts State Board of Trade, on "Inland Water Ways"; by Louis D. Brandeis, on the proposed merger of the New Haven and Boston & Maine Railroad systems. The annual ladies' night reception, concert and banquet will be a feature of Thursday evening. Among those who are expected to address this gathering are Lieutenant-Governor Eben S. Draper of Hopedale, Hon. Louis A. Frothingham of Boston, R. W. Luce of Somerville, Representative Robert M. Washburn of Worcester, and the Rev. Charles A. Bidwell of Waverly. A special railroad rate of one and one-third fare has been arranged for on the certificate plan. The membership of the association now includes about 200 firms, and it is expected that the total attendance of members and their ladies and guests at the convention will be in the neighborhood of 350.

The National Meeting at St. Louis.

AT a meeting of the members of the Executive Committee of the National Retail Hardware Association held in St. Louis on the 28th and 29th ult., the Planters Hotel was selected as headquarters. An interesting programme has been prepared for the meeting, which will open on the 24th and continue until the 27th inst., two sessions, morning and afternoon, being held each day. All entertainment of delegates will be confined to the evenings, a theater party being given on Tuesday evening, a reception by the National officers and Executive Committee to delegates and the St. Louis Hardware trade and their ladies on Wednesday evening, and a banquet tendered to the association by St. Louis merchants and manufacturers on Thursday evening. A large representation of the trade is expected and all delegates from the State associations are urged to bring their wives with them, special provision being made for their entertainment during their stay in St. Louis.

Dahman and Quiring have succeeded Dahman & Grane, Newton, Kan., in the Shelf Hardware, Stove, Tinware and Agricultural Implement business.

The Post Office Appropriation Bill.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., March 3, 1908.

THE House Post Office Committee has reported the annual post office appropriation bill free and clear of all the objectionable parcel post and post check currency projects so strongly urged upon Congress by the Post Office Department. The bill is one of the most conservative post office budgets reported to the House during the past decade. Not only has the committee rejected the parcel post and kindred schemes, but it has refused to make the heavy increase in the salaries of rural carriers provided for in nearly a score of pending bills, and it has applied the pruning knife to the estimates for the extension of the rural service.

Even with this businesslike handling of the administrative problems presented to the committee the figures are stupendous, viewed from the taxpayer's standpoint. The bill carries a total of $220,765,392, or $9,675,624 less than the original estimates of the department. That the committee has not followed a cheese paring policy is evidenced by the fact that the amount carried by the bill exceeds the amount appropriated a year ago by $8,674,199, an increase of 4.09 per cent. This increase would be larger but for the fact that Congress a year ago raised the salaries of many postal employees, the increase carried by last year's bill being 10.65 per cent. over the total for the previous year.

The New Bill Carries the Enormous Sum

of $35,375,000 for the pay of rural carriers, and even this sum is $500,000 less than the estimate of the Post Office Department. The appropriation for the current fiscal year, made by Congress just a year ago, was $34,900,000, so that while the allotment for the coming fiscal year represents high water mark, it is only $473,000 larger than that made a year ago. It is difficult in view of these colossal figures to realize that the rural free delivery service was inaugurated but 11 years ago at an initial cost of $10,000. It was not until 1901 that the annual expenditure passed the $1,000,000 mark, but from that time on the growth was phenomenal, the appropriation leaping in a single year—1904 to 1905—from $12,640,000 to $20,819,000. The practical certainty that the growth of this service hereafter will be decidedly moderate has already been foreshadowed in this correspondence and it is highly significant that the increase for the coming fiscal year over the present year is less than that in any year since 1900.

For City Free Delivery Service.

The new bill carries but $26,650,000 for the city free delivery service, or about $9,000,000 less than the cost of rural free delivery. When it is remembered that the city service covers every city, town and village large enough to boast a free delivery and serves nearly one-half the population of the country, as compared with about 15 per cent. served by rural free delivery, the disproportionate cost of the two services becomes apparent. The city free delivery service was established in 1863 at a cost of $204,477 for the first year. Its growth has been very slow and for the 45 years since its establishment the annual gain has been little over $500,000, as against an annual increase of more than $3,000,000 in the rural free delivery.

It is the present plan of Chairman Overstreet of the Post Office Committee, to bring the appropriation bill before the House about the 10th inst. He anticipates that an effort will be made by the advocates of a parcel post to secure the adoption of an amendment incorporating the terms of the so-called Burnham bill drafted by the Postmaster-General and recently presented in the Senate. It is also probable that a second amendment, drawn on the lines of the Kean bill now pending in the Senate, will also be offered. The Burnham bill, it will be remembered, provides for a rural parcel post, while the Kean measure authorizes a reduction in the general merchandise rate from 16 to 12 cents per pound. Under the rules of the House unanimous consent is required to incorporate new legislation in an appropriation bill, and Mr. Overstreet is prepared to make a point of order against these amendments when offered. He will also resist any attempt to add a postal currency feature to the bill.

Postal Currency.

In connection with the proposition to authorize a postal currency, the promoters of that particular scheme are making special efforts to create the impression that the Joint Postal Commission, which recently reported to Congress upon the general conduct of the Post Office Department, indorsed the Hitchcock plan for the issuance of post check notes. The facts, however, do not bear out the statements. In connection with the detailed work of investigation, the Joint Commission employed two auditing companies, which in addition to compiling certain statistics presented a number of suggestions, including one to the effect that "the use of postal notes be adopted not to exceed $10 in amount, and that thereafter the number of money order offices be reduced by eliminating all those not issuing 500 money orders per annum." In support of this suggestion the auditing companies quoted from the last annual report of the Postmaster-General of the English postal service, showing the annual increase for a period of years of the postal notes used in Great Britain. The auditors thought it only fair, however, to state that "it should be remembered that in England there is no unit of paper currency of a less amount than £5 ($25)." The auditors gave no consideration whatever to the probable effect upon the business of the country of a postal currency, considering it merely from the Post Office Department's standpoint. Their conclusions were that the postal notes would probably take the place of money orders to a great extent, and might possibly result in a small economy to the postal service, for the reason that the proposed notes could be more easily issued and accounted for than the present money orders. These suggestions of the auditors were carefully considered by the Joint Commission, but were not regarded as sufficiently conclusive to warrant an indorsement, and the commission's report as submitted to both Houses contains no reference whatever to the subject of postal notes.

Significant Action Has Been Taken by the Senate

which should serve to draw attention sharply to the prospective campaign of the Post Office Department before the Senate Postal Committee. Upon the motion of Senator Burnham the Senate a day or two ago authorized the printing of 10,000 extra copies of the Post Master General's rural parcel post bill "for the use of the Post Office Department." The Senate has also passed a resolution submitted by Chairman Penrose of the Senate Post Office Committee providing for a series of hearings as follows:

Resolved, That the Committee on Post Offices and Post Roads be, and the same is hereby, authorized to employ a stenographer from time to time, as may be necessary, to report such hearings as may be had on bills or other matters pending before said committee, and to have the same printed for the use of the committee, and that such stenographer be paid out of the contingent fund of the Senate.

This resolution, it will be observed, does not specify the particular measures which are to be the subject of hearings before the Post Office Committee. It may be assumed that the first measure will be the annual Post Office Appropriation bill, but the committee has an extensive docket, prominent upon which are the Burnham and Kean bills. The committee has received requests for hearings on these bills, and in view of the resolution adopted by the Senate it is quite probable that they will be taken up as soon as the annual appropriation bill has been disposed of. The hearings will furnish an opportunity for the Postmaster-General to present to the committee a mass of material which he has been gathering for nearly a year and which represents the fruits of his campaign in advocacy of a parcel post. The Department has accumulated a considerable number of indorsements which may be applied to both the Burnham and Kean bills, and which, carefully segregated from the great mass of communications condemning both propositions, will make quite an impressive showing.

Merchants in the Hardware and other trades will

hardly need the suggestion that they must be prepared to meet the officials of the Post Office Department on their own ground before the Senate Committee if hearings are granted on the Burnham and Kean bills, as now seems likely. They should not only be able to show the fallacies in the projects themselves, but should be in position to inform the committee as to the manner in which the indorsements thereof have been secured.

AUSTRALIAN NOTES.

FROM A SPECIAL CORRESPONDENT.

AUSTRALIAN trade during 1907 showed a healthy general expansion as compared with preceding years. The purchasing power of the community was considerably increased as the result of the good returns from the 1906-'07 season, and importers and manufacturers have had a really good year. While the import returns are not yet available, it is estimated by competent authorities that the value of imports in 1907 will be found to have totalled £48,000,000. Imports in 1906 were £42,500,000, and in 1905 about £37,000,000, so progress is clearly marked.

While volume of turnover thus stamps 1907 as a big year it does not follow that profits, though undoubtedly good, have been correspondingly great. Twelve months ago metal goods were materially affected by the dearness of raw materials and the difficulty of placing orders for quick delivery. The Australian market at that time did not respond to the higher prices, being well stocked with lines earlier at lower rates. This market responds much more quickly to a decline in costs, and now that American competition is helping to bring down English and German prices, importers will have to face the problem of falling prices, in spite of the fact that they did not get the full benefit of the former increases.

The Outlook for the Coming Year

is fairly good. Of course the weather is the chief factor in considering Australian productiveness, and the rains have not, of late, been in sufficient quantity, or of sufficient regularity to insure best results. While this season's (1907-'08) wheat production will fall below last year's in volume, the higher price ruling in the Northern Hemisphere on account of poor local harvests will go some way toward balancing our loss in volume. Wool will also show a decrease in quantity this season, and the fall in other metals than gold is affecting some of our workers. None the less the outlook is for a good, average year, with the probability of something even better.

New Zealand's Progress.

New Zealand has just issued her 1907 official Year Book, telling an enthusiastic story of progress. The Dominion, with its population of 910,000 whites and about 50,000 Maoris, is industrially energetic. Taking its import trade it is worthy of note that, while imports from America in 1901 were valued at £1,415,260, imports in 1906 were £10,000 less. By contrast, Germany sent £139,000 worth more to New Zealand in 1906 than in 1901. As illustrating the growth of New Zealand export trade in various lines, her frozen meat trade has grown in 10 years from £1,252,000 to £2,877,000. The butter trade from £281,000 to £1,560,000, and the export of wool from £4,392,000 to £6,765,000.

While New Zealand is carrying a heavier national debt (£61,000,000) than any of these Australian States, her progressive social experiments can well account for the money. With 128,000 freeholders settled on her land, with advances to workers, settlers, &c., with a capital value of £236,000,000 on the land itself, and a State railroad earning 3½ per cent. on capital cost, there need be little fear of a debt scare. It's a hustling, energetic little country, and well worthy the close attention of America's exporters.

The Commonwealth Customs Tariff now awaits only revision by the Upper House, the Federal Senate. Meantime, the new duties are being collected. They are, on the whole, a shade lower than the schedule recently published in *The Iron Age*.

The New South Wales Hardware Assistants, following the example of their Victorian neighbors, have formed an association, with rooms at 482 George street, Sydney.

The building trade throughout the States is more than ordinarily good. While public buildings, &c., are no doubt necessary, there is a strong danger of overbuilding private residences, and the boom at present existing must fall off soon.

HONESTY IN ADVERTISING.

FOR some time men who are deeply interested in the general proposition of advertising have been endeavoring to bring about some measure to compel honesty in advertising statements. They have found a supporter in the person of Congressman Coudrey of St. Louis, who is about to introduce a bill in Congress. This fact is of interest to retail merchants because of the effect such a law would have upon the large mail order houses.

The proposed bill provides against any person, firm or corporation in the United States printing, using, circulating, displaying or transporting any fraudulent, false or misleading advertisement. Each violation is to be punishable by a fine of not less than $100, the precise amount being left to the discretion of the court. Each day the offense is continued it will be considered as a separate offense.

Among the Kinds of Advertisements That Will Be Prohibited

under the proposed law are those of damaged goods sales, fire sales, bankrupt sales and the like, where merchandise that has not been damaged is offered as a part of such stock; advertisements stating present or former worth in excess of recognized trade standards of such selling, or where articles are represented as worth more than the prices at which they were sold in the regular course of business to a number of persons within the previous 18 months; advertisements where the articles offered are seconds or inferior quality, and this fact not disclosed in the wording of the announcement; advertisements which represent merchandise to be other than as stated on labels or other markings on the merchandise; advertisements describing any article as of one material or substance only, when it is a combination of two or more materials or substances, especially when the additional substance is used to cheapen the article; advertisements containing statements as of fact, when it is a matter of opinion, unless clearly stated as opinion, as where the words "the best in the world" are used; advertisements in which are so-called guarantees or promise of guarantee of future increase in the value of merchandise or other commodity.

The bill also covers very fully objectionable advertisements of stocks, real estate, patent medicines, cures for disease, fortune tellers, &c., especially where any guarantee is made.

The Sweet of the Maple.

BY CLARFIELD.

The day of the maple is near at hand,
When out in the "bush" the fires will gleam,
And farmer and helper throughout the land
Will be busy with spigot and bucket and team.

It's pails they'll need, and kettle and can
To catch and to cook the sparkling sap,
That God made the maple to give to man,
As it drips day and night from each little tap.

Oh, the joy of a day in the maple grove,
'Neath trees grown tall and stately and old;
In summer they shelter the bird and the drove,
Where in dim past day roamed savage bold.

With woolen mittens and an old fur hat,
In the mountain air so clear and cold;
Oh, where is the man so hardened that
He feels no longing when this story's told?

SO, MISTER HARDWARE MAN, WATCH OUT,
AND CAREFULLY LAY YOUR BUSINESS PLANS,
FOR THE FARMER AND HIS HELPER ARE NOW ABOUT
LOOKING FOR THE PAILS AND THE KETTLE AND CANS!

Missouri Retail Hardware Association.

AMONG distinctive features of the eleventh annual meeting of the Missouri Association, at St. Louis on the 27th and 28th ult., that will be recalled by every member present, none will be remembered with more genuine pleasure than the presence and participation of President Miles, First and Second Vice-Presidents Stebbins and Williams, Treasurer McNamara and Secretary Corey of the national organization, who were all present at the concluding sessions on Friday and took a conspicuous part in the proceedings.

The sessions were held at the Mercantile Club, and considerable credit must be given the officers of the State organization for crowding so much good convention material into two days. As a result of the gathering new life has been infused into the association, and a notable



O. W. JOHNSON.

growth in membership and influence is looked for during the ensuing year.

The address of President Hahn was a frank, cordial expression of welcome, and a business outline of what the association is, was and hopes to be. Mr. Hahn made the point that exhibits had been omitted in connection with the convention because St. Louis was "one big display of Hardware in every conceivable form," and delegates had courteous, educated guides in great numbers from the big houses of the Simmons Hardware Company, Norvell-Shapleigh Hardware Company, Witte Hardware Company and others to show them anything made in the shape of Hardware, and at "headquarters."

Convention Committees.

The convention committees, as designated by President Hahn, were as follows:

RESOLUTIONS: R. D. Quisenberry, Slater; G. A. Pauley, St. Louis; M. A. Wengert, Kansas City.

PRESS: F. D. Kansteiner, St. Louis: F. P. Hauss, St. Louis.

AUDITING: W. T. Shoop, Richmond; O. W. Johnson, Marshall; Taylor Frier, Louisiana.

NOMINATIONS: M. C. Post, Brookfield; John T. Cochran, Breckenridge; August C. Albers, Florissant.

Secretary's Report.

Secretary Kansteiner in his report noted some of the difficulties that beset the work of the officers through illness and other disadvantages, and the condition of affairs when he took hold a few weeks before the convention. He recommended some changes in the by-laws, which matter came up later and the desired alterations made and said that he had sent out nearly 5000 letters since January 1. Among the results were 20 new members, besides retention within the fold of all the old ones. There was also a nice balance on hand in the treasury.

Question Box.

Thursday afternoon was given over largely to the Question Box, and under the leadership of Vice-President M. A. Wengert of Kansas City, proved one of the most interesting features of the convention. Sixteen pertinent queries were printed in the official souvenir and notice was given that they would be threshed out by the members.

Most of the members present believed that the price, artistically and strikingly displayed in a show window, was a powerful magnet for attracting a customer. President-elect Johnson believed the price should be named in newspaper advertising of goods, and so did many others, although there were a few who averred that price should never be mentioned, particularly in advertisements of stores in the smaller towns.

The concensus of opinion was that the handling of Mixed Paints was a good business practice for Hardware merchants, and that notwithstanding occasional fierce competition it was a good standard line.

The encouragement of clerks to read and post up on articles and illustrations and hints in the trade journals was given as the best method to educate clerks along the lines of merit and adaptability of the goods they were employed to sell.

It was generally believed to be a good thing to display a line of 5 and 10 cent goods, if there is available room in the store. The ladies find much to interest them in these counters, and their visits develops trade in other goods.

President Miles' Address.

S. R. Miles, president of the National Association, referred to the work of that body, told of the big meeting in Ohio, which he had just come from; recited the benefits to be derived from the Question Box features, and having an interruption from a member, who asked, "How can we secure larger attendance at our meetings," gave an outline of the splendid accomplishments along that line by associations which had made the Hardware mutual fire insurance organizations a factor in their association life.

"The big associations," said President Miles, "have all been built up largely through their co-operation with the Hardware insurance organizations. Keep in touch with the work of the national and other State organizations. Read your trade journals; learn how others do it; go after members the same as you would handle an especially serious feature of your business; select and keep an aggressive enthusiastic secretary; see that your nonaffiliated competitor in your town gets an invitation



F. D. KANSTEINER.



WM. H. HAHN.

to join the association, and realize that the upbuilding of the Hardware trade in your town through co-operation of everybody interested in it in a retail way is the surest method of increasing your own business and your own future happiness.

President Miles referred to the record made by the North Dakota Association, and said that 85 per cent. of the retail Hardware merchants in that State were members of the organization. "If you will work along the lines I have indicated, you should have 500 of the 1200 merchants in your State as members at the time of your next annual meeting."

He made a strong plea for the spirit of forebearance; toleration of the competitor, and finally a communion of interests that would put the Hardware business of the

towns on a plane of importance second to none in the category of retailing. In conclusion the speaker said:

"You cannot afford to stop your trade journal; that would be a typical false economy. It is one of your best investments. Put it where your clerks can read it; can study it. Post up on what the most progressive in your line are doing. Realize that your profession is one of the standard occupations in the world of retailing; live up to the best ideals; appreciate what a power you are in the land, the national organization now having 12,000 members against 10,000 a year ago. Realize what this great army which is gaining strength and influence yearly can do."

Addresses by Other National Officers.

A. T. Stebbins, first vice-president of the National organization, is a good story teller. He has a strong, resonant voice, and is full of Minnesota, his native State, which he noted was a pioneer in the Retail Hardware Association work. He said that keeping intact the retail Hardware business of the smaller towns, could be best subserved by becoming faithful members of the State retail Hardware organization. He explained the workings of the Minnesota State Hardware Fire Insurance Company, and suggested certain lines of conduct in working up memberships through the instrumentality of these mutual fire insurance associations.

Second Vice-President Charles H. Williams recalled the trials and tribulations of the Illinois Association during their early meetings, and noted that the association is now at the head of the list with more than 1200 members. He said the factors in this success were a good secretary, strong mutual insurance features and regular attendance at the annual meetings. "A good State Association," he said, "is one made up of members, each of whom can see in dollars and cents money coming back to him paid out in dues."

National Secretary Corey read some letters from Missouri dealers who apparently had a misunderstanding of the intents and purposes of the State organization. He outlined the trouble and suggested the remedy. He argued for a stronger and clearer insight into political life and participation to the extent of being an influence when inimical legislation was threatened. Touching on threatened Parcel Post legislation he said he believed that nothing would be done at this session of Congress, but feared that the question was a very menacing one for the future.

H. L. McNamara, national treasurer, said his excuse for being in the big company was that he had been brought along merely as "a filler," which, considering his position, was felt to be sufficiently clear. As an encouragement for the Missouri Membership Committee, he told of what had been done in Wisconsin, where, out of a possible 950, the organization claims 643 members. He attributed their success largely to the insurance feature, making the point that members could pay their traveling and other expenses in attendance upon conventions out of the return premiums on their insurance.

Address of W. D. Simmons.

W. D. Simmons, president of the Simmons Hardware Company, in a short informal talk, after expressing his appreciation of the courtesy of putting him out of his turn in order to enable him to say a word of welcome and at the same time keep his engagement at court, spoke of the tiresome 10 days he had spent waiting to be called as a witness and of the comparative rush and drive of the Hardware business even under present conditions, by comparison with the procedure of the average court.

He then referred to the present conditions, the new elements which were of great moment, particularly among commercial people and to the importance to every merchant, whether his business be large or small, of making a careful study and forming his own plans to conform with the tide as it rises and falls, rather than attempt to ignore it and be swept away by it.

Mr. Simmons spoke of the pleasure of the local jobbers in having the merchants come to St. Louis to confer with them, exchange ideas and get the benefit that should come from such contact. He then went on to give reasons why he was glad to have these merchants visit St. Louis and to see its progress in both local and national affairs, calling attention to the fact that the men who were prominent in the Hardware business of St. Louis were also prominent in its progressive work, speaking with particular appreciation and commendation of the services of Mr. Norvell as a member of the City Council and of Messrs Smith and Witte of the Business Men's League especially, in connection with the effective work of that organization in the development of the great internal waterways' movement.

He referred to the frequency with which Hardware merchants were found to be leaders in all progressive movements, and was glad to be able to point out to the visiting Hardwaremen that St. Louis was no exception to that rule.

Mr. Simmons then extended to the visitors, in the name of all the merchants of the city, a cordial invitation to visit their respective business establishments, become acquainted with the people who are handling their orders and to learn from close personal contact that they were earnestly and conscientiously endeavoring to serve them faithfully with the hope of increasing, through such visits, the elements of good cheer, good will and good fellowship which should characterize any business relations based largely upon confidence.

MR. NORVELL'S ADDRESS.

S. Norvell, Norvell-Shapleigh Hardware Company, delivered a very interesting address, in which emphasis was laid on St. Louis as a Hardware market. He spoke, in part, as follows:

St. Louis is the leading Hardware market not only in the United States, but in the world. The statistics compiled by the Business Men's League indicate that $40,000,000 of Shelf Hardware, Heavy Hardware, Metals and Railway Supplies are sold by this city annually.

The Shelf Hardware and Heavy Hardware jobbers have a capital invested in their business amounting to $12,000,000. An army of more than 750 traveling salesmen represent this city in the Hardware line.

St. Louis not only sells Hardware in every State and Territory in the United States, but in almost every civilized country in the world. In one mail this week I noticed a complete new stock order from a dealer in Wisconsin. This new stock will be shipped through the city of Chicago; also a mail order for a good, round quantity of goods from a first-class Hardware dealer in Vermont. And another order for Hardware from a dealer in the Republic of Costa Rica.

St. Louis has set the pace for the Hardware trade of this country for more than a generation. Twenty-five years ago Philadelphia and Cincinnati jobbers sold goods west of the Mississippi River. Where are their salesmen now? St. Louis has not only held its own territory in the Hardware line, but it has invaded the territories of all other cities in this country.

What Is the Secret Cause of the Greatness

of St. Louis in the Hardware line? Let me answer—two things—men and ideas. We hear of different schools of art. St. Louis established a school of Hardware. The dean of that school is E. C. Simmons. I am sorry he is not here to talk to you to-day. Mr. Simmons is the great Hardwareman of this country. He blazed the trail where others followed. He was not only bold and courageous to conceive new ideas, but he was quick and indefatigable in carrying them out. He surrounded himself with a group of remarkable men. I will call them the "old guard." Many of the older men within the sound of my voice know John E. Pilcher, Henry M. Meier, Charles D. Smiley, Frank N. Johnson, R. H. Stockton, Frank Wyman, J. E. Smith. A generation ago these men, with their gripsacks in one hand and their catalogue in the other went into the wilderness and sold Hardware from this city. When the railroads stopped they went by stage, and at the end of the stage they went on horseback carrying their samples in pack saddles.

These were real men. They were not mollycoddles. Mr. Pilcher is now a wealthy manufacturer. Mr. Smiley has retired from business. Mr. Meier is a capitalist. Mr. Stockton is president of the Majestic Mfg. Company. Mr. Wyman is postmaster of St. Louis. Mr. Smith is not only one of the vice-presidents of Simmons Hardware Company, but is also president of the Business Men's League. I speak of these men because it was my good fortune to have been associated with them.

Other Houses.

At the same time they were working for the Hardware trade of St. Louis, there were other houses spreading the fame of this city in the Hardware line. A. F. Shapleigh

established the Hardware house of that name in 1843. He brought out the "Diamond Edge" brand in 1864, and from the best information I have I believe this is the first special brand to be placed on the market. Associated with Mr. Shapleigh was Mr. Cantwell, now passed into the great beyond—a man who was famed among all the Hardware trade for his knowledge of the business.

Then the Witte Hardware Company has done its part. A house that has always done a careful and conservative business, and that has always been very popular with the trade.

Association Work.

Now let me say a few words on the subject of Associations and Association Work: The main object of all associations should be educational. That fact is sometimes forgotten. I have been to many association meetings. The troubles of the trade are sometimes given undue prominence. You would think from what you hear at some of these meetings that nobody except the Hardware dealers have any troubles.

Some months ago I went to a grocery association meeting. When I listened to all their troubles I made up my mind we were better off in the Hardware business.

Then I went to the banquet of the Paint, Drug and Oil Club of St. Louis. There I heard them complaining because the retail Hardware dealer was taking the Paint business away from the drug store. They wanted to know by what right the retail Hardware dealer did this. Somebody intimated that a Paint house that sold a Hardware house should be boycotted.

Not long ago I had a talk with some Sporting Goods dealers. They complained of the fact that the retail Hardware trade had killed the Sporting Goods business. They called attention to the fact that where the country formerly had a gunsmith with his shop in almost every good size town, now the gunsmith and the exclusive Sporting Goods dealer was almost a thing of the past. They blamed the retail Hardware stores.

Now I suppose at this meeting, as at other meetings, the retail Hardware dealers will complain of the department stores. I suggest before you call attention to the mote in your brother's eye you note the beam in your own. Let us be frank with each other: Has not the Hardware jobber annexed almost any line he pleased, and is it not also true that the retail Hardware dealers, especially those who have been most successful, have also annexed almost everything except groceries and dry goods?

Jobber Also Has Troubles.

Let me tell you, when you are considering your own troubles, that the jobber also has his troubles. A manufacturer from whom we buy $100,000 worth of goods per annum comes to St. Louis and sells our retail customers. He goes out into all the large towns in the country and sells our customers. When we complain he answers, "if we did not do it some other manufacturer would."

A manufacturer who decides to protect the jobber arranges a protection of 10 per cent. That is, the differential between the jobber's price and the price to the retail dealer is just 10 per cent. Some manufacturers do not seem to realize it costs jobbers anything to do business.

Then we have the manufacturer who sells goods to wholesale grocery houses, such as Nails, Rope, Tinware and many other items in the Hardware line.

The country is flooded with a horde of special salesmen from manufacturers selling Cutlery, Builders' Hardware and other lines of goods that are profitable.

Often when we analyze the business of some of our good retail customers we find we are getting the "skimmed milk"—the staple goods—while these special men from the manufacturers are getting the "cream" of the business. The jobber cannot live by staple goods alone.

Selling Ability Necessary.

Let me say that in my opinion what the retail dealer most needs is selling ability. You cannot sit in your store and build up a business. Get somebody to do your bookkeeping and detail work for you, and you yourself get out among your customers, see what they need and what you can sell them.

Here is a dealer with two or three Sewing Machines on his floor. He waits for a customer. Then a Sewing Machine agent comes into his community and sells 40 or 50 Sewing Machines under the merchant's nose.

Here is a dealer with four or five Steel Ranges on his floor waiting for customers. Then along come the Steel Range men, work the county, and clean up the business.

Then there are the Lightning Rod men, and all the other special men who work the farmers direct.

You cannot compete with these people by legislation. The only way for the retail Hardware dealer to hold his own is to learn how to sell Steel Ranges, Sewing Machines and other special lines. You must become a salesman, and then you can hold your own against this class of competition.

Resolutions.

The resolutions offered by the Committee on Resolutions returned thanks to the St. Louis members, the Mercantile Club, the daily and trade press and the various speakers, particularly the national officers. The association also put itself on record as opposed to the passage of a parcel post measure and asked for the co-operation of all similar bodies for its defeat.

Election of Officers.

The officers selected for the ensuing year are as follows:

PRESIDENT, O. W. Johnson, Marshall.
VICE-PRESIDENT, R. H. Myers, St. Louis.
SECRETARY-TREASURER, F. D. Kansteiner, St. Louis.
DELEGATES TO THE NATIONAL MEETING: The president, secretary, and G. A. Pauly, St. Louis.
ALTERNATES: J. G. Weber, Clayton; W. T. Shoop, Richmond; M. A. Wengert, Kansas City.
EXECUTIVE COMMITTEE: R. D. Quisenberry, Slater; W. T. Shoop, Richmond; Taylor Frier, Louisiana.

Banquet at the Mercantile Club.

The especially enjoyable incident of the convention's social side was the smoker that brought members and other visitors together in the big banquet room of the Mercantile Club on Thursday evening. At the guest table were seated National and State officers, together with those of the local association, as well as several prominent jobbers and manufacturers. The affair was delightful in its informality; R. H. Myers was the efficient toastmaster. Among those who made addresses were Saunders Norvell, Norvell-Shapleigh Hardware Company; J. E. Smith, Simmons Hardware Company; Secretary Corey of the National Association; H. J. Gordon, Norvell-Shapleigh Company; R. A. Pendleton, Witte Hardware Company; F. B. Hauss, the veteran traveling representative of the Charter Oak Stove & Range Company; H. V. Kent, Kent & Purdy Paint Company; Mr. Magill, American Steel & Wire Company, and W. H. Chase, Murphy Varnish Company.

Convention Notes.

St. Louis was selected as the place of meeting for the 1909 convention. It was felt that the strong attractions of St. Louis as a jobbing and manufacturing center made it an ideal visiting place for the country retailer.

Secretary Kansteiner was congratulated on his original and striking tag sent to members announcing the eleventh convention. It reads: "Say, tie this to your finger, as a reminder to come to the Missouri Retail Hardware Dealers' convention at St. Louis, February 27-28." A classic drawing of a hand and pointing finger contributed to the effectiveness of the design.

Among the diversions of the convention the courtesies afforded members and visitors at the plants of the Charter Oak Stove & Range Company, the Buck's Stove & Range Company, the Bridge & Beach Mfg. Company, the big stores and warehouses of the Simmons, Norvell-Shapleigh and Witte companies, were very greatly enjoyed by the members.

Very interesting and instructive addresses were also made by O. H. Green of the National Lead Company on "White Lead," and H. V. Kent of the Kent & Purdy Paint Company, St. Louis, on "Pure Paint."

Models for Window Displays,

J. WISS & SONS COMPANY, Newark, N. J., manufacturer of Shears, Scissors, Razors, &c., has devised an original plan for the assistance of retail merchants in increasing their sales of its line. The idea relates to window displays, and would seem to be a practical and efficient method of co-operating with the trade. Photographs have been prepared of ten or a dozen different displays, which, while not too large or complicated for use in the average Hardware store, are none the less attractive and well arranged. The company is ready to furnish these illustrations to its customers as models for displays to be installed in their windows, and but little time and trouble will be required to use them with satisfactory results. This plan is to be employed in connection with the liberal use of space in general periodicals, any direct returns from which will be referred to local merchants.

The Hardware store and stock of P. W. Kempster, Prophetstown, Ill., have been totally destroyed by fire.

Minnesota Retail Hardware Association.

THE Minnesota Retail Hardware Association concluded its four days' session of the twelfth annual convention Friday afternoon, February 28, in good season for members, exhibitors and other visitors to leave by the evening trains. It was the consensus of opinion that in many respects this meeting was the most successful, satisfactory and productive of good results in the entire series so far.

This association having in attendance perhaps 700 members is believed to rank in numbers immediately after Illinois and Ohio, and the large membership roll of Illinois is attributed indirectly to the fire insurance facilities



A. MARCKEL.



E. H. HEINS.

afforded by the Minnesota Company, the pioneer mutual insurance company under such auspices in the United States, a prerequisite to participation in its benefits being membership in the State Hardware association in which the fire risk is located. Naturally the good results accomplished in the field of insurance by this organization has augmented the placing of insurance in this company, and obviously has in a measure served to lead retail Hardwaremen into whichever State organization they must necessarily belong to obtain such insurance.

It was apparent from the start that members and officials alike had clear cut ideas of what they were assembled for and what they wished to accomplish. The proceedings from session to session as they occurred revealed to the observer that the ante-convention work had been well planned. An unmistakable evidence of this was the relation of the Hardware exhibition to the real convention work. At some of the conventions in the past such exhibits have operated to divide the interest, and even make it difficult to get members into the meetings. Here it was the reverse.

The original determination was to have the annual meeting in Minneapolis, but great difficulty was experienced in obtaining a suitable place that would accommodate both the convention and exhibition, except at prohibitory prices, and this made it necessary for the executive officers to select St. Paul within two months of the convention date. The fine new St. Paul Auditorium, recently built by popular subscription at a cost of $435,000, was secured at a nominal rate. It then developed that some manufacturers as well as jobbers were averse to participating on account of the consequent cost incidental to exhibiting at all the numerous State conventions. Being committed to the project the officers, with proverbial Western enterprise, perfected their arrangements, plotted the area, determined rates and in various ways communicated with possible exhibitors so successfully that before the doors were open every space was rented. There was some doubling up, and more area could have been rented had there been room.

The Auditorium is approximately 300 ft. long and 185 ft. wide, having an aggregate seating capacity of 8500. It is so built that the entire space can be thrown into one convention hall or divided in two parts, but in this instance one portion was reserved for exhibitions, and the other, on practically the same level, separated by a drop curtain, was utilized for the sessions of the convention. The association, by its effective and intelligent control of both the convention work and displays, arranged the programme so that members could visit the booths from about 10 o'clock a.m. each day uninterruptedly until the meetings in the afternoon at about 2.15 o'clock. As soon as the meetings adjourned, about three hours later, the exhibits were again opened to the members, and so continued until about 10.30 each night.

The entire programme of entertainment was planned to be given on a large improvised stage in the exhibition hall, commencing at 8 o'clock and lasting the entire evening. These entertainments included instrumetal music by two symphony orchestras of 25 musicians each, one of which was composed of women and the other of men, playing on different evenings; a male quartette, wrestling bouts, tumbling acts, club swinging, clog dancing and other vaudeville features wholesome in character.

Mutual Fire Insurance.

The Thursday afternoon session was under the direction of the officers of the Fire Insurance Company, Charles F. Ladner, its president, in the chair, this being in fact the annual meeting. The reports of the secretary and treasurer showed that there was a surplus of approximately $120,000 available at the close of last year's business, with a rebate to insured members equivalent to 50 per cent. of premiums paid. Where reinsurance is effected this rebate remains in the treasury, the applicant for insurance merely remitting the remaining portion of the determined premium. Where insurance lapses for any cause the beneficiary receives the entire rebate of 50 per cent. in cash.

In this connection it may be said, the question of State taxation on premiums paid was brought up. The point made was that taxes now were paid on the gross premiums, when rightfully they were due only on the amount of premiums actually retained as such and not returned later as rebates resulting from a more economical conduct of the business. This matter was assigned to a proper committee for action.

An exceedingly instructive and able address on insur-



M. S. MATHEWS.



ance was delivered extemporaneously by John A. Hartigan, Insurance Commissioner of Minnesota, in which he gave much valuable information on the subject of insurance, how to maintain better inspections and minimize risks. He congratulated the officers of the insurance company heartily on their sound business methods and on the company's prosperous condition. While the speaker hesitated to volunteer advice, he did say that in relation to a proposed change in the by-laws, having for its purpose the raising of the limit of insurance from a maximum of $3000 in any one risk to $5000, he saw no objection to such action in this instance and believed it would be beneficial.

Later in the session this matter was considered, and after a practical discussion of the advantages and disad-

vantages of it, which included a recital of why the limit of $3000 was made originally when the enterprise was started, the amendment was carried unanimously. The large cash surplus in proportion to risks, the high class of Hardware hazards, the impossibility of serious danger to the fund from which to pay fire losses even in a conflagration in a large city, in consequence of the comparatively few risks insured in any one city or town, and the average lower hazard in Hardware stocks, were some of the reasons cited to justify the increased limit of insurable stocks.

In Fire Insurance Commissioner Hartigan's address he reviewed some of the preventable causes of fire, adding that most fires occurred in the territory of which he was cognizant in October and November. He advised close attention to furnaces, stoves and the various heating systems, particularly at such periods. He also called attention to the importance of locating defective flues, insulation, &c., both immediately before and soon after starting fires in the fall, which would prevent many fires, some of which it was his experience were caused by having goods stored in the spring, summer and early fall of a more or less inflammable character near steam and other heating appliances. If care was taken to ascertain that such goods were not left in contact or near such apparatus the fire losses would be largely decreased. He also spoke of the dangerous parlor match and other sources of fire which a reasonable amount of caution would prevent. In this discussion it was brought out that 75 per cent. of fire losses in connection with Hardware stocks originated outside of the Hardware stock affected.

In the Minnesota Association the indemnity paid during the year was about $70,000, the surplus itself being invested largely in municipal bonds bearing interest at 6 per cent. Those insured in this company paid the rates made by the regular line companies, the rebate thus indicating both the decreased hazard and the more economical administration of the business.

Mr. Hartigan emphasized the wastefulness and extravagance of people in this country, and particularly in the matter of fire casualties, which he said aggregated for the United States and Canada in 1907 $215,000,000.

A. R. Sale, secretary of the Iowa Mutual Fire Insurance Association, organized in 1903, spoke interestingly of the association's work regarding the increase in both membership and percentage of rebate, which for 1908 is 40 per cent.

A proposition to change the method of auditing the insurance accounts from the present system by the appointment of three members of the organization, to that of the hiring of expert accountants outside of the organization, was rejected unanimously and the present system retained. There seemed to be universal approval of the service the Auditing Committee had rendered in the past and the members were loath to change to any other system, the Auditing Committee having power to employ expert assistants if found necessary. The main argument advanced for a committee of members was that important business was usually best done by those having a personal interest and exact knowledge of current conditions, while specialists outside could be retained whenever wise to do so.

Freight Claims and Adjustments.

John M. Callahan, claim agent and adjuster of the Chicago & Northwestern Railroad, was present, by invitation, to talk on the vexatious question of railroad claims. As a prelude to a technical treatise Mr. Callahan related a number of humorous stories which caught his auditors, and with this introduction of what he referred to as a dry subject he read a carefully prepared paper full of valuable hints, both of a preventive and corrective character.

He emphasized the importance of a proper preparation of goods for shipment, much of which if followed would make unnecessary or impossible future troubles and delays. He also outlined correct methods of filing claims with a view to getting quicker action. Merchants, he said, would often ship goods in boxes or barrels which had already performed a similar service one or more times and on which the former shipping marks still remained on different sides. The freight train employees, perhaps at night in cold weather and late, would see one set of marks, and thinking the goods had been inadvertently carried past a junction or destination would put the shipment off at the first station, which would start a series of troubles and delays caused largely by the duplicate or triplicate marks appearing on the shipment. With all irrelevant marks removed many such difficulties could be eliminated.

Other hindrances consisted of arbitrary marks in character, which mean nothing without way bill conveniently at hand, although common enough in foreign shipments, where consignments are handled on a different basis and good reasons exist for character marks. He also explained at length the compulsory details in adjusting claims after they had been received by the claim agent.

Question Box.

The Question Box discussions were very animated and interesting. The box at all times contained many more questions than it was possible to take up and discuss within the time available, but considerable attention was given to this feature of the programme. Some of the questions considered were the following:

"*How do you get the best returns from newspaper advertising?*"

"*How to get best results from help, by kindness or going roughshod?*"

"*Does it pay to read trade papers?*"

"*Would it not be better if the word 'warranted' were removed from connection with all edge tools?*"

"*Has the short account system helped you?*"

"*Is it best to mark retail prices in plain figures?*"

"*Does local newspaper advertising pay?*"

"*Should bank laws be changed?*"

Regarding the warranty on edge tools one phase of the discussion referred to Axes, the breakage often being in intensely cold weather and not due to flaws or imperfections. The short account system was commended, and strong efforts were made by some who discussed the question to allow as few of such accounts to get on the books as possible. Others emphasized the desirability of securing as much cash as possible in the first payment, and then naming a definite day for the payment of the remainder and within a reasonably near time. It was found advantageous to follow this method with hints or reminders a few days in advance of the time payments were due.

In relation to the marking of retail prices in plain figures, Mr. Evans, who was in charge of the Question Box on the last day, said, "Yes, emphatically yes." If a merchant intended to deal fairly with his customers and desired to make buying as easy as possible, in his opinion, it was a great help to mark goods in plain figures rather than characters.

One of the members, speaking about the question of newspaper advertising, gave as his method the writing of catchy conversational matter, with a view to imparting real information rather than, as is often the case, commonplace statements which mean nothing. As a foundation for such matter he kept a scrapbook in which he put anything of possible interest for future use, as it occurred to him or came under his notice, rather than waiting until he was about to write, for the inspiration of the moment.

Secretary Mathews' Report.

In his report, M. S. Mathews, the able and efficient secretary of the association, stated that at the meeting one year ago the Minnesota membership was 752. The total membership at the opening of the convention just held was in excess of 800. With the larger membership he remarked there were fewer grievances to be reported and of those presented during the past year only two remained unsettled.

The financial statement rendered by Mr. Mathews was as follows, showing a balance on hand of nearly $1000:

Receipts.

March 1, 1907, cash on hand	$720.56
Fees and dues	2,287.00
From programme	181.95
Returned defense fund	150.00
Total	$3,339.51

Disbursements

Expense to National Convention	$513.91
Printing	188.06
Rent	60.00
Salaries	600.00
Postage	141.40
General expense	69.72
Executive Committee 10 meetings	10.60
National dues and subscription to Bulletin	652.00
Expenses of annual meeting	111.25
Advertising (exhibits)	7.48
Balance with treasurer	955.09
Total	$3,339.11

Election of Officers.

At the meeting Thursday afternoon the following officers for the ensuing year were chosen:

PRESIDENT, A. Marckel, Perham.
VICE-PRESIDENT, E. H. Heins, Renville.
TREASURER, H. H. Heydon, Chatfield.

The secretary of the Hardware Association is an appointive office and will, as heretofore, be chosen by the Board of Directors, probably naming M. S. Mathews to succeed himself.

The Executive Committee chosen consists of C. F. Ladner, St. Cloud; Charles Grill, Sherburne, and J. C. Stuhlman, St. Paul.

The following delegates to the national convention at St. Louis were chosen: Amos Marckel, Perham; Julius Schmidt, Wabasha; C. F. Ladner, St. Cloud; C. W. Bouck, Royalton; D. H. Evans, Tracy; C. H. Casey, Jordan; J. H. Smith, Minneapolis; M. S. Mathews, Minneapolis, and W. H. Tomlinson, Le Sueur.

The new directors of the insurance company are W. H. Tomlinson, Le Sueur, re-elected to succeed himself; D. H. Evans, Tracy; Charles Grill, Sherburne, and Elmore Houghtaling, Fairmont, succeeding J. F. McGuire, resigned. The Auditing Committee of the insurance company consists of D. R. Thompson, Rockford, one year; Chris Juni, Jordan, two years; U. S. G. Henry, Park Rapids, three years.

Business Methods in a Hardware Store.

"Business Methods in a Hardware Store" was discussed by W. H. Stepanek of Cedar Rapids, Iowa. He sketched entertainingly what had been accomplished in his store in a town of but 500 inhabitants. He had a sale for which was purchased 100 bouquets at 5 cents each as souvenirs for the ladies. There was a display of Enameled Ware which was piled up in the store window. One of the attractions was an Edison phonograph.

In passing, he mentioned Phonographs as one of the best selling specialties in his experience which not only afforded a profit on the machine itself, but was a continuous performance in producing dividends on records that are frequently required. He said that on a total original cash investment of $125 five years ago he had cleared $3600 profit. In such sales he found it necessary often to sell on the installment plan, but as an inducement for cash payments on instruments selling for say $50 on installments he would offer them for immediate cash on delivery at $47, and it was his experience that the saving of $3 would often tempt the purchaser to pay ready money.

At the sale referred to above hot coffee and hot biscuit, which was prepared on the premises, was served to all comers. All sorts of summer goods were exhibited. The total expense of conducting the sale was kept within 10 per cent. of the sales. His recommendation was to have at least four of these bargain sales in a year.

Another similar event was held in September and included Heating Stoves and fall goods, and a feature of the sale was a contest, open to farmers, for the best ear of corn, for which a prize of $1 was offered, with a 50-cent prize for the second best. There was also a $1 prize for the best pumpkin and a 50-cent second prize.

He outlined many helpful processes and announced that he had in preparation a reproduction of his store system in book form, which he expected in the near future to offer to his fellow Hardwaremen.

Resolutions.

The Committee on Resolutions made a report in which great credit was given W. H. Tomlinson for the masterful way in which, under many difficulties, he had carried on and developed this the first formal Hardware exhibition of the association. Thanks were also extended to all the speakers, to advertisers in the official programme, exhibitors and the management of the Auditorium for its use of it at a low rental.

A recommendation was made that the Executive Committee be instructed to appoint a committee to consider the proposed federation of all retail merchants' associations in the State. Subsequently the following committee was appointed: D. H. Evans, Tracy; E. H. Heins, Renville, and J. H. Smith, Minneapolis.

Another recommendation made was that Hardware jobbers be requested to not recognize small orders for goods from various employees for personal accounts, a practice that has become quite common in the Twin Cities.

CONVENTION NOTES.

A strong bid for the privilege of entertaining the association next year was made by the business men of Minneapolis, who offered substantial inducements in a communication submitted to the convention. The matter was referred to the officers and Executive Committee for final decision.

At the closing session on Friday afternoon Mr. Ladner reviewed the history of the Minnesota Association, and referred feelingly to the high character and executive ability of its officers. He eulogized Julius Schmidt, the retiring president of the association, and at the conclusion of his reamrks presented Mr. Schmidt, on behalf of his fellow members, with a handsome carved mahogany and leather easy rocking chair.

On Wednesday afternoon the members listened to an able address by Governor Johnson, in the course of which he made the point that "Hardware merchants are justified in any measures they may see fit to take to combat the encroachment of the great non-tax paying catalogue houses." Another attractive address made during this session was that of Edward T. Young, Attorney-General of the State, whose subject was "State Problems." Among other addresses made at the convention were those of H. F. Emery, president of the North Dakota Hardware Association, who described features of the work done by his association, and Lieut.-Gov. A. O. Eberhardt.

The Pritchard-Strong Company, Rochester, N. Y., in its display of Kitchen and Household Utensils, exhibited the Prisco Copper Wash Boilers, made of 16 oz. planished Lake copper, having retinned iron clip handles, mahogany finished hardwood grips and cover handle with brass ferrules. A feature of these Boilers is a wood clothes stick held in a curved wire device attached to the handle on cover. The goods are also made in 1 X X and 1 X X X X tin plate and all are finished in 8 and 9 in. sizes.

W. S. Day & Co., Minneapolis, Minn., sole distributors of the Minneapolis Kettle Company, exhibited Day's Steamless Lid Tea Kettle, a siphon like device absolutely preventing steam from issuing except from the spout itself.

Buffalo Mfg. Company, Buffalo, Minn., displayed the Abbott Bread Mixer, which is made in four and eight loaf capacities. The retinned container, with parallel sides, has a removable cover and a two to one gearing device at top, there being also a slide cover pivoted so as to permit an inspection of the contents from time to time.

The Justrite Company, 14 Franklin street, Chicago, Ill., represented by Ohlerking & Smith, 40 Dearborn street, Chicago, offered the Justrite Pails for garbage, hospital use and waste, made of heavy galvanized steel in 6, 8 and 10 gal. sizes, with cover that closes automatically.

N. W. Lundy of the Lundy Mfg. Company, Marshalltown, Iowa, exhibited the Lundy Double Blast Soldering Furnace, with attached gasoline tank and hand pressure pump, which economizes fuel by heating all sides of the iron at once.

Edman-Hundeby Company, Minneapolis, Minn., exhibited Edman's Patent Easy Instep and Shoe Protector, made of 18-gauge cold rolled steel, to be strapped to shoe under arch of foot, for use by railroad men, ditchers, excavators, gardeners, farmers, prospectors, &c.

THE HARDWARE EXHIBITION.

Following is a list of the exhibitors at the Minnesota convention:

AMERICAN STEEL & WIRE COMPANY, Chicago: Wire Fences. E. H. Guise, E. H. Derby, W. E. Turner and M. W. Smithwick.

E. C. ATKINS & Co., Indianapolis, Ind.: Saws. A. A. Teel, P. L. Edwin, A. Munich.

AMERICAN BABY CARRIAGE COMPANY, Minneapolis: Baby Carriages. I. E. Rosenstein.

ATLAS PAINT MFG. COMPANY, Minneapolis: Atlastic Paints. W. M. Curtis, W. G. Brophy.

ALMA MFG. COMPANY, Minneapolis: Gasoline Engines and Paper Presses. Mack H. Joy, S. Burch, Charles Salak.

IVER JOHNSON'S ARMS & CYCLE WORKS, Fitchburg, Mass.: Bicycles. Thos. L. Bird.

BURROUGHS ADDING MACHINE COMPANY, Minneapolis: Adding Machines. J. A. McHenry.

BUFFALO MFG. COMPANY, Buffalo, N. Y.: Abbott Bread Mixer and Kneader. A. L. Denny.

BROWN SPRING ICE SKATE COMPANY, Webster City, Iowa: Brownie Spring Skates. B. R. Brown.

CARBORUNDUM COMPANY, Niagara Falls, N. Y.: Sharpening Stones. Harry A. Eaton, W. R. Embleton.

CHICAGO VARNISH COMPANY, Chicago, Ill.: Stains and Varnishes. William Dressler, Henry Cowap, F. P. Budinger.

CRIBBEN & SEXTON COMPANY, Chicago, Ill.: Universal Stoves and Ranges. C. H. Cook, J. R. Barse, J. H. Roelker.

COLUMBIAN HARDWARE COMPANY, Cleveland, Ohio: Wall Registers, Spring Hinges and Screen Door Hardware. E. A. Mathison.

CRANE & ORDWAY COMPANY, St. Paul: Improved Ideal Premier Boilers. N. A. Chamberlain, H. R. Leaf, C. E. Porter, M. M. Cochran, E. S. Doran.

CANTON STEEL CEILING COMPANY, Minneapolis: Steel Ceilings and Metal Office Furniture. W. A. Ziegler.

DE LAVAL CREAM SEPARATOR COMPANY, Chicago, Ill.: Cream Separators. C. C. Kimball, W. C. Thompson, V. A. Sandburg, E. W. Carter.

E. I. DU PONT DE NEMOURS COMPANY, Wilmington, Del.: Dynamite and Powders.

DODD & STRETCH, Des Moines, Iowa: Lightning Rods. A. E. Athey, G. E. Larsen.

ECONOMY FUEL SAVING COMPANY, Minneapolis. Otto Bachman.

EXCELSIOR THRESHER TOOTH COMPANY, Dexter, Iowa: Monarch Washing Machine. Thos. Bagley.

FULLER-WARREN COMPANY, Milwaukee, Wis.: Stuart Stoves and Ranges. C. H. Conner, J. L. Potter.

FOWLER & PAY, Mankato, Minn.: Building Cements. E. H. Bassett, C. H. Wilson.

FORMAN, FORD & CO., Minneapolis: Wholesale Paints and Glass. W. E. Lean, A. W. Morey.

GRAND CROSSING TACK COMPANY, Chicago Heights, Ill.: Fences. H. V. Dimick.

GABEL MFG. COMPANY, Hawkeye, Iowa: Twentieth Century Pig Forceps. W. A. Hathaway.

GERMER STOVE COMPANY, Erie, Pa. T. J. Duffy.

HALL-BENEDICT MFG. COMPANY, Monticello, Iowa: Steel Hoists and Tackle Wire Stretchers. M. Kehoe.

HUDSON & THURBER COMPANY, Minneapolis: Hardware Specialties, Thresher and Implement Supplies. M. S. Thurber, I. O. Komisrud, T. P. Davis, W. S. Young.

HARTWELL BROS., Chicago Heights, Ill.: Hickory and Oak Tool Handles. W. A. Hartwell.

HOME COMFORT BREAD & CAKE CABINET COMPANY, St. Paul: Bread and Cake Cabinets. C. E. Griswold.

J. C. JAMIESON COMPANY, St. Paul: Advertising Novelties.

H. W. JOHNS-MANVILLE COMPANY, Minneapolis: Asbestos Products. H. L. Tourtelotte.

F. C. JOHNSON, Stillman Valley, Ill.: Axle Grease. F. C. Johnson.

LASHER MFG. COMPANY, Davenport, Iowa: Kitchen Specialties. J. H. Ohlerking.

LOUDEN MACHINERY COMPANY, St. Paul: Hay Tools and Barn Equipments. A. A. Fry, C. C. Johnston, O. B. Stichter, George Anderson.

LAW MFG. COMPANY, Merriam Park: Hardware Specialties and Steel Harrows. A. L. Law, W. J. Law.

LANSING WHEELBARROW COMPANY, Lansing, Mich.: Wheelbarrows. W. H. Beggs.

LUNDY MFG. COMPANY, Marshalltown, Iowa: Lundy Double Blast Soldering Furnace. N. W. Lundy.

MAJESTIC MFG. COMPANY, St. Louis, Mo.: Majestic Ranges. J. L. Hickerson.

MILWAUKEE CORRUGATING COMPANY, Mankato: Sheet Metal Goods and Metal Ceilings, Conductor Pipe, &c. G. M. Matteson.

MINNESOTA LINSEED OIL PAINT COMPANY, Minneapolis: Paints. E. T. Jones.

MALLEABLE STEEL RANGE MFG. COMPANY, South Bend, Ind.: Ranges, Hoisting Blocks and Benedict's Tackle Wire Stretcher. R. E. Adams, C. D. Britton.

MCCLELLAN PAPER COMPANY, Minneapolis: Roofing and Building Papers. J. H. Camp, J. W. Cooper.

METAL STAMPING COMPANY, Jackson, Mich.: Refrigerators. Geo. F. Darr, H. L. Smith.

MANSON, CAMPBELL COMPANY, Detroit, Mich.: Fanning Mills, Incubators, Brooders and Fireless Cookers. James Wellman, D. D. Wellman, P. J. Downey, W. E. Daniels, W. C. Marden.

MINNESOTA WEATHERPROOF PASTE COMPANY, Minneapolis: Glass Setting, Crack Filling and Conservatory Skylight Paste. J. Henderson.

W. S. NOTT, Minneapolis: Composition Roofing, Leather Belting and Mechanical Rubber Goods. Harvey Dale, Charles Brudigam, H. McLeod.

NATIONAL CABLE MFG. COMPANY, Niles, Mich.: Copper Lightning Rods, Schmidt, Biebighauser Company.

NOVELTY MFG. COMPANY, Jackson, Mich.: One Minute Oil Stoves and Alumino Oil Heaters. George F. Darr.

NEY MFG. COMPANY, Canton, Ohio: Hay Carriers and Hardware Specialties. J. M. Mobley, Charles Domer.

NICOLS, DEAN & GREGG, St. Paul: Hardware Specialties. George O. Norton.

OMEGA SEPARATOR COMPANY, Lansing, Mich.: Cream Separators. D. E. Morron.

ONEIDA COMMUNITY, Oneida, N. Y.: Game Traps and Chains and Silver Flat Ware. W. F. Nash, G. H. Miller.

OHLERKING & SMITH, Chicago, Ill.: Hardware and Kitchen Specialties. J. H. Ohlerking.

OHIO VARNISH COMPANY, Cleveland, Ohio: Varnish and Chinamel. W. H. Angell.

G. A. OLSON MFG. COMPANY, Albert Lea, Minn.: Hay Tools. S. L. Hanson and S. O. Simonson.

CHRIS. PAGEL, Atwater: Pagel's Automatic Pump Pipe Puller.

PRITCHARD-STRONG COMPANY, Rochester, N. Y.: Money-Back Metal House Ware. Will T. Richards.

PITTSBURGH PLATE GLASS COMPANY, Minneapolis: Patton's Paints. W. M. Burns, G. H. Temme, A. P. Ladd, W. H. Reese, R. F. McIntosh.

PETERS CARTRIDGE COMPANY, Cincinnati, Ohio: Ammunition. C. E. Robbins, W. M. Ferguson, H. C. Hirschy.

PUFFER, HUBBARD MFG. COMPANY, Minneapolis: Wheelbarrows and Carts. W. C. Hervey.

OLE N. PETERSEN, Canby, Minn.: Hay Rake Clamps.

QUINCY STOVE MFG. COMPANY, Quincy, Ill.: Stoves. J. E. Stultz.

REMINGTON ARMS COMPANY, Ilion, N. Y.: Rifles and Shotguns. J. L. D. Morrison, C. A. Hale, W. P. Brown, G. E. Trent.

SCHLECHT HEATING COMPANY, Minneapolis. E. F. Schlecht.

STURGES & BURN MFG. COMPANY, Chicago, Ill.: Milk Cans, Freezers, Spiders and Griddles and Metal Specialties. J. W. Campbell.

STRAYER & NESBITT, Minneapolis: Faultless Malleable Range. W. W. Strayer, W. L. Nesbitt.

ST. PAUL ROOFING, CORNICE & ORNAMENT COMPANY, St. Paul: Architectural Sheet Metal Products. Jesse H. Neal, A. M. Smith, Ivan A. Campbell, George W. Howard.

SEEGER-GALLASCH COMPANY, St. Paul: Refrigerators. W. G. Seeger.

STANLEY WORKS, Chicago, Ill.: Hinges and Wall Registers. A. J. Wessling.

CHARLES A. STICKNEY COMPANY, St. Paul: Gasoline Engines. H. R. Havard, A. F. Ingalls, E. F. Van Borries.

ST. PAUL WHITE LEAD & OIL COMPANY, St. Paul: Paints. C. L. Butcher, George W. Besler, F. O. Brown.

W. C. SHINN, Lincoln, Neb.: Copper Cable Lightning Rods. W. C. Shinn, L. F. Diddie, Grant Terryll.

J. M. THOMPSON & SONS HARDWARE COMPANY, Owatonna: Cream Separators and Decorated Enameled Ware. Guy Thompson, George Thompson, J. M. Thompson.

M. TOWNSLEY & SONS, Minneapolis: Lightning Rods. G. A. Clark, M. Townsley.

TWENTIETH CENTURY HEATING & VENTILATING COMPANY, Akron, Ohio: Furnaces and Boilers. O. F. Morrow, E. L. Jaynes.

TWIN CITY VARNISH COMPANY, St. Paul: Varnishes. J. K. Ogden, George Hall.

UNITED STATES REGISTER COMPANY, Minneapolis: Side Wall Registers. L. Moblo.

UNION METALLIC CARTRIDGE COMPANY, St. Paul: Ammunition. J. L. D. Morrison, C. A. Hale, W. P. Brown, G. E. Trent.

VERMONT FARM MACHINE COMPANY, Bellows Falls, Vt. William Mau, J. S. Sweiger, Geo. Rosenberg, C. J. Brown, G. L. Busian, J. W. Otis.

WHITE LILY WASHER COMPANY, Davenport, Iowa: Washing Machines. H. W. Power, Theodore Rosche.

WATERLOO REGISTER COMPANY, Waterloo, Iowa: Side Wall Registers. O. Knox, E. H. Riley.

WAHLE FOUNDRY & MACHINE WORKS, Davenport, Iowa: Washing Machines. A. Nielsen.

WISE FURNACE COMPANY, Akron, Ohio: Furnaces. W. R. Williams, E. D. Gruenhagen.

WHITE ENAMEL REFRIGERATOR COMPANY, St. Paul: Refrigerators. Wm. Bohn.

WOODMANSE MFG. COMPANY, Freeport, Ill.: Windmills, Tanks and Pumps. A. C. Hagemeier.

THE STATE OF NORTH CAROLINA has just granted a charter to the Southern Collar & Bridle Company, Greensboro, N. C. This company has been organized with a capital stock of $50,000, and will manufacture Horse Collars, Leather Leggins, Wagon Lines, Bridles and Strap Goods. The company will make a specialty of this particular line, and will not manufacture full sets of Harness. The company comprises the following persons: W. K. Merrick, Asheville, N. C., formerly engaged in the manufacture of leather goods; E. B. Jones, Hickory, N. C., formerly in the wholesale grocery business; John Donnell, capitalist, Greensboro; E. L. Paylor, formerly with Kone-Export and Commission, Greensboro; R. H. Westbrook, Westbrook Bros., wholesale Hardware, Greensboro; A. M. Scales, vice-president American Exchange Bank, Greensboro; C. C. McLain, wholesale grocer, Greensboro; C. D. Benbow, capitalist, Greensboro; Chas. H. Ireland, manager, Odell Hardware Company, Greensboro, and C. H. Wells, Hickory, N. C., manufacturer of Old Hickory collars.

A COURT ORDER has been granted dismissing the bankruptcy proceedings brought against the Reed Mfg. Company, Newark, N. Y. The settlement was effected by the larger creditors, chiefly banks, accepting renewal notes of the company for periods of three, six and nine months, all small creditors being paid in full. The company, which is capitalized at $500,000, manufactures Enameled Ware, employing 250 men and 30 traveling salesmen. Frank Garlock, Newark; Frank A. Hamlin, Canandaigua, and Henry E. Boller, Buffalo, will act as directors of the Reed Company until it has paid its debts in full.

THE PITTSBURGH AUTOMATIC VISE & TOOL COMPANY, Pittsburgh, Pa., has opened a branch office in the Dwight Building, Kansas City, Mo., with E. Metz, Jr., in charge, so as to fill promptly all orders from Missouri and immediate territory. The company has branches in other important cities in the United States as well as in foreign countries.

NEW ENGLAND IRON AND HARDWARE ASSOCIATION.

THE fifteenth annual banquet of the New England Iron and Hardware Association was given at Hotel Somerset, Boston, Wednesday, February 26, and was the most largely attended dinner in the history of the association, there being 180 guests seated at round tables accommodating six persons each. The banquet hall of the Somerset is the largest and most ornate in Boston, and on this occasion was beautifully decorated. Preceding the dinner, a reception in charge of the following committee was held: William A. Hopkins, chairman; R. E. Hofer, Charles C. Lewis, E. L. Richards, C. F. King, John W. Crooks, C. E. Henderson, W. H. Dunning, Oscar A. Shepard, F. H. Butts, A. B. Marble, J. N. Stanley and William Chamberlain.

The speakers were R. M. Boutwell, president of the association; Col. Willis L. King, vice-president Jones & Laughlin Steel Company; Hon. Edgar T. Brackett, New York; Hon. Arthur B. Chapin, Treasurer of Massachusetts; Hon. George A. Hibbard, Mayor of Boston; Rev. Arthur H. Brown. Others occupying seats at the speakers' table were Fred Krebs, Samuel A. Bigelow, William



R. M. BOUTWELL.
President.

Chamberlain, Allen J. Chase, F. A. Chandler, A. B. Marble and Walter C. English.

During the dinner music was furnished by an orchestra. Oscar A. Shepard, one of the prominent members of the association, led in the singing of popular songs, including an original composition by Charles H. Carter of H. W. Hayes & Co., entitled "The Smoke Went Up the Chimney Just the Same," by the entire company.

As usual on similar occasions there was a large representation of prominent manufacturers and merchants from various parts of New England and from other States.

President R. M. Boutwell delivered a felicitous address of welcome and efficiently acted as toastmaster. Senator Brackett's address was chiefly political in character. Hon. Arthur B. Chapin brought greetings of the Commonwealth of Massachusetts, and Hon. George A. Hibbard those of the city of Boston. The speechmaking was closed by Rev. Arthur H. Brown.

Colonel King's Address.

The address of Col. Willis L. King of the Jones & Laughlin Steel Company, abstracts of which are given below, was listened to with close attention and frequently applauded:

Probably no industry ever had such a stormy beginning, several hundred years ago in Virginia. The crude foundry then launched was closed so effectually by the Indians with their tomahawks that further efforts were abandoned for many years.

Later on, other small foundries and forges were started in various States without success, and the industry finally found a more congenial home in Pennsylvania, owing to its natural advantages in coal, ore and market. The early makers of iron had small return for their efforts, and even after the Civil War the business was so small that it was conducted by individuals, the corporation with its larger capital not being necessary. It is a matter of history in Pittsburgh that very few of these firms were successful, although fostered by a protective tariff, and it was not until the discovery of Bessemer steel, in the later seventies, that the business began to assume national importance.

The Business Conditions in Those Old Days of Iron

were most discouraging. Gold and silver coin was so scarce and bank notes of State banks of such uncertain value, and so uncollectible, that business was confined largely to trading. The rolling mill traded finished iron bars to the blast furnace for pig metal, who in turn traded it for groceries, flour and bacon, with which to pay their workmen, who rarely ever saw or owned a piece of money. The canal boats took for their freight iron bars, which they carried to market and traded for flour and groceries, to get a return cargo. Settlement of balances was made every six months by note, which when due was usually renewed or paid in another trade.

The present generation cannot realize the restrictions and difficulties in conducting business in those days, and should regard themselves fortunate beyond expression for our present financial and business structure.

Feast or Famine, Mostly the Latter.

From 1860 to 1900 the trend of production was upward, but there were many and long periods of stagnation. It was either a feast or a famine for the producer, and mostly famine. Three good years out of ten was the rule. These conditions naturally brought about great fluctuations in price; some times unreasonably high, but mostly unprofitably low. The merchant might make much profit if he happened to have a large stock at the beginning of a so-called boom, but was almost sure to lose it when the inevitable depression came about. There was no regularity or stability in prices, and the most intelligent buyer could do no more than guess at the future conditions. I submit that the position of the buyer or consumer of late years has been much improved by the efforts of steel makers to prevent unreasonable variation in prices.

A Tribute to the U. S. Steel Corporation.

This brings us up to 1901, when the United States Steel Corporation was formed, and now we come to the most interesting and wonderful part of the story of steel.

The combination of 100 separate and distinct firms or companies into one organization, with nearly one and a half billions capital, was so stupendous and unheard of, that the public and independent steel makers had apparently good reason for alarm. The public feared a monopoly with attendant high prices, and outside steel makers saw visions of drastic competition.

Well, we are all here yet and fairly healthy. The Corporation has run along with and not against economic laws, knowing that these apply to a large corporation as well as a small one. It has had respect for State and national statutes, and has taken its stockholders and the public into its confidence. It has maintained a fair and reasonable price for its products through years when the demand far exceeded its ability to supply, and has reduced prices when the cost and conditions warranted.

After six years of operation I am prepared to say that the Corporation has shown its right to exist, and I am glad of the opportunity to make this public statement. At the same time I must testify that it is an active and powerful competitor, and that it does not run its business on philanthropic lines. It spends money lavishly to increase its output, improve its quality, and cheapen cost, and its commercial department loses no opportunity to find a market.

It begets a rivalry between [illegible] gives premiums to the men who are successful in breaking records in production. Its competitors must bestir themselves, I assure you, to keep up with the procession; but in the final analysis the great consuming public gets the benefit of this competition.

But the Corporation has intelligent competition worthy of its respect. About 50 per cent. of steel production in finished material is made outside of its mills, and those who have feared a monopoly in steel can dismiss such a contingency. In fact, I may say that, if the Corporation thought it had, or might have, a monopoly, it would not know what to do with it. That word is not popular now.

The Present and the Future.

But I have said enough of the past which, though mighty in achievements, loses interest in our anxieties of the present and hopes of the future. It is, perhaps, idle to speculate on the exact or particular cause of our present financial and commercial depression. It is impossible to say with certainty that any one cause brought it about. In general terms, overexpansion, overlegislation, cupidity and extravagance may justly bear the burden.

It is unfortunate that the innocent must suffer with the guilty, but such is the law. The workman who is not conscious of any hand in it may have helped it along by extravagance, as well as his employer. The innocent holder of stocks has inflated prices in his greed for profits and furthered the plans of those "high financiers" who have enriched themselves at the expense of the public. The manufacturer has probably expanded his business beyond safe limits. It is safe to say that each of these has been a contributing cause, but fortunately they are all correctible.

The correcting process has been going on for some months, and I feel that we are well along in our convalescence. That homely old virtue, patience, is all we need to complete the cure, and happily all kinds and conditions of man can contribute.

We Are Now Undergoing a Rest Cure

which our activities in the past have made necessary. We are suffering mainly from a disease called pessimism, and it is entirely a mental or sentimental trouble. If we could be given a good strong dose of medicine called optimism to-night, the business situation would change to-morrow morning; but whether the change comes to-morrow or later, I know that when it does come this great country will go forward with more vigorous strides by reason of its rest.

This chastening has been salutary. It is bearing fruit already in a change of business morals. I know you must have felt it in this center of learning and business intelligence, for this organization of yours is an evidence of it. I feel we are entering the Golden Age of business; perhaps I should say the Golden Rule Age, for that is what it means. All over the land there is a sentiment that

The Moral Right of Your Neighbor

is pre-eminent. His legal rights under the Constitution do not measure your whole duty to him. This neighbor may be a competitor or consumer. It does not matter; he must be treated decently. I am free to say that this spirit has taken hold of the steel manufacturers of this country, perhaps against their natural inclination, and certainly against all precedent. They want to treat the public fairly; to make prices based on a fair return over cost, having a just regard for their stockholders and workmen, and I shall fail of my purpose to-night if I do not enlist your enthusiastic support in this great movement; for it will surely bring about that return of prosperity which we so urgently desire and need at this moment.

Future Prices of Products Will Neither Be High Nor Low.

I do not believe that unnatural or abnormal conditions will affect the price of manufactured products as much in the future as in the past. They will neither go unreasonably high nor low. An impartial public sentiment will determine what is fair for both maker and consumer.

If too high, the public will not buy; if fair and reasonable, they will buy largely. This suggests present conditions and the question as to the reasonableness of prices. I do not hesitate to say that prices for steel products are now fair and reasonable, based on their cost.

Under the old conditions that I have spoken of, prices would have advanced in the last few years probably 100 per cent., and naturally would have reacted sharply under present demand. It is not the price of steel, but doubt of the financial ability to buy it and want of confidence in the future, that has caused the lack of orders, and any reduction in price would not, in my opinion, increase the demand, but would still further unsettle values and confidence. I want to say, however, that if I should be wrong in my belief as to the equity of present prices, the public will surely convince me of my mistake.

The most desirable thing that can come to a business man is to have his path of duty made plain and straight before his face. I must confess that this path just now is anything but plain and straight. We cannot see very far ahead, because of the sharp turns in the path.

All we need, I think, is confidence that the next turn will be the last, and that

The Road of Prosperity Will Then Unfold Itself

straight and fair as far as the eye can see. I therefore would urge you to go forward in confidence, forgetting present troubles in the knowledge that our great country, in spite of financial and industrial depression and political strife, must fulfill the destiny marked out for her by the great Creator of all things.

In closing, I want to thank you again for your courtesy. I want you to remember me as one who put his country above selfish or partisan motives; as one who believes in the justice and patriotism of the American people and in their recuperative genius. I want to leave with you a message of confidence in the future under the guidance of Almighty God, who has watched over us from the beginning and made us a great people.

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OHIO HARDWARE ASSOCIATION.

THE great convention held last week in the Ohio capital marked the culmination of 14 years' uninterrupted development and growth. It was remarkable for its size, for its pervading spirit of enthusiasm and loyalty, for the dignity, interest and practical value of its proceedings and for the substantial success of every related feature. This sober statement means much to those who are familiar with the history of organization in the Hardware trade. Justification, indeed, might be found for resorting to superlatives, but suffice it to say that the members of the National Retail Hardware Association may still look with pride to the state in which the association movement took its rise.

Ohio Maintains Her Position

of prominence, and her Hardwaremen are justly proud of their history, as well as their present standing and influ-



A. L. SHEARER



C. S. JOHNSON.

ence. Their strength is due not alone to the steady numerical growth of their association, but quite as much to the development of individual members resulting from their participation in its work. Fortunate, at the outset, in the wisdom, farsightedness and broad gauge ability of its founders and early officers, the association now counts among its rank and file numbers of men who have shown by the increasing activity and intelligence of their participation in convention work that they are fully qualified to take up the mantles of the officers who join the honor roll.

Limitation of President's Term.

To retiring president, C. S. Johnson, Barberton, falls the honor of being the last executive to serve a second term, the association having voted henceforth to limit the president's tenure of office to one year. It may of course be argued that a man cannot do his best work until he has had one term in which to familiarize himself with his duties, but on the other hand the association has such a wealth of presidential timber and so much to gain by its development that the new rule is probably a wise one. President Johnson deserves and has the gratitude and appreciation of every member for his devoted labors which have contributed so much to the progress of the past two years.

In Frank A. Bare the association has a great secretary, whose ceaseless and well directed efforts have done much to enlarge, strengthen and unify the organization and bring out the best efforts of its membership. In him every member of the Ohio Hardware Association feels that he has a personal ally, and the office he holds is his as long as he can be induced to retain it.

Veterans Honored.

Although committed to a policy of bringing out young blood, the Ohio Association annually pays deserved honor to its organizers and to the veterans who formerly directed its affairs. Their counsel is still sought and heeded as coming from those who have proved wise and conservative advisers in the past. It has become a happy custom to introduce some of these former officers at the opening session, requesting from each a word or two of greeting and reminiscence. This year after the association had been welcomed to Columbus by Governor Harris and President Johnson had responded in an appreciative vein, the latter called in turn upon J. F. Baker, Dayton; J. P. Duffey, Greenville; W. P. Bogardus, Mt. Vernon; H. C. Wiseman, Springfield; O. M. Scott, Marysville; O. L. Davis, Columbus; M. Talmage, Mt. Gilead; D. A. Le Fevre, Greenfield, and J. J. Ewing, Lima.

The keynote was struck perhaps by former President Baker, whose felicity of expression is well known and whose brief remarks were almost touching in their sincerity. He said:

The figures 14 upon this programme have brought to my mind a flood of recollection. Fourteen years have passed since this association was organized; 14 times the association has met and 14 times some of us have attended its conventions. Never have we failed to enjoy meeting and greeting each other, and I want you all to realize that it is a genuine delight to me to see again the members of the Hardware fraternity of Ohio. As little children wait earnestly, longingly, but as patiently as may be for the happy Christmas time, so I confess to you that I wait longingly and anxiously but as patiently as I can for the last Tuesday in February of each year.

Greetings.

F. W. Ingalls, formerly a member of the association from Bryan, and holder of the vice-presidency last year, sent a telegram of greetings and good wishes from his new home in Winnipeg. The association, in which Mr. Ingalls has many warm friends, sent a cordial reply. A telegram of congratulation was also received from R. R. Williams, Hardware editor of *The Iron Age*, who was unable to be present. It was voted that the secretary be instructed to send greetings to the Illinois and Minnesota associations, contemporaneously in session.

National President Miles a Guest.

S. R. Miles, Mason City, Iowa, president of the National Retail Hardware Association, was present as the representative of that body. This was President Miles' first visit to the Ohio association, and he was enthusiastic over the organization, its officers and its work.



F. A. BARE



He delivered an informal address, touching on the work of the national association and various trade questions, including parcel post, speaking substantially as in his Iowa address reported in our last issue. He also conducted a portion of the Question Box.

Other Guests.

included J. H. Bradish, Batavia, N. Y., president of the New York Retail Hardware Association, who was present as an observer, but was introduced and voiced the greetings and congratulations of his association. C. D. Kyle, Wellsburg, W. Va., former president of the West Virginia Association, who visited the Ohio convention a year ago, was again present this year, and reported en-

couraging growth in his association. Secretary P. T. Rathbun of the Tri-State Implement Dealers' Association, attended one of the sessions and participated in discussing some questions of interest to his organization. Secretary W. H. Cooke of the Ohio Grocers' Association, was also a guest at the open session, Tuesday afternoon.

HARDWARE SHOW.

It was generally conceded that the Hardware show, again installed in the spacious Memorial Hall, was one of the handsomest and best managed that has ever been held by a State organization. The exhibits were numerous, including an extensive variety of high grade goods, and were remarkably well set off by the elaborate decoration of the entire hall in orange and black bunting. A new scheme was tried of having universal booths, practically all alike, built and decorated by the management, so that it was only necessary for exhibitors to come in and arrange their goods. The plan worked admirably, proving economical and convenient, as well as greatly reducing irritating delays, confusion and disorder. All exhibits gained in richness and attractiveness from the harmonious general effect, and nothing but praise was heard for all arrangements. Great appreciation was expressed for the work of the able Exhibit Committee, consisting of W. L. Jacobs, Youngstown; W. M. Crumrine, Salem, and J. R. Dickson, Columbus, who were warmly congratulated on all sides for the success of their undertaking. A full list of the exhibitors will be given in our next issue.

In spite of the success of the Hardware show, representatives of exhibiting houses generally reported that the actual business done was somewhat disappointing, being considerably less than a year ago. This was undoubtedly due, however, to changed conditions rather than to reduced interest on the part of the retail merchants.

QUESTION BOX.

All but one of the Ohio meetings were executive in character, being devoted to the consideration of intimate trade matters suggested by the Question Box. Practically the entire time of the convention, except that required for routine business, was occupied by this feature, which was conducted under the leadership of several different members eminently qualified for the work. No formal addresses or papers were arranged for, thus leaving almost unlimited opportunity for informal discussions of lively interest to every one present. This was, of course, an innovation, but was generally regarded as a move in the right direction, tending to make the convention work of greatest practical value. It may be that it will not be found practicable to give quite so much time to the Question Box at every convention, and there are advantages to be gained by varying the programme, but for this year at least the arrangement was highly satisfactory, and the attendance throughout was the largest that the association has ever had. Those who took charge of the Question Box on different occasions were O. E. Johnson, Bellvue; H. Dimon, Galion; W. P. Bogardus, Mt. Vernon, and National President Miles. The session presided over by Mr. Dimon was especially lively and interesting, Mr. Dimon's practical views of business problems, his enthusiasm and quick wit making him an ideal leader for such discussions.

Without attempting to cover the Question Box completely, we give below a number of the subjects brought up, with a brief report of some of the suggestions offered. Many of the queries were of such a nature that the discussions could not be published, especially those referring to matters connected with the work of the Grievance Committee, such as manufacturers and jobbers selling Hardware to grocers and general stores, and occasionally to consumers, whom the retailers regard as their legitimate customers. Other questions were brought up several times with some slight variation, but not sufficient to justify separate treatment, questions, for example, relating to the credit and collection departments of a Hardware store.

1. *What is the best plan for getting a correct list of the Hardware merchants in the State, and what systematic method can be found for keeping the list correct?*

Special attention was given to this question at the solicitation of Secretary Bare, who declared that the problem was a serious one for his office, and that practical assistance would be appreciated. A number of members offered suggestions such as reference to Dun's and Bradstreet's commercial books, securing the co-operation of traveling men, &c. One suggested that if the secretary could persuade one member in every county of the State to act as his assistant and keep him posted as to the different Hardwaremen in their county he would get a solution of the question.

2. *Has the stringency in money matters affected the Hardware trade in Ohio, and what was the real cause of the panic?*

There was no disposition to deny that the trade had been affected by recent financial disturbances, but only one member attempted to answer the latter part of the question. He stated that in his opinion the fundamental cause of all the trouble was stock speculation on margins.

3. *How many members charge interest on open book accounts, and what is the effect on their business?*

There were a variety of answers to this question, some members stating that they charge interest after three months, and some after a longer period. There was a general agreement that after book accounts have run a reasonable length of time it was desirable to get a settlement either by note or cash, but nearly every one admitted a laxity in this respect.

4. *What can be done to prevent bad debts?*

This question, closely allied with the preceding one, brought out interesting suggestions running all the way to the establishment of the business on a cash basis. Considerable emphasis was laid on the value of local merchants' credit associations, &c., but the principal point made was the importance of persistency and system in following up overdue bills.

5. *How often should statements to town and country trade in a place of about 2000 inhabitants be sent out?*

Here again the importance of strict attention to the bookkeeping end of the business and the systematic following up of outstanding accounts was strongly emphasized.

6. *Would it not be better to devote more time to the convention sessions and less to the Hardware display?*

It was generally agreed that the division of the time as arranged this year with strict adherence to scheduled hours had proved successful, and was eminently fair both to exhibitors and members.

6. *Does it pay to sell Axes on your own guarantee?*

A merchant expressed the belief that it does not, and stated that where he guaranteed Axes he charged 25 cents more than for the same Axe without a guarantee, clearly explaining to the customers that there was no difference in the goods.

7. *Should Hardware retailers buy goods from jobbing firms whose salesmen call on grocery and dry goods dealers, and furnish any line of Hardware to such merchants?*

There was no difference of opinion on this question.

8. *What is the best method of pursuing a prospective customer in order to land the sale of a Stove, for instance, which you know he intends to buy, especially if you have no particular claim on his trade?*

It was agreed that whatever line of goods a merchant handled, if he was a good salesman, he ought to find plenty of favorable features and strong talking points which he could present to the customer in such a way as to merit his favorable consideration. Little is to be gained by emphasizing a low price.

9. *How many members run plumbing shops in connection with their Hardware stores, and is this branch of the business profitable?*

Some surprise was expressed at the comparatively small proportion who answered this question in the affirmative, but nearly every one who operated a plumbing and tin shop stated that it paid.

10. *Could a system be adopted for keeping up our public roads on some such plan as is employed by the railroad companies in keeping up their road beds?*

The desirability of improving country roads was generally admitted, and the question was regarded as a legitimate one for the consideration of retail merchants. After some discussion it was suggested that the matter be referred to the Committee on resolutions, whose report will be found in another column.

11. *What is the best way to handle Linoleum or Oil Cloth?*

One member stated that he hung samples on a rack made of Gas Pipe, and, extending up to the ceiling, exposing perhaps 4 or 5 ft. of the different rolls.

12. *What can we do to keep farmers' trade at home?*

This practical question brought out an animated discussion connected with the problem of meeting the competition of mail order houses. It was agreed that the merchant must give farmers good goods at reasonable prices, and convince them that they were getting better service and better articles than from catalogue houses.

The keynote of the discussion was that merchants would make a mistake to assume a combative attitude, and that it was far better to win farmers' trade with kindness than to fight them. No class, it was asserted, is quicker to respond to kind treatment.

13. *In contentions over replacing guilty goods should jobbers selling guaranteed lines make the retailer stand the brunt of the argument with the manufacturer with whom he has no individual dealings?*

It was brought out that the jobber by his direct intercourse with the manufacturer is in the best position to compel fulfillment of such guarantee and ought to protect the retailer from loss.

14. *Should we go into politics at home?*

In taking up this subject retailers apparently believe that they have something to lose, as well as to gain, by mixing in politics, but there is a general agreement that their duty to the community demands such activity, and that they themselves would be the gainers in the end.

15. *What success have members had with 5 and 10 cent counters?*

Varying experiences were reported. The consensus of opinion was that such a department was profitable, especially in that it brought purchasers of small articles to the store, who frequently bought more profitable goods.

16. *Should clerks and salesmen receive vacations with full pay?*

Generally answered in the affirmative.

17. *What percentage of dealers make purchases of exhibitors while attending the convention?*

The belief was expressed that the percentage was good.

18. *Does it pay to hire a man to canvass for outlying trade?*

There seemed to be a general feeling that this method of soliciting business had been carried too far, its adoption by one merchant compelling his competitor to take similar action, and resulting in no profit to either, as there is rarely trade enough to be secured in this way to pay the expenses of more than one man. Some members said that they had found this profitable a few years ago, but not so much so recently.

PRESIDENT JOHNSON'S ADDRESS.

The routine business of the convention was transacted in a most thorough and businesslike but expeditious manner. In this connection the efficiency and good judgment of President Johnson were especially marked. In his annual address the president said, in part:

I congratulate you upon the fine showing of membership for this year. The increase has been very gratifying. Let us all be loyal to our association. By calling your attention to this I mean that every member should be just what the word means and faithful to the cause for which our association stands. We cannot always have things just as we would like to have them, so we must give and take.

Trade Journals.

I wish to call your special attention to the Hardware trade journals, and especially mention our *National Bulletin*. Give them your hearty support, as we need them and they in turn need us. They give us information and advice that is a benefit in many ways. We are still facing some of our old enemies in the business world. Some of them are still doing business at the old stand; but do not despair. Our association work is having its effect. These large corporations are feeling it on every side.

Legislative Questions.

I recommend that some steps be taken as regards exemption laws, collections and garnishments, so as to give us more protection against dishonest customers.

There is no problem that is so unfair to the retailer as taxation. Under existing laws the tax dodgers or dishonest citizens have the advantage. Every honorable retailer is willing to bear his share of taxation to support the Government, but he does not want to carry more than his share. When farm lands and city property, mining lands and public franchises produce a larger income per dollar than the retailer's merchandise on his shelves, I would recommend that this association encourage every honorable movement that will give us a just tax.

Parcel Post.

This is a question which we must still watch with eager eyes. I would recommend that we co-operate with other State associations, such as the grocers', furniture dealers' and Implement dealers' on such questions as legislation, taxation, parcel post, freight and passenger rates, &c.

Exhibits.

Our annual conventions have taken on an air of Hardware exhibitions. Your officers are pleased that their efforts in this line enable us to see and examine all the new things in Hardware and kindred lines. These exhibitions are great schools for us. Manufacturers and jobbers are represented here by beautiful displays of their goods, and have men in charge who are the best of fellows, experts in their lines. You cannot talk with one of these men without learning something that will do you good. Let us spend as much time as we can among these exhibits and we will profit by it.

Increasing Membership.

The office of the secretary the past year has given more attention to nonmembers than regular members, thinking that our older members knew the great benefit derived from the organization. In order to get those that are not members into our organization he has devoted a great deal of time to writing personal letters to those nonmembers, and we are glad to note its effect as our membership shows quite an increase.

Relations with Jobbers.

This subject has been talked over more than any other question by dealers privately, in meetings and in assemblies. Some members have called my attention to jobbers retailing and setting a price for their commodities at the retailer's distributing point. Now I believe that the Ohio jobbers could so arrange their prices that nearly all retailers would buy the bulk of their goods of them. The retailers could do the same business on much less capital if they could get their goods nearby, meet competition and make money.

Local Organizations.

I believe in organizations that have for their object the betterment of local conditions and business; that were it possible to organize every town and village that has two or more Hardware stores, and also organize the respective counties into mutual associations, and the same all over the State, a great many perplexing questions could be overcome.

SECRETARY'S REPORT.

The following extracts are taken from the annual report of Secretary Bare:

Immediately after our 1907 convention, the following letter was sent to every member of the Ohio Hardware Association:

We wish to make the next convention at Columbus in February, 1908, a great success. While the details of the session just closed are fresh in your memory, won't you write to me offering any suggestions or criticisms you may have to make? Your reply will be filed and given careful consideration by your Executive Committee in planning next year's programme. I sincerely hope you will assist us.

This letter was sent to the members of the Ohio Hardware Association, for the purpose of

Getting New Ideas,

and learning, if possible, just what the majority of our members desire to have done. The replies received, gave many good suggestions. If every individual member could but realize the encouragement and support he furnishes his officers, by writing a letter once in a while, more members would write. While we like to hear the nice things and the good things, yet we are more

Anxious to Have the Criticisms

that show us our faults. If we can once find where the faults are, the remedy can usually be applied. If the Ohio Hardware Association is not doing all you think it should; if the things it is doing, are not in accordance with your views; if in your estimation, its work and scope can be broadened, please say so. The secretary keeps on his desk a carefully prepared list of the Hardware merchants of Ohio, who answer his letters. Do not hesitate to express your views. It's your association, and your convention. We have said many times, and take this opportunity to repeat that the Ohio Hardware Association belongs to its members. Its officers, without exception, desire to carry out the will of the majority.

Strength of the Association.

Do you know it is a fact that we have the best commercial organization in the State of Ohio? Do you know that it is an admitted fact that the Hardware merchants of Ohio are more thoroughly and more perfectly organized than any other body of retail merchants in this or any other State? Our association has done and is doing a good work, but we are merely started, as compared with our possibilities.

Just stop to think! Suppose all the Hardware merchants in Ohio (over 2000) should earnestly and unitedly oppose or advocate certain legislation; suppose the 21 Congressmen of our State, or the members of our State Legislature should, within one week's time, receive letters from 2000 Hardware men, advocating or opposing a bill; suppose our two United States Senators should receive a like number of communications from the Hardware merchants of this State, what do you suppose would be the result?

Larger Questions.

It is to be hoped that as our organization grows and strengthens that it will take up larger questions—questions that stand for the growth and improvement of local communities, as well as for the State at large.

The good roads question has been called to our attention. It seems to me that the Ohio Hardware Association can very logically advocate and urge good roads legislation.

State List of Merchants.

The first of January of this year the secretary prepared 88 lists, one list for each county in the State. Each list contained the name of every Hardware merchant in that county, both members and nonmembers, as shown by the records in the secretary's office. One list was submitted to a Hardware merchant in each county with the request to correct by adding or cutting out as found necessary. Nearly every man to whom this was sent responded promptly. Strange to say, however, some of the names and addresses sent us are wrong, as letters have been returned by the Postoffice Department. Another difficult proposition is to get the name of every Hardware merchant properly spelled, together with postoffice address for our directory. The secretary begs to assure you that extraordinary care was used in making up our 1908 directory, but as you know some errors crept into it as well as in the supplement.

Personal Letters.

The secretary's faith in personal letters has grown instead of decreasing. Aside from personal solicitation, the personal letter system seems to be the best possible means for securing new members. We desire to again express our appreciation of the valuable service rendered by a number of Hardware merchants over the State who have written personal letters to nonmembers urging them to join our association. We have sometimes sent the name of a nonmember to as many as 10 members, asking that a personal letter be directed to this one man, setting forth the strong points of our organization. When a nonmember receives 10 letters coming from all parts of the State, he begins to realize that our members are very deeply interested in the work.

The National Retail Hardware Association

has been a strong factor in looking after the requirements and needs of retail Hardware men. Our national association membership is over 10,000, and such a body naturally is able to wield a great influence. The president of the national association, S. R. Miles, Mason City, Iowa, who honors us with his presence in this convention, has worked in season and out of season developing and advancing the national association. The results show that his labors have been well directed. New States have affiliated, and States which were already members have become more enthusiastic in their work. It is a matter for congratulation that such men as Mr. Miles would give so liberally of their time and ability.

Convention Committees.

The following committees were appointed by the president:

AUDITING: Messrs. Baker, Dayton; Swan, Steubenville; Hartley, Cambridge.

RESOLUTIONS: Messrs. Ballmer, Fostoria; Carr, Salem; Cross, Akron; Boebinger, Cincinnati; Hennie, Youngstown.

PRESS: Messrs. Seyler, Marietta; Milar, Akron.

NOMINATING: Messrs. Rahe, Cleveland; Cover, Lima; Ricketts, Coshocton; Glockner, Portsmouth; Massey, Osborn; Kryder, Alliance.

IN MEMORIAM: Messrs. Bogardus, Mt. Vernon; Rothwell, Hamilton; Taylor, Sidney; Harding, Jewett; Martin, McComb.

LAWS RELATIVE TO THE HARDWARE TRADE: Messrs. Oatman, Medina; Scott, Bridgeport; Held, Hamilton; Frame, Washington; Good, Akron; Eshelman, Orrville; Harris, Columbus.

Officers for 1908.

On recommendation of the Nominating Committee the following officers were elected for the ensuing year:

PRESIDENT, A. L. Shearer, Dayton.

VICE-PRESIDENT, Alexander M. Glockner, Portsmouth.

FINANCIAL SECRETARY, Frank A. Bare, Mansfield.

TREASURER, Otto Dellanbaugh, Lorain.

SECRETARY, Frank A. Bare, Mansfield.

EXECUTIVE COMMITTEES John F. Baker, Dayton; W. B. Cosgrave, Zanesville; Homer P. Smith, Ashtabula; D. L. Williams, Columbus.

DELEGATES TO NATIONAL CONVENTION: W. P. Bogardus, Mt. Vernon; Frank A. Bare, Mansfield; George M. Gray, Coshocton; H. C. Wiseman, Springfield; J. S. Spoerle, Hamilton; W. L. Jacobs, Youngstown. ALTERNATES: T. C. Weir, Steubenville; D. O. Thompson, Cambridge.

President-elect Shearer has served the association for several years as financial secretary, an office which is now merged with that of secretary. He has an unusually wide personal acquaintance with the individual members, has given lavishly of his time and effort at every convention and has actively supported the officers in their work throughout the year. He richly deserves the high honor that has been conferred upon him. In Vice-President A. M. Glockner and Treasurer Otto Dellanbaugh, the official family gains two new members whose previous work for the association promises the able administration of their respective offices. Former President J. F. Baker, W. B. Cosgrave, H. P. Smith and D. L. Williams are the new members of the Executive Committee.

Enlarged Delegation to National Convention.

It will be noted that the association has elected a larger delegation to the national convention than in former years. The Ohio body has never had more than three or four delegates, a number which is insufficient to represent the strength of the association, as compared with the delegations sent by other States. J. F. Baker gave a brief report of last year's national convention, attaching a high value to the work done. He declared that it was a highly educating influence to attend the national convention, and expressed the belief that the National Association exerted a threefold influence—helpful to the retailers, educational to the jobbers and salutary to the manufacturers.

Columbus Next Year.

The selection of the place of meeting for next year aroused considerable discussion. Early in the week badges made their appearance reading, "Toledo, 1909," and many thought favorably of the suggestion. When the matter came up for final decision, however, it was shown that there were many weighty reasons for coming back to Columbus, and on vote it was decided to do so by a large majority. Some considerations favoring Columbus were that it is centrally located, thus reducing time consumed in travel and traveling expenses, the hotel accommodations are reasonable and good, and the facilities for meeting place and exhibit hall are particularly convenient. It was shown that the Hardware show could be conducted in Columbus at much less cost than in a new city and that all arrangements previous to the convention would be less laborious and troublesome if the association came back to familiar ground.

Revision of Constitution.

A movement was set on foot to accomplish a revision of the constitution and by-laws, which were declared to be in some respects not well adapted to the needs of the association at the present time. It was voted to appoint a committee to study the subject, and report their recommendations by January 1, 1909. The committee was made up of W. P. Bogardus, J. F. Baker, and F. A. Bare.

Reports.

The treasurer of the association, C. C. Fouts, Middletown, and the financial secretary, A. L. Shearer, Dayton, made satisfactory and encouraging reports, as did the Auditing Committee. In the absence of Chairman W. B. Martin, Mansfield, F. J. Hibbs, Bridgeport, read the important report of the Grievance Committee.

Resolutions.

Acting on the report of the committee on In Memoriam, the association passed suitable resolutions relative to the loss of John Cramer, Dayton, and W. D. Voorhees, Frankfort, who died during the year. A special resolution of thanks to the retiring officers was passed by rising vote. The report of the committee on resolutions was also adopted without change. It contained the usual expressions of thanks and appreciation to all who assisted in the success of the convention.

The following paragraphs referring to topics of interest to the trade may be quoted:

Resolved, That we heartily indorse the Question Box feature at our sessions and recommend its continuance.

Resolved, That the association go on record as being unanimously in favor of bills Nos. 428, 929, 377, and bills relating to game.

PARCEL POST.

Resolved, That the Ohio Hardware Association is unalterably opposed to a parcel post in any shape or form, either local or general. We are especially opposed to the bill recently in-

troduced in Congress. We believe it will injure every retail Hardware merchant in the United States.

GOOD ROADS.

Resolved, That the Ohio Hardware Association go on record as in favor of any legislation that will further the interests of good roads.

TRANSFER OF STOCKS.

Whereas, Bill No. 428, by Senator Rathburn, regulating the transfer of stocks of goods in bulk, outside of the regular course of business, and with intent to defraud, has passed the Senate and is now before the House of Representatives for consideration:

Resolved, That the Ohio Hardware Association has hereby indorsed said bill in the interests of honestly conducted stores.

We are also in favor of a national law prohibiting false advertising and misrepresentation of goods handled by the Hardware dealers, in the belief that justice is the foundation of prosperity.

Mutual Insurance Company.

Great activity was shown by the officers and directors of the Ohio Hardware Mutual Fire Insurance Company, and although many members already carried policies in the company much new business was written. This organization is conducted along unusually conservative lines, and solicits no business outside the State. The annual meeting of the Insurance Company was held during the convention, and its able secretary, G. M. Gray, Coshocton, was re-elected by acclamation for three years. Secretary Gray delivered a splendid report, referring to the policy of the organization, its advantages and its claims upon association members, making an eloquent and earnest plea for loyalty, unity and devotion to the common cause.

Entertainment.

As stated in our telegraphic report last week, a large theater party was held on the first night of the convention, the entire house being occupied by the Hardwaremen, their ladies and guests. In the afternoon of Wednesday the ladies were entertained at an enjoyable card party and musical. Wednesday evening was occupied by combined business and pleasure, the early part of the evening being taken up by the Question Box, and the balance by a smoker and general good time, with music, some of it by Hardware talent, stories, informal speaking, &c.

CONVENTION NOTES.

As in former years, Secretary Bare and Financial Secretary Shearer were greatly assisted in the work of registration, &c., by Mrs. H. E. Hall, formerly Miss Shearer, and Miss Lucille J. Anderson, who are now almost regarded as members of the association. Acceptable work was also done by Miss Murray of Columbus.

Valuable assistance at headquarters was also given by James Maule, George Worthington Company, Cleveland; James Carson, McIntosh Hardware Corporation, Cleveland, and A. L. Becker, Belmer Company, Cincinnati, who have helped the association in this department from year to year, so that their wide acquaintance is a valuable asset in the work.

Members were favored with the free use of the Bell telephone lines in Ohio and the Western Union and Postal telegraph lines throughout the convention.

The officers and committees of the association were emphatic in their appreciation of the assistance rendered them by O. L. Davis, Smith Bros. Hardware Company, and Mr. Luthe, Columbus Hardware Company, both local jobbing houses.

Landers, Frary & Clark, New Britain, Conn., manufacturers of the Universal line of Bread and Cake Makers, Coffee Percolators, &c., had a very popular booth at the Hardware show, where they served delicious coffee to all comers. It was also intended to exhibit the Bread Maker, as was done last week at Indianapolis, by baking dainty sample loaves and sending them out as souvenirs, but owing to inability to get proper baking facilities in the hall this part of the display had to be given up.

The Cattaraugus Cutlery Company, Little Valley, N. Y., had an attractive display of its line, and gave out desirable souvenirs. Two genuine Cattaraugus Indians in native dress added picturesqueness to the exhibit.

A. H. PROCTOR, who has represented H. D. Thompson & Co., jobbers of Hardware, Malone, N. Y., on the road, has been elected secretary of the company, and will hereafter have charge of the buying in place of F. J. Riley, resigned.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM WESTON HARDWARE COMPANY, which will open up in business in Weston, W. Va., about April 1. The company will handle Shelf and Heavy Hardware, Queensware, Enameled and Tinware, Cutlery and Sporting Goods.

FROM ROCKLAND HARDWARE COMPANY, Rockland, Me., whose catalogues were all destroyed in a recent fire. The company's business includes Stoves, Hardware, Agricultural Tools, Garden and Field Seeds, Steam, Hot Water and Hot Air Heating, Cornice and general metal work.

FROM ADAM HELLER & Co., 616 East Pratt street, Baltimore, Md., who have just opened up a new Hardware, Paint and Oil business.

FROM FRANK R. SIMPSON, who has purchased the business of E. H. Spradlin, Goleta, Cal., and will handle Shelf and Heavy Hardware, Agricultural Implements and Paints.

FROM TEMPLE & SONS, Greensburg, Pa., who have suffered a $25,000 loss by fire, covered by insurance. The firm handles Shelf and Heavy Hardware, Stoves, Tinware, Paints, and Sporting Goods.

FROM PASCO HARDWARE COMPANY, Pasco, Wash., in which Wm. H. Ide and H. W. DeMuth have recently purchased an interest. The company has just moved into a new building which has been built for its use, and do a wholesale and retail business in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Sporting Goods and Plumbing Supplies.

FROM INLAND HARDWARE COMPANY, Spokane, Wash., handling Shelf Hardware, Stoves, Tinware, Paints, Oils, Glass, Pipe and Plumbing Supplies. An addition 22 x 24 ft. has been built for manufacturing all kinds of sheet metal work, and for ventilating and heating work.

WYETH HARDWARE & MFG. COMPANY, Saint Joseph, Mo.: Spring catalogue devoted to Farm and Garden Tools, Pruners, Garden Seeds, Lawn Mowers, Pumps, Wire Fencing, Screens and Trimmings, Brushes, Refrigerators, Gas Ranges, &c.

The American Hardware Corporation.

IN our last issue we referred to the annual meetings of the constituent companies of the American Hardware Corporation, and announced the names of the officers recently elected. This indicated that these companies are under substantially the same management as of late, with the important exception that Philip Corbin has retired from the presidency of P. & F. Corbin and of the Corbin Cabinet Lock Company. At a subsequent meeting of the American Hardware Corporation the following officers of this corporation were elected:

President, Philip Corbin.
First Vice-President, Charles M. Jarvis.
Second Vice-President, Howard S. Hart.
Secretary, Charles E. Wetmore.
Assistant Secretary, Charles B. Parsons.
Treasurer, Andrew J. Sloper.
Assistant Treasurer, Charles H. Parsons.
Directors: Philip Corbin, Charles M. Jarvis, Andrew J. Sloper, Charles H. Parsons, Charles Miller, Carlisle H. Baldwin, Charles Glover, Howard S. Hart, Sylvester C. Dunham, Frederick [illegible]

It will thus be seen that Philip Corbin continues at the head of this great corporation, to whose interests he still gives his attention, with the able assistance of Charles M. Jarvis, who as first vice-president, remains as before in the active direction of its business.

Illinois Retail Hardware Association.

THOSE whose good fortune it was to attend the eleventh annual convention of the Illinois Retail Hardware Association at Peoria, February 26, 27 and 28, had the pleasure of participating in one of the most successful and interesting meetings of this body. For the third time since its organization Peoria assumed the role of host to the Hardwaremen, and its hospitality, always generous, was never more open handed than on this occasion. Since its first visit in 1900, when it was a struggling organization with comparatively few members, the association has increased in numbers and importance until it now claims the proud distinction of outranking all other State associations in point of membership. Of the 1200 or more members now included in its roster somewhere near one-half were in attendance at this meeting, not a few of whom came from remote portions of the State. The Chicago local association helped materially to swell the total with a delegation of 70 members, together with 20 nonmembers invited as guests from among the merchants of the city. The healthy condition of the State organization and the vigorous and effective work accomplished by its officers is strikingly attested by its growth during the last year, within which period its numerical force has been increased by the accession of 182 members.

Hardware Exhibits.

In extent, completeness and orderly arrangement the Hardware exhibits shown at the Coliseum were highly creditable to the exhibiting jobbers and manufacturers and the association. All available space on the floor and stage of the building was fully occupied, and some very elaborate and artistically decorated booths were seen, the effect of which was hightened by the attractive lines of goods displayed. Under the carefully executed plans of the committee in charge of this work admission was restricted to members and merchants, except for a few hours on Thursday evening, when paid admission was extended to the public. A notable degree of interest was manifested in the various lines of goods shown, and that it was prompted by something more substantial than mere curiosity was attested by the placing of a fair amount of orders.

ADDRESS OF THE PRESIDENT.

The first session of the convention was called to order on Wednesday at 1.30 p.m., and was opened with an invocation delivered by Rev. Arthur N. Little, D.D., Peoria, after which Mayor Thomas O'Connor delivered an address of welcome, response to which was made by G. R. Lott, Chicago, in a few well phrased expressions of courteous appreciation. The annual address of the president, T. J. Mathews, followed in order. In it he boldly counseled his hearers to join in a conspiracy—a conspiracy of cheerfulness—and made a strong appeal for the cultivation of a spirit of optimism coupled with a safe degree of conservatism. The address was as follows in part:



T. J. MATHEWS,
President.



LEON D. NISH,
Secretary.

During the few brief years of our existence as an association we have witnessed, and shared in, an unparalleled era of commercial expansion and business prosperity, with which our association has kept pace. From a small beginning we have, with our affiliated State associations, grown into a vast trade organization, whose power has been used solely to correct trade evils and abuses, ward off unwise legislation and improve our own business methods.

In these objects we have not failed. The rapidity of our growth is the best measure of our success. An association of business men which cannot produce results is foredoomed to failure. But

We Are Making Good in Many Ways;

we are reducing the cost of fire insurance to our members; cultivating a fraternal spirit between competitors at home; reducing the sale of merchandise to consumers by manufacturers and jobbers, and improving business relations between the different branches of the trade. We are curbing the power of catalogue houses, exposing their methods of doing business and daily reducing the number of manufacturers' brands which they may safely catalogue with the assurance of obtaining supplies.



H. E. GNADT,
Treasurer.

We have so far successfully blocked the passage of the iniquitous Parcel Post bill, launched as it was under the most favorable circumstances, and backed by our resourceful Postmaster-General, who ought to be working in the interest of the public instead of fostering laws for the benefit of the mail order octopus, whose tentacles are even now reaching into every country district, draining it of its circulating medium. But the end is not yet; for the Parcel Post bill has a catlike propensity for bobbing up serenely after every killing. If it has nine lives we must give it nine funerals.

Modern business is a strict application of the Darwinian principle of the survival of the fittest. The strong thrive, while the weak go to the wall. We should not forget that our strength lies in our organization, and that we must keep it up as a measure of self-protection. So let us not only be alert and aggressive, but loyal.

A Word on Optimism.

We have seen within the last few months how, in the midst of the greatest prosperity, the reckless and unscrupulous methods of a few buccaneers of finance may precipitate an entirely unnecessary panic upon the country. But happily some of the pirates have been eliminated from the game, and for the time being Wall Street is on its best behavior, business is improving and confidence is being restored. Let us all be optimists and join the conspiracy of cheerfulness that is sweeping over the country; for the man who talks hard times is in effect telling his customer to hoard his money instead of making needful purchases. Be optimistic, and remember that the effect of the panic will not have been wholly bad if it teaches us the lesson that conservatism in business spells safety to the merchant. Price may sometimes tempt us to buy beyond our needs, but regrets usually follow in its wake. Don't overbuy, and you will save much gray matter, and may be some gray hairs.

Some of Our Members Are Perhaps Here

for the first time. There are others who have been here before, but have with characteristic modesty refrained from taking part in the business of the meeting. This is your convention, please do not forget it, and when the Question Box is opened give some of the results of your experience in exchange for what you get from others. If you are a newcomer, introduce yourself to the officers, or to the Reception Committee, or to any one you care to meet. When you are among friends you may safely forget you are a stranger. But do not feel hurt if some one forgets your name. Some of us have short memories, and find it hard to remember the names of those we meet but once a year.

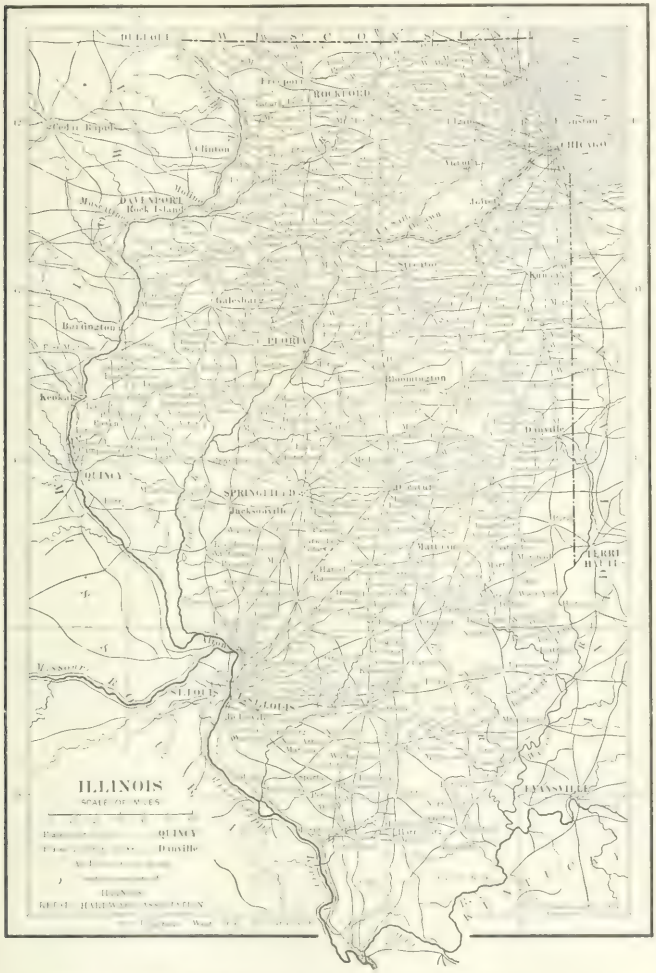
Growth of the Organization.

It is with great pleasure I record the continued growth of this association. We have now something over 1100 members in good standing, but there should be more, as many as there are dealers in the State. I won-

der that any are content to remain without the fold. It is true they may do so and without expense reap the benefit of much of our labors, but it is also true that we get some good things in which they cannot share. We do not look on our small annual dues as an expense, but as an investment yielding larger returns than any other we can make.

The Man Who Attends Trade Conventions

rubs up against the brightest minds in his line of business. He absorbs new methods and ideas, as the thirsty soil drinks up the summer rains, and like mother earth, he gives as well as takes, for he has learned that selfishness is not a good business asset. He returns



Hardware Association Map of Illinois—All the Towns Shown Contain One or More Members of the Association.

home fired with a new ambition—to become a better merchant; to have a brighter, cleaner, more up to date store than any of his competitors; to win recognition as a working force in the social and civic, as well as the business life of his community. His outlook becomes greater, his sympathies wider and the spirit of brotherhood deeper. He is no longer a cog, but an independent wheel in the vast machinery of business, whose work is to supply the world with some of the finest products of human ingenuity and invention, products that have not only been mile stones marking the progress of civilization, but also its stepping stones.

I hope that each of you will find the present meeting not only a pleasant vacation, and a welcome change from the problems of every day life, but also a business inspiration that will help you to take a new joy in your work.

REPORT OF THE SECRETARY.

The report of Secretary L. D. Nish was replete with facts of an encouraging nature concerning the prosperous condition of the association in all that relates to its welfare as an organization. Particular emphasis was laid upon a growing feeling of interest among the individual members, which was manifest in their prompt attention to matters suggested in letters from the secretary's office. The report is given, in part, as follows:

As secretary of this association it is again my pleasure in submitting the annual report to be able to advise you of its continued advancement in all that contributes to its strength and power as an organization. It is a source of pleasure to me, as it must be to you, to know that our membership has during the past year been materially increased, and that the influence and effectiveness of the association has grown in corresponding proportion. Through the letters and printed matter sent out from the secretary's office you have from time to time been acquainted with the details of the work in which it is engaged, and the spirit of co-operation exhibited by the members in the responses received affords gratifying evidence of your loyalty and interest in the work.

The Executive Committee has at all times manifested a generous interest and a willingness to serve in the promotion of all of the affairs of the association, and not a week has gone by but that several letters from the members of this committee have reached the secretary's office in connection with matters of importance to the association.

Complaints that have been received have been promptly taken up and carefully investigated. Most of these complaints have been taken up with manufacturers or others whom they concern and were generally adjusted without much friction.

Energetic Opposition to Parcel Post.

Parcel post legislation, a subject of great importance and one uppermost in our minds, has demanded and received a considerable portion of our time. The secretary, as you know, wrote a personal letter to each member of the association upon this subject, which was generously responded to; and let me assure you that the Congressmen of the State of Illinois are now fully aware of the existence of a Hardware association in this commonwealth. I wish to thank you for your prompt and energetic action in writing to the several Congressmen of this State, which, I am sure, has not been without its effect.

As a result [illegible] position to the practice of using freight cars as billboards for an advertising medium of the various mail order houses this objectionable method of publicity has been stopped.

Membership Larger Than Any Other State Body.

Touching our standing among the State organizations comprising the national body, I am pleased to say that we still maintain our rank at the head, being numerically the largest of them all; 182 members have been added to our roll this year. Of the 21 that have dropped out, 7 have been removed by death, and I am confident that of the 14 who have allowed their membership to lapse, several, if not all, will eventually be re-enrolled.

Advisory Board of Ex-Presidents.

I wish to offer for your consideration a suggestion the adoption of which would, in my judgment, prove helpful

in fostering the growth and facilitating the work of the association. We have need at all times for men qualified by experience to handle the problems we are called upon to solve, and it would seem advisable, therefore, to devise some means for keeping our ex-president in the harness. By reason of their official service these men have been brought in close touch with the work and are consequently familiar not only with the aims and purposes of the organization, but have, as well, an intimate knowledge of the methods best adapted to the proper despatch of its business. This question has received the attention of the national association, with the result that its ex-presidents now constitute an Advisory Board. I believe, therefore, that it would be a good thing for the Illinois association to create a similar board composed of its ex-presidents. Such a committee would never be over large, since at the present time, after an existence of 11 years, we have now but two ex-presidents, H. G. Cormick, Centralia, and Charles H. Williams, Streator, Frank B. McKenney, who was succeeded by our present president, being now a resident of California.

QUESTION BOX.

The Question Box, conducted under the direction of Mr. Cormick, was especially interesting for the number and interest of the queries propounded. On many subjects, however, the members seemed to be a little backward in expressing themselves, and a number of good questions were passed without discussion. Among these may be noted the following:

What are the best lines of goods to add to the average Hardware stock in a town where the trade is largely country trade?

Does it pay to stick to one line of goods, and if so, should it be a jobber's or a manufacturer's brand?

Does it pay to buy goods from manufacturers in large quantities, or is it better to buy in smaller quantities from jobbers at a slight advance in price?

What class of Hardware dealers have been most successful during the past few years, those who have pushed specialties of various kinds, or those who have devoted themselves exclusively to the legitimate Hardware trade?

Would it pay to increase stock of active lines, and cut out slow selling ones? Which pays the best, selling active lines at a small profit, or slow moving lines at a large profit?

Following are some of the questions which evoked discussion, with abstracts of the ideas suggested:

Do cooking exhibitions in connection with steel ranges pay?

Some members declared that they did, but others were less positive. One member wisely suggested that it was not always possible to trace directly the results of demonstrations. The point was made, however, that all ranges will bake, and no public demonstration will prove conclusively the value and advantages of any particular design or brand. Such demonstrations were said to be unknown in cities of any size.

A number of manufacturers send out Tin and Enamelware that does not hold the amount marked upon the label; for instance, a Pudding Pan marked 2 quarts may hold only 1½ quarts.. Is the statement that these are "stock sizes" a sufficient answer to these complaints?

It was agreed that the associations ought to take steps to require manufacturers to furnish the actual sizes named.

Should the retail Hardwaremen of Illinois incorporate an accident insurance company for their employees?

This question, it would appear, arose from the present general discussion of employers' liability, and various ideas and suggestions were given out. One member reported that he carried a blanket employers' liability policy, which cost something like $40 a year, and insured any three men against accident and death. He did not have to mention names. This form of policy was regarded with much interest by many present.

Is the Bicycle and Sporting Goods trade profitable, and does not a large part of this trade go to department stores and mail order houses? How about loaded Shells?

Animated discussion was started by this question, referring especially to the power and policy of the ammunition association. One reported that he had built up an excellent trade by selling black powder Shells at the catalogue house price, and then educating customers to purchase smokeless Shells on standard loads. He found that while his Shell business itself was not very profitable, it helped materially in other lines of Sporting Goods.

Is there any one present who conducts a strictly cash business?

There was a lively discussion as to the feasibility of conducting a Hardware store on a strictly cash basis, provoking much amusement and bringing out many suggestive ideas.

The Clerk and the Show Window.

H W. Beegle of the Coulter-Beegle Company, Chicago, read an instructive paper on "The Merchants' Aids—The Clerk—The Window." Valuable suggestions were offered respecting the treatment and training of employees and the advertising value of window dressing. Mr. Beegle's paper will be given in a later issue.

Convention Committees.

Convention committees appointed by the president were comprised as follows:

LOCATION: George Englehart, Chicago; Charles Zinnbrook, East St. Louis; Harry Reed, Bloomington; Lawrence Babst, Kankakee.

NOMINATIONS: The officers, and H. G. McCormick, Centralia; A. J. Englehardt, Chicago; Fred. Geissing, East St. Louis; William Bittel, Peoria; Charles Williams, Streator.

AUDITING: R. G. Schewier, Vandalia; C. G. Gilbert, Oregon; W. H. Hauss, East St. Louis.

PRESS: I. K. Neeley, La Salle; Edson Smith, Elmwood; Ernest Bolser, Peoria.

RESOLUTIONS: Grant Porter, Chicago; O. H. Howe, Streator; Geo. P. Tomlinson, Kinmundy.

MEMORIAM: J. P. Eckles, Decatur; Royal Kimball, Elgin; Geo. Soegler, Peru.

Work of Business Men's Associations.

In acknowledgment of a special invitation extended by Secretary Nish, Mr. Gibson, secretary of the Business Men's Association, Battle Creek, Mich., arrived on Friday morning to speak on what a "Business Men's Association Can Do." Starting with the observation that such an organization can accomplish nothing without the favorable backing of a united public sentiment he asserted that it was obviously necessary to create a sentiment of this kind. He related how the business men of Battle Creek, through their association had endeavored to remove the prejudice existing, to a greater or less degree among farmers, against the city. In order to prove the mutuality of their interests and demonstrate their own desire to co-operate with the farmers of the community a monthly farmers' sale was instituted. These free auction sales are held on the first Wednesday of each month for the purpose of enabling farmers to dispose of such goods and chattels as they desire to sell, without cost. In addition to assuming the expense of these sales the association also serves a free lunch at its rooms, at which time topics of interest, such as good roads, means of checking the spread of San Jose scale and kindred subjects were introduced for discussion. In this way the barrier of distrust are being gradually broken down and the results have proven the experiment to be an invaluable aid in establishing the cordial relations necessary to the preservation of home trade.

The benefits derived from expenditures made in this way by the association and the means adopted to secure the co-operation of the farmer in the extension of the work were demonstrated by facts and figures presented. The very practical suggestions contained in Mr. Gibson's address were received with expressions of emphatic approval by the convention.

Prize Window Designing Contest.

An interesting feature of the convention was the contest for the prizes offered for the best window displays, represented by photographs handed in under an assumed name, with a sealed envelope containing the proper name of the contestant. For the windows which, in the judgment of the committees in charge, would prove most effective in making sales the following prizes were offered:

1. $10 for best Hardware window display in retail Hardware store of Peoria during the convention.
2. $10, best photograph of window from towns of 25,000 and over.
3. $10, best photograph of window from towns of 10,000 to 25,000.
4. $10, best photograph of window from towns of 3000 to 10,000.
5. $10, best photograph of window from towns of 3000 or under.

In accordance with these provisions the following awards were made: For Peoria window, No. 1: Prize to Hunter & Strehlow. For out of town windows: No. 2, C. Hauss Hardware & Stove Company, East St. Louis; No. 3, W. E. Good, Kewanee; No. 4, E. N. Howell Hardware

Company, Dixon; No. 5, James E. Vorhees, Bushnell. H. F. Ruhe & Co., Crete, received honorable mention.

Photographs to the number of 21 were entered in the contest, all of which possessed a high degree of merit, both from the viewpoint of artistic taste and practical advertising value.

New Officers and Committees.

The terms of office of the secretary, treasurer and two members of the Executive Committee were the only ones of the Executive Staff expiring at this time. To fill these, L. D. Nish was re-elected secretary and H. E. Gnadt, treasurer. Two new members of the Executive Committee elected to succeed retiring members were H. C. Peppler, Chicago, and William Bittel, Peoria. Following is a list of officers who will serve for the ensuing year:

PRESIDENT, T. J. Mathews, Mt. Vernon.
VICE-PRESIDENT, E. L. Sommers, Chicago.
SECRETARY, Leon D. Nish, Elgin.
TREASURER, H. E. Gnadt, Chicago.
EXECUTIVE COMMITTEE: D. M. Norris, Kankakee; E. N. Howell, Dixon; David Refior, Ottawa; J. H. Vawter, Salem; H. C. Peppler, Chicago; William Bittel, Peoria.
LEGISLATIVE COMMITTEE: C. H. Williams, Streator, H. P. Harris, Monticello; Geo. Englehardt, Chicago; Charles Woodward, Carlinville; Charles Mauer, East St. Louis.
INVESTIGATING COMMITTEE: O. H. Howe, Streator; C. G. Gilbert, Oregon; R. G. Scheurer, Vandalia; Guy McCurdy, Bloomington; E. R. Paton, Pekin.

The following Delegates to national convention were chosen: T. J. Mathews, Mt. Vernon; L. D. Nish, Elgin; J. H. Vawter, Salem; F. Geissing, East St. Louis, O. H. Howe, Streator: Geo. Englehardt, Chicago; James Gormley, Chicago; Wm. Bittel, Peoria; Thos. E. Conner, Evanston; Charles Zumbrock, Springfield; Charles M. Hurst, Decatur.

Resolutions.

The following, among other resolutions, were adopted:

Whereas, It has been brought to the notice of our association that the railroad companies are making indirect and unlawful rebates to catalogue houses; and,

Whereas, We, as dealers and members of this association, are being injured by this unjust discrimination; therefore, be it

Resolved, That we urge immediate and definite action by the Railroad and Warehouse Commission to make this practice impossible.

Whereas, During the past few months letters from a great many of our members have been addressed to the Senators and Congressmen of our State relative to and with the intention of obtaining their attitude toward the proposed parcel post; and,

Whereas, The response in the main has been satisfactory, each Representative and Senator expressing himself as either against, or yet to be convinced, in favor of the above measure; therefore, be it

Resolved, That we as an association recognize and show our appreciation of their sound judgment in their various expressions, through this, our resolution, and that our secretary be instructed to furnish a copy of this expression to each.

Whereas, The development of the natural resources of the Central West by every possible method is of incalculable benefit to all lines of industry; and,

Whereas, The possibility of naval protection for our inland cities is an insurance to business; and,

Whereas, The proposed deep waterway from the lakes to the gulf will greatly develop the territory through which it passes, both by building up such territory, affording a natural regulation of freight rates, and by giving such naval protection and where, more than one-half of the cost of building the lakes to the gulf deep waterway from Chicago to St. Louis, has already been expended, and 40 miles of available channel has been completed; and,

Whereas, The most expensive part of the work, from Chicago to St. Louis, not yet completed, can be met ultimately by the revenue derived from the water power created incidental to its construction; therefore, be it

Resolved, That the Illinois Hardware Association, in convention assembled, hereby indorses the proposed lakes to the gulf deep waterway; also the proposed issue of $20,000,000 in bonds to be voted upon at the election in November, and call upon our Representatives in Congress to use every effort to further the interest of such lakes to gulf deep waterway and hasten its early completion.

Resolved, That this convention in assembly do indorse the action of the jobbers, who are opposing the manufacturers in selling catalogue houses.

Resolved, That this association discourages the purchase of all lines of goods that are now sold to and distributed by the premium houses.

CONVENTION NOTES.

As a delegate to the last national convention at Boston, H. G. Cormick, Centralia, presented a comprehensive, yet well digested, report of the proceedings of that body, in which the business of each session was summarized in a concise form that gave his hearers a clear and intelligent understanding of what was undertaken and accomplished in the national assembly.

Addresses were also made by Charles W. Burrows, Cleveland, Ohio, on "Postal Fallacies and Their Effect Upon the Country," and by Geo. H. Maxwell, Chicago, who spoke upon the evils of the centralization of population in large cities. Both of these subjects were ably handled and the telling points made by each speaker were roundly applauded.

Secretary Nish, on behalf of the donor, C. Hauss, East St. Louis, presented President T. J. Mathews with a beautiful rosewood gavel. Discarding a rough wooden mallet, which had hitherto done service in the conduct of deliberations, the president accepted the gift in a few words of graceful acknowledgment.

Being called upon to address the assembly, Geo. E. Green, secretary of the Illinois Retail Merchants' Association, made an impromptu speech in which he commended the Hardware associations for the effectiveness of their efforts, and urged the extension of such organizations into every town not already represented in their membership.

The National Association was represented at the convention by H. L. McNamara, treasurer, and Charles H. Williams, second vice-president, both of whom were contributors to the discussion, which filled every hour of each session with lively interest. Mr. McNamara, under the topic, "The National Association," also made an eloquent address, in which he counseled closer relations between the State and national associations.

C. A. Peck, secretary of the Wisconsin Association, and Jos. F. Doty, vice-president of the Iowa Association, were guests of the convention, and in addition to bringing greetings from these bodies gave informal talks upon the subject of mutual fire insurance.

The space occupied by the Simmons Hardware Company, St. Louis, Mo., was furnished as a rest room for visitors. Comfortable chairs and settees, thoughtfully provided, proved a welcome haven for tired sightseers and made the Simmons headquarters a popular resort. Occupying a prominent position in this booth was a huge wooden fac-simile of the notable catalogue recently issued by the firm. It was mounted on a pedestal, and upon opening the top cover it was discovered, by those curiously inclined, that instead of illustrated Hardware lists the interior contained an inviting stock of cigars, which were freely dispensed to all callers. Guests were courteously entertained by the following representatives of the company: Frank J. Wachter, Geo. A. Lubbe, C. A. Nelson, E. E. McGrath, F. E. Beeth, C. J. Moore and A. W. Houck.

Instead of displaying its well-known line, which has frequently formed a creditable feature of many former Hardware shows, the Cattaraugus Cutlery Company, Little Valley, N. Y., converted its booth into a realistic Indian camp, including a native tent, weapons and other accouterments made and used by Indians. The effect of this novel display was hightened by the presence of two Cattaraugus Indians from the reservation near Little Valley. Bedecked with feathers and fantastic native costumes these two braves attracted much attention and were the center of interest for the crowd. As an evidence of their peaceful mission Tint Champlin, president of the company, displayed to the inquiring throng a curiously wrought peace pipe, which he explained was a guarantee against any hostile demonstration.

One of the most elaborate booths in the Auditorium was that of the wholesale Hardware firm of Clark, Quien & Morse, Peoria. It was constructed of Copper Spouting neatly framed and decorated and contained a tastefully assorted display of Cutlery and Shelf Hardware. Visiting members and Hardware merchants were also entertained at the company's store, where an inviting lunch was served to all who called.

The exhibit of the Isaac Walker Hardware Company, Peoria, spoke eloquently for the enterprising character of Peoria's wholesale Hardware interests. It comprised a well assorted, a neatly arranged line of Builders' Hardware, Cutlery and other goods.

Headed by W. H. Bennett the Chicago delegation consisting of 90 persons on their arrival at Peoria in a special car, were met at the depot by a band which escorted them in marching order with banners flying to their hotel. The marked courtesy of their reception was only the beginning of continued attentions and hospitality shown them by members of the Peoria Association during their stay.

Telegrams of greeting and congratulation were received from W. H. Hahn of the Missouri Association, and R. R.

Williams. Hardware editor of *The Iron Age*, both of which were suitably acknowledged.

On Wednesday evening the members, guests and exhibitors were delightfully entertained at a smoker given by the local association in the auditorium of the Creve Cœur Club. The programme of entertainment included a number of songs and specialties by amateurs and professional talent, which were keenly enjoyed by the audience of 750 people, which filled the hall. One of the particularly pleasing numbers was a song by Charles S. Burdick, secretary of the Commercial Club, who after a storm of applause and persistent encore responded by singing "Illinois." The ladies attending the convention were entertained on the same evening at a theater party given at the Majestic Theater. For these very pleasing entertainments and other thoughtful provisions made for the comfort and convenience of their guests credit is due to William Bittel, J. L. Douglas and James A. Hunter, who comprised the Entertainment Committee appointed by the local association to carry out its hospitable plans.

After considering the urgent appeals of both Peoria and Springfield to be chosen as the location of the next convention, it was unanimously decided to accept the recommendation of the Committee on Location, which pronounced in favor of Springfield.

The financial report of Treasurer H. E. Gnadt showed the total resources for the year to be $5394.72; expenditures, $4601.55; leaving a balance on hand of $793.17.

Following the reading of a letter from ex-President Frank B. McKenney, now a resident of San Jose, Cal., expressing his wishes for the continued success of the association, he was upon motion unanimously elected an honorary member of the organization.

EXHIBITS AND EXHIBITORS.

Following is a list of the exhibiting manufacturers at the Illinois convention, with their representatives:

A B Polish Company, Chicago: Liquid, Paste or Powder Stove Polish, Metal Polish and Iron Enamels.

Acme White Lead & Color Works, Detroit, Mich.: Acme Paints, Enamels, Stains and Varnishes. Represented by Mr. Sackett, F. O. Clizbe and A. S. Dougall. Souvenir, Paint Pail Paper Weight.

Allith Mfg. Company, Chicago: Barn, Warehouse, Parlor Door and Door Equipment. Represented by B. Boyce and F. E. Sladden.

American Wringer Company, New York: "Chemical" Clothes Wringers. Represented by Charles T. Ziegler and L. Schmetzer.

Auer Register Company, Cleveland, Ohio: Side Wall Registers. Represented by D. J. Metzger.

Automatic Damper Company, Milwaukee, Wis.: Automatic Specialties and Star Ball Bearing Pulleys. Represented by A. B. Ferdinand.

Barstow Stove Company, Providence, R. I.: Hot Air Furnaces and Steam and Hot Water Heaters. Represented by Geo. Clark Powers.

Blackstone Mfg. Company, Jamestown, N. Y.: Niagara and Magic Power Washers.

Bommer Brothers, Brooklyn, N. Y.: Bommer Screen Door Hinges. Represented by J. V. Wise.

Boss Mfg. Company, Kewanee, Ill.: Husking Pins and Hooks. Represented by T. H. Blair and E. Weber.

Bullard & Gormley Company, Chicago: Hardware and Sporting Goods. Represented by Louis Kumpfer, Harry Bullen and Wm. T. Gormley.

Carborundum Company, Niagara Falls, N. Y.: Abrasive Wheels, Sharpening Stones, Carborundum Paper and Cloth, &c. Represented by Charles O. Taylor, E. J. Eames and B. L. Cohen. Souvenirs, Pocket Hone and photograph of Niagara Falls.

Philip Carey Mfg. Company, Cincinnati, Ohio: Roofing. Represented by Hunter & Strehlow.

Cassens Mfg. Company, Edwardsville, Ill.: Ideal Eaves Trough. Represented by Geo. Cassens.

Cattaraugus Cutlery Company, Little Valley, N. Y.: Cutlery. Represented by H. P. Corwith, C. E. Shape and Tint Champlin.

Central Specialty Mfg. Company, Chicago: Bathroom Fixtures. Represented by W. H. Hender.

Chicago Stove & Range Company, Chicago: Stoves and Ranges. Represented by F. A. Steele, J. W. Dimmett and H. O. Whipp.

Clark, Quien & Morse, Peoria, Ill.: Wholesale Hardware. Represented by S. L. Barnhart and T. J. Coughlan.

Columbian Hardware Company, Cleveland, Ohio: Registers and Hardware Specialties. Represented by R. S. Hickey and C. W. Domine.

Comstock-Castle Stove Company, Quincy, Ill.: Economy Stoves and Ranges. Represented by Philip Loughnane, C. W. Curtis and J. H. Bannon.

Crandall Right-Handed Cutlery Company, Bradford, Pa.: Right-Handed Pocket Cutlery and Automatic Stropping Machines. Represented by K. G. Bartley.

Cutler & Proctor Stove Company, Peoria, Ill.: Stoves and Ranges. Represented by J. C. Fox and staff.

Dairy Queen Churn Company, Monmouth, Ill.: Churns. Represented by J. H. McLaughlin and S. R. Dorris.

Detroit Stove Works, Detroit, Mich.: Jewel Stoves and Ranges. Represented by G. W. Johnston, Frank Foster, M. L. Smith and A. P. Burnett. Souvenirs, Needle Case and Kitchen Reminder, Paper Knife and Yard Sticks.

Dodd & Struthers, Des Moines, Iowa, and Peoria, Ill.: Copper Cable Lightning Rods. Represented by D. E. De Nise and Bert Wolford.

Dover Mfg. Company, Canal Dover, Ohio: Asbestos Sad Irons. Represented by Charles T. Johnson and M. H. Snyder.

Economy Washing Machine Company, Chicago: Economy Washing Machines. Represented by L. W. Mammen and W. E. Wentzel.

Elliott Mfg. Company, Warren, Ill.: Anti-rusting Tinware and Galvanized Ware. Represented by G. E. McDonald and W. T. Fisher. Souvenir, Money Bank.

Engineering & Supply Company, Milwaukee, Wis.: Brett Grain Savers. Represented by C. H. Barker and F. W. Mahneke.

Estate of P. D. Beckwith, Inc., Dowagiac, Mich.: Round Oak Stoves, Ranges and Furnaces. Represented by R. R. Elliott and D. E. Cummings. Souvenir, Stick Pin.

Farwell, Ozmun, Kirk & Co., St. Paul, Minn.: Cutlery, Silverware and Novelties. Represented by F. L. Farra.

Faultless Stove Works, St. Charles, Ill.: Stoves. Represented by J. R. Strahlendorf. Souvenir, Swedish Match Safe.

Ferdinand Dieckmann, Cincinnati, Ohio: Conductor Elbows. Represented by Otto Dieckmann. Souvenir, Cigar Cutter.

Frazer Stove Company, Indianapolis, Ind.: Ranges and Stoves. Represented by L. M. Frazer, K. P. Knight and P. J. Ryan.

Gabel Mfg. Company, Hawkeye, Iowa: Pig Forceps. Represented by W. G Krueger.

Gillespie-Benedict Company, Chicago: Everlastic White Lead. Represented by Walter C. Koch and Arthur J. Gillespie.

Glascock Brothers Mfg. Company, Muncie, Ind.: Baby Jumpers, Wood and Steel Hand Cars. Represented by C. L. Bender.

Globe Stove & Range Company, Kokomo, Ind.: Stoves and Ranges. Represented by L. Leu and J. A. Hutchings.

Green Foundry & Furnace Works, Des Moines, Iowa: Furnaces. Represented by C. L. Burch and F. O. Green.

Hawkeye Incubator Company, Newton, Iowa: Washing Machines. Represented by F. A. Goff and C. H. Pierson.

Hefenga, Barkemeier Bros. & Co., Riverdale Station, Chicago: Heyenga Short Turn Non-Upsetable Gears. Represented by H. Barkmeier.

Hill & Nieman, Fithian, Ill.: Patent Gates.

Ideal Concrete Machinery Company, South Bend, Ind.: Concrete Machinery. Represented by Robert F. Havlik.

International Harvester Company, Chicago, Ill.: Cream Separators and Gas Engines.

Iwan Brothers, Streator, Ill.: Augers and Diggers, Mining Tools, Hay Knives, Chimney Tops, Conductor Pipe Hooks and Hangers. Represented by A. L. Iwan.

Keith Furnace Company, Des Moines, Iowa: Cast Iron Furnaces. Represented by Geo. E. Willsie and Bert R. Pranke.

Keystone Steel & Wire Company, Peoria, Ill.: Square Deal Poultry Fence. Represented by O. E. Rort and L. H. Phelps.

Lasher Mfg. Company, Davenport, Iowa: Kitchen Utensils. Represented by E. C. Greeley.

Lennox Furnace Company, Marshalltown, Iowa: Heating and Soldering Furnaces. Represented by Geo. C. Thiele, A. W. Heald and S. P. Britt.

Lowe Brothers Company, Dayton, Ohio: Paints and Varnishes. Represented by Leo D. Johnson and H. A. Baldwin. Souvenir, Putting Stone.

Lyons Specialty Company, Lyons, Iowa: Petersen Steel Barn Door Latch and Holder. Represented by Wm. Petersen.

M & D Range Company, Chicago: Wrought Steel Ranges. Represented by E. A. Clark and E. E. Van Dien. Souvenir, Pocket Stamp and Plaster Book.

Majestic Mfg. Company, St. Louis, Mo.: Steel Ranges. Represented by Carl Sommer.

Malleable Iron Range Company, Beaver Dam, Wis.: Monarch Ranges. Represented by Charles Miller and C. W. Stewart.

Martin-Senour Company, Chicago: Paints. Represented by Frank B. Martin, E. C. Frantz and N. J. Austin.

F. Meyer & Bro. Company, Peoria, Ill.: Handy Furnace Pipe and Fittings. Represented by Charles Uhlig, Geo. Harms, Geo. Meyer, W. E. Bruniga, J. A. Flickinger and Charles Spindler.

Michigan Washing Machine Company, Muskegon, Mich.: Washing Machines. Represented by G. E. Harding.

National Cable & Mfg. Company, Niles, Mich.: Pure Copper Cable Lightning Rods. Represented by T. J. Dougherty and Rome O'Connell.

National Cutlery Company, Detroit, Mich.: Cutlery. Represented by William L. Bigelow.

National Lumber & Woodenware Company, Cairo, Ill.: Washboards. Represented by E. D. Carey, E. A. Hebberd and H. C. Crittenden.

National Roofing Materials Company, Edwardsville, Ill.: Roofing. Represented by G. W. Corman.

Nelson & Morrison Mfg. Company, Peoria, Ill.: Snap Hose Coupling. Represented by L. R. Nelson.

Never-Break Range Company, St. Louis, Mo.: Represented by R. C. Probasco and F. P. Krielkenbaum.

Newton & Haggerty Ladder Company, Detroit, Mich.: Ladders. Represented by C. D. Pinkney.

Ney Mfg. Company, Canton, Ohio: Haying Tools and Hardware Specialties. Represented by L. Stern and J. M. Leidigh. Souvenirs, Memorandum Book and Watch Fob.

William Norris & Co., Peoria, Ill.: Lightning Rods and Fixtures. Represented by L. S. Schnebly and William R. Norris.

Northwestern Barb Wire Company, Sterling, Ill.: Dillon Square Mesh Field Fence. Represented by P. W. Dillon and A. H. Dillon.

Novelty Iron Works, Sterling, Ill.: Handy Automatic Stock Fountain.

Oneida Community, Ltd., Oneida, N. Y.: Chains, Game Traps, &c. Represented by Frank H. Primo and W. E. Scanlon.

People's Direct Supply Company, Dubois, Pa.: Porch Swings. Represented by Dole Hamilton.

Peoria Drill & Seeder Company, Peoria, Ill.: Peoria Seeding Machinery. Represented by E. G. Isch & Co.

Peoria Lawn Mower Grinder Company, Peoria, Ill.: Mower Grinders. Represented by A. C. Warner.

Petaluma Incubator Company, Petaluma, Cal.: Incubators. Represented by R. A. Pearson.

Peters Pump Company, Kewanee, Ill.: Murchison Clothes Line Reel. Represented by R. Murchison.

Pittsburgh Plate Glass Company, Chicago: General distributers for the Patton Paint Company, Milwaukee, Wis., and Newark, N. J.; Patton's Sun-Proof Paints. Represented by J. C. Connell, G. A. Hopkins, C. M. Shaw and Wm. C. Magee. Souvenir, Stick Pin.

Pittsburgh Steel Company, Pittsburgh, Pa.: Wire Fence. Represented by E. W. Watson, H. W. Bartell and T. E. Gilbert. Souvenir, Key Chain.

Pritchard-Strong Company, Rochester, N. Y.: Prisco Lanterns and Metal Ware. Represented by F. J. Schmitt.

Oscar C. Rixson Company, Chicago: Door Checks. Represented by J. V. Wise.

Rock Island Tool Company, Rock Island, Ill.: Machinists' Vises. Represented by C. E. Shields and A. S. Lindeblad.

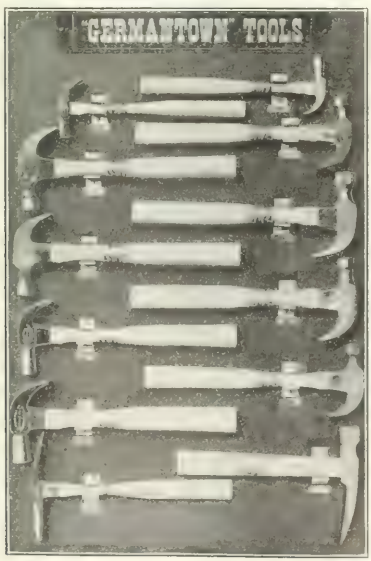
Rotary Washing Machine Company, St. Louis, Mo.: Washing Machines. Represented by Henry Brammer and A. W. Heitmeyer.

Samson Cordage Works, Boston, Mass.: Binder Twine. Represented by J. V. Wise.

SHELBY SPRING HINGE COMPANY, Shelby, Ohio: Hinges. Represented by R. E. Murray. Souvenir, Match Safe.
SHERWIN-WILLIAMS COMPANY, Cleveland, Ohio: Paints. Represented by the Globe Mfg. Company, Peoria.
SIMONDS MFG. COMPANY, Fitchburg, Mass., and Chicago, Ill.: Saws, Files and Machine Knives. Represented by R. H. Myers, Charles A. Morse and Will J. Feddery.
SIMMONS HARDWARE COMPANY, St. Louis: General Hardware. Represented by Frank J. Wachter, Geo. A. Lubbe, C. T. Nelson, E. E. McGrath, F. E. Beeth, C. J. Moore and A. W. Houck.
STANLEY WORKS and HART & COOLEY COMPANY, New Britain, Conn.: Builders' Hardware and Steel Registers. Represented by H. M. Libe and D. B. Woodbury.
SUPERIOR MFG. COMPANY, Sterling, Ill.: Superior Washing Machines. Represented by E. W. Aument.
TAYLOR & BOGGIS FOUNDRY COMPANY, Cleveland, Ohio: Locks. Represented by E. F. Coulter.
THATCHER FURNACE COMPANY, Chicago: Furnaces, Steam and Water Heaters. Represented by S. E. McLaughlin and R. C. Cook.
R. N. THOMAS, Shenandoah, Iowa: Corn Huskers. Represented by J. N. Skaggs.
U. S. INDUSTRIAL ALCOHOL COMPANY, Peoria, Ill.: Denaturized Alcohol. Represented by Wm. J. Conzelman.
UNITED STATES REGISTER COMPANY, Ltd., Battle Creek, Mich.: Registers. Represented by A. O. Jones.
UNITED STATES WIRE MAT COMPANY, Decatur, Ill.: King Fly Killer.
VERMONT FARM MACHINE COMPANY, Bellows Falls, Vt.: United States Cream Separators. Represented by C. Hall and James Hall.
VICTOR MFG. COMPANY, Leavenworth, Kan.: Wonderful Wonder Washers. Represented by E. J. Rorapaugh and F. J. Taylant.
VOSS BROS. MFG. COMPANY, Davenport, Iowa: Voss line of Washers. Represented by W. H. Voss and A. Clifford.
WAGNER MFG. COMPANY, Sidney, Ohio: Aluminum and Iron Hollow Ware, Sugar Kettles, Feed Cookers, Mauls, &c. Represented by Carl Umbarger.
WAHLE FOUNDRY & MACHINE WORKS, Davenport, Iowa: Washing Machines. Represented by H. H. Wahle.
ISAAC WALKER HARDWARE COMPANY, Peoria: Wholesale Hardware. Represented by Wm. Jack, Oscar Berquist, P. Harrington, L. C. Welting, C. D. Schenck, Geo. Brucker, T. N. Goldstein and K. Huisman. Souvenirs, "Old File" Kitchen Knives and Match Safes.
HARRY L. WEISBAUM, Chicago, Ill.: Wholesale Hardware.
WHITE LILY MFG. COMPANY, Davenport, Iowa: White Lily Washing Machines. Represented by A. Ruhling, S. T. White, W Walters and W. Standford.
WINCHESTER REPEATING ARMS COMPANY, New Haven, Conn. Firearms. Represented by L. A. Cummings.
XXTH CENTURY HEATING & VENTILATING COMPANY, Akron, Ohio: Water Tube Sectional Boilers, Radiators and Supplies, Warm Air Furnaces, Registers and Fittings. Represented by John Kersch and J. H. Cundiff. Souvenirs, Mirror and Blotter.
YALE & TOWNE MFG. COMPANY, New York City: Yale Locks, Builders' Hardware and Art Metal Works. Represented by R. J. Kleinsmid, Charles J. Bellfuss and F. A. Maycumber.
YOUNG MFG. COMPANY, Bellevue, Iowa: Young's Combination Strainer and Cut-off.

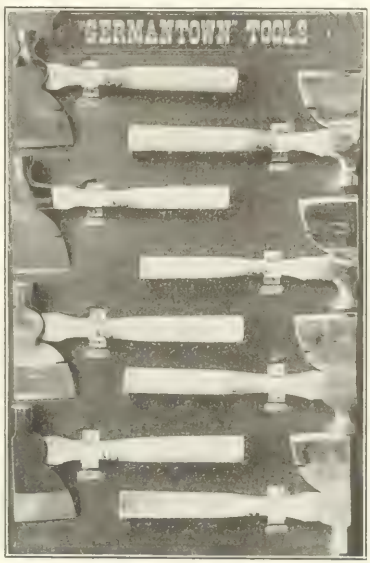
Display Boards of Germantown Tools.

THE accompanying illustrations show a new departure in the methods adopted to bring to the attention of the trade, and particularly that of the prospective buyer,



Assortment A, Carpenters' and Mechanics' Hammers.

the line of Hammers and Hatchets manufactured by the Germantown Tool Works, Philadelphia. The company has prepared a series of four boards or cards 22 x 23 in. in size, of hardwood in natural finish, on which are mounted by means of nickel plated brass clips, under which are German silver number plates for instantaneous identification, the various tools to be exhibited and sold. The idea of the makers of these tools is that the cards or boards should be displayed in a prominent place in the store, or used alternately or collectively in window displays. They may also be fastened together by means



Assortment C, Half Hatchets.

of loose pin Hinges, and so used in the form of a hollow square or any other design, or fastened to partitions, as the surroundings permit, but at a hight which will enable them to be in easy reach for selling purposes, so that sales can be made directly from the board and the tools thus sold replaced from stock, a fresh and bright appearance being always thus secured. A photograph showing the arrangement and corresponding number of the tools is furnished with each board, which can be fastened to the back of it and used for a guide in the assembling and proper maintenance of the display. These display boards are furnished the retailer without additional cost, the merchant paying only the regular price for the tools. With the display boards complete price lists of the line of tools and smaller catalogues for distribution among the consumers are furnished. The various card assortments are made up of the most popular types of tools; in other words, those which are usually the best sellers, and it has already been demonstrated that this method of appealing to the customers' eye or bringing particular attention to the line of goods has developed the sale of the goods. The four assortments now placed on the market are known as Assortment A—comprising a line of Carpenters' and Mechanics' Hammers; B—Machinists' Hammers; C—Half Hatchets, and D—Lathing and Produce Dealers' Hatchets. These assortments will be modified, however, to meet the demands of the trade in the various sections of the country.

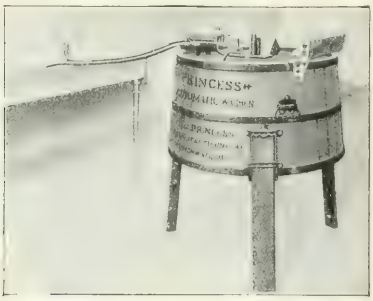
THE D. P. HARRIS HARDWARE COMPANY, 18 Warren street, New York, handling Bicycles, Bicycle Parts, Sundries and Hardware as manufacturers' representative, has been incorporated with $200,000 capital, all paid in. The officers of the company are D. P. Harris, president; Samuel Monroe, treasurer, and J. L. Miner, secretary. Mr. Harris personally owns and operates the Penn Shear Company, Reading, Pa., and its product is marketed by the Harris Company.

Eradication of Farm Weeds.

A STRIKING example of the manner in which very diverse interests are related is furnished in a pamphlet issued by the American Steel & Wire Company, Chicago, entitled, "Eradication of Farm Weeds," which abounds in illustrations of an agricultural character. Among these are pictures showing the comparative yield of flax and grain according to the use made of sulphate of iron, which is one of the byproducts of the company. The pamphlet is sent out for the purpose of extending the knowledge of the merits of sulphate of iron for destroying wild mustard and other weeds that infest fields of grain. The chemical in question is put up in barrels, bags or in bulk and may be shipped in smaller quantities or in carloads direct from the company's mills. In use the sulphate is dissolved in water and applied with hand or field sprayers, illustrations of various styles of which are given. This is a subject which may well be looked into by Hardware merchants with a view to becoming familiar with the methods to which it relates in which their farmer customers will be interested. In many cases too it might bring up the question as to the desirability of adding this chemical to the Hardware stock, thus bringing together under the same roof the sulphate of iron and the Wire in the manufacture of which it was developed as a byproduct.

The Princess Automatic Washing Machine.

The accompanying illustration represents an automatic washing machine placed on the market by the Princess Mfg. Company, 451 E. Second street, Cincinnati, Ohio. Regarding the motor the manufacturer says that all internal valves and springs have been eliminated; that the valve motion is accomplished by a purely mechanical throw, which not only positively reverses the valves, but securely locks them in their seats, giving the motor great power; that the most powerful man cannot stop it at the throw of the valves, if the water



The Princess Automatic Washing Machine.

pressure is 35 lb. or more; that the motor will not choke up on high pressures, but that it will respond in increased speed, and that no matter how great the load or how high the water pressure, the valves cannot be lifted from their seats and so stop the motor. All parts are interchangeable, and the material and workmanship are referred to as being first class.

Westinghouse Electrically Heated Glue Pots.

The Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., is putting on the market a line of improved electrically heated glue pots that represent the application of electricity in a simple and convenient form. The pots are made in 2-quart and 4-quart sizes, in both portable and bench types. They are made of the best materials for the purpose, and the application of electricity is simple and efficient. There is nothing to get out of order or to require any more attention than the ordinary glue pot. They are especially desirable for use in those crafts where cleanliness is an important factor, where drip from steam pipes means damage to valuable materials, and where the fire risk from a gas heater glue pot is hazardous. At the same time their convenience and reliability recommend them to all users of glue. The pots themselves are of seamless drawn copper with brass bail and wiper rod. The water bath is made of seamless



Fig. 1.—Four-Part Portable Glue Pot, Showing Water Circulating Device.

copper, and the heating element, which is wrapped around the lower portion, is inclosed in a watertight tin envelope. The water bath is provided with a patent circulating device, which gives it the maximum heating efficiency. This device consists of a hollow ring, the lower end of which is closed by a diaphragm having a central opening. This confines the heating action to the thin film of water outside of the device and sets up a rapid circulation in the water, which brings the glue up to the work-

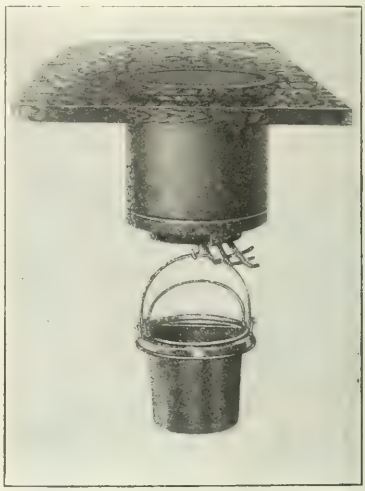
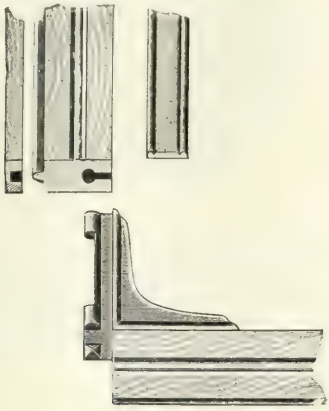


Fig. 2.—Bench Glue Pot, with Cover in Place.

ing temperature in a short time. To further promote economical heating the pots are provided with heat regulating switches, by means of which the glue can rapidly be brought to the desired temperature, and then maintained there by a lower temperature of current. Fig. 1 shows the parts of the 4-quart portable pot, including the water circulating device. Fig. 2 shows the bench pot with the cover in place, giving an unobstructed working surface on the bench. The glue pot and water bath are hung underneath, so as to be out of the way. When the pot is in use the cover is hung on the hook underneath the table. Electrically heated dry glue pots are made for those industries in which the water bath glue pot is undesirable.

The Arcade Window Screen Frames.

The window screen frames herewith illustrated are put on the market by the Arcade Mfg. Company, Freeport, Ill. The illustration clearly shows the method of attaching the corner irons and the various parts of the frames, the frame being easily put together by means of the corner irons, these holding it firmly in shape. The complete frames, including strips, slides, molding and

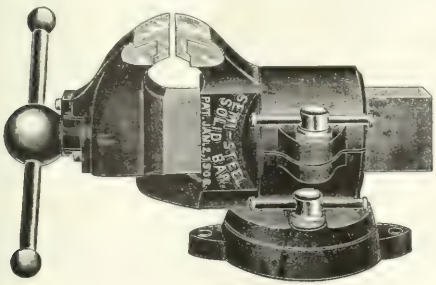


The Arcade Window Screen Frames.

corner irons are packed in crates of 2 doz. each, in sizes ranging from 30 x 36 in. up to 36 x 84 in. The material for making the screens is also sold in 12-ft. strips, which can be cut to the size desired by customers. The strips are made in 1½ and 2 in. widths. These are packed in crates containing 144 ft., half of the strips being without slides for the top and bottom pieces of the frames. All frames and strips are finished with one coat of filler. The storage room required for this style of frame is very small, a feature which will be regarded with favor by the trade.

The Parker Double Swivel Vise.

The Charles Parker Company, Meriden, Conn., has added to its line a double swivel vise, shown herewith, which permits of universal adjustment, so that the work may be quickly set at any angle in either vertical or hori-



The Parker Double Swivel Vise.

zontal plane without touching vise screw or lever. The special new feature is the barrel arrangement to procure the rotation of the vise for the vertical adjustment. The barrel is cast on the body of the vise and is broached out to take the slide. The binding clamp is released for adjustment or tightened to make of the vise a solid whole. The horizontal swivel is endless, and may be set at any point of the circumference, to accomplish which the base has a dovetailed circular keyway in which a binder is rigidly fastened by means of the clamping handle. It will be noted that the vise possesses features of convenience for tool makers and others to whom a vise is an important tool. It is of semisteel, with solid steel bar slide strengthener, and has solid under portion to front jaw, which is a distinctive feature of the company's vises. The jaw faces are of the best tool steel and are removable and renewable. The vise is made in three sizes, weighing, respectively, 45, 69 and 86 lb., with jaws 3¼, 3¾ and 4¼ in., and opening 3¾, 6 and 7¼ in.

Superior Spring Hinge.

The Superior Spring Hinge Company, 123 South Clinton street, Chicago, Ill., is placing on the market a new double acting, ball bearing, adjustable tension spring hinge, as illustrated herewith. The construction of the hinge is on the same principle as the company's superior floor spring hinge. Fig. 1 represents the hinge as it appears on the door. It is applied with less skill and labor than floor hinges, it is explained, as no cutting of the floor is necessary. The hinge is secured to the bottom part of the door by means of four machine screws, which enter through the cold rolled steel side plates into the hinge; also four wood screws, which fasten the plates to the door. By this arrangement the same size hinge can be used for doors of different thicknesses, and at the

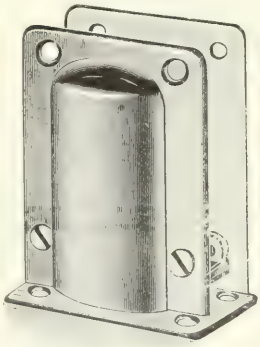


Fig. 1.—The Superior Spring Hinge.

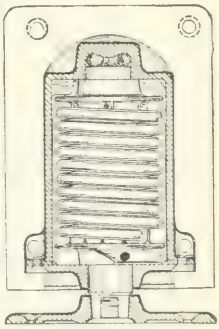


Fig. 2.—Sectional View of Superior Spring Hinge.

same time reinforces the door where the hinge is applied. Fig. 2 gives a sectional cut of the hinge, with side plate removed. The hinge is compact, neat and strong in the construction, and on account of its simplicity it is pointed out that friction is reduced to a minimum. The hinge can be used wherever a spring hinge is wanted for outside or inside doors, as all the working parts are above the floor concealed between the side plates in the door, fully protected from moisture and grit. The weight of the door rests on a ball bearing pivot, which is located on top of the hinge, so that no dirt or grit can enter. When hinges are required with two finishes there can be no mistake as to the right or left hand finish, as the same plate will fit either side. The tension spring is made of the best crucible steel.

The Universal Y-R Kitchen Brush.

The Osborn Mfg. Company, Cleveland, Ohio, is manufacturing the Universal Y-R kitchen wire brush, adapted to cleaning sinks, pans, skillets, kettles, stoves, &c. The ferrule is wound with wire to hold the brush wires so they will not fall out. The handle is highly polished, and the device is made attractive in every way as well as durable. Merchants are furnished with display stands holding a dozen brushes, showing them to good advantage.

The New Green River Screw Plate for Brazed Brass Tubing.

The Wiley & Russell Mfg. Company, Greenfield, Mass., has placed on the market a new and improved screw plate for threading brazed brass tubing, as shown in the accompanying illustrations. The die used in the screw plate, Figs. 2 and 3, is the company's standard Green River patent screw cutting die, as furnished with its ordinary sets for threading bolts and nuts, but has a Green River screw plates. Attention is directed to the long bearing secured on the die, Figs. 2 and 3, which permits the cutting of a straight and perfect thread. Large clearance holes are provided for chips and also for oiling the work. The point is made that the guide is nicely reamed making it accurate and true. The screw plates are furnished to thread all sizes of brazed brass tubing, 3-16 in. to 1 in. diameter, having 27 threads to the inch for all sizes, American thread, and 26 threads to the inch, all sizes English thread (Whitworth).



Fig. 1.—The Green River Screw Plate for Brazed Brass Tubing.

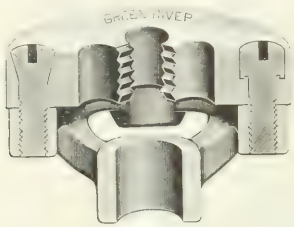


Fig. 2.—Sectional View of Die with Guide.

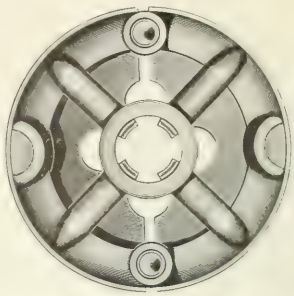


Fig. 3.—Rear View of Die with Guide.

Ideal Gas Ranges.

The Ideal Mfg. Company, Detroit, Mich., has added many new patterns to its line of gas ranges this year, as shown in its No. 13 catalogue. Among other new features is the centrifugal top burner, safety oven lighter, cast iron coke attachment, so devised as to attach to right or left end of gas range, and elevated oven gas ranges.



Fig. 4.—Elastic Stock.

new and improved guide. The stock, Fig. 4, is used in all the company's regular Lightning and

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, State and Western, raw, in bbls	.41 @42
City, Boiled, in bbls	.44 @45
City, Raw, in bbls	.43 @44
Raw, Calcutta, in bbls	.59 @..
Lard, Prime, Winter	.65 (@70
Extra No. 1	.49 @51
No. 1	.47 @52
Cottonseed, Crude, f.o.b. mill	.28@.29
Summer Yellow, prime	.37 @37½
Summer White	.39@.40½
Yellow Winter	.43 @44½
Tallow, Prime	.58 @60
Menhaden, Brown, Strained	.41 @42
Light, Strained	.41 @42
Northern	.39 @..
Southern	.36 @..
Cocoanut, Ceylon	₱ lb. 6½@.7
Cochin	₱ lb 8 @ 8½
Cod, Domestic, Prime	.42 @44
Newfoundland	.41 @46
Red Elaine	.14 @42
Separated	₱ lb .. @..
Olive, Yellow	.64 @70
Neatsfoot, Prime	.. @..
Palm, Lagos	₱ lb 6 @ 6¾

Mineral Oils—

	₱ gal.
Black, 20 gravity, 25@30 cold	.13 @13½
28 gravity, 15 cold test	.13½@.14
Summer	.12½@.13
Crude, light filtered	.29 @.31
Dark filtered	.19 @.20
Paraffine, 32 deg. sp. gravity	.14½@.15
Red, 32 deg. gravity	.15½@.16
Red, 30 deg. gravity	.13½@.14
Red, Summer	.12 @.14

Miscellaneous—

Barytes:	
White, Prime	₱ ton $18.00@20.00
American, Prime	₱ ton 10.00@12.00
Off color	₱ ton 12.00@16.00
Chalk, in bulk	₱ ton 3.00@ 3.40
China Clay, Imported	₱ ton 11.50@18.00
Cobalt, Oxide	₱ 100 lb 1.45@ 2.60
Whiting, Commercial	₱ 100 lb .42@ .52
Gilders	₱ 100 lb .55@ .62
Ex. Gilders	₱ 100 lb .60@ .65

Putty, Commercial—₱ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.45
In 1 lb to 5 lb cans	2.55 @2.85
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—₱ gal.

In Oil bbls	.53½@54
In machine bbls	.54 @54½

Glue—

	₱ lb
Cabinet	.12 @15
Common Bone	.7½@ 9
Extra White	.18 @21
Fish, liquid, 50 gal, bbls., per gallon	.60 @1.20
Foot Stock, White	.12 @14
Foot Stock, Brown	.9 @11
German Common Hide	.10 @12
German Hide	.12 @18
French	.10 @10
Irish	.13 @16
Low Grade	.10 @12
Medium White	.14 @17

Gum Shellac—

	₱ lb
Bleached, Commercial	.24 @25
Bone Dry	.30 @31
Bronze	.40 @50
Diamond I	.17 @18
Fine Orange	.30 @35
Garnet	.. @..
Gum, A. L.	.20 @22
Knot, Button	.24 @25
D. C.	.49 @50
Orange, B	.38 @40
T. N.	.23 @25
V. S. O.	.17 @18

Colors in Oil—

	₱ lb
Black, Lampblack	.12 @14
Blue, Chinese	.36 @46
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @14
Green, Chrome	.12 @16
Green, Paris	.. @24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, English white, in Oil	.10½@10⅝
Lead, American White:	
Lots of 500 lbs or over, in Oil	@ 6¾
Lots less than 500 lb, in Oil	@ 7¼
Lead White, in oil, 25 lb tin pails	@ 7¾
Lead, White, in oil, 12½ lb tin pails	@ 7¾
Lead, White, in oil, 1 to 5 lb assorted tins	@ 8¾
Lead, American. Terms: On lots of 500 lbs, and over 2% for cash if paid in 15 days from date of invoice	₱ lb

Zinc, Dry—

	₱ lb
American, dry	5¼@ 5⅝
(French process), Red Seal	6¾@ 7
(French process), Green Seal	7¼@ 7½
Dry German (French process), Red Seal	6⅝@ 7
Green Seal	7¼@ 7½
White Seal	7¾@ 8¼
French, Red Seal	8¼@ 8¾
Green Seal	10¼@10¾

Dry Colors—

	₱ lb
Black, Carbon	6½@10
Black Drop, American	3½@ 8
Black Drop, English	5 @15
Black, Ivory	16 @20
Lamp, commercial	4 @ 6
Blue, Celestial	4 @ 6
Blue, Chinese	.31 @33
Blue, Prussian	.29 @31
Blue, Ultramarine	3½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.10@3.25
Green, Chrome, ordinary	3½@ 5
Green, Chrome, pure	.17 @25
Lead, Red, bbls., ½ bbls., kegs	@ 6¾
Litharge, bbls., ½ bbls., kegs	@ 6¾
Ocher, American	₱ ton $8.50@16.00
American Golden	.2½@ 3½
French	1½@ 2
Foreign Golden	3 @ 4
Orange Mineral, English	.10 @11
French	12½@13
German	.10 @11
American	8½@ 8¾
Red, Indian, English	4½@ 6
American	3 @ 3½
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, American	₱ 100 lb $0.50@1.25
English	₱ 100 lb $1.15@1.60
Sienna, Italian, Burnt and Powdered	3 @ 9
Italian, Raw Powdered	3 @ 7
American, Raw	1½@ 2
American Burnt and Pow'd	1½@ 2
Talc, French	₱ ton $18.00@25.00
American	₱ ton 15.00@25.00
Terra Alba, French	₱ 100 lb .90@ 1.00
English	₱ 100 lb .80@ 1.00
American	₱ 100 lb, No. 1 .75@ .80
American	₱ 100 lb, No. 2 .60@ .65
Umber, Turkey, Burt, & Pow	2½@ 3
Turkey, Raw and Powdered	2½@ 3
Burnt, American	1½@ 2
Raw, American	1½@ 2
Yellow Chrome, Pure	.13 @15
Vermilion, American Lead	.7 @25
Quicksilver, bulk	.65 @..
Quicksilver, bags	.. @66
English, Imported	.65 @70
Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓
North's 10
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ires' Patent.....35%
Tapin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ₱ doz. pairs, Nos. 1, $0.50; $0.60; 4, $1.10; 5, $0.50.
Fernald Quick Shifter, ₱ doz. pairs .....$2.00@$3.00

Anvils—American—

Eagle Anvils.....₱ lb @8½¢
Hay-Budden, Wrought.....9½@9¾¢
Trenton .....₱ lb 9½@9¾¢

Imported—

Swedish Solid Steel Stock, Superior, ₱ lb.....
Peter Wright & Sons, ₱ lb. 21 to 349 lb. 11¢; 350 to 699 lb. 11½¢.

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....10

Augers and Bits—

Cam. Double Spur.....75&10@50%
Jennings' Path., Bright.....50&10@70%
Black Lip or Blued.....65@65&5
Bonny Mach. Augers.....70%
Car Bits, 12-in. Twist.....40&10%
Ford's Auger and Car Bits.....45&5
Ft. Washington Auger Co., Conard's 45%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, ...25&7½%
No. 30, R. Jennings' list.....50%
Russell Jennings .....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Car Bits, Hanger Bits.....60%
Snell's Car Bits, 12-in twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's Pattern, No. 1, ₱ doz. $28; No. 2.....60&10%
Ford's, Clark's Pattern.....66⅔&5%
C. E. Jennings & Co.'s Steel's Pat. .5%
Lavigne Pat., small size, $18.00; large size, $26.00.....6&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut.....$3.00@3.25
German Pattern, Nos. 1 to 10, ...$4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz...$6.50@7.00
Ames .....35&10%
Universal 20%

Ship Augers and Bits—

Ship Augers.....50@60%
Ford's .....35%&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Warren's .....33⅓&7½%
Swan's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unbdled, Rbldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 51@54¢
Unbdled, Rbldered..gro. 65@70¢
Scratch Awls:
Handled, Com....gro. $3.50@4.00
Handled, Socket..gro $11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz
First Quality.....$4.75@5.00
Second Quality.....$3.25@3.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles—

Iron or Steel
Concord, Loose Collar...4½@5 c
Concord, Solid Collar...4½@5¼¢
No. 1 Common, Loose.....3¾@4¼¢
No. 1½ Com. Neat, Stub.....4¼¢
No. 2 Solid Collar.....4¾@5 c
Half Patent.
Nos. 7, 8, 11 and 12...65@65&10%
Nos. 13 to 14.....65@65&10%
Nos. 15 to 18.....70@70&10%
Nos. 19 to 22.....70@70&10%

Boxes, Axle—

Common and Concord, not turned
lb, .5@6¢
Common and Concord, turned, lb, 6@7¢
Half Patent.....lb., 9½@10¢

Bait—Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chattillon's:
Light Spg Balances.....50&50&10%
Straight Balances.....40@40&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb..... per lb, —@21½@24¢

Towel—

No. 10 Ideal, Nickel Plate..₱ gro. $8.50

Beams, Scale—

Scale Beams.....40%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₱ doz. $0.80; Tinned.....$0.85
No. 11 Wire Coppered ₱ doz. $1.15; Tinned.....$1.20
No. 10 Wire Tinned.....₱ doz. $1.50

Beaters, Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.: T. & S. Dover.....$6.50

Bellows—

Blacksmith, Standard List..
Split Leather.....60&10@65%
Grain Leather.....50@50&10%

Hand—

Inch.. 6 7 8 9 10
Doz..$5.00 5.50 6.00 6.50 7.00

Molders—

Inch.. 10 12 14 16
Doz..$7.50 9.00 12.00 15.00

Bells—Cow—

Ordinary Goods...75&5@75&10&5%
High grade.....70&5@70&10%
Texas Star.....

Door—

Hime, R. & E. Mfg. Co.....55&10%

Hand—

Polished, Brass.....
White Metal.....
Nickel Plated.....50&5%
Swan's .....
Taplin Globe Hand Bell.....

Miscellaneous—

Farm Bells.....lb., 2¼@2½¢
Church and School....60@60&5%

Belting—Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard .....70&5%
Light Standard.....75%
Cut Leather Lacing.....30&10%
Leather Lacing Sides, per sq. ft. .....2½¢

Rubber—

Agricultural (Low Grade)..... 75@75&5%
Common Standard....70@70&10%
Standard .....70@70&5%
Extra .....60&5@60&10%
High Grade.....50&5@50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Cham. Parts, Spokes.....50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden.....75@75&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....40%
Embossed 30%

Boards, Wash—

See Washboards.

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):
⅝ & 6 and smaller.....75%—
Larger and longer.....70%—
Phila. Eagle, $3.00 list.....50%—
Bolt Ends.....70%—
Machine (Cut Thread):
⅝ & 6 and smaller.....75&5%—
Larger and longer.....70%—

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob.
Inch.....
Per doz.....
Cast Iron Spring Foot, Jap'd.
Inch.....
Per doz.....
Cast Iron Chain, Flat, Japanned:
Inch.....
Per doz.....
Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch.....
Per doz.....
Wrought Barrel Japd..80@80&10%
Barrel.....
Screw.....
Screw Neck.....
Barrel Bolt.....
Wrought Metal.....

Expansion—

Richards Mfg. Co.....50&10%
Swan & Esty Mfg. Co.....
Taplin Mfg. Co.....
Taplin Globe Hand Bell.....

Plow and Stove—

Plow .....
Stove .....

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99.....80%
Phila. Eagle, list Oct. 16,1884..82½%
Union Nut Co.:
Tire Bolts.....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:
Inch..... 1¼ 1½ 1¾ 2
Per doz....$4.50 5.00 6.50 8.00
Inch.....2¼ 2½
Per doz.....$8.00 11.50
Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme .....15&10%
Perfection 10
Seaver 45

Braces—

Common Ball, American....$1.50
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat..50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat..60&10%

Brackets—

Wrought Steel.....70&10@75&10%
Bradley Metal Clasp .....
Griffin's Pressed Steel.....75@75&10%
Griffin's Folding Brackets .....
Taplin Victor Handy Egg Beater Bracket .....₱ doz. $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Wire Goods Co.....75%

Buckets, Galvanized—

M'f'gr's list, price per gross.
Quart .....
Water, Reg....$5.35 28.00 52.00
Water, Ex. Hvy.....
Fire, Rd. Bott.....
Well .....

Bull Rings—See *Rings, Bull*

Butts—Brass—

Cast Iron—

Fast Joint, Broad.....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Pin.....70&10@75%
Parliament Butts.....70@70&5

Wrought Steel—

Light Broad.....
Light Narrow.....
Reversible and Broad..70@75%
Loose Joint, Narrow, Light .....
Heavy .....
Loose Pin.....
Light Narrow, Loose Pin.....
Light Narrow, Ball Tip.....
Steel, Tipped.....
Steel, Plain.....
Ball Tipped.....

Extra Heavy

Cages, Bird—

Henryrx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 500 ..... 30%
Hendryx Bronze; Series 700, 800 ..... 30%
Hendryx Enameled 35

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb., 4¼@4¾¢
Sharp, 1 prong, per lb., 4¾@5¼¢
Burke's, Blunt 4@4¾¢; Sharp, 4½@5¾¢
Lautier, Blunt, 4@4¾¢; Sharp, 4½@4¾¢
Perkins', Blunt, ₱ lb, 3.65¢; Sharp, ₱ lb, 4.15¢

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Eley's E. B ..... 52@55¢
G. D ..... *per M* 34@35¢
F. L ..... *per M* 40@42¢
G. E ..... *per M* 48@50¢
Musket ..... *per M* 62@63¢

Primers—

Berdan Primers, $2 per M ..20@5%
Primer Shells and Bullets ..15@10%
All other primers per M.$1.50@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:
32 C. F., $5.50 ..... 10@5%
38 C. F. $7.00 ..... 10@5%
22 cal. Rim, $1.50 ..... 10@5%
32 cal. Rim, $2.75 ..... 10@5%
B. B. Caps, Can. Ball, Swgd. $1.90
B. B. Caps, Round Ball $1.40
Central Fire 35%
Target and Sporting Rifle ..15@5%
Primed Shells and Bullets ..15@10%
Rim Fire, Sporting 30%
Rim Fire, Military ..... 15@5%

Casters—

Bed ..... 65@10%
Plate ..... 60@5%
Philadelphia ..... 70@10%
Acme, Ball Bearing 35%
Gem (Roller Bearing) ..... 70@10&10%
Steel Worm 30%
Standard Ball Bearing 45%
Yale (Double Wheel) low list..40&10%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:

3/16	1/4	5/16	3/8	1/2	9/16
$8.65	6.65	5.90	4.55	4.15	4.10
5/8	3/4	7/8	1	1 1/8	to 1 inch.
$4.05	3.95	4.00	4.00		

In cask lots, deduct 25¢.
German Coil ..... 60@60&5%
German Pattern Coil:
6-0 to 1 ..... 70@5@70&10%
2 and 3 ..50&10@60&10@60&10&5%
4, 5 and 6 ..50&10@50&10&5%

Halter—

Halter Chains ..... 60@60&5%
German Pattern Halter Chains, list July 24, '97 ..... 60@60&5%
Covert Mfg. Co. ..... 35&5%
Halter ..... 35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-8, *Straight, with ring* .$28.00
6¼—6-2, *Straight, with ring* .$29.00
6¼—8 2, *Straight, with ring* .$32.00
6¼—10-2, *Straight, with ring* .$37.00
NOTE.—Add 2¢ per pair for Hooks *Twist Traces, add per pair for Nos. 2 and 3; No. 1, 8c; No. 0, 4c to price of Straight Link.*
Eastern Standard Traces, Wagon Chain, &c. ..60&10@60&10&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron ..... 60&10%
Brass 50%
Safety and Plumbers' Chain, ... 60&10%
Gal. Pump Chain....lb., 4½@5¢
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion 40%
Oneida Community:
American Halter, Dog and Kennel Chains ..... 35&2½&10%
Niagara Dog Leads and Kennel Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain 70%
Universal Dbl Jointed Chain..... 50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain 60%
Pullman:
Bronze Chain, 60%; Steel Chain, 60&10%
Sash Chain Attachments, per set .8¢
Aluminoy Sash Ribbon, per 100 ft ..... $1.25@$3.00
Sash Ribbon Attachments, per set 8¢

Chalk—(From Jobbers.)

Carpenters' Blue....gro., 50@55¢
Carpenters' Red.....gro., 45@50¢
Carpenters' White....gro., 40@45¢

Checks, Door—

Bardsley's 45%
Pullman, per gro $81.00
Russwin 33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools 50%
Youths' Chests, with Tools 25%
Gentlemen's Chests, w.o Tools..25%
Farmers', Carpenters,' etc., Chests, with Tools 20%
Machinists' and Pipe Fitters' Chests, Empty 45%
Tool Cabinets 45%
C. F. Jennings & Co.'s Machinists Tool Chests 7½%

Chisels—

Socket Framing and Firmer

Standard List ..... 80@—%
Buck Bros 30%
C. E. Jennings & Co.:
Socket Firmer No. 10 ..... 25&7½%
Socket Framing No. 15 ..... 25&7½%
Swan's ..... 60%@70%
L. & I. J. White Co ..... 30@30&5%

Tanged—

Tanged Firmers ..... 30&5@35%
Buck Bros 30%
C. E. Jennings & Co. Nos. 191, 181 ..25%
L. & I. J. White Co ..... 35&5%

Cold—

Cold Chisels, good quality ..13@15¢
Cold Chisels, fair quality ..11@13¢
Cold Chisels, ordinary ..9@10¢

Chucks—

Almond Drill Chucks 35%
Almond Turret Six-Tool Chuck.....40%
Beach Pat., each $8.00 ..... 35&5%
Empire 25%
Blacksmiths' 25%
Jacobs' Drill Chucks 35%
Pratt's Positive Drive 25%
Skinner Patent Chucks:
Independent Lathe Chucks 35%
Universal, Reversible Jaws 35%
Combination, Reversible Jaws 35%
Drill Chucks, New Model, 25%; Standard, 45%; Skinner Pat., 25%; Positive Drive 10%
Planer Chucks 20%
Face Plate Jaws 35%
Standard Steel Chuck:
Improved Drill Chuck 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 9; 40%; No. 21 ..... 35%
Scroll Combination, Nos. 83 and 84 ..... 30%
Geared Scroll, Nos. 33, 34 and 35..30%
Independent Iron, Nos. 18 and 318..35%
Independent Steel, No. 64 ..... 25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104 ..... 35%
Union Czar Drill 35%
Universal, 11, 12, 16, 17, 13, 14, 15..40%
Universal, No. 42 ..... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50 ..... 35%
Steel Face Plate Jaws, Nos. 70 and 72 ..... 30%
Westcott Patent Chucks:
Lathe Chucks 50%
Little Giant Auxiliary Drill 50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved 50%
Oneida Drill 50%
Scroll Combination Lathe 50%
Whitcher Bros. Co.:
National Drill 25%

Clamps—

Adjustable Hammers' ..... 20@20&5%
Carriage Makers', P., S. & W. Co ..... 50&10%
Besly, Parabel ..... 33⅓&10%
Myers' Hay Rack 45%
Lineman's Speedie Neverturn 65%
Wood Workers' Hammers ..... 40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable 50%
Iwan's Champion, Stationary 40%

Sidewalk—

Star Socket, All Steel..₱ doz. $4.05 net
Star Shank All Steel ₱ doz. $3.24 net
W. & S. Shank All Steel, ₱ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros. 30%
Fayette R. Plumb 30%
L. & I. J. White Co 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Horse, each $15.00
Chicago Belt Horse, each $20.00
Stewart's Enclosed Gear Horse, each $8.75
Stewart's Detroit Sheep Shearing Machine, each..... $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75

Clips, Axle—

Regular Styles, list July 1, '05. 80&10@40&10%

Cloth and Netting, Wire—

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Rocking, Liquor, Bottling, &c. ..... 70@—%
Compression Bibbs.60&10@—%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list 40%
Leather, Walter B. Stevens & Son's list 40%

Compasses, Dividers, &c.

Ordinary Goods ..... 70@10@75%
Wm. Schollhorn Co.:
Excelsior Dividers 60%
Lodi Dividers ..... 70&10%

Conductor Pipe,—

L. C. L. to Dealers:

	Galvanized		
Galv. Steel.	*Charcoal Iron.*		*Copper. 14, 16&20 oz.*
Eastern:			
70&7½%	50&10&12½%		45%
Central:			
70&7½%	55%		45%
Western and Southern:			
65&10%	50&12½%		40&5%
So. Western			
65&5%	45&5%		40&12½%

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:						
Gal.	2	3	4	6	8	
Galvanized	$1.85	$2.00	$2.25	$2.90	$3.90	
Galvanized, Lined, side handles, Gal.	2	3	4	6	8	
Each	$1.95	$2.15	$2.40	$3.30	$4.15	
White Enameled						10%
Agate Lined						10%

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 24@27¢; lighter than 3 lb. to pair.....26@29¢

Cord—Sash—

Braided, Drab.....lb. 35¢
Braided, Sash Cord, Com., Nos. 8 to 12, 23¢; No. 7, 23½¢; No. 6, 24½¢. In lots of 24 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India.....lb., 11@11½¢
Parana Sash Cord, Inv'ble 18@20¢
Patent Russia.....lb..20¢
Cable Laid Russia.....lb..21¢
India Hemp, Br'd'd.....lb..21¢
India Hemp, Twisted..lb.13@14¢
Patent India, Twisted...lb..17¢
Pearl Braided, cotton, No. 6 ₱ lb. 27¢; No. 7, 25½¢; Nos. 8 to 12, 26¢; 7, 25½¢; 6, 25½¢.
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 25½¢; 6, 25½¢.
Harmony Cable Laid Italian, Nos. 7 to 12 ..... ₱ lb 23 ¢
Pullman:
Wire Sash Cord 10%
Sash Cord Attachments, per doz. 10¢
Samson, Nos. 8 to 12:
Braided, ₱ lb, Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢ } 15%
Cord, 50¢ } 15%
Massachusetts, White..₱ lb 40¢ } 15%
Massachusetts, Drab...₱ lb 45¢ } 15%
Phoenix, White, Nos. 8 to 12, 27¢;
Silver Lake, ₱ lb. 12:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen..57½¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906.....90@—%
Hendryx Standard Wire Picture Cord, old list, 85&10%.
Turner & Stanton Co. Wire Picture Cord ..... 85&10%

Cradles—

Grain ..... 40¢12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber, ₱ gro.
White and Purple, Indelible...$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.50
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14; Black.....$10.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16.....$3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $5.50; Light $5.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden 50%

Cutlery, Table—

International Silver Company:
No. 12 Medium Knives, 1847, ₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor ..... ₱ doz. $3.00
Wm. Rogers & Son ..... ₱ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co 40%
Red Devil 60%
B. Mfg. Co 10%
Woodward 50%

Meat and Food—

American 30%

Nos.	401	402	403	404	405	406	407
Each	$5	$7	$10	$12	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

25@25&7½%
Nos. 202, $3.50 ..... 40&7½%
P. S. & W. Co.:
Dixon's ..... ₱ doz 33⅓%

Nos.	1	2	4
	$11.00	$17.00	$19.00

Ideal ..... 10@10&5%
Hales ..... 60&10&5%
Little Giant ..... ₱ doz 40@50%
Nos. 305, $10; 312, $20 ..... 20%

$35.00	$48.00	$11.00	$72.00	$68.00

New Triumph No. 605, ₱ doz. $24.00, 40&10%
Russwin Food, No. 1, $24.00 ..... No. 2, $27.00 ..... 45&10&10%
$15.00 ..... $18.00
Enterprise Beef Shavers ..... 25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters 3
Corn Graters 3
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife ..... ₱ doz. $3
Combined Slaw Cutter and Corn Grater ..... ₱ doz. $1

Tobacco—

All Iron, Cheap...doz. $4.25@$4
Enterprise ..... 25&3
National, ₱ doz., No. 1, $21; No. 2, $18 ..... 40&10%

Diggers, Post Hole, &c.

Disston's:
Rapid, ₱ doz., $24.00 25
Samson, ₱ doz., $34.00 25
Iwan's Improved Post Hole Auger..40
Vaughan Pattern Post Hole Augers, ₱ doz. ..... $7.
Perfection Post Hole Diggers, ₱ doz. ..... $8.
Split Handle Post Hole Diggers, ₱ doz. $7
Hercules Pattern, ₱ doz. ..... $10.
Kohler's, ₱ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $8.00; Rival, $8.50; Pioneer ..... 50&5%
Never-Break Post Hole Diggers, ₱ doz., $24.00 60

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers..... 35
Sterling Wheel Dresser Cutters..... 35

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines ..... $1.50@$1.75
Breast, Millers Falls ..... List
Breast, P., S. & W. 30%
Goodell Automatic Drills..50&10@60&10%
Millers Falls Automatic Drills..33⅓&10%
Ratchet, Barnes & Curtis 25%
Ratchet, Parker's 40%
Ratchet, Weston's 40%
Ratchet, Weston's, Style H Improved ..... 50&5%
Ratchet, No. 012 ..... 40%
Ratchet, Celebrated 40%
Ratchet, Whitney's, P., S. & W. ..... 50&5%
Whitney's Hand Drill, No. 1, $10.00, Adjustable, No. 10, $12.00 ..... 33⅓%

Twist Drills—

Bit Stock.....70@70&5%
Taper and Straight Shank..... 60&10@70%

Drivers, Screw—

Screw Driver Bits, per doz. 45@50¢
Balsey's Screw Holder and Driver, ₱ doz., 2¼-in., $6; 4-in., $7.50; 6-in., $9.
Buck Bros.' Screw Driver Bits..... 30%
Champion 30%
Disston's 70%
Fay & Sol. H'dle Sets, No. 3, $12.50
Ford's Brace Screw Drivers....40&10%
Gay's Double Action Ratchet 35%
Goodell's Auto....., ... 65@65&10%
Mayhew's Black Handle 40%
Mayhew's Monarch 40%
Millers Falls, Nos. 20 and 21 ..25&10%
Millers Falls, Nos. 11, 12, 41, 42, 15&10%
Smith & Hemenway Co. Screw turn, 66⅔%; Elmora, 60%; Star, 30&10%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized*		
Galv. Steel.	*Charcoal Iron.*		*Copper. 14, 16&20 oz.*
Eastern:			
70&7½%	60&10%		45%
Central:			
70&10%	65%		45%
Western and Southern:			
75%	60&5%		40&5%
So. Western:			
70&10%	55&7½%		42½%

Terms,—2% for cash. Factory shipments generally delivered.
Note.—Lower prices are made in some sections.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories: Galv. Steel and Galv. I. C. Standard Gauge.....85@85&10%
No. 26 ..... 30%
No. 24 ..... 25%
No. 22 ..... 10%
Copper ..... 50&10%

Elbows, Stove Pipe—

Edwards, Standard Blue.....40&10&10%
Edwards, Royal Blue.....40&10&10%
Reeves, Dover, one piece.....40&10%

Emery, Turkish—

	4 to 46:	*5½ to 220:*	*Flour.*
Kegs.....lb.	5 ¢	5½¢	5½¢
½ Kegs.....lb.	5½¢	5¾¢	5¾¢
¼ Kegs.....lb.	5½¢	6 ¢	6 ¢
10 lb. cans, in case	6½¢	7 ¢	6 ¢
10-lb. cans, less than 10	10 ¢	10 ¢	10 ¢
Less quantity	10 ¢	10 ¢	8 ¢

NOTE.—In lots 1 to 3 tons a discount of 10¢ is given.

Extractors, Lemon Juice—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's ..... 50&10%
Walling's ..... 40&10%
Upson's Patent 40%

Cord and Weight—

Ives and Titan 33⅓%

Corrugated—

Acme Corrugated Fasteners 70%

Faucets—

Cork Lined ..... 50&10%@60%
Metallic Key, Leather Lined ..... add 10%
Red Cedar ..... 40&5%@40&10&5%
Petroleum ..... 70&10@75%
B. & L. B. Co.:
Metal Key ..... 60&10%
Star 60%
Wrist Lock ..... 50&10%
John Sommer's Peerless Tin Key 40%
John Sommer's Rose Tin Key 50%
John Sommer's Victor Mtl Key ..... 50&10%
John Sommer's Duplex Metal Key 60%
John Sommer's Diamond Lock 40%
John Sommer's I. X. L. Cork Lined 50%
John Sommer's Reliable Cork Lined ..... 50&10%
John Sommer's Chicago Cork Lined 50%
John Sommer's O. K. Cork Lined 50%
John Sommer's No Brand, Cedar 50%
John Sommer's Perfection, Cedar 40%
Self Measuring:
Enterprise, ₱ doz. $36.00 ..... 40&10%
Lane's, ₱ doz. $36.00 ..... 40&10%
National Measuring, ₱ doz. $36 ..... 40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List Nov. 1, 1899.
Best Brands ..... 70&10@75&10%
Standard Brands ..... 75&10@80&10%
Lower Grade ..... 70&10@80&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 ..... $3 1 3@40%

Fixtures, Fire Door—

Allith Underwriters' Approved 50%
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 ..... $3.75
Finishing Links, No. 96 ..... 60%
Expansion Bolts, No 107 ..... 60&10%

Grindstone—

Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.60*	*3.85*	*4.15*	*4.65*

P. S. & W. 60%
Reading Hardware Co. 60%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato ..... 60&10%
Victor, Hay ..... 60&15&2½%
Victor, Manure 60%
Victor, Header 65%
Champion, Hay 60%
Champion, Header 65%
Champion, Manure ..... 60&15&2½%
Columbia, Hay ..... 60&20%
Columbia, Manure 70%
Columbia, Spading ..... 70&10&2½%
Hawkeye Wood Barley 40%
W. & C. Potato Digger ..... 60&10%
Acme Hay 60%
Acme, Manure, 4 tine ..... 60&10&5%
Dakota Header ..... 60&20%
Jackson Steel Barley ..... 60&20%
Kansas Header 60%
W. & C. Favorite Wood Barley 40%
Plated.—See Spoons.

Frames— Wood Saw—

White, S'g't Bar, per doz. 75@80¢
Red, S'g't Bar, per doz. $1.00@1.25
Red, Dbl. Brace, per doz. $1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.25*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped.. 3.65
Waterproof Dbl. Taped.. 4.40
Waterproof Tpl. Taped.. 5.15

Gates, Molasses and Oil—

Stebbins' Pattern ..... 50@50&5%

Gauges—

Marking, Mortise, &c. 50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c ..... 50&50&10%
Disston's Marking, Mortise, &c 67½%
Wire, Brown & Sharpe's 33⅓%
Wire, Morse's 25%
Wire, P. S. & W. Co. 33⅓%

Gimlets— Single Cut—

Numbered assortments, per gro.
Nail, Metal, No. 1. $2.00; 2. $2.30
Spike, Metal, No. 1. $4.00; 2. $4.30
Nail, Wood Handled, No. 1. $2.00; 2. $2.60
Spike, Wood Handled, No. 1. $3.00; 2. $3.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co. ..... 65@65&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush.. 25¢10@50%
Elwell's 40%

Grease, Axle—

Common Grade.. gro. $6.00@6.50
Dixon's Everlasting, 10-lb pails, ea 8¢, in boxes, ₱ doz., 1 lb. $1.20, 2 lb. $2.00
Helmet Hard Oil 25%

Griddles, Soapstone—

Pike Mfg. Co. ..... 33⅓@33⅓&10%

Grinders—

Royal Mfg. Co.:
Alundum Grinding Machines, each. Nos. 01, $1.75; 1A, $2.50; 10, inch, ₱ doz., $2.00 ..... 33⅓%
Richards Mfg. Co., Ell and Cycle, Ball Bearing, mounted 40%

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... 60&5@60&10%
Covert Mfg. Co.:
Web ..... 30&2%
Jute 35%
Sisal Rope 20%
Cotton Rope 45%
Hemp Rope 40%
Oneida Community:
Am. Coil and Halters ..... 40@40&5%
Am. Cow Ties ..... 45@50%
Niagara Coil and Halters. 45@50&5%
Niagara Cow Ties ..... 45&5@50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists' ..... 55&10@55&10&5%
Heller's Farriers' ..... 40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel 50%
Garriers' ..... 40&10&5%
Riveting 50%
Machinists', revised list ..... 66⅔&5%
Blacksmiths' ..... 50&5%
Payette Mfg. Co.:
A. E. Nail ..... 40&2½@40&12½%
Eng. and B. S. Hand ..... 50&10&20&5%
Machinists' Hammers ..... 60@60&10
Rivet and Tinners' ..... 40&7½@40&12½&5%

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢ .. 80&10%
3 to 5 lb., per lb., 70¢ .. 80&10%
Over 5 lb., per lb., 30¢ .....
Over 5 lb., per lb., 40¢ .. 80&10&10%

Handles—

Agricultural Tool Handles

Axe, Hick, &c. .. 40&10@40&10&5%
Hoe, Rake, &c. 40%
Fork, Shovel, Spade, &c.:
Long Handles 40%
D Handles 40%

Cross-Cut Saw Handles—

Atkins 40%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—

Auger, assorted.. gro. $3.00@$3.50
Brad Awl ..... gro. $1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory.. $2.15@2.40
Socket Firmer, Apple, $1.75@ $1.95; Hickory $1.60@$1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted ..... gro. $1.30@$1.40
Hammer, Hatchet, &c. ..... 60&10@60&10&5%
Hand Saw, Varnished, &c. 80&85¢; Not Varnished ..... 65@75¢
Plane Handles:
Jack, doz. 80¢; Jack, Bolted 75¢
Fore, doz. 45¢; Fore, Bolted 90¢
Chapin-Stephens Co.:
Carving Tool ..... 30@30&10%
Chisel ..... 50@50&10%
File and Awl ..... 60@60&10%
Saw and Plane ..... 30@30&10%
Screw Driver ..... 30@30&10%
Millers Falls Adj. and Ratchet Drawer Handles ..... 15&10%
Nicholson Simplicity File Handle ..... ₱ gr., $0.85@$1.50
J. L. Osgood:
Indestructible File and Tool ₱ gro., No. 1, $8.00; No. 2, $8.50; No. 3, $9.00; No. 4, $9.50; No. 5, $10.00 ..... gro. lots 10%
W. A. Zelnicker Supply Co.:
Hammer, ₱ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.20; 18 in., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, ₱ doz., oval 30 in., $3.80; octagon, 30 in., $3.80; oval 36 in., $4.00; octagon, 36 in., $4.00.
Axe ₱ doz., 28 to 31 in., $5.60; 36 in., $5.80.
Adze, ₱ doz., 36 in., $5.80; 36 in. $7.80.
Pick, ₱ doz., R. R. 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ₱ doz., 12 to 14 in., $2.00.

Hangers—

NOTE—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable, Nos. 1 and 2: Allith, No. 3; Allith Adjustable No. 6; Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60&2½%
Roller Bearing ..... 70&2½%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00 ..... 60&10%
Roller Bearing, No. 11, $15.00; No. 22, $18.00 ..... 60&10%
Roller Bearing, Ex. Hy. No. 22, $18.00 ..... 60&10%
Bull Dog, $24.00 ..... 70%
Lane Bros. Co.:
Parlor, Ball Bearing, $1.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard ..... 60&10%
Hinged ..... net $6.08
Covered ..... 60&5%
Special No. ..... 70&5%
Lawrence Bros.:
Advance ..... 55&10%
Cleveland ..... 70&7½%
Clipper, No. 75 ..... 55&10%
Crown ..... 55&10%
Cyclone, No. 40 ..... net $6.50
Tandem, No. 50 ..... net $7.50
New York ..... 55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2 ..... 70%
Anti-Friction 60%
Hinged Hangers, King Charm 60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3, $2.25
Roller B'r'g St'l Track No. 12, $2.20
Roller B'r'g St'l Track No. 19, $3.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19 ..... 50&10%
Adjustable Track Tandem Trolley Track, No. 16 ..... 50&10%
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22 ..... 50&5%
Trolley B. B. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150 ..... $2.50
Safety Underwriters F. D. No. 101 ..... 50%
Tandem No. 41, 2½ and 3 ..... 60&10%
Place. Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 122 ..... 50&10%
Ives' Wood Track No. 1 ..... $2.25
Trolley B. B. No. 20 ..... 50&10%
Trolley B. B. No. 24, $1.30; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2 ..... 70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3 ..... 60%
Hinged Tandem No. 48 ..... 60&5%
Folding Door B. B. Swivel No. 135 ..... 40%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing ..... 50&15&10&5%
Myers' Stayon Hangers 60%

Hangers— Garment—

Pullman Trouser, ₱ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 1 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $10.50; Garment Hanger Loops, Round Nickeled, per gro. $10.50
Victor Folding ..... ₱ gro. $9.60

Gate—

Myers' Patent Gate Hangers, ₱ doz. net $4.80

Joist and Timber—

Lane Bros. Co. 30%

Hasps—

Griffin's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, ₱ doz. 60%

Hatchets—

Regular list, first qual. 40&2½%—
Second quality ..... 50&5%—

Heaters, Carriage—

Clark No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50 ..... 25%
Clark Coal, ₱ doz., $0.75 ..... 20%

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Cumberland; Clark's Tip; Buffalo.)

No.	*1*	*1½*	*2*
Doz. pair	*$0.75*	*$0.85*	*$0.90*

Mortise Shutter: (L. & P., O. S., Acme, &c.)

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*65*	*60*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*65*	*60*

North's Automatic Blind Fixtures, No. 2 for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Charles Parker Co. ..... 70&7½%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hales Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00 ..... 20%
Reading's Gravity 60%
Stanley's Steel Gravity Blind Hinges, No. 1845, ₱ doz. sets, without screws, $0.95; with screws, $1.25.
Wright, Ille Hardware Co.:
O. S., Lull & Porter ..... 75&5%
Acme, Lull & Porter 75%
Queen City, Reversible 75%
Shepard's Nonsense, Nos. 60 to 55 ..... 75&5%
Niagara, Gravity Locking, Nos. 3 & 5 ..... 75&5%
Tip Patent, No. 1 ..... 75&10%
No. 3 ..... 70&5%
Buffalo Gravity Locking, No. 3 & 5 ..... 75&10%
Shepard's Double Locking 75%
Champion Gravity Locking ..... 70&5%
Pioneer ..... 50&10%
Empire 65%
W. B. Co.'s Mortise Gravity Locking, No. 2 ..... 60&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L't'chs	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.35*

New England:
With Latch ..... doz. ..... @$2.00
Without Latch ..... doz. ..... @$1.60
Reversible Self-Closing:
With Latch ..... doz. ..... @$1.75
Without Latch ..... doz. ..... @$1.35
Western:
With Latch ..... doz. $1.75
Without Latch ..... doz. $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 ..... 70%

Pivot Hinges—

Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—

Holdback, Cast Iron.. $6.75@$7.00
Non-Holdback, Cast Iron $6.50@$6.75

J. Bardsley:
Bardsley's Non-Checking Mortise Hinge 40%
Bardsley's Patent Checking 33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor 40%
Bommer Spring Hinges 40%
No. 999 Wrot. Steel Hold Back, ₱ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor 50%
Garden City Engine House 25%
Keene & Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 25%
American 30%
Columbia, ₱ gr., No. 14, $8.00; No. 18, $25.00
Columbia, Adj., No. 7, ₱ gr. $15.00
Columbian Hinges ..... 60&10%
Gem, new list 30%
Clover Leaf ..... ₱ gr. $12.00
Odd-side, new list 30%
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co.: Matchless 30%
Norfolk Hardware & Supply Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye Ball Steel Holdback Screen Door ..... ₱ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door 25%
No. 777, Sheet Steel Holdback, ₱ gr. pr $9.00
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓%

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904.
Light Strap Hinges ..... 50&10%
Heavy Strap Hinges ..... 50&10%
Light T Hinges ..... 50&10%
Heavy T Hinges ..... 50&10%
Perin H. & H. ..... 50&10%
Hinge Hasps ..... 50&10%
Cor. Hinges ..... 50&10%
Cor. Iron ..... 50&10%
Screw Eyes ..... 50&10%
Screw Hook and Eye: ..... 50&10%

Hitchers, Stall—

Hitchers ..... 50&2%

Hods— Coal—

M'f'r's list, price per gross.

Inch	*15*	*16*	*17*	*18*
Galvanized	*$35*	*$39*	*$42*	*$46*
Japanned	*30*	*34*	*37*	*40*
Galvanized Funnel	*38*	*38*	*42*	*46*
Jap. Funnel	*33*	*36*	*39*	*43*

Extra 10% often given on most of these Hinges

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick, No. 162 ..... each $1.05
Steel Mortar, No. 158 ..... each $1.35

Hoes— Eye—

Scarfl and Oval Pattern ..... 60&10@60&10&10%
Grub, list Feb. 24, 1900 ..... 70&10@70&10&10%

D. & H. Scovil.....27½%
Am. Fork & Hoe Co. (Scovil Patterns).....60%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding, No. 1,$2.00; No. 2,$2.50
Star Double Bit.....$3.20
Ft. Madison Cotton Hoe.....70&10%
Ft. Madison Crescent Cultivator Hoe, ₱ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. 40&5
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz., 60&10
Ft. Madison Dixie Tobacco Hoe.....75&15%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & I. Weeding.....30%
B, B, 6 in., Cultivator Hoe.....$3.40
B, B., 6½ in.....$3.80
Acme Weeding.....₱ doz. net, $4.25
W. & C. Living Shuffle Hoe, ₱doz.$5.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders—Bit—

Augusar, ₱ doz. $24.00.....45&10%

Door—

Bardsley's, Iron, 40%; Brass and Bronze.....50%
Imperial.....50%
Pullman.....35%
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip.....50%
Superior.....33⅓%

File and Tool—

Nicholson File Holders and File Handles.....33⅓&40%

Fruit Jar—

Triumph Fruit Jar Holder, ₱ gross, $10.80; ₱ doz.....$1.25

Trace and Rein—

Fernald Double Trace Holder, ₱ doz. pairs.....$1.25
Dash Rein Holder, ₱ doz. pairs.$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German.....33⅓%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Clothes line, Reading List.....40%
Coat and Hat, Reading.....45&20%
Coat and Hat, Wrightsville.....60&5
Harness, Reading List.....40%

Wire—

Belt 80%
Ware C. & H. Hooks.....75@—%
Bradley Metal Clasp Wire, Coat and Hat, 70&10%; Ceiling.....70&10%
Columbian Hdw. Co., Gem.....70&5%
Parker Wire Goods Co., King..70&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.90; 8 in., $1.25; 10 in., $3.50.
Cotton .....*doz. $1.05@1.25*
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see Stops, Bench.
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz.$3.00
Grass, common grades, all sizes, per doz.....$1.50
Whiffletree .....*lb. 5%@6¢*
Hooks and Eyes:
Brass .....60&60&10%
Malleable Iron.....70&70&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....40%
Ft. Madison Cut-Easy Corn Hooks, ₱doz. $3.25 net
Turner & Stanton Co. Cup and Shoulder.....80&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition .....*ft. 5¢ 6¢*
3-ply Guaranteed.....*ft. 8¢ 9¢*
4-ply Guaranteed.....*ft.10¢11¢*
Cotton Garden, ¾-in., coupled:
Low Grade.....*ft. 8¢ 9¢*
Fair Quality.....*ft.10¢11¢*

Irons—Sad—

Flat, ¼ to 10.....*lb 3¢@3½¢*
B. B. Sad Irons.....*lb.3½@3¾¢*
Mrs. Potts', cents per set:

Nos.	50	55	60	65
Japid Tops	85	80	93	91
Tinned Tops	88	85	98	95

New England Pressing.*lb.3¾@4¢*

Bar and Corner—

Buffalo Mfg. Co. Bar.....60&10%
Corner.....60%

Pinking—

Pinking Irons.....*doz.60¢*

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45% Lockport.....50%
Lane's Steel.....30&5%
Richards' Tiger steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Kettles—

Brass, Spun, Plain.....*20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros' Butcher &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60%
Wilmington Acme, ₱ doz. $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....*80&10%*
C. E. Jennings & Co., Nos. 45, 46, 50&5%
Jennings & Griffin, Nos. 41, 42, 66&5%
Swan's.....60%
Wattous.....60&10%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge, per doz. $3.50@3.75
Iwan's Sickle Edge.....₱ doz. $9.50
Iwan's Serrated.....₱ doz. $10.00

Miscellaneous—

Farriers' .....*doz. $3.00@3.25*
Wostenholm's .....*doz. $3.00@3.25*

Knobs—

Base, 2½ inch, Birch, or Maple, Rubber Tip.....*gro.$1.25@$1.40*
Carriage, Jap., all sizes.....*gro. 40@45¢*
Door, Mineral.....*doz. 65@70¢*
Door, Por. Jap'd.....*doz. 70@75¢*
Door, Por. Nickel.....*doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....20%
P. S. & W.....40&10%
Reading 60%

Lanterns—Tubular—

Regular, No .....*doz. $4.35@4.50*
Side Lift, No. 0.....*doz. $4.60@4.75*
Hung Globe, No. 0.....*doz. $4.00@4.15*
Other Styles.....*40&40&10%*

Bull's Eye Police—

3-inch .....*$4.25@4.50*

Latches— Thumb—

Roggin's Latches, with screw..
doz. 35@40¢

Door—

Allith Mfg. Co., Reliable and Alligator, 50%; Reliable Cold Storage, 50%
Cronk & Carrier Mfg. Co.....50%
₱ doz. $2.30
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....*doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E.....10%

Lines—

Wire Clothes, Nos. 18 19 20
100 feet.....*$2.50 2.25 2.00*
75 feet.....*2.10 1.80 1.65*
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons.....30%
Silver Lake Braided, coupled—
$6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₱ gr. 20%
Masons' Linen, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines, White Cotton.....20%
Shade Cord, Cotton or Linen.....20%

Locks— Cabinet—

Cabinet Locks.....*33⅓%*

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass .....75&10%

Sash, &c.—

Iver Patent
Bronze and Brass, 55&5%; Crescent, 60%; Iron, 60%; Window Ventilating, 40&20%; Robinson Pat. Ventilating Sash Lock, 33⅓%.
Pullman Patent Ventilating Lock..35%
Reading Sash Locks.....40%

Machines—Boring—

Com. Upr't, without Augers.
$2.00@2.25
Com. Angl'r, without Augers,
$2.25@2.50
Swan's Improved.....40&10%
Jennings', Nos. 1 and 4.....25&7½%
Miners' Fancy.....5 75
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Invincible Hand Power.....
₱ doz. $18.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist..30%
Moore's Hand Hoist, with Lock Brake.....30%
Moore's Cyclone, High Speed Chain Hoist.....25%

Ice Cutting—

Chandler's.....12½%

Washing

Boss Washing Machine Co.: Per doz
Boss No. 1.....$57.00
Boss Rotary.....$57.00
Champion Rotary Banner No. 1..$57.00
Standard Champion No. 1.....$50.00
Standard Perfection.....$27.00
Cincinnati Square Western.....$33.00
Uneeda American, Round.....$33.60

Mallets—

Hickory .....*45&5@50%*
Lignumvitæ .....*45&5@50%*
Tinners' Hickory and Apple-wood .....*doz. 45&5@50%*

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Acme Checkbar Steel.....50%
Elastic Steel Wire Mat Co., new list.50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....20@25%
National list Jan. 1, 1907.....30%
Parker's Columbia and Victoria..33⅓%
Parker's Book and Side.....50&10%
Swift, Lane Bros. Co.....30%

Motors, Water—

Divine's Red Devil.....30%
Lippincott's 50%

Mowers, Lawn—

NOTE—Net prices are generally quoted
Cheapest, 10-in., $2.00; 12-in., $2.10, etc.
Cheap, 10-in., $2.25; 12-in., $2.45, etc.
Better Grade, 10-in., $3.00; 12-in., $3.25, etc.

	12	14	16	18-in.
High Grade....	*$4.50*	*4.75*	*5.00*	*5.25*

Continental.....60%
Great American.....40%
Great American Ball Bear'g, new list..70%
Quaker City.....70%
Pennsylvania.....30%
Pennsylvania, Jr., Ball Bearing, 50&10&5%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel.....70%
Style B, Low Wheel.....70%
Style C, High Wheel, spcl. list, 75&10%
Style D, High Wheel, spcl. list..70%
Philadelphia.....30%
Styles M., S., C., K., T....70&10&5%
Style A, all Steel.....60&10&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.40%
Horse .....40&5%
Pony .....40&5%
26-in., Horse.....30%
Eagle Horse.....30&5%
I. X. L. Horse.....50%

Nails—

Wire Nails and Brads, Miscellaneous .....*87½@87½&10%*
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	.....	23	21	20	19	18 ...40&5%
Coleman	.....	23	21	20	19	18 ...net
New Haven	.....	23	21	20	19	18 ...40&5%
Livingston	.....	19	18	17	16	16 ...10%
Western	.....					per lb. 8¢@

Jobbers' Special Brands
per lb. 9@10¢

Picture—

	lb.	*2*	*2½*	*3*	*4in.*
Brass H'd	*.45*	*.55*	*.60*	*.70*	*.. gro*
Por. Head	*... 1.10*	*1.10*	*1.10*	*... gro*	

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: *Off list*
Square, Blank or Tapped.....*Case*
Hexagon, Blank or Tapped.....*Case*
Square, Blk., C., T. & R.....*Case*
Hexagon, Blk., C., T. & R......*Case*
Hot Pressed:
Square, Blank.....*Case*
Hexagon, Blank.....*Case*
Square, Tapped.....*Case*
Hexagon, Tapped.....*Case*

Oakum—

Best .....*lb., 6½¢*
U. S. Navy.....*lb., 6¢*
Navy .....*lb., 5¢*
Plumbers' Spun Oakum..*2¾@3¢*

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated.....*75%*
Chase or Paragon:
Brass and Copper.....*50&10%*
Zinc .....*65&10%*
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70&70&10%
Railroad Oilers, &c.....60&60&10%
Maple City Mfg. Co.:
Spring Bottom Cans.....70&70&10%
Railroad Oilers, &c.....60&60&10

Openers— Can— *Per doz.*

Sprague, Iron Handle....*.30@35¢*
Sprague, Wood Handle....*.35@40¢*
Sargent Scissors.....*$1.75@$3.00*
Yankee Can and Bottle Opener, ₱ doz., net, $0.75; Little Gem, ₱ doz., net.....$3.65

Egg—

Hartigan Nickel Plate, ₱ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope .....*20@25¢*

Rubber—

(Fair quality goods.)

Sheet, C. I......*11@12¢*
Sheet, C. O. S......*11@12¢*
Sheet, Pure.....*12@13¢*
Sheet, Pure Gum.....*40@45¢*
Sheet, Red.....*40@30¢*
Jenkins' '96, ₱ lb. 80¢.....25%

Miscellaneous—

American Packing...*lb. 7@10 ¢*
Cotton Packing.....*lb. 16@25 ¢*
Italian Packing.....*lb. 9@12½¢*
Jute .....*lb. ¼@ 4½¢*
Russia Packing.....*lb. 8@11 ¢*

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.....*65&7½@70%*
Edwards, Royal Blue.....65&7½%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos: lb.
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.3½@5¢
Roll Roofing—Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft......*6¢*
Mill Board, Sheet, 40 & 60 lb., 1-32 to ½ in......*3@5¢*
Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll
$3@$3.50
Medium weight, 30 lbs. to roll, 50¢@70¢
Heavy weight, 40 lbs. to roll..
75¢@85¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.00; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....*$55.50*
Red Rope Roofing, 250 sq. ft. per roll.....*$1.75*

Tarred Paper—

1 ply (roll 400 sq. ft.), ton....
$34.00@$38.00
2 ply, roll 108 sq. ft.....*65¢*
3 ply, roll 108 sq. ft.....*88¢*
Slater's Felt (roll 500 sq. ft.).80¢

Sand and Emery—

Flint Paper and Cloth.50&10%@—%
Garnet Paper and Cloth.....*85%*
Emery Paper and Cl'h..50&10@60%

Parers— Apple—

Goodell Co.:
Family Bay State.....₱ doz. $15.00
Improved Bay State.....₱ doz. $36.00
New Lightning.....₱ doz. $5.00
Turn Table '98.....₱ doz. $6.00
White Mountain.....₱ doz. $5.00
Bonanza Improved.....each $7.50
Dandy .....each $10.00
Eureka Improved.....each $20.00
New Century.....each $20.00
Ranger .....each $25.00
Livingston Nail Co.:
Daisy .....₱ doz. $1.00
Little Star.....₱ doz. $3.00
Rising Table.....₱ doz. $6.25
Reading Hardware Co.:
Advance .....₱ doz. $4.00
Baldwin .....₱ doz. $4.00
Reading 72.....₱ doz. $5.25
Reading 78.....₱ doz. $6.25

Potato—

Saratoga .....₱ doz. $7.00
White Mountain.....₱ doz. $6.00

Picks and Mattocks—

(List Jan., 1908.)
List.....*70¢@70&10%@70%*
Cronk's Handled Garden Mattock, ₱ doz., No. 2, $2.60; No. 3, $6.40.

Pinking Irons—
See Irons, Pinking.

Pins, Escutcheon—
Brass ..... 50@50&10%
Iron, list Nov. 11, '05 .. 60%&60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in ..... 60&10%
Extra Heavy, 2-6 in ..... 50&10%
Fittings, Standard and Heavy ..... 55&10%

Pipe, Merchant—

	Consumers, Carloads. Steel. Blk.	Galv.	Iron. Blk	Galv.
⅛ and ¼ in.	65	48	35	21
⅜ in.	66	52	39	31
½ in.	68	56	61	50
¾ to 6 in.	72	62	66	56
7 to 12 in.	69	54	61	46

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 8 to 24 in., f.o.b. factory.
First-class ..... 77@7 %
Second class 5

Pipe, Stove—

	Per 100 joints. C. L.	L. L.
Edwards' Nested: 5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	6.75	7.75
7 in., Standard Blue	7.75	8.75
6 in., Royal Blue	7.50	8.50
7 in., Royal Blue	8.50	9.50
Wheeling Corrugated Cooks Nested: 5 in., Uniform Color	$6.15	$7.15
6 in., Uniform Color	6.65	7.65
7 in., Uniform Color	7.65	8.65

Planes and Plane Irons—

Wood Planes—
Bench, first qual ..... 50@50&10%
Bench, second qual ..... 30@30&10%
Molding ..... 25@25&10%
Chapin-Stephens Co.:
Bench, First Quality 30
Bench, Second Quality 25
Molding and Miscellaneous 30
Toy and Germans 50
Union 60%

Iron Planes—
Chaplin's Iron Planes ..... 50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06 ..... 25%
Buck Bros. 30%
Chapin-Stephens Co 25%
Union 50%
L. & I. J. White ..... 20&5&25%

Planters, Corn, Hand—
Kohler's Eclipse ..... ₩ doz. $8.00

Plates—
Fellue ..... lb. 4@4¼¢

Pliers and Nippers—
Button Pliers ..... 75&5@75&10&5%
Gas Burner, per doz., 5 in., $1.25 @ $1.50; 6 in., $1.45 @ $1.50.
Gas Pipe .. 7 8 10 12-in.
$2.00 $2.25 $2.75 $3.50
Acme Nippers ..... 50&5%
Cronk & Carrier Mfg. Co.:
American Button 80%
Improved Button ..... 75&10%
Cronk's 60%
No. 80 Linemen's 50
Stub's Electric 45%
Combination and others 33⅓%
Heller's Farriers' Nippers, Pincers and Rasps ..... 40&5&10&17&5
P. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 35%; Elm City, 35%; Paragon, 50%; Lodi, 55%.
Swedish Side End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels ..... 30@30&10%
Chapin's Imp. Brass Cir. Level ..... 40@40&10%
Pocket Levels ..... 30@30&10%
Extension Sights ..... 30@30&10%
Mason's Levels ..... 40@40&10%
Disston's Plumbs and Levels ..... 60&10%
Disston's Pocket Levels ..... 60&10%
Stanley's Duplex 30%
Woods' Extension 33⅓%

Points, Glaziers'—
Bulk and 1 lb. papers ..... lb. 9¢
½-lb. papers ..... lb. 9½¢
¼-lb. papers ..... lb. 10¢

Police Goods—
Manufacturers' Lists .. 25@25&5%
Towers 25

Polish—Metal, Etc—
Prestobrac Liquid No. 1, ½ pt. ₩ doz. $3.00; No. 2, ½ pt. $9.00 40%
Prestobrac Paste 60%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₩ doz. 50¢; ₩ gro. $4.50, ½ lb boxes, ₩ doz. $1.25; 1 lb ₩ doz $2.25
U. S. Liquid, 8 oz. cans, ₩ doz., $1.25.
Barkeepers' Friend Metal Polish, ₩ doz., $1.75.

Stove—
Black Eagle Bruzine Paste, 5 lb cans, ₩ lb 10¢
Black Eagle, Liquid, ½ pt. cans, ₩ doz. 75¢
Black Jack Paste, ¾ lb cans, ₩ gr. $9.00
Black Kid Paste, 5 lb cans each, $3.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon's, ₩ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ₩ lb 8¢
Fireside ..... ₩ gr. $2.50
Vena, ₩ gr. $1.50 ..... ₩ doz. $1.50
Japanese ..... ₩ gr. $3.50
Jet Black ..... ₩ gr. $3.50
Peerless Iron Enamel, 13 oz. cans ..... ₩ doz. $1.50

Poppers, Corn—
1 qt. Square...doz.$6.50; gro.$75
1 qt. Round...doz.$6.50; gro.$75
½ qt. Square...doz.$1.00; gro.$11.00
2 qt. Square...doz.$1.50; gro.$16.50

Post Hole and Tree Augers and Diggers—
See also Diggers, Post Hole, &c.

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft. 46¢, 6½ ft., 48¢.
Steel Hitching Posts ..... each $1.30

Potato Parers—
See Parers, Potato.

Pots, Glue—
Enameled ..... 35&10%
Tinned ..... 30&10%

Powder—
In Canisters:
Duck, 1 lb. ..... *each 45¢*
Fine Sporting, 1 lb. ..... *each 75¢*
Rifle, ½ lb. ..... *each 15¢*
Rifle, 1 lb. ..... *each 25¢*
In Kegs:
12½-lb. kegs *$3.50*
25 lb. kegs *$4.50*
King's Semi-Smokeless:
Keg (25 lb bulk) $6.50
Half Keg (12½ lb bulk) 3.50
Quarter Keg (6¼ lb bulk) 1.90
Case 24 (1 lb cans bulk) 8.50
Half case (1 lb cans bulk) 4.50
King's Smokeless Shot Gun Rifle.
Keg (25 lb bulk) $12.00 $15.00
Half Keg (12½ lb bulk) .. 6.25 7.75
Quarter Keg (6¼ lb bulk) .. 3.25 4.00
Case 24 (1 lb cans bulk) .. 14.00 17.00
Half case 12 (1 lb c. bk) .. 7.25 8.75

Presses—
Fruit and Jelly—
Enterprise Mfg Co. ..... 20@25%

Seal Presses—
Morrill's No. 1, ₩ doz., $20.00 ..... 50%

Pruning Hooks and Shears
See Shears.

Pullers, Nail—
Cyclops 60%
Miller's Falls, No. 3, ₩ doz., $12.00 ..... 33⅓&10%
Morrill's No. 1, Nail Puller, ₩ doz. $20.00 ..... 50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 ..... 50%
The Scranton Co., Case Lots:
No. 3B (large $5.50
No. 3B (small) $5.00
Smith & Hemenway Co.:
Diamond B 70%
Giant 50
Staple Pullers, Utica and Davison 60

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05

Hay Fork, Swivel or Solid Eye. doz., 4 in., $1.25; 5 in., $1.65

Inch	1	2	2¼	2½
Hot House, doz.	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz.	$0.16	.19	.25	.30
Inch	1¾	2	2¼	2½
Side, doz.	$0.25	.30	.35	.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in ..... 17@21¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in ..... 20@21¢
Acme, No. 35, 1¾ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain
Wrought Steel Ball
Fox-All-Steel, No. 3 and 7, 2 in. ₩ doz. 50
Grand Rapids All Steel Noiseless 50%
Niagara, No. 25 ..... 20%
No. 36, Tw ..... 20½¢
Star, No. 36, 1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Patches, Sheet ..... 75&5&25&10%
Wood Pumps Tubing, &c. 50%
Barnes Drill
Barnes Pocket
Contractors' Rubber Diaphragm
Deane
Daisy Straw Pump ..... ₩ doz. $6.50
Flint & Walling's Fast Mail Hand, plow bolt 50
Flint & Walling's Fast Mail (low list) 50
Flint & Walling's Tight Top Pitcher, ... 75&15
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.00 50
Myers' Pumps (low list) ..... 40&5%
Myers' Power Pumps ..... 40&5%
Myers' Spray Pumps ..... 15&5

Pump Leathers—
Plunger and Valve Leathers—Per doz.
No. .....
Cup Leathers, Per Inch .....

Punches—
Saddlers' or Drive, good doz. 50@75¢
Spring, single tube, good quality *$1.75*
Revolving (4 tubes) ..... *doz. $3.50*
Bonnes & Cie, Geneva, Swiss Drive 50
Miller's No. 1AA, A, 1B, 1C, 1D, $15.00 ..... 50%
Hercules, 1 die, each $5.00 ..... 50%
Niagara Hollow Punches 40%
Niagara Solid Punches ..... 35&10%
Wm. Schollhorn Co.:
Best and Tiger, Bernard, 35%; Paragon, 50%; Lodi 55%
Tinners' Hollow, P., S. & W. Co. 40%
Tinners' Solid, P., S. & W. Co. ₩ doz., $1.44 ..... 40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron .....
Sliding Door, Wrought Brass, 1½ in., lb., 56¢ 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..₩ ft. 31¢
O. N. T. Rail $0.12
Griffin's:
xxx, ₩ 100 ft., 1 x 3-16 in., $3.35, 1¼ x 3-16 in., $5.75.
Hinged Hanger Track, 1 ft., 1 x 3-16 in. $3.30, 1¼ x 3-16 in., $4.80.
Lane's:
Hinged Track, ₩ 100 ft. $3.45
O. N. ₩ 100 ft., 1 in., $5.00, 1¼ in., $5.45; 1½ in., $4.00.
Standard, 1¼ in. ..... ₩ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ₩ 100 ft., $7.50; 1¼ x 3-16 in., $8.75 ..... 55&7½%
McKenney's:
Hinged Hanger Track, ₩ ft 11¢.
1 x 3-16 Track ..... 60&5%
Myers' Stayin Track ..... 60&5%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail ..... 60&10%
Lag Screw Rail, No. 65 ..... 50%
Gauge Trolley Track, ₩ ft., No. 31, 9¢; No. 32, 11¢; No. 33, 20¢
No. 50 ..... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25, 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn $3.25
Fort Madison Blue Head Lawn 2.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor ..... 80&25%
Queen City Lawn, ₩ doz., 20 teeth, $2.85; 24, $3.00 ..... net
Malleable Lawn, ₩ doz. $4.00
Malleable Garden ..... 70&10
Ideal Steel Garden, ₩ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00 ..... 80%
Kohler's:
Lawn Queen, 20-tooth ..... ₩ doz. $3.15
Lawn Queen, 24-tooth ..... ₩ doz. $3.25
Paragon, 20-tooth ..... ₩ doz. $2.70
Paragon, 24-tooth ..... ₩ doz. $2.75
Steel Garden, 14-tooth ..... ₩ doz. $2.40
Malleable Garden, 14-tooth, ₩ doz. $2.00&25

Rasps, Horse—
Disston's 75
Fox Rasps, No. 1, ₩ doz. $8.00; No. 2, $6.00; No. 3, $4.80; Diston, ₩ doz. $25.00 25
Red Jacket

Reels, Fishing—
Hendryx:
Multiplying Reels, Nickeled Plate, Agate Rings, Click, Drag, Level Wind, Reverse, Tension Regulator, Thumb Rest:
Model A

Saws—

Atkins:
Circular 45%
Band ..... 50@50&10%
Butcher Saws 50
Cross Cuts 35
One-Man Cross Cut 50%
Nurse or Cross Cut 50%
Hand, Rip and Panel ..... 35&5
Miter Box and Compass 40
Muiay, Mill and Drag 45%
Wood Saws ..... 10&10%
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth..50%
Band, 2 to 18 in. wide 60%
Band, ¾ to 1¾ 60%
Crosscuts 50%
Narrow Crosscuts 50%
Muiay Mill and Drag 50%
Framed Woodsaws 25%
Woodsaw Blades 25%
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Connaught 30%
Compass, Key Hole, &c. 25%
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 16⅔%
Butcher Saws ..... 25&7½%
Compass and Key Hole Saws, 33⅓&5&7½%
Framed Wood Saws ..... 25&7½%
Hand Saws 12½%
Wood Saw Blades ..... 33⅓&7½%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&50%
Butcher Saws Blades ..... 35@40%
Peace & Richardson's Hand Saws..30%
Simonds:
Circular Saws 45%
Crescent Ground Cross Cut Saws..30%
One-Man Cross Cuts ..... 40&10%
Gang, Mill, Muiay and Drag Saws..45%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. .25@25&7½%
Wood Saws 40%7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A ..25%
Disston's:
Compass Blades 25%
Keystone Blades 35%
Hack Saw Frames 30%
Simonds Mfg. Co. 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180, ... 40&7½%
Hack Saws, Nos. 175, 180, complete, ... 40&7½%
Goodell's Hack Saw Blades..... 40&10%
Grimm's Hack Saw Frames..... 35&5&10%
Griffin's Hack Saw Blades..... 35&5&10%
Star Hack Saws and Blades..... 15&10%
Sterling Hack Saw Blades..... 30&10&5%
Sterling Hack Saw Frames..... 40&10%
Sterling Pocket Saw Machines, each, No. 1, $25 00; No. 2, $30.00..10%
Victor Hack Saw Blades..... 20%
Victor Hack Saw Frames..... 40%
Whitaker Mfg. Co.:
National Hand Blades..... 40
National Hand Frames..... 30&5
National Power Blades..... 30&10%

Scroll—

Barnes, No. 7, $15..... 25%
Barnes' Scroll Saw Blades..... 60%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20..... 25%
Lester, complete, $10 00..... 15&10%
Rogers, complete, $3 50 and $4 00..... 15&10%

Scales—

Familia, Turnbull's.....50@50&10%
Counter:
Hatch, Platform, ½ oz. to ½ lbs. .....doz., $5.50
Two Platforms, ½ oz. to 8 lbs. .....doz., $16.00
Union Platform, Plain.$1.70@1.90
Union Platform, Stpd.$1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Trip Scales 50%
The Standard Portables..... 40%
The Standard R. R. and Wagon ..... 50&10%

Scrapers—

Box, 1 Handle.....doz. $2.00@2.25
Box, 2 Handle.....doz. $3.00@3.60
Ship ..... right, $2.00; Hearn, $1.50
Chapin-Stephens Co., Box...30@30&10%
Richards Mfg. Co., Foot..... 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $4.00@5.25; 1¼, $5.50@5.75
Bench, Wood.....20@20&10%
Hand, Wood...70&10@70&10&10%
Chapin-Stephens Co., Hand..... 70@70&10&2½%

Coach, Lag and Hand Rail

Log, Cone Point.....80@80&5%
Coach, Gimlet Point, ... 75@70&10&5%
Hand Rail.....70&10@75%

Jack Screws—

Standard List.....70&10@75%
Wilkes Rails..... 50&10&10%
Swett Iron Works..... 70@75%

Machine—

Cut Thread, Iron, Brass or Bronze:
Flat Head or Round Head, ... 50@50&10%
Fillister Head.....10@10&10%
Rolled Thread, F. H or R. H., Iron .....75&10%
F. H. or R. H., Brass, Nos. 8 to 14.....65&10%

Set and Cap—

Set (Iron).....75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap.....70&10&7½%
Hex. Hd. Cap.....70&10&7½%
Rd. Hd. Cap.....50&7½%
Fillister Hd. Cap.....60&7½%

Wood—

List July 23, 1903.
Flat Head, Iron.....87½&5@..%
Round Head, Iron.....85&5@..%
Flat Head, Brass.....80&5@..%
Round Head, Brass...77½&5@..%
Flat Head, Bronze.....75&5@..%
Round Head, Bronze.72½&5@..%
Drive Screws.....87½&5@..%

Scroll Saws—

See *Saws, Scroll.*

Scythes— *Per doz.*

Grass, No. 1, Plain.....$7.00@7.50
Clipper, Bronzed Webb..$7.25@7.75
No. 3 Clipper, Pol'd Webb.. ..... $7.50@8.00
No. 6 Clipper and Solid Stee.. ..... $7.75@8.25
Bush, Weed and Bramble, Nos. 11, 12 and 13.....$7.25@7.75
Grain, No. 1.....$9.00 @ 9.50
Bronzed Webb, No. 1...$9.25@9.75
Nos. 3 and 4 Clipper, Grain.. ..... $9.50@10.00
Solid Steel, No. 6.....$10.00@10.50

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18..20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel..... ₩ doz sets $9.00

Sets, Nail—

Octagon .....gro. $3 50@3.75
Buck Bros..... 7½%
Cannon's Diamond Point, ₩ gro, $12, ... 10&10%
Mayhew's ..... ₩ gro $9.00
Snell's Corrugated, Cup Pt.....40&10%
Snell's Knurled, Cup Pt.....40&10%
Victor Knurled Cup Pt....₩ gro. $7.50

Rivet—

Regular list.....75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Morrill's No. 1..... $15.00
Nos. 3 and 4, Cross Cut.... $20 60
No. 5, Mill..... $30.00
Nos 11, 11½..... $13.80
No. 1 Old Style..... $19.00
Special $16.25
Giant Royal Cross Cut..... ₩ doz. $8 00
Royal, Hand..... ₩ doz. $4.80
Taintor Feed..... ₩ doz. $4.75

Shaving—

Fox Shaving Sets, No. 30..... ₩ doz., net, $24.00
Smith & Hemenway Co.'s..... 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₩ doz..... $1.50
Mounted Kitchen Sand Stone, ₩ doz..... $1.50
Natural Grit Carving Knife Hones, ₩ doz..... $3.00
Quick Cut Emery Carving Knife Hones, ₩ doz..... $1.50
Quick Edge Pocket Knife Hones, ₩ doz..... $2.50

Skate—

Smith & Hemenway Co., Eureka..50%

Shaves, Spoke—

Iron .....doz. $1.25
Wood .....doz. $2.00
Bailey's (Stanley R. & L. Co.)....45%
Chapin-Stephens Co.....30@30&10%
Goodell's ₩ doz. $9.00..... 15&10%

Shears—

Cast Iron.. 7 8 9 in.
Best ...$16.00 18.00 20.00 gro.
Good ...$13.00 15 00 17.00 gro.
Cheap ..$5.00 6.00 7.00 gro.
Straight Trimmers, &c.:
Best quality Jap....70@70&10%
Best quality, Nickel..60@60&10%
Tailors' Shears.....40@40&10%
Acme Cast Shears..... 40@40&5%
Heinisch's Tailor's Shears..... 10%
Wilkinson Shear & Cutlery Co.:
Sheep, 1900 list..... 30&10&5%
Grass ..... 50&10%
Horse or Mule..... 50&10%
J. Wiss & Sons Co.:
Best Quality Japd..... 60&10%
Best Quality Nickeled..... 50&10%
Tailors' 25%

Tinners' Snips—

Steel Blades.....20&5@20&10%
Steel Laid Blades.....40&10@50%
Forged Handles, Steel Blades, Berlin 50%
Heinisch's Snips..... 40%
Jennings & Griffin Mfg. Co.'s 6½ to 10 in..... 33⅓&7½%
Niagara Snips..... 10%
P., S. & W. Forged Handles, 25%
W. R. W..... 40&10%
J. Wiss & Sons Co.:
Wiss Forged Steel..... 25%

Pruning Shears—

Cronk's Hand Shears..... 33⅓%
Cronk's Wood Handle Shears..... 33⅓%
Disston's Combined Pruning Hook and Saw ₩ doz $18 00..... 25%
Disston's Pruning Hook only, ₩ doz. $12 00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades..... 40%
P. S. & W. Co..... 40&10%
Columbian Cutlery Co.:
Hedge, Wilcut Brand..... 60&10%
Lawn and Border, Wilcut Brand, ... 60&10%

Sheaves—Sliding Door—

Reading 40%
R. & E. list..... 15%

Sliding Shutter—

Reading list..... 40%
R. & E. list..... 10%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge..... 65&10%
Club, Rival, 65&5%; First Quality, ... 60&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, ... 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Leader 12, 16 and 20 gauge; Leader grade, ... 25&5%
Union, League, 12 and 12 gauge; Rival Grade..... 20%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge..... 20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%

Shells, Loaded—

Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade..... 40&5%
Loaded with Smokeless Powder, high grade.....40&10&10%
Union Metallic Cartridge Co.:
New Club, Blue Powders..... 40%
Nitro Club, Smokeless Powders.40&5%
Arrow, Smokeless Powders.40&10&10%
Winchester:
Smokeless Repeater Grade.....40&5%
Smokeless Leader Grade...40&10&10%
Black Powder..... 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20 in	$4 25	$5 50
Dixie, 10 x 14 in	4.50	6.00
Dixie, 7 x 10 in	4.50	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron .....per keg.$4.10
Steel .....per keg.$3.85
Burden's, all sizes..... ₩ keg $3.90

Shot—

25-lb. bag.
Drop, up to B.....$1.85
Drop, B and larger..... 2.10
Buck 2.10
Chilled 2.10
Dust 2.30

Shovels and Spades—

Association List, Nov. 15, 1902. 40%
Avery Stamping Co..... 40%

Snow Shovels—

Long Handle.....$3.25@$3.50
Wood and Mall. D. Handle.. ..... $3.75@$4.00

Sieves and Sifters—

Hunter's Imitation ..... gro. $9.50@10.00
Hunter's Genuine..... per gro. $12.00@12.50

Sifters, Ash—

Acme Ball Bearing Sifter, $3.25; Automatic Ash Sifter, each, $3.25; ₩ doz..... $39.00

Sieves, Seamless Metallic

—Per dozen.—

Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.35*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested....doz. $0.90@0.95
Mesh 20, Nested....doz. $1.00@1.05
Mesh 24, Nested....doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard List:
12 x 12 to 22 x 36 in.....60%
20 x 40 to 24 x 50 in.....50%
24 x 60 to 24 x 120 in.....30%
Barnes' low list:
Up to and including 20 x 36 in 50&5%
20 x 40 to 24 x 50 in 45%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron.....70@75&10%
Steel .....40@45%

Slates, School—

Factory Shipments.
"D" Slates.....50@50&10%
Eureka, Unexcelled Noiseless.. ..... 60&5 tens
Victor A, Noiseless.60&4 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German .....40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%..... 60%
High Grade, 40%; Trojan..... 40%
Jockey 25%

Snaths—

Scythe .....55@60%

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality.....50&10@60&5%
Cheap .....60@60&10%
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton..... 50&10%
Rogers & Bro., William Rogers, Eagle Brand..... 50&10%
Anchor, 30&2%..... 60%
Wm. Rogers & Son..... 60&10%

Miscellaneous

German Silver.....60@60&5%

Tinned Iron—

Teas .....per gro .50@75¢
Tables .....per gro .$0.90@$1.00

Springs— Door—

Bardsley's Spring and Check..... 40%
Chicago (Coil)..... 40&10%
Gem (Coil)..... 35%
Pullman (Coil)..... 35%
Reliance (Coil)..... 40&10%
Star (Coil)..... 30%
Torrey, No. 29 in..... ₩ doz. $1.10

Carriage, Wagon, &c.—

1¼ in. and Wider: Per 100 lb.
Black .....$4.75@5.00
Half Bright.....$4.75@5.00
Bright .....$5.25@5.50
Painted Seat Springs:
1½ x 2 x 26.....per pr .49@52¢
1½ x 3 x 28.....per pr .73@77¢

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; National, ₩ doz..... $12.00
Enterprise ..... 20@30%
Philadelphia No. 1, ₩ doz. $12; No. 2, $15; No. 3, $20..... 30%

Squares—

Nickel plated..} List Jan 5, 1900.
Steel and Iron.} 80@80&5%
Rosewood Hdl. Try square and T. Bevels .....40&10@40&10&10%
Iron Hdl. Try Squares and T. Bevels .....40&10@40&10&10%
Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel..... 15%

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap .....doz. $1.00
Good Grade.....doz. $1.25
Tinned Iron.....doz. $0.75@1.25
Iron, Porcelain Lined...doz. $1.75

Staples—

Barbed Blind..... 85&5@87&10%
Electricians' .....80&10&10@85%
Fence Staples, Plain, $2.15; Galvanized $2.45
Poultry Netting Staples..... per lb. 3¼@3½¢

Steels, Butchers'—

Dick's 30%
Foster Bros..... 30%

Steelyards— ....30@30&10%

Stocks and Dies—

Blacksmiths' .....50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates..... 25%
Green Screw Plates..... 25%
Lightning Screw Plate..... 25%
Little Giant..... 25%
Reece's New Screw Plates..... 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones—Oil, &c.

Pike Mfg. Co., 1907 list: ₩ lb
Arkansas Sc. No. 1, 3 to 5½ in. 2.50
Arkansas St. No. 1, 5½ to 8 in $3.50
Arkansas Slips No. 1..... $4.00
Lily White Washita, 4 to 8 in. 80¢
Rosy Red Washita, 4 to 8 in..60¢
Washita St., Extra, 4 to 8 in.50¢
Washita St., No. 1, 4 to 8 in..40¢
Washita St., No. 2, 4 to 8 in..25¢
Lily White Slips..... 90¢
Rosy Red Slips..... 90¢
Washita Slips, Extra..... 80¢
Washita Slips, No. 1..... 70¢
Washita Slips, No. 2..... 40¢
India Oil Stones (entire list)....33⅓%
Quincy Axe and Corundum Oil Stone, Double Grit..... 40%
Quickcut Emery and Corundum Axe Stone, Double Grit..... 33⅓%
Quickcut Emery Rubbing Bricks..40%
Hindostan No. 1, R'g'lar, ₩ lb 8¢
Hindostan No. 1, Small..₩ lb 10¢
Axe Stones (all kinds)..... 33⅓%
Turkey Oil Stones, Extra, 6 to 8 in..... ₩ lb 80¢
Queer Creek Stones, 4 to 8 in.20¢
Queer Creek Slips..... 40¢
Sand Stone..... 8¢

Scythe Stones—

Pike Mfg. Co., 1901 list:
Black Diamond S. S. ... gro. $12.00
Lamoille S. S. ... gro $11.00
White Mountain S. S. ... gro $9.00
Green Mountain S. S. ... gro $6.00
Extra Indian Pond S. S. ... gro $5.50
No 1 Indian Pond S. S. ... gro $5.00
No 2 Indian Pond S. S. ... gro $4.50
Leader Rod End S. S. ... gro $4.50
Quick Cut Emery ... gro $1.00
Pure Corundum ... gro $18.00
Crescent ... $7.00
Emery Scythe Rifles, 2 Coat $8
Emery Scythe Rifles, 3 Coat $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1901 list 33⅓%.
Electro (Artificial), ... gro.
$12.00 ... 33⅓%
Lightning (Artificial), ... gro.
$18.00 ... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers ... gro. $9.00

Stops— Bench—

Millers Falls ... 15&10%
Morrill's, No. 1, $10.00 ... 60%
Morrill's, No. 2, $12.50 ... 60%

Door—

Chapin-Stephens Co. ... 50@50&10%

Plane—

Chapin-Stephens Co. ... 20%

Straps— Box—

Acme Embossed case lots ... 20&10&10%
Cary's Universal, case lots ... 20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket ... doz. $1.60
Excelsior Stretcher and Tack Hammer Combined, ... doz. $6.00 ... 20%

Stuffers, Sausage—

Enterprise Mfg. Co. ... 25@25&7½%
National Specialty Co., list Jan. 1, 1902 ... 50&5%
P., S. & W. Co. ... 40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ... doz.
Superba, Crotch Mahogany ... $36.00
Triumph, Fancy Veneers ... $33.00
Parlor Queen, Fig. Rosewood ... $30.00
Ideal, Birch-Lite Maple ... $25.00
Am. Queen, Fig. Mahogany ... $27.00
Ideal, Birch-Lite Maple ... $25.00
Grand Rapids, Nickel, $24.00; Japan ... $22.00
Standard, Nickel, $22.00; Japan $20.00
Crown Jewel, Nickel, $21.00; Jap. $19.00
Crystal, Glass Top ... $36.00
Grand, 17 in. wide ... $30.00
Cub, 24 in. wide ... $30.00
Hall, 28 in. wide ... $60.00

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five dozen lots; $2 per dozen on ten dozen lots; $2.50 per dozen on twenty-five dozen lots

Tacks, Finishing Nails, &c.

American Carpet Tacks ... 90&40%
American Cut Tacks ... 90&40%
Swedes' Cut Tacks ... 90&40%
Swedes' Upholsterers' ... 90&40%
Gimp Tacks ... 90&50%
Lace Tacks ... 90&40%
Trimmers' Tacks ... 90&40%
Looking Glass Tacks ... 60%
Bill Posters' and Railroad Tacks, 90&50&10%
Hungarian Nails ... 80&20%
Finishing Nails ... 70%
Trunk and Clout Nails ... 80&10%

NOTE.—The above prices are for straight Weights.

Miscellaneous—

Double Pointed Tacks ... 90&5 tens @—%
See also Nails, Wire

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
120	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ... 50@—%
Patent Leather ... 25&10&5%
Steel ... 33⅓&10&5%
Chesterman's ... 25&25&5%
Keystone & Esser Co.:
Linen, Asses' Skin ... 40&10&5%
Linen, Buck and Leather ... 40&10&5%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Pike's:
Asses' Skin ... 40&10&50%
Metallic ... 35&5&5%
Patent Bend, Leather ... 25&50@25&10%
Pocket ... 40&10&5%
Steel ... 33⅓&35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L ... 35%
Chesterman's Steel, No. 1939L ... 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger ... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c. ... 30@33⅓%

Ties, Bale—Steel Wire—

Single Loop ... 80&10&5%
Monitor, Cross Head, &c. 70@2½%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White ... 20@20&5%

Haying—

Myers' Hay Tools ... 45%

Miniature—

Smith & Hemenway Co.'s, Davidson, ... doz., Nickel Plated $1.50, Gold Plated ... $2.00

Saw—

Atkins' Cross Cut Saw Tools ... 35&5%
Simonds' Improved ... 33⅓%
Simonds' Crescent ... 25%

Ship—

L. & I. J. White ... 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro. ... $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida ... 75&10%
Newhouse ... 40&10&5%
Hawley & Norton ... 65%
Victor ... 75&5%
Oneida Community Jump ... 50%
Hecla ... 75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes ... 12¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ... doz., $13.25..$11.50 doz.
No. 3, Rat, ... doz., $6.50 ... $5.75 doz.
No. 3½, Rat, ... doz., $5.25, $4.70 doz.
No. 4, Mouse, ... doz., $3.50 ... $3.00 doz.
No. 5, Mouse, ... doz., $3.00, $2.25 doz.
Oneida Community:
Out o' Sight, Mouse, ... doz.....$0.60
Out o' Sight, Rat, ... doz..... 1.25
Easy Set, Mouse, ... doz..... .55
Easy Set, Rat, ... doz..... 1.00
Wood Choker, Rat, ... doz. holes. .12
Premier Tin Choker, 5 hole, ... doz. traps ..... .75

Trowels—

Disston Brick and Pointing ... 25%
Disston Plastering ... 20%
Disston "Standard Brand" and Garden Trowels ... 30%
Kohler's Steel Garden Trowels, ... gro., 5 in., $4.80; 6 in., $6.00.
Never Break Steel Garden Trowels ... gro. $6.00
Woodrough & McParlin, Plastering ... 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York ... 50&10%
Western Pattern ... 60&10%
Handy Trucks ... doz. $16.00
Gruney ... doz. $15.00
McKinney Trucks ... each, net $10.00
Model Stove Trucks ... doz $18.50

Tubs, Wash—

M'f'r's list, price per gross.

No.	0	1	2	3
Galvanized	$67	$79	$89	$99

10&5%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls 21¢@22¢
No. 12, ¼ and ½-lb. Balls 21¢@24¢
No. 18, ¼ and ½-lb. Balls 18@20¢
No. 24, ¼ and ½-lb. Balls ... 17½@19¢
No. 36, ¼ and ½-lb. Balls 17@19¢
Chalk Line, Cotton Balls ... 26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz. ... 11@19¢
Cotton Wrapping, 5 Balls to lb., according to quality ... 15½@25¢
American 2 Ply Hemp, ¼ and ½-lb. Balls ... 14½@16¢
American 3 Ply Hemp, ¼-lb. Balls ... 13½@16¢
India 2 Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) 10½@11½¢
India 3 Ply Hemp, ¼-lb. Balls ... 10½@11½¢
India 3 Ply Hemp, ½-lb. Balls ... 10½@11½¢
2, 3, 4, 5 and 6 Ply Hemp, ¼-lb. Balls ... 14½@16¢
Mason Line, Linen, ¼ lb. Balls 17¢
No. 36, Mattress Twine, ¼ lb. Balls, according to quality ... 14@16¢
Wool, 3 to 6 ply ... B 9¢; A 10¢

Vises—

Solid Box ... 50@50&10%

Parallel—

Athol Machine Co. ... 40%
Simpson's Adjustable ... 40%
Standard ... 40%
Amerind ... 25%
Columbian Hdw. Co. ... 40%
Fisher & Norris Double Screw, net, each, Nos. 2, 3, 30, 3, $16.00; 4, $20.50; 5, $27.00.
Fulton Mach. & Vise Co.:
Reed, Swivel ... 25%
Star, Solid Jaw ... 40%
Hollands':
Machinists' ... 10&10&5%
Keystone ... 60&5%
Lewis Tool Co.:
Adjustable Jaw ... 30%
Monarch, 50%; Solid Jaw ... 50%
Massey Vise Co.:
Clincher ... 40%
Perfect, 15%; Lightning Grip ... 15%
Merrill's ... 20%
Millers Falls Oval Slide Pattern 60&10%
Parker's:
Victor, 20@25%; Regulars ... 20@25%
Vulcan's ... 40&45
Combination Pipe ... 55&10%
Prentiss ... 20@25%
Rock Island ... 25%
Snedeker's X. L. ... 30%
Stephens' ... 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ... doz., $24.00, 30%; Clamps ... 30%
Perfection Saw Clamps, ... doz. ... $4.50
Reading ... 60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed ... 25%
Star ... 40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect ... 15%
Wyman & Gordon's Quick Action, 6 in., $6.00, 9 in., $7.00, 11 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe ... 40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.
Rock Island Pipe ... 25%

Wads—*Price per M.*

B. E., 11 up ... 60¢
B. E., 9 and 10 ... 70¢
B. E., 8 ... 80¢
B. E., 7 ... 80¢
P. E., 11 up ... $1.00
P. E., 9 and 10 ... 1.25
P. E., 8 ... 1.50
P. E., 7 ... 1.50
Ely's B. E., 11 and larger $1.70@1.75
Ely's P. E., 12 to 20 ... $3.00@3.25

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled ... 55&10%
Ground ... 50&5%
Plain or Unground ... 60%
Country Hollow Ware, per 100 lbs. ... $3.00
White Enameled Ware:
Maslin Kettles ... 65&10%
Copper Ware:
Tinned and Turned ... 35&10%
Enameled ... 45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware ... 30%
Iron Clad Ware ... 30%
Lava and Volcanic Enameled ... 40%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles ... 60%
Porcelained ... 50&10&20
Never Break Spiders and Griddles ... 65&5%
Never Break Kettles ... 60%
Solid Steel Spiders and Griddles 65&5%
Solid Steel Kettles ... 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone ... 40@40&10%

Washboards—

Solid Zinc: ... doz.
Crescent, family size, bent frame $4.25
Rival ...
...
Double Zinc Surface:
...
...ary protector ... $3.60
Single Zinc Surface:
...
...
...
...
No. 1001 Nickel Plate, Single Surface ... $3.00
...
Enamel King, Single Surface, reversible back ... $3.00

Washers—Leather, Axle—

Solid ... 90&10&10%
Patent ... 90&10&10%
Coil: ⅜ 1 1¼ 1¾ Inch
90 1.10 1.10 1.25 per box

Iron or Steel—

Size bolt. ... 2.50 2.30
Washers ... $4.90 4.60 2.70 2.50 2.30
The above prices are based on $6.50 off list.
In lots less than one keg add ½¢ per lb.; 5 lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots ... per lb. 1¾@2¢

Wedges—

Oil Finish ... lb., 6@7¢

Weights—Hitching—

Covert Mfg. Co. ... 30&5%

Sash—

Per ton, f.o.b. factory:
Eastern District ... $25.00@28.00
Southern Territory ... $25.00
Western and Central Districts ... $27.00@27.50

Wheels, Well—

Sch., $2.00; Jeff., $2.75; 12-in., $2.25; 14-in., $3.25

Wire and Wire Goods—

Bright and Annealed:
6 to 9 ... 72½&10&5%
10 to 18 ... 72½&10&10%
19 to 26 ... 75&10&10&2½%
27 to 36 ... 77½&10&2½%
Galvanized:
6 to 9 ... 72½&10&5%
10 to 14 ... 72½&10&10%
15 to 16 ... 72½&10&10&5%
17 to 18 ... 72½%
19 to 26 ... 75&10&2½%
27 to 36 ... 65&10&10%
Coppered:
6 to 9 ... 65&10&10%
10 to 14 ... 70&10&10%
15 to 16 ... 65&10&10&5%
17 Series, 60%; 187 Series, 60&5%; No. 870, 40%.
27 to 36 ... 72½&10&2½%
Tinned:
6 to 18 ... 67½&10&10%
Brass ... 17½¢ lb., base
Copper ... 32¢ lb., base
Cast Steel Wire ... 50%

Spooled Wire—

Annealed and Tinned:
... 70&10&10&10
Brass and Copper ... 60&10&10&10%
Retailers' Assortments, per box ... $2.10@$2.40
Wire Clothes Line see Lines
Wire Fence Board see Board

Bright Wire Goods—

Steel Wire Goods ... 70&10&10%
Brass Wire Goods ... 90&10&10%
Brass Cup and Shoulder Hooks, ... 80&15%

Wire Cloth and Netting—

Galvanized Poultry Netting, ... 50&10&2½%
Painted Screen Cloth, 100 ft., $1.35
Standard Coal Hardware Grade—
Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh ... $2.50
Nos. 4 and 5 Mesh ... $2.40
No. 6 Mesh ... $2.30
Nos. 7 and 8 Mesh ... $2.15

Wire, Barb—*See Trade Report*

Wrenches—

Ambulatual ... 80%
Alligator or Crocodile ... 70&10&25
Baxter Pattern S Wrenches ... 70&50&10&10%
Drop Forged S ... 45@45&5%
Acme ... 50%
Alligator Pattern, 70%; Bull Dog..70%
Bemus & Co.'s:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut ...
Combination Pipe ...
Merrick Pattern ...
Boardman's ... 65&5%
Coes' Genuine Knife Hdl. 40&10&5&5%
Coes' Genuine Steel Hdl. 40&10&5&5%
Coes' Genuine Key Model 40&10&5&5%
Coes', Genuine Hammer Handle ...
...
Eagle ... 71%
...
Case lots ... 50&5%
...
Solid Handles, P., S. & W. 50&10%
...
Peoria Wrench Co.:
...
...
Whitaker Machinists' ...

Wrought Goods—

Solid Eye Bolts, &c. List 60 and ...
...
...

Zinc—

Sheet ... per 100 lb. $5.00

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:
1 to 1½ in. round and square ..... ₱ ℔ 2.00¢
1 to 1 in x ½ to 1 in. ..... ₱ ℔ 2.20¢
Rods—¾ and 11-16 round and square ..... ₱ ℔ 2.30¢
Angles: Cts ₱ ℔
3 in. x ¼ in. and larger ..... 2.40¢
Special sizes and x ¼ ..... 2.50¢
3 in. x 5/16 in. and ¼ in. ..... 2.65¢
1½ to 2 in. x ¼ in. ..... 2.45¢
1 to 2½ in. x 3-16 in. and thicker ..... 2.90¢
1 to 2½ in. x 5-16 in. ..... 2.45¢
1 to 2½ in. x ⅜ in. ..... 2.50¢
3 in. x ¼ in. ..... 2.45¢
3 in. x ⅜ in. ..... 2.55¢
3 in. x ½ in. ..... 2.60¢
½ x 1/32 in. ..... 4.20¢
Tees:
1 in. ..... 2.55¢
1½ in. ..... 2.55¢
1½ to 2 in. ..... 2.45¢
2½ in. and larger ..... 2.45¢
Beams ..... 2.40¢
Channels, 3 in. and larger ..... 2.40¢
Bands—1 to 6 in. x 16 to No. 4 ..... 2.55¢
"Burden's Best" Iron, base price ..... 3.30¢
Burden's "H. B. & S." Iron, base price ..... 3.10¢
"Universal" ..... 3.10¢
Norway Bars ..... 3.10¢
Norway Shapes ..... 3.80¢

Merchant Steel from Store—

per ℔

Bessemer Machinery ..... 2.10¢
Tool Steel, Titanium Special Steel ..... 2.50¢ to 10¢
Best Cast Steel, base price in small lots ..... 11¢

Sheets from Store—

Black

	One Pass, Soft Steel.	C.R. Cleaned.	R. G.
No. 31	₱ ℔ 2.55		2.90¢
Nos. 27 to 29	₱ ℔ 2.95		3.10¢
No. 26	₱ ℔ 3.15		3.40¢
No. 28	₱ ℔ 3.20		3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment, W. Dowerswood ..... ₱ ℔ 11¾@14½¢
Patent Planished ..... ₱ ℔ A, 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16 ..... ₱ ℔ 3.15¢
Nos. 22 to 24 ..... ₱ ℔ 3.35¢
No. 27 ..... ₱ ℔ 3.40¢
No. 28 ..... ₱ ℔ 3.45¢
No. 20 and lighter 36 inches wide, .5¢ higher

Tin Plates—

American Charcoal Plates (per box.)

"A A A" Charcoal:
IC, 14 x 20 ..... $6.40
IX, 14 x 20 ..... 7.65
A. Charcoal:
IC, 14 x 20 ..... $5.45
IX, 14 x 20 ..... 6.55

American Coke Plates—Bessemer—
IC, 14 x 20 ..... $4.45
IX, 14 x 20 ..... 5.45

American Terne Plates—
IC, 20 x 28 with an x lb. coating $8.60
IX, 20 x 28 with an x lb. coating 10.60

Seamless Brass Tubes—

List December 4, 1905. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List December 4, 1905. Base price 18¢

Copper Tubes—

List December 4, 1905. Base price 21¢

Brazed Brass Tubes—

List June 6, 1898. 20¾¢ ₱ ℔

High Brass Rods—

14½¢ ₱ ℔

Roll and Sheet Brass—

List June 6, 1898. 14½¢ ₱ ℔

METALS—

Tin—

Straits Pig ..... ₱ ℔ 30 .31 ¢

Copper—

Lake Ingot ..... ₱ ℔ 13¾@14 ¢
Electrolytic ..... ₱ ℔ 13¾@13¾¢
Casting ..... ₱ ℔ 13¼@13½¢

Sheet Copper Hot Rolled, 16 oz ..... ₱ ℔ 17¢
" " " 14 " ..... " " 17½¢
Sheet Copper Cold Rolled, 1¢ ₱ ℔ advance over Hot Rolled.
Sheet Copper Polished 24 in. wide and under, 1¢ advance over Cold Rolled
Sheet Copper Polished over 20 in. wide, 2¢ advance over Cold Rolled.
Bottoms, Pits and Flats ..... ₱ ℔ 21¢ basis
Planished Copper, 1¢ ₱ ℔ more than Polished.

Spelter—

Western ..... ₱ ℔ 5.50@6 ¢

Zinc.

No. 9, base, casks, ₱ ℔ 7.50¢; Open ..... ₱ ℔ 8.00¢

Lead.

American Pig ..... ₱ ℔ 4½@4.5 ¢
Bar ..... ₱ ℔ 5.50@6 ¢

Solder.

½ & ½, guaranteed ..... ₱ ℔ 20@2 2 ¢
No. 1 ..... ₱ ℔ 18@18½¢
Refined ..... ₱ ℔ 16.50@17 ¢
Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ..... ₱ ℔ 12¢
Hallett ..... 11¢
Other Brands ..... 10¢

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:
Small lots ..... 38¢
10-ton lots ..... 36¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents—
Copper, Heavy and Wire	₱ ℔ 10.50@11.00¢
Copper, Light and Bottoms	₱ ℔ 9.75@10.00¢
Brass, Heavy	₱ ℔ 8.00@8.50¢
Brass, Machine Composition	₱ ℔ 10.50@10.50¢
Clean Brass Turnings	₱ ℔ 6.50@7.25¢
Composition Turnings	₱ ℔ 8.00@8.50¢
Lead, Heavy	₱ ℔ 4.00@4.25¢
Tea Lead	₱ ℔ 3.00@3.00¢
Zinc Scrap	₱ ℔ 3.00@3.00¢
No. 1 Yard Wrought, Long	$9.00@10.00
No. 1 Yard Wrought, Short	$8.50@9.00
Wrought Pipe	$7.50@8.25
No. 1 Machinery Cast	$11.25@12.25
Stove Plate	$10.00@10.50

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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New York, Thursday, March 12, 1908.

The Coal Briquetting Plant at Bankhead, Canada.

In an illustrated article in *The Iron Age* of April 19, 1906, describing the New Jersey Briquetting Company's plant in Brooklyn, N. Y., the general features of the Zwoyer Fuel Company's process for manufacturing coal briquettes were detailed. In brief the process consists in reducing the coal or "mined dust" to a uniform fineness by rolls or a disintegrator, then passing it through mixers in which it is heated and mixed with the binder, consisting of coal tar pitch to the extent of 8 to 10 per cent. of the weight of the coal. There are six mixers. In passing through Nos. 1 and 2 the dust is heated to drive off all moisture. The coal tar being previously heated is introduced into No. 3 mixer. It is atomized by a steam jet and blown in the direction opposite to that taken by the dust, which is thrown into suspension by the mixer blades, so that the pitch may reach each particle. As the mixture passes through Nos. 4 and 5 mixers heat is added. In No. 6 mixer the material cools down to the proper temperature for the press, to which it is conveyed by an elevator. From the press the briquettes are carried by an endless belt conveyor to the cooling table. The construction of the press, the shape and size of the briquettes, and the details of the cooling operation which requires about an hour, were referred to in the original article in these columns.

At the meeting of the American Institute of Mining Engineers in New York, February 19, 1908, Edward W. Parker of the United States Geological Survey, Washington, D. C., presented the paper given below, describing the latest briquetting plant erected to employ the Zwoyer process, that at Bankhead, Alberta, Canada:

The plant was built at the Bankhead Mines, Ltd., to manufacture briquettes by the Zwoyer process under license from the Zwoyer Fuel Company, 60 Wall street, New York. The building was constructed to contain two units of 10 tons per hour capacity, one unit being installed at the time the building was constructed. The product and machinery having exceeded expectations, the second unit has been ordered and is being installed.



Fig. 1.—Interior View of the Briquette House at Bankhead Mines, Alberta, Canada.—A, Briquetting Press; B, Elevator; [illegible] Mixer No. 6 to Press; C, Mixers; D, Pitch Pipe to Mixers; E, Pitch Tank; F, Dust Bin.

The coal being briquetted is an anthracite, which is more friable than the Pennsylvania anthracite, consequently a larger percentage of dust or waste is produced. This was formerly thrown upon the slackpile as waste, but now passes to the "dust bin" in the breaker from which it is conveyed to the briquette plant. An average analysis of the coal is as follows:*

	Per cent.
[illegible]	[illegible]
Volatile	8.00
[illegible]	[illegible]
[illegible]	[illegible]
Total	100.00
[illegible]	[illegible]

Specific gravity, 1.40; ash, white; B.t.u., 14,000.

The plant is run under two shifts of 12 hr. each. There

*Paper of Lewis Stockett and B. R. Worden, read before the Canadian Mining Institute, Vol. IX.

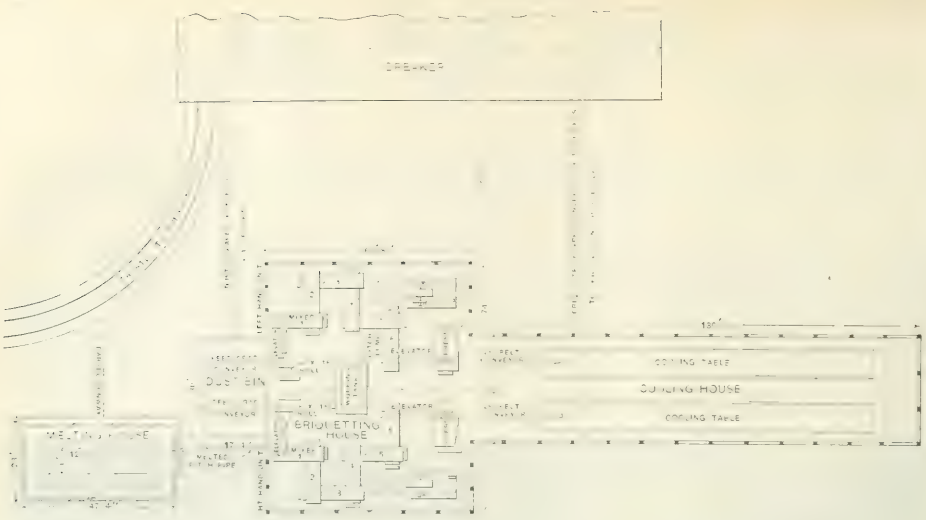


Fig. 2.—Plan of the Two-Unit Coal Briquetting Plant at Bankhead.

is for each shift one superintendent, one engineer, one briquetter, one helper and one laborer for cleaning up. In the pitch melting house are two men on one shift only. The steam for the engine is furnished from a central boiler plant, which also supplies steam for the breaker, the electric light and power plant, machine shop and boiler shop. During March, April, May and half of June, 1907, the plant was run on part time, due to the reduction of boiler capacity on account of heavy scale being formed on the boiler tubes and sheets, and to the miners' strike. About the middle of June an additional boiler was installed, and the water from a spring supplied by the melting snow was used. This enabled them to run the briquetting plant from Monday morning until Sunday morning continuously. Any loss of time at present will be from failure to obtain cars for loading the briquettes:

	Tons.
The run for June was	4,882
The run for July, 459 hr., was	4,593
The run for August, 499 hr., was	7,054
The run for September, 420 hr., was	5,432
The run for October, 570 hr., was	7,668
The run for November, 558 hr., was	8,147

During October, notwithstanding the loss of five days



Fig. 3.—General Arrangement of Plant of Bankhead Mines, Ltd.—A, Slack Dump; B, Breaker; C, Briquette Building; D, Dust Conveyor; E, Boiler House; F, Electric Plant.

(four days on account of not having cars to load and a day in installing a pitch tank for the second unit), the production, as shown above, amounted to 7668 tons in a total running time of 570 hr. Had it not been for this delay the production would probably have exceeded 8000 tons, as was done in November, with a total of 8147 tons and 558 hr. of run. The average run in October was 13.45 tons per hour. In November the average run was 14.6 tons per hour.

The latest information regarding the operations of the Bankhead plant was received about January 1. This was to the effect that a second press had been shipped from New York the early part of December, and that as soon as it was received and in place so that a sufficient output could be obtained, one division of the Canadian Pacific Railroad would burn nothing but briquettes on its locomotives. This would indicate that the experiments up to the first of the year had been quite satisfactory; otherwise, the railroad company would not have gone to the expense and trouble of drafting its locomotives to burn briquettes exclusively. When the additional unit is in operation it is expected that the plant will produce from 15,000 to 16,000 tons of briquettes per month. Domestic consumers seem to be well pleased, and there is a large demand for briquettes, which sell for $4 per ton at the plant.

The briquette plant consists of a pitch melting house and the main building, which includes dust bin, machinery house and cooling house. The pitch melting house is separated from the main building, and is about 23 x 47 ft., containing two melting tanks, 12 x 6 ft. by 8 ft. deep. The dust bin is 20 x 30 ft. by 24 ft. deep, and is located at the rear of the machinery house. The machinery house is 60 x 73 ft., and contains the briquetting machinery proper, a crusher, a mixer of six units, a pitch storage tank, 12 x 6 ft. by 8 ft. deep; a double cylinder engine, 14 x 20 in. stroke; two dust elevators, and the briquette press. The cooling house is 31 x 129 ft., and contains the cooling table and machinery for driving the briquette conveyor. Fig. 1 is an interior view of the machinery house, and shows the press at the left, back of which the engine is placed; the conveyor from No. 6 mixer to the press; the mixers in the center and back; the pitch storage tank at the right, and bins forming the end of the building. A plan view of the entire plant is given in Fig. 2. In Fig. 3 is a general photographic view of the Bankhead Mines buildings, including the briquette plant at the right of the breaker. The boiler plant is located on the right between the briquette plant and the electric light and power plant. The slackpile is shown on the low ground at the left of the breaker.

The dust from the operations of the breaker is conveyed to a dust bin at one end of the breaker from which it is taken by a scraper conveyor to the dust bin in the briquetting plant. It is removed from the bins and conveyed to the crusher by a drag chain. The dust passes through the crusher, and is elevated to a series of six mixers where it is heated by means of the hot gases from the mixer furnace, which enter the mixers through flues in their sides. The pitch is introduced by means of an atomizer while the dust is passing through the mixers. When the mixture reaches the end of No. 6 mixer it is conveyed by an elevator to the press. From the press the briquettes are carried by a belt conveyor to the distributer over the cooling table, then carried back and forth the length of the table seven and three-quarters times and dropped into the briquette conveyor. This carries them to the briquette bins in the breaker, from which they are loaded by means of chutes on flat cars and by means of a Victor box car loader into box cars. There is no handling of material except by machinery, which gives a continuous operation from the time the dust leaves the breaker until it is returned to the breaker in the form of briquettes.

The American Bureau of Inspection and Tests, Monadnock Block, Chicago, has issued a booklet for general distribution, giving the full text of the new specifications for standard Bessemer steel rails adopted November 1, 1907, by rail manufacturers in the United States and Canada.

January Exports and Imports of Iron and Steel.

The January report of the Bureau of Statistics of the Department of Commerce and Labor shows that the recession in exports of iron and steel, which had been in progress since November, continued. The total value of exports of iron and steel and manufactures thereof, not including ore, for the month of January was $13,643,828, against $14,967,869 in December, $17,051,755 in November and $18,951,198 in October, the last named month having attained the highest figures on record. In heavy lines the recession is similarly observed, as the January figures for exports of commodities for which quantities are given were 74,352 gross tons, against 85,999 tons in December, 116,308 tons in November and 123,216 tons in October. The following table gives details of the exports of such commodities for January and for the seven months of the current fiscal year ending with January, as compared with corresponding periods of the previous year:

Exports of Iron and Steel.

	January.		Seven months.	
	1908.	1907.	1908.	1907.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	2,546	8,086	34,619	51,456
Scrap	1,516	2,197	10,467	7,622
Bar iron	407	4,743	9,863	31,940
Wire rods	595	1	3,630	2,589
Steel bars	5,101	3,061	45,097	20,893
Billets, blooms, &c	5,317	12,325	34,525	75,408
Hoop, band, &c	934	962	7,015	4,327
Steel rails	16,285	26,341	212,176	174,648
Iron sheets and plates	3,307	2,075	25,936	13,673
Steel sheets and plates	4,581	7,705	37,487	56,761
Tin and terne plates	963	272	4,859	2,847
Structural iron and steel	11,017	9,314	84,472	69,459
Wire	12,022	10,794	97,342	96,133
Cut nails	449	443	3,558	4,494
Wire nails	2,678	2,808	23,391	21,284
All other nails, including tacks	559	452	4,030	3,762
Pipes and fittings	6,075	11,051	117,231	73,508
Totals	74,352	102,630	755,698	710,804

The imports of iron and steel continue comparatively inconsiderable, as the total value for January, not including ore, was $2,076,766, against $2,049,560 in December. The January total of imports of commodities for which quantities are given was 28,008 gross tons, compared with 20,255 tons in December and 35,255 tons in November. The slight gain in the January imports was due to somewhat larger importations of pig iron and tin plate. The following table shows the details of the imports of these commodities for January and for the seven months of the current fiscal year ending with January, as compared with corresponding periods of the previous year:

Imports of Iron and Steel.

	January.		Seven months.	
	1908.	1907.	1908.	1907.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	15,387	50,005	173,031	283,020
Scrap	678	2,776	16,124	12,019
Bar iron	4,086	3,987	24,623	23,397
Rails	149	134	2,181	3,024
Hoop, band, &c	41	990	278	
Billets, bars and steel in forms n.e.s	759	2,083	12,301	12,812
Sheets and plates	165	228	1,688	1,461
Tin and terne plates	5,005	3,147	31,907	35,905
Wire rods	1,165	1,303	9,197	10,766
Structural iron and steel				
Totals	28,008	65,112	272,563	394,001

The imports of iron ore in January were 57,659 gross tons, against 87,100 tons in January, 1907. Imports of ore from Cuba in January were 47,450 tons, against 52,300 tons in January, 1907.

Exports of steel rails, billets, beams, blooms, bars, plates, hoops, wire, &c., in February totaled 92,036 tons from the Eastern seaboard ports alone. This shows an increase of 175 per cent. over the shipments from these ports for January, notwithstanding the fewer working days last month. The February tonnage is 50 per cent. higher than the average monthly exports for last year.

Collapsible Core Barrels for Ingot Molds.

To the steel manufacturer the ingot mold is an important part of his equipment and a large item of expense. The method of manufacture is very similar in most ingot mold foundries, and the style of flasks, core barrels and general equipment is quite uniform. A saving of a dollar or even 50 cents a ton on the thousands of tons produced in a month by a large steel plant means a great aggregate at the end of the year, and any method of reducing the cost of ingot mold production is welcomed. Chief items of expense are the core barrels and the labor of extracting them after the mold is poured. The contraction of the casting as it cools off wedges the barrel very tightly and it requires powerful machines to remove it. Several pushers have been designed, and other devices are used to force or hammer out the barrel, all of which are expensive to make, keep in repair and operate, and the use of such powerful extractors is destructive to the barrel, while its life is further shortened by warping. Breaking and warping thus mean a constant supply of new barrels in a large mold foundry.

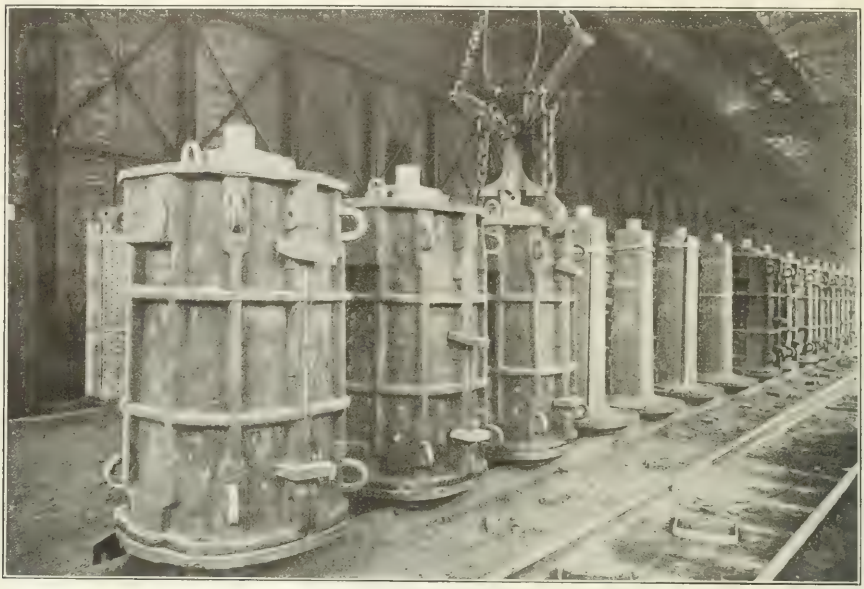


Fig. 1.—View in Lackawanna Steel Company's Ingot Mold Foundry Showing Flasks After Pouring, Also Core Barrels After Extraction.

At the plant of the Lackawanna Steel Company, Buffalo, N. Y., the expensive barrel and pusher have been replaced by a recently patented collapsible core barrel and an extractor, which have been in operation for two years and have proved very successful as cost savers. This barrel is no more expensive to make than the rigid barrel and its life is practically unlimited. The method of extraction is very simple. The lifting of the flask containing the casting from off the bottom or drag forces the barrel out. It is stated that 25 barrels have been extracted in 15 min., which was as fast as the crane could hoist the flasks. The method of extraction is shown in Figs. 1 and 2.

A large item of expense saved is flour, which is extensively used as a wash on the rigid barrels and burns off after the mold is poured. To some extent this releases the barrel, thus reducing the pressure required to force it out. Without flour there is more destruction of a rigid barrel. On the collapsible device a simple clay wash to hold the sand is all that is used.

In another respect this core barrel has an advantage. A steel mill superintendent, who has had trouble getting his ingots stripped, has noticed that the molds have not expanded to the extent they should. The explanation seems to be that after a mold is poured and begins to cool off and shrink it meets resistance from the rigid barrel, with its small coating of sand, and the barrel itself becoming heated from the hot casting expands and counteracts the effort of the mold to contract, the result being a strained mold. By the quick collapsing and extraction of the patent barrel the casting has an opportunity to shrink to the full limit, and when in

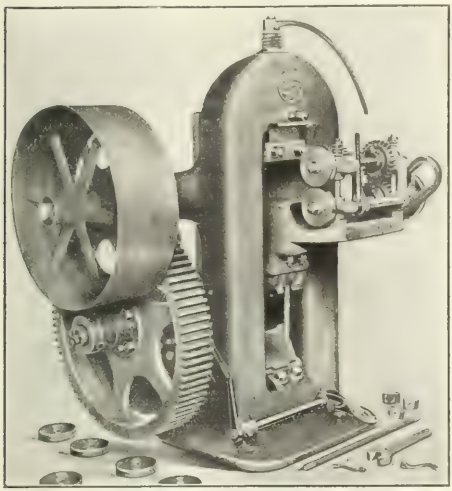


Fig. 2.—The Method of Extraction.—Construction of Collapsible Core Barrel Shown at the Left.

service will expand in greater proportion, allowing the ingot more liberty. In other words, if the mold with the collapsed barrel would have an opportunity to shrink ¼ in. it would expand the same amount when heated by an ingot; on the other hand, with the rigid barrel about 1-16 in. is the limit of contraction, leaving the mold practically at the size it will have when containing a hot ingot. It is also proved that by the better venting of this barrel for the escape of gases a smoother mold free from scabs is produced. Use has been made of the collapsible barrel with good results also on castings similar to ingot molds.

A Ferracute Cable-Mashing Press.

The strands of an ordinary rope are approximately of circular section, and on being twisted together the circles come in contact, forming spiral longitudinal tangential lines. The space between the circles is wasted.



An Embossing Type of Press Built by the Ferracute Machine Company, Bridgeton, N. J., and Adapted to Mashing Wire Cable to Approximately True Circular Section.

the finished cable being of larger diameter than if the strands or small cables which make the large one were of polygonal section, in which case the faces of the polygons would coincide. Round strands make a rope more flexible, as the spiral cylinders roll on each other, but when stiffness and strength for a given diameter are desired the strands should have flat faces, a condition that cannot be produced in the spinning operation.

The Ferracute Machine Company, Bridgeton, N. J., has built several presses of special design for an English manufacturer of wire cables, the function of the press being to mash the round strands of wire into sections that are sectors of a circle, or, to use a more familiar and homely expression, the shape of a piece of pie. This shape was chosen because it allowed of considerable latitude, as a cable could be made up of any reasonable number of similar sectors.

To crush or mash down even a small steel cable requires considerable power. The press selected for the work was therefore of the coining or embossing type, as shown in the illustration. The frame is a massive iron casting containing steel toggles capable of giving a ram pressure of 150 tons. The press is geared, the pinion being part of the steel forged back shaft, and all teeth cut from the solid. The clutch is of an effective and durable type, the adjustment being such that a pressure on the treadle causes the press to make one stroke and then stop, unless the treadle is locked down, in which case continuous strokes would be made.

The automatic roller feed attachment is an important feature. It consists of a pair of grooved rolls fitted to the cable to be mashed, the driving mechanism being so timed that several inches of round cable are fed between the dies when they are apart, the rolls being inactive during the mashing process, the dies constantly opening and closing between the times of feeding and mashing the cable to the particular shape desired. An indefinite number of sizes and shapes can be produced in the press by merely providing dies and rolls to correspond. Several sets of these tools were sent with the presses to England.

The dimensions of the machine are as follows: Distance between columns, 10 in.; stroke, ¾ in.; adjustment of head, ½ in.; speed of main shaft, 50 rev. per min.; total weight, 5500 lb.

The Railway Steel Spring Company's Report.

President W. H. Silverthorn has submitted a statement to the stockholders of the Railway Steel Spring Company, showing the company's financial condition at the close of business December 31, 1907, which compares as follows with a similar statement for the previous year:

	1907.	1906.
Net earnings	$2,320,136.76	$2,341,120.19
Less interest on Latrobe plant bonds	216,632.78	215,587.48
Balance	$2,103,503.98	$2,125,532.71
Less dividends	1,484,974.25	1,484,967.00
Balance	$618,529.73	$640,565.71
Account Latrobe plant purchase	.....	450,000.00
		$190,565.71
Previous surplus	2,236,464.87	2,045,899.16
Surplus December 31	$2,854,994.60	$2,236,464.87
Assets.		
Plants	$30,290,638.11	$29,627,026.25
Merchandise on hand	2,341,340.43	2,203,043.43
Stocks, bonds and investments	185,408.85	202,158.85
Accounts receivable	2,348,821.30	1,873,451.29
Other items	84,131.85	38,998.67
Cash	264,058.42	312,637.42
Totals	$35,514,398.96	$34,257,315.91
Liabilities.		
Capital Stock—Preferred shares	$13,500,000.00	$13,500,000.00
Capital stock—Common shares	13,500,000.00	13,500,000.00
Latrobe plant bonds	4,223,000.00	4,362,000.00
Accounts payable	1,238,915.47	330,434.38
Bills payable	50,000.00	200,000.00
Reserved for preferred stock dividend, taxes, &c.	147,488.89	128,416.66
Surplus	2,854,994.60	2,236,464.87
Totals	$35,514,398.96	$34,257,315.91

Large Contracts for McClure Hot Blast Stoves.—G. W. McClure, Son & Co., Bessemer Building, Pittsburgh, have recently received a contract from the Tennessee Coal, Iron & Railroad Company, Birmingham, Ala., for seven McClure three-pass hot blast stoves, 21 ft. in diameter by 100 ft. high, on which work will be commenced at once. They have also secured a contract for remodeling and relining Belmont Furnace of the Wheeling Steel & Iron Company, Wheeling, W. Va.; also for relining the Martin's Ferry, Ohio, furnace of the same company. They have just completed a 19 x 85 ft. McClure stove for the Genesee Furnace Company, Charlotte, N. Y. also a 22 x 100 ft. stove at Edith Furnace of the American Steel & Wire Company, Allegheny, Pa., and are now turning out the ironwork for another stove at the same place. A 21 x 85 ft. stove has recently been completed for the United Iron & Steel Company, Leetonia, Ohio, and also the ironwork for another 21 x 70 ft. stove for the company's furnace at West Middlesex, Pa.

The Stiles Foundry & Supply Company, Parkersburg, W. Va., manufacturer of gray iron, brass and aluminum castings, emery grinders, shaft hangers, transmission accessories, &c., has installed additional equipment and will shortly place on the market a new engine lathe, complete with taper attachment, &c., in sizes from 14 to 16 in. swing.

New Forms of Steel for New Uses.*

The Development of the Field for Steel Sheet Piling—A Great Diversity in Design.

BY R. B. WOODWORTH.

The production of steel plates is in a measure an index to the development of certain classes of construction distinctive of the closing years of the nineteenth century and the inception of the twentieth. Steel as a material for shipbuilding construction was first introduced under modern methods of manufacture in the period from 1870 to 1875, but the first all-steel merchant vessel seems to have been the Cunard liner Servia, built in 1881, and the first all-steel battleship seems to have been the Benbow, constructed by the British Government in 1885. In 1900, however, 93.21 per cent. of all the vessels of 100 tons register and over, whether on lake or ocean service, were constructed of steel, and the steady

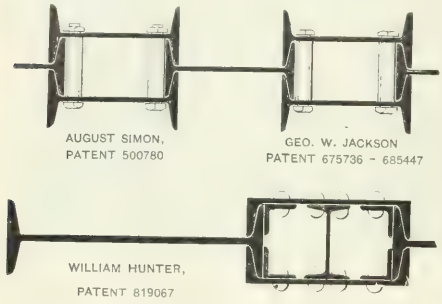


Fig. 1.—Fabricated Beam Types of Sheet Piling.

growth of plate production marks the gradual development of the shipbuilding industry. This development continued to be gradual until about 1896, about which time the first steel railroad car was built by the Keystone Bridge Works. Since that date the increase in plate production reflects the rapid development in the manufacture of steel cars. About 1898 the Schultz Bridge Company at McKees Rocks, Pa., built the first steel barge for river transportation, and the increased use of steel barges on our own rivers has added its quota to the increased production of steel plates.

Steel for Bridges and Buildings.

The production of steel shapes, meaning by that beams, beam girders, zees, tees, channels, angles, &c., is an index to the development of the steel bridge and especially of the steel building. In 1884 the first 15-in. steel beams were rolled at Upper Union Mills, Pittsburgh. They were followed by the rolling of 20-in. beams on the 33-in. mill, Homestead Steel Works, January 3, 1888; 24-in. beams on the 33-in. mill, Homestead Steel Works, June 19, 1889, and 18-in. beams on the 35-in. mill, Homestead Steel Works, February 3, 1897. The rolling of these sizes of beams has made possible and economical the skeleton steel building, and the production of shapes has grown in accordance with the growth of the modern office building in the principal cities of the United States. From 360,305 gross tons in 1894, the production of steel shapes advanced to 2,118,772 tons in 1906.

When steel was not the convenient material it is, other forms of construction may have taken its place, but, as matters stand to-day, steel is the only material known to the engineering profession which is absolutely homogeneous in all particulars, of unquestioned strength and reliability, easy to fabricate and erect, convenient and satisfactory in all respects. Besides its unquestioned economy, there are two considerations which have led to the large use of steel as the ideal building construction. The first of these is its fireproof character. This is not the principal reason, but beyond question it is a very important one. Our annual fire bill has been steadily growing as our population increased. In 1905, for example, building operations throughout the country represented a total investment of $525,000,000, and in 1906 the high water mark in the nation's history, $700,000,000. In 1904 our fire losses alone aggregated $229,198,050. In 1906 the losses in the United States and Canada by fire were $536,860,400. Of this last sum San Francisco was responsible for $350,000,000, including buildings and contents. While the number of fireproof buildings is still really small, even in our largest cities, yet beyond question the requirements of fireproof construction have been and will continue to be large factors in the extension of the use of steel. The evolution in building which has not yet reached its culmination, dates back to the first introduction of rolled I-beams of iron in France and Belgium in 1854, but the famous Chicago fire showed the unreliability of unprotected iron beams in a hot fire. Unprotected steel is a better fire resisting material than unprotected iron, but the ideal modern building is a skeleton structure of steel fully protected by refractory materials, which, by reason of being once burnt, are in a

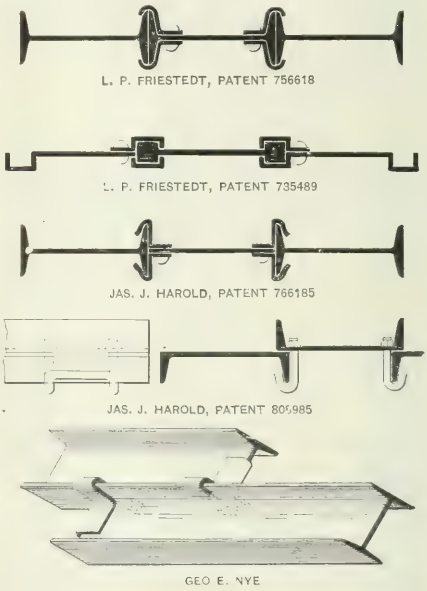


Fig. 2.—Beam Clip Types.

position to resist successfully, as they have done in numerous instances, the hottest temperature an office or warehouse building can develop.

Prices of Steel and Wood Approximating.

The chief factor, however, which has occasioned great extension in the use of steel bridges and buildings has been the rapid increase in the cost of timber, as well as the great decrease in the quality of the timber which actually comes on the market, and in this connection the annexed table showing the course of wholesale prices, from statistics furnished by the Bureau of Commerce and Labor, demonstrates very plainly that the price for lumber per 1000 ft. is gradually approaching the price of steel per ton, and that if conditions now in force con-

* From a paper read before the Structural Section of the Engineers' Society of Western Pennsylvania, January, 1908. Mr. Woodworth is of the engineering staff of the Carnegie Steel Company.

tinue, the difference between steel and wood will be quickly diminished. Five-year intervals are shown in the table for the period of 1890-1900:

Wholesale Prices of Lumber and Steel.

	Hemlock.	White oak.	White pine.	Yellow pine.	Spruce.	Steel.
1890.....	$12.58	$37.88	$16.79	$20.75	$16.29	$60.00
1895.....	11.15	36.25	17.25	16.92	14.25	28.00
1900.....	16.50	40.83	21.50	20.71	17.38	38.20
1901.....	15.00	36.77	20.88	19.67	18.00	31.55
1902.....	15.83	40.88	23.50	21.00	19.25	32.00
1903.....	16.79	44.83	24.00	21.00	19.19	32.00
1904.....	17.00	46.50	23.00	21.42	20.50	30.60
1905.....	17.88	47.33	24.17	24.92	21.42	32.60
1906.....	21.90	50.42	29.75	29.33	25.54	34.00

The price of steel beams and channels is f.o.b. cars, Pittsburgh, per ton of 2000 lb. Prices for lumber are per 1000 ft. board measure. Prices for hemlock are based on 2 x 4 pieces 12 to 14 ft. long, Pennsylvania stock, f.o.b. New York. Prices of white oak are for 1 x 6 boards, same place. Prices of white pine are for No. 2 barn grade, 1 x 10 rough, f.o.b. cars, Buffalo. Yellow pine prices are for 1 in. long leaf boards, f.o.b. cars, New York, and spruce 6 ft. to 9 ft. cargoes, New York City. It is to be noted that since 1897, a year of great

buildings must necessarily be restricted. There is no restriction to the use of steel.

It would be very interesting to touch upon quite a number of the uses of steel, which distinctly mark the beginning of the twentieth century. Iron has given place to soft steel in the manufacture of all kinds of agricultural shapes and machinery. Special forms of steel are used in the manufacture of turbine plates for the construction of the turbine, so prominent in transmission line construction. Steel wheels, whether cast or forged or steel tired, are rapidly taking the place of the ordinary iron castings, and we hear no more of the [illegible] paper wheel, which, it will be recalled, was seriously advocated some years ago. Our heaviest and best trains, composed of steel cars and coaches, are carried safely over roadbeds constructed of steel ties. The steel tie has not yet supplanted wood, but beyond question will form the ideal roadbed of the future.

Fabricated Beam Piling.

The production of structural shapes in this country, as has been stated, reflects accurately the expansion of steel construction in buildings and bridges, or the increasing use of steel in that class of construction which deals with the superstructure. It is confidently believed that the application of steel for use in the construction of foundations, cofferdams, &c., will play a large part in the shape

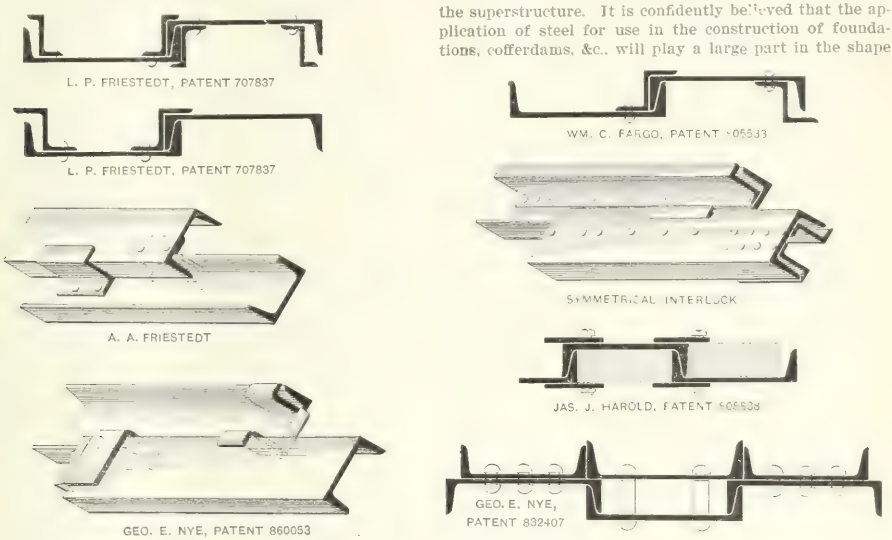


Fig. 3.—Interlocking Channel Bar Types.

industrial depression, the price of timber of the grades used in building has practically doubled, and while the price of steel has been subject to great fluctuations and stands to-day, due to improvements in manufacture, at relatively low figures, the price of lumber has steadily increased.

Among other things the table shows very plainly that the prices of timber per thousand feet and the price of steel per net ton have approached very closely to each other; that the question of comparative cost is not to-day the feature it was 10 years ago, and that the lower first cost of wood is not very much of an item when compared with the much longer life of steel, its much more satisfactory character and its convenience in manufacture and erection. Beyond doubt the development of the immediate future lies in the rapidly increasing substitution of steel for wood in all classes of ordinary building construction. Of course, in the modern building, some place will be taken by reinforced concrete, which offers numerous advantages for those places in construction for which it is peculiarly suitable. It cannot, however, take the place of steel, and the building laws of our best cities have begun to reflect the prevailing opinion of the engineering profession to the effect that reinforced concrete must be used under conditions of the most careful manufacture and inspection, and that even when so used, its use on high

and plate production of the future. We have to speak, therefore, of modern methods of substructure construction, which offers large place for the substitution of steel for wood.

Round piles of cast iron seem to have been in use as early as 1822, but the invention and application of forms of steel sheet piling has fallen chiefly within the twentieth century. These forms have varied, as the inventors were numerous, and it is difficult to classify satisfactorily all the types of steel sheet piling presented in the documents which have passed through the Patent Office. There are, however, certain outstanding types which will be mentioned. First, is the fabricated beam type. It consists in the main of two standard beams or channels connected together by bolts and separators to form what might be called a box pile. The boxes are connected together in a straight line by standards, beams or channels, the flanges of the single beams forming this connection interlocking with the flanges of the beams or channels forming the box. This type of construction shown in Fig. 1 was first covered by Patent 500,780, granted July 4, 1893, to August Simon of Gnadau, Germany, and the basal ideas of Simon reappeared in the improvements made in Patents 675,736 of June 4, 1901, and 685,447, granted October 29, 1901, to Geo. W. Jackson. It is to be noted that the first steel sheet piling used in the United

States and driven in November, 1901, at Randolph Street Bridge, Chicago, Ill., was of this type, which affords large possibilities in heavy submarine construction, but at the same time is deficient in its ability to furnish light weight sections for ordinary cofferdam and sewer construction. The driving of the Jackson piling demonstrated the necessity of some provision to make the piling water tight, and Jackson and Hogan Patent 758,656 of May 3, 1904, covers this feature of the fabricated beam type steel sheet piling. The further development of this type is to be found in the ideas of Wm. Hunter of Kincardine, Ont., as recorded in Patent 819,067, which consists essentially of a series of steel columns built up of beams and channels and connected together by heavy weight I-beams, which would make a construction extremely difficult to drive and about four or five times as heavy as there is any need for, but which after it has reached its final position in the construction, would have the strength of Gibraltar.

The Beam Clip Type.

The excessive weight of the fabricated type of beam piling led inventors to consider the use of beams aligned successively with the top flange of the one against the bottom flange of the other, which I will call the beam clip type. This is represented in Patent 756,618, Fig. 2, granted to L. P. Friestedt of Chicago on April 5, 1904, in which regular structural beams are used to form an interlocked wall. The weight of this section, however, caused Mr. Friestedt to turn his attention to a lighter form of construction based on the same idea. This is covered by Patent 735,489, Fig. 2, dated August 4, 1903, in which the place of beams has been taken by sections either round or square headed and similar to the bullhead rails in use on the railroads of England. Mr. Friestedt's original ideas have stimulated others to action, and James J. Harold of Jersey City, N. J., has taken out Patents 766,185 of August 2, 1904; 807,378 of December 12, 1905, and 820,970 of May 22, 1906, in all of which the same idea occurs of connecting together standard beams assembled edgewise by clips which may be riveted either to beams themselves, or to a plate (Fig. 2). The latest development in the idea of connecting standard beams by clips, either full length or of short pieces, appears in the latest patents taken out by Geo. E. Nye of Chicago, Ill.

Interlocking Channel Bar Piling.

The beam clip type of piling, however, in spite of its simplicity and strength, due to its large radius of gyration, suffers from the same criticism already made on the use of beams in piling construction—namely, that due to the weight being beyond absolutely necessary requirements. This consideration has called forth interlocking channel bar piling, which is due to the inventive genius of L. P. Friestedt of Chicago, and the success of which in a large measure has made steel sheet piling one of the indispensable factors of substructure construction. Mr. Friestedt's basal patent is No. 707,837 (Fig. 3), granted August 26, 1902, and is so broad that it covers any combination of channel beams joined edgewise, and having back and face sides thereto positioned alternately with reference to each other and presenting a wall structure of single thickness at all points, and also the combination of zee bars, as applied to such channels to form an interlock. The first of the Friestedt interlocking channel bar piling was driven in October, 1902, in the mine shaft of the Johnson City & Big Muddy Coal & Mining Company, at Johnson City, Ill., and its increasing use has demonstrated the correctness of the ideas on which it was based.

In the endeavor to get away from the weight due to the use of zees extending the full length of the channels and forming a continuous interlock, the idea has arisen that it might be possible to use short pieces. This has given rise to the clip interlock, which appears in the first instance in patents 734,843 of July 28, 1903, and 739,072 of September 15, 1903, granted to L. P. Friestedt, and covering frictional pieces to wedge the steel piling members closely together, and at the same time to do away with the excess weight. This idea had hardly passed into history before it was followed by patent 808,985 (Fig. 2), granted to Jas. J. Harold of Jersey City on January 2, 1906, in which a clip interlock is formed by double U-bolt connecting adjoining channels or beams together. A. A. Friestedt has patented a clip successor to the full length interlock, his idea being to use short length zees simply to guide the channels in driving, and to depend upon the frictional resistance of the channels themselves and earth or water pressure to form a continuous interlock. His ideas have been reflected in patent 860,053 of July 16, 1907 (Fig. 3), and 871,177 of November 19, 1907, granted to Geo. E. Nye of Chicago, in which the clips are formed not of rolled zee bars, but of steel castings approximating the zee bar shape. Experimental tests with the clip form of steel

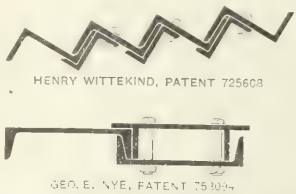


Fig. 4. Zee Bar and Double Tee Interlocking.

piling have shown that, while it may be admirably suited to light, easy driving in shallow soils, it cannot be depended upon for heavy work through quicksands, boulders or other closely compacted material. As the channels are fastened together only at the top and bottom, the driving of the piling to a refusal will tend to cause the channels to buckle about their middle and open out, thus destroying any effective interlock, and resulting in submarine work in excessive leakage, which cannot be stopped except by expensive means and undue delay in operation. There is an advantage in the clip interlock in having zees on each piece to hold material in exact alignment.

Wm. G. Fargo of Jackson, Mich., had occasion to use in the construction of the dam for the Grand Rapids-Muskegon Power Company quite a quantity of Friestedt interlocking channel bar piling under difficult conditions of driving. He had fabricated by the Friestedt Company a quantity of piling which differed from that covered by the basal patent in having a single zee bar riveted to each piece instead of two zees riveted to alternate sections. By this means he succeeded in making each piece of the same strength and found that the most difficult driving could be satisfactorily accomplished. His ideas have been covered by patent 805,533 (Fig. 3), dated November 28, 1905.

The success of Friestedt interlocking channel bar piling has incited James J. Harold to work up a wooden composite type of piling based on the use of standard channels in which the zee bars are omitted and the channels held together by short bars, overlapping the interlocking flanges and bolted to wooden timbers, making a solid steel and wood wall. This form of composite piling is covered by Patents 808,838 (Fig. 3) of January 2, 1906, and 820,304 of March 8, 1906.

Geo. E. Nye, in Patents 832,407 of October 2, 1906, 850,043 and 850,044 of April 9, 1907, has developed what might be called interlocking double channel bar piling.

Other Interlocking Forms.

The success of the interlocking channel bar piling called forth interlocking zee bar piling, represented in Patent 725,608 (Fig. 4), granted to Henry Wittekind of Chicago on April 14, 1903. The Wittekind piling does not seem to have received any particular attention from the engineering profession and is rather too complicated for ordinary uses.

Geo. E. Nye has patented what might be called the double tee interlock form of steel piling, which is represented in Patents 753,094 of February 23, 1904 (Fig. 4); 778,601 of December 27, 1904, and 816,994 of April 3, 1906, all of which are owned by L. P. Friestedt and which require the manufacture of special rolled shapes before any fabrication can be done.

Structural mills also roll plates which can be fabri-

cated into various forms, and we have the next form of steel piling, which may be called the interlocking trough plate type, and consists essentially of the use of trough plates or similar forms in steel piling construction. Any form of this type of piling would give a large radius of gyration and a corresponding high strength. They are, however, difficult to fabricate and are based on a high priced class of material to begin with. The first patent based on the use of trough plates (Fig. 5) was granted to Frank N. Kneas of Chicago, No. 744,361 of November 17, 1903. This was followed by Patent 751,469, February 9, 1904, granted to Walter L. Cowles and Jas. N. Hatch of Chicago, Ill. The ideas of these inventions have been extended and improved upon in Patent 801,946 of October 17, 1905, granted to Julius R. Wemlinger of New York. No form of interlocking trough plate piling has yet been fabricated or driven, and the Wemlinger piling in its latest form calls for very expensive rolling processes to produce the necessary plain sections.

The use of plates for sheet piling has been a fertile idea in the minds of inventors. Geo. W. Jackson's patent, 697,943 of April 15, 1902 (Fig. 5), covers what might be called the box interlock, in which the ends of the plate are bent around into a box form to make an interlock. Patent 824,513 of June 26, 1906 (Fig. 5), granted to R. H. Stevens, Homestead Steel Works, represents what may be called the scroll interlock, in which the complete pile has an end section like the scroll of the engraver, with the exception that one end is of smaller radius of curvature than the other. Lester R. Gifford and R. V. Sage of Westmont, Pa., took out Patents 766,131, 766,132 and 766,147, all dated November 29, 1904, on corrugated interlock, in which the sheets themselves are corrugated as in roofing and the interlock is formed by a special rolled shape fitting closely over the apex of adjoining sheets.

Spring Lock Steel Piling.

Steel plate piling, however, finds probably its best representation in the spring lock steel piling, on which Patents 842,120 of June 22, 1907, 843,307 of February 5, 1907, and 863,886 (Fig. 6) of August 20, 1907, were granted to Frank W. Skinner, of New York. The essential idea is to provide adjoining plates with their ends

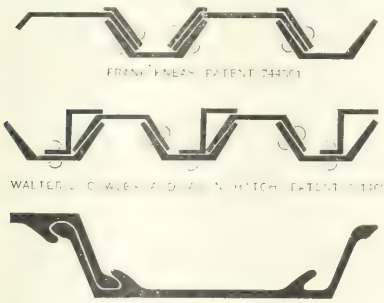


Fig. 5.—Trough Plate Interlocking.

curved to slightly different radii which in driving compels the sheets to lock closely to each other. The same idea is represented in Patent 838,152 (Fig. 6) of December 11, 1906, granted to John R. Williams, of East Orange, N. J. So far as information goes, no form of plate piling has yet been driven in the United States. The great difficulty with it is that there is required in connection with the piling itself some form of mechanical device in the way of a follower to go down with the sheets, and to hold them in position until bracing can be done, and it is very apparent that the use of these followers, as is necessary with each sheet, calls for not only increased expenditure, but delay in the driving itself. A very interesting form of plate piling is known as the camber plate piling (Fig. 6), which has had considerable use in Germany. It was invented by F. Lang, of Hamburg, and it has been employed at Hanover for the extensive cofferdam foundation of the Provincial Revenue Offices, and consists of bending vertical edges in specially constructed machines to form a labyrinth U-joint. The plates themselves are bent to a radius of 27 in., which gives a camber of 2¾ in. in each sheet. This form seems too cumbersome to meet that simplicity and economy which is required by the engineering and contracting ideals of America.

The First Rolled Section.

This exhausts the consideration of the fabricated forms of steel piling. It is apparent to everyone that the ideal steel piling should be complete in itself; that it should be simple; that it should interlock perfectly, and that each adjoining piece should have the same theoretical strength. Consequently the ideal form of steel piling should be a rolled section and patents have been granted along this line of various value. The first United States patent covering a rolled section was 103,028 (Fig. 7), dated May 17, 1870, and granted to Lewis Dodge, of Chicago, for improvements in the construction of tunnels and dams. This patent shows two forms, the ball and socket form, with head of one piece fitting into the socket of the other, and the rectangular form in which the connections were made by dovetailing. It is also interesting to note that Mr. Dodge contemplated the use of his section for tunnel lining rather than for sheet piling purposes, an indication of what has often happened in the use of new material which has advantages, that those who built, built better than they knew, and that really valuable ideas are developed and extended and improved upon and used for different purposes by the generations that succeed their originators.

Novel Ideas in Roll Turning.

Practically 65 per cent. of the piling sold to-day is covered by Patent 639,884 (Fig. 7), granted to Samuel K. Behrend, of Washington, on December 26, 1899, and is known commercially as United States Steel sheet piling. This piling incorporated the idea advanced by Lewis Dodge, but improved upon it by making the section more ideal and by the introduction of packing strips to provide for that water tightness which is necessary in submarine construction. The manufacture of this form of steel piling has also brought forth novel ideas in roll turning. Walter C. Harder was granted on October 4, 1904, Patent 771,426 (Fig. 7), in which the essential idea was to form an interlocking member by turning over a beam flange so as to form an interlocking curve. Immediately on the issuance of this patent, its infringement with the Behrend patent was noted. The matter was taken into court and in the court room it was testified that steel piling covered by the Behrend patent could not be rolled by any method known to the art. In spite of this, the Behrend piling was rolled successfully on December 23, 1904, and it was rolled by the special method of rolling invented by Edwin E. Slick, and covered by Patent 852,984, granted May 7, 1907. It is this Slick method of rolling which has made possible the development and success of the United States Steel sheet piling.

Vanderkloot Piling.

This success has called forth competition, and Mathias R. Vanderkloot of Chicago, has taken out patents 763,526 of June 28, 1904, and 786,329 (Fig. 7) of April 4, 1905, covering a form of rolled section in which an interlock is formed by bending over into hooks the flanges of what starts through the mill as an unsymmetrical beam section. The form of the Vanderkloot piling as actually rolled represents quite a departure from that shown in his patent, which is only an illustration of the fact that successful invention must go hand in hand with practical rolling mill experience.

Patent 778,354 of December 27, 1904, granted to Rudolph Dobry (Fig. 7), represents a form of piling in which the interlock is made by unique dovetailing. It is needless to say that this form of piling is out of the question from a rolling mill standpoint. The same criticism applies to George E. Nye's Patent 782,872, February 21, 1905, also the very ingenious but far fetched idea represented in Patent 826,801, July 24, 1906, granted to C. H. Quimby, Jr., of Pittsburgh; also to another unique dovetailed form of steel piling covered by Patent 829,596,

granted to J. J. Nolty of Canal Dover, Ohio, August 28, 1906, all shown in Fig. 7. The Vanderkloot ideas have been followed by Truman Hill of Chicago, in Patent 829,399 of August 28, 1906, in which the interlock is similar to the construction of the modern coupler attachment of standard freight cars.

We are not dealing here especially with composite wooden piling, but reference should be made in this connection to Patent 863,837 (Fig. 7) of August 20, 1907, granted to Francis R. Dravo of Sewickley, Pa., which represents the ideas of a substructure contractor who has had large experience in driving steel piling himself. It is based on the use of two special rolled steel shapes and wooden fillers in which interlocking means are provided and ample attention paid to the requirements of watertightness.

Uses of Steel Piling.

Steel sheet piling in general can be used for any purpose for which wooden sheet piling can be used, and its first and most common use is in the construction of cofferdams for building bridges. It is for this purpose that

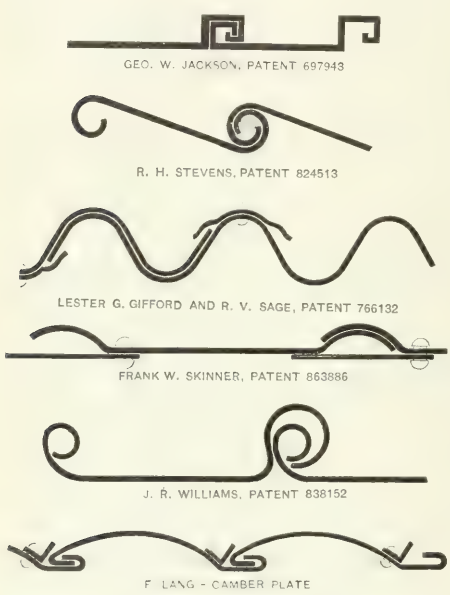


Fig. 6.—Box, Scroll, Corrugated, Spring and Camber Plate Interlocking.

the largest sales of steel sheet piling have been made. Its repeated use in such work has called forth entire satisfaction from its users, its large advantage and great economy consisting in the ease with which it can be driven and the ability to withdraw and reuse over and over again without serious injury. The cofferdam for the new bridge now being built by the Chicago & Northwestern Railroad across the Mississippi River at Clinton, Iowa, for example, has required about 1166 tons of 40-lb. United States steel sheet piling. There are nine cofferdams to be constructed and steel piling will be used three times. The piling is being driven with a 3200-lb. drop hammer falling approximately 15 ft. Packing strips were not used. There were leaks present in the piling, but not of sufficient size to interrupt the work. In order to rush the work on this job, the railroad used a double wall of steel piling with puddle. They admit, however, that with a single wall of piling, using the wooden strips, they would have had practically a watertight dam. Six to 30 piles were driven each working day, at a cost of 18 cents per lineal foot of structure.

The National Tube Company, in carrying out improvements at its Pennsylvania Department, this city, constructed in 1907 a concrete river wall 1660 ft. long. One end of this wall is entirely in the Monongahela River and the wall runs along the river bank in a direction inclined thereto, so that the other end is in dry ground, the space between the wall and the bank being eventually filled in. This wall was constructed in four installations of three cofferdams each, the piling being driven with a 3600-lb. drop hammer, pulled and used over again, sufficient piling being purchased for one installation only. Thirty-five pound United States Steel sheet piling was used without caulking beyond the silt and mud found in the river bottom. There were no leaks present of a size sufficient to interrupt the work, which was entirely satisfactory in every respect.

The Marsh Bridge Company has recently built a cofferdam for a bridge pier at Peoria, Ill., using 130 tons of Friestedt 15-in. 38-lb. This material was bought second-hand from the Cullen-Friestedt Company, who had used it for two cofferdams previously. The Marsh Bridge Company have driven it fully three times, making five times in all that the same set of steel piling has been used. Bayne & Hewitt, contractors, Minneapolis, Minn., used a 15-in. 38-lb. Friestedt piling in cofferdams for Government bridge at Rock Island. They installed the same lot of piling four times, driving it down through 17 ft. of sand, gravel and hardpan. No method of caulking was used, and yet the leakage interfered at no time with the progress of the work, and the cost of driving amounted to only 14½ cents per lineal foot of substructure.

Steel piling in use has met, of course, with all sorts of obstructions. It has successfully penetrated in one case three 16-in. square timbers without any difficulty; but the most difficult driving of which we have record was that encountered by the Hoover & Kinnear Company, at Wheeling, W. Va., in constructing a cofferdam for the Baltimore & Ohio Railroad bridge. Here the material encountered all kinds of difficulties. It was even attempted to drive the stuff through a locomotive axle which happened to be in the débris on the river bank, and while the piling was seriously bent and twisted, and redrawing was extremely difficult, it was finally accomplished, and the second installation proceeded with. In this connection the experience of the Norfolk & Western Railway is instructive. In changing the alignment of their bridge over Paint Creek, near Chillicothe, it was necessary to rebuild the structure which had stood for about 20 years, and absolute comparison between wood and steel became possible, the piers built with wooden cofferdams on the old bridge being only about 250 ft. from the new ones.

Relative Cost of Steel and Wood.

Twenty years ago the contract cost per structure of several certain wood cofferdams was $452.50. At present, the same wood structure would cost $638.22. United States Steel piling was used five times for five cofferdams within 300 ft. of those of 20 years ago, and came out of the work practically as good as new. Making no allowance for salvage or scrap value, the cost per structure was $505.09, with piling on hand as good as new. Charge depreciation, on account of a final or scrap value, of from 30 to 35 per cent., and in view of the good condition of piling after using five times, it is hardly reasonable to charge off 10 per cent. of the total cost of piling against each of five cofferdams, 41 per cent. in all. But even on that basis, the cost per structure would be $289.95, and the piling would be on hand as good as new, possessing a salvage value of 59 per cent., equal to $1075.68, or a scrap value of, say, 30 per cent., equal to $546.50. Credit a scrap value, $546.50, pro rata to five cofferdams charged at $505.09 each, and the net cost per structure would be $395.79; or credit a salvage value $1076.68 pro rata to five cofferdams charged at $505.09 each, and the net cost per structure would be $289.95. The saving on steel piling on any calculation is apparent.

Retaining Walls, Sewer and Trench Work.

Steel sheet piling has also been used extensively in the construction of retaining walls, sewer and trench work and foundations of all kinds. It has been used by the United States Reclamation Service in the driving of curtain walls to resist underground percolation of water

and has in this way effected a great saving in the reduction of excavations otherwise necessary and in the time consumed in the construction. Along the same lines is its use by the Engineering Department of the United States Government in the protection of the wooden dams in the Allegheny River. During the freshets of the early part of 1907 the wooden dams became undermined and it was also necessary to use dynamite to dislodge the ice gorges which had accumulated beyond them. Also the banks at Springdale, with the buildings thereon erected, were eroded and swept away by the force of the current. In reconstruction of these dams, and in order to economize where possible, the United States Government decided to drive 40-ft. United States steel piling along the entire upstream face of the dams and along the wing walls. This will most effectively prevent any underscouring action of the water and will make the structure practically perfect.

In line with this use in streams to prevent underscour is its use in the construction of dams for hydro-electric projects. The dam at Grand Rapids-Muskegon Power Company, Grand Rapids, Mich., is an illustration of what can be done in this direction, and the same company which years ago constructed that dam built this year a dam for the Berrien Springs Power Company, at Berrien Springs, Mich. Under previous methods of operation in building a dam across a valley, it would have been necessary to excavate far below the surface of the ground and to construct a masonry or concrete wall as a core to prevent seepage of water below the dam itself. All the expense and delay incurred by this practice has been avoided by the use of steel sheet piling, which is driven down to the surface of the ground and the masonry dam built above it.

Along this same line also is the intended use by the United States Government of steel sheet piling in the construction of a sea wall at Fort St. Philip. Here steel piling will be driven and the tops capped with concrete to form the outline of the wall itself. About 1450 tons will be used in this construction.

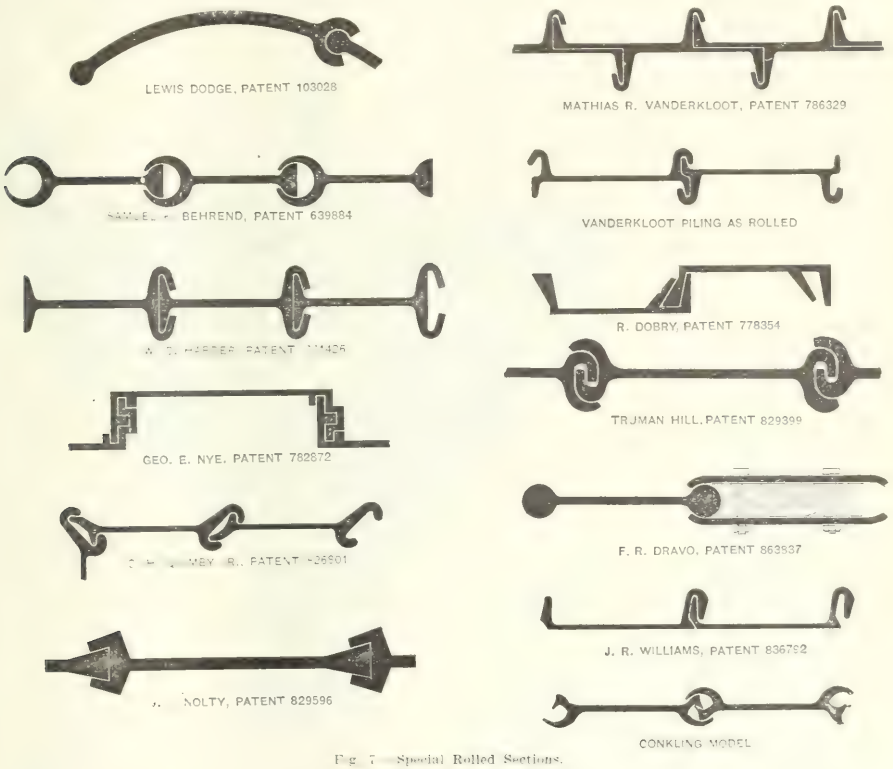


Fig. 7.—Special Rolled Sections.

[The concluding portion of Mr. Woodworth's paper is devoted to the developments of recent years in the use of steel in coal mining. That this is not to be looked upon as experimental, the author argues, is shown by the fact that in the past 12 or 15 years in the mines of the Susquehanna Coal Company steel timbered gangway supports have been in use in deep parts of the mines exposed to constant contact with mine water, and without signs of failure or corrosion. Nature builds the strongest sections in the form of hollow cylinders, but round sections for mine timbers are not simple, and to make connection with them is difficult and intricate. As close an approximation to circular form as is possible under present conditions is the H section, which has a large radius of gyration and the most economical distribution of material in comparison with its weight. The first manufacturer to furnish these in the United States was the Carnegie Steel Company, and its 4, 5, 6 and 8 in. sections, all of which are now successfully rolled, have been designed especially for use in coal mining operations. The 4-in. section weighs 13.6 lb. per lineal foot, the 5-in. 18.7 lb., the 6-in. 23.8 lb. and the 8-in. 34.6 lb., which gives a range of sizes sufficient to take care of all of the ordinary requirements of coal mining operations. When the H sections were placed on the market their usefulness in other directions became plainly apparent. They will take their place with the ordinary structural shapes, heretofore rolled, in the construction of light columns for all sorts of purposes, and the present range of sizes is sufficient to construct an ordinary five or six story building. They will also be used [illegible] supports and for other purposes for which ordinary structural material, and, indeed, timber, are now employed.]

The Cape to Cairo Railroad in Africa only requires the completion of 700 miles to enable travelers to make a connected journey by rail, lake and river from Cairo to Cape Town. Negotiations are progressing for the construction of this link.

The Vibracone Separator.

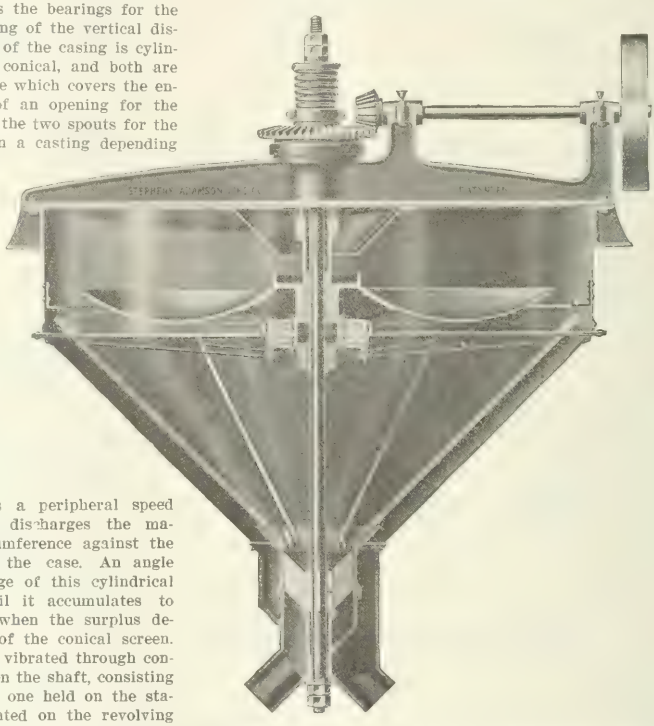
A vibrating conical screen separator, hence the name "Vibracone," invented by C. J. Reilly, superintendent of the Sandusky Portland Cement Company, and made by the Stephens-Adamson Mfg. Company, Aurora, Ill., is illustrated by the sectional view presented herewith. It is adapted for screening any material, wet or dry, such as cement, lime, clay, ores, sand, fine coal, carbon, graphite, phosphate, guano, fertilizers, chemicals, stone, salt, &c., where a uniform separation is required of material capable of passing screens of from 3 to 200 meshes per inch. Briefly, the essential features are a revolving seamless steel disk distributer, a cone shaped screen and a vibrating mechanism.

The whole machine is contained in a top shaped casing adapted to be suspended from a beam like casting which spans the top and supports the bearings for the driving shaft and the upper bearing of the vertical distributer shaft. The upper section of the casing is cylindrical in form, the lower section conical, and both are made of 3-16 in. steel. A top plate which covers the entire surface with the exception of an opening for the feed hopper is of No. 10 steel, and the two spouts for the tailings and fines are combined in a casting depending from the lower end of the cone. It will be seen that the apparatus is substantially inclosed so that it is practically impossible for dust to escape during its operation.

It is usual to feed the material through one-half of the feeding hopper, which is of 3-16 in. steel, 13½ in. in diameter at the bottom. The other half has a loose cover which can be removed to inspect the material being fed to the machine. This material falls upon the distributer, which is dished, as shown, and is 3-16 in. thick and 6 ft. in diameter. This, revolving at about 33 1-3 rev. per min., has a peripheral speed of about 625 ft. per minute, and discharges the material uniformly around its circumference against the sides of the cylindrical part of the case. An angle shelf secured near the lower edge of this cylindrical section retains the material until it accumulates to the angle where slipping occurs, when the surplus descends gently into the large end of the conical screen. The screen does not revolve, but is vibrated through connections to a mechanism mounted on the shaft, consisting of two chilled ratchet faced disks, one held on the stationary shaft and the other mounted on the revolving sleeve beneath the distributer. The vertical vibration thus produced is at the rate of 600 impacts per minute, and agitates the screen sufficiently to cause the material to slide down the conical screen without clogging and insure full efficiency of the screening surface. The amplitude of the vibration may be regulated from 1-64 to ½ in. by adjusting the ratchet faced disks from or toward one another by means of a nut at the lower end of the vertical shaft, this shaft being spring supported at the top, as shown. Adjusting this shaft has no effect on the engagement of the bevel gears, since the driven bevel gear is separately supported on a sleeve. The fines passing through the screen are collected at the bottom of the conical receptacle and pass through the right hand spout, while the tailings, continuing over the entire surface of the screen, fall into the central collecting chamber leading to the left hand spout.

The driving snaft is 1 15-16 in. in diameter and ordinarily runs at 100 rev. per min., the bevel gears being in the ratio of 1 to 3. The speed of the separator is claimed to be less than one-half that of other vibrating screens. The screening surface consists of eight triangular sections of steel or brass wire cloth set at an angle of 45 degrees. These sections are interchangeable, so that different meshes may be substituted when it is desired to get different sizes of fines. They are attached to the steel sash bars by eccentric clips, no bolts or screws being used, and can be readily removed and replaced. On account of the even distribution of material to the screening surface the wear on the wire cloth is uniform and it is said more than double the usual life is secured from screening cloth. In the outer shell there is a removable door through which the screen sections can be removed or replaced. While normally the screen surface does not revolve on the vertical shaft it can be turned to bring the sections successively opposite the opening in the outer case to allow their removal or inspection.

Both discharge spouts are provided with covered hand holes so that inspection of the fines or tailings can be made direct from the machine, and any foreign substance, such as waste or accumulation of like character, can be removed. The spouts are each 6 in. outside diameter. All joints of the steel shell casing are made tight, so that dust cannot be scattered. The entire driving mechanism which operates the distributer and vibrator is carried on ball bearings. The driving quill is of steel and is babbitted in its bearing surfaces, and is provided with means for lubricating. The total hight of the separator is 8 ft. 9 in., the diameter 8 ft. 3 in. and the weight approximately 3000 lb. One-half horsepower is sufficient to operate the separator at its full caapcity.



The Vibracone Separator Made by the Stephens-Adamson Mfg Company, Aurora, Ill.

The purpose of any separator is to produce the largest percentage of sized product with the least loss of fines in the tailings, and it is reported that in actual practice the Vibracone separator has screened 10 tons of Portland cement clinker per hour, 99 per cent. of which would pass a 20-mesh screen, with not to exceed 10 per cent. of fines in the tailings. This test was made in connection with a mill used for preliminary grinding which practically reduced only one-third of the material to the proper fineness at one operation, which means that 30 tons per hour of material passed through the machine in order to give the 10 tons per hour of fines. This, however, did not indicate the full capacity of the machine, as

it was impossible to feed more material to the grinding mill.

The screen cloth used is about twice the size of the product desired. For instance, in screening material all of which will pass a 20-mesh screen, a 10-mesh No. 20 wire screen is used, and for 100-mesh product a 50-mesh No. 32 wire screen. An advantage results from using as heavy wire as possible, since it insures longer life to the screening surface and contributes to rigidity of the screening plates.

On account of its form the Vibracone separator has a much greater area of live screening surface for the space occupied than is possible in any other type. The screen is 6 ft. in diameter at the top, thus giving about 19 ft. of lineal screening surface at the point where the material is first received from the distributer. This is naturally where the greatest amount of surface is required.

In some classes of very fine screening it is desirable to place a coarse scalping screen directly over the fine screen, to protect the latter from the heavy or coarse pieces that might be mixed in with the fine material. In screening fine sand containing a percentage of coarse gravel stones it is possible with a scalping screen to deliver the coarse material at once through the tailing spout while the balance passes on to the fine screen, the fines passing on through the fine screen and the smaller tailings over the fine screen to the tailings spout. Where conditions require the separator may be used as a double unit, placing one machine directly over the other.

At the company's plant there is a Vibracone separator equipped with a complete complement of screening plates of various meshes, in which the company is prepared to make tests for those desiring to know what may be accomplished in the separator with their materials.

The American Radiator Company's Report.

The ninth annual report of the American Radiator Company furnishes the following comparative financial showing for the fiscal year ending January 31:

Assets.

	January 31, 1907.	January 31, 1908.
Real estate, plants, machinery, patents, &c.	$7,976,641.19	$8,269,290.31
Additions during year	392,649.12	361,994.32
Totals	$8,369,290.31	$8,631,284.63
Less depreciation	100,000.00	100,000.00
Net	$8,269,290.31	$8,531,284.63
Cash	$308,541.43	$475,178.26
Notes receivable	15,985.63	11,217.32
Accounts receivable	2,535,568.27	1,768,618.66
Raw material, supplies and finished products	1,370,331.48	1,506,432.40
Total quick assets	$4,230,426.81	$3,761,446.64
Totals	$12,499,717.12	$12,292,731.27

Liabilities.

Preferred stock	$3,000,000.00	$3,000,000.00
Common stock	5,000,000.00	5,000,000.00
Accounts and bills payable	1,115,645.18	518,934.91
Totals	$9,115,645.18	$8,518,934.91
Balance (surplus)	$3,384,071.94	$3,773,796.36
Totals	$12,499,717.12	$12,292,731.27

The net profits for the years above given were as follows:

	January 31, 1907.	January 31, 1908.
Net profits	$864,281.29	$899,724.42
Less dividends—Preferred stock	210,000.00	210,000.00
Common stock	200,000.00	300,000.00
Totals	$410,000.00	$510,000.00
Balance	$454,281.29	$389,724.42

In his accompanying statement to the stockholders Clarence M. Woolley, president of the company, explains that in the first nine months of the fiscal year, when universal prosperity prevailed, the company's sales and profits were increased, but that in the last three months these sales and profits did not keep pace with those noted in the earlier months of the year. Nevertheless, the net profits were the largest in the history of the company. The net quick assets or working capital is now in excess of the total amount of preferred stock issued. Continuing, he says:

The company has steadily enlarged its producing capacity, and, following conservative price policies, the business has gradually increased, until the volume annually transacted exceeds its capitalization. This enables the company advantageously to transact the larger volume of business on a smaller percentage of profit, rendering available to a greater number of people with moderate means its sanitary and home improving products.

The inventories of raw materials and manufactured products were adjusted at the end of the year on the basis of actual market values by the utilization of funds reserved for that purpose. This permits the company to enter the new fiscal year untrammeled by a burden inherited from the preceding year, and its operations can be established upon legitimate conditions, made possible by the elimination of artificial valuations.

The last fiscal year was marked by signal progress, not alone in improving its manufacturing facilities, but in realizing refinements in both the manufacturing and the selling organizations, which constantly express a higher degree of co-operative efficiency.

The growth of the European companies continues at a gratifying rate. Each has transacted a larger volume of business than during the preceding year, accompanied by a corresponding increase in earnings. The profits realized by the European companies have been utilized for increases in producing capacity and working capital. This has rendered it advisable not to declare dividends, and their profits, therefore, have not been included in the balance sheet of the company.

The plant in England is thoroughly organized and in successful operation. The plant in Germany produced a larger volume of product than ever before, and the outlook for continued growth is favorable. The first plant constructed in France was outgrown by the increased demands placed upon it, necessitating the building of a new and larger plant, which will be in operation in the near future. The climatic conditions in Europe render the use of these products quite as essential for comfort and economy as in our own country, and we are more than ever encouraged by the outlook for the continued development of this line of industry abroad.

Canadian Furnace Notes.

TORONTO, March 7, 1908.—The furnace of the Atikokan Iron Company, which has been out of blast for some time, is expected to be blown in before the spring is far advanced and to be kept in operation throughout the year. It is said that the lateness of the company's entry into the field of production last year put it at some disadvantage for the sale of its output, buyers having mostly covered their wants for some time ahead before the company got into a position to offer product. The money stringency toward the end of the year was likewise adverse to business, and it was thought better to close down than to continue piling up output. During the shut down some changes are being made in the plant.

Notice has been given to the employees of the Deseronto Iron Works that the plant will be put out of operation for a time. A shortage of charcoal, which is the fuel used in the manufacture of the Deseronto pig iron, is given as the reason for the stoppage.

An agreement has been entered into by the Canadian Steel Rolling Mills, Ltd., and the municipal corporation of Campbellford, Ontario, wherein the company undertakes to erect and operate in the town a plant for the manufacture of steel plates and sheets. On its part, the town grants a 5-acre site free, exempts the plant for 10 years from all taxation save that on school and local improvement account, and engages to supply the company with 1500 electric horsepower at $10 per horsepower per year. The works are to cost $60,000, to employ not less than 100 hands for 11 months each year, and are to be ready for operation by next January. C. A. C. J.

The annual meeting and dinner of the Manufacturers' Association of Pittsburgh will be held in the Hotel Duquesne in that city on the evening of March 13. W. D. Averman is secretary.

The Union Steel Annealing Box.

A patent has recently been granted to the Union Steel Casting Company, Pittsburgh, Pa., on a new form of annealing box. It is a one-piece steel casting, the best material available for the purpose on account of its ability to resist the intense, long continued heat to which annealing boxes are subjected, and is specially designed to counteract what has always been the most serious objection to such boxes, the tendency of the roof to sag and the sides to distort. Of these difficulties the first is the worst, and is largely overcome by what is practically a truss construction under the roof on the inside of the box. The form of this is clearly shown in the side and end views of a box given in Fig. 1. Tie members extend across between the upper parts of the side walls near the bases of the roof arch, which has the effect of preventing the outward bulging of the sides, and from these tie rods vertical struts project to support the arch. Altogether these structural parts form what are practically webs with openings in them, and have the combined effects of preventing the sagging of the roof and the bulging of the side walls. There are also horizontal flanges cast on the outside of the box all around which materially stiffen the flat surfaces. The whole is cast in a single one-piece casting and has the usual trunnions near the center of the box for lifting it.

Fig. 2 shows one of these boxes which has been used for annealing sheet steel, after it had been fired for 207 times. A number of these boxes are now in use in various sheet and tin plate mills in different parts of the country, and are reported to be giving excellent satisfaction.

The boxes are handled in the usual way. Generally two tracks are provided to accommodate round steel balls about 8 in. in diameter, and are laid in the furnace and extend out into the shop. On these tracks the 8-in. balls are placed, and on the balls a heavy steel bottom having grooves for the balls on the under side and a flange around the upper edges. This flanged bottom is 2 or 3 in. larger inside all around than the outside dimensions of the box. In the center of the bottom the sheet steel is stacked as high as the box will accommodate, and then the box is lowered over the top of the pile, so that it does not touch the sheets. The space between the lower edge of the box and the bottom flange is filled with sand to exclude air from the box, the object being to anneal the sheets without their coming into contact with air and so prevent oxidation. The bottom, with the sheets and box placed upon it, is then rolled into the furnace on the balls, the door of the furnace closed and heat applied from a gas, oil, coal or coke fire. The heat comes in contact with the outside of the box, making it very hot, and through conduction and radiation is transmitted to the inside, heating the sheets to the proper temperature.

The heat necessary on the outside of the box to raise

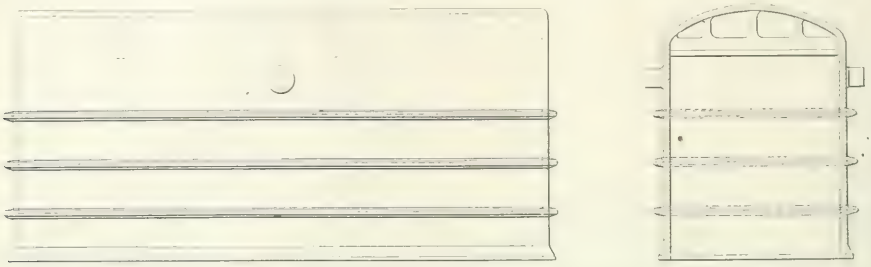


Fig. 1.—Side Elevation and Cross Section of the New Form of Steel Annealing Box Made by the Union Steel Casting Company, Pittsburgh, Pa.

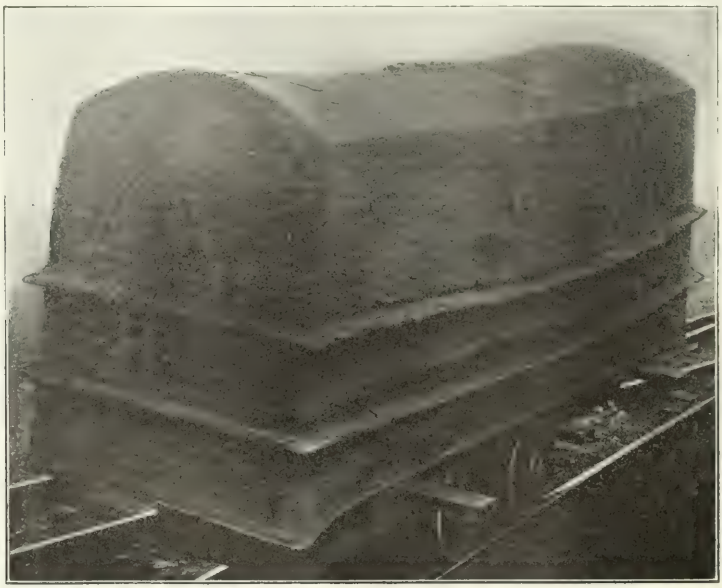
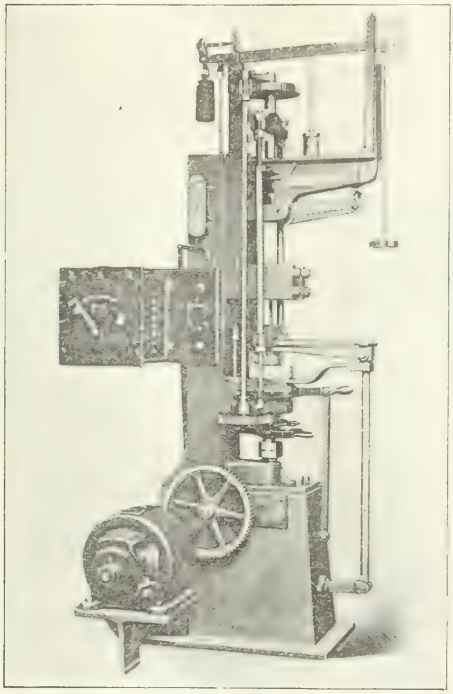


Fig. 2.—One of the Union Annealing Boxes After It Had Been Fired 207 Times.

the temperature of the sheets inside to the required point must be very severe. An ordinary box soon becomes deformed, the sides bulging and the roof caving in, which may either produce cracks, or, if it be sufficiently tough to prevent cracks, the box soon so changes shape that it will not pass over the pile of sheets or fit evenly on the bottom. By means of the inside trusses the roof is prevented from sagging and the sides from bulging, so that no cracks or undue distortion occur, greatly prolonging the life of the box. Tests made by the Union Steel Casting Company of these boxes indicate that their life is about double that of boxes of ordinary construction. They are made in various sizes.

An Olsen Motor-Driven Vibratory Testing Machine.

A vibratory and endurance testing machine, designed for testing staybolt material under conditions simulating



A Special Staybolt Testing Machine Built by Tinius Olsen & Co., Philadelphia, Pa.

those of actual service, is shown in the illustration. It was built by Tinius Olsen & Co., Philadelphia, Pa., and is equipped with a type R Westinghouse motor.

Staybolts as used in locomotives are subjected to severe strains due to vibrations and temperature effects, consequently a tensile test alone is not sufficient to determine their ability to perform the function required of them. Formerly tests were made by vibrating the specimen with an ocsillating motion only, and the results thus obtained were not entirely reliable, because the strains did not closely enough approximate the conditions met with in use. The Olsen machine makes the test complete by subjecting the specimen to a rotary vibratory motion while under a tensile load.

This machine will test staybolts up to 1¼ in. in diameter, and it grips the threaded bar so that no preparation of the test piece is necessary. The specimen is held firmly in the frame of the machine at one end and the other is clamped in a ball, around which a bearing is rotated eccentrically to produce the desired strain. A total eccentricity of ⅜ in. may be placed on a specimen and is indicated on a scale, while a tensile load is applied reaching 4000 lb. as a maximum. The revolutions or number of vibrations necessary to cause rupture are shown by a counter. Specimens 5 to 8 in. long from the point of application of eccentricity to the fixed support may be tested.

In addition to this test for a staybolt, the illustration shows an attachment by which the ordinary pendulum motion may be transmitted to the specimen when required. An attachment may also be obtained with this machine by which an initial fiber stress may be placed on the specimen while it is thus vibrated, if that should be preferable to subjecting the specimen to a known eccentricity. The machine as shown by the engraving is exceedingly compact. Its direct connection to a Westinghouse type R motor affords a form of drive that is well suited to its requirements. The motor may be supplied from a lighting circuit and run day and night throughout the test without special attention, which is cheaper and more convenient than driving from a line shaft.

The Sheffield Coal & Iron Company's Reorganization.

The Reorganization Committee of the Sheffield Coal & Iron Company, Sheffield, Ala., consisting of E. C. Converse, James Gayley, Isaac L. Elwood, William M. Douglass and C. William Funk, has sent out to the bondholders and stockholders of the company their proposed plan. This provides for decreasing considerably the present fixed charges by reducing the bonded indebtedness and interest charge and by authorizing the issue of preferred stock to take the place of about one-half of the present indebtedness. It is proposed that the holders of the Sheffield Coal, Iron & Steel Company bonds, which are a lien only upon the blast furnaces, give up that lien and receive in exchange 45 per cent. of the face amount of their bonds in new bonds secured by a first lien upon the entire property of the new company and 45 per cent. in new preferred stock, coming next behind the bond issue of about half the amount now upon the properties. The Sheffield Coal, Iron & Steel Company is the original company, and about 56 per cent. of its bonds are held by a trustee for the further security of the bond issue of the Sheffield Coal & Iron Company.

The plan of reorganization contemplates that the new corporation, which will probably be called the Sheffield Iron Company, shall have a total of mortgage and capital liability of $4,000,000, of which $750,000 will be 5 per cent. bonds, $750,000 noncumulative 6 per cent. preferred stock and $2,500,000 common stock. The stockholders are asked to pay in $500,000 new cash, or 20 per cent. on the par value of their present holdings. This money is to be used as follows: $125,000 for the payment of floating indebtedness, $100,000 for improvements to furnaces and ore properties, $75,000 for improvements to coal and coke properties and $200,000 for working capital. Stockholders subscribing the new money will receive bonds and preferred stock at the same rate as the present holders of both classes of bonds, while at the same time receiving new common stock in the some proportion as their present stock holdings. At 90, the $322,000 of bonds of the Sheffield Coal, Iron & Steel Company are to be taken in at the basis upon which they were sold in 1903, and the $400,000 of bonds of the Sheffield Coal & Iron Company are to be taken in at the amount of the liens and interest for which they were held as collateral, or about $378,000. The mortgage and capital issues proposed would leave in the hands of the committee $165,400 of bonds and $165,400 of preferred stock, to be used in carrying out the plan, or to be turned into the new company's treasury.

The Tri-State Mining Association, representing zinc mining interests in Wisconsin, Illinois and Iowa, will hold a convention at Milwaukee in the month of May, and will make a feature of the convention an exhibit of ore from various mines in those three States.

Freight Classification Rules.

Some of the Dangers Confronting Shippers.

BY R. L. ABBREY.

Several difficulties which shippers have encountered recently, like the new lighterage rules in New York Harbor, have grown out of one question which has not received consideration from shippers. Should the Interstate Commerce Commission recognize "usage and custom" in construing or interpreting the rules of the carriers, or should it prescribe new interpretations to conform literally and technically with whatever language may be used in these rules? Should the commission assume that everything that has been done in the past is bad, or at least open to suspicion, and that carriers and shippers must change their customs and re-establish their business to conform to whatever new rules or interpretations the commission may adopt?

Readers of *The Iron Age* are familiar with some of the fierce controversies that grow out of a single word or phrase in the customs tariff. In many cases a single lawsuit has cost $25,000 or more to the citizen, firm or company interested. This hair-splitting litigation has been very profitable to the lawyers, and some of the decisions of the highest courts have caused wonder and bewilderment to the unfortunate business man who foots the bills. Now railroad tariffs and classifications have been erected into "law" by decisions of the commission and the courts. Are they to become, like customs law, a happy hunting ground for the legal fraternity? Railroad tariffs and rules are generally written by traffic men, who use language familiar to them, and the words are interpreted in accordance with the usage and custom of traffic men, and the business affairs of shippers are adjusted to this interpretation. Are these documents to be examined in the future with a judicial microscope which will search out and magnify interpretations entirely foreign to commercial usage?

The New York Lighterage Case.

Lighterage "switching" in and about the harbor of New York is very cheap, compared with switching by rail in interior cities. Practically all carload shipments involve a switching movement at each end of the haul. The running expense of a switch engine and crew is $30 to $40 per day, and in large cities the terminals over which they operate have cost a vast amount of money, involving heavy charges both for interest and maintenance. A shipper at the New York terminals can obtain the use of a lighter for $10 per day, and there is no expense for interest or maintenance of the right of way, which, being navigable water, has been provided by nature and improved at public expense.

Recognizing this economy in disposing of export freight in New York, as compared with the expense on rail terminals, the carriers in the past have allowed "split" deliveries from a car to two or more piers for export shipment. The Interstate Commerce Commission, however, has rendered decisions, not directly on this question, which seem to make the split delivery illegal. The question is one of legal interpretation of a rule framed to cover deliveries on expensive rail terminals. If this rule is interpreted from a business point of view in accordance with usage and custom the split lighterage delivery at regular carload rates is not illegal, but lawyers employed as counsel for the railroads who follow the courts and the commission are earnest in their contention that the legal view must prevail.

The Team Track "Assistance" Case.

Another case of the same character has made trouble recently for thousands of shippers. Classification rules provide that the shipper and consignee must do the loading and unloading on shipments at carload rates. On crowded team track terminals, however, the railroads have long made a practice of furnishing assistance for loading and unloading. It has helped to avoid congestion and protected the roads against loss and damage claims, but the word went out that the commission considered this "assistance" illegal, because it was not provided for in the rules and tariffs. From a strictly legal point of view the commission is undoubtedly right. Just at present shippers are suffering no irreparable injury because the traffic is not heavy enough to crowd the team tracks, but if business ever gets back to a full normal basis compliance with this legal doctrine will make the congestions of former years seem like a pleasant memory.

Loss and Damage Rules.

If the doctrine that has governed in these cases is to be followed all the way through the classifications of the railroads there will be real trouble for the shipper. All the classifications, for example, contain loss and damage rules, which were adopted years ago, when certain bright young men in the employ of the committees sought to distinguish themselves by making the shipper or owner assume the risk. The commission has not been given any direct jurisdiction over this question, but it has power to make regulations regarding the $25,000,000 a year which the railroads pay out to shippers for damage to property in transit. It has been generally believed by shippers that these classification rules were dead, but in view of recent events it is scarcely safe to assume this of anything that bears an "I. C. C." number. There has been mysterious activity among the railroads regarding these rules, which has not yet been explained. The Western Classification Committee at its recent meeting at Hot Springs, Ark., adopted changes in its rule which bring it more into line with the official and Southern rules. As amended it will appear in the new issue, to take effect on all Western roads May 1.

In December *The Iron Age* reported the intention of the transcontinental roads to incorporate a similar rule in their commodity rates to and from the Pacific Coast. At their recent meeting the transcontinental lines adopted the proposed rule, substantially as previously published, but with an additional clause, which provides that the railroad will not be liable "for loss or damage of any kind unless caused by the negligence of carriers." The point in this amendment is that if the rule actually proves binding on the shipper he cannot collect a claim until he has proved that the damage was due to the negligence of the carriers. While this, from a business point of view, is true in more than 9 cases out of 10, it is almost impossible for the shipper to prove it in court.

In all the three classifications, covering the entire country, and in the new transcontinental commodity tariffs, the rules are on their face binding on the shipper, unless he has given notice to the agent at the time of shipment that he wants the carriers to assume their full legal responsibility, in which event the rate will be 20 per cent. higher. There are very few cases where shippers have voluntarily asked the railroads to charge them 20 per cent. more than the regular rates, and, so far as the writer knows, the claim agents have not used this rule as an excuse for declining claims. If they have done so with any shipper they have discriminated against him.

Statute Law and Railroad Tariff Law.

The Hepburn law was supposed to have settled this question, because a clause in it makes a carrier responsible for any loss or damage. Under the common law and the laws of many of the States the railroad is not liable if the loss or damage results from an act of God, the Government or the public enemy, but Congress ignored these exceptions, and has made the carrier an absolute insurer of the property while in its possession. This is the law as enacted by Congress, but the commission and the courts have held that whatever is printed in the tariff is also "law." Under the law enacted by Congress the shipper can sue the railroad and recover for damage to his property, but under the other "law," on file with the Interstate Commerce Commission, the railroad is liable to a fine of $5000 each time it pays money to a shipper voluntarily, contrary to the provisions of its tariff. If any railroad wanted to stop paying claims, excepting when the shipper sues and gets a judgment, these rules would offer an excellent opportu-

nity. Not one claim in a hundred is large enough to justify the shipper in suing.

The muddle on this question of loss and damage shows the futility of attempting to place a strict legal construction on every word or clause in a tariff or a classification. As long as there is no intent to favor one shipper at the expense of his competitor, the commission should be urged to adopt a liberal view in the interpretation of tariffs. Favoritism to the large shipper was the one thing that the people intended to make a crime when they insisted that Congress should pass the Hepburn law. It would be intolerable to the business interests of the country if the 220,000 railroad tariffs filed last year, and all those that preceded them and have not been canceled, are to be given the same force as the customs tariff laws, and to be made the same kind of a field for hair-splitting litigation. The great Roman Empire, which embraced all of the then civilized world, was ruined by the multiplication of taxes, laws and lawyers, and the people of the United States are not prepared for so long a step in the same direction.

The Universal Adjustable Flask Bar.

In the foundry a great deal of annoyance, expense and loss of time results from the lack of suitable or convenient means of anchoring the sand in the flask. Seeking to supply this need the Mitchell-Parks Mfg. Company, St. Louis, Mo., has brought out the universal adjustable flask bar herewith illustrated. Of the common means employed to perform the same functions, such as plain wood bars in some cases, with nails or spikes driven into their edges, or iron bars provided with holes, dovetailed edges or corrugated sides, &c., probably the most efficient are the former. One disadvantage of this is that the nails soon burn loose and fall out, so that they have to be repaired or replaced very frequently. Other disadvantages of the usual supporting bars are the difficulty of ramming the sand properly beneath them, either by hand or machine, and the inability to adjust them to support the sand at weak points where there is a special tendency to break down, or to conform to patterns of peculiar shapes, without special fitting for each case. When the last is accomplished with some success the flask is then unfit for use with other patterns, and it is necessary to tear out and replace and refit for different patterns. The only alternative to this is the carrying of an enormous variety of flasks, with bars fitted for different kinds of work, which is prohibitive in most foundries.

The new adjustable bar is claimed to overcome the objections met with in the use of the ordinary means, and to have the advantages that it is easy to ram the sand underneath the bar around the anchors, either by hand or machine; that all the anchors or sand supports can be instantly adjusted to conform to the shape, angles, curves, &c., of any pattern or set of patterns that can be placed within the flask; that each of the anchors or supports can be separately and independently adjusted vertically or to any angle necessary to support the sand in weak spots, that a flask equipped with this bar can be used as often as desired with one pattern, and then without much loss of time instantly readjusted to another radically different one; that a set of flasks equipped with these bars will go further and handle a greater variety of work than four or five times as many flasks equipped with the ordinary bar. In short, flasks so equipped are claimed to save time, labor and money by avoiding trying to fit the ordinary bars or replace and refit them, in ramming the mold properly underneath, and in preventing the sand from falling down where it is not properly supported. It eliminates the use of all forms of gaggers, &c., saving annoyance and expense. The cost of equipping flasks with the adjustable bar is said to be no more than that of rigging up the usual makeshift. While it can be used to advantage in connection with wooden flasks it is preferable, even in a jobbing foundry, to replace the latter with permanent metal ones, since a comparatively small number of assorted sizes equipped with the bar will answer all requirements for handling any class of work.

One of the most striking features of the bar is its simplicity. It can be easily cast and placed in any flask in proper lengths to fit the flask. The slots through the center of the bar for anchors and wedges are cored and no machine work is necessary. As anchors, either ordinary wire nails or wire cut to proper length may be used and the lower ends bent at right angles to form the heads to support the sand. To move or adjust the anchors the keys are loosened by striking the small ends with a hammer, and when a pair of anchors are properly placed or adjusted the large end of the key is struck a blow which securely locks the pair in position, and so on with the remaining pairs. The bars are secured transversely in the flask, as indicated in the illustration, either by dowel pins, bolts or rivets, and are spaced sufficiently far enough apart to leave plenty of room for ramming the sand between them and under them. The illustrations herewith show three typical applications of the bar with nails head down used as the anchors.



The Universal Adjustable Flask Bar Applied to the Cope of a Flask, Showing Three Typical Arrangements of the Anchors.

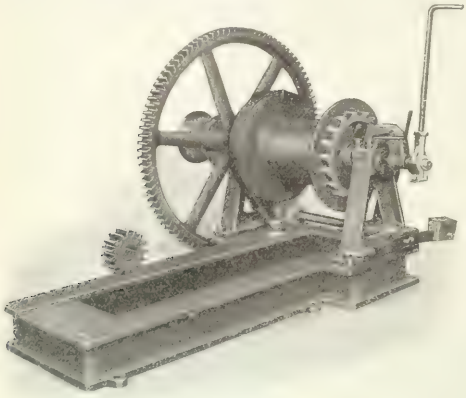
The device has been patented in the United States and foreign countries. The Mitchell-Parks Mfg. Company is prepared to sell rights or licenses to use the universal adjustable bar, allowing the purchaser either to make his own bars or purchase them from the company in any desired lengths. Samples will be furnished for trials to those contemplating purchasing the license to use the bar.

Starting Gasoline Engines.—While unknown to the editor at the time, it now appears that the apparatus for starting gasoline engines by means of a compressed explosive mixture, described under the above title in *The Iron Age*, March 5, 1908, page 752, is patented. The patent is owned by the Otto Gas Engine Works, Philadelphia, Pa., and other makers and users of gasoline engines are not entitled to employ the device or apply its principle without the permission of the owner of the patent.

The creation of a new executive branch of the Government, to be known as the Department of Transportation and Public Works, is provided for in a bill introduced by Representative Ransdell of Louisiana. The measure provides that the proposed new department shall construct and maintain all public buildings, works and improvements which shall be authorized by Congress, and that it shall in addition discharge the functions performed now by the Interstate Commerce Commission.

A Carlin Contractor's Hoist.

All the parts for a self-contained gas engine driven hoist, with the exception of the engine, are supplied in the equipment herewith illustrated, by the Carlin Machinery & Supply Company, Allegheny, Pa. The hoist has a cut cast iron gear connected to the shaft of the drum through a friction clutch. A cut steel pinion is also a part of the equipment, and the base is extended beyond the drum and made of dimensions that will accommodate any of the leading types of gas or gasoline engines. Thus the foundation bolt holes need simply to be drilled through the flanges and the engine secured, adding a new line to



A Hoist and Subbase Adapted for Gas Engine Drive, Sold by the Carlin Machinery & Supply Company, Allegheny, Pa.

the gas engine manufacturers' stock. This hoist is for the particular use of building and engineering contractors.

P. B. Test, a building contractor of Pittsburgh, Pa., made a rather unique use of a similar complete hoist. After arranging to use the gas supply of a neighboring house he connected the gas engine to it with a common garden hose. Thus he dispensed with the labor of hod carriers and hoisted all brick necessary for a three-story brick building at an expense for fuel of but 2 cents per thousand brick. The price of gas was 25 cents per 1000 ft., and the arrangement was eminently satisfactory. Where gas cannot be secured gasoline is easily obtainable.

The hoist is single geared—that is, has only one set of gears between the engine shaft and the drum shaft—thereby effecting considerable saving in friction losses, wear and tear and the consequent replacements. These hoists are built in capacities of from 3½ to 12 hp. The smaller size is capable of lifting 1200 lb. on a single line at 100 ft. per minute. The 12-hp. size will lift over 2000 lb. at the same speed with a single line. In addition to the single drum type described, where these hoists are to be used in connection with derricks, they are made with double drums. A further specialization is where two cages operating on the endless rope principle are to be used in building construction in which case the mechanism is such that the direction of the drum rotation can be reversed, while the gas engine continues in the same direction. This is a decided advantage, owing to the difficulty of reversing the gas engine.

The cast iron beds of these machines are made open in the inside, so that when an engine does not have a gasoline reservoir contained in its bed a tank can be placed in the subbase of the outfit. The friction drum is made so that the engine can run constantly, but hoisting on the drum only takes place when the friction lever is moved, as on an ordinary steam hoist. The capacity of the 6-hp. size is sufficient to hoist two barrows of brick with two men in three and four story buildings. It is claimed by the manufacturer that the operation is so simple that an ordinarily intelligent laborer getting $2 or $2.25 per day can be intrusted with its care in a very short time after seeing it operated.

The drum on the 6-hp. machine is 10 in. in diameter, 14 in. long, and will hold about 900 ft. of ½-in. wire rope. Other sizes of drums than the above can be furnished. The illustration shows a spool or cathead on the end of the drum shaft. This is not put on all machines, but when attached it can be used for dragging, hoisting, sometimes for raising the boom on a light derrick, and for other purposes.

The Hobbs Finger Protectors.

For the use of operatives who work on machinery dangerous to fingers, including presses, punches, drills, automatic machinery, woodworking machinery and various machines used in general manufacturing, the Hobbs Mfg. Company, Worcester, Mass., is putting on the market a steel finger protector. The protector, which is shown in use in the accompanying illustrations, consists of a steel thimble long enough to fully cover the first joint of the forefinger, the digit that generally reaches farthest toward the point of danger. The tip is of solid metal; the walls are thick enough to offer sufficient resistance to working parts of a machine. The protector is tapered. When the finger thus covered is caught the shock has a tendency to throw it out. The end of the protector may be crushed flat, but the finger escapes injury under circumstances that ordinarily surround such an accident. In Fig. 1 the protector is shown on the forefinger of an operator on a paper box cornering machine. In Fig. 2 one of the protectors has been caught in the jaws of the machine, throwing out the finger and saving it. The device has been in use for some months, during which time the makers have received from users a large number of protectors which have been on fingers caught in machinery, the operators escaping injury, though the metal was badly crushed and occasionally broken or cut. They are furnished in pairs, packed in a box, and are made in two sizes, which cover difference in sizes of fingers.

The protector not only frees the operative from a constant source of danger and possible crippling injury, but



Fig. 1. Fig. 2.

The Hobbs Finger Protectors as Used When Working on a Paper Box Cornering Machine.

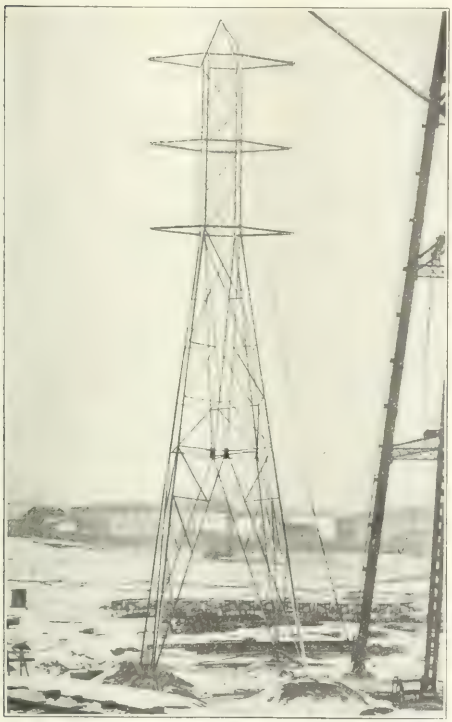
lessens the employer's legal liability in case of injury to an operative, for with the warning which imposes the assumption of risk on the part of the employees additional protection against injury is given him or her. For this reason accident insurance companies have interested themselves in the protector.

A complete ocean to ocean rail line is now controlled by the Harriman interests. The links are the Southern and Union Pacific, the Illinois Central and the Central of Georgia. These interests have several terminals on the Pacific, while their Atlantic terminal at present is Savannah.

Milliken Structural Steel Poles.

The high voltage power transmission lines of the Great Western Power Company of California will eventually extend a distance of about 1000 miles. The power will be transmitted on two circuits of three wires each, carrying a current of 100,000 volts. This high voltage involves such danger to life and risk from fire that great care was exercised in selecting the poles to support the wires. The type which was adopted is shown in the accompanying illustration. The receivers of Milliken Bros., Inc., 11 Broadway, New York City, are manufacturing these poles at Milliken, Staten Island, N. Y., where complete arrangements have been made in the bridge and structural shops for getting out this particular class of structural work.

The pole is designed with three cross arms, it being intended to carry a feed wire on the outer end of each cross



The Milliken Structural Steel Tower for Supporting Electric Transmission Lines.

arm by suspended insulation. The top of the pole is arranged to take a guard wire. The poles are intended to be used about 750 ft. apart. The bottom of the lowest cross arm is 51 ft. 2 in. above the ground; the second cross arm is 10 ft. above the first, and the third 10 ft. above the second. The extreme top of the pole carrying the guard wire is 5 ft. 1 in. above the bottom of the highest cross arm. The feed wires will be carried 17 ft. 1 in. apart in a horizontal plane on the two upper cross arms and 18 ft. 1 in. apart on the lowest cross arm, thus making all feed wires 6 ft. 5 in. from the nearest part of the pole proper, measured in a horizontal direction. The bottom of the pole at the ground level occupies a base 17 ft. square. The stub ends of the pole—*i. e.*, the parts in the ground—are separate pieces of steel and are long enough to embed 7 ft. in the ground.

These poles are constructed entirely of structural steel and are designed to follow the theoretical stresses and produce a pole of given strength and stiffness, with a minimum amount of material. There are a great many duplicate pieces, thus making it a simple matter to assemble the poles in the field.

Very complete and careful tests of the strength of these poles were made before their regular manufacture was started. The test pole was erected in a vertical position on an immovable concrete foundation, and strains were applied in various directions to determine the allowable loads and the deflections produced. The pole as designed will withstand a simultaneous horizontal side pull of 1000 lb. at the top and 2500 lb. at each of the three cross arms, or, in other words, a total strain of 8500 lb. The cross arms will support a suspended weight of 1000 lb. at their extreme ends, and any one of the cross arms at these ends a horizontal pull along the line of 3000 lb.

As all the material, except the bolts and nuts, is galvanized by the hot process before shipment, and after all the shop work has been done, there has been added to the Milliken plant a large galvanizing department for doing this particular work. It is unique in that it has the largest hot galvanizing bath ever constructed. This bath is capable of taking pieces somewhat over 30 ft. long at a single dipping, which is much better than dipping long pieces one end at a time. The facilities are very complete in this plant for turning out large quantities of this class of work quickly.

These poles are all put together with bolts, and to reduce freight charges are shipped in pieces. The poles are stiff enough in themselves to stand being erected in one piece, thus obviating the necessity of erecting them piecemeal from the ground up.

The German Iron and Steel Situation.

The output of pig iron in Germany and Luxemburg in January was 1,061,329 tons, as against 1,062,152 tons in January, 1907. The January figures show a decline of 45,046 tons from those for December, 1907. The January output of foundry iron was 192,456 tons; of Bessemer iron, 39,303 tons; of basic iron, 682,402 tons; of forge iron, 57,706 tons, and of ferro and spiegel, 89,462 tons.

The German Steel Syndicate reports that the deliveries of A products in January were 383,056 tons, as compared with 359,515 tons in December. In January, 1907, they were 489,571 tons. The Syndicate announced in the last week of February that, in view of the absence of inquiries for half finished steel for the second quarter and the fact that some consumers had still to buy for March, it would postpone fixing prices for April, May and June delivery. Some improvement in domestic inquiry for billets and blooms was noted, and the fact that February prices were maintained on the January level led to a betterment in export inquiry. Several large export orders for rails were reported pending.

Pig iron sales were light in the last week of February, and with stocks increasing a number of furnaces were blown out. The Rhenish Westphalian Pig Iron Syndicate on February 22 reduced the price it pays its members for hematite and foundry iron by 3 marks. The price to consumers is expected to be reduced accordingly. On March 1 the Syndicate introduced the export pig iron bounty on the same basis as when it was previously allowed in 1906—namely, 2 marks 50 pfennigs per ton. It was decided also to meet the competition of foreign hematite irons, so that best German hematite might not be displaced.

On petition of Charles W. Franzheim and others, John E. Wright of Wheeling, W. Va., has been appointed special receiver for the Wheeling Enameled Iron Company, which has a plant at Elm Grove, near Wheeling. The company was organized a few years ago with a capital of $125,000 to make bathtubs and other plumbing goods, and finding a great increase in business, the stockholders a few months ago decided to authorize a bond issue, secured by a deed of trust upon the property, to meet the cost of building an extension. Owing to the financial stringency these bonds could not be marketed and a receiver was asked for in order to hold the property. The company is understood to be perfectly solvent.

The Chicago Foundry Foremen's Convention.

An Accompanying Exhibit of Machines and Material.

The convention of the Chicago Foundry Foremen's Association, held at the Lewis Institute, Chicago, March 5 to 7, inclusive, marks the second annual gathering of this prosperous and growing organization, which now numbers 105 members. Standing primarily for the encouragement of scientific study and investigation of matters pertaining to the art of molding and founding in all its branches, the association seeks in an educational way to further the interests of foundry and pattern shop foremen and incidentally to promote social intercourse between fellow craftsmen in this line of work.

In connection with the convention, and forming a specially attractive feature of the occasion, was an exhibition of foundry and pattern shop machines and material. The features of the machines were demonstrated by practical operation. The exhibits were shown under the joint auspices of the association and the Lewis Institute in the engineering building of the institute, the auditorium of which was used for the convention meetings.

Papers and Addresses.

The discussion of subjects relating to foundry practice engaged the attention of the convention on Thursday and Friday evenings, when several interesting papers and addresses on live topics were heard. In a talk on "The Work of a Commercial Chemist," C. C. Kawin, Chicago, outlined and emphasized the intimate relation of commercial chemistry to foundry work, and noted the advancement that had been made through this agency. He expressed the opinion that, in spite of strong prejudices which in some quarters still favor the employment of old hit and miss methods in foundry practice, the application of scientific knowledge to the problems involved will gradually supersede the inaccuracy of guesswork. A cinematograph demonstration and explanatory description of the French system of universal machine molding, given by E. H. Mumford, Philadelphia, commanded the undivided attention of an audience keenly alive to every point of practical value brought out in the demonstration.

The necessity for improved and modernized foundry plants and equipment formed the keynote of an address delivered by A. O. Backert, editor of the *Foundry*. The present depression, he asserted, strongly accentuates the need for the rehabilitation of old shops, and careful attention to every detail that will make for economical production in the arrangement and equipment of new shops. The scrap pile to which old machinery is consigned was referred to as a barometer of prosperity. Attention was also called to the fact that hitherto the foundry has not been given the liberal treatment and discriminating attention that has characterized the intelligent development of the machine shop, with the result that the former is not so nearly abreast of the times. As a reminder of the exacting qualifications required in a foundry foreman, the possession of which are essential to success, it was pointed out that he must not only have a comprehensive knowledge of metals and molding, but must have an intimate acquaintance with pattern work as well, and withal be successful in handling men.

Dr. Richard Moldenke, Watchung, N. Y., secretary of the American Foundrymen's Association, read an instructive paper on the "Prevention of Waste." Among the means noted for its accomplishment were the provision of good light and ventilation in foundries; the installation of adequate facilities, both within and without the shop, for the transportation of material, and more careful attention to the selection of molding sand. What was referred to as a particularly encouraging feature in foundry work is the growing inclination of foundry foremen to acquire every available scrap of information bearing upon the industry.

H. M. Lane, secretary of the Foundry Supply Association, and editor of *Castings*, spoke enthusiastically of the coming convention of his organization and the American Foundrymen's Association, to be held jointly at Toronto, Canada.

The Exhibits.

The entire foundry department on the sixth floor of the Lewis Institute engineering building was occupied by molding machine exhibits, rooms on the second floor and basement being devoted to core machines, woodworking tools and other foundry equipment. A list of firms represented and machines exhibited is as follows:

Arcade Mfg. Company, Freeport, Ill. Modern molding machines.
Goldschmidt-Thermit Company, New York. Demonstration of materials and apparatus used in welding and treating iron in ladle.
Killing Molding Machine Company, Davenport, Iowa. Molding machines and flasks.
Kroeschell Bros. Company, Chicago. Gyrating flame furnace in operation.
Macphail Flask & Machine Company, Chicago. Flasks and emery wheel dressers.
E. H. Mumford Company, Philadelphia, Pa. Machine molding and pattern making apparatus.
Henry E. Pridmore Company, Chicago. Molding machines.
Sandwich Mfg. Company, Sandwich, Ill. Bench molding machines.
Tabor Mfg. Company, Philadelphia. Power and hand molding machines.
Garden City Sand Company, Chicago. Sand, brick and foundry supplies.
Ballou's White Sand Company, Millington, Ill. Full line of sands.
Brown Specialty Machinery Company, Chicago. Hammer core machines.
S. H. Brand Company, Chicago. Eureka core machines.
Falls Rivet & Machine Company, Cuyahoga Falls, Ohio. Wadsworth core machines.
Fox Machine Company, Grand Rapids, Mich. Universal wood working tools.
Holland Linseed Oil Company, Chicago. Demonstration of core oils.
Killing Molding Machine Company, Davenport, Iowa. Electric connected saw tables.
S. Obermayer Company, Cincinnati, Ohio. Core oven and core compounds.
Oliver Machine Company, Grand Rapids, Mich. Woodworking tools.
J. W. Paxson Company, Philadelphia.
Calumet Engineering Works, Chicago. Calumet cupola.
W. C. Toles Company, Chicago. Patternmakers' vises.
Norton Company, Chicago. Grinding machinery.
Chicago Pneumatic Tool Company, Chicago. Rammers, chipping hammers.
Hanna Engineering Company, Chicago. Pneumatic and electric shakers.
Ingersoll-Rand Company, Chicago. Air hoist and rammers.

A very enjoyable and well attended smoker, given at the Sherman House on Saturday evening, concluded the programme. The officers of the Chicago Association are as follows:

President, Eugene W. Smith, foundry superintendent of the Crane Company; vice-president, Wm. J. Legg, foundry superintendent of the Featherstone Company; secretary-treasurer, C. E. Hoyt, instructor in the foundry department, Lewis Institute; chairman Educational Committee, A. M. Thompson, foundry superintendent of the Link-Belt Company.

The *Obermayer Bulletin*, issued by the S. Obermayer Company, Cincinnati, Chicago and Pittsburgh, was adopted as the official programme of the exhibit of the Chicago Foundry Foremen's Association, the current issue containing a great deal of information regarding several of the larger technical schools of the country. The *Bulletin* is intended for general distribution.

The Foundry Exhibit at Toronto.—A meeting of the Executive Committee of the Foundry Supply Association was held March 2 and 3 at Toronto, Ont., and was attended by E. H. Mumford, W. S. Quigley, J. S. McCormick, F. N. Perkins, U. E. Kanavel, J. S. Smith, E. J. Woodison, George Rayner and the secretary, H. M. Lane. A report was made by the Committee on Entertainment for the Toronto convention of the American Foundrymen's Association, to be held in the second week of June, and on behalf of the Foundry Supply Association $500 was voted to the entertainment fund, in addition to

$40 from the initiation fee and dues of each new member joining the Supply Association from Canada. It was stated that applications for exhibit space have been coming in well, one of these being from a Montreal firm, which will exhibit a French cupola in operation, so as to furnish molding machine exhibitors with iron for pouring molds. The secretary reported that the present membership of the Supply Association is 100, with six applications pending.

The Philadelphia Foundrymen's Association.

The regular monthly meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club, Philadelphia, on the evening of March 4. Thomas Devlin, president, occupied the chair. R. B. Seidel, Inc., Philadelphia Black Lead Crucible Works, 1324-1334 Callowhill street, Philadelphia, represented by H. Y. Seidel, was elected to membership in the association.

A. A. Miller, secretary of the Local Weight Committee, tendered a report of the conference of foundrymen, pig iron and coke producers and transportation companies, held at the Bellevue-Stratford Hotel, February 5, after which the committee was discharged with the thanks of the association. The appointment of William S. Hallowell of the Harrison Safety Boiler Works, Philadelphia, and August A. Miller, *The Iron Age*, Philadelphia, by Henry A. Carpenter, chairman of the Weight Conference, to represent the Philadelphia Foundrymen's Association in the deliberations of a committee appointed under a resolution passed at the Weight Conference, was confirmed by motion, and these members will represent the association in the further work in endeavoring to formulate a plan for the correction of discrepancies in the delivered weight of pig iron, coal and coke. The first meeting of this committee will be held at the Bellevue-Stratford Hotel, March 18, and it was particularly requested that any foundryman who had experienced shortages in the delivery weight of the materials mentioned communicate at once with either of the representatives above named, giving specific information in each case.

The regular programme of having a paper read at this meeting of the association was departed from, and an open discussion by the members on the business situation was substituted. Abram C. Mott of the Abram Cox Stove Company; Dr. E. E. Brown of E. E. Brown & Co.; H. L. Haldeman, Pulaski Iron Company; T. Howard Sheeler, Sheeler-Hempsher Company; R. C. Oliphant, Trenton Malleable Iron Company; W. J. Spencer, Nelson Valve Company, and W. S. Hallowell, Harrison Safety Boiler Company, expressed themselves on the business outlook, and the consensus of opinion was that there had been some improvement in the situation in the past month. While plants were in almost every case running far below normal, gains in the number of orders were to be noted. The tendency of some foundrymen to reduce prices was deplored, as it was said that there was no reason for any decline, and the maintenance of prices was strongly advocated. Many of the foundries have iron still due them on high price contracts, and consumers are not disposed to buy in quantity or for forward delivery at any price under the existing conditions. Plants were stated to be running at varying rates of activity, ranging from 35 to 65 per cent. of the production at the corresponding time last year.

The Westinghouse Electric & Mfg. Company has won its suit in the United States Circuit Court of Appeals for the District of New Jersey against the Prudential Insurance Company of Newark, restraining it from further infringement of the Nolan patent No. 582,481 in the use of a direct current generator manufactured by the Bullock Electric Mfg. Company. The feature of the generator to which this patent relates is the means used for clamping the armature laminæ in place, which is a method of construction obviating the use of bolts passing through the laminæ for the purpose of holding them together.

The Foundrymen's Weight Conference Committee.

Chairman Henry A. Carpenter, Providence, R. I., who presided at the Philadelphia conference of foundrymen and pig iron, coke and railroad interests last month, has announced the complete committee appointed under the resolutions passed at that conference, as published in *The Iron Age* of February 13. The committee will meet for organization and further consideration of the short weight question at the Bellevue-Stratford Hotel, Philadelphia, March 18. The members of the committee are as follows:

J. J. Archbald, West Side Coal Company, Pittston, Pa.; E. M. Shaw, Wythe & Peter Mfg. Company, Boston, Mass.; New England Foundrymen's Association.
W. S. Hallowell, Harrison Safety Boiler Works, Philadelphia, Pa.; A. A. Miller, *The Iron Age*; Philadelphia Foundrymen's Association.
H. E. Field, Mackintosh, Hemphill & Co.; S. D. Sleeth; Pittsburgh Foundrymen's Association.
E. F. Fackenthal, Thomas Iron Company.
J. G. Hawshaw, Woodward Iron Company; Lead Mountain Coal & Coke Company.
Leonard Peckitt, Empire Steel & Iron Company.
F. A. Burr, Tennessee Coal, Iron & Railroad Company.
Neal Mission, Lewis Coal & Coke Company.
John M. Jamison, Jamison Coal & Coke Company.
C. S. Hoskins, freight traffic manager Maryland & Pennsylvania Transportation Company.
T. W. Galleher, general freight agent; H. M. Matthews, general coal and coke agent; Baltimore & Ohio Railroad Company.
E. E. Harriman, coal traffic manager; I. H. Hedges, general freight agent; New York Central & Hudson River Railroad Company.
R. C. Wright, general freight agent; R. H. Large, coal freight agent; Pennsylvania Railroad Company.
A. S. Crane, assistant freight traffic manager, Boston & Maine Railroad Company.
F. S. Holbrook, general freight agent, New York, New Haven & Hartford Railroad Company.
G. R. Browder, assistant freight traffic manager, Southern Railway Company.

The Westinghouse Companies.

The directors of the Westinghouse Electric & Mfg. Company have called a special meeting of the stockholders, to be held at East Pittsburgh, April 29, to vote on a proposition to increase the capital stock and bonded indebtedness of the company. The committee for the readjustment of the debt of the company, of which James N. Jarvis is chairman, has given notice to holders of the convertible sinking fund 5 per cent. gold bonds, 5 per cent. debt certificates, three-year 6 per cent. collateral notes and evidences of floating debt, that the time for deposit of such obligations has been extended until to and including March 31. A large part of these have already been deposited under the plan and agreement of January 20, which placed March 1 as the limit when deposits could be made, but the committee deemed it wise to make the extension. Under the agreement, the committee has the power to extend the time of deposits.

The rehabilitation of the Westinghouse Machine Company has been assured, the Creditors' Committee having met with the receivers and agreed to the plan proposed December 24, to issue bonds in denomination of $500 for all indebtedness other than amounts smaller than $500, which will be paid in cash. For the removal of the existing receivership it is only necessary to make application to the court, all creditors having agreed to the plan proposed. The bonds, which will be received as part payment of indebtedness, are for three years and bear 6 per cent. interest. During the interim business has been going on with little or no decrease.

D. B. Marwick, who has been manager of the Penn Shovel Mfg. Company's plant at Warren, Ohio, for the past year, has resigned to take the presidency and general managership of the Canadian Steel Rolling Mill Company, which will erect a plant at Campbellford, Ont., about midway between Toronto and Montreal on the Trent River. Mr. Marwick has interested American capital in the formation of the company. The products of the mill will be sheets, bars and cold drawn steel. Water power will be used in operating the plant.

A Mammoth Toledo Toggle Drawing Press.

A toggle drawing press of immense size and capacity, declared by its builder, the Toledo Machine & Tool Company, Toledo, Ohio, to be the largest of this type ever built, is shown in Fig. 1, as compared with a man of average size. It is intended for the manufacturing of a general line of deep stampings of steel or other sheet metals, but more particularly for brake drums and cast-

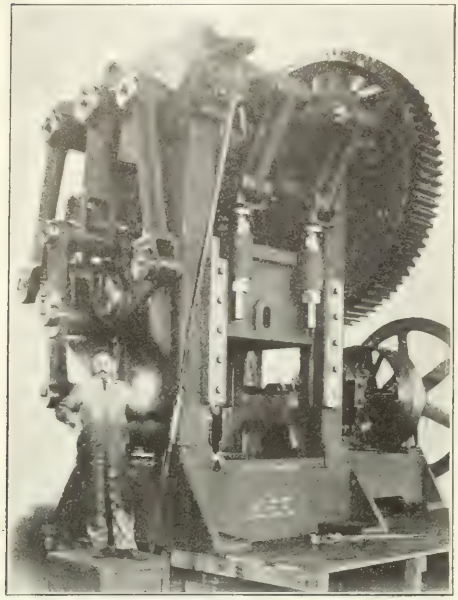


Fig. 1.—An Extremely Powerful Toggle Drawing Press, Built by the Toledo Machine & Tool Company, Toledo, Ohio.

ings for automobiles, steel closet tanks, sinks, bathtubs and similar work. An interesting feature of the machine is the small amount of power found necessary to operate the press, the belt used being 8 in. wide only, although

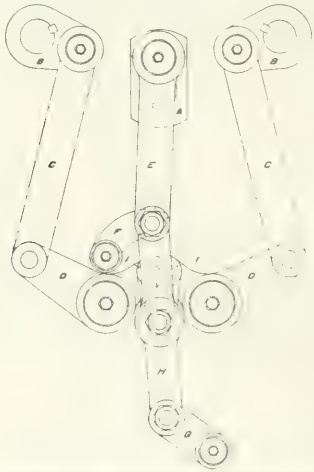


Fig. 2.—The Toggle Operating Links and Levers.

the machine is intended to be operated by a 10-in. double belt. The machine can be equipped also for direct drive from a motor or engine when so ordered. The reduction in amount of power required is obtained, it is stated, by the almost complete absence of friction in the new patented movement used for operating the toggles and blank holder slide. This movement is entirely different from the slide bar and head movement used in other presses of similar types.

The crank A, Figs. 2 and 3, keyed to the outer end of the main crank or plunger shaft, connects to yoke H; this yoke is suspended between levers F and G, the levers having their opposite ends pivoted in each case to the side of the main housing or frame. Fitted in the yoke H are two levers, I, one end of each being attached to bell cranks D. The opposite ends of these two bell cranks connect with the links C, and these links connect with the cranks B, which are keyed to the rocker arm shafts. These shafts connect directly with the toggle movement of the blank holder. All these parts are steel castings and each bearing is bushed with bronze. The cranks B are practically at rest during over 90 degrees of the movement of the crank A, at the lower part of its revolution. The blank holder of the press operated by the inner toggle movement is by this method given the most perfect possible dwell during that part of the plunger stroke necessary in the drawing, redrawing or reducing operations.

All joints of the outer movement are oiled through the end of each of the bearing pins by self-feeding oil or compression cups. The easiest and smoothest movement is

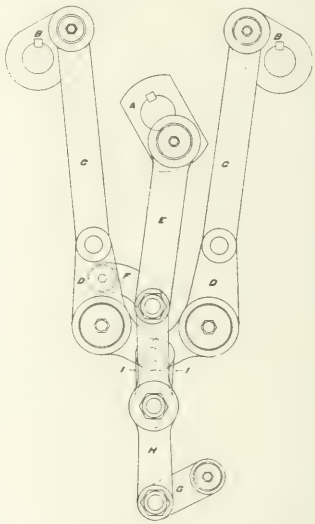


Fig. 3.—Another Position of the Toggle Mechanism.

obtained, and the very little motion necessary in the majority of the joints is held to eliminate over 80 per cent. of the friction occurring in the other forms of toggle operating movement. The press illustrated has a capacity for drawing cold steel plate as thick as 5-16 in.

The press is operated by a powerful friction clutch and is therefore under complete control of the operator at all points of the stroke of both plunger and blank holder. It is estimated that a resistance is obtained on the blank holder of over 2000 tons pressure. Some of the measurements of the machine are:

Complete weight	175,000 lb.
Width between uprights and bed area	57 in.
Distance bed to blank holder, stroke down and adjustment up	24 in.
Distance bed to plunger, stroke down and adjustment up	25 in.
Stroke of blank holder	18 in.
Stroke of plunger	26 in.
Size of balance wheel, 84 in.; weight	3,000 lb.
Size of belt pulleys	50 x 10 in.
Speed	250 rev. per min.
Size of main gearing	124 x 14 in.
Proportion of gearing	50 to 1
Size of shaft at crank bearing	13 in.
Floor space of base, 100 in. front to back, 176 in. right to left.	
Hight over all from floor line	21 ft.

This press was designed and built for the A. O. Smith Company, Milwaukee, Wis.

Data on Rail Mill Practice.

The investigations of the joint committee of steel works experts and railroad engineers last year into the practice of the rail mills of the country included a detailed examination into rail mill arrangement and procedure. This showed considerable diversity as to the number of passes, for example; also in the matter of shrinkage and time elapsing from the passing of the rail out of the finishing rolls until the drop of the saws. The railroad representatives found, on going into these questions, that differences in construction of mills and the relation of the components of the mill to each other, made it impossible to lay down hard and fast rules as to saw runs, for example, and as to time between various passes. Some of the tabulated data gathered by the committees have been published by the *Railway Age*, from which the accompanying table is taken.

Particularly noteworthy is the variation in the number of passes and the relation of the number of passes to the size of the ingot. The amount of bloom crop and of rail crop is also a matter of special interest. The figures given are based upon the average of 50 consecutive ingots rolled in each mill, and are considered representative of the practice obtaining on December 1, 1907.

Data on Practice in American Rail Mills—December 1, 1907.

Mill.	Ingot.—In.	Designated area of Section	Designated weight per yard	Number of passes— Bl.	Rou.	Fin.	Total	Saw cut Sec.*	Saw cut 70-lb.	Saw cut 80-lb.	Saw cut 85-lb.	Saw cut 100-lb.	Discard from rail— Average Inches	Discard from rail— Average per cent.	Discard from rail— Average wt. of discard	Discard from rail— Rail crop wt.	Discard from rail— Average In.	Discard from rail— Average Lb.	Total discard. % of rail crop wt.	Total discard. wt. of ingot.
A	18½ x 19½	5,400	19	8	3	30	35	...	68½	...	...	23.5	17.4	8.77	80	21.1	46.0	6.87	9.64
B	19 x 23	6,600	15	10	2	27	17-19	5	6	6	6	6 1/16	27.7	62.8	10.46	80	30.1	67.0	1.12	11.58
C	17½ x 19½	4,800	7	10	1	18	12-14	...	...	6½	...	...	15.8	43.7	9.10	85	26.3	62.1	1.29	10.39
D	17½ x 19½	4,800	7	...	...	...	...	7½	...	...	...	...	15.8	43.7	9.10	65	24.2	43.7	0.91	10.01
E	18 x 22	...	11	10	1	22	12-17	5½	6½	6	...	...	...	...	...	...	...	...	...	...
F	18 x 20	4,720	17	7	5	29	32	6½	6½	7	...	...	25.5	44.6	9.45	85	23.4	60.0	1.27	10.72
G	18 x 19	4,360	9	8	1	18	12	6½	7	7½	7½	...	12.0	24.5	5.63	85	17.0	40.1	0.92	6.55
H	19 x 19	4,200	6	4	5	15	40-45	6½	6½	6½	6½	...	10.8	19.5	4.65	80	32.2	71.5	1.70	6.35
I	20 x 22	5,750	13	6	5	24	28-30	6½	6½	6½	6½	...	14.2	47.5	8.26	90	20.7	51.8	0.90	9.16
J	19 x 23	6,800	15	10	1	26	...	...	...	...	...	...	20.0	70.7	10.40	75	24.0	50.0	0.74	11.14
K	17 x 17	...	9	6	5	20	5	6½	6½	6½	6½	...	...	...	...	...	...	...	...	...
L	...	...	...	...	...	...	16-19	...	...	...	5	...	...	...	...	...	...	...	...	...
M	19 x 23	6,690	15	7	2	24	27	6½	6½	6 9/16	6½	...	25.6	46.5	6.94	85	27.0	64.0	0.96	7.90
N	18 x 21	6,127	11	10	1	22	...	...	6½	...	6½	...	24.1	35.0	5.87	60	17.0	28.3	0.46	6.33

* Time in seconds from time rail leaves finishing rolls till saws drop.

Special notes as to reheating and as to the holding of rails between passes are made, relative to the practice in the different mills, as follows: A.—Blooms reheated: Rails held between passes 35 sec. till both ends of first rail are cut. B.—Blooms reheated. C and D.—Blooms reheated. Rails not held between passes. E, F and G.—Rails not held between passes. H.—Rails held 40 to 45 sec. till both ends of first rail are cut. I.—Rails held between passes. M.—Rails not held between passes.

Metal Trades Association Meetings.

The annual meeting of the Boston Branch of the National Metal Trades Association was held at the Parker House, Boston, March 4, with the largest attendance in the history of the organization, 98 being present. The reports of officers showed a most prosperous condition. Edwin E. Bartlett was elected president; E. P. Robinson, Atlantic Works, East Boston, vice-president; A. L. Lovejoy, Simplex Faucet Company, Hyde Park, treasurer; M. H. Barker, American Tool & Machine Company, Boston, and Fred F. Stockwell, Barbour-Stockwell Company, Cambridge, members of the Executive Committee for two years; and Winslow Blanchard, Blanchard Machine Company, Cambridge, member for one year, to fill the vacancy caused by the election of Mr. Robinson as vice-president. D. F. S. Clark will be reappointed secretary by President Bartlett. The speakers at the banquet following were Mayor George A. Hibbard of Boston; Melville H. Barker, president of the National Association; Henry F. Arnold, president of the New England Foundrymen's Association; George H. Ellis, ex-president of the United Typothetæ of America, and J. H. Cone, assistant secretary of the National Metal Trades Association. A generous entertainment was furnished.

The annual meeting of the Worcester Branch was held at State Mutual Restaurant, Worcester, Mass., with a record breaking attendance. Edward M. Woodward, Powell Planer Company, was elected president; George I. Alden, Norton Company and Norton Grinding Company, vice-president; Charles F. Marble, Curtis & Marble Machine Company, treasurer, and George F. Brooks, Harrington & Richardson Arms Company, Albert E. Newton, Prentice Bros.' Company, and Clarence W. Hobbs, Hobbs Mfg. Company, members of the executive board for a term of two years. Donald Tulloch will be re-elected secretary by the executive board. The annual reports showed the branch to be in a most prosperous condition. George F. Brooks, the retiring president, was the toastmaster at the dinner following, at which the speakers were President Melville H. Barker of the National Association, Edwin E. Bartlett, the newly elected president of the Boston Branch; J. H. Cone, assistant secretary of the National Association, and Frederick Fosdick of Fitchburg.

The second annual meeting of the Cleveland Branch of the National Metal Trades Association was held at the Hollenden Hotel on the evening of March 5. The election of officers resulted as follows: President, George Bartol, Otis Steel Company, Ltd.; vice-president, L. D. Weaning, Variety Iron & Steel Works Company; treasurer, C. J. Snow, Macbeth Iron Company; executive board, Thomas P. Robbins, Cleveland Hardware Company; L. H. Kittredge, Peerless Motor Car Company; A. D. Anderson, V. D. Anderson Company; W. D. Sayle, Cleveland Punch & Shear Works Company, and Fred R. White, Baker Motor Vehicle Company. Philip Frankel will be reappointed secretary at the next meeting of the executive board. A report on the work of the branch during the past year was made by L. H. Kittredge, the retiring president. The report of the treasurer, W. C. Bruce, showed that the financial condition of the branch is very satisfactory, being better than ever before. Secretary Frankel's report showed that eight new members had been added during the year, making the present membership 56. At the banquet which followed, brief addresses were made by C. O. Bartlett, T. P. Robbins, W. D. Sayle, H. H. Hammond, S. P. Orth and others. Henry W. Avery acted as toastmaster. Mr. Bartlett presented the matter of having Cleveland manufacturers unite in sending a representative to South America for the purpose of enlarging their trade in those countries. No action was taken on the matter.

The two blast furnaces under construction at the Ohio works of the Carnegie Steel Company, at Youngstown, Ohio, will be equipped with Cowper two-pass firebrick stoves lined with the design of checker brick patented by Frank C. Roberts, Philadelphia. Five of the six furnaces are furnished with Cowper-Roberts stoves. Including those under construction, there are 20 stoves of this type at these works.

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Revolutionary Political Campaigns.

It has happened more than once in recent time that the American people, either in an important political campaign, or in the thick of some great labor conflict, have gone into a vital economic or social question as though it were new. At such times all that established custom was presumed to have settled and all that years of legislation and administration had grained into the life of the country seem to count for little.

The Presidential campaign of 1892, when tariff reform was made the issue, is one example. The friends of "tariff reform" took nothing for granted, in spite of the splendid industrial development of the 25 years following the Civil War, which the advocates of protection considered to be obviously the fruit of that policy. The discussions in the press and on the stump centered about the question whether or not the proposed change in the national revenue policy would result in a wider distribution of the profits of industry and raise the general scale of living.

The campaign of four years later, when the country was passing through the fourth year of prostration resulting from the panic of 1893, furnished an even more striking example of the ease with which a very large proportion of the American people have occasionally allowed themselves to be persuaded that by a single stroke of legislation many of the ills from which they suffered—not to mention some from which they were not suffering—would be permanently cured. What had been reckoned as established principles underlying our currency laws were brushed aside as though they had never gained a footing. Babes and sucklings in finance went up and down the country speaking as those having authority, and proclaiming in the ears of the people their coming emancipation from the errors and wrongs of years. The remarkable thing about that campaign, as it is now looked back upon, is that so large a percentage of American voters cast their ballots for a proposal which, as is generally admitted to-day, would have plunged the country into financial and industrial chaos.

Six years later came the anthracite strike, and again the country was swept with a wave of economic reform. Property rights in mineral fuel were treated for the time as though the question had just come up for consideration, whether there were any obligation to recognize them. Government seizure of coal mines and their operation "in the interest of the people" was seriously advocated as a solution of the conflict between mine workers and mine owners.

With the presidential campaign of 1908 but a few months ahead, we are in no doubt as to the character of some of the issues that will be raised. Tariff, labor and railroad and other corporation questions, have already been put in the forefront. Government control of trade will be proposed on a scale that may even lead the Socialist party to claim, as another party has been claiming for some time, that its issues have been appropriated by those who are not of it. Starting with the pronouncement that dishonest business methods must be put down, we may expect to find many reformers crying this year for the overturning of the foundations of business. Encouraged to believe in government by denunciation, many who go out to tell the people of their political wrongs and perils may be expected to arouse all the passions that were stirred up in 1896, and that have been appealed to on various occasions since. The doctors of finance who from a thousand platforms taught the people 12 years ago will reappear in 1908 as final authorities on the questions that for years have vexed the best brains in the railroad world. The people will be asked, because there has been moral delinquency in business, to make it harder for railroads and other corporations to carry on business at a profit. Moreover, the issues, as the party platforms define them, will quite certainly be obscured by the conflicting attempts to fasten responsibility for the business slackening that has already brought suffering to so many industrial communities We shall expect the present depression to be urged as a strong reason for tempering the radicalism of some of the legislative programmes. We also look to see this same industrial distress made use of, as in 1896, to lead voters to fly to ills that will be offered to them as panaceas.

Some of the political issues of the coming campaign are new in form of statement, yet they are in fact the reappearance of populistic proposals of other years, that represent the effort to limit the rewards of exceptional talent in the fields of transportation, manufacture and finance. The turmoil attending the discussion of these proposals is not welcomed by business. Yet it cannot be argued that all change is necessarily evil. New issues must be met and the temporary ferment and upheaval are often a necessary preliminary to a better order of things. At the same time the great fear is that change will be mistaken for betterment. Granting that some things need reforming, the cure should not be worse than the disease.

There is one source of encouragement in facing the impending discussion of questions of such vital concern to the vested interests of the country: it is the fact that the American people are not apt to go wrong on questions involving property rights. Mistakes have been made, but when the issues are clearly drawn it has not been possible yet to get a majority for any policy taking away freedom of opportunity or depriving the individual citizen or the corporation of the fruits of honest effort. The saving good sense of the people must yet be depended upon.

The Cultivation of Home Trade.

In the keener search for business that comes with reduced demand, the manufacturer naturally looks over his immediate home market to see if it is developed as it should be. Difficulty is sometimes experienced in so judiciously distributing patronage among local dealers that they may not be inclined to take on a competing line to the detriment of the home product. Some manufacturing houses have heretofore paid little attention to local conditions, so far as their own output is affected.

But influences are now working which are likely to foster a sentiment of reciprocal home relations between lines of business that by their nature are somewhat dependent upon one another. Buyers are paying more attention to the welfare of their neighbors, friendliness playing some part in the change, but to an extent secondary to business considerations.

This, in many cases, is a proposition which is not free from difficulties. The manufacturer using large quantities of supplies can buy more cheaply as a rule in a market that is not confined to the narrower limits of his own section. This is true practically everywhere, excepting in the great cities, the degree varying somewhat in proportion to the population and the nature of the local industries. There is, however, another side of the question. If a manufacturer produces some article of mill supply, for instance, he must expect that the local dealer will be disposed to carry a competing line unless he has an adequate share of the manufacturer's mill supply business. For this reason it not infrequently happens that a customer is put to some trouble to secure a local product, because its maker has not secured the co-operation of the local dealer. It would seem to be an easy matter for the two to get together on an equitable basis, especially in small places where there are no great number of dealers. A chance for some form of association work in a wide variety of lines is suggested by the thought. Perhaps local boards of trade and chambers of commerce and other similar organizations could do fully as much good for their communities in this direction as in others which are attempted. If the condition of working at cross purposes existed everywhere, it would even up the distribution of business to a great extent. But cities and towns are to be found where the most cordial co-operation exists, and the local manufacturers and dealers reap the benefit of their own loyalty, together with the results of the lack of co-operation in other places. And, *vice versa*, those other places suffer in proportion as the loyal community benefits.

Some railroads, it is observed, are beginning to see that it is not always the best economy to buy at the lowest possible price in the open market, if the strict enforcement of such a policy means the purchase of supplies from manufacturers and dealers located on other railroad systems. An important Eastern system has recently made a rule, we are informed, that as far as possible supplies shall be purchased locally—that is to say, in the city or town where they are to be used. There is a chance that the cost to the road may be greater, though there should be some saving in the rehandling of goods that have been delivered to a central warehouse and have to be distributed over the system. But the prosperity of communities dependent upon the road will be enhanced and their purchasing power correspondingly increased.

In the machinery trade complaints of the lack of loyalty between neighbors is no uncommon one. Machine tool men of the same place or section are apt to buy of one another unless they can do materially better elsewhere in price, delivery or excellence of machine. But other users of machine tools sometimes evince almost a prejudice against a home product. It is a case of a prophet without honor in his own country. There may be no good reason for preferring machinery built by neighbors in any direct returns to the buyers. But friendliness results in influences which later may indeed be very important. Some cities are noted for the loyalty of their industries to one another. Other communities are as well known for the tendency in the other direction. The latter condition exists more often in old manufacturing centers than in the newer ones where a broader spirit of co-operation prevails.

A Contemplated Advance in Freight Rates.

Decidedly unusual action is stated to be under discussion by important railroad interests. They propose to advance freight rates, instead of reducing them. It is further reported, and with some show of official sanction, that the national administration will not be averse to an advance of, say, 10 per cent. The attitude of the administration with regard to the maintenance of present rates of wages paid to railroad employees invests this report with plausibility. The fact is now recognized that the decreased earnings, resulting from the diminished volume of traffic, due to the depression in general business, have put many railroad companies in a position requiring something to be done for the purpose of keeping them in solvent condition, to say nothing of giving a little return to those who have made investments in railroad securities. The railroads are being ground between the upper and nether millstones. Their rates are being regulated both by the national administration and State authorities, and under present conditions of business they can only safeguard their earnings through the application of minor economies. They can lay off train crews and put their idle locomotives and cars on side tracks and reduce repairs to the absolute minimum. With no shrinkage in their fixed charges, however, it has become a grave question with numerous railroad companies how to offset continued diminution in gross earnings. The natural and time honored way in which to effect further economy would be through a general reduction in wages. That some movement in this direction is contemplated has been shown by the announcement of proposed reductions by a few railroad companies and by drastic reductions in officers' salaries made by some important systems.

The admonition to railroad companies by the national administration that in the event of reductions in wages the Interstate Commerce Commission would be directed to institute an investigation for the purpose of determining whether such reductions were warranted, shows that the power of the Government is to be exercised to prevent a movement of this character. This is the first time in our history that an effort has been made by the Government to interfere with what would appear to be the natural order of things. It is an attempt to set aside economic laws and introduce a new era.

An advance in freight rates would seem to be the necessary corollary to such a procedure for the purpose of preventing disastrous consequences. It remains to be seen whether this can be made effective. There are numerous branches of industry which have suffered heavily, not only in a reduction in the volume of business, but also in a serious recession in prices. Under such circumstances manufacturers naturally endeavor to reduce their cost of production and are further anxious to effect some saving in the cost of marketing their goods. In previous times of depression struggling manufacturers have turned to the railroads for relief, and have been favored with reductions in freight rates. To manufacturers of pig iron, for instance, these reductions have been exceedingly desirable, as they are obliged to assemble such great quantities of raw materials that even moderate freight reductions have been of high importance. They have also been favored with reductions on the transportation of their product to distant markets. Even now efforts are being

made to secure lower rates on pig iron where long hauls must be made from the furnaces to consumers. If at this time, in spite of securing concessions of this kind, a movement should be made in the other direction, and freight rates advanced, it is easy to see that the regular course of trade will be impeded and operations may be further restricted.

In considering this question, the fact cannot be overlooked that the national administration does not have the field of railroad regulation completely to itself. Many States have railroad commissions clothed with authority to regulate rates on railroads operated wholly within the boundaries of the State. Within the past three months some of these companies have ordered reductions in freight rates, a conspicuous example being the Kansas Commission, which has ordered a reduction of 20 per cent. How an obstruction of this kind could be overcome in case the interstate railroads should make an advance of 10 per cent. does not appear. The situation is one which has numerous complications, and therefore promises interesting developments in case such a policy should be carried into effect.

Eight Hour Bill Hearings.

The Measure Strongly Opposed by Prominent Steel Men.

WASHINGTON, D. C., March 7, 1908.—The House Committee on Labor has just given a series of hearings to the representatives of prominent manufacturing and employing interests on the pending bill forbidding Government contractors or subcontractors from employing their workmen in excess of 8 hr. on Government work in any calendar day. The hearings will continue for another week or so, when the bill will be voted upon first by the subcommittee, which now has it in charge, and then by the full committee. Owing to uncertainty as to the attitude of several members of the committee, the final action on the measure cannot be foreshadowed.

An interesting feature of the past week's hearings was the testimony given by I. Walter Jenks, general manager of the bar division of the Carnegie Steel Company, and A. R. Hunt, general superintendent of the Homestead plant of the same company. Both were before the same committee in 1904 and have since made a very careful investigation with a view to determining whether it would be practicable for the Carnegie Company to accept Government contracts or subcontracts, and have reached the conclusion that steelmakers as a class would refuse all such work, and that the Government would be compelled to build its own plants. Mr. Jenks said:

Testimony of I. Walter Jenks.

I have taken the matter up for careful investigation, and have conferred with at least 50 people in all lines, including mechanics, sub-foremen, superintendents, and so on, up to the president of the company. We have come to the conclusion that we could not possibly meet the conditions of this bill, and we should have to choose between a universal 8-hr. day and declining to bid on Government contracts.

As steel is made at our works, it would be impossible to make a part of our product on an 8-hr. and a part on a 10 or 12-hr. basis. It does not make any difference where you start. If you take the actual making of the steel you cannot divide that. The same is true of the running of the engines. We have cases where one engineer looks after two engines, one of which may be running on Government work for two or three hours while the other is not on such work at all during the day. You cannot subdivide such work on the basis of this bill. Even assuming that your administrative force is exempt, you could not divide the work of the force that would unquestionably come within the operation of the proposed law. Now, the Government buys a great deal of steel, but the amount we supply is only about 3 or 4 per cent. of our output. If we had to take that under this bill there would be an enormous increase in its cost. I am not the executive head of the Carnegie Company, but personally, I would never touch Government work under the conditions it is proposed to prescribe. The competition among steel makers is so keen and the profits so small that no one could afford to meet the difficulties that would arise under this bill.

There is a point I would like to speak about relative to the character of the labor in the steel industry of to-day. I have gathered the impression that these gentlemen around this table believe that a man in a steel works is obliged to work so hard that he can hardly walk home at night. We have no such jobs left in the business. Years and years ago we had one or two positions that were very hard, but to-day such work is done by machinery, and it is simply a matter of pushing a button for an electric crane or something of that sort, and I will guarantee that our men are less tired at night than a girl who works in a department store.

Superintendent Hunt's Statement.

Mr. Hunt said the Homestead plant now employs about 10,000 men, and its output last year was 120,000 tons per month, of which about 3 per cent. was for the Government. Continuing, he said:

In making steel there are three requisites: first, quality; second, quantity, and, third, low cost of manufacture. We are opposed to this compulsory law, first, because we could not make the necessary quality of steel under its provisions. It requires about 12 hours to make a heat of steel in an open-hearth furnace. The work has to be observed very closely, and should you change crews during a heat the new man, not knowing exactly how the furnace is working, would in all probability spoil the metal. After the heat is made it is tapped into a ladle, which is picked up by a crane costing about $25,000. The time of this crane would have to be divided between Government and commercial work, and the man operating it, who is usually high up in a cage, would be required to step out at what might be a very critical moment and give place to another man. Similar difficulties would be encountered in the handling of material intended for a heat where powerful cranes are used.

After the steel reaches the rolling mills it is rolled into a plate and in order to make good material it must be finished by the same roller and crew. If you change these men the chances are that you will spoil the job. It is even more important that there should be no shifts of crews on a single job in the tempering shop, as there the operation is so delicate that no two men could divide the work of supervising it. It would be impossible to overestimate the demoralization that would be brought about by the division of responsibility that would be made necessary by this measure. In the case of two crews making a single heat of steel which came out badly, you could not tell whether the first or the second was to blame and the same is true of practically every other branch of the work.

Would Restrict Output.

We are opposed to this bill in the second place because it would materially reduce our output. More tonnage can be made in 24 hours divided into two shifts of 12 hours than would be possible in three shifts of 8 hours. This has been fully demonstrated in our plate department at the Homestead mills, which were operated on an 8-hr. shift for experimental purposes. We soon changed back to 12 hours, and the output immediately increased 35 or 40 per cent. without the outlay of a single dollar for improvements.

We are also against this measure because of the increase in cost that would ensue. The amount of spoiled material would be very great; the loss of time going off and coming on, and other factors in the operation would entail a very heavy unnecessary expense, which would materially increase the cost of all serviceable material produced.

With regard to the argument that men will do better work on an 8-hr. basis than if working a longer day, I know it to be a fallacy from my own practical experience. I have been a workman, and I know the trials and tribulations of workmen, but I also know that the man working in a steel mill on a 12-hr. turn will do more and better work the last two or three hours of the 12 than he will do in the first two or three or four hours. I do not know that I can fully explain it, but it is due to a sort of getting together, or to a desire to get out of the day's work all there is in it. It is the reason they produce a much heavier tonnage in the last hours of the shift, and this is also true with regard to the night shift.

Scope of Exemptions.

Following Mr. Hunt's statement there was an interesting discussion, participated in by members of the committee and by the attorneys present, with regard to the significance of the exemption contained in the pending bill, which excludes from its operation any article purchaseable in the open market, "even though made to conform to particular specifications." Great diversity of opinion was developed, and it now appears either that the exemption is valueless or that it is so broad as to render the proposed law an absolute dead letter, for the

reason that it is possible to buy in the open market articles similar to practically everything which the Government is required to purchase. Inasmuch as steel material of all kinds, vessels, guns, &c., of comparatively small size may be bought in the open market, it seems to follow that all such articles, "even though made to conform to particular specifications," are entitled to exemption, and that this would cover even a battleship or a rifle of the largest caliber. The question serves as an excellent illustration of the vague character of many of the most important provisions of the pending bill.

The committee is in receipt of a request from the New York Metal Trades Association that its representatives may be heard in opposition to the bill, and will give them a day the coming week. Upon the conclusion of the hearing two or three days will be devoted to arguments by the attorneys for the principal industries affected by the pending measure. It is therefore unlikely that a final vote will be taken on the bill before March 20.

W. L. C.

Canadian Industrial Bonuses.

An attempt is being made at this winter's session of the Ontario Legislature to prohibit municipalities in that province from giving bonuses and tax exemptions to new industrial undertakings. This is the second time within 10 years that an effort has been made to this end. The last was in the session of 1900, when the late Andrew Pattullo, editor of the *Sentinel Review* of Woodstock and member for North Oxford, introduced a bill much on the lines of that which J. P. Downey, member for North Wellington, has submitted to the present Legislature.

The Evils of Bonuses.

When Mr. Pattullo asked the Legislature to give a second reading to his bill he went over the 95 Ontario municipalities which up to 1900 had given bonuses or other largesse to industries. He showed that more than one-third of the bonused industries had failed, and insisted that bonuses usually represented the pitiable efforts of decaying towns, decaying industries and decaying men. Bonuses went to those who did not need them, to those who were going down in the industrial race, or to adventurers who were ready to gamble on success with the money of the municipalities.

He characterized the system of bonusing as a fruitful source of municipal corruption, and maintained that voters at municipal elections were bribed with their own money to support bonus by-laws. He showed that there was no precedent for bonusing industries in the history of British municipalities; that 30 of the American States, by clauses in their constitutions, prohibited municipal largesse to industry; and argued that the system as it had developed in Ontario was particularly hard on labor, which was compelled to move from place to place when one municipality outbid another in voting bonuses to an industry. The province was industrially prosperous in 1900, and Mr. Pattullo pleaded that an end could best be made to the system when times were good.

A Liberal government was then in power and it gave no support to the Pattullo bill. It was opposed by Mr. Whitney, then leader of the Conservative opposition, now Premier of Ontario. The bill for prohibiting bonusing accordingly failed to become law; and since that time the system of bonuses, municipal loans and other largesse to industry has been more rampant than at any time in the industrial history of Ontario.

The Bonus System Older Than the Protective Policy.

It is sometimes claimed that the system grew out of the national policy adopted by Macdonald and the Conservatives in 1879. But as a matter of fact it is older than that policy. It was in existence before Macdonald in 1876 committed the Conservative party in Dominion politics to protection, for in that year, while Macdonald and the Conservatives were still in opposition at Ottawa, Macdonald directed the attention of the House of Commons to the bonus system in Ontario, and cited it as a proof that the people of Canada were ready to make sacrifices for the upbuilding of Canadian industries. Since then the Ontario system has been adopted in one form or another in the provinces of Quebec, Nova Scotia and New Brunswick.

Of over 140 American industrial firms—most of them in the iron and steel industry—now established in Canada—many have been recipients of municipal largesse. To go no further back than 1907, Chatham, Ont., voted a municipal loan of $20,000 to a brass goods concern from Grand Rapids; Sarnia voted a $12,000 bonus to a chain company of Pittsburgh, and a loan of $12,000 to the Jenks-Dresser Bridge Company; Stratford undertook to guarantee $30,000 of the bonds of a Bradford, Pa., cutlery company; Parry Sound raised a loan of $100,000 for promoters connected with a smelting company which had its headquarters in the United States; and as recently as February 24, 1908, Campbellford, Ont., gave a free site and 10 years' exemption from taxation to a group of American promoters who are about to install a $60,000 rolling mill. Lachine, near Montreal, stands ready to-day with a bonus of $50,000 for the Imperial Locomotive & Machine Company, an English concern, and has also pledged itself to exempt the company's plant from municipal taxation for 20 years; and Fort William, Ont., in 1907, voted $68,000 to purchase industrial sites, one of which was assigned to the Imperial Steel & Wire Company.

Competition of Municipalities for New Industries.

In Ontario the system of bonusing and granting tax exemptions has become so common with the smaller municipalities, that no sooner does an industrial promoter appear on the scene than the municipal authorities crowd on him at his hotel with offers of largesse. By setting one municipality in competition with another, he can get practically anything he wants in the way of free sites, free water, free power and tax exemptions. Many Ontario municipalities have thus for a time propped up industries that under normal conditions could not be made to succeed in the localities where they were established.

On Collingwood Harbor, on Georgian Bay, there are to-day an open hearth plant and a rolling mill which constitute a somber monument to the system against which Mr. Downey's bill now before the Ontario Legislature is aimed. The output of the plant was just sufficient to secure for its promoters the large bonus voted by the municipality of Collingwood. But this comprised practically the whole of the output, and the plant, which was transferred from Indiana to Collingwood, has for 12 months been idle and unproductive. The cities of Toronto, Hamilton and London would like to see an end of the municipal largesse system. It is the votes of the representatives of the smaller communities which will endanger Mr. Downey's bill in the Legislature.

E. P.

Scottdale Sheet Works Improvements.—The American Sheet & Tin Plate Company, Pittsburgh, has started its Scottdale Works at Scottdale, Pa., which shut down last August for the purpose of erecting a new building and making some extensive improvements. The original mill was a frame structure, erected in 1872, but it was torn down last summer. Since that time a new steel frame building has been erected to take the place of the old one, a new annealing building erected, and a large galvanizing plant built, all the buildings being of steel frame with galvanized sides and roofs. They are fitted with modern appliances for annealing and galvanizing sheets, and a system of electric cranes will convey the material to all parts of the buildings, from the time it enters on the east side in sheet bars until it is ready to be loaded on the west side of the plant in the form of galvanized and corrugated sheets.

The New York Shipbuilding Company, Camden, N. J., launched successfully February 29 the steamship Oklahoma, the largest bulk carrier of oil ever built in this vicinity. The vessel is being built for the J. M. Guffey Petroleum Company, to ply between the Gulf and Northern ports. The length over all is 441 ft., width 55 ft., and depth 21 ft. It will be equipped with compound engines developing 3200 hp., three boilers fired with oil fuel and will have a carrying capacity of 2,100,000 gal. of oil.

Foundry Waste.*

BY DR. RICHARD MOLDENKE, WATCHUNG, N. J.

In these times of serious industrial depression perhaps no subject should receive greater attention than the prevention of waste. In the rush of the high periods of our national prosperity all too often the maxim is forgotten that "waste makes want." In view of the present attempt to hold up the natural laws of supply and demand, we will undoubtedly have ample opportunity to take stock of the situation and to apply every possible remedy in our foundry establishments until material and labor come down to normal conditions. As this eventuality may be considered a foregone conclusion, now is the time to plan improvements to do away with wasteful methods of manufacture. When the low level has been reached these improvements should be completed, so that when the next rush comes conditions nearer the ideal as we now know it may prevail and our prosperity be correspondingly enhanced.

Let me say at the outset that genuine improvements do not necessarily mean a cutting down of the wages of employees, but rather the opposite. Brains are worth money, but manual labor should be turned over to the coal pile as much as possible. The time is fast approaching when our knowledge of methods and materials will be such that what was formerly considered an art will be so simplified that men with less skill, operating on machines, will turn out as good if not a better product than is the case to-day. This will not hurt the present supply of highly skilled men, but rather enable them to turn their art to better account in higher positions.

Buried Wealth in Foundries.

In passing through many foundries I have often been tempted, on seeing the end of a lump of iron stick out from behind a lot of rubbish in a corner, to take a silver dollar from my pocket and ask the foundry foreman to throw it in there also. The point is generally quickly understood, for there are several good dollars, even if in iron and not silver, lying idle and destined to be buried or lost in some other way. While in Pittsburgh in my earlier days I usually had some 50 lb. of dynamite on hand for use in blowing up salamanders as they were unearthed in the foundry in making changes in the plant. From what one hears of the burial of accidents and mistakes in that city, its manufacturing districts must be veritable mines for salamanders and bad castings. This is the case doubtless in other cities, and yet every bit of that material should go into the cupola or basic steel furnace. In short, the foundry foreman working in the interests of his employers can save quite a lot of waste in iron in the course of a year. Every foundry of any account should have an electro-magnetic separator for the shot made, as well as a slag barrel for the same purpose. I have known these separators to pay for themselves in three months, and saw one some time ago set up on the dumping pile of the foundry waste which was paying handsomely in iron recovered.

Who has not gone through the matter of saving the unburned portion of the cores used in the foundry and profited thereby? How many foundrymen will allow their foremen to experiment with binders and mixtures until the proper one is found giving the greatest satisfaction at the least cost? Yet unless this is done for every new set of conditions arising there is a positive waste.

Economical Arrangement and Equipment.

To take up the subject systematically we must first start with the general layout. If the means of communication in the foundry or manufacturing establishment are not at once simple and effective no time should be lost to make them so, even if walls have to be cut with a general rearrangement of the departments. This can be accomplished slowly and without disturbing conditions of work too seriously. Next proper light and ventilation should be provided. There should be no dark corners nor too convenient gates. An electric light plant of ample capacity is a good investment. The use of torches and dirty windows is waste. Heavy smoke induces cessation of work that has money value. Means should be provided to carry iron to every point in the foundry without breaking down men. In the larger shops small jib cranes save money in allowing a molder to handle his own work without disturbing every one near him. All this comes under the head of equipment, which makes the first cost of the foundry higher, but saves labor and thereby money. We could add to this air equipment for chipping, molding, cleaning and what not. These things you know of and many installations can be bought on terms which practically allow them to pay for themselves. In such a case never hesitate to add them to the shop.

Molding Sand and Molding Machines.

Perhaps the one thing to which the least attention is given is the molding sand and molding problem. Probably it is thought we can learn little more in these directions, but this is a serious mistake. We of all countries are farthest behind in the matter of preparing our molding sand. It is still too cheap. We sometimes buy ground sand because we think we are getting a better material, and yet find roots and soil in it. I venture to say that no foundry foreman is entirely satisfied with his sand. He would always like to have it better. Now, this is no fault of the sand man, for he gives his best. He even mixes and treats it for his customers so that they have the best possible chance for fine castings. The trouble is that we do not yet know enough about the physical constitution of a molding sand to give it the proper treatment. The ideal conditions are those in which any amount of pounding will not prevent proper venting, and yet the sand must be able to bond properly. At the same time it must be refractory to a high degree and stand repeated applications of melted metal without spoiling too much of it. The American Foundrymen's Association is giving considerable attention to this matter from the standpoint of the art of founding, leaving the practical application to the individual.

The greatest elimination of foundry waste ever brought about was through the introduction of the molding machine. Perfect as these machines are becoming, 50 years from now we will think those of to-day crude. Think for a moment how the success of a molding machine is tied up with the sand used on it. Correct this element of uncertainty and a further step in the direction of the elimination of waste will have been taken.

Loss of Castings Through Ignorance.

The next greatest waste in the foundry is the loss through ignorance of the molder's art. The discount and time cards speak for this. What is badly needed is instruction day in and day out to the men engaged in molding, coremaking and other occupations requiring skill. The foreman has his hands full with the larger questions. He cannot go into the small details, and yet from neglect of these the waste is great. The old custom of piling up the molder's bad castings for inspection at dinner time is a good one, but still better is an interview with him at his bench or floor by an expert specially engaged to do this under the foreman's direction. How many of our larger shops have this in operation?

In the larger classes of work, the loss of pieces is small, but the time taken for molding is great. How often this could be cut down effectively by proper appliances. For small castings the usual custom is to pay by the piece, with perhaps a premium attached for extra efficiency. But how many bad castings are made which could have been saved by proper instruction, not to speak of the greater output per flask if the mixing and melting of the metal were made more perfect.

One of the most notable improvements I have seen in recent years is the desire on the part of foundry foremen and superintendents to acquire every scrap of information it is possible to get hold of. They have realized the importance of this far more quickly than their employers, and therein really lies the hope for future improvement in the industry. The foreman of to-day is just as able to calculate out a mixture as the chemist. He may not yet understand the action of the elements completely, but with the aid of night schools, by reading and asking questions, he will soon get all that he re-

* A paper read at the convention of the Chicago Foundry Foremen's Association, March 5, 1908.

quires. The general movement for industrial education is not only the result of effort on the part of the employer, but also the willing acceptance of the idea by those who will eventually profit by it.

Waste in Melting.

Taking more particularly the metallurgical end of the foundry, we find a direct waste in improper melting methods. How often have I found a 2000-lb. charge consisting of the usual pig irons and scrap, and a 500-lb ladle to tap into. And then there was worry about porous or otherwise defective castings. To come right down to a question of daily practice: Inasmuch as the bed of a cupola coke charge is fixed by the desired capacity to hold iron and by the location of the melting zone (only the coke above the tuyeres being effective and the rest only so much filling to cool the iron rather than heat it) why is the first charge of iron used made so heavy? The melting of this lowers the coke bed seriously and the second charge of coke does not bring it back to the place it had originally. Now as the iron and the coke come down in the succeeding charges this level may be raised again, even above the original bed, with the result that often the last coke charges must be reduced to get proper results. A much better practice would seem to be to make all the iron charges small, the first as well as the last, dividing the coke so that the proper ratio is kept for the whole run. This gives the smallest variation of the coke bed and, as I have always found, the most uniform iron. After all, it would seem that our old foundrymen were not so far off when they first put in their bed of anthracite, then charged so many shovels of scrap, so many pigs, then some more anthracite, then metal again, all in very small quantities. They did make castings that are our admiration for quality to-day, though we consider the melting method crude. I will only say that with even large diameter cupolas, where the work has to stand water pressure tests, and hence must be perfectly uniform in character, besides correct in composition, the above method of very small charges of 500 lb. of metal and the corresponding coke directly from the bed up gives excellent results where the old big charge method fails.

Now in cupola practice saving is in most cases waste. I strongly deprecate the attempt to get high melting ratios. The few pounds of coke saved always mean trouble in other directions. As long as the first iron shows from 7 to 10 min. after the wind is put on, and the iron does not come too slow or hot at the end, it is better not to tamper with the coke ratio of the cupola in question. Similarly to attempt to save 25 cents a ton in the mixture and increase the percentage of discards or the cost of machinery is a waste. Buying high silicon iron to mix with plow points may work all right, but usually means waste until handled right. Far better, if hard and soft irons are to be made in a day's run, to use high grade ferrosilicon in the ladle.

It is incumbent on every foundryman to study his problem carefully, working hand in hand with his foremen, and making change after change on careful deliberation. Eternal vigilance is the price of financial success, and with safeguards placed about every process used, details put into responsible and intelligent hands, the supervision of a plant becomes a pleasure instead of a burden.

Haniel & Lueg, Duesseldorf, Germany, state that an inaccuracy occurred in an item printed in *The Iron Age* of February 6, saying that the Krupp Works at Essen had ordered a 4000-ton hydraulic forging press from Davy Brothers, Ltd., Sheffield, England, the latter firm receiving the contract in competition with German manufacturers. The facts are as follows: Some short time before the above mentioned contract was arranged the Krupp Works had placed a contract with Haniel & Lueg for the supply of a 4000-ton steam hydraulic press to make gun barrels, &c. As the Krupp Works desired two such presses, it ordered the second one from Davy Brothers, who, to receive the order, were compelled to meet the requirements of the Krupp Works and adopt the specified German press principle, namely, steam and hydraulically driven.

Connecticut River Power Projects.

Two great projects for developing the water power of the Connecticut River are being formulated. One is that of a new corporation known as the French-King Rapids Power Company, which is seeking rights from the Massachusetts Legislature to build a dam five miles above Turner's Falls, with the purpose of distributing power in Worcester County. The incorporators named are Philip Young, Henry I. Harriman and Joseph O. Proctor, Jr., representing the same interests that have already begun the development of large power projects on the Connecticut River at Hinsdale, N. H., and Vernon, Vt. Strong opposition is presented by the Turner's Falls Company, which controls large water power at that place.

The second project is that of residents of Springfield, Mass., to build a dam just above Windsor Locks, Conn., with the purpose of developing power and at the same time co-operating with the plan to create a navigable channel to Springfield. This is a matter for the Federal Government to decide, and the question is being given serious consideration by Congressman Lawrence of Massachusetts.

The construction of a dam across the Connecticut at Brattleboro, Vt., is now well under way. By means of the dam it is proposed to distribute the electric power within a radius including parts of three States. Now that the plan to utilize the power has materialized the work is being rushed to completion by a force of 450 men working day and night. The cost of the dam will be more than $1,000,000. The electric power developed will be 16,500 hp., and the rights at the French King Rapids, 14 miles south of the present site, have been acquired, where an auxiliary dam will be constructed if a petition for a charter, now before the Massachusetts Legislature is granted. This would materially increase the available power.

The Alabama Consolidated Coal & Iron Company's Finances.

The Alabama Consolidated Coal & Iron Company will ask its preferred stockholders to exchange their shares for third mortgage 5 per cent. bonds. It is proposed to issue $1,750,000 of the bonds and to offer to exchange them for preferred stock on a basis of par for par, provided the preferred stockholders subscribed to an amount of the bonds equal to 20 per cent. of their stock holdings at 70. This plan, if availed of by the preferred stockholders, will work out as follows:

Bonds exchanged for stock	$1,250,000
Bonds subscribed for	250,000
Bonds left in treasury for future requirements	250,000
Total	$1,750,000

It is proposed to pay the preferred stock dividend to February 1 to those accepting the proposition. The bonds are to be dated February 1. The preferred stock is entitled to dividends of 7 per cent. a year, but the last quarterly dividend was not paid. It was earned several times over, but because of bad collections payment was deferred.

The Baltimore Bridge Company, Baltimore, Md., has recently taken several contracts for bridge and building work, and now has enough orders on hand to enable it to operate its plant at two-thirds capacity for the next three months. One of the orders recently taken by this company was for a bridge to be erected in Panama for the United Fruit Company. This will have a main cantilever span of 500 ft., and takes about 1200 tons of steel. This company is now erecting a bridge of about the same size across the Changuinolo River, in the same country.

Estimates of the American Railway Association show that the surplus of idle cars, from being 343,000 on February 5 and 320,000 on February 19, was below 300,000 on March 1, and it is officially stated that the number was reduced in still greater ratio in the first 10 days of March.

The Coal Movement Increasing.

BY F. E. SAWARD, NEW YORK.

The coal movement continues to increase, as there is an awakening of industrial conditions. The chief index in the Eastern section is the report of the Pennsylvania Railroad, which now shows a reduction of less than 16 per cent. of soft coal carried, as against the corresponding time last year. There is now grave prospect of a suspension of production after April 1 in the central producing districts, and many operators would welcome the stoppage of mining for a month, in order to help use up the supplies on hand with their customers, as well as the stocks held on their own account. Events in the past week in reference to the Bituminous wage agreement resolve themselves into three chief happenings: 1. The failure of the Illinois operators and miners to reach a preliminary understanding. 2. The adjournment of the Interstate conference at Indianapolis without calling a joint convention. 3. The summoning of a miners' national convention in extraordinary session for March 12.

At tidewater soft coal continues to show a gradual picking up. There is a better demand for the higher grades, and there is less heard of the cheaper grades. The shippers of the lower grades have discontinued sending them forward for the present, and business is turning to the better qualities, making a fairly good market for them, but at what would ordinarily be termed low prices. The demand, however, outside of contract business, is almost entirely local, the Eastern market still remaining dull and very little coal being sold in that direction. New England requirements seem to be confined to contract business. The railroads are taking what they can, but a large volume of their requirements has been cut off for the time being. New orders are scarce, and, so far, there has been nothing like the usual volume of contract business closed. This is being delayed much later than ordinarily. The Sound trade is nearly as bad as further east. There is a little better demand in this section, all wanting high grades of coal as cheap as possible.

Philadelphia line business is fairly good, and prices are about on a par with those prevailing in the usual summer. Tidewater business is not heavy, the bulk of the coal going on export or Southern business, outside of the Eastern contracts, and deliveries on those are light. Shipments from Baltimore are heavy, as compared with other ports, a great deal going to the Eastern market on contract orders. It is almost impossible to sell spot coal standing at the piers at that port, all shippers having all of their own grades required.

As to Anthracite steam coals, it may be said that pea coal is still short as ever, and is commanding good prices for that available. The restriction has had its natural effect on this size, and has made the shortage more pronounced during the past few weeks. The advance made some months ago by the various companies has been maintained for the coming year, and will no doubt be held firm. Buckwheat is also short, and prices on the cheaper grades have advanced somewhat in consequence. This size is short with practically all of the companies, and if the demand was as strong as usual at this season this feature would be much more pronounced. Rice is also scarce. Prices are better as a result, but no material advance has as yet taken place. Very little is coming forward on account of the heavy pumping being done by all of the companies in the Lehigh and Schuylkill regions. Shippers formerly using barley under their boilers have been compelled recently to use all of their barley, most of the rice and in many cases a large quantity of buckwheat for this purpose. As a result, but a small quantity is available for the market, making it particularly short at present. Barley is short, but not feeling the effect of its scarcity to as great an extent as the other of the small sizes. This is mainly due to the small general demand for it, next, that most consumers have considerable in storage, and, last, that most of this size comes from the Wyoming District, where the operators are not having the water trouble to anything like the extent that is troubling the other districts.

Prices at New York ports are about as follows:

Georges Creek	$3.25 to $3.55
High grade three-quarter lump	3.10 to 3.15
High grade gas, run of mine	2.90 to 2.10
Best Miller vein coals	2.75 to 2.85
Good Miller and Moshannon	2.60 to 2.70
Best Somerset	2.70 to 2.80
Ordinary Somerset	2.60 to 2.70
Fairmont, three-quarter	2.65 to 2.70
Fairmont, run of mine	2.80 to 2.90
Odds and ends to believe embargoes, &c	2.40 to 2.50

Line Bituminous rates are as follows:

Pennsylvania Railroad Coals.

Georges Creek	$1.[illegible] to $1.80
Best Miller vein	1.25 to 1.30
Good Miller and Moshannon	1.[illegible] to 1.25
Best gas coal, three-quarter lump	1.30 to 1.40
Best gas coal, run of mine	1.20 to 1.30
Best gas coal, slack	.75 to .85
Ordinary Clearfield	1.00 to 1.10
Ordinary Latrobe	.90 to 1.00

Baltimore & Ohio Coals.

Georges Creek	$1.60 to $1.80
Best Somerset	1.15 to 1.20
Somerset	1.05 to 1.10
West Virginia Freeport	1.00 to 1.10
Fairmont District, three-quarter lump	1.00 to 1.10
Fairmont District, run of mine	.90 to 1.00
Fairmont District, slack	.65 to .75

PERSONAL.

J. W. Scull, formerly purchasing agent of the Pressed Steel Car Company, Pittsburgh, has resigned to accept the position of manager of the Pittsburgh office of the Summit Lumber Company, St. Louis, located in room 509, People's Bank Building, Pittsburgh.

Theodore Geissmann & Co., Commercial National Bank Building, Chicago, have appointed D. S. Hunter manager of their Minneapolis office, having in charge the firm's interests in the Northwest.

Charles H. Gifford, Dedham, Mass., has resigned his position as assistant general manager of the B. F. Sturtevant Company, Hyde Park, Mass. E. B. Freeman, who was formerly general sales manager of the company, has been made assistant general manager.

Henry R. Towne, president of the Yale & Towne Mfg. Company, has been elected president of the Merchants' Association of New York.

Vincent Callaghan, who has been employed by the Frick Coke Company in sinking a shaft at its Standard Works, has been appointed superintendent of the Oliphant Works in the Connellsville region.

J. W. Duntley, president of the Chicago Pneumatic Tool Company, returned to New York this week from Europe.

Joseph Wharton, Philadelphia, celebrated his eighty-second birthday anniversary on March 3. Mr. Wharton is still confined to his home.

George Shook, superintendent of Hannah Furnace of the Republic Iron & Steel Company, Youngstown, Ohio, has been made superintendent of the Haselton furnaces of the company, succeeding William Fair, resigned.

The Youngstown Sheet & Tube Company Buys the Morgan Spring Company at Struthers, Ohio.

After negotiations extending over several months, the Youngstown Sheet & Tube Company, Youngstown, Ohio, has purchased the plant of the Morgan Spring Company at Struthers, Ohio, and it will be turned over to the former on March 16, and will be operated by the new owner after that date. This purchase does not in any way affect the plant of the Morgan Spring Company at Worcester, Mass. The Struthers plant consists of quite a large acreage of very desirable land, practically adjoining the property of the Youngstown Sheet & Tube Company at East Youngstown, and comprises one continuous Morgan rod mill, a wire drawing plant and a wire nail factory.

The purchaser will at once proceed to double strand the rod mill, thereby doubling the capacity, and will also double the product of the wire drawing plant and wire nail factory, which will give an output of 8000 to 10,000 tons of wire products per month. The sale of this product after March 16 will be handled from the Youngstown offices of the Youngstown Sheet & Tube Company and its regular authorized agents at other points. Its present sales organization will be considerably enlarged to take care of the details of this new line of business, and also of its greatly increased pipe production, due to the erection of a number of additional pipe furnaces now under way.

Reports that the Youngstown Sheet & Tube Company is negotiating for the purchase of Mary Furnace of the Ohio Iron & Steel Company, Lowellville, Ohio, are absolutely untrue.

OBITUARY.

CHARLES STODDARD CHAPIN, Worcester, Mass., until recently treasurer and manager of the Washburn & Garfield Mfg. Company of that city, died March 3, aged 67 years. He was a native of Enfield, Mass. His earlier business experience was with a dry goods house, but for many years he was connected with the Washburn & Garfield Company, jobber and manufacturer of steam heating and plumbing supplies. He was a member of the firm for many years before its incorporation, and was its treasurer until his retirement on account of poor health a year ago. He served in the Civil War in the 60th Massachusetts Infantry, was for years quartermaster of the Third Brigade of Massachusetts Militia, for two years president of the Worcester County Mechanics' Association, former president of the Commonwealth Club, member of the Worcester Board of Trade and member of a number of social and fraternal organizations. He leaves one daughter.

JUSTUS A. TRAUT, New Britain, Conn., long prominently identified with the rule department of the Stanley Rule & Level Company, and president of the Traut & Hine Company of the same city, died suddenly March 9. He was born in 1840 at Potsdam, Germany. The father was an inventor, and his genius was inherited by the son, for from his brain came hundreds of useful inventions, some of them very important. As a boy he entered the employ of the Stanley Rule & Level Company under his father, F. A. Traut, who founded what is known as the Traut department of the great factory, and at the death of the elder, the son assumed charge of that branch of the business. In June, 1904, there was celebrated the fiftieth anniversary of his connection with the company. He was a director of the New Britain National Bank, was instrumental in the founding of the New Britain Hospital, was a member of the New Britain Club and was president of the Country Club of Farmington, Conn. He leaves a widow and two sons—George W. Traut, treasurer of the Traut & Hine Company, and Frank L. Traut, who was associated with his father in the works of the Stanley Rule & Level Company.

GUSTAV MAWITZ WESTMAN, who came to this country from Sweden in 1877, died in New York City, March 6, aged 73 years. He was graduated in chemistry from the Upsala University, and attained distinction in the Russian iron and steel trade, introducing original processes. A recent invention of his covered a process for the manufacture of wrought iron from iron ore.

NEWS OF THE WORKS.

Iron and Steel.

The rod mill at the plant of the Page Woven Wire Fence Company at Monessen, Pa., which has been running on half time or less, is expected to run practically full during March. While all departments of this plant are in operation they are not running to quite full capacity, but the outlook for the future is regarded as fairly encouraging.

It is authentically reported that the Woodstock Iron & Steel Corporation will rebuild its furnace at Anniston, Ala., now idle, at an approximate cost of $200,000. One furnace at the Anniston plant is in operation.

The Rothert Steel Company, Hoquiam, Wash., has been incorporated with a capital stock of $100,000, and will engage in the manufacture of crucible steel. The incorporators are E. H. Rothert, R. E. Arthaud and Howard Cox.

The Vulcan Crucible Steel Company of Pittsburgh, with offices and works at Aliquippa, Pa., manufacturer of high grade tool steels, is installing additional boiler capacity and making other extensions to its plant, which will largely increase its output.

The National Tube Company, McKeesport, Pa., has received some fairly large orders for Shelby steel tubing from the Isthmian Canal Commission.

General Machinery.

The Reineke-Wagner Pump & Supply Company, Pittsburgh, has received an order for two 12 x 10 in. and three 7 x 8 in. Goulds triplex pumps for the Woodward Iron & Steel Company, Woodward, Ala., which company also ordered from the General Electric Company, through George R. Wood, two 30-hp. and three 6-hp. induction motors. The Reineke-Wagner Company has recently received the following orders: 9 x 4 in. triplex pump for the Mack Mfg. Company, New Cumberland, W. Va.; 9 x 12 in. triplex pump, Atlantic Turpentine Company, Mt. Pleasant, Ga.; 5 x 6 in. triplex pump, Shawmut Mining Company, St. Marys, Pa.; 7 x 8 in. triplex pump, American Sewer Pipe Company, Barberton, Ohio, plant; 4 x 6 in. triplex pump, National Metal Moulding Company, Economy, Pa.; 3 x 4 in. triplex pump, United States Sewer Pipe Company, White Oak, Pa. The company has just shipped a 10 x 12 in. electric pump and an 8 x 10 in. boiler feed pump to the Diamond Rubber Company, Akron, Ohio, and two 5 x 6 in. triplex pumps to the Monongahela River Consolidated Coal & Coke Company.

The Barnes Mfg. Company, Lanesboro, Pa., manufacturer of mill and quarry machinery, steam engines, turbine water wheels, &c., is enlarging the capacity of its plant and increasing the scope of its business. Within the past few weeks it has purchased the stock and equipment of the Alston Stone Machine Company, Endicott, Pa., including Garvin millers, lathes, radial and post drills, presses, shapers, bolt machine, boring mill, slotter, and emery and tool grinders, which will be added to the present equipment. A Pelton water wheel and a new generator have also been installed. In addition to its present production it will manufacture the Alston stone sawing machines, which have an extensive sale in this country, England, Canada and Germany.

The capital stock of the Leader Iron Works, Decatur, Ill., has been increased from $75,000 to $100,000. This action is preliminary to the execution of plans now in contemplation for the extension of its plant necessary to take care of its increasing business.

Power Plant Equipment.

The Crown Cork & Seal Company, Baltimore, Md., has purchased the following equipment for the new extension to its power house: One 450-hp. Harrisburg engine, one 300-kw. Crocker-Wheeler generator, direct connected to engine; one 100-kw. Crocker-Wheeler motor generator set and one eight-panel switchboard.

The Board of Control of Winnipeg, Man., will receive bids until March 24 for a 2,500,000-gal. turbine pump with motor for the city water works.

For the purpose of furnishing power to pump water for the irrigation of a tract of 15,000 acres located in the Stone Corrall country, the San Joaquin Light & Power Company contemplates the extension of its transmission lines into that territory for a distance of about 21 miles. In submitting this information A. G. Wishon, manager of the company, states that a substation will also be located about 16 miles from Dinuba, near the Docker Place.

The Hillsboro Light & Power Company, Hillsboro, Wis., has been incorporated, with a capital stock of $10,000. Rollin F. Myers is president; O. J. Kauffman, secretary.

The town of Lamoni, Iowa, has under consideration a proposition to establish a municipal water works system, the estimated cost of which is $25,000. The matter will be determined at an election to be held during the present month. The engineers in charge are W. K. Palmer & Co., Kansas City, Mo.

Plans and specifications are in course of preparation for a municipal electric light plant for Farmington, Mo., the cost of which is estimated at $25,000. It is expected that plans will be completed and submitted for bids about April 1. The engineer in charge of this work is Thomas B. Carter.

A. E. Stein writes that the Rocky River Water, Light & Power Company, Rocky River, Ohio, of which he is superintendent, contemplates the installation of new dynamos in its plant for the purpose of lighting the town.

It is stated by Paul Smyly, secretary-treasurer of the Two Republics Mining Company, Jerome, Yavapai County, Ariz., that the company will install an electric plant early in the summer to run drills and pump air in the tunnel. There is a water head of 15 hp. on the property, which will be utilized for the generation of motive power. Work is in progress on a 700-ft. tunnel, 6 x 4½ ft. in the clear, and in the near future 1200 ft. will be driven, which will tap the ledge at about 1000 ft. in depth.

The Philadelphia Compress Company, Philadelphia, Miss., has in contemplation the erection of an electric light plant, plans for which are being prepared.

The Mineral Railroad Company, the Street Railway Company and the plant of the Industrial Electric Company, Chihuahua, Mexico, have been taken over by and merged into the Campañía Eléctrica y de Ferrocarriles de Chihuahua, S. A., which has been organized with a capital of $2,200,000. It is the purpose of the new company to convert the Mineral Railroad from a steam to an electric line, and also to operate all of the city lines by electricity. A plant with a capacity to serve these companies and furnish current for lighting will be built. The president of the company is Enrique C. Creel; general manager, A. C. Nash.

F. R. Chinnock of the electrical department of the New York office of the B. F. Sturtevant Company reports as follows some recent sales of electrical generating sets, consisting of engines and directly connected generators, both of the hori-

zontal and vertical type: Board of Water Supply, Babylon, N. Y., 9 x 8 in. vertical center crank engine, standard slow speed 25-kw. generator; Federal Ice Company, Newark, N. J., 9 x 8 in. vertical engine, 30-kw. generator; Thompson-Starret Company, New York, 8 x 8 in. vertical engine, 25-kw. generator; Eberhard Faber Pencil Company, Brooklyn, N. Y., 16 x 14 in. horizontal engine, 100-kw. generator; American Can Company, Lubec, Maine, 9 x 12 in. horizontal engine, 40-kw. generator; Williams-Balfour Company, New York, for Callao, 13 x 12 in. horizontal engine, maximum English dynamo; New York Steam Company, New York, 8 x 8 in. vertical engine, 25-kw. generator; Andrew McLean Company, Passaic, N. J., 6 x 6 in. vertical engine.

The Parker Boiler Company, Philadelphia, Pa., has recently sold the Quincy Mining Company, Hancock, Mich., three 234-hp. boilers; City Laundry Company, Pueblo, Colo., one 116-hp. boiler; Hawaiian Pineapple Company, Honolulu, T. H., two 122-hp. boilers.

Bridges and Buildings.

The Riverside Bridge Company, Martins Ferry, Ohio, has a fair amount of work on hand, including the steel for the new McFadden business block, Wheeling; a gas producer for the Tyler Tube & Pipe Company, Washington, Pa., and 1500 ft. of steel trestle connecting this plant with the Baltimore & Ohio Railroad; some large additions to the plant of the Whitaker Iron Company, Wheeling, and several highway bridges in West Virginia, Ohio and Maryland.

Fires.

The blacksmith and machine shops of the Golden Cycle Mill, Victor, Colo., were destroyed by fire February 29, the loss being about $10,000.

The Southern Stove Works, Evansville, Ind., suffered a $25,000 loss by fire at its plant.

On March 8 the washing plant of the Dominion Coal Company at Port Morier, N. S., was destroyed by fire, the loss being about $100,000.

Foundries.

The A. Moresi Company, Ltd., Jeanerette, La., has been making some improvements in its foundry, including a building 83 x 115 ft., supplied with three cupolas, having a melting capacity of 40,000 lb. per hour.

The Ardmore Foundry, Machine & Bridge Company, Ardmore, Okla., whose present plant consists of one building, 100 x 200 ft., is planning the erection of an extension thereto, work upon which will probably be begun about May.

The Galesburg Malleable Casting Company, Galesburg, Ill., has increased its capital stock from $60,000 to $100,000.

Hardware.

The Miller Mfg. Company, Monroe, Wis., has been incorporated with a capital of $30,000 and will erect a plant for the manufacture of buggies, harness and a number of patent specialties. The initial building will consist of a four-story and basement building. The incorporators are Fred. Miller, Percey Holloway and J. C. Cilium.

Miscellaneous.

The Parkersburg Mill Company, Parkersburg, W. Va., manufacturer and dealer in poplar and oak lumber, interior finish, brush handles, blocks, &c., whose plant was destroyed by fire December 18, 1907, is arranging to rebuild on the old site. A new 40 x 220 ft. two-story brick and concrete building will be used as a sawmill, in which equipment with a capacity up to 60 ft. long will be installed. A 64 x 200 ft. three-story brick building will serve as a planing mill. This will be equipped with a large timber sizer for surfacing at one time four sides of 16 in. by 30 ft. timbers. A 40 x 40 ft. brick building will be erected for generating power for all of the motor driven machinery, which will be of the best and modern make, capable of turning out a large product. Three dry kilns of brick construction will also be built. The company advises the trade that it will then be in a position to manufacture its full line of supplies made heretofore, especially car and ship oak, the latter in long lengths. Contracts for buildings and machinery have been let, and it is expected that the plant will be in operation in about 90 days.

The Meyercord-Carter Company, Union Trust Building, Parkersburg, W. Va., is erecting a new plant near that place, which will be devoted to the sole manufacture of Vitrolite milk white plates and tiling for structural use. The main building will be 135 x 400 ft., of concrete block construction, and will contain two large annealing kilns, contracts for which have been placed with the H. L. Dixon Company, Pittsburgh; also three 30,000-lb. melting tanks and modern machinery, with individual motor drive. The power house will be 16 x 20 ft., and will also contain modern equipment. This plant will be ready for operation about April 15.

A. V. Kaiser & Co., Philadelphia, Pa., dealers in railroad and contractors' equipment, are in the market for 20 Rodger convertible ballast cars.

The business of the Automatic Specialty Company, Cincinnati, Ohio, has been taken over by the Printing Machinery Company, which will continue the manufacture of automatic and special paper goods and printing machinery under the same management as heretofore.

The Smith Machinery Company, Milwaukee, Wis., manufacturer of concrete mixers, has amended its articles of incorporation, increasing its capital stock from $15,000 to $125,000.

Robert Wilkinson, Poughkeepsie, N. Y., has been appointed receiver for the New York Power & Truck Company, manufacturer of car trucks, automobiles and accessories, whose plant is located at Kingston, N. Y. It is stated that the assets amount to $75,000.

The Denver Gas & Electric Company, Denver, Colo., is arranging for extensions to its plant during the coming summer, which will involve the expenditure of about $50,000. Practically all of this sum will be applied to the improvement of the gas department, which will include a stack of 10 benches, six retorts each, together with the necessary ironwork required. An operating floor, constructed of I-beams and steel plates, will also be built. About $20,000 of the above sum will be devoted to the extension of street mains, meters, &c. L. E. Malone is superintendent of the gas department.

Bonds to the amount of $150,000 have been authorized by the city of Jugo, Okla., for the purpose of securing funds to construct a water works system.

L. A. & W. F. Briggs, electrical contractors, Fond du Lac, Wis., have been succeeded by the Briggs Electric Company, recently incorporated with a capital stock of $15,000. The officers of the new company are as follows: Robert T. Mellis, president; L. A. Briggs, vice-president and superintendent; W. F. Briggs, secretary and treasurer.

The Massachusetts Fan Company, Watertown, Mass., is furnishing waste heat drying apparatus for the Paterson Clay Products Company, Clearfield, Pa. This apparatus, consisting of a 140-in. three-quarter housed steel plate fan, with water jacketed box, driven by a 9 x 12 in. direct connected horizontal engine, is to be applied to operate an eight-tunnel dryer. Each tunnel will be 100 ft. long, the entire dryer having a capacity of 50,000 brick in 24 hr.

The Electric Cable Company, 17 Battery place, New York, whose plant at Bridgeport, Conn., was partially destroyed by fire, announces that it has made arrangements which will permit of filling all orders received for its various products, including Voltax, the transparent protective compound; rubber covered wires, weatherproof wires and cables, magnet wire, annunciator and office wire, &c. Pending adjustment of insurance details the company will make no announcement of its plans for rebuilding.

The White Oak Mills, controlled by the Proximity Mfg. Company, Greensboro, N. C., has lately entered its third order with the Green Fuel Economizer Company, Matteawan, N. Y., for an equipment of economizers. These mills are the largest denim mills in the world, employing 1300 operatives and working up about 145 bales of cotton per day on the average. The buildings are of the latest improved construction, with saw tooth roofs to secure good lighting, and other modern improvements and machinery. Some of the machines do the work for which 12 persons are required in other mills. Not only is this the third order for Green economizers from the White Oak Mills, but in addition the owners have bought a Green economizer for the Proximity Mills, two for the Minneola Mills and two for the Revolution Mills, making a total equipment of about 8000 hp.

The Petroleum Iron Works Company, Sharon, Pa., builder of all kinds of steel plate construction, has received a contract for the fabrication and erection of 20 stacks, 62 in. in diameter and 120 ft. high, for the new pipe mills being erected by the Youngstown Sheet & Tube Company, at East Youngstown, Ohio. The material is now going through its shops and erection will begin in about a week. The company has also recently received orders for one 55,000-bbl. oil storage tank for the Owasso Oil Company, Sapulpa, Okla.; 15 oil tanks, 8 ft. in diameter and 30 ft. long, and one stack, self-supporting, 4 ft. 6 in. in diameter and 80 ft. high, for the Texas Company, to be erected in Texas, and also contracts for two Blake asphalt and concrete mixers for the same company.

The Oliver Iron & Steel Company, Pittsburgh, has received a number of orders from the Isthmian Canal Commission for nuts, bolts and other products.

Citizens of Middletown, Pa., are considering plans for the formation of a company to erect and operate a pipe and pipe bending plant near that town. Thomas Holland of Royalton, Pa., has offered to give 2 acres of ground for the plant along the Pennsylvania Railroad.

The day turn at the cotton tie mill of the Pittsburgh Steel Company, Glassport, Pa., recently turned out 1729 bundles of cotton ties, and the night turn following turned out 1793 bundles, this output breaking all previous rolling records at the plant.

The Iron and Metal Trades

The movement among some of the railroad interests to establish an advance of about 10 per cent. in rates comes at a singularly inopportune time from many points of view. If seriously attempted it would certainly meet with very vigorous opposition on the part of shippers. So far as can be learned, only a minority is inclined to commit itself to so shortsighted a policy.

The week has been very barren of new business in the Iron and Steel trade at large, and while this is a disappointment, the increased confidence in a moderate and sustained betterment is maintained. It seems to be a question of patience above all.

Very little is being done in Pig Iron for any use. The inquiries are small and the buying is timid. What sales are effected, under competitive conditions, go to those who are willing to make concessions. Those furnaces which decline to shade prices are favored with orders only when it is a question of brand. Yet stocks are only accumulating very slowly.

The only Rail order of any consequence placed during the week was for 10,000 tons for the Reading, which was allotted to two mills. It is true that the order for 55,000 tons of Steel Rails for the Pennsylvania Railroad, distributed among a number of the mills some time since, has not been accepted by them as yet. There are details to be adjusted before the orders are accepted, although the work would be particularly welcome at this time.

The largest order for Structural Material placed during the current week was that for 2500 tons for the New Haven at Providence. Otherwise the tonnage placed was moderate. The fabricators are figuring very closely.

The Wire trade is quite busy and goods are being manufactured for stock in anticipation of the opening of the spring trade. The plant of the Morgan Spring Company at Struthers, Ohio, has been purchased by the Youngstown Sheet & Tube Company, which brings that concern into the Wire trade. The purchaser will double strand the Rod mill at once, which will carry the capacity up to about 8000 tons per month. The Sheet trade is gaining a little, while the Tin Plate trade is seasonably busy. The leading interest has 67 per cent. of its Tin Plate capacity at work.

In the Tube trade the report is current that an Eastern mill has taken an order for 25 miles of 8-in. Line Pipe. Specifications are coming in rather slowly in the Merchant Steel trade, and Iron and Steel Bars are quiet.

The shipyards are figuring on some steamers for the coastwise trade. They need work badly.

In the Cast Iron Pipe trade there is in sight about 50,000 tons, contingent in many cases upon the successful placing of municipal bonds.

Outside of some inquiries for Old Car Wheels for shipment abroad, for which good prices are bid, there seems to be little chance for export of Old Material at the present time.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

Mar. 11, 1908. | Mar. 4, 1908. | Feb. 12, 1908. | Mar. 13, 1907.

PIG IRON, Per Gross Ton:				
Foundry No. 2 Standard, Philadelphia	$18.25	$18.25	$18.25	$25.25
Foundry No. 2 Southern, Cincinnati	15.75	15.75	15.75	25.00
Foundry No. 2, Local, Chicago	17.50	17.50	18.00	25.50
Bessemer, Pittsburgh	17.90	17.90	17.90	22.85
Gray Forge, Pittsburgh	15.90	15.90	16.00	21.85
Lake Superior Charcoal, Chicago	21.50	21.50	21.50	27.00
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	29.00
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.00
Open Hearth Billets, Phila	30.40	30.40	30.40	33.00
Wire Rods, Pittsburgh	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	12.25	12.25	13.00	18.00
Steel Rails, Melting, Phila	13.00	14.00	14.00	19.25
Iron Rails, Chicago	15.75	16.00	17.50	25.00
Iron Rails, Philadelphia	18.00	18.00	18.00	27.00
Car Wheels, Chicago	15.50	15.50	18.50	24.00
Car Wheels, Philadelphia	16.00	16.00	17.00	23.25
Heavy Steel Scrap, Pittsburgh	13.00	13.75	14.00	18.00
Heavy Steel Scrap, Chicago	11.50	11.50	12.50	16.00
Heavy Steel Scrap, Philadelphia	13.00	14.00	14.00	19.00
FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.65	1.65	1.65	1.93½
Common Iron Bars, Chicago	1.65	1.65	1.65	1.81½
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.70	1.70	1.70	1.90
Skelp, Sheared Steel, Pittsburgh	1.80	1.80	1.80	2.00
SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	1.90	1.90	2.00	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	12.62½	12.50	13.37½	25.50
Electrolytic Copper, New York	12.50	12.37½	13.37½	25.37½
Spelter, New York	4.75	4.75	4.90	6.95
Spelter, St. Louis	4.60	4.60	4.75	6.80
Lead, New York	3.75	3.75	3.75	6.35
Lead, St. Louis	3.60	3.60	3.75	6.10
Tin, New York	29.25	30.25	29.50	42.25
Antimony, Hallett, New York	9.00	9.00	9.00	23.50
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, March 11, 1908. (*By Telegraph.*)

Closely as the markets are being scanned for signs of general improvement of a permanent and positive character, developments of the past week have unfolded nothing of striking importance in this direction. At the same time the situation is not without certain features of encouragement. For instance, it is noted that requests for prompt shipment now accompany nearly all specifications and orders for material, from which it is inferred that stock supplies in the hands of consumers are running low. This is particularly the case with the railroads, whose orders for track and store supplies are gradually increasing. Added to orders of fair tonnage noted in last week's report, the principal [illegible] Spikes. The Light Rail mill at the South Works of the Illinois Steel Company was started up this week with a moderate amount of specifications already in hand. All departments at Joliet are this week in operation, except the merchant mills. Railroad bridge construction continues to supply the major part of new business coming to fabricating shops, there being but few building structures included in the total tonnage. Of the several important building projects in contemplation, only that of the La Salle Hotel seems to be taking definite form, promising early closure of contract for Structural Material. The 8000 tons required for this building is expected in the market at an early date. In the shifting and intermittent operation of the various Western merchant Bar mills, the aggregate output remains

about the same. The demand for Iron Bars is, perhaps, a little stronger than for Steel, but in neither is it great enough to engage more than a small part of mill capacity. New Plate business is extremely backward in coming out, what little there is being comprised almost wholly of quick orders for current consumption. There is, however, no apparent effort on the part of producers to force business, and save for moderate concessions on specifications within the range of capacity of some of the smaller mills, prices are firm. Other lines of finished and semifinished material are not notably changed, either as respects price or demand. Considerable notice has been taken of recent inquiries in this market for upward of 10,000 tons of Basic Iron, but they have been generally regarded as being of a more or less tentative character, and it is now stated that the proposed purchases have been indefinitely postponed. The immediate development of large tonnage requirements by the big Steel casting foundries is not indicated by the present rate of consumption. The demand for metals has been somewhat better for the past week, within which time orders for Ingot Copper, though comparatively small in quantity, have been coming in more freely.

Pig Iron.—There is nothing to be gleaned in any quarter of the market that reflects a fair semblance of activity. No orders of good size are reported, and the few lots of small tonnage changing hands are almost invariably for immediate shipment to cover casting contracts as they develop. Even the large melters, who are occasionally in the market for current requirements, seem to be buying in the same way, the American Car & Foundry Company, for instance, being in the market this week for 200 tons of No. 2 Foundry. One inquiry for 1000 tons and another for 2000 tons, the latter for last half delivery, are reported, but it is doubtful if they represent anything more tangible than a desire on part of the consumer to keep in touch with the trend of prices. The same may be said respecting the widely mentioned inquiries for from 5000 to 10,000 tons of Basic Iron from large Steel foundry interests here and in St. Louis. None of this tonnage has, as yet, been placed, but when it is recalled that a similar inquiry several weeks ago finally resulted in a purchase of 500 tons, these incidents seem to have but little market significance. A majority of the business comprising standard fracture grades of No. 2 Foundry is being made on a basis of $13, Birmingham, but on some lots of off grade Iron of 200 tons and under, sold by analysis, $12.50, and even $12, has been done. Production in the Northern District is limited to the output of four or five furnaces, and even this limited capacity is in excess of consumption at the present time. There is no dissent from the opinion that the aggregate business of last week was one of the lightest of the present year. The following prices are for March delivery, f.o.b. Chicago:

Lake Superior Charcoal	$21.50 to $22.00
Northern Coke Foundry, No. 1	18.00 to 18.50
Northern Coke Foundry, No. 2	17.50 to 18.00
Northern Coke Foundry, No. 3	17.00 to 17.50
Northern Scotch, No. 1	18.50 to 19.00
Southern Coke, No. 1	17.85 to 18.35
Southern Coke, No. 2	17.35 to 17.85
Southern Coke, No. 3	16.85 to 17.35
Southern Coke, No. 4	16.35 to 16.85
Southern Coke, No. 1 Soft	17.85 to 18.35
Southern Coke, No. 2 Soft	17.35 to 17.85
Southern Gray Forge	15.35 to 15.85
Southern Mottled	15.10 to 15.60
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	19.40 to 19.90
Jackson Co. and Kentucky Silvery, 6 %	20.40 to 20.90
Jackson Co. and Kentucky Silvery, 8 %	22.40 to 22.90
Jackson Co. and Kentucky Silvery, 10 %	24.40 to 24.90

(*By Mail.*)

Billets and Rods.—With no orders or inquiries of consequence coming in for Billets, lethargy of movement continues a ruling feature of the market. On the very meager tonnage changing hands no further indications of irregularity in prices have developed, and we are advised that the regular quotations of $33 to $34, Chicago, are being firmly maintained. Only a moderate demand for Wire Rods is reported, on which prices continue firm at the following quotations: Bessemer, $35; Basic, $36; Chain, $37, all at Pittsburgh.

Rails and Track Supplies.—While no new Rail tonnage has been added to the purchases recently noted, a fair amount of orders for Track Supplies keeps coming in. Among those received by the principal interest this week are orders for 175 tons of Screw Spikes for the Chicago City Railway, probably for use in connection with the 8000 tons of high section Tee Rails ordered from the Lorain Steel Company about a month ago; also 3500 kegs of Standard Spikes from another source. The prospects of a better demand for railroad supplies is held out by the fact that prompt shipments are being asked on nearly all orders placed. This would indicate that railroad store stocks are depleted and orders must, therefore, be placed for needs as they arise. Quoted prices of Light Rails continue to be shaded from $3 to $5 a ton by Rerolling mills. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.90c. to 2c., according to delivery; Track Bolts, 2.40c. to 2.50c., base, Square Nuts, and 2.55c. to 2.65c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—A good many inquiries are being received, but most of them have to do with the smaller projects requiring light tonnage. Contract closures for last week embraced no undertakings of particular note, nor were there many of them. A purchase of 1000 tons of bridge material was equally divided by the Chicago, Milwaukee & St. Paul Railroad between the Wisconsin Bridge & Iron Company and the Fort Pitt Bridge Company. Now that the general contract for the La Salle Hotel has been let, fabricators are anxiously awaiting the award of the Structural Material, which will include about 8000 tons. Several sets of figures have already been submitted by fabricators on this work, both on the original and revised plans. Of the 1000 tons included in orders taken by the principal interest in Western territory last week, 800 tons was for building structures, showing a better ratio of tonnage for requirements of this character. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—New business continues quiet, and lags somewhat behind other mill products in the development of tonnage. Both the Universal and Sheared Plate mills of the Illinois Steel Company are down, awaiting a supply of specifications sufficient to warrant a resumption of operations. Store business is principally comprised of small lots representing shop needs occasioned by the contract requirements as they arise. Buying all along the line is held closely to current necessities. We quote, for shipment from mill, as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—Slight improvement is noted in the demand for Galvanized Sheets from manufacturers engaged in making up stock for forward requirements. Some business of this character received during the week from makers of gutter spout and roofing have helped to swell, in a moderate degree, the aggregate of tonnage booked. Hand to mouth buying in small lots from jobbers' stocks indicates the prevalence of conservatism among consumers, who are evidently not inclined to discount the future by buying for forward requirements. There is, if anything, more activity in Light Sheets, both Black and Galvanized, than in the heavier gauges. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 to 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c. Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—About the same proportion of Bar mill capacity is engaged this week as has been operating for the past 10 days or two weeks. Specifications on Bar Iron contracts are coming in a little more freely than for Steel Bars, but new business on both is developing very slowly. The fact that in nearly all cases Bar specifications are accompanied by requests for prompt shipment indicates very clearly that stocks in the hands of consumers are at a low ebb, and any quickening of consumptive demand will be promptly reflected in a better flow of orders. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—Owing to the gradual depletion of jobbers' stocks, orders for replenishment seem to be increasing in number and volume, but general stock orders of notable size are still slow in coming out. An improvement is also noted in the demand from small consumers, which is being

stimulated to some extent by better weather conditions and more activity in outside construction. A little reaction from the extreme low level of store prices is noted, but there is considerable room for improvement in this respect. Mill prices on Steel Pipe continue firm, though concessions of from 1 to 2 points are being offered on Iron Pipe. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 72 to 72½ per cent. on Black Steel Pipe, ¾ to 6 in. From 2 to 3 points above these prices is asked for Iron Pipe.

Boiler Tubes.—The development of new business shows but little if any improvement in mill shipments. Consumers' wants, which continue very moderate, are being supplied largely from store stocks. Some rumors of unevenness in prices are heard, but as a matter of fact there is hardly enough business moving to tempt a departure from regular schedules. Mill quotations for future delivery, on the base sizes, are as follows: 2¾ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1¼ in.	55	55	55
1½ to 2 in.	50	55	55
2½ in.	52½	55	55
2½ to 4 in.	60	47½	47½
6 in. and larger	50	55	

Merchant Steel.—There is but little demand for miscellaneous shapes used by implement makers, but specifications for Tire sizes from wagon and carriage builders are being offered a little more freely. On the moderate orders coming out for Shafting the regular prices here quoted are frequently shaded from 5 to 10 per cent. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1¼ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 54 per cent. off in car lots; 48 per cent. less than car lots, base territory delivery.

Old Material.—Following last week's recession in Scrap values, the market has steadied somewhat, and but few grades are this week reported decidedly weaker. Iron Fish Plates, Railroad Springs and Turnings are a little lower. It is understood that very little of the 7500 tons offered last week by the Great Northern was sold, since the prices tendered were considered inadequate. On the other hand, a smaller tonnage offered by the Illinois Central brought fair prices and was taken principally by dealers, presumably to apply on unfilled contracts. Sharply divergent views are entertained as to the future course of the market by various interests, but it is a well established fact that the demand from consumers has not materially increased. The Santa Fe is offering 3600 tons, which will be closed early this week; included in this material are 1000 tons of Railroad Wrought. In addition to this, there are lists out from the Chicago, Milwaukee & St. Paul, 2000 tons, and the Wabash, 2200 tons, more than half of which is composed of Rerolling Rails. The Wisconsin Central is also offering a moderate list of material. We quote per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$15.75 to $16.25
Old Steel Rails, rerolling	12.25 to 12.75
Old Steel Rails, less than 3 ft.	12.25 to 12.75
Relaying Rails, standard sections, subject to inspection	20.50 to 21.50
Old Car Wheels	15.50 to 16.00
Heavy Melting Steel Scrap	11.50 to 12.00
Frogs, Switches and Guards, cut apart	11.75 to 12.25
Mixed Steel	9.00 to 9.50

The following quotations are per net ton:

Iron Fish Plates	$13.50 to $14.00
Iron Car Axles	16.25 to 16.75
Steel Car Axles	14.75 to 15.25
No. 1 Railroad Wrought	11.50 to 12.00
No. 2 Railroad Wrought	10.50 to 11.00
Railway Springs	10.75 to 11.25
Locomotive Tires, smooth	14.25 to 15.25
No. 1 Dealers' Forge	9.00 to 9.50
Mixed Busheling	7.75 to 8.25
Iron Axle Turnings	6.75 to 7.25
Soft Steel Axle Turnings	6.75 to 7.25
Machine Shop Turnings	6.75 to 7.25
Cast Borings	4.75 to 5.25
Mixed Borings & Turnings	4.75 to 5.25
No. 1 Mill	7.00 to 7.50
No. 2 Mill	6.00 to 6.50
No. 1 Boilers, cut to Sheets and Rings	7.00 to 7.50
No. 1 Cast Scrap	12.25 to 13.00
Stove Plate and Light Cast Scrap	10.25 to 10.75
Railroad Malleable	10.00 to 10.50
Agricultural Malleable	9.50 to 10.00
Pipes and Flues	8.50 to 9.00

Cast Iron Pipe.—Nearly all of the small lettings noted in last week's report, which aggregated about 4000 tons, have been closed. The principal tonnages embraced in these transactions were those taken by Waukesha, Wis., and Grand Rapids, Mich., each amounting to 700 tons. The only new business reported are small lots advertised for letting by the cities of Fort Wayne and Milwaukee. We continue to quote per net ton, Chicago, as follows: Water Pipe, 4-in., $30; 6 to 12 in., $29; 16-in. and up, $28, with $1 extra for Gas Pipe.

Metals.—The past week has developed considerably more business, as well as a better line of inquiries, for nearly all metals. While the orders, as a rule, are not large and are principally confined to current requirements, their greater frequency is an encouraging feature. Very little change is noted in the prices of either new or old material. We quote as follows: Casting Copper, 13c.; Lake, 13½c. to 13¾c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 32c.; small lots, 31½c.; Lead, Desilverized, 3.95c. to 4c., for 50-ton lots; Corroding, 5.15c. to 5.25c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 13c., and other grades, 11c. to 11½c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 11c.; Copper Clips, 11c.; Red Brass, 12½c.; Yellow Brass, 10¼c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 23c.; Block Tin Pipe, 25c.

Pittsburgh.

PARK BUILDING, March 11, 1908.—(*By Telegraph.*)

Pig Iron.—The Pig Iron market continues quiet, inquiries being mostly for small lots for prompt shipment. One inquiry is reported for 1500 tons of Basic for April, and the same quantity for May, and this will probably bring out some pretty low prices. Consumers who are willing to buy Iron for any considerable time ahead make such low offers for it that furnaces will not consider them. Prices are practically unchanged, but the demand is not enough to actually test the market. Standard Bessemer Iron is still held at $17, Valley furnace, but several small lots have sold as low as $16.85 to $16.90, at furnace. Northern No. 2 Foundry is held at $15.75 to $16, at Valley furnace, but a sale of 1000 tons is reported at $15.50, the buyer getting this low price by agreeing to take the Iron out this and next month. Northern Forge Iron is held nominally at $15, at Valley furnace, or $15.90, Pittsburgh, but no sales have been made in this market for some time.

Steel.—A moderate amount of new business is being taken by the mills in Sheet and Tin Bars, and specifications against contracts are coming in more freely. There is not much inquiry for Billets, and the regular sellers state they are maintaining prices, quoting Bessemer and Open Hearth Billets at $28, Sheet and Tin Bars at $29.50, and Forging Billets at $30, for delivery in Pittsburgh and nearby districts.

(*By Mail.*)

The Steel trade is still very quiet, and in some quarters the opinion is expressed that actual conditions to-day are not as good as they were in the latter part of February. However, there is no doubt that with three or four weeks of milder weather, and the resumption of outdoor operations, there will be an improvement in the demand for nearly all kinds of Finished Iron and Steel, particularly such lines as enter into building construction. Reports from the Car Service Association are that 2300 more cars were in service on March 1 than on February 1, showing that the number of cars in actual use is steadily increasing. There is very little movement in Pig Iron, and prices show no betterment, but a fair movement is observed in Sheet and Tin Bars. In Structural Material, Plates and Iron and Steel Bars very little new business is being placed, but in Tin Plate, Sheets and Pipe, mill orders are increasing. The Coke trade is practically lifeless, and the Scrap trade has quieted down, while prices have gone off to some extent.

Ferromanganese.—We do not hear of any recent sales, and we quote [illegible] 80 per cent. Ferro at $44.50 to $45, Baltimore, the freight to Pittsburgh being $1.95 a ton.

Muck Bar.—No sales have been reported for some months, and, in the absence of demand, prices are weak. We quote best grades of Muck Bar, made from all Pig Iron, at nominally $27 to $27.50, Pittsburgh.

Skelp.—We note a recent sale of 1000 tons of Grooved Steel Skelp on the basis of 1.60c., Pittsburgh. The general demand is quiet, and none of the Skelp mills has enough

work to the last ton. We quote nominally as follows: Grooved Steel Skelp, 1.60c.; Sheared Steel Skelp, 1.70c.; Grooved Iron Skelp, 1.80c., and Sheared Iron Skelp, 1.90c., f.o.b. Pittsburgh.

Rods.—An item of interest in the Rod trade is the purchase of the plant of the Morgan Spring Company, at Struthers, Ohio, by the Youngstown Sheet & Tube Company, which makes the latter a producer of Wire Rods, Wire and Wire Nails. The plant thus acquired will have an ultimate capacity of 8000 to 10,000 tons per month, the new owner having decided to double strand the Rod mill at once. New demand for Rods is very quiet, and we have not heard of any sales in this market for some time. The American Steel & Wire Company quotes $35 for Bessemer, $36 for Open Hearth and $37 for Chain Rods, f.o.b. Pittsburgh.

Steel Rails.—No new business of any moment is being placed. An inquiry is in the market for 6000 tons of Standard Sections for Australia, but has not been closed. Nos. 1, 2 and 3 Rail mills at the Edgar Thomson plant of the Carnegie Steel Company are in operation this week, the No. 3 rolling Light Rails, but these mills are being "gaited," and are only making about 40 per cent. or less of actual capacity. Regular prices on Light Rails, which are still being shaded $3 to $4 a ton by the mills rerolling Rails, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—New business and specifications against contracts continue very light. Most of the Plate mills are badly in need of orders, and are operating only to 50 per cent. or less of capacity. With the advent of spring and the resumption of outside work it is believed the demand for Plates will show betterment, as considerable work is in sight, which if put through will need a considerable tonnage of Plates. Prices continue to be shaded to the extent of $1 to $2 a ton. We quote: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼ in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell grade of steel is abandoned.

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—Very little new business has been placed in the past week, and inquiries are light. The Pittsburgh Steel Construction Company has taken the Steel, about 300 tons, for an extension to the plant of the Page Woven Wire Fence Company, Monessen, Pa., and the McClintic-Marshall Construction Company has taken a blacksmith shop and machine shop for the National Transit Company, Oil City, Pa., about 250 tons. The two largest local jobs in sight, and which will probably come up before long, are the Pittsburgh & Lake Erie bridge at Beaver, about 17,000 tons, and an extension to the Fort Pitt Hotel in this city, about 1800 tons. Complaint is made over the very low prices at which work is being taken. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—There is some improvement in the demand for both Black and Galvanized Sheets, the American Sheet & Tin Plate Company operating this week 40 per cent. of its Sheet capacity, while the independent Sheet mills also report conditions somewhat better. With three or four weeks of good weather it is confidently believed that the demand for Sheets, particularly for building purposes, would quickly show an increase equal to about double the present demand. Regular prices are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—Conditions in the Tin Plate trade are steadily showing betterment, the American Sheet & Tin Plate Company operating this week 67 per cent. of its Tin Plate capacity, while the Pope Tin Plate Company, at Steubenville, has started up its 12 hot mills with good prospects for the future, and other Tin Plate concerns report orders as steadily improving. Shipments are increasing, and specifications against some contracts held up some time ago are now coming forward. Regular prices are being firmly maintained. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Iron and Steel Bars.—New business being placed with the mills in both Iron and Steel Bars continues light, and it is estimated that only about 40 per cent., and possibly less, of the Bar mill capacity of the country is active at the present time. Specifications against contracts are not coming in at a satisfactory rate, a good deal of tonnage having been held up on which consumers are not specifying. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further west. Steel Bars remain very firm at 1.60c., Pittsburgh.

Spelter.—New business continues very light, and prices are slightly weaker. A sale of 50 tons of prime grade is reported at 4.60c., St. Louis, equal to 4.72½c., Pittsburgh. We quote prime grades of Western Spelter at 4.60c. to 4.65c., East St. Louis, the freight to Pittsburgh being 12½c.

Hoops and Bands.—Specifications against contracts placed early in the year are coming in at a fairly satisfactory rate, but practically no new business is being placed with the mills, as most consumers covered their requirements for the current year some time ago. Prices, as reaffirmed in January, and guaranteed against decline, are as follows: We quote Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60, base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Railroad Spikes.—The demand continues very quiet, the amount of new business being placed with the mills by the railroads being relatively small. Prices are only fairly strong. We quote Standard sizes of Steel Railroad Spikes at $1.80, but this price is shaded in competition with Iron Spikes. Prices on the smaller sizes range from $1.85 to $1.90 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—Conditions in this trade do not seem to be as good as they were in the latter part of February. Specifications against contracts have fallen off, and new buying is very light, and is only for small lots for actual needs. Prices on Shafting continue to be shaded from 5 to 10 per cent., regular prices being 54 per cent. off in carloads, and 48 per cent. in less than carloads, but as low as 55 and 2½ per cent. off has been named on single carload lots. There is a fair demand for Spring and Tire Steels, but other grades, including Tool Steels, are dull. Prices are somewhat easier, and we quote nominally as follows: Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality, Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades, and 10c. and upward for special grades.

Pipes and Tubes.—The discount on Steel Pipe of 75 and 5 per cent., given in this report last week, was a typographical error, and should have read 74 and 5 per cent. Prices on Steel Pipe are firm, not having been changed for some months. It is reported that an Eastern mill has taken a contract for about 25 miles of 8-in. Line Pipe. Spang, Chalfant & Co. will start up their large Pipe mill March 16, to work up accumulated orders. This mill has a capacity for rolling up to 24 in. in diameter. There is a fair buying movement in Pipe, but jobbers and consumers seem disposed to limit their purchases to small lots, for actual needs. Net discounts on Steel Pipe to the large trade on ⅜ to 6 in. remain at 74 and 5 per cent. off list, while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black. %	Galv. %
⅛ to ¼ in.	65	49
⅜ in.	67	53
½ in.	69	57
¾ to 6 in.	72	63
7 to 12 in.	70	55
Extra strong, plain ends:		
⅛ to ⅜ in.	58	46
½ to 4 in.	65	53
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

Discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
	%	%
⅛ and ¼ in.	63	..
⅜ in.	65	51
½ in.	67	55
¾ to 6 in.	71	61
7 to 12 in.	68	53
Extra strong, plain ends:		
⅛ to ⅜ in.	56	44
½ to 4 in.	63	51
4½ to 8 in.	59	47
Double extra strong, plain ends:		
½ to 8 in.	52	41

Boiler Tubes.—Very little buying of Boiler Tubes is being done by the railroads, and the demand for Merchant Tubes is also quiet. Prices are fairly firm, but discounts are sometimes slightly shaded. Discounts on Merchant Tubes for small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ in.	42	47
1¼ to 2¼ in.	42	50
2¼ in.	47	61
2¾ to 3 in.	52	55
3½ to 13 in.	42	50

2¼ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Iron and Steel Scrap.—The demand for Scrap from the mills has fallen off somewhat in the past two weeks, with the result that prices are lower. It is believed, however, that the Scrap trade is on a better basis now than it was when the market was higher, as prices now ruling represent what the mills will pay for Scrap, and not what dealers charge each other. We have reduced prices on nearly all kinds of Scrap from 50c. to 75c. a ton, and now quote, per gross ton, as follows: Heavy Steel Scrap, $13 to $13.25; No. 1 Railroad Wrought Scrap, $14 to $14.25; No. 1 Cast Scrap, $15 to $15.25; Bundled Sheet Scrap, $10 to $10.25; Cast Iron Borings, $7.75 to $8; No. 1 Busheling Scrap, $13 to $13.25; No. 2, $10.25 to $10.50; Steel Axles, $16.50 to $17; Sheet Bar Crop Ends, $17 to $17.25; Low Phosphorus Melting Stock, $17.25 to $17.50; Iron Axles, $20 to $20.50; Machine Shop Turnings, $8.75 to $9; Rerolling Rails, $14.25 to $14.50; Old Steel Rails, short pieces for Open Hearth use, $13 to $13.25; Grate Bars, $13.25 to $13.50. On March 5 the Pennsylvania Railroad sold a large tonnage of Scrap, among which were the following items: 1800 tons of Rerolling Rails, $14; about 500 tons of Heavy Steel Scrap, $13.25; 300 tons of No. 1 Wrought Scrap, $14; 100 tons of No. 1 Cast Scrap, $15.05; 100 tons of Iron Axles, $20; 150 tons of Cast Iron Borings, $8.25, delivered; 100 tons of Machine Shop Turnings, $8.75, all per gross ton.

Coke.—There is practically no demand for either Furnace or Foundry Coke, and prices are somewhat weak. Very little strictly Connellsville Furnace Coke is being offered, but Furnace Coke made in the Klondike and Latrobe districts is being offered as low as $1.60 to $1.65 at oven. Best grades of 72-hr. Foundry Coke are offered to consumers at $2.25, and in some cases as low as $2.15. It is not believed there will be much improvement in the Coke trade for the next month or two at least. About 1200 less ovens are going now than a week or 10 days ago. There are 36,584 ovens in the Upper and Lower Connellsville regions, of which 16,720 were active last week and 19,864 were idle. The output was 157,982 tons, a falling off compared with the previous week of about 23,000 tons.

Cleveland.

CLEVELAND, OHIO, March 10, 1908.

Iron Ore.—According to estimates made by a representative of one of the leading local merchant Ore firms, there is at present on the Lake Erie docks and on furnace stock piles 18,500,000 tons of Ore. About 1,750,000 tons of Lake Superior Ore is being consumed every month by the blast furnaces, and allowing for a slight increase in consumption it is estimated that 4,500,000 tons will be used before the opening of navigation, leaving about 14,000,000 tons on the docks and furnace yards when the movement of this season's Ore can begin. The largest merchant producers are adhering to their plans announced some time ago to mine about 60 per cent. as much Ore as a year ago, and state that their properties are being operated at about that capacity at the present time. Some of the estimates of the amount of Ore that will be brought down the lakes this season, that were made a few weeks ago, have been cut down somewhat, and the present maximum estimates are about 25,000,000 tons. Some Ore firms report considerable improvement in shipping orders, while with others the shipping orders are only slightly better than a month ago. As the Ore movement down the lakes will start late, and the dock space will not be needed for some time, it is expected that furnaces will be slow in ordering shipments on Ore that they do not need. The only inquiry so far for 1908 Ore has not resulted in a sale, and it is thought that it will be well along in the spring before there is any buying movement of importance. We quote Ore prices as follows, at Lake Erie docks, for 1908 delivery, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.20; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—The market shows no improvement. There is an entire absence of inquiries for any good sized tonnages. The largest sales during the week in this territory were of 100-ton lots, and these were very limited in number. The melt in this territory does not show much if any improvement, and consumers are slow in taking Iron on old contracts. While furnace interests are extending deliveries on old contracts to suit the convenience of consumers, none of these old contracts for high priced Iron has been canceled, as far as can be learned. Consumers, however, are allowed to equalize the price by extending deliveries on contracts and taking half of the Iron they need at the present market price. Shipping orders are coming in much more slowly from the large melters than from the small consumers. The first blast furnace controlled by local interests to start up since the period of depression began is that of the Penn Iron & Coal Company, Canal Dover, Ohio, which will go in blast in a day or two. The recently established price of $17, at furnace, for delivery in the immediate territory is being firmly maintained, but inquiries in the local market have been for such small tonnages that they have not encouraged price cutting or tested the market. A local interest was a bidder last week on an inquiry from a large pump manufacturer for 2000 tons of Foundry Iron for Eastern consumption. It is reported that of 17 bidders 16 held to the established price, but that the order went to the other one, who made some concession. There are no inquiries for either Southern or Basic Iron. For prompt shipment and for second quarter we quote, delivered, Cleveland, as follows:

Bessemer	$17.90
Northern Foundry, No. 1	17.85
Northern Foundry, No. 2	17.35
Northern Foundry, No. 3	16.85
Southern Foundry, No. 2	$16.85 to 17.35
Gray Forge	15.90 to 16.40

Coke.—The market continues very quiet and weak. Some Furnace Coke is being sold in small lots for spot shipment at low prices. We quote Connellsville Furnace Coke for spot shipment at $1.80 to $1.90, at oven, and Connellsville 72-hr. Foundry Coke at $2.25 to $2.40, at oven.

Finished Iron and Steel.—No improvement is noted in the demand for any lines of Finished Material, either on current orders or in specifications, and the aggregate volume of business is limited. The feeling regarding an early improvement in the situation cannot be said to be satisfactory. The only transactions of any size reported were two contracts closed by the local representative of a mill for over 1000 tons of Forging Steel Bars for delivery during the balance of the year. There is also an inquiry for 2000 tons of Plates from a fabricating plant in this territory, the plant being a bidder on some export work for which the Plates are needed. Specifications are still coming in quite freely from the implement makers, the majority of whose plants are turning out their normal output. There are also a few inquiries from implement makers for Steel Bars for the balance of 1908 delivery. The new demand for Bars shows no improvement. Consumers of Iron Bars were pretty well covered before the recent advance in price, and practically no new orders are being taken. Local Bar Iron mills are getting enough specifications to keep them running on about half time. The only orders from the railroads are for very limited tonnages. The price of Iron Bars is being maintained, but it is reported that some of the smaller mills are shading the price of special shapes of Steel Bars and for extras. The demand for Rails for new traction projects in this State this year is expected to be light. One or two projects of that kind are being held up at present because the promoters are unable to finance the undertakings owing to the condition of the money market and the caution of investors. Warehouse business is still light, although sales show a slight improvement over January and February. We quote Iron Bars at 1.60c., Cleveland; Steel Bars, 1.70c., Cleveland, for car lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼-in. and heavier, 1.80c., Cleveland. We quote Sheets, mill shipments, carload lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. The warehouse price on Steel Bars is 1.80c., and on Iron Bars 1.80c. Beams and Channels from warehouse are 2.10c. to 2.15c., base. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in. are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—The market appears somewhat weaker, and there has been less activity the past week than for some time. This is attributed to the fact that old orders have been pretty well cleaned up, and as a result trading between dealers has fallen off materially. Inquiries from the mills are very scarce, the only buying being in small lots for immediate needs. Under existing conditions dealers are not expecting an improvement in the market soon. Prices re-

main about the same, most quotations still being largely nominal. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$11.50 to $12.00
Old Iron Rails	16.00 to 17.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	15.50 to 16.00
Relaying Rails, 50 lb. and over	22.00 to 23.00
Heavy Melting Steel	11.50 to 12.00
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	8.00 to 9.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	7.00 to 8.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Bushelling	11.00 to 11.50
No. 1 Railroad Wrought	12.50 to 13.00
No. 1 Cast	12.00 to 13.00
Stove Plate	10.50 to 11.00
Bundled Tin Scrap	8.00 to 9.00

Philadelphia.

PHILADELPHIA, PA., March 10, 1908.

Conditions in the crude and finished material markets show but little change from week to week. The same hesitating policy on the part of buyers which has characterized business for the past month or two continues, and as yet there is no disposition shown to anticipate requirements to any degree. Notwithstanding the fact that transactions are almost entirely of a small volume individually, there is an undercurrent of hopeful feeling as to the future, not particularly that any very marked gains in tonnage will be made, but rather that the present volume of business will be maintained and that a slow forward movement may continue in the various branches of the trade. Generally speaking, the gain in tonnage during the past week has been small. Improvements are to be noted in some directions, but there are frequent temporary declines which offset to some extent these gains, so that on the whole production goes along at an average of from 40 to 50 per cent. of that at the same time last year. Prices are being well maintained all along the line, even in view of the small volume of business coming out, and at the present writing few weak spots are discernible. Business in all lines will be closely observed during the next 30 days, as it is believed that if we can show a moderate increase or even hold our own in the way of tonnage of orders placed during the month, it will go a great way toward strengthening confidence in the general situation.

Pig Iron.—While there has been a little more buying of Pig Iron in some directions, it is fairly well balanced by a falling off in the demand in others, so that the actual volume of business coming out from week to week does not show any material change. Melters in some cases, who took on fair tonnages a week or so ago, are now out of the market, and in the present day method of buying will only come in again when the quantities taken are fairly well worked up. The Pipe foundries that bought moderate lots of local Irons recently, owing—it is said—to non-deliveries on Southern Irons previously purchased, are now getting these Irons more freely, and have consequently made no further purchases. One or two of these foundries are said to be in the market for a fair tonnage, but have not yet placed the business. The bulk of the business done in this territory has been in the Foundry grades. Sales as a rule continue in small lots, ranging from carloads up to 100 tons, at established prices, for delivery in the next 30 or 60 days. The sale of one lot of 500 tons of No. 2 X Foundry, delivery during the next three months, has been reported, while an inquiry for 1000 tons of No. 2 Plain for early delivery is to be noted. Eastern furnacemen hold the prices of these grades pretty firmly. Not so much can be said of some of the Virginia furnaces, which, however, are outsiders as far as the established basis of prices is concerned. Some of these interests are nevertheless holding at the ruling quotations for delivery in this territory, while others appear to be willing to take business at a concession of from 25c. to 50c. a ton. One lot of 200 tons was sold last week at a price equivalent to $18, delivered, Philadelphia, while it is quite probable that $17.75 might be done for a fair tonnage. Notwithstanding this softening in the price of Virginia Irons, the tonnage of business done has been extremely light, and hardly worthy of consideration as far as the general market is concerned. Forge Irons have developed a little more activity the past week. One seller made sales aggregating something over 1000 tons, at full prices. Most of the orders were small, although there was one for a fair tonnage. Basic Iron continues a drug on the market, as buyers as a rule are pretty well covered, having heavy quantities still due them on old contracts. One or two mills have been feeling the market, but their idea of prices is far below that which is now established for that grade. Low Phosphorus Iron still continues in demand, but there have been no contracts placed, although it is believed that some business will shortly come out in this grade. There is also some further inquiry for misfit Low Phosphorus, but orders are slow in developing. There has been no change in Pig Iron prices as far as Eastern producers are concerned. Quotations against inquiries are at the established basis, although consumers frequently make counter offers of 10c. to 25c. under the prices named, but these are not being met by the leading interests. We quote the following range of prices for delivery in buyers' yards, eastern Pennsylvania and adjoining territory, for the first half of the year:

No. 2 X Foundry	$18.25 to $18.50
No. 2 Plain	17.75 to 18.00
No. 3 Foundry	17.25 to 17.50
Gray Forge	16.50 to 16.75
Basic	17.25
Low Phosphorus	23.50 to 24.50

Ferromanganese.—While there has been a little more inquiry for Ferro, sales have been extremely light and confined to small tonnages and broken lots. No business of any quantity has developed in this territory. Prices are unchanged, $45 to $47, Baltimore, being quoted for small lots.

Steel.—The demand for Steel continues extremely quiet. Mills in this territory are running on greatly reduced capacities, as orders received are for small tonnages only, and are confined to prompt shipment. The leading mill in this territory is operating only 20 per cent. of its capacity. Prices, however, are fully maintained, ordinary Rolling Steel being quoted at $30.40, with Forging Steel at $32.40 to $33.40, according to analysis.

Plates.—Orders come out rather slowly and are largely of a miscellaneous character. Mills are about able to hold former gains, but show no further increase in tonnage or orders on their books. Quotations are fully maintained, the following range of prices being named for delivery in this territory:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—There is a fairly even demand, although orders are hardly as large as they were some weeks ago. Individual orders have been small and of a miscellaneous nature, and mills continue in operation at about 50 to 60 per cent. of their capacity. Prices are being fully maintained, 1.85c. to 2c. being quoted, according to specification.

Sheets.—New business comes out slowly, and is confined almost entirely to immediate requirements of consumers. No forward business is being placed and mills are unable to gain in their output. Prices remain unchanged. We quote, for mill shipment, with a tenth extra for small lots, as follows: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Old Material.—Mills show less interest in the market, and business during the week has been extremely quiet. There has been a further decline in prices of Heavy Melting Steel, and the tonnage sold has been small and largely between dealers. The situation continues unsettled, and prices in the leading grades show a further recession. We quote for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory, about the following range:

No. 1 Steel Scrap and Crops	$13.00 to $13.50
Low Phosphorus	18.50 to 19.00
Old Steel Axles	17.50 to 18.00
Old Iron Axles	21.00 to 22.00
Old Iron Rails	18.00 to 19.00
Old Car Wheels	15.00 to 17.00
Choice No. 1 R. R. Wrought	15.50 to 16.00
Machinery Cast	15.00 to 15.50
Wrought Iron Pipe	12.00 to 12.50
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	9.75 to 10.25
Stove Plate	13.00 to 13.50
Cast Borings	7.75 to 8.25
Grate Bars	12.00 to 13.00

Bars.—The amount of new business which mills are taking is extremely small. Buyers are taking only limited quantities for immediate needs, and mills continue to operate irregularly. Prices meanwhile are being fairly well maintained, Refined Iron Bars being quoted by the leading mills at 1.65c., delivered, Philadelphia, and adjoining territory.

Coke.—The tonnage of orders placed continues small. Buyers are not inclined to contract under existing conditions, and most of the business taken is for delivery in the near future. Prices are unchanged. We quote Furnace Coke at $1.75 to $2.25, at oven, with Foundry Coke at $2.25 to

$2.75, at oven. For delivery in the Philadelphia territory the range of prices is as follows:

Connellsville Furnace Coke	$4.05 to $4.50
Foundry Coke	4.50 to 5.00
Mountain Furnace Coke	3.75 to 4.10
Foundry Coke	4.10 to 4.60

Cincinnati.

CINCINNATI, OHIO, March 11, 1908.—(*By Telegraph.*)

While scarcely perceptible to the anxious man of affairs immersed in manufacturing details, incidents of the week in connection with crude and some finished products indicate better feeling. In the line of boilers and throttling engines, products which are marketed largely in the South and Southwest at this time, the gain is visibly marked over the end of 1907. It figures, according to a large manufacturer in this section, about 65 per cent. of the high standard of 1907. There is considerable activity among manufacturers of motors and generators of medium size units, and the medium and smaller jobbing foundries are making inquiries for Pig Iron. A number of rousing meetings in progress to-day at the Hotel Sinton, and all of manufacturers, suggest important pending announcements in the way of rates and perhaps changes in prices. The third meeting of furnacemen from the Hanging Rock District was held here to-day. They are endeavoring to secure a more equitable freight rate on Coke from the Connellsville and Virginia fields to their furnaces. No announcement is obtainable to-night of any concession secured. Another meeting of importance, comprising about 40 representatives of Conductor Pipe and Eaves Trough establishments from as far east as Boston and west as Chicago, are conferring here on matters of reorganization and prices. The organization, which seems to have deteriorated somewhat of late, is to be rejuvenated and probably under a new name, the National Conductor Pipe Association. President W. Edwards of the Edwards Mfg. Company, entertains the representatives to-night at the Grand Opera House. The opening of the week finds buyer and seller nearer in the way of inquiries and possibilities for business, but practically nothing is doing but small purchases ranging from 100 to 200 tons. The mails are of a more encouraging nature, and there is unquestionably more interest manifest. Rumors of $12 Iron from the Birmingham District are apparently without good foundation, since it is definitely known that a case or two of alleged cutting turned out no sale, but did develop a purchase at $12.50. The range on Southern No. 2 is therefore $12.50 to $13, with an inclination toward the lower price. There have been some few sales of off Iron at $12, but the tonnage has not been large, and these are designated as odd lots. On Northern No. 2 the price is $16 to $16.50, but strong competition with the Southern product has, it is said, shaded the lower figure on certain routings. There is an increased inquiry for Silicon Irons ranging from 5 to 8 per cent., and also a little inquiry for 10 per cent. Bessemer Ferrosilicon, which is quotable at about $29, Ironton. On the plain Silicons the quoted price for 8 per cent. is $19, the range being $1 for the upward units and 50 cents between the lower ones. An inquiry comes to-day for 2000 tons of Southern Basic for a central Ohio Steel maker for April and May delivery. The Pipe making concerns have bought some Iron during the week and, it is said, at bargain prices. Dealers generally believe that the time is ripe for business with the jobbing foundries if anything at all is to be done, for stocks are about depleted in all sections. For immediate delivery and balance of the first half we quote as follows, the freight rate being from the Hanging Rock, Valley and Birmingham districts, respectively, $1.20, $1.80 and $3.25.

Southern Coke, No. 1	$16.25 to $16.75
Southern Coke, No. 2	15.75 to 16.25
Southern Coke, No. 3	15.25 to 15.75
Southern Coke, No. 4	14.75 to 15.25
Southern Coke, No. 1 Soft	16.25 to 16.75
Southern Coke, No. 2 Soft	15.75 to 16.25
Southern Coke, Gray Forge	14.25 to 14.75
Southern Coke, Mottled	13.75 to 14.25
Ohio Silvery, 8 per cent. Silicon	20.20 to 20.70
Lake Superior Coke, No. 1	17.70 to 18.20
Lake Superior Coke, No. 2	17.20 to 17.70
Lake Superior Coke, No. 3	16.70 to 17.20
Standard Southern Car Wheel	24.25 to 24.75
Lake Superior Car Wheel	23.00 to 23.50

(*By Mail.*)

Coke.—The Coke market is very quiet, and dealers anticipate little early improvement. Spot Connellsville Foundry ranges from $2.25 to $2.50, at oven. Furnace grades range from $1.75 to $2.10, according to period of delivery.

Finished Iron and Steel.—The situation is a trifle better, but there is no change in prices. A little larger inquiry is noted for both Iron and Steel Bars, but in the main consumers are still buying very conservatively, and for actual needs only. Dealers quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.65c., with half extras; small lots from store, 1.85c, base, one-half extras. Steel Bars, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels, and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼ in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c. Blue Annealed Sheets (heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.25c. No. 12, carload lots, 2c.; small lots from store, 2.35c. Sheets (light), Black No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4 in. and heavier, carload lots, 1.95c., base. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Old Material.—The temporary flurry in the Chicago Scrap market has apparently had no influence locally, and indications point to still lower levels. Such mills as are operating and have exhausted stocks on hand are buying but in very small lots. There is some little inquiry for Relayers. The local market is conservatively about as follows, f.o.b. Cincinnati:

No. 1 R. R. Wrought, net ton	$11.00 to $12.00
Cast Borings, net ton	4.50 to 5.00
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	15.00 to 16.00
Old Iron Rails, gross ton	14.00 to 15.00
Old Steel Rails, long, gross ton	11.50 to 12.50
Relaying Rails, 56 lb. and up, gross ton	21.00 to 22.00
Old Car Wheels, gross ton	14.00 to 15.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00

Birmingham.

BIRMINGHAM, ALA., March 7, 1908.

Pig Iron.—The schedule of quotations recently adopted is being adhered to and the distribution of sales made on this basis is indicative of a maintenance, yet the reduction has not induced buyers to enter the market for larger propositions and no transaction recorded during the week can really be considered a criterion of market conditions. The sales reported range from a carload to lots of 100 tons, and the price received was $13, Birmingham, but carload lots of a favorite brand for immediate delivery are reported sold at $1 per ton premium on this basis. An increase in the number of inquiries received is reported, and the fact that the aggregate of shipments is materially increased by old contracts having been reinstated lends a cheerful tone to the situation, but the disposition manifested by purchasers as to negotiating for anticipated requirements does not materialize in additional strength. The activity recently noted in the Cast Iron Pipe market and the prospects for additional orders have been slow to improve the demand from that quarter, and smaller interests are still disposed to engage limited quantities only. However, producers report that order book requirements are practically equivalent to the accumulation on furnace yards and the present output, and maintain that the output will not be increased unless warranted by the volume of business presented. Such a condition has resulted in one stack having been put in blast during the week. Some improvement is noted in the demand for Basic Iron, and when old contracts are reinstated to some extent, which indications favor, the output will no doubt necessarily be increased. The total Iron production in the State is represented at present by 14 merchant stacks and four stacks making Basic Iron. None of the Charcoal furnaces is in operation.

Cast Iron Pipe.—In addition to the letting of 15,000 tons for Eastern points, which is pending the satisfactory disposition of municipal bonds, the aggregate of small contracts to be placed during the month is approximately 35,000 tons. This tonnage consists of lots ranging from 400 to 800 tons for maintenance work and small municipalities, and is principally for Southern points. Prices are still at variance and we revise nominal quotations on Water Pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., $27; 8 to 12 in., $25; over 12-in., average $24, with $1 per ton extra for Gas Pipe.

Old Material.—Improvements in market conditions are slow to develop. The consumption increases from time to time and the volume of material now being moved is encouraging, but the demand is not steady and each sale is largely a market within itself. The established schedule of quotations is being adhered to, but transactions recorded do not warrant a statement that prices are being maintained, and we quote nominally as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$18.00 to $18.50
Old Iron Axles	16.50 to 17.00
Old Steel Axles	15.50 to 16.00
Old Car Wheels	18.50 to 19.00
[illegible]	[illegible]
[illegible]	[illegible]
No. 1 Country Wrought	12.50 to 13.00
No. 2 Country Wrought	9.50 to 10.00
Wrought Pipe and Flues	10.50 to 11.00
Railroad Malleable	12.50 to 13.00
No. 1 Steel	12.00 to 12.50
No 1 Machinery Cast	10.50 to 11.00
Stove Plate and Light Cast	9.50 to 10.00
Cast Borings	6.00 to 6.50

New York.

NEW YORK, March 11, 1908.

Pig Iron.—The market continues very quiet. What small lots of Foundry Iron are being purchased are being taken at concessions by outside interests. It is only when the brand is demanded that the leading furnaces book the business at the schedule prices. We quote, at tidewater, as follows: No. 1 Northern Foundry, $18.75 to $19; No. 2 Foundry, $17.75 to $18.25; No. 2 Plain, $17.25 to $17.50; Gray Forge, $16.25 to $16.50. Southern Irons are $17.50 to $18 for No. 1 Foundry, and $16.50 to $17 for No. 2.

Steel Rails.—Little further Rail business has been entered in the past week, though some of the Eastern roads are expected to give some indication of their needs for 1908 in the near future. The Southern mill has been making its best records lately, but will soon be shut down for the installation of the new mill. The wide distribution of the Great Northern order is a matter of some comment. The provision in all the contracts that delivery shall be made in the first month after the opening of navigation suggests some urgency about getting the Rails, but it is well known that the facilities of the road to receive and forward Rails at its lake terminal are entirely inadequate to handling such a tonnage within a month. The final 10,000 tons of the total of 60,000 tons was placed with the Cambria Steel Company. Of the 10,000 tons taken by the Reading a short time ago 6000 tons went to the Pennsylvania Steel Company and 4000 tons to the Bethlehem Steel Company.

Structural Material.—More business has been coming to the mills recently, and the feeling is better, both among manufacturers and fabricators. The latter have not booked any great business lately, but they find indications that even the moderate reduction in cost of construction is stimulating some inquiry which may come to the point of real business as the season opens. In the East the principal contract taken in the past week was for over 2500 tons of Steel to go into the second section of the New Haven Railroad viaduct at Providence. L. F. Shoemaker & Co., who had the first section of this work, were the successful bidders. The Boston & Maine let 400 to 500 tons of viaduct work at Greenville, N. H., to the Boston Bridge Works. The St. Paul's contract for 1000 tons of bridge work is likely to be let this week. The Lehigh Valley is in the market for several hundred tons, and pier work at Baltimore, Md., will require about 1000 tons. The three ferry boats for New York City are still held up for financial reasons. About 600 tons of Plates and Shapes for each will be required, chiefly the former. Shipments are now being made from the Waverly, N. J., warehouse stocks of the Carnegie Steel Company. We quote prices, unchanged, as follows, on mill shipments, tidewater delivery: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—The week has been quiet, transactions having been confined to small quantities. Prices are continued at 1.50c., Pittsburgh, or 1.66c., tidewater, on Bar Iron, and 1.60c., Pittsburgh, or 1.76c., tidewater, on Steel Bars. An error was made last week in "Current Metal Prices," on page 832. Burden's Best Iron from store should have been quoted at 3.15c. base, instead of 3.30c., and Burden's H. B. & S. Iron at 2.95c. base, instead of 3.10c.

Plates.—Inquiries are few and the orders received by local sales agents have called for quite small quantities. Prices are unchanged as follows on standard sizes of Plates at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—Manufacturers are hoping that some of the large business awaiting the consummation of financial arrangements will soon come on the market. At present nothing definite is known as to the time when Syracuse will be prepared to purchase its heavy requirements nor when the finances of this city will enable important work to proceed which is now held up. The business at present being placed consists almost entirely of small lots, but competition among manufacturers is apparently as sharp for these small quantities as if they ran up to hundreds or thousands of tons. Carload lots of 6-in. could be had within the past few days at $23.50 to $24 per net ton, at tidewater. It is not believed that these low prices will prevail long if the price of Pig Iron is maintained at or about its present level, as very few foundries are able to show any profit on their operations at such prices.

Old Material.—Local conditions are unsatisfactory. The demand is very light, even foundries buying but small quantities and placing no orders whatever for future delivery. Some little Steel Scrap has been taken by dealers, and in a few instances rolling mill stock has been sparingly bought. The entire market, however, shows a decided lack of interest by consumers, and prices would probably be lower but for the influence of neighboring centers of trade. Shippers of material on contracts are meeting with much difficulty in making deliveries, as buyers are exceedingly critical, making rejections for causes which would ordinarily not be taken into consideration. Quotations are nominal, being continued as follows per gross ton, New York City:

Old Girder and T Rails for melting	$9.50 to $10.50
Heavy Melting Steel Scrap	9.50 to 10.50
Old Steel Rails, rerolling lengths	11.00 to 12.00
Relaying Rails	18.50 to 19.50
Old Iron Rails	14.00 to 15.00
Standard Hammered Iron Car Axles	16.50 to 17.50
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	12.00 to 13.00
Iron Track Scrap	10.00 to 11.00
No. 1 Yard Wrought, long	11.00 to 12.00
No. 1 Yard Wrought, short	10.00 to 11.00
Light Iron	5.00 to 6.00
Cast Borings	4.50 to 5.50
Wrought Turnings	6.00 to 7.00
Wrought Pipe	9.00 to 10.00
Old Car Wheels	17.50 to 18.50
No. 1 Heavy Cast, broken up	13.50 to 14.50
Stove Plate	11.50 to 12.50
Grate Bars	9.50 to 10.50
Locomotive Grate Bars	10.00 to 11.00
Malleable Cast	11.50 to 12.50

Metal Market.

NEW YORK, March 11, 1908.

Pig Tin.—The demand is light, and very little business has been transacted. Buyers were evidently scared by the sharp advance last week, and are waiting more settled conditions. At the same time prices in London have not receded to the level maintained previous to the Dutch Government's announcement. The scarcity of spot Tin was again in evidence. Price changes during the week were as follows, all being for spot delivery:

	Cents.
March 4	30.00
March 5	29.50
March 9	29.62½
March 10	29.75
March 10	29.50
March 11	29.25

Tin to arrive during the week was offered at about ¼c. below the spot price. Most of the metal brought by the Mesaba and Minneapolis was shipped to the interior, but the Minneapolis reaching here March 16 will send some Tin to store. The total arrivals this month will reach about 3300 tons. Arrivals so far are 1967 tons, and there are afloat 2357 tons. The London market is firm, but slightly below last week's price at £134 for spot and £131 for futures.

Copper.—The rumored sale of a round lot of Electrolytic at 12.37½c. is not confirmed. This was supposed to be by one of the large producers to a wire manufacturer. Some sales of carload lots of Electrolytic have been made at about 12.50c. to 12.62½c., and second-hands have Lake to sell at 12.75c. Producers of Lake, however, are not in the market—at least not for the small demand now ruling. Inquiries are more numerous, but the actual business transacted is small. Announcement was made this week that the Greene properties, with a production of over 3,000,000 lb. per month, would resume shortly. The lighter branches of finished material are moving more freely, but the heavier trades, where most of the Copper is used, show little or no improvement. Some stiffening in prices was noted early to-day, and 12.75c. was asked for Electrolytic. A bid at 12.12½c. for Casting was promptly refused, and an offer to sell was made at 12.50c. European speculative business has fallen off during the week, although some buying has been going on, but not as much as would be expected in view of the rising market for warrants. While European consumers will doubtless buy for speculative purposes whenever the market declines to a figure considered favorable, there is little hope that the large takings which were in evidence up to a month ago will be continued unless prices should again decline. The London market is about £1 higher than last week, at £57 15s. for spot, and £58 2s. 6d. for futures. Best Selected is held at £62. Exports are light, amounting to 6010 tons so far this month.

Pig Lead.—An inquiry in the market for a round lot at 3.70c. was not accepted. The prevailing price is firm at 3.75c., New York, and 3.60c., St. Louis. Improvement is looked for by the end of the month.

Spelter.—The curtailment of the output, said to be 50 per cent., has not had much effect on stimulating prices, although prevailing quotations are steady at 4.60c., St. Louis, and 4.75c., New York. The light business both in Galvanizing mills and Brass works is not taking more than the present output. Little accumulation of metal, however, is in evidence.

Antimony.—Business is at a low ebb. So little demand is in evidence that prices continue nominal and unchanged at 9.50c. for Cookson's, 9c. for Hallett's and 8.50c. for outside brands.

Nickel.—Prices are without change at 45c. for ton lots and 55c. to 60c. for smaller quantities.

Tin Plate.—Considerable difference of opinion exists in the Tin Plate trade. In New York trade is dull, and the outlook is not very clear. A feeling prevails that specifications on contracts are not being supplied as freely as the mills desire. Prices are steady at $3.89, New York, and

$3.70, Pittsburgh, for 100-lb. IC Coke Plates. In Swansea, Welsh Plates are 1½d. higher at 12s. 1½d.

Ferroalloys.—The price of $85 which has prevailed for some time for 50 per cent. Ferrosilicon is being shaded, and on a firm offer probably lower prices would be accepted, but sellers have not seen fit to revise their quotations as yet, in view of the light demand. Ferromanganese is quoted at about $45, seaboard.

Old Metals.—A broadening tendency is observed, although lower prices are quoted on Brass and Composition. More inquiry is in evidence, and a better sentiment prevails. Dealers' selling prices are as follows:

	Cents.
Copper, Heavy and Crucible	12.00 to 12.25
Copper, Heavy and Wire	11.75 to 12.00
Copper, Light and Bottoms	11.00 to 11.25
Brass, Heavy	9.00 to 9.50
Brass, Light	7.00 to 7.50
Heavy Machine Composition	11.25 to 11.75
Clean Brass Turnings	8.00 to 8.25
Composition Turnings	9.00 to 10.00
Lead, Heavy	3.50
Lead, Tea	3.25
Zinc Scrap	3.50

Iron and Industrial Stocks.

NEW YORK, March 11, 1908.

The period covered since the last issue of *The Iron Age* has been one of continuous improvement in the stock market. Prices have advanced from day to day, and for a portion of the time an almost buoyant condition was indicated. Iron and steel stocks may be said to have led the movement, as the strength they displayed caused renewed attention to be paid to railroad stocks and striking advances were then made in all lines. The cause of the upward movement appears to have been the improvement shown in the volume of business transacted by the United States Steel Corporation. The range of prices on active stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 29⅝ to 32¾, preferred 92¾ to 96⅜; Car & Foundry common 28⅞ to 31, preferred 87½ to 88⅞; Locomotive common 33 to 37¼, preferred 90½ to 91; Steel Foundries common 5 to 6, preferred 30 to 31; Cambria Steel 27½ to 29½; Colorado Fuel 16⅜ to 18⅜; Crucible Steel common 4⅞ to 5, preferred 35¼ to 36½; Pressed Steel common 20 to 21⅞, preferred 73 to 80; Railway Spring common 25⅞ to 29⅜; Republic common 15½ to 17½, preferred 66 to 69; Sloss-Sheffield common 42½ to 46½; Cast Iron Pipe common 19⅛ to 19½, preferred 64 to 66⅛; Can common 4½ to 5, preferred 45⅞ to 48⅛. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 33, preferred 96¼; Car & Foundry common 29¼, preferred 87½; Locomotive common 37, preferred 90⅜; Colorado Fuel 18¼; Pressed Steel common 21½, preferred 79; Railway Spring common 29½; Republic common 17⅝, preferred 69¼; Sloss-Sheffield common 47; Cast Iron Pipe common 20, preferred 66¼; Can common 5; preferred 48.

Dividends.—The Canadian General Electric Company has declared a quarterly dividend of 1¾ per cent. on the common stock, and a semiannual dividend of 1½ per cent. on the preferred stock, both payable April 1.

The Otis Elevator Company has declared a quarterly dividend of 1½ per cent. on the preferred stock, and a semiannual dividend of 1½ per cent. on the common stock, both payable April 15.

The Railway Steel Spring Company has declared the regular semiannual dividend of 2 per cent. on the common stock, payable April 22.

The American Can Company has declared the quarterly dividend of 1¼ per cent. on the preferred stock, payable April 1.

The American Car & Foundry Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock and 1 per cent. on the common stock, both payable April 1.

The Barney & Smith Car Company has declared a quarterly dividend of 2 per cent. on the preferred stock, payable March 15.

The secretary, Andrew M. Fairlie, Box 197, McCays, Tenn., announces that 10 new members have been added to the list of the American Brass Founders' Association. This association will hold its first annual convention at Toronto, Canada, in the second week of June, simultaneously with the convention of the American Foundrymen's Association. The secretary desires that all who intend to contribute papers notify him at once and announce their subjects.

The American Can Company, New York, intends to erect a plant in Canada, and is now negotiating for a site in the vicinity of Montreal. As soon as a location is selected it is probable that plans will be prepared and work of construction started.

Customs Decisions.

Automatic Pistols Classed as Side Arms.

A customs controversy which has waged for a long time has been brought to a close by the Board of United States General Appraisers deciding that so-called automatic pistols are to be regarded for the purposes of duty as "side arms." In a previous case the board, while not approving of the classification of 45 per cent. as manufactures of metal imposed by the Government, was unable to sustain the contention, as the wrong claim had been made by the importer. In the latest case, which stands in the name of M. J. Corbett & Co., New York, the board upholds the claim of the protestants for duty at 35 per cent. as side arms.

Steel Plates for Engraving.

Judge Hough, in the United States Circuit Court, has handed down a decision in which it is held that steel plates intended to be engraved and used in the printing of steel engravings, and so-called monogram dies used for engraving monograms, are properly dutiable as "plates" at specific rates, together with additional duty as polished steel plates, under the provisions in the tariff for articles undergoing a brightening process. The test case stood in the name of W. B. Sellers, New York. It was alleged by the Government that the duty should be at the rate of 45 per cent. under the provision in the law for "manufactures of metal," but this contention the court holds to be incorrect.

German Chamber of Commerce Certificates Not Evidence.

The Board of Appraisers, in a decision recently promulgated, has made it clear that certificates of chambers of commerce of Germany cannot be accepted as competent evidence in dealing with questions of valuation, unless such certificates are sworn to and verified. The decision is considered in importing circles as something of a surprise in view of the provision in the German-American tariff agreement relating to the certificates as "competent evidence." The case before the board was that of the American Express Company, which imported merchandise from Germany. Attached to the invoice was a certificate from the Hamburg Chamber of Commerce to the effect that the prices stated in the invoice were correct. In overruling the contention of the importers and affirming the action of the Appraiser of the Port in making advances over entered value, General Appraiser Hay, who writes the decision, says in part:

> The certificate in question, however, cannot be treated as anything more than the unverified statement of the gentleman who is the president of the Chamber of Commerce of the city of Hamburg, and, from the very nature of the statement itself, we think it a fair presumption that he had no personal knowledge of the facts set out in that statement. . . . Before this board can make a finding of facts, those facts must be established by competent testimony, fairly deducible from such testimony, or the result of a presumption of law.

The semiannual meeting of the American Society of Mechanical Engineers, in Detroit, will be held June 23 to 26. This is later than usual for the so-called spring meeting, and is partly a consequence of an arrangement to convene simultaneously with the Society for the Promotion of Engineering Education, and partly to make it easier for professors and students to attend, as by that time their class work will be over for the summer. Both societies will hold their headquarters in the same hotel, and as far as practicable the sessions of the two organizations will be so arranged that those desiring to attend both may do so. Interesting and pleasurable occasions are planned, and among the papers presented will be a symposium on the conveying of materials.

The United Steel Company, Canton, Ohio, shipped during February to the Ford Motor Company, Detroit, Mich., about 400 tons of vanadium steel. This steel was made especially for the motor company and is to be used in the construction of its automobiles. This is probably the largest shipment of vanadium steel for automobile work ever made in this country.

The Machinery Trade.

NEW YORK, March 11, 1908.

The depression in the machinery trade was further emphasized the past week by the few inquiries and orders received, and the disposition on the part of buyers to purchase second-hand machinery; in fact, there are many dealers in this territory whose business is made up to a great extent of this latter class of trade. It is stated that there is a large quantity of second-hand machinery in stock which is nearly new, and because of the dullness in business buyers who are compelled to make purchases select these tools. Aside from the few tools urgently needed by works, but little inquiry has developed and no sizable sales are reported. In the power line the spurt of a few weeks ago has subsided, and since our last report inquiries have again fallen off. In this branch of equipment, however, there has been a fair export demand, particularly from Europe. Shipyards in Germany have placed orders for a considerable amount of pneumatic tools and for several air compressors.

It has been stated that the New York Central Railroad has decided to spend a large amount of money in improvements to its shops at West Albany, N. Y., and a traveling crane list which has been placed before the trade within the last week indicates that the buying movement has about commenced. The list of cranes on which the company is asking bids includes one 15-ton crane, one 30-ton crane and one 40-ton crane, all for indoor service in the company's large boiler shop, and one 20-ton crane to be used outdoors over the yard abutting on the boiler shop. These cranes are to be fitted for alternate current electric service, and the bids are to be sent to George W. Kittridge, who is chief engineer of the electric zone. It will be remembered that some time ago the company laid down plans for spending about $300,000 for the construction and equipment of the buildings at West Albany, and the plans include an erecting shop, 90 x 440 ft., and other buildings. The motive power department some time ago asked for $2,000,000 for the purchase of new equipment, and it is thought in the trade that part of this amount will be appropriated for machinery for the West Albany shops.

Several erroneous reports have been recently printed concerning the plans of the South & Western Railroad for replacing its shops at Carnegie, Pa., which were recently destroyed by fire, and for the location of new shops for taking care of the principal repairs. The shops at Carnegie were of minor importance, having been acquired with a small road purchased by the South and Western Railroad, and will not be rebuilt. The principal shops of the railroad, which will constitute a modern plant capable of handling the largest motive power, will be erected some time this year, the location for which has not been definitely decided. Several locations are under consideration, and it is believed that as soon as one is selected plans will be prepared for the new buildings. As it is the intention to make these shops modern in every respect, it is expected that a substantial amount of new equipment will be purchased for their equipment. As yet no decision has been made as to the character of the shops or the machinery to be installed.

Victor Beutner, consulting engineer, Westinghouse Building, Pittsburgh, has prepared plans and is asking estimates for the buildings and equipment for the Union Portland Cement Company, at Iola, Kan. The company was recently organized with $3,500,000 capital stock and will build a plant to cost $1,000,000 to produce 3000 bbl. of cement per day. Included in the equipment will be five large kilns, five 600-hp. gas engines, and $80,000 worth of electrical equipment. The main office of the company is at Kansas City, Kan.

The Pressed Steel Car Company, Pittsburgh, Pa., has a number of inquiries in the market which indicate the company is doing some buying toward filling its shop needs. An order was placed during the week for a threading machine with a large Liberty street house, and inquiries now before the trade include a number of larger machines to be used in a similar capacity.

The Strong Steel Foundry Company has been placing some orders for its plant which is to be fitted up in the buildings formerly occupied by the Buffalo Cement Company, at Main and Amherst streets, Buffalo, N. Y. It will be remembered it was stated in these columns on February 20 that the company would need a complete line of foundry equipment, and it is said in the trade that preparations are being made to equip the plant as early as possible.

The Chicago Pneumatic Tool Company, New York, has recently received a number of orders for compressors from foreign countries, particularly Germany, where shipyards are adding to their equipment compressed air machinery. In addition to compressors orders for a substantial amount of pneumatic tools have also been received from the shipyards.

Last week mention was made of the partial destruction by fire of the power plant of the Pennsylvania Power Company, at Ellwood City, Pa. While the company has made no plans for rebuilding there is no doubt that the plant will be rebuilt, but as it has not yet decided upon the location for the new plant and as it may possibly add materially to the capacity it had before the fire, definite plans will not be made until these matters are settled at a meeting of the Board of Directors, which will take place as soon as the insurance is adjusted.

George R. Webb has been elected president of the Duquesne Light & Power Company, Pittsburgh, Pa., succeeding Robert C. Hall, who has been elected vice-president. This company has plans for the construction of a large electric light plant, but which have been held in abeyance on account of the financial stringency.

The management of the Genesee Hotel, Buffalo, N. Y., is considering the advisability of installing an electric light plant in the house, and has inquiries now in the trade regarding the material, with a view to ascertaining the cost. The inquiries indicate the company will need two 75-hp. engines and two 50-kw. generators for a direct connection.

The Ott, Freundt & Arnold Yeast Company, Osgood avenue and John street, Stapleton, S. I., has inquiries in the trade for power equipment which includes a 75-hp. engine and a 15-kw. generator.

Plans for barge canal work involving the expenditure of about $5,000,000, have been approved by the State Canal Board at Albany, N. Y. The plans cover contract No. 20 for dredging the Mohawk Valley at an estimated cost of $3,480,000; contract No. 64, improving the canal in Orleans County at an estimated cost of $1,307,000, and contract No. 45, for damming the Oneida River and constructing a lock at Baldwinsville at an estimated cost of $250,000.

Business Changes.

Edwin N. Ludeman & Co., 42 Broadway, New York, have arranged with the Detroit Stoker & Foundry Company, Detroit, Mich., to represent it throughout the Eastern States and for all the export trade for the sale of Detroit automatic stokers. Over 500 of these stokers have been installed for service in connection with the leading makes of both water tube and fire tube boilers.

The general offices of the Wheeler Condenser & Engineering Company have been removed to the factory at Carteret, N. J. A sales office will be maintained at 90 West street, New York, under the management of George D. Atwood.

Catalogues Wanted.—In the item printed last week the address of Edward G. Spitz was not correct. Mr. Spitz, who only expects to remain in this country a short time, is located at 241 West Fifty-second street, New York, and desires to receive catalogues at that address of all classes of machine tools and general foundry equipment, with a view to making connections to sell American machinery in Europe.

Eisenwerk Frauenfeld, A. G., vormals F. Martini & Co., Frauenfeld, Switzerland, desires catalogues from manufacturers of machinery for making machine screws, bolts and nuts, drop forgings, &c.

Chicago Machinery Market.

CHICAGO, ILL., March 10, 1908.

While the total volume of business in machinery lines for the month of February was doubtless in excess of that of the preceding month, the margin of gain is scarcely wide enough to be regarded as of special significance. No change is observed in the character of orders being placed, which continue to include no extensive equipment requirements, but are mainly for single machines or small lots of machine tools. Dealers, however, report the continuance of an encouraging amount of inquiries, which they feel sure will result in business as soon as conditions become more settled. During the week some of these have originated in a few of the larger industrial plants, which leads to the inference that some of the factories now running light see hopeful signs of a better demand for their product in the near future. At the same time there is no general disposition on the part of the large manufacturing interests to extend their present shop facilities, the moderate purchases made by such plants being restricted largely to replacement orders. Among the sales of machine tools effected during the week by dealers, one is reported which includes two or three fair sized machines aggregating $3000. Generally, however, the orders have been scattered, and nothing is coming from the railroads except as the result of persistent effort in demonstrating the economy of substituting a modern tool of particular merit for an out of date machine. One of the noticeable effects of the present business depression is the increased activity of machinery sales departments, which are thoroughly alive to every opportunity presented to secure orders. The buyer of machine tools who happens to come into the market now, instead of a weary wait of months for delivery, as was the case last

year, can now, in most cases, have his wants supplied from stock, or, at least, can rely on prompt shipment from factory.

Plans are being made for and bids are being sought on electric and motive power equipment for quite a number of municipal electric light and power plants, most of them, however, being for small or moderate sized units. Electricity is now playing an important part in mining operations, especially in coal mines, from which source a fair number of orders for electric generators, motors and auxiliary equipment are being received. In addition to electric haulage locomotives, motors are required for ventilating fans, electric hoists, centrifugal pumps, elevators, conveyors, &c. The boiler and engine trade is extremely quiet so far as large power units are concerned, and as a whole is only moderately active.

Demolition of the two blocks between the streets of Canal, Clinton, Lake and Washington, which formerly comprised a good portion of what was known as "Machinery Row," is rapidly progressing, and the remaining tenants of this district are moving to new locations. Among the recent removals, and those in early contemplation, are a number of concerns who have for many years occupied quarters on Canal and Clinton streets.

The Scott Valve Company, formerly at 63 South Canal street, has removed to 31 East Randolph street.

The Chicago Belting Company, now at 67 Canal street, is preparing to move into its new modern factory at 12-22 South Green street, which is nearing completion, and will be ready for occupancy about March 14.

About May 1 the H. A. Stocker Machinery Company will move into its new store at the northeast corner of Randolph and Jefferson streets. It will occupy the first floor and basement of this building, which is 100 x 100 ft.

The Brown & Sharpe Mfg. Company has moved from 16-18 South Clinton street to 101-107 Washington boulevard.

The Foote Brothers Gear & Machine Company, 24-30 South Clinton street, has under construction a new building at 44-50 Carpenter street, into which it expects to move about the first of June. This building, which is of concrete construction, has ground dimensions of 92 x 121 ft., one-half of which is built three stories high. The one-story extension in the rear has a saw tooth roof, giving ample light in the machine shop.

The city of Fort Worth, Texas, is asking for sealed proposals on equipment for an electric light plant, which will be opened on April 7. Included in the requirements for this installation are one 650-kw., three-phase, 60-cycle, 2300-volt alternating generator with exciter; 10 current transformers, switchboard panels for 50 arc each, and other auxiliary equipment; also one compound condensing Corliss engine, direct connected to the generator. Alternate proposals will be received for a 325-kw. generator with corresponding equipment. J. J. Nunnally is city auditor.

The Grupe Drier & Boiler Company, Davenport, Iowa, is contemplating the erection of a new shop to enable it to take care of its rapidly increasing business in grain drier presses and machinery. It is stated that the company is now employing more men than at any time in its history and is rapidly gaining an export trade. Among the recent installations and shipments made are seven driers for the Milwaukee Grain & Feed Company, Milwaukee, Wis.; four driers for the starch plant of Douglas & Co., Cedar Rapids, Iowa; two driers and two presses, Melrose Grain Drying Company, New York; complete plant, Standard Brewing Company, New Orleans, La., and Hiram Walker & Sons, Ltd., Walkerville, Ontario. Other shipments of like equipment were made to Douglas y Cia, Aguascalientes, Mexico; Edwardsburg Starch Company, Cardinal, Ontario; Keever Starch Company, Columbus, Ohio; Huron Milling Company, Harbor Beach, Mich.

Arrangements are now under way for the installation of a water system at Rosalia, Wash., by the Rosalia Water Company, Inc., for which it is estimated that the expenditure of about $20,000 will be required. The plant will be operated by electricity, and the machinery equipment upon which bids are being taken includes: One 6 x 8 in. double acting triplex power pump adopted to pumping against 125 lb. pressure; one air lift machine with a capacity of 150 to 200 gal. per minute from a depth of 90 ft.; standard electric motor of from 25 to 40 hp. The compressor or pump may be either direct connected or belt driven. For the distribution service about 12,000 ft. of 4, 6 and 8 in. pipe will be needed.

The Coquille River Electric Company, Coquille, Ore., expects to install a 250-hp. engine in its plant during the coming summer or fall. The type of engine has not as yet been selected, nor has it been determined whether the engine will be simple or compound. This enlargement of the plant is stated to be necessary on account of the rapidly increasing business. Frank Morse is manager.

Plans are under way for the erection of a plant for the manufacture of generators and electrical equipment, to be established by O. C. Irwin, Berlin, Wis. The plant will consist of a main building, 92 x 140 ft., and a foundry, 60 x 90 ft., the motive power for which will be electric, the current being furnished from the outside.

Otto Tonn, Haven, Kan., has been granted a franchise to erect a small plant at that place to [illegible] by electricity. A plant having a capacity [illegible] about 225 street lights, with a fair margin for [illegible] lighting, will be required.

The contract has been let by the city of Oxford, Miss., for a building to house an electric light plant, which it is proposed to install. Bonds in the sum of $15,000 will be sold March 21 to secure funds for the construction of the building and purchase of equipment required for this improvement. It is expected the plant will be completed and ready for operation by July 1.

The Wisconsin Engine Company, Corliss, Wis., has received the resignation of Frank Engelhardt, who was in charge of the Chicago sales office of the company. The Wisconsin Engine Company has closed the Chicago office and for the time being will conduct the business from that district under the direct charge of C. T. Myers, general sales manager at Corliss.

Cleveland Machinery Market.

CLEVELAND, OHIO, March 10, 1908.

Local machine tool builders report a slight improvement in inquiries, but orders are slow in materializing, and the volume of orders is showing little if any improvement. Manufacturers of machinery continue to run their plants on about the same reduced capacity that they have been operated on for several weeks past. Some are running on about 75 per cent. of their normal capacity, and a few at less than 50 per cent. The average capacity that is being operated is probably a little over 50 per cent.

The situation as regards dealers shows practically no change. Business is fairly good by spells. For a few days there will be quite a number of orders, and then for the next few days there will be practically nothing doing. The past week was a quiet one. Sales were few and they were limited mostly to single tools. Dealers are placing no stock orders, so that the only orders they are sending to the manufacturers are for tools for which they have taken orders, but which they do not have in stock. No orders for tools that were cancelled last fall are being reinstated, but dealers are hearing from some of these buyers, who say that they will want the tools as soon as business gets a little better. Tools are needed for some industrial plants that were being erected or enlarged late last fall, the equipment for which has not yet been ordered, or if ordered the orders were cancelled. The orders for heavy machinery are still scarce, but inquiries are better. Some local projects on foot indicate an improvement in the demand for small power plant equipment.

The supply of second-hand tools is still rather scarce. Few used tools are being offered to the dealers, and those that are offered are held at higher prices than dealers are willing to pay.

The automobile industry shows considerable improvement as far as the local plants are concerned. About all have considerably increased their working forces during the past two or three weeks, and some are now running at full capacity. The better outlook for the season has resulted in the placing by the automobile builders of some orders for machine tools during the past week or so.

The local jobbing foundry situation shows no change or improvement. Buyers of castings are placing only orders for their immediate needs, and the strong competition for the limited amount of business has resulted in orders being placed at prices so low that it is claimed that they will [illegible] no profit to the foundrymen.

The Board of Trade of Coshocton, Ohio, [illegible] into a contract with James B. Clow & Sons, Chicago, according to the terms of which the Chicago company will erect a large pipe and radiator plant [illegible] a bonus of $100,000 is raised [illegible] given for a site. The company at present has a plant in Newcomerstown, Ohio, but it desires to build a larger plant in a more desirable [illegible]. It is stated that the Clow company [illegible] in the neighborhood of $1,000,000, and that it will include one of the largest foundries in the country.

At the annual meeting of the Brown Hoisting Machinery Company held a few days ago a highly satisfactory financial report was submitted for the past year. All the old officers were [illegible]. The company has taken three or four good sized orders since the first of the year and has considerable other work on hand, some of which was temporarily held up late last year. Inquiries and sales have improved during the past few weeks, and the company reports that the prospects for a good year's business are now very fair. The plant of the company is now being operated at full capacity with its day turn, and it is hoped that conditions will soon improve sufficiently to warrant the employment of the night force.

The Village Council of Cuyahoga Falls has under consideration the question of purchasing new machinery equip-

ment for the municipal lighting plant. It is estimated that the equipment needed will cost about $30,000.

The Notman Stove Company, recently organized with a capital stock of $50,000, by Canton and Alliance business men, has decided to locate in Alliance and has secured the plant of the Ohio Pressed Sheet Steel Company in that city.

The Square Deal Mfg. Company has been incorporated at Delaware, Ohio, with a capital stock of $25,000, and will erect a plant for the manufacture of hay presses. The incorporators are H. F. Owen, James J. Neville, Luther Trabue, Newton M. Miller and A. S. Conklin.

William H. Creahan and Mr. Hitchcock, who have been running an automobile repair shop in Warren, Ohio, are planning the erection of a plant for the manufacture of automobiles. In connection with this they will operate a machine shop. They are now looking for a site for a new plant.

The Ohio Metallic Packing Company, Cleveland, has been incorporated with a capital stock of $50,000, by George C. Ford, G. M. Dahl, M. G. McAleeman, N. J. Webster and J. C. Rexroth.

The Fetzer Automobile Mfg. Company, Galion, Ohio, has been incorporated with a capital stock of $100,000 by James F. Shumaker, M. E. Shumaker, Grover Shumaker, Allen H. Fetzer and James O. Sloan.

The Thomas-Peter Company, Canton, Ohio, has been incorporated with a capital stock of $20,000 to manufacture toys, sheet metal specialties, &c. The company has been operating under the name of the National Mfg. Company. A new plant may be built.

The plant of the Lyman Mfg. Company, Chardon, Ohio, has been sold to E. M. Lyman, the principal stockholder. He intends to dispose of it and start a new plant in another place for the manufacture of pails. The new plant may be located in Warren or Niles.

Philadelphia Machinery Market.

PHILADELPHIA, PA., March 10, 1908.

A few more inquiries for machine tools have developed in the local machinery market, but they are confined to the smaller and medium class of tools, mostly individually or in lots of two or three tools. The situation on the whole, therefore, shows but little change. Business in every branch of the trade is largely of a day to day character. Tools purchased are for actual needs only, and there is almost nothing being done in the way of plant extension. Practically all the new propositions in this territory are being held in abeyance, one or two exceptions only being noted, and in these cases the placing of the machine tool orders is postponed until the last possible moment.

Manufacturers continue operating their plants in a more or less irregular fashion. The larger industrial concerns are catching up pretty well on the old orders on their books, and new business comes out but slowly, so that there is no opportunity for any gain in the output. Plants are running at varying capacities, ranging from 30 to 60 per cent. of their production at this time last year. The Baldwin Locomotive Works, while it has taken a few orders for locomotives from both foreign and domestic sources, has not made any gain in its production or working force. Other large industrial concerns are in much the same shape and few indeed are the plants which are being operated at 75 per cent. of their capacity. Special tool builders report a somewhat better demand, but there has not been enough business placed to change the situation in any marked degree. Dealers as a rule find business pretty well scattered, and although close attention is given to prospective buyers, the amount of business coming out is light.

Second-hand tool and machinery merchants report the demand as fair, there being a good number of inquiries for both metal and wood working machinery, although the individual needs are small and sales on the whole do not aggregate a very large total. Second-hand boilers, engines and power equipment are only in moderate demand, and no new business of any moment has come out during the week. Manufacturers as well as dealers in new boilers and engines also report trade extremely quiet.

The foundry trade shows practically no improvement. There have been some gains in spots, but in the aggregate the increase in tonnage has not been heavy. Foundrymen report plants in operation on a varying basis, in some instances 30 to 35 per cent., and in others at 50 to 60 per cent. of the capacity. Consumers will not take castings even at price concessions, except as absolutely needed, and forward business is therefore pretty scarce.

Heacock & Hokanson, engineers, have awarded the contract for the new warehouse building to be erected at 106-114 Bread street, for the Berger Bros. Company, to F. A. Havens & Co., builders and contractors. The cost will be $26,827. This does not include the power installation, elevators or cement work, which will be separately awarded by the Berger Company, which is now considering the various power systems before placing orders.

The Director of Public Works, Bureau of Water, 790 City Hall, Philadelphia, will receive bids until March 17, under what is known as contract No. 130, for auxiliary pumps for the Torresdale filter plant; contract No. 139, for pump ends, for the Queen Lane pumping station; contract No. 141, pipe connections, for the Lardner's Point station, and contract No. 142, track scales, for the Torresdale pumping station. Specifications, drawings, &c., can be obtained at the office of the chief of the bureau, room 700, City Hall.

Franklin & Clark, architects and engineers, have completed plans for a two-story brick factory building, 50 x 100 ft., with a wing addition, to be built for the MacAndrews & Forbes Company, chemical manufacturer, Camden, N. J. Estimates for the erection of the building are now being taken by the architects.

The County Commissioners of Bucks County will receive proposals at Doylestown, Pa., until March 16 for the construction of two reinforced concrete bridges, one in Hilltown township, near Dublin, the other near Pipersville. Plans and specifications showing the character of work and materials can be seen at the commissioners' office.

The contract for furnishing and installing two horizontal pumping engines, each having a capacity of 5,000,000 gal. per day, in the Shawmont pumping station, to replace old ones now in service, was awarded by the Director of the Bureau of Water to the Snow Steam Pump Company, which proposed to install the pumps in 280 days at a cost of $78,000. At the same time a contract was awarded to the Bethlehem Steel Company to furnish and install two engines, each with a capacity of 10,000,000 gal. daily, in the Belmont pumping station, which will be installed in 225 days at a cost of $88,520.

The machinery, general equipment and stock of materials on hand of the North Penn Iron Company, Third and Venango streets, which was declared a bankrupt some months ago, will, it is understood, be sold on the premises on March 20.

Cincinnati Machinery Market.

CINCINNATI, OHIO, March 10, 1908.

If conditions which marked the flight of the first week of the last month of the first quarter are in any way significant, the second quarter should see a marked improvement in trade. There has been a decidedly better feeling manifest among makers of power plant equipment, and a little better tone pervades the atmosphere of tool manufacturing, although this is only discernible in spots. There has been very little change in the shop situation at most plants. With few exceptions all are running on part time, and with much reduced forces.

Some singularly sharp contrasts in conditions are noticed by the careful observer who has followed the course of a half dozen or more tool manufacturers during the months which marked and since the sudden depression of the past year. A few local tool builders, as soon as the storm set in and the flood of cancellations began to accumulate, hit upon the plan of endeavoring to counteract its ill effects, and notably two of these employed additional stenographers and clerks, increased their advertising appropriation, got up some strong and persuasive trade and follow-up letters and have gone after the business with an energy and aggressiveness that is now beginning to show pleasing results.

One concern making shapers is running on full time and with a complete force, and reports some excellent sales during the week. There are a few isolated cases of plants like this one running normal time and forces, and the encouraging condition can be traced directly to a determined stemming of the tide, a disposition to deny the depressing sentiments of the calamity howler, a setting determinedly to work for a share of what is going in the way of orders.

At the plant of the Allis-Chalmers Company in Norwood there have come in some good orders for large power equipment. Among these are a 1500-kw. generator for shipment to Nevada, another of 1000-kw. to go Southwest, one 500-kw. turbo generator for the East, a 1500-kw. generator for the Washburn-Crosby plant, three motor generators of 500 kw. each to be installed in the plant of the Youngstown Sheet & Tube Company, two 1500-kw. turbo generators for a large plant in the Northwest and a lot of smaller equipment. The Norwood plant is not as yet running full, but a gradually increasing force will be taken on as the orders above noted reach the constructing and erecting shops. In the foundry the present output is about one-third of that of last summer, when unusual conditions prevailed.

The widely published reports indicating radical changes in the Norwood plant of the Allis-Chalmers Company have only a fair semblance of truth, according to information from authentic sources here. There is contemplated a centralization or co-operation of interests in the engineering, drafting and correspondence departments, and about April

21 such parts of that work as has been done in Norwood will be transferred to the general offices in West Allis, Wis. About 30 employees will be affected. The report that all the large work would thereafter be done in Milwaukee or at West Allis is untrue.

The foundry of the Peck-Williamson Company, manufacturer of furnaces, is closed down at Wellston, Ohio. President A. W. Williamson of the company is on the scene, and will investigate and adjust some small differences that resulted in the walk-out of about 100 molders. As this is the annual inventory time, advantage will be taken of the temporary close down for that annual function. A local official expects a resumption of work in about a week, and reports business and prospects bright.

The John Grossius Furnace Company will build a $15,000 factory in Broadway near Court street. The present plant of the company is in Eighth street just east of Broadway, and is directly in the path of the proposed route for the Gilbert avenue viaduct. The buildings, with others, will be razed to permit of this improvement. The new structure will be of three stories, with basement, 40 x 80 ft. The architect is C. M. Foster, who is taking bids.

City authorities have decided to order two additional pumping engines for installation in the Western Hills pumping station of the Cincinnati Water Works. The engines are needed to supply the suburb of Westwood, which is 75 ft. higher than any other district of the city.

The Stewart Iron Works Company is a new corporation for Cincinnati with a capital of $10,000, launched by Harry L. Gordon, A. B. Horton, Victor Heintz, R. C. Stewart, and W. A. Stewart.

The Thew Automatic Shovel Company is a new incorporation at Lorain, Ohio. The capital stock is $50,000. The incorporators are R. Thew, W. A. Donaldson, E. M. Pierce, S. Hitchcock, and F. A. Smythe.

Work of repairing the furnaces at the plant of the Columbus Iron & Steel Company, Columbus, Ohio, is progressing favorably. Both stacks will be relined, and a number of other repairs made. The furnaces will not go into blast earlier than May or June, according to present arrangements.

A report from South Bend, Ind., says that the Northern Indiana Railroad may remove its shops from that place to Goshen because of their present undesirable location. It is said that ultimately the owners of this system will manufacture their own cars and equipment.

The Bellevue Pipe & Foundry Company, Bellevue, Ohio, which has been shut down for some time, is again in operation.

The Seneca Chain Company, Mansfield, Ohio, is running with a force of 230 men, and when some necessary machinery is installed the force is expected to be increased to 300. Reports from this company indicate that the outlook is very encouraging.

The Eclipse Stove Company, Mansfield, Ohio, is running with full force half time, but expects shortly to resume full time in all departments.

Resumption of normal time and forces is gradual at the plant of the Aultman-Taylor Company, Mansfield, Ohio, and the company expects, if present inquiries materialize in orders, to open all departments soon.

The Cincinnati Milling Machine Company, Cincinnati, Ohio, has recently purchased a 72 x 72 in. x 40 ft. planer from William Sellers & Co., Philadelphia, Pa.

New England Machinery Market.

WORCESTER, MASS., March 10, 1908.

No further improvement has been noted in the machine tool trade. Second-hand machines are being sold in considerable numbers, which is always characteristic of similar periods. A good many used tools have come into the market, and their presence is undoubtedly influencing the demand for new machinery. The dealers are selling a few tools, mostly small and inexpensive machines, with an occasional larger order. One dealer has disposed of three high priced milling machines within a few days to different customers. Practically everything in machinery may now be had for immediate delivery, the builders of milling machines and grinders, the last to quote anything but immediate or almost immediate shipment, now having caught up with their back orders.

Among the machine tool builders, as a whole, the production is falling off a little as old orders are cleaned up, or stocks have been sufficiently completed in accord with the ideas of the manufacturers. But some foreign orders have helped out to an extent, and an occasional domestic order has been a cheerful variation from the practical absence of new business. Inquiries continue to be numerous with the dealers, and to some extent with the manufacturers, especially for the standard machines. It is a matter of frequent comment that there should be so many who express by inquiries their intention of buying, with so few who decide to go ahead immediately and prepare for a resumption by the time when machinery will be needed. Among the builders of automatic and semiautomatic machines there is little life in the way of business.

Enormous crowds and lively interest at the Boston Automobile Show at the Mechanics' Building are giving encouragement to the automobile people, who now look for a season by no means so poor as they had expected. The exhibition does not include such large displays of machinery as some people had expected, nor so many hardware novelties. The Chandler & Farquhar Company, Boston, had a notable exhibit, including a number of machine tools in practical operation, including grinders of the Norton Grinding Company, Worcester; gear cutting machine of the Standard Mfg. Company, Bridgeport, Conn.; the combined milling machine and upright drill of the W. B. Knight Machinery Company, St. Louis; cutting off machines and automatic saw grinder, Cochrane-Bly Company, Rochester, N. Y., and a number of power driven specialties of the Coates Clipper Company, Worcester.

The Waterbury Casting Company, Waterbury, Conn., has practically completed its foundry, and expects to begin operations early in April. The company will manufacture high grade castings for combustion engine cylinders and other purposes.

The American Ball Company, Providence, R. I., has sold its entire department for the manufacture of metal balls to the E. J. Jones Company, Buffalo, N. Y., and 49 Federal street, Boston. The Providence company will continue its important department of bearings, and its is understood will increase it in the near future. The sale to the E. J. Jones Company includes machinery and other tools, stock in hand, material, patent rights, patterns, &c. The equipment will be removed to Buffalo, where the new owner is concentrating its business in the plant of the Excelsior Machine Company, which it acquired not long ago. It is stated that its new acquisitions and recent improvements will give the company 65 per cent. of the country's production of balls.

The Eureka Reverse Gear Company, Hartford, Conn., has been incorporated under Connecticut laws, with an authorized capital stock of $50,000, to manufacture a new reverse gear for motor boats and shaftings. The incorporators are Louis A. Sherman, Frederick A. Saunders, and Frederick G. Johnson, all of Hartford. The new device will be manufactured at 172 Pearl street.

Hill, Clarke & Co., Inc., Boston, are fitting up a model machine shop in their store at Oliver and Purchase streets. A number of important tools carried by the house will be in practical operation for the benefit of customers who wish a demonstration.

The Corbin Bros. Company, New Britain, Conn., manufacturing a line of hardware, has increased its capital stock from $50,000 to $300,000.

The Carlyle Johnson Machine Company, Hartford, Conn., manufacturer of friction clutches, had the largest month's business in its history in February. The volume of orders booked was practically equal to that of any previous month, even without an order for 120 friction clutches from William Sellers & Co., Philadelphia, which will go into the factory of Wolff Bros., in that city.

It is stated in a dispatch from Augusta, Maine, that Portland capital is interested in the establishment of a new shipyard at Tenants Harbor, land having been secured for the purpose along the water front. No details of the personnel of the enterprise are available.

The business of B. F. Smith & Bro., 38 Oliver street, Boston, has been incorporated as B. F. Smith & Co., Inc., with a Massachusetts charter and capital stock of $30,000. The company makes a specialty of artesian and driven wells and foundation borings. H. F. Hill is president; S. P. Gates, vice-president, and C. D. Kirkpatrick, treasurer. The officers and C. H. Waterman constitute the Board of Directors.

Government Purchases.

WASHINGTON, D. C., March 10, 1908.

The Isthmian Canal Commission will receive bids until March 14, circular No. 430, for engine and generator and engine driven exciter.

Proposals will be received until April 6 at the office of the United States Engineer, Cincinnati, Ohio, for boilers, machinery, &c.

The Isthmian Canal Commission will receive bids until March 30, circular No. 429, for rock drills, tin shop machines, &c.

The following bids were opened March 2, circular No. 423, for supplies for the Isthmian Canal Commission:

Class 1, Pumps and Pumping Engines. Bidder 2, Alberger Pump Company, New York, $4988; 8, Blackhall & Baldwin Company, New York, $4748; 14, Buffalo Steam Pump Company, Buffalo, N. Y., $4189; 15, Camden Iron Works, Camden, N. J., $5500 and $4560; 27, Dayton Hydraulic Machinery Company, Dayton, Ohio, $5950, $4900 and $5050; 32, Dravo, Doyle & Co., Philadelphia, Pa., $4860; 39, Fox Bros. & Co., New York, $4922 and $5922; 87, Platt Iron Works Company, Dayton, Ohio, $3600;

42; H. A. Roers Company, New York, $5435; 115, H. R. Worthington, New York, $4496, pumps only.

Class 2. Four boiler feed pumps—Bidder 19, Central Metal & Supply Company, Baltimore, Md., $900; 25, M. T. Davidson Company, New York, $800; 34, Fairbanks, Morse & Co., New York, $620; 39, Fox Bros. & Co., New York, $1319.95; 66, Manning, Maxwell & Moore, New York, $784.60; 72, Motley, Green & Co., New York, $8789.74; National Electrical Supply Company, Washington, D. C., $692; 87, Platt Iron Works Company, Dayton, Ohio, $756; 96, Schoellhorn-Albrecht Machine Company, St. Louis, Mo., $368; 108, Warren Steam Pump Company, New York, $652; 115, H. R. Worthington, New York, $963.24.

Class 3. Six horizontal boiler pumps—Bidder 19, Central Metal & Supply Company, Baltimore, Md., $310; 25, M. T. Davidson Company, New York, $294; 34, Fairbanks, Morse & Co., New York, $303.86; 39, Fox Bros. & Co., New York, $303.86; 42, Gardner Governor Company, Quincy, Ill., $216.40; 66, Manning, Maxwell & Moore, New York, $270.90; 72, Motley, Green & Co., New York, $271.60; 74, National Electrical Supply Company, Washington, D. C., $221; 87, Platt Iron Works Company, Dayton, Ohio, $262; 96, Schoellhorn-Albrecht Machine Company, St. Louis, Mo., $272; 108, Warren Steam Pump Company, New York, $238; 115, H. R. Worthington, New York, $200 and $212.

Class 4. One punching and shearing machine—Bidder 63, Long & Alstatter Company, Hamilton, Ohio, $845; 67, Manning, Maxwell & Moore, New York, $1020; 85, Henry Pels & Co., New York, $1050; 88, Queen City Punch & Shear Company, Cincinnati, Ohio, $992.50; 106, Vandyck-Churchill Company, New York, $875; 112, Wickes Bros., Saginaw, Mich., $1025; 113, Williams, White & Co., Moline, Ill., $1030; 120, Joseph T. Ryerson & Son, Chicago, Ill., $1110.

The following bids were opened March 3 for machinery for the navy yards:

Class 11. One power press—Bidder 14, E. W. Bliss Company, Brooklyn, N. Y., $1350; 60, Frevert Machinery Company, New York, $1294; 71, Henshaw, Bulkley & Co., San Francisco, Cal., $1088; 140, Standard Machinery Company, Providence, R. I., $1525 and $1825; 201, Manning, Maxwell & Moore, New York, $1450.

Class 12. One power circle shear—Bidder 60, Frevert Machinery Company, New York, $60; 71, Henshaw, Bulkley & Co., San Francisco, Cal., $86; 123, Joseph T. Ryerson & Son, Chicago, Ill., $112; 140, Standard Machinery Company, Providence, R. I., $280 and $305.

Class 13. One dry floor grinder—Bidder 60, Frevert Machinery Company, New York, $156; 71, Henshaw, Bulkley & Co., San Francisco, Cal., $178; 126, Ransom Mfg. Company, Oshkosh, Wis., $145; 140, Standard Machinery Company, Providence, R. I., $140 and $167; 151, Fred. Ward & Son, San Francisco, Cal., $196.62; 200, Manhattan Supply Company, New York, $209; 201, Manning, Maxwell & Moore, New York, $143; 230, Harron, Rickard & McCone, San Francisco, Cal., $181 and $183.20.

Class 21. Two duplex boiler feed pumps, two duplex underwriter fire pumps, one duplex pump and one receiver—Bidder 24, Buffalo Forge Company, Buffalo, N. Y., $2155; 61, Gardner Governor Company, Quincy, Ill., $1710; 95, W. G. Morris, Phœbus, Va., $2383; 100, National Electrical Supply Company, Washington, D. C., $1961; 116, Platt Iron Works Company, Dayton, Ohio, $2255; 213, J. J. Shannon & Co., Philadelphia, Pa., $1992.50; 228, C. H. Wheeler Mfg. Company, Philadelphia, Pa., $1959.

Class 22. One motor driven concrete mixing machine—Bidder 36, William Wirt, Clark & Sons, Baltimore, Md., $785; 87, Koehring Machine Company, Milwaukee, Wis., $730; 97, Municipal Engineering & Contracting Company, Chicago, Ill., $798; 134, Standard Scale & Supply Company, Pittsburgh, Pa., $700; 160, Waterloo Cement Machinery Company, Waterloo, Iowa, $651; 174, Chicago Concrete Machinery Company, New York, $835.45; 185, R. W. Geldart, New York, $779; 213, J. Shannon & Co., Philadelphia, Pa., $1000 and $795; 224, Ernst Wiener Company, New York, $835 and $640; 225, Frank H. Woodruff, New York, $550.

Class 31. One timber planer—Bidder 129, Charles H. Robidoux, St. Louis, Mo., $3446; 163, American Wood Working Machinery Company, New York, $2866.40; 183, J. A. Fay & Egan Company, New York, $3389.10.

Class 32. One combination hand resaw and rip saw—Bidder 96, William B. Mershon, Saginaw, Mich., $1314.94; 129, Charles S. Robidoux, St. Louis, Mo., $1610; 183, J. A. Fay & Egan Company, New York, $1695.

Class 41. One 15-ton electric traveling crane—Bidder 5, Alliance Machinery Company, Alliance, Ohio, $5974; 22, Alfred Box & Co., Philadelphia, Pa., $4399; 34, Case Mfg. Company, Columbus, Ohio, $5400; 45, Cleveland Crane & Car Company, Wickliffe, Ohio, $4999; 91, Modern Steel Structural Company, Waukesha, Wis., $4720; 102, Northern Engineering Works, Detroit, Mich., $4750; 113, Pawling & Harnischfeger, Milwaukee, Wis., $6350; 153, Whiting Foundry Equipment Company, Harvey, Ill., $5340; 190, Hoisting Machinery Company, New York, $6490; 197, Morgan Engineering Company, Alliance, Ohio, $4995; 198, Motley, Green & Co., New York, $5913; 201, Manning, Maxwell & Moore, New York, $4781; 202, Richard Morton, Baltimore, Md., $6500; 203, Niles-Bement-Pond Company, New York, $4985.

Class 42. Two electric traveling cranes—Bidder 5, Alliance Machinery Company, Alliance, Ohio, $11,830; 22, Alfred Box & Co., Philadelphia, Pa., $8150; 34, Case Mfg. Company, Columbus, Ohio, $11,800; 45, Cleveland Crane & Car Company, Wickliffe, Ohio, $11,490; 91, Modern Steel Structural Company, Waukesha, Wis., $10,350; 102, Northern Engineering Works, Detroit, Mich., $5650; 144, William Sellers & Co., Philadelphia, $12,190; 197, Morgan Engineering Company, Alliance, Ohio, $11,360; 198, Motley, Green & Co., New York, $10,762; 201, Manning, Maxwell & Moore, New York, $11,530; 203, Niles-Bement-Pond Company, New York, $11,190.

Class 43. One extension gap lathe—Bidder 60, Frevert Machinery Company, New York, $2424; 203, Niles-Bement-Pond Company, New York, $1743; 207, Prentiss Tool & Supply Company, New York, $1956; 216, Tucker Tool & Machine Company, New York, $2435; 221, Vandyck-Churchill Company, New York, $2380.

Class 44. One screw cutting lathe—Bidder 75, Hendey Machine Company, Torrington, Conn., $1150; 114, Pratt & Whitney Company, Hartford, Conn., $1287; 188, Garvin Machine Company, New York, $946; 201, Manning, Maxwell & Moore, New York, $1150 and $970; 203, Niles-Bement-Pond Company, New York, $1096; 207, Prentiss Tool & Supply Company, New York, $1164; 221, Vandyck-Churchill Company, New York, $1092.

Class 45. One shaping machine—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $880 and $833; 75, Hendey Machine Company, Torrington, Conn., $788; 112, Potter & Johnson Machine Company, Pawtucket, R. I., $686; 188, Garvin Machine Company, New York, $847 and $839; 203, Niles-Bement-Pond Company, New York, $823; 207, Prentiss Tool & Supply Company, New York, $941; 221, Vandyck-Churchill Company, New York, $736.

Class 46. One power feed drill press—Bidder 60, Frevert Machinery Company, New York, $719; 188, Garvin Machine Company, New York, $636; 201, Manning, Maxwell & Moore, New York, $617 and $576; 203, Niles-Bement-Pond Company, New York, $518; 207, Prentiss Tool & Supply Company, New York, $793; 221, Vandyck-Churchill Company, New York, $425.

Class 47. One electrically driven sensitive drill—Bidder 41, James Cogg, Jr., Electric Company, Louisville, Ky., $143.50; 88, Landis Machine Company, Waynesborough, Pa., $440; 188, Garvin Machine Company, New York, $193; 203, Niles-Bement-Pond Company, New York, $123; 221, Vandyck-Churchill Company, New York, $194.

Class 48. One emery grinder—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $332; 41, James Cogg, Jr., Electric Company, Louisville, Ky., $141; 43, Challenge Machine Company, Philadelphia, Pa., $250; 60, Frevert Machinery Company, New York, $322; 103, Northern Electrical Mfg. Company, Madison, Wis., $205; 148, Thompson Grinder Company, Springfield, Ohio, $90; 198, Motley, Green & Co., New York, $324; 201, Manning, Maxwell & Moore, New York, $335, $275 and $295; 215, W. E. Shipley Machinery Company, Philadelphia, Pa., $340; 216, Tucker Tool & Machine Company, New York, $329.39.

Class 49. One milling machine—Bidder 58, W. H. Foster Company, New York, $1055.

Class 50. One universal milling machine—Bidder 26, Brown & Sharpe Mfg. Company, Providence, R. I., $373.18; 79, Hill, Clarke & Co., Boston, Mass., $2300; 203, Niles-Bement-Pond Company, New York, $2856; 207, Prentiss Tool & Supply Company, New York, $2685.

Class 51. One mortising machine—Bidder 17, Bentell & Margedant Company, Hamilton, Ohio, $720; 66, Greenlee Bros., Chicago, Ill., $810 and $765; 129, Charles S. Robidoux, St. Louis, Mo., $1030; 163, American Wood Working Machinery Company, New York, $725; 183, J. A. Fay & Egan Company, New York, $1034.

Class 52. One automatic cut-off saw—Bidder 17, Bentell & Margedant Company, Hamilton, Ohio, $1000; 66, Greenlee Bros. Chicago, Ill., $732 and $682; 129, Charles S. Robidoux, St. Louis, Mo., $865; 147, Tindel-Morris Company, Eddystone, Pa., $1260, $1468 and $1596; 183, J. A. Fay & Egan Company, New York, $885.50.

Class 53. One drilling machine—Bidder 170, Baker Bros., Toledo, Ohio, $1430; 201, Manning, Maxwell & Moore, New York, $875; 203, Niles-Bement-Pond Company, New York, $1275 and $1350.

Class 54. Five engine lathes—Bidder 55, Fairbanks Company, Philadelphia, Pa., $5655 and $5680; 75, Hendey Machine Company, Torrington, Conn., $7107; 84, I. H. Johnson, Jr., Company, Philadelphia, Pa., $5999; 188, Garvin Machine Company, New York, $4932; 201, Manning, Maxwell & Moore, New York, $8753 and $7197; 203, Niles-Bement-Pond Company, New York, $6598; 215, W. E. Shipley Machinery Company, Philadelphia, Pa., $6161; 221, Vandyck-Churchill Company, New York, $5460 and $6126.

Class 55. One patternmakers' lathe—Bidder 17, Bentell & Margedant Company, Hamilton, Ohio, $116; 55, Fairbanks Company, Philadelphia, Pa., $90 and $137.50; 60, Frevert Machinery Company, New York, $136; 129, Charles S. Robidoux, St. Louis, Mo., $145; 163, American Wood Working Machinery Company, New York, $100; 183, J. A. Fay & Egan Company, New York, $135.30; 198, Motley, Green & Co., New York, $128; 205, Oliver Machinery Company, New York, $110, $84 and $74; 207, Prentiss Tool & Supply Company, New York, $91.25 and $123.25; 215, W. E. Shipley Machinery Company, Philadelphia, Pa., $119.

Class 56. One universal shaping machine—Bidder 58, W. H. Foster Company, New York, $555; 144, William Sellers & Co., Philadelphia, $1420.

Class 57. One bolt heading and forging machine—Bidder 3, Ajax Mfg. Company, Cleveland, Ohio, $3297; 8, Baird Machinery Company, New York, $3995; 60, Frevert Machinery Company, New York, $3984; 198, Motley, Green & Co., New York, $4100; 201, Manning, Maxwell & Moore, New York, $4400.

Class 58. One planing machine—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $1430; 13, Bailey-Libby Company, Charleston, S. C., $1335; 60, Frevert Machinery Company, New York, $1298; 129, Charles S. Robidoux, St. Louis, Mo., $1230 and $1245; 144, William Sellers & Co., Philadelphia, Pa., $1425; 188, Garvin Machine Company, New York, $1369; 203, Niles-Bement-Pond Company, New York, $1409; 207, Prentiss Tool & Supply Company, New York, $1490; 215, W. S. Shipley Machinery Company, Philadelphia, Pa., $1510; 216, Tucker Tool & Machine Company, New York, $1266; 221, Vandyck-Churchill Company, New York, $1220 and $1353.

Class 59. One boring and turning mill—Bidder 13, Bailey-Libby Company, Charleston, S. C., $1875; 15, Becker-Brainard Milling Machine Company, Hyde Park, Mass., $1813.97; 58, W. H. Foster Company, New York, $2100; 129, Charles S. Robidoux, St. Louis, Mo., $2340; 201, Manning, Maxwell & Moore, New York, $2377; 203, Niles-Bement-Pond Company, New York, $2025; 207, Prentiss Tool & Supply Company, New York, $1755; 215, W. E. Shipley Machinery Company, Philadelphia, Pa., $2330; 221, Vandyck-Churchill Company, New York, $2460.

Class 60. One boring and milling machine—Bidder 51, Fitchburg Machine Company, Fitchburg, Mass., $4270; 203, Niles-Bement-Pond Company, New York, $4150; 234, Ingle Machine Company, Rochester, N. Y., $2825.

Class 61. One universal radial drill—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $1395; 13, Bailey-Libby Company, Charleston, S. C., $1475; 60, Frevert Machinery Company, New York, $1399; 129, Charles S. Robidoux, St. Louis, Mo., $1350; 188, Garvin Machine Company, New York, $1265 and $1302; 201, Manning, Maxwell & Moore, New York, $1265 and $1390; 203, Niles-Bement-Pond Company, New York, $1350; 207, Prentiss Tool & Supply Company, New York, $1470; 215, W. E. Shipley Machinery Company, Philadelphia, Pa., $1559 and $1663; 221, Vandyck-Churchill Company, New York, $1354.

Class 62. One vertical drill press—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $275; 13, Bailey-Libby Company, Charleston, S. C., $380; 60, Frevert Machinery Company, New York, $294; 79, Hill, Clarke & Co., Boston, Mass., $339; 129, Charles S. Robidoux, St. Louis, Mo., $340; 150, Thomas & Lowe Machinery Company, Providence, R. I., $345; 188, Garvin Machine Company, New York, $265; Manning, Maxwell & Moore, New York, $300 $497 and $523; 203, Niles-Bement-Pond Company, New York, $258; 207, Prentiss Tool & Supply Company, New York, $297; 215, W. E. Shipley Machinery Company, Philadelphia, Pa., $376; 221, Vandyck-Churchill Company, New York, $294.

Class 63. Two vertical drill presses—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $178 and $202; 13, Bailey-Libby Company, Charleston, S. C., $258; 28, Batchelor, Clark & Batchelor, New York, $186; 60, Frevert Machinery Company, New York, $166 and $196; 79, Hill, Clarke & Co., Boston, Mass., $200; 129, Charles S. Robidoux, St. Louis, Mo., $220; 150, Thomas & Lowe Machinery Company, Providence, R. I., $300;

188, Garvin Machine Company, New York, $187; 201, Manning, Maxwell & Moore, New York, $228 and $221; 203, Niles-Bement-Pond Company, New York, $196; 207, Prentiss Tool & Supply Company, New York, $240; 215, W. E. Shipley Machinery Company, Philadelphia, Pa., $296; 221, Vandyck-Churchill Company, New York, $240.

Class 64. One sensitive drill—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $49; 28, Batchelor, Clark & Batchelor, New York, $61.45; 60, Frevert Machinery Company, New York, $55; 79, Hill, Clarke & Co., Boston, Mass., $49; 129, Charles S. Robidoux, St. Louis, Mo., $55; 188, Garvin Machine Company, New York, $57; 203, Niles-Bement-Pond Company, New York, $49; 207, Prentiss Tool & Supply Company, New York, $56; 215, W. E. Shipley Machinery Company, Philadelphia, Pa., $296; 216, Tucker Tool & Machine Company, New York, $47.75; 221, Vandyck-Churchill Company, New York, $52.

Class 65. One universal milling machine—Bidder 13, Bailey-Libby Company, Charleston, S. C., $595; 16, Becker-Brainard Milling Machine Company, Hyde Park, Mass., $790; 26, Brown & Sharpe Mfg. Company, Providence, R. I., $765.65; 42, Charlotte Supply Company, Charlotte, N. C., $702.28; 75, Hendey Machine Company, Torrington, Conn., $758; 79, Hill, Clarke & Co., Boston, Mass., $600; 129, Charles S. Robidoux, St. Louis, Mo., $755; 188, Garvin Machine Company, New York, $700; 198, Motley, Green & Co., New York, $822; 201, Manning, Maxwell & Moore, New York, $708; 203, Niles-Bement-Pond Company, New York, $710; 221, Vandyck-Churchill Company, New York, $770.

Class 66. One plain milling machine—Bidder 16, Becker-Brainard Milling Machine Company, Hyde Park, Mass., $700; 26, Brown & Sharpe Mfg. Company, Providence, R. I., $522.40; 42, Charlotte Supply Company, Charlotte, S. C., $558.91; 75, Hendey Machine Company, Torrington, Conn., $701; 79, Hill, Clarke & Co., Boston, Mass., $550; 188, Garvin Machine Company, New York, $512; 198, Motley, Green & Co., New York, $672; 201, Manning, Maxwell & Moore, New York, $701; 203, Niles-Bement-Pond Company, New York, $710; 221, Vandyck-Churchill Company, New York, $640.

Class 67. One screw cutting engine lathe—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $1335; 13, Bailey-Libby Company, Charleston, S. C., $1378; 60, Frevert Machinery Company, New York, $1694; 75, Hendey Machine Company, Torrington, Conn., $1287; 84, I. H. Johnson, Jr., Company, Philadelphia, Pa., $1346; 188, Garvin Machine Company, New York, $1265 and $1220; 198, Motley, Green & Co., New York, $1275; 201, Manning, Maxwell & Moore, New York, $1348; 203, Niles-Bement-Pond Company, New York, $1240 and $1343; 221, Vandyck-Churchill Company, New York, $1322.

Class 68. One screw cutting engine lathe—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $920; 60, Frevert Machinery Company, New York, $968; 75, Hendey Machine Company, Torrington, Conn., $978; 79, Hill, Clarke & Co., Boston, Mass., $750; 84, I. H. Johnson, Jr., Company, Philadelphia, Pa., $824; 150, Thomas & Lowe Machinery Company, Providence, R. I., $901; 188, Garvin Machine Company, New York, $992 and $955; 198, Motley, Green & Co., New York, $784; 201, Manning, Maxwell & Moore, New York, $915 and $978; 203, Niles-Bement-Pond Company, New York, $898; 221, Vandyck-Churchill Company, New York, $794.

Class 69. Two engine lathes—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $1190 and $1212; 60, Frevert Machinery Company, New York, $1224; 75, Hendey Machine Company, Torrington, Conn., $1430; 79, Hill, Clarke & Co., Boston, Mass., $590; 114, Pratt & Whitney Company, Hartford, Conn., $1546; 150, Thomas & Lowe Machinery Company, Providence, R. I., $1240; 188, Garvin Machine Company, New York, $1160; 201, Manning, Maxwell & Moore, New York, $1440 and $1430; 203, Niles-Bement-Pond Company, New York, $1266; 211, W. G. Stevenson, Philadelphia, Pa., $1214.

Class 70. One engine lathe—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $382 and $450; 60, Frevert Machinery Company, New York, $363; 75, Hendey Machine Company, Torrington, Conn., $548; 114, Pratt & Whitney Company, Hartford, Conn., $550 and $577; 150, Thomas & Lowe Machinery Company, Providence, R. I., $458; 198, Motley, Green & Co., New York, $460; 201, Manning, Maxwell & Moore, New York, $548; 203, Niles-Bement-Pond Company, New York, $473; 221, Vandyck-Churchill Company, New York, $495.

Class 71. One toolroom lathe—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $425 and $483; 60, Frevert Machinery Company, New York, $498; 75, Hendey Machine Company, Torrington, Conn., $539; 79, Hill, Clarke & Co., Boston, Mass., $487; 114, Pratt & Whitney Company, Hartford, Conn., $552; 198, Motley, Green & Co., New York, $385.50 and $418.50; 203, Niles-Bement-Pond Company, New York, $464; 221, Vandyck-Churchill Company, New York, $511.

Class 72. One post shaper—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $355; 13, Bailey-Libby Company, Charleston, S. C., $417; 60, Frevert Machinery Company, New York, $418 and $448; 75, Hendey Machine Company, Torrington, Conn., $490 and $438; 112, Potter & Johnson Machine Company, Pawtucket, R. I., $546; 188, Garvin Machine Company, New York, $485; 198, Motley, Green & Co., New York, $385.50 and $418.50; 203, Niles-Bement-Pond Company, New York, $433; 207, Prentiss Tool & Supply Company, New York, $341 and $443; 215, W. E. Shipley Machinery Company, Philadelphia, Pa., $493; 221, Vandyck-Churchill Company, New York, $470.

Class 73. One slotting—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $1120; 13, Bailey-Libby Company, Charleston, S. C., $1000; 104, Newton Machine Tool Works, Philadelphia, Pa., $960; 198, Motley, Green & Co., New York, $1159; 203, Niles-Bement-Pond Company, New York, $966; 215, W. E. Shipley Machinery Company, Philadelphia, Pa., $1167; 216, Tucker Tool & Machine Company, New York, $1126.

Class 74. One single bolt cutter—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $430; 25, H. B. Brown Company, East Hampton, Conn., $470; 60, Frevert Machinery Company, New York, $394 and $426; 129, Charles S. Robidoux, St. Louis, Mo., $420; 144, William Sellers & Co., Philadelphia, Pa., $700; 155, Wiley & Russel Mfg. Company, Springfield, Mass., $335.47; 201, Manning, Maxwell & Moore, New York, $498; 207, Prentiss Tool & Supply Company, New York, $399; 215, W. E. Shipley Machinery Company, Philadelphia, Pa., $420; 221, Vandyck-Churchill Company, New York, $437.

Class 75. One bolt threading and cutting machine—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $488; 13, Bailey-Libby Company, Charleston, S. C., $410; 44, Central Metal & Supply Company, Baltimore, Md., $550; 58, W. H. Foster Company, New York, $575; 60, Frevert Machinery Company, New York, $409; 79, Hill, Clarke & Co., Boston, Mass., $625; 136, Thomas Summerville & Co., Washington, D. C., $726.33; 176, Drew Machinery Agency, Manchester, N. H., $728.55; 198, Motley, Green & Co., New York, $409.75; 201, Manning, Maxwell & Moore, New York, $698; 203, Niles-Bement-Pond Company, New York, $463; 215, W. E. Shipley Machinery Company, Philadelphia, Pa., $493; 221, Vandyck-Churchill Company, New York, $794; 222, Venuleo & Power, New York, $225.60.

Class 76. One grinding machine—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $133 and $150; 13, Bailey-Libby Company, Charleston, S. C., $145; 43, Challenge Machine Company, Philadelphia, Pa., $110; 60, Frevert Machinery Company, New York, $134; 198, Motley, Green & Co., New York, $148.13; 215, W. E. Shipley Machinery Company, Philadelphia, Pa., $135; 216, Tucker Tool & Machine Company, New York, $155; 221, Vandyck-Churchill Company, New York, $97.

Class 77. One water tool grinder—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $190 and $147; 13, Bailey-Libby Company, Charleston, S. C., $185; 43, Challenge Machine Company, Philadelphia, Pa., $130; 60, Frevert Machinery Company, New York, $153; 79, Hill, Clarke & Co., Boston, Mass., $89; 126, Ransom Mfg. Company, Oshkosh, Wis., $85; 198, Motley, Green & Co., New York, $144.77; 207, Prentiss Tool & Supply Company, New York, $88; 215, W. E. Shipley Machinery Company, Philadelphia, Pa., $145; 216, Tucker Tool & Machine Company, New York, $151; 221, Vandyck-Churchill Company, New York, $80.

Class 78. One twist drill grinder—Bidder 8, Baird Machinery Company, Pittsburgh, Pa., $78; 13, Bailey-Libby Company, Charleston, S. C., $63.75; 28, Batchelor, Clark & Batchelor, New York, $69.50; 215, W. E. Shipley Machinery Company, Philadelphia, Pa., $69; 216, Tucker Tool & Machine Company, New York, $62.98; 221, Vandyck-Churchill Company, New York, $70.

Class 81. Two 200-hp. boilers—Bidder 23, Babcock & Wilcox Company, New York, $6087 and $5947; 80, Heine Safety Boiler Co., Philadelphia, Pa., $5388; 125, Howard W. Read, Philadelphia, Pa., $6840; 172, R. D. Cole Mfg. Company, Newnan, Ga., $6270; 180, Frick Company, Waynesboro, Pa., $7200; 186, A. D. Granger Company, New York, $6596; 214, Standard Engineering Company, Philadelphia, Pa., $6625; 233, John D. Westbrook, New York, $6987.50.

Class 91. One band saw mill equipment—Bidder 1, Allis-Chalmers Company, Milwaukee, Wis., $9158; 18, Berlin Machine Works, Beloit, Wis., $9397.20; 96, William B. Mershon, Saginaw, Mich., $10,672.85; 183, J. A. Fay & Egan Company, New York, $11,330.

Class 101. One crank shaft lathe—Bidder 147, Tindel-Morris Company, Eddystone, Pa., $2400.

The following awards have been made for supplies for the navy yards, bids for which were opened February 25:

Ingersoll-Rand Company, New York, class 61, six chipping hammers, $153.90.

Chicago Pneumatic Tool Company, New York, class 62, four pneumatic screen shakers, $180.

Independent Pneumatic Tool Company, Chicago, Ill., class 63, four pneumatic drills, $203.

Labor Notes.

The Iron Molders' Union has called off its strikes at St. Louis against the Carondelet Foundry Company, Green's Car Wheel Mfg. Company, the Scullin-Gallagher Iron & Steel Company, St. Louis Car Wheel Company and Whitman Agricultural Company. Some of these strikes were started in 1906 and the foundries involved have been operated since as open shops. At Beloit, Wis., the local union has voted to call off the strike begun May 1, 1906, and at Rockford, Ill., 40 striking molders have been notified that the national body will discontinue strike benefits there.

Notice has been posted in a number of foundries in the Pittsburgh District, announcing a reduction in wages of core makers from $3.50 to $3.25 per day. The men have decided to accept the reduction and have appointed a committee to confer with the foundry operators.

A meeting of the New York Branch of the National Metal Trades Association was held this week, at which statements were presented showing that out of 12,000 men employed by the members of the branch under the full operation of plants in the fall of 1907, the number now at work is about 6000. No reduction in wages has been made. The association has no agreements with any of the unions represented in the shops of its members.

The Bristol Company, Waterbury, Conn., has taken up the publication of a monthly known as the *Recorder*, the first issue of which has just appeared. It is about 4 x 6¾ in. in size, and the present issue contains 16 pages. The purpose in publishing this periodical is to keep in closer touch with the company's customers, to acquaint them with new lines, types and ranges of instruments which are continually being produced, and afford them the benefit of the experiences of others in the use of the instruments. In short, the object is to increase the knowledge of the useful applications of recording instruments. The *Recorder* will be published at the Chicago office of the Bristol Company, 753 Monadnock Building, and will be mailed free each month to those who signify a desire to receive it.

An effort is being made and has strong support in the House at Washington to increase the number of battleships provided for in this year's naval bill from two to four.

The Cincinnati Metal Trades Association.

The Cincinnati Metal Trades Association held its annual meeting on the evening of March 5 at the Business Men's Club. The usual banquet preceded the business meeting. President S. P. Egan, with his fellow officers and the guest speaker of the evening, James A. Green of Matthew Addy & Co., sat at the head table and ranged down the sides of three projecting wings were about 100 members of the association, which comprises the Seventh District, and includes Hamilton County, Ohio, and Kenton and Campbell counties, Kentucky. After the banquet President Egan briefly recalled pleasures of past meetings of the same character, outlined something of what might be expected during the course of the evening and announced that the reports of various officers would be heard.

Secretary John M. Manley gave an exhaustive résumé of the work of the year. Among some of the points made by Mr. Manley in his address were that the organization has grown in three years from 46 to 70 members, representing under normal conditions an operating force of 10,000 employees. He dwelt particularly on the good results obtained from the summer outings of the association, which were participated in by many thousands of employees, and gave the working force food for thought and discussion sound in principle and of a nature calculated to help the employer, rather than retard him and disturb shop discipline. Referring to the bill recently presented by Senator Beveridge in the Senate, concerning injunctions in labor disputes, the secretary said:

> The bill is radical and somewhat vague in its terms, although it recognizes one standard before the law of organized labor and a different and narrower standard by which to judge the collective activities of every other class in the community. Mr. Gardner of New Jersey has also introduced in the House of Representatives his famous bill providing for the 8-hr. day, and it is now pending before the Committee on Labor of the House. If enacted into a law it would involve revolution and destruction to American manufactures. If you had a contract to supply machinery to the Government, and the foundryman who supplies the castings should find that his cupola was not working well and that it was necessary for his force to work 1 min. over 8 hr., you would be subjected to a fine of $5 apiece for each person who worked overtime, this amount to be held from your contract as liquidated damages. It is an effort to give the industries of this country applied socialism by force of law.

Mr. Manley referred feelingly to the recent death of a valued member, James Powell, and a special committee composed of C. H. M. Atkins of the Warner Elevator Company, Andrew Messmer of the Andrew Messmer Company, and George W. Krapp of the Ahrens Fire Engine Company presented, later, a touching and eloquent tribute to the memory of the deceased.

The Executive Committee, composed of H. Ritter of the Lunkenheimer Company, Isidor Rauh of the Cincinnati Electrical Tool Company, and George Langen of the Cincinnati Planer Company, reported the following:

> The Executive Committee has carefully considered the proposed new constitution of the National Metal Trades Association, and while in some respects the changes meet our views, we do not believe the proposed constitution provides sufficient scope for the development of branch associations. We therefore recommend that our members vote against the proposed constitution. Your Executive Committee will urge upon the convention the reference of this matter to the same or a new committee for further consideration.

Chairman B. B. Quillen of the Entertainment Committee in his report recalled pleasures of the year in outings and at table. It concluded with a recommendation that a third annual outing of the association be held during the coming summer at a time and place to be selected by the Executive Committee.

Chairman J. C. Hobart of the Nominating Committee announced the committee's selections for officers for the ensuing year, and they were elected as follows: President, John W. Neil, secretary and treasurer of the John H. McGowan Company; vice-president, B. B. Quillen, secretary and treasurer of the Cincinnati Planer Company; secretary, F. E. Le Blond, manager of the Le Blond Machine Tool Company; treasurer, J. B. Doan, vice-president and general manager of the American Tool Works Company; Executive Committee, E. M. Chace, Henry Ritter and L. G. Robinson.

After the short business session was concluded Mr. Green was introduced, and the remainder of the evening was given up to his portrayal of the delights of a trip over the route of the Panama Canal, pleasantly diversified with side journeys around and through the West Indies. The pictures thrown on the screen were photographs made by Mr. Green and other members of the combined Commercial Club's party which a year ago chartered a ship and made an inspection of operations in the Canal Zone.

The British Iron Market.

In the last week of February a better feeling developed in the pig iron markets of Great Britain. Higher prices were paid for Cleveland pig iron than had been reported since November. There was freer buying at the end of February by German and other Continental consumers, and the price of No. 3 Cleveland iron advanced to 50s. 9d. Shipments in February from the Cleveland District were greater than in the corresponding month of any other year. Up to February 26 the exports were 113,034 tons, as compared with 86,855 tons in January this year and 100,663 tons in February, 1907—all to the 26th of the month.

Stocks of pig iron in Connal's stores, which increased in January and the early part of February, were decreasing at the end of the month, the total decrease in February being 10,265 tons. The stock then on hand was 90,262 tons. The expectation of a settlement of the dispute in the shipbuilding and machinery trades encouraged optimism, and while new business at shipyards and engineering works is not large, it is the opinion that conditions will improve in the next two months.

A European Spelter Agreement.—A combination among European producers of spelter has been effective in keeping the London market within a narrow range of £2 10s. since the first of the year. Prices are now £1 10s. above the lowest. It is understood that the principal Rhenish-Westphalian, Silesian and Belgian producers are in the combination. Spelter is much more widely used in Europe than in this country, and in the three districts mentioned the product is approximately 350,000 tons per annum, compared with slightly over 200,000 tons in the United States. While some of the largest foreign producers have not formally entered into the agreement they have signified their intention of maintaining prices, and among these are supposed to be Vieille Montagne and G. von Giesche's Erben. It is the intention of the combination to appoint a selling agent to take care of the marketing of products and production has already been reduced a considerable degree.

For two years an annual dinner has been given by the heads of departments and the office force of Milliken Brothers, Inc., New York. The third dinner was held at Reisenweber's, New York, on the evening of March 7, and was attended by 106 men, including the following guests of the evening: J. Van Vechten Olcott and William L. Ward, receivers of Milliken Brothers, Inc.; Foster Milliken, Francis Dykes and Waddill Catchings, secretary to the receivers. August Heckscher, the third receiver, who is in Europe, sent a letter of greeting. Addresses were made by the guests, and a musical and vaudeville programme was given, followed by an entertainment by members of the office force. James M. Ryan was toastmaster, and Charles W. Eckhardt was chairman of the committee having charge of the affair. It was most successful in all respects, and was marked by a much larger attendance than either of the preceding functions. The addresses indicated a high degree of enthusiasm throughout the organization.

The autumn meeting of the Iron and Steel Institute will be held at Middlesbrough, England, this year. The last meeting in the Cleveland District was at Middlesbrough 25 years ago.

HARDWARE

MUCH attention has naturally been given during the past two months to the annual reports of corporations and business houses, showing the financial results for the period to which they relate. Back of such condensed reports there are of course records, voluminous and complicated, relating to the various departments, and with a multitude of details, all of which are covered and summarized in the accounting system. An important part of this mass of statistics is that which has to do with the manufacturing costs. In these times there is perhaps more opportunity, under the relaxed pressure of orders, for the examination of accounting methods and for making such improvements as may be suggested. All manufacturers who produce more than one line of goods should see to it that their office and factory accounts are so arranged that when their annual statement of profits is rendered they may ascertain exactly how much is made or lost on each different line of goods they make. This information should be valuable, and it often reveals a surprising condition of things.

Some years ago, for example, an expert accountant devised and introduced for a prominent manufacturing firm a factory business and cost system, and after its installation supervised its practical working. The result of the first year's work was such as to cause the management to question the accuracy of the figures presented, owing to the fact that it showed conditions existing in some departments which were diametrically opposite to those which had always been supposed to prevail. The head of this firm had always believed that a department in which he took a peculiar interest, one indeed which used the greatest quantity of material in the course of the year, was the most profitable and, as he supposed, was carrying the load of other less remunerative departments. When at the end of the first year the detailed statement of profits was laid before him, and this particular department was shown to be doing business at a loss, it was so different from what was expected that he could not be convinced of its accuracy, and was indeed disposed in his disappointment to discharge the expert, whom he regarded as the cause of the trouble. The second year's report, however, only substantiated the results given in that of the first year, and while it was an exceedingly bitter pill to swallow its accuracy was clearly and thoroughly demonstrated.

In the knowledge thus gained was laid the foundation for a better order of things. The report showed the use of a greater quantity of certain expensive supplies than was realized, and experiments were conducted with the view to substitution wherever possible; labor saving methods in processes of manufacture were adopted, and automatic machinery invented and introduced, so that before long the department showed a gain. Still further improvements and substitutions were continually made until to-day this is one of the firm's most profitable departments of manufacture. In the case of another line, owing to the prevailing selling conditions, it was found impossible to remedy the losses sustained; it was therefore decided to discontinue it, and utilize the space and energy to expand a line which was productive of profit. Only system and accurate knowledge of costs and conditions permitted the changes to be effected, thus contributing in an important manner to the profit of the business.

Condition of Trade.

The question as to the condition of trade in any particular line is obviously dependent on the general state of the market in other lines, for the improvement desired in any branch of trade can only come with the clearing of the commercial skies in general and be accomplished by an increased volume of business in other branches. When the business in Hardware and related lines is compared with that in other departments of trade there is little reason for complaint, as the interests with which our readers have to do are getting their share of orders and contributing their part to the resumption of normal activity. Taking a broad outlook over the various markets there is undoubtedly on the whole a substantial advance being made in the direction of healthful business of materially increased volume. This is the case, notwithstanding the fact that merchants generally are still very cautious in their buying, and scrupulously limiting their orders to their early requirements, while the mills and factories, in the presence of a very moderate demand, are keeping their production down, and in most cases running their works on short time. There is, however, looking at the Hardware field, a good deal of unevenness in the demand. Makers of heavy stuff and of products which are marketed mainly to the railroads or for larger enterprises have most reason to complain of a sluggish and hand to mouth demand, while those who produce seasonable goods and articles used mainly by the farmers are pretty well occupied. Even in the strictly Hardware line some classes of goods are moving much more freely than others. This condition is illustrated in the case of a prominent manufacturing concern whose product includes a wide diversity of goods which require different treatment: One part of the plant is running nine hours, six days; another part nine hours, five days; a larger department eight hours, five days, and a portion of the plant eight hours, three days. It is a question to what extent larger activity is waiting on the development of lower prices. It would seem in general that the matter of price is not a fundamental one at this time, and that a suspicion that lower quotations in a good many lines are to be expected sooner or later contributes to the caution of buyers. In the Hardware field, as a rule, the trade are glad to see prices maintained, at least until stocks are well reduced. The course of the market in this regard should be satisfactory. The fact that the prices of a good many important products are steady is certainly gratifying to the merchants, and the reductions which are frequently made in other lines are not excessive or indicative of a demoralized condition, and are indeed on the whole regarded as reasonable and not undesirable. Notwithstanding the fact that a return to a lower level of values is always an unpleasant process, it is generally recognized that it would be beneficial and tend to the development of a more healthful and continued movement of business in the future. Merchants and manufacturers are presumably endeavoring to make the most of the opportunities of the present, which call for different management in some respects from that which characterized their policy when the demand was large and insistent.

Chicago.

Broadly speaking it may be said that what movement there is in the Hardware trade at least continues in the

right direction. This is evidenced by the fact that the volume of business for February shows a moderate gain over that of January and indications of a favorable nature are not lacking upon which to base expectations for a more decided increase during the present month. The comparison between the corresponding month of last year is, of course, not so favorable, save in the Northwest, where trade was seriously obstructed for several weeks in January and February of 1907 by snow blockades, which to a large extent interrupted traffic. That the demand from retail dealers will quicken under the stimulating effects of milder weather seems to be a result that may reasonably be expected. How far this will be reinforced by increased activity in manufacturing industries can only be surmised, but the depletion of railroad store stocks, due to the long continued policy of retrenchment, affords hope of freer buying from this source. In no line is there any disposition shown to anticipate future wants, and in consequence dealers are ordering more frequently but in smaller quantities. The reckless and indiscriminate slashing of prices that has been a concomitant result of other like periods of depression has so far not developed to complicate the present situation. In some lines, it is true, important concessions are not withheld when desirable business is to be had by yielding from established schedules, but all things considered values hold fairly even. Opinion varies as to how much business is halting because of an expectation of lower prices, but in any event it seems likely that the prevalent spirit of conservatism would operate against extensive commitments even at sharp reductions from current price levels. Nails and Wire continue in fair demand, and in those sections of the country where the season is more advanced specifications are frequently accompanied with requests to rush. Building Hardware and material are moving slowly, but considerable improvement is looked for in these lines within the next few weeks, when building operations will doubtless respond favorably to the influence of spring activities.

NOTES ON PRICES.

Wire Nails.—There has been enough of an improvement in the demand upon mills during the past week or so, to indicate a revival in spring trade. The volume of new business and specifications on contracts, however, show that buyers are ordering conservatively until such a time as customers' requirements become larger. This policy is also conspicuous in other Hardware lines, and can be pursued with safety, as manufacturers generally are in position to make prompt deliveries. Quotations are unchanged, as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

New York.—The volume of business in small lots of Wire Nails at store is small. Nail houses are represented as maintaining regular prices, but it is reported that jobbing houses sometimes shade prices when Hardware is also sold. Regular quotations are on the basis of $2.40 for small lots at store.

Chicago.—While specifications against existing contracts are being furnished in fair volume, new business is coming forward in a moderate way that indicates a strong feeling of conservatism and inclination to keep well within the lines of safety, as to future commitments. At the same time expressions of confidence in a better demand following the permanent opening of spring weather are quite general. In the meantime the mills are making shipments with promptness that contrasts sharply with the delays of last year. Prices continue firm. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—Mills report a material improvement in demand for Wire Nails in the past week or 10 days, probably due to the favorable weather and to the fact that Spring trade is commencing to open up. The Youngstown Sheet & Tube Company at Youngstown will take possession on March 16 of the Struthers, Ohio, plant of the Morgan Spring Company, and after that date will be a large producer of Wire and Wire Nails. Shipments by the mills are reported heavier and specifications against contracts are coming in better than for some time. Quotations are unchanged, as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

Cut Nails.—The Eastern Cut Nail Association is holding a meeting in Philadelphia to-day (Wednesday), which will make it too late for any report of the result in our columns this week. It is claimed that the irregularity in prices cannot be attributed to Eastern mills, as the opinion has prevailed that lower prices would not increase the volume of sales. Whether the prevailing sentiment at the meeting will be for a continuance of this policy, in the face of competition, remains to be seen. Demand shows no improvement, and mills continue to restrict production, so as not to pile up stocks. Regular quotations are on the basis of $2.05 per keg, at mill. Iron Nails generally should command about 10 cents more than Steel.

New York.—Requirements for Cut Nails in this market are light. Regular prices are said to be adhered to by Nail houses, but it is reported that Hardware jobbers sometimes shade prices when other goods are sold. Quotations are on the basis of $2.30 per keg for small lots, at store.

Chicago.—Notwithstanding the reduced output of the mills the demand is insufficient to support the market on an even keel and in consequence more or less irregularity in prices exists. Neither the mills or jobbers are proof against the temptation of business offered at reduction of 10 cents a keg below regular quotations. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; Steel, to jobbers, in carloads, $2.28; to retailers, $2.33.

Pittsburgh.—New demand for Cut Nails does not show any improvement, and on the small amount of new business that is being placed with the mills, prices are being shaded over official quotations 10 cents a keg or more. It is stated that only 30 to 35 per cent. of the Cut Nail capacity is active at the present time. The mills continue to cut down production rather than pile up stocks of Nails in the face of the present light demand. We quote Steel Cut Nails at $1.90 to $1.95, f.o.b. Pittsburgh, for carload lots, and about $2 for small lots, to which freight to point of delivery is added. Iron Cut Nials are about $2.05, at maker's mill.

Barb Wire.—An increase in new business for the past week is reported by the mills, while contract specifications are also larger. Prices are being maintained at regular quotations, according to information from the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.59
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—Although the bulk of the business up to the present time has been originating in the South the approach of milder weather is gradually bringing it northward. Barring unfavorable conditions, that would operate to retard spring work, considerable additions to the present moderate amount of new business may be expected from this section within the next few weeks. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—There has been a perceptible improvement in demand for Barb Wire in the past week, new business being placed with the mills showing a considerable increase. Specifications against contracts are better, and shipments by the mills are heavier than for

some time. Prices are firm, but unchanged, and the mills advise us they are being strictly maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—A greater activity in demand encourages the mills to anticipate a steady increase in business from manufacturers of Wire Fencing. Prices are unchanged and the market firm. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Chicago.—A fair amount of activity in the development of new business continues, but buyers are not disposed to overestimate their wants. The outlook for a fair trade in fencing is good, and when the fence building season is fairly open a better movement is expected. Prices continue firm and unchanged. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—New tonnage placed with the mills in the past week has been larger than for some time, and shipments are also heavier. Spring trade is about to open up, and it is believed demand by the fence manufacturers and other consumers will show a steady increase from this time forward. The tone of the market is firm, but prices are unchanged. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Axes.—The active solicitation of Axe business for next season began about two weeks ago, as reported in our last issue. Arrangements had been made by the manufacturers with a view to maintaining a stable market on a level approximating that of a year ago, and at the outset it seemed as if this might be accomplished. There is, however, a considerable overproduction of these goods and a prospect of a moderate season's business. Trade in Axes throughout the country has been rather light and some jobbers have carried over unusually large stocks as a result of the open winter and the difficulty in financing lumbering operations. These facts, together with the general business depression, have apparently caused anxiety on the part of some producers to be forehanded in booking a fair proportion of their output. Within a few days some slight cutting has developed, which may possibly be only temporary and exceptional. Prices are by no means high, and it is argued with good reason that reducing them will not lead to any increase in the season's business.

Stove Boards.—As stated in our last issue, a new and higher schedule of list prices has been adopted by leading manufacturers of Stove Boards. Although it is subject to a greater discount than heretofore, there is a resulting net advance in the cost of Boards amounting to about 10 per cent. The new list, on which the regular published discount is 55 per cent., is as follows:

Wood-Lined, Square.

Inches	24 x 24	26 x 26	28 x 28	30 x 30	33 x 33	36 x 36
Per dozen	$13.20	$15.00	$18.00	$19.80	$25.80	$32.40

Wood-Lined, Oblong.

Inches	24 x 36	26 x 32	28 x 34	30 x 38	32 x 42
Per dozen	$16.80	$18.60	$21.00	$24.00	$28.80

Paper-Lined, Square.

Inches	18x18	24x24	26x26	28x28	30x30	32x32	34x34	36x36
Per doz.	$7.80	$9.00	$9.84	$10.92	$12.96	$14.76	$16.80	$20.40

Paper-Lined, Oblong.

Inches	18 x 24	24 x 36	26 x 30	28 x 32	30 x 36	32 x 42
Per dozen	$8.76	$12.60	$12.60	$14.40	$16.80	$20.76

Paper-Lined, Embossed, Round.

Inches	24	26	28	30	32	34	36
Per dozen	$8.04	$9.00	$10.08	$11.28	$12.96	$14.52	$18.00

Paper-Lined, Embossed, Square.

Inches	18x18	24x24	26x26	28x28	30x30	32x32	34x34	36x36
Per doz.	$6.96	$8.04	$9.00	$10.08	$11.28	$12.96	$14.52	$18.00

Paper-Lined, Embossed, Oblong.

Inches	18 x 24	24 x 36	26 x 30	28 x 32	30 x 36	32 x 42
Per dozen	$7.80	$11.64	$11.64	$12.60	$14.40	$18.00

Enterprise Mfg. Company.—Under date of March 2, the Enterprise Mfg. Company of Pennsylvania, Philadelphia, Pa., has announced new list prices on many of its lines. Declines are shown in the list on Meat and Food Choppers, and particularly on knives, plates and other parts for these articles. On other lines the changes represent for the most part moderate advances on former list prices. The lists are given herewith, together with the regular printed discounts applying to the different lines, these in all cases remaining unchanged:

Meat and Food Choppers.—(Discount, 25 per cent.)

	Numbers.							
5	10	20	12	22	32	222	232	122	132
$1.75	$2.50	$5.00	$2.25	$4.00	$5.00	$6.00	$8.00	$7.00	$9.00 each.

Meat and Food Chopper Parts.—(Discount, 25 per cent.)

	20, 120	10, 110	22, 222	32, 232	
	Nos. 5	& 12	& 422	& 432	42 & 242
Knives, regular	$0.15	$0.18	$0.25	$0.40	$0.50 each.
Plates	.20	.35	.50	.65	3.00 "
Plates, ⅛-in	.40	.50	.65	1.30	3.60 "
Plates, 5-64-in	.60	.75	1.00	2.00	7.50 "
Feed Screws	.35	.55	1.00	1.50	5.00 "
Rings	.18	.25	.50	.65	2.00 "
Cranks	.18	.20	.35	.50	.85 "

	Nos. 41	43 & 44	51 & 52	62 & 72	56	66 & 76
Knives (tool steel)	$0.40	$1.65	$1.65	$2.75	$1.65	$2.75 each.
Plates	.65	3.00	3.00	5.50	3.25	6.75 "
Plates, 5-32 & ⅛ in	1.30	3.60	3.60	6.75	4.00	7.50 "
Plates, 5-64-in	2.00	7.50	7.50	17.00	8.00	18.00 "
Feed Screws	4.00	6.25	5.00	17.50	5.00	17.50 "
Rings	1.30	2.00	2.00	4.50	3.25	7.50 "
Thrust Bearings	...	...	...	...	10.50	18.50 "

Sad Irons.—Discount, 12½ per cent.)

	Per dozen.			
	Nos. E50	E55	E60	E65
Nos. 1, 2 or 3, with "The Best" Handles	$7.00	$6.75	$7.75	$7.50
Nos. 1, 2 or 3, without Handles	4.50	4.25	5.25	5.00
No. 4, with "The Best" Handles	...	...	9.50	9.00
No. 4, without Handles	...	...	7.00	6.50

	Per dozen.	
	Nos. E30	E40
Nos. 1, 2 or 3, with No. 200 Combination Handles	$9.00	$10.00
Nos. 1, 2 or 3, without Handles	6.00	7.00

Nos. 70	75	76	77	85	87
$5.50	$5.25	$5.50	$5.25	$8.75	$7.00 per dozen.

Detachable Meat Hooks.—(Discount, 40 per cent.)

Nos. 1	2	3
$10.00	$12.00	$14.00 per gross.

	Nos. 212	214	512
Coffee Mills	$35.00	$40.00	$15.00 each.

Discount, 16⅔ per cent.

	Nos. 1	2
Lawn Sprinklers	$3.75	$3.00 each.

Discount, 25 per cent.

	No. 49
Vegetable Slicer	$8.00 each.

Discount, 20 per cent.

	1-quart.	8-quart.
Tincture Presses	$3.75	$10.00 each.

Discount, 20 per cent.

	Nos. 1	2	18
Cherry Stoners	$8.00	$9.00	$11.00 per dozen.

Discount, 25 per cent.

	No. 34
Ice Shredders	$18.00 per dozen.

Discount, 25 per cent.

Sheet Metal Products.—Business in Roofing Sheets, Conductor Pipe and Eaves Trough, Elbows, &c., continues in light volume, merchants showing no disposition to enlarge their stocks, which are now low. Low prices still prevail on Leader and Gutter, quotations depending on the locality and class of trade. Competition is keen in all sections, but as usual is sharpest in the West. Tinware, Enameled Ware, Galvanized Ware, &c., are dull but fairly steady. Dripping Pans are unchanged.

Coil Chain.—There is no improvement in the market for Coil Chain, although no lower quotations are reported. Competition for all orders in sight is exceedingly keen.

Tacks.—The tone of the market for Tacks is uncertain. Comparatively low prices are being made by a few producers, and some revision of the quotations of leading manufacturers would not be unexpected.

Bolts and Nuts.—In spite of the attempt to tone up the market, quotations on Bolts and Nuts continue to show irregularity. Nuts, however, are steadier at the reduced prices recently announced, than are Bolts. Buyers are finding it wise to scan quotations carefully, as some manufacturers are now making special concessions

on one line and some on another, according, no doubt, to their stock on hand. On the whole, heavy goods are somewhat easier than smaller sizes. Stove Bolts, Tire Bolts, &c., continue steady.

Picks, Mattocks, &c.—Prices on Sledges, Picks, and Mattocks, and other heavy tools have ruled fairly steady since the reductions announced some time ago. Business is in light volume, but it is asserted that there is little inducement to cut below the present level.

Machine Screws.—The market in Machine Screws continues somewhat irregular, and on both cut and rolled thread Screws in iron and brass concessions in price are obtainable.

Sash Cord.—It is generally agreed that the volume of business in Sash Cord is surprisingly good, especially as regards the product of leading manufacturers. No disposition is shown to make concessions on established prices.

Rope.—Market conditions show no improvement over those of a week ago. Jobbers are conservative and business is with rare exceptions confined to less than carload lots, to meet immediate requirements. Manufacturers are, of course, anxious to make sales, consequently there is some irregularity in quotations, particularly when desirable orders are in sight. Manila Fiber is about ½ cent lower than last week, and Sisal Fiber has advanced about ⅜ cent during the same period. The following quotations for base sizes fairly represent the market: Pure Manila, 10¾ to 11½ cents; B quality grades down to 8 to 9 cents: Pure Sisal, 7½ to 8 cents; lower grades Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¾ cents.

Window Glass.—It is stated on good authority that fires have been lighted in factories with a capacity representing from 1200 to 1400 pots, but that owing to labor troubles there is not an actual production exceeding the capacity of 700 to 800 pots. The fact is recalled that last year at this time the American Window Glass Company had a stock on hand approximating 1,000,000 boxes, and that its factories were all running practically full, also that in the neighborhood of 2400 pots of handmade Glass were in operation. From present prospects it would appear that the production of Glass this year will equal the consumption, and that the distribution will be unequal, as the West is likely to require a much larger proportion than the East. A meeting of the Eastern Window Glass Jobbers' Association was held last Friday at Atlantic City, but owing to the small representation present adjournment was taken for about 30 days. In this market conditions remain as for some time, and regular quotations are unchanged. Local demand is also exceedingly light. The minimum prices recommended by the Eastern Window Glass Jobbers' Association are as follows: Single strength, 90 and 25 per cent.; double strength, 90 and 30 per cent. discount from jobbers' list. These prices are, however, not closely adhered to.

Linseed Oil.—The week has been a quiet one in this market, and sales have been restricted to small lots for actual requirements. Buyers have no reserve stocks on hand, and crushers are supposed to have light supplies of both Oil and Seed. A brisk spring demand would probably send Oil prices up. Local quotations are as follows: In five-barrel lots, State and Western Raw, 41 to 42 cents; City Raw, 43 to 44 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—A lack of business at Southern points caused a falling off in prices, and this condition has been reflected in this market, where hand to mouth buying has been the rule. In view of the present market conditions, it is interesting to recollect that a year ago quotations at this point were 77 to 77½ cents for Oil Barrels. The New York market is represented by the following quotations: Oil Barrels, 51 to 51½ cents; Machine Made Barrels, 51½ to 52 cents.

THE ELLER MFG. COMPANY, Canton, Ohio, manufacturer of an extensive line of Sheet Metal Goods, is sending out a convenient 6-in. rule and paper cutter combined. The company will be pleased to furnish these in response to any requests from the trade.

Death of Joseph Keene.

AFTER an extended illness, Joseph Keene died on March 4 at his residence, 6601 Harvard avenue, Chicago. For 37 years Mr. Keene was closely identified with the Hardware business in that city, where he was well and favorably known. Born in London, England, in 1849, Mr. Keene came to this country as a boy and located permanently in Chicago in 1865. In 1871 he in company with his brother established a Hardware business on Clark street, between Polk and Harrison, the firm being known as Keene Brothers. A few months after the firm was organized and started in business the city was devastated by the great Chicago fire, which fortunately spared the buildings of their immediate vicinity



JOSEPH KEENE.

and theirs was among the few firms whose property escaped that memorable conflagration. After retiring from this business he founded the Chicago Spring Butt Company, of which he was secretary and treasurer, and with which he was connected up to the time of his death. Mr. Keene was a member of the Art Institute of Chicago, in the affairs of which he took an active interest. He is survived by his wife and one son, Wm. J. Keene, president of the Chicago Spring Butt Company.

Death of Evans Nelson.

EVANS NELSON, president of the Lawson Mfg. Company, died at his home in Chicago on March 4 after a brief illness from pneumonia. Mr. Nelson was born in Denmark, August 4, 1867, and came to this country in 1876. From the time of its organization he was connected with the Lawson Mfg. Company, and, being elected its president four years ago, continued in that office to the time of his death. He was widely known to the trade, and counted in the local circle of his friends were many of the well-known Hardwaremen of his home city. Mr. Nelson was a member of the Royal Arcanum. He is survived by his wife and one son seven years of age. At the funeral services, held at his residence March 6, the following persons from among his friends of the Hardware trade acted as pallbearers: J. H. Gormley, Bullard & Gormley Company; James Swanson, Orr & Lockett Hardware Company; Chas. Beyfus, Yale & Towne Mfg. Company; Bert Morse, P. & F. Corbin; W. H. Bennett, Jr., Russell & Erwin Mfg. Company; Henry Ernest, Lawson Mfg. Company.

THE NORVELL-SHAPLEIGH HARDWARE COMPANY, St. Louis, Mo., whose recent striking advertisements styled "Uncle Sam's Boys" have attracted much attention, has responded to numerous requests for copies of the advertisements by collecting them in pamphlet form for distribution. The pamphlet is attractively bound with the traditional representation of Uncle Sam in colors on the cover, and contains in addition to the historical matter effective advertisements of the company's lines.

House Debate on Parcel Post Project.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., March 10, 1908.

FOR the first time since the proposition to establish a domestic parcel post became an issue of real importance to the merchants of the country, the debate in the House upon the annual post office appropriation bill, which will have been passed before this issue of *The Iron Age* reaches its readers, was marked by an exceedingly animated discussion of this subject occupying several hours and ending in the rejection of the Postmaster-General's recommendations. The debate on the rural parcel post project was exceedingly interesting and brought to the front a new champion of the rural merchants of the country in the person of Representative Sylvester C. Smith of California, who has made an exhaustive study of the subject and whose logical argument against the recent paternalistic tendencies of the postal service was followed closely by his colleagues on the floor, who manifested their approval by frequent applause. The rural parcel post plan was advocated in the debate by Representatives Hardwick of Georgia and Sims of Tennessee, minority members, the latter being the introducer of the original rural parcel post bill, with certain provisions of which the Postmaster-General now takes issue.

Representative Smith's Address.

Taking up the question of the proper function of the mail service, Mr. Smith contended that it should be limited to the dissemination of information, and that if so limited no complaint against the annual postal deficit would have a sound basis. Such a deficit, he said, would be chargeable to our educational system, the value of which could not be measured in dollars and cents. Referring to the transportation of merchandise and the Postmaster-General's rural parcel post plan, Mr. Smith said:

The carrying of parcels of merchandise, however, is a very different thing. It bears scarcely no relation whatever to the Governmental function above referred to. One is essentially education, the others purely commercial.

While this country has long carried some merchandise in the mails, it has not encouraged that department of the service. Prior to 1863 the weight of the package was limited to 3 lb., and since then it has been but 1 lb. more, the rate being 1 cent for each ounce or fraction thereof—16 cents the pound.

The Postmaster-General's plan now is to enlarge the weight of the package received and reduce the rate, thus openly bidding for this line of business. It is true he limits the scope of these operations to the minimum, confining the origin and destination of each package to the rural routes out of a common terminus.

An Entering Wedge.

One is strongly inclined to regard this as merely an entering wedge. I am perfectly sure that it will not satisfy the people; but, on the contrary, will operate to increase the demand for this form of governmental service generally throughout the country. It has not been asked for by either the merchant on the routes, nor by the patrons served by them. It would accommodate but a small per cent. of the people, and those whose rights to such a service are no more urgent than that of many others. The people in and about the thousands of small villages strung along the railroad will demand and should receive as good facilities for trading at the larger towns and cities as those along the rural routes; and in the West the people living in the remote valleys, off the main lines of communication, and served only by star route mails, are more in need of mail privileges in their trading than either of the former groups, because their isolation makes it more difficult to visit the larger centers of trade. These, as well as those in and about small villages, usually have but one or two local stores at which to trade, stocks from which to select are small, and the belief at least prevails that prices are high. Rural routes usually radiate from the larger centers and swinging around in belt line fashion are at no point far from a city of considerable size. Hence the patrons served are the best able of either of these three groups of people to reach a satisfactory trading place.

Trading by Mail Not a Desirable Habit.

I am equally certain that the merchants at the beginning of the rural routes do not want their customers to form a habit of trading by mail. They want them to come to the store in person to do their buying. Their advertisements teem with special offers to purchasers in person. Cranberries to-day, some garden tool to-morrow, with laces or ginghams, are offered at frequent intervals below cost price in order to bring the farmer or his good wife into the store, the expectation being that once there they will see and buy many other things, some of which, at least, might have been done without had they not been pressed on their attention by the merchant.

From a Social and Mental Standpoint,

too, it is not profitable, but absolutely injurious, to the country to induce farmers and their families to remain too close to the farm. There is no class of people in the country who work as many hours a day as these, and none who normally enjoy as little of the cheer and benefit of association with others as our rural folk. They recreate too little already; they are predisposed to tarry at home and toil incessantly—a thing especially true of the patient, industrious wives of our farmers—and to take away their chief incentive to take a holiday—the occasional trip to town for necessary purchases—is a matter of much actual seriousness.

The demand for the larger postal service comes chiefly from the rural districts, but it is not sought that they may trade more easily at their home town or city, but because they hear of advantages to be had at a more remote metropolis. "Distance lends enchantment" to the view of those properly in search of bargains, and whether the Postmaster-General so meant it or not, the real question to be met is whether it is wise for the Government to embark on a wider field of the carrying trade of the country.

An Appeal Against Paternalism.

Mr. Smith made a strong appeal against paternalism in the Government service, protesting that purely business activities should not be engaged in. He said:

Of late years there has been a growing tendency to say, when dissatisfaction arises over some existing condition of things, "Let the Government do it." Neither political party is free from this charge, but both have sought to curry favor in this way until, undoubtedly, many seeds of Socialism have taken root. Thoughtful men in neither party favor that end, and probably a large majority believe that it would prove fatal to our institutions. Yet, not a few well meaning citizens urge us to take "just this step" in that direction, and to gain a temporary advantage we are coming to suggest such things quite too often.

Carrying produce to market is no part of the function of this Government, as planned by the fathers, any more than the planting or harvesting of the crop would be. There is not a single argument in favor of the parcel post that does not tend to prove by the same argument that the Government should set up a shoe factory or open a bakery for all. Each and all would be outside the realm of government as planned by the architects of the nation, and foreign to that interesting and beneficial spirit of individualism which has brought us such marked results as a people.

Rest assured that if we begin by carrying the dairyman's milk to the creamery we will end by feeding the cows and manufacturing the butter. There will be no stopping place between these stations. And why, indeed, should one be sought? If that supposedly all powerful thing vaguely referred to as "the Government" is to carry one business burden for us, why not load them all on? Father Government is not supposed to know either weight or weariness.

International Postal Service Rates.

Referring to the Postmaster-General's argument that the rates and conditions of the international postal service are more favorable than those of the domestic service, Mr. Smith refuted these contentions most convincingly in part, as follows:

But in order to induce a beginning in this new departure it is pointed out that we already carry larger parcels and at lower rates to foreign points than between two domestic offices. This is true in a sense. But 4 lb. can be sent from one post office in the United States to another and the rate is 16 cents per pound, while as high as 11 lb. may be mailed at a domestic office if the destination of the parcel be a point in certain foreign countries and at 12 cents per pound.

These figures, while proving the contention just stated, largely refute it. Literally we may send larger packages out of this country than from point to point at home. But what does it signify that we may send 11-lb. parcels to Barbadoes or the Windward Islands? Who wants to traffic with these unimportant countries? I venture to say

that not one man in a thousand who advocates the parcel post ever had occasion to send a parcel of any weight to one of these countries. Most assuredly the farmers, mechanics, &c., are not benefited by this privilege.

It will be observed that the countries with which we have greatest commercial intercourse exchange only the 4-lb. 6-oz. parcel with us—namely, Great Britain, Germany, Norway, &c. We have no parcel post convention with France allowing more than our domestic 4-lb. parcel.

The rate of postage charged on this international business should be noted. A single ounce, or any weight up to 1 lb., is 12 cents; our domestic rate is but 1 cent for each ounce. Similarly, any fraction over a pound takes the rate of the full pound in international business. Thus 1 ounce would cost from 12 to 20 cents international, against 1 cent domestic; or 1 lb. and 1 ounce international would cost 24 to 40 cents, against 17 cents domestic. So we have not discriminated so badly against local business after all.

Welfare of Towns and Villages.

In conclusion Mr. Smith appealed to the House not to sanction any measure that would tend to injure the towns and villages of the country or reduce the prosperity of the people residing therein. In this connection he said:

How far does our present service, limited to a 4-lb. parcel, meet the real needs of the people? Are we not meeting the practical requirements of the people? Practically very article of wearing apparel of women and children that would be intrusted to the mails may now be sent, and a pretty good suit of clothes for a man will be carried. A very wide range of presents may be exchanged by post—one of the primary purposes of this service—as witness the volume of business done at the holiday season. Local merchants without competition find in our mail privileges a very salutary restraint on their prices, for their customers may send away for a large part of their daily needs if local conditions justify it. In stress of weather or of work the post will bring a temporary supply of groceries, but leaves intact the meritorious incentive for the farmer and his wife to drive into town occasionally.

But the postal rates and privileges do not and should not permit buyers to send their trade to remote cities to the destruction of local businesses. The rights of the country merchant are as much a proper thing for our consideration as are the desires of the buyers. Every store that is built adds value to the surrounding farms, and the larger the town or city the greater the value of the adjacent holdings and the greater the opportunities of all kinds of craftsmen. If it were proper for the Government to embark in the carrying trade, it would not be wise for it to throw its weight into the balance against the country towns, for these rallying points are of inestimable value socially, politically and financially to the whole country. They give equilibrium and homogeneity of the very first importance to our institutions. It will be a sad day for the country if it shall ever resolve itself into the two extremes—the great city and the uninterrupted rural district. The country town is the bond that binds all avocations together and makes the nation truly democratic in thought and custom.

Mr. Hardwick in Defense of Parcel Post.

The first champion of the Postmaster-General's plan to address the House was Representative Hardwick of Georgia, whose advocacy of the rural parcel post proposition occasioned some surprise, not only because members of the minority are almost unanimously opposed to paternalistic legislation, but also for the reason that the mail order houses have recently made so much progress in the South, and especially in Georgia, as to cause no little apprehension among Southern retail merchants. Mr. Hardwick's speech will be recognized as a very close paraphrase of one of the numerous addresses delivered by the Postmaster-General during the last Congressional recess. Its general scope will be gathered from the following brief extract:

I am deeply disappointed at the failure of the Committee on Post Office and Post Roads to include in this bill legislation to carry into effect the recommendation of the Postmaster-General for a parcel post. If the committee had seen fit to confine the system strictly to rural routes, I should have been satisfied with that, and it is difficult to see how any member of this body, who represents a constituency that is even partly rural, or who has the interests of our country people at heart, could have opposed it. For this service the scale of charges would be, according to the departmental recommendation, 5 cents for the first pound and 2 cents for each additional pound up to 11 lb., which is the limit in weight proposed by the Department, so that the total charges for a package weighing 11 lb. would be 25 cents.

The establishment of this system would be a great boom to our rural people. It would go hand in hand with our present rural mail delivery system, utilizing the machinery already provided for that system using the same men, the same horses, and the same vehicles, or certainly not more expensive ones than are now provided for the delivery of the rural mail. It would be self-sustaining and self-supporting, and would enable us from its profits to still further increase the pay of our rural carriers without taking a cent from the public treasury. It would greatly increase the comfort and convenience of life in the country. The same principle of economy that is the basis of our rural mail delivery is the basis of this proposed parcel post delivery.

So far from injuring the trade of our retail merchants in the small towns and even in the rural districts, this system would improve and extend that trade, for the small merchant would always have a cheap, prompt and reliable delivery service for his own use. The objection is sometimes urged against the proposition that it is paternalistic in its character; that it is no part of the Government's duty to engage in the delivery of parcels, or in the transportation of merchandise of any kind. The same argument was urged against the establishment of our Post Office Department itself. In that case the argument has reduced itself to such a practical absurdity that few, if any, now make it, and its ridiculousness is now universally conceded. But I would like to inquire what is the difference in principle between transportation by the Government of sheets of paper, either printed or written, and the transportation by the Government of other articles of merchandise that are just as important and just as necessary as newspapers or magazines or letters for the development of our civilization and the improvement of the conditions of life among our people. If there is any difference, it is so finespun, so hairsplitting that I cannot perceive it.

In conclusion Mr. Hardwick made a statement that will prove gratifying to the retail interests of the country as showing the apparent hopelessness of the campaign to secure the enactment of a rural parcel post law. In this connection, he said:

I confess that I am disappointed at the failure of the Post Office Committee to include in this bill provisions for a parcel post system, limited to rural routes. If the committee had found the point of order insisted on, it could have easily overcome that difficulty by an appeal to the Committee on Rules. No individual member of this body can, however, hope to follow that road successfully. The responsibility for the failure of the committee and of this House to follow the recommendation of the Republican Postmaster-General must and can only rest on the shoulders of the Republican party, for that party, through its majority membership on the Committee on Post Offices and Post Roads, has declined to pursue the only practical road by which consideration could be obtained for this most meritorious measure. I do not see how the Republican party can hope to escape this responsibility. It certainly cannot do so.

Representatives Griggs of Georgia, Gaines of Tennessee and Hardy of Texas spoke briefly in favor of various extensions of the weight limits of packages eligible to transportation on rural routes and reductions in the rates thereof. Chairman Overstreet, however, intimated that he would make the point of order against all such changes that new legislation can be incorporated in an appropriation bill only by unanimous consent, which operated to prevent further consideration of these propositions. The bill was practically perfected before the House adjourned to-day and will be voted on to-morrow.

A. H. Briggs, 136 Liberty street, New York, has recently been appointed by the Helwig Mfg. Company, St. Paul, Minn., its New York representative for the sale of the line of Helwig Pneumatic Tools. These include Pneumatic Hammers, Reversible Pneumatic Motors, Pneumatic Staybolt Clippers, Improved Self-Feeding Flue Expanders and other labor saving devices. Mr. Briggs is experienced in metal working tools, having been long identified with both the L. S. Starrett Company and the Frasse Company. Mr. Briggs at the beginning of this year started in business for himself, as a representative of tool manufacturers.

W. J. Fowler of the Hardware firm of Fowler & Co., Greenville, Mich., died February 26. He was born in Kinderhook, N. Y., in 1838 and went to Michigan in 1870. He had been in the Hardware business for 30 years.

Colorado Retail Hardware and Implement Association.

THE sixth annual convention of the Colorado Retail Hardware and Implement Association was held on the 20th, 21st and 22d ult., at the Albany, Denver. It was largely attended and the deliberations were interesting and profitable. Governor Buchtel was present at the first afternoon session, and delivered a felicitious address of welcome.

Convention Committees.

After opening the exercises in a brief address President Harding announced the following committees to serve during the convention:

AUDITING: O. A. Cramer, Monte Vista; C. C. Huddleston, La Mar; A. Duenweg, Brush; Mr. Green, Ordway; C. Anderson, Ft. Collins.

RESOLUTIONS: John A. Steele, Gunnison; Fred Moys, Boulder; A. B. Meservey, Colorado Springs; John Sprriesterbock, Alamosa; H. R. Quilitch, Trinidad.

NOMINATING: A. B. Corbin, La Junta; Geo. Wilson, Florence; Preston Day, Castle Rock; B. L. Van Vechten, La Jara; E. A. Miller, Tinmath.

John Linder, Golden, was appointed sergeant-at-arms.

Secretary Unfug's Report.

In his annual report as secretary, Adolph Unfug, Walsenberg, included a summary of the proceedings of the National Retail Hardware convention at Boston last year, which he attended. Referring to the subject of Hardware mutual fire insurance, he spoke as follows:

It is evident that our members are not taking very kindly to this line, but I beg to state right here that you are making a great mistake in not informing yourselves as to rates and stability of this kind of insurance. By referring to the statistics of the State of Colorado we find that the average rate of premium paid by the insuring public during the last 23 years has been $1.62 per $100. We also note in this connection that the rate of fire losses during this period has been 44 2-10 cents. To make it still plainer, the stock companies during the last 23 years have collected from our people $1.62 for every $100, used 44 2-10 cents to pay fire losses and retained for their profits and expense $1.17 8-10. In face of such figures do you believe that it is just and right that you should give them your business?

He also touched on the parcel post question, and called attention to some manufacturers who were selling their goods directly to the consumers of the State, when they failed to place their line with the local merchant.

Despite the existence of the itinerant vender law Mr. Unfug stated that a Vehicle manufacturing company had been very active in "traveling" its Vehicles through the State, but so far as he was advised the company's representatives had been arrested in every county in which the goods were offered for sale. In his own town they were found guilty and fined, but an appeal was taken to the county and district courts, both of which confirmed the decision of the lower court. A question of unconstitutionality was raised, but the higher courts refused to rule and nothing was left but for the defendants to appeal to the Supreme Court, where the case now rests, awaiting decision. Should the Supreme Court sustain the appellant Mr. Unfug suggested that it would be well for the association to take the matter up and have some good attorney prepare a bill to be presented at the next session of the Legislature, with a view to ridding the law of its unconstitutional features.

Mr. Unfug's report as treasurer showed that the receipts during the past year, with the cash on hand at its beginning, amounted to $832.55. The disbursements were $430.34, leaving cash on hand at present time, $402.21. Quite a number of the members of the association, it was stated, were in arrears for dues, and it was recommended by the Auditing Committee that a special effort be made to collect these dues at an early date.

UNREASONABLE EXPRESS RATES.

Albert L. Vogel addressed the convention on the subject of excessive express rates, speaking in part as follows:

As you know, owing to the great distances in our country and to the slowness of freight, many goods have to be shipped by express. From New York to Omaha, a distance of 1400 miles, the rate is $4.50, but from Omaha to Denver, a distance of only 530 miles, the rate is $4.

The express companies talk a great deal about the volume of business east of the Missouri River, but the volume of business west of the river is constantly growing, and especially is this true of Denver. The agent of Adams Express Company admitted in Washington that business had increased three times in the past 15 years, but that the rate had never been lowered in the past 18 years.

The whole trouble lies in the fact that the Missouri River is made the basing point, and Colorado has to pay two rates. I told the committee in Washington that they should make Colorado common points basing points.

There are no through lines from New York to San Francisco, or vice versa. Every package has to be unloaded and reloaded at Chicago. From San Francisco to New York the rate is $2 more than from Chicago to New York, while Denver is plus $2.50. We thus pay 25 per cent. more than San Francisco.

If a jewelry house ships to Denver from New York and reships to San Francisco, the rate is $17.50, but the man at St. Joseph, Mo., can reship for a $14 rate.

This applies to Utah points also. A Denver man reships New York goods to Utah at a $12.75 rate, while the Omaha man pays only $10.50.

Denver, virtually for a 500-mile haul, pays $4 express rate, where other people only pay $2.

Figures Showing Discrepancies in Rates.

I have prepared a few interesting figures which show many discrepancies in rates, but in every case the man at the river is able to ship out at a better rate than the Denver man.

10-lb. package, New York to Salt Lake City, via Denver, costs	$1.85
10-lb. package, New York to Salt Lake City, via Omaha, costs	1.60
20-lb. package, New York to Salt Lake City, via Denver, costs	3.00
20-lb. package, New York to Salt Lake City, via Omaha, costs	2.55
30-lb. package, New York to Salt Lake City, via Denver, costs	4.23
30-lb. package, New York to Salt Lake City, via Omaha, costs	3.45
10-lb. package, New York to Pacific Coast terminals, via Denver, costs	2.15
10-lb. package, New York to Pacific Coast terminals, via Omaha, costs	1.90
20-lb. package, New York to Pacific Coast terminals, via Denver, costs	3.70
20-lb. package, New York to Pacific Coast terminals, via Omaha, costs	3.40
30-lb. package, New York to Pacific Coast terminals, via Denver, costs	5.55
30-lb. package, New York to Pacific Coast terminals, via Omaha, costs	5.10

Do you wonder that Montgomery Ward & Co. went to Kansas City instead of Denver when they wanted to establish a distribution center for their Western trade?

The people of Denver will never get better express rates unless they keep up the fight till they do get them; that is the way the shippers along the Missouri River got reduced rates; then Salt Lake City came along and forced a reduced rate, and until Denver does the same she will never get more favorable rates.

When Montgomery Ward & Co. wanted a good distributing point in the West they considered Denver, Omaha and Kansas City, but on account of the better facilities they selected Kansas City. Now I know you are opposed to mail order houses, but in spite of that it would have been a good thing for Denver to have had a firm like that establish a branch house here rather than in Kansas City.

Colorado Has Another Grievance [illegible] Companies.

Section 6 provides that when a shipment exceeding 7 lb. in weight is carried by more than one company it is charged separately by both, except where billed through. As the American Express comes only as far West as Hastings, Neb., and as many of your cities only have the Globe Express entering them, there is a graduate scale charged. Here are a few samples of what the double graduate means to Colorado:

7-lb. package, New York to Telluride	$1.00
10-lb. package, New York to Telluride, under this rule	2.35
10-lb. package, New York to Telluride, without this rule	1.50
15-lb. package, New York to Telluride, under this rule	2.90
15-lb. package, New York to Telluride, without this rule	2.15
20-lb. package, New York to Telluride, under this rule	3.30
20-lb. package, New York to Telluride, without this rule	2.75

It appears to me where a 7-lb. package is carried through at a certain rate that a 14-lb. one should be carried at the same rate, or twice what it cost in a 7-lb. package, but this is not so.

The secretary of one of your local agencies said that

you "should be friendly with transportation companies and not needlessly harass them." But they did not get anything by being friendly and not harassing them.

If you are to get results Colorado must have a traffic bureau, not made up of railroad men or officials of express companies, but an organization of business men, and they will have to employ an experienced attorney, or they will be up against some of the finest minds in this country who have been doing nothing else for years but excusing the methods of the express companies. I hope if your organization does not take up this matter, that the business men of Denver will organize and not remain under control of the transportation companies.

STATE TAXATION OF CATALOGUE HOUSES.

"Taxing Catalogue Houses" was the subject of the address by F. W. Byrd, Fort Morgan, who spoke in part as follows:

In our country catalogue houses only pay taxes in the State of their origin, and then become the competitor of every retailer in every other State in the Union, and this unequal taxation we should remedy, either by legislation or through the courts, and not cease our efforts until this wrong is righted.

They come into our midst and take our trade, yet pay no State or municipal taxes. We have to build churches and schoolhouses and public roads. We educate the children and then they sell them goods in a few years.

We cannot prevent them bringing goods into our State, for the law says that no State shall interfere with the commerce of a sister State. We dare not tax them as they cross our border. Thus they enjoy the privilege of bringing their goods into Colorado and distributing them to the detriment of the local retailers. They perform none of the duties which we as citizens perform, and I feel they should be put upon, the same basis of taxation that we are. "But how are we to accomplish this?" you ask. I answer: "This privilege constitutes a franchise, a right conferred by the sovereign power of the State, and one provided for nonresident corporations doing business in the State." Now if we insist on this, as in the case of insurance companies, every catalogue and mail order house will have to close their doors. It will be impossible for them to meet the local dealer on equal terms.

You may argue this privilege is not a franchise; you may say it is a privilege enjoyed by all.

But, I answer, it is a special privilege, and it should be conferred by statute, and thus a franchise would be created.

If the insurance agent who comes into our State to sell policies can be controlled and taxed, we have the right to say to the catalogue men, "You must comply with our local laws, and while we do not assess you when you bring your wares across our border, you must pay your share of taxes the same as the local dealers."

Not a single legislature, nor a court, has ever endeavored to crystallize this principle into a law. The question of franchises is only in its infancy. Until recently a franchise was not considered worth much. But the enormous profit systems that have been built up under franchise in all our large cities have proved that they are sometimes the most valuable asset a company or corporation possesses. And this system is escaping taxation in every State of the Union.

Now it may seem a very difficult matter to take this up, as our courts have not passed upon it. But it has become a very vital question to us, and until recently was in a chaotic state. But we began to protect ourselves, and the first effort was to have all nonresident firms doing business in a community represented by a resident agent or manager; but this has not accomplished as much as taxation would.

You ask, "Will it not be a hard matter to take up with our Legislature?" But it is their province to protect their constituents, and we must tell them our trade is being affected, and that we only ask exact justice. They may call when and where they please, but we must be given a fair deal and not have to pay more taxes than they do, and the taxes they pay to be employed in the same channels as those we pay. I want to say that I don't think our legislators will deny so fair a request to the people of our State. It is so plain a contention that the man who goes into a territory to dispose of goods should pay for the privilege the same as the resident dealer, that our Legislature cannot turn you down when you ask for equal taxation.

ADDRESS OF NATHAN ROBERTS.

Nathan Roberts, Omaha, Neb., who represented the National Retail Hardware Association, brought the greetings of that body, and then spoke in part as follows:

Experience, perhaps dearly bought, has taught us the lesson that what injures the trade of the retailer follows up through the jobber to the honorable up to date manufacturer. I need not dwell on this except to say that it would have been wiser and better for all concerned if the manufacturer and jobber had awakened to their own best interests some years back, and refused to cater to the wants of the pirates of trade and our common enemy, and I might add not only the common enemy of the retail dealers of the country, but rather the octopus whose tentacles are ever abroad to bring within its avaricious grasp the boy, the girl, the man and the woman of the village, town and farm, changing our beautiful homes and firesides that have taken us years to rear into waste places of the earth.

The time is coming and is near at hand when the farmer and mechanic and day laborer will sit up and take notice, and realize they are slowly but surely being destroyed by what they feed upon. We believe that

The Patriotic Slogan of the Whole People

of this nation should be—every child in a garden, every mother in a homecroft, and individual industrial independence for every worker, in a home of his own on his own land. Concentration of trade to the large cities will surely and most certainly accomplish the most dire results, not alone in laying waste the monuments to our American civilization, but in drawing the youth of our land and the industry of our people from the country, town and village into the commercial maelstrom that is now sweeping industry and humanity into the vortex of the great cities.

This question should come home in all its force to every patriotic man within reach of my voice, "What can I do to make better the condition of my fellow man?" I will grant you that the local association, the jobbers' meetings and the manufacturers' assemblies were born in selfishness and for self-advancing interests, but we have outgrown that spirit.

"On earth peace and good will toward men," is the powerful magnet that is drawing us together for the common good of all men in this the best nation on earth. Therefore, in coming to you to-day with greetings, it is not mere idle mouthings, but that you may appreciate the fact that the national body is interested in your behalf and is in existence for the sole purpose of helping you in every way within its power.

Mutual Insurance Pays.

I desire to call your attention to the mutual fire insurance feature of our associations. What are you doing along this line? A member in one of our meetings of the Nebraska Association last week stated that he came to Lincoln, paid his dues, railroad fare, hotel and other expenses, and went home $42.50 ahead of the game. Money saved on his insurance. Our yet very youthful company, the Nebraska Mutual Insurance Company, paid back to its members over $3000 last year. The older companies are returning from 45 to 50 per cent. of their premiums and have accumulated large reserves for emergencies. These are vital matters. Look them up.

REPORTS OF DISTRICT SECRETARIES.

Reports of the district secretaries were read at the Friday afternoon session. Edwin Starkey for District No. 1 reported in part as follows:

District No. 1, which is better known as the Northern Colorado Implement Dealers' Association, held its annual meeting in Loveland, December 11 and 12. It was attended by representatives from almost every town north of and including Denver. While the attendance was not very large, it was agreed that it was the best meeting we have ever had.

Every dealer who came was prepared for work, the committees met promptly and did the best work we have ever had. Reports given at this meeting show that nearly every dealer in our territory is a member of the association. There are only one or two exceptions, and they are continually being prevailed upon by your secretary to become members.

We have found that if we get an Implement dealer to meet with us once, he invariably becomes an enthusiastic member; this merely shows that the much talked of thing is true, that the getting together is really the important thing.

Briefly summing up, we feel that the work we are endeavoring to accomplish in northern Colorado has met with considerable success. Competitive dealers are on more friendly terms, one with another, fair profits are being obtained from the sale of our goods, and the interest of the individual member is being guarded as closely as possible.

For 1908 we have set our dues at $5 per member, which is over and above any dues of the State organization.

H. B. Dye reported for district No. 2. He said that on January 24 the annual meeting of the association was

held at La Junta. All present gave very favorable reports from the different sections of the district. It was resolved that merchants should educate their trade to shorter time payments, and that they should quote but one price with a discount for cash. Action favoring 1-cent. letter postage was also taken, and parcel post legislation was condemned.

For District No. 3, covering the Western Slope Mr. Smith reported that he was not able to make as favorable a statement as he would like. His section was either too prosperous or the merchants had not fully investigated the benefits resulting from organization. He had succeeded in obtaining several new members, and thought more might join if the merchants could be induced to attend a meeting.

H. W. Beers for District No. 4 rendered the following report:

The dealers of District No. 4, comprising the San Luis Valley, met at Alamosa, and effected an organization, with John Spriesterbach as president, and your humble servant as secretary, and we have been working incessantly ever since trying to get the other dealers in the valley to become members, with more or less success. I am sorry to say there are a few dealers who seem to put a brake on our work, making it hard to maintain prices. One of these men is now in Denver and has been attending this convention. We have given him application blanks, but have not succeeded in getting him to sign so far. However, we will keep on trying, as to reap full benefits of this association we must have all the dealers in our district as members.

Resolutions.

Among the resolutions adopted as reported by the committee appointed for that purpose were the following:

PARCEL POST.

Whereas, There is a persistent and determined effort made by interests that are not in sympathy with the success of the great army of retail merchants throughout the country to secure the passage of a parcel post bill; and,

Whereas, We believe the passage of such a bill is in direct conflict with the growth and development of the smaller cities and towns of the entire country; and,

Whereas, We believe the passage of any parcel post law however modified or limited it might be in its operation, would become at once an entering wedge to secure the passage of such a law general in its application; therefore, be it

Resolved, That this association is unalterably opposed to the passage of any parcel post bill; and be it further

Resolved, That a copy of this resolution be sent to each of the Colorado Senators and Representatives.

POST OFFICE DIRECTORIES.

Whereas, There has been introduced in the Hardware Retail Association a bill designated as H. R. No. 13477, the effect of which is to permit individuals or corporations, under the guise of compiling a public directory, to secure from any postmaster in the United States a list of persons receiving mail from such post office upon payment of the expense of copying such list; and,

Whereas, Such a law is principally in the interests of the catalogue or mail order houses; therefore, be it

Resolved, That the association is most earnestly opposed to the passage of such a bill; and be it further

Resolved, That our secretary send each a copy of this resolution.

RACKET STORES, ETC.

Whereas, Some manufacturers and jobbers have a tendency to want to sell all kinds of store keepers regardless of whether or not they are Hardware dealers.

Resolved, That all wholesale Hardware houses should confine their sales to bona-fide Hardware merchants as far as possible.

GOVERNMENT EMPLOYEES EXEMPT.

Whereas, Public officials of all classes in Colorado are exempt from garnishment or attachment,

Resolved, That we instruct our Executive Committee to co-operate with similar organizations looking to the passage of a State law making all public officials other than Federal liable to garnishment or attachment.

DIVISION OF PROFITS.

Whereas, There should be a better division of the average profit on goods bought in Colorado as between the jobber and retailer,

Resolved, That our Executive Committee be instructed to confer with all Colorado jobbers and manufacturers, and endeavor to bring about an adjustment of prices which will be fair and reasonable to all parties and will be to our mutual interest.

MUTUAL INSURANCE.

Whereas, The National Hardware Mutual Fire Insurance Company is [illegible] and is maintained and operated principally in the interest of the State Hardware Association and the Hardware merchants in particular, and that other State mutuals are also entitled to our support;

Resolved, That we recommend that every member of this association take a portion of their insurance in the National Hardware Mutual Fire Insurance Company, and where possible also take policies with the other Hardware mutuals.

STATE FRANCHISES

Whereas, A large portion of the merchandise coming in Colorado is shipped direct to consumers by merchants outside the State, and that said merchants are exempt from taxation in this State;

Resolved, That we advocate the passage of a law requiring all outside concerns shipping goods into Colorado direct to consumers to obtain a State franchise permitting them to do business in this manner, and that said franchise be proportionally taxed;

That the Executive Committee of this association be empowered to use such efforts and funds as they see fit toward the introduction and passage of such a measure;

Resolved, That our delegates to the National Convention be instructed to bring this matter to the attention of the National Convention.

SUBSTITUTIONS.

Whereas, Several publications are endeavoring to create the impression that merchants offering substitutions of any character for an article asked for are dishonest;

Resolved, That we condemn the practice of some manufacturers of inverting the names or style of package or labels of other well-known articles; that we deplore deception or misrepresentation of any kind;

That we resent the implication that a merchant offering a substitute as such is dishonest, but claim that it is in the province of good salesmanship to sell substitutes when necessary but without misrepresentation.

TERMS OF SETTLEMENT.

Whereas, There seems to be a concerted action on the part of the manufacturers of Agricultural Implements to shorten the dealers' terms of settlement for same; and,

Whereas, Such action will work a hardship on many of our dealers; be it

Resolved, That this association go on record as uncompromisingly opposed to such shortening of terms, unless such change is accompanied by a mutual reduction in price of said Implements.

ADVANCE FREIGHT CHARGES

Whereas, The Implement manufacturers require their customers to pay cash for advance charges on freight shipments,

Resolved, That we request our Executive Committee to confer with the Implement manufacturers regarding the feasibility of changing this condition.

Question Box.

Nathan Roberts, Omaha, Neb., representing the National Association, was invited to take charge of the Question Box discussion and under his leadership this feature of the meeting was interesting and instructive. Reference will be made to the work of the convention under this head in a later issue.

Election of Officers.

The following officers were chosen for the ensuing year:

PRESIDENT, Edwin Starkey, Greeley.
VICE-PRESIDENT, W. H. Clatworthy, Fort Morgan.
SECRETARY-TREASURER, Adolph Unfug, Walsenburg.
DIRECTOR FOR TWO YEARS, John A. Steele, Gunnison.

Other Addresses.

A stimulating and suggestive address on organization was made by Hon. Jerome Shamp, president of the South Platte Implement Dealers' Association.

Edwin Starkey made an admirable report of the proceedings of the meeting of the National Federation of Retail Implement and Vehicle Dealers' Associations, which he attended as a representative of the Colorado body. Mr. Starkey stated that about 50 delegates representing different associations and covering 27 States were in attendance at the national convention.

P. P. Moys [illegible] of the National Hardware Implement Dealers' Mutual Insurance Company, made a brief address, in which he referred to the subject of mutual fire insurance. He stated that the total insurance of that company in Colorado at the present time was about $55,000. Following his remarks Mr. Moys answered a number of questions on the subject, which were addressed to him by the members. Mr. Spreisterbach said that he was insured with the National Company and that the insurance was perfectly satisfactory and the rate very low.

Pennsylvania Retail Hardware Association.

SEVENTH ANNUAL CONVENTION.

AN exceedingly important and, on the whole, very successful meeting of the Pennsylvania Retail Hardware Association was held March 4 and 5 at Cambridge Springs. The Rider Hotel, which was the headquarters of the association, was found to be admirably adapted to the requirements of the meeting, and the members and their many guests were given every attention and made thoroughly at home. The theater of the hotel, in which the meetings were held, not only served as a most suitable convention hall, but, opening, as it does, on the main lobby, could not have been better located to secure full and prompt attendance. The exhibition hall was also near at hand, so that the merchants could very readily pass from one scene of interest to the other, securing more than usual attention to the meetings on the one hand and to the exhibits on the other.



J. F. HOWE.

Spirit of the Convention.

While the attendance was not large in proportion to the number of merchants in the State, the convention was characterized by a hopeful and even enthusiastic spirit. It was brought out in the secretary's report and in addresses made by a number of members and visitors that there are more than 2000 firms in Pennsylvania who are entitled to membership in the association, and in view of the wealth of the State and its commanding position, industrially and commercially, it was recognized that it should have one of the largest and most useful associations in the country. While the growth of the association has been slow, it was the feeling of the members that a good foundation had been laid, and that the plans consummated at the convention would probably result in largely increasing the membership and adding to the usefulness of the organization. A reason for anticipating the success of the association is found, however, not only in the number of merchants in the State, but in the ability and caliber of many of the Hardware merchants, who are already actively identified with association work. A further augury of good is found in the fact that while there were several somewhat difficult and perplexing questions considered, there was entire harmony and good feeling from beginning to end.

Opening of the Meeting.

In view of the fact that many of the members were not expected until Wednesday, the opening of the convention was deferred until that date, although the programme called for a meeting on Tuesday. The wisdom of this was seen when the trains on Wednesday morning brought some of the members from the more distant parts of the State, as well as some from neighboring towns, enabling the business meeting to open with a good representation of the merchants who are actively identified with the work of the association. The fact, however, was brought out that a good many merchants, nominally members of the organization, have failed to keep in active relations with it. There were, however, present at the meeting a number of new members, some of whom entered with notable interest and enthusiasm into its work.



A. H. KAUFMAN.

A letter was read from William W. Supplee, president of the Supplee Hardware Company, Philadelphia, in which he expressed his regret at being unable to attend the meeting, and his interest in retail Hardware Association work in general and especially that of the Pennsylvania Association.

Committees.

At the first session of the convention the chair announced the following committees:

PLACE OF MEETING: E. C. Goodwin, Germantown; D. E. Hibner, Du Bois; C. C. Dickson, New Castle.

PRESS: R. R. Williams, New York; George R. Thompson, Mt. Jewett, Pa.; L. W. Burry.

AUDITING: Wm. Mendenhall, Montoursville; Henry Seltz, Galeton; J. R. McDowell, Pitcairn.

RESOLUTIONS: S. S. Bryan, Titusville; D. A. Gill, Meadville; A. W. Lieb, Williamsport.

Association Finances.

The report submitted by J. E. Digby, treasurer, was gratifying as showing that the association is in sound financial condition, having a substantial balance on hand after paying nearly $1000 covering the expenses of the association during the year. There remains due from the members also a considerable amount of back dues, upon a good part of which it is hoped it may be feasible to realize. In accordance with the by-laws of the association, the offices of secretary and treasurer are held by the same person, and W. P. Lewis was accordingly elected treasurer to succeed Mr. Digby.

Parcel Post.

The subject of parcel post was prominently discussed. The principal argument in regard to it was made by M. L. Corey, secretary of the National Retail Hardware Association, whose presence at the association contributed very much to its success. Mr. Corey brought out clearly and forcibly the objections to the measures before Congress in regard to parcel post, as well as the arguments which bear against the project on general principles. The debate was participated in by several of the members, and the judgment of the association in regard to the matter was expressed in a strong resolution in opposition to the establishment of a parcel post.

Insurance.

The matter of mutual fire insurance received a good deal of attention at the convention, and some of the members who had not previously had an opportunity to become familiar with the lines on which the National and State Hardware Insurance companies are conducted were given an opportunity to become familiar with their methods and usefulness through the clear-cut and comprehensive explanations which were given by W. P. Lewis, who has lately assumed the secretaryship of the National Insurance Company and also of the Hardware Mutual Fire Insurance Association of Pennsylvania. The manner in which the insurance feature may be made a factor in promoting the membership of the association was clearly brought out, and it is hoped that Mr. Lewis, having been chosen secretary of the association, will be in a position from his connection with the insurance company to add largely to the membership of the association.

Question Box.

While there were few formal addresses and no papers in discussion of general trade topics the amount of business before the association left little time for the Question Box, which in the meetings of so many associations is found so profitable in eliciting useful information and suggestions from the members. The hour, however, devoted to this part of the programme under the trained and stimulating direction of Secretary Corey was productive of valuable suggestions and interesting discussions. The Question Box being opened in executive session left the members free to express themselves without reserve. There was thus secured, for example, a frank expression in regard to the percentage of profit at which va-

rious lines are sold, the general trend of which was to emphasize the importance of broadening in some way the exceedingly narrow margin at which some staple articles especially are handled.

A show of hands in regard to the members who make use of 5 and 10 cent counters brought out the fact that a goodly proportion of the members have these as a regular or special feature of their stores, and there was substantial unanimity in the opinion that this practice is advantageous, not so much on account of the profit made on such goods as because the people, and especially the ladies, are thus attracted to the store.

There was some discussion in regard to the lien laws, which appear to be in Pennsylvania in a very unsatisfactory shape, making the placing of a legitimate lien a complicated and difficult matter, and on the whole operating against the best interests of responsible parties.

The sale of goods to consumers by manufacturers, but more especially by certain jobbing houses, is carried to such an extent that it is evident that the merchants of Pennsylvania have in this matter real grievances which should be corrected. The manner in which this can be done was touched upon in the discussion.

Addresses.

Most of the attention of the association was given to the business of the organization, and the discussions which occupied the principal part of the session came up in connection with association matters. A forcible address abounding in practical suggestions was, however, made by H. J. Fueller of the Abram Cox Stove Company who spoke on "The Master Sheet Metal Worker as a Business Man," imparting much valuable information and giving many definite suggestions which were much appreciated. R. R. Williams of *The Iron Age* referred to the work of associations in other States, and the opportunity presented to the Pennsylvania Association in view of the position of the State and the ability and number of its Hardware merchants. He also called attention to some practical points in connection with the work of the association, and means which might advantageously be adopted in increasing its membership and its usefulness. One of the principal addresses was made by M. L. Corey, the national secretary, on the latest phases of the parcel post agitation, but he referred also to a number of other matters connected with the association movement, his familiarity with this movement enabling him to answer readily a number of questions which were asked him in regard to it. Mr. Lewis' admirable address on insurance and his work in furthering the interests of the companies he represents is given in full on another page.

Election of Officers.

The following gentlemen were elected by a unanimous vote to their respective offices:

PRESIDENT, J. F. Howe, Freedom.
VICE-PRESIDENT, D. E. Hibner, Du Bois.
SECRETARY AND TREASURER, W. P. Lewis, Huntingdon.
EXECUTIVE COMMITTEE: Geo. L. Moore, Brownsville; J. E. Digby, McKees Rocks; Geo. V. Thompson, Mt. Jewett; S. S. Bryan, Titusville.

The association is certainly to be congratulated on this board of officers. Mr. Howe, the new president, is recognized as an able and successful business man of admirable executive ability, who will doubtless be able to give a most efficient administration. Mr. Hibner, a new member of the association, made an exceedingly favorable impression on the convention on account of his interest in the work of the organization, his ability and breadth of view and his forcible and attractive personality. Secretary-Treasurer Lewis was known to many by reputation and made a host of friends for himself and the special work in which he is engaged, encouraging the expectation of a successful discharge of his duties as an official of the association. That three of the four members of the Executive Committee, Messrs. Moore, Digby and Thompson, were at this meeting re-elected is a tribute to their efficiency, while the board is unquestionably strengthened by the accession of S. S. Bryan of Titusville, one of the prominent merchants of the association and a business man of wide connections and thoroughly in sympathy with the retail Hardware association movement.

Delegates to National Association.

The following gentlemen were elected to represent the Pennsylvania Association at the coming St. Louis meeting of the National Association: A. H. Kaufman, Lock Haven; J. F. Howe, Freedom; W. P. Lewis, Huntingdon; J. E. Digby, McKees Rocks. It will be seen that this delegation admirably represents the association, as the delegates are the retiring and the newly elected presidents and secretaries.

The Secretaryship.

J. E. Digby, who, from the first has been the secretary of the Pennsylvania Association, declined a re-election on account of the pressure of other duties and the recognition of the fact that it would be desirable to have some one occupying this responsible and laborious position who had more time to devote to its duties. The appreciation by the association of Mr. Digby's interest in the organization and their high regard for him was appropriately expressed in a special resolution of thanks. In order that the association might be able to make use to the best advantage of the insurance feature it was evidently desirable that the secretary of the insurance company should also be secretary of the association, thus uniting the two secretaryships in one person. On this account as well as for other reasons it was obviously a wise course to elect W. P. Lewis as association secretary, and this was done after a full discussion of the matter by a unanimous vote. Mr. Lewis is recognized as possessing peculiar qualifications for this position, having been prominently connected with association work from the beginning of the movement. Besides having served as president of the Indiana State Association he is also an ex-president of the National Association, and is thus familiar with all phases of the movement. As a merchant of experience and ability with an attractive personality he is especially qualified for the duties which he has assumed. It is expected that he will be able to visit the principal places in the State, and thus personally advance the interests of the association and of the insurance company.



J. E. DIGBY.

Dues $4 a Year.

Important action was taken by the convention in making the annual dues $4 instead of $6, as heretofore. This was done because the lower sum was deemed sufficient to meet the financial requirements of the association, especially with a materially larger membership.

Place of Meeting.

The Committee on Place of Meeting, after a careful consideration of the claims of the different cities and different sections of the State, recommended Philadelphia for the 1909 convention. This recommendation was very cordially seconded by J. H. Bonbright of the Supplee Hardware Company, who dwelt upon the advantages of that city as a place of meeting for Hardware interests, and promised on behalf of the trade that a very hearty welcome would be extended to the association. While the precise date of the meeting was left to be determined by the Executive Committee, it was the sense of the convention that February or early in March would be the most suitable and convenient time.

Exhibits.

The exhibit feature received a good amount of attention at the convention. The number of exhibits were

not large, but the members found it advantageous to devote some time to the inspection of the lines of goods thus brought to their attention. The fact that the exhibit hall was open at the same time as the sessions of the association was found to interfere somewhat with the attendance of the members, some of whom found it difficult to leave promptly to attend the sessions of the convention because of their interest in the goods displayed. The suggestion was made that at future conventions it would be desirable to follow the practice of other States where the exhibit feature is made prominent, and have the exhibit hall closed during the business sessions of the association. In connection with the exhibits a good many souvenirs were given out.

The Banquet.

More than 100 persons sat down to the banquet on Thursday evening, and it proved to be a most interesting and enjoyable occasion. The Rev. Mr. Beatty of Franklin, Pa., made a very efficient toastmaster. Among the speakers were A. H. Kaufman, retiring president; J. F. Howe, the newly elected president; J. S. Bonbright, Philadelphia; W. P. Lewis, Huntingdon; C. S. Wettach, Pittsburgh; F. C. Goodwin, Philadelphia, and F. L. Spiller, Pittsburgh.

Resolutions.

Among the resolutions adopted was one in which the association put itself on record as opposed to the Burnham bill, S. 5122, first, because it would not have the effect expected; second, because it fixes charges for a service now practically free, and third, because it would unload the present post office deficit on the farmer or the merchant or both. Opposition to the Keene bill, S. 5115, was also expressed because it would reduce the post office revenue on merchandise, on which there is already a deficit. A separate resolution was also adopted protesting against the installation of a domestic parcel post, and declaring in favor of 1-cent postage.

Visit to the Lovell Wringer Plant.

On Friday morning a party comprising about 50 of the merchants in attendance at the meeting, several of them accompanied by their wives, left Cambridge Springs in a special car, provided by the Lovell Mfg. Company, Erie, arriving in that city a little before noon. The tourists were taken directly to the Reed House, where they were entertained by the company at luncheon. Subsequently they visited the extensive plant, where the party was divided into groups of six or eight persons and shown through the different departments by the company's officers. The tour of inspection occupied from 2 to 3 hr. and was very much enjoyed.

The Secretary's Report.

Secretary Digby reported a total membership of 304, including 21 new members, mostly from the Western part of the State, who united with the association during the year. Six members withdrew from business, making a net gain of 15 during the year, and 49 salesmen are on the honorary list. Reference was made to the work of the secretary, and some of the difficulties encountered by the Executive Committee in arranging for the meeting just held, and an appeal was made to the membership to put forth more individual effort for the advancement of the association's interests. Mr. Digby recommended that use be made in connection with future conventions of the exhibit feature as a means of assisting the association, not only financially, but also in creating a greater interest in its annual meetings. He recommended that a committee should be appointed for this purpose. In view of the changes made in the by-laws a revised edition of the constitution and by-laws will be issued in the near future.

Exhibitors.

Following is a list of exhibitors at the convention:

ALUMINUM COOKING UTENSIL COMPANY, Pittsburgh, Pa.: A. E. Bergelin.

AMERICAN STEEL & WIRE COMPANY, Chicago: Woven Fencing. S. N. Lippincott and J. D. Sankey. Souvenir, vest pocket memorandum book.

E. C. ATKINS & Co., Indianapolis, Ind.: Saws. D. R. Branson and P. R. Kilbourn. Souvenirs, silver Tea Spoon and pocket comb.

BERGER MFG. COMPANY, Canton, Ohio: Sheet Metal Work.

CANTON ART METAL COMPANY, Canton, Ohio: Sheet Metal Work. W. H. Gardner.

CARBORUNDUM COMPANY, Niagara Falls, N. Y.: H. L. Davis, L. M. Haskins and F. L. Spiller. Souvenir, Pocket Hone.

ABRAM COX STOVE COMPANY, Philadelphia, Pa.: Harvey J. Fueller.

DOVER MFG. COMPANY, Canal Dover, Ohio: Asbestos Sad Irons. J. W. Muckley and L. L. Keyser.

W. W. LAWRENCE & Co., Pittsburgh, Pa.: Paints.

LOGAN-GREGG HARDWARE COMPANY, Pittsburgh, Pa.: Souvenir, Glass Paper Weight.

JOHN LUCAS & Co., Philadelphia, Pa.: Paints. A. H. Jennings.

MCINTOSH HARDWARE CORPORATION, Cleveland, Ohio: E. H. Pugh. Souvenir, sprig of heather.

MAJESTIC MFG. COMPANY, St. Louis, Mo.: Stoves. C. R. Tendick. Souvenir, pocket pieces and cigars.

MATHER GAME COMPANY, Canton, Ohio: Mather's Parlor Baseball Game. J. S. Mather.

PATTON PAINT COMPANY, Milwaukee, Wis.: Paints and Brushes.

PIKE MFG. COMPANY, Pike, N. H.: Oil Stones, Whet Stones, Pyko Grinder, &c. John A. Winters and H. W. Busler. Souvenirs: Combination Paper Weight and Blotter, India Oil Stone, pocket size, and Knife Sharpener and Blotter.

PITTSBURGH STEEL COMPANY, Pittsburgh, Pa.: Wire Fencing. P. C. Bigelow and F. G. Knight. Souvenirs: Keystone Key Guard and Bronzed Ash Tray and Vest Pocket Dictionary.

REMINGTON ARMS COMPANY, Ilion, N. Y. H. E. Young and Henry H. Stevens.

SIMONDS MFG. COMPANY AND SIMONDS FILE COMPANY, Fitchburg, Mass.: Saws and Files. George T. Curtis, F. L. Mercier and H. A. Schulte.

SUPPLEE HARDWARE COMPANY, Philadelphia, Pa.: Worth Butcher Knives and Lawn Mowers. J. H. Bonbright and John W. Welbley.

UNION METALLIC CARTRIDGE COMPANY, Bridgeport, Conn.: Ammunition. Henry H. Stevens and H. E. Young.

W. P. LEWIS' ADDRESS.

Following was the address of W. P. Lewis, who discussed the subject of mutual fire insurance and its relation to the growth and development of the association:

It gives me much pleasure to count Pennsylvania my adopted State, and to meet for the first time the members of the Hardware Association. If I could square to the measure of the stature of the men who have left their impress on this mighty commonwealth I would be great indeed, but to dwell where they have dwelt, to enjoy the influences of institutions they have founded and to breathe this atmosphere of progress and opportunity, is no mean privilege. I am proud of my native State, a gem of the Middle West. In every channel of human activity Indiana has developed men of commanding potentiality. In literature and culture it has been said that her chief city is the Athens of America. In commercial enterprise, in the high art of government, education, philanthropy and modern civilization, she is honored everywhere. In the field of activity which is nearest the interest of those assembled here to-day, she has been a pioneer, a never faltering champion, an undaunted defender of the principle of the fair deal for the Hardware merchant. She has developed a State Hardware Association of over 1000 members; their annual convention is a magnificent event. She has presented to the National Retail Hardware Association two presidents, she has given to the national association their first and only secretary. I have for years known and observed his capacity for work, his energy, earnestness, ability to grow and to grasp those larger questions which are ever present in the onward sweep of this great movement. Mr. Corey is here to-day; no man can meet him without feeling there is a reason for the marvelous growth of our National Retail Hardware Association.

A Mighty State.

But, notwithstanding the prowess of my native State, notwithstanding her exhibit of energy, interest, brains and success; notwithstanding her national influence and power, I am constrained to believe there are far greater possibilities in the State of Pennsylvania than elsewhere in the union. This is a mighty empire, stretching from the banks of an inland river to the shore of a mighty sea; on her western border she has created the greatest freight producing city in the world; on her eastern boundary there lies a city whose greatness and fame is fixed on the page of history for all time; from the lake on the north to the bay on the south, on her mountain side, in her fertile valleys, on her highways and her rivers, there dwell in cities and towns and hamlets a citizenship marked for its thrift, energy, intelligence, resourcefulness and wealth, the richest State on this continent, save one, founded by the illustrious Penn, guided by the brilliant Franklin, defended by Anthony Wayne and developed in the present day by the greatest captains of industry the world has ever known. This, men of Pennsylvania, is the land in which you dwell; here is present a reservoir of power, which, if utilized and directed in proper channels, can be felt across the western plains. Are we measuring up to present opportunity? Are we?

We Must Grow or Die.

A law, as fixed in the economy of the universe as the law of gravity, is the law of growth. We must grow or die; we must increase or decline; either we exhibit signs of life or we exhibit signs of decay. I am here to-day in the interest of the Pennsylvania Hardware Mutual Fire Association. This insurance company was organized by the founders of this association, operates under

a charter issued by this great State, proceeds on a plan of mutual insurance, the most scientific that can be formulated in this day and age; has been in existence nearly six years; has paid liberal dividends during that time, and yet of the five large companies in the field we have the smallest volume of insurance in force; this should not be. I will never rest, so long as the affairs of the company are confided to my care, till the Pennsylvania Company shall take equal rank with the foremost Hardware mutuals in the land.

Let us study briefly recent history—perchance we may gather a lesson or two.

Are these other companies in more favored States?

No; they are in States not nearly so well favored.

Are they better managed?

No; they are not.

Is there any point of superiority in their methods?

There is not.

Are they older than the Pennsylvania Company?

No. All of them are younger than the Pennsylvania Company, with one exception.

What Then Is the Reason

for their greater growth? There is to my mind but one answer. Every one of those Western companies is organized in States which have a powerful and highly developed State Hardware Association; the Western temper of mind is broad, breezy and loyal to the core to their institution; the Hardware associations throw all their powerful influence to their respective insurance companies, and the insurance companies in turn make the Hardware associations grow. As far as I know there is no schism in any of the Western associations—they pull as one man for their own.

Pennsylvania to the Front.

I am here for the purpose of declaring to you that the Pennsylvania Insurance Company will do all in her power to increase the prestige of the Pennsylvania Hardware Association, for it must be clear to any man that a declining association means a declining insurance company, unless the insurance company breaks away from association relationship. This is an anomaly that must not be thought of. Men of the Pennsylvania Hardware Association, if there is one thought that should be burned in deeper than the surface, it is this, "Pennsylvania to the front," both in association work and insurance company progress. I will not say our honor is at stake, but certainly our dignity is.

The spirit of the Quaker and the spirit of the Dutch must hear this call, and hearing, with those dauntless souls, means action.

There's a fount about to stream,
There's a light about to gleam,
There's a warmth about to glow,
There's a flower about to blow,
There's a midnight darkness changing into gray,
Men of thought and men of action—Clear the way!

PRESIDENT KAUFMAN'S ADDRESS.

President Kaufman's annual address was in part as follows:

The purpose of this association is, first, the organization of the retail Hardware dealers of Pennsylvania into a body, wherein each member may have equal rights and privileges, and share in its mutual benefits. The slogan for the year should be: The association for every retail Hardware dealer in Pennsylvania and every retail Hardware dealer in Pennsylvania in the association.

The need of a line of distinction is apparent. Not all venders of Hardware are legitimate dealers. The employing of dishonorable means and practices in disposing of goods should be discountenanced. Only dealers doing a legitimate and honorable business should be eligible to membership in the association. I also believe that a line of distinction should be drawn between the retailer and jobber of Hardware, as we have distinct organizations for both. If, however, a man is eligible to both associations, by virtue of being in both wholesale and retail business, then he should be amenable to both associations for dishonorable and illegitimate practices. Neither fear nor favor should be shown in dealing with such parties.

Only such legislation as will mutually benefit all, or at least a major part of the membership, should be enacted. All efforts now being made, or that may hereafter be made, for the protection of the legitimate merchant, such as protesting against the establishing of parcel post delivery, &c., should have the prompt and emphatic endorsement of this association.

Perpetuity of the Association.

An organization of this character cannot continue without official activity. It is no small matter for a business man to assume an official relationship in it, for it demands a great deal of time and attention. The larger it grows the more time and attention are required. A great amount of credit is due our officers both past and present for what has been accomplished, but I am satisfied the demand of the hour is for officials who are in a position to give more time to the work of the association than has been given it in the past.

Association does not mean simply convention. It means continuous effort. One man could be kept busy during the whole year soliciting membership, creating association sentiment and promoting the insurance feature of the association. Let us select a man from among our membership who can and will devote time to this work; then clothe him with official power, and give him sufficient remuneration for his labor. I am satisfied this would be a good investment. Success, however, does not depend upon the officers alone. Every member should strive to increase the membership of the association, for the stronger we are numerically, the greater our influence.

Now as to this convention. After a skirmish of several months, with a view to locating the seat of this convention in one of the many undeveloped sections of the State, we were compelled to turn our attention to the place selected at the time of the last session, Cambridge Springs. Sunbury, Wilkes-Barre, Reading, Scranton, Altoona and Williamsport were visited by members of the Executive Committee, but in none of these places were we able to find a person willing to assume the responsibility of entertaining same. We have come to a time when something must be done.

Interest Must Be Aroused in Association Work

in the above mentioned, and many other cities and towns in Pennsylvania. Is not the association to blame for the lack of interest? What has it ever accomplished for its membership outside of its insurance feature, and the pleasure of attending its annual gatherings? The very best way to arouse interest is to plan, and carry to a successful completion, some definite work. Our convention should be of such great value to a city, and interest to its Hardware trade, that it would not be considered a burden and have to go begging for a place of meeting, but be counted a privilege by any city, and a pleasure by any Hardware dealers to entertain it. These remarks are not to be construed as objecting to Cambridge Springs as a place of meeting, for a more desirable spot and a place with better facilities for holding a convention could not be found. There is no reason why we should not have a most pleasant and successful convention here.

Logical Meeting Place.

It does seem to me, however, that the most logical place for the annual meeting would be the great metropolis of the State, Philadelphia, the greatest manufacturing city of the world, and the home of the jobbers of the State. I am also inclined to believe that the association would be benefited and the members appreciate more fully the pleasure and profit of attending the convention, if it were held some time during the summer months. I would ask that this matter as to time and place of meeting be given due consideration at this meeting.

Your very presence here manifests your interest in and expresses your earnestness for the success of this convention. As I look into your faces I am impressed with the ability displayed in the general make-up of this assembly, and, by the evident unanimity of purpose, am satisfied that you are determined to take advanced steps in association work and push the same to the very borders of this Commonwealth.

This is not a convention of officials, nor of a few, but it is your convention; you are equally responsible for the success or failure of this meeting. The privilege of being active is implied in your membership. I ask you to exercise that privilege and make this one of the very best conventions ever held by the Pennsylvania Retail Hardware Association. Let due consideration and mature judgment mark every action of this meeting, so that upon adjournment we can feel assured that our work has been well done.

F. E. KOHLER & Co., Canton, Ohio, tendered a dinner to their superintendents, foremen and officemen on the 21st ult. The occasion was a very pleasant and profitable one. Brief addresses were made by several of those present, including the members of the firm, Messrs. Kohler and Harter. It was pointed out by Mr. Harter that a very friendly feeling existed between the employees and the firm, and that no labor troubles of any kind had taken place during the period of 29 years covered by the concern. Mr. Kohler likened a manufacturing establishment to an army, the workmen being the rank and file, the foremen the division commanders, who were in turn commanded by a leader or general. As long as the different divisions co-operated together and worked in unity victory was practically certain, but if one or more divisions tried to operate independently or jealousy existed among them it was pretty sure to result in disaster.

Western Massachusetts Hardware Association.

THE annual banquet of the Western Massachusetts Hardware Association was held at the Cooley Hotel, Springfield, March 4. The following officers were elected: President, F. E. Stacy, Springfield; vice-president, A. J. Osborne, Holyoke; secretary-treasurer, W. A. Pearson, Holyoke. The association had as its guests the officers of the Connecticut and New England Retail Hardware associations and several members of the Hartford local association. As a feature of the occasion there was a discussion of the parcel post question led by James L. Cowles, New York, secretary of the Postal Progress League, who favored the idea. Mr. Cowles was opposed in the discussion by F. Alexander Chandler, president, and C. L. Underhill, secretary, of the New England Association; J. De F. Phelps, secretary; I. C. Treat, former president, and F. A. Farrar, financial secretary, of the Connecticut Association, as well as by other speakers, including G. I. Clapp, secretary of the Hartford local association. Mr. Chandler also urged the merchants present to affiliate with the organization which he represented as well as with the National Retail Hardware Association.

Corbin Cabinet Lock Company's No. 22 Catalogue.

THE CORBIN CABINET LOCK COMPANY, New Britain, Conn., and 21 Warren street, New York, has just issued cloth bound descriptive catalogue No. 22, of 26 pages, each 10 x 7½ in. Cabinet Locks are shown by half size illustrations in great variety, from the inexpensive to combination keyless styles. Knobs. Escutcheons and Striking Plates are also reproduced, and in the back of the book there is a comparative list of Corbin, Eagle and Yale Cabinet Locks. This book is confined to illustrating and describing the company's Cabinet Locks and Accessories only. In the front is a description of finishes, price-list of Cabinet Locks and extra Keys, Escutcheons and Strikes in numerical order, together with a list of Locks which can be made with more than 12 changes of Keys and those which can be made all different with Master Key and price for making master keyed. There are no list prices in the body of the book, which can be shown freely.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM VALLEY HARDWARE COMPANY, Harrisonburg, Va., which wishes catalogues, price-lists, &c., of Bathroom Supplies and Fixtures, Bathtubs, &c.; also Electric Light Fixtures.

FROM BISOM & NELSON, successors to the Hardware, Stove, Tinware and Implement business of S. R. Nelson, Brayton, Iowa.

FROM FREDERIKA HARDWARE COMPANY, Frederika, Iowa, which was burned out recently, but will shortly reopen in a new building.

FROM CLARKSVILLE HARDWARE COMPANY, Clarksville, Tenn., whose stock of Hardware, Stoves, Implements, Paints, &c., was damaged by water in a recent fire.

FROM BEACHMAN HARDWARE COMPANY, Spartanburg, S. C., handling a general line of Hardware, Crockery, Stoves and House Furnishings. This business has recently been started by H. O. Beachman, late manager of the Spartan Hardware Company.

FROM EDWARD G. SPITZ, 241 West Fifty-second street, New York, who desires catalogues and other printed matter issued by Hardware manufacturers, especially relative to Mechanics' Tools, Locks, Hinges, &c. Mr. Spitz is looking for manufacturing connections in these lines, with a view to taking up their representation to the trade in Belgium, Germany and France.

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SPECIALIZATION IN HARDWARE BUSINESS.

BY HARVEY J. FUELLER, SECRETARY OF ABRAM COX STOVE COMPANY, PHILADELPHIA.



HARVEY J. FUELLER

My early business training was acquired "on the road," in the stern school of practical salesmanship. Though my direct business experience has been confined as a manufacturer to the stove, range and furnace department of the hardware trade, yet I have spent no inconsiderable part of my life in retail hardware stores and in contact with hardware merchants. My somewhat extensive observation of the conditions which generally prevail in your business is my excuse for venturing to direct your attention to certain views which I entertain regarding methods and policies that I believe could be adopted by retail hardware merchants for increasing their profits and curtailing the evils of unwise competition.

Impossible to Eliminate Competition.

I take it for granted that you are all in business with the purpose of making the maximum returns on your capital invested, and that no topic is of more practical interest to you than a discussion of methods for increasing your profits. There is no danger that your profits will be excessive. There is, I believe, among our retail hardware merchants no individual whose enormous wealth is considered as constituting a menace to society or a proof of oppressive business policies. The laws of competition are as inexorable as the laws of nature, and they prevent any man who is engaged in a business which is not monopolistic from making undue profits or from oppressing the consuming public.

By a careful study of conditions and by wise cooperation among yourselves you may eliminate certain harmful and destructive features of competition, but you will never be able to eliminate competition itself. Your organization can be made a valuable and effective agency for promoting your interests, but if any of you indulge the hope that it will ever be able to bring about a condition in which competition will be absent, you are merely deluding yourselves. The different degrees of success attained by different hardware merchants under practically similar conditions and opportunities make it obvious that the methods of some are better adapted than the methods of others to promote success. A study and an analysis of methods of conducting the business are therefore of the highest importance to retail hardware merchants.

Unduly High Selling Prices.

It is plain that in order to make money you must sell your goods at an increase over the amount you pay for them, plus your cost or expense of conducting business. But do not jump to the conclusion that the higher your selling prices are the greater your profits will be. Unduly high selling prices are ultimately almost as destructive of profit as unduly low selling prices. One of the most difficult tasks which confronts the hardware merchant is that of fixing proper selling prices on the different classes of goods which he handles. On certain goods it seems to him that he must ignore his general percentage of expense in fixing the selling price or be outside of the market entirely. In my opinion it is an error for a merchant to compute his profits on the volume of his sales. They should be computed upon the investment in the business.

The retail fruit dealer, who, on the average, turns his entire capital weekly, will make a far greater profit by selling his goods for 10 per cent. more than he pays for them than the jeweler, who turns his capital on the average once each year, will make by selling his goods at an advance of 100 per cent. over his purchase price. Say that in a given hardware business the merchant finds that his total expenses, including interest on capital, his own salary and those of other executives, rent, insurance, wages, office force, shipping, taxes, light, heat, advertising, bad accounts and all other costs of conducting business, amount to 20 per cent. of the purchase price of all goods which he has sold during the year; yet it is apparent that it has cost him less than 20 per cent. to sell some of the quick moving, cheaply handled goods, and it has cost him much more than 20 per cent. to sell some of the other goods, which he must carry a long time and on which his selling expenses are heavier.

Some merchants consider that the only difference to them in profit between a class of goods on which they turn their capital every 60 days and another class on which they can turn their capital annually is 10 months' interest at the current rate; but this is a great mistake, as in one case they make six profits in one year on a given investment and in the other case they make but one profit in one year on a given investment. Of course the carrying of book accounts is an element in the turning of capital which must always be taken into account, and if hardware merchants generally realized the great importance of prompt collections as a factor for producing profit, they would devote more attention to this feature of the business.

Profits and Ease of Selling Goods.

The hardware merchant, in order to understand what he is doing, to know what classes of goods it will pay him to push and to maintain a price scheme which will bring the best results, should analyze his business thoroughly and should classify the goods which he handles into divisions, showing separately, in groups, those in which he turns his capital respectively in 60 days, in 4 months, in 6 months, in 8 months, in 10 months, in 1 year, in 18 months, in 2 years, &c.

An additional account should be opened for each specialty to which the merchant devotes particular attention and on which he aims to secure more than the ordinary rate of profit, and, of course, such specialties should not be grouped with other goods. Such specialties might be ranges, heating stoves, different branches of the cutlery business, paints, wall paper, a line of high grade wooden ware, and firearms and ammunition. He can then, using his own good judgment, and justly estimating other factors known to him, apportion to each class the percentage of expense which it should rightly bear.

Accounts for Separate Groups of Merchandise.

In apportioning this expense the merchant should be very certain to have the total apportionment equal his entire expense as based upon his previous year's experience. After adding the proper percentage for expense to each article or kind of merchandise he will have the real cost thereof. He can then open an account with each separate group of merchandise, charging it with all of its costs and crediting it with its sales. He will then know at the close of the year just where each class of goods stands as a profit earner.

There is no mistake more common than the failure to include the full expense of doing business in calculating costs and selling prices. Unless conditions are radically changed, there are some classes of goods which it is practically obligatory for retail hardware merchants to handle on which it will never be possible for them to make a reasonable profit. As an offset to this unprofitable business they should develop a trade on specialties upon which they can secure a profit above the ordinary rate.

Advantage in Handling Ranges.

There are many specialties in different lines of manufacture which the shrewd hardware merchant can push and advertise and promote until he has a valuable franchise in the continuous profit accruing to him from their sale. In many cases he can control the sale of special goods of certain kinds, and can then very profitably work up a reputation for them which will permeate the entire community.

For example, most hardware merchants handle ranges, and the profit thereon, considering the cost of selling and handling them, is usually very moderate.

Many hardware merchants try to increase their profits in the range business by scouring the market for the lowest priced ranges they can find, thinking thus to be able to undersell their competitors and build up a large business. But what they can do in purchasing cheap and nasty ranges can be duplicated by their competitors, and they can never build up a good reputation nor establish a profitable trade by handling such goods.

Reputation for Handling High Grade Specialties.

On the other hand, it has been frequently demonstrated that if the merchant will select a strictly first-class, high grade range, with special features of merit, and push it as a specialty, he can build up a permanent, profitable trade on it, which cannot be taken away from him by means of any price concessions which his competitors may make on other ranges. And what can be done on ranges can be done on many other specialties on which it is possible for the skillful hardware merchant to develop and maintain a profitable and, practically, an exclusive business.

Hardware Merchants and Furnace Heating.

As many hardware merchants are engaged in the heating business, I desire to direct attention to warm air furnace heating and ventilation as a most striking example of specialization, through which, if properly conducted, they could build up a profitable and highly satisfactory trade. Cheap competitive bidding has performed its sinister work in the furnace business, until furnaces of utterly inadequate capacity are merely thrown into cellars or basements and installed without regard to the proper proportioning of the piping system or for any other elements necessary to right results. As a result of these poor methods of installation and of the use of furnaces of too small capacity, warm air furnace heating to-day is seldom given the slightest consideration for first-class or even for medium priced residences. Yet with a good furnace of the proper size, with the piping correctly proportioned, and with first-class installation in other respects, there is no other plan of heating so practical, so successful or so satisfactory as warm air furnace heating.

Warm Air Heating Superior.

This is an age of sanitation, and from the standpoint of healthfulness warm air furnace heating is immeasurably superior to direct water or steam heating. When furnace heating was discredited by the evil demon of cheapness, which meant deficient capacity and defective workmanship, the people who built good houses turned eagerly to steam and water, believing that these were sure and sound methods of heating. And thus the heating of good residences was taken away from the furnace merchant by a system that cost much more than good furnace heating. This proves that it was really the low price of furnace heating, necessarily accompanied by inferior quality, that drove it from the market to such a marked extent, and that this better method of heating would never have been supplanted if a high standard of installation had been maintained. Furnace heating has been discredited because the average furnace dealer mistakenly supposes that he can get work only on the low price of the job. And even those few furnace dealers who pride themselves on getting what they call good prices go only half way and do not attempt to do strictly first-class, highest grade work, through which alone can furnace heating be brought into the favor and standing to which its merits entitle it.

There is an enormous amount of unsatisfactory steam and hot water heating being done, very largely due to the "skinning" of jobs through cheap competitive methods. The profits in steam and hot water heating are notoriously low. Direct steam or water heating, even at its best, is condemned by every practical and scientific test as being unsanitary and unhealthful. Every authority on ventilation, every competent heating engineer, every physician who has given the question the slightest study, condemns direct steam or water heating as being in violation of nature's laws. There is no division of opinion amongst those who speak with authority on this subject; they agree without a dissenting voice that the only proper way to heat an apartment is by pouring pure warm air into it. With every argument, practical, scientific and hygienic, in his favor, why should not the hardware merchant take advantage of the heating situation as it exists to-day.

Opportunities in Furnace Business.

If the members of this organization, regardless of how expert they believe themselves to be, would make a study of the furnace business and would start a determined and systematic crusade in favor of strictly first-class warm air furnace heating, a very large proportion of all first-class residences could unquestionably be captured for this superior method. And while you would be giving your customers far better value for their money than they could possibly receive with any other system of heating, you could legitimately make much larger profits for yourselves than it would be possible to make by installing any other method of heating. For strictly first-class warm air furnace heating and ventilating there is no reason why the house owner should not pay at least as much as the price of the inferior and unsanitary direct steam or water system. The field is not liable soon to be overcrowded, and those who start in to do strictly first-class furnace heating and ventilation are not likely to have much serious competition, for only those who have the insight and the foresight to get out of the beaten path of custom will enter this rich field, and they are not likely to be large enough in number to crop off the pasturage for a long time to come.

Responsibility of the Furnace Manufacturer.

To some extent furnace manufacturers have been to blame in times past for the defective installation of furnaces, because they failed to furnish the trade with definite, practical rules and directions for installing warm air heating plants, or for determining the capacity of apparatus required to heat a given building. There are now, however, several manufacturers who give attention to the instruction of their customers, in a general way, which will insure for the customer good results in furnace heating; and there is one furnace manufacturing house that furnishes each of its customers with a manual or handbook, which gives clear, positive, definite rules and directions for properly installing a warm air heating and ventilating plant in any residence or in any other building to which the system is adapted.

Those who desire to increase their profits in the heating department of their business are assured, therefore, that they can secure, without money and without price, all of the rules and directions necessary to enable them to do strictly first-class, highest grade warm air furnace heating and ventilating. And so great, so obvious, are the advantages of strictly first-class warm air furnace heating over the direct steam or water method that the dealer who once gets a start with the better system will soon have an extensive and lucrative business in that line.

The Wheeling Corrugating Company.

THE WHEELING CORRUGATING COMPANY manufacturer of sheet metal and sheet metal products, whose headquarters are at Wheeling, W. Va. and New York office and warehouse at 47-51 Cliff street has issued its general catalogue No. 265 for 1908. In addition to giving complete information concerning sheets and valuable tables, rules of measurement, directions for applying roofing and siding, &c., the catalogue covers the extensive line of sheet metal products made by the company, including Conductor Pipe and Gutter, Eaves Trough Hangers, Elbows and Shoes, Stove Pipe Elbows and Collars, Dripping Pans, and a large line of Galvanized Ware including Pails, Tubs, Garbage Cans, Ash Cans, Oil Cans Coal Hods, Dry Measures, &c. Special attention is given to Metal Ceilings and Metal Shingles, with directions for applying both.

E. J. H. North, Yates City, Ill., has purchased the Hardware business of Chamberlain & Co. and will continue it at the old stand, carrying a line of Hardware Pumps, Spouting and Tin Roofing.

Correspondence.

Cash Discounts and Cash Rebates.

To the Editor: The national association of Hardware manufacturers has of late worked itself up to almost a frenzy regarding the abuse of cash discounts, but before it calls the jobbers again would it not be well to do a little missionary work among its own members, not only regarding their taking 15 and 20 days, but in some instances insisting on 30 days on 10 days' discount goods. Does it not look absurd for the pot to call the kettle black?

Many lines of goods are now sold "restricted," the manufacturer fixing the jobbers' selling price, and to protect the price and prevent the jobbers from cutting the manufacturer holds back the jobber's profit in what is known as rebates, payable at the expiration of fixed periods, some three months, some six months, and so on.

The three months' period is most popular with most manufacturers, but generally the manufacturer takes three months more to figure up his accounts and settle with the jobber. Goods shipped in January, February and March are not rebated until July 1; then the jobber gets his profit of 10, 15 or 20 per cent., as the case may be.

Thus the manufacturer has all of the jobber's profit for three months, and part of it six months, without interest. This rebate should be paid promptly on the day it is due, but manufacturers have been known to take 30 days longer to figure the rebate (?) when three months has already been taken, and then send credit memorandums for the amount of cash due the jobber.

This is about the limit, for if the jobber needs no more goods of this particular make for three or four months, and if seasonable goods, possibly six months, he may be out of the use of his money a year.

I have known jobbers to accept these credit memorandums and size the manufacturer up accordingly. If the jobber owes the manufacturer, and especially is slow pay, then the credit memorandums are all right, but when no indebtedness exists it is mighty narrow business, especially if the same manufacturer takes overtime to discount his bills. It is especially one sided for such a manufacturer to belittle the jobbers who run over the 10 days three or four days, when he is doing very much worse.

Let the manufacturers' association brace up some of its members before denouncing the methods of the jobbers.

Manufacturers who do not discount their bills and do send credit memorandums for rebates make themselves appear small potatoes when they decry the jobber who does not discount on time.

Overtime should not be taken on any bills, and this applies with equal force to manufacturer as well as jobber.

AJAX.

The De Haven-Dawson Co.

THE ALLEN HARDWARE COMPANY, Charlotte, N. C., and the De Haven-Dawson Company, Chester, S. C., have consolidated their interests under the style of the De Haven-Dawson Company, which has been incorporated with a capital of $200,000, of which $150,000 is paid in. The new company will have its headquarters at Norfolk, Va., where its largest stock will be carried, while the Chester branch will be continued under practically the same management and policy as heretofore. The business at Charlotte will be discontinued, except for a storehouse stock of some heavy lines, which the company will continue to maintain for the convenience of its trade in that locality. The officers of the De Haven-Dawson Company are: President, Hugh De Haven, who is also president of the De Haven Mfg. Company, Brooklyn, N. Y.; first vice-president, D. E. Allen; second vice-president, L. B. Dawson; secretary and treasurer, G. R. Dawson. Directors: Hugh De Haven, E. A. W. Murray, New York City; D. E. Allen, Charlotte, N. C., and L. B. and G. R. Dawson, Chester, S. C. The business will be under the direct management of D. E. Allen and G. R. Dawson at the Norfolk headquarters and L. B. Dawson at the Chester branch, all of whom are practical Hardwaremen of experience and proved business [illegible]

This consolidation has been brought about largely through the initiative of the Oliver Bros. Purchasing Company, New York, which has heretofore controlled the stock of the Allen Hardware Company. On account of their position as New York and Pittsburgh purchasing agents for many other Southern jobbing houses, the Messrs. Oliver have, as a matter of policy, resigned as officers and directors, and will not in any way be identified with the interests of the Allen Hardware Company's successor, except as minority holders of some stock which they are taking in part payment for their former interest.

Memorandum of Seasonable Goods.

THE EMERY-WATERHOUSE COMPANY, Portland, Maine, is furnishing its salesmen with a novel announcement in the form of a memorandum of seasonable goods for which future orders will be solicited. It takes the shape of a stiff folder which may be inclosed in a long letter envelope and mailed unsealed, the salesman's name being printed and the approximate date of his call indicated by a rubber stamp. Special attention is called to Poultry Netting, Wire Screen Cloth, Screens and Screen Doors, Barbed Wire and Lawn Mowers. On the inside pages is a very complete and comprehensive list, with a margin in which wants may be checked. Space is also provided for additional memoranda to be referred to when the salesman calls. Following is the seasonable goods list to which reference is made:

SEASONABLE GOODS.

Please check your wants in margin.

Space for additional memoranda will be found on back page.

Loaded Shells. Cartridges.
Axes. Axe Handles.
Baskets.
Tackle Blocks.
Brooms. Brushes.
Chimneys. Wicks. Burners.
Curry Cards. Curry Combs.
Cow Ties. Halter Chains.
Trace and Stake Chains.
Files. Horse Rasps.
Lumber Leads. Lead Pencils.
Food Choppers. Raisin Seeders.
Sausage Stuffers. Lard Presses.
Alarm Clocks.
Manila, Sisal, Cotton Rope.
Cant Dogs and Handles.
Ice Creepers. Heel Irons.
Nest Eggs.
Wood Faucets.
Wood Choppers' Mauls and Wedges.
Glass. Putty. Glaziers' Points.
Glue, Liquid, Sheet and Ground.
Ox Goads.
Hay Knives.
Bolt Hooks. Ladder Hooks.
Halters. Rope Ties. Surcingles.
Horse Clippers.
Barn Door Hangers. Rail.
Hinges, Butt, Strap and Tee.
Thumb Latches.
Hasps. Hooks and Eyes.
Saw Clamps.
Cable Chain. Repair Links.
Sad Irons
Saw Sets. Saw Bucks. Saw Frames.
Lanterns. Globes.
Sheet Lead. Lead Pipe.
Clothes Lines. Reels.
Padlocks.
Dry Measures.
Thermometers.
Wood and Steel Snow Shovels.
Copper, Tubular, Clinch Rivets.
Stake Irons.
Wire and Cut Nails.
Galvanized Nails.
Tarred Paper and Roofing
"Congo" Roofing.
Sheathing Papers.
Blanket Pins.
Metal and Stove Polish.
Enterprise Molasses Pumps.
Sweat Pads.
Framed Saws. Saw Plates.
X Cut Saws and Handles.
Ice Saws. Ice Hooks.
Ice Tongs.
Shovels. Scoops.
Sleds. Skates.
Sleigh and Team Bells.
Harness Snaps.
"O. K." Registers.
Oil Heaters.
Soapstones.
Washboards. Wringers.
Weather Strip.
Sheet Zinc.
Builders' Hardware.
Ogden Door Checks.
Tinware. Enameled Ware.
Rome Nickel Plated Ware.
Rogers' Plated Ware.
Galvanized Pails. Tubs.
Coal Hods. Sieves.
Corn Poppers.
Stove Board.
Stove Pipe. Elbows.
Dampers. Stove Pipe Rings.
Oil Cans.
Ash Barrels.
Stove Shovels.
Pokers. Cover Lifters.
Carpet Sweepers.
Game Traps. Chains.
Log and Board Rules.
Carving Sets. Pocket Cutlery.
Stove Bolts.
Fireplace Goods.

Seattle Hardware Company's Catalogue.

THE SEATTLE [illegible]
Wash., [illegible]

covering its extensive stock of Hardware and allied lines. The book is of the loose leaf variety, containing between 1300 and 1400 pages, with gaps in the numbering, so that new leaves can be inserted without breaking the sequence. It is carefully indexed and fully illustrated, containing much useful information, tables, &c., pertaining to Hardware and kindred lines. The catalogue was prepared, set up, printed and bound in the company's own plant installed for the purpose, and all the pages are left standing in type, so that revisions may be made at short notice. Following are the comprehensive departments into which the book is divided: Tools, Builders' Hardware, Miscellaneous Hardware, House Furnishing Goods, Metals, Pumps, Brass Goods, &c., Ship Chandlery, Cutlery, Sporting Goods and Fishing Tackle.

OHIO HARDWARE SHOW.

As stated in our last issue, a very large and successful Hardware show was held in connection with the convention of the Ohio Hardware Association at Columbus, February 25-27. The exhibition was held in the largest hall in the city, which was elaborately decorated by the management, following out a uniform design and color scheme, which added much to the beauty and harmony of the general effect. Exhibitors were thus relieved of all the trouble and expense of preparing booths. The success of the affair was largely due to the efficient work of the association's committee in charge, consisting of W. L. Jacobs, Youngstown; W. M. Crumrine, Salem, and J. R. Dickson, Columbus. Following is a full list of the exhibitors and their representatives in charge:

ACME WASHING MACHINE COMPANY, Columbus, Ohio: Acme Washing Machines. Represented by F. E. Jack and staff.

ADAMS BROS. COMPANY, Findlay, Ohio: Arras Sulky Breaking Plow. Represented by J. D. Arras and D. Adams.

ADRIANCE, PLATT & CO., Poughkeepsie, N. Y.: Farm Machinery and Plymouth Binder Twine. Represented by C. C. La Clare.

AJAX CONDUCTOR & MFG. COMPANY, Chicago: Ajax System of Lightning Protection. Represented by W. H. McCullough and J. A. Scarvelli.

ALABASTINE COMPANY, Grand Rapids, Mich.: Alabastine sanitary wall coating in a variety of tints. Represented by A. E. Harper and G. H. Kranenburg.

S. L. ALLEN & CO., Philadelphia: Flexible Flyer Sleds. Represented by Chas. Klepinger.

ANTHONY FENCE COMPANY, Tecumseh, Mich.: Anthony Fence. Represented by E. E. Bassett and E. S. Dunham.

AUTOMATIC LEVEL COMPANY, Toledo, Ohio: Concrete and Masons' Levels. Represented by H. C. Bussell.

BANY & HADLEY MFG. COMPANY, Delphos, Ohio: Bany Washing Machines, Lawn Swings, &c. Represented by B. F. Hadley and G. A. Johnston.

BERGER MFG. COMPANY, Canton, Ohio: Line of Sheet Metal products. Represented by A. T. Enlow, L. D. Mercer, H. P. Resch, E. Bechel and R. C. Moore.

W. F. BERGY, Madisonville, Ohio: Abram Cox Stove Company's Princess Novelty Ranges for coal and gas and combination coal and gas warm air Furnace.

BILLINGS-CHAPIN COMPANY, Cleveland, Ohio: Paints, Varnishes, Dry Colors, &c., with effective motor display. Represented by W. W. Rankin and M. L. Strausbaugh.

F. W. BIRD & SON, East Walpole, Mass.: Paroid Roofing and Neponset Building and Insulating Paper. Represented by F. Lowe.

BOMMER BROS., Brooklyn, N. Y.: Bommer Spring Hinges. Represented by E. A. Ditman.

BOSS WASHING MACHINE COMPANY, Cincinnati, Ohio: Boss Banner, Champion, 1904 Automatic, Uneeda, Cincinnati Square and Standard Perfection Washers. Represented by C. W. Magill.

BROWN STAMPING COMPANY, Toledo, Ohio: Tin and Galvanized Ware, Brown's Improved Anti-Rust Ware, &c. Represented by O. H. Eggert, C. S. Duvall and F. H. Crawford.

BURROUGHS ADDING MACHINE COMPANY, Detroit, Mich.: Adding Machines, particularly one for use in retail stores. Represented by R. W. Reid.

CARBORUNDUM COMPANY, Niagara Falls, N. Y.: Complete line of Sharpening Stones, Scythe Stones, &c. Represented by G. N. Allen, G. E. Dresser and C. G. Emery.

CATTARAUGUS CUTLERY COMPANY, Little Valley, N. Y.: Full line of Pocket and Table Cutlery, Scissors, Razors, &c. Represented by E. E. Kelley and W. B. Ten Brook.

CENTRAL OHIO PAPER COMPANY, Columbus: Genasco Roofings, Sheathing Papers, Wrapping Paper, Twines, &c. Represented by F. B. Atchinson, E. L. Wood and M. C. Roberts.

CHAMPION LEVER MACHINE COMPANY, Indianapolis, Ind.: Monitor Lever Cream Separator. Represented by J. M. Woods and H. H. Stamets.

CHAMPION STEEL RANGE COMPANY, Cleveland, Ohio: Champion Hot Blast Steel Ranges, including interchangeable coal and gas Range. Represented by C. H. Miller, C. H. Miller, Jr., and L. M. Crane.

CHASE COLVIN, South Charleston, Ohio: Stay-There Steel Fence Posts, Gates, Lawn Fence, &c. Represented by Chase Colvin, W. C. Ramsey and J. W. Hill.

CINCINNATI GALVANIZING COMPANY, Cincinnati, Ohio: Queen Corrugated Ash Can and Sanitary Kitchen Pails. Represented by G. M. Schott and W. C. Mahoney.

CLARK SHOWCASE COMPANY, Columbus: Floor Display Cases, Counters, &c. Represented by G. H. Clark and W. W. Lyman.

COLONIAL WORKS, Bronzite Factory, Brooklyn, N. Y.: Permanent Green Bronzite. Represented by W. E. Amback and J. E. Mathews.

COLUMBIAN HARDWARE COMPANY, Cleveland, Ohio: Tubo Registers, Ball Bearing Floor Spring Hinges, Columbian Wrought Steel Spring Hinges and Builders' Hardware. Represented by J. E. Stenger and F. W. Wood.

COLUMBUS HEATING & VENTILATING COMPANY, Columbus: Combination Gas and Coal Heater and Coal Furnace and Ventilated Urinal. Represented by F. H. Field and D. D. McLellan.

COLUMBUS ROOFING & SUPPLY COMPANY, Columbus: Carey Roofing, Pipe Coverings and Asbestos Goods. Represented by C. L. Cockrell, W. M. Hoffman, J. H. Cooper and A. R. Smith.

COLUMBUS VARNISH COMPANY, Columbus: Architectural Varnishes and Crown Paint and Varnish Remover. Represented by W. P. Emhoff.

CONSTANCE COMPANY, Mansfield, Ohio: Blust Self-Recommending Churn. Represented by J. D. Constance, Jr.

CYCLONE WOVEN WIRE FENCE COMPANY, Cleveland, Ohio: Cyclone Field and Lawn Fences, Gates, Borders, Tree Guards. Represented by C. J. Lane and L. A. Gaines.

DAIRY CREAM SEPARATOR COMPANY, Lebanon, Ind.: Dairy Queen Cream Separator. Represented by W. B. Dix.

FERDINAND DIECKMAN COMPANY, Cincinnati, Ohio: One-Piece Conductor Elbows, Speaking Tubes, &c. Represented by E. H. Hoffeld.

DICKELMAN MFG. COMPANY, Forest, Ohio: Sheet Metal Supplies. Represented by C. H. Golling and J. H. Coughlin.

DOVER MFG. COMPANY, Canal Dover, Ohio: Asbestos Sad Irons. Represented by D. L. Keyser and J. W. Muckley.

ECONOMY STOVE COMPANY, Cleveland, Ohio: Elevated Oven Gas Ranges and Air Duct Natural Gas Heaters. Represented by A. L. Gassett, C. S. Smith and M. C. Bober.

EMPIRE DRILL COMPANY, Shortsville, N. Y.: Empire Grain Drills and Broad-Casters and Corn Drills. Represented by E. W. Truax.

FAIRBANKS, MORSE & CO., Cleveland and Cincinnati: Scales, Gasoline Engines, Electrical Machinery and Eclipse Rubber Roofing. Represented by H. W. Bonnell, H. E. Chickering, C. W. Sparr, B. M. Brooke and L. C. Allen.

FARMERS' FENCE COMPANY, Bellefontaine, Ohio: Woven Wire Fence. Represented by K. A. Frick and J. R. Casey.

FARQUHAR FURNACE COMPANY, Wilmington, Ohio: Welded Steel Warm Air Furnace. Represented by L. P. Beech and O. L. Skinner.

FERROSTEEL COMPANY, Cleveland, Ohio: Registers and Ventilators. Represented by F. B. Cowley and A. E. Menke.

FLEXIBLE STEEL LACING COMPANY, Chicago: Flexible Steel Belt Lacing. Represented by J. E. Frank.

J. B. FORD COMPANY, Wyandotte, Mich.: Wyandotte Dairyman's Cleaner and Cleanser. Represented by R. W. McWhirter.

GARRY IRON & STEEL COMPANY, Cleveland, Ohio: Galvanized Roofing, Asphalt Roofings, Trough and Conductor and Expanded Metal Lath. Represented by C. S. Bigsby, F. W. Horton and C. E. Justus.

GERMER STOVE COMPANY, Erie, Pa.: Represented by C. C. Hammand and Harry Knapp.

GLASCOCK BROS. MFG. COMPANY, Muncie, Ind.: Glascock Racers, Baby Jumpers and Walkers, Charts and Desks and Washing Machines. Represented by J. J. Dow.

GOSHEN MFG. COMPANY, Goshen, Ind.: Hay Slings and Carriers, Ladders, Lawn Swings and Boyer's Gliding Settees. Represented by G. M. Richardson.

HANNA PAINT MFG. COMPANY, Columbus: Green Seal Liquid Paints and full line of Painters' Supplies. Represented by J. B. Hanna and staff.

HART & COOLEY COMPANY, New Britain, Conn.: Wrought Steel Registers. Represented by S. McClelland.

HASTINGS & ANDERSON, Chicago: Rock Island Tool Company's Vises and Mossberg Wrenches. Represented by P. H. Hamming.

HENKEL MFG. COMPANY, Canal Dover, Ohio: Automatic Rain Water Shifter. Represented by F. Hoff.

A. D. HOWE MACHINE COMPANY, Wheeling, W. Va.: Excello Water Power Washing Machines. Represented by W. G Black and W. F. Weir.

INDIANAPOLIS SADDLERY COMPANY, Indianapolis, Ind.: Harness, Blankets, Robes, &c. Represented by J. W. Walters and R. G. Spillman.

JAYCOX MFG. COMPANY, Fishkill Landing, N. Y.: Jaycox Self-Closing Blind Hinge. Represented by E. L. Jaycox.

H. W. JOHNS-MANVILLE COMPANY, Cleveland, Ohio: Asbestos Roofing, Cements, Packing, &c. Represented by Harry Gillette, P. A. Smith and A. A. Forshee.

LAMB & PEERLESS WIRE FENCE COMPANY, Adrian, Mich.: Lamb and Peerless Fence. Represented by A. J. Walters, M. L. Gillen, A. L. Parker and Geo. Abbott.

LANDERS, FRARY & CLARK, New Britain, Conn.: Universal Coffee Percolators, Coffee Machines, Cake Makers and Bread Makers. Represented by L. L. Redick and C. S. Williams.

LASHER MFG. COMPANY, Davenport, Iowa: Spring-in Handle Pot Cover and Cabinets and Kitchen Kumfort Plate Scraper. Represented by L. G. Lasher.

W. W. LAWRENCE & CO., Pittsburgh, Pa.: Lawrence Paints, Varnishes, White Lead, &c. Represented by H. G. Porterfield, G. E. Carter and E. D. Ferris.

LOGAN-GREGG HARDWARE COMPANY, Pittsburgh: Represented by H. M. Baldwin, C. Knox, T. C. Reed and W. H. Parker.

MCINTOSH HARDWARE CORPORATION, Cleveland, Ohio: Heather brand Tools and Cutlery. Represented by C. E. Clark, J. S. Harris, W. W. Dammel, J. Carson, E. Fruend, J. Anderson and E. E. Spottswood.

MARYLAND BELTING & PACKING COMPANY, Baltimore, Md.: Ruby and Lord Baltimore Canvas Belts. Represented by G. D. Iverson, Jr., and H. C. Lawrence.

MAY-FIFREGER COMPANY, Akron, Ohio: Ath-a-nor, Solid Comfort and Akron Air Blast Furnaces. Represented by L. M. Pettitt and R. R. Coon.

MICHIGAN WIRE FENCE COMPANY, Adrian, Mich.: Michigan Fence. Represented by C. P. Morse and E. G. Kuney.

MIDLAND LINSEED COMPANY, Minneapolis, Minn.: Line of Linseed Oil. Represented by E. W. Donley.

H. MITHOFF & CO., Columbus: Monarch Paints, Lawn Mowers, &c. Represented by Wm. Schunk, W. J. Saile, W. H. Amrhein and F. Lehman.

NATIONAL CABLE & MFG. COMPANY, Niles, Mich.: National Copper Cable, Lightning Rods. Represented by O. Mitchell.

NATIONAL ROOFING COMPANY, Tonawanda, N. Y.: Security, Safety, Royal and Crystalite Roofings and Permanent Asphalt Paints. Represented by C. H. Newell, W. W. Fluker and F. Crestlick.

NATIONAL STOVE COMPANY DIVISION, American Stove Company, Lorain, Ohio: Direct Action Gas Ranges and Lorain Steel Ranges. Represented by J. R. Dickson and C. E. Bartenbach.

L. F. NEER, Butler, Ohio: Lightning Solder.

T. H. NEVIN COMPANY, Pittsburgh: Pioneer Prepared Paints and White Lead. Represented by H. R. Gibbs, C. W. Stansbury and C. M. Freenian.

NEW METHOD COMPANY, Mansfield, Ohio: New Method Gas Ranges. Represented by B. E. Hamlin and F. L. Wood.

NEY MFG. COMPANY, Canton, Ohio: Haying Tools, Hangers and Hardware Specialties. Represented by I. N. Kinney and F. E. Stalder.

OHIO BASKET COMPANY, West Liberty, Ohio: Hand Made Round Splint White Oak and Rattan Corn and Feed Baskets. Represented by S. C. Black.

OHIO VARNISH COMPANY, Cleveland: Chi-namel Varnish and Self-Graining Process. Represented by W. J. Knapp, W. H. Hetrick and A. F. Walker.

OLIVER MACHINERY COMPANY, Grand Rapids, Mich.: Quick Acting Vises, Foster Turn Table Planes and Hand Screws. Represented by G. V. Stoddard.

OMAHA LIGHTNING ROD & ELECTRIC COMPANY, Omaha, Neb.: Lightning Rods. Represented by T. B. and Daisy Adams.

ONEIDA COMMUNITY, Oneida, N. Y.: Community Silver Ware, Chains, Traps, &c. Represented by J. H. Cragin and L. A. McFarland.

ONE-MINUTE WASHER COMPANY, Sandusky, Ohio: One-Minute Washer. Represented by A. J. Leake.

ONYX PAINT COMPANY, Columbus: Muresco Interior Water Finish, made by Benjamin Moore & Co., New York. Represented by H. J. Dobson and C. W. Cadle.

PERFECTION MFG. COMPANY, Columbus: Perfection Mortiser and Tool Grinder. Represented by G. W. Campbell.

PETALUMA INCUBATOR COMPANY, Petaluma, Cal.: Incubators. Represented by A. M. Williams.

PETERS BUGGY COMPANY, Columbus: Buggies. Represented by D. B. Smith and G. W. Landes.

PHŒNIX HORSE SHOE COMPANY, Joliet, Ill., and Poughkeepsie, N. Y.: Horse Shoes. Represented by R. J. Clarke.

PIKE MFG. COMPANY, Pike, N. H.: Complete line of Sharpening Stones with new combination stock and display cabinet and Pyko Grinder in operation. Represented by J. A. Winters, R. J. Horton and J. C. Peirce.

PITTSBURGH PLATE GLASS COMPANY, Pittsburgh, Pa.: Patton's Sun-Proof Paints, Rennous-Kleinle Brushes, &c. Represented by A. W. Martin, J. A. Kight, A. R. Hock, B. C. Root and C. C. Breeding.

PITTSBURGH STEEL COMPANY, Pittsburgh: Pittsburgh Perfect Fence. Represented by E. Steytler, G. W. Hampshire and E. D. Findlay.

PRATT & LAMBERT, Buffalo, N. Y.: All Star line of Varnishes and Andrews' Nukote for floors, furniture and woodwork. Represented by A. B. Dunn, C. D. Sproule and E. B. Bailey.

PRITCHARD-STRONG COMPANY, Rochester, N. Y.: Prisco Money-Back Metal Ware, including Dinner Pails, Wash Boilers and Tubs, Dairy Pails and Sanitary Sink Strainer and Prisco Lanterns. Represented by A. J. Brede.

REX BUGGY COMPANY, Connersville, Ind.: Rex Buggy with Star Ball Bearing Axle. Represented by W. W. Hurst and E. J. Ryan.

RUBY CHEMICAL COMPANY, Johnstown, Ohio: Ruby Soldering Compound. Represented by D. L. Palmer and O. C. Hoover.

ST. LOUIS CORDAGE COMPANY, St. Louis, Mo.: Mound City Binder Twine, Rope and Fodder Yarn. Represented by Will Cumback

F. O. SCHOEDINGER, Columbus: Metal booth showing Steel Ceilings, Sidings, Roofing, Cornices, Skylights, Finials, Stamped Work, &c. Represented by G. Z. Hayes, F. G. Mirick, O. Baker and F. O. Schoedinger.

J. H. & F. A. SELLS COMPANY, Columbus: Harness, Horse Collars, Robes, Blankets, &c.

SHELBY SPRING HINGE COMPANY, Shelby, Ohio: Shelby Chief Double Acting Floor Hinge, Ball Bearing Spring Butts and Stamped Steel Goods. Represented by H. W. Steele and L. D. Malone.

SIDNEY HOLLOW WARE COMPANY, Sidney, Ohio: Full line of cast iron polished and nickel plated Cooking Utensils. Represented by A. A. Gerlach.

SIDNEY STEEL SCRAPER COMPANY, Sidney, Ohio: Wheelbarrows, Wheel and Drag Scrapers, Trucks, &c.

SMITH BROS. HARDWARE COMPANY, Columbus: Acme White Lead & Color Works' Paints, Oils and Varnishes, Village Blacksmith Tools, Du Pont Powder, Waverly Washers and Indruoid Roofing.

SPRING STEEL FENCE & WIRE COMPANY, Anderson, Ind.: Shimer Fence, Farm Gates, Fence Stretchers and Fence Tools. Represented by S. C. Hill, O. B. Smith and W. S. Poling.

STANDARD LIGHTING COMPANY, Cleveland, Ohio: Visible Gas Ranges and New Process Oil Cook Stoves. Represented by J. R. Dickson and C. E. Bartenbach.

STANDARD MFG. COMPANY, Shelby, Ohio: Champion and Standard Double Acting Spring Hinges and New Home, National and New Shelby Washers. Represented by F. Brucker, Chas. L. Bushey, Ferd. Brucker and R. R. Shultz.

STANLEY WORKS, New Britain, Conn.: Wrought Steel Butts and Hinges, Brackets and Japanned Strap and T Hinges. Represented by S. McClelland.

STOVE & RANGE COMPANY OF PITTSBURGH, Pittsburgh: Cinderella, Good Luck and Trade Mark Stoves and Ranges. Represented by H. M. Baldwin, T. C. Read and C. Knox.

THRESHER VARNISH COMPANY, Dayton, Ohio: Thresher Varnishes and Boiled Linseed Oil. Represented by J. A. Pfanner.

TOLEDO STOVE & RANGE COMPANY, Toledo, Ohio: Gem Gas Range, Capital, New Toledo and Ideal Coal Ranges, Radiant Gem and Gem Base Burners and Taylor's Gas Heater. Represented by B. J. Taylor and B. F. Long.

TRACY-WELLS COMPANY, Columbus: Onyx Enameled Ware, Glacier and Edelweiss Refrigerators, Hamilton Rifles and Specialties. Represented by G. W. Hines, J. Flinchbaugh and E. W. McCuskey.

UNION COOPERAGE COMPANY, St. Louis, Mo.: Water Coolers, Harvest Kegs and Well Buckets. Represented by F. J. Benner.

VEHICLE APRON & HOOD COMPANY, Columbus: Waterproof Aprons, Hoods, Horse Covers, &c., Leggins, Feed Bags, &c. Represented by B. B. Clark and W. R. Daughert.

VERMONT FARM MACHINE COMPANY, Bellows Falls, Vt.: United States Cream Separator. Represented by Floyd J. Smith, D. W. Hurr, G. N. Farr and E. M. Sovocool.

JACOB J. VOLLRATH MFG. COMPANY, Sheboygan, Mich.: Special blue and pure white Enameled Ware. Represented by C. D. Brown.

WAGNER MFG. COMPANY, Sidney, Ohio: Cast Aluminum Cooking Utensils and Cast Iron Hollow Ware. Represented by W. F. Mellen and E. W. Laughlin. Souvenir, fac-simile of first casting made in the United States.

H. F. WATSON COMPANY, Erie, Pa.: Roofing, Asbestos, Building Papers, Pipe Covering, &c. Represented by W. L. Bennett.

WHITE LILY MFG. COMPANY, Davenport, Iowa: White line of Washing Machines, including the new White Washer and Gasoline Engines. Represented by R. P. Searle and A. F. Victor.

WHITE MOP WRINGER COMPANY, Fultonville, N. Y.: White Mop Wringers. Represented by F. S. Porter.

WOOD-SHINE COMPANY, Chicago: Wood-Shine Color Varnish and Graining Compound. Represented by E. A. Benedict, R. Benedict, C. C. Allen and W. R. Rae.

S. S. WYER, Columbus: Automatic Rain Water Cut-off and Y R Iceless Cooler.

YOST GEARLESS MOTOR COMPANY, Springfield, Ohio: Yost Gearless Motor Washer. Represented by C. J. Schellman.

Many representatives of manufacturing and jobbing houses attended the convention in an informal way or entertained in their rooms at the hotels. Among these were noted the following:

Columbus Hardware Company, Columbus: Occupied suite in Southern Hotel.

American Steel & Wire Company, Chicago: Suite in Chittenden Hotel.

J. M. & L. A. Osborn Company, Cleveland: Represented by L. A. Osborn, J. R. Reichert, R. E. Curtis, E. C. Howard, A. Hossler, A. Howe and J. G. Henninger.

Genuine Bangor Slate Company, Easton, Pa.: Represented by R. S. Brown, E. R. Armstrong, J. Stewart and E. W. Skinner.

Art Stove Company, Detroit: Represented by J. Huntley, F. Wilson and E. F. Hahn.

Bostwick Braun Company, Toledo, Ohio: Suite at hotel.

Lowe Bros. Company, Dayton, Ohio.

Rathbone, Sard & Co., Aurora, Ill.: Represented by F. R. McGrew.

Rochester Stamping Company and Robeson Cutlery Company, Rochester, N. Y.: Represented by G. A. Teller.

Lisk Mfg. Company, Canandaigua, N. Y.: Represented by C. H. Hughes.

Cleveland Co-operative Stove Company, Cleveland: Represented by O. M. Zehring.

Van Camp Hardware & Iron Company, Indianapolis, Ind.: Represented by E. H. Erk.

Meriden Cutlery Company, Meriden, Conn.: Represented by S. L. Gudgen.

Northern Ohio Blanket Mills, Cleveland: Represented by D. H. Bingman.

Empire Cream Separator Company, Bloomfield, N. J.: Represented by R. Anthony.

Estate of P. D. Beckwith, Dowagiac, Mich.: Represented by D. W. Van Antwerp.

Cribben & Sexton Company, Chicago: Represented by D. E. Magee.

Lindsay Light Company, Chicago: Represented by H. L. Town.

Lovell Mfg. Company, Erie, Pa.: Represented by I. B. Wingate.

Reed Mfg. Company, Newark, N. J.: Represented by W. G. Olmstead.

Geo. Worthington Company, Cleveland: Represented by H. P. Wood.

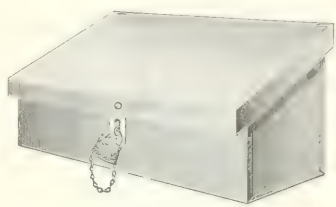
Simonds Mfg. Company, Chicago: Represented by W. J. Feddery.

Standart-Simmons Hardware Company, Toledo, Ohio: Represented by W. W. Osborn.

Bindley Hardware Company, Pittsburgh: Represented by Mr. Stoneburger.

Beaver Handy Tool Box.

The Beaver Mfg. Company, Beaver, Pa., has added to its line the tool box illustrated herewith. It is strongly made of 22 gauge galvanized iron and is given a coat of aluminum paint, which is said to make it absolutely rustproof. There are no raw edges. It is 18 in. long, 7 in. wide, 9 in. deep at the back and 5 in. deep in front. It is furnished with a padlock and chain. This tool box



Beaver Handy Tool Box

is recommended by the manufacturer for the home, for farmers, to protect small tools, oil cans, &c., used on agricultural machinery; for the stable, to contain curry combs, brushes, wrenches and other articles, often needed; for factories, &c. The boxes can be secured to the wall by screws, which cannot be removed until the box is open.

Durand Steel Lockers.

The Durand Steel Locker Company, Chicago, is manufacturing an extensive line of steel lockers and wardrobes, which are carried in stock in several standard sizes, single tier or double tier. These are furnace baked, black japanned finish, similar to bicycles, which is said to be handsomer and more durable than paint or air dry enamel. No. 16 gauge steel is used for the doors, making them strong enough to withstand the usual slamming and the knocks that come against the fronts. No. 20 gauge steel is used for the remainder of the locker. It is stated that this unusually heavy construction is favored because light sheet steel can be easily cut if one wants to steal from the locker, and the metal will pull away from the bolts under pressure. Ventilation is afforded by perforation, which can be as liberal as desired. Lockers are equipped with keyless locks, rim key locks or padlocks, as preferred. All corresponding parts are interchangeable, so that lockers can be arranged in different groupings without cutting or mechanical alterations. They are usually shipped knocked down to save freight as all parts fit accurately and no skilled labor is necessary to erect them.

Swastika Design Hammock.

The I. E. Palmer Company, Middletown, Conn., manufacturer of cotton tissues, hammocks, mosquito netting, window screen cloth, canopies and canopy fixtures, self-adjusting pulleys, &c., has added to its extensive output of hammocks a line in the new Swastika design here illustrated. This design is referred to as an old emblem

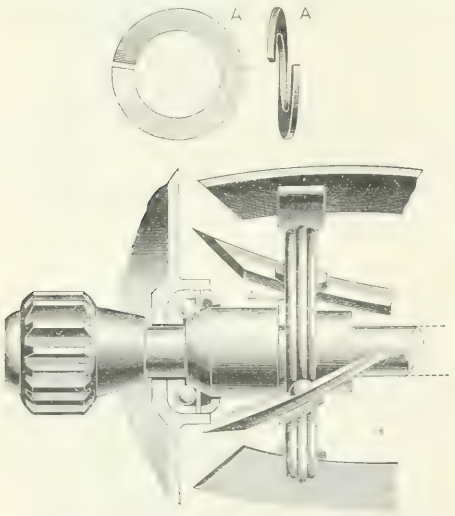


Swastika Design Hammock.

of good luck, which is proving popular in many lines of manufacture. It has been adapted to a Jacquard design for hammocks, as shown in the illustration, and the company has secured a patent on its use. Three attractive color combinations are offered, white and olive, red and green and black, green and white.

Blair Self-Adjusting Ball Bearing Lawn Mowers.

The Blair Mfg. Company, Springfield, Mass., manufacturer of lawn mowers, is offering this season an improvement in the way of self-adjusting ball bearings,

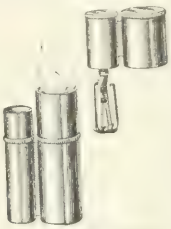


Blair Self-Adjusting Lawn Mower Ball Bearings.

detail of which is shown in the accompanying illustration. In this device, which is covered by patents, the rotary cutter shaft has at both ends bearings with tapered contact surfaces, with a sort of spring washer indicated by A in the diagram, which prevents the separation of these contact surfaces from their seats in the bearings of the side frames, thus maintaining a yielding contact between the bearings of the shaft and their supports. This provides automatic compensation for any lost motion in the bearings caused by wear, springing or warping of the frame parts or other causes. The results claimed by the company from the use of these bearings are that they do not require adjustment, that the revolving knives run true and bear evenly on the stationary knife, and that there is a resultant marked improvement in the work done, and in the ease of operating the machines.

Flaming Pocket Lighter.

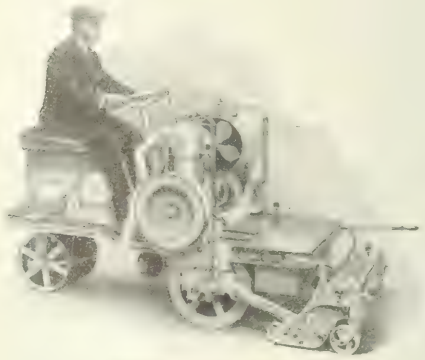
The Auto Igniter Company, 1947 Broadway, New York, has just put on the market the Auto Igniter, or flaming pocket lighter, for smokers' pocket use as here shown, being an improved form of a similar article originally brought out by it last year. It is intended for lighting purposes as a substitute for matches, except that it is said to be more reliable in windy weather, not affected by moisture and cheaper than matches. It is strongly made of seamless metal tubing, polished and nickeled, having four fine platinum wires protected by a cagelike formation of four strong brass wires. The outer dimensions are 2 x 1⅛ x ⅝ in., and it weighs ready for use less than 1 ounce. The larger tube is lined with cotton wick, which is to be saturated occasionally with deordorized wood alcohol or Columbian spirits (not grain alcohol). To obtain a blue flame instantly the upper portion is withdrawn and the platinum wired cage inserted in the saturated wicking, which owing to the manner of its installation causes the platina to glow and ignite the gaseous alcoholic substance. The device is well and substantially made, has milled edges, and is packed with a vial of suitable spirits in a neat double slide cover pasteboard box.



Pocket Lighter, Half Size.

Coldwell's Motor Lawn Mower.

The Coldwell Lawn Mower Company, Newburgh, N. Y., has put on the market the motor lawn mower illustrated herewith. The machine weighs 2000 lb. and, it is said, will negotiate 25 per cent. grades. It consumes from ½ to ¾ gal. of gasoline per hour, cuts a 40-in. swath and is alluded to as doing three times as much work in a day as an ordinary horse lawn mower. The cutting part can be lifted free from the ground by means of a single lever. The mower is intended for use on large lawns, such as found in connection with golf grounds, parks and extensive estates.



Coldwell's Motor Lawn Mower.

The Macon Hardware Company, Mineral Wells, Texas, has been incorporated with a capital of $10,000, by A. W. Macon, V. O. Rosser and George Mellers.

Harris Geared Ventilating Devices.

The Peyson Mfg. Company, Chicago, is manufacturing an improved line of ventilating apparatus and skylight operators. Three designs of these devices are shown in the accompanying illustrations. That shown in Fig. 1 is

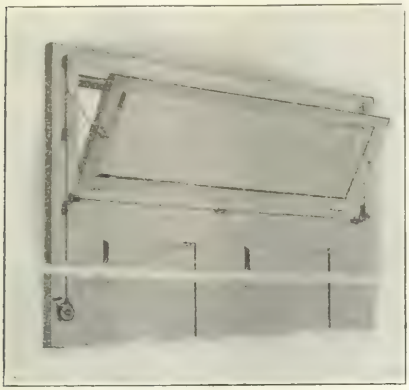


Fig. 1.—Harris Geared Transom Operator No. 1.

intended to operate heavy bottom hung transoms, although it may be used for pivoted or top hung sashes. It is said to be easy of adjustment and operation, and is worked from one side as indicated. It closes the

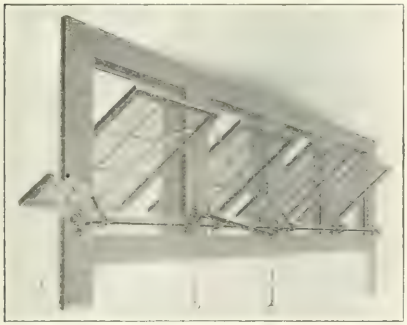


Fig. 2.—Harris Geared Transom Operator No. 2 for Gangs of Windows.

transom tight and keeps the sash from twisting and noisy vibration. Two sizes are offered having ⅜ and ½ in. rods, respectively, and all varieties of finish are also furnished on order. Fig. 2 shows a geared operator for



Fig. 3.—Harris Operator No. 3 for Gangs of Transoms.

gangs of four or five windows, which is worked by pulling the handles attached to the gear arm. It is stated that when closed the windows are absolutely locked by this device, and when open the leverage exerted is such as to prevent any movement or vibration of the sash, even by the highest wind. These operators are fitted for ⅞-in. pipe, having an outside diameter of 1⅛ in. Fig. 3 shows an operator which is intended for use where the point of operation is directly beneath at either end of a line of transoms. It is simple in construction, and, it is said, will easily control a gang composed of as many as 12 windows.

The Lawneta Canopy Table.

The Hurley Machine Company, Chicago, Ill., is offering the canopy table outfit illustrated herewith. The table is made in artistic metal design, 40 in. in diameter and accommodates six people comfortably. The chairs, entirely of metal, are strong and durable. The canopy is 9 ft. in diameter and the rib framework is made of steel, so as not to bend or break. The pole supporting the canopy is inserted in a pipe which is screwed into the ground for out of door use, and the canopy can be adjusted to any hight desired. The canopy is made of



The Lawneta Canopy Table.

heavy sail drill in the following colors: Green and white stripes, red and white stripes, orange and white stripes, solid tan and solid drab, the fringe matching the solid color. The canopy has a ring on the outer end of each rib, and curtains can be furnished with snap rings, to be hooked to the canopy for protection from sun or wind as well as affording seclusion for the occupants. The canopies are designed for use on lawns, verandas, country club grounds, open air cafés, parks, &c., and can be readily moved to any location.

Hennen's Glazing Paste.

The Minneapolis Waterproofing Company, 1000 Plymouth avenue, Minneapolis, Minn., has recently put on the market Hennen's glazing paste, similar in character, but much superior, it is asserted, to putty. One advantage named is that unlike putty it will not dry up and fall off, it being a tough and durable composition. It is used for skylights, bedding and cementing miters on plate glass, hot houses, filling cracks and openings between window frames in stone or brick, &c., It can be supplied in color to match body, when ordered in sufficient quantities, and regularly in ordinary putty color and black. It is put up in small tin boxes and 50, 100 and 500 packages.

Steel Lockers and Shelving.

The accompanying illustrations are representive of two lines manufactured by the Federal Steel Fixture Company, 493-501 West Kinzie street, Chicago, Ill. The lockers shown in Fig. 1, as well as other styles, are built on the unit system, so that they can be shipped knocked down, effecting a saving in freight charges, and can be erected by inexperienced workmen quickly and easily at destination. The lockers are so arranged that any number can be joined together in a continuous row. The fronts and backs are assembled complete, each securely riveted together and entirely supported by angle iron frames. The sides are accurately punched and the entire locker can be set up with no other tools than a wrench and screw driver. The lockers are finished with baked enamel of various colors, being put on in two coats and baked to a smooth, hard and durable finish. The steel shelving shown in Fig. 2 is designed for use in factories, and is made with heavy flanged steel shelves and solid partitions securely bolted together in one rigid section. It is shipped knocked down and can readily be erected on receipt. The shelving can be unbolted and taken apart at any time and moved to different parts of the factory without injury. The point is made that this is practically impossible where wooden shelving is used, and also that while the cost of steel shelving is a little more than wood

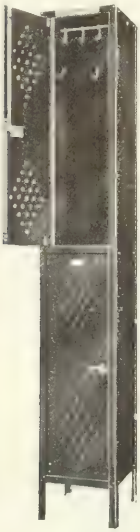


Fig. 1.—Double Tier Lockers



Fig. 2.—Federal Steel Shelving

at the beginning, experience has shown that it is much cheaper in the long run. The shelving has a carrying capacity of 100 lb. per square foot per shelf. Each section has 10 shelves 36 in. long, 24 in. wide, with 7-in. spaces between shelves.

Rust's Invisible Top Hanger and Fastener.

For hanging full or half size window screens, E. G. Rust, Dallas, Texas, is manufacturing the invisible hangers and fasteners as herewith illustrated. For hanging full screens the end of the hanger marked F in Fig. 1 is put flush with the top and inner face of the screen, and the pins or screws are located at the top of the opening, as shown in Fig. 3, so that the point of the hook of the hanger will just pass over the pin or screw when the screen is placed in the opening. The fasteners may be applied, as shown in Fig. 5, at any point necessary most effectively to draw the screen frame against the blind stop. For half screens the end of the hooks marked H in Fig. 1 is placed uppermost, and applied as shown in Fig. 4. Among the points of excellence the following are mentioned: That the hangers and fasteners are comparatively low in price; that the fixtures are easily and

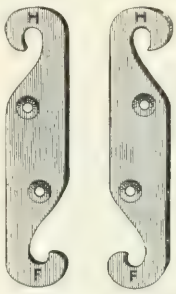


Fig. 1.—Rust's Invisible Screen Hangers.

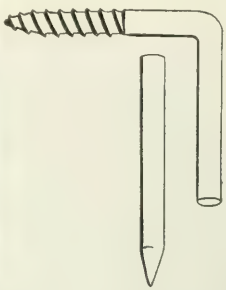


Fig. 2.—Pins and Screw Hooks for Rust's Invisible Screen Hangers.

quickly applied to screens before they are put up, and the only overhead work is driving two screws in the casings at the top of the window, this being done from the inside of the building on second and third floors, obviating the

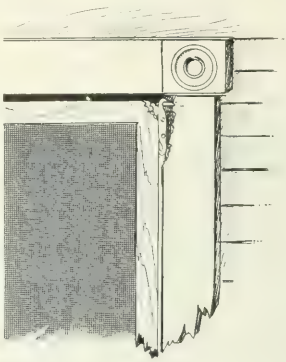


Fig. 3.—Screen in Place and Hung on Screw Hooks.

use of long ladders or scaffolds; that the device is operated, removed and replaced with ease by any one who is strong enough to handle the screen; that being invisible it does not mar the outside appearance of the house, or cause rusty streaks on white or light colored casings; that

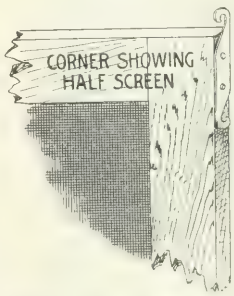


Fig. 4.—Hanger as Attached to a Half Screen.

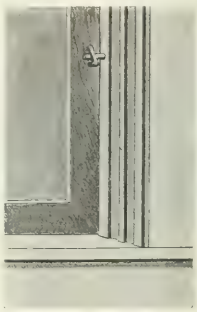


Fig. 5.—Fastener Applied to Draw Screen Frame Against Blind Stop.

the hanger can be used on the ordinary brick mold, and that both full or half screens can be hung with the same hangers.

New Model No. 24 Marlin Repeating Shotgun.

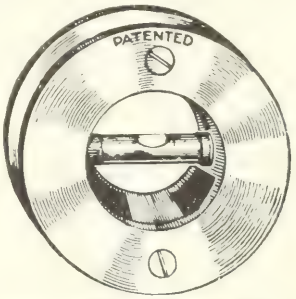
The Marlin Firearms Company, New Haven, Conn., is offering the 12 gauge take down shotgun here illustrated. The improved take down construction does away with the foreend slide stop, slide screw in band, forearm screws and escutcheons and other small parts. The magazine is not cut away at the front as in the company's former models, and there are no sharp edges or corners. The entire front end is supported by the tube plug, which keeps the magazine firmly locked in its closed position, yet allows the tube to go forward instantly when the latch is pressed. A ring on the magazine under the steel core of the forearm prevents the action bar disconnecting from the locking bolt when the magazine is closed. When the tube is moved forward, the forearm and action bar readily slide forward to clear the frame and are held in this position by a friction spring. The barrel turns into the frame with a large, square, left hand thread that leaves exactly the same amount of metal at this point of greatest strain, with exactly the same distribution as in a solid frame, non-take down gun. The lock nut, threaded to turn on the barrel and lightly clamped abutting the front end of the frame, takes up the wear and insures a firm and rigid union. The company's improved automatic recoil block hooks on to the locking bolt when closing the action and holds the gun firmly locked until after the explosion of the cartridge, when it instantly and automatically releases by the recoil. Extra interchangeable barrel portions complete can be furnished, by which this long range trap or duck gun can be quickly changed into a brush gun suitable for birds and short range work, and for the use of buck shot. The model No. 24 can also be furnished in grades B C and D, same quality of material and workmanship and same prices in the respective grades, as the company's model No. 19.



New Model No. 24 Marlin Repeating Shotgun.

The Diamond Adjustable Spirit Level-Plumb.

The Diamond Power Specialty Company, 234-236 Fort street, West, Detroit, Mich., is putting on the market the spirit level-plumb, shown herewith. It can be attached to a straight edge by boring a plain, round hole and mounting the device in the hole. The device consists of two metal disks 2⅝ in. in diameter, with an opening in the center of 1¼ in., and having on the reverse sides two lugs or bearing posts. When placed in position the lugs of one disk rest against the other disk, forming four bearing points between the two disks. Into one set of lugs are inserted hollow tubes that hold the common level glass, and from the face of that disk are inserted two screws entering into the end of the lugs of the other disk. The level glass is mounted in the little tubes or bushings, and can be placed in position by the average mechanic, as comparatively little skill is required. The bushings are split into quarters at the outer ends, thus forming a flexible bearing against solid metal lugs which, it is claimed, make it almost impossible to break the glass by a fall. The little screw through the end of one of the bushings into the lug holds the glass firmly in place. The device is such that at the will of the workman it may be used either as a level and plumb or inclinometer. It is designed to take the place of the plumb bob and line as used on a plumb staff, and it can be attached to any straight edge of any length to suit any conditions of work. The company claims that the device is more rapid in its operation than either the straight edge and level or bob and line.



The Diamond Adjustable Spirit Level-Plumb.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, State and West'n, Raw, in bbls	.41 @44
Linseed, State and West'n, Boiled, in bbls	.44 @45
Linseed, Raw, in bbls	.41 @44
Linseed, Calcutta, in bbls	.70 @..
Lard, Prime, Winter	.65 @.71
Lard, Extra No. 1	.55 @.57
Lard, No. 1	.45 @.48
Cotton seed, Crude, f.o.b. mill	.24 @.26
Cotton seed, Yellow, prime	.30 @.32
Cotton seed, Summer White	.34 @.36
Cotton seed, Yellow, White	.32 @.34
Tallow, Prime	.06 @.06½
Menhaden, Brown, Strained	.41 @42
Menhaden, Light Strained	.42 @..
Menhaden, Pale, Strained, Northern	.43 @..
Menhaden, Pale, Strained, Southern	.42 @..
Cocoanut, Ceylon, Cochin	.07 @..
Cocoanut, Cochin	.07½ @..
Cod, Domestic, Prime	.41 @..
Cod, Newfoundland	.40 @..
Red Ellaine	.10 @.12
Sperm, Natural	.78 @..
Olive, Yellow	.94 @..
Neatsfoot, Prime	.60 @..
Palm, Lagos	.07½ @..

Mineral Oils—

	₱ gal.
Black, 29 gravity, 25@30 cold test	.11½@..
28 gravity, 15 cold test	.13½@.14
Summer	.11 @..
Cylinder, light, filtered	.20½@.21
Dark, filtered	.18 @.19
Paraffine, 30@32 sp. gravity	.11 @.15
903 sp. gravity	.10 @.11
885 sp. gravity	.11 @11½
Red	.13½@.14

Miscellaneous—

Barytes:	
White, Foreign	₱ ton $18.50@20.50
Amer. floated	₱ ton 19.00@20.00
Off color	₱ ton 13.00@16.50
Chalk, in bulk	₱ ton 2.00@3.40
China Clay Imported	₱ ton 11.50@18.00
Cobalt, Oxide	₱ 100 lb. 1.45@1.60
Whiting, Commercial	₱ 100 lb. 42@.52
Gilders	100 lb. .55@..
Ex. Gilders	₱ 100 lb. 60@.65

Putty, Commercial—₱ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.45
In 1 to 5 lb cans	.80 @.90
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—₱ gal.

In oil bbls	.51 @51½
In machine bbls	.51½@.52

Glue—

	₱ lb
Cabinet	.12 @15
Common Brown	.7.. @..
Extra White	.18 @24
Fish, liquid, 50 gal. bbls., less gal. lots	.60 @1.20
Hoof Stock, White	.12 @14
Hoof Stock, Brown	.10 @13
German Common Hide	.11 @12
German Hide	.15 @18
French	.13 @14
Irish	.13 @16
Low Grade	.10 @..
Medium White	.14 @17

Gum Shellac—

	₱ lb
Blk-lead, Commercial	.7.. @..
Blonde, Dry	.7.. @..
Button	.1.. @..
Diamond I	.1.. @..
Fine, Orange	.1.. @..
A. C. Garnet	.1.. @..
G. A. L.	.1.. @..
Kala, Button	.1.. @..
D. C.	.1.. @.70
Octagon, B.	.38 @40
T. N.	.1.. @..
V. S. O.	.47 @48

Colors in Oil—

	₱ lb
Black, Lampblack	.12 @14
Black, Carbon	.0.. @..
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @14
Green, Chrome	.12 @16
Green, Paris	.0.. @24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, English white, in Oil	.10½@13⅜
Lead, American White:	
Lots less than 500 lb, in Oil	.0.. @..
Lead, White, in oil, 12½ lb tin	
Lead, White, in oil, 25 lb tin	
Lead, White, dry	
Lead, White, Ground in Oil	
in 15 days from date of invoice	

Zinc, Dry—

American	₱ 100 lb. No. 1 .75@.80
American	No. 2 .60@.65
American	No. 3
Turkey, Raw and Powdered	.03½@..
French, American	.1½@..
Red, American	.1½@..
Yellow Chrome, Pure	.13 @15
Vermilion, American, Lead	.0.. @25
Quicksilver, bulk	.65 @..
Quicksilver, flasks	.0.. @..
English, Imported	.65 @70
Chinese	$0.90@1.00

Dry Colors—

	₱ lb
Black, Carbon	.6.. @10
Black, Drop, American	.0.. @..
Black, Dry, English	.5 @15
Black, Ivory	.16 @20
Lamp, commercial	.4 @.. 6
Blue, Celestial	.4 @.. 6
Blue, Chrome	.0.. @..
Blue, Paisian	.0.. @..
Blue, Ultramarine	.3½@15
Brown, Spanish	.0.. @.. 1
Carmine, No. 40	.$3.10@3.25
Green, Chrome, Dark	.0.. @..
Green, Chrome, pure	.17 @25
Lead, Red	.0.. @..
Lemon	.0.. @..
Ochre, American	₱ ton $8.50@16.00
Ochre, American	.0.. @..
Ochre, French	.0.. @..
Ochre, Italian	.0.. @..
Ochre, Spanish	.0.. @..
Orange Mineral	.0.. @..
Rose Pink	.0.. @..
Sienna, Burnt	.0.. @..
Sienna, Raw	.0.. @..
Terra Alba	.0.. @..
Umber, Burnt	.0.. @..
Umber, Raw	.0.. @..
Vandyke Brown	.0.. @..
Venetian Red, American	.0.. @..
Venetian Red, English	.0.. @..
Vermilion, English	.0.. @..
Vermilion, Pale	.0.. @..

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓
Norris's 10
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ₰ doz. pairs, Nos. 1, $4.50; 2, $5.50; 3, $6.50; 4, $8.50; 5, $9.50.
Fernald Quick Shifter, ₰ doz. pairs.....$2.00@$3.50

Anvils—American—

Eagle Anvils .....₰ lb @8½¢
Hay-Budden, Wrought .....9½@9¾¢
Trenton .....₰ lb 9½@9¾¢

Imported—

Swedish Solid Steel Sisco, Superior, [illegible]
Peter Wright & Sons, ₰ lb. 84 to 343 lb. list .350 to 56 lb. 11½¢
Anvil, Vise and Drill—
Mintern Bros Co., $15.00.....15&10%
Apple Parers—See *Parers, Apple, &c.*
Aprons, Blacksmiths'—
Livingston Nail Co.....10

Augers and Bits—

Com Double Spur.....75&10@50%
Jennings' Path, Gimlet.....50&10@75%
Black Lip or Blued.....65@60&5%
Boring Mach. Augers.....50&10%
Car Bits, list.....40&10%
Ford's Auger and Car Bits.....10&5
Ft. Washington Auger Co., Cordell's 35%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, ...25%
No. 9, R. Jennings' list.....50
Russell Jennings .....25&10&2½%
L'Hommedieu Car Bits.....15
Mayhew's Countersink Bits.....40
Pugh's Blacks 20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's Pattern, No. 1, ₰ doz. $26; No. 2, $18.....60&10%
Ford's, Clark's Pattern.....65%&5
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $26.00 .....60&10%
Saw's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut.....$3.00&3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz. $6.50@7.00
Ames .....25&10
Ives 20
Ship Augers and Bits—
Ship Augers .....50@60%
Ford's .....33⅓&5
C. E. Jennings & Co.:
1, 11 inch Bell's 6
Water .....33⅓&5½
Steer's 40

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdld, Shldered...gro.63@66¢
Unhandled, Patent...gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 51@54¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket...gro $11.50@12.00
Awl and Tool Sets—See *Sets, Awl and Tool.*
Axes—
Single Bit, base weights: Per doz
First Quality.....$4.75@5.00
Second Quality.....$3.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles—

Iron or Steel
Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar..4¾@5¼¢
No. 1 Common, Loose.....3¾@4¼¢
No. 2½ Com., Nor. Skein.....4@4½ ¢
No. 2 Solid Collar.....4½@5 ¢
Half Patent.
Nos. 7, 8, 11 and 12..65@65&10%
Nos. 13 to 14.....65%&10%
Nos. 15 to 18.....70%&10%
Nos. 19 to 22.....70%&10%

Boxes, Axle—

Common and Concord, not turned lb., 6@6¢
Common and Concord, turned. lb., 6@7¢
Half Patent.....lb., 9½@10¢

Bait—Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....50@50&10%
Straight Balances.....10@10&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb.... per lb. —@2½@2¾¢

Towel—

No 10 Ideal, Nickel Plate..₰ gro. $8.50

Beams, Scale—

Scale Beams.....40%
Chattillon's No. 1.....20%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₰ doz. $0.80; Tinned .....$.95
No. 11 Wire Coppered ₰ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned.....₰ doz. $1.50

Beaters, Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dozer, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $10.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $5.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.50

Bellows—

Blacksmith, Standard List..
Split Leather.....60&10@65%
Grain Leather.....50@55&10%

Hand—

Inch... 6 7 8 9 10
Doz... $5.00 5.50 6.00 6.50 7.50

Molders—

Inch... 10 12 14 16
Doz... $7.50 9.00 12.00 15.00

Bells—Cow—

Ordinary Goods...75&5@75&10@5%
High grade.....70&10@75%
Jersey .....75&10
Texas Star.....50%

Door—

Heme, R & F Mfg. Co's .....55&10%

Hand—

Polished Brass .....70&10@5%
White Metal .....50&10@50&5%
Nickel Plated .....50@55%
Screw .....70@75%
Cone's Globe Hand Bells.....33⅓@35

Miscellaneous—

Farm Bells.....lb., 2¼@2½¢
Church and School....60@60&5%

Belting—Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard .....50&5
Light Standard.....55
Cut Leather Lacing.....50&10%
Leather Lacing Sides, per sq. ft. .....2¼@2¢

Rubber—

Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10
Standard .....70@70&5
Extra .....60&5@60&10%
High Grade.....50&5@50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 30%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Spokes.....50%
Tubes 40%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden.....75@75&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 50%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....40%
Enclosed 50%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓&5

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut threads):
Sizes 6 and smaller.....75%
Larger and longer.....70%
Phila. Eagle, $3.00 list...80@—%
Bolt Ends.....70@—%
Machine (Cut Threads):
Sizes 6 and smaller.....75%
Larger and longer.....70%

Door and Shutter—

Cast Iron Barrel, Japanned. Round Brass Knobs:

Inch	4	5	6	8
Per doz	$.45	.50	.55	.80

Cast Iron Spring Foot, Jap'd:

Inch	6	8	10
Per doz	$1.20	1.50	2.25

Cast Iron Chain, Flat, Japanned:

Inch	6	8	10
Per doz	$1.00	1.40	1.65

Cast Iron Flat Shutter, Jap'd., Brass Knobs:

Inch	6	8	10
Per doz	$.55	.95	1.25

Wrought Barrel Japd..80@80&10%
Barrel Bronzed.....60&10%
Spring .....70&10@70&10&5%
Shutter .....50&5@50&10&5%
Square Neck.....75@75&10%
Square .....70&10&10%
Ives' Patent Door 55%
Ives' Wrought Metal 45%

Expansion—

Richards Mfg. Co.....50&10%
Steward & Romayne Mfg. Co.:
Style No. 15, Double 55%
Style No. 1 Single 55
Style No. 100 Dbl. Exp. Single 55
Lag Screw 60%

Plow and Stove—

Plow .....65&5@50%
Stove .....50@50&5%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Bay State, list Dec. 28, '99.....80%
Franklin Mowie Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84... 80%
Eagle 82½
Shelton Co.:
Tiger Brand, list Dec. 28, '99...80
Phila., Eagle, list Oct. 16, 1884..82½%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch	1¼	1½	1¾	2
Per doz	$4.80	5.60	6.40	8.00
Inch	2	2¼	2½	
Per doz	$8.65	11.50		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25

Boxes, Mitre—

C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme .....15&10%
Perfection 40
Seavey 45

Braces—

Common Ball, American....$1.50
Barber's .....50&20&10@60&...
Fray's Genuine Spofford's 60
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces .....25&10
P., S. & W. Co., Peck's Pat. 60&10%

Brackets—

Wrought Steel.....70&10@75&10%
Bradley Metal Clasp..80&10@80&10&5%
Griffin's Pressed Steel.....75@75&10%
Griffin's Folding Brackets .....50&10%
Taplin Victor Handy Egg Beater Bracket .....₰ doz. $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Wire Goods Co.....75%

Buckets, Galvanized—

M'f'gr's list, price per gross.

	Quart	10	12	14	
Water, Red		$2.35	2.80	$2.90	10&5%
Water, Blue		3.45	4.00	5.00	
Fire, Rd. Bim		$2.60	$4.65	38.65	
Well		$7.35	$1.35	$5.35	

Bull Rings—See *Rings, Bull*

Butts—Brass—

Wrought, High List, Oct. 26,'06.55%
Cast Brass, Tiebutts 10

Cast Iron—

Fast Joint, Broad .....40&10@50%
Fast Joint, Narrow.....40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Machines.....70@75%
Parliament Butts.....70@70&5

Wrought Steel—

Bright.
Light Narrow, Light Reversible .....70@75%
Reversible and Broad, 70@75%
Loose Joint, Narrow, Light Inside Bind &c. 70%
Buck Flaps, Tuthill, Chest..65 Japanned.
Light Narrow, Loose Pin .....70@75%
Light Narrow, Ball Tip and Broad .....70@75%
Steeple Tipped.....70%
Ball Tipped.....70%

Extra 10%

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100 net list, 1200 15%, 200 30%, 300 ...

Hendryx Bronze: Series 500, 800 ...

Hendryx Unplated ...

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb. 4½@4½¢
Sharp, 1 prong, per lb. 4½@4½¢
Barse & Hall: Sharp, 4-prong ...
Lauter Bros.: 4-prong, Sharp ...
Perkins, Beard, & Bl...: Sharp, 4-prong, 4.15¢

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Elegy E. B ... $2@55¢
G. D. ... *per M* 3.00@35¢
E. L. ... *per M* 4.00@42¢
G. E. ... *per M* 4.50@50¢
Musket ... *per M* 6.25@65¢

Primers—

Berdan Primers, 8 per M ... 2.45
Primer Shells and Bullets, 15@20
All other primers per M. $1.52@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:
32 C. F. ... *$3.60* ... *10@5%*
38 C. F. ... *$7.00* ... *10@5%*
22 cal. Rim, $1.50 ... *10@5%*
32 cal. Rim, $2.75 ... *10@5%*
B. B. Caps, Gun Balls, Shot .$1.90
B. B. Caps, Round Ball ... *$1.40*
Central Fire ... *25%*
Target and Sporting Rifle ... *15@5%*
Primed Shells and Bullets 15@10%
Rim Fire, Sporting ... *50%*
Rim Fire, Military ... *15@5%*

Casters—

Bed ... *65@10%*
Plate ... *60@5%*
Philadelphia ... *70@10%*
Acme Ball Bearing ...
Gem Roller Bearing ... 5" & 6" ... 4.50
Steel Gem ... 30
Standard Ball Bearing ... 15%
Yale Ball Bearing: Low list 40@10

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:
5/16 ... *5-16* ... *7-16* ... *½* ... *9/16*
$8.00 ... *$6.00* ... *$4.25* ... *$3.75* ... *$3.50*
⅝ ... *¾* ... *⅞ to 1* ... *1¼ to 1½ inch.*
$3.00 ... *$2.75* ... *$2.50*
In stock lots, deduct 25c.
German Co. ... *60@10&5%*
German Patent Coil:
6-0 to 1 ... *70@5@70@10%*
1¼ and 1½ ... *60@10@5%*
1¾ and 2 ... *50@10@5%*

Halter—

Halter Chains ... *60@10@5%*
German Pattern Halter Chains, list July 24, '97 ... *60@10@5%*
Covert Mfg. Co.
Halter ... 35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Straight, with rings ... *$36.00*
6½—6-6, Straight, with rings ... *$38.00*
6½—6-9, Straight, with rings ... *$42.00*
6½—6-3, Straight, with rings ... *$47.00*
NOTE—Add 25c per pair for Hooks Tugs, add per pair for ¾ and ⅞ ... No. 1, ... No. 9, to price of Straight Link.
Eastern Standard Traces, Wagon Chain, 6-6@6-9@6-12@6-15

Miscellaneous—

Jack Chain, list July 10, '93:
Iron ... *60@10%*
Brass ... *60%*
Safety and Plumbers' Chain ... *60@10*
Gal. Pump Chain ... *lb., 4½@5%*
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion ... 40%
Oneida Community:
Ahead or Halter Dog and Kennel Chains ... 40%
Niagara Log Loads and Kennel Chains ... 40&5
Wire Goods Co.:
Dog ... 60
Universal Dehorned Chain ... 50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain ... 60%
Pullman:
Bronze Chain, 60%; Steel Chain ...
Sash Chain Attachments, per set .8¢
Aluminum Sash Ribbon, per 100 ft ... $1.25@$3.00
Sash Ribbon Attachments, per set .8¢

Chalk—(From Jobbers)

Carpenters' Blue ... *gro.* ... *50@55¢*
Carpenters' Red ... *gro.* ... *45@55¢*
Carpenters' White ... *gro.* ... *40@45¢*

Checks, Door—

Bardsley: ... 45%
Pullman, per gro. ... $8.00
Russell ... 33⅓%

Chests, Tool—

American Tool Chest Co.:
[illegible] ... 5
Yankee Tool Co.: [illegible] ... 5
Gardner & Co.: [illegible] ... 5
Hinges, Carpenters', etc., Chests with Tools ... 20
Machinists' and Pipe Fitters' Chests, Empty ... 10
Tool Chests ... 5
Lathes, Planers & Other Machinists Tool Chests ... 5

Chisels—

Socket Framing and Firmer

Standard List ... *Net*
Geo. Bl...: ... 40
C. E. Jennings & Co.: ... 20
Socket Firmer No. 10 ... 40&5
Socket Framing No. 15 ... 40&5
Swan's: ... 40
L. & I. J. White Co. ... 40&5

Tanged—

Tanged Firmers ... *Standard*
Lucas Bros. ... 30
L. & I. J. Firmers & C. Nos. 10 ... 25
L. & I. J. White Co. ... 25&5

Cold—

lb.

Cold Chisels, good quality .15@15¢
Cold Chisels, fair quality .11@12¢
Cold Chisels, ordinary... 9@10¢

Chucks—

Almond Drill Chucks ... 35%
Almond Turret Six Tool Chuck ... 40%
Beach Pat., cards $5 list ... 40&5
Empire ... 5
Blacksmiths' ... 35
Jacobs' Drill Chucks ... 35%
Drill's Positive Drive ... 35
Skinner Patent Chucks:
Independent Lathe Chucks. ... 20
Universal, Reversible Jaws ... 20
Combination, Reversible Jaws ... 35%
Drill Chucks, New Model ... 25
Standard, 45° Jaws ... 25
Skinner Pat., 25° Positive Drive ... 10
Planer Chucks ... 20%
Face Plate Jaws ... 35%
Standard Tool Co. ...
Starrett Drill Chuck ... 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17 and No. 21 ... 35
Scroll Combination, No. 83 and 84 ... 35
Geared Scroll, Nos. 33, 34 and 35 ... 35
Independent Iron, Nos. 18 and 318 ... 35%
Independent Steel, No. 64 ... 25
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104 ... 35
Union Star Drill ... 35
Universal, 11, 12, 16, 17, 13, 14, 15 ... 40
Universal, No. 42 ... 35
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50 ... 35
Steel Face Plate Jaws, Nos. 70 and 72 ... 30
Westcott Patent Chucks:
Lathe ... 50%
Little Giant Auxiliary Drill ... 50%
Little Giant Double Grip Drill ... 50%
Little Giant Drill, Improved ... 50%
Oneida Drill ... 50%
Scroll Combination Lathe ... 50%
Whitaker Mfg. Co. ...
National Drill ... 25

Clamps—

Adjustable Hammers' ... 20@20&5%
Carriage Makers', P., S & W. Co. ... 50&5%
Boss Parallel ... 33⅓&10
Myers' Hay Rake ... 45
Lineman's Swedish Necktam ... 60
Wood Mortising Hammers' ... 40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable ... 50%
Iwan's Champion, Stationary ... 40%

Sidewalk—

Star Socket, All Steel, ⅜ doz. $4.05 net
Star Shank, All Steel, ⅜ doz. $3.24 net
W. & C. Shank, All Steel, ⅜ doz., 7-in. ... $3.24 net

Cleavers, Butchers'—

Foster Bros. ... 30%
Fuller & Plumb ... 30%
L. & I. J. White Co. ... 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each ... $10.75
20th Century Horse, each ... $5.00
Lightning Belt Horse, each ... $15.00
Chicago Belt Horse, each ... $20.00
Stewart's Enclosed Gear Horse, each ... $8.75
Stewart's Patent Sheep Shearing Machine ... $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each ... $9.75

Clips, Axle—

Regular Styles, list July 1, '05, ...

Cloth and Netting, Wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Packing, Liquor, Bottling, &c. ... *70@*
Compression Bibbs, Stop and ...

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list ... 40%
Leather, Walter B. Stevens & Son's list ... 40%

Compasses, Dividers, &c.

Ordinary Goods ... *70@10@75*
Wm. Schollhorn Co.:
Excelsior Divider ... 60
Lodi Dividers ... 70&10%

Conductor Pipe,—

L. C. L. to Dealers:

	Galvanized		
Galv.	*Charcoal*	*Copper.*	
Steel.	*Iron*	*Tr.*	*16@2 oz.*
Eastern:			
[illegible]			
Central:			
[illegible]			
Western and Southern:			
[illegible]			
So. Western			
[illegible]			

Terms, 60 days, 2 cash; does [illegible] buy shipments, prevailing discount.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:
[illegible] ...
Galvanized ... $6.00
[illegible] ...
[illegible] ...
W. [illegible] ...
Agate Lined ... 10%

Coopers' Tools

See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 8 lbs. to pair and heavier, 22@25c; lighter than 8lbs to pair ... @27c

Cord— Sash—

Braided, Drab ... lb. 55¢
Braided, White, Com., Nos. 8 to 12, 23¢; No. 7, 23½¢; No. 6, 24¢. In lots of 25 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18.. 37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India ... lb., 11@11½¢
Cotton Sash Cord, Ivy Red ... 20¢
Patent Russia ... lb.. 20¢
Cable Laid Russia ... lb.. 21¢
India Hemp, Br'd ... lb. 21¢
India Hemp, Twisted.. lb. 13@14¢
Patent India, Twisted ... lb... 17¢
Pearl Braided ... ⅜ lb
Sash Cord, No. 5 to 12, 36¢
Eddystone, Braided, Nos. 8 to 12, 23¢; 7, 25½¢; 6, 27½¢.
Hathaway Cable Laid Italian, Nos. 7 to 10 ... ⅜ lb 23 ¢
Pullman ...
Wire Sash Cord ... 10%
Sash Cord Attachments, per doz. 10¢
Samson, Nos 6 to 12 ...
Braided, ⅜ lb, Drab Cotton ... 55¢; Italian, Hemp 40¢; 50¢; Linen, 65¢; White Cotton ... 50¢; Spun Silk ... 90¢
Massachusetts, White ... ⅜ 40¢
Massachusetts, Drab ... ⅜ lb 45¢
Phoenix, White, Nos. 8 to 12, 27¢; Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢;
B, Drab, 40¢; B, White, 35¢;
Italian Hemp, 40¢; Linen ... 55¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906 ... *90%—*
Hendryx Standard Wire Picture Cord, ... old list, 85&10%
Turner & Stanton Co. Wire Picture Cord ... 35&5

Cradles—

Grain ... *40@12½%*

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber. ... ⅜ gro.
White and Purple, Indelible ... $7.50
Blue, Red, Green, Yellow and Terra Cotta ... ⅜ doz. 24
Giant Lumber, 5¼ in. x 15-16 in. ... ⅜ doz. 24
Lubon, $10.00; Blacks ... $10.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.25; 5 x 1¼ x 3-16 ... 5¢ x

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $5.50; Light ... $5.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden ... 50%

Cutlery, Table—

International Silver Company:
No. 1 M 1 in Knives [illegible] ... $3.50
Star 1 in Roger & Hamilton and Anchor ... doz. $3.00
Wm. Rogers & Son ... doz. $2.50

Cutters— Glass—

H. H. Morrow Co. ... 10
Red Devil ... 10
B. Mfg. Co. ... 10%
Wonderful ...

Meat and Food—

American ...
[illegible] ...
[illegible] ...
[illegible]

Fasteners, Blind—

Zimmerman's ..... 60&10%
Wilcox ..... 40&1
Upson's Patent 40%

Cord and Weight—

Ives and Titan 33⅓%

Corrugated—

Acme Corrugated Fasteners 70%

Faucets—

Cork Lined ..... 50&10@60%
Metallic Key, Leather Lined, ... 60&10@70%
Red Cedar ..... 40&5@40&10&5%
Petroleum ..... 70&10@75%
B. & L. B. Co.:
Metal Key ..... 60&10%
Star 50%
West Lock ..... 50&10
John Sommer's Peerless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Mfd Key ..... 50&10%
John Sommer's Duplex Metal Key 60%
John Sommer's Diamond Lock 40%
John Sommer's Metal Cork Lined 50%
John Sommer's Reliable Cork Lined ..... 50&10%
John Sommer's Chicago Cork Lined 60%
John Sommer's O. K. Cork Lined 50%
John Sommer's No Brand, Cedar 50%
John Sommer's Perfection, Cedar 40%
Self Measuring:
Enterprise, ₱ doz. $36.00 ..... 40&10%
Lane's, ₱ doz. $36.00 ..... 40&10%
National Measuring, ₱ doz. $36.40 ..... 40%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List Nov. 1, 1899.
Best Brands ..... 70&10@75&10%
Standard Brands ..... 70&10@80%
Lower Grade ..... 75&10&10@80&10%

Imported—

Stubs' Tapers, Stubs' Ilat, July 24, '97 ..... 33 1-3@40%

Fixtures, Fire Door—

Allith Underwriters' Approved 50%
Richards & Co.:
Universal, No. 103; Special, No 104 ..... $3.75
Fusible Links, No. 96 ..... 50%
Expansion Links, No. 107 ..... 60&10%

Grindstone—

Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.60*	*3.85*	*4.15*	*4.65*

P., S. & W. Co. 60%
Reading Hardware Co. 60%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but wholesalers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Eze Potato ..... 60&10%
Victor, Hay ..... 60&15&2½%
Victor, Manure 66⅔%
Victor, Potato 65%
Champion, Hay 66⅔%
Champion, Header 65%
Champion, Manure ..... 60&15&2½%
Columbia, Hay ..... 60&20%
Columbia, Manure 70%
Columbia, Spading ..... 70&12½%
Lawyer's Wood Barley 40%
W. & C. Potato Digger ..... 60&10%
Acme Hay ..... 60&20%
Acme, Manure, 4 tine ..... 60&10&5%
Dakota Header ..... 60&20%
Jackson Steel Barley ..... 60&20%
Kansas Header 65%
W. & C. Favorite Wood Barley 40%
Plated.—See Spoons.

Frames— Wood Saw—

White, S'g't Bar, per doz. 75@80¢
Red, S'g't Bar, per doz. $1.00@1.25
Red, Dbl. Brace, per doz. $1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.25*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped.. 3.65
Waterproof Dbl. Taped.. 4.40
Waterproof Tpl. Taped.. 5.15

10&5%

Gates, Molasses and Oil—

Stebbins' Pattern ..... 80@80&5%

Gauges—

Marking, Mortise, &c. .50@50&10%
Chas. Stephens Co.:
Marking, Mortise, &c. ..... 50&50&10%
Disston's Marking, Mortise, &c. 67½%
Wire, Brown & Sharpe's 33⅓%
Wire Morse 25%
Wire P., S. & W. Co. 33⅓%

Gimlets— Single Cut—

Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.50
Spike, Metal, No. 1, $4.00; 2, $4.50
Nail, Wood Handled, No. 1, $2.50; 2, $2.80
Spike, Wood Handled, No. 1, $4.50; 2, $4.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co. ..... 65@65&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush ..... 25&10@50%
Elwell's 40%

Grease, Axle—

Common Grade ....gro. $6.00@6.50
Dixon's Everlasting, 10-lb pails, ea. 80¢; in boxes, ₱ doz., 1 lb, $1.20; 2 lb $2.00
Helmet Hard Oil 25%

Griddles, Soapstone—

Pike Mfg. Co. ..... 33⅓@33⅓&10%

Grinders—

Royal Mfg Co.:
Alundum Grinding Machines, each, Nos. 01, $4.75; 1A, $2.50; 10, $5.00 ..... 50%
Alundum Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A Combined, $8.50 ..... and Cycle. 30%
Alundum Disc Grinders, each, $2.50 ..... 30%

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., $2.00 ..... 33⅓%
Richards Mfg. Co.: and Cycle. Ball Bearing, mounted 40%

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... 60&65@60&10%
Covert Mfg. Co.:
Web ..... 30&2%
Jute Rope 35%
Sisal Rope 20%
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am. Coil and Halters ..... 40@40&5%
Am. Cow Ties ..... 45@50%
Niagara Coil and Halters. 45@50&5%
Niagara Cow Ties ..... 45&5@50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists' ..... 55&10@55&10&5%
Heller's Farriers' ..... 40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel 50%
Farriers' ..... 40&10&5%
Riveting 30%
Machinists', revised list ..... 66⅔&5%
Blacksmiths ..... 50&5
Fayette R. Plumb:
A, No. 1 Nail ..... 40&2½@40&12½%
Eng and B. S. Hands 45&10&5@50&5
Machinists' Hammers ..... 60@60&10
Riveting Hammers ..... 40&10@40&12½&5

Heavy Hammers and Sledges—

Under 3 lb., per lb. .50c. .50&10%
3 to 5 lb., per lb. .40c. .40&10%
Over 5 lb., per lb. .30c. .30&10&10%
Over 5 lb., per lb., 30c. 30&10&10%

Handles—

Agricultural Tool Handles

Ax, Pick, &c. .60&10@60&10&5%
Hoe, Rake, &c. 40%
Fork, Shovel, Spade, &c.:
Long Handles 40%
D Handles 40%

Cross-Cut Saw Handles—

Atkins 40%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—

Auger, assorted...gro. $3.00@3.50
Brad Awl ..... gro. $1.65@1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory ..... $2.15@2.40
Socket Firming, Apple, $1.75@ $1.95; Hickory ..... $1.60@1.75
Socket Framing, Hickory ..... $1.60@1.75
File, assorted ..... gro. $1.30@1.40
Hammer, Hatchet, &c. ..... 60&10@60&10&5%
Hand Saw, Varnished, doz. 80&85¢; Not Varnished ..... 65@75¢
Plane Handles:
Jack, doz. 80¢; Jack, Bolted 75¢
Fore, doz. 45¢; Fore, Bolted 90¢
Chapin-Stephens Co.:
Carving Tool ..... 70@70&10%
Chisel ..... 60@60&10
File and Rasp ..... 60@60&10
Saw and Plane ..... 70@70&10
Screw Driver ..... 30@30&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 15&10%
Nicholson Simplicity File Handle ..... ₱ pr., $0.85@$1.50
J. L. Osgood:
Indestructible File and Tool ₱ doz. No. 1, $8.00; No. 2, $8.50; No. 3, $9.00; No. 4, $9.50; No. 5, $10.00 ..... gro. lots 10%
W. A. Zelnicker Supply Co.:
Hammer ₱ doz.: 8 in., $2.00; 10 in., $2.20; 12 in., $2.50; 14 in., $2.70; 16 in., $2.90; 18 in., $3.00; 20 in., $3.20; 22 in., $3.30; 24 in., $3.30; 26 in., $3.50; 30 in., $4.00
Sledge, ₱ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval 36 in., $4.00, octagon, 36 in., $4.00 ..... 30%
Axe ₱ doz., 28 to 34 in., $5.60; 36 in., $5.80
Adze, ₱ doz., 36 in., $5.80; 36 in., $7.80
Pick, ₱ doz., R. R., 36 in., $8.00; coal, 34 in., $5.80
Hatchet, ₱ doz., 12 to 14 in., $2.00

Hangers—

NOTE.—Barn Door Hangers are generally graded per pair, without track, and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable, Nos. 1 and 2; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door 50%

Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60&2½%
Roller Bearing ..... 70&2½%
Gruno Mfg. Co.:
Solid Axle, No. 10, $12.00 ..... 60&10%
Roller Bearing, No, 11, $15.00, 22, $18.00 ..... 60&10%
Roller Bearing, Ex. Hy. ..... 60&10%
Bull Dog, $24.00 ..... 70%
Lane Bros. Co.:
Parlor, Ball Bearing, $1.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard ..... 60&10%
Hinged ..... net $6.08
Covered ..... 60&5%
Special ..... 70&5
Lawrence Bros.:
Advance ..... 55&10%
Cleveland ..... 70&7½%
Clipper, No. 75 ..... 60%
Crown ..... 55&10%
Cyclone, No. 40 ..... net $7.50
Tandem, No. 50 ..... net $7.50
New York ..... 55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2.70%
Anti-Friction 60%
Hinged Hangers, King Charm. 60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, Pioneer Wood Track, No. 3. $2.25
Roller B'r'g St'l Track No. 12 $2.20
Roller B'r'g St'l Track No. 13 $2.50
Roller B'r'g, Nos. 39, 43, 70&7½%
Hero, Adj Track No. 19 ..... 50&10%
Adjustable Track Tandem Trolley Track No. 16 ..... 50&10%
Steel, Steel Track No. 24 ..... 40&5%
Auto Adj. Track No. 22. —50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 122 ..... $2.80
Safety Underwriters F. D. No. 101 ..... 50%
Tandem No. 41 2½ and 3 ..... 60&10%
Flack Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 122 ..... 50&5%
Ives' Wood Track No. 1. ..... $2.25
Trolley B. D. No. 24 ..... 50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½%
Anti-friction, No. 42, No. 44, sizes 2½ and 3. ..... 60%
Hinged Tandem No. 48 ..... 60&5%
Folding Door B. B. Swivel No. 135 ..... 40%
Taylor & Boggis Fry Co.'s Kidder's Roller Bearing ..... 50&15&10&5%
Myers' Stayon Hangers 60%

Hangers— Garment—

Pullman Trouser, ₱ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $8.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $10.50; Garment Hanger Loops, Round Nickeled, per gro $10.50
Victor Folding ..... ₱ gro. $9.60

Gate—

Myers' Patent Gate Hangers, ₱ doz. net $4.50

Joist and Timber—

Lane Bros. Co. 30%

Hasps—

Griffin's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, ₱ doz. ..60%

Hatchets—

Regular list, first qual. 10@21@—
Second quality ..... 50&65@—

Heaters, Carriage—

Clark No. 5, $1.15 No. 5B, $2.00 No. 3, $2.35 No. 3D, $2.75 No. 7D, $3.00 No. 3E, $3.25; No. 1, $3.50 ..... 25%
Clark Coal, ₱ doz., $0.75 ..... 20%

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.		*1*	*5*	
Doz. pair		*$0.75*	*1.35*	*2.70*

Mortise Shutter: (L. & P., O. S., Acme, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Charles Parker Co. ..... 70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%

often given. Extra 10&10%

Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00 ..... 20%
Reading's Gravity 60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ₱ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter ..... 75&5%
Acme, Lull & Porter 75%
Queen City Reversible 75%
Shepard's Noiseless, Nos. 60, 65, 55 ..... 75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&5%
Tip Pattern, No. 1 ..... 75&10%
No. 3 ..... 75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 70&10&5%
Shepard's Double Locking 75%
Champion Gravity Locking ..... 75&5%
Pioneer ..... 75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L'tchs.	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.85*

New England:
With Latch ..... doz. ...@$2.00
Without Latch ..... doz. ...@$1.60
Reversible Self-Closing:
With Latch ..... doz. ...@$1.75
Without Latch ..... doz. ...@$1.35
Western:
With Latch ..... doz. $1.75
Without Latch ..... doz. $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 ..... 70%

Pivot Hinges—

Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—

Holdback, Cast Iron... $6.75@7.00
Non-Holdback, Cast Iron $6.50@6.75

J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 40%
Bardsley's Patent Checking 33⅓%
Bommer Bros.
Bommer Ball Bearing Floor. 40%
Bommer Spring Hinges 40%
No. 999 Wrot. Steel Hold Back, ₱ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple Rod Spring Hinges 50%
Chicago City Engine Floor 60%
Garden City Engine House 25%
Keene's Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 25%
American 30%
Columbia, ₱ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ₱ gr. $12.00
Columbian Hinges ..... 60&10%
Gem, New Model 50%
Clover Leaf ..... ₱ gr. $12.00
Oxford, new list 30%
Floor Spring Hinges ..... 65&10%
Lawrence Bros. Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinge 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door ..... ₱ gr. $9.00
Chief All Bearing Floor Hinge 50%
Ball Bearing Door 25%
No. 777, Sheet Steel Holdback, ₱ pr. $9.00
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges	*.50&10%*
Heavy Strap Hinges	*.60&5%*
Light T Hinges	*.50%*
Heavy T Hinges	*.40%*
Extra Heavy T Hinges	*.50&10%*
Hinge Hasps	*.33⅓%*
Cor. Heavy Strap	*.60&5%*
Cor. Ex. Heavy T	*.50&10%*

Extra 10&2½%

Screw Hook and strap.	*6 to 12 in ..lb*	*3½¢*
	14 to 20 in ..lb	*3¼¢*
	22 to 36 in ..lb	*3¢*

Screw Hook and Eye:

¾ to 1 inch ..... lb	*6¼¢*
⅝ inch ..... lb	*7½¢*
½ inch ..... lb	*8½¢*

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers ..... 30&2%

Hods— Coal—

M'f'gr's list, price per gross.

Inch	*15*	*16*	*17*	*18*
Galv. Open	*$35*	*$39*	*$42*	*$46*
Jap. Open	*30*	*33*	*37*	*$5*
Galv. Funnel	*48*	*52*	*56*	*60*
Jap. Funnel	*.83*	*.90*	*.59*	*1.8*

30&5%

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick, No. 162 ..... each $1.05
Steel Mortar, No. 158 ..... each $1.35

Hoes— Eye—

Scovill and Oval Pattern ..... 60&10@60&10&10%
Grub, list Feb. 24 ..... 70&10@70&10&10%

D. & H. Swivel 27½
Am. Fork & Hoe Co. (Solid Patterns) 60

Handled—

NOTE—Manufacturers are selling from the list of Sept. about 1, 1904, but many orders are still accepted at August 1, 1899, or existing at net prices.

Cronse's Weeding, No. 1 Each $3.50
Star Double Bit $3.20
Ft. Madison Cotton Hoe..... 70&10&10%
Ft. Madison Crescent Cultivator Hoe, ₰ doz. ..... 70&10
Ft. Madison Mattock Hoe, Regular Weight ..... ₰ doz. $4.85
Ft. Madison Sprouting Hoe ..... ₰ doz. $4.80
Ft. Madison Dixie Tobacco Hoe..... 70&10&10%
Kretsinger's Cut Easy..... 70&10
Warren Hoe ..... 45&10%
W. & C. Hoe ..... 70&10
B. B. 6 in., Cultivator Hoe $3.40
B. B., 6 in. $3.50
Nine Webbing ..... ₰ doz. net $1.35
W. & C. L'ning Shuffle Hoe, ₰ doz. $5.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Augular, ₰ doz. $24.00..... 45&10%

Door—

Bardsley's, Iron, 40; Brass and Bronze 50
Empe 50%
Pullman 35%
Richards Mfg. Co.: No. 115, Everready, 42; No. 116, Sure Grip 50
Superior 33⅓%

File and Tool—

Nicholson File Holders and File Handles ..... 33⅓&40%

Fruit Jar—

Triumph Fruit Jar Holder, ₰ gross, $10.80, ₰ doz. $1.25

Trace and Rein—

Fernald Double Trace Holder, ₰ doz. pairs $1.25
Dash Rein Holder, ₰ doz. pairs..$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty. 50; German ..... 50&10

Hooks—Cast Iron—

Bird Cage, Reading..... 40%
Clothes Line, Reading List..... 40%
Coat and Hat, Reading ..... 45&20%
Coat and Hat, Wrightsville 60%
Harness, Reading List..... 40%

Wire—

Belt 80%
Wire C. & H. Hooks....75@—%
Bradley Metal Clasp Wire, Coat and Hat, Picture Ceiling ..... 75&10
Columbian Hdw. Co., Sem..... 70&5%
Fauver Wire Goods Co., Kingsford Wire Goods Co.:
Acme, 60&10%; Chief, 70%, Crown, 75%; Car, 65%; V. Brace, 75; Car Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.90; 8 in., $1.25; 10 in., $1.50.
Cotton ..... *doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—
See Wrought Goods

Miscellaneous—

Hooks, Bench, see *Stops, Bench*
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz. $4.00
Grass, common grades, all sizes, per doz *$1.50*
Waistliner ..... *lb. 5%@6¢*
Hooks and Eyes:
Brass ..... *60&10&10%*
Malleable Iron ..... *70&10&10%*
Covert Mfg. Co. Gate and Seattle Hooks 40%
Ft. Madison Cut-Easy Gate Hooks
Turner & Stanton Co.: Cut $2.00
Shoe Ladder ..... 50&10
Rein Hooks—See Rein Holders.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾ inch
Competition ..... *ft. 5½ 6¢*
2 ply, Guaranteed ..... *ft 8¢ 9¢*
4 ply, Guaranteed ..... *ft 10&11¢*
Cotton Garden, ¾ in., coupled
Low Grade ..... *ft 8½ 9¢*
Fair Quality ..... *ft 10&11¢*

Irons— Sad—

From ¼ to 10 ..... *lb 3½@3¾¢*
B. B. Sad Irons ..... *lb. 3½@3¾¢*
Mrs. Potts', cents per set:

Nos.	50	55	60	65
Jap'd Tops	85	80	95	91
Tin'd Tops	88	85	98	95

New England Pressing, lb. 3½@4¢

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%; Corner 60

Pinking—

Pinking Irons ..... *doz. 60¢*

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Acme Screw..... 30&2%; Steel, 45%
Lockport 50%
Lane's Steel ..... 30&5
Richards Mfg. Co., Nos. 1 to 5 5
Smith & Hemenway Co. 5

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Kettles—

Brass, Spun, Plain..... *20¢@25½¢*
Enameled and Cast Iron, See Ware, Hollow

Knives—

Butcher, Kitchen, &c.—

Foster Bro. Butcher & 5
Wilkinson Shear & Cutlery Co.....60%

Corn—

Columbian Cutlery Co., Without Hand Knives and Holder 60
Witherell's, No. 8 ..... $2.00
Dent, $2.75; Adj. Serrated, $3.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. $1.15

Drawing—

Standard Line ..... *set* 5
C. L. Jennings & Co., No. 10, 2 knives 5
Jennings & Griffin Nos. 11, 12, 13, 2 knives 5
Swan's ..... 60&10
Watrous 16⅔
L. & I. J. White..... 20&5&25%

Hay and Straw—

Serrated ..... *per doz. $1.00@1.75*
Iwan's Nickel Edge..... ₰ doz. $5.00
Iwan's Serrated..... ₰ doz. $10.00

Miscellaneous—

Farriers' ..... *doz. $3.00@3.25*
Westenholm's ..... ₰ doz. $3.00@3.25

Knobs—

Base, 2½ inch, Birch or Maple, Rubber Tip....gro. $1.25@1.40
Carriage, Jap., all sizes....gro. $0.45¢
Door, Mineral..... *doz. 65@70¢*
Door, Por. Jap'd..... *doz. 70@75¢*
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable..... 50%
Lane's Store..... 25%
Myers-Noiseless Store Ladders 5
Richards Mfg. Co.:
Improved Noiseless, No. 112..... 50%
Climax Shelf, No. 113..... 50%
Trolley, No. 109..... 50%

Ladles, Melting—

L. & G. Mfg. Co. (low list)..... 20%
F. S. & S. ..... 40&10%
Reading 60

Lanterns—Tubular—

Regular, No. 0 ..... doz. $4.50@4.50
Side Light, No. 0 ..... doz. $5.00@5.75
Hinge Globe, No. 0, doz. $4.00@5.75
Other Sizes ..... *doz. @10*

Bull's Eye Police—

5 inch ..... *$4.25@4.50*

Latches— Thumb—

Roggin's Latches, with screw..
doz. 35&40¢

Door—

Allith Mfg. Co., Reliable and Alligator, Double Acting Spring.
Cronk & Carrier Mfg. Co.:
No. 101, ₰ doz. $2.30
Richards' Bull Dog, Heavy, No. 125 ..... 50&5%
Richards' Trump, No. 127..... $1.50

Leaders, Cattle—

Small ..... *doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, 45; Hemp, 45; Jute, 35; Sisal, 30

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E. 10%

Lines—

Wire Clothes, Nos. 18 19 20
per foot..... *$2.50 2.25 2.00*
75 feet..... *$2.10 1.80 1.65*
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'..... 30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ..... 30%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50..... 20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 ..... 20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 86 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25..... 20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines..... 40%
Clothes Line Wire..... 50
Shade Cord, Cotton or Linen... 20%

Locks— Cabinet—

Cabinet Locks *$11.½*

Door Locks, Latches, &c —

NOTE—Net Prices are very often made on these goods
Reading Hardware Co..... 40%
R. & E. Mfg. Co. 10

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass ..... 55&10%

Sash, &c.—

Iree' Patent Sash Balance:
Bronze and Brass ..... 55&5; Crescent, 60; Iron, 60; Window Ventilating, 40&20%; Robinson Pat. Ventilating Sash Lock, 33⅓%.
Pullman Patent Ventilating Lock 5
Reading Sash Locks 5

Machines—Boring—

Com. Ang'r, without Augers.
$2.00@2.25
Com. Ang'r, without Augers,
$2.25@2.50
Swan's Improved ..... 10&5
Jennings, New Pattern 5
Smith's, Low 5
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Improved Hand Power ..... ₰ doz. $12.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake 30%
Moore's Cyclon. High Speed Chain Hoist 30

Ice Cutting—

Chandler's 12½%

Washing

Boss Washing Machine Co.: Per doz
Boss No. 1..... $57.00
Boss Rotary..... $57.00
Champion Rotary Banner No. 1..$57.00
Standard Champion No. 1..... $50.00
Standard Perfection..... $27.00
Cincinnati Square Western..... $33.00
Uneeda American, Round..... $33.00

Mallets—

Hickory ..... *45&5@50%*
Lignumvitæ ..... *45&5@50%*
Tinners' Hickory and Apple wood ..... *doz. 45&5@50%*

Mangers, Stable—

Swett Iron Works..... 50%

Mats, Door—

Acme Flexible Steel 50%
Elastic Steel (W. G. Co.), new list.50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co..... 20@25%
National Mfg. Co. 10%
Parker's Columbia and Victoria..33⅓
Parker's Bell and Side ..... 50&10
Swift, Lane Bros. Co..... 30%

Motors, Water—

Divine's Red Devil..... 30%
Lippincott's 5

Mowers, Lawn—

NOTE—Net prices are generally quoted
Cheapest, 10-in., $2.00; 12-in., $2.10, etc.
Cheap, Iron, $2.25; 12-in., $2.40, etc.
Better Grade, 10-in., $3.00; 12-in., $3.25, etc.

	12	14	16	Iron
High Grade....	*$4.50*	*4.75*	*5.00*	*5.25*
Continental	6			
Great American	6			
Great American Ball Bearing, new list	6			
Quaker	6			
Pennsylvania	6			
Pennsylvania, Jr., Ball Bearing	5&5			
Pennsylvania Golf	5			
Pennsylvania Hi-Cut	5			
Pennsylvania Pony	40&5			
Granite State:				
Style A, Ball Wheel	5			
Style B, Low Wheel	5			
Style C, High Wheel, spcl. list,	5			
Style D, High Wheel, spcl. list,	70			
Pennsylvania:				
Styles M., S., C., K., T.	70&10&5			
Style A, all Steel	60&10&5			
Steel Frame Worm	50&10			
Drexel and Gold Coin, special list	40			
Horse	40&5			
Pony	40&5			
Goat, Horse	50			
Eagle Horse	30&5%			
I. X. L. Horse	50%			

Nails—

Wire Nails and Brads, Miscellaneous ..... *87½@88¾¢*
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10
Anchor	12	12	12	12	12
Coleman	12	12	12	12	12
New Haven	12	12	12	12	12
Westcott	12	12	12	12	12

Jobbers' Special Brands
per M. Add for

Picture—

	7/8	1	2½	2	in
Brass H'd	45				
Por. Head	*1.10*	*1.10*	*1.10*		*gro*

Nippers

See *Pliers and Nippers.*

Nuts—

Cold Punched ..... *Off List*
Square, Rolled or Tapped *5.00c*
Hexagon, Rolled or Tapped *5.00c*
Square, Rolled C. T. & R. *5.50c*
Hexagon, Rolled C. T. & R. *6.00c*
Hot Pressed
Square, Blank *5.80c*
Hexagon, Blank *6.30c*
Square, Tapped ..... *5.40¢*
Hexagon, Tapped *5.90c*

Oakum

Bags ..... *lb.*
In Mass ..... *lb.*
Navy ..... *lb.*
Packing Specialties *25%*

Oil Tanks

See Tables Of

Oilers—

Steel, Copper Bottom
Coast or Lap
Brass and Copper
Zinc
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans..... 70&10%
Rich
Maple City Mfg. Co.:
Brass
Regular
Openers— Can

Sprague, Iron Handle.... *$0.80*
Sprague, Wood Handle.... *$5.60*
Sardine Scissors ..... *$1.75@1.85*
Yankee Can and Bottle Opener, ₰ doz., net, $0.75; Little Gem, ₰ doz., net..... $0.

Egg—

Hartigan Nickel Plate, ₰ doz., $2
Silver Plate, $4

Packing—

Asbestos Packing, Wick and Rope ..... *20¢@*

Rubber—

(Fair quality goods.)
Sheet, C. F. ..... *11¢@*
Sheet, C. O. S. ..... *11¢@*
Sheet, C. B. S. ..... *12¢@*
Sheet, Pure Gum..... *40¢@*
Sheet, Red..... *40¢@*
Jenkins' '96, ₰ lb. 80¢.....

Miscellaneous—

American Packing.. *lb. 70@10*
Cotton Packing..... *lb. 16@25*
Italian Packing..... *lb. 9@12*
Jute Packing ..... *lb. 4¢*
Russia Packing..... *lb. 8@11*

Pails, Water, Well, &c.

See *Buckets.*

Pans— Dripping—

Standard List..... *65&7½@7*
Edwards, Royal Blue ..... 65&

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.3*

Refrigerator, Galva.—

Inch *12 14 16*
Per doz. *$1.75 2.25 2.80*

Paper—Building Paper

Asbestos:
Roll Board or Building Felt
6 to 9 lb., per 100 sq. ft.3½¢
Roll Board or Building Felt 8-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.
Mill Board, Sheet, 40 x 40 in., 1-32 to ⅛ in.
Per
Rosin Sized Sheathing: 500 sq. Light weight, 25 lbs. to roll
Medium weight, 30 lbs. to
Heavy weight, 40 lbs. to roll
Black Water Proof Sheathing 500 sq. ft., 1 ply, 65¢ ; 2 ply, 85¢ ; 3 ply, $1.10; 4 ply, $1.2
Deafening Felt, 9, 6 and 4 sq. ft. to lb
Red Rope Roofing, 250 sq. per roll

Tarred Paper—

1 ply (roll 400 sq. ft.), ton
2 ply, roll 108 sq. ft.
3 ply, roll 108 sq. ft.
Slater's Felt (roll 500 sq. ft.)

Sand and Emery—

Flint Paper and Cloth 50&10&0%
Garnet Paper and Cloth
Emery

Parers— Apple—

Dandy ..... *each $10*
Eureka Improved ..... *each $20*
Livingston Nail Co.:

Potato—

Saratoga ..... ₰ doz. $7
White Mountain ..... ₰ doz. $6

Picks and Mattocks—

(List Jan. 1908.)
List *70c 60c 70c 10c 10*
Cronk's Handled Garden Mattock, ₰ doz., No. 2, $2.60; No. 3 $6.40.

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass .....50@50&10%
Iron, list Nov. 11, '85 ..60@60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in. .....60&10@—
Extra Heavy, 2-6 in. .....70&10@—
Fittings, Standard and Heavy .....50&10@—

Pipe, Merchant—
Consumers, Carloads. Steel, Iron.
Blk. Galv. Blk. Galv.
% % % %
1/8 & 1/4 in.....64 48 57 41
3/8 in.....66 52 59 44
1/2 in.....68 56 61 49
3/4 to 6 in.....72 62 66 56
7 to 12 in.....69 54 61 46

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory
First class .....75@75%
Second-class .....50@51%

Pipe, Stove—
Per 100 joints
Edwards' Nested: C. L. L. C. L.
5 in., Standard Blue.....$6.25 $7.25
6 in., Standard Blue.....6.75 7.75
7 in., Standard Blue.....7.75 8.75
5 in., Royal Blue.....7.00 8.00
6 in., Royal Blue.....7.50 8.50
7 in., Royal Blue.....8.50 9.50
Wheeling Corrugating Co.'s Nested:
5 in., Uniform Color..$6.15 $7.15
6 in., Uniform Color..6.65 7.65
7 in., Uniform Color..7.65 8.65

Planes and Plane Irons—
Wood Planes—
Bench, first qual. .....30%&10@10%
Bench, second qual. .....40%@40@10%
Molding .....25@25&10%
Chapin-Stephens Co.:
Bench, First Quality 30%
Bench, Second Quality 40
Molding and Miscellaneous.....25%
Toy and German 20
Union 60%

Iron Planes—
Chaplin's Iron Planes.....50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06 .....25%
Buck Bros.....30
Chapin-Stephens Co.....35
Ohio 50
L. & I. J. White.....25&5@25%

Planters, Corn, Hand—
Kohler's Eclipse.....per doz. $8.00

Plates—
Pellet .....lb. 47@47½¢

Pliers and Nippers—
Button Pliers .....75@75&10@75%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe .. 7 8 10 12-in.
$2.00 $2.25 $2.75 $3.50
Acme Nippers.....50&5%
Chapin-Stephens Mfg. Co.:
American Button.....
Improved Button.....75&10
Clinton 60
No. 80 Linemen's.....50
Stub's Pattern.....45
Combination and others 33⅓
Heller's Terrule Nippers, Pincers and Tools.....40@5&10@5%
H., S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Pearl, Plain City, 35%; Paragon, 50%; Lodi, 55%.....
Saw Set, Side Bead and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels .....30%&10%
Combination Brass Cor. Plumb&10%
Beaver Level.....40&10%
Electric Side Level.....40&10%
Mason's Level.....40&10%
Dustan's Plumbs and Levels..60&10%
Dustan's Pocket Level.....60&10%
Keystone Duplex 35%
Woods' Extension.....33⅓%

Points, Glaziers'—
Soft and 1/8 papers.....lb. 9¢
1/4 papers.....lb. 9½¢
1/2 papers.....lb. 10¢

Police Goods—
Manufacturers' Lists.....25@25&5%
Net 25%

Polish—Metal, Etc—
Prestolite Liquid No. 1 (½ pt.) ⅓ doz., $3.00; No. 2 (1 qu.), $9.00.40%
Prestolite Paste.....60%

George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ⅓ doz. 50¢; ⅓ gro $4.50; ½ lb. boxes, ⅓ doz. $1.25; 1 lb. boxes, ⅓ doz. $2.25.....
U. S. Liquid, 8 oz. cans, ⅓ doz., $1.25.
Barkeepers' Friend Metal Polish, ⅓ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ⅓ lb 10¢
Black Eagle, Liquid, ½ pt. cans, ⅓ doz 75¢
Black Jack Paste, ¾ lb cans, ⅓ gr. $9.00
Black Kid Paste, 5 lb can.....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's, ⅓ gr. $5.75.....10%
Dixon's Plumbago.....⅓ lb 8¢
Pireside .....⅓ gr. $2.50
Avena, ⅓ gr. $4.50.....10%
Japanese .....⅓ gr. $3.50
Jet Black.....⅓ gr. $3.50
Peerless Iron Enamel, 10 oz cans, ⅓ doz. $1.50

Poppers, Corn—
1 qt. Square.....doz. $0.80; gro $8.25
1 qt. Round.....doz. $0.90; gro $9.00
1½ qt. Square.....doz. 1.00; gro $11.00
2 qt. Square.....doz. $1.25; gro $13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled .....85@10%
Tinned .....50@10%

Powder—
In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb.....each 75¢
Rifle, ½ lb.....each 15¢
Rifle, 1 lb.....each 25¢
In Kegs:
12½ lb. kegs.....$3.50
25 lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....3.50
Quarter Keg (6¼ lb bulk).....1.40
Case 24 (1 lb cans bulk).....8.50
Half case (1 lb cans bulk).....4.50
King's Smokeless, Shot Gun, Rifle, Keg (25 lb bulk).....$12.00 $13.00
Half Keg (12½ lb bulk).....6.25 7.75
Quarter Keg (6¼ lb bulk).....3.25 4.00
Case 24 (1 lb cans bulk).....14.00 17.00
Half case 12 (1 lb cans bulk).....7.25 8.75

Presses—
Fruit and Jelly—
Enterprise Mfg. Co.....20@25%

Seal Presses—
Morrill's No. 1, ⅓ doz. $20.00.....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 50%
Miller's Falls, No. 3, ⅓ doz., $12.00.....
.....33⅓&10%
Morrill's No. 1, Nail Puller, ⅓ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $2.00.....33%
The Stanley Co. Case Lots:
No. 5B case.....$7.50
No. 5B (small).....5.00
Smith & Hemenway Co.:
Dimpled B.....
Giant .....
Staple Pullers, Utica and Daisy 60%

Pulleys, Single Wheel—
Inch 1½ 1¾ 2 3
Awning or Tackle, doz. .....$0.30 .35 .60 1.05
Hay Fork, Swivel or Solid Eye, doz., 1 in., $1.25; 5 in., $1.55
Inch 2 2¼ 2½
Hot House, doz .....$0.65 .85 1.20
Inch 1¼ 1½ 1¾ 2
Screw, doz. .....$0.16 .25 .35 .50
Inch 1¾ 2 2¼ 2½
Side, doz. .....$0.25 .40 .55 .60
Inch 1½ 1¾ 2 2½

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in. .....17@20¢
Auger Mortise; no Face Plate, per doz., 1¾ and 2 in. .....20@21¢
Acme Manufacturing Co.:
American Pulley Co.:
Wrought Steel American Plain Axle .....
Wrought Steel Eagle .....50&10%
Fox All Steel, Nos. 3 and 7 .....17@20¢
.....⅓ doz. 50¢
Grand Rapids All Steel Nos. 50¢
Nonpareil, No. 25, 1¾ in. .....19¢
.....
No. 26 Trade, 1¾ in., 1¼ in. .....20¢
Star, No. 26, 1¾ in., 1¼ in. .....20¢
Trade Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout .....75@75&10@75%
Wood Pumps, Tubing, &c. 50%
Barnes Drill, Angle Chain list .....40&5%
Barnes Post Drill .....50&10%
Contractors' Rubber Diaphragm No. P. & I. Rock Co.....$16.00
Daisy Spray Pump.....⅓ doz. $6.50
Flint & Walling's Fast Mail Hand, (low list).....50
Flint & Walling's Fast Mail (low list).....50
Flint & Walling's Tight Top Pitcher.....75&5%
National Specialty Mfg. Co. Measuring, Nos. 2, $6.00; 3, $5.50.....30%
Myers' Pumps (low list).....40&5%
Myers' Power Pumps.....40&5%
Myers' Spray Pumps.....40&5%

Pump Leathers—
Plunger and Valve Leathers, Per gro.:
No.....1 2 3 4
$5.00 6.00 7.00 8.00
Cup Leathers—Per Doz:
Inch.....2½ 3 3½ 4 4½
$5.00 7.00 9.00 12.00

Punches—
Saddlers' or Drive, good.....doz. 50@75¢
Spring, single tube, good quality $1.75
Revolving 4 tubes .....doz. $4.50
Bemis & Call Co.'s Cast Steel Drive 50
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00.....50
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40
Niagara Solid Punches.....55&10%
Wm. Schollhorn Co.:
Belt and Set, Bernard, 35%; Paragon, 50%; Lodi.....55
Tinners' Hollow, P., S. & W. Co..40
Tinners' Solid, P., S. & W. Co. ⅓ doz., $1.44.....40

Rail—Barn Door, &c.—
Sliding Door, Painted Iron.....
Sliding Door, Wrought Brass, 1½ in., lb., 36¢ .....2½@2¾¢
Allith Mfg. Co.: Reliable Hanger Track 50%
Cook's:
Double Braced Steel Rail..⅓ ft. 3¼¢
O. N. T. Rail.....$0.12
Griffin's
xxx, ⅓ 100 ft., 1 x 3-16 in., $3.25.
1¼ x 3/16 in., $3.75.
Hinged Hangers, ⅓ 100 ft. 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ⅓ 100 ft. $3.15
O. N. T., ⅓ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.20.
Standard, 1¼ in. .....⅓ 100 ft. $4.00
Lawrence Bros.:
1 x 3/16 in., ⅓ 100 ft., $7.50; 1¼ x 3-16 in., $8.75.....50&5%
McKinney's:
Hinged Hanger Track, ⅓ ft. 1½ in., 6¾¢
1 x 3-16 Track .....50&5%
Myers' Stayon Track.....60&5%
Richards' Mfg. Co.:
Common, 1 x 3/16 in., $5.00; 1¼ x 3-16, $5.25, 1¼ x 3/16, $5.50.
Steel-Hinged Hanger Rail.....60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ⅓ ft., No. 31, No. 32, 11¢; No. 33, 21¢
No. 50 .....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $4.25; 46, $4.50; 49, No. 1, $5.25; 49, No. 2, $5.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Bone Head Lawn.....$3.25
Fort Madison Bone Head Lawn.....$..75
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor, ...50&5%
Queen, Cast Lawn, ⅓ doz., 20 teeth, $2.50; 22 teeth, $2.75.....40
Antique Lawn, ⅓ doz. .....$1.
Malleable Garden, ...
Hot Steel Garden, ⅓ doz., 12 teeth, $3.00; 14, $3.60; 16, $4.20.....$4
Kellers':
Lawn Queen, 20-tooth.....⅓ doz. $3.15
Lawn Queen, 24-tooth.....⅓ doz. $3.25
Paragon, 20-tooth, ⅓ doz. $2.50
Paragon, 24-tooth, ⅓ doz. $2.70
Steel Garden, 14-tooth, ⅓ doz. $2.40
Malleable Garden, 14-tooth, ⅓ doz. $2.00@2.25

Rasps, Horse—
Disston's 75%
Heller Bros.' .....75&10@75%
Liverright Bros.' Gold Medal.70&10@75%
McCaffrey's American Standard .....
.....50&10@75%
New Nicholson .....50&10&5%
See also Files.

Razors—
Lyon's Razors 60%
Fox Razors, ⅓ doz., No. 42 $9.00; No. 91, $7.50, No. 92, Platina, $9.00 } 2½
Red Dead 75%

Reels, Fishing—
Hendryx:
M 6 Q 6 A 6 B 6 M 3½ M 16.
Q 16 A 16 B 16 Rubber.
Papulo Nickeled Papulo .....
Aluminum, German Silv., Bronze.25%
1240 N. 124 N. 20%
2001 P. 6 RM. G 9 .....20%
2001 P. 2 N. 24 N. 25 PN 20%
2001 P. 2334 .....2001 PN. 3234 .....2021 N. 2334 .....2001 PN. 3334 .....002004 PN. 3334 .....002004 PN. 3334 .....002004 PN. 3334 .....
992 PN. 2001 N. 974 PN. 25%
2006 PN. 5009 N. 20%
Competitor. 102 P. 102 PN. 202 P. 202 PN. 102 PR. 202 PR. 25%
304 P. 304 PN. 00304 P. 00304 PN. 33⅓%

Registers—*List July 1, 1905.*
Japanned, Electroplated and Bronzed .....5@5&20@10%
White Porcelain Enamel..50&10%
Solid Brass or Bronze Metal..40%

Revolvers—
Single Action .....95¢@$1.00
Double Action, except 44 cal...$2.00
Double Action, 44 caliber $2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grade
16 in.....per doz. $2.50@$2.75
17 in.....per doz. $2.75@$3.00
18 in.....per doz. $3.00@$3.25

Rings and Ringers—
Bull Rings—
2 2½ 3 inch.
Steel .....$0.70 0.75 0.80 doz
Copper .....1.10 1.25 1.65 doz.

Hog Rings and Ringers—
Hill's Rings, gro boxes.....$4.25
Hill's Ringers, Gray Iron, doz..60¢
Hill's Ringers, Malleable Iron .....doz. .80¢
Blair's Rings.....*per gro boxes*
Blair's Ringers.....*per doz.* 75¢
Brown's Rings.....*per gro boxes*
Brown's Ringers.....*per doz.* 75¢

Rivets and Burrs—
Copper 30%
Carriage, Coopers', Tinners, &c.: Black .....70&10%
Metallic Tinned.....70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, paste board boxes, 100 count, 23@23¢; Tin boxes, 100 count, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 54@58¢.

Rollers—
Cronk's Stay, No. 50.....$1.00
Cronk's Reinforced, No. 55 .....$0.60
No. 56, $4.75; No. 60.....$4.75
Lane's Stay.....40
Hawkins Stays:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underrollers, Nos. 59, 60.....50%
Favorite, No. 54.....60%

Rope—
Manila, 7-16 in. diam. and larger: Pure .....lb., 11½@12¢
Sisal, 7-16 in. diam. and larger: Pure .....lb., 8¢
Sisal, 7-16 in. diam. and smaller: No. 2 quality.....lb., 7@7½¢
Sisal, Hay, Hide and Bale Rope, Medium and Coarse: Mixed .....lb., 7½@8¢
Pure .....lb., 9½¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred Mixed .....lb., 6¾@6¾¢
Pure .....lb. 7½¢
Cotton Rope: Best, ¼ in. and larger...18@20¢
Medium, ¼ in. and larger..16@17¢
Common, ¼ in. and larger...10¢
In coils, ½¢ advance.
Jute Rope: Thread, No. 1, 3 in. 6 up, lb. .....20@21¢
Thread, No. 2, 3 in. 6 up, lb. .....20@21¢

Wire Rope—
Galvanized .....87½@2½%
Plain .....75@2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal.....20%

Rules
Boxwood .....60@60&10%
Ivory .....35&10@35&10@65%
Chapin-Stephens Co.:
Boxwood 60%
Flexible .....
Ivory .....
Miscellaneous .....
Stephens' Aluminum .....
Stationers' 50%
Keuffel & Esser Co.:
Folding, Wood .....35&10%
Folding, Steel .....
Lufkin Steel .....
Lufkin Lumber .....50&10%
Upson Nut Co.:
Boxwood .....
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 45%
Band ..... 50&10&10%
Butcher Saws 50
Cross Cuts 35
One-Man Cross Cut 40
Narrow Cross Cut 50
Hand, Rip and Panel ..... 35&5
Miter Box and Compass 40
Mulay, Mill and Drag 15
Wood Saws ..... 40&10
Chapin-Stephens Co.:
Circular Saws and Frames ..... 30&10&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth 50%
Band, 2 to 18 in. wide 60%
Band, ¼ to ⅞ 60%
Cross-cuts 45%
Narrow Crosscuts 50%
Mulay, Mill and Drag 50%
Framed Woodsaws 25%
Woodsaw Blades 50%
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100 ..... 25%
D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 2, 0, 00, Combination 30%
Compass, Key Hole, &c. 25%
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 16%
Butcher Saws ..... 40&7½
Compass and Key Hole Saws, Framed Wood Saws ..... 40&7½
Hand Saws 12½
Wood Saw Blades ..... 40&7½
Miners Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&50%
Butcher Saws Blades ..... 35&40%
Peace & Richardson's Hand Saws 30%
Simonds:
Circular Saws 45%
Crescent Ground Cross Cut Saws 30
Ouch Cross Cuts ..... 40&5%
Gang Mill, Mulay and Drag Saws 15%
Band Saws 50%
Back Saws ..... 25&25&7½
Butcher Saws ..... 35@35&5%
Hand Saws ..... 25&25&7½
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. ..... 25@25&7½
Wood Saws ..... 40&10%
Wheeler, Madden & Clemson Mfg. Co's Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A A 25%
Disston's:
Concave Blades 25%
Keystone Blades 35%
Hack Saw Frames 35%
Simonds' File Co. 25%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete, ... 40&7½%
Goodell's Hack Saw Blades ..... 10&10%
Griffin & Hack Saw Frames ..... 35&5&5%
Griffin's Hack Saw Blades ..... 35&5&10%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..... 30&10&5%
Sterling Hack Saw Frames ..... 30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25 ..... No. 2, $30 ..... 10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%
Whitaker Mfg. Co.:
Nat'l Hand Blade 10
Nat'l Hand Frames 40
Nat'l Power Blade 40

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester complete, $10.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00 ..... 15&10%

Scales—

Jewelry, Tea and Druggists' Counter:
Hatch, Platform, ½ oz. to 4 lbs ..... doz., $5.50
Tea Platforms, ½ oz. to 8 lbs ..... doz. $36.0
Union Platform, Plain $1.70@1.90
Union Platform, Nickel plated $1.75
Chatillon's:
Eureka 40
Improved 40
Counter Tea Scales 50
The Standard Portables 40
The Standard R. R. and Wagon ..... 50&10%

Scrapers—

Box, 1 Handle ..... doz. $2.00@2.25
Box, 2 Handle ..... doz. $2.50@2.80
Ship, Light, $2.00; Heavy, $3.50
Chapin-Stephens Co., Box ..... 30@30&10%
Richards Mfg. Co. 40

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1¾, $3.50@3.75
Bench, Wood ..... 2.00@2.25
Hand, Wood ..... 2.50@2.75
Chapin-Stephens Co. ..... 40 & 5

Coach, Lag and Hand Rail—

Lag, Coach Point ..... 65&7½%
Coach, Gimlet Point ..... 70&10&7½%
Hand Rail ..... 70&10&10%

Jack Screws—

Standard, List ..... 70&10&7½%
Morris, Tasker Co. ..... 70&10&10%
Swift Iron Works ..... 70&7½

Machine—

Cut Thread, Iron, Brass or Bronze:
Flat Head or Round Head, ... 50&7½&10%
Fillister Head ..... 70&7½&10%
Rolled Thread, F. H. or R. H., Iron ..... 75&10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65&10%

Set and Cap—

Set (Iron) ..... 75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70&10&7½%
Hex. Hd. Cap ..... 70&10&7½%
Rd. Hd. Cap ..... 50&7½%
Fillister Hd. Cap ..... 60&10&7½%

Wood—

List July 28, 1908.
Flat Head, Iron ..... 85&5@...
Round Head, Iron ..... 85&5@...
Flat Head, Brass ..... 85&5@...
Round Head, Brass ..... 85&5@...
Flat Head, Bronze ..... 75&5@...
Round Head, Bronze ..... 75&5@...
Drive Screws ..... 85&5@...

Scroll Saws—

See *Saws, Scroll.*

Scythes— *Per doz.*

Grass, No. 1, Plain ..... $7.00@7.50
Clipper, Bronzed Webb ..... $7.25@7.75
No. 3 Clipper, Pol'd Webb ..... $7.50@8.00
No. 6 Clipper and Solid Steel, ... $7.75@8.25
Bush, Wood and Brumbole, Nos. 11, 12 and 13 ..... $7.25@7.75
Grain, No. 1 ..... $9.00@9.50
Bronzed Webb, No. 1 ..... $9.25@9.75
Nos. 3 and 4 Clipper, Grain ..... $9.50@10.00
Solid Steel, No. 6 ..... $10.00@10.50

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
Millers Falls Adj. Tool Handles No 1, $12; No. 4, $12; No. 5, $18 ..... 20&10%

Garden Tool Sets—

Ft Madison Three Plows, Hoe, Rake and Shovel ..... @ doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 75%
Cannon's Diamond Point, @ gro, $12, ... 40&10
Mayhew's ..... @ gro $9.00
Snell's Corrugated, Cup Pt. ..... 40&10%
Snell's Knurled, Cup Pt. ..... 4 &10
Victor Knurled Cup Pt. ..... @ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Morrill's No. 1 ..... $15.00]
Nos. 3 and 4 Cross Cut ..... $2.60]
No. 5 ..... $1.40]
Nos. 11 to 15 ..... $10.00] 60%
No. 1 Old Style ..... $2.00]
Special ..... $16.25]
Giant Regal Cross Cut ..... @ doz. $8.00
Regal, Handled ..... @ doz. $4.50
Taintor Positive ..... @ doz. $6.75

Shaving—

Fox Shaving Sets, No. 30 ..... @ doz. net, $21.60
Smith & Hemenway Co. 75

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, @ doz. ..... $1.50]
Mounted Kitchen Stand Stone ..... @ doz. ..... $1.50] 50%
Natural Grit Carving Knife Hones, @ doz. ..... $2.00]
Quick Cut Emery Carving Knife Hones, @ doz. ..... $1.50]
Quick Edge Pocket Knife Hones, @ doz. ..... $2.50]

Skate—

Smith & Hemenway Co., Eureka 50%

Shaves, Spoke—

Iron ..... 50&10%
Wood ..... 50&10%
Barnes (Starks) R & I Co. 40
Chapin-Stephens Co. 50
Goodell's, @ doz. $9.00 ..... 15&10%

Shears—

Cast Iron..	7	8	9 in.
Best	$16.00	18.00	20.00 *gro.*
Good	$13.00	15.00	17.00 *gro.*
Cheap	$5.00	6.00	7.00 *gro.*

Straight Trimmers, &c.:
Best quality Jap ..... 70@70&10%
Best quality, Nickel ..... 60@60&10%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40&10%
Heinisch's Tailor's Shears ..... 40&10%
Wilkinson Sheer & Cutlery Co.:
Sheep, 1909 list ..... 40&10&5%
Grass ..... 40&10&5%
Horse or Mule ..... 40&10&5%
J. Wiss & Sons Co.:
Best Quality 40
Best Quality Nickel ..... 50&10%
Tailors' 40

Tinners' Snips—

Steel Blades ..... 20&10&10%
Steel Laid Blades ..... 40&10&50%
Forged Handles, Steel Blades, Bent 50
Hemphill's Snips 40
Jennings & Griffin Mfg. Co.'s 6 to 13 in. ..... 33⅓&7½
Newell's Snips 40
Pexto & W. Forged Handles, 25" ..... 40&10%
W. R. W. ..... 40&10%
J. Wiss & Sons Co. 40
Wiss Duplex Steel 25

Pruning Shears—

Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Disston's Combined Pruning Hook and Saw @ list ..... 50 & 5
Disston's Pruning Hook only, @ doz $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
L. S. & Co. ..... 40&10
Columbian Cutlery Co.:
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand ..... 60&10%

Sheaves— Sliding Door—

Reading 40%
R. & E. list 15%

Sliding Shutter—

Reading list 40%
R. & E. list 10%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge ..... 65&10%
Club, Rival, 65&5%; First Quality, ... 60&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, ... 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge, Leader grade, ... 25&5
Union, League, 12 and 12 gauge, Rival Grade 5
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade 20%

Shells, Loaded—

Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40
New Club, Smokeless Powders 40
Arrow, Smokeless Powders ..... 40&10
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Leader Grade ..... 40&10&10%
Black Powder 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.25	$5.00
12 x 14	4.50	6.25
7 x 15	4.25	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20 in.	$4.25	$5.50
Dixie, 10 x 14 in.	4.50	6.20
Dixie, 7 x 15 in.	5.4	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg $4.10
Steel ..... per keg $3.85
Burden's, all sizes ..... @ keg $3.90

Shot—

25 lb. bag
Drop, up to B $1.85
Drop, B and Larger ..... 1.
Buck ..... 1.
Chilled 1.10
Dust ..... 1.

Shovels and Spades—

Association List, Nov. 15, 1902. 40%
Avery Stamping Co. 40

Snow Shovels—

Long Handle ..... $2.00@$2.25
Wood and Mall, D. Handle, ... $8.75@$1.00

Sieves and Sifters—

Hunter's Imitation ..... gro. $9.50@10.00
Hunter's Genuine ..... per gro. $12.00@12.50

Sifters, Ash—

Ames Bros. 50
Ames Plow Co. 50

Sieves, Seamless Metallic

Per doz.

Mesh	14	16	18	20
Iron Wire	$1.05	1.05	1.10	1.20
Tinned Wire	$1.15	1.15	1.20	1.30

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... doz. $0.90@0.95
Mesh 20, Nested ..... doz. $1.00@1.05
Mesh 24, Nested ..... doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list

Barnes' low list:

Skeins, Wagon—

Cast Iron ..... 70&7½&10%
Steel ..... 70&7½%

Slates, School—

Factory Shipments.
"D" Slates ..... 50&5&10%
Eureka, Unexcelled Nolseless ..... 60&5 to
Victor A, Noiseless ..... 60&5 tens &

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40&10&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%
High Grade, 40%; Trojan
Jackes

Snaths—

Scythe

Snips, Tinners

Spoons and Forks—

Silver Plated—

Good Quality ..... 50&10@60&10
Cheap ..... 60&10&10
International Silver Co.:
184, Rogers Bros., 40&10
& Hamilton
Rogers & Bro., William Rogers, Eagle Brand
Anchor, Rogers Brand
Wm. Rogers & Son

Miscellaneous

German Silver ..... 60@60&10

Tinned Iron—

Teas ..... per doz. net
Tubes ..... per gro. net $1

Springs— Door—

Bardsley's Spring and Check
Chicago (Coil)
Gem (Coil)
Pullman (Coil)
Reliance (Coil)
Star (Coil)
Torrey's Rod, 39 in. ..... @ doz. $1

Carriage, Wagon, &c.—

Tin, in and Wider: Per pou
Black ..... $5.25@5
Half Bright ..... $5.25@5
Bright ..... $5.25@5
Painted Seat Springs:
Tip 4 x 28 ..... per gro. 40@4
Tip 5 x 28 ..... per gro. 50@5

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; National, @ doz.
Enterprise
Pulsometer No. 1, @ doz $12, No. 2, $15, No. 3, $2

Squares—

Nickel plated..] List Jan. 5, 190
Steel and Iron..]
Rosewood Hdl. Try Squares and T-Bevels ..... 6 & 10&10%
Iron Hdl. Try Squares and T-Bevels ..... 10&10&10%
Barnes's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... doz. $1
Good Grade ..... doz. $1.
Tinned Iron ..... doz. $
Iron, Porcelain Lined ..... doz. $1.

Staples—

Barbed Wire
Fence Staples, Plain, $2.15; Galvanized
Poultry Netting Staples ..... per lb.

Steels, Butchers'—

Dicks
Foster Bros.

Steelyards—

Stocks and Dies—

Blacksmiths' ..... 50&50&10
Curtis & Curtis
Dalton Bros.
Geo. Rice
Lightning
Reed & Prince
Stoners, Cherry

Stones—

Arkansas St. No. 1, 5" to 8 in
Arkansas Slips No. 1
Washita St., Extra, 4 to 8
Washita St., No. 1, 4 to 8
India Oil Stones (entire list) 33⅓%
Queen City Stones
Queen Emery and Corundum Axe Stone
Quicksilver Pocket Razor Hone
Hindostan No. 1, Regular @ lb. 8c
Hindostan No. 1, Small @ lb 10c
Axe Stones all kinds
Turkey Oil Stones, Extra, 5 to
Queer Creek St nes 4 to 8 in
Queer Creek Slips
Sand Stone

Scythe Stones—

From Mfg. Co.; 15-1 list:
Black Diamond S. S., gro. $12.00
Lehigh S. S., gro. $11.00
White Mountain S. S. gro. $9.00
Green Mountain S. S. gro. $6.00
Fair Imported Razor S. gro. $6.00
No. 1 Indian Head S. S. gro. $7.00
No. 2 Indian Head S. S. gro. $4.50
Leader Red End S. S. gro. $4.50
Quick Cut Emery, gro. $3.00
Pure Corundum, gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 4 Coat, $10
Balance of 1904 list 33⅓%.
Electro (Artificial), gro. $12.00 ..... 75%
Lightning (Artificial), gro. $18.00 ..... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers .... gro. $9.00

Stops— Bench—

Millers Falls ..... 15&10%
Morrill's, doz., No. 1, $10.00 ..... 60%
Morrill's, No. 2, $12.80 ..... 60%

Door—

Chapin-Stephens Co ..... 50@50&10%

Plane—

Chapin-Stephens Co 20%

Straps— Box—

Acme Embossed case lots 20&10&10%
Cary's Universal, case lots ..... 20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket ..... doz., $1.00
Excelsior Stretcher and Tack Hammer Combined, doz. $6.00 ..... 20%

Stuffers, Sausage—

Enterprise Mfg Co. ..... 25@25&7½%
National Specialty Co., list Jan. 1, 1902 ..... 30&5%
P., S. & W. Co. ..... 40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: doz.
Superba, Polished Mahogany $36.00
Triumph, Fancy Veneers $33.00
Parlor Queen, Fig, Rosewood. $30.00
Elite, Hungarian, Ash $27.00
Am. Queen, Fig, Mahogany $27.00
Ideal, Bird's-Eye Maple $25.00
Grand Rapids, Nickel, $21.00; Japan $22.00
Standard, No. 8, $22.00; Japan $19.00
Crown Jewel, Nickel, $21.00; Jap. $19.00
Crystal Glass Top $36.00
Grand, 17 in. wide $36.00
Club, 17 in. wide $34.00
Hall, 23 in. wide $60.00

NOTE.—Rebates: 50c *per dozen on three-dozen lots;* $1 *per dozen on five-dozen lots;* $2 *per dozen on ten dozen lots;* $2.50 *per dozen on twenty-five dozen lots*

Tacks, Finishing Nails, &c.

American Carpet Tacks ..... 90&10&5%
American Cut Tacks ..... 90&10%
Sweden Cut Tacks ..... 90&10%
Sweden Upholstering ..... 90&10%
Gimp Tacks ..... 90&10%
Lace Tacks ..... 90&10%
Tinmmers' Tacks ..... 90&10%
Looking Glass Tacks 85%
Bill Posters' and Railroad Tacks ..... 90&10&10%
Hungarian Nails ..... 80&10%
Finishing Nails 80%
Trunk and Chest Nails ..... 80&10%

NOTE.—The above prices are for straight Weights.

Miscellaneous—

Double Pointed Tacks ..... 90&5 less 5%

See also Nails, Wire

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
120	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ..... 50@—%
Patent Leather ..... 25@30&5%
Steel ..... $3 1-3&65%
Chesterman's ..... 25@25&5%

Kendall & Esser Co.:
Excelsior Ass Skin ..... 10&10&5%
Favorite, Duck and Leather ..... 25&5%&10%

Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.

Lufkin's:
Asses' Skin ..... 40&10@50%
Metallic ..... 30@30&5%
Patent Bend, Leather ..... 25&5@25&10%
Pocket ..... 40@40&5%
Steel ..... 33⅓@35%

Whitbeck & Hilger:
Chesterman's Metallic, No. 34L, etc 25%
Chesterman's Steel, No. 1038L, etc 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c. ..... 50@50&5%

Ties, Bale—Steel Wire—

Single Loop ..... 80&10&5%
Mountain, Cross Head, &c. 70@25&5%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White ..... 20@20&5%

Haying—

Myers' Hay Tools 45%

Miniature—

Smith & Hemenway Co.'s, Davidson, doz., Nickel Plated, $1.50. Gold Plated $2.00

Saw—

Atkins' Cross Cut Saw Tools ..... 35&5%
Simonds' Improved 33⅓%
Simonds' Crescent 25%

Ship—

L. & I. J. White 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro. ..... $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida ..... 75&10%
Newhouse ..... 40@45&5%
Hawley & Norton 65%
Oneida ..... 75@75&10%
Oneida Community Jump 50%
Hector ..... 75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85@80¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, doz., $10.25 $11.50 doz.
No. 3, Rat, doz., $6.50 ... $5.75 doz.
No. 2, Rat, doz., $8.50 ... $7.50 doz.
No. 4, Mouse, doz., $4.50 ... $4.00 doz.
No. 5 Mouse, doz., $3.00 ... $2.75 doz.
Oneida Community:
Out o' Sight, Mouse, doz. ... $0.60
Out o' Sight, Rat, doz. ... 1.35
Easy Set, Mouse, doz. ... .55
Easy Set, Rat, doz. ... 1.00
Wood Choker, Rat, doz. holes, .12
Pioneer Tin Chicken, 5 hole, doz. traps ... .75

Trowels—

Disston Brick and Pointing 25%
Disston Plastering 20%
Disston "Standard Brand" and Garden Trowels 30%
Kohler's Steel Garden Trowels, gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels, gro. $6.00
Woodrough & McParlin, Plastering 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern ..... 50&10%
Western Pattern ..... 60&10%
Handy Trucks ..... doz. $16.00
Grocers' ..... doz. $18.00
McKinney Trucks ..... each, net $10.00
Model Stove Trucks ..... doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.
No. 0 1 2 3 4 5
Galvanized 807 870 880 890 900 910

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls 23@25¢
No. 12, ¼ and ½-lb. Balls 21@22¢
No. 18, ¼ and ½-lb. Balls 18@20¢
No. 24, ¼ and ½-lb. Balls 15@16¢
No. 36, ¼ and ½-lb. Balls 12@13¢
Chalk Line, Cotton ½-lb. Balls ..... 26@31¢
Cotton Mops, 6, 9, 12 and 15 lb to doz. ..... 11@19¢
Cotton Wrapping, 1 Balls to lb., according to quality ..... 21½@23¢
American 2-Ply Hemp, ¼ and ½-lb. Balls ..... 14½@15½¢
American 3 Ply Hemp, 1-lb. Balls ..... 15½@16½¢
India 2 Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) 10½@11½¢
India 3-Ply Hemp, 1 lb. Balls ..... 10½@11½¢
India 3-Ply Hemp, 1½-lb. Balls ..... 10@11¢
2, 4, 4 and 5-Ply Jute, ½-lb. Balls ..... 13½@14½¢
Mason Line, Linen, ½-lb. Bls. 47¢
No. 264 Mattress, ¼ and ½-lb. Balls, according to quality ..... 39@60¢
Wool, 3 to 6 ply.... B 9¢; A 10¢

Vises—

Solid Box ..... 50@50&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co. 40%
Fisher & Norris Double Screw, net, each, No. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00
Fulton Mach. & Vise Co.:
Bench Screw 25%
Star, Solid Jaw 40%
Hollands':
Machinists ..... 10&10&5%
Knuckle ..... 50&5%
Lewis Tool Co.:
Adjustable Jaw 30%
Machinists' Solid Jaw 30%
Massey Vise Co.:
Clincher 40%
Perfect, 15%; Lightning Grip 15%
Merrill 20%
Millers Falls, Oval Slide Pattern 60&10%
Parker's:
Victor, 20@25; Regulars ..... 20@25%
Vulcans ..... 4@45
Combination Pipe ..... 35@50
Prentiss ..... 20@25
Rock Island 25%
Stuebler's X 33⅓%
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, doz., $24.00, 30%; Clamps 30%
Perfection Saw Clamps, doz. $1.80
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed 25%
Slide 40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe ..... 60@60&5%
Quick Action Pipe 40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870 ..... 40%
Rock Island Pipe 25%

Wads—*Price per M.*

B. E., 11 up ..... 60¢
B. E., 9 and 10 ..... 70¢
B. E., 8 ..... 80¢
B. E., 7 ..... 80¢
P. E., 11 up $1.00
P. E., 9 and 10 ..... 1.25
P. E., 8 ..... 1.50
P. E., 7 ..... 1.50
Ely's B. E., 11 and larger $1.70@1.75
Ely's P. E., 12 to 20 ..... $3.00@3.25

Dia. 15%

Ware, Hollow—Cast Iron, Hollow—

Store Hollow Ware:
Enameled ..... 45&10%
Ground ..... 50&5%
Plain or Unground 60%
Country Hollow Ware, per 100 lbs. $3.00
White Enameled Ware:
Maslin Kettles ..... 65&10%
Covered Wares:
Tinned and Turned ..... 35&10%
Enameled ..... 45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware 33⅓%
Iron Clad Ware ..... 30&5%
Lava and Volcanic, Enameled ..... 40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	*.45¢*	*50¢*	*65¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles ..... 65@65&5%
Avery Kettles 60%
Porcelained ..... 5 & 10%
Never Break Spiders and Griddles ..... 65&5%
Never Break Kettles 60%
Solid Steel Spiders and Griddles ..... 65&5%
Solid Steel Kettles 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone ..... 40@40&10%

Washboards—

Solid Zinc doz.
Crescent, family size bent frame $4.35
Red Star, family size, stationary protector $4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $3.55
Cable Cross, family size, stationary protector $3.60
Single Zinc Surface:
Naiad family size, open back, perforated $2.00
Single Saginaw Globe $2.85
Brass Surface:
Brass King, Single Surface, open back $4.05
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.60
Glass Surface:
Glass King, Single Surface, open back $3.95
Enamel Surface:
Enamel King, Single Surface, vertically indented back $3.95

Washers—Leather, Axle—

Solid ..... 90@90&10%
Patent ..... 80@80&5%
Coil: ⅞ 1 1¼ 1½ Inch
90c. 1.00 1.10 1.15 per box

Iron or Steel—

Size bolt.... 5/16 ⅜ ½ ⅝ ¾
Washers.... $4.90 4.00 2.70 2.50 2.30

The above prices are based on $6.50 off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add 1½¢ to list.

Cast Washers—

Over ½ inch, barrel lots ..... per lb. 1¼@2¢

Wedges—

Oil Finish ..... lb., .@3¢

Weights—Hitching—

Covert Mfg. Co. ..... 30&2%

Sash—

Per ton, f.o.b. factory:
Eastern District ..... $25.00@$28.00
Southern Territory $25.00
Western and Central Districts ..... $24.00@$27.50

Wheels, Well—

8-in., $2.00; 10-in., $2.45; 12-in., $2.75; 14-in., $3.45.

Wire and Wire Goods—

Bright and Annealed:

6 to 9	*72¢10¢7½%*
10 to 18	*72½¢10¢10%*
19 to 26	*75¢10¢10¢2½%*
27 to 36	*77½¢67½2%*

Galvanized:

6 to 9	*72½¢10%*
10 to 14	*72½¢10¢3½%*
15 to 16	*72½¢10¢5%*
17 to 18	*72½¢*
19 to 26	*70¢55¢2½%*
27 to 36	*65¢10¢10%*

Coppered:

6 to 9	*65¢10¢10%*
10 to 14	*70¢10¢5%*
15 to 16	*65¢10¢10¢2½%*
19 to 26	*70¢55¢2½%*
27 to 36	*72½¢10¢2½%*

Tinned:

6 to 18	*67¢10¢10%*

Brass ..... 17½¢ lb., base
Copper ..... 32¢ lb., base
Cast Steel Wire 50%

Spooled Wire—

Annealed and Tinned ..... 70¢10¢10¢10%
Brass and Copper... 60¢10¢10¢10%
Retailers' Assortments, per box, $2.10@$2.40

Wire Clothes Line, see Lines.
Wire Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods..... 80¢25%
Brass Wire Goods..... 90¢90¢10%
Brass Cup and Shoulder Hooks, 80¢15%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80¢25¢50¢75¢
Painted Screen Cloth, 100 ft., $1.35
Standard Galv. Hardware Grade: Per 100 sq. ft.
Nos. 2, 3 and 4 Mesh $2.00
Nos. 5 and 5 Mesh $2.00
No. 6 Mesh $1.50
Nos. 7 and 8 Mesh $1.35

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural 80%
Alligator or Crocodile.. 70&10@75%
Baxter Pattern S Wrenches ..... 70&5@70&10%
Drop Forged S ..... 45@45&5%
Acme ..... 60&10%
Alligator Pattern, 70%; Bull Dog, 70% Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut 50%
Combination Black ..... 40&5%
Merrick Pattern 50%
Boarman's 40%
Coes' Genuine Knife Hdl. 40&10&5&5%
Coes' Genuine Steel Hdl. 40&10&5&5%
Coes' Genuine Key Model 40&10&5&5%
Coes', Genuine Hammer Handle ..... 40&10&5&5%
Coes' "Mechanics'" ... 40&10&10&5&5%
Dempsher's Engineer ..... 40&10%
Eagle 70%
Gem Pocket 60%
Hercules 10%
W. & B. Machinist:
Case lots ..... 50&5%
Less than case lots 50%
W. & B. Railroad Special:
Case lots 50%
Less than case lots ..... 40&10&5%
Solid Handles, P., S. & W., 50&10%; full cases ..... 5%&10&5%
Stillson 65%
Uwanta Wrench Co.:
Railroad Special, Iron Handle, 40&10&5%
Other Wrenches 50%
Vulcan and Acrippa Chain 50%
Whitaker Machinists':
Case lots ..... 50&10%
Less than case lots 50%

Wrought Goods—

Staples, Hooks, &c., list March 17, '92 ..... 85&10&10%

Zinc— *(Cask lots at mill.)*

Sheet ..... per 100 lb., $7.00

THE IRON AGE

New York, Thursday, March 19, 1908.

A Huge Tod Rolling Mill Engine.

An engine of unusual size and design has recently been installed at the Ohio Works of the Carnegie Steel Company by the William Tod Company, Youngstown, Ohio. The engine, shown in Fig. 1, is of the tandem compound Corliss type, having long range cutoff gear, and its cylinders are 52 and 90 in. in diameter by 60 in. stroke. It drives the new three-high blooming mill and replaces a 45 x 72 in. twin cylinder reversing engine built by the same maker several years ago.

A special feature of the design is the direct attachment of both the high pressure and low pressure cylinders to the bed plate. The high pressure cylinder is secured by studs to the flange of the bed plate, while heavy forged steel tie bolts 13 in. in diameter extend from lugs on the bed plate to sockets in the low pressure cylinder head. The tie bolts pass alongside of the high pressure cylinder, but are entirely free from it. By this construction the expansion and contraction of each cylinder is taken care of separately, and in operation no perceptible motion of either cylinder occurs. The sole plate under the cylinders is of the heaviest construction, although it simply maintains the alignment of the machine, both cylinders being free to slide upon it.

The main bearing, which is 30 in. in diameter by 58 in. long, is cast in one with the guide barrel, and the finished bed plate weighs 95 tons. Its massive proportions are indicated in Fig. 3, which is from a photograph taken while the casting was being handled on a planer during the machining of the ways for the bearing boxes. The back bearing is similar in design to the main bearing, and is secured to the foundation by numerous bolts, and the illustration of the former, Fig. 2, shows clearly the construction of these bearings. Each is provided with four shells, rigidly locked in place by the cap, which is reinforced by two heavy horizontal bolts. A liberal channel around the edge of all main castings entirely prevents oil from reaching the foundation.

The pistons are both of steel and of the conical or umbrella form, the use of which has been the standard practice of the William Tod Company for several years. Pistons of this type of large diameters have been in successful operation for some years, and have proved entirely satisfactory. The high pressure piston rod is 11 in. in diameter and is solid, and the low pressure piston rod is 15 in. in diameter and is hollow. Both pistons are carried free from the cylinders, the rods being cambered and supported on sliding heads. The construction is such that easy access may be had to both cylinders without disturbing any tie pieces or heavy parts of the engine. The low pressure cylinder is provided with a manhole in the backhead.

The crosshead is of cast steel, of light construction, and has adjustable shoes. Its bearing surface is 30 x 60 in. The connecting rod is of the marine type, with babbitt directly in the rod at the crank end, and a solid end with bronze boxes at the crosshead end. The crank shaft is 30 in. in diameter in the bearings and 36 in. in diameter through the flywheel, and is a hollow steel forging. The flywheel is of extra heavy construction. The rim is in two parts and was cast with the arms. The latter are separated at the center to eliminate shrinkage strains, are of H section, giving extreme rigidity, and are secured in a cast steel hub. The complete wheel weighs 250,000 lb., and is 25 ft. in diameter.

Owing to the extremely heavy and variable service which this engine has to perform, a special type of cutoff gear was required. The power required for certain passes of the ingot is far in excess of the power which the steam cylinders can develop, and the flywheel was designed to supply the deficiency in power: the engine of necessity slows down during the rolling periods, but recovers its speed in the intervals between passes. The engine must therefore regulate quickly and be free from any tendency to race. As the engine will develop 8000 hp. at its rated speed, and as this will bring the wheel back to full speed in about two revolutions, the governor must have great stability to prevent racing.

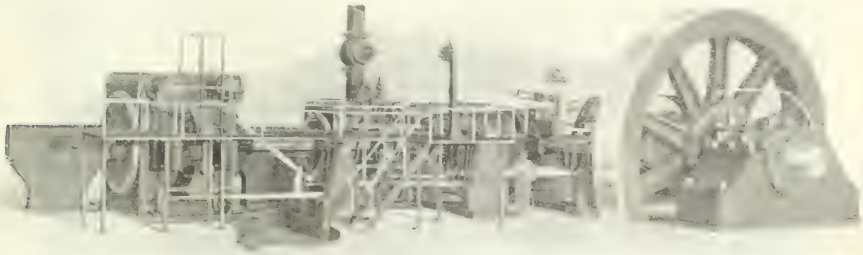


Fig. 1.—8000 H.P. Tandem Compound Rolling Mill Engine Built by the William Tod Company, Youngstown, Ohio, for the Ohio Works of the Carnegie Steel Company.

The range of cutoff is from nothing to full stroke, and as the usual expedient of giving the steam valves negative lap was not permissible on account of the danger of the engine running away in case of derangement of the dash pots, a floating trip gear was adopted. The governor can release the steam valves at any point of the piston travel, but the steam valves are positively closed by the wrist plate at the end of the piston stroke, so that in no event can the boiler pressure pass directly to the low pressure cylinder, as is the case with the usual double eccentric type of gear. The steam valves for both the high pressure and low pressure cylinders are driven from a single eccentric, while the exhaust valves on each cylinder have a separate eccentric, thus departing from usual practice and providing for the separate adjustment of compression and release in each cylinder. Owing to this arrangement perfect valve setting has been attained in both cylinders, as the indicator cards have demonstrated. The valve gear rockers are inverted from their usual position and hang downward. The carrier rods, therefore, tend to swing pendulum fashion, which is claimed to reduce wear and tear as compared with the usual ar-

rangement. A hand operated piston valve is provided in a convenient position, by means of which the engine may be turned by hand in either direction.

As may be seen from Fig. 1, the enormous size of the engine demands a special arrangement of operating platforms around the valve gear. This platform is 7 ft. above the floor line, leaving ample room underneath for access to the lower valve gear. This is believed to be the largest tandem compound engine ever built, and is the only engine regularly transmitting over 8000 hp. through

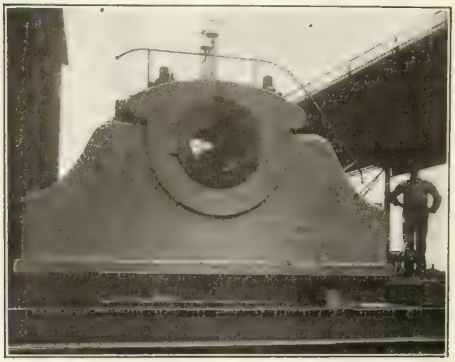


Fig. 2.—The Outboard Bearing on a Car Ready to Be Shipped.

the necessary excess of oxrgen and heat are thus supplied to produce smokeless combustion of the soft coal when more than the ordinary amount of air is admitted under and over the grates. A somewhat remarkable fact is that a better economy results than when either fuel is used alone. The coal costs abopt $1 a ton delivered at the plant and the gas 10 cents per 1000 cu. ft.

The New England Foundrymen's Association.

At the monthly meeting of the New England Foundrymen's Association at the Exchange Club, Boston, March 11, the Committee on Shortages reported through J. L. Anthony that the chairman had called a meeting of the general committee, representing the various interests of pig iron and coke shippers and consumers, to be held at the Bellevue-Stratford Hotel, Philadelphia, March 18, when the questions discussed at the recent conference will be considered, with the idea of formulating a plan of relief. The selection of J. L. Anthony, Weir Stove Company, Taunton, and B. M. Shaw, Walker-Pratt Mfg. Company, Boston, to represent the New England Association was confirmed.

A communication was received from the New England Stove Manufacturers' Association asking the cooperation of the Foundrymen's Association in bringing about the adoption of a universal pig iron contract that would protect the interests of the buyer and be acceptable to the seller as well. In the discussion that followed members stated that under present conditions the pig iron people insist on having things their own way and that the time has come when consumers should get together and have the contract amended to give them better protection. Messrs. Anthony and Shaw were appointed a committee to act in the matter in conjunction with the Stove Manufacturers' Association. The Debevoise-Anderson Company, New York, was elected to membership. President Henry F. Arnold was in the chair.

After dinner George N. Jeppson, Norton Company, Worcester, Mass., gave a highly instructive talk on grinding wheels, describing alundum and its manufacture, the advantages of grinding wheels, the machines with which they are used, their mounting and safety devices and their selection. Announcement was made that the next meeting would be at Boston, April 11, and would be addressed by T. E. Byrnes, vice-president of the New York, New Haven & Hartford Railroad.

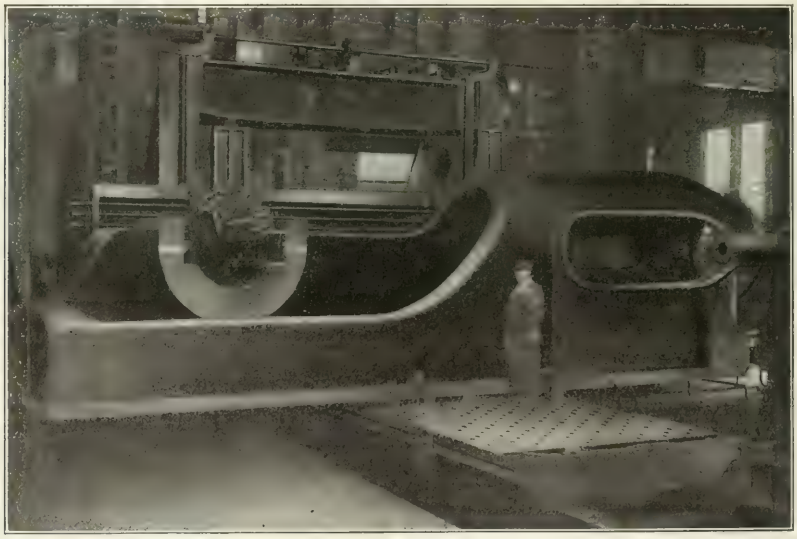


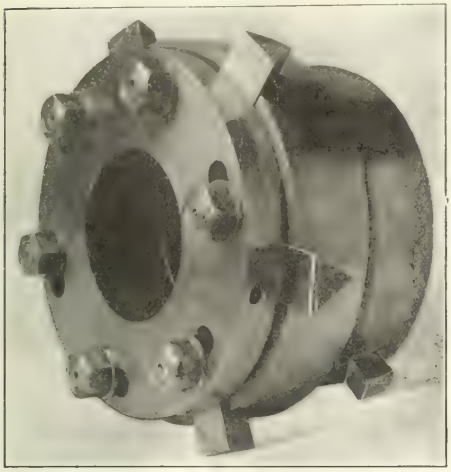
Fig. 3.—The Main Bed and Largest Single Casting (Weight 95 Tons) as It Was Handled on a Big Planer.

a single crank pin. An idea of the immense size of the engine may be had from the following dimensions: Total length, 71 ft.; hight of low pressure cylinder above foundations, 13 ft.; hight of center of engine above foundations, 6 ft. 11 in.

Smokeless Combustion.—To effect the smokeless burning of bituminous slack, the Chester B. Albree Iron Works Company, Pittsburgh, Pa., simultaneously fires its boiler furnaces with a small amount of natural gas. Plain stationary grates are used, and the gas is introduced through five small jets in the side walls of the furnace, about a foot above the level of the grate. Originally the two equipments were installed for alternative use of either independently, so that one might be a reserve for the other. Now, however, they are generally used in combination, since it has been found that

The Melvin Boring Head.

The 10-in. shell type boring head illustrated is the latest pattern of multiple tool boring head made by Melvin & Hamaker, Meadville, Pa. Like its predecessors, it uses cutters which are of equilateral triangular section inserted in the body of the head in milled seats so formed



The New Multiple Tool Boring Head Made by Melvin & Hamaker, Meadville, Pa.

as to give the proper clearance angle at the cutting edges and end clearance allowed by inclining the slots forward from true radial position. The cutters are reversible from one cutting edge to another and are also reversible end for end, so that six cutting edges are available. When finally all cutting edges are dulled the cutters can be ground on the sides and are again ready for use. The head is made of steel and the cutters of high speed steel.

In the type illustrated the body is counterbored and has an internal thread. A ratchet shaped cam fits into this counterbore, and has a flange on the outside which serves as the main clamping collar. The end of the body has V-shaped seats to receive the cutters, and an intermediate steel clamping ring is milled at corresponding angles with the V seats in the head proper. This ring is bound against the cutters by screwing up the nuts on the bolts which extend through the slots in the flange of the cam ring. There is a wrench furnished for tightening this clamping collar. The cutters are first brought to their seats on the ring having cam faces; the latter is adjusted to give the correct cutting diameter, and the clamping collar is then fastened. This engages all of the cutters and locks them firmly in position.

The head has an adjustment from [illegible] depending on its size. The cam controlling the adjustment is revolved by inserting a rod in a hole in the periphery of the flange. A definite amount of adjustment is allowed by the slots in the cam ring flange or clamping ring, and graduations enable the operator to obtain the required size without calipering. The intermediate collar, which lies between the clamping ring and the cutters, has rubber compression rings between the screws and ring. These maintain a pressure on the cutters when the front collar is loosened, so that the cutters are prevented from falling out, chips are prevented from accumulating between the cutters and the seat, and the operator is permitted to make an adjustment without any likelihood of the cutter not being seated on the adjusting seat.

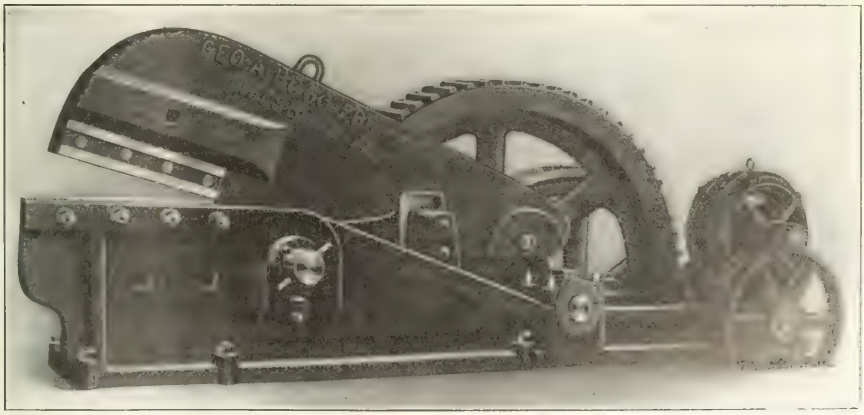
The shell type of cutter head is made in sizes of from 5 to 18 in. in diameter, and the machine type in sizes from 2 to 16½ in.

A Hogg High Knife Scrap Shear.

A No. 7½ high knife scrap shear built by the George A. Hogg Iron & Steel Foundry Company, Pittsburgh, Pa., for the Joseph Joseph & Bros. Company, Chicago Heights, Ill., is shown in the accompanying illustration. This shear is capable of cutting cold soft steel up to 5 x 5 in. in section. It is of the high knife type, pitman driven, and is especially designed for shearing miscellaneous scrap and old pipe. A pipe crushing attachment has been provided which can be attached to the front of the shear and removed when not in use, allowing pipe up to 16 in. in diameter to be crushed.

The shear weighs approximately 90,000 lb., has knives 30 in. long and is driven by a Bullock 60-hp. three-phase induction motor. The main pin of the shear is a steel forging 10 in. in diameter. The main gear is of heavy pitch and is driven by a steel pinion. The gears connecting the motor are machine cut, insuring smooth running.

The shearing of the high knife type is especially adapted to shearing old boiler plate and like material, and in its design it has been the aim to increase the metal at the points of greatest strain to prevent the breakages that usually occur in shears of this type.



The No. 7½ High Knife Scrap Shear Built by the George A. Hogg Iron & Steel Foundry Company, Pittsburgh, Pa.

Judge Lewis Shepard, Judge D. L. Snodgrass and Dr. S. D. Spence of Chattanooga, Tenn., have been granted a patent for an electric furnace. The process, it is stated, can be used for a small or large furnace and melt from 10 lb. of any kind of metal or ore to 100 tons.

The Compression of Semiliquid Steel Ingots.*

BY N. LILIENBERG, PHILADELPHIA.

The production of sound steel continues to be one of the most important questions of the present time. Previous efforts in that direction have mostly concerned special high grade steel, but of late even makers of structural steel and rails are looking for some suitable means of making ingots solid and of proper structure as well a of lessening the crop ends and segregation. In regard to rails, it has been conclusively demonstrated by experts (especially by the able engineer of the Philadelphia & Reading Railroad) that most of the failures in actual use, sometimes causing serious disasters, are due not to wrong chemical composition or to faulty heat treatment, but to treacherous cavities in the steel ingots, compressed by the rolling but not welded. High authorities therefore now recommend that even rail steel be compressed before the ingots are solid. It is well known to be quite possible by any steel process to make sound steel without blowholes, the whole shrinkage then being taken up by the pipe which is correspondingly larger when other cavities are absent. In that case compression shows to greatest advantage, but even steel developing gases after being poured in the molds can be compressed solid. It is only steel with surface blowholes which cannot be improved by compression.

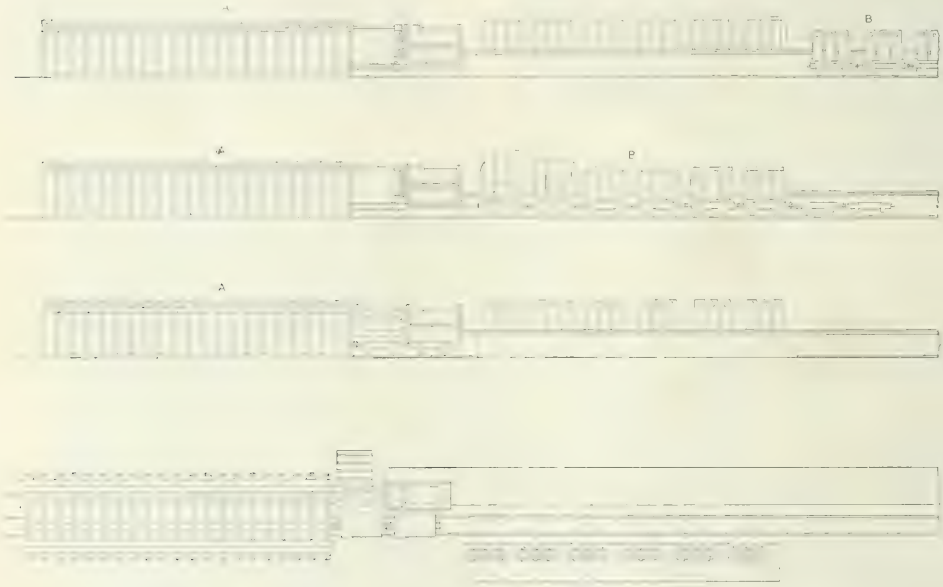


Fig. 1.—Plan and Elevation of Continuous Press for Steel Ingots Cast on Cars.

The formation of pipe in steel ingots has recently been studied to considerable extent. Mr. Stead, in England, has published very valuable observations, but especially has Prof. H. M. Howe gone deep into this matter. He shows that the formation of pipe is very complicated, because steel increases in volume at solidification and the sinking of the liquid steel then takes place at the different periods in accordance with the difference between swelling and shrinking of the interior and exterior. By a series of experiments with melted stearic acid he has also shown the influence of the temperature of the steel and of rapid and slow cooling on the formation of pipe. I do not intend to discuss these matters here, as my object is to deal only with practical manipulation for improving steel. It is enough for practical work to know that pipe will form more or less in every steel ingot, no matter in what way it is cast. The advice to cast steel at certain desirable temperature is of course difficult to follow, because the melted steel changes temperature between the casting of the first and the last ingots.

Effects of Cooling and Heating.

When steel has filled the mold there is instantly a thick crust of solid steel formed at the bottom and a thin crust on the sides inclosing a quantity of liquid steel. If the steel is allowed to cool undisturbed, the liquid mass inside gradually settles as solid steel in the inside of the shell, and as the quantity is not sufficient, owing to the contraction, a space is left extending from the top irregularly downward. If the ingot after being entirely solid and red hot is allowed to cool slowly without being worked, large crystals are formed, especially around the pipe, and there is danger that the internal strain may separate them and form fissures which afterward may develop into large cracks.

This danger is again repeated when a cold unworked ingot is put into a heating furnace. An ingot allowed to cool slowly and undisturbed is made up of a surface of interlaced crystals and an interior of larger crystals of weaker cohesion. When, therefore, such an ingot, especially if it is of large size, is laid into a reheating surface it is very difficult to prevent the surface from expanding more rapidly than the interior, which, therefore, is liable to break, sometimes with a perceptible sound. The cracks between the interior crystals are of course not visible, and there are cases where these have been enlarged by forging into considerable cavities, discovered when the finished article is machined, or, still worse, not discovered until a break occurs.

It has been fully demonstrated that the steel crystals are larger in proportion to the length of time for solidification. Thereafter it depends on whether the substance binding the crystals together is strong enough to resist the internal strains during continued cooling.

* From a paper read before the Mining and Metallurgical Section of the Franklin Institute and printed in the Journal of the Institute for February.

The whole steel industry may be characterized as "the struggle against crystals," and I therefore beg to emphasize the abovesaid as being of equal importance with the obviation of pipe.

Segregation, depending on the floating upward of the alloys of iron with lighter substances, can never be completely avoided, but only lessened under special circumstances. These have been completely investigated by scientists, and it is not within the scope of the present paper to make a review of this matter. For practical purposes it is sufficient to remember that the longer the steel is kept liquid the greater opportunity is given for this separation to take place.

How to Prevent Defects in Ingots.

The defects to be overcome in steel ingots can be summed up as follows: Coarse crystalline structure in the interior; full sized pipe in sound steel; partial pipe and blowholes in steel where chemical action between carbon and ferrous oxide takes place in the molds; segregation. A great deal of work and money has been spent on several methods of preventing all this:

1. Aluminum thrown into molds acts on the upper part of the ingot, keeping it more evenly liquid, and hence the diameter, but not the length of the pipe, is lessened. It reduces ferrous oxide, thereby making the steel more quiet. But its action is confined to the upper part, and the lower is apt to have more cavities than otherwise. A larger quantity of aluminum is liable to be distributed in brittle spots all through the steel. The opinions as to the effect of aluminum on segregation seem to be divided.

2. Casting continuous ingots has been tried, but the practice has been largely abandoned. The apparatus is complicated, and as the attachments to the cast ingots have to be removed, it can be used advantageously only for small ingots.

3. Keeping the top uniformly hot by placing a clay lined box on the top of the mold and applying a flame directed downward by blast through a coke fire is in successful operation. The apparatus is complicated, however, and must consume a considerable amount of coke. When the operation stops the remaining liquid steel will continue to sink somewhat before solidification. The action can only extend to a limited depth, and thus cavities are liable to form in the lower pasty part of the steel. As the steel is kept liquid a longer time it is difficult to see how coarse crystals and segregation can be avoided.

4. Casting with the large end upward. The pipe is generally composed of one upper visible cavity ending with a thin bottom, below which another pipe stretches irregularly downward to an undefined length with a point, or with a series of scattered cavities. This is the case in the ordinary tapered molds standing on loose bottoms with the small ends upward. In casting with wide end upward the pipe is generally confined to the upper visible sinking and the long stretched appendix under the bottom is absent, which is so far an advantage. This is now the prevailing method in Sweden. A clay lined box is placed on the top of the wide end of the mold, whereby the pipe is still further lessened. In most cases it does not stretch below the upper wide end of the ingot, which, however, cannot always be entirely relied on. Between the box and the mold the clay lining is so shaped as to create a neck in the steel, which facilitates the subsequent striking off of the head. It is obvious that all casting with the wide end upward tends to increase the formation of coarse crystals, but, on the other hand, the wider end receives more working in subsequent rolling. The method gives good results in Sweden, where high priced steel is produced, and thus the expense can be borne. It consists in handling the molds by turning them upside down to get out the ingots, forming and drying the sink boxes, striking off and remelting the sink heads.

With a view of taking advantage of the shorter pipe

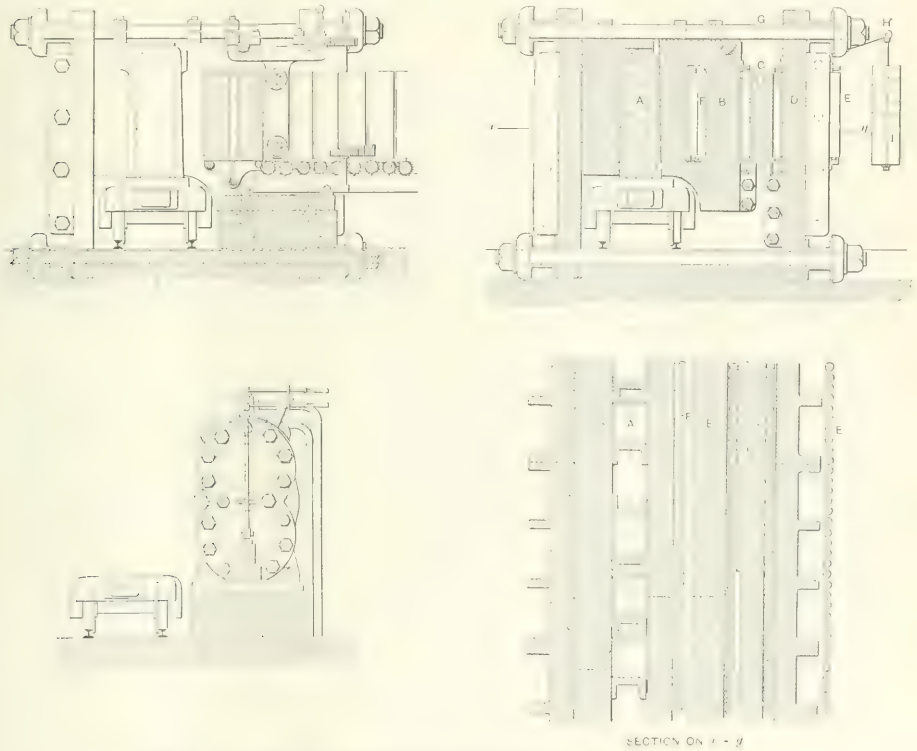


Fig. 2.—End Elevation and Vertical and Horizontal Sections of Pressing Apparatus.

when the wide end is turned upward for ingots so heavy that it would be impracticable to turn the molds upside down after casting the following plan has been suggested. The small end is provided with a loose conical bottom, fitting closely into the recess. After solidification the mold is placed over a hydraulic ram to force bottom and ingot upward out of the mold, which is held down by two upright stationary bars shaped as hooks on the upper end.

5. Centrifugal force acts favorably in driving out blowholes, but of course can not obviate the pipe. Machines for the purpose are, however, too unwieldy to come into general use. The molds would have to be suspended on trunnions in the circumference of a horizontal revolving wheel. I may mention that I have built a machine for making hollow ingots by rotating the circular molds each separately in vertical position.

Some Methods of Compression.

The only way to treat heavy ingots, especially those cast on trucks, is by compression of the semi-liquid steel.

1. Compression from the top has not gained ground. It is impossible to close up the pipe in that way, considering that the solid walls of the upper part of the ingot cannot well be compressed lengthways. Besides the gases are given no opportunity to escape.

2. Compression from the bottom is in successful operation at some works in France and England. The steel is forced upward into a conical mold, which the inventor compares to wire drawing, the top being left open. The bottom of the mold is of course loose and supported by a piston. The casting is done in a place separate from the press, and the ingots and molds are then transported together over a plunger which forces the loose bottom upward together with the steel. The mold has to be strong and is preferably round or octagon, and it must be heavily banded. As the ingot gets firmly stuck another plunger from the top forces it loose from the mold after the operation is finished. This works well and economically when it comes to making a few large ingots, such as for heavy guns, shafting, &c. But if, for instance, a 50-ton

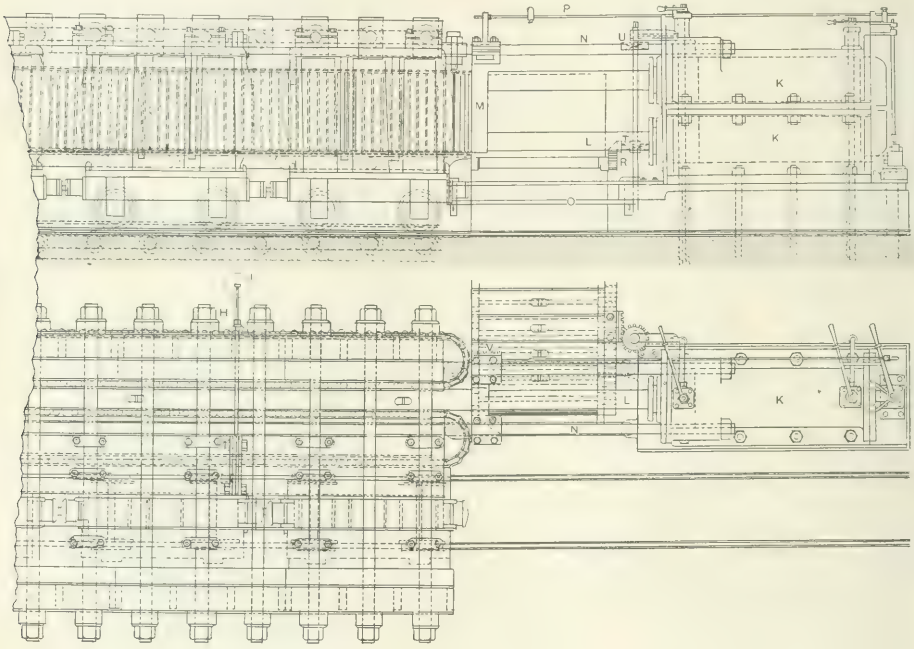


Fig. 3.—Side Elevation and Plan of Pressing Apparatus, with Ingots Under Pressure.

This will improve the structure by making the interior crystals smaller, thereby also lessening the subsequent work on the solid ingot and reducing the segregation. To be effective the compression will have to be timed according to the solidification. It must begin as soon as possible after casting and be continued as long as any liquid steel remains in the interior. If it commences too late the pipe has already been covered with oxide and is thus impossible to completely efface. If finished too early some liquid steel will remain and continue to form pipe. In several compression methods the inventors have lost view of these points. I have stated above that even steel developing gases in the mold can be compressed solid provided these gases do not appear close to the sides. The following changes then take place: The first zone of occluded gases is closed up. Then a new quantity of gases in the liquid interior near the center is set free. If the compression stops there it has only moved the blowholes further inward, but if it is continued as long as liquid steel remains even these secondary blowholes will be closed up. Below is given a review of the principal methods of compression which have been tried or are in practical use:

charge divided among 20 ingots shall be treated in this way, a sufficient number of presses will have to be in operation simultaneously with correspondingly high expenses of installation. The attendance will also be expensive, as it is impossible for one man to watch over the whole row of ingots. The molds will be very expensive and heavy to handle. It would be still more difficult to apply this system for the large quantities of steel cast on trucks.

3. Compression from the side in the molds. The constructions made on this principle must of course have divided molds. Two constructions of this kind are worthy of mention:

(*a*) The casting is done while the halves of the mold are kept together by a hydraulic ram. When the solid skin of the ingot is strong enough the mold is opened sufficiently for introducing a plate as long as the ingot, after which the halves are forced together again by hydraulic pressure. The liquid interior is thereby forced to keep the mold filled to the top until the ingot is solid. Such machines give good results, but can only be used for small sized ingots.

(*b*) For heavier ingots the following construction is

made. The halves of the molds are separated by two bars, cross shaped in section and held together by a hydraulic ram during the casting. As soon as a skin sufficiently thick is formed the cross shaped bars are drawn up, leaving the empty space between the edges of the molds. The hydraulic ram then slowly forces the molds together, thus giving the necessary pressure. This procedure gives very good results and is in continued practical operation. It can also be used for treating ingots standing on trucks. The obstacle in the way of a general adoption of this method are: That the molds of the steel makers will have to be changed from the ordinary solid tapered ones to straight divided; that the handling of the divided molds is expensive; that the walls will have to be made extra strong at the base to stand the swelling of the steel during compression, thereby making the molds heavy and expensive; that the expense is further increased by the edges having to be planed; that it is difficult to avoid a fin where the skin folds in the space between the edges (the fins being planed off by a machine on the cold ingots, a procedure obviously unsuitable for a large and rapid production).

4. Compression from the side on the bare ingots stripped of the molds. In this way many of the above named difficulties are avoided, besides the molds will last longer as not being in contact so long with the hot steel and liable to be pressed out of shape. The first question is whether it is possible to strip the ingots early enough. The time of solidification stands in proportion to the weight and size of the ingot. An 18-in. square ingot weighing about 2½ tons will require about 1 hr. to get solid to the center. The stripping of such ingots usually takes place about 30 min. after casting. Although this is somewhat late, liquid compression can still be done at that time, but it is preferable to reduce this to 15 min. Experience has shown that this can be done at steel works, where the casting and stripping is managed properly. The taper of the molds should, of course, be sufficient, and the inside of them smooth.

Procedure with Stripped Ingots.

The proposed methods of compressed early stripped steel ingots are mainly the three following:

(A) Rolling the ingot in vertical position between four slowly revolving rollers. This would be theoretically the ideal compression, but it is very difficult to carry out for these reasons: The ingots get out of shape between the rollers; they cannot be easily grasped and handled in semiliquid state; the machine is not only complicated, but there will have to be a great number of them, as the ingots cannot be treated one at a time, because some would cool off.

(B) Placing the stripped ingot in a corner and working on it from two sides by hydraulic rams, after which it is allowed to fall through the bottom and be carried away. It would be necessary to have a great number of hydraulic cylinders for compressing all ingots at the same time, which would be very expensive.

(C) Leaving the stripped ingots standing where they are and acting on the whole row simultaneously with a battery of hydraulic rams placed side by side, the whole being surrounded by a sufficiently strong frame. In this way the compression can be prolonged during the whole period of solidification and lifting the semiliquid ingots is avoided.

It therefore seems that this could be used for ingots while standing on trucks. We, however, meet with several great difficulties. The ingots will have to be moved a small distance sideways so as to release them, and in case of casting on wheels to enable the locomotive to pull out the train without delay. This lateral movement should be made by the returning stroke of the hydraulic rams, but such machinery will not be easy to construct for a group of ingots, especially considering that of the mold and trucks must be made free and clear from all constructions in one moment when the train shall be pulled out. [The difficulties of the problem are detailed at some length.]

How the Requirements May Be Met.

Looking over the requirements again we find them standing as follows:

1. The casting should be made without changing the ordinary solid tapered molds, but the ingots should be stripped earlier than usual, which can be done.

2. The stripped ingots should not be removed from their places on the bottom until the compression is finished.

3. In order that the pressure may be continued according to the solidification, all the ingots will have to be pressed simultaneously, but they must be finished at different periods, according to the difference in heat between the preceding and following ingots.

4. This should arrange itself automatically without any special attendance and the work of hauling, &c., should be reduced to a minimum.

5. The installation should be sufficiently simple and not occupy too large space in a steel works.

To all appearance there is only one way to accomplish this: Leaving the early stripped ingots standing inside of a framework, pressing the whole row of them simultaneously by a wall moved forward by driving in wedge blocks. As the construction is patented, I hereby give some details. Figs. 1, 2 and 3 represent the case of a 40-ton charge divided between 18 ingots 18 in. square, 60 in. high, weighing about 2¼ tons each.

In Fig. 1 the first view shows the press A and the ingot train B during casting. The molds can remain the same as they are now, but the bottoms should be made so as to extend whole under each group of molds. As early as practicable after casting the ingots are stripped. For this purpose it is desirable that the taper of the molds as well as their inside condition is such that the stripping can be done by ordinary plunger. For this size of ingot the stripping should be done not later than 15 min. after casting, when a crust is found sufficient to hold the liquid interior. In the second view the train has moved nearer to the press and the stripping of the ingots has begun. Three ingots are placed on each car, although the number is generally two. On each group of ingots has been placed a frame of cast iron, D, filling up the space between the ingots, and the outside plates provided with ridges are inserted between the ingots and flanges on the bottom plate. These frames are simple to make, and can be shoved in sideways. Their placing in position by traveling crane will only take a few minutes. These frames keep the ingots from falling when they stand stripped on the moving cars unsupported by the molds, and they take up the side pressure during the compression.

The frames are left on the ingots until the train has departed from the press and reached the soaking pit, where they are easily taken out at the time of lifting the ingots. The stripped ingots standing on the train are immediately backed up by the locomotive so as to enter the press, as shown in the third view of Fig. 1.

Operation of the Lilienberg Press.

Figs. 2 and 3 show the installation and operation of the machine. On the cross section Fig. 2, the ingot A is shown as caught between the two walls. The movable piece is pressed by the wedge block C being forced in between the stationary wall D and the movable one B. Roller bearings are placed between the wedge blocks and the walls, as otherwise an extravagant expenditure of force would be needed. These are made very simply of solid rolled steel with the ends set off and inserted into links. The link chains turn around half-round surfaces on each end of the press. The returning idle parts of these link chains and roller bearings move the one outside the fixed wall and the other inside a cavity in the movable wall, as shown at E and F, Fig. 2. The links holding the rollers slide between channel irons fixed to the walls. The lower of these contains steel balls on which the links can roll. It should be remembered that the movement will be as slow as about ¾ in. per second, and that therefore these roller bearings do not have many of the inconveniences of ordinary rapid roller bearings. The wear is of course comparatively small, also the inclination to tilt, which in roller bearings is more apparent in conical than in cylindrical rollers. To steady them against tilting the chain can be made to contain plates at a few points having rollers inserted and made like hinges to bend around the ends. These link chains present the advantage over other roller bearings that they can

be inspected during the open passage around the ends, and it is easy during the slow movement to exchange any broken or worn part.

The wedge blocks are in this case 6 ft. long, 3 ft. 9 in. high. The ends stand at right angles to the side gliding against the fixed wall and the opposite side is tapered. As the time of compression is about twice the time of casting, the first cast ingot placed in the front end of the press should be only half pressed through when the last cast ingot at the other end begins to be pressed. With a compression of 3 in. the tapering of the wedge blocks should therefore be 1½ in. on the blocks moving in the press at the same time, that is about ⅛ in. per 6 ft. length. Beginning with a thickness of 12 in., the last end of the blocks should therefore be 15 in. It is easy to make the total slanting surface of the blocks slightly curved, so that the pressure is automatically changed according to the different periods of solidification. The wedge blocks should preferably be made of steel and planed on all sides, but if this should be too expensive some good cast iron chilled on the two long sides can be used. As the blocks are driven out from the press they are taken care of by the traveling crane, returning them in groups to their position. This is the only actual handling during the operation. The blocks stand on rollers ready to be fed in before the hydraulic rams one by one by a simple mechanism. The rollers are connected by cog wheels and by a rack with slanting teeth, which is moved back and forth from two corresponding cog wheels T and U, Fig. 3, fixed on a vertical shaft. The upper of these cog wheels engages in a short rack fixed on the crosshead of the hydraulic piston rods. It is thus apparent that the movement of the pistons feed in the blocks automatically into position for the next forward stroke. The last wedge block is driven forward by blocks with parallel sides leaving a clearance space of 3 in. When all the wedge blocks are driven out the movable wall is thus released and can be moved backward. The release is then effected automatically by drawbars, G, hooked on the top of the movable wall. These bars are connected with levers H on which the weights I hang.

The hydraulic compressor is composed of two cylinders, K, and pistons, L, which in this case have a stroke of 7 ft. The piston rods are 10 in. in diameter, which is somewhat more than is needed for the strength in order to reduce the consumption of water at the returning stroke. The front ends are screwed to a cross head, M, which is guided by sliding on the bolts N, connecting the cylinders with the press. The valves are made as revolving disks, but can just as well be piston valves if this should be preferable. The movements of the valves are automatic by connecting them with a sliding bar, P, provided with lugs which are pushed by the movement of the cross head.

The construction of this machine is not difficult, and it does not contain more movable parts than several appliances in a steel works (for charging, &c.). It is evident that the automatic movements reduce the attendance, and this consists in fact only by the work of one machinist in regulating the hydraulic pressure and looking at the proper movements of all parts. It is the only machine in which all the ingots are finished automatically in order according to their solidification.

For a machine treating 20 tons, or 10 ingots 17 in. square 55 in. high, standing on five cars, the train occupying a length of 32 ft., the estimated cost is $33,159.

Pressing Stripped Ingots in a Casting Pit.

The same principle as previously described is applied to this case, but the construction of the machine has to be different. As the stripped ingots must not be removed the casting pit will have to be contained in the press and sufficient space given for lifting the molds, handling the ingots, changing the bottoms, and getting down into the pit for cleaning. The distance between the movable and the fixed wall will therefore have to be greater than in the previous case, and the movement of the movable wall back and forth will have to be made by special machinery before the pressure with the wedges is applied. [In the concluding portion of the paper details of this special adaptation of the mechanism are given.]

A. B. C. Blowers in New York City.

A census of the more important blower equipments in or about New York City, and particularly in connection with the ventilation of subways and tunnels, shows a rather remarkable number to the credit of the American Blower Company, Detroit, Mich. Shortly after the opening of the New York Subway it was decided to ventilate the station toilets by some positive means. Small volume blowers were adopted, and 60 outfits were furnished by the American Blower Company. Later the Rapid Transit Commission (as it was then) decided upon a plan for ventilating the Subway itself by means of centrifugal exhausters, and for this purpose A B C steel plate exhaust fans were adopted, 25 of which have been installed in special vaults built in the line of the Subway, about midway between stations, from Fulton to Fifty-ninth streets. These exhausters draw the air from the Subway, many thousand cubic feet a minute, causing an equal amount of fresh air to flow in at the stations. This action is augmented by the plunger effect of the trains themselves forcing the air out through the fan vaults, by means of automatic louvres, which allow the air to pass out, but close automatically when the air tends to flow in the opposite direction. Independent of the ventilating equipment a cooling plant was installed at the Brooklyn Bridge station of the Subway, which employs four more large A B C fans.

In the tunnel extending under the East River from the Battery to Brooklyn, connecting the subways of Manhattan and Brooklyn, opened within the last few months, fresh air is supplied by A B C blowers, two of which are installed at each end of the tunnel, supplying air in the directions in which the trains operate. Following closely upon their adoption by the Interborough Rapid Transit Company, the engineers of the Hudson Companies decided upon A B C blowers for the ventilating of the McAdoo or Hudson tunnels, connecting New York and Jersey City, and the architects of the Hudson Terminal Buildings, for the ventilation of these large buildings, which, taken together, will form the largest office building in the world.

Among the tall buildings in New York which are equipped with A B C fans are the Singer, City Investment, Trinity, United States Realty, West Street, Bank of America, Tribune, St. Paul, United States Express and Flatiron buildings. Less conspicuous in point of hight, but quite as well known, are the Macy, Wanamaker, Altman, McCreery and Claflin stores, the New York press and Saks buildings, the Hippodrome, Police Headquarters, Fordham Hospital, the various public baths, and many others.

The Pennsylvania Railroad Company's Rail Specifications.

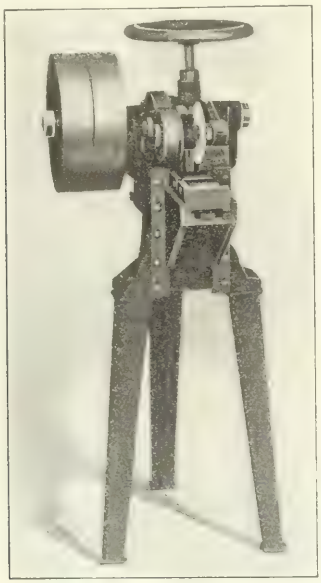
With regard to reports emanating from Pittsburgh to the effect that differences exist between the Pennsylvania Railroad and the United States Steel Corporation over the new steel rail specifications, the following statement has been issued by the Pennsylvania Railroad Company:

"The report in the daily papers to the effect that there is a controversy in progress between the Pennsylvania Railroad and the United States Steel Corporation on the question of the new steel rail specifications is entirely without foundation. The Steel Corporation has not refused to manufacture these rails under the specifications as given, and the Pennsylvania Railroad has not addressed any communication to other lines for the purpose of inviting a discussion of the subject. In view of the fact that the specifications for 1908 were entirely new and represented many distinct innovations in the art, the question of the price to be paid for the rails naturally had to be taken up and agreed upon. Consideration of that subject is now in progress."

It is well known that many other railroads give their orders for rails on the basis of the Pennsylvania's specifications, and for this reason it is natural that care should be used in fixing a price for the new rails, for it will govern not only the Pennsylvania Railroad's order, but other orders as well.

The Victor Pipe Cutting Machine.

A power operated machine for cutting off pipe to lengths, using a gear driven rolling cutter, is offered by the Patterson Tool & Supply Company, Dayton, Ohio. The machine is particularly intended for plumbers and steam and gas fitters and will cut off any kind of pipe from ¼ to 2 in. inside diameter to any lengths. The principle is very much the same as that of the ordinary hand pipe cutter, except that the cutter, instead of being revolved around the pipe, is held stationary and the pipe revolves by the action of the cutter. It is declared that the machine will do the work quickly and cut a perfectly square end, which makes it easy to start a straight



The Victor Power Pipe Cutting Machine Sold by the Patterson Tool & Supply Company, Dayton, Ohio.

thread on the pipe, and that there is scarcely any burr left on the inside of the pipe.

As the illustration shows, the machine is very compact. It occupies a floor space of 18 x 24 in., is 48 in. high and weighs 210 lb. It is constructed to withstand the ordinary usage that such a machine is likely to be put to. The gears are cut from the solid, the cutter spindle is of steel and has bronze bearings, and the lower rolls and bearings upon which the pipe rests are of tool steel and hardened. These rolls are mounted upon the main saddle in a frame which is adjustable vertically, so that the rolls can be caused to press the pipe upward against the cutter by turning the hand wheel at the top.

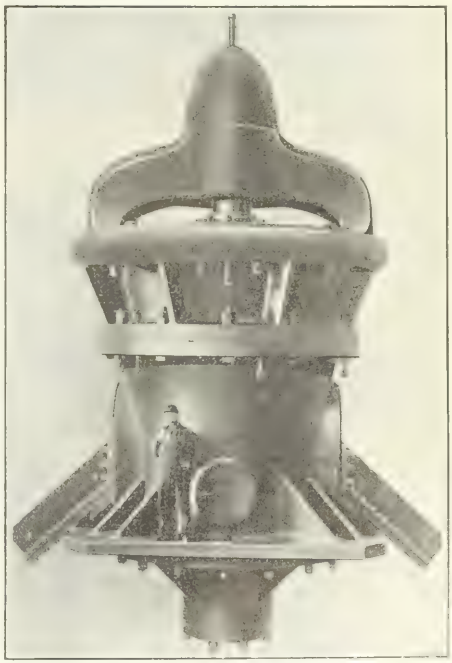
The machine is generally placed at the end of a bench which supports the long end of the pipe when the latter is placed in the machine. If desired the pipe may rest in a V block on the bench to lessen the friction while the pipe is rolling. When in this position the pipe is shifted until the point at which the cut is to be made is directly under the cutter of the machine, and then the hand wheel is turned at the top. This brings the pipe in contact with the cutter and the pipe begins to revolve by power and continues to do so until the pipe is cut off, the feeding being accomplished by the manipulation of the hand wheel, which maintains the pressure between the pipe and the cutter.

It is claimed that the machine when cutting off pipe will not split it even when a short end is cut off. For example, a pipe which is perhaps only ⅜ in. or more too long can be cut to proper length without splitting. Actual tests have shown that it is possible to cut a piece of either part.

A Big Allis-Chalmers Rock Breaker.

One of the direct results of the extended use of crushed stone in concrete construction and other industrial uses is a growing demand for crushers of greater power and capacity. The accompanying illustration shows what is described as one of the two largest rock crushers ever built, and was made at the Reliance Works of the Allis-Chalmers Company, Milwaukee, Wis., for the Casparis Stone Company, Columbus, Ohio. This machine is known as No. 18, Style K, breaker, and stands 25 ft. high, measures 14 ft. across the top shell, and weighs approximately 400,000 lb. It has a minimum feed opening between the crushing surfaces of 36 in., and is supplied with two discharge openings through which the crushed product leaves the machine, differing in this respect from the smaller breakers, which usually have but one opening. This arrangement makes it possible to build the machine lower, thus making it more stable and at the same time obtaining a better angle for the discharge.

This machine is adapted to use only in the largest quarries, where the stone is blasted, taken out with powerful steam shovels, and brought to the crusher in very big



A No. 18, Style K, Breaker Built for the Casparis Stone Company by the Allis-Chalmers Company.

pieces, many of which are too large to be handled by breakers of the greatest capacity heretofore built. It is stated that the machine illustrated is capable of crushing the largest pieces which it is practicable to take from the quarry without the need for any preliminary breaking by sledge hammer or secondary blasting.

In ordinary practice stone is lifted in quarry cars up an incline to a platform at the top of the breaker, and is automatically dumped into the top of the machine. It therefore can be seen that the capacity of this mammoth crusher is practically unlimited, for it is practically impossible to bring stone from the quarry fast enough to choke it. A clear idea of the unusual size of the machine is furnished by the contrasted proportions of the man standing on its base.

Rodd's Improved Automatic Nut Tapper.

The nut tapper shown herewith is designed to thread automatically nuts of all kinds, whether manufactured in large or small quantities. The machine is fully automatic, and claimed to be rapid and economical, the rated capacity of a ¼-in. machine tapping steel nuts being 18,000 in 10 hr., and other sizes in proportion. The machine was designed by Robert T. Rodd, Cuyahoga, Ohio, who for a number of years has been with the Falls Rivet & Machine Company as superintendent of its rivet and bolt works. It is built by that company, and the Waterbury Farrel Foundry & Machine Company, Waterbury, Conn., and 428 Williamson Building, Cleveland, Ohio, is the sole selling agent.

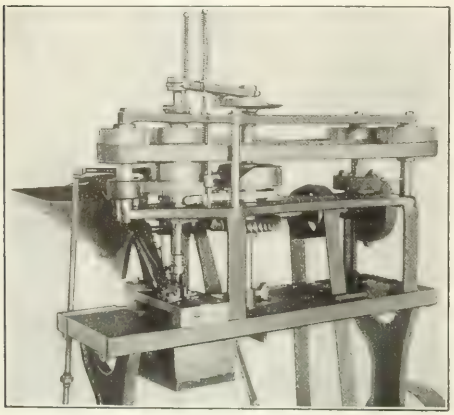


Fig. 1.—The Head of Rodd's Automatic Nut Tapper.

Referring to the illustrations, the drive is imparted to the horizontal shaft *a*, Fig. 3, and thence through bevel gears to a vertical shaft, from which the tap spindle is driven by an endless belt. Motion is also transmitted from the driving shaft to the vertical cam shaft *c* through worm and worm gear *d*. The tap spindle shaft *b* runs in a quill, *e*, which is supported at its upper end by the ball race *f*, the function of which is to take up the upward thrust of the clutch to reduce friction. The tap spindle is splined to the quill, so as to rotate with it, but is free to slide up and down. It is raised by the cam *g* on the vertical cam shaft working through the fork *h* and collar, and descends by gravity.

Mounted on and attached to the quill *e* is a cone clutch. *k*, which is adapted to engage with the pulley *i*, mounted loosely above the clutch on the quill. This mechanism permits the application of the fundamental principle of the machine, that of an endless belt revolving a tap, tapping at slow speed and withdrawing at high speed.

The lower half of the clutch consists of a cone, *k*, which carries on its outer edge, integral with it, the gear *r*. The cone is loose in the cup *i*, and is recessed on its under side for the hardened steel ball races *l*. It receives its thrust motion upward to engage with the cone pulley from the pressure of the springs *m* located in the frame of the machine. These springs, which are easily adjustable for tension, support the ball race *l*. As the center cam *o* revolves its lower edge releases the fork *p*, allowing the clutch *k* to be thrown into engagement by the springs. Simultaneously the belt is shifted by the upper face of cam *o* to the idler pulley *j*, and the tap is revolved at slow speed, being driven from the forward pulley *q* through the train of gears *r*, *s* and *t*. On completion of the tapping operation the cam draws the cone *k* out of engagement, removing the pressure from the ball races, and the belt shifts to the clutch pulley *i*, causing the tap to reverse at high speed. Simultaneously, the spindle is lifted by the cam *g*, the nut is dropped from the tap and another blank is immediately brought into position ready to be tapped.

The blanks, which should be uniform in size and diameter of hole, are placed in the hopper *u*, and by means of suitable mechanism are fed through a chute into a pocket, from which they are transferred successively to position beneath the tap by the action of the lever *v*, which once in each cycle is oscillated by a cam near the lower end of the cam shaft *c*. If a tap breaks or refuses to act, the feeding of blanks stops automatically until the trouble is corrected. It will be noticed that the threading of the nut is always performed through the train of gears without the use of lead screws or other complicated mechanism, the tap entering the nut by gravity, assisted if necessary by the pressure of a spring on the top of the fork *h*, the tension of which may be regulated or entirely released. Withdrawing the tap

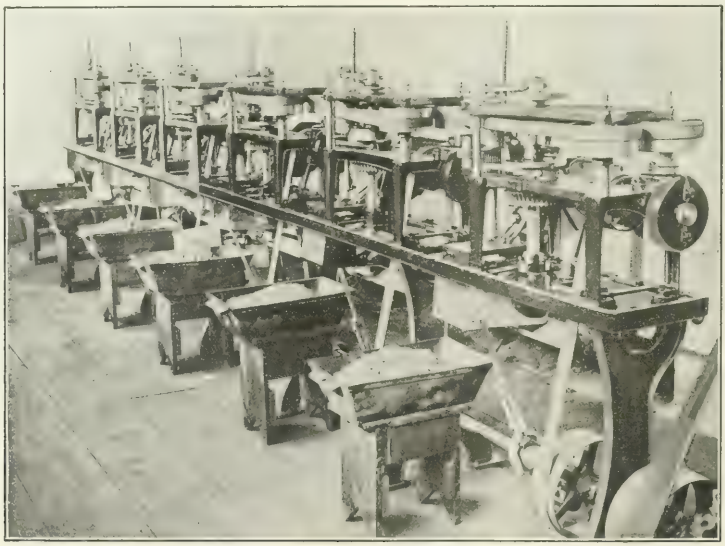


Fig. 2.—A Group of Six Tappers Mounted on One Base.

from the nut is accomplished by the open belt, the train of gears and clutch meantime running idly. The rear idler pulley *w* is carried on an eccentric sleeve which may be revolved by the attached handle and serves to take up the slack in the endless driving belt; this adjustment may be made while the machine is in motion.

The Rodd nut tapper is at present built in sizes to handle nuts from ⅛ to ½ in., and larger sizes to order. The machine may be used singly, as shown in Fig. 1, or in groups of two or more. The manipulation is so simple that one attendant can usually take care of six or eight. A machine of six unit type is shown in Fig. 2. Each unit has its own separate driving clutch on the single main countershaft, which is preferably mounted beneath the table on the legs of the machine; thus overhead belting is avoided and floor space saved. By the method of driving through individual clutches greater facility is obtained in setting up and handling work and the taps. All the operations of the tap threading and withdrawing are in plain sight. It is impossible to mix blanks and finished nuts. A forced system of lubrication is provided, together with catch pans for returning the lubricant to a common center for redistribution. The wearing parts of the machine are of steel, hardened where necessary, and the bearings are of bronze. All gears are cut.

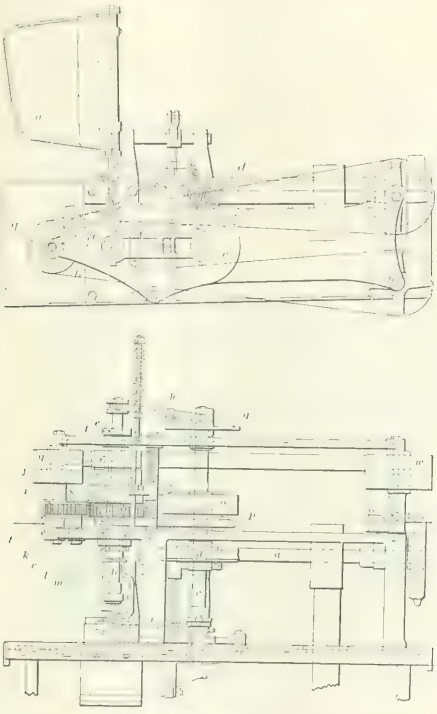


Fig. 3. Top View and Front Elevation of the Working Parts of Rodd's Automatic Nut Tapper.

The record of one of these machines for 22 days in one month shows that tapping ⅝-in. United States standard steel nuts, 16 threads to the in., each tap used on the machine during the period tapped on the average 63,955 nuts, so that the cost of tapping was very low.

The No. 1 machine taps 5-32, 3-16, ¼ and 9-32 in. nuts, at the rate of 30, 30, 27 and 25 per minute, respectively, weighs 550 lb. and occupies a floor space of 29 x 35 in.; the No. 2 machine taps ¼, 5-16 and ⅜ in. nuts at the rate of 27, 25 and 23 per minute, respectively, weighs 600 lb. and requires a floor space 30 x 48 in., and the No. 3 machine taps 7-16 and ½ in. nuts at the rate of 16 and 13 per minute, respectively, weighs 675 lb. and requires a floor space 32 x 48 in. Each machine will tap a nut of any thread common to the sizes within the respective capacities stated above.

Customs Decisions.

Miners' Diamonds.

A customs controversy, involving nearly $1,000,000 worth of imports annually, has arisen between the Government and importers of so-called miners' diamonds used extensively by miners in the construction of drills. For many years it has been the practice of the Treasury Department to admit the diamonds duty free, under the provision in the tariff for "miners' diamonds, not set." The Government now comes forward and insists that, as the diamonds are advanced in value by splitting or cutting, they should be classified under paragraph 445 of the law, which specifies duty at the rate of 10 per cent. To determine the correctness of the Government's action in returning the stones for duty, a test case has been brought by the Sullivan Machinery Company, Chicago. Hearings have been held before the Board of United States General Appraisers. At the request of John A. Kemp, solicitor of customs, General Appraiser Sharretts has granted an adjournment of the case until March 13, to enable the Treasury counsel to produce witnesses to substantiate the contention for the imposition of the 10 per cent. duty.

The Board Refuses to Mandamus a Collector.

The Board of United States General Appraisers has laid down the principle that the tribunal has no authority to issue an order in the nature of a mandamus to compel a collector of customs to grant a reappraisement after such official has declined to accede to the request of an importer. It appears that R. F. Downing & Co., New York, imported an automobile which was assessed by the collector at a valuation deemed excessive by the importer. Thereupon an application was lodged with the collector by the firm within the prescribed time demanding a reappraisement before the Board of Appraisers. The collector reported to the board that he refused to transmit the request on the ground that no regular entry of the merchandise had been made and no certified invoice presented. The importer's contention in writing follows:

> It is respectfully submitted that the protest must be sustained and that the liquidation of the collector must be declared invalid and of no effect, and that this board order the collector to forthwith direct a reappraisement, as originally demanded.

In dismissing the protest Judge Somerville, in his decision for the board, says in part:

> The application of the importers is tantamount to requesting the board to grant what in legal effect would amount to a mandamus to the collector, ordering him to grant a reappraisement. Such an order could not be made without express statutory authority. It has been held that even the circuit courts of the United States have no jurisdiction of an original proceeding seeking relief by mandamus.

Steel or Stamped Shapes.

The Board of United States General Appraisers has taken adverse action on a protest filed by the Cleveland Stamping & Tool Company, Cleveland. It was decided that so-called steel shapes are properly dutiable at 45 per cent. ad valorem under the steel provisions of the tariff. It was alleged by the importers that the merchandise should be admitted to classification at specific rates as "stamped shapes." In overruling the protest, the decision says, in part: "No evidence has been offered to sustain the importer's contention as to the character of the merchandise. The case has been submitted for our decision on the record, and various official samples forwarded with previous protests of the same importer are said to properly represent the goods here in question."

Tube C, the third of the Pennsylvania Railroad tunnels under the East River connecting New York with Long Island, was put through March 5. Boring in the first two tubes was completed a few days previous. The last of the four will be put through by the end of this month.

Boiler Feed Water Treatment.

All natural waters contain some impurities, the kind depending upon the nature of the soil or strata over or through which the water has passed. When introduced into a steam boiler the impurities are precipitated, either because the water at the higher temperature loses its power of holding in solution these impurities, or, owing to the concentration from the evaporation of some of the water, the remainder becomes supersaturated and the impurities in excess crystallize or otherwise deposit.

The Causes of Scale.

When deposited in a steam boiler these impurities take the form of scale, more or less hard and adherent, depending upon the nature of the impurities and the rate and temperature at which the boiler is operated. This scale is a source of annoyance and expense, and is often so serious as to be dangerous. Occurring as it does on the heated parts of the boiler, it materially reduces the efficiency of the transmission of heat through the metal. If the scale is very thick the resistance to the passage of heat may be so great as to overheat the metal, thus reducing its strength and causing a dangerous condition to ensue, which may result in bagging of the plates, rupture of the parts, or even explosion. This scale must be removed from time to time.

Nature does not provide us with water that is soft and clear, except in rare instances. Nearly all natural waters, whether from streams, lakes or wells, hold in solution and suspension both organic and inorganic matter. The organic substances are vegetable and animal, and are taken up either by flowing over the ground or by direct contamination from city or factory wastes. These substances, however, are not usually present in sufficient amount to be objectionable for boiler feed use. The inorganic impurities, such as lime, magnesia and iron in combination as carbonates, sulphuric and hydrochloric acid, a small amount of silica and the oxides of iron and alumina, are the ones which cause trouble for the steam plant owner.

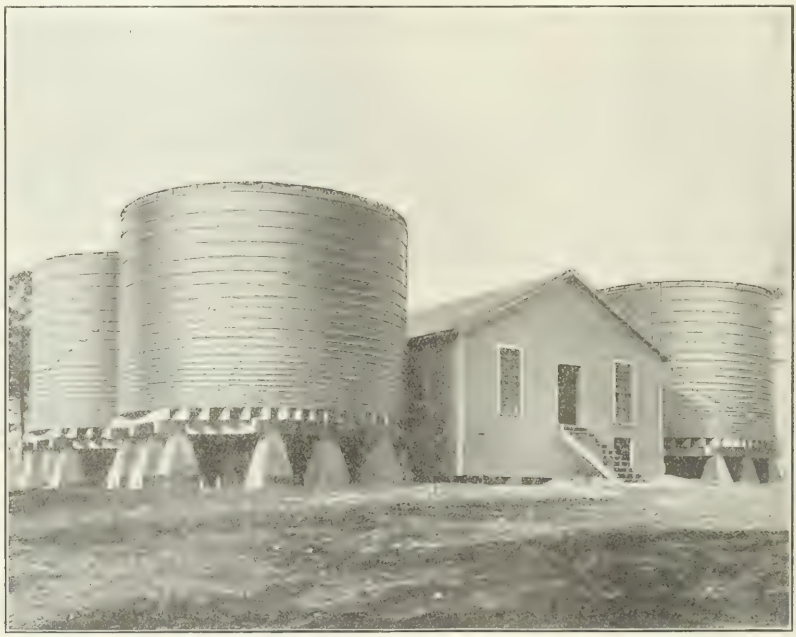
The Causes of Corrosion.

Some natural waters contaminated from coal mines and other industries contain free acid, such as sulphuric, which causes considerable trouble from corrosion. There are also some salts, such as magnesium chloride, which at the temperature of the boilers are dissociated and liberate acids which rapidly destroy the metal of the boiler.

Remedies for Bad Feed Water.

There are three ways by which it is possible to operate steam boilers on hard water. The first and oldest, consists in scraping and picking the scale from the boilers. This is expensive, laborious and often ineffectual; but, having been resorted to for so long it is considered by some the only proper method, notwithstanding the expense.

The second is the use of chemicals introduced directly into the boiler to throw the scale forming matter into suspension in a form that will not adhere to the boiler as scale. This, with the compound introduced, fills the boiler with a muddy, insoluble mass. Blowing off only partially removes the suspended mass. To blow it all out would mean emptying the boiler and introducing fresh water, requiring more compound and the formation of a similar mass of sludge. The steam leaving the boiler takes none of the sludge with it unless the boiler is priming, when it is carried over mechanically, and may cause trouble in the engines. This muddy, insoluble mass increases the density of the water in the boiler, thus raising the boiling point (for the same reason that it requires more heat to boil sea water, and more heat to boil molasses than either), which means more heat, and therefore more fuel. And not only the expense of additional fuel, but the cost of the compound must be taken into consideration.



Exterior View of a 10,800 Hp. Wo Pa Co Water Softening and Purifying System Installed for the Woodward Iron Company, Woodward, Ala., by the Wm. B. Scaife & Sons Company, Pittsburgh, Pa

The chemistry of boiler compounds is correct and is thoroughly understood. But a boiler is a still of high efficiency under proper conditions, and not a retort for carrying on chemical reactions, all of which require heat in addition to interfering with steam generation in the boiler, nor is a boiler designed for storing suspended matter.

The third way to take care of steam boilers is to feed into them nothing but clear soft water. Inasmuch as it is generally impossible to obtain a natural supply which will allow boilers to be operated economically, the consideration of the best means for eliminating the in-

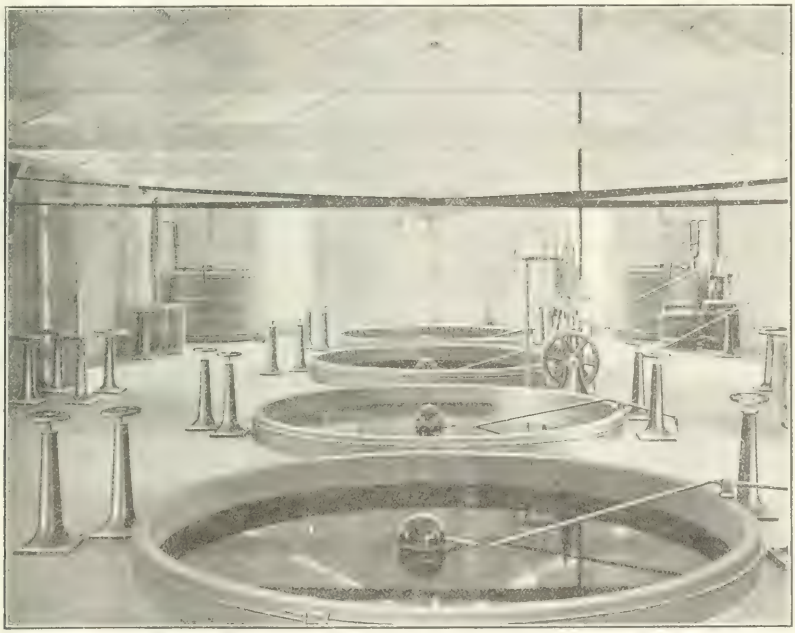
crusting and corroding substances from the water before feeding it into the boilers is important. There are only two methods, distillation and chemical softening and purification of the water. Distillation is at a disadvantage on account of the extremely high cost of the apparatus and the continued high cost of producing distilled water. An apparatus to economically distill 10,000 gal. of water per hour by means of quadruple effects will cost about $40,000, and the best figure on record for distilling 1000 gal. of water, with coal at $2 per ton, is in the neighborhood of 40 cents. With the ordinary distilling apparatus with coal at the same cost, the cost of distillation runs as high as $5 per 1000 gal.

The Chemical Softening and Purifying of Water appears to be the ideal and correct way to prepare the ordinary boiler supply. Although the process of water softening was discovered by Cavendish as early as 1766, and later in the same century by Thomas, it was not tried on a practical basis until 1841, when Dr. Thomas Clark of Aberdeen, Scotland, built a water softening system, and later, in conjunction with Porter, brought out the lime and soda process used to-day.

All sorts of substances have been tried, but so far none have produced as efficient results for the same cost as can be obtained with lime and soda. Mechanical devices of every kind have also been tried. Feed water heaters are frequently advertised as water purifiers, and they are to the extent that by heating the water to about 212 degrees they precipitate some of the carbonates of lime and magnesia. Live steam heaters fitted with pans for catching the precipitation of the scale forming matter and in which the water is raised to boiler temperature, are also in use to a considerable extent. However, heat alone does not bring about the complete purification of water unless concentration occurs, which cannot be effected in any type of feed water heater. Even with the introduction of chemicals into feed water heaters, complete purification cannot be effected, because sufficient time is not allowed for the reactions to take place. Mechanical devices consisting of floats, skimmers and filters have been applied to make the boiler assist in the purification of the water, but as there is neither energy nor space to spare in the boiler to effect it, these devices have failed to give thoroughly satisfactory results. It therefore seems best to apply the chemical softening and purification of the water before feeding it into the heaters and boilers.

A Typical Equipment.

To obtain the best results from a water softening and purifying system it is essential to have accurate chemical treatment, a thorough mixing of the reagents with the water, apparatus large enough to allow time for chemical reactions to take place, means for mixing the sludge of previous softening to accelerate chemical reaction and hasten sedimentation by weighting the new finely divided precipitate, and a crushed quartz or sand bed filter to insure perfect clarification, so that the water which goes to the boilers is clear. A water softening and purifying system installed by the Woodward Iron Company, Woodward, Ala., embodies these features. This system consists essentially of four treating and settling tanks equipped with mechanical stirring devices operated by power, reagent or chemical mixing tanks with stirring devices, and jet pumps for introducing the reagents into the treating tanks, and four filters to effect final clarification.



View Showing the Interior of the Operating House and the Filters of the Same Water Softening and Purifying Plant

The treating tanks are filled one after the other with water, and while a tank is filling the reagents are introduced and thoroughly mixed with the water by the mechanical stirring device, which consists of an especially designed paddle revolved by the power furnished from a small engine. This paddle not only mixes the reagents with the water, but at the same time stirs up from the bottom the lime sludge of previous purification. This lime sludge floats in the water, hastens the chemical reaction and causes the new finely divided precipitate to form large woolly flakes heavy enough to settle as soon as the water stops moving. After a tank is filled the stirring device is stopped and the water permitted to stand, to allow the precipitate to settle to the bottom of the tank. The softened water is taken out of the tank through a hinged floating outlet pipe, arranged to rise and fall with the water, so that the pipe always draws water from the top. The water at the top being clearest, carries the least amount of floating sludge through the floating outlet pipe to the filter beds; therefore the filters can be operated for a long time without being cleaned. The rate of flow to the filters is automatically

controlled, so that they are supplied with water as fast as it is drawn from them.

While one tank is being filled, treated and settled, one of the other tanks is supplying treated water, and by the time it is empty another tank is ready to use. In this way a constant supply of soft, clear water is always on hand. This system is so arranged that any treating tank can be used with any or all filters, and the entire system can be operated from the filter house located between the treating tanks, as is shown by the accompanying illustration.

The following are the analyses of the water before and after being softened and purified:

Creek Water.	Grains per U. S. gal.	*Creek Water After Being Softened and Purified.*	Grains per U. S. gal.
Volatile and organic matter	0.70	Volatile and organic matter	0.15
Silica	0.85	Silica	0.45
Oxides of iron and alumina	Trace	Oxides of iron and alumina	Trace
Calcium carbonate	4.46	Calcium carbonate	1.45
Magnesium carbonate	1.30	Magnesium hydrate	0.36
Magnesium sulphate	2.46	Sodium carbonate	0.38
Sodium sulphate	1.35	Sodium sulphate	3.12
Sodium chloride	0.82	Sodium chloride	1.48
Sodium nitrate	0.24	Sodium nitrate	0.35
Total solids	12.18	Total solids	7.74
Suspended matter	0.60	Suspended matter	0.05
Free carbonic acid	0.33	Incrusting solids	2.41
Incrusting solids	9.77		

Thus it will be seen that the incrusting solids have been reduced to a point where scale cannot be formed, and the corroding substances entirely removed. It is, of course, impossible to remove from the water all the scale forming matter, but it can be reduced to a point where scale cannot form and the boilers can be kept clean indefinitely.

Chinese Pig Iron in the United States.—Consul-General Charles Denby of Shanghai, China, has written recently concerning shipments of pig iron from China to the United States. Referring to the shipment of 1500 tons of basic iron made to the Atlantic Coast in July, 1907, he says that the price laid down in Brooklyn was $17.50, gold, per ton, including freight of $4.75 a ton from Hanyang to destination. The Hanyang Iron Works are located on the Yangtse River 600 miles from the sea, and from the Chinese seaboard to New York via Suez Canal the distance is 14,000 miles. Such shipments as the above are made possible by the fact that oceangoing vessels can reach Hanyang with 18 ft. draft at nearly all seasons of the year, permitting the loading of cargoes of 2000 tons, and there is no subsequent breaking of bulk. An American company operating a number of trans-Pacific steamships under the British flag has the agency of the Hanyang Iron Works for the supply of Chinese pig iron to the Pacific Coast. Occasional quantities of pig iron are delivered at San Francisco by these vessels, as well as by the Pacific mail steamships. It may have been noticed by our readers that the San Francisco iron market report of *The Iron Age* gives regular quotations on Chinese pig iron. The shipments of pig and manufactured iron from the Chinese Government works at Hanyang in the year 1906 amounted to 41,050 tons, valued at $825,000, gold, an increase of tenfold in 10 years.

The new Wisconsin State Mining Trade School at Platteville, Wis., established by act of the Wisconsin Legislature of 1907, was opened for students January 28, 1908. The first catalogue has just been issued. A two years' mining course is provided. Underground work is required for a diploma and a minimum of 96 shifts must be worked, half of the time in coal mining and half in metal mining. Platteville is located in the southwestern corner of Wisconsin, in a district in which lead mining was carried on a century ago. Within a mile of the mining school six productive zinc mines are now being worked. A large body of zinc ore underlies the mining school building, and plans are under way to sink a shaft for its development. The director of the school is Robert B. Brinsmade, instructor in mining and natural science.

The Burke Two-Spindle Automatic Milling Machine.

With the exception of the automatic knee and a slight variation in some of the dimensions, the machine illustrated is similar to the two-spindle milling machine illustrated in *The Iron Age* April 25, 1907, built by the Burke Machinery Company, Cleveland, Ohio. The new feature, however, is a radical one—a knee which raises, reverses and lowers automatically—and this machine is the only one of its type on the market. It is especially designed for use in typewriter factories, where there are large numbers of duplicate parts to be milled, and four or five of the machines, it is claimed, can be operated by one girl.

Fig. 1 is a general view of the machine and Fig. 2 gives elevations from which the automatic operation of the knee may be understood. In a recess in the front of the machine is mounted a drum cam, *a*, which rests on

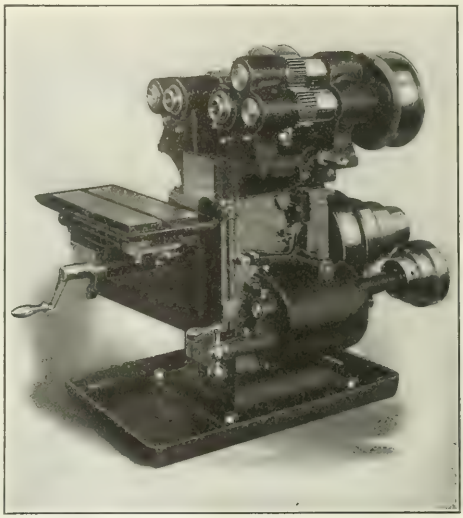


Fig. 1.—The Two-Spindle Automatic Milling Machine Built by the Burke Machinery Company, Cleveland, Ohio.

a ball thrust bearing and is held at the top by a dead center. The spiral groove in this cam has two pitches, a coarser one at the bottom and a finer one at the top. By means of these different pitches the knee is raised and lowered at different speeds, rising rapidly until the work engages the milling cutter and then more slowly while the cut is being taken. After the machine is reversed the knee travels downward again at an increased speed until the work is clear of the cutter and then drops very rapidly to the starting point.

The cam is revolved by a worm wheel attached to the bottom of it, driven by a worm on a cross shaft, which is bevel gear driven from the feed gear box mounted on the side of the column. The knee is adjustably mounted on an intermediate saddle bearing against the front face of the column, so that its vertical position, when the faster elevating movement changes to the slower one, may be varied to suit the work and the cutters. The intermediate saddle carries a roller follower engaging in the spiral groove of the cam. The limit of the upward movement at the slower speed may be altered to suit the work by shifting the adjustable stop *d*. The spindles rotate in opposite directions and the work is passed between the cutters, the two ends of a piece being thus cut simultaneously with a downward cut in each case.

Assuming the work to be set up and the various adjustments made, the operation is started with the knee in its lowest position. The lever *b* is depressed and the lever *c* raised to the respective positions shown in Fig. 2. Then the clutch mechanism associated with the lever *c*

is thrown in by depressing that lever, which causes the knee to rise, first rapidly until the cutting begins and then slowly until the adjustable stop *d* lifts the lever *b* and the overlapping lever *c*. When these reach the position where the pin *e* registers with a slot the pressure of a spring behind the pin causes it to enter the slot, and the clutch is thrown past the center so as to engage on the opposite side, causing the knee to descend again to its starting point, as determined by an adjustable stop limiting the lowering movement. The clutch is then disengaged and the knee comes to rest and remains so until the work is removed, a new piece substituted and the operation repeated by setting the levers as described.

The table has a longitudinal adjustment of 6 in., a transverse feed of 1½ in. and a maximum vertical movement of 5½ in. The adjustment of the knee on the intermediate slide is 3 in. The working surface of the table is 12 x 5 in. The maximum and minimum distances between the two spindles are 6½ and 4 in. No. 9 B. & S. taper holes are provided in the ends of the spindles. The overall hight of the machine is 25 in. and the weight 475 lb. The machine may also be used for surface milling, and with both spindles working simultaneously the capacity is practically double that of a single miller.

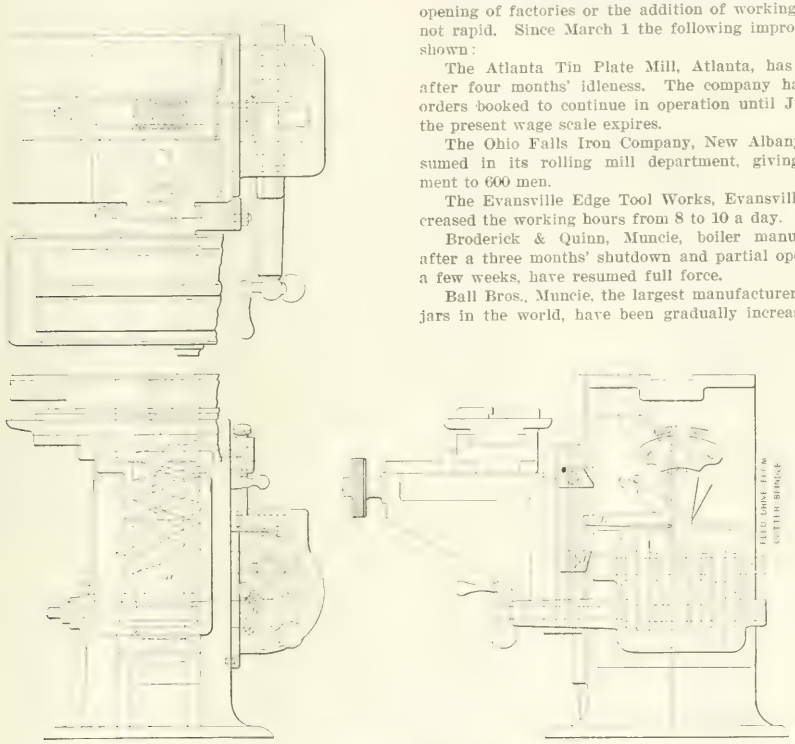


Fig. 2.—Top, Front and Side Views, Showing the Mechanism Effecting the Automatic Raising and Lowering of the Knee

The Philippine Islands and United States Trade.—We have received a brochure of some 60 pages entitled "Reciprocal Trade," from Harold M. Pitt of the Publicity Committee of the Manila Merchants' Association, Manila, P. I. This publication is intended to develop a sentiment in favor of free trade between the United States and the Philippine Islands, and presents strong arguments therefor. It gives comprehensive statistical articles on specific subjects. For instance, chapters are specially devoted to agricultural implements, iron and steel manufactures, brass and copper products, instruments and apparatus for scientific purposes, cotton goods, &c. Tables are presented which show how little the United States is exporting to the Philippines at present and what the increased volume of such exports would probably be if our trade relations with the islands were on the same basis as with Porto Rico, which has enjoyed free trade with the United States since 1901. Those who are interested in this matter can doubtless secure copies of the work by addressing the Publicity Committee of Manila Merchants' Association, 27 Escolta, Manila.

Indiana Industries Reviving.

INDIANAPOLIS, IND., March 16, 1908.—The industrial situation in Indiana continues to brighten, though the reopening of factories or the addition of working forces is not rapid. Since March 1 the following improvement is shown:

The Atlanta Tin Plate Mill, Atlanta, has reopened after four months' idleness. The company has enough orders booked to continue in operation until July, when the present wage scale expires.

The Ohio Falls Iron Company, New Albany, has resumed in its rolling mill department, giving employment to 600 men.

The Evansville Edge Tool Works, Evansville, has increased the working hours from 8 to 10 a day.

Broderick & Quinn, Muncie, boiler manufacturers, after a three months' shutdown and partial operation of a few weeks, have resumed full force.

Ball Bros., Muncie, the largest manufacturers of fruit jars in the world, have been gradually increasing their force until 950 of the 2000 employees are again at work.

All but one of the 55 manufacturing plants of Kokomo are again in operation. Not all are running full time or with full forces, but it is believed that such a condition will be reached this spring. The Kokomo Steel & Wire Company, having the largest plant, employing 1000 men, has exceeded in the last eight months the business done in any corresponding period since its organization, seven years ago.

The Chicago Sewer Pipe Company, Brazil, has resumed with a full force, after a suspension of six weeks. Nearly all the factories in the city are now working full forces.

The Caldwell & Drake Iron Works, Columbus, has been forced to night work to keep up with orders. The company has never been busier.

The large double tank factory of the American Window Glass Company, Hartford City, is in blast again, giving employment to 600 workmen. It is the largest machine equipped plant west of the Alleghenies. It was idle since September, since which time, however, it has been rebuilt and doubled in capacity. It is known as the No. 3 plant. Fires have been put under tank No. 2, and it will soon be in operation with 300 men.

Charging Machines for Cupolas.*

BY G. R. BRANDON.†

The very simplicity of the work of collecting charges and of the operation of charging itself has induced neglect of this important department. A little study into methods might lead to the adoption of a more efficient vehicle for carrying charges, the use of cars, for example, with roller bearings and running on tracks instead of wheelbarrows. The arrangement of tracks to permit through routing and the location of the scale for weighing charges are of an importance frequently overlooked, and it is surprising that in this enlightened day the long inclined plane, taking up much valuable space and with its laborious methods, is still used in place of the modern foundry elevator. Where the material handled is in sufficient quantity a quick acting electric traveler should be installed to cover the entire stock yard, to unload pig iron, fuel and supplies and also handle flasks. A magnet can be used for handling pig iron and a drop ball for breaking scrap with distinct advantage. Charges may be collected from different parts of the yard and raised to the charging floor with a crane at minimum expense. The charging operation lends itself to power manipulation, and consequently at this point a saving in labor may also be obtained. The purpose of this paper is to describe the charging machine developed and manufactured by the Whiting Foundry Equipment Company, Harvey, Ill.

The designers are indebted to the blast furnace operators for the idea of the charging machine. Every one is familiar with the skip hoists and the great saving effected over the old practice of using elevators and dump buggies pushed by laborers. This refinement in handling charges naturally was introduced by the blast furnace people, as their operations are continuous for months, 24 hr. a day. The elimination of laborers made tremendous economy in cost of production. The skip hoist is an end dump and is fitted with automatic features which would not be applicable to the conditions in cupola practice. There have been end dump machines used for cupolas, and the author believes such a device is in use at the Pennsylvania Car Wheel Company. The Whiting Company has adopted the side dump, claiming it to be simpler and better for continuous movement of cars. Other advantages are that there is less handling of cars and a narrower charging floor is permissible.

The construction of the Whiting pneumatic machine

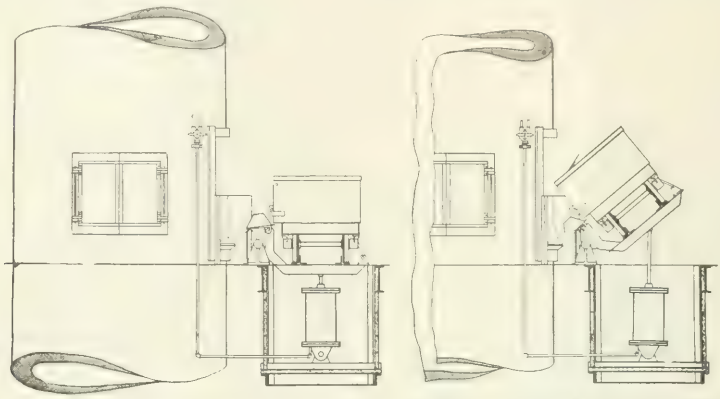


Fig. 1.—The Whiting Cupola Charging Machine with the Car Ready to Dump and in Dumping Position.

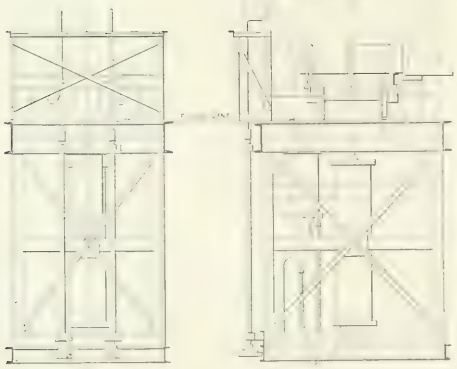


Fig. 2.—Front and Side Elevations of a Whiting Compound Cupola Charging Machine Arranged to Elevate the Car Before Dumping It.

* From a paper read before the Pittsburgh Foundrymen's Association, March 2, 1908.

† Whiting Foundry Equipment Company, Harvey, Ill.

is illustrated in the drawings. Fig. 1 gives elevations of the machine with the car in position ready for raising and in dumping position. The machine consists of a platform hinged at a level above the charging platform on the side toward the cupola, provided with a track for the charging car in line with the stationary tracks, guard angles, as shown, and a hook for holding the car to the platform when being dumped. A dumping cylinder is supported by framing attached to the charging floor and pivoted to allow the slight swing required when the platform is tipped. The piston rod is pivoted in a bracket attached to the underside of the platform. The platform is constructed of structural shapes and all joints are strongly riveted; the hinge pins are of ample size and are arranged for easy removal and replacement. An apron plate is hinged to the platform and laps over an inclined chute in front of the cupola door. The controlling valve is located at any convenient point and is piped to the cylinder and connected with the air supply.

In operation, the car is run on the platform and the hook engaged with an eye attached to the car frame. Then the valve is opened to admit air into the operating cylinder, and the platform is raised to the dumping position. The iron charges are put on cars with ends about 12 in. high, but open on both sides. Coke cars have ends and sides inclosed, one side being fitted with a hinged door. By manipulation of the valve the charges may be distributed as desired. The level of the charges must be maintained 3 to 4 ft. below the level of the door sill to get the best results. Electric power may be used in place of compressed air, using a geared hoisting machine. The ordinary crane controller will give the different movements and speeds required.

A device of this character is necessarily of greatest benefit where the cupola output is large and the speed of melting relatively high. A cupola 54 in. in diameter inside of lining is about the smallest size which should be charged by machine. With a No. 9½ Whiting cupola, 90-in. shell, 72 in. inside diameter, and melting 20 tons per hour, two men with the charging machine perform the work which would otherwise require five or six men. Assuming the duration of heat to be 4 hr., the saving in labor will be 12 hr. time, at, say, 17½ cents, or $2.10 per day, which represents an annual saving of $630, or about 200 per cent., on the investment.

The charging door in the cupola for use with this machine is 9 in. above the charging floor. To obtain maximum economy of fuel the charging floor should be from 20 to 24 ft. above the bottom plate, or about 5 ft. higher than for hand charging. Other charging doors, at ordinary hight for hand charging, are located at the sides for use in emergency, and for leveling the stock charged by the machine if this should ever be necessary.

The company has devised a compound machine, shown in Fig. 2, for use in connection with low charging floors, consisting practically of an elevator of the plunger type, which lifts the car and charging machine together to the required level. The two mechanisms are controlled independently and may be operated by pneumatic power, as shown, or by electric power. The original charging doors may be left in the cupola, being shifted as necessary, and used for hand charging and leveling.

A few diagrams showing actual layouts of charging floors and tracks may be of interest. Figs. 3 and 4 represent the cupola charging department of the Canada Car Company, Montreal, Que. There are two No. 9½ Whiting cupolas for the wheel foundry and one No. 7 and one No. 4 for the gray iron foundry. All are equipped with charging machines. The two foundries adjoin and the charging houses are connected, giving ample track space on the charging floor and providing storage facilities below, very desirable in that vigorous climate. The tracks on the charging floor are arranged with cross ovens, so that cars may travel continuously without interference. On the ground floor layout, Fig. 3, attention is called to the location of the scales in relation to the elevator, and the arrangement of tracks, which permits the passing of empties to the yard without interfering in any way with loaded cars ready to be elevated to the charging floor.

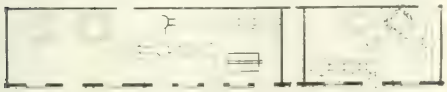


Fig. 3.—Ground Floor Plan.



Fig. 4.—Charging Floor Plan.

Cupola Charging Arrangement in the Canada Car Company's Foundry.

Fig. 5 shows the layout of the ground floor and Fig. 6 of the charging floor for the wheel foundry of the American Car & Foundry Company, at Madison, Ill. Two No. 11 Whiting cupolas are used in this foundry and both are charged by Whiting pneumatic machines. The special location of the elevators was necessitated through the peculiar yard arrangement. The end elevators are used for iron and the one on the side for coke. Each cupola is served by the elevator nearest it in ordinary operation. The tracks on the charging floors have storage capacity for about 70 cars. A transfer table at each end is arranged so that a loaded car from the elevator may be transferred to any storage track; turntables in the middle provide passage from any one track to any other, and empty cars are transferred from the charging track to the elevator, thus completing the circuit.



Fig. 5.—Ground Floor Plan.



Fig. 6.—Charging Floor Plan.

Cupola Charging Department of the American Car & Foundry Company's Plant at Madison, Ill.

New German Battleships.—The Nassau, the largest battleship in the German Navy, was launched March 7 at Wilhelmshaven. Its dimensions are as follows: Length, 472 ft.; beam, 82 ft. 9 in.; draft, 26 ft.; tonnage, 18,000; horse power, 25,000, and speed 19 knots an hour. Its armament will consist of 12 11-in., 12 6.6-in. and 8 3.4-in. guns, together with six torpedo tubes for the discharge of a torpedo 19 in. in diameter. The Nassau is built entirely of hardened steel, is to be fitted with three sets of triple expansion reciprocating engines and is to be provided with three propellers. The cost of construction, including trial runs, will total $9,190,000. A twin ship in every respect, the Sachsen, is to be launched from the Weser Yard at Bremen in a very short time, while work is proceeding rapidly on the Wurtemberg at the Vulkan Yard, Stettin, and on the Baden at the Germania Works, Kiel.

Steam Heat from Electric Locomotives.

BY C. M. RIPLEY.

Not the least of the problems connected with the new railroad terminals now being built in New York City was that of heating the passenger coaches while they are handled by the electric locomotives through the yards and tunnels and until they are regularly taken up by the steam locomotives. To install stoves for temporary use in the individual coaches was too expensive and dangerous to be thought of. To heat the cars by electricity would require a double equipment of heating apparatus in every coach, as steam heat would still have to be supplied during the major part of the run. The problem has been ingeniously solved in the two methods now in successful operation by the New York Central & Hudson River Railroad and the New York, New Haven & Hartford Railroad. So far as these methods are identical they may be briefly described as follows:

In the electric locomotive is installed a vertical boiler, which, as soon as the steam locomotive is detached, is connected to the regular piping system of the train. Thus, with virtually no interruption steam heat is supplied to the coaches regardless of the change in the mode of traction, without necessitating any additions to the regular heating apparatus of the coaches. The fuel for this boiler is ordinary commercial fuel oil.

The illustrations herewith, Figs. 1 and 2, of the inside of one of the New York Central electric locomotives show the oil fired auxiliary steam boiler. The apparatus consists of a multitubular boiler mounted on a cast iron firebox lined with brick. The boiler has 800 ½-in. copper tubes, and is fitted with steam and water gauges, try cocks, safety valve set to 80 lb., blow-off connection and automatic feed water regulator. Water and oil are carried in two steel tanks under pressure. The pressure on the water is 135 lb. per square inch, which is sufficient to supply the boiler without employing a feed pump. The oil is stored at a pressure of 25 lb. per square inch. The air for supplying this pressure is taken from the main reservoir in the locomotive airbrake apparatus, and is reduced to feed the oil tank through a regulating valve.

The water tank is of 200 gal. capacity and is filled by attaching a hose on either side of the locomotive and opening the vent valve on the top of the tank. The water is then forced up into the tank by the pressure on the mains. Try cocks are fitted to test the hight of the water in the tank. The oil tank, which is of 40-gal. capacity, is fitted with two glass gauges to enable the operator to ascertain the amount of oil contained. Water is led to the boiler through an air trap, which prevents air from blowing into the boiler should the water give out.



Fig. 1.—An Oil Fired Steam Heating Boiler Installed in a New York Central Electric Locomotive.

The main difficulty in connection with oil as a fuel is to obtain complete combustion of the ordinary com-

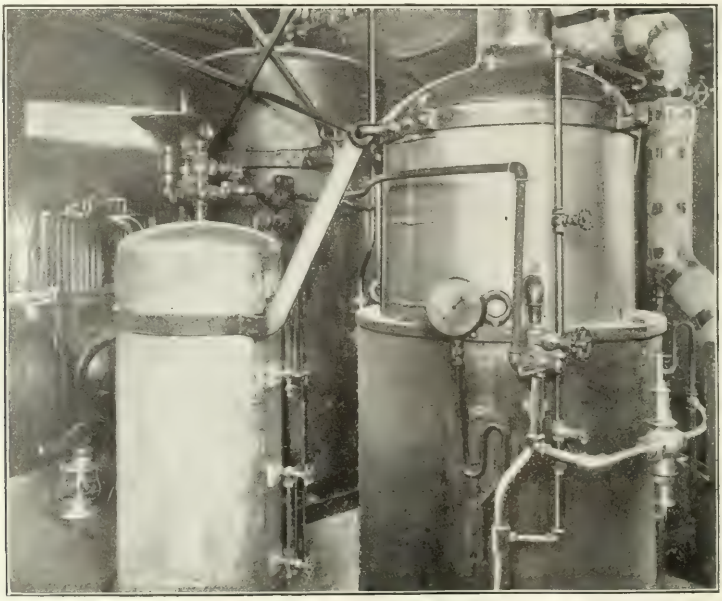


Fig. 2.—A Side View of the Same Equipment, Showing the Oil and Water Pressure Tanks.

mercial fuel oil, which is overcome by first completely atomizing the oil. To atomize each gallon of oil there is required approximately 60 cu. ft. of free air at a pressure of 15 to 25 lb. per square inch. There must then be supplied by one or the other of two means approximately 1440 cu. ft. more to give sufficient oxygen to the flame. The Kirkwood oil burning system manufactured by Tate, Jones & Co., Inc., Pittsburgh, Pa., which supplies the fuel for the boiler, is arranged to use either air or steam to atomize the oil. The change is made from one to the other by means of a threeway cock. Air is used to start the fire and steam when boiler pressure is reached. In Fig. 1 the screen is shown thrown back to better show the apparatus under the boiler.

The New York Central Method.

The New York Central apparatus is arranged to allow considerable space around the nozzle of the Kirkwood burner, through which air from the surrounding atmosphere is drawn into the combustion chamber by the force of the injected atomized oil. This method of drawing in the 1440 cu. ft. of air has been known to result in a noisy burner at times, and it has been open to the objection that it is difficult to control the amount of air drawn in. It is also obvious that the use of a greater amount of compressed air than is necessary for atomizing is required in order to draw in a sufficient amount of the surrounding air. This method makes out with compressed air any deficiency in the quantity of surrounding air drawn in. A decided advantage, however, in this method is that it makes unnecessary the expense of installing any extra blowing apparatus and means for driving it, both of which take up considerable room in the rather confined space of the electric locomotive.

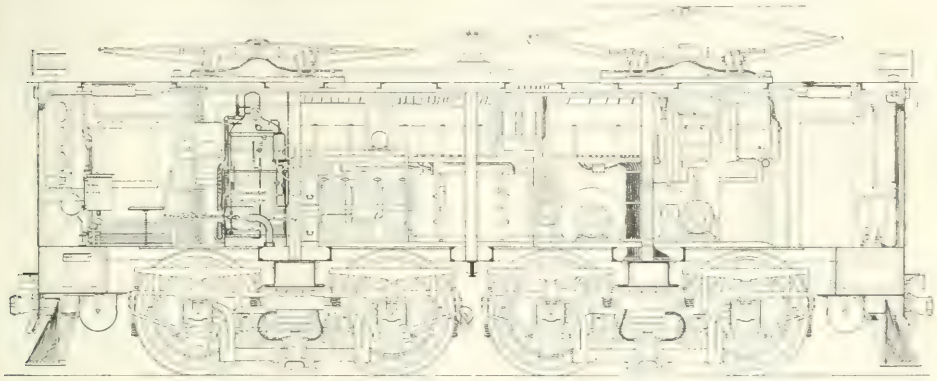


Fig. 1.—Sectional Elevation of a Pennsylvania Electric Locomotive Equipped with Oil Burning Steam Heating Apparatus.

The New York, New Haven & Hartford Method.

The electric system of the New York, New Haven & Hartford Railroad is rather unique in the field of American electric traction, inasmuch as transformers are used in the locomotive to reduce the voltage of the alternating current supplied. The advisability of cooling these transformers by air needs no further comment, and hence this company has made use of an air blast apparatus both to cool the transformers and to assist in the burning of the oil. Fig. 3 illustrates one of these electric locomotives in which a Kirkwood oil burner is installed. A low pressure fan blast at from 3 to 4 oz. pressure is used for blowing into the combustion chamber the necessary air for combustion. Thus compressed air is needed only for atomizing the oil.

This scheme cuts down the amount of compressed air used and increases the efficiency of the fire. It enables the operator or fireman to completely control the nature of the fire by varying the quantity and pressure of the air blast for combustion. The oil and compressed air for atomizing it are regulated by one lever, and the ratio between the oil and the compressed air for atomizing always remains at a constant point, which has been found to be the best for complete atomization. The fireman or operator cannot make an inefficient or smoky fire, the regulation of the air blast varying only the nature of the fire from a soft and nonoxydizing flame to a hot concentrating fire.

Convenience.

Both the New York Central and the New York, New Haven & Hartford heating systems are simple to operate, and no extra men are required in the cab to operate them, this work being done by the engineer and fireman. It is obviously best that the safety of an entire passenger train should not be intrusted to but one motorman, and hence the practice of an engineer and fireman is continued, the above being part of the duty of the fireman.

A Montana Hydro-Electric Power Project.—An important hydro-electric power development is a project planned by the Capital City Power Company, Helena, Mont., which involves the construction of a multi-cellular concrete steel dam across the Missouri River near that place. The building of this dam, which will be 1500 ft. in length and have a 120 ft. head, is expected to furnish power to generate and transmit 30,000 hp. at 70,000 volts, three-phase, to the cities of Helena, Butte and Anaconda, and to mines and plants in their vicinity. In connection with this work there will be built about 40 miles of 70,000-volt transmission line. It is expected that work will be started early in the spring by the Capital City Improvement Company of Helena, which has the contract for construction of the dam. When completed the system will be operated in conjunction with the one now controlled and operated by the Missouri River Power Company. M. H. Gerry, Jr., is the chief engineer, and W. L. Miller is engineer in charge.

The Short Weight Conference at Philadelphia.—We have received a handsomely printed copy of the stenographer's report of the proceedings of the conference of representatives of the New England, Philadelphia and Pittsburg Foundrymen's associations and shippers and carriers of Pig iron, coal and coke, held at Philadelphia, February 5, for the purpose of endeavoring to eliminate the frequent claims of shortage in the delivery of pig iron, coke and coal. The proceedings cover 45 pages of printed matter, issued from the press of C. A. Hack & Son, Taunton, Mass. The gist of these proceedings was published in The Iron Age February 13, pages 515 to 517.

The year 1908 brings the fiftieth anniversary of the opening of the first Atlantic cable over which messages were successfully sent. Tuesday, March 10, was the fifty-fourth anniversary of the signing, at Cyrus W. Field's house, in New York, of the contract to organize the first cable company.

Ore Shipments Not to Be Pushed.

DULUTH, MINN., March 13, 1908.—Ice conditions on the lakes are such as to promise little interference with the early opening of navigation, much to the regret of vesselmen, who would not be averse to any condition that would force a late opening. This, however, may be brought about by a general strike of the Seamen's Union, in which the great majority of men employed on lake vessels are members. There is little doubt that owners would welcome such a strike, and they are likely, under any conditions, to demand a change in union rules and a revision in wages for the coming season. They have been so long without control of their own ships that they may seize the chance to regain control of their property.

Curtailment of Production General.

There have been important conferences among Lake Superior mining men recently. The curtailment of production undertaken by some interests has now extended to all, and labor has become very plentiful on the various ranges. It is safe to state that underground mines, including those of the Steel Corporation, are not running to 50 per cent. of normal capacity. Some concerns, such as Corrigan, McKinney & Co. and the Republic Iron & Steel Company are lower than that. The former of these two is pretty nearly closed down on the old ranges, and its Mesaba operations are less than in years. Its big Stevenson, which has usually stripped steadily through the winter, is now down tight. The Republic Company is doing very little, and expects to make a production from underground materially below 50 per cent. It has some open pit mines from which the bulk of production will come. Pickands, Mather & Co. are carrying forward development on some difficult propositions, as usual, but in the way of stock piling and mining they are running slowly. Their proportion of the total is larger than that of most of the independents. The Cleveland-Cliffs Iron Company has cut off its night shift at several Marquette mines, and will fill its stock piles gradually. Its work at the new Gwinn District progresses steadily and without delay, but this is in the way of development, and there is no good reason why it should be suspended. These properties cannot at the best become considerable producers for some time. Ore sales have been less than in many years; indeed, it is reported that none of consequence have yet been closed. Furnacemen and steel makers evince no interest in the market.

A further diminution of employed miners is looked for shortly. It will come, doubtless, in the discharge of unmarried and independent men. Operators of the district have been in conference at various times of late, and expect more meetings. The lay off will have its effect on all ranges somewhat, though more severe on the Mesaba. On the Marquette range the Steel Corporation has cut off 25 per cent. of its men, and the hope is that no further reduction there will be required.

Mesaba Operations Will Keep Up.

While these conditions exist work on the ranges remains at a higher tide than would seem probable. The Steel Corporation's stripping operations are maintained in most cases on the even tenor of the plans. In this way the corporation is a steadying factor that is of the utmost value and consequence, and its effect in keeping men employed and the wheels of commerce and general business moving regularly is far greater than is appreciated by most people. The fact that Mesaba range properties are generally held under lease, and that these leases require certain annual payments on large tonnages annually will have a decided tendency to make the Mesaba a larger producer this year than ever, compared with the total from Lake Superior mines in general. And as the great minimum annual agreements of the Mesaba are chiefly on the large mines that can be worked open pit, the proportion of steam shovel ore will be greater than usual. This means, among other things, that the labor cost per ton of ore mined the coming year will be less than usual, and less than it may be in subsequent seasons, without reference to the maintenance of the wage scale.

The stripping of several of the large Mesaba properties, undertaken some time ago and on a plan for continued operation till certain areas shall have been made ready for mining, continues steadily. At its Sellers mine at Hibbing the corporation has been stripping since the close of 1906, and is still employing several shovels. It has made a pit large enough for the economical mining of several million tons of ore, and this pit reaches to within a few hundred feet of the center of the town of Hibbing, only 200 ft. from the large Centre School. Three shovels are at work in the Hull-Rust pit, on the other side of Hibbing, and a large section of the east side of the mine has been uncovered. This was the pit from which 2,900,000 tons of ore were taken last year, and the operations planned for the coming season, while not so large as that, will be enormous. For a long time drills have been testing the ore body on that part of this vast deposit not yet developed. As many as 12 drills have been at work at one time. It is the policy of the corporation to thoroughly explore its ore bodies before laying out a plan of development, and this work has been along that line.

Stripping at other large deposits at Hibbing has been suspended for the winter. These include the Pillsbury, which was being done by the Roberts-Kingston Company; the Stevenson and Morris, where the Drake & Stratton Company had eight shovels in the overburden; the Burt and Monroe, which was under a contract by Winston & Dear; the Mahoning, which was on company account, and the Hartley and Leonard, being done by the Steel Corporation. Most of these will be resumed in the spring, possibly on a considerably lessened scale of activity. A great deal of stripping by other operators in the Hibbing District is in contemplation, and while it may be somewhat delayed there will be a large amount of dirt moved the coming season, especially on that part of the Mesaba at and westerly from Virginia.

Operations in Other Districts.

Great difficulty is being experienced by the Rogers-Brown Ore Company in its work of sinking in the Cuyuna District, where it is putting down a three compartment shaft. This shaft, though under way since early last summer, has not yet reached ledge, and water conditions are occasionally such as to delay the sinking materially. Just at present the shaft is badly drowned by the inflow. There is little doubt that work on the Cuyuna is liable to suffer from this sort of thing indefinitely. Very little exploration is under way in the district, and the number of drills there is less than at any time within the past three years.

I have referred to explorations conducted in north central Minnesota west of Cuyuna, in Otter Tail County, where magnetic attractions were discovered, and invited attention after these attractions had been found on the Cuyuna to point to bodies of imperfectly concentrated iron ores. Still another field is now enlisting the attention of some pioneers in this field, and a line of attraction has been developed, lying in the southeast part of Hubbard County, Minn., about 75 miles northwest of the Cuyuna District. This has served to upset theories of amateur geologists, and some of them are now wondering if the whole of northern Minnesota may not become an iron mine. These Hubbard County explorations have not progressed very far, and it may be a long time before we are startled by the news of a new mining district.

The Breitung interests of Negaunee, are opening the old Baron mine at Humboldt, and will commence hoisting in a few weeks. The old shaft has been relined and rebuilt, a shaft house erected, machinery installed and the underground workings reopened and extended somewhat. Humboldt has been dead since the Bessie closed down, but the town is now showing some signs of life. The Baron will employ a considerable force if it is decided to go ahead heavily, but this decision can only come after a period of exploration. This mine was worked some 20 years ago and employed 300 to 400 men.

An important find of ore has been made in the Kinney

property at Spring Valley, Menominee range. A shaft is down 200 ft. and is all in ore, which came in some distance above, pitching from the south side. This ore is analyzed at better than 62 per cent. Another find has been made in the Waldron property, near Stambaugh, where the Brule Mining Company is exploring. Other developments in the same general district are most encouraging. D. E. W.

The Official Finding on the Quebec Bridge Collapse.

The Canadian Government Commission of Inquiry on the Quebec Bridge disaster made its report recently, and it was laid before Parliament at Ottawa, March 9. It is a voluminous document, but the conclusions of the commission are summarized in formal findings as follows:

(a) The collapse of the Quebec Bridge resulted from the failure of the lower chords in the anchor arm near the main pier. The failure of these chords was due to their defective design.

(b) The stresses that caused the failure were not due to abnormal weather conditions or accident, but were such as might be expected in the regular course of erection.

(c) The design of the chords that failed was made by P. L. Szlapka, the designing engineer of the Phœnix Bridge Company.

(d) This design was examined and officially approved by Theodore Cooper, consulting engineer of the Quebec Bridge & Railway Company.

(e) The failure cannot be attributed directly to any cause other than errors in judgment on the part of those two engineers.

(f) These errors of judgment cannot be attributed either to lack of common professional knowledge, to neglect of duty or to a desire to economize. The ability of the two engineers was tried in one of the most difficult professional problems of the day and proved to be insufficient for the task.

(g) We do not consider that the specifications for the work were satisfactory or sufficient, the unit stresses in particular being higher than any established by past practice. The specifications were accepted without protest by all interested.

(h) A grave error was made in assuming the dead load for the calculations at too low a value and not afterward revising this assumption. This error was of sufficient magnitude to have required the condemnation of the bridge, even if the details of the lower chords had been of sufficient strength, because, if the bridge had been completed as designed, the actual stresses would have been considerably greater than those permitted by the specifications. This erroneous assumption was made by Mr. Szlapka and accepted by Mr. Cooper, and tended to hasten the disaster.

(i) We do not believe that the fall of the bridge could have been prevented by any action that might have been taken after August 27, 1907. Any effort to brace or take down the structure would have been impracticable, owing to the manifest risk of human life involved.

(j) The loss of life on August 29, 1907, might have been prevented by the exercise of better judgment on the part of those in responsible charge of the work for the Quebec Bridge & Railway Company and for the Phœnix Bridge Company.

(k) The failure on the part of the Quebec Bridge & Railway Company to appoint an experienced bridge engineer to the position of chief engineer was a mistake. This resulted in a loose and inefficient supervision of all parts of the work on the part of the Quebec Bridge & Railway Company.

(l) The work done by the Phœnix Bridge Company in making the detail drawings and in planning and carrying out the erection, and by the Phœnix Iron Company in fabricating the material, was good and the steel used was of good quality. The serious defects were fundamental errors in design.

(m) No one connected with the general designing fully appreciated the magnitude of the work nor the insufficiency of the data upon which they were depending. The special experimental studies and investigations that were required to confirm the judgment of the designers were not made.

(n) The professional knowledge of the present day concerning the action of steel columns under load is not sufficient to enable engineers to economically design such structures as the Quebec Bridge. A bridge of the adopted span that will unquestionably be safe can be built, but in the present state of professional knowledge a considerably larger amount of metal would have to be used than might be required if our knowledge were more exact.

(o) The professional record of Mr. Cooper was such that his selection for the authoritative position that he occupied was warranted, and the complete confidence that was placed in his judgment by the officials of the Dominion Government, the Quebec Bridge & Railway Company and the Phœnix Bridge Company was deserved.

Quebec Bridge Losses.—The Quebec Bridge & Railway Company, which was organized to construct the Quebec Bridge, was capitalized at $1,000,000, of which but $48,700 was paid in in cash. In 1899, when the Parliament at Ottawa was asked to vote $1,000,000 to the project, the estimate of cost presented was $4,000,000. In 1903, when the question of guaranteeing the company's bonds came up in Parliament, it was estimated that the total cost would be $8,316,394. The liabilities of the company are $779,551, floating debt, and $5,561,507 borrowed from the Bank of Montreal on the guaranteed bonds, making $6,341,058 definitely known. In addition the Government gave the company powers of expropriation, which were exercised and will increase the liability on the part of the Government. The company had no insurance on the bridge, so that the loss is absolute.

The Westinghouse Machine Company, Pittsburgh, builder of the Roney mechanical stoker, reports for the first two months of this year a good demand for stoker equipment. Perhaps the most interesting orders have come from cold storage companies. The Merchants' Ice & Cold Storage Company, Cincinnati, is installing three equipments; Montgomery Ice & Cold Storage Company, Jenkintown, Pa., two equipments; Holt Ice & Cold Storage Company, Indianapolis, Ind., the same number. Another municipal lighting station at Troy, Ohio, operated by the Board of Public Service, has adopted Roney stokers, and the Pennsylvania Light, Heat & Power Company, Allegheny, Pa., operating a large central station at that place, increases its present equipment with two stokers of large capacity. The Mutual Union Brewing Company, Aliquippa, Pa., is installing three equipments, and the Alpha Portland Cement Company, operating a number of plants in the country, one of the largest size.

The *General Electric Review*, which has been published for the last five years by the General Electric Company, Schenectady, N. Y., for distribution within its own organization, is now being offered for general circulation at a subscription price of $2 per year. It is the intention to make the paper of value and interest to those engaged in the electrical industry, but particularly those having to do with lighting, power and railroad work, and new and interesting developments in these fields will be treated by authorities from time to time as they appear. It is also the intention to make it a medium for presenting the latest, most novel, and useful types of apparatus, devices and supplies applicable to lighting, power and railroad work.

Germany's naval estimate for 1908 provides for nine new battleships, four armored cruisers, six small cruisers, 24 destroyers and seven submarines. Two of the battleships are of 13,000 tons each and are practically ready, as are two of the armored cruisers. Seven battleships are to be laid down in 1908, having a displacement of 18,500 tons each.

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The New Salesmanship in Iron and Steel.

Comment has already been made in these columns on the increased efficiency of workmen apparent in many industries since the decline in trade reversed the order of last year and made men much more numerous than jobs. The phenomenon is only natural, but the transition from one condition to the other has been rapid. There are shirks and incompetents in every body of workmen; they especially flourish in boom times. They are the first to be dropped when work falls off. Then an unusual competition sets in—competition to hold such jobs as remain.

Perhaps fully as marked a change as this in the operating department, though of a different sort, has come over the sales department. So far as iron and steel salesmen are concerned no other business recession has brought conditions such as have prevailed in the past four or five months. It is no new experience for a seller of finished steel products to compete sharply for orders, and in other times of slack demand the hunt for business has been enlivened now and then by savage slashing of prices when particularly desirable contracts were given out. To-day the salesman, with a hungry mill and an anxious general manager of sales behind him, needs to be master of the fine art of getting business without cutting prices. Going back to the crowded months of 1907, we will see that what has just been referred to is not the only hard problem that has taxed the resources of the salesman in the remarkable year we have passed through. For many months his functions had been largely those of a diplomat and intercessor. On the one hand it was his task to placate his friend, the buyer, who, in turn, with customers besieging him from every direction, was compelled each day to put a new touch on the threadbare story of the wicked mills that had taken more orders than they could possibly fill. On the other hand was the salesman's home office, whose distractions were his daily food and drink. In the intervals of pleas for early shipments of material due his more violent customers, he felt it his duty to say to headquarters, in terms both respectful and convincing, that the day would yet come when he would have to hunt hard for orders, and then buyers with good memories and a grievance would rise up to plague him.

Suddenly—it was like a change over night—the salesman found that the bulk of his correspondence was with the credit department. Between the customers who stopped shipments and those to whom the mill ceased to ship, for reasons of prudence, the order department was *functus officio*. It was a strange experience for the salesman, who had long been adding his pleas to those of the buyer to persuade the mill to get out material, now to add his tact to that of the credit department to accelerate transmission in the opposite direction. It was doubtless the most trying of all his varied activities. The unpleasant duty was done heroically, but with the stout mental reservation that the functions of collector and salesman ought to be unalterably divorced.

Since the opening of the year the salesman has been a salesman again. The serious, almost pained, look that went with the discussions of finance in his customers' offices just following October has disappeared from his face and the light of orders yet to come is in its place. The brute argument of a lower price than that of the competitor last on the ground has found various substitutes. No influence is too high to invoke, if it will help gain an order. Friendship, collateral trade relations, and considerations that under ordinary conditions would never be urged, are now being made use of to get orders on the books at "the going price." General managers of sales and even presidents are showing a concern about business from their smaller customers that they could not be expected to entertain in normal times. The fact that a few months ago it was not considered desirable to make shipments to many of these same customers is no longer to the point. Seller and consumer are willing to forget all that. Moreover, if it appears that some things that happened to deliveries in the stress of 1906 and most of 1907 are now operating to the detriment of the seller, there are also evidences that special exertions to meet emergencies then are finding proper recognition from buyers now. Undeniably it is a situation in which precedents are not specially useful and one whose difficulties call for the highest order of salesmanship.

The Dingley Tariff's Long Life.

Attention has been called to the fact that the present tariff law, known as the Dingley Tariff law, has been in effect longer than any previous customs law. The tariff of next longest duration was the Walker tariff, which became effective December 1, 1846, and was not superseded for 10 years and 216 days. The Dingley tariff became effective July 24, 1897, and therefore attained the age of the Walker tariff last month. From present indications it is not likely to be amended or displaced for some considerable time, so that it seems destined to make a conspicuous record for longevity. That the Dingley tariff has retained its place among active statutes so long is not because it more nearly approaches the ideal tariff than any of its predecessors, nor because it was laid down on such scientific or symmetrical lines that it was incapable of amendment without absolute reconstruction. It owes its immunity from changes to fortuitous circumstances. Not since its enactment have tariff revisionists or reformers secured sufficient power in Congress to enable them to make an effective attack on it for the purpose of generally reducing duties. Attempts have been made to work up a sentiment in favor of modifying some of the schedules which the lapse of time and commercial changes have made desirable to certain domestic interests, but all movements of that kind have received no encouragement from those who have been and are influential in directing national legislation. The fear of precipitating a general tariff revision, with its accompanying interruption to business, has always operated as a deterrent. With very brief interruptions, the period covered by the Dingley law has been one of abounding prosperity, and to interpose so serious a check to business as a gen-

eral tariff revision would have been to endanger political supremacy from which the boldest leaders of the dominant party might well shrink.

It is unfortunate that under our system of legislation, changes in our revenue laws cannot be made without upsetting business. The process of revision is usually long drawn out, a period of months elapsing between the time when the Ways and Means Committee of the House of Representatives begins the preparation of a tariff bill and the final agreement by both Houses of Congress on a set of schedules to be submitted for the signature of the President. Meanwhile enterprise halts, business languishes and capital consumes itself for lack of remunerative employment. This method of accomplishing a revision of the tariff seems to be irrevocably fastened upon us. Congress does not take kindly to the proposition of a tariff commission or the often suggested creation of a body clothed with the duty of making or recommending changes in duties whenever new business conditions make such changes seem desirable. The same slow process, the same agonizing interference with the orderly procedure of current business, must continue to mark every revision of the tariff.

With this practice unchangeably fastened upon us, it would seem to be wise for those who are intrusted with the responsibility of making or revising our laws to attempt no revision of the tariff during a season of trade activity, but if a revision is really necessary, take it in hand in a time of depression like the present. Existing conditions could not be made worse, as buying is only being done for immediate needs. Individual enterprise would not be interfered with, as apparently all enterprise has halted to await further developments politically or financially. If it should be found expedient or desirable to reduce duties on some classes of merchandise, and such action should correspondingly lower domestic values, the shrinkage to the merchant or the manufacturing consumer would be relatively small, as stocks of merchandise are probably as low as they ever will be. A revised tariff could be put in effect under these circumstances with far less shock to the country and much less loss to the interests adversely affected than at any other time. This, however, is not to be done. The country is advised that a revision is surely to be made, but not until after the Presidential election. By that time, we all fervently hope, the effects of the panic will have worn off and the country will be well on the way to another era of prosperity. Should that prove to be the case, it may reasonably be expected that, unless tariff reformers shall have overturned the party in power, a demand too strong to be ignored will be made by business interests to let the tariff question alone. He would be a rash man indeed who at such a time would interpose so serious a check to the country's recovery as tariff agitation. The Dingley tariff may be destined to live until it is revised by its enemies, instead of its friends, as now promised.

That the very favorable condition of our foreign trade continues is shown by the February statistics of imports and exports. The excess of the value of merchandise exports over imports for that month totaled the huge sum of $88,743,361. The excess for the corresponding month of 1907 was only $36,511,538. The excess of exports for the eight months ending with February was $520,889,724. The excess for the corresponding period of the previous fiscal year was $356,480,012. The exports of merchandise for February were $167,867,762, the largest ever reported for the month of February, while the imports were only $79,124,401. For February, 1907, the imports of merchandise had reached a value of $123,005,683. These figures indicate not only the retention here of the heavy gold imports of last fall, but also the possibility of further imports to cover the trade balance now running so strongly in favor of this country.

Workmen's Rewards for Suggestions.

A writer in one of the English engineering journals, in discussing the relations of producer and user in the development of machinery, makes this statement: "Many workmen, especially where their observation is suitably encouraged, are as likely to contribute to efficiency of design as draftsmen; their experience is direct, practical and intimate. No reading of a drawing, however perfect, can compare with the constant study of the actual machine in operation, or of the growth of any given product. Some trained mechanics have considerable capacity for reflection, and then, during machinery operations, ideas are more likely to develop than is the case with draftsmen isolated from manufacturing processes. This must materially affect those parts in the design which are influenced by machining operations, and which undoubtedly affect not only economy of manufacturing, but of the accessibility of parts of the product."

We believe that in most American industrial establishments the workman is given little substantial encouragement to apply his mind toward improvements in the design of machinery and processes. To carry out such a plan is no easy proposition. A few works have adopted elaborate systems of premiums for ideas, either on a competitive basis, or on one in which the worth of the suggestion determines the reward. But in the ordinary manufacturing plant this form of encouragement of a workman is not a simple matter. If he is an operative, his worth must be reckoned on his producing capacity rather than on an occasional suggestion that the drafting room will work up later. His invention of an improvement on a machine tool would not necessarily justify an advance in his wages; in fact, in many cases it would really afford no ground for it. Perhaps a money reward, an unsolicited present, in recognition of a valuable idea would be as potent a stimulus as anything. The personal equation of the workman would always be important in this connection; there are plenty of men who spoil easily under praise or reward, and their notion of their own worth increases out of proportion to reality. It is easy to imagine a capable workman whose value has been actually impaired because of exaggerated egotism wrought by the finding of an extra banknote in his pay envelope. In some shops the existence of labor complications might render such a practice unwise. The likelihood of engendering jealousy is another consideration. Then, again, the employer may feel that suggestions constitute a part of the work for which his men are paid, and that their reward lies in their wages.

On the other hand, it is not at all uncommon to hear of the complaint of a workman that no recognition has been taken of a suggestion, the value of which has been evidenced by its adoption. He feels hurt; he has not been appreciated; the drafting room has taken credit for his idea; he should have some return for the value received from him. The next time he has an idea he may keep it to himself. He may become a less valuable man than he would have been if the idea had not entered his brain.

It is an undisputed fact that few machines are designed on paper that do not require radical changes from their first model. And the design of no machine, no matter how perfect, can be permitted to stand still. Constant

improvement must be made in order to meet competition.

The English writer states that the man operating a machine is in the best position of all to see opportunities for improvement. Probably, however, the most efficient man in this connection would be the trained designer who takes the time to act as an operator under commercial conditions. This idea is carried out to a certain extent. The designer spends as much time as possible in the shop, keeping in close touch with the machine upon the improvement of which he is working. He should have full knowledge of the criticism of customers and the weaknesses which result in excessive repairs, and with improvements in competing machines. In most modern establishments special pains are taken that this knowledge is provided. There is a growing tendency to give the engineer a practical knowledge of his specialty in its practical operation. As an illustration of this, some foreign ship builders are sending young engineers, and occasionally an expert, on cruises, that they may study various questions under service conditions. The drafting room is recruiting from the shop whenever genius for design is shown by young mechanics, and such a man has advantages over his associates who are trained exclusively at the drawing board and in the books. But no matter how skillful the machine designer, no matter what pains he may take to study his subject, or what his training has been, the mechanic in the home shop or that of some other user of the tool will continue to give valuable suggestion in design, and to encourage him judiciously may mean the realization of important advantages over competitors.

The Unique Position of the Cleveland Pig Iron Trade.

The London *Iron and Coal Trades Review* has the following interesting article on the pig iron trade of northeastern England, known on this side of the Atlantic as the Middlesbrough District:

It is universally asserted that the pig is a "contrary animal," and that pig iron is like unto it; certainly there would appear to be some foundation for the latter statement, for we frequently find that pig iron prices rise when every one is expecting them to be on the down grade, and *vice versa*. An instance of the value of pig iron advancing when everything would indicate that it should be decreasing is afforded in the Cleveland District at the present moment. The position is a peculiar and practically unique one, such as probably has not come within the experience of the present generation of those who are engaged in the iron and steel industries. Everywhere else trade is depressed, and locally the finished branches of the iron and steel trades are in a very unsatisfactory position. Yet in the face of that the Cleveland pig iron industry is in a most excellent condition, and the deliveries are in excess of the production. Indeed, the demand from consumers is keener than the makers can satisfy, so that the balance of demand which they are unable to supply has to be obtained from the stock in the public stores.

An Unprecedented State of Affairs.

The pig iron trade of northeastern England is now as busy as one ever finds it at this period of the year. Undoubtedly it is a curious if not altogether unprecedented position of affairs to see the demand for, and prices of raw materials improving steadily at the same time that the sale of the finished materials falls off, with prices for the latter on the move downward. From all quarters reports of dullness and depression in the metallurgical industries were received last month, yet the Cleveland ironmasters were called upon to ship over 130,000 tons of pig iron, a quantity greatly in excess of anything dispatched in any previous February; indeed, the best return for the second month of any year was last month exceeded by 11 per cent., and there was sent away 60 per cent. more than the average of February over the last 10 years. Never, perhaps, has it been so difficult at this season of the year to get pig iron from the Cleveland ironmasters for shipment, and it became necessary last month to draw so much iron out of Connal's public stores to assist in satisfying the requirements of consumers that the public stock declined 12,474 tons, which was in contrast with an increase of 11,324 tons in the month of January. Besides this the makers are reported to have exhausted their own stocks, and it became almost as hard last month to get prompt deliveries of Cleveland iron as it is in the hight of the regular shipping season in really good times.

The March figures are even more favorable for the producers of Cleveland iron than those of last month were, and the trend of prices is upward, while those of the finished article are on the decline. At the commencement of last month No. 3 Cleveland pig iron was sold at 48 shillings per ton; now 50 shillings 9 pence is the least that will be accepted for it. Any changes that have been made in the quotations for finished iron and steel have invariably been in a downward direction. Indubitably the position is most unexpected, and the majority of traders would have hardly counted it possible for such a state of affairs to exist. It is not easy fully to account for what must be described as the extraordinary activity of the Cleveland pig iron trade at the present time, when apparently such a state of affairs is not justified by the position of the industries that consume that commodity.

The Activity Largely on Export Account.

There is this to be said, that the increased business is largely on export account, particularly to Germany, Italy and France, and though the Cleveland prices have risen 2 shillings 9 pence per ton, the iron is still comparatively cheap, at any rate cheaper than iron to be obtained from other quarters. The Germans have certinly bought Cleveland iron very heavily of late, and the deliveries of it to Hamburg during the last three or four weeks have been almost unprecedented. Cleveland is no longer required to send pig iron to the United States—last month not a ton went from the Tees either to the United States or Canada, whereas 30,164 tons were wanted in February last year. But this lack of business with the States was much more than counterbalanced by the larger deliveries to Germany, which took 35,089 tons from Cleveland, or two and a half times more than in February last year. Also Italy received 17,553 tons from the Tees, or thrice the quantity reported in the corresponding period of last year, and France 11,423 tons, or twice as much as in February, 1907. It is doubtless the cheapness of Cleveland iron that is leading to so unexpectedly good an export demand for it, thus in some measure causing an activity that was unlooked for at this period of the year, and, moreover, in the midst of a general depression.

The feature of the new steel rail specifications which the Pennsylvania Railroad has adopted, as already noted, and which is recommended by the American Railway Association, is the branding of the rails in such a way as to show from what part of the ingot each rail was rolled. The Philadelphia & Reading Railway has enforced this practice since 1901, the rail from the top of the ingot being marked A, the next B, and so on to E. The chemist of this road, J. Bertram Young, says that over 66 per cent. of the rails which fail in track come from the top of the ingot. The rails from the bottom of the ingot show the next largest percentage of failure.

To improve the service in the New York Subway by shortening the time of the station stops, Bion J. Arnold, in a report to the Public Service Commission, recommends that two doors be added on each side of the cars, near the ends, the space of two seats from the present end doors. It would be the scheme to enter by the latter as usual and leave the cars through the new doors, so that the receiving and discharging of passengers can go on simultaneously without conflict.

Cost Keeping in the Foundry.

BY W. L. CHURCHILL.

The question of foundry costs has been attracting considerable attention and foundrymen's associations have endeavored to devise a uniform system of obtaining such costs. There will no doubt be some difficulty experienced in having such a scheme universally adopted, as the necessities for accuracy in foundry costs vary to such an extent with different manufacturers that a system which would meet the requirements of a concern making strictly competitive goods on close margins of profit might stand more attention to detail than another manufacturer (for whom an approximation of costs per pound would answer all purposes) would consent to use.

Two Extreme Cases.

It was my fortune to be connected for several years with a manufactory whose product was chiefly made in its iron foundry and whose lines were of such staple character that only by the closest attention to detail could they be manufactured and sold with a certainty that the market prices were bringing a profit. Shortly afterward I was invited to take charge of a plant manufacturing patented specialties, and whose manager was very emphatic in his assertions that he desired no cost records. To quote his own expressions:

"I don't give a hoot what any of my goods cost. I am making several hundred per cent. profit. This is a close corporation; I have no reports to make to a Board of Directors, and as long as my bank balance shows gain I don't need to know whether any particular item I make costs me 3 cents of $3. When competition creeps in and I am unable to name my own prices, then it will be time enough to figure costs."

These two cases are extremes and aptly illustrate the fact that the necessities of the case will influence the degree of refinement to which cost keeping will be carried.

The Cost of Melting Per Article Made.

There is one factor in foundry cost keeping, especially in the manufacture in quantities of the smaller castings, that does not usually get the attention it deserves—that is, the cost of melting per article produced, and it is my purpose in this article to show the influence of this factor on costs.

The establishment I have under consideration manufactured a varied line of stove and builders' hardware. Two items which were extensively made were stove pipe dampers and Mrs. Potts' sadirons, for both of which lines contracts were taken in car lots. These two articles represent the extremes of the proportion of remelt. The stove pipe dampers being cast as light as possible, the proportion of gate and sprue to weight of finished casting was greatly in excess, and after adding the broken castings from the cleaning, assembling and shipping rooms the result showed that, for every 100 lb. of dampers shipped, approximately 250 lb. of iron was melted. The sadirons, on the other hand, being much more bulky and having a less proportionate loss of completed castings, averaged about 150 lb. of iron melted per 100 lb. of castings shipped.

To show what this means in money to the respective lines, I will add that the average of the entire foundry melt equaled 50 per cent. new iron and 50 per cent. remelt, so that in figuring on the old basis the cost for melting iron for each 100 lb. shipped was the same in both cases, thus misleading the cost figures on each item by the cost of melting iron for the number of pounds melted over or under the average.

Charges Made Against the Weight Produced.

The cost of melting iron was obtained by charging all cupola labor, fuel, material, power, &c., against the total weight of iron produced. This factor was kept entirely distinct from the cost of the iron itself, being considered strictly as a manufacturing operation, and in round figures amounted to 35 cents per 100 lb. of melted iron.

Now we will assume a carload of dampers to include 30,000 lb. of iron castings, to make which there was melted 75,000 lb. of iron at 35 cents per 100 lb., or $262.50 for cost of melting, which, if figured on the average basis of 60,000 lb. melted per car, would show a cost of $210 for melting, or misleading us by $52.50 per car, and on a commodity subject to as sharp competition as this article, might mean getting business at too small a profit, if figured in the old way.

On the other hand, a carload of sadirons, containing also 30,000 lb. of castings, required but 45,000 lb. of iron to be melted, or cost for melting only $157.50, against the average figure of $210, or $52.50 per car less than if figured without a knowledge of the actual weight of iron melted for each article made.

These figures are not intended as an accurate cost of the items mentioned, but to illustrate the principle and one of the advantages of knowing the weight of iron melted for each article made, and the cost of melting iron as separate from cost of iron.

The Method Pursued

for obtaining the weight of iron melted was to weigh one gate of castings from each pattern, when first put in commission. This weight was entered in an upper corner of a record card for the article, and on this record card the number of molds put up each day was copied from the foundry time cards, together with the weight and count of the accepted castings from the cleaning room report. In addition to this all defective or spoiled castings returned to the foundry from machining rooms, &c., were also entered on these cards. These cards, besides becoming a perpetual inventory and cost record, enable comparisons to be made of losses on similar articles of different sizes or designs, and lead to changes in shape of gates or sprues; also to investigations for cause of work being returned to the foundry. To illustrate the value of this study I will again cite an experience in this same plant:

It was first noticed that a certain size of sadiron had a very small percentage returned for remelting. An investigation disclosed a slight difference in the gates used on this pattern, and the others were changed to conform to it, resulting in a decided reduction in bad castings.

Next the number of castings being returned from machining and finishing rooms was watched, and the causes of their return were carefully investigated and remedies introduced to cure these causes, with the result of making their remelt a negligible factor. I well recall the perturbation and concern of our cupola tender when he reported that he had no sadirons for his mixture. He had so long been accustomed to putting a certain amount of sadirons in each charge that he considered it as necessary for a successful melt as the addition of silicon iron, and actually proposed to use good castings from the last previous heat to make up the apparent deficiency.

It is obvious that concerns whose product is the most varied and whose proportion of remelt is greatest can profit the most from a study of this factor in foundry costs. On heavy work in which remelt is insignificant, or in which the foundry element is a small portion of their total costs, it would scarcely be worth while to check the weight of metal melted per each article produced, although it is generally considered good policy to know what it costs to melt iron as a separate factor from the cost of molding, even where the pound cost of castings is sufficiently accurate, as it enables economies to be effected that might otherwise be neglected.

Prices of staples moved lower in February, continuing the receding movement which has now run for a year. On March 1, 1907, prices were at the highest level for at least 16 years. On March 1, 1908, *Bradstreet's* index number was $7.9862, a decrease of 1.7 per cent. from February 1, and of 12.5 per cent. from the high level on March 1, 1907, but it is still 40 per cent. higher than on July 1, 1896. Ten out of 13 groups of staples moved lower in February, textiles leading, and 35 articles fell off in price, while 15 advanced and 54 were unchanged.

The Eight-Hour Bill Hearing.

A Notable Demonstration Before House Committee on Labor.

WASHINGTON, D. C., March 17, 1908. The House Committee on Labor the past week has heard protests against the pending Eight-Hour bill from representatives of leading steel manufacturers, shipbuilders, bridgebuilders, structural iron and steel erectors, and other manufacturers in the metal trades. Without an exception these witnesses have denounced the pending measure as exceedingly mischievous, and the majority have declared frankly that should it become a law they would thereafter refrain from competing on Government business under any and all circumstances. Never before in the history of the movement for the enactment of a national Eight-Hour law have the protests against the measure been so urgent, a fact which is, perhaps, significant of the somewhat unsettled conditions now prevailing, which emphasize the danger of experimental legislation of any kind.

The testimony presented to the committee would fill several complete issues of *The Iron Age*, but the following brief synopsis of the evidence of a few of the more important witnesses will indicate the character of the opposition to the Eight-Hour bill, and will, no doubt, be read with interest:

From the Steel Makers' Standpoint.

EUGENE C. GRACE, general superintendent of the Bethlehem Steel Company: We have operations in the melting of special steels in the open hearth furnaces which absolutely require the personal attention of one individual from the start of the heat to its completion. One of my first experiences with my company was in the employment for some time in our open hearth department, and I had direct charge of the making of the higher class of steel for armor plate work and gun work. It was my duty, and it was of necessity, to follow in all stages of manufacture the heat required for the making of an armor plate ingot. If that heat was tapped at 2 o'clock in the morning or 4 o'clock in the afternoon, I was on duty to see that heat tapped. There is an element of personality, necessarily, in knowing the action of that furnace from its original charge until the final tap of the steel. I could not go to my relief and give him certain conditions existing in that bath to the best of my knowledge. I could not impart what I would know of the internal workings of that bath to him. We have found it possible to, and do on the ordinary class of steel, change shifts, where the composition is of no import; but where the composition is of such character, and there is so much at stake, representing our largest ingots, 300,000 lb. of steel, nickel and chromium, you certainly would not take chances that you would in the case of steel of lower grade, where you do find it possible to employ two or more shifts of men in carrying out the operation.

We take a contract for 12-in. finished guns, which are not accepted until they have been proof fired by the Government, and then they are put in service on a battleship or a land battery. It is a very difficult operation of machining, as you can all imagine, in the making of a gun of the larger type which is built up of in the neighborhood of eight to nine large hoops, starting from the original tube and being built up with hoops shrunk one on top of the other, making a complete gun. Each one of these surfaces has to be of the accuracy of a half of a thousandth of an inch, and an inaccuracy of that dimension will cause the condemnation of the forging or the piece that is being worked on, and I think you can all appreciate the necessity of having those measurements taken and having a particular operation executed from its inception to its completion by one individual.

I have in mind at this time what happened to a mechanic in our plant not more than two or three months ago, where, for some particular reason, the Government was anxious and was urging that a certain large gun tube should be completed, where we were compelled to change the individual on a particular operation. One man was taken ill, and we placed another man on the operation and we lost the tube, valued at in the neighborhood of $15,000. It is absolutely necessary, from our point of view and from our experience in the manufacture of ordnance material requiring such a degree of accuracy, that the conception of those operations, their measuring and machine cutting, the operation of that machine, must be carried through by the one man. The temperament of the man, the accuracy of the measurements, must be all considered. When you consider that you are measuring with a micrometer to the accuracy of half a thousandth of an inch, Mr. Jones and Mr. Smith will certainly vary more than that in their way of looking at the micrometer.

Could Not Take Government Work.

ANDREW M. MORRISON, of the Pennsylvania Steel Company: In looking over the bill and reading it very carefully, I find that it would be impossible for us to bid on Government work under those requirements. To reduce the ore to pig iron, you have to use a blast furnace running continually. The metal is drawn from the blast furnace and taken over into the open hearth furnaces, and the steel does not get cold until it reaches the finished state, or the structural materials or rails, whichever it might be, so that it would be absolutely impossible for us to run a steel plant on an 8-hr. basis. In addition to that we manufacture steel castings, iron castings, frogs, switches, structural material for bridges and so on, and take large contracts for the manufacture and erection of both bridges and buildings, and we have done quite a little work for the Government.

Taking this bill, for instance, on the structural part of the work, where we would have a contract for furnishing a Government building, we employ in our structural department, say 1000 men. It is necessary to run that shop economically, to run certain parts of it both day and night in order to relieve the congestion. The other part of the shop we run simply on a 10-hr. basis. The Government work represents a very small percentage of our actual output, and it would be impossible for us to take that work, classify it in the shop, and keep the hours of the men different on the several grades of work. In addition to that, where we do take a contract, it is necessary for us to go out in the open market to buy certain things which we do not produce, such as stone and building material of various qualities, and this bill makes it obligatory on our part to see that they do not violate the Eight-Hour law, which would be impossible for us to do.

F. S. CHAVAUNES, of the Central Iron & Steel Company, entered his protest along the same lines.

The Opposition of Shipbuilders.

Harry W. Hand and Joseph W. Powell, officers of the Cramp Ship & Engine Building Company, W. G. Randle of the New York Shipbuilding Company and John A. McGregor, president of the Union Iron Works, presented arguments against the bill from the standpoint of shipbuilders, and all of them showed that it would be practically impossible to engage in Government work if the provisions of the bill should become law. Their statements were emphasized and reinforced by arguments made by James H. Mull, general superintendent, William H. Glocker, shop superintendent, and John F. Keen, foreman of the shipwright department of the Cramp Company. Mr. Powell gave the following interesting instance of the manner in which Government work and private work are conducted side by side in the shops of his company:

Any one going into our machine shops to-day would see near the door a large hydraulic turbine that is being built for the Canadian Copper Company. Next to that are the bedplates for the South Carolina's engines, and the engines themselves in course of erection. Next are the bedplates for the engine for a merchant ship, and beyond are various parts of the engine for a side wheeler. Then there are the casings for some water turbines, and beyond is the turret track for the South Carolina in process of machining. On the sides of the shop there are a number of hydraulic pumps for various purposes, and possibly parts of sugar apparatus for Cuba or for Porto Rico.

I think it will be conceded that this shop must either run on the 8 or the 10 hr. basis, and I think it will also be conceded that if it was on the 8-hr. basis it would be at the 10-hr. pay. That would mean an immediate increased cost of labor of 20 per cent. at the present time. In our foreign turbine work for Canada we are practically on an even basis with the Swiss and the Germans, in so far as duties are concerned, and we have been able to do a very large proportion of all this work that the Canadians have purchased. With the extra cost entailed by putting these shops on an 8-hr. basis we would simply have to give up either the Government work or this lucrative export trade.

Other Interests in Opposition.

Speaking for the bridge-builders and building erectors, Robert J. Davis of the American Bridge Company, H. D. Bush of the Baltimore Bridge Company, James Baird of the George A. Fuller Company, James B. Kelley of the Thompson-Starrett Company and W. C. Post of Post & McCord, all gave most emphatic reasons why their interests were opposed to the bill. Francis J. Tucker of the South Chester Tube Company made an argument both from the standpoint of a workingman and of a manufacturer, he having had experience in both capacities. William H. Matthai of the National Enameling & Stamp-

ing Company stated that his company is manufacturing goods for the Government to a limited extent. It is but a small proportion of the company's business, however, and if it was necessary to comply with such a law as laid down in this bill the company would be prevented from making any goods whatever for the Government.

W. J. C.

The Pittsburgh Manufacturers' Association.

The fifth annual meeting and dinner of the Manufacturers' Association of Pittsburgh was held in the banquet hall of the Duquesne Hotel, Pittsburgh, on the evening of March 13. Despite a heavy downpour of rain there was an excellent turnout, 96 people being seated. After the serving of the dinner the meeting was called to order by President H. H. Zimmers, who spoke in part as follows:

The past year has been a good illustration of organization. It has shown us conclusively the value of co-operation, and I think we have learned some lessons we will not forget soon. It has also established our standing and position among our workmen, as to our ability to resist unjust demands. It requires backbone, and plenty of it, to practically shut your shops down with more orders and contracts than you can fill, and this was the position of our members whose machinists struck last April. What can we do to impress on our friends who are outside of this association what we have accomplished, and what more we could do if they would join us and help us in completing an organization which stands "for the good of all?"

The labor unions can teach us a lesson in this respect and certainly have done so. There are in the neighborhood of 50 to 60 firms and corporations in our city who should be members of the Manufacturers' Association and join us in this work and take their share of the burden. Our Labor Bureau in itself will amply repay the cost in selecting competent men who make application for work, and through this means can be identified and their records looked up. It saves the time and cost of trying out incompetent men.

We, as manufacturers of Pittsburgh and vicinity, must wake up. We have strong competition, and plenty of it, and it is only through co-operation among ourselves that we can keep the price of labor at the point that will permit us to compete successfully with outside places. With the aid of our two national associations, the National Founders' Association and the National Metal Trades' Association, we have the co-operation and financial assistance of some 2000 firms and corporations in the United States and Canada. With this bulwark of strength behind us, why should we not stand up for what is fair and right—the right to operate our own shops in our own way? Nor do we mean by this that we have any quarrel with labor. Their interests and ours are identical. What is good for them is good for us. We have some good friends with us to-night who will speak more fully on this subject.

I think we can be proud of the gentlemen who have given their time and attention to this association in the past. I refer to our past presidents, Mesta, McFadden, Shaw and Heyl, and our old war horse, Isaac W. Frank, and also to our counselors and officers and to the good members who have always been ready with their advice and assistance when called on. I congratulate the members of this association on the work they have accomplished, and trust that they will further cement the ties of friendship and good feeling for each other, and that we will be able to convince our friends on the outside that the Manufacturers' Association is a good thing and we are proud to belong to it.

President Zimmers then introduced M. C. Rinehart of the Pittsburgh White Metal Company, the toastmaster of the evening. A. E. McClintock, commissioner of the National Founders' Association, presented interesting information on the working of that organization. Robert Wuest, commissioner of the National Metal Trades Association, called special attention to its labor bureau and the benefits to be derived by its members. He cited a number of cases in which this bureau proved of valuable assistance, and stated that it would be well worth while for manufacturers not now members to affiliate themselves with the association. Isaac W. Frank of the United Engineering & Foundry Company, Pittsburgh, and John A. Penton of the Penton Publishing Company, Cleveland, were also among the speakers. The Executive Committee of the Manufacturers' Association of Pittsburgh consists of the following: F. H. Zimmers, Union Foundry & Machine Company; Wm. H. Hamilton, Rosedale Foundry & Machine Company; Biddle Arthurs, Simonds Mfg. Company; F. W. Gerdes, Hall Steam Pump Company; W. J. Carlin, Thomas Carlin's Sons Company; C. C. Smith, Union Steel Casting Company; Thomas Fawcus, Fawcus Machine Company. Walter B. Averman is secretary.

Pipe Freight Rates to the Pacific Coast.

An interesting situation has developed on the Pacific Coast in relation to transcontinental freight rates on cast iron and steel pipe. The terminal rates at present are the same per ton on both kinds of pipe, and the cast iron pipe manufacturers feel that the railroads should make a difference in their favor of at least 15 cents per 100 lb. They give as their reason for asking that a difference be made that cast iron is a more crude or less refined metal than steel. The plea which they have made before the Transcontinental Association for a reduced rate is substantially as follows:

"The value of any article is a consideration in the making of rates. Cast iron pipe is made by melting pig iron in a cupola and pouring it into molds, the process of manufacture being a comparatively simple one, which does not noticeably change the character of the metal. The value of the pig iron is increased only by the labor cost and cost of melting, &c., and to so slight an extent that there is no article made from remelted pig iron so cheap per ton as cast iron pipe.

"In the case of steel pipe, the pig iron is converted into steel by the Bessemer or open hearth process, involving a large amount of invested capital for converters and equipment, and is refined, losing in its finished state by the burning out of some of its elements some little of its original weight. The process makes a homogeneous metal, of an increased tensile strength of about 300 per cent. This steel is poured into ingots and rolled into sheets of suitable size and thickness, trimmed, then welded into tubing by special and expensive machinery, the ends cut off and threaded, after which it is ready for the market.

"Pipe made from steel, on account of its tensile strength, is made much thinner than cast iron, and weighs much less per foot. The freight rates being on a per ton basis, it will readily be seen that the freight charges per foot on cast pipe will be much greater. The actual difference is so great that the steel pipe manufacturers have been able to sell their product on the Coast at a much less figure than cast iron pipe can be sold, even though the basis at the mill is reversed. In the case of water works and gas works extensions a great deal of business legitimately belonging to the cast iron pipe manufacturers has been taken away from them. It is claimed by the cast iron pipe interests that the business referred to would be theirs, if the rate adjustment asked for was ganted."

This matter of adjustment of rates has been brought before the Transcontinental Freight Bureau, but so far as is known no definite action has been taken. An advocate of the differential says: "The steel pipe interests naturally oppose the granting of a differential in rates, and the railroads find it difficult to make the adjustment because they think the present rate is a low one, and the only way out of it would be to raise the rate on steel pipe. It is almost an impossibility to raise rates when once they are lowered, even though this case would seem to demand its being done. The advantage realized by the railroads will be the increased tonnage they will haul, for the same footage, in case a differential is made in favor of cast iron pipe. The railroads also realize that their revenue will greatly increase if the steel pipe rates are raised, because the greater part of the steel pipe tonnage sold does not compete at all with cast iron pipe, and the additional amount of freight on such pipe would be clear gain."

This matter has been before the Transcontinental Association more than a year, and arguments were made by the interested pipe manufacturers in Chicago a few months ago. There are no indications at present that a change in the rates is to be made. It is said that, if the railroads are unable to make the differential asked for, it is probable the matter will finally come before the Interstate Commerce Commission for a ruling.

The Cambria Steel Company's Report.

The income account of the Cambria Steel Company for the year ending December 31, 1907, is as follows:

Net earnings from operations		$3,888,199.39
Receipts from rents, investments, interest on bank accounts, profit on ore sold, &c. (Of this amount $602,743.90 was due to profits from subsidiary ore mining and lake transportation companies, and $301,649.78 to profit on surplus ore sold)		1,094,754.91
Total		$4,982,954.30
Fixed charges under Cambria Iron Company lease and incidentals		420,687.58
Net income		$4,562,266.72
Which has been appropriated as follows:		
Dividends	$1,350,000	
Set aside to betterment and improvement account	2,400,000	
Set aside to general depreciation fund	500,000	
Set aside to inventory depreciation fund	300,000	
		4,550,000.00
Balance carried to credit of profit and loss account		$12,266.72
The profit and loss account, which had a credit December 31, 1906, of		$2,357,227.41
Has been increased by balance of income account transferred as above		12,266.72
Total		$2,369,494.13
And reduced by bad or doubtful accounts in 1907	$49,361.03	
Less collection of accounts charged off in previous years	36,085.33	
		13,275.70
Leaving balance to credit of profit and loss account, December 31, 1907		$2,356,218.43

The general balance sheet as of December 31, 1907, is as follows:

Assets.

Property, works, coal, ore lands, &c., subject to payment of $338,720 annual rental, under Cambria Iron Company lease		$33,090,304.68
Plant additions to Dec. 31, 1906	$9,317,479.38	
Plant additions year ending Dec. 31, 1907	1,986,017.37	
		11,303,496.75
Total		$44,393,801.43
Equipment additions		888,090.25
Real estate, titles in Cambria Steel Company		326,462.02
Sundry securities, principally stock in ore and steamship companies		1,518,638.00
Inventory account, materials, supplies and products		7,192,231.97
Special deposit	$1,000,000.00	
Cash	1,186,517.65	
		2,186,517.65
Accounts receivable		5,070,589.80
Bills receivable		678,420.56
Total		$62,254,751.68

Liabilities.

Capital stock issued	$45,000,000.00
General depreciation fund	3,150,000.00
Inventory depreciation fund*	300,000.00
Betterment and improvement fund	9,400,000.00
Accounts payable, including dividend No. 13, $675,000	2,048,533.25
Profit and loss account	2,356,218.43
Total	$62,254,751.68

* The supply of iron ores is provided from the Lake Superior District; to insure continuous operation of plants, heavy stocks are carried at this season of the year. Due to the prevailing stagnation in business these are not being marketed as rapidly as usual, and it is deemed prudent to protect the probable depreciation by this account.

From the accompanying statement by President Powell Stackhouse and Chairman E. B. Morris, the following details are taken:

Mineral Properties.

The coal, iron ore and limestone properties owned produced satisfactory results. Explorations for ore are being continued on a large body of land in Michigan held under option, thus far with negative results. The Penn Iron Mining Company shipped from its mines on the Menominee range, Michigan, 378,764 tons of iron ore for use at Cambria Works. The Republic Iron Company of Michigan, of which the Cambria Steel Company owns over 99½ per cent. of the capital stock, shipped from its mines in the Marquette District, Michigan, 171,048 tons of iron ore, about 150,000 tons for use, the remainder having been sold.

The Mahoning Ore & Steel Company, Mesaba District, Minnesota, of which the Cambria Steel Company owns 50 per cent. of the capital stock, produced 1,547,711 tons or iron ore, Cambria's proportion of which was 692,-107 tons; 515,000 tons for use and 177,000 tons were sold at a profit. Its annual output can be increased, when required, and its ore reserves are ample for a very long term of years.

Cambria Plant.

Expenditures aggregating a large sum have been made at many points in the original works, in the line of remodeling and betterments. The chief of these are: The steel stock bins at Nos. 5 and 6 blast furnaces; one-half of these are now in use and the balance should be completed in the first half of 1908. The new and enlarged fireproof machine shop which is finished and operative; the placing of a few new tools and rearranging of tools now in use remain to be done.

There is being added 2000-kw. electric power with 2400-hp. boilers at No. 6 blast furnace. The use of this convenient and for many uses economical power is constantly increasing in all parts of the plant. A repair shop, with special tools, is under construction for this department.

Gautier Plant.

The 22-in. plate and breakdown mill under construction last year commenced rolling steel in September. The boilers of this department were consolidated in one building, gaining room at a point badly congested, and economy in operation.

Two 75-ft. spans of steel and concrete construction have replaced an equal width but a less length of the temporary wooden buildings erected in 1889. After the rebuilding and removal of the 20-in. plate mill into the new building, and as opportunity offers, the work of reconstruction will be proceeded with until all the old buildings are replaced.

Franklin Plant.

The work that has been carried on during the year has been in the direction of the completion of the plant in accordance with the plans contemplated when originally designed.

The Franklin mines, furnishing the coal supply for the Otto Hoffman ovens, have been equipped with an electric haulage plant, reducing the cost of haulage.

The Otto Hoffman coke oven plant now comprises 312 ovens. The eighth battery of 56 ovens produced coke in April. Some additions were made to the coal and tar storage and ammonia house.

The No. 8 blast furnace made its first metal August 7, and is completed, with the exception of a spare gas blowing engine and appliances, now under construction.

Nos. 16 and 17 50-ton open hearth furnaces and the 200-ton hot metal receiver were completed toward the close of the year. Minor additions have been made to the bloom and billet mill, which with additioal boiler power now being erected should put this plant in fair balance for a larger output when required.

Excepting a curtailment of output in November and December, the car shop was in full operation during 1907, with satisfactory results. The additions under construction at date of last report have been completed. The plant is now idle, with little prospect of orders being secured in the early future.

Shipments of steel show a decrease of 4 43-100 per cent. in quantity, and 87-100 per cent. in the gross value of all products shipped, compared with the preceding year, which was the company's maximum year. The mills and shops were under great pressure to fill orders for their products up to the commencement of the financial panic in October, which promptly caused a substantial paralysis in all operations, and while the order books contained orders for several months' work ahead, in nearly all lines cancellations and suspensions practically rendered the plant idle, and from which it is slowly recovering.

Robert C. Morris has been appointed receiver for the Breakwater Construction & Engineering Company, New York, which is said to have $2,000,000 worth of contracts on hand for United States Government work.

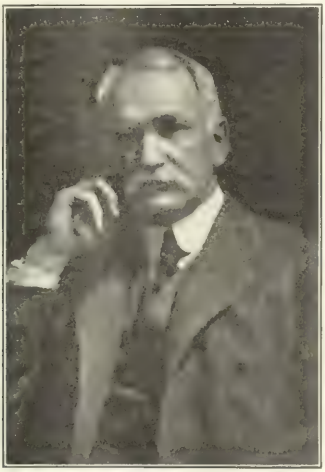
OBITUARY.

JAWOOD LUKENS.

Jawood Lukens, president of the Longmead Iron Company, Conshohocken, Pa., died March 10, aged 65 years. He belonged to a family of Pennsylvania ironmasters. He was named after J. A. Wood, his maternal grandfather, who was one of the earliest manufacturers of iron in the Schuylkill Valley. J. A. Wood's descendants are the owners of the Alan Wood Iron & Steel Company and of the John Wood & Brothers Iron Company, also of Conshohocken.

Jawood Lukens was the youngest son of Lewis A. Lukens, an original partner in the Alan Wood Company. The son took up a part of his father's interest in that company in 1873, but in 1881 he withdrew and started the Longmead Iron Company, with which afterward was incorporated the Conshohocken Tube Works, of which Mr. Lukens was one of the founders. These companies have grown to large dimensions and have enjoyed much prosperity.

Mr. Lukens served his community in the Town Council and on the School Board. He was long a director in



JAWOOD LUKENS.

the First National Bank and the Tradesman's Bank of Conshohocken and the Quaker City National Bank of Philadelphia. For many years he was treasurer and practically manager of the Conshohocken Water Works. In all these capacities and in his own business he was capable, assiduous, clearsighted and in possession of the confidence and esteem of his fellow citizens. In his private life his lofty character, his refinement, his consideration for others and his unblemished integrity warmed into affection the feeling of those persons with whom he came in contact. He was a remarkable member of a remarkable family. Mr. Lukens was born March 8, 1843, in Lebanon County, Pa., where his father had a charcoal forge. He was educated at a private school in Norristown, Pa., and at the Polytechnic College in Philadelphia. He graduated as a civil engineer in 1864, having meantime served in the Pennsylvania militia in the emergency calls of 1862 and 1863. After his graduation he was for a time engaged with an engineer corps in surveying a route for the Pan Handle Railroad in West Virginia and Ohio, and later was engaged in surveying in the oil fields of Pennsylvania. In 1867 he took a position in the employ of Alan Wood & Co., subsequently, as above noted, entering the firm. In 1868 he married Susan, daughter of Dr. Hiram Corson of Plymouth Meeting, Pa., who survives him. He was a member of the American Institute of Mining Engineers, the Engineers' Club of Philadelphia, the Franklin Institute, the Union League, the Art Club and the Manufacturers' Club.

DAVID A. CLARKE, who for a number of years has been purchasing agent for the Phœnix Iron Company, Philadelphia, Pa., died March 16, aged 64 years. He was born in Philadelphia, entered the employ of the Phœnix Iron Company in 1866, and continued with the company for 42 years, serving during a long portion of the time as purchasing agent. He was a man of sterling worth, honored by all who had business transactions with him, and was held in the highest esteem by the company which he had served for so many years.

Labor Notes.

It is reported from Montreal that the Nova Scotia Steel & Coal Company has decided upon a reduction of 10 per cent. in the wages of all employees. This is the first Canadian industrial concern to make a general reduction.

A convention will be held in June to put on a permanent basis the federation of labor unions in the metal trades, which was organized at Cincinnati in February. It is to be known as the Metal Trades Department of the American Federation of Labor. The temporary president is James O'Connell of the International Association of Machinists and the temporary secretary is James P. Frey of the International Molders' Union of North America. The national unions represented are those of the molders, machinists, patternmakers, blacksmiths, boilermakers, foundry employees, metal polishers and buffers, electrical workers, steam fitters, stove mounters, engineers and firemen. The local organizations of the new federation will be known as local metal trades councils.

The bimonthly wage adjustment between the Amalgamated Association and the bar iron mills that sign the Amalgamated scale were made in Pittsburgh last week. It was found that the average price on shipments of iron bars in January and February was 1.45 cents at mill, and this makes a reduction in puddling of 25 cents a ton, or from $6.37½ to $6.12½ for March and April. Wages of finishers will be reduced 2 per cent. for those two months. Wages of tin plate employees will be reduced 2 per cent. for March and April, the average price of shipments of tin plate in January and February having been $3.50 per box, which is 10 cents per box above the base of the scale. Wages of sheet mill employees will be reduced 2 per cent. for March and April over wages paid in January and February, which brings the wages of sheet mill hands down to the base of the sheet scale, which is 3 cents per pound, averaged for Nos. 26, 27 and 28 gauge.

The Decalcomania Industry.—Decalcomania manufacturers have won a victory in the United States Circuit Court at Philadelphia, which is expected to have the effect of reviving the industry in this country. The court holds that decalcomania paper is dutiable at 3 cents a pound and 20 per cent. ad valorem under the provision of the tariff for "surface coated papers." Since 1897 this paper has been entering the United States as "lithographic prints" with a duty of 20 cents a pound. The importers, however, have been separating the tissue carrying the decalcomania transfer from the body of the fabric, which greatly diminishes the weight, and it is said has reduced the effect of the duty to less than 3 per cent. ad valorem, practically driving domestic manufacturers out of business. Decalcomania transfers, while mainly used in the decoration of china and pottery, are also employed to quite a considerable extent in the decoration of house furnishing goods and other articles whose surfaces present favorable conditions for the adherence of the tissue. The importers will not accept the decision as final, but a new case is to be made up for another test.

The Golden-Anderson Valve Specialty Company, Fulton Building, Pittsburgh, has been appointed sales agent in the Pittsburgh District for the Gould safety continuous feed water regulator, made by the Gould Mfg. Company, Chicago, for maintaining a uniform water level in steam boilers.

PERSONAL.

George R. Carr, vice-president of the Dearborn Drug & Chemical Works, Chicago, is on a combination business and pleasure trip to the City of Mexico. John W. Brashears, who for many years has been first assistant to W. A. Converse, chemical director of the company, in charge of its analytical laboratories, has been appointed assistant superintendent of the manufacturing department.

C. S. Johnson has severed his connection with the Mexican Steel Products & Machinery Company, S. A., Mexico, D. F., and the management is now composed of K. M. Van Zant, Jr., president and treasurer; Phillip G. Roeder, vice-president; Bernabé de la Barra, secretary, and W. H. Sinclair, manager.

William L. Saunders, president of the Ingersoll-Rand Company, New York, returned March 10, after a five months' absence in Europe.

Charles A. Schieren, Jr., of the Charles A. Schieren Company, New York, leather belting manufacturer, sailed March 17 for Europe, where he will visit the company's branch offices and agencies. He expects to be away four weeks.

R. S. Stangland has been placed in charge of Muralt & Co.'s construction office at New Fort Lyon, Colorado, and will superintend the erection of the complete lighting, heating and power plant which his firm is building for the United States Government at the New Fort Lyon Naval Hospital.

H. P. Bope, vice-president of the Carnegie Steel Company, and Homer J. Williams, general manager of the Duquesne Works of the same company, have returned from Mexico.

A. R. Hunt, general superintendent of the Homestead Works of the Carnegie Steel Company, has returned from Florida.

The Republic Iron & Steel Company, Pittsburgh, announces the following appointments: J. W. Deetrick, general superintendent of blast furnaces and steel works, with headquarters at Youngstown, Ohio, in charge of operation of all blast furnaces North and South and the Bessemer Steel plant and Brown-Bonnell Department at Youngstown. T. R. Akin, general superintendent of rolling mills, with headquarters at Pittsburgh, in charge of operations of the Mahoning Valley Works, Shafting Works, Corns Works, Toledo Works, Inland Works, Tudor Works, Sylvan Works and Indiana Works in the North, and Gates City and Birmingham Rolling Mill in the South. Frank L. Brown, chief clerk, will have charge of the order department, together with all clerical work of the operating department, in the Pittsburgh office in the Frick Building Annex.

W. E. Brandt, formerly mechanical engineer of the Pittsburgh Mfg. Company, has associated himself with Harry E. McCoy, 619 Ferguson Building, Pittsburgh. Under the name of McCoy & Brandt, the new firm will act as manufacturers' sales agent, and will also deal in second-hand machinery. It has secured the Pittsburgh agency for the products of the Whitlock Coil & Feed Water Heater Company, Hartford, Conn.

At the annual meeting of the stockholders of the E. W. Bliss Company, Brooklyn, N. Y., held March 17, William H. Lyon, treasurer of the Charles Parker Company, Meriden, Conn., and Jesse Metcalf of Providence, R. I., were elected directors to succeed Thomas B. Kent and W. E. Murdock, resigned. The other directors were re-elected.

R. Kent, formerly superintendent of the Bessemer Rolling Mill, Bessemer, Ala., has been appointed superintendent of the Tennessee Coal, Iron & Railroad Company's rail mill at Ensley, Ala., to succeed J. C. Sutherland, who becomes assistant superintendent of the company's Ensley steel plant.

At a meeting of directors of the Pittsburgh Coal Company held last week, W. K. Field was elected vice-president and placed in charge of the mining department. Mr. Field has been president of the New Pittsburgh Coal Company, a subsidiary interest, with former headquarters at Columbus, Ohio. Other officials of the Pittsburgh Coal Company for the ensuing year were elected as follows: M. H. Taylor, chairman and president; W. R. Woodford and C. E. Wales, vice-presidents; F. J. LeMoyne, secretary, and William Miller, treasurer.

The Railroad Engineering and Maintenance of Way Convention.

The ninth annual convention of the American Railway Engineering and Maintenance of Way Association was opened at the Auditorium Hotel, Chicago, on Tuesday, to continue in session for three days. The morning session of the opening day was devoted to an address by the president, A. W. Jackson, general manager of the New York, Chicago & St. Louis Railroad, and hearing reports of the secretary, treasurer and standing committees. Meetings were held in the morning, afternoon and evening, during which a number of interesting papers upon engineering problems relating to railroad construction and operation were presented.

The programme includes an extended list of subjects which will be considered in a large number of carefully prepared papers. The attendance, at the opening sessions, which was unusually full, included quite a number of prominent railroad officials and engineers, as well as a large number of manufacturers of railroad supplies. An extensive line of exhibits comprising railroad appliances and material occupied the parlor floor of the Auditorium, and was the center of attraction for a throng of visitors.

The Republic and the Amalgamated.—The continuous working agreement entered into in 1904 between the Amalgamated Association and the Republic Iron & Steel Company has been discontinued at the request of the Republic Company. Under the terms of the continuous agreement the mills were to remain in operation after the expiration of the wage agreement, June 30 each year, until a new agreement should be made. In the event of failure of the Amalgamated Association and the manufacturers to agree, the settlement was to be left to a Board of Conciliation. The award of the Board of Conciliation which met at Cambridge Springs in August, 1907, was not agreeable to the manufacturers, and has now led to the annulling of the continuous agreement. This action means that unless a settlement of the Amalgamated Association's scales is reached with the Republic Company prior to June 30 next, on which date these scales expire, the mills of the company will close down and remain closed until the question is settled.

The J. W. Paxson Company, Philadelphia, Pa., at a recent meeting elected the following officers, the action being made necessary by the recent death of J. K. Bougher, president. The new officers are: H. M. Bougher, president and general manager; L. B. Shaw, vice-president and marine superintendent; Howard Evans, treasurer; J. S. Hibbs, assistant general manager; S. C. Bougher, purchasing agent and secretary; A. G. Warren, consulting engineer.

The open hearth steel plant of the Sharon Steel Hoop Company, Sharon, Pa., which contains five 35 ton furnaces, and which has been idle since early in December, has been put in partial operation, four furnaces having started on Monday of this week. The company's hoop mills have also been started, to work up a small accumulation of orders. The duration of their activity depends on the inflow of orders.

The Warwick Iron & Steel Company, Pottstown, Pa., blew in its No. 1 furnace last week, and now has two stacks in blast. Orders have been sufficient to reduce to a considerable extent the stocks of pig iron on hand at the first of the year.

NEWS OF THE WORKS.

Iron and Steel.

Keystone Furnace of the Reading Iron Company, Reading, Pa., resumed operations March 13.

The Halcomb Steel Company, Syracuse, N. Y., has increased its capital stock from $1,500,000 to $1,750,000.

The Warwick Iron & Steel Company, Pottstown, Pa., blew in its No. 1 furnace March 12. As this furnace is equipped with the Gayley dry blast the company considers it best to keep it in operation rather than its No. 3 furnace, which is not equipped with the dry blast.

The tin plate plant of the Alcania Company at Avonmore, Pa., which contains three hot mills and has been idle for about two years, was put in operation March 16.

No. 4 Eliza furnace of the Jones & Laughlin Steel Company, at Pittsburgh, is to be torn down and rebuilt. This furnace made a practically continuous run of seven years, in which time it turned out 1,202,056 tons of Bessemer iron. The company is also making repairs to some of its other Eliza furnaces, and is relining and making important improvements to its Soho Furnace in Pittsburgh.

The three new blast furnaces of the Republic Iron & Steel Company at Haselton, Ohio, are now in operation and Hall Furnace, at Sharon, Pa., has also been started. This leaves two stacks idle, Atlantic at New Castle and Hannah at Youngstown.

D. Lamond & Son, Ferguson Building, Pittsburgh, have just completed the building of two Foote hot blast stoves, 18 x 85 ft., for the Hanging Rock Iron Company, Hanging Rock, Ohio.

It is reported on good authority that the plants of the Southern Steel Company will be put in operation within 60 days. These plants have been idle since the Southern Steel Company was adjudged a bankrupt in October, 1907.

General Machinery.

The Thomas Carlin's Sons Company, River avenue, North Side, Pittsburgh, Pa., manufacturer of shears, grinding pans, hoisting engines, &c., has received an order through the Garrett-Cromwell Engineering Company, Cleveland, Ohio, for two 9-ft. dry grinding pans and one 20 x 12 in. crusher, all to be equipped for motor drive, for installation in the new open hearth steel plant now being built by the Pittsburgh Steel Company at Monessen, Pa. The company has also booked some orders for medium and small sized shears from different concerns for use in cutting scrap.

The recent fire at the shops of the Northern Pacific Railroad at Jamestown, N. D., did but little damage to the buildings and only scorched the equipment. The machinery is being repaired and placed in operation.

The Crescent Machine Company, Leetonia, Ohio, manufacturer of woodworking machinery, states that notwithstanding the general business depression its business has held up remarkably well and at this time is showing some improvement. Never at any time during the financial stringency was it obliged to resort to the use of checks, but always managed to meet its payrolls with cash. The plant has been operated steadily right along and is even now obliged to run six days a week in order to keep up with deliveries. The company reports inquiries as rather plentiful, while the orders being received are scattering, coming from all sections of the country, which is construed as an indication that a reasonable quantity of business is being done, with good prospects for a further increase. The company is now working on several new machines which will be ready for formal announcement in a few weeks. These machines will be shown in its 1908 catalogue, which will be issued in about two months. It expects to make still further additions to its line of woodworking machinery, which will be announced later in the year.

Power Plant Equipment.

The Segura, Braniff Company, Orizaba, Ver.-Mexico, has been reorganized under the name of Compania de Luz Electrica y Fuerza Motriz de Orizaba, S. A. The new company has a capital stock of $1,200,000 and purposes to enlarge and extend the present system. Another large unit is being installed in the power house in order to accommodate the increased demand for light and power in the cities of Orizaba and Cordoba.

The Board of Water Commissioners of McGrawville, N. Y., will receive bids until March 30 for water works material, including one double geared power driven single acting triplex pump, with cylinders approximately 7 in. in diameter by 10 in. stroke, outside packed, with water delivery of from 200 to 320 gal. per minute. Specifications can be obtained from H. C. Chaffee, McGraw, N. Y., or from W. G. Stone, engineer, Utica, N. Y.

Sealed proposals will be received at the office of the County Clerk, Grand Rapids, Mich., until April 2, for additional water supply and fire protection system for the Kent County Home, including pumping station, tank, water main, &c.

Additional equipment being installed in the municipal electric light plant, Crustal Falls, Mich., includes two Leffel turbines; one 300-kw. Fort Wayne alternator, three-phase, 2300-volt, 60-cycle; one 1000-gal. per minute Gould triplex pump. Work upon this installation was begun last fall and will again be resumed some time in May.

The citizens of Wahoo, Neb., will on March 27 vote upon the question of a bond issue of $50,000 for the installation of a water plant, and $15,000 for an electric light plant.

The United Light & Power Company, Moline, Ill., incorporated with a capital stock of $60,000 to supply gas and electricity to the towns of East Moline, Silvis and Watertown, Ill., is planning to install a plant during the coming summer.

The Hill City Electric Power & Mining Company, Hill City, S. D., has been incorporated with a capital stock of $500,000, and has secured a water right on Spring Creek, near Hill City, where it is arranging to construct a dam and flume, the purpose being to generate current for lighting neighboring towns and supplying power to its own and outside mines. It is stated that as soon as the frost is out of the ground steps will be taken to carry out these plans.

The North Electric Company, Dallas, Texas, has been incorporated with a capital stock of $10,000, the officers being Geo. C. Steele, president; A. A. Marrs, secretary, treasurer and manager.

To provide funds for the rebuilding and partial re-equipment of its electric light plant, burned last January, the city of Linneus, Mo., has voted bonds in the sum of $3500. Motive power will be supplied by an Atlas four-valve heavy duty engine of 125 hp., and a boiler also furnished by the Atlas Engine Company, Indianapolis, Ind. Plans for the remaining machinery requirements are being prepared.

The F. G. Grote Mfg. Company, Evansville, Ind., has been incorporated with $50,000 capital stock. It will manufacture heating appliances and machinery to furnish power. The directors are F. Grote, Emil Grote and J. D. Carmody.

Foundries.

The Columbiana Foundry Company, Columbiana, Ohio, manufacturer of gray iron castings up to 5 tons, is completing a contract for the Brier Hill Iron & Coal Company, Youngstown, Ohio, for the castings required in the new blast furnace being built by that company.

The Coatesville Foundry & Machine Company, Coatesville, Pa., which purchased a tract of land just outside of the city limits in the latter part of 1907, has placed a contract with the McClintic-Marshall Construction Company, Pottstown, Pa., for the construction of buildings on the site, which will be equipped for the manufacture of boiler fronts and other castings, such as grate bars, &c. The buildings will be of structural steel and will include a main structure, 114 x 208 ft.; fireprof pattern shop, 40 x 60 ft.; pattern storage buildings, &c. The machinery, pattern shop and foundry equipments have been purchased, and the company expects to have the plant ready for operation in the early part of August.

The Anderson Foundry & Machine Works, Anderson, Ind., has increased its capital stock from $50,000 to $100,000.

The McInnes Steel Company, Corry, Pa., has started up its new plant for the manufacture of steel castings. The company has a good many orders on its books and is operating its entire plant to nearly full capacity.

Bridges and Buildings.

Bids are being received by the Northwestern Consolidated Milling Company, Minneapolis, Minn., for the construction of a 1,000,000-bushel fireproof elevator, which is to be erected on property adjacent to the A. & F. mills of the company.

Fires.

The machine shop of the Bryant Machine Company, at Rumford, R. I., was damaged $5000 by fire, March 10.

The coke washer, tipple, engine house and laboratory of the Colorado Fuel & Iron Company at Sophis, Colo., were damaged $50,000 by fire, March 15.

On March 13 part of the paper mill at Herrings, owned by W. P. Herring, Watertown, N. Y., was burned.

Hardware.

The Howard Stove & Mfg. Company, Savannah, Mo., is contemplating a change of location, and has under consideration propositions from St. Joseph, Mo., and Pueblo, Colo., offering inducements for the establishment of the plant in those cities.

The Southern Stove Works, Evansville, Ind., is notifying its customers that reports of damage done to its plant by fire on March 5 are greatly exaggerated. Only one storage house for patterns and the mounting room on the third floor were destroyed; the loss incurred by the destruction of these two buildings and contents will not exceed $20,000. Orders are being promptly filled from stock on hand and arrangements are being made to rebuild the destroyed portion of the plant as soon as the loss is adjusted.

The Harness Specialty Company, recently incorporated under the laws of Ohio with a capital of $20,000, has secured one of the buildings formerly occupied by the Crescent Machine Company, Leetonia, Ohio, and which is three stories high and 50 x

125 ft. in size. The building has been equipped with modern machinery for the manufacture of leather specialties for harness.

The Ohio Lock-Nut & Bolt Company, Columbus, Ohio, manufacturer of the Amberson lock-nut, has a plant at Summit Station, Ohio, equipped to turn out 10 tons of nuts per day, varying in size from ⅜ to 1½ in. Machinery is also being installed for the production of bolts and washers, and the company will be able to make deliveries about April 15.

The Penn Shovel Mfg. Company, Warren, Ohio, has gone into the hands of receivers, Clay Hanna and Gordon Brown having been appointed by the court. It is probable the company will be reorganized.

The Iddings Company, Warren, Ohio, has been incoporated to take over the business of the Peerless Sifter Company, a partnership composed of Frank A. and W. T. Iddings. The new company has a capitalization of $75,000. The business of the company will be extended and it is expected that other lines will be taken up.

Miscellaneous.

The financial statement issued by A. B. Brock, receiver of the Beaumont Iron Works, Beaumont, Texas, February 29, shows a surplus over liabilities of $75,613.44.

The Sterling Alternating Ignition Company, organized a short time ago, is now operating its factory at Binghamton, N. Y., where it is manufacturing electrical ignition apparatus and automobile timers.

The Hines Mfg. Company, Portland, Ind., has incorporated, with a capital stock of $100,000, to manufacture sectional collapsible steel derricks, the invention of John L. Hines, who is president. A new plant will be equipped for constructing the derricks.

The property and equipment of the Southern Metal & Mfg. Company, Cape Girardeau, Mo., will be sold at foreclosure sale March 30.

The Storm King Stone Company has placed a contract with the Mashek Engineering Company, New York, for a 1000 cu. yd. per day stone crushing plant, to be built at Storm King Mountain, on the Hudson River. The contract calls for the complete plant to be turned over to the owners in operation. All plans are complete and work on foundation and dock will be started this week.

The Davenport Wagon Company, Davenport, Iowa, has completed plans for a new wagon factory, the erection of which will be begun at once. The buildings are to be of reinforced concrete and modernly equipped with suitable machinery for the manufacture of the Davenport roller bearing steel wagon, which will now be made on an extensive scale.

The C. W. Smith Elevator Company, Chicago and Perry streets, Buffalo, N. Y., has incorporated, with a capital stock of $25,000, to manufacture freight and passenger elevators under the patents and designs of Charles W. Smith. The directors are Charles W. and Merritt E. Smith of Buffalo, and Frank L. Barnet of Alden, N. Y. Arrangements have been made for manufacture, so that no new equipment or machinery will be required at the present time. Offices have also been established at Cleveland, Pittsburgh, New York and Boston.

The Best Mfg. Company, Pittsburgh, manufacturer of complete piping equipments for power plants and blast furnaces, has received an order from the United States Coal & Coke Company, Gary, W. Va., for all the steam, exhaust, boiler feed and blow-off piping, including valves and fittings, ranging in size from 16 in. down, for the new power plant being erected by the latter company. The work is now under way and will be completed in about two months.

The James McNeil & Brother Company, Pittsburgh, has lately been awarded a contract by the Pittsburgh Steel Company, involving 800 to 900 tons of material. The work consists of several large flues for 51 gas producers, the flues varying in diameter from 5 to 8 ft., including all branches, supports and castings; also eight self-supporting steel stacks, 12 ft. bottom diameter and 175 ft. high, for open hearth plant, and five self-supporting steel stacks, 7 ft. bottom diameter and 100 ft. high, for soaking pit furnaces. All this work is to be erected at the new plant of the Pittsburgh Steel Company at Monessen, Pa. This same company has been awarded a contract by the Liquid Carbonic Company, Pittsburgh, for several large cooling towers and tanks, the largest of which are 10 ft. in diameter and 100 ft. high.

The Ash Grove Lime & Portland Cement Company, Kansas City, Mo., has now under construction at Chanute, Kan., a high grade Portland cement plant, which is designed to be one of the most modern and best equipped plants in the Middle West. Five 8 x 125 ft. rotary kilns will be installed and the fuel used will be natural gas, of which the company now has a flow of 130,000,000 ft. per day. The entire mill will be operated by a power plant consisting of four 22 x 42 in. Reynolds Corliss engines, built by the Allis-Chalmers Company, Milwaukee, and supplied through the Hunt Engineering Company, Chicago. These engines will be connected by rope drive to line shafts operating the cement-making machinery.

New Publications.

The Present and Future of the Bituminous Coal Trade. By Henry S. Fleming. 8 vo., 90 pages, with numerous inserted tables and diagrams. Published by the Bituminous Coal Trade Association, New York.

Mr. Fleming is the secretary of the Bituminous Coal Trade Association, 1 Broadway, New York, and this volume is his report to the association on the world's supply and consumption of bituminous coal. Following somewhat the method of some statisticians who have estimated the curves of iron production and consumption in the United States, Mr. Fleming has made estimates of the future movement of bituminous coal. His calculations are based on the determination of the theoretical curve produced by the known tonnage of past years. The intention has not been to predict the actual tonnage for any year or period of years, but to show the tendency in so far as it may be anticipated by the yearly records of the trade. The rate of increase will doubtless change, but the writer says that the rate of the decrease in the increase is so slight that the reversing of the curve is remote. While the total production will continue to become larger from year to year, the rate of percentage increase will become less each year, it is predicted, until far in the future the total production year after year will be about the same. Then, with the gradual exhaustion of the coal fields, it will in the same manner begin to decrease.

Mr. Fleming has made his report a statistical encyclopedia of the bituminous coal trade of the world. Naturally the production and consumption in the United States are given with fullest detail. An interesting set of statistics is that in which the table of yearly production and consumption of bituminous coal in the United States at 5-year intervals is supplemented with estimates for future decennial and quinquennial years, beginning with 1910. For that year the estimated production of bituminous coal in this country is 365,000,000 tons; for 1915 it is 480,000,000 tons; for 1920, 606,000,000 tons, and so on up to 1950, for which the estimated production is 1,355,000,000 tons. Another interesting table is that which gives the distribution of bituminous coal consumption in the United States according to uses. For example, in 1905 44,000,000 tons went into coke, 97,000,000 tons was consumed by railroads, 117,000,000 tons was burned in industrial and domestic fires and 7,000,000 tons was exported. For 1910 the estimate is 46,000,000 tons for coke, 124,000,000 tons for railroads, 163,000,000 tons for industrial and domestic use, and 12,000,000 tons for export. For 1950 the estimated totals are, respectively, 216,000,000 tons, 418,000,000 tons, 489,000,000 tons and 157,000,000 tons.

Mr. Fleming says that while his estimates of production for 1906 and 1907, based on records for preceding years, were largely exceeded by actual production in those two years, he considers that his hypothetical line will not be far from the average output in coming years. A remarkable fact is brought out in one of the diagrams, namely, that there have been but five years in the history of the trade in which the production of bituminous coal has been less than in the preceding year. This outdoes the record of pig iron production, remarkable as that is considered to be, for making new high points and for rapid recovery after a year of declining production. Another revelation of the tables, to which attention is called, is that from 1825 to the present time the production of bituminous coal in the United States for any 10 years has been greater than the total from 1825 to the beginning of that 10 years.

In addition to many pages of statistics of coal production by States from 1814 to the present time, there are 35 inserted sheets, equivalent to two pages each, containing detailed statistical tables. The diagrams plotting the production in the United States and foreign countries year by year are contained in a pocket at the back of the book.

The Iron and Metal Trades

The volume of new orders booked by the rolling mills and Steel works continues to hover about the 50 per cent. mark of actual productive capacity. There is, if anything, a falling off in railroad purchases, which is compensated for by the better demand for the lighter lines. Among these the Wire trade is conspicuous. It is estimated that the leading interest is taking orders thus far in March equal to 82 per cent. of the business taken during the same period last year. Tin Plate is doing well and an increasing number of mills is being put into operation.

The Steel Rail trade is very quiet and car builders have very little work. There is the prospect of more activity in locomotive building. One leading system is in the market for 100 locomotives, another is asking for bids on 25 locomotives, and an order has been placed for 30 engines for export to France.

It is significant that the St. Paul road has decided to build for its Pacific Coast extension 2500 60-ton Steel under-frame freight cars and 70 locomotives, in its Milwaukee shops. An order for the Steel under-frames has been placed and the inquiry for the 10,000 axles is in the market.

Fabricators, particularly the smaller ones, are taking structural work at very low prices, so that the question is asked whether they do not in some way obtain the Shapes at concessions. It is pointed out, however, that costs have been markedly lessened through the greater efficiency of labor, which is a striking factor in nearly all manufacturing operations. Quite a number of small contracts have been closed, and a fair amount is in sight. One of the interesting transactions of the week has been the sale of 7000 tons of Sheet Piling for harbor work at Buffalo.

The Pig Iron markets have continued dull and are characterized by an increased amount of cutting of prices. Nearly every district has its independent interests, who are securing the bulk of what little business is being done, by making concessions. At Birmingham $12 can be done for No. 2, and at Virginia points $14 is available. Unless business picks up the situation will have to be met by the majority of the merchant furnaces, who until now have believed it a wise policy to maintain prices.

Quite a number of small contracts for Cast Iron Pipe have been placed lately, and additional tonnage is coming up, but very low figures are being made in many instances.

Copper is firmer, and 13c. is now being generally asked. The reports of large sales lack confirmation, and leading consuming interests do not report any appreciable betterment in the requirements. Thus far Europe has purchased very large quantities which certainly have not gone into consumption, and the question arises whether the desire and the ability to buy surplus Copper for the future may not be ultimately impaired.

Pig Lead has been put up ¼c. per pound during the week, making the New York price 4c. a pound. It is stated that the demand from corroders is good.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Mar.18, 1908.	Mar.11, 1908.	Feb.19, 1908.	Mar.20, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	$18.25	$18.25	$18.25	$25.25
Foundry No. 2, Southern, Cincinnati	*15.25*	15.75	15.75	26.00
Foundry No. 2, Local, Chicago	*17.50*	17.50	17.75	26.00
Bessemer, Pittsburgh	17.90	17.90	17.90	22.85
Gray Forge, Pittsburgh	15.90	15.90	15.90	21.75
Lake Superior Charcoal, Chicago	21.50	21.50	21.50	26.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	29.00
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.00
Open Hearth Billets, Phila	30.40	30.40	30.40	33.00
Wire Rods, Pittsburgh	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	*12.25*	12.25	13.00	18.00
Steel Rails, Melting, Phila	*12.75*	13.00	15.00	19.25
Iron Rails, Chicago	*15.00*	15.75	17.00	25.00
Iron Rails, Philadelphia	*17.00*	18.00	18.00	27.00
Car Wheels, Chicago	**15.50**	15.50	15.00	24.00
Car Wheels, Philadelphia	*14.00*	16.00	16.50	24.00
Heavy Steel Scrap, Pittsburgh	*13.00*	13.00	13.75	18.00
Heavy Steel Scrap, Chicago	*11.50*	11.50	12.50	16.00
Heavy Steel Scrap, Philadelphia	*12.75*	13.00	15.00	18.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.65	1.65	1.65	1.93½
Common Iron Bars, Chicago	1.65	1.65	1.65	1.81½
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.86
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.70	1.70	1.70	1.90
Skelp, Sheared Steel, Pittsburgh	1.80	1.80	1.80	2.00
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	*1.90*	1.90	2.00	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	**13.00**	12.62½	12.87½	25.50
Electrolytic Copper, New York	**12.87½**	12.50	12.62½	25.37½
Spelter, New York	**4.80**	4.75	4.75	6.95
Spelter, St. Louis	*4.60*	4.60	4.80	6.80
Lead, New York	**4.00**	3.75	3.75	6.30
Lead, St Louis	**3.85**	3.60	3.65	6.10
Tin, New York	**30.50**	29.25	28.15	40.65
Antimony, Hallett, New York	9.00	9.00	9.00	23.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, March 18, 1908. (By Telegraph.)

The most important industrial development of the week is the announcement made by the Chicago, Milwaukee & St. Paul Railroad of its purpose to build at its Milwaukee shops 2500 60-ton Steel underframe freight cars for its new Pacific Coast line, now under construction. Work on this equipment is to begin at once. An order for the Steel underframes and trucks has been placed, and an inquiry for the 10,000 Axles required is now in the market. Arrangements are being made for the building [illegible] on the new line, which will also be constructed in the company's shops. Further evidence of a more active demand for the material by the railroad is furnished by a perceptible betterment in the movement of Track Supplies. Purchases recently noted were last week supplemented [illegible] 25,000 kegs, and the closure of a contract awarding to the Cambria Steel Company the remaining 20,000 [illegible] Great Northern's 60,000-ton. Rail orders [illegible] week. An increasing number of small orders for Standard Section Rails is also noted, and Light Rail [illegible] are being offered a little more freely. Of the 10,000 tons of Structural Material on which closure is reported, the most important contract was that of 7000 tons of Sheet Steel Piling for harbor work at Buffalo. Plans including an aggregate of 10,000 tons for various building structures are now in the hands of fabricators for estimates. Plates, Bars and Tubular Goods continue inactive, though on the whole there is, perhaps, a slight improvement. It is reported that an advance of 25c.

a ton in freight rates on Cast Iron Pipe has been agreed upon by the Central Freight Association, to apply in central territory north of the Ohio River. The rate from the river to Chicago was advanced last fall from $1.60 to $2, and the proposed rate would fix the tariff at $2.25. The additional advance has not yet been promulgated and is meeting with strenuous opposition from Cast Iron Pipe interests. The purchase of 2000 tons by a local stove foundry was the chief feature of the week in the Pig Iron market. The strain of protracted dullness is bearing heavily upon values and is resulting in further weakness. The demand for Metals has sensibly improved, and under the strengthening influence of more active buying prices have firmed up, with a slight advance in Copper.

Pig Iron.—The sale of 2000 tons of No. 2 Southern Foundry constituted the chief transaction last week in this market. It was made to the Moore Bros. Company, Joliet, manufacturer of stoves, for delivery through the second, third and fourth quarters. The order, it is understood, was taken by a Tennessee furnace, but nothing definite regarding the price made has been learned. Offers made on this business by the various furnace interests indicate a marked disinclination on the part of the principal producers to contract for deliveries extending through the last half on the basis of present minimum prices. It is no longer questioned that some of the Southern furnaces are willing to do $12, Birmingham, on shipments through the first half, and even somewhat beyond that time, but the majority of them are at present not disposed to make large commitments for low priced contracts throughout the year. One sale of not over 300 tons for last half delivery was made last week at $13.50, Birmingham, by a seller whose price for second quarter on the same quantity was $13. While it is doubtless true that a majority of the small lots now changing hands in this market command $13, Birmingham, it is nevertheless evident that the offering of considerable tonnage does not fail to bring out lower prices on Southern Iron. In view of this fact, that market is more fairly represented by quotations of $12.50 to $13, Birmingham, for No. 2 Foundry, in accordance with which they are this week revised. Aside from the principal sale above noted, business for the past week has been limited to a few scattering orders, ranging from car lots to 400 tons. There has been a slight improvement in the number of inquiries received, which are practically all for Foundry Iron. Some talk of an advance in freight rates is heard, but furnacemen regard such action at the present time as being so wholly out of line with current conditions that the railroads will hardly insist upon an advance over existing tariffs. The following prices are for March delivery, f.o.b. Chicago:

Lake Superior Charcoal	$21.50 to $22.00
Northern Coke Foundry, No. 1	18.00 to 18.50
Northern Coke Foundry, No. 2	17.50 to 18.00
Northern Coke Foundry, No. 3	17.00 to 17.50
Northern Scotch, No. 1	18.50 to 19.00
Southern Coke, No. 1	17.35 to 17.85
Southern Coke, No. 2	16.85 to 17.35
Southern Coke, No. 3	16.35 to 16.85
Southern Coke, No. 4	15.85 to 16.35
Southern Coke, No. 1 Soft	17.35 to 17.85
Southern Coke, No. 2 Soft	16.85 to 17.35
Southern Gray Forge	14.85 to 15.35
Southern Mottled	14.60 to 15.10
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	19.40 to 19.90
Jackson Co. and Kentucky Silvery, 6 %	20.40 to 20.90
Jackson Co. and Kentucky Silvery, 8 %	22.40 to 22.90
Jackson Co. and Kentucky Silvery, 10 %	24.40 to 24.90

(*By Mail.*)

Billets and Rods.—In actual orders placed nothing of noteworthy importance has developed. There is, however, an inquiry in the market for 2500 tons of Car Axles, which represents definite requirements, and to cover which it is expected that an order will be placed without delay. Under present conditions a purchase of this size will doubtless serve to test the firmness of the market. On current transactions, which are few and unimportant, prices on Forging Billets are reported to be firmly held at the ruling quotations of $33 to $34, Chicago. Wire Rods continue unchanged as follows: Bessemer, $35; Basic, $36; Chain, $37, all at Pittsburgh.

Rails and Track Supplies.—Some betterment is noticed in the number of small orders coming out for Rails, which are evidently being required for maintenance work. Individually these orders rarely exceed a few hundred tons, but in the aggregate they help materially to fill out rolling schedules. The demand for Track Supplies continues on a fairly liberal scale, the principal interest having during the past week booked an aggregate of 25,000 kegs. Of this amount 22,000 kegs were comprised of 12,000 kegs from the Northern Pacific; 5000 kegs from the Great Northern, and 5000 kegs from the Chicago, Burlington & Quincy, the remainder being made up of miscellaneous orders. Light Rails show some improvement, orders of lots from 100 to 500 tons being more frequent, but prices are still being cut from $3 to $4 a ton. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.90c. to 2c., according to delivery; Track Bolts, 2.40c. to 2.50c., base, Square Nuts, and 2.55c. to 2.65c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—Fabricators are finding encouragement in the hopeful signs of movement that are beginning to appear among some of the deferred building projects. The Milwaukee Auditorium, which has been held up by litigation for several months, has finally been let to the Worden Allen Company, Milwaukee; about 1700 tons are required for this structure. Another contract that has been hanging fire for some time is that of the Raymond Lead Company, Chicago, 387 tons, which was let to the South Halsted Street Iron Works. The American Bridge Company secured a contract for 526 tons of fabricated material for the Barron Estate Building, San Francisco, which was supplemented by other orders taken during the week amounting to approximately 900 tons. The most important transaction of the week was a Government contract taken by McArthur Brothers, Chicago, for 7000 tons of Sheet Steel piling, to be used in harbor work at Buffalo. Figures are now being submitted on a large Catholic cathedral to be constructed in St. Louis, plans for which call for 1000 tons of Steel; and figures are also being submitted on 1000 tons for the Anaconda smelter, Butte, Mont. Prospects are favorable for the nearby closure of contracts on the 18-story Leavy Estate Building, Seattle, Wash., for which between 2000 and 3000 tons of Structural Shapes will be required. There are a dozen or more postoffices and public buildings being figured on throughout the Middle West, which involve an aggregate of about 6000 tons. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—Both as respects new orders and specifications, business in Plates is exceedingly quiet. While there is here and there some work in prospect that if carried out would produce a fair Plate tonnage, nothing of importance is being closed. Jobbers' stocks are not being depleted fast enough to require much replenishment. Prices continue to be shaded by some mills from $1 to $3 a ton. We quote for shipments from mill as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—The demand for Sheets continues to improve slowly, and the rolling schedules of Sheet mills are better filled than those of other lines. Buyers generally are not anticipating their wants far ahead, but are supplying specifications pretty freely for current needs. A fair amount of business is being done by jobbers in both Black and Galvanized Sheets, and prices continue firm. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 to 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c. Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—Bar Iron specifications have been coming out a little better, and as a result the East Chicago mills of the Interstate Iron & Steel Company ran steadily all of last week. Some new business is also being received, but it is small in proportion as compared with the whole. Steel Bars are exceedingly quiet, and specifications from consumers are scanty and irregular. Quick shipments are demanded on nearly all orders, which are plainly for immediate use. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—Moderate improvement is noted in the general volume of business being booked, which continues to

be made up of small orders for actual requirements. There is, however, a notably better feeling in the market, which is reflected by more numerous inquiries, indicating a resumption of outside operations. Under the pressure of strong competition store prices continue relatively low and irregular and afford but little profit to jobbers on stock shipments. Mill prices hold firm on Steel Pipe. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 72 to 72½ per cent. on Black Steel Pipe, ¾ to 6 in. From 2 to 3 points above these prices is asked for Iron Pipe.

Boiler Tubes.—There is possibly a little more activity in Merchant Tubes, but not of a pronounced character, such as would indicate positive improvement. Store stocks move slowly in small lots on orders arising from current requirements. Railroads are taking Locomotive Tubes a little more freely, but it is evident that their orders include nothing more than is actually required for repair work. Mill quotations for future delivery, on the base sizes, are as follows: 2⅜ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	35	35	35
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2¾ to 3 in.	50	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—As respects the demand from implement makers conditions are unchanged, and, indeed, there is little prospect for decisive betterment from this source during the remainder of the season. Orders and specifications in moderate amount for plain and special Tires are coming from the wagon makers and jobbers, but the demand for Smooth Finished Steel and Crucible Tool Steel is limited. Shafting is inactive and irregular; discounts continue to be shaded from 5 to 10 per cent. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1⅛ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 54 per cent. off in car lots; 48 per cent. less than car lots, base territory delivery.

Old Material.—With practically no support from consumers the market shows some tendency toward further weakness, which has, however, not yet developed into actual recession, except on a few grades. Railroad Wrought is off about 50c. a ton, and Iron Rails have declined 25c. The mills are taking on no more tonnage, except upon attractive offers. Last week's railroad offerings dragged somewhat, very little going to consumers. Lists to be closed this week include 1650 tons from the Missouri Pacific and 5000 tons from the Baltimore & Ohio, 2200 tons of the latter being Rerollers. We quote per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$15.00 to $15.50
Old Steel Rails, rerolling	12.25 to 12.75
Old Steel Rails, less than 3 ft.	12.25 to 12.75
Relaying Rails, standard sections, subject to inspection	20.50 to 21.50
Old Car Wheels	15.50 to 16.00
Heavy Melting Steel Scrap	11.50 to 12.00
Frogs, Switches and Guards, cut apart	11.75 to 12.25
Mixed Steel	9.00 to 9.50

The following quotations are per net ton:

Iron Fish Plates	$13.50 to $14.00
Iron Car Axles	16.25 to 16.75
Steel Car Axles	14.75 to 15.25
No. 1 Railroad Wrought	11.00 to 11.50
No. 2 Railroad Wrought	10.00 to 10.50
Railway Springs	10.75 to 11.25
Locomotive Tires, smooth	14.25 to 15.25
No. 1 Dealers' Forge	9.00 to 9.50
Mixed Busheling	7.00 to 8.00
Iron Axle Turnings	6.00 to 6.50
Soft Steel Axle Turnings	6.00 to 6.50
Machine Shop Turnings	6.00 to 6.50
Cast Borings	4.75 to 5.25
Mixed Borings, &c.	4.75 to 5.25
No. 1 Mill	7.00 to 7.50
No. 2 Mill	6.00 to 6.50
No. 1 Boilers, cut to Sheets and Rings	7.00 to 7.50
No. 1 Cast Scrap	12.00 to 12.50
Stove Plate and Light Cast Scrap	10.25 to 10.75
Railroad Malleable	10.00 to 10.50
Agricultural Malleable	9.50 to 10.00
Pipes and Flues	8.50 to 9.00

Cast Iron Pipe.—The principal prospective business reported is a lot of 2000 tons to be let March 17 by the city of Cincinnati. Among the awards made last week were 900 tons by Columbus, Ohio, and small lots by Fort Wayne, Ind., and Milwaukee, Wis., all of which were taken by the United States Cast Iron Pipe & Foundry Company. Routine orders, including requirements of municipal water plants, are fairly numerous. Most of the foundries have considerable stock on hand, and the competition for such business is unusually keen. We continue to quote per net ton, Chicago, as follows: Water Pipe, 4-in., $30; 6 to 12 in., $29; 16-in. and up, $28, with $1 extra for Gas Pipe.

Metals.—Last week brought out more orders for Copper than have developed in the past month or more. Several carload lots were included in these transactions, and the demand from smaller consumers was considerably improved Copper prices are a shade stronger, and Pig Tin has advanced 1c. a pound. A little better movement is also noted in Old Metals, the prices of which remain unchanged. We quote as follows: Casting Copper, 13¼c.; Lake, 13¾c. to 14c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 33c.; small lots, 31½c.; Lead, Desilverized, 3.95c. to 4c., for 50-ton lots; Corroding, 5.15c. to 5.25c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 13c., and other grades, 11c. to 11½c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 11c.; Copper Clips, 11c.; Red Brass, 12½c.; Yellow Brass, 10¼c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 23c.; Block Tin Pipe, 25c.

Pittsburgh.

PARK BUILDING, March 18, 1908.—(*By Telegraph.*)

Pig Iron.—The market continues excessively dull, and only small lots of Pig Iron for prompt shipment are being sold. There is probably a little more inquiry so far this month than in February, but consumers seem to lack confidence in the future, and are buying only such Iron as they absolutely need. The official prices on Foundry Iron agreed upon at the meeting held in Cleveland a few weeks ago are not being strictly held. We continue to quote Standard Bessemer Iron at $17, at Valley furnace, but reports are that a few small lots have sold as low as $16.75, at furnace. Basic Iron is weak, and a sale of 500 tons is reported on the basis of about $15.50, Valley furnace. Northern No. 2 Foundry Iron is about $15.75 to $16, Valley furnace, but several recent sales were on the basis of $15.50, at furnace. We note a sale of 300 tons of Northern Forge Iron at $15, Valley furnace, or $15.90, Pittsburgh, and we quote the market at that price.

Steel.—Considerable tonnage in Sheet and Tin Bars is being taken by consumers, but the demand for Billets is very dull. Reports are that small quantities of some sizes of Billets are still being furnished by outside mills at less than regular prices. We quote Bessemer and Open Hearth Billets at $28, Sheet and Tin Bars at $29.50, and Forging Billets at $30, for delivery in Pittsburgh and nearby districts.

(*By Mail.*)

Weekly reports received from agents all over the country by several of the leading local Steel companies are almost a unit in stating that general conditions are beginning to show betterment, and the tone of the market is more cheerful than for some time. However, improvement will probably be very slow. It is the impression that, while the second quarter may show up better than the first, material improvement is not likely to come until the political situation has cleared up and the money market has become easier. Railroads and traction lines still find it difficult to get money except at very high rates of interest, and numerous projects have come up involving large tonnages of material, which are almost invariably turned down by the mills, as terms of payment are not satisfactory. In the Mahoning and Shenango valleys only four merchant blast furnaces are running, these being No. 3 of the Shenango Furnace Company and the stack of the Youngstown Steel Company, which are on Bessemer, and one, Andrews & Hitchcock, and the Girard, both of which are on Foundry. None of the Valley furnaces is running on Basic or Forge, a very unusual condition, and one which shows clearly the lack of demand for Pig Iron. The output of Bessemer Iron in the two valleys last week was only 1685 tons, while the shipments of Bessemer and Basic were over 6000 tons. Stocks are still pretty heavy, but if this ratio is maintained they will soon show a material decrease. Both Bessemer Steel plants at Youngstown are idle this week, but the Sharon Steel Hoop Company, Sharon, Pa., has started to clean up accumulated orders. The demand for Steel is light, and occasional lots of Billets are being sold at about $2 a ton less than regular prices by sev-

eral outside mills in conversion deals. The business in Finished Iron and Steel placed with the mills so far this month is a little larger, on the whole, than in the same period in February. Coke and Scrap are both very dull and prices are weak.

Ferromanganese.—A local Tin Plate interest is reported to have bought a small lot of Ferro at a price somewhat under $46, Pittsburgh. A good deal of Ferro is being offered for resale by consumers who cannot use it and who need money, with the result that such lots are sometimes sold at $1 to $2 a ton under the regular market price. We quote 80 per cent. at about $44, Baltimore, or $45.95, Pittsburgh, but on a firm offer and for any considerable tonnage this price would be shaded about $1 a ton.

Muck Bar.—In the absence of actual sales on which to base prices, we continue to quote best grades of Muck Bar made from all Pig Iron at nominally $27 to $27.50, Pittsburgh.

Skelp.—There has been some little inquiry, but general conditions are very quiet. We quote nominally as follows: Grooved Steel Skelp, 1.60c.; Sheared Steel Skelp, 1.70c.; Grooved Iron Skelp, 1.80c., and Sheared Iron Skelp, 1.90c., f.o.b. Pittsburgh.

Rods.—The new demand for Rods continues dull, but the market is firm. The Youngstown Sheet & Tube Company on March 16 took possession of the plant of the Morgan Spring Company at Struthers, and is now prepared to quote on Rods through its home office at Youngstown and its regular agents. We continue to quote $35 for Bessemer Rods, $36 for Open Hearth and $37 for Chain Rods, f.o.b. Pittsburgh.

Steel Rails.—The Carnegie Steel Company has taken contracts for about 1500 tons of Light Rails for export, among which were 1100 tons of 18-lb. sections. The inquiry for the Isthmian Canal Commission for 2200 tons of Standard Sections, together with fastenings, has not all been placed, but the purchase is likely to be made of a Pittsburgh mill. Practically no domestic business in Standard Sections has been done, and the Rail mills have little work ahead. Regular prices on Light Rails, which are still being shaded $3 to $4 a ton by the mills rerolling Rails, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—New buying is very light, and specifications against contracts are coming in slowly. Requirements of Plates from the Steel car interests have dwindled to almost nothing, and the outlook for orders from this class of consumers is not very bright. Prices on narrow sizes continue to be shaded from $1 to $2 a ton, but not enough new business is being offered to thoroughly test the market. Regular prices are as follows: We quote: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼ in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell grade of steel is abandoned.	

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—Reports that the Oliver Building project for an office structure, occupying the square on Smithfield street from Oliver to Sixth avenue, and which will require about 14,000 tons, had come to life again, are not confirmed. It has gone over until next year. All the Structural concerns are badly in need of work, and very low prices are being made on the small amount that is coming out. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—The demand for Corrugated Sheets is showing betterment, while Black and Galvanized Sheets are also reported to be showing some improvement. This week the American Sheet & Tin Plate Company is operating 44 per cent. of its Sheet mills, against 40 per cent. last week. Prices on the whole are fairly well maintained, but slight concessions are sometimes made by a few mills that are anxious for orders. Regular prices are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—The demand is increasing, and the outlook is brighter than for some time. The American Sheet & Tin Plate Company has just started 10 of the hot mills at its Sharon Works and expects to start the other 10 mills next Monday. We are advised that regular prices are being maintained. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Iron and Steel Bars.—The differential of $2 a ton on Iron Bars against Steel is having the effect of diverting some business to the former by consumers who usually specify Steel Bars. For this reason new orders for Iron Bars and specifications against contracts are coming in a little more freely. It is a notable fact that on orders for both Iron and Steel Bars consumers usually specify prompt deliveries, showing that stocks in the hands of jobbers and consumers are much lighter than usual. The price of 1.60c. on Steel Bars is being strictly maintained, but the mills are entering very little new business. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further west. Steel Bars remain very firm at 1.60c., Pittsburgh.

Hoops and Bands.—A fair amount of specifying against contracts is being done, but some that should be coming forward has been held up, and practically no new business is being entered by the mills. The Sharon Steel Hoop Company has started its mills to work off an accumulation of orders. Regular prices are as follows: Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60, base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Spelter.—The market is weaker, the restriction in output agreed to by the smelters not having yet had the effect of firming up prices. Prime grades of Western Spelter are offered as low as 4.50c., East St. Louis, equal to 4.62½c., Pittsburgh, and very little new business is being placed, many consumers of Spelter operating their plants to half capacity or less.

Railroad Spikes.—This trade continues unusually quiet, and very little new business is being placed with the mills by the railroads or other consumers. Some of the Spike mills are badly in need of work, and concessions in prices are being made. We quote Standard sizes of Steel Railroad Spikes at $1.80, but this price is shaded in competition with Iron Spikes. Prices on the smaller sizes range from $1.85 to $1.90 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—While business continues light, some mills report that so far this month it is a little better than in February. Specifications against contracts are not coming in at a satisfactory rate, and shipments by the mills are light. Cold Rolled Shafting continues to be shaded, 55 and 2½ per cent. being named on carloads. Tire Steel is in fairly good demand, but the other grades are dull. We quote: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 2.10c. to 2.15c. Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron, finished, 1½ in. and wider, 1.60c.; under 1½ in., 1.75c. Planished Tire Steel is 1.80c., all f.o.b., at mill.

Iron and Steel Scrap.—The market has been quiet and very little material has been sold. The Sharon Steel Hoop Company has an embargo on Scrap, which may soon be removed, as this company has started up its Steel plant to partial capacity. Bids on the Baltimore & Ohio Scrap have gone in and awards are to be made on the 19th. Prices are weaker, and it is more of a consumers' market than for some time. Dealers quote about as follows: Heavy Steel Scrap, $13 to $13.25; No. 1 Railroad Wrought Scrap, $14 to $14.25; No. 1 Cast Scrap, $15 to $15.25; Bundled Sheet Scrap, $10 to $10.25; Cast Iron Borings, $7.75 to $8; No. 1 Busheling Scrap, $13 to $13.25; No. 2, $10.25 to $10.50; Steel Axles, $16.50 to $17; Sheet Bar Crop Ends, $17 to $17.25; Low Phosphorus Melting Stock, $17.25 to $17.50; Iron Axles, $20 to $20.50; Machine Shop Turnings, $8.75 to $9; Rerolling Rails, $14.25 to $14.50; Old Steel Rails, short pieces for Open Hearth use, $13 to $13.25; Grate Bars, $13.25 to $13.50.

Pipes and Tubes.—Several of the larger mills report

that orders entered so far this month show an increase in volume of about 25 per cent. over the corresponding period last month. The Oklahoma Natural Gas Company, which laid several gas lines last year, is preparing to lay more lines this summer, and is figuring on 15 miles of 8-in. Pipe which is likely to be closed this week. Jobbers are buying a little more freely, but are still disposed to limit their purchases to actual requirements and not carry large stocks. The market on both Iron and Steel Pipe is firm, but there is still an impression that possibly prices may be changed before long. However, nothing official about this has been given out, and the mills continue to adhere rigidly to regular prices. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 74 and 5 per cent. off list, while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black. %	Galv. %
⅛ to ¼ in	65	49
⅜ in	67	53
½ in	69	57
⅝ to 6 in	73	63
7 to 12 in	70	55
Extra strong, plain ends:		
⅛ to ⅜ in	58	46
½ to 4 in	65	53
4½ to 8 in	61	49
Double extra strong, plain ends		
½ to 8 in	54	43

Discounts on Genuine Iron Pipe are as follows:

	Black. %	Galv. %
¼ and ⅜ in	63	..
½ in	65	51
¾ in	67	55
1 to 6 in	71	61
7 to 12 in	68	55
Extra strong, plain ends:		
⅛ to ⅜ in	56	44
½ to 4 in	63	51
4½ to 8 in	59	47
Double extra strong, plain ends:		
½ to 8 in	52	41

Boiler Tubes.—The demand continues quiet, and prices are only fairly strong, one or two mills being disposed to make concessions to get orders. Discounts on Merchant Tubes for small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in	42	47
1¾ to 2¼ in	42	59
2½ in	47	61
2¾ to 5 in	52	65
6 to 13 in	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Coke.—The Coke trade continues exceptionally quiet, and there is very little demand for either Furnace or Foundry Coke. It is stated that about 40 per cent. of the ovens in the Connellsville region are active, while in the Latrobe and other districts a smaller percentage of ovens is being operated. Furnace Coke made in the Latrobe and Klondike districts is being offered at $1.60 to $1.65, at oven. Best grades of 72-hr. Foundry Coke are usually quoted at $2.25, but Foundry Coke made outside of the Connellsville region is offered as low as $2.10, at oven. The output of Coke last week in the Upper and Lower Connellsville regions was 158,824 tons, a slight increase over the previous week.

On April 1 the offices of Walter-Wallingford & Co., Pig Iron and Coke, now located in Farmers' Bank Building, will be removed to the People's Bank Building, Fourth avenue and Wood street, Pittsburgh.

Charles H. Daker, formerly connected with the Pittsburgh office of Hickman, Williams & Co., has resigned, and is now secretary of the Iron City Steel Company, 615 Bessemer Building, Pittsburgh. This company deals in new and Relaying Rails, and is arranging to handle Sheets, Bars, Angles and other forms of Iron and Steel.

On April 1 the offices of the Wilkoff Brothers Company, dealer in Iron and Steel Scrap, will be removed from Park Building to Room 826, Farmers' Bank Building, Pittsburgh.

Cincinnati.

CINCINNATI, OHIO, March 18, 1908.—(*By Telegraph*).

Only in the slightest degree and in very few directions can there be regarded any improvement in the trend of trade in Iron and Steel. Sentimentally the market is improved, the increase in Coke shipments suggesting enlarged melt of Iron, although the furnacemen's coffers cannot be regarded as fuller thereby, for melters are still taking hold-up contracts. The jobbing foundries show little or no interest in the Pig Iron market, and there is a falling off of inquiry from the pipe men and stove makers. Freights on both Coke and Pig Iron have been factors in the daily routine of Coke and Iron manufacturers' lives the past few days, and some important meetings which have officially considered and requested freight reductions have been fruitless. A quarterly meeting of the Central Association of Stove Manufacturers has been concluded to-day at the Hotel Havlin, at which it was determined to reaffirm the prices named in the resolutions of last December, recalling that the advances warranted by the manufacturing cost at that time were not made, and further also because of the existing molding contracts between the Stove Founders' National Defense Association and the International Molders' Union. The last advance in prices was in February, 1907. It was determined at this meeting also to work in harmony with the National Iron Buyers' Association, and a special committee will take up the matter with that organization. A central purchasing agency with power to buy for the various concerns in the association may be established. The Iron Buyers' Association is in receipt of an official letter from the interested lines in Southern territory, announcing that they cannot make any change in the prevailing rate to the Ohio River crossing, which is now $3.25, and still another meeting is to be held between the furnacemen in the Ironton and Wellston districts and the railroad men in the matter of rates on Coke shipments, to which the Columbus operators are to be invited. This meeting will be held in Columbus and will be subject to the call of Chairman T. D. Davant of the Norfolk & Western Railroad.

Pig Iron.—Inactivity has ruled the market, and dealers have had fewer actual transactions to record this week than for many weeks. Some Iron is being taken on old contracts and some small lots at bargain prices are going, but very little is heard of any round tonnage. Sharp competition has driven the price on Southern No. 2 to about $12, although such sales as have been made on this basis are conservatively regarded as furnace sales direct. The Northern product has also weakened, and while some agencies claim to hold firmly for $16, instances are cited of sales at a shaded price. There has been a fair inquiry for low grades, No. 3 Southern Foundry being quotable at $11.50 and Forge at $10.50. Sales of the week have been of a carload or so mainly, and anything approximating 1000 tons has been unknown. An inquiry from a Detroit melter is for a couple of hundred tons of Northern No. 3 Foundry. A northern Ohio concern wants 750 tons. A central Ohio Steel maker, who has recently purchased some Basic at a specially attractive price, is again in the market for April and May delivery. Charges of extensive cutting are made by some of the agencies, and some of the best informed local sellers predict lower levels, and soon, particularly on the Southern product. None of the agencies is willing to quote on the last half alone, but sales have been made extending into the third and fourth quarter and covering immediate requirements, and this price is said to approximate $12. For immediate delivery and balance of the first half we quote, f.o.b. Cincinnati, as follows, the rates being $3.25, $1.80 and $1.20 from the Birmingham, Valley and Hanging Rock districts, respectively:

Southern Coke, No. 1	$15.75 to $16.25
Southern Coke, No. 2	15.25 to 15.75
Southern Coke, No. 3	14.75 to 15.25
Southern Coke, No. 4	14.25 to 14.75
Southern Coke, No. 1 Soft	15.75 to 16.25
Southern Coke, No. 2 Soft	15.25 to 15.75
Southern Coke, Gray Forge	13.75 to 14.25
Southern Coke, Mottled	13.25 to 13.75
Ohio Silvery, 8 per cent. Silicon	19.70 to 20.20
Lake Superior Coke, No. 1	17.70 to 18.20
Lake Superior Coke, No. 2	17.20 to 17.70
Lake Superior Coke, No. 3	16.70 to 17.20
Standard Southern Car Wheel	23.75 to 24.25
Lake Superior Car Wheel	22.50 to 23.00

(*By Mail.*)

Coke.—The little improvement recently noted concerning the movement of Foundry Coke has not abated, and the buying, although not large in individual cases, aggregates fairly well. There is practically nothing doing in Furnace grades. Prices have not changed. Connellsville Foundry is quotable at about $2.25 to $2.50, at oven, and Furnace grades at $1.75 to $2. Best Virginia grades range about the same. As a result of the meeting held in this city last week by furnacemen in the Hanging Rock District, another meeting is to be called in the near future, to which Columbus operators are to be invited, and the subject of freights and assembling charges from the ovens to the Wellston and Ironton districts will be again discussed.

Finished Iron and Steel.—The situation, if anything, is quieter, and beyond sales of a few Bars and some Sheets in small lots to blacksmiths and specialty people, the stores are doing little or nothing. Collections are better. Prices are unchanged. Dealers quote f.o.b. cars, Cincinnati, as follows: Iron Bars, carload lots, 1.65c., with half extras; small lots from store, 1.85c., base, half extras. Steel Bars, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼ in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c. Blue Annealed Sheets (heavy) No. 16,

carload lots, 2.15c.; small lots from store, 2.50. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.25c. No. 12, carload lots, 2c.; small lots from store, 2.35c. Sheets (light) Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c., base. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Old Material.—There is no activity in any line of the Scrap market. Dealers are inclined to predict still lower levels. The largest dealers have immense stocks on their yards, which they are increasing at present prices, believing when the reaction does set in the recovery will be rapid. Mills are still out of the market. The local market is about as follows, prices being f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$11.00 to $12.00
Cast Borings, net ton	4.50 to 5.00
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought	8.00 to 9.00
Old Iron Axles, net ton	15.00 to 16.00
Old Iron Rails, gross ton	14.00 to 15.00
Old Steel Rails, long, gross ton	11.50 to 12.50
Relaying Rails, 56 lb. and up, gross ton	21.00 to 22.00
Old Car Wheels, gross ton	14.00 to 15.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00

Philadelphia.

PHILADELPHIA, PA., March 17, 1908.

Buying continues on a small scale and is confined almost entirely to such quantities as are needed for immediate requirements. Inquiries in some cases show an improvement, new buyers who have about used up their stocks coming into the market from time to time, but they are taking only moderate quantities, so that while there is an increased quantity of business, the actual tonnage placed does not show much improvement. The report that the several Steel works had not accepted the recent orders for 50,000 tons of Rails placed by the Pennsylvania Railroad Company is denied by the officials of the company. They say, however, that, owing to the new specifications under which the Rails are to be made, new prices will have to be agreed upon, and the adjustment of this price is still the subject of discussion. The officials of the same railroad deny the published reports that the company had begun work on repairs of a large number of its freight cars. Finished materials show some improvement, but the business which has been coming out is irregular, and day to day gains and losses about balance themselves, as is indicated by the fact that there is no appreciable gain in the output of mills. The financial situation shows a little improvement. Local banks reduced the discount rate to 5 per cent. last week, which is the lowest general rate made by the financial institutions since October of last year.

Pig Iron.—The tonnage of new business coming out is small in the aggregate, although a few lots of fair size have been recently placed. Buying is confined to small quantities for prompt shipment, although there is some inquiry for more extended delivery, covering as a rule the next three or four months. Some foundries are now getting rather bare of stocks and are buying more frequently. The demand during the week has been of a more general character. Foundry Irons continue as heretofore in the greater demand, but small tonnages of some of the other grades have been sold, and a little more inquiry with some small sales of Steel making Irons is noted. As far as forward business is concerned, buyers' and sellers' ideas seem pretty far apart. Consumers as a rule ask material concessions in price, which producers are not willing to make. Eastern furnaces are usually maintaining established rates. Some of the Virginia furnaces, which are not considered as being included in the present price arrangement, have held the established rates firmly. Others, however, still make lower quotations and have taken quite a fair tonnage, which under ordinary circumstances would to a considerable extent at least, have gone to the Eastern producers. Sales of No. 2 X Virginia Iron have been made in this territory at about $17.50, delivered, while No. 2 Plain has been done at a shade under $17, delivered. There have also been some offerings made, it is said, of Virginia Basic, under the ruling price for delivery in this territory, but this is not considered of particular interest owing to the variation in the analysis of the Iron made in the different districts. Sales of Foundry Irons are still confined to small lots, ranging from carloads up to a few hundred tons. The leading interests are still maintaining firmly at $18.25, delivered, for No. 2 X, and $17.75 to $18 for No. 2 Plain. The Pipe foundries are not as active buyers as they were, having covered pretty well on their larger requirements. One interest, however, has an inquiry in the market for 3000 tons of Pipe Iron, but the order will depend entirely on whether or not the foundry gets the business on which it is bidding. There has been a little more buying of Forge Iron, one sale of 500 tons and another of 600 tons being reported at full prices. Some inquiry has developed for Basic Iron, but buyers and sellers do not agree very well on the present price, and no business has yet developed. Scattered sales of Low Phosphorus Iron are reported. Tonnages, however, are small and for early delivery. Prices on this grade show no material change, sellers quoting $22.50, furnace, on small sized lots, but this would probably be shaded if a good tonnage came out. The following is the established range of prices for delivery in buyers' yards, eastern Pennsylvania and adjoining territory, for the first half of the year:

No. 2 X Foundry	$18.25 to $18.50
No. 2 Plain	17.75 to 18.00
No. 3 Foundry	17.25 to 17.50
Gray Forge	16.50 to 16.75
Basic	17.25
Low Phosphorus	23.50 to 24.00

Ferromanganese.—There has been a little more inquiry for Ferro. The demand, however, has been confined to small lots, with an occasional inquiry for a 100-ton lot. Orders are still scarce, and no business of any moment has been transacted. Quotations range from $44 to $46, Baltimore, the former for spot lots.

Steel.—Mills are just about able to maintain their former production, orders coming out not being numerous, and confined almost entirely to small lots for prompt delivery. Prices are unchanged, $30.40 being quoted for Ordinary Rolling Steel, with $32.40 to $33.40 named, according to analysis, for Forging Steel.

Plates.—While immediate business does not show much change, the outlook is considered more favorable. The placing of contracts recently for piers and wharfs in Baltimore will result in the purchase of some 3000 tons of Plates. Orders placed for Steel Pipe, which will require some 2000 tons of Plates, are expected to result in the purchase of that quantity from some of the mills in this territory. Day to day orders are small, and of a miscellaneous character, but the tonnage is sufficient in the aggregate to enable mills to maintain their recent rate of production. Prices are fully maintained, the following range being quoted for delivery in this territory:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—Inquiries have increased slightly, although the tonnages asked for are usually small. Some little improvement is to be noted from week to week, however, and the trade feels more hopeful as to the future. A few buildings and bridges, averaging several hundred tons each, have recently been booked by mills in this territory, while several large building propositions are now being estimated on. Prices show no change, and are being fully maintained, 1.85c. to 2c. being quoted according to specification.

Sheets.—There is a little more business being taken by the mills, but not enough to enable them to make any material gain in production. Consumers order in small quantities, to meet immediate needs, and, as a rule, want prompt deliveries. The opening of spring is expected, however, to bring out an improved volume of seasonable business. Prices show no variation. We quote for mill shipment, with a tenth extra for small lots, the following range: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Old Material.—The market for Old Material is still greatly unsettled, and shows a further downward tendency. Buying is on a small scale, mills taking no interest in the market, and but little business is being done between dealers. Prices in the leading grades show a decline over those of last week. We quote about as follows for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory:

No. 1 Steel Scrap and Crops	$12.75 to $13.25
Low Phosphorus	17.50 to 18.00
Old Steel Axles	17.50 to 18.00
Old Iron Axles	20.00 to 21.00
Old Iron Rails	17.00 to 18.00
Old Car Wheels	14.00 to 15.00
Choice No. 1 R. R. Wrought	15.00 to 15.50
Machinery Cast	15.00 to 15.50
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	9.50 to 10.00
Stove Plate	12.00 to 12.50
Cast Borings	7.50 to 8.00
Grate Bars	11.75 to 12.25

Bars.—The demand for Refined Iron Bars is extremely light. Consumers are buying in small lots to meet immediate needs only, and the amount of business taken by the mills is meager and does not enable them to make any

material gains on production. Prices are fairly well maintained, Refined Iron Bars being quoted by the leading mills at 1.65c., delivered, Philadelphia and adjoining territory.

Coke.—There has been a little more business done in Foundry Coke. Some contracts have been closed, but the tonnage taken has not been particularly large. Furnace Coke shows but little activity in this territory. Prices are unchanged. Furnace Coke is quoted at $1.75 to $2.25, at oven, with Foundry Coke at $2.25 to $2.75, at oven. For delivery in the Philadelphia territory prices range about as follows:

Connellsville Furnace Coke	$4.05 to $4.50
Foundry Coke	4.50 to 5.00
Mountain Furnace Coke	3.75 to 4.10
Foundry Coke	4.10 to 4.60

Potts & Wittman, Iron, Steel, Coal and Coke, North American Building, Philadelphia, announce that H. H. Seidel has formed a connection with them and will represent them in their business. He has for some years been engaged with L. & R. Wister & Co.

San Francisco.

SAN FRANCISCO, CAL., March 11, 1908.

While a great improvement is seen in local conditions since the money stringency checked many new enterprises last fall, there is still difficulty in raising funds for new projects, such as electric railroads, electric power plants and manufacturing and mining enterprises. Much capital is needed to set the wheels moving in these lines, which are essential to the prosperity of our rolling mills, foundries, engineering works, &c. Much Eastern capital could be invested profitably in long term loans at 6 or 7 per cent. interest. Business in Iron and Steel, Pipe, Sheets and Bars, which is still very quiet, will probably continue so until there is more money available. The local banks are disposed to be very conservative in loaning money for building or for new enterprises of any kind unless the security offered is exceptionally good. The outlook is bright for a good year in the mining districts, although the scarcity of money for improvements and extensions is still delaying operations in some districts of rich promise.

Structural Material.—No large contracts for Structural Steel were closed this week. Contracts are still pending for several Steel frame structures, however. The plans have just been announced for the construction of the new *Examiner* Building, covering an irregular shaped site, 96½ x 160 ft., on the southeast corner of Market and Third streets. The design, by Kirby, Petit & Green of New York, shows a 20-story Steel frame structure. It is to be as thoroughly fireproof as is possible for a building of its class. The partitions will be made of Steel studs and Wire lath. The fireproof ceilings will be unusually substantial. The construction of buildings is increasing, as shown both by the records of the building inspector and the filing of contracts. During the month of February 596 building permits were filed, with a total valuation of $2,685,292. In Oakland the February building permits totaled $729,000 and in Los Angeles $579,163. San Francisco stood third in the list of American cities in building construction on the basis of the February permits, its total valuation being exceeded only by New York and Chicago. Since January 1, 1907, the building contracts filed have aggregated more than $50,000,000, and it is estimated that about $100,000,000 has been expended in construction work since the fire.

Pig Iron.—Little improvement is noted in the local demand for Pig Iron. Stocks are ample for all requirements, although very little has arrived from Europe lately. Business is still comparatively light at most of the local foundries and engineering works, but repairs to steamers and machinery orders from the mining districts of the Pacific Coast are expected to cause considerable improvement in the situation this summer. The Union Iron Works is running its foundry and machine shop with a comparatively small force, owing to lack of orders for the construction of vessels. The company's uptown office has been moved from the Flood Building to a new building on the corner of Market and Pine streets. The Notre Dame d'Arvor has arrived from Newcastle, England, with 800 tons of Pig Iron for Girvin & Eyre, wholesale dealers. No. 1 English, No. 1 Scotch and Chinese Pig Iron are quoted in this market at about $28 to $29 per ton, ex-yard.

Cast Iron Pipe.—While few contracts have been closed for Cast Iron Pipe this month there are inquiries for several lots aggregating about 1800 tons, and the outlook is good for the year's business in a conservative way. The United States Cast Iron Pipe & Foundry Company, through R. W. Martindale, Pacific Coast sales agent, has taken a contract for 278 tons of 6, 10 and 12 in. in diameter for use on the extensions of the distributing system of the municipal water works in Sacramento. The contract price was $34.85 per net ton. There were two other bidders. The Marin Water & Power Company, with its principal office at San Rafael, Cal., will soon vote on a bond issue of $2,000,000 for the extension of its system. The Los Angeles city authorities recently passed a resolution looking toward the calling for bids on the first section of the Owens River municipal aqueduct, involving the expenditure of the $3,000,000 raised by the issue of bonds. Concrete lined open and covered ditches will be used, and siphons will be put where valleys are crossed. The contract for Pipe casings and fittings for Kings Canyon was divided between Harper & Reynolds and the H. R. Boynton Company at $3314 and $6298, respectively. Prices of Cast Iron Pipe, f.o.b. cars San Francisco, are about as follows per net ton: 6, 8, 10 and 12 in., $38; 4-in., $39.

Merchant Pipe.—Sales of Steel Pipe are light and stocks in jobbers' hands are sufficient for the present requirements of this market. Discounts on Steel Pipe are about as follows on jobbers' carloads:

	Steel	
	Black.	Galv.
	%	%
¼ and ⅜ in.	58.5	42.5
½ in.	60.5	46.5
½ in.	62.5	50.5
¾ to 6 in.	66.5	56.5
7 to 12 in.	65.5	48.5
Extra strong, plain ends:		
⅛ to ⅜ in.	51.5	39.5
½ to 4 in.	58.5	46.5
4½ to 8 in.	54.5	42.5
Double extra strong, plain ends:		
½ to 8 in.	47.5	36.5

Sheets.—The general jobbing demand for both Black and Galvanized Sheets is light. The supply largely exceeds the requirements and manufacturers' agents are not trying to force the market. There is only a moderate amount of business locally in all of the lines requiring the use of Sheets, and it is difficult to say when there will be a decided improvement. Prices have been unchanged since the reduction announced in January. The many thousands of Galvanized Iron garbage cans that have been sold in this city since the sanitation campaign began have helped out many of the sheet metal shops that were short of contract work.

Mining Supplies.—The stampede to Rawhide, Nev., caused by the rich strikes that were recently made and the mining excitement in the new camp at Hart in Southern California have resulted in an increased demand for the necessities of life, but the market for Iron, Steel and machinery has not been much improved thereby. However, there are strong indications of a good year in mining throughout California and Nevada, and supply dealers are expecting to have their stocks reduced considerably a little later in the season.

According to advices from Spokane, Wash., contractors have begun work on the electric plant to furnish power for trains of the Great Northern Railway over the Cascade Mountains from Leavenworth to Skykomish. A Steel Pipe 1600 ft. long will be laid, running across the Wenatchee River and connecting with a large Steel pen stock 196 ft. high, holding about 1,000,000 gal. of water, to carry the water for the turbines, which will be directly connected to four General Electric polyphase generators. Each unit is expected to develop about 13,000 hp.

It is announced that the San Francisco, Oakland and San José Railway Company, which operates the Key Route system of electric railroads and ferry boats connecting Oakland, Berkeley and San Francisco, is to build a 50-mile extension to San José, as contemplated when the company was first incorporated. The earning capacity of this line and of the Oakland Traction Consolidated, which is owned by the same capitalists, is very large in proportion to the investment and the extension will undoubtedly be pushed to completion. Electric trains of from three to eight cars are operated by overhead trolleys.

The San Francisco, Oakland & San José Railway Consolidated has just been incorporated, with a capital stock of $7,750,000, to take over the San Francisco, Oakland & San José Railway and the San Francisco & Bay Counties Railway, a new concern with lines projected northward. The incorporators of the Consolidated Company include those of the two corporations just mentioned. The extensions to San José and elsewhere will be made by the new company, which will operate when completed a total of 81 miles of electric trackage.

The Southern Pacific Railroad Company announces that orders for rolling stock have been placed, and that the electrification of its local steam lines connecting Oakland with Alameda and Berkeley will be carried out within a year. It is probable that the electric lines will be extended south to Hayward, a distance of 14 miles. Two large turbogenerators for the company's electric power plant in Oakland are being constructed.

The Morgan Construction Company, Worcester, Mass., has been awarded the contract for an 18-in. continuous billet mill for the Pittsburgh Steel Company, to be located at the company's plant at Monessen, Pa. The mill will be equipped with Edwards flying shears and cooling table. Work on the mill will begin immediately, so that it will be ready for operation about August 1.

Cleveland.

CLEVELAND, OHIO, March 17, 1908.

Iron Ore.—Orders for shipment of Ore from the docks to the furnaces continue to improve from week to week, but the improvement is slight. Merchant Ore firms owning their own boats are making no preparations to fit them up for the opening of navigation. According to general opinion, little, if any, Ore will be shipped from the Lake Superior mines before June 1. No change has developed in the Ore situation as far as sales for 1908 delivery are concerned. No sales have been made, and consumers are not yet sufficiently interested in the matter to make inquiries. With enough last year's Ore to last them until late in the summer or longer, the majority of the furnace interests are expected to hold off for a number of weeks yet before closing new contracts. Some of the local Coal shippers have closed freight contracts in the past few days at the same rates that prevailed last season, but with the exception of a small amount several weeks ago there has been no chartering for Ore shipments and the rates for Ore have not yet been fixed. Chartering for Ore, however, will be light this year, for the reason that the leading firms that have used considerable outside boat tonnage the past few seasons will be able to carry all the Ore they ship this year in their own boats. We quote Ore prices as follows, at Lake Erie docks, for 1908 delivery, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous non-Bessemer, $2.35 to $2.60.

Pig Iron.—The past week has been as quiet as any in the past three months, as far as inquiries and actual sales are concerned. The only sales reported are car lots of Foundry Iron, and these sales have been comparatively few. Consumers are buying only for immediate needs, and there are no inquiries in the market for even 100-ton lots. While the market is almost stagnant, a better feeling prevails than has been noticed for several weeks. This is due to the fact that the majority of furnace interests report quite an improvement in shipping orders. The melt has increased somewhat in this territory, and a number of consumers report that the enlarged number of inquiries they are receiving make the prospects look considerably brighter to them. While there are reports of Iron being offered below the schedule, prices are being firmly maintained on the small sales in this immediate territory, there not being an inquiry for a large enough tonnage to test the market. While shipping orders are better, the furnaces still in blast are accumulating considerable Iron on their stock piles. Furnacemen expect that a number of consumers will be compelled to come into the market shortly. The demand for Southern Iron shows no improvement, and there are practically no inquiries. There are rumors of price cutting, but, according to reports, an offer by a consumer in this territory to take 1000 tons of No. 2 Southern at $12 was rejected. There are no inquiries for Basic Iron. A local interest is shipping about 2000 tons of Bessemer Iron per month to a Youngstown consumer. For prompt shipment and for the second quarter, we quote, delivered, Cleveland, as follows:

Bessemer	$17.90
Northern Foundry, No. 1	17.85
Northern Foundry, No. 2	17.35
Northern Foundry, No. 3	16.85
Southern Foundry, No. 2	$16.85 to 17.35
Gray Forge	15.90 to 16.40

Coke.—No sales of either Furnace or Foundry Coke are reported. Prices remain low. We quote Connellsville Furnace Coke at $1.70 to $1.80, at oven, for prompt shipment, and Connellsville 72-hr. Foundry Coke at $2.25 to $2.40, at oven.

Finished Iron and Steel.—While there is a slight improvement in the demand for some lines, orders and specifications are still light. Some mills report a larger volume of orders, but they are all for small quantities. The only contract of any size reported during the week is for 2000 tons of Forging Steel Bars. The mill getting this contract also reports some good specifications on a similar contract closed the previous week. The demand for Plates and Sheets shows a slight improvement, but the orders are for small lots for immediate delivery. The Cleveland Steel Company, which has been shut down for three months, has resumed operations on double turn and hopes with the present volume of orders to keep running the greater part of the time. During the shutdown the plant has undergone extensive repairs and improvements and its capacity has been increased 50 per cent., although no additional sizes are being made. There are more reports of price cutting among smaller mills than there have been for some time. A concession of $1 per ton is reported in Sheets, and the price of Light Plates is being cut $2 a ton by two or three of the smaller mills. Iron Bars are weak and the demand is light. The price is being shaded to 1.40c., Pittsburgh. The demand for Steel Bars is light both on new orders and specifications. The price is being firmly maintained except on Steel specialties, on which small mills are cutting prices. Structural shops report an improvement in small orders, especially for fire escapes, the recent Collinwood disaster having stirred up municipalities to have buildings more generally equipped with fire escapes. The general Structural outlook, however, is far from satisfactory. As a rule projects requiring a fair amount of tonnage are being held back, and unless they develop soon it is not believed that they will be carried out this year. It is understood that the Lake Shore Railroad Company will go ahead with some bridge work this season that will require from 5000 to 10,000 tons of material, but there are no reports of other bridge work projected by railroads in this territory. There is still some demand for Light Rails in car lots for coal mines. The price is being shaded to meet the competition of rerolling mills. Warehouse business shows only a slight improvement, and the stock price on Iron and Steel Bars is being shaded on good orders. We quote Iron Bars at 1.50c. to 1.60c., Cleveland, car lots; Steel Bars, 1.70c., Cleveland, for car lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼-in. and heavier, 1.80c., Cleveland. We quote Sheets, mill shipments, carload lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. The warehouse price on Steel Bars is 1.75c. to 1.85c., and on Iron Bars, 1.75c. to 1.80c. Beams and Channels from store are 2.10c. to 2.15c., base. Store prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount. The city of Toledo has closed a contract with the United States Cast Iron Pipe & Foundry Company for 600 tons of Pipe for its Water Works Department.

Old Material.—While some dealers report a slight improvement in inquiries, the market has been absolutely dead as far as actual sales are concerned. Prices remain nominally stationary, but show a tendency toward further weakness. Dealers are looking for a slight improvement in the demand, but do not expect much change in prices. The Baltimore & Ohio Railroad is offering a list of about 4000 tons which will be closed this week. Dealers' prices to the trade, which are unchanged, are as follows, per gross ton, f.o.b., Cleveland:

Old Steel Rails	$11.50 to $12.00
Old Iron Rails	16.00 to 17.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	15.50 to 16.00
Relaying Rails, 50 lb. and over	22.00 to 23.00
Heavy Melting Steel	11.50 to 12.00
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	8.00 to 9.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	7.00 to 8.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	11.00 to 11.50
No. 1 Railroad Wrought	12.50 to 13.00
No. 1 Cast	12.00 to 13.00
Stove Plate	10.50 to 11.00
Bundled Tin Scrap	8.00 to 9.00

Birmingham.

BIRMINGHAM, ALA., March 14, 1908.

Pig Iron.—The level of prices seems to have settled around a basis of $13, Birmingham. Notwithstanding the fact that buying has not been stimulated to an appreciable extent, melters find it necessary to make frequent purchases, and the aggregate of tonnage engaged shows the market to be in better condition than is indicated by general appearances. At least four concerns are practically out of the market for first half deliveries, and the demand is being met by leading interests who have manifested most reluctance in making concessions in prices. The statement that the output of producing capacity now in operation is equivalent only to order-book requirements is substantiated by the fact that accumulations on furnace yards are being gradually reduced. The largest single accumulation in the district is practically depleted. Reports of offerings at figures below the established quotations are less frequent, and within the week bona fide offers for approximately 1000 tons have been refused by reason of a difference of 50c. per ton in the price offered and quoted. It is true that buyers manifest a disposition to pursue a conservative course as to negotiations, and the demand is such as hardly to test the strength of the market, but producers appear to be willing to accept the situation as presented, and, like consumers, are disposed to await further developments. The general foundry trade displays some improvement, yet the melt does not increase materially, and despite the encouraging outlook for Pipe manufacturers, the idle capacity is not decreased. Furnace stacks that are idle are being put in good condition, however, and no doubt production could be made to meet an increased demand on short notice.

Cast Iron Pipe.—With the approach of a favorable season, proposed improvements and extensions to water works systems are more numerous, and the new business reasonably expected to develop is gratifying. The principal new letting reported is 3000 tons for the city of Milwaukee, Wis., but a number of smaller lots will be placed upon the

satisfactory disposition of municipal bonds. Among the contracts placed during the week were 500 tons for Seattle, Wash., 800 tons for Grand Rapids, Mich., and approximately 500 tons each for Rockford, Ill., and Ft. Wayne and Evansville, Ind. These orders were fairly well distributed among producers, which would indicate firmer quotations. However, prices recently made on larger contracts were very much at variance, and we continue to quote nominally. Nominal quotations on Water Pipe, f.o.b. cars here, are as follows: 4 in. to 6 in., $27; 8 in. to 12 in., $25; over 12-in., average, $24, with $1 per ton extra for Gas Pipe.

Old Material.—The condition of the market is practically unchanged. Quotations are being adhered to, and an attitude of independence is generally displayed by dealers, yet the business offered would hardly be increased by concessions in prices. The sale of bargain lots is the feature of the market, and prices received are considerably at variance. We quote nominally as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$18.00 to $18.50
Old Iron Axles	16.50 to 17.00
Old Steel Axles	15.50 to 16.00
Old Car Wheels	18.50 to 19.00
No. 1 Railroad Wrought	13.50 to 14.00
No. 2 Railroad Wrought	10.50 to 11.00
No. 1 Country Wrought	12.50 to 13.00
No. 2 Country Wrought	9.50 to 10.00
Wrought Pipe and Flues	10.50 to 11.00
No. 1 Steel	12.00 to 12.50
No. 1 Machinery Cast	10.50 to 11.00
Stove Plate and Light Cast	9.50 to 11.00
Cast Borings	6.00 to 6.50

New York.

NEW YORK, March 11, 1908.

Pig Iron.—The market for Foundry Irons is very quiet, and lower offerings are being made by some Southern sellers, both in this territory and in New England. We quote, at tidewater, as follows: No. 1 Northern Foundry, $18.25 to $18.75; No. 2 Foundry, $17.50 to $18; No. 2 Plain, $17 to $17.50. Southern Irons are $17.25 to $17.75 for No. 1 Foundry and $16.25 to $16.50 for No. 2 Foundry.

Steel Rails.—No new business of any consequence has been placed during the past week. It is understood that negotiations with reference to the price to be paid for Rails under the Pennsylvania specifications are still in progress.

Structural Material.—Contracts for buildings and bridges are few and comprise only small quantities. In this city the Hay Foundry, Newark, N. J., has taken contracts for the erection of a loft building at Broadway and Fourth street, 1600 tons, and a building for Henry Corn at Fifth avenue near Forty-second street, 1000 tons. Local bidders had expected to secure a 12-story building to be erected at Seattle, Wash., requiring 1500 tons of Steel, but the contract for the erection of this building has been placed with the Brown-Ketchum Iron Works, Indianapolis. Another Seattle building, which is at first to be three or four stories in hight, and will eventually be expanded to possibly 18 stories, is practically secured by the American Bridge Company. The Chicago, Milwaukee & St. Paul Railroad gave out 1000 tons of bridge work, half of which went to a bridge company at Roanoke, Va., and the other half to a company at Pittsburgh. Quite a number of railroad companies are in the market for bridge work, but in nearly all cases the quantity to be purchased is small. A contract for 700 tons placed by the Manufacturers' Railroad, St. Louis, is understood to have been secured by the Cambria Steel Company. Financial conditions are holding back some projects in the building line which looked promising quite recently. Those who have the capital or are able to secure it can now build at a cost of 10 to 15 per cent. less than a year ago, and those who can command the necessary funds will hardly allow this opportunity to slip past them. Fabricators are taking work at cost, or even below it, to keep their forces together. One important item which is cutting a figure in work of this kind is that labor is now much more efficient than it has been, prominent contractors stating that they are securing from 20 to 30 per cent. more work out of the same number of men than during the busy period of last year. Mills rolling Structural Shapes are securing considerably more business than for several weeks, which indicates that the consumption in this line is increasing. Prices continue to be quoted as follows on mill shipments, tidewater delivery: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—Consumers and jobbers are confining their purchases to cover their immediate requirements. As far as can be ascertained, no contracts are being placed for forward delivery. Purchasers feel assured that prices in the near future are not likely to be higher, and they have no inducement in increased business to lay in stocks or cover their expected needs. Prices are maintained at 1.50c., Pittsburgh, or 1.66c., tidewater, on Bar Iron, and 1.60c., Pittsburgh, or 1.76c., tidewater, on Steel Bars. The Bar manufacturers will meet this week for their usual monthly consideration of trade conditions.

Plates.—Inquiries are few, as consumers of Plates in this vicinity are doing little new work, and even their repair business is not large. Prices are unchanged as follows on standard sizes of Plates at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—The city of Ithaca, N. Y., has opened bids on 500 tons, the lowest being about $23.50. The city of Rome, N. Y., will shortly purchase 4000 tons, and is now asking for bids. The order for 772 tons recently placed by the city of Grand Rapids, Mich., was awarded at $22.90, delivered, which is said to have netted the successful bidder $18.30, at foundry in the South. This is claimed to have been the lowest price realized on Pipe since prices began to recede. The general demand is exceedingly quiet, even orders for small lots being few. Carload lots of 6 in. are quoted at $23.50 to $24 per net ton, at tidewater.

Old Material.—Railroad lists recently put out have been quite heavy, and as they have gone to many consumers this has naturally interfered to some extent with sales by dealers. The general market has therefore been decidedly quiet, with sales of scattering lots of foundry stock and a little rolling material, almost exclusively for immediate use. Consumers are limiting their purchases to their daily needs and are not anticipating their requirements to any extent. Prices are nominally about the same as have recently been quoted, but buyers may be able to shade prices on some grades of material 25c. to 50c., especially if dealers are found who are desirous of moving material. Wrought Scrap is stated to be notably weak. We quote as follows, per gross ton, New York City:

Old Girder and T Rails for melting	$9.50 to $10.50
Heavy Melting Steel Scrap	9.50 to 10.50
Old Steel Rails, rerolling lengths	11.00 to 12.00
Relaying Rails	18.50 to 19.50
Old Iron Rails	14.00 to 15.00
Standard Hammered Iron Car Axles	16.50 to 17.50
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	12.00 to 13.00
Iron Track Scrap	10.00 to 11.00
No. 1 Yard Wrought, long	11.00 to 12.00
No. 1 Yard Wrought, short	10.00 to 11.00
Light Iron	5.00 to 6.00
Cast Borings	4.50 to 5.50
Wrought Turnings	6.00 to 7.00
Wrought Pipe	9.00 to 10.00
Old Car Wheels	17.50 to 18.50
No. 1 Heavy Cast, broken up	13.50 to 14.50
Stove Plate	11.50 to 12.50
Grate Bars	9.50 to 10.50
Locomotive Grate Bars	10.00 to 11.00
Malleable Cast	11.50 to 12.50

Iron and Industrial Stocks.

NEW YORK, March 18, 1908.

The past week has witnessed increased activity in the stock market. Conditions have been buoyant, and notable gains have been made in the price of practically every railroad stock, as well as all of the iron and steel stocks. This condition of affairs was brought about by rumors of a more favorable character regarding the attitude of the administration toward business interests, as well as by reports of better conditions financially and commercially. It is possible that some of the reports regarding improvement in business have been too strong, and that cold facts as they come along may have too great a corresponding effect in depressing prices. Heavy profit taking occurred on Monday, causing a recession to set in, which continued part of Tuesday, when the market again turned upward. An exception to the general course of the market was in Crucible Steel, which declined sharply with the passing of the preferred dividend. The range of prices on active iron and steel stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 32⅜ to 34¼, preferred 95½ to 98⅜; Car & Foundry common 28¾ to 30⅞, preferred 88½ to 90; Locomotive common [illegible] to [illegible], preferred 90½ to 91½; Steel Foundries common 5¼ to 5¾, preferred 30¾ to 31; Cambria Steel 28¼ to 29¾; Colorado Fuel 18 to 21; Crucible Steel common 4⅝ to 5⅛, preferred 34½ to 37½; Pressed Steel common 21⅛ to 22¾, preferred 78 to 80; Railway Spring common 31½ to 33½; Republic common 17¼ to 18⅞, preferred 69 to 74; Sloss-Sheffield common 46¼ to 51¼; Cast Iron Pipe common 19⅜ to 21½; Can common 5, preferred 48 to 50. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 33¼, preferred 97; Car & Foundry common 30, preferred 90; Locomotive common 37¾, preferred 91; Colorado Fuel 20; Pressed Steel common 22¼, preferred 79; Railway Spring common 33¼; Republic common 17¾, preferred 72½; Sloss-Sheffield common 50; Cast Iron Pipe common 21, preferred 67½; Can common 4¾, preferred 47⅝, ex-dividend.

The Crucible Steel Company of America has issued a statement for the six months ending February 29, 1908.

which shows a net profit for the half year of only $174,132.91 before charging off adjustments of inventory values. November showed a loss of $13,865.48; December, $56,729.40; January, $23,070.13; February, $42,324.86. The profit in September and October was $313,558.79. The deficit for the half year, after charging off adjustments of inventory values and paying a dividend of 1 per cent. on the preferred stock, was $496,524.09. The action of the directors in passing the dividend for the current quarter was commendable. The company's surplus February 29 was $1,960,759.72.

The adjourned special meeting of the American Steel Foundries, which was to have been held March 14 in Jersey City, was again adjourned, this time to April 18. No business was transacted, but after the adjournment Judge E. H. Gary, one of the committee which drafted the stock readjustment plan which is to be acted on, made a statement to the stockholders. He said that at the present capitalization it would be years before the company could pay dividends. The company has a good business and its prospects are bright, but dividends cannot be paid unless there is a surplus. The directors of the company had considered the stock reduction plan very carefully, he said, and if it was carried out the present holders of preferred stock would have 70 per cent. of the control of the company, but the holders of common stock would get substantial benefits. The plan, to which 75 per cent. of the stockholders have consented, would make the stock of the company intrinsically valuable.

The special meeting of the stockholders of the Alabama Consolidated Coal & Iron Company, which was to have been held in Jersey City March 14 to act on the proposition to issue $1,750,000 third mortgage 5 per cent. bonds, has been indefinitely postponed for lack of a quorum.

Dividends.—Manning, Maxwell & Moore, Inc., have declared the regular quarterly dividend of 1½ per cent., payable April 1.

The American Iron & Steel Mfg. Company has declared a quarterly dividend of 1¼ per cent. on the common and preferred stocks, payable April 1.

The United Shoe Machinery Company has declared a quarterly dividend of 1½ per cent. on the preferred stock and 2 per cent. on the common stock, payable April 4.

The Union Switch & Signal Company has declared a quarterly dividend of 3 per cent. on the common and preferred stocks, payable April 10.

The Washburn Wire Company has declared the regular quarterly dividend of 1¼ per cent. on the preferred stock, payable April 1.

The Standard Screw Company has declared a quarterly dividend of 1¾ per cent., payable March 31.

The E. W. Bliss Company has declared the regular quarterly dividend of 2 per cent. on the preferred and 2½ per cent. on the common stock, payable April 1.

The International Nickel Company has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable May 1.

The Sloss-Sheffield Steel & Iron Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable April 1.

Metal Market.

NEW YORK, March 18, 1908.

Pig Tin.—A fair American demand, largely for forward delivery, stimulated the London market, and prices are over 1c. higher than a week ago. The total turnover during the week is estimated at above 500 tons, which is about 60 per cent. of normal. Price changes during the week have been as follows:

	Cents.
March 11	29.20
March 12	29.50
March 13	29.90
March 14	30.00
March 16	30.75 to 30.85
March 17	30.50 to 30.60
March 18	30.50

Apparently there is sufficient spot metal to meet the demand, but, as has been the case for a year, supplies are concentrated in a few strong hands. Much of the week's buying is believed to have been semi-speculative. The London market is over £4 higher than last week, at £138 5s. for spot, and £135 17s. for futures. The arrivals are 3257 tons, and there are afloat 1689 tons, of which about 300 tons will make this month's delivery and 600 tons may possibly arrive March 31.

Copper.—Considerable metal has been sold for domestic consumption, but nothing like the extravagant claims made by some of the daily papers. The American market is and has been dominated by the London market, and as long as the chief outlet is abroad this will continue. Sales have been made at 13c. for both Lake and Electrolytic, but in view of the higher prices abroad to-day 13.12½c., would probably be asked for high grade Lake. Exporters can secure metal at slight concessions, but 13c. has been paid for Electrolytic for export. Good Casting Grades can be had at 12.75c. to 13c. Consumption in this country is still at a low ebb. A leading electrical apparatus manufacturer is using about 35 to 40 per cent. of normal, and wire drawers 25 per cent. and even less. No great improvement in prices is anticipated until the wire trade shows signs of picking up. Considerable price cutting is noted in finished lines, such as Brass and Copper Sheets. European buyers are covered for at least six weeks, and therefore are not likely to bid freely on an advancing market. The March exports so far amount to 11,408 tons. In London prices close this afternoon about £1 10s. higher than last week at £59 2s. 6d. for spot and £59 10s. for futures. Best Selected is held at £62 5s.

Pig Lead.—An advance of 15c. by the American Smelting & Refining Company March 13 was followed by one of 5c. the next day, and another of like amount March 16, bringing the price to 4c., New York, and 3.85c., St. Louis. This is the highest price since November. Considerable business was stimulated. Paint manufacturers are reported to have a good run of trade. No shortage of Lead, however, is probable in the near future.

Spelter.—Little or no improvement is noted in the demand here, but Steel manufacturers are buying a little more freely. Prices are a trifle firmer at 4.75c. to 4.80c., New York, 4.70c. being refused for a round lot. In St. Louis prices are also higher at 4.60c. to 4.65c.

Ferroalloys.—More inquiries for Ferroalloys are in evidence than for some weeks. Several are in the market for fair sized tonnages of Ferromanganese, also for a few cars of 50 per cent. Ferrosilicon. A Steel manufacturer was in the market this week for a few cars, and it is understood that a price equivalent to about $80, Pittsburgh, was paid for 50 per cent. Ferrosilicon. There is still some irregularity in the price of 80 per cent. Ferromanganese, and rumors are heard that $44, at seaboard, is being shaded. Continental brands are offered at lower figures.

Aluminum.—The principal producer adheres to the old quotation of 33c. for No. 1 ingots, and 31c. for No. 2 ingots, but it is understood that metal can be imported in large quantities at lower prices. Business is light.

Antimony.—The dullness prevailing for several months continues, and prices are nominal, at 9.50c., for Cookson's, 9c. for Hallett's, and 8.50c. for outside brands.

Nickel.—Quotations are unchanged, at 45c., for ton lots, and 55c. to 60c. for smaller quantities.

Tin Plate.—Additional mills have resumed operation, and the Tin Plate trade continues the brightest spot in the metal line. Prices are unchanged, at $3.89, New York, and $3.70, Pittsburgh. A rather sharp advance of 3d. brings the price of Welsh Plates, in Swansea, to 12s. 4½d.

Old Metals.—Some improvement is noted, chiefly in sentiment and prices, to correspond with the advance in Copper, but the volume of business is small. Dealers' selling prices are as follows:

	Cents.
Copper, Heavy Cut and Crucible	12.25 to 12.50
Copper, Heavy and Wire	12.00 to 12.25
Copper, Light and Bottoms	11.25 to 11.50
Brass, Heavy	9.25 to 9.50
Brass, Light	7.25 to 7.75
Heavy Machine Composition	11.50 to 11.75
Clean Brass Turnings	8.00 to 8.25
Composition Turnings	9.00 to 10.00
Lead, Heavy	3.65
Lead, Tea	3.40
Zinc Scrap	3.50

The Great Northern Ore Properties.—The trustees of the Great Northern ore properties have reported to stockholders the results of the operation of the trust formed to hold these properties for the year ended December 7 last, the first year of its existence. The total amount received by the trustees was $1,650,000. Administration expenses were $67,750 and the distribution to stockholders of a 1 per cent. dividend called for $1,500,000, so that the balance of undistributed income at the close of the year was $82,250. The trustees say that in addition to the 39,000 acres of ore lands leased to the United States Steel Corporation the trust holds stock in companies which control by lease or ownership an additional 26,000 acres of ore lands. Under the leases made prior to December 7, 1906, the date of the creation of the trust, there were mined and shipped during the past season 3,307,000 tons of ore. No mention is made of the amount mined for the Steel Corporation.

The Wm. B. Scaife & Sons Company, Pittsburgh, has received an order from the American Iron & Steel Mfg. Company, Lebanon, Pa., for a 25,000-gal. per hour We-Fu-Go water softening and purifying system. It is to be ready for operation about June 1.

The Manufacture and Upkeep of High Speed Steel Milling Cutters.

At the December meeting of the Institution of Mechanical Engineers, held in London, Dr. H. T. Ashton read a paper entitled "Notes on the Manufacture and Upkeep of Milling Cutters." Dr. Ashton is connected with the Royal Small Arms Factory at Enfield Lock, England. While his methods are of general application, they have been developed more particularly to extend the usefulness of the high speed steels, especially when applied for cutting to give an accurate finish and a good surface.

In discussing the advantages of using high speed steels for milling cutters, he pointed out that they not only keep a cutting edge for a reasonable time when taking very heavy cuts at a previously unattainable speed; but they also keep their cutting edge much longer than ordinary steel tools, when used with moderate cut and speed. The milling cutter is the most expensive tool used in cutting metals. In the simplest cutter, the cost of workmanship so greatly exceeds the cost of material that a moderate increase of life obtained by improvements in the raw material far outweighs a considerable increase in its original cost.

It is desirable that cutters should have as long a life as possible in actual service, not only to minimize the first cost and upkeep, but to keep the output of the machines as constant as possible, by freedom from delays in changing the cutters. These points chiefly depend upon: The quality of the steel from which they are made; the method of hardening adopted; the care and accuracy with which the new cutters are made, and the facility and correctness with which the cutters can be ground.

Annealing the Blanks.

For the raw material, any of the well known classes of steel can be used. Before cutting, the blanks must be annealed, and the method adopted is to pack them in spent powdered charcoal and steel turnings in cast iron pans, with covers which can be luted close. The boxes are slowly heated to from 700 to 750 degrees C. (1292 to 1382 degrees F.), the time being about five hours, are held at this temperature for about four hours and are then allowed to cool gradually for 48 hours. While some of the high speed steels are satisfactorily annealed by the makers, it is generally best to apply the above treatment to insure thoroughly satisfactory results.

The accuracy of the form of the cutters, both when being cut in the first place and also subsequently reformed, is secured by turning the blanks and milling out the teeth in the ordinary manner, and then backing off the teeth in a machine illustrated and described in the paper.

Hardening the Cutters.

The hardening is done in a coke fired furnace, with a forced draft. This has been found especially adapted for obtaining a soaking heat, together with the high temperature necessary in treating this class of steel. The cutters are packed closely in powdered charcoal in sheet steel boxes about 6 x 6 x 3 in. These boxes take from two and three-quarters to three hours to reach the necessary hardening temperature, the time taken varying with the weight of metal to be heated. The hardening temperature varies somewhat according to the class of steel used, but is usually between 2000 and 2100 degrees F. The exact temperature necessary for satisfactorily hardening any particular class of steel is previously determined, and the temperatures of the hardening furnace are checked by means of a Féry radiation pyrometer.

The cutters when sufficiently heated are quickly removed from the charcoal and are at once placed upon the hardening table, which is of a type frequently used in workshops for heating tools by gas. In this case only air is supplied through two nozzles. These can be moved as required through vertical pivots, so as to cause the air blast to impinge upon the periphery of the cutters at any required point, and simultaneously upon the vanes of a spindle upon which the cutter is placed. This causes the whole arrangement to rotate and equalizes the cooling and hardening effect. The cutter will last longer if the heat to which it was raised before hardening was such that the steel just began to fuse. The surface must just show signs of running. Though different makes of steel have been found to vary somewhat in this respect, the general statement remains true of them all. At the same time it is found that this fusing effect for a given heat is considerably minimized by the method of heating in closed boxes, as compared with the ordinary method of heating either in a muffle or a direct gas flame. Even the scaling, which with the latter systems is frequently very marked, is, with the method now described, so slight that the cutters can be wholly freed from scale by placing momentarily under a revolving scratch brush. Allowance is made for the expansion of the hole by leaving the bore slightly smaller than is required. On the average about 0.01 in. less than the finished diameter. After hardening the cutters are placed in a self-centering chuck and the internal bore is ground true to size.

Grinding the Teeth.

Special grinding machines are used for sharpening the cutting edges and subsequently regrinding their faces or edges as required from time to time. The life of some milling cutters prepared by the methods indicated above has been extraordinary. For example, a cutter has been working in an automatic cross milling machine on the bodies of the surface rifle. The composition of the steel is from 0.5 to 0.6 per cent. carbon and the ultimate stress not less than 78,000 lb. per square inch. With an average cutting speed of 69 ft. per minute, a feed of 1¾ in. per minute, a depth of 0.08 in., and taking a cut of an average width of 1 11-16 in. and ⅞ in. long, this cutter has produced, at the present time, 39,170 bodies, and is still good for about half as many more.

In the reply to the discussion Dr. Ashton said that the main virtue of the charcoal used in hardening was that it gave a nonoxidizing atmosphere during the heating, and being, comparatively speaking, a nonconductor, allowed of a uniform slow heating. If the steel was carbonized it was probably to such a slight extent that the thin skin was removed during the grinding operation.

G. B. W.

Gas Engines for a Steel Foundry.—The Duquesne Steel Foundry, which operates a large plant in the Pittsburgh District, has decided to adopt the gas power system to operate the works formerly driven by steam. The initial equipment will consist of a 400-hp. Westinghouse gas engine of the three-cylinder vertical inclosed type, directly connected to a 240-kw. generator, which will serve the various motor drives around the plant. The plant will operate on natural gas, which is available at such low rates as to render gas power the cheapest form of power available in that section of the country.

The Pennsylvania Railroad Company has completed and put in operation a terminal line connecting with its new ore docks and ship canal at South Buffalo, N. Y. The new line, which is 7 miles in length, permits the carrying of freight around instead of through the crowded Buffalo yards, and will prove of great value in moving ore, coal and other freight which is transported over the lake and rail routes. The company's South Buffalo ore dock has a capacity of 1,000,000 tons, and is equipped with electrically operated devices loading 500 tons per hour into cars on the track.

The best 24-hr. record at the Ensley blast furnaces of the Tennessee Coal, Iron & Railroad Company was made Saturday, when four stacks produced 1365 gross tons of pig iron. An average of 341 tons, the best previous day's record, was made in May last year, when five furnaces produced 1353 tons, an average of 270 tons. The Ensley rail mill made a record of 1525 tons March 12, and if the rate of the past two weeks is maintained, it will produce 30,000 tons of rails this month. This mill will shut down April 1 for the installation of new finishing trains and of a new roughing mill and engine.

The Machinery Trade.

NEW YORK, March 18, 1908.

The demand for machinery the past week was very light, with both inquiries and orders small in volume and no indication of an immediate resumption of activity. Trade appears to be lifeless, and transactions covering more than two or three tools are exceptions. Some fair business has been received for export and from the Government, without which trade with some houses would be extremely dull. Second-hand machinery is in better demand than new, but this is not unusual during a business depression, when buyers prefer to supply their wants at a minimum cost. Manufacturers of large power equipment are faring better than machine tool builders at the present time, because of the number of municipalities which are installing new lighting plants and water works or enlarging the present plants. There has been a decided falling off in building operations in and near New York during the last few months, and as a consequence the demand for small power equipment is not as large as it was, but with the coming of spring it is expected that business in that line will pick up to some extent, and some inquiries now in the market indicate that there will be a resumption of construction work within the next few weeks. The demands for power accessories and parts of machines has been quite brisk, which is taken as an indication that many manufacturers are taking advantage of the dull times to make needed repairs.

Few large projects are showing signs of activity, and though spring is at hand companies which have held important work in abeyance for some time are not inclined to proceed with their plans until there is a decided improvement in business. The railroads are doing practically nothing in the way of shop construction and purchases of machinery, the activity in the trade being confined almost wholly to the smaller establishments. Of the larger work, a determined effort is being made to start the construction of the Lexington avenue subway in Manhattan and the Fourth avenue subway in Brooklyn, with every likelihood that work will be commenced this summer. A plan has been brought forward for the construction of the subways in sections, and it is possible that contracts for the first section of each subway will be let within the next few months. The Public Service Commission has laid out and approved plans for both routes and is ready to let contracts as soon as it receives permission from the Board of Estimate.

Preliminary inquiries placed in this market indicate that it will not be long before work of constructing a tunnel under the Delaware River, from Philadelphia to Camden, will be commenced. A suit directed against the project, which was brought in the New Jersey courts, has been settled satisfactorily and the syndicate organized by Philadelphia bankers to start the work has engaged the Philadelphia engineering firm of Stearns & Castor to make estimates on the job. The project will include the construction of subways under a section of both cities, each about one-half mile in length, and twin tubes under the river 2700 ft. long. The plan will also necessitate the erection of a power house, and although the work will not compare in size to any of the tunnel projects to connect New York with other shores, it is safe to assume that there will be a good deal of equipment bought.

Contract No. 9 for work on the Erie Barge Canal has been awarded to the Thomas Crimmins Construction Company, New York, at its bid of $755,995. The work to be done covers 5½ miles near Medina, Orleans County, N. Y.

A local machinery man who is close to railroad affairs recently returned from a trip through the South and East with some more encouraging reports regarding the outlook than the trade has had in several weeks. He stated that a number of railroads in the South are preparing to do some buying, and at least one road will come into the market before long for a large quantity of machine tools, while others will make purchases for additions needed for their shop equipment. Some of the New England railroads will also come into the market shortly, it is thought, for repair equipment, and while none of them have lists, from all accounts there will be considerable scattered buying. The New York Central Railroad continues to place some orders for its West Albany shops, mostly in the line of conveying equipment and power accessories.

The South & Western Railroad Company, Johnson City, Tenn., has filed papers in Nashville changing its name to the Carolina, Clinchfield & Ohio Railroad Company, with increased capital stock from $7,000,000 to $27,000,000. The increase of capitalization evidently means that the company, which now operates 67 miles of road from Johnson City, Tenn., to Alpapass, N. C., intends to go ahead with its projected 285 miles. It will be remembered that this company's small shops at Carnegie were destroyed by fire a few weeks ago, and that the company intends to erect main shops for the heavy repairs some time this year, the location for which has not been selected. Negotiations are under way for the property, and it is likely that plans for the buildings and construction work will be started within the next few months.

It is stated that the Michigan Central Railroad has purchased 110 acres of land at Kalamazoo, Mich., located between the tracks of the Chicago, Kalamazoo & Saginaw Railroad and the Kalamazoo River, and that the company intends to move its shops from Jackson and Michigan City, consolidating them on the new site. It is understood that the shops will not be moved this year, but that during the next few months plans will be perfected and operations started some time during the summer. It is planned to leave only a few small shops at Jackson for repair work and to construct the shops at Kalamazoo for heavier work.

Important Pumping Engine Orders.

The largest orders for pumping engines placed in this market in some time were given out last week by the National Transit Company, one of the subsidiary interests of the Standard Oil Company, for its Oil City, Pa., plant, where some extensive improvements are being made. The orders were placed by F. M. Towl from the office of the Standard Oil Company, 26 Broadway, New York, and included 20 three-cycle triplex expansion double acting pumping engines, the steam cylinders 20½ in. and 38 in. and 54 x 36 in. in diameter, with a piston cylinder 5 x 36 in. The orders aggregated an expenditure of about $300,000. Ten of these engines were ordered from the Snow Steam Pump Company and the order for the other 10 was placed with the Maryland Steel Company. It is expected that there will be some other buying for the Oil City plant, and it has been announced that a large sum will be spent in the shops there, as the improvements will include an addition to the machine shop, 130 x 200 ft., and a new foundry, 70 x 300 ft.

The Fuller Engineering Company, Allentown, Pa., has been awarded the contract for the construction of a 3000-barrel Portland cement plant at Courtney, Mo., for the Blue Seal Portland Cement Company. No time has been set for starting the construction of the plant, and it is not likely that the equipment will be purchased until building operations have been commenced. The offices of the Blue Seal Portland Cement Company are in the Scarritt Building, Kansas City, Mo.

The Elkins Power Company, Elkins, W. Va., which is to erect an electric light and power plant, to be equipped with engines, generators and other machinery at a cost of about $30,000, will purchase a complete equipment of from 500 to 600 kw. capacity.

There are inquiries in the market for about 200 hp. of equipment for a factory which is being rebuilt at 129 Degnon avenue, Brooklyn, for E. B. Jordan & Co.

Business Changes.

The United Gas Machinery Company has been incorporated under the laws of the State of New York to take over the business formerly conducted by Thomas F. Fitzsimmons, 100 Broadway, and will manufacture and market a complete line of gas generators for making producer gas for gas engines and heating and water gas for high temperature furnaces, forges, annealing, &c. The company has offices in the Engineering Building, 114-118 Liberty street, New York, and Thomas F. Fitzsimmons is the president and general manager.

Chicago Machinery Market.

CHICAGO, ILL., March 17, 1908.

Machinery interests, in common with those in other lines of manufacture, are bending their efforts to make the best of present conditions and to that end are carefully canvassing the field in search of business, either immediate or prospective. The conditions of 1906 and the early months of 1907 are reversed and the seller is now seeking the buyer, instead of the latter searching for those of the former who were in position to furnish the goods. No striking change is observed in the volume or character of business developed during the past week. Some of the machine tool dealers have noted a moderate increase in trade for the week, while others report somewhat less activity, but it is fair to assume that the general average holds fairly even. Several good sized millers were included in the shipments made, which were widely distributed, orders mainly covering only single tools. Demand is principally confined to two classes of buyers, represented by the small shops, which are adding a tool here and there, and newly organized enterprises requiring shop equipment. The latter are, of course, comparatively few, but some investors with an eye to the future regard the present situation as favorable to the building and equipping of plants where funds are available for the carrying out of such plans. There is, however, nothing of importance on foot looking to the extension of established plants, either in

building or equipment. The scattering orders that are received from such sources are pretty generally confined to occasional purchases for replacement of obsolete machines. Inquiries are reported not only to be increasing in number, but are of a firmer nature than heretofore, holding out a better promise of concrete results.

The recent placing of an order for 300 electric cars by the Chicago City Railway is of special interest to the manufacturers of electrical and air brake equipment. This order represents only a part of the requirements of this company which will be needed to carry out plans for the rehabilitation of its line. How many more cars will be required is not yet determined, but in addition to those now in service which may be remodeled, it is certain that orders for a considerable number of new cars will be placed later on.

Nothing indicative of an early resumption of activity by the Frisco System respecting the purchase of tool equipment for its new shops at Springfield, Mo., has developed. It will be recalled that bids on this important list were submitted last fall, but no purchases were made, and since that time the whole matter has been in a quiescent state. Just when it will again come into the market is undetermined.

Jos. Cody & Sons, Peoria, Ill., have in contemplation the erection of a new boiler shop during the coming season. It is their purpose to build a shop 100 x 200 ft., of steel frame construction, which will be equipped with modern tools, including rolls, punches, shears and pneumatic tools. For the more economical handling of work in general and for the execution of a contract recently taken for 1000 steel pressure tanks for individual house water systems, improved facilities are required. Plans for this improvement will be completed in the early spring.

The Noxall Mfg. Company, Seward, Neb., has been incorporated, with a capital stock of $50,000, to manufacture the Noxall seed and grain graders and cleaners. Only a part of the necessary equipment has been purchased. The machines already bought include saws, sand drums, planer and gasoline engine. The incorporators are Thomas J. Hatfield, Frederick N. Wullenwaber and Daniel J. Hartrum.

The plant of the Fred M. Prescott Pump Company, Milwaukee, Wis., has work enough in hand to keep a full day shift actively employed. A fair amount of new business continues to develop, a good portion of which is coming from mining interests.

About $30,000 will be expended in alterations and improvements to the municipal electric light plant, Carlyle, Ill. These will include a 30 x 60 ft. addition to the power house and additional generator and engine, and one 250-hp. boiler, and pipe for the extension of water mains, plans for which are now being prepared. G. H. Berger is Mayor of the city.

For the betterment of its service the city of Crawfordsville, Ind., is contemplating alterations in and improvements to its municipal electric light and power plant. The nature and extent of these improvements will be determined as soon as a consulting engineer has been selected to formulate and submit plans.

Philadelphia Machinery Market.

PHILADELPHIA, PA., March 17, 1908.

While the volume of new business in the tool and machinery trade continues comparatively small, there is a little more inquiry for the medium and smaller class of tools. Although it is difficult in many cases to get inquiries turned into orders, the trade feels more encouraged as to the ultimate volume of business which will come out in the near future. Under ordinary circumstances there is an improvement in the trade in the early spring months, and while it is not expected that the volume of business this spring will be as large as is usually the case, it is believed that some improvement over the existing conditions will be noted. Practically all of the business placed recently has been for single tools and largely of a miscellaneous character. Sales of lathes of the smaller sizes, medium sized drills, an occasional milling machine, or a grinder, together with some classes of the smaller special tools, make up about the usual range of business transacted. As buyers are placing orders only for tools absolutely needed, the delivery desired is usually prompt, which can be had without difficulty in almost every class of the so termed standard tools, as stocks both in manufacturers' and dealers' warehouses are heavier than they have been for a long time.

As far as manufacturers are concerned, the situation shows little change. Sales by dealers do not aid them to any material extent, as the tools disposed of, which come out of stock, are not usually covered by renewal orders, as most of the dealers already have stocks much larger than they wish to carry, and frequently still have tools due them from the makers. Tool builders continue to operate plants in a rather restricted fashion, and orders coming in are hardly sufficient to keep them going even with the present reduced forces. Locomotive builders and other large industrial concerns report no material increase in business, as the railroads still maintain their policy of remaining out of the market. Until these various industries begin to see an improvement in conditions and become more active buyers themselves, the machine tool trade will likely continue on a rather unsatisfactory basis.

The demand for second-hand tools and machinery shows some little improvement. There is a better inquiry for the medium sized tools, and some dealers report sales of rather fair size. In one instance a complete shop equipment was furnished by one of the local merchants. Both wood and metal working machinery has been in better demand, as have also some classes of power transmission equipment. Several of the local machine tool merchants who have as a rule not catered to the second-hand class of business, are now giving this branch of the trade more attention, and are meeting, it is said, with fair success. The demand for second-hand boilers and engines does not improve rapidly, although dealers are hopeful of an enlarged demand as the spring advances.

There is practically no change in the demand for castings, either iron or steel. Foundries continue to operate on a restricted basis, in some cases not over three days a week being made. Some scattered improvement in the demand has been reported for certain classes of work, but the increased volume of business has not been maintained except in isolated cases. Forward business continues extremely light, as buyers cannot be induced to anticipate their wants. Some foundry men endeavor to maintain firm prices, as it is considered that no increased business can be had at price concessions. Others, however, will, it is said, make concessions to get business to keep plants in operation.

Plans will be drawn by Albert S. Damon, engineer, Darby, Pa., for the purification and disposal of sewage in the Cobbs Creek and Darby Creek valleys, which has been emptying into those streams, which are tributaries of the Delaware River. These plans will include septic tanks and filter beds, at an estimated cost of $150,000, provided the surface water is allowed to continue to drain into the streams.

The Pottstown Water Company, Pottstown, Pa., has decided to increase its capital stock from $225,000 to $400,000, in order to provide funds for the construction of a filter plant and to make other needed improvements to its water service.

J. J. Felin & Co., packers, are having plans prepared for a large addition to the plant at 4142-4156 Germantown avenue. The proposed building will be two and three stories in hight, 75 x 250 ft. The architect, P. A. Klee, will shortly take bids for the erection of the building, which is estimated to cost about $180,000.

Actual work has now been started, under the various contracts, on the work of removing the Ninth street grade crossings of the Philadelphia & Reading Railroad. Temporary tracks have been laid to take care of traffic, and there will be no interference to the work in connection with the elevation and depression of the tracks, which will now go steadily forward to completion in that district between Berks and Broad streets. Engineers are now engaged in completing plans for the other sections of the work which, it is expected, will be ready for bids in a short time.

The Board of County Commissioners at Washington, Pa., will receive bids until March 24 for the construction of three steel plate girder bridges, one of 50-ft. span, over Wheeling Creek; one of 56-ft. span, over Mingo Creek, and one of 56-ft. span, over Cross Creek. Also one 16-ft. span reinforced concrete bridge in North Franklin Township. Specifications may be had from the County Engineer at the above address.

Stockholders of the E. H. Mumford Company, manufacturer of molding machines, will meet at the office of the company in this city March 23, to consider a proposition of increasing the capital stock of the corporation from $30,000 to $200,000. Under the plan of increase there will be $65,000 of preferred stock and $135,000 of common stock.

There has been some little improvement at the League Island Navy Yard. Sixty additional men will be given employment, it is said, to overhaul the New Hampshire, which docked at the yard last week. The Mississippi, it is understood, will also be overhauled at this yard, and it will, it is expected, require a further additional number of mechanics.

Cincinnati Machinery Market.

CINCINNATI, OHIO, March 17, 1908.

Uncertainty still pervades the local machine tool producing interests, and although the feeling is perhaps a trifle more hopeful, one cannot truthfully say that conditions are improved. Inquiries there are, but sales are comparatively few and far between, consisting of a purchase here and there of a tool or two that is absolutely needed. Many plants are still running on limited time and with a handful of men, although there are, as has been stated in previous letters, a few running on full time and with approximately a full

force, but these are not the larger works. The recent specifications for small lots of tools for the Mare Island and Puget Sound navy yards interested and in a measure revived somewhat the flagging spirits of toolmakers, but actual developments give little license for gratification. As a prominent tool manufacturer says to *The Iron Age*, "It is simply a case of wait; we are hopeful, but there it ends."

A member of one of the largest tool manufacturers in this section has been exploring the Far West for several weeks, making an exhaustive investigation into agency conditions in a section of the country not hitherto visited personally by many manufacturers. His report to the other members of his company indicated that he found business very quiet there, and little if any better than the East and Central territory. He is returning by way of St. Paul, Minneapolis and other Northwest interior cities, and expects to reach home by Thursday or Friday of this week. His report is awaited with no little interest by the entire toolmaking district, for he has investigated very carefully and conservatively.

Considerable interest has been aroused by President Hargreave of the Cincinnati Machine Tool Company, Vice-President F. B. Wiborg of the Ault & Wiborg Company and other members of the Manufacturers' Club in the contemplated trip of manufacturers to South American countries in the interests of their products. There is no doubt that the journey will be made, and for the most part the party will be made of officials from the large plants. This, however, is a matter for the fall or early winter months because of climatic conditions.

In the matter of the Weber Foundry sale, the property has been placed in the hands of a local firm of auctioneers and April 15 has been set for its disposal.

A careful inquiry into foundry conditions shows that there are few Cincinnati foundries running more than two heats per week, and the melt is conservatively not more than from 20 to 25 per cent. of the normal. Manufacturers using castings apparently are not inclined to contract for anything in forward deliveries even under price concessions, which some foundries, it is said, are inclined to grant to keep working forces engaged.

The Troy Foundry & Machine Company, Troy, Ohio, has been adjudged bankrupt.

A recent transaction involving the purchase of additional ground and improved property by the Cincinnati Iron Store Company has given a little local stimulus to the iron and steel trade. This company, of which E. H. Busch is president; James I. Stephenson, vice-president; James A. Sebastiani, secretary and treasurer, has purchased the realty known for many years as the Scott Pottery Works, which is located at Front and Carr streets, adjoining its present property. There are about 55,000 sq. ft. of ground in the piece and four or five buildings in comparatively good repair. Within the next 30 or 60 days the organization will have been completed under the new name, the Cincinnati Iron & Steel Company, the charter for which was acquired last July, with a nominal capital of $10,000. The company now owns practically the entire block bounded by Front, Carr, Freeman avenue and Sargent streets, with a ground space of about 140,000 sq. ft. Under the outlined plans of expansion the company will carry a large line of machine tools and special machinery, utilizing the buildings on the property, which are now being reroofed and put into shape for use. There will be no change in the management. The amount involved in the purchase was about $75,000.

The F. H. Lawson Company, manufacturer of and dealer in tinware, copper, sheet iron, stamped and japanned ware, specialties, &c., has purchased the stock and part of the machinery of the Queen City Tinware Mfg. Company on lower Walnut street, involving between $40,000 and $50,000. The latter company retires from the trade. The F. H. Lawson Company states that there will be no immediate changes made in its large plant on Whately and Evans streets and Cincinnati, Hamilton & Dayton Railroad, but that some additions and improvements may eventually be made.

Manufacturers of machinery and machine specialties are interested in the outlined projects of the Merchants' and Manufacturers' Association of Cincinnati, which contemplates a large buyers' excursion into local trade marts in the early fall. Some special forms of entertainment are being devised, and committees will be appointed to take charge of the various diversions arranged for buyers' pleasure and profit. The suggested dates are August 26, September 2 and 9.

The removal of the San Francisco branch of the Sterling Emery Wheel Mfg. Company, Tiffin, Ohio, is announced. The far Western headquarters of this company is now located at 461 Market street, in the Sheldon Building, rooms 305 to 316 inclusive. The notice is signed by Harron, Rickard & McCone, San Francisco.

Operations have been resumed at the new plant of the Ohio Steel Castings Company, Lima, Ohio, which was shut down for a brief period.

At the plant of the Lima Locomotive Works in Lima some special orders are on hand and a slight improvement is noted in the demand for the patent Shay locomotive. A 150-ton Shay locomotive has been shipped to the Chesapeake & Ohio Railroad, and the Pennsylvania Railroad has placed order for a 250-ton Shay locomotive, which will be the largest, it is stated, ever built at that plant.

The Ridgway Dynamo & Engine Company, Ridgway, Pa., builder of automatic engines and dynamo and electric machinery, has opened a district sales office at 907 Andrews Building, Cincinnati, Ohio, under the management of George W. Euker, who has had a varied experience in electrical and power plant work.

Cleveland Machinery Market.

CLEVELAND, OHIO, March 17, 1908.

Local dealers report a slight improvement in their sales of machine tools during the past week and considerable improvement in inquiries. While the market is quiet when compared with normal conditions, the increased number of inquiries leads dealers to feel considerably encouraged and to look for a fair increase in the volume of their sales as general conditions gradually grow better. The character of the buying has not changed materially, the orders being largely for single tools, mostly lathes, planers, shapers and milling machines. A few larger orders, however, are now appearing, one dealer reporting having received during the week two orders, each for four tools.

None of the new inquiries is large, but there are several from large industrial plants that have under consideration the matter of throwing out some of their old and out of date equipment and replacing it with more modern tools. There are several inquiries of this nature for three or four tools. Some of the buying during the week has been by new repair shops and by small companies organized some time ago, but which have delayed going ahead with their projects because of the financial and industrial conditions. Traveling salesmen representing local machine tool dealers report that conditions show some improvement in the territories which they visit and they are getting more requests for quotations on tools. Among the inquiries received by a local dealer is one from a Pittsburgh concern for several large tools, including a boring mill, two milling machines, lathe, shaper and gear cutter. The company has not definitely decided whether it will buy at the present time. Quite a number of small tools will be required for the new Technical High School in Cleveland, the list of which will soon be out.

The demand for second-hand tools is fairly good and the supply is becoming somewhat more plentiful.

While inquiries are somewhat better with tool builders the majority report that orders have not increased in volume, the prospective purchasers being very slow about placing orders. While general conditions appear brighter, few machinery and other industrial plants have had enough of an increase in orders to warrant the operation of their plants on a larger capacity than they have been running on during the past few weeks. Projects now on foot indicate a fair demand for equipment for small electric lighting plants. The demand for cranes shows a little improvement, the inquiries being mostly for small single cranes. Local structural shops report considerable improvement in small orders, particularly for fire escapes, the recent disaster in the burning of the Collinwood school having aroused the authorities in many places to provide adequate fire escapes for schools and other public buildings. Structural work is being taken at low prices.

Machinery Requirements of Technical High School.

The list of machine tools that will be required for the new Technical High School, Cleveland, has been partially prepared and will be given out by the Board of Education through Principal Barker within the next two weeks. The list as now planned, although some slight changes may be made, includes 18 14-in. lathes, one 24-in. lathe, boring mill, surface grinder and tool grinder. Some tools now in use in another school will be transferred to complete the machine shop equipment. Complete equipment will be purchased for the turning room and pattern shop. This will include 60 10-in. woodworking lathes, five band saws, surfacer, jointer, saw bench, &c. Specifications have been prepared for the generators and engines for lighting, power, ventilating and elevator in the new building. There will be two single cylinder medium grade steam engines, for direct connection with the generators. There will be two direct current three-wire generators, one 200 kw. and the other 125 kw. The specifications also include one 20 to 22 hp. fan motor and one 28 to 30 hp. fan motor. In addition several motors will be required for the machine and other shops, specifications for these not yet having been prepared.

The Clough-Baird Mfg. Company, Cleveland, manufacturer of stove trimmings, &c., has increased its capital stock from $7500 to $60,000, for the purpose of building a new plant, on which work will be started soon. The capacity will be much larger than that of the present plant. An order has been placed for a 200-hp. gas engine, and the company will be in the market for very little other equipment for its new plant.

The company reports business quite satisfactory at present, orders having improved materially during the past two or three weeks.

The Fuel & Gas Improvement Company, Cleveland, has been incorporated, with a capital stock of $1,000,000, to place on the market a new gas producer. Permanent officers have not yet been chosen. The company has opened offices at 613 Schofield Building, and it is equipping a room in a factory for demonstration purposes. The company will assemble the parts, but will have its manufacturing done by other concerns.

The National Iron & Wire Company reports considerable improvement in the demand for structural work. In addition to the contract for the structural steel work for the West Side market house, requiring about 800 tons, this company has just secured the contract for the structural work for two buildings for Cleveland, one in Warrensville, taking 100 tons, and for a new plant to be erected by the American Brass Mfg. Company, Cleveland, requiring 100 tons. The company has also in the past two weeks received a number of orders for fire escapes.

The Parr Regrinding Globe Valve Company, recently incorporated with a capital stock of $10,000, has purchased the greater part of the machine tool equipment for its plant, which will be placed in operation in a few days. The company has opened temporary offices at 600 Broadway.

W. H. Welch, dealer in metal working machinery, has removed from 723 Williamson Building to 202-204 St. Clair Avenue, N. E., where he has opened a machine tool storeroom. The room will be the headquarters for northern Ohio of the Hamilton Machine Tool Company, Hamilton, Ohio. Mr. Welch being that company's representative in this territory. A complete line of the Hamilton Company's tools will be carried in stock.

The city of Cleveland will probably soon be in the market for a new engine and generator for the municipal lighting plant at South Brooklyn. The City Council has taken steps to appropriate $35,000 for that purpose.

With a capital stock of $20,000, the Warren Construction Company, Warren, Ohio, has been incorporated by Elmer A. Osborne, C. E. Osborne, Edward Tanneyhill, W. H. Tanneyhill and Mrs. Maude Gilmer. The company will do a general contracting business in iron and steel work.

The Bolivar Electric Company, Bolivar, Ohio, has been formed by Canton men, with a capitalization of $30,000, to build an electric lighting plant in Bolivar. It will be operated by water power. The officers are L. P. Conrad, president; A. H. Elliott, secretary, and R. P. Lambright, treasurer.

The Square Deal Mfg. Company, Delaware, Ohio, recently organized to manufacture hay presses, has elected the following officers: H. F. Owen, president and general manager; Joseph J. Neville, vice-president; L. Trabue, superintendent, and A. S. Conklin, secretary and treasurer.

The recently incorporated Radio Furnace Company, in which a number of Youngstown men are interested, has decided to locate its plant in Warren, Ohio, and has purchased the property formerly owned by the Warren Pottery Company, which will be fitted up for a plant. The company will manufacture hot air furnaces. M. J. Murdock is president.

The Akron Clutch Company, Akron, Ohio, including the machinery, patents and good will, has been purchased by the Williams Foundry & Machine Company, Akron, and the plant will be moved to the plant of the latter company, where the business will be continued under the name of the Akron Clutch Company.

New England Machinery Market.

WORCESTER, MASS., March 17, 1908.

The machine tool dealers are booking a few orders, and some of the builders report that there is a slight improvement, though not sufficient to denote any permanency. The usual number of inquiries continues. They have been so long in evidence, the total amount of business which their realization in orders would mean is so great, that they constitute a most tantalizing factor in the situation. There is marked difference in the reports of machinery men. The experience of some has been more encouraging than that of others. But none is doing a large business. In fact, the belief is gaining ground that it will be autumn before a really important improvement will be noted. But utter certainty is expressed that when the change comes it will be to times of greatest prosperity, even, perhaps, exceeding that which recently passed.

"Hustling" is a good word to apply to the efforts of many manufacturers. Their forces are straining every energy to get what business there is doing, and at the same time putting in a vast amount of missionary work, which will count as soon as the market revives in a pronounced degree. An instance of the seeking of new business is that of a gray iron foundry man in one of the towns of Massachusetts some distance from Boston, who went to that city on the first morning train, secured the services of a district messenger boy as pilot and visited 22 customers during the day. He secured two good orders, which meant enough business to increase the working hours of his foundry. It was not easy for a manufacturer or dealer to get down to such strenuous effort when business first fell off; there had been so different a condition that the sudden change was not easy to get used to. But now every one is down to the new basis, and competition is most keen. Because of this it is all the more satisfactory to see how well prices are being maintained. There is yet to be recorded a complaint of one of the Boston dealers against another.

Collections are improving, according to the best sources of information. They are not yet good, but there is less of delay from those customers who are ordinarily quick pay but who were compelled to abandon temporarily their practice of taking advantage of all discounts, or where no discount was obtainable of meeting religiously all bills on the appointed day. The banks are no longer stinting customers who need money for legitimate purposes, there having been a marked change in this respect during the past month or six weeks.

New manufacturing enterprises are going along with the fulfilment of plans, and there will be considerable building activity among them as well as among established concerns, considering the state of business. There is a natural feeling that this is a first rate time to start business and to prepare for the time when the market will be greedy for all kinds of manufactured products.

For this same reason some notable new machine tools are being brought out, and will be given to the public soon. Some of them will be of special interest, because of almost epoch making improvements on established designs. This is true of the machinery centers of other parts of the country as well as New England.

The Universal Machine Screw Company, Hartford, Conn., is to erect new shops in that city. The capital stock has been increased from $100,000 to $250,000 to provide funds for the new plant, and to otherwise increase facilities to take care of increasing business. The company builds a multi-spindle screw machine. It began business about two years ago, in a part of the factory building, the whole of which it now occupies, and which it has already outgrown.

The C. G. Garrigus Machine Company, Bristol, Conn., which will manufacture special machinery in that place, has been incorporated under Connecticut laws with capital stock of $50,000. The incorporators are Clarence G. Garrigus and William L. Barrett, Bristol, and Louis G. Judd, New Britain, Conn. Work on the new shop building, already alluded to in this column, will begin in the near future.

The interesting, though unverified, rumor comes from Hartford, Conn., that the Packard Motor Car Company is to take the plant of the Electric Vehicle Company, in that city, removing its works from Detroit.

The Gardner General Foundry Company, Gardner, Mass., manufacturer of gray iron, brass and composition castings, has made material improvements to its foundry, including an addition for a machine shop, and various important changes in the main building. The company has increased its running time from four to five days a week.

The Seamless Rubber Company, New Haven, Conn., manufacturer of rubber goods, has added $100,000 of new stock to its capital, all of which was paid in cash. The purpose of the new money is not to increase the plant, but to provide additional working capital.

The Connecticut industrial stocks, quoted on 'change at Hartford, are remaining firm, with a slight improvement in price, if any change at all is to be noted. These stocks, including the larger concerns in the metal lines, constitute an excellent barometer of business. During the last six months there has been a decided falling off in stock values, and the slight reaction of improvement would seem to have some significance.

The Heald Machine Company, Worcester, Mass., has brought out a new internal grinder for general manufacturing work, which includes a number of interesting new features for this class of work.

A dispatch from Waterbury, Conn., states that the Waterbury Mfg. Company of that city, manufacturer of brass goods, has had plans prepared for a new group of manufacturing buildings, but that no definite decision has been reached as to what will be done this season in their erection.

The Blake & Johnson Company, Waterbury, Conn., has decided not to proceed with the erection of its new shop buildings this season, as the present plant will answer its purposes until next year.

Government Purchases.

WASHINGTON, D. C., March 17, 1908.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until March 31 for 18 motors, one boring bar, one turbine blower and one portable grinder for the Eastern navy yards. Bids will be received until April 14 for a 10-hp. motor, and until April 21 for

two turret lathes and one lathe for the Mare Island Navy Yard.

The Isthmian Canal Commission will soon ask bids for one horizontal duplex steam pump and other supplies.

Bids will be received until April 7, at the office of the Lighthouse Engineer, Tompkinsville, S. I., for a boiler.

The following bids were opened March 10 for supplies for the navy yards:

Class 51. Two 10-ton three-motor electric traveling cranes—Bidder 9, Alliance Machine Company, Alliance, Ohio, $10,980; 43, Cleveland Crane & Car Company, Wickliffe, Ohio, $7040; 56, Case Mfg. Company, Columbus, Ohio, $11,440; 138, Morgan Engineering Company, Alliance, Ohio, $9390; 149, Manning, Maxwell & Moore, New York, $9930; 156, Niles-Bement-Pond Company, New York, $7828 and $8340; 158, Northern Engineering Works, Detroit, Mich., $9400; 176, Pawling & Harnischfeger, Wilwaukee, Wis., $11,300.

Class 101. One 20-ton steam locomotive crane—Bidder 6, American Hoist & Derrick Company, St. Paul, Minn., $8648; 29, Browning Engineering Company, Cleveland, Ohio, $7519, $8644 and $8582; 33, Brown Hoisting Machinery Company, New York, $11,490; 43, Cleveland Crane & Car Company, Wickliffe, Ohio, $7147; 112, Industrial Works, Bay City, Mich., $10,425; 254, Interstate Engineering Company, Bedford, Ohio, $9999.50; 266, McMyler Mfg. Company, Cleveland, Ohio, $7500.

Class 62. One universal milling machine—Bidder 100, Henshaw-Bulkley & Co., San Francisco, Cal., $1905; 125, Kamey & Precker Company, Milwaukee, Wis., $1895; 156, Niles-Bement-Pond Company, New York, $2373; 179, Pacific Tool & Supply Company, San Francisco, Cal., $2368; 253, Harron, Rickard & McCone, San Francisco, Cal., $2030, $2135, $1995 and $2034.

Class 152. One pump—Bidder 55, W. W. Clark & Son, Baltimore, Md., $169.90; 98, R. W. Geldart, New York, $171.47; 127, Knox & Bro., New York, $169; 149, Manning, Maxwell & Moore, New York, $172; 191, J. B. Roach, Brooklyn, N. Y., $171.10; 193, H. A. Rogers Company, New York, $160; 225, Vermilye & Power, New York, $170.

Class 171. One single acting triplex gasoline engine driven pump—Bidder 85, Fairbanks Company, New York, $1000; 92, G. & W. Mfg. Company, New York, $924; 147, Model Gas Engine Works, New York, $1267; 169, National Electrical Supply Company, Washington, D. C., $171.39; 171, Ole K. Olsen, New Orleans, La., $947; 181, Peerless Motor Company, New York, $1170; 189, Rumsey & Co., Seneca Falls, New York, $995.75 and $1203.25; 241, R. B. Carter Company, New York, $961, $991, $885 and $920; 269, Otto Gas Engine Works, Philadelphia, Pa., $930 and $945; 274, Fairbanks, Morse & Co., New York, $954.65.

Class 191. One duplex pump—Bidder 15, Blake & Knowles Steam Pump Works, New York, $1100; 71, M. T. Davidson, Brooklyn, N. Y., $390.

The following bids were opened March 10 by the Department of Justice, Washington, D. C., for boilers, pipe, &c., for the United States Penitentiary at Atlanta, Ga.:

Oil City Boiler Works, New York, $16,700; Babcock & Wilcox Company, New York, $14,000; Heine Safety Boiler Company, New York, specifications submitted but no price quoted; Peter-Eichler Heating Company, St. Louis, Mo., $13,737; Abendroth & Root Mfg. Company, Newburg, N. Y., $11,145; Urbaner-Atwood Heating Company, St. Louis, Mo., $13,450; J. B. Hughes Heating Company, St. Louis, Mo., $13,400; Standard Engineering Company, Philadelphia, Pa., for Heine boiler $12,807.50, for Babcock & Wilcox boiler $13,840.

The following awards have been made for supplies for the navy yards, bids for which were opened January 28:

I. H. Johnson, Jr., Company, Philadelphia, Pa., class 1, one lathe, $7096.

Harron, Rickard & McCone, San Francisco, Cal., class 2, two lathes, $3350

Newton Machine Tool Works, Philadelphia, Pa., class 3, one slotter, $2490.

Under bids opened February 10, Circular No. 416, for supplies for the Isthmian Canal Commission, the American Tool Works Company, Cincinnati, Ohio, has been awarded class 4, one screw cutting lathe and one lathe chuck, $593.

The following awards have been made for supplies for the Isthmian Canal Commission, under opening of March 2, circular No. 423:

Fairbanks, Morse & Co., New York, class 2, four boiler feed pumps, $620.

H. R. Worthington, New York, class 3, six horizontal boiler pumps, $212.

Long & Alstatter Company, Hamilton, Ohio, class 4, one punching and shearing machine, $845.

The following awards have been made for supplies for the navy yards, bids for which were opened March 3:

Henshaw, Bulkley & Co, San Francisco, Cal., class 11, one power press, $1088.

Frevert Machinery Company, New York, class 12, one power circle shear, $60; class 13, one dry floor grinder, $156.

Class 22, one motor driven concrete mixing machine, has been canceled.

Trade Publications.

Swedish Iron and Steel.—Swedish Iron & Steel Corporation, 16 Exchange place, New York City, and L. & L. & G. Building, New Orleans, La. Catalogue. Covers the company's imports of Swedish tool steel, anvils, chains, &c. Rekord Superior is a high speed steel offered. Instructions are given for its working and treatment in the making of various kinds of tools, and a list of shapes and sizes carried in stock. The brand labels for cast steels handled are reproduced in colors, and their uses and carbon contents are given. They include Superior Swedish cast steel and several kinds of Dannemora cast steel, hard and soft. Information concerning each class is given as to its utility, characteristics, treatment, &c., with tables of prices, dimensions and weights. Swedish solid steel anvils and Swedish steel chain are also referred to and lists given of stock sizes.

Water Tube Boilers.—Oswego Boiler & Engine Company, Oswego, N. Y. Bulletin No. 12. Illustrates and describes the Oswego-McNaull water tube boilers, which are regularly built in standard units of from 50 to 500 hp. The boilers are claimed to be designed on correct principles with straight tubes, longitudinal drums and steel headers, and to meet the requirements for a safe, durable and economical boiler.

Brace Railroad Rails.—Thomas Brace Rail Company, Temple Bar, Brooklyn, N. Y. Catalogue. Contains an article entitled "Railroad Rails, Their Defects, How to Improve and Reduce the Cost," by E. T. Thomas, with special reference to the "Thomas" brace railroad rail, of which specifications and line drawings are given.

Turret Lathes.—Niles-Bement-Pond Company, 111 Broadway, New York City. Catalogue. Size 6 x 9 in.; pages 43. Illustrates and describes the Pond rigid turret lathe, which is designed for producing work ordinarily done on engine lathes, and is especially adapted to such work as gear blanks, flywheels and gas engine cylinders, and for heavy work such as wrist pins and projectiles. The lathes are regularly built in 21 and 28 in. sizes.

Feed Water Heaters.—Harrison Safety Boiler Works, Columbia Station, Philadelphia, Pa. Circular entitled "May We Inquire?" Discusses how to obtain more hot water from a boiler feed water heater where the quantity of exhaust is limited. It shows that open heaters have the advantage over closed heaters in this respect, also in that they save the condensed exhaust, provide for purifying the water and liberating air and carbonic acid gas, that they serve as an independent oil separator, expansion and return tank, pump governor, hot well, &c. The Cochrane heater is an example of the open type, and is further claimed to be more easily cleaned than a closed heater, this point being illustrated by photographs.

Riveters.—Hanna Engineering Works, 820 Elston avenue, Chicago, Ill. Circular and blotter. These pertain to Hanna pneumatic and hydraulic riveters, which are built in any style, size or pressure, and which may be operated in any position to suit conditions.

Sheet Metal and Paper Machinery.—Charles Leffler & Co., 61 Clymer street, Brooklyn, N. Y. Loose leaf catalogue. Size 6 x 8¾ in. The pages at present in force give illustration and specifications of foot power pendulum presses, notching machines, lever and toggle lever presses, adjustable power presses with and without automatic feeding devices, power horning presses, stationery and inclined arch power presses, reducing presses, double crank power presses, power punching presses, double action adjustable power press, slitting machines with and without automatic feeds, foot power cam body formers, cam body flanging machines, double seaming machines, round double seamers, square double seamers, seam rolling machines, trimming and beading lathes, double head crimping machines, threading machine with automatic pressure, crimping and beading machines, soldering frames and cylinders, power squeezers, drop presses, and an automatic machine for folding circulars, and one for pasting labels on bottles.

Economizers.—Green Fuel Economizer Company, Matteawan, N. Y. Catalogue. Size 6 x 9 in.; pages 160. Takes up not only the history and merits of the Green fuel economizer, but also such engineering topics as the absorption of heat by different parts of the boiler surface; the relative economy of boiler surface and economizer surface under various conditions; methods of determining the economy of additional heating surface from the load curve; the effects of oil fuel, high steam pressures and superheat on boiler economy; methods of measuring the temperature of flue gases, and reports of various tests of boiler plants containing economizers.

Engines and Batteries.—Westinghouse Machine Company, East Pittsburgh, Pa. Nine catalogues. These give illustrated descriptions of Westinghouse single acting compound engines, standard engines, Westinghouse-Parsons steam turbines, Westinghouse storage batteries, storage batteries for gas engine ignition and storage batteries for stationary use. Three catalogues of instructions and suggestions refer respectively to Westinghouse compound automatic engines, Westinghouse-Parsons steam turbines, and Westinghouse gas engines.

Corliss Engines.—Vilter Mfg. Company, Milwaukee, Wis. Catalogue E. Size, 6¾ x 10 in.; pages, 65. Presents a number of illustrations of the company's Corliss engines, showing the general design and construction, for which the special claims of efficiency, durability and simplicity are made. The parts of the engines are described and illustrated, and some views of the company's plant are given. Tables of capacities and dimensions and partial lists of users are included.

Pipe Cutting and Threading Machinery.—Bignall & Keeler Mfg. Company, Edwardsville, Ill. Catalogue No. 17. Size, 6 x 9 in.; pages, 54; cloth binding. Covers the company's complete line of products, including Peerless, P. D. Q. C. and Duplex improved pipe threading and cutting-off machines, emery surfacers, die stocks and rolling cutters. Brief descriptions accompany each of the illustrations of the different sizes of the various machines and their more important parts. Information bearing on pipe and pipe threading is appended.

HARDWARE

MERCHANTS of certain agricultural sections who depend upon the farmers for a large amount of their custom report that the Pure Food law is working to their advantage in an important way. Vermont affords a striking illustration of this in the maple sugar and butter industries. At the present time the Hardware merchants are enjoying a brisk trade in the tools and appurtenances of maple sugar gathering and manufacturing. The Pure Food law struck deep into the root of the industry as it has existed, compelling a stop to the very general adulteration of the product of the maple sap. The result is a large increase in the demand for the pure sugar, and the consequent increase in prices has impelled owners of sugar maple groves to make the most of the harvest until an important demand for equipment has resulted. Higher prices for pure butter have worked out in a similar manner. The farmers of the section are thus reaping a richer reward for their labor and investment. These are only instances of the workings of the new law; similar changes in conditions must prevail in other sections of the country, and in a widely diversified list of agricultural products.

So radical an industrial outcome of a new law suggests a field of business activity for the merchant in seeking out every opportunity for his patrons to benefit by any change in the existing order of things. Many farmers are not progressive. They are not in as close touch as are well informed merchants with what is going on in the commercial and industrial world. They are slow to take advantage of the conditions of their market beyond the immediate present. They are not equipped to plan for the next season. Their sources of information are apt to be meager, and they are unable to look into the future and see where they can best direct their efforts to secure the greatest possible remuneration from their toil and their acres. The intelligent merchant can assist them greatly, and in their success lies the profits of his business. If some one crop of his section promises to bring high prices, because of some known influence on the market, such as the Pure Food law, a campaign of education should bring results. In many communities the farmer is dependent for much of his news of the outside world upon his visits to the stores of the town where he does his trading. It is for Hardware merchants of intelligence to make it their business to be informed and alert in regard to matters in which their customers, and especially their farming customers, are pecuniarly interested. The Hardware store should be the center of information in town, and directly or indirectly the merchant occupying such a position and disseminating useful information would be sure to reap substantial advantage.

Curious and unexpected results often follow from interference with the natural course of trade. A manufacfacturer's selling goods direct to consumers seems far removed from efforts by merchants to induce him to market his products through the branch of trade to which the merchants in question belong. The direct dealing with the consumers, the merchants being ignored in the premises, is, however, a consequence of the efforts made by the merchants in this line to have the manufacturers refuse to sell goods to any branch of the trade. The facts are that jewelers objected strenuously to the sale of Silverware to Hardware merchants, and did this so emphatically that one prominent manufacturer at least, not deeming it expedient to accede to their request—using a mild word to express a graceless and imperative demand—has reached the conclusion that it will be advisable for him to go direct to the public, cutting out altogether the merchants, wholesale and retail. The attempt to confine trade too closely in a certain channel seems in this case to result in breaking down such barriers as existed, and thus instead of restricting the sale as desired had a directly opposite result. Dictation in such matters is naturally resented and generally fails to accomplish its purpose.

Condition of Trade.

Without any important development in the market a gradual improvement in the general situation is apparent. If there were simply no change for the worse this would be in fact a progress toward recovery and a better state of things. It would indicate that there is little danger of a relapse, and that the commercial and manufacturing situation is sufficiently sound to hold its own and withstand influences which might tend to give it a setback. There are, however, evidences of improvement in business generally. There is less financial stringency, money, in fact, becoming abundant. There is also at the same time a considerable larger volume of current business when the market as a whole is regarded. While the railroads feel seriously the falling off in the amount of merchandise carried and have many idle cars, impressing upon them the necessity of reducing operating expenses, there is with the advance of the season more for them to do, and reports are not altogether discouraging. With a good though diminished volume of exports, there is every prospect that the country will have a noble balance of trade to its credit, and this should be an important influence in securing its financial security and ease. In connection with farm products, we are assured that there is a large amount of grain still in the farmers hands, which will find its way before long into market and thus keep up the prosperity of those who are fortunate enough to own it. At this early date, too, it is well to note that the indications, whatever they may be worth, in regard to the crops are good, the winter having been generally favorable. We dwell on these general features because Hardware and its related lines can only be expected to keep step with the movement of trade in other branches. In the Hardware field the market in different sections and in different lines of goods presents many unevennesses. The reports from jobbing houses are on the whole gratifying in regard to the volume of business they are doing and the general healthfulness of the trade in their territory. Some manufacturers find the demand comparing pretty well with other years at this season, but in some lines there is a good deal of complaint. The disposition on the part of merchants, wholesale and retail, is to defer buying unless goods are actually required, and in such cases to place orders very conservatively and for small quantities. Prices in many leading lines are well sustained, and manufacturers generally are to be given credit for much self-control in refusing to lower their quotations in the attempt to secure orders. In some lines, however, there is a notable weakness and irregularity, and in some goods,

of which Axes and Agricultural Wrenches are an example, the market seems to have given way. The strength of raw material and such lines as Wire and Wire Nails, owing to the steadying influence of the leading interest, does much apparently to keep things from going to pieces. With the advance of the season and the coming of settled weather an increase in the volume of business is looked for.

Chicago.

Already the anticipated effects of continued spring-like weather are being felt in a perceptible quickening of trade movements in Hardware lines. The increased interest of dealers is being expressed in more frequent requests for shipments of contract orders and new orders are coming out a little more freely, especially from buyers who have delayed purchase of seasonable goods beyond the usual time. Poultry Netting is thus more in demand and under the same stimulus Wire Cloth orders are more numerous, although neither are moving in normal volume. The general conditions underlying market activities have undergone no positive change, and an undertone of hesitation, due to an apprehension of shrinkage of prices, is still strongly in evidence. The prevalent attitude of buyers in this respect is strengthened by current comment in the daily press and elsewhere predicting a widespread revision of prices on Iron and Steel material, which would of necessity effect values of the more highly finished products. Whatever may be said of the potency of this feeling in restricting buying for forward requirements, it can hardly be regarded as having an important bearing on purchases for immediate consumption, which constitute the bulk of the business. At the same time it is generally recognized that a greater degree of certainty as to the ultimate course of prices would contribute materially to a clearing of the situation. Meanwhile most of the standard staples continue to show a satisfactory degree of firmness. Sheets, both Black and Galvanized, are rather in advance of other mill products in steadiness of prices and strength of demand. Wire Nails maintain their position reasonably well, and considerable improvement in new business is looked for very soon if the promises of an early spring are realized. In the Heavy Hardware trade only a moderate demand for Steel and Iron Bars is reported, but some fair sized orders for Tire sizes have been coming in of late, which would signify more activity in the wagon and carriage shops. After months of delay the La Salle Hotel project, which involves the construction of a building costing approximately $2,500,000, seems to be taking definite form and bids fair to swell the year's volume of local trade in Builders' Hardware by a considerable sum. In general, however, the outlook for business in this line is more favorable for the ordinary grades required in flats and dwellings of moderate size than for the higher grades used in large public structures.

Portland, Oregon.

FAILING, HAINES & MCCALMAN.—Conditions in the Portland territory, as near as the writer can find out, continue to be remarkably good compared to the rest of the country. The writer has just returned from a visit to California, and a short time before was in the Puget Sound territory. Owing to local conditions, we find that in these territories business is not as good as it is in Portland. All along the Pacific Coast merchants are looking for a gradual revival of business during the year, especially after the political uncertainty is terminated by the Presidential election.

One feature is the same up and down the Coast—country business is uniformly better than city business in proportion to preceding years. While business as a whole is not an improvement over last year, there is practically no decrease in the Portland territory. Outside territories do not give as good a report of themselves. This is due to a variety of causes, but very largely to the fact that dealers are buying from hand to mouth, and therefore buy as close to home as possible. From all we can learn, the Middle West and Eastern jobbers are showing comparatively a much larger decrease in Coast territory business than local jobbers. One favorable indication which we might mention of our business conditions is the fact that houses here are receiving very few applications for positions, except from people who have recently come from the East, and even these are not as numerous in Portland as in other parts of the Coast.

As this letter is being written the last spike is being driven on the North Bank road, which will give Portland in effect two more transcontinental lines, and will divert a large portion of the traffic going to Puget Sound down the water grade of the Columbia into Portland. This promises a great increase of business to Portland merchants.

Swift & Co., according to the daily papers (and we believe in this case the papers have the facts), are about to commence construction of a $3,500,000 plant just outside the boundaries of the city of Portland, and if they can obtain the right site Swarzchild & Sulzberger are about to invest $1,500,000 in another packing plant, also in Portland. They already have option on a portion of the necessary property. These two plants mean a great deal, not only to Portland itself in the way of pay rolls and rentals, but a great deal more directly to the territory tributary to Portland, affording them a large competitive market for their cattle.

It has been rumored in the papers that the Hill line, on completion of the North Bank road, will establish their own steamship line running out of Portland to San Francisco in competition with the Harriman lines and the independents now on the run. It is also rumored, but with how much foundation it is impossible to say, that these lines may cover an even greater distance. This undoubtedly will bring much business to Portland which it has not heretofore enjoyed.

From all the writer can learn from the papers and from conversation with people who have returned recently from the East, and from his observation on his trip to the South, the Pacific Coast is probably in better shape financially than any other section of the country, and that on the Coast Portland territory to-day is probably in the best condition.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—Since the first of the month we have had very pleasant weather. There is danger that the conditions of last year will be repeated—a very warm March, with freezing weather in April. Last year this caused great damage to the fruit crop. It resulted in a late spring, making it necessary to plant a number of crops several times.

We offer up our prayers for winter in the wintertime and summer in the summertime. If it were possible to legislate on the weather we would appeal to our State Legislature. We would call for a commission to be appointed to investigate the weather and make a report.

Again we have been treated to the annual Axe vaudeville. If the entertainment were not so expensive it would be more amusing. On account of the financial disturbances the latter part of last year practically all jobbers and retailers have carried over good stocks of Axes. Therefore there was no call either from the jobbing or retail trade for a reduction in the price of Axes. It seems, however, it is not possible for all the Axe manufacturers in this country to remain on the map at the same time. Somebody is destined to "get off the earth."

Each of the leading Axe manufacturers accuses the other of being the cause of the fracas. We have heard stories of one manufacturer traveling, followed by several detectives, who send daily reports to other manufacturers. Surely this is competition down to date.

Following the tradition of most fights, the innocent bystander gets hurt. The manufacturers fight—jobbers and retailers with stocks of goods on hand suffer the consequences.

The original plan outlined was that prices on manufacturers' brands should be maintained. New fighting Axes have been brought out for this season's carnage. It seems, however, even the prices on manufacturers' brands will not be maintained. Both manufacturers' brands and jobbers' special brands will be lower. Spe-

cial cheap Axes for fighting purposes will be put on the market. The writer suggested to one manufacturer he name his fighting Axe "The Idiot Child," and he is still considering the suggestion.

Laying joking aside, it seems to us—and we believe to all the other large distributers of Axes—it is a shame that this important line of goods should be subject to such conditions.

Cross Cut Saws are in many sections gradually usurping the place of Axes. There is less waste with a Cross Cut Saw. There are a number of manufacturers of Saws. They advertise, they "talk fierce," but we have never yet heard one of them accused of cutting the prices on his goods. In fact, when we balance a first-grade Cross Cut Saw in our hands, when we figure up the amount of steel and amount of labor, we take off our hats to the sales department of the manufacturers.

The trouble with Axes is in the fact they are very easily made. Notwithstanding the protests we are sure to hear from some of our Axe manufacturing friends, we do not believe it takes any remarkable skill to produce a satisfactory Axe. That is the main cause of the trouble. When an Axe factory is once organized they can produce Axes *ad infinitum*. In other lines, probably in the making of Saws, it takes more skill. Skilled workmen are educated slowly. Therefore this one condition, in a measure, checks the production of Saws.

We sometimes wonder just what it does cost to produce an Axe. When we consider the price of "The Idiot Child," and then compare it with one of the same manufacturer's own brands, we are led to conclude that either he must be losing money on his "Idiot Child," or that he is making an enormous profit on "The Pride of the Family."

Are there manufacturers in other lines preparing to star the country in similar vaudeville stunts? If so, please don't. Most of us have not quite recovered from the vaudeville on Wall Street last November.

Jes so! Jes so!

Cleveland.

THE W. BINGHAM COMPANY.—Since writing our last letter we are pleased to note there has been quite an improvement in business. Orders are coming in more freely, both by mail and from our salesmen, especially for season goods. The low stocks carried by the retailers throughout the country have caused many of them to order often and in small quantities, but for the past week orders have been coming in more freely and fairly well assorted, also in larger volume, and the outlook is more encouraging from day to day.

With warmer weather and the natural opening up of the spring trade there should be still further improvement. Many of our manufacturers who have been running on short time are increasing their hours and also the number of men employed, and while we may not receive the amount of business in the year 1908 that we did in 1906 and 1907, we have every confidence to believe we will have good business from now on. Our collections are fairly good, and the outlook is much more reassuring.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—Springtime has come sure enough, according to the thermometer, barometer, hydrometer and all the other "meters" in the calendar. We are enjoying (?) our third flood this year—not so high as a well turned upside down, but evidently wider than any barn door we know of, and it certainly suffices for all the needed aqueous demonstrations of these prevailing prohibition times. The ground is getting a good soaking, and no doubt springs will be running uninterruptedly all summer long. Sunshine has come, and with it the hope which springs eternal in the human breast.

Business is climbing upward slowly and laboriously. The orders are a little larger, a little more frequent, and the comparison between now and a year ago is not quite so trying as in November and December. There has been very little actual distress so far as we can measure it. Social settlements and the rival Salvation armies have made the most of what there was. Much of the trouble has been in the apprehension of what would happen if things grew worse. All sorts of prescriptions are being doled out by the various legislatures. It is the patient who has been subjected to the shaking rather than the 8 or 10 oz. phial.

The railroads are complaining of short tonnage. The writer has recently taken a trip through the South, and found the cars full of travelers wherever he went, and the terminal yards and main tracks better cleared of trash. There did not seem to be a stray spike or any odd nuts and washers strewn around as usual along the line. Every scrap has been picked up which would stand for money or if left would indicate waste. I was told that instead of putting in new ties, which in many instances should have been done last year, the section hands were simply reversing them and turning the old ties bottom up in the hope that the bottom was in better condition than the top. Just how far this can be done economically we cannot tell. It would seem as though the railroads might follow a policy of:

1. Reducing dividends to a recognized low substantial basis, say not over 5 per cent.; 4 per cent. might do.

2. A reduction of the number of trains which could be profitably employed only in flush times. It is very convenient to have a train every half hour or so, but when traffic is not there to support it, people might learn to do their railroad riding as they do their banking—within limited hours.

3. The schedules, which have been pushed up to almost unattainable execution, should be lengthened. The passenger would rather be sure that he is to arrive at his journey's end on time than hold in his hand a fast time-table and arrive 3 to 6 hr. late, as is a common experience. It may be counter to the spirit of the age, but possibly going a little slower on the railroads will be quite as healthy as a slowdown in other directions.

Money is reasonably plenty; collections fair. Stocks of merchandise are being run rather close for comfort, so that later on if we have good crops and the balance of trade continues anything like its recent showings we shall all be happy again with plenty to do.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—March business is about up to expectations. The first quarter of the year will fall somewhat below the sales of last year, but as spring approaches the orders are increasing, both in number and size, and especially in the latter, and the indications are now for about a normal business as April comes in. Stocks in the hands of retailers are not large and are likely to need frequent sorting up.

Throughout most of our farming country, and especially in the parts having mixed dairying, &c., there is ground for expecting a very fair spring trade. The consumers of goods over this extended area are on hand, and their wants will be steady and in the aggregate will be pretty large. These large and important sections of the country have not known much of the presence or as yet of the serious effects of the outside disturbances of last fall. For a month or thereabouts, in the pinch of the flurry and during the temporary currency stringency, they realized that something had gone wrong; but when that period passed over things again came around about in their usual way, and they may now reasonably be expected to continue so till another crop is at hand and takes its place as the important factor then in the situation. At that time the vital points to be considered will be: First, conditions of the crops, and, second, prices. Until the time for the settlement of these two questions we shall hope for a fair trade, and with average crops and reasonable prices the Northwest will be able to go through the year in good shape.

Omaha.

LEE GLASS-ANDERSEN HARDWARE COMPANY.—During the past two weeks the business situation has remained practically the same as outlined in our former review. Business is steadily improving in a satisfactory manner, conditions are favorable and the outlook is encouraging.

At this season of the year pleasant and stormy days follow each other closely, which will probably represent

the weather conditions until about May 1. The agriculturists are taking prompt advantage of every favorable opportunity to make preparations for the necessary field work. A copious supply of moisture throughout the corn belt has placed the soil in admirable condition for the reception of seed grain, so that general conditions as they exist at the present time could not be materially improved.

The satisfactory volume of business now being transacted warrants the conclusion that a still heavier trade will develop just as soon as the weather settles and permits outdoor work of all kinds to proceed uninterruptedly.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—General conditions in this part of the country seem to be fairly satisfactory. The spring business is proving to be very good. Orders from traveling men, while not as large as they were last year, are quite plentiful and are well assorted, covering almost the entire line. Mail orders are heavy, and are better than they have been for some months.

Prices are being well maintained. We do not hear of any cutting going on, and there seems to be a pretty firm tone to the market.

Collections are improving, and our collections so far this month are much better than they were in February. During the past 30 days quite a number of new stocks have been sold in this city. This is a good indication of a revival of confidence in business.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—The weather conditions during the past week or 10 days should somewhat improve trade, and, notwithstanding the fact that buyers have recently been very careful in their buying, largely limiting their orders to immediate wants or requirements, it can be safely stated that the weather conditions look encouragingly to improved trade. There has been some delay in placing orders for spring goods, but this condition cannot continue long, as it is now time to place orders for these goods, which, if not on hand when called for, will naturally reduce the merchant's trade.

There has probably never been a time since the years 1893 and 1894 when the general retail trade has been more careful in its purchases than since November last. As to how careful they have been in collecting accounts each dealer is naturally his own judge, but that effort is quite an important one.

We admit there has been something of a scare over the country because quite a number of men have been temporarily thrown out of employment, many of whom have suffered from having accumulated no savings during the past two years, when trade and employment have been so exceedingly good. There is more than one reason why many men were thrown out of employment, which was not alone due to the large increase in the number of persons coming from foreign countries during the past two or three years, estimated to be nearly equal to the thousands out of employment. Many manufacturers have been for years so largely engaged that they have been unable to give attention to the matter of keeping their works in proper condition, and when reduced trade came upon them the plants were closed in order that they might be put in good working condition. Again, trade has been so enormous (this reference is not made to general Hardware) that money was essential, and the interest rates on money had been so largely increased that a temporary holding up was more important to them than a continuance of operations to meet coming requirements. All these matters have combined to scare the trade throughout the country, and some employees temporarily out of employment have unfortunately suffered because they had saved no money.

In conversation a short time since with a person who has a large number of men in his employ, he referred to a man who had been in his service a number of years at a certain salary. This man had a family of five sons who had been well educated and were then in employment. The family had always lived well, but, notwithstanding, when the father died he owned the house the family lived in and two other houses, small, of course, but well rented. Another man who had been in his employ the same length of time at the same salary and with a smaller family of two sons died without having any money saved, which only goes to show what is possible if persons are careful and not too careless or extravagant with their income. Whether employer or employee, all should try to save money and prepare for contingencies which are liable to come up.

Market conditions are gradually improving. While it cannot be fully determined what 1908 crop conditions will be, yet, so far, matters look very encouraging and quite equal to the same time one year ago. Exports for the month of February exceed those of the same month one year ago. Money conditions have also wonderfully improved, and the rates on money are down to about the price that existed prior to the Wall Street trouble, and this, too, is an encouragement for the future.

New Orleans.

WOODWARD, WIGHT & CO.—We are all breathing a little more freely in New Orleans, now that the carnival is over and people have settled down to their normal gait and are able to pay a little closer attention to business than they have been during carnival week. For four or five days after the carnival there was quite a little spurt and it looked like old times to see good sized orders coming in, but it has slackened off again to the gait we had in February.

People, however, are all taking a little more cheerful view of the situation. All down here have made up their minds that they have got to face an economical régime for the next 6 or 12 months, and that the thing to do is to adapt themselves to the conditions and not cry over spilled milk.

Although it is pretty early in the year to tell about our crops, there have been no untoward developments so far, and with the customary optimism of the American merchant we believe that we are going to have good crops for the coming year, and that as a consequence the spirit of retrenchment is going to be in the end good for us, as it will get us on a more solid basis, and we will all get better value for the money we spend.

NOTES ON PRICES.

Wire Nails.—The market continues steady and the convenience of the trade is served by prompt shipments from the mills. Spring like weather has opened up trade to the extent of increasing demand within moderate limits. Specifications on contract orders and new business indicate conservatism on the part of buyers. Quotations are unchanged, as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

New York.—Sales of Wire Nails in small lots at store continue along moderate lines. Nail houses are represented as maintaining regular prices, but it is reported that jobbing houses sometimes shade prices when Hardware is also sold. Regular quotations are on the basis of $2.40 for small lots at store.

Chicago.—Specifications continue to come out in a way that, contrasted with the movement of other mill products, is quite satisfactory. New business shows considerable improvement, which adds to the strength of the situation. Continued springlike weather has been a strong factor in the development of business, and will doubtless exert a stimulating influence all along the line. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The continued favorable weather and the opening up of spring trade have caused a larger demand for Wire Nails, the mills entering more business at present than for some time past. However, the volume of new business and specifications against contracts are lighter so far this year than usual, this being due

to the conservative attitude of jobbers in placing orders, the mills being in position to make prompt deliveries. There is also a feeling that nothing is to be gained by carrying heavy stocks, as higher prices on Wire Nails are not likely under present conditions. Quotations are unchanged, as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

Cut Nails.—Existing prices were reaffirmed at the meeting of the Eastern Cut Nail Association held last week. It was believed that no additional business would result from lower prices, while maintaining present values more confidence in the future stability of the market would be assured and would aid in the return of confidence. The statement has been made that the present price of Cut Nails is entirely too low, in view of the cost of material and labor in making them. Most mills have cut down their production considerably as demand continues light. There is more or less irregularity in prices. Regular quotations are on the basis of $2.05 per keg, at mill. Iron Nails generally should command about 10 cents more than Steel.

New York.—There is comparatively little demand for Cut Nails in the local market. Regular prices are said to be adhered to by Nail houses, but it is reported that Hardware jobbers sometimes shade prices when other goods are sold. Quotations are on the basis of $2.30 per keg for small lots, at store.

Chicago.—There is very little demand for Cut Nails from any source. Locally trade is extremely quiet and regular prices continue to be shaded 10 cents or more a keg. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; Steel, to jobbers, in carloads, $2.28; to retailers, $2.33.

Pittsburgh.—The Eastern Cut Nail Association at its meeting held in Philadelphia on Wednesday, March 11, reaffirmed old prices. Demand continues very dull and there is more or less cutting in prices. The mills are still running very light in an effort to keep stocks as low as possible. We quote Steel Cut Nails at $1.90 to $1.95, f.o.b. Pittsburgh, for carload lots, and about $2 for small lots, to which freight to point of delivery is added. Iron Cut Nails are about $2.05, at maker's mill.

Barb Wire.—The more general demand throughout the country has materially increased the volume of orders booked by the mills. The territory from which orders are received includes the South and Northwest. Prices are being maintained at regular quotations, according to information from the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—Added to the demand from the South, orders are coming in more freely from Northern territory, with the result that distinct improvement is noted. Buyers are following orders with requests to hurry shipments, which indicates that consumers are getting busy. Prices are unchanged and firmly maintained. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55, Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The continued favorable weather has brought out considerable tonnage in Barb Wire from the Northwest, so that the buying movement is now more general throughout the country than for some time past. It is confidently believed that new tonnage will continue to expand with good weather and conditions and the opening up of spring trade. The mills are maintaining regular prices and the market is firm. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—Manufacturers of Wire Fencing have proceeded along conservative lines in placing orders for Wire, as have also other large buyers. When actual consumptive demand for Wire and Wire Fencing commences an increase of orders is anticipated by the mills. Prices are reported as being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Chicago.—While business is developing in a satisfactory way, there are good prospects for an even better movement as the season advances. Manufacturers have been buying conservatively, and if the Fence trade overreaches their moderate provisions, as it reasonably may, they will be compelled to supplement their stocks by further purchases. Prices hold firm and steady. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—New tonnage being placed with the mills is increasing, but buyers are placing orders conservatively in the belief that they will be able to get prompt shipment from the mills and fill their customers' orders promptly. As soon as the Fence building season actually starts a heavier buying movement is confidently anticipated. The mills report that they are maintaining prices and that the market is firm. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Axes.—The unfortunate disturbance in the Axe market, referred to in our last issue, seems to be becoming more acute and difficult of correction, so far as next season's business is concerned, inasmuch as low quotations have been given wide circulation. The reduction in prices bears with especial heaviness, not only on the smaller manufacturers, but also on the jobbing trade, most of whom are carrying over considerable stocks purchased last year. Business booked this season promises to be light, although the low prices offered may tempt some large handlers with ample financial resources to purchase more freely than they would under other conditions. The general state of the market is not, however, such as to encourage speculative buying.

Cast Iron Hardware.—A tone of irregularity continues to prevail in the market for Cast Iron Hardware including Gate and Blind Hinges, Latches, Grindstone Fixtures, &c. Quotations are frequently shaded with a view to securing orders.

Cast Iron Soil Pipe.—In the market for Cast Iron Soil Pipe there seems to be some recovery from the extreme weakness of a short time ago. This is apparent in the tone of the trade rather than in actual prices, but in some cases there is a quotable improvement and a slight but appreciable increase in the inquiries for this material.

Agricultural Wrenches.—The line of Agricultural Wrenches, which has shown some weakness recently, is now in a condition bordering on demoralization and lower prices are reported than for a long period. While it is hardly possible to name a figure that will fairly cover all sections, the market may be represented in a general way by a discount of 80 and 10 per cent., or a trifle better.

Hatchets.—Prices on Hatchets, which have remained practically unchanged for many months, were reaffirmed last week by leading manufacturers. The market is represented by a base discount of 40 and 2½ per cent., beyond which there are further concessions to different classes of buyers.

Brass Cocks.—The extreme low quotations which have been made on Brass Cocks and Bibs have in some cases been withdrawn and prices show a slight tendency to improve.

Tacks.—The Tack market continues to be character-

ized by low and irregular prices, the result of sharp competition, and orders for moderate quantities may now be placed at low figures. The present level may be represented by a quotation on American Carpet and Cut Tacks of 90 and 35 to 90 and 40 per cent. discount, with additional discounts to larger trade.

Conductor Pipe.—A conference of manufacturers, representing perhaps 75 per cent. of the production of Conductor Pipe, Eaves Trough, &c., was held at Cincinnati last week in an effort to correct the irregularity in prices which has for some time prevailed in the market for those products. As a result quotations have been toned up appreciably, although some important interests are still maintaining an independent position. It is asserted, however, that the latter will co-operate in the attempt to maintain prices. The market may be represented in a general way by a discount on Galvanized Steel Pipe in Eastern territory of 70 and 10 per cent. and in Central territory of 75 and 10 per cent.

Rope.—Business continues light and orders are generally for small lots. Manufacturers are, as a rule, supplied with Fiber purchased at prices higher than those now ruling, so that Rope sold at present values does not show much if any profit. Still manufacturers appear anxious to make sales, especially of carload lots, on which low quotations are made. A comparison of values shows that Manila Fiber is 4 cents per pound lower than at this time last year, and that Sisal Fiber is 1¼ cents lower than at this time last year. Fair Current Manila Fiber and Sisal Fiber are now both quoted at 5¾ cents per pound. The retail trade throughout the country do not seem to be selling much Rope, as low quotations sent them does not bring orders. The following quotations for base sizes fairly represent the market: Pure Manila, 10¾ to 11½ cents; B quality grades down to 8 to 9 cents; Pure Sisal, 7½ to 8 cents; lower grades Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¾ cents.

Window Glass.—Marked improvement in the Glass situation is still lacking. Some Glass is being ordered from manufacturers, but prices lack uniformity and stability. Each factory is acting individually in the matter of prices and each is anxious to market its product. Under these conditions an open market is the result, and prices are favorable to the jobber. Locally business is light and prices more or less irregular. The minimum prices recommended by the Eastern Window Glass Jobbers' Association are as follows: Single strength, 90 and 25 per cent.; double strength, 90 and 30 per cent. discount from jobbers' list. These prices are, however, not closely adhered to. The Pittsburgh Plate Glass Company has made a reduction in the price of Plate Glass, which averages, on the various sizes, about 25 to 30 per cent. It is understood that no contract orders are being accepted, but that the new prices are for immediate acceptance. This indicates that the reduction in prices may be temporary.

Linseed Oil.—The past few days of more springlike weather has brought out an improved demand for small lots of Oil. Interest in forward deliveries is lacking, as the views of buyers and crushers regarding price are still considerably far apart. Crushers are talking advances in prices, which are likely to come with a brisk demand. Local quotations are as follows: In five-barrel lots, State and Wesern Raw, 40 to 42 cents; City Raw, 43 to 44 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—The prospect of the new crop of Turpentine reaching the market in a few weeks and general business conditions restrict demands to immediate requirements. The independent operators are supposed to have about 30,000 barrels of tank supply, which is an element of uncertainty, as this supply has been held for some time, but it may be necessary to dispose of it in some way and at some price. The New York market is represented by the following quotations: Oil Barrels, 51½ to 52 cents; Machine Made Barrels, 52 to 52½ cents.

Pecos Valley Lumber Company, Elkins, N. M., has put in a line of Hardware.

Pennsylvania Wholesale Hardware and Supply Association.

THE Pennsylvania Wholesale Hardware and Supply Association held its annual meeting on the 11th inst., at the Hotel Astor, New York City. The meeting was largely attended. The following officers were chosen for the ensuing year: President, James N. Kline, Kline & Co., Williamsport, Pa.; first vice-president, R. E. Weeks, Foote & Shear Company, Scranton, Pa.; second vice-president, H. M. Melchoir, Bright & Co., Reading, Pa.; treasurer, George D. Krause, George Krause Hardware Company, Lebanon, Pa. A pleasant feature of the gathering was a luncheon at which a number of informal addresses were made, several by invited guests. A. B. Stein, former president of the association, acted as toastmaster, and among those who spoke were T. B. Coles, American Steel & Wire Company; T. James Fernley, secretary of the National Hardware Association; Charles H. Rockwell, president of the Atlantic Glass Company, and R. R. Williams, Hardware editor of *The Iron Age*. In the evening a theater party was enjoyed.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM HORGAN & HOPPER, who have purchased the business of N. M. Jones in Friendship, Wis. The firm handles a general line of Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, Sporting and Athletic Goods, Wall Paper, &c.

FROM OLSON HARDWARE & IMPLEMENT COMPANY, Brandon, Minn., which has been incorporated to deal in General Hardware, Stoves, Implements, Paints and Sporting Goods.

FROM W. H. WILHELM, who has opened a new Hardware and Paint store, at 633 West North avenue, Baltimore, Md.

FROM ELDON HARDWARE & LUMBER COMPANY, Eldon, Mo., which has been incorporated with a capital of $20,000, and will handle Shelf Hardware, Stoves, Tinware, Implements, Paints, Sporting Goods and Harness.

FROM MCGRANE COMPANY, Buffalo, N. Y., which has been incorporated for $12,000 by J. I. McGrane, S. B. De Witt and T. B. Casey, and will in addition to conducting a General Hardware business, make a specialty of Gas Fixtures and Lighting Supplies, Bicycles and Motor Cycles.

FROM WATERTOWN HARDWARE COMPANY, Watertown, Tenn., H. & J. S. Phillips, proprietors, which has just opened a good sized store.

FROM NORMAN BAILEY, Christiana, Pa., who is about to add Farming Implements, &c., to the lines carried in connection with his General Hardware business.

FROM NEW AMSTERDAM HARDWARE COMPANY, 618 Amsterdam avenue, New York, which has lately opened up in business. In addition to carrying Hardware, Sewing Machines and Phonographs, the company will give attention to electrical work, locksmithing and general repairing.

FROM CHAPMAN HARDWARE COMPANY, Elmira, N. Y., successor to I. R. Chapman and dealer in Shelf Hardware, Stoves, House Furnishing Goods, &c.

Legget-Wisda Hardware Company, Ord, Neb., has been succeeded by Ord Mercantile Company.

TRADE ITEMS.

THE CONNEAUT SHOVEL COMPANY, Conneaut, Ohio, has within the last three months established branches at Portland, Ore.; Seattle, Wash.; Los Angeles and San Francisco, Cal., and Denver, Colo.

OWING to extended interests in other lines, E. B. Gibford has resigned as treasurer and sales manager of Gibford-Weiffenbach Company, Adrian, Mich., manufacturer of Red-E-for-Use and other brands of razor strops. G. U. Weiffenbach becomes general manager of the company. We are advised that there will be no change in the product or the quality standards of the company, which is equipped with a new factory, and will continue to give prompt and careful attention to orders.

THE Sioux City Iron Company, Sioux City, Iowa, wholesale Heavy Hardware, suffered a loss by fire March 5, which destroyed the stock in its main warehouse.

G. M. THURNAUER & BRO., 37 Park place, New York, importers of and merchants handling complete lines of Housefurnishing Goods, Kitchen Utensils, &c., have removed to 83-85 Worth street, New York.

THE WOLFF-LANE HARDWARE COMPANY, Pittsburgh, one of the oldest Hardware houses in that city, and in fact in the entire country, has been recently reorganized, the following officials having been elected: Edmund D. Graff, president; L. L. Banks, vice-president and treasurer; H. C. McKee, assistant treasurer, and John B. Maus, secretary and general manager. Prior to his connection with the company Mr. Maus was connected for 19 years with Kelly, Maus & Co., Chicago. Considerable new blood has recently been infused into the Wolff-Lane Company and it is the intention to push trade actively and extend its territory wherever feasible to do so.

THE ALBANY HARDWARE & IRON COMPANY, Albany, N. Y., has re-elected the Board of Directors which served during the past year. The following officers were chosen: President, Charles H. Turner; vice-president, W. I. Baker; secretary, W. J. Wackerhagen; treasurer, James K. Dunscomb.

IN the reference in our last issue to catalogue No. 22 issued by the Corbin Cabinet Lock Company a typographical error occurred in noting the number of pages, which should have been 264 instead 26. The catalogue represents the company's entire line of Cabinet Locks for innumerable purposes, together with some accessories, such as Knobs, Escutcheons and Striking Plates.

THE VULCAN TOOL MFG. COMPANY Quincy, Mass., has succeeded to the business formerly conducted by Alexander Clark Company and Gifford-Pinel Company. The company will manufacture a variety of Iron and Steel Tools of superior quality, making a specialty of the quarry and stone trade, and Contractors' Tools, including Picks, Sewer Tools and Tools for structural steel work.

HARTFORD MACHINE SCREW COMPANY, Hartford, Conn., has opened a New York office and warehouse at 88-90 Walker street, where a complete stock will be carried of Set and Cap Screws, Taper Pins, finished and case hardened Nuts, and practically all other goods made by the company.

THE NATIONAL ACME MFG. COMPANY, Cleveland, Ohio, has established a New York office at 77 White street, under the management of L. M. Waite, where a complete stock of Cap and Set Screws will be carried for the convenience of the trade.

THE R. E. DIETZ COMPANY, 60 Laight street, New York, has issued an illustrated catalogue, No. 40, 116 pages, representing an extensive line of Lanterns for all purposes and containing all details of interest to purchasers regarding fittings, packing, weights, dimensions of cases, cubic contents, &c. The catalogue illustrates nearly 100 styles of Dietz Lanterns, with a concise description of each, so that a person not familiar with the goods may order intelligently from it.

Dixon Hardware Company, Dixon, Mo., has been incorporated with a capital of $10,000.

AMONG THE HARDWARE TRADE.

Walther-Williams Hardware Company has succeeded Sexton-Walther Company, The Dalles, Ore., Mr. Sexton having retired. The company is carrying on a wholesale and retail business, and has a fine modern store covering 100 x 400 ft. of floor space.

The Baumann Hardware Company, Wausau, Wis., has been incorporated with a capital of $25,000, to conduct a retail Hardware, Stove, Implement and Sporting Goods business.

C. S. Lynde, Dalton, N. Y., has been succeeded by Lynde & Ryan, who will add Farm Machinery and Fertilizers to the stock formerly carried.

C. H. Reinholdt, Manning, Iowa, has been succeeded by C. H. Reinholdt & Co., who have been incorporated with a paid in capital of $17,000.

Horan & Hopper have succeeded N. M. Jones in the Hardware and Implement business at Friendship, Wis.

Hubert Day, Elyria, Ohio, has been succeeded in the Hardware, Tool, Paint and Sporting Goods business by Hubert Day & Sons.

The firm of French & Welch, Bismarck, N. D., general Hardware, Farm Machinery, Harness, &c., has been incorporated under the title of French & Welch Hardware Company, with a capital stock of $50,000. There will be no change of interest under the reorganization.

The Union Hardware Company, Hope, Ark., has recently been incorporated to do a wholesale and retail business in Shelf and Heavy Hardware, Farm Implements, Harness, Wagons and Buggies, Sash, Doors and Builders' Material. The officers of the new company are A. A. Gibson, president; J. H. Weaver, vice-president; S. A. Scott, secretary and treasurer; C. W. True, manager.

Walter Brummett and Edwin Morgan have formed a partnership and will engage in the Hardware and furniture business at Stephens, Ark.

The Melass, Johnson & Siebe Company, Stoughton, Wis, has sold the Implement and Machinery department of its business to Thos. Oscar of that city, but will continue the Hardware department as heretofore under the same firm name.

C. E. Baker has succeeded to the Hardware business of Ray & Rice, Camden, Ind.

Frank W. Prothero, Du Bois, Pa., has sold his Hardware, Stove, Paint, Vehicle and Harness business to Hibner-Hoover Hardware Company.

J. W. Timmons, who has been a salesman of the International Harvester Company for several years, has purchased the Hardware, Implement and Vehicle business of Ora Thomasson, Pine Valley, Ind.

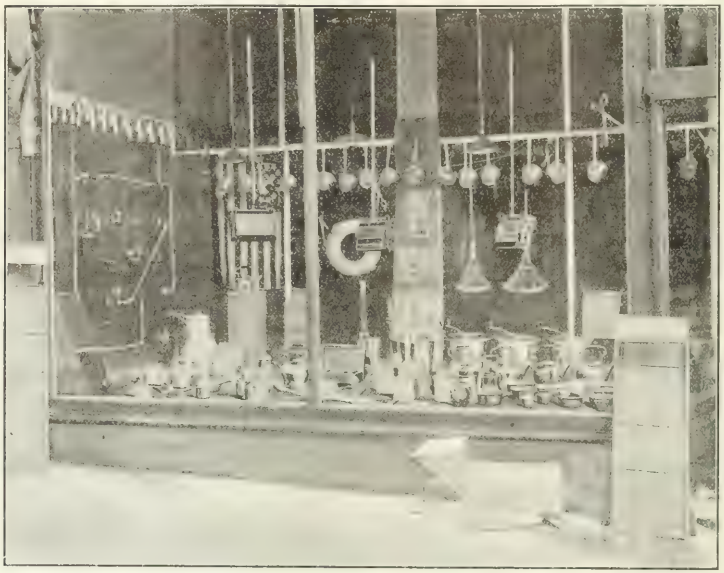
H. J. Conant, proprietor of the Worcester Hardware Company, Worcester, Mass., has sold his interest and good will to J. F. Chandler, formerly of the firm of Chandler & Morse, Putnam, Conn. The business will be continued under the old style, under the management of H. B. Chandler.

The retail Hardware, Stove, Implement, Paint, Oil and Varnish business of Wm. Kerr & Sons, Union City, Ind., has been incorporated for $10,000 by J. H. Morris, Wm. Kerr, Thad. S. Barr and C. F. Kerr.

Turner Hardware Company, Magnolia, Ark., has been incorporated with a capital of $25,000 by J. W. Turner and others.

A HARDWARE GIRL.

IN a merchants' carnival at Caruthersville, Mo., the Caruthersville Hardware Company was represented by the businesslike Hardware girl whose photograph is reproduced herewith. She marched in the parade in which the leading merchants of the city were represented by young women dressed to represent their business. Her dress consisted of a tan hunting coat and a skirt of green satin, which furnished a brilliant background for the numerous articles which were sewed onto it. Every available kind of Hardware was represented in her costume, including spurs for her heels, leggins and a border on her skirt made of Scissors and Jack Chain. Dog Collars were used for belt and collar. The hat was trimmed with Teaspoons all the way round the crown, with crossed Forks and an Egg Beater standing up in front. The skirt weighed 26 lb. A Butcher Knife stuck in the crease of the hat represented a feather. The girl carried a Gun, which she fired from time to time, and naturally attracted a great deal of attention. Although the idea was one of the best advertising schemes the company ever employed, it did not entail much work, as the entire costume was made in one afternoon.



Display of Household Goods, Nickel Plated Ware, &c.



A Hardware Girl.

HOUSEHOLD GOODS WINDOW DISPLAY.

"FOR our retail trade we find that good show windows, well and frequently dressed, are the best advertisement we can have." This is the experience of M. R. Manhard & Son, Marquette, Mich., one of whose window exhibits is here reproduced to give point to their remark. The firm's windows are large, measuring 14 ft. wide by 6½ ft. deep, and their floors are low, so that goods moderately elevated are not too far above the eye of the passer-by. The window illustrated will be recognized as an excellent display of Household Goods sure to interest a woman. These include Nickel Plated Ware, Carpet Sweepers, Fancy Teapots, Granite Ware, Bread Mixers, Bathroom Fixtures, Kitchen Utensils, &c.

THE PRITCHARD-STRONG COMPANY, Rochester, N. Y., announces that this year it will furnish free the striking life size lithograph of Uncle Obediah, with which many in the trade are familiar, with either of two assortments of Prisco Lanterns, instead of only one assortment, as in 1907. The company's new 1908 assortment consists of a small sample line of Lanterns, not more than a single Lantern of any one number. Every item is referred to as a fast selling number, and Uncle Obediah is relied upon to attract customers.

THE RED JACKET MFG. COMPANY, Davenport, Iowa, has received a diploma for its Pumps, Cylinders and supplies exhibited by H. G. Chamberlin Company, Oklahoma City, at the first annual fair of Oklahoma, October 5 to 16, 1907. The company states that this was the only award given for a display of this line.

QUESTION BOX AT THE COLORADO CONVENTION.

IN our last issue we presented a report of the proceedings of the annual meeting of the Colorado Retail Hardware Association at Denver, with the exception of the Question Box discussion. This was a valuable feature of the convention. Some of the questions, with the substance of the replies, were as follows:

1. What percentage of handling sales should expense be?

Ordinarily it seemed that expense would average 12½ to 16½ per cent. It was asked whether this should be figured on gross sales or on the capital stock invested and the answer was on the gross sales.

2. Will $100 go further in advertising in local newspapers or in sending out circulars or personal letters?

After a lengthy discussion it was decided that this was an open question, depending on local conditions. A good local newspaper deserves support, but the value of the advertising depended a good deal upon its makeup. Mr. Steele stated that his store was so well and favorably known that it was unnecessary for him to advertise in the papers. He made his customers believe that he was a good fellow by passing out good cigars and Jackknives. Mr. Roberts said that he believed in heart to heart talks with those from whom his trade was drawn and in telling in his newspaper advertising the facts relating to his goods, using illustrations wherever possible. He believed in supporting the papers in his town. President Harding believed that locals or reading notices were more effective than a regular advertisement, especially if you had anything particular to say.

3. Have you got nerve enough to ask for interest on an overdue back account?

Some of the members had the necessary nerve, but others confessed that they had not. The general opinion, however, prevailed that it was entirely fair and just to ask for interest on such accounts. Mr. Clatworthy stated that he added interest on over due bills and got it sometimes, but in other cases had to take it off where the customer made a very vigorous kick. Mr. Moys thought that merchants should educate their customers in a farming community who only wanted a settlement once or twice a year so that they should not expect more consideration than other customers who are only given 10 days to settle. If 30 day settlements were insisted upon the farmers could readily get the money at the banks. Mr. Dye said that settlement should certainly be made in 30 days, but he handled the matter in a different fashion. On his bills it was stated that "If paid by the 15th," so much deduction would be allowed. The percent. was not stated but the amount was as much as could be afforded on the line sold. If the account were not paid by the date named it was understood that the customer should pay the full amount of the bill, and if it ran longer than the time stipulated for net he arranged to get a note drawing 10 per cent. interest.

Mr. Coddington explained that his terms were 10 per cent., 30 days, this being printed on the billheads. When due, if unpaid, notes or mortgages for any amount were taken. He had taken one as low as $14, and he said that at the time of coming to the convention his firm had only one bill amounting to $20 on back account, a statement which astonished his brother merchants and evoked applause.

4. As we seem to be drifting to a cash basis should we not encourage this method of doing business?

The opinion was unanimous that the cash basis of conducting business should be encouraged in every way possible.

5. Should we not organize a State insurance company?

The answer was that owing to the heavy expense of starting such a company under the laws of Colorado it was not feasible.

6. Ought time prices on implements be higher than cash prices?

The answer was an emphatic yes. It was suggested that terms should be cash in 30 days, with 5 per cent. discount allowed for prompt payment. After 30 days a note with interest should be required.

7. Why should not the Colorado jobber-retailer give the country merchants some of the profits?

Mr. Roberts stated that there was nothing of this sort in Nebraska, but he thought the solution rested with the merchants themselves, who should take a united stand in opposition. The position should be taken that jobbers are in the jobbing business and not in the retail and that the retailer expects them to protect his interests. Mr. Dye suggested writing the jobber who ships to a retailer's customer asking for a credit memorandum.

MERCHANTS' DAMAGE CLAIMS AGAINST RAILROAD COMPANIES.

IT is a very slow and tedious task to collect a claim against a railroad for a shipment damaged in transit, but no merchant can afford to neglect these losses, which amount to a considerable sum in the course of a year. The general rule of law is that a railroad must deliver a shipment in as good condition as it received the property, and settle with the owner for any loss or damage in transit. Claim agents are fertile in excuses for declining claims, but there are only a few cases where they are legally justified in refusing to pay. Under the common law and the laws of all the States, they are not liable if the loss or damage is caused by an act of God, the public enemy or the act of government. They must pay for everything else.

The legal term "act of God" is somewhat indefinite and covers a remote class of casualties. Fire caused by lightning, an unusual flood which could not be foreseen, an earthquake, and in some cases a wreck caused by a washout or landslide, and other similar manifestations of nature come within this rule, if the railroad could not, by diligence, guard against them and protect the property. The government in this country seldom does anything to cause damage to freight, excepting in the Southern States, which are subject to quarantine regulations. If a box of Hardware were rusted or damaged as a result of fumigation, the owner could not recover because it is an act of the Government. Since the Civil War we have had no "public enemy" in this country in the form of an army, but the courts of many of the States have held that an overwhelming mob is a "public enemy," and that the railroad is not responsible if it was unable, by diligent effort, to protect the property destroyed.

These questions may be of great interest to the lawyers, but they seldom concern the merchant who wants to recover for a lot of broken, damaged or rusted Hardware. The excuses that a railroad may legally offer for refusing a claim are mentioned, merely to show that they can seldom be honestly invoked. The railroad is responsible for all ordinary loss and damage. Rates have been adjusted to cover this liability. Hardware pays higher rates than pig iron, chiefly because of the risk of damage, and the merchant is entitled to the "insurance" which he has paid for. The railroads do not refuse the claims of the mail order houses, and they must be equally fair with the smallest merchant.

The most important thing when a shipment is received in bad order is to insist that the railroad agent shall acknowledge the damage on the freight bill in his own handwriting. This acknowledgment by the railroad in writing is the most important document in the settlement of every claim. If the merchant does not obtain it his claim will be turned down by the claim department of the road. The claim agent may make other excuses, but his real reason for refusing to pay is that the consignee has no legal, "documentary," evidence that the property was damaged. It is important that the railroad agent should state in his notation on the freight bill what articles or parts are broken or damaged, and he has authority to do this. Attention to this little detail is nine-tenths of the battle in collecting a claim.

The agent keeps a record of all shipments that he delivers in bad order, and on most railroads he is required to make a report to the general office or the claim department at the time of delivery. It is a useful and necessary precaution to show him the exact extent of the damage, and impress it clearly on his mind, so he will remember the circumstances when the claim agent inquires of him regarding the shipment. A railroad is like any other corporation. It cannot pay out the money

of its stockholders without having exact, documentary evidence to justify the payment. The clerk in the claim department who receives the papers on a claim and rejects or "vouchers" the amount never saw the shipment, does not actually know that such a shipment was made or that it was damaged, knows nothing about the value of the goods, and cares very little about anything excepting that he must have documents to show for any money that he orders paid. He does not look for evidence to warrant payment, but it does not take him long to find a flaw that justifies refusing the claim. He is deaf, dumb and stupid, and blind to everything except documents, and it is necessary to furnish the documents to get attention. Mail order houses and other large concerns get results on their claims by taking care in presenting them.

When a claim is presented to the agent three documents are usually required:

The freight bill, with agent's notation of damage.

The original invoice to show the value of the goods.

And an accurate description of the nature and amount of the damage.

Some roads also require the bill of lading. The agent should forward these with his own report to the claim department. It is practically useless to present a claim unless the agent will indorse it. A book of some kind should be kept as a record of claims that have been filed, so that during the next six months or a year idle moments can be turned to account by going over the book and writing polite inquiries to know when the claim will have attention. The most important entry to be made in this book is the railroad file number of the claim, which should be mentioned in every letter regarding it.

Where a railroad does not pay just claims within six months it would be well to compare notes with other merchants in the town, and find out if they have had the same experience. In such a case they should have a meeting, get in touch with the members of the Legislature from their district, the members of Congress and the Senators for their State. Action along this line is not expensive and is more likely to bring results than a lawsuit.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

Maple City Mfg. Company, Monmouth, Ill.: Catalogue illustrating Howland Pump and Valve Oilers, Polished Steel, Copperized Steel and Solid Brass Spring Bottom Oilers, Special Pattern Drip Oilers, Torches, Lamps, &c.

Diamond Rubber Company, Akron, Ohio: Catalogue, superceding all previous issues, devoted to Mechanical Rubber Goods, including Belting, Hose, Packing, Respirators, Diaphragms, Plumbers' Supplies, &c.

Stratton Level Company, successor to Stratton Brothers, Greenfield, Mass.: Catalogue F, relating to high grade Spirit Levels. The company also publishes an instructive pamphlet entitled "Valuable Hints," dedicated to the trade and mechanic, which will be forwarded free of charge by the company upon application by merchants.

Federal Steel Fixture Company, Chicago, Ill.: Catalogues and price-lists relating to Steel Lockers and Wardrobes, also to steel factory equipment. The latter line includes Steel Shelving, Boxes, Core Trays, Barrels, Foreman Desks, Shop Benches, Tool Racks, Trucks, &c.

Republic Forging & Vise Company, Cleveland, Ohio, Surpless, Dunn & Co., New York and Chicago, sole agents: Illustrated price-list of Anvils, Solid Box Blacksmiths' Vises, and Machinists', Farmers' and Coachmakers' Vises.

Springfield Wire Screen Company, Springfield, Ill.: Illustrated catalogue devoted to Smillie's High Grade Antimalarial Door and Window Screens.

Milwaukee Tack Company, Milwaukee, Wis.: Illustrated catalogue and price-list descriptive of the company's product, which consists of all forms and sizes of Tacks, Brads and special Nails in steel and brass, including also a large variety of Wire Staples.

Coldwell Lawn Mower Company, Newburgh, N. Y.: Attractive booklet referring to Lawn Mowers, especially Motor Lawn Mowers.

Cincinnati Tool Company, Cincinnati, Ohio: Illustrated catalogue containing price-lists referring to the company's line of Hardgrave Brand Tools, including Hollow Augers, Clamps, Drills, Drivers, Pliers, Wrenches, &c., and Perfection Roller Blotter Baths.

Gifford-Wood Company, Arlington, Mass.: Illustrated catalogue of Ice Handling Machinery, Ice Tools, &c., with revised price-lists for summer of 1908.

H. B. Sherman Mfg. Company, Battle Creek, Mich.: Illustrated catalogue No. 18, referring to Hose Brass Goods, Lubricators, Fittings, Oil Cups, Pump Leathers, &c.

Boston Bolt Company, Boston, Mass.: Illustrated catalogue of Bolts, Nuts, Rivets, Washers, &c., Expansion Bolts, Jack Screws, Turnbuckles, &c.

Norvell-Shapleigh Hardware Company, St. Louis, Mo.: Illustrated catalogue of an extensive line of Bicycles and Bicycle Sundries. The Bicycles are shown in the colors in which they are furnished.

Knapp & Spencer Company, Sioux City, Iowa: Budget of leaves for insertion in the company's loose leaf catalogue.

Ferguson Mfg. Company, Bellevue, Iowa: Mailing card referring to Kegler's Patent Galvanized Steel Chain Pumps.

Edward Darby & Sons Company, Philadelphia, Pa.: Illustrated catalogue No. 42, referring to Bird Cages and budget of other printed matter, referring to Screens, Sieves and Riddles, Cleaning Brushes, Mouse Traps, Pendar Metal Lockers, &c.

H. L. Bennett & Co., Westerville, Ohio: Illustrated mailing card, referring to Stump Pullers, Tile Ditchers, Corn Harvesters, &c.

Duane H. Nash, Inc., Millington, N. J.: Illustrated catalogue referring to the Acme Pulverizing Harrow, Clod Crusher and Leveler, with booklet entitled "A Perfect Seed Bed," containing a series of articles of interest to agriculturalists.

Edwin B. Stimpson Company, 31 Spruce street, New York: Illustrated catalogue of Perforated Metals, with circular referring to Rivets, Washers, &c.

Dover Stamping & Mfg. Company, Cambridge, Mass.: Illustrated catalogue No. 33, referring to Stamped Ware, Japanned and Pieced Tinware, Black and Galvanized Sheet Steel Ware, Kitchen Furnishing Goods and Dover Egg Beaters.

Union Steel Screw Company, Cleveland, Ohio: Illustrated price-list of Wood Screws, Bolts and Rivets.

Montgomery & Co., 105-107 Fulton street, New York: Convenient illustrated handbook of Tools, many of which are quoted at net prices.

Huber Account Register Company, Buffalo, N. Y.: Illustrated circular, referring to the Huber account system for retail merchants.

Samuel Harris & Company, Chicago: Illustrated pocket catalogue containing price-lists of tools and supplies for machinists and manufacturers.

Fanner Mfg. Company, Cleveland, Ohio: Illustrated catalogues, referring respectively to extensive lines of Brass Bedsteads, Stove Trimmings and Hardware specialties.

Robert C. Reeves Company, 187 Water street, New York: 1908 illustrated catalogue of Agricultural and Horticultural Implements, Machinery, Seeds, Fertilizers, &c.

American Stove Board Company, Chicago: Revised price-list of Stove Boards for 1908.

Parcel Post Debate in the House.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., March 17, 1908.

THE closing hours of the debate on the annual post office appropriation bill, which was on the eve of passage when last week's issue of *The Iron Age* went to press, were marked by an unexpectedly animated discussion of the Postmaster-General's rural parcel post project and a stubborn but unsuccessful fight to saddle it as a "rider" upon the pending measure.

It had been assumed that the intimation by Chairman Overstreet of the House Post Office Committee that he would make a point of order against any parcel post amendment, would deter members from offering such provisions after the close of general debate. Two members of the House, however, insisted upon going upon the record, Messrs. Griggs of Georgia, and Sims of Tennessee, both of whom have introduced bills drawn either by the Post Office Department or in accordance with the Postmaster-General's suggestions. These two members therefore collaborated in the framing of an amendment offered by Mr. Griggs, as follows:

Section 1. That beginning July 1, 1908, there shall be a parcel post limited to 11 lb. on every rural route in the United States. Said parcel post shall be confined exclusively to the rural route upon which the parcel originates and its rural-route connections, and shall not extend beyond said route upon which it originates and routes with which said route connects directly, without the intervention of railroad mail service, star route, messenger, or any other form of mail service.

Sec. 2. That the rate of postage on such packages shall be 5 cents for packages weighing not more than 3 lb, 7 cents for packages weighing not more than 5 lb., 10 cents for packages weighing more than 5 and not more than 8 lb., and 15 cents for all packages weighing more than 8 and not more than 11 lb.

Sec. 3. That the provisions of this act shall not apply to matter which is classified by law as first, second and third class, nor affect existing rates of postage thereon; nor shall there be accepted for transportation and delivery, as mail matter, by rural mail carriers, any intoxicating liquors (ardent, vinous, spirituous or malt), habit-forming drugs, explosives, liquids liable to explosion by shock or jar or to spontaneous combustion, or any matter exhaling bad odor, or which from its nature or constituency is liable to contaminate or damage the mails.

Sec. 4. That the compensation of rural carriers be increased to the extent of all receipts for such parcel post service hereby established, on each route, respectively, not to exceed $300 per annum to each carrier, to be paid under such rules and regulations as may be established by the Postmaster-General.

Chairman Overstreet said he would reserve the point of order to enable Mr. Griggs to explain his amendment, which he did at some length, declaring that while other loosely drawn bills had been introduced he had taken special pains with his measure, believing that a law to stand the test ought to be like the pasture fences of Georgia—"pig tight, horse high and bull strong."

A Spirited Debate.

Mr. Sims followed in support of the amendment, precipitating an exceedingly spirited debate, a verbatim report of which will no doubt be of great interest to the readers of *The Iron Age*. It is as follows:

Mr. SIMS: This amendment simply provides for the establishment upon rural delivery routes of a parcel post confined to the rural routes upon which the parcel is mailed, which was recommended as a part of the general recommendation of the Postmaster-General in his last report. I have received numbers of letters from parties opposing the bill. These letters usually come from retail merchants throughout the rural sections where these routes are. This amendment will not injure the retail merchants, but will be of great benefit to them, inasmuch as they will have the exclusive privilege of using the parcel post, and it will be a great benefit to the people who are patrons of these routes.

Mr. HUMPHREYS of Mississippi: What do you mean by "exclusive privilege"?

Mr. SIMS: When I say "exclusive privilege," I mean this: That the great department stores in the cities that are not situated upon these routes cannot use them, and therefore the retail merchants who are situated upon them can only use them, and in that sense it is an exclusive use.

Mr. FITZGERALD of New York: Why does the gentleman wish to discriminate against the department stores in favor of the retail stores on the routes? Why not give all the privilege alike?

Mr. SIMS: My reply is that the opposition is made by retail merchants situated on these "roots," to use Republican pronunciation, when, in fact, this amendment is in their interest.

Mr. MADDEN: Does the gentleman not believe it would be possible for a mail order house doing business outside of a particular route to freight its goods to a town within the route, and then, by means of the route, to have them carried by mail to the people living on the route, and thereby destroy the business of the local merchant?

Mr. SIMS: To ask what is a possibility is one thing; to ask what is practicable or profitable is another thing.

Mr. MADDEN: Does the gentleman believe it would not be practicable?

Mr. SIMS: I do not believe the department stores can profitably take advantage of this legislation.

Mr. MADDEN: Does not the gentleman conceive that a bill like this would do the very thing that he seeks to prevent being done?

Mr. SIMS: Do what?

Mr. MADDEN: To give all the business within the mail route to the large mail order houses in the big cities and take away from the merchants doing a local business all the business that they could otherwise do.

Mr. SIMS: I do not see how it would be possible under this bill.

Mr. OVERSTREET: I move that all debate on the paragraph and amendments thereto close in five minutes.

Mr. Johnson of South Carolina, Mr. Griggs, Mr. Gaines of Tennessee, and others rose.

Mr. OVERSTREET: I made that motion for the purpose of seeing how many gentlemen would rise and how many amendments were in preparation.

Mr. GAINES of Tennessee: I hope the gentleman will not insist on that. This is an important matter, and we want to get as much light as possible.

Mr. OVERSTREET: I move that all debate on the pending amendment close in five minutes.

The motion was agreed to.

Mr. SIMS: In further reply to the gentleman from Illinois [Mr. Madden], I cannot conceive how the great department stores in his city could send their goods down into my district or the district of the gentleman from Georgia in such a way as to deprive the merchants there of the benefits intended to be conferred under this section.

Mr. GAINES of West Virginia: Would the gentleman favor a proposition that would permit the department stores to use the parcel post?

Mr. SIMS: I do not want them to use it upon equal terms with the local merchant, because it would destroy the local merchant. The Postmaster-General has not recommended such law.

Mr. GAINES of West Virginia: Then is not the whole proposition wrong? If it is right to apply to the people of one place, is it not right to apply to the people of another place? As far as I am concerned, I am opposed to this whole parcel post business.

Mr. SIMS: There is a great difference between sending a package on a rural route extending not to exceed 25 miles for 5 cents, and sending a similar package of equal weight from San Francisco to my district for 5 cents. A flat parcel post would discriminate absolutely against the local merchant.

Mr. MADDEN: Does the gentleman concede the right of mail order houses to freight their goods to any town in the United States and then mail them at the post office within that town at the reduced rate to any person living on a rural delivery route?

Mr. SIMS: No, indeed; and I do not conceive that this amendment provides for that or makes it practically possible.

Mr. MADDEN: I beg the gentleman's pardon. I did not ask if this amendment provided for it or not. What I wanted to know was whether the gentleman believed that the mail order merchant could do that under this law.

Mr. SIMS: I do not think so; such is not the intention.

Mr. MADDEN: Is there anything in the law to prevent any citizen of the United States, no matter where he is located, from sending through the mails anything that may be required by any citizen in any rural district?

Mr. SIMS: He can send it but he must pay the rate now prevailing for such a service; he could not get the benefit of the reduced rate under this bill unless mailed originally on the route.

Mr. MADDEN: If he sent it by railroad, by freight, to a town within the route, would he not then have the right to mail it from that town to any point within the route?

Mr. SIMS: Not as I understand it; that would be an evasion; but if he would have such a right we will offer an amendment so as to exclude it. Now another point. In the parcel postal service, as recommended by the Postmaster-General, there is no recommendation for additional compensation for the rural carriers. If the service

is established, the compensation ought to be reasonably and equitably increased. The bill I introduced, and above referred to, provides that they shall have all of the receipts on the route up to and not exceeding $300 per annum, to be paid under such regulations as the Postmaster-General may make. I would be opposed to putting so heavy a burden on the rural carriers, as recommended by the Postmaster-General, with no additional compensation or increase of salary. As it will be experimental, I thought it was best at first not to have a flat increase, but let the compensation rest on the fees received. I thought it better not to make a flat increase of so many hundred dollars a year, but rather provide that the receipts from the service, for the first year or two, be paid the rural carriers until the service was fully established. This will make the service self-sustaining while in its experimental stage. But, if after being tried, it was found to be self-sustaining, we can then give such a fixed increase of the salaries of carriers as may be warranted.

Mr. Overstreet insisted on the point of order, which was sustained.

The bill was then passed and sent to the Senate. The Senate Post Office Committee will give it consideration at once, and under a special order recently adopted, will give hearings, not only upon this measure, but upon the Burnham and Kean parcel post bills heretofore introduced. The Postmaster-General has prepared for an active campaign in the Senate by securing the printing on Senate resolutions of many thousand copies of the parcel post bills "for the use of the Post Office Department," together with a mass of literature on the subject compiled by the Department.

NEW YORK AND NEW JERSEY HARDWARE AND IRON ASSOCIATION.

THE New York and New Jersey Hardware and Iron Association, held its ninth annual banquet on Saturday evening, March 14, at the Hotel Knickerbocker, New York City. There was a large attendance of the members of the association, a number of representatives of manufacturers of vehicle materials being also present. The participants assembled in the reception room and spent some time before the dinner in renewing friendships and comparing notes on business conditions. The company took places at the table in the banquet room at 8 o'clock, and after being seated were photographed.

At the close of the repast, President P. C. Quackenbush, in the capacity of toastmaster, delivered a brief address of welcome, in which he touched upon the unusual prosperity of the larger part of 1907, referring also to the financial stringency marking the close of the year. He alluded to the value of the association in sustaining kindly feelings among the various branches of the Heavy Hardware trade during the latter period, and the maintenance of prices secured thereby. The suggestion was made by Mr. Quackenbush that at future annual meetings an instructive and entertaining feature might be the introduction of a Question Box, with a view to bringing up a discussion of live trade topics. He also counseled the maintenance of prices and cautioned members of the association not to believe all that customers said about competitors cutting prices.

E. R. Merrill of the E. R. Merrill Spring Company, was referred to as the "Dean of the Trade" by the president when he called upon him for remarks. In response Mr. Merrill congratulated the association upon its adherence to the ideas upon which the organization was founded, and complimented it upon the results achieved. M. Eisig, whose enjoyable papers have been a yearly feature of this assemblage, accompanied his regrets with verses appropriate to the occasion, which were read by William E. Kleine.

Instrumental and vocal selections, and a professional entertainer, one of whose points was, "When a man has a birthday he takes a day off, but when a woman has a birthday she takes two or three years off," added to the evening's enjoyment.

Among manufacturing and other interests represented at the banquet were the following: W. S. Comly, Russell, Burdsall & Ward Bolt & Nut Company; E. R. Merrill, John Merrill and W. C. Merrill, E. R. Merrill Spring Company; A. G. Matheasen, Lambertville Spoke Company; Dr. W. H. Pruden, New Jersey Plumbing Company; F. W. Wurster, Jr., F. W. Wurster Company; Charles A. Hauck, Hardware Board of Trade; L. B. Morris, Cambria Steel Company; F. F. Van Olinda, Paterson Tank Company; J. D. Keith, Phœnix Horseshoe Company, and F. E. Thompson of *The Iron Age*.

The officers of the association for the past year have been as follows: P. C. Quackenbush, president; Henry Bodevin, vice-president; George J. Hollereith, treasurer; R. H. Tiebout, secretary.

THE FURNACE BUSINESS AS AN ADJUNCT TO HARDWARE.

OUR readers have doubtless observed in the reports of proceedings of Hardware associations that quite a number of conventions were attended by Harvey J. Fueller, secretary of the Abram Cox Stove Company, Philadelphia, who delivered interesting addresses on features of the Hardware trade. A theme which received special consideration from him was the proper handling of furnace business by Hardware merchants. Mr. Fueller called attention to the fact that in many instances heating by means of warm air furnaces had been discredited either by the installation of furnaces of insufficient capacity or by defective workmanship in piping and other connections. He dealt convincingly on the opportunities offered to Hardware merchants for extending their business in this direction by adopting good methods of installation and avoiding the "evil demon of cheapness." The furnace business is one which is admirably suited to be taken up in connection with a Hardware store, as Hardware merchants in many cases operate tin shops and are thus in a position to handle easily this line of work. They should, however, thoroughly inform themselves as to the principles of warm air heating, and, further, should not hesitate to avail themselves of the opportunities now offered by leading furnace manufacturers, who give attention to the instruction of their customers regarding furnace setting, which will insure for the house owner good results in furnace heating. The company of which Mr. Fueller is an officer furnishes its customers with a manual or handbook which gives definite rules and explicit directions for properly installing a warm air heating and ventilating plant. Those who conduct this branch of their business on intelligent lines, avoiding the temptation to do competitive business on a cheap basis, will unquestionably find it profitable.

National Retail Hardware Convention.

THE complete programme for the convention of the National Retail Hardware Association, to be held at St. Louis March 24-27, inclusive, promises an interesting and profitable series of meetings. Morning and afternoon sessions will be held each day, the evenings being given over to entertainment features, which have been arranged with the co-operation of the local Hardware interests, including theater party, reception and banquet. The opening sessions will have the usual formal and congratulatory features, followed by the reports of officers and committees, which have served during the past year. Most of the meetings will be executive in character, but an open session of much interest will be held on the morning of the second day, when addresses are announced from C. W. Asbury, president of the American Hardware Manufacturers' Association; W. S. Wright, president of the National Hardware Association; E. C. Simmons and S. Norvell of St. Louis jobbing houses, and G. H. Maxwell, Chicago. At another session there will be a discussion by State secretaries, led by Frank A. Bare, Ohio, on the question, "What Assistance Can the National Render to Promote Association Work in Our Affiliated States?" There will also be an address on "The Business Man in Politics," by L. C. Abbott, Marshalltown, Iowa, who is well qualified to discuss the subject.

Lucas Bros., Davenport, Wash., have sold their Hardware business to Denson & Phillips.

THE COMMONWEALTH OF AUSTRALIA AND THE DOMINION OF NEW ZEALAND.

First Article

BY JOHN L. SARDY.

VERY likely many people unfamiliar with Australasia think of Australia as an island in the South Pacific Ocean, instead of which it is a vast Continent, founded by England just when she had lost the American Colonies, and for a wonder acquired without use of the sword, which is more than can be said for other parts of the far-reaching British Empire, its area being approximately that of the United States proper. The people of New Zealand and Tasmania when contemplating a trip to Australia do not say "we are going to Australia," but "we are going to the mainland."

An Interesting Inventory.

Going back about 120 years the total number of Europeans on the Australian Continent was 1000, of whom over half were convicts. Considering its distance from other parts of the world the advancement made is creditable. Forty years after the colony was founded there was a flour famine, to-day there are millions of acres of wheat under cultivation, and that staple forms part of her exports. When the colony was founded there were 6 horses, 7 head of cattle, 29 sheep, 19 goats, 74 pigs and 5 rabbits. To-day the Commonwealth possesses 1,500,000 horses, over 1,000,000 pigs, nearly 8,000,000 cattle, about 66,000,000 sheep and more rabbits than there are stars.

Although Australia is per capita probably the largest importing country in the world, it is essentially an exporting country as well. The total yearly trade amounts to about £200,000,000, of which exports are over £110,000,000. Each State and the Dominion of New Zealand exports more than is imported.

The present Commonwealth of Australia consists of six States: Victoria, New South Wales, Queensland, South Australia, Western Australia and Tasmania. Leaving out the Island of Tasmania, the continent of Australia covers an area of about 3,000,000 square miles, big enough from point of area to be a continent, but not big enough from point of population for the good of the commonwealth.

A Population Problem.

According to the latest Government statistics, the total population of the Commonwealth of Australia with New Zealand added was 4,939,223. Think of this vast stretch of productive land capable of sustaining many millions with not many more inhabitants than Greater New York and less than Greater London.

At a recent meeting of the Royal Society of New South Wales the retiring chairman of the engineering section of that body showed a diagram comparing the density of populations of Australia and her neighbors, which created almost a sensation. Japan, one-eighteenth the area of Australia, has 46,000,000 of people, increasing at the rate of 500,000 per annum. India, half the size of Australia, contains 300,000,000, the yearly increase being 1,000,000. China proper, a little less than one-half larger than Australia, contains 400,000,000 of inhabitants, increasing over 1,000,000 every year. The Island of Java, which is less than one-sixteenth the area of Australia, and lying just off the northern coast, has a population of 30,000,000, the increase being six times greater than Australia's.

Labor Hindrances.

According to the London Board of Trade, the total emigration from the United Kingdom to Australasia shows that prior to 1893 arrivals ranged from 44,055 in 1886 down to 16,183 in 1892, and from that date have never reached 16,000 per annum. The labor cry of "Australia for Australians," and a "White Australia," serves at least one purpose, and that is to retard increase of population, instead of fostering it, as should be done. Increased population means increased activity and increased activity means increased labor, not decreased wages; but the laborites do not see this. It is their idea to enhance the value of labor by making it scarce, instead of making a greater demand for labor by a greater community. Another thing is a lack of co-operation on the part of the various States. Each State has been working its own immigration scheme, independent of the Federal Government, notwithstanding pledges made when federation was in process to act in concert for the good of the Commonwealth. The Prime Minister of the Commonwealth has spoken plainly and to the point on this most important subject, urging the different States to act together and with the Commonwealth for the good of all concerned.

What would we think if each State in the Union were to act independently concerning immigration? Yet that is exactly what the Australian States are doing. Instead of helping each other as a concrete whole, they are rivals, one State trying to outdo the other in the endeavor to secure immigrants.

Jealousy Predominant.

The constitution of the Australian Commonwealth is largely patterned after our own, and will no doubt work out all right when the six States quit being jealous of one another. For instance, Sydney cannot get over the seat of the Federal Government being in Melbourne. When federation was carried out both cities struggled to become the Federal capitol, and a compromise was finally arrived at that some neutral place like our own District of Columbia should be selected, and in the meantime Melbourne should be the temporary capitol. That was seven years ago, and Melbourne has hung on like grim death ever since. Whenever New South Wales selects a neutral spot Victoria objects, and when Victoria picks out a place New South Wales won't have it.

Another instance of lack of co-operation is this: All the States in the Commonwealth are connected by rail except Western Australia. The railroads are owned and operated by the Government, and Western Australia naturally enough wants the lines extended connecting the State, but Queensland, situated on the extreme other side of the continent, contends it would be unfair to ask her to help pay the cost, losing sight of the fact that the desired extension of the line would work out for the benefit of all concerned. Though a commonwealth in name, sectional feeling exists to such an extent that things are done which are not good for the commonwealth of the people.

(To be continued.)

Rhode Island Hardware Association.

THE annual meeting of the Rhode Island Hardware Dealers' Association was held on the 3d inst., at the Narragansett Hotel, Providence. A banquet at 7 p.m. preceded the meeting, which was called to order an hour and a half later. The meeting was well attended, and there was considerable discussion of matters of interest to the members. The officers elected for the ensuing year are as follows: President, Charles W. Aspinwall, Aspinwall Hardware Company, Providence; vice-president, John McGlinchey, Olneyville; secretary, John R. Bemis, Thompson Hardware & Chandelier Company, Providence; treasurer, William B. Ayer, Belcher & Loomis Hardware Company, Providence. The following members of the Executive Committee were chosen in addition to the officers: F. T. Kelley, Barker, Chadsey & Co., Providence; William K. Toole, Pawtucket; Charles E. Dudley, Union Hardware & Electrical Supply Company, Providence.

AT the recent annual meeting of Benedict Mfg. Company, East Syracuse, N. Y., the following officers and directors were elected: Harry L. Benedict, president; George N. Crouse, first vice-president; C. C. Graham, second vice-president; Charles Van Wagner, secretary; John Bailey, assistant secretary; R. B. Rontree, treasurer, and Newton Owen, assistant treasurer. The directors elected were George N. Crouse, Charles Van Wagner and Harry L. Benedict. Reports showed the business of the company to be in a most satisfactory condition. Dividends were declared on both the preferred and common stock, 7 per cent. on the former and 6 per cent. on the latter.

New England Hardware Dealers' Association.

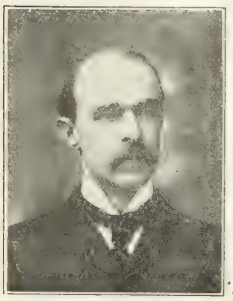
THE New England Hardware Dealers' Association held its annual convention at the Hotel Vendome, Boston, March 11 and 12. There was a large and representative attendance from all over the New England States that are prominently identified with the association, Connecticut being less fully represented because of the existence of its own association. Great interest was shown in the various questions that are affecting the Hardware trade, though there was no lengthy formal discussion of these topics. The ladies' night dinner was the usual success. The year has shown a slight increase in membership and a decided increase in financial strength. The meeting opened Wednesday afternoon with President F. Alexander Chandler in the chair. This session was a short one. Secretary Charles L. Underhill read a number of communications and the president named convention committees, as follows:

NOMINATIONS: J. B. Hunter, Boston; M. A. Chandler, Boston; Franklin K. Brown, Boston.

RESOLUTIONS: George A. Fiel, Waltham; Frank E. Peirson, Pittsfield; Bion C. Pierce, Taunton.

REVISION OF BY-LAWS: S. H. Thompson, Lowell; G. C. Winter, Southbridge; A. Lubbe, Cambridge.

Many of the members then attended a hearing before the Committee on Federal Relations of the Massachusetts Legislature on a resolution endorsing the parcel post legislation as proposed by Postmaster-General Meyer. The committee room at the State House was filled with Hardware merchants, nearly 40 in number, as well as representatives of the Retail Grocers' and Retail Druggists' Association. The speakers in opposition to the resolutions included President Chandler and D. Fletcher Barber of the New England Association, and A. H. Abbe, New Britain, Conn., the latter representing the National Association at the Boston convention.



S. H. THOMPSON.



F. E. PEIRSON.



D. F. BARBER.



H. M. SANDERS.

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At the Thursday morning session the Committee on Resolutions, through its chairman, Mr. Fiel, reported resolutions indorsing the Appalachian and White Mountain forest reserves, and the general plan of inland waterways, which were carried.

Officers Elected.

The report of the Committee on Nominations resulted in the election of the following officers:

PRESIDENT, S. H. Thompson, Lowell, Mass.
FIRST VICE-PRESIDENT, Frank E. Peirson, Pittsfield, Mass.
SECOND VICE-PRESIDENT, D. Fletcher Barber, Boston.
SECRETARY, Charles L. Underhill, Somerville, Mass.
TREASURER, Henry M. Sanders, Boston.
DELEGATES TO NATIONAL CONVENTION: D. Fletcher Barber, Boston; Ernest L. Davis, Boston; Frank E. Peirson, Pittsfield, Mass.
DIRECTORS: Ernest L. Davis, Boston; Bion C. Pierce, Taunton; S. E. Pope, Jeffersonville, Vt.; James De F. Phelps, Windsor Locks, Conn.; H. P. King, Portland, Me.; J. F. Willets, Roxbury, Mass.; W. H. Underwood, Manchester, N. H.; Austin W. Whitcomb, Beverly, Mass.; W. H. Sawyer, Providence, R. I.; Elwood Adams, Worcester, Mass.; Joseph H. Williams, Boston; H. L. Russell, Holyoke, Mass.

The Board of Directors now consists of 17 persons, including the officers, the association having voted to increase the number from 11, as formerly.

A vote of thanks was extended President Chandler for his efficient services during the year.

Report of the Secretary.

Secretary Charles L. Underhill's annual report was as follows in part:

Did you ever think what an influence our association would have if every Hardware merchant in New England took a personal interest in its growth, and responded to the requests of its officers? The National Association with which we are affiliated now numbers over 12,000. The New England Association has less than 200; Connecticut, 75, and western Massachusetts Association about 25 members. In contrast, Illinois and Ohio have over 1000; Indiana, Minnesota and Wisconsin about 800; Nebraska, 500; North and South Dakota about the same; and the other 27 State associations are constantly adding to their lists of members.

To make our association complete and give the greatest good to all we should have on our membership list the name of every Hardware merchant in Maine, New Hampshire, Vermont, Rhode Island and Massachusetts. It actually pays in dollars and cents, and every dealer who is not a member should be ashamed to reap the benefits and refuse to stand his share of the expense and labor.

Association Achievements.

A few of the recent benefits have been:

1. Over 200 manufacturers and jobbers have agreed to confine their sales to legitimate channels, and are doing so.

2. Since October 1 the railroads have forbidden the posting of big advertising placards on freight cars and making billboards of them.

3. Railroad agents are not allowed to deliver catalogues, and in several States are not permitted to solicit business for any firm.

4. Over 5000 Hardware dealers are saving from 30 to 50 per cent. on their fire insurance and all our members have that privilege.

5. In Massachusetts a bill to license dealers in Firearms and subject them to a fee of $50 was defeated in the Legislature, largely through association work.

These and many other benefits have been brought about through the combined efforts of the national and the various State associations, and the membership of every Hardware dealer we secure aids just that much more in accomplishing these results, to say nothing of the friendships formed, business acquaintances extended, the co-operation and organization which broadens the mind, establishes confidence and makes for the prosperity and happiness of all.

Activity of Members.

Your Executive Committee has held several meetings, and your officers many conferences during the year, but the success of every organization depends upon its members. Be an active member, talk Hardware association all you can and aid yourself and your fellow tradesmen, for the larger the number the stronger the organization and the more good it can accomplish.

As I said before, our association now numbers about 200. If that number can be increased to 300 I would suggest that our custom of giving the members a dinner every year be discontinued, and the corresponding secretary be paid a sufficient salary to enable him to look out for the interests of the association and keep in close touch with its members. Many members think the banquet or other entertainment is all there is to it, and too much stress has been laid upon the social side. If all could be induced to hold office in the association for one year those who say, "It is of no benefit to me," would have a very different opinion before serving one month.



F. A. CHANDLER.

With a little personal effort on the part of all our members we can easily add 200 to our list before our next convention.

Treasurer Henry M. Sanders made his report, showing the largest balance in the history of the association.

Question Box.

On Thursday afternoon the Question Box discussion was opened, with A. H. Abbe as chairman, the following questions having been submitted:

1. Is it wise to hold for a large margin on staples?
2. Does the carrying of mutual insurance jeopardize our interests with stock company insurance?
3. Is it time for the formation of a New England Hardware Mutual Fire Insurance Company?
4. Can a business man afford to enter the political field?
5. Are the dead beats and slow pays growing less?
6. What can we afford to do to best train our sales people?
7. Should price regulation be a feature of association work?
8. Should we encourage the manufacturer of patented specialties to establish a uniform retail price?
9. When is a jobber or manufacturer justified in selling outside of regular trade channels?
10. Does good buying depend most upon prices or upon selection and quality?
11. What kind of advertising by manufacturers helps the retail dealer?
12. Are we drifting toward a cash basis?

J. B. Hunter stated that in his experience the dead beat has been growing less numerous. The Hardware merchant has had a good deal of experience with this class of customer and has learned the lesson, until he is more particular in his accommodations, looks up credits more carefully and watches book accounts.

Secretary Underhill, in speaking on the question, Can a Hardwareman afford to enter the political field? stated that in his own experience he has found his political activity a profitable one in his own business, through friendships made and by the bringing of people to his store.

Hardware Mutual Insurance.

W. P. Lewis, Huntington, Pa., secretary of the Hardware Mutual Fire Association of Pennsylvania, and the National Hardware Mutual Fire Insurance Company, read an interesting paper on the subject of mutual fire insurance. In the course of his answers to questions he made announcement that the directors of the Pennsylvania Company had voted to increase its limit of insurance from $3000 to $5000.

After some general discussion of the advisability of establishing a New England Hardware Mutual, it was voted that a committee of three be appointed to make a general investigation of the subject, and report to the association at next year's convention. President Chandler appointed A. H. Abbe, Charles L. Underhill and H. L. Russell.

Other Addresses.

J. A. Welch, Globe Mfg. Company, Taunton, Mass., addressed the meeting, extending the greetings of the American Hardware Manufacturers' Association.

Charles H. Jones of the Commonwealth Shoe & Leather Company, Boston, took the place of Louis D. Brandeis, who was to have made an address on the situation relating to the merger of the Boston & Maine and

the New York, New Haven & Hartford railroads. Mr. Jones followed the same line of argument as that which Mr. Brandeis has been making in his campaign against the merger. As many of those present would be personally affected by the consolidation the address was listened to with unusual intentness. Representative Norman H. White and George L. Barnes, secretary of the Massachusetts Anti-Merger League, spoke along the same lines.

A. H. Abbe, representing the National Retail Hardware Association, as a member of the administrative council, discussed various matters of interest. He also presented a resolution protesting against the passage of a domestic parcel post bill, which was adopted.

Next Meeting at Springfield.

It was decided to hold the 1909 convention at Springfield, Mass., possibly a little later in the year, that advantage may be taken of the spring weather in seeing the country round about the city. The change from Boston establishes a new precedent of visiting the various important centers, instead of confining the convention place to one locality.

The annual banquet was held Thursday evening at the Vendome. It was ladies' night, many of the members being accompanied by their wives. President Chandler was the toastmaster. The speakers were Albert E. Winship of the Massachusetts State Board of Education, who took for his subject the influence of New England colleges on industrial life; Representative Robert Luce, Somerville Mass.; Rev. Charles A. Bidwell, Waverly, Mass.; Hon. Louis A. Frothingham, Boston, and Representative Robert M. Washburn, Worcester,

Hardware Exhibits.

The exhibit of manufacturers' products was not so large as last year on the occasion of the joint conventions of the National and New England associations, but it was none the less interesting. Following is a list of the manufacturers represented:

STANLEY WORKS, New Britain: Wrought Steel Butts and Hinges. W. E. Stevens, G. B. A. Baker.
HART & COOLEY COMPANY, New Britain: Wrought Steel Registers and Lockers.
RUSSELL & ERWIN MFG. COMPANY, New Britain: Builders' Hardware. A. H. Bowman.
GLOBE OPTICAL COMPANY, Boston: Optical Goods. W. E. Munday, R. F. Elie.
A. R. MITCHELL, 24 Beach street, Boston: Ratchet Screwdriver.
CARBORUNDUM COMPANY, Niagara Falls, N. Y.: Abrasive Materials. H. H. Miller, H. W. Tobey.
AMERICAN STEEL & WIRE COMPANY, New York: Fencing. L. A. Dietrich, J. G. Fletcher, C. L. Tite.
STRATTON LEVEL COMPANY, Greenfield, Mass.: Levels. A. L. Richtmyre, F. W. Proctor.
H. H. MAYHEW COMPANY, Shelburne Falls, Mass.: Mechanics' Tools. A. L. Richtmyre, F. W. Proctor.
PIKE MFG. COMPANY, Pike, N. H.: Sharpening Stones. H. E. Smith, H. W. Busler.
F. M. TRAFTON COMPANY, Boston: Metal Polish.
MALLEABLE IRON FITTINGS COMPANY, Bransford, Conn.
E. & G. BROOKE IRON COMPANY, Birdsboro, Pa.
J. W. HOFFMAN COMPANY, Boston: Paints. A. K. Woodward.
F. W. BIRD & SON, East Walpole, Mass.: Paroid and Neponset Waterproof Building Paper. J. C. Donnelly.
SHERWOOD METAL WORKING COMPANY, Syracuse, N. Y.: Adjustable Metal Frame Window Screens. J. E. Sherwood.
PRITCHARD-STRONG COMPANY, Rochester, N. Y.: Prisco Lanterns, Boilers and Dinner Pails. A. J. Breede.
WADSWORTH, HOWLAND & CO., Boston: Paints. A. P. Felton, R. H. Russell.
LEE CHAIR COMPANY, Oneida, N. Y.: Reliance Mop Wringer. M. E. Davis.

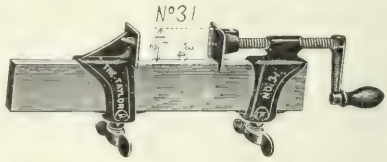
THE general tendency of Wire Rope to untwist when hoisting buckets and other similar loads from deep shafts, such as mines, is well known, and has been the subject of much careful investigation on the part of manufacturers seeking to discover the cause and provide a remedy. This tendency is so pronounced that when being lifted from a great depth the load is sometimes scattered by being spun rapidly around. After considerable research and continued experiment a process of laying the rope together in such a manner that it will not untwist, regardless of the length of rope suspended in a shaft, has been discovered by Olaf Tangring, wire expert of the American Steel & Wire Company. A patent covering this process has just been granted Mr. Tangring by the Patent Office.

Rock Island Hinged Pipe Vise.

The Rock Island Tool Company, Rock Island, Ill., New York office 136 Liberty street, has just put on the market the Rock Island hinged pipe vise and a similar vise of self-locking type. The hinged vise is made in Nos. 110, 111 and 112, the capacities of which are ⅛ to 2½, ¼ to 3½ and ½ to 4½ in. pipe. The body and base are malleable, screw and handle cold rolled steel and jaws of crucible tool steel. The self-locking type is made of the same material, in the same way, with identically the same capacities and prices, but the base has lugs on both sides, so that a strong latch pivoted to the upper part may hang on either side for greater convenience by simply reversing the position of the upper portion.

Taylor Clamp Heads No. 31.

The James L. Taylor Mfg. Company, Bloomfield, N. J., is putting on the market clamp heads, as shown in the accompanying illustration. They are designed for cabinet and light sash and door work, and are also handy for holding a joint after it has been made and the glue squeezed out by a heavier clamp. The castings are of refined malleable iron, and the clamps are constructed to give greatest strength with least weight. It is explained



Taylor Clamp Heads, No. 31.

that there is no tendency to slip, for the head holding set screw and serrated shoe, which is fastened in, is set forward and grips permanently without injuring the bar. A turn of the screw is sufficient to tighten or release the grip, a crank being used as the quickest and easiest method of turning. The clamps are designed for use on 2¼-7⁄8 in. wooden bars, which need only be ripped off with a saw. They require no special preparation, and may be used in any desired length.

The Brown Fireproof All Steel Window Sash.

The Brown Hoisting Machinery Company, Cleveland, Ohio, originally made the all steel window sash shown



Fig. 1.—The Brown Double Hung All Steel Window Sash.

in Figs. 1 and 2 for its own shops, erected about six years ago. The sash has, however, received so much favorable

comment that the company has decided to market it regularly. The sash is made of a small channel frame, on the inside of which are fastened small angles. The angles are set in the frame and are used for holding the glass. Besides this use, they tend very much to stiffen the channel frame. The angles on one side of the glass are riveted to the channel frame, while on the other side



Fig. 2.—The Bowen Pivoted All Steel Window Sash.

they are bolted and screwed to the frame, so that the glass can be easily removed by simply unbolting the angles. In a sash where there is more than one light the angles between the lights are fastened together by means of muntin bars. The company explains that this type of sash is extremely strong, neat and attractive in appearance, and that the metal used, with its proper distribution with respect to center of gravity, makes it a very satisfactory fireproof construction. The company recently made an interesting test of the sash. The lights were ¼-in. Mississippi wire glass. The outside dimensions of the sash were 3 ft. 7¾ in. x 4 ft. 8⅛ in. On account of the conditions some difficulty was experienced in getting the temperature desired, but in the course of about six hours a temperature of over 1200 degrees was

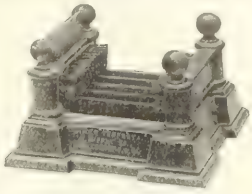


Condition of Sash After Fire Test

obtained. The glass was badly bowed inward and cracked, as shown in Fig. 3, but the sash was not in the least affected. When the above temperature was obtained, the blast was turned off and water was turned on to the glass through a 2½-in hose under full city pressure. This resulted in breaking the glass in some places, but the sash remained unaffected.

Shoe Scraper and Cleaner.

The Stiles Foundry & Supply Company, Parkersburg, W. Va., is putting on the market the device for scraping and cleaning shoes shown in the accompanying illustration. It is made of cast iron and is nicely painted. On either side of the top are two brushes, and on the bottom is a scraper. As the shoe is pushed back and forth



Shoe Scraper and Cleaner.

between the brushes it cleans all sides at once. It also has a scraper between two of the knobs at the top for removing the dirt that collects between the heel and the instep, in this manner cleaning the shoe perfectly on all parts. The weight of the cleaners is 17 lb. each, so that they will stay in position, even if used by heavyweights. The brushes are detachable, and can be replaced very easily when necessary. They may be expected to last, however, for a considerable period.

Ford's Double Quick Auger Bit.

The Ford Auger Bit Company, Holyoke, Mass., placed on the market several months ago an extremely fast cutting bit, which is shown in the accompanying illustration. It has two extension lips and spurs, combined with Ford's patented concave twist, which the company guarantees not to clog when boring any kind of wood, while it cuts easily enough for the hardest oak or ash, and very smoothly. The bit was first made in 10-16th and 11-16th sizes only, for the use of electricians, but it was so successful in filling a demand for such a tool that the company now manufactures all sizes, from 4-16 to 16-16ths. It is remarked that the bit, besides being a great time saver for electrical work, is well adapted to putting in door locks, &c.



Ford's Double Quick Auger Bit

Weldarine.

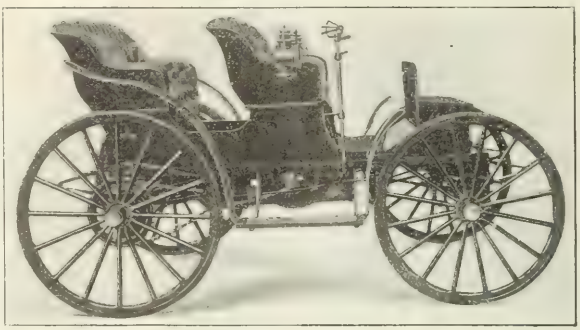
The Weldarine Agency Company, D. S. Morgan Building, Buffalo, N. Y., is offering a preparation under the name of "Weldarine," for welding broken castings. It will not only make a strong joint in brazing cast iron, but will braze cast iron to steel and steel to semisteel. It is claimed that with this preparation every machinist, blacksmith and metal worker can satisfactorily braze cracked automobile cylinders, broken typewriter frames, heavy vises and other large or small castings at a cost of from 50 [illegible] $10.

Arcade Roller Skate Wheels.

The Arcade Mfg. Company, Freeport, Ill., is manufacturing iron roller skate wheels in large quantities, the demand having largely increased with the renewed popularity of roller skating. The wheels are referred to as of the finest quality and made of the best grade of gray iron.

Road King Gasoline Car.

The Model D Road King, manufactured by the Monarch Machine Company, Des Moines, Iowa, and illustrated herewith, is described as a utility car. It is the outgrowth of a demand for a low priced machine for general service and is designed to be operated with a minimum maintenance expense. The tires, being of hard rubber, are not subject to disablement by puncture, and its mechanism throughout is designed for durable service. Motive power is furnished by a two-cylinder, double opposed, four-cycle gasoline engine, of from 16 to 20 hp. The inlet and exhaust valves are inclosed in cages in the cylinder head. The engine is water cooled, the water being circulated by a gear pump with direct drive. Ignition is furnished by a jump spark from dry batteries. A mechanical oiler furnishes lubrication for the engine and hard oil cups are fitted on the countershaft. Both high and low speeds are controlled by a hand lever at the right of the driver and the reverse is operated by a foot lever, as are also the brakes. The car is rated at a speed capacity of 30 miles an hour on high gear. Wheels are 40 x 40 in. in diameter, with a wheel base of 84 in. and thread of 56 in. All wheels are equipped with roller bearings, and four full elliptic springs support the body anr relieve the jolts. The steering gear is controlled by a lever or wheel, as desired. The gasoline tank has a storage capacity of 9 gal. and the car complete weighs 1500 lb.



Road King Gasoline Car, Model D.

Howland Pump Oiler.

The Maple City Mfg. Company, Monmouth, Ill., has added to its line of oilers one of new design, as shown in the accompanying illustrations. This is known as the Howland pump oiler, and differs from oilers of the same character heretofore made by the company in that the pump is located inside the can body, where it is constantly submerged in oil. The advantages claimed for this design are that the pump cannot lose its priming and is protected from dents and injuries incident to rough usage. The can has a detachable spout, the connection being made by a union nut with a leather gasket, which makes a tight fitting joint. The pump plunger, as will be noted in Fig. 2, is located just above the handle in a position for convenient operation. The cans are made of drawn steel, with double seamed and soldered bottoms. For overhead oiling, spouts up to 10 ft. long can be supplied, and it is claimed that oil can be pumped when it is so cold it will not run out of a common can.



Fig. 1.—Howland Pump Oiler, Spout Detached.



Fig. 2.—Pump Oiler in Overhead Operation.

Machinists' Portable Tool Case.

C. E. Jennings & Co., 42 Murray street, New York, has just added to an already large line of tool chests the Machinists' Tool Case, No. 75, here illustrated. Fig. 1 shows it closed, ready to carry, the front pulled down as in a sectional bookcase, and fastened with a Yale pattern chest lock in center of bottom strip. Fig. 2 is a reproduction of the case with lid raised and recessed at right angles over the drawers. The chest is made of chestnut, natural finish, protected at every corner with ornamental brass parts, has a leather slip handle with brass mountings, and is designed not only for convenience in carrying about, but as a handy place for tools, which can easily be kept locked by the owner. The outer dimensions are: length, 19 in.; width, 9 in., and hight, 11⅛ in. All drawers are 17 in. long and 6¾ in. wide, the upper three having a uniform depth of 1 in. and the lower drawer 3⅛ in. clear. At the bottom is a secret compartment 1⅝ in. deep, reached by taking out the lower drawer, designed for the safe keeping of sketches, drawings, blue prints or valuable papers of kindred character. The drawer fronts are recessed and brass trimmed. In original packages the cases are crated in fours. A similar tool case, specifically adapted to the use of auto-ists, to be carried in the car, is about ready for the market.



Fig. 1.—Machinists' Portable Tool Case, Closed.

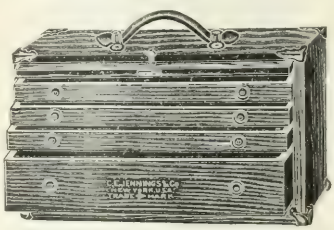
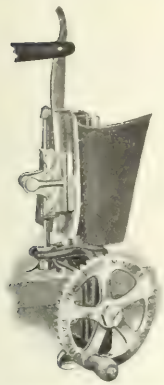


Fig. 2.—Portable Tool Case, Open.

Boeke & Raymer, Lena, Ill., have succeeded Boeke & Altenbern, and will continue the business in Shelf and Heavy Hardware, Stoves, Tinware, &c.

Half-Minute Razor Edger.

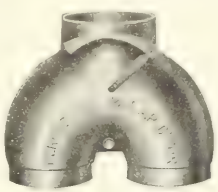
The Half-Minute Edger Company, 329 Broadway, New York, has put on the market the Half-Minute razor edger here illustrated. Its purpose is to strop any kind of a razor, standard or safety, wafer or concaved blade. The blade of whatsoever kind is held rigidly in position by means of a rubber covered clamp 1½ in. high, which has a stout steel spiral spring at back of clamp, which by pressure permits insertion of blade. The cutting edge should project beyond this clamp about ¼ in., and for adjustment to accommodate the many widths of blades there is a travel of about ⅜ in. inward or outward of the vertical spindle 3-16 x 4 in. over all, which is fastened at any desired position by a thumb screw. This need be changed only for varying widths of blade. The two flexible stropping leathers are fastened at one side and free at the other, laterally, 3 in. from top to bottom and biased so that the width of 3⅛-in. tapers to 2 in. The leathers are of the same dimensions, but the bias on one is the opposite of the other, so that in operation there is a diagonal or sweeping motion which imparts to a razor blade a better cutting edge, but which for the novice in free hand stropping is difficult to acquire. The body of the edger is an iron frame, maroon finish, with polished and nickeled working parts, its outer dimensions being 7 in. top to bottom. It can be fastened to table, shelf, &c., up to a thickness of 1⅜ in. The geared flywheel 3 in. in diameter meshes at the bottom with a ⅞-in. diameter gear wheel, which in turn revolves the 5-32 in. vertical spindle, to which one of the stropping leathers is fastened. The other stropping leather, similarly mounted, is turned in the opposite direction by the gear of first spindle, so that both edges of the blade are simultaneously stropped outwardly. The directions given for stropping are to turn the wheel rapidly about 40 times and then slow down to 20 or 30 final strokes to produce an excellent cutting edge. A cog shield at the bottom prevents any contact of razor blade with the spindle gears. The edger is put up singly in a neat dovetailed slide cover wood box 7⅜ x 3¼ x 3⅛ in.



Half-Minute Razor Blade Edger.

Cast Iron Spout Cut-Off.

The new cast iron rain spout cut-off, shown in the following illustration, is a recent production of the Perfection Cut-Off Company, 1503 Glendale avenue, Peoria, Ill. It is claimed for this cut-off that, being cast in one solid piece without joints, it is practically indestructible. The cut-off valve is also of cast metal, made in one piece, and is operated by a malleable cast iron handle firmly secured to it. These cut-offs are made to fit the ordinary sizes of spout, which are easily attached and secured without cutting or fitting. No soldering is necessary, there being two holes at the top and four at the bottom of the cut-off into which small rivets or nails are driven to secure the pipe. In order to determine the effect of freezing when full of water upon this cut-off, tests were conducted through two entire winters, which are said by the company to have resulted in no breaks, although at times the device was solidly filled with ice. These cut-offs are made in two sizes, 3 and 4 in.



Cast Iron Cut-off.

T. D. W. MOORE has become general manager of the Savage Arms Company, Utica, N. Y., succeeding W. J. Green, who continues vice-president of the company. Mr. Moore has long been identified with the Firearms business, starting with Hartley & Graham 27 years ago and having for the past three years been associated in an executive capacity with the Remington Arms Company. Within the past few months the capital stock of the Savage Arms Company has been increased, and arrangements have been made whereby a new automatic Pistol will soon be added to the line of Arms now being made.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₰ gal.
Linseed, State and Western, raw, in bbls	@42
City, Boiled, in bbls	@45
City, Raw, in bbls	@44
Raw, Calcutta, in bbls	@..
Lard, Prime, Winter	@57
Extra No. 1	@57
No. 1	@..
Cotton-seed, Crude, f.o.b. mill	@29
Summer Yellow, Prime	@..
Summer White	@..
Yellow, Winter	@..
Tallow, Prime	@..
Methadet, Brown, Strained	@42
Light, Strained	@42
Northern	@..
Southern	@..
Cocoanut, Ceylon	@..
Cochin	@..
Cod, Domestic, Prime	@44
Newfoundland	@46
Red, Elaine	@42
Saponified	@..
Olive, Yellow	@..
Neatsfoot, Prime	@58
Palm, Lagos	@..

Mineral Oils—

	₰ gal.
Black, 29 gravity, 25@30 cold test	@12½
29 gravity, 15 cold test	@..
Summer	@..
Cylinder, light, red	@..
Dark, filtered	@..
Paraffine, 903.90° sp. gr.	@15
903 sp. gravity	@14
888 sp. gravity	@12½
Red	@14

Miscellaneous—

Barytes:	
White, Foreign	₰ ton $18.50@20.50
Amer. floated	₰ ton 19.00@20.00
Off color	₰ ton 12.50@16.50
Chalk, in bulk	₰ ton 3.00@ 3.40
China Clay, Imported, in bbls	@..
Co balt, Oxide	₰ lb 1.45@ 2.40
Whiting, Commercial	₰ 100 lb .42@ .52
Gilders	₰ lb .60@
Ex. Gilders	₰ 100 lb 60@ .65

Putty, Commercial—

	₰ 100 lb
In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.45
In 1 lb to 5 lb cans	2.50 @2.75
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—

	₰ gal.
In Oil bbls	@..
In machine bbls	@..

Glue—

	₰ lb
Cabinet	12 @15
Common Bone	@..
Extra White	18 @21
Fish, liquid, 50 gal. bbls., per gal.	@..
Foot Stock, White	12 @14
Foot Stock, Brown	@..
German Common Hide	11 @12
German Hide	12 @..
French	13 @17
Irish	@..
Low Grade	10 @12
Medium White	14 @17

Gum Shellac—

	₰ lb
Fine Commercial	@..
Bone Dry	@..
Button	40 @50
Diamond I	@..
Fine Orange	@..
A. C. Garnet	@..
G. A. L.	@..
Kola, Button	@..
Orange, Bone Dry	@40
T. N.	@..
V. S.	@..

Colors in Oil—

	₰ lb
Black, Lampblack	12 @14
Bone, Ground	@16
Blue, Prussian	@36
Blue, Ultramarine	@..
Brown, Vandyke	@14
Green, Chrome	@16
Green, Paris	@24
Sienna, Raw	@15
Sienna, Burnt	@15
Umber, Raw	@14
Umber, Burnt	@14

White Lead, Zinc, &c.—

	₰ lb
Lead, English white, in Oil	@10¾
Lead, American White:	
Less than 500 lbs	@..
500 lbs. and over	@..
Lead, White, in oil, 25 lb tin pails	@..
Lead, White, in oil, 12½ lb tin pails	@..
Lead, White, in oil, 1 to 5 lb	@..
Lead, White, ₰ lb, 500 lbs. and over 2% for cash if paid	@..

Zinc, Dry—

	₰ lb
American, No. 1	@..
No. 2	@..
No. 3	@..
French, No. 1	@..
No. 2	@..
No. 3	@..
Green Seal	@..
Red Seal	@..
White Seal	@..

Dry Colors—

	₰ lb
Black, Carbon	6¼@10
Black, Drop, American	2½@ 8
Blue, Dry, English	5 @15
Black, Ivory	16 @20
Lamp, commercial	1 @ 6
Blue, Celestial	@..
Blue, Chinese	@..
Blue, Prussian	@..
Blue, Ultramarine	@..
Brown, Spanish	@..
Carmine, No. 40	$3.10@3.25
Green, Chrome	@..
Green, Chrome, pure	@25
Indian Red, Pure	@..
Indian Red, Commercial	@..
Ocher, American	₰ ton $8.50@16.00
French	@..
Persian Gulf	@..
Orange Mineral	@..
Ultramarine	@..
Powdered	3 @ 9
Red, Indian	@..
American Burnt and Pow'd.	@ 2
Red, Venetian	@..
Rose Pink	@..
Terra Alba, French	@..
English	@..
American	₰ 100 lb No. 1 @..
American	₰ 100 lb No. 2 @..
Umber, Turkey, Raw and Powdered	@ 3
Turkey, Raw and Powdered, 2%	@ 3
Burnt, American	@ 2
Raw, American	@ 2
Yellow Chrome, Pure	@15
Vermilion, American	@25
Quicksilver, bulk	@..
Quicksilver, flasks	@..
English, Imported	@70
Chinese	@..

Current Hardware Prices

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol "@." Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓%
North's 10%
Zimmerman's. See Fasteners, Blind.

Window Stop—

Iress', Patent 35%
Taplin's Perfection 35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—

Fernald Mfg. Co. Button Anti-Rattlers, ₱ doz. pairs, Nos. 1, $0.75; ... $0.60; 3, $0.50; 4, 50; Fernald Quick Shifter, ₱ doz pairs ..... $2.50@$3.00

Anvils—American—

Eagle Anvils ..... ₱ lb. @8½¢
Hay-Budden, Wrought ..... 9½@9¾¢
Trenton ..... ₱ lb 9½@9¾¢

Imported—

Swedish Solid Steel Sisco, Superior, ₱ lb. ..... 10@10½¢
Peter Wright & Sons, ₱ lb, 24 to 449 lb. 11¢; 450 to 699 lb. 11½¢

Anvil, Vise and Drill—

Millers Falls Co., $45.00 ..... 10&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Lycoming Mfg. Co. 15%

Augers and Bits—

Cam Double Spur ..... 70&10&10%
Jennings Pattern, Bright ..... 50&10&10-7½
Black Lip or Blued ..... 60&10&10
Boring Mach. Augers 70
Car Bits, Irwin Insert ..... 40&10%
Ford Auger and Car Bits 60
Ft. Washington Auger Co., Cutters 35
Forstner Pat Auger Bits 25%
G. F. Jennings, C. 35
No. 10 Nest, Jap. R. Jennings' list, ... 2.85
No. 50, R. Jennings' list 2.85
Russell, Jennings' ..... 50&10&10%
L. Hammacher Car Bits 15
Maydole Countersink Bits 45
Push & Brace 50
Pusher Centers, Patterns 35
Snell's Auger Bits 60
Snell's Ext. Hanger Bits 60
Snell's Irwin Bits 60
Snell's Kirk Auger Bits 50%
Wright's Jennings' Bits 60%

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Clark's Pattern, No. 1, ₱ doz. $26; No. 2, $18 ..... 60&10
Ford's Cutters, Pattern ..... 40&10
G. D. Jennings & Co., Short Pat. 25
Lavigne Duke, small size, $18.00; large size, $26.00 ..... 60&10
Swan 60%

Gimlet Bits—

Per gro.
Common Dble. Cut ..... $3.00@3.25
Germain Pattern Nos. 1 to 16, $4.75; 17 to 13, $5.75
Germain Pattern Nos. 1 to 16, $4.75; 17 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz. ..... $6.50@7.00
Ames ..... 25&10
Cook's 20%

Ship Augers and Bits—

Ship Augers ..... 40&10&10
Ford's ..... 33⅓&10&5
G. D. Jennings & Co.:
L. J. Jennings' 60%
Wright's ..... 33⅓&10&5
Scott 40%

Awl Hafts—*See Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled ..... *gro. $2.75@$3.00*
Unhdld. Shldrd. ..... *gro. 63@66¢*
Unhandled, Patent ..... *gro. 66@79¢*
Pegging Awls:
Unhandled, Patent ..... *gro. 51@54¢*
Unhdld. Shldrd. ..... *gro. 55@70¢*
Scratch Awls:
Handled ..... *gro. $4.50@5.00*
Handled, Socket ..... *gro. $11.50@12.00*

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality ..... *$4.75@5.00*
Second Quality ..... *$4.25@4.50*
Double Bit, base weights:
First Quality ..... *$7.00@7.50*
Second Quality ..... *$6.50@6.75*

Axle Grease—

See *Grease, Axle*

Axles— Iron or Steel

Concord, Loose Collar ..... 4½@5 ¢
Concord, Solid Collar ..... 4¾@5¼¢
No. 1 Common, Loose ..... 3¾@4¼¢
No. 1½ Com., New Style ..... 4½@5 ¢
No. 2 Solid Collar ..... 4½@5 ¢
Half Patent:
Nos. 7, 8, 11 and 12 ..... *65@65&10%*
Nos. 13 to 14 ..... *65@65&10%*
Nos. 15 to 18 ..... *50@50&10%*
Nos. 19 to 22 ..... *50@50&10%*

Boxes, Axle—

Common and Concord, not turned ..... *lb., 6@6½¢*
Common and Concord, turned. ..... *lb., 6@7¢*
Half Patent ..... *lb., 9½@10¢*

Bait— Fishing—

Hendryx:
A Bait 20%
B Bait 25%
Competitor Bait ..... 20&5%

Balances— Sash—

Caldwell new list ..... 50&10@60
Pullman ..... 50&10@60

Spring—

Spring Balances ..... *50&10@60%*
Chatillon's:
Light Spg. Balances ..... 50&5&10%
Straight Balances ..... 40@40&10%
Circular Balances ..... 50&10%
Large Dial 30%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars 4 to 10 lb. per lb., —@2½@2¾¢

Towel

No. 10 Ideal Sanitary Paper ₱ gro $8.50

Beams, Scale—

Scale Beams 40%
Chattillon's No. 1 ..... 30%
Chatillon's No. 2 ..... 40%

Beaters, Carpet—

Holbrook:
No. 12 Wire Coppered ₱ doz. $0.80; Tinned ..... $.85
No. 11 Wire Coppered ₱ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned ₱ doz. $1.55

Beaters, Egg—

Holbrook Cutlery Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $.85; No. 0 Jap'd $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dexter, per gro. No. 60, $6.50; No. 8, $7.50; No. 102, Tin'd, $8.50; No. 150, Hdld., $15; No. 150, Hdld. Tin'd, $17.00; No. 200, Tumbler, Sq. Wire, $25; Panther, Tipped, $9.50; No. 200, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.: T. & S. Dexter $6.50

Bellows—

Blacksmith, Standard List.
Split Leather ..... *6@6½¢*
Grain Leather ..... *5@5¼¢*

Hand—

Inch 6 7 8 9 10
Doz. $2.75 3.00 3.50 4.00 4.50

Molders—

Inch 10 12 14 16 18
Doz. $2.00 2.50 3.00 3.50 4.00

Bells— Cow—

Ordinary Goods ..... *75&5@75&10&5%*
High grade ..... *70@70&5%*
Jersey ..... 75&10%
Texas Star 50%

Door

Home R & F Mfg. Co. ..... 55&10%

Hand—

Bridgeford Brass 70%
Waite Metal ..... 70&10&5-10&10&5%
Nickel Plated ..... 70&5%
Swiss ..... 70&5%
Case's Globe Hand Bells ..... 33⅓&5

Miscellaneous—

Farm Bells ..... *lb., 2¼@2½¢*
Church and School ..... *60@60&5%*

Belting— Leather—

Extra Heavy, Short Lap ..... *60&5%*
Regular Short Lap ..... *60&10&5%*
Standard ..... *70&5%*
Light Standard 75%
Cut Leather Lacing ..... *50&10%*
Leather Lacing Sides, per sq. ft. ..... 2½@2¾¢

Rubber—

Agricultural (Low Grade) ..... 75&10&5%
Common Standard ..... *70@70&10%*
Standard ..... *70@70&5%*
Extra ..... *60&5@60&10%*
High Grade ..... *50&5@50&10%*

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Spokes 50
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden ..... *75@75&5%*
I. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Jumper 50%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined *40%*
Unboxed *50%*

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Kendfel & Esser Co. ..... 33⅓&5

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut threads):
Coach and Saddler *75%*
Larger and heavier *70%*
Phila. Eagle, $3.00 list ..... *80@—%*
Boiler Rivets *70%*
Machine (cut Threads):
Coach and Saddler ..... *75&5%*
Larger and heavier *70%*

Door and Shutter—

Cast Iron Barrel, Japanned.
Round Brass Knob.
Inch 3 4 5 6 8
Per doz ..... $0.85 .95 1.05 1.20 1.50
Cast Iron Spring Foot, Jap'd:
Inch 6 8 10
Per doz $1.20 1.35 2.25
Cast Iron Chain, Flat, Japanned:
Inch 6 8 10
Per doz $1.00 1.40 1.65
Cast Iron Flat Shutter, Jap'd., Brass Knobs.
Inch 6 8 10
Per doz ..... $ .75 .95 1.35
Wrought Barrel Japd. ..... *80@80&10%*
Barrel, Bronzed ..... *60@60%*
Spring ..... *70&10@70&10%*
Shutter ..... *70@70&10&10%*
Square Neck ..... *75@75&10%*
Square ..... *70@70&10%*
Ives' Patent Door 55%
Ives' Wrought Metal 45%

Expansion—

Richards Mfg. Co. ..... 50&10%
Stanwood & Ingalls Mfg. Co.:
Steel, No. 1, Double 55%
Steel, No. 1, Single 55%
Steel, No. 1½ to 10, Double 55%
Steel, No. 1½ to 10, Single 55%
Screw 66⅔%

Plow and Stove—

Plow ..... *65@65&10%*
Stove ..... *80@80&10%*

Tire—

Common Iron *80%*
Norway Iron *80%*
American Screw Company:
Norway Phila., list Oct. 16, '84.. 80%
Eagle Phila., list Oct. 16, '84.. 82½%
Bay State, list Dec. 28, '99..... 80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84.. 80%
Eagle Phila., list Oct. 16, '84.. 82½%
Eclipse, list Dec. 28, '99..... 80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99..... 80%
Norway Phila., list Oct., '84 .. 80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99.... 80%
Phila. Eagle, list Oct. 16, 1884.. 82½%
Ideson Nut Co. 72½%
Tire Bolts 70%

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch	1¼	1½	1¾	2
Per doz	*$7.80*	*5.60*	*6.40*	*8.00*
Inch	2¼	2½		
Per doz	*$8.65*	*11.50*		

Hertel Mfg. Co.: No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each 25%

Boxes, Mitre—

C. E. Jennings & Co. 25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme ..... 15&10%
Perfection 1
Seaver 15%

Braces—

Common Ball, American *$1.50*
Barber's ..... 50&10&10&10&5%
Fray's Genuine Spofford's 60%
Fray's No. 70 to 120, 81 to 123.. 207 to 414 ..... 60%
C. E. Jennings & Co. ..... 50&5%
Mayhew's Ratchet 60%
Mayhew's Quick Action Hay Pat.. 50%
Millers Falls Drill Braces ..... 35&10%
P., S. & W. Co., Peck's Pat 60&10%

Brackets—

Wrought Steel ..... *70&10@75&10%*
Bradley Metal Clasp ..... 80&10@80&10&5%
Griffin & Pressed Steel ..... 75@75&10%
Griffin's Bronze Brackets 70%
Taplin Victor Handy Egg Beater Bracket ..... ₱ doz $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kishacoquillas Mfg. Co. 33⅓ 10%
Wire Goods Co. 75

Buckets, Galvanized—

M'f'gr's list, price per gross.

Water, Red	*$2.35*	*28.00*	*32.00*
Water, Blue	*2.35*	*28.00*	*32.00*
Fire, Rd. Blue	*$2.00*	*$7.65*	*$8.65*
Well	*$7.35*	*41.35*	*45.35*

10&5%

Bull Rings—See *Rings, Bull*

Butts— Brass—

Wrought, High List, Oct. 26, '06. 55%
Cast Brass, Tabor 10

Cast Iron—

Fast Joint, Broad ..... *40&10&50%*
Fast Joint, Narrow ..... *40&10&50%*
Loose Joint ..... *70&10&75%*
Loose Pin ..... *70&10&10&7%*
Maner's Hinges ..... *70&10&5%*
Parliament Butts ..... *70&10&5%*

Wrought Steel—

Light
Light Narrow, Light Broad ..... *70&5%*
Reverse's and Broad *70%*
Loose Joint, Narrow, Light Inside Bead &c *70%*
Back Flaps, Table Chest *65%*
Japanned
Light Narrow, Loose Pin ..... *50&5%*
Light Narrow, Ball Tip *50%*
Broad ..... *40&5%*
Steeple, Tipped *70%*
Ball, Tipped *70%*

Extra 10%

Cages, Bird—

Canaries' Brass: Series 3040, 5400, 1100, net list; 1200, 15" ; 200, 500 ...
Hardware Bronze, Series 700, 800 ...
Nickel Plated ...

Calipers—See Compasses.

Calks, Toe and Heel—

Bright, 1 pound, per lb. ...
Steel, 1 pound, per lb. ...
Light, 1 pound, per lb. ...
Horse Shoe, Steel, per lb. ...
Peters' Brand, per lb. 5.50 ... 4.75

Can Openers—

See Openers, Can.

Caps, Percussion—

Eagle E. B. ... per M $2.25@3.50 ¢
G. D. ... per M $2.25@3.50 ¢
G. L. ... per M $2.00@2.50 ¢
G. E. ... per M $2.00@3.00 ¢
Musket ... per M $2.00@3.00 ¢

Primers—

Berdan Primers, $5 per M ...
Primer Shells and Bullets, 15&10%
All other primers per M $1.25@1.60

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

Blank Cartridges:
32 C. F., $5.00 ... 10&5%
38 C. F., $7.00 ... 10&5%
22 cal. Rim, $1.50 ... 10&5%
32 cal. Rim, $2.25 ... 10&5%
B. B. Caps, Can. Ball, Sweepl $1.00
B. B. Caps, Round Ball ... $1.50
Central Fire ... 25%
Target and Sporting Rifle ... 10&5
Primed Shells and Bullets, 15&10%
Rim Fire, Sporting ... 50%
Rim Fire, Military ... 15&5%

Casters—

Bed ... 60&10%
Pedt ...
Philadelphia ...
Axle, Box ...
Gas ...
Steel Gear ...
Standard Ball Bearing ... 15 ...
Yale Double Wheel, Par list ...

Cattle Leaders—

See Leaders, Cattle.

Chain, Proof Coil—

American Coil, Straight Link.
3/8 in. ... per lb. 7.16 ... 6.16
5/16 in. ... per lb. 7.25 ... 6.25
1/4 in. ... per lb. 7.50 ... 6.50
5/16 in. 3.90 ... 3.90
In cash lots, deduct 25c
German Coil ... 60&10&5%
German Pattern Coil:
3/8 in. List ... 70&5@70&10%
7/16 in. ... 70&5@70&10%
1/2 in. and heavier ... 70&5@70&10%
5/16 and heavier ... 70&5@70&10%

Halter—

Halter Chains ... 60&10&5%
German Pattern Halter Chains, list July 24, 97 ... 60&10&5%
Covert Mfg. Co.
Halter ... 35&5%

Cow Ties—

See Halters and Ties.

Trace, Wagon, &c.—

Traces, Western Standard. Per pr
6/8—2 3. Straight, with ring ...
6/8—2 3. Straight, with tug ...
6/8—2 3. Straight, with ring ...
6/8—2 3. Straight, with tug ...
NOTE—Add 25c per pair for Hooks, Tees or Eyes, add per pair for Nos. 1 and 2, No. 1, 3c; No. 2, 1c; for Straight Link.
Eastern Standard Traces, Wagon Chain, &c. ... 60&10&5%

Miscellaneous—

Jack Chain, list July 10, '98:
Iron ... 60&10%
Brass ... 60%
Safety and Plumbers' Chains ...
Gal. Pump Chain ... lb., 4½@5%
Covert Mfg. Co.
Breast Halter, Hook, Ring, Snap, Bolt ...
Chain Combination ...
Ajax Halter Dog and Key ...
Ajax ...
Niagara Dog Leads and Fasteners ...
Wire Goods Co.:
Dog Chain, ...
Combination Halter and Check ... 50

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain ...
Pin ...
Brass Chain ...
Nickel ...
Sash Chain, Axle, Pulley ...
Adjusting Sash Rod ...
Sash Ribbon ... $1.25@$3.00
Sash Ribbon Attachments, per set, 8 ¢

Chalk

Carpenters' Blue ...
Carpenters' Red ...
Carpenters' White ...

Checks, Door

Brass ...
Brass, per 7 ...
Bronze ...

Chests, Tool—

American Tool Chest Co.:
Blue Chests, with Tools ... 25%
Youths' Chests, with Tools ... 25%
Gentlemen's Chests, w/o Tools ... 25%
Farmers', Carpenters,' etc., Chests, with Tools ... 25%
Mechanics' and Pair Fitters' Chests, Empty ... 25%
Tool Cabinets ... 15 ...
Tool Bags & Cases, Machinists' Tool Chests ...

Chisels—

Socket Framing and Firmer

Standard List ... 50&5 %
Iron Handled:
C. E. Jennings & Co.
Socket Firmer, No. 1 to ... 25&5%
Socket Framing, No. 3 ...
Socket ...
I. & I. J. White Co. ... 40&10%

Tanged—

Tanged Firmers ... 50&5@5 %
Buck Bros. ... 30
C. E. Jennings & Co., Nos. 1 to 18 ... 25
I., & I. J. White Co. ... 25&5 %

Cold— lb.

Cold Chisels, good quality. 13@15 ¢
Cold Chisels, fair quality. 11@12 ¢
Cold Chisels, ordinary ... 9@10 ¢

Chucks—

Almond Drill Chucks ... 35%
Almond Turret Six Tool Chuck ... 40
Beach Eds., each $5 ... 35&5
Empire ... 25%
Fay & Smith's ...
Hall's Drill Chucks ... 35
Lucas Positive Drive ... 25
Morse Drill Chuck ...
Independent, No. 1 ...
Universal, No. 1 ...
Nos. 2 and 3 ...
Nos. 4 and 5 ...
Nos. 6 and 7 ...
Combination, Nos. 1, 2, 3, 4, 5, 6 ...
No. 7 ...
No. 8 ...
Nos. 9 and 10 ...
Nos. 11 and 12 ...
Nos. 13 and 14 ...
Nos. 15 and 16 ...
Nos. 17 and 18 ...
Nos. 19 and 20 ...
Nos. 21 and 22 ...
Nos. 23 and 24 ...
Nos. 25 and 26 ...
Nos. 27 and 28 ...
Nos. 29 and 30 ...
Nos. 31 and 32 ...
Nos. 33 and 34 ...
Nos. 35 and 36 ...
Nos. 37 and 38 ...
Nos. 39 and 40 ...
Nos. 41 and 42 ...
Nos. 43 and 44 ...
Nos. 45 and 46 ...
Nos. 47 and 48 ...
Nos. 49 and 50 ...
Nos. 51 and 52 ...
Nos. 53 and 54 ...
Nos. 55 and 56 ...
Nos. 57 and 58 ...
Nos. 59 and 60 ...
Nos. 61 and 62 ...
Nos. 63 and 64 ...
Nos. 65 and 66 ...
Nos. 67 and 68 ...
Nos. 69 and 70 ...
Nos. 71 and 72 ...
Westcott Patent Chucks:
Lathe Chucks ... 50%
Little Giant Auxiliary Drill ... 50%
Little Giant Double Grip Drill ... 50%
Little Giant Drill, Improved ... 50%
Oneida Drill ... 50%
Star Combination Lathe ... 50%
Worcester Mfg. Co.
National Drill ... 25

Clamps—

Adjustable Hammers' ... 20@20&5%
Carriage Makers', P., S. & W. Co. ...
Bench ...
Bench, Parallel ...
Morse Hay Rack ...
Lumbermans' Swedish Needle ... 65
Hand Wood Working Hammers ... 40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Bowes Company, Ad. Stubble ...
Bowes Champion Stationary ... 40 ...

Sidewalk—

Star Socket, All Steel, $1 doz. $4.05 net
Star Swivel, All Steel, $1 doz. $3.24 net
W. & S. Shovel, All Steel, $1 doz. ...
Pat. Clip ... $3.00 ... $2.25

Cleavers, Butchers'—

Lister Bros. ... 30%
Fayette R. Plumb ... 30%
I. & I. J. White Co. ... 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company
1902 Chicago Horse, each ... $10.75
20th Century Horse, each ... $5.00
Lightning Horse, each $15.00
Chicago Belt Horse, each ... $20.00
Stewart's Enclosed Gear Horse, each ... $8.75
Stewart's Patent Sheep Shearing Machine, each ... $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each ... $9.75

Clips, Axle—

Bessemer Steel, Cold Rolled ...
Solid ...

Cloth and Netting, Wire

See Wire, &c.

Cocks, Brass—

Hardware list:
Jenkins Bros. Globe, Kerosene, Bushing, Engine, Boiler &c. ... 70@—%
Radiator ...

Coffee Mills—

Enterprise ...

Collars, Dog—

Nickel Chain, Water Proof ...
Sen's Instructor ... 40%
Sleeper Wire ...

Compasses, Dividers, &c.

Wing, Screw ...
Firm ...
Hermaphrodite ...

Conductor Pipe,—

L. C. L. to Dealers:

	Galvanized Iron	Charcoal Iron	Copper
Galv. Steel.		1½	16&2 oz
Eastern:			
7			
8			
9			
Western and Southern:			
7			
No. 11 Western			
8			
9			

Extra for long and short lengths. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

I. & G. Mfg. Co.
Gal. ... 2 ... 3 ... 4 ... 6 ... 8
Tinned ...
Galvanized, Lined, side handles, ...
Lined ...
Wire ...
Agate ... 10 ...

Coopers' Tools—

See Tools, Coopers'.

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier. Lighter than 3 lb. to pair ... 24@25c

Cord— Sash—

Braided, Drab ... lb. 55¢
Braided White, Cotton, Nos. 8 to 12, 3c; Nos. 5, 6, 7, 2½c; Nos. 2½@3c. In lots of 12 doz. or more, 1 cent less per pound.
Cable Laid Italian, lb., No. 18 ... 87c
Italian, Nos. 10 to 16 ... lb. 22c
Common India ... lb., 11@11½c
Cotton Sash Cord, Tested ... 15@20c
Patent Russia ... lb. 24c
Cable Laid Russia ... lb. ... 21c
India Hemp, Br'd ... lb. ... 21c
India Hemp, Twisted ... lb. ... 18c
Patent India, Twisted ... lb. ... 17c
Lamp Wick, Nos. 0 to 3 ...
Nos. 2 to 5 ...
Nos. 6 to 8 ...
Nos. 9 to 12 ...
Extra ... 25c doz.
Hamburg Cable Laid Italian, Nos. 7 to 10 ... ¢ lb. 23 c
Pullman's ...
Wire Sash Cord ... 10
Sash Cord Attachments, per doz. 10 ¢
Samson, Nos. 8 to 12:
Braided ... 2 ... Twisted ...
55c ... Italian Hemp ... 44c
50c ... Linen ... Waste ...
Nos. 13c ... Sash Cord ...
Massachusetts ... Braided ...
Massachusetts, Twisted ... 45c
Phoenix, White, Nos. 8 to 12, 27 ¢ :
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢;
B, Drab, 40¢; B, White, 37½¢
Italian Hemp, 40c ... Linen, 57½¢
See also Chain and Ribbon.

Wire, Picture—

Last July 1, 1906 ... 90&5 ...
Brooklyn Standard Wire Lessons ... old list, 85&10% ...
Turner & Stanton Co. Wire ...
Cord ...

Cradles—

Grain ... 40¢@12½ ¢

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but prices made by jobbers.

Crickets—

Zehnder's Lumber. ... ½ gro.
White and Purple, Indelible ... $7.50
Pine Red, Green, Yellow ...
Red Cross, Steel ...
Giant Lumber, 5¾ in. x 15-16 in. ...
Enamel, all colors, Nos. 1 and 2 ...
ibles, $14.00; Blacks ... $10.00
Genuine Soapstone, Metal Workers', 2 in. x 1 in. ... $ ...
2 in. Square $2.25 ... 3 x 1½ x 3-16 ...
$2.50; 5 x 1¼ x 3-16 ... $3.0 ...

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $5.50; ...
Light ...

Crow Bars—See Bars, Crow.

Cultivators—

Victor Garden ...

Cutlery, Table—

Interchangeable ...
No. 12 M'd'm Knives, 1½" ... doz. $3.50
Stag ...
Buck ...
Wm. Rogers ...

Cutters— Glass—

Meat and Food

Giant ... ½ doz. 45¢
Nos. 45&10&15
Universal Beef ...

Slaw and Kraut

Hand ...
Rapid ... ½ doz. ...
Samson, ½ doz., $31 00. ...
Swan's Improved Post Hole Auger ... 40%
Improved ...
Improved Long Handled ... ½ doz., $7.00
Post ...
Split Handle Post Hole ... ½ doz. ...
Hercules Pattern, ½ doz. ... $10.00
Kohler's, ½ doz., Universal, $15.00;
Little Giant, $12.00 ... Hercules, $10.00; Invincible, $9.00; Rival ...
Spoon, Post Hole ... 50
Steel Handled Post Hole ... ½ doz., $24.00 ... 60%

Dividers—See Compasses

Drawing Knives—

See Knives, Drawing

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers ...
Sterling Wheel Dresser Cutters ... 35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines ... $1.50@$1.75
Breast, No. 1 ...
Breast, P., S. & W. ... 33⅓%
Goodell Automatic Drills, 50&10@60&10%
Ratchet, Barnes' ... 40%
Ratchet, Parker's ... 40%
Ratchet, Weston's ... 40%
Ratchet, Weston's, Style H Improved ... 45%
Ratchet No. 012 ... 40%
Ratchet, Goodell's ...
Ratchet, Whitney's, P., S. & W. ... 33⅓%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00 ... 33⅓%

Twist Drills—

Bit Stock ... 70@70&5%
Taper and Straight Shank ...

Drivers, Screw—

Screw Driver Bits, per doz. 45@50¢
Balsey's Screw Holder and Driver, ½ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9 ...
Bench Screw Driver Bits ... 30%
Combination ...
Double End ... 20%
Pray's Hol. H'dle Sets, No. 3, $12 ... 50%
Ford's Brace Screw Drivers ... 40&10%
Gage Double Action Ratchet ...
Goodell's Auto ... 65@65&10%
Mayhew's Black Handle ... 40%
Mayhew's Monarch ... 40%
Millers Falls, Nos. 20 and 21 ... 25&10%
Millers Falls, Nos. 11, 12, 41, 42 ... 15&10%
Smith & Hemenway Co., Nevertire ... Ratchet ... 50%
Swain's ...
Nos. 7565 to 7568, 50¢ ... No. 7740, 40&10%

Eave Trough, Galvanized—

Terne ... Iron ... Charcoal Iron ... Copper
Galv. Steel ... 1½ ... 16&2 oz.
Eastern:
7 ... 60&10 ...
Central:
7 ...
Western and Southern
7 ...
No Western
7 ...
Terne ...
Extra for long and short lengths ... ments generally delivered.

Elbows and Shoes

Elbow ...

Elbow Stove Pipe

Edwards Standard Blue ... 10&10&10%

Emery, Turkish—

Extractors, Lemon Juice

See squeezers, Lemon.

Fasteners, Blind—

Acme Handle ..... 50&10%
Wire ..... 40&10
Hasp's Patent 40

Cord and Weight—

Cord, Flat 33⅓

Corrugated—

Acme Corrugated Fastener 75

Faucets—

Cork Lined ..... *50 & 10 off*
Metallic Key, Leather Lined *50*
Plain ..... *50 & 10 off*
Red Cedar ..... *Add 50 and 10 off*
Petroleum ..... 70&10@75
B. & L. B. Co.:
Metal Key ..... 60&10%
Stop 60
West Lock ..... 55&1
John Sommer's Perfect Tin Key 40
John Sommer's Key Tin Lock 50
John Sommer's Metallic Key, Key ..... 50&10
John Sommer's Modern Metal Key 60
John Sommer's Diamond Lock 40
John Sommer's Tin Key Lock 50
John Sommer's Reliance Cork Lined ..... 50&10
John Sommer's Unique Cork Lined 60
John Sommer's Cork Lined 50
John Sommer's No Brand, Cedar 40
John Sommer's Perfection, Cedar 40
Self Measuring:
Entering, ₱ doz. $36.00 ..... 40&10
Lance's ₱ doz. $36.00 ..... 40&10
National Measuring, ₱ doz. $36.40 ..... 40&10

Felloe Plates—

See Plates, Felloe.

Files— Domestic—

List Nov. 1, 1899.

Best Brands ..... *70&10@75&10%*
Standard Brands ..... *Advance 10%*
Lower Grades ..... *75&10 @ 70&10%*

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 ..... *$5 1 5@40%*

Fixtures, Fire Door—

Allith Underwriters' Approved 50
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 ..... $3.75
Fusible Links, No. 26 ..... 60%
Expansion Bolts, No. 107 ..... 60&10%

Grindstone—

Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.00*	*3.85*	*4.45*	*4.65*

P. S. & W. Co. 60
Read Bros. Hardware Co. 60

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Eze Potato ..... 60&10
Victor, Hay ..... 60&15&2½
Victor, Manure 66⅔
Victor, Header 65
Champion, Hay 66⅔
Champion, Header 65
Hodgson, Manure ..... 60&15&2½
Columbia, Hay ..... 60&20
Columbia, Manure 70
Columbia, Spading ..... 70&10&2½
Hakeway Wood and Barley 40
W. & C. Potato Digger ..... 60&10
Acme Lite 60
Acme Manure, 4 tine ..... 60&10&2½
Dakota Header ..... 60&20
Dakota Steel Header ..... 60&20
Kansas Header 65
W. & C. Wood Barley 40%
Plate ..... See Stamps

Frames— Wood Saw—

White, S'g't Bar, per doz. 75@80¢
Red, S'g't Bar, per doz. $1.00@1.25
Red, Dbl. Brace, per doz. $1.40@1.50

Freezers, Ice Cream—

Qt. *1 2 3 4 6*
Each *$1.25 $1.60 $1.20 $2.20 $3.50*

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp *$2.75*
Cotton *3.20*
Waterproof Sgl. Taped. .. *3.85*
Waterproof Dbl Taped. .. *4.40*
Waterproof Tpl. Taped. .. *5.15*

10@8%

Gates, Molasses and Oil—

Stebbins' Pattern ..... *80@80&5%*

Gauges—

Marking Mortise, &c. ..... *50@50&10%*
Mortise, Marking & Mortise, &c. ..... 50&50&10%
Plough—Marking & Mortise, &c. 67½
Wire, Brown & Sharpe's 25
Wire 25
Wire, P., S. & W. Co. 33⅓

Gimlets— Single Cut—

Numbered assortments, per gro.

Nail, Metal, No. 1, $2.00 .. *2, $2.50*
Stile, Metal No. 1, $4.00 .. *2, $4.50*
Nail, Wood Handled, No. 1, $2.00 .. *2, $2.60*
Spike, Wood Handled No. 1, $4.00 .. *2, $4.60*

Glass, American Window

See Trade Report

Glasses, Level—

Plain Stephens Co. 50

Glue, Liquid Fish—

Bottles or Cans, with Brush ..... *25&10@50%*
Jewell's 40

Grease, Axle—

Common Grade ..... *gro. $6.00@6.50*
Dixon's Everlasting, 1-lb pans ea. 5c in boxes, ₱ doz., 1 lb. $1.25 25
Hemet Hard Oil 25

Griddles, Soapstone—

Pike Mfg. Co ..... 33⅓@33⅓&10%

Grinders—

Royal Mfg. Co.:
Alundum Grinding Machines, each, No. 0, $1.75; 1A, $2.50; 1½, $5.80 ..... 30%
Alundum Sickle Grinders, each, No. 2, $3.50; 2A, $4.50; Combined, $6.50 ..... 30%
Alundum Disc Grinders, each, $2.30 ..... 30%

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch ₱ doz. $2.0 ..... 33⅓
Richards Mfg. Co. Ball and Circle Ball Bearing, mounted 45

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... *60&5@60&10%*
Corbett Mfg. Co.:
Web ..... 30&2
Plain Rope 35
Sisal Rope 21
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am. Coil and Halters ..... 40@40&5%
Am. Cow Ties ..... 45@50%
Niagara Coil and Halters ..... 45@50&5%
Niagara Cow Ties ..... 45&5@50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists' ..... 55&10@55&10&5%
Heller's Farriers' ..... 60&5@60&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel 50
Farriers ..... 40&10&5
Riveting 50
Machinists', revised list ..... 66⅔&5%
Tinners' ..... 50&5
Lawrence & Plumb:
A. E. Nail ..... 40&2½@40&12½%
Eng. and B. S. Hand ..... 50&10@60&5%
Machinists' Hammers ..... 60@60&1
Riveting and Tinners' ..... 40&12½@55%

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢ .. 80&10%
3 lbs. per lb. ..... 50¢
Over 3 lb. per lb. ..... 30¢
Cross Pein, per lb., 30¢ and 40¢

Handles—

Agricultural Tool Handles

Ax ..... *60&10@60&10%*
Hoe, Rake, &c. *40%*
Fork, Shovel, Spade, &c.:
Long Handles *50*
D Handles *40*

Cross-Cut Saw Handles—

Adams' 40
Champion 50%
Hotchkiss 40

Mechanics' Tool Handles—

Auger, assorted ..... *gro. $3.50 $3.50*
Brad Awl ..... *gro. $1.65@$1.75*
Chisel Handles, Ass'd, per gro.: Tanged Firmer, Apple. $2.40@ $2.65; Hickory ..... *$2.15@2.40*
Socket Firming, Apple, $1.75@ $1.95; Hickory ..... *$1.90@$1.75*
Socket Framing, Hickory ..... *$1.50@$1.75*
File, assorted ..... *gro. $1.30@$1.40*
Hammer, Hatchet, &c. ..... *60&10@60&10&5%*
Hand Saw, Varnished, doz. 80¢@85¢; Not Varnished ..... *65¢@75¢*
Plane Handles:
Jack, doz. 30¢; Jack, Bolted 75¢
Fore, doz. 45¢; Fore, Bolted 90¢
Chapin-Stephens Co.:
Carving Tool ..... 30@30&10%
Chisel ..... &10
File and Awl ..... 60@60&10
Saw and Tool 50
Screw Driver ..... 30@30&10%
Miller Falls Automatic Expansion Bit Stock:
No. 1, $2.50; 2, $2.75; 3, $3.00; 4, $3.25; 5, $3.50; 6, $3.75; 7, $4.00; 8, $4.25; 9, $4.50; 10, $4.75; 11, $5.00; 12, $5.25; 13, $5.50; 14, $5.75; 15, $6.00; 16, $6.25; 17, $6.50; 18, $6.75; 19, $7.00; 20, $7.25;

D. & H. Steel ..... 57 2...
Am. Fork & Hoe Co.'s list Pat. holts ..... 6...

Handles—

NOTE—Manufacturers are selling from the list of September 1, 1907, but many prices are shaded on account of quantity, terms or special prices.

Cowes Wrought, No. 1, 2, 3, No. 2 ..... 5...
Star Double Bit ..... 4...
Ft. Madison Cutter Hoe ..... A...
Ft. Madison Crescent Cultivator Hoe, ₱ doz. ..... 5...&10
Ft. Madison Mattock Handles, Regular Worked ..... ₱ doz. $1.5...
Ft. Madison Split Ring Hoe, ₱ doz. ..... $1.0...
Ft. Madison Dixie Tobacco Hoe ..... A...
Kretsinger's Cut Easy ..... A...
Warren Hoe ..... 45A1...
W. & C. Hammer ..... A...
B. B. 6 in., Cultivator Hoe $1.10
B. B. ..... $1...
Adze Eye ..... $1...
W. & C. L'ting Shuffle Hoe, ₱ doz. $5.25

Hoisting Apparatus—

See Machines, Hoisting.

Holders— Bit—

Augusta, ₱ doz. $1.10 ..... 45&10...

Door—

Bardsley's, Iron, 10 in., Brass and Iron ..... 5...
Lincoln ..... 5...
Pullman ..... 5...
Richards Mfg. Co.'s, No. 117, Ever-Ready, 4 in. No. 116, Safe Grip ..... 5...
Superior ..... 33⅓...

File and Tool—

Nicholson Tire Holders and File Handles ..... 33⅓&10...

Fruit Jar—

Triumph Fruit Jar Holder, ₱ gross, $1.50; ₱ doz. $1.25

Trace and Rein—

Fernald Double Trace Hooder, ₱ doz. pairs ..... $...5
Dash Rein Hooder, ₱ doz. pairs $1.25

Hones—Razor—

Pike Mfg. Co., Bergen and Swaty, 3 in., German ..... 3...

Hooks—Cast Iron—

Bird Cage, Reading 40%
Clothes Line, Reading List 40%
Coat and Hat Reading ..... 40&...
Coat and Hat, Wrigglesville ..... 40...
Harness, Reading List 40%

Wire—

Belt 80%
Wire Cloth & Hooks ..... 50&...
Bradley Metal Cloth Wire Cloth and Hat & Coat Hooks ..... 50...
Columbian Hook & Gem ..... 5...
Parker Wire Goods Co., King..70&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 50; Czar, 65; V Brace, 75; Czar Harness, 5 &10 ...
Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $1.50.
Cotton ..... doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—
See Wrought Goods

Miscellaneous—

Hooks, Bench, see Stops, Bench
Bush, Light, doz. $6 to $8 ...Heavy
Grass, best, all sizes, per doz. $...
Grass, Common grades, all sizes, per doz. $1.50
Wardrobe ..... lb. 5...&6¢
Hooks and Eyes:
Brass ..... 6...
Malleable Iron ..... 6...
Cast Adjustable Gate and Screen Hooks ..... 40...
Ft. Madison Coat and Hat ....
Tower & Sons Co., Shoe ..... A...
Bird Cage ..... A...
Coat, Hat ..... A...

Horse Nails—

See Nails, Horse.

Horseshoes—

See Shoes, Horses.

Hose, Rubber—

Garden Hose, ¾ inch:
Complainville ..... ft. 1...¢
Alpha Garden ..... ft. 10¢ 9...
Alpha Guaranteed ..... ft. 1... 12¢
Crown Garden ..... ft. 1...
Lion Grade ..... ft. 9...
Lion Guaranteed ..... ft. 1... 11¢

Irons— Sad

From 4 to 10 ..... lb. 3...¢
R. B. and Hollow ..... lb. 3...¢
Mrs. Potts' irons per set:

	No. 55	60	65
Japd Tops	85	90	95
Tinned Tops	95	00	05

New England Pressing ..... lb. 9...¢

Bar and Corner—

Reliance Mfg. Co. ..... A...
Crescent ..... A...

Pinking—

Pinking Irons ..... doz. 60¢

Irons, Soldering

See Coppers.

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw ..... 30&2...; Steel 45...
Lockport ..... 50...
Lane's Steel ..... A...
Richards Paper Slitter, No. 130 ..... 30...
Smith & Hemenway Co.'s ..... 25...

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Kettles—

Brass, Spun, Plain ..... 20@25%
Enameled and Cast Iron—*See* Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Hunter Bros. Butcher & ...
Wilkinson Shear & Cutlery Co.....60%

Corn—

Columbian Cutter, Co., Wrought Bread Knives and Handles ..... 60...
Wrought Adjustable ..... $...
Dent, $...; Adj. Serrated, $...; Serrated, $2.5...; Tobacco No. 1, $1.50; Tobacco $1.12
Tobacco $1.12

Drawing—

Standard List ..... 6...
C. L. Jennings & Co., No. 4 ..... 4...
Jennings & Griffin, No. 4 ..... 4...
Swain's ..... 4...
Wattous ..... 10...
L. & L. J. White ..... 20&10...

Hay and Straw—

Serrated Lever, per doz. $... ..... 5...
Iwan's Sickle Edge ..... ₱ doz. $...
Iwan's Serrated ..... ₱ doz. $10.00

Miscellaneous—

Farriers' ..... *doz. $3.00@$3.25*
Westerbrook's ..... ₱ doz. $...0@$3.25

Knobs—

Brass, 2½ inch, Birch, or Maple, Rubber Tip ..... gro. $1.35@$1.40
Carriage, Jap., all sizes ..... gro. $...@$...
Door, Mineral ..... doz. 65@70¢
Door, Por. Jap'd ..... doz. 70@75¢
Door, Por. Nickel ..... doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—

See Belting, Leather—

Ladders, Store, &c.—

Adams Mfg. Co., Reliable ..... 5...
Lane's Style ..... 5...
Morse, Williams & Co.'s Lifters ..... 5...
Richards Mfg. Co.:
Improved Noiseless, No. 112 ..... 5...
Improved Sheet, No. 115 ..... 5...
Triumph, No. 119 ..... 5...

Ladles, Melting—

L. & G. Mfg. Co., new list ..... 4...
P. S. & W. ..... 4...
Reading 60%

Lanterns—Tubular—

Regular, No. ..... doz. $...@$...
Side Lift, No. 0 ..... doz. $...@$4.15
Hinge Globe, No. 0 ..... doz. $...@$4.75
Other Styles ..... *prices*

Bull's Eye Police—

8 inch ..... $...

Latches— Thumb—

Roggin's Latches, with screw ..... doz. $...@...

Door—

North Mfg. Co., Reliable ..... 4...
Gator, 50%; Reliable Cold Storage, 50...
Crane & Carrier Mfg. Co., New ..... ₱ doz. $...
Richards' Ball Dog, Heavy, No. 125 ..... 5...
Richards' Trump, No. 127 ..... $1.50

Leaders, Cattle—

Small ..... *doz. 50¢; large, 65¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal ...

Leathers, Pump—

See Pumps—

Lifters, Transom—

R. & L. ..... 10...

Lines—

Wire Clothes, Nos. 18 19 20
100 feet $2.50 2.25 2.00
50 feet $2.00 1.80 1.65
Sash Cord, White Cotton:
Solid Braided Masons' 30%
Silver Lake Braided Chalk, No. $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $...
Mason's Lines, Shade Cord, &c.
White Cotton, No. 3½, $1.50; No. 4, $2...; No. 5, $...; No. 6, $...
$1.75; No. 4, $...; No. 5, $...
Linen, No. 3, $...; No. 4, $...; No. 5, $1...
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50
Clothes Lines, White Cotton: 50 ft., $...; 60 ft., $...; 72 ft., $1.00; 80 ft., $1.25; 90 ft., $1.75; 100 ft., $...
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines ..... 40...
Shade Cord, Linen ..... 1...

Locks— Cabinet—

Cabinet Locks ..... $2...

Door Locks, Latches, &c

NOTE—Net prices generally quoted in Chase goods.
Adams Hardware Co. ....
R. & E. Mfg. Co. ....

Padlocks

R. & E. Mfg. Co., Wrought, Brass ....

Sash, &c.—

Jones Patent ....
Brass and Bronze ....
Covert Mfg. Co. ....
Iron 45&2... Brass Pat. Lamp Lating Sash L... ...

Perkins Patent Ventilator & Lock ....
Reading Sash ....

Machines—Boring—

Com. Ang'l'r, without Augers ..... $2...@$2.2...
Com. Ang'l'r, without Augers ..... $2.2...@2.5...
Swain's Improved ..... 10...
Uniform No. 1 to 4 ....
Swain's Upright Sq. Auger ....

Corking—

Reisinger Patent Cork Puller ..... ₱ doz. $...

Fence—

Williams' Picket ..... each $...

Hoisting—

Moore's Anti Friction Chain Hoist..50...
Morse, Williams & Co.'s Steel Chain Hoist ....

Ice Cutting—

Chandlers ..... 2...

Washing

Boss Washing Machine Co.: Per doz.
Boss No. 1 ..... $57...
Boss Rotary ..... $57...
Champion Rotary Banner No. 1..$57.00
Standard Champion No. 1 ..... $50.00
Standard Peerless ..... $...
Ultimatic Washing Machine ..... $...
Universal American, Round ..... $...

Mallets—

Hickory ..... 45¢@$1.50
Lignumvitæ ..... 40@$1.00
Painters' Hickory and Lignumvitæ wood ..... *doz. 45¢@$1.50*

Mangers, Stable—

Sweet Iron Works ..... 50...

Mats, Door—

Adams ..... 50...
Enterprise Stove Works Co., new list ....

Mattocks—

See Picks and Mattocks.

Milk Cans—*See Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co. ..... 2...@45
Parker's Columbia and Victoria..33⅓...
Parker's Box and Side ..... 5...
Swain's Lever ....

Motors, Water—

Dayton's Red Devil ..... 3...
Lippincott ....

Mowers, Lawn—

NOTE—Net prices generally quoted
Cheapest, 10-in., $2.00; 12-in., $2.10, etc.
Cheap, 10-in., $2.25; 12-in., $2.45, etc.
Better Grade, 10-in., $3.00; 12-in., $3.25, etc.

	12	14	16	18 in.
High Grade	$4.50	4.75	5.00	5.25

Combination ....
Great American ..... 1...
Great American Ball Bear. new list ....
Quaker City ..... 70...
Pennsylvania ....
Pennsylvania Jr. Ball Bear. ..... 5...&...
Pennsylvania Golf ..... 50...
Pennsylvania Horse ..... 35...&5...
Pennsylvania Pony ..... 40&5...
Granite State:
Style A, Low Wheel ....
Style B, Low Wheel ....
Style D, High Wheel, spcl. list..70...
Style M., S., C., K., T. ..70&10&5...
Style A, all Steel ..... 60&10&5...
Drexel and Gold Coin, special list..40...
Horse ....
Pony ....
Page Horse ....
I. X. L. Horse ..... 50...

Nails—

Wire Nails and Brads, Miscellaneous ..... *See Trade Report.*
Cut and Wire.—See Trade Report.
Hungarian, Finishing, Upholsterers' &c. See Tacks.

Horse—

Nos. 6 7 8 9 10
Arcade ....
Champion ....
Globe ....
Lion ....
Warren ....
Lawson, Sterling Brand ....

Pictures—

Per Head... 1.10 1.10 1.10 .. gro

Nippers

See Pliers and Nippers.

Nuts—

Hexagon ....
Hexagon Blank ....
Square ....
Square Blank ....
Hexagon Jam ....
Square Jam ....

Oakum

Lead ..... lb. 6...
Yarn ..... lb. 6¢
Nut ..... lb. 5¢
Pipe Layers' ..... ₱ doz. $...

Oil Tanks

Steel, Copper Bottom ....
Chase or Paragon ....
Brass and Copper ....
Zinc ....
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50...
American Tube & Stamping Co.:
Brass ....
Copper ....
Maple City Mfg. Co.:
Brass ....
Copper ....

Openers Can

Sprague's Iron Handle ..... 50@55¢
Sprague's Wood Handle ....
Sardine Scissors ..... $1.75@$3.00
Yankee ....
₱ doz., net, $0.75; Little Gem ....

Egg

Hartigan Nickel Plate, ₱ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope ..... 20@25¢

Rubber

(Fair quality goods.)

Sheet, C. L. ..... 11@12¢
Sheet, C. O. S. ..... 11@12¢
Sheet, C. B. S. ..... 12@13¢
Sheet, Pure Gum ..... 14@15¢
Sheet, Red ..... 10@12½¢
Jointed ₱ doz. $...&...¢ ..... 25...

Miscellaneous—

American Packing ..... lb. 20@...¢
Cotton Packing ..... lb. 16@25 ¢
Italian Packing ..... lb. 9@12½¢
Jute ..... 8...
Russia Packing ..... lb. 20@...¢

Pails, Water, Well, &c.—

See Buckets.

Pans— Dripping

Standard List ..... 65...
Lowaire, Royal Blue ....

Fry—

Common Lipped:
Nos. 1 2 3 4 5
Per doz. $0.75 $0.90 1.1... 1.3...

Refrigerator, Galva.—

Inch ..... 12 14 ...
Per doz. ..... $1.75 2.25 2.8... $ 3...

Paper—Building Paper

Asbestos: lb.
*Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.*3½@5...¢
Roofing or Building, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft. ..... 6...¢
Mill Board, Sheet, 40 x 40 in., 1/32 to 1/8 in. ....

Per roll

Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll ....
Medium weight, 30 lbs. to roll ....
Heavy weight, 40 lbs. to roll ....
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.0...; 4 ply, $1.2...
Deafening Felt, 9, 6 and 4½ sq. ft. to roll ..... 36...
Red Rope Roofing, 250 sq. ft. per roll $1.75

Tarred Paper—

1 ply (roll 400 sq. ft.), ton ....
Tarred ....
Dry ....
Fibre ....

Sand and Emery—

Sand ....
Garnet Paper and Cloth ..... 25...
Emery ....

Parers— Apple—

Goodell Co.:
...
...
...

Pinking Irons—
See Irons, Pinking.

Pins, Escutcheon—
...50@50&10%
...list Nov. 11, '85. 60@60&10%

Pipe, Cast iron Soil—
...6in. ...60 list
...6in. ...40 "
...5in. ...50 "
...4in. ...55 "
...3in. ...62½ "
...2in. ...85 "

Pipe, Merchant—
Consumers, Carloads.

	Steel		Iron.	
	Blk	Galv.	Blk	Galv.
...	...	...	...	...
...	45	55	50	40
...	50	50	50	40
...	55	60	55	45
...	62½	65	60	50
...	65	65	60	50

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 5
... f.o.b. factory
...50@12½%
...50@12½%

Pipe, Stove—

	Per length	
Edwards' Nested:	C. L.	L. L.
5 in., Standard Blue	$6.25	$7.25
6 in., Stand'd Blue	7.75	9.00
7 in., Stand'd Blue	9.50	11.00
8 in., Russ Blue	7.50	8.50
6 in., Russ Blue	5.50	6.50
7 in., Russ Blue	6.75	8.00
...	Nested	
...	5.00	5.75
... Uniform Color	5.75	6.75
... Uniform Color	7.50	8.65

Planes and Plane Irons—
Wood Planes—
Bench, best quality ... $6.00 & 10
Bench, second quality ... 4.00 & 10
Molding ... 2.50 & 10
Chapin-Stephens Co.:
Bench, First Quality ... 30
Bench, Second Quality ... 25
Molding, all Miscellaneous ... 35
Ohio Tool Co.'s German ... 60%
Union ...

Iron Planes -
Chapin's Iron Planes ... 50&10%
Union ... 60%

Plane Irons—
Wood Bench Plane Irons, list
Ohio Tool Co. ... 25
Buck Bros. ... 30
Chapin-Stephens Co. ... 30
Union ...
L. & I. J. White ... 20&5&25

Planters, Corn, Hand—
Kohler's Eclipse ... ₰ doz. $8.00

Plates—
Tallow ... lb. 4@4¼¢

Pliers and Nippers -
Button Pliers ... 75@75&10&5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe ... 7 10 12-in.
$2.00 $2.25 $2.75 $3.50

Acme Nippers ... 50&5%
Cooper & Hewitt Mfg. Co.:
American Button ... 80
Improved Button ... 75&10%
Clinch ... 60%
No. 50 Lacemaker's ... 50
Stub's Pattern ... 15%
Combination and Others ... 30-5
Heller Patents Nippers, Pliers and Tools ... 4 & 5 & 40 & 5
P. S. & W. Tinners' Cutting Nippers ... 40%
Wm. Schollhorn Co.:
Bernard, 35%; Elm City, 35%; Lisbon ...
Side Cutting, Round and Diagonal Cutting Pliers ... 50%
Pliers, Lever & Tool Co.:
Pliers and Nippers, all kinds ... 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs, Levels ... 30&5
Chapin's Imp. Brass Cor. ... 40@40&10%
Disston ...
Keystone ...
Millers Falls ...
Stanley Rule & Level Co. ... 38%
Starrett ... 20%

Points, Glaziers'—
... lb.
... lb.

Police Goods—
Manufacturers' Lists ... 60@65&5%
Trade ...

Polish—Metal, Etc—
Peerless Liquid, No. 1 (by gal.) ... 30
... doz. ... $2.00 ... $3.00 ... 40
Universal Polishing Paste, 3 oz. tins, ₰ gro. $4.50; 1 lb. tins, ₰ doz. $1.25; 1 lb. tins, ₰ doz. $2.25
Universal Liquid, 8 oz. cans, ₰ doz., $1.25
Brilliantine Frieud Metal Polish, ₰ doz. $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb. cans, ₰ lb. 10¢
Black Eagle, Liquid, ½ pt. cans, ₰ doz. 75¢
Stove Lustre Paste, ¼ lb. cans, ₰ gr. $2.00
Stove Lustre Paste, 5 lb. can, each $3.65
Little Black Beauty Liquid, per doz. ... $6.75
Lustre, 1 lb. tins, ₰ gr. $5.75 ... 10
Lustre Dumbbells ... ₰ lb. 8¢
Lustrine ... ₰ gr. $2.50
Oxine, ₰ gr. $1.50 ... 10
Tripoline ... ₰ gr. $2.00
Zinc Black ... ₰ gr. $3.5
Peerless Iron Enamel, 10 oz. cans, ₰ doz. $1.50

Poppers, Corn—
Opt. Square, flat seam; per $8.75
Opt. Round, one piece; per $11.00
Opt. Square, one piece; per $11.00
Opt. Square, dbl. M. S.; per $14.00

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 8½ ft., 48¢.
Steel Hitching Posts ... each $1.30

Potato Parers—
See Parers, Potato.

Pots, Glue—
Enameled ... 85@10%
Tinned ... 30@10%

Powder—
In Canisters:
Duck, 1 lb. ... each 15¢
Fine Sporting, 1 lb. ... each 75¢
Rifle, 1 lb. ... each 15¢
Rifle, ½ lb. ... each 25¢
In Kegs:
12½ lb. kegs ... $3.50
25 lb. kegs ... $4.50
King's Semi-Smokeless:
Keg, 25 lb. ... $6.50
Half Keg, 12½ lb. tank ... $3.50
Quarter Keg, 6¼ lb. tank ... $1.90
Can, 1 lb. tin cans ... $0.50
Half Case 1 lb. cans (bulk) ... $4.50
Semi-Smokeless Shot Gun Rifle, ₰ lb. cans ... $12.00 $13.00
Half Keg (12½ lb. bulk) ... 6.25 7.75
Quarter Keg (6¼ lb. bulk) ... 3.25 4.00
One-half lb. cans (bulk) ... 11.00 17.00
Half case 12 (½ lb. c. bk.) ... 7.25 8.75

Presses—
Fruit and Jelly—
Enterprise Mfg. Co. ... 20@25%

Seal Presses—
Merrill's No. 1, ₰ doz. $30.00 ... 50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops ... 60%
Miller's Falls, No. 3, ₰ doz., $12.00 ... 60&10%
Merrill's No. 1, Nail Puller, ₰ doz. $2.00 ... 50%
Pearson No. 1, Cyclone Spike Puller, $8.00 ... 50&10%
The Scranton Co. Case Lots:
No. 3B large ... $5.50
No. 3B small ... $5.00
Wm. A. Hennenway Co.: ... 70%
Diamond B. ... 70%
Grant ... 50%
Spike Pullers, Utica and Davis ... 60%

Pulleys, Single Wheel—

Inch	*1½*	*1¾*	*2*	*3*
Awning or Tackle, per doz.	*$0.30*	*.45*	*.60*	*1.05*
Hay Fork, Swivel or Solid Eye, per doz., ½ in., $1.25; 5 in., $1.55				
Inch		*2*	*2¼*	*2½*
Hoist House, doz.	*$0.65*	*.85*	*1.20*	
Inch	*1¼*	*1½*	*1¾*	
Screen, doz.	*$0.16*	*.19*	*.25*	*.30*
Inch	*1½*	*2*	*2¼*	*2½*
Side, doz.	*$0.25*	*.40*	*.55*	*.60*
Inch	*1½*	*1¾*	*2*	*2½*

Sash Pulleys—
Common Frame; Square or Round End, per doz. 1¾ and 2 in. ... 17½¢
Upper Member, no Face Plate, per doz. 1¾ and 2 in. ... 20@21¢
Solid Brass, per doz. ... $0.30
American Pulley Co.:
Wood ... American Pulley
Wood ... Ideal
Wood ... Stanley
Wood ... Hartford
Wood, Nos. 5 and 7, 2 in. ...
Steel Rope Sash Sockets ...
Steel Rope Sash Weights ...
Wood ... Blocks.

Pumps—
... 60%
Pitcher Spout ... 75&5@75&10%
Wood Pump Tubing, &c. ... 50%
Barnes Dbl. Acting (low list) ... 40&55
Bateman's ...
Contractors' Rubber Diaphragm No. 1, B, A, E, ...
Flint & Walling's Fast Mail Hand ... list
Flint & Walling's Fast Mail ... "
... list
Flint & Wading's Tight Top Pitcher ... "
... list
National Specialty Mfg. Co., Measuring ... 50 & 5
Myers Deep Well ... 10%
Myers Force Pumps ... 10%

Pump Leathers—
Plunger and Valve Leathers—Per ...
No. ...
... ...
Cup Leathers—Per ...
Inch ...
... ...

Punches—
Saddlers' or Drive, good ... doz. 50@75¢
Spring, single tube, good quality ... $1.25
Revolving (¼ tubes) ... doz. $3.50
Bemis & Call Co.'s Fast Set Drive 50
Merrill's Nos. 1AA, 1A, 1B, 1C, 1D, $3.00 ... 50
Hercules, 1 die, each $5.00 ... 50%
Niagara Hollow Punches ... 45
Niagara Solid Punches ... 55&10
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35%; Lisbon ...
Tinners' Hollow Punches, & W. Co. 40
Tinners' Solid Punches, & W. Co. ... 40
doz., $1.41 ...

Rail—Barn Door, &c.—
Sliding Door, Painted Iron ... 2½@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb., 50¢ ... 50%
Allith Mfg. Co.: Reliable Hanger Track ... 50%
Cook's:
Double Braced Steel Rail, ₰ ft. 2¼¢
O. N. T. Ranges ... 50&10
Griffith's:
XXX, ₰ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ₰ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged 1 Track, ₰ 100 ft. ... $3.45
O. N. T. ... 50&10
... in., $3.45; 1½ in., $4.00.
Standard, 1¼ in. ... ₰ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ₰ 100 ft., $7.50; 1¼ x 3-16 in., $8.75 ... 55&5&7½%
McKenney's:
Hinged Hanger Track, ₰ ft., 2½¢ ... 6 & 5
1 x 3-16 Track ... 50&5
Myers' Stayon Track ... 6 & 5
Richards' Mfg. Co.:
Common, 1 x 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail ... 60&10%
Lag Screw Rail, No. 65 ... 50%
Gauge Trolley Track, ₰ ft., No. 31, 2½¢; No. 32, 2¾¢ ... 60%
No. 50 ... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn ... $3.25
Fort Madison Blue Head Lawn ... $2.75
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor ... 80&25%
Queen City Lawn, ₰ doz., 20 teeth, $2.85. 24, $3.00 ... list
Attbrey Lawn, ₰ doz. ... $1
Model Steel Garden ... 50&10%
Ideal Steel Garden, ₰ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00 ... 80%
Kohler's:
Lawn Queen, 20-tooth ... ₰ doz. $3.15
Lawn Queen, 24-tooth ... ₰ doz. $3.25
Paragon, 20-tooth ... ₰ doz. $2.70
Paragon, 24-tooth ... ₰ doz. $2.75
Steel Garden, 14-tooth ... ₰ doz. $2.40
Malleable Garden, 14-tooth, ₰ doz. $2.00@2.25

Rasps, Horse—
Disston's ... 75%
Heller Bros.' ... 70&5&70&10&5%
Hyndell Bros. & Co.'s ... 60&10&5%
McCaffrey's American Standard, ... 60&10&5%
New Nicholson ... 70&10@75%
See also Files.

Razors—
Lamb Razors ... 60%
Fox Razors, No. 1, ₰ doz. $30.00; No. 11, $24.00, No. 82 Platina, $25.00 ...
Red Devil ... 65%

Reels, Fishing—
Hendrees:
M. O. G. A. B. R. M. ... M. ... Q. ... A. ... B. ... Ball-bearing ... Pumpkin ... Nickel Plated ... Anti-German Silver ... Brass ... N. ... N. ... RM. ... PN. ... 200 PN. ... PN. ... PN. ...

Saws—

Advertisement:
Circular 45
Band ..... 50&10&10
Rubber Saws .....
Cross Cuts .....
One Man Cross Cut .....
Saw Arbors .....
Hub, Rip and Cut .....
Mill Saws and Clamps .....
Mason, Mill and Drag .....
Wood Saws .....
Compass Saws .....
Tapering Saws and Frames .....
Patented Saw & Stamping Works—
Sterling Kitchen Saws....30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth..50%
Band, 2 to 18 in. wide .....
Hub Saws .....
Cross-cuts .....
Narrow Crosscuts.....50%
Wood Saws .....
Framed Windows .....
Window Backs .....
Window Rods, Plated .....
Hand Saws, Nos. 12, 99, 9, 16, d100..
Dis. 120, 76, 7, 8 .....
Hand Saws Nos. 7, 107, 10, 5, 11, 6, 4, 4&d, 4&p .....
Compass, Key Hole, &c. .....
Butcher Saws and Blades.....
O. E. Jennings & Co.'s:
Back Saws .....
Butcher Saws .....
Compass and Key Hole Saws .....
Frame .....
Frame Window Saws .....
Hand Saws .....
Wood Saw Blades .....
Miters Boxes .....
Dovetail Saws .....15&10
Mar Saw Blades .....15&10
Mason's Concrete Saw Works:
Victor Hack Saws .....50&10&5
Butcher Saws Blades .....25&10
Peace & Richards-on's Hand Saws. 3..
Saws .....
Circular Saws 45%
Crescent Ground Cross Cut Saws..30%
Cross Cut Saws .....
Gang Mill, Mulay and Drag Saws.15%
Hand Saws .....
Back Saws .....
Butcher Saws .....
Hand Saws .....
Hand Saws, Bay State Brand.....15%
Compass, Key Hole, &c. .....25&10&2%
Wood Saws .....
Wheeler & Clemsen Mfg. Co.'s Cut Saws 50

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A..25%
Disston's:
Concave Blades .....
Keystone Blades .....
Hack Saw Frames .....
Simonds File Co. 35%
Saw Blades .....
Hack Saw Frames, Nos. 175, 180.....
.....10&5%
Hack Saws, Nos. 175, 180, complete, ...10&5%
Goodell's Hack Saw Blades.....40&10%
Grimes's Hack Saw Frames .....50&5%
Griffin's Hack Saw Blades.....35&6&10%
Star Hack Saws and Blades 15%
Sterling Hack Saw Blades....30&10&5%
Sterling Hack Saw Frames..30&10&10%
Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Victor Hack Saw Blades.....20%
Victor Hack saw Frames.....40%
Wheeler & Co.:
National Hand Blades.....40%
National Hand Frames.....30&5
National Power Blades.....

Scroll—

Barnes, No. 1, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment $20 .....
Lester complete, $14 .....15&10%
Rogers, complete $3.50 and $4 .....15&10%

Scales—

Fairbanks, Morse & Co.:
Counter:
Hopper, Platform, 2½ feet, 6 by 8 ft. .....
Iron Platform, 12 by 12 ft. $5.50
Iron Platforms, 12 by 16 ft. .....
Iron Platforms, 16 by 16 ft. $36.00
Union Platform, Plain.$1.70@1.90
Union Platform, Slide .....
Chatillon's:
Counter .....
Hopper .....
Counter Top Scales .....
Improved Portables .....
Improved R. R. and Wagon .....

Scrapers—

Bay, 1 Handle .....doz. $2.00@2.25
Bay, 2 Handle .....doz. $2.75@3.00
Shop .....doz. $2.00 Flat $1.00
Chase Scraper Co., Boston .....
Rogers, Mfr. .....

Screws—Bench and Hand

Bench, Iron, doz., 1 in. $2.00@2.25; 1½ in. $3.00@3.25; 1¾ in. $4.00@4.25
Bench, Wood .....
Hand, Wood .....
Hand, Iron .....
Chase Screw Co. .....

Coach, Lag and Hand Rail

Coach, Gimlet Point 45%
Coach, Gimlet Point .....
Hand Rail .....

Jack Screws

Standard Tool Co. .....
Morse .....
Reed Bros. .....

Machine

Carriage, Iron, Japanned, Bright .....
Flat Head and Round Head .....
Fillister Head .....
Patent Thread F. H. & R. H. Iron .....
F. H. & R. H. Brass Nos. 5 to 14 .....65&10%

Set and Cap—

Set (Iron) .....70&10&5%
Set (Steel), net advance over Iron 25%
Set (Steel) Copper .....
Set Hd. Cap .....70&10&5%
Rose Hd. Cap .....70&10&5%
Fillister Hd. Cap.....60&67½%

Wood—

List June 25, 1895.
Flat Head, Iron .....85&95&5%
Round Head, Brass.....80&85%
Flat Head, Brass.....80&85&5%
Round Head, Brass.....80&85&5%
Flat Head, Bronze....75&85&5%
Round Head, Bronze..72½&85&5%
Drive Screws .....85&95&5%

Scroll Saws—

See *Saws, Scroll.*

Scythes— *Per doz.*

Grass, No. 1, Plain.....$7.00@7.50
Grass, Bronzed Webb, No. 2.....
No. 3 Clipper, Pol'd Webb..
No. 6 Clipper and Solid Steel,
Bronze Wood and Brumbelle Nos. 1 to 4 .....
Clover .....
Bronzed Webb, No. 1...$9.25@9.75
Nos. 3 and 4 Clipper, Grain .....
Solid Steel, No. 6....$10.00@10.50

Seeders, Raisin—

Fillerless .....25&30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; No. 2, $18; 3, $12; 4, $9; 5, $6.....50%
Mortise Tool Handles, No. 1, $24; No. 2, $18; No. 3, $12; No. 4, $9; No. 5, $18.....&c.

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ₱ doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 37½%
Cannon's Diamond Point, ₱ gro. $12. .....
Maydwell .....
Maydwell .....₱ gro. $7.50
Snell's Corrugated, Cup Pt.....40&10%
Snell's Knurled Cup Pt. .....
Victor Knurled Cup Pt. ..₱ gr $7.50

Rivet—

Regular list.....75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Tri-umph 40%
Morrill's Nos. 1 .....$35.00
Nos. 3 and 4, Cross Cut.....$20.60
Nos. 5, Mfr. $15.00
Nos. 10, 11, 95 .....$12.00
No. 1 Old Style.....$10.00
Special $16.25
Ottawa Cross Cut .....₱ doz $8
Royal Hand .....₱ doz $4.50
Tamitor Positive .....₱ doz $6.75

Shaving—

Fox Shaving Sets, No 30 .....
₱ doz. net $21.00
Smith & Hemenway Co. .....

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₱ doz.....$1.50
Mounted Kitchen Sand Stone, ₱ doz .....
Natural Grit Carving Knife Hone ₱ doz .....$.90
Quick Cut Emery Carving Knife Hones ₱ doz $1.20
Quick Edge Pocket Knife Hones, ₱ doz.....$2.50

Skate—

Smith & Hemenway Co., Eureka..50%

Shaves, Spoke—

Iron .....doz. $1.27
Wood .....
Barnes .....
Barnes's .....
Disston's R & L C .....
Disston's .....
Victor .....₱ doz $4.00.....15&10%

Shears—

Cast Iron..	7	8	9 in.
Best	$16.00	18.00	$2.00 gro.
Good	12.00	15.00	17.00 gro.
Cheap	8.00	6.00	7.00 gro.

Straight Trimmers, &c.
Best cast iron .....gro. $18.00
Best quality .....
Japanned .....
Tinners' .....
Tinners' .....
Tinners' 10%

Tinners' Snips—

Snell's Bunches .....
Snell's Bunches .....

Forged Handles, Steel Blades, Berlin .....
Hollow Ground .....
Jennings & Griffin Mfg. Co.'s 6½ to 12 in. .....
Nicholson .....
Peck, Stow & Wilcox .....
W. R. W. Forged Handles .....
J. Wiss & Sons Co.:
Wiss Handles .....

Pruning Shears—

Cronk's Hand Shears.....33½%
Cronk's Wood Handle Shears.....33½%
Disston's Combined Pruning Hook and Saw, ₱ doz. $48.00
Disston's Pruning Hook only, ₱ doz. $20.00
John T. Henry Mfg. Co.:
Pruning Shears, all grades.....40%
Nos. 5 & 6 .....
Columbian Cutlery Co.:
Hedge, Wire, Br. .....25&10%
Lawn and Border, Wilcut Brand. .....60&10%

Sheaves—Sliding Door—

Reading 40%
R. & E. list 15%

Sliding Shutter—

Reading list 40%
R. & E. list 10%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge.....65&10%
Club, Rival, 65&5%; First Quality, ...60&5
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge. .....50&5
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader (grass) .....25&5
Union League, 10 and 12 gauge, Rival Grade.....25%
New Camp, Improved, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge.....40&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%

Shells, Loaded—

Loaded with Black Powder..40
Loaded with Smokeless Powder, medium grade 40
Loaded with Smokeless Powder, high grade Co.....40&10&10%
Union Metallic Cartridge Co.:
New Club Black Powders .....
Nitro Club, Smokeless Powders.40&5%
Arrow, Smokeless Powders.40&10&10%
Winchester:
Smokeless Repeater Grade.....40&5%
Smokeless Leader Grade...40&10&10%
Black Powder.....40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted	Galv.
14 x 20	$4.50	$6.00
10 x 14	3.25	4.75
7 x 10	1.75	2.50

Wheeling Corrugating Co.:

Dixie, 14 x 20	$4.50	$5.50
Dixie, 10 x 14 in.	3.50	6.00
Dixie, 7 x 10 in.	1.50	2.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron .....per keg $4 10
Steel .....per keg $3.85
Burden's, all sizes.....₱ keg $3.90

Shot—

25 lb. bag
Drop, up to B $1.85
Drop, B and larger .....
Buck .....
Chilled 2.10
Dust .....

Shovels and Spades—

Association List, Nov. 15, 1902..40%
Avery Stamping Co. 40%

Snow Shovels—

Long Handle.....$3.25@$3.50
Wood and Malt. D. Handle .....$3.25@$3.

Sieves and Sifters—

Hunter's Imitation .....
.....gro. $4.50@10.00
Hunter's Genuine .....
.....per gro. $12.00@12.50

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme .....

Sieves, Seamless Metallic

—Per dozen.—

Mesh	4	8
Iron Wire	$1.05	1.05
Tinned Wire	$1.05	1.10

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested....doz. $0.90@0.95
Mesh 20, Nested.....doz. $1.00@1.05
Mesh 30 .....

Sinks, Cast Iron—

Skeins, Wagon—

Slates, School—

Factory Shipments.
"D" Slates .....doz. $.10
Eureka Cover ed Slates .....
.....per box
Victor A. Nonacoss Slates .....

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German .....
Covert Mfg. Co.:
Roller, 30&2% .....
High Grade, 40%; Trojan.....40%
Jaxon .....

Snaths—

Scythe .....

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated
Good Quality .....doz. $9.00
Cheap .....60@60&10%
International Silver Co.:
1847 Rogers Bros., 1881 Rogers & Bro., Wm. Rogers & Son, Eagle Brand.....50&10%
Meriden Britannia Co.:
Wm. Rogers & Son .....60&10

Miscellaneous

German Silver.....60@60&5%

Tinned Iron—

Tops .....per box, $1.10
Tubes .....per box, Special $1.00

Springs— Door—

Bardsley's Spring and Check.....40%
Corbin .....
Cotton Reel .....
Pullman 35%
Reliance (Coil).....40&10%
Star (Coil).....30%
Torrey's Rod, 39 in. .....₱ doz. $1.10

Carriage, Wagon, &c.—

Bar and Welder .....per lb.
Blister .....$4.75&5.00
Half Bright.....$4.75@5.00
Bright .....
Painted Seat Springs:
Full Elliptic .....per pr. 40@
Half .....per pr. 75@
Side .....

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; Na-
Enterprise .....
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $20.....30%

Squares—

Nickel plated.. } List Jan. 5, 1900.
Steel and Iron. }
Rose and Hdl. Try Squares and T-Bevels .....60&10&10%
Iron Hdl. Try Squares and T-Bevels .....60&10&10%
Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Sq. and Bevel 15%

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap .....doz. $1.00
Good Grade.....doz. $1.25
Tinned Iron .....doz. $0.75@1.25
Iron, Porcelain Lined...doz. $1.75

Staples—

Barbed Wire .....
Insulators .....
Fence Staples, Plain, $2.15; Galvanized $2.45
Poultry Netting Staples .....
.....per lb. $1.40@

Steels, Butchers'—

Dicks .....
Foster Bros .....

Steelyards— ....80@80&10%

Stocks and Dies—

Blacksmiths .....
Cutting Box .....
Drills, Twist .....
Green Reel .....
Lever .....
Little Giant 25%
Reed's New Screw Plates.....25%

Stoners, Cherry—

Iron .....

Stones—Oil, &c.

Arkansas .....
Arkansas St. No. 1, 5 in. .....
Washita St., Extra, 4 to 8 in. .....50¢
India Oil Stones (entire list).....33⅓%
Quirkcut Emery and Corundum Oil Stone, Double Grit.....40%
Quirkcut Emery and Corundum Axe St. .....
Oil .....
Hone .....
Hone .....
Turkey Oil Stones, Extra, 5 to 10 in. .....
Oil .....
Oil .....
Oil .....
Scythe .....

Scythe Stones—

Pine Mfg. Co., 1901 list:
Black Diamond S. S. @ gro. $12.00
Lamoille S. S. ..... @ gro. $11.00
White Mountain S. S. @ gro. $9.00
Green Mountain S. S. @ gro. $6.00
Extra Indian Pond S. S @ gro. $7.50
No. 1 Indian Pond S. S @ gro. $7.00
No. 2 Indian Pond S. S @ gro. $4.50
Leader Red End S. S @ gro. $1.50
Quick Cut Emery....@ gro. $10.00
Pure Corundum..... @ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%.
Electro (Artificial), @ gro., $12.00 ..... 33⅓%
Lightning (Artificial), @ gro., $18.00 ..... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.....@ gro. $9.00

Stops— Bench—

Millers Falls.....15&10
Morrill's, @ doz., No. 1, $10.00.....50%
Morrill's, No. 2 .....50%

Door—

Chapin-Stephens Co.....50&5&5

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Acme Enhanced, case lots. 20&10&10
Carr's Universal, case lots....20&10&10

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@50&10%
Socket ..... *doz., $1.00*
Excelsior Stretcher and Tack Hammer Combined, @ doz. $8.00.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1, 1902 ..... 30&5%
P., S. & W. Co.....40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: @ doz.
Superba, Crotch Mahogany.... $36.00
Triumph, Fancy Veneers..... $33.00
Parlor Queen, Fig. Rosewood..$30.00
Baby Hungarian As Above..... $20.00
Am. Queen, Fig. Mahogany....$27.00
Ideal, Bird's-Eye Maple..... $25.00
Grand Rapids, Nickel, $24.00; Japan $22.00
Standard, Nickel, $22.00; Japan $20.00
Crown Jewel, Nickel, $21.00; Jap.$19.00
Crystal, Glass Top..... $36.00
Grand, Fig. Mah., wide..... $60.00
Club, 24 in. wide..... $54.00
Hall, 28 in. wide..... $60.00

NOTE.—Rebates: 50¢ per dozen on three dozen lots; $1 per dozen on five dozen lots; $2 per dozen on hundred lots; $2.50 per dozen on twenty-five dozen lots

Tacks, Finishing Nails, &c.

American Carpet Tacks.....90&10%
American Cut Tacks.....90&10
Swedes' Cut Tacks.....90&10%
Swedes' Upholsterers.....90&5%
Gimp Tacks.....90&5%
Lace Tacks.....90&5%
Privates' Tacks.....90&10
Looking Glass Tacks.....65
Bill Posters' and Railroad Tacks.....90&5&10
Hungarian Nails.....80&20%
Finishing Nails.....70%
Trunk and Chest Nails.....80&10

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks
90&5 tens 90
See also Nails, Wire

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather.....25%10%&5%
Steel ..... $3 1 &&5%
Chesterman's .....25%@25&5%
Keuffel & Esser Co.:
Flexible Asses' Skin.....40&10@50%
Favorite, Duck and Leather.....25&5%&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Sullivan's
Asses' Skin.....40&10@50%
Metallic ..... 3 &30&5%
Patent Bend, Leather....25&5@25&10%
Pocket ..... 40@40&5%
Steel ..... 33⅓@35%
Tiebusch & Hilger:
Chesterman's Metallic, No. 34L, 25%
Chesterman's Steel, No. 1938L, 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, 6¾-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c. ..... *30@&3 1 %*

Ties, Bale—Steel Wire—

Single Loop.....80&10&5
Monitor, Cross Head, &c. 70&2½

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Haying—

Myers' Hay Tools 45%

Miniature—

Smith & Hemenway Co.'s, Davidson, @ doz., Nickel Plated $1.50; Gold Plated.....$2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simonds' Improved.....35%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.50@$1.25; gro. ....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida.....75&10%
Newhouse ..... 45@45&5%
Hawley & Norton..... 65%
Victor ..... 30@35&10
Oneida Community Jump..... 50%
Bull ..... 75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85¢@90¢
Marty French Rat and Mouse Traps (Genuine): } *Dis. 15%*
No. 1, Rat, @ doz., $13.25..$11.50 doz.
No. 3, Rat, @ doz., $6.50... $5.75 doz.
No. 4, Rat, @ doz., $5.25.. $4.50 doz.
No. 1, Mouse @ doz., $5.85 $5.00 doz.
No. 5, Mouse @ doz., $3.00 $2.25 doz.
Oneida Community:
Out of Sight, Mouse, @ doz. ...$6.00
Out of Sight, Rat, @ doz. 1.25
Easy Set, Mouse, @ doz. 75
Easy Set, Rat, @ doz. 1.00
Wood Chicken Rat, @ doz. holes. .12
Premier Tin Clicker, 5 holes, @ doz. traps..... 75

Trowels—

Disston Brick and Pointing..... 25%
Disston Plastering..... 20%
Disston "Standard Brand" and Garden Trowels..... 30%
Kohler's Steel Garden Trowels, @ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels.. @ gro. $6.00
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern.....50&10%
Western Pattern..... 60&10%
Handy Trucks..... @ doz. $18.00
Grocery ..... @ doz. $15.00
McKinney Trucks.....each, net $10.00
Model Store Trucks..... @ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.
No. 0 1 2 3
Galvanized 867 879 889 899 90&5%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls 2.6¢@3¢
No. 12, ¼ and ½-lb. Balls 2.1¢@2.6¢
No. 18, ¼ and ½-lb. Balls 1.8¢@2¢
No. 24, ¼ and ½-lb. Balls 1.5¢@1.8¢
No. 36, ¼ and ½-lb. Balls 1.7¢@1.9¢
Chalk Line, Cotton ..... 17¢@19¢
Balls ..... *26@31¢*
Cotton Mops, 6, 9, 12 and 15 lb. to doz. ..... *11¢@19¢*
Cotton Wrapping Balls 10 lb. according to quality....15¢@25¢
American 2-Ply Hemp, ¼ and ½-lb. Balls. ..... *14½@15½¢*
American 3-Ply Hemp, 1 lb. Balls ..... *15½@16½¢*
Indian 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) .10½@11½¢
India 3-Ply Hemp, 1-lb. Balls ..... *10½@11½¢*
India 3-Ply Hemp, 1½-lb. Balls ..... *10@11¢*
2, 3, ¼ and 5-Ply Jute Balls ..... *13½@14½¢*
Manila Line, Linen, ½-lb. Bls. 47¢
No. 2½ Mattress, ¼ and ½-lb. Balls, according to quality ..... *30@60¢*
Wool, 3 to 6 ply....B 9¢; A 10¢

Vises—

Solid Box.....50@50&10%

Parallel—

Athol Machine Co:
Simpson's Adjustable.....40%
Standard 40%
Amateur 25%
Columbian Hdw. Co. 40%
Fisher & Norris Double Screw, net, each, Nos. 2 $13.50, 3, $16.00; 4, $20.50, 5, $27.00.
Fulton Mach. & Vise Co.:
Reed, Swivel 25%
Star, Solid Jaw..... 40%
Hollands:
Machinists' ..... 10&10&5%
Rustproof ..... 65&5&10%
Lewis Tool Co.:
Adjustable Jaw..... 30%
Monarch, 50 : Solid Jaw..... 50%
Massey Vise Co.:
Clincher 40%
Perfect, 15%; Lightning Grip.....15%
Merrill 50%
Millers Falls Oval Slide Pattern 60&10%
Parker's:
Victor, 20@25%; Regulars.....20@25%
Vulcan's ..... 4@45
Combination Pipe..... 55&60
Prentiss..... 20@25
Rock Island 55%
Schraubker's 33⅓%
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, @ doz., $24.00, 30%; Clamps..... 30%
Perfection Saw Clamps, @ doz....$4.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed 25%
Star 40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect.....15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.80; 11 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe..... 40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870 ..... 40%
Rock Island Pipe..... 25%

Wads—*Price per M.*

B. E., 11 up ..... *60¢*
B. E., 9 and 10 ..... *70¢*
B. E., 8 ..... *80¢*
B. E., 7 ..... *80¢*
P. E., 11 up *$1.00*
P. E., 9 and 10 ..... *1.25*
P. E., 8 ..... *1.50*
P. E., 7 ..... *1.50*
Ely's B. E., 11 and larger..$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled ..... *45&10%*
Ground ..... *50&5%*
Plain or Unground *60%*
Country Hollow Ware, per 100 lbs. *$3.00*
White Enameled Ware:
Maslin Kettles.....65&10%
Covered Wares:
Tinned and Turned.....35&10%
Enameled ..... *45&10%*
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware..... 33⅓%
Iron Clad Ware..... 70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles..... 60%
Porcelained ..... 50&60&5&10
Never Break Spiders and Griddles ..... 60&5%
Never Break Kettles..... 60%
Solid Steel Spiders and Griddles 65&5
Solid Steel Kettles..... 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: @ doz.
Crescent, family size, bent frame.$4.05
Red Star, family size, stationary protector $4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector..... $5.55
Cable Cross, family size, stationary protector..... $3.60
Single Zinc Surface:
Naiad, family size, open back, perforated $2.00
Single Saginaw Globe..... $2.85
Brass Surface:
Brass King, Single Surface, open back $4.05
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.60
Glass Surface:
Glass King, Single Surface, open back $3.95
Enamel Surface:
Enamel King, Single Surface, ventilated back..... $3.95

Washers—Leather, Axle—

Solid ..... *90@90&10%*
Patent ..... *80@90&5%*
Coil: ⅞ 1 1⅛ 1¼ *inch*
90¢ 10¢ 11¢ 14¢ per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers....$4.00 4.00 2.20 2.50 2.50
The above prices are based on $6.50 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots.....
per lb. 1¾@2¢

Wedges—

Oil Finish.....*lb.*,..@3¢

Weights—Hitching—

Covert Mfg. Co..... 30&2%

Sash—

Per net ton, f.o.b. factory:
Eastern District...$25.00@$28.00
Southern Territory.$22.00@$24.50
Western and Central Districts ..... *$22.50@$23.50*

Wheels, Well—

8-in., $2.00; 10-in., $2.45; 12-in., $3.25; 14-in., $4.45.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....72¢&10¢&7½%
10 to 14.....72½¢&10¢&10
15 to 18.....75¢&10¢&2½%
19 to 26.....75¢&10¢&5%
27 to 36.....77½¢&7½%
Galvanized
6 to 9.....72½¢&10%
10 to 14.....72½¢&10&5%
15 to 18.....72½¢&10&5%
19 to 26.....72½%
27 to 36.....70¢&5&2½%
Coppered
6 to 9.....65¢&10&10%
10 to 14.....70¢&10&5%
15 to 18.....65¢&10¢&10%
19 to 26.....70¢&5&2½%
27 to 36.....72½¢&10¢&2½%
Tinned
6 to 18.....67¢&10&10%
Brass ..... *17¼¢ lb., base*
Copper ..... *32¢ lb., base*
Cast Steel Wire.....50%

Spooled Wire—

Annealed and Tinned,
70¢&10¢&10%
Brass and Copper.....60¢&10¢&10%
Retailers' Assortments, per box $2.10@$2.40

Wire Clothes Line, see Lines
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods.....90&5%
Brass Wire Goods.....90@90&10%
Brass Cup and Shoulder Hooks, 80&15%

Wire Cloth and Netting—

Galvanized Poultry Netting,
80¢@90¢&7½%
Painted Screen Cloth, 100 ft., $1.35
Standard Galv. Hardware Grade: Per 100 sq. ft.
Nos. 2, 3½ and 3 Mesh....$2.75
Nos. 4 and 5 Mesh.....$3.00
No. 6 Mesh.....$3.25
Nos. 7 and 8 Mesh.....$3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural *80%*
Alligator or Crocodile..70&10%&5%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S.....*45@45&5%*
Acme ..... 60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut..... 50%
Combination Black..... 40&5%
Merrick Pattern..... 50%
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' " Mechanics' "....40&10&10&5&5%
Donohue's Engineer..... 40&10%
Eagle 70%
Gem Pocket..... 50%
Hercules 70%
W. & B. Machinist:
Case lots..... 50&5%
Less than case lots..... 50%
W. & B. Railroad Special:
Case lots..... 50%
Less than case lots..... 40&10&5%
Solid Handles, P., S. & W., 50&10%; full cases..... 50&10&5%
Stillson 65%
Uwanta Wrench Co.:
Railroad Special, Iron Handle, 40&10&5%
Other Wrenches..... 50%
Vulcan and Acrippa Chain..... 50%
Whitaker Manufacturing Co.:
Case lots..... 50&10%
Less than case lots..... 50%

Wrought Goods—

Staples, Hooks, &c., list March 7, '02.....*85@10&10%*

Zinc—*(Cash lots at mill.)*

Sheet.....*per 100 lb. $7.00*

THE IRON AGE

New York, Thursday, March 26, 1908.

Rolling Mill Equipment for Japan.

A tribute to the worldwide reputation which American made steel mill machinery has acquired in the years that its manufacturers have developed it in the competition to supply domestic plants is the order recently filled by the Mesta Machine Company, Pittsburgh, Pa., for the Imperial Steel Works of Japan, through Mitsui & Co. 40 x 48 in. Corliss tandem compound engine, a 16 x 60 in. three-high roughing mill and a 10-in. merchant mill of four stands, 36 x 30, 14 and 12 in.; a heavy motor driven roll turning lathe, four shears and a cold draw bench. The reliability and shock absorbing characteristics of power transmission by rope drive will be made use of in the case of the four stand 10-in. mill, which will be driven by 12 1¼-in. ropes in multiple from the 16-ft. 60,000-lb. rope wheel of the engine. A cast steel crab,

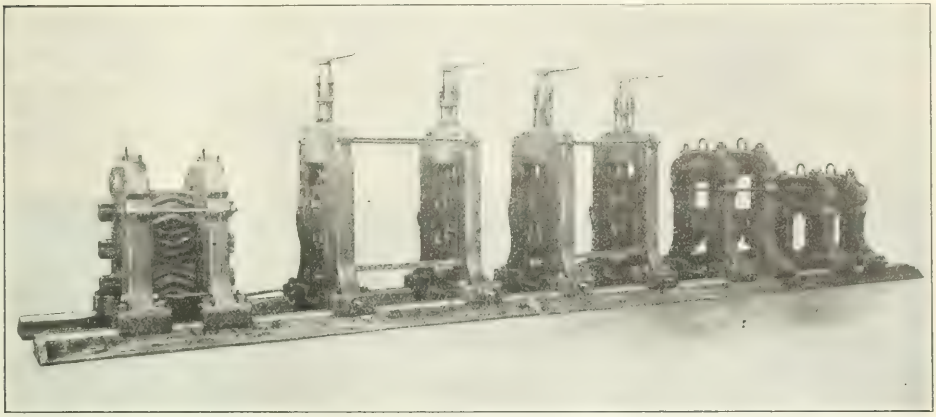


Fig. 1.—Ten-In. Merchant Mill with Four Stands 36 x 30, 14 and 12 In.

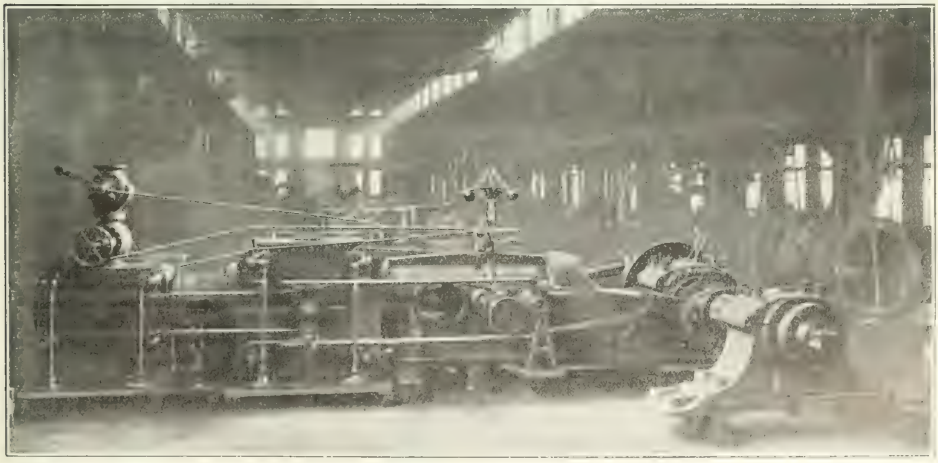


Fig. 2.—1300-Hp. 26 and 40 x 48 In. Corliss Tandem Compound Engine.

Rolling Mill Equipment Built for the Imperial Steel Works of Japan.

The development of the iron and steel industry in Japan has been largely aided by the study which the representatives of that country have given to the methods employed in the United States. By using foreign built machinery the Japanese are able to meet the demand for finished product quicker than they would if the equipment was designed and built in Japan, where the lack of experience and manufacturing facilities are serious handicaps.

The order above alluded to included a 1300-hp. 26 and coupling directly, will connect the 16-in. mill to the engine shaft, which is designed to run at 100 rev. per min.

The mills, which are designed for rolling tool steel, are of exceedingly heavy construction. Cast steel double helical machine molded pinions drive the chilled rolls, which are set in cast steel bronze lined journal boxes carried by very heavy housings of air furnace iron. The three-high 16-in. roughing mill, which is directly connected to the engine shaft, receives 5 x 5 in. 200-lb. billets. These are then passed to the 10-in. finishing mill, a

view of which is given in Fig. 1. This mill has two three-high stands and two two-high stands, and is designed to turn out rounds from 10 to 50 mm. (3/8 to 2 in.) diameter, squares from 9 to 50 mm. (3/8 to 2 in.), and flats from 10 x 12 mm. (3/8 x 1/2 in.) to 35 x 55 mm. (1 3/8 to 2 1/8 in.).

The engine, as shown in Fig. 2, is a heavy design especially fitted to meet the exacting demands of rolling mill work. Air furnace iron was used for the larger castings, such as the cylinders, flywheel and the heavy one-piece frame. A tongue and groove attachment for the cylinders to the sole plate assures perfect alignment, and at the same time obviates the expansion strains due to temperature changes. The use of double eccentrics affords a wide range in engine power, giving a cut-off variation up to three-quarter stroke.

The matter of automatic safety devices, always of great importance, has received particularly careful attention in this engine. To the usual flyball governor stop, which blocks the admission valve hooks should any part of the governor driving mechanism fail, is added a lever connection to a rolling cut-off valve in the main steam line. This valve will also be closed independently of the flyball governor, in case the belt should run off or break by the falling of the idler pulley on the governor belt drive, or by the action of a small shifting eccentric governor placed inside the governor belt pulley. This eccentric governor is set to operate at 5 per cent. above normal speed.

The four motor driven shears are intended for cutting 2 x 2 in. bars and 1/2 x 2 in. flats, together, and the cold draw bench is capable of exerting a pull of 40,000 lb.

The Mesta Machine Company, Pittsburgh, recently made shipment of a twin reversing engine to be directly connected to a roughing rail mill for the Tennessee Coal, Iron & Railroad Company, Ensley, Ala. The general dimensions of the engine are: Length over all, 50 1/2 ft.; width, 29 1/2 ft.; weight, 850,000 lb.; cylinders, 55 in. diameter by 66 in. stroke. The contract calls for operation with 150 lb. steam pressure and a speed of 150 rev. per min., under which conditions and a three-quarter cut-off the engine will develop 27,000 hp. In general, the engine is twin simple with piston valve gear, and, following the usual Mesta custom, shows a massive construction to stand the shocks and severe service encountered in reversing mill work.

The Massillon Iron & Steel Company, Massillon, Ohio, engineer, founder and machinist, is making some large additions to its plant which will considerably increase its capacity.

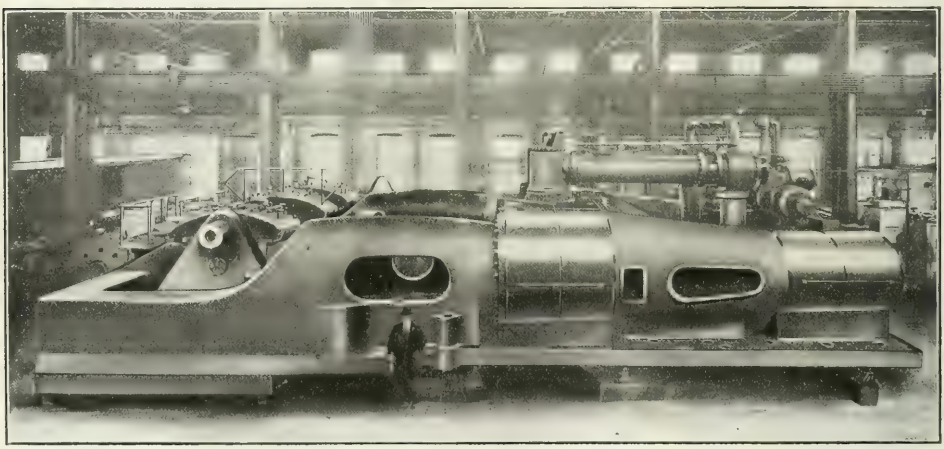
The Largest Engine in the World.

The United States Steel Corporation has recently installed in the mills of the Carnegie Steel Company at South Sharon, Pa., the most powerful engine ever built. It has a capacity of 25,000 hp., or nearly double the size of its nearest rival, and was erected complete in the engine building shops of the Allis-Chalmers Company at West Allis, near Milwaukee, Wis.

Some idea of the size of this engine is afforded by the illustration, which shows it contrasted with a man of average hight. Two of the castings for it weighed, after machining, 118 tons each, requiring for their transportation the special reinforced 100-ton cars built in the Chicago, Milwaukee & St. Paul Railroad shops at Milwaukee for Allis-Chalmers Company for just such purposes as this. The engine as a whole weighs 550 tons without foundation plates or flywheel. It is a horizontal, twin tandem compound rolling mill engine, with cylinders 42 and 70 x 54 in. stroke, designed to operate condensing at 175 lb. steam pressure and a speed of 150 to 200 rev. per min.

Notwithstanding the enormous size of the engine and the tremendous power which it exerts, it is easily controlled and requires the services of only one engineer. Being used to operate the rolls in a steel mill, it has to be quickly reversed at the end of each run, and the load varies within a few moments from nothing to the maximum power exerted. The reversing mechanism used for changing the direction of the engine is of the Reynolds-Marshall type and is run by a small independent engine with oil cylinder lock. Another small engine is also employed in operating the steam throttle valves, all of these units being under the perfect control of the one engineer. No more than a few seconds' time is consumed in the reversing.

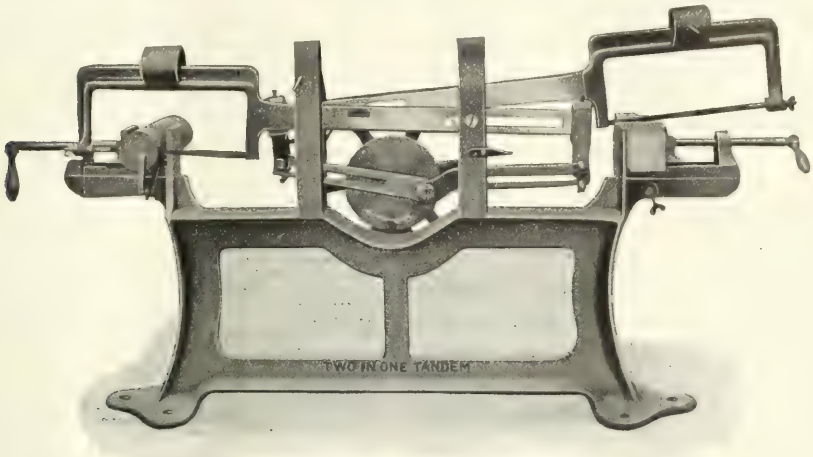
Some years ago the work of installing a machine of this size would have required months, with considerable additional time spent in getting it ready for service, but this company has built so many huge engines of this class that its engineers and erecting men have acquired great facility in the work. An instance of it is the installation of an engine which preceded the 25,000-hp. unit above referred to. This was placed on its foundation and completely assembled within 10 days after arrival at the mill, notwithstanding that before the new engine could be erected an old one which had been kept in service until the last minute had to be torn out. Most remarkable of all is the fact that within 30 min. after the last bolt had been adjusted and steam admitted to the cylinders, the engine was doing its full work rolling rails, and remained continuously in operation thereafter.



The 25,000-Hp. Allis-Chalmers Tandem-Compound Rolling Mill Engine for the Carnegie Steel Company, as It Appeared Partly Erected in the Builder's Shop.

The Ryerson Tandem Hack Saw.

A rather unusual type of power hack saw is the double tandem one illustrated, which is being offered by Joseph T. Ryerson & Son, Chicago. Besides effecting a saving in floor space and auxiliary equipment, it is designed to reduce the cost of maintenance, lubrication and attendance, which would attend the operation of two separate machines. As will be observed, both saws are mounted on a single frame, and are reciprocated by a single crank mounted on the pulley shaft at the center of the machine. The driving arms are carried in two upright guide yokes, which serve to keep the saws in alignment.



A Two in One Tandem Power Hack Saw Sold by Joseph T. Ryerson & Son, Chicago, Ill.

On the forward or cutting stroke a downward pressure is exerted, which results in faster cutting, and on the return stroke, when the saw is not cutting, the pressure is relieved by the lifting motion imparted to the arm. Each saw is fitted with an independent automatic stop, which engages the holding clamp at the end of the slotted driving arm and stops the saw when the cut is finished.

Vises with swivel jaws capable of adjustment to material of various shapes are provided; they are removable and are so fitted as to insure contact of the saw through the entire length of the blade. The machine occupies a floor space of 12 x 48 in., weighs 260 lb., and carries a pulley 14 in. in diameter by 3-in. face, which should run at a speed of from 65 to 75 rev. per min.

Twenty-three of the district managers of the Westinghouse Electric & Mfg. Company concluded last week a meeting at East Pittsburgh. They were summoned together to report on conditions in the various fields, such meetings being held annually. As to the business outlook, the managers were divided in opinion, those from the West predicting that the trade record for this year would be as good as that of 1907, and the Eastern managers saying they expected a decrease. All were united, however, in the belief that business has begun to pick up all over the country. It was concluded, after all reports were heard, that the electrical business for 1908, compared with that of 1907, will not show as great a loss as has been anticipated.

The Murchie Safety Clamp Collar.

That the projecting heads of set screws in shaft couplings and other revolving parts are a menace is so well known that any device to eliminate them is of timely interest. What is designated by the patentee and maker, S. T. Murchie, Kaukauna, Wis., as a safety clamp collar, is represented to combine the desired features of safety, simplicity and ease of application, together with practical efficiency. The coupling is shown in the accompanying illustration assembled and disassembled.

It consists of two parts, composed of the collar proper and a binder ring, both of which are of steel. The former is made with a projecting sleeve, carrying two slightly tapered bosses on its outer surface opposite to each other, and is split longitudinally on one side. Grooved ways are cut on the inside of the compression ring corresponding in position to the collar bosses. When in position the ring is slipped on the collar, and set up to the shoulder, the wedge taper of the bosses being sufficient to compress the collar and cause it to firmly grip the shaft.



A Clamping Collar or Shaft Coupling Devoid of Dangerous Projecting Parts, Made by S. T. Murchie, Kaukauna, Wis.

Held solely by a friction clutch thus applied there are no set screws in this coupling to mar the shafting or catch the clothing of employees or others. It is, moreover, easily adjusted and removed, and avoids as far as practicable the preventable accidents occasioned by the old style collar with protruding set screws. This clamp coupling is furnished in sizes to fit all shafting of ordinary diameters.

The United States Steel Corporation's Annual Report.

Gross Sales and Earnings $757,014,767.68. Increase Over Best Previous Year $60,257,876.67.

Net Earnings $160,964,673.72. Increase Over Best Previous Year $4,340,400.54.

The sixth annual report of the United States Steel Corporation, covering the operations of the fiscal year ending December 31, 1907, shows that its gross sales and earnings far surpassed those of any previous year. The business thus transacted totaled the stupendous sum of $757,014,767.68, which was $60,257,876.67 in excess of the amount reached in 1906, when a new record was made. The net earnings were $160,964,673.72, exceeding those of the previous year by $4,340,400.54. The report, which includes operating results of the Tennessee Coal, Iron & Railroad Company, for November and December, enables the following comparisons to be made.

Income Account.

	1907. $	1906. $	Increase. $
Earnings	160,964,673.72	156,624,273.18	4,340,400.54
Less appropriations for the following purposes:			
Sinking funds on bonds of subsidiary companies	1,977,761.03	1,904,063.50	73,697.53
Depreciation and extinguishment funds	6,681,746.03	5,857,410.91	824,335.12
Extraordinary replacement funds	15,560,237.38	15,395,860.64	164,376.74
Special replacement and improvement funds	3,500,000.00	7,500,000.00	*4,000,000.00
Net earnings in the year	133,244,929.28	125,966,938.13	7,277,991.15
Deduct interest on U. S. Steel Corporation bonds outstanding	22,860,352.82	22,839,849.98	20,502.84
Sinking funds on U. S. Steel Corporation bonds—viz.:			
Installments	4,050,000.00	4,050,000.00	
Interest on bonds in sinking funds	1,087,497.18	858,000.02	229,497.16
	105,247,079.28	98,219,088.13	7,027,991.15
Less charged off for various accounts and adjustments	681,515.52	90,501.19	591,014.33
Balance	104,565,563.76	98,128,586.94	6,436,976.82
Less dividends on preferred stock, 7 %	25,219,677.00	25,219,677.00	
Dividends on common stock, 2 %	10,166,050.00	10,166,050.00	
Surplus net income for the year	69,179,836.76	62,742,859.94	6,436,976.82
Appropriated from surplus net income for the following purposes:			
Account expenditures on authorized appropriations for additional property, new plants and construction, and for discharge of capital obligations	35,500,000.00	28,500,000.00	7,000,000.00
Set aside for construction of plant at Gary, Ind.	18,500,000.00	21,500,000.00	*3,000,000.00
Balance of surplus for the year	15,179,836.76	12,742,859.94	2,436,976.82

* Decrease.

Employees and Pay Rolls.

The average number of employees in the service of all companies during the fiscal year 1907, in comparison with the fiscal year 1906,. was as follows:

	1907.	1906.
Manufacturing properties	151,670	147,048
Coal and coke properties	21,447	21,929
Iron ore mining properties	16,462	14,393
Transportation properties	18,133	16,638
Miscellaneous properties	2,468	2,449
Totals	210,180	202,457
Total annual salaries and wages	$160,825,822	$147,765,540

On January 1, 1907 (on March 1, 1907, in case of the coke companies), an advance was made in the wages and salaries of approximately 65 per cent. of the total employees of all companies. This advance increased the wages and salaries of the employees affected about 6 6-10 per cent. The average rate of wages and salaries paid all employees during 1907 was above 5 per cent. higher than the similar average rate in the next preceding year.

Statement of Surplus.

The net profits and surplus of the corporation and its subsidiary companies since April 1, 1901, are given as follows:

Capital surplus provided at date of organization		$25,000,000.00
Aggregate quarterly net profits	$515,303,938.08	
Less amount included therein representing accrued profits on inter-company materials on hand in inventories	$10,371,803.25	
Charges against profits made at close of fiscal years, not applicable to particular quarters	7,513,699.74	
Reserve to cover possible failure to realize advanced mining royalties	2,500,000.00	
	20,385,502.99	
Balance of profits earned		494,918,435.09
		$519,918,435.09
Dividends paid on U. S. Steel stock:		
Preferred, 4⅞ per cent	$193,755,597.66	
Common, 13½ per cent	68,598,982.50	
		262,354,580.16
Leaving a surplus of		$257,563,854.93
Of the foregoing surplus the following amounts have been appropriated for the purposes named:		
For payment of construction and capital expenditures and special charges per fifth annual report	$108,827,364.16	
For payment of construction and capital expenditures and for reserve for contemplated appropriations, per income account for 1907	54,000,000.00	
		162,827,364.16
Balance of surplus, December 31, 1907, exclusive of subsidiary companies' inter-company profits in inventories		$94,736,490.77
Undivided surplus of subsidiary companies on December 31, 1907, representing profits accrued on sales of materials to other subsidiary companies and on hand in latter's inventories		27,908,752.85
Total		$122,645,243.62

This surplus shows a handsome gain on that given in the report for 1906—$24,924,529.27.

Production.

The production of the several properties for the year, exclusive of that of the Tennessee Coal, Iron & Railroad Company, in comparison with the results for the fiscal year 1906, was as follows:

Products.	1907. Tons.	1906. Tons.
Iron ore mined:		
From Marquette Range	1,170,496	1,442,290
From Menominee Range	1,625,358	1,874,680
From Gogebic Range	1,425,457	1,465,375
From Vermilion Range	1,724,217	1,794,186
From Mesaba Range	16,458,273	14,068,617
Totals	22,403,801	20,645,148
Coke manufactured	12,373,938	13,295,075
Coal mined, not including that used in making coke	1,841,259	1,912,444
Limestone quarried	2,957,163	2,227,436
Blast furnace products:		
Pig iron	10,631,620	11,058,526
Spiegel	130,554	150,044
Ferromanganese and ferrosilicon	57,794	58,807
Totals	10,819,968	11,267,377

Products	1907	1906
Steel ingot production:		
Bessemer ingots	7,556,460	8,052,655
Open hearth ingots	5,543,088	3,458,494
Totals	13,099,548	11,511,149
Rolled and other finished products for sale:		
Steel rails	1,733,814	1,982,042
Blooms, billets, slabs and sheet and tin plate bars	758,699	1,096,727
Plates	877,682	836,399
Heavy structural shapes	587,954	620,823
Merchant steel, skelp, hoops, bands and cotton ties	1,316,387	1,240,548
Tubing and piping	1,174,629	1,025,913
Rods	126,095	111,488
Wire and products of wire	1,481,226	1,399,717
Sheets—black, galvanized and tin plate	1,070,752	1,112,542
Finished structural work	719,887	643,622
Angle and splice bars and joints	195,157	176,730
Spikes, bolts, nuts and rivets	67,991	70,233
Axles	189,006	181,913
Sundry iron and steel products	77,463	79,736
Totals	10,376,742	10,578,433
Spelter	31,454	28,884
Copperas (sulphate of iron)	24,540	21,933
	Barrels.	Barrels.
Universal Portland cement	2,129,700	2,076,000

Capital Expenditures for Property and Construction.

The expenditures made during the year, and properly chargeable to capital account, for the acquisition of additional property and construction, less credits for property sold, but exclusive of the amount paid for the purchase of stock of the Tennessee Coal, Iron & Railroad Company, were as follows:

Expended by all companies, exclusive of amount of construction outlays by the Tennessee Company	$65,996,365.72
Expended by Tennessee Coal, Iron & Railroad Company during the months of November and December, 1907	984,886.74
Total	$66,981,252.46

The expenditures in 1907 include, as shown below, a large outlay for account of the Gary plant and the building of the city of Gary. All of the above expenditures comprehend only actual additions and extensions to the plants and properties. The capital expenditures are classified by property groups as follows:

Gary plant, the city of Gary and terminal railroad work adjacent thereto	$19,343,229.62
All other manufacturing properties except Tennessee Company	23,329,673.09
Tennessee Company	984,886.74
Coal and coke properties	4,093,283.65
Iron ore properties	5,854,797.07
Transportation properties	13,194,074.61
Miscellaneous properties	181,307.68
Total for the year 1907	$66,981,252.46
Amount expended for additional property and construction from April 1, 1901, to January 1, 1907	139,094,037.49
Making a grand total expended to January 1, 1908, of	$206,075,289.95

Inventories.

The book valuation of the inventories of all of the properties at December 31, 1907, aggregated $136,188,874, in comparison with a total at the close of the preceding year of $119,897,467, an increase of $16,291,407. This increase in the total figures is due in part to including this year the Tennessee Coal, Iron & Railroad Company's inventories, amounting to $2,507,804, but principally to the increased quantity of iron ore in stock. The tonnage of this commodity on hand at furnaces and lower lake docks was 27 per cent. greater than at December 31, 1906, while the average price at which it was inventoried is also somewhat higher than the price used at the close of the preceding year. The diminution in operations which began in November, 1907, resulted somewhat in adding to the tonnage of ore on hand, but it was the intention to have on hand a larger supply than usual. The diminution in operations above mentioned also accounts to some extent for the increased inventory of fuels, fluxes and refractories, manufacturing and operating supplies and finished products on hand.

Inventories were taken on the basis of actual purchase or production cost of materials to the respective companies holding the same, unless such cost was above the market value on December 31, 1907, in which case the market price was used. The aggregate inventory valuation of all raw, partly finished and finished materials produced within the organization is much below the market price on December 31, 1907. Inventory valuations do, however, include the profits on materials embraced in inventories which have been purchased by one subsidiary company from another; but, as shown by the general balance sheet, such profits are segregated and carried in a specific surplus account, and will not be included in the reported earnings of the entire organization until such profits shall have been converted into cash or a cash asset to the organization. The specific surplus account referred to is, therefore, practically a guarantee fund for these profits so locked up in inventories pending realization in cash.

The following is a general classification of the inventory valuations at December 31, 1907, in comparison with December 31, 1906:

	December 31, 1907.	December 31, 1906.
Ores	$58,984,718	$42,330,919
Pig iron, scrap, ferro and spiegel	6,417,224	7,071,656
Coal, coke and other fuel	2,697,728	1,610,161
Copper, nickel, aluminum and alloys	358,482	662,626
Pig tin, lead, zinc, spelter, dross and skimmings	3,146,385	5,958,744
Limestone, fluxes and refractories	2,243,268	1,455,996
Rolls, molds and stools	4,331,139	3,638,855
Manufacturing supplies, stores and sundry items	11,569,216	10,133,018
Ingots—steel and nickel	451,552	750,146
Blooms, billets, slabs, sheet and tin bars, &c.	6,416,619	5,785,217
Wire rods	709,060	714,517
Skelp	1,212,483	1,502,314
Finished products	24,868,713	21,626,657
Mining supplies and stores (for ore and coal properties)	3,101,742	2,793,688
Railroad supplies and stores	2,979,707	2,167,005
Merchandise of supply companies	797,115	762,154
Material, labor and expense locked up in bridge and structural contracts, less bills rendered on account	2,294,103	4,054,060
Stocks abroad and on consignment	1,806,138	1,380,890
Material in transit	1,803,482	5,498,844
Totals	$136,188,874	$119,897,467

General Balance Sheet.

The condensed general balance sheet, as of December 31, 1907, is as follows:

Assets

Property account (properties owned and operated by the several companies):		
Balance of this account as of December 31, 1906	$1,378,185,605.07	
Additions during 1907 to foregoing balance	614,722.63	
Tennessee Coal, Iron & Railroad Company's properties:		
Cost of fixed property as acquired at November 1, 1907	$48,961,208.83	
Expended for construction in November and December	984,886.74	
	49,946,095.57	
Expended for additional property and construction in 1907 other than by or for account T. C., I. & R. R. Co.	[illegible]	
	$1,494,742,788.99	
Less charged off to the following accounts:		
Bond sinking funds	$572,500.00	
Depreciation, extinguishment and replacement funds	4,680,421.03	
[illegible] from surplus net income for payment of capital expenditures	53,949,799.46	
	$1,435,540,068.50	
Expenditures for stripping and development at mines, &c.:		
Balance at December 31, 1906	$5,722,340.61	
Net increase during the year 1907	4,575,041.26	
	10,297,381.87	
		$1,445,837,450.37

Deferred charges to operations:		
Payments for advanced mining royalties, exploration expenses and miscellaneous charges, chargeable to future operations	$6,204,733.85	
Less fund reserved from surplus to cover possible failure to realize advanced mining royalties	2,500,000.00	3,704,733.85
Investments:		
Outside real estate and other property		1,717,119.87
Sinking and reserve fund assets:		
Cash held by trustees, account of bond sinking funds ($31,559,000 par value of redeemed bonds, held by trustees, not treated as an asset.)	$444,200.88	
Contingent fund and miscellaneous assets	1,215,522.85	
Insurance fund assets (at market value)	4,120,158.63	
Depreciation and extinguishment fund assets (at market value)	10,741,977.19	
Investments (at market value) for special construction fund for Gary plant	15,920,542.14	32,442,401.69
Current assets:		
Inventories*	$136,188,874.28	
Accounts receivable	58,398,454.36	
Bills receivable, customers' and guaranteed loans	10,193,706.91	
Agents' balances	835,269.33	
Sundry marketable bonds and stocks	8,831,154.32	
Loans on collateral	6,000,000.00	
Cash in hand and on deposit subject to check $51,222,395.07		
Deposits loaned on call 2,741,453.81		
	53,963,848.88	274,411,308.08
Grand total		$1,758,113,013.86
Liabilities.		
Common stock	$508,302,500.00	
Preferred stock	360,281,100.00	$868,583,600.00
Stocks of subsidiary companies not held by United States Steel Corporation (par value)		761,810.00
Bonded and debenture debt:		
United States Steel Corporation 50-year 5 per cent bonds	$303,957,000.00	
United States Steel Corporation 10-60-year 5 per cent. bonds	200,000,000.00	
Total	$503,957,000.00	
Less redeemed and held by trustees of sinking funds	23,758,000.00	
Balance outstanding	$480,199,000.00	
Subsidiary companies' bonds (guaranteed by United States Steel Corporation)	$48,036,000.00	
Subsidiary companies' bonds (not guaranteed by United States Steel Corporation)	79,716,904.13	
Total	$127,752,904.13	
Less redeemed and held by trustees of sinking funds	7,801,000.00	
Balance outstanding	119,951,904.13	
Debenture scrip, Illinois Steel Company	34,366.66	600,185,270.79
Mortgages and purchase money obligations of subsidiary companies:		
Mortgages	$2,135,240.38	
Purchase money obligations	3,258,700.65	5,393,941.03
Current liabilities:		
Current accounts payable and payrolls	$22,506,488.45	
Bills payable (of Tennessee Coal, Iron & Railroad Company)	1,052,747.59	
Special deposits or loans due employees and others	1,057,495.58	
Accrued taxes not yet due	3,736,747.80	
Accrued interest and unpresented coupons	7,863,913.57	
Preferred stock dividend No. 27, payable February 29, 1908	6,304,919.25	
Common stock dividend No. 17, payable March 30, 1908	2,541,512.50	45,063,824.74
Total capital and current liabilities		$1,519,988,446.56
Sinking and reserve funds:		
Sinking, depreciation and replacement funds	$41,360,655.19	
General construction fund for authorized appropriations	3,923,814.96	
Special construction fund for Gary plant	26,051,242.62	
Contingent and miscellaneous operating funds	7,991,275.89	
Insurance funds	4,648,358.57	83,975,347.23
Bond sinking funds with accretions represented by cash (and by redeemed bonds not treated as assets).		31,503,976.45
Undivided surplus of United States Steel Corporation and subsidiary companies:		
Capital surplus provided in organization	$25,000,000.00	
Balance of surplus accumulated by all companies from April 1, 1901, to December 31, 1907	69,736,490.77	
Total surplus exclusive of subsidiary companies' inter-company profits in inventories	$94,736,490.77	
Undivided surplus of subsidiary companies, representing profits accrued on sale of materials and products to other subsidiary companies and on hand in latter's inventories	27,908,752.85	122,645,243.62
Grand total		$1,758,113,013.86

* Inventory valuations include profits accrued to subsidiary companies on materials and products sold to other subsidiary companies and undisposed of by the latter—see contra specific surplus account for these profits. The total of all inventories is, however, below the actual current market prices.

General Profit and Loss Account.

The condensed general profit and loss account for the year ending December 31, 1907, is as follows:

Gross receipts—Gross sales and earnings		$757,014,767.68
Less manufacturing and producing cost and operating expenses		*564,166,777.12
Balance		$192,847,990.56
Sundry net manufacturing and operating gains and losses, including idle plant expenses, royalties received, depreciation in inventory valuations, &c.	$2,567,150.85	
Rentals received	699,058.60	3,266,209.45
Total net manufacturing, producing and operating income		$196,114,200.01
Net profits of properties owned, including those of the Tennessee Coal, Iron & Railroad Company for two months, but whose operations (gross revenue, cost of product, expenses, &c.) are not included in this statement.	$1,737,939.35	
Interest and dividends on investments and on deposits, &c.	4,744,801.62	6,482,740.97
Total income		$202,596,940.98
Administrative, selling and general expenses, and employees' bonus and pension funds (not including general expenses of transportation companies)	$15,945,436.84	
Taxes	5,383,923.95	
Miscellaneous expenditures and charges (net)	114,008.89	
Commercial discounts and interest	3,952,009.65	25,395,379.33
Balance of income		$177,201,561.65
Interest on bonds and mortgages of the subsidiary companies	$6,368,163.50	
Interest on purchase money obligations and special deposits or loans of the subsidiary companies	124,031.92	6,492,195.42
Balance, being the aggregate earnings of the several companies for the year		$170,709,366.23

* Includes charges for ordinary maintenance and repairs, approximately $35,000,000.

Less profits carried by subsidiary companies on sales made and service rendered account of materials on hand in purchasing companies' inventories, and which profits have not yet been realized in cash from the standpoint of a combined statement of the business of the United States Steel Corporation and subsidiary companies	9,744,692.51
Earnings for the year 1907	$160,964,673.72

Earnings by Months and Quarters.

Following is a table showing earnings by months and quarters from January 1, 1905, to December 31, 1907:

Month.	1905. $	1906. $	1907. $
January	6,810,846.88	11,856,375.42	12,838,703.25
February	6,629,462.87	10,958,275.20	12,145,814.95
March	9,585,585.87	13,819,839.50	14,137,973.85
First quarter	23,025,895.62	36,634,490.12	39,122,492.05
April	9,037,924.89	12,581,901.80	14,800,837.97
May	10,602,187.27	14,041,601.28	16,056,832.06
June	10,665,004.46	13,501,529.84	14,846,034.82
Second quarter	30,305,116.42	40,125,032.92	45,503,704.85
July	9,035,168.49	12,242,098.07	13,804,167.34
August	10,986,901.02	13,158,860.10	15,279,172.67
September	11,218,513.43	12,713,666.08	14,720,945.15
Third quarter	31,240,582.94	38,114,624.25	43,804,285.16
October	12,400,306.52	14,984,925.75	17,052,210.70
November	11,827,214.98	13,482,464.58	10,467,252.60
December	10,988,541.95	13,282,735.56	5,014,728.36
Fourth quarter	35,216,063.45	41,750,125.89	32,534,191.66
Total for year	119,787,658.43	156,624,273.18	160,964,673.72

Maintenance, Renewals and Extraordinary Replacements.

The expenditures made by all companies during the year 1907 for maintenance and renewals, including the relining of blast furnaces, and for extraordinary replacements, equaled the total sum of $55,828,253.12, an increase in comparison with the expenditures for the same purposes during the preceding year of $7,495,163.75, or 15.5 per cent. The expenditures in the year 1907 were the largest of any year in the organization's history. The annual expenditures since 1902 have been as follows:

1902	$29,157,010.73	1906	$48,333,089.37
1903	34,785,191.21	1907	55,828,253.12
1904	26,258,372.22		
1905	37,471,769.63	Total	$231,833,686.28

The entire amount of the foregoing expenditures was charged to current operating expenses and to replacement funds reserved from earnings.

Special Construction Fund for the Gary Plant.

There have been specifically set aside from surplus net income for account of this fund amounts as follows:

Advances have been made from this fund to cover expenditures for the acquirement of real estate and construction work at the Gary plant, the building of the city of Gary, and terminal railroad work adjacent thereto, as follows:		
1906	$4,632,202.11	
1907	19,316,555.27	
		23,948,757.38
Leaving a balance unexpended December 31, 1907, of		$26,051,242.62
1905		$10,000,000.00
1906		21,500,000.00
1907		18,500,000.00
Aggregate		$50,000,000.00

Of the unexpended balance reserved as above, $15,920,542.14 had been specifically invested prior to December 31, 1907, in salable securities, pending the actual requirement of the money. The balance of the fund is in the cash assets of the organization.

Acquisition of the Tennessee Coal, Iron & Railroad Company.

In and since November, 1907, the corporation acquired $30,374,825, par value, of the common stock and of common stock subscription receipts of the Tennessee Coal, Iron & Railroad Company, being all but $220,160 of the total of said common stock and common stock subscription receipts issued and outstanding at December 31, 1907. Of the foregoing aggregate of common stock and common stock subscription receipts acquired $29,742,170 was purchased at par, the corporation delivering in payment therefor its 10-60 year 5 per cent. sinking fund gold bonds, as the equivalent of cash, at the rate of $11,904.76, par value, of said bonds, for $10,000, par value, of Tennessee common stock; the balance of $632,655 of said stock acquired was paid for in cash, being the installment of 20 per cent. payable December 15, 1907, on the common stock subscription receipts. The total cost to the corporation of the stock acquired as above was as follows:

	Stock acquired.	Bonds delivered in payment.	Par of bonds issued and cost of bonds purchased; also cash paid.
For full paid common stock certificates	$29,109,515	$34,654,000	$33,949,282.48
For common stock subscription receipts, 20 per cent. paid	632,655	753,000	735,695.16
Total paid for with bonds	$29,742,170	$35,407,000	$34,684,977.64
For 20 per cent. installment paid December 15, 1907, on subscription receipts	632,655		(Cash) 632,655.00
Total acquired and its cost	$30,374,825	$35,407,000	$35,317,632.64

Of the bonds delivered as above $30,000,000 were bonds held in the corporation's treasury, which had been executed and certified in 1903, as authorized by the directors and stockholders. The balance of the bonds delivered was acquired by the corporation through purchase in the open market.

During the year 1907 the production of the mineral and manufacturing properties of the Tennessee Company was as follows:

	Gross tons.
Iron ore	1,576,757
Limestone and dolomite	244,059
Pig iron for market	315,573
Pig iron for conversion at steel works	287,254
Total pig iron	602,827
Open hearth steel ingots	243,444
Steel rails	146,171
Billets, plates and bars	88,009
	Net tons.
Coal (not including that used in making coke)	1,709,251
Coke	1,170,826

The net profits of the Tennessee Company for the year 1907, after charging off $437,666.84 for depreciation and extraordinary replacements, and $885,552.31 for net interest charge on bonded and floating debt, were $1,426,684.58.

Extensive outlays were made during the year for construction and improvement work. The total amount expended aggregated $6,589,116.99. The outlays covered additions and betterments as follows:

Land and real estate account	$71,936.41
Extensions and betterments at ore and coal properties	1,259,017.77
Improvements at Bessemer rolling mills	4,592.87
Additions, extensions and betterments at Ensley furnaces, steel works and rolling mills	5,253,569.94
Total	$6,589,116.99

Employees' Subscriptions to Preferred Stock.

In January, 1908, there was again offered to the employees of the United States Steel Corporation and of the subsidiary companies the privilege of subscribing for 25,000 shares of preferred stock on substantially the same conditions as offered previously, except the price was fixed at $87.50 per share. The offer was oversubscribed by about 100 per cent., applications having been received from 24,884 employees for an aggregate of 50,075 shares. Allotments were made as follows: Each subscriber for one share was allotted the same, and all others were allotted 50 per cent. of their subscriptions. The total number of shares allotted on this basis was 30,621.

General Statement to Stockholders by Chairman Gary and President Corey.

During the first 10 months in the year 1907 the several departments of the subsidiary companies were operated at substantially their maximum capacity. The production by the manufacturing properties of finished prod-

ucts for sale during the period from January 1 to November 1, 1907, showed an increase of 5 per cent. over the corresponding period in 1906. Owing, however, to the sudden and severe check to general trade conditions which took place in the fall of 1907, the volume of business of the subsidiary companies was materially curtailed, resulting during the last two months of the year in a decrease in production of finished products which exceeded the gain made during the preceding 10 months. The production of finished steel products for sale in the entire year of 1907 shows a decrease compared with 1906 of 201,691 tons, or about 2 per cent. The decrease in actual shipments of products made to customers showed a somewhat larger falling off, 10,451,488 tons of all kinds of manufactured materials (including furnace products and scrap) having been shipped in 1907 against 10,862,425 tons in the preceding year. Prices of steel commodities for domestic sale were not generally advanced during the year notwithstanding there were marked increases in the cost of raw materials and supplies used in manufacturing, in railroad freight charges, in wages and in taxation charges.

EXPORTS.

The satisfactory results obtained from the export business, through the building up of a permanent and continuous export trade, as noted in previous reports, have continued. During the year there were shipped for export 1,014,082 tons of steel commodities of various kinds, a decrease of 6 per cent. as compared with the shipments in the previous year. The gross receipts for the 1907 shipments, however, exceeded those for 1906 by 16 per cent. The average mill price per ton received for all exported materials was only 7½ per cent. less than the average price received for all domestic shipments. The advantages to the employees, the domestic consumer and the manufacturer, of a fair volume of foreign trade during periods of business depression in the United States, have been emphasized in previous reports. In order to obtain the maximum benefits from such trade during times of lesser activity in business in the domestic market, it seems wise to sell continuously in the neutral markets of the world and even at times when foreign trade conditions do not result in prices so near the domestic prices as were received during 1907.

THE TENNESSEE PURCHASE.

In November, 1907, the corporation acquired a majority of the common stock of the Tennessee Coal, Iron & Railroad Company. The purchase was made during the financial panic of October, 1907. The parties owning or controlling a majority of the Tennessee Company's stock offered it to the corporation on terms which were satisfactory, both as to price and manner of payment. The purchase of the property promises benefit to the corporation and also aided promptly and materially in relieving the financial stress at the time existing. The Tennessee property is very valuable. Its mineral resources are large. The location of the iron ore and coal deposits in the immediate proximitiy of the manufacturing plants enables the production of iron at reasonable cost. It is believed the lines of business of the Tennessee Company can be materially extended. During the last two years about $6,250,000 was expended in rehabilitating, modernizing and enlarging the furnaces and steel plant. Additional expenditures of considerable magnitude in 1908 are contemplated to complete the plans for improvements which were under way when the corporation acquired the property. It is believed that when these improvements and extensions shall have been completed and the operating management perfected the business of the company will be profitable.

The expenditures by subsidiary companies during 1907 for additional property and construction, including the Tennessee Company's expenditures for two months only, amounted to $66,981,252.46. Included in this total is $19,343,229.62 for account of the Gary plant in Indiana. The subsidiary companies also made during the year expenditures aggregating $20,324,584.90 for extraordinary replacements. The properties have been maintained at the highest state of efficiency, and through liberal outlays their production and earning power have been materially increased. At the close of the year a large amount of construction and improvement work was still in progress, being principally the uncompleted portion of the programme for extensions and betterments authorized in the early part of 1907. The amount unexpended at January 1, 1908, for these purposes, including those for Tennessee Coal, Iron & Railroad Company, but exclusive of the requirements for the new work at Gary, equaled approximately $40,000,000. It is estimated that about 85 per cent. of this total amount can be expended in 1908.

THE GARY PLANT.

Substantial progress was made during the year in the construction of the new plant at Gary. The expenditures made in connection with it to December 31, 1907, including the cost of about 9000 acres of land, amounted to $24,063,388.53. This amount has been provided entirely from surplus net profits of the corporation. At December 31, 1907, there was reserved in the special fund set aside and available for this work, a balance of $26,051,242.62. The balance unexpended at January 1, 1908, on appropriations heretofore authorized, was $35,517,000. It is believed about $18,000,000 of this amount can be expended during 1908. The following is a brief description at December 31, 1907, of the property and the status of the construction work at Gary:

The property is located at the southern end of Lake Michigan, in Lake County, Indiana, 25 miles from the business center of Chicago, Illinois. The tract contains about 9000 acres, with about 10 miles frontage on the shore of Lake Michigan, and the area will ultimately be increased by filling the present submerged lands adjoining the Lake Michigan shore line. The property is located on, or immediately adjacent to, five trunk lines of railroads.

The steel plant is being constructed on an area of 1000 acres of the above property fronting on the lake. Ground was first broken in August, 1906. The plant construction authorized to date is as follows:

Eight 450-ton per day blast furnaces, with the necessary vessel slip, ore unloading and storing facilities, power houses, pig casting plant and other auxiliaries; 56 60-ton open hearth furnaces, estimated to produce 225,000 tons of ingots per month; rail mill, estimated to produce 100,000 tons of rails per month; billet mill, estimated to produce 100,000 tons of billets per month; 48-in. universal plate mill; 160-in. sheared plate mill; merchant mills, with a capacity of 50,000 tons per month; complete equipment of mechanical shops; office building.

The general plans adopted provide various departments in this plant, which will permit increasing the number of blast furnaces to 16, and the steel producing and rolling capacity accordingly.

The progress made in the construction work to date is as follows:

The vessel slip, which is 250 ft. wide and is to extend inland 3000 ft. and from the shore line into the lake 2000 ft., has been excavated to approximately 2500 ft. inland; the two docks forming the sides of the slip extending into the lake are well under way, the piling and sheeting having been placed for nearly the entire distance.

The ore unloaders are erected complete, and the ore bridges and bins are in process of erection.

The ironwork on four blast furnaces is nearing completion, and the foundations for the second four are ready to receive the ironwork.

The blowing engines for the first four furnaces, comprehending eight gas driven and two steam driven engines, are under process of erection. The foundations have been started for the blowing engines for the second four furnaces.

The electric power plant, which is to furnish power for driving all of the mills in the plant, also for pumping water and for lighting the city of Gary, includes a power house 969 ft. long by 107 ft. wide, one-half of which is now erected, together with the foundations for nine gas engines and two steam turbines. The foundations for the remainder of the building and machinery are well under way. There will be installed in this plant in all 17 3000 hp. gas driven generators and two 2500 hp. steam turbine driven generators. It is believed this is the largest installation in one unit of gas engines that has ever been made.

In the steel producing department, one open hearth unit, consisting of 14 60-ton furnaces, with hot metal mixer and other auxiliaries, is nearing completion, and the foundations for the second similar unit are completed and erection of the steelwork has been started.

On the rail mill the foundations and the building are nearing completion, and the erection of the machinery is well advanced.

On the billet mill a part of the excavation and foundation work has been completed. Seventy-five per cent. of the machinery for this mill has been contracted for, and is now being constructed.

For the plate mills and merchant mills the plans have been completed.

The shop equipment, including machine shop, boiler shop, foundry, blacksmith shop, carpenter and pattern shop, pattern storage shop, roll shop and general store building, is practically completed and in operation.

The office building has been completed.

THE CITY OF GARY.

Approximately 800 acres of the property acquired, lying immediately south of the mill site and separated from it by the Grand Calumet River, has been platted into about 4000 lots and incorporated as the first subdivision of the city of Gary. This subdivision will contain more than 25 miles of paved and macadamized streets. To date 25,250 lineal feet of streets have been paved, and 37,000 lineal feet of sidewalks laid.

A sewer system, consisting of a discharge main 96 in. in diameter, with lateral branches 60, 54 and 36 in., respectively in diameter, has been installed, having a total length of 97,000 lineal feet.

Ninety-one thousand lineal feet of water pipe has been laid in the first subdivision and temporary pumps installed, which are now furnishing the water supply from driven wells. There is under construction a permanent water works pumping station, which contemplates the construction of a water tunnel 72 in. in diameter, 15,000 ft. long, extending into the lake 7000 ft. from the present shore line.

A gas plant, with a capacity of 300,000 cu. ft. of water gas per day, is completed and in operation. Seventy-one thousand lineal feet of gas pipe has been laid in the first subdivision.

An electric lighting plant, furnishing both incandescent and arc lights, has been installed and is in operation, current being furnished temporarily from lines connecting with the Illinois Steel Company's electric generating plant at South Chicago.

Approximately 500 dwelling houses have been erected. Many of these houses are now occupied. In addition to the dwelling houses, the following public buildings have been erected and are now occupied: One hotel building, containing 40 rooms; one restaurant; two lodging houses; schoolhouse, containing nine rooms.

All of the above development and construction work in the city of Gary has been carried on by the Gary Land Company, a subsidiary company of this corporation.

Residence and business lots have been offered for sale, with the requirement that buildings of an approved character be erected thereon within 18 months after purchase. Under this plan approximately 240 lots have been sold, largely in the business districts. On the principal business street in the first subdivision there have been constructed by purchasers of lots about 40 business blocks, the estimated cost of which is $600,000 or more. Most of these buildings have been completed and are now occupied by stores of various kinds, two banks and offices.

TERMINAL RAILROAD WORK.

The main lines of the Baltimore & Ohio Railroad Company and the Indiana Harbor Railroad Company ran directly through the manufacturing mill site. In order to remove these lines of railroad from the mill site and to permit the construction of a sufficiently large and properly located railroad yard for use in connection with the steel plant, an agreement was entered into by the various railroad companies concerned whereby the main lines of the Baltimore & Ohio Railroad Company and the Indiana Harbor Railroad Company were changed so as to run south of the mill site. This changing of the main lines of the companies named also involved a change in the main line of the Lake Shore & Michigan Southern Railway Company and the construction of a new line of railroad from a connection with the Indiana Harbor Railroad east of the mill site, southwesterly and westerly, passing to the south of the city of Gary, to the town of Gibson, where a connection is again made with the Indiana Harbor Railroad.

A great deal of clearing, grading and filling, and track laying has been done in connection with the foregoing rearrangement and construction of railroad lines. Upon the completion of the work an adjustment of the expenditures is to be made between all of the companies interested.

Within the steel plant of the Indiana Steel Company 41.6 miles of standard gauge yard tracks have been laid. Outside of and adjacent to the steel plant to the westward the large railroad yard known as Kirk Yard is under construction by a subsidiary company. In this work approximately 21 miles of tracks have already been laid and additional grading done to take care of necessary additional tracks for some time to come. At the eastern end of this yard substantial progress has been made in the construction of a large roundhouse, coal chutes and power house.

THE MINNESOTA STEEL COMPANY.

There has been purchased a site containing about 1580 acres (of which 300 acres are now submerged) located in St. Louis County, Minnesota, 10 miles from the center of the city of Duluth, on which it is proposed to construct a moderate sized iron and steel plant. The tract fronts on the St. Louis River, which is navigable for large lake steamers, and is located on the line of the Northern Pacific Railway. It is expected, however, that there will be constructed in connection with the steel plant a belt railroad extending northwardly therefrom to a connection with the Duluth, Missabe & Northern Railway, to enable the prompt and economical delivery of ore to the plant from the Minnesota ore ranges; also eastwardly from the steel plant across the St. Louis River into Superior, Wis., where connections will be made with five trunk lines of railroads reaching the head of Lake Superior from the south and west. It is proposed to have the plant constructed by the Minnesota Steel Company, a subsidiary corporation. The plans for the scope and construction of the steel plant have not yet been fully developed. The expenditures on account of this property during 1907 include the purchase of the real estate and some clearing and leveling of the site.

PENSION FUND.

Reference was made in the last annual report to the proposal to establish from the employees' bonus fund for 1907 a separate fund to be used for pension purposes. Accordingly there was reserved for this purpose the sum of $1,600,000. The plan under which the benefits accruing from this pension fund will be extended to employees is under consideration.

ORDERS INCREASING.

During the first six months of 1907 orders for steel products were received equaling substantially the maximum capacity of the mills. Subsequently there was a marked falling off in the new business offered. As a result the tonnage of unfilled orders on the books at December 31, 1907, was only 4,624,553 tons of all kinds of manufactured steel products. In common with other lines of industry there was a material reduction in sales during the latter part of 1907. However, the bookings for January were 25 per cent. better than December, and for February 25 per cent better than January. As this report goes to press the bookings per day are at least 25 per cent. larger than those of February. The management expresses hopeful views of the future.

General Work in Progress.

At the close of the year the following are the principal improvements which are in progress at various plants of the subsidiary companies here designated:

Carnegie Steel Company: Duquesne Works—Two new blast furnaces, 18 new open hearth furnaces, electric power station, gas cleaning plant, one 2000-kw. steam driven generator, including buildings. Homestead Steel Works—New 72-in. plate mill; additional facilities at 23, 35 and 40 in. structural mills. Carrie Furnaces—Two new blast furnaces; additions to electric power plant. Ohio Works—Two new blast furnaces, 12 open hearth furnaces complete, new blooming mill, new bar and hoop mills.

Illinois Steel Company: South Works—Two additional gas driven blowing engines; ore, coke and limestone pockets at blast furnaces Nos. 1-4; extending electric station, including gas cleaning and washing machine; two additional steam turbines directly connected to two 1000-kw. generators; two rotary converters, in substations at north and south ends of plant; new pumping engine at central station and additional 24-in. water line; new coke storage yard at Stockton, Ind. Joliet Works—By-product coking plant, Kopper type, 275 ovens. North Works—New paint mill.

Lorain Steel Company: Johnstown Works—Enlargement of plant for manufacture of frogs, crossings, street and steam railroad special work. The additions will about double the capacity of the plant.

National Tube Company (Lorain, Ohio): Open hearth plant, six 50-ton furnaces; additional six-hole pit furnace and [illegible]

National Tube Company: The work of enlarging and rebuilding the National Works at McKeesport was continued during the year 1907. As stated in the previous year's report, this work will not be entirely completed until in 1908.

Shelby Steel Tube Company: At Ellwood City, Pa., work was continued during the year in the rebuilding and enlargement of the seamless tube mills. The work comprehends the ultimate removal to and concentration at Ellwood City of several of the smaller outlying plants of the company. The additions and improvements will largely increase the annual productive capacity of seamless tubes. One-half of the cost of the new work only is being charged to capital account.

American Steel & Wire Company: Newburgh Wire Works—Additional cold rolling machinery. Central Furnaces—Addition to power plant; extending dock and installing ore handling equipment. Waukegan Works—Enlarging spring mill building; new spring machinery; testing machine, tools, &c.; additional fine wire blocks. Rankin Works—New warehouse. Braddock Works—Additional wire drawing blocks. Allentown Works—New wire mill engine and wire drawing equipment. Trenton Works—Additional equipment for manufacture of wire rope and high grade wires. Cuyahoga Plant—New mill for rolling flats; 10 additional steel barges. Worcester Works—Additional buildings and equipment for the manufacture of insulated wire and cables; additional paper cable equipment; additional rope machinery; extension to building and additional equipment in spring department; new warehouse and siding at central department.

American Sheet & Tin Plate Company: New Philadelphia Works—One additional jobbing and one sheet mill. Scottdale Works—New galvanizing department. Guernsey Works—Four additional sheet mills. Canton Foundry—New furnace, including casting pit, yard crane and crane runway; additional roll machinery.

American Bridge Company: Elmira Plant—Construction of a new bridge plant having an annual capacity of 40,000 tons of finished structural work. The new plant is of modern type in every particular. Only 40 per cent. of the cost is being charged to capital account.

Union Steel Company: South Sharon Works—New shop building and overhead crane runway. Donora Works—New sewers; new triple expansion pump; 15 standard gauge cars; additional wire drawing equipment.

Clairton Steel Company: New 22-in. structural mill; new 14-in. structural mill; new steam driven generator, engine, &c., in power plant; new 24-in. water line and two 10,000,000-gal. centrifugal pumps.

Meeting of the Foundrymen's Weight Conference Committee.

The committee appointed by Chairman Henry A. Carpenter, under the resolution adopted at the February 5 conference of foundrymen with producers of pig iron and coke and transportation interests, held a meeting at the Bellevue-Stratford Hotel, Philadelphia, March 18, to organize and further consider the question of a means to overcome discrepancies between the shipping and outturn weights of these materials.

The morning session was held at 10 o'clock. J. L. Anthony, Weir Stove Company, Taunton, Mass., acting as temporary chairman, called the meeting to order at that hour and suggested the election of permanent officers. On motion, B. M. Shaw, Walker & Pratt Mfg. Company, Boston, Mass., was elected chairman, and August A. Miller, *The Iron Age*, Philadelphia, secretary. The meeting was officially declared a confidential one, and the various members immediately entered into a spirited discussion of the various subjects.

The morning session was given over entirely to the discussion of the coke question, while at the afternoon session the discussion of the pig iron question was given particular attention. While no definite action was taken by the committee, a number of points were brought out which will, no doubt, aid the foundrymen materially in obtaining a means of overcoming to a great extent the difficulties arising in connection with the short weight question. The committee will report to Chairman Carpenter of the general conference at a later date, it having been decided that the proceedings of the day be printed, after editing, for which purpose B. M. Shaw, J. L. Anthony and A. A. Miller were appointed. The meeting was exceptionally well attended, there being but one absentee, although several substitutions were made by those originally appointed and whose names were printed on page 853 of *The Iron Age* of March 12.

The annual dinner of the Traffic Club of Pittsburgh will be held in the Hotel Schenley on the evening of April 3. The principal speakers will be Robert Mather, president of the Chicago, Rock Island & Pacific Railroad Company, and Dr. Woodrow Wilson, president of Princeton University. During the day a terminal trip will be taken around the manufacturing plants in the Pittsburgh District, and lunch will be served at the plant of the Westinghouse Air Brake Company at Wilmerding, Pa.

Tests of Graphite on Ball Bearings.

The question of the value of graphite in the lubrication of ball bearings appears to be settled so far as its use in combination with oils or greases is concerned by the investigation made by Prof. W. F. M. Goss,* reported in the following from the Joseph Dixon Crucible Company, Jersey City, N. J. Six series of tests were run:

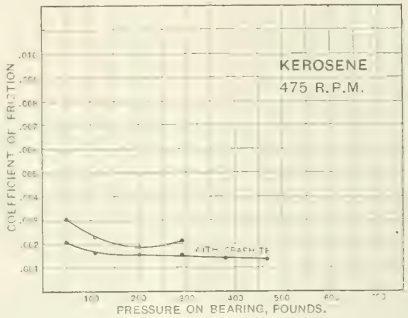


Fig. 1.—Kerosene With and Without Graphite.

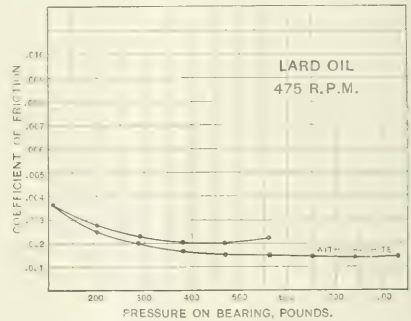


Fig. 2.—Lard Oil With and Without Graphite.

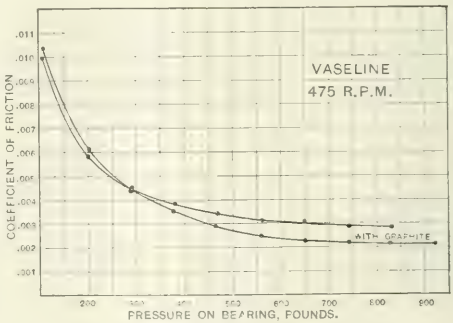


Fig. 3.—Vaseline With and Without Graphite.

Curves Comparing the Friction of a Ball Bearing with Various Lubricants Alone and in Combination with 4 Per Cent. of Dixon's Ticonderoga Flake Graphite.

three with kerosene, lard oil and vaseline singly, and three with each of these in combination with 4 per cent. of Dixon's Ticonderoga flake graphite. The curves, Figs. 1, 2 and 3 show the comparative results with each of the three lubricants alone and combined with the graphite. The curves not marked are the ones corresponding to tests in which no graphite was used.

The apparatus was the same in all of the tests and is illustrated in Fig. 4. In this the test ball bearing is

* Formerly dean of the Schools of Engineering, Purdue University; now dean of the College of Engineering of the University of Illinois.

shown at *b*. It has the form of a grooved ball thrust bearing and was made by the Standard Roller Bearing Company, Philadelphia, Pa. It consists of two hardened steel rings, each having a groove or race to receive the balls. The bearing fits a 1⅝-in. shaft and contains 23 7-16 in. balls. The lower race is caused to revolve through the action of the machine, while the upper one is fixed in position. The entire bearing is inclosed in the cup *d*. The cup is held in place by the wire *h*, which serves to oppose its tendency to turn, and also to receive the tensional stresses due to the normal loading of the bearing. A pointer attached to the lower part of the cup *d* plays over a scale on which the deflection may be read in terms of the coefficient of friction.

The lower race *b* rests upon the casting *a*, which is attached to the spindle of the machine. By means of the cone pulley *k* and the pulleys *j*, *j* and *j* the spindle may

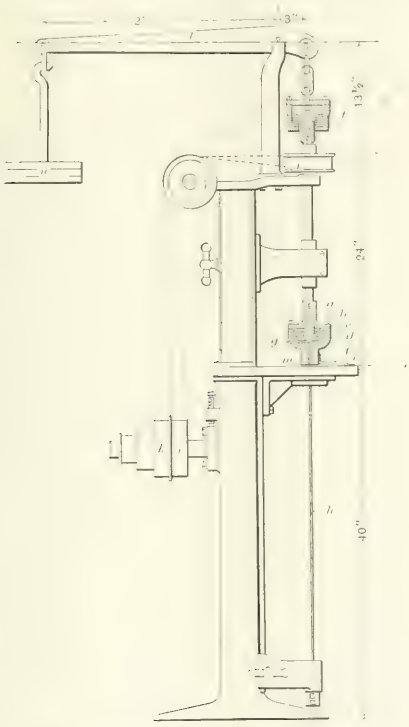


Fig. 4.—The Testing Machine and the Test Ball Bearing.

be driven at three different speeds. The pressure imposed upon the balls is regulated by means of weights applied to the lever arm *l*, which is of such length that each 10 lb. applied to the weight pan *w* gives a reaction of 90 lb. along the line of the spindle through the bearing *t* and thence to the test ball bearing. The bearing *t* is similar in all resepects to the test bearing, except that it is of greater capacity.

From the results of these tests Professor Goss draws the following general conclusions:

"A combination of graphite and lard oil makes up a lubricating mixture which, when applied to ball bearings, will accomplish everything which lard oil alone will do and which at the same time will give a lower frictional resistance of the bearing and permit a large increase in the load which it may be made to carry. An oil as light as kerosene, when intermixed with graphite, will be converted into an effective lubricant for ball bearings when operated under light or medium heavy pressure. Even so viscous a lubricant as vaseline will better perform a given service in the lubrication of ball bearings when supplemented by small amounts of graphite. The bearing to which the mixture is applied will work with less frictional resistance and will carry a heavier load than when vaseline alone is used. The admixture of graphite with either a liquid or a viscous lubricant serves both to reduce the friction and to increase the possible load which a bearing thus lubricated can be made to carry."

The Maintenance of Way Association at Chicago.

The concluding sessions on Wednesday and Thursday of the convention of the American Railway Engineering and Maintenance of Way Association, held in Chicago, March 17, 18 and 19, were occupied with the reading and discussion of reports of committees covering important phases of railroad engineering problems. These reports comprised the results of committee investigations, and in each case recommendations were presented to the meeting for consideration and action. Among the subjects which received prominent attention were the following: Uniform Rules for the Government of Supervisors of Signals; Signaling and Interlocking; Iron and Steel Structures; Track, Yards and Terminals; Rails.

The report of the Committee on Rail reviewed the report of the American Railway Association Committee on Standard Rail and Wheel Sections, and pointed out the desirability of all railroad companies uniting on rail sections. It also recommended a form of blank for reporting rail failures, which because of the letter sheet size adopted, its general simplicity and for other reasons was recommended for use in preference to a similar form designed by the American Railway Association and reported at the meeting of the latter organization in New York in October, 1907.

On Tuesday evening a paper on the "Strength and Endurance of Steel Rails," prepared by James E. Howard, engineer of tests at Watertown Arsenal, was read by J. P. Snow, bridge engineer of the Boston & Maine Railroad, the author being unable to be present. The paper is given elsewhere in this issue.

Coincident with this convention was held the annual meeting and exhibit of the Road and Track Supply Association. At this gathering 129 manufacturing and sales organizations were represented, and notwithstanding the limited space afforded for display in the parlors of the Auditorium Hotel, a large number of exhibits were grouped therein, representing a great variety of railroad appliances and equipment. On Thursday the annual convention of this body was held, at which time the following officers were elected:

President, George Stanton, sales manager Cleveland Frog & Crossing Company, Cleveland, Ohio; vice-president, W. F. Schleiter, secretary, Dilworth, Porter & Co., Pittsburgh, Pa.; secretary and treasurer, John N. Reynolds, vice-president, Wilson Company, Chicago; Executive Committee: John C. McKinnon, secretary and general manager Kalamazoo Railway Supply Company, Kalamazoo, Mich.; J. H. Martin, Hussey-Binns Shovel Company, Pittsburgh, Pa.; William Goldie, Sr., William Goldie, Jr., & Co., West Bay City, Mich.; T. W. Snow, president Otto Gas Engine Works, Chicago; Robert E. Belknap, Chicago agent Pennsylvania Steel Company and Maryland Steel Company; Theodore Huss, secretary and treasurer, Lufkin Rule Company, Saginaw, Mich.

The next monthly meeting of the American Society of Mechanical Engineers will be held in the auditorium of the Engineering Societies Building, New York, on the evening of April 14. The general subject of the meeting is the "Conservation of Our Natural Resources." Addresses will be made by four speakers who will consider forest preservation in its relation to water power, economy in the utilization of fuels and the attitude of the engineer in regard to these. Dr. Henry S. Pritchett, president of the Carnegie Foundation for the Advancement of Teaching, will be one of the speakers, and will discuss the "Relation of the Engineer to the Body Politic."

Machinery in Germany.

Capt. Godfrey L. Carden of the United States Revenue Cutter Service, an expert on the subject of machine tools, who is now investigating the opportunities for their increased sale abroad as a special agent of the Department of Commerce and Labor, makes his first report, writing from Berlin, February 10, as follows:

The machine tool business in eastern Prussia is at present quieter than at any time in the past 12 months. The large tool makers are for the most part building only for stock, and, generally speaking, the situation is regarded by the leading interests here as a reflex of the monetary outlook in America. While the conditions are quiet the German shops are, comparatively speaking, more active just now than those in America. This statement the writer bases on his personal observations, covering more than 30 of the leading machine tool houses in the United States during the period from December 18, 1907, to January 14, 1908. One of the best known of the Prussian machine houses, and the one which probably approximates closer to American standards than any other, is running practically all of its departments, and the statement was made to me by the chief director that the maximum number of men, 2000, was at present employed. While this establishment was apparently busy, it was admitted that the tools which are being produced are mostly for stock.

The foregoing statements with reference to the general situation, it must be emphasized, apply specifically to eastern Prussia. I am informed on good authority that, in general, the same conditions now hold along the Rhine and in Saxony.

Difference Between German and American Establishments.

From the best opinions which I have been able to obtain, the outlook for American machine tools in this territory depends, as it always has, on the merits of the machine. The American manufacturer who has not heretofore attempted to negotiate the European market will find that the German shops are turning out many tools which for ordinary shop work serve the purpose as well as the average American tool, and unless the German can buy the American machine tool much cheaper he may be expected to patronize his own market. But it is a fact that the majority of our American manufacturers can undersell in German territory the German tool manufacturers, and this despite the lower wages paid here. This condition is due to the American policy of specializing and to a higher standard of shop efficiency, which so many of our plants have attained. While very few of the German establishments attempt to confine themselves to a few lines of tools, it is common in America to find firms which make only one type of machine tool, and there are instances where only one size of tool has for many years been made.

The American machine tool houses which, for example, are engaged in making boring mills, may be expected not only to turn out a highly specialized tool, but to offer various sizes of this tool in a highly perfected form. Such American establishments can hope to undersell, every day in the year, a firm like a large one here which only occasionally makes, and then to order, a tool of the same type. This fact is recognized by the German firm, and that house will order from America tools of this type for its customers.

The same statement applies to lathes. There are a number of American engine lathes which cannot be produced in eastern Prussia as cheaply as in the American shop; but this alone would not suffice for their sale here did they not possess superior merit. In other words, we owe our ability to excel the foreigner, whenever we do excel him, to superior technical knowledge, and this technical knowledge covers not only the design of the machine, but the shop method involved in its construction.

Business Conditions Different—Failure to Make Prompt Deliveries.

An American tool manufacturer who has a good tool to offer, and is in a position to extend his trade, may calculate at the outset that he can undersell a European manufacturer. This will in general prove true, provided the American is specializing on his tool. He will find, however, when he comes to negotiate the Continent, that business conditions here are radically different from those at home. He may consider it advisable to assign his interests in various districts to local agents. The experience of our manufacturers has been varied in this respect. There are potent reasons why the business should be established by a general manager. It is not necessary that this manager know the language, but it is essential that he employ as assistant manager a man who is not only familiar with the country, but with its commercial law. Very often conditions arise which, if a general manager vested with the necessary authority were on the spot, could be dealt with to the advantage of the home company. A still more important reason is the necessity for having a responsible representative at hand who can appreciate the conditions of the territory. A statement was made recently to the writer by one of the first commercial men in Prussia that American business interests had suffered during the past two years by reason of the failure to make good representations regarding deliveries, and that had been a strong factor in assisting the business of a number of German shops.

Americans Who Lack Knowledge of European Practices.

Some of these latter statements may seem like the very rudiments of business requirements here, but the writer is frank to admit that he has been struck with the apparent ignorance on the part of many machine manufacturers in America, and even men who are presidents of prominent concerns, of what constitutes the latest and most up to date practice in Europe. It is this very lack of knowledge which has probably had much to do with the failure of many American machine houses to accomplish more in the outside world. There is, however, some excuse for this when we consider the great stress under which home firms have been engaged during the past few years in attempting to meet the enormous domestic demand. Under such conditions for many of our houses there has been little incentive to study foreign markets.

In contradistinction to the plan of sending a general manager abroad there is in Prussia one well-known German house which has earned an enviable reputation for the manner in which it has handled American machine tools. This firm has been engaged since 1892 in handling this form of American product, and during the period of 1897 to 1902 did an enormous business. The success of this German house was due both to the local knowledge it possessed of European conditions and its high business integrity. But it is not always possible for every manufacturer to be so fortunate in his foreign connections, and naturally the number of firms which one house can represent is limited.

The manufacturers of large machine tools, such as are required for heavy arsenal work, are feeling the present depression more than the makers of moderate sized tools.

Better Wages—American Tools Needed.

The rate of wages has increased in the German shops in recent years. The average wage paid at one large establishment is, I am informed, 70 pfennigs (about 17 cents) per man per hour, and for the most part the men are working there 9 hr. a day. A first-class man at the lathe is paid about 6 marks ($1.42) a day. The workman is probably of a higher standard in eastern Prussia, and particularly in the Berlin section, than in any other part of Germany, and a higher rate of speed is observable here in shop practice than at any time in the history of German machine tool building. When the German workman learns to use constantly those accurate measuring tools without which an American workman would deem himself lost, then, and not until then, may the former be regarded as a dangerous competitor. The introduction of gauges into Germany, as turned out by some of our best American houses, is serving as a potent means of educating the German workman. There are measuring instruments manufactured here, but I have yet to find that they are recognized as the equal of the best produced in America.

There is very little real competition here on the part of English firms.

The Russian territory will, I am told, shortly offer good selling opportunities, probably earlier than has generally been believed. Well informed circles here declare that there will be business in Russia before many months, and preparations are being made to take advantage of it. All agree, however, that the territory demands a higher degree of local knowledge than any other in Europe. Berlin, it should be understood, generally possesses the earliest and most reliable news from Russia.

Progress of German Ingenuity.

Fifteen years ago the machinery houses of eastern Prussia used many English tools. Now all this is changed, and in lieu of English tools only those of German make are found, with the exception that in the shops doing high grade work a group of American machine tools are used, a tribute to the excellence of the American output. How long this latter condition of affairs will exist depends entirely upon the ability of our manufacturers to keep ahead of foreign designers. Six years ago, when I had occasion to inspect some of these same German shops, I estimated that we were from eight to nine months ahead of the Germans, but now this margin has been reduced.

What concerns American manufacturers vitally is the fact that the Germans are putting more engineering thought into their designs than at any time in the history of tool construction. The mechanical skill still holds in favor of the Americans, and will probably remain to their credit in the case of those American firms which are paying close attention to the drawing room. It is the new establishment that must take heed that when its tools are introduced into Germany every feature of those tools will be the subject of a close scrutiny, and if engineering skill backed up by careful mathematical deductions will make it possible to produce a better machine, the Germans will be among the first to discover the fact. The American firm need not then be surprised if, in a very short time, there is found on the market a similar German tool, possibly American in its original idea, but essentially German in its improved technical form.

The Importance of Technical Knowledge.

We excel the foreigner, whenever we do excel him, by reason of superior technical knowledge. This is the crux of the whole situation, and it is sheer madness for any American firm which proposes to hold its own in foreign competition to ignore technical education. There is a well founded belief here that the loss of English trade in machine tools has been due to this very lack of technical training. Committees of boards of trade in England which have endeavored to ascertain the cause for the English loss of business in machine tools in Germany have ascribed various reasons for this, but the German has summed it up by declaring that it is no longer necessary for him to go to England for superior tools. There are exceptions, of course, to this statement, but in the main the conclusion seems to be right.

At the great Borsig plant at Tegel, near Berlin, I find only American pneumatic tools in use. There are pneumatic tools made in Germany, but there was no hesitancy in stating to me at the Borsig plant that the American pneumatic tools were purchased because they are considered superior to those of German design. How long this will continue is problematical. There seems to be little question that the American pneumatic tool manufacturer can meet the German in prices for some time to come—certainly he can undersell him at present—but it is noteworthy that recent German designs of this form of tool are showing marked improvement.

The firm of A. Borsig at present employs approximately 5000 men. The shop managers have learned wonderfully well how to get the maximum capacity of work out of tools. There could undoubtedly be reductions made in the force employed, but there can be no mistake about the tools working at practically 100 per cent. efficiency. It would be refreshing for some of our American manufacturers, who believe that we alone understand the term "shop efficiency," to take a walk through these shops, and I believe that a glimpse of the workings of this particular plant would cause a realization of what there is ahead of America in foreign competition.

Efficiency of German Machinery.

To be sure, Borsig stands in a class by himself. He is a user of machine tools and not a maker, like the Ludwig Loewe Aktien-Gesellschaft. Borsig demands the highest grade of tools obtainable, and in particular he wants tools which will give him both high grade results and speed. He uses planers, gear cutters, lathes, milling machines, and practically the entire gamut of tools required in locomotive construction, boiler work, &c. His plant fairly bristles with high grade American machine tools, but only those of the best American make. The manufacturer's agent who has a tool of late construction and superior merit to offer should have no hesitancy in going to such a firm, and this statement applies not only to Borsig, but to every other first-class German house; in other words, let there be no misunderstanding on the part of our machine tool makers that the Germans are turning out to-day machinery of a wonderfully high standard. This standard demands high grade tools for its production, and the market exists here for the American machine tool makers who have a superior tool to offer.

To better understand the situation, it must be borne in mind that practically one-half of the machinery production in Prussia is for export. Borsigs state that considerable over one-half of what they produce is for foreign countries, and quite recently this foreign trade has been considerably augmented by substantial orders from French territory. The French have not at all been inclined, for many years, to patronize German houses, but the merit of German production has forced itself even on the French buyer, and, at this writing, Borsig, for example, has in hand a considerable number of locomotives for French railroads.

Probably the greatest danger which the American manufacturer has to meet abroad is enhanced shop efficiency. The Germans are not economical in man labor, but they are learning. They are realizing more and more the possibilities in tools, and in every particular the German workman is improving. I know of the Germans using two men with a gear cutter where the American designer of the tool never contemplated that more than one man should be employed. They know better than this at Borsig's, and there are other German plants which would not be guilty of the same practice.

Learning from America.

On the whole, they do not yet understand, in the great majority of the German shops, how to operate the greatest number of tools with the least number of men. This calls for the highest degree of intelligence and skill, such as is found to-day in the most enhanced form in our best American shops. We have not been giving the German credit for learning in the same line, but he is learning, and is learning fast; and if we propose to keep ahead in shop efficiency, and in our ability to run a shop with the least possible number of men, we must look to the training of our workmen from boyhood up. In some shops the schools for the apprentices are in the shops. These schools are presided over by men who operate the shops. The apprentice works in the schoolroom either early in the morning, when he first comes to work, or at some other hour in the day, and the time devoted to the schoolroom is deducted from his wages. The education of the apprentice is the very antithesis of haphazard. It is on careful and well thought out lines, and always with the one view of developing him into a highly skilled and technically trained workman for the firm where he is employed.

In the issue of *The Iron Age* of March 12 our Birmingham correspondent reported that none of the charcoal furnaces of the South is now in operation. This was an error, as we are advised that the Rock Run Furnace, operated by the Bass Foundry & Machine Company, located at Rock Run, Ala., has not shut down at any time except for necessary repairs since 1892. The management expects to keep the furnace in operation throughout the present year, unless business should become very much worse.

Strength and Endurance of Steel Rails.*

The Watertown Laboratory's Investigations.

BY JAMES E. HOWARD.

In the use of steel rails, as with other materials of construction, interest is directed to the subject of the limiting values of applied stresses, their accurate definition and how closely they may be approached with safety under those conditions of service which pertain to the specific uses of the materials in question. In the constructive arts may be found examples of steel exposed to different kinds of stresses, and in varying degrees of intensity, but it is not recalled where there are instances of greater diversity of action than witnessed in the case of steel rails. The whole gamut of conditions is here present in the same piece of metal, and a feature of unusual occurrence in the use of steel lies in the fact that the stresses are received on so limited an area of contact at the running surface of the rail heads. The feature of intense local pressure between the wheels and the rail is an important one, and one which does not admit of the adoption of those corrective measures which can be applied to other features of the rail question.

Tests have been made on rails at the Watertown arsenal laboratory in earlier years, while at present a series is in progress in connection with the current programme on ingots and derivative shapes. In the present tests the laboratory is working in co-operation with and aided by members of this association and others, which places beyond a doubt the fact that results of great value will be attained.

Loss of Toughness.

Referring to the earlier work of the laboratory, the tests comprised rails of domestic manufacture, some of the early English rails and an example or two of French and German make. Many of these had been in service. Among the features of interest developed by the tests it was shown that rails from the track were generally less tough when loaded so that the head was in tension; in fact they were very brittle when so loaded, and fractured with comparatively little permanent deflection. Upon planing off metal from the running surface of the head the rail was restored to a tough condition and then bent well with either the head or the base on the tension side. Planing off ⅛ in. of metal was sufficient to affect the restoration, but it was necessary to remove all of the affected metal, which included some from the sides as well as that from the top of the head. A restoration in toughness was also accomplished by annealing the rail, without planing off any of the metal.

This loss in toughness is due to the flow of the metal under the wheel pressures. It will, of course, take place promptly and quite easily in the softer grades of steel. From this point of view a soft steel has the advantage of low strength and is not immune from brittleness, notwithstanding the primitive toughness of the metal. The original properties of such steel are apt to be misleading and encourage greater confidence in its ductility than is warranted by its subsequent behavior. It does not follow, however, that the initially harder steels will not also become more brittle at the running surface of the head of the rail, since all grades of steel are probably affected in this manner by wheel pressures as they are now used. It is not known whether present service conditions are such as to enable the metal at the immediate surface of the head of the rail to retain its primitive tensile properties unimpaired until lost by abrasion and wear. In the harder rails the depth of the affected metal is thought to be less than in the softer rails, but still of appreciable depth and influence on the toughness of the steel.

The exhaustion of ductility is due to the relative flow of the metal of the surface of the head with relation to the other parts of the rail, and not per se to the high compressive stress between the wheel and the rail. Other tests have demonstrated that high compressive stresses unaccompanied by relative displacement of the metal does not change the physical properties when subsequently tested by tension. High compressive stresses of this kind may be applied in tests by cubic compression, specimens being immersed and subjected to hydrostatic pressure, such tests having been made with pressures up to 100,000 lb. per square inch.

Lowering the Elastic Limit.

Tests on alternate tension and compression have shown that overstraining in either direction lowers the opposite elastic limit; that is, a load of tension applied in excess of the elastic limit has a detrimental effect on the compressive elastic limit, materially lowering the latter value. Upon making similar tests with steel rails, but loading them transversely instead of by direct tension and compression, it was found that the application of a high load —one causing decided permanent sets—resulted in lowering the elastic limit of the rail when it was reversed in position and loaded in the opposite direction. The reexamination of a rail after the lapse of 14 months' time failed to show a restoration of this disturbed state during the interval of rest. Repeated reversals resulted in lessening the magnitude of the deflection sets, over the first display, an effect which would pass as a stiffening of the rail in common parlance, although the modulus of elasticity of the steel is lowered by overstraining of the metal. Heating the metal to a red heat effected a partial restoration but did not fully return the rail to its original condition as regards the development of sets. The effect on the surfacing of the track from overloading a rail is apparent from these results.

Since the cold straightening of a rail at the time of manufacture is another illustration of loading beyond its elastic limit, similar results to the foregoing are certain to follow. A rail thus straightened is left in a state of initial strain, in equilibrium when without a load but in condition to develop sets in the track upon the reapplication of very moderate loads. The opposing internal strains augment the effects of the wheel loads and facilitate early sets. Surfaces of metal first to cool from higher temperatures are put into a final state of initial compression, and this tends to add to the complexity of the situation in the case of rails.

The lines of magnetic scale which leave the rail in the vicinity of the gagged parts show where the steel has been overstrained locally. Unless the metal is structurally unsound in the paths of such lines, no unfavorable results would be immediately looked for in consequence of the gagging. The number of repeated stresses and their magnitude necessary to cause rupture of the steel would be such as to relieve anxiety as to the early rupture of the rail from this cause, although this action, such as it is, is a detrimental one. While a given effect is more easily produced in a soft steel rail than in a hard one, on account of the difference in strength, yet a slight defect existing in the hard metal is of greater consequence than in the softer metal.

Tracing Causes of Rupture.

Seemingly minor and accidental causes may lead to early rupture. So slight are some which have located rupture (abrasion of the base by a spike, an indentation of the flange by a chance hammer blow) that a larger number of broken rails will be expected, provided service conditions become more severe. It affords aid in judging of the cause of rupture to trace back the line of fracture to its point of incipiency. Fortunately in steel fractures this may generally be done. A well defined nucleus marks the origin of a granular fracture, from which a fan like or radiant structure diverges. It is usually possible also to tell the order in which the fractures occurred, when more than one surface is presented, by inspection of the fractures and noting their appearances as indicated. In this way rail fractures might be exhibited in which the first break detached a moon shaped fragment from one flange, having its origin near the middle of the base, which was followed by a secondary fracture separating the other flange and extending up through the web and then through the head; fractures beginning at one edge of the flange, extending across the base and

* A paper read at the ninth annual meeting of the American Railway Engineering and Maintenance of Way Association, Chicago, March 17-19, 1908. Mr. Howard is engineer of tests at Watertown Arsenal.

thence through the rest of the rail; fractures beginning at a bolt hole and extending each way until the fracture is complete; or fractures having their origin at the running surface of the head and extending downward through the rail.

Service conditions and influences which contribute toward fracture of the rail have been mentioned in the preceding remarks, and among them one of the most important is that of flow of the metal under the wheel pressures. Whatever may be done to strengthen the rail in other respects, the fact still remains that the load is applied on a very limited surface of contact. This obstacle is insuperable, and imposes a limit on the magnitude of concentrated wheel loads.

Structural Defects.

The influences which have been enumerated tend to develop fractures in rails structurally sound and having good physical properties, but it is recognized that rails are not always free from structural defects, although they may be in possession of satisfactory tensile properties. Some of the structural defects are of a serious character and apparently have led to a considerable number of rail fractures in recent years. It has been found in a number of rails examined that longitudinal streaks are present in both the head and in the base, streaks of a different color from the adjacent metal, as they appear when etched with tincture of iodine. Some of the streaks are several feet long, others a few inches or only a fraction of an inch in length. The streaks are of different widths, from a few hundredths of an inch to upward of an eighth of an inch, and not infrequently have a fine hair line or crack along the middle of their width. The cracks are commonly short, less than an inch in length, and in depth penetrating the metal but a few hundredths of an inch. They are in some rails quite numerous, and in planing the metal away for purposes of examination new hair lines appear in succession as those first in view are planed away. The steel fractures, without elongation, when ruptured by stresses applied at right angles to the direction of the cracks. That the streaks represent lines of weakness there is hardly a doubt, and their elimination if practicable is desirable and would be of advantage to the rails. The development of moon shaped fractures may be traced to streaks or hair cracks in the rail at or near the surface of the base. Deep interest attaches to the ascertainment of the causes of these lines of structural unsoundness or lack of continuity and by what means they may be avoided, if such is possible.

The presence of these streaks and fissures is not a matter of recent occurrence. They are found in rails of early manufacture, and even more pronounced than is generally the case of rails of current make. The examinations of a number of rails of early English manufacture show streaks and fine cracks present. They have been found in rails of domestic make from different mills and from a sufficient number to establish their universal character. It does not seem to be the case, however, that all rails from the same mill are equally affected. There are wide differences among them, although it may be difficult to find those which are strictly sound throughout.

It may safely be said that there is urgent need of information, to be developed in a connected manner from the state of the metal in the ingot through each successive stage to the finished rail. In this inquiry all the metal from the several ingots comprised in the series of tests should be available for examination. This has reference to the metal usually discarded from the ingot, and to crop ends of the rails, which should be comprised in the tests as well as the portions of the ingots made use of in the rails. These rail tests are comprised in the general series on "Ingots and Derivative Shapes," previously mentioned, in which the laboratory was aided by a committee of engineers.

Discussion.

The above paper was read in the absence of the author by J. P. Snow, bridge engineer of the Boston & Maine Railroad. Mr. Snow also presented a number of lantern slides, six of which are reproduced herewith, and are the result of current work of the Watertown laboratory. In Figs. 1-4 defects which in the rail appear as longitudinal streaks first show in the bloom in an irregular ring about half way between the center and the outer surface, and can be traced through the various processes of rolling to the finished rail. Mr. Snow gave the following description of these views:

In the section of an 8 x 8 in. rail bloom (Fig. 1) the spotted circle of darker marking will be noticed. This



Fig. 1.—Cross Section of an 8 x 8 In. Rail Bloom, Rolled from an Ingot 20 In. Square.

bloom was reduced from an ingot about 20 in. square. A section of the ingot reduction was examined, but no markings such as are shown on the blooms were brought out upon etching it. The two succeeding cross sections of rails (Figs. 2 and 3) show subsequent stages in the reduction of a portion of the same bloom in the roughing rolls, the markings becoming a little more pronounced in the later than in the earlier pass. The cross section of a

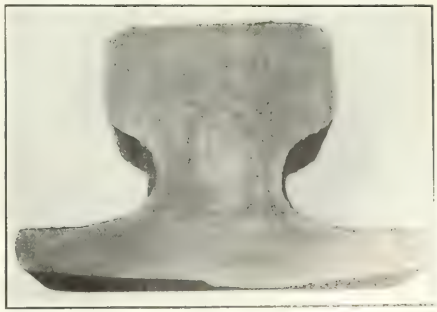


Fig. 2. Rail from an Ingot [illegible] Bloom Shown in Fig. 1.

finished rail from the same ingot (Fig. 4) shows the familiar lines often witnessed in rails.

Fig. 5, showing the head of a modern rail, illustrates the white streaks which occur so commonly in rail steel. Along the middle of the width of some of these streaks hair lines or cracks are evident, in which there is plainly a separation of the metal. In all the white streaks that I have examined with a high power microscope I have found cracks at some points of their length. A well defined crack will usually be found pinching out to a series of very short cracks, exactly in line, but perhaps only a few hundredths of an inch long. After these there may

occur clusters of small holes, four or five together, so small as to be hardly discernible with a magnification of 200 diameters. Following this the white streak will be in evidence, looking under the microscope like a pathway strewn with light colored gravel, not very well



Fig. 3.—Same Rail as in Fig. 2, After Further Reduction in Roughing Rolls.

spread. There will frequently be seen clusters of white metal similar to a shovelful of gravel dumped in one place. At the sides of the streak white specks will appear like the scattered gravel of a walk at its edge, and at one point I observed a plumelike spray branching out from one side of the streak, looking for all the world like a shovelful of gravel, spread in a curved line outside of the line of a walk. The white specks are not rounded like gravel, but seem to be little chips, which might be cut by the polishing grit and caught on the fibers of the adjacent steel. The white metal looks as if it was softer than the ordinary metal surrounding it. This is not proved, but is only an appearance.

Fig. 6 shows the streaks in the head of an early rail, made by the Landore-Siemens Company. These streaks



Fig. 4.—Finished Rail from the Same Ingot as the Bloom and Pieces Shown in Figs. 1-3.

appear to be of the dark variety and of a broken character, which will not cause a break or crack to develop as easily as is the case in the modern rail, in which the streaks are continuous and of a lighter color.

Flange Breaks and Split Heads.

Mr. Snow then exhibited a piece of rail, on the head of which the longitudinal section was made as shown in Fig. 5, and commented as follows on the causes of rail breakages:

White streaks appear in the deeper cuts (the specimens had been planed to different depths), but they are generally not in line with those above, showing that they are diffused throughout the metal. As we get deeper into the metal, however, white streaks become scarce and finally disappear, but in this particular specimen the deeper cuts show dark streaks. These are not so definite in their widths as the white streaks, but they penetrate the metal somewhat deeper and show in the end section of the rail, whereas the white streaks do not show in this location. White streaks with their accompanying cracks lead to flange breaks and perhaps to split heads. Dark streaks appear to be the result of segregation and lead to crushing of the head. In addition to these two kinds of streaks there is another defect which is not in evidence on this specimen, but is very common in the rails rolled during recent years. I have previously called the cracks found in white streaks "gas seams." I called the defects which I am now describing "rolling flaws." The cracks of the gas seams are strictly parallel to the rolling and straight. The plane of the cracks is also at right angles to the surface of the metal. The seams called rolling flaws are parallel to the rolling in a general way, but are usually somewhat crooked. They are similar to the flaws called snakes in plates, but in the case of rails they are practically straight. The planes of these seams are generally inclined to the surface of the



Fig. 5.—Streaks on the Head of a Modern Rail.

metal, and their sides are fluted and usually of a bluish color, similar to mill scale, indicating that they were oxidized while the metal was hot.

The crescent fractures I have examined have almost all shown their origin to be one of these rolling flaws, although occasionally the origin seems to be a gas seam, but my observation leads me to think that by far the larger number of recent breaks are due to seams of the rolling flaw type. The older rails which have been examined, while they show plenty of white and dark streaks, do not exhibit the defects which I call rolling flaws, this undoubtedly accounting for the greater prevalence of flange breaks and split heads in rails of recent make. In view of the facts that all of the crescent breaks which I have examined—and that is a good many—it has always been possible to discover a manifest flaw from which the break started; and from the fact that Mr. Howard in his paper claims that this class of breaks is due to seams which are in the rails when they leave the mill, I claim that the case is fully proved that flange breaks and perhaps split heads are due to incipient flaws existing in the rails when purchased. It is a remarkable fact that the rail tests prescribed in our specifications do not in any way tend to develop these defects. I wish to recommend that tests be prescribed, which will show whether these flaws exist or not.

Gas Seams and Shrinkage Cracks.

Perhaps I ought to rest my case here, as it is all that has been fully proved. The temptation is strong, however, to make guesses at what causes these defects. I stated in a paper printed in Bulletin No. 93 that in my opinion the flaws here called "gas seams" were due to gas bubbles in the ingot. I still think so, but the flaws

which I call rolling flaws appear to me to be due to shrinkage cracks, or checks in the ingots, or tears in the bloom, and perhaps the gas holes are so near the surface of the ingot as to burst out to the outside in the soaking pit, due to softening the metal, or afterward to the pressure of the blooming rolls.

If we go a little farther and try to investigate the cause of gas bubbles in the ingot, we get on more uncertain ground. Professor Howe of Columbia University claims they are largely due to mechanical action, the shrinking of the interior of the ingot tending to cause tension in the plastic metal, thereby relieving the pressure and allowing the evolution of gas. The metallurgist of the Illinois Steel Company, Mr. Von Maltitz, in a paper read before the London meeting of the American Institute of Mining Engineers, claims that they are wholly due to chemical and thermic action. Both of these investigators prescribe means of lessening the difficulty. As to the cause of the cracks, &c., which lead to rolling flaws, the remedy is self-evident. Chipping ingots and blooms, as was formerly done, will remedy the shrinkage cracks, checks and gas holes. Less severe reduction in the blooming and roughing rolls will obviate tears, provided the metal is not unduly hot, short from excess of oxygen or sulphur. Mr. Howard is on the trail of these defects. We ought to encourage him all that we can to trace them to their origin, whether it be in the rolling, the ingot, the ladle or the bath.

Wm. R. Webster, referring to the calling in of a number of engineers to assist in the investigations at the Watertown laboratory, said that the whole matter was brought up originally by a report of Mr. Howard to the Ordnance Bureau, suggesting an investigation of this kind, and asking for a larger appropriation. The appropriation for this year's work is about $35,000, or about twice the amount received before. Two committees have been appointed, one on compression members and the other on ingot structure, blooms and billets. Both have

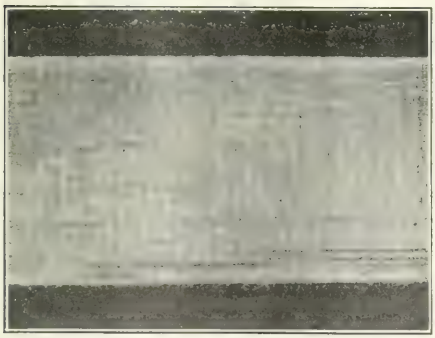


Fig. 6.—Dark, Broken Streaks on the Head of a Landore Siemens Rail of Heavy Manufacture.

their work under way. Railroad engineers and some steel manufacturers are co-operating, the latter freely furnishing samples of their material, including ingots and finished products.

The Association of Swedish Iron Works finds that the exports of iron and steel from that country in 1907 were 398,700 tons, or 1800 tons less than in 1906. Bars showed the highest total, 154,200 tons, a decrease of 40,200 tons. The pig iron total was 129,000 tons, an increase of 17,600 tons. The production of pig iron in 1907 amounted to 603,400 tons, or 8200 tons in excess of 1906; that of billets, blooms, &c., was 588,300 tons, or 23,000 tons increase. The average production of the past 10 years has been: Pig iron, 533,200 tons; blooms, billets, &c., 500,500 tons. These are all metric tons—2204 lb.

Parker V. P. Dodge, Pittsburgh representative of the Youngstown Car Mfg. Company, manufacturer of industrial cars, is now permanently located in Room 406, House Building, Pittsburgh, Pa.

Canadian Mineral Output in 1907.

TORONTO, March 21, 1908.—The Canadian Department of Mines has issued its preliminary report on the mineral production of Canada in the calendar year 1907. It shows that the total value of the Dominion's mineral output in that year was $86,183,477, as compared with $79,057,308 in 1906. The metallic products were valued at $42,434,087. Included in the total for 1907 are the following items:

Product	Quantity	Value
Metallic.		
Antimony, ore, tons	2,016	$65,000
Copper, pounds	57,381,746	11,478,644
Gold	...	8,264,766
Iron ore exported, tons	25,901	45,907
Pig iron from Canadian ore, tons	107,599	1,982,307
Lead, pounds	17,565,000	2,532,856
Nickel, pounds	21,189,793	9,535,407
Silver, ounces	12,750,044	8,329,221
Cobalt, zinc and other metallic products	.....	200,000
Non-metallic.		
Asbestos, net tons	62,018	2,482,984
Asbestic, net tons	28,519	22,059
Chromite, net tons	7,196	72,901
Coal, net tons	10,510,961	24,560,238
Peat, net tons	50	200
Corundum, net tons	1,892	177,922
Feldspar, net tons	12,584	29,809
Graphite, net tons	579	16,000
Grindstones, net tons	5,382	46,876
Gypsum, net tons	475,508	642,470
Limestone for flux in iron furnaces, net tons	359,503	298,097
Mica, net tons	.....	333,022
Natural gas	.....	748,581
Petroleum, barrels	788,872	1,057,088

Besides the pig iron from Canadian ore, whose aggregate quantity and value are given in the foregoing table, there is the much greater production of pig iron made from imported ore. This is shown in a footnote to amount to 544,363 net tons, valued at $7,142,919. The imported ore thus worked up in Canadian furnaces came from the Lake Superior District of the United States and the Belle Island mines of Newfoundland. Small though it still is, the output of pig iron made from Canadian ore is about 2¾ per cent. greater in quantity than it was in 1906. The new furnace at Port Arthur ran almost exclusively on domestic ore. The total shipments of iron ore from mines in Canada in 1907 were 310,996 net tons, valued at $662,441 at the mine, as compared with total shipments of 248,831 tons, valued at $589,206, in 1906. In 1907 Canada exported 27,453 net tons of iron ore to the United States. As has been shown, the total production of pig iron made in Canadian furnaces from domestic and imported ore was 651,962 net tons, valued at $9,125,226. This quantity is 9 per cent. greater than the output of 1906. Ferro-products, made in electric furnaces, are not included in this aggregate. Charcoal was used as fuel in the production of only 10,047 tons, coke being used in the smelting of the remaining 641,915 tons. The amount of Canadian ore, including mill cinder, &c., used in the Canadian manufacture of pig iron was 244,104 tons, and the quantity of imported ore used was 1,117,260 tons. The total amount of coke used was 847,150 net tons, valued at $3,383,223. Of this quantity 520,068 tons, valued at $1,652,125, was made in Canadian ovens. The figures relating to the pig iron production were obtained directly by the department from nine companies operating 16 furnaces. Returns from seven companies making steel showed a total output during the year of ingots and castings amounting to 706,982 net tons, valued at $16,612,590. Of this quantity 685,229 tons was in ingots and 21,753 tons in castings. Of the ingots made 225,989 tons was Bessemer steel and 459,240 tons open hearth. All but 1151 tons of the castings was open hearth steel. The total bounties paid on iron and steel during the year were as follows:

	Tons.	Bounty.
Pig iron, made from Canadian ore	95,914.97	$201,421.47
Pig iron, made from imported ore	537,803.45	591,583.80
[illegible]	673,718.42	$793,005.27
[illegible]	666,580.87	$1,099,858.37
Steel wire rods	68,738.22	412,417.26
Total bounty paid on iron and steel	.....	$2,305,295.90

Metallic products to the value of $14,592,118 and non-

metallic $10,033,600, making a total of $24,625,718. The gold produced was valued at $66,399; silver, $5,927,858; cobalt, $92,751; nickel, $2,271,616; copper, $1,045,511; iron ore, $471,126; pig iron, $4,716,857. C. A. C. J.

Harbor Improvements at Cleveland, Ohio.

As the volume of ore, coal and grain carried by the Great Lakes has steadily increased in the last few years, larger vessels have been found necessary. The majority of those now in use are more than 600 ft. long, and the harbor facilities at the principal lake ports are no longer adequate to accommodate them. Among the cities which have taken steps to improve and develop the internal harbor systems afforded by the rivers is Cleveland, Ohio, at the mouth of the Cuyahoga River. Improving this river means not only conserving vested interests, but developing the entire valley of the river into advantageous and economical sites for manufacturing industries and railroad terminals.

The Cuyahoga River pursues a very winding course for several miles through the heart of Cleveland. It has only one branch, known as the Old River Bed, which runs westerly for about a mile from a point a few hundred feet inside of the harbor mouth. The river originally was narrow, shallow and crooked, but has been widened, deepened and straightened, and projects are now pending that will remove the remaining natural obstructions in the course of the stream.



Fig. 1.—The 230-Ft. Span Scherzer Rolling Lift Bridge for the Baltimore & Ohio Railroad at Cleveland, Ohio.

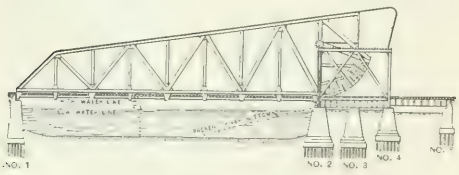


Fig. 2.—Elevation of the Bridge, Showing the Method of Rolling the Counterbalanced Structure.

The provision of movable bridges has naturally been an important consideration, and more than 20 highway and railroad bridges now span the river. These structures were originally nearly all of the center pier swing type, and for the most part hampered the passing of large vessels. A number of these have now been replaced by rolling lift bridges, which leave the channel unobstructed. Such a one is that recently substituted by the Baltimore & Ohio Railroad Company for its bridge across the Old River Bed on the line of West River street. It is a long span single leaf Scherzer rolling lift bridge and was completed and placed in service a few months ago.

This bridge, shown in Fig. 1, replaced a swing bridge used by the railroad company for many years to reach the extensive ore docks on the north side of the river. The old bridge had its center pier on the west side of the river, with an approach extending well out into the channel on the opposite side. In the new structure the main supporting piers on which the bridge rolls are placed on the east side of the river, with the front or rest pier on the edge of the far side of the channel, making the entire width of the river available for navigation. A particular advantage of the rolling lift bridge is that it makes available all dock space adjacent to the bridge; the disadvantage of the swing bridge in this respect is especially apparent when the main pier is located at one side of the channel, as it was in this instance.

An elevation of the new bridge is shown in Fig. 2. The bridge carries a single track and has a movable span measuring 230 ft. from center to center of bearings, the longest span single leaf bascule bridge in the world. The clear channel for navigation, measured between faces of piers, is 210 ft. The total length of steel work, including the short plate girder fixed approach span at the rear end of the bridge, is 334 ft. The width is 20 ft. from center to center of the trusses, and the minimum clearance above the ties is 22 ft. The counterweight is of Portland cement concrete carried in steel boxes in the plane of each truss, the bridge being counterweighted so as to be at rest in all positions.

The bridge is operated by two 75-hp. alternating current electric motors. In the operator's house are placed the controller governing the motors and an independent switch which operates the solenoid brakes on the motors. As may be seen in Fig. 2, the power is applied in the operation of the bridge by pinions on the main operating shaft engaging with fixed racks placed on independent supports outside of each truss. Indicators in the operator's house show all positions of the bridge during operation and also the positions of the end latch. Signals are placed at each end of the bridge, interlocked with derailing switches and with the end latch and main operating controller, so that the bridge cannot be operated until these signals have been set at "danger" and the derailing switches opened.

The substructure consists of one front pier, three main piers carrying the track girders on which the bridge rolls, and an abutment supporting the rear end of the plate

girder approach span. These piers are of concrete carried on piles. The bridge was erected in its open position without interfering with the railroad traffic over the old swing bridge or the opening of that bridge to pass vessels. The front pier of the new bridge was constructed under the old swing span on the channel side of the center pier. The main piers of the new bridge were built under the approach to the swing, the superstructure being erected on these piers so as to provide ample clearance for the operation of trains over the old bridge at all times.

The bridge was constructed under the superintendence of J. E. Greiner, assistant chief engineer of the Baltimore & Ohio Railroad Company. The design was prepared in accordance with the railroad company's specifications for material and workmanship for steel structures and the design and erection of bridges. The design of the superstructure, operating machinery and electrical equipment was the work of the Scherzer Rolling Lift Bridge Company, Chicago, which company also maintained a general consulting engineering supervision over the construction and erection of the bridge. The substructure was designed and built by the railroad company. The contract for the superstructure was executed by the King Bridge Company, Cleveland, and the erection of the steel work by the Pittsburgh Construction Company.

The Proposed Advance in Freight Rates.

BY E. I. ARDREY.

Railroad traffic managers are practically unanimous in disapproving of the contemplated horizontal advance in freight rates, and it is understood that the carriers will proceed very cautiously in the readjustment of their tariffs. Packing house products and some other commodities are slated for an immediate advance, but the only important branch of the iron trade that is affected thus far is the cast iron pipe interest. The traffic experts of the railroads express privately the opinion that a general advance at this time in all rates would have a tendency to check the recovery of trade, and it is probable that a general readjustment will be deferred until late in the fall or early winter.

Until a few years ago it was a custom of the railroads to give "discounts" from their rates, especially on commodity freight, whenever trade depression left them with large numbers of empty cars on their hands. There was more or less abuse of this practice of discounting rates, but the primary reason for it was the desire to fill empty cars and encourage the movement of traffic. In the past 10 years freight traffic has grown so rapidly that the reason for giving rebates or discounts disappeared, but the old-time traffic managers make no secret of the fact that if the laws had not become so rigid they could do much to-day to promote the recovery of business by making rates that would encourage the industries of the country. The railroads never had so many idle cars and locomotives on their sidings as they have had the past winter, and the advocates of the proposed advance in rates will have difficulty in overcoming the objections of their traffic experts.

New Methods of Rate Making.

When this general readjustment takes effect the shippers of the country will have an opportunity to get better acquainted with the new method of rate making which the railroads have adopted, with the approval of the Interstate Commerce Commission. Heretofore a large shipper of iron or steel or any other commodity has often been able to defeat a proposed advance by getting some one of the competing lines interested to stand by him by maintaining the old rate. The new rate would fail if any one road decided not to file the proposed advance with the commission, unanimous agreement by the competing lines being necessary. The new method of rate making may prove somewhat bewildering to shippers who rely upon past experience.

Under a plan approved by the commission competitive rates are now filed by joint agents, who represent all the roads in their respective districts. The Hepburn law gives the commission power to prescribe the manner in which a railroad shall "concur" in the through rates of its connecting lines, and the commission has ruled that no through rate can be accepted until all the roads interested have concurred through their agents. Each railroad must give a power of attorney to one agent, through whom all its tariffs and concurrences are filed. The commission has taken the view that it simplifies the rate situation to have all the roads in a district appoint one man as their joint agent. The railroad which has given power of attorney to a joint agent can no longer file tariffs or make rates independent of his authority, as the commission refuses to accept such tariffs. The "pirate" railroad is effectually brought under control by this new system, as it cannot participate in through rates to or from points beyond its own rails, unless it concurs in the harmonious plan which the commission has indorsed to simplify through rates.

The Traffic Manager Should Be Rate Maker.

The tendency of the times is in the direction of taking the rate making power out of the hands of the traffic manager of the railroad. This tendency should be resisted by shippers and every one interested in the development of industries. The broad-minded traffic manager should be the best friend of every industry on his road. His primary duty is to promote tonnage, and he can only do this by making rate adjustments that enable the industry to grow. He is a traffic builder rather than a manager, and the marvelous growth of industries in this country is due in no small measure to the fact that, until the present time, railroad rates as a rule have adjusted themselves automatically to the needs of industries. The railroad builder has performed wonders in leveling mountains and overcoming other natural barriers to trade, but the traffic manager has performed an equally great service to the country in leveling rates. After all, it is not the physical structure of the railroad but the rate that moves business.

Political and financial influences, although antagonistic to each other, are both seeking to destroy this automatic adjustment of transportation cost. A railroad should devote all its energies to the work of carrying freight and passengers. Too many roads are overburdened with sins of the financial world which they are expected to bear, and if they must also carry elections and all the political theories that may confront them the industrial shipper will be unable to get the fair consideration for his interests which he has received in the past.

A Southern Foundry for High Grade Small Castings.—Harry Wallwork & Co., Birmingham, Ala., commenced in May last the manufacture of light and medium sized soft gray iron castings. Mr. Wallwork was for several years one of the managers of the firm of Henry Wallwork & Co., Manchester, England, which was established by his father about 75 years ago. That firm from its beginning secured a high reputation for the production of perfect castings, and this standing it still maintains. In the works at Birmingham Mr. Wallwork is following the same methods for the making of the best possible castings, which have proved so successful at Manchester. The location is considered exceedingly favorable for operating a foundry on this class of work.

The New York Central Lines has signed contracts with the American Locomotive Company for the purchase of 138 locomotives, all of which will be delivered during the summer months. Payment for these locomotives, the cost of which will approximate $2,600,000, will be made in equipment trust bonds which the American Locomotive Company has agreed to accept in lieu of cash. This is the largest order received by locomotive builders for several months. It includes 12 electric engines for use on the New York City terminal.

By an error in the telegraphic transmission the 24-hr. record at the Ensley, Ala., rail mill of the Tennessee Coal, Iron & Railroad Company was given in our issue of March 19 as 1525 tons. It should have been 1425 tons.

Massachusetts Ball Bearing Exhausters.

In a line of exhausters, examples of which are shown in Fig. 1, now being manufactured by the Massachusetts Fan Company, Watertown, Mass., the wheels are supported on ball bearings of the Chapman double ball type, with single ball races. Case hardened cups are forced into the hanger and case hardened cones are forced on tapered parts of the fan shaft, as may be seen in Fig. 2. Between the two run hardened steel balls separated by small ball idlers carried in light steel floats, as plainly shown in Fig. 3. The function of these floats is to keep the idler centers in line with the centers of the adjacent larger balls. These idler balls rotate in the opposite direction from that of the load balls, thus eliminating the destructive grinding action of the latter. The shaft may be readily driven out through the fan wheel, pulley and bearings, easily breaking the taper contact between the shaft and inner sleeve. The bearings are packed in vaseline when shipped from the factory and require no attention except repacking about every six months. To detect any defective parts each bearing is subjected to severe running load tests under pressures measured in tons. Such bearings have been run for months under various conditions without showing wear or deterioration.

This type of fan possesses many advantages over older forms. In the smaller sizes the bearing supports form a part of the hanger, making a very compact and rigid combination, while insuring alignment of the fan shaft. Freedom from the necessity and expense of oiling is also secured. Such fans may be placed in unprotected places without collecting dirt and dust, due to escaping oil. Journal friction has been almost entirely eliminated. If necessary the different parts of the bearing may be readily dissembled for inspection or replacement. The smaller sizes are made so they may be set to discharge in any direction. The purchase of a new fan or even a change of hanger is thus obviated. These fans may be made either right or left hand or inverted without reference to the bearings, for which special oiling arrangements would be required in other types. The same hanger is used on both single and double exhausters.

Comparative tests indicate the superiority of the ball bearing fan over one fitted with plain babbitted bearings. A summary of such tests shows a decrease of about 10 per cent. in the power required below that necessary with the older type. Curves of the tests are given in Fig. 4. To provide against misleading results in these tests both fans were previously run for several weeks, so that they represented ordinary conditions. Such economy in favor of the ball bearing fan shows an approximate annual saving of 25 per cent. of the purchase price of the fan.

The convertable type, with bearings formed in the hanger and with overhung wheel, is made in sizes up to and including 60 in. in diameter of shell. In larger sizes the ordinary form of casing construction is employed and the bearings are of necessity constructed as independent boxes to be bolted on to the supports. In the larger fans the bearings each contain two ball races instead of one, as in the case of the smaller sizes. Two case hardened cups are forced back to back into a circular containing

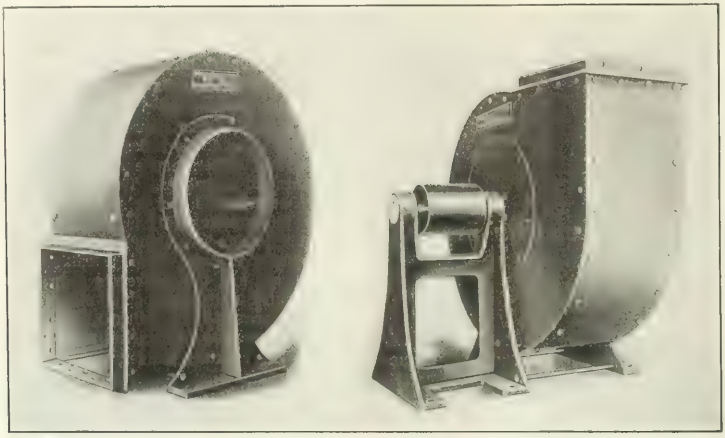


Fig. 1.—Two Settings of the Convertible Ball Bearing Exhauster Built by the Massachusetts Fan Company, Watertown, Mass.

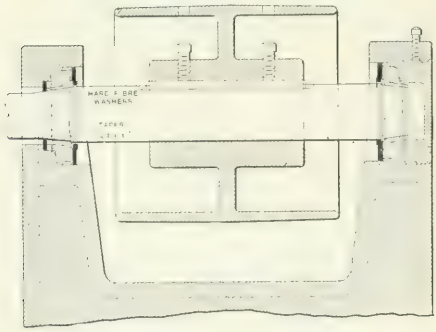


Fig. 2.—Vertical Longitudinal Section Through the Driving Pulley and Ball Bearings.

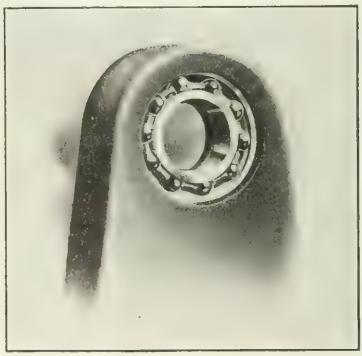


Fig. 3.—End View of a Bearing with the Ball Races Exposed.

ring; a sleeve is placed at the middle, upon each end of which is forced a case hardened cone. The whole, including balls, is held on pivot centers of the ball and socket type, by which self-alignment is secured. The bearings, each of which is entirely independent of the fan, are bolted to cross bars, supported by angle iron uprights, both securely riveted to the fan sheet. The fan shaft is slipped through the sleeve.

In both types the balls are protected from dust by easily removable washers. There is no leakage of oil, no pollution of air by odors of heated oil and no soiling of

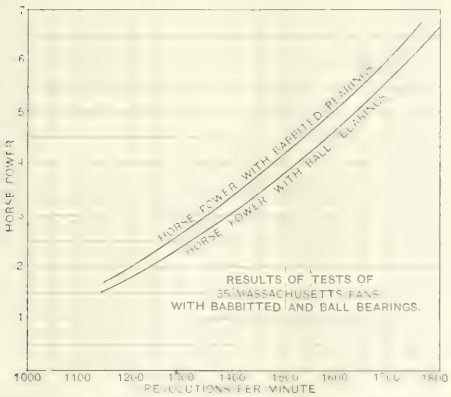


Fig. 1.—Curves from Comparative Tests of Ball Bearing and Babbitted Bearing Fans.

surfaces with which the oil may come in contact. The fire risk incident to dripping bearings and collected lint is eliminated. The fact that a well tried type of bearing of established standing has been adopted insures freedom from the troubles often common to the somewhat experimental stage of development of a new design.

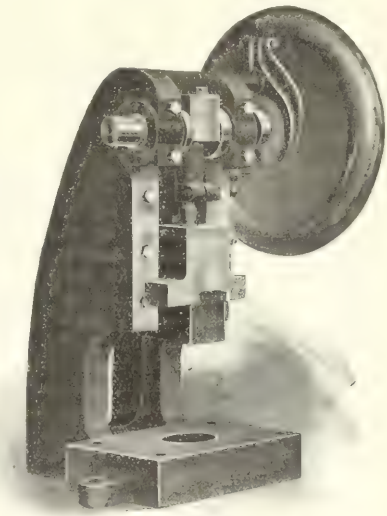
A New Measuring or Lineal Counter.—The C. J. Root Company, Bristol, Conn., manufacturer of counters, has brought out a new type of the instrument known as a measuring or lineal counter, the function of which is to measure and compute the output of a machine by feet or yards. It has neither lever, key nor springs, being run by gears entirely, the figures moving at the proper time. A shaft extends through the back on the right hand side, connecting with a roll for measuring cloth, paper, wire or other product. The roll is designed to be attached to the shaft, a foot or yard in circumference, as the standard of measurement requires. The device counts to 1,000,000. Its dimensions are 9½ in. long, 2¾ in. wide and 1¾ in. thick. The figures are ⅝ in. high. Its shipping weight is 6 lb.

The Westinghouse Air Brake Company has within the last three years completed the development of an entirely new type of brake for freight, passenger and locomotive service which has proved so successful that many of the larger railroads have not only adopted it, but made it standard in all their rolling stock. This new brake can stop a freight train of 100 cars as quickly as the old form of brake would stop a 50-car train. At the works of the company in Wilmerding, Pa., a number of extensive improvements, which were made necessary to facilitate the manufacture of the company's increasing product, have lately been completed. The company is therefore in a better condition than ever to cope with the demand made upon its manufacturing capacity. When the railroads are again ready to extend their operative facilities, which must surely occur, this plant will be in good condition to render prompt service.

The United States steel derelict destroyer Seneca was successfully launched at the yards of the Newport News Shipbuilding & Dry Dock Company March 18. It is the first craft of that type ever constructed anywhere in the world, and was specially designed by the engineers of the revenue cutter service. The vessel will be completed in July, and its mission will be to patrol the north Atlantic coast and destroy derelicts and other wreckage.

A New Atlas Power Press.

The power press shown in the illustration is built by the Atlas Machine Company, Waterbury, Conn., and is designed to take the place of the ordinary foot press, in doing light blanking, perforating, riveting, forming and closing. Its clutch mechanism is so designed that but one revolution of the shaft can be made for each depression of the treadle, the clutch being of the standard Johnson type usually employed for this purpose. The frame is of the open back type, heavily ribbed to secure ample rigidity. The gate is long, with standard V-shaped ways, well gibbed to secure alignment of the punch and dies. A downward adjustment of 1½ in. is provided by means of a clamp sleeve and a screw connection of the



The No. 1 Bench Power Press Built by the Atlas Machine Company, Waterbury, Conn.

ball and socket type, the ball and socket being set in the gate. The gate is finished plain, or with projections for stripper attachment, as shown in the engraving. It is also furnished with dovetailed punch block.

The shaft is turned from solid stock and is made large and long in its bearings, and is extended beyond the left hand side of frame to drive the slide, feed and knockout attachment. The front of the bed is machined so that attachments may be put on when desired. The machine is furnished with the ordinary balance wheel, turned to serve as the pulley, or with rounded hand wheel, as shown, with a 9-in. pulley cast on its side, this being the type which the company regularly furnishes unless otherwise specified.

The press is built in two sizes, known as the No. 1 and No. 2. The former has a hight from the bed to the gate in its lowest position of 6 in., a stroke of 1½ in., a distance between uprights of 3⅝ in., a bed surface of 7⅜ x 10 in. and an opening in bed of 3 in. The flywheel weighs 60 lb., and the press complete 265 lb. In the No. 2 machine the hight from the bed to the gate is 7 in., the stroke 1½ in., the distance between the uprights 6 in., the bed surface 8¼ x 12 in., the opening in bed 3 in., and the weight of the wheel is 60 lb., and that of the press complete 325 lb. The speed for both sizes is 250 rev. per min.

THE IRON AGE

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Canadian Politicians and Canadian Limitations.

Canadians would be saved much perturbation due to the excessive zeal of the propagandists of the "made in Canada" movement, if those who make or lead public sentiment would but master the broad facts of industrial economy and become acquainted with the limitations as well as the capabilities of the existing iron and steel plants in the Dominion.

Parliament at Ottawa has recently been in a commotion over the fact that the steel for the barrels of the rifles made at the Ross factory in the city of Quebec is imported from Pittsburgh, and that the drop forgings are imported from Hartford. The Government insisted on a rifle for the Dominion militia, which should be made in Canada. As far as was practicable, the Ross factory lived up to the conditions of this "made in Canada" contract; yet notwithstanding that the Department of Trade and Commerce is paying out bounties to the amount of $2,500,000 a year to the iron and steel plants of Nova Scotia and Ontario, the fact does not seem to have been known at Ottawa that there is not a plant capable of making steel for rifle barrels anywhere within the Dominion. Had this been generally known, there could have been no commotion over the Ross rifle.

About the same time that Ottawa, Montreal and Quebec were in a newspaper provoked hysteria over the importation of American crucible steel and drop forgings, it was discovered at Windsor, Ontario, that the steel that is going into the international tunnel under the Detroit River is from American plants. There was immediately a "made in Canada" flare up at Windsor. Telegraphic connection between Windsor and Toronto is good. Night press tolls over the telegraph wires are low. Accordingly, the hysterics at Windsor spread as quick as lightning eastward to Toronto, and went on eastward to Ottawa, where, like the "made in Canada" commotion over the American made parts of the Ross rifle, it eventually flickered out. Had there been a news editor in the Toronto daily paper offices who was acquainted with the fact that there is not a plant in Canada at which structural steel of the size and weight necessary for the Detroit tunnel can be made, the scare would have stopped at Windsor.

Only a few days before the Ross rifle commotion the House of Commons gave up a night to discussing the imperative need for tonnage bonuses for Canadian shipbuilders, and filled up an issue of Hansard with "made in Canada," and otherwise patriotic talk of the hardships of Ontario shipbuilders, who are only partially within the tariff breastworks, and who at that time were not on the Government bounty schedules. All the talk was of the capabilities of "iron" shipyards on the Ontario shores of the lakes, and not a man among the whole crowd of politicians seemed to be aware of the fact that iron ships are long ago of the past; that Canadian shipyards never went through the iron stage, and that iron ships never have been and never will be built in Canada.

Eight or nine years ago four large blast furnaces were built at Sydney, Cape Breton, and by the summer of 1905 a rolling mill for the manufacture of steel rails had been added. The story of the plant at Sydney was widely published; for the plant is a political one, and the bounty enactments and the tariff were amended in the interest of the rail mill there. Notwithstanding the nature of the plant, the municipality of Sydney concluded that a steel shipyard was a necessary adjunct of a mill, like that which was to be built, and long before the four furnaces were in blast it was out with an offer of a heavy bonus to secure the establishment of such a yard on the shores of the harbor. The popular idea was that structural steel and ship plates were to be produced by the Sydney rail mill, and that it was contrary to the "made in Canada" idea to allow this material to be shipped elsewhere. This popular idea of what a steel plant could be made to do quickly spread to the Provincial Legislature at Halifax and to the municipal councils of that city and Dartmouth, a city on the other side of the harbor from Halifax. All three of these representative bodies, actuated by the "made in Canada" sentiment, pooled their treasuries, with the result that for three years there has been a free location, an exemption from taxation and $300,000 of Provincial and municipal money awaiting a promoter who will bring about the installation of a steel shipbuilding plant at Dartmouth. The foundation for the project was that, as Nova Scotia had blast furnaces and a rail mill, if a shipyard was established at Dartmouth it would only be necessary for its superintendent to telephone to Sydney for whatever he might require for ship construction.

The "made in Canada" propaganda, now of seven years' standing, and a valuable political asset as far as Canadian manufacturers are concerned, like the immigration propaganda, is never permitted to flag. It keeps the press and the politicians of the Dominion keyed up and in a highly excitable condition. There can be no end to the frequently recurring commotions and the worry they inflict on the politicians at Ottawa, until a few of the politicians and daily newspaper editors in the Dominion make themselves acquainted with the fact that while at this stage of Canadian industrial development there are some things that Canada can do, some for the present must be done elsewhere. The Government at Ottawa is doing much for the iron and steel industry. It has bestowed $12,000,000 or $14,000,000 on the industry in direct gifts, to say nothing of the concessions made in the Dominion tariff. It would do something for industrial education in Canada, and incidentally would add to the peace of mind of the politicians and editorial writers, if it were to ascertain what Canadian plants in this year 1908 are doing and where their limitations begin.

Passenger Earnings Constitute a Railroad Problem.

The detailed statistics given in the annual report of the Interstate Commerce Commission afford quite a measure of explanation of the causes which have led to the situation of unrest in railroad circles. They illustrate quite forcibly what an unpleasant position the railroads

have been placed on by adverse State legislation upon passenger rates; how great has been the promise of reward to railroads through the enormous increase there has been in their business, and how little they have been able to get out of this increase. Herewith are given statistics covering 11 years, ending with the fiscal year 1906, so that comparisons can be made between years separated by a decade. A comparison of earnings and results in this period is as follows:

	1896.	1906.
Gross earnings from operation	$1,150,169,376	$2,325,765,167
Operating expenses	772,989,044	1,536,877,271
Income from operation	$377,180,332	$788,887,896
Income from other sources	129,024,731	256,639,591
Total income	$506,205,063	$1,045,527,487
Total deductions	416,573,137	660,341,159
Net income	$89,631,926	$385,186,328
Total dividends	88,097,757	272,851,567
Surplus	$1,534,169	$112,334,761

The earnings, expenses and total income showed a uniform doubling in the 10 years. The deductions, including interest, &c., of course did not double, thus permitting a tripling in dividends and the passing of a moderate amount to surplus instead of the negligible amount so passed in 1896.

The results shown above have of course been satisfactory to the railroads. An analysis of the means by which they have been achieved is much less satisfactory when the strenuous efforts lately made to hamper the passenger earnings are considered. The cost of labor and supplies has enormously increased, and the much higher standard of equipment and roadway now required greatly increases, in its turn, the necessary expenditures. To meet these much heavier expenditures the railroads have been able to increase the efficiency of the freight department as a means to greater earnings, but have not been able to increase the efficiency of the passenger department. The movement is clearly shown in the accompanying tables:

Passenger Statistics.

Years.	Passenger miles. (Millions.)	Passengers per train.	Revenue per passenger mile. (Cents.)
1896	13,049	39	2.019
1897	12,257	37	2.022
1898	13,380	39	1.973
1899	14,591	41	1.978
1900	16,038	41	2.003
1901	17,354	42	2.013
1902	19,690	45	1.986
1903	20,916	46	2.006
1904	21,923	46	2.006
1905	23,800	48	1.962
1906	25,167	49	2.003

Freight Statistics.

Years.	Ton miles. (Millions.)	Tons per train.	Revenue per ton mile. (Cents.)
1896	95,328	199	0.806
1897	95,139	205	0.798
1898	114,078	226	0.753
1899	123,667	244	0.724
1900	141,597	271	0.729
1901	147,077	281	0.750
1902	157,289	296	0.757
1903	173,221	311	0.763
1904	174,522	308	0.780
1905	186,463	322	0.766
1906	215,878	344	0.748

Percentage of Operating Expenses to Operating Income.

Years.	Per cent.	Years.	Per cent.
1896	67.20	1902	64.00
1897	67.06	1903	66.16
1898	65.58	1904	67.79
1899	60.24	1905	66.78
1900	64.05	1906	66.08
1901	64.85		

Train Mileage, Revenue and Cost.

	1896.	1906.
Revenue per passenger train mile	$0.986	$1.203
Revenue per freight train mile	1.633	2.608
Revenue per train mile	1.396	2.075
Cost per train mile	0.938	1.371

The average freight rate, as thus shown, has been reduced slightly, but the average train load has been increased in 11 years by 73 per cent., from 199 tons in 1896 to 344 tons in 1906. Thereby, despite the slight decrease in freight rates, the revenue per freight train mile has increased by 60 per cent. In passenger traffic quite a different result is shown. It has not been possible to load the passenger trains; the average number of passengers per train increased only from 39 in 1896 to 49 in 1906, or 25 per cent., and on account of a slight decrease in passenger rates the revenue per passenger train mile increased only 22 per cent.

Unfortunately it is impossible to know what the cost of operating passenger trains has been. The commission does not present statistics, doubtless because there is no satisfactory method of compiling them, but common judgment would certainly be that by reason of higher speeds, higher costs of labor and supplies, better equipment and the necessity of maintaining better roadways, the cost of operating passenger trains has increased much more than 22 per cent. in 11 years.

Thus the freight operations of the railroads have been made to carry an increasingly improper proportion of the expenses of operation and maintenance. The speed and load of the freight trains are subject to the dictation of the management; the speed and load of the passenger trains are not subject to the dictation of the management, by reason of competition and the popular demand for quick and convenient transportation.

Greatly increased earnings would naturally be expected from the enormous increase in business, which is shown by these statistics. From 1896 to 1906 the tonnage of freight carried 1 mile increased from 95,328,000,000 to 215,878,000,000, or 126 per cent.; passengers carried 1 mile increased from 13,049,000,000 to 25,167,000,000, or 93 per cent. While there was an excellent increase in both directions, the increase in freight business was considerably greater than the increase in passenger business. On account, however, of the fact that freight trains are carrying much greater loads by 60 per cent., while passenger trains are carrying only 25 per cent. greater loads, the number of passenger trains has increased more rapidly than the number of freight trains. Obviously, this is an unfavorable trend; if continued indefinitely it would lead to a domination by the passenger trains, whereas the proportion of total earnings derived from passenger traffic is constantly decreasing. The statistics are perfectly clear in showing that this trend exists in a marked degree.

In 1896 the passenger earnings were 34.3 per cent. of the freight earnings; in 1906 they were only 31.2 per cent. of the freight earnings. In 1896 the passenger train mileage was 69.4 per cent. of the freight train mileage; in 1906 it was 80.6 per cent. of the freight train mileage. Probably it is perfectly safe to say that this phase of the railroad matter has been given no distinct consideration by the legislators who have striven to "regulate" the railroads. A problem is presented to the railroads which they have been anxious to work out by relegating the freight and passenger business to separate tracks, by endeavoring to carry more passengers per train and by other means. The public should recognize that the railroads are confronted by a serious problem in contending with this trend, and some latitude should be afforded for its solution.

The proposed modification of the Sherman antitrust law is in accordance with the desire of important business interests. The law is too sweeping in its scope, which is probably the reason why it has never been en-

forced very thoroughly. Even those whose interests might have been benefited to some extent by such action have hesitated to invoke its provisions against manufacturers known to be maintaining agreed prices. Amendatory legislation, however, will not have a smooth passage, but is likely to be bitterly opposed at every step by members of Congress who would even go further in restrictive measures.

The Parity of the Open Hearth and Converter.

Two features of steel trade history for 1907 are given prominence in statistics published in the past week. The returns made by manufacturers to the American Iron and Steel Association show, in the first place, that open hearth steel production in the United States has practically reached a footing of equality in volume with Bessemer steel. In the second place, these figures, with those the United States Steel Corporation has just given out, tell of a further decline in the corporation's percentage of the country's total output of steel.

We have already given the exhibit of the Bessemer steel industry for 1907, showing a falling off of over 600,000 tons from the product of 1906. Elsewhere is given that for the open hearth works of the country, adding another to the unbroken series of years in which the open hearth steel output has increased. At 11,549,088 gross tons in 1907, open hearth steel production advanced to within 118,000 tons of Bessemer, and raised its own high record, that of 1906, by more than 568,000 tons. In the table below the interesting fact is brought out that while the United States Steel Corporation is responsible for more than five-sixths of the falling off in Bessemer steel last year, it is to be credited with little more than one-sixth of the gain in open hearth steel. The figures show the relative production of the two kinds of steel by the country and the Steel Corporation in the two years and are in gross tons:

	Total.	Steel Corporation.
Bessemer, 1907	11,667,549	7,556,460
Bessemer, 1906	12,275,830	8,072,655
Open hearth, 1907	11,549,088	5,543,088
Open hearth, 1906	10,980,413	5,438,494
Decrease Bessemer	608,281	516,195
Increase open hearth	568,675	104,594

The uninterrupted decline in the Steel Corporation's share of the Bessemer steel of the country and the less accentuated decline in its open hearth percentage appear below. The Bessemer decline of 9 per cent. in five years is striking:

The Steel Corporation's Percentage of Bessemer and Open Hearth Ingots and Castings.

	Percentage of Bessemer.	Percentage of open hearth.
1902	73.9	52.4
1903	72	51
1904	69	50.4
1905	67.4	51.4
1906	65.7	49.5
1907	[illegible]	48

It is noteworthy that the Bessemer falling off last year from 1906, for the whole country, and the open hearth increase upon 1906 is 5 per cent. in both cases. The total of Bessemer and open hearth steel in 1906 was 23,256,243 tons; for 1907 it was 23,216,637 tons. The crucible steel production, with that of minor processes, amounted in 1906 to 141,893 tons; the total for 1907 will probably not be far from that amount.

Were 1908 a normal year we might now predict that open hearth steel production, on the showing of last year and the known tendencies, would pass that of Bessemer. We may look for a heavy falling off in Bessemer rail production—that much is certain. But the other lines calling for Bessemer steel—wire, sheets, tin plates, wrought pipe and bars—are now and promise to continue more active than plates and structural material, which are the mainstay of the open hearth steel manufacturers. Open hearth steel rails will make a new record this year, but it will be far from compensating for the great falling off in other forms of finished material.

CORRESPONDENCE.

New York Metal Exchange Quotations.

To the Editor: The New York Metal Exchange is the only exchange in these United States designed to facilitate the buying and selling of those most important factors of our country's wealth—the metals. It was chartered under the laws of the State of New York in the year 1883, and its plan of organization states:

> The objects for which said corporation is formed are to foster trade and commerce, to protect it from unjust or unlawful transactions, to reform abuses in trade, to diffuse accurate and reliable information among its members as to the standing of merchants and other matters, to produce uniformity and certainty in the customs and usages of trade, to settle differences between its members, and to promote a more enlarged and friendly intercourse between merchants.

During the 10 years prior to 1897 transactions in tin, lead, spelter or copper were of daily occurrence. In 1887 and later the transactions in copper were of so considerable a magnitude that important banking houses and prominent members of other New York exchanges joined the New York Metal Exchange, and some of these were daily represented upon the floor of that institution. The official quotations issued by the exchange in those days were based upon the actual price of metal as evidenced by sales on the floor of the exchange or were determined and fixed by the rules of the exchange at a fair medium between the bid and asked price made by members actually attending the daily calls and personally and visibly making such bids or offers. Thus the "official quotations" gradually grew to mean something—to producer, to consumer, to those dealing in metals and to those bankers or institutions whose business was the advancement of money on metals.

Later, and more recently, very considerable copper producing interests in this and neighboring countries based the price of raw copper which they delivered to important smelting interests for refining and sale by such smelting interests upon the "official quotations" of the New York Metal Exchange. Later, contracts were entered into by such producing interests by which they obligated themselves, in some instances for a period of years, to deliver to certain smelting interests fixed quantities of ore bullion matte or raw copper, which was to be paid for on a basis of the official quotation of copper on the day the unrefined copper was shipped from the producer, or on the day it arrived at the buyer's works. When it is remembered that such shipments are of daily occurrence, that their volume is not defined by tons, but by thousands of tons; that a fluctuation of one-eighth of 1 cent means a difference of $2.50 on every ton, we can readily see that the absolute fairness of the official quotation is vital to the integrity of the Metal Exchange. Since the New York Metal Exchange is the only body in the United States having for an object the regulation of rules and methods of trading in metals, any stigma which may rightfully or wrongfully attach to its methods, be it uncorrected, becomes a national disgrace.

In 1897 the majority of the present incumbents became officers of the New York Metal Exchange, and with some unimportant changes have since so continued. The president of the exchange then elected was Robert M. Thompson. In his inaugural address to the members he dwelt with particular fervor upon the national importance of America as a copper producer; he alluded to the fact that the transactions in this metal on the London Metal Exchange were of enormous volume; he criticised the fact that although England's place as a copper producer was insignificant, her supremacy, obtained through such enormous transactions on the London Metal Exchange, was unquestioned; and, finally, he promised that

through his influence the New York Metal Exchange should wrest this supremacy from London and place it where it belonged, on the metal exchange of the leading producing country of the world. That president has since continued to be annually elected, although he has never again favored the members of the New York Metal Exchange with his presence at any meeting of its members.

In 1902 the method of producing the official quotations of the New York Metal Exchange suffered a radical change. Instead of the average between bid and asked prices actually made on the floor of the exchange determining the official price of the day, a committee was appointed, consisting of three members of the exchange, whose duty it was to daily meet and issue a so-called "official quotation." Every member of that committee was vitally interested in copper, either as buyer or seller. But one member of that committee, except on the most exceptional occasions, has ever appeared on the floor of the Metal Exchange on call time.

Frequently the prices actually bid for copper on the floor have been considerably higher than the highest or supposedly asked price fixed on the same day by the committee. On several occasions members of the exchange have in writing lodged complaints against such glaring discrepancies between the actual bid and asked prices and the "official quotation" made for the same day by the committee. No attention apparently was paid to such written complaints, and they were not even deemed worthy of a reply.

The members of the exchange who are now endeavoring to institute reforms contend that if there is to be an official quotation there is only one absolutely fair method of producing it; that is, by quoting a medium or average of the price at which the metal so quoted is bid for and offered at on the daily call on the floor of the Metal Exchange.

It is contended by those in opposition that there is no copper business on the floor of the exchange. Granted. But if these official quotations are not obtained as a result of the equilibrium obtained by the contending forces of buyer and seller, then there should be no official quotation, and if the rule is once established that such contending forces must establish the official quotations, I hold that those forces will, as in former times and upon other exchanges, quickly seize upon a method and produce a result for which, and only for which, the Metal Exchange has the right of existence. JAMES E. POPE.

NEW YORK, March 23, 1908.

Open Hearth Steel Production in 1907.

The American Iron and Steel Association has collected the statistics of the production of open hearth steel ingots and castings in the United States in 1907. The total was 11,549,088 gross tons, against 10,980,413 tons in 1906, an increase of 568,675 tons, or over 5.1 per cent. The production was larger than in any preceding year, and was only 118,461 tons less than the production of 11,667,549 tons of Bessemer steel ingots and castings in the same year. The year of next largest production of open hearth steel was 1906. When the collection of the statistics of crucible and miscellaneous steel ingots and castings is completed it will be found that the total production of all kinds of steel ingots and castings in this country in 1907 approximated 23,360,000 gross tons, as compared with an ascertained production in 1906 of 23,398,136 tons. The following table gives the production of open hearth steel ingots and castings by States since 1904 in gross tons:

States.—Gross tons.	1904.	1905.	1906.	1907.
New England	[illegible]	239,282	251,047	[illegible]
New York and New Jersey	[illegible]	348,072	553,189	[illegible]
Pennsylvania	4,306,498	6,471,818	7,718,213	7,867,705
Illinois	358,215	617,625	884,472	1,013,251
Ohio	480,906	687,392	818,683	819,642
Other States	[illegible]	607,187	754,859	[illegible]
Totals	5,908,166	8,971,376	10,980,413	11,549,088

Basic and Acid Steel.

A total of 10,279,315 tons of open hearth steel was made by the basic process in 1907 and 1,269,773 tons by the acid process, while in 1906 the production by the basic process amounted to 9,658,760 tons and by the acid process to 1,321,653 tons. This is a gain in production in 1907 over 1906 by the basic process of 620,555 tons, but a loss by the acid process of 51,880 tons. In 1905 there was made 7,815,728 tons of open hearth steel by the basic and 1,155,648 tons by the acid process.

The following table gives the production by States of both basic and acid open hearth steel ingots and castings in 1907. Pennsylvania made over 66.4 per cent. of the total production of basic steel ingots and castings in 1907 and over 82 per cent. of the total production of acid steel ingots and castings, against 68.4 per cent. of basic and over 83.3 per cent. of acid ingots and castings in 1906. Illinois, Ohio and New York were the next largest producers of open hearth steel in each of these two years:

States.—Gross tons.	Basic open hearth steel.	Acid open hearth steel.	Totals. Gross tons.
New England	172,960	66,837	239,797
New York and New Jersey	665,474	40,545	706,019
Pennsylvania	6,826,479	1,041,226	7,867,705
Illinois	1,006,589	6,662	1,013,251
Ohio	758,401	61,241	819,642
Other States	849,412	53,262	902,674
Totals	10,279,315	1,269,773	11,549,088

Ingots and Castings.

The production of open hearth steel ingots in 1907, excluding castings, amounted to 10,803,211 tons, against 10,260,522 tons in 1906, an increase of 542,689 tons, or over 5.2 per cent. The production of castings alone in 1907 amounted to 745,877 tons, against 719,891 tons in 1906, an increase of 25,986 tons, or over 3.6 per cent. The following table gives in gross tons the production of basic and acid open hearth steel ingots in 1907 by States:

States.—Gross tons.	Basic ingots.	Acid ingots.	Total. Gross tons.
New England, New York and New Jersey	782,325	63,282	845,607
Pennsylvania	6,766,950	792,471	7,559,421
Illinois, Ohio and other States	2,363,564	34,619	2,398,183
Totals	9,912,839	890,372	10,803,211

The production of open hearth steel castings last year —745,877 tons, as compared with 719,891 tons in 1906—was the largest in our history. The year of next largest production was 1906. Of the 1907 production, 379,401 tons, or almost 51 per cent., was made by the acid process and 366,476 tons, or over 49 per cent., by the basic process. As compared with 1906, when 406,343 tons of castings was made by the acid process, the decrease in 1907 by this process was 26,942 tons. Of basic castings the increase was 52,928 tons, the production by this process in 1906 having amounted to 313,548 tons. The following table gives the production of open hearth steel castings by both the basic and acid processes in 1907 by States, in gross tons:

States.—Gross tons.	Basic castings.	Acid. castings.	Total Gross tons.
New England, New York and New Jersey	56,109	44,100	100,209
Pennsylvania	[illegible]	[illegible]	[illegible]
Illinois, Ohio and other States	250,838	86,546	337,384
Totals	366,476	379,401	745,877

The open hearth steel made in 1907, including both ingots and castings, was produced by 136 works in 20 States and the District of Columbia. The District of Columbia appears among the producers for the first time. One hundred and twenty-five works in 20 States made open hearth steel in 1906 and 111 works in 17 States made open hearth steel in 1905.

The United States Steel Corporation is reported to have the names of 95,000 stockholders on its books to-day, the largest number in its history. It is also estimated that the banking houses, brokers and syndicates whose names appear on the records carry stocks for 30,000 persons in addition to the above number.

The Electro Metallurgical Company will remove its general sales office from Chicago to 79 Wall street, New York, about April 15. This company is the manufacturer of 50 per cent. ferrosilicon and of ferrochrome.

Steel Differences.

BY J. KENT SMITH, PITTSBURGH.

In no other industry has the progress of scientific control been more marked than in the manufacture of steel. It is but a few years, comparatively speaking, since the laboratory became an indispensable feature of the up to date steel mill, and to-day chemical investigation is being increasingly supplemented by many physical instruments, notable among which are the microscope and pyrometer, while systems of dynamic testing, in one or more forms, are in many cases used in addition to the purely static tests registered by the tensile machine. In addition, the great effect on the dynamic attributes of the finished product of such purely mechanical details as temperature of casting and amount and nature of the "work" put on the ingot metal have been dealt with abundantly by many writers. These two latter points too often receive but little consideration in the case of failures, though they may be the responsible ones in many instances.

Chemical Investigation Incomplete.

As regards chemical investigation, the examination is more or less perfunctory, and the so-called "complete analysis" is far from complete, since it takes absolutely no note of the presence or absence of such ingredients in steel as oxygen, nitrogen, &c., which in this respect can only be reckoned as powerful poisons. But even as far as it goes, how seldom is it interpreted with any degree of real insight? Let concrete instances be taken. It is stated frequently that "such and such an amount of sulphur makes steel red short." Now this statement is most misleading. Arnold has shown incontrovertibly that sulphide of manganese is comparatively harmless, and has demonstrated in a most spectacular manner that steel containing nearly ½ of 1 per cent. of sulphur in proper combination with manganese can be rolled into perfect bars, while the presence of a fraction of this amount of sulphur contained as sulphide of iron rendered ingots "rotten," brittle and unworkable when hot; furthermore, that the amount of sulphur required to endow steel with bad properties, the manganese content being constant, is much affected by the content of oxygen and of copper in the metal.

Again, we hear the statement that "such and such a percentage of phosphorus makes steel brittle," the brittleness spoken of being demonstrated by static test. It is worthy of remark here that the absence of brittleness to static test does not invariably imply the slow development of brittleness under repeated strains, stresses, &c.; in other words, it is very necessary to discriminate between the property of brittleness and the very important one of potential brittleness, which latter is responsible for a great proportion of the break downs and failures so disastrous in service.

The Effect of Phosphorus.

Now any such statement as to the effect of phosphorus, like the one as to sulphur, is utterly misleading. To begin with, phosphorus may exist in two totally distinct forms, called by Von Jornstoff "hardening" and "phosphide" phosphorus. Again, brittleness caused by phosphorus is enormously influenced by the amount of silicon, carbon, &c., concomitant with it. Silicon itself, when kept within the comparatively large proportion necessary to influence the cubical crystallization of the ferrite in which it is dissolved, is quite harmless, and even benefits the resultant steel. The writer has most successfully made cold drawn seamless tubes of 0.15 per cent. carbon, and of great purity as to sulphur, phosphorus and oxygen, containing nearly ½ of 1 per cent. of silicon. On the other hand, a friend showed to him a little time ago a piece of basic open hearth steel, very low in carbon and silicon, and containing but a very small amount of nitrogen and oxygen, which, although it carried ¼ of 1 per cent. of phosphorus, could be knotted cold. Any attempt to cold bend steel containing 0.15 per cent. carbon, 0.50 silicon and 0.25 phosphorus, would lead to immediate fracture.

Thus it will be seen that it is not so much the actual amounts of deleterious elements themselves as their relative amount and their state of combination, which strongly influences their effect on normal steel, and this is further modified again by the physical status of those compounds, as to whether they be in eutectoid formation, solid solution, or what not.

Considerations in the Study of Alloy Steels.

Thus to cope with the successful study of alloy steels it is very necessary to consider primarily: 1. The way or ways in which the alloy acts. 2. The proximate as well as the ultimate composition of the alloy.

In no alloy is this of more importance than in the case of vanadium, which acts on steel in at least three totally distinct ways, as described by the writer in many treatises, and which alloy furthermore must be used with a reasonable amount of intelligence on account of its very great avidity for oxygen and of its oxygenated product forming a powerful acid.

In spite of much work in all the directions indicated, many points exist in connection with steel which to date await satisfactory explanation.

It has long been known that steels of the same analysis made by different processes vary considerably in their mechanical properties. No attempt to form any correlation on this point had been made until Prof. F. W. Harbord of London, England, in the latter half of 1907, published carefully observed data on the tensile and hardness investigations of acid Bessemer, basic Bessemer, acid open hearth and basic open hearth steels, without, however, attempting any explanation of the observed phenomena. In the ensuing discussion two suggestions were made: First, that oxidation, and second, that heat of refining, had something to do with the differences. But both suggestions are untenable, at any rate, as forming the basis of complete explanations, in the light of our present knowledge.

Two Important Causes of Difference.

The writer would submit two other possible—and probable—causes of difference: 1. The question of the atmosphere in which the steel was refined. 2. The nature of the slag covering the steel bath, and of the material forming the container of the molten steel, with the consequent extent of such atmosphere being transmitted to the steel bath in radiation or conduction processes.

It is generally admitted that some of the finest possible steels are the product of the coke fired "white" pot. The latter, as has been abundantly shown, is porous to gases, and the atmosphere surrounding the steel must be in this case one of nitrogen and carbonic oxide. The product of a gas fired crucible furnace in which "black lead" pots are used should be identical in nature, provided the analysis of the material coincides.

In the electric furnace a similar atmosphere prevails, and its product is comparable in all ways with the best crucible steel of similar composition, while its units are of much greater dimensions. It is almost entirely a question of this atmosphere that endows the steel made in the electric furnace with such high attributes, which are in no way due to the imparting of any especial virtue by the electricity, *per se*, which is used as a heating agent. It will thus be seen that the electric furnace is preeminently suited to the production of the highest grades of alloy steel, in which it is a *sine qua non* that a most excellent base be used.

For given stiffness with regard to similar composition, the writer would place steels made by different processes in the following order:

1. { Coke fired crucible ("white" or "black lead" pot).
   { Gas fired crucible ("black lead" pot).
   { Electric furnace.
2. Bessemer acid.
3. Bessemer basic.
4. Open hearth acid.
5. Open hearth basic.

While the product of the Tropenas converter, acid lined, very strongly resembles in nature that of the acid Bessemer, it differs from it in some respects. If there is anything in the question of atmosphere, this is exactly as would be expected

Professor Harbord considers that for rail steel the product of the basic open hearth should contain at least 0.10 per cent. more carbon than that of the acid Bessemer to give the same conditions of wear.

The writer, who is more particularly interested in alloy steels, would naturally draw an illustration from such a source, and would say that, selecting the type A chrome-vanadium (machinery) steel of the American Vanadium Company, the product of the crucible or electric furnace should contain 0.22 to 0.23 per cent. carbon, that of the acid open hearth 0.25 to 0.26 per cent. carbon, and that of the basic open hearth 0.28 to 0.30 per cent. carbon, while other tempering types should vary more or less in proportion with regard to carbon.

This note will demonstrate the extreme inadvisability of submitting a general analytical specification to those manufacturers who use different processes. Either physical results alone or analytical composition coincident with a given process should be specified; otherwise, confusion and dissatisfaction are bound to result.

Tariff Revision Being Planned.

Congressional Leaders Considering the Preliminary Steps.

WASHINGTON, D. C., March 24, 1908.—The movement to lay the foundation at the present session of Congress for the comprehensive revision of the tariff act in the near future is rapidly taking tangible form, and it is now probable that the policy of the majority in Congress will be fully disclosed before adjournment for the summer recess. A resolution authorizing the Ways and Means Committee to hold sessions during the recess, to employ experts and to call upon the executive departments for information and co-operation has been framed by Representative Tawney of Minnesota, who is chairman of the House Committee on Appropriations and the real floor leader of the majority, although that title is usually bestowed upon the chairman of the Ways and Means Committee. The only active opponent who exercises much influence in the House is Representative Dalzell of Pennsylvania, who is a standpatter under all conditions, and who is as yet unconvinced that any action should be taken at this session looking toward the amendment of the tariff. The impression is now very strong that the Tawney resolution will be introduced in a few days, favorably reported from the Ways and Means Committee and passed some days in advance of the recess adjournment.

Object of the Tawney Resolution.

In discussing his plan, Mr. Tawney makes it perfectly clear that he does not anticipate any tariff legislation in the present Congress. He believes that the long recess should be utilized in gathering information regarding industrial conditions in this country and abroad with special reference to labor conditions, relative scales of wages in the leading industries, cost of raw materials, &c. He does not think that the Ways and Means Committee would be called upon to give hearings during the coming recess nor to take any steps which would have a tendency to unsettle industrial conditions in this country. He is firmly of the opinion, however, that the public sentiment in favor of tariff revision is so strong that unless the majority in Congress accords it some such recognition as would be involved in the passage of his resolution, the complexion of the present House may be changed at the elections next November, and the "friends of the tariff" thus be deprived of their last opportunity to revise it for some years to come.

The Metal Schedule Discussed.

Mr. Dalzell is not alone in standing out against the proposed Tawney resolution, and the general debate on current measures is beginning to reflect both sides of the contest. The metal schedule of the Dingley act has been forced to the front in these discussions, and during the past week attention was drawn to the subject in a speech by Representative Bannon of Ohio, one of the leading protectionists of the House. Mr. Bannon is opposed to tariff revision, and believes that the rates of the metal schedule are none too high. In this connection he said:

No schedule in the tariff law [illegible] so vehemently and at the same time [illegible] as the iron and steel schedule. In the nation this industry has made a most wonderful and marked [illegible] the Republican party first came into power, we were dependent upon Europe for our iron and steel. We had the ore and we had the coal and the other materials necessary in this industry. By an adherence to our protective policy these plants increased in number and grew in size, so that to-day, instead of being dependent upon Europe for these products, we are ourselves furnishing them to the world. In 1887 our exports of iron and steel products were valued at $16,250,600; in 1897, $63,000,00, and in 1907, $200,000,000. Expressed in percentage for these 20 years it is 1131 per cent. increase. Almost one-half of our iron and steel exports for 1907 was machinery of various kinds.

Our home market is supplied by our home industries, and the tremendous growth of this market is apparent to all. But the great growth of this industry, its marvelous extension and development, of which we are all so proud, has proved to be the source of the attacks made upon it; and because it has been successful it is threatened with the infliction of a penalty by a very material reduction in the duty.

The growth of the production of steel rails is one of the results of the protective system. From an output of 2277 tons in 1867, our production has grown to 3,500,000 tons in 1907. Of our production of rails last year we exported 338,906 tons, or about 10 per cent. Now the fact that this 10 per cent. of steel rails produced in American mills by American workmen, who were paid an American wage, may have been sold abroad for 5 per cent. less than the domestic price is seized upon as a point for attack upon the iron and steel schedule and is urged as a reason why our tariff act should be a revenue measure only and not a protective measure.

In answer to them I would say that the American railroad buys rails from American manufacturers cheaper than the English railroad buys rails from the English manufacturers; cheaper than the German railroad buys from the German manufacturer; cheaper than the French railroad buys from the French manufacturer; cheaper than the Austrian railroad buys from the Austrian manufacturer, and cheaper than the Belgian railroad buys from the Belgian manufacturer.

A Low Export Price Justified.

No manufacturer can calculate with exactness what quantity he can sell in a year or how much he ought to or can produce. The market may be strong or it may be weak. The accumulation of a stock of steel rails is neither practicable nor the exercise of good business judgment, and it is far better that our mills be kept busy on full time, paying the breadwinner of the family good wages and giving him steady employment, than to put out the fires, disorganize and disrupt the force, and deprive the wage earner of his wage. An export discount of 5 per cent. on 10 per cent. of the production—what does it amount to? It does not cripple our railroads; they are not complaining. It does not influence our freight rates; ours are now the lowest in the world. Simply a small surplus is sold abroad. The home market, the home industry and the home wage earner are maintained. Besides, if there is a demand for the entire output for home consumption at $28 per ton is any sensible being justified in presuming that the home market will not be first supplied?

But this question of export discounts has become what the lawyers call *res judicata*. It was submitted to the American people in 1900, again in 1902 and in 1904 and in 1906. The verdict was that there was nothing in it. Out of every $3000 worth of manufactures produced in this country $1 worth is sold abroad at a discount under the domestic price, and it is better to do this and keep our industries busy on full time and our wage earners in steady employment at good wages than to put out the fires, still the hum of industry and deprive our people of work.

An Early Adjournment Probable.

The plans of the majority leaders now contemplate the adjournment of the present session about May 15. The Tawney resolution will not be introduced until every effort to bring the standpatters into line behind it has been exhausted, but the Speaker is said to favor its passage well in advance of adjournment, with a view to avoiding a deadlock in the closing days of the session. For obvious reasons the House leaders would be unwilling to invoke a special order to force the resolution through, as such a procedure would disclose a lack of harmony that, from a political point of view would fully offset the good effect of the preliminary movement for revision. W. L. C.

The Great Northern Ore Output.

DULUTH, MINN., March 20, 1908.—In the report of the Great Northern Ore trustees, made last week, no mention was made of the amount of ore mined for the Steel Corporation for the reason that the corporation did no mining on its Great Northern properties in the year. The 3,307,244 tons of ore mined under the trusteeship—that is, from lands of the Great Northern—was from the Mahoning, Stevenson, Kinney and a 50 per cent. interest in Leetonia.

The Steel Corporation Lease.

At the risk of partial repetition, there will be some figures concerning this lease and its operation that may be given with propriety. The entire trusteeship includes 65,091 acres, of which 39,296 acres are held by the Great Western Mining Company, a subcorporation of the United States Steel Corporation. The remainder is chiefly in the hands of companies operating the mines above mentioned. The lease with the Great Western Company provides for the mining of a minimum amount of 1,500,000 tons during the present year, but it is certain that neither this amount, nor any appreciable quantity, will be actually mined during the year. The Great Western Company, however, will pay its royalties upon this quantity, which will be applicable for ores to be mined in future years, in excess of the minimum for those years. It will be several years, of course, before the Great Western can proceed far enough with its development to mine its minimum and the tonnages for which it has paid, when it was not able to mine the total minimums.

As has been stated, the basic ore under the Steel Corporation lease is 59 per cent. iron, the royalty falling 4.82 cents for each 1 per cent. iron below that standard. As it is fairly safe to assume, from a general knowledge of the qualities of ore contained in these Great Northern lands leased to the Great Western, that the average of such ore, as shown by present explorations, is not in excess of 55 per cent., the actual average royalty will be about 19.25 cents a ton less than the standard rate. This standard rate is 85 cents a ton for the first year, increasing annually by 4 per cent. interest.

The Cost of the Ore at Lower Lake Ports.

There will be ore mined under this lease that will be higher in grade than the standard of 59 per cent., and on this the premium of 4.82 cents a ton will apply. But the minimum grade recognized as minable under this contract is 49 per cent., which would be taken at a royalty rate, for the first year, of 36.80 cents a ton. This, delivered at dock on Lake Superior by the Great Northern Railroad at the customary rail rate of 80 cents a ton from mine to lake, which is provided for in the agreements, would cost the Steel Corporation $1.168 at the head of Lake Superior. With a freight rate of 75 cents a ton to lower lake ports this ore would stand a charge of $1.91 a ton before unloading.

It is a common error of those estimating the receipts to accrue on ore certificates to assume that the certificates receive the entire benefit of the price of this ore, delivered at dock on Lake Superior. This is an inexcusable mistake, for the Great Northern Railroad, carrying the ore under a contract which covers the entire tonnage of these lands, receives the full freight charge of 80 cents a ton, and this is true, not only of the Steel Corporation lease, but of all other leases given by the Great Northern. Indeed, the primary reason for the accumulation of mines which have been leased by the trusteeship was the haulage earnings for the road itself, and any royalty benefits are merely subsequent and incidental, however great they may be.

One provision of the Great Western lease is that, should any ores of lower iron content than 49 per cent. be shipped, they shall pay a royalty of 25 cents flat, plus the freight rate, of course.

The Royalty for 1908 and 1909.

The basic royalty for 1908, being the second year of the term, is 88.4 cents, this being arrived at by adding the annual 4 per cent. interest charge to the original base of 85 cents for standard grade ores. For 1909 the rate will be 91.8 cents, and the total royalty paid by the Great Western Company, estimating all ore to be of the standard, will be $2,065,500. Against this the Great Northern will be obliged to pay out large sums in underlying royalties to fee owners from whom it has leased a very considerable proportion of the lands which it has held. On Mahoning, Stevenson, Kinney and half Leetonia, which it owns outright and has leased to others, there are no underlying royalties. These properties will probably mine less ore in 1908 than they did last year.

The Great Western lease carries provisions as to liens, taxes, minimums, &c., such as are common on the Mesaba range. There are also full provisions for the continued exploration of the Great Western leases, similar to most of those on the Mesaba range, requiring at least five drill holes to each 40-acre tract, and the complete exploration of the entire holdings, with not less than 40 drills continuously worked. This provision is being carried out very satisfactorily, and more than the required number of drills has been steadily employed. It is understood that the corporation has discovered some new ore and has materially enlarged the areas of deposits formerly known.

General Conditions of the Lake Trade.

There is little change in lake freight conditions. A lot of coal has been chartered for up-lake delivery, 600,000 tons by one Duluth agency, 400,000 tons by another and some 2,000,000 tons in all. But there has been no desire on the part of ore shippers to make contracts, and it looks as though the Pittsburgh Steamship Company and its immediate associates would be pretty nearly the whole thing this year in the trade.

The Oliver Iron Mining Company is stripping at the Gilbert mine, Mesaba range, where it commenced operations on surface last spring and mined about 100,000 tons in 1907. It is stripping in two pits, and will mine the deposit by the milling process. Resumption of stripping operations at the Fayal mine will take place at once, and will be continued with one or two shovels. It has been reported that the ore to be moved from the La Rue mine, western Mesaba range, would amount to 1,250,000 tons this year, but this is very much exaggerated. The tonnage to be taken will be small. Last year the mine produced 300,000 tons. Mines of many of the independent companies will produce less ore than last year by 50 per cent.

At Escanaba the Oliver Iron Mining Company is beginning the work of overhauling its large Menominee range ore crushing plant, and will have it ready for operation as early as usual. At Iron Mountain, same range, the cost of maintaining railroad tracks across the Chapin pit, which is continually caving in, was about $60,000 last season, and efforts will be made to so change the alignment there as to avoid the difficulty this season.

The work of diverting the Escanaba River at the Cleveland-Cliffs Company's new mining district of Gwinn, which has been in progress for some months, has been completed, and the river is no longer a danger to mine operations there. The diversion of the Sturgeon River at the Loretto mine is still in progress. D. E. W.

The Detroit Steel Products Company.—The Detroit Steel Products Company, Detroit, Mich., is enlarging its plant to provide room for the installation of machinery to manufacture the Fenestra rolled steel window sash. This sash has hitherto been manufactured abroad, but it is expected that the company will be ready to produce it here in about 60 days. Work on the construction of a large additional building to accommodate the automobile construction department will also be begun immediately. The erection of this building was begun last year, but owing to unfavorable industrial conditions work was suspended; its resumption means the early completion of the plant, which is located on the corner of the Boulevard and Chene street. The building of the forge and car spring department has been completed, and that part of the plant is now in operation in the new building. In this connection, it is stated, that business is more satisfactory, and that specifications are now being placed for several months ahead, which is taken as an indication of increased public confidence.

Bridge and Tunnel Events.

Wednesday, March 18, saw the beginning of the end of two notable engineering undertakings in New York City, the connecting of the last open space in the Blackwell's Island Bridge, and the last of the four Pennsylvania Railroad tunnels under the East River.

In the presence of a party of guests invited by the Pennsylvania Steel Company, the first piece connecting the Queens cantilever span was inserted, completing a continuous line of steel between the Manhattan and Queens anchorages. This member was a 29½ ton steel beam 88 ft. 2¼ in. long, 1 ft. 9⅝ in. wide and 4 ft. ½ in. deep. When it was secured in position wooden platforms and railings were hastily constructed so that the party could pass across. The first over the beam was acting Mayor Sullivan, who broke a bottle of champagne at the middle of the beam and simultaneously a large flag was unfurled, swinging between the two overhanging cantilevers. There were present nearly all the officers of the Pennsylvania Steel Company, which constructed the bridge, among them E. C. Felton, president, J. V. W. Reynders, vice-president, Thomas Earle, superintendent, F. C. Kunz, chief engineer and F. W. Cohen, engineer of erection.

The Iron Age, March 7, 1907, contained a full description of the bridge, but it may be interesting at this time to repeat some of the more important dimensions. Overall it will be 3724½ ft. long. The river span west of the island is 1182 ft. long, and the river span east of the island 984 ft. The clear hight above mean high water is 135 ft., and the greatest width 86 ft. The only bridges of longer single span are the Firth of Forth bridge, the Williamsburg bridge and the Brooklyn bridge, respectively 1710, 1600 and 1595 ft. long. The new bridge will have four elevated railroad tracks, two promenades, four trolley tracks and a general roadway. The maximum live load allowable on the structure will be 16,000 lb. per foot of bridge, or 100 lb. per square foot over the entire area. The approximate dead load of the bridge will be about 120,000,000 lb. The total weight of steel will be about 50,000 tons.

At 8 o'clock Wednesday evening the two crews of workmen in the last of the four Pennsylvania Railroad tunnels between Manhattan and Long Island City met. Superintendent Johnson was the first through the breach, followed by his assistant, Thomas Lynch, and the entire gang of workmen. Late that night the iron plates were placed in position and Vice-President Ernest W. Moir, of the S. Pearson Contracting Company, went through the joined ends of the tube. The last finished tunnel is known as tube A. Tube B, the first of the four to be joined, was connected on Washington's Birthday, and Tubes C and D quickly followed. The four tunnel excavations were begun a little more than two years ago by S. Pearson & Sons, the English firm of contractors. They have finished the work several months within the contract time. The four tubes are 23 ft. in diameter and when the steel casings and concrete lining are installed will be 20 ft. from side to side. A tour of inspection by a party of Pennsylvania Railroad engineers was made last Thursday.

The Westinghouse Machine Company.

An important move looking to the rehabilitation of the Westinghouse Machine Company has been made in the election of the Board of Directors who will have the affairs of the corporation in charge when it is taken out of the hands of receivers. There are a number of new names on the board, among them being John F. Wallace, late chief engineer of the Panama Canal and at present at the head of the Electric Properties Company, with headquarters in New York. The names of the other directors are as follows: George Westinghouse, Pittsburgh; H. H. Westinghouse, New York; Robert Wardrop, president People's National Bank, Pittsburgh; James C. Chaplin, vice-president Colonial Trust Company, Pittsburgh; W. H. Donner, Pittsburgh; William McConway, president McConway-Torley Company, Pittsburgh; Wilson A. Shaw, president Bank of Pittsburgh, and Horace E. Smith, Philadelphia.

The affairs of the corporation are said to be in an extremely satisfactory condition, and the officers are pleased with the outlook. Application will be made in the Federal Court near the close of the month for the discharge of the receivers, and the corporation will be ready to continue its business under the direction of the new board at the beginning of the fiscal year, April 1. The announcement of the new directorate is important from the fact that it shows the confidence displayed by important banking interests in the future of the corporation.

Canadian Vessel Repairs.

TORONTO, March 21, 1908.—Finance Minister Fielding's budget speech, which was delivered on Tuesday, contained no announcement of new customs duties or other fiscal changes. In some quarters hopes were entertained that he would provide for an export duty on pulp wood, but it looks now as if the most to be expected in that behalf is the appointment of a royal commission to make a study of the question and report to Parliament. That course was recommended by the Premier of Quebec in his budget speech of a few days ago. Quebec is the province mainly concerned in the question, and the Quebec government is in party sympathy with the Dominion government.

Notwithstanding that Mr. Fielding's speech made no reference to the subject, ministerial newspapers continue to hold out hopes that something will be done this session for shipbuilding. The Toronto *Globe's* Ottawa correspondent said a short time ago that he understood that the tariff regulations are to be amended in the interest of Canadian shipbuilders. Repairs are now nondutiable, and the *Globe's* information is that they will probably be made dutiable. Canadian vessels may have large sums expended upon them for repairs or improvements made in American yards without incurring any liability to pay duty on the new work when they resume their business between Canadian ports. Second-hand vessels, bought by Canadians at low prices in the United States, are often practically reconstructed and re-equipped before being brought to their Canadian routes. Yet they are dutiable ad valorem on what was paid for the unimproved ship. On the other hand, Canadian shipbuilders have to pay duty on many of the articles they must import as materials of construction. It is not thought so probable that the government will make reductions in the duty on materials as that it will make repairs dutiable.

As was to be expected, the intimation that such a change may be forthcoming is not welcome to the vessel owners, who naturally cling to the advantage of access to American shipyards for repairs, in view of the fact that Canadian repairing facilities are to be found at only two points on the lakes.

It is the desire of the government to have the facilities for building and repairing vessels within the country increased and distributed over the waterways. As far back as 1882 an act to encourage the construction of dry docks was placed on the Dominion statute book. It provided for the payment of a subsidy to the constructing companies. In 1906 the Dry Docks Subsidies act of the Revised Statutes (1906) is the form to which that legislation finally passed.

Mr. Fielding, Minister of Finance, has now before Parliament a measure to take the place of the Dry Docks Subsidies act, which is therefore to be repealed. The new bill provides for the construction of new docks and the extension of old ones. It empowers the Governor in Council to pay a subsidy of 3 per cent. per annum of the cost of such work to the incorporated company by whom the dock is built or extended. To be eligible for the subsidy the dock must be equipped with all necessary plant and appliances for vessel repairing, and must be approved by the Minister of Public Works. In no case must the subsidy exceed $45,000 per annum for a new dock, or $15,000 per annum for the extending of an old one. The subsidy is to be paid annually for 20 years from the time of completion of the work. If the more liberal terms of the new measure have the effect of in-

creasing the number of Canadian dry docks, existing shipbuilding and repairing companies may not be much better satisfied, unless duties on American repairs to Canadian vessels are adopted.

The Collingwood Shipbuilding Company has 300 hands at work. It has just secured the contract for building a passenger and freight steamship for the Northern Navigation Company, the price to be $500,000. The vessel is to be ready for the water at the opening of navigation on the Upper Lakes in 1909. It is to be 365 ft. long, 50 ft. beam and 27 ft. molded depth.

C. A. C. J.

PERSONAL.

Alex. E. Outerbridge, Jr., of William Sellers & Co., Inc., Philadelphia, has recently returned from a stay in the South, in which he recuperated from a critical illness of many weeks.

A. W. Allen, Pencoyd, Pa.; S. G. Worton, Donora, Pa.; J. A. Nichols, Clairton, Pa., and George L. Danforth, South Chicago, Ill., attended a meeting of the Open Hearth Committee of the United States Steel Corporation subsidiaries at Birmingham, Ala., last week. In the previous week the committee held a meeting at South Chicago.

D. Ralph Day has resigned as secretary of the Northwestern Malleable Iron Company, Milwaukee, Wis., to accept the position of manager of the Union Malleable Iron Company, Moline, Ill.

James H. Baker has opened an office at 316 Fourth avenue, Pittsburgh, Pa., as forging engineer. He will give special attention to forging development, the examination of plants, forging and special machinery, designing forgings and castings, &c. In 1886 he with others organized the Baker Chain & Wagon Iron Mfg. Company, Pittsburgh, and made Baker products which became known throughout the country. This concern finally consolidated with other companies, after which he organized the Baker Forge Company, which developed and made all the forgings for the then rapidly expanding pressed steel car industry. This company was bought later by one of the steel car interests, and is still perhaps the leading forge in this line. Mr. Baker next, with others, organized the James H. Baker Mfg. Company in 1900, which was afterward combined with another forge and named the Solid Steel Tool & Forge Company, from the presidency of which he resigned December 1, 1907, to lay the foundation of a new branch of engineering. He has taken out many patents for improvements in various branches of metal manufacturing.

S. W. Eccles, former traffic manager for the Guggenheim interests, has transferred his activities to the mines and mills. He has been elected a vice-president of both the American Smelting & Refining Company and of the Smelters Securities Company, and will have general charge of the mines and plants of both companies. He has also been elected to vice-presidencies in the Cumberland-Ely Copper Company and the Nevada Consolidated Copper Company. S. W. Sproule, formerly traffic manager of the Southern Pacific, has taken the management of the traffic department of the American Smelting & Refining Company.

Herbert Foster, New Haven, Conn., who has contributed a number of articles on costs and kindred subjects to the columns of *The Iron Age*, has been appointed lecturer on the problems of business management in the Sheffield Scientific School of Yale University.

Anton M. Olsen, an apprentice of the Kempsmith Mfg. Company, builder of milling machines, Milwaukee, Wis., is the first apprentice west of New England to receive the diploma recently adopted by the National Machine Tool Builders' Association to mark the completion of an apprentice's time under the uniform apprenticeship contract. The presentation of the diploma, which took place last week, was made the occasion of an evening luncheon at which were present all the company's apprentices, as well as the superintendent, foremen and executive officers.

John C. Spiers, formerly factory manager for the Autocar Company, has been appointed factory manager of the Standard Roller Bearing Company, Philadelphia, with full charge of the manufacturing department.

The American Society of Mechanical Engineers, 29 West Thirty-ninth street, New York, with the desire to still further develop its publications, has secured Lester G. French to direct its editorial department. Among the immediate improvements to be undertaken is the establishing of departments in the monthly *Proceedings*, thus providing a greater variety of technical articles of interest. All such papers, however, will first be presented and discussed before the society at its meetings, as formerly, thus benefiting the membership twofold. Mr. French received his degree in mechanical engineering from the Massachusetts Institute of Technology in 1891. After four years' apprenticeship, drafting room and shop experience and a year and a half as a text book writer, he was engaged on the editorial staff of *Machinery*, and for nine years was its editor in chief. Recently Mr. French re-engaged in the publishing of text books on algebra and applied mechanics and of a treatise on steam turbines.

J. W. Hemmerle of J. W. Hemmerle & Co., *Times* Building, Pittsburgh, is now connected with Edgar M. Moore & Co., 914 Farmers' Bank Building, manufacturers' agents, in the capacity of salesman. Mr. Hemmerle has been representing the Hawley Down Draft Furnace Company, Chicago, manufacturer of the Schwartz metal melting and refining furnaces, which have been added to Edgar M. Moore & Co.'s regular line. The firm will also hereafter pay special attention to foundry equipment.

Thomas McDonald, general superintendent of the Ohio works of the Carnegie Steel Company, Youngstown, Ohio, has been absent recently on a Venezuelan trip.

Dr. Hugo K. W. Ackermann, one of the engineers of the famous firm of Thyssen & Co., steel makers of Muelheim a. d. Ruhr, Germany, is now visiting this country in behalf of the Walzwerk Dinslaken.

The Du Bois Iron Works, Du Bois, Pa., has appointed as its representative for Cleveland and vicinity Robert R. Harkins, with offices at 1526 Williamson Building, Cleveland, Ohio. Mr. Harkins was formerly Pittsburgh manager for the Atlas Engine Works, and has had extensive experience with steam engines, gas engines and producer gas plants.

Joseph G. Walton, formerly a salesman for the Robert Field Company, Cincinnati, and prior to that connection identified with the Cincinnati office of Matthew Addy & Co. for several years, has taken a position as salesman for Walter Wallingford & Co., with headquarters at the Cincinnati office in the Traction Building.

Mail Subsidy Bill Passes the Senate.—The United States Senate on March 20 passed the Gallinger mail subsidy bill providing that American vessels plying to the Orient and Australasia should receive the same subsidies as those granted to vessels carrying mail in the Atlantic, provided that the total expenditure for foreign mail service in any one year shall not exceed the estimated revenue therefrom for that year. The present ocean mail law gives to 20-knot vessels that cross the Atlantic to European ports $4 a mile for mail service; to 16-knot vessels, for any port, $2 a mile, and to 14-knot vessels, $1 a mile. It was explained that the amount to be appropriated for this service would be $3,600,000 a year for 10 years. This was thought to be sufficient to establish two steamship lines to South America and one to Oriental ports. The estimated revenue from the foreign service is now $6,000,000 a year, from which there is an estimated net profit of $3,600,000. The revenue has been increasing at the rate of $500,000 a year for the last few years.

Work has been pushed actively during the depression on the two new blast furnaces, Nos. 5 and 6, being built by the Carnegie Steel Company at its Ohio Works, Youngstown, Ohio. The construction of the new 12 open hearth furnaces and eight finishing mills was practically stopped some time ago, but orders have recently been given to the different machinery concerns that are supplying equipment to resume work on the contracts.

NEWS OF THE WORKS.

Iron and Steel.

The William B. Pollock Company, Youngstown, Ohio, builder of lowa steel plate work, is forwarding to the Schaghticoke Electric & Power Company, Schaghticoke, N. Y., 750 tons of penstock to be used in the construction of a new plant. The company is dismantling the old Grace stack of the Brier Hill Iron & Coal Company, Youngstown, and is daily shipping material to be used in the construction of the new furnace.

The report that the United States Works of the American Sheet & Tin Plate Company, at Demmler, near McKeesport, Pa., will be dismantled is officially denied. This plant contains 11 hot mills and is one of the best equipped plants owned by the company.

The Standard Steel Tie Company, recently organized under the laws of Delaware with a capital of $133,000, has opened offices at 714-715 Curry Building, Pittsburgh. The company will manufacture Standard steel ties and fasteners for street railway and railroad service. It intends to erect buildings near skelp and plate mills for the manufacture of the new tie and fasteners.

The Carnahan Tin Plate & Sheet Company, Canton, Ohio, reports that it is running its plant at full capacity and that orders are coming in in a very satisfactory manner.

General Machinery.

The American Foundry & Construction Company, Pittsburgh, has plans under way for improvements and additions which will more than double the output of its plant. Contracts have been awarded for the erection of a large steel building, which will contain equipment for bending, welding and cutting pipe, and this also will have an electric crane for handling material. The foundry will also be enlarged. These additions will be completed within three months.

Power Plant Equipment.

The city of Whittier, Cal., is considering the establishment of a municipal electric light plant and a committee has been appointed by the Board of Trade, consisting of N. T. Edwards, C. F. Klingberg and H. E. Humphrey, to investigate the proposition. It is estimated that an installation can be made in connection with the present municipal pumping plant for about $75,000.

The City Council of St. Peter, Minn., has under consideration the question of installing a new generator and engine and making necessary repairs to the power house. No plans or specifications have as yet been prepared.

The New World Reduction & Power Company, Spokane, Wash., has under construction and near completion a 200-ton smelter in Park County, Mont., in the vicinity of the New World and Cook City mining camps. In connection therewith an electric plant of 6000 hp. is being built. All machinery equipment required for the present installation has been purchased.

The Mitchell Illuminating & Power Company, Mitchell, S. D., is contemplating improvements to its plant and system which, according to plans now under consideration, will require the purchase of some new machinery.

The Manistee Light & Traction Company, Manistee, Mich., which has heretofore operated two separate plants, is consolidating them into one. In connection with this work other improvements will also be made.

The Pellston Light & Power Company, Pellston, Mich., has increased its capital stock from $35,000 to $50,000, and expects to begin work about April 1 upon the construction of an additional dam to develop about 1000 hp. A power house will also be built, together with about 20 miles of the transmission line.

The Yorktown Light & Ice Company, Yorktown, Texas, which was recently incorporated with a capital stock of $7500, has purchased of Koenig & Son the local light and ice plant and is preparing to spend a considerable sum on improvements.

Plans are being prepared for the enlargement of the city water works, Centralia, Ill. Among the improvements contemplated are the purchase of new pumps and the building of a reservoir, but until plans are completed details of requirements cannot be supplied.

The Entiat Power Company, Seattle, Wash., has been incorporated, with a capital stock of $200,000, to develop a water power of 2000 hp. capacity and transmit current 20 miles along the Columbia River for furnishing power and water for irrigation purposes. Rights have been secured for a flume line 1¼ miles long. No machinery has yet been purchased. Among those interested in this project are M. D. Barash, J. H. Allen and A. B. Gray.

E. R. Cushman, Viola, Wis., is contemplating the erection of an electric light and power plant at that place, for which plans are being prepared. The estimated cost of this improvement is from $15,000 to $20,000.

The Gulfport & Mississippi Coast Traction Company, Gulfport, Miss., will spend $120,000 for new machinery to increase the capacity of its power plant, the installation to include a 500-kw. Westinghouse turbo generator, 445-hp. Babcock & Wilcox boiler, Worthington condenser and accessories.

The Board of Commissioners of Dallas, Texas, has accepted the bid of the Wm. Todd Company, Youngstown, Ohio, for furnishing the high service pumping engine for the city water works. The engine will cost $84,000.

The City Clerk of Council Bluffs, Iowa, will receive bids until May 18 for a water works system under four separate divisions, as follows: Division 1, power plant complete; 2, settling reservoir; 3, distribution system; 4, high service reservoir.

E. G. Whitacre, Wellsville, Ohio, has sold his boiler works to Joseph and J. W. D. Noon and other Pittsburgh capitalists for $30,000. The new owners will take charge at once, and it is understood to be their intention to enlarge the capacity.

The Dittlinger Lime Company, New Braunfels, Texas, has purchased a Bullock generator and other necessary equipment for the installation of an electric light plant in its factory and grounds.

Foundries.

The large stove plant of the H. Wetter Mfg. Company at South Pittsburg, Tenn., has again started up. It is reported that the Shuster plant of the Central Foundry Company, in the same town, will start up in a few days, employing 200 men.

The Nashville Foundry Company, Nashville, Tenn., recently organized, is proceeding with the construction of its buildings and the foundry will be ready to open by May 1. A seven-story brick structure will be utilized and 50 men will be employed. J. W. Satterwhite, O. H. Looney, W. F. Roberts and L. E. Jones are identified with the company.

The American Car & Foundry Company, St. Louis, Mo., will erect an addition to its plant at Binghampton, Tenn., near Memphis, to cost $200,000 and employ 400 men. The plant has been closed since October. With the completion of the wheel foundry it will employ 1800 men. The resumption of operations depends on business conditions.

The Ralph Molding Device Company has been incorporated at Buffalo, N. Y., with a capital stock of $100,000, to manufacture a patented molding machine for metal castings and will establish a factory in Buffalo. Maulsby Kimball, E. C. Shafer, Clifford E. Branch and B. Kerr, Buffalo, are directors, and the company's office will be located at 786 Ellicott square for the present.

The Manitowoc (Wis.) Foundry & Machine Company has been incorporated by Michael W. Glenn, Samuel G. Smith and Lillie Smith, with a capital stock of $30,000.

The Union Steel Casting Company, Pittsburgh, has been making six heats per week from January 1 until week before last, when seven heats were made, while last week the company made eight heats. It reports that business is slowly improving and that it expects soon to be able to run to nearly full capacity.

Bridges and Buildings.

William Farris & Brother, bridge engineers and contractors, 204 Diamond Bank Building, Pittsburgh, have received a contract for three highway bridges, with reinforced concrete foundations, to be built over the Bluestone River in Mercer County, W. Va.

Fires.

The plant of the Bowker Fertilizer Company, Brooklyn, N. Y., was burned March 22. The loss is placed at $30,000.

The plant of the Beaver Dam Gas Company, Beaver Dam, Wis., was wrecked by an explosion March 15.

A part of the plant of the Penn Spring Works at Baldwinsville, near Syracuse, N. Y., was destroyed by fire March 22, the loss being about $50,000.

The oil mill and power plant of the Summit Gin & Improvement Company, Summit, Miss., were badly damaged by fire March 18, the loss being placed at $25,000.

Hardware.

The Washington Stove Works, Everett, Wash., is constructing a two-story addition, 48 x 50 ft., to its present plant, which will be devoted to the manufacture of a new line of sheet iron heaters. Later on it is proposed to include the manufacture of steel ranges.

V. B. Starr and A. M. Starr of the Starr Bros. Bell Company, East Hampton, Conn., have purchased the Nettleton reversible nipper patents of the Starr-Nettleton Company and plan to manufacture the tool at East Hampton.

The Northwestern Consolidated Iron & Steel Mfg. Company, Burlington, Iowa, has been recently organized for the manufacture of a line of hardware specialties, and is incorporated with a capital stock of $50,000. The company has purchased the machinery and patents of the Pierce & Laux Mfg. Company and is now making in connection with its own line the products formerly made by this concern, which include several patented articles. A. L. Kriechbaum, secretary of the company, was formerly connected with Hibbard, Spencer, Bartlett & Co., Chicago. The other officers are F. C. Ihrer, president; W. W. Copeland, vice-president.

Miscellaneous.

The Rock Island Plow Company, Rock Island, Ill., has increased its capital stock from $600,000 to $2,200,000. While plant extensions are contemplated, present plans do not include any work in this direction during the current year.

The Board of Public Works of Nashville, Tenn., has awarded contract for steel valve deck plate for the Holly engine at the pumping station to the Nashville Machine Company.

R. W. Smith, Charlotte, N. C., intends to establish a plant for the manufacture of wire nails, the installation of which will be started about June 1.

The new factory buildings of the Waterbury Mfg. Company, Waterbury, Conn., maker of brass goods, mentioned in this column last week, are not intended so much to make addition to manufacturing capacity as to replace some of the older buildings on the premises that they may be more in harmony with structures of later erection. It being a dull time for orders, the company decided to do some building if they can be constructed at low enough prices. The matter is not yet fully determined. The buildings as planned will probably be six stories in hight and of brick, mill construction, though cement is also being considered.

The New Century Steel, Wire & Iron Works, 602-604 South Regester street, Baltimore, Md., recently incorported, with a capital stock of $20,000, has installed a plant for the manufacture of the New Century automatic farm gate, in addition to which it will make a full line of common steel gates. The machinery has all been secured, with the exception of a combination punch and shear. J. E. Reinburg is president, and M. A. Blackburn, secretary and treasurer. James W. Denny and Henry A. Roth are also interested.

The plant, equipment and stock of the North Penn Iron Company, Philadelphia, Pa., has been sold at public sale to Samuel T. Freeman & Co. The company was adjudged a bankrupt some time ago.

The question of a bond issue for the purpose of building a system of water works will be submitted to the voters of Winchester, Ill., some time in May. The expenditure contemplated for this improvement is between $30,000 and $40,000.

Trade Publications.

Mercury Arc Rectifiers.—General Electric Company, Schenectady, N. Y. Bulletin No. 4530, superseding Nos. 4411 and 4472. Describes and illustrates mercury arc rectifiers for producing direct current from alternating current for storage battery charging and other commercial purposes. A brief outline of the theory of the apparatus is given and various types of rectifying sets are shown.

Traction, Stationary and Portable Gasoline Engines.—Kansas City Hay Press Company, Kansas City, Mo. Catalogue. Describes particularly a traction gasoline engine which embodies recent improvements in the company's stationary and portable gasoline engines. It has a capacity of 10 hp., makes a speed of from 2½ to 3 miles per hour and weighs 7200 lb. It is especially recommended for farm work, since it can be used to operate stationary machinery when not engaged in hauling loads. The catalogue describes in detail the principal parts of the engine.

Pneumatic Tools.—Ingersoll-Rand Company, 11 Broadway, New York. Mailing card. Calls attention to the economies resulting from the use of pneumatic tools, showing the per cent. of saving in cost and time over hand labor methods.

Crushing Rolls.—Sturtevant Mill Company, Boston, Mass. Bulletin series 107. Contains illustrated descriptions of the Sturtevant crushing rolls, including sectional views, outlines their special utilities, and calls attention to other products of the company which are a part of its line of rock and ore crushing, granulating, pulverizing, grinding and screening machinery.

Billet Prices Outside of Pittsburgh.

In order to overcome the disadvantages in freights of finishing mills located outside of Pittsburgh that are consumers of steel billets, there has been formulated a schedule of delivered prices on billets under the terms of which the mill absorbs one-half the freight rate when it is more than $1 a ton and up to $3 a ton. This equalization in the prices of billets is not in any sense a reduction on the base price, which remains at $28, Pittsburgh, but has been made solely to put consumers of billets located at points far distant from the supply on an equitable basis in competing with finishing mills located nearer Pittsburgh, and which, therefore, have the advantage of lower rates of freight. For instance, the rate on billets from Pittsburgh to Albany is $2.60 a ton, so that the delivered price of billets in Albany under the new arrangement would be the base price at Pittsburgh, $28, plus one-half the freight of $1.30, or $29.30. To Buffalo the billet rate from Pittsburgh is $1.80, so that the delivered price on billets would be $28.90, Buffalo. To several other points the delivered price on 4 x 4 in. billets is as follows: Bethlehem, Pa., $29.20; Bridgeport, Ohio, $29.50; Boston, Mass., $29.50; Cleveland, Ohio, $28.75; Chicago, Ill., $29.50; Canal Dover, Ohio, $28.60; Corry, Pa., $28.75; Detroit, Mich., $29.15; Franklin, Pa., $28.70; New York City, $29.30; Philadelphia and vicinity, $29.20, and Zanesville, Ohio, $28.75.

OBITUARY.

PETER J. DONOHUE, a prominent manufacturer of Brooklyn, N. Y., died March 21, aged 80 years. He was born in Ireland and came to the United States when a boy. He founded the steam boiler manufacturing firm of P. J. Donohue & Sons. He was a United States boiler inspector during the last administration of President Cleveland.

S. DECATUR SMITH, well known in the foundry trade, died in the Jefferson Hospital, Philadelphia, Pa., in which city he resided, on March 18. He met with an accident about a month ago, which resulted in a broken leg, causing complications from which at his advanced age he was unable to recover. He was 88 years old. While actively engaged in the foundry trade for a long period, he retired from active business several years ago. He leaves a widow and one son.

JOHN EASTWOOD, president of the Eastwood Wire & Chemical Mfg. Company, Belleville, N. J., died March 24 at St. Augustine, Fla., after an illness of only a few days. In 1843 he began business in Belleville in the manufacture of liquor used in setting colors in silk. In 1874 he went into the wire weaving business, developing an important establishment.

JOHN GOOD, once president of the National Cordage Company, died at his home in Brooklyn, N. Y., March 23. He invented many appliances for simplifying rope making and organized two large cordage companies. His last venture was the John Good Cordage Company, which went into the hands of a receiver.

Heavy Losses by Molders' Strikes.

The National Founders' Association, in the March issue of its *Review*, gives a summation of the causes and outcome of 114 molders' strikes in 99 cities in the period from March, 1904, to May, 1907. These strikes were supported by the Iron Molders' Union, and the largest of them were started in 1906. The *Review* says that for seven years previous to 1904 the foundrymen of the United States and Canada made persistent efforts to negotiate with the Iron Molders' Union, and nearly 2500 conferences were held in that period, participated in by officers of the union. "The union persisted in forcing its obnoxious conditions upon the foundry proprietors—conditions which, if accepted, meant the ruination of the foundry business in this country. These union efforts culminated in 1906, when the molders' organization started the largest strike ever known in the foundry business."

The summation of losses, based upon data in the possession of the National Founders' Association and information specially gathered for the present exhibit, shows that the strike benefits paid in the 114 strikes were $1,382,965. The approximate loss in wages is put at $3,803,935. It is impossible to give here in brief a statement of the outcome of the above strikes. The *Review* devotes a paragraph, in some cases an extended one, to a statement of the outcome of each. The memorandum, "open shop established," applies to many of the 99 cities. In other cases it is stated that nonunion shops were established. In not one instance does it appear that the union succeeded in winning its demands. The article says: "This enormous loss of 5¼ millions is only a portion of what the union has squandered in three and a half years in a futile attempt to enforce the strictly closed shop, an illegal and unwarranted undertaking. These strikes were absolutely lost to the union a year ago, but only within a few months has it seen fit to do the proper thing in the interests of the molders and call them off."

The iron market commentators are finding some humor in the present situation. One sales agent in introducing his weekly letter to his house wrote recently: "The stronger undertone referred to in our last report has gone further under in the week just closed."

The Iron and Metal Trades

There has been a halt in the volume of new business placed during the last 10 days, and the improvement, which has been gradual and quite steady since the beginning of the year, has not been maintained. There has been some misinterpretation of the report made by the United States Steel Corporation that there was an increase in new orders of 25 per cent. in January over December, and of a like amount for February over January and of the first half of March over February. The tonnage of new orders in December was about 8500 tons per day, or roughly 28 per cent. of the productive capacity. Adding the progressive increases over previous months an active capacity of about 50 per cent. was reached during the first half of March, as reported at the time.

The crux of the situation lies in the restricted demands from the railroads, which in ordinary times consume about 60 per cent. of the production, and their buying in turn depends upon the ability of the railroads to finance their requirements. In some instances the burden of that financing has been shifted to the builders of equipment, a course which has its limitations.

While the locomotive builders have taken some very good orders during the last week, the car builders have very little in sight, and the shipbuilders on the lakes are now practically out of work. This means a slack demand for Plates and Shapes.

The New York Central Road has placed an order for 24,000 tons of Steel Rails with the Lackawanna Steel Company, and is negotiating with other mills for additional quantities.

No important contracts for Structural Material have been let, but some pretty large work is coming up, like the Beaver Bridge, calling for 14,000 tons; the elevated work for the Reading in Philadelphia, 16,000 tons; the new building on the site of the Fifth Avenue Hotel, with a minimum of 7000 tons, and the extension of the Hotel Astor in New York.

While the immediate prospects of those who depend upon the railroads are not very encouraging, the lighter lines which largely sell to the farming interests, directly and indirectly, have been holding up very much better. The Wire trade has now, however, accumulated an adequate stock to take care of the spring trade well, and production will probably be somewhat less active.

The Pig Iron markets are very quiet throughout the whole country. The market is in the possession of those makers who have not committed themselves to the effort to maintain prices. Ferromanganese is lower, a large lot having been sold on the basis of $42.50 seaboard.

Copper has advanced squarely to 13¼c. for both Lake and Electrolytic, and there has been some business, although its volume is being exaggerated in the public prints. There has been buying for home consumption, but there has been little demand for export, on account of the advance.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Mar 26 1908.	[illegible]	[illegible]	Mar 27, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	*$17.75*	$18.25	$18.75	$24.25
Foundry No. 2, Southern, Cincinnati	*15.25*	15.25	15.75	26.00
Foundry No. 2, Local, Chicago	17.50	17.50	17.50	26.00
Bessemer, Pittsburgh	*17.75*	17.90	17.90	22.85
Gray Forge, Pittsburgh	15.90	15.90	15.90	21.60
Lake Superior Charcoal, Chicago	*20.50*	21.50	21.50	26.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	29.00
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.00
Open Hearth Billets, Phila	*29.20*	30.40	30.40	32.00
Wire Rods, Pittsburgh	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	*12.00*	12.25	13.00	18.00
Steel Rails, Melting, Phila	*12.75*	12.75	14.50	19.25
Iron Rails, Chicago	*15.00*	15.00	17.00	25.00
Iron Rails, Philadelphia	*17.00*	17.00	18.00	27.00
Car Wheels, Chicago	*15.50*	15.50	15.75	24.00
Car Wheels, Philadelphia	*14.00*	14.00	16.00	24.00
Heavy Steel Scrap, Pittsburgh	*13.00*	13.00	13.75	18.00
Heavy Steel Scrap, Chicago	*11.25*	11.50	12.50	16.00
Heavy Steel Scrap, Philadelphia	*12.75*	12.75	14.50	18.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.65	1.65	1.65	1.93½
Common Iron Bars, Chicago	1.65	1.65	1.65	1.81½
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.70	1.70	1.70	1.90
Skelp, Sheared Steel, Pittsburgh	1.80	1.80	1.80	2.00
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	*1.90*	1.90	2.00	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	**13.25**	13.00	12.62½	25.25
Electrolytic Copper, New York	**13.25**	12.87½	12.50	25.12½
Spelter, New York	4.75	4.80	4.75	6.85
Spelter, St. Louis	*4.55*	4.60	4.75	6.65
Lead, New York	**4.00**	4.00	3.75	6.25
Lead, St. Louis	**3.85**	3.85	3.65	6.05
Tin, New York	**32.25**	30.50	28.70	40.35
Antimony, Hallett, New York	**9.50**	9.00	9.00	23.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, March 24, 1908.

The Iron and Steel interests find encouragement and reassurance in the fact that a number of lines of mill products, there is unquestionably improvement noted in nearly all departments. business and specifications being entered by the Illinois Steel Company are now within 20 per cent. of 1907. With the exception of the sheared and universal Plate mills, the mills at the South Works are this week all in operation. Plate week. to be built by the Chicago, Milwaukee & St. Paul Railroad will divert this tonnage from the Steel mills to the forge road in pushing construction work on its Pacific Coast extension. principal interest for 30,000 kegs of Spikes. Another order for fastenings placed last week by the Chicago Street Railroad System comprised 1000 tons of Fish Plates, which went to the Pennsylvania Steel Company. The tonnage of Structural Material secured by fabricators last week was extremely light. The most important Structural projects are holding back, some doubtless because of the difficulty experienced in financing large enterprises, while others are perhaps influenced by the hope of an ultimate break in Steel prices. At a meeting of the Central Freight Association, held in Chicago last week, it was finally decided to postpone action indefinitely relative to the raising of the freight rate

on Cast Iron Pipe 25 cents per ton in Central territory north of the Ohio River.

Pig Iron.—The Pig Iron market has experienced another extremely dull week. Some of the furnacemen are of the opinion that the foundry melt is steadily increasing in a moderate way, but not to an extent that is forcing consumers into the market. Absence of transactions covering more than carloads and small lots for immediate or nearby delivery makes it difficult to determine what prices might be developed by offers of round tonnage. Northern furnace interests are positive in their statements that they are not seeking forward delivery contracts at prices below those now being quoted, notwithstanding the sagging in values of Southern Iron. The principal Southern producers maintain their unwillingness to sell far into the second half for less than $13. Birmingham, for No. 2 Foundry, but it is well established that $12.50 can be done, and rumors of $12 are still heard. There is no question that sales have been made at the latter figure, but how much strictly No. 2 Foundry is available at this price is not determined. Nothing in the way of firm inquiries indicating a purpose to buy is heard from the malleable foundries. Based upon the general tendency toward improvement seen in nearly all lines, there is, in spite of the existing dullness, a hopeful feeling of encouragement among the furnace interests. The following prices are for March delivery, f.o.b. Chicago:

Lake Superior Charcoal	$20.50 to $21.00
Northern Coke Foundry, No. 1	18.00 to 18.50
Northern Coke Foundry, No. 2	17.50 to 18.00
Northern Coke Foundry, No. 3	17.00 to 17.50
Northern Scotch, No. 1	18.50 to 19.00
Southern Coke, No. 1	17.35 to 17.85
Southern Coke, No. 2	16.85 to 17.35
Southern Coke, No. 3	16.35 to 16.85
Southern Coke, No. 4	15.85 to 16.35
Southern Coke, No. 1 Soft	17.35 to 17.85
Southern Coke, No. 2 Soft	16.85 to 17.35
Southern Gray Forge	14.85 to 15.35
Southern Mottled	14.60 to 15.10
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	19.40 to 19.90
Jackson Co. and Kentucky Silvery, 6 %	20.40 to 20.90
Jackson Co. and Kentucky Silvery, 8 %	22.40 to 22.90
Jackson Co. and Kentucky Silvery, 10 %	24.40 to 24.90

Billets and Rods.—Beyond the incidental lots of small tonnage that have for some time comprised the full measure of market activity, there is nothing doing in Billets. It is understood that the 10,000 Car Axles required for the 2500 new cars to be built by the Chicago, Milwaukee & St. Paul will be of Iron; competition among the Steel mills for this tonnage will therefore be eliminated. Forging Billets remain firm at the ruling quotations of $33 to $34, Chicago. Wire Rods continue unchanged, as follows: Bessemer, $35; Basic, $36; Chain, $37, all at Pittsburgh.

Rails and Track Supplies.—No new Rail tonnage of importance has appeared in the market during the week. Light Rail orders are coming in very slowly. Both the standard and rerolling mills of the Illinois Steel Company are running, but the latter is not provided with specifications to assure its indefinite continuance. Spike orders have developed through March at a rate somewhat in excess of the output capacity of the company's Joliet factory. To the tonnage previously reported were added 30,000 kegs placed last week by the Chicago, Milwaukee & St. Paul. An order for 1000 tons of Fish Plates for reconstruction work on the Chicago street railroad system was secured by the Pennsylvania Steel Company. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.90c. to 2c., according to delivery; Track Bolts, 2.40c. to 2.50c., base. Square Nuts, and 2.55c. to 2.65c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—It had been expected that contracts for a considerable amount of Structural tonnage would be placed last week, but results in this respect were disappointing. It is believed that closures were held back in the hope that the meetings of the Steel committees in New York on Thursday night result in a decision to reduce prices. The reaffirmation of prices has, however, eliminated any hope of immediate action in that direction. Considering the number of moderate sized projects upon which estimates are being furnished, and the numerous new plans being submitted for figures, the situation is prospectively stronger. The only transactions of any note reported for last week were the contract let by the city of Milwaukee for the Kinnickinnic avenue bascule bridge amounting to 960 tons, which was taken by Arthur Vogel for $119,842, the fabricating work going to the Worden-Allen Company, Milwaukee, and 800 tons of bridge material taken by the Pennsylvania Steel Company. A small contract was secured by the Minneapolis Steel Machinery Company, Minneapolis, for an addition to the State Capitol at Boise, Idaho. The Structural mill of the Illinois Steel Company at the South Works is in operation this week, but unless specifications are materially augmented by an increase in new business, it is likely that another period of idleness will ensue. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—Although not stronger in a notable increase of business there is a better feeling in the market. The number and character of inquiries coming in indicate an awakening of interest from some of the dormant projects requiring Plates. The car shops, however, are practically out of the market, having no immediate prospect of new car orders. Some of the mills are willing to cut prices from $2 to $3 a ton when there is any business to be secured by price concessions. It is probable that the Sheared Plate mill of the Illinois Steel Company, which has been idle for some weeks, will be started up again next week. We quote for mill shipment as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—In point of activity Sheets continue in the lead of rolling mill products. All the mills of the Inland Steel Company are now on double turn, and a fairly good tonnage of new business is being entered. As a rule buyers are ordering conservatively and not far in advance of actual wants. At the same time several fair sized contracts for delivery some months ahead have been placed by jobbers. Prices are reported to be firmly maintained. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 to 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c. Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—There is possibly a trifle of improvement in Bar specifications, but it is not pronounced enough to change the situation materially. The various mills in this district continue to run intermittently as the accumulation of tonnage warrants. Three of the Bay View mills of the Illinois Steel Company are in operation this week. Improved weather conditions form the basis of hope for a general quickening of the pulse of trade and a marked degree of improvement in the near future. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—A project is under consideration for the extension of the Government's pneumatic tube service in this city, which if finally carried out will require a large amount of Pipe. The present system is constructed of brass tubing, but the Wrought Pipe interests are making investigations with a view to submitting proposals for Steel Pipe in case the proposed construction takes definite form. Pipe of about 3 in. in diameter would probably be required for this service. There is no noteworthy change in the development of new business, which is being offered only in small orders to meet actual requirements. The number of inquiries received, however, is increasing under the influence of favorable weather conditions. Conservative buying on the part of jobbers for some months past has effected a reduction in stocks. However, under the limited demand made upon them, they are ample for present needs. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 72 to 72½ per cent. on Black Steel Pipe, ¾ to 6 in. From 2 to 3 points above these prices is asked for Iron Pipe.

Boiler Tubes.—Aside from the small orders representing the incidental needs of contract and repair shops, there is no movement of significance in Merchant Tubes. Mill orders from jobbers and manufacturers are limited to sorting up requirements. There is practically no buying for forward deliveries. Mill quotations for future delivery, on the base

sizes, are as follows: 2¾ to 5 in., in carload lots. Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 in. and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1¼ in.	35	35	35
1⅜ to 2¼ in.	50	50	50
2½ in.	52½	35	35
2¾ to 5 in.	50	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—In the small volume of business coming to the mills there is noted a slightly better demand for Machinery Steel and small Shapes from manufacturers of Hardware specialties. There is also a fair demand for Tires, Toe Calk and Spring Steel from the Heavy Hardware jobbers and blacksmith shops. Shafting discounts are still subject to more or less shading. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1¼ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 54 per cent. off in car lots; 48 per cent. less than car lots, base territory delivery.

Cast Iron Pipe.—The letting by the city of Cincinnati of 2000 tons advertised for March 17 has been deferred until April 2. No prospective lettings of important tonnage are reported, but a few of minor importance ranging from 100 to 500 tons will be in the market within the next week or two. About 400 tons let last week by Muscatine, Iowa, was taken by the Dimmick Pipe Company. The demand for Gas Pipe is exceedingly light, there being very few new installations, and existing plants are making only such extensions and repairs as are absolutely necessary. Competition for what business there is is extremely keen, often resulting in sharp concessions from regular prices. We continue to quote nominally per net ton, Chicago, as follows: Water Pipe, 4-in., $30; 6 to 12 in., $29; 16-in. and up, $28, with $1 extra for Gas Pipe.

Old Material.—The past week has brought no developments of an encouraging nature as respects the indifferent attitude of consumers toward purchases of anything, save what is imperatively required for actual consumption. Even tempting concessions from the low prices now prevailing fail to rouse interest, and in consequence there are no noteworthy transactions to record. There have been inquiries in the market for small lots of various rolling grades from which perhaps a few unimportant sales have resulted. There is not enough of Foundry activity to create anything like a firm demand for melting stock, but no further recession in prices is noted on cast grades. It naturally follows, however, that under existing conditions prices are generally soft and yielding, and sellers are not inclined to abandon negotiations within any reasonable limit of values. Very little of the railroad material offered last week reached this market, but a list submitted by the Chicago, Burlington & Quincy for closure on March 25, comprising 5000 tons, will prove a test of its power of absorption. Among the important tonnages contained in the list are 1000 tons of Iron Rails, 750 tons Rerollers and about 700 tons of Wrought. We quote per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$15.00 to $15.50
Old Steel Rails, rerolling	12.00 to 12.50
Old Steel Rails, less than 3 ft.	12.00 to 12.50
Relaying Rails, standard sections, subject to inspection	20.50 to 21.50
Old Car Wheels	15.50 to 16.00
Heavy Melting Steel Scrap	11.25 to 12.00
Frogs, Switches and Guards, cut apart	11.50 to 12.00
Mixed Steel	9.00 to 9.50

The following quotations are per net ton:

Iron Axles	$13.50 to $14.00
Iron Car Axles	16.00 to 16.50
Steel Car Axles	14.75 to 15.25
No. 1 Railroad Wrought	11.00 to 11.50
No. 2 Railroad Wrought	10.00 to 10.50
Railway Springs	10.75 to 11.25
Locomotive Tires, smooth	14.00 to 14.50
No. 1 Dealers' Forge	9.00 to 9.50
Mixed Busheling	7.00 to 8.00
Iron Axle Turnings	6.00 to 6.50
Soft Steel Axle Turnings	6.00 to 6.50
Machine Shop Turnings	6.00 to 6.50
Cast Borings	4.75 to 5.25
Mixed Borings, &c.	4.75 to 5.25
No. 1 Mill	7.00 to 7.50
No. 2 Mill	6.00 to 6.50
No. 1 Boilers, cut to Sheets and Rings	7.00 to 7.50
No. 1 Cast Scrap	12.25 to 12.75
Stove Plate and Light Cast Scrap	10.25 to 10.75
Railroad Malleable	10.00 to 10.50
Agricultural Malleable	9.50 to 10.00
Pipes and Flues	8.00 to 8.50

Metals.—The better movement noted in last report has not been sustained. It is characteristic of the demand that it comes in spurts, showing an evident lack of the confidence that is necessary to establish it on a firm basis. Copper prices are reported to be firm and strong at present quotations, and Lead and Spelter have scored moderate advances. We quote as follows: Casting Copper, 13¼c.; Lake, 13¾c. to 14c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 33c.; small lots, 31½c.; Lead, Desilverized, 4.15c. to 4.25c., for 50-ton lots; Corroding, 5.35c. to 5.45c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5.25c.; Cookson's Antimony, 13c., and other grades, 11c. to 11½c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 11c.; Copper Clips, 11c.; Red Brass, 12½c.; Yellow Brass, 10¼c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 23c.; Block Tin Pipe, 25c.

Cleveland.

CLEVELAND, OHIO, March 24, 1908.

Iron Ore.—Shipments from the docks to the furnaces are growing slightly better every week. The Steel Corporation is shipping about 50 per cent. as much Ore as it did this time a year ago, but the shipments by the merchant Ore firms are not showing up quite as well as that. Evidence of the improvement in shipments is shown by the figures of one Ore firm. The shipments of this firm during January were only 6 per cent. of those in January, 1907, but its March shipments are running about 43 per cent. of the March shipments a year ago. Early this week the Great Lakes Towing Company, which operates at all the lake ports except Milwaukee, reached an agreement with its employees, the tugmen's unions, under the terms of which the present wage scale, which has been in force for two years, will be continued for two years longer, or to May 1, 1910. During the past few days vessel capacity has been chartered to move 50,000 tons of Steel Rails from Lake Erie ports to the head of Lake Superior at 80c. a ton, the same price as was paid last year. Ore shippers have not yet taken up the matter of Ore carrying charges for this season and are not expected to do so for some time. There has been a very small amount of chartering for Ore at 75c. from the head of the lakes, the same as last year, but it is believed that lower rates will prevail. The amount of vessel tonnage that the Steel Corporation will be in the market for will depend to a large extent on the rates. If carrying charges are low, the corporation will use considerably more outside tonnage than if rates are well maintained. The leading interests all seem disposed not to start shipments of Ore down the lakes before June 1. The Ore market is still lifeless, no sales for this season being reported as yet. We quote Ore prices as follows, at Lake Erie docks, for 1908 delivery, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.20; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—The market remains almost stagnant. The only sales reported during the week were two 100-ton lots and a very few car lots. The demand is so limited that some of the furnace interests are not looking for orders, and unless considerable improvement is shown in the next few weeks one or two merchant furnaces in this territory will go out of blast as soon as they pile enough Iron to fill outstanding contracts. While some furnace interests report a slight improvement in shipping orders, one local furnace is not shipping as much Iron on contract as a month ago, and has sent out notices to those of its customers who are sending in no shipping orders that they must begin to take some of their contract Iron. A few consumers have pretty well cleaned up their old contracts, and when these are entirely wiped out a slight improvement is expected in the demand for spot Iron. The local melt has improved only slightly, and practically no sales are being made to local foundries. Local furnaces are holding firmly to the price schedule, but there are numerous reports of price cutting by furnaces in the Valley and other Ohio districts. Rather than make quotations below the established schedule, some of the furnaces will stay out of the market until prices become firmer. Of the two 100-ton lots reported sold during the week, one was sold by a local furnace to a local consumer at $17, at furnace, for No. 2 Foundry, and the other was to a Detroit consumer at $15.75, Valley furnace, for No. 2. The freight rate is $1.75, making the price $17.50, delivered, the schedule price for Detroit. The only inquiries for Southern Iron are for car lots. A few car lot sales were made during the week at $13, Birmingham. There are no inquiries for Basic Iron. For prompt shipment and for the second quarter, we quote, delivered, Cleveland, as follows:

Bessemer	$17.90
[illegible]	17.85
Northern Foundry, No. 2	17.35
Northern Foundry, No. 3	16.85
Southern Foundry, No. 2	$16.85 to 17.35
Gray Forge	15.90 to 16.40

Coke.—The market remains inactive and prices are stationary. There is some demand for small lots of Foundry Coke for prompt shipment, but there is no inquiry for Fur-

nace Coke. We quote Connellsville Furnace Coke at $1.70 to $1.80, at oven, for prompt shipment, and Connellsville 72-hr. Foundry Coke at $2.25 to $2.50, at oven.

Finished Iron and Steel.—Taken altogether the past week has been as quiet as any since the first of the year in the Finished lines. Orders of all kinds have been scarce and only for very small lots. One or two mills report a little improvement in specifications. The strong competition for the small volume of business that comes up has resulted in a great deal of price cutting on the part of the smaller mills, and those that are maintaining prices are getting scarcely any of the orders. The demand for Iron Bars shows no improvement, and orders are usually for less than car lots. Local Bar mills are running this week with a limited amount of tonnage on their books. The price of Iron Bars remains weak, orders being taken on the basis of 1.40c., Pittsburgh. The demand for Steel Bars shows no improvement, but the price is being firmly maintained, with the exception that small mills are making concessions on Steel specialties. The locomotive building programme of one railroad has resulted in the placing of an order for Plates for fireboxes with a local mill. Plates are weak, prices of both Heavy and Light Plates being shaded $2 a ton by some of the smaller mills. Price concessions of at least $1 a ton are also being made on Sheets. The demand for Structural Material is very light. Contracts have been closed for about all the projected municipal work in this territory for this season, and there are no building projects in sight that will require a large tonnage. An order was placed with the local agent of a mill during the week for 20 car trucks. There are few inquiries for Billets. One order for 50 tons of Forging Billets is pending. They are held firm at $30, Pittsburgh. We quote Iron Bars at 1.50c. to 1.60c., Cleveland, for car lots; Steel Bars, 1.70c., Cleveland, for car lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼ in. and heavier, 1.80c., Cleveland. We quote Sheets, car lots, Cleveland, as follows, from mills: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. The store price on Steel Bars is 1.75c. to 1.85c., and on Iron Bars, 1.75c. to 1.80c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—The market is weaker, quotations being 50c. to $1 a ton lower on Heavy Melting Steel and several other grades of Scrap. The demand is very light, no improvement being shown in this regard. Mills are buying only for their immediate needs and in car lots. An occasional car lot order is received from a foundry. Dealers have to a certain extent kept the market up by covering to fill orders on old contracts, but these contracts are now well cleaned up, and to this fact and the absence of a demand is attributed the new weakness in the market. The Lake Shore Railroad will sell about 1500 tons of Scrap this week. Dealers' prices to the trade, as revised, are as follows, per gross ton, f.o.b. Cleveland:

Old Steel Rails	$11.00 to $11.50
Old Iron Rails	15.00 to 16.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	15.00 to 15.50
Relaying Rails, 50 lb. and over	21.00 to 22.00
Heavy Melting Steel	11.00 to 11.50
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	7.50 to 8.50

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	7.00 to 8.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	10.50 to 11.00
No. 1 Railroad Wrought	12.50 to 13.00
No. 1 Cast	12.00 to 13.00
Stove Plate	10.00 to 10.50
Bundled Tin Scrap	8.00 to 9.00

Birmingham.

BIRMINGHAM, ALA., March 23, 1908.

Pig Iron.—Some inquiries are received daily and requests of melters for prompt shipment of tonnage previously engaged give some life to the situation, but so far as sales are concerned the market is extremely quiet as compared with what it should be under normal conditions. The lull is not wholly unexpected, however, by reason of the fact that during the recent activity negotiations were consummated to cover the immediate requirements of most plants in operation. Foundries generally have increased their melt, and in some cases the consumption is normal, but idle capacity is still much in evidence. The ability to secure cars as readily as desired has been very effective toward the depletion of furnace stocks, and within the week the accomplishment in that direction is material. There are no indications of an immediate increase in the production, but six concerns now report their output disposed of as far ahead as July 1, and the output of the remaining active capacity is being moved in an apparently satisfactory manner. Quotations are believed to be firmer, and $13, Birmingham, on a No. 2 Foundry basis, with a differential of 50c. per ton for lower grades, is the market price. However, a recent sale evinces the fact that low grades can be had at a greater differential than quoted. The sale referred to is a lot of 250 tons of No. 4 Foundry, which sold for $11.50, Birmingham. An offer of $12.50 for 500 tons of Nos. 2 and 3 Foundry did not result in a sale, and a number of attempts to place small lots on the same basis were unsuccessful. Some resale Iron has been offered at $12, but the tonnage to be had is comparatively insignificant. Charcoal Iron is quoted at $21, furnace delivery.

Cast Iron Pipe.—Specifications have been received for 2000 tons of Water Pipe for the city of Memphis, Tenn., and the contract will be awarded to-day. The city of Meridian, Miss., will award a contract for 3000 tons of Water Pipe March 24, and bids have been submitted on a number of small orders which will probably be placed before April 1. The proposed expenditures for the cities of San Rafael and Los Angeles, Cal., as well as for San Francisco, will no doubt develop an attractive tonnage from that territory, and it is understood that small lots recently placed for Northern points are initiative orders. There appears to be no doubt that, if it could be done, the establishment of firm quotations would be effective toward an active market. We quote Water Pipe nominally as follows per net ton, f.o.b. cars here: 4 in. to 6 in., $27; 8 in. to 12 in., $25; over 12-in., average $24, with $1 per ton extra for Gas Pipe.

Old Material.—Some decrease is perceptible in stock accumulations, and in view of the fact that indications are favorable for a resumption of operations at the plants of probably the largest consumer in the district, dealers are more encouraged. The aggregate of sales for the week is in excess of that for last week, but quotations have not stiffened. We revise quotations on grades for which there is a demand as follows per gross ton, f.o.b. cars here:

Old Iron Rails	$16.50 to $17.00
Old Iron Axles	15.50 to 16.00
Old Steel Axles	14.50 to 15.00
No. 1 Railroad Wrought	13.00 to 13.50
No. 2 Railroad Wrought	10.00 to 10.50
No. 1 Country Wrought	11.50 to 12.00
No. 2 Country Wrought	9.50 to 10.00
Wrought Pipe and Flues	10.00 to 10.50
No. 1 Steel	11.50 to 12.00
No. 1 Machinery	10.50 to 11.00
Stove Plate and Light Cast	9.50 to 10.00
Cast Borings	6.00 to 6.50

Philadelphia.

PHILADELPHIA, PA., March 24, 1908.

The dullness which has characterized the local market for both crude and finished materials for a number of weeks continues. There is little disposition on the part of consumers to enter the market for anything beyond their immediate requirements. Notwithstanding the absence of business in any quantity there is a hopeful feeling prevalent, and it is believed that we will continue to hold the small increase in the tonnage of business on hand, and also make slight further gains in the near future. In some instances the Bituminous Coal situation is viewed with more or less anxiety, particularly as to the effect it would have on the trade should there be difficulty experienced with the miners or should a temporary suspension of mining be made after April 1.

Pig Iron.—Sales have been small and as a rule unimportant. Buyers are taking Iron somewhat more regularly than heretofore, but the tonnages have generally been small, the disposition being to buy in moderate lots at frequent intervals, covering to a great extent the immediate needs of consumers rather than buy for extended delivery. When, however, a tonnage is taken covering several months' delivery it is as a rule for but a small proportion of the usual requirements. There has been some little inquiry for Iron for more extended delivery, but makers are in most cases not willing to make quotations for delivery beyond the first half of the year. The Eastern Pig Iron Association, which met in this city last week, reports orders on the whole but slightly under those for the preceding month. One weak spot developed on the question of the price of Foundry Iron, but this was eliminated and prices based on $18.25, delivered, for No. 2X Foundry were reaffirmed. Stocks were reported as being practically unchanged, but it was also reported that unless there was an increase in the volume of business there would probably be a further curtailment in production. The preponderance of sales recently has been confined to the Foundry grades. Prices show some variation. The Eastern furnaces have in practically every case held to the established basis of $18.25 for No. 2X Foundry, at which quite a tonnage in the aggregate has been sold. Independent furnaces, however, are offering and have sold quite a tonnage on the whole at $17.75, delivered, so that at the time there are really two sets of prices at which business is being transacted. The Virginia furnaces also continue to maintain the lower figures named on No. 2X and

No. 2 Plain Foundry, and some little business has again been done by those interests at from $17.50 to $17.75 for No. 2X and $17 to $17.25 for No. 2 Plain, according to delivery point. Quite a fair tonnage of Pipe Iron has also been sold by the Virginia interests, but practically all of this has been for local or Western account. The pipe foundries in this territory have not been taking any heavy tonnages during the last week, but some buying in small lots from both Northern and Virginia furnaces has been reported. Forge Iron has been in light demand recently, and no sales of any moment have been made. Steel making Irons, generally speaking, show no increased demand. One mill placed an order for 5000 tons of Basic about 10 days ago, the price reported being $17.25, delivered. Low Phosphorus Irons have been in light demand. Sales of one or two small lots have been made at ruling quotations. There has also been some little inquiry for misfit Low Phosphorus Iron, but no business has resulted. To cover the selling prices of No. 2X and No. 2 Plain, the inside figures in the prices tabulated below represent those of the so termed independent furnaces, while the outside figures represent the prices of practically all of the Eastern furnaces, delivery in each case being for the remainder of the first half of the year, in buyers' yards, eastern Pennsylvania and adjoining territory:

No. 2 X Foundry	$17.75 to $18.25
No. 2 Plain	17.25 to 17.75
Gray Forge	16.50 to 16.75
Basic	17.25
Low Phosphorus	23.50 to 24.00

Ferromanganese.—A little more demand is to be noted for Ferro. One inquiry is on the market for 1000 tons for delivery during the second half of the year, while some small scattered lots for prompt delivery have also come out. Quotations are unchanged and range from $44 to $46, Baltimore.

Steel.—One sale of 1500 tons of Slabs for early delivery at the ruling quotations has been made. Outside of this business the demand has been of a hand to mouth character, consumers taking but small tonnages for prompt shipment. Mills are about able to hold their present rate of production and are largely dependent on daily orders to keep them in operation. Prices are firm, $29.20 being named for ordinary Rolling Steel, while Forging Steel is quoted at $31.20 to $33.40, according to analysis.

Plates.—No material change is to be noted in the demand for Steel Plates, and the volume of business coming out is made up largely of a variety of small orders, with an occasional one for a larger tonnage. One mill received an order recently for 2000 tons of Locomotive Plates, while several other fair sized lots which have been before the trade have not yet been placed. Mills are getting enough business to enable them to maintain their present rate of production, but as a rule are not able to make any appreciable gain. Prices continue firm and unchanged, the following range being quoted for delivery in this territory:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—While there has been no particular increase in the sales for Structural Material, the tonnage inquired for is somewhat larger, and the trade is more encouraged regarding the future. Some new work in connection with the elevated structure of the Philadelphia & Reading Railway in this city is expected to come out shortly, which, it is reported, will require some 16,000 tons of Structural Material. With the advent of spring considerable business is also expected to develop in the building trades, and although the tonnage will probably not be large individually, it is believed that in the aggregate it will run to a very fair amount. Prices continue unchanged, 1.85c. to 2c. being quoted, according to specification.

Sheets.—Business continues on a fairly even basis, and mills are able to maintain an average output of about 50 per cent. of their capacity. Orders coming in are for moderate tonnages individually, and the business is largely of a miscellaneous character. Prompt shipment is asked in almost every case, as consumers' stocks are low, but there is no disposition shown to take any quantity beyond that required for immediate consumption. Prices are being well maintained. We quote for mill shipments, with a tenth extra for small lots, the following range: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Old Material.—There is practically no demand for Old Material. Mills continue to show no interest in the market, and transactions have fallen off to occasional small lots for prompt shipments. Heavy Melting Steel is particularly inactive, but one sale of a small lot at $13, delivered, being reported. Prices are not strong, but remain unchanged in the absence of business. We quote about as follows for prompt deliveries in buyers' yards, eastern Pennsylvania and nearby points:

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
Choice No. 1 R. R. Wrought	15.00 to 15.50
[illegible]	[illegible]
[illegible]	[illegible]
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
[illegible]	[illegible]
[illegible]	[illegible]
Cast Borings	7.50 to 8.00
Grate Bars	11.75 to 12.25

Bars.—There has been no improvement in the demand for Iron Bars, and mills do not show any material gain in tonnage. Specifications on contracts come out very slowly, while new business is in small lots only, and plants are being operated on capacities ranging from one-quarter to one-half of their tonnage. At the meeting of the Bar Iron Association, held last week, the present price, 1.65c., delivered in this territory, was reaffirmed. A considerable amount of business, estimated at 20,000 tons, is on the books of the association mills, mostly at a lower range of prices, against which specifications are coming out very slowly. Shipments during February, by 23 mills in the association, on both old and new orders, aggregated about 10,500 tons, which is on a basis of about 40 per cent. of their normal capacity.

Coke.—Foundry Coke shows a little more activity. Contracts have been made in some cases for the year's delivery, dating April 1, at prices ranging from $2.25 to $2.50 at oven, but the tonnages taken have not been large. Furnace Coke has not been in much demand and the business transacted has not been extensive. Prices show practically no change, and while some sellers will contract at $2.25 to $2.50 at oven for Foundry Coke, others are holding at $2.75 at oven. Furnace Coke can be had at prices varying from $1.75 to $2.25, at oven, dependent on the grade. For delivery in the Philadelphia territory we quote the following range of prices:

Connellsville Furnace Coke	$4.00 to $4.50
Foundry Coke	4.45 to 4.95
Mountain Furnace Coke	3.60 to 4.10
Foundry Coke	4.10 to 4.60

Cincinnati.

CINCINNATI, OHIO, March 25, 1908.—(*By Telegraph.*)

Listless, and for the most part uninteresting and featureless, are the local markets on Iron and Steel. In the finished products buyers are still holding off, although dealers are hopeful, and recent investments in the way of improvement and enlargements show that they have confidence in the future. Local jobbing foundries, which have kept out of the market since the first of the year, are beginning to show some interest, and the first inquiry of any size is noted in the subjoined paragraphs concerning Pig Iron. The Scrap markets suggest still lower levels. The first of the month is expected to usher in notices of many changes in the various agencies and representatives of Iron selling concerns. Just now several heads of departments of large Pig Iron agencies are going over with furnace interests in and about Birmingham important matters affecting Cincinnati and other agency centers. Nothing has developed during the week in the various movements instituted by Coke consumers to secure lower tariffs on these products from ovens and furnaces. A meeting which was to have been held on the 25th has been postponed.

Pig Iron.—There are fewer inquiries out than for many weeks, and sellers are less certain of the market to-day than at any previous time this year. While standard brands of Southern No. 2 Foundry are quoted at $12.50, Birmingham, and even $13, it is generally acknowledged that the lower price is being shaded, and that the $12 figure is most frequently in evidence. The same conditions apply to the Northern product; while $16, at furnace, and even higher, is being asked, there is evidence of shading to $15.50 and $15.75. In the few instances that furnaces have been approached, for a price on last half requirements, they all suggest the conviction that it would be a mistake to sell for that period at present prices, although some few have quoted on deliveries extending into the third quarter. An Indiana melter is in the market for 500 to 1200 tons of Analysis Foundry Iron for delivery during the last half. The Detroit inquiry for 750 tons each of Northern and Southern analysis, with 500 tons of Silvery 5 per cent. Silicon, is still pending, and will not be closed, it is said, for about two weeks. This contract contemplates delivery

through September and October. A local foundry is out with an inquiry for 500 tons of No. 3 Southern Foundry Iron. Eastern pipe interests are asking for prices on 2000 to 3000 tons of Foundry Irons. Some scattering inquiries for early deliveries on modest tonnages of 5 and 6 per cent. Silicons are noted also. Arrangements have been perfected to operate both the old and new Vanderbilt furnaces in North Birmingham. A new engine has been ordered, and will soon be installed so that the old stack will be kept in operation instead of blowing out, as originally designed. The furnace of the Embree Iron Company, Embreeville, Tenn. went into blast March 23. This furnace was banked in December. Reports from the Birmingham District show 20 furnaces of a total of 54 now in blast. Another of the Woodward furnaces is expected to go into blast next month. Indications are that the furnaces operating on Ohio Silveries are not parties to any shading of prices based on $19, at furnace, for 8 per cent. The prices given out by a leading interest are $18 for 6, $18.50 for 7, and $19 for 8 per cent., and it is affirmed that these prices are not being actually shaded, except possibly where an agent may sacrifice a small percentage of his commission in contesting close sales, which would not seriously affect the asked price. For immediate delivery and for balance of first half we quote f.o.b. Cincinnati, as follows, freight rates being $3.25, $1.80 and $1.20 from the Birmingham, Valley and Hanging Rock districts, respectively:

Southern Coke, No. 1	$15.75 to $16.25
Southern Coke, No. 2	15.25 to 15.75
Southern Coke, No. 3	14.75 to 15.25
Southern Coke, No. 4	14.25 to 14.75
Southern Coke, No. 1 Soft	15.75 to 16.25
Southern Coke, No. 2 Soft	15.25 to 15.75
Southern Coke, Gray Forge	13.75 to 14.25
Southern Coke, Mottled	13.25 to 13.75
Ohio Silvery, 8 per cent. Silicon	20.20 to 20.70
Lake Superior Coke, No. 1	17.70 to 18.20
Lake Superior Coke, No. 2	17.20 to 17.70
Lake Superior Coke, No. 3	16.70 to 17.20
Standard Southern Car Wheel	23.75 to 24.25
Lake Superior Car Wheel	22.50 to 23.00

(*By Mail.*)

Coke.—Some little increase is noted in the movement of Foundry Coke, but prices have not changed materially. Practically nothing is doing in Furnace brands, and absolutely nothing in the matter of deliveries beyond the first half. Connellsville Foundry is quotable at about $2.25 to $2.40, at oven, and for some specially select grades $2.50 has been done. In the New River District prices are a little stiffer, the range being about $2.65 to $3. Connellsville Furnace grades are quoted at $1.55 to $1.90. One 100 carload lot of Foundry Coke was an incident of last week. Best Virginia grades are bringing about $1.75 to $1.85, at oven, for Furnace, and $2.25 to $2.50 for Foundry.

Finished Iron and Steel.—Quiet still characterizes the market on finished products, there being no activity in any line. Stores are maintaining prices, and what little business is going is in small lots and for immediate needs. Collections are about the same, being neither good nor bad. Showing faith in the future, one of the prominent selling agencies has had plans drawn and contracts have been placed for a large extension to its place of business for carrying a greater stock of Steel. The enlargement plans of the Cincinnati Iron Store Company have already been noted. Dealers quote f.o.b. cars Cincinnati, as follows: Iron Bars, carload lots, 1.65c., with half extras; small lots from store, 1.85c., base, half extras. Steel Bars, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼ in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c. Blue Annealed Sheets (heavy) No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10, and heavier, carload lots, 1.95c.; small lots from store, 2.25c. No. 12, carload lots, 2c.; small lots from store, 2.35c. Sheets (light) Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c., base. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Old Material.—Dullness characterizes every division of the Old Material market. Dealers are still bearish and are not looking for any improvement soon. Reports from other sections, received at local Scrap headquarters, indicate that the inactivity is general. There is very little business between dealers, and scarcely anything is being done with the mills. The local market is about as follows, prices being f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$11.00 to $12.00
Cast Borings, net ton	4.50 to 5.00
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	15.00 to 16.00
Old Iron Rails, gross ton	14.00 to 15.00
Old Steel Rails, long, gross ton	11.50 to 12.50
Relaying Rails, 56 lb. and up, gross ton	20.00 to 21.00
Old Car Wheels, gross ton	14.00 to 15.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00

Pittsburgh.

PARK BUILDING, March 25, 1908.—(*By Telegraph.*)

Pig Iron.—The agreement on prices made at the meeting of furnace interests held in Cleveland last month is not being observed by two or three furnaces, with the result that the small tonnage of Pig Iron wanted by consumers is being sold at somewhat lower prices than those scheduled. At this time only five furnaces in the two valleys are running. While the usual quotation on Bessemer is $17, at furnace, sales have been made at $16.85 and $16.90, at furnace. Basic Iron is weaker, and is readily obtained at $15.50, Valley furnace, or $16.40, Pittsburgh. Foundry Iron also seems to be weaker, and we quote Northern No. 2 at $15.50 to $15.75, at Valley furnace. Sales of about 1000 tons of Northern No. 2 have been made at the lower price. Forge Iron is neglected, and the nominal market on Northern Forge is $15, Valley furnace, or $15.90, Pittsburgh, but on a firm offer, this might be shaded.

Steel.—Inquiries are reported as a little better, and this week the Bessemer plants of Republic and Youngstown Sheet & Tube are running full. Prices on Steel are firm. We quote Bessemer and Open Hearth Billets at $28, Sheet and Tin Bars at $29.50, and Forging Billets at $30, for delivery in Pittsburgh and nearby districts.

Iron Bars.—At a meeting of the Western Bar Iron Association held to-day in the Hotel Lincoln, Pittsburgh, existing prices on Iron Bars were reaffirmed.

(*By Mail.*)

Local conditions in the Iron and Steel trades are without special feature, but are of an encouraging nature. Leading Steel interests and finishing mills report that both new business actually placed this month and specifications against contracts are heavier than in February, which month showed an increase over January. The worst feature of the local situation is the Pig Iron market, which is practically an open one, and some low prices are being made. Bessemer Iron remains at $17, or slightly under, at Valley furnace, but Basic and Northern No. 2 Foundry are being rather freely offered at $15.50, Valley furnace. The price agreement made by the furnace interests in Cleveland last month is in the main being observed by the large producers, but a few of the makers are not living up to the agreement, and in the present light demand for Pig Iron are practically taking at low prices all the orders that are being offered. The situation in Steel is firm, and the new schedule of delivered prices on Billets, Sheet and Tin Bars just agreed on by the leading manufacturers, will no doubt give general satisfaction to consumers of Steel located at a distance from Pittsburgh, and who heretofore have been paying full rates of freight. The market on Finished Iron and Steel remains firm, and there is almost an entire absence of price cutting. Coke and Scrap are still dull and prices are weak.

Ferromanganese.—In the almost entire absence of demand, prices of Ferro are weaker, and we now quote 80 per cent. foreign at $43, Baltimore, or $44.95, Pittsburgh. We note a sale of about 50 tons of foreign to a local consumer at this price.

Muck Bar.—No actual sales have been reported in this market for some time, and there is no inquiry. We quote best grades of Muck Bar made from all Pig Iron at nominally $27 to $27.50, Pittsburgh.

Skelp.—The improvement in the demand for Tubular products is causing some inquiry for Skelp, and there have been moderate sales of Grooved and Sheared Steel Skelp. Prices are fairly strong and we quote: Grooved Steel Skelp, 1.60c.; Sheared Steel Skelp, 1.70c.; Grooved Iron Skelp, 1.80c., and Sheared Iron Skelp, 1.90c., f.o.b. Pittsburgh.

Rods.—Inquiries are reported as a little better, due to the larger demand for Wire Products, and several sales of Wire Rods are reported to have been made in this market recently. We continue to quote $35 for Bessemer Rods, $36 for Open Hearth and $37 for Chain Rods, f.o.b. Pittsburgh.

Steel Rails.—Inquiries for Rails for export are fairly active. The Carnegie Steel Company at present is figuring on about 20,000 tons of Standard Sections and about 6000 tons of Light Rails for foreign delivery. The Edgar Thomson mill continues in operation, with limited bookings ahead, but is only running to about 30 or 40 per cent. of capacity. Regular prices on Light Rails, which are still being shaded $3 to $4 a ton by the mills rerolling Rails, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—The situation continues quiet. While some important work is ahead that will require a good deal of ton-

nage, notably for water lines and other purposes. Business is coming out but slowly, and all the Plate mills are badly in need of rolling orders. Not much new business can be expected from the Steel car interests for some time. Prices are fairly well maintained, but are sometimes shaded from $1 to $2 a ton, mostly on the narrow sizes. Regular prices are as follows: We quote: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼ in. to and including 3 16-in. Plates on thin edges	$0 10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 1 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell grade of steel is abandoned.

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—No local work involving any large tonnage has been placed for some time. The only job of any magnitude in sight is the Pittsburgh & Lake Erie bridge at Beaver, which is to be changed into a two-track structure. Contracts for the masonry work have been placed, but bids on the Steel will hardly be asked for for several months. This work will take about 14,000 tons, and the local Structural manufacturers are anxious to see it go through this summer. Low prices, in some cases actual cost or below, are being made by fabricators on the small amount of new work that is coming up. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—The demand for both Black and Galvanized Sheets continues to show some improvement, and the American Sheet & Tin Plate Company is increasing its active Sheet capacity, now having approximately 50 per cent. in active operation. The independent mills are also running to larger capacity and the outlook, as compared with a month ago, is reported as decidedly better. Prices are quite well maintained, being only occasionally slightly shaded. Regular prices are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—The demand is slowly but steadily showing betterment, and the American Sheet & Tin Plate Company is operating this week 186 Tin mills, or about 75 per cent. of normal capacity. The independent mills also report a slight increase in orders, and the outlook is regarded as encouraging. We are advised that prices are being absolutely maintained, there being no disposition to cut prices in order to get business. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Iron and Steel Bars.—A meeting of the Western Bar Iron Association is to be held in the Hotel Lincoln, Pittsburgh, on Wednesday of this week, but it is not expected that any change in prices will be made. The Eastern and Western Bar Iron mills are working harmoniously together to sustain the market, with the result that prices are quite firm. New business in both Iron and Steel Bars continues light, and is mostly of a hand to mouth character, buyers usually insisting on prompt shipments, which is a clear indication that stocks are light. The Republic Iron & Steel Company is operating most of its Bar mills this week, and reports that both new business and shipments are better than in February. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further west. Steel Bars remain very firm at 1.60c., Pittsburgh.

Hoops and Bands.—As large consumers placed their contracts in January for this year's requirements no new business is being placed. Specifications against these contracts are coming in fairly well. Regular prices are as follows: Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60c., base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Spelter.—The demand is reported to be a little better, and prices are slightly firmer. Prime grades of Western Spelter are now held at 4.55c. to 4.60c., East St. Louis, equal to 4.67½c. to 4.72½c., Pittsburgh. The Western smelters have reduced the output of Spelter very materially recently in an effort to keep down stocks and prevent prices from a further decline.

Railroad Spikes.—The Great Northern Railroad recently placed an order for 15,000 kegs of Spikes, about equally divided between the Illinois Steel Company, Dilworth, Porter & Co. and the Jones & Laughlin Steel Company. The Big Four Railroad has also recently placed a good order for Spikes, and is expected to buy more in a short time. Prices have recently been rearranged, and we now quote Standard sizes, 4½ x 9-16 in., at $1.70, and the smaller sizes at $1.80 per 100 lb. in carloads and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Merchant Steel.—Both new business entered and shipments by the mills this month are reported as slightly larger than in February, but present conditions in this trade are far from being satisfactory. The demand for Shafting is dull, and the regular price of 54 per cent. off in carloads continues to be shaded. We quote: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 2.10c. to 2.15c. Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron, finished, 1½ in. and wider, 1.60c.; under 1½ in., 1.75c. Planished Tire Steel is 1.80c., all f.o.b., at mill.

Pipes and Tubes.—Orders booked and specifications against contracts so far this month show an increase of 15 to 20 per cent. over the same period last month. It is believed that business from this time forward will steadily improve. It is stated that prices will not be changed prior to July 1 at least, with the chances largely in favor of present discounts being maintained through the year. As soon as financial arrangements can be made the Pipe for several oil and gas lines will be placed. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 74 and 5 per cent. off list, while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black. %	Galv. %
⅛ to ¼ in.	60	40
⅜ in.	67	53
½ in.	69	55
¾ to 6 in.	74	59
7 to 12 in.	70	55
Extra strong, plain ends:		
⅛ to ⅜ in.	58	46
½ to 4 in.	65	53
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

Discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
⅛ and ¼ in.	43	4
⅜ in.	65	51
½ in.	67	55
¾ to 6 in.	71	61
7 to 12 in.	68	55
Extra strong, plain ends:		
⅛ to ⅜ in.	58	44
½ to 1 in.	65	52
1¼ to 8 in.	61	47
Double extra strong, plain ends:		
½ to 8 in.	52	41

Boiler Tubes.—The contract for the Locomotive Tubes on the large order for locomotives placed by the New York Central with the American Locomotive Company, aggregating over 1000 tons, has been given to the Worth Brothers Company, Coatesville, Pa. This is the largest single order for Railroad Tubes placed for some time. Some other purchases of Railroad Tubes have recently been made and further business is pending. Discounts on Merchant Tubes for small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in.	42	47
1¾ to 2¾ in.	42	50
3 in.	47	61
3½ to 5 in.	52	65
6 to 13 in.	42	50

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Iron and Steel Scrap.—The market continues dull, and prices generally are weaker. Consumers are not disposed to take in much Scrap, in the belief that the market may go

lower, and for this reason the tonnage that is being sold is quite light. On a firm offer, and for reasonably prompt shipment, it is probable that our prices might be shaded in some cases from 25c. to 50c. a ton. Dealers quote about as follows: Heavy Steel Scrap, $13 to $13.25; No. 1 Railroad Wrought Scrap, $14 to $14.25; No. 1 Cast Scrap, $15 to $15.25; Bundled Sheet Scrap, $10 to $10.25; Cast Iron Borings, $7.75 to $8; No. 1 Busheling Scrap, $13 to $13.25; No. 2, $10.25 to $10.50; Steel Axles, $16.50 to $17; Sheet Bar Crop Ends, $17 to $17.25; Low Phosphorus Melting Stock, $17.25 to $17.50; Iron Axles, $20 to $20.50; Machine Shop Turnings, $8.75 to $9; Rerolling Rails, $14.25 to $14.50; Old Steel Rails, short pieces for Open Hearth use, $13 to $13.25; Grate Bars, $13.25 to $13.50.

Coke.—There is but little demand for either Furnace or Foundry Coke, and more than 50 per cent. of the Coke capacity is shut down at present, and will remain idle until demand improves. Furnace Coke made in the Klondike and Latrobe districts continues to be offered quite freely at $1.60 to $1.65, for prompt shipment, while 72-hr. Foundry Coke is held at $2.10 to $2.25, the higher price being for the best grades. The output of Coke last week in the Upper and Lower Connellsville regions was 160,369 tons. There are 36,590 ovens in these two regions, of which 16,837 were active last week and 19,753 were idle.

William Wieman has been appointed exclusive sales agent for the Sloss-Sheffield Steel & Iron Company in northern Ohio, in addition to representing it in New York State and western Pennsylvania. He is associated with G. P. Bassett, Jr., in a general Pig Iron and Coke business, with offices in the Commonwealth Building, Pittsburgh, Pa.

The offices of the Standard Bridge Tool Company, builder of Bridge and Structural Shop Machinery, have been removed from room 425 Bissell Building to room 709-710 Curry Building, corner Ross street and Fourth avenue, Pittsburgh.

The American Vanadium Company, miner and manufacturer of vanadium, with plant at Bridgeville, Pa., has removed its offices from 303 to 324 Frick Building, Pittsburgh.

The Mark Mfg. Company, Chicago, operating pipe and tube mills at Zanesville, Ohio, has opened a sales office in room 510 Park Building, Pittsburgh, in charge of B. F. Bechtel.

Metal Market.

NEW YORK, March 25, 1908.

Pig Tin.—Business has fallen off to a considerable extent. Buyers are fairly well supplied for present needs, and as they have little faith in the advance are holding off. A marked difference in quotations has been in evidence, on one day ton lots selling below 5-ton lots. Price changes during the week have been as follows:

	Cents.
March 19	30.65
March 20	31.00
March 23	30.87½
March 24	31.50
March 25	32.25 to 32.50

The best day of the week was Thursday. On Monday some sellers liquidated under the London market equivalent, as they had good profits. The reason for the London advance is threefold: It was started by the good buying from America two weeks ago; continued in the hope of securing good prices at the Banca sale to-morrow, and helped by a well defined rumor that a large short interest would have to cover in April. The London market is up about £10 from last week, closing easy at £146 10s. for spot and £144 for futures. The advance of 1c. to-day was the result of the rapid upbidding in London, and there is considerable irregularity to the market.

Copper.—Slowly but steadily advancing prices of Copper Warrants in London helped furnish the initiative for higher prices in America. A better demand from consumers and freer buying caused quotations to advance ⅛c. to ¼c. A fair number of contracts have been made for April delivery of Lake at 13.25c., and some holders are now asking 13.37½c., but no metal has been sold at the latter price. Electrolytic is likewise stronger, most of the week's transactions ranging between 13.12½c. and 13.25c. Nothing is offering to-day under 13.25c. The advance has been quiet and not accompanied by startling rumors of big sales, which generally have the opposite effect from the seeming intent. For want of some better reason to account for the advance, some express the opinion that more reassuring news from Washington has been the cause of it. There is no doubt, however, that sentiment has improved, and not only that more tangible results in the way of orders for electrical equipment are in evidence. These, however, are overrated. Wire business, although somewhat better, is still very quiet. Copper producers are apparently concerning themselves little over the increase in production which will come from Montana shortly, preferring to live in the better conditions of to-day. The greater efficiency of labor is aiding producers in making both ends meet. A recent report, only one of many like incidents, is that 750 men are now getting out as much Ore as 900 did last year. If the advance goes farther rumors will likely be revived of a Copper shortage. Most of the selling companies, however, can ship on four days' notice, and many lose no time in getting cars out. When the present speculative movement in London culminates, this market may be expected to follow that lead as it has done on the advance. Buying by European melters is light, they being well supplied with Copper for six weeks at least. Exports so far this month are 17,165 tons. The London market closes easy, but about £1 above a week ago, at £60 7s. 6d. for spot, £60 15s. for futures and £63 10s. for Best Selected. L. Vogelstein & Co., agents for Aron Hirsch & Sohn, Halberstadt, Germany, give the German consumption of foreign Copper for January, 1908, as 14,160 tons, compared with 8332 tons during January, 1907.

Pig Lead.—A few stray lots in the market early in the week were rapidly picked up at 3.97½c., New York, and since then the market has been steady, at 4c., New York, and 3.85c., St. Louis. Although business is dull, there is little Lead offering by outside producers.

Spelter.—This metal has not shared in the general advance, and while there is considerable difference between quotations, they are on the whole lower. Prime Western brands can be had at 4.75c., New York, and 4.55c., St. Louis.

Aluminum.—The old quotations of 33c. for No. 1 Ingots and 32c. for No. 2 Ingots continue. Dealers importing this metal, although without stocks here, express the belief that they will be able to take large orders at lower figures.

Antimony.—Dullness continues to rule and prices are nominal, at 9.50c. for Cookson's and 8.50c. for outside brands. Hallett's is purely nominal, because there is little of that brand here.

Nickel.—Quotations are unchanged, at 45c. for ton lots and 55c. to 60c. for smaller quantities.

Ferroalloys.—Only a light inquiry is in evidence, and consumers are doing considerable shopping even for small orders. The price of 50 per cent. Ferrosilicon is so low—$77 seaboard and $79 Pittsburgh—that manufacturers are talking of closing their works. Ferromanganese is quoted at $44, but this price is reported to have been shaded.

Tin Plate.—The American Sheet & Tin Plate Company is operating about 75 per cent. of its Tin Plate capacity, and specifications on Bright Plates are coming in rather more freely. The leading American user of foreign Tin Plates is taking Plates as rapidly as they are laid down on the dock. Prices are unchanged, at $3.89, New York, and $3.70, Pittsburgh, for 100-lb. I. C. Coke Plates. Prices of Welsh Plates in Swansea are again 1½d. higher, at 12s. 6d.

Old Metals.—The demand, although showing improvement, is not brisk. Prices, however, are higher, because of advancing quotations for Copper. Dealers' selling prices are as follows:

	Cents.
Copper, Heavy Cut and Crucible	12.50 to 13.00
Copper, Heavy and Wire	12.50 to 12.75
Copper, Light and Bottoms	11.50 to 11.75
Brass, Heavy	9.50 to 9.75
Brass, Light	7.50 to 7.75
Heavy Machine Composition	11.75 to 12.00
Clean Brass Turnings	8.25 to 8.50
Composition Turnings	9.00 to 10.00
Lead, Heavy	3.80
Lead, Tea	3.55
Zinc Scrap	3.50

Iron and Industrial Stocks.

NEW YORK, March 25, 1908.

The stock market has continued under the influence of stimulating conditions. The annual report of the United States Steel Corporation was in itself a strong showing for the stocks of that company, while reports from Washington were of a more agreeable character, and Supreme Court decisions promised checks to aggressive legislation against railroads. Stocks consequently showed a steadily advancing tendency from day to day, reaching points higher on Tuesday than at any time since the present rise began. The range of prices on active industrial stocks was as follows from Thursday of last week to Tuesday of this week: Steel common 32½ to 36¼, preferred 96½ to 100; Car & Foundry common 29½ to 33, preferred 89½ to 91½; Locomotive common 36¼ to 43¾, preferred 92 to 93; Steel Foundries common 5½, preferred 30⅝ to 31¾; Cambria Steel 28¼ to 29⅝; Colorado Fuel 19⅛ to 23½; Crucible Steel common 5 to 5⅝, preferred 35½ to 36½; Pressed Steel common 22 to 25½, preferred 78 to 80½; Railway Spring common 32 to 36; Republic common 17½ to 19½, preferred 70⅜ to 73, ex-dividend; Sloss-Sheffield common 50 to 52; Cast Iron Pipe common 21 to 23⅛, preferred 60½; Can common 5, preferred 47 to 49¾. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 35⅛, preferred 99¼, bonds 95; Car & Foundry common 32¾, preferred 91½; Locomotive common 44¼, preferred 94; Colorado Fuel 22⅜; Pressed Steel common 24, pre-

ferred 81½; Railway Spring common 36; Republic common 19, preferred 72½; Sloss-Sheffield common 50½; Cast Iron Pipe common 26, preferred 71¼; Can common 5, preferred 50¼.

The semiannual financial statement of the Lake Superior Corporation for the six months ended December 31 shows earnings of the subsidiary companies as follows:

Gross earnings	$5,390,601
Expenses	1,556,412
Net earnings	$834,189
Interest on loans	93,123
Interest Lake Superior first mortgage bonds	214,000
Balance	$526,066

The balance as above, $526,066, compares with $29,030 for the fiscal year ended June 30 last and $556,880 for the year 1906. The full 5 per cent. dividend on the $3,000,000 income bonds, payable October 1, calls for $150,000 yearly. The floating debt is now $500,000 less than a year ago. The annual meeting, which has been adjourned from time to time because of the injunction preventing the vote on 50,174 shares of stock held as collateral, will be held April 6.

Dividends.—Directors of the Westinghouse Air Brake Company, Pittsburgh, met last week and declared a quarterly dividend of 2½ per cent. For the preceding quarter 2½ per cent. regular and 2½ extra was paid. Last year the stock paid dividends of 20 per cent. In 1906 the dividends paid aggregate 22½ per cent.; in 1905, 20 per cent.; in 1904, 21 per cent.; in 1902 and 1903, 24 per cent., and in 1901, 18 per cent. In 1895 dividends of 22½ per cent. were paid; in 1896, 40 per cent.; in 1897, 35 per cent.; in 1899, 25 per cent., and in 1900, 30 per cent. In December, 1907, a stock dividend of 25 per cent. was declared. The company declared a stock dividend of 25 per cent. in December, thus increasing the capital from $11,000,000 to practically $14,000,000. It was not expected that dividends at the 20 per cent. rate could be maintained under existing conditions.

The American Shipbuilding Company has declared a quarterly dividend of 1¼ per cent. on the preferred stock.

The Central Coal & Coke Company has declared a quarterly dividend of 1¼ per cent. on the preferred stock and 1½ per cent. on the common stock, payable April 15.

The recent statement in this column that the Standard Screw Company, Worcester, Mass., had declared a quarterly dividend of 1¾ per cent., payable March 31, was an error. The dividends of the company are paid semiannually, in January and July.

New York.

NEW YORK, March 25, 1908.

Pig Iron.—There have been a number of sales of fairly round lots to the general foundry trade and to Pipe shops, the aggregate being placed at close to 15,000 tons. Included in this is one lot of 2000 tons for delivery at Troy, N. Y., at $17.25 for No. 2 Soft. Alabama and Virginia makers are underselling the majority of Northern furnaces and are penetrating inland to an unusual extent. We quote at tidewater as follows: No. 1 Northern Foundry, $18 to $18.50; No. 2 Foundry, $17.50 to $18, and No. 2 Plain, $17 to $17.50. Southern Irons are $17.25 to $17.50 for No. 1 Foundry and $16.25 to $16.50 for No. 2 Foundry.

Steel Rails.—The New York Central order for 24,000 tons, placed with the Lackawanna Steel Company, is the only large business of the week. It is understood that the same road is negotiating also with one or two other companies. Through the R. C. Hoffman Company, Baltimore, the Pennsylvania Steel Company has taken 2200 tons of 70-lb. Rails for Panama Canal work. These will be rolled at Sparrows Point. An inquiry is up this week for 1500 tons of Rails for Subway work in Greater New York. More figuring on Standard Rails is reported, and the delay with some roads is due to decisions that must be made in connection with proposed new sections. The turning up of rolls for these will require some time after the business finally gets to the mills.

Structural Material.—The conditions are reported somewhat better, and more work is in sight than was the case a few weeks ago. In New York City the decision to close the Fifth Avenue Hotel April 1 marks the practical placing of a contract for the office building that will take its place. The number of stories is not fixed as yet, but it is believed 6000 or 7000 tons of Steel will be needed. An addition to the new Hotel Astor will require about 4000 tons, and plans are already completed. A building at 18 East Twenty-seventh street is also being figured on. In outside work, interest is being taken in the projected Bureau of American Republics Building, at Washington, D. C., and the Regents' Building, estimated to cost $3,500,000, at Albany, N. Y. A number of public buildings in various parts of the country are projected. Bridge contracts are few of late. The Lehigh Valley is figuring on seven small bridges and a viaduct that will call for 800 or 900 tons of Steel, and the Lackawanna expects to build several bridges of moderate size. The Structural mills are running with a shade greater activity, and expectations are entertained of better things as spring work advances. We continue our quotations on tidewater deliveries, shipments from mill: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—While Eastern manufacturers have not changed the nominal price on Bar Iron, which continues at 1.50c., Pittsburgh, or 1.66c., tidewater, quite a number of mills are selling on the basis of 1.40c., Pittsburgh, or 1.56c., tidewater. The demand is quite light for either Iron or Steel Bars. Manufacturers of Steel Bars are quoting 1.60c., Pittsburgh, or 1.76c., tidewater.

Plates.—General business continues quiet. Some of the mills, however, will doubtless secure quite a quantity of new work, as a result of the large contract for locomotives recently placed by the New York Central Lines. It is intimated that other locomotive orders are to come out in good quantity, which will still further improve the condition of mills rolling Plates for such purposes. Prices are unchanged, as follows, on standard sizes of Plates at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—The city of Reading, Pa., opened bids yesterday on about 2000 tons of Water Pipe. The Brooklyn Union Gas Company will this week place orders for 3000 tons of Gas Pipe. New York City, having made financial arrangements, is now beginning to purchase Water Pipe for the coming season's needs, but the opening orders only cover small quantities. Outside of carload inquiries not much business is being done. Municipalities generally and private corporations as well are finding difficulty in securing funds for extensions, and are therefore not yet in position to undertake such work as has been contemplated for the year. While prices show no betterment, the Pipe manufacturers are resisting the declining tendency. Carload lots of 6-in. are quoted at $23.50 to $24 per net ton, at tidewater.

Old Material.—More inquiries are being received for Relaying Rails than for almost any other Old Material. As spring is now opening and outdoor operations are being taken in hand, contractors and others are making preparations for operations which involve the use of Rails. Parties who would naturally be inclined to purchase new Rails are now economizing by buying Relaying Rails, as they require the investment of much less money. Foundries are doing a little better than they were, but still they are not taking any large quantities of Cast Scrap, a 100-ton order being looked upon as good business. As far as can be ascertained, nothing is being done in the purchase of Steel Scrap, while the Bar mills are buying rolling mill stock in exceedingly limited quantities. We quote as follows, per gross ton, New York City:

Old Girder and T Rails for melting	$8.50 to $10.50
Heavy Melting Steel Scrap	9.50 to 10.50
Old Steel Rails, rerolling lengths	11.00 to 12.00
Relaying Rails	19.00 to 20.00
Old Iron Rails	14.00 to 15.00
Standard Hammered Iron Car Axles	16.50 to 17.50
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	12.00 to 13.00
Iron Track Scrap	9.50 to 10.50
No. 1 Yard Wrought, long	10.50 to 11.50
No. 1 Yard Wrought, short	10.50 to 11.50
Light Iron	5.00 to 6.00
Cast Borings	4.50 to 5.50
Wrought Turnings	6.00 to 7.00
Wrought Pipe	9.00 to 10.00
Old Car Wheels	15.50 to 16.50
No. 1 Heavy Cast, broken up	13.50 to 14.50
Stove Plate	11.50 to 12.50
Grate Bars	10.50 to 11.50
Locomotive Grate Bars	10.00 to 11.00
Malleable Cast	11.50 to 12.50

The Philadelphia Supply and Machinery Dealers' Association held its second annual banquet at the [illegible] Stratford Hotel on the evening of March 19, with quite a large attendance. An address prepared [illegible] the officers of the association [illegible] was served in the Clover Room. President Alfred M. Maddock, of Maddock & Co., acted as toastmaster. In his introductory remarks he called attention to the fact that the association [illegible] is now entering upon [illegible] trade is rapidly disappearing, and it is realized that the interests of the members, as far as business is concerned, are identical, and that co-operation and not competition is the life of trade. He called upon Louis Pelletier, of the Industrial Press, New York, who made a brief address on the status of the machinery trade generally. August A. Miller, of *The Iron Age*, Philadelphia, followed with a few remarks on the local and general conditions governing the machinery market. The concluding feature of the banquet was an enjoyable vaudeville entertainment, given under the personal direction of Frank Clouds, of Powell, Clouds & Co.

The National Metal Trades Convention.

About 200 members of the National Metal Trades Association were present at the Hotel Astor, New York, to open their tenth annual convention on Wednesday morning. The Administrative Council had been in session for two days winding up the affairs of the present administration and making final arrangements for the two days' convention.

The Alumni Banquet.

The annual banquet of the officers' alumni was held on Tuesday night in one of the private dining rooms at the Hotel Astor, when an old-fashioned grandfather's hall clock was presented to President Barker by those who attended. Among those present were: W. D. Sayle, H. N. Covell, H. P. Eells, Robert Wuest, William Lodge, F. A. Geier, F. K. Copeland, Charles E. Hildreth, P. B. Kendig, A. H. Bullard, O. B. Kinnard, George Garvin, A. E. Falkenau, W. L. Pierce, P. W. Gates, A. W. Hoyt, J. Kirby, Jr., George Steadman, William Taylor, Ernest Du Brul, M. K. Bowman, N. W. Dingwall, John R. Back, J. H. Schwacke, M. H. Barker, F. H. Stillman and J. W. Reynolds. The clock was presented by Mr. Covell, who in a neat speech referred to Mr. Barker's activity in promoting the affairs of the association. The presentation came as a surprise to Mr. Barker, but he managed to make an appropriate response. The banquet was presided over by Mr. Sayle, and those who spoke in response to his call were Messrs. Taylor, Steadman, Du Brul, Lodge, Geier, Hoyt, Back and Copeland.

The First Session of the Convention.

At the opening of the convention Patrick H. McGowan, acting Mayor of New York City, delivered the address of welcome. The roll call, reading of the minutes, &c., were dispensed with, and the association got down to business promptly by the naming of the following committees:

NOMINATING: H. N. Covell, Lidgerwood Mfg. Company, New York; J. W. Gardner, Gardner Governor Company, Quincy, Ill.; W. D. Sayle, Cleveland Punch & Shear Works, Cleveland, Ohio.

AUDITING: F. C. Caldwell, H. W. Caldwell & Son Company, Chicago, Ill.; J. W. Glover, Glover Machine Works, Marietta, Ga.; Frank E. Hoadley, Farrell Foundry & Machine Company, Ansonia, Conn.

CONVENTION: W. D. Sayle, Cleveland Punch & Shear Works, Cleveland, Ohio; Henry D. Sharpe, Brown & Sharpe Mfg. Company, Providence, R. I.; Exile Burkitt, H. Jackson Engine Company, Jackson, Tenn.; F. S. North, Union Special Machine Company, Chicago, Ill.; E. C. Page, Page-Storm Drop Forge Company, Brightwood, Mass.

WAYS AND MEANS: Wm. Kehoe, Wm. Kehoe & Sons, Savannah, Ga.; A. H. Bullard, Bullard Machine Tool Company, Bridgeport, Conn.; C. S. Bonsall, Buckeye Engine Company, Salem, Ohio; E. H. Hargrave, Cincinnati Tool Company, Cincinnati, Ohio; E. W. Heyl, Heyl & Patterson, Inc., Pittsburgh, Pa.

HOURS AND WAGES: L. H. Kittredge; S. P. Egan, J. A. Fay & Egan Company, Cincinnati, Ohio; George F. Steadman, Curtis & Co. Mfg. Company, St. Louis, Mo.

STRIKES AND LOCKOUTS: E. P. Robinson, Atlantic Works, East Boston, Mass.; A. L. Lovejoy, Becker-Brainard Milling Machine Company, Boston, Mass.; C. H. Cowdrey, Fitchburg, Mass.; W. S. Hallowell, Harrison Safety Boiler Works, Philadelphia, Pa.

CONSTITUTIONAL AMENDMENTS: H. N. Covell, Lidgerwood Mfg. Company, New York; F. K. Copeland, Sullivan Machinery Company, Chicago, Ill.; J. Kirby, Jr., Dayton Mfg. Company, Dayton, Ohio; J. H. Schwacke, Wm. Sellers & Co., Inc., Philadelphia, Pa.; E. P. Robinson, Atlantic Works, East Boston, Mass.; J. C. Hobart, Triumph Electric Company, Cincinnati, Ohio.

President M. H. Barker in his annual report congratulated the association upon its steady growth during the last year, stating that although 118 names were dropped from the rolls and only 101 have been added, he considered the association has been a gainer by the change. This he attributed to the fact that the names added are all of concerns that will be a great help and benefit to the organization. Speaking of business conditions of the last year he said:

I wonder sometimes if the Machinists' Union thinks it has accomplished one of the objects it has been working for—namely, the 9 hr. day. It has certainly come in many shops, not only of our members, but those outside as well.

The past year has been a hard one for the officers and more especially Commissioner Robert Wuest. I have many times wished I had no other business but matters of the association to take my attention. I am very strongly convinced that our association should, as soon as possible, secure the services of a good, strong man, one who could devote his entire time to the business of the association and be made a permanent president, or, rather, elected for a term of years. I for one should like to see such a man made president of the two sister associations, the National Metal Trades Association and the National Founders' Association, and then let him conduct the affairs of both associations, and have a separate organization otherwise for each. Think this matter over, gentlemen, and I know you will see the wisdom of the suggestion.

After again referring to the excellent work of the commissioner and showing how economically the great work of the year had been performed, Mr. Barker outlined the doings during the year of the Administrative Council. He said: "At the first meeting of your Administrative Council, held at Boston in March, 1907, the council voted that the president should appoint a committee of three, who, with the president, should constitute an Executive Committee, to meet once a month and to have charge of the business of the association, as far as it could do so under the constitution and by-laws. Your president appointed on this committee Messrs. C. Bermingham, Howard P. Eells, Paul B. Kendig and W. H. Pfahler. The committee has held eight meetings during the year and it has been of great help, not only to your president and commissioner, but to the whole association."

He paid a touching tribute to former Commissioner William P. Eagan, who died at Pasadena, Cal., on June 26, 1907. He referred to the appointment of Nelson W. Dingwall to the post of secretary of the association and complimented the new secretary upon his efficient work.

After reviewing the efforts to bring the National Metal Trades and National Founders' associations into closer relations, he said that the committee in charge of the work reported another agreement, which provides for a joint committee of three, appointed from each Administrative Council and including the two presidents. This joint committee is to meet at least four times each year, and is to be called a Conference Board. For the Metal Trades Association F. K. Copeland and John Kirby, Jr., were appointed, with Wm. M. Taylor and John R. Back as alternates. This board has held three meetings, and has appointed F. W. Hutchings, secretary of the National Founders' Association, as its secretary. The board has taken up matters of labor legislation at Washington, and has appointed Marshall Cushing, formerly secretary of the National Association of American Manufacturers, to represent the two associations at the capital and watch the actions of the labor leaders and labor legislation there. Mr. Cushing is under the direct control of the presidents of the two associations, and is doing excellent work.

The report of Commissioner Robert Wuest showed the organization to be in a flourishing condition as regards its ability to combat labor difficulties. He stated that a determined attempt was made in the spring of last year by the International Association of Machinists to disrupt the organization by calling a number of strikes in a widely scattered territory. In all, 126 strike cases against members of the association were reported during the year, of which 98 were officially defended by the organization. The home office succeeded in shutting off 13 of the cases reported before they became active. The commissioner also reported on the movement to organize a Federation of Metal Trades Association, which resulted from a meeting of representatives of national organizations of metal trades labor unions at Cincinnati last February, as was reported in *The Iron Age*.

Mr. Wuest deplored the fact that the strength of the majority of the labor organizations is in railroad shops, the management of which, the commissioner stated, seems to favor the agreement method of dealing with labor disputes. The report included the statement that if the success of the organization in dealing with strike problems was generally known among manufacturers eligible to membership, the association would have a rapid growth

The Machinery Trade.

NEW YORK, March 25, 1908.

Some houses report a slightly better demand for machinery, while others, particularly dealers in machine tools, say that business with them shows practically no improvement. The business received has come from scattered sources and those who secured a fair portion of the few orders placed feel somewhat encouraged, but on the whole it cannot be said that trade has increased to a noticeable degree. As for some weeks the buying covered small lots of tools for the less important industrial plants, the larger interests having not yet come into the market, except in a few isolated cases, and then for only a few tools. The volume of inquiries received was not large, and none was of sufficient importance to indicate a much greater demand in the immediate future. In the West inquiries have been received from the Chicago, Milwaukee & St. Paul Railroad for a fair sized list of machine tools.

The demand for power plant equipment continues more active than that for machine tools, the number of new projects coming up daily constantly adding to the amount of machinery required. Many of the new propositions are water power developments, and among the more recent for which a large amount of machinery will be required is the Central of Georgia Power Company, Macon, Ga., which intends to develop the water power of middle Georgia. The company has lately obtained permission to issue $16,000,000 of bonds and $20,000,000 in stock, and W. J. Massee, president of the company, is now in New York in connection with the project. Plans have not yet been prepared, and it will probably be a month or so before they are in such shape that the company will be in a position to know the amount of machinery that it will require. It is expected that the entire development will entail the expenditure of several millions of dollars.

The New York Central Railroad has instituted some new arrangements in its purchasing agent's office, and as a result of the changes all the buying done by the company will be practically under the supervision of an auditing committee composed of three officers of the railroad. The Central continues to send out inquiries for small requirements, and is now asking the trade to bid on a motor driven bulldozer and motor driven iron bolt shears.

The Gifford-Wood Company, Hudson, N. Y., manufacturer of ice tools, has inquiries in the trade covering equipment which is to be installed in extensive additions the company expects to make to its plant. Work will be commenced on the new buildings within a few weeks, and they will consist of a boiler and engine room, 25 x 46 ft.; one-story foundry, 84 x 100 ft.; storage building, 40 x 76 ft.; pattern shop and carpenter shop, 100 x 110 ft.; forge shop, 100 x 130 ft.; manufacturing building, 50 x 100 ft., and an office building, 50 x 90 ft. The company will need about 100 hp. of power equipment.

The Eberhardt Brothers Machine Company, Newark, N. J., has received a good sized order for gear cutting machines from the National Transit Company, Oil City, Pa. The company reports a substantial increase in orders, particularly from the Middle West. The National Transit Company, a subsidiary of the Standard Oil Company, is making extensive improvements at Oil City, including the construction and equipment of several large buildings, which will necessitate the installation of a large amount of machinery. The trade has already received some good business from the Standard Oil Company for its new plant at Bayway, N. J., and as the company is going ahead with the improvements both at Bayway and Oil City, it is likely that considerable additional business will be secured.

The Heindel Mfg. Company, Hanover, Pa., recently incorporated with a capital stock of $200,000, has taken over the plants of the Heindel Mfg. Company and the old American Foundry & Machine Company, located between the Western Maryland and Pennsylvania railroads. The company has about completed a new building, 93 x 430 ft., of steel and brick construction, to be equipped with electric traveling cranes, and intends to install about $40,000 worth of machine tools and new cupolas.

The Heddon Iron Construction Company, 22 Clinton street, Newark, N. J., whose plant at Bloomfield, N. J., was recently destroyed by fire, has erected temporary buildings for carrying on its work until new buildings can be designed and erected. The company expects to build a modern shop in the near future, with the latest improved machinery for structural and ornamental ironwork. The dimensions of the new buildings and the amount and character of equipment that will be required have not yet been decided upon.

The washing plant of the Dominion Coal Company at Glace Bay, N. S., was recently destroyed by fire and the company has under consideration several plans for rebuilding it. A change of location is also under consideration. Until these matters are settled the company will not be in a position to state what new equipment will be required.

The engineering firm of Seymour & Whitlock, New Jersey Railroad avenue, Newark, N. J., is doubling its plant, at an expense of about $17,000, and it is expected that before long the firm will be buying machinery equipment. The firm manufactures special machinery and acts as consulting and designing engineer for all such work.

It is probable that the Williams Engineering & Contracting Company, 13 Park row, New York, will need some contractors' equipment for use on the construction of a dry dock at the Brooklyn Navy Yard, for which it has been awarded a contract amounting to $764,400. The contract was taken out with a proviso that if Congress appropriates an additional $500,000 for the work the dock will be made 50 ft. longer than the plans now call for.

The Kenilworth Water Company, 220 Broadway, New York, is asking bids for the installation of a water works system at Kenilworth, N. J., consisting of a water tower, pumping station and about 6 miles of pipes, at an estimated cost of $35,000. C. C. Vermeule is consulting engineer.

The Department of Water Supply, Gas and Electricity, New York, will receive bids until April 1 for completing the work to be done under the contract for furnishing, delivering, erecting and connecting four water tube boilers at the Ridgewood pumping station in Brooklyn. The contract was left unfinished and has been abandoned by the company which secured the original contract for the work under date of January 2. The department will also receive bids until April 8 for four water tube boilers, with economizer, feed water heaters and all appurtenances, for the boiler room of the 179th street pumping station, Manhattan. The time allowed for the completion of this contract is 150 days, and the security required is $20,000.

Philadelphia Machinery Market.

PHILADELPHIA, PA., March 24, 1908.

Business in the local machinery market has been rather light, although there has been some little increase in inquiries. The demand continues to be almost entirely confined to the smaller propositions, and mostly for single tools. The trade, however, feels more hopeful as to the future, not that any large volume of business is expected to develop, but rather that the small business which has been coming out from week to week will gradually increase as the spring advances. The railroads in this territory show no indications of placing orders for machine tools in the immediate future; in fact, it is reported that some railroads have adopted a policy of supplying deficiencies in some shops from others on their lines, which at the time are either idle or less actively engaged.

There is little inclination on the part of industrial concerns to purchase equipment in any quantity, the policy being to reduce expenditures to the lowest possible point, and when requirements make it necessary to make purchases the market is carefully scrutinized for the best available price and delivery. Prices, however, are being pretty firmly held, particularly in the better grades of tools, although small concessions are sometimes learned of on other grades. But little difficulty is being experienced as far as deliveries are concerned. Dealers in most cases are pretty well stocked up, and manufacturers, while not overstocked as a rule, can usually make prompt deliveries on any of the regular lines of tools.

Manufacturers do not experience much change in conditions. Orders on hand are being cleaned up to some extent, and this business, together with what little comes in from day to day enables plants to continue in operation at a restricted basis. New business comes out irregularly, however, and while some few builders have taken on a little more business in the aggregate, others have not done as well. On the average plants are maintained in operation on about a 50 per cent. basis.

There has not been much improvement in the foreign demand. In some few special lines a little more business has been offered, but the number of orders booked have usually been extremely small.

The second-hand machinery market shows more activity. Inquiries have been more numerous, and there is some disposition shown by buyers to purchase in this field rather than take new tools. In some cases, it is said, tools as good as new can be had at prices which are attractive. Some concerns have adopted a policy of disposing of their surplus tools at this time, and lists have, in instances, been sent the trade showing the various tools which they desire to dispose of. Most of the business coming to the dealers is of a day to day character, and while individually small the aggregate makes a fairly good total, when existing conditions are taken into consideration. The demand for boilers and engines shows practically no change. Inquiries are not numerous and the amount of business being closed is small.

Iron and steel castings continue in light demand, the business placed being of a miscellaneous character. Consumers are ordering only such castings as may be required to

complete orders on hand. Plants continue to operate on materially reduced capacities, and while gains are made in some directions, they are largely balanced by a falling off in others, so that on the average no material improvement in foundry conditions is to be noted.

The Midvale Steel Company, which has a large quantity of Government work on its books, is operating its plant with about 80 per cent. of its normal payroll, and has sufficient work on hand to maintain close to that percentage for some five or six months.

The Reading Railway Company has been purchasing considerable property in the neighborhood of Eighth and Noble streets and contemplates the establishment of an extensive freight station and yard at that location.

A company has recently been organized at York, Pa., to construct an electric railroad from Shrewsbury to York, via Glen Rock, Hummeltown, Logansville and Jacobus. D. B. Goodling, Logansville, is president; J. H. Keller, Shrewsbury, secretary, and J. L. Meyers, Glen Rock, Pa., treasurer.

Bids have been opened by the Assistant Director of Public Works, city of Philadelphia, for the installation of two centrifugal auxiliary pumping engines at the Torresdale filter plant, each having a capacity of 5,000,000 gal. per day; also for pump ends and pipe connections for the Lardners' Point pumping station. Bids for the pumping engines are as follows: Doyle & Co., $6510; D'Olier Engineering Company, $6475; Walson & Stillman Company, $5700; Walter Wood, $5850 and $5070; Allis-Chalmers Company, $9730. The last named bid is for the two pumps. Awards will be made at a later date.

The same department will receive bids until April 7 for furnishing, under what is known as contract No. 143, pump ends for the Belmont pumping station. Specifications may be obtained from the office of the Chief of the Bureau of Water, Room 790 A, City Hall, to whom all communications should be addressed.

Sealed proposals for furnishing material and constructing a system of pipe lines for the Borough of Verona, N. J., will be received in the Council Room in that borough until 8 p.m. March 30. The work will include the furnishing of 1000 tons of cast iron pipe, fire hydrants, valves, &c. Specifications regarding the work to be done may be obtained from the engineer in charge, W. E. Sexton, 46 North Twelfth street, Philadelphia, Pa., or from D. H. Slayback, Verona, N. J.

The Common Council of the city of Philadelphia, at a recent meeting, passed a bill authorizing a new $10,000,000 loan for municipal improvements. This will have to pass the Select Branch of the Council at its next meeting on April 2, which is practically assured. Some of the purposes on which the new loan will be applied are as follows: New school houses and sites, $2,500,000; water filtration, $800,000; sewers, $1,100,000; high pressure fire mains, $500,000; bridges, $600,000.

The Philadelphia & Reading Railway Company will, it is said, be ready to receive bids in the near future on that section of work in connection with the elevation of its Ninth street tracks, which includes the portion between Green and Berks streets. This will include the building of a four-track viaduct and will necessitate a considerable quantity of materials and equipment. A freight yard is also to be constructed at Ninth and Master streets, which is in the above mentioned section.

Cleveland Machinery Market.

CLEVELAND, OHIO, March 24, 1908.

The volume of new business in the machinery and machine tool trade is still very light, and it cannot be said that there has been any improvement during the past week. The sales by dealers have been in most cases single tools in small and medium sizes, the largest orders being for not more than three tools. Inquiries are fairly good, both with the tool dealers and tool builders. In fact, there has been a satisfactory volume of inquiries for the past three or four weeks, but orders have been very slow in materializing, and the amount of buying has not been nearly as large as dealers would ordinarily expect from the number of inquiries.

Some of the local tool builders report a slight improvement in their sales, and the outlook with many of them is much brighter than it was a few weeks ago. After being taxed to their utmost for a year or two and delaying needed changes, many industrial plants are taking advantage of the present lull to overhaul their equipment and bring it up to the highest point of efficiency by putting in more modern machinery. This movement to reduce the cost of production by the installation of the latest labor saving machinery has brought to the machine tool builders quite a number of orders for special machinery. Tool builders are receiving no inquiries from the railroads and are looking for very little business from that source during the present year. While prices are as a rule being maintained by both dealers and builders, the competition among the latter for some orders that have been pending outside of this territory has resulted in price concessions.

The demand for heavy machinery shows practically no improvement. One builder of locomotive cranes reports the receipt of several orders from Canada, and that it is getting more business in that line from Canada at the present time than in domestic orders.

There is a fair demand for second-hand tools, but the supply is still quite limited and local dealers are on a sharp lookout for good second-hand tools.

The general manufacturing situation shows a slight improvement in the majority of lines. While plants in some industries that were most severely affected during the recent depression are finding the recovery slow and are not running on over half of their full capacity, other industries have so far recovered that plants are running with practically their full force of men. Considerable change is noticed during the past month in the activity of the majority of manufacturing plants to get business. The managers realize that there is a certain amount of business to be had and there is hustling everywhere to secure orders.

There is an increase in the number of new concerns incorporated in this territory to engage in the metal trades, and these new projects, if carried out, will help the machinery market. Promoters of new enterprises, however, are still having considerable trouble in financing their undertakings.

The local jobbing foundry business shows only a slight improvement, and low prices are being named in the strong competition to secure the limited amount of business. In most cases users of castings are placing orders only for their immediate needs.

The Massillon Foundry & Machine Company, Massillon, Ohio, has purchased the business, plant, patterns, patents, &c., of the Lane Tool Company of Cleveland, maker of forge and drop hammers. The Cleveland plant will be removed to Massillon and installed in an addition that will be erected to the plant of the Massillon Company. The addition will be 60 x 130 ft. The contract for the building has been closed and it is expected that the removal will take place about May 1. The taking over of the Cleveland plant will mean an important addition to the products of the Massillon Foundry & Machine Company, which now makes sand rolls and friction hoists for quarries, industrial cars and other equipment for coal mines, and does general foundry work. The plant has been running on full time nearly all winter.

The National Sanitary Mfg. Company has just been incorporated at Salem, Ohio, with a capital stock of $200,000, and as soon as estimates can be secured and contracts closed will begin the erection of a large plant for the manufacture of metal porcelain enameled ware, including bathtubs, lavatories, sinks and other enameled goods. Some time ago several Pittsburgh men, among them Edward Baillie, formerly of Salem, began to look for a site for the projected plant, and the Salem Board of Trade took up the matter and succeeded in securing the location of the industry in that city. The company has purchased 14 acres of land opposite the Pennsylvania Railroad passenger depot, having 1400 ft. along the right of way of the railroad. Two buildings will be erected, each 60 x 200 ft. One will be used for the foundry and cleaning departments, and the other for the polishing, enameling and shipping departments. The new company has effected its organization by the election of the following officers: Frank G. Borden, president; S. Grove, Jr., vice-president; D. W. Davis, secretary and treasurer, and Edwin Baillie, general manager.

The stockholders of the Fover Steel Stamping Company, Painesville, Ohio, will hold a meeting April 24 to consider the question of changing the name of the company and of increasing the capital stock from $60,000 to $100,000. The company now manufactures small metal specialties, but it is proposed to change the line of manufacture to wheelbarrows, dump carts, wagons and other similar products. The present plant will probably be greatly enlarged and considerable new machinery added. W. J. Springborn, president of the Board of Public Service, Cleveland, is president of the company.

With a capitalization of $75,000 the Diamond Heating Company, Akron, Ohio, has been incorporated to manufacture a new furnace. It is reported that the company will establish a plant at Creston, Ohio. The incorporators are Cecil A. Armstrong, Delbert B. Ports, James L. Zaring, O. C. Robinson and R. E. Hall.

The Lake Erie Forging Company, Cleveland, has been incorporated, with a capital stock of $10,000, by John A. Markley, who was formerly connected with the Crucible Steel Forge Company of this city; John C. Kapka, W. H. Harker, Clara K. Markley and H. G. Powell.

Plans for an addition to the power plant of the Cleveland Worsted Mills Company have been prepared by George S. Rider & Co., consulting engineers. The only equipment to be purchased will be two 500-hp. water tube boilers. These have been contracted for.

The G. H. Williams Company, Cleveland, builder of clam shell buckets, reports a fair run of orders and many inquiries. The company has contracted with E. M. Beatty & Sons, Ltd., Welland, Ont., to manufacture its buckets for the Canadian

trade, the castings being furnished by the Cleveland company. The company has just secured a contract to build a revolving derrick, capable of handling a clam shell bucket of 2½ yd. capacity at a 50-ft. radius, for the Builders Supply & Sand Company, Erie, Pa., which has also placed an order with the Empire Shipbuilding Company, Buffalo, for a boat 135 ft. long, with 32-ft. beam, for hauling sand and gravel.

The Republic Stamping Company, Canton, Ohio, is not complaining of industrial depression. The volume of orders has been sufficient to keep the plant running at full capacity, and the company will shortly install some additional equipment in order to increase its output to supply the increased demand. The company manufactures enamel ware.

The Canton-Hughes Pump Company, Canton, Ohio, reports that it has a large volume of orders on its books. During the period of depression the company's plant was not shut down and now nearly the full force is being employed. Since February 1 the plant has been operated on a 10-hr. schedule.

A recent item in this column concerning the purchase of the Akron Clutch Company, including machinery, patents and good will, by the Williams Foundry & Machine Company, Akron, Ohio, was in error in stating that the business would be continued by the Akron Clutch Company. The Akron clutch will continue to be manufactured by the Williams Foundry & Machine Company, which will combine the plant recently taken over with its own.

Chicago Machinery Market.

CHICAGO, ILL., March 24, 1908.

Aside from the development of prospective business in the way of inquiries, but little progress toward advancement has been made in the machine tool market during the past week. As the season advances, however, signs of increased activity continue to multiply. The scattered orders for tools which constitute the chief movement at the present time continue to come from the small industrial centers throughout the West. It is noted that buyers of such equipment are nearly always prepared to pay cash for their purchases, which is significant of easier financial conditions throughout this region. Collections, too, are fairly good, and reports of financial embarrassment are gratifyingly few considering the long continued strain of dullness. Here and there machine tool factories are fairly well supplied with orders, but generally they are running very light. While it may be safely said that on the whole there is some improvement, it is not pronounced enough as yet to be regarded as an indication of permanent betterment. The market seems to be actuated by spasmodic spurts, as a result of which there is a good deal of fluctuation observed in the week to week reviews of transactions. This feature of market movements makes it difficult to judge with accuracy the general trend of trade, and the uneven distribution of business tends to influence the views of the various interests according to the degree in which they have participated in it. No sales of special importance are reported for the week, and shipments were extremely light. Among the orders received were a number for sheet iron punches and presses of moderate capacity from manufacturers of metal specialties.

The date for reception of bids on the list of tools required for the Lake High School, Chicago, published some weeks ago in these columns, expired on March 20. The awards for the purchase of this equipment will probably be made in the near future.

Manufacturers of motive power equipment and electrical machinery are not much more favored than those in other lines. There is considerable inquiry for electrical equipment from various municipalities, but they have to do chiefly with small installations.

A few of the larger shops have yet on hand some unfinished contracts taken last year for rolling mill machinery and other large enterprises; these serve to furnish work to a considerable number of men who would otherwise be out of employment. One effect of the present quiet period, to which reference has before been made, is the increased attention that is being paid to the development and perfecting of new machinery. Many new ideas of improvement conceived during recent busy years got no farther than the drawing board, but now that more time is available for such work many of these designs are taking concrete form, and when business again revives the results will be seen in the introduction of many new and improved tools and machinery. Last year was particularly barren of results in this respect; instead of devoting time to new designs and construction manufacturers were bending their energies to keep pace with the demand for their regular product. Indeed, many of them abandoned for a time the manufacture of some of their less profitable lines.

Chicago, Milwaukee & St. Paul Railroad's Machinery Requirements.

The new Pacific Coast extension of the Chicago, Milwaukee & St. Paul Railroad is one of the few large enterprises of this character which has not been seriously retarded by the present financial and industrial depression. Not only is line work being actively pushed without interruption, but arrangements are being made for rolling stock and shop equipment for this division. The following list of machine tools, which has just been issued, is for distribution among the various shops along the line, and forms a very welcome addition to the moderate volume of machine tool business now in the market. It is desired that bids on these tools shall be accompanied by a statement of the net weight, instead of shipping weight, of each tool.

One 36-in. instantaneous change gear lathe, four step cone, double or triple back gears, about 20 ft. bed, compound rest, power cross feed, 2⅛ in. hollow spindle, follow rest, steady rest, taper attachment, friction countershaft; four 34-in. back geared upright drill presses, equipped with automatic stop and self-feed, spindles to be fitted with No. 5 Morse taper shank drills, complete with tight and loose pulleys and belt shifter; five 15-in. back geared bolt lathes, arranged for belt drive and complete with taper attachment, power cross feed, screw cutting attachment, compound rest, countershaft and necessary tools; four 42-in. triple geared lathes to take 10 ft. between centers, arranged for belt drive, complete with taper attachments, hollow spindle, power cross feed, compound rest, countershaft and necessary tools; three 2½-in. double bolt cutters, complete with pump, countershaft, wrenches, chip pans, automatic, with power feed and lead screw attachment applied on both die heads, with two sample lead screws and 24 sets of cap dies as follows: one set ¾ in., 2¼ in., 2½ in.; three sets, 1⅛ in., and two sets each ⅞ in., 1 in., 1¼ in., 1⅜ in., 1½ in., 1⅝ in., 1¾ in., 1⅞ in. and 2 in.; four 36 x 36 in. x 10 ft. planers, with two heads on cross rail, arranged for belt drive and complete with power cross feed, countershaft and necessary tools; five planer vises, with 18-in. jaw for 36 x 36 in. x 10 ft. planer; two four-jawed 24 in. diameter chucks for 36-in. instantaneous change gear lathe; six four-jawed 12-in. diameter chucks for 16-in. back geared both lathes; four four-jawed chucks 30 in. diameter for 42-in. triple geared lathes.

Another departure from Machinery Row is noted in the removal of D. O. James, manufacturer of cut gears and special machinery, who will move from 35 South Canal street about May 1 to 351-353 West Monroe street, where a new two-story brick building 48 x 120 ft. will furnish increased room and light. Among the new tools already purchased for installation in the new building are Gould & Eberhardt and Cincinnati Milling Machine Company's milling machines, and a Gleason beveled geared planer.

Plans are being prepared for the construction of an electric power plant by Merrill H. Fisher, Alamogordo, N. M. This project will include the erection of a power house 36 x 120 ft., with a boiler room 30 x 33 ft., and an engine room 33 x 50 ft. In conjunction therewith plans are also being made for the development of a water power of 1000 hp. capacity at a point 7 miles distant from Alamogordo, current from which will be distributed from the central station. Considerable machinery will be required for carrying out of this enterprise.

The Telephone & Improvement Company, Sweetwater, Tenn., has planned improvements to its plant which will require the purchase of some new electrical machinery and equipment. The company is now in the market for a 60-cycle 100-volt single phase alternating generator. The operating department is in charge of D. L. Smith, superintendent.

The use of traveling cranes is common enough in stove foundries, but the Wehrle Company, Newark, Ohio, is among the first to install such equipment in its storage warehouses for the handling of finished product. For this purpose a three-motor electric traveling Northern crane of about 50-ft. span has been installed. This crane is of special design and was built by the Northern Engineering Works, Detroit, Mich. The latter company recently equipped the foundry of the J. C. Woodcock Feed Mill Company, Litchfield, Ill., with a Newten cupola.

Cincinnati Machinery Market.

CINCINNATI, OHIO, March 24, 1908.

A careful inquiry into local conditions in the machine tool manufacturing district develops some interesting points. For instance, while the general conditions of trade still show a balance on the side of mechanical inactivity, there are occasional flashes of a stimulating and encouraging sort that augur well for the future, and serve most admirably to sustain the faith and hope these men of iron and steel have in their products. One of the largest lathe manufacturers on Friday sold a bill of 10 machines, aggregating over $10,000, eight of which went to one city in the East, the other two to Canada. This was the first order of any size of the week, although inquiries of the past two or three weeks have been uniformly of an encouraging nature.

A recently returned official of another large lathe manufacturing concern made an exhaustive inquiry into manu

ing conditions on the Pacific Coast. He found that the machinery manufacturers in the Far West were running about 60 per cent. of capacity. In a general way, however, the visitor found conditions better than in the East or Central West. He believes that conditions are propitious for better times soon, and cites figures showing comparative results at his own establishment here in support of his feeling.

At the plant of a manufacturer of shapers and planers a steady run on full time with but a comparatively small reduction in working force since the first of the year has been almost exclusively on foreign orders. These have now been worked up and for the most part shipped, and the company will very likely reduce working time the coming week to conform to general conditions in this section. Two carloads were shipped to Europe from this plant last month, one already so far this month, and preparations are making at this writing to ship two machines to Paris, France, ordered by cable.

Some nice orders from Europe have been booked recently by the Cincinnati Machine Tool Company, maker of upright drills. Although the practice cannot be said to have been general, a few of the most enterprising builders of tools in this field have employed the few months of depression in perfecting new machines which had been in mind, but which had to remain in the background undeveloped because of the tremendous shop strain of 1907. As a consequence, there are a number of new devices which will be in good shape to go on the market this summer. The perfection of these new types, therefore, and the arrangements for reinforcing and replacing worn out machines in the shops, has given heads of departments plenty to do during the past few weeks.

Five of the largest tool making establishments have signed contracts and will have a splendid Cincinnati exhibit at the convention, June 17 to 24, in Atlantic City, N. J., of the Railway Master Mechanics and Master Car Builders. The machinery will all be in motion and will be shown on Young's Pier. The companies that will exhibit are Cincinnati Milling Machine Company, Cincinnati Machine Tool Company, Cincinnati Planer Company, Bickford Drill & Tool Company and the Lodge & Shipley Machine Tool Company.

Manufacturers in this field are maintaining prices in a very commendable way, and save for an occasional small percentage of discount allowed dealers on closely contested sales in competition with foreign makes, prices are being rigidly adhered to. One local manufacturer during the week received an order for two shapers from the Southern office of a large company which has offices in all large cities. The sale was contingent on a cut (which would represent about $10 on a machine) off the net price, but the cut was not allowed and the company did not buy.

Taking the local field of tool makers into consideration, the situation shows that all plants are engaged, ranging from 4 hr. per day of five days a week to 40 hr. per week, and with forces ranging from a few assemblymen and superintendents to a three-fourths payroll, but a few running on the larger time are economizing by laying off one week in three. This seems a rather favorite practice and until times become normal it is quite likely a number of the larger establishments will follow the plan.

In some other manufacturing lines the times seem almost normal in matter of sales and producing capacity. Companies making machinery for handling sheet iron and sheet metal particularly are running for the most part on full time and with practically full forces.

The J. M. Robinson Mfg. Company, maker of sheet metal machinery, on Spring Grove avenue, has had a splendid run of orders and inquiries the past few weeks. One good sized order of the past week was shipped to Ft. Wayne, Ind., of machinery for shaping corrugated iron. An order just received from a large Parkersburg, W. Va., house specifies a 12-ft. corrugating machine and a 10-ft. roll, and altogether is worth $5000. What might be denominated a run on corrugated rolls of 3 and 4 ft. sizes has developed in the South and Southwest, where the product made of corrugated sheet iron is popular for sewer pipe service.

A general rehabilitation is in process at the old stove foundry of John A. Schulte & Co., at 2619-2623 Colerain avenue. The E. H. Bardes Range & Foundry Company is the style of the company, which has taken possession and will manufacture Bardes stoves and ranges, linings for stoves and ranges and make castings to order. The officers are: E. H. Bardes, president and treasurer; Charles H. Resor, vice-president; William Krummell, second vice-president, and Frank S. Krug, secretary. All the gentlemen have had more or less practical experience in the stove and range business. Mr. Bardes, the president, was for several years the dominant factor in the business of the Kruckemeyer Company, jobber and retailer in ranges and furnaces of this city.

There is considerable local interest in this week's convention in New York City of the National Metal Trades Association. Treasurer William Lodge of the Lodge & Shipley Machine Tool Company, Commissioner Robert Wuest and Secretary N. W. Dingwall started Saturday night to be in time for the meetings of the Administrative Council preceding the opening of the regular sessions on Wednesday.

There is no appreciable improvement in the jobbing foundry line, and owners of plants are making strenuous efforts to keep forces employed a small part of the time. But a very small part of the local field is employed, and the melt is not more than 15 or 20 per cent. of normal. There exists, however, a feeling of hopefulness, and with the encouraging news from the machine tool districts, which tell of increase in inquiries, it is believed, that it will not be long ere castings will be needed.

In the line of steam and engineering specialties the improvement is quite marked, although in the main buying is still of the hand to mouth character.

It is expected that a meeting will be called soon for reorganization of the William Powell Company, brass founder, on account of the death recently of President James Powell. The business was so largely under the personal control and direction of the deceased president that some time will be necessary ere the many threads can be intelligently gathered, although everything about the great establishment was in the very best condition at the time. Theodore Albert is first vice-president and treasurer, Chas. E. McFarlan, second vice-president; George E. Weitkamp, secretary, and Rudolph Muller, superintendent.

The Columbus Structural Steel Company recently closed another successful year, and has reelected the old officers and directors, with the exception that E. N. Freeman was named to replace E. Spencer in the board. The present officers are: O. M. Blose, president; Henry Richter, vice-president; Joseph Shoenthal, treasurer; W. E. W. Cherry, secretary, and E. N. Freeman, general manager.

Reports from Marion, Ohio, indicate that the Fairbanks Steam Shovel Company has inaugurated a 13 hr. per day schedule, and President James G. Fairbanks is quoted as saying that business is improving steadily at that institution. At the plant of the Marion Steam Shovel Company the weekly running time has been increased one day, so that a 40 hr. per week schedule is now being done, and conditions are reported as improving materially at the plant of the Huber Mfg. Company in Marion.

Extensive preparations are under way at the big plant of the Andrews Rolling Mill Company in Newport, for an auspicious opening of the new steel mills, which were illustrated and described in a recent issue of *The Iron Age*. Col. Andrews and his efficient assistants are preparing for the formal opening.

New England Machinery Market.

WORCESTER, MASS., March 24, 1908.

No noteworthy change is apparent in the general business situation in New England. Little, if any, gain in orders is reported in any line of manufacture. The machinery dealers report some business doing, consisting for the most part of second-hand tools and individual new machines. Their business is better than it was two months ago, but it is still far from normal. An unprecedented number of inquiries and requests for prices and estimates are in hand, but up to date they have brought little actual business.

A few of the machine tool builders report an increase in orders. Among them is the Henry & Wright Mfg. Company, Hartford, Conn., which has received sufficient orders to place the works on full running time, though with reduced force. This is in contrast to a period of actual idleness. The new business is sufficient to necessitate manufacturing, in spite of the fact that a considerable stock of the company's high speed drills is already in hand.

The process of adjusting wages to the new conditions is going on rapidly. In the shops this has been accomplished by treating with the men as individuals. In other industries a flat percentage of reduction has gone into force. Little disposition is shown to contest the change.

The New York, New Haven & Hartford Railroad announces that it will erect a large power station at Milford, Conn., similar to that at Cos Cob, for use in connection with its system of electric traction.

The Worcester Steel Foundry Company has leased its plant at Millbury, Mass., to Eugene Edwards, Boston, who will operate it hereafter. William Pestell, who has been manager of the Millbury works for the past three years, retires from the business. Mr. Edwards already operates the steel foundry of the New England Steel Castings Company at Hyde Park, Mass. Both plants manufacture crucible steel castings. They will be operated separately as heretofore, it is understood.

The Terry Steam Turbine Company, Hartford, Conn., has bought a tract of land in the northern part of the city and purposes to build a new plant on the premises. The plans call for a shop building, 80 x 200 ft., designed to be extended to 600 ft. as the demand for new room shall require it. While it is not definitely settled, the building will probably be erected this season. With its completion new machinery will be required, though it is too early to state

what the list will include. Power will be furnished by a Terry steam turbine; the company already has a number of sufficient capacity for its initial needs. The business is now located on State street, Hartford. Steam turbines are built in sizes from 10 to 750 hp. The officers of the company are E. C. Terry, president, and James Terry, secretary and treasurer.

The plant of George W. Fifield, Lowell, Mass., manufacturer of engine lathes, was burned March 20, with a loss of about $300,000. The fire originated in the paint shop, and the effects of the conflagration were most sweeping, though it is expected that there will be some salvage in certain parts of the buildings. A large amount of finished work was destroyed. George W. Fifield, owner of the property and the business, had been manufacturing for stock for a considerable time; producing in large lots. Most of the new tools were not assembled. He states that it is too early to decide as to future plans. He may rebuild and continue the business, but this is not settled, nor will it be until the ruins can be gone over to determine what tools have not been damaged beyond satisfactory repair.

It is announced at New Haven, Conn., that the property of the Nettleton & Kelsey Mfg. Company, Fair Haven, has been purchased by Edward Millett and an associate from Waterbury, and that they will continue the business as brass founders. The company succeeded the Oxford Brass Company about a year ago.

The hope is expressed that the Hardware & Woodenware Mfg. Company, manufacturer of toys, will soon be able to resume business by the termination of the receivership. There are a number of plants in New England, including those at Winchendon, Mass.; Keene, N. H.; Brattleboro, Vt., and Pawtucket, R. I. Already a few men have been put to work in one or two of the company's factories. It is said that the company has orders on its books to the amount of $100,000.

Government Purchases.

WASHINGTON, D. C., March 24, 1908.

The Commanding Officer, Frankford Arsenal, will receive bids until April 2 for four Cleveland automatic turret machines.

The following bids were opened March 14, Circular No. 430, for an engine, generator and exciter for the Isthmian Canal Commission:

Class 1. One cross compound, four-valve Corliss noncondensing engine—Bidder 1, Erie Engine Company, Phoenix plan, Pa., $10,500; 4, G. & W. Mfg. Company, New York, $16,400 and $11,875; 5, General Electric Company, Schenectady, N. Y., $12,300; 6, Manning, Maxwell & Moore, New York, classes 1 and 2, $13,500; 7, McIntyre Schleicher & Co., New York, $15,900; 8, Motley, Green & Co., New York, $12,550, $13,550 and $14,750; 11, Providence Engineering Works, New York, $14,400, $11,300 and $13,900; 13, Western Electric Company, New York, $15,439; 14, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., $11,025, $14,374, $12,328, $13,792 and $13,470.

Class 2. One 400-kw. generator—Bidder 3, Crocker-Wheeler Company, Ampere, N. J., $6600, $5550, $5100 and $4600; 5, General Electric Company, Schenectady, N. Y., $7000 and $4845; 7, McIntyre, Seymour & Co., New York, $12,700; 8, Motley, Green & Co., New York, $6930, $5827.50, $5355 and $4830; 13, Western Electric Company, New York, $6420 and $5154; 14, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., $5370 and $6850.

Class 3. One engine driven exciter—Bidder 2, Buffalo Forge Company, Buffalo, N. Y., $1072; 5, General Electric Company, Schenectady, N. Y., $1245; 9, Northern Electric Mfg. Company, Madison, Wis., $925; 12, B. F. Sturtevant Company, Hyde Park, Mass., $970; 13, Western Electric Company, New York, $970; 14, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., $1233.80.

The following bids were opened March 16, Circular No. 426, for supplies for the Isthmian Canal Commission:

Class 6. Two duplex steam pumps—Bidder 12, Central Metal & Supply Company, Baltimore, Md., $2300; 18, Epping, Carpenter Company, Pittsburgh, Pa., $2000; 20, Fairbanks, Morse & Co., Chicago, Ill., $1400; 24, Fox Bros. & Co., New York, $1625.96; 26, Gardner Governor Company, Quincy, Ill., $1325; 29, A. D. Granger Company, New York, $2548; 41, Knox & Bro., New York, $1612; 51, Manning, Maxwell & Moore, New York, $1430.20; 55, Motley, Green & Co., New York, $1370; 57, National Electrical Supply Company, Washington, D. C., $1665; 68, Platt Iron Works Company, Dayton, Ohio, $1776; 73, H. A. Rogers Company, New York, $2540.50; 89, D'Olier Engineering Company, Philadelphia, Pa., $2600; 92, Henry R. Worthington, New York, $1790.

Class 7. Two vertical tubular boilers—Bidder 14, P. Delany & Co., New York, $2050; 24, Fox Bros. & Co., New York, $1778; 25, G. & W. Mfg. Company, New York, $2143; 29, A. D. Granger Company, New York, $1752; 32, Henshaw, Bulkley & Co., San Francisco, Cal., $2150; 40, E. Keeler Company, Williamsport, Pa., $1784; 48, MacKinnon Boiler & Machine Company, Bay City, Mich., $1819; 54, I. P. Morris Company, Philadelphia, Pa., $2350; 55, Motley, Green & Co., New York, $1720; 63, Oil City Boiler Works, New York, $1780; 66, Phoenix Iron Works, Meadville, Pa., $1570, $1670 and $1655; 71, Charles E. Robidoux, St. Louis, Mo., $1700; 83, Vermilye & Power, New York, $1758; 88, Griscom-Spencer Company, New York, $2096; 90, Donegan & Swift, New York, $1922.

The following bids were opened March 12 for a 125-hp. boiler at the office of the Quartermaster, Key West, Fla.:

Babcock & Wilcox Company, Philadelphia, Pa., $3000; Kingsford Foundry & Machine Works, [illegible], N. Y., New York; $2975, Key West, their specifications; I. P. Morris Company, Philadelphia, Pa., $2950; Roome [illegible] Mfg. Company, St. Louis, Mo., $3550; S. D. Granger Company, New York, $3385; Oil City Boiler Works, Oil City, Pa., $3330; E. Keeler Company, Williamsport, Pa., $3192; Donnegan & Swift, New York, $3[illegible]; [illegible] Augusta, Ga., $1033; National Boiler & Sheet Iron Works, Indianapolis, Ind., $2790; Springfield Boiler & Mfg. Company, Springfield, Ill., $2957; E. Burhorn, New York, $2980; Pennsylvania Boiler Works, Erie, Pa., $2775; Henry Vogt Machine Company, Louisville, Ky., $2791; Standard Engineering Company, Philadelphia, Pa., $4462.50, New York, $4607.43, Key West; Wm. Curry's Sons' Company, Key West, Fla., $2952.50.

Under bids opened March 3 for machinery for the navy yards Alfred Box & Co., Philadelphia, Pa., have been awarded class 41, one 15-ton electric traveling crane, $4360.

The Grant-Ferris Company, Troy, N. Y., has been awarded contract for one 18-hp. engine for the launch at Tompkinsville, N. Y., at its bid of $725.

The following awards have been made for supplies for the navy yards, bids for which were opened February 25:

Frevert Machinery Company, New York, class 1, one extension gap lathe, $2596; class 78, one radial drill press, $458.

Pacific Tool & Supply Company, San Francisco, Cal., class 2, one toolroom lathe, $1025; class 3, one toolroom shaping machine, $700.

Joseph Clark, Jr., Electric Company, Louisville, Ky., class 5, one sensitive drill, $150.50; class 6, one emery grinder, $150.

Prentiss Tool & Supply Company, New York, class 72, one gap lathe, $675; class 73, one pattern makers' lathe, $303.

Niles-Bement-Pond Company, New York, class 74, one backgeared screw-cutting engine lathe, $436; class 76, one universal milling machine, $665; class 77, one sensitive drill press, $48.

[illegible] Company, New York, class 75, one planer, $805.

Labor Notes.

The molders' strike at Scranton, Pa., which started in several foundries on [illegible] May 1, 1906, because the union demanded that these plants be run as it might dictate, has been declared off unconditionally by the molders' organization of that city, and the strikers are attempting to secure employment in the shops they left two years ago. These foundries have all been manned with independent molders and coremakers for many months and at the present time it is hardly possible for the proprietors to consider applications from strikers. The Scranton plant of the Allis-Chalmers Company was involved in this strike, with other firms, and the union officials have been particularly vehement in their statements that they would never give up until this company was compelled to concede the demands of the union.

Union molders who recently went on strike from the foundries of the East Buffalo Iron Works, Lackawanna Steel Company and the Buffalo Pitts Company, at Buffalo, N. Y., have been notified by the headquarters of the national union at Cincinnati that strike benefits will be discontinued on and after March 28 on account of lack of funds.

The American Federation of Labor and President Gompers and others of that organization were permanently enjoined from "conspiring, agreeing or combining to restrain, obstruct or destroy" the business of the Buck's Stove & Range Company, in a decision rendered by Chief Justice Clabaugh of the Supreme Court of the District of Columbia, March 23, making permanent the temporary injunction of Justice Gould against the Federation in that case. The Federation's counsel immediately noted an appeal to the District Court of Appeals. This last decision bars the Federation from placing the company on the "unfair list."

The Southern Steel Company, now in receivers' hands, is to be rescued from disintegration by a reorganization fund of $2,500,000 if present plans succeed. Of this amount $500,000 is intended for immediate plant betterment. A Birmingham dispatch says that it is "believed to be very probable that the security holders will raise the desired [illegible] bound for all stock subscribed for and not paid for to the full amount."

February was the fifth successive month in which the Pulaski Iron Company's furnace at Pulaski, Va., has produced over 5000 tons of pig iron, the total for the five months being 25,926 tons. With the same size of furnace and using the same grade of ores as heretofore, the mixture containing 41.4 per cent. iron, this is an output of nearly 1000 tons more per month than the average month of previous blasts. Of the above tonnage 98.8 per cent. was standard foundry iron.

HARDWARE

THE annual Hardware conventions this year, as in other years, have afforded evidence of the valuable work which the State associations are accomplishing and the increasing strength, dignity and importance of these organizations. One feature of the movement which may easily be lost sight of is the value of association work in developing the individual merchant. While it is true that men of broad experience and recognized ability are likely to become leaders, many members have benefited quite as much by their association work as the organization with which they are identified. Examples are numerous where the responsibilities of an official position or of important committee work have brought out latent ability in a man which was unsuspected even by his best friends. The atmosphere of the conventions is educating and broadening to the average merchant, who is usually closely confined to his business, and this is especially true of those who participate in the discussions and share the work. Many retail Hardwaremen have grown to be bigger men and better citizens through the reflex of their efforts to serve their association. Unfamiliar and ill at ease they may have been at first, but it has needed only two or three years to effect a change patent to the most casual observer. Naturally those who have worked most zealously for the cause have enjoyed the greatest benefits along the line of individual development.

At its recent meeting the Pennsylvania Retail Hardware Association put itself on record in a most emphatic manner on the question as to the eligibility for membership in the association of merchants who are doing something of a jobbing business. It appears to have been the unanimous opinion of the convention that the fact that a house is broadening out into a wholesale trade is no objection whatever to its membership in a retail Hardware association. The association is to be congratulated on establishing this principle. In view of this action, it certainly cannot be said that the Pennsylvania organization is confined to the smaller merchants, and indeed some of the leading and most progressive houses in the State are connected with it and active and influential in its management. In considering the questions which come before it, it will have the benefit of merchants of wide business relations, marked ability and breadth of view. It may be that the disposition apparent a short time ago in a few of the associations to make it uncomfortable within the organization for the retailers who are developing into jobbers was sporadic and exceptional, the general disposition being to give a liberal interpretation to the term retail Hardware merchant. Unless the association door is wide enough to admit the larger retail houses, and has a spirit sufficiently broad to make them feel at home, the movement would be likely to languish, as merchants of enterprise and ambition with a growing business would be likely to hold aloof. That this danger is being recognized and avoided is a matter for general congratulation. The influence of the example of the Pennsylvania association will doubtless be felt in other State organizations.

Condition of Trade.

Viewed broadly, the Hardware trade continues its steady progress toward the return of normal conditions. In some sections the improvement is so slow as to be hardly appreciable from week to week, a fact which is disappointing to some and gives rise to a feeling of discouragement here and there which is not justified by general conditions. Comparisons with last year's volume of business are, of course, unfavorable, but compared with the totals of two or three years ago the showing of the present season tends to reassurance. Some manufacturers whose capacity has been largely increased during the period of expansion naturally find it necessary to reduce production materially in accordance with the present slackened demand. It is doubtful, however, if general consumption has decreased to the extent which would be indicated by the reduced purchases of merchants, who are generally pursuing the policy of scaling down their stocks to a minimum working basis. This is directly contrary to the plan pursued a year or two ago, and results in manufacturers being forced to carry the stocks which have in more confident times been distributed among their customers. The rigid curtailment of output, however, which has been decided upon by most manufacturing houses, continues effective in preventing serious declines in prices, and the small stocks now carried by the distributing trade necessitate steady purchases of a routine character for immediate requirements and promise a buying movement of some proportions at no very distant date. As already stated, heavy and abrupt declines in prices are being avoided, but it is nevertheless true and to be expected that the market should have an undertone of weakness, which is evidenced, not so much by open reductions, as by quiet concessions to regular customers and on desirable orders tactfully handled. Seasonable goods are now moving in moderate but healthy volume, and, so far as can be judged at this early date, prospects favor an average demand for lines sold in agricultural sections. Complaints regarding collections are heard in some quarters, particularly in the East, but the improvement in the general financial situation should have a beneficial effect on this branch of business.

Chicago.

Assuming that business will continue to develop at its present rate through the remainder of the month, March will show a fair increase in volume over February, but will, withal, be considerably short of the total for March of last year. While the movement is too slow footed to arouse much enthusiasm, the fact that it is forward instead of backward is worthy of emphasis. An estimate of conditions in the Hardware trade should take into account its position as respects other mercantile interests, in comparison with which it shows to good advantage. While in actual results the improvement shown in this or that commodity during the past week has not been of notable importance, there are nevertheless some noticeable signs of coming activity developing in certain directions that should not be overlooked. In the local trade, for instance, the demand for Barrows, Hods, Mortar, Hose and other building contractors' supplies has expanded considerably within the past 10 days, and may reasonably be expected to improve still further as the season advances. Some reorders for spring goods are beginning to make their appearance, and if the consumptive demand is anything like as large as the com-

paratively strong condition of rural communities seems to warrant, the volume of reorders should be relatively important. It is well known that orders placed last fall for spring delivery were based on extremely conservative estimates, and would perhaps hardly suffice to cover a demand reaching even 75 per cent. of normal. Of over 200 dealers in Illinois responding to an inquiry put out to ascertain their views concerning trade prospects for the coming season, 85 per cent. expressed confidence in the development of more than 75 per cent. of normal trade, while the remaining 15 per cent. were doubtful. As a result of an understanding reached by the leading manufacturers of Conductor Pipe, Eaves Trough, &c., prices on these goods have firmed up, and are more regularly maintained. While there is only a moderate amount of building projects actually under way, quite a number of dormant plans are being revived and will shortly be in the hands of contractors. As an instance of this movement one architect this week reports five and another seven small buildings, which had been on the boards for several months, but are just now getting ready for the letting of construction contracts. Makers of Sash Weights are finding a very quiet market, and are not hopeful of much betterment until there is a decided improvement in building. Prices are generally quoted around $24 a ton.

NOTES ON PRICES.

Wire Nails.—As the season advances less conservatism is reported in buying, and mills are receiving new business in fair volume. The necessities this season, either from a large consumptive demand or from fear of lack of Nails and congested conditions of traffic, do not make the placing of large contract orders imperative. Prompt shipments are requested by some buyers, indicating that jobbers are not carrying large stocks. Regular prices are reported as being maintained. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

New York.—Merchants are showing conservatism in making purchases, confining them to actual requirements. Sales of Wire Nails in small lots at store are consequently along moderate lines. Nail houses are represented as maintaining regular prices, but it is reported that jobbing houses sometimes shade prices when Hardware is also sold. Regular quotations are on the basis of $2.40 for small lots at store.

Chicago.—With the Nail and Wire mills of the principal interest running within 15 to 20 per cent. of normal capacity this industry is, in point of activity, well in advance of all others engaged in the manufacture of steel products. New business is being offered in fair volume, and the extreme conservatism that characterizes buying in other directions is not apparent here. Dealers, it is true, are not stocking as heavily as was the case a year ago, but the necessity for anticipating wants far in advance no longer exists. From the demands that are being made upon the mills for prompt shipment of specifications it is inferred the open weather of the past few weeks is stimulating the consumptive demand which, it is believed, will continue to increase as the season advances. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—New business being placed with the mills and specifications against contracts are showing betterment, while shipments of Wire Nails by the mills this month show a decided increase over the same period in February. The present favorable weather, if continued, will be an important factor in stimulating demand, and the mills expect a further increase in business from this time forward. New orders and specifications against contracts are largely confined to nearby requirements, the trade being inclined to be conservative in the matter of carrying stocks. It is stated that regular prices are being maintained. Quotations are unchanged, as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

Cut Nails.—There is no perceptible improvement in market conditions. The average reduction in output of the various Cut Nail mills for the past three months ranges from 30 to 50 per cent., compared with that of the past three years, while sales show about the same proportional falling off. To manufacturers not operating Steel plants there is small profit in the manufacture of Cut Nails at the price asked for Steel. Concessions are being made on regular Steel Nail quotations, which are as follows: $2.05 base, per keg for carload lots at mill. Iron Nails generally should command about 10 cents more than Steel.

New York.—The demand for Cut Nails in the local market is comparatively light. Regular prices are said to be adhered to by Nail houses, but it is reported that Hardware jobbers sometimes shade prices when other goods are sold. Quotations are on the basis of $2.30 per keg for small lots, at store.

Chicago.—The movement in Cut Nails continues extremely quiet. The car shops, which are the most important consumers, have about cleaned up old contracts, and with no new business in sight are ordering practically nothing. Usually there is a good demand for Cut Shingle Nails at this season of the year, but it is holding back. It will, however, develop in a greater or less degree a little later. On the very limited amount of business moving concessions of about 10 cents a keg from regular quotations are being made. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; Steel, to jobbers, in carloads, $2.28; to retailers, $2.33.

Pittsburgh.—Restriction in output among the Cut Nail manufacturers is very general, this being necessary on account of the light demand and also to keep stocks to a minimum. It is stated that present prices of Cut Nails are extremely low in view of the relatively high prices charged the mills for Steel. Prices continue irregular, the official price on Cut Nails being $2.05, but this is being materially shaded. We quote Steel Cut Nails at $1.90 to $1.95, f.o.b. Pittsburgh, for carload lots, and about $2 for small lots, to which freight to point of delivery is added. Iron Cut Nails are about $2.05 at maker's mill.

Barb Wire.—An increasing demand has resulted with continued favorable weather, this showing itself from various sections of the country. The outlook is for a larger volume of business during the coming two months. Prices are being maintained at regular quotations, according to information from the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted	Galvanized
Jobbers, carload lots	$2.20	$2.55
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—Continued favorable weather has had a stimulating effect upon the demand, as is evidenced by the increasing volume of business coming from North and Northwest. The financial resources of consumers of this product have suffered no general impairment, and the prospects of an ultimate volume of business not far from normal seem good. The mills are well supplied with specifications and shipments are going forward at a satisfactory rate. Prices hold firm and unchanged. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The general demand for Barb Wire from all sections of the country is showing material increase, and the mills are entering more actual new business than for some time past. Mills report that regular prices are being maintained, and the tone of the market is firm. It is not expected that the quantity of Barb Wire pur-

chased in the next month or two will be as heavy as in the same periods last year, but the mills look for a very comfortable run of orders, and confidently anticipate that demand in April and May will show material increase over March. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—Manufacturers of Fencing and other lines are not anticipating requirements by placing contract orders far in advance, but demand is improving, as shown by an increased number of moderate sized orders. Requirements for Fence building by farmers are not yet pronounced. Prices are reported as being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Chicago.—An increasing volume of new business is reported, though the individual size of orders is moderate as compared with those of last year. This is due not only to a natural feeling of conservatism, but also to existing financial conditions which make it desirable for manufacturers of Fence and other products to limit their obligations on account of stock purchases as closely as possible. While not anticipating forward requirements far in advance, hopeful expectations of a fairly satisfactory demand are generally entertained. Prices are reported to be firmly maintained. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—A material increase in orders at an early date is confidently expected by the mills, as farmers will soon commence to build fences and consumption along other lines will also increase. Fence manufacturers have been placing orders conservatively, and with stocks very light, are expected to come in the market at regular intervals with additional new business. Prices are unchanged, but the tone of the market is firm. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Pocket Cutlery.—A special conference of American manufacturers of Pocket Cutlery was held last week for the purpose of discussing various phases of the present situation as regards that industry. A resolution was passed expressing the sense of the manufacturers that "present costs of production do not warrant and will not permit of any changes in established prices." In a period of reaction in business, this line is certain to feel severely any reduction of stocks or scaling down of purchases by the trade. Cutlery runs into money, and a merchant can cut down the assortment carried, especially in the way of fancy grades, without much injury to his business. The manufacturers, however, are unanimous in the decision to prevent the accumulation of stocks which the market will not readily absorb. During the past couple of years they have found the labor problem a serious one, and the present opportunity to reduce production and get the situation in hand is not entirely unwelcome.

Conductor Pipe, Eaves Trough, Etc.—Following our report of last week referring to the market for Conductor Pipe, Eaves Trough, &c., we give below the schedule of discounts to the trade recommended in a circular letter sent to jobbers under date of March 17. Because of noteworthy changes which have been made we also give the territorial limits in which the discounts are effective. It will be observed that there is considerable variation in the prices recommended for different territories, a fact which may be explained by peculiar conditions in the way of competition. It should also be noted that no prices are named on Copper lines, which are reported as low and irregular in all sections. Terms of payment are the same as formerly—that is, 2 per cent. discount for cash 10 days from date of invoice. There is no freight allowance on shipments of less than 250 lineal feet. On shipments of this amount or more the allowance varies according to the territorial limits, which are as follows:

UNDEFINED TERRITORY:

Undefined territory consists of the States lying west of the territory actually defined, and all points in undefined territory will take the prices for Northwestern territory, with freight allowed not exceeding the tariff rate of freight to whichever one of the following points through or nearest which the shipment must pass to reach destination: Joplin, Mo., Nevada, Mo., Kansas City, Mo., St. Joseph, Mo., Omaha, Neb., Sioux City, Iowa, St. Paul, Minn., Duluth, Minn.

EASTERN TERRITORY:

Eastern territory consists of the New England States, New Jersey, Delaware, the District of Columbia, Virginia, North Carolina, South Carolina, and that portion of the State of New York including the counties of Wayne, Ontario, Steuben, and all that part of the State lying east of said counties; that portion of the State of Pennsylvania including the counties of Tioga, Lycoming, Clinton, Center, Huntingdon, Fulton, and all that portion of the State lying east of the same; the State of Maryland, excepting the counties of Allegany and Garrett, and the city of Savannah, Ga.

PITTSBURGH TERRITORY:

Pittsburgh territory consists of Ohio and West Virginia, the counties of Allegany and Garrett in the State of Maryland; that portion of the State of Pennsylvania including the counties of Monroe, Livingston, and Allegany, and all that portion of the State lying west of the same; that portion of the State of Pennsylvania including the counties of Potter, Cameron, Clearfield, Blair and Bedford, and all that portion of the State lying west of the same.

CENTRAL TERRITORY:

Central territory consists of Kentucky, Indiana, Illinois, Wisconsin, and the southern peninsula of Michigan.

NORTHWESTERN TERRITORY:

Northwestern territory consists of Iowa, Missouri, the northern peninsula of the State of Michigan and that part of the State of Minnesota lying south and east of the Minneapolis, St. Paul, and Omaha Railroad from a point on the Iowa State line near Worthington to Minneapolis and St. Paul, and south and east of the St. Paul and Duluth Railroad from Minneapolis to Duluth, also the city of Sioux Falls, S. D.

TENNESSEE TERRITORY:

Tennessee territory consists of Tennessee only.

SOUTHERN TERRITORY:

Southern territory consists of Mississippi, Alabama, Georgia, excepting the city of Savannah, Florida and the cities of New Orleans, La., Galveston, Texas, and Houston, Texas.

WESTERN TERRITORY:

Western territory consists of Kansas and Nebraska.

SOUTHWESTERN TERRITORY:

Southwestern territory consists of Oklahoma, Louisiana, Arkansas and Texas, except the cities of New Orleans, La., Galveston, Texas, and Houston, Texas.

Following are the discounts ruling at point of destination in the various districts:

CONDUCTOR PIPE AND EAVES TROUGH.

Article.	Eastern. Per cent.	Pittsburgh. Per cent.	Central. Per cent.	North-western. Per cent.	Western. Per cent.	Tennessee. Per cent.	Southern. Per cent.	South-western. Per cent.
Conductor Pipe:								
Galv. Steel, standard sizes and gauges	70-10	75-10-5	75-10	75-7½	70-12½	70-10	70	70
Galv. steel, irregular sizes and gauges	70-10-5	75	75	75	70-10	75	70-10	70
Galv. C. C. Iron, standard sizes and gauges	50-10-7½	60	60	60	50-12½	50-12½	50-12½	50-5
Galv. C. C. Iron, irregular sizes and gauges	70-5	70-5	70-5	70-5	70	70-5	70	65-10
Eaves Trough:								
Galv. Steel, standard sizes and gauges	75-10-5	80-20	80-10-10-2½	80-10-10	80-10	80-5	80	75-10-2½
Galv. Steel, irregular sizes and gauges	75	75	75	75	70-10	75	70-10	70
Galv. C. C. Iron, standard sizes and gauges	60-20	65-10	65-10	65-10	60-10-5	60-10-5	60-10-5	60-5
Galv. C. C. Iron, irregular sizes and gauges	70-5	70-5	70-5	70-5	70	70-5	70	65-10
Plain Ridge Roll and V. Ridge Cap:								
Galvanized Steel, crated	80	80-20	80-10-10-2½	80-10-10	80-10	80-5	80	75-10-2½
Galvanized Steel, wired in bundles		80-20-5	80-10-10-5	80-10-10-2½	80-10-2½	80-5-5	..	75-10-7½
Galvanized C. C. Iron, crated	70	65-10	65-10	65-10	60-10-5	60-10-5	60-10-5	60-5
Formed Valley:								
Galvanized Steel	60-20-5	70-10-10	70-20	75	60-20-10-5	70-2½	60-20-5	60-10-7½
Galvanized C. C. Iron	40-20	50-5	50-5	50-5	40-10	40-10	40-10	40-2½

Axes.—There has been no change in the situation on Axes since our last report. The market continues to develop irregularity, which seems to have had the effect of causing many jobbers to postpone placing their orders. While low prices are being reported, it sometimes devel-

ops that these are quoted on goods not in every way up to the standard of a first quality Axe. Thus attempts to represent in figures the level of the market at the present time are largely futile.

Brass Goods.—Base prices on Brass material were advanced ½ cent per pound each on Sheets, Wire, Rods and Brazed Tubing March 23. The base prices for moderate purchases are: Sheets, 14¾ cents; Wire, 16¼ cents; Rods, 15 cents and Brazed Brass Tubing 21¼ cents per pound. The market for both Copper and Brass material continues featureless, with very little being done.

Bolts and Nuts.—The monthly conference of manufacturers of Bolts, Nuts, Rivets, &c., held last week, resulted in a reaffirmation of published prices. Where orders of any importance are to be placed, however, special concessions may be obtained.

Vises.—Some manufacturers of Solid Box Vises have revised their prices, announcing a reduction amounting to about 10 per cent. on base sizes. The market for these goods may now be represented in a general way by discounts of from 70 and 10 to 70, 10 and 5 per cent.

Coal Hods.—A concession of 7½ per cent. beyond prices previously ruling is noted in the quotations of leading manufacturers of Coal Hods. It is reported that this concession is offered only to the jobbing trade on orders for delivery east of the Mississippi River.

Pumps.—While there has been no marked irregularity in quotations on competitive styles of Pumps, such as Sink and Cistern, Pitcher Spout, &c., and while no general reduction has been made by leading manufacturers, prices may fairly be reported as somewhat lower. Concessions noted amount to about 5 per cent. beyond the figures recently ruling.

Oilers.—A movement counter to the general tendency of the Hardware market is observed in several classes of Oilers, manufacturers of which are announcing advances of considerable importance. The new level of the market may be represented in a general way by quotations on Copperized Steel, Spring Bottom Oilers of 70 to 70 and 10 per cent. discount; on Railroad Oilers, 60 to 60 and 10 per cent., and on Brass Oilers, 50 to 50 and 10 per cent.

Binder Twine.—With the arrival of spring, according to the calendar, the volume of business indicates an increasing interest by purchasers of Twine, although possibly smaller than at the corresponding period last year. The recent price of Sisal Fiber, in comparison with that of Manila Fiber, has had a tendency to impart a firmer tone to the Twine market. With the exception of quotations on the so-called plain tag Twine, which it is reported some concerns are offering at ¼ to ½ cent below regular prices, Western quotations appear to be well maintained, as follows:

	Cents per pound
Sisal	8½
Standard	8¾
Standard Manila (550 ft)	9¾
Manila (500 ft)	11¼
Pure Manila	12

Carload lots, ¼ cent less; 5-ton lots, ⅛ cent less; central delivery, fall terms.

Rope.—The market continues quiet, and while manufacturers are receiving orders continually they are usually for small lots. Even jobbers are confining their purchases to immediate requirements and are carrying no surplus stock. Sisal Hemp is now quoted at 5½ cents per pound and fair current Manila Hemp at 6 cents per pound, but Manila is weak at this figure. Shipments of Manila Hemp are being received liberally at this port, with light demand from manufacturers, owing to the fact that they still have supplies on hand. The light demand for Rope has not given them an opportunity to work all their Hemp up into Rope. The following quotations for base sizes fairly represent the market: Pure Manila, 10½ to 11 cents; B quality grades down to 8 to 9 cents; Pure Sisal, 7½ to 8 cents; lower grades Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¾ cents.

Window Glass.—Manufacturers are turning out about the same quantity of Glass that they were a week ago, although some factories have difficulty in keeping the different departments satisfactorily manned. Prices do not show much firmness, and continue favorable to the jobber. Demand from factory is light as the result of general business conditions. Locally business is light and prices more or less irregular. The minimum prices recommended by the Eastern Window Glass Jobbers' Association are as follows: Single strength, 90 and 25 per cent.; double strength, 90 and 30 per cent. discount from jobbers' list. These prices are, however, not closely adhered to.

Linseed Oil.—The demand for small lots of Oil is fairly good, although no great amount of activity is shown in this market. Crushers are operating in a moderate way and are carrying comparatively small stocks of Oil and Seed. The market continues very even, and shows no indication of a desire for business by sacrificing prices. Local quotations are as follows: In five-barrel lots, State and Western Raw, 40 to 42 cents; City Raw, 43 to 44 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—An unusually rapid and unlooked for advance has taken place in Turpentine during the week, as the result of operations in the Savannah market. The exact cause of the flurry has not yet been definitely reported. With the new crop expected in considerable volume in the near future and with general business conditions as they are, it is not anticipated that manufacturers will purchase heavily. The New York market is represented by the following quotations: Oil Barrels 57½ to 58 cents; Machine Made Barrels, 58 to 59 cents.

THE NATIONAL RETAIL HARDWARE CONVENTION AT ST. LOUIS.

(By Telegraph.)

THE ninth annual convention of the National Retail Hardware Association began its sessions in the Planters' Hotel, St. Louis, on Tuesday forenoon, 24th instant, with a large attendance of delegates and guests. The room in which the meetings are held is admirably adapted to its purpose, being of suitable size and conveniently located.

When President Miles called the meeting to order he referred to the pleasant circumstances under which the association meets, touching briefly on the history of the organization and its position of strength and usefulness. The singing of "America" was very heartily united in by the assembled company, after which the invocation was offered by Rev. A. H. Jordan. At this point the regular programme was interrupted by the presentation to President Miles of a handsome gavel, the gift of the members of the association in recognition of his services as presiding officer. The presentation was made by F. Alex. Chandler, Boston, in a very happy and interesting address.

The welcome on behalf of the city was expressed by Edward Devoy, president of the Merchants' Exchange, who in his address referred to the position occupied by St. Louis in manufacture and commerce and also to the advantages which result from trade associations as the members are brought together and given an opportunity to learn from one another.

The welcome on behalf of the St. Louis Hardware interests was made by O. H. Witte, president of the Witte Hardware Company, in introducing whom Mr. Miles referred briefly to the history of the company and its prominent place among Hardware jobbing houses. Mr. Witte, after referring to the pleasure afforded him by the opportunity to extend the city's welcome to the National Association, alluded happily to the fact that the jobbers of St. Louis have sometimes been accused by the manufacturers of not acting in full harmony with one another, and made the point that these manifestations of the spirit of competition resulted in benefit to the retail merchant. These little skirmishes, as they were termed,

were referred to as having made St. Louis the leading Hardware market of the world.

W. P. Bogardus, ex-president of the National Association, was called upon to respond to these addresses of welcome. On his introduction he was greeted with long continued applause, which indicated the affection and honor in which he is held. Mr. Bogardus, after some pleasant references to the immediate circumstances, called the attention of the convention to the position the country occupies in industry and commerce, and also to the opportunities that are afforded by the annual gatherings of the Hardware merchants for conference, which should be exceedingly useful in giving a broad view of their business relations and in formulating and carrying out a policy for the great betterment of the trade.

An admirable and carefully prepared paper was then presented by R. W. Shapleigh, vice-president of the Norvell-Shapleigh Hardware Company, in which he discussed the question, "Are Goods Well Bought Half Sold?" This address was an interesting discussion of the question and abounded with valuable suggestions.

Brief and informal addresses extending hospitality were made by W. C. Simmons, president of the Simmons Hardware Company, and by S. Norvell, president of the Norvell-Shapleigh Hardware Company. Brief remarks were also made by C. W. Asbury, president of the American Hardware Manufacturers' Association, and representatives of the trade press.

H. J. Gordon, on behalf of the Committee of Entertainment, made a felicitous address, introducing announcements of the entertainment provided for the delegates and their friends. The features of entertainment included a theater party on Tuesday evening, matinee for the ladies on Wednesday, reception in the parlors of the Planters' Hotel on Wednesday evening, a banquet on Thursday evening, and a carriage drive for the ladies on Friday afternoon.

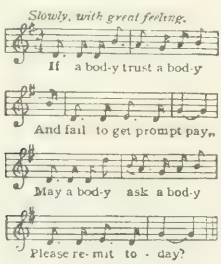
The exercises were interesting from first to last and kept the close attention of the large company assembled, in which were many ladies.

The session on Tuesday afternoon was called to order promptly at 2 o'clock by the president, there being in attendance about 80 delegates. The programme covered some routine business of the association, including the president's address, secretary's report, treasurer's report and reports of various committees.

The association enters on its work under very favorable auspices, and the convention promises to be exceptionally successful.

A Tuneful Reminder.

THE accompanying bars of music, printed on business stationery, illustrate a tactful method which some merchants have employed during the period of slow collections to remind customers of their overdue accounts.

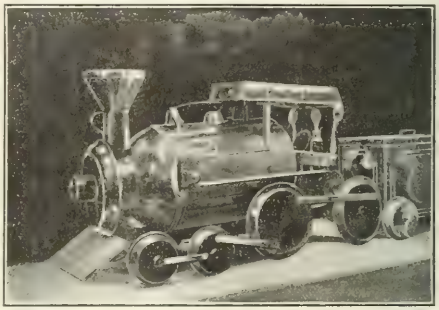


The tune to which the words are set is the familiar one of "Comin' Through the Rye," and if sung slowly and with great feeling, according to directions, the effect is certainly plaintive enough to touch the heart of the most incorrigible slow pay.

LETTERS are being sent out by C. E. Kersey, Richmond, Va., secretary-treasurer of the Southern Hardware Jobbers' Association, announcing transportation routes, hotel rates, &c., for the annual convention of the association, to be held jointly with the semiannual meeting of the American Hardware Manufacturers' Association, at Hot Springs, Ark., June 9-12, with headquarters at the Arlington Hotel. In connection with this announcement an attractive booklet descriptive of Hot Springs is also being mailed.

AN INGENIOUS TINWARE LOCOMOTIVE.

THE enterprising Hardware firm of John S. Menagh & Co., Jersey City, N. J., recently set up in one of its prominent show windows the businesslike looking locomotive shown in the accompanying illustration. It furnished a striking method of displaying kitchen goods and attracted much attention from passersby. A heavy 10-gal. Milk Can formed the main body and boiler of the engine. Deep round Pans served as wheels and a square Pan as the roof to the engineer's cab. A realistic smokestack is formed by a Funnel set in a Quart Measure, from which belches a cloud of smoke represented by Steel Wool.



Locomotive in the Window of John S. Menagh & Co.

A fine Wire sticking in the smokestack and bent back over the engine serves to hold the smoke in a natural position. Other goods used in the get-up will readily be recognized in the illustration.

THE formal opening of the new store of F. A. Hull & Son, Danbury, Conn., took place on the 4th inst. There was music by an orchestra, refreshments were served, and the occasion was most successful and enjoyable. In the evening a banquet was tendered by the firm to its employees and visitors from out of town. The former Hull Block was destroyed by fire on March 4 of last year, just one year previous to the opening of the new store. On the site of the burned structure a strictly modern fireproof business block of solid concrete reinforced with steel has been constructed. It is said to be the most costly as well as substantial building in Danbury. The main building measures 71 x 150 ft., three stories, with a four-story L, 46 x 64 ft. The block provides three stores on Main street, the principal frontage. The middle store, 25 x 150 ft., the full second floor, 71 x 150 ft., and the entire four-story L will be occupied by the Messrs. Hull. The firm has lately issued a booklet giving on the front cover a sketch of the new store and presenting a short history of this old and well-known Hardware firm. The business was founded in 1843 by Charles Hull, F. A. Hull's father. Illustrations are given of Mr. Hull's tin shop and stove store, the construction of which was largely done by Mr. Hull himself; Charles Hull's "block" as it appeared in 1850; Hull & Rogers' establishment, 1865 to 1890, and the Hull block which was erected in 1890 and burned out last year. Portraits are given of Mr. Hull and also of Frederick A. Hull, his son, and Charles Hull, his grandson, the two latter comprising the firm at the present time.

THE LOCKWOOD COMPANY, representative in New York of the Lockwood Mfg. Company, South Norwalk, Conn., manufacturer of Locks, Latches and a full line of Builders' Hardware, will on or about May 1 remove from the present address, 79 Reade street, to 16-18 Reade street, near Centre street.

Correspondence.

The True Valuation of Export Business to the American Manufacturer.

To the Editor: The active, wide awake manufacturer appreciates the valuation of not only making his product known but wanted, by means of the numerous advertising channels, and accordingly he permits no stone to be left unturned to accomplish the desired end. The result of such a policy soon becomes productive of an established name in all parts of the globe which in turn signifies inquiries, orders and an increased business.

On the other hand, the inactive ones are unknown outside of the limited established trade to whom they have been catering for years. Their business has a fixed high point, beyond which it never traverses.

Many of the latter maintain that the foreign business does not justify the trouble necessary for its culmination; a point worthy of careful consideration. We all appreciate the large volume of increased labor necessary for the proper execution of such orders; the packing, marking, shipping and the careful compilation of numerous documents, &c., but if these essential minor details be carried out in the manner required, the increase in the volume of business at an advanced American market figure would soon assert the justification of a close adherence to this particular trade.

The valuation of this export business was never so pronounced as during the recent financial and industrial depression when the American factories were forced, more or less, to depend upon their foreign orders to tide them over until such a time as the home buying should resume its normal condition.

Many of the manufacturers have heretofore paid but little attention to this branch of business, not realizing the wonderful opportunities that are in store in this particular trade. The more progressive, however, have cultivated it to the best of their ability by not only adapting their business policy to the conditions of the many foreign markets, but their goods as well, altering them where necessary to better meet the particular circumstances peculiar to the country in which they are to be used. As a result their foreign orders have remained strong when most needed, and have, in many cases, permitted the factories to remain open, which otherwise would have been forced to close down, throwing thousands out of work.

The export trade, therefore, serves as the flywheel to the American manufacturer, maintaining the same momentum in times of panic as in the more prosperous periods. It penetrates to every corner of the world, augmenting a call for the product, which materially enhances its valuation.

Further, where properly managed, this unlimited business can be transacted upon a cash basis, a fact which certainly gives preference over our own domestic trade.

On the other hand, American goods are in demand not because we have the monopoly on the machine trade, but because of the quality and ingenuity of the machine tool products. The American made tools have, as a rule, a decided characteristic peculiar to themselves, the result being an increased output at a reduced cost but at a material sacrifice to the life of the tool. In other words, the best foreign tools appear to have a somewhat longer life than the American makes.

The tendency of general demand leans in favor of the American tool and consequently a gigantic volume of business awaits the American manufacturers who have articles of real worth and who do not hesitate to make the fact known.

With the true American ability and perseverance properly handled, industrial depression should be a thing of the past.

G. P. BLAKISTON,
President Pittsburgh Automatic Vise & Tool Company.

PITTSBURGH, March 11, 1908.

THE EDGAR DICK HARDWARE COMPANY has lately moved into new and finely appointed storerooms at 311 Wabash avenue, Terre Haute, Ind.

Price-Lists, Circulars, Etc.

Manufacturers of Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

CLEVELAND GALVANIZING WORKS COMPANY, Cleveland, Ohio: Illustrated bulletin E-7, referring to Standard Butter Cutters and Butter Boxes and Elgin Butter Cutters.

CARBORUNDUM COMPANY, Niagara Falls, N. Y.: Large two-color circular, referring to Sharpening Stones, &c., and illustrating the company's current publicity advertising.

STELWAGON MFG. COMPANY, Philadelphia, Pa.: Circular referring to Kure-a-Leke Mastic Compound, for roofing gutters, &c.

PHENIX MFG. COMPANY, Milwaukee, Wis.: Illustrated price-list circulars referring to Swinging Half Screens, Hangers and Fasteners, Full Size Window and Door Screens and Hardware Specialties.

J. S. WOODHOUSE, 189-191 Water street, New York: Illustrated catalogue R, referring to a large line of Agricultural Implements and Machines for farm, field and garden.

PIKE MFG. COMPANY, Pike, N. H.: Booklet entitled "Money Makers," illustrating and describing new assortments of Oil and Scythe Stones and Razor Hones.

BERNARD GLOEKLER COMPANY, Pittsburgh, Pa.: Illustrated "Smoke-Talk" circular referring to Kitchen Equipments, Refrigerators, &c., of which the company makes a specialty.

EGYPTIAN LACQUER MFG. COMPANY, 152 Front street, New York: Booklet describing Egyptian Black Lacquers and the purposes for which they are used.

UNITED STATES CARTRIDGE COMPANY, Lowell, Mass.: Catalogue and price-list for 1908 of Metallic Cartridges, Paper Shot Shells, Brass Shot Shells, Primes, Belcher's Shot Shell Loaders, &c.

ILLINOIS HEATER & MFG. COMPANY, Chicago: Illustrated booklet referring to Self Watering Flower Boxes and Baskets, Fireless Cookers, Window Refrigerators, &c.

NOVELTY CUTLERY COMPANY, Canton, Ohio: Illustrated catalogue and price-list of Shears and Scissors, Pocket Knives, Paper Knives, &c., which are especially offered for premium purposes.

J. EDWARD OGDEN COMPANY, 147-149 Cedar street, New York: Large cloth bound catalogue and price-list, containing more than 400 pages, illustrating and listing an extensive line of Heavy Hardware and Supplies for mines, mills, machinists, railroads, contractors, electrical constructors, dock builders, shipyards, &c.

BERGMAN HARDWARE & TOOL MFG. COMPANY, Buffalo, N. Y.: Illustrated circulars referring to B. B. Combination Pliers, Forged Tool Steel Tinners' Snips and Corner Bit Braces.

REVERE RUBBER COMPANY, Boston, Mass.: Illustrated catalogue covering an extensive line of Rubber Goods for mechanical use, including Belting, Hose, Packing, Blankets, Rubber Covered Rolls, Valves, Springs, &c.

[illegible] Budget of booklets, circulars, &c., referring to House Finishes, Carriage and Auto Car Varnishes, Railway Varnishes, Marine Spar Varnish, Klearstone Stains and Insulating Specialties.

NEW YORK RUBBER COMPANY, 84-86 Reade street, New York: Illustrated price-list of Rubber Belting, Hose, Packing, &c.

[illegible] Mo.: 1908 spring catalogue, 290 pages, illustrating and describing a complete jobbing line of seasonable goods, including Fishing Tackle, Baseball Goods, Tennis Goods, Hammocks, Boating Supplies, Cutlery, Tents, Firearms, Bicycles, Garden Tools, Hose Goods, Screen Goods, Refrigerators, Freezers, &c. The catalogue is accompanied by a discount sheet.

Death of George M. Clark.

GEORGE M. CLARK, president of the Cutaway Harrow Company, Higganum, Conn., died suddenly at the factory on Monday afternoon, 2d inst. George Marshall Clark was born in Haddam, Conn., June 11, 1833, a son of George Washington and Cynthia Selden Clark. Mr. Clark received but a limited school training, and as he was but 12 years of age when his father died, he was early obliged to go to work to aid in the support of the family, which devolved upon him and an elder brother, who was but 15. For about two years following the death of his father he was employed on neighboring farms. He then worked at wool carding and subsequently for 17 months at blacksmithing and the making of edge tools. Thinking it improbable that he would ever be able to return to school, he obtained the best known works upon mechanical work and spent from three to five hours each evening in their study. Mr. Clark's first opening came when he was 17 years of age. He had made a trip to Savannah, Ga., where he worked as a common hand in a sawmill. The main shaft of the mill broke and it was thought there was no one at hand capable of making the repairs. Mr. Clark's knowledge of blacksmithing came to his aid, and he welded the shaft and thus brought himself into notice. He was very soon afterward given the contract for the erection of three large steam sawmills in Georgia, which were completed and in operation within five months. All this was done before Mr. Clark was 18 years old. Mr. Clark then formed a partnership with his elder brother, who was a stonemason, and they continued together as Clark Brothers for over 30 years.

For about 10 years Mr. Clark carried on shipbuilding in summer and house carpentering in winter, working from Bangor to New Orleans. In the fall of 1859 Mr. Clark engaged with a Meriden cutlery firm as a journeyman carpenter at $1.75 a day, but within a very short time his ability was discovered and he was made foreman of all outside men at a salary of $10 per day, remaining in this position for seven years. Meanwhile Mr. Clark had turned his attention to the improvement of agricultural implements, and in the fall of 1867 he and his brother commenced the erection of a factory in Higganum. They began the manufacture of mowing machines, for which Mr. Clark had invented a new mechanical movement, but finding that they were infringing on other patents, they abandoned this line to commence the manufacture of other agricultural implements. At the beginning of their operations a stock company was formed, of which George M. Clark was president, and his brother, Thomas J. Clark, vice-president. Mr. Clark invented and patented a number of improvements on agricultural implements, all of which were utilized by the company. In 1871 Mr. Clark invented a wire rope plant, which he soon afterward patented, which is said to have been the first that effectually prevented the slipping of the rope.

In later years Mr. Clark devoted much time to the cultivation of grass, and was considered an authority on its culture. He had delivered lectures on the subject all over the eastern part of the United States. Mr. Clark was of a benevolent disposition and performed many acts of charity during his life. He was an attendant at the Congregational Church at Higganum, which he helped to raise when a mere boy, and had been a regular supporter of the church ever since.

THE house of Stratton Bros., Greenfield, Mass., which has recently been succeeded by the Stratton Level Company, was established in 1869 by C. M. & E. A. Stratton, who continued in the business for 30 years. Since their retirement the concern has been managed by R. O. Stetson, whose continuous connection with it covers a period of 15 years, and who retains an interest in the new company as treasurer. O. L. Richtmyre, for some years connected with the claim department of the Boston & Maine Railroad, enters the company as president, and will have charge of the business management and sales department. Mr. Stetson will be in full charge of the manufacturing department, and a new and modern factory of increased production is shortly to be built.

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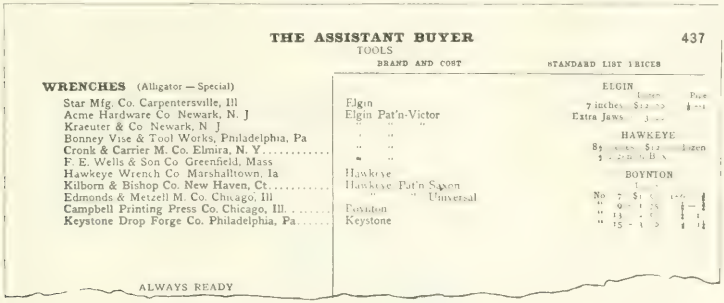
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The Assistant Buyer.

THE SULLIVAN SYSTEM, 280 Broadway, New York, is the publisher of the "Assistant Buyer," a reference book devised especially for the Hardware and Supply trades, among whom its distribution is limited. It consists of some 1500 pages, approximately 9 x 11 in. in size, contained in a neat loose leaf binder, which has the attractive features of rapid action, combined with simple and durable construction. The book is to be issued in annual editions, the first having been recently completed and placed in the hands of subscribers, who, we are advised, include close to 75 per cent. of the members of the National Hardware Association, the Southern Hardware Jobbers' Association, the National Supply & Machinery Dealers' Association and the Southern Supply & Machinery Dealers' Association.

The work, which is printed in concise form, comprises five general divisions: 1. Heavy Hardware, Iron and Steel, Blacksmiths' Supplies, &c.; 2, Mechanics' Tools; 3, Machinery; 4, Supplies, including Steam, Water and Gas, Mill, Mine, Railroad, Machine Shop and Contractors' Supplies; 5, Shelf Hardware, Paints, Sporting Goods, Housefurnishing Goods, &c. Each division is arranged as if it formed a separate book, with subjects classified in alphabetical order. All five divisions are covered by one exhaustive general index in the front of the book.

The arrangement of the information given under each classification is indicated by the accompanying reproduction of a section referring to Wrenches and may be described as follows: Beginning at the left, the first column gives names and addresses of manufacturers; in the second column such brands or trademarks as a manufacturer may use are given after his name, and a space is provided for the buyer to note after the name or brand the discount or net price quoted, thus affording a convenient record of comparative costs. In the last column standard list prices are given where they apply, so that a buyer has all points pertaining to any line grouped together on a single page. The principal value of the work, however, consists in the record of manufacturers' names, addresses and brands properly indexed and classified. The other features, such as comparative price-lists, capacity of mills, independent manufacturers, or members of combinations, manufacturers' agents, &c., are merely incidental.



THE ASSISTANT BUYER 437

TOOLS

BRAND AND COST | STANDARD LIST PRICES

WRENCHES (Alligator—Special)

Star Mfg. Co. Carpentersville, Ill
Acme Hardware Co Newark, N. J
Kraeuter & Co Newark, N. J
Bonney Vise & Tool Works, Philadelphia, Pa
Cronk & Carrier M. Co. Elmira, N. Y.
F. E. Wells & Son Co Greenfield, Mass
Hawkeye Wrench Co Marshalltown, Ia
Kilborn & Bishop Co. New Haven, Ct.
Edmonds & Metzell M. Co. Chicago, Ill
Campbell Printing Press Co. Chicago, Ill.
Keystone Drop Forge Co. Philadelphia, Pa.

Elgin
Elgin Pat'n-Victor
" "
" "
" "
Hawkeye
Hawkeye Pat'n Saxon
" " Universal
Boynton
Keystone

ELGIN
HAWKEYE
BOYNTON

ALWAYS READY

Portion of Page from The Assistant Buyer.

A feature which recommends the book is the fact that its compilation is based on practical experience, its author, Alfred T. Sullivan, having been associated for 14 years with the Oliver Bros. Purchasing Company, New York, buyer for a number of wholesale Hardware and Supply houses in the United States and foreign countries. The work is dedicated to Thomas E. Oliver of this house. In addition to his own records the author had access to the records of five other buyers among his friends in New York City, and also received valuable contributions of information from buyers in other parts of the country. Having traveled considerably during the past few years, Mr. Sullivan has also secured many important points from manufacturers direct. Judging from the expressions of many experienced buyers, the book has commended itself to the trade and will prove of much practical value to those interested in the lines which it covers. The subscription cost of $10 per year covers the book complete with loose leaf binder and all revised pages which may be issued during the year. Subscriptions to this book are contingent upon their being entered for a period of not less than three years. New editions containing revisions and improvements will be issued the first of each succeeding year.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM WEATHERFORD HARDWARE COMPANY, Weatherford, Texas, which has been incorporated with a capital of $15,000 by W. W. Major and others. The capital stock is fully paid up. The company handle Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, Vehicles, &c.

FROM LARSON HARDWARE COMPANY, Sioux Falls, S. Dak., which has disposed of its retail department to Olaf Hanson, and will hereafter confine itself to the wholesale business in Shelf and Heavy Hardware, Stoves, Tinware, White Lead, Linseed Oil, Glass, Blacksmiths' Supplies, Mechanics' Tools and Hardwood Lumber.

FROM WELLMAN MCROBERTS COMPANY, which has opened a new Hardware store in Orfino, Idaho.

FROM OLAF HANSON, formerly of Mt. Horeb, Wis., who has purchased the retail business of the Larson Hardware Company, Sioux Falls, S. Dak.

FROM HALBERT & WEBBER HARDWARE COMPANY, Wenatchee, Wash., in which A. V. Shepard has recently bought an interest. The company handles Shelf and Heavy Hardware, Stoves, Tinware, Paints, Oils and Sporting Goods.

FROM W. S. WOOLSEY, who has opened a general Hardware, Tinware, Implement and Harness store at Dalton, Neb.

FROM DAVID D. SLAIGHT HARDWARE COMPANY, Newark, N. J., which has been incorporated with a capital of $100,000 by D. T. Slaight, E. B. Irvin and S. H. Williams.

The firm of Wachter, Arnolt & Co., Pender, Neb., Hardware merchants, has been dissolved and will hereafter be known as the Wachter Hardware Company, George A. Wachter and John Forest having purchased the interest of Mr. Arnolt.

CENTERS OF MANUFACTURES AND POPULATION IN THE UNITED STATES.

THE accompanying maps, prepared from advices for which we are indebted to S. N. D. North, Director of the Census, Washington, give a clear idea in regard to the centers of manufactures and population in the

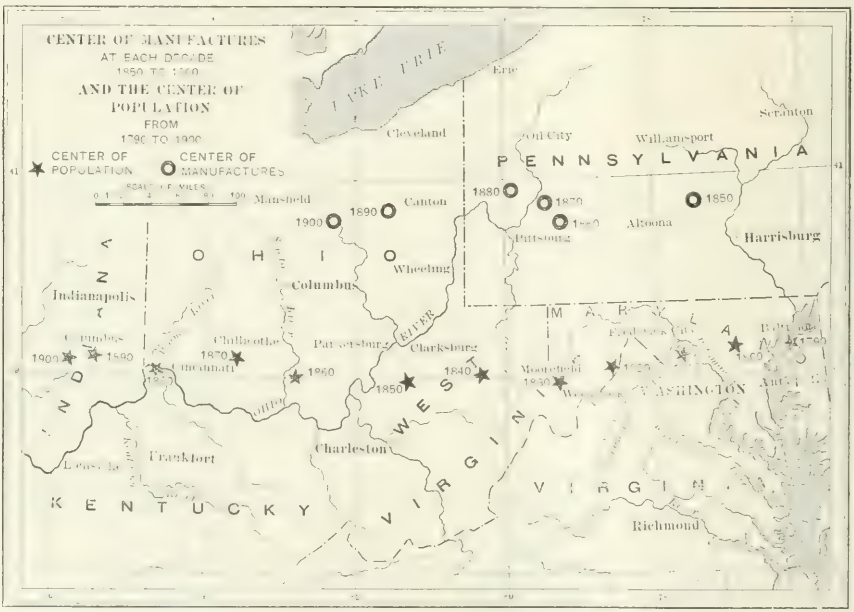


Center of Manufactures in the United States in 1900 and 1905, Based on Cities of Over 8000 Population.

United States at different periods. It will be observed that with both centers the movement has been spreading westward, with but little inclination to the north or south with the progress of time. The manufactures center has kept close to 41 degrees latitude north and always south of it, while the population center has maintained even closer relations with 39 degrees latitude north, most of the time a few miles north of it. In 1830 and 1850 the center managed to get over the line and a very short distance south.

The center of manufactures in both 1900 and 1905 was in Stark County, Ohio, in the former year south of Canton and in the latter near Wilmot. In comparing the center at the census of 1905 with that of 1900 it should be explained that the computations were made on different bases. For the census of 1900 the statistics of manufactures were published for counties, and the manufacturing center of the country was computed on the basis of the county showing. For the census of 1905 the statistics were not published by counties, but by cities of over 8000 population, these cities being 344 in number. Thus the center of urban manufactures for 1900, using the city as a unit, falls approximately 49 miles east of the center computed in 1900, using the county as a unit and including all manufactures. The center of urban manufactures in 1905 was located west of the center for 1900, approximately 13.8 miles. The center of manufactures of these cities, or of the urban manufactures, in 1900 was located 6.7 miles south of Canton, Ohio, or in latitude 40° 42′ 36″ north, and longitude 81° 22′ 12″ west. The location for 1905 was latitude 40° 39′ 36″ north, and longitude 81° 38′ 24″ west, near Wilmot, a small town in the extreme southwestern corner of Stark County.

The center of manufactures in 1850 was 5 miles east and 6 miles north of Mifflintown, Pa.; in 1860, 5.5 miles west and 6.5 miles south of Indiana, Pa.; in 1870, 6 miles east and 3.75 miles south of Kittanning, Pa.; in 1880, 2 miles east and 2 miles south of Butler, Pa.. In 1890 it moved into Ohio, where it has since remained.



Centers of Manufactures and Population in the United States.

Russwin Hardware.

THE RUSSELL & ERWIN MFG. COMPANY, New Britain, Conn., and 94-98 Lafayette street, New York, has just issued an elegantly printed book of the loose leaf type, containing illustrations of buildings equipped with Russwin Hardware of its manufacture. The leaves are 9 by 7 in. in size, but one engraving appearing on a leaf. The names of architects and contractors are given in addition to name of building. The structures shown are located all over the country, from the principal Atlantic seaboard cities to Seattle and Los

Angeles on the Pacific Coast, and from Toronto and Lake Minnetonka, south, including fine hotels, residences, office buildings, apartment houses, clubs, garages, public libraries, museums, high schools, railroad terminals, churches and numerous other public buildings.

THE COMMONWEALTH OF AUSTRALIA AND THE DOMINION OF NEW ZEALAND.

Second Article.

BY JOHN L. SARDY.

Before the Commonwealth each colony had its own system of duties, and to commercial travelers with samples it was no fun. All that is changed now. Once in the Commonwealth the traveler can pass from State to State unmolested. Last year a new tariff went into effect and there has been an uproar ever since. It is a protective tariff and in a way suits Victoria, which is more or less a manufacturing State.

Australasia as a whole is an agricultural and mining country, and imports the great bulk of the manufactured articles used, hence the buyers of these products raise a howl over the increased duties.

Labor Party Holds Balance of Power.

In the Commonwealth Parliament the Labor Party hold the balance of power and dictate to the Government. The present tariff is in favor of the workers in the larger cities without consideration for the farmer tilling the great Australian fields, the man in fact, who is the bone and sinew of the country. The legislation is for a class only. The duty may prove in a way prohibitive; indeed, it is already so on some articles, and it is a moot question whether it will be beneficial to the Commonwealth at large. On certain lines importation will diminish or cease altogether, being supplanted by inferior goods locally made, the price being kept just within the importing limit. Thus the user pays about as much as the imported article costs for a domestic production, which is not so well made and will probably have to be replaced more frequently. He is a loser and so is the Government. The idea of the Labor Party is to make up for this loss of Government revenue by direct taxation. This would get at the land owners and would take the form of a progressive land tax, which would practically amount to confiscation, as there is already in existence a Lands Resumption Act, which empowers the Government to resume and pay for at a fair valuation any large estates desired for closer settlement. The tax proposed is of such a nature that land owners would probably let their estates go rather than pay it.

In a speech by Sir William Lyne, the Commonwealth Treasurer, who is assuming the difficult job of trying to please everybody, he said:

> The idea was that the employee should be protected as well as the manufacturer, and while duties were imposed for the protection of the manufacturer as a matter of form, they put an excise duty on the manufacturer, which could not be collected so long as the manufacturer conformed to the ordinary rules of wages in each State. They asked him to put on his goods a mark, a Commonwealth trademark, which was a recognition of the fact that he was paying a proper wage, an indication to everybody that he was recognized as a man who was receiving the protection of the tariff, and was paying a proper and living wage. They would appoint an excise board which would probably be called a board of trade, whose function would be to inquire into matters and see that everything was going on all right.

From this it would appear that the lot of the Australian manufacturer is unlikely to be a happy one, and the importer bears him company.

How the Tariff Went Into Effect.

The new protective tariff went into effect August 9, 1907. No previous notice had been given. Importers were totally unaware what changes were to be made. On that day in August, when Sir William Lyne finished reading the new tariff, it at once became operative, although it was not law until subsequently passed by Parliament, which has now been done under a somewhat modified form. Fremantle, the port for Perth, western Australia, is the first Australian port arrived at by steamers from England. A steamer arrives before the new tariff has been introduced, carrying a cargo, some of which is free under the old tariff. She discharges part of her cargo at Fremantle, does the same as she proceeds to Adelaide and Melbourne; but by the time she arrives at Sydney the new tariff act has been read in Parliament, imposing a duty, say, of 25 per cent. on articles which were formerly free, and the unfortunate importer in Sydney has to pay it, while his rivals at the other ports do not.

Even worse yet. The steamer may actually be in port, but if not passed through the customs when the Commonwealth Treasurer gets up and announces the new tariff, the goods on board become at once subject to the revised duties. Furthermore, where an article was dutiable under the old tariff and made free under the new one, importers have to pay the old duty pending a decision in Parliament, but where an article was free and under the new tariff became dutiable, the duty must be paid.

Another thing. On all dutiable goods imported 10 per cent. is added to the invoice, and the ad valorem duty is collected on this increased value. Again, a manufacturer's discount for export must not be greater than the discount allowed for home trade, and the collector takes it upon himself to decide what the discount should be. There is now pending a dispute between the importers and the Collector on a certain American Hardware line, which for many years has had and is still having the largest sale of its kind throughout Australasia. The manufacturers' discount is 50 and 10 per cent., whether for home or foreign trade. Every one in the Hardware business knows this, but the collector in Melbourne not being in the Hardware business does not know, so he assumes that discount to be a special one for export and only passes the goods on the basis of 40 per cent. discount. Affidavits from the manufacturer and his representative in Australia will no doubt in time correct this, but in the meantime duties are paid under protest and importers are at sea.

Imports Will Diminish.

The tariff in a way is preferential on British made goods, but it is doubtful if England will benefit materially, as the duties have been increased to such an extent that importations will probably decrease. At any rate, one thing is certain, the United States and other countries, not British, will suffer. As an instance, a well-known importing Hardware firm in Brisbane had to cable to New York to stop shipment of about $5000 worth of Wagon Wheels, on account of the duty being raised to the equivalent of about $8 per set of four against about $1.50 under the old tariff. Another instance: Huge quantities of Wire Netting are imported on account of the rabbit pest. The new tariff imposed a duty of 25 per cent., whereat the Australian farmer rose up in his wrath and raised such a row that Parliament had to change the duty to 5 per cent. on British Netting and 10 per cent. on foreign. There has been an advance all along the line, and Hardware gets its full share of it.

Freak Duty on Magazines.

On all imported magazines whose advertisements constitute over one-fifth of the whole a tax levied of 6 pence (12 cents) per pound. Unless this be remedied by Parliament the importations of magazines will be seriously curtailed, and not only this. Our Hardware manufacturers who advertise in magazines are not likely to benefit as the newspaper importing agent tears out the advertisements, presumably in the custom house, so as to save the duty. It is said the object of this duty on the advertising portion of magazines is to prevent people in the Commonwealth ordering things abroad to the detriment of Australian labor. The fact is lost sight of that clever advertisements in magazines or a publication like *The Iron Age* often gives ideas to manufacturers, thus helping labor instead of retarding it.

Tax on Catalogues and Price-Lists Repealed.

The tariff also placed a duty of 12 cents per pound on all catalogues, price-lists and other similar advertising

matter imported into the country through the regular shipping channels or sent through the mails. Many American catalogues, single copies, sent through the post were held up for this duty and consequently failed to reach the persons to whom they were addressed. This obstacle to the distribution of American advertising matter in Australia has been removed. An amendment to the tariff, taking effect December 9, 1907, provides that "catalogues, price-lists, show cards, or pictures, issued by or referring to the goods of any manufacturer or producer not having an established place of business in Australia" shall be exempt from all customs duty.

PAINT LEGISLATION.

AT the recent annual meeting of the New York State Retail Hardware Association E. J. Cornish of the Carter White Lead Company, Chicago, made an address on legislation affecting the manufacture and marketing of Paint. In view of the interest and importance of the subject we take pleasure in giving the following liberal extracts from Mr. Cornish's address:

Paint legislation is by no means as recent as some of us may think. As long as 8 or 10 years ago an ill-digested bill was introduced in the Legislature of Michigan by a representative who happened also to be a Paint manufacturer in a small way. It was defeated by its evident absurdity and inadequacy. Minnesota also tried its hand at the question a little later, and finally succeeded in getting a law which simply amounted to a prohibition of the word "pure" on Paints and colors that were not pure. In the spring of 1905, however, North Dakota, with the advice of its highly competent Food Commissioner, Prof. E. F. Ladd, unexpectedly adopted the measure which gave the present impetus to the entire proposition. You are doubtless familiar with this law. It provides that all Paints containing materials other than pure carbonate white lead, pure zinc oxide, pure tinting colors, pure linseed oil, pure turpentine and japan driers shall bear a complete formula label.

This law was attacked in the United States courts on the ground that it is unjustly discriminating in its character, and, therefore, in violation of the Fourteenth Amendment to the Federal Constitution. The case was carried to the Supreme Court and was recently decided in favor of the State, on the ground that a State has the right to adopt even ridiculous precautions for the protection of its citizens. The legal status of this law is therefore finally settled. I wish, however, to point out to your discernment a few of the reasons why in the view of Paint manufacturers its provisions are unreasonable, burdensome and in contravention of the public good. I wish also to call your attention to a measure by which all the good results contemplated in this law are assured, without hampering industry, or interposing an arbitrary limit to technical progress. Let us acknowledge, first of all, that the demand for Paint legislation is not due to mere irrational caprice; that it is the consequence of

A Natural Revolt Against Trade Abuses,

and that if all Paint manufacturers had always been honest Paint legislation would never have been proposed. That conditions in this particular industry have been so unexceptionally bad as to warrant its selection for the bad eminence of adverse legislation I do not for a moment admit. That the consequences of individual misrepresentation in this commodity are sufficiently serious to warrant its classification with foods and drugs for legislative restriction I believe you will admit is a ridiculous assumption. If it were to be regulated in this sense it would be far more rational for our legislators to follow the example of France and other European countries in surrounding the use of certain pigments dangerous to health with legal restrictions, than to restrict or penalize the use of harmless adulterants.

The North Dakota statute assumes, first of all, that white lead and zinc oxide only among the white pigments are pure Paint, and that there is a natural standard of purity in colors; that purity is synonymous with quality, and that, therefore, the consumer is protected by requiring a formula label on impure Paints.

Were these assumptions correct it would have been far simpler, wiser and more serviceable to the Paint consumers of the State to establish one legal formula for Paints and prohibit the sale in the State of any others.

But it is not true, or if true, no one has as yet discovered the truth, and the weight of technical authorities is on the other side. I think I am safe in asserting that there is not in the United States a single large industrial consumer of paint (including the great railroads) that does not habitually use in preference paints which are classed as adulterated under the North Dakota law. Dr. C. B. Dudley, Chief Chemist of the Pennsylvania Railroad, who has probably gone more systematically and more intelligently into this question than an other investigator not interested in the manufacture of paint, has repeatedly stated in writing and on the witness stand his conviction, based on experience and test, that the so-called adulterated paints give better service and better protection than the so-called pure paints; and every disinterested technical authority expresses the same conclusion.

It is generally acknowledged and in private it is acknowledged, by those manufacturers of white lead whose opinion is based on practical knowledge, that the addition of oxide of zinc does improve the wearing qualities as well as other service qualities of white lead. It is quite probable that in many cases this combination makes the best obtainable white paint; but there are other conditions in which the use of white lead is technically inadmissible and others in which the use of zinc is at least inadvisable. Therefore it is not proper to standardize lead and zinc to the exclusion of other available and useful pigments, even if it were wise thus to close the path of progress and invention.

It Is Held by a Large Majority of Paint Manufacturers

that the introduction of an inert reinforcing pigment like sulphate of barium, silica, silicate of aluminum, sulphate of calcium, &c., into the white paint base greatly improves the wearing qualities of the paint film by reducing the chemical effect of the more active pigments on linseed oil: and in this Dr. Dudley fully agrees with them.

Moreover, it is not beyond the bounds of reason to suppose that the science of paint manufacture will continue to advance in the future as it has in the past, and that some proportion of this advance will be in the direction of new inventions and new discoveries. Suppose that North Dakota had been in existence about the middle of the past century, and had then enacted a paint law on the lines of its present statute. It would have read about as follows: All paint containing ingredients other than carbonate of lead corroded by means of fermenting manure, pure vegetable colors, the natural earth colors, cold pressed linseed and gold size japan shall be labeled, &c.

Since the Middle of the Last Century

zinc oxide, the chemical lakes, chrome green, hot pressed linseed oil and the modern dryers have all made their way into use against conservatism and competition, and it was only because the North Dakota law found them intrenched that they are permitted to be used without the incriminating label.

Other pigments and vehicles of more recent introduction, because of their mere youth, were branded with the mark of dishonor. Such are, to mention merely a few—sublimed white lead, zinc lead, lithopone, Chica Wood oil and the highly welcome asphaltum spirits, which was a godsend in view of the approaching exhaustion of our Southern pine forests.

However, the example of North Dakota and the high authority and character of its law's sponsor, Professor Ladd, immediately stimulated other States into activity, so that last year, with about two-thirds of the legislatures in session, something like 66 Paint laws were introduced in 15 States, all of them based upon the North Dakota law, but most of them differing therefrom in important particulars.

The Paint manufacturers, realizing from their experiences in North Dakota and from their observations that something of the kind would probably confront them, decided that for self-preservation three things were essential: First, that they should have early information of any proposed legislation; second, that the provisions of any laws enacted should be uniform; and third, that these laws should be equitable and should not require technical impossibilities. I may remark in passing that it is due rather to Professor Ladd's sensible application of the law of North Dakota than to the provisions of the law itself that the sale of many excellent Paints is still practicable in that State. The manufacturers thought they recognized the existence of a

Genuine Demand for Paint Legislation,

and when the Master Painters' Association and the National Paint, Oil and Varnish Association proposed a joint conference on the subject they gladly consented.

But I am running somewhat ahead of my topic. It was agreed that while legislation was undesirable and

unwarranted by the facts, it should be accepted if reasonable, and that not 1 cent should be spent for corruption or prevention. A bureau was organized which in the course of the year examined in detail 66,000 bills on every conceivable topic, and when a Paint bill appeared, either alone or as part of another measure, a hearing was arranged by wire and a representative dispatched to argue the matter.

In every case the first question asked of this representative was, "If you do not like this measure, what would you propose?" The demand for legislation existed, but the legislators were willing to listen to reason.

Recommended Bill.

Out of this fact grew the comprehensive measure adopted with full approval of the conference to which I have alluded, as the fairest measure for all concerned that could be devised. It has the complete indorsement of the joint committee representing the International Association of Master House Painters and Decorators of the United States and Canada, the National Paint, Oil & Varnish Association and the Paint Manufacturers' Association of the United States, and I trust that after you have studied it carefully, it will receive yours. Except for variations in verbiage it is the law now in force in Iowa, South Dakota and Minnesota. It has been accepted by Representative Marshall of North Dakota as the bill which he proposes to introduce in Congress, and was accepted last year as a more equitable substitute for the original bills introduced in the legislatures of several States, including New York and Pennsylvania.

This bill includes some important provisions which are wanting in the North Dakota statute while differing therefrom in other important particulars. In requiring the entire formula to be placed on every package it guards against misrepresentation and fraud on the part of the manufacturer (the buyer knows from the formula exactly what he is purchasing in the sealed package), but at the same time it does not attempt, like the North Dakota law, to set up a standard which will enable the manufacturers of certain products to advertise, as they did in North Dakota, "If I bear a formula label it is a warning that I am impure—don't buy me." It goes as far as a law should go, in compelling truthfulness of statement, without lending the powerful influence of the law to the backing of any particular commercial proposition. The law should be a guardian, not a wet nurse.

In the Case of Tinted Paints,

while it is made compulsory to show the combined percentage of coloring matter, and the analysis of each pigment used, it is not necessary to give the percentage of each individual color. This provision is made necessary by the fact that the colors differ in tinting strength, and that tinting is done by the eye and not by weight or measure. Thus, in a given tint of pearl gray, for example, there may be in one lot a little more or a little less blue, according to the strength of the pure blue, and if the percentage of each individual tinting color were required, it would mean a separate analysis and a different label for every fresh batch of the tint produced.

I wish to call your attention to another provision which is absent from the North Dakota law, but present in this: Section 4 requires

The Net Contents of the Package to Be Stated

on the container. To my mind this provision is more important than all the rest together. The man who gives short weight or short measure may defraud the buyer more seriously than the man who misrepresents his formula. If a manufacturer states that his goods consist of lead and zinc, while in reality they consist of zinc and barytes, he may be really selling better paint than if he told the truth, but the man who sells seven pints for a gallon is defrauding the buyer, no matter what the formula. This provision is now a part of the law in Iowa and South Dakota, and should appear in any paint law hereafter adopted.

The majority of the leading paint manufacturers have not waited for laws to compel honesty; but are preparing as rapidly as possible to put out all their products in full measures and net weights, and those who do not adopt this simple precaution of honesty should be compelled to do so, either by public opinion or by law. Many manufacturers are also anticipating Paint legislation by printing complete formulas on their labels. Others take the reasonable ground that their formulas are the fruit of experience and expenditure and that they should not be compelled to make them public. Be that is it may, it is obvious that if we are to have legislation, when we have it it should be as far as possible uniform, otherwise the Paint manufacturing industry would be thrown into inextricable confusion. A label which is legal in one State must be legal in all the States.

In the legislature of New York late last spring Representative G. H. Whitney introduced a Paint law. On being made acquainted with the provisions and purposes of the bill which has just been read, he promptly accepted it as a substitute for his own. Your representative found him to be fair minded and intelligent. It is not impossible that he may reintroduce the measure this year. If he does, and if you deem legislation on the subject desirable or advisable, I trust you will lend him your support.

Personally, I deem it a matter of indifference whether New York legislates on the subject or not, so long as any law adopted follows the provisions of the proposed act. There are many who differ from me in opinion, but my attitude is based on the fact that we are going to have such laws, here and there in spots, whether we want them or not. Now, it is obvious that with a law in New Jersey and Massachusetts and Ohio, for example, it will help the New York manufacturers very little if New York and Pennsylvania refrain. If he is compelled to print his formulas for the three States named he cannot afford to leave them off his cans in neighboring States. So, as I have said, I regard the attitude of any individual State as a negligible factor.

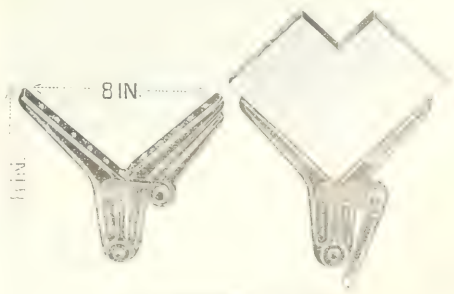
A Word Now as to the Proposed National Legislation

and I shall have taxed your patience far enough. First of all, I do not believe that we shall have any Paint legislation from the present Congress. There are other things of more importance to engage the attention of our law givers. Representative Marshall's bill, unless he amends it inviduously, is as fair as such a law can be made. But it should be remembered first that Paint legislation is novel and as yet untried—we want to find out by actual experience how these laws work in the States before we petrify them into a rigid national law; secondly, the Federal law runs only in interstate commerce and has no mandatory power within the borders of any State. After the goods are on the shelves in the State the State has full control of them. It can require a label entirely different from that required by the Federal law, and in that event the cans might have to be enlarged to accommodate the labels. Secondly, Paint manufacturers are having enough trouble and expense at the present moment to comply with the State law, without making confusion worse confounded by piling a Federal law on the back of the overburdened animal. Business in all lines is sufficiently embarrassed at the moment without further complications.

On behalf of practically the entire Paint manufacturing trade of the United States, I urge you to lend your powerful influence toward the discouragement of federal legislation at this time. After the State laws have been tried out and perfected so that the consumer shall receive the fullest measure of protection with the least resultant injury to legitimate commerce and industry and the least possible interdiction of competition, progress and improvement, it will be time—and not until then—to embody this wisdom of experience in to a federal statute.

Taylor Miter Clamp, No. 36.

The accompanying diagram illustrates the Taylor miter clamp, made by James L. Taylor Mfg. Company, Bloomfield, N. J. The castings are of refined malleable



No. 36.

iron and the gripping pins of best quality Stubbs' steel. The eccentric is so designed that the first part of the motion brings the jaw quickly into engagement and the latter part closes more slowly, affording greater holding

power. A spring action holds the clamp open, always ready for use. In the construction of this device lightness and strength were especially studied. The jaws are planed true and fitted to hold the work exactly square when closed. The pins are only large enough to give a grip that prevents slipping.

A Universal Family Sewing Machine Motor.

The Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., has placed upon the market a Motor with all the necessary attachments for fitting any one of the standard types of Sewing Machines, as illustrated herewith. This Motor can be applied equally as well on drop head and stationary head machines, and may be fitted to new or old machines. Full instructions

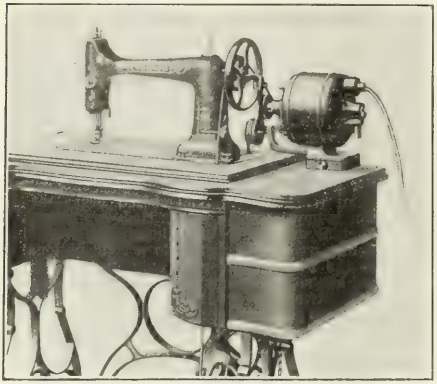


Fig. 1.—Drop Head Sewing Machine with Alternating Current Motor.

for mounting and operating the Motor are supplied with each outfit. The Motor is mounted on the top of the table, and runs at a constant speed. The speed of the needle is regulated by increasing or decreasing the belt tension. A special brake and belt tightener arm is attached by chain to the foot pedal, which should be disconnected from the large balance wheel. Pressure on the

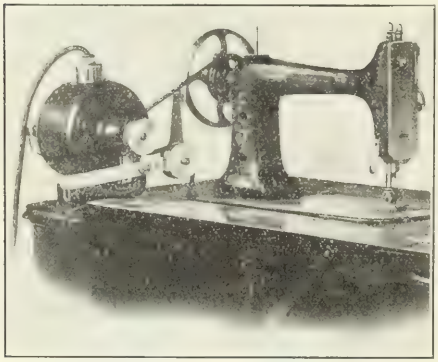


Fig. 2.—Sewing Machine with Direct Current Motor.

pedal releases the brake, tightens the belt and starts the machine. It is stated that perfect regulation of the speed may be obtained after a few minutes' practice. In fact, the needle may be stopped, it is said, with greater promptness than when running from the foot pedal, and the usual control over the speed is readily learned. The entire outfit presents a neat appearance, being well finished in black japan with nickel trimmings. The Motor and its attachments are especially well made, and require only a minimum of care and of attention in operation. These machines are made for 100-110 volt alternating current, 60 cycles, and for 100-110 direct current circuits.

Electric Glue Pot.

The electric glue pot here illustrated has recently been placed on the market by the General Electric Company. It embodies a new feature of design, namely, the elimination of the water jacket. The water jacket is a necessary part of the ordinary glue pot, inasmuch as this water bath serves not only to distribute the heat evenly to all parts of the glue, but also prevents it from



Fig. 1.—Two-Qt. Electric Glue Pot Connected.

becoming overheated. The elimination of this feature in the General Electric glue pot has been made possible by the adoption of a casting of pure aluminum, which forms the glue pot proper. The high conductivity for heat, together with the proper design of the heating unit and the correct proportioning of radiating surface, combine to keep the glue at the proper temperature, although the maximum temperature of the exterior and bottom of the pot never exceeds 180 deg. F. The heating element is of



Fig. 2.—Two-Qt. Electric Glue Pot Disconnected, Showing Parts, &c.

the well known cartridge type, which is said to be characterized by simplicity, renewability and long life. The company claims that a saving in electricity has resulted by the omission of the water jacket amounting to as much as 50 per cent. in the smaller sizes. It particularly recommends this glue pot for carpenters, pattern makers, book binderies, &c.

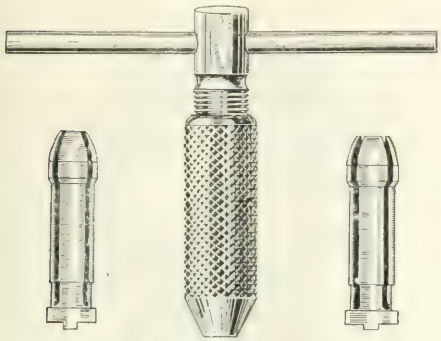
Forsyth Mfg. Company.

The Forsyth Mfg. Company, 308-314 Terrace, Buffalo, N. Y., has made a number of additions to its lines of bathroom accessories and hardware specialties. Among these as shown in a catalogue lately issued, are match safes, always ready wrenches, tumbler holders, soap trays, &c.

The Farmers' Hardware Company, Sweetwater, Texas, has started a branch store at Blackwell, handling Agricultural Implements, Buggies, Shelf Hardware and Queensware. The company has erected a rock building, 50 x 80 ft. in size, with plate glass front.

Combination Tap Wrench.

The Bergman Hardware & Tool Mfg. Company, Buffalo, N. Y., is manufacturing the tool shown in the accompanying illustration to supply the demand for a tap wrench that will take all taps up to medium size. It is furnished

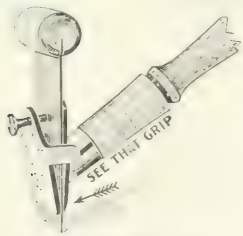


Tap Wrench with Two Collets.

with two collets made of 60-carbon tool steel, the smaller holding taps from 1-16 to 3-16 in. and the larger from 3-16 to ⅜ in. Drills from 1-6 to ¼ in. are accommodated. The tools are highly polished and each is packed in an individual box.

Bennett Adjustable Scraper.

The Bennett Mfg. Company, 420 Auburn avenue, Buffalo, N. Y., whose sales agents for Greater New York are Warner & Haviland, 49 Warren street, has put on the market the Bennett adjustable scraper for cabinet work, parquet floors, &c., as here illustrated. Aside from the quality of the entire tool and care with which it is made marked characteristics of it are rigidity of blade, strong grip and absence of chatter. The blade of tool steel is 3 x 5 in., and the company asserts it can be used to the last ½ in. No special blade for renewal is required other



Bennett Adjustable Wood Scraper.

than of suitable dimensions and quality. The handle working on ball and socket principle, can be adjusted to any necessary position by a few turns of the handle or detached to save space. The 10½-in. hardwood handle of practical pattern is polished and varnished natural. At the working end there is a turned head ¼ x 2 in. carriage bolt, which works in a pinioned nut imbedded in the handle, two sides of the head being ground off a total of ⅛ in. to permit it to enter the socket slot in the rear clamp, which is forged from ⅛-in. steel. The clamp and ball socket are formed of one piece of metal, the socket being 1 in. in diameter and 9-16 in. deep, outside measurements. To reinforce this part of the tool there is a 1-in. tapered heavy malleable iron ferrule, thus providing a strong construction at this important point. The front clamp also made of ⅛-in. sheet steel is tightened on the scraper blade by a stout milled head machine screw ¼ x ⅞ in. under the head and 9-16 in. diameter head. The wood grip at top of blade is 3 x 1 1-16 in., and is slotted ⅜ in. to admit the scraper on whichever end used. The clamps, binding screw and ferrule are polished and nickel plated, and the tool is well put up in white tissue paper and double pasteboard box singly.

The Ideal Freezer.

An ice cream freezer possessing the unique feature of being operated without gear mechanism is manufactured by the Commercial Can Company, 101-105 North Lincoln street, Chicago. Fig. 1 of the accompanying illustrations shows the machine ready for operation. In Fig. 2 it is shown in vertical position ready for filling, and Fig. 3 shows the disassembled parts and the interior of the freezer can. The tub is made of indurated fiber and has a tube inserted in the bottom at the center, which serves as a sleeve bearing for the shaft upon which it revolves. The shaft is bent so that when in position for operation the tub is inclined at an angle of about 45 degrees and is fastened to a baseboard 8 x 14 in. The freezer is held in position by a wire lock at the base of the shaft, and the baseboard is secured to the table by a clamp. Ice and salt are introduced through a screw top opening into the space between the cam chamber and the tub. The ice is not in direct contact with the can, which being evenly balanced and free from the binding and friction of lumpy ice is easily revolved by use of the knob shown on the top of the freezer in Fig. 1. The can is readily restored to a perpendicular position for filling by releasing the fastening from the shank of the shaft. A scraper is provided which facilitates the free contact of the contents with the interior surface of the can. It is stated that cream can be frozen in 5 min. or less, according to quantity. The freezer is made in one size only, having a capacity of one gallon, but will work effectively when only partly filled.



Fig. 1.—The Ideal Freezer.

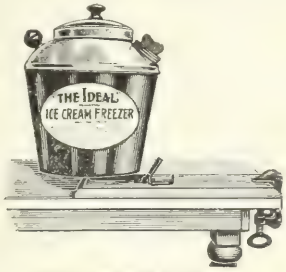


Fig. 2.—Position for Filling.

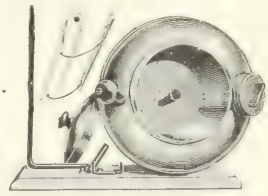


Fig. 3.—Disassembled Parts and Interior.

The Detroit Shipbuilding Company, Detroit, Mich., has issued an illustrated descriptive price-list, C, 108 pages, of special marine hardware, oil and grease cups, life rafts and life boats. Among recent additions to the line of marine hardware are screen door locks, towel racks with teeth, bracket comb, brush, tumbler and pitcher holders, swivel door hooks, three and four prong coat hooks, door fasteners and bumpers, whistle pulls, bathtub and lavatory water heaters, telemotor flange unions, iron body brass plug air cocks, self-bailing plugs, elbow oil cups and iron body dope cups. The catalogue is accompanied by a discount sheet.

Jersey Vises and Display Stand.

The Leavens Mfg. Company, Vineland, N. J., represented in New York by Warner & Haviland, 49 Warren street, has recently put on the market the Jersey vises in three styles, two of which are here illustrated. These vises are referred to as of high grade and low price, especial care and attention being given to details, unusual in vises sold at such prices, although there are several patented features peculiar to these goods. The lowest in price are six all-clamp bottom vises, identical in appearance to the vises illustrated in Fig. 1, but having plain iron jaws, the widths of which are 1½, 1¾, 2, 2¼, 2½ and 3 in., weighing respectively 3, 3¼, 3½, 4, 5 and 8¾ lb. Fig. 1 illustrates exactly the same vise in the same sizes and weights, but has steel faced jaws, and they are a little higher in price. Fig. 2 reproduces the swivel base style, with steel faced jaws, the widths of which are 1¾, 2, 2¼, 2½ and 3 in., weighing complete 3, 3½, 4½, 5½ and

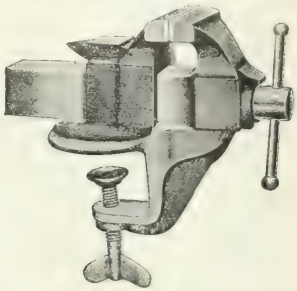


Fig. 1.—Jersey All Clamp Bottom Steel Faced Vise.

9½ lb. each. All three groups have a solid steel polished head, square thread screw and lever handle proportioned to the service it should properly render. The interior nut of malleable iron is well secured, and yet flexible enough to allow of some lateral and vertical play which insures an easy movement of the screw through the nut, there being also a stout wrought iron pin 3-16 x ⅜ in. driven through the vise base back of the nut to keep it securely in position. All jaws and slides are ground and properly fitted, well polished, and the bodies of the vises finished in a brown japan baked on instead of air dried. The swivels on both all-clamp bottom styles represented by Fig. 1, attached to the malleable iron thumbscrews, are so made, it is said, that they can always be depended upon to swivel with a free movement. This patented swivel of

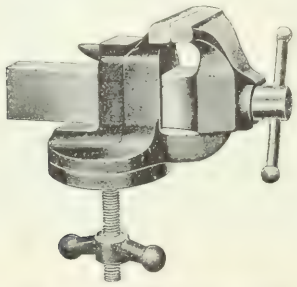


Fig. 2.—Similar Vise, Swiveled Bottom.

malleable iron is cast with a slit from center to circumference and closed in assembling on the inverted cone shaped end of screw. The recess feature in the bottom of the slide is likewise patented, which admits the one-piece screw in the process of assembling. All vises are wrapped singly in two or three sheets of strong hardware paper, according to sizes, thus protecting the hard, dry finish and enhancing the salability of the vises, which can be kept fresh until they reach the consumer. Each vise has a horn and polished anvil, and all parts are interchangeable. As an earnest of its faith in the goods, the company offers to send an assortment of three dozen vises to any reliable merchant in the United States on approval, which may be returned at the company's expense if not as represented and entirely satisfactory. In this connection the company has originated a unique display stand,

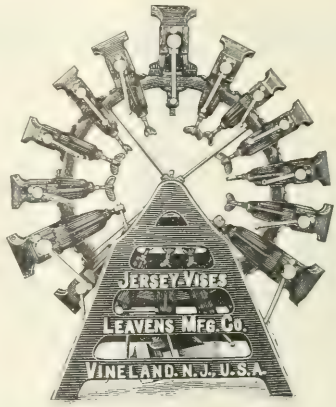


Fig. 3.—Jersey Vise Rotary Display Stand.

Fig. 3, on which to conveniently show its line of vises; one of the stands being sent gratis with first order for assortment No. 14 of 36 vises. Two other assortments, Nos. 12 of 24 vises and 10 of 18 vises are put up, with which stands are sent but for which a partial charge is made. There are two lettered ornamental cast standards having a spread both ways to better sustain the vises clamped to an oak rim, the dimensions of which are 15¼ x 2 x ⅝ in. The four wheel spokes are ¾ in. stove rods, screwed into a tapered iron hub 1⅝ in. center diameter. Through this hub runs a machined ¾-in. spindle held at each standard bearing by square head setscrews, thus permitting the wheel with its vises to revolve. The distance from base to top of wheel is 21 in., with room enough below for vises to clear as the display revolves. The bottom width of both standards in line with the wheel is 15¼ in., and the lateral spread of 8½ in. at top increases to 13 in. at bottom, thus affording a good foundation.

Murchison Clothes Line Reel.

A new clothes line reel manufactured by the Peters Pump Company, Kewanee, Ill., and here illustrated, af-



The Murchison Clothes Line Reel.

fords a convenient means for stretching and storing clothes lines. The ends, reel, ratchet and crank are made of cast iron inclosed in a casing of galvanized sheet steel, in the front of which is a sliding door which when closed protects the line from exposure to the weather. Cast iron lugs perforated with screw holes are attached to the back of the reel for the purpose of securing it to the house or other convenient place. When the line is drawn out and fastened in position it is easily tightened to the desired tension by a few turns of the ratchet crank. Besides the protection it affords to the line and the saving in time and labor effected, the device is durably constructed and neat in appearance.

Pioneer Portable Pipe and Bench Vises.

Schnebardt & Schutte, 136 Liberty street, New York, have just put on the market in this country, their Pioneer, No. 2, portable combined bench and pipe vises. The illustrations show it set up for use, Fig. 1, and in knocked down form for portability, Fig. 2. The outfit consists of a pipe vise mounted on a folding steel frame with hinged platform, on which to stand at work and hold securely. The frame of the platform is made of strong U iron. The two side supports carry the vise, back of which a ¾-in. pipe (1⅛ in. outside diameter), forms the third support. This support is held in position by means of a hinged tool table 15 x 12 in., the latter having a rim around it to prevent tools from rolling off. The pipe vise is made of crucible tool steel with tempered jaws. There is a small bridge under the pipe vise to assist in holding the bench vise, the latter being also made of crucible tool steel and tempered. The bench vise, with its hooked tongue, is suspended in the base of the metal pipe vise so as to bring the lower pivot in the hole of the bridge, thus fastening the vise as firmly as if it were part of the frame. The changing of the vise requires but a few seconds. The bench vise jaws are 4 in. wide, and will take work easily up to 3⅝ in. The steel and wood platform is 26 in. front to back, and has a spread of 31 in. where hinged to legs. When using the pipe vise for large pipe, necessitating the attention of two workmen, each stands with a foot on the platform. The metal parts have a gray machine tool finish. The Pioneer No. 1 outfit, with pipe vise only, weighs complete 50 lb.; the Pioneer No. 2, with pipe and bench vises combined, weighs 85 lb., the pipe vise in both instances being capable of taking up to 2 in. pipe.



Fig. 1.—Pioneer No. 2 Portable Combined Pipe and Bench Vises.



Fig. 2. Pioneer No. 2 Knocked Down for Carrying or Transporting.

C. Doering & Sons.

C. Doering & Son, Chicago, whose product covers an extensive line of sheet metal goods, tanks, &c., are making a specialty of sheet steel equipment for stores, warehouses, shops and stockrooms, consisting of sectional shelving, shelf drawers, &c. Such equipment is made of 20, 18 or 16 gauge steel and may be had in various styles and subdivisions to suit particular requirements. The firm also makes an extensive line of sheet metal supplies for machine shops, foundries, &c., including pans, tote boxes, tool boxes, barrels, trucks, wheelbarrows, &c.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal
Linseed, American, raw	.44
Linseed, American, boiled	.47
Linseed, English, raw	.49
Linseed, English, boiled	.52
Linseed, Calcutta, raw	.44
Linseed, Calcutta, boiled	.47
Lard, Prime, Winter	.70
Lard, No. 1	.65
Neatsfoot	.70
Cottonseed, Crude	.32
Cottonseed, Yellow	.36
Cottonseed, White	.40
Yellow, Winter	.42
Tanners' Paste	.32
Menhaden, Brown, Std.	.32
Menhaden, Pale, Std.	.42
Menhaden, Natural	.40
Menhaden, Refined	.45
Cocoanut, Ceylon	.44
Cocoanut, Cochin	.48
Cod, Domestic, Pale	.44
Neatsfoot, Extra	.60@.65
Red, Lard	.11
Sperm, Natural	.85
Olive, Yellow	.90
Olive, Foots	.85
Palm, Lagos	.06

Mineral Oils—

	₱ gal
Black, 25 gravity, 500 gal. bbls.	.11
Black, 25 gravity, 50 gal. bbls.	.13
Black, 25 gravity, 5 gal. cans	.14
Summer	.14
Coal Tar Creosote, Dead	.11
Coal Tar Creosote, Live	.11
Paraffine, 24 gravity	.11
Paraffine, 30 gravity	.11
Paraffine, 32 gravity	.11
Red	.11

Miscellaneous

	₱ lb
Barytes:	
White, Foreign	.02½@.03
American, floated	.02½@.03
Off color	.02@.02½
Chalk, in bulk	.00@.00
Chalk, Paris	.00@.00
Chalk, Oxford	.00@.00
Whiting, Commercial	.00 lb .42@.52
Gilders	.00@.00

Putty, Commercial—

	₱ 100 lb
In bladders	$2.75@2.85
In tins, 100 lb kegs	2.90@3.00
In tins, 50 lb kegs	3.00@3.10
In tins, 25 lb kegs	3.15@3.20

Spirits Turpentine—

	₱ gal
In 100 bbls	.71
In less than 100 bbls	.73

Glue—

	₱ lb
Cabinet	.12@.15
Common Brown	.07@.08
Common White	.08@.09
Fish, liquid, 50 gal. bbls., per gal.	.75
Fish, Scotch, White	.50
Fish, Scotch, Brown	.40
German Common Hide	.10@.12
Cabinet, Hide	.15
Flake, White	.12
Glue, Grade A	.15
Medium White	.14

Gum Shellac

	₱ lb
Fine Orange	.00
Fine Pale	.00
Fine Garnet	.00
Fine Orange	.00
Fine Pale	.00
Fine Garnet	.00

Colors in Oil—

	₱ lb
Black, Lampblack	.12@.14
Black, Ordinary	.00
Blue, Prussian	.32@.36
Blue, Ultramarine	.00
Brown, Vandyke	.00
Green, Chrome	.12@.16
Green, Paris	.00
Siennia, Raw	.00
Siennia, Burnt	.12@.15
Umber, Raw	.00
Umber, Burnt	.00

White Lead, Zinc, &c.—

	₱ lb
Lead, English white, in Oil	.12½@.13½
Lead, American White:	
Lots less than 500 lb, in Oil	@.7¼
Lead, White, in Oil	.00
Lead, White, in oil, 12½ lb tin pails	.00
Lead, White, dry	.00
Lead, White, in oil, assorted tins	@.8½
Lead, American, Terms: On lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice	

Zinc, Dry

	₱ lb
Red Seal	.06½@.07
Green Seal	.00
Blue Seal	.00

Dry Colors

	₱ lb
Black, Carbon	.00@.10
Black, Drop, American	.3½@.8
Blue, Celestial	.4 @.6
Blue, Prussian	.00
Blue, Ultramarine	.00
Brown, Vandyke	.00
Carmine, No. 4	.00
Carmine, No. 40	.00
Green, Chrome	.00
Green, Paris	.00
Ochre, American	.3½ ton $8.50@16.00
Ochre, French	.00
Ochre, Italian	.00
Ochre, Turkey	.00
Ochre, Yellow	.00
Siennia, Italian, Burnt and Raw	.00
Siennia, Raw	.00
Siennia, Burnt	.00
Umber, Raw	.00
Umber, Turkey, Burnt	.00
Vermilion, American, No. 1	.65
Vermilion, American, No. 2	.55
Umber, Turkey, Brt. & Pow.	2½@.3
Umber, Raw, Powdered	.1½@.2
Umber, Burnt, Powdered	.2½@.2
Vermilion, English	.00
Vermilion, Quicksilver	.65
Vermilion, Chinese	.65
Vermilion, Pulverized	.65@.75
Yellow, Chrome	.00@1.00

Current Hardware Prices.

General Goods. In the following quotations General Goods that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Kaplin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—

Fernald Mfg. Co Burton Anti-Rattlers, ₱ doz. pairs, Nos. 1, $0.75, 2, $0.85, 4, $1.00, 5, $0.50.
Fernald Quick Shifter, ₱ doz. pairs ..... $2.00@$3.00

Anvils—American—

Eagle Anvils .....₱ lb @8½¢
Hay-Budden, Wrought .....9½@9¾¢
Trenton .....₱ lb 9½@9¾¢

Imported—

Swedish Solid Steel Sisco, Superior, ₱ lb ..... 13c@10½c
Peter Wright & Sons, ₱ lb, 84 to 349 lb. 11¢; 350 to 699 lb. 11¼¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....10%

Augers and Bits—

Com. Double Spur.....75&10@80%
Common Pattn., Bright.65&10@70%
Black Lip or Blued.....65@66⅔%
Boring Mach. Augers.....70%
Car Bits, 12-in. twist.....40&10%
Ford's Auger and Car Bits .... 40&5%
Ft. Washington Auger Co., Cin.....25%
Ford's 25%
Forstner Pat. Auger Bits.....25%
J. E. Jennings & Co:
No. 10 ext. lip, R. Jennings' list.....25&7½%
No. 30, R. Jennings' list.....50%
Russell Jennings .....25&10&2½%
Hammered Car Bits.....15%
Lathiwe's Countersink Bits.....45%
Hugh's Black.....70%
Hugh's Jennings Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' 50%

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Clark's Pattern, No. 1, ₱ doz. $26
No. 2, 18 ..... 60&10%
Ford's, Clark's Pattern..... 66⅔&5%
J. E. Jennings & Co's Steel Pat. 25%
Lavigne Pat., small size, $18.00, large size, $26.00 ..... 60&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut.... $3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz.. $6.50@7.00
James ..... 15&10%
Universal 20%

Ship Augers and Bits—

Ship Augers.....Sol. plat.—
Ford's ..... 33⅓&5%
J. E. Jennings & Co:
L'Hommedieu's 66⅔
Watrous ..... 33⅓&7½%
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdld, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent gro.31@34¢
Unhdld, Shldered gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool*

Axes—

Single Bit, base weights: Per doz
First Quality..... $4.75@5.00
Second Quality..... $4.25@4.50
Double Bit, base weights:
First Quality..... $7.00@7.50
Second Quality..... $6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles—Iron or Steel

Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar..4½@4¾¢
No. 1 Common, Loose...3¾@4¼¢
No. 1½ Com., New Style..3¾@4¼ ¢
No. 2 Solid Collar..... 4½@4¾ ¢
Half Patent.
Nos. 7, 8, 11 and 12..65½@65&10%
Nos. 13 to 14 .....65½@65&10%
Nos. 15 to 18 .....70@70&10%
Nos. 19 to 22 .....70@70&10%

Boxes, Axle—

Common and Concord, not turned lb., 6@6¾¢
Common and Concord, turned lb., 6@7¢
Half Patent.....lb., 9½@10¢

Bait—Fishing—

Hendryx:
A Bait..... 20%
B Bait..... 25%
Competitor Bait..... 20&5%

Balances—Sash—

Caldwell new list..... 50%
Pullman ..... 50&10&60%

Spring—

Spring Balances..... 50&10@60%
Chatillon's:
Light Spg. Balances..... 50@50&10%
Straight Balances..... 40@40&10%
Circular Balances..... 50&10%
Large Dial..... 30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb.... per lb., —@21½@22½¢

Towel—

No. 19 Ideal, Nickel Plate, ₱ gro $8.50

Beams, Scale—

Scale Beams..... 40%
Chatillon's No. 1..... 30%
Chatillon's No. 2..... 40%

Beaters, Carpet—

Holt Lye Co:
No. 12 Wire Coppered ₱ doz. $0.80.
Tinned..... $0.85
No. 11 Wire Coppered ₱ doz $1.15.
Tinned..... $1.20
No. 10 Wire Tinned ... ₱ doz. $1.50

Beaters, Egg—

Holt Lye Co:
Holt, per doz., No. 5, Jap'd, $0.80; No. 4, Jap'd, $1.15; No. 3, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro. No. 60, $6.00, No. 75 $6.50, No. 100, $7.00, No. 192 Tinn'd, $8.50; No. 150, Hotel, $15.00, No. 152, Hotel Tin'd, $17.00, No. 200, Tumbler, $8.50, No. 202 Tumbler Tin'd, $9.50, No. 300, Mammoth, per doz., $25.00
Turner & Seymour Mfg. Co: T & S Dover..... $6.50

Bellows—

Blacksmith, Standard List..
Split Leather..... 60&10%67½%
Grain Leather..... 50@50&10%

Hand—

Inch... 6 7 8 9 10
Doz.. $5.00 5.50 6.00 6.50 7.50

Molders—

Inch... 12 14 16
Doz.. $9.00 12.00 15.00

Bells—Cow—

Ordinary Goods 75&5@75&10&5%
Hush grade..... 70&10@75%
Ives ..... 75&10%
Texas Star 50%

Door—

Home R & E Mfg Co's..... 55&10%

Hand—

Polished Brass ..... 70&10@75%
White Metal ..... 70&10@70&10&5%
Nickel Plated 70%
Sterling ..... 50&5%
Curtis Globe Hand Bells..... 33⅓@35%

Miscellaneous—

Farm Bells..... 2½@2½¢
Church and School.... 60@60&5%

Belting—Leather—

Extra Heavy, Short Lap..60@65%
Regular Short Lap.....60&10&5%
Standard ..... 70&5%
Light Standard..... 75%
Cut Leather Lacing..... 40&10%
Leather Lacing Sides, per sq. ft. 2½¢

Rubber—

Agricultural (Low Grade)....
75@75&5%
Common Standard....70@70&10%
Standard ..... 70@70&5%
Extra..... 60&5%@60&10%
High Grade..... 50&5%@50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Spokes..... 50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden..... 75@75&5%
B. & L. R. Co:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%;
Lane's Patent Automatic Lock and Junior 50%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined..... 75
Embossed 75

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co..... 33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage Rent threads, ⅝ ... 6 and smaller... 75@—%
Larger and longer ..... 70@—%
Phila. Eagle, $4.00 list 50&—%
Bolt Ends ..... 70@—%
Machine Coat Threads, ⅝ ... 6 and smaller.....75&5@—%
Larger and longer.....70@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob.
Inch..... 3 4 5 6 8
Per doz $4.50 .55 .65 .80 .80
Cast Iron Spring Foot, Jap'd:
Inch..... 6 8 10
Per doz..... $1.20 1.50 2.25
Cast Iron Chain, Flat, Japanned:
Inch..... 6 8 10
Per doz..... $1.00 1.40 1.65
Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch..... 6 8 10
Per doz..... $ .75 .97 1.25
Wrought Barrel Japd. 80@80&10%
Barrel Bronzed..... 60&10%
Spring ..... 70&10@70&10%
Shutter ..... 50&5@50&10&5%
Square Neck..... 75%@75&10%
Square ..... 70&10&10%
Ives' Patent Door..... 55%
Ives' Wrought Metal 45%

Expansion—

Richards Mfg. Co ..... 50&10
Steward & Romaine Mfg. Co.
Style No. 13, Double..... 55%
Style No. 1, Single 55
Style No. 100, Dbl. Jas. Single 55
Lag Screw..... 66⅔

Plow and Stove—

Plow ..... 65&5@70%
Stove ..... 85@85&5%

Tire—

Common Iron..... 80%
Norway Iron..... 80%
American Screw Company:
Norway Phila., list Oct. 16, '84 .80%
Eagle Phila., list Oct. 16, '84...82½%
Bay State, list Dec. 28, '99..... 80%
Franklin Mfg. Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Eclipse, list Dec. 28, '99..... 80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99..... 80%
Norway Phila., list Oct., '84 ..... 80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99....80%
Phila., Eagle, list Oct. 16,1884..82½%
Upson Nut Co.:
Tire Bolts..... 72½%

Borers, Bung

Borers Bung, Ring, with Handle:
Inch..... 1¼ 1½ 2
Per doz...$1.80 5.40 6.40 8.00
Inch 2¼ 2½
Per doz..... $8.65 11.50
Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each..... 25%

Boxes, Mitre—

C. E. Jennings & Co..... 25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme ..... 15&10%
Perfection 40%
Seavey 45%

Braces—

Common Ball, American.... $1.50
Barlett's ..... 50&10&10@60&10
Fray's Genuine Spofford's..... 60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 ..... 60%
C. E. Jennings & Co..... 50&5%
Mayhew's Ratchet..... 60%
Mayhew's Quick Action Hay Pat.. 60%
Millers Falls Drill Braces..... 35&10%
P., S. & W. Co., Peck's Pat..60&10%

Brackets—

Wrought Steel..... 70&10@75&10%
Bradley Metal Clasp..80&10@80&10&5%
Griffin's Pressed Steel.....75@75&10%
Griffin's Sliding Bracket ..... 70&10
Taplin Victor Handy Egg Beater Bracket ..... ₱ doz. $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg Co..... 15&20%
Wire Goods Co..... 15%...

Buckets, Galvanized—

M'f'gr's list, price per gross.

	Quart	10	12	14	
Water, Rem...	25.35	28.00	32.00		10&5%
Water, How	45.35	48.00	52.00		
Fire, Rd. Btm.	32.00	34.65	38.65		
Well	37.35	41.35	45.35		

Bull Rings—See *Rings, Bull*

Butts—Brass—

Wrought, High List, Oct. 26,'06.55%
Cast Brass, Tiebout's..... 40%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow....40&10@50%
Loose Joint..... 70&10@75%
Loose Pin..... 70&10@75%
Mayer's Hinges..... 70@70&5
Parliament Butts..... 70@70&5

Wrought Steel—

Bright.
Light Narrow, Light Reversible ..... 70&5%
Reversible and Broad..70&7½%
Loose Joint, Narrow, Light
Inside Blind &c.... 70%
Back Flaps, Table, Chest..67½%
Japanned
Light Narrow, Loose Pin, ... 50&5%
Light Narrow, Ball Tip..70%
Broad ..... 40&5%
Steeple Tipped..... 70%
Ball Tipped..... 70%

Extra 10%

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200 15" ; 200 300, 900 ..... 40"
Hendryx Bronze, Series 700, 800..30"
Hendryx Enameled 35

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb., keg of 14¢
Sharp, 1 prong, per lb., keg of 14¢
Barnes Round Edge, Sharp, 4 cents
Lasting, Blunt, 1 prong, Sharp 1 prong
Perkins Blunt, 2 lb. 3 doz., Sharp 3 lb. 4.15¢

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Eagle's L. B. ..... 58@56¢
G. D. ..... *per M 34@34¢*
F. L. ..... *per M 40@42¢*
G. E. ..... *per M 46@50¢*
Musket ..... *per M 62@63¢*

Primers—

Berdan Primers, c. per M. ..... *20@5..*
Primer Shells and Bullets..15&10%
All other primers per M $1.52@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:

32 C. F., $5.50	*10&5%*
38 C. F., $7.00	*10&5%*
22 cal. Rim, $1.50	*10&5%*
32 cal. Rim, $2.75	*10&5%*

B. B. Caps, Con. Ball, Sieyd. $1.90
B. B. Caps, Round Ball *$1.40*
Central Fire *25%*
Target and Sporting Rifle ..... *15&5%*
Primed Shells and Bullets..15&10%
Rim Fire, Sporting *50%*
Rim Fire, Military ..... *15&5%*

Casters—

Bed ..... *65&10%*
Plate ..... *60&5%*
Philadelphia ..... *70&10%*
Acme, Ball Bearing 35%
Gem Roller Bearing ..... 35&10&5%
Steel Wheel 20
Standard Ball Bearing 45%
Yale (Double Wheel) low list..40&10%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:

3-16	*¼*	*5-16*	*⅜*	*½*	*9-16*
$8.65	*6.95*	*4.90*	*4.25*	*4.15*	*4.10*
⅝	¾	⅞ to 1	1⅛ to 1¼ inch.		
$4.05	*3.95*	*3.90*	*4.00*		

In cask lots, deduct 25c.
German Coil ..... *60&10&5%*
German Pattern Proof Coil Chain
6 to 12 ..... *70&5%*
2 and 3 ..... *70&10&10%*
¼, 5 and 6 ..... *70&10&10&10%*

Halter—

Halter Chains ..... *60&10&5%*
German Pattern Halter Chains, list July 24, '97 ..... *60&10&7%*
Corbett Mfg. Co.
Halter ..... 35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, *Straight, with ring* *$28.50*
6½—6-2, *Straight, with ring* *$28.00*
6½—8-2, *Straight, with ring* *$32.00*
6½—10-2, *Straight, with ring* *$37.00*

NOTE.—Add 2c per pair for Heads. Twist Traces, add per pair for No. 5 and 5, 2c; No. 4, 3c; No. 6, 4c to price of Straight Link.

Eastern Standard Traces, Wagon Chain, &c. ..... *60&10&10&5%*

Miscellaneous—

Jack Chain, list July 10, '93:
Iron ..... *60&10%*
Brass *60%*
Safety and Plumbers' Chain ..... *60&10*
Gal. Pump Chain ..... *lb., 75@75¢*
Bridgeport Chain Co.
Triumph Halter and Coil ..... 50&10%
Triumph Dog ..... 50&10%
Halter, Tie and Coil ..... 50&10%
Covert Mfg. Co.
Breast, Halter, Heel, Rein, Stallion 40%
Oneida Community:
American Halter, Dog and Kennel Chains ..... 50&10%
Niagara Dog Leads and Kennel Chains ..... 60&5&5%
Wire Goods Co.:
Dog Chain 70%
Universal Dbl. Jointed Chain 50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain 60%
Pullman:
Bronze Chain, 60" ..... Steel Chain
Sash Chain Attachments, per set 3c
Aluminum Sash Ribbon, per ft. ..... $1.50@2.00
Sash Ribbon Attachments, per set 8c

Chalk—(From Jobbers.)

Carpenters' Blue ..... *gro.* 5@35c
Carpenters' Red ..... *gro.* 15@75c
Carpenters' White ..... *gro.* 10@15c

Checks, Door—

Bardlee's 45%
Pullman, per gro. $51 00
Russwin 33⅓%

Chests, Tool—

American Tool Chest Co.:
[illegible] 50
[illegible] 5
[illegible] 5
Comfort Chest, No. 2 5
Farmers Carpenters' etc. Chests, with Tools 25
Machinists and Pipe Fitters Chests, Empty 15
Tool Cabinets 15
Tool Benches & Cox's Machinists Tool Chests 5

Chisels—

Socket Framing and Firmer

Standard List ..... *90@—%*
[illegible]
C. D. Lemmings & Co.
Socket Firmer No. 10 ..... 5&5%
Socket Framing No. 15 ..... 5&5%
Stanley
L. & I. J. White Co. ..... 30&30&5

Tanged—

Tanged Firmers ..... *30&5&5%*
Buck Bros. 30
C. D. Lemmings & Co. Nos. 191, 181, 25%
L. & I. J. White Co. ..... 25&5%

Cold— *lb.*

Cold Chisels, good quality..15@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary ..... *9@10¢*

Chucks—

Almond Drill Chucks 35%
Almond Turret Six-Tool Chuck 40%
Beard Pat., each ..... 35&5%
Empire 35
Buckmasters 35
Jacobs' Drill Chucks 35%
Pratt's Positive Drive 25%
Shriver Patent Chucks:
Independent Lathe Chuck 35%
Universal, Reversible Jaws 35%
Combination, Reversible Jaws 35%
Drill Chucks, New Model 25
Standard, 45%; Skinner Pat., 25; Positive Drive 10%
Planet 20%
Face Plate Jaws 35%
Standard Tool Co.:
Improved Drill Chuck 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17 40%, No. 21 ..... 35%
Scroll Combination, Nos. 80 and 81 ..... 30%
Geared Scroll Nos. 23, 24 and 35 ..... 25%
Independent Iron, Nos. 18 and 318 ..... 35%
Independent Steel, No. 61 ..... 25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104 ..... 35%
Union Czar Drill 25%
Universal, Nos. 15, 16, 17, 13, 14, 15 ..... 40%
Universal, No. 42 ..... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50 ..... 35%
Steel Face Plate Jaws, Nos. 70 and 72 ..... 30%
Westcott Patent Chucks:
Lathe Chucks 50%
Little Giant Auxiliary Drill 50%
Little Giant Double Grip Drill 50%
Little Giant Drill, Improved 50%
Oneida Drill 50%
Scroll Combination Lathe 50%
Whitaker Mfg. Co.:
National Drill 25%

Clamps—

Adjustable, Hammers' ..... 20@20&5%
Carriage Makers', P., S. & W. Co. ..... 50&10%
Besly ..... 35&10%
Mors' Hiv Rack 45
Linsman's Swedish Neverturn 65%
Wood Workers' Hammers' ..... 40&10%
Saw Clamps, see Vises, Saw Filers.

Cleaners, Drain—

Iwan's Champion, Adjustable 50%
Iwan's Champion, Stationary 40%

Sidewalk—

Star Socket, All Steel, ₰ doz. $4.05 net
Star Shank, All Steel, per 5" ..... 5¢ net
W. & C. Shank All Steel, ₰ doz. 2½ in., $3.00; 3 in., $3.25

Cleavers, Butchers'—

Foster Bros 30%
Fayette R. Plumb 3
L. & I. J. White Co 33

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each $10.75
20th Century Horse, each $5.00
Lightning Belt Horse, each $15.00
Chicago Belt Horse, each $20.00
Stewart's Enclosed Gear Horse each ..... $6.75 ₰
Stewart's Patent Sheep Shearing Machine, each $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75

Clips, Axle—

Regular Stocks, list July 1, '05:
50&10&10%

Cloth and Netting, Wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c. ..... *70@—%*
Compression Bibbs, Stop Cock ..... *—%*

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son 40%
Leather, Walter B. Stevens & Son 40%

Compasses, Dividers, &c.

Ordinary Grades ..... *70&10&10&7.5%*
Wm. Schollhorn Co.:
Excelsior Divider 60%
Ledi Divider ..... 5&10%

Conductor Pipe,—

	Gal. Steel.	*Charcoal Iron.*
L. & I. J. White Co. Jobbers		
Eastern	*70&10%*	*60&10%*
Pittsburgh	*70&10%*	*60&10%*
Central	*70&10%*	*60&10%*
Northeastern	*70&10%*	*60&10%*
Western	*70&10%*	*60&10%*
Tennessee	*70&10%*	*60&10%*
Southern	*70&10%*	*60&10%*
Southwestern	*70&10%*	*60&10%*

Terms, 60 days, 2 cash 10 days. Less than carload shipments charged delivered.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:

Gal.	3	4	5
Galvanized Lined	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized Lined, side and bottom faucet					
Gal.	4	5	6	7	8
Enamel	$2.25	$2.45	$2.90	$3.40	$4.15
White Enameled					
Agate Lined					

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 22@25¢; lighter than 3 lbs. to pair ..... *24@27¢*

Cord— Sash—

Braided, Drab ..... *lb. 35¢*
Braided, White, Com., Nos. 8 to 14, 23c; No. 7, 24c; No. 6, 25c. In lots of 12 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India ..... *lb., 10@11¢*
Cotton Sash Cord, Twisted..15@20¢
Patent Russia ..... *21¢*
Cable Laid Russia ..... *lb..21¢*
India Hemp, Br'd'd ..... *lb..21¢*
India Hemp, Twisted..lb..13@14¢
Patent India, Twisted..lb..17¢
Pearl Braided ..... No. 6, 6½ lb., 27½c; No. 7, 26c; No. 8, 25¢
Eddystone, Braided, Nos. 8 to 12, 25¢; 7, 26½c; 6, 27½c.
Harmony Cable Laid Italian, Nos. 7 to 14 ..... ₰ lb 25 ¢
Pullman:
Wire Sash Cord 10%
Sash Cord Attachments, per doz. 10¢
Simpson, New:
Braided, ₰ lb., Drab Cotton, 55¢; Italian Hemp, 40¢; Jute, 35¢; Linen, 65¢; White Cotton 50¢; Spot Cord ..... 50¢ ₰
Massachusetts, White.... ₰ lb 40¢
Massachusetts, Drab.... ₰ lb 45¢
Phoenix, White, Nos. 8 to 12, 27¢;
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp ..... 57½¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906 ..... *90@—%*
Hendryx Standard Wire Picture Cord, old list, 85&10%
Turner & Stanton Co. Wire Picture Cord ..... 85&10%

Cradles—

Grain ..... *40&12½%*

Crayons—

White Round Crayons, Cases, 100 gro., $6 net; $7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber. ₰ gro.
White and Purple, Indelible....$7.50
Blue, Red and Yellow, Indelible $8.00
Terra Cotta, $6.50; Black..... $4.50
Giant Lumber, 5¾ in. x 15-16 in. round, all colors, $12.00; Indelible, $14.00 ; Black..... $18.00
Genuine Soapstone, Metal Workers', 5 in. x ¾ in. Round, $2.50; 5 in. x ⅞ in. Square, $2.75; 5 x ⅛ x 3/16, $2.50; 5 x 1¼ x 3/16 ..... $3.00

Crooks, Shepherds'—

Fort Madison, per doz. Heavy, $7.50
Light $5.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden 50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ₰ doz. $3.50
Star Brand, Rogers & Hammered and Anchor
Wm. Rogers & Son.

Cutters— Glass—

H. H. Murview Co. 40
Red Devil 60%
B. Mfg. Co. 40%
Wonder

Meat and Food—

American

Nos.	401	402	403	[illegible]
Each	$	$	$	$50	$60

Enterprise:

Nos.				
Each	$2	$3	$2	$	$

Nos. 202, $1.50
P. S. & W. Co.

No.			
Ideal	$17.00	$	$20.00
Hales			
Little Giant			

Nos. [illegible] $7.00 $14.00
Reading, Pat. No. 1, $24.00 No. 2 $27.00 ..... $15.00 10&10&10%
Enterprise Beef Shavers ..... 25@30%

Slaw and Kraut

Hall's [illegible]
Kraut [illegible]
Cole [illegible]
J. M. Ney Mfg. Co. [illegible] $2.00
[illegible] Cutter and Corn Grater ..... ₰ doz $4.00

Tobacco—

All Iron, Cheap ..... *$3, 2.15¢, 70*
Enterprise
No. [illegible]
$18

Diggers, Post Hole, &c —

Disston's:
Rapid, ₰ doz., $24.00 ..... 25%
Simplex ₰ doz. $3.00
Iwan's Improved Post Hole Auger
Vaughan Patent Post Hole Auger
Perfection Post Hole Diggers, ₰ doz $7.75
Split Handle Post Hole Digger
Hercules Pattern, ₰ doz. $10.00
Kohler's, ₰ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $8.00; Rival, $8.50; Pioneer $7.50
Never-Break Post Hole Diggers ₰ doz., $24.00 ..... 60%

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers 35%
Sterling Wheel Dresser Cutters..... 35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines ..... *$1.50@$1.75*
Bradley Millers Falls 20%
Breast, P., S. & W. 33⅓%
Goodell Automatic Drills..50&10@60&10%
Millers Falls Automatic Drills..33⅓&10%
Hubbard, Curtis & Curtis 25%
Ratchet, Parker's 40%
Ratchet, Weston's 40%
Ratchet, Weston's, Style H Improved 40%
Ratchet, No. 012 ..... 40%
Ratchet, Celebrated 40%
Ratchet, Whitney's, P., S. & W. 33⅓%
Whitney's Hand Drill No. 1, $15; Adjustable, No 10, $12.00 ..... 33⅓%

Twist Drills—

Bit Stock ..... *70@70&5%*
Taper and Straight Shank ..... *60&10&10%*

Drivers, Screw—

Screw Driver Bits, per doz..45@50¢
Balsey's Screw Holder and Driver, ₰ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9 ..... 50%
Buck Bros.' Screw Driver Bits 30%
Champion
Disston's 70%
Fray's Hol. H'dle Sets, No. 3, $12.50; Forged Brace Screw Drivers..40&10%
Gay's Double Action Ratchet
Goodell's Auto ..... 65@65&10%
Mayhew's Black Handle.
Mayhew's Monarch 40%
Millers Falls, Nos. 2, 3 and 21 ..... 25&10%
Millers Falls, Nos. 11, 12, 41, 42 ..... 15&10%
Smith & Hemenway Co. Nevertorn, 66⅔%; Elmira, 60% ..... Star, 30&10%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*Gal. Steel.*	*Charcoal Iron.*
Eastern	*75&10&5%*	*60&20%*
Pittsburgh	*80&10%*	*60&10%*
Central	*80&10%*	*60&10%*
Northeastern	*80&10%*	*60&10%*
Western	*80&10%*	*60&10%*
Tennessee	*80&10%*	*60&10%*
Southern	*80&10%*	*60&10%*
Southwestern	*80&10%*	*60&10%*

Terms, 60 days, 2 cash 10 days. Less than carload shipments charged delivered.
A. [illegible]
See also Conductor Pipe.

Elbows and Shoes—

Factory shipments, all territories:

No.		
No.		
No.		
Corru		
No.		

Elbows, Stove Pipe—

No.		
No.		
No.		
No.		
No.		

Emery, Turkish—

	½	½ to 2	2½ to 5
Kegs	*10½¢*	*9½¢*	*8½¢*
½ Kegs	*10½¢*	*9¾¢*	*8¾¢*
¼ Kegs	*10½¢*	*9¾¢*	*8¾¢*
10 lb. cans	*11½¢*	*10½¢*	*9¾¢*
5 lb. cans	*12½¢*	*11½¢*	*10½¢*
1 lb. cans, in case	*13½¢*	*7¢*	*6¢*
1 lb. cans, less than 10	*14½¢*	*10¢*	*9¢*
Less quantity	*15¢*	*12½¢*	*11½¢*

NOTE.—In lots 1 to 3 tons a discount of 10c is given.

Extractors, Lemon Juice

—See *Squeezers, Lemon.*

Fasteners, Blind—

Zinc Thimbles ..... 50&10%
Wire Thimbles ..... 40&10%
Clark's Patent 40%

Cord and Weight—

Ives and Titan 33⅓%

Corrugated—

Acme Corrugated Fasteners 70%

Faucets—

Cork Lined ..... 50&10%&60%
Metallic Key, Leather Lined, compound 60%
Red Cedar ..... 40&5%@40&10&5%
Petroleum ..... 70&10@75%
P. & L. & W. Co.:
Metal Key ..... 60&10%
Star 60%
West Lock ..... 30&10%
John Sommer's Peerless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Mfd. Key ..... 30&10%
John Sommer's Duplex Metal Key 60%
John Sommer's Diamond Lock 40%
John Sommer's I. X. L. Cork Lined 50%
John Sommer's Bemable Cork Lined ..... 50&10%
John Sommer's Chicago Cork Lined 60%
John Sommer's O. K. Cork Lined 50%
John Sommer's No. Brand, Cedar 50%
John Sommer's Perfection, Cedar 40%
Self Measuring:
Enterprise, ₱ doz $36.00 ..... 40&10%
Lake's ₱ doz $36.00 ..... 40&10%
National Measuring, ₱ doz. $36.40&10%

Felloe Plates—

See Plates, Felloe.

Files— Domestic—

List Nov. 1, 1899.

Best Brands ..... 70&10@75&10%
Standard Brands ..... 75&10&5%
Lower Grade ..... 75&10&10@80&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 ..... 33 1-3@40%

Fixtures, Fire Door—

Allith Underwriters Approved 50%
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 ..... $3.75
Fusible Links, No. 96 ..... 50%
Expansion Bolts, No. 107 ..... 60&10%

Grindstone—

Net Prices:

Inch	15	17	19	21
Per doz.	$3.60	3.85	4.15	4.65

P., S. & W. Co. 25
Reading Hardware Co. 60%

Fodder Squeezers—

See Compressors.

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1906, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato ..... 60&10%
Victor, Hay ..... 60&15&2½%
Victor, Manure 66⅔%
Victor, Stallet 65%
Champion, Hay 66⅔%
Champion, Header 65%
Champion, Manure ..... 60&15&2½%
Columbia, Hay ..... 65&10%
Columbia, Manure 70%
Columbia, Spading ..... 70&12½%
Manwaye Wood Barley 40%
W. & C. Potato Digger ..... 60&10%
Acme Hay ..... 65&20%
Acme Manure, 4 tine ..... 60&10&5%
Dakota Barley ..... 60&20%
Jackson Stee. Barley ..... 65&20%
Kansas Header 65%
W. & C. Flexible Wood Barley 40%
Plated See Spoons

Frames— Wood Saw—

White, Sq't Bar, per doz .75@80¢
Red, Sq't Bar, per doz .$1.00@1.25
Red, Dbl. Brace, per doz $1.40@1.50

Freezers, Ice Cream—

Qt.	1	2	3	4	6
Each	$1.25	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—

See Pans, Fry.

Fuse—

Per 1000 Feet.

Hemp	$2.75
Cotton	3.20
Waterproof Sgl. Taped	3.85
Waterproof Dbl. Taped	4.40
Waterproof Tpl. Taped	5.15

Gates, Molasses and Oil—

Stebbins' Pattern ..... 80@80&5%

Gauges—

Marking, Mortise, &c. ..50@50&10%
Cutting Supply Co.:
Marking Mortise &c. ..... 50&50&10%
Disston's Marking Mortise, &c. 67½%
Wire, Brown & Sharpe's 33⅓%
Wire, Morse's 25%
Wire, P. S. & W. Co. 33⅓%

Gimlets— Single Cut—

Numbered assortments, per gro.

Nail, Metal, No. 1. $2.00; 2. $2.20
Spike, Metal, No. 1. $3.00; 2. $3.30
Nail, Wood Handled, No. 1. $2.50; 2. $2.80
Spike, Wood Handled, No. 1. $3.00; 2. $3.60

Glass, American Window

See Trade Report.

Glasses, Level—

Chas. Stanley & Co. ..... 60&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush ..... 25&10@50%
Ellwell's 10%

Grease, Axle—

Common Grade ..... *gro. $6.00@6.50*
Dixon's Everlasting, 10-lb pails, wt. 86¢; in boxes, ₱ doz., 1 lb. $1.20, 2 lb. $2.00
Helmet Hard Oil 35%

Griddles, Soapstone—

Pike Mfg. Co ..... 33⅓@33⅓&10%

Grinders—

Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 1, $1.75, 1A, $2.50, 10, $5.00 ..... 30%
Alundum Sickle Grinders, each, Nos. 20 $5.00, 20A, $6.00, 20A Combined, $6.50 ..... 30%
Alundum Disc Grinders, each, $2.50 ..... 30%

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., $2.00 ..... 33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted 40%

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... 60&5@60&1%
Bridgeport Chain Co.:
Bridgeport Cord and Halters ..35%2%10
Brown Cord and Halters ..45@40&5
Brown Cow Ties ..... 50&5%&10&5
Brown Tie Outs ..... 70&10@75&5
Covert Mfg. Co.:
Web ..... 30&2%
Jute Rope 35%
Sisal Rope 30%
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am. Cord and Halters ..... 40@40&5%
Am. Cow Ties ..... 45@50%
Niagara Coil and Halters ..45@50&5%
Niagara Cow Ties ..... 45&5@50&10&5%

Hammers—
Handled Hammers—

Heller's Machinists' ..... 55&10@55&10&5%
Heller's Farriers' ..... 40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel 50%
Farriers' ..... 40&10&5%
Riveting 30%
Machinists', revised list ..... 66⅔&5%
Blacksmiths' ..... 50&5%
Fayette R. Plumb:
A. E. Nail ..... 40&2½@40&12½%
Eng and B. S. Hand ..... 40&5@60%
Machinists' Hammers ..... 60@60&10
Rivet and Tinners' 40&7½@40&12½&5%

Heavy Hammers and Sledges—

Under 3 lb., per lb., 30¢ ..... 80¢@1.00
3 to 7 lb., per lb., per ..... 80¢@1.00
Over 5 lb., per lb., 30¢ .....
Over 5 lb., per lb., 30¢ ..... 80¢@1.00

Handles—

Agricultural Tool Handles

Ax, Pick, &c ..... 80¢@10&60¢@10&5
Hoe, Rake, &c 40%
Fork, Shovel, Spade, &c.:
Long Handles 40%
D Handles 40%

Cross-Cut Saw Handles

Acme 50
Champion 50
Disston's 50%

Mechanics' Tool Handles—

Auger, assorted ..... gro. $3.60@$3.50
Brad Awl ..... gro. $1.05@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@$3.75; Hickory ..... $2.15@2.40
Socket Firmer, Apple, $1.75@1.95; Hickory ..... $1.60@$1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted ..... gro. $1.30@$1.40
Hammer, Hatchet, &c. ..... 60¢@60¢@10&5%
Hand Saw, Varnished, doz., 80¢@85¢; Not Varnished ..$5@75¢
Plane Handles:
Jack, doz. 80¢; Jack, Bolted 75¢
Fore, doz. 45¢; Fore, Bolted 90¢
Clapin-Stephens Co.:
Carving Tool ..... 20@20&10%
Chisel ..... 60@60&10
File and Awl ..... 60&10%
Saw and Hammer ..... 70@70&10%
Screw Driver ..... 50@50&10
Millers Falls Adj. and Rat Tail Auger Handles ..... 15&10%
Nicholson Simplicity File Handle ..... 50&10%
J. L. Disston:
Industrial Tribble File and Tool ₱ gro., net $8.00
Tribble, No. 1 ₱ gro. $9.00
No. 2 $9.00, No. 4 $9.50, No. 5, $10.00 ..... gro. lots 10%
W. A. Zelnicker Supply Co.:
Hammer, ₱ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 in., $2.50; 20 in., $2.70; 22 in. $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $4.00 ..... 50%
Sledge, ₱ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval 36 in., $4.90, octagon, 36 in. $4.90
Axe ₱ doz., 28 to 34 in., $5.60; 36 in., $8.00
Adze ₱ doz., 36 in., $5.80, 36 in., $7.80
Pick, ₱ doz. R. R. 36 in., $8.00; coal, 34 in., $5.80.
Hammer, ₱ doz., 12 to 14 in. $3.00

Hangers—

NOTE—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable Nos. 1 and 2, Allith, No. 3, Allith Adjustable No. 6; Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chesholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60&2½%
Roller Bearing ..... 70&2½%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00 ..... 60&10%
Roller Bearing, No. 11, $15.00, 6 ..... 60&10%
Roller Bearing, Ex. Ho No. 22, $18.00 ..... 60&10%
Ball Dog, $24.00 ..... 70%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard ..... 60&10%
Hinged ..... net $6.08
Covered ..... 60&5%
Special ..... 70&5%
Lawrence Bros.:
Advance ..... 55&10%
Cleveland 55%
Clipper, No. 15 ..... 60%
Crown ..... 55&10%
Cyclone, No. 40 ..... net $6.50
Tandem, No. 50 ..... net $7.50
New York ..... 55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2 ..70%
Anti Friction 60%
Hinged Hangers, King Charm ..60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3. $2.25
Roller B'rg Steel Track No. 12 $2.20
Roller B'rg Steel Track No. 13 $2.50
Roller B'rg, Nos. 39, 41, 43, 70&7½%
Hero Adj Track No 13 50&10%
Adjustable Track Tandem Trolley Track No. 16 ..... 50&10%
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22 ..50&5%
Trolley B. B. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 130 ..... $2.50
Safety Underwriters F. D. No. 101 ..... 50%
Tandem No 41 2½ and 3 60&10%
Place Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 122 ..... 50&10%
Ives' Wood Track No. 1 ..... $2.25
Ives B. B. No. 23 ..... 50&10%
Trolley B. B. No. 24, $1.30; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2 70&7½%
Anti friction, No. 42, No. 44, sizes 2½ and 3 ..... 60%
Hinged Tandem No. 48 ..65&5%
Folding Door B. B. Swivel No. 125 ..... 40%
Taylor & Boggis Foundry Co.'s Kidder & Rouse Hanging 5&15&10&5%
Myers' Stayon Hangers 60%

Hangers— Garment—

Pullman Trouser, ₱ gro. 1 pair Flat Aluminox, $9.00; 1 pair Round Nickeled, $9.00, 1 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding per gro., $21.00, Coat Hangers, Folding, per gro., $8.00 Garment Hanger Rods, Round Nickeled, per doz. $10.50; Garment Hanger Loops, Round Nickeled per gro $10.50
Victor Folding ..... ₱ gro. $9.60

Gate—

Myers' Patent Gate Hangers, ₱ doz net $4.00

Joist and Timber—

Lane Bros. Co. 30%

Hasps—

Griffin's Security Hasp ..... 50&10%
McKinnon's Perfect Hasp ₱ doz 60

Hatchets—

Regular list, first qual. 70&21 Q—
Second quality ..... 50&5% —

Heaters, Carriage—

Clark No. 3, $1.75, No. 3B $2.00, No. 3 $2.25, No. 3D $2.75, No. 2D, $3.00, No. 2E $3.25, No. 1 $3.50 ..... 25%
Clark Coal, ₱ doz $0.75 ..... 20%

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind: (Victor: Nationals: 1868 O. P.; Niagara: Clark's Q. P.; Clark's Tip; Buffalo.)

No.	1	3	5
Doz. pair	$0.75	1.35	2.70

Mortise Shutter: (L. & P., O. S., Acme, &c.)

No.	1	1½	2	2½
Doz. pair	$0.70	.65	.60	.55

Mortise Reversible Shutter (Buffalo, &c.):

No.	1	1½	2
Doz. pair	$0.70	.65	.60

North's Automatic Rev. 1 pair screws, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Charles Parker Co. ..... 70&5%
Parker Wire Goods Co.:
Hyde & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00 ..... 20%
Reading Hardware Co. 60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ₱ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter ..... 75&5%
Acme, Lull & Porter 75%
Queen City Reversible 75%
Shepard's Noiseless Nos. 60 55 ..... 75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&5%
Tip Pat'n, No. 1 ..... 75&10%
No. 3 ..... 75&10%
Buffalo Gravity Locking, Nos. 3 & 5 ..... 75&10&5
Shepard's Double Locking 75%
Champion Gravity Locking ..... 75&10%
Pioneer 65%
Empire 65
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with L't'chs	$2.00	2.70	3.00
Hinges only	1.40	2.05	2.80
Latches only	.70	.70	.35

New England:
With Latch ..... doz. ....@$2.00
Without Latch ..... doz. ....@$1.60
Reversible Self-Closing:
With Latch ..... doz. ....@$1.75
Without Latch ..... doz. ....@$1.35
Western:
With Latch ..... doz. $1.75
Without Latch ..... doz. $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 ..... 70%

Pivot Hinges—

Hommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—

Holdback, Cast Iron ..$3.75@$7.00
Non-Holdback, Cast Iron $3.50@$6.75

J. Bardsley:
Bardsley's Non-Checking Mortise Door Hinges 40%
Bardsley's Patent Checking ..33⅓%
Bommer Bros.
Bommer Ball Bearing Floor ..40%
Bommer Spring Hinges 40%
No. 999 Wrot, Steel Hold Back, ₱ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor ..50%
Garden City Engine House 25%
Keene's Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 25%
American 30%
Columbia, ₱ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. ₱ gr. $12.00
Columbian Hinges ..... 60&10%
Gem, new list 30%
Clover Leaf ..... ₱ gr. $12.00
Oxford, new list 30%
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co. Matchless 30%
Michael Strauss Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door ..... ₱ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door 25%
No. 777, Sheet Steel Holdb'k, ₱ gr. gr. $9.00
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓%

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges ..50&10%
Heavy Strap Hinges ..60&5%
Light T Hinges 50%
Heavy T Hinges 40%
Extra Heavy T Hinges .50&10%
Hinge Hasps 33⅓%
Cor. Heavy Strap ..60&5%
Cor. Ex. Heavy T ..50&10%

Screw Hook and strap. { *6 to 12 in ..lb. 3½¢* / *15 to 30 in ..lb. 3½¢* / *32 to 36 in ..lb. 3¢*

Screw Hook and Eye:
3½ to 4 inch ..... lb. 6½¢
5 inch ..... lb. 6¼¢
6 inch ..... lb. 6¼¢

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—

Mf'gr's list, price per gross.

Inch	15	16	17	18
Galv. Open	$3.75	$3.90	$4.25	$4.60
Jap. Open	3.00	3.25	3.50	3.75
Galv. Funnel	3.10	3.25	3.50	3.75
Jap. Funnel	2.85	3.00	3.50	3.75

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick, No. 162 ..... each $1.05
Steel Mortar, No. 158 ..... each $1.35

Hoes— Eye—

Scroll and Oval Pattern ..... 60&10%@60&10&10%
Grub, list Feb. 28, 1899 ..... 70&10@70&10&10%

Extra 10% often given on most of these lines.

Extra 10% often given.

D. & H. Scovil ..... 37½ &
Am. Fork & Hoe Co. (Scovil Pattern) ..... 60 &

Handled—

NOTE — Manufacturers are selling from the list of September 1, 1903, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding, No. 1 & 2 ..... 50 & 5–50
Star Double Hitch ..... 50 & 5–50
Ft. Madison Cotton Hoe ..... 70 & 10 & 5
Ft. Madison Crescent Cultivator Hoe ..... 70 & 10 &
₰ doz ..... 4 & 5
Ft. Madison Diamond Hoe ₰ doz. ..... 4 & 5
Ft. Madison Sprouting Hoe ₰ doz. ..... 4 & 5
Ft. Madison Dixie Tobacco Hoe ..... 75 & 10 & 5
Kretsinger's Cut Easy ..... 70 & 10 &
Warren Hoe ..... 45 & 10 &
W. & C. Hollow ..... 45 & 2
B. B. 6 in., Cultivator Hoe $3.50
B. B., 9 in. $3.50
Acme Weeding ₰ doz. net, $4.35
W. & C. L'tning Shuffle Hoe, ₰ doz. $5.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Augurar, ₰ doz. $24.10 ..... 45 & 10 &

Door—

Bardsley's, Iron, 40 ..... Brass and Bronze ..... 25 &
Lingate ..... 50 &
Pullman ..... 25 &
Richards Mfg. Co.: No. 117, Electric ready, 40c.; Nos. 118, 119, Sure Grip 50
Superior ..... 33⅓ &

File and Tool—

Nicholson File Holders and File Handles ..... 33⅓ & 40 &

Fruit Jar—

Triumph Fruit Jar Holder, ₰ gross, $10.80; ₰ doz. $1.25

Trace and Rein—

Fernald Double Trace Holder, ₰ doz. pairs $1.25
Dean Rein Holder, ₰ doz. pairs, $1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50 .. German ..... 50 &

Hooks—Cast Iron—

Bird Cage, Reading ..... 40 &
Clothes Line, Reading List ..... 40 &
Coat and Hat, Reading ..... 45 & 20 &
Coat and Hat, Wrightsville ..... 60 & 5
Harness, Reading List ..... 40 &

Wire—

Belt ..... 80 &
Wire Cut & H. Hooks ..... 75 & —
Bradley Metal Clasp Wire, Coat and Hat, Cotton Clothes Lines ..... 70 & 5
Columbian Hide Co., Gem ..... 70 & 5
Parker Wire Goods Co., King ..... 70 & 10 &
Wire Goods Co.:
Acme, 60 & 10 & 5; Chief, 70 &; Crown, 75 &; Ace, 65 &; V Brace, 75 &; Czar Harness, 50 & 10 &

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $1.50.
Cotton ..... doz. $1.05 @ $1.25
Wrought Staples, Hooks, &c—
See Wrought Goods

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz. $3.00
Grass, common grades, all sizes, per doz. $1.50
Whiffletree ..... 15 & 5 & 10 &
Hooks and Eyes:
Brass ..... 60 & 10 & 5 &
Malleable Iron ..... 70 & 10 & 10 &
Corn Husking, Gate and Scuttle, Hooks ..... 40 &
Ft. Madison Cut-Easy Corn Hooks
Turner & Stanton Co., Cup and Shoulder ..... 80 & 10 &
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾ inch:
Complation ..... ft. 5½ & 6
2 ply, Guaranteed ..... ft. 8½ & 9
4 ply, Guaranteed ..... ft. 10½ & 11
Cotton Garden, ¾ in., coupled:
Low Grade ..... ft. 8½ & 9
Fair Quality ..... ft. 10½ & 11

Irons— Sad—

From ¼ to 10 ..... lb. 3½ & 3¾ &
B. B. Sad Irons ..... lb. 3¼ & 3¾ &
Mrs. Potts', nickel, Nos. 50 55 60 65
Japan Tops 85 90 93 95
Tinned Tops 88 93 98 95
New England Pressing lb ¾ & 4 &

Bar and Corner—

Richards Mfg. Co., Bar, 65 & 10 &
Corner ..... 60 &

Pinking—

Pinking Irons ..... doz. 60 &

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw ..... 30 & 2½; **Steel**, 45 &
Lockport ..... 50 &
Lane's Steel ..... 30 & 5 &
Richards Ratchet, No. 130 ..... 30 & 5 &
Smith & Hemenway Co's ..... 25 &

Ladder

Richards Mfg. Co., Ladder Jacks 5 &

Kettles—

Brass, Spun, Plain ..... 20 @ 25 &
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Exeter Bros. Butcher Knives ..... 50 &
Wilkinson Shear & Cutlery Co. ..... 60 &

Corn—

Columbian Cutlery Co., Without Braided Handles and Hooks ..... 60 &
Worcester Acme, ₰ doz. $2.65; Dent, $2.75, Adj. Serrated, $2.20; Serrated, $2.10; Tankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List ..... 80 & — & —
C. E. Jennings & Co., Nos. 10 to 16, Common ..... 12½ &
Jennings & Griffin, Nos. 11, 12, Common ..... 12½ &
Swan's ..... 66⅔ & 70 &
Watrous ..... 66⅔ &
L. & L. & White ..... 20 & 5 & 25 &

Hay and Straw—

Serrated Edge, per doz. $3.00 @ 3.75
Iwan's Sickle Edge ..... ₰ doz. $9.50
Iwan's Serrated ..... ₰ doz. $10.00

Miscellaneous—

Farriers' ..... doz. $3.00 @ 3.25
Westenholm's ..... ₰ doz. $3.00 @ 3.25

Knobs—

Base, 2½ inch, Birch, or Maple, Rubber Tip ..... gro $1.25 @ 1.40
Carriage, Cup., all sizes ..... gro. 40 @ 45 &
Door, Mineral ..... doz. 65 @ 70 &
Door, Por Jap'd ..... doz. 70 @ 75 &
Door, Por Nickel, doz. $2.05 @ 2.15
Bardsley's Wood Door, Shutters, &c. 15 &

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable ..... 50 &
Latue & Stone ..... 25 &
Myers' Noiseless Store Ladders ..... 50 &
Richards Mfg. Co.:
Improved Noiseless, No. 112 ..... 50 &
Climax Shell, No. 113 ..... 50 &
Trolley, No. 109 ..... 50 &

Ladles, Melting—

L. & G. Mfg. Co. (low list) 20
P. S. & W. ..... 40 & 10 &
Reading ..... 60 &

Lanterns— Tubular—

Regular, No. 1 ..... doz. $4.35 @ 4.50
Side Light, No. 0 ..... doz. $5.00 @ 5.35
Hinge Globe, No. 0 doz. $4.60 @ 4.75
Other Styles ..... 40 @ 60 &

Bull's Eye Police—

5 inch ..... $1.25 @ 1.50

Latches— Thumb—

Roggin's Latches, with screw.. doz. 35 @ 40 &

Door—

Allith Mfg. Co., Reliable and Alligator, 50 &; Reliable Coil Storage, 50 &
Cronk & Carter Mfg. Co., No. 131, ₰ doz. $2.80
Richards' Bull Dog, Heavy, No. 125 ..... 50 & 5 &
Richards' Trump, No. 127 ..... $1.50

Leaders, Cattle—

Swan ..... doz. 50 &; large, 60 &
Covert Mfg. Co.:
Cotton, 4 ... Hemp, 45 &; Jute, 35 &; Sash, ...

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E. ..... 10 &

Lines—

Wire Clothes, Nos. 18 19 20
100 feet $2.50 2.25 2.00
75 feet $2.10 1.80 1.65
Samson Clothes Lines:
Solid Braided Chain, Nos. 0 to 3 40 &
Solid Braided Masons' ..... 30 &
Silver Lake Braided, Chalk ..... 0.
$6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50. ..... ₰ gr. 20 &
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 5, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50 ..... 30 &
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 ..... 20 & 5 &
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25 ..... 20 &
Turner & Stanton Co.:
Solid Braid Chalk, Masons' and Awning Lines ..... 20 &
Cloth Lines, White Cotton ..... 20 &
Shade Cord, Cotton or Linen ..... 20 &

Locks— Cabinet—

Cabinet Locks ..... 33⅓ &

Door Locks, Latches, &c —

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co. .....
R. & E. Mfg. Co. .....

Padlocks—

R. & E. Mfg. Co., Wrought Steel and Brass ..... 25 &

Sash, &c.

Iron Pattern:
Bronze and Brass 75 & Crescent 62½ & Weather Stripping 10 & 20 & Reading Pat. Ventilating Sash Lock 33⅓ &
Pullman Patent Ventilating Lock 35 &
Reading Sash Locks ..... 40 &

Machines—Boring—

Com. Cp'rt, without Augers, $2.00 @ 2.25
Com. Ang'r, without Augers, $2.25 @ 2.50
Swan's Improved ..... 40 & 10 &
Jennings', Nos. 1 and 4 ..... 25 & 5 & 2 &
Miniature ..... 5 & 10 &
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Invincible Hand Power ..... ₰ doz. $18.00

Fence—

Williams' Fence Machines ..... each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist. 30 &
Morse's Hand Hoist, with Locks & Brake ..... 25 &
Moore's Cyclon, High Speed Chain Hoist ..... 25 &

Ice Cutting—

Chandler's ..... 12½ &

Washing

Boss Washing Machine Co.: Per doz
Boss No. 1 ..... $55.00
Boss Rotary $57.00
Champion Rotary Banner No. 1 ..... $57.00
Standard Champion No. 1 ..... $50.00
Standard Perfection $27.00
Cincinnati Square Western $33.00
Uneeda American, Round $33.60

Mallets—

Hickory ..... 45 & 5 @ 50 &
Lignumvitæ ..... 45 & 5 @ 50 &
Turners' Hickory and Apple-wood ..... doz. 45 & 5 @ 50 &

Mangers, Stable—

Swett Iron Works ..... 50 &

Mats, Door—

Acme Flexible Steel 50
Elastic Steel (W. G. Co.), new list. 30 &

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co. ..... 20 @ 25 &
National Specialty ..... 50 &
Parker's Columbian and Victoria ..... 35 &
Landis Bros. and Noll ..... 55 & 10 &
Swift, Lane Bros. Co. ..... 30 &

Motors, Water—

Divine's Red Devil 30
Lippincott's ..... 60 &

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; 12-in., $2.10, etc.
Cheap, 10-in., $2.25; 12-in., $2.45, etc.
Better Grade, 10-in., $3.00; 12-in., $3.25, etc.

	12	14	16	18-in
High Grade	$4.00	4.75	5.00	5.25
Continental				
Great American				
Great American Ball Bearing, new list				70
Quaker City				50
Pennsylvania				60 &
Pennsylvania Ball Bearing				50 & 10 &
Pennsylvania Golf				50 &
Pennsylvania Pony				30 & 5 &
Granite State:				
Style A, Low Wheel				70 &
Style B, Low Wheel				70 &
Style C, High Wheel, spcl. list,				70 &
Style D, High Wheel, spcl. list,				70 &
Detachable Pony				40 & 5 &
Styles M., S., C., E., T.				70 & 10 & 5 &
Style A, all Steel				60 & 10 & 5 &
Style E, 25-in. Sweep				60 &
Drexel and Gold Coin, special list				40 &
Horse				10 & 5 &
Pony				10 & 5 &
6-in. Horse				10 & 5 &
Eagle Horse				30 & 5 &
I. X. L. Horse				50 &

Nails—

Wire Nails and Brads, Miscellaneous ..... 85 & 5 & 10 & 5 &
Cut and Wire, See *Trade Report.*
Hungarian, Finishing, Upholsters' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	22	21	20	19	18	40 &
Coleman	13	12	12	11	11	
New Haven	23	21	20	14	18	40 &
Lancaster	19	18	17	16	15	
Western						25 &

Jobbers' Special Brands ..... per M. 0.75 @ 1.00

Picture—

	1½	2	2½	3
Brass Head	55	50	45	40
Por. Head	1.10	1.00	.90	.80

Nippers—

See *Pliers and Nippers.*

Nuts—

Square Blank	5.80 &
Hexagon Blank	6.30 &
Square Tapped	7.50 &
Hexagon, Tapped	5.90 &

Square Blank	5.80 &
Hexagon Blank	6.30 &
Square Tapped	7.50 &
Hexagon, Tapped	5.90 &

Oakum—

Best	lb. 6½ &
1 & Navy	lb. 6 &
No. 2	lb. 5 &
Plumbers' Spun Yarn	3¼ & 3½ &

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated ..... 75 &
Chase or Paragon ..... 70 & 10 &
Brass and Copper ..... 70 & 10 &
Zinc ..... 70 & 5 &
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20 &; Old Pattern, Nos. 1, 2, 3, 50 &.
American Lace & Stamping Co.:
Spring Bottom Cans ..... 70 & 10 & 5 &
Railroad Oilers, Ac. ..... 60 & 10 & 5 &
Maple City Mfg. Co.:
Spring Bottom Cans ..... 70 & 10 &
Railroad Oilers, &c. ..... 60 & 10 &

Openers— Can— *Per doz.*

Sprague, Iron Handle ..... 30 & 35 &
Sprague, Wood Handle ..... 35 & 10 &
Sargent's Screwdriver ..... $1.75 & $3.00
Yankee Can and Bottle Opener ₰ doz., net, $0.75; Little Gem, ₰ doz., net $0.65

Egg—

Hartigan Nickel Plate, ₰ doz., $2.00. Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope ..... 20 @ 25 &

Rubber—

(Four quality goods.)
Sheet, C. L ..... 11 & 12 &
Sheet, C. O. S ..... 11 & 12 &
Sheet, C. O. S ..... 12 & 13 &
Sheet, Pure Gum ..... 40 & 45 &
Sheet, Red ..... 40 & 50 &
Jenkins' '96, ₰ lb. 80 & ..... 25 &

Miscellaneous

American Packing ..... lb. 70 & 10 &
Cotton Packing ..... lb. 15 & 25 &
Italian Packing ..... lb. 9 & 12 & 15 &
Jute ..... lb. 4 & 4½ & 5 &
Russia Packing ..... lb. 80 & 11 &

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List ..... 65 & 7½ @ 70 &
Edwards, Royal Blue ..... 65 & 7½ &

Fry—

Common Lipped:
Nos. 1 2 3 4 5
Per doz. $0.75 0.80 0.90 1.10 1.30

Refrigerator, Calva.—

Inch 12 14 16 18
Per doz. $1.75 2.25 2.80 3.15

Paper—Building Paper

Asbestos: lb.
Roll Board or Building Felt, 6 to 20 lb., per 100 sq. ft. 45 &
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft. ..... 6 &
Mill Board, Sheet, 40 to 40 in., 1-32 to ¼ in. ..... 3 & 5 &
Rosin Sized Sheathing: Per roll
500 sq. ft. Light weight, 25 lbs. to roll ..... 45 & 5 & 50 &
Medium weight, 30 lbs. to roll ..... 55 & 7½ & 60 &
Heavy weight, 40 lbs. to roll ..... 70 & 7½ & 80 &
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65 &; 2 ply, 85 &; 3 ply, $1.10; 4 ply, $1.25.
Deadening Felt, 9, 6 and 4 lbs. 80 sq. ft. to lb. ..... $5 & 5 & 50 &
Red Rope Roofing, 250 sq. ft. per roll $1.75

Tarred Paper—

1 ply (roll 400 sq. ft.), ton .....
2 ply, roll 108 sq. ft. ..... 65 &
3 ply, roll [illegible] .....
Slater's Felt (roll 500 sq. ft.) .....

Sand and Emery—

Flint Paper ..... per ream
Garnet Paper ..... per ream
Emery Paper and Cl'th ..... 50 & 10 & 60 &

Parers— Apple—

Goodell Co.:
Family Bay State ..... ₰ doz. $15.00

Livingston Nail Co.:

Reading Hardware Co.:

Reading $4.00

Potato—

Saratoga ..... ₰ doz. $7.00
White Mountain ..... ₰ doz. $9.00

Picks and Mattocks—

(List Jan., 1908.)
List ..... 70 & 10 & 10 & 10 & 10 &
Cronk's Handled Garden Mattock ₰ doz., No. 2, $2.60; No. 3, $3.40.

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass ..... 50@50&10%
Iron, list Nov. 11, '05.. 60@60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in ..... 60&10@—%
Extra Heavy, 2-6 in.. 70&10@—%
Fittings, Standard and Heavy, 75&10@—%

Pipe, Merchant—

	Consumers, Carloads.	
Steel.		*Iron.*
Blk.	Galv.	Blk. Galv.
%	%	% %
⅛ & ¼ in.....67	58	62 52
⅜ in.....66	52	64 56
½ in.....68	56	66 54
¾ to 6 in...72	62	70 60
7 to 12 in....69	54	67 52

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 8 to 24 in. f.o.b. factory
First class ..... 77@7-%
Second class ..... 80@1%

Pipe, Stove—

	Per 100 joints.	
Edwards' Nested	C. L.	L. C. L.
6 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	7.75	8.75
7 in., Standard Blue	7.75	8.75
5 in., Royal Blue	7.00	8.00
6 in., Royal Blue	7.50	8.50
7 in., Royal Blue	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color	$6.15	$7.15
6 in., Uniform Color	6.65	7.65
7 in., Uniform Color	7.65	8.65

Planes and Plane Irons—
Wood Planes—
Bench, first qual ..... 30@30&10%
Bench, second qual ..... 40@40&10%
Molding ..... 25@25&10%
Cleaveland Co.'s:
Bench, First Quality 30%
Bench, Second Quality 40%
Molding and Miscellaneous 25%
Toy and German 50%
Union 60%

Iron Planes
Chaplin's Iron Planes ..... 50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06 ..... 25%
Buck Bros. 30%
Chapin-Stephens Co. 25%
Union 50%
L. & I. J. White ..... 20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse ..... ₩ doz. $8.00

Plates—
Felloe ..... lb. 4@4¼¢

Pliers and Nippers -
Button Pliers ..... 75&5@75&10&5%
Gas Burner, per doz. 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe.. 7 8 10 12 in.
$2.00 $2.25 $2.75 $3.50
Acme Nippers ..... 50&5%
Cronk & Carrier Mfg. Co.:
American Button 80%
Improved Button ..... 75&10%
Cronk's 60%
No. 80 Linemen's 50%
Stub's Pattern 45%
Combination and others 33⅓%
Keller's Farriers' Nippers, Pincers and Tools ..... 40&5@40&10&5%
C. S. & W. Tinners Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 35%; Elm City, 35%; Paragon, 60%; Lodi 55%.
Heavy Side, End and Diagonal Cutting Pliers 50%
Erica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels ..... 30&10@35&10%
Cornish Imp. Brass Cor ..... 40&10&10%
Pocket Levels ..... 20@20&10%
Extension Sights ..... 20@20&10%
Adjustable Levels ..... 40&10&10%
Best Iron Plumbs and Levels ..... 40&10%
Best Brass Pocket Levels ..... 60&10%
Keystone Dupler 38%
Masons' Extension 33⅓%

Points, Glaziers'—
¼ and 1 lb. papers ..... lb. 9 ¢
½ papers ..... lb. 9½¢
¾ lb. papers ..... lb. 10 ¢

Police Goods—
Manufacturers' Lists.. 25@25&5%
Peters 25%

Polish—Metal, Etc—
Stoline Liquid, No. 1 (½ pt.) ₩ doz., $3.00; No. 2 (1 qu.), $6.00. 40%
Stoline Paste 40%

George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₩ doz. 50¢; ₩ gro. $4.50, 1½ lb. boxes, ₩ doz. $1.25, 1 lb boxes, ₩ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₩ doz., $1.25.
Bittseegers' Friend Metal Polish, ₩ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ₩ lb 10¢
Black Eagle, Liquid, ½ pt. cans, ₩ doz 75¢
Black Lack Paste, ¾ lb cans, ₩ gr. $3.50
Black Kid Paste, 5 lb cans, each $0.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon's, ₩ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ₩ lb. 8¢
Firende ..... ₩ gr. $4.50
Gem, ₩ gr. $1.50 ..... ₩ gr. $4.50
Japanese ..... ₩ gr. $3.50
Jet Black ..... ₩ gr. $3.50
Peerless Iron Enamel, 10 oz. cans, ₩ doz. $1.50

Poppers, Corn—
Light Square..doz.$0.80; gro.$8.75
Light Round...doz.$0.90; gro.$10.00
Regular Square doz.$1.00; gro.$11.00
Large Square...doz.$1.25; gro.$13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft. 46¢; 7 ft., 48¢.
Steel Hitching Posts ..... each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled ..... 35&10%
Tinned ..... 30&10%

Powder—
In Canisters:
Duck, 1 lb ..... each 45¢
Fine Sporting, 1 lb ..... each 75¢
Rifle, ½ lb ..... each 15¢
Rifle, 1 lb ..... each 25¢
In Kegs:
12½ lb. kegs $3.50
25 lb. kegs $4.50
King's Semi Smokeless:
Keg 12½ lb. bulk $6.50
Half Keg (12½ lb bulk) $3.50
Quarter Keg (6¼ lb bulk) $1.75
Case 24 (1 lb cans bulk) $8.50
Half case (1 lb cans bulk) $4.50
King's Smokeless Shot Gun Rifle.
Keg (25 lb bulk) $12.00 $15.00
Half Keg (12½ lb bulk)... 6.25 7.75
Quarter Keg (6¼ lb bulk)... 3.25 4.00
Case 24 (1 lb cans bulk)... 11.00 14.00
Half case 12 (1 lb c. bk)... 7.25 8.75

Presses—
Fruit and Jelly—
Enterprise Mfg. Co. ..... 20@25%

Seal Presses—
Morrill's No. 1, ₩ doz., $20.00 ..... 50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 50%
Miller's Falls, No. 3, ₩ doz., $12.00 ..... 33⅓&10%
Morrill's No. 1, Nail Puller, ₩ doz. $20.00 ..... 50%
Pearson No. 1, Cyclone Spike Puller, $30.00 ..... 50%
The Scranton Co., Case Lots:
No. 2B large $5.50
No. 3B small $3.00
Smith & Hemenway Co.:
Diamond 70%
Giant 50%
Staple Pullers, Utica and Daisy 60%

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.50	.55	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., 4 in., $1.25; 5 in., $1.55				
Inch	2	2¼	2½	
Hot House, doz.	$0.65	.85	1.20	
Inch	1¾	1½	1¾	2
Screw, doz.	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz.	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz. 1¾ and 2 in ..... 17@18¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in. ..... 20@21¢
Axle, 1¼ in. 19¢; 2 in. ..... 20¢
American Pulley Co.:
Wrought Steel American Plain Axle ..... 50&10%
Wrought Steel, Eagle ..... 12 inch
Fox All-Steel, Nos 3 and 4, 2 in. ..... ₩ doz. 50¢
Grand Rapids All Steel Noiseless 50%
Niagara, No. 25 1¾ in., 19¢; 2 in., ... 20¢
New York, 1¾ in., 14½¢; 2 in., ... 20¢
Star, No. 26, 1¾ in., 19¢; 2 in., ... 20¢
Tuthill Brass Sash Pulleys 50%

Pumps—
Cistern 60%
Force Spout ..... 75&5@75&10%
Wood Pumps, Tubing, &c. 50%
Barnes Dbl. Acting Low list ..... 40&5%
Barnes Pitcher Spout 50%
Contractors' Rubber Diaphragm 50%
C. B. & L. Rubber Diaphragm ..... No
Daisy Spray Pump ..... ₩ doz. $6.50

Flint & Walling's Fast Mail Hand, Power list 50%
Flint & Walling's Fast Mail, Hand list 40%
Flint & Walling's Tight Top Pitcher 50%
National Specialty Mfg. Co. Meadow King, Nos. 2, $6.00; 3, $5.50 ..... 30%
Myers Double Acting Lever ..... 40&5%
Myers Deming Pumps ..... 40&5%
Myers Spray Pumps ..... 40&5%

Pump Leathers—
Plunger and Valve Leathers—Per doz

No.	1	2	3	4
	$5.00	6.00	7.00	8.00

Cup Leathers, Line bore:

Inch	2	3	4	5	6
	$5.00	7.00	9.00	12.00	15.00

Punches—
Saddlers' or Drive, good ..... doz. 50@75¢
Spring, single tube, good quality $1.75
Registering or Tubes ..... doz. $3.50
Bemis & Call Co.'s Cast Steel Drive 50%
Merrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00 ..... 50%
Hot Punches, each $5.00 ..... 50%
Niagara Blow Punches 40%
Niagara Nail Punches ..... 35&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 33⅓; Paragon, 50; Lodi 55%
Tinners' Hollow, P., S. & W. Co. 40%
Tinners' Solid, P., S. & W. Co., doz., $1.44 ..... 40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron ..... 2¼@2¾¢
Sliding Door, Wrought Brass, Trk in., lbs., 36¢ 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..₩ ft. 3¼¢
O. N. T. Rail $3.12
Griffin's:
XYX, ₩ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.50.
Hinged Hanger Track, ₩ ft. 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ₩ 100 ft. $3.45
O. N. T., ₩ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard 1¼ in. ..... ₩ 100 ft. $4.06
Lawrence Brass:
1 x 3-16 in., ₩ 100 ft., $7.50; 1¼ x 3-16 in., $8.75 ..... 55&5%
McKinney's:
Hinged Hanger Track, ₩ ft., 11¢
1 x 3-16 Track ..... 50&5%
Myers Stayon Track ..... 60&5%
Richards' Mfg. Co.:
Common, 1 x 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¾ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65 ..... 50%
Gauge Trolley Track, ₩ ft. No. 31, 3-16 in. 32, 1/8 in., No. 33, 20¢
No. 50 ..... 60&10%
No. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00, 45, $3.25; 46, $3.50; 49, No. 1, $3.75; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn... $3.25
Fort Madison Blue Head Lawn... $2.75
Cronk's:
Steel Garden; Champion, 75; Ideal, 85; Victor ..... 80&5%
Queen Lawn, ₩ doz., 20 tecth, $2.85, 24, $3.00 ..... net
Attiring Lawn ₩ doz $1.60
Malleable Garden ..... net
Ideal Steel Garden, ₩ doz. 12 teeth, $15.00; 14, $16.00, 16, $18.00 ..... $2.40
Kohler's:
Lawn Queen, 20-tooth ..... ₩ doz. $3.15
Lawn Queen, 24-tooth ..... ₩ doz. $3.25
Paragon, 20-tooth ..... ₩ doz. $2.70
Paragon, 24-tooth ..... ₩ doz. $2.75
Steel Garden, 14 in. ..... ₩ doz $2.40
Malleable Garden, 14-tooth, ₩ doz. $2.00@2.25

Rasps, Horse—
Disston's 75%
Heller Bros. 75%
Heller Bros.' Gold Medal ..... 70&10@75%
McCaffrey's American Standard ..... 60&10&5%
New Nicholson ..... 70&10@75%
See also Files.

Razors—
Lamb Bros. & Co.:
Fox Razors, ₩ doz., No. 42 $20.00; No. 44 $20.00, No. 82, Platina $25.00 ..... 60%
Red Devil 65%

Reels, Fishing—
Hendryx:
M. 6, Q. 6, A. 6, B. 6, M. 9½, M. 16, Q. 16, A. 16, B. 16, 45½ Rubber Pomo, Nickeled Pomo 20%
Aluminum German Silv., Br. 25%
1240 N, 124 N 20%
3004 N, 06 N, 6 BM, G. 6 ..... 20%
N. 8, PN, 24 N, 08 PN 20%
2904 P, 3304 P, 2904 PN, 3304 N, 3304 PN, 02904 PN, 03304 PN, 3302 N, 3302 PN 25%
902 PN, 902 N, 3302 P 25%
5004 PN, 5002 N, 974 PN 25%
5004 P, 5002 N 25%
Competitor 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20%
304 P, 304 PN, 00304 P, 00304 PN, 3304 P 20%

Registers—*List July 1, 1905.*
Japanned, Electroplated and Bronzed ..... 70&10@70&10%
White Porcelain Enamel..30&10%
Solid Brass or Bronze Metal..40%

Revolvers—
Single Action ..... 95¢@$1.00
Double Action, except 44 cal. $2.00
Double Action, 44 caliber $2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grade

16 in.	*per doz.*	$2.50@$2.75
17 in	*per doz.*	$2.75@$3.00
18 in	*per doz.*	$3.00@$3.25

Rings and Ringers—
Bull Rings—

	2	2½	3 inch
Steel	$0.70	0.75	0.80 doz
Copper	$1.10	1.25	1.65 doz.

Hog Rings and Ringers—
Hall's Rings, gro. boxes $1.25
Hill's Ringers, Gray Iron, doz. 60¢
Hill's Ringers, Malleable Iron, doz. 80¢
Blair's Rings ..... per doz.
Blair's Ringers ..... per doz. 75¢
Brown's Rings ..... per gro. $3.25
Brown's Ringers ..... per doz. 75¢

Rivets and Burrs—
Copper 50%
Carriage, Coopers', Tinners, &c.:
Black ..... 70&10%
Metallic Tinned 70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes paste-board boxes, 50 count, 23@23¢; 100 boxes, 100 count, 20@20¢. Tubular, per doz. boxes, 50 count, 20@20¢; 100 count, 17@18¢.

Rollers—
Cronk's Stay, No. 50 ..... $1.00
Cronk's Registering No. 55, $0.60; No. 56, $0.75; No. 60 ..... $0.75
Lane's Stay 40%
Richards Stay:
Handy Adj. and Reversible No. 53 75¢
O. K. Adj. and Reversible No. 58..50¢
Tag Setters, Nos. 55 and 57 ..... 50%
Underwriters', Nos. 59, 60 ..... 50%
Favorite, No. 54 ..... 60%

Rope—
Manila, 7-16 in. diam. and larger: Pure ..... lb., 10½@11½¢
Sisal, 7-16 in. diam. and larger: Pure ..... lb., 7½@8¢
Sisal, 7-16 in. diam. and larger: No. 1 quality ..... lb., 6¾@7¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed ..... lb., 6½@6¾¢
Pure ..... lb., 7¾@8¼¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred: Mixed ..... lb., 5½@5¾¢
Pure ..... lb., 6¼¢
Cotton Rope: Best, ¼-in. and larger.. 18@20¢
*Medium, ¼ in. and larger..*16@17¢
Common, ¼-in. and larger.. 10¢
In coils, ½¢ advance.
Jute Rope: Thread, No. 1, ¼-in. & up, lb. ..... 6¼¢
Thread, No. 2, ¼-in. & up, lb. ..... 5¾¢

Wire Rope—
Galvanized ..... 37½@21½%
Plain ..... 45@21½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal 20%

Rules
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%
Chapin Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory ..... 25@25&10%
Miscellaneous ..... 50@50&10%
Stephens' Combination 25%
Stationers' ..... 50@50&10%
Ironsfel & Keser Co.:
Folding, Boxwood ..... 33⅓&10%
Folding, Steel ..... 33⅓&10%
Lumber's Jumbo 50%
Lumber's Lumber ..... 50&10%
Union Nut Co.:
Boxwood ..... 60%@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—

Saws—

Atkins':
Circular 45
Band ..... 10&10&10
Butcher Saws 50
Cross-cut 40
Off. Mat. Cross Cut 10
Narrow Cross Cut 4
Hack, Rip and Panel ..... 50&5
Mitre Back and Compass 4
Meaty, Mill and Drag 15
Wood Saws ..... 10&10
Coe's Wrinkle Co.
Butchers' Saws and Frames ..... &
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....30&10&10%
Disston's:
Circular Steel and Inserted Teeth.50
Band, 2 to 18 in. wide 60
Band, 1/4 to 1/8 60
Crosscuts 40
Narrow Crosscuts 50
Meaty Mill and Drag 50
Framed Web Saws 25
Woodsaw Blades 25
Woodsaw Reels, Tinned 15
Hand Saws, Nos. 12, 99, 9, 16, d100, 119 75
Hand Saws, Nos. 7, 107, 107½, 3, 1, 8, 80, Combination 30
Compass, Key Hole &c 25
Butcher Saws and Blades..... 30%
C. E. Jennings & Co.'s:
Back Saws 50
Butcher Saws ..... 40&10
Compass and Key Hole Saws 50
Framed Wood Saws 50
Hand ..... 40&10
Wood Saw Blades ..... 40&10
Millers Falls:
Butcher Saws ..... 15&10
Rear Saw Blades ..... 15&10
Massachusetts Saw Works.
Victor Kitchen Saws ..... 40&10&5
Butcher Saws Blades ..... 40&10
Peace & Richardson's Hand Saws...30%
Simonds:
Circular Saws 45
Crescent Ground Cross Cut Saws..30%
Circular ..... 40&10
Gang Mill, Mulay and Drag Saws.45%
Band Saws 50
Hack Saws ..... 50&10
Butcher Saws ..... 40&10
Hand Saws ..... 40&10
Hand Saws, Bay State Brand..... 40%
Compass, Keyhole Hole &c ..... 25&10&5
Wood Saws ..... 40&10
Weeder, Madden & Clemsen Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A ..25%
Disston's:
Concave Blades..... 25%
Keystone Blades..... 25%
Ideal 30%
Simonds File Co..... 35%
C. E. Jennings & Co.'s
Hack Saw Frames, Nos. 178, 180..... 40&5%
Hack Saws, Nos. 178, 180, complete, each 10
Goodell's Hack Saw Blades ..... 10&10
Greenfield Hack Saw Frames ..... 35&10&5
Grilles Hack Saw Blades.....35&5&10
Sterling Hack Saw Blades..... 10
Sterling Hack Saw Blades ..30&10&5%
Sterling Hack Saw Frames..30&10&10%
Stevens Power Hack Saw Machines, each: No. 1, $30.00; No. 2, $40.00 25
Victor Hack Saw Blades 25
Victor Hack Saw Frames..... 40
Whitaker Mfg. Co.:
National Hand Blades..... 40%
National Hand Frames..... 40
National Power Blades..... 30&10

Scroll—

Barnes, No. 7, $15..... 25%
Barnes' Scroll Saw Blades..... 40%
Barnes' Scroll Power Scroll Saw, without boring attachment, $18; with boring attachment, $20..... 20%
Lester, complete, $10.50..... 15&10%
Rogers, complete, $3.50 and $4.00..... 15&10%

Scales—

Fairbanks, Morse & Co.:
Counter:
Hutch, Platform, 1½ to 4 lbs. ..... doz. $5.50
Two Platforms, ½ to 4 lbs. ..... doz. $16.00
Union Platform, Platte, $1.75 to 1.90
Union Platform, Stpd. $1.85@2.15
Chatillon's:
Eureka 40
Peerless 40
Tea and Spice 40
The Standard Portables 10%
The Standard R. R. and Wagon ..... 50&10%

Scrapers—

Bay, 1 Handle..... doz. $2.00@2.25
Bay, 2 Handle..... doz. $3.50@3.60
Ship ..... Tinned, $2.00; Heavy, $4.50
Ox or Stable, Cast, Box, 20-24-28 in.
Barrett Mfg. Co.:
Bay 40

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.70@2.75; 1¼ in., $3.00@3.25; 1½ in., $3.30@3.75
Bench, Wood ..... 2.25@2.40
Hand, Wood...70&10@70&10&10%
Chatillon Stephens Co. Hand 40
Coach, Lag and Hand Rail
Iron, Cone Point ..... 70&10&5%
Coach, Gimlet Point ..... 70&10&5%
Tank ..... 70&10&5%
Tank Rail..... 70&10&5%

Jack Screws—

Standard List..... 70&10@75
Millers Falls ..... 50&10&10
Swett Iron Works 50

Machine—

Cut Thread, Iron, Brass or Composition:
Flat Head or Round Head, 56&5&10%
Fillister Head..... 40@40&10%
Rolled Thread, F. H. or R. H., Iron ..... 57½&10%
F. H. or R. H., Brass, Nos. 8 to 14..... 65&10%

Set and Cap—

Set (Iron) ..... 75&10@75&10%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 50&10%
Hex. Hd. Cap ..... 50&10&5%
Rd. Hd. Cap ..... 50@75%
Fillister Hd. Cap ..... 60@75%

Wood—

List July 23, 1903
Flat Head, Iron..... 87½&5&10...%
Round Head, Iron.. 85&5&10...%
Flat Head, Brass.. 80&5&10...%
Round Head, Brass.. 75&5&10...%
Flat Head, Bronze.. 75&5&10...%
Round Head, Bronze.. 72½&5&10...%
Drive Screws..... 87½&5&10...%

Scroll Saws—

See *Saws, Scroll.*

Scythes— *Per doz.*

Grass No. 1, Plain ..... $7.50@7.75
Clipper, Bronzed Web 7.75
No. 1 Clipper, Pol'd Web ..... 8.50@9.00
No. 6 Clipper and Solid Steel... 12.00@13.00
Bush, Weed and Bramble, Nos. 11, 12 and 13..... 9.00@10.00
Grain, No. 1..... $9.00@9.50
Bronzed Webb, No. 1... $9.25@9.75
Nos. 3 and 4 Clipper, Grain ..... 10.00@11.00
Solid Steel, No. 6..... Special list

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; ..., $18, 3, $15, 4, $20, 5, $25 50
Millers Falls Adj. Tool Handles No. 1, $12; No. 4, $12; No. 5, $18 50

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel..... doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 75
Cannon's Diamond Point, doz gro, $12; ..... 15&10
Matthews ..... doz gro $7.50
Smith & Orrgreave's Cup Pt. 10
Smith's Knurled Cup Pt. ..... 10&10
Victor Knurled Cup Pt... doz gro. $7.50

Rivet—

Regular list..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Arrowsmith 40%
Disston's Star, Monarch and Tri-Angle 30%
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut....$20.60
No. 5 Mill $30.00
Nos. 11, 11, 95 ..... $15.60
No. 1 Old Style..... $10.00
Special $16.25
Grant Royal Cross Cut..... doz. $8.00
Royal, Hand..... doz. $4.50
Taintor Positive..... doz. $6.75

Shaving—

Fox Shaving Sets, No 30..... doz. net. $21.00
Smith & Hemenway Co.'s..... 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, doz..... $1.50
Mounted Kitchen Sand Stone, doz..... $1.50
Natural Grit Carving Knife Hones, doz 50
Quick Cut Emery Carving Knife Hones, doz $1.50
Quick Cut Pocket Knife Hones, doz $2.50

Skate—

Smith & Hemenway Co.'s..... Europa 50

Shaves, Spoke—

Iron ..... doz. $1.00
Wood ..... doz. $2.00
Barnes' Patent, R. & L. Co.'s 50
Clarus Stephens Co. 50
Disston's list ..... $4.00 ..... 15&10

Shears—

Cast Iron..	7	8	9 in.
Best	$16.00	18.00	$0.00 gro.
Good	$13.00	15.00	17.00 gro.
Cheap	5.00	6.00	7.00 gro.

Straight Trimmers, &c.:
Best quality Jap....70@70&10%
Best quality, Nickel...60@60&10%
Tailors' Shears ..... 40@50
Acme Cast Shears ..... 40&5
Wilkinson Shear & Cutlery Co.:
Sheep, 1900 list..... 30&10&5%
Grass 10
Hedge & Mule 10
J. W. & S. C. 10
Best Double Ply 20%
Best Quality Nickel 20%
Tailors' 25%

Tinners' Snips—

Steel Blades ..... 2.25@2.40
Steel Lap Blades ..... 2.40@2.50
Forged Handles, Steel Blades, Berlin 50
Jennings & Co.'s 40
Jennings & Co.'s Mfg. Co.'s Cast Iron 40
Niagara 40
Pexto 40
P. S. & W. Extra Heavy 25
W. & W. ..... 40&10
J. Wiss & Sons Co.:
Wiss 25

Pruning Shears—

Clauss Hand Shears 33½
Clauss Wire Hedge Shears 33½
Disston's Combined Pruning Hook and Saw 25
Disston's Pruning Hook only, doz. $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades..... 40%
C. S. Co. ..... 10&5
Columbian Cutlery Co.:
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand..... 60&10%

Sheaves— Sliding Door—

Reading 40%
R. & E. list..... 10%

Sliding Shutter—

Reading list 40
R. & E. list..... 10

Shells—Shells, Empty—

Brass Shells, Large:
Climax, 10 and 12 gauge..... 65&10%
Club, Rival, 65&5%; First Quality, 60&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, 25&5%
Union, League, 10 and 12 gauge; Rival Grade..... 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge..... 50&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%

Shells, Loaded—

Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade ..... 40&5
Loaded with Smokeless Powder, high grade..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders..... 40%
Nitro Club, Smokeless Powders.40&5%
Arrow, Smokeless Powders.40&10&10%
Winchester:
Smokeless Repeater Grade.....40&5%
Smokeless Leader Grade...40&10&10%
Black Powder..... 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted	Galv.
14 x 20	$4.25	$6.00
10 x 14	2.50	3.25
7 x 10	1.75	2.50

Wheeling Corrugating Co.:

Dixie, 14 x 20	$4.25	6.50
Dixie, 10 x 14	2.50	3.25
Dixie, 7 x 10	1.75	2.50

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg, $4.10
Steel ..... per keg, $3.85
Burden's, all sizes ..... per keg $3.90

Shot—

25-lb. bag.
Drop, up to B..... $1.85
Drop, B to 1.90
Buck 1.90
Chilled 1.90
Dust 2.00

Shovels and Spades—

Association List, Nov. 15, 1902, 40%
Avery Standard Co. 40
Snow Shovels—
Long Handle..... $3.20@$3.70
Wood and Malt, D. Hanna ..... $3.75@$4.50

Sieves and Sifters—

Hunter's Imitation ..... gro. $4.50@5.00
Hunter's Genuine ..... per gro. $12.00@12.50

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme 40
Ames 40

Sieves, Seamless Metallic

—Per doz.—

Mesh	14	16	20
Iron Wire..	$1.05	1.05	1.10
Tinned Wire.	$1.15	1.15	1.20

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.

Mesh	10	20
Mesh 20, Nested	doz. $1.00	1.05
Mesh 40		1.10

Sinks, Cast Iron—

Painted, Standard list:
Barnes' low list:
Including 20 x 36 in 50&5
Enameled 40
Enameled, Corrugated 40
Enameled, Corrugated, Extra Heavy 40

Skeins, Wagon—

Cast Iron..... 70@75&10%
Steel ..... 10@15%

Slates, School—

Factory Shipments.
"D" Slates ..... 40&10%
Eureka, Unexcelled Noiseless... 60&5 tens
Victor A. Noiseless 6x8 65

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40&10
Covert Mfg. Co.:
Dee 50
Harness 50
Jockey 50

Snaths

Scythe ..... 10&5

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality ..... 60&10
Cheap ..... 60&10
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton..... 50&10%
Rogers & Bro. Wm. Rogers & Son, Eagle Brand 40
Anchor, Rogers Brand..... 60%
Wm. Rogers & Son 40

Miscellaneous

German Silver..... 60&10

Tinned Iron—

Tea ..... per doz. $1.00
Tables ..... per gro. $1.00

Springs— Door—

Bardsley's Spring and Check..... 40%
Chicago Co. 40
Grip 40
Pullman (Coil)..... 35
Reliance (Coil)..... 40&10
Star (Coil)..... 40
Torrey's Rod, 39 in..... doz. $1.10

Carriage, Wagon, &c.—

1¼ in. and Wider: *Per 100 lb.*
Bow 5.00
Elliptical 5.00
Basket 5.00
Painted Seat Springs:
Elliptical ..... per pr. 25c
Full ..... per pr. 50c

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; National 40
Enterprise 40
Peerless No. 1, doz. $12; No. 2, $15; No. 3, $20..... 30%

Squares—

Nickel plated ..... List Jan 5 '03
Steel and Iron..... 40
Rosewood Hdl. Try Square and Bevels ..... 60&10&10%
Iron Hdl. Try Squares and Bevels ..... 60&10&10
Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel..... 15%

Squeezers, Lemon

Wood, Common, gro., No. 0, $3.25@$3.50, No. 1, $6.25@$6.50
Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron..... doz. $0.75@1.25
Iron, Porcelain Lined..... doz. $1.75

Staples—

Barbed Bind..... 40&10&5
Electric ..... 40&10&5
Fence Staples, Plain, $2.15; Galvanized $2.45
Poultry Netting Staples ..... per lb. $.02½

Steels, Butchers'—

Dick's 40
Foster Bros.'..... 30%

Steelyards

Stocks and Dies—

Blacksmiths 40
Coffin Screw 40
Drill Screw 40
Green Bros. 40
Lee 40
Reed 40

Stoners, Cherry—

Stones—Oil, &c.

Arkansas Oil Stones, per lb.:
Arkansas St. No. 1, 5½ to 8 in $0.55
Arkansas Slips No. 1..... $1.00
Lily White Washita, 4 to 8 in. 50
Washita St., Extra, 4 to 8 in. 50
Washita St., No. 1, 4 to 8 in. 40
Washita St., No. 2, 4 to 8 in. 30
Washita Slips, Extra..... 80c
Washita Slips, No. 1..... 70c
Washita Slips, No. 2..... 40c
India Oil Stones (entire list) 33⅓%
Queen Creek Stones, medium Oil 40
Stone Trough, Oil 40
Queen Creek Stones, 4 to 8 in Axe 40
Queen Creek Slips..... 33⅓
Quincy Axe Stones, Extra 40%
Hindostan, No. 1 Regular 80
Hindostan, No. 1 Small 80
Axe Stones and Hones 40
Turkey Oil Stones, Extra, 5 to 8 in 40
Queen Creek Stones, 4 to 8 in 20
Queer Creek Slips..... 40
Sand Stone..... 60

Scythe Stones—

Pike Mfg. Co., 1901 list:
Black Diamond S. S. ₱ gro. $12.00
Dannville S. S. ..... ₱ gro $11.00
White Mountain S. S ₱ gro $9.00
Green Mountain S. S. ₱ gro $6.00
Extra India Pond S. S ₱ gro $5.50
No 1 Indian Pond S S ₱ gro $4.50
No 2 Indian Pond S S ₱ gro $4.50
Leader Red End S. S. ₱ gro $4.50
Quick Cut Emery ..... ₱ gro $10.00
Pure Corundum, ... ₱ gro $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%.
Electro (Artificial), ₱ gro.. $12.00
Lightning (Artificial), ₱ gro.. $18.00 ..... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers..... ₱ gro. $9.00

Stops—Bench—

Millers Falls..... 15&10%
Merrill's, ₱ doz., No 1, $10.00..... 50%
Merrill's, No 2, $12.50..... 50%

Door—

Chapin Stephens Co..... 50@50&10%

Plane—

Chapin-Stephens Co..... 20%

Straps— Box—

Acme End steel case lots 20&10&5%
Cary's Universal, case lots..... 20&10&5%

Stretchers, Carpet—

Cast Iron, Steel Points, doz.
60@80&10%
Socket ..... *doz. $1.50*
Excelsior Stretcher and Tack Hammer Combined, ₱ doz. $6.00 ..... 20%

Stuffers, Sausage—

Enterprise Mfg. Co..... 25@25&7½%
National Specialty Co., list Jan. 1, 1902 ..... 50&5%
P., S. & W. Co..... 40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ₱ doz.
Superba Dutch Mahogany..... $36.00
Triumph Tea Vessels..... $ 9.00
Parlor Queen, Fig. Rosewood..$30.00
Dale Hardwood As ..... $ 9.00
Am. Queen, Fig. Mahogany $27.00
Ideal, Birdseye Maple $25.00
Grand Rapids, Natural ..... $ 9.00
Japan ..... $ 9.00
Standard Nickel ..... $ 9.00
Crown Jewel, Nickel, $21.00; Jap. $19.00
Crystal, Glass Tea ..... $ 9.00
Grand, 17 in. wide ..... $ 9.00
Club, 21 in. wide $5.50
Hall, 28 in. wide ..... $ 6.00

NOTE.—Rebates: 50c per dozen on three dozen lots, $1 per do en on five dozen lots; $2 per dozen on ten dozen lots; $2.50 per dozen on twenty-five dozen lots

Tacks, Finishing Nails, &c.

American Cut Tacks..... 90@90&10%
American Cut Tacks..... 90@90&5%
Sweden Cut Tacks..... 90@90&5%
Sweden Upholsterers..... 20&5%
Gimp Tacks..... 90@90&5%
Lace Tacks..... 90@90&5%
Diamond Tacks..... 90@90&5%
Looking Glass Tacks..... 60&5%
Bill Posters' and Railroad Tacks..... 90@90&10%
Hungarian Nails..... 80@80&5%
Finishing Nails..... 70%
Trunk and Clout Nails..80@10%

NOTE.—The above prices are for straight Weights.

Miscellaneous—

Double Pointed Tacks .....
..... 90@95 tons 60 ..... 5%

See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
20	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather..... 25@25&5%
Tape..... 33⅓&5%
Festerman's..... 25@25&5%
Gould & Esser Co.:
Favorite Ass Skin ..... 40&10&5%
Favorite Buck and Leather ..... 25&25&10
Metallic and Steel lower list, 35@35&5%; Pocket, 35@35&5%.
Mifkin's:
Asses' Skin ..... 40&10&5%
Metallic ..... 30&10&5%
Patent Bend, Leather..... 25&5%
Pocket ..... 40&10&5%
Steel ..... 33⅓&10&5%
Jebusch & Hilger:
Chesterman's Metallic, No 30L, etc. 35%
Chesterman's Steel, No 1008L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger, per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c. ..... 30@33⅓%

Ties, Bale—Steel Wire—

Single Loop ..... 50&10&5%
Monitor, Cross Head, &c. 70&25%

Tinners' Shears, &c.—

See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See Benders and Upsetters, Tire.

Tools—Coopers'—

L. & I. J. White..... 20@20&5%

Haying—

Myers' Hay Tools 45%

Miniature—

Smith & Hemenway Co.'s, David-son ₱ doz. Nickel Plated, $1.50; Gold Plated... ..... $2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simonds Improved..... 30%
Simonds' Crescent..... 25%

Ship—

L. & I. J. White..... 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon Globe or Acme, doz. $1.15@$1.25; gro. ... $11.50@12.00 Jumper, Champion or Paragon, doz. $1.25@1.50; gro. $13.00@13.50

Game—

Imitation Quail..... 75&10%
Newhouse ..... 40&10&5%
Hawes & Norton..... 65%
Victor ..... 75&75&10%
Oneida Community Jump..... 50%
Hawes ..... 75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes ..... *12¢*
Mouse, Round or Square Wire, doz. ..... *85¢@90¢*
Marty French Rat and Mouse Traps (Hartford):
No. 1, Rat, ₱ doz., $13.25. $11.50 doz.
No. 1, Rat, ₱ doz., $6.50.... $5.75 doz.
No. ½, Rat, ₱ doz., $5.25, $4.70 doz.
No. 0, Mouse, ₱ doz., $3.85. $3.00 doz.
No. 1, Mouse, ₱ doz., $3.00. $2.25 doz.
Oneida Community:
Out-o'-Sight Mouse, ₱ doz.... 55&10%
Out-o'-Sight Rat 1.10
Ideal Set, Mouse, ₱ doz..... .35
Ideal Set, Rat, ₱ doz..... 1.00
Wood Choker, Rat, ₱ doz. holes. .12
Bucket Tilt Chaser, 3 hole 1.00
Rat traps..... .75

Trowels—

Disston Brick and Pointing..... 25%
Disston Plastering 20%
Disston Nos. 1 and 2 Hard Brand Garden Trowels 20%
Kohler's Steel Garden Trowels, ₱ gro. 5 in., $4.80; 6 in., $6.00.
Never Break Steel Garden Trowels ..... ₱ gro. $6.00
Woodrough & McParlin Plastering..25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern..... 50&10%
Western Pattern..... 60&10%
Handy Trucks..... ₱ doz. $16.00
Gravity ..... ₱ doz. $15.00
McKinney Trucks..... each, net $10.00
Model Stove Trucks..... ₱ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.
Galvanized 80@ 85@ 85@ 80@ 75%

Twine, Miscellaneous—

Flax Twine:
No. 9, 1¼ and 1½-lb. Balls 24@25¢
No. 12, 1¼ and 1½-lb. Balls 21@22¢
No. 18, 1¼ and 1½-lb Balls 18@22¢
No. 24, 1¼ and 1½ lb Balls ..... 17@19¢
No. 36, 1¼ and 1½ lb. Balls 17@19¢
Chalk Line, Cotton 1½-lb. Balls ..... 26@31¢
Cotton Mops, 6, 9, 12 and 15 lb to doz. ..... 11@19¢
Cotton Wrapping, 5 Balls to lb., according to quality... 15¢@25¢
American 3-Ply Hemp, 1 and 1½ lb. Balls..... 14½@16¢
American 3-Ply Hemp, 1 lb. Balls ..... 15½@16½¢
Indian 2-Ply Hemp, 1¼ and 1½ lb. Balls
Indian 4-Spring Twine 13½@11½¢
India 3-Ply Hemp, 1½-lb. Balls ..... 10½@11½¢
India 3-Ply Hemp, 1½-lb. Balls ..... 10¢@11¢
2, 3, 4 and 5-Ply Jute 1½-lb. Balls ..... 13½@14½¢
Mason Line, Linen, ½-lb. Bls. 47¢
No. 261 Mattress, 1¼ and 1½-lb. Balls, according to quality.
Wool, 3 to 6 ply.... B 9¢, A 10¢

Vises—

Solid Box..... 50@70&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable..... 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co. 50%
Fisher & Norris Double Screw, net, each, Nos. 2, $4.50; 3, $16.00; 4, $20.50; 5, $27.00
Fulton Mach. & Vise Co.:
Reed, Swivel 25%
Star, Solid Jaw..... 40%
Hollands':
Machinists' ..... 1 and 2&5%
Keystone ..... 60&5%
Lewis T. & Co.:
Adjustable Jaw 50%
Monarch, 50%; Solid Jaw 50%
Massey Vise Co.:
Cuncher 40%
Perfect, 15%; Lightning Grip .. 15%
Merrill's 20%
Millers Falls Oval Slide Pattern 60&10%
Parker's:
Victor, 20@25%; Regulars..... 20@25%
Vulcans 45%
Combination Pipe 55%
Peerless 40%
Rock Island 25%
Stedtfeder, X. L. 33⅓%
Stephens' 33⅓%

Saw Filers—

Disston's D 8 Clamp and Guide, ₱ doz., $24.00, 30%; Clamps..... 30%
Perfection Saw Clamps, ₱ doz.... $4.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed 25%
Star 40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect.....15%
Wyman & Gordon's Quick Action, 6 in., $6.00, 9 in., $7.50, 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe..... 40%
Parker's Combination Pipe:
87 Series, 60%; 197 Series, 60&5%; No. 320, 40%
Rock Island Pipe..... 25%

Wads—*Price per M.*

B. E., 11 up..... *60¢*
B. E., 9 and 10..... *70¢*
B. E., 8..... *80¢*
B. E., 7..... *80¢*
P. E., 11 up..... *$1.00*
P. E., 9 and 10..... *1.25*
P. E., 8..... *1.50*
P. E., 7..... *1.50*
Ely's B. E., 11 and larger..$1.70@1.75
Ely's P. E., 12 to 20..... *$3.00@3.25*

Dis. 1%

Ware, Hollow—Cast Iron, Hollow—

Stove Holloware:
Enameled..... 45&10%
Ground..... 50&5%
Plain or Unground..... 60%
Country Hollow Ware, per 100 lbs...... *$3.00*
White Enameled Ware:
Mashin Kettles..... 65&10%
Covered Ware:
Tinned and Turned..... 35&10%
Enameled..... 45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware..... 33⅓%
Iron Clad Ware..... 70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	*45¢*	*50¢*	*65¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles..... 60%
Pyrelamel ..... 50&10%
Never Break Spiders and Griddles..... 65&5%
Never Break Kettles..... 65&5%
Solid Steel Spiders and Griddles 65&5%
Solid Steel Kettles..... 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ₱ doz.
Crescent, family size, bent frame $4.05
Best Star family size, stationary protector $4.35
Double Zinc Surface:
Saginaw Globe, family size, stationary protector..... $3.35
Cable Cross family size, stationary protector $3.60
Single Zinc Surface:
Naiad family size, open back, perforated $2.50
Single Saginaw Globe $2.85
Brass Surface:
Brass King, Single Surface, open back $4.05
Nickel Plate Surface:
No. 1001 Nickel Plate Single Surface $3.60
Glass Surface:
Glass King, Single Surface, open back $3.95
Enamel Surface:
Enamel King, Single Surface, vertically slated back..... $3.95

Washers—Leather, Axle—

Solid ..... *90@90&10%*
Patent ..... *90@90&5%*
Coil: ⅞ 1 1⅛ 1¼ *inch.*
9c. 9c. 11c. 13c. per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers... $4.00 4.00 2.70 2.50 2.30
The above prices are based on $6.50 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots.....
per lb. 1¾@2¢

Wedges—

Oil Finish..... *lb.. @3¢*

Weights—Hitching—

Covert Mfg. Co..... 30&2%

Sash—

Per net ton, f.o.b. factory:
Eastern District... $25.00@$28.00
Southern Territory $22.00@$24.00
Western and Central Districts ..... $22.50@$25.00

Wheels, Well—

8-in., $2.00; 10-in., $2.45; 12-in., $3.25; 14-in., $4.45.

Wire and Wire Goods—

Bright and Annealed:

6 to 9	*72¢ 10&7½%*
10 to 18	*72½¢ 10&10%*
19 to 26	*75¢ 10&10¢ 2½*
27 to 36	*77½¢ 10&7½%*

Galvanized

6 to 9	*72½¢ 10%*
10 to 14	*72½¢ 10&5%*
15 to 16	*72½¢ 10&5%*
17 to 18	*72½¢*
19 to 26	*70&5¢ 2½*
27 to 36	*65¢ 10&10%*

Copper

6 to 9	*65¢ 10&10%*
10 to 14	*70¢ 10&5%*
15 to 18	*65¢ 10&10¢ 2½*
19 to 26	*70&5¢ 2½*
27 to 36	*72½¢ 10&2½*

Tinned:

6 to 18	*67½ 10&10%*
Brass	*17½¢ lb., base*
Copper	*52¢ lb., base*
Cast Steel Wire	*50%*

Spooled Wire—

Annealed and Tinned,
70&10&10&10%
Brass and Copper... 60&10&10&10%
Retailers' Assortments, per box.
$2.10@$2.40

Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods .... *90&25&10%*
Brass Wire Goods..... *90@90&10%*
Brass Cup and Shoulder Hooks, 80&15%

Wire Cloth and Netting—

Galvanized Poultry Netting,
50@50&10&5@50&10&2½%
Painted Screen Cloth, per ft., $1.35
Standard Galv. Hardware Grade: Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh..... $2.75
Nos. 4 and 5 Mesh..... $3.00
No. 6 Mesh..... $3.25
Nos. 7 and 8 Mesh..... $3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ..... *50&10*
Alligator or Crocodile.. 70&10@75%
Baxter Pattern S Wrenches... 70&5&70&10%
Drop Forged S..... 45@45&5%
Acme ..... 60&10%
Alligator Pattern, 70%; Bull Dog, 70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut 50%
Combination Black..... 40&5%
Merrill Pattern..... 50%
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Screw Hdl. 40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer, ₱ dle..... 40&10&5&5%
Coes' "Mechanics'".. 40&10&10&5&5%
Donohue's Engineer..... 40&10%
Eagle 70%
Hem Pockets..... 50%
Hercules 70%
W. & B. Machinists':
Case lots..... 50&5%
Less than case lots..... 50%
W. & B. Railroad Special:
Case lots..... 50%
Less than case lots..... 40&10&5%
Solid Handles, P., S. & W., 40&10&5% full cases..... 50&10&5%
Stillson 65%
Twain's Wrench Co.:
Railroad Special, Iron Handle, 40&10&5%
Other Wrenches..... 50%
Unican and Acrippa Chain 50
Whitaker Machinists':
Case lots..... 50&10%
Less than case lots..... 50

Wrought Goods—

Staples, Hooks, &c., list March 15, '02..... *85@40&10%*

Zinc—*(Cask lots at mill.)*

Sheet..... *per 100 lb. $7.00*

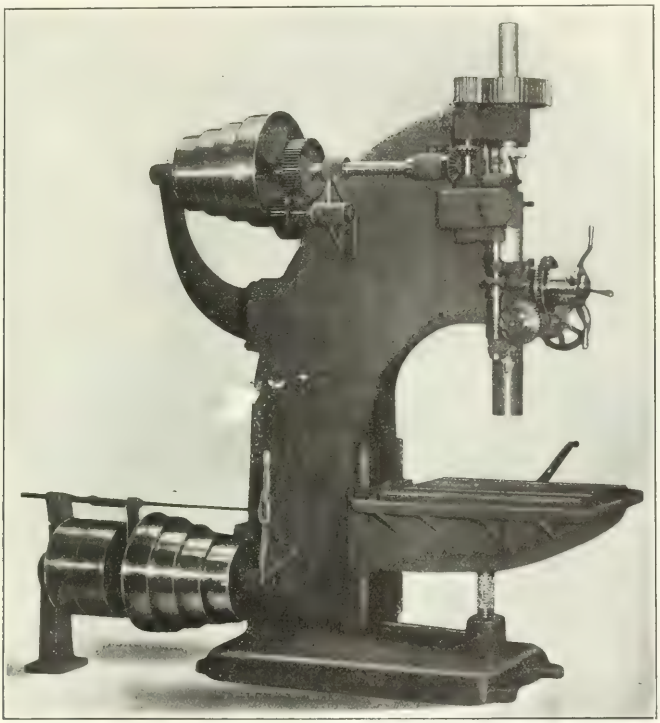
For the Table of "Current Metal Prices" see the First Issue of Every Month.

THE IRON AGE

New York, Thursday, April 2, 1908.

A New Foote-Burt High Duty Drill.

Extreme rigidity and powerful driving mechanism are the important features of the No. 26 high duty drill now being manufactured by the Foote-Burt Company, Cleveland, Ohio. The machine is guaranteed to drive a 3½-in. high speed steel drill to its full cutting capacity. All parts, moving and stationary, are designed with a large factor of safety and on the basis of much greater stresses than were ever anticipated in the construction of the old time drilling machine, intended only for driving the ordinary tool steel drills. The effect is particularly noticeable in the massiveness of the frame and its weight



The New No. 26 High Duty Drill Built by the Foote-Burt Company, Cleveland, Ohio.

and in the wide faced gears which transmit the spindle drive. The machine as illustrated is built with two depths of throat, capable of drilling, respectively, to the centers of 44 and 60 in. circles, and is supplied either with a straight drive countershaft, as shown, or with a right-angle drive. Another option is the provision of a compound table for the plain table.

The spindle is of forged high carbon steel, 3½ in. in diameter in the sleeve and 3⅜ in. in the upper section. The nose of the spindle is fitted with a No. 6 Morse taper socket. The spindle is counterbalanced by a weight inside of the column connected by chain with the top of the sleeve. The sleeve is 23 in. long, 5¼ in. in diameter, and has ball bearing thrust collars of the company's own make, using ¾-in. balls, and is warranted to withstand the hardest continual service without breakage of balls or crushing out of collars.

Three changes of speed are provided through the change gear mechanism located at the side of the spindle which are instantly made by shifting the lever over the gear box. The box works on the pull pin, as distinguished from the sliding key principle. Any particular combination of gears is made active by the entering of a lock bolt through the shaft in a hole in the gears, when the shaft is shifted to its various positions by a rack and pinion connection with the operating lever. The device is positive, simple, and has been used satisfactorily for a number of years in other of the company's products. While the cut is being taken the mechanism may be engaged or disengaged without danger or injury. In addition to the power feed, hand feed through worm and worm wheel and quick return by the pilot wheel are provided after the usual custom in drilling machines, and all of these are within easy reach of the operator from the working position.

The feeds are also provided with automatic stops, which operate the knockout controlled by the horizontal lever projecting toward the front immediately behind the quick return pilot wheel. This lever is also so connected with the frame as to make a positive stop when so desired. The feed mechanism is disengaged for the operation of the quick traversing movement by a pin clutch controlled by the pilot wheel handles, which are swiveled. By pulling this member out the worm connecting this part of the clutch and the feed shaft is disconnected and a direct connection made between the pilot wheel and the pinion meshing in the rack on the spindle sleeve.

The drive is simply transmitted, as is clearly indicated in the illustration. Four speeds are provided through the four-step cone pulleys, and these are in turn doubled by the back gears. With the countershaft running at 300

rev. per min. and the back gears in, the speeds of the spindle are 23, 30, 38 and 50 rev. per min., and with the back gears out, 80, 103, 153 and 170 rev. per min. The miter gears, which transmit the drive from the upper horizontal shaft to the vertical parallel shaft connecting with the spindle, are of forged steel with plain teeth.

The table is fitted to the column by a square locked slide and is clamped by straps. Additional support is given underneath by the 3-in. square thread screw which is used to elevate the table, although during operation this performs the important function of a solid jack beneath the table in the line of the spindle. The table is provided with a large oil groove and has a working surface inside of the groove, 26 x 34 in.

Following are the other more important dimensions: Maximum distance from the spindle to the top of the plain table, 32 in.; distance from the center of the spindle to the face of the column, 22 or 30 in.; range of spindle movement, 16 in.; feeds, 0.7, 0.016, 0.32 in. per revolution;

The G. & E. Improved Automatic Rack Cutter.

In a new design of Eberhardt's patent entirely automatic rack cutting machine, shown in the accompanying illustrations and built by Gould & Eberhardt, Newark, N. J., several new features have been embodied. An important change has been made in the design of the bed, which was formerly of the box leg type, supporting the main table bed. The new bed presents a continuous line of contact with the floor, and better resists the strains produced while the cutters are at work. The cutter slide is actuated on the draw-cut, or pull-down, principle, and in conjunction with this style of bed insures not only increased feeds, but greater accuracy in the work. That part of the bed which supports the upright cutter slide stanchion is also cast as an integral part of the main bed casting, still further increasing the rigidity.

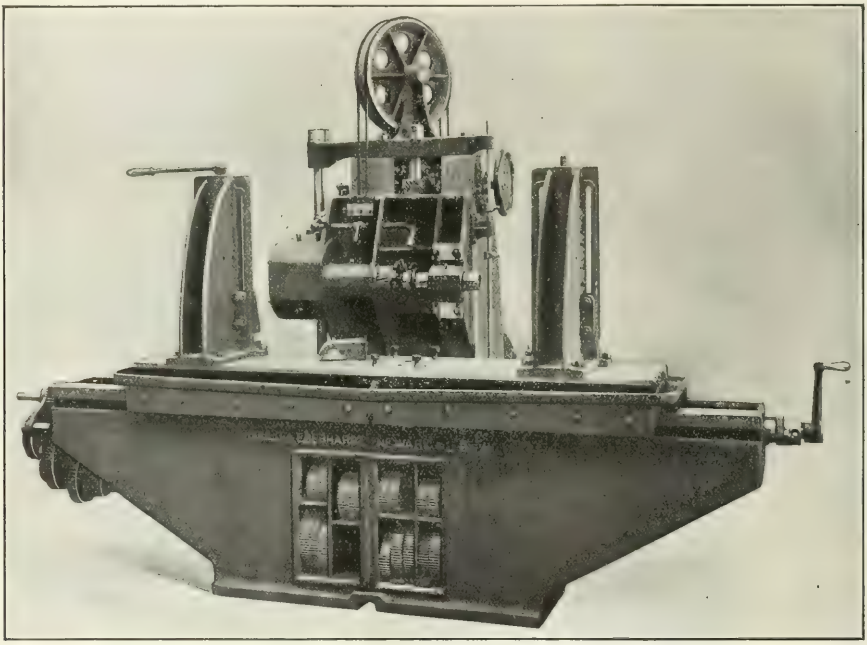


Fig. 1.—Front View of the Improved Automatic Rack Cutting Machine Built by Gould & Eberhardt, Newark, N. J.

weight of 44-in. swing machine, 6000 lb., and of 60-in. swing machine, 6800 lb.

The company also builds a No. 25 high duty drill, which is capable of driving a 2¼-in. high speed steel drill to its maximum capacity. It is made in two patterns, with 24 and 36 in. swings, respectively.

The Toronto Testing Laboratory, Ltd., has been incorporated and has established an office in the Saturday Night Building, Toronto, Canada. This is a company of analytical and consulting chemists, their specialty being looking after the requirements of iron and steel foundries and steel manufactories. They also carry on the assaying of ores. The officers of the company are as follows: President, J. D. Stoddard; vice-president, W. P. Putnam; secretary, Henry Blumhart; treasurer and manager, Hugh Lamont. This company was formed to look after the Canadian business of the Detroit Testing Laboratory, and although the company is a separate and distinct one, the management and shareholders are practically the same, Mr. Lamont, who will manage the Canadian business, has had many years' experience in handling analytical work in foundries, and has been connected for the last few years with the Detroit Testing Laboratory.

These features are typical of the aims throughout the design of the machine to make it capable of using high speed steel cutters to full advantage and turning out very accurate racks.

The first machine of this type was built for a planer manufacturer for cutting planer table racks, and duplicate machines have been furnished to manufacturers of machine tools, printing presses, and for notching large track scale beams. The machine is built in 6, 8 and 10 ft. sizes. The one shown is the smallest—that is, will take work up to 6 ft. long at one setting, and longer lengths of rack can be cut by shifting the blank between operations. It will cut any width of face up to 10 in., or a series of narrow faced racks of equivalent combined width, and any pitch up to as coarse as 1½ diametrical pitch in cast iron or 2 in steel, using from 1 to 12 cutters, depending upon the pitch to be cut. It is possible to use a gang composed of one roughing and one finishing cutter at the maximum rated capacity of the machine. The gang cutters which are used have their cutting points set spirally to avoid chatter and rapid dulling of the cutting edges.

The cutter slide is counterbalanced and is so arranged that it cannot be fed downward unless the proper divi-

sions and all previous movements have been completed. The cutter spindle is located approximately in the center of the slide, and large bearing surfaces insure rigidity and freedom from chatter under the heaviest work. The cutter spindle is driven through double spiral gears, one gear effect neutralizes end thrust in the cutter spindle. The guard over the gears has been removed in Fig. 1 to show the position of this spiral gear drive, immediately adjacent to the cutter.

The feed to the cutter slide ranges in geometrical

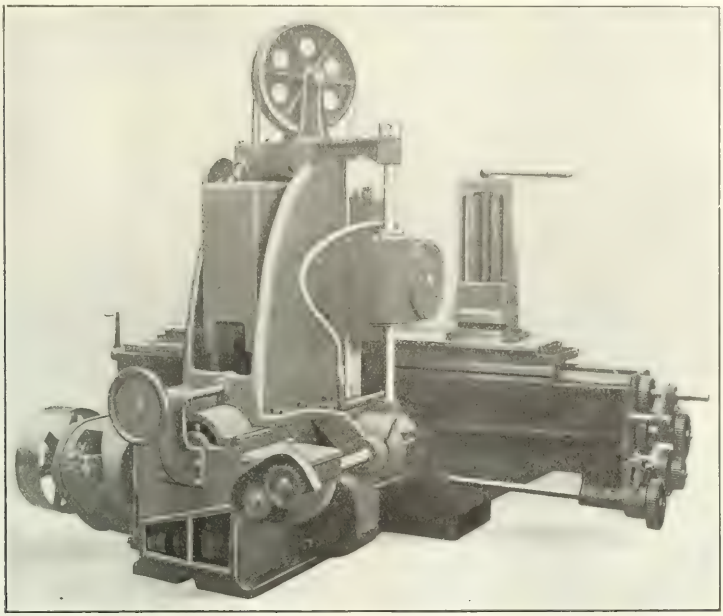


Fig. 2.—Rear View of the New Gould & Eberhardt Rack Cutter, Showing the Feeding Mechanism.

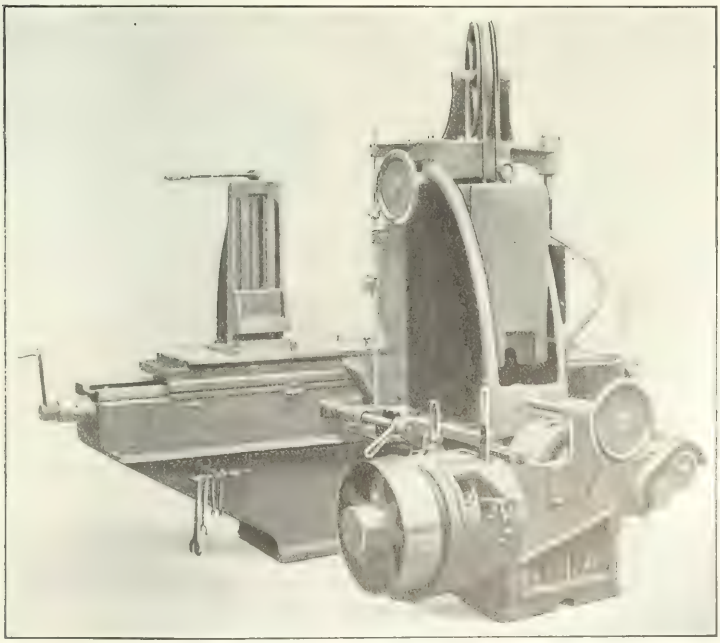


Fig. 3.—Another Rear View, Showing the Change Gear Box That Starting the Drive.

pair being placed on the outboard end and the other pair close to the cutter, where the full driving effect can be obtained. One of these two pairs of spiral gears is cut right hand and the other left hand. This herringbone progression from ¾ to 14½ in. per minute, thus providing a range that will economically take care of all classes of work. The feed is taken from the single driving pulley of the machine, through the gear box shown at the rear

end in Fig. 2. Cutter speed changes are provided, from 12 to 76 rev. per min., in geometrical progression.

The chucks or vises for holding the rack blanks are rigidly held to the top of the table by bolts in T-slots. The vises are so designed that they can be fastened solidly, metal to metal, with the top of the table, without springing or warping the latter out of line. The table is provided with generous bearing surfaces and strongly gibbed to the ways of the main bed casting.

The blanks are held in a vertical position, and consequently the cutter slide travel is vertical. This permits chips and cuttings to drop down out of the way of the cutters. There is an opening in the bed of the machine through which the chips and lubricant are drained, the latter flowing into a pocket which is cast in the bottom of the bed, where a screen separates the chips from the oil. A second pocket is formed in the oil pan bed, into which the lubricant rises and from which it is again pumped to the cutters.

A departure in this machine which will be found useful where a variety of work is to be cut, as in a jobbing shop, is the arrangement whereby the same lead or dividing screw can be used to divide for either circular or diametral pitches, or for module or metric circular pitches, by changing two gears. An auxiliary end adjustment for the table screw is provided, which is often useful in resetting work to be recut or in taking a light cut from one side of a tooth. The table is geared to use the traveling movement in either direction, saving wear on the various parts, and obviating the necessity of returning the table every time a new blank is set. In this machine the dividing or advancement of the table for each tooth to be cut is accomplished by a positive dividing mechanism, thus reducing the chance of error. Adjustable stops are provided to automatically throw out the table feed at any predetermined points.

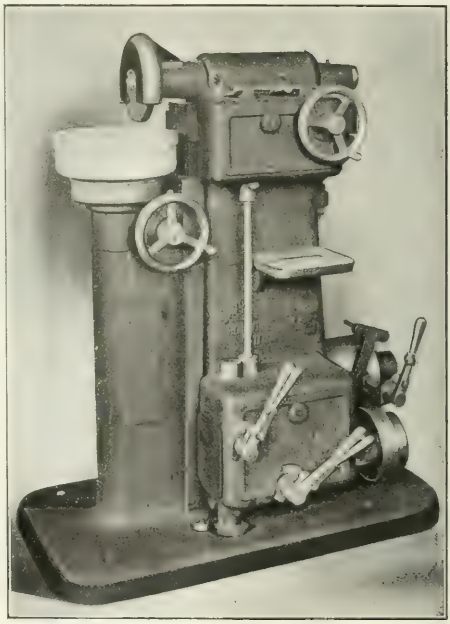
In addition to cutting racks the machine can also be used for milling or facing off spots on castings and similar work, generaly done on a vertical milling machine. The entire construction has been simplified, and only one belt is required to drive the machine, the various movements being transmitted through splined shafts, gearing, &c. This also makes it convenient when it is desired to drive the machine by a constant speed electric motor.

A New Saxon Ring Grinder.

The improved ring grinder, illustrated and built by the Saxon Machine Company, Holyoke, Mass., has ample weight and stiffness to handle any work within its capacity, which are essential to the obtaining of the required accuracy. The design is simple and effective, as evidenced by the fact that a large amount of work per hour can be turned out by a boy. It is contended that parts with open surfaces can be ground more nearly true on a rotating table than on a reciprocating table, and that much work done on larger and more expensive machines can be done on this one with a considerable saving of time. The grinding of piston rings can be accomplished with this machine at a fraction of the cost of filing and scraping. This is its most important function, for it has been demonstrated that properly fitted piston rings increase the power of a gas engine from 5 to 10 per cent.

The chuck is attached to a vertical spindle driven from the lower gear box, which gives eight different speeds for work of varying diameters. It is elevated by a hand wheel graduated to read in thousandths of an inch of vertical movement produced. Regularly a magnetic chuck is fitted to each machine, which affords the quickest way of fastening iron or steel work and avoids the liability of springing it. Either 110 or 220 volts, direct current, is suitable for the chuck and can be supplied through a connection made directly to a lamp socket. If direct current is not available, a small generator is furnished, which can be placed wherever convenient, and the wires brought to the grinder. The chuck takes no more current than an ordinary lamp. The magnetic chucks are made in three sizes, 8⅝, 10⅝ and 12⅝ in. diameter. A plain chuck is furnished for brass, copper, hard rubber or work of other nonmagnetic material, or if the magnetic chuck is not wanted. This chuck may be had with three or four jaws, as preferred.

The head which carries the wheel is adjustable to incline the spindle from the horizontal, so that work may be ground thicker or thinner at the center than at the circumference. This is necessary, for example, when grinding saws and cutters. The head may be advanced at three different speeds, giving the feeds best adapted to roughing and finishing. The spindle is provided with adjustable bushings, for taking up the wear, which are protected from dust to keep the bearings in perfect condition. The feed is automatic, but can be operated by hand when necessary. The wheel is 8 in. diameter, ¾ in. thick and has a 2-in. hole. All handles and dogs for adjusting the grinder to the work are on the side nearest to the operator. The machine occupies a floor space of 26 x 45 in., is 46 in. high to the center of the wheel spindle and weighs 1300 lb. The greatest distance from the center of the wheel to the chuck is 12 in. As the machine is driven directly from a line shaft no countershaft is required. The intended speed of the driving shaft is 450 rev. per min.



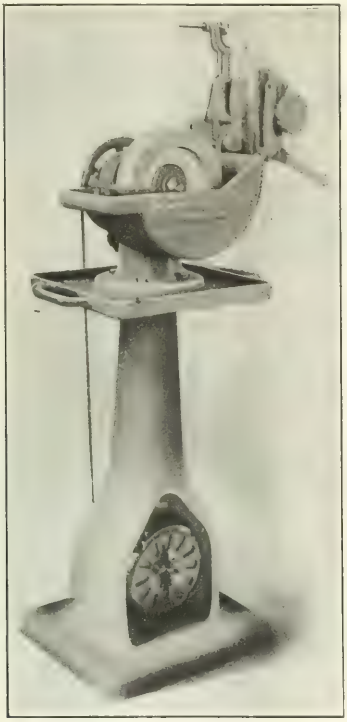
The New Automatic Ring Grinder Built by the Saxon Machine Company, Holyoke, Mass.

A Thermit Periodical.—The Goldschmidt Thermit Company, 90 West street, New York, has just begun the publication of a quarterly periodical known as *Reactions*, devoted to the science of aluminothermics. Its function will be to acquaint those concerned with the operation of foundries, manufacturing plants, railroads and others with the many improvements constantly being developed in connection with the applications of thermit, particularly in the making of repairs. It will invite inquiries and publish answers regarding the processes. The leading articles in this first issue are "Rail Welding," "The Influence of Nitrogen on Iron and Steel," "Recent Improvements in the Thermit Welding Process," "Important Repairs Made by the Process in 1907," "Applications of Thermit in Railroad Shops," "The Evolution of a Motor Case Repair," "Tests of a Thermit Weld," "Thermit for Military Purposes," and "Annealing Spots in Armor Plate." The publication is about 8 x 10¾ in. in size and contains 24 pages.

The Mummert, Wolf & Dixon Scraper Sharpener.

The old method of sharpening a scraper, by rubbing it over an ordinary oilstone, requires not only considerable time, but experience, so that the scraper when sharpened will take hold of the surface being scraped. To accomplish this work quicker and more accurately the Mummert, Wolf & Dixon Company, Hanover, Pa., has designed a motor driven revolving oilstone scraper sharpener, shown in the accompanying engravings. The machine will grind the face perfectly straight or slightly convex, if desired, or by holding the scraper on the periphery of the stone and nearly tangent to it the sides may be concaved, giving two acute angle cutting edges, which cut very freely. By the hand method of sharpening this was not possible, as the angles had a tendency to become obtuse, and if not held at the proper angle the tool would not take hold on the surface to be scraped.

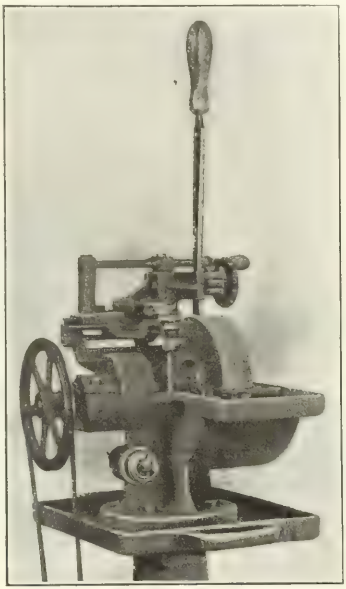
The tool to be ground is held in an attachment comprising a vise which is attached to compound slides, and



The Self-Contained Motor Driven Scraper Sharpener Built by the Mummert, Wolf & Dixon Company, Hanover, Pa.

by the use of the hand lever the vise and scraper may be moved parallel with the wheel and laterally across its face. By these two motions the wear is evenly distributed over the whole face of the stone. To enable the scraper to be quickly and accurately set in the vise there is a small platform provided, which is always in line with the face of the wheel and parallel with the lines of motion of the two slides. Therefore, to set the scraper it is only necessary that the vise be pushed back over the platform, the scraper placed in the vise and clamped by means of a small hand wheel, when the vise is again moved laterally over the wheel and grinding proceeds. The feed is regulated by an adjusting screw on an arm at the front of the holding attachment. This attachment is hinged at the back, so that it may be swung out of the way for doing other kinds of grinding, such as the sharpening of cutting tools.

The oilstone wheel in this machine runs in a bath of kerosene oil, which prevents heating of the tool, and keeps the surface of the wheel clean and sharp. The wheel is driven through a set of spur gears, having a ratio of two to one. The drive as shown in the illustration is by a motor, placed in the hollow base of the pedestal. This is of ⅛-hp. and is furnished for use with either direct or alternating current. It is usually supplied from an electric light circuit through an ordinary lamp socket at the back of the machine. A small snap



Detail of the Scraper Sharpener Head as Set for Honing the End of a Scraper.

switch for starting and stopping is conveniently located at the front of the machine, within easy reach of the operator.

The machine can also be furnished with pulley and countershaft for belt drive, if so desired. While the machine is heavy enough to be firm it is not too heavy to be easily transferred from place to place, and is provided as shown with handles on either side of the bed plate, so that two persons can move it readily.

The Mount Union Silica Brick Company.

The general sales office of the Mount Union Silica Brick Company, which has been maintained in the Park Building, Pittsburgh, has been transferred to the works at Mount Union, Pa. W. H. Hill, who has been the general sales agent, is no longer connected with that company. This change in the personnel of the sales organization and in the location of the sales offices should not be construed to mean a reduction of the company's organization or efforts. It was made as a part of a policy of concentration and centralization, which policy, the company is confident, will also benefit its trade, as it places the entire responsibility of manufacture and distribution under the one central management.

The plant has been in successful operation for six years and during that period its product has grown in the esteem of all users. The sales having steadily increased, the plant has been enlarged and maintained on a thoroughly modern scale to permit an output sufficient to insure prompt shipments. The company carries at all times a large stock of regular sizes, together with the most generally used special shapes. When large orders of special shapes are required the company's facilities are such that it can make and ship the goods in the minimum time. All communications from this time should be sent to the Mount Union Silica Brick Company at its general office and works, Mount Union, Pa.

Hart's Buckeye Die Stock.

The distinctive features of the Buckeye pipe threading die stock recently brought out by the Hart Mfg. Company, Cleveland, Ohio, are the form of the dies, the provisions for adjusting them, and automatically releasing them, and the die leading device and cutting-off attachment.

The dies are of the chaser form, and are made to cut easily by being formed with a short cutting edge. They automatically recede radially as they are advanced on the pipe, which makes it possible with such short edges to produce threads having the taper necessary for pipe joints. The remarkably small amount of power needed for working these dies is due principally to the reduced friction between them and the metal being cut, as compared with that accompanying the use of dies with cutting edges of the usual length equal to the length of the taper threads desired. The cutting edges are also so made that the dies will do their work without the aid of a leader screw. Each of the dies is a plain, flat piece easily removed from the tool, and as readily sharpened as an ordinary chisel by grinding its edges. The dies themselves and the stock allow a wide range of diameters to be covered by one set. For example, a single set is used for cutting 1, 1¼, 1½, and 2 in. pipes, which avoids frequent changes and the care of additional parts. The adjustability afforded allows for varying the size cut either larger or smaller than standard.

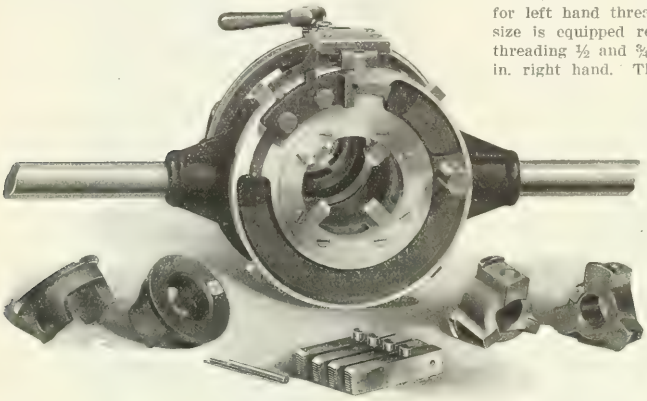


Fig. 1.—The No. 23½ Buckeye Die Stock Made by the Hart Mfg. Company, Cleveland, Ohio

As soon as a sufficient length of thread has been cut the dies release themselves from the work. A slight turn of the controlling cam plate by hand then retracts the dies enough to clear the thread while the tool is being removed without turning it backwards over the thread. To cut a duplicate thread the dies can be instantly reset by turning the cam plate until two parts are brought into contact, one of which acts as a stop. No clamping is necessary in this operation.

Instead of a leader screw ordinarily used with the narrow expanding style of dies, a leader ring has been adopted which starts the dies without hand pressure to force them on the pipe. The thread cutting that the tool is capable of doing is thus not limited simply to threads of the same pitch as with a leader screw, nor to one direction of lead. To adapt a tool to the cutting of left handed threads the leader ring is released from engagement by moving a screw. The dies can then be started by hand pressure. After a thread has been finished, no reversing of the dies is necessary nor screwing apart of pieces, as there is with a leader screw. Neither is there the wear to contend with that occurs to a leader screw and is ordinarily as much to be watched as that of the cutting edges of the dies.

A cutting-off attachment can be clamped on the tool when desired. It does its work smoothly and with moderate speed, cutting the ends square and clean without leaving a burr on the inside or outside. The cutter is in full view of the operator, and can be quite readily detached for grinding.

The supplying of lubricant for the dies during their cutting is amply provided for by pockets for injecting the oil, besides which there are pockets in which it is caught as it drips from the work, and is repeatedly poured on the dies and the work. For threading nipples or short pieces of pipe nipple holders may be inserted in the tool.

At present the die stocks are made in two sizes, No. 23 having a range of from 1 to 2 in. pipe, and No. 23½ from ½ to 2 in. pipe. The first is equipped with one set of dies that threads 1, 1¼, 1½, and 2 in. right hand, and weighs 29 lb. It is furnished either with or without the cut-off, and with extra dies for cutting extra sizes or for left hand threads when so ordered. The No. 23½ size is equipped regularly with two sets of dies, one threading ½ and ¾ in., and the other 1, 1¼, 1½ and 2 in. right hand. This stock weighs 31 lb., and is also provided when so ordered with cutting off attachment and extra dies for either right or left hand. Special dies can be supplied for bolts and plumbers' drawn brass pipe, and when required, dies for threading 1¼ in. English pipe.



Fig. 2. One of the Removable Dies.

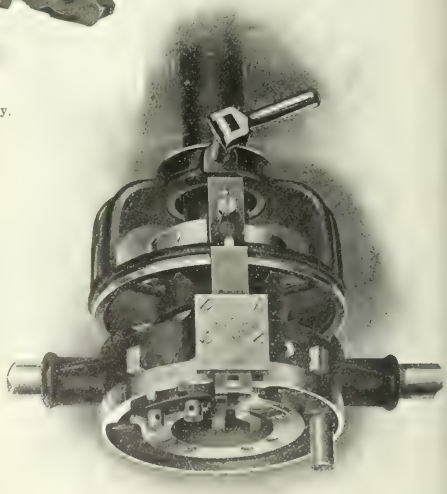


Fig. 3.—A Top View of the Stock Ready to Thread.

A general view of the die stock which also shows bushings and extra chasers is given in Fig. 1, and a detail of one of the chasers in Fig. 2. A view from above, when the stock is ready to thread, is given in Fig. 3, and Fig. 4 shows the leading device and Fig. 5 the stock equipped with the cutting-off attachment. The construction is well shown in the line drawing, Fig. 6.

In the working of the tool the outward pressure of the chaser dies operates to turn the cam plate *g*, Fig. 6, in a clockwise direction, and by properly controlling this movement by the contact of the helicoidal surfaces of

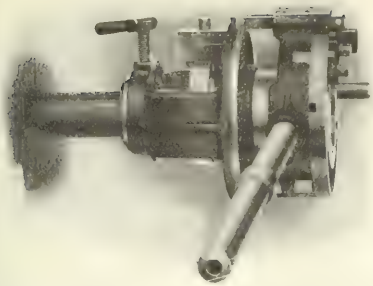


Fig. 4.—A Side View of the Stock, Showing the Leading Device.

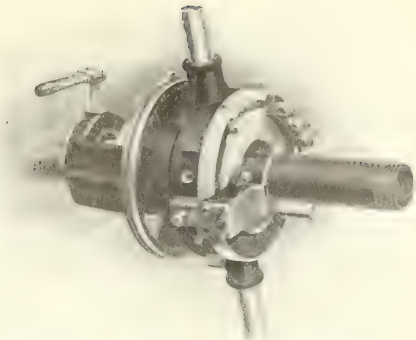


Fig. 5.—A Stock Equipped with the Cutting-off Attachment.

the stop *e* and the dog *l* the dies are allowed to expand as they screw on the pipe at a rate which produces a thread of correct taper. When the body *a* is located properly in the frame *b* to begin the threading, the pin at the right in the plunger block *j* is in contact with the leader ring *k* at the most depressed point on its right or front edge. It is possible then to only revolve the body in one direction, the proper one for the thread that is to be cut. The function of the leader ring, a detail of which is shown at the left in Fig. 6, is simply to aid the starting of the thread; it performs all of its work during the first revolution of the body or die head. When the body has almost completed one revolution the plunger at the left of or behind the ring mounts upon an incline on the ring's rear edge and disengages from that edge.

At this instant the hardened pin is at the highest point of the front edge of the leader ring. On further revolving the body contact between the pin and the leader ring discontinues and the plunger rides around on the cylindrical surface of the leader ring until it drops down in front of the ring. From this position it can be slipped back over the ring, when it snaps down behind the ring, the action being similar to that of a spring latch, due to the bevel surfaces on the front edge of the ring and the rear of the plunger and the helical spring coiled around the plunger.

In using the die stock the body *a*, Fig. 6, is first properly positioned in the frame *b* by turning it so that the rider bar *c* is in line with a boss at the top of the frame, and then it is pulled forward out of the frame as far as possible. The stop *e* is then clamped so that the mark on the boss *f* is in line with the mark opposite the figure denoting the size to be threaded, after which the cam plate *g* is turned until the stop touches the dog *c* which should be thrown down in its way. A bushing, *h*, of proper diameter should be placed in the rear of the frame. The tool is next put on the pipe with the rider bar above the center and pushed back so that the pipe enters the dies as far as possible, when the set screw *i* is tightened. While threading is being done the dies are lubricated by injecting lard oil into holes through the body. When the dog slips past the end of the stop and the dies have released themselves from cutting they are opened by turning the cam plate slightly. Finally the body is brought to starting position again before the set screw *i* is released and the tool removed.

Where a few left hand threads are to be cut it is simply necessary to remove the plunger block *j* and proceed as in cutting right hand threads, except that a little pressure is required on the front of the body to make the dies grip. A leader ring, *k*, for left hand threads can be supplied if desired. To cut straight threads, that is without any taper on the pipe, the frame *b* is allowed to revolve with the body *a* and the clamp screw *i* is not set. To remove the dies the screws on the stop *e* are first loosened, and the dog *c* swung out of the way of the stop, then turning the cam plate *g* so as to open the dies as far as possible allows them to be withdrawn. The handles are made with two sections so that when a great leverage is not required, as on small pipes of ½ or ¾ in., only the inner end pieces need be used.

The cutting-off attachment is used as indicated in Fig. 5. During its use blank dies are inserted in place of the cutting dies, and the stop *e* of Fig. 6 is set as in threading. The plunger block *j* is removed, and with the dog *c* turned to point toward the center of the tool the body *a* is positioned in the frame *b* so that the outer end of the stop just catches the dog. The tool is then slipped on the pipe, and when the cutter is screwed out and set where the cut is to be made the frame is pushed backward until the dog wedges tightly on the surface of the stop, then the set screw *i* is tightened. The cut is made by feeding lightly with the hand wheel shown, care being taken to turn the stock around the same as when cutting right hand threads. The cutter is sharpened by removing the cover plate of the attachment and grinding the surface on the end of the cutter, keeping the angle with the top edge as it was originally.

The Ellwood Ivins Tube Works, maker of seamless steel tubing, whose mills and general offices are at Oak Lane Station, Philadelphia, has recently opened an office at 315 Chamber of Commerce Building, Chicago, to look after its Western business. The company still continues its established New York office at 487 Broadway and its English branch at 13 South Hampton street, London.

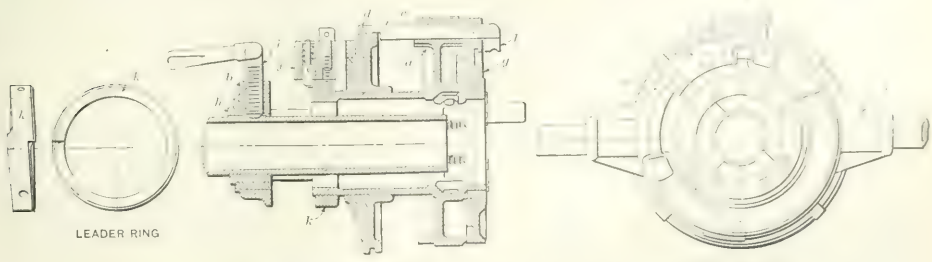


Fig. 6.—Constructional Details of the Buckeye Die Stock.

The Analysis of Blast Furnace Tuyeres and Similar Castings.

BY M. ANDERSON, PITTSBURGH.

The methods here given are supposed to be new, as they represent considerable experimenting by the writer. For the analysis of blast furnace tuyere metal, dissolve the drillings, one-half grain, in just enough 1 to 1 nitric acid to effect solution, using a 100 c. cm. capacity glass beaker. Evaporate off the dark fumes and add 5 c. cm. concentrated sulphuric acid, letting it run down the sides of the beaker into the nitric acid solution to avoid violent action. Now evaporate to white fumes of sulphuric anhydride. Remove from heat, allow to cool and fill the beaker half full of cold water, stirring well to get the copper sulphate dissolved. Possible lead sulphate will appear as a fine white precipitate. Possible tin will be in solution, as sulphuric acid dissolves metastannic acid. When the copper sulphate is all broken up and in solution, filter off the lead sulphate on a dense paper, previously dried and weighed, washing with 2 per cent. sulphuric acid and receiving the filtrate in a 600 c. cm. capacity beaker. Dry at 110 degrees C. and reweigh after all moisture is gone. The increase multiplied by 2 then by 68.3 gives the per cent. of lead.

To the filtrate introduce for 15 min. briskly hydrogen sulphide gas generated in a filtering flask, using blast furnace slag dissolved in hydrochloric acid. Allow the precipitates of copper and tin (sulphides) to settle and filter on a soft paper (15 cm. diameter), washing several times with water and receiving the filtrate in an 800 c. cm. capacity beaker, setting the solution on heat and boiling off the hydrogen sulphide gas. The precipitates of tin and copper are dissolved in nitric and hydrochloric acid in the following manner:

A 250 c. cm. capacity beaker is placed under the funnel and a hole is punched in the paper and precipitates washed through with hot water, using as little as possible. Then pick up the paper with the fingers, open out and wash the rest into the beaker. The stain left is immaterial. Now introduce concentrated nitric acid to beaker little by little until all copper is dissolved. Place on heat and boil hard; then add enough hydrochloric acid to dissolve the tin precipitate, when the solution becomes clear. Add about 10 c. cm. concentrated nitric acid and evaporate off hydrochloric acid, at which point, with an excess of nitric acid, metastannic acid separates out. Evaporate to just short of dryness, remove, add hot water to half fill the beaker, allow the residue to settle and filter on a dense paper, washing with hot water. The filter and contents are placed in a porcelain crucible and dried, charred, burned and ignited in a strong heat to stannic oxide. Its weight multiplied by 2 and then by 78.8 gives the per cent. of tin. The filtrate is the copper in solution. As copper is determined by difference it is not needed.

The solution boiling contains possible iron and zinc. Use ammonia to excess and throw down ferric hydroxide, boil, allow to settle, filter on soft paper, catching the filtrate in a 1000 c. cm. capacity beaker. The precipitate and paper are burned in a porcelain crucible over a bunsen flame to ferric oxide, which multiplied by 2 and then by 70 gives the percentage of iron. The filtrate from the precipitate of iron is made acid with a few drops of sulphuric. Then add 30 c. cm. of a cold saturated solution of sodium and ammonium phosphate. Heat to boiling and precipitate zinc ammonium phosphate by adding ammonia water slowly to slight excess while the solution is stirred constantly. Continue boiling and stirring until the solution is as near as possible to the exact point of neutrality. Let settle, wash with hot water until free from phosphoric acid; use a dense paper previously dried and weighed and dry the precipitate at 110 degrees C. The increase in weight multiplied by 2 then by 36.49 gives the percentage of zinc.

Notes.

Good judgment is required when reporting the amount of iron, whether impurity or contamination, on a discarded casting. Considerable iron is present, put there by the furnace. If the analyst drills the sample he should either clean the surface with acid or drill deep, brushing away the first drillings.

Tin in the presence of iron solution is sometimes soluble or partly so in nitric acid; also very difficult or impossible to filter, metastannic acid going through the paper. So dissolving the metastannic acid in sulphuric, precipitating as stannic sulphide with cupric sulphide, dissolving both in nitric and hydrochloric, evaporating low with the excess of nitric acid to separate out the metastannic, and then determining as stannic oxide, are the features of the method especially recommended for tuyere analysis and similar bronze and copper castings used at a blast furnace.

It is hard to dissolve cupric sulphide by nitric in the cold, so boiling is necessary, when finally all will go in solution. Only add the hydrochloric after the cupric sulphide has been dissolved.

Report the analysis to add up between 99.80 to 99.90. There is always a little oxide in the metal; also phosphorus, probably. If this determination is asked for dissolve 0.815 gram in 30 c. cm. 1 to 1 nitric, using a 500 c. cm. capacity Erlenmeyer flask. Boil off dark fumes; add a little saturated solution potassium permanganate sufficient to oxidize the phosphorus. Then add hydrochloric acid drop by drop to clear the solution, and dissolve the metastannic acid. Finish as if pig iron, weighing the yellow precipitate direct after drying.

A New Steel Deoxidizer.

The influence of manganese, silicon and aluminum in the prevention of blowholes and in the deoxidizing of steel is well known and generally admitted. One of the chief causes of the formation of blowholes is due to ferrous oxide present in the molten metal. It has been found by careful experiments that the deoxidizing action of manganese, silicon and aluminum is more thorough and gives more uniform and satisfactory results when these metals are added to the molten steel in the form of a triple alloy of special composition. The same results cannot be obtained by adding these metals singly or in the form of ferroalloys. Many works attempt the complete deoxidization of steel by adding proportions of ferromanganese, ferrosilicon, or a manganese silicon alloy and aluminum. The composition of these alloys varies considerably, and the results obtained are by no means satisfactory.

For many years a silicon, aluminum and manganese alloy has been manufactured by an English firm, Geo. G. Blackwell, Sons & Co., Ltd., of Liverpool, and this alloy is being extensively used. This firm has recently patented and is now introducing for high grade steels a much more powerful combination of these three metals, which is of the following approximate analysis:

	Per cent.
Manganese	58
Silicon	25
Aluminum	15
Iron	2
Carbon	0.20 to 0.30

The firm states that this combination alloy can be used in all classes of steel, and will be particularly advantageous for the manufacture of high grade steel castings. In practice it is found that the addition of 350 to 375 g. of the alloy is sufficient to deoxidize completely 100 kg. of open hearth steel. To do the same work with 80 per cent. ferromanganese about 1.5 kg. of that alloy would have to be added, and one third of this, say, about 0.5 kg., would remain undecomposed in the steel in the form of double carbides of iron and manganese.

The Standard Building Construction Company, 828 Fulton Building, Pittsburgh, has recently completed the erection of a plant of concrete construction at Neville Island, near Pittsburgh, and is now operating it. This plant is designed on the most approved lines and contains the latest motor driven machinery for the manufacture of standardized concrete building material, including concrete joists, sills, concrete protection and other products required in building construction.

A Transfer for Rolling Mills.

A rolling mill transfer system, one form of which is to be installed in the rail mill of the Indiana Steel Company at Gary, Ind., has been patented by K. C. Gardner of the United Engineering & Foundry Company, Pittsburgh. The illustrations show the application of the invention to the side transfer of metal from one roller table in line with a rolling mill pass to another roller table at a higher level, arranged to feed the metal to another pass. Fig. 1 is a cross section and Fig. 2 a partial plan view. The plain faced rollers of the table on the lower level are shown at *a*, and *b* represents the parallel rollers of the table, these being provided with grooves, as shown. The rollers are driven by the shafts brackets secured to a rock shaft, *n*, capable of moving endwise in its bearings. The rollers *b* are shown with grooves for feeding three passes, and the bottom of the guideway is made in three parts, any one of which may be dropped so that the dog may fall and the piece be thus disengaged at this point. These bottom sections are kept closed by lugs which rest on projections. In releasing any bottom section the corresponding shaft *n* is rocked to raise the lug off its projection. The shaft is then moved endwise a short distance, so that the lug clears the end of the projection and the door falls by gravity, the metal being thus deposited at the desired point. The travel of the chains may be stopped by the operator until the next section arrives on the roller table *a*, when the chains are started in motion and the next dog engages the piece. If desired the bottom sections of the chain

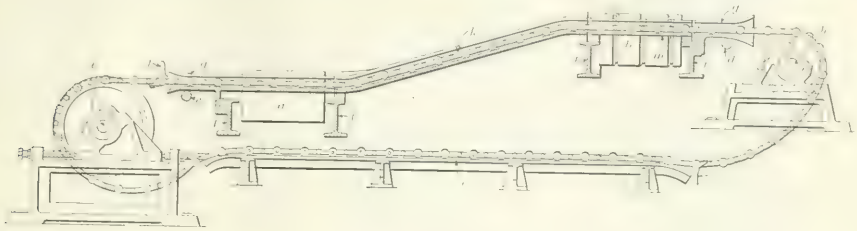


Fig. 1.—Cross Section of the Gardner Transfer System for Rolling Mills.

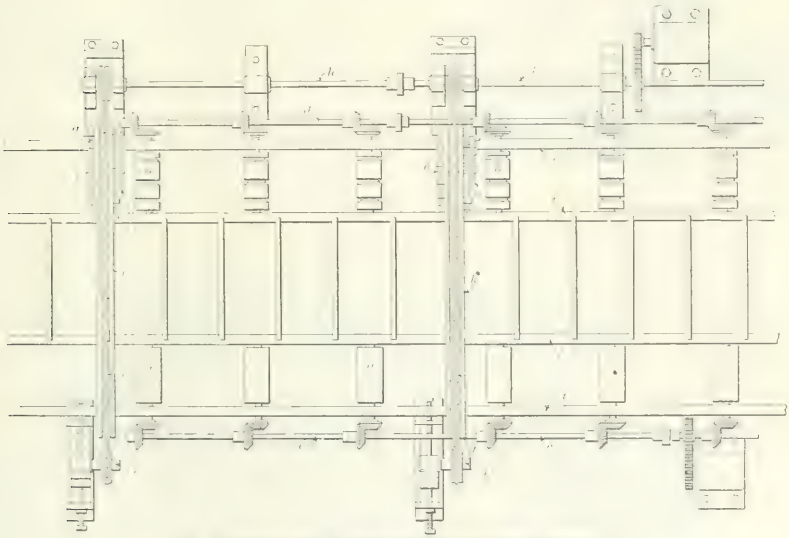


Fig. 2.—Partial Plan View of the Gardner Transfer System.

c and *d*, having bevel gear connections with the shafts of the table rollers. The sprocket chain *e* has for its upper guideway two channel shaped sections with wide lower flanges which project toward each other. The channels are supported on the side I-beam members *f* of the roller tables and terminate in bell shaped castings at each end. The sprocket wheels are mounted on shafts *h* and *i*, adjacent to the delivery table. In its lower path the chain is supported on a guide, *j*, while the rollers carrying it travel between the flanges of the beams *k*.

In the operation of the transfer the piece is engaged by the dog *l*, which is in the form of a bell crank pivoted to the chain pin between two of the links and connected by a cross bar below them. This prevents the dog from swinging forward beyond its upright position, and this position is maintained except where the inner flanges of the channel track of the chain are cut away for depositing the piece. The bottom of the track through its delivery portion between the rollers *b* is cut away, being made in separate sections or doors, *m*. These are carried on channel may be grouped between the two roller tables and the dogs used to feed to one side of the group and take away from the other side. Other modifications may be made, moreover, by providing the removable floor sections or dog supports where it is desired to stop the metal, or the dog supports may be cut away if no adjustment is desired. It is possible also to employ the apparatus for hot bed or other side transfer service.

Metal gaskets made so that they can be cut in the shop to fit any kind of a union have recently been put on the market by the U. S. Indestructible Gasket Company, 16 South William street, New York City. These gaskets, which are made of a lead composition, are made in rolls up to 84 in. in width and 1-32, 1-16 and 3-32 in. in thickness. Gaskets can be cut to fit irregularly shaped unions such as are used for ammonia and hydraulic work. They will withstand a pressure of 6000 lb. to the square inch and a temperature of 800 degrees F.

The Wilmarth & Morman No. 2 Surface Grinder.

A new type of grinder which may be furnished simply for surface grinding, as in Fig. 1, or with cutter, reamer, and drill grinding attachments, as in Figs. 2 and 3, is manufactured by the Wilmarth & Morman Company, Grand Rapids, Mich. The surface grinding table may be had with hand feed only, or with both hand and automatic feed, for the longitudinal movement only or for both the longitudinal and the traverse movements. Where the grinder is furnished as a plain hand feed machine, longitudinal movement is through a plain rack and pinion type of feed which is operated by the hand wheel at the left of the front of the knee. The transverse movement is effected by a screw indexed by thousandths, with a ball crank handle at the right of the front of the knee, and the vertical adjustment, indexed by one-half thousandths, is operated by the hand wheel at the right of the knee in connection with bevel gears driving the elevating screw, which works in a bronze nut. The weight of the knee is largely carried by ball bearings on the elevating screw and is thus removed from the column bearings.

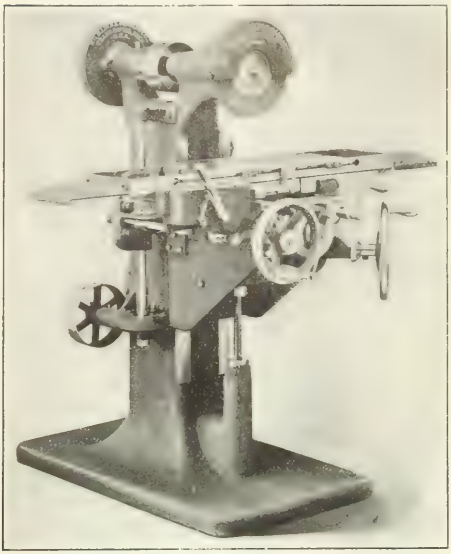


Fig. 1.—The New Wilmarth & Morman Grinder Equipped for Plain Grinding.

The transverse automatic feed is applied or released by a friction device operated by the small knurled hand wheel in the center of the large longitudinal feed wheel. This feed may be arranged to operate in either direction, at the will of the operator, who also has full control over the amount of feed. When automatic feeds are used the drive is by bevel gears with a reversing clutch on the vertical shaft at the left side of the machine. The clutch is counterbalanced to make it work more freely. The reversing mechanism is mounted on the front left end of the saddle, and its lever may be placed to hold the clutch in neutral position when the hand feed is being used. Fig. 4 shows the tripping mechanism actuating this clutch, the inclosing case being removed.

The cutter and reaming grinding attachment, which is secured on the table by two bolts, gives a capacity for large face mills, small angle cutters, reamers of all kinds, and milling cutters, including face and side mills up to 13 in. in diameter, which results in a universal type of cutter and reamer grinder which can be manipulated conveniently and quickly.

The New Yankee drill grinding attachment can also be supplied for grinding drills of any range of sizes, and is attached to an extension at the rear of the spindle where it does not interfere with the use of the surface grinder, thus one operator may do surface grinding while another is sharpening a drill.

The spindle is of crucible steel, ground and lapped, and is supported close to the wheel to avoid spring or overhanging strain and eliminate vibration. The two-step spindle cone pulley is turned inside and outside to secure perfect balance. Fig. 5 gives a sectional view of the spindle construction. The bearings are of phosphor-bronze, 8 and 5 in. long, respectively, and 2 in. tapered to 1½ in. in diameter. They have convenient means for adjusting either box independently. The housings for the boxes are bored in the main column casting which insures perfect and permanent alignment of the spindle bearings. This is important, as all working surfaces are trued to proper relation with the spindle. Making the spindle bearings integral with the frame provides a rigid spindle design, obviously preferable to split boxes, babbitted bearings and constructions in which the spindle bearings are carried by attached parts.

The saddle is 36 in. long, thus giving a liberal bearing for the table. The front bearing is a sharp V-way, while the rear bearing is broad and flat. A gib at the rear of

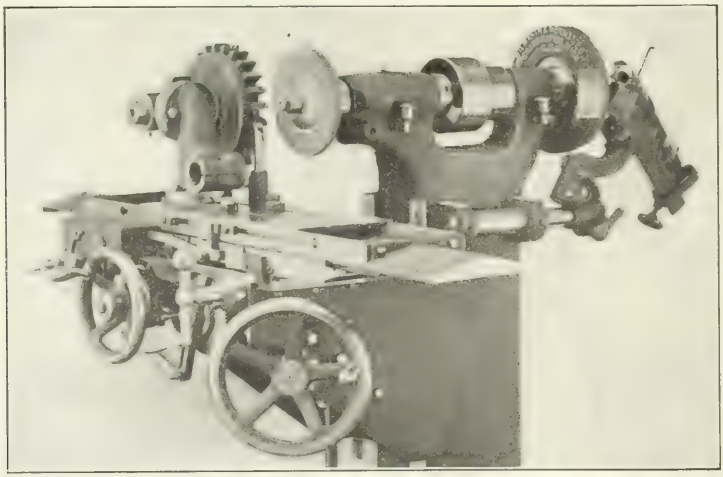


Fig. 2.—The Machine Equipped for Grinding Milling Cutters, Showing Also the Drill Grinding Attachment.

the table effectively prevents tipping even when an excessive load is placed on the overhanging end of the table at its extreme limit of travel.

The table is 8 x 50 in. in size, and has a working surface of 8 x 20 in., the 20 in. length of travel being carried, as mentioned, by a 36-in. length of saddle. The machine is intended to use a 10-in. wheel for ordinary

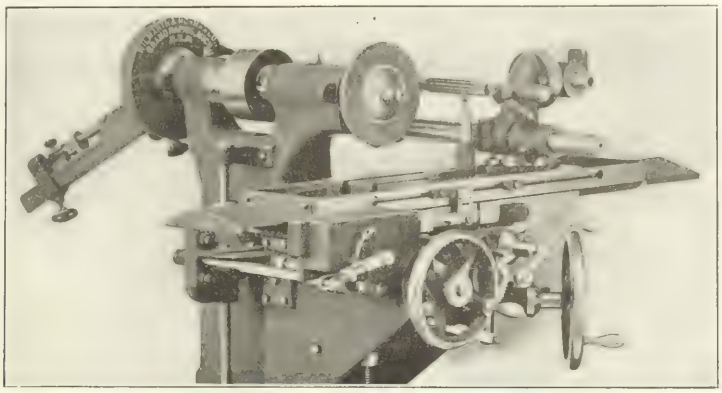


Fig. 3. The Machine Equipped for Reamer Grinding, Also Showing Drill Grinding Attachment.

surfacing work, and a 7-in. wheel for cutting and reamer grinding, or surface work where circumstances make it preferable. The two steps of the spindle driving cone are proportioned for proper speeds for either the 7-in. or the 10-in. wheels. With the small wheel work up to 13 in. high may be accommodated, and with the large wheel work up to 11½ in. high.

Lubrication has been given careful attention. The oil chambers are large and supply the bearings with oil through felt wicks by capillary attraction. Surplus oil that may run to the front of the taper bearings is re-

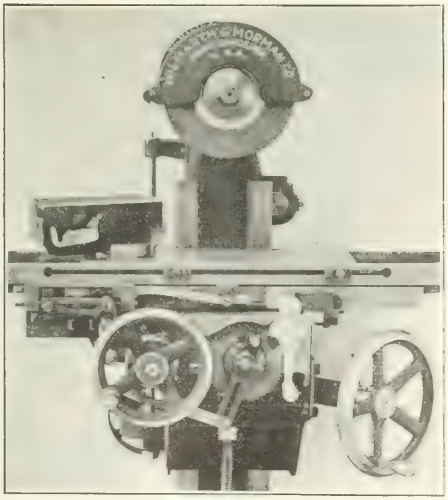


Fig. 4. Front View, Showing the Feed Reversing Mechanism with Cover Removed.

turned to the oil chambers by small channels. All gears are shrouded, and the gears, ways and bearings are protected from dust and dirt.

The Proposed Copper and Brass Institute.—The movement in England to form a copper and brass institute appears to be proceeding with promise of success. A large meeting of copper and brass manufacturers was held in Manchester, March 10, at which the proposition was thoroughly discussed. Quite a number of letters were received from others unable to attend, all of which were in support of the project. It was decided that, while the sentiment of the meeting was favorable to the formation of an institute, it was desirable that before entering upon its definite constitution manufacturers, large users, consulting engineers and scientists should be further ap-

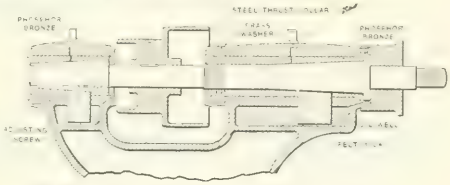


Fig. 5.—Sectional View of the Spindle Construction.

proached. A later meeting was, therefore, called in London on June 10 for a final decision as to the feasibility of forming such an institute. Dr. Carpenter, professor of metallurgy at the University of Manchester, has consented to become the secretary *pro tem* of the proposed institute, and will be pleased to receive letters on the subject. The society, if formed, is to be cosmopolitan in membership and not confined to Great Britain. It is stated that the project has already secured the support of many leading Continental metallurgists and scientists.

The Pennsylvania Railroad Claim Department.

To promote greater promptness in settlements, the Pennsylvania Railroad Company has increased the force employed in its claim department. Instructions have been sent to all freight agents, directing them to give prompt attention to claims, division freight agents being empowered to settle small claims, which are obviously proper, with cash instead of waiting to have them audited and paid through the general office. Considerable extra work devolves upon the claim department because, under the Hepburn law, it is more than ever necessary to make certain that a claim is just and true, and that there is no possible element of an improper refund involved.

As the principal delays occurring in the past have been in cases where it was necessary to make investigations through other railroads, a new system has been devised whereby correspondence shall hereafter be with agents of foreign roads instead of through the circuitious method of first addressing head officers. Delays have also occurred through the loss of papers, which were being sent from point to point, but hereafter all papers will be retained at the main office, and only a brief of the claim sent out. This will be highly pleasing to shippers and often save friction and bitterness. As an additional measure to secure promptness, a special set of men has been detailed to trace and keep claims moving, and to see that when delays occur, the cause is ascertained, and if possible removed.

The Norka and Economy Drills and Chucks.

The Whitman & Barnes Mfg. Company, Chicago, Ill., maker of the Diamond carbon and high speed twist drills, has brought out two new types of drills and chucks, here illustrated. The Norka high speed twist drill, Fig. 2, and chuck, Fig. 1, are the latest, having been but recently perfected. This drill, instead of being mill grooved in the usual way, is formed flat and twisted while hot. It is contended that by this process the grain of the steel is undisturbed, and that the steel is strengthened rather than impaired by this treatment. While it is not claimed that the extreme accuracy to be obtained by machine grooving is as yet attained by the twisting process, it is so closely approximated that for all ordinary uses the variation is imperceptible. The cost of manufacturing being somewhat lessened, the new drills can be sold at a moderate prcie.

The Norka drills are formed with correct clearance, are ground to size and are said to satisfactorily stand the rough usage incident to indiscriminate shop service. They are ground like other twist drills including the nicking of the center web. A flat shank beaded to fit corresponding grooves in the jaw of the chuck takes the place of the ordinary taper shank, and effectually prevents turning in the socket and breaking of tangs. The drill is centered at the top by a steel plug, and is securely locked in the grooved jaws with a clamping nut. Both the jaws and the centering plug are removable, and when taken out, the chuck can also be used for taper shank drills; but to protect the thread, the clamping nut should be replaced when using taper shank drills.

The Economy high speed flat drill, Fig. 3, and chuck, Fig. 4, are designed for extremely heavy feeds at rapid speeds in hard and tough high carbon steels, such as steel rails, arch bars, tool steel and steel castings. This drill is especially adapted to shallow drilling where the depth of hole runs from 1 to 3 in. Being tempered so that almost the entire length of the drill may be used there is little waste of material. It is recommended that in grinding care be exercised to keep the centerpoint as thin or narrow as on twist drills. In the special Economy chuck provided for the flat drills, grooved jaws similar to those of the Norka chuck are used. The upper end of the drill is fitted in a recessed plug which is held in place by a retaining pin inserted through holes in the barrel of the chuck as shown. There are two sets of holes at right angles to each other and staggered, bringing them close enough for all adjustments. The pin when inserted is retained by a sliding sleeve fitting over the perforated barrel. With the adjustments provided the projecting length of drill may be made as short as the work allows, reducing the torsional strain on the drill and permitting a high rate of speed without danger of breaking.

The Norka twist drills are made in all the usual sizes, from ⅜ to 2 in. diameter, with chucks of corresponding size; the Economy flat drills and chucks to accommodate them are furnished in sizes from ¼ to 3 in. diameter and in lengths up to 15 in.

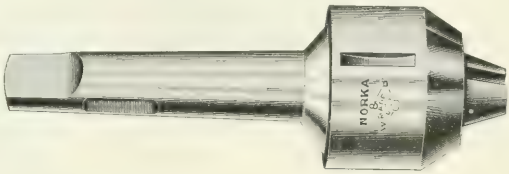


Fig. 1.—The Norka Drill Chuck.

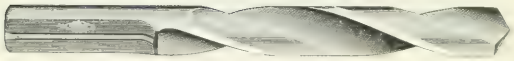


Fig. 2.—The Norka Twist Drill.



Fig. 3.—The Economy Flat Drill.



Fig. 4.—The Economy Drill Chuck.

New High Speed Drills and Chucks Made by the Whitman & Barnes Mfg. Company, Chicago, Ill.

The Growth of Our American Trade.

Trade of the United States with its American neighbors in 1907 amounted to nearly $1,000,000,000, against a little more than a third as much a decade ago, as shown by the figures of the Bureau of Statistics, Department of Commerce and Labor. To be more accurate, the total exports to all America (including in this term our own noncontiguous territories of Porto Rico and Alaska) amounted in 1907 to $490,000,000 and the imports therefrom to $448,000,000, making a total of $938,000,000. A decade ago the exports to all America were, as nearly as can be stated, $163,000,000 and the imports therefrom $205,000,000, making the total volume of trade $368,000,000, though these latter figures in 1897 do not include the trade with Alaska, which was not then recorded.

This indicates an increase of 200 per cent. in the exports to our American neighbors in the decade, and of about 120 per cent. in the imports therefrom. During that time the exports to Europe increased less than 50 per cent. and the imports therefrom 80 per cent.; exports to Asia increased 140 per cent. and imports therefrom 130 per cent.; exports to Oceania increased 109 per cent. and imports therefrom 25 per cent., while to Africa exports showed an increase of but 13 per cent. and imports therefrom increased 138 per cent.

Manufactures form a larger percentage of the merchandise exported to the American countries than most of the other sections of the world. To Canada manufactures formed 62 per cent. of the exports, basing this statement upon the official figures for 1906, the latest now available; of the exports to Mexico, manufactures formed 70 per cent. of the total; to Cuba, 55 per cent. of the total; to Argentine, 98 per cent. of the total; to Brazil, 83 per cent. of the total. Of the exports to North America as a whole, manufactures formed, in 1906, 62 per cent. of the total; South America, 86 per cent.; Europe, 27 per cent.; Asia, 75 per cent.; Oceania, 85 per cent., and Africa, 66 per cent.

The Conciliation and Arbitration Board governing the Scotch iron trade has agreed on a reduction in wages of 7½ per cent. on account of the decrease in the iron business.

The Wells Cutter and Reamer Grinder and Bench Centers.

Two new products of the F. E. Wells & Son Company, Greenfield, Mass, are illustrated in the accompanying engravings, Fig. 1 being a self-contained motor driven cutter and reamer grinder and Fig. 2 a set of bench testing centers.

As shown, the cutter and reamer grinder has a double countershaft for circular work, such as arbors, &c., and can be furnished with a complete universal equipment. The spindle is driven direct from the motor shaft, and the other end of the motor shaft drives the overhead drum, which in turn revolves the work for circular grinding by means of a small round belt. An idler which does not show in the engraving is used to keep the belt from the drum to the circular centers always at the right tension, regardless of the position of the carriage. The motor is placed where it allows the table to be swung to present the work at any angle to the wheel without interfering with any belts or the upright standards which support the countershaft. Dustproof covers are provided on the motor to keep particles of emery dust out of the bearings and armature. As plainly shown, all parts of the machine are self-contained, and no part of either the grinder proper or the countershaft has to be fastened to the wall or ceiling.

The company also builds plain cutter and reamer

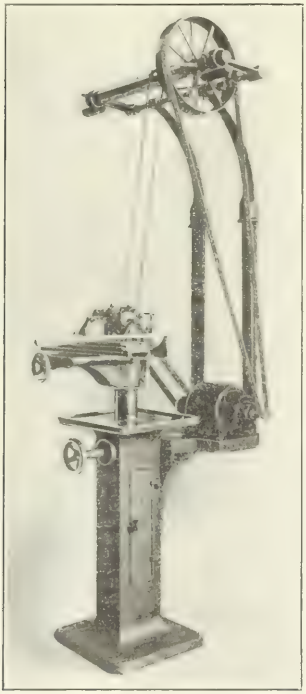


Fig. 1.—A Motor Driven Self-Contained Cutter and Reamer Grinder Built by the F. E. Wells & Son Company, Greenfield, Mass.

grinders, Nos. 164, 165 and 168, which have plain countershafts arranged in the same way as just described, except that since there is no need of a circular drum the overhead shaft is done away with and the motor is simply belted direct to the spindle, as in the case of the machine illustrated.

The new bench centers are described as strong and substantial, but still inexpensive and capable in many cases of answering the purpose of an engine lathe in testing work to find if it runs true on centers. The tail center is held in place in the center hole by a spring, so that work can be taken out and inserted quickly without making adjustments, and the spring is of the right tension to hold the piece true and at the same time allow it to revolve freely. For work of different lengths the centers are adjustable in distance from one another. In

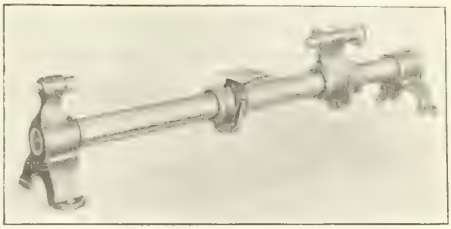


Fig. 2.—The Wells New Bench Testing Centers.

connection with the hand rest shown a test indicator can be furnished to measure the inaccuracy of the work in thousandths of an inch.

A White Star Oiling System Installation.

As a part in the economical operation of a power plant it has become the general practice to include an oil filter in the equipment, and usually in connection with a continuous oiling system to insure a positive and plentiful supply of lubricant to all bearings. The installation here described has the distinction of being located where well equipped power plants are not very common in the mining regions of south central West Virginia. The plant is that of the McKell Coal & Coke Company, Glen Jean, W. Va., operating collieries scattered over several thousand acres. Electric power is supplied by a high tension alternating current system of distribution from a central power plant, and in local substations is transformed and converted into low tension continuous current for use at the adjacent mines.

The central station contains a 500-kw. alternating current generating unit and provides space for installing a duplicate. For lubricating its bearings a White Star continuous oiling system is employed, as furnished by the Pittsburgh Gage & Supply Company, Pittsburgh, Pa., which includes a duplex type of filter and circulating pump. Overhead is a reservoir from which the oil is piped to feeds fitted to all the bearings on the engine. All oily drips from the various bearings are drained to a tank beneath the floor, from which they are returned automatically to the filter on the floor. After being cleaned in the filter the oil is pumped back to the reservoir for repeated use. Thus there is a constant flow of oil fed to all bearings, amounting in this case to a circulation of about 200 gal. per day. The reservoir is so arranged that any excess taken from it is returned through automatic valves to the filter. There is no waste, since no oil can escape from the system, except that consumed in the bearings.

The Aluminum Company of America, Pittsburgh, Pa., recently secured the very important contract for furnishing the transmission wires to be used in the electrification of the Southern Pacific Railroad Company's terminals in San Francisco. Copper is here displaced by aluminum. The contract provides that the conductors for high tension current shall be bare, and those for low tension shall be covered with ordinary waterproof insulation. This is the largest order received for such wire in the past three months.

To what extent electric mining machinery has been introduced from the United States into Mexico and has aided in a practical revolution of the entire mining industry of that country may be estimated from the fact that in one of the mining camps at Guanajuato, the Pinginco mines, no less than 250 Westinghouse electric motors are being operated, ranging in capacity from 5 to 200 hp.

The National Metal Trades Association.

Tenth Annual Convention Held at New York, March 25 and 26.

Although the tenth annual convention of the National Metal Trades Association, which was brought to a close at noon on Thursday, March 26, at the Hotel Astor, New York, was a short one, some important business was transacted, and the meeting was particularly successful in point of attendance.

As was stated in *The Iron Age* last week, the meeting was opened on Wednesday morning, and the proceedings up to noon on Wednesday were covered on page 1026 in that issue. At the afternoon session the annual report of the secretary, N. W. Dingwall, was received, and in it he gave a detailed account of the strikes and labor differences handled by the association during the year. The reports of the standing committees and of the Finance Committee were received, and they showed the affairs of the organization to be in a satisfactory condition.

Technical Education.

William Lodge of the Lodge & Shipley Machine Company, Cincinnati, Ohio, in a report for the Committee on Technical Education, reviewed the action of the association at its previous convention at Boston, leaving the question of co-operation with the Winona Technical Institute, Indianapolis, to the Administrative Council, and that body had again decided to bring the matter before the convention. Mr. Lodge recommended for his committee that the organization support 30 scholars for at least four years, the institute to furnish the buildings and machinery. He read a list of contributions from various firms belonging to the association, and said that in all $4100 had been secured from outside sources for the school. He stated that the movement had been popularly favored in the minds of the people in different localities, and the purpose of the institute, he said, was to give tuition, which would probably include elemental studies, calculated to help a boy during his apprenticeship and so arrange the tuition that a boy might earn money during some of his time. At present the technical pupils in the institute are given a moral talk 20 min. a day, and such addresses are directed toward making him fair in his judgment affecting his future employer. The curriculum is arranged so that the graduates are all round men, and the speaker called attention to the fact that in an ordinary shop boys are not taught to draw and never learn it unless in a night school.

Scholars Pay Back Cost of Tuition.

In making his appeal for the scholarships, the speaker said that the school needs $8000 more to take care of applicants on hand. He said that it takes $300 to educate a boy, and arrangements are made so that the scholar can give his note for the amount and pay it off in installments in the future. This does not make him legally responsible for the debt, but puts him on honor. He said it was the intention, if an appropriation was made, to secure about six trained machinists as tutors.

L. H. Kittridge of the Peerless Motor Car Company, Cleveland, Ohio, suggested that a scheme of assessing members pro rata might be adopted. D. M. Wright, Henry & Wright Mfg. Company, Hartford, Conn., asked where the applicants for tuition are coming from, and Mr. Lodge said that at present they are coming from the vicinity of the institute. E. F. Du Brul, Miller-Du Brul & Peters Mfg. Company, Cincinnati, Ohio, stated that the experience was that the attendance was local as with most educational institutes, and he added that members, as a rule, ought to know more about technical trade schools, most of which, he declared, do not submit their course to the approval of employers. The school in question was the only one, he thought, where the course is arranged by members.

George Mesta of the Mesta Machine Company, Pittsburgh, Pa., gave it as his opinion that trade schools should be encouraged by the association, but not supported by it, as it did not appear to him that the organization was formed for that purpose. Fred. A. Geier, Cincinnati Milling Machine Company, Cincinnati, Ohio, declared that trade schools had demonstrated the fact that they could develop workmen quicker than the shops. He declared that the organization should not only spend money for present defense, but encourage the making of efficient, clear minded workmen, and he offered a resolution that the association appropriate for the committee $3000 a year for the next four years, to be used in carrying out its plans for the Institute. Several members opposed the resolution on the ground that the association was not organized under a charter to spend money for educational purposes, and F. H. Stillman, Watson-Stillman Company, New York, pointed out that such an appropriation would doubly assess those who had contributed. E. M. Woodward, Woodward & Powell Planer Company, Worcester, Mass., declared that if such an appropriation was made he would ask for a similar appropriation for a technical school in his vicinity, and other members opposed the motion on the same ground. The resolution was finally voted down.

The convention indorsed the work of the joint committee appointed to confer with a similar committee of the National Founders' Association on matters affecting both organizations.

To Protect American Patents Abroad.

Frank S. North, Union Special Machine Company, Chicago, Ill., offered resolutions of unusual importance to American manufacturers of machinery, as follows:

Whereas, The Patents and Designs Act, 1907, of the Parliament of Great Britain provides "that at any time not less than four years after the date of a patent and not less than one year from the passing of the act (*i.e.*, from August 28 last), any person may apply to the Comptraller for the revocation of the patent on the ground that the patented article or process is manufactured or carried on exclusively or mainly outside the United Kingdom"; and

Whereas, France and Germany have passed similar laws; and

Whereas, Such laws impose excessive burdens upon American manufacturers owning patents granted by these countries, in that they require unnecessary duplication of costly plants and equipment, deprive American workmen of employment which the operation of these laws transfers to foreign workmen, and generally cause a widespread loss to the mercantile, transportation and labor interests of the United States; and

Whereas, The interchange and mutual respect of patent privileges among nations in the past is most praiseworthy and is to be favored; therefore be it

Resolved, That the President and Congress of the United States be petitioned by this association to enact proper legislation to protect American manufacturers by imposing similar conditions upon those foreign persons or corporations to whom United States patents are issued; be it further

Resolved, That the attention of the President and Congress be called to the benefits that might be derived through reciprocal agreements with such countries, relating to patents, which would modify the restrictions to the mutual advantage of the citizens of the countries interested; and be it further

Resolved, That a committee of three be appointed by the president of this association with power to act, to present this matter in the proper manner.

Several members spoke in hearty favor of the resolutions, and they were adopted without a dissenting vote. It was also decided to send a copy to the National Association of Manufacturers and ask the co-operation of that body.

The Wednesday afternoon session was adjourned early so that a caucus of the members having objection to the proposed changes in the constitution might be held and the question generally gone over. George F. Steedman, Curtis & Co. Mfg. Company, St. Louis, was appointed chairman of the caucus by President Barker, and the following morning the convention, after a short discussion, adopted a resolution providing for the appointment of a committee to gather further information on the subjects under discussion and obtain views of the members, with the purpose of bringing the matter up for a vote at some future date. The vote on the changes recommended, it was explained, was not sufficiently large either to pass or shelve the committee's recommendations.

The Annual Banquet.

The annual banquet was held in the banquet room of the hotel on Wednesday evening, and it was one of the most successful gatherings of the kind ever held by the organization. M. K. Bowman, Griscom Spencer Company, New York, presided over the affair as toastmaster, and when the time came for the speeches of the evening he introduced Henry S. Pritchett, president of the Carnegie Foundation for the Advancement of Teaching and the National Society for the Promotion of Industrial Education, who spoke on

"Industrial Education."

Mr. Pritchett said that the organization he headed was a distinctive one, in that it has the union of practical business with technical schools. Heretofore, he explained, this country was behind foreigners in that respect, as it had not succeeded in mastering business science. Foreigners, he said, speak of industrial chemistry differently from what we do. An American chemist as a rule, the speaker declared, has his heart on chemistry, while a German chemist has his heart on business. He added that we in this country have kept our science and business separated.

"Taking it for granted that we do not equip our mechanics as practically as possible," the speaker said, "how shall we go about solving the problem? We must begin in the public schools; but just now the public schools do not lead to technical education, and the question arises as to how may the public school be equipped to be adapted to help industrial education." Continuing, the speaker described the approved system of industrial schools, explaining that in some schools the pupils work part of the time and spend part of the time in the schoolroom. All methods, he said, are worth trying, and any method that makes a boy a good mechanic is a good method. The speaker contended that a boy should be started right in the public schools and added that while too much should not be expected from that direction, the school can train a boy in such a way that he can turn his hand to an honest skilled trade. Speaking of the problem of interesting a boy in the right direction, Mr. Pritchett said that the question as to what is to be done with a boy's future is the most important between the ages of 14 and 16, and he stated that the average employer owes every boy a duty in that the lad should be given an opportunity to perfect the skill shown in development in the public schools. In conclusion, he dwelt briefly on the labor question and urged that problems be met with patience and firmness and that the association should lend its efforts, not to the cause of war, but to the cause of industrial peace.

Some Dangerous Modern Tendencies.

William H. Speer of Jersey City, who is a judge of the Essex County Circuit Court, made a stirring address on this subject. He said in part:

The first modern tendency which I consider dangerous and to which I desire to direct your attention is the tendency to hasty and ill advised legislation. There is now pending before the Congress of the United States a bill to amend the Sherman anti-trust act in order that labor unions may be excepted from its provisions as organizations in restraint of trade. In this republican government of ours there is only one kind of trade that it is not only lawful but even praiseworthy to conspire to restrain, and that is the trade between the labor union and the politician. The labor union leader approaches the politician, and, in consideration of votes which he cannot deliver or because of threats which he cannot carry out, he induces or compels the politician to give him something which is against the public good. And it seems to me that one of the especially valuable functions of an organization such as this is to see to it that bargaining of that kind shall not triumph in this country.

We read in the daily papers that this amendment is being sought because it tends to publicity in the efforts of organization, and also because it was brought about by a conference between the President of the United States, officers of the Government and the National Civic Federation. But you men know that the primary object of that legislation is not publicity at all, but is to relieve labor organizations from a restraint which the Supreme Court of the United States in promulgating an American doctrine has declared shall rest upon the shoulders of labor. And you know and I know that it is pretty near election time. And we know furthermore, that no labor organization should be permitted to masquerade under the name and guise of the National Civic Federation for the purpose of obtaining license for itself to carry on practices that are un-American.

LAW THE WILL OF THE PEOPLE.

It seems to me that the primary object that organizations of this character should keep in view is to put their hand upon the public pulse, ascertain the public will, and translate that will into law, for in no other way can American principles predominate. For what is a law? A law is nothing else than the response of the legislature to the wants of the people—not 2½ per cent. of the people, nor 5 per cent. of the people, but to the will of the majority of the people; and therefore any discrimination in favor of any class of citizens is reprehensible, un-American, and ought not to be translated into law.

Another effort that is being made is to so amend the injunction law that a hearing shall be had before a temporary restraining order shall be permitted to issue. I have had, I think, some 15 years of experience, first as a practicing lawyer, afterward as prosecutor of the pleas of my county, and now as judge; and I say to you that it is the result of my observation and experience that such a change will make for evil in this government. And I say to you that the very essence of preventive justice, which the injunction has been called by Lord Coke, is to apply a remedy to preserve the object of litigation until a hearing can be had. And if you notify a labor organization or any other organization bent upon violence, crime and intimidation; if you give it notice that you are going to apply for a temporary restraining order, the interim between the notice and the granting of the order will be a saturnalia of violence. And therefore I say that such a practice ought not to be engrafted upon the jurisprudence of this country.

THE INJUNCTION.

The injunction originated in the reign of a popular sovereign to protect the rights of common, ordinary people; it has outlasted the storms of hundreds of years in its present shape; and it is a queer manifestation of the times, but unforseen consequences always follow social movements.

If you make a law to suppress a vote, its object is defeated because you simply increase its circulation. The laws that were made for the purpose of stopping usury, instead of relieving the debtor, bore more vigorously upon his condition. And so we find that now in the times of greatest prosperity there are outcries and clamors against the present order of things. The more prosperous the times the more vigorous the outcry. It is a perverse manifestation of social progress to find agitation and clamor accompanying prosperity and development. And therefore we ought never to take these clamors and outcries too seriously at the time, but we ought to let them sink in and filter through and be thoroughly threshed over and thought over and determined upon in calmness before action shall ensue.

And if any concrete illustrations are necessary to enforce that argument, we have them before us right now. We take the decisions of the United States Supreme Court in the North Carolina and Minnesota rate law cases; we take the decision of the Supreme Court of Pennsylvania in the Pennsylvania rate law case; we take the action of Governor Hughes in refusing to put a rate law upon the statute books without due consideration. These are evidences of a healthy return to the old standards of looking before you leap and thinking before you act.

Now these are matters that will bear thought, and these are matters that will bear thought also in high places. It is not the time for any politician to lend himself to any doctrine inimical to the general welfare for a political purpose; it is not the time to do that; it is the time rather to determine upon sanity of thought and sanity of action.

THE ANTI-TRUST AMENDMENT.

To revert for an instant to this Sherman anti-trust amendment, the law was passed originally in such wise that some of the greatest statesmen we had said that no one then knew what the law meant; that the courts would have to construe it. And now what is the programme? The programme is to add to that inscrutable law a most marvelously obscure amendment, and no one can tell now whether that amendment will permit a labor union to carry on a boycott or not; and it is my judgment that probably it can. Therefore I say that laws ought not to be written in that way. Why that is little short of the old Roman method of Caligula, who used to write his laws on little cards and hang them on high pillars, the better to ensnare the people. In one you read but you do not understand; and in the other you cannot read and therefore you cannot understand. But in the ultimate analysis the result is the same.

Let us then band ourselves together as American citizens; let us demand that the laws shall say what they mean and that the courts that expound them shall not be decried but upheld; for the great foundation stone of this Government from its inception to the present time has been the Supreme Court of the United States.

Let me say that where justice lies pleading because of the assaults, whether they are made intelligently or otherwise, of those who see fit for their own purposes to decry and declaim against them, the country is being shaken in its foundation stones. Therefore, let us march forward until we have seen to it that the representatives of the people represent the people, that the laws that we write upon the statute books represent the will of the people, and then the principles of Americanism will sleep secure beneath the tents of victory upon the heights of success.

It was deemed necessary for William Lodge, after the speaking, to sing the organization's favorite ditty about "Smoke Going Up the Chimney," and then an excellent vaudeville programme, furnished through the New York and New Jersey Branch, was carried out.

THURSDAY'S SESSION.

After some routine business at the Thursday morning session Prof. Herman Schneider, dean of the College of Engineering at the University of Cincinnati, spoke on

CO-OPERATIVE ENGINEERING COURSE.

He said that the present unfitness of universities for training engineering students in a practical manner is largely due to the too close adherence to precedents going back to the monastery as the forerunner of the college. At the beginning of his work, he learned that business men demand of their technical men knowledge of the science underlying production; intimate acquaintance with the attitude of labor; a practical idea of the work to be done and a sense of business in shop operations. He made up his mind at once that the first of these requirements only could be obtained in the university, and the shop must supply the other requisites. He thereupon planned to take the university to the shop by providing for two shifts of students to alternate week by week in attendance at the university and the manufacturing plant. A six-year course is arranged for, and the student spends the summer period of four months in the shops. In this manner he spends a total of 48 months in the year in the midst of actual manufacturing operations. A high school diploma or its equivalent is required to admit a boy to the university, and a boy must begin work in the shop several weeks previous to the opening of the regular college term in order that he be given a thorough trying out.

The Survival of the Fittest Students.

The professor stated that in the first year of 75 boys who applied 45 were enrolled and 28 survived the preliminary weeding out. During the second year 800 applications were received, of which only 60 could be put in the shops, and of these 44 qualified to enter the university. The students are paid for shop work at a rate of about 10 cents an hour at first and an average increase of 1 cent an hour every six months until they earn 21 cents an hour. One of the methods of the trying out process is to start the boys during the hot summer months in wheeling sand in a foundry alongside of the common laborers, and later they are put in the machine shop, the designing department and the office, and toward the end of their term they alternate in attendance at the university at periods of every six months.

In summing up the results accomplished from these methods, Professor Schneider stated that it has been demonstrated that the average co-operative student can accomplish more in his half of six years spent in the university than the regular engineering students can in four years, and the grade of the former averages 20 per cent. better than the regulars. He quoted a chemistry test in which 90 per cent. of the co-operative students passed, against 67 per cent. of the regular students. The students are given the privilege of asking questions evolved from their shop experience, and this plan is known as the "reverse quiz." As a result of the earnest efforts of the students to get the most out of their subjects two instructors have resigned. The labor organizations, the speaker stated, are as a whole in sympathy with the school.

A Manufacturer's View of the System.

Fred A. Geier, Cincinnati Milling Machine Company, Cincinnati, Ohio, discussed the school from the manufacturer's point of view. He said that at first the men in the shops were opposed to the movement, and those in charge of departments were particularly against the scheme. When they had had an opportunity to observe the workings of the system, however, they speedily changed their minds, and he declared that students at the university who spend their working hours in his own company's shops are doing so at a profit to the company, as they are earnest and energetic, and put their hearts in their work. The speaker said that more attention should be paid to the education of mechanics, and he considered that as important as the details of any department in the plant. Labor should not be considered as a common piece of machinery, he said, and he told of an investigation he had made as to the educational condition of 40 apprenticed machinists in his shops, finding the average of them so deficient in the elements of education as to be unable to translate fractions into decimals, or read a blue print.

The condition of the average apprentice, he said, has induced his company to engage a teacher to conduct night classes, so that the boys might be instructed in the knowledge they will need as mechanics. In order to meet and counteract the tendency toward shorter hours and higher wages, the speaker declared, the efficiency of the workman must be raised, and his co-operation must be secured to keep down the cost of production. This work must be begun in the shops, and later taken up in the communities, and finally pushed throughout the country through national organizations. The Winona school was planned as a model for the country, and its foundry school has been entirely commercialized, and the castings turned out there are as good as can be made anywhere. In conclusion the speaker quoted figures showing a remarkable growth in the production of machine tools in Germany, which he attributed to the low illiteracy rate in that country and the practical nature of its educational methods. He added that it might be well to take up the social side of the question and improve the home and home influences in the interests of the workmen of the future.

Both of the speakers were tendered a vote of thanks by the association.

Advantages of Shop Experience.

Mr. Du Brul, during the discussion which followed, said that he agreed with the statement that we have not progressed to where the Germans have in technical education, and added that criticisms of the impractical methods of technical teachers are often found in the trade papers. He told of one firm he knew that would not employ a college man unless he had been broken in for two years by some one else, and referred to Professor Kent of Syracuse as authority for the statement that the pupils the Cincinnati school graduate know more than the graduate of the average engineering college six years after his graduation, because the former has been so long in contact with the shop.

Mr. Geir called attention to the fact that the first graduates will make excellent teachers for other institutions of a similar nature. In answer to a query Professor Schneider said that manual training in the high school was of no real assistance to the pupils.

Anthony B. Dunlap of Cincinnati, attorney for the association, was to have submitted a lengthy paper on "Some Recent Legislation," but as it was seen that the convention could be concluded without an afternoon session by making haste, he decided to file the paper with the secretary instead. The paper discussed laws which have recently been passed affecting trade organizations and manufacturing interests.

J. Kirby, Jr., Dayton Mfg. Company, Dayton, Ohio, presented the report of the Committee on Legislation, reciting the status of a number of measures now pending before legislative bodies.

The New Officers.

The Nominating Committee, through H. N. Covell, Lidgerwood Mfg. Company, New York, presented its report, which was unanimously adopted, and the following officers were duly elected: President, F. K. Copeland, Sullivan Machinery Company, Chicago; first vice-president, Howard P. Eells, Bucyrus Company, South Milwaukee, Wis.; second vice-president, J. H. Schwacke, William Sellers & Co., Inc., Philadelphia; treasurer, William

Lodge, Lodge & Shipley Machine Tool Company, Cincinnati. Councillors—H. W. Hoyt, Great Lakes Engineering Works, Detroit, Mich.; E. P. Robinson, Atlantic Works, Boston; W. A. Layman, Wagner Electric Mfg. Company, St. Louis, and George Mesta, Mesta Machine Company, Pittsburgh, Pa. W. H. Pfahler, Philadelphia, and M. H. Barker, the retiring president, were made honorary members of the Council. The newly elected officers were then presented to the convention. Mr. Covell spoke highly of Mr. Barker's efforts in behalf of the organization, and called attention to the fact that he had never missed a meeting of the organization. Each of the new officers made a few remarks, after which the convention was formally adjourned.

The new Administrative Council was in session until late on Thursday afternoon and again on Friday morning. Robert Wuest was reappointed commissioner, and N. W. Dingwall was made secretary for another term. The Council discussed various matters affecting the internal affairs of the organization, and at the close of the session President Copeland announced the following Administrative Council committees: Executive—Messrs. Copeland, Eells, Hoyt, and P. B. Kendig of the Senaca Falls Mfg. Company, Senaca Falls, N. Y. Technical Education—Messrs. Lodge, Pfahler, and Covell. Legislative—Messrs. Schwacke, M. K. Bowman of the Griscom-Spencer Company, New York, and Mr. Robinson. Joint Committee with National Founders' Association—Messrs. Copeland, Barker, and Hoyt; alternates, John R. Back of the F. E. Reed Company, Worcester, Mass., and Mr. Layman.

Notes.

Just before the meeting was ready to adjourn on Wednesday afternoon, Mr. Du Brul arose and on being asked by President Barker to cut his remarks short, he good-naturedly refused to be ruled out, and proceeded to make some eulogistic remarks on the president's zeal for the organization. He finished by asking for three cheers for President Barker, and the convention got on its feet and cheered accordingly.

The ladies were not forgotten in the social arrangements, and under the auspices of the local branch of the association they had a dinner and theater party on Wednesday evening.

On Wednesday afternoon a number of the members accepted an invitation to visit the building of the Metropolitan Life Insurance Company, which, when finished, is to be the tallest in New York.

There was a good representation of local machinery and supply dealers at the convention, and many of the manufacturers made it a point to spend their spare time on Thursday afternoon in visiting the trade here.

Water Power Development on the Border.

Cecil B. Smith, consulting engineer, Toronto, Canada, delivered the principal address at the twelfth anniversary of the granting of the charter of the Clarkson School of Technology, Potsdam, N. Y., March 14. He was engineer in charge of construction of the Canadian Niagara Power Company from 1901 to 1904, and chief engineer of the Hydro-Electric Power Commission of Ontario from 1905 to 1907, and was therefore splendidly qualified to talk on the subject of the development and utilization of water powers.

The United States, Mr. Smith said, has more fully developed its water powers than any other country, largely through the diversity of its climate. Canada's water powers come next in order, where 400,000 hp. has been developed; and next to that stands Italy. He had the pleasure of examining the water powers of Italy a few years ago, and brought back the highest regard for the Italian engineers. He said that he returned to Canada very much humbled, after seeing the wonderful progress that foreign engineers had made in developing water powers for manufacturing purposes.

He touched on the great natural resources of Canada, but deplored the fact that in the most populous parts of the Dominion no coal is to be found. Therefore, he said, dependence must be placed upon shipments by rail of coal from distant points, whether in the United States or Canada, for heating and power purposes. It will easily be seen that in the lower central and lake provinces every effort should be put forth to make the most of the natural resources there abounding, namely, the almost unlimited water powers.

At the Long Sault, for instance, near Massena, N. Y., there are developments projected something like 700,000 hp. Although Mr. Smith would hesitate to say that a dam would ever be built across the St. Lawrence River, nevertheless to do so would result in untold benefits to both Canada and the United States. If it should be the case that the International Conference gives permission to place a dam across the Long Sault, thereby making it necessary for all the lake shipping vessels on their way to the sea to go through canals, there would be one of the greatest hydroelectric developments in the world at our doors, as great, in fact, as Niagara Falls, because the respective governments have already limited the amount of water to be taken out for power purposes at Niagara.

The Medical Air Lock for Compressed Air Victims.

The workmen and staff of S. Pearson & Son, Inc., who have just completed the excavation for the Pennsylvania East River tunnels, on March 20 presented to E. W. Moir, vice-president of the Pearson Company, a very interesting model of a medical air lock, with the following inscription: "Presented to Mr. E. W. Moir, the maker of the first medical air lock on the old Hudson Tunnel, 1890, by grateful 'sand-hogs' on the Pennsylvania East River Tunnels, New York, 1908." The model is made of brass, oxidized to look like steel, is mounted on mahogany and has a silver name plate. It is built to a scale of 1½ in. to the foot and measures about 2 ft. 6 in. long by 9 in. in diameter. It is complete in every respect, being lit with electric lights and the compressed air being supplied by an air pump. The hospital beds for the men to lie on and the compressing and decompressing valves, along with thermometers and pressure gauges, are shown in full detail. The model was made by H. E. Boucher, New York. The presentation was made in the yards of S. Pearson & Son, Inc., in Long Island City. Henry Japp, the local manager for the Pearson company, tendered the salutation of the occasion.

Mr. Moir built the first air lock ever constructed, in 1890, and this model is a mark of the appreciation, regard and gratitude of compressed air workers to the man who has done so much to relieve them of the dangers of their calling. He was employed by S. Pearson & Son, Ltd., on the old Hudson Tunnel, in 1889, and successfully built a shield 2000 ft. from the shore and drove a little over 2000 ft. of tunnel at a final rate of 10 ft. per day. It was this same shield, which Mr. Moir left in good shape more than half way across the Hudson River, that Mr. McAdoo and Mr. Jacobs ultimately pushed through to Manhattan.

The importance of the medical air lock in tunnel work is little understood. In the building of the East River tunnels there have been at least three cases of men who, to all intents and purposes, were dead, but after being treated in the medical air lock have fully recovered. Similarly, there have been cases of men who, to all intents and purposes, were paralyzed, and who were thoroughly restored to their normal condition in the medical air lock. There are six medical air locks in the East River tunnels, for the use of engineers and workmen, these being all fitted with a double chamber, so that the medical officer can pass in and out to his patients without interfering with or interrupting the decompression.

With a view to concentrating its operating forces, the Colorado Fuel & Iron Company, Denver, Colo., is transferring the manager of the fuel department, the manager of the iron mines department and the engineering staff connected with these departments to Pueblo, Colo., where its steel plant is located. This change will bring the entire operating forces of the company in its own office building at that place.

Malleable Cast Iron.*

A Comparison of "Black Heart" and Old Process Castings.

BY WILLIAM HERBERT HATFIELD.

The first description of the method of making cast iron malleable is due to Reaumur. He published in 1722 "the fact that the heating of cast iron castings embedded in red oxide of iron softens the metal perfectly and much more rapidly than all the other matters which he had tried." Practically the identical method described by Reaumur is at the present time in operation, and is producing a large quantity of the malleable cast iron consumed in Great Britain. It is strange that Samuel Lucas should have been allowed to patent in 1804 a process which obviously was so well known practically a hundred years previously, but such is the case. Of later date there has been developed another process for making malleable cast iron which is called in America the "black heart" process. Before going into the difference in the two varieties produced, it might be well to describe what malleable cast iron really is.

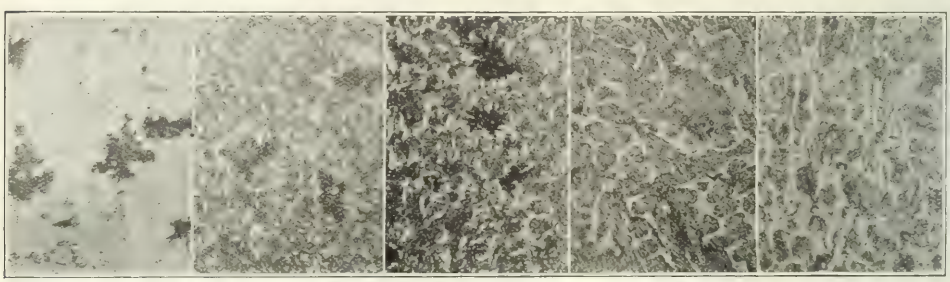


Fig. 1.—White Cast Iron, Showing Microstructure of the Two Carbides.

Fig. 2. Intermediate Structures.—Etched Magnification, 120 Diameters.

Fig. 3.

Fig. 4.

Fig. 5.—Microsection of White Iron After Being Converted Into Malleable Cast Iron, Showing the Structure of the Free Carbon.

It consists of castings made by melting suitable pig iron and casting it into the required forms, which castings are, of course, annealed in order to produce the requisite malleability. The finished article, if successfully manufactured, possesses all the advantages of cast iron in that the low melting point of the pig iron allows the most intricate and difficult casting to be made, and these castings have the same beautiful skin and finish for which cast iron is so well known. As a further fact it may be said that this material is practically free from blow holes, the composition of it ensuring the perfect occlusion of the gases which in a steel casting very often cause so much trouble. As regards the physical properties, it is malleable and ductile and is easy to work in the machine shop.

All malleable cast iron when cast is identical in analysis with some variety of pig iron, having present in its composition from 3 to 4 per cent. of combined carbon, which gives it that intense hardness found in the unannealed casting. The malleableizing of the material is done either by the oxidation and elimination of the carbon or by precipitating it into such a condition that it does not militate against the production of the qualities desired.

European and American Practice.

Certain specific conditions are, of course, necessary for the production of this material when the carbon is merely changed in form, and as the irons from which the malleable castings in this country and Europe are made are generally extremely high in sulphur, not being able to change the form, manufacturers in the past have had to eliminate the carbon. Consequently the method employed is that of Reaumur, namely, packing the castings with iron ore which oxidizes and eliminates the carbon to such an extent that the casting has attained that degree of malleability which is desired, the fracture of such casting being very similar to that of steel.

The malleable castings produced in America are of the black heart variety, and generally speaking the American process consists of precipitating the carbon and not eliminating it. These are castings which, in the finished state, have the same composiiton as pig iron, and which bend double and fulfil the most stringent malleable cast iron specifications. Owing to the natural resources of America producing a pure iron with very little sulphur, the secrets of the manufacture of black heart castings were quickly learned, and this industry to-day produces from 700,000 to 1,000,000 tons of malleable castings per year.

In the first place, the iron in both the American and the European malleable processes was melted in the crucible; the next stage was to melt this iron in cupolas as larger quantities were required, and as purity became more essential the reverberatory and the open hearth furnaces came into play. The methods of annealing, of course, have been considerably improved. During the last 20 or 30 years the system of producing malleable similar to the American black heart has been developed. The author is at present actively engaged in producing both varieties, each having different qualities and therefore applicable to its own sphere of utility. The original malleable cast iron produced in Europe, the Reaumur, has a steely fracture, and is obtained by oxidizing the carbon contained in the original casting by hematite iron ore. The other, called by one English manufacturer "special" malleable, is produced merely by changing the form of the carbon.

Most of the malleable castings in Europe are of the Reaumur type. The castings are packed in cast iron boxes in hematite ore and taken to a heat at which the ore commences reaction with the carbon in the castings. This action is the converse of the production of steel by cementation, in which process the carbon enters from the outside and gradually permeates the whole bar. In the Reaumur process exactly the contrary takes place, and the carbon is gradually eliminated from the outside first, so it follows that the interior of one of these castings has generally considerably more carbon than the outside. If successfully manufactured, however, the carbon in the center is in such a condition as not to militate against its working capabilities.

The Decarbonizing Action.

The actual chemical reaction which takes place between the iron ore and the carbon in the iron is not as yet sufficiently understood. However, it is known that gases easily diffuse through metals of the iron group in considerable quantities, and it is most likely that the action is somewhat dependent on the equation $CO_2 + C = 2CO$. In other words, the oxygen of the ore oxidizes the first carbon to CO_2, and this carbon dioxide possibly combines with more carbon, forming CO, which in itself receives further oxygen from the iron ore, and so what might be called catalytic action takes place, in which the

* From a paper read before the Institution of Engineers and Shipbuilders in Scotland, March 17, 1908.

CO is the carrier of the oxygen from the ore to the carbon contained in the interior of the castings. Such explanation seems as likely as any other at present put forward. This variety is very much like some grades of steel. The photomicrograph, Fig. 6, shows the constitution of this metal as seen by the high power of the microscope. It consists chiefly of well laminated pearlite distributed through a ferritic matrix.

A few weeks ago the following abstract from a paper read before the Scandinavian Technical Society, regarding the strength of malleable castings as made in the Scandinavian Peninsula, was published in one of the technical papers:

> The paper gives the tensile strength as between 40,000 and 50,000 lb. per sq. in. It has an elongation varying with different samples from 1 to 6 per cent., with a reduction of area at the breaking point of from ¾ to 3 per cent. It is thus seen that the ordinary grade of cast iron having a tensile strength of 20,000 to 30,000 lb. per sq. in. is but half as strong as malleable castings, though its compressive strength is much higher.

Obviously the malleable castings described are of similar type to the Reaumur, and the above appears to be a fair statement of the mechanical tests which this type of malleable will give. The similarity between this material and steel is very much in evidence on comparing the microstructure, and it seems remarkable that, while the elongation and reduction of area of this type of casting are so low, it can not only be hammered and bent to a very considerable degree, but it will harden, temper and forge, if properly made.

The Carbon Change in Annealing.

However, it must be confessed that while this material has great malleability and great working powers, and is extremely useful for parts where wear and tear take place, it does not produce anything like the tests which the author has obtained by the development of the black heart type. Attention was first seriously drawn to the development of this special malleable by the requirements of the British Admiralty. Their specification, by the way, is 18 tons to the square inch, a minimum elongation of 4½ per cent. in 3 in., and a bending angle of at least 90 degrees over a 1-in. radius, the bar being 1 in. x ⅝ in. in section. The variety of malleable casting known as American black heart has for its essential ditsinction the fact that the castings when cast are of such a composition that the carbon, which previously exists as combined carbon, is by annealing completely changed to that condition of carbon known as annealing carbon, to which Ledebur, the German metallurgist, gave the name of temper carbon.

The author in May, 1907, went thoroughly into the question of the change of the carbon, in a paper read before the Iron and Steel Institute, under the heading "Decomposition of Carbides," and he thinks this change can be best explained by reference to some of the photomicrographs given in that paper. These are five in number, Figs. 1 to 5, the first being the hard initial casting, while the last is the completely softened finished one. Fig. 1 gives the typical structure of cast iron. All the carbon is in the combined state, the carbon of "supersaturation" being present as carbide Fe_3C, while the carbon of "saturation" is present as a compound roughly equivalent to $Fe_2 4C$. The castings are heated up during the annealing process to the temperature required (this, of course, differs with different makers), maintained for a varying period at this temperature and then cooled. The result is a casting in which the carbides are completely broken down into pure carbon and iron. Fig. 5 clearly illustrates this. Figs. 2, 3 and 4 show the intermediate appearances of castings while the change is taking place.

Reference will now be briefly made to wrought iron, which is prepared by eliminating in the plastic condition, by means of oxides, the carbon and other impurities from pig iron. The result is pure iron, with traces of sulphur, phosphorus, manganese and a little carbon with a varying proportion of slag, the slag being mechanically contained in the iron. Wrought iron of the best make is as pure as iron can commercially be made, and every one is familiar with its great ductility and malleability. Apart from iron, the only content of this material worth considering is the involved slag which, during the rolling out of the iron, is drawn into threads running the length of the bar, and gives to wrought iron that peculiar fibrous nature of the fracture. Of course there is no such thing really as fiber in iron products, as they are all crystalline.

Fig. 7 represents a longitudinal section of wrought iron which shows the crystalline structure of the pure iron along with a longitudinal section of the slag threads. It is obvious that this slag is practically of no detriment to the high properties of wrought iron. Wrought iron forgings, were it not for their high cost, are unquestionably excellent, and in working upon the subject of malleable cast iron, wrought iron forging has been taken as a basis, the endeavor being to produce in a malleable casting a structure as similar as possible.

Malleable Castings with High Strength.

The maximum stress in wrought iron is approximately 20 to 21 tons per square inch, and its elongation will vary from 20 to 30 per cent. Now, if against this the test previously given for malleable cast iron is placed, namely, about 20 tons tensile strength with 1 to 6 per cent. elongation, it will be noticed that there remains considerable scope for improvement in the last mentioned product. Working on these lines, bars have been produced giving a tensile strength of 23 tons along with 19 per cent. elongation, 20.6 reduction of area, along with 180 degrees bending angle. Table 1 is made up from a test sheet containing the results obtained from these castings. Material such as that of which the tests have just been given, and which is, of course, a casting and not a forging, is, one might almost say, a new product. The old tests for malleable cast iron have been left far behind, and a ma-

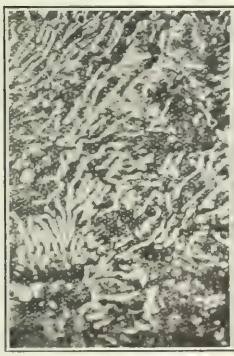


Fig. 6.—Microstructure of Reaumur Malleable Cast Iron.—Magnification, 350 Diameters.

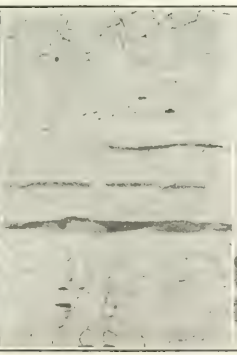


Fig. 7.—Longitudinal Section of Swedish Wrought Iron Under the Mircoscope.—Magnification, 90 Diameters.

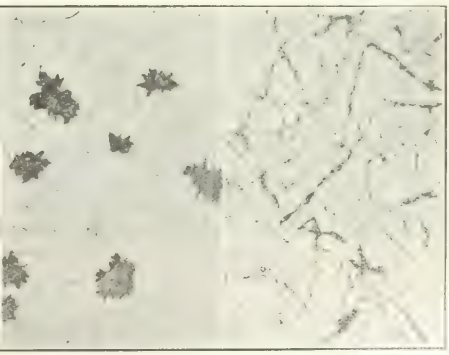


Fig. 8.—Microstructure of Black Heart Malleable Cast Iron.—Magnification, 90 Diameters.

Fig. [illegible] Gray Cast Iron, Showing Plates of Graphite.—Mag-

terial has been produced which has before it a much greater field than the original malleable cast irons.

Table I.—Tests of Special Malleable Castings.

Test No.	Original dimensions. Size in inches.	Original dimensions. Area Sq. in.	Fractured dimensions. Size in inches.	Fractured dimensions. Area Sq. in.	Maximum stress. Elongation in inches.	Maximum stress. Elongation, Per cent.	Maximum stress. On section. Tons.	Maximum stress. Per sq. in. Tons.	Elongation, Per cent.	Reduction of area, Per cent.
24,137	1.010		0.93							
	0.385	0.389	0.35	0.326	0.46	8.85	22.75	15.3	16.2	
24,138	1.010		0.93							
	0.390	0.394	0.35	0.326	0.54	9.15	23.22	18.0	17.3	
24,139	1.010		0.91							
	0.385	0.389	0.34	0.300	0.58	8.92	22.93	19.3	20.6	

These special castings are very similar in structure to wrought iron. Microscopically they consist of ferrite, which is pure iron, with free carbon in such a form as will be obvious by the results obtained to be little more detrimental than the slag which is found in wrought iron; in fact, samples of wrought iron have been met which have not given much better results than the tests submitted in this paper. It will be well to conclude by asking whether malleable cast iron with the properties and tests as stated is not entitled to a much higher position in the metallurgical world than it is given, and the author would venture to suggest that the "Nomenclature" Committee gave malleable cast iron undeservedly short shrift when they stated that it merely lacked "the extreme brittleness of cast iron."

The demand for malleable in this country as compared with that of the United States gives food for thought. The Americans are said to be producing over 90 per cent. of the world's production, Europe only producing the remaining 10 per cent. Here in this country, a material giving tests considerably superior to those obtained in the States is produced, and yet this selfsame material is excluded from many purposes for which in the States it would be allowed to be used. The following table gives the comparative results which are now being obtained:

Material.	Maximum stress. Tons sq. in.	Elongation. Per ct.	Reduction of area. Per ct.	Bending angle. Deg.
Cast iron	12.0	Nil.	Nil.	Nil.
Old process malleable (Reaumur)	21.0	3.0	4.0	45
American Blackheart	19.0	5.0	6.0	90
Special malleable (Meadow Hall Iron-works)	23.0	14.0	17.0	180
Admiralty specification	18.0	4.5	..	90

It will be noticed that in the special malleable the maximum stress is very high, while the ductility much surpasses that of any other malleable cast iron. One obvious feature will be the ease with which this material passes Admiralty requirements.

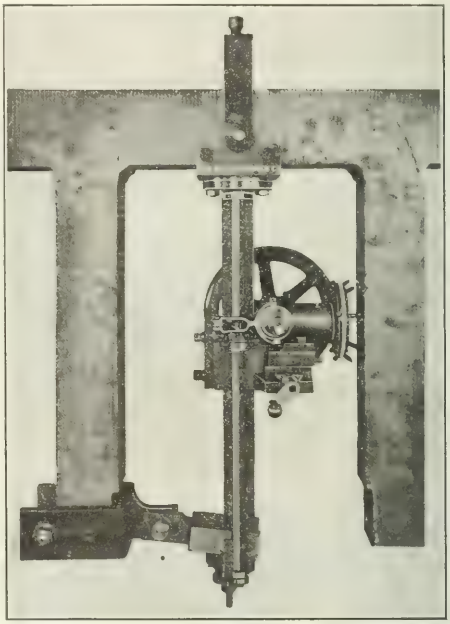
The Underwood Locomotive Pedestal Facing Machine.

A new portable power driven equipment for facing the pedestal legs of locomotive frames has been developed by H. B. Underwood & Co., Philadelphia, Pa. Its parts and the manner of working are plainly shown in the illustration, which represents it as applied in the facing of the vertical side of a set of pedestal jaws. The frame of the device is a square bar secured at each end by clamps to the frame and parallel with the work. The support of the upper end is a steel swivel, which allows the cutting tool to be positioned squarely with the angular side of the jaws as well. The top of the swivel is a large surface which clamps firmly to the frame, and is easily changed for a smaller one when the device is to be used in a constricted space. The lower clamping member is universally adjustable to hold the bar firmly at any angle.

In one side of the square vertical bar, which is also the guide on which the milling head slides, is a square thread feed screw. The head has a bronze half nut engaging this screw, which is operated for the feeding by a ratchet and pawl and an eccentric on the shaft driving the milling head. The feed is thus automatic, and is variable to suit the requirements. The milling head has two adjustments, from and toward the work and across its face. These allow both fine and quick adjustments, making it unnecessary to loosen the supporting clamps after they are once set. The adjustments are through screws, for the operation of which an interchangeable crank handle is furnished.

The milling spindle is driven through bevel gears from a telescopic shaft with universal joints at each end, affording the connection directly to the power source, and consequently eliminating any belts in connection with the device itself. An electric motor may be used or a small countershaft belt driven from a convenient line shaft. A very complete rig for driving this and the company's other portable tools is a two-cylinder air or steam motor, which is furnished when desired.

The milling spindle is threaded to receive the milling



A Portable Machine for Facing the Pedestal Jaws of Locomotive Frames, Made by H. B. Underwood & Co., Philadelphia, Pa.

cutters, which are made with inserted square high speed teeth, removable for grinding and adjusting. A large quantity of metal can be removed in a short time, not by one pass, but by taking several light cuts, as only a brief time is consumed in each transit.

Oglebay, Norton & Co., Cleveland, Ohio, send out their iron ore handbook for 1908, containing analyses and guarantees of the various ores they will handle this year—seven from the Gogebic range, six from the Menominee range and one each from Canada and the Cascade District of the Marquette range. The firm's Moose Mountain ore, from the Sudbury District, Canada, is offered as of the same analysis as in 1907, except that silica is 12.79 per cent., as against 13.29 per cent. formerly. This ore is crushed to 2-in. size and runs 55.50 per cent. iron and 0.10 per cent. phosphorus.

The Aldrich financial bill to provide for an emergency issue of taxed currency notes in time of money stringency was passed by the Senate March 27 by 42 ayes to 16 noes. In substance it authorizes national banks to issue such notes on depositing collateral of United States or State bonds or the bonds of certain described counties and municipalities, these notes to be subject to a progressive tax which will compel the banks to withdraw them from circulation when the emergency has passed.

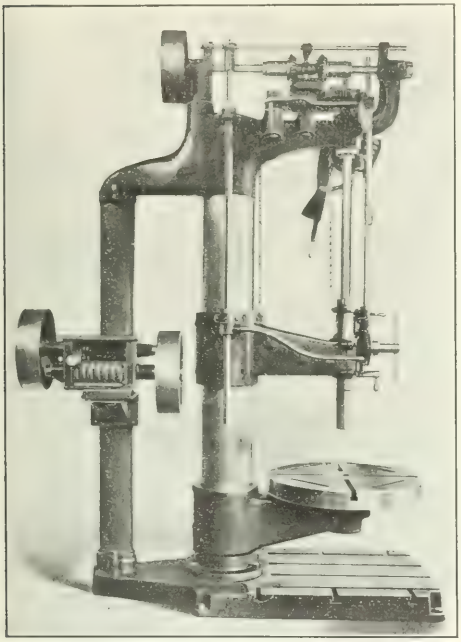
The New Hilbert Triple-Geared Upright Drill.

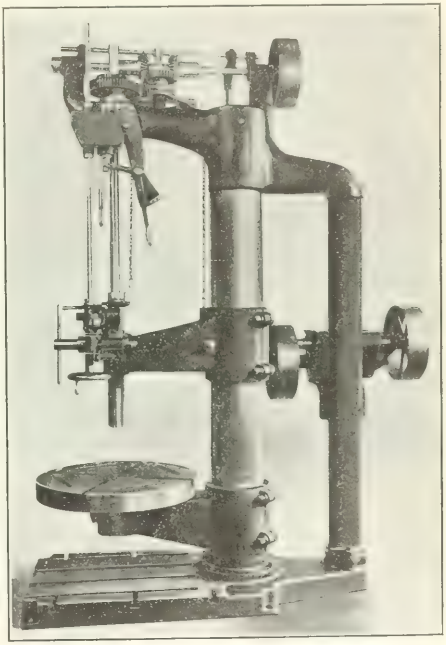
For so important a tool it is strange that the upright drill has been so little improved in the last few years. The older forms are generally open to the following criticisms: The spindle stock is not sufficiently rigidly secured to the column for accurate work; too much work is put upon the bevel gear drive in proportion to the back gears which are usually of 1 to 2 or 1 to 3 ratio; the transmitting shafts have to run two or three times faster than the spindle, resulting in more rapid wear and often noise; when tapping attachments are provided they are too frequently placed disadvantageously to be really powerful; and the friction clutch in the transmission, in its common location directly associated with the spindle, has not the aid of the ratio of speed reduction between the driving shaft and the spindle.

The above objections are among those which it has been sought to remove in the new triple geared upright drilling machine built by the Hilbert Machine Company, Cincinnati, Ohio, and illustrated herewith. Its round column is large and terminates at the bottom in an extended flange, which is bolted to the heavy ribbed T-slotted base. Still greater rigidity is secured by the columnar back brace which connects the top housing and the base, the four members forming substantially one solid piece. This secondary column carries the speed changing mechanism through which the power is delivered from a large single step pulley. Because of this single pulley drive the machine may be set either parallel with or at right angles to the line shaft. The speed variator is simple and, with its single operating lever, affords six changes in speed, ranging in geometrical progression. Near the spindle the six speeds are tripled by gears manipulated by a hinged lever provided with a locking pin. This lever is in front of the operator and enables three series of spindle speeds to be obtained instantly; one for high speed drilling, one for medium speed and one for heavy drilling and boring, six speeds in each series. The spindle has two gears, a large one of coarse pitch and a smaller one of fine pitch for high speed. There are no running idle gears; when any set is in action the others are disengaged. The provision of the extra gear at the spindle for high speeds removes the necessity of ever running any shaft at greater than a moderate speed.

All of the principal gears are of steel and are carried in phosphor-bronze bearings. The belt which transmits power from the speed variator to the top shaft introduces a yielding link in the transmission by its slipping, when the drill is unduly crowded and thus eliminates considerable danger of breakages.

The tapping attachment, with which each machine is supplied, is favorably located on the shaft which affords the greatest power and is conveniently accessible to the operator. Two miter gears provided with band friction clutches, adjustable for wear, connect it with the drive. These clutches have the property of increasing their hold as the load increases. A conical sleeve causes one or the other of these friction bands to engage the corresponding miter gear to give backward or forward rotation to the spindle as desired. The controlling lever is easily within reach of the operator to stop, start or reverse the spindle. The latter may be done at any speed. The friction clutches by years of use have been demonstrated to be reliable and to require no adjustment for wear.





Views from Opposite Sides of the New Triple Geared 36 In. Upright Drill Built by the Hilbert Machine Company, Cincinnati, Ohio.

The automatic spindle feed is positive, powerful and gives four changes of speed easily and quickly accomplished. Hand feed and quick return and approach movements are provided for the spindle, and an automatic trip which is sensitive and does not depend much upon the pressure on the spindle.

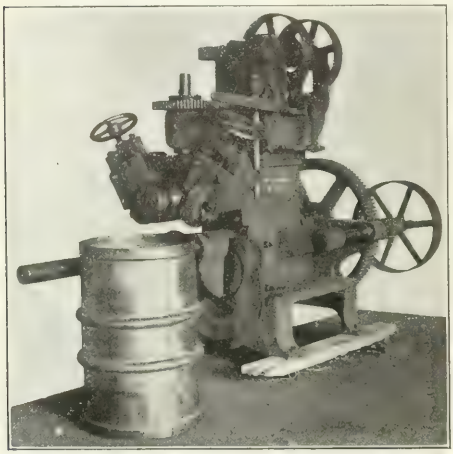
The front arm or spindle stock has long bearings and surrounds the column completely. It slides down on the latter to the top of the table arm, where the spindle will nearly touch the base. This feature allows omitting an inconvenient raising and lowering mechanism for the heavy arm and table. The spindle and table arms are of box girder section and of similar pattern. Each is clamped securely to the column by two strong screws, and with the extra support maintained by the back brace perceptable deflection of either arm, it is claimed, would

not be shown by the severest test. The gears are proportioned to allow for performing the heaviest work at maximum speeds with high speed steels.

The following are the principal figures: Floor space, 30½ x 80 in.; hight, 112 in.; weight, 3800 lb.; distance from center of spindle to face of column, 18 in.; diameter of table, 30½ in.; greatest distance between base and spindle, 56¾ in.; between table and spindle, 37½ in.; traverse of spindle, 15 in.; diameter of spindle at lower end, 3⅜ in.; in sleeve, 2 3-16 in.; above sleeve, 2 1-16 in.; socket in spindle, No. 5 Morse taper; diameter of column, 10 in.; size of driving pulley, 4 x 16 in.; speed, 250 rev. per min.; changes of speed, 18; changes of feed, 4—0.006, 0.01, 0.018, 0.03 per revolution of spindle.

A New Toledo Swedging Machine.

A new machine design for swedging or rolling the large beads on steel oil barrels and the shoulders at each end for supporting the heads or ends is shown in the accom-



The No. 336 Swedging Machine Built by the Toledo Machine & Tool Company.

panying illustration. The machine is fitted with two parallel shafts connected at the rear end with gears. These shafts support the upper and lower swedging rolls, which are made of tool steel and hardened.

The cylinders are first prepared in their plain, smooth shape and placed in position on the machine, guided by the apron in front of the machine, which is adjustable. The machine is fitted with an automatic lifting attachment operated by a reverse clutch mechanism, which necessitates only the starting by the operator. The upper shaft or head descends automatically to the work and finishes the swedging or rolling of the beads, when the clutch is automatically reversed by striking a stop, which is set to the correct position at the lower end of the travel of the head. This stop reverses the lever, which throws the clutch mechanism to the opposite side when the head is elevated to the required hight, where it is stopped automatically.

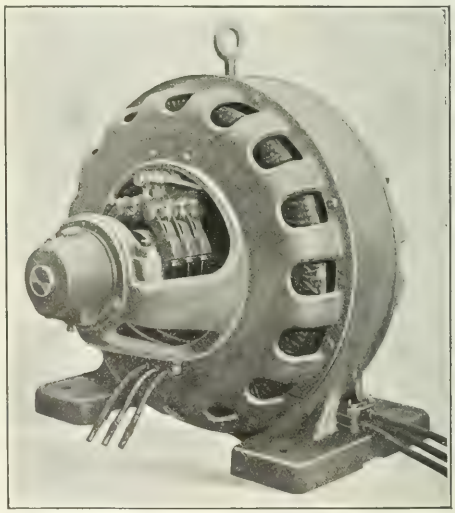
It requires about 1 min. to roll or swedge each bead or shoulder, and the machine, therefore, has capacity for finishing at the rate of about 30 cylinders or barrels per hour. The machine has capacity for working metal as heavy as No. 14 gauge, varying in diameter from 12 to 36 in. It is known as the Toledo No. 336 swedging machine and is designed and built by the Toledo Machine & Tool Company, Toledo, Ohio.

This week the Bessemer steel plant, 20 puddling furnaces and No. 2 skelp mill of the Youngstown Sheet & Tube Company, Youngstown, Ohio, are on double turn, while No. 3 skelp mill is running single turn. The sheet mills and No. 1 skelp mill are off this week. The plant of the Morgan Spring Company at Struthers, recently bought by the Youngstown Sheet & Tube Company, embracing rod and wire mills, is running double turn in all departments.

A New Westinghouse Induction Motor.

The first polyphase motors were of the brushless or squirrel cage type, and compared in their characteristics with shunt wound direct current motors. Now the high starting torque with a low initial current peculiar to a series wound direct current motor have been approximated by the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., in a modified form of alternating current motor, type H F. The illustration shows its general appearance. It is designed throughout for severe service. The frame, although affording ample ventilation, is strong and substantial and protects the laminations from injury. The insulation on the coils is made equal to much greater stresses than it is ever expected to receive, and the wearing effect of vibration has been guarded against.

By means of the brushes shown, connection is made to an external resistance. These bear on continuous rings of metal, hence are not subject to sparking, and are liberally proportioned for long life and little attention. The rotor is unlike the usual short-circuited type of induction motor armature, and has a regular winding in which the resistance is inserted while starting, to limit the current supplied at that time. Approximately full load current is required to produce full load starting torque. Where



An Example of the New Alternating Current Motor Built by the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.

it may be desired semi-inclosing covers are provided to protect the brushes and slip rings from coarse foreign bodies, or fully inclosing covers to exclude even dust.

The motors are regularly built in the usual sizes, from 5 to 500 hp., and larger sizes on order. The standard frequencies are 25, 40 and 60 cycles, but motors for other frequencies are furnished when required.

Special starting devices are supplied with these motors, for varying the starting current by hand by cutting out the resistance in circuit with the armature. When the motor is up to speed all of the resistance is short circuited and the motor runs with practically the constant speed characteristics of a motor with a squirrel cage armature. Motors of 100 hp. or larger can be provided with a special switch to short circuit the windings inside of the motor and relieve the brushes and the leads and contacts of the starter.

The Heald Manufacturing Internal Grinder.

The internal grinding machine illustrated is designed for general manufacturing use in the grinding of round straight or taper holes in pieces that can be rotated. The machine, which is built by the Heald Machine Company, Worcester, Mass., has a number of special features, as well as several radical changes from the hitherto accepted design of its general type. Especially noteworthy is the mounting of the grinding spindle directly on the main table, and the headstock on a heavy bridge casting that permits the passage of the table underneath, constituting a massive and rigid construction. Another new feature is the self-contained and interchangeable wheel heads. The driving pulley of each is proportional to the diameter of the grinding wheel, thus automatically giving the correct speed for all sizes of wheels. The cross slide is operated either by hand wheel or by automatic feed ranging from 0.00025 to 0.003 in. at each reversal of the table. In addition to the wheel feed a finger lever provides the operator with hand micrometer feed, each movement of the lever causing the index wheel to rotate a single notch, advancing the grinding wheel 0.00025 in.

Five speeds of rotation of the work are obtained through a quick change gear box mounted as a part of the countershaft, and three speeds of table travel for each of the five work speeds through the quick change gear box seen at the left on the base, giving fast travel for roughing out stock and slower speeds for truing and finishing. At the right on the base is the automatic reversing gear box. This and the other two gear boxes have been described in detail in *The Iron Age*.* The machine shown in Figs. 1 and 2 swings 14 in. and grinds 11 in. deep. The diameter of the smallest hole ground is ⅞ in., and the largest 10 in.

Internal grinders are becoming perforce more generally used. They are succeeding reamers for many purposes, and for parts too large for reaming there is no other substitute if work is to be exact. Where a piece of work has thin walls it is very difficult to hold it for reaming without distortion, while for grinding it can be strapped to a face plate avoiding this danger. There is also an advantage in being able to face work at the same setting with the grinding of the hole, as, for instance, a shoulder at the bottom of the hole, or the face of a ring or collar. This may be done on this internal grinding machine by using the face of a cup wheel instead of the periphery as in internal grinding. It is frequently of advantage to be able to make the hole and the face accurately square, one with the other, and if distinct operations are made of these, as transferring from grinder to lathe, or vice versa, accuracy is dependent entirely upon the precision of the chucking, which may not be within the limit of error allowed.

The departure of mounting the grinding spindle on the machine table, instead of behind it, reaching up and over it, contributes to rigidity, enabling the operator to take heavy cuts with a free cutting wheel; the absence of vibration also maintains the texture of the abrasive wheel. The main table is long and heavy, with wide bearings to insure good wearing qualities. Guards protect the ways from grit or dust, and oil pockets and rolls distribute oil uniformly.

The headstock, mounted on a bridge over the table, is arranged to swivel to various angles for grinding taper holes, and is graduated in degrees and in inches taper per foot. It is a heavy casting, and the chuck spindle is made of a special grade of high carbon steel, ground and lapped and of large diameter. Details of the head are shown in Fig. 3. The bronze bushings *a* are tapered outside; and have straight bearings. The adjusting nuts for the bushing are shown at *b*, the dove tail wedges to seat the bushing in the head at *c* and their adjusting screws at *d*. The hardened check nuts to take up end play are at *e*, and opposite them is the hardened thrust collar *f*. The hardened stud on which the head swivels is shown at *g*.

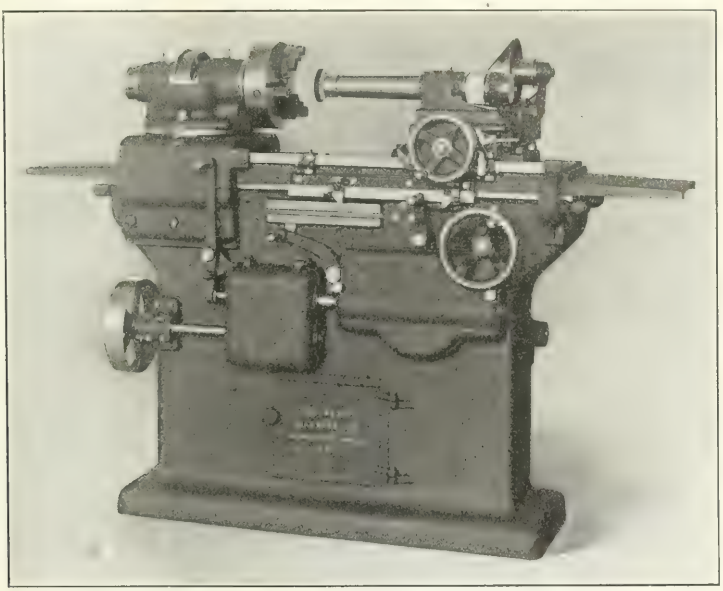


Fig. 1. Working Side of the New Internal Grinder Built by the Heald Machine Company, Worcester, Mass.

The head spindle is driven by a belt from a five-speed quick change gear box mounted overhead on the countershaft. By this correct working speeds can be obtained, and the operator is enabled to speed up the work with great facility for the finish cut to procure a mirrorlike surface, unobtainable at slower speeds.

The details of the grinding wheel spindle are shown in Fig. 4. The spindle runs in the phosphor bronze bushing *h*, adjustment being obtained through the adjusting nut *j* and adjusting screws *k*. The wheel collet is shown at *l*, the radial ball bearings at *n*, and adjusting nuts at *m*. The spindle is hardened, ground and lapped. The pulley bearings consist of double radial ball bearings, so located

* April 12, 1906.

that there is no belt pull on the spindle. The idler pulley is also fitted with ball bearings, and is adjustable on the cross slide to maintain correct belt tenison. It has two steps, the smaller being driven from the countershaft, and the larger driving the wheel spindle at correct speeds from a moderate countershaft speed.

A special feature is the construction of the wheel head, the outer bearing of the driving pulley being so supported that endless belts can be used, and yet be put on or taken off without any changes or adjustments. This facilitates exchanging the interchangeable wheel heads, which not only permit of easily adapting the machine to work of different sizes at correct cutting speeds, but permit the use of any size wheel head on any one of several machines. Wheel heads are furnished in the following seven sizes:

Size A, smallest hole ¾ in. diameter and upward by 4 in. long.
Size B, smallest hole 1¼ in. diameter and upward by 3 in. long.
Size C, smallest hole 1¼ in. diameter and upward by 5 in. long.
Size D, smallest hole 2 in. diameter and upward by 4½ in. long.
Size E, smallest hole 2 in. diameter and upward by 7½ in. long.
Size F, smallest hole 3 in. diameter and upward by 6½ in. long.
Size G, smallest hole 3 in. diameter and upward by 11 in. long.

Sizes C, E and G are the same as B, D and F, except as to length, which is made greater to handle extra long holes.

feed is stopped at the predetermined point. A stationary index pointer, *d*, is arranged directly over the center of the index wheel from which all micrometer readings are taken.

Cooling water is circulated by a centrifugal pump mounted on top of an unusually large tank, and the table is provided with channels leading to the water pan, and thence to the tank. The tank contains a large settling chamber for grit, so that only clear water passes to the pump chamber. A novel feature is the mounting of the water tank on truck rolls, so that it can be wheeled to any convenient point for dumping and cleaning out. An exhaust fan is included in the equipment for carrying off the dust produced by dry grinding. Where works are equipped with an exhaust system, or if wet grinding is preferred, this can be omitted.

Another radical departure is the means taken for taking up wear in the various bearings. In each the cap is slightly separated from the lower half of the box, and in the box is fitted a bronze bushing of uniform diameter outside and in, and split at the top. Ordinarily such a bushing is carried in a round hole bored in the box, and when adjusting the cap more closely the tendency is to

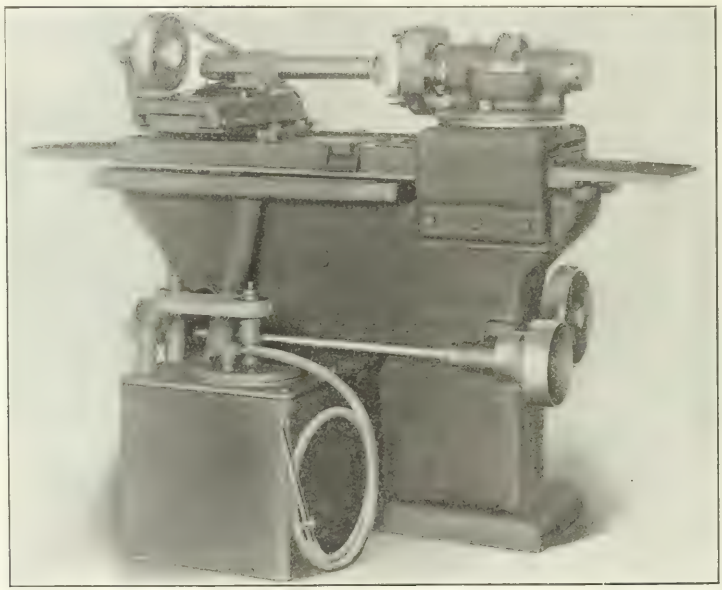


Fig. 2. Rear View of the New Heald Internal Grinder for General Manufacturing.

The construction of the cross slide is shown in Figs. 5 and 6. The hand feed is through the wheel *a*, or the finger lever *l*, operating the upper of the two pawls shown at *c*, this motion limiting the feed to quarter thousandths of an inch, or one notch of the index.

The power feed mechanism is also shown in Figs. 5 and 6. At the end of the pawl lever *o*, opposite the pawl *p*, is a V-shaped depression, *r*, in which rides the roll *s* on the end of the oscillating lever *u*. Normally, the roll rests at the bottom of the V, but when the table travels to the right or left and comes in contact with the stops *w* on the dog bar *x*, the roll moves from its normal position, and in swinging to either side forces down the end of the lever and elevates the pawl end, causing the wheel to feed, more or less according to the setting of the dog, which can be adjusted to feed from 0.00025 to 0.003 in. at either one or both ends of the stroke, according to whether one or both of the pawls are set to operate. For an automatic knock-off the ratchet wheel is provided with a guard, *y*, covering a portion of the toothed surface of the index wheel *z*, this being set so that when it is brought round to the pawl *p* the latter no longer engages and the make the hole elliptical with the short axis vertical. To avoid this the boxes of the new grinder are made with a recess at the bottom extending 90 degrees laterally. This construction gives a three-point bearing, with the three points practically equidistant. Consequently the bushing is closed with uniformly distributed pressure, making all diameters of the hole alike and a fit on the shaft.

The length of base of the machine is 52 in., hight of work spindle from floor 45 in., the work spindle bearings are 2¾ and 2¼ in. diameter, and the hole through the work spindle ¾ in. The width of the belt on the grinding spindle is 1¾ in., the head is graduated 45 degrees, and to 4 in. per foot each way. The floor space required is 40 x 92 in. The countershaft is complete, containing a steel drum 12 in. in diameter by 30 in. long for driving the wheel spindle; a five-speed box, with friction clutch and quick acting brake for driving and stopping the chuck spindle, and tight and loose pulleys for the belt from the main line.

W. L. Brubaker & Brothers, manufacturers of taps, dies, reamers and screw plates, Millersburg, Pa., formerly

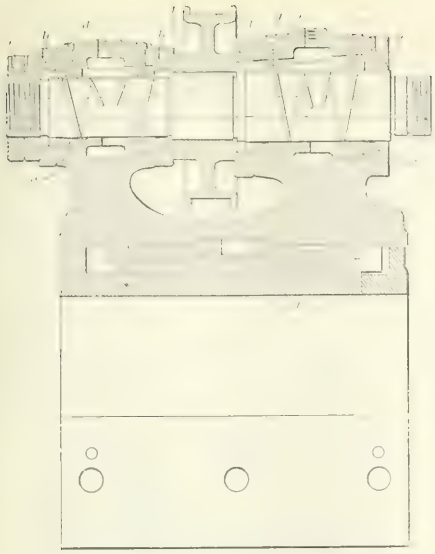


Fig. 3.—Sectional Detail of the Work Head.



Fig. 4.—Section of the Wheel Spindle.

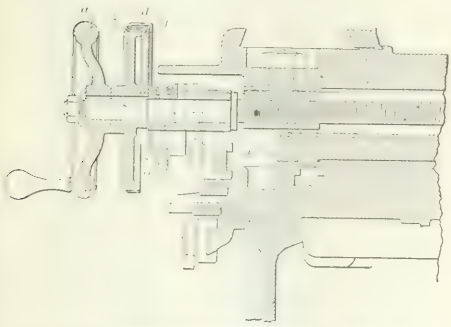


Fig. 5.—Lateral Section of the Spindle Cross Slide.



Fig. 6.—Front View of the Cross Slide and Power Feeding Mechanism.

represented in Pittsburgh by the Messenger-Pringle Company, and the Ohio Blower Company, Cleveland, manufacturers of the Swartwout cast iron exhaust head and centrifugal steam separators heretofore represented by the Pittsburgh Steam Specialty Company, have both transferred their agencies to H. W. Hendrickson, 1206 Park Building, Pittsburgh, who will represent them hereafter in that district.

Westinghouse Steam Turbine Census.

The following table shows the aggregate turbine business of the Westinghouse Machine Company at the beginning of the year, classified according to industries. This table shows a summary of 640,700 kw., or 930,000 hp. This output is distributed among 282 plants (averaging 3298 hp. per plant), and 433 machines averaging 1886 hp. per machine.

Summary of Westinghouse Turbines Shipped or on Order up to December 31, 1907.

Classification.	Plant capacity Under 1,000 kw.	Plant capacity Above 10,000 kw.	Total number of plants.	Average number of turbines.	Total capacity. kilow'ts.
Electric traction:					
Electric railroads	18,900	144,500	69	1,975	282,800
*(Railroad electrification)		33,900	4	3,350	46,900
Totals	18,900	178,400	73	....	329,500
Electric lighting:					
Central stations	23,550	45,000	73	1,440	180,100
Isolated plants	3,200	....	7	400	3,200
Municipal	4,000	....	11	570	8,700
Totals	31,700	45,000	91	....	192,000
Steam railroads:					
R. R. electrification	....	33,900	4	3,350	46,900
*(R. R. car shops)	9,200	....	17	490	15,700
Totals	9,200	33,900	21	....	62,600
Industrial:					
Textile mills	8,200	....	22	595	13,700
R. R. car shops	9,200	....	17	490	15,700
Cement mills	700	....	5	1,012	7,100
Iron and steel works	1,000	....	3	500	5,000
Pulp and paper mills	800	....	5	778	7,000
Rubber works	900	....	4	621	4,350
Powder works	1,200	....	2	400	1,200
Machinery manufacturers	5,400	....	12	576	15,000
General manufacturers	5,750	....	11	453	7,250
Totals	33,150	....	81	....	76,300
Mining and irrigation	8,000	....	19	686	21,950
U. S. Government	1,750	....	4	1,225	12,250
Miscellaneous	6,700	....	14	483	8,700
Grand totals	99,250	223,400	282	....	640,700

*Industries in parentheses, but allowed for in grand totals.

NOTE.—Business uncompleted December 31, 1907: 60 turbines of 153,550 kw., total, leaving shipped or in operation 433 machines, or 487,150 kw., averaging 1122 kw.

In addition to this output listed above there were at that time under construction at East Pittsburgh 148 machines. These bring the grand total of the turbine business of this company up to 864,300 kw., or 1,253,000 hp.

Although there are comparatively few railroad electrification plants yet installed, their capacity is large, 11,670 kw. per plant. In paper and textiles there are 27 plants, aggregating 20,700 kw., or 767 kw. per plant. Nineteen mining properties have adopted turboelectric drive. Thus, while the most fruitful field for the turbine in the early days of its development was in electric traction and electric lighting work its field has greatly broadened out into the general industries, until to-day nearly 15 per cent. of the total represents manufactures, as against 34 per cent. electric lighting and 51 per cent. in traction. An idea of the size to which modern central stations have grown is furnished by the fact that nearly 35 per cent. of the total capacity listed is contained in stations of over 10,000 kw. capacity. A decade ago, at the beginning of the turbine business, stations of this size were few. To-day most large cities have at least one if not several stations of this capacity.

In this connection, some data on the development of the Parsons type turbine for marine work in Europe is of interest. Sir William Matthews, in his recent presidential address before the British Institute of Civil Engineers, cited the following: "In the middle of the present year (1907), there were in service 61 steamships fitted with Parsons turbines, and 65 vessels under construction to be furnished with them. The total horsepower of these ships approached 1,400,000. Of this, about 42 per cent. was in merchant vessels and yachts, and 58 per cent. in war ships. In new ships of the Royal Navy reciprocating engines have given place to turbines."

The Bogoslovsk Mining Estate.*

BY WILLIAM H. SHOCKLEY, TONOPAH, NEV.

The Bogoslovsk Estate lies in the low rolling hills east of the summit of the Ural range, and is geographically in Siberia, though politically in the Perm Government of European Russia. Its irregular area of 3600 square miles extends 144 miles N. S., with an extreme breadth of 53 miles; the town of Bogoslovsk, near the center, being in latitude 60 degrees N., longitudinal 60 degrees E. The estate also owns some outlying areas. While exceeded by the immense private properties of the Czar and by some others (such as that of the Prince of Thurn and Taxis, which is said to comprise 40,000 square miles, of which 17,560 belong to the Domains Company, Ltd., of London), this is one of the largest in the Russian Empire, and ranks with the great estates of the world.

The chief industry of the estate is iron making in charcoal blast furnaces and the manufacture of steel. The product in 1905 was 75,000 tons, nearly all of which was made into steel. Both the iron and the steel are of exceptionally good quality. The latter is made into rails and structural shapes at the Nadesda Works. In 1903 the product was:

	Per ton.
54,000 tons of iron, costing	$8.10
63,000 tons of steel, costing	13.70
44,000 tons of rails, costing	21.08

Extensive alterations and additions, since made to these works, have increased their capacity and reduced the cost of their product. It was estimated that, after completion of the works, the iron would cost $6.85 per ton (a figure which, at the present time, is probably surpassed in cheapness only by the iron furnaces of Shansi, China, where excellent iron is made for $5 per ton), and that the annual product would be 83,000 tons, or one-sixth of the total product of the Urals.

In 1905 the motive power employed at Nadesda amounted to 4555 hp. But a gas engine of 6000 hp., made by the Cockerill Works of Belgium, was then being erected to replace the steam engines, and to be run by the waste gases from the iron blast furnaces. The power in excess of that employed in the iron industry was to be electrically transmitted to the copper mines. The erection of this large gas engine, of most modern type, is a creditable illustration of the enterprise of Russian managers in this region. Other instances could be given. Steam engines were used in the Urals in 1766, and some of the earliest (as the Russians claim, the very earliest) experiments in copper converting were made there. The Bogoslovsk copper converter was set up in 1882.

The charcoal pig iron made on the estate is converted by the open hearth process into steel of excellent quality, which is, for the most part, rolled into rails and structural shapes.

The quantity of the developed iron ores, including those of the Northern iron mine on the Lozva River, has been estimated by Professors Feodoroff and Nikitin at 8,000,000 tons. They are hematites and limonites, containing 30 to 66 per cent. of iron, and occurring in basin deposits, from 13 to 65 ft. thick, 200 to 650 ft. wide and 500 to 1600 ft. long. There is believed to be a great deal of undeveloped ore on the estate and in the Northern iron mine. The output of ore from 1896 to 1903 was 686,000 tons, mined at a cost of from $1.15 per ton in 1896 to 81 cents in 1902.

The deposits are worked by pick and shovel, the ore being hauled from the quarries in 1000-lb. loads by wagons, often driven by women.

Belt Talks.—The first two of a series of six semi-technical booklets on belting have been issued by the J. A. & W. Bird & Co., 34 India street, Boston, Mass. No. 1 deals with belt drive design, covering how a belt drives, ways to increase power, effect of centrifugal force, value of high speed, coefficients of friction and arc of contact. No. 2, dealing with the power of belting, gives a simple rule for power, a rule for belt speeds, describes a computer, referred to later; gives a theoretical rule, and explains the tension due to centrifugal force and the selection of constants. The computer mentioned is copyrighted by the J. A. & W. Bird & Co., and is a celluloid and paper contrivance, which works somewhat on the principle of a slide rule. Directions for its use are printed on the slide, which explains how to compute the horsepower, speed of belt, size of pulleys and size of shafting, and how to correct these results for centrifugal force and arc of contact. In this way it is made theoretically accurate, yet it is simpler than the ordinary computers and quicker to operate. The booklets are sent free on request and the computer for 6 cents in stamps.

* From a paper read before the American Institute of Mining Engineers, New York, February, 1908.

A New W. P. I. Sensitive Drill.

The sensitive drill shown in the illustrations is new, in that the drive is accomplished through a double disk and roll friction and positive cam clutches, doing away with cone pulleys and quarter turn belts. It is a high speed machine, though not an extreme example, and is intended for commercial use with drills up to 9-16 in. in diameter, although heavier work may be done in an emergency, as has been demonstrated by tests. Instantaneous variation of speed is obtained by the movement of a lever handle which changes the relations of the rolls and their disks. The clutches are designed to increase the power automatically as greater duty is imposed at the drill point. The speed of the drill is determined by the passage of the friction rolls across the faces of the disks, with a degree of variation of four to one. The machine is built by the Washburn Shops of the Worcester Polytechnic Institute, Worcester, Mass., in single spindle form as illustrated in Fig. 1, and in multispindle pattern of which Fig. 2 is an example.

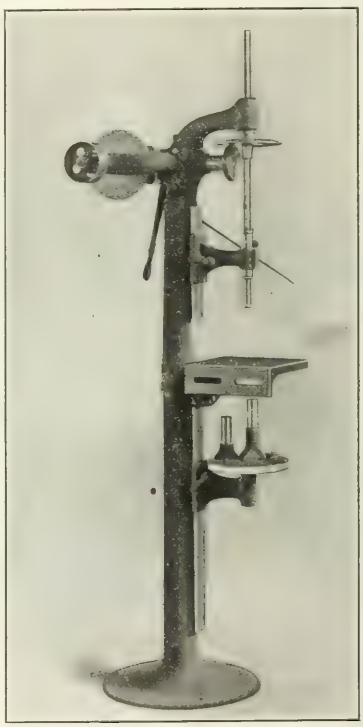


Fig. 1.—The New Friction Driven Sensitive Drill Made by the Washburn Shops of the Worcester Polytechnic Institute.

The transmission of the power from the driving shaft to the spindle through the double friction is shown in detail in Fig. 3. The sleeve *b*, keyed to the driving shaft *a*,

carries as a part of itself one member *c* of the cam clutch. The other half of the clutch, *e*, is a part of the friction disk *d*, which is engaged while operating by the fiber roll *f* mounted on the roll shaft *g*. On the opposite end of this shaft is another fiber roll *h*, engaging the friction disk *j* on the spindle. The two rolls are of equal diameter, as are the two disks. The roll shaft is carried in a self-oiling sleeve in which is cut a rack meshed by a gear segment operated by the handle *l*, which gives the motion of the rolls across the disks, its operation being similar to that of the mechanism for raising and lowering the spindle.

It will be seen that as the roll *f* passes from the smaller to the larger diameter of its disk its speed is increased, while at the same time the roll *h* passes from the larger to the smaller diameter of its disk, which has the effect of multiplying the speed of the drilling shaft in geometric progression. Consequently, with the proportions adopted, the speed of the spindle when the roll *h* is at the smallest diameter of the disk *j*, is four times as great as when it is at the largest diameter. The central portion of the disk *d* is recessed to break contact with its roll and stop the drive to the spindle.

The direct drive of the spindle from its disk is obtained through the cam clutch *k*, which is of the same construction as that on the driving shaft. The part *m* is carried in the bushing running in the bearing of the head and driving the spindle by a sliding key. The lower half of the clutch is a part of the disk *j*. When the drill is started the clutch engages positively, and as greater pressure is applied at the drill point the lower cam surfaces move upon the upper, increasing the normal pressure on the fiber roll, thus automatically increasing the

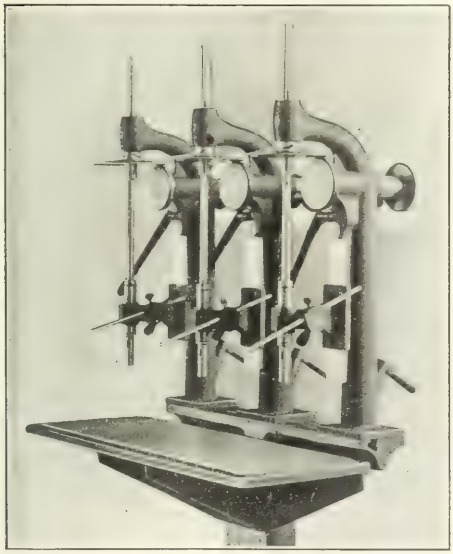


Fig. 2.—A Drill of the Same Type with Three Independent Spindle Heads.

driving power as the demand for it increases with the work. The cam is backed by a ball bearing, and a slight spring serves to keep the cam surfaces together, so that the disk may always be in contact with the roll. The recommended speed of the driving shaft is 800 rev. per min., which gives a variation in speed to the drill of from 400 to 1600 rev. This speed has been chosen on the theory that best efficiency is obtained with surface speeds of about 70 ft. per minute for high speed drills. Higher or lower cutting speeds can easily be obtained, if desired, by changing the speed of the driving shaft. The spindle has a No. 1 Morse taper socket, which takes drills up to 9-16 in. diameter, which seems to be the generally accepted limit of sensitive drill work.

The disks are of cast iron and the rolls of fiber, held between iron plates. The spindle has a travel of 3 in. and the head a vertical adjustment of 7½ in. The diameter of the spindle in the sleeve is ⅞ in.

In the multiple spindle type each head is a unit in itself. The heads may be slid along the column to as

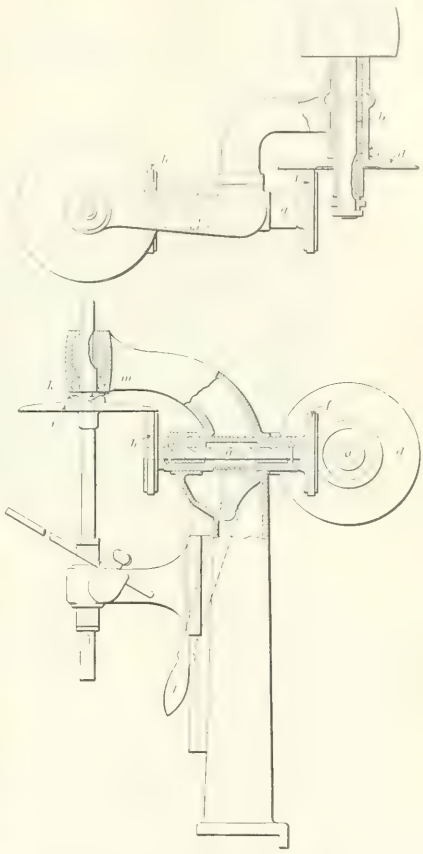


Fig. 3.—Details of the Friction Driving Mechanism of the W. P. I. Drill.

close as 10 in. centers. Any head may be taken from the column or extra heads added as the work requires. The head is fastened to the column by a T-bolt set at an angle, and is drawn into position by the lever nut shown at the rear of the machine. The single spindle machine weighs about 250 lb., the two-spindle 450, and the three-spindle 650 lb.

The Fore River Shipbuilding Company, Quincy, Mass., is building four steam turbines of 12,000 hp. each for the Japanese Government. Two of them will go into a cruiser now building, and are designed to give a speed of 23 knots. The other two will be installed in a first-class battleship, which will have a speed of 21 knots under the contract. They are 144 in. in diameter and will weigh 450 tons boxed. The two sets of turbines will cost about $750,000.

The recent purchase of the plant of the Morgan Spring Company at Struthers, Ohio, by the Youngstown Sheet & Tube Company, has led to the publication of reports that the latter concern is negotiating for the purchase of practically every plant in the Mahoning Valley. We are officially advised that the company is not considering in any way the purchase of more plants at the present time.

Hand Bending Tests of Materials.

Tensile tests alone are inadequate to indicate the true value of material in actual working practice; when a material will have to sustain moving stresses, it is evident that to test it merely by static loads is insufficient and a dynamic test is required. The most favored and promising method of testing in this way is by bending a piece in opposite directions, counting the number of alternations necessary to fracture it. In Professor Arnold's machine the metal is alternately strained beyond the elastic limit in each direction.

Capt. H. Riall Sankey, who in conjunction with J. Kent Smith has done such good pioneer work on vanadium steels, has devised a workshop testing machine, which was described in *Engineering* (London) some months ago. By means of this instrument, in which a test piece is bent alternately backward and forward through a given angle, results are obtained very similar to those given by Arnold's machine.

Description of the Instrument.

The machine is illustrated in Figs. 1 and 2. Its general character may be best understood by a reference to Fig. 2. It consists essentially of a bedplate to which is secured the small vise *a*. One end of the test piece is secured in this vise, while the other end is fastened in a similar vise, *b*, mounted on the end of a movable frame. The specimens used are ⅜ in. square and 4 in. long. A gauge is used in placing them in position, so that the piece being bent is the same length in all cases. The specimen is then bent through a definite angle by means of the handle *e*, first in one direction and then in the other, until it breaks. In Fig. 2, it may be seen that the movable frame swings about *d*, and that the pressure exerted is transmitted through the springs *f*. The compression of these springs measures the load applied to the specimen, and as the springs compress the handle *e* swings around the pivot *d*. The displacement of the handle is utilized for the drawing of an autographic diagram, which shows the maximum force applied on each alternate bend of the specimen, and also the total number of bends before failure occurs.

Sample diagrams are shown in Fig. 3. The cards, circular in form, fit down upon the ratchet wheel *k*, with which they are concentric. A pencil seen in Fig. 1 and indicated at *g*, Fig. 2, traces a circular arc on the card when the lever is pushed over. On the return bend the ratchet wheel is pushed over one tooth, so the pencil traces another arc. Each arc on the diagram represents a bend in each direction, so that the total number of bends is equal to twice the number of arcs on the card. The concentric circles shown on the diagram represent equal increments of load on the specimen. It may be seen that much more effort was required when the right hand diagram, Fig. 3, was taken, than with the left hand one. The cards form a permanent record of both the stiffness of the material and the number of bends required to fracture it.

Some Results Obtained.

Tests have been made upon a series of carbon steels and upon three samples of steels containing 0.04, 0.3 and 0.5 per cent. phosphorus respectively. In the case of the phosphorus steels, tensile and Wöhler tests gave unsatisfactory results, whereas impact and Arnold tests showed the injurious effect of the phosphorus. In making hand bending tests it was noticed that in many cases the final rupture gave some warning by small cracks appearing, but in others there was no previous indication and the steels broke with a snap and a loud noise. Both of the high phosphorus steels snapped. The results are given in the following table:

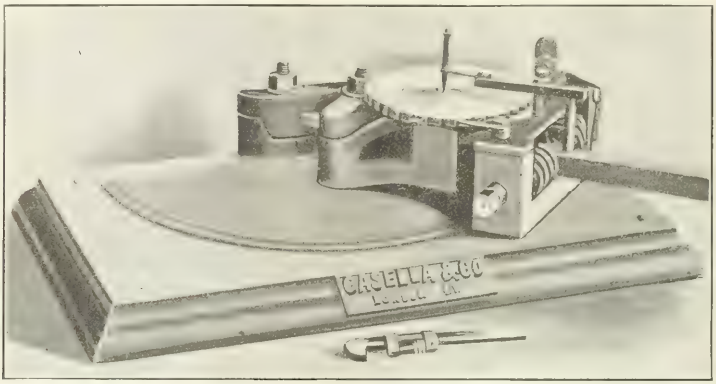


Fig. 1.—A Small Hand Machine for Making Bending Tests of Materials, Invented by Capt. H. Riall Sankey.

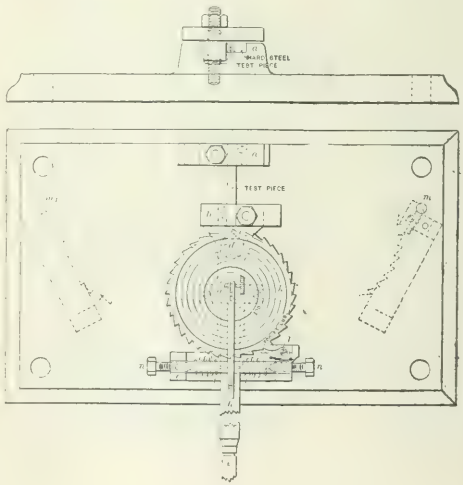


Fig. 2.—Constructional Details of Captain Sankey's Hand Bending Tester.

Mark.	Number of bends.	Average bending effort	Energy absorbed foot-pounds. to fracture.	Fracture.
0.04-P	18.0	110	3,960	Silky.
0.30-P	11.3	128	2,900	Granular and silky.
0.50-P	5.3	157	1,660	Fine crystalline.

The series of carbon steels were very pure crucible steels, with the carbon running from 0.13 to 1.306. The full analyses, and many tests upon them, are given in the Sixth Alloys Report of the Institution of Mechanical Engineers. A comparison of the hand bending with the ordinary tests shows that numerical figures are obtained by means of which the quality of the steel can be compared in the same manner as by the ordinary tensile test

and the impact test combined. They are given in the following table, the tests being on forged unannealed steels:

Number.	Carbon.	Number of bends.	Average bending effort, foot-pounds.	Energy absorbed.
1	0.13	43.5	61	5,300
2	0.18	30.5	83	5,060
3	0.25	21.2	72	3,050
4	0.47	23.5	92	4,320
5	0.72	12.2	130	3,170
6	0.87	5.1	170	1,730
7	0.95	4.3	157	1,300
8	1.31	3.2	124	800

The bending machine also produces a fracture which varies very considerably with the quality of the steel, a variation greater than with an impact test, and much

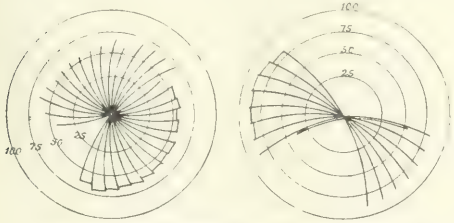


Fig. 3.—Specimen Diagrams from One of the Testers.

greater than in the case of a tensile test. This is illustrated in the following table:

No.	Carbon.	Fracture impact test.	Fracture bend test.
1	0.13		Silky.
2	0.18	Very fine granular.	Silky.
3	0.25	Very fine granular.	Granular and silky.
4	0.47	50 % very fine crystalline.	Fine granular.
5	0.72	Fine crystalline.	Granular and crystalline.
6	0.87	Very fine granular.	Medium crystalline
7	0.95	Very fine granular.	Fine crystalline.
8	1.31	Crystalline.	Fine crystalline.

Captain Sankey's simply constructed, readily operated machine seems to have demonstrated its efficiency and to be worthy of adoption on an extended scale for practical use.

The Des Moines Bridge & Iron Company's Pittsburgh Plant.

The Des Moines Bridge & Iron Company, Des Moines, Iowa, some time ago purchased 10 acres of land on Neville Island, near Pittsburgh, on which it is now completing a plant to supply the Eastern and part of the Western trade. This plant comprises a number of buildings, as follows: The fabricating shop is of steel construction, with sheet sidings, 120 x 150 ft., and contains four Cleveland combination punches and shears, one 8-ft. bending roll, six 2-ton chain cranes, one 48-in. plate shear, one dishing machine of special design, one rotary planer and a bulldozer. The blacksmith shop, now being completed, is also of steel construction, 50 x 100 ft., and will contain forges, lathes, bolt cutters, &c. A machine shop, 50 x 100 ft., will be built later. An Ingersoll-Rand compressor located in a shed furnishes air for operating the tools. The machine tools will have individual motor drive, the power being furnished by the Brunots Island plant of the Allegheny County Light Company.

The stockyard is served by three 350-ft. crane runways. It is connected by spur track from the Pittsburgh & Lake Erie Railroad to the main building, and also has a system of narrow gauge tracks for hauling plates and structural material. In this yard are a friction cold saw, a Cleveland combination punch and shear and a riveting machine, located close to the stock.

This plant will be known as the Pittsburgh branch and will be devoted to the manufacture of steel tanks, bridges and general structural work. It will have an ultimate capacity of 500 to 1000 tons per month. H. L. Eastman is the Pittsburgh manager, having his office at the plant. This branch is now turning out an order for 2000 tons of structural work for a new post office at Los Angeles, Cal., and four large water towers of the hemispherical bottom type and steel work to support them, for shipment to different points. It also has orders on its books for much other work.

Customs Decisions.

Cold Rolled Steel in Strips.

After a litigation extending over the tariffs of 1894 and 1897, the Joseph F. McCoy Company and others at New York have won a victory in the contention for reduced duty on certain cold rolled steel in strips. The merchandise, which was imported at various times, was assessed for duty as "sheet steel in strips," whereas the importers claimed the articles to be dutiable properly as "steel in all forms and shapes," at the specific rates provided for this class of goods under the Wilson and Dingley laws. The strips are of very thin steel, in lengths of about 50 ft. or over, and in width varying from 1 to 12 in. After reviewing the issue at some length, General Appraiser Fischer, in his decision for the board, reaches the conclusion that the claims of the importers are well taken. The protest is accordingly sustained.

Knife Sharpeners Made of Emery.

In sustaining a claim filed by George Borgfeldt & Co., New York, the Board of United States General Appraisers has decided that knife sharpeners made of emery composition with wooden handles are free of duty under the provision in the tariff act for "whetstones." The question for the board to settle was whether the sharpeners should pay duty according to the component material of chief value, which in this case is stated to be wood. After a consideration of the testimony, however, the tribunal, in a decision written by General Appraiser McClelland, reaches the conclusion that the articles should be allowed to enter as "whetstones."

Actual Examination of Goods by General Appraisers Not Required.

That there is nothing in the Federal statutes requiring the actual examination of imported merchandise by a board of three general appraisers in a reappraisement proceeding is the burden of a decision just promulgated by the Board of United States General Appraisers. The decision of the tribunal was called forth by a protest filed by Loeb & Schoenfeld, New York, who through the law firm of Curie, Smith & Maxwell, sought to upset reappraisements made nine years ago during the administration of Wilbur F. Wakeman as Appraiser of the Port. The attempt, however, so far as the board is concerned, ends in defeat for the protestants. Eugene G. Hay, who writes the decision for subboard No. 3, further lays down the proposition that in the case at bar, the examination of the goods, which happened to be Swiss embroideries, would not have in any way aided in arriving at a right conclusion. "Hence," says the decision, "the reappraisement in question is not invalid by reason of the failure of the board to have before it the exact merchandise in question or samples thereof. The protest is therefore overruled."

A Railroad Shop Uses a Suction Producer and Gas Engine.—The main car repair shop of the Minneapolis & St. Louis Railroad at Minneapolis is one of the first railroad shops to introduce the suction producer and gas engine. Proximity to a desirable residence section made it necessary to suppress smoke. The *Railway Age* says of the results: "The elimination of smoke has been effected, and it is reported that in operation the plant shows a low cost for fuel. The coal used is anthracite pea, and the consumption, when the engines are carrying 75 to 80 per cent. of normal rate, is only 1 lb. per brake horsepower, and the total cost of fuel, attendance and operation is given as $1.24 per horsepower per month. There is one engine of 140 hp. for the mill and two engines of 80 hp. for driving electric generators. The first cost of large gas engine plants is virtually on a par with first-class reciprocating engine plants, about $100 per horsepower, while the costs for fuel, for labor, handling of coal and ashes, and for maintenance, are each reported to be about one-half as much per unit as the corresponding items for a plant using steam engines and boilers."

THE IRON AGE

Established in 1855.

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The "Academic Rights" of Labor Unions.

The comments of labor journals, the published utterances of labor leaders and "Labor's Protest to Congress"—all dealing with recent court decisions unfavorable to labor unions—indicate how thoroughly ingrained in unionism is the idea that the application of the law of the land must be bent to the wishes of organized labor. There is irony in that protest, which, in attacking the Supreme Court for holding that some acts of labor unions fall under the prohibition of the Sherman Anti-Trust law, views with alarm the "endangering of individual liberty." This from organizations that make no apology for using any means to prevent a nonmember from working when the union says no work can be done! And a trade union journal, apparently laboring under the belief that an effort is being made "to drive them [the unions] out of existence by legislation and court decrees," serves notice that "the unions of labor will live; they cannot be, they must not be, will not be driven out of existence"; and, finally, that "labor demands relief at the hands of Congress, and demands it *now*." Along with these various stormy protests and demands there is this sarcastic reference to the "rights" now guaranteed to labor by the courts:

> The right to be maimed and killed without liability to the employer.
> The right to be discharged for belonging to a union.
> The right to work as many hours as employers please and under any conditions they may impose.

It is hardly necessary to say to those who have followed the labor legislation and court decisions of recent years, and particularly the attitude of municipal authorities and some State Executives toward lawbreaking strikers, that the catalogue of union labor "rights" has not been diminishing but rather expanding. Just now excited utterances are evoked by court decisions indicating that there are constitutional bounds which legislation forced by the so-called labor vote cannot cross. This outcry reminds one of the reason given by the New Zealand labor unions for refusing to accept the results of certain arbitration under that country's well advertised system: "Why, they've decided against us!" The loose rein under which unionism has been running receives a check, and the air is suddenly full of tumult, because "the association of human beings for education and progress" has been interfered with.

If the declared purposes of trade unions—those purposes so well set forth in magazine articles and so uniformly urged by ministers, professors and the sociology specialists who occasionally get seats in legislative bodies—were their only purposes, there would be no trouble from adverse court decisions. But the benevolent programme of aspiration, uplift, betterment and all the rest somehow gets diverted and in its place we sometimes get mobs, riots, murders, maiming, boycotts, incendiarism and dynamiting. It is not what trade unions do to help their members that the courts have found fault with, but what they do to injure nonmembers and to hurt the business and destroy the property of employers. And when courts attempt to define the rights of unions and to point out what things they may lawfully do, naming the very things the labor leaders specify when writing for the public prints, there promptly comes back the derision of "Labor's Protest to Congress," and we are told that "labor is justly indignant at the bestowal or guaranteeing of these worthless and academic 'rights' by the courts."

The trouble has long been that the labor unions have paid too little attention to their announced programme of improving the condition of their members and vastly too much to their campaign of coercing workmen into their ranks and coercing employers to grant their demands, whether reasonable or not. If the unions agitated for skill and efficiency and high grade workmanship with half the energy they put into inflicting injury their influence would be greater, as would also their ability to secure better conditions for their members. In very large part the present agitation for the improvement of mechanical ability and for increasing the number of skilled workmen in all manual trades is carried on by employers, either as individuals or as members of employers' associations, while militant unionism spends large sums in carrying on strikes and in battling for the "right" to boycott and coerce. We are not pessimistic enough to believe that unions of the Gompers type will always be as representative of the trade union movement as they seem to be to-day. Some of the strong unions of the country have maintained a different standard and have operated on a higher plane. They have spent less time in contending for the "right" to lay violent hands on the persons and business of others, but they have made more progress toward the legitimate objects of unionism, which leaders of the violent type are now pleased to deride as "academic and worthless."

The Buying of Heavy Milling Machines.

The scope of the milling machine has been broadly increased in recent years. It has been applied to work formerly considered entirely outside of its field, and its builders believe that the extent of its usefulness is even now but dimly realized in the machine shops. The successful manufacture of high speed cutters caused its greatest advance, and at the same time compelled its redesigning on lines giving greater weight and power. In this connection there is interest in the statement of a writer in the London *Engineer* that the tendency, presumably in England, is to buy milling machines by weight rather than by general excellence of design. We do not believe that this is the case in the United States. Yet it is conceivable that with the realization of the greater rigidity and general strength required with the use of high speed steels buyers may have been influenced in the beginning of the new machine tool epoch by weight, regardless, perhaps, of the fact, as the writer asserts, that cast iron is cheap, and its bulk is not always a part of correct design for high duty machinery. The buyer should take into account correct design only, which includes sufficient, properly distributed weight and sufficient power. The English critic lays down these maxims:

The purpose of a heavy milling machine is to remove metal. The metal is removed by utilizing the power which is provided.

If a large amount of power is not provided, a large amount of metal cannot be removed, no matter how well built the machine may be.

If the power is provided and the equivalent amount of metal cannot be cut away, the machine must be badly designed or badly made.

If a milling machine is well designed and well made and has a large amount of power, the work that can be done will bear an approximate relation to the power provided.

Tests are cited, made with 10 milling machines of different makes to determine the ratio of power to weight. The machines ranged in weight from 3820 to 4620 lb. The heaviest machine had only 2.4 hp., the lowest of them all. The lightest machine had 3.6 hp. The most efficient of all was a machine weighing 4000 lb., which developed 7.94 hp. "It might, perhaps, be urged," says the writer, "that the horsepower of such a machine [referring to one of low power] may be increased by speeding it up; and while this is true, it is, of course, also true that the low spindle speeds have to be sacrificed, and as they are often needed for the heaviest work, the gain in the power supplied to the machine is discounted by the loss of the low spindle speeds. Moreover, machines which are designed to run at a low speed are very liable to be noisy and to suffer under undue wear when speeded up. This is a fact which was very forcibly brought home to machine users by their earlier experiments in speeding up old lathes to use high speed steels."

Then follows a pretty good summary of the success which the American builders of milling machines have achieved in designing tools for use in high duty work: "The working parts of a machine which is to utilize high power and to remain in good condition must be stronger and of better material than is the case with low powered machinery. The bearings and wearing surfaces must be better, and the lubricating more efficient; high tensile steels must be used for shafts and spindles, and steel gearing must be liberally employed; the workmanship also must be of the best class, and, therefore, if high power is to be fairly provided for when buying, it cannot be expected that machines of the necessary high class character can be obtained at the same price per ton as low priced powered machine tools of the same or even greater weight."

The British builders of machine tools have always gone in for weight. There is a solidity of design and construction which looks powerful, and one can readily see how the prejudice referred to can exist over there. The difference in weight, power for power, between American and English machinery has grown less in high duty tools under modern demands, due to the advent of the new steels. But our own machine tool builders and designers have always had the faculty of distributing the metal in a machine tool as it should be. Weight is usually sufficient for the purposes of the machine, but the effort has always been made not to saddle the tool with unnecessary iron. In the extraordinarily rapid advance in milling machine design during the past few years, weight has been added with prodigal hand, where high speed cutters were to be employed. The very latest machines, some of which the public knows little of as yet, have probably reached the limit of the new steels, following in the footsteps of other types of standard machinery. But with such American machines the customer need have no fear in buying by weight. The metal is needed; there is none too much, though massiveness is the only word that will adequately describe their lines. Chips of brutal size indicate the work they impose upon their cutters; chips of steel, blued with the heat of friction, just as the modern lathe or planer rips off metal in the process of removing stock. The horsepower required is astonishingly great. American milling machine builders may feel a pardonable pride in the fact that no criticism of imperfect ratios of weight and strength and design and power can be fairly applied to their latest mechanical creations.

The Industrial College Problem.

The engineering schools, especially in their departments of mechanical and electrical engineering, receive frequent inquiries concerning entrance examinations from young men who have the means in sight to carry them through the course, but are without the necessary preliminary training. A large percentage of these men are mechanics who have saved their money and are ambitious to equip themselves for higher places, realizing that the training of a polytechnic institute bridges a very great gap in the mechanic arts. They would be well served by an industrial college, such as the Industrial Commission of Massachusetts has recommended for that State and for which a bill is now before the Legislature. The plan includes extensive buildings, the most modern of shop, laboratory and other equipment, and a corps of instructors sufficient in number to train a large student body. The idea as it is generally understood is to place the institution between the engineering school and local technical or trade schools. The students would not graduate as engineers, but would be equipped to become superintendents and high class foremen. This is a kind of timber it is more difficult to secure every year, especially where the manufactured product he is to deal with requires the supervision of a man with more engineering knowledge than is ordinarily obtainable in working up through successive steps in the shop itself.

Strong advocates of the plan have appeared at the hearings on the recommendations of the Massachusetts commission, but the opposition has been equally aggressive. It is argued that many of the cities and larger towns of the State are not yet provided with local industrial schools, which are essential to the manufacturing life of the community, and it is maintained that the State would do better service to its people by using the money asked for the college in the establishment or assistance of such schools. Another argument is that, were the college established, the tendency would always be to raise its standard until it would be on a par with the engineering schools of the State, such as the Massachusetts Institute of Technology, Worcester Polytechnic and the engineering school of Tufts College.

In considering the matter of State aid to local industrial schools the smaller towns are lost sight of. There are those who maintain that each community should support its own school, just as it does its high school. Many of the States have plenty of small towns and villages built around important industries which are not large enough or rich enough to maintain industrial schools for their young men, even with the assistance of the State. To be sure, the ambitious can move to larger places where, if they are employed during the day, they can attend the evening classes which constitute an essential feature of the modern school. But at best this entails the drawing away of ambitious men from manufacturing centers where their services are needed. The desire to get ahead and dissatisfaction with the prospect of going through life without the advantages of education are potent influences on the better class of American youth of humble means. If they can see a way to get an education they will save the money even at much sacrifice in order to carry out their purpose.

Some are able to enter the engineering schools, where their success is often notable. But by far the larger number have not the basic education to enable them to enter these higher institutions, or, if they do, to endure successfully the ordeals of advanced work in subjects in which they are insufficiently well grounded. They realize this after inquiry or experience and their ambition goes for naught, because there is no other opening for them. If an institution in their State would take them without an onerous examination, and if its course were not dependent upon advanced earlier training in the textbooks, the way would be clear to them. A considerable percentage of them would return to their own towns to take responsible positions with home manufacturers who know them. Doubtless employers would assist some worthy employees in obtaining such education; parents and friends would help others. Still another class of young men would profit by the college—those whose engineering instincts are strong, but who have not the mental power to master other branches of study that are necessary to round out the course of the engineering school.

In some way better provision will have to be made by the State or private philanthropy for the education of competent men who will carry on the work lying between that of the engineer and office, on the one hand, and the working forces, on the other. The beginning has already been made on a limited scale, in the establishment of the right sort of industrial schools, which are above ordinary trade schools or manual training schools. The apprentice system is reviving, but the number of graduates is very small compared with the need of the future resulting from the wonderful growth of the country. It is doubtful if the apprentice system and the common type of industrial school can go far enough in their preparations of young men for positions of responsibility, though they establish a basis from which men may be developed. The training of boys of school age must of necessity be far less effective than that of young men of college age or beyond it, especially if the latter have had the preliminary practical experience of employment in a shop, combined with the ambition which has led them to drop their work and seek a more advanced education. Many of them would be graduate apprentices. The drafting room would also furnish its quota.

Judged as an investment the college should bring a high percentage of return to a State. Good men are wealth producers. The average mechanic who has the training of such an institution would have a much greater earning power for the community than if he had been compelled to live out his life as it was begun in the shop. The idea of an industrial college supported by public funds may be premature, but its need is none the less apparent, a fact that will be realized more and more, as the scarcity of thoroughly efficient men for intermediate positions of responsibility is felt more acutely.

Steel and Malleable Castings.

The large field occupied in the United States by steel castings and malleable cast iron is emphasized anew in the production statistics of the former for 1907, and in the recent paper of William H. Hatfield on malleable castings, of which a considerable portion is given on other pages of this issue. With a capacity to produce more than 1,000,000 tons of malleable castings a year, and with an output that in 1907 probably reached 800,000 to 850,000 tons, and nearly as much in 1906, the United States has utilized this form of cast iron to the extent of more than 10 times the totals for all other countries combined. The paper referred to above calls special attention to the slowness with which Great Britain and other European countries have developed the use of this serviceable product, and by reproducing the results of tests points out that in ductility and in resistance to strain malleable castings have been made, that much better fill the place of steel than has been commonly accepted. In ductility the special castings referred to in the paper are certainly noteworthy, though the tests cited do not do justice to American malleable castings in the matter of strength.

The steel castings production of the United States is not so greatly in excess of that for the rest of the world as is that of malleable castings. Great Britain collects no separate statistics of steel castings. Germany in 1906 produced 189,000 tons. With 745,877 tons of open hearth castings and about 33,000 tons of Bessemer castings, the United States probably produced of crucible and other kinds sufficient to bring the total above 800,000 tons last year, so that the combined production of steel and malleable castings was between 1,600,000 and 1,700,000 tons. The combined railroad consumption was well beyond the 1,000,000 ton mark. What is of special interest to steel founders is the further advance of basic open hearth steel castings, bringing them almost to a parity with acid open hearth castings. The geographical distribution of the two processes is shown as follows in gross tons for the past two years:

	Basic castings.	Acid castings.	Basic castings.	Acid castings.
	1907.		1906.	
New England, New York and New Jersey	56,109	44,100	38,533	50,977
Pennsylvania	59,529	248,755	31,914	273,148
Ohio, Indiana, Illinois and other States	250,838	86,546	243,101	82,218
Totals	366,476	379,401	313,548	406,343

From being 77 per cent. in 1906, basic open hearth castings were more than 96 per cent. of the acid open hearth total in 1907. In Pennsylvania and the Eastern and New England States basic castings increased, while acid castings declined, and in the Middle West and the Southwest, the St. Louis District being an important factor, both acid and basic open hearth castings increased slightly. The total of 800,000 tons of steel castings in 1907, compares with 773,705 tons in 1906, 560,767 tons in 1905 and 330,000 tons in 1904. So recently as 1900 the production of steel castings was but 192,803 tons, or less than 25 per cent. of last year's record.

In a pamphlet of 45 pages, entitled "Tie Plates," the Hart Steel Company presents illustrations and details of the product of the Elyria Iron & Steel Company, Elyria, Ohio, for which the former company is the selling organization. A special feature is a collection of diagrams showing the punching data for a number of rail bases used by railroads, for which the company has furnished tie plates. The full dimensions are given for intermediate and joint plates, and elevations as well as plans are shown indicating the style of tie plate, number of holes and method of applying right and left hand plates. Twenty-five pages are given up to these drawings and other details. Half-tone views are shown of the various styles of rolled steel plates of the McKee type, and the result of this reinforcement is presented in a report of tests conducted by Robert W. Hunt & Co. The general sales office for the company's tie plates and spikes is at Elyria, Ohio, and the Hart Steel Company also has offices at New York, Chicago, Atlanta and San Francisco.

The Federal Railroad Tunnel through the Ricken Mountains, near Lake Zurich, Switzerland, was completed March 30. Construction on this tunnel, which is nearly 5 miles long, was begun four years ago.

Alcohol and Gasoline Compared.

Tests Made by the U. S. Geological Survey.

The Technologic Branch of the United States Geological Survey, under the direction of J. A. Holmes, has recently completed an elaborate series of tests on the relative value of gasoline and alcohol as producers of power. The tests, over 2000 in number, probably represent the most complete and exact investigation of the kind that has been made either in this country or abroad, and includes much original research work. Prof. R. H. Fernald, engineer in charge of the gas producer section, and professor of mechanical engineering in the Case School of Applied Science, Cleveland, Ohio, was in general charge of the tests. R. M. Strong, formerly connected with the engineering department of Columbia University, had personal supervision of the work. He was assisted by a corps of specially trained men. These tests were conducted at the fuel testing plant of the Geological Survey, at Norfolk, Va., and show the following results in regard to the comparative fuel consumption of 73 degrees specific gravity gasoline and commercial completely denatured alcohol, per unit of power.

Equal Volumes Consumed Under Like Conditions.

Correspondingly well designed alcohol and gasoline engines, when running under the most advantageous conditions for each, will consume equal volumes of the fuel for which they are designed. This statement is based on the results of many tests made under the most favorable practical conditions that could be obtained for the size and type of engines and fuel used. An average of the minimum fuel consumption values thus obtained gives a like figure of eight-tenths of a pint per hour per brake horse power for gasoline and alcohol.

Considering that the heat value of a gallon of the denatured alcohol is only a little over six-tenths that of a gallon of the gasoline, this result of equal fuel consumption by volume for gasoline and alcohol engines probably represents the best comparative value that can be obtained for alcohol at the present time, as is also indicated by Continental practice. Though the possibility of obtaining this condition in practice here has been thoroughly demonstrated at the Government fuel-testing plant, it yet remains with the engine manufacturers to make the "equal fuel consumption by volume" a commercial basis of comparison.

Conditions Under Which the Tests Were Made.

The gasoline engines that were used in these tests are representative of the standard American stationary engine types, rating at 10 to 15 hp., at speeds of from 250 to 300 rev. per min., while the alcohol engines were of similar construction and identical in size with the gasoline engines.

The air was not preheated for the tests on alcohol and gasoline, and the engines were equipped with the ordinary types of constant level suction lift and constant level pressure spray carburetters. Many special tests with air preheated to various temperatures up to 250 degrees Fahrenheit and tests with special carburetters were made, but no beneficial effects traceable to better carburation were found when the engines were handled under the special test conditions, including constant speed and best load.

The commercial completely denatured alcohol referred to is 100 parts ethyl alcohol plus 10 parts methyl alcohol plus one-half of 1 part benzol, and corresponds very closely at 94 per cent. by volume, or 91 per cent. by weight ethyl alcohol (grain alcohol). No detrimental effects on the cylinder walls and valves of the engines were found from the use of the above denatured alcohol.

The lowest consumption values were obtained with the highest compression that it was found practical to use, which compression for the denatured alcohol ranged from 150 to 180 lb. per square inch above atmosphere.

Price Conditions Necessary for Competition.

Eighty per cent. alcohol (alcohol and water) for use in engines of the present types would have to sell for at least 15 per cent. less per gallon than the denatured alcohol in order to compete with it. The minimum consumption value in gallon per hour per brake horsepower for 80 per cent. alcohol is approximately 17.5 per cent. greater than for the denatured alcohol used or for gasoline. A series of tests made with alcohol of various percentages by volume, ranging from 94 to 50 per cent., showed that the minimum consumption values in gallons per hour per brake horsepower increased a little more rapidly than the alcohol decreased in percentage of pure alcohol—that is, the thermal efficiency decreased with the decrease in percentage of pure alcohol. This decrease in thermal efficiency or increase in consumption referred to pure alcohol is, however, comparatively slight from 100 per cent. alcohol down to about 80 per cent. alcohol. Within these limits it may be neglected in making the calculations necessary to compare the minimum consumption values for tests with different percentages of alcohol.

The nearer the alcohol is to pure, the greater the maximum horsepower of the engine. The reduction in maximum horsepower for 80 per cent. alcohol, as compared with that for denatured alcohol used, was less than 1 per cent., but the starting and regulating difficulties are appreciably increased.

With suitable compression, mixtures of gasoline and alcohol vapors (double carburetters) gave thermal efficiencies ranging between that for gasoline (maximum 22.2 per cent.) and that for alcohol (maximum 34.6 per cent.), but in no case were they higher than that for alcohol. These thermal efficiencies are calculated from the brake horsepower and the low calorific value of the fuel, which for the gasoline was 19,100 B.t.u. per pound, and for the denatured alcohol was 10,500 B.t.u. per pound.

Use of Alcohol in Gasoline Engines.

As has been previously published, alcohol can be used with more or less satisfaction in stationary and marine gasoline engines, and these gasoline engines will use from one and one-half to twice as much alcohol as gasoline when operating under the same conditions. The possibilities, however, of altering the ordinary gasoline engine as required to obtain the best economies with alcohol are very limited, for the amount that the compression can be raised without entirely redesigning the cylinder head and valve arrangement is ordinarily not sufficient, nor are the gasoline engines usually built heavy enough to stand the maximum explosive pressures, which often reach 600 and 700 lb. per square inch. With the increase in weight for the same sized engine designed to use alcohol instead of gasoline comes an increase in maximum horsepower of a little over 35 per cent., so that its weight per horsepower need not be greater than that of the gasoline engine, and probably will be less.

The work was taken up to investigate the characteristic action of fuels used in internal combustion engines with a detailed study of the action of each fuel (gasoline and alcohol), as governed by the many variable conditions of engine manipulation, design and equipment. These variables were isolated, so far as possible; their separate and combined effects were determined; worked out under practical operating conditions, and lead up to the conditions required for minimum fuel consumption. The results show the saving that can be obtained over conditions for maximum consumption, and also establish a definite basis of comparison under conditions most favorable to each fuel. This latter is a point of much commercial interest, and a study of the comparative action of gasoline and alcohol may be of great service in solving some of the general internal combustion engine problems where other than liquid fuels are used.

A large number of fundamental tests were necessary in order to clearly define conditions and interpret results. In a way they follow the work conducted by the Department of Agriculture, supplementing to a certain extent, but not duplicating bulletin 191, which gives much data of general value.

Many of the tests of internal combustion engines have been made, but most of them, especially in this country, were by private concerns, for a specified purpose, and the results are not generally available. Furthermore, as is generally recognized by those familiar with gas and especially gasoline engine operation, the conditions influencing engine performance are so numerous and varied

as to make the value of off-hand comparison very limited, and oftentimes misleading, exact comparisons only being possible under identical conditions or with reference to the actual known differences in all conditions that influence the results.

With a view to supplying the continually increasing demand for more complete and exact information concerning the operation and design of gasoline and alcohol engines, and to assist the Government and others interested in the larger and more general internal combustion engine problems, this investigation was made.

The Foundrymen's Convention at Toronto.

The secretary, Dr. Richard Moldenke, Watchung, N. J., makes a general announcement concerning the convention of the American Foundrymen's Association, to be held at Toronto, June 8 to 12, 1908. Arrangements are being made for reduced rates, with possible stop over at Niagara Falls. Instead of the reading of elaborate papers the association will return to the old order and discuss live subjects pertaining to foundry practice. Some of these have been selected and speakers have been appointed to introduce them. Members are asked to send in questions of special interest which they would like to have discussed. The technical sessions will be held in a building separate from that containing the exhibits of foundry machinery and supplies. The Associated Foundry Foremen meet Monday evening, June 8. On Tuesday afternoon the convention and exhibition will be formally opened by the Lieutenant-Governor of Ontario, at a joint meeting of the American Foundrymen's Association, the American Brass Founders' Association, the Associated Foundry Foremen and the Foundry Supply Association. During some of the sessions for business and discussions the exhibition will be closed, so that there may be a full attendance at the meetings. On Tuesday evening occurs the official reception at the City Hall and the local committee has arranged excursions or other forms of entertainment for Thursday evening, Friday afternoon and Friday evening.

Harbison-Walker Brick for Carnegie Schools.

The Harbison-Walker Refractories Company, Pittsburgh, Pa., has closed a contract with the trustees of the Carnegie Technical Schools, in that city, for over 2,000,000 high grade light colored front building brick, for use in the erection of additions to the great group of buildings founded through the generosity of Andrew Carnegie. About three years ago this company, which is the largest manufacturer of fire clay, silica, magnesia and chrome brick in the world, erected a special plant at Templeton, Pa., for the manufacture of high grade front building brick exclusively, and its success has been most gratifying. The company has furnished millions of these brick to important buildings in New York and in other parts of the country.

On account of the magnitude of the order placed by the Carnegie Technical Schools there was unusually strong competition on the part of all the manufacturers of first quality front brick, and the success of the Harbison-Walker Refractories Company in securing this contract is, therefore, all the more pronounced, and speaks well for the high quality of the brick, as nothing but the best was considered. In line with the policy of the company in the manufacture of refractory materials, its front brick plant at Templeton was built on a large scale and is capable of filling the largest orders in quick time. Speed of delivery was a most essential point in the placing of this contract.

Figures have just been compiled from the payrolls of some of the Pennsylvania anthracite coal mining companies showing the earnings of capable contract miners since the October panic. These figures indicate that the anthracite mine workers have fared better during the business depression than almost all other classes of labor. At one of the large collieries in the middle field the net earnings of 60 efficient miners were computed; the table shows that each earned, on the average, $4.44 for every working day. Several of them earned more than $100 a month for the three months considered. At another colliery there were six miners who earned, respectively, $5.03, $6.14, $6.52, $6.75, $8 and $9.15 a day. The record of 18 capable men at still another mine shows average daily earnings of $4.77.

February Exports and Imports of Iron and Steel.

The February report of the Bureau of Statistics of the Department of Commerce and Labor does not confirm the unofficial figures published early in March relative to the large volume of exports of iron and steel in heavy forms from the Eastern seaboard ports. Nevertheless, the statistics show a gain over the January exports. The total value of exports of iron and steel and manufactures thereof, not including ore, for the month of February was $14,069,249, against $13,643,828 in January. Taking the commodities for which quantities are given, the February total is 81,755 gross tons, against 74,352 tons in January, 85,999 tons in December, 116,308 tons in November and 123,216 tons in October. The following table gives details of the exports of such commodities for February and for the eight months of the current fiscal year ending with February, as compared with corresponding periods of the previous year:

Exports of Iron and Steel.

	February.		Eight months.	
	1908.	1907.	1908.	1907.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	1,676	4,743	36,295	56,199
Scrap	693	1,254	11,171	8,876
Bar iron	1,124	4,881	10,987	36,821
Wire rods	972	31	4,602	2,620
Steel bars	2,868	3,533	47,965	24,426
Billets, blooms, &c	21,744	4,193	56,269	79,601
Hoop, band, &c	588	200	7,603	4,528
Steel rails	8,949	20,987	221,125	195,035
Iron sheets and plates	3,946	3,595	29,881	17,264
Steel sheets and plates	4,647	5,948	42,134	62,709
Tin and terne plates	173	590	5,033	3,437
Structural iron and steel	9,337	8,838	93,809	78,297
Wire	11,278	14,112	108,621	110,244
Cut nails	187	516	3,745	5,010
Wire nails	3,764	3,530	27,155	24,814
All other nails, including tacks	353	643	4,383	4,405
Pipes and fittings	9,456	10,318	126,687	84,273
Totals	81,755	87,912	837,465	799,159

The imports of iron and steel show quite a decline, as the total value for February, not including ore, was $1,697,525, against $2,076,766 in January. The total of imports of commodities for which quantities are given was 19,054 gross tons, compared with 28,008 tons in January, 20,255 tons in December and 35,255 tons in November. The following table shows the details of the imports of these commodities for February and for the eight months of the current fiscal year ending with February, as compared with corresponding p riods in the previous year:

Imports of Iron and Steel.

	February.		Eight months.	
	1908.	1907.	1908.	1907.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	8,031	53,669	181,062	336,689
Scrap	398	725	16,532	12,744
Bar iron	3,943	3,998	28,566	27,395
Rails	....	105	2,181	3,129
Hoop, band, &c	59	13	286	4,058
Billets, bars, and steel in forms n.e.s	429	1,211	12,730	14,023
Sheets and plates	117	1,090	1,805	2,521
Tin and terne plates	5,134	2,235	37,040	38,140
Wire rods	903	1,509	10,100	11,675
Structural iron and steel	40	173	1,325	8,355
Totals	19,054	64,728	291,627	458,729

The imports of iron ore in February were 80,094 gross tons, against 97,112 tons in February, 1907. Imports of ore from Cuba were 52,951 tons, against 49,070 tons in February, 1907.

The total value of all kinds of exports of iron and steel, not including iron ore, in the eight months ending with February, was $130,575,718, against $115,606,590 in the corresponding period of the previous year, while similar imports were, respectively, $21,170,314 and $26,610,428.

PERSONAL.

At the recent annual meeting of the stockholders of the Massachusetts Fan Company, Watertown, Mass., Horace Chenery was elected president and D. K. Bartlett, treasurer. Mr. Bartlett will have general charge of sales and manufacture. The business of this company is now in a flourishing condition, having been nearly trebled in the last three years.

Peter Boyd, general superintendent of the National Tube Company, who has been making a tour of the Pacific coast, is visiting the San Francisco office, which is in charge of G. S. Garritt, Pacific coast sales agent.

The Carnahan Tin Plate & Steel Company, Canton, Ohio, announces that on February 1 A. B. Clark assumed the office of general manager, and G. F. Thomas the position of manager of sales.

F. H. Brown, formerly of the Brown & Zortman Machinery Company, Pittsburgh, Pa., but who for some time has been conducting a machinery business under the name of the F. H. Brown Machinery Company, 1206 Park Building, Pittsburgh, has disposed of this to accept the position of manager of sales with McDowell, Stocker & Co., machinery dealers, 16-18-20 South Jefferson street, Chicago.

H. E. Frazier, of Cincinnati, has been elected vice-president, general manager and one of the directors of the American Steel & Iron Company, Norwalk, Ohio, formerly the Norwalk Steel & Iron Company. As general manager he succeeds S. G. Lockwood, who resigned. The company reports a considerable increase in orders.

John MacCormack, well known to engineers and steam users, and S. E. Bryner, for many years prominently identified with the sales department of the A. A. Griffing Iron Company, Jersey City, N. J., have opened an office at 718 Broadway, Bayonne, N. J., under the firm name of MacCormack & Bryner. They will act as consulting engineers and as sales agents for power plant and steam specialties, engine room and factory supplies and general machinery.

Fred. K. Potter, for many years connected with the Capell Fan Engineering Company, has been appointed manager in the Pittsburgh District for the Sirocco Engineering Company. His offices will be in the Keenan Building, Pittsburgh. It is only recently that the Sirocco fans and blowers have been manufactured in the United States, at the new plant of the Sirocco Company, at Troy, N. Y.

Geo. K. Hamfeldt, formerly general manager of the Midland Steel Company, Pittsburgh, Pa., arrived in New York March 28 from an extended trip in Europe. He expects shortly to sail for the Continent again, having accepted an engagement with deWendel & Cie., Germany.

Alfred Pearson has recently been appointed general sales manager of the Pressed Radiator Company, Bailey-Farrell Building, Pittsburgh.

R. D. Hawley, Pacific coast representative of the Railway Supply Company, Chicago, who recently returned from an extended Eastern trip, has opened a new office at 911 Crocker Building, San Francisco.

John A. Topping, chairman of the Republic Iron & Steel Company, has returned to New York from a month's stay in Florida.

Henry Gulick, Jr., and J. W. Henderson have opened offices and laboratories at 439 Third avenue, Pittsburgh, under the name of Engineers' and Founders' Laboratories, as chemists and metallurgists. Mr. Gulick was formerly in charge of the railroad equipment department of Robt. W. Hunt & Co. in the Pittsburgh District, and Mr. Henderson was formerly superintendent of the Central Car Wheel Company and later manager of the plant of the Butler Car Wheel Company, Butler, Pa. They will make a specialty of inspection of railroad equipment and expert foundry work, but are also open for general consultation and for all kinds of analytical and inspection work. They have a complete laboratory for chemical and physical tests of iron, steel, coal, coke, ores, alloys, clays, oils, &c., and are installing appliances for standard cement tests.

Lewis N. Lukens succeeds the late Jawood Lukens as president and treasurer of the Longmead Iron Company, Conshohocken, Pa.

A number of iron manufacturers, among them W. E. Corey, president of the United States Steel Corporation, and J. G. Butler, Jr., of Youngstown, Ohio, are expected to visit the Birmingham District next week.

O. C. Talbot of Toledo, Ohio, has connected himself with the Pioneer Iron & Steel Company, manufacturers' agent, Kansas City, Mo., and is at the head of the structural department.

General Strike of Bituminous Coal Miners.

Owing to the failure of the United Mine Workers of America and the bituminous operators in the various fields to agree upon a wage scale for another year, it is estimated that over 225,000 bituminous coal miners stopped work March 31. It is not believed that a prolonged strike will result. However, there are sharp differences between operators and miners in some districts. In the Southwest District a meeting is being held at Kansas City which may result in an agreement affecting 35,000 men. In the Kanawha field in West Virginia an agreement is probable. President-elect Lewis of the miners' national organization says that no move will be made for some days. In Michigan it was agreed that last year's scale of wages should continue in effect until March 31, 1909. At Pittsburgh it is said that mine owners employing 45,000 miners will insist on a two-year contract, with the sympathetic strike eliminated and with a proviso for arbitration of differences. The open winter and much reduced demand for coal for industrial purposes have resulted in considerable accumulations, and the strike will therefore not be detrimental to manufacturing unless it should be prolonged.

The Westinghouse Machine Company's Receivership Ended.—The receivership for the Westinghouse Machine Company, created last October, at the beginning of the financial depression, was vacated March 31 by Judge James S. Young of the United States Circuit Court, Pittsburgh, on petition of the company and the receivers. The property was turned back to the stockholders April 1, when the company began its fiscal year free from debt, with cash in bank and orders to justify operating the plant on about a 75 per cent. basis, as has been the case all through the receivership, and bright prospects for increasing the output in the near future.

A new company, organized for the manufacture and sale of heating appliances, is the Peck, Anderson & Peck Company, Cincinnati, just incorporated. John K. Peck and Robert E. Peck were prominently identified with the Peck-Williamson Company; A. J. Anderson was for 10 years vice-president of the James McWilliams Company, Louisville; L. D. Ault, another incorporator, is vice-president of the Ault Woodenware Company, Cincinnati. The capital stock is $50,000. A large building at Court street and Broadway is being refitted for occupancy, and it is expected to begin operations in May. The company will make all kinds of heating and ventilating appliances.

The Westinghouse Electric & Mfg. Company, Pittsburgh, has received orders for about 100 mining locomotives, to be shipped to various parts of this country and Mexico. Their capacities run from 4 to 30 tons. Among the orders placed are those of the Crescent Coal Company, Pittsburgh, for five; Lehigh Valley Coal Company, six; Birmingham Coal & Iron Company, three, and J. H. Sanford Coal Company, two, for use at Stickton, Pa. Business lately has been of a most encouraging nature. One of the orders received within the past few days comes from the Rio Janeiro Tramway, Light & Power Company, for 10 double electrical equipments for use on street cars.

Tool Rooms.

Equipment and System.

BY C. L. GOODRICH.*

Keeping track of the small tools used in a machine shop pays, as a considerable saving in time and consequent saving in the cost of producing work result when materials and tools can be quickly obtained. Fewer duplicate tools are required when a systematic check of their location is kept, but it is desirable that a sufficient number in proper working condition be always available for the average demand at least.

The stock of tools, &c., needed depends upon the work produced. This article enumerates most of the common tools and the number of each which answer for a department of about 75 men building small automatic and hand turret lathes and similar work. The large number of drills and counterbores are required because multiple spindle drilling machines are used to quite an extent. Very little milling, planing or gear cutting is done in this department, so that very few tools for such work are kept in the tool room. The list of tools follows. (Of material that is continually being used up, such as files, emery cloth, &c., there is a stated amount that is kept on hand.):

Typical Equipment.

Air drills:
- For 1-in. drills....3
- For ½-in. drills....2

Air hammers....2
Air hose, 30-ft. lengths....4
Alphabets (steel punches), 3-64, 5-64, ⅛ and 3-16 in. sizes....2 each.
Arbors for milling machine cutters (standard):
- ⅞ in. hole....2
- 1 in. hole....4
- 1¼-in. hole....4 ..3

Arbors, old, for turning to special sizes (assorted)....52
Arbors or mandrels:
- ⅛ to 11-16 in. by 1-16's....3 each.
- ¾ to 1 5-16 in. by 1-16's....4 each.
- 1⅜ to 1⅞ in. by 1-16's....3 each.
- 2 to 2⅜ in. by 1-16's....3 each.
- 2½ to 2⅞ in. by ¼'s....2 each.
- 3 to 4 in. by ¼'s....1 each.

Awl for punching holes in belt lacing....1
Belt lacing, 4-ft. lengths....20
Belt punches....2
Bench lathe collets, ⅛ to ½ in. by 1-32's....2 sets.
Bit braces, 10-in. swing....3
Ball joints and connections for boring (assorted sizes)....10 pairs.
Babbitt metal in 1-in. square bars, 8 in. long....20
Counterbores for screws, 3 per set:
- 1, teat size = tap drill; large dia. = body size; ⅛ to ½ in. by 1-16's....8 each.
- 1, teat size = tap drill; large dia. = head size; 9-16 to ¾ in. by 1-16's....6 each.
- 1, teat size = body size; large dia. = head size; 1 3-16 to 1 in. by 1-16's....4 each.

Cutting-off tool holders and tools....6
Center turning fixtures....2
Chalk....2 lb.
Center reamers, 4 sizes....8 each.
Center drills, 4 sizes....12 each.
Center drills and reamers (Slocum), 4 sizes....8 each.
Combination 3-jaw chucks:
- 4-in....2 each.
- 6-in....3 each.
- 9-in....5 each.
- 12-in....5 each.
- 15-in....2 each.
- 18-in....2 each.

Combination 4-jaw chucks:
- 6-in....2 each.
- 9-in....2 each.
- 12-in....2 each.
- 15-in....1
- 18-in....1

Clamps, wooden, 6 sizes, 3 to 12 in. opening....4 each.
Chucks for small drills, 0 to 5-16 in....8
Clamps, machine and parallel, 2 to 6 in....4 each.
Drills:
- Straight shank twist:
  - Nos. 1 to 60....8 each.
  - A to Z....4 each.
  - 1-64 to ¼ in. by 1-64's....8 each.
- Taper shank (tap drill sizes):
  - ⅛ to ½ in. by 1-16's....10 each.
  - 9-16 to ¾ in. by 1-16's....8 each.
  - 13-16 to 1 in. by 1-16's....4 each.

Drills:
- Taper shank:
  - 3-16 to ½ in. by 1-64's:
    - Carbon....8 each.
    - High speed....3 each.
  - 33-64 to ¾ in. by 1-64's:
    - Carbon....6 each.
    - High speed....3 each.
  - 49-64 to 1 5-16 in. by 1-64's:
    - Carbon....4 each.
    - High speed....2 each.
  - 1 21-64 to 1½ in. by 1-64's:
    - Carbon....3 each.
    - High speed....2 each.
  - 1 17-32 to 2 in. by 1-32's:
    - Carbon....2 each.
    - High speed....2 each.

Drilling fixtures, Yankee, for small holes (hand)....1
Drilling fixtures, increased speed (power)....2
Drill rod, sizes ⅛ to ¾ in. by 1-32's....3-ft. each.
Dowels, sizes ⅛ to ¾ in. by 1-16's (assorted lengths) 15 to 30 each.
Dogs
- Bent tail lathe:
  - ⅜, ½ and ¾ in....8 each.
  - 1¼, 1½ and 1¾ in....6 each.
  - 2, 2¼ and 2½ in....4 each.
  - 3 and 4 in....3 each.
  - 5-in....2 each.
- Straight tail, short:
  - ⅜, ½, ¾, 1 and 1¼ in....3 each.
  - 1½, 1¾, 2, 2¼ and 2½ in....2 each.
  - 3 and 4 in....1 each.
- Straight tail, long, for reamers:
  - ⅜, ½, ¾ and 1 in....3 each.
  - 1¼, 1½, 1¾ and 2 in....2 each.

Emery cloth:
- Nos. 60 to 120....20 sheets each.
- Flour and crocus....10 sheets each.

Files:
- Flat, various sizes....12 each.
- Half-round, various sizes....6 each.
- Round, various sizes....4 each.

Figures, Nos. 1 to 9, sizes 3-64, 5-64, ⅛ and 3-16 in....4 each.
File cleaning brushes....6 each.
Gears for lathes....All belonging to the department.
Gauges, cylindrical, ¼ to 2 in. by 1-16's....1 each.
Hack saw holders....2
Hack saw blades....4 doz.
Index fixtures for milling....2
Indicators, work testing....2
Indicator, speed....1
Jaws, soft, for combination chucks:
- 6-in....2 sets.
- 9-in....2 sets.
- 12-in....2 sets.
- 18-in....2 sets.

Knurling tool holders and knurls....3 sets.
Lead taps and taper arbors:
- ⅜ to ¾ in. by 1-16's....2 each.
- 13-16 to 2 in. by 1-16's....1 each.

Lead lap molds for above....1 each.
Levels, spirit....2
Lathe tools for turning and boring, &c., assorted types, 10 to 15 each.
Micrometers, 1 to 6 in....2 sets.
Mandrels (see Arbors).
Milling cutters, slitting, end mills, &c., varies to suit conditions.
Numbers (see Figures).
Oil cans....12
Oil brushes....12
Oil pans, 3 x 5 in....6
Oil, machine....2 gal.
Oil, lard....4 gal.
Prussian blue paint....3 tubes.
Parallels, assorted sizes....20 pairs.
Reamers:
- Solid hand:
  - ⅛ to 1½ in. by 1-16's....3 each.
  - 1 3-16 to 1¾ in. by 1-16's....2 each.
- Expansion hand:
  - ½ to 1 in. by 1-16's....2 each.
  - 1⅛ to 1¾ in. by 1-16's....1 each.
- Long straight shank:
  - ⅛ to 1⅛ in. by 1-16's....2 each.
  - 1 3-16 to 2 in. by 1-16's....1 each.
- Taper shank:
  - ⅛ to 1⅛ in. by 1-16's....4 each.
  - 1 3-16 to 2 in. by 1-16's....2 each.
  - Taper pins, Nos. 00, 0, 1, 2, 3, 4 and....30 each.

Sockets:
- Presto holders, Nos. 2, 3 and 4, Morse shank....4 each.
- Presto collets, Nos. 1, 2 and 3 hole....12 each.
- No. 4 hole....4

Sockets (Morse inside and outside and sleeves), assorted combinations....50
Shears for sheet metal....1
Straight edges, 12 and 24 in....1 each.
Solder, wire....3 lb.

* Department foreman Pratt & Whitney Company, Hartford.

Soldering irons, assorted.....4
Screw gauges, male and female, 3-16 to ¾ in. by 1-16's..2 each
Taps
Hand (3 per set), sizes:
1/8 to ½ in. by 1 16's.....6 sets each
9 16 to 13 16 in. by 1 16's.....3 sets each.
7/8 to 1¼ in. by 1/8's.....2 sets each
Pulley, long shank:
¼ to ⅝ in. by 1-16's.....3 sets each.
Tap extensions, 5 sizes.....3 each.
Tap extractors, ⅛ to 1 in.....2 each.
Tap extractor blades.....5 sets.
Taps for oil cups, 3 sizes.....3 each.
Tapping fixtures for drill presses.....6
Threading tool holders and tools, 3 to 32 per inch.....3 each.
Tramming bars.....1
Vises for milling machines and drill presses, assorted...8
Wrenches, solid, ⅛ to ¾ in. opening.....6 each.
Wrenches, adjustable, 5 sizes:
To ⅝ in.....5 each.
Larger.....2 each.
Waste.....25 lb.
Wire for springs, 6 sizes.....1 coil each.

Tool Keeping Systems.

In most well regulated shops each department has an inclosed section in which the tools are kept. A competent man in charge of this room sees that tools are given out as required and returned in proper shape, and so placed as to be easily found. An alphabetical index book is convenient to list the various tools and the numbers of the drawers and shelves where they belong. This book is particularly useful when the tool room man is absent.

Of the various methods of keeping track of tools the best and most universal seems to be to assign a number to each workman, and issue him a given number of checks bearing this number. When a workman takes a tool from the tool room he leaves a check, which is placed in the compartment where the tool belongs. This makes it possible to locate a given tool at any time, but it also is desirable to know exactly what tools each workman has when he is to be discharged. With the single check system, so far described, every compartment must be looked through, which is time consuming. It is usual to insist that the workman turn in his full quota of checks before paying his wages, but if any have been lost it complicates matters. Many concerns keep the men's checks for them on a board in the tool room and find this more satisfactory, as it shows how many tools are held by each workman. Periodically examining the checks discloses any irregularity, and very little loss of tools results. Still the single check system thus handled only shows how many and not what particular tools each man has out.

By the duplicate check system a check of different contour than the workmen's check is kept with the tool in the tool room, and when that tool is given out the check is placed on the board on a peg beside the workman's number. The workman's checks are kept on an adjoining peg. The total of the checks on these two pegs should always equal the number originally issued to each man. If the workman's checks are round the tool checks are usually square. This system has a moral effect on the men, which any system lacks which does not keep account of what the man has.

The system is rather cumbersome, however, if a check is provided for each tool of the same kind. The distributing of these checks as tools are returned is tedious and they require much space. For instance, in one drawer holding twist drills from No. 1 to 31, if there be eight of each, 240 checks are needed to completely check any possible requirement—*i. e.*, eight No. 1 and eight No. 2 drills wanted simultaneously. The writer, therefore, has modified the system by marking such checks with the drawer or compartment number instead of the tool name or number, thus fewer checks are required and it is much easier to redistribute them. It is practically as easily to locate the tools held by any workman, as his circular check is retained in the place from which the tool is taken.

For special tools, jigs, &c., the writer finds it better to have a duplicate check for each piece and to give the jig number on the duplicate check and also its location and thus facilitate putting away the jig.

Tool Room Conduct.

Each engine lathe in the shop has one set of gears suitable for turning, and when any other gears are required they will be exchanged by the tool room man, who is conversant with gears suitable for cutting threads, &c. This makes it possible to quickly obtain correct gears and avoids accumulating gears on the floor around each lathe. When a man wants waste he turns in his unclean waste for the new. This contributes to economy and neatness, as there is less loss and no loose waste seen in the pans and on the floors.

In designing a tool room the endeavor should be to place special tools in sight, while more common material may be kept in drawers or open compartments not necessarily in sight. The writer permits his assistants to look into the tool index book, which posts them thoroughly as to just what equipment is on hand. The tool room has a drill grinder, and it is the duty of the man in charge to keep all drills sharp. Other tools, if in poor working shape, are put aside and corrected or replaced by other help.

The American Iron and Steel Institute.

There has been incorporated under the laws of the State of New York the American Iron and Steel Institute, the incorporators being Elbert H. Gary, chairman of the United States Steel Corporation; W. E. Corey, president of the United States Steel Corporation; E. A. S. Clarke, president of the Lackawanna Steel Company; E. C. Felton, president of the Pennsylvania Steel Company; Powell Stackhouse, president of the Cambria Steel Company, and C. M. Schwab, chairman of the Bethlehem Steel Company. The directors until its first annual meeting are the incorporators and the following: Willis L. King of Jones & Laughlin Steel Company, Pittsburgh; Edward Bailey, Central Iron & Steel Company, Harrisburg; W. J. Filbert of the United States Steel Corporation; John A. Tapping, president of the Republic Iron & Steel Company; J. C. Maben, president of the Sloss-Sheffield Steel & Iron Company; W. A. Rogers of Buffalo; J. F. Welborn, president of the Colorado Fuel & Iron Company; T. J. Drummond of Montreal, and Samuel Mather of Pickands, Mather & Co., Cleveland.

The constitution of the new society recites that its objects "shall be to afford a means of communication between members of the iron and steel trades upon matters bearing upon their business interests." The institute is to be managed and controlled by a Board of Directors consisting of 15 members, and the regular annual meeting shall be held on the first Monday of May of each year. All men engaged in and prominently identified with the steel and iron trades will be eligible to membership, and provision is made for honorary members to the number of not exceeding 50.

The first officers of the institute are:

PRESIDENT, E. H. Gary.
FIRST VICE-PRESIDENT, Powell Stackhouse.
SECOND VICE-PRESIDENT, C. M. Schwab.
THIRD VICE-PRESIDENT, Willis L. King.
SECRETARY, W. J. Filbert.
TREASURER, Edward Bailey.

A meeting of the directors is to be held on Thursday, April 2, to pass finally upon the by-laws, and it is probable that the details of the organization will be announced at the banquet which is to be given on Thursday evening by Judge Gary at the Waldorf-Astoria.

The scope of the new institute is a very wide one, and in that respect differs radically from the British institution which deals exclusively with technical subjects, and does not in any way touch commercial or economic topics. The discussion of these will be the principal field of the new institute, which is expected to wield a beneficent influence in the American iron industry.

The rolling mill of the Tennessee Coal, Iron & Railroad Company at Bessemer, Ala., has been put in operation after a suspension of about six weeks. The company's rail mill at Ensley will suspend operations April 1 for the installation of new machinery.

OBITUARY.

WILLIAM H. PFAHLER.

William H. Pfahler, who has for many years been prominently identified with the foundry trade, died at Pasadena, Cal., March 29. He was born at Columbia, Pa., March 26, 1842, and was educated at the Millersville Normal School, Millersville, Pa. He engaged in the tin and stove business with his father at Columbia and in 1861, at the age of 19 years, enlisted in the 45th Regiment of Pennsylvania Volunteers. He served through the war and was mustered out with the title of brevet major. He then opened a hardware store at Columbia under the style of Pfahler & Herr, afterward purchasing the interest of his partner. He continued in this business until he accepted the position of general manager of the Keeley Stove Company, Royersford, Pa., subsequently removed to Columbia. In 1886 he accepted the position of superintendent of the Abram Cox Stove Company of Philadelphia, afterward becoming its treasurer, from which position he retired in 1905, but was still a director of the company at the time of his death. In 1906 the Model Heating Company was formed, to take over the house heating boiler business of the Abram Cox Stove Company and he was made its treasurer. At the time of his death he was president of that company and also president of the Reading Radiator Company.

He was a member of the Union League of Philadelphia, honorary member of the Administrative Council of the National Founders' Association, honorary member of the Administrative Council of the National Metal Trades Association, served on the original Executive Committee of the National Civic Federation, was a director of the City Trust Company of Philadelphia and a member of the Loyal Legion. Although not actively identified with the management of the Stove Founders' National Defense Association, Mr. Pfahler was a careful observer of its work, and in that way became deeply interested in the settlement by conciliation of questions arising from the relations of employers and molders. Shortly after the organization of the American Foundrymen's Association at Philadelphia in 1896, he came to the conclusion that the time was ripe for introducing in the general foundry trades the methods which had been adopted by the stove founders in settling labor troubles and seized the opportunity afforded by a meeting of Western foundrymen in Cincinnati in October, 1897, to present his views. The proposition was not deemed one which could be taken up by the American Foundrymen's Association, but a new organization was formed to handle labor questions under the name of the National Founders' Association. Of this new organization Mr. Pfahler was the first president, and took a prominent part in its affairs for a number of years. He also assisted in the organization of the National Metal Trades Association, for the purpose of inculcating his ideas in the minds of employers in the machinist trade. He was a close student of economics and a forcible speaker, possessing that personal magnetism which carries conviction. Few men have so impressed their personality on the foundry trade as Mr. Pfahler. In recent years his health has prevented him from taking the prominent part in the discussion of labor questions which he would otherwise have been impelled to do by reason of his ripe experience, sound judgment and intense zeal in his life long purpose of bringing about better relations between employers and employed. He leaves a widow, one daughter and one son, the latter being A. E. Pfahler, treasurer of the Model Heating Company.

FERDINAND PHILIPS, president of the Philips Pressed Steel Pulley Works, and senior member of the firm of Philips, Townsend & Co., Philadelphia, died in that city March 26, after a short illness. He was born in Elberfeld, Rhein Province, Germany, in 1850. He came to this country when a young man, and was for a long time connected with Hoopes & Townsend, Philadelphia. In 1883 he established the firm of Philips, Townsend & Co., which was the first to engage in the manufacture of wire nails in Philadelphia. He was an engineer and inventor of high attainments, making numerous inventions, one of his latest being the well known Philips pressed steel pulley. He leaves a widow.

JOHN A. BRILL, one of the founders of the J. G. Brill Car Works, Philadelphia, died in that city March 25, after an illness covering a period of several years. He was born in Philadelphia in 1852, and entered the works of his father, J. G. Brill, at an early age, and was later in charge of the department of sales. He gave the matter of car trucks special attention, and his inventions embrace many of the features of car trucks in use in electric transportation at the present day.

Steel Scrap Specifications.

Steel manufacturers and scrap dealers will alike be interested in the following specifications for open hearth melting scrap, which have been issued in printed form by the Lukens Iron & Steel Company, Coatesville, Pa.:

Class Specifications.

First: Shipments must be made in flat bottom gondola or box cars.

Second: Shipments must be made at the rate specified by us. Excess shipments will be held on cars and the demurrage charged to the shipper.

Third: All advance charged (regular freight charges excepted), must be paid by shipper before cars will be accepted.

Fourth: Written notice of the shipment of every car must be mailed on day of shipment from point of shipment to this company. Such notices must give the car number, and the gross, tare and net weights should be mentioned if possible. Cars for which notices have not been received will not be unloaded, and any demurrage charges resulting will be charged to shipper.

Scrap Specifications.

No. 1 heavy steel scrap, long: Straight rails over 5 ft., frog, switch and guard rails, cut apart; straight structural up to 12 in. wide and over 5 ft. long, cut apart; straight bars and axles from 1 in. diameter to 4 in.

No. 1 heavy steel scrap, short: Heavy railroad steel in charging box shape, rail, bloom, billet and structural crops under 5 ft. in length and 500 lb. weight, flat boiler plate ¼ in. and heavier, cut in charging box sizes, not over 20 in. wide and 5 ft. long, structural material, straight, not over 5 ft. long.

No. 2 steel scrap: Cut yard scrap ¼ in. thick and heavier, all charging box shape, heavy punchings, skate scrap and all good heavy clean shoveling scrap; no light, tangled or badly rusted scrap included.

No. 3 steel scrap: Bundled sheets in compressed packages, light shoveling, bundled skeleton.

No. 4 steel scrap: Frogs and switches not cut apart, structural material not cut, flat boiler plate not cut and other material of similar shape.

Note No. 1: No mixed cars of scrap (that is long and short) will be received except by special agreement in writing.

Note No. 2: Where short scrap and shoveling are in same car, the shoveling must be in one end or bottom of car; if on top will be sufficient cause for rejection.

Note No. 3: Heavy turnings, malleable railroad, detinned billets, car wheels, both iron and steel, cast iron scrap, all are special and not within any above classification.

The Nevada-California Power Company, Goldfield, Nev., is preparing to install a fourth Allis-Chalmers alternating current generator of the water wheel type, having 1500 kw. rated capacity, to augment the enlarged power service now contracted for in the vicinity, pending the completion of its new hydro-electric stations on Bishop Creek, Inyo County, California. Current from these generators is transmitted 113 miles at 60,000 volts to Tonopah and Goldfield, Nev., with branches from this line to other points, and supplies power to a number of the mines in that district whose equipment is electrically operated.

NEWS OF THE WORKS.

Iron and Steel.

Howard H. Houston has been appointed receiver for the Tidewater Steel Company, Chester, Pa

General Machinery.

The Colburn Machine Tool Company, Franklin, Pa., has received contracts for a number of its vertical boring and turning mills for shipment to Germany. The company reports inquiries more numerous than for some time, and reports the outlook for future business as fairly promising.

The Fairbanks Steam Shovel Company, Marion, Ohio, advises us that the entire output of its plant for the past three years has consisted of dipper dredges rather than steam shovels. As these dredges are used for land reclamation and as recent financial depressions have not affected land values there has been no falling off in its business; in fact, the company has nearly twice as many orders on hand now as at any time previous, and expects to put on a night force and run its shops double turn in the near future.

At the annual meeting of the Standard Roller Bearing Company, Philadelphia, Pa., Samuel S. Eveland was elected president; W. B. Osgood and Lenox Smith, vice-presidents, and William N. Baldwin, treasurer.

The Sheffield Stove & Foundry Company, Sheffield, Ala., is in the market for the following second-hand machinery for its stove foundry for making iron castings: Exhaust tumbling mills, exhaust fan, 1 15-16-in. shafting and hangers, emery stands, drill presses and other equipment.

The business of the Curtis & Curtis Company, Bridgeport, Conn., manufacturer of the Forbes patent die stock, continues to show encouraging signs of improvement. Unusually large shipments have recently been sent from the works on export delivery, which included six machines to Russia, five to Australia, five to England, four to Kobe, Japan; four to Yokohama, Japan; three to Mexico and several to South America and British Columbia. This, with a fair domestic business, is very gratifying to this well-known house.

The Thomas Carlin's Sons Company, 1600 River avenue, Allegheny, Pa., manufacturer of shears, grinding pans, contractors' equipment, &c., is furnishing the P. W. Finn Company a 9 x 12 in. double cylinder, double drum hoisting engine and two large derricks, one having a 90-ft. beam, with a capacity for lifting 10 tons, for use in erecting the new Memorial Hall, Pittsburgh. The company also has an order for two large steel derricks and two 9 x 12 in. triple drum hoisting engines, to be shipped to the Ball-Carden Company, Dallas, Texas.

Power Plant Equipment.

The Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., through its export department, has received a contract from the Dominion Iron & Steel Company, Halifax, N. S., for a 500-hp. electric generator, which will be used in the operation of one of the company's iron mines on Belle Island, Newfoundland.

The Hartford City Electric Light Company, Hartford City, Ind., has in contemplation some plant changes and improvements that may later on require the purchase of additional equipment. No definite plans have, however, yet been formulated to this end.

The Harlowton Light & Power Company, Harlowton, Mont., of which L. D. Glenn is secretary, has been incorporated with a capital stock of $30,000. F. F. Goss, Lewistown, Mont., is general manager.

The Huntington Park Gas & Electric Company, Los Angeles, Cal., has been incorporated with a capital stock of $200,000 for the purpose of constructing an electric light and gas plant. The former will be equipped with a 65-kw. generator, to be driven by 120-hp. twin engines, and the gas plant is designed to have a capacity of 20,000 ft. per hour. Contract for the construction of the gas plant exclusive of the pipe line has been awarded to E. A. McGillivary, and it is stated that the Western Gas Engine Company will probably secure the contract for the electric plant. Henry F. Leukfeld, Los Angeles, Cal., is president of the new company.

The city of Hartley, Iowa, voted on March 9 to issue bonds for $12,000, the proceeds of which when sold are to be used in the erection and equipment of an electric light and power plant. F. R. Lock is mayor.

Creditors of the Niles Boiler Company, Niles, Ohio, for which H. S. Pell was recently appointed receiver, have been directed by the court to file their sworn claims with the receiver by April 30.

Bridges and Buildings.

The Riter-Conley Mfg. Company, Pittsburgh, builder of steel construction, has secured a contract for the erection of an addition to the Erie City Iron Works, Erie, Pa., which includes a steel frame building 64 ft. 4 in. wide, 400 ft. from center to center of end columns, and 38 ft. 6 in. high under trusses.

Foundries.

An involuntary petition in bankruptcy has been filed against the Darlington Foundry Company, Darlington, Beaver County, Pa.

Fires.

The plant of the Leach Windmill Mfg. Company, Joliet, Ill., was burned March 22, the loss being about $10,000.

Hardware.

The National Wire & Metal Mfg. Company, Oklahoma City, Okla., has recently been incorporated with a capital stock of $5000, and will engage in the manufacture of wire baskets and chicken coops. The officers of the company are as follows: Geo. J. Eacock, president; Guy Miller, vice-president; W. E. Seaman, secretary and treasurer; J. M. Narsh, manager.

The Sidney Steel Scraper Company, Sidney, Ohio, now has its remodeled factory in full operation, which gives an increase in output of 50 per cent. over that of the former plant. The new works are run entirely by electrical power and have the latest improved sprinkler system of fire protection.

Duane H. Nash, Inc., Millington, N. J., manufacturer of the well-known Acme pulverizing harrow, has just completed its most successful season in the Southern States. The factory is now running to its fullest capacity getting ready for Northern trade, and the indications, we are advised, point to a record year in sales of the harrows.

Miscellaneous.

The Home Water Works Company, Spencer, Ind., recently incorporated with a capital of $20,000, has under consideration the construction of a new water works plant at that place. These plans have not been fully developed. The directors of the company are John R. Thomas, J. F. Lawson and J. H. Smith.

The Just Right Light & Furnace Company, Wakarusa, Ind., has been incorporated, with a capital stock of $10,000, and will engage in the manufacture of gasoline lights and furnaces for residences, churches, stores, &c. The officers of the company are W. O. Yarian, president; Jacob Helmkee, vice-president; R. E. Myers, secretary and treasurer.

The Detroit Copper & Brass Rolling Mill Company, Detroit, Mich., has increased its stock from $1,000,000 to $1,500,000.

In order to properly handle its increased volume of business the Standard Brass Works, Detroit, Mich., has increased its capital stock from $5000 to $30,000.

The E. A. Humphries Coal & Coke Company, Scottdale, Pa., has completed a modern mining and coke plant at Bradenville, Pa., on land recently acquired. Forty ovens of the Mitchell type have been completed and are ready for operating when market conditions justify. The company at a recent meeting elected the following officers: E. A. Humphries, president; R. J. Humphries, vice-president; J. M. Zimmers, secretary and treasurer.

R. S. Armstrong & Bro., Atlanta, Ga., iron brokers and machinery dealers, in order to accommodate their increasing trade, have found it necessary to erect an addition to their ware house and are building a handsome two-story mill construction building, 80 x 100 ft., which will double their capacity.

The Milwaukee, Wis., School Board has placed contracts with the Dow Wire & Iron Works, Louisville, Ky., for the erection of chute fire escapes on 24 school buildings, at a total cost of $19,470.25. The escapes are of the standard patent Kirker-Bender type.

The Burley Heater Company, Tyrone, Pa., manufacturer of the Burley steam and hot water heaters, advises us that it has again established its factory at Tyrone and now has one of the best equipped boiler plants in the country, with splendid facilities for receiving and shipping. New machinery is in full operation and the company is accumulating stock for the 1908 heating season. Arrangements for opening a Philadelphia sales office and warehouse are now under way, and the company expects to push the sale of Burley steam and hot water boilers with much vigor in the future. C. Imhof is secretary.

The business of the old established house of the Williams Stove Lining Company, Taunton, Mass., manufacturer of brick stove linings and Eagle stove clay, has been incorporated under Massachusetts laws, with capital stock of $25,000. The incorporators are Joseph S. Williams, John G. Williams and Sarah E. Williams. There will be no change in name or management.

The recent fire at the plant of the Penn Spring Works, Baldwinsville, N. Y., completely destroyed the building, a one-story frame structure 70 x 400 ft. The loss is entirely covered by insurance and the plant will be rebuilt, although the location for the new building has not been decided upon. The machinery used in the plant is mostly of special manufacture, and the equipment to be purchased will include transmission machinery, pulleys, shafting, hangers, &c.

The Walton Cement Stone Company, Albion, Pa., recently organized, will equip a plant for the manufacture of building blocks, porch columns, &c. W. H. Walton is president and C. H. Smith, secretary and treasurer.

The Ruud Mfg. Company of Pittsburgh, Pa., has moved into its new building at Twenty-ninth and Smallman streets. The building is a four-story structure, 120 x 120, and is equipped with everything that is modern for the manufacturing of water heaters.

The Massachusetts Fan Company, Watertown, Mass., is furnishing for the Clarendon Clay & Mining Company, North

Clarendon, Vt., a complete hot blast outfit for drying Kaolin. The apparatus consists of a steam heater and one of the Massachusetts ball bearing fans. The adaptability of the type of fan is shown by the fact that when the balls are once packed in vaseline no further attention is required for at least six months.

Indianapolis Industrial Notes.

INDIANAPOLIS, IND., March 30, 1908.—The Indiana capital city has weathered the half year of depression and industrial falling off with flattering success. Inquiry in the manufacturing districts and among the hardwaremen and iron and steel trades shows that the recessions in trade have not been so great as in some of the Eastern cities, and the recovery has in the main been more rapid and satisfactory.

President Martindale of the Shirley Radiator & Foundry Company speaks encouragingly of the future, and decries the prevailing fault among some manufacturers of allowing themselves to be affected by hard times talk. He expresses himself as believing that the tendency of the times is toward a sound, safe, conservative resumption of business in all lines, and that it is not many months off.

President L. M. Wainwright of the Diamond Chain & Mfg. Company is a careful statistician on business records at his large plant, and has compiled figures from returns in the sales department which indicate to him that 1908, if the recovery is as rapid as it evidences in the start, will show about the normal of former prosperous years; in other words, that of 1906, and may perhaps reach the figures of 1907. The fine four-story addition to the plant, which was completed about the first of the year, is now being pressed into service gradually, and with this modern department the plant covers one entire side of a city block. One of the newest features of the Diamond Chain Company's specialty department is the Diamond repair block, a device for detaching the links of riveted roller chains, making the removal of links or rivets a quicker operation than can be performed with detachable chains.

At the plant of E. C. Atkins & Co., on South Illinois street, where silver steel saws are made and marketed, both President Atkins and Advertising Manager Benham were found deep in the details of new and original advertising campaigns, and, considering the conditions of trade, were quite pleased with the outlook. This concern has also found sufficient time during the months of recession and return to normal conditions to get out some new things, which will soon be announced.

Another of the local establishments which has felt but slightly the changed conditions of the half year is the Indianapolis Drop Forging Company, Madison avenue and Downey street. President and Manager H. J. Martin is quite conservative, and while reporting that business is "fair" qualified it with the statement that the company is running with but a few short of its regular force, and on a 44-hour per week schedule—eight hours per day, instead of the usual 10. The plant is now on a booking of three months' contracts ahead; at this time last year (an abnormal period with most plants) the orders were six or seven months ahead. The company makes forgings of from a few ounces to about 25 lb.

There is a noteworthy increase of activity in structural iron circles. At the works of the Noelcke-Richards Iron Company, Contracting Manager G. F. Beckerly was found busy with the details of some things in building which are expected to assume tangible form on the first of the coming month. The plant has run uninterruptedly through the holiday and slack period, and if some more of the large projects outlined in the early fall of 1907 are taken up, as is now anticipated, this concern, along with others in the same trade, expects to see normal conditions ere the close of 1908.

At the new and modern eight-story establishment of the Van Camp Hardware & Iron Company, every department was found busy, and the heads of departments and officials especially so. Samuel Van Camp has recently returned from a trip to the Bermudas. Speaking of the ramifications of the hardware trade in general and of his observations on the trip, Mr. Van Camp noted that he saw two or three hardware stores in the Bermudas that would compare favorably in every way with the best stores in the United States. The Van Camp establishment is the one which has gained some considerable renown for its widely announced policy of getting out 75 per cent. of all orders on the day of the receipt of order.

In the line of heavy hardware and iron and steel generally, W. J. Holliday & Co., West Georgia street, find the return to normal conditions gradual, and are confident that present conditions are propitious for the carrying forward of large plans in building and other enterprises. The department of the Holliday business showing encouraging increase in activity and suggesting returning confidence among large builders is that devoted to structural irons, and with the large number of inquiries and published statements of improvements going ahead, it is believed that the rounding out of the last half of the year will present some interesting new records.

The Indianapolis Foundry Company, of which Frank W. Lewis is president, James I. Dissette vice-president and treasurer, and Fred. B. Whitlock secretary, has but recently celebrated its twenty-fifth anniversary. In this period enough has been accomplished to have warranted the installation of a four-cupola foundry, with floors for 250 molders and in all 450 employees, with a capacity of 80 tons per day. This melt, in line with all other foundries in the country, has fallen off somewhat, keeping pace with the times and slack conditions in the machinery trade. The company makes no specialties for the market, as do some other establishments of the same kind, confining its business to fine light gray castings to order.

Among the larger building enterprises outlined for early consummation in Indianapolis and about ready for the asking or awarding of bids, are the Masonic Building on Illinois street, in which a low pressure heating system is to be installed—Rubush & Hunter, architects; the building of the Young Women's Christian Association, which will require about 300 tons of structural steel, and the Young Men's Christian Association Building—Fultz & Parker, architects—which will require more. The power plant for this last building has been purchased. The Atlas Engine Works will furnish the boilers and the Chandler & Taylor Company the engines.

The Middletown Car Works, Middletown, Pa., has secured an extension of time from its creditors, an agreement having been signed by all creditors whose claims exceed $100 to give the company until January 1, 1909, to pay such indebtedness, with 6 per cent. interest. A committee of creditors, composed as follows, will control the stock of the company in the meantime and thus have supervision over its affairs: James Lord, F. M. Campbell, E. M. Grove, C. Theodore Buchholz, Ernest Law, F. J. Hall, A. G. Wellington and Frank G. Kennedy, Jr.

The Youngstown Sheet & Tube Company of Youngstown, Ohio, recently contracted for three 500-kw. Allis-Chalmers synchronous motor generator sets, similar in design to those furnished the Jones & Laughlin Steel Company, and intended for operation in connection with two Allis-Chalmers steam turbines and generators, each of 1500 kw. capacity, ordered some time ago.

The National Fire Proofing Company, Pittsburgh, has been awarded a large contract by the Pennsylvania Railroad for underground conduit work for the New York City terminal. The same company recently received an order for 200 miles of conduit work from Belgian interests.

A plant will shortly be erected in western Pennsylvania, probably at Bradford, to demonstrate the commercial value of a process patented by Dr. Henry Spencer Blackmore, Washington, D. C., for converting natural gas into alcohol.

The Iron and Metal Trades

The Steel trade is quiet, and the volume of new business coming to the mills which roll Rails, Plates and Structural Material is light. The export trade, which has been steady, has recently reflected also the slackening demand in the leading industrial countries.

The Rail mills report no orders of consequence, and the additional purchases on the part of the New York Central lines are still pending. In the Plate trade, outside of the orders from locomotive builders, which were placed with an eastern Pennsylvania mill, there has only been some work for Steel Pipe. Two car builders have divided an order for 500 cars for the Lehigh & New England Road.

The Structural mills have had rather a poor month in March, the demand for railroad bridge work being particularly light. The backbone of the business now is what demand there is for buildings.

In the Chicago District about 4000 tons were placed, including 2500 for a viaduct in Milwaukee. Among the new work coming up is a lot of 7000 tons for the State Regents Building at Albany. A few small lots have been let for the Pacific Coast. Fabricators are competing sharply, prices being down to the level of $50 to $52 per net ton now, as compared with $58 to $60 per net ton a year ago, with the cost of material unchanged.

In some sections the demand for Steel Billets, Sheet Bars and Forging Billets has been somewhat stimulated by the absorption on the part of the mills of one-half of the freight charges.

There has been sharp competition between the mills which make light rails by rerolling and by the mills which roll from Billets, and prices have receded to $23, at mill.

A Youngstown mill has secured the order for a considerable tonnage of Merchant Pipe, for the Panama Canal, and further work of this character is expected from the same quarter.

While the Bar trade is very quiet and the Sheet trade is not as active as anticipated, the Tin Plate trade is holding very well. The leading interest has 85 per cent. of its capacity in operation.

In some sections there has been increased buying of Foundry Iron, but the bulk of the business is being done by Alabama furnaces, on the basis of $12 to $12.25, Birmingham, and by Virginia furnaces, on the basis of $14 to $14.25, at furnace, for No. 2. For the first time figures, apparently from an authoritative source, are being quoted with reference to stocks of Pig Iron in the hands of merchant furnaces and of the Steel companies. They seem large, but it is impossible to judge of their significance in the absence of data relative to stocks for former periods.

Quite a number of fair sized contracts have been placed for Cast Iron Pipe, but the prices at which they are being let are so low that some leading makers are pulling out of the market.

Copper has receded, and Electrolytic is now available for domestic consumption at 13c., while a shade lower can be done for export.

Little attention is paid in the Iron industry to the coming cessation of operations in some of the Western Bituminous Coal mines. It is not expected to last long enough to cause any inconvenience.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date one week, one month and one year previous.

	Apr. 1 1908	Mar. 25 1908	Mar. 4 1908	Apr. 1 1907
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	$17.00	$17.00	$18.00	$24.00
Foundry No. 2, Southern, Cincinnati	14.25	15.25	14.75	23.00
Foundry No. 2, Local, Chicago	17.50	17.50	17.50	25.00
Bessemer, Pittsburgh	18.25	17.75	17.00	24.85
Gray Forge, Pittsburgh	15.65	15.90	15.90	21.90
Lake Superior Charcoal, Chicago	20.50	20.50	21.50	26.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	30.00
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.00
Open Hearth Billets, Phila.	29.30	29.20	30.40	31.50
Wire Rods, Pittsburgh	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	13.00	12.00	12.25	18.00
Steel Rails, Melting, Phila.	12.75	12.75	14.00	19.00
Iron Rails, Chicago	15.00	15.00	16.00	25.00
Iron Rails, Philadelphia	17.00	17.00	18.00	27.00
Car Wheels, Chicago	14.50	15.50	15.50	25.00
Car Wheels, Philadelphia	15.00	14.00	16.00	24.00
Heavy Steel Scrap, Pittsburgh	13.00	13.00	13.75	18.00
Heavy Steel Scrap, Chicago	11.25	11.25	11.50	16.00
Heavy Steel Scrap, Phila.	12.75	12.75	14.00	18.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.65	1.65	1.65	1.93½
Common Iron Bars, Chicago	1.65	1.65	1.65	1.81½
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.70	1.70	1.70	1.90
Skelp, Sheared Steel, Pittsburgh	1.80	1.80	1.80	2.00
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	1.90	1.90	1.90	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	13.25	13.25	12.50	24.50
Electrolytic Copper, New York	13.00	13.25	12.37½	24.00
Spelter, New York	4.70	4.75	4.75	6.85
Spelter, St. Louis	4.55	4.55	4.60	6.65
Lead, New York	3.97½	4.00	3.75	6.25
Lead, St. Louis	3.80	3.85	3.60	6.05
Tin, New York	31.25	32.10	30.25	40.00
Antimony, Hallett, New York	8.75	9.50	9.00	23.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, April 1, 1908.—(*By Telegraph.*)

The final summing of results for March will probably show some improvement over February in the aggregate volume of new business entered by the mills, but the measure in which the various products have contributed to this result is by no means uniform. Wire and wire products, reflecting the unimpaired financial strength of the farming communities, continue, in point of activity, far in advance of other lines. The effect of a counter condition in railroad affairs is seen in the relatively small percentage of the aggregate tonnage being taken by those interests. As was shown in the report of the Track Supervisors, the [illegible] urgent requests for prompt shipment that accompany such orders [illegible] Chicago Railway Terminal [illegible] 40,000 tons of Structural Material [illegible] Chicago [illegible] Union Station [illegible] Pittsburgh [illegible] Union Station [illegible] Chicago [illegible] Company's new [illegible] booked for Chicago [illegible] will probably develop a fair sized tonnage later on in the season. New inquiries and specifications are coming out too slowly to permit the continued operation of the Structural mill at the South Works, and it is again shut down. While there is a slight improvement in the movement of Merchant Pipe, Bars, Plates and Sheets, it is not of notable degree in any of these lines. Recent bids on Cast Iron Pipe disclose an extremely low range of prices, which in some cases seem to have been made without regard to profit. With no demand from consumers there is practically nothing doing in Old

Material. Buyers will pay market prices for what little tonnage is actually needed, but decline tempting offers for forward deliveries. Some indications seem to point to an increase in the consumption of Foundry Pig Iron, but such a condition is not yet reflected in the present demand.

Pig Iron.—While no distinctive signs of improvement are observable in the general situation, a somewhat better sentiment has developed. Signs of increasing activity in the stove foundries is to some extent responsible for the hope of an enlarged consumptive demand. There is, however, no appreciable change noted in the character or volume of actual transactions, and instead of any tendency toward greater firmness the market seems to be gradually settling to lower price levels. This is especially true of Southern Irons, which are now obtainable at from $12 to $12.50, Birmingham, for No. 2 Foundry. The Northern furnaces are not inclined to follow the decline in Southern prices, and there is consequently an increasing spread between Northern and Southern quotations. Among the sales reported for the week were two lots of 500 tons each and one of 300 tons of Southern Foundry Iron, the greater part of which, it is understood, was taken at $12, Birmingham. A lot of Northern Iron of special grade, amounting to 1000 tons, was also placed. There is practically no change in the furnace situation in this district. Early resumption of furnaces now out of blast is unlooked for. The following prices are for April, May and June delivery, f.o.b. Chicago:

Lake Superior Charcoal	$20.50 to $21.00
Northern Coke Foundry, No. 1	18.00 to 18.50
Northern Coke Foundry, No. 2	17.50 to 18.00
Northern Coke Foundry, No. 3	17.00 to 17.50
Northern Scotch, No. 1	18.50 to 19.00
Southern Coke, No. 1	16.85 to 17.35
Southern Coke, No. 2	16.35 to 16.85
Southern Coke, No. 3	15.85 to 16.35
Southern Coke, No. 4	15.35 to 15.85
Southern Coke, No. 1 Soft	16.85 to 17.35
Southern Coke, No. 2 Soft	16.35 to 16.85
Southern Gray Forge	14.35 to 14.85
Southern Mottled	14.10 to 14.60
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	19.40 to 19.90
Jackson Co. and Kentucky Silvery, 6 %	20.40 to 20.90
Jackson Co. and Kentucky Silvery, 8 %	22.40 to 22.90
Jackson Co. and Kentucky Silvery, 10 %	24.40 to 24.90

(*By Mail.*)

Billets and Rods.—A few small sales are reported, but none of significant tonnage, the demand being limited to small lots to supply needs as they arise. The forge shops are doing little and the demand for Forging Billets shows no material increase. The Chicago, Milwaukee & St. Paul Railroad has purchased 10,000 Iron Car Axles, the order, it is understood, having been placed with the Block-Pollak Iron Company. Under a new arrangement that has been formulated to equalize the disadvantage in freight rates of finishing mills outside of Pittsburgh, the mill absorbs one-half of the freight rate when it exceeds $1 a ton and up to $3 a ton. In conformity with this schedule, quotations for this market are revised, and we quote Forging Billets at $31.50 to $32.50, Chicago. There is a fair demand for Wire Rods, the prices of which continue firm at the following quotations: Bessemer, $35; Basic, $36; Chain, $37, all at Pittsburgh.

Rails and Track Supplies.—While there are a number of small inquiries in the market for Standard Section Rails, and a few small sales are reported, the aggregate tonnage is very light; nor are there any present indications of a notable increase in the immediate future. Orders for Spikes and Fastenings continue to develop in a moderate way, and it is noted that in almost every instance these are accompanied by requests for prompt execution and shipment. In view of the evident fact that supplies of this character in the hands of the roads are greatly reduced, the prospects for a reasonably fair demand are good. Prices of Spikes and Track Bolts are easier, and are herewith revised. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.80c. to 1.90c., according to delivery; Track Bolts, 2.25c. to 2.35c., base, Square Nuts; and 2.40c. to 2.50c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—The principal tonnage of fabricated material included in last week's closures was that involved in a contract taken by the Milwaukee Bridge Company for the Washington avenue viaduct, Milwaukee, comprising 2550 tons, the contract price being $215,670. Of the bids offered by the seven interests competing for this work, the highest was $229,550. Among the small contracts awarded during the week were 365 tons for the North Denver High School, taken by the Pittsburgh Steel Construction Company; 200 tons for a draw bridge over the Skagit River, Mount Vernon, Wash., taken by the Morava Construction Company, and a small tonnage for track elevation let by the Illinois Central Railroad to J. T. Ryerson & Son. Fabricators are figuring on what represents the initial requirements for the Corn Products Company's new building at Summit; this will probably be let in a few weeks. A contract for 900 tons of material required by the Chicago, Burlington & Quincy Railroad for track elevation work will likely be let this week. Under the pressure of competition, prices on fabricated material have declined to a point that admits of little or no profit. Specifications are coming in very slowly, and the Structural mill of the Illinois Steel Company, having cleaned up all orders in hand last week, is again idle. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.: Beams, larger than 15 in., 1.98c.: Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—There is no perceptible quickening in the movement of Plates, nor do the inquiries received give promise of early betterment. The large jobbing interests are taking on no new tonnage save in desultory lots required for stock assortment. In the main the limited business offered consists of small orders, on which immediate shipment is desired. The slow accumulation of tonnage during the past few weeks has enabled the Sheared Plate mill of the Illinois Steel Company to resume; it was started up on Monday with only enough specifications in sight to keep it going for a short time. The only irregularity in prices noted is the concession of $2 to $3 a ton, obtainable from a few sources on narrow Plates. We quote for mill shipment as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—While continuing more active than most of the heavier mill products, a normal demand for Sheets has not yet been approached. At the same time a moderately good tonnage is being booked and buyers are disposed to specify a little more freely. Both jobbers and mills report prices to be firm and unchanged. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 to 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c. Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No 30, 4.40c. to 4.45c.

Bars.—No business worth while is being offered and specifications are coming out very reluctantly. The various consuming interests are ordering only what is needed for actual consumption and do not anticipate their requirements. Only a small portion of the Bar mill capacity of this district is in operation this week. The entire situation, both as respects mills and consumers, is one of hand to mouth supply, but there is a hopeful feeling that more decided improvement will come with the development of spring work. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.: Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras: Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—Business for the month of March will register a slight increase in the aggregate over that of the preceding month. There is, however, no radical change in the situation; buyers continue to limit their purchases to the needs that develop from week to week. It is believed that with the opening of navigation, which will take place about April 15, there will be a better demand, especially from the Northwest. Store prices have stiffened up somewhat, and there is less disposition among jobbers to make extreme concessions on shipments from stock. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 71 per cent. on Black Steel Pipe, ¾ to 6 in. From two to 3 points above these prices is asked for Iron Pipe.

Boiler Tubes.—Until the tide of business brings an increased volume of new work to the Boiler shops there will be little quickening in the demand for Merchant Tubes. Only a moderate amount of business, consisting of scattered orders for immediate use, is being handled by either the mills

or jobbers. Rumors of price concessions made by some of the outside mills are heard, but nothing of importance in this respect is so far confirmed. Locomotive Tubes share the general inactivity noted in other Tubular goods. Mill quotations for future delivery, on the base sizes, are as follows: 2¾ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1¼ in.	35	35	35
1¼ to 2¼ in.	50	35	35
2¼ in.	52½	35	35
2½ to 3 in.	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—The implement dealers are manifesting no interest in the market, and practically no new business is received from this source. A moderate demand for small Shapes and Machinery Steel is reported, and this is supplemented by a fair run of small orders for Tire stock from vehicle manufacturers. There is very little demand for Shafting, the regular discounts on which continue to be shaded. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c. and 1¼ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 54 per cent. off in car lots; 48 per cent. less than car lots, base territory delivery.

Cast Iron Pipe.—The tonnage taken last week dwindled to a few small lettings of no particular importance, among which were 200 tons for Jackson, Mich., awarded to the Dimmick Pipe Company, and 200 tons let by Bay City, Mich. As far as can be ascertained, there is small prospect of any large tonnage requirements coming into the market in the immediate future. The eagerness of competition for what little business there is in sight has resulted in wide departures from the quoted prices. These on the whole are lower, and are herewith revised, but are at best only nominal. We, therefore, quote nominally, per net ton, Chicago, as follows: Water Pipe, 4-in., $28; 6 to 12 in., $27; 16-in. and up, $26, with $1 extra for Gas Pipe.

Old Material.—A recent purchase by a consumer, comprising about 2000 tons of Railroad Knuckles and Springs, is the only one of moment reported. This, it is understood, was taken for three months' delivery, on a basis of $11.25, Chicago. The rolling mills at their present rate of operation are not eating into their stock piles very rapidly, and replenishment orders from this source are, in consequence, light. Small lots of Cast Scrap are being taken here and there by the melters to meet current requirements, but no round lots for forward needs are included in these transactions. An offer of 1000 tons of Car Wheels was made this week by a prominent dealer at $14.50, without results. Due to the slack work in car shops, there is practically no demand for Wheels. It is understood that the 1000 tons of Iron Rails offered last week by the Chicago, Burlington & Quincy was disposed of to a manufacturer of Track Supplies under a trade exchange agreement. The Chicago & Northwestern is this week offering 650 tons of material. With the exception of Car Wheels prices are practically unchanged. We quote per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$15.00 to $15.50
Old Steel Rails, rerolling	12.00 to 12.50
Old Steel Rails, less than 3 ft.	12.00 to 12.50
Relaying Rails, standard sections, subject to inspection	20.50 to 21.50
Old Car Wheels	14.50 to 15.00
Heavy Melting Steel Scrap	11.25 to 12.00
Frogs, Switches and Guards, cut apart	11.50 to 12.00
Mixed Steel	9.00 to 9.50

The following quotations are per net ton:

Iron Fish Plates	$13.50 to $14.00
Iron Car Axles	16.00 to 16.50
Steel Car Axles	14.75 to 15.25
No. 1 Railroad Wrought	11.00 to 11.50
No. 2 Railroad Wrought	10.00 to 10.50
Railway Springs	10.75 to 11.25
Locomotive Tires, smooth	14.00 to 14.50
No. 1 Dealers' Forge	9.00 to 9.50
Mixed Busheling	7.00 to 8.00
Iron Axle Turnings	6.00 to 6.50
Soft Steel Axle Turnings	6.00 to 6.50
Mine Shop Turnings	6.00 to 6.50
Cast Borings	4.75 to 5.25
Mixed Borings, &c.	4.75 to 5.25
No. 1 Mill	7.00 to 7.50
No. 2 Mill	6.00 to 6.50
No. 1 Boilers, cut to Sheets and Rings	7.00 to 7.50
No. 1 Cast Scrap	12.25 to 12.75
Stove Plate and Light Cast Scrap	10.25 to 10.75
Railroad Malleable	10.00 to 10.50
Agricultural Malleable	9.50 to 10.00
Pipes and Flues	8.00 to 8.50

Metals.—In response to the upward tendency of Copper, a little stronger feeling has developed, but is not yet reflected in a decided betterment of demand. There are perhaps a few more orders coming out, but they continue to represent actual needs rather than prospective requirements. Other metals are somewhat firmer, but it cannot be said that a general forward movement is indicated by the present rate of consumption. We quote as follows: Casting Copper, 13¼c.; Lake, 13¾c. to 14c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 33c.; small lots, 31½c.; Lead, Desilverized, 4c. to 4.25c., for 50-ton lots; Corroding, 5.35c. to 5.45c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5.25c.; Cookson's Antimony, 12½c., and other grades, 10½c. to 11c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 11c.; Copper Clips, 11c.; Red Brass, 12½c.; Yellow Brass, 10¼c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 25c.; Block Tin Pipe, 27c.

Pittsburgh.

PARK BUILDING, April 1, 1908.—(*By Telegraph.*)

Pig Iron.—Prices of Pig Iron seem to be lower at present than at any time since the decline in the market started, last October. Three or four furnaces that make Foundry and Malleable Bessemer are going out aggressively for business, and are naming low figures. Northern No. 2 Foundry is weak, at $15.50, Valley furnace, and on a firm offer and for desirable business this price could be shaded. Basic Iron is also quite weak, and can be had as low as $15.25, Valley furnace. There is practically no demand for Bessemer, the nominal market being $17, Valley furnace. Only very small lots of Pig Iron are being sold, consumers refusing to buy ahead in the present weak condition of the market. Northern Forge is also weaker, and we quote this at $14.75, Valley furnace, with a probability that even this low price might be shaded on a firm offer.

Steel.—There is some inquiry for Billets and Sheet and Tin Bars, especially the latter. The Steel mills that are now in operation are making heavier shipments than for some time. The Bessemer plants of the Republic and the Youngstown Sheet & Tube companies at Youngstown are both in full operation this week. We quote Bessemer Billets under the new arrangement put in force last week at $28, Pittsburgh; $28.50 Youngstown or Wheeling; and $28.75 for delivery in the Cleveland District. Sheet and Tin Bars are $29.50 and Forging Billets $30, Pittsburgh.

(*By Mail.*)

Conditions in the Steel trade are of an encouraging nature. While improvement is certain to be slow, yet it is believed the turn has been made and that there will be steady improvement from this time forward. The tonnage of new business entered by the mills in March and specifications against contracts in that month show an improvement over February, and it is believed April will bring a decided betterment over March. Good weather is an important factor in the situation, and now that spring has set in it is certain that the demand for a great many finished forms of Iron and Steel that are used in building construction and in other outside work will soon be larger. The chief trouble at the present time is the fact that the railroads are not buying, but as soon as they are able to negotiate loans which will give them money to make purchases of needed equipment, conditions in the Steel business are bound to show material improvement. It is stated that some of the railroads are so short of motive power that they are stripping engines now standing on side tracks and using part of the equipment in other locomotives that are being kept in active service. It is estimated that the railroads consume from 55 to 60 per cent. of the various forms of Iron and Steel, and with the railroad demand practically shut off for the last six months the reason for the present depression in the Steel trade can be readily seen. The Pig Iron market shows no betterment either in demand or prices, but early in April it is expected that a meeting of the Western furnace interests will be held in Cleveland to see if something cannot be done to improve the situation. There is a fair demand for Steel, and regular prices, in the main, are being observed. New business and specifications on contracts in Finished Iron and Steel are slowly increasing, the improvement having been most marked in the Tin Plate, Wire and Pipe trades. The Tin Plate trade is nearly back to what it was at this time last year, and the demand is increasing. The Coke trade continues very dull, and the same is true of Scrap, prices on the latter being weaker than for some time.

Ferromanganese.—New demand continues very dull, and with free offerings prices are weak and will likely be

lower. We quote 80 per cent. foreign Ferro at $43, seaboard, or $44.95, Pittsburgh.

Muck Bar.—The market is absolutely bare of sales, and we continue nominal quotations of $27 to $27.50, Pittsburgh, for best grades of Bar, made from all Pig Iron. Muck Bar made from part Scrap, can be bought at lower prices.

Rods.—There is a fair amount of inquiry for Rods, but no large tonnage is being sold, consumers buying only for actual needs. Bessemer Rods are held at $35, Open Hearth at $36, and Chain Rods at $37, Pittsburgh.

Skelp.—There is a fair amount of new inquiry, but the mills rolling Skelp are badly in need of orders, and it is probable that prices would be shaded on a firm offer. We quote nominally as follows: Grooved Steel Skelp, 1.60c.; Sheared Steel Skelp, 1.70c.; Grooved Iron Skelp, 1.80c., and Sheared Iron Skelp, 1.90c., f.o.b. Pittsburgh.

Steel Rails.—We note an active demand for Light Rails, specifications and new orders booked by the Carnegie Steel Company in the past week amounting to 2000 tons, among which was 500 tons for the Monongahela River Consolidated Coal & Coke Company. Very little new tonnage is being booked in Standard Sections, but negotiations with a number of the leading railroads have reached the point where it is believed it will be only a short time until they place orders. The Edgar Thomson Rail mills continue in operation, but have been "gaited" to about 30 per cent. of capacity. Prices on Light Rails are a little firmer, but mills that re-roll Rails are still cutting under from $2 to $3 a ton. We quote Light Rails as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—The outlook is not encouraging. It is true that locomotive builders have recently taken some work, but the Steel car builders have practically cleaned up all old orders and have little in sight, while the lake boat builders have practically no work ahead. The tonnage of Ore that will be brought down this season will be much less than in 1907, and this means that probably no large boats will be built this year. In the main regular prices on Plates are being observed, but occasional concessions of not more than $2 a ton, mostly on the narrow sizes, are made. We quote: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼ in. to and including 3 16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell grade of steel is abandoned.	

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—A good deal of new work is coming up in the East, and also in Chicago and other Western points, but in the immediate Pittsburgh District very little is in sight. A new bank building at Connellsville, Pa., about 400 tons, and the extension to the Fort Pitt Hotel, about 1800 tons, are being figured on, but the latter job has not been financed as yet. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—The aggregate new business placed with the mills in March showed an increase over February, but the Sheet trade is not as active at present as anticipated. It would be well to bear in mind that a material improvement in demand is likely to come at any time, and that large jobbers would be wise in carrying more liberal stocks than they are disposed to hold at present. Stocks all over the country are very low, and if a heavy demand should suddenly start there would be delay in filling orders from the mills, which have been running for some time to light capacity. The American Sheet & Tin Plate Company is operating this week 47 per cent. of its Sheet mill capacity, and next week will start up its Piqua, Ohio, plant, which contains four hot mills. As a rule, prices on Sheets are fairly well maintained, but occasional concessions are being made by a few mills. Regular prices are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—The demand is reported to be steadily increasing, and the American Sheet & Tin Plate Company recently started 12 of the hot mills in the American Works, at Elwood, Ind., and will start the other 16 hot mills next week. This company is now operating a total of 202 hot mills, or about 85 per cent., of its Tin mill capacity. The jobbing trade is still disposed to place orders only as actual needs require, and the low stocks on hand are shown from the fact that some recent orders for Tin Plate were sent in by telephone, with the request that spot shipment be made. The Tin Plate trade is peculiar in the fact that it does not depend to any extent on whether the railroads are buying or not, but as most of it is used in canning, there does not seem to be any good reason why this should not be a good year in the Tin Plate trade, providing we have average crops of fruits and vegetables. The fact is pointed out that jobbers would best serve their interests by placing orders more liberally, and having larger stocks of Tin Plate on which to draw when their demand sets in, which it is expected to do in the very near future. We are advised that prices are being maintained. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Iron and Steel Bars.—The mills rolling Iron and Steel Bars continue to run intermittently, depending on current orders, which up to this time are not large enough to keep the mills running to more than 50 per cent. of their capacity, if that. The belief prevails to some extent that prices on Steel Bars may be readjusted to a lower basis before long, and for this reason the trade is buying conservatively, placing orders only for what may be actually needed. Specifications against contracts and new business entered in March show an increase over February, but conditions are still far from being satisfactory to the mills. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further west. Steel Bars remain very firm at 1.60c., Pittsburgh.

Hoops and Bands.—Consumers are covered by contracts placed some time ago, against which they are specifying at only a fairly satisfactory rate, but there is no new buying. Regular prices are as follows: Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60c., base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Spelter.—Prices are very erratic, and, on the whole, are weaker. Prime grades of Western Spelter are now quoted at 4.50c., East St. Louis, equal to 4.62½c., Pittsburgh, but on a firm offer this price would likely be shaded. The demand is light, and the smelters are cutting down their output materially to keep down stocks as much as possible.

Railroad Spikes.—No large business has been placed since our last report, but several roads are in the market with inquiries for a fairly large tonnage, which may be placed before long. We quote: Standard sizes, 4½ x 9-16 in., at $1.70, and the smaller sizes at $1.80 per 100 lb. in carloads and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Merchant Steel.—We note a fair demand for season Steels, such as Toe Calk, Spring and Tire, but new orders are small and continue to represent actual needs of customers. The regular discount of 54 per cent. off on Shafting in carload lots continues to be shaded. We quote: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 2.10c. to 2.15c. Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron, finished, 1½ in. and wider, 1.60c.; under 1½ in., 1.75c. Planished Tire Steel is 1.80c., all f.o.b., at mill.

Pipes and Tubes.—New business is showing a slow but steady increase, orders and specifications in March having been slightly larger than in February. The Youngstown Sheet & Tube Company has taken an order for about 11 miles of Galvanized Iron Pipe from 2½ to 6 in. in diameter, about 15 miles of Black Iron Pipe and about 9 miles of extra strong Wrought Iron Pipe for the Panama Canal, the total contract amounting to $45,628. It is understood that considerable tonnage in Steel Pipe is yet to be placed by the Canal Commission. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 74 and 5 per cent. off list,

while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black.	Galv.
	%	%
⅛ to ¼ in	65	49
⅜ in	67	53
½ in	69	57
¾ to 6 in	73	63
7 to 12 in	70	55
Extra strong, plain ends:		
⅛ to ⅜ in	58	46
½ to 4 in	65	53
4½ to 8 in	61	49
Double extra strong, plain ends:		
½ to 8 in	54	43

Discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
	%	%
⅛ and ¼ in	63	...
⅜ in	65	51
½ in	67	55
¾ to 6 in	71	61
7 to 12 in	68	53
Extra strong, plain ends:		
⅛ to ⅜ in	56	44
½ to 4 in	63	51
4½ to 8 in	59	47
Double extra strong, plain ends:		
½ to 8 in	52	41

Boiler Tubes.—No large contracts have been placed since our last report, but some business in Locomotive Tubes is pending, which is expected to be given out in a short time. We are advised that prices are being fairly well maintained. Discounts on Merchant Tubes for small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in	42	47
1¾ to 2¼ in	42	59
2½ in	47	61
2¾ to 5 in	52	65
6 to 13 in	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Coke.—There is practically no new demand for either Furnace or Foundry Coke and prices continue weak. Furnace Coke made in the Klondike and Latrobe districts continues to be freely offered at $1.60 to $1.65, at oven, for prompt shipment, while other grades of Coke, not so high in quality, are offered at lower prices. Best grades of 72-hr. Foundry Coke are held at about $2.25, at oven, to consumers, but Main Line grades are offered at $2 to $2.10. The output of Coke in the Upper and Lower Connellsville regions last week was 160,085 tons, which is only about 40 per cent. of capacity of these two regions.

Iron and Steel Scrap.—Not enough is being sold to test the market, consumers limiting their purchases to small lots for actual needs. Not much improvement in demand is expected until finishing mills are able to get more orders and operate their mills to larger capacity than they are doing now. Prices are weak, and on a firm offer it is probable that the quotations named below would be shaded. Dealers quote about as follows: Heavy Steel Scrap, $13 to $13.25; No. 1 Railroad Wrought Scrap, $14 to $14.25; No. 1 Cast Scrap, $15 to $15.25; Bundled Sheet Scrap, $10 to $10.25; Cast Iron Borings, $7.75 to $8; No. 1 Busheling Scrap, $13 to $13.25; No. 2, $10.25 to $10.50; Steel Axles, $16.50 to $17; Sheet Bar Crop Ends, $17 to $17.25; Low Phosphorus Melting Stock, $17.25 to $17.50; Iron Axles, $20 to $20.50; Machine Shop Turnings, $8.75 to $9; Rerolling Rails, $14.25 to $14.50; Old Steel Rails, short pieces for Open Hearth use, $13 to $13.25; Grate Bars, $13.25 to $13.50.

Birmingham.

BIRMINGHAM, ALA., March 30, 1908.

Pig Iron.—Melters have found it necessary to negotiate for additional tonnage, and the aggregate of sales is considerably in excess of those reported last week. Some inquiries are pending and the market shows additional strength. Purchasers are still disposed to pursue a conservative course as to engagements, but proportions of requirements have increased perceptibly. The manufacturers of Cast Iron Pipe are consuming more tonnage, and shipping orders from all sources indicate an increase in their melt. An improvement is also noted in the demand for Basic Iron, the sales consummated during the week reaching fair proportions. The recent decisions favoring railroad companies are not without a salutary effect, and in view of the developments in monetary affairs a general improvement in sentiment is noted. Despite the fact that frequent sales are reported at figures below the established price of $13, Birmingham, leading interests are adhering to such a basis without manifesting a disposition to make concessions. A reported sale of 1000 tons at $13 is not confirmed, but a number of lots ranging from one carload to 100 tons have brought that price, while the principal sale reported for the week was a lot of 2000 tons at $12.75, Birmingham. However, a lot of 250 tons of No. 2 Foundry was sold for $12.50, and there is evidence of a disposition to make a greater differential than 50c. per ton on a No. 2 basis for lower grades. With the coming of the second quarter two additional furnaces will be put in blast, which will increase the active capacity to 20 stacks. The completion of the new Vanderbilt Furnace of the Birmingham Coal & Iron Company and the remodeling of the Woodstock Iron & Steel Corporation's idle furnace at Anniston, Ala., will increase the available capacity two stacks.

Cast Iron Pipe.—Among the contracts placed with Southern plants during the week the following are most significant: Milwaukee, Wis., 3800 tons; Meridian, Miss., 1000 tons; approximately 1000 tons for the Kansas City Southern Railway; 600 tons for Savannah, Ga. The contract for Memphis, Tenn., has also been awarded, but the tonnage cannot be ascertained. It is to be noted that the American Cast Iron Pipe Company is making frequent shipments of Water Pipe to Alaska. This is probably the first material of the kind that has been furnished that territory by the South in a number of years. No new lettings are advertised, but the recent sale of bonds is encouraging and an optimistic feeling prevails. Sharp competition continues to result in low prices on large contracts, but for comparatively small lots quotations are firmer. We quote nominally as follows for Water Pipe per net ton, f.o.b. cars here: 4 to 6 in., $27; 8 to 12 in., $25; over 12-in., average $24, with $1 per ton extra for Gas Pipe.

Old Material.—As noted in the Pig Iron market, sentiment has improved, but the volume of business has not increased in proportion. Transactions continue on the hand-to-mouth order, with dealers and producers apparently most interested in bargain lots. An occasional sale is made of high grades, but the demand is chiefly for Cast Scrap and Stove Plate, which is being met with prices considerably at variance. We continue to quote nominally the following per gross ton, f.o.b. cars here:

Old Iron Rails	$16.50 to $17.00
Old Iron Axles	15.50 to 16.00
Old Steel Axles	14.50 to 15.00
No. 1 Railroad Wrought	13.00 to 13.50
No. 2 Railroad Wrought	10.00 to 10.50
No. 1 Country Wrought	11.50 to 12.00
No. 2 Country Wrought	9.50 to 10.00
Wrought Pipe and Flues	10.00 to 10.50
No. 1 Steel	11.50 to 12.00
No. 1 Machinery	10.50 to 11.00
Stove Plate and Light Cast	9.50 to 10.00
Cast Borings	6.00 to 6.50

Cleveland.

CLEVELAND, OHIO, March 31, 1908.

Iron Ore.—One merchant Ore firm has received some inquiries from furnace interests during the past few days asking what it will have to offer this season in the way of Old Range Bessemer; but the communications were not regarded as actual inquiries for Ore. Although orders for shipment of Ore from the docks to the furnaces have improved since the first of the month, the improvement from week to week is very slight. While some Ore firms are making a considerably better showing, one of the largest Ore companies reports that its shipments at the present time are not over 10 per cent. as large as at this time a year ago. The Ore stock piles of some furnaces that have been in blast the greater part of the winter are said to be getting nearly cleaned up, so that it is believed there will be a considerable increase in shipping orders during April. There are many furnaces, however, that have enough Ore on their stock piles to last them until this season's shipments from the mines begin, and these will be in no hurry to move their Ore from the docks. The leading interests seem determined to adhere to their plan not to start their Ore shipments before June 1, and vessel interests in general are preparing for a late opening of navigation. Vessel tonnage is being offered for Ore, but no chartering is being done, and it is not expected that any will be done until the Ore is sold. The question of lake rates has not yet been taken up by the vessel owners. At a meeting of the Lake Carriers' Association held in this city last week the vesselmen present expressed themselves in favor of an open shop on the lake boats. There is no disposition to cut wages, but the boat owners want to do away with dictation in the handling of their property. Vesselmen generally are willing to pay last season's scale of wages, but they feel that all agreements in regard to working conditions and duties of the men aboard the boats should be eliminated. No action was taken, but the matter will be further discussed at a meeting of the Board of Directors, to be held April 9. We quote Ore prices at Lake Erie docks, for 1908 delivery, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.20; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—The only sales of Foundry Iron reported in this territory during the week are a few car lots and one or two 100-ton lots. While the price schedule adopted at the Cleveland conference of furnace interests a few weeks ago

is being maintained by the leading producers and the two local furnaces, plenty of Iron is being offered by furnaces that are willing to make sales at about $15.50, at furnace, for No. 2 Foundry. Local consumers have been offered No. 2 Foundry Iron at $16.40, delivered, or $15.50, Valley furnace, the local delivered price under the schedule being $17.35. While one or two furnace interests report some increase in shipping orders, the improvement is slight and the general condition of the foundry trade in this territory does not indicate that there will be much if any increase in the demand for Foundry Iron in the near future. We note the sale of 100 tons of Off Malleable Iron by a local interest at $16, Valley furnace. A local interest operating furnaces in Buffalo and Pittsburgh territories reports some improvement in the Eastern demand for Foundry Iron. This interest reports sales of 1000 tons of No. 2 Foundry Iron at western Pennsylvania furnace at prices ranging from $16.50 to $16.75, Pittsburgh, and 3000 tons at western New York furnace at prices ranging from $16 to $16.50, at furnace. The sales were made in lots ranging from carloads to 500 tons for spot and second quarter delivery. Buffalo Union furnace A of M. A. Hanna & Co. has gone out of blast as the result of a hot spot, and will have to be relined. As a result of the shutdown furnace B will probably be put in blast in about 10 days. No sales of Southern Iron are reported, and there are no inquiries for Basic Iron. For prompt shipment and for the second quarter we quote, delivered, Cleveland, as follows:

Bessemer	$17.90
Northern Foundry, No. 1	$17.00 to 17.85
Northern Foundry, No. 2	16.50 to 17.35
Northern Foundry, No. 3	16.00 to 16.85
Southern Foundry, No. 2	16.35 to 16.85
Gray Forge	15.90 to 16.40

Coke.—There is practically no demand for either Furnace or Foundry Coke. Prices remain about stationary. We quote Connellsville Furnace Coke at $1.60 to $1.80, at oven, for spot shipment, and Connellsville 72-hr. Foundry Coke at $2.25 to $2.40, at oven, although some interests are holding for $2.50.

Finished Iron and Steel.—Conditions in this line show little, if any, improvement, although there are some reports of a slight improvement in specifications. The principal activity has been in Structural Material and Light Rails. One mill received specifications for several hundred tons of material, mostly Structural, from a local bridge builder, and another local fabricator placed an order for 350 tons. Stocks in some of the local Structural shops have become depleted. While there is no work in sight requiring a large tonnage of Structural Material, municipalities and counties in this territory are planning considerable bridge work for the coming season. The only building for which a fair tonnage will be needed soon is the First National Bank Building in Youngstown. The amount required has not yet been announced. An order was placed during the week with the Lorain Steel Company for 1200 tons of girder Rails, to be used in rebuilding two street car lines in this city, that were torn up a year ago during the local street railroad war. Quick delivery is wanted. During the week two contracts were closed by Coal mining companies, one for 175 tons of Light Rails for delivery during the balance of the year, and the other for 400 tons. Orders for several car lots were also placed. The sales were made below the regular price quotations, but at better prices than the mills have been compelled to make recently in competition with the mills rerolling Rails. A careful canvass of this territory shows that it is very improbable that any considerable tonnage of Rails will be bought for interurban traction lines the coming season. The general demand for Finished Material from consumers shows little change, and the few current orders are for small lots. Local warehouses report that their stock sales for March will be but slightly larger than during February. The demand for Iron and Steel Bars is light, being nearly all on contracts. Local Bar Iron mills continue to run about half time. Iron Bars, on which the price was shaded for several weeks, are firmer, as the result of the action of the Western Bar Iron Association in reaffirming prices last week, and the established price is now being maintained. The demand for Plates is light, and smaller mills are still making price concessions of $2 a ton. Sheet prices are weak, and there is practically no demand. We quote Iron Bars at 1.60c., Cleveland, for car lots; Steel Bars, 1.70c., Cleveland, for car lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼-in. and heavier, 1.80c., Cleveland. We quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. The store price on Steel Bars is 1.75c. to 1.85c., and on Iron Bars, 1.75c. to 1.80c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—There is no improvement in the demand, and the market shows a tendency to further weakness. In the absence of any demand Old Car Wheels are quoted $2 a ton lower than last week, and quotations about 50c. a ton lower are being made on Railroad Wrought and Cast Scrap. Dealers say that they cannot buy Scrap at prices low enough to sell to consumers at the prices the latter are now offering. The railroad offerings this week include some tonnage to be sold by the Erie Railroad and about 1000 tons to be sold by the Pennsylvania Lines, West. Dealers' prices to the trade are as follows, per gross ton, f.o.b. Cleveland:

Old Steel Rails	$11.00 to $11.50
Old Iron Rails	15.00 to 16.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	13.00 to 13.50
Relaying Rails, 50 lb. and over	21.00 to 22.00
Heavy Melting Steel	11.00 to 11.50
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	7.50 to 8.50

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	7.00 to 8.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	10.50 to 11.00
No. 1 Railroad Wrought	12.00 to 12.50
No. 1 Cast	12.00 to 12.50
Stove Plate	10.00 to 10.50
Bundled Tin Scrap	8.00 to 9.00

Philadelphia.

PHILADELPHIA, PA., March 31, 1908.

A slight improvement was to be noted in the number of orders taken in several branches of the trade the past week, but there has been no appreciable gain in the tonnage output of the various mills. It seems hard to get above the 50 per cent. basis, at which plants have been running for some months. Here and there a temporary gain will be made, but usually it has been impossible to keep running very long at the increased rate of production. That there is more business floating around there is no doubt, but prospective buyers do not seem to be inclined to place the business, preferring, it seems, to wait a little longer before actually giving out their orders. Some railroad business has come out. The Lehigh & New England Railroad, controlled by the Lehigh Coal & Navigation Company, placed an order last week for 250 Steel gondola cars of 80,000 tons capacity with the Cambria Steel Company, and another for 250 Steel framed box cars of 60,000 tons capacity with the American Car & Foundry Company. Cast Iron Pipe makers report orders more numerous, several pretty fair sized orders for Pipe having been recently booked, while the aggregate tonnage of miscellaneous orders is said to be larger than has been the case for some time. The feeling in the trade generally is a shade more hopeful, and it is believed that a fair share of the business which has been withheld for so long will come out in the near future.

Pig Iron.—Little change is to be noted in the demand. In some instances sellers report increased sales, while others report buying to have been lighter. The aggregate tonnage taken is not large, although there is a disposition shown by some buyers to protect themselves more fully against their requirements for the second quarter and in a few cases part of the third quarter. The same hesitancy continues to be shown in most cases, however, in placing orders for anything much beyond immediate requirements. The Cast Iron Pipe interests have been the most active, and some of the local makers have been buying both standard and off grades of Iron in small quantities. No large tonnages have been sold, although there is now an inquiry in the market for 4000 tons for early delivery. Prices continue unsettled, but the leading Eastern furnaces maintain their established prices on the basis of $18.25, delivered, for No. 2 X Foundry. Sales of this grade have been made in lots ranging from carloads up to several hundred tons, and some lots of No. 2 Plain have also been sold at the established basis. There seems to be no weakening by those in the agreement as far as price is concerned, and in a number of instances producers say they will curtail production rather than reduce the price. Outside interests, however, continue their lower quotations, which range about 50c. below those agreed on by the leading interests, so that No. 2 X Foundry can be had to-day at prices ranging from $17.75 to $18.25, delivered, and a large share of the business, under these conditions, is going to the independent furnaces. Sales of Virginia Irons have again developed a little irregularity; some interests have sold quite heavily, while others have done but little business. Most of the sales have been in small tonnages, but in one instance a 1000-ton lot of No. 2 X for Western delivery was sold, the price being $14.50, at furnace. Prices for delivery in this territory range at about $17.75 for No. 2 X and $17.25 for No. 2 Plain, although some makers would no doubt take 25c. a ton less on fair sized tonnages. Sales of Southern Irons have been reported rather light the past week, although there is some figuring now being done on several good sized tonnages. Forge Iron has not been in active demand. Sales of small lots by both inside and outside interests have been made, but there are no large tonnages on the market. Prices

range from $16.25, at which sales have been made by the independent furnaces, to $16.75, the price maintained by those in the agreement. Steel making Irons are uncalled for, and what inquiries there were on the market a few weeks ago for Low Phosphorus Iron have been withdrawn. Prices show no change, the inside figures in the tabulated prices below (with the exception of Low Phosphorus Iron) being those at which business has been done by the independent furnaces, while the outside figures represent the agreed prices of the Eastern makers for delivery in buyers' yards, eastern Pennsylvania, and adjoining territory during the second quarter:

No. 2 X Foundry	$17.75 to $18.25
No. 2 Plain	17.25 to 17.75
Gray Forge	16.25 to 16.75
Basic	17.25
Low Phosphorus	23.50 to 24.00

Ferromanganese.—The demand for Ferro has again quieted down, and such business as is coming out is confined to broken lots, for prompt shipment. The inquiry for 1000 tons before the trade early last week was closed at a price close to $42.50, seaboard, and 200 tons of Ferro-silicon was sold to the same buyer at approximately $80, seaboard. Prices for 80 per cent. Ferromanganese are a little easier, $42.50 to $43.50, Baltimore, being named for early shipment.

Steel.—The adjustment of the delivered prices in Steel Billets, Sheet Bars, and Blooms, by the absorption on the part of the mills of half of the freight charges, within certain limitations, has stimulated the demand in this territory to some extent. One mill has booked a very satisfactory order for Billets on the new basis, while there has been an increased number of small orders. Production continues, however, at about the same rate, the total volume of business not yet being sufficient to increase the output to any appreciable extent. We quote, for delivery in Philadelphia and vicinity, $29.20 for ordinary Rolling Billets, and $31.20 for Forging Billets, with the usual extras for high carbons and large sizes.

Plates.—A little more business has developed. There has been more inquiry from several sources, and Plate makers are more hopeful as to future business. One consumer is in the market for several thousand tons of Tank Plates, while another has placed an order for 2000 tons, for Steel Pipe work, for delivery next month. Orders for several other moderate sized tonnages have also been booked. Production meanwhile continues on a fairly even basis, and prices are being fully maintained, quotations for delivery in this territory being as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—The amount of business coming out is not large. Spring building operations develop slowly, although several fair sized propositions are being figured on. The new pavilion of the Athletic Baseball Club will require some 800 tons of Structural Material, while a new opera house, to be built during the summer, will require, it is thought, even a larger tonnage. The greater proportion of the business booked recently has been of a miscellaneous character, but with the amount of new work in sight it is believed there will be an improvement in the demand before a great while. Quotations are being firmly maintained, 1.85c. to 2c. being named, according to specification.

Sheets.—Inquiry for Sheets has been decidedly better, and buyers show a disposition to consider larger tonnages, which would indicate an improvement in the near future. Orders, however, are not developing rapidly at the time, and mills do not show any gain in production. Prices are unchanged, the following range being quoted for mill shipments, with a tenth extra for small lots: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—New business is extremely quiet, while specifications on old orders come out but slowly. Mills, therefore, do not gain in tonnage and are running irregularly. Some consumers are not inclined to pay the present basis of 1.65c., delivered in this territory, for Refined Iron Bars, and there are rumors that their counter offers of 1.55c. are being met either directly or on conversion deals. The leading mills, however, are maintaining the established price.

Old Material.—The market is extremely quiet and the demand has fallen off to almost nothing. Mills show no interest in the market. Prices are not considered very strong, but in the absence of business there is no quotable change. We quote nominally as follows, for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory:

No. 1 Steel Scrap and Crops	$17.75 to $18.25
Low Phosphorus	17.50 to 18.00
Old Steel Axles	17.50 to 18.00
Old Iron Axles	20.00 to 21.00
Old Iron Rails	17.00 to 18.00
Old Car Wheels	14.00 to 15.00
Choice No. 1 R. R. Wrought	15.00 to 15.50
Machinery Cast	15.00 to 15.50
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	9.00 to 9.50
Stove Plate	11.00 to 11.50
Cast Borings	7.50 to 8.00
Grate Bars	11.75 to 12.25

Coke.—The demand for Coke has again become inactive. Sales of small tonnages are reported, but there is little business of any size around. What business has been done was at the lower range of prices, which for Foundry Coke are $2.25 to $2.50 at oven, with Furnace Coke at from $1.75 to $2 at oven. For delivery in the Philadelphia territory we quote the following range of prices:

Connellsville Furnace Coke	$4.00 to $4.25
Foundry Coke	4.45 to 4.70
Mountain Furnace Coke	3.60 to 3.85
Foundry Coke	4.10 to 4.35

Matthew Addy & Co., whose local office is in the Real Estate Trust Building, Philadelphia, Pa., have been appointed sole sale agents in America for the Pyle & Blaina Works, Ltd., Monmouthshire, England, manufacturer of 80 per cent. Ferromanganese and Spiegeleisen.

Cincinnati.

CINCINNATI, OHIO, April 1, 1908.—(*By Telegraph.*)

The passing of March shows scarcely the expected improvement in the Iron and Steel trades in turning the first quarter, although at the offices of the Pig Iron sales agents the accumulation of the last few days' inquiries suggests better things for April's debut. Evidences are plenty that the buying mood is on, both of crude and finished product, but sales are restricted in the matter of volume and quantity, for the hand to mouth system rules absolutely. Some of the jobbing foundries are coming in the market for small needs, and a few of the machinery concerns are putting out salesmen who have been idle thus far in the year. A call sent to all members of the Iron Buyers' Association asks attendance at a meeting to be held on Thursday, April 2, at the Phillips House, Dayton, Ohio. This meeting is a very important one, inasmuch as the proposed uniform contract submitted to furnaces and selling agents late last year will be up for adoption. If it is passed as drafted furnaces will have to make several changes in their individual contracts, and the Traffic Committee hopes to effect a change also in the prevailing tariffs from the Birmingham District. In the Scrap market great dullness prevails, and scarcely any line may be said to be in even moderate demand.

Pig Iron.—The second and third weeks of March were not duplicated in the flight of the last one, and sales of Pig Iron have gone off in this market until one hears of little but hurry orders of a carload or so for immediate use. Most of the tonnage now going is of this character or on contract. Conservative dealers say that the business is all that could be expected, and that a fair volume may be expected ere the close of the second quarter. Among the few inquiries heard is one for 4000 or 5000 tons for an Eastern Pipe shop for April and May delivery and a 100-ton requirement of Malleable Bessemer from a northern Ohio melter. The Indiana inquiry mentioned last week of 700 tons of High Silicon is expected to be closed to-morrow. A local stove founder has purchased some Northern Foundry Iron analyzing No. 2 at a price said to be near $15.50 at furnace. A Detroit melter is in the market for some Foundry Iron for immediate needs, and a small lot of high Manganese Iron is wanted by an Ohio melter. While most dealers are asking $12.50 and $13, Birmingham, for Southern No. 2, it is pretty well established that purchases are being made freely at $12, Birmingham. There are a number of offers in hands of agents from buyers which have been turned down by the furnaces, among them one of $10 at furnace on some Forge Iron. The price of $19 at furnace on 8 per cent. Silicon Northern is apparently being well maintained. It is reported here that the new furnace in the Jackson County District will be blown in soon. On forward deliveries extending beyond the first half one hears nothing better than $13, Birmingham, on Southern No. 2, and few of the furnaces are willing to do that. Gadsden Furnace of the Alabama Consolidated, which has been out since December, is going in blast within the next week or so. Victoria Furnace of the Goshen Iron Company was blown in March 25. It was blown out in early December. The capacity is 125 to 150 tons a day, and the output is sold exclusively by Rogers, Brown & Co. There are now but four furnaces in blast in the Ironton District. We

quote for immediate delivery and for balance of first half, f.o.b. Cincinnati, as follows, the freight rates being $3.25, $1.80 and $1.20 from the Birmingham, Valley and Hanging Rock districts, respectively:

Southern Coke, No. 1	$15.75 to $16.25
Southern Coke, No. 2	15.25 to 15.75
Southern Coke, No. 3	14.75 to 15.25
Southern Coke, No. 4	14.25 to 14.75
Southern Coke, No. 1 Soft	15.75 to 16.25
Southern Coke, No. 2 Soft	15.25 to 15.75
Southern Coke, Gray Forge	13.75 to 14.25
Southern Coke, Mottled	13.25 to 13.75
Ohio Silvery, 8 per cent. Silicon	20.20 to 20.70
Lake Superior Coke, No. 1	17.70 to 18.20
Lake Superior Coke, No. 2	17.20 to 17.70
Lake Superior Coke, No. 3	16.70 to 17.20
Standard Southern Car Wheel	23.75 to 24.25
Lake Superior Car Wheel	22.50 to 23.00

Big Work.

Coke.—Business, such as it is, is satisfactory in character to dealers, if not altogether in volume. In the matter of volume, however, close observers of the situation are inclined to regard the last two weeks as about the quietest and least productive of the year so far. Word from the Connellsville and Pocahontas districts indicates that more ovens have been put out. There is practically no Furnace Coke moving; there are some Foundry grades selling, however, and the indications are that jobbing foundries all over are fixing to come into the market soon for requirements. The report that one of the large lathe manufacturers has just contracted for 800 tons of castings interests local jobbing interests and Coke sellers. Connellsville Foundry, choice grades, is quotable at $2.25 to $2.50; Pocahontas, $2 to $2.25; New River, $2.75 to $3; Wise County, $2.25, all at oven. Connellsville Furnace grades are $1.70 to $1.90; Pocahontas, $1.75 to $1.90; New River, $2.40 to $2.60; Wise County, $1.75 to $2, all at oven.

Finished Iron and Steel.—Jobbers and small dealers note a trifle better inquiry for staple lines, and there is a little movement on Plates and some interest manifested in Structural Material. The mills are vigorously campaigning for specifications. Rumors of cutting on Iron Bars in another part of this territory are attributed to a special desire at this time to move surplus stocks, anticipating some further reducions from the mills. Stores here are maintaining prices firmly, and there are no changes to be noted. Collections are a little easier, and the end of the month will show a better balance in this regard. Dealers quote f.o.b. cars at Cincinnati, as follows: Iron Bars, carload lots, 1.65c., with half extras; small lots from store, 1.85c., base, half extras. Steel Bars, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c. Blue Annealed Sheets (heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c.; No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.25c. No. 12, carload lots, 2c.; small lots from store, 2.35c. Sheets (light) Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c., base. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Old Material.—Practically nothing is doing in the Scrap market, and it is very difficult to get figures upon which to base prices. The larger dealers, however, for the first time this year are not talking lower levels, and for the most part believe that bottom has about been reached. The mills are not buying, and very little trading is going on between dealers. As nearly as it can be estimated, the local market is about as follows, prices being f.o.b. cars Cincinnati:

No. 1 Railroad Wrought, net ton	$11.00 to $11.50
Cast Borings, net ton	4.50 to 5.00
Heavy Melting Steel Scrap	11.00 to 11.50
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	15.00 to 16.00
Old Iron Rails, gross ton	14.00 to 15.00
Old Steel Rails, long, gross ton	11.00 to 12.00
Old Steel Rails, short, gross ton	11.00 to 12.00
Relaying Rails, 56 lb. and up, gross ton	20.00 to 21.00
Old Car Wheels, gross ton	13.00 to 14.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00

The Domhoff & Joyce Company, Cincinnati, has been appointed sole agent for the Central West territory for the Sloss-Sheffield Steel & Iron Company, succeeding Robert Field, resigned. This agency has retained the services of Mr. Field, who will be given charge of select territory. The change and appointment are effective April 1. J. C. Layne, Jr., formerly with the Robert Field Company, Cincinnati, as salesman, is now with Eaton, Rhodes & Co., Cincinnati, the appointment effective April 1.

Buckner Wallingford, Jr., of the firm of Wallingford & Co., Cincinnati, is now in charge of the Pittsburgh office, which has moved from the Farmers' Bank Building, in that

San Francisco.

SAN FRANCISCO, CAL., March 25, 1908.

There has been some improvement in the Iron and Steel trade in the past two weeks, although the scarcity of money for carrying out new enterprises is still very marked. The continued fine weather has been very favorable for building construction. Not as much new work has been initiated in the building line as during the first three months of last year, but it is estimated that $50,000,000 worth of construction work is now in progress. In the aggregate quite a lot of Steel bridge work will be done in California in the present year, but no large contracts have been closed recently. The announcement this week by Charles M. Schwab that, owing to the favorable manufacturing results of the past year, at least $600,000 will be expended in betterments at the Union Iron Works in this city, has had a good effect. No Government construction contracts are being filled at the company's yards at present, and most of the new work on merchant vessels is finished. The plant is getting its share of the marine repair work of the port, however, and the outlook is good for heavy mining machinery. There are more inquiries and collections are somewhat better.

Structural Material.—Shipments of Steel for several new buildings are coming through from the East in very good time, as the railroads now have plenty of empty cars. A number of Steel frames have been completed in the past month, and comparatively few crews are now engaged in erecting Steel.

Cast Iron Pipe.—The immediate demand for Cast Iron Pipe is light, but there are a number of small lots in sight, contingent, in some cases, upon the voting and successful placing of municipal bonds. The Town Trustees of Redwood City, Cal., have called for bids for 2000 ft. of 4-in. Pipe, with hydrants, &c. It is proposed to hold a bond election in Madera, Cal., in April for the purpose of securing a water works system. Yuba City, Cal., is negotiating for a system of fire protection. Prices of Cast Iron Pipe are about as follows, per net ton, f.o.b. Pacific Coast terminal points: 4-in., $39; 6, 8, 10, and 12-in., $38.

Merchant Pipe.—Stocks in jobbers' hands are rather small, and comparatively few orders are being placed. Bids will be opened by the Board of County Commissioners of Humboldt County, Nev., April 7, for 6500 ft. of 4-in. Casing Pipe; 100 ft. of 6-in. Casing Pipe; two 6-in. Hub End Gate Valves, and nine anti-freezing National 4-in. double nozzle hydrants, to fit 2½ in. fire hose. Discounts on Steel Pipe are about as follows, on jobbers' carloads:

	Steel. Black. %	Steel. Galv. %
⅛ to ¼ in.	58.5	42.5
⅜ in.	60.5	46.5
½ in.	62.5	50.5
⅝ to 6 in.	66.5	56.5
7 to 12 in.	63.5	48.5
Extra strong, plain ends:		
⅛ to ⅜ in.	51.5	39.5
½ to 4 in.	58.5	46.5
4½ to 8 in.	54.5	42.5
Double extra strong, plain ends:		
½ to 8 in.	47.5	36.5

Pig Iron.—Dullness is still the predominating feature in the local market. Very little has been added to the ample stocks on hand by new shipments from Europe via Cape Horn, and no Chinese Pig Iron has arrived recently. The Heroult Electric Iron & Steel Company is still experimenting with its electric furnace at Heroult, Shasta County, Cal., in the hope of finally producing a satisfactory commercial Pig Iron. Plenty of heat can be secured by the use of electric power, but it may take some time to find the proper mixture of ores and treatment to make a grade of Iron that will meet requirements. No. 1 Scotch Pig Iron and No. 1 English Pig Iron are quoted in this market at about $28 to $29 per ton, ex yard.

Coke.—A slight improvement is noted in the demand for Coke, especially in the cheaper grades used for smelting in the mining districts and elsewhere. Receipts of Coke at this port by sea have been extremely light for a month. Prices are unchanged. Stocks are sufficient for present needs, but the starting up of several smelters will improve the demand.

Railroad Supplies.—Great stagnation still prevails in nearly every department of Railroad Supplies. Several new railroad projects are being promoted, but the money to purchase materials and equipment is not yet available. Dealers in supplies are living in hope of an improvement in railroad finances within a few months. A few Spikes and sundries are being purchased, but no large orders for Rails are being closed. The Arthur Koppel Company was the lowest bidder on a requisition for 1200 ft. of 20-lb. portable Railroad Track and several platform cars for the Mare Island Navy Yard at Vallejo, Cal.

The Board of Public Works of Oakland, Cal., has received bids for the pumping machinery to be used at Lake Merritt for an auxiliary salt water pumping station, as fol-

Company, $36,600; Joshua Hendy Iron Works, $39,475; Union Gas Engine Company, $45,000; Fairbanks, Morse & Co., $27,990; Atlas Gas Engine Company, $39,750; Doak Gas Engine Company, $28,971; United Iron Works, $35,000. The specifications provide that the gas engine driven pumps shall supply 2000 gal. of water per minute against a working head of 200 lb. per square inch.

Advices from Estancia, N. M., say that a representative of the Standard Oil Company has closed a deal for property contiguous to the Sante Fe tracks at Willard, on which the company will erect three very large Steel tanks for the storage of oil.

Holbrook, Merrill & Stetson, San Francisco, have been awarded a contract for 25,000 ft. of 1-in. Black Iron Screw Pipe at 4.8c. per foot, for use in connection with the new Owens River aqueduct, by the Los Angeles Board of Public Works.

Two English engineers, H. B. Alexander and J. B. Lyndon, have submitted ideas for a city incinerating system for garbage to the local Health Board. It is proposed to install four plants, which will also utilize ashes and clinkers and generate electric power.

The new experimental electrical furnace, at Heroult, Cal., has been in continuous operation for some days. Twenty-four hundred pounds of Pig Iron have been produced daily, and the furnace is tapped every six hours. This new furnace is an invention of Professor Lyon of Stanford University, who has superintended its construction and is directing its operation. The plant for the manufacture of carbon electrodes of very large size for use in the furnace is nearing completion, as is the plant for obtaining by-products of wood incident to the manufacture of charcoal and carbons.

The Coal Trade.

BY J. E. SAWARD, NEW YORK.

The mining companies in Illinois, Indiana, Ohio and western Pennsylvania would welcome a full month's suspension of output, so as to have a livelier tone to trade for the remainder of the year. Under the possibility of labor troubles Coal shipments have been showing a material increase, but nothing like what many expected. Manufacturers, railroads and general consumers have been accumulating Coal, but they have evidently been studying the statistical position and realize that there is much more Coal above ground than is needed for some weeks, and that if a strike should come it would not prove very embarrassing to anybody. The central Pennsylvania District has made, by the convention of operators' and of miners' representatives, a renewal of last year's wages basis for the term of one year. Judged from this, one may expect similar action in other districts. Prices in open market, therefore, will not be any less than those heretofore quoted.

New River and Pocahontas people have made their opening prices 10c. less than last year, and consequently figures quoted for cargo and contract business are on the basis of $2.65 at Norfolk and Newport News for shipments to September 1, and $2.75 for shipments after that date. This will certainly make hard sledding for Pennsylvania operators, more particularly where they compete for tidewater business. It is true that these operators have a distinctive and exclusive territory so far as New River and Pocahontas competition is concerned in Connecticut, western Massachusetts, New Hampshire and Vermont, which is more particularly all rail territory, but they certainly will lose some tidewater business in New England, which will be "competitive."

New York shippers are reportiug that the Coal situation shows a little more improvement. The operators are still holding down the production, and prices are about the same. Quite a number of contracts are being closed for the coming year, although not so many as were closed during the same period last year. The contract prices, as nearly as can be ascertained at the present time, will be on abount the same basis as last year, although some time ago it looked as though they would be a little lower. No doubt some of the cheaper grades of Coals will be closed this year at lower prices, but Coal bearing a reputation will command as good a price as last year.

The Anthracite business is practically at a standstill so far as new orders are concerned, on account of the reduced prices on April 1. Consumers are merely buying in sufficient quantities to keep them going. Contract prices seem to be about the same as last year, with the exception of Pea Coal, which will be advanced 25c. per ton. Anthracite at tidewater, per gross ton, is quoted as below:

	Lehigh.	Free-Burning.
Pea	$3.00 to $3.20	$3.00 to $3.25
Buckwheat	2.35 to 2.50	2.45 to 2.75
Rice or No. 2 Buck	1.70 to 1.75	1.75 to 2.00

Individual and Washery Pea, $2.85 to $3.00; Washery Buckwheat, $2.40 to $2.50; Washery Rice, $1.65 to $2.00; Barley, $1.45 to $1.50.

The April prices of the several domestic sizes of Anthracite are put on the usual schedule—a reduction of 50c. a ton, but the steam sizes seem to be well held, for the present at least.

A feature of the closing Coal year was the largely increased demand for Steam Coal. Pea Coal was sold at a premium in nearly every month, while other small sizes were scarce and more profitable. Within a short time Pea Coal will no doubt command a permanently higher price. It is quite as valuable as Chestnut Coal from all points of view as domestic fuel, and the public is fast discovering the fact.

Bituminous at tidewater, per gross ton, is quoted as follows:

Georges Creek	$3.25
High-grade, three-quarter lump	3.25
High-grade, Gas, run-of-mine	3.15
Best Miller, vein coals	2.95
Good Miller and Moshannon	2.65
Best Somerset	2.75
Cambria Somerset	2.60
Fairmont, three-quarter	2.95
Fairmont, run-of-mine	2.65
Webb and coals	2.25 to 2.45

Prices on Bituminous at the mines per net ton, prompt delivery, are:

Pennsylvania Railroad Coal.

Georges Creek	$1.60
Best Miller, vein	1.30
Good Miller and Moshannon	1.15
Best Gas Coal, three-quarter lump	1.25
Best Gas Coal, run-of-mine	1.15
Best Gas Coal, Slack	0.65
Ordinary Clearfield	1.00
Ordinary Latrobe	0.95

Baltimore & Ohio Railroad Coal.

Georges Creek	$1.60
Best Somerset	1.25
Somerset	1.05
West Virginia Freeport	0.90
Fairmont Dist., three-quarter lump	1.00
Fairmont Dist., run-of-mine	0.80
Fairmont Dist., Slack	0.65

Metal Market.

NEW YORK, April 1, 1908.

Pig Tin.—Business has been light, and the market uninteresting. Consumers are not in need of metal, and as they have little faith in present prices, are waiting. During the week there was only one day—March 26—when business was at all active. The following prices are for 5-ton lots and larger, spot delivery, New York:

	Cents
March 25	32.10
March 26	31.75
March 27	31.75
March 30	32.10
March 31	31.90
April 1	31.25

The statistics compiled by C. Mayer, secretary of the New York Metal Exchange, show that the imports during March were 3662 tons, and the deliveries into consumption, 3150 tons. This increases stocks in the United States 500 tons, making them 855 tons March 31. On the same day the visible supply in Europe and the United States was 15,385 tons, an increase of 600 tons, compared with the end of February, and 2200 tons larger than a year ago. The London market has declined about £5 during the week, closing to-day at £141 5s., for spot, and £139 10s., for futures. There are afloat, for American ports, 2261 tons.

Copper.—Prices are lower, and Electrolytic can be had for domestic consumption at 13c. This price is shaded for export orders, but there is little doing in that quarter. Producers of Lake are holding prices at 13.25c., and even higher, but the difference between this price and that for Electrolytic is too wide to permit of much business being placed at that figure. The week's business was largely confined to carload orders for nearby consumption. No difficulty is experienced in making shipments promptly, as all sellers have good stocks. Europe cannot be expected to continue to take the large share of surplus metal which it has been taking during the last four months of last year, and the early part of this year. Exports have fallen off considerably, those for March amounting to only 21,000 tons. Imports are slightly heavier, as shown by the February statistics just issued by the Government, the imports for that month having been 8600 tons. The London market is about £1 10s. lower than last week, closing at £58 17s. 6d., for spot, and £59 7s. 6d., for futures. Best Selected is held at £63. Numerous mining consolidations are under way, aimed to secure a better operating efficiency. Germany's consumption in 1907 was estimated at 160,000 tons, compared with 163,000 tons during 1906.

Lead.—Little inquiry is in evidence, but Desilverized Lead is scarce, and held at 4c., New York. Soft Missouri brands can be had at 3.95c. to 3.97½c. The St. Louis market is quoted at 3.80c. to 3.85c.

Spelter.—The gradual sagging in the price of Spelter from round 4.90c. two months ago is because many brass manufacturers and some of the galvanizing works had too much Spelter in their stock rooms costing above 6c. It is

said there is considerable in consumers' hands bought at least six months ago. While business is dull, with little evidence of any buying, there is more inquiry in the market. Prime Western brands are quoted at 4.75c., New York, and probably 4.70c. could be done; 4.55c. is quoted, St. Louis. The ore market has advanced slightly, and now there is little unsold ore in Joplin.

Aluminum.—The old quotations of 33c., for No. 1 ingots, and 31c., for No. 2 ingots, continue to be named by the principal producer. A large order for wire has recently been taken for electrical transmission lines on the Pacific Coast.

Antimony.—More Hallett's is here, and is now quoted at 8.75c. Cookson's is also lower, at 8.75c. to 9c., and outside brands can be had at 8.50c.. There is little business doing.

Nickel.—Quotations continue unchanged, at 45c., for ton lots, and 55c. to 60c., for smaller quantities.

Ferroalloys.—An advance in the price of 80 per cent. Ferromanganese abroad has caused some dealers in America to advance their quotations to $45, seaboard. There is, however, some irregularity in the market and on a desirable order this price could probably be shaded. So many resale lots of 50 per cent. Ferrosilicon are in the market that the irregularity is more marked than ever. Dealers quote $80, Pittsburgh, but this is more or less nominal.

Tin Plate.—The demand is good. Prices are unchanged, at $3.70, Pittsburgh, and $3.89, New York, for 100 lb. IC Coke Plates. Prices abroad have been again advanced 1½d., making the quotation for Tin Plates, in Swansea, 12s. 7½d.

Old Metals.—Trade is dull. In the absence of demand, dealers' selling prices are quoted, unchanged, as follows:

	Cents.
Copper, Heavy Cut and Crucible	12.50 to 13.00
Copper, Heavy and Wire	12.50 to 12.75
Copper, Light and Bottoms	11.50 to 11.75
Brass, Heavy	9.50 to 9.75
Brass, Light	7.50 to 7.75
Heavy Machine Composition	11.75 to 12.00
Clean Brass Turnings	8.25 to 8.50
Composition Turnings	9.00 to 10.00
Lead, Heavy	3.80
Lead, Tea	3.55
Zinc, Scrap	3.50

At the annual election of the New York Metal Exchange, held March 30, the following officers were elected: President, P. R. Jennings; vice-president, Morton B. Smith; treasurer, Robert L. Crooke; members of the Board of Managers, B. Hochschild, H. W. Hendricks, L. Vogelstein, G. E. Behr, Paul Koning, George W. Jaques, Emil Baerwald, A. B. Hall; Arbitration Committee, J. Langeloth, E. A. Caswell, Edwin Groves, E. J. Keane, Humphrey D. Bond. This was the regular ticket.

Iron and Industrial Stocks.

NEW YORK, April 1, 1908.

General retrogression characterized the stock market in the period which has elapsed since the publication of the last report. In almost every case considerably lower values were realized on Tuesday of this week as compared with Thursday of last week. This was partly due to the general awakening to the belief that the improvement in business had by no means been sufficiently great to warrant a continued upward movement in the values of stocks. In the absence of specific reasons for stimulating speculative operations, the stock market naturally subsided to a lower level. The range of prices on active iron and steel stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 33⅜ to 35¾, preferred 97¾ to 99¾; Car & Foundry common 30⅞ to 33¾, preferred 92 to 93½; Locomotive common 43¼ to 48, preferred 93 to 94½; Steel Foundries common, 5¼ to 5½, preferred 30½ to 31½; Cambria Steel 29¼ to 30½; Colorado Fuel 22¼ to 24⅜; Crucible Steel common 5¼ to 5⅝, preferred 37¼ to 38; Pressed Steel common 23½ to 25, preferred 75¼ to 80; Railway Spring common 34¾ to 36¼; Republic common 17⅞ to 20, preferred 71½ to 75; Sloss-Sheffield common 46½ to 50⅛, preferred 93; Cast Iron Pipe common 25½ to 27½, preferred 68½ to 71; Can common 4⅞ to 5, preferred 49¼ to 50¾. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 34, preferred 98¼, bonds 94⅛; Car & Foundry common 31½, preferred 94½; Locomotive common 43¾, preferred 93; Colorado Fuel 24¾; Pressed Steel common 23, preferred 75¼; Railway Spring common 34; Republic common 18½, preferred 70½; Sloss-Sheffield common 47¾; Cast Iron Pipe common 25½, preferred 68½; Can common 4⅞, preferred 50.

Notices have been sent to stockholders of the Westinghouse Electric & Mfg. Company, calling attention to a special meeting to be held in East Pittsburgh on April 29 for the purpose of voting for or against the increase of the indebtedness of the company by the issuing of bonds secured by mortgage or otherwise, also for or against the increase of the capital stock of the company, and also for or against the issuing of part or all of such new capital stock as may be authorized, or of stock now authorized but not issued, as preferred stock of the company, with such preferred or deferred provisions and features as the stockholders may authorize and the Board of Directors shall thereafter prescribe. The plan for the rehabilitation of the company has been extended for the second time, to June 1. It is probable that the proposed plan will be modified.

The American Car & Foundry Company, under date of April 1, reports its net earnings for the quarter ending January 31, 1908, at $1,772,201.47; dividends for the quarter, $825,000; surplus, January 1, 1908, $23,271,250.99; surplus to date, not including February and March earnings, $24,218,452.46.

Dividends.—The American Locomotive Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable April 21, and 1¼ per cent. on the common stock, payable May 27.

The American Brake Shoe & Foundry Company has declared a quarterly dividend of 1¾ per cent. on the preferred and 1 per cent. on the common stock.

The Great Lakes Towing Company, Cleveland, Ohio, has declared a quarterly dividend of 1¾ per cent., on the preferred stock, payable April 1.

The National Fire Proofing Company, Pittsburgh, has declared a quarterly dividend of 1 per cent.

The Pittsburgh Lamp, Brass & Glass Company, Pittsburgh, has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable April 1.

New York.

NEW YORK, April 1, 1908.

Pig Iron.—There has been a more active market, and some sales have been made for delivery into September. Practically all of the business, however, is being done by Alabama and Virginia furnaces and by a few Pennsylvania stacks. A feature has been the appearance in the Eastern markets, as sellers, of some Ohio furnaces. The result has been that prices are irregular and that Alabama Irons have been offered at $16.25, and Virginia Irons at $17, for No. 2, tidewater. We quote, at tidewater, as follows: No. 1 Northern Foundry, $18 to $18.50, No. 2 Foundry, $17.25 to $18.25, and No. 2 Plain, $17 to $17.50. Alabama Irons are $17.25 to $17.50 for No. 1 Foundry, and $16.25 to $16.50 for No. 2 Foundry.

Steel Rails.—No further announcements of Rail contracts have been made in the past week, though reference is made to business pending, which is expected to be closed in the near future. Export orders are of small tonnage. Some South American business recently figured on has gone to British and German mills.

Structural Material.—The holding back of work figured on in recent weeks indicates, in some cases, that bids will be asked again, in the hope of getting lower figures. If all that has been canvassed since the opening of the year should materialize it would mean that architects and fabricators would be temporarily hard pressed if advantage is to be taken of the early weeks of the building season. In March the American Bridge Company booked about 15,000 tons, and outside companies evidently took considerably more. Bridge business has fallen to the lowest point in many months. It is estimated that scarcely more than 5000 tons of railroad bridge work was booked last month. The construction of buildings in various parts of the country is on a scale perhaps greater than might be looked for in the generally shrunken proportions of the steel trade. Prices continue sharply competitive, and the fabricating companies have been pressing for reductions in Structural Shapes which the Steel manufacturers have steadily declined to make. From $6 to $8 a ton has come off bids for Steel construction, much of it due to lower labor costs through the better efficiency of workmen. In the past week the American Bridge Company has taken the Steel for the Barron Building, at San Francisco, and a commercial building at Spokane requiring 500 tons. The Bureau of American Republics Building, at Washington, about 700 tons, has brought some very low bids. The State Regents Building, at Albany, will require 7000 tons of Steel. We quote as follows on mill shipments, tidewater deliveries: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—Transactions are confined to small lots for immediate requirements. Bar Iron is selling at 1.40c. to 1.50c., Pittsburgh, equivalent to 1.56c. to 1.66c., tidewater. Steel Bars are maintained at 1.60c., Pittsburgh, or 1.76c., tidewater.

Plates.—The demand in this locality is still limited to small lots. Prices are unchanged, as follows, on standard sizes of Plates, at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—Jersey City opened bids on Monday for 1000 tons of Water Pipe on which R. D. Wood & Co., Philadelphia, were the lowest bidders at $23.35, delivered. This is regarded as quite a good price, all things considered, as it is rather better than some of the figures realized in Eastern territory a few weeks since. The city of New York opens bids on about 1000 tons to-day. Considerably larger business is expected from this city soon, as it is possible that 2800 tons may be let next week, and other purchases are to follow. The improvement association now operating at Long Beach, Long Island, is expected to be in the market in about two weeks for 3000 tons. Manufacturers report only a light demand for small lots. Some of the Eastern foundries are now absolutely refusing to meet the low prices which have for some time been current. Carload lots of 6-in. are quoted at $23.50 to $24 per net ton at tidewater.

Old Material. Some demand is noted for Relaying Rails in moderate quantities, but the supply is large, and prices are therefore held at former quotations. Limited sales of Steel Scrap have been made, and foundry stock has had a moderate movement. Rolling mills are doing practically nothing in the market, and dealers who took contracts some time ago are finding difficulty in making deliveries of satisfactory quality to consumers. Buyers appear to be more critical than they have ever been. We quote as follows, per gross ton, New York City:

Old Girder and T Rails for melting	$9.50 to $10.50
Heavy Melting Steel Scrap	9.50 to 10.50
Old Steel Rails, rerolling lengths	10.50 to 11.50
Relaying Rails	19.00 to 20.00
Old Iron Rails	14.00 to 15.00
Standard Hammered Iron Car Axles	16.00 to 17.00
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	11.50 to 12.50
Iron Track Scrap	9.50 to 10.50
No. 1 Yard Wrought, long	10.50 to 11.50
No. 1 Yard Wrought, short	9.50 to 10.50
Light Iron	5.00 to 6.00
Cast Borings	4.50 to 5.50
Wrought Turnings	6.00 to 7.00
Wrought Pipe	9.00 to 10.00
Old Car Wheels	15.00 to 16.00
No. 1 Heavy Cast, broken up	13.50 to 14.50
Stove Plate	11.50 to 12.50
Grate Bars	9.50 to 10.50
Locomotive Grate Bars	10.00 to 11.00
Malleable Cast	11.50 to 12.50

Seattle Business Conditions.

SEATTLE, WASH., March 23, 1908.—The iron and steel trade has shown a slight improvement in the last two or three weeks—somewhat of a recovery from the depression of the early winter. Seattle representatives of the United States Steel Corporation and its subsidiary companies say that all back orders have about been cleared up, and they are starting out with a clean slate. A few orders are received, but all large rail orders for use in the Northwest are placed in the East.

The Northwest in the next two years will use more rails than for many years, with the Chicago, Milwaukee & St. Paul and the Harriman systems extending to Puget Sound, the expected invasion of American territory by the Canadian Pacific and the construction of the Grand Trunk across upper Canada, with the possible building of the Chicago & Northwestern to the Coast. Railroad building on this large scale is attracting great attention to the Northwestern States and British Columbia, and in addition Seattle is building up perhaps with more rapidity than any other Coast city, with the stimulus of the Alaska-Yukon-Pacific Exposition to open next year. First actual laying of rails on the Milwaukee began in eastern Washington this week, and it is announced by the officials of the road that trains will be in operation over the new line by May 1 of next year, a month before the time of the opening of the exposition.

Within the last few days the Harriman franchises covering the entrance of the Union Pacific into Seattle have been passed, and soon work will begin on the terminals in this city. Operations were dragging along, following the financial depression, but the recent decision of the Interstate Commerce Commission holding that a railroad could not go beyond its own territory for business, absorbing rates to its terminus, virtually cut the Union Pacific and Southern Pacific out of the Puget Sound passenger traffic. They had been absorbing the local rate to Portland, and thus obtained a share of the transcontinental business from this part of the country. So it was that orders were sent out to the engineers to complete their plans and maps at the earliest possible moment in order that construction work might start, for Mr. Harriman wants a share of the traffic to Puget Sound during the exposition.

Terminal plans for the Harriman lines include a magnificent station within a block of that occupied by the Hill roads, the Northern Pacific and the Great Northern, the building to cost about $500,000. Work was started some time ago on a tunnel under the city of Seattle, almost paralleling the Hill tunnel, to the yards in the northern part of the city. On the waterway known as Salmon Bay Mr. Harriman plans great docks and wharves for his ocean business.

The sale of logging locomotives and other logging paraphernalia, together with rails, has been seriously affected by the depressed condition of the lumber trade, due largely to the advance in lumber rates announced some time ago by the transcontinental railroads, and to the weakening of general business conditions throughout the East and Middle West. Following the announcement of the Hill roads that lumber rates eastward would be advanced about 25 per cent., mills throughout western Washington, Oregon and British Columbia were compelled to suspend, throwing out of employment more than half of the 100,000 men directly employed by the lumber industry, which represents about 60 per cent. of the business of the Northwest. Mills shipping by water were about the only ones not affected.

For the last two or three years the lumbermen were so severely troubled by the car shortage problem that they lost much of their Eastern trade to the Southern and Norway pine manufacturers, and since the rate fight began the Westerners have had a harder struggle than ever to hold their territory. They carried the question into the Federal courts and obtained an injunction against the operation of the advanced rate, but they were required to furnish bonds aggregating $310,000 to indemnify the railroads in case the Interstate Commerce Commission should hold that the advance in rates is justified. The decision in this case, which is of so much importance to all the Northwest industries, is expected early in May. The lumbermen feel confident of winning, but are almost helpless pending the decision. It is said by railroad men that the railroads probably will reduce the rates to the old basis, even though they win. As it is now, something like $15,000,000 worth of logs and the poorest grades of timber is wasted annually because of the high transportation charges in reaching a market.

The tin plate demand for the salmon pack this year will probably be about normal. A pretty good pack of the lower grades of fish is expected, but canners and packers are not hopeful that there will be a good run of the higher grades. Next year should be a good year, according to the four year cycle theory, for 1904 saw a good yield, but nothing to compare with that of four years and eight years before.

British Columbia commercial organizations are much disturbed because much of the railroad material destined for the work in the Northern part of the province and the Yukon District is coming through Seattle instead of going through Vancouver, which is its natural channel. There is nothing in the Canadian shipping regulations to prevent the shipping of goods in bond through an American port, and the result is that Seattle is profiting to a very noticeable degree.

The Holyoke Steam Boiler Works, Walsh & Heywood, proprietors, Holyoke, Mass., has received an order from the Anglo-Newfoundland Development Company for part of the equipment in connection with that company's water power plans. Two steel penstocks will be furnished, each 15 ft. in diameter and 2600 ft. long. About 2000 tons of plates will be required for this work.

It is stated that the Pittsburgh Coal Company has recently closed a contract to supply the Crucible Steel Company of America, Pittsburgh, with 300,000 tons of coal, running over a period of years.

The Machinery Trade.

NEW YORK, April 1, 1908.

There was no noticeable improvement the past week in the demand for machinery, which was rather light, the transactions covering, with few exceptions, but a few tools each. Inquiries were not numerous, and none were reported that indicate any large undertaking aside from those that have already been mentioned in these columns and for the carrying out of which the greater portion of the mechanical equipment has been purchased. Some houses report a slightly better demand for their products, but the increase is due almost wholly to foreign business and is counterbalanced by the dullness of domestic trade with the majority of houses in this territory who are agents and who have no foreign outlet for their machines. March has been a disappointment to the trade generally, the volume of business booked being no greater than that of February, which is a shorter month and has two holidays. Though March is usually one of the best months of the year in the machine tool trade, the business of the past month with some houses was less than that of the previous month.

It is noticed in the trade that there are a large number of inquiries which are not followed with immediate business, and in some cases the same inquiries have come up several times. These inquiries cover a general line of equipment, and the fact that they are placed without being followed by orders is not taken as an indication that those asking bids are merely curious, but it is thought in the trade that there are a good many people who are in need of machinery, but for one reason or another have decided to delay their purchases. Many machinery dealers who have received such inquiries have followed them up with the request to know what has been done in the matter of the orders, and invariably the reply is that the company making the request for a bid has not fully decided on making the purchases yet. Consequently, it is thought that as soon as conditions improve to any extent the machinery trade will benefit largely. It is known that some heretofore large buyers are actually in need of equipment, and are only waiting for a slight improvement to warrant their making additional expenditures.

With a number of the more important machinery manufacturers in this territory the falling off in domestic orders has been supplemented to a large extent by the receipt of a good foreign business. Among the foreign nations which have lately been good customers is Japan, which has within the past few weeks placed large orders in this city for machinery. Among those who have secured a portion of the Japanese business is the Chicago Pneumatic Tool Company, which in addition to the several orders mentioned a short time ago has within the past few days received orders for five large air compressors.

At this time last year manufacturers' capacities were not only fully taken, but many of the more important were months behind with deliveries and were exerting every energy to enlarge their output to supply the demand for machine tools. Do what they could they found it impossible to cope with the business received. Many of them greatly enlarged their plants, but it was some time before they could secure the necessary equipment, for others like themselves were months behind with deliveries and if they installed their own make of machines their customers had to wait just so much longer. There is no doubt that many builders of machine tools would have made a great deal more money last year had they had larger plants. During the last business depression a leading machinery manufacturer made extensive additions to one of its plants. The head of the business stated at that time that when the next boom in business came he intended to be in a position to get a much larger share, and he did. The capacity of the enlarged plant was as greatly taxed as was that of the smaller one. The business of the country is increasing yearly, necessitating enlarged shop capacities, and the time to build additions and prepare for a greater business is when trade is quiet. With no rush of business to occupy all one's time one can plan better, can give more time to the selection of the tools to be installed and can get any desired deliveries. Then, too, a saving can often be made in the purchase of building material and equipment.

Secretary of War William H. Taft has accepted an invitation to address the joint open meeting of the American Supply and Machinery Manufacturers' Association, National Supply and Machinery Dealers' Association and the Southern Supply and Machinery Dealers' Association to be held at Richmond, Va., May 13, 14 and 15.

Machinery Requirements of Coatesville Foundry & Machine Company.

One of the most important inquiries before the trade is that for about $10,000 worth of machine tools for the new plant of the Coatesville Foundry & Machine Company, Coatesville, Pa. The inquiries are being sent out by Edwin T. Moore, secretary and treasurer of the Coatesville Boiler Works, who in addition to the machine tools is getting prices on 5 and 10 ton cranes and is also looking into the subject of molding machines. It has not yet been decided whether to purchase a 5 or 10 ton crane. This machine tool equipment is required for a part of the foundry building, which it is to equip as a machine shop, and it is the intention to erect later on a building the same size as the foundry, which will be thoroughly equipped as a machine shop, for which a great deal of additional machine tool equipment will then be purchased. The Coatesville Foundry & Machine Company was organized in the latter part of 1907 and has a paid in capital of $50,000. A large tract of land outside of the city limits was purchased, upon which it will erect a new plant, contract for the structural work for the buildings having been awarded to the McClintic-Marshall Construction Company, Pottstown, Pa. The main building of the plant, which is to be equipped for the manufacture of boiler fronts, grate bars, castings, &c., will be 114 x 208 ft., in addition to which there will be a pattern shop, 40 x 60 ft.; pattern storage building, &c., all of structural steel. The machine shop, for which a large amount of equipment will be purchased later on, will also be 114 x 208 ft. For the foundry, pattern shop and other smaller buildings considerable equipment has been purchased, including a 12-ton cupola from the Whiting Foundry Equipment Company, Harvey, Ill. The officers of the Coatesville Foundry & Machine Company are Penrose N. Davis, president; Howard M. Garrett, vice-president, and Frederick E. Moore, secretary and treasurer. These officers are all connected with the Coatesville Boiler Works, and the Executive Committee of the foundry company consists of the officers of the boiler works, which are Charles Edgerton, president; Nelson H. Genung, vice-president, and Edwin T. Moore, secretary and treasurer. The entire capital stock of the foundry and machine company is held by employees of the boiler works, a very broad and liberal arrangement having been made whereby the most insignificant employee may invest his savings in the company.

The Standard Oil Company, which has large construction work under way at both Bayway, N. J., and Oil City, Pa., will purchase a great deal of additional equipment for the new buildings in course of construction. It will be remembered that in the early part of the past month the company placed large orders for pumping engines, including 20 engines aggregating in value about $300,000. These were three-cycle triple expansion double acting pumping engines, with steam cylinders 20½ in. and 30 in. and 54 x 36 in. in diameter, with a piston cylinder 5 x 36 in. We understand from a reliable source that the company intends to purchase within a short time 10 additional pumping engines of about the same size as those recently purchased, the engines to cost $15,000 each. The work which the company has under way is of such magnitude that it is likely that the company will be in the market for various equipment for some time.

It is expected that during the summer the Securities Corporation, Ltd., 40 Wall street, New York, which controls among other subsidiary companies the Juanuato Development Company, will spend in the neighborhood of $4,000,000 for machinery equipment to develop mining properties in Mexico. The latter company controls a number of large mining plants in the immediate vicinity of Juanuato, Mexico, and during the last few years has spent a large amount of money for mining equipment in this vicinity. The company is now building an extensive railroad system in that territory, and its plans for the summer include the construction of a 1000 stamp mill at La Luz, in the State of Juanuato. This project, it is understood, will cost about $2,000,000, American, and a similar amount will be expended for mining and power equipment to develop the company's properties. The buying will not be begun for at least four months, but the orders, it is understood, will be placed in this country, although, as heretofore, foreign bidders will be asked to compete.

The American Car & Foundry Company, St. Louis, Mo., which intends to make important improvements to its plant at Binghamton, Tenn., has not yet completed plans for the work, which, it is understood, will include the construction of a new car wheel foundry. The company is not yet in a position to state just what new machinery it will purchase for equipping the new additions.

The Delaware, Lackawanna & Western Railroad has sent out a good-sized list covering foundry equipment for its Scranton shops on which purchases, it is understood, will be made shortly. As has been stated before, the company decided against completing all of the work laid out for this year, but it was thought necessary to put the foundry in shape. The building will be equipped with some of the apparatus which was in use in the old shops at Scranton, but the new machinery needed will amount to a large sum.

Some new machinery will probably be purchased by the Alabama & Mississippi Railroad Company, Vinegar Bend, Ala., for completing the equipment of its new shops. The company's repair shops, which were recently destroyed by fire, are being replaced by three new buildings, the largest of which is almost completed. The buildings under construction include a main structure, 50 x 100 ft.; a building 20 x 100

ft. and another 20 x 50 ft. The company will use the machinery that was in the old shops and which was not badly damaged, but has not yet decided on the new machinery it will purchase.

Builders of equipment used in the construction of subways, tunnels and water works are closely following the actions taken by the city authorities looking toward the construction of the proposed subways in Manhattan and Brooklyn and the new watershed up the State. It is thought that as soon as warm weather sets in the city will take up these matters and will let contracts for at least some of the work. The first work to be taken up will be the construction of the Fourth avenue subway in Brooklyn, contracts for the construction of which are scheduled to be advertised next Monday. The work is divided into six sections, and separate contracts for each section will be let. The estimated cost of the subway is about $15,000,000. The contracts will be let for construction only, and arrangements for equipping and operating the road will be made later. This subway is to be run from the Brooklyn end of the Manhattan Bridge under the Flatbush avenue extension to Fulton street, under Fulton street to Ashland place, under Ashland place to Fourth avenue and under Fourth avenue to Forty-third street.

The State Department of Public Works, Albany, N. Y., has awarded contract No. 26 for Barge Canal work to the Lake Erie Dredging Company, Buffalo, N. Y., for $59,795. The engineers' estimate on this work was $60,225.

Bids will be received at the office of the President of the Borough of Brooklyn on Wednesday, April 15, for six steel frame derricks, with vertical gasoline hoisting engines, which are intended for the use of the Department of Sewers.

The Board of Water Commissioners of White Plains, N. Y., will receive bids until April 17 for a 2,000,000-gal. triple expansion direct acting condensing pumping engine for the Orchard street plant.

At a meeting of the Board of Directors of the Smith-Courtney Company, Richmond, Va., held several days ago, Alvin M. Smith was elected president of the company to succeed the late George A. Smith. The new president of the company has been general manager for several years, and although comparatively a young man, he is ably fitted for the position, as he is recognized as an efficient machinery and supply man. Mr. Smith is also secretary-treasurer of the Southern Supply & Machinery Dealers' Association.

Catalogues Wanted.—The Catasauqua Castings Company, Catasauqua, Pa., whose office building was completely destroyed by fire several days ago, desires catalogues from manufacturers.

Chicago Machinery Market.

CHICAGO, ILL., March 31, 1908.

The machinery market in general continues quiet, and whatever gain there may be in business as a whole is not reflected in a noticeable increase of activity among manufacturers. Conditions which limit the operation of shops and factories to a small part of their output capacities are obviously not calculated to create a demand for new equipment. Replacement of worn out tools and machinery is and will, of course, be necessary to a greater or less degree so long as the wheels of industry continue to turn, and orders to supply such needs constitute a considerable portion of the business now coming out. Power plant development, especially in the far West, is responsible for some fair sized inquiries, embracing requirements in electrical machinery and boilers and engines. Some of these concern prospective enterprises not yet fully developed, while others are more advanced, a fair proportion of the latter having reached the stage of placing contracts for equipment. While the events of the past week have disclosed no change of noteworthy importance in the machine tool market and inquiries are apparently not more numerous than for some weeks past, it is the general consensus of opinion among dealers that more of them now represent actual needs, fewer, it is thought, being put out as market feelers. One sale of a carload of assorted tools for the equipment of a far Western shop is among the transactions reported for the week. Scattered orders from the smaller manufacturing interests widely distributed throughout the West continue to be the mainstay of the market.

The Board of Education, Chicago, will receive bids until April 17 on 24 woodworking lathes, 24 in. between centers, 10-in. swing, belt driven, for the Lake High School; also one motor head speed lathe, 36 in. centers, 12-in. swing, for the Franklin School.

Under a franchise granted to F. X. Waldron & Co., Seattle, Wash., the Vashon Electric Company is preparing to begin construction of an electric railway system and light plant on Vashon Island. The line will consist of 12½ miles of main line and an equal mileage in branches. The plant equipment will comprise two 300-kw. 550-volt d. c. generators, belted to two 400-hp. engines, and one direct connected alternating generator of 2300 volts, the latter being required to supply current for the lighting system. It is estimated that the project will involve the expenditure of $350,000, of which $75,000 will be spent upon the power plant. E. T. Heberton is chief engineer in charge of the work.

Sealed proposals will be received by the State Board of Control, Topeka, Kan., until April 29, for the remodeling of the boiler house at the School for the Feeble Minded Youth, Winfield, Kan.; also for a 75-kw. direct current generator for the same institution. Plans, details and specifications governing the submission of bids, character of equipment and execution of work can be secured from F. W. Knapp, secretary, Topeka.

Obethier & Meadows, Hereford, Texas, have secured from the City Council a franchise for an electric plant, construction of which will be begun in about 60 days. The equipment will consist of a 75-kw. 60-cycle Warren generator and a 12 x 36 in. Murray Corliss engine. The boilers for this plant have not yet been purchased.

The Santa Maria Electric & Gas Company, Santa Maria, Cal., which about eight months ago took over the Valley Electric Company, is carrying out extensive improvements upon its line, which include the rebuilding of transmission lines and power house and the installation of new boilers, generators and engines. The company is also making arrangements to furnish current for the operation of an electric road now under construction by the Pacific Coast Railway Company between Santa Maria, Guadalupe and Betteravia, and is also planning to extend its line to Guadalupe and Betteravia for light and power service.

Canon City, Colo., having disposed of bonds issued for the new water supply system, to cost about $225,000, will now proceed with the building of this project. Specifications for construction are now being prepared by Engineer Peter O'Brien, Canon City, and bids will be asked for within 60 days. L. D. Dawson is city clerk.

The San Angelo Traction Company, San Angelo, Texas, has under construction a building for new electric power plant, 38 x 52 ft., which will furnish power for the street railway. It is understood that no bids have yet been received for machinery equipment. J. H. Ransom is president and general manager.

The Ros Engine Works, Alma, Mich., has been organized to manufacture marine and automobile gasoline engines of the two-cycle two-part type, in both double and single cylinders. The officers of the company are Charles R. Murphy, president and manager; B. A. Forquer, secretary and treasurer, and R. O. Smith, superintendent.

Cleveland Machinery Market.

CLEVELAND, OHIO, March 31, 1908.

The volume of sales of machine tools during March shows no improvement on the previous month. While the majority of the dealers report that their business will aggregate about the same as February, one or two say that their sales will show a slight falling off. The demand for machinery and machine tools the past week was light, the volume and character of the sales being about the same as during the previous few weeks. Some fairly good inquiries that have been pending have not yet developed into orders and the sales have been limited to small tools. Practically all the buying is being done by small concerns, the sales in about every case being single tools. There is very little inquiry for large tools. Dealers are still carrying a large number of tools on the floors of their storerooms and it will be some time before they will need to place stock orders.

The demand for second-hand tools is about equal to that for new tools. While dealers have few second-hand tools on hand, having sold them out about as fast as they have taken them in, the scarcity that has existed in used tools will probably soon disappear, for second-hand tools are now being offered to dealers in quite liberal quantities. Dealers claim that these tools are being held at too high prices, and are slow in buying second-hand tools unless they think they are getting some good bargains.

Machine tool builders report only a very slight improvement in orders, although some of them are getting a better volume of inquiries. There is no noticeable improvement in the demand for heavy machinery. There is a little better demand for light power plant equipment, and builders of generators and motors report some improvement in orders for small sizes. Some local machine tool builders during the present period of dullness are turning their attention to the development of new tools which they have had under consideration for some time, but with which they made no headway when their plants were taxed to their utmost to fill orders. Local makers of twist drills report that the volume of their business continues to improve slowly. Some of the local automobile plants are running at about full capacity and builders of automobile parts have much more work on hand than they did a few weeks ago.

The local jobbing foundry situation shows very little improvement and the majority of the foundries are running on

about half time. Foundries engaged principally in making stove castings are now fairly well filled with work.

The Peerless Automatic Machine Company, that was incorporated several months ago, with a capital stock of $100,000, to make a new multiple spindle automatic machine, the invention of Leon F. Schulze of this city, has started to equip a plant at 1144 West Third street. The company has bought some of its machinery and is now in the market for a 16-in. lathe, one or two drills, a planer and a universal milling machine. The company has effected its organization by the election of A. T. Schraner, president; R. P. Cattrall, vice-president; A. W. May, secretary and treasurer, and Leon F. Schulze, superintendent.

The Comstock Brass Company, Cleveland, which was incorporated a few days ago with a capitalization of $10,000 is erecting an excellent plant at 2539 East Seventy-ninth street, which will be ready for operation about April 20. The plant will be 40 x 115 ft. The company for the present will engage in general jobbing business in brass castings. An order for the foundry equipment has been placed with the J. D. Smith Foundry Supply Company. The company will have a machine shop in connection with its plant and will be in the market in about 30 days for a number of special tools. It is now in the market for a 10 or 15 hp. motor. The officers are C. W. Comstock, president and treasurer; J. H. Shafner, secretary, and M. J. Arth, superintendent.

The new plant of the Standard Welding Company on West Seventy-sixth street is practically completed and the company is now doing some work at its new location. The work of moving the equipment from the old plant on Central avenue will not be completed for a few weeks, but the company expects to have its new plant in full operation by May 1. The company reports a very satisfactory amount of work on hand at the present time, there being a large increase in its orders during the past few weeks.

The Lincoln Electric Company, formerly located on East Third street, has moved into a new plant which it has just completed at Kelley avenue and East Thirty-eighth street. The building is 55 x 120 ft. and three stories high. The company builds direct and alternating current motors and generators. The new plant provides a large increase in the capacity over the old plant and the company will build a greater range of sizes, manufacturing larger sizes than it did in the old plant.

The Elyria Iron & Steel Company, Elyria, Ohio, reports considerable improvement in the business outlook. The Hart Steel Company, the selling organization for the company, has taken a number of orders for tie plates, and now has some good sized inquiries for tie plates from Western railroads.

The stockholders of the Cyclone Drill Company, Orville, Ohio, have voted to increase the capital stock from $100,000 to $200,000.

With a capital stock of $10,000, the National Cornice & Ceiling Company, Cleveland, has been incorporated by Philip Ettinger, Alexander Laks, Harry Ettinger, C. C. Hyland and R. D. Morgan.

The city of Cleveland will receive sealed proposals at the office of the secretary of the Board of Public Service on April 14 for installation of additional equipment at the municipal electric light plant, consisting of one 1000-kw. unit, including engine, generator and appurtenances.

The Municipal Traction Company, Cleveland, has notified the St. Louis Car Company that it will soon be in the market for 100 additional electric street cars.

The plant of the American Multigraph Company is now being operated with its full force of men on full time. During the recent depression the company's plant was shut down only one week.

The Shull Steel Castings Company, Canton, Ohio, which started its new plant February 1, reports that orders are coming in quite freely. The company is now employing 60 men, but expects to increase its force in a short time.

Cincinnati Machinery Market.

CINCINNATI, OHIO, March 31, 1908.

Save for a few scattering domestic orders and the receipt of some interesting inquiries, the week has been productive of little business to tool manufacturers in this section. The prevailing dullness and inactivity among the automobile manufacturers of France and Italy have greatly affected inquiries and business from that part of Europe, and save for an occasional order for a single tool or two from Germany and England there is little doing in those ordinarily busy sections. The sales during the week of a few shapers, planers and grinders in lots of five or six have encouraged builders of those types to believe that the retarded buying movement is opening up and that delayed projects will now go forward in a normal way.

One order of the week was from the Japanese Government and called for five 30-in. planers for use in the arsenals, two planers from Germany. Another encouraging order of the week was received by one of the largest companies making a specialty of milling machines and grinders and called for five of the first and two of the second named. A shaper manufacturer received a wire order Saturday for two 16-in. back gear pattern from a large Southern city, and for immediate shipment. The significance of this order to the tool trade generally is in the fact that it was a "held up" order; the one, in fact, mentioned in the Cincinnati machinery letter of last week, in which the inquirer wanted an extra discount and refused to buy at that time because this discount was not forthcoming. The manufacturer concerned in this order had orders for seven shapers in all for the week, and all of them domestic.

The lathe manufacturers have not been so fortunate, and beyond an occasional order for a single tool nothing of any consequence has developed to suggest improvement in that line.

Another large manufacturer of tools, who recently made the trip to the Pacific Coast to study Western conditions and look up agency prospects, &c., is home, and his reports of conditions accord with that of the first of the local tool men to take in the Far West since the slump. This gentleman also found that the machinery trade was not so dull in the coast country as the East and Central sections, which he accounted for by the fact that the interests there are so largely of an agricultural nature or developments of the mining and lumber interests that the machinery interests were scattered and fewer, and competition is consequently reduced to the minimum.

The jobbing foundries have not recovered much in the past month. About the best that is being done is a three-day-a-week run, and the greater number find that they can handle about all the business that is offered in two days per week. Foundrymen, however, are hopeful of some business soon, because of the bare conditions of castings stocks. With any kind of increase in orders at the tool plants will come orders for castings, because practically all makers have been running along on surplus stocks since the first of the year.

Stockholders of the Graham Phillips Horseshoe & Iron Company will meet at the office of the company in the First National Bank Building, Tuesday, April 21, to arrange for dissolving the corporation and surrendering its charter. The business of this company was taken over about a year ago by the Cincinnati Horseshoe & Iron Company, and with the exception of Frank C. Graham, who is out, the officers are practically the same as under the old name. C. E. Hooven is president; H. Lee Early, vice-president, and William Eynon, general manager. The company owns a fine plant at Cleves, Ohio, within the Cincinnati switching district, and is running full time and with about 100 employees.

Emil F. Glaser, an architectural designer, for several years with the L. Schreiber & Sons Company, has gone into business for himself, and has opened offices in the old Western German Bank Building at Twelfth and Vine streets.

The business of Ferdinand Dieckmann, at Cincinnati, for many years conducted under that name, has been incorporated as the Ferdinand Dieckmann Company, with Otto Dieckmann, vice-president and manager, in charge. The Dieckmann factory is located at Brighton, Cincinnati suburb, and the line is sheet metal conductor elbows and shoes. All the stock is retained in the hands of those interested in the business under its former management, and the policy will not be changed.

A meeting of the Iron Buyers' Association will be held at the Phillips House, Dayton, Ohio, on Thursday, April 2, at 11 o'clock. The notice of the meeting sent out calls attention to the proposed uniform contract for the purchase of pig iron by members, and notes that reports from committees will be heard. As these committee reports will include the answers of furnaces and agents to the proposed form of contract as submitted some time ago, and in the form of an ultimatum, the meeting should prove a very important one.

President J. A. Andrews and other officials of the new steel plant on the Licking River, in Newport, Ky., are deploring the unauthorized publication in the daily papers of their intention to make a trial run this week, to which many invitations had been sent out. The officials are working hard to get the plant in shape for beginning operations in about 10 days.

New England Machinery Market.

WORCESTER, MASS., March 31, 1908.

Taken as a whole, there appears to be a slight increase in the number of orders booked for new machinery. Though the shops are no busier they are manufacturing more on orders and less on stock. Foreign business seems slightly more active. The machine tool builders who have brought out new tools that embody radical improvements are reaping immediate results, for the demand for these machines is all out of proportion to that for types better known to the trade.

which users of machinery are making in taking advantage of the lull in business to rehabilitate their works.

While the tale of the unusual number of inquiries has been repeated in many forms, it is by no means a hackneyed topic in the trade. The nature of many of the inquiries amounts almost to an order; in ordinary times the deal would be considered as good as closed. But at the present time there is many an instance of slip 'tween cup and lip. The customer procrastinates. This is the experience all over the country, to judge from reports brought to New England by visitors and those who travel to their trade. Dealers and manufacturers like this side of the outlook, for they see in it a quick and satisfactory volume of business when the balance turns toward general confidence and its inevitable strong influence for the better.

The new works of the Universal Machine Screw Company, Hartford, Conn., will be built this season. Three acres of land in the northern section of the city have been acquired. The property is on the line of the New York, New Haven & Hartford Railroad, and is otherwise advantageously situated for manufacturing purposes. The plans have not been finally decided upon, but the buildings will contain between 25,000 and 40,000 sq. ft. of manufacturing space. A considerable amount of machine tools will be required later, but the company states it is not in the market at the present time. The matter of power has not been determined. An engine, boilers and electric equipment will be purchased, but no decision as to type has been reached. The company has just increased its capital stock from $100,000 to $250,000 to provide funds for the enlargement of its business. Its present building is no longer adequate for the purposes of manufacturing, so rapidly has the demand increased for the new multispindle type screw machines.

The storehouse of the Chandler & Farquhar Company, Boston, was wet down in a fire which damaged the upper portion of the building, March 30, but the fire itself did no injury to the large stock of machine tools on the floor. The press dispatches were in error in naming Hill, Clarke & Co., Inc., as among the losers, as they were not occupants of the building, but of that next door.

The Pratt & Whitney Company, Hartford, Conn., has received so many orders for its new surface grinder that it has been compelled to enlarge that department of its shops, increasing the working force beyond any previous payroll and operating on full time.

There appears to be an excellent chance that the Packard Motor Car Company, Detroit, will acquire the plant of the Electric Vehicle Company, Hartford, and remove its manufacturing business to that city. It is understood that the matter rests with the bondholders of the Electric Vehicle Company, which is in the hands of a receiver. A large minority of the holders of these securities already favor the transfer of the property. No great hope remains that a reorganization of the company is practicable, and it is stated that the chief reason why objection to the sale exists is a wish to resume manufacturing. The Packard Company is well organized and is financially substantial, and its addition to New England's industries would be warmly welcomed. The dealers would have a new and important customer in their territory.

The difference between the New York, New Haven & Hartford Railroad and its shop men is being watched with much interest. The company has announced the establishment of the piecework system in its repair shops, and the men and their unions resent the change. They threaten to strike if the order goes into effect. So extraordinary an action at this time would be hailed with pleasureable sensations by the thousands of mechanics who are out of work. The places of strikers would be filled with little delay, without a doubt.

The machinery industry is weathering the absence of good business in a manner to indicate a most substantial basis. Consequently an exception comes rather as a surprise. The Bridgeport Safety Emery Wheel Company, Bridgeport, Conn., went into receivers' hands on Monday, the reason given being inability to collect accounts receivable.

The Corbin Motor Vehicle Company, New Britain, Conn., has increased its capital stock from $200,000 to $500,000. The purpose of the new capital is to enlarge the business, including the plant, but it is not determined whether anything in the way of increased manufacturing facilities will be attempted this season, everything depending upon business conditions. However, business with the company has improved materially of late, in common with that of other automobile builders.

The Whitcomb-Blaisdell Machine Tool Company, Worcester, Mass., manufacturer of planers and lathes, has received a number of orders for planers from customers in France and Sweden.

A prominent builder of metal planers has sent out a circular letter to his agents all over the country, and has received replies from most of them. They agree in details of their experience that business is not good so far as actual sales are concerned, though they are selling some tools. But, on the other hand, inquiries are very numerous. One dealer wrote that inquiries were as plentiful as during the most prosperous period of the recent good business. When he sought to close business, however, he was unsuccessful in most cases. The replies from other agents were along these same lines. One Western railroad is contemplating placing large orders for machine tools, but the culmination of the plan has not been reached. The railroads, as a whole, have not yet begun to buy.

The Challenge Brass Company is the new company that will operate the plant formerly conducted by the Nettleton & Kelsey Company, 501 Quinnipiac avenue, New Haven, Conn., allusion to the sale of which was made in this column last week. The new owners are E. F. Millett and W. H. Burt, who were formerly foremen in the employ of the Waterbury Mfg. Company, Waterbury, Conn. The company will manufacture brass, bronze and aluminum castings and babbitt and type metals. It is proposed to enlarge and extend the business.

The Wm. H. Page Boiler Company, Norwich, Conn., whose plant was burned recently, has begun the removal of the Norwich business to the company's new works at Meadsville, Pa. It is stated that a new company will be organized at Norwich to manufacture house heating boilers, the interested parties being headed by a prominent employee of the Page Company.

The Stockbridge Machine Company, Worcester, Mass., manufacturer of shapers, is building a lot of four of a new type of shaper on order from a customer. It will later be added to the company's regular line. It is an 18-in. machine, all gear driven for constant speed drive from single pulley or direct connected motor. The Stockbridge Company reports an increasing number of orders. Up to a month ago the new business booked was largely from abroad and the Pacific Coast, but later orders are confined principally to the Eastern States. The company is running its shops 40 hr. a week with reduced force, but is manufacturing on orders entirely, having secured a sufficient number of tools for stock.

Walsh's Holyoke Steam Boiler Works, Holyoke, Mass., is reported to be in the market for machine tools.

Philadelphia Machinery Market.

PHILADELPHIA, PA., March 31, 1908.

The volume of new business which has come out in the local machinery market the past week has been comparatively small. Manufacturers and dealers report a slight let up in the demand, but as business in the past few months has been more or less irregular, the lack of orders now is not looked upon with any apprehension. The week to week business is hardly considered as indicating the condition of trade under existing circumstances; frequently an entire absence of orders is to be noted for several days at a time, the deficiency being made up by the number sometimes taken in a single day. On the whole the business averages up to about the same volume from month to month. In some directions gains are to be noted, but they are not large, as prospective buyers have, in most cases, not yet made up their minds to make purchases, even though the equipment may be badly needed. The large industrial plants are still out of the market, as they find little improvement in the demand for their various products, and until this develops little buying can be expected from those sources. The railroad situation is unchanged, and there has been no further development of business in that direction. Municipal improvements, however, will have some indirect effect on the trade, as should also the work of elevating the Philadelphia & Reading Railroad tracks in certain portions of the city, in connection with which a considerable amount of work is yet to be placed.

While manufacturers are not able to report any particular increase in orders received, there is a more hopeful feeling expressed as to the future. Machine tool builders are still operating their plants on a very largely restricted basis and in some cases production does not exceed over 40 per cent. of the normal capacity. In other instances, however, particularly in the manufacture of specialties or power equipment, some further improvement in the volume of business coming in is to be noted and some plants have for the time gone above the 50 per cent. mark, which, for a long time, seemed to be as well as could be done. Whether this gain can be maintained is yet to be determined, but a more hopeful feeling is expressed and it is believed that before the close of the second quarter of the year some more permanent improvement will be noticeable.

Inquiries have hardly been as numerous as they were the previous few weeks. They are still usually confined to single tool propositions, with an occasional small lot coming out; mostly, however, of the smaller classes of tools. Sales have been almost entirely of the smaller and medium sized tools—drill presses. Small lathes and grinders have had the best sale, while an occasional order has been taken for a milling machine, boring mill or a larger lathe.

The foreign demand, as far as machine tools are concerned, shows practically no change. There has been a bet-

ter demand for some of the power transmission specialties, and manufacturers of these lines report a considerable increase in orders.

The second-hand machinery market about holds its own. The demand is not large, but there has been a fair sprinkling of business coming out from week to week, and dealers report more inquiry. Both metal and woodworking machinery are reported in fairly active demand, with a moderate inquiry for second-hand pumps, engines and boilers of medium size.

There is little change in the situation as far as the foundry trade is concerned. The demand continues light, reflecting the general condition of the machinery and building trades. No particular gains have been made in the output of either steel or gray iron casting plants, and the business taken continues largely of a day to day character.

Announcement has been made of a contract awarded to John Dobbling, York, Pa., for an extension of the Hanover street railroad from Hanover to Littletown, Pa., by the way of McSherrytown, a distance of 7 miles. Another extension is projected from McSherrytown to Oxford, a distance of some 5 miles.

The Standard Engineering Company, Land Title Building, was the lowest bidder at $127,667 for furnishing a power plant and equipment for the Great Lakes Naval Station for the United States Government, bids for which were recently opened. This work includes a battery of boilers, direct connected engines and four 175-kw. electric generators. A heating plant is included as part of the equipment.

The Royersford Foundry & Machine Company, Royersford, Pa., has discontinued the manufacture of cast iron pulleys as a branch of its business, and will dispose of the entire equipment for their manufacture, including molding machines, turning machines and other equipment. This company reports a fair demand for its line of punch and shearing machinery, a recent order being for a No. 2 machine for the Ellis Keystone Agricultural Works, Pottstown, Pa. In its power transmission department business is not reported active, orders being largely of a hand to mouth character.

Sealed proposals will be opened April 2 at the office of the Board of Education, room 392, City Hall, by the superintendent, department of supplies, Board of Public Education, for mechanical and other equipment to be installed in the Southern and Central manual training high schools. The equipment required is largely composed of the smaller classes of machine tools, &c., including six drill presses, six grinders, a band saw, and a combination wood lathe.

The Standard Pressed Steel Company reports an increased demand for its line of pressed steel shaft hangers, particularly from abroad. Some little improvement has also been noted in the domestic demand, one order for 400 hangers having been taken from a concern in the Middle West and another for 100 hangers from parties in Iowa. An order for 60 extra large hangers has been received from Vienna, Austria, while good orders have been taken from other foreign countries and from Canada. While an improvement has been noted in sales recently, the demand is still reported somewhat irregular.

The E. H. Mumford Company, manufacturer of molding machines, reports some improvement in the demand, particularly from the Middle West, where sales have recently been made of split pattern and jolt ramming machines. Several installations of the Ph. Bonvillain & E. Ronceray types of machines and equipment have about been completed, and the demand for this class of equipment is reported good. The Mumford Company has now become pretty well established in its new quarters, 1223-1225 Spring street, to which it recently removed its office and showrooms.

Government Purchases.

WASHINGTON, D. C., March 31, 1908.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until April 7 for four electric motors, seven induction motors, one boiler, one engine lathe, one drill, and other supplies for the Eastern navy yards.

The Isthmian Canal Commission will receive bids until April 20, circular No. 434, for engine, power hammer, belt driven punch, power shears, blacksmith drills, forges, tinsmiths' punches and other supplies.

The following bids were opened March 24 for machinery for the navy yards:

Class 21.—Item 1, ammonia compression plant—Bidder 60, De La Vergne Machine Company, New York, $13,200; 73, Frick Company, Waynesboro, Pa., $9000; 214, Vilter Mfg. Company, Milwaukee, Wis., $9950; 227, Erie Foundry Company, Erie, Pa., $8825.

Class 71.—Fifty pneumatic scaling hammers and spare parts—Bidder 39, Cleveland Pneumatic Tool Company, Cleveland, Ohio, $1531.80; 51, Chicago Pneumatic Tool Company, New York, $935.60; 107, Helwig Mfg. Company, St. Paul, Minn., $1425; 110, Independent Pneumatic Tool Company, Chicago, Ill., $1007.35; 159, George Oldham & Son Company, Frankford, Pa., $1382; 197, Standard Railway Equipment Company, St. Louis, Mo., $1105.

Class 72.—Five pneumatic hammers and spare parts—Bidder 39, Cleveland Pneumatic Tool Company, Cleveland, Ohio, $165; 51, Chicago Pneumatic Tool Company, New York, $119.90; 107, Helwig Mfg. Company, St. Paul, Minn., $147.75; 110, Independent Pneumatic Tool Company, Chicago, Ill., $127.35; 159, George Oldham & Son Company, Frankford, Pa., $172.75; 197, Standard Railway Equipment Company, St. Louis, Mo., $170.

Class 73.—Three pneumatic hammers and spare parts—Bidder 39, Cleveland Pneumatic Tool Company, Cleveland, Ohio, $329.20; 51, Chicago Pneumatic Tool Company, New York, $65.90; 107, Helwig Mfg. Company, St. Paul, Minn., $97.80; 110, Independent Pneumatic Tool Company, Chicago, Ill., $79.25; 159, George Oldham & Son Company, Frankford, Pa., $92.45; 197, Standard Railway Equipment Company, St. Louis, Mo., $105.

Class 74.—Six nonreversible pneumatic drilling machines and spare parts—Bidder 39, Cleveland Pneumatic Tool Company, Cleveland, Ohio, $329.20; 51, Chicago Pneumatic Tool Company, New York, $230.25; 110, Independent Pneumatic Tool Company, Chicago, Ill., $277.26; 197, Standard Railway Equipment Company, St. Louis, Mo., $384.

Class 75.—One pipe yoke riveter and spare parts—Bidder 51, Chicago Pneumatic Tool Company, New York, $214.70; 231, Excelsior Equipment Company, Pittsburgh, Pa., $237 and $765.

Class 77.—One pneumatic tube cleaner and spare parts—Bidder 5, Thomas Andrews Mfg. Company, Rockaway, N. J., $235.20; 35, James S. Clark, New York, $711.50; 126, Liberty Mfg. Company, Pittsburgh, Pa., $499.75.

Class 81.—One motor driven punch—Bidder 44, Cleveland Punch & Shear Works, Cleveland, Ohio, $1200; 101, Hilles & Jones Company, Wilmington, Del., $895; 129, Long & Allstatter Company, Hamilton, Ohio, $980; 161, Prentiss Tool & Supply Comapny, New York, $957; 200, Scully Steel & Iron Company, Chicago, Ill., $1055; 206, Toledo Machine Tool Company, Toledo, Ohio, $1033; 221, Wickes Bros., Saginaw, Mich., $829.

Class 101.—One motor driven gate shear—Bidder 44, Cleveland Punch & Shear Works, Cleveland, Ohio, $1425; 57, Camden Iron Works, Camden, N. J., $4450; 101, Hilles & Jones Company, Wilmington, Del., $4985; 129, Long & Allstatter Company, Hamilton, Ohio, $5984; 237, Erie Foundry Company, Erie, Pa., $6817; 238, Morgan Engineering Company, Alliance, Ohio, $7150 and $7225.

Class 136.—Six hydraulic jacks—Bidder 20, Brooklyn Forge & Supply Company, Brooklyn, N. Y., $297.60; 23, Batcheller, Clark & Batcheller, New York, $282.45; 33, William Wirt, Clark & Son, Baltimore, Md., $305.28; 79, Fairbanks Company, New York, $283.20; 94, R. W. Geldart, New York, $293.94; 123, J. R. Kendall, Washington, D. C., $258; 134, Manhattan Supply Company, New York, $282; 144, Montgomery & Co., New York, $282; 145, Manning, Maxwell & Moore, New York, $296.28; 164, S. N. Price Machinery Company, Norfolk, Va., $300; 179, J. B. Roach, Brooklyn, N. Y., $253.20; 191, H. A. Rogers Company, New York, $291.20; Wacker Tool & Machine Company, New York, $279.60; 212, Vermilye & Power, New York, $275.75.

The following bids were opened at the office of the superintendent of United States Capitol Building and Grounds, Washington, March 21, for a 60-ton electric traveling crane:

Cleveland Crane & Car Company, Wickliffe, Ohio, $9245; M. K. Kellogg Company, Jersey City, N. J., $9390; Pawling & Harnischfeger, Milwaukee, Wis., $11,300; Whiting Foundry Equipment Company, Harvey, Ill., $9520; Modern Steel Structural Company, Waukesha, Wis., $8700; Morgan Engineering Company, New York, $9390; Alfred Box & Co., Philadelphia, Pa., $9000; Alliance Machine Company, Alliance, Ohio, $10,995; Manning, Maxwell & Moore, New York City, $8475; Case Mfg. Company, Columbus, Ohio, $10,500; Northern Engineering Works, Detroit, Mich., $9275—if cast steel trolley sides are used, add $235; Niles-Bement-Pond Company, New York, $8240—if awarded contract on a four-wheel crane will furnish same for $7990.

The following bids were opened for an engine and compressor for the Humboldt Bay fog signal, Cal.:

Western Gas Engine Company, Los Angeles, Cal., $1617.50, accepted; Northwestern Iron Works, Seattle, Wash., $2400; Harron, Rickard & McCone, San Francisco, Cal., $1820, $2754.54 and $2941.50; Union Gas Engine Company, East Oakland, Cal., $2368; Rix Compressed Air & Drill Company, San Francisco, Cal., $1605, incomplete.

The following awards have been made for machinery for the navy yards, bids for which were opened November 26:

Philadelphia Pneumatic Tool Company, New York, class 174, 75 pneumatic scaling hammers, $1382; 172, 30 pneumatic calking hammers, $651.90; 173, 95 pneumatic chipping and calking hammers, $1986.30; 174, three pneumatic hammers, $65.90; 175, 20 pneumatic hammers, $616.60; 176, 40 pneumatic hammers, $1233.20; 177, 25 pneumatic hammers, $469.10; 178, 25 nonreversible pneumatic drilling machines, $965.85; 179, 40 nonreversible pneumatic drilling machines, $1706; 186, 20 pneumatic breast drills, $522.70; 187, 10 pneumatic drilling machines, $792.90; 188, 12 pneumatic drilling machines, $1004.10; 191, 20 pneumatic holderson, $300; 192, two jamd riveters, $162.40; 193, three jamd riveters, $237.40; 194, 20 electric breast drills, $7815.20; 195, 20 electric drilling machines, $882.40; 196, 20 electric drilling machines, $1424.70; 197, five electric drilling machines, $408.30; 198, five electric drilling machines, $510.

Independent Pneumatic Tool Company, Chicago, Ill., class 182, 20 nonreversible drilling machines, $1576.90; 183, two pneumatic boring machines, $586.60; 184, 20 pneumatic boring machines, $1185; 185, 10 pneumatic boring machines, $595.50; 190, four fine rolling and tapping machines, $256.30.

Class 189, 12 pneumatic drilling machines, has been canceled.

Under bids opened March 3 for machinery for the navy yards, the Berlin Machine Works, Beloit, Wis., has been awarded class 91, one band saw mill equipment, $9397.20.

The following awards have been made for supplies for the Isthmian Canal Commission, circualr No. 426, bids for which were opened March 16:

Motley, Green & Co., New York, class 6, two duplex steam pumps, $1370.

Phœnix Iron Works, Meadville, Pa., class 7, two vertical

HARDWARE

THE subject of freights is for merchants and manufacturers a complicated one, and on this account usually receives less attention than its importance represented in dollars and cents demands. Recent legislation in some respects may seem to simplify it and to give the ordinary shipper of small or medium quantities a degree of protection against overcharges, while it tends in various ways to conserve his rights and promote his interests. There is, however, still sufficient complexity in the management of freights—securing the delivery of goods at the lowest cost and under the most favorable conditions—to commend a proper care of this important matter to many who are too much accustomed to accept charges and conditions as they find them and to neglect details of routing, classification, rates, the receipt of commodities in good condition, &c. Knowledge and care in this department would, however, yield results in more than one way directly advantageous. With the large concerns these details are of sufficient importance to justify the employment of competent persons whose business it is to look after freights and transportation of goods coming in and going out. With houses doing a manufacturing or a distributing business of much less volume the conditions are very different. Such firms or companies cannot afford to employ a traffic manager to attend exclusively to freight matters, and these are handled by members of the management as part of their ordinary routine. They are apt to lack familiarity with the subject and are consequently unable to grapple in a practical manner with the problems presented, and are thus frequently subjected to imposition and overcharges which with proper care and vigilance might have been prevented. In view of these conditions the articles we are publishing from time to time on this subject, especially as relating to the shipments of merchants and manufacturers of moderate standing, will be found, we believe, instructive and helpful, written as they are by persons in direct contact with transportation matters and thoroughly familiar with the subject theoretically and practically. To aid in the discussion of the subject we invite inquiries and suggestions from our readers, with a view to our furnishing information which will be of the greatest practical usefulness to them in connection with their attention to freight matters.

The cash discount coupon is the latest form of trading stamp scheme in which promoters are trying to interest the retail merchant. In connection, however, with its introduction in a New England city the Business Men's Association there took up the matter and through its president published in the local paper a formal warning against those who were fathering the plan. The notice, which is formally signed, advises investigation of the promoters' claims regarding subscribers secured and explains that the scheme has been disapproved by the association's committee. Organized opposition to the scheme is certainly to be commended, and this method of opposing it should be effective. The inception of most such practices is in the playing of one merchant against another, and this tends to result injuriously to the general interests of the town or city. Where there is a local merchants' association such a method of introducing a trading stamp or any other doubtful form of advertising or trade inducement should be impossible, for members can consult together and in their mutual understanding act intelligently in turning down the proposition. Attempts to revive the trading stamp scheme in any form should be frowned upon; it has no place among legitimate business methods.

Condition of Trade.

The influence of the caution and conservatism which characterize trade in practically all branches is felt in more than one direction. It tends on the one hand to prevent manufacturers from pursuing an aggressive policy in the production and marketing of their goods. They are accordingly keeping down the output of their factories by running only part time and with considerably diminished forces. In following this course they are at the same time keeping close to shore financially and avoiding an undue accumulation of product which might be troublesome to carry and would constitute something of a menace to the market. Their conservatism is, however, seen also in the degree of steadiness with which prices are maintained. With the situation, in which there are several elements of weakness, it is to the credit of manufacturers in most lines that prices have not become more seriously demoralized. The present period of reaction from the heavy pressure of business which has for so long been a feature of the market is noticeable for the selfrestraint exercised by manufacturers and the efforts made by them with a view to sustaining the market as a whole. The conservatism of buyers on the other hand naturally and indeed necessarily operates in the limiting of the volume of business, as orders are placed as a rule only for such quantities as the immediate exigencies of trade require. This reluctance to buy freely is encouraged by the general disposition on the part of the public to economize, and even in the agricultural sections where there is much less of the effect of distrust and financial disturbance than is experienced in the cities and industrial centers, the curtailment of business is noticeable and in some cases marked. An illustration of this is seen in the diminished business, according to general report, of the great catalogue houses. In these circumstances the business which is doing must be characterized in general as of moderate volume, but varying materially according to the location and kind of goods. In the heavy products and materials concerned in railroad and large work the demand is decidedly sluggish, and mechanics' tools, except in the agricultural sections, are moving slowly. Seasonable goods give little reason for complaint and constitute a good proportion of the current demand. While the finer goods in the line of Shelf and general Hardware are suffering less than Heavy Hardware and the cruder products, an important feature of the market which must be taken into account is the diminished consumption of iron, suggesting questions as to the future course of prices in this material. Thus far the great interests are working together with commendable conservatism, and the policy pursued by them has had an excellent effect on the market, the advantages of which continue to be experienced by the trade. There is reason to hope that the disposition to united action along conservative lines will prevent too

early and too radical reduction in values. Whatever may be anticipated in this direction, the proper policy for Hardware merchants, large and small, is to conduct their business conservatively and hopefully, making the best of the present opportunities, and seeing to it that their caution is accompanied by courage and energy, with persistent efforts to market goods wisely and successfully.

Chicago.

Whatever may be said of trade conditions generally and the probable effect of this or that influence upon the financial or industrial developments of the future, it is a fact that, notwithstanding the indisputable evidences of depression which mark the present situation, there is a strong disposition among Hardwaremen throughout the Middle West to regard the outcome with hopeful equanimity, tempered, of course, by sane moderation in a forecast of results. In the various assemblages of retail dealers gathered in the recent State conventions, and at that of the national convention held last week at St. Louis, the expressions heard concerning trade prospects were reassuring in that they reflect not oversanguine hope, but rather a firm confidence in the development of a fair volume of business during the coming season. The prevalence of springlike weather has perceptibly quickened consumptive demand, which in turn can reasonably be expected to result in more replenishment orders from the retail trade; for, according to accepted estimates, stocks are generally below normal, and when seasonable lines begin to move should require frequent renewals. In reviewing the progress of current events the natural tendency is to compare present results with those of last year, which, so far at least as volume goes, were admittedly abnormal. Measured, however, by the average of previous years the business of March will suffer little by contrast. Considering the pressure of competition between manufacturers growing out of eagerness to secure their respective shares of available orders, the general level of values has been more evenly maintained than might have been expected. There is inevitably more or less weakness noted in some lines, but in the heavy staples, such as Wire and Wire products, there are no important lapses from regular price schedules. However, the strongest supporters of the policy of sustaining prices made no concealment of the fact that ultimate readjustment may become necessary, but before contrary winds compel a shifting of the market course all sails will have been trimmed and set to make the tack without the careening strain of an unexpected squall.

Cleveland.

The W. Bingham Company.—"As the days begin to lengthen, trade begins to strengthen," and we believe from reports we are getting from different sections of the country that the "advance agent of prosperity" is on the road again. Take, for instance, the splendid showing of the United States Steel Corporation just published—that is, the immense business done by it last year and the encouraging reports given of orders placed in January and February of this year—namely, 25 per cent. more in January than December, and February 25 per cent. more than January. This report goes a long way to express a hopeful view of the future. The large order recently given by the New York Central Railroad for over a hundred locomotives, and for many tons of steel rails, is a good omen of the starting of new railroad business.

Now that the United States Supreme Court have declared that some of the drastic laws that were passed by some State legislatures are unconstitutional, it may have the effect on capitalists to turn more money into the channels of railroad and transportation companies, enabling them to renew and increase their facilities, which, we all know, is greatly needed. In the last four months the purchases of the railroad companies have been very small. They have been working up all the odds and ends that were thrown in the junk pile or scrap heap, but there is not much left, and they are getting now to the point where they have got to make purchases and not only refit old engines, cars, tracks, &c., but build new equipment, and just as soon as this starts in, which bids fair to be soon, it will go a long way toward reviving trade and traffic in the supply line, for confidence is being restored.

The business sentiment seems to be more cheerful all around. Of course, we understand the actual progress in commercial channels is always slow, but there is a little improvement each week, and the opening up of spring will stimulate the trade very much.

To show how well our securities are thought of abroad it is reported that during the recent panic Holland investors purchased from $15,000,000 to $20,000,000 United States Steel common stock; German investors also purchased large blocks of this stock. The transfer books of the Steel Corporation, it is said, show that 150,000 to 200,000 shares of their stock were entered on their books with foreign addresses. This goes to prove the confidence that our brothers on the other side of the Atlantic have in our industrial corporations.

If the continued economies and savings of our people keep on we are going to accumulate a great surplus. For instance, say each person saves 5 cents a day, then 80,000,000 people would save $4,000,000 daily, and in a year it would amount to $1,400,000,000 to $1,500,000,000. It is said our prosperity from 1900 to 1906 led us into a career of gambling and extravagance, and now we are on the other tack, and the depression through which we have passed will have a very beneficial effect, we believe, and many people will lay aside many dollars for future use that will come in very handy in future deals.

The general trend in the Hardware business in this section is very fair. Orders for spring goods are coming in quite freely and such orders are well assorted, showing that the stocks are light in the hands of the retailer and they are not afraid to purchase in a liberal manner for their immediate wants. They are a little timid, however, about tackling futures, but they will get over this very soon, with the opening of spring weather and bright skies, and with cheerful and hopeful conditions we will all feel better and take hold of business affairs with renewed energy. You cannot keep good men down long and the business communities are asserting themselves all over the country, and we are having and looking for better trade conditions from now on.

Nashville.

Gray & Dudley Hardware Company.—Since our last report conditions have not materially changed. The volume of business with the Hardware jobbing houses seems to be about 20 per cent. less in the spring months this year than it has been in former years. Jobbers and retailers do not seem anxious to do business without a profit; consequently, prices are pretty well maintained. The foundries, of which there are quite a number in the city, are curtailing their output by running four days in the week instead of six, as they haven't found sufficient demand for their product to justify them in running full time. We have had some beautiful weather in the past 10 days, and the preliminary work for producing the crop for 1908 is well under way. Collections are about as usual at this season of the year.

St. Louis.

Norvell-Shapleigh Hardware Company.—This week our correspondence has been neglected. Have not even had time to think up an article for *The Iron Age*. All the Hardware jobbers of this city have been busy entertaining the delegates to the National Retail Hardware Association, which has been holding its annual convention in St. Louis this week.

All of us have enjoyed this convention very much. The same rivalry that has always existed in this city between the several Hardware jobbers in selling goods, has come to the front in a friendly way, in entertaining the delegates. Each jobber has attempted to outdo the other, and as a result we are told our guests cannot complain of any lack of hospitality.

When the writer was in Boston seeking the convention for the city of St. Louis, he made some pretty strong promises. The delegates tell me that they find these promises have been fulfilled. If this is true, we have every reason to feel satisfied.

Notwithstanding the competition in the way of en-

tertainment, as far as we know there has not been an unpleasant or disagreeable incident.

The writer will say frankly he enjoyed the Boston convention more than the St. Louis meeting, but probably this year there were more responsibilities on his shoulders.

We congratulate our sister city, Milwaukee, on obtaining the convention for next year, and we are sure the delegates will meet with a warm welcome in that city.

We will now proceed to clean up the accumulation of work on our desks, and if any of our correspondents are impatient at the delays in replying to their letters we trust they will accept our apologies.

Louisville.

Belknap Hardware & Mfg. Company.—The market continues to improve slowly. The value of each order is being somewhat increased, and it really looks as though we were having a wave of genuine spring trade. Whether this is destined to last or whether we shall have another period of quiet in May and June is the question. A good many astute buyers think it likely that we shall experience the latter. Manufacturers generally admit the partial employment only of their plants, and we all have to talk very bravely in order to keep prices on the present level. The railroads have taken heart since the last decision, but we never know what morning we are to wake up and find a new lot of suggestions from national headquarters as to what should be done in the shops and warehouses and in all the callings of life.

The employment of Government agents or detectives to look into the matter of the Louisville & Nashville Railroad Company, seems to be generally conceded. What the result of their reports was has never been published, but for the time being the proposed reduction of wages has been withheld. When there is not enough work for all it means that some have to go altogether, or that all have to stand their share of the reduction. Nearly all institutions, particularly railroads, may thus be obliged to operate at a loss until a readjustment in all departments takes place. Just how to make a profit is certainly the province of those who have been elected to the leading positions in the manaegment, and it is pretty rough to be told by an outsider how, even if he speak *ex cathedra*. The demand for Athletic Goods is marked. We cannot remember when more interest has been taken in baseball, and tennis and golf promise to claim their share.

Philadelphia.

Supplee Hardware Company.—Figures are funny fellows. Figures of speech; figures as used in printed interviews, and, we fancy, in a good many unauthorized statistics given in the last three or four months, are going to make a lot of us see the wisdom in the corrected version of the old Saw, "Figures can't lie." But "Liars can figure."

During the last few months any optimistic plain citizen, who ventured to express the opinion that times were not so awfully bad, and that they were getting better, was apt to be confronted with an array of figures, showing the decreasing clearing house statements; the great number of idle freight cars and locomotives, and the constantly decreasing business of the railroads, as shown in their monthly statements, all of which were very convincing, especially if he had no means of knowing anything about the other side; if, for instance, he did not know that a goodly number of freight cars were apt to be idle in the winter, and remember that sometimes corporations are tempted to make the figures in their reports serve the double purpose of checking a labor demonstration, and proving that there had been too much politics in connection with business.

We feel that even the most determined opponents of the Administration's policy toward corporations will be agreeably surprised at the end of the year when the true balance sheet is struck, and we welcome the approach of warm weather, which will give us all less opportunity to read the newspapers, and more to get our hands soiled with work out of doors.

If Mother Nature has heard anything of the hard times she has given no intimation thus far of having been in the least disturbed by it, as from all accounts crops are coming forward, if anything, earlier than a year ago. The demand for seasonable Hardware has been quite noticeable, for its increase within the last fortnight; collections are better and money fairly abundant.

Baltimore.

Carlin & Fulton.—The warm weather of the last few days has given an impetus to business in the lines of Agricultural Tools, and indicates that the farming community is getting ready for business. Very soon the "Man with the Hoe" will be greatly in evidence. A little more warm weather will also stimulate the demand for hot weather supplies, and the Refrigerator, the Ice Cream Freezer, the Hammock and the Lawn Swing will be greatly needed, and not classed as luxuries either.

In the plan of creation the uselessness of the ordinary house fly and of the mosquito has been quoted, but when we think of the great amount of business in Wire Cloth and in Screen Doors and Windows resulting from their activity we think they should really be put on the salaried list of the Hardware trade, as they are important adjuncts in the distribution of these goods.

The demand for Building Hardware, while improving, has not yet reached the proportions of last year. Lumber and some other materials may be somewhat lower, but labor still continues high, and while many are out of work yet there seems to be little disposition to announce any voluntary reduction in the rate of wages for skilled mechanics.

Business in the mining sections is undoubtedly quiet, while it is equally dull in the lumber districts, but with these exceptions outside of the manufacturing centers, the activity of trade is undoubtedly increasing, depending upon the absolute necessities of a population whose daily consumption of goods is enormous, and who have undoubtedly more wealth per capita than any other nation on the face of the earth.

New Orleans.

Woodward, Wight & Co.—There is a little better demand coming in now with the beginning of spring, but it is still fitful, still on the hand to mouth order, and no large stock orders are being placed by any one. At the same time, there is a substantially better feeling among everybody here. While we do not see any actual betterment, perhaps, except in the way the bank reserves are getting on, yet at the same time we are all feeling cheerful. We have the outlook for good crops, and have got ourselves to a certain degree adjusted to the new conditions.

We all look for the next 60 days to tell the story of the crisis. If the improvement reported by our Northern friends, who have been down here to escape the cold weather, continues, and if we begin to see actual improvement here, we expect to see the orders coming out in more solid blocks of stuff and not quite so much variety and so little weight to a wagonload.

The lumber industry is particularly dependent upon the next 60 days, but cotton, rice and sugar are also interested. The last three industries feel that if the next 60 days are as good as the last two or three weeks, we have every prospect for good crops and good business.

A great deal of improvement is going on in the city here in the way of municipal work—drainage, sewerage and paving—and this has tended to keep enough labor employed and still enable us all to get a fair day's work for a day's labor.

Collections are coming in quite a little better than they were before, and we are all of us getting paid in full now, instead of being paid on account.

St. Paul.

Farwell, Ozmun, Kirk & Co.—Trade during last half of March has improved considerably, and has now reached fair proportions. The increase in this period has been in about the usual relative ratio with that of preceding years, and if this condition holds during the balance of the spring, as it very probably will do, the situation will

be favorable at the closing of the first half of the year. At that time the determining factor will be the condition of the grain and grass crops. About the usual amount of small grain will be seeded this season, and the same may be expected of corn and other crops.

The weather throughout March has been open and mild, as the entire winter has been; so much so indeed as to have rendered it unnecessary for those to go to milder climates during the winter who wish to avoid the rigor of our normal years.

The trade is watching closely the movements of manufacturers in the maintenance of prices, and hopes to see the production lessened in cases in which this is necessary rather than have prices cut.

The efforts of all the manufacturers who are working on this line are fully appreciated.

Collections are about up to expectations.

Portland, Oregon.

FAILING, HAINES & MCCALMAN. Prospects for business in this section of the country continue to improve. All lines of business are looking up, especially lumber. Lumbering was dead for a time, but more and more mills are beginning to operate, and some of those in export business are working double shifts.

As near as anybody can tell at this very early date crops will be good this year, and if people would only devote their attention to business instead of worrying about politics, we can see no reason why this should not be a profitable year on the Pacific Coast.

The recent slump came at a time when really its effects were beneficial to the jobbers on this coast, as they were beginning to stretch out a good deal more than their capital justified, and to extend in some cases longer credits than were businesslike. These bad habits were just beginning, and the recent flurry brought them to a realization of this bad policy before they had gone far enough to really injure themselves. To-day on the coast, and especially in Portland, business is on a better footing, we believe, than it was one year ago; that is to say, while all of us are not doing as much business as at that time, the business we are doing is safer, saner and, in the long run, more profitable. This we think will apply not only to the Hardware business, but to all lines.

The fact that Portland was not affected other than superficially by the recent panic is to a certain extent indicated by a comparison of real estate values, which have at the very least maintained the level reached just before the flurry. In some cases transfers have been made at 10 and 15 per cent. advance over the prices asked at that time. Building permits continue to be issued in large numbers for dwelling and apartment houses, and bank clearances compared with those of the same time last year are considerably higher than those of any other city on the coast. However, the rest of the coast is, we believe, sharing to a great extent in the better business conditions, and we look forward to a good year on the whole coast.

NOTES ON PRICES.

Wire Nails.—Orders covering specifications and new business are being received by the mills in fair volume. There is urgency expressed in many instances for prompt shipments, showing stocks in merchants' hands are light. Orders are restricted to conservative quantities, which indicates that they are designed to cover near-by requirements, and that buyers see no reason for anticipating supplies for extended periods. There is no indication of an immediate change in prices, and demand is less than the capacity of the mills, which are to some extent curtailing production. Regular prices are reported as being maintained. Quotations are as follows, f. o. b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

New York.—The number of kegs of Wire Nails sold in small lots at store during the month of March was larger than for the preceding month. The increased sales did not, however, represent a very large volume of business. Nail houses are represented as maintaining regular prices, but it is reported that jobbing houses sometimes shade prices when Hardware is also sold. Regular quotations are on the basis of $2.40 for small lots at store.

Chicago.—The hesitation shown in the movement of other mill products is not apparent in Nails and Wire. Specifications and new business are being furnished in fairly good volume, and there is an increasing amount of urgency in the demands of buyers for prompt shipment. Present indications point to continued improvement under the influence of more rapid consumption, which can reasonably be expected as spring advances. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—A fair amount of business in Wire Nails is being placed with the mills, but the trade is placing orders very conservatively and only for actual needs, purchases being smaller in volume than at this time last year. There does not seem to be need of buyers anticipating requirements, as the mills are able to fill orders promptly, and there is no prospect that prices of Wire Nails will be any higher in the near future. As a rule prompt shipments are asked on orders being placed, this indicating that stocks held by jobbers are light. We are advised that regular prices are being absolutely maintained. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

Cut Nails.—The movement of Cut Nails continues slow and in small quantities, for present requirements. Mills continue to cut down production to actual needs, but there appears to be no improvement in prices or demand. Concessions are being made on regular Steel Nail quotations, which are as follows: $2.05 base, per keg for carload lots at mill. Iron Nails generally should command about 10 cents more than Steel.

New York.—A comparatively light demand for Cut Nails characterizes the local market. Regular quotations are said to be adhered to by Nail houses, but it is reported that Hardware jobbers sometimes shade prices when other goods are sold. Quotations are on the basis of $2.30 per keg for small lots, at store.

Chicago.—In spite of the restriction of output by the mills demand lags behind supply. There is very little doing in the local market and jobbers' stocks continue adequate for all requirements. There is a hopeful prospect for a moderate degree of improvement when building operations become more active, and with a continuance of favorable weather there ought soon to be a decided betterment in the demand for Shingle Nails at least. Regular quotations are still being shaded 10 cents a keg or more. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; Steel, to jobbers, in carloads, $2.28; to retailers, $2.33.

Pittsburgh.—There is no improvement, either in demand or prices, and the Cut Nail trade is very far from being in a satisfactory condition to the mills. Output is only about 30 per cent. to 35 per cent. of what it was at this time last year, while the trade is placing orders only for small lots and actual needs, not being disposed to anticipate requirements. It is claimed that Cut Nail mills that have to buy Steel Plate in the open market are not able to make any money on Cut Nails at present prices. The mills are endeavoring to hold prices and are cutting down output to meet actual requirements, but the jobbing trade is cutting more or less. We quote Steel Cut Nails at $1.90 to $1.95, f.o.b. Pittsburgh, for carload lots, and about $2 for small lots, to which freight to point of delivery is added. Iron Cut Nails are about $2.05, at maker's mill.

Barb Wire.—An improved demand is apparent, as weather conditions permit active work in Fence building. This is becoming more general in other sections than in the South, where consumption of Barb Wire has been in

evidence for some time. Buyers, however, are conservative in their purchases, not being inclined to accumulate large stocks. Prices are being maintained at regular quotations, according to information from the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—Fence building is now in general progress in nearly all sections of the country, and dealers' stocks are beginning to move freely. Encouraged by a liberal consumptive demand orders are coming out without hesitation, and a growing volume of tonnage is being booked by the mills. The outlook for a satisfactory business through the spring months is most promising. Prices are reported to be firm and unchanged. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The volume of business from the West and Northwest is reported to be increasing, while from the South it has been fairly active for some time. Consumers are not placing as large orders as at this time last year, being disposed to limit purchases to actual needs and not carry large stocks. The mills are able to make prompt deliveries, and there is no probability of higher prices for some time at least. We are advised that the market is firm, and that regular prices are being held. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—Early orders from manufacturers of Wire Fencing were not as large as at the same period last year, and increased consumption is anticipated from this source, while it is probable that orders will keep well within actual requirements. Mills are in a position to make prompt deliveries. Prices are reported as being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Chicago.—Fence salesmen continue to report a growing demand, which in some parts of the country is not far behind that of last year. Having been very conservative in their purchases for anticipated requirements, it is not unlikely that Fence manufacturers will find it necessary to make material additions to their purchases. General firmness characterizes the market and prices are unchanged. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—A fair amount of new tonnage is being placed with the mills, but Fence manufacturers and other consumers are not disposed to anticipate requirements and are buying only such tonnage as their actual needs require. The mills are able to make prompt deliveries, and with no probability of any higher prices in the near future, there is no incentive for the trade to carry large stocks. We are advised that the market is firm, regular prices being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Table Cutlery.—Leading manufacturers of Table Cutlery have adopted a new schedule applying to Scale Tang goods by which their prices are established on a fairly uniform basis. The schedule is said to represent no important changes in ruling quotations, either in the way of advances or declines.

Padlocks.—As has doubtless been inferred by readers of *The Iron Age*, manufacturers of Padlocks have for several months been working in harmony, and prices have remained remarkably steady in the face of general market conditions. Competition has been decidedly sharp in the past and prices on some classes of Padlocks, principally in the cheaper grades, have been kept down to an unprofitable level. In an effort to correct this situation, the manufacturers have been at work for some time classifying their goods according to uniform standards and endeavoring to establish a basis by which the lines of different makers could be intelligently compared. This task was a difficult one, involving much time and labor as well as moderation, since mutual concessions were of course necessary, but it has finally been accomplished to the satisfaction of all. Although no attempt has been made to establish a uniform basis of quotations in the way of lists and discounts, a complete readjustment of prices has been effected, withdrawals of old quotations having been sent out on Monday of this week. The new prices of the different manufacturers are now being mailed. They represent little change in Padlocks of the higher grade, but there are numerous changes in cheaper goods, for the reasons already suggested. While advances are the more numerous, there are some declines, the ultimate result being to bring corresponding lines of the various makers into practically the same level.

Coil Chain.—Irregularity in prices, to which attention has frequently been called in these columns, continues to characterize the market for Coil Chain. No tendency toward improvement has yet been observed, and quotations currently reported establish a level on ⅜-in. Chain somewhat below $3.50 f.o.b. Pittsburgh. Although prices are so low buyers are showing little disposition to place orders beyond immediate requirements.

Chisels and Drawing Knives.—While some lines of Tools are fairly steady, at least on the surface, there has been considerable irregularity in Chisels and Drawing Knives for many weeks, and at the present time a discount of 80, 10 and 10 per cent. is easily obtainable.

Galvanized Ware.—It is announced this morning that leading manufacturers of Galvanized Ware have reduced their established prices 10 per cent. on regular Pails and Tubs and 5 per cent. on a few less important lines. The market for these goods has recently shown some irregularity, and the open cut does not come as a surprise to well informed members of the trade.

Linseed Oil.—Market conditions remain practically unchanged and demand is, for the most part, confined to small lots. Manufacturing consumers have purchased a few cars to cover immediate requirements. Stocks are generally light in the hands of manufacturers and buyers, which accounts for the firmness possessed by the market. Local quotations are as follows: In five-barrel lots, State and Western Raw, 40 to 42 cents; City Raw, 43 to 44 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—The Savannah market continues firm at comparatively high prices, which are the result of other influences than demand. The new crop of Turpentine has begun to arrive at Southern points and there is consequently little confidence expressed that Savannah prices will continue at the present level. It is said an option has been taken on the independent tank supplies in the South. The New York market is represented by the following quotations: Oil Barrels, 56 to 56½ cents; Machine Made Barrels, 56½ to 57 cents. Locally demand is light.

Rope.—Manufacturers who are putting forth exertions to get business notice some improvement in demand. This has a tendency to be spasmodic rather than regular, varying considerably from day to day. The wisdom of buyers in not laying in large stocks of Rope early in the year is apparent, when the weak and low market for Hemp is taken into consideration. Fair current Manila Hemp is only ¼ cent higher than Sisal Hemp. The supply of both classes of Hemp is largely in excess of demand, owing to general trade conditions. The following quotations for base sizes fairly represent the market: Pure Manila, 10¼ to 11 cents; B quality grades down to 8 to 9 cents; Pure Sisal, 7½ to 8 cents; lower grades Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¾ cents.

Window Glass. Demand for Window Glass in the Central West shows a slight improvement, although carload buying is not general. In the Eastern section of the country demand continues light. In New York and vicinity business is light, and prices are more or less irregular. The minimum prices recommended by the Eastern Window Glass Jobbers' Association are as follows: Single strength, 90 and 25 per cent.; double strength, 90 and 30 per cent. discount from jobbers' list. These prices are, however, not closely adhered to. It is reported that the Colburn sheet drawing machine is now in successful operation. This is a machine for the manufacture of Window Glass by a continuous sheet drawing process. It is explained that the use of the machine practically eliminates skilled workmen, doing away with the necessity of blowers, snappers, or flatteners, cutters being the only skilled labor required.

THE COMMONWEALTH OF AUSTRALIA AND THE DOMINION OF NEW ZEALAND.

Third Article.

BY JOHN I. SARDY.

IMPORTERS of American Hardware complain about the long time vessels from the United States take to discharge cargo. This does not apply to the first Australian port of call, but as these steamers stop at every port, of which usually the last one is Brisbane, it takes about two months after the vessel has arrived at the first port before the importer at the last port gets his goods. This not only hampers American trade, but also compels the importer to pay for the goods before he gets them, which, naturally enough, he does not like, and serves to send business to England and Germany which otherwise we would have.

One Port Steamer Calls.

What they would like to see is an American line of steamers going to alternate ports on one sailing and the other ports on the next, instead of stopping all along the coast. At the same time our trade with Australasia is not declining; the reverse is the case. A paragraph in one of the New Zealand papers is to the effect that "A steady increase in the importation of American goods is becoming a feature of local shipping. The local companies who act as agents for tramp lines agree that the expansion is unmistakable, though they are unable to give the cause."

American Files.

A few years ago importations of American Files were only about 20 to 25 per cent. of the total. From this the trade has grown until now it reaches about 60 per cent. In former times the English File makers put up their goods in paper parcels, labeled with pen and ink. The American manner of packing in neat pasteboard boxes with clearly printed labels in different colors for different cuts, forced the English makers to do the same, and now they tell their customers that their Files are packed according to the American method; but American Files hold the sway and are preferred to any other make.

Other American Goods in Large Demand.

Gun Metal Steam Fittings have also shown a large American increase in the last 10 years. Of course, American Tools and Machines, Locks, Hinges, &c., have to a considerable extent held the Australian market for years and a good trade also exists in American Household and Builders' Hardware, to say nothing of Axe, Pick and Shovel Handles and Agricultural Implements.

Although American Auger Bits are sold in Australasia the English made Mathieson Bit is the favorite for hardwood, on account of its coarse point and single twist. It has a large sale, the ½-in. size retailing for 1 shilling (24 cents) each.

As for Cutlery, the cheap sort is nearly all of German manufacture. The really good Cutlery is English, so it is said.

German Hardware Coming In.

Of late a lot of German Hardware has been coming into Australia, on account of steamship companies cutting rates, which were brought down as low as two shillings and 6 pence to 5 shillings per ton, instead of the usual rate of 25 shillings. At present the rate has risen, but it is still about half price, and German manufacturers are, and have been, benefiting largely, especially makers of Enameled Ware, Lamps and Lamp Chimneys, and other low priced bulky articles. At the same time an American Lamp Chimney has such a good name in Australia that it keeps on holding its own.

An English imitation of a well-known American Carpet Sweeper appears to be gaining a strong foothold. Perhaps the American maker had better wake up and push his Carpet Sweeper, which, after all, is what they are made for.

Anthony Hordern & Sons.

It is not the purpose of these articles to advertise by name any particular firm, but a short account of a mammoth business, conducted on the other side of the world, of which Hardware forms a considerable part, may not be amiss. Nearly 90 years ago a progressive young man with more brains than capital started a small retail place of business in Sydney. This was early in the history of the colony. The young man was Anthony Hordern, founder of the firm of Anthony Hordern & Sons, now being carried on by his grandson, Samuel Hordern, who has the ability of his grandfather, assisted by a capital said to be upward of £1,000,000 sterling. It is required in wages and salaries alone about £1000 per day to run this immense establishment, the business of which in proportion to the population catered to is stated to be the largest of its kind in the world. Dry Goods, Clothing, Hardware, Groceries, Furniture, Agricultural Implements, Wagons, Carriages—in fact, practically everything—can be supplied. The discovery of gold in 1851 gave the business a boom from which it has never receded, but has steadily advanced with the growth of the city.

It may be interesting to note that the rules and regulations of this enormous establishment are so well devised that one of our largest similar firms in the United States applied for a copy, which was gladly sent, and about two-thirds of them were adopted.

The total area covered by the building, courtyards and adjuncts exceeds three acres, and the total frontages to all streets, lanes and alleyways measure 2600 ft. All this in the Southern Hemisphere in a comparatively young city of only about 500,000 inhabitants!

The whole of the Pitt street end of the establishment is devoted to Hardware, Domestic, Builders', Horticultural and Household Fittings, Tradesmen's Tools, Electrical Accessories, Saddlery, Harness, Guns, and in fact every conceivable article in the Hardware and kindred lines. It is a gratifying fact to note that a good proportion of all this Hardware is of American manufacture, the firm's trade with the United States being a most extensive one. It is also noteworthy that the system of pneumatic cash tubes, said to be among the largest in the world, is American.

Samuel Hordern, owner of and presiding over this wonderful business, is by no means inaccessible, but on the contrary is a polite, affable gentleman who puts on no airs, thoroughly understands the secret of efficient organization, wastes no time himself and has imbued his managers with the same excellent business trait.

New York Exporters.

Nearly all the American business done in Australasia is through the New York export shipping firms, to whom due credit must be given for developing our trade in this lucrative market. The traveler representing American manufacturers rarely obtains an actual order. All in good time the business reaches the manufacturer through the commission house.

Rise in Real Estate.

To show the vast increase in real estate values a single instance will suffice. In the early fifties an English army officer was passing through Melbourne on his way to England. While waiting there for his ship the

first public auction sale of land took place, and as a flyer he bought a lot for which he paid £80, or about $400, and then left for England thinking no more about it. The years rolled on and Melbourne grew.

The family retained the title to the lot, which became the corner of Swanston and Collins streets, one of the finest business locations in Melbourne, on which now stands the Nicholson Building, bringing in to the English family a rental of £25,000 sterling, say, $125,000, per annum.

Charles Parker Company's Vise Catalogue

THE CHARLES PARKER COMPANY, Meriden, Conn., and 32 Warren street, New York, has just issued a finely illustrated descriptive catalogue, No. 5, of Vises and Ratchet Drills, covering 77 pages in an exhaustive line. This is in contrast with a four-page pamphlet issued over 50 years ago by the company, which then included the entire assortment. Vises are shown in many styles and sizes, for mechanics in metal and wood, and for use on automobiles. At the back are a number of pages, pricing, illustrating, describing and numbering the numerous parts of the Vises, to facilitate ordering for repairs. Facing the title-page is an illustration of the Parker factories at Meriden.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

READING HARDWARE COMPANY, Reading, Pa.: Catalogue and price-list of Reading Lawn Mowers, with and without ball bearings, in nine styles, with a total of 72 sizes, illustrated in *fac-simile* colors. The Mowers are made in 3, 4 and 6 blade styles, and hights of wheels are 8, 9 and 10 in.

GREGG HARDWARE COMPANY, Detroit, Mich.: Catalogue illustrating and listing an extensive line of Builders' Hardware, Tools, &c.

ROBERT J. MASBACH, 80 Vesey street, New York: Illustrated catalogue No. 15, referring to Peanut Roasters and Warmers, for charcoal, gas or gasoline fuel, Frankfurter Broilers, &c.

LEFEVER ARMS COMPANY, Syracuse, N. Y.: Illustrated catalogue of Shot Guns, describing details of construction, special features and advantages, and giving much information regarding care and handling of Guns, Loads, &c.; also salesmen's aid, telling how one of the company's Guns was sold by an expert salesman.

MATHER GAME COMPANY, Canton, Ohio: Illustrated circular referring to Mather's Parlor Baseball Game.

LINCOLN-WILLIAMS TWIST DRILL COMPANY, Taunton, Mass.: Illustrated catalogue and price-list of high speed Twist Drills.

CULLMAN WHEEL COMPANY, Chicago: Illustrated catalogue No. 6, referring to Spur Differentials, and automobile and machinery Sprockets and Chains.

LOUDEN MACHINERY COMPANY, Fairfield, Iowa: Illustrated catalogues referring to overhead Carriers for farm, store, mill and factory, and Perfect Barn Equipments, including Hay Carriers, Slings and Forks, Pulleys, Hangers, Cattle Stanchions, &c.

F. C. JOHNSON, Stillman Valley, Ill.: 1908 illustrated price-list of Neck Yokes, Steel Centers, Whiffletree Attachments, Bridle Bits, Anti-Rattlers, Quick Shifts and Coil Washers.

RELIANCE EDGE TOOL COMPANY, Youngstown, Ohio: Circular referring to Reliance Chisels, Gouges and Drawing Knives.

BOSTON WOVEN HOSE & RUBBER COMPANY, Cambridge, Mass.: General illustrated catalogue A 2, combining department editions and referring to an extensive line of rubber products, including Belting, Hose, Packing, Gaskets and Tubing, Mats and Matting, Fruit Jar Rings, Brushes, Insulating and Friction Tapes, Hose Goods, &c.

W. R. HARRISON & Co., Massillon, Ohio: Illustrated catalogues referring respectively to Tornado Tubular Silos and Feed and Ensilage Cutters, Carriers, Blowers, Land Rollers, Wheelbarrows, Farm Trucks, &c.

NATIONAL CUTLERY COMPANY, Detroit, Mich.: Attractive illustrated catalogue referring to Butcher Knives, Household Knives, Cold Chisels, Punches, &c.

LANE BROS. CO., Poughkeepsie, N. Y.: Illustrated catalogue of Joist and Timber Hangers, Door Hangers and Track, Tackle Blocks, Coffee Mills and Hardware specialties.

BAY STATE BRASS COMPANY, Haydenville, Mass.: Illustrated catalogue of Plumbers' Brass Goods and Sanitary Specialties.

TRADE ITEMS.

LEE & UNDERHILL, 35 Warren street, New York, manufacturers' representatives of sporting goods lines, such as Golf and Tennis goods, Roller Skates and kindred articles, have been appointed United States agents for the Gibson Band Forged Iron Golf Heads, manufactured by William Gibson & Co., Kingborn, Fife, Scotland, an old and representative house, well known in the trade. Lee & Underhill are also Eastern agents for the Rainbow Amusement Company, 192-200 Washington Boulevard, Chicago, Ill., manufacturing the Rainbow Roller Skate, recently put on the market and which has some novel features.

E. J. MARTIN'S SONS, Rockville, Conn., have issued an exceedingly attractive booklet referring to their Kingfisher brand braided silk fish lines. The cover of the booklet is embellished with an effective nature view in natural colors and between the inside pages of printed matter are a number of beautiful half-tone panel prints depicting fishing scenes.

ARTHUR PRATT, manufacturers' agent, Sydney, N. S. W., Australia, left that city on a visit to England and America on March 18, and should arrive in London about the end of April. Mr. Pratt's address in the British metropolis for a few weeks will be care of the Manager, Bank of New South Wales, 64 Old Broad street, London, E. C., where any communications from American manufacturers concerning Australian and New Zealand trade may be sent.

THE STRATTON LEVEL COMPANY, Greenfield, Mass., has issued an interesting folder, entitled "Valuable Hints on the Subject of Spirit Levels and Their Construction." Points on Level Glasses are gone into in some detail, including Machine Ground Van Hoesen Vials and the Cat's Eye Glass, which strikes the user like the eye of a feline in the darkness.

E. BISSELL & Co., Hardware auctioneers, 5 and 7 Mercer street, New York, announce an important trade sale for Thursday, April 9. The offerings will consist of a general line of Hardware, Tools, Garden Hose, Steel Goods, including Forks, Hoes, Rakes, &c., direct from and by order of the manufacturers. The goods are in store and ready for immediate delivery. They will be sold in quantities to suit the jobbing and retail trade. A descriptive catalogue relative to the sale will be ready April 4.

THE NETTLETON MFG. COMPANY, Middletown, Conn., has sold its business to the Starr Brothers Bell Company, East Hampton, Conn., which will manufacture the Nettleton Reversible Cutting Nippers under the style of Starr Nettleton Mfg. Company, at East Hampton, Conn.

A CONSOLIDATION has been effected of Meyer Hardware Company and E. M. Bush Hardware Company, both of Evansville, Ind. Additions and improvements have been begun in the latter store, which will be the headquarters of the new concern. E. M. Bush, the head of the company, is an ex-president of the National Retail Hardware Association, and has a wide reputation as an able merchant and an intelligent, aggressive worker on behalf of retail interests. The name of the consolidated concern is the E. M. Bush Hardware Company.

California State Retail Hardware Association.

THE seventh annual convention of the California State Retail Hardware Association was held at Reed's Hall, Oakland, on March 18, 19 and 20. President Frank T. Duhring, Sonoma, who has been in poor health recently, delivered his annual address at the first session at the close of which he was forced to retire. It was with much regret that the members saw him relinquish the chair for the remainder of the convention. M. M. Brown, San Francisco, second vice-president, handled the gavel at the other sessions.

Mayor F. K. Mott of Oakland delivered a felicitous address of welcome, in which he expressed his appreciation of the association's first visit to the "Athens of the Pacific," and reviewed the rapid growth of Oakland from a suburban town in 1906 to a thoroughly modern city of metropolitan aspirations and a doubled population in 1908. The Mayor explained that, although he made the beginning of his business career in the Hardware trade, he gave it up several years ago for the easier line of selling real estate, which has proved very profitable to many enterprising Oaklanders.

A. C. Rulofson, who left the Hardware trade about two years ago to take up the sheet metal line, becoming the first president of the Master Sheet Metal Workers' Association of San Francisco, made an interesting address on "Good of the Order." In his usual forcible and convincing style Mr. Rulofson showed the members the weak and strong points of associations and their work. Both his criticisms and words of advice were well received.

Wakefield Baker of Baker & Hamilton, whose subject was "The Relation of the Wholesaler to the Retailer, and Their Duty One to the Other," made an eloquent address, which was listened to with marked attention.

Another interesting address was that by F. J. Martin, secretary of the Northwestern Mutual Fire Insurance Association, Seattle, Wash., on the subject of "Mutual Insurance."

Resolutions of thanks were extended to *The Iron Age* for courtesies received at its hands, and also to the *Pacific Hardware Journal* and the *Hardware World* for favors rendered.

While no formal resolution was passed in opposition to parcel post legislation, it was the sense of the convention that the members should use all means in their power to defeat the proposed law, including personal influence and the writing of letters to Congressmen and Senators.

A very interesting and suggestive address on the "Benefits of Association Work" was delivered by Andrew Carrigan of the Dunham, Carrigan & Hayden Company, San Francisco, and president of the Pacific Coast Hardware & Metal Association. Mr. Carrigan, citing the 12 years' experience of the Pacific jobbers' association as an example, advocated the formation of local or sectional organizations in different parts of the State for looking after matters of purely local or limited interest, all to be affiliated with the larger body or State Association, which should confine itself to the broader questions and principles affecting the business as a whole. He pointed out that in this way much more effective work could be done on behalf of the retail Hardwareman and at no increased cost to him.

Secretary Dickson's Report.

Since our annual meeting, held in Los Angeles last March, the association, to some no doubt, has made very little progress. Still, at the same time it has done a great deal considering the conditions which it had to work under. Your association is no different from your business. Without the proper interest your business can never prosper. Without the proper interest your association cannot prosper. Your president cannot do it all. Your Executive Committee cannot do it all, and without the proper support your secretary's hands are tied.

The Cartwright law prevented the association from doing a great many things that had been mapped out, although we at that time were attempting to keep within the limits of the law. As soon as matters became a little more settled current prices that prevailed in San Francisco were sent to all the members. Since the first of November four of these cards have been sent to you,



C. H. PHILPOTT



F. B. DICKSON



J. H. STEVES.

and had it been possible to have secured these current prices you would have received them all the year.

Quite a number of members have taken advantage of the mutual insurance plan, and were you to receive no other benefit from the association it would more than pay you to belong to the association.

Your office should have a rating on all of your customers, in other words, a record like that of a mercantile agency. This book to be confidentially kept under lock and key, so that when any of you had a new customer coming among you, you could get in communication with the State secretary's office and get a line on your man without taking any chances. This is being done very successfully in other associations. If things of this kind can be done you can have plenty of money to run your office successfully.

There are many ways of making money other than through price regulations, and one is by developing a kindly feeling for one another. The price question will then have a tendency to regulate itself. Your secretary is a firm believer in association work. One trouble with us business men is that we all seem to think it is the other fellow who is to blame for low prices, no profit, go-broke methods. We are very apt to attribute our failure to his unbusinesslike methods, while if we could stand before a mirror it might reflect something that would astonish us all. We must remember "the beam in our own eye" and then pluck the mote out of our competitor's eye.

The manufacturer, the jobber, the dealer and the farmer are all alike interested. Unless the jobber makes a profit, the manufacturer loses; unless the dealer succeeds, the jobber fails, and unless the farmer prospers, we all fail. The soil being the source of all our wealth

we must not ignore the farmer, who is the very essence and backbone of our prosperity.

Executive Committee Report.

We are now entering upon a new year and, we are glad to state, with several new features consummated during the year just passed, which are calculated to be of great benefit and interest to every member of the association who wishes to avail himself thereof. Primarily among these opportunities is that of Hardware mutual insurance. Arrangements have been completed during the year whereby members of this association are now enabled to secure their insurance through the association at a saving of 25 to 50 per cent. on their premiums. This subject will be taken up and discussed independently during the convention, and we sincerely hope that every Hardware dealer throughout the State will see that it is to his interest and advantage to become a member of this organization and thereby place himself in a position to take advantage of our insurance proposition.

The subject of insurance, we believe, will prove to be the future backbone of our organization. For the past two years your several Executive Committees have worked diligently in an effort to establish their own insurance company in the State of California. Existing legislation, however, makes this impracticable. Your committee has, therefore, succeeded in closing an arrangement with the Northwestern Mutual Fire Insurance Association of Seattle, Wash., whereby that company agrees to accept insurance from our members when applied for through our secretary, and on which insurance they guarantee to decrease your rate of premium to a figure ranging from 25 to 50 per cent.

Paints and Linseed Oil.

After reviewing the present arrangement existing between the wholesale dealers in Paints and Oils and the retail dealers in these lines, it was found that the existing differential of 2 cents per gallon on Linseed Oil and ¼ cent per pound on White Lead has been satisfactorily maintained by the wholesale dealers during the past year in all places throughout the entire State of California with the exception of San Francisco and Oakland.

The conditions existing in the two cities mentioned are understood to be such as to make the establishment of this differential impracticable. While this differential is not as great as might be desired by the retail dealers, we find that under the existing conditions it is as great as could be maintained; primarily owing to possible Eastern competition which would result from broadening the differentials as above mentioned. Under the circumstances we find that these differentials are for the present satisfactory, and it is suggested by your committee that the incoming Executive Committee, through its Paint and Oil Committee, confer with the representatives of the wholesalers in Paints and Oils, with a view to having the present arrangement continued and maintained.

It is further suggested that the wholesale dealers be requested to inform their representatives on the road of these differentials, so that they will be thoroughly familiar with the conditions existing in that they might properly respect and adhere to the same.

Wagons and Implements.

In connection with the matter of Wagons and Implements, the committee appointed at the last convention took up with the wholesale dealers in these lines, through Secretary Dickson, the subject of changing either the prevailing lists or discounts. It was the original preference of the wholesalers to allow the list prices to remain the same and to change the discounts to the trade. Secretary Dickson, however, succeeded in making the wholesale dealers realize that greater satisfaction and less distrust would result between the retail dealer and his customer by permitting the discounts to remain as heretofore, but raising and publishing a new list, showing the advance on Wagons made necessary by the increased cost of raw materials.

We believe that the matter of the present limited profit to the retail dealer is one for which he is entirely responsible. The close margins at which Wagons are sometimes sold we think to be due entirely to local conditions between dealers of the same or adjacent towns. This could and should be overcome or regulated by the retail dealers themselves through local association work. Provided no local association exists in your immediate vicinity or town at the present time, we most earnestly suggest and urge that the various dealers of each town or adjacent localities endeavor to get together among themselves for the purpose of a better general understanding toward the maintenance of prices.

Stoves and Tinware.

It was reported to the convention by the Executive Committee of one year ago that certain wholesale dealers in Stoves and Tinware were at that time doing a retail business as well. To the best of our knowledge these firms are still pursuing the policy of retailing. Furthermore, we find certain distributors of Stoves and Ranges, located both in San Francisco and Oakland, who have been selling their lines of Ranges among the second-hand dealers of these towns, much to the detriment of the legitimate dealers.

We most emphatically disapprove and condemn the action of any wholesaler in any line of goods either selling their wares to the consumer or to the second-hand dealer, and we unanimously recommend that each and every member of our State association take cognizance of the existing conditions and take such individual action as is calculated to show their displeasure and disapproval of such policy.

We further recommend that the Stoves and Tinware Committee of the Executive Committee be instructed to call upon and confer with these firms, as well as with those doing business with the second-hand dealers, and that this committee be empowered to make such final arrangements and recommendations best calculated to bring about the desired conditions, and that this association pledge itself to abide unanimously by the recommendations of its committee.

Pipe and Iron.

It is with much regret that we are obliged to report the present deplorable condition in the Pipe situation with reference to the jobbers handling that line of goods. Regardless of what the reasons for this condition may be, the fact remains that the upsetting of the former existing differentials between jobbers and legitimate retailers has taken from the latter the reasonable margin of profit to which they are entitled on this commodity.

We would therefore recommend that the subcommittee of the incoming Executive Committee whose duty it shall be to look after the Pipe and iron interests of this association be instructed to promptly take up with the wholesale dealers in Pipe this subject of demoralization in prices.

We further recommend that there be steps taken to promptly cause the re-establishment of the former differentials and to properly protect the retail dealer. We wish to place our stamp of disapproval on the present "open" market condition of this commodity.

The situation on Iron and Horseshoes appears to be quite satisfactory, and it is to be hoped that same will continue as at present.

Re-establishment of Local Associations.

Your Executive Committee fully realizes the unfortunate effect upon its sub-associations resulting from the suggested disbandment of the various local associations. We believe that the most benefit to the individual members in various sections of the State is returned to them through the existence of their local associations, no matter how small may be their membership or how limited the scope of their territory.

We wish to encourage the immediate re-establishment of all former local associations, so that they may be able to work out matters which are of special interest to them in their own localities, and who may be in position to take up with the State secretary from time to time any subjects which they themselves are not in position promptly or satisfactorily to handle and adjust.

It will be the aim of our secretary during the coming year to personally assist in the re-establishment and reorganization of local associations as herein outlined.

While we are given to understand that the parcel post bill is not likely to pass Congress at this session, the matter should nevertheless not be neglected by the members of this association. Our secretary has during the past year addressed letters to each Senator and Representative in Congress from the State of California, and has received replies from all stating that they were in favor of and would report the contentions of our association. Nevertheless, it behooves each and every one of us to continue our interest in the defeat of this proposed law and to do all in our power to prevent its final passage.

The Outlook in Hardware.

A. W. Scott of the Pacific Hardware & Steel Company, San Francisco, made an address on "The Outlook for the Hardware Business for 1908," from which we make the following extracts:

We all know what has taken place the last four months, or what originated in about October; I refer to the financial stringency in the money market, caused primarily, at least in a great degree according to a great many people, by overspeculation in Wall Street, as well as overspeculation in other parts of the country.

I suppose if the Wall Street magnate had been a little closer to the Western farmer he probably would not

have overspeculated quite so much. I think that is equally true of the wholesale merchant; if he stayed a little closer to home, and the people he is dealing with, he would not be so apt to overspeculate. It seems to me to be a time when all conservative merchants

Should Go a Little Slow.

All consumers are economizing, and that economy naturally affects all the merchants, wholesale and retail. Not long ago there was a gentleman in our store who talked about having just placed an order for a carload of goods. I asked him what he thought of the market; he said he did not know. I told him that I thought it might be well to look into the matter before placing any large orders; that usually we bought of this commodity from 250 to 500 tons per month, but that we had just placed an order for only about two cars. He was surprised.

I think it is certainly a time when every buyer should economize. It is a good time for him to collect his bills. There is no time like the present for collecting accounts.

As to the volume of business for the coming year, I don't think we need give ourselves any great anxiety on that account. The State of California is certainly very prosperous. We in San Francisco have been more affected by the financial stringency of the past four months than you in the country. We were going pretty rapidly ourselves. Rebuilding was going on to a great extent. The reaction was much greater with us than in the interior.

The prospects are for a good crop. If we have a fair amount of rain between this and May 1 we are pretty sure of good crops; in fact, that is pretty true of all the Western country, and especially true of the Pacific Coast. To resume normal conditions after going through what we have is naturally slow, but, as far as I can judge, we have nothing to fear. Business will gradually get back to a normal condition. We must all bear in mind that the conditions preceding the panic were abnormal conditions.

Decline in Prices Looked For.

There is one thing that I think we can all congratulate ourselves on: There has been no radical decrease in prices. That there will be a decrease in prices I do not doubt; in fact, I do not think there can be a question of doubt but this will be the case, but if prices come down gradually there need be no serious loss on this account. With staple goods prices have been steady for the last four months; there has been no marked decrease in these prices in the State of California and on the Pacific Coast.

While it may take a year or two years to reach a normal condition we are bound to reach it; you cannot have hard times when you have good crops and fair prices. The State of California has had abundant crops, and the signs are that we will have another good year, and we are having a large number of people coming into our State every day. I believe that the records of the Southern Pacific and the Santa Fé railroads show that more colonists have come into the State this year than in any preceding year, which is certainly a good sign.

Election of Officers.

The following officials were chosen for the ensuing year:

PRESIDENT, George H. Smith, Oakland.
FIRST VICE-PRESIDENT, C. H. Philpott, San Francisco.
SECOND VICE-PRESIDENT, J. H. Steves, St. Helena.
THIRD VICE-PRESIDENT, H. E. Humphrey, Whittier.
SECRETARY-TREASURER, Frank B. Dickson, San Francisco.

EXECUTIVE COMMITTEE: John P. Maxwell, Oakland; F. A. Rittigstein, Oakland; Geo. M. Hickman, San Francisco; I. C. Walker, San Francisco; Fred Fisher, Fresno; R. Barcroft, Merced; Henry Guiot, Los Angeles; John W. Baxter, Watsonville; J. C. Mailer, Santa Rosa; W. J. Boschkin, San Jose; W. C. Barth, Corona; R. O. Kimbrough, Sacramento.

Entertainment.

The programme of entertainment included a sightseeing trolley ride and luncheon for the 90 ladies, as guests of the Oakland Chamber of Commerce, on Thursday morning, and a theater party in the evening for members and their ladies at Idora Park. Special cars conveyed the guests, leaving the Hotel St. Mark at 7.30 p.m. for Oakland's famous amusement resort. There was also a banquet for the members and guests at Reed's Hall on Friday night. On Saturday a trip was made to the Pacific Steel & Wire Company's plant at East Oakland. All of the Hardware stores in Oakland were visited in the afternoon. The very efficient Entertainment Committee consisted of Frank A. Rittigstein, chairman; Geo. H. Smith, John P. Maxwell, Fred A. Osborn, Walter Meese, LeRoy R. Smith.

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TRIBUTE TO PHILIP CORBIN.

IT will be recalled by our readers that at the recent annual meeting of P. & F. Corbin and the Corbin Cabinet Lock Company, Philip Corbin declined to accept re-election as president of these corporations, continuing, however, as the head and president of the American Hardware Corporation. This action was taken by him with a view to escaping some responsibilities, because of his advanced age, and at the same time of promoting younger men to more important positions. At a meeting of the directors of these companies a committee was appointed to draft suitable resolutions. This committee reported the present week, recommending the following minute and testimonial, which were unanimously adopted by the directors as expressive of their high appreciation of Mr. Corbin:

At the annual meeting of the stockholders and directors of the Corbin Cabinet Lock Company, held February 17, 1908, Philip Corbin, president of the company for many years since its organization, in graceful relinquishment of the arduous duties of such office, declined re-election, and we, his associates on the Board of Directors, for ourselves and for the stockholders of the company, desire to place on record a testimonial expressing our hearty appreciation of the magnificent service rendered by him during the years that have passed.

In the early history of the company, during its financial struggles for existence, Philip Corbin was a giant of strength and a leader; in fact, we may say that the very existence of this corporation is due to the help, guidance and direction which he gave it in every way since its formation.

With such support founded on genius, integrity and executive ability, the success of the company has been amply assured, and we who are interested with Mr. Corbin in this enterprise, deem it a privilege and honor thus to express our obligation and appreciation:

A Testimonial to Hon. Philip Corbin.

Philip Corbin, president of this company since 1878, desiring to give more attention to the comprehensive affairs of the American Hardware Corporation, and to give recognition to the services of those so long associated with him in the conduct of the affairs of this company, declined a re-election as president at the annual meeting, held February 17, 1908. We, his friends, associates and admirers, avail ourselves of this opportunity to express in writing, and have made a part of the records of the Board of Directors of this company, our appreciation of his great usefulness and his great worth.

Few men witness, as he has done, the growth from an humble beginning to gigantic proportions of such an industry as that of which he is the active and honored leader.

Not many find time or opportunity while engrossed in building up and directing a great industrial enterprise to render helpful service as he has done to his neighbors, his city and his State.

Few are so fortunate as to win and retain the respect and confidence of associates and competitors alike throughout a strenuous business career of more than half a century.

In the midst of business perplexities and anxieties, to which Mr. Corbin has been no stranger, his sagacity has solved problems, his magnetic influence has healed dissensions, his courage has inspired others, his leadership has turned defeat into victory, and in all such experiences his honor and integrity have stood the test of the most exacting standards.

No man has challenged adversity with a more cheerful humor and none has enjoyed prosperity with more grace, humility and dignity.

We, who for many years have been intimately associated with this admirable man, have been benefited by his grand personality, have been inspired by his example, and instructed by his wisdom, believe this is a fitting time to testify for ourselves and for many others to those qualities of mind and heart which have made Philip Corbin the first citizen of New Britain.

Hardware Club of New York.

AT the annual meeting of the Hardware Club of New York, held at the club rooms, March 21, the following were elected to the Board of Governors for three years: Joseph Gales, George H. Sargent, Arthur G. Sherman, Edward Stagg and Edward C. Van Glahn. Subsequently the Board of Governors held a meeting, on March 24, and re-elected the following officers: President, Eugene Bissell; vice-president, Thomas F. Keating; treasurer, Alfred D. Clinch; secretary, Arthur G. Sherman.

The past year has been an eminently successful one with the club, thus continuing the fine record which has been made by it from the first. Its prosperity is indicated in the fact that there is so long a waiting list that resident members have to wait from 12 to 15 months for admission. There is, however, an opportunity still for a few nonresident members, who can be admitted promptly.

National Retail Hardware Association.

NINTH ANNUAL CONVENTION.

THE promise of a profitable, pleasurable and successful meeting, which was foreshadowed in the preliminary report given in last week's issue of the opening on Tuesday, March 24, of the ninth annual convention of the National Retail Hardware Association at St. Louis, was fully realized in the subsequent proceedings of this body, held on March 25, 26 and 27. A superior record of attendance was established in that nearly all of the



delegates present responded to the roll call at each of the sessions, which were convened promptly at the appointed hour.

The session on Wednesday morning was occupied with addresses upon various phases of association work, delivered by speakers officially connected with allied organizations. C. W. Asbury, president, American Hardware Manufacturers' Association, spoke of the related interests of manufacturers and distributors and the helpful advantages to be derived from mutual co-operation in organized effort. He was followed by W. S. Wright, president, National Hardware Association, who representing the jobbing interests, referred to the better understanding that had been established between the wholesale and retail trades through the influence of their respective associations which are, as they should be, gen

[illegible] adjustment of any differences that may arise.

A stirring address, delivered by George H. Maxwell, on "National Problems," dealt with the physical ruin that must surely follow the rapid deforestization of the country and social and moral questions involved in the growing congestion of population in large cities. The

force and fiery eloquence with which the speaker portrayed the cause and effect of these evils, together with the remedies proposed to counteract them, held the audience in rapt attention. Enthusiastic and prolonged applause followed the conclusion of Mr. Maxwell's address. The remaining sessions of the convention were principally executive, being devoted to the intimate business of the association.

CENTRAL: Wisconsin, Indiana, Illinois, Kentucky, Missouri, Michigan and Ohio.

EASTERN: Connecticut, New England, New York, Pennsylvania and West Virginia.

SOUTHERN: Arkansas, Oklahoma, Mississippi, Alabama, Tennessee, Carolinas and Georgia.

The plan is for the officers of the State associations in these divisions to arrange the schedule so that exhibitors, speakers and representatives of the National Association



Management of the Convention.

Too much praise cannot be given to President Miles and his associates for the skill and wisdom shown in the direction of the convention. The administration of the retiring president has been very successful and exceedingly creditable. The meetings during the three days of the convention, several of which were open to the public, were well attended and began with commendable promptness. The principal executive sessions were attended by an unusual proportion of the delegates. It was [illegible]

may visit at least two conventions a week. This would certainly promote the convenience of outside parties who may desire to attend several conventions.

Meetings of the Secretaries.

Perhaps the most important practical work connected with the St. Louis meeting was done by the secretaries as the result of their conferences with one another. The action taken by them in regard to the dates of the annual conventions in the various States was especially important. It was recognized throughout the convention that



found necessary to hold the meeting on Friday forenoon, as laid down in the programme, the business of the association having been finished up Thursday afternoon. Meetings of the secretaries and of the Executive Committee were, however, held, giving attention to some matters connected with the future working of the association.

Hardware Insurance.

Mutual Hardware insurance was a prominent topic in the convention. The reports from the various companies were regarded as eminently satisfactory, but there was the manifestation of a conservative disposition in order to keep this mutual Hardware insurance on a safe basis. It was pointed out that it might be a wise policy for the companies to be conservative in the distribution of dividends until there is the accumulation of a substantial surplus, which will be a safeguard against possible disaster in the future.

to the secretaries belong a large measure of the credit for the success which attends the various State associations and the opportunity given to them to compare notes in regard to methods was admirably improved. This coming together of men prominent and influential in the association movement will doubtless result in the more wide adoption of the most approved methods as well as in the developing of a continued and possibly increased enthusiasm all along the line. These conferences were under the direction of Frank A. Bare of Ohio.

The Catalogue House Question.

Much less attention than heretofore was given to the catalogue house question, the policy of the association being not to make this a prominent subject of discussion.



Territorial Divisions.

In accordance with the suggestions of Secretary Corey measures were taken to subdivide association territory, as follows, making four divisions—Western, Central, Eastern and Southern:

WESTERN: North and South Dakota, Nebraska, Colorado, Iowa and Minnesota.

While there is much inconvenience still suffered by the merchants on account of the mail order business which is done with their customers, the disposition on the part of the trade generally is to accept the situation and make the best of it, some merchants indeed finding that by proper management of their own business they can greatly diminish the trade of the catalogue houses in their territory. The Joint Committee which was efficiently represented by E. M. Bush and A. H. Abbe, reported in regard to its work. The convention was thus

advised as to the views and aims of the committee in their efforts to conserve the interests of the regular distributers. The extent to which manufacturers are cooperating with the merchants as they either refuse to sell the catalogue houses or endeavor to control the prices at which their goods are sold is a gratifying feature of the situation. It is evident, too, from reports made that the mail order business has suffered a good deal of late as a result of the depression, while one of the great houses especially has lost, it is thought, many friends because of inferior quality of goods sent out.



A. T. STEBBINS.



S. R. MILES.

Resolutions.

Among the resolutions passed by the association are those given below. It will be observed that they cover a wide range of subjects, some of which have not been at all prominent in the discussions of the State associations and in regard to the wisdom of which there may be some difference of opinion:

Whereas, There is now pending before the United States Congress certain bills of great public interest, and their enactment into laws would be beneficial and of direct benefit to each and every State; and

Whereas, We believe that our Senators and Representatives in Congress desire to know what the sentiment and opinion of the people are upon the several bills now under consideration, so that they may act in harmony and intelligently on the questions; therefore, be it

Resolved, That the National Retail Hardware Association, representing 35 States, in convention assembled in the city of St. Louis, the 26th day of March, 1908, do hereby place themselves on record as unqualifiedly in favor of the enactment into laws of the following bills now under consideration, for we believe that they are laws necessary for growth, prosperity and development of the United States:

A National Pure Paint Law.
A National Pure Seed Law.
A National Good Roads Law.
A National Development of Atlantic and Inland Waterways.
For the Better Preservation of Our Forests.
For Honesty in Advertising.

And be it further Resolved, That we as a National Association of retail Hardware merchants stand against any and all legislation by Congress tending to a centralization of business or a curtailment in any way of the growth and development of our smaller cities and towns and our agricultural communities.

Resolved, That the secretary be directed to forward to each member of Congress a copy of this preamble and resolution.

Resolved, That the National Retail Hardware Association desires to express their sincere thanks to the jobbers and manufacturers and their ladies of St. Louis for and their appreciation of the cordial, generous and magnificent reception, entertainment and courtesy tendered and accorded the officers and delegates attending this convention and the ladies who accompanied them during their visit to this city. We wish to assure them that our visit will be one of our most pleasant and happiest recollections. We confidently believe our convention in St. Louis will result in promoting closer, stronger bonds of sympathy and trade interest between the manufacturer, the jobber and the retail merchant; be it further

Resolved, That our secretary be directed to send to the jobbers and manufacturers of St. Louis a copy of the above resolutions.

Resolved, That the National Retail Hardware Association desires to extend their hearty thanks to all the speakers who addressed the convention; and

Resolved, That the National Retail Hardware Association wish to extend to the St. Louis press and the trade press their thanks for the full and fair report which they have given of the proceedings of this convention.

Resolved, That the National Retail Hardware Association extend their thanks to the manufacturers and jobbers of this country, who have recognized the justice of our position that it is unwise to sell their products to other than those who are recognized Hardware merchants.

Delegates Present.

The following delegates representing the different State bodies affiliated with the national association were in attendance:

ALABAMA
L. G. Smith, Ensley.
CAROLINAS.
F. W. Dixon, Charlotte, N. C.
GEORGIA.
H. C. Briggs, Valdosta.
ILLINOIS.
T. J. Mathews, Mt. Vernon.
L. D. Nish, Elgin.
J. H. Vawter, Salem.
F. Geissing, East St. Louis.
O. H. Howe, Streator.
Geo. A. Englehart, Chicago.
James Gormley, Chicago.
Wm. Bittel, Peoria.
Thos. E. Connors, Evanston.
Chas. Zumbrock, Springfield.
INDIANA.
W. C. Ott, Rockville.
H. R. Culbertson, Auburn.
W. M. Hunter, Versailles.
H. G. May, Shirley.
J. T. Gardner, Scottsburg.
M. L. Lewis, Marion.
A. Reichenbach, Huntington.
IOWA.
P. C. De Vol, Council Bluffs.
A. R. Sale, Mason City.
J. F. Doty, West Liberty.
L. C. Abbott, Marshalltown.
C. E. Haas, Le Mars.
H. S. Vincent, Fort Dodge.
C. T. Gadd, Des Moines.
T. N. Peterson, Council Bluffs.
KENTUCKY.
John W. Reid, Hodginsville.
J. M. Stone, Sturgis.
MICHIGAN.
C. M. Alden, Grand Rapids.
A. J. Scott, Marine City.
MINNESOTA.
A. Marckel, Perham.
J. Schmidt, Wabasha.
C. F. Ladner, St. Cloud.
C. W. Bourk, Royalton.
D. H. Evans, Tracy.
C. H. Casey, Jordan.
W. H. Tomlinson, Le Sueur.
M. S. Mathews, Minneapolis.
J. H. Smith, Minneapolis.
MISSISSIPPI.
T. H. Baird, Greenwood.
W. E. Biggs, Crystal Springs.
MISSOURI.
G. A. Pauly, St. Louis.
O. W. Jones, Maryville.
F. D. Kansteiner, St. Louis.
NEBRASKA.
Dan Kavanaugh, Fairbury.
J. Frank Barr, Lincoln.
Max Uhlig, Holdrege.
M. D. Hussie, Omaha.
Geo. R. Wessels, Minden.
H. J. Hall, Lincoln.
NEW ENGLAND.
Ernest L. Davis, Boston, Mass.
S. H. Thompson, Lowell, Mass.
Frank E. Pierson, Pittsfield, Mass.
NEW YORK.
L. J. Ernst, Rochester.
J. Holley Bradish, Batavia.
J. G. Ferres, Johnstown.
A. E. Towne, Saratoga Springs.
NORTH DAKOTA.
W. R. McIntosh, Bottineau.
J. S. Cole, Lisbon.
C. N. Barnes, Grand Forks.
OHIO.
W. P. Bogardus, Mt. Vernon.
G. M. Gray, Coshocton.
H. C. Wiseman, Springfield.
W. L. Jacobs, Youngstown.
J. S. Spoerle, Hamilton.
Frank A. Bare, Mansfield.
OKLAHOMA.
O. A. Smith, Watonga.
PENNSYLVANIA.
J. F. Howe, Freedom.
A. H. Kaufman, Lock Haven.
W. P. Lewis, Huntingdon.
SOUTH DAKOTA.
E. Gregory, Alexandria.
H. E. Johnson, Redfield.
TENNESSEE.
L. D. Love, Nashville.
M. A. Walker, Covington.
WEST VIRGINIA.
Leslie Hawker, Shinnston.
WISCONSIN.
Jas. Murphy, Racine.
H. F. Krueger, Neenah.
C. A. Peck, Berlin.
R. C. Murdock, Beloit.
John Hessel, Antigo.
Emil Teitgen, Manitowoc.
H. C. Scofield, Sturgeon Bay.

Election of Officers.

Careful attention was given to the selection of officers for the coming year, and the Nominating Committee, under the chairmanship of C. F. Ladner, recommended the choice of the following, who were unanimously chosen:



C. H. WILLIAMS.



H. L. McNAMARA.

PRESIDENT, A. T. Stebbins, Rochester, Minn.
FIRST VICE-PRESIDENT, C. H. Williams, Streator, Ill.
SECOND VICE-PRESIDENT, H. L. McNamara, Janesville, Wis.
TREASURER, F. A. Bare, Mansfield, Ohio.
EXECUTIVE COMMITTEE: Nathan Roberts, Omaha, Neb.; J. G. Ferres, Johnstown, N. Y.; L. C. Abbott, Marshalltown, Iowa; F. Alex. Chandler, Boston, Mass.

To these should be added the name of M. L. Corey, who will, of course, continue as secretary, a position which he has filled with distinguished ability and success.

The peculiar fitness of these gentlemen for the positions to which they have been called will be recognized

by all who know them. A. T. Stebbins, the new president, from his familiarity with public affairs and deliberative assemblies and his experience, especially as State Senator, give him qualifications which admirably supplement his ability and position as a merchant who has from the first been prominent and influential in association work. The vice-presidents, C. H. Williams and H. L. McNamara, have also been long identified with the association movement and are entitled to the promotion which thus comes



M. L. COREY.



FRANK A. BARE.

to them. The new treasurer, F. A. Bare, has made a notable record as State secretary, and his influence in his new position, which will not interfere with the invaluable work he has been doing in his own State, should be felt in the direction of the affairs of the national body. The members of the Executive Committee will be recognized, too, as men of broad views and ability, whose counsels must be of value. The association is certainly to be congratulated on having such a board of officers.

Next Meeting.

By a unanimous vote Milwaukee was chosen as the place of the next meeting. It will be remembered that that city had been practically decided upon at Boston as this year's meeting place for the association, but that at the last it was determined to accept the very cordial invitation to St. Louis.

Entertainment Committee.

The Entertainment Committee consisted of representatives of the following manufacturing and jobbing interests of St. Louis:

Ætna & American Powder Mills.
American Steel & Wire Co.
E. C. Atkins & Co.
Beck & Corbitt Iron Co.
Bridge & Beach Mfg. Co.
Buck's Stove & Range Co.
Charter Oak Stove & Range Co.
John Deere Plow Co.
Dupont Powder Co.
Fairbanks, Morse & Co.
A. Geisel Mfg. Co.
Gelber, Ward & Hasner Hardware Co.
C. Hagar & Sons Hinge Co.
Hoyt Metal Co.
International Harvester Co.
Jackes-Evans Mfg. Co.
Kent & Purdy Paint Co.
Kingman-St. Louis Implement Co.
Ludlow-Saylor Wire Co.
Majestic Mfg. Co.
W. C. Manley Implement Co.
Missouri Glass Co.
Mound City Paint & Color Co. and Gregg Varnish Co.
Murphy Varnish Co.
National Enameling & Stamping Co.
National Lead Co.
Norvell-Shapleigh Hardware Co.
Oliver Chilled Plow Works.
Parlin & Orendorff Co.
Platt & Thornburgh Paint Co.
Ringen Stove Co.
St. Louis Shovel Co.
Simmons Hardware Co.
Sligo Iron Store Co.
E. E. Souther Iron Co.
Standard Stamping Co.
Vane-Calvert Paint Co.
Western Iron & Supply Co.
Wheeling Corrugating Co.
Witte Hardware Co.

Entertainment.

That the forceful spirit of modern commercialism which has contributed so much to the splendid industrial development of St. Louis can be harmoniously blended with the typical ideals of Southern hospitality was most happily demonstrated in the delightful series of entertainments provided for the delegates and guests of the convention. Some feature of enjoyable interest was arranged for every unoccupied moment and every possible attention that could in any way contribute to the pleasure of those in attendance was shown by the Committee on Arrangements in particular and the St. Louis Harwaremen in general. A mileage book, as illustrated herewith, "good for a continual round of pleasure" and inclosed in a handsome seal leather pocketbook, was issued to each guest, which, besides specific information regarding the places of chief interest in the city, contained coupon tickets for each of the several diversions planned for the occasion. These included a theatre party at the Olympic Theatre on Tuesday evening; a matinee for ladies in the afternoon, followed by a reception and social gathering in the parlors of the Planters' Hotel by the officers of the National Retail Hardware Association to the delegates, St. Louis friends and ladies, on Wednesday evening; a banquet at the Planters' Hotel, on Thursday evening, and a carriage drive for delegates and ladies through the city and parks on Friday afternoon. In addition to this comprehensive programme the ladies in attendance were delightfully entertained on Tuesday and Wednesday at club luncheons given by the Simmons Hardware Company, Norvell-Shapleigh Hardware Company and the Witte Hardware Company.

Too much cannot be said in praise of the painstaking care, tact and judgment displayed by the special Committee of Arrangements, not only in the comprehensive scope of its plans, but the admirable way in which they were carried out. This committee consisted of H. B. Gordon, secretary Norvell-Shapleigh Hardware Company; F. J. Semple, vice-president Simmons Hardware Company; F. A. Witte, secretary Witte Hardware Company. The numerous expressions of gratification voiced by members of the convention bore eloquent testimony of the recipients' appreciation of the cordial hospitality enjoyed at the hands of St. Louis Hardwaremen and their ladies and the allied trade interests of the city.

While the hospitality was exceedingly warm and cordial in its spirit and the manner in which it was manifested, the Hardware interests of the city are to be congratulated on the care and skill with which all details were planned and carried out. It is safe to say that the city and its merchants and manufacturers made many friends in view of the reception extended the visitors.

The Banquet.

The guests who were fortunate enough to be present at the splendid banquet given by the jobbers and manufacturers of St. Louis in the main dining room of the Planters' Hotel on Thursday evening, enjoyed not only a sumptuous repast but were entertained by a number of excellent after dinner speeches. Under the tactful man-



O. H. WITTE.

agement of James E. Smith, officiating as toastmaster, every moment occupied by the programme was filled with interest and the presentation of speakers was conducted in a most happy vein.

Speaking as a representative of the mayor, Saunders Norvell contrasted modern municipal conditions and customs with those of the Medieval Ages, when the cities were walled and guarded by locked gates. At the conclusion of his remarks, which terminated with a reference to the old time custom of presenting the keys of the city to visiting guests, a blare of trumpets was heard outside the hall; immediately there entered a page, followed by a retinue of courtiers all gorgeously costumed, bearing a huge wooden Key on a satin pillow which, after a stately march about the banquet hall, was ceremoniously deposited before President Miles. This inci-

dent being unannounced came as a complete surprise to the assembled guests and because of the happy manner in which it was conceived and carried out was highly appreciated.

The principal address of the evening was delivered by Gov. Jos. W. Folk of Missouri, who spoke with telling effect upon State and civic problems involved in the suppression of political corruption. Knowledge of his achievements in the successful assaults conducted by him against bribery and graft lent peculiar significance to his words, which rang with the expressed conviction of an awakening of the public conscience. Short speeches by President S. R. Miles, Henry T. Kent, W. S. Wright and Julius C. Birge added to the zest and pleasure of the occasion, which was conceded to be one of the most brilliant and delightful in the history of the association.

As a concluding feature of the banquet there was the awarding of prizes. Dispensing with the formalities usual to such occasions, the toastmaster announced the winner of the prize for gentlemen to be Secretary M. L. Corey, who was forthwith tendered a full spool of Barb Wire, which he accepted as peculiarly described on account of its Hardware points. The ladies' prize was awarded to Mrs. S. R. Miles, who in acknowledgment of the Washboard that was presented to her responded to the sentiment expressed by the toastmaster in phrases as graceful and felicitous as they were impromptu.

S. R. MILES' PRESIDENTIAL ADDRESS.

The address of S. R. Miles, president of the association, was an interesting and elaborate presentation of matters having direct connection with the work of the national organization and the various State bodies, and was listened to with close attention. Mr. Miles remarked that the holding of the last annual convention in Boston in June, three months later than the usual dates, had made the official year just closing a short one in point of time, although it was long in the way of events. Referring to the business disturbance which made itself felt during the closing quarter of the year, Mr. Miles said:

The incipient panic during the closing months of the year, precipitated apparently from a clear sky, brought to the business world many anxious moments. But, having ridden so long upon the top wave of prosperity, the legitimate business public refused to down, and by sheer faith alone averted a repetition of the panic of 1893—faith not only in each other, but faith to believe that aside from a speculative tendency in some quarters the business of the entire country was on a sound, legitimate basis; faith in our monetary system; faith in the Government; faith in the executive ability of that type of American citizenship as exemplified in Theodore Roosevelt, and faith to believe the people can be trusted to elect, as his successor, one from among their citizens who will continue the campaign so ably inaugurated by the President against the many evils that have crept into and menaced the very foundations of the Government.

With the beginning of the new year the atmosphere had very materially cleared, and in spite of the usual Presidential year "bogie man," 1908 promises well in a business way. In an association way, too, the past months have been eventful.

Mr. Miles then referred to the experiences of the South Dakota Retail Merchants' Association, the Northwestern Lumbermen's Association, and other bodies in combating the competition of catalogue houses, and the suits brought by these houses against the associations as a result of their activities, which, as the trade is aware, were decided against the mail order concerns.

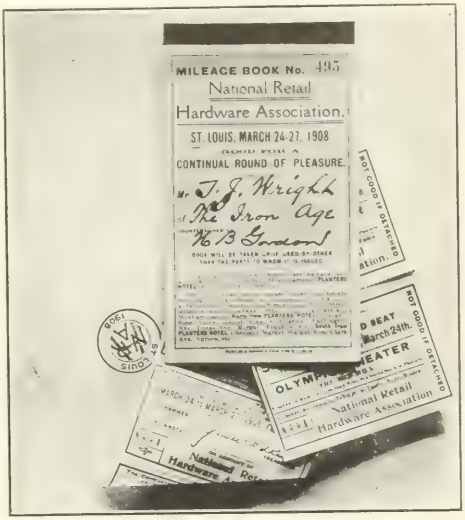
Mail Order Business.

Alluding to the volume of mail order business and especially the trade in Hardware and kindred lines, Mr. Miles spoke as follows:

Enormous as the mail order business seems to be, reliable information develops the fact that in the Hardware and kindred lines less than 1 per cent. of the business is handled by mail order houses; or, in other words, more than 99 per cent. of all the Hardware business is handled through members of this association and the retail Hardware merchants still outside the fold. The bone of contention is not the volume of business done by mail order houses.

The volume of business transacted by some of the larger mail order concerns is unquestionably greater than that of any individual retail Hardware merchant, anywhere, and this is where organization has borne fruit. We have been able to say to the manufacturer and jobber, and with reason, that it is unfair to put the retail mail order concerns, that are admittedly selling only 1 per cent. of their output, in a position to name the price at which the other 99 per cent. must be sold. Is that in restraint of trade? What court of justice could, by any stretch of imagination, place any such construction upon it?

Upon such argument has our work been based. As an evidence of this, let me quote you from a letter written



Mileage and Entertainment Book.

only a few days ago by a well-known manufacturer that decided to discontinue all relations with mail order concerns:

And, as you are aware, no pressure has been brought to bear upon us other than the intelligent presentation of the Hardware side of the case, by our friends in the Hardware Association.

Whole volumes might be written without paying a higher compliment to the work of the National Retail Hardware Association and the affiliated State associations than is contained in the above quotations.

Parcel Post.

He then discussed the parcel post compaign of Postmaster-General Meyer at considerable length. He said he had attended conferences of various trade organizations in Chicago in December, called for the purpose of looking into the situation and devising ways and means of defeating any measure of the kind at the present session of Congress. A very thorough discussion of the subject was had, and while it seemed to be the concensus of opinion that there would be no legislation of this character enacted at the present session, it was decided to inaugurate a campaign of education that would place the whole subject fairly and squarely before the people, thus giving them an opportunity to study and decide the question intelligently and on its merits. Mr. Miles continued:

One of the best ways to get this information into the hands of the farmers and retail merchants of the country, who are supposed to favor a domestic parcel post because the Postmaster-General says it is in their interest, is by placing the literature in the hands of your local editors. I would advise that in doing this you suggest to these editors that they secure from the Postmaster-General all of the literature that he has published on this subject, which may be had for the asking, and that they study both sides of the question. I am very sure that the outcome of this investigation will be the appearance of strong editorials in opposition to any plan as yet proposed by the Postmaster-General.

Association Spirit.

Referring to his attendance at recent meetings of the State associations and the impressions made upon him thereby, he said:

It was my pleasure to attend the recent meetings of the North Dakota, Iowa, New York, Ohio and Missouri State associations. Everywhere was I impressed with the splendid spirit of loyalty and enthusiasm that prevailed. Questions vitally affecting not simply the business of the retail Hardware merchant, but retail business of every kind and character, were taken up and handled without gloves, and yet handled in a fair, clean, conservative manner, and with fairness and consideration for the interests of the other party in the controversy. It is little wonder, with this spirit controlling, as it does, the work of all State association gatherings, that Hardware organizations everywhere are recognized as standing for fair treatment for all and special favors to none.

Organization Growth.

He remarked that since the last National meeting three new States, Mississippi, Alabama and Tennessee, had been organized and were now members of the National Association. Suggestion had also come from the California Association indicating that the matter of joining the national body was under consideration. It was felt, however, by the present officers of the national organization that owing to geographical considerations it might be better if the Pacific and far Western States, four of which are now organized, California, Washington, Oregon, and Idaho, should form a Pacific branch of the national body. Mr. Miles believed that a strong affiliated organization of this sort would be able to handle questions peculiar to that section of the country to better advantage while by co-operating with the national association they could work out problems of national scope and character. He also suggested that the Texas association, a strong and influential body, should be urged to join the national.

Mutual Fire Insurance.

Touching on the subject of mutual insurance, Mr. Miles spoke as follows:

While we are to have a report upon the mutual insurance feature of our association work, I cannot refrain from touching the subject briefly, and to congratulate the Hardware merchants of the country on being able to place so large a percentage of their insurance with the best and safest insurance companies doing business in this country to-day, and at a saving to them in cost of from 25 to 50 per cent. While this insurance feature has outgrown the wildest imaginings of any of its organizers, I feel safe in making the prediction that it is only in its infancy, and that it will eventually be the means of revolutionizing the insurance business of the country. Profiting by the example we have set, other lines will organize to carry their own insurance, until eventually there will be little business left for the stock company doing a general business; each line of trade will be carrying its own risks.

In this work, as well as other features of the association movement, the individual member can render great assistance. He can do this by being fair in his demands on the Hardware mutuals; by not undertaking to take advantage in any way on rates; by doing everything possible to safeguard his own risk, and by placing all of his insurance, as fast as possible, with Hardware mutuals.

Mr. Miles suggested that it was desirable to get in closer touch with organizations in other lines. In the campaign against parcel post it had been urged at Washington that the Hardware people seemed to be the only ones that were making vigorous opposition. In a sense this was a handicap, and if the Hardware organizations could do anything that would in any way secure the co-operation of associations in other lines it would materially promote the general welfare.

Recommended Legislation.

After paying a high tribute to the work of Secretary M. L. Corey, he said that inasmuch as the association has always stood for growth and progress generally, it should now put itself on record in support of the following legislation:

A national pure paint law.
A national pure seed law.
A national good roads law.
A national system of irrigation of arid lands.
A national development of inland waterways.
For the better preservation of our forests.
For a reduction and regulation of express rates.
For honesty in advertising.

And we must continue to stand against any legislation looking to a centralization of business or a curtailment in any way of the growth and development of our smaller cities and towns and our agricultural communities.

He concluded as follows:

The work of this organization has grown beyond that of mere trade discussion. Each year marks a forward step; the entrance into a broader field; the accomplishment of better things; the placing of association effort on a higher plane. While much has been accomplished, much more remains to be done. New fields are awaiting development, and no man must accept an office in this association in the future with the thought there is little left for him to do. Our progress has been slowly but steadily onward and upward. We cannot and will not take a backward step.

MR. COREY'S ANNUAL REPORT.

In his report as secretary, Mr. Corey said that three new States had become affiliated with the National organization since the last meeting, and that very little desirable territory remained unorganized. Efforts should now be exerted in the direction of building up and strengthening associations identified with the National body rather than seeking new fields, although there were a few States to which help should be extended whenever the merchants showed a desire to get together. Mr. Corey said that about 30,000 letters had passed in and out of his office during the nine months that had elapsed since the 1907 convention, which was held in Boston in June. He had personally attended 10 of the State retail conventions, besides participating in meetings of other bodies, including several not directly identified with the Hardware field, and had traveled over 15,000 miles and in or through 25 States. Mr. Corey suggested a rearrangement of State convention dates on a territorial basis, so as to have as few conflicting dates as possible, reference to which is made elsewhere. He also touched on the necessity of introducing some new features in convention work, with a view to sustaining the interest of members and encouraging their attendance. Mr. Corey had the following to say in regard to the matter of terms and policies under which the retailer was expected to distribute goods:

Our reputation as a fair and conservative organization is pretty well established. In the forming and arranging of terms and policies under which the retail trade is expected to distribute goods we ought to have more to say. I am glad to announce there is a growing tendency to consult your representatives in this direction. To be able to do much effective work along this line requires more thorough knowledge of the inside of plans and methods that now prevail. We are gradually growing wise, but not fast enough to exercise our full amount of influence on the changing conditions. There should exist a more perfect understanding between manufacturer, jobber and retailer in dealing with matters in which we are mutually interested. A manufacturer of a well-known specialty, which is sold under a controlled price agreement, recently told me that he was guided in making changes of prices and terms almost entirely by criticisms that came from our conventions. The prosperity of the retail merchant is a matter of deep concern to both manufacturer and jobber. Anything that prevents us from supplying the goods used by the consumer is equally injurious to the maker and wholesaler.

Mr. Corey's report of the finances of the association showed that there was a balance on hand exceeding $8400.

ADDRESS OF FRANK BAACKES, VICE-PRESIDENT AMERICAN STEEL & WIRE COMPANY.

The address of Frank Baackes, vice-president and sales agent of the American Steel & Wire Company, Chicago, was as follows:

It gives me great pleasure to meet so many delegates—such a large, successful, representative body of men; men who handle directly $100,000,000 of our products per annum; and, indirectly, $200,000,000 more; in other words, a total of $300,000,000 of goods you distribute in the course of a year.

Naturally, we are very much interested in you and you in us. Therefore I think it proper that I say something to you to-day on the policy of the United States Steel Corporation.

Cause of the Depression in Business.

Let us look into the matter and see what was the real cause of the present depression. We read a good deal in the newspapers about this man or that man—Mr. Roosevelt or some other prominent men being responsible for present conditions. In my opinion they have nothing to do with it.



FRANK BAACKES.

What we have gone through was inevitable, and we all knew it and still we are surprised. We felt it coming for a year; and in the interest of you gentlemen and of the manufacturers of the country, the United States Steel Corporation maintained prices and values. Why? They knew that we had been very prosperous for a year; they knew that the country and the merchants were absolutely loaded up to the roof with material and stocks. Had they followed any other course what would have been the result? The result would have been disaster for every merchant in the United States—the biggest commercial panic of modern times. We prevented it. And, in consequence of that policy we are somewhat misunderstood. I don't think we are misunderstood by the merchants, but by the population at large.

Mutual Interest.

I don't want you to think that because we have taken that position, in order to allow you to liquidate without loss, it was entirely from philanthropic motives; at the same time it was to our own interest. We were as much interested as you were. Had we pursued any other course every man in this room would have had to invoice his stock 25 and 30 per cent. less than he did. And who would have been the gainer?

The Worst Is Over.

These conditions will not be better until we are through liquidating. The worst is over. I have been 29 years in this business, and have always found that good times follow a period of financial depression. Each one of us—the manufacturer, the jobber and the retailer—is carrying his load. There is no shifting of the burden as in previous panics, and, thank the Lord, we are all well off to-day.

Economic Laws Will Govern.

Now, just because the Corporation has taken that stand I don't want you to feel that it means that in future no flexibility of price may be expected. We cannot go contrary to economic laws; we can modify the actions of those laws, and that is what we are trying to do and what we have done successfully up to this time. When the proper time comes—when liquidation has run its course, when the slates are clean—and they must be clean before we can have a new era of prosperity—then, I am satisfied, proper adjustments can be made. But in the meantime you can go on and do business and order goods. Order them as you need them. The wise man always does that. There is nothing in speculation. If every man and every merchant buys just what he needs the fluctuations of prices won't hurt him.

Live and Let Live Its Motto.

I believe the policy of the Steel Corporation, "Live and let live," is generally recognized. Our record for the past eight years speaks for that. You must admit that your interests as distributors for the Steel Corporation's $300,000,000 are in safe hands. We must consult your interests, as well as our own, for they are mutual. We are so big we cannot be anything but honest. We've got to be honest whether we like it or not. That applies to every one of you. The bigger the man the more necessary to follow this policy, and the less dust he can throw in people's eyes. Our policy is absolutely open and above board. The United States Steel Corporation's statements are to-day adopted as models in the leading commercial schools of Europe.

We have nothing to conceal at this time, and shall conceal nothing in the future. We are one of the greatest corporations in the world, and, of course, I am somewhat egotistical on account of my connection therewith.

Credit Was Too Cheap.

Now I am going to offer you a little comfort. That panics will and must come is a foregone conclusion to every thinking man; otherwise the trend of things would have led us into another Mississippi bubble.' When this depression is over we will have had time to take counsel with ourselves, to see where we were. Credit is too cheap. This depression was absolutely necessary to afford us an opportunity to realize the situation. We need it once in a while; we must be hit on the head once in a while by something or somebody to bring us to our senses.

Every Man Must Stand His Share.

Now, a word on the labor question. They say that there must be no reduction of wages. I think that's wrong. Labor must also take its share in the present liquidation, because, as we are coming to another period of prosperity, labor will not be satisfied to stand still when the trend is upward. Where will that lead to? There is an Unseen Power that regulates all these things—something that regulates all these affairs, and every man, whether laboring man, or capitalist, must stand his share.

Conservatism the Watchword.

Therefore, this is no time to be pessimistic; but you should be conservative. Conservatism should be your watchword. If you follow that, you will be all right. You are not going to do as much business this year, as last; you will have a chance to make all who owe you pay up—to make all of them pay up. To my mind, the man who can't liquidate to-day, after three years of prosperity, should be "wiped off the board."

Good times will come again; credit is going to be just as cheap as of old. You are going to have the same volume of prosperity that you had before. Only, we must thank the Steel Corporation and other large corporations of the same character for relieving the bad effect of the panic. Prosperity and panics are inseparable.

Locating in the Country.

I heartily approve of Mr. Maxwell's ideas suggesting that manufacturers should locate in the country. I don't know whether it was forethought, or because of necessity on the part of the Steel Corporation; but the Steel Corporation is doing just the very thing that Mr. Maxwell spoke of. It is going into the country—I cite the new town of Gary, out of Chicago, as a good example of what Mr. Maxwell thinks should be done.

As I said before, there is absolutely nothing to be pessimistic about. Go home, and attend to your business. Keep your stock up, because you can't do business without stock—and trust to the Lord and the United States Steel Corporation.

ADDRESS OF C. W. ASBURY, PRESIDENT AMERICAN HARDWARE MANUFACTURERS' ASSOCIATION.

Representing the American Hardware Manufacturers' Association, we desire to have you thoroughly realize that we are not unmindful of the great work you are doing. Your organization has proved beyond the possibility of question the advantage of organized effort. Your plan of organization certainly brings to mind careful study and forethought. Through the State associations you are enabled to come into very close touch with your membership and all those who are engaged in the ultimate distribution of Hardware.



Value of the National Association.

When you concentrate this effort into a centralized body, as you have done in the National Association, you gather together the very best from each State for the use of the trade as a whole. Furthermore, you are enabled to advise upon business policies which cannot help to be beneficial to the individual members. Those who have come into direct contact with the retail trade are loud in their praise of the result of your efforts. They say that methods in the retail trade are rapidly changing, as a result of your work. Stores are being enlarged, systems are being installed, which means rapid progressiveness. We are not unmindful of the splendid work which has been done by your officers; their aggressiveness tempered with conservatism and wisdom is a subject of

Praise for Officers.

general comment among jobbers and manufacturers. You are all very familiar with the well directed efforts of these officers in opposition to the Parcel Post. You know they have extended beyond your own magnificent organization to organizations in other lines of trade—the result being such a unanimous expression of protest that Congress will naturally hesitate.

Influence in Legislation.

Those who represent the people at Washington always have an ear to the ground, listening for public opinion; and, furthermore, my experience teaches that these public men are only too glad to be informed before taking action. This spirit has been manifested in the hesitancy of Congress in enacting many of the bills which they are urged to enact by labor leaders.

Labor Problems.

The manufacturers, as large employers of labor, are very much interested in the "square deal," as applied to class legislation. You all probably know that the labor leaders are strenuously urging upon Congress the enactment of laws which specially favor them, or relieve them from the penalties of their acts while inflicting the prescribed penalty upon all others. They desire to be free in practicing conspiracy by boycott,

Unreasonable Demands.

while they especially desire to have general conspiracy treated criminally. They desire to restrain the courts in the issuance of injunction in labor disputes. Now, that proposition is really so simple as to need no special description. The very object of an injunction is to restrain temporarily the infliction of injury by one person or persons upon another person or persons until the cause can be heard in an orderly way and judicially determined. There certainly can be nothing wrong with that. Yet there are at the present moment nine separate bills pending in Congress, each attempting to reg-

Anti-Injunction Laws.

ulate the judiciary in such a way as to prevent the issuance of these injunctions and labor disputes, and no attempt whatever is being made that the injunction shall be otherwise restricted in other cases.

There are many bills pending looking toward a compulsory reduction in the hours of labor upon all contract work for the Government. This you can readily see will quickly mean the establishment by law of an 8-hr. work day. If this can be accomplished in an

Reducing Labor Hours.

orderly way I know of no objection to it. But stop and think. One concern has a contract with the Government; at the same time this concern is doing a large amount of work for the public. They would be compelled to operate that portion of their force which is engaged upon Government work 8-hr. only; whereas, the other portion of their force must of necessity work longer. This would bring chaos into any manufacturing establishment.

Confusion Should Be Avoided.

Far better let the hours regulate themselves, and the tendency will be to lessen them as the time goes on. And it will probably be but a comparatively short time when the hours will be voluntarily reduced and the same object accomplished—but without force.

Labor Leaders Do Not Always Represent Unions.

These and many other things are being attempted by the labor leaders. And you will notice that I distinctly specify labor leaders, and not labor unions; the large bulk of the membership of the labor union is composed of members for peace sake only, and not

Members for Peace's Sake.

because they are in harmony with the movement. This I have amply demonstrated in my own experience. Last spring we had a very small number of men in one department who went on strike upon the usual foolish proposition. After remaining out about two weeks and finding no evidence of weakening on our part, the labor leaders concluded that the only effective weapon they could use was to call a sympathetic strike in the entire plant. They arranged to have orators from the American Federation of Labor and from the International As-

A Sympathetic Strike.

sociation of Machinists address a general meeting called for the purpose of urging a general strike. I concluded that our proper course was to attend the meeting. After the usual speeches—class against class—had been delivered, I concluded that our employees only asked to have the truth presented to them, and if it was so presented we need entertain no fear.

Fair Dealing with Employees.

I stated openly before the meeting that we had no objection to labor unions; that not one man or boy within the hearing of my voice could claim that he had ever been asked the question whether or not he was a member of a labor union; whether he was a Baptist, Presbyterian, Methodist or Catholic—to us it made not the slightest difference. All that we asked of any of them was that they should have proper moral character and that they should work well and be well paid. This is the beginning and end of our contract with them. I said that I would be even more specific in saying that if they could show me a labor union managed for the uplifting of labor I would not only say that we had no objection to it—I would actually subscribe to its treasury. If I were asked to be more specific still I could quote an actual instance which has been called to my attention, the instance being an employer right in the city of Philadelphia employing largely female help. He employs a woman to keep the toilet rooms clean. He contends that this work is done in the interest of his employees and should therefore be paid for by them. He assesses them from 8 to 10 cents per week each, in order to pay the scrubwoman; net result, he collects from $28 to $30 per week and pays her $6. I said, "Go for him and I'll help you." It is unfortunately true that there are some unfair employers, and the field for profitable activity is wide for the labor union. It certainly has a great work to do, and if the work is properly directed it can be well done for the uplifting of labor. But when the labor union attacks a concern like the Enterprise Mfg. Company in such an unfair way, or for such an unfair cause, as the one now existing, we will certainly fight, and we will fight to the bitter end.

The result of this talk to our employees was that not only did they refuse to go out in a sympathetic movement, but those who were complaining actually withdrew their complaint and came back to work. This shows with some definiteness that the great body of the members of labor unions are inclined to be fair, reasonable and conservative.

Fairness to Employer and Employee.

My object in calling attention to this subject is to ask the assistance of your affiliated bodies in securing absolute fairness in legislation—both to the employer and to the employee.

Mutual Fire Insurance.

There is another branch of your activity which has attracted attention: mutual fire insurance of your members. Many of those engaged in industrial pursuits have long maintained mutual insurance, and have found it to be exceedingly profitable to them. To cite our own case: Our plant was insured in the stock companies for some years when, through disagreement with them, we concluded to join the then young mutual companies. The result has been a reduction in our rate from $1.25 to less than 8 cents as an average for the past five years. I predict success in your endeavor in that branch far beyond the expectation of those who are now joining the movement.

Preference for Standard Brands.

I am going to advocate to you one other item which I believe you will find beneficial: If you can induce your members to give preference to standard goods of quality, it will certainly mean the hope of greater permanency and greater profits in your business. If you sell an article, well worth the money, and of good, durable quality, you are making a permanent customer. It is not every dissatisfied customer who files a complaint. Many will harbor their dissatisfaction secretly and turn their business into other channels. There is one thing no merchant, no jobber, no manufacturer can afford: and that is the loss of customers.

Inland Waterways.

My attention was attracted to another item, suggested in Mr. Bogardus' address, yesterday: Waterways for the more efficient transportation of merchandise. We are all familiar, through the utterances of the President, with the great Mississippi Valley project; and, without desiring to detract one iota from the greatness and the large value resulting from this undertaking, I am going to suggest another, which seems to me to have equal possibilities. The Atlantic seaboard is made up of a succession of elongated islands and peninsulas, which give a very excellent opportunity, formed by Nature, for inland waterways. Do you realize that, in acquiring and enlarging three existing canals, and projecting the fourth, the total length of all being but 66

Atlantic Seaboard Canals.

miles, a continuous inland waterway can be formed very nearly 1000 miles in length? A canal is now being constructed through Cape Cod, which will connect Boston with New York. There is an existing canal from New York harbor to the Upper Delaware, which connects New York harbor with Delaware Bay; an existing canal across the short neck of Virginia, connecting Delaware and Chesapeake bays; and the one canal remaining is at Beaufort, S. C., which will

Possible Development.

complete the chain. If this scheme is carried a little farther by the use of the Erie

Canal from the Hudson to Lake Erie, then a continuous waterway will be formed from Duluth, in far Minnesota, to Beaufort, S. C.

Again, if a canal should be constructed between Pittsburgh and Lake Erie, the connecting link would be formed between the Mississippi Valley project and the Atlantic Ocean.

Advantages to Commerce and in War.

I need not take your time in describing the advantages of these waterways, not only to commerce, but in the protection of the country itself, in times of war. Consider for a moment the advantage of having such an inland waterway along the Atlantic seaboard for the use of the navy. The vessels could be harbored in any of the existing navy yards inland, and they could be mobilized and emerge at a point unknown to the enemy.

Permit me to again express to you the very high appreciation I have of the courtesy you have extended to me through your officers in permitting this talk. I look forward to the time when very much closer conferences will be the daily rule among manufacturers, jobbers and retailers. I think I can see great benefits to be derived from these conferences, and I can only express the hope that they will be furthered.

R. W. SHAPLEIGH ON "ARE GOODS WELL BOUGHT HALF SOLD?"

The phrase that composes the subject of this paper is one of those compact, crisp, potent sentences commonly called proverbs, maxims, wise sayings, old saws, &c., and I wish, in passing, to pay my respects to the man who gathered the wisest of these proverbs together from the different nations and tongues, and set them systematically and in order before the people.

Maxims That Stick.

Don't you remember the adages contained at the head of each page of your copybook when you were learning to write at school? Alas! now so many years ago for many of us. Can you not see them before you now? I am sure you cannot have forgotten them. Some of them are as follows: "Congenial occupation makes work easy." "Idleness is the first cousin to ignorance." "One example is better than 10 precepts." "It is hard for an empty sack to stand upright." "It is never too late to mend," as the boy said when he brought his torn trousers to his mother at 12 o'clock at night. The great seal of the State of Missouri contains one, peculiarly applicable to the National Retail Hardware Association in convention assembled to-day: "United we stand, divided we fall."



R. W. SHAPLEIGH.

There are hundreds of these trite sayings, each with a deep and sober meaning contained in very few words. In fact, these old proverbs contain practically all of the philosophy and wisdom of the ages boiled down. For over 150 years they have been in daily and hourly use, and scarcely a situation can arise to which one or more of them is not applicable in a practical way. If we read, mark and inwardly digest them, we find that they are not simple, but that their true meaning reaches down to the innermost fibers of the subject they relate to.

Wisdom Boiled Down.

Thus it is with our present text, "Are goods well bought, half sold?" At first appearance this saying appears to be perfectly simple, and self evident, but let us analyze it. Let us divide it into two parts, because in modern business affairs, while the buying and selling of goods should be and are, intimately interwoven, the characteristics of the two parts are entirely different. In taking up the first part, "goods well bought," it seems that the essence of this phrase lies in the definition of the words "well bought." In other words,

When Are Goods "Well Bought"?

On this point there may be many differing opinions, but if we can establish good, practical methods of buying goods *well*, we have solved the first portion of the subject. Let us, therefore, attempt to establish a few rules, the observation of which will insure us of goods being well bought. The two most important principles in buying goods are entirely self-evident. They are as follows:

1. To have the goods you want when you want them.
2. Not at any time to have goods that you do not need.

This is a beautiful theory, but poor human nature cannot, in practice, absolutely meet these requirements. The buyer who keeps these maxims constantly in mind, and is not diverted by the bait of attractive prices, is the one who comes nearest to perfection in this matter. We superior men often laugh at the eagerness of the bargain hunter, who rushes down town to purchase something that she has seen advertised at a low price in the paper, when she doesn't need the article at all. She rushes to get it simply because it is cheap. But do we, in our business, adopt firmly the first principle above mentioned? After these comes, less in importance, really, the question of *price*. Ah, price! How often does this little word obscure the buyer's vision to the exclusion of all other considerations? How often does he think that the mere figures given him represent the price?

Weakness of Bargain Hunting.

Temptations of Price.

Price a Complex Matter.

What is the price? What goes to make up this item that seems to stand foremost in the mind of almost every buyer? If some one were to offer you an article at a price 5 per cent. less than some one else, has he offered you a better price, and should you, in justice to yourself, give him the order? Not necessarily so by any means. This matter of price is a complex affair and mere figures do not by any means constitute it all. There are many other things to be taken into consideration before we can arrive at the real price. The quality of the goods to be received must be looked into very carefully. Have you not often bought goods because the figure on them was very cheap, only to find that they are poor in quality, badly packed, slovenly in appearance, and really dear at any price? The promptness with which the shipments are made is, in this age of quick service and frequent orders, a thing greatly to be desired. The completeness with which the order will be filled is also a vital question. Many times, in the experience of every one here, I am sure, have you paid a little higher figure in order to get all the goods you ordered. The character of the packages and the attractiveness of the labels on these packages is a point often not thought of, but of much importance, in order that the goods may present a pleasant appearance on the shelves. Also the manner in which the goods are packed in cases and the condition in which they will reach you should not be overlooked. Again must be taken into consideration the reputation of the house for shipping honest, full weight, full size, and clean, fresh, up to date merchandise, and the reputation of the house for prompt and fair adjustment of any claims.

Figures Not Everything.

Quality.

Shipments.

Packing.

Reputation of Seller.

Good Service.

All these items constitute service. Consider the reputation of the house for good service and honest dealing generally. All of the above are as much a part of the complete price as are the figures, and a careful consideration of them all is necessary in order to buy goods well. Is it not within the experience of each of you that you would prefer to pay a little higher figure when you know that you will get good service, good goods and good treatment in every particular?

Willingly Paid For.

It is a well established principle in business that good service is part of the price and should be paid for even to-day under the closest supervision by law. Some railroads are allowed to charge a higher price for the same haul on account of their giving better service.

A Part of Price.

In this age of close competition and close scrutiny the jobbing Hardware house must be right in price to be successful. Indeed, there is no margin in this business for a serious difference in mere figures between reputable concerns, although there may be a vast difference in the other items mentioned as comprising the complete price. The margin of profit made by jobbing houses to-day is extremely small, and the dealer who says he can buy at 10 per cent. or even 5 per cent. cheaper from one reputable concern than from another reputable concern on an assorted purchase is indulging in a large consignment of "hot air," or else is very ignorant.

Jobbers' Prices Show Little Difference.

Ordering Seasonable Goods in Advance.

Referring to the first principle to adopt that goods may be well bought, viz.: to have the goods you want when you want them, it is very necessary to look ahead

and to place orders for seasonable goods in advance, so that they may be in stock when you need them. Manifestly, if all waited for the opening of the season and all ordered this seasonable item at practically the same time, the stocks of the jobbers would quickly be broken and many dealers would be disappointed. The burden of this is borne by the jobbers, as they give a future dating on such orders. There has been some argument against the policy of placing "future" orders, but it is all false. Future orders are necessary, since it is physically impossible for the factories to supply the demands of the trade for seasonable goods unless they receive their specifications long in advance of the season and have an opportunity to make up and assemble the goods. It is quite evident that a careful observation of all the above mentioned rules will surely result in goods being *well bought*.

Jobbers Bear Burden.

Future Orders Necessary.

Relation Between Buying and Selling.

Now, let us now turn to the second portion of our text, and see if this careful buying will result in their being half sold. I am not at all prepared to say that this is true, for no matter how well goods may be bought, they will not sell themselves, and while good buying certainly does help to sell, it seems foolish to think that it helps out to the extent indicated in the text. In my judgment, the selling of goods in the proper way, is a more important and difficult operation than the buying. The buying is done, usually from houses of such a character that they will take the proper care of the orders of their customers voluntarily, but when it comes to a matter of selling, the whole burden lies on the merchant himself. Therefore, it is the most important feature of the business, and the disposing of his stock at a proper profit the most important and difficult part of the proprietor's duties. Even if it were true that goods well bought were half sold, no live merchant would be content with that. He would want the remaining half well sold, and the last half is much harder than the first half. It is with considerable regret that I cannot adopt the whole proverb as being absolutely true, but I know how difficult it is oftentimes to properly dispose of goods, be they never so well bought. Let us, therefore, attack the selling problem with more vigor and intelligence than heretofore. Let us give more thought to this feature of the business than we have done in the past.

Goods Won't Sell Themselves.

Two Halves to Be Sold.

Easier to Buy Than Sell.

Is it not true that it is much easier to buy than it is to sell? If it becomes known that any person desires to buy an article—a horse, a house and lot, or even any small item—he is immediately besieged by sellers of all descriptions, and often he is puzzled to know from whom to buy. How different it is when one has a horse, or a house and lot to sell. He often finds it takes a very long time to find a buyer, and then they want to get it for less than it is worth. To illustrate: I was besieged last week by the representative of two factories desiring to sell me an Automobile. I didn't want to buy one, hadn't said so, or even thought of it; for this is no time to buy Automobiles, and yet these men were diligently seeking for buyers, and spending much time and effort on very long chances.

Some Principles of Selling.

It is not in my province to attempt to give you experienced merchants any advice as to how to sell your goods. You know how, much better than I, but from general observation it has become impressed upon me that the most successful retail merchants are those whose stores, in the first place, are most attractive; stores in which the atmosphere, as well as the floors and shelving, is clean and sweet; where the ladies are welcome, and where the surroundings are such that they are glad to enter; stores where the clerks are neat and clean in their appearance; polite and attentive in their manners; where they are not smoking or chewing tobacco, or talking politics; stores where the shelves are filled with neat, clean, attractive packages, and where the proprietor is visible in the front part of the store, looking after the interests of his customers, and by his presence indicating to them that they are his first consideration. This in contradistinction to the proprietor who is rarely visible in the front part of his store, but spends his time in his office figuring over invoices and bills in an endeavor to buy goods cheaper, rather than interesting himself in adopting new and taking methods of selling goods, and being willing to spend a little money in that direction, if necessary.

I have noticed also that the most successful stores are those in which the clerks are well posted on the talking points of the different articles, and where they know the practical and everyday use to which these articles are put. People like to deal with those who can talk intelligently about the merits of an article, and who seem, at least, to know more about it than they themselves do. Many times a person will go into a store in search of information as to what he needs in order to do a certain thing. If he receives intelligent, practical advice, he will buy, and come back again. If not, he will not buy, and probably never come back.

Attractive Stores.

Presence of Proprietor.

Well Posted Clerks.

Pictures are very well in their way, and interesting, but the goods themselves, particularly in the Hardware and kindred lines, seem to have a fascination for the average person that is hard to overcome, and the proper displaying of one article is better than 10 pictures.

Goods Must Be Shown.

The first impression that one receives is sometimes very strong, and the impression made on a passer-by by a beautiful, harmonious show window—a window in which everything is neat and clean and good, or where some striking novelty is shown, an index of the character of the entire establishment, is too valuable an asset to be overlooked.

Attractive Windows.

Both Departments Important.

In conclusion, I will say that while my argument is not proven that "Goods well bought are half sold," let us not forget at all the real importance of buying them well. It is your duty to yourself to purchase your goods at the lowest price, and it is a part of the business that cannot be slighted in the least degree. But in considering as to what is the lowest price, let me urge you to take into your reckoning all the points above mentioned. Then after having done your duty with respect to the *buying*, use your best intelligence and energy in *selling*. Then will your goods not only be well bought, but well and completely sold.

E. C. SIMMONS ON SALESMANSHIP.

It seems peculiarly fitting that this convention should be held in St. Louis, because it is—as Mr. Norvell has recently said—the largest and best Hardware market, not only in this country but in the world, and it has been made so chiefly by reason of good salesmanship. In view of that statement, can you question the great importance of the science of salesmanship in the conduct of your business? Do you know that the sales of the Hardware jobbers of St. Louis are more than the combined sales of all of the Hardware jobbers of New York, Boston, Philadelphia and Baltimore? For that reason, the selection of this city as your place of meeting seems eminently correct. If there is any word that I can say, any experience that I can relate, or any suggestion I can make that will be of substantial benefit to even one man in this audience, I shall be glad to have been permitted to speak.



E. C. SIMMONS

Present Study of Salesmanship.

This subject has been so talked about and written about in the last five years, and so frequently the subject of papers or addresses, that I feel it has been thrashed over and thrashed out until there is but little if anything now to be said about it. I am rather fearful I may weary you in saying over again, in perhaps different form, what you have so often heard and read about before. You want a recital of facts, not theories, a relation of things accomplished and how they were done, rather than some one's imagination as to how it should be done. There are schools for salesmanship, and while I am not well posted as to their work, it is difficult for me to understand how salesmanship can be successfully taught in schools. It reminds me of an article by an old maid on "How to Raise Children," or the old story Mrs. Partington, who heard and old maid say "I can't bear children," and she replied, "Perhaps if you could you would like them better." If in the course of my remarks the personal note should appear, I beg you to excuse it. I shall try to avoid it; but I have been in the Hardware business so long and been so active in it that I feel myself to be part and parcel of it.

Salesmanship in Schools.

Relative Importance of Buying and Selling.

I regard good salesmanship as of the first importance in the conduct of the retail Hardware business. Here let me say that I will treat on salesmanship both of wholesale and retail houses, and I may mix them up a bit. If I do, kindly pardon it, as I have had experience in both, and they are so interlinked in the same qualities that one can hardly speak of one without reference to the other. I say, therefore, that salesmanship is the most important factor in the successful conduct of the Hardware business. The best evidence I can give of the sincerity of this statement is the fact that during all of the time that I actively managed our business I gave most all of my time to the selling of goods. When it came to the buying, I would do that largely on honor of the man I was trading with, and make short work of it. I assure you, so that I could get back to the selling end of the business as quickly as possible. I remember once buying a bill of Pocket Knives of Mr. Graef, who afterwards said that I bought over 4000 dozen assorted Pocket Knives in less than 30 min. Let me say in passing that my experience in trading "on honor" with manufacturers and their salesmen was always satisfactory, for never did one of them betray the trust I put in him. Don't draw the conclusion from what I have just said that I do not regard the buying end as important, for I do. The stock of goods you have to sell is the foundation stone of your business house, and we all know that unless our house has a good solid foundation the floods and winds will soon destroy it; but I mean that the buying is, so far as price is concerned, far less important than the selling, for I take it that the difference in price on articles of equal, or nearly equal, value is not 5 per cent, and therefore of far less importance than the selling end. The old adage that "goods well bought are half sold" is obsolete, and is to-day misleading; goods should be well bought, but, if so, it does not necessarily follow that they are half sold. It requires brains, tact, good nature and diplomacy to sell them.

Buying on Honor.

Old Adage Obsolete.

In an address that Mr. Norvell made last month in this city, before the Retail Hardware State Association of Missouri, he referred to a number of men who had prospered and become pronounced successes in the commercial world, who had been connected with our house, and he named R. H. Stockton, J. E. Pilcher, C. D. Smiley, J. K. Smith, H. M. Meier and C. H. Markle, and to this list I would add, as a noteworthy example, the name of Saunders Norvell. All of these men prospered, and have taken a front rank among commercial men. To these names should also be added that of my late and always deeply lamented partner, Isaac W. Morton, who was a bookkeeper and then a salesman for us before he became a partner of the firm and afterwards an officer of the corporation. I have named those gentlemen for two reasons: First, because it makes me happy to have it said that so many men profited and succeeded in such large measure by association with our house, and, second, because I want to impress it on your minds that those men were all salesmen, and that their success in life is due to the fact that they were good salesmen. Speaking of the wholesale business, a good road salesman is the most independent man engaged in the business. His wares (and by that I mean his salesmanship) are always in demand, for during all the time of my active direction of the business I never had a man who applied to me, and who impressed me as a "cracker-jack" salesman, get away. No matter how full we were, or how dull business was, I always engaged him, and never failed to do so in one single instance.

Successful Salesmen.

Demand for Salesmen.

The Qualities of a Salesman

have been so often written up that it seems superfluous to recite them, but in simple language I would say he must be "As wise as a serpent and as harmless as a dove." He must have capacity, health, industry, integrity, and be an early riser. Just why he must be an early riser I can hardly explain, except that the head is clearer and one is able to plan better by early rising than otherwise; but this I do know—that all of those men whose names I have mentioned as being very successful salesmen have been early risers. Industry is essential, because no man can possibly succeed in large measure in the Hardware business—wholesale or retail—unless he is a worker. It is a business of such great detail that he must work hard, real hard, or go to the "financial graveyard." Health is necessary to enable him to do the work required, and integrity must possess him, because if he is untruthful he cannot command the respect and confidence of customers, and without that his success will be small. To these qualities must be added tact or diplomacy. He should never contradict a customer—it never pays—one may differ pleasantly without contradicting. He should be a good mixer, and cultivate such habits of thought and conversation as will make him a welcome guest wherever he goes, and the better posted he is on general topics outside of his business the more welcome and the more successful will he be. I would impress upon your minds the great value of good "small talk" properly applied as a most important help to any salesman. I mean this to apply to the retail salesman, as well as the road man representing the jobber.

Industry Essential.

Value of Small Talk.

Good Retail Salesmen Not Always Successful Travelers.

I am often asked if a good retail salesman will necessarily be successful as a wholesale salesman. I say most emphatically No—not necessarily. The fact that he has been a good retail salesman is greatly in his favor, but I have known many good retail salesmen to make absolute failures as road men. The qualities required are different. The customer who comes to the retail store has a distinct want—he asks for some given article that he needs, and it is then up to the salesman to sell it to him, and to sell something else if possible before the customer departs. But with the traveling man it is quite the opposite. He enters a man's store, and is told at once, "There's nothing doing." "Don't want a thing this time," &c. Then is when the master mechanic salesman gets in his work, and convinces the merchant he does want something, and before he leaves he has booked a handsome order from the man who didn't want a thing. It's a contest of intellect; a triumph of mind over mind, which requires brains of an experienced and high order—it's no boy's work I assure you.

Contrasting Requirements.

A Contest of Intellect.

A Good Traveling Salesman Defined.

My favorite definition of a good traveling salesman is "one who helps his customers to prosper," for if the retail merchant does not prosper, how impossible it is for the jobber and his salesmen to prosper. The interests are so interlinked that they are identical. Hence, I say that a salesman who is not truthful, or who does not try to do his level best for his customer at all times and under all circumstances, or who is tricky or guilty of sharp practices, is a fool. A salesman must be a man of good habits to succeed. The day has gone by, thank God, when treating or taking a man out to get a drink, was in vogue with desirable merchants; but just why a retail merchant will continue to give orders to men who get drunk and have other bad habits I cannot understand. A few years ago I was talking with a merchant who divided his trade—giving one-half to our man, and the other to an Eastern man—who was notorious for being under the influence of liquor. I said to him, "Don't you get as good service, as low prices, and as good goods from us as you do from the other party?" He said, "Yes, and I get quicker and more complete shipments." I then said, "Why do you put these two men on an even basis? This man has been for years coming to you under the influence of liquor; my man never has, because he does not drink, and besides he is a perfect gentleman from his toes to his head." "Well, the other party is a good fellow." "Yes," I replied, "but my man has always been upright, sober, truthful and painstaking to please you. Are you rewarding him for his good qualities? I think not." He replied, "Well, I never thought of it that way, but I believe you're right, and if that other man doesn't stop drinking I will quit him and give your man all my business." Now, I think there is too much of this "good fellow" sort of business, and that you ought not to give your orders to men whose habits and character do not command your respect. If a man is not worthy, turn him down, and patronize the worthy salesman, and in that way compel the house to send out good men and men of high character.

Good Habits.

Character Should Be Recognized.

Salesman Must Know Goods.

In the Book of Proverbs, Solomon says: "The principal thing is knowledge; therefore, get wisdom." There is no line of business in which this is more important than in Hardware, and I would impress it, with all the emphasis I possess, upon every man within the sound of my voice to-day, and if haply these remarks should be published in any trade journal, upon all Hardware merchants and their clerks who may read them—to know your goods—to learn if they are good, why they are so, and how one article is better than another, that you may with a clear conscience recommend and guarantee them and sleep sweetly afterward. Are you willing to pay the price of success? That price is study and labor work—plenty of hard work. You all like to buy of the salesman who knows his goods, who is posted both as to prices and quality, who can quote you the principal items offhand without thumbing his catalogue and

Study the Price of Success.

keeping you waiting. If this be true, as I am sure it is, are not your customers like-minded? Do they not want to be waited upon by people who know what they have and the merits of same, as well as the price. When I sold goods the greatest want of all in retail Hardware stores was salesmanship. A good salesman (whether proprietor or clerk) was a great rarity. Since then this is greatly changed; most all successful retail stores have very good salesmen, and many proprietors take great pains to teach their clerks the general principles of salesmanship. One of the best salesmen I ever knew gave me this reply to my question as to what he considered of first importance in selling goods,

"*Know 'em and Show 'em.*"

There's a whole sermon in these five words. Know your goods and show them intelligently. I recall an incident of only a few years ago when I went into the store of one of our customers and found him on a ladder counting or taking stock of his Tinware. He greeted me with "Good morning," and kept on with his work. That was all right, but a few minutes later two ladies entered and he called down to them from his ladder, "Well, what is it this morning?" One of the ladies said, "I want a six quart Granite Milk Pan." He replied, "We haven't any," and kept on counting his Tinware and the ladies went out. Such a merchant can never succeed; this man failed within two years. Perhaps you will say I am taking an extreme case and no such things exist at present. Perhaps not. This was 10 years ago, and merchants are better educated—more polite, tactful and resourceful now than then. I believe this is true, and largely due to the benefits from membership in your State and national associations. Long may they live and prosper! I have always been in favor of them and consider them a great benefit to each and every member, because you come together in the most friendly spirit and learn from each other how to improve your business and to conduct it more profitably and successfully.

A Whole Sermon.

Benefits of Associations.

Good Men and Good Goods.

I believe that our house was the "pioneer" in establishing the principle of paying salesmen all they are worth, demonstrated by results, which has been copied (substantially) by every other jobbing Hardware house in this country. I don't believe in cheap men for salesmen. If you get a good man, or the "makings" of a good man, develop him; encourage him; pay him all he is worth. Don't wait for him to ask for it—volunteer it, but do it on the basis of payment after the service has been rendered. Encourage the sale of good goods rather than cheap goods. They are the cheapest in the end and will give greater satisfaction and also pay you better profits. A good Hand Saw is cheaper at $2 than a poor one at 50 cents. If a party buys of you something "cheap" that proves unsatisfactory he will always remember you or your store unpleasantly, and never think of the price or how cheap it was; whereas, if he buys a good article that is absolutely satisfactory he will not only remember you pleasantly, but will speak a good word for your store and recommend his friends to you "because you keep good goods."

Good Goods Cheapest.

When I say "try to sell good goods," I don't mean that I would not keep any cheap or low priced goods, for I would, just to show I had 'em, but, mark you, I would keep them, not sell them, so far as was possible. I would show the cheap goods first, where it seemed policy to do so, but would say, "Now, these are cheap goods and I cannot recommend them, but I have something here—producing the better goods—that I can swear by and guarantee in the strongest terms possible."

Keeping Cheap Goods.

Good Salesmanship Exemplified.

Here let me give you an incident that occurred in Florida about a year ago. I was in the store of one of our best and most intelligent customers, when two men came in (evidently carpenters) and asked for a Hand Saw. The clerk took out two standard brand Saws and laid them before these two men, but said nothing. One asked the price, and the clerk said, "$1.50 each," then silence ensued again. "Have you any others?" said the carpenter, and I motioned to the clerk to show another kind he had on the shelf, which he did. I then stepped up and said, "My friend, I know that to be one of the best Hand Saws in the world." I took it and "snapped" the blade; then I rung it with my finger tips, and said, "If you buy this you will never regret it." "What's the price?" said he. I answered, "$2." "Whew! I couldn't give $2 for any Hand Saw on earth." I said, "All right; I took you to be a good carpenter who wanted the best tools." He responded, "I am. I'll give you $1.50 for it." I said, "No; $2 is the lowest price." He said, "Well, I'll compromise it, and give you $1.75 for it." I said, "Not on your life; nothing less than $2 will buy it." He then said he wouldn't buy a Saw, and started for the door, so I called to him, saying, "If you buy that Saw you will like it so well you will take it to bed with you every night; and more than that, you will kiss it before you put it in bed. Don't forget it is sold on the basis of 'money back if you don't like it.' You run no risk." He said, "Well, I'll take it; wrap it up." When they had gone I called the clerks together and explained how this man had made a profit of $1 for the house, instead of about 35 cents, as he started out to do, and the way for them to earn good wages was to sell good goods at good prices. Three days later this carpenter came in and bought another Saw of the same kind, paying $2 for it, to take to a friend, who was working some 60 miles up in the country, and stated that the other was the best Saw he had ever owned or used in his life. I firmly believe that I transmitted to him, by good salesmanship, the confidence I had in the tool. This winter, when I visited them again, the proprietor referred to the incident, and said it had been of great benefit to his clerks, and they often talked about it.

Infectious Confidence.

Speaking of good goods, have you noticed how many failures there have been lately of the 5 and 10 cent stores and Racket stores? Lots of failures since January 1. That class of trade cannot stand the pressure of hard times and empty dinner pails.

Personal Attention to Customers.

There are so many kinds of salesmanship I cannot attempt reference to any considerable number of them, but I earnestly recommend to you to meet and welcome—by personal contact—all of your customers when they enter your store. A cordial grasp of the hand and welcome: "How are you, John; how's the wife and babies; is the gray mare over her lameness yet, and how's the farm work getting on?" &c., &c.,—is worth more than all the low prices you or your competitor have to offer.

A friend of mine started in business in Minnesota, and was not successful. He came to me and asked if I could tell him what was the matter. I replied, "I can't tell, but I will come up and look you over—maybe I can tell then." I did so, and found he was spending most of his time in his back office, figuring on how to buy something 2½ to 5 per cent. cheaper, and working on his books. I said: "Get out of this—get you a small flat desk—put it near the front door—greet all your customers—tell them you are glad to see them—ask what they want, and then call a clerk to wait on them. What you lack is personal contact with your customers. You are trying to make 2½ to 5 per cent. in your buying, while you are losing 33 1-3 to 50 per cent. in the selling end." He followed my advice, and is to-day a rich man, and often says he never got a start until he put his desk by the front door.

Expert Opinion.

I strongly advise you to do the same—there's nothing like personal contact. People want it—they expect it—appreciate it, and will have it. Don't, I beg of you, spend your time in your back office—keep out in front—mix with the people—welcome them—treat every person who enters your store as an honored guest, if you would succeed. That is good salesmanship of the highest order.

When I Was a Boy,

working in stock in the house of Child, Pratt & Fox (I think it was in 1857) it was my special duty to get out the orders sold by Mr. Fox. I was known as "Fox's boy," and he was "Foxy" not only by name, but by nature. On one occasion, a man whose name was Jake Smith, from Topeka, Kan., came to buy a new stock, and Mr. Fox waited on him. When the order came to me to get out, I saw that a lot of the goods were sold at higher prices than those marked on the samples in the sample room, so I took the book to Mr. Fox, and called his attention to it. He said, "You mind your own business, and get out that order—I know what I am doing." Well, the matter weighed on my mind, for I was most conscientiously brought up by my dear mother, and I could not sleep that night for the wrongdoing I felt I was a party to. So next day I went to Mr. Fox and said, "I'm afraid you did not understand me. This is wrong. Don't you see you are doing a wrong—charging a man more for the goods than the marked prices." He said to me, "My boy, let me teach you a lesson. This man lives in Topeka—66 miles west of Kansas City—beyond the rain belt. The goods go by boat to Kansas City, and then have to be hauled by ox team to Topeka. We will never see this man again, and therefore we must make all we can out of him now, as we will never get another chance; so run along, my boy, and finish up the order." But, I was not satisfied, and said: "But *it's wrong—it's wrong,*" until he threatened me with discharge. Well, next spring, after the ice had passed

out of the river so the boats could run. (There were no railroads in those days). Jake Smith came down and called upon Mr. Fox, and I was present at the interview.

Foxy Mr. Fox.

He upbraided Mr. Fox for taking advantage of his ignorance of prices—overcharging him, &c., &c., and called him a lot of vile names; but Mr. Fox took it all calmly, and let Mr. Smith exhaust himself. Then he said: "Jake, you're all wrong; I am the best friend you ever had, and I'll prove it to you before we get through." "Well, do it," said Smith. "Well," said Mr. Fox, "you were going up into a new country, weren't you?" "Yes." "Into a new market where no prices had been established?" "Yes." "You knew nothing about prices, did you?" "No." "Naturally you would base your selling prices on your cost, and mark your goods accordingly, wouldn't you?" "Yes." "Then, I said to myself, I must help this friend to establish good, high market prices. If I sell him cheap, he will establish low selling prices. No, I won't do him that injury—I will charge good, stiff prices, and he will go to Topeka, and, based upon the high prices *I* have charged him, he will establish high selling prices in Topeka, and when he has the market so established, he will come back here again, and I will then sell him a bill of goods so cheap that it will make his eyes water, and he can take them to Topeka, and sell them at the high prices I have been the means of helping him to establish. Now I am prepared to sell you a bill of goods so cheap as to make the two average up to your entire satisfaction." Jake Smith grasped Mr. Fox's hand, and thanked him, and bought another bill of him all right—just as Mr. Fox said he would, and then Mr. Fox privately gave me a lesson on shrewd salesmanship, which I thought so crooked that I left his employ, and went to another firm, who did business on the square. Let me add that Mr. Fox failed shortly afterwards—those kind of people usually do. No salesman can afford to be tricky, sharp or untruthful. He must be squarely honest and truthful, to be in a large way successful. I have recited this merely as a sample of the kind of salesmanship that is never a success.

Recently when visiting Florida, I noticed in a new addition to one of the Flagler hotels some solid mahogany furniture, and I said to the manager, "Why did you think it wise to buy that very heavy furniture?" He replied, "Because I was a fool and didn't know what I was doing. I was looking at some other mahogany furniture that was veneered when some very smart salesman came along and offered me solid mahogany at the same price, and he dwelt so emphatically on solid that I thought it must be better and bought it; but I found out afterward that the veneered was lighter and better and cost more to make; that it won't crack, while the solid will. I was convinced simply because the man was a better salesman than the one who had the better and cheaper goods."

Applied to Furniture.

Brains in Salesmanship.

Take the case of one of the gentlemen whose name I have mentioned as having prospered by reason of being connected with our house—R. N. Stockton. He was a natural born salesman of the first class; he sold a world of Cutlery, chiefly Pocket Knives and Razors, to druggists, and I never found out how he did it until after he had left us, as he never gave away his plans or methods to anybody. It was this: He learned all about tooth brushes, how they were made, what bones for the handles, where the bristles came from, how bleached, how glued in, &c.; in fact, all there was to know about tooth brushes. Then he would go into a drug store, leaving his Cutlery samples by the door, ask for the proprietor and if in he would say, "I want to buy a tooth brush." Then he would talk tooth brushes so intelligently that he would get the merchant interested by telling him a lot of things he didn't know before; then he would buy a tooth brush, thus putting himself in the attitude of a customer. Then his real work would begin, for he would draw from his pocket a sample of Razor or Pocket Knife and say, "I've got something here I want to show you; you haven't anything like it and it's a great seller." And from this he would get a start and then bring up his samples and end up with a fine Cutlery order. That is what I call brains in salesmanship.

From Tooth Brushes to Pocket Knives.

When in Minneapolis last September a customer of Hurty-Simmons Hardware Company told me this story: A farmer near him, who was exceedingly close but scrupulously honest, and who had the catalogue house habit, came to him to buy a Draw Knife, and on asking the price of the best Knife the merchant had, was told 90 cents. He threw up his hands and said he would never pay that for he could send to the catalogue house in Chicago and buy one for 25 cents. The merchant argued with him about quality, but to no avail, and he did send to the catalogue house and get one. When it came the merchant was posted, as he devised means to keep himself apprised of the arrival of the Draw Knife. A week or two later he drove out to this farmer's house, took him the daily paper, had a little pleasant visit and then asked to see the Draw Knife. After looking at it and finding it wretchedly bad, he said: "Mr. ———, will you do me a favor? Let me loan you what I call a real good Draw Knife for a week or two. I don't think you know how they have improved those goods lately." The farmer said, "Yes, I will; some day when I am in town I will get one from you." The merchant said, "I have one in my buggy, let me leave it," and he did so. The result was that in a short time he came in and asked the merchant to trade Draw Knives and let him pay the difference, which was done. The merchant says the farmer is, to a large extent, cured of the catalogue house habit. That merchant was a salesman sure.

Drawing Knives.

Salesmanship May Be Cultivated.

Some people say that salesmen are born, not made. I don't believe it. Almost any intelligent man can succeed as a salesman if he is possessed of good health and habits, is honest and truthful, and is willing to pay the price, which is work, work, and real hard work. Pardon the repetition in reference to work and my dwelling upon it, because it is my confident belief that unless a man is a "worker," he had better never enter the Hardware trade. It is all well enough to have ambition, but to gratify that you must pay the price.

Following Up Collections.

Before closing I want to take advantage of this opportunity of speaking to you on one of the most important parts of your business, and a feature that I believe is sadly neglected by many retail Hardware merchants, and that is to collect promptly. Under the date of December 31, 1907, I received the following letter from one of our very good customers, in which he said:

> On January 13, 1902, you wrote us, in response to our letter asking you to give us some advice and tell us how to conduct our business (which we were then just starting) successfully, and you replied, "Be good collectors." This may seem like a small matter, but these three words have done more to give us courage than all the other advice we ever had.
>
> We reasoned it out in this way: If you thought that a wise policy and had been successful with it, it must be a good thing for us, so we put it into practice. The result is, we have taken advantage of every cash discount since our store was opened, and are worth twice as much as we were six years ago. We thank you over and over again.

I cannot speak too strongly on this subject. It is of vital importance. Never have I known any merchant to achieve any material success who was not a good collector.

Don't Be Afraid to Ask for Your Money

when it is due, because it is due. More failures have occurred in the last half century because merchants did not collect promptly than from all other causes combined. Do you think it well to put your judgment against such a record as that? I hardly think so. When I sold goods, the weakest spots in the conduct of the retail Hardware business were lack of salesmanship and not being good collectors. Perhaps it is so yet. Why not follow

The Example of the Farmer,

who sells his products for cash only? Why is his property or his farm product any nearer a cash article than your merchandise? I can't see why it should be, and yet it is. Did you ever hear of a farmer offering to sell his hogs, his calves, his grain or his chickens on six months' time? I think not, for certainly I never did, and yet if you will permit it, he willingly asks you to sell him your merchandise, which represents cash in labor and raw material just as truly as his farm products. If this meeting resulted in nothing else than the positive determination of each and every one of you retail dealers to become better collectors—in fact, good collectors hereafter—I should say the meeting would be a great success in the best sense.

I thank you for the patience shown in listening to me and for your undivided attention; it seemed to me you wanted a simple statement, giving my ideas and experiences rather than a scholarly essay or an attempt at oratory. My purpose in addressing you was in the hope that some one at least might find suggestion, inspiration and instruction from my remarks—something he could take home, apply and receive benefit from. I love the Hardware business. My work in it has never been a drudgery, but always a pleasure. I plead for higher ideals in our business; better methods; a closer regard to living by the strictest conception of the meaning of the words integrity, truth and fairness. I wish that each and every one of us may so live as to uplift and ennoble the business, so that when we shall have crossed the Great Divide it may be truly said of us that the business in which we were engaged, and the world at large, is better for our having been in it.

Federal Pure Paint Law.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., March 31, 1908.

THERE have been important developments during the past week in the campaign for the enactment of a Federal pure Paint law, and the outlook for the passage of a well considered statute during the present Congress is now regarded as very encouraging by the advocates of this legislation. The House Committee on Interstate and Foreign Commerce has decided to give a hearing on April 7 at 10.30 a. m. upon the bill heretofore introduced by Representative Marshall of North Dakota, a full outline of which has already appeared in *The Iron Age*. In addition to the Marshall bill, Representative Dalzell, of Pennsylvania, on March 27 introduced a second measure, which is understood to have been prepared by the representatives of a number of firms engaged in the manufacture of mixed paints and of the National Association of Master House Painters and Decorators. The hearings on the Marshall bill will probably continue several days and will be followed by hearings on the Dalzell bill.

Readers of *The Iron Age* will be interested in a brief summary of the points of difference between the Marshall and Dalzell bills, as the latter measure will be regarded by the House Committee as a series of amendments offered to the former measure. The Mixed Paint manufacturers have adopted the general framework and the greater part of the text of the Marshall bill, but the changes made are of considerable importance and will be the basis of spirited discussion at the coming hearings.

Marshall and Dalzell Bills Compared.

The Marshall bill makes it unlawful for any person to manufacture, sell, or expose for sale within any Territory or the District of Columbia any Paint, Turpentine or Linseed Oil which is "adulterated or unlabeled," within the meaning of the act. In the Dalzell bill the prohibition is against "improperly labeling or misbranding" goods, and the penalty of one year's imprisonment provided by the Marshall bill is reduced to three months.

Section 2 of the Marshall bill prohibits the interstate shipment of adulterated or unlabeled Paint, Turpentine and Linseed Oil, while the Dalzell bill applies the same prohibition to "improperly labeled or misbranded" goods. The proviso to this section of the Marshall bill exempting goods intended for export and goods sold under a written contract direct to consumer has been rewritten in the Dalzell bill and reads as follows:

> Provided, that no article shall be deemed improperly labeled or misbranded within the meaning of this act when intended for export to any foreign country, the laws of which do not require such article to be so labeled; and provided further, that no article shall be deemed improperly labeled or misbranded within the meaning of this act when sold upon a written contract to a consumer for use in his own business and the label upon which article shall bear conspicuously the printed statement that it is made in accordance with a private formula; but if such article so sold to a consumer under a written contract upon a private formula be in fact resold by such consumer, then this proviso shall not exempt said article from the operation of any of the other provisions of this act; and a contracting painter applying said article on the property of others shall be deemed to resell the same within the meaning of this act.

The third sections of both bills are practically identical and authorize the collection and examination of samples of Paints, Turpentine and Linseed Oil in the open market. Section 4 of the Marshall bill, which provides the procedure before the Secretary of Agriculture in the case of the detection of spurious products on the market, is adopted in the Dalzell bill, but modified so as to permit the accused manufacturer to introduce evidence at the hearings provided for, and it is further required that it shall appear from the evidence that the alleged violation of the law was unintentional.

The Dalzell bill adopts section 5 of the Marshall bill, which makes it the duty of each District Attorney to whom the Secretary of Agriculture shall report any violation of the act to cause appropriate proceedings to be commenced and prosecuted in the proper courts of the United States, but it eliminates the provision requiring district attorneys to act upon representations of "any health or food or drug officer or agent of any State, Territory or the District of Columbia, who shall present satisfactory evidence of any such violation."

Sections 6 and 7 of the Dalzell bill, which respectively define the term "Paint," and specify the method of labeling, differ materially from the Marshall bill and are as follows:

> Sec. 6. That the term "Paint" as used in this act shall include Oxide of Zinc, Red Lead and White Lead, dry or in any kind of Oil, and any compound intended for the same use, colors ground in Oil, paste or semipaste Paint, and liquid or mixed Paint ready for use.
>
> Sec. 7. That for the purposes of this act Paint shall be deemed to be improperly labeled unless the package containing it shall bear a label printed in the English language in plain legible type and stating thereon the following:
>
> (a) The name and residence of the manufacturer of the Paint, or of the distributer thereof, or of the party for whom the same is manufactured.
>
> (b) The name and, with substantial accuracy, the percentage of each ingredient, both solid and liquid, contained therein. In the case of Paint other than white Paint, where more than one coloring material is used, the several coloring materials may be shown by their combined percentage, in which case it shall be necessary to state the name and, with substantial accuracy, the chemical analysis of each of such constituent coloring materials.
>
> (c) The net measure of the contents of the container of all liquid or mixed Paint, and the net weight of the package of all paste and semipaste Paint sold by weight, or, if sold by measure, the net measure of such package.

Section 8 of the Dalzell bill provides that "for the purposes of this act Paint, Turpentine and Linseed Oil shall be deemed to be misbranded if the package containing it be marked or labeled in any manner so as to tend to deceive the purchaser as to its nature or composition or as to the net content of such package." The Marshall bill contains a more elaborate provision covering practically the same ground, but substitutes the term "improperly labeled" for "misbranded," as used in the Dalzell bill.

Section 9 of the Marshall bill protects from prosecution a dealer when he can establish a guaranty signed by the wholesaler, jobber, manufacturer or other party residing in the United States from whom he purchased the articles in question. The Dalzell bill elaborates this section to include both wholesalers and retailers, and adds painters to the category.

Sections 10 and 11 of the Marshall bill, which are purely administrative and prescribe the court procedure for the enforcement of the law, are adopted bodily in the Dalzell bill, as is also section 12, which defines the term "Territory" as including the insular possessions of the United States, and the word "person" as including corporations, companies, societies and associations. In both bills section 12 provides that "when construing and enforcing the provisions of this act the act, omission or failure of any officer, agent or other person acting for or employed by any corporation, company, society or association, within the scope of his employment or office, shall in every case be also deemed to be the act, omission or failure of such corporation, company, society or association as well as that of the person."

A new section is incorporated in the Dalzell bill providing that "the provisions of this act shall not apply to any Paint, Turpentine or Linseed Oil which has been manufactured, produced or sold prior to the time that this act takes effect."

Under the terms of the final section of the Marshall bill the proposed law would go into force six months from the date of its passage and approval, but in the Dalzell bill the statute would become effective "from and after the first day of July, 1909."

At the coming hearings before the Interstate and Foreign Commerce Committee Professor Ladd, the well-known North Dakota Paint expert, who was instrumental in securing the enactment of the law of that State which was recently held to be constitutional by the United States Supreme Court, will champion the Marshall bill and will oppose the most important changes suggested by the Dalzell bill. Dr. Harvey W. Wiley, chief of the Bureau of Chemistry of the Department of Agriculture, under whose supervision the Marshall bill was revised previous to its introduction, will also attend the hearings, and it is understood will urge a favorable report upon that measure.

Death of Philip Scheeler.

PHILIP SCHEELER, president of the Buffalo Wire Works Company, Buffalo, N. Y., died on March 16 after a very brief illness. Born in West Seneca, N. Y. (now a suburb of Buffalo), October 5, 1854, he received his education in the public schools of Buffalo, where he had lived continuously, and by his sunny temperament and genial disposition had made many friends, to whom his death came as a great shock. Mr. Scheeler started early in life to follow the footsteps of his father, who died six years ago, and who was the originator of the Wire Cloth and Wire Work business in that section of the country. When he attained the age of 16, he began to work for his father and learned the weaving and Wire Work business from the bottom up. In 1883 he became interested in the business with his father and brother, composing the firm of Scheeler & Sons. After a few years the two sons, with Ferdinand Grimm, succeeded, under the style of Scheeler's Sons. In 1903 the present corporation of the Buffalo Wire Works Company was formed, Mr. Scheeler being elected president. Mr. Scheeler was prominent in social and fraternal circles. He is survived by his wife and two sons, Philip M. and Charles A., also one brother, Martin, and four sisters, Mrs. Jacob Pfohl, Mrs. John L. Fischer, Mrs. Ferdinand Grimm and Miss Frances Scheeler.



PHILIP SCHEELER.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM F. E. WEINLAND, who is opening a new Hardware store at Bethlehem, Pa.

FROM SEMINOLE HARDWARE COMPANY, Seminole, Texas, which has been incorporated with a capital of $10,000.

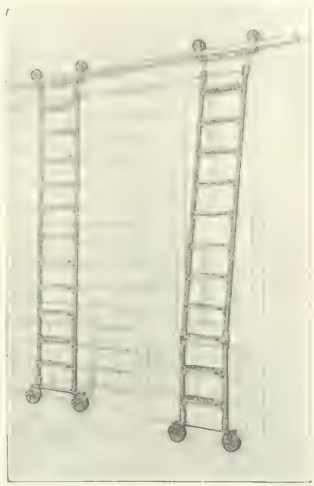
FROM JOHN HOENE, who is starting a Hardware store at Cottonwood, Idaho.

FROM S. W. KANADY, who has lately started a Hardware, Stove, Implement, Sporting Goods, and Saddlery store, at Denton, Texas.

FROM M. E. BROGAN, Portageville, N. Y., who has just built a new store, putting in a general line of Hardware, Saddlery, Vehicles, &c.

The Wilcox Rolling Store Ladder.

The Wilcox Mfg. Company, Aurora, Ill., has put on the market the Wilcox adjustable steel rolling store ladder, here shown, both bent and straight. The construction is such that all parts are interchangeable, and various lengths can be easily furnished. The ladder may be used straight or bent at the knuckle joint to conform to various angles necessitated by different projections of lower drawers or shelving. The ladders may be carried in stock by the merchant for instant delivery as conveniently as any other compact merchandise. The sides of round tubing are slotted to receive the ends of the steps, so that any hight of rise in inches can be obtained most acceptable to the user, the step being held rigidly by a set nut. Steps worn by excessive use or injured from any cause can be easily and quickly replaced with duplicate parts at moderate expense, thereby keeping the ladder practically new. Various lengths of ladder can be made on the extension principle. The malleable top and bottom brackets holding the rollers are also fastened with set screws. Regularly the ladders are finished a dead black, resembling in appearance the Bower-Barff finish, but both bronze and nickeled finishes can be supplied to harmonize with other store trim and fixtures.



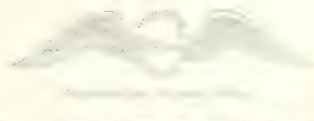
The Wilcox Steel Rolling Store Ladder.

The Acme New Oval Pattern Cast Shear No. 701.

The Acme Shear Company, Bridgeport, Conn., is putting on the market oval pattern, straight and bent cast trimmers, with steel screw, as shown in Fig 1. These are spoken of as being well made, strong, highly finished, perfectly adjusted and beautiful in design. Each shear is oiled, wrapped in antirust tissue, placed in antirust pockets, packed half-dozen in neat box. In Fig. 2 is illustrated the emblem, registered in the United States Patent Office, used in connection with these shears.



Fig. 1.—The Acme New Oval Pattern Cast Shear, No. 701.



Pattern Shears.

The Hardware firm of Lawson & Peterson, Rockford, Ill., has been succeeded by the Lawson-Peterson Hardware Company, which is incorporated with a capital stock of $10,000. The incorporators are William R. Lawson, Morton E. Peterson and P. A. Rosene.

Alcohol Gas Sad Iron.

The George L. Marion Mfg. Company, 129-131 Front street, New York, has perfected the self-heating laundry iron using denatured alcohol fuel, as here illustrated. Fig. 1 represents the flat iron as used, Fig. 2 showing the two working parts separated, with the combined burner and reservoir resting on the warming plate. In the depression of the steel plate a little alcohol is poured, the heat generated warming the burner, which in turn vaporizes the alcohol into a gaseous substance, producing an intense blue flame. Purchasers are cautioned to use denatured alcohol, not wood alcohol, as the latter not only has fewer heat units, but, vaporized, is especially injurious to the individual. The tubular brass burner

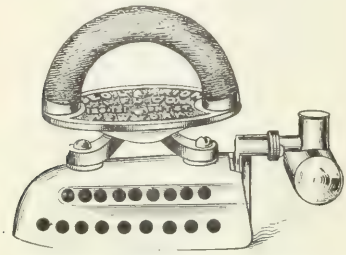


Fig. 1. Self-Heating Flat-Iron, Using Denatured Alcohol.

with Bunsen attachment is ⅜ x 4 in., and perforated on both sides and bottom to heat adequately the iron where most needed. In two minutes the alcohol vaporizes and ironing temperature is reached in 10 to 12 minutes, with a maximum heat in about 15 minutes. The standard size, No. 2, weighs 6 lb. with reservoir filled, and is 7 in. long and 3 in. wide at rear, tapering gracefully toward the front and slightly beveled at the heel. The wood handle is protected from heat by an oval iron plate, 3⅜ x 5¾ in., insulated with asbestos mill board, both next the plate itself and at the two points of contact with body of iron, which is perforated alike on both sides. The seamless tube fuel tank has a removable top cap, and is of 1¾ x 3½ in. capacity, and partially filled with soft cotton candle wick. The one-piece burner and reservoir by lifting slightly can be instantly withdrawn from its place in the iron. The cooling effect of damp-

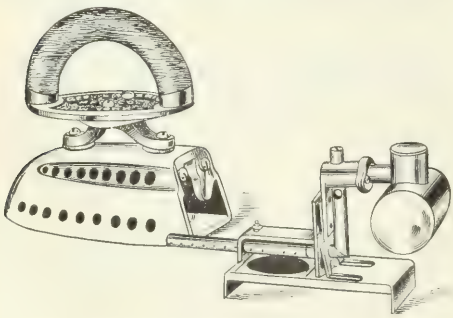


Fig. 2.—Burner Attachment on Warming Plate Device.

ened clothes on the temperature of the iron has been accurately determined; the heat generated being equal to the continuous demand on it. For ironing laces or other fabrics of any kind not moistened, consequently requiring less heat, the temperature can be easily reduced to prevent possible scorching by occasionally withdrawing the burner and resting it on the warming plate, which is struck up from one piece of 1-16 in. gauge steel, the top of which measures 2⅝ x 4¾ in. All metal parts, brass and iron, except warming plate, are finely polished and nickeled. The No. 1 is a smaller iron, suitable for boarders, tourists, &c., having 6 in. length of ironing surface, weighing 4 lb., and consuming 1½ oz. of alcohol in from 40 to 45 minutes. The No. 2, 6 lb., iron requires 4 oz. of alcohol in from 1½ to 2 hours. For convenience, either about the house or when traveling, portable black full leather cases, purple felt lined, are furnished. The front is hinged at bottom and top is hinged both back and front, the top and drop front being locked with a nickeled snap suit case catch. A 1 in. wide leather strap, sewed to each end of the case, with buckle, is used for carrying it. The larger case measures outside 5½ x 8 x 14½ in., the case for the No. 1 being proportionately smaller. Inside the case a sheet metal compartment at one end contains a filled pint glass alcohol flask and at the other end is a place for warming plate. Between the two the iron, properly braced, rests on a fixed ½ in. asbestos mat. There is also a removable asbestos mat or iron rest containing a supply of ironing wax. Some of the features of this device emphasized by the manufacturer, are: Safety, cleanliness, and uniformity in heat distribution; readiness for use in three to four minutes after alcohol gas is ignited; availability indoors or out, upstairs or down, independent of separate heat supply; freedom from odor, and cost, about a cent an hour, reckoned at 60 cents per gallon of denatured alcohol.

Underground Gasoline Tank and Pump Outfit.

The Wilson & Friend Company, 200 East Kinzie street, Chicago, Ill., is offering the underground gasoline outfit shown herewith. It consists of a tank and pump, necessary filler pipe and cap, vent pipe and cap; elbows and 20 ft. of pipe to connect tank and pump. The tank is made of heavy galvanized iron, and the pump of brass and iron, all wearing parts being brass, with no leather or rubber packing. It is a plain lift pump and is in-

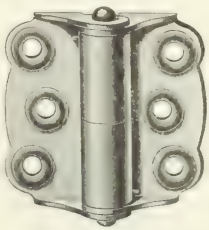


Underground Gasoline Tank and Pump Outfit.

tended for use only where the gasoline does not have to be lifted over 8 ft. from the bottom of the tank to the spout of the pump, and the horizontal pipe is not over 30 ft. The company is prepared to furnish the tanks with rotary pumps, where the distance from the tank is too great, or where quick action is desired. The tank is designed to be buried from 12 to 24 in. below the surface of the ground, according to climatic conditions.

Screen Door Hinge No. 900.

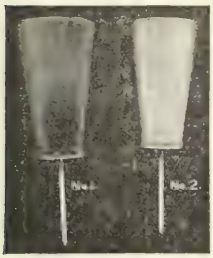
Bommer Brothers, 255-271 Classon avenue, Brooklyn, N. Y., are putting on the market the recently patented screen door hinge, shown herewith. It has a covered coil spring made of the best oil tempered wire. The barrel is made of two sections, and this construction, it is explained, gives an additional bearing, so that the hinge always carries the weight of the door on two bearings, no matter which end is uppermost. It is pointed out that this arrangement doubles the strength of the hinge and doubles its wearing quality. It is well finished and attractive in appearance.



Screen Door Hinge No. 900.

The Peterson Cemetery and Lawn Vase.

The William F. Kasting Company, 383-387 Ellicott street, Buffalo, N. Y., is offering the vase shown herewith for holding cut flowers. It is made of tin, white enameled, with a spike in the bottom to stick in the ground, holding the vase in an upright position. The spike is substantially braced in the bottom of the vase, which is watertight. It is made in two sizes, Nos. 1 and 2, the No. 2 measuring 6¼ in. in hight and 3½ in. in diameter at the top. The No. 1 is somewhat larger in size. The vases are particularly designed for cemetery use in ornamentation of graves, and also for the decoration of lawns. They are simple and durable and present an attractive appearance. Holding a large quantity of water they keep the flowers fresh.



The Peterson Cemetery and Lawn Vase.

The Ball Safety Razor.

The new safety razor illustrated herewith is being put on the market by the O. V. Ball Cutlery Company, Bourse Building, Philadelphia, Pa. The razor is a three-piece one, consisting of a double edged hollow ground razor blade, the handle and the guard. The blade is made of the finest high carbon bar steel, hammer forged, double concaved and perfectly ground. It is made heavy, like



Fig. 1.—The Ball Safety Razor.

an ordinary razor, giving the necessary weight to insure the best shaving results. The blades rest flat upon the guard, and have a threaded shank which fits into a socket in the handle, by means of which the blade is held tightly in the guard and kept in perfect alignment. The blades are interchangeable, and two are furnished with each outfit, so that with the double cutting edges of each blade practically four razors are supplied. A stropping guard, into which the razor blades slide, and in which they may be firmly held by the handle during the operation of stropping is also supplied. The different parts of the Ball razor are made of white metal, heavily silver plated, and any part can be replaced at any time and a perfect fit insured. In using the razor the manufacturers claim that the weight of the blade makes it adaptable to both light and heavy shaving. Its construction enables it to be used as an ordinary razor, and it can be used with the sliding motion required for the proper and easy method of shaving. Either edge of the blade may be used, and the company claims that there is absolutely no danger of cutting the face. The razor is supplied with metal or pearl handle, neatly packed in a wooden box 1½ x 7½ in., velvet lined, and covered with grain leather, and has button fastening clasp. The razor is offered at a price which will allow both jobbers and retailers a good margin of profit. The part of the outfit shown separately at the bottom of Fig. 2 is the stropping guard. To strop the razor the blade is removed from the shaving guard and placed in the stropping guard. The handle is then screwed on tightly and the stropping done as with an ordinary razor. To strop the other side the blade is reversed.

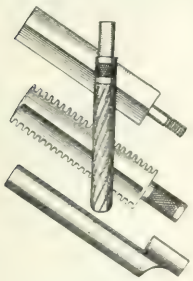


Fig. 2.—Different Parts of Ball Safety Razor.

Sopefount Shaving Brush.

The Posterity Company, 140 Commerce street, Newark, N. J., is manufacturing the Sopefount shaving brush and Sanitary shaving case, here shown. Fig. 1 is a phantom cut illustrating both the outer appearance of the nickeled handle to which the brush portion is screwed and the aluminum tube, 2¾ x ⅞ in., containing plastic soap of creamlike consistency. The brush proper is made of all pure imported badger hair or of blended hair, according to price. The hair is rubber set in a detachable screw cap, through the center of which is a small opening to permit entrance of soap tube, the contents of which is medically prepared and sealed by Johnson & Johnson, manufacturers of hospital supplies, for this purpose. In use the end thumb nut is given two or three turns to the right and pushed forward, causing sufficient soap to exude into the base of the brush for a shave. The thumbpiece operates a slender left-hand threaded rod, on the extreme end of which is an aluminum backed cork disk, which, as the disk recedes slightly on the rod and is then pushed forward, forces the substance into the brush in



Fig. 1.—Sopefount Shaving Brush.

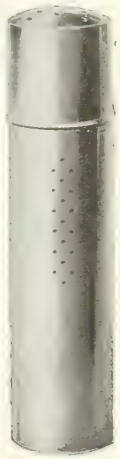
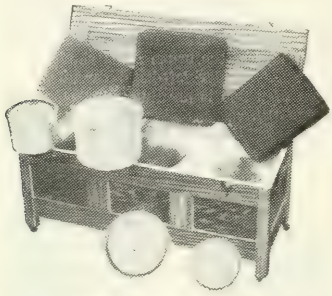


Fig. 2.—Nickeled Case for Brush and Razor.

wholesome sanitary condition to become lather by the addition of warm water. The bottom of the seamless tube handle is recessed ⅜ in., so the individual can conveniently reach the thumbnut and yet absolutely protect the contents of tube from possible contamination. There is an abundance of material for three months' average use, but when the tube is exhausted it may be thrown away and a new one under seal inserted. The brush itself is 2 in. long, and over all 1 x 5¾ in., weighing with soap tube complete 3 oz. The company also provide brush cases, listing but 25 cents each in aluminum, very light, measuring outside 1⅛ x 5½ in. There is also one of celluloid, ivory finish, 1¼ x 5¾ in., both of which have friction tight caps, ventilated, and all are noncorrosive. Fig. 2 is a seamless nickeled ventilated shaving case, 1½ x 6½ in., containing separate, removable compartments for both brush and standard razor, all of which are germproof and can be kept clean and sterile by scalding. The brush slides into a seamless tube by itself, and the razor has its own distinct space, spring controlled, to prevent movement or rattling about, the entire case with brush and soap weighing but 7 oz. The Sopefount brush is attractively put up in a double pasteboard box, with compartment for brush and separate space for the inner tube with soap; the latter an original package under seal until it reaches the consumer. The vulcanized rubber setting for brush prevents any shedding of hair.

Chatham Fireless Cooker.

The Manson Campbell Company, Detroit, Mich., is putting on the market the Chatham fireless cooker here shown. As now manufactured it has improvements of varied character on the cooker recently made. The cooker consists of an ornamental paneled hardwood, air-tight cabinet on casters. In use any food material, preferably cooked by boiling or steaming, may be placed in any or all of the three enameled ware cooking pots with covers and brought to a boil, 212 degrees F., in the usual way. The receptacles are then placed in the close fitting air-tight compartments, the close fitting pads, several inches thick, replaced, the chest lid closed and the food allowed to cook gradually and thoroughly for several hours, if necessary, by effectually retaining the heat first developed by any of the customary processes. All parts of the cabinet are thoroughly insulated, thus preventing



Chatham Fireless Cooker, Open.

dissipation of heat by radiation caused by lower surrounding temperature. Frozen mixtures, ice cream, &c., can be prepared and kept, by reversing the process. This method of cooking prevents the escape of odor except when the vessels are uncovered, thus retaining the aroma or flavor and natural juices. Fruits, vegetables, meats, &c., preserve shape, because there is no violent disintegrating boiling to break up their form. Fuel is greatly economized, especially if gas, kerosene, gasoline or alcohol is used for the starting operation, as that expense ceases shortly after it begins, instead of continuing for hours. There is no possibility of burning or scorching in the cabinet, boiling over, exhausting the moisture or need of care or vigilance. The insulating agents are upholstered in soft flannel and closely fitted around each compartment. The assertion is made by the company that food may be left in the compartments as long as 14 hours and still be hot, palatable and ready to serve.

The Fournier Automatic Weather Strip.

The accompanying illustrations represent weather strips offered by the Abel-Bauer Grille Mfg. Company, 423 Gratiot avenue, Detroit, Mich. As shown in Fig. 1

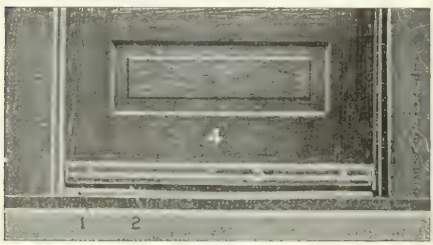


Fig. 1.—The Fournier Automatic Weather Strip.

the design of the door strip is automatically to close the space between the door and threshold. The device is composed of a flexible rubber strip held firmly between two galvanized iron strips hung at each end to work automatically, and firmly secured in a neat molding. It is pointed out that the action of the device is perfect, as its purpose is accomplished by its own weight, not coming in contact with the threshold until the door is closed, and not rubbing on the carpet, floor or rug. It is explained that the strip will work equally well on a new threshold or one partly or wholly worn out; that it is airtight and rainproof, and not affected by ice or snow, and that it will last as long as the door to which it is

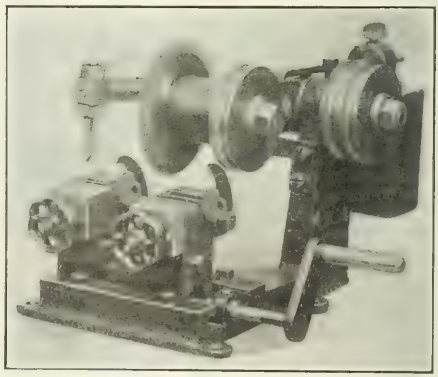


Fig. 2.—Copper Strip for Outside of Windows.

attached. In Fig. 2 is shown the company's copper weather strip for use on the outside of windows. The company also makes an oak weather strip for use on the inside of windows.

Taylor-Milligan Key Duplicating Machine.

Difficulties in the duplication of flat or so termed "Yale" keys have been entirely overcome, according to the claims made for the key duplicating machine, illustrated herewith. The machine described will cut any of the different makes of keys, having either U or V cuts, and make them accurately inside of one minute's time. The frame of the machine is of cast iron and is mounted on a wooden or metal table 24 in. square, and is operated by a foot treadle through a flywheel 26 in. in diameter by means of a round belt, the drive being through a loose pulley to a pulley on a short shaft, to which is attached a 4-in. milling cutter. The depth, width and direction of



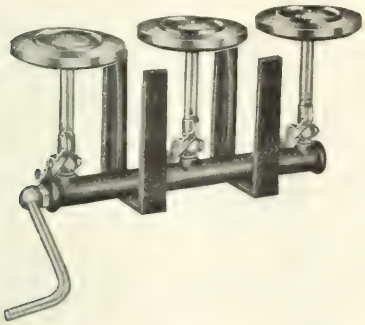
Taylor-Milligan Key Duplicating Machine.

the cut are governed by a guide on an extended arm, which is held firmly in position by lock nuts and by means of a setscrew, and keyway is always maintained in a parallel position with the milling cutter, insuring a perfect cut at all times. The cutter itself is held against a collar on the shaft, so as to keep it also in perfect alignment with the guide. The milling cutter and guide are counterbalanced by an adjustable weight at the rear of the machine, so that the front of the machine can be swung back out of the way while the keys and blanks are being adjusted in the vises. To overcome variation in the key blanks, as may be found in those manufactured by different makers, interchangeable jaws are supplied for use with the various makes of blanks. These are held in the vises by means of screws and can be changed with ease and rapidity, and govern the depth of the cut as compared to the bottom groove in the key. The vises for holding both the master keys and the blanks are on a common bed, and have a lateral motion through a screw feed which is operated by a hand wheel at the right of the machine. After inserting the master key and blank in the vises, the position as to the depth to which they enter

the lock is determined by two gauges. These take the adjustment from the top of the keys, which gives the actual depth that the key enters the lock. The key and blank are then locked in the vises by means of the hand wheels at the front, the gauges are pushed back out of the way and the machine is ready for operation. In operating the machine the guide pin, which has a slightly rounded, hardened edge, so as to prevent wear, is held down on the master key by the hand. With the other hand the operator, by the crank at the right of the machine, gives the vises the lateral motion bringing the different portions of the key under both the guide pin and cutter, and the operation is completed in a very short time. The machine, patents on which have been applied for, is now being manufactured for the patentees, Taylor & Milligan, by Chester S. Leonard, 2322 Market street, Philadelphia, Pa. The machine will either be sold outright or leased, and is furnished with or without the table; countershaft for power drive can also be furnished with the machine if desired.

Kalor Gas Attachment.

The Willock Mfg. Company, 140 West Forty-second street, New York, has just got out the improved Kalor portable gas attachment here shown. This heating and cooking device can be used in a cook stove or brick set range, as well as independently by connecting it with the gas supply, using a flexible rubber tube, slipped over the ⅜-in. brass curved tube with ball joint. Anything that can be baked or roasted in a coal stove, gas range, &c., or boiled on top can be cooked with a Kalor. Some of the new features include a much better distribution of gas through the perforated sheet metal burners several inches in diameter and the prevention of flash backs. The Bunsen burner keys are now made about 2½ in. long, with upper corrugations or grooves to facilitate turning off the gas supply when hot without risk of burning the hand, a push with the poker being sufficient. The cast iron body is 10½ in. long and 5½ in. high, with bottom center tube ⅞ in. outside. When used in a firebox the burners can be raised by a brick or other support, so that the flame is close to the covers, and when inserted in an oven they can stand upright or lie on the side according to necessity, the oven door closing, except for the space required by the long curved brass jointed tube, thus allowing the escape of the products of combustion and ventilating the oven and simultaneously admitting oxygen from the surrounding atmosphere to support combustion. In the absence of coal or wood fire in the firebox the burners can be turned directly against the water back and heat water for the connected range boiler. With this attachment the ordinary stove or brick set range can be improvised instantly into a serviceable summer stove for quick results, and without having the constant unnecessary heat beyond immediate requirements, at the same time getting the advantage of top stove space and a better control of heat by dampers and flue connection when the Kalor is in the firebox.



Improved Kalor Portable Gas Attachment.

The Lefever Arms Company.

With the completion of a large addition to its plant and the increased manufacturing facilities thus provided, the Lefever Arms Company, Syracuse, N. Y., will add the 16 gauge in the Durston Special and Durston Special Ejector grades fitted with Dura Nitro steel barrels. The company has heretofore furnished the 16 gauge in the H and higher grades only. The 20 gauge in the H grade, fitted with Carman fluid steel barrels, black, standard length of barrels and regular length of drops of stocks, will also be added. Previously the 20 gauge was to be had in the G and higher grades only. The 12 gauge H grade gun has previously been furnished fitted with best London twist barrels only. The company is now prepared to make immediate shipments of the H grade fitted with Carman fluid steel barrels, black, in addition to the twist barrels, and will be ready to make shipment after September 1 next of the 16 gauge in the Durston special grade and the 20 gauge in the H grade. The company has lately issued its 1908 catalogue giving full description of the different grades now manufactured.

Louden's New Wire Stretcher.

The Louden Machinery Company, Fairfield, Iowa, is offering the wire stretcher shown in Fig. 1 of the accompanying cuts. The wire grips are fitted with raised flanges or guards to prevent absolutely wires slipping under the eccentric grips, while these, in turn, are fitted with a comparatively long handle, which has an offset curve to add to the convenience and power for setting the grip with the hand. The iron sheaves are made to turn on special steel thimbles to insure ease of operation and strength, and take rope full ⅜ in. in diameter. The sheaves are finished in bright vermillion, with gold retouching. When desired the stretcher can be fitted with hooks instead of grips, as in Fig. 2, for hoisting purposes. A feature of the device to which the company directs attention is that when stretching wire the operator stands away from the wire, out of danger; also that when used for hoisting purposes the operator is away from the load instead of under it.

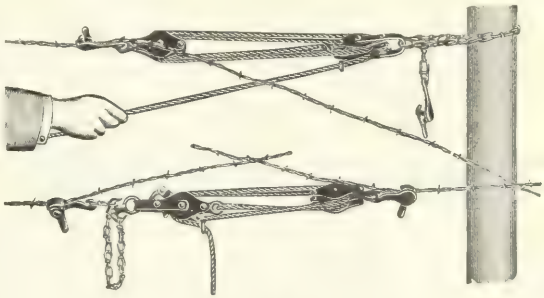


Fig. 1. Louden's New Wire Stretcher.



THE McVOY-WESSLING HARDWARE COMPANY, wholesale Hardware, Chicago, which since its fire on December 26 has been doing business at 22 Lake street, is now re-established in its former quarters, 72-76 Lake street. All traces of the damage done by water and flames have been removed, and the company is now prepared to carry on its business with improved facilities.

New Styles of Yankee Screwdrivers.

The North Brothers Mfg. Company, Philadelphia, is offering several new styles of Yankee screwdrivers and their attachments. Fig. 1 shows the magazine ratchet screwdriver, No. 65, which has four interchangeable

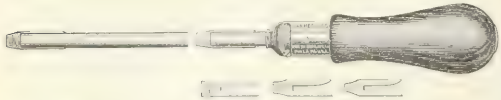


Fig. 1.—Magazine Ratchet Screwdriver with Blades.

blades easily removable and a magazine in the handle to hold them when not in use. As the four blades vary to suit different sizes of screws the one driver answers the place of four, affording a considerable saving in cost and much added convenience. The shank is of high quality steel, 11-32 in. in diameter, with the end grooved to correspond with forks on the blades and leaving a web of metal to connect the end, so that it is not weakened.



Fig. 2.—Holder with Blades for Use in Bit Brace.

The blades are of tool steel, an ingenious device holding them securely in place, although they may readily be pulled out with the fingers. When in use the magazine already referred to is flush with the end of the handle. The ratchet mechanism is for right or left hand and corresponds in material and workmanship with other tools of this company. This tool is made in two sizes, having 1¼ in. and 6 in. shanks, respectively. Fig. 2 shows a



Fig. 3.—Ratchet Screwdriver with Screw Holder Attachment.

screwdriver holder with four heavy blades for use in a bit brace. The length is 4⅞ in. Fig. 3 shows a ratchet screwdriver with screw holder attachment, which latter may be pushed back on the blade out of the way when not required, as shown in Fig. 4. The screw holder is intended to hold the screw, put it in place and to drive it especially in places difficult to reach and when one hand only can be used. The attachment consists of two jaws fastened to a head at one end with a ring to limit the spread of the jaws at the other end and a spring to operate them. When the screw is ratcheted in place the jaws will open as the head sinks into the wood so that the screw can be



Fig. 4.—Screw Holder Pushed Back on Blade.

driven in flush without having to unfasten the holder. It releases automatically. The company points out that in many places where it would be annoying to drop a screw in removal it can be partly turned out, the holder



Fig. 5.—Ratchet Screw Eye Driver.

slipped over it and removed in the holder. Fig. 5 illustrates a ratchet screw eye driver which is made in two sizes, No. 80, to hold No. 7 wire and smaller, and No. 81, to hold No. 11 wire and smaller. This tool consists of a regular ratchet driver with a holder or fork on the end

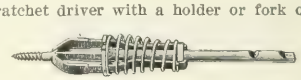


Fig. 6.—Bit with Screw Holder.

of blade. Outside there are two spring steel jaws fastened together at the lower end and kept in place by a surrounding ring which is fastened to the fork on the end of the blade. A spring between the fork and the lower end of the jaws keeps the latter in position to hold the screw eye as indicated in the illustration. The tool is equally valuable for driving or taking out screw eyes,

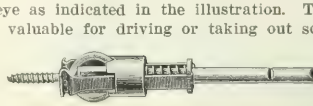


Fig. 7.—Bit with Screw Eye Holder.

especially in places where one hand only can be used. Figs. 6 and 7 show screw attachments for Yankee screwdrivers, the former being a longer bit than regular to fit drivers Nos. 30, 31, 35 and 20, sizes 1, 2 and 3. Fig. 7 shows a bit with screw eye holder made for Nos. 30 and 20, in size 2, to hold No. 8 and smaller screw eyes, and for Nos. 35 and 20, size 1, to hold No. 12 and smaller screw eyes.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, State and Western, raw, in bbls.	40 @42
City, Boiled, in bbls.	44 @45
City, Raw, in bbls.	43 @44
Raw, Calcutta, in bbls.	70 @..
Lard, Prime, Winter	65 @70
Extra No. 1	55 @57
No. 1	47 @52
Cotton-seed, Crude, f.o.b. mill	31 @31½
Summer Yellow, prime	41 @42
Summer White	41 @42
Yellow Winter	42 @43
Tallow, Acidless	57 @58
Menhaden, Brown, Strained	41 @..
Light Strained	41 @..
Northern	@..
Southern	@..
Cocoanut, Ceylon	₱ lb 6½@ 7
Cochin	₱ lb 7¾@ 8
Cod, Domestic, Prime	42 @44
Newfoundland	44 @46
Red Lilaine	9 @10
Sperm, Natural	₱ lb 37½@ 38
Olive, Yellow	67 @69
Neatsfoot, Prime	55 @58
Palm, Lagos	₱ lb 6 @ 6½

Mineral Oils—

	₱ gal.
Black, 29 gravity, 25@30 cold test	13 @13½
29 gravity, 15 cold test	13½@14
Summer	@15
Cylinder, light, filtered	20 @21
Dark, filtered	18 @19
Paraffine, 903-907 sp. gravity	14½@15
885-895 gravity	13½@14
88 sp. gravity	11 @11½
Red	13½@14

Miscellaneous—

Barytes:	
White, Foreign	₱ ton $18.50@20.50
Amer. Bleached	₱ ton 19.00@20.00
Off color	₱ ton 13.00@16.50
Chalk, in bulk	₱ ton 3.00@ 3.40
China Clay, Imported	₱ ton 11.50@18.00
Cobalt, Oxide	₱ 100 lb 1.45@ 2.60
Whiting, Commercial	₱ 100 lb .42@ .52
Gilders	₱ 100 lb .55@ .60
Ex. Gilders	₱ 100 lb .60@ .65

Putty, Commercial—₱ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.45
In 1 lb to 5 lb cans	2.65 @2.95
In 1½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—₱ gal.

In Oil bbls.	57½@58
In machine bbls.	58 @58½

Glue—

	₱ lb
Cabinet	12 @15
Common Bone	7½@ 9
Extra White	18 @24
Fish, liquid, 50 gal. bbls., per gallon	.60 @1.20
Foot Stock, White	12 @14
Foot Stock, Brown	9 @11
German Common Hide	10 @12
German Hide	12 @18
French	10 @10
Irish	13 @16
Low Grade	10 @12
Medium White	14 @17

Gum Shellac—

	₱ lb
Bleached, Commercial	23 @24
Bone Dry	28 @29
Button	10 @50
Garnet No. 1	17 @18
Fine Orange	29 @32
A. C. Garnet	23 @24
G. A. L.	18 @19
Kelly Button	17 @18
D. C.	18 @19
Octagon B	38 @40
T. N.	21 @23
V. S. O.	47 @48

Colors in Oil—

	₱ lb
Black, Lampblack	12 @14
Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	13 @16
Brown, Vandyke	11 @14
Green, Chrome	12 @16
Green, Paris	@24
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, English white, in Oil	10½@10¾
Lead, American White:	
Lots of 500 lb or over, in Oil	@ 6¾
Lots less than 500 lb, in Oil	@ 7¼
Lead, White, in oil, 25 lb tin pails	@ 7¼
Lead, White, in oil, 12½ lb tin pails	@ 7¾
Lead, White, in oil, 1 to 5 lb assorted tins	@ 8¾
Lead, American, Terms: On lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice.	

Zinc, Dry—

	₱ lb
American, dry	5½@ 5¾
(French process), Red Seal	6¾@ 7
(French process), Green Seal	7¼@ 7½
German (French process), Red Seal	6¾@ 7
Green Seal	7¼@ 7½
White Seal	7¾@ 8¾
French, Red Seal	8¼@ 8¾
Green Seal	10½@10¾

Dry Colors—

	₱ lb
Black, Carbon	6½@10
Black Drop, American	3½@ 8
Black Drop, English	5 @15
Black, Ivory	16 @20
Lamp, commercial	4 @ 6
Blue, Celestial	4 @ 6
Blue, Chinese	31 @33
Blue, Prussian	29 @31
Blue, Ultramarine	3½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.10@3.25
Green, Chrome, ordinary	3½@ 5
Green, Chrome, pure	17 @25
Lead, Red, bbls., ½ bbls., kegs	@ 6¾
Litharge, bbls., ½ bbls., kegs	@ 6¾
Ocher, American	₱ ton $8.50@16.00
American Golden	2½@ 3½
French	1½@ 2
Foreign Golden	3 @ 4
Orange Mineral, English	10 @11
French	12¾@13
German	10 @11
American	8½@ 8¾
Red, Indian, English	4½@ 6
American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer.	₱ 100 lb $0.50@1.25
English	₱ 100 lb $1.15@1.60
Sienna, Italian, Burnt and Powdered	3 @ 9
Italian, Raw Powdered	3 @ 7
American, Raw	1¼@ 2
American Burnt and Pow'd.	1½@ 2
Tale, French	₱ ton $18.00@25.00
American	₱ ton 15.00@25.00
Terra Alba, French	₱ 100 lb 90@1.00
English	₱ 100 lb .80@ 1.00
American	₱ 100 lb, No. 1 .75@ .80
American	₱ 100 lb, No. 2 .60@ .85
Umber, Turkey, Burnt & Powdered	2½@ 3
Turkey, Raw and Powdered	2½@ 3
Burnt, American	1½@ 2
Raw, American	1½@ 2
Yellow Chrome, Pure	13 @15
Vermilion, American Lead	7 @25
Quicksilver, bulk	65 @..
Quicksilver, bags	@66
English, Imported	65 @70
Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓%
Norris 10%
Zimmerman's—See Fasteners, Blind

Window Stop—

Ires' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ℔ doz. pairs, Nos. 1, $1.75; 2, $2.00; 3, $1.50; 4, $1.00; 5, $0.85.
Fernald Quick Shifter, ℔ doz pairs .....$2.00@$3.00

Anvils—American—

Eagle Anvils.....℔ lb @8½¢
Hay-Budden, Wrought.....9½@9¾¢
Trenton .....℔ lb 9¾@9¾¢

Imported—

Swedish Solid Steel Sisco, Superior, ℔ lb.....
Peter Wright & Sons, ℔ lb, 84 to 349 lb. 11¢; 350 to 699 lb. 11½¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....10%

Augers and Bits—

Com. Double Spur.....75&10@50%
Jennings' Pat. Bright.....50&10@70%
Black Lip or Blued.....50&10&5%
Boring Mach. Augers.....70%
Car Inside Screw.....40&10%
Ford's Auger and Car Bits.....40&5
Ft. Washington Auger Co., Canada's 35
Forstner Pat. Auger Bits.....20
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, 25%
No. 30, R. Jennings' list.....50
Russell, Jennings .....25&10&5%
L'Hommedieu Car Bits.....15
Mayhew's Countersunk Bits.....20
Pugh's Black.....60
Pugh's Jennings' Pattern.....35
Snell's Auger Bits.....60
Snell's Bell Hanger Bits.....60
Snell's Car Bits, 12-in twist.....60
Snell's King Auger Bits.....50
Wright's Jennings' Bits.....60%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's Pattern, No. 1, ℔ doz $26; No. 2, $30.....40&10
Ford's Clark's Pattern.....60&5
C. E. Jennings & Co., Steer's Pat..25%
Taplin Pat., small size, $18.00; large size, $26.00.....40&10
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 9, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$6.50@7.00
Ames .....25&10
Universal 20%

Ship Augers and Bits—

Ship Augers.....50&10%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6
Watrous' .....33⅓&5%
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdld, Shldered...gro.65%66¢
Unhandled, Patent...gro.66&70¢
Peg Awls:
Unhandled, Patent...gro. 41@51¢
Unhdld, Shldered...gro. 65@70¢
Scratch Awls:
Handled, Com...gro $3.50@4.00
Handled, Socket gro $11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz
First Quality.....$1.75@5.00
Second Quality.....$1.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles—

Iron or Steel
Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar.....4½@5¢
No. 1 Common, Loose.....3¾@4¼¢
No. 1½ Com., New Style.....4¼¢
No. 2 Solid Collar.....4½@5 ¢
Half Patent.....
Nos. 7, 8, 11 and 12.....65&5&10%
Nos. 13 to 17.....65&10&10%
Nos. 15 to 18.....70&10&10%
Nos. 19 to 22.....70&10&10%

Boxes, Axle—

Common and Concord, not turned lb., 5½@6¢
Common and Concord, turned lb., 6@7¢
Half Patent.....lb., 9½@10¢

Bait—Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....50&5%&10%
Straight Balances.....40&10&10%
Circular Balances.....50&10%
Large Dia.....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb per lb., —@2½@2¾¢

Towel -

No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—

Scale Beams.....40%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt, Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.80; Tinned $1.05
No. 11 Wire Coppered ℔ doz. $1.15; Tinned $1.20
No. 12 Wire Tinned.....℔ doz. $1.50

Beaters, Egg—

Holt, Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.30; No. 8, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dozer, per gro., No. 60, $6.00; No. 75 $6.50; No. 100 $7.00; No. 102, Tin'd, $8.50; No. 150, Plated, $15.00; No. 180, Plated Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dozer.....$6.50

Bellows—

Blacksmith, Standard List..
Split Leather.....60&10&10&5%
Grain Leather.....50&10&10%

Hand—

Inch.	6	7	8	9	10
Doz.	$5.50	$6.00	$6.50	$7.00	$7.50

Molders—

Inch.	10	12	14	16
Doz.	$5.50	$6.00	$12.00	$15.00

Bells—Cow—

Ordinary Goods...75&5@75&10&5%
High grade.....70&10@75&10%
Jersey .....25&10
Texas Star.....

Door

Home, R & E Mfg. Co.....55&10

Hand

Polished, Brass
White Metal
Nickel Plated
Steel
Cone's Globe Hand Bells.....33⅓@35%

Miscellaneous—

Farm Bells.....lb., 8¼@8½¢
Church and School.....60&10&5%

Belting—Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard .....50&5
Light Standard .....
Cut Leather Lacing.....40&10%
Leather Lacing Sides, per sq. ft. .....2½¢

Rubber—

Agricultural (Low Grade).....
.....75&10&5%
Common Standard....70&10&10%
Standard .....70&10&5%
Extra .....60&5&10&10%
High Grade.....50&5@60&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 30%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Spokes.....30
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden.....75&5&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....35
Cushioned 25

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage Bolt threads, ... and smaller.....75%
Tamper and hopper .....
Plow Bolts, Short Nose .....
Bolt Ends .....
Machine Bolt (Turned) ... and smaller.....
Tamper and Hopper .....

Door and Shutter—

Cast Iron Butts, Japanned, Round Brass Knob.
Inch 6 7 8
Per doz. $0.75 .....
Cast Iron Spring Foot, Jap'd:
Inch .....
Per doz. .....
Cast Iron Chain, Flat, Japanned:
Inch 6
Per doz. .....
Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch 6 8
Per .....
Wrought Butts, ... Brass ... Knobs.
... Brass ...
... Brass ...
*... Brass ...

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list: 1200 15%; 200, 300, 500 ... 30%
Hendryx Bronze, Series 700, 800 ...
Hendryx Enameled ... 35

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb. 4½@4¾c
Sharp, 1 prong, per lb. 4½@4¾c
Bliss, Blunt Barrel, Sharp, 1 prong
Lawler, Blunt, Heel & Toe, Sharp 1 prong
Perkins', Blunt, ₱ lb, 3.65¢; Sharp, 4.15¢

Can Openers—

See Openers, Can.

Caps, Percussion—

Eley's E. B. ... $8@$35
G. D. ... *per M* $4@$5
F. L. ... *per M* $6@$12
G. B. ... *per M* $5@$50
Musket ... *per M* $2@$3

Primers—

Berdan Primers, copper M ... 20@5%
Primed Shells and Bullets ... 15@10%
All other primers per M ... $1.50@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:
32 C. F., $6.00 ... 10@5%
38 C. F., $7.00 ... 10@5%
22 cal. Rim, $1.50 ... 10@5%
32 cal. Rim, $2.75 ... 10@5%
B. B. Caps, Can. Ball, Stegl. ... $1.90
B. B. Caps, Round Ball ... $1.40
Central Fire ... 25%
Target and Sporting Rifle ... 15@5%
Primed Shells and Bullets ... 15@10%
Rim Fire, Sporting ... 50%
Rim Fire, Military ... 15@5%

Casters—

Bed ... 65@70%
Plate ... 60@70
Piano ... 70@75
Ball Bearing ... 50
Stem ...
Standard Ball Bearing ... 45
Yale Double Wheel Cast Iron ...

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:
5/16 in. ... 7/16 ... 1/2 ... 9/16
5/8 in. ... 3/4 ... 7/8 ... 1 in.
Above sizes, discount ... per cwt.
Proof coil tests, deduct 25c
German Coil ... 60@10%
German Pattern Coil:
6-0 to 1 ... 70@5@70&10%
1 in. to 1 1/4 in. ... 70@10%
1 1/4 in. to 1 1/2 in. ... 70@10%

Halter—

Halter Chains ... 60@60&5%
German Pattern Halter Chains, list July 24, '97 ... 60@10&5%
Covert Mfg. Co.
Halter ... 35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.

Traces, Western Standard: 100 pr.
6½—6¾, Straight, with ring ... $25.0
6½—6¾, Straight, with ring ... $29.0
6½—8, Straight, with ring ... $32.0
6½—8, Straight, with ring ... $37.00
NOTE—Add 50 per cent for Hook Trace Traces; add per cent for Nos. and ... Nos. 1 to 3, in place of Straight Link.
Eastern Standard Traces, Wagon Chain, &c. ... 60&10@10&5%

Miscellaneous—

Jack Chain, list July 10, '95:
Iron ... 60&10%
Brass ... 60%
Safety and Plumbers' Chain, ... 60&10
Gal. Proof Chain ... lb. 7½@7¾c
Bird-cage Chain ... 50
Tower Chain ... 50&10@60
Trimmers' Chain ... 50
Bird Head and Tail Chain ... 50
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stall Bolt ... 50
Oneida Community:
American Halter, Dog and Key Chains ... 50
Niagara Dog Leads and Key Chains ... 45@5&5
Wire Goods Co.:
Iron ... 70
Coupling for Jointed Chain ... 50

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain ... 60%
Pullman:
Brass Chain, Steel Chain ... 50
Sash Chain Attachments, per set ... 3c
Aluminum Sash Ribbon, per ft ... $1.50@2
Sash Ribbon Attachments, per set ... 8c

Chalk—From Jobbers

Carpenters' Blue ... 5@5.35c
Carpenters' Red ... 5@5.35c
Carpenters' White ... 5@5.35c

Checks, Door—

Barrett's ... 45%
Pullman, per gro ... $5.00
Russwin ... 33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests with Tools ... 50%
Youths' Chests with Tools ... 33⅓
Gentlemen's Chests, with Tools ... 25
Farmers', Carpenters', etc., Chests with Tools ... 20%
Machinists and Pipe Fitters' Chests, Empty ... 15%
Tool Cabinets ... 45
C. E. Jennings & Co's Machinists' Tool Chests ... 7½

Chisels—

Socket Framing and Firmer

Standard List ... 80@—%
Iron & Brass ... 50
C. E. Jennings & Co.:
Socket Firmer No. 10 ... 25&7½%
Socket Framing No. 15 ... 15&—%
Swan's ... 60&10%
L. & I. J. White Co ... 30@30&5%

Tanged—

Tanged Firmers ... 80@5@35%
Iron & Brass ... 30%
C. E. Jennings & Co. Nos. 191, 181, 25%
L. & I. J. White Co ... 25&5%

Cold— *lb.*

Cold Chisels, good quality ... 13@15¢
Cold Chisels, fair quality ... 11@13¢
Cold Chisels, ordinary ... 9@10¢

Chucks—

Almond Drill Chucks ... 35%
Almond Turret Six-Tool Chuck ... 40%
Beach Pat., each $5.00 ... 35&8%
Empire ... 25
Blacksmiths' ... 25
Jacobs' Drill Chucks ... 35%
Peck's Positive Drivers ... 25%
Sargent Drill Chucks:
Independent Lathe Chucks ... 35
Universal, Reversible Jaws ... 35%
Combination Reversible Jaws ... 35%
Drill Chucks, Key Model, 25%:
Standard, 45; Shank Pat. 25%; Positive Drive ... 40%
Planer Chucks ... 30%
Taper Shank Drill Chucks ... 35
Standard Taper Shank Drill Chuck ... 45
Improved Drill Chuck ... 45
Pease Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21 ... 35%
Small Combination, Nos. 83 and 85 ... 35
Geared Scroll, Nos. 33, 34 and 35 ... 25%
Independent Iron, Nos. 18 and 318 ... 35%
Independent Steel, No. 64 ... 35
Union Drill, Nos. 000, 00, 100, 102, 103, 104 ... 35%
Union Gear Drill ... 25
Universal, 2, 3, 4, 5, 6, 7, 8, 15 ... 35%
Universal, 41, 42 ... 35%
Iron Face Plate Jaws, Nos. 38, 39, 48 and 50 ... 35
Steel Face Plate Jaws, Nos. 70 and 72 ... 30%
Westcott Patent Chucks:
Lathe Chucks ... 50%
Little Giant Universal Drill ... 50
Little Giant Double Grip Drill ... 50%
Little Giant Drill, Improved ... 50%
Oneida Drill ... 50
Small Universal Lathe ... 50%
Wright Mfg. Co.:
Universal Drill ... 25%

Clamps—

Adjustable Hammers' ... 20@20&5%
Carriage Makers', P., S. & W. Co ... 50&10%
Book Parallel ... 33⅓&8%
Morse Bit Rack ... 45
Linemans' Swedish Neverturn ... 65%
Wood Workers' Hammer ... 40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable ... 50%
Iwan's Champion, Stationary ... 40%

Sidewalk—

Star Socket. All Steel, ₱ doz. $1.05 net
Star Socket. All Steel, Stationary Pipe, $1.4 net
Star All Steel, ₱ doz.,
7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bro ... 30%
Fayette R. Plumb ... 30%
L. & I. J. White Co ... 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each ... $10.75
20th Century Horse, each ... $5.00
Lightning Belt Horse, each ... $15.00
Chicago Belt Horse, each ... $20.00
Stewart's Enclosed Gear Horse, each ... $6.75
Stewart's Patent Sheep Shearing Machine, each ... $12.75
Stewart Enclosed Gear Shearing Machine No. 8, each ... $9.75

Clips, Axle—

Regular Stales, list July 1, '95, net ... 60&10%

Cloth and Netting, Wire—

See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Packing, Liquor, Buttress, &c. ... 70%—
Compression Bibbs ... 60&10@—%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list ... 40%
Leather, Walter B. Stevens & Son's list ... 40%

Compasses, Dividers, &c.

Ordinary Goods ... 70&10@75%
Wm. Scholhorn Co.:
Excelsior Dividers ... 60%
Lodi Dividers ... 70&10%

Conductor Pipe,—

	Gal. Steel.	*Charcoal.*
L. C. L. to Dealers:		
Eastern	70&10	50&10&21½%
Pittsburgh	75&10&5	60
Central	75&10	6½%
Northwestern	75&10	60%
Western	70&12½%	50&12½%
Tennessee	70&10	50&12½%
Southern	70	50&12½%
Southwestern,	70	50&5%

Terms, 60 days; 2 cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co:

Gal.	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90
Galvanized, Lined, side handles, each	$2.50	$3.00	$3.50	$4.00
Each	$1.95	$2.15	$2.40	$3.30
White Enameled	10%			
Agate Lined	10			

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers ... *to pair and heavier, 22@25c; lighter than 3 lb. to pair* ... 24@27c

Cord— Sash—

Braided, Drab ... *lb.* 35¢
Braided, Colors, Nos. 8 to 12, 22¢; No. 7, 23½¢; No. 6, 25¢; in lots of 12 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18.. 87¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India ... *lb.* 11@11½¢
Cotton Sash Cord, Tw'ted ... *lb.* 8¢
Patent Jute ... *lb.* 20¢
Cable Laid Russia ... *lb.* 21¢
India Hemp, Br'd'd ... *lb.* 21¢
India Hemp, Twisted ... *lb.* 13@15¢
Patent India, Twisted ... *lb.* 17¢
Pearl Braided, ... No 6, ₱ lb, 25c; 7, 26c; 8, 27c; 10, 12, 26¢
Eddystone, Braided, Nos. 8 to 12, 22c.; 7, 23c.; 6, 25c.
Harmon Cable Laid Italian, Nos. 7 to 10 ... ₱ lb 23 ¢
Pullman:
Wire Sash Cord ... 10%
Sash Cord Attachments, per doz. 10¢
Samson, Nos. 8 to 12:
Braided, ₱ lb, Drab Cotton, 55¢; Italian Hemp, 40¢ @ 50¢; Linen, 85¢; White Cotton, 50¢ ... ₱ lb 40¢
Massachusetts, White ... ₱ lb 40¢
Massachusetts, Drab ... ₱ lb 45¢
Phoenix, White, Nos. 8 to 12, 27¢; Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian, 50¢; 40¢; Linen, 57½¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906 ... 90@—%
Hendryx Standard Wire Picture Cord, old list, 85&10%
Turner & Stanton Co, Wire Picture Cord ... 85&10%

Cradles—

Grain ... 40¢&12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber, ₱ gro.
Red, Blue and Purple, Indelible ... $7.50
Blue, Red, Yellow and Green ... $4
Terra Cotta ... $4
Giant Lumber, 3½ in. x 15-16 in. round and ... $12.50
Indelible, $14.00; Blacks ... $10.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 6 x 3-16 ... $3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $5.50; Light ... $5.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden ... 50%

Cutlery, Table—

International Silver Company:
No. 12 Medium Knives, 1847, ₱ doz. $3.50
Rogers Bros. Knives & Hamilton and Anchor ... ₱ doz. $3.00
Wm. Rogers & Son ... ₱ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co ... 40
Red Devil ... 60%
B. Mfg. Co ... 60
Wallward ... 50

Meat and Food—

American:

Nos.	1	2	3	4	5	6	7
Each	$5	$7	$9	$12	$25	$30	$60

Enterprise:

Nos.	5	10	20	22	32
Each	$5	$7	$9	$14	$25

Enterprise, ₱ doz., 5 to 32 ... 30&7½%
No. 202, $1.50 ... 40&7½%
P., S. & W. Co.:
Dixie ... 50&10&5%
No. ... $30.00
Ideal ... 40&10&5
Habo ... 60&10&5
Little Giant ... 40&10&5
No. ... $68.00
New Triumph No. 605, ₱ doz. $24.00 ... 40&10%
Russwin Food. No. 1, $24.00; No. 2, $27.00 ... 45&10&5%
No. ... $15.00 ... $18.00
Enterprise Beef Shavers ... 25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters ... 35
Corn Graters ... 30
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife ... ₱ doz. $3.00
Combined Slaw Cutter and Corn Grater ... ₱ doz. $1.00

Tobacco—

All Iron, Cheap ... *doz. $4.25@$4.50*
Enterprise ... 25@30%
National, ₱ doz., No. 1, $21; No. 2, $18 ... 40%

Diggers, Post Hole, &c.

Disston's:
Rapid, ₱ doz., $24.00 ... 25
Samson, ₱ doz., $34.00 ... 25
Iwan's Improved Post Hole Auger ... 40
Vaughan Pattern Post Hole Augers, ₱ doz., $7 ...
Perfection Post Hole Diggers, ₱ doz. ... $8
Split Handle Post Hole Diggers ₱ doz., $7 ...
Hercules Pattern, ₱ doz ... $10
Kohlers, ₱ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival $8.50; Pioneer ... $7
Never-Break Post Hole Diggers, ₱ doz., $24.00 ... 60

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers ... 35
Sterling Wheel Dresser Cutters ... 35

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines ... *$1.50@$1.*
Breast, Millers Falls ... 60
Breast, P. S. & W ... 50
Goodell Automatic Drills ... 50&10@60&10
Millers Falls Automatic Drills ... 33⅓&10
Ratchet, Curtis & Curtis ... 2
Ratchet, Parker's ... 40
Ratchet, Weston's ... 40
Ratchet, Weston's, Style H improved ... 40
Ratchet, No. 012 ... 40
Ratchet, Celebrated ... 40
Ratchet, Whitney's, P., S. & W ... 50&5
Whitney's Hand Drill, No. 1, $10.00 ... Adjustable, No. 10, $12.00 ... 33⅓

Twist Drills—

Bit Stock ... 70@70&5
Taper and Straight Shank ... 60&10@70

Drivers, Screw—

Screw Driver Bits, per doz. ... 45@5
Bailey's Screw Driver and Gimlet, ₱ doz., 2½-in., $6; 4-in., $7.50; 6-in. ... 9
Buck Bros.' Screw Driver Bits ... 30
Champion ... 5
Disston's ... 7
Fray's Hol. H'dle Sets, No. 3, $12 ... 5
Fray's Brace Screw Drivers ... 40&10
Gay's Patent Action Ratchet ... 30
Goodell's Auto ... 65@65&10
Mayhew's Black Handle ... 40
Mayhew's Monarch ... 40
Millers Falls, Nos. 20 and 21 ... 25&10
Millers Falls, Nos. 11, 12, 41, 42 ... 15&10
Smith & Hemenway Co., Never turn, 66⅔%; Elmora, 60%; Star ... 30&10
Swan's:
Nos. 7565 to 7568, 50%; No. 7540 ... 40&10

Eave Trough, Galvanized

Territory.	*Gal. Steel.*	*Charcoal Iron*
Eastern	75&10&5%	60&20%
Pittsburgh	75&10&5	60&20
Central	80&10&10&2½%	65&10%
Northwestern	80&10&10	65&10%
Western	80&10	60&10&5%
Tennessee	80&5	60&10&5%
Southern	80	60&10&5%
Southwestern	75&10&2½	60&5%

Terms—2% for cash. Factory shipments generally delivered.
Note.—Lower prices are made in some sections.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories
Galv. Steel and Galv. C. I. Standard Gauge ... *85@85&10%*
No. 26 ... 50
No. 24 ... 85
No. 22 ... 10

Elbows, Stove Pipe—

Edwards Standard Blue ... 40&10&10
Edwards Royal Blue ... 40&10&10
Reeves, Dover, one piece ... 40&10

Emery, Turkish—

	4 to 16:	*5¼ to 22:*	*Flour*
Kegs ... *lb.*	5 ¢	5½ ¢	5¼
½ Kegs ... *lb.*	5¼ ¢	5¾ ¢	5¾
¼ Kegs ... *lb.*	5½ ¢	6 ¢	6
10 lb. cans, 10 in case ...	6½ ¢	7 ¢	8
10-lb. cans, less than 10 ...	10 ¢	10 ¢	8
Less quantity ...	10 ¢	10 ¢	8

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice—See *Squeezers, Lemon*

Fasteners, Blind—

Zimmerman's ..... 50&10%
Wellington's ..... 40&10%
Upson's Patent 40%

Cord and Weight—

Ives and Titus ..... 33⅓ %

Corrugated—

Acme Corrugated Fastener Co. 50%

Faucets—

Cork Lined ..... 3rd list 60&10%
Metallic Key, Leather Lined,
Quadruple ..... 70&10%
Red Cedar ..... 40&10% 40&10&5%
Petroleum ..... 70&10&7.5 %
B. & L. B. Co.:
Metal Key ..... 60&10%
Star 60%
West Lock ..... 55&10%
John Sommer's Peerless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Mill Key 50&10%
John Sommer's Dollar Metal Key 60%
John Sommer's Diamond Lock 50%
John Sommer's I. X. L. Cork Lined 50%
John Sommer's Reliable Cork Lined..
50&10%
John Sommer's Chicago Cork Lined 60%
John Sommer's O. K. Cork Lined 50%
John Sommer's No Brand, Cedar 50%
John Sommer's Perfection, Cedar 40%
Self Measuring:
Either ⅛ doz $36.00 ..... 40&10%
Larger ⅛ doz $36.00 ..... 40&10%
Natural Measuring, ⅛ doz. $36.40&10%

Felloe Plates—

See Plates, Felloe.

Files— Domestic—

List Nov. 1, 1899.
Best Brands ..... 70&10&7.5&10%
Standard Brands ..... 67 & 10 & 5%
Lower Grades ..... 70&10&5%

Imported—

Stubs' Tapers, Stubs' list, July 24, 97 ..... 35 & 10 & 10%

Fixtures, Fire Door—

Acme Underwriters Appliance Co. 50%
Automatic Mfg. Co. Special No. 1 ..... 50%
Universal No. 1 ..... $6.75
Peerless No. 2 ..... 60%
Expansion Bolt No. 1 ..... 60&10%

Grindstone—

Net Prices:

Inch	15	17	19	21
Per doz	$3.60	3.85	4.15	4.60

P. S. & W. Co. 60%
Reading Hardware Co. 60%

Fodder Squeezers—

See Compressors.

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig Ezy Potato ..... 6 &15
Net List, Hay ..... 6&10&5%
Victor, Manure 66⅔
Victor, Header 65
Champion, Hay 66⅔
Champion, Header 66⅔
Champion, Manure ..... 6&10&5%
Columbia, Hay ..... 6.&2
Columbia, Manure 70%
Columbia Spading ..... 6&10%
Hawkeye Wood Barley 40
W. & C. Potato Digger ..... 6&10
Acme Hay 60%
Acme, Manure, 4 tine ..... 60&10&5%
Dakota Header ..... 6.&2
Jaxson Steel Barley ..... 6.&20
Kansas Header 65%
W. & C. Favorite Wood Barley 40%
Plated.—See Spoons.

Frames— Wood Saw—

White, S'g't Bar, per doz. .75@80¢
Red, S'g't Bar, per doz. .$1.00@1.25
Red, Dbl. Brace, per doz $1.40@1.50

Freezers, Ice Cream—

Qt.	1	2	3	4	6
Each	$1.25	$1.60	$1.90	$2.25	$2.80

Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp $2.75
Cotton 3.20
Waterproof Soft Taped .. 3.85
Waterproof Dbl. Taped .. 4.40
Waterproof Tpl. Taped .. 5.15

Gates, Molasses and Oil—

Stebbins' Pattern ..... 50@50-5%

Gauges—

Marking, Mortise, &c. .50@50&10%

Combination 50%
Marking, Mortise & ..... 50&10%
Dodge Marking, Mortise & 60%
Wire, Brass & Steel 50%
Wire, Wood 50%
Wire, P. S. & W. Co. 33⅓

Gimlets— Single Cut—

Numbered assortments, per gro.

Nail, Metal, No. 1, $2.00; 2, $2.40
Spike, Metal, No. 1, $3.00; 2, $3.40
Nail, Wood, Handled, No. 1,
$2.00; 2, $2.40
Spike, Wood, Handled, No. 1,
$2.00; 2, $2.40

Glass, American Window

See Trade Report

Glasses, Level—

Chapin-Stephens Co. ..... 65%&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush ..... 25&10%&50%
Elwell's 10%

Grease, Axle—

Common Grade, per gro. $6.00@6.50
Dixon's Everlasting, 10-lb pails, ea. 85¢; in boxes, ⅛ doz., 1 lb., $1.20; 2 lb. $2.00
Helmet Hard Oil 25%

Griddles, Soapstone—

Pike Mfg. Co. ..... 33⅓ & 33⅓ & 10%

Grinders—

Royal Mfg. Co.:
Aluminum Grinding Machines, each, No. 1, $1.75; 1A, $2.50; 10, $5.00 ..... 40%
Aluminum Sickle Grinders, each, No. 1, $5.00; 2A, $6.00; 3A, Combined $6.50 ..... 40%
Aluminum Disc Grinders, each, $2.50 ..... 30%

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, ⅛ doz., $2.00 ..... 33⅓
Richards Mfg. Co., Ellwood City, Pa., Bar Boring mounted 10

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... 6 & 4 & 10 & 4 & 1 %
Halter and Chain:
Tie Out Halters, No. 1 ..... 50%
Blind Halters, No. 1 ..... 50%
Blind Halters, No. 2 ..... 50%
Blind Halters, No. 3 ..... 50%
Cow Ties 50%
Jute Rope ..... 30&2
Jute Rope 30%
Sisal Rope 20%
Cotton Rope 45%
Hemp Rope 46%
Oneida Community:
Am. Cow Halters ..... 40&10&5%
Am. Cow Ties ..... 45&5%
Niagara Coil and Halters. 45&50&5%
Niagara Cow Ties ..... 45&5&50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists' ..... 55&10 & 55&10&5%
Hebert's Hartford ..... 40&5&10&5&2½%
Peck, Stow & Wilcox Co.:
Cross Peen 50%
Hatchets 50%
Riveting 50%
Machinists' Ball Peen 50%
Blacksmiths' 50%
Lawrence B. Wright:
A. B. S. No. 1 ..... 40%
A. B. S. No. 2 ..... 40%
A. B. S. Hatchet 40%
Machinists' Hammers 40%
Riveting Hammers ..... 40&10&5%
Riveting Hammers ..... 40&10&12½&5%

Heavy Hammers and Sledges

Under 3 lb., per lb., 50¢ ..... 80&10%
3 lb. and over, per lb. 70%
Cross Peen, per lb. 60%
Riveting, per lb. 50%

Handles—
Agricultural Tool Handles

Axe ..... 6 & 4 & 10 & 4 & 1 %
Hoes, Rake, &c. 40%
Fork, Shovel, Spade, &c.:
Long Handles 40
D Handles 10

Cross-Cut Saw Handles—

Atlas 40%
Champion 50%
Disston 50%

Mechanics' Tool Handles—

Adzes, assorted, open eye $1.50
Broad Axe ..... gro $1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@
$2.65; Hickory ..... $2.15@2.40
Socket Firming, Apple, $1.75@
$1.95; Hickory ..... $1.60@$1.75
Socket Framing, Hickory,
$1.60@$1.75
File, assorted ..... gro. $1.30@$1.40
Hammer, Hatchet, &c.
..... 6 & 4 & 10 & 4 & 5%
Hand Saw, Varnished, doz
sides; Not Varnished ..... 65@75¢
Plane Handles:
Jack, doz. pr.; Fore, doz. pr. ..... 75¢
Cabinet 50%
Carving Tool ..... 30&10%
Chisel 50%
Firmer 50%
Socket 50%
Socket Framing 50%
Mallet, Variety 50%
Hatchet 50%
Sandpaper File, Hollow 50%

J. L. Osgood:
Jack 50%
Fore 50%
Smooth 50%
Cabinet 50%
5, $10.00 ..... gro. lots 10%
W. A. Zelmicker Supply Co.:
Hammer $2.00
Hatchet 2.00
Saw 2.00
$3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80 ..... 2.00
Saw 2.00
36 in., $4.00 ..... 2.00
Saw 2.00
36 in., $5.80 ..... 2.00
Saw 2.00
in., $7.80 ..... 2.00
Plane 2.00
$8.00; coal, 34 in., $5.80 ..... 2.00
Hammer 2.00
$2 ..... 2.00

Hangers—

NOTE—Barn Door Hangers are quoting good 1 per cent. discount, and Parlor Door Hangers per cent. 2 per cent. less.

A. Mfg. Co.:
Rolling No. 1 and 2 Allith No. 2 Adjustable No. 6; Rolling Parlor Door 50%
Chicago Spring Butt Co.:
Friction 65%
Ornamental 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Rolmaker Car Door 50
Rollafast 50%
Railroad 50%
Crane & Carpenter Mfg. Co.:
Lower Arm ..... 70 & 2
Roller Bearing ..... 70 & 2
Garnet Co.:
Steel Arm, No. 10 ..... $12.00 60&10
Roller Bearing, No. 11 ..... $5.00 60&10
Roller Bearing, Ex. Hy. 22, $18.00 ..... 60&10%
Roller Bearing, $4.00 50
Large Barn Door:
Parlor Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion 50%
Barn Door, Standard ..... 60&10%
Hinged ..... net $6.08
Covered ..... 60&5%
Special ..... 70 & 5
Lawrence Bros.:
Advance ..... 55&10%
Cleveland ..... 70&7½%
Corbin 50%
Crane 50%
Garnet 50%
Tandem, No. 50 ..... net $7.50
New York 50%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2 ..... 70%
Anti-Friction 60%
Hinged Hangers, King Charm 60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 148, ... 60&10%
Pioneer Wood Track, No. 3.. $2.25
Roller B'rg St'l Track No. 12 $2.20
Roller B'rg St'l Track No. 13, $2.50
Roller B'rg, Nos. 29, 4, ... 50%
Hero, Adj. Track No. 19.. 50&10%
Adjustable Track Tandem Troller Track No. 16 ..... 50&10%
Seal, Steel Track No. 8.. $2.25
Auto Adj. Track No. 22.—50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150 ..... $2.50
Safety Underwriters' D. No. 122 ..... 50&5%
Tandem No. 41, 2½ and 3 ..... 60&10%
Palace, Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 122 ..... 50&10%
Iron Wood Track No. 2 ..... 50%
Trolley B. D. No. 21, $1.30; No. 22, $1.40; No. 23 ..... 50%
Roller Bearings, Nos. 37, 38, 39, 41, 43, 41, Sizes 1 and 2, 70&7½%
Anti-Friction No. 44 ..... 50%
sides 50%
Hinged Pattern No. 48 ..... 60&5%
Folding Door B. B. Swivel No. 135 ..... 40%
Tasker & Biggs Fry Co.'s Kid ..... 50 & 5 & 5 & 5
Myers' Stayon Hangers 60

Hangers— Garment—

Pullman Trouser ⅛ gro., 1 pair Fast Aluminoy, $9.00; 1 pair Round Nickeled, $8.00; 1 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00 Garment Hanger Roda Round Nickeled, per gro., $10.50; Garment Hanger Loops Round Nickeled, per gro. $10.50
Victor Folding ..... ⅛ gro. $9.60

Gate—

Myers' Patent Gate Hangers, ⅛ doz net $1.50

Joist and Timber—

Lane Bros Co. 30%

Hasps—

Grant's Separate Hasp ..... 50&10%
M. Kinnon's Perfect Hasp, ⅛ doz. 60

Hatchets—

Regular list, first qual. .40&2½%—
Second quality 40%

Heaters, Carriage—

Clark, No. 1, $3.75; No. 2, $3.25; No. 3, $2.75; No. 4, $2.50; No. 5, $2.25; No. 6, $2.00; No. 7D, $3.00; No. 7E, $2.25; No. 1, $3.50 25
Clark Coal, No. 1 ..... $3.75 25

Hinges

Blind and Shutter Hinges

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip Rest)
No. ..... 1 ..... 2 3
Doz. pair ..... $ .25 ..... $ .30 ..... $ .40
Mortise Shutter
No. ..... 1 ..... 2 3
Doz. pair ..... $ .25 ..... $ .30 ..... $ .40
Mortise Reversible Shutter (Buffalo, &c.):
No. ..... 1 ..... 1½ 2
Doz. pair ..... $0.20 ..... $.25 ..... $.30
North's Automatic Blind Fixtures
No. 1 ..... $4.00 ..... 50%
Brick, $11.50 ..... 10%
Corbin's Parker's Co. ..... 50&10%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%

Extra heavy offset given

Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00 ..... 20%
Reading Screw Co. 50%
Stanley's Steel Gravity Blind Hinges, No. 184, japanned, with screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. [illegible] ..... 7 & 5
A. [illegible] ..... 7 & 5
Queen City [illegible] 75%
Special [illegible] ..... 75&5%
55 ..... 75&5%
Niagara, Gravity Locking, Nos. 1, 2 ..... 75%
Buffalo Gravity Locking, Nos. 1, 2 & 3 ..... 70&10&5%
Shepard's Double Locking 75%
Champion Gravity Locking ..... 75&5%
Pioneer ..... 75&10
Empire 75
White [illegible] 75
Bell [illegible] 75

Gate Hinges—

Clark's or Shepard's—Doz. sets:
No. 2 3
Hinges with L Hooks $2.00 $2.50
Hinges only 1.40 2.00
Latches only ..... .70 .70 .80
New England:
With Latch ..... doz. ..... @$2.00
Without Latch ..... doz. ..... @$1.60
Reversible Self-Closing:
With Latch ..... doz. ..... @$1.75
Without Latch ..... doz. ..... @$1.50
Western:
With Latch ..... doz. $1.75
Without Latch ..... doz. $1.10
Wrightsville Hardware Co.:
Shepard's [illegible] 75
Hinges [illegible] 75
Gravity [illegible] 75

Pivot Hinges—

Bommer Bros. [illegible] 40
Lawson Mfg. Co., Matchless 50%

Spring Hinges—

Holdback, Cast Iron ..... $6.75@ $7.00
Non-Holdback, Cast Iron $6.50@ $6.75
J. Barnes [illegible] 50%
Barnes' [illegible] 50%
Bardsley's Patent Checking 33⅓%
Bommer Bros. [illegible] 40
Bommer Ball Bearing [illegible] 50
Bommer Self-Closing [illegible] 40
No. 999 Wrot. Steel Hold Back, ⅛ doz. $7.50
Chicago Spring Butt Co.:
Chicago Spring Hinges 25
Triple Ball Bearing Hinges 50
Chicago Ball Bearing Floor 50
Garden City Engine House 25
Reversible Spring Hinges 25
Columbian Hardware Co.:
Acme, Wrought Steel 50
Acme, Brass 50
Absorbent 50
Columbia, ⅛ gr., No. 14, $9.00; No. 24 ..... $12.00
Columbia, Adj., No. 7, ⅛ gr. $12.00
Columbian Hinges ..... 60&10%
Gem, new list 30
Clover Leaf ..... ⅛ gr. $12.00
Oxford, new list 30%
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co. Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Bookcase Steel Heddtack Screen Door ..... ⅛ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door 50
No. 737 Sheet Steel Heddtack ⅛ gr. $9.00
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓%

Wrought Iron Hinges—

Strap and T Hinges, &c., 1st December 20, 1904:
Japanned [illegible] 70
Hinges [illegible] 70
Light [illegible] 70
Heavy [illegible] 70
Light [illegible] 70
Heavy [illegible] 70
Blacksmith [illegible] 70
Screw [illegible] 70

Screw Hook and Eye:
Japanned [illegible] ..... 50&10%
Light [illegible] ..... 50&10%
Heavy [illegible] ..... 50&10%

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers ..... 30&2%

Hoes— Cast

Mf'g'r's list, price per gross.

Light	15	16	18	20
Garden	$5.00	$5.50	$6.00	$6.50
Heavy	15	16	18	20

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brad, No. 16 ..... each $1.35
Steel Mortar, No. 18 ..... each $1.35

Hoes— Eye—

Scovil and Oval Pattern
..... 60&10%&10&10%
Grub, list Feb 28, 1899
..... 70&10%&70&10&10%

P. & H. Swivel 35%
Am. Fork & Hoe Co. (Scovil Pat-tern) 60

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1900, but many others are still using list of August 1, 1899, or selling at net prices.

Crom's Weeding, No. 1, $2.00; No. 2, $2.25.
Star Double Bit..... $3.20
Ft. Madison Cotton Hoe..... 70&10&10
Ft. Madison Crescent Cultivator Hoe, ₩ doz..... 70&10%
Ft. Madison Mattock Hoes:
Regular Weight..... ₩ doz. 40&5%
Junior Size..... ₩ doz. $4.00
Ft. Madison Sprouting Hoe, ₩ doz., 60&10
Ft. Madison Dixie Tobacco Hoe..... 75&10&5%
Kretsinger's Cut Easy..... 70&10
Warren Hoe..... 75&10
W. & C. Hatchet..... 75%
B. B. 6 in., Cultivator Hoe..... $2.40
B. B., 6½ in..... 2.60
Acme Weeding ..... ₩ doz. net, $4.35
W. & C. L'ting Shuffle Hoe. ₩ doz. $5.25

Hoisting Apparatus—

See Machines, Hoisting.

Holders— Bit—

Argular ₩ 3-8" $3.40 ..... 45&10%

Door—

Bardsley's, Iron, ... Brass and Bronze 50
Lafayette 50
Pullman 35
R. Lords Mfg. Co.: No. 117, Ever-ready, ... Nos. 118, 119, Sure Grip 50
Superior 33⅓%

File and Tool—

Nicholson File Holders and File Handles ..... 33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, ₩ gross, $10.80; ₩ doz..... $1.25

Trace and Rein—

Fernald Double Trace Holder, ₩ doz. pairs $1.25
Dash Rein Holder, ₩ doz. pairs..$1.25

Hones—Razor—

Pike Mfg. Co., Bohman and Swaty, 50%; German..... 50 &

Hooks—Cast Iron—

Bird Cage, Reading..... 40%
Clothes Line, Reading List..... 40%
Coat and Hat, Reading..... 45&20%
Coat and Hat, Wrightsville..... 60&10
Harness, Reading List..... 40%

Wire—

Belt 80%
Ware C. & H. Hooks.... 75@—%
Bradley Metal Clasp Wire, Coat and Hat, Book, Cooling ..... 70&5%
Columbian Hdw. Co., Knig..70&10%
Parker Wire Goods Co., King..70&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Star, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.90; 8 in., $1.25; 10 in., $2.50.
Cotton ..... *doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—
See Wrought Goods

Miscellaneous—

Hooks, Bench, see *Stops, Bench*
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz.$3.60
Grass, common grades, all sizes, per doz *$1.50*
Waffle Irons, Cookeyes..lb. 35@40c
Hooks and Eyes:
Brass ..... *60@60&10%*
Malleable Iron..... *70@70&10%*
Covert Mfg. Co. Gate and Scuttle Hooks ..... 60&10
Ft. Madison Cut-Easy Corn Hooks, ₩ doz. $3.25 net
Turner & Stanton Co. Cup and Shoulder ..... 80&10
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition ..... *ft. 5@6c*
3-ply Guaranteed..... *ft. 8@9c*
4-ply Guaranteed..... *ft. 10@11c*
Cotton Garden, ¾-in., coupled:
Low Grade..... *ft 8@9c*
Low Quality..... *ft. 10@11c*

Irons— Sad—

Flat, 4 to 10 ..... *lb. 3@3½c*
B. B. Sad Irons ..... *lb. 3½@3¾c*
Mrs. Potts', cents per set:

	Nos. 50	55	60	65
Japed Tops	88	90	93	97
Tinned Tops	88	85	98	95

New England Pressing lb. 3½@4c

Bar and Corner—

Richards Mfg. Co. Bar ..... 60&10
Corner 60

Pinking—

Pinking Irons ..... *doz. 60c*

Irons, Soldering

See Coppers.

Jacks, Wagon—

Covert Mfg. Co.:
Ajax Screw..... 30&2½; Steel, 45; Lockport 50

Lake's Steel ..... 30&5%
Richards Tool Steel, No. 130...50&10%
Smith & Hemenway Co.'s..... 25%

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Kettles—

Brass, Spun, Plain..... *.20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Lester Bros. Butcher, &c..... 30%
Wilkinson Shear & Cutlery Co.....60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks..... 60%
Wisconsin Acme, ₩ doz..... $2.65
Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List..... *.80@ —%*
C. E. Jennings & Co., Nos. 45, 46, 25&5%
Jennings & Griffin, Nos. 41, 42, 66%&10
Swan's ..... 66%&10
Watrous 16⅔
L. & I. J. White..... 20&5&25

Hay and Straw—

Serrated Ledger, doz. $3.00@ 5.75
Iwan's Sickle Edge..... ₩ doz. $9.50
Iwan's Serrated..... ₩ doz. $10.00

Miscellaneous—

Farriers' ..... *doz. $2.60@3.35*
Wiedemann's ..... ₩ doz. $3.00@3.50

Knobs—

Bust, 2½ inch, Birch, or Maple, Rubber Tip..... *gro. $1.25@$1.40*
Carriage, Jap., all sizes..... *gro. 40@45¢*
Door, Mineral..... *doz. 65@70c*
Door, Por. Jap'd..... *doz. 70@75¢*
Door, Por. Nickel..*doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—

See Belting, Leather—

Ladders, Store, &c.—

Allith Mfg. Co., Reliable..... 50%
Lyons Store 25
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112..... 50%
Climax Shelf, No. 113..... 50%
Trolley, No. 109..... 50%

Ladles, Melting—

L. & G. Mfg. Co. (low list)..... 20
P. & W. ..... 40&10
Reading 60

Lanterns—Tubular—

Regular, No. 0..... *doz. $4.50@4.50*
Side Lift, No. 0..... *doz. $4.60@4.75*
Hinge Globe, No. 0 doz. $4.60@4.75
Other Styles..... *40@50&10*

Bull's Eye Police—

3-inch ..... *$4.25@4.50*

Latches— Thumb—

Roggin's Latches, with screw..
doz. 35@40¢

Door—

Allith Mfg. Co., Reliable and Allegator, for ... Raised Oval Storage..30%
Clunk & Carrier Mfg. Co., Danish, ₩ doz $2.30
Richards' Bull Dog, Heavy, No. 5..... 50&5%
Richards' Trump, No. 127..... $1.50

Leaders, Cattle—

Small..... *doz. 50c; large, 60¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E. 10%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet.....	*$2.50*	*2.25*	*2.00*
75 feet.....	*$2.10*	*1.80*	*1.65*

Samson Cordage Works:
Solid Braided Chalk, Nos 0 to 3..40%
Solid Braided Masons'..... 30%
Silver Lake Braided Chalk. No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50..... ₩ gr. 50
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50, No. 4 $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50, No. 4½, $4.50..... 20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50..... 30%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25..... 20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines..... 40
Clothes Lines, White Cotton 20
Shade Cord, Cotton or Linen...20%

Locks— Cabinet—

Cabinet Locks *33⅓%*

Door Locks, Latches, &c.—

NOTE.—Prices are very often made on these goods.
Reading Hardware Co..... 40%
R. & E. Mfg. Co. 10

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass ..... 75&10%

Sash, &c.—

Iron Pulleys:
Bronze and Brass, 55&5%; Crescent 60%; Iron, 60%; Window Ventilating, 40&20%; R. D. & E. Pat. Ventilating Sash Lock, 33⅓%.
Pullman Patent Ventilating Lock..35%
Reading Sash Locks..... 40

Machines—Boring—

Com. Upr't, without Augers,
$2.00@2.25
Com. Angl'r, without Augers,
$2.25@2.50
Swan's Improved..... 40&10%
Jennings', Nos. 1 and 4..... 25&5%
Millers' Falls..... $4.75
Snell's, Upright..... $2.65; Angular, $2.90

Corking—

Reisinger Invincible Hand Power,
₩ doz. $18.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist..30%
Moore's Hand Hoist, with Lock Brake 20%
Moore's Cyclon, High Speed Chain Hoist 25%

Ice Cutting—

Chandler's 12½%

Washing—

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rotary	$57.00
Champion Rotary Banner No. 1	$57.00
Standard Champion No. 1	$50.00
Standard Perfection	$27.00
Cincinnati Square Western	$33.00
Uneeda American, Round	$33.00

Mallets—

Hickory ..... *45&5@50%*
Lignumvitæ ..... *45&5@50%*
Tinners' Hickory and Apple-wood ..... *doz. 45&5@50%*

Mangers, Stable—

Swett Iron Works..... 50%

Mats, Door—

Acme Combination Steel..... 50%
Enastic Steel (W. G. Co.), new list.50%

Mattocks—

See Picks and Mattocks.

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co..... 20@25%
National Specialty Co..... 20
Parker's Columbia and Victoria...33⅓%
Parker's Box and Side..... 50&10%
Swift, Lane Bros. Co..... 30%

Motors, Water—

Dayne's Red Devil..... 30%
Lippincott's 30

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; 12-in., $2.10, etc.
Cheap, 10-in., $2.25; 12-in., $2.45, etc.
Better Grade, 10-in., $3.00; 12-in., $3.25, etc.

	12	*14*	*16*	*18 in.*
High Grade....	*$4.50*	*4.75*	*5.00*	*5.25*

Continental 60%
Great American 10
Great American Ball Bear'g, new list.70%
Quaker City 40
Pennsylvania 60
Pennsylvania, Jr., Ball Bearing, 50&10&5
Pennsylvania Golf..... 50
Pennsylvania Horse..... 33⅓&5%
Pennsylvania Pony..... 40&5%
Granite State:
Style A, Low Wheel..... 70%
Style B, Low Wheel..... 70%
Style C, High Wheel, spcl. list, 70&5%
Style D, High Wheel, spcl. list, 70%
Philadelphia:
Styles M., S., C., K., T. 70&10&5%
Style A., all Steel..... 60&10&5%
Style B., High Wheel..... 70&10&5%
Drexel and Gold Coin, special list 40%
Horse ..... 40&5%
Pony ..... 40&5%
36-in. Horse..... 30&10%
Eagle Horse..... 30&5%
I. X. L. Horse..... 50%

Nails—

Wire Nails and Brads, Miscellaneous..... *82½@87½&10*
Cut and Wire... *See Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos	6	7	8	9	10	
Anchor	23	21	20	19	18	40&5%
Coleman	13	12	12	11	11	net
New Haven	22	20	19	18	17	40&5%
Livingston	14	13	12	11	10	70%
Western						₩ lb. 9¢

Jobbers' Special Brands
per lb. 9@10c

Picture—

Ins	*2*	*2½*	*3*	*in.*
Brass H'd..	*.55*	*.60*	*.70*	*... gro*
Por. Head...	*1.10*	*1.10*	*1.10*	*... gro*

Nippers—

See Pliers and Nippers.

Nuts—

Cold Punched ..... *Off list.*
Square, Blank or Tapped ..5.80c
Hexagon, Blank or Tapped 6.30c
Square, Blank or Tapped, C. T. & R. 5.60c
Hexagon, Blank or Tapped, C. T. & R. 6.30c
Hot Pressed:
Square, Blank 5.80c
Hexagon, Blank 6.30c
Square, Tapped 5.80c
Hexagon, Tapped..... 5.90c

Oakum—

Best ..... *lb., 6½c*
U. S. Navy..... *lb., 6c*
Navy ..... *lb., 5c*
Plumbers' Spun Oakum...2¾@3c

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated..... *75%*
Chase or Paragon ..... 65&10%
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans..... 70@70&10%
Railroad Oilers &c..... 60@60&10%
Maple City Mfg. Co.:
Spring Bottom Cans..... 70@70&10%
Railroad Oilers, &c..... 60@60&10%

Openers— Can— *Per doz.*

Sprague, Iron Handle..... *.80@35¢*
Sprague, Wood Handle..... *.35@40¢*
Sardine Scissors..... *$1.75@$3.00*
Yankee Can and Bottle Opener, ₩ doz., net, $0.75; Little Gem, ₩ doz., net..... $0.65

Egg—

Hartigan Nickel Plate, ₩ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope ..... *.20@25¢*

Rubber—

(Fair quality goods.)
Sheet, C. I...... *.11@12¢*
Sheet, C. O. S...... *.11@12¢*
Sheet, C. B. S...... *.12@13¢*
Sheet, Pure Gum..... *.40@45¢*
Sheet, Red..... *.40@50¢*
Jenkins' 196, ₩ lb. 80¢ 25%

Miscellaneous—

American Packing.. *lb. 7@10 ¢*
Cotton Packing..... *lb. 16@25 ¢*
Italian Packing..... *lb. 9@12½¢*
Jute ..... *lb. 4@ 4½¢*
Russia Packing..... *lb. 8@11 ¢*

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List..... *65@71@70%*
Edwards, Royal Blue..... 65&7½%

Fry—

Common Lipped.

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Calva.—

Inch	*12*	*14*	*16*	*18*
Per doz....	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos: *lb.*
Roll Board or Building Felt, 5 lb. to 30 lb., per 100 sq. ft.3¼@5¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft..... *6¢*
Mill Board, Sheet, 40 & 40 in., 1-32 to ⅛ in..... *.50@5c*

Per roll

Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll
.48@58c
Medium weight, 30 lbs. to roll
.56@70c
Heavy weight, 40 lbs. to roll
.75@78c
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton..... *$54.50*
Red Rope Roofing, 250 sq. ft. per roll..... *$1.75*

Tarred Paper—

1 ply (roll 400 sq. ft.), ton.....
$34.00@$38.00
2 ply, roll 108 sq. ft..... *.65¢*
3 ply, roll 108 sq. ft..... *.88¢*
Slater's Felt (roll 500 sq. ft.)..*80¢*

Sand and Emery—

Flint Paper and Cloth.50&10@—%
Garnet Paper and Cloth..... *25%*
Emery Paper and Cl'h..50&10@60%

Parers— Apple—

Goodell Co.:	
Family Bay State	₩ doz. $15.00
Improved Bay State	₩ doz. $36.00
New Lightning	₩ doz. $7.00
Turn Table	₩ doz. $9.00
White Mountain	₩ doz. $9.00
Bonanza Improved	each $7.50
Dandy	each $10.00
Eureka Improved	each $20.00
New Century	each $20.00
Rancer	each $25.00
Livingston Nail Co.:	
Daisy	₩ doz. $4.00
Little Star	₩ doz. $5.00
Rocking Table	₩ doz. $6.20
Reading Hardware Co.:	
Advance	₩ doz. $4.20
Baldwin	₩ doz. $4.00
Reading 72	₩ doz. $3.25
Reading 78	₩ doz. $6.25

Potato—

Saratoga ..... ₩ doz. $7.00
White Mountain..... ₩ doz. $6.00

Picks and Mattocks—

(List Jan., 1900.)
List ..... *70&10@70&10&10%*
Cronk's Handled Garden Mattock, ₩ doz., No. 2, $2.60; No. 3, $6.40.

Pinking Irons

See *Irons, Pinking.*

Pins, Escutcheon—

Brass .....50@50&10%
Iron, list Nov. 11, '05...60@60&10%

Pipe, Cast Iron Soil—

Standard, 2-6 in .....60&10@—%
Extra Heavy, 2-6 in .....50&10@—%
Fittings, Standard and Heavy .....75&10@—%

Pipe, Merchant—

	Consumers, Carloads.			
	Steel.		*Iron.*	
	Blk	*Galv.*	*Blk*	*Galv.*
	75		65	
⅛ & ¼ *in*	67½	58	62½	53
⅜ *in*	66	52	64	50
½ *in*	68	56	66	54
¾ to 1 *in*	72	62	70	60
1 to 2 *in*	69	54	67	52

Pipe, Vitrified Sewer—

Carload lots.
Standard Pipe and Fittings, 8 to 24 in., f.o.b. factory
First class .....57@47 %
Second class .....50@47½%

Pipe, Stove—

	Per 100 joints.	
Edwards' Nested:	C. L.	L. C. L.
5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	6.75	7.75
7 in., Standard Blue	7.75	8.75
8 in., Royal Blue	7.00	8.00
9 in., Royal Blue	7.50	8.50
10 in., Royal Blue	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color	$6.15	$7.15
6 in., Uniform Color	6.65	7.65
7 in., Uniform Color	7.65	8.65

Planes and Plane Irons—

Wood Planes

Beach, first qual .....50@50&10%
Beach, second qual .....40@40&10%
Molding .....25@25&10%
Chapin-Stephens Co.:
Beech, First Quality 30%
Beech, Second Quality 25%
Molding and Miscellaneous 25%
Toy and German 25%
Union 60%

Iron Planes

Chaplin's Iron Planes .....50&10%
Union 60%

Plane Irons—

Wood Bench Plane Irons, list Dec. 12, '06 .....25%
Buck Bros 30%
Chapin-Stephens Co 50%
Union .....20&5@25%
L. & J. White .....20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse .....per doz. $8.00

Plates—

Lelloe .....lb. 4@4½¢

Pliers and Nippers

Button Pliers....75&5@75&10&5%
Gas Burner, per doz., 3 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe ..... 8 10 12-in.
$2.00 $2.25 $2.75 $3.50
Acme Nippers .....50&5%
Cronk & Carrier Mfg. Co.:
American Button 80%
Improved Button .....75&10%
Nos. 6 .....50%
No. 8 Linemen's 50%
Stub's Pattern 45%
Combination and others 35%
Electrical Barriers, Nippers, Pincers and Tools .....10&5&4&10&5%
P. S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bullard, 35; Elm City, 35%; Paragon, 50%; Lodi, 55%.
Swedish Side, End and Diagonal Cutting Pliers 60%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels .....30&5@50&10%
Cabinet Iron, Brass Cor. .....10&5&10%
Pocket Levels .....20&5&10%
Extension Sights .....40&10%
Mortising Gauges .....10&5&10%
Dust-proof Plumbs and Levels .....60&10%
Dust-proof Pocket Levels .....70&10%
Stauffer's Duplex 35%
Extension 30%

Points, Glaziers'—

Bulk and 1-lb papers .....lb. 2 ¢
½-lb papers .....lb. 2½ ¢
1-lb papers .....lb. 3 ¢

Police Goods—

Manufacturers' Lists .....25@25&5%
Leader 25%

Polish—Metal, Etc—

Peerless Liquid, No. 1 (½ pt.) 75
doz. $3.00; No. 2 (1 qu.), $9.00 .....40%
Peerless Paste 60%

George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, per doz. $0.45; per gro. $4.50; ½ lb. boxes, per doz. $1.25; 1 lb. boxes per doz. $2.25
U. S. Liquid, 8 oz. cans, per doz. $1.25.
Barkeepers' Friend Metal Polish, per doz., $1.75.

Stove—

Black Eagle Benzine Paste, 5 lb. cans, per lb. 10¢
Black Eagle, Liquid, ½ pt. cans, per doz. 75¢
Black Jack Paste, 3½ lb. cans, per gr. $8.00
Black Rod Paste, 5 lb. can, each $0.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon's, 8 oz. per gr. $5.75 .....10¢
Dixon's Plumbago .....per lb. 8¢
Fireside .....per gr. $2.50
Gem, per gr. $4.50 15
Japanese .....per gr. $3.50
Jet Black .....per gr. $3.50
Peerless Iron Enamel, 10 oz. cans per doz. $1.50

Poppers, Corn—

1 qt. Square ...doz. $0.90; gro. $8.75
1 qt. Round ...doz. $0.90; gro. $8.90
2 qt. Square ...doz. $1.05; gro. $11.00
2 qt. Square ...doz. $1.55; gro. $15.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts .....each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled .....35&10%
Tinned .....30&10%

Powder—

In Canisters:
Duck, 1 lb. .....each 45¢
Fine Sporting, 1 lb. .....each 15¢
Rifle, ½ lb. .....each 15¢
Rifle, 1 lb. .....each 25¢
In Kegs:
12½ lb. kegs $3.50
25 lb. kegs $4.50
King's Semi-Smokeless:
Keg (25 lb. bulk) $6.50
Half Keg (12½ lb. bulk) $3.50
Quarter Keg (6¼ lb. bulk) $1.90
Case 24 (1 lb. cans bulk) $6.50
Half case (1 lb. cans bulk) $4.50
King's Smokeless: Shot Gun Rifle
Keg (25 lb. bulk) $12.00 $15.00
Half Keg (12½ lb. bulk) 6.25 7.75
Quarter Keg (6¼ lb. bulk) 3.25 4.00
Case 24 (1 lb. cans bulk) 14.00 17.00
Half case 12 (1 lb. c. bk)... 7.25 8.75

Presses—

Fruit and Jelly—

Enterprise Mfg. Co. .....20@25%

Seal Presses—

Morrill's No. 1, per doz. $20.00 .....50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Nail—

Cyclops 50%
Miller's Falls, No. 3, per doz. $12.00 .....
Morrill's No. 1, Nail Puller, per doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 .....50%
The Scranton Co. Case Lots:
No. 1 .....$5.50
No. 3B (small) $5.00
Stanley Rule & Level Co.:
Diamond B 70%
Giant 50%
Staple Pullers, Utica and Davis 60%

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz	$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., 4 in., $1.25; 5 in., $1.55				
Inch		2	2¼	2½
Hot House, doz	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—

Common Frame; Square or Round End, per doz. 1¾ and 2 in .....17@20¢
Lager Mortise, no Face Plate, per doz., 2¼ and 2 in .....20@21¢
Acme Mfg. Co. .....net
American Pulley Co.:
Wood .....
Wrought Steel Single .....
Fox-All-Steel, Nos. 3 and 7, 2 in. .....per doz. 50¢
Grand Rapids All Steel Noiseless .....
Niagara No. 25, 1¾ in. .....
in. .....
in. .....
Star, No. 28, 1¾ in., 19¢; 2 in., 20½¢
Tinnie Brass .....

Pumps—

Cistern 60%
Pitcher, Sweat .....75&5@75&10%
Wood Pumps, Tubing, &c 50%
Barnes Dbl. Acting (low list) .....40&5%
Berger Mfg. Co. .....
Contractors' Rotary Discharge No. 1 .....
No. 2 .....
No. 3 .....
Daisy Spray Pump .....per doz. $6.50

Flint & Walling's Fast Mail Hand, (low list) 50%
Flint & Walling's Fast Mail Power, (low list) 50%
Flint & Walling's Tight Top Pitcher, ...75&10%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50 .....30%
Myers' Deep Well Pumps .....10&5%
Myers' Power Pumps .....10&5%
Myers Syr. Pumps .....10&5%

Pump Leathers

Plunger and Valve Leathers—Per gro.:
No. 1 2 3 4 5
Standard Grade .....
Cup Leathers—Per Doz:
Inches 2 3 4 5 6
Standard Grade .....

Punches—

Saddlers' or Drive, good .....doz. 50@75¢
Spring, single tube, good quality $1.75
Revolving or Tubular .....doz. $3.50
Brass & Nickel Plated Steel Drive 50%
Merrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00 .....50%
Hercules, 1 die, each $5.00 .....50%
Niagara Hollow Punches 40%
Niagara Solid Punches .....35&10%
Wm. Schollhorn Co.:
Belt and Tinner's, Bullard, 35; Paragon, 50%; Lodi 55%
Tinners' Hollow, P., S. & W. Co. 40%
Tinners' Solid, P., S. & W. Co. per doz., $1.44 .....40%

Rail—Barn Door, &c.—

Sliding Door, Painted Iron .....2½@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb. .....36¢
Allith Mfg. Co.: Reliable Hanger Track 50%
Crane:
Double Braced Steel Rail...per ft. 3¼¢
O. N. T. Rail $2.12
Griffin's:
XXX, per 100 ft., 1 x 3-16 in., $2.25, 1¼ x 3-16 in., $3.75.
Hinged Hanger, per ft., 1 x 3-16 in., $3.67, 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, per 100 ft. $3.45
O. N. T., per 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in. .....per 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., per 100 ft., $7.50; 1¼ x 3-16 in., $8.75 .....55&5%
McKinney:
Hinged Hanger Track, per ft., 11¢
1 x 3-16 Track .....55&5%
Myers' Sliding Door Track .....60&5%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1½ x 3-16, $3.75; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65 .....50%
Gauge Trolley Track, per ft., No. 31, 3¼¢; No. 32, 11¢; No. 33, 23¢
No. 50 .....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25, 49, No. 2, $3.50.

Rakes—

NOTE—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor .....80&25%
Queen, Steel Lawn, per doz., 20 teeth $2.85; 24, $3.00 .....net
Automatic Lawn, per doz $1
Malleable Garden .....40&10
Ideal Steel Garden, per doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00 .....80%
Kohler's:
Lawn Queen, 20-tooth .....per doz. $3.15
Lawn Queen, 24-tooth .....per doz. $3.25
Paragon, 24-tooth .....per doz. $3.25
Paragon, 24-tooth .....per doz. $2.75
Steel Garden, 14-tooth .....per doz. $2.40
Malleable Garden, 14-tooth .....per doz. $2.00@2.25

Rasps, Horse—

Disston .....
Heller Bros. .....70&5@70&10&5%
Liverpool Bros.' Gold Medal .....70&10@75%
McCaffrey's American Standard .....
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Razors—

Boker .....
Fay Rubber Shell .....
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Saws—

Circular 45%
Band ..... 50@50&10%
Butcher Saws 50
Cross Cuts 35
One-Man Cross Cut 40
Narrow Cross Cut 50
Hand, Rip and Panel ..... 35&5
Miter Box and Compass 40
Mulay, Mill and Drag 45
Wood Saws ..... 40&10%
Chapin-Stephens Co.:
Turning Saws and Frames ..... 30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth 50%
Band, 2 to 18 in. wide 60%
Band, 1 to 1¼ 60%
Crosscuts 45%
Narrow Crosscuts 50%
Mulay, Mill and Drag 50%
Framed Woodsaws 25%
Woodsaw Blades 25%
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, 4100, D8, 10, 7, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 9, 1, 0, 00, Combination 30%
Compass Saws, Nos. &c. 25%
Butcher Saws and Blades 30%
C E. Jennings & Co.'s:
Back Saws 10%
Butcher Saws ..... 35&5%
Compass and Key Hole Saws ..... 35&5%
Framed Wood Saws 12½
Hand Saws 12½
Wood Saw Blades ..... 35@35&5%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&50%
Butcher Saws and Blades ..... 35@40%
Peace & Richardson's Hand Saws 30%
Simonds':
Circular Saws 45%
Crescent Ground Cross Cut Saws 30%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws 45%
Band Saws 25%
Back Saws ..... 25@25&5%
Butcher Saws ..... 35@35&5%
Hand Saws ..... 25@25&5%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. ..... 25@25&5%
Wood Saws ..... 40&5%
Wheeler, Madden & Clemson Mfg. Co.:
Circular Saw Blades 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A 25%
Disston's:
Concave Blades 25%
Keystone Blades 35%
Hack Saw Frames 30%
Simonds File Co. 35%
C. E. Jennings & Co.'s
Hack saw Frames, Nos. 175, 180 ..... 40&10%
Hack Saws, Nos. 175, 180, complete, each 40c
Goodell's Hack Saw Blades ..... 40&10%
Griffin's Hack Saw Frames ..... 35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Star Hack Saw Blades ..... 15&10%
Sterling Hack Saw Blades ..... 30&10&5%
Sterling Hack Saw Frames ..... 30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $28.00; No. 2, $30.00 ..... 10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%
Whitaker Mfg. Co.:
Nutmeg Hand Blades 10
Nutmeg Hand Frames ..... 30&5
National Power Blades ..... 30&10%

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Keyseat Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 10&10%
Rogers, complete, $3.50 and $4.00 ..... 15&10%

Scales—

Family, Turnbull's ..... 50@50&10%
Counter:
Hatch, Platform, ½ oz. to 1 lbs. ..... doz. $5.50
Two Platforms, ½ oz. to 8 lbs. ..... doz. $16.00
Union Platform, Plain $1.70@1.90
Union Platform, Stpd $1.85@2.15
Chatillon's:
Druggists' 20
Egg 20
Grocers' Trip Scales 50%
The Standard Portables 40%
The Standard R R. and Wagon ..... 50&10%

Scrapers—

Box, 1 Handle ..... doz. $2.00@$2.25
Box, 2 Handle ..... doz. $2.50@2.60
Ship Light, $2.00; Heavy, $4.50
Chapin-Stephens Co., Box ..... 30@30&10%
Richards Mfg. Co., Box 30%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1¼, $3.50@3.75
Bench, Wood ..... 25@25&10%
Hand, Wood ..... 25@25&10%@10%
Chapin-Stephens Co., Hand 25
Coach, Lag and Hand Rail—
Iron Case Point ..... 60@60&5%
Coach, Gimlet Point ..... 70@70&10%
Hand Rail ..... 70@70&10%

Jack Screws—

Standard, List ..... 50@10@7.75
Morse, Ilall ..... 30&10&10%
Small Iron Works ..... 70@75

Machine—

Cut, Thread, Iron, Brass or Bronze—
Flat Head or Round Head.
.50@.50&10%
Fillister Head. ..... .10@.10&10%
Rolled Thread, F. H or R. H., Iron ..... .75&10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... .65&10%

Set and Cap—

Set (Iron) ..... 75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 60@60&7½%
Hex. Hd. Cap ..... 70&10@7½%
Rd. Hd. Cap ..... 50&7½%
Fillister Hd. Cap ..... 60&7½%

Wood—

List July 23, 1903.
Flat Head, Iron ..... 87½&65@..%
Round Head, Iron ..... 85&65@..%
Flat Head, Brass ..... 80&65@..%
Round Head, Brass ..... 77½&65@..%
Flat Head, Bronze ..... 75&65@..%
Round Head, Bronze ..... 72½&65@..%
Drive Screws ..... 87½&65@..%

Scroll Saws—

See *Saws, Scroll.*

Scythes—

Per doz.

Grass, No. 1, Plain ..... $7.00@7.50
Clipper, Bronzed Webb ..... $7.25@7.75
No. 3 Clipper, Pol'd Webb ..... $7.50@8.00
No. 6 Clipper and Solid Steel ..... $7.75@8.25
Bush, Weed and Bramble, Nos. 11, 12 and 13 ..... $7.25@7.75
Grain, No. 4 ..... $9.00@9.50
Bronzed Webb, No. 5 ..... $9.25@9.75
Nos. 3 and 4 Clipper, Grain ..... $9.50@10.00
Solid Steel, No. 6 ..... $10.00@10.50

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18 ..20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ₩ doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 50%
Cannon's Diamond Point, ₩ gro, $12 ..... 40&10%
Mayhew's ..... ₩ gro $9.00
Snell's Corrugated, Cup Pt. ..... 40&10%
Snell's Imperial Cup Pt. ..... 40&10%
Victor Knurled Cup Pt.... ₩ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut $20.00
No 5, Mill Cut $30.00
Nos. 10, 11, 95 ..... $15.00
No. 1 Old Style $10.00
Special $18.25
Giant Royal Cross Cut ..... ₩ doz. $8.00
Royal, Hand ..... ₩ doz. $4.50
Taintor Positive ..... ₩ doz. $4.75

Shaving—

For Shaving Sets, No. 30 ..... ₩ doz. net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₩ doz. $1.50
Mounted Kitchen Sand Stone, ₩ doz. $3.50
Natural Grit Carving Knife Hones, ₩ doz. $3.00
Quick Cut Emery Carving Knife Hones, ₩ doz. $4.50
Quick Edge Pocket Knife Hones, ₩ doz. $2.50

Skate—

Smith & Hemenway Co., Eureka 50%

Shaves, Spoke—

Iron ..... doz. $1.25
Wood ..... doz. $2.00
Barker's (Stanley R & L. Co.) 45
Chapin-Stephens Co. ..... 30@30&10%
Goodell's ₩ doz $9.00 ..... 15&10%

Shears—

	8	9 in.	
Cast Iron..			
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Cheap	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality Jap ..... 70@70&10%
Best quality, Nickel ..60@60&10%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40@40&5%
Hinsdale Shears 10%
Wilkinson Shear & Cutlery Co.:
Sheep, 1900 list ..... 30&10&5%
Grass ..... 50&10%
Hedge or Mule ..... 50&10%
J. Wiss & Sons Co.:
Best Quality, Nickel ..... 60&10%
Best Quality, Nickeled ..... 50&10%
Tailors' 25%

Tinners' Snips—

Steel Blades ..... 20&5@20&10%
Steel ¾ ₩d Blades ..... 40&10@50%
Forged Handles, Steel Blades, Berlin 50%
Heinisch's Snips 40
Jennings & Griffin Mfg. Co.'s 6½ to 10 in. ..... 33⅓&7½%
Niagara Snips 40%
P. S. & W. Forged Handles, 25% and Saw ₩ doz $18.00 ..... 40&10%
J. Wiss & Sons Co.:
Wiss Forged Steel 25%

Pruning Shears—

Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Diston's Combined Pruning Hook and Saw ₩ doz $18.00 ..... 25%
Disston's Pruning Hook only, ₩ doz., $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
P. S. & W. Co ..... 40&10%
Columbian Cutlery Co.:
Heller Brand ..... 60&10%
Lawn and Border, Wilcut Brand. ..... 60&10%

Sheaves— Sliding Door—

Reading 40%
R. & E. list 15%

Sliding Shutter—

Reading list 40%
R. & E. list 10%

Shells—Shells, Empty—

Brass Shells Empty
Climax, 10 and 12 gauge ..... 65&10%
Club, Rival, 65&5%; First Quality, 60&5%
Paper Shells Empty
New Rapid, 10, 12, 16 and 20 gauge ..... 20&10
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, 25&5%
Union, League, 12 and 16 gauge; Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%

Shells, Loaded—

Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10
Union Metallic Cartridge Co.:
New Club, Black Powders 40
Nitro Club, Smokeless Powders..40&5%
Arrow, Smokeless Powders..40&10&10%
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Leader Grade ..... 40&10&10%
Black Powder 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4 50	6.25
7 x 10	4 75	6.50

Wheeling Corrugating Co.:

Dixie, 7 x 20 in.	$5.50
Dixie, 10 x 14 in.	6.00
Dixie, 7 x 10 in.	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg. $4.10
Steel ..... per keg. $3.85
Burden's, all sizes ..... ₩ keg $3.90

Shot—

25-lb. bag.
Drop, up to B $1.85
Drop, B and larger 2.10
Buck 2.10
Chilled 2.10
Dust 2.30

Shovels and Spades—

Association List, Nov. 15, 1902. 40%
Avery Stamping Co. 40%

Snow Shovels—

Long Handle ..... $3.25@$3.50
Wood and Mall. D. Handle ..... $3.75@$4.00

Sieves and Sifters—

Hunter's Imitation ..... gro. $9.50@10.00
Hunter's Genuine ..... per gro. $12.00@12.50

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each, $2.25; ₩ doz $24.00

Sieves, Seamless Metallic

—Per dozen.—

Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... doz. $0.90@0.95
Mesh 20, Nested ..... doz. $1.00@1.05
Mesh 24, Nested ..... doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:
12 x 12 to 22 x 36 in. 60%
20 x 20 to 24 x 36 in. 50%
24 x 60 to 24 x 120 in. 30%
Barnes' low list:
Up to and including 20 x 50 in. 45%
20 x 40 to 24 x 50 in. 40%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron ..... 70@75&10%
Steel ..... 40@45%

Slates, School—

Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless ..... 60&5 tens
Victor A, Noiseless ..60&5 tens d5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2% 5
High Grade, 40%; Trojan 40%
Jockey 25%

Snaths—

Scythe ..... 55@60%

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality ..... 50&10@60&5%
Cheap ..... 60@60&10%
Lutaea Imitation Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton ..... 50&10%
Rogers, Bro. William Rogers, Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous

German Silver ..... 60@60&5%

Tinned Iron—

Teas ..... per gro. 50@55¢
Tables ..... per gro. $0.90@$1.00

Springs— Door—

Bardsley Spring and Check 40%
Chicago Cow ..... 40&10%
Iron City 30
Pullman (Coil) 35%
Reliance (Coil) ..... 40&10%
Sargent 30
Torrey's Rod, 39 in. ..... ₩ doz. $1.10

Carriage, Wagon, &c.—

Bar, in. and Wider: Per 100 lb.
Black ..... $1.75@$5.00
Half Bright ..... $1.75@$5.00
Bright ..... $5.25@$5.50
Painted Seat Springs:
Fig. 2 x 28 ..... per pr. 49@52¢
Fig. 3 x 28 ..... per pr. 73@77¢

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cadiz, 65; Japanese, 70; Nautilus, ₩ doz. $12.00
Enterprise 50%
Philadelphia Nu. 1, ₩ doz. $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated. { List Jan 5, 1900. Steel and Iron. { 80@80&5%
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10&7½%
Iron Hdl. Try Squares and T-Bevels ..... 40&10&10&10%
Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel 15%

Squeezers, Lemon

Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.25
Iron, Porcelain Lined ..... doz. $1.75

Staples—

Barbed Blind ..... 85&10&5&10%
Electricians' ..... 80&10&10&5%
Fence Staples, Plain, $2.15; Galvanized $2.45
Poultry Netting Staples ..... per lb. 3¼@3½¢

Steels, Butchers'—

Dick's 30%
Foster Bros. 30%

Steelyards— ....30@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%
Curtis Revolving Ratchet Die Stock 25%
Derby Screw Plates 25%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plates 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones—Oil, &c.

Pike Mfg. Co., 1907 list: ₩ lb
Arkansas St. No. 1, 3 to 5½ in. 2.80
Arkansas St. No. 1, 5½ to 8 in 3.50
Arkansas Slips No. 1 ..... $4.00
Lily White Washita, 4 to 8 in. ..... 60¢
Rosy Red Washita, 4 to 8 in. ..... 60¢
Washita St., Extra, 4 to 8 in. ..... 50¢
Washita St., No. 1, 4 to 8 in. ..... 40¢
Washita St., No. 2, 4 to 8 in. ..... 25¢
Lily White Slips ..... 90¢
Rosy Red Slips ..... 90¢
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 70¢
Washita Slips, No. 2 ..... 40¢
India Oil Stones (entire list) 33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit 40%
Quickcut Emery and Corundum Stone, Double Grit 33⅓%
Quickcut Emery Rubbing Bricks..40%
Hindostan No. 1, Regular ₩ lb 8¢
Hindostan No. 1, Small, ₩ lb 10¢
Axe Stones (all kinds) 33⅓%
Turkey Oil Stones, Extra, 5 to 8 in. ..... 80¢
Queer Creek Stones, 4 to 8 in. ..... 60¢
Queer Creek Slips ..... 40¢
Sand Stone ..... 6¢

Scythe Stones—

Pike Mfg. Co.: 1901 list:
Black Diamond S. S. ... gro. $12.00
Lamoille S. S. ... gro. $11.00
White Mountain S. S. ... gro. $9.00
Green Mountain S. S. ... gro. $6.00
Extra Indian Pond S. S. ... gro. $7.00
No. 1 Indian Pond S. S. ... gro. $7.00
No. 2 Indian Pond S. S. ... gro. $4.50
Leader Red End S. S. ... gro. $4.50
Quick Cut Emery ... gro. $10.00
Pure Carundum ... gro. $18.00
Crescent ... $7.00
Emery Scythe Rifles, 2 Coat. $9
Emery Scythe Rifles, 3 Coat. $10
Emery Scythe Rifles, 4 Coat. $13
Balance of 1904 list 33⅓%.
Electro (Artificial), gro., $12.00 ... 33⅓%
Lightning (Artificial), gro., $18.00 ... 33⅓%

33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers ... gro. $9.00

Stops— Bench—

Miners Falls ... 15&10%
Morrill's, doz. No. 1, $10.00 ... 50%
Morrill's, No. 2, $12.50 ... 60%

Door—

Chapin-Stephens Co. ... 50@50&10%

Plane—

Chapin-Stephens Co. ... 20%

Straps— Box—

Acme Embossed, case lots..20&10&10%
Cary's Universal, case lots...20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. ... $2.00@2.25
All Steel Socket ... doz. $2.00@2.25
Excelsior Stretcher and Tack Hammer Combined, doz. $6.00 ... 20%

Stuffers, Sausage—

Enterprise Mfg. Co. ... 25&25&7½%
National Specialty Co. list Jan. 1, ... 30&5%
P. S. & W. Co. ... 40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: doz.
Sanitary Grotch Machines ... list
Triumph, Fancy Veneers ... $33.00
Parlor Queen, Fig, Rosewood..$30.00
Parlor Queen ... $27.00
Am. Queen, Fig. Mahogany ... $27.00
Ideal, Bird's-Eye Maple ... $25.00
Grand, Rapids, Natural ... $24.00
Ideal ...
Standard, Nickel, $22.00; Japan $20.00
Crown Jewel, Nickel, $21.00; Jap.$19.00
Cyclone, Cane Top ... $26.00
Cyclone, Cane ... $24.00
Club, 24 in. wide ... $54.00
Hotel, 36 in. wide ... $69.00

NOTE.—Rebates: 70c per dozen on three dozen lots, $1 per dozen on five dozen lots, $2 per dozen on ten dozen lots, $2.25 per dozen on twenty dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks ... 90@40%
American Cut Tacks ... 90@40%
Scouts' Cut Tacks ... 90@40%
Scouts' Upholsterers' ... 90@70%
Gimp Tacks ... 90@50%
Lace Tacks ... 90@70%
Patentee Tacks ... 90@40%
Looking Glass Tacks ... 60%
Bill Posters' and Railroad Tacks, ... 90@60&10%
Hungarian Nails ... 80@20%
Finishing Nails ... 70%
Trunk and Clout Nails ... 80&10%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks ...
... 90&5 less ¼—%

See also Nails, Wire

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Linen Skin ... 50@—%
Patent Leather ... 25@30&5%
Steel ... $3 1-8&5%
Chesterman's ... 25@25&5%
Kraft's Paper Co.:
Paper, Pocket Leather ... 40&—&5%
Metallic and Steel Lever list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Linen Skin ... 40&10@50%
Metallic ... 30@30&5%
Patent Bend, Leather ... 25&5@25&10%
Pocket ... 30@30&5%
Steel ... 33⅓@35%
Woodruff & Hilker:
Chesterman's Metallic No. 34L, etc. ... 25%
Chesterman's Steel, No. 1038L, ... 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger, ... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c. ... 30@33⅓%

Ties, Bale—Steel Wire—

Single Loop ... 50&10&5%
Monitor, Cross Head, &c. 70&2½%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White ... 20@20&5%

Haying—

Myers' Hay Tools ... 45%

Miniature—

Smith & Hemenway Co.'s, Davidson, doz., Nickel Plated, $1.50; Gold Plated ... $2.00

Saw—

Atkins' Cross Cut Saw Tools ... 35&5%
Simonds' Improved ... 33⅓%
Simonds' Crescent ... 25%

Ship—

L. & I. J. White ... 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro. ... $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida ... 75&10%
Hawley & Norton ... 65%
Victor ... 40%
Oneida Community Jump ... 50%
Hector ... 40%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes ... 12¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, doz., $13.25..$11.50 doz.
No. 3, Rat, doz., $6.50... $5.75 doz.
No. 3½, Rat, doz., $5.25. $4.70 doz.
No. 4, Mouse, doz., $3.85. $3.00 doz.
No. 5, Mouse, doz., $3.00. $2.25 doz.
Oneida Community:
Out o' Sight Mouse, doz.....$0.60
Out o' Sight, Rat, doz. ... 1.00
Easy Set, Mouse, doz. ... 1.00
Easy Set, Rat, doz. ... 1.00
Wood Choker, Rat, doz. holes. .12
Premier Tin Choker, 5 hole, doz. traps ... .75

Trowels—

Disston Brick and Pointing ... 25%
Disston Plastering ... doz. $16.00
Disston "Standard Brand" and Garden Trowels ... 30%
Kohler's Steel Garden Trowels, gro., 5 in. $4.80; 6 in. $6.00 ...
Never-Break Steel Garden Trowels.. gro. $6.00
Woodrough & McParlin, Plastering ... 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern ... 50&10%
Western Pattern ... 60&10%
Handy Trucks ... doz. $16.00
Grocers ... doz. $15.00
McKinney Trucks ... each, net $10.00
Model Stove Trucks ... doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.
No. 0 1 2 3
Galvanized $67 $79 $89 $99 10&5%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls 24@25¢
No. 12, ¼ and ½-lb. Balls 21@24¢
No. 15, ¼ and ½-lb. Balls 19@24¢
No. 24, ¼ and ½ -lb. Balls. ... 19@22¢
No. 36, ¼ and ½-lb. Balls 17@19¢
Chalk Line, Cotton ... 20&10%
Balls ... 20&10%
Cotton Mops, 6, 9, 12 and 15 to doz. ... 16@19¢
Cotton Wrapping, 5 Balls to lb., according to quality ... 15½@23¢
Domestic 2 Ply Hemp ... and ½ lb. Balls ... 14½@15¢
American 3 Ply Hemp, ½ lb. Balls ... 15½@16¢
India 2 Ply Hemp, ½ and ¼ Balls (Spring Twine) ... 16½@17½¢
India 3 Ply Hemp, ½ lb. Balls ... 16½@17½¢
India 3-Ply Hemp, ½ lb. Balls ... 19@21¢
2, 3 and 5 Ply Jute, ½ lb. Balls ... 15@16½¢
Mason Line, Linen, ½ lb. Balls 17¢
No. 36, Mattress, and Balls, according to quality. ... 17@19¢
Wool 3 to 6 ply ... 8@9¢, A 10¢

Vises—

Solid Box ... 50&10&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable ... 40%
Standard ... 40
Amateur ... 40
Columbian Hdw. Co. ... 40
Fisher & Norris Double Screw, net, each, Nos. 1, 2, $11.50; 3, $16.00; 4, $20.50; 5, $27.00 ... 40
Fulton Mach. & Vise Co.:
Reed, Swivel ... 25%
Star, Solid Jaw ... 40
Hollands':
Machine ... 10&10&5%
Knife ... 30&5%
Lewis Tool Co.:
Adjustable Jaw ... 30%
Monarch, 50%; Solid Jaw ... 50%
Massey Vise Co.:
Climber ... 40
Perfect, 15%; Lightning Grip ... 15%
Merrimac ... 50
Millers Falls Oval Side Pattern 60&10
Parker's:
Victor, 20@25; Regulars ... 20@25
Vibrators ... 15@15
Combination Pipe ... 5@0
Prentiss ... 40
Rock Island ... 25
Sandusky X L ... 30%
Stephens' ... 33⅓%

Saw Filers—

Disston's D 8 Clamp and Guide, doz. $24.00, 3 Clamps ... 30
Perfection Saw Clamps, doz. $4.50
Reading ... 40

Wood Workers—

Fulton Mach. & Vise Co.:
Reed ... 25
Star ... 40
Massey Vise Co.:
Lightning Grip, 15%; Perfect ... 15%
Wyman & Gordon Chuck Actuator, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Maydole's Quick Action Pipes ... 40
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. ...
Reed Combination Pipe ... 25%

Wads—*Price per M.*

B. E., 11 up ... 60¢
B. E., 9 and 10 ... 70¢
B. E., 8 ... 80¢
B. E., 7 ... 90¢
P. E., 11 up ... $1.00
P. E., 9 and 10 ... 1.25
P. E., 8 ... 1.50
P. E., 7 ... 1.50
Ely's B. E., 11 and larger. $1.70@1.75
Ely's P. E., 12 to 20 ... $3.00@3.25

Dia 1¢

Ware, Hollow—
Cast Iron, Hollow—

Stove Hollow Ware:
Japanned ... 45&10
Grounded ... 30&5
Plain or Unground ... 60
Country Hollow Ware, per 100 lbs. ... $3.00
White Enameled Ware:
Muslin Kettles ... 65&10%
Glazed Wares:
Tinned and Turned ... 35&10%
Enameled ... 45&10%
See also *Pots, Glue.*

Enameled—

Acme Nickel Steel Ware ... 70%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles ... 60%
Peerless ... 50%
Never Break Spiders and Griddles ... 65&5
Never Break Kettles ... 60%
Solid Steel Spiders and Griddles 65&5
Solid Steel Kettles ... 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@10&10%

Washboards—

Solid Zinc: doz.
Crescent ... $1.50
Rex ... 1.75
Double Zinc Surface:
Saginaw Globe, family size, stationary protector ... $3.55
Cable Cross, family size, stationary protector ... $3.60
Single Saginaw Globe ... $2.85
Brass Surface:
Rex ... $4.50
Nonpareil ... 4.50
Double Single Surface:
Globe ... $2.60
Single Surface:
Rex ... $3.95
Enamel Surface:
Rex, King, Single Surface, ventilated back ... $3.95

Washers—Leather, Axle—

Axle ... 90@40%
Patent ... 90@60%
Cast: ⅝ 1 1¼ 1½ Inch ... per hundred

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers.... $4.00 4.00 2.70 2.50 2.00
The above prices are based on $6.50 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel ... 4¢ ... per lb. 1¾@2¢

Wedges—

Oil Finish ... lb., ..@3¢

Weights—Hitching—

Covert Mfg. Co. ... 30&2%

Sash—

Per net log, inch face:
Eastern Department ...
Southern Territory $22.00@$4.50
Western and Central Departments ...

Wheels, Well—

Acme Wheels, iron, $2.75; ... $3.25; 14-in., $4.45.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 ... 72&10&7½%
10 to 18 ... 75&10&10%
19 to 26 ... 77½&10&10%
27 to 36 ... 77½&10&10%
Galvanized:
6 to 9 ... 72½&10&10%
10 to 18 ... 75&10&10%
19 to 26 ... 77½&10&10%
27 to 36 ... 77½&10&10%
Coppered:
6 to 9 ... 65&10&10%
10 to 18 ... 70&10&10%
19 to 26 ... 72½&10&10%
27 to 36 ... 72½&10&10%
Tinned:
6 to 18 ... 65&10%
Brass ... 17½¢ lb., base
Copper ... 32¢ lb., base
Cast Steel Wire ... 50%

Spooled Wire—

Annealed and Tinned:
... 70&10&10&10%
Brass and Copper ... 50&10&10%
Retailers' Assortments, per box, ... $2.10@$4.40

Wire Clothes Line, see Lines.
Wire Painters' Loaf.

Bright Wire Goods—

Steel Wire Goods ... 70&10%
Brass Wire Goods ... 50&10%
Brass Cup and Shoulder Hooks, ... 50&15%

Wire Cloth and Netting—

Galvanized Poultry Netting ... 50&10%
Painted Screen Cloth ... 50&10%
Standard Gage Hardware Grade: Per 100 sq. ft.
Nos. 2, 3 and 4 Mesh ...
Nos. 5, 6 and 7 Mesh ...
No. 8 Mesh ...
Nos. 9 and 10 Mesh ... 35

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ... 50&10%
Alligator or Crocodile.. 70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S ...
Acme ...
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S. I. ... Alligator Pattern, 40%; Briggs Pattern, 40%; Combination Bright, 40% ...
Steel Handle Nut ... 50%
Cutting ...
Merrick Pattern ...
Boardman's ...
Coes' ...
Coes' "Mechanics'" ... 40&10&10&5&5%
Peck ...
Reid ...
Saunders ...
Trimont ...
Whitman & Barnes ...
Less than case lots ... 40&10&5%
Solid Handles, P., S. & W., 50&10%;

Whitaker Machinists':

Wrought Goods—

Staples, Handles, &c., list March 15, '02 ... 50&10&10%

Zinc— *(Cash, lots at mill.)*

Sheet ... per 100 lb. $7.00

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1 in round and square ... ₰ lb 2.00¢
1 to 4 in x ⅛ to 1 in. ... ₰ lb 2.20¢
Rods—⅜ and 11-16 round and square ... ₰ lb 2.20¢
Angles: Cents ₰ lb
¼ in x ¼ in and larger ... 2.10¢
¼ in x 1⅛ in and ¼ in ... 2.00¢
1 to 2 in x ¼ in ... 1.90¢
1 to 2¼ in x 3-16 in and thicker ... 2.10¢
1 to 4 in x ⅜ to 1 in ... 2.15¢
3 to 6 in x ¼ in ... 2.15¢
5x3 in ... 2.25¢
4x3 in ... 2.25¢
3x3 in ... 2.40¢
2½x3 in ... 2.40¢
Tees:
1 in ... 2.75¢
1¼ in ... 2.75¢
1½ to 2 in ... 2.75¢
3 in and larger ... 2.75¢
Beams:
4 inches, 13 lb. and larger ... 2.75¢
Channels—1 to 8 x 3-16 to ½ ... 2.75¢
"Lowmoor's Best" Iron, base price ... 4.00¢
"Burden's" H. B. & S." Iron, base price ... 2.75¢
Universal ... 2.75¢
Norway Bars ... 5.00¢

Merchant Steel from Store—

per ₰
Bessemer Machinery ... 2.10¢
Toe Calk, Tire and Sleigh Shoe ... 2.25¢
Best Cast Steel, base price in small lots ... 11¢

Sheets from Store—

Black

	One Pass, C.R. Steel	Box Annealed
No. 14	₰ lb 2.95	3.00¢
Nos. 15 to 21	₰ lb 3.05	3.10¢
No. 27	₰ lb 3.15	3.20¢
No. 28	₰ lb 3.20	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment ... ₰ lb 11½@11¾¢
Russia, W. D. Worswood ... ₰ lb 11¾@12¢
Current Planished ... ₰ lb A, 10½; B, 9½, net.

Galvanized.

Nos. 14 to 16 ... ₰ lb 3.45¢
Nos. 22 to 24 ... ₰ lb 3.55¢
No. 27 ... ₰ lb 4.05¢
No. 28 ... ₰ lb 4.25¢
No. 20 and lighter 36 inches wide, 25¢ higher.

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:
IC, 14 x 20 ... $6.40
IX, 14 x 20 ... 7.65
A. Charcoal:
IC, 14 x 20 ... $5.45
IX, 14 x 20 ... 6.55

American Coke Plates—Bessemer-

IC, 14 x 20 ... 107 lb ... $4.45
IX, 14 x 20 ... 5.45

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating ... $8.00
IX, 20 x 28 with an 8 lb. coating ... 10.00

Seamless Brass Tubes—

List December 4, 1905. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List December 4, 1905. Base price 18¢

Copper Tubes—

List December 4, 1905. Base price 21¢

Brazed Brass Tubes—

List June 6, 1898. 20½¢ ₰ lb

High Brass Rods—

14½¢ ₰ lb

Roll and Sheet Brass—

List June 6, 1898. 14½¢ ₰ lb

METALS—

Tin—

Straits Pig ... ₰ lb 34 @35 ¢

Copper—

Lake Ingot ... ₰ lb 14 @14¼¢
Electrolytic ... ₰ lb 14 @14¼¢
Casting ... ₰ lb 13½@13¾¢

Sheet Copper Hot Rolled, 16 oz. ... ₰ lb 17@..¢
" " 14 oz. ... ₰ lb 18@..¢
Sheet Copper Cold Rolled, 1¢ ₰ lb advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, 1¢ advance over Cold Rolled.
Sheet Copper Polished over 20 in. wide, 2¢ advance over Cold Rolled.
Bottoms, Pits and Flats ... ₰ lb 21¢ basis
Planished Copper, 1¢ ₰ lb more than Polished.

Spelter—

Western ... ₰ lb 5½@6 ¢

Zinc.

No. 9, base, casks, ₰ lb 7.50¢ | Open ... ₰ lb 8.00¢

Lead.

American Pig ... ₰ lb 4½@4.5 ¢
Bar ... ₰ lb 5½@4.6 ¢

Solder.

½ & ½, guaranteed ... ₰ lb 22 @22½¢
No. 1 ... ₰ lb 18½@20½¢
Refined ... ₰ lb 17½@18 ¢
Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ... ₰ lb ..@12½
Hallett's ... ..@11¢
Other Brands ... ..@10¢

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:
Small lots ... 38¢
100-lb lots ... 36¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy and Wire	₰ lb 11.00@11.50
Copper, Light and Bottoms	₰ lb 10.25@10.50
Brass, Heavy	₰ lb 8.00@8.50
Heavy Machine Composition	₰ lb 10.25@10.50
Clean Brass Turnings	₰ lb 6.75@7.25
Composition Turnings	₰ lb 8.00@8.50
Lead, Heavy	₰ lb ..@3.10
Tea Lead	₰ lb ..@3.15
Zinc Scrap	₰ lb ..@3.00
No. 1 Yard Wrought, Long	$ ..@11.00
No. 1 Yard Wrought, Short	$ ..@10.00
Wrought Pipe	$ ..@9.00
No. 1 Machinery Cast	$11.25@12.25
Stove Plate	$ ..@11.50

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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THE IRON AGE

New York, Thursday, April 9, 1908.

Iron Mining in Cuba.

The Old and the New Properties of the Spanish American Iron Company.

However widely opinions may differ concerning the dangers of an exhaustion of available iron ore resources, important additions thereto will be welcomed, particularly when they are directly available to the American steel industry. Since the discovery of the Mesaba range, and the opening up of the deposits of Lapland, no addition to the world's iron ore resources approaching that found in Cuba has been made.

The Cuban Discoveries of High Importance.

These discoveries are of international importance, but primarily will assure the future of the steel industry of our Eastern States and our Atlantic seaboard, which, since the opening of the Mesaba mines, has been gradually driven on the one hand in the direction of producing specialties, and on the other hand of relying upon old material to feed its steel furnaces.

The known new deposits of the north coast of Cuba are so extensive that it is likely that the steel producing interests controlling them will ultimately supply the open market on both sides of the Atlantic with increasing quantities. Primarily, of course, the possession of the new deposits absolutely assures the future of the two allied works, the Pennsylvania Steel Company and the Maryland Steel Company, so far as ownership in raw material is a guarantee of life. But it is well to emphasize the probability that the influence of the ore developments in Cuba goes far beyond that range, narrower from the standpoint of this country's steel industry.

Significance of These Developments Not Realized.

The iron trade at large does not as yet appear to have fully realized what the near future will bring as the outcome of the new developments on the north coast of Cuba. The significance of the opening of distant fields is usually not measured correctly until the full force is felt by shipments on a large scale. It was not until the markets for pig iron and finished materials crumbled under the enormous weight of cheaply mined Mesaba ore that iron manufacturers in competitive districts not supplied from the new Lake range began to wake up. Their attitude in the earlier days was characterized by that of an iron maker who was then a leader in the Birmingham District. He declined an opportunity to visit the new range on the ground that no discovery anywhere could hope to rival in advantages those of his own district, and waived aside reports relating to the new range as the fabrications of wild boomers.

We believe that we have detected the evidences of a similar attitude on the part of some authorities in the iron trade toward the new developments in Cuba. There are some circumstances which may seem to justify a conservative attitude, and which have caused the interests that are now committed to the opening of the mines to move with extreme caution.

Unique Features of the Deposits.

The deposits themselves are unique in many respects. They are enormous in extent. They can be mined at a cost which can only be duplicated elsewhere under exceptional circumstances, for comparatively very limited areas. Suffice it to state that it is a question of excavating by steam shovel tens of thousands of acres of a deposit of ore averaging a thickness of 15 ft. at least, without any stripping whatever! Suffice it to say that operations have begun with only the smaller of two tracts, the Mayari, and that for the present there is in reserve a second larger tract, the Moa, which it is not proposed to touch for the present.

The cardinal facts are therefore an enormous quantity of Bessemer ore—many hundreds of millions of tons—all of which can be mined at an unprecedentedly low cost. But a very large capital outlay is necessary, the amount required to prepare for a tonnage of 1,500,000 tons per annum of ore ready for shipment being $4,500,000, including the acquisition of the property, the cost of exploration and development, the transportation facilities, drying and clinkering plant, the loading appliances, harbor works, and the housing of the employees. A considerable part of these capital charges is independent of the tonnage produced, and this points in the direction of a steady expansion of operations and the seeking of wider, outside markets, in order to lessen the fixed annual charge and the amortization per ton of product.

Some Offsets to Low First Cost.

The character of the ore offsets to some extent the advantages of very low first cost. The ore approaches clay in its consistency. It carries about 40 per cent. of water, and its physical condition is such that it must be agglomerated before going into the blast furnace. It is unusually high in alumina, so that questions arose as to its behavior in the blast furnace and the fuel requirements in smelting it. It contains 1.70 per cent. of chromium, concerning the elimination of which in steel making there were no precedents. Experiments on a commercial scale running over several years have, however, been made at the works of the Pennsylvania Steel Company, which have solved satisfactorily the chromium elimination. It is interesting to note that the same subject has been before Bolckow, Vaughan & Co., Ltd., Middlesbrough, England, and the experiments carried out by them were described at the London meeting of the Iron and Steel Institute in May, 1907, by Arthur W. Richards.

A direct and unavoidable charge to the cost of mining which these peculiar features of the ore imposes is the necessity for drying and clinkering the ore. It means that nearly two tons of the ore in place must be mined to obtain one ton of dry shipping ore, and that this nearly doubles the cost of excavation and transportation to the harbor, where the drying and clinkering plant is being installed. Were it not for the fact that this mining is so exceedingly low in cost, this circumstance might be regarded as being of some importance.

The Ore Carries Nickel.

One highly important fact of great compensating value, so far as the peculiar character of the ore is concerned, is that the Mayari ore carries nickel, which goes through the different metallurgical processes and is ultimately found in the steel, the quantity being about 1.5 per cent. While this is below the nickel contents of the special nickel steels which have been so successfully used in rails to meet particularly severe service, for which 3 to 5 per cent. has been adopted, still there is little doubt that the presence of the smaller quantity will materially contribute toward higher capacity to resist wear. To what extent the presence of 1.5 per cent. of nickel will find expression in a higher selling value of certain steel products, or will secure preference from consumers at equal prices, is, of course, a matter which the future must develop. Thus far, too, it is a question whether the chrome by-products obtained are capable of profitable utilization.

In its broad lines such is the situation so far as the new Cuban developments on the north coast are concerned. The balance drawn between the advantages and the drawbacks, although the latter can not yet be measured to the last cent, leaves the former in so commanding a position that the effects of the new developments upon the American steel industry must be far reaching. These

developments place the Pennsylvania Steel Company and its affiliated interests in a commanding position, with an unlimited supply of cheap ore. For some years that company has enjoyed, through the operations of the Spanish-American Iron Company in the Santiago District, a large supply of hard Bessemer ore at a low net cost. The future of this supply is absolutely assured for years, but the nature of the new deposits is such that they can be relied upon for generations.

There is evidence that the ore formation of which Mayari and Moa are parts extends over a considerable part of northern Cuba; in most instances, however, the deposits are too shallow or too lean to justify developments. Reference may be made, by way of illustration, to the large acreage of a deposit of about 1½ ft. of ore on the line of the Cuba Railroad at Ciego de Avilla and vicinity. Iron ore has also been found at numerous points in the western part of the island.

In the province of Pinar del Rio a high phosphorus ore has been found at Loma de Hierro, but it will require the building of a 35-mile line of railroad to reach a shipping point in Gudiana Bay. At Tortugas, near La Palma in Pinar del Rio, a shallow deposit has been discovered which is in character similar to that of Mayari, although understood to be somewhat lower in iron. Mulata is 7 miles from Mulata Bay, and 20 miles from Bahia Honda.

Cuban Mining Laws.

The Cuban Government is very liberal in its efforts to encourage mining enterprises. The present mining law dates back to 1868 and is administered in a very liberal spirit. There is no fee for filing claims, nor annual payments, nor royalties. The only payments are a deposit to cover the cost of the survey, an excess over that cost being refunded, and 50 cents per hectare for executing the title. The claim must specify the mineral found. The miner may condemn what land is needed for his operations and the land owner must sell at a maximum advance of 20 per cent. over the appraised value. These liberal laws have had the effect of encouraging a good deal of speculative filing of mining claims, with little intention on the part of the claimants to do any serious prospecting or development work, but it rarely takes long before extravagant notions of values disappear and reasonable royalties are accepted.

There is every evidence to encourage the belief that the mountain ranges of the eastern part of Cuba are rich in minerals, but prospecting in the jungles is fraught with very serious difficulties, notably on the northern flank of the Maestra range. Besides, the lack of transportation in the Cauto valley, fertile though it be, makes it impossible to go much beyond the prospecting stage at the present time. The very fact, however, that the Cauto valley, with Manzanillo as its outlet, is quite well cultivated and rich makes it probable that the railroad will soon open it up and give facilities to the development of the known deposits on the north flank of the Maestra range.

The Labor Problem.

The labor problem is a serious one in all parts of Cuba. In the eastern end a considerable proportion of the population (probably three-fourths) is of African race, and while fairly sturdy is not, generally speaking, very intelligent. The climate, on the whole, is not inimical to sustained physical effort, but nature is so bountiful that the necessities of life are readily obtained. So far as mining enterprises are concerned, there is competition for hands during the sugar cane cutting season, the estates generally drawing heavily upon the mines for labor. For common labor, reliance must be had upon the native, and while the per day rate is relatively low, the efficiency, too, is below the average. The nominal rate of $1 per day is not therefore so low as would appear at the first glance.

For more skilled work, the native labor has not been found either efficient or reliable. At some mines the system of letting contracts based on output of ore to small groups of men has been found to work out quite well, but the main reliance for actual miners has for years been a flow of immigration from northern Spain, through the intermediary of agents resident in that country. Sturdy and steady, eager to accumulate what is to them a competence, the Spanish miners are good workers, but the majority of them return to their homes after a stay varying from one to three years, so that constant recruiting is necessary. Both the Juragua and Spanish-American companies have devised systems for encouraging steady work. There has also been adopted the tarea, or task, system in mining, based on a day's work of a given number of cars of ore or of waste.

THE DAIQUIRI MINES.

Attention was called first to the iron ore deposits on the southern coast of Cuba, near Santiago, about 25 years since, by Alfred Earnshaw, an iron importer of Philadelphia. He induced the Pennsylvania Steel Company and Bethlehem Iron Company to investigate the deposits. Fred W. Wood, then of Steelton, Pa., studied the situation, visiting every outcrop then known in what was then an almost inaccessible jungle. During the first half of the nineteenth century a large part of the country had been under cultivation, there being extensive coffee, sugar and cacao estates, largely in the hands of French planters. These had been utterly destroyed during the first war of the revolution and the land had relapsed into wilderness. Practically the only guide to the estimation of the extent of the ore and to its character was a large amount of float, which in later years, in the case of some other enterprises, proved a very treacherous indication. Ultimately the Juragua property was selected as the most promising, and a limited partnership for 20 years was formed by the Pennsylvania Steel Company and the Bethlem Iron Company, under the laws of Pennsylvania, to operate the mines. At the expiration of the partnership the Bethlehem Company purchased the interest of the Pennsylvania Company in the Juragua property and has since operated it alone.

The opening up of the Juragua mines gave a great impetus to mining in the district, among those attracted to it being Samuel P. Ely and George H. Ely, Cleveland, Ohio, who had had a successful career as ore merchants and mine operators on the lake ranges. They acquired the property close to Daiquiri. Associated with them were Colgate Hoyt and John D. Rockefeller and C. W. Harkness of the Standard Oil party. The Spanish-American Iron Company was formed, with a capital stock of $800,000, which subsequently issued $250,000 of debentures and $250,000 of first mortgage notes. The operations were not financially successful and matters were practically in a deadlock when, in 1894, Charles F. Rand, who had been identified for years with the Aurora and other mines on the Gogebic range, was called somewhat suddenly to the presidency. Persistent work along broad lines developed the mines and led to increasing output with growing efficiency of the entire plant and organization.

On April 1, 1901, the Pennsylvania Steel Company acquired the entire capital stock of the Spanish-American Iron Company, Mr. Rand remaining the president. With the active backing of the new interests the property has been made a model enterprise in every respect, has been very successful financially and has accumulated a large surplus, although every improvement has been charged off to operating expenses year after year. From 1895 to 1907, both inclusive, 4,036,451 tons of ore have been produced, and there are now in sight, estimated on the most careful and conservative basis, 2,656,000 tons of ore in all the mines.

Ore in Sight and Exploration.

The methods of estimating ore in sight have been well tested in the case of numerous small operations dealing with isolated deposits. In the case of the principal group of mines there is only included what is technically in sight by actual discovery in mining operations, so that the probable life of the mines is far longer than the tonnage revealed would indicate. The determination of the ore in sight possesses value chiefly because it enables the management to judge whether a given expenditure for betterments may be safely made.

It has always been the policy to explore the ore bodies well in advance of actual mining operations, so that the

latter may be conducted with a clear conception of the effect of current work upon the cost and facility of extracting ore at future times. In open cut working the removal of overburden and waste and the disposal of spoil, if not conducted in a comprehensive manner, may seriously compromise the mine at a future date, or at least gravely affect the cost of production. The management of the Daiquiri mines therefore conducts, through tunnels and shafts, an extended system of exploration well in advance of current mining. The system followed is to keep the exploration drifts and tunnels along the contact of the ore and the gangue, and this is the only underground mining which is done. During the past year the system has been adopted of basing the estimates of ore in sight upon a series of cross sections from 25 to 50 ft. apart, so that they reflect, as closely as it is possible with so irregular a deposit, the minimum quantity of ore actually available even though practically every opening might cease to show ore further on.

The Vinent Group.

The ore properties of the Spanish-American Iron Company have been divided into two groups: the Vinent group, so named after the Marquis of Vinent, who owned a large plantation in the district, the only relic of which to-day is the ruin of an old sugar crushing mill close to the village of Daiquiri, and the Berraco group, which includes a considerable number of mines to the east. To the west the property of the Juragua Iron Company adjoins that of the Spanish-American Iron Company, at no great distance from the Vinent mines. While the existence of some ore deposits is known in the intervening territory, the amount of ground available in that direction to the Spanish-American Iron Company is not large.

The Vinent group includes the Lola, Magdalena and San Antonio mines (practically one operation), on Lola Hill; the Providencia, which crowns an adjoining mountain, and the Alfredo. The Berraco group, which is scattered to the eastward and made accessible through a 10-mile narrow gauge railroad, includes a series of smaller mines, of which some like the Berraco, Concepcion, Elvira, Fausto and Fausto Segundo have been either wholly or largely exhausted, and of which others like the Norte, San Sebastian, Escondida, Falconera, Ceres and Vesta are newly developed mines. These, however, are of minor importance, so that the question has even been discussed of entirely abandoning the Berraco Railroad. Out of the total production in 1907 of 500,330 tons for the whole property, the Berraco mines furnished 107,508 tons.

The chief interest centers in the deposits of the Lola Hill, a cone shaped hill, which rises from the valley to the hight of about 850 ft., with the Lola mine, the first opened, flanked by the Magdalena on one side and the San Antonio on the other. In the accompanying general view of the camp the Lola mine is seen occupying the crest of the hill, while the San Antonio is to the right, somewhat lower. The Magdalena is not visible in the view shown, being hidden by a spur of the hill.

The Lola Hill Ore Deposits.

While some suggestion may be traced of an original lenticular form, the deposits have apparently been subjected to so many and such violent changes that they are highly irregular. While in place the ore occurs in great masses, yet it is difficult, if not impossible, to convey any exact impression of the character and extent of the deposits by quoting dimensions. Their form and thus far their position have made open cut working the only system available, although the increasing amount of overburden has at least raised the question whether lower cost might not be attainable by underground mining. We believe that thus far a careful study of the figures has pretty emphatically answered that question in the negative. It is a fact, however, that both of the great companies find their costs increasing through the necessity of removing a larger quantity of waste. In the case of the Lola Hill mines this has now risen to 2.36 tons of waste per ton of ore produced. It was less than half of that in the earlier days. The recent discovery of deep bodies of ore, mostly in the Lola and Magdalena mines, may, however, again bring up the matter of underground mining.

The general layout of the Lola Hill mines and of the ore bodies is shown in the accompanying general plan. The hatched surfaces represent the ore, the darker areas indicating its extent on the slopes between the different levels, while the lighter shade shows the ore in place on the floors of the cuts. The areas of intermediate hatching indicate mixed ore.

Wherever ore has been encountered in exploring tunnels, the plan shows where the drift is in solid ore, where the ore is in the upper part, where in the floor and where on the side. Recently good ore has been somewhat unexpectedly discovered in the highest cuts of the Magdalena mine during the work of removal of the overburden. In the main body of the same mine bunches of largely oxidized copper ore have been discovered. When the Cobre smelter was in operation this ore was picked out and was shipped to that plant. In some of the lower parts of the Magdalena, too, patches of ore higher in sulphur have been discovered.

The Character of the Ore.

The ore, however, is very uniform and is low in phosphorus. The average of all the mine analyses during 1906 was 57.40 per cent. of iron, 11.80 per cent. of silica, 0.038 per cent. of phosphorus and 0.20 per cent. of sulphur. In 1907 the average was 57.80 per cent. of iron, 10.80 per cent. of silica, 0.034 per cent. of phosphorus and 0.18 per cent. of sulphur.

During 1907 the average of 94 cargoes shipped was 56.67 per cent. iron, 11.80 per cent. silica, 0.032 per cent. of phosphorus, 0.21 per cent. of sulphur and 0.687 per cent. of moisture. The maximum, in eight cargoes, was 57.28 per cent. of iron, while the minimum, in 11 cargoes, was 55.746 per cent. of iron. The indications from monthly samples of all the explorations in the Vinent group of mines indicates that the 2,500,000 tons of ore in sight will average 59 per cent. of iron.

Mining Methods.

The deposit is attacked by a series of levels from 40 to 60 ft. above one another, the stripping being kept well ahead of the mining operations proper. The configuration of the ground is such that the great amount of waste can be readily disposed of. Under some circumstances the ore is hoisted from lower to higher levels, for hauling to the main inclines, and in one case the ore and the waste are milled from an upper to a lower level.

The mining proper consists of drilling holes from 30 to 40 ft. deep, widening a chamber by some light charges and then loading with black powder. The larger boulders are shattered with dynamite. The waste is loaded with steam shovels and is carried to the dumps. The ore is conveyed to inclined planes, at the foot of which it is dropped into pockets, from which it is loaded into cars having a capacity of 25 tons on the standard gauge railroad which connects with the shipping harbor. This railroad, admirably ballasted and maintained, is 4 miles long and has a mixmum grade of 2 per cent. It is equipped with four locomotives and 95 cars.

Transportation and Handling.

On the route to the shipping port the company has during the past year installed a crushing plant, consisting of a modern engine, two boilers and two No. 8 Gates crushers, with ample capacity to take care of the product of the mines, all of which goes through the crusher irrespective of size. The crushers deliver the ore into pockets, from which the cars are loaded. The empties are delivered to the crusher pockets and then to the storage tracks by gravity.

The company now has pockets and storage capacity in cars to accumulate about 10,000 tons, so that when an ore boat is to be loaded it can be done quickly. The pockets are now partially used to load the standard gauge cars with Berraco ores, which must first go through the crusher.

The company has just completed arrangements to stock a large quantity of ore on an extensive tract of level ground alongside the main line track. During the present depression shipments have been cut down to 15,000 tons per month, and about 15,000 tons per month will be stocked, so that the operations of the mines will

continue undisturbed. The normal production is about 40,000 tons per month.

The Harbor.

The harbor and its improvements are shown in the accompanying engraving. There is one low level dock, which is chiefly used for the tugboat Colon, belonging to the company, which is in service chiefly between Santiago and Daiquiri. The shipping dock was originally built with the intention of employing whalebacks, which the Standard Oil interests backing the mining enterprise at that time regarded as the coming type of carrier for bulk freight. The result was that the ore chutes were placed too low. Now two of the 10 pockets are so arranged that they will dischage when the vessel is high in the water, the balance of the cargo being loaded from the other pockets. The total capacity of the 10 pockets is 2500 tons.

In 1907 there were put through the storage pockets 155,825 tons, and there were put on a stockpile 43,900 tons, subsequently rehandled by steam shovel. Very rapid work has been done in the loading of vessels, the charges for demurrage being serious. In 1905 the average time of loading vessels, which averaged 4608 tons, was 25 hr. In 1906, when there were loaded 102 ships with an average cargo of 4966 tons, the average time was 20 hr. and 31 min. In 1907, with 98 cargoes of 4979 tons, the time was cut down to 17 hr. 27 min., or 285 tons per hour. A premium is paid to laborers for loading at a rate exceeding 200 tons per hour.

In close proximity to the dock are the machine shops and foundry of the company, in which repairs to plant and equipment are made, and the refrigerating plant, which is a necessary adjunct to every large plant in Cuba.

The Output.

Since May, 1895, the production of the mines of the Spanish-American Iron Company has been as follows:

	Tons.		Tons.
1895	74,991	1902	463,987
1896	114,110	1903	477,575
1897	206,029	1904	342,108
1898*	84,643	1905	422,003
1899	218,959	1906	510,500
1900	286,140	1907	500,330
1901	335,076		

* Interrupted by the war.



Map Showing the Magdalena, Lola and San Antonio Mines

The rapid development in the output has been largely due to the introduction of the steam shovel into mining at Daiquiri. The first steam shovel was brought in with great difficulty in April, 1900, a second being brought in during the same year. One more followed in 1901, two in 1905, one in 1906 and four in 1907. The majority of these are the Marion model 20, with 1¼-yd. dipper. This year the Marion model 50, with 2-yd. dipper, will be introduced. In February, 1908, seven shovels were engaged in stripping above the Lola and Magdalena mines, one was working in ore on the Lola proper and two were in ore in the San Antonio opening.

The Spanish-American Iron Company has a contract with the Earnline Steamship Company to ship the ores produced. The United States customs duty is 32 cents

per ton, being the duty of 40 cents per ton under the general tariff law, less 20 per cent. thereof under the preferential arrangement existing between the United States and Cuba. The ore is sold under a contract to the Maryland Steel Company and the Pennsylvania Steel Company, under which the price is close to that obtainable in the open market.

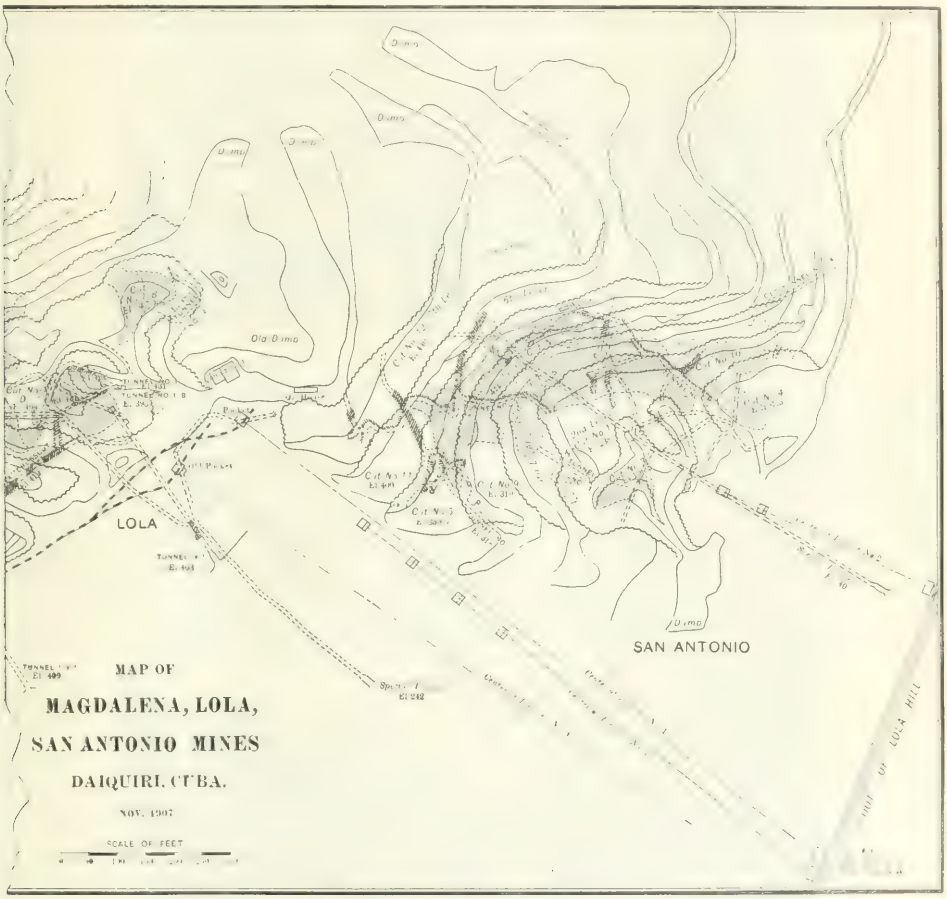
Sanitation and the Care of the Sick.

Close to the port, pleasantly situated on the brow of a low hill, is the hospital of the company. Very great attention has been given to the sanitary condition of the whole mining population. The guiding consideration throughout is that every effort must be bent toward the prevention of sickness and the spread of contagious dis-

men, and has fluctuated between 1.8 and 2 since then.

In 1907, with an average of 1315 men on the pay roll, there were only 1034 patients in the hospital during the whole of the year. There were only eight deaths, and besides there were five deaths due to accidents at the mines caused by the negligence of the men themselves. Out of 808 cases of sickness 689 were malarial fever, of which 678 were cured. There were 215 cases of slight injury, of which 209 were cured, and 22 cases of heavy injury, of which 21 were cured.

The hospital itself is an airy, well designed building, well equipped with the necessary surgical implements and medicines, with broad verandas and a promising garden.



of the Spanish-American Iron Company, at Daiquiri, Cuba.

eases. The chief physician is at the head of an organized sanitary police, which subjects the dwellings of the workmen to frequent and searching inspection and is vigilant and unrelenting in demanding that precautionary measures be followed. All the buildings are spick and span, and there is no litter anywhere. The physician spends a considerable part of his time visiting the mines and watching the force, to prevent any attempts to disguise early symptoms of sickness.

The result has been a marked improvement in the health of the community. While in 1899 the average number of patients in the hospital each day was 6.7 in each 100 of the men on the pay roll, and was 5.9 in 1900, it dropped to 3.8 in 1901 and 3.2 in 1902, sank to 2.2 in 1903, fell to the record of 1.5 in 1904, with picked

Mention may be made in this connection of the fact that the officers and principal employees enjoy one month's vacation every year, the cost of a visit to a northern climate being refunded to them. It has been the experience of all who work in tropical and semi-tropical climates that they must return to the north at regular intervals to escape the debilitating effects of sustained effort in the warmer countries.

THE MAYARI MINES.

The discovery of the Mayari deposit was not a lucky accident, but was the result of the work of an organization carefully planned, well manned and consistently supported. The Spanish-American Iron Company has for many years had its corps of expert explorers in the field in different parts of Cuba. Their long experience has

taught them how to meet more effectively the difficulties and lessen the hardships and risks of exploration in a tropical country. The attitude and method of the company has led to the practice throughout Cuba, on the part of prospectors and explorers, to bring their discoveries first to the attention of this company.

The first indication of the Mayari deposit, which was approached from the south flank of the Nipe range along an old highway which crosses the range, was the comparatively small bed of hardened ore which is found in some places, and notably the Plancha claim. With this cue, exploration was prosecuted and soon led to the discovery that there was a good deal of coarse loose ore which greatly expanded the possibilities. Later it was found that for its entire thickness the bed is iron ore, in spite of the yellowish colors of its deeper part. Test pitting was undertaken in a systematic manner, and the extraordinary extent of the bed became more and more apparent.

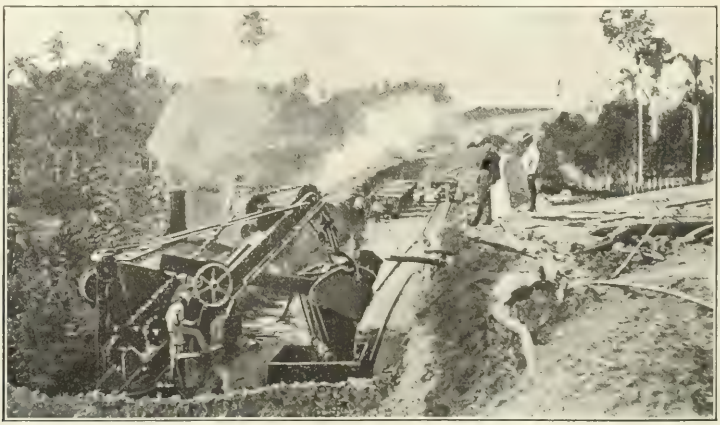
The total cost of the acquisition of the property, its exploration and development, including the building and equipment of the railroad and inclines, the dredging of the harbor, the construction of drying and clinkering plant, of ore loading apparatus, and the building of villages and shops at the mines and at the terminals, will aggregate about $4,500,000. The Spanish-American Iron Company has arranged an issue of bonds to meet this outlay.

The principal features of the Mayari district were fully and accurately described in the issue of *The Iron Age* of August 15, 1907, so that a brief summary of the principal facts will suffice with special reference to the present condition of the works for the development of the property.

The ore covers a plateau on the Nipe range, about 1800 ft. above the undulating plain which stretches to Nipe Bay. A number of routes were surveyed to overcome this rise, with special reference also to crossing the Mayari River at a point and a hight which would avoid the dangers of the floods to which the streams are subject. The route finally selected, while more costly than others rejected, is secure from floods. Between Felton, the terminal established on Cagimaya Island, on Nipe Bay, and the main switching yards at Piedra Gorda, at the foot of the mountain, a distance of 13.5 miles, there are five steel bridges and one wooden trestle. All the bridge material is delivered and is in process of erection. The greatest delay which has occurred thus far is in the Guaya cut, through unseasonable rains. This is now nearly completed, and track laying will follow quickly.



Coal Steamer, Brown Hoist and Sand Fleet at Felton.



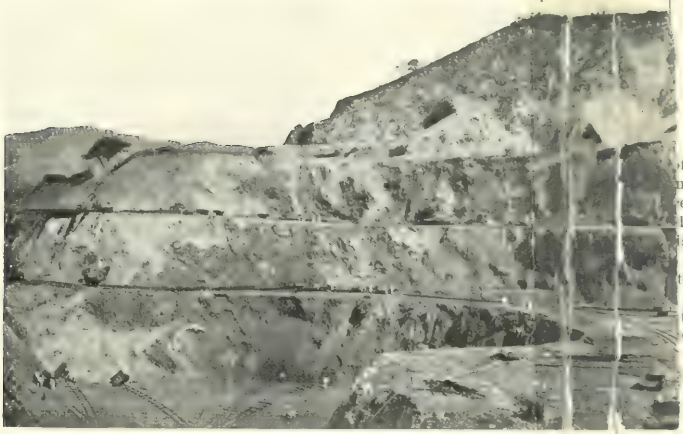
Steam Shovel at Guayo.

The mountain top is reached by two inclines, the upper 6957 ft. long and the lower 1876 ft. long, connected with 4071 ft. of level track. The grading of the lower incline has been completed, and the contractors were recently putting in the cableway for carrying on the work. From the head of the upper incline a mine railroad is planned, to be 3 miles long, to give room for five steam shovel tracks. The incline machinery, which has been designed by the New York Cableway & Engineering Company, New York, and under construction by the Nordberg Mfg. Com-



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THE IRON MINES OF THE SPA
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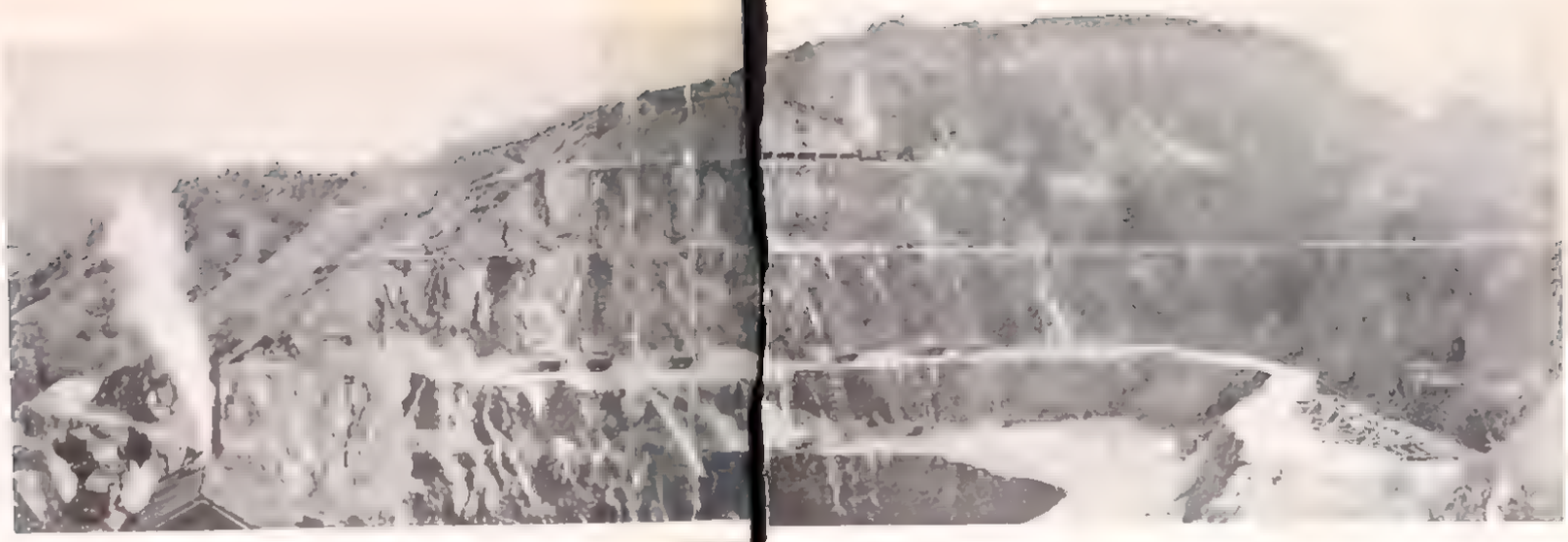
THE SHIPPING PORT OF THE SPANISH-AMERICAN IRON COMPANY, IRON MTN.

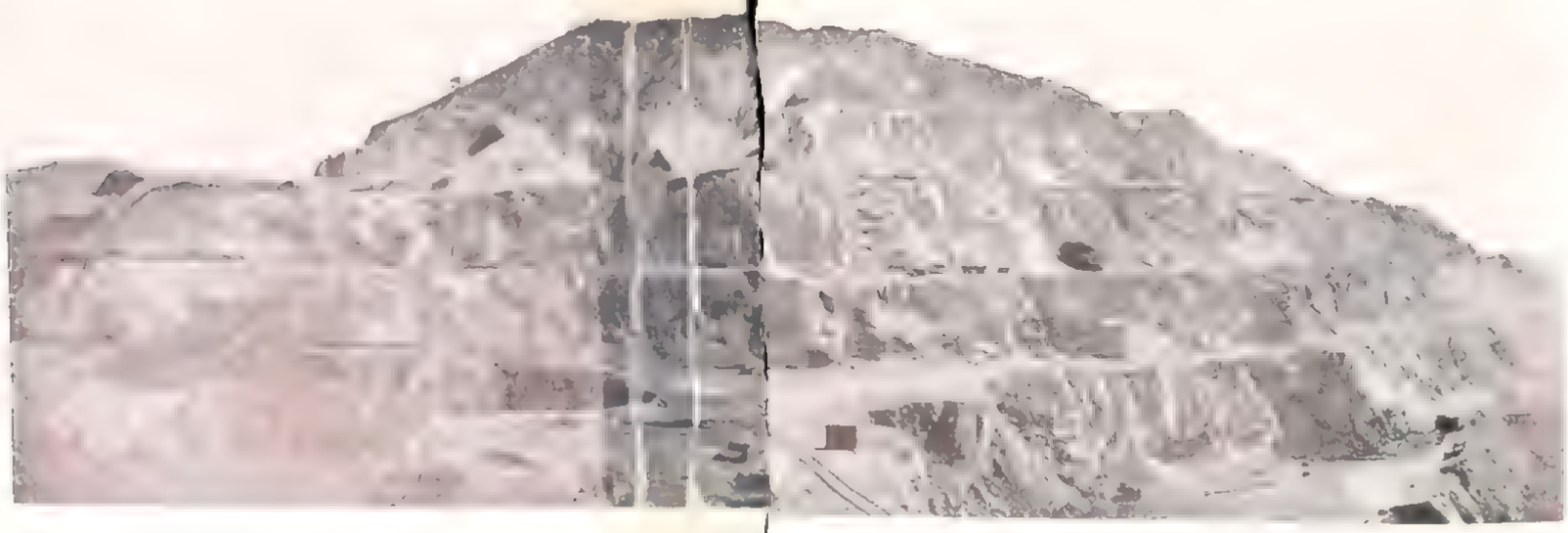


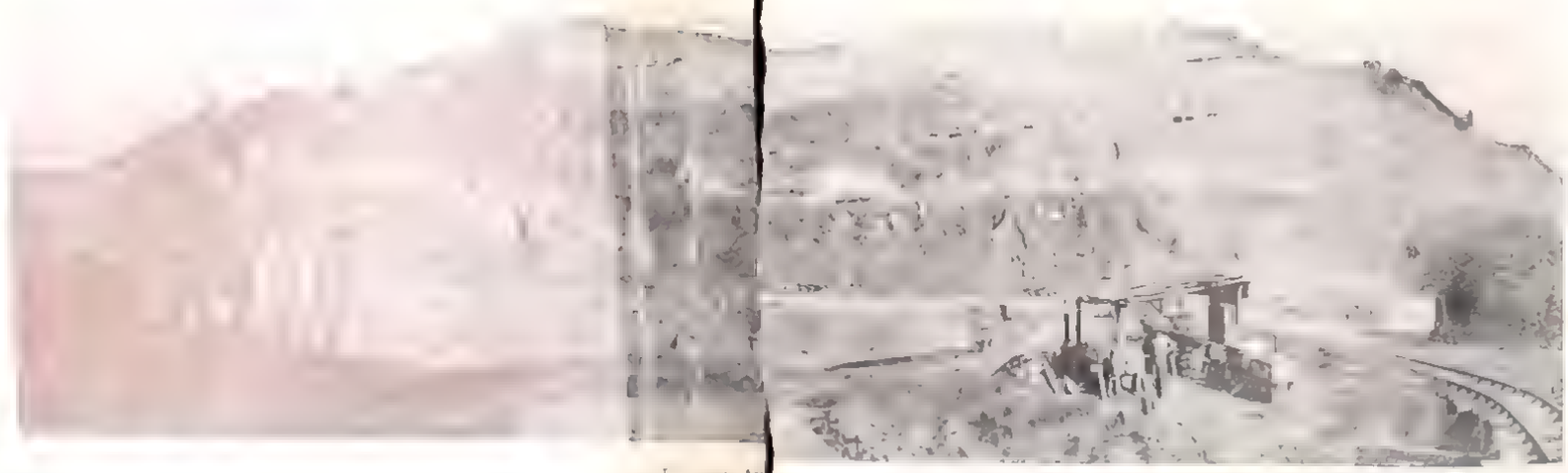


A GENERAL VIEW OF THE TOWN OF DAIQUIRI AND THE SAN ANTONIO MINE IN THE RIGHT OF THE VIEW AND THE [illegible] IN THE LEFT

THE IRON MINES OF THE SPANISH-AMERICAN IRON COMPANY
AT DAIQUIRI, NEAR SANTIAGO, CUBA







OF THE SPA H AMERICAN IRON COMPANY
AT DAIQUIRI, NEA ANTIAGO CUBA

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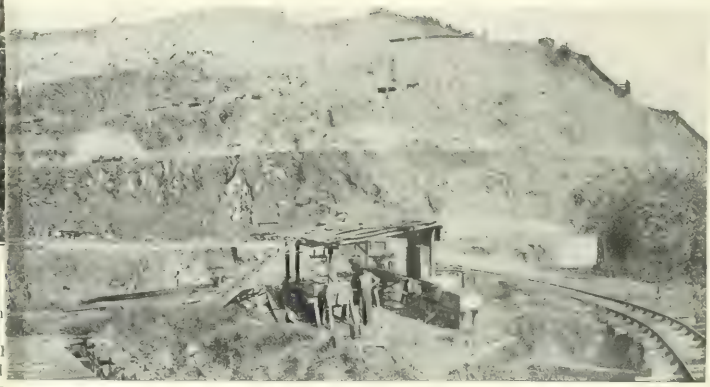
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NISH AMERICAN IRON COMPANY
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pany, Milwaukee, will at first have a capacity of 6000 to 8000 tons in 10 hr. It will be so arranged that it can handle three 50-ton cars when using a larger rope. At first, with a smaller rope, it will handle only two cars. Later, when necessary, the capacity can be further increased by dividing the upper incline at a point half way down, where the grade is reduced to 5 per cent., thus making three inclines.

of the basin was moved out about 245 ft. from the shore line. There will be 28 ft. of water for 1500 ft. along the shore available for handling ore, coal and lumber.

At Felton the ore from the mines will be dried and clinkered. A special car has been designed to handle the sticky ore, which will be either fed directly into the drying and clinkering furnaces or delivered to storage. A long series of experiments



Mayari Falls, Mayari River.

The Terminal.

At the terminal, Felton, a great deal of work has been accomplished. A pier 1700 ft. long has been in use for a considerable time, there being enough water at the last 200 ft. for ocean going vessels. It has been used steadily for bringing in track materials, supplies and fuel, a Brown locomotive crane having been found a very useful tool in connection with it. By far the greater part of the 3000 ft. of channel from the shore of Cagimaya Island to the main ship channel has been dredged to a width of

led to the final selection of the type of plant for drying the ore and clinkering it. The initial layout at Felton provides for six clinkering furnaces, having a total capacity of 3000 tons of calcined ore daily. From these drying and clinkering furnaces the ore is discharged into transfer cars. The run on the wall of a long trough, lined with concrete and located parallel with the shore line. From this trough the ore is lifted by a grab bucket on a trolley, moving on a bridge with a cantilever overhang and a knife arm reaching out from the end of the



South Abutment, Mayari River Bridge.

over 200 ft. and to a minimum depth of 28 ft. This work was decided upon after the question had been carefully considered of building a pier 3000 ft. long from the shore to deep water. It was ascertained, however, that the foundations were too poor to permit this to be done, and the plan was adopted of dredging the channel to the shore and excavating a basin along the shore for loading. Drillings showed that there was a considerable yardage of rock close to the natural shore, and therefore the rear edge

cantilever over the vessel to be loaded. The ore may be loaded by the bridge from the trough to vessels or to a stockpit, as occasion requires. It is claimed that the machinery can load from the trough to a vessel at the rate of 600 to 1000 tons of clinkered ore per hour.

The presence of chrome in pig iron has been a perplexing matter to steel makers, chiefly because chrome slags are infusible and sticky and are troublesome either in the Bessemer converter or in the open hearth furnace.

Very extensive tests have been carried out in the acid and basic Bessemer converter and open-hearth furnaces at the Pennsylvania Steel Company which led to a successful issue, the metallurgical considerations being determined which should guide in the conversion of pig high in chromium. As yet the details are not available for publication beyond the fact that the steel produced has been of very high quality.

At Felton a machine and repair shop have been installed, together with a woodworking shop. A warehouse is under construction, and a considerable number of workmen's houses and barracks and of officers' houses have been completed together with a roomy hotel. The village has been laid out in accordance with the plans of Hinchman, Pilat & Tooker, New York, with sewerage and water supply complete. It is located on Cagimaya Island, facing the bay, on ground considerably above the sea, and promises to be thoroughly healthful and pleasant. For the permanent water supply a plant has been provided capable of furnishing 300,000 gal. per day, the water being taken from the Mayari River at an advantageous point, where the railroad line crosses that stream. The water, which is of remarkable purity and softness, is elevated by steam pumps to tanks on a hill, and flows through an 8-in. cast iron pipe by gravity 12 miles to Felton. A second village will be built at the mines.

It is expected that in the first year when the entire operations swing into line the shipments will amount to 500,000 tons, and that the second year, 1910, will see them carried up to 1,000,000 tons of clinkered shipping ore.

THE MOA DEPOSIT.

The Moa deposit, almost all of which is owned by the Spanish-American Iron Company, is located 45 miles east of Nipe Bay. It is larger in extent than the Mayari, but has some leaner spots. While it is quite close to the sea and might have been opened at somewhat less cost than Mayari, it was evident that the operating costs would be higher. The harbor is also inferior. Until after the Mayari properties have reached their maximum shipping capacity, it does not seem probable that any development will be undertaken at Moa. The deposit is located in a country which is very sparsely populated, while the Mayari mines are close to a district which has a relatively large population, the town itself having upward of 3000 souls, cultivating extensive tobacco fields. On and adjacent to Nipe Bay are the sugar plantations of the United Fruit Company, with upward of 25,000 acres in cultivation, and one of the largest sugar mills in Cuba, having a capacity of 2000 bags per day, and a lay out for 1000 bags additional, located at Preston, the terminal, with ample docks and dwellings. On Nipe Bay also is Antilla, the terminal of the Van Horn railroad enterprise, while the large fruit plantations of Dumois are at Saetia, close to the entrance to the sea. The Mayari enterprise is therefore established in a well settled country, with ample opportunity to furnish the needed supply of labor, of which a comparatively small proportion will be skilled.

PROPERTIES OF THE PONUPO MANGANESE COMPANY.

The first discovery of manganese ore at Ponupo, Cuba, was on Vencedora hill, the deposits possessing the irregularity which seems to characterize all manganese de-



Incline No. 1, from Station 125.

posits, the world over. The ore is in the form of pyrolusite, and is in irregular though often very considerable bodies, and mixed, often, with clay and with jasper. In the earlier days of mining at Ponupo, the jasper was considered to be an indication that no further ore would be found below it. That idea has now been completely abandoned.



Incline No. 2

The ore is worked in open cuts and is separated into two classes, the shipping ore and the wash ore. In

recent years a great deal of systematic exploration has been carried out, and the mine tracks have been extended to the Balkanes mines, which were opened and were ready to ship when the decline in the demand for manganese ore following the recent financial panic led to the closing down of the Ponupo manganese mines for the time being.

The wash ore is brought to barrel washers, placed side by side, driven by an engine. The water is supplied by a pumping station located on the Ponupo River, from which it is pumped to tanks placed 180 ft. above them. The wash water is allowed to settle in reservoirs formed by throwing up dams along the side of the hill. A considerable amount of wash has thus accumulated which contains about 20 per cent. of manganese and a like amount of silica. Experiments have been made to utilize this material with the aid of a vanner, but they have not yet been successful. The main incline serves a series of levels for delivering ore to the bin, which is located on the main line. A new bin for direct shipments has just been completed.

During the period in which the present management conducted active operations, from March, 1906, to September, 1907, the mine produced about 50,000 tons. The mines have employed up to 400 men. A considerable share of the output is made by contractors who employ small crews of men on the many small and isolated deposits. They are paid a fixed price for clean ore, alongside the track of the railroad, based upon analysis of an average sample. A considerable number of the working population are negroes.

The Ponupo shipping ore runs about 42 per cent. of manganese, 0.08 per cent. of phosphorus, 11 per cent. of silica, and 6 per cent. of iron, in the dried ore. The hygroscopic water is about 10 per cent. Cargo analyses show shipments up to 46 per cent. of manganese.

While the mines were in operation they shipped up to 4000 tons of ore per month, while the capacity of the leased operations was about 600 to 700 tons per month additional. Of the shipments made, three averaging 2500 tons each were made to Europe, the balance coming to the United States.

The distance from the mines to the coast is 22 miles, the freight being $1.45 to $1.50 per ton, alongside the ship's tackle. The royalty is usually 80 cents per ton, but is lowered to about 50 cents when shipments go above 10,000 tons in one year. The ocean freight is about $1.60 per ton.

The Cuero Iron Mine.

The Ponupo Manganese Company, which is owned by Charles F. Rand, Jennings S. Cox, Jr., and Pedro Aguilera, has recently begun the opening of an iron ore deposit at El Cuero, close to the coast, 8 miles west of Santiago. This property is expected to begin shipping about 10,000 tons of iron ore per month in November, 1908. The character of the ore is like that of the Daiquiri mines, and is expected to run in cargo lots 60 per cent. of iron, 0.03 per cent. of phosphorus, 8 per cent. of silica, and 0.02 per cent. of sulphur. A railroad line, 2.8 miles in length is being built. The loading point will be in the Bay of Nima Nima, where the wreck of the Spanish warship Oquendo lies.

The Future of Cuba and American Interests.

A brief sojourn makes it a hazardous undertaking to touch upon the all absorbing question of the political future of Cuba, and of her relations to the United States, but the latter have assumed increased importance through the very discovery of the new iron ore mining fields. They will become a main source of supply to one of our great foundation industries so that another tie is being formed in the economic interdependence of the two countries, and our interest in a stable, well managed government for the Pearl of the Antilles is increased.

The opinion seems to be prevalent in this country that Cuba owes us a great debt of gratitude for having aided in securing her independence and for having introduced and maintained an orderly government. However much or little this feeling may be justified is really beside the question, since the practical point is whether the majority of the Cubans share in that sentiment. It is the opinion of clear sighted observers that they do not, and that, in fact, they are impatient of control and eager to manage their affairs in their own way. The "American" is not, on the whole, more popular in Cuba than he is in Mexico, or any other Spanish-American country. His money is very, very welcome. His energy is more envied and resented than it is admired. The better, wealthier, ambitious classes, who have a stake in the country, realize that they must share in the well being which an influx of capital and enterprise has already brought to the country and will bring in to an increasing measure. While they should be the ruling class, they are not because too many of them have been identified with Spanish interests or are themselves natives of Spain. The mass of the people, and particularly the laborers, have been greatly benefited by the higher level of wages established, but they are easily led by agitators, and they do not like the "Americans," whose attitude, manners and methods are very far from being sympathetic.

It is difficult to escape the conviction that in Cuba it is a matter of the "ins" and the "outs," rather than one of fundamental principles. The future would be clearer, if the people were more eagerly and more intelligently given to promoting their own material interests by sustained effort. Enlarged opportunities and the example of success may be depended upon to stimulate this feeling, but its growth can not help being gradual at best.

The Cuban people should be assisted and given the greatest possible latitude and a fixed policy should be pursued which will assure peace and the undisturbed development of great material resources, in which American capital has so large a stake. That our own country will protect those investments is accepted as an axiom.

The Pennsylvania State Railroad Commission.

HARRISBURG, PA., April 7, 1908.—The new Pennsylvania State Railroad Commission this week begins its hearing of complaints, first taking up that of the York Manufacturers' Association against the Northern Central and Western Maryland railroads. The complaint involves switching charges. Over two dozen formal complaints have been filed with the commission, mostly on insufficient train service and switching, there being none of discrimination or lack of car service. The commission has large powers of inquiry and can recommend prosecution by the Attorney-General if its orders are not complied with. The work under the commission is to be divided among bureaus, as follows: Bureau of accidents, to have charge of the investigation of all accidents; bureau of railroad inspection, to have charge of the inspection of roads, grade crossings, safety appliances, and all other physical features of steam railroads; bureau of street railroad inspection, also to have charge of the inspection of telephone and telegraph equipments and facilities; bureau of traffic, to have charge of all matters relating to rates, service, &c.; bureau of statistics, to collect and compile statistics.

The members of the commission are as follows: Judge Nathaniel Ewing, Uniontown, president; Charles N. Mann, Philadelphia, and John Y. Boyd, Harrisburg. Harry S. Calvert, Pittsburgh, is secretary; William H. Allen, Warren, is attorney, and John P. Dohoney, Harrisburg, is marshal.

This commission has jurisdiction over approximately 1700 corporations. These include 509 steam railroads, 710 electric railroads, 350 telephone companies and the various telegraph, express, pipe line, fast freight, steamboat, ferry and bridge companies. Its jurisdiction covers more than any other State Railroad Commission or similar body in the United States.

The Commonwealth Steel Company, Granite City, Ill., after a month of idleness, has resumed work in its open hearth steel casting plant, employing about 400 men. Under normal conditions more than double this number is employed, and it is expected that the improvement in business will within a short time increase the force materially.

The New Blast Furnace of the Hamilton Steel & Iron Company, Ltd.

Hamilton, Ont., has been for a number of years the location of an important factor in Canadian iron and steel manufacture. In the beginning a rolling mill plant was built there in 1861, which has turned out a variety of products, principally bar iron, fish plates, nail plate, cut nails and rivets. In 1894-1895 a blast furnace was erected at Hamilton, operated for a time by the Hamilton Iron & Steel Company, Ltd., and later by the Hamilton Blast Furnace Company, Ltd. Various extensions to the rolling mill plant have been made from time to time, including in recent years an open hearth plant, and the larger development led in 1899 to the organization of the Hamilton Steel & Iron Company, Ltd., which has operated the blast furnace and mills with continued success. The steel works embrace four 30-ton open hearth furnaces, and the rolling mill department consists of the following: One 20-in. bar, one 20-in. plate, two 14-in. trains, two 10-in. trains, one 9-in. train, four busheling furnaces, four double puddling furnaces and nine heating furnaces. The forge plant is provided with four steam hammers, lathes, &c. Including the new blast furnace referred to below, the capacity of the plant per annum is as follows: 180,000 gross tons of pig iron, 100,000 net tons of steel ingots and 90,000 to 100,000 net tons of rolled iron and steel, besides forgings, steam and electric railroad axles and track spikes.

With increasing demands for pig iron, both for its own consumption and the requirements of the merchant trade, it became necessary for the company to build an additional blast furnace plant, which was placed in operation in November, 1907. It is located adjacent to the original furnace. Fig. 1 shows the elevation of the furnace, bins, ore yard, &c., while Fig. 2 is a front elevation of the two furnaces and their stoves. The blast furnaces are located in the outskirts of Hamilton, on the shore of Hamilton Bay and Lake Ontario.



Fig. 1.—Elevation, Part in Section, of Ore Stock Piles, Bins, Blast Furnace and Cast House of the Hamilton Steel & Iron Company, Hamilton, Ontario.

Ore Storage Yard and Bin System.

Owing to local conditions it is advantageous to deliver raw materials by rail rather than by water. While the plant has been designed to meet this requirement, the possibility of water delivery has been borne in mind and provision made therefor. The advantage in cost of production arising from the ability to unload and store the winter's ore supply in summer are of unusual importance at Hamilton, and as a consequence an ore storage yard is provided of ample capacity. This consists of a series of trestles, the ore being unloaded from the railroad cars and stored between and below the trestles by "whirly" cranes equipped with grab buckets. These cranes are also used to lift the ore from the storage piles and deliver it into drop bottom cars, which are in turn transferred over and discharged into the stock bins. The stock bins are constructed of steel, the bottoms and sides being yellow pine plank. The interior surfaces are lined with maple. The bins are of the double type, with a railroad track located over each row. Those on the furnace side are devoted to coke, limestone and special ores, while those on the opposite side are reserved for the main ore supply. During the open season the major portion of the current ore supply is delivered direct to the bins, while at the same time ore for winter use is being unloaded and stored in the ore yard.

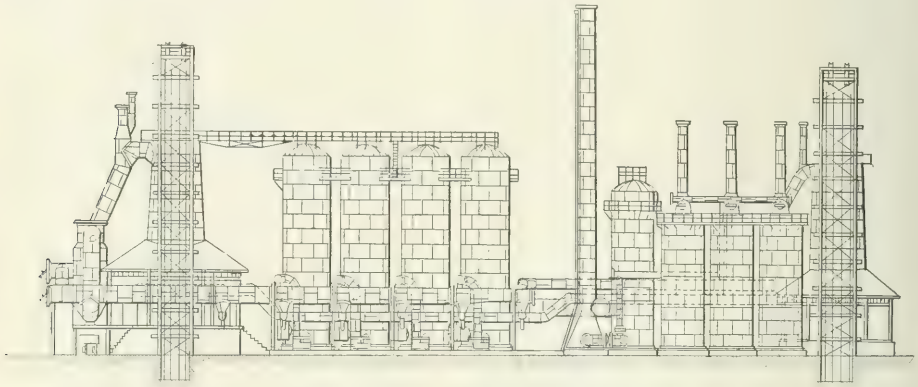


Fig. 2.—Elevation of Blast Furnaces and Stoves.

The coke bins discharge directly into the furnace skip car, by means of a chute equipped with a screen. The ore and limestone are transferred from the bins to the skip car by an electrically operated transfer scale car. The stock bin gates are of the pivoted type, arranged to be operated by a lever carried by the transfer car, thus avoiding the expense and complication of a separate operating apparatus for each car.

The Blast Furnaces and Equipment.

The original furnace, known as A, is 75 ft. 6 in. in hight, with a bosh diameter of 16 ft. and a hearth diameter of 10 ft. 3 in. The furnace is at present equipped with a vertical hoist and all stock is handled

in barrows. The stove plant consists of three Gordon chimney top stoves and one Cowper-Roberts stove. Plans are about completed for the complete reconstruction of Furnace A and its equipment. The new furnace, known as B, is 80 ft. high, with a bosh diameter of 20 ft. and a hearth diameter of 13 ft. 6 in. It embraces the modern construction of a steel shell carried on cast iron columns, and is furnished with bronze bosh cooling plates of the Scott design and a wrought steel hearth jacket. This furnace is provided with a double skip hoist and a charging apparatus of the Roberts revolving type. The hoisting equipment consists of a Crane steam engine. The starting lever for the hoist engine, the control of the bell cylinders, the bell indicators and the furnace



Fig. 3.—View of the New Blast Furnace, with Centrifugal Dust Collector.

sounding apparatus are all located in the stock house at the foot of the skip hoist and are under the control of one man. The fire brick stove plant embraces three Cowper-Roberts stoves, 21 ft. in diameter and 90 ft. in hight, the intention being to add a fourth stove of the same type in the near future.

The downcomer is connected to the furnace at one point, the downcomer as well as the furnace being provided with suitable relief valves. A dust catcher is located at the foot of the downcomer, with a connection leading therefrom to a centrifugal dust collector of the Roberts type, described in *The Iron Age*, of May 9, 1907, page 1414. A by-pass gas connection is also provided around the dust collector. The gas main is equipped with a series of pockets, closed by counterweighted bells and discharging into spouts, which in turn deliver the dust into railroad cars. Fig. 3 shows the arrangement of downcomer, dust catcher and centrifugal dust collector.

The casting house is 55 ft. in width by 235 ft. long, and consists of a steel frame building covered with galvanized corrugated iron and arranged with sliding doors to close all side openings. The furnace and pig bed levels are placed high enough above the yard level to permit the use of ladles for both cinder and metal. The pig bed retaining wall is shown in Fig. 1.

A pig breaking equipment manufactured by the Brown Hoisting Machinery Company, Cleveland, Ohio, is located at the top of the casting house, the roof of the latter extending over the breaker. An electric crane traverses the casting house and carries the pig combs to the breaker. Two railroad tracks are provided in connection with the breaker, one on the outside and one between the breaker and the pig bed.

Power Plant.

The boiler plant is common to both furnaces and consists of 3200 hp. of Stirling boilers and 400 hp. of Babcock & Wilcox boilers. All boilers are arranged to permit both gas and coal firing and are furnished with independent chimneys. The steam piping system embraces a header over the boilers, with lines leading to steam receivers in the engine house, from which distribution is made. The boiler house is a brick building.

The engine house is common to both furnaces, and the blowing engine equipment consists of two Gordon engines, 42 in. and 84 in. by 60 in.; one Laurie engine, 42 in. and 84 in. by 60 in., and two Tod engines arranged to operate compound, the high pressure steam cylinder being 42 in. in diameter and the low pressure cylinder 82 in. in diameter, while the air cylinders are 84 in. in diameter by 60-in. stroke. A sixth engine will be installed before the improvements are completed. The pumping plant consists of direct acting plunger and electrical turbine pumps, having a total capacity of 12,000,000 gal. in 24 hr. The electric generating plant consists of three units, having a total capacity to meet the ordinary requirements of the plant.

In determining the location and design of the new furnace plant it was the aim of the management and the engineers to construct a works which, in conjunction with the original furnace and the improvements thereto, would form a well balanced furnace plant, and in which the power equipment, the fuel and labor saving devices as a whole would result in general efficiency and economical operation. The operation of the plant for several months has demonstrated that these objects have been successfully accomplished. The plant was built under the designs and supervision of Frank C. Roberts & Co., Philadelphia.

The directors of the Hamilton Steel & Iron Company, Ltd., are Charles S. Wilcox, Robert Hobson, Charles E. Doolittle, William Southam, George Lynch Staunton, K.C., John Milne, A. E. Carpenter. Charles S. Wilcox is president; Robert Hobson, vice-president and general manager; H. H. Champ, secretary and treasurer; D. D. O'Connor, sales manager; Charles A. Grimes, superintendent of furnaces; F. B. McKune, superintendent of steel works, and George L. Drew, general superintendent.

The S. Obermayer Company, Cincinnati, Ohio, has opened a warehouse at 1604 North Broadway, St. Louis, Mo., with C. M. Barker, one of the best known foundry supply men in the West, in charge. Mr. Barker, as representative of the company, has occupied offices in the Roe Building for a number of years, and the company, on account of the ever increasing demand for its goods, has found it necessary to carry a large stock of foundry facings and supplies to supply the immediate needs of the foundries in and adjacent to St. Louis at a more accessible location. The S. Obermayer Company now has factories and warehouses located as follows: Cincinnati, 647 Evans street; Chicago, Eighteenth and Rockwell streets; Pittsburgh, Thirty-fifth and Charlotte streets; Philadelphia, 2514 Aspen street; St. Louis, 1604 North Broadway; Cleveland, 6305 Euclid avenue; Denver, 305 Appel Building and 620 Nineteenth street; Kansas City, Massachusetts Building; Milwaukee, 696 Prospect avenue; Troy, Campbell's highway and Thomas street.

Trade Syndicates Growing in Germany.

The annual report of the Berlin Chamber of Commerce refers to the rapid increase in the number of trade syndicates in all branches of business in 1907. In fact, the entire report of this foremost commercial body in Europe is devoted to the subject of commercial trusts, so called. A long list of active kartells, or syndicates, is given, and it is stated that a good many others exist. The report says that all have a common feature in their constitutions—the endeavor to improve the position of their members by strengthening relations with their customers, and by customers the middlemen are meant. The agreements all aim at unity of sale price. When the quality and price of an article differ with different manufacturers, the agreement aims at other commercial conditions which, though less important than price, may be improved by co-operation. For instance, deliveries, methods of payment, discounts, free delivery of samples, taking back unsold goods and other such matters are subject to agreement. Very often agreements as to price are supplemented by understandings as to sales conditions. Some of these do not aim at fixing a minimum sale price, but reach the end indirectly by restricting competition in the district or by regulating the output. If a retailer sells an article below the syndicated price no other goods manufactured by the syndicate are sold him.

The kartells act powerfully in bringing non-syndicated industries under a similar system. In some cases the less profitable types of business trusts have been gradually eliminated, and in others an indirect but very effective pressure is exerted. Customers are bound to pay their debts to syndicate members within a strictly limited period, so that they have very little cash left at their disposal for their non-syndicated creditors. The latter have to wait a considerable time for their money, and end up by organizing kartells on their own account. The report also says that numerous associations have been formed to secure for members the advantages of buying on wholesale terms; they are largely composed of employees and officials of public and private institutions.

At first these trade organizations were looked upon in Germany as a sort of noxious excresence upon the commercial body, which it was the Government's duty to suppress. But to-day public opinion has become used to them and sees nothing amiss in their development. The principal grievances brought against the kartells are summarized as follows: Concerning price policy, those dealing with raw materials and semi-manufactured products are constantly accused of putting difficulties in the way of exporting German manufactured products, because they sell more cheaply abroad than at home. Complaints are also made that the kartells raise or lower the price suddenly without giving any warning, while with free competition such changes only take place gradually. It is stated further that the influence of a single governing body on a whole syndicated product has a very bad effect upon its manufacture from the technical point of view. Customers often receive quite other manufactured goods than those they ordered and often are compelled to accept brands different from what they ordered, merely to "keep in" with the governing body of the kartell.

The Asbestos Protected Metal Company, Canton, Mass., has recently issued a pamphlet giving particulars of its products. The company's principal output is asbestos protected metal. This material is becoming well known to the building trade, large quantities of it now being in use in a wide variety of service. The asbestos protected metal is especially valuable for roofing and sheathing buildings where severe acid fume, steam and rust resisting properties are required. In addition to the flat and corrugated roofing sheets which the company originally manufactured, several new forms have been added, including curved corrugated sheets, beaded siding, standing seam roofing, ridge capping, flashings and other specialties for the general covering of buildings of all classes. The company is also manufacturing the Robertson standard box car roof, a patented construction, which has been in use for some time on the Intercolonial Railway of Canada. It is now being introduced in this country. The company reports not only a heavy demand for its products but bright prospects for an active season.

Progress in Cornell Engineering Courses.

The annual circular letter to the alumni of Sibley College, Cornell University, gives interesting information concerning developments in the work of the various departments. The machine design and machine construction departments have been consolidated, and in connection with the machine shop work a course of lectures on the principles of manufacturing has been added. In line with the policy of the last few years greater effort has been made in the shops to approach the conditions of regular manufacturing practice. The foundry is now teaching the advantages of molding machines for duplicate castings, and the blacksmith shop the advantages of machine methods over hand work. More and more the lines are being drawn between the purpose of a trade school and that of an engineering school. Sibley College is of the latter class, and holds to the belief that the shop should aim to make the student resourceful in ideas rather than skillful as an artisan.

The experimental engineering department now provides a junior electrical laboratory, for performing elementary exercises in the third year, and the new refrigerating testing plant is probably the most complete ever put in an educational institution. Four courses have been established in gas engineering: one of lectures on the general theory of gas engines, another on gas engine design, a drafting room course in gas engine design and a lecture course which treats of the engineering problems involved in the conversion of various solids and liquid fuels into gas fuels and in the transmission of gas fuels. The gas engine laboratory has been established in a building of its own of fireproof construction and its equipment is unusually complete.

The electrical engineering courses have been improved and modified to make the work of mechanical and electrical engineers the same up to the close of the junior year, desirably postponing the time when a student must decide in which he will specialize. Last year there were more than ever graduated in the course of naval architecture and this year the registration in the railway mechanical engineering course was the largest to date. The co-operation of the department of mechanical engineering with that of experimental hydraulics conducted by the College of Civil Engineering for the experimental work is reported very successful. In the marine engineering course special attention has been given to steam turbine design. All of the shops and laboratories have had accessions to their equipment.

The Arrangement and Construction of a Modern Manufacturing Plant.

A paper on the above subject illustrated with stereopticon views was presented recently before the Brooklyn Engineers' Club by Thomas C. Flinn of the Kennedy Valve Mfg. Company, Elmira, N. Y. It describes a unique way of developing a manufacturing plant. The company's works at Coxsackie, N. Y., being unequal in producing capacity to the company's requirements, a new plant was projected, and instead of seeking for a site in the vicinity the company first decided on the size and shape of the plot it would require and then sought within a radius of 500 miles for the place that would afford such a site. The machines necessary, represented by scaler templets, were grouped in plans, as required for economical production, and the buildings drawn around them. Then these buildings were put together in the most advantageous way which determined the shape or the plan of the complete plant. Elmira afforded the site required and offered excellent shipping facilities and hence was decided upon. The detailed description of the engineering work, with illustrations of the plant in course of construction, has been reprinted by the Kennedy Valve Mfg. Company, and will be sent to any interested.

An Important Lake Ore Deal Reported.

DULUTH, MINN., April 4, 1908.—There are rumors of the progress of negotiation of a deal for the purchase of the properties of the largest independent ore mining firm by the Oliver Iron Mining Company. How authentic these rumors are cannot be determined here, but it need astonish no one if they should in time prove correct. The firm in question, Corrigan, McKinney & Co., owns and operates important mines on every lake range but the Marquette and Vermillion, and holds properties on the first named of these two. Its shipments the past year were in the neighborhood of 2,500,000 tons, and this amount could be easily increased. It has several Mesaba and Menominee properties that have been under heavy expense for development of late, and that are most excellent in every way. This firm is especially strong on the Menominee range, where it has been gathering in properties since the panic of 1893. Its lands on the Menominee contain immense bodies of soft ores characteristic of the region, and its mines are opened on broad and able lines, well and carefully.

In the Crystal Falls District of the Menominee Corrigan, McKinney & Co. control the Crystal Falls, Lincoln, Lemont, Tobin, Armenia, Dunn, Fairbanks, Great Western and Quinnesec, as well as several operations that are proving into mines and have much promise. Of all these the Tobin is perhaps the most important, so far as present developments indicate. Its ore averages nearly 59 per cent., and, like most of the Menominee propertis, is non-Bessemer. On the Gogebic range the firm owns the Colby, Ironton and Winona. It is developing these extensively, and has been amply rewarded the past year by important developments at depth. On the Cascade section of the Marquette District it has the Star West and other idle properties, containing large tonnages of rather lean siliceous ores. On the Mesaba it is operating the Stevenson, Jordan, Commodore, St. Paul and St. James. The latter is a new development on the eastern Mesaba, and has as yet shipped no ore. Its Stevenson is an immense open pit property, which has reached a production of more than 1,600,000 tons in a single season. This property has been extensively stripped the past season and the extent of the ore body is now known to be greater than before supposed probable. These Mesaba properties are standard Bessemer mines of excellent character, and all can be mined at low costs; with the exception of St. Paul and St. James they are open pits. The Stevenson is credited by the State Tax Commission with a reserve of 2,500,000 tons, but it is probably somewhat in excess of that.

The Oliver Company's Operations.

The Oliver Iron Mining Company is commencing stripping operations on the Leonard mine, taken over in its Great Northern ore deal. This property had been a considerable shipper before the purchase, but the pit is in such condition that it is questionable if the company mines any ore there this season. The pit is restricted in size and is quite deep. A large amount of stripping will be necessary to make it an economical mine.

The Oliver Company is now hoisting from its McKinley mine, which has been under development for some time. This ore is coming out of development work, and when spring opens the pit will be mined. For some time, however, the main operation at this mine will be in opening drifts for handling ore to the shaft, under the pit that steam shovels have for some time been opening. The company is at work grading the site of the new village of Sparta, which is to be moved from its present location on account of the discovery of a large mine beneath it. After the site is filled and settled the company will move buildings, open streets and make other improvements at its own expense, to fit the place for comfortable residence.

The same company has just completed a fine steel shafthouse at its Prince of Wales mine, Negaunee, and the property, with this and other betterments put in during the winter, is in shape for a much more important production than it has yet reached.

Ore Railroads Looking for Light Traffic.

Significant of the ore shipping season are notices that have been sent out to employees by the three iron ore railroads centering at Duluth. Most of the skilled men employed by these railroads go to other parts of the country during the winter and return here in April for the ore season. Within the past day or two the roads have sent these men notices to the effect that they need not report for work until after June 1, the idea being that they may remain at work where they are as late as possible, the roads having no doubt that their regular train crews will be ample to handle all ore traffic up to, say, about June 15. The customary date for the commencement of ore movement on some scale is about April 15, or, as last year, even earlier than that.

No advices have been received from mine managements here as to the schedule of operation for the year, even the Steel Corporation being unwilling to set any figure for the guidance of mine operators. The most that can be learned is "you may figure about 60 per cent. of last year, and we will see later how much that will be cut." Surely this is not a very encouraging estimate. But the general feeling her is that, as has happened in such times before, the season will open late, but that it will end in a rush to get down ore. This will, to be sure, be modified this season by the fact that there is so much ore on hand below that the rush may not take place.

D. E. W.

The Exposition of Safety Devices.

Lighted lamps that will not explode when turned upside down, containers through which lighted gasoline can be poured without exploding, an Industrial Chamber of Horrors, a model house fireproofed within and without, a mine gallery constructed with steel instead of wood, with lagging and fudged with coal, safety davits, signal lights, life buoys, collapsible lifeboats, occupational dusts, ambulances and emergency boxes are among the exhibits to be shown at the Exposition of Safety Devices, to open April 13 at the rooms of the American Museum of Safety Devices, 231 West Thirty-ninth street, New York. There is no charge for space. As the object of the exposition is not coercive but suggestive, the inventors and makers are invited to take part by sending their devices to Dr. William H. Tolman, director, at the museum. Among the exhibitors are the Carnegie Steel Company, Westinghouse Air Brake Company, American Bridge Company, Union Switch & Signal Company, Yale & Towne Mfg. Company and Travelers' Insurance Company. Three solid gold medals will be awarded for the best devices in transportation and mining and the best safety device for motor boats and motor vehicles. The chairman of the Committee of Direction is Charles Kirchhoff, and of the Exhibits Committee Prof. F. R. Hutton.

A Quick Engine Replacement.—Quick replacement of a wrecked engine, enabling speedy resumption of service, was illustrated a short time ago at the Davidson Rubber Works in Charlestown, near Boston, when upon shutting down in the evening the old Brown engine driving the plant was wrecked. The cylinder head and frame were demolished and the crank pin was broken, while the crank shaft and back bearing remained intact. Two days later an order for a 28 x 48 in. Allis Chalmers engine was placed and work on the foundations begun. Three days after the contract was let the engine was shipped by express and arrived at its destination two days later. Parts of the old engine, such as the wheel and shaft, were used again, and the crank was rebored to take a new pin. By midnight, five days after letting the contract, the engine had been delivered and placed on the foundation, which in the meantime had been finished, though not yet quite dry. Three days thereafter the engine was turned over, and just 10 days after the order was placed was started up with its full load.

Chippewa Falls, Wis., has voted to issue bonds in the sum of $35,000 for the purpose of building a 300-ft. steel bridge over the Chippewa Falls River.

The Schuchardt & Schutte Steel Hardness Tester.

An Electro-Magnetic Instrument for Determining Certain Properties of Iron and Steel.

The fitness for their intended purposes of iron or steel products cannot be judged alone by chemical tests of their composition or physical tests of their strength under various kinds of strain, when their heat treatment has anything hardness, and is later referred to in substantiation of the accuracy of the electro-magnetic method of testing herein described. The latter has the further advantages that it is rapid and does not mar the appearance or affect the utility of the tested piece, since the most that is done to it is to subject it to a magnetizing influence by inserting it in a solenoid carrying an electric current.

The instrument illustrated is sold by Schuchardt & Schutte, 136 Liberty street, New York, and is based on the electro-magnetic balance invented by Prof. D. E. Hughes of England, who has deduced the following laws that hold with every variety of iron and steel: The mag-

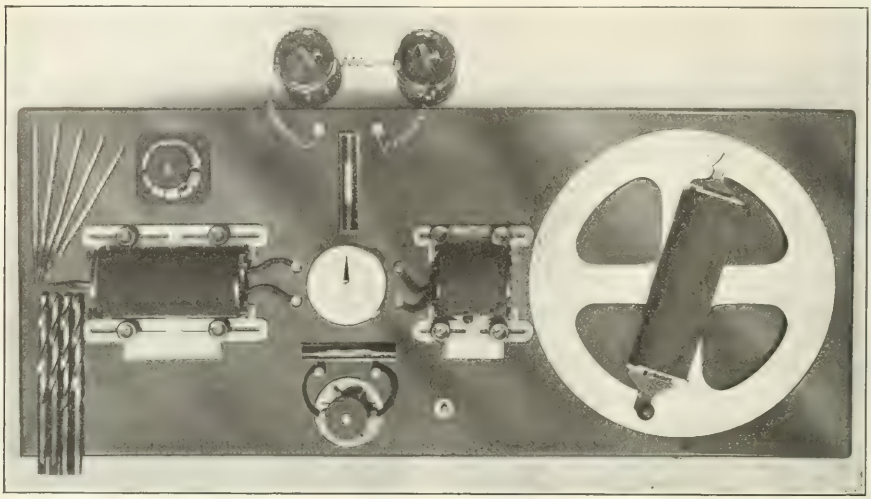


Fig. 1.—Top View of the Electro-Magnetic Instrument for Testing the Hardness of Iron and Steel.

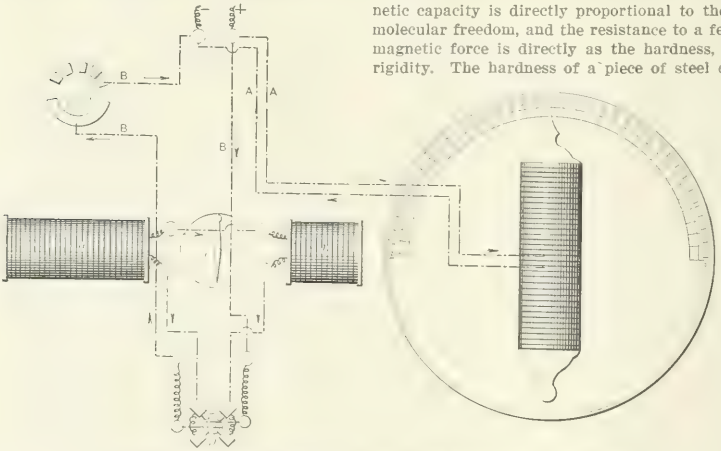


Fig. 2.—Diagram of the Arrangement and Wiring Connections of the Parts.

netic capacity is directly proportional to the softness, or molecular freedom, and the resistance to a feeble external magnetic force is directly as the hardness, or molecular rigidity. The hardness of a piece of steel depends upon its chemical composition and upon the degree to which it is tempered. By comparison with known standards this instrument therefore makes possible several determinations. Given an annealed specimen of known chemical composition, the percentage of carbon in any other annealed piece may be determined, or the degree of temper in any other piece of the same composition; given a fully tempered specimen of known composition, the carbon in another fully tempered piece may be determined, or the degree of temper of a piece of the same composition; given a standard that is known to be of proper composition and degree of temper for the most efficient service, the sufficiency or insufficiency of duplicate pieces is very speedily disclosed. The abilities of the instrument are

thing to do with their utility. An inferior article may be made from good material by improperly working or treating it. The cutting, elasticity and wearing or strain resisting properties are all functions of the hardness of a material, hence the importance of including in the tests to which it is subjected, one which will indicate the degree of hardness. The oldest and most familiar methods of testing the temper of finished pieces are to try its surface with hard steel punches or files. These are not only inaccurate at best, but have the disadvantage of injuring the finish. What is known as Brinnell's test consists of forcing a hardened steel ball into the piece to be tested and measuring the diameter of the impression. It is regarded as the most reliable mechanical means of test-

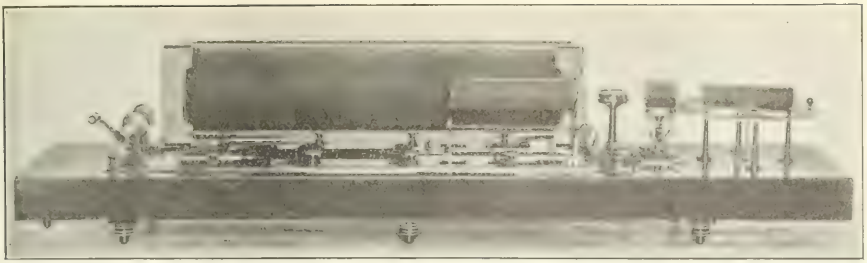


Fig. 3.—An Instrument for Testing Beams and Rails, Having Also an Extra Solenoid for Test Pieces.

such that it is not limited to the comparison of pieces of the same shape or size, but for the most rapid and commercially satisfactory use of it, where quantities of similar pieces are to be tested, it is desirable to first standardize a specimen of the same form and dimensions to be thereafter made the standard.

Inasmuch as the cutting property of a steel depends upon its hardness, the instrument is highly useful for testing tools of all sorts. Fig. 1 shows a top view of an instrument adapted for such purposes, being intended for testing drills, reamers and similar tools. With slight modification lathe, planer and like tools may be tested. Also since wear and strength are functions of hardness, a great variety of other important applications of the instrument may be made, as, for example, the testing of rails and structural shapes, where an instrument like that of Fig. 3 is suitable, which will be seen to be provided with a roller for facilitating the introduction of the test piece; the testing of rifle barrels, for which a long small diameter solenoid is provided as in Fig. 4. (This instrument is also somewhat universal, being arranged with several solenoids of various sizes to accommodate different parts that enter into a rifle); and the testing of projectiles, which may be done in an instrument such as that of Fig. 5. Being intended for the larger sizes requiring overhead means of handling, this one has a trunnioned solenoid which may be swung to vertical position while the test projectile is lowered into it, and then turned horizontally during the testing. Smaller projectiles may be tested in another type of instrument, not illustrated, which has a fixed solenoid with a sliding carriage for introducing the test piece. In all testing coils proper copper or brass thimbles or supporting forms are provided to hold the test specimen in the exact center of the solenoid. Where various shapes or sizes are to be tested interchangeable supports are furnished.

The principle of the electro-magnetic testing instrument and the manner of using it will be best understood from Fig. 2, which shows the relation and connections of the parts. The testing solenoid, or one in which the test piece is inserted is indicated by *a*; *b* is a balancing solenoid used to affect the compass needle *f* in a way later explained; *c* is an electromagnet known as the compensator which is arranged to revolve over a circular graduated scale. The other parts are incidental to the current controlling and directing features, *d* being a commutator for reversing the current through the solenoids *a* and *b*, and *e* a rheostat for altering the intensity of the current. The wiring circuits A and B indicate, respectively, those connecting the compensator *c* and the solenoids *a* and *b* with the source of current, which is preferably a battery of two or more dry cells affording a constant current at a pressure of from 3 to 8 volts.

The top view given in Fig. 1, taken in connection with the diagram Fig. 2, will best make clear the manner of operating the typical instrument. The entire apparatus is mounted on a board provided with adjusting screws and spirit levels at right angles, so that it may be accurately leveled. This is the first step after the instrument has been positioned, so that with no current flowing and the compass needle *f* pointing north and south, it is at zero of its scale, or as shown in Fig. 1. Before inserting the test piece and after the compensator is turned to its zero, current is passed through the solenoids. This will probably alter the position of the needle *f*, and the balancing solenoid *b* is adjusted axially until the needle returns to zero and no deflection is produced when the current is reversed, *i. e.*, the needle should remain at zero or as it stood when no current was flowing. This neutralizes the magnetic effect of the solenoid *a* when it has only an air core.

The instrument is now ready for use and the piece is inserted in solenoid *a*, immediately producing a deflection of the needle, because the steel or iron core which it forms affords a better path for the magnetic flux and increases its density. A damping device operated by a button on the board facilitates bringing the needle to rest at this and all later stages when its position is suddenly changed. The compensator is then revolved until its magnetic influence counteracts the distortion of the magnetic field produced when the piece was placed in solenoid *a*, or in other words, until the needle *f* is brought back to zero. The compensator has therefore been used to nullify only that part of the magnetic effect due to the inserting of the test piece in the solenoid *a*. The displacement of the compensator is then proportional to the magnetic capacity of the test piece and is read on its scale and noted. By turning the commutator *d* to reverse the current in the solenoids *a* and *b*, the needle is again deflected, but in the opposite direction, and the compensator is manipulated again until the needle is restored to zero. The compensator will then be found to have been turned roughly to the same angle as before on the opposite side of its neutral position, and the reading noted is added to the one previously taken. The compensator scale is graduated to give the magnetic capacity of the test piece in arbitrary units, allowing for the doubled reading given by reversing the current. The latter is necessary to eliminate the error which a single reading would have due to inequalities in form or character of the test piece, or the initial mag-



Fig. 4.—An Instrument for Testing Gun Parts.—An Example of How Several Shapes May Be Provided for on One Instrument.

netism which is always present in forged or tempered steel and that would increase the effect in one direction and decrease it in the other.

If a swing of the compensator through 90 degrees will not restore the balance, the intensity of the current must be changed through the rheostat *e*, or the distances of the solenoids from the needle increased. Where possible the standard and the test piece should be tested under the same conditions of current and positions of solenoids *a* and *b*, but if this is not expedient, due to a radical difference in the form or size of the two pieces, true comparisons may be arrived at by taking into consideration in the calculations the relative intensities of current in the two cases, and the positions of the solenoids as indicated on the scales attached beside their slides. To avoid calculations at the end and make the readings obtained directly proportional when the standard and test samples are of different size, the solenoids may be adjusted for testing each, so that their effects would be the same on the needle if their magnetic capacities were equal, *i. e.*, in accordance with the formula $f=\frac{m_1 m_2}{r^2}$ where f is the force exerted to attract or repel, m_1 and m_2 are the magnetic bodies, and r the distance between the magnetic poles.

As showing the influence of the dimensions of the test piece (cross section and length), the table I of data is interesting, taken from special tests of a steel of 0.398 per cent. carbon, 1.03 per cent. manganese, 0.07 per cent. silicon, 0.04 per cent. sulphur, and 0.06 per cent phosphorus:

tested, whether in rough or finished form, and a rail or projectile can be as readily tested as a finished razor

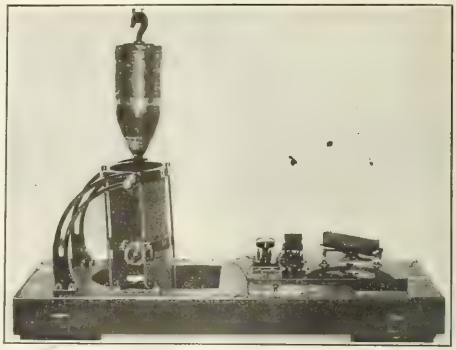


Fig 5. An Instrument for Testing 8-In. Projectiles, Showing the Receiving Position. The Solenoid Swings Down After the Projectile Is Entered.

blade. For economical manufacturing the importance of the hardness test is apparent. The proper materials can always be selected before any labor and finish are put upon the article. The work can also be tested and inspected during process of manufacture and when finally finished to ascertain that it has the required hardness to best perform its intended service.

Table I.

Shape.	Dimensions of cross section or diameter.	Surface dimensions in square inches.	Weight in grams.	Cross section in square inches.	Actual magnetic capacity. Annealed.	Actual magnetic capacity. Tempered in oil.	Magnetic capacity proportional to a weight of 100 gm. Annealed	Magnetic capacity proportional to a weight of 100 gm. Tempered in oil.	Magnetic capacity proportional to a surface of 10 sq. in. Ann'led.	Magnetic capacity proportional to a surface of 10 sq. in. Tempered in oil.	Magnetic capacity proportional to a cross section of 1 sq. in. Ann'led.	Magnetic capacity proportional to a cross section of 1 sq. in. Temp'ed in oil.
Square	0.512	8.072	79.059	0.0973	190	110	240	139	231	136	195	113
Round	0.512	6.34	61.977	0.0764	170	82	274	132	267	130	222	107
Rectangular	0.312 X 0.208	6.69	52.625	0.0649	155	82	294	155	235	123	239	126
Rectangular	0.512 X 0.156	6.00	39.61	0.0487	140	58	353	146	233	97	287	119
Square	0.208	5.34	35.1	0.0433	130	53	370	151	243	100	300	122
Round	0.208	4.10	28.4835	0.03396	110	46	386	161	262	109	323	135
Square	0.156	3.987	19.747	0.02434	95	36	481	181	238	89	395	150
Round	0.156	3.13	15.8735	0.01915	80	29	504	182	255	92	417.7	151

In this table the figures in the columns headed "annealed" and "tempered in oil" are the readings of the compensator, and represent the magnetic capacity as measured in the units in which the compensator is graduated.

The electro-magnetic test has been found by extensive experiments to agree closely with physical tests when a sufficient number of the latter had been averaged to correct for their own errors. Among other the Brinnell test has been compared with the electro-magnetic test and seems to confirm the even greater accuracy of the latter. Table II gives a comparison of the results obtained on steels of stated composition and physical properties, when tested by the Brinnell method and by the electro-magnetic method. It is of course to be understood that the figures of the two methods cannot be directly compared, but only by ratios, since each method employs arbitrary units.

Table II.

Composition of the steel. Per cent. C.	Mn.	Si.	Physical properties.—Elastic limit, kg. per sq. mm.	Tensile strength, kg. per sq. mm.	Elongation. per cent.	Ann'led.	Test by Brinnell's method—Tempered in oil.	Tempered in water.	Overheated for water hardening.	Ann'led.	Test by the electro-magnetic method.—Tempered in oil.	Tempered in water.	Overh'ted for water hardening.
0.09	0.27	0.48	19	33.6	31	112	128	143	149	1,000	968	800	440
0.11	0.28	0.05	26.8	37.9	35.5	112	128	137	140	889	870	730	544
0.45	0.645	0.2	40	64.8	23	183	269	466	532	510	261	243	544
0.43	0.489	0.09	35.5	63.2	18.2	183	248	466	532	580	270	249	250
1.1	0.187	0.27	50	73.8	17.5	217	387	480	532	406	225	150	117
Difference in dimensions according to the different methods.							3	3.35	3.8	2.46	4.3	5.33	4.65

The manufacture of malleable cast iron fittings for automobiles is expected to develop to considerable proportions in the United States, according to the *Foundry*. For several years foreign builders of motor cars have used malleable castings with good results, and a car is now building in this country containing no less than 30 malleable parts. High grade material is specified for automobile malleables, and the prices paid have been quite remunerative to manufacturers who can meet the specifications.

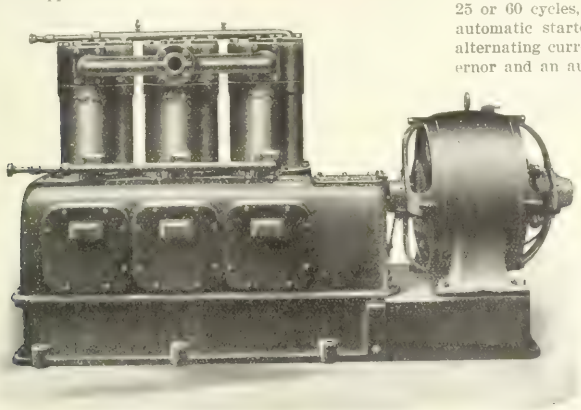
Girder exports from Belgium in 1907 reached a total of 88,730 tons, as compared with 100,730 tons in 1906. The countries receiving the largest shipments of the above total were Great Britain, 14,310 tons; Egypt, 9050 tons; British India, 5280 tons, and Argentina, 11,010 tons.

Unlike the mechanical test the electro-magnetic test can be applied regardless of the condition of the piece

The National Type 3 VS Air Compressor.

A motor driven air compressor, particularly suitable for shop and works supply, is that known as the type 3 VS, built by the National Brake & Electric Company, Milwaukee, Wis., and herewith illustrated. The aim was to make it a machine of unlimited utility, compact and self-contained, and capable of economical, reliable and efficient operation under all conditions. It is a single stage, medium capacity type of compressor, having three vertical cylinders. The vertical construction favors smaller dimensions and less strain and wear on the pistons and cylinder surfaces, and the inclosing of all working parts affords protection from mechanical injury. The compressor illustrated has a capacity of 100 cu. ft. of free air per minute at a pressure of 90 lb., but the compressors can be furnished for pressures up to 150 lb. at slightly reduced capacity.

The main frame is divided horizontally, the lower half supporting the bearings for the crank shaft, and also acting as a storage chamber for lubricating oil, and the upper half supporting the cylinders and being heavily ribbed to give maximum strength. Doors on both sides of the upper half afford access to the crank chamber.



A 100-Cu. Ft. 3 V. S. Type Air Compressor with Direct Current Motor, Built by the National Brake & Electric Company, Milwaukee, Wis.

crank shaft, connecting rods, &c. The motor is mounted on an extension of the lower half of the compressor frame, and drives through herring-bone open hearth steel gear and tool steel pinion, mounted inside of the crank case. The upper half of the frame contains an outboard bearing in which an extension of the pinion end of the armature shaft is fitted. There are four main bearings lined with lumen metal, and giving ample wearing surface. The crank shaft is a steel casting having four large bearing surfaces. The connecting rods are of cast steel to afford strength and stiffness at light weight. The wrist pin end of the connecting rod is fitted with lumen bushings, which are easily and cheaply renewed when worn out. The crank pin end is similarly fitted and is provided for taking up wear.

The compressor is provided with trunk pistons, each having a self-adjusting metal packing ring, which dispenses with the use of stuffing boxes. The cylinders are of hard, close-grained iron, and are subject to but slight wear, and the clearance of the piston has been limited as much as possible to increase the economy obtained. The suction and discharge valves are contained in the cylinder heads, which are of cast iron and are bolted to the cylinders. The valve seats are removable. By special piping the discharge ports of the three cylinders are all connected by one connection with the air receiver. The suction ports are similarly connected. The discharge valves are of the tubular type and the suction valves of the disk type. They work vertically and either set may be removed without interfering with the other. Access to them is had by removing the valve caps which are fastened to the cylinder head. Both the cylinders and cylinder heads are water jacketed.

The lubrication of the bearings and other working parts is liberal and automatic. The lower half of the crank case is partly filled with oil, which is splashed over the crank shaft bearings while the compressor is running. The driving gear is partly immersed in oil and lubricates itself and the pinion as well as the outboard bearing. An ingenious device lubricates the piston wrist pin, and consists of a long, slender tube with a steel ball valve at its lower extremity. This tube is fastened to the connecting rod and its upper end so secured as to permit oil passing through it to flow through oil holes under the wrist pin. By the action of the connecting rod oil is forced through this tube to the wrist pin as long as the compressor is in operation.

Either direct or alternating current motors may be provided for driving the compressor. The first are of the company's standard constant speed type, which are particularly well adapted to the work, as are also the alternating current or induction motors used in connection with the compressors. The latter are of the slip ring type, designed for operating on two or three phase circuits of either 25 or 60 cycles, and 200, 400 or 550 volts pressure. An automatic starter is furnished for either the direct or alternating current motors, which consists of an air governor and an automatic rheostat. By starting and stopping according to the demands upon the system they keep the pressure constant at the desired point.

A water governor can be had with these compressors, the function of which is to automatically stop the circulation of water in the jackets when the compressors are shut down and start it again when operation is resumed. Unloading devices actuated by magnets can also be furnished with either the direct or alternating current motor driven compressors when conditions require them. When other than electric drive is desired the machine can be provided for belt drive with a compressor part proper identical to that described. The complete line of compressors include those of capacities from 50 to 225 cu. ft. of free air per minute, requiring from 10 to 40 hp. for the drive. The smallest motor driven machine measures 77 in. long, 24½ in. wide and 36 in. high, and weighs 3500 lb. The largest is 110 in. long, 45 in. wide and 68 in. high, and weighs 8000 lb.

The college of engineering of the University of Wisconsin will this year give for the first time a summer course for advanced work for chemical, electrical, hydraulic, mechanical and gas and steam engineers. Much of the instruction will also be of practical value for architects and contractors, as well as practicing engineers and graduate students in engineering. The engineering summer session will be held at the same time as the regular university summer session, beginning June 20 and continuing until July 31. Fifteen members of the regular faculty of the college of engineering, assisted by Prof. John J. Wilmore of the Alabama Polytechnic Institute, will conduct the instruction in the various departments.

Statistics published by the Government of India show that the production of manganese ore from being 253,896 tons, valued at $1,241,545, in 1905, was 495,730 tons, valued at $2,176,340, in 1906. Only 150,297 tons were mined in 1904. The production of iron ore in 1906 was 74,106 tons, against 102,579 tons in 1905. Only sufficient iron ore is mined for the needs of the Baracar Iron Works, the only plant smelting according to European methods. Practically all the iron ore of India is supplied by the province of Bangal.

Test of a Mietz & Weiss Oil Engine Air Compressor.

There is such a scarcity of material showing actual results of tests of air compressors in service that the following tests made of a Mietz & Weiss air compressor direct connected to a Mietz & Weiss oil engine may be of interest, especially as the volumetric efficiences of this compressor were obtained by actual measurement of the air discharged and not from indicator cards. A general arrangement of the complete set, which is built by August Mietz, 128 Mott street, New York, is shown in Fig. 1. Before describing the special features and tests of the air compressor, however, the oil engine and a test of the oil consumption will be described.

The engine is of the two-cycle type, and is claimed to be as simple, reliable, economical, safe and neat in design as the builders' horizontal engine. The oil fuel feed-piston this air is compressed, and a port, *b*, opened by the piston, allows it to pass, together with the steam generated in the water jacket, to the combustion space of the cylinder. At the same time the exhaust port *e*, being overrun and opened by the piston, discharges the products of combustion. The fuel oil is mixed with the air and steam, so that on completion of the compression or return stroke the mixture of air, oil vapor and steam is automatically fired, the expansion driving the piston downward. The heat imparted to the water in the cylinder jacket is allowed to vaporize and the steam produced is passed into the cylinder. By means of a device similar to a steam trap the water is maintained at a constant level, regardless of the temperature of the cylinder. Thus, there is no circulation, as usually found, but only as much water is supplied to the jacket as is needed to make up the loss by evaporation. The use of steam reduces considerably the trouble from carbon deposit in the cylinder and makes it possible to operate the en-

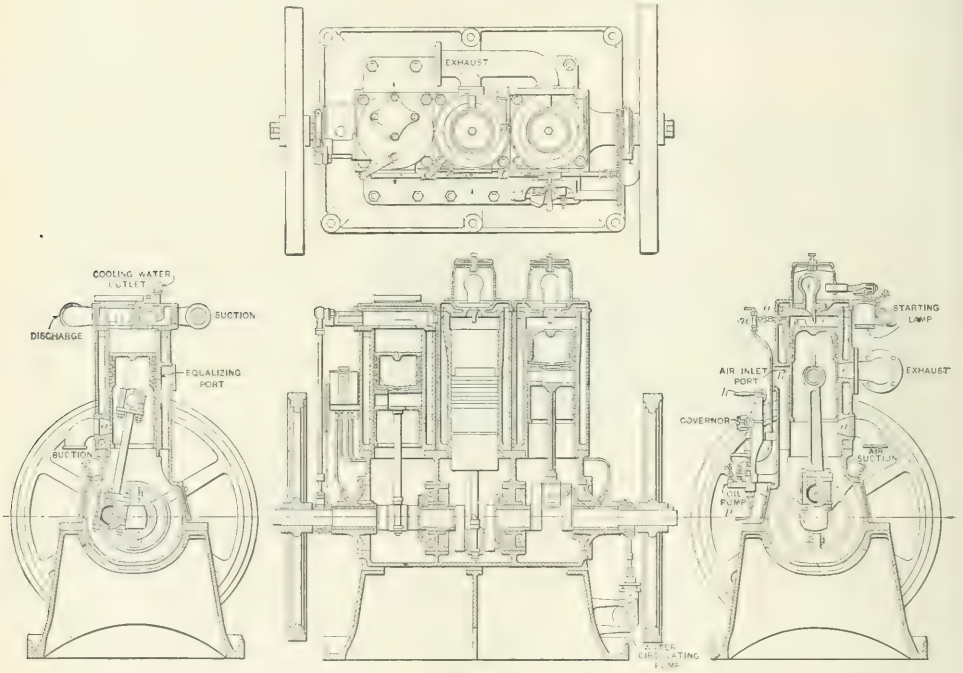


Fig. 1.—Top View and Sectional Elevations of a Mietz & Weiss Combined Air Compressor and Two-Cylinder Oil Engine.

ing and distributing depends upon the pressure difference in the cylinders, the injection pump being under direct control of the governor. This system is simple, and exactly regulates the quantity of oil delivered to each cylinder under varying loads and speeds. The use of a single pump for multicylinder engines has proved satisfactory and does not impair the fuel economy.

The fuel oil is stored in a tank, which may be placed at the side of the engine or underground. A small pump, *p*, feeds it through the injection nozzle *o* into the cylinder, and forces it to the projection *v* of the igniter *i*. Each cylinder is provided with a needle valve, *n*, at each injection nozzle for putting a cylinder out of action if necessary. The igniter *i* is a hollow, spherical casting, and is heated by a gas or oil lamp before starting the engine; during the operation of the engine it is kept hot enough to ignite the successive charges without a flame or electrical sparking device. The projection *v*, which is at the same high temperature as the igniter, vaporizes the oil.

The method of operation is as follows: Air is drawn into the closed crank case through a port, *a*, in the lower part of the cylinder. On the downward stroke of the

gines, not only by common kerosene oil, but also fuel or crude oil.

As appears from Fig. 1 there are no valves or other moving auxiliary parts except the fuel pump *p*. The speed of the engine is controlled by a centrifugal governor, driven by gears and silent chain from the main shaft, both gears being keyed on the shaft. The governor operates an eccentric, which works in conjunction with the plunger of the pump *p*. The speed of the engine can be accelerated or retarded by tightening or releasing the governor springs at the adjusting screws. It can be regulated by a throttle or hand regulator, *h*, which limits the stroke of the pump or throws it away from the governor eccentric entirely, thereby stopping the engine

One of the latest features of the Mietz & Weiss engines is the force feed lubricator for oiling the cylinders, piston, crank pins and shaft bearings. The lubricator has no valves and is mechanically operated. It consists of an oil reservoir, containing two steel worm wheels, driven by a single worm on the driving shaft, and in turn operating ratchets, which actuate plungers and eject the oil.

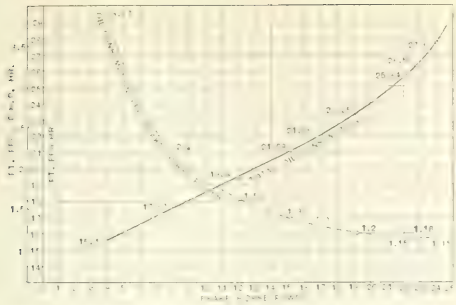


Fig. 2.—Curves of the Engine's Oil Consumption with the Compressor Disconnected.

Data and results of tests made on the engine shown in Fig. 1 are summarized in the following table and in the curves of Fig. 2:

Diameter of cylinder, inches							8
Area of piston, square inches							50.26
Length of stroke, inches							8
Piston displacement, cubic inches							402
Piston displacement from exhaust port closure to inner dead center, cubic inches							314
Clearance volume, cubic inches							116
Clearance, per cent., of volume at beginning of compression, per cent							27
Number of run	1.	2.	3.	4.	5.	6.	7.
Brake horsepower	3.9	8.0	12.16	16.55	19.2	22.42	24
Revs. per minute	432	424	419	407	394	390	385
Oil consumption, total per hour, pints	15.2	17.67	19.40	21.96	23.25	25.84	27.6
Oil consumption, total per hour, pounds	13.7	15.62	17.16	19.4	20.55	22.84	24.84
Oil consumption per brake horsepower per hour, pints	3.97	2.2	1.59	1.32	1.21	1.15	1.15
Oil consumption per brake horsepower per hour, pounds	3.51	1.94	1.41	1.17	1.07	1.02	1.02
Approximate cooling water consumption, gallons per hour	...	...	...	...	...	10	...
Specific gravity of oil	0.848	0.848	0.848	0.848	0.848	0.848	0.848

Description of Air Compressor.

The air compressor differs in many particulars from others on the market. One departure is the driving by direct connection to the oil engine crankshaft instead of by belt or gears. Compactness is secured, floor space minimized and expense of foundation reduced. Such an equipment is especially useful in machine shops and foundries, and when made portable, as in Fig. 3, in mines or other places, where but little attention can be given to a compressor.

The compressor, of which the following tests were made, is of single acting type, with 8-in. cylinder diameter and 8-in. stroke, running at about 400 rev. per min. It is commonly believed that a compressor can not run at high speed, but automobile engines run satisfactorily at very high speeds and yet they combine the function of an air compressor, using the air in the combustion of their fuel instead of discharging it. Fig. 4 illustrates an air compressor running at 600 rev. per min.

A special feature in the design of this compressor is the advantage taken of the pressure in the crankcase. It works on the same principle as the engine already described. Air is drawn into the closed crankcase through a port *a* in Fig. 1 in the lower part of the cylinder when the piston is nearing its upper dead center. On the down stroke this air is compressed, and simultaneously the space above the piston is filled with air at atmospheric pressure through the mechanically operated suction valve. This valve is closed at the moment the piston uncovers the equalizing port, and the compressed air from the crankcase rushes through this port and increases the presssure in the cylinder several pounds above the atmospheric pressure.

Fig. 5 shows two indicator cards, the one at the left being an ordinary pressure card taken with a fourth

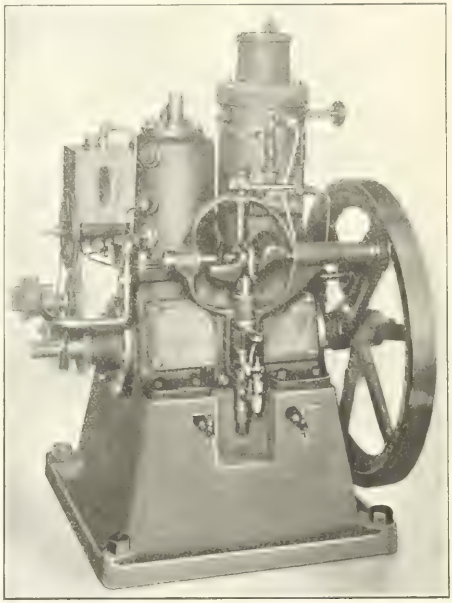


Fig. 4.—An Equipment Similar to that of Fig. 1, but Having Only One Engine Cylinder.

spring, and the second one one taken with a light spring and pencil stop arrangement to investigate the functions of the equalizing port. At high speeds the pencil mechanism is subjected to serious vibrations which greatly influence the shape of the indicator card, and a fairly good card

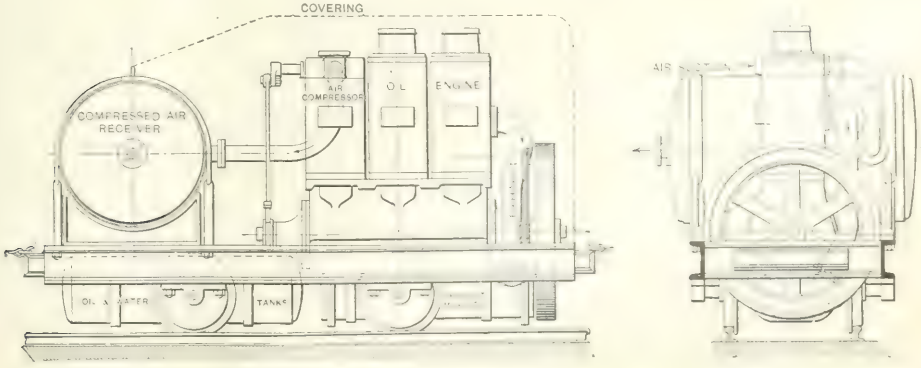


Fig. 3.—A Mietz & Weiss Portable Oil Engine and Air Compressor Outfit for Mines.

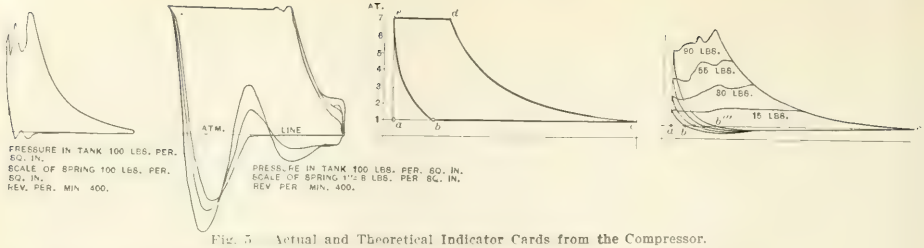


Fig. 5. Actual and Theoretical Indicator Cards from the Compressor.

can only be obtained with a short movement of the drum and a relatively heavy spring. The cards are too small for computing the indicated horsepower, but they give a fair idea of the suction and compression lines. The clearance losses are very small (only 1¼ per cent.), and special care was given to the cooling of the cylinder walls and cover.

The commercial value of any compressor depends on the actual quantity of air it delivers and the power it requires to compress and discharge the air. The correct determination of the air actually discharged is of importance, inasmuch as this is the only item that furnishes the necessary data to establish the actual power consumed by the compressor.

Of three compressors of the same size, same clearance volume and same speed, the first may discharge the normal quantity of air at the normal power, the second less air at less power, due to leakage, and the third still less air at greater power than any of the preceding compressors, due to the throttling and heating of the suction.

It is common to give the piston displacement per minute as the quantity of air delivered by a compressor. No account is taken of the re-expansion losses resulting from the clearance volume. The piston displacement must be multiplied by the volumetric efficiency in order to find the actual amount of air delivered. A method often applied for finding the volumetric efficiency and often giving very unsatisfactory results is the use of the indicator card. The ratio $\frac{a\ c}{b\ c}$ of the third diagram in Fig. 5 is called the volumetric efficiency. The line $a\ b$ depends on the size of the clearance volume and the nature of the re-expansion curve.

Common to all air compressors is the fact that the volumetric efficiency is less than that theoretically obtainable from the re-expansion curve. This difference is largely due to the heating up of the entering air, caused by the higher temperature of the cylinder walls and piston. Another reduction of the volumetric efficiency, not shown on the indicator card, is due to leakages. If a certain quantity of air is taken into the cylinder part of it may leak by the piston or back into the suction pipe during the compression stroke. A compressor being equipped with a mechanically operated suction valve can easily be adjusted to show any desired volumetric efficiency on the indicator card, it is only necessary to open the valve right after the piston leaves its dead center, so that the compressed air left in the clearance space returns into the suction pipe; doing so the re-expansion curve falls very rapidly and nothing is gained in volumetric efficiency, but instead a loss of power is unavoidable. A mechanically operated suction valve must not open before the re-expansion curve cuts the atmosphere line. This point cannot, however, be accurately determined, and besides it changes when the discharge pressure changes.

The volumetric efficiencies of the Mietz & Weiss compressor were obtained by pumping into a large receiver E, Fig. 6. Very often a tank containing a certain number of cubic feet is simply pumped up from zero to the pressure the compressor is designed for; and the time and number of revolutions necessary to fill the tank are observed. If a tank containing a volume V is pumped up from a pressure P_1 to another P_2 (absolute pressures), the formula for finding the quantity of air V pumped, expressed in terms of one atmosphere absolute (disregarding the temperature), is

$$v = V\ (P_2 - P_1).$$

If, for example, the tank has been pumped up from 0 to 7 atmospheres gauge pressure, the quantity of air discharged by the compressor is

$$v = V\ (8 - 1) = 7\ V.$$

The theoretical quantity is equal to the piston displacement $A \times S$ (A = area, S = stroke of compressor), multiplied by the number of revolutions n taken to fill the tank; and the volumetric efficiency u is therefore represented by the formula.

$$u = \frac{V\ (P_2 - P_1)}{A \times S \times n}$$

Following the above method, the volumetric efficiency was obtained not for the pressure of 7 atmospheres, which the compressor finally worked against, but for only about 3.5 atmospheres. When pumping up the tank the volumetric efficiency decreases gradually when the pressure increases. This fact is shown in the right hand diagram in Fig. 5.

Fig. 6 is a sketch of the arrangement of apparatus used to find the volumetric efficiency of the compressor in the present test. Two tanks, E and F were used and by means of the regulating valve V the air in F was maintained at the constant pressure from which it was intended to establish the volumetric efficiency. The large tank E was pumped up from a pressure P_1, to another P_2, either one lower than the pressure in the tank F.

It is advisable not to commence any test when the pressure gauge indicates zero, if a commercial gauge is used. (In these tests a standard Schaeffer & Budenberg test gauge was used.) Commercial gauges do not register accurately at the zero point. It is possible that a slight pressure is at hand while the gauge does not show it. Therefore, the tank should be shut off first and the pressure and the pressure gauge watched till it passes a suitable point, say 10 lb. From this time on until the pressure P_2 is reached the number of revolutions

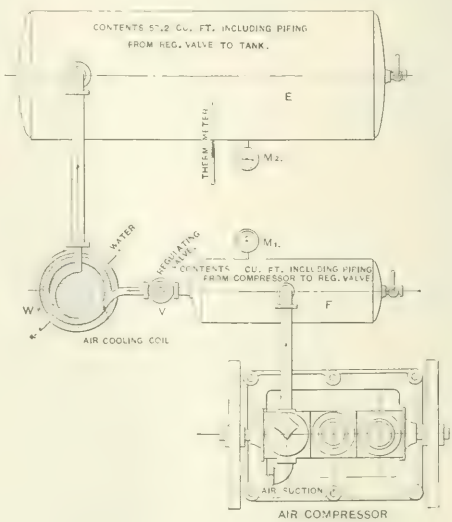


Fig. 6.—Sketch Showing the Arrangement of the Testing Apparatus.

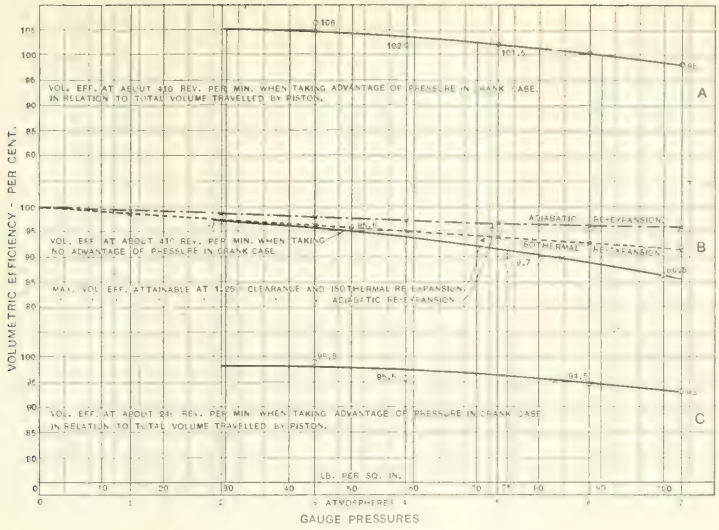


Fig. 7.—Curves of the Volumetric Efficiencies of the Compressor.

of the compressor, time of run, temperature, &c., were taken.

If the compressor is located near the tank the temperature of the air is considerably higher when it reaches the tank than when it is sucked into the cylinder, unless a cooler, as shown in Fig. 6, is employed. If there is no cooler the temperature must be measured and considered in the calculations. The quantity of air u discharged into the tank, expressed in terms of atmospheric pressure and suction temperature is then found by the following formula:

$$v = V\,\frac{273 + t_1}{273 + t_a}\left(\frac{P_2}{273 + t_2} - \frac{P_1}{273 + t_1}\right)$$

Where t_a represents the temperature of the room, from which the compressor takes the air; t_1, the temperature of the air in the tank at the beginning of the test; t_2, the temperature of the air in the tank at the end of the test (all temperatures in degrees centigrade); P_1, the pressure of the air in the tank at the beginning of the test; and P_2, the pressure of the air in the tank at the end of the test (pressures in atmospheres absolute).

If the temperature is neglected the volumetric efficiency appears 1 per cent. too high for every 3 degrees C. difference of temperature of the air in the tank, and that in the room from which the compressor takes the air. The barometric pressure also influences the results and cannot be neglected for accurate calculations. Commercial gauges are usually graduated in 14.7 lb. (29.92 in. mercury), to the atmosphere. If the barometric pressure varies from the above it must be allowed for, and the formula becomes:

$$v = V\,\frac{273 + t_1}{B}\left(\frac{29.92 \times P_2}{273 + t_2} - \frac{29.92 \times P_1}{273 + t_1}\right)$$

where B is the barometric pressure in inches of mercury.

The principal data and results of the volumetric efficiency tests of the Mietz and Weiss compressor are summarized in the following table and plotted in Fig. 7:

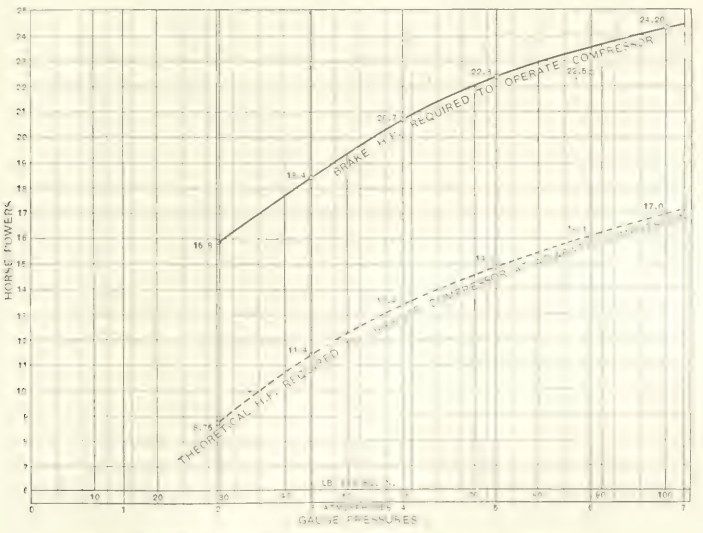


Fig. 8.—Curves of the Horse-power Required to Operate the Compressor.

Compressor Data.

Diameter of cylinder, inches	8
Area of piston, square inches	50.26
Length of stroke, inches	8
Piston displacement, cubic feet	0.2327
Clearance volume, per cent.	1.25
Contents of tank, including piping, cubic feet	57.2

Contents of tank, including piping, 57.2 cu. ft.

Number of run	1.	2.	3.	4.	5.
Barometric pressure in mercury	29.9	29.9	29.9	29.9	29.9
Gauge pressures:					
At discharge of comp., pounds per square inch	44.1	58.8	73.5	88.2	103
P_1 in tank at start of test, pounds per square inch	14.7	14.7	14.7	14.7	14.7
P_2 in tank at finish of test, pounds per square inch	44.1	58.8	58.8	73.5	88.2
Temperatures:					
t_1 in tank at start of test, Cent.	30.5	30.5	32	32	33
t_2 in tank at finish of test, Cent.	37	42.5	43.5	46.5	50
t_3 of suction, Cent.	30.5	30.5	30.5	30.5	30.5
Of cooling water at inlet, Cent.	13	13	13	13	13
Of cooling water at outlet, Cent.	27	29	30	31.5	34
Quantity of cooling water, gallons per hour (approximate)	90	90	90	90	90
Duration of run, seconds	63.6	97.6	99	132.4	171
Total number of revolutions	444	678	680	900	1,161
Revolutions per minute	419	417	412	408	406
Actual quantity of air discharged per minute, cubic feet	103.3	99	97.4	96	92.6
Piston displacement per minute, cubic feet	97.5	97	95.9	94.94	94.47
Volumetric efficiency, per cent., in relation of volume swept per minute	106	102	101.5	101	98

suction pipe, and connect to it a vacuum gauge. This was done in this case and a vacuum as low as 98.5 per cent. could be observed—the lowest possible at 1¼ per cent. clearance.

In Fig. 7, group B, are plotted the theoretical volumetric efficiencies, derived from isothermal and adiabatic re-expansion of the air inclosed in the clearance volume. The isothermal curve is obtained from the formula:

$$N_v = \frac{1 - a\,P_2}{1 - a}$$

The equation is that of a straight line. The adiabatic curve, which is never obtained in practice, follows the formula:

$$N_v = \frac{1 - a\,P_2^{\frac{1}{k}}}{1 - a}$$

where $k = 1.41$ and represents a parabola approaching a straight line.

The power required to operate the compressor was determined in the following way: The connecting rod of the compressor was disconnected from the crank shaft, and the oil engine tested for its brake horsepower at the same time the oil consumption was measured. The latter is plotted in Fig. 2. The compressor was then connected again and by means of the regulating valve V, Fig. 6, the pressure in the tank F was kept constant. The oil consumption was again determined, and the corresponding brake horsepower directly obtained from Fig. 2. These results are shown in the following table, and are plotted in Fig. 8 with the theoretical horsepower at adiabatic compression, which can either be obtained from the theoretical indicator card neglecting the clearance space, or by the formula:

$$W = 3.463\ P_1\ V_1 \left\{ \left(\frac{P_2}{P_1} \right)^{0.29} - 1 \right\}$$

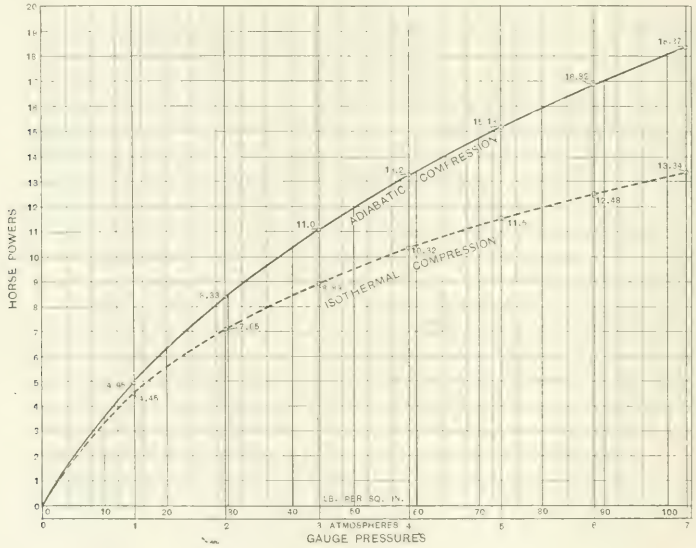


Fig. 9.—Curves of Theoretical Horsepower Required to Compress and Deliver 100 Cu. Ft. of Free Air Per Minute.

Each test was made at least three times, and the values given in the preceding table are the averages. The data for each test did not vary more than 1¼ per cent. either way from the tabulated figures.

From Fig. 7 it can be seen that three different groups of tests were made as follows: A—taking advantage of the pressure in the crank case and running the compressor at about 400 rev. per min.; B—taking no advantage of the pressure in the crank case, and running the compressor at the same speed as before; and C—taking advantage of the pressure in the crank case and running the compressor at only 240 rev. per min.

There is considerable difference between the efficiencies of tests A and B, and also between A and C. The former shows the actual gain by the use of the air from the crank case, and test C gives proof that any small leakage caused by the piston, valves, &c., is of greater consequence in a slow speed compressor than in one of high speed—a fact demonstrated long ago in tests of internal combustion engines. A method often applied to reveal leakage in a compressor is to blank flange the

Number of run	1.	2.	3.	4.	5.	6.
Revolutions per minute of compressor	423	415	410	405	401	398
Pressure in tank pounds per square inch (gauge)	29.4	44.1	58.8	73.5	88.2	100
Quantity of air discharged, cubic feet	103.8	102.6	98	96.8	95	93
Oil consumption, total per hour, pounds	18.94	20.25	21.63	22.8	22.95	24.84
Oil consumption, total per hour, pints	21.4	22.9	24.4	25.8	26	28.1
Corresponding brake horsepower	15.8	18.4	20.7	22.3	22.5	24.20
Theoretical horsepower required	8.75	11.4	13.4	14.9	16.1	17
Net or total efficiency	55.4	62	64.8	66.8	71.5 (?)	70.1

The power consumed, compared with the air discharged, often appears too favorable, for the reason that the quantity of air discharged is assumed too high, as is nearly always true when the volumetric efficiency is taken from the indicator card, or even the displacement considered as the amount of air delivered.

In Fig. 9 are shown the theoretical horsepower curves for 100 cu. ft. of free air at various pressures, and adiabatic and isothermal compression at single stage compression. Should it appear in practice that for any compressor a better adiabatic curve at a corresponding pressure was found, it would not prove excellence of design of the compressor, but rather corroborate the fact that it did not deliver the air assumed in the calculations and a leakage will usually explain the low power required.

To obtain the actual horsepower required to operate a compressor the theoretical power must be multiplied by the net or total efficiency. The net efficiency is the product of the indicated and mechanical efficiencies. The indicated efficiency is the ratio of the theoretical indicator card to the actual indicator card taken from a compressor. The latter is larger than the former, due to the valves, heating of the air when entering the cylinder and sometimes leakage from the discharge valve. The indicated efficiency varies from 80 to 95 per cent., depending upon the design of the compressor and valves. The mechanical efficiency is about the same as found for steam engines and may be from 70 to 90 per cent.

The net efficiency of the Mietz & Weiss compressor is 70.1 per cent. at 100 lb. pressure, as shown in Fig. 8 and a table previously given. Assuming the mechanical efficiency of this small compressor to be 80 per cent. the indicated efficiency would be 87.6 per cent., since $70.1 = 80 \times 87.6$. The power required is, therefore, not more than that necessary to drive a slow speed compressor directly from an engine. If a compressor must be geared or belted the losses resulting from these drives will naturally reduce the net efficiency of the installation.

A number of the compressors described have been built for the United States Government, and one of them is installed in the builder's works to supply the different shop departments with compressed air. It is constantly in use and requires very little attention. The cost for a 10-hr. run to compress and deliver 60,000 cu. ft. (or 100 cu. ft. per minute) of free air, at 100-lb. pressure with this oil engine and air compressor is $2.60, including $1.50 for fuel oil at 4 cents per gallon, 10 cents for water, 50 cents for lubricating oil and waste and 50 cents for attendance. This type of air compressor is built in sizes of from 10 to 200 cu. ft. of free air per minute and for pressures up to 100 lb.

Canadians Would Conserve Niagara Falls Power.

Canadians have become aroused to the conviction that existing power franchises still undeveloped form a menace to the Falls of Niagara, and the commissioners of Victoria Park at Niagara recommend in their report for 1907, just sent to the Ontario Legislature, that these charters be nullified. The report says:

Impressed with the vital importance of the subject, the commissioners would again draw attention to the charters which have been granted by the Parliament of Canada to several corporations to generate power at various points in the Niagara District from water which at present flows through the Niagara River and over the Falls, for which charters have not up to the present time been proceeded with. Without question the works already constructed by the three companies operating on the Canadian side are of sufficient capacity to supply the demand for electricity for lighting and power purposes for Canadian uses for a great many years to come.

As the undeveloped charters are all without limitation as to the volume of power which may be developed, and without restrictions as to the quantity of water which may be taken for such development, it is essential to the safeguarding of the Falls that immediate steps should be taken to cancel them, or to place a limit on their operations, so that the menace they now present to the preservation of the Falls as a great natural wonder may be removed. In this connection the commissioners would strongly recommend that the government of the Province of Ontario, being chiefly interested, should be officially represented at any international conference that may be held, having in view the uses of the waters of Niagara for commercial purposes or for the limitation of such uses in furtherance of the preservation of the Falls.

This latter request of the commissioners to be represented at international conferences having a bearing on the preservation of the falls is significant, for up to this time the province has been very pronounced in its position that the development should not be checked, its Hydro-Electric Commission having organized or had connection with a municipal league for the wide and extended distribution of electrical power from Niagara. Ontario expects much from this power transmission, many places awaiting the coming of the current in order that new industries may be developed and thrive.

Columbia University Course Revision.

In 1907 Columbia University revised the entrance examination requirements for its schools of mines, engineering and chemistry by simplifying them and co-ordinating them with the programmes of the best secondary schools. By the adoption at the same time of a uniform programme of studies for the first year in all courses, students were no longer compelled to make up their minds at the outset as to the particular course they desired to take, and it became much easier for college graduates to enter the schools with adequate credit for advanced standing. Following these steps have come the co-ordination and revision of the three subsequent years of each of the courses. This revision, which has been the subject of earnest consideration by the Committee on Programme of Studies and by the officers of instruction concerned, has just been formally adopted by the faculty and will go into effect on July 1.

In the first place, the programmes have been thoroughly co-ordinated by cutting out such duplication of instruction as had grown up in the development of the several departments, and courses whose value has been lessened by changes in actual professional methods have been replaced by subjects of greater value to the professional students of to-day. Second, the work in many subjects has been made more intensive, and as a result it has been possible to reduce the total number of attendance hours in such courses. Third, the free time created by this work of excision and condensation will make possible the introduction of important new material. For example, new courses in gas power and steam power machinery and in alternating current laboratory practice have been introduced in the third year of the course in mining engineering. The course in mechanical engineering will have additional work in machine design, in the design of manufacturing plants, in metallurgy, in shop organization and works management, and the course will be further broadened by instruction in industrial law and economics.

The results of the change in entrance requirements and the uniform first year have been most satisfactory to the schools, the total of new students in 1907-08 being 239 as against 162 in 1906-07, a gain of 47½ per cent., and the number of entrance conditions carried by students being reduced 62 per cent. and the number of term conditions 43 per cent. It is expected that the new programmes in the professional courses, together with the close personal contact which is now being maintained by the dean and the professors with all the students in the schools, will still further enhance the reputation of the historic "Columbia School of Mines."

The annual meeting of the Lake Superior Corporation was held in Jersey City April 6, at which peace was restored between the contending interests. Directors were elected as follows: Francis B. Reeves, James Hay, Horatio G. Lloyd, Charles S. Hinchman, J. Tatnall Lea, all of Philadelphia; John T. Terry of New York, Leander N. Lovell of New Jersey, Charles D. Warren of Toronto, Thomas J. Drummond and O. R. Wilson-Smith of Montreal, George Tatginson of Preston, Ont., and William J. Sheppard of Toronto. Charles D. Warren was re-elected president, Francis B. Reeves was chosen first vice-president and John T. Terry secretary and treasurer.

The Kennedy Gyratory Crusher.

The Kennedy gyratory crusher is a recent addition to a line of rock crushing machinery made by Chalmers & Williams, Commercial National Bank Building, Chicago, Ill., at their Chicago Heights factory. As will be seen from Fig. 1 this machine in its general design does not depart radically from the usual crushers of the gyratory type, but it embodies certain improvements which, it is claimed, make it one of the most modern and efficient machines of its class.

Among the features of chief importance are the arrangement of the hopper, which permits the removal of the spider, concaves, main shaft or crushing head without detaching it from the top shell; the high arch of the two spider arms providing ample space for the free passage of rock or ore as it is carried around the hopper; the ball and socket self-aligning eccentric having an unusually large eccentric contact tending to diminish the wear and contributing to uniformity of operation and output, and the keyed fastening provided to connect the main gear with the eccentric sleeve which facilitates the babbitting of the eccentric. The double arm spider is cast in one piece with the ring, which rests on top of the shell and supports the bearing from which the main shaft is suspended. This bearing plays an important part in the gyratory movement of the shaft because of its unusually wide range of adjustment.

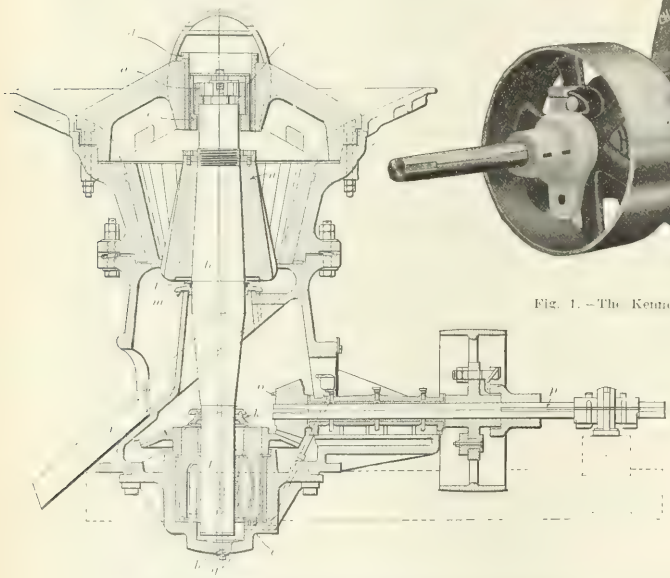


Fig. 2. Sectional View of the Kennedy Gyratory Crusher.

A clear idea of the principal parts of the machine is conveyed by the sectional drawing, Fig. 2. It will be seen that a suspension ring, *a*, is keyed to the upper end of the main shaft *b*, and is supported by an adjusting nut, *c*, screwed into a steel sleeve, *d*, set in the spider. A steel bushing, *e*, caps the suspension ring, and protects it from contact with the thread on the inside of the sleeve. By means of the vertical adjustment afforded by the adjusting nut the fulcrum can be changed to an extent equal to the adjustment of the main shaft, thus effecting a corresponding variation in the inclination of the shaft, for which compensation is provided by the ball and socket eccentric *f*. It is claimed that by this method a greater range of adjustment is secured than is found in other crushers of this type.

Particular stress is laid upon the advantages of the ball and socket eccentric, which is a patented feature peculiar to this machine. The eccentric is housed in a sleeve, *g*, made of two parts bolted together, and runs in a bath of oil, which is always kept above the working parts. Any sediment that may deposit in the oil chamber is drawn off through a drain plug, *h*, in the bottom of the inclosing casting *i*. The eccentric sleeve is encircled at the top by the hub of the bevel gear *j*, which effectually protects the working parts from dust. As an additional protection against the penetration of dust to these parts a packing ring, *k*, is set above the bevel gear, and an upper packing ring, *l*, and dust plate, *m*, are located under the crushing head *n*. Especial care has been taken to provide dust-proof housings for all bearings, a feature of importance in rock and ore crushers because of the damaging character of the rock dust to which they are exposed.

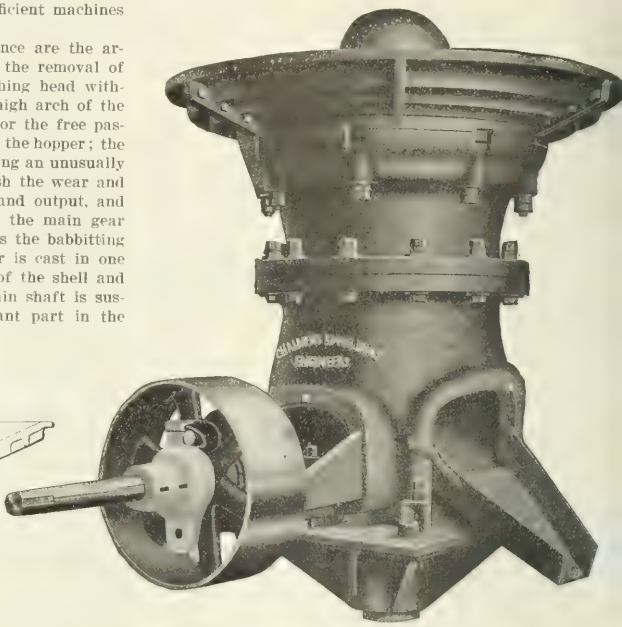


Fig. 1.—The Kennedy Gyratory Crusher Built by Chalmers & Williams, Chicago, Ill.

The machine is belt driven through the bevel pinion *o* and the countershaft *p*, and is constructed throughout with a view to securing a maximum of strength and rigidity; at the same time it is claimed that use of the self-aligning eccentric obviates undue strains to which it might otherwise be subjected. The driving pulley is equipped with keyed or breaking pin connection, as desired, the former being recommended.

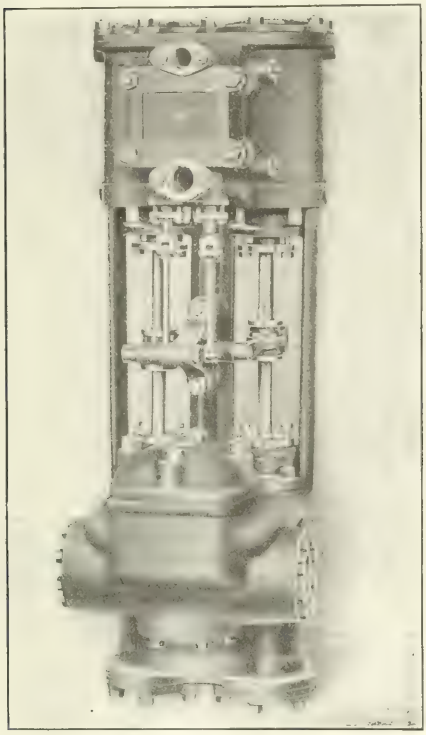
This crusher is built in sizes from No. 1 to No. 12, ranging in weight from 6800 lb. for the smallest to 360,000 lb. for the largest, with capacities for crushing 5 to 10 tons and 600 to 1600 tons per hour, respectively, according to fineness of product and other conditions.

Plans are well under way, and it is expected that a deal will be closed this week, for the consolidation of the Imperial Steel Company, which recently built a crucible steel plant at Imperial Station, near Chagrin Falls, a suburb of Cleveland, Ohio, and the Baldwin Steel Company, which about a year ago built a plant at Charleston, W. Va., for making high grade tool steel.

The Pittsburgh Forged Steel Wheel Company, Pittsburgh, Pa., has increased its capital stock $500,000, making it $1,750,000.

A New Blake-Knowles Vertical Pump.

An inexpensive vertical steam pump of moderate size, adaptable to boiler feeding and general service against high working pressures, is that recently perfected by the Blake & Knowles Steam Pump Works, New York City. It is a vertical duplex double acting pump, as the accompanying illustration indicates, and is especially adapt



The New Special Vertical Duplex Piston Pump Built by the Blake-Knowles Steam Pump Works, New York City.

ed for use where compactness and strength are of first importance, as in ships and power houses where the floor space is limited.

The pump cylinders are of the piston pattern, and are fitted with substantial brass linings. The pump pistons are deep and are packed with fibrous packing suited for hot or cold water. The piston rods are of Tobin bronze. The steam cylinders are of the regular duplex pattern and of similar design to those which have been used for many years in the horizontal Blake-Knowles special duplex pumps. The cast iron cradle or centerpiece which ties the steam and water ends is extremely rigid, an improvement on the ordinary tie bar construction, as it prevents possibility of the cylinders getting out of alignment. The cylinders are ordinarily fitted with brackets for bolting to a bulkhead or wall, but if preferred a special base is substituted so that the pump may be placed directly on the floor.

The pumps are suited for a working water pressure of up to 200 lb. per square inch. They are built in 12 sizes, ranging from 2 x 1¼ x 2¾ in., which has a capacity of 2 to 8 gal. per minute, to 14 x 7 x 10 in., which has a capacity of 245 to 410 gal. per minute.

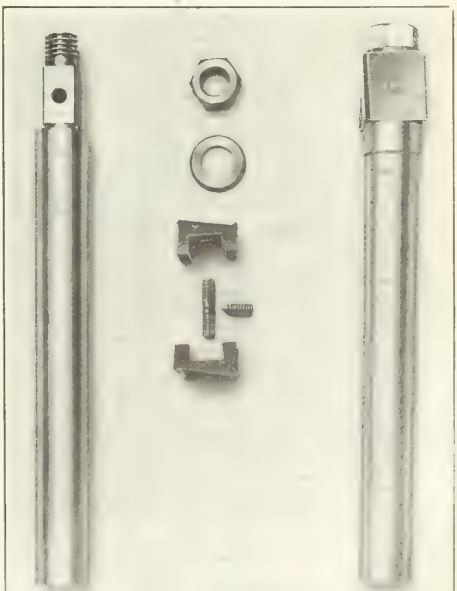
The Buffalo Crucible Castings Company, Buffalo, N. Y., manufacturer of crucible and vanadium steel castings, has appointed Edgar M. Moore & Co., 914 Farmers' Bank Building, as its agents in the Pittsburgh District.

Doubtful Success of Japanese Steel Works.

The Imperial Steel Works, built and operated by the Japanese Government at Wakamatsu, have not been a financial success, according to articles in the British engineering and financial press, in which those works are persistently referred to as an "iron foundry." The lack of iron ore in Japan has been one of the great drawbacks. Ore is obtained from China, and a Chinese mine has been secured recently at an initial expenditure of 1,296,000 yen ($648,000). The high price of coal has been referred to in official reports as another handicap. Changes in the management of the works have been made from time to time, foreign experts being engaged at intervals, and each new management undoing some of the work undertaken under the old. The difficulty of producing commercially acceptable product has been a constant one. Army officials seem latterly to be in charge of the enterprise. One complaint has been that under the conventional tariffs pig iron can be imported at a duty of 5 per cent. ad valorem, and the hope has been held out that by 1912, when the conventional tariffs terminate, the duty on pig iron can be increased. Then, it is argued, pig iron prices can be maintained high enough in Japan to "encourage" the sale of the product of the government steel works. Nothing is said in this connection as to the handicap high prices of steel products would impose on consuming interests. It is stated that from first to last more than 56,000,000 yen ($28,000,000) has been spent on the enterprise. This expenditure covers a period of 10 years.

The Turney Adjustable Reamer.

The Turney adjustable reamer, details of which are shown in the engraving, has a high speed steel head of



[illegible] Adjustable Reamer, Manufactured by the Grant Nail & Supply Company, Boston, Mass.

approximately square cross section with four cut lips formed as left hand spirals of 5-degree angle. The head is made in two sections, each having a channel on the inside, ground after hardening to fit over the squared end of the reamer shank, which preserves alignment of the cutting edges and prevents the possibility of the head turning on the shank. Parallel adjustment of the head

sections is controlled by a double end right and left hand screw, which extends laterally through the end of the reamer shank, and engages threaded holes in the reamer head sections. When the adjustment is made a set screw at right angles to the adjusting screw is tightened against the latter, and the head is locked firmly against a shoulder on the shank by a nut and washer at the outer end. The tool is sold by the Grant Nail & Supply Company, 47 High street, Boston, Mass.

While these reamers have only recently been put on the market they have been used in a large machine shop in New England for the past two years, and have made it possible to do away with hand reaming on certain work it had theretofore been necessary to do by hand to obtain smooth holes and preserve standard sizes. It is stated to be no unusual matter to ream 100 holes and upward in bronze 3¼ in. in diameter and 6 in. long, without appreciable wear of the reamer. The tool works in either copper, bronze, steel, cast iron or babbitt. It is simple and strong in its construction, and has the advantage of expanding parallel through its entire length, which increases its length of life, because it is necessary to grind away a small amount only when resetting and grinding are required. The adjustment of the reamer is sufficient to allow for its full wear, until the lips or lands are entirely ground away. It is made in all sizes from 1 to 8 in., inclusive.

Gröndal Concentrates and Briquettes.

A Summation of the Recent Development of This Process.

Data have been prepared recently, showing the extent to which the Gröndal process of concentrating and briquetting fine iron ores has been introduced, particularly in Norway and Sweden. One year ago, out of 19 magnetic concentration plants in operation in Sweden, 12 used the Gröndal apparatus, and now other plants are under construction which will use the same system. The magnetic ores of Scandinavia contain from 30 to 60 per cent. of iron, with varying amounts of sulphur and phosphorus. With fine grinding the iron content can be brought by concentration to from 63 to 68 per cent. At the plants named below the Gröndal process is in use, with the results indicated as to output. Where tons of concentrates are not given the whole output is briquetted. Where only briquettes are given concentrates or fine or purple ores are used:

	Works	Tons ore treated.	Concentrates.	Briquettes.
1.	Strassa	150,000	75,000	60,000
2.	Bredajö	40,000	. . .	20,000
3.	Herräng	60,000	. . . .	30,000
4.	Guldsmedshyttan	90,000	45,000	30,000
5.	Uttersbergs	24,000	. . . .	12,000
6.	Flogberget	50,000	. . .	24,000
7.	Lulea	60,000	. . . .	50,000
8.	Sandvikens	. . . .	. . . .	12,000
9.	Horndal	. . .	. . .	12,000
10.	Helsingborg	. . . .	. . . .	50,000
11.	Swmavon (Wales)	. . . .	. . . .	36,000
12.	Alquife (Spain)	. . . .	. . . .	40,000
13.	Pennsylvania Steel Co.	200,000	100,000	. . .

There are also under construction the following plants:

1	Hellefors	20,000	. .	10,000
2.	Vigelsbo	20,000	. . . .	10,000
3.	Salangen	300,000	. . . .	100,000
4.	Sydvaranger	1,200,000	. . . .	600,000
5.	Traversella	50,000	. . . .	25,000
6	Riddarhyttan	20,000	. . . .	10,000
				755,000

The plant under construction at Sydvaranger will deal with iron ore containing only 38 per cent. metallic iron. A company has been financed by German interests, all arrangements made with the Norwegian Government, and plans perfected whereby a minimum production of 600,000 tons of concentrates annually will be produced, shipments to begin in 1910. The plant will consist of 40 units each containing ball mill, crusher, tube mill and separators. At least 100 separators will be required. It has been found that standard Gröndal ball mills will handle, on an average, 135 tons of hard magnetite ore in 24 hr.

The company at Salangen, Norway, is composed of German ironmasters, who will themselves absorb the entire annual production of 100,000 tons.

Improvements in Practice.

Technical advances of considerable interest have been made in the development of the Gröndal process. These are summarized as follows by the American Gröndal-Kjellin Company, New York:

1. The introduction of heavy rock crushers of the Gates or Blake type for preliminary crushing, thus throwing less work upon the ball mills.

2. Where the ore is of suitable character the use of magnetic cobbing machines to get rid of such rock pieces as contain little or no iron. This reduces the amount of ore to be handled in all subsequent operations per ton of product.

3. Somewhat finer grinding in the Gröndal ball mills. It is generally found that the magnetite particles reduce more quickly than the ganque particles, so that the finer grading does not necessarily involve reducing all the particles to pulpy condition. The practical effect of such finer grinding is a higher percentage of recovery and a higher iron content in the concentrate. As most of the concentrated material is destined to be briquetted, the fact that the grains are smaller is of no moment.

With regard to briquetting, the following are noted as improvements:

1. Better design of briquetting presses reducing the wear. The life of the die plates has been quadrupled. At Cwmavon, working on pyrites residues, a single set is good for about 800 tons of briquettes.

2. The original briquetting furnaces and cars were 1 m. wide. It has been found that this may be increased to 1.5 m. without materially increasing the investment. The result of the change is a 50 per cent. increase in the daily production of the furnace. The furnaces, therefore, will give a tonnage approaching the nodulizing kiln, with the advantage that the briquettes are more desirable from the metallurgical point of view.

3. The fuel consumption, which in the 1 m. furnace had reached 7 per cent. of the weight of briquettes produced, is expected to be further reduced in the wider furnace.

4. Bilbao spathic ore has been treated successfully. The ore was first ground in a tube mill to 0.75 mm. mesh. The mill will grind about 6 tons per hour, using 75 hp. to drive it. The ground ore was mixed with a little water, pressed and burnt in the usual manner. The original ore ran 47 per cent. iron, which with the loss of carbon dioxide in the briquetting furnace brought the iron content of the finished briquette up to 58 per cent.

The fuel economy introduced by the use of the Gröndal briquettes has been ascribed to two leading causes:

1. High iron content and consequent small amount of material to be slagged off.

2. Porosity of briquettes, permitting an enormous surface of contact between reducing gases and iron oxide. This porosity averages over 20 per cent. of the volume of the briquette.

Reference is made to one test of 1000 tons of Strassa briquettes, containing 65 per cent. iron, put through a blast furnace at the Cockerill Works, at Seraing, Belgium, where a fuel economy of 15 per cent. was claimed.

Market Prices.

In the past year the following prices have been paid:

For concentrates containing 63 per cent. iron, for home consumption in Sweden, about $3.65 per ton, on cars at concentrators. For export, containing 65 per cent. iron and about 10 per cent. water, $4.25 at port of export.

For briquettes, f.o.b. port of export, containing 65 per cent. iron, sales have been made at $5.45 per ton, and 10,000 tons have been engaged for Germany for this year at about $5.25, at port of export. Purple ore briquettes from Helsingborg bring about $6 per ton, c.i.f. Stockton.

Pyrites residues briquettes from South Wales works

command from $5.50 to $6.35, delivered, according to cost of transport. These briquettes contain about 62 per cent. iron, with sulphur down to 0.044 per cent.

Results of Gröndal Concentrating and Briquetting.

The accompanying table gives the results from various ores by the Gröndal concentrating and briquetting methods.

Ore.	Crude ore. Fe.	S.	P.	Concentrates. Fe.	S.	P.	Fe.	Briquettes. Fe.	S.	P.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Blotberg	35.0	0.15	0.010	67.2	0.050	0.004	6.9	61.1	0.020	0.004
Fledegget	37.4	0.31	0.003	67.4	0.040	0.003	7.1	65.3	0.007	0.003
Guldsmedshyttan	50.7	3.0	0.003	70.1	0.5	0.002	10.2	68.2	0.010	0.002
Helsingborg (purple ore)	60.6	0.17						60.6	0.023	
Herring	10.2	1.21	0.003	67.3	0.170	0.002	6.4	65.5	0.003	0.002
Hjulsje	39.7	0.12	0.008	67.1	0.035	0.004	6.1	65.2	0.015	0.004
Lulea	58.2	0.110	1.230	71.1	0.015	0.005	11.4	69.3	0.005	0.005
Riddarhyttan	42.8	0.025	0.006	64.2	0.017	0.005	7.4			
Salsjo	35.7	0.039	0.23	69.3	0.019	0.009	4.9			
Strassa	46.8	0.030	0.015	68.2	0.015	0.005	6.1	67.1	0.005	0.003
Stripa	40.3	0.030	0.010	67.1	0.020	0.002	6.1	65.2	0.005	0.002
Svartvattnet	38.0	0.066	0.030	68.3	0.020	0.014	5.5	68.0	0.006	0.014
Tuggelsberg	34.5	0.020	0.024	62.6	0.02	0.004	9.3			
Vigelsbo*	35.2	0.45	0.026	64.6	0.089	0.005	6.7			
Ovmakan	61.43	1.65	0.019					61.1	0.044	

* Under consideration.

Briquettes containing from 63 to 65 per cent. metallic iron, low in sulphur and phosphorus, and easily reducible in the blast furnace with economy of fuel, would be superior to the average run of old range Bessemer ore of the Lake Superior region, on which the guarantee is now 55 per cent. iron. The present price for such lake ore is $5 per ton, delivered at Lake Erie dock. In European and American markets, it is stated, Gröndal briquettes would command a price of 10 cents a unit, or $6.30, delivered. The Swedish companies using the process have formed the Iron Export Association, whose products find a ready market in Europe. It is said that every operating company has been a financial success. The average cost of concentration on an output of 200 tons daily in the United States or Canada, on ores of which 2 tons would be needed per ton of concentrates, is estimated at 40 cents a ton of concentrates. The average cost of briquetting, on 200 tons daily, is put at 45 cents a ton.

The Philadelphia Foundrymen's Association.

The regular monthly meeting of the Philadelphia Foundrymen's Association was held on the evening of April 1, Horace L. Haldeman presiding. During the business session membership was authorized in the American Anti-Accident Association, of which Thomas D. West, Sharpsville, Pa., is president. W. S. Hallowell, who, together with A. A. Miller, represented the association at the meeting of the so-termed "Short Weight Committee" of foundrymen, shippers and transportation interests, reported progress, and announced that a formal report would be presented as soon as the proceedings of the committee had been edited and formally presented to H. A. Carpenter, chairman of the General Committee. Copies of the report will thereafter be printed.

Announcement of the recent death of three members of the association was made by the secretary, these being George V. Cresson of the George V. Cresson Company, J. K. Bougher of the J. W. Paxson Company and William H. Pfahler of the Model Heating Company. Resolutions of regret were adopted. W. S. Hallowell, John A. Penton and H. L. Haldeman made brief addresses, eulogizing particularly Mr. Pfahler, who was one of the originators of the National Founders' Association, in which he took a very prominent part, and who was one of the most conspicuous foundrymen in the United States.

The Gardner Eight-Hour bill, the Anti-Boycott bill and other labor bills now before Congress were discussed, and a resolution was adopted instructing the secretary to protest to the House Labor Committee in the name of the association against the adoption of these bills.

An informal discussion on the general foundry trade followed, after which a luncheon was served.

The Pittsburgh Traffic Club Dinner.

The sixth annual dinner of the Traffic Club of Pittsburgh was held in the Hotel Schenley, on the evening of April 3. It was the most successful function from every point of view yet given by this organization, a total of 560 persons being in attendance, including a number of special guests, among whom were Robert Mather, president of the Rock Island Company; Dr. Woodrow Wilson, president of Princeton University, and Nathaniel Ewing, chairman of the Pennsylvania State Railroad Commission. In the morning of that day, a special train of the Pennsylvania Railroad conveyed the party to the plants of the Westinghouse Machine Company and Westinghouse Electric & Mfg. Company at East Pittsburgh, and Westinghouse Air Brake Company at Wilmerding, Pa., luncheon being served at the last named plant. A considerable number visited the Homestead and Edgar Thomson works of the Carnegie Steel Company, the process of rolling rails being witnessed at Edgar Thomson. The club has been of great benefit to its members, and is in a most flourishing condition, with its membership steadily increasing. William Hodgdon, freight traffic manager of the Pennsylvania Lines, acted as toastmaster at the dinner. W. B. Everest, traffic manager of the Westinghouse Electric & Mfg. Company, is president of the club. Mr. Everest delivered an able address on "Industry, Transportation and the Traffic Club;" Dr. Wilson spoke with characteristic force on "The Government and Business," and Mr. Mather delivered an address on "Railroad Regulation," which is worthy of wide circulation. Souvenirs presented to the guests included a handsome cigar tray and ash receiver from the American Sheet & Tin Plate Company, and a nickel railroad spike paper weight from the Jones & Laughlin Steel Company.

Scientific Instrument Makers Consolidate.

The Bausch & Lomb Optical Company, Rochester, N. Y., has incorporated with a capital stock of $600,000, with the following directors: John J. Bausch, Henry Lomb, Edward Bausch, Henry Bausch, William Bausch, Carl F. Lomb, William A. E. Drescher, Adolph Lomb, Henry C. Lomb, George N. Saegmuller of Rochester, and Rudolph Straubel of Jena, Germany. The incorporation is the outcome of a recent association formed by the [illegible] Saegmuller Company of Rochester, N. Y., and the Carl Zeiss Optical Works of Jena, Germany. The combination of these three manufacturers of scientific instruments is important, in that it concentrates the knowledge, skill and experience of well known companies in the same class of manufacture. Under the new corporation the Bausch Lomb-Saegmuller Company becomes an integral part of the Bausch & Lomb Optical Company, losing its identity as a separate corporation. The Carl Zeiss Optical Works becomes a member of the new organization, and it is the intention of the new company to manufacture certain products of the works in the United States, but the Zeiss Works in Germany retains its identity as a separate corporation.

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The First Quarter of 1908.

Since the iron trade has entered upon the second quarter of the year it might be presumed that more data are at hand for an estimate of the place 1908 will take in iron and steel consumption than were available three months ago. It cannot be said, however, that the course of trade since the year opened has been conclusive in any respect, unless it has modified the views of those who looked for a quick return to confidence and prosperity. Optimism has been the prevailing sentiment among iron and steel manufacturers, as it has been in practically all manufacturing and commercial lines. So far as published utterances go, the contrary sentiment has been almost entirely confined to railroad interests, the effect of legislation and of national administrative policies upon the ultimate attitude of capital toward railroad securities being still a chief factor of uncertainty.

The five months since the panic of October have furnished the railroads some basis for gauging the extent to which, without reduction in wages, they may be able to adjust their expenditures to materially shrunken incomes. For reasons that have had wide publicity, railroad wage reductions are not this year, as has been the case in after-panic months heretofore, the line of least resistance in the effort to make readjustments. To what extent that fact will accent the abstinence of the railroads from purchases of iron and steel is yet to be seen. Marked as the policy of cutting such expenditures has been in other times of recession, the peculiar conditions surrounding the railroad situation now may lead to even a more drastic enforcement of economies than, for example, in the mild reaction of 1904. With fixed charges and wages undiminished, all construction work, except that on which there would be greater loss by postponement, has been stopped; expenditures for new equipment have been suspended, and it is estimated that under the policy of putting damaged rolling stock out of commission the amount of equipment now in yards is more than twice the ordinarily allowable maximum. Of course, the economizing policy will one day pass the point of economy and then money will be spent to prevent serious waste of property. But that phase of the railroad situation has not yet arrived.

So far as the money side of the present trouble is concerned, we are plainly some distance from the point at which even the stronger railroad companies will think of attempting to float loans with the general public. Many plans of this sort involve the refinancing of expenditures of which the iron industry has already had the benefit.

Within the iron trade itself the conditions have been so unusual that comparisons with other panics are difficult. The customary measurements in such times are taken from market prices. But as is well known, prices do not tell the story now. Looking to production, the pig iron statistics show a gradual increase in the first three months of the year. From 33,718 tons a day in January, the output of coke and anthracite pig iron was 37,163 tons in February, and 39,619 tons in March, against an average of about 72,500 tons a day in the 10 months ending with October, 1907. The gradual nature of the increase is only in line with what was noticed in the early months of 1894, which was likewise a year following a panic. From having averaged 25,000 tons a day for six months preceding the panic of 1893, coke and anthracite pig iron production fell to a rate of 10,000 tons a day in October, the month of lowest output in that year, and by January, 1894, it had advanced to 14,000 tons a day, which was also the rate in February, while March showed an advance to 15,700 tons a day.

A general parallel between 1874, 1894 and 1908 has been established by the developments in the first quarter of this year, according to the New York *Evening Post*, which follows the citation of statistics with this comment:

> It is safe to predict that nine out of ten readers will be astonished, and some of them perhaps a little incredulous, over the discovery that the outward and visible signs in American finance these past three months, during which we have repeatedly been talking of "immediate return to former conditions," have in reality done nothing more than duplicate closely the events which characterized the same period after other panics. We are a little apt, in taking a retrospect of the completed sequel to such financial crises as those of 1873 and 1893, to imagine that the community was plunged for months and years in a gulf of depression and pessimism, into which no ray of light intruded until the hard times had reached their distant end. But this was certainly not so. The men of 1894 and 1874 were the same in temperament as the men of 1908; they were optimistic by nature, and they grasped at every chance of indulging optimism, of which there were many in the vicissitudes of trade. There were hasty predictions then that all of the period of reaction was over, and that the "boom times" were about to begin again. So far as the longer future was concerned, such ideas were well founded in those earlier years, and they are well founded to-day.

Whatever the disagreements as to the duration of the present depression, an encouraging feature is the general belief that while the progress to recovery may not be even-paced, the low point in consumption has been passed. Since the malady from which the country is suffering has so large a mental side, the time element in recovery is important, as it has been in other cases where confidence has been temporarily lost. On the other hand, it is well to give full weight to the important changes from conditions existing in other depressions, changes which should tend toward the more rapid rebuilding of the foundations of sound business.

Responsibilities of Machinery Buyers.

The question is constantly arising as to the time and money a machine builder should spend with a customer in getting a tool running up to the specified standard, where the fault is in the customer's works. There is no dispute, of course, concerning the responsibility of the builder, where something is wrong with the tool itself. But the usual complaint is due to the ignorance or negligence of the buyer's superintendent or foreman, and sometimes results in a serious burden to the builder if he assumes the expense, which may be sufficient to eat into the price to a point even below that where profit begins. This is a phase of the general question of the responsibility of the manufacturer.

A machine tool is shipped with careful directions as to its setting up and operation, including speeds and

feeds, based on the speed of the countershaft. The tool is put into use and then comes a complaint that it will not do the work promised by its maker. The latter sends an expert to investigate. The distance may be hundreds of miles and the bill for traveling expenses proportionately heavy, in addition to the item of wages. The expert finds that the directions regarding the machine have been disregarded. The countershaft speed may be but half of that required to give the designed efficiency, or it may be very much too great. There is no doubt that an impartial referee would decide that the customer should reimburse the builder for the expense entailed in correcting the trouble, yet the customer nearly always rebels at the bill.

These instances are numerous. In one case a special grinding machine was installed in the works of a customer, and after a time trouble was met in its operation. A man sent to investigate found that the exhaust fan furnished with the machine to remove grit and dust during dry grinding had been installed on another machine of an entirely different type, and that this obvious means of protecting working parts had never been applied as intended. In another case a complaint received from a customer located 1000 miles from the shops of the builder, that the machine would not grind to exact size, brought out the fact that no one had ever thought of the necessity of truing up the grinding wheels, though the directions sent with the machine included this warning printed in conspicuous capitals. Every machine tool man can probably relate numerous similar experiences.

In the past the customer has usually had the better of the controversy in the settlement of expense resulting from the faults of his own shop. But manufacturers and dealers are now breaking away from the custom and are standing more firmly by their rights. As soon as they have established this attitude toward their trade customers will go at the matter in a different way. They will then hold their mechanical men more strictly accountable, which should, of course, be done.

The foreman or superintendent (the latter should either supervise or, after careful examination, pass his approval on the installation of new machinery) can have no excuse for making the blunders that occur so frequently. If the foreman does not understand a machine, if there is any doubt concerning any part of its mechanism or arrangement, the builder is always glad to lend a helping hand. It is for his interest to do so, and the customer realizes that he has the right to call for any assistance of the sort that may be needed. Every modern establishment has a speed indicator, so that there need be no doubt as to a tool being driven at the proper speed. If after the machine is started up it will not run according to its guarantee, the mechanical man of the shop should be able to determine whether the fault is his own or that of the builder. In most cases of unwarranted complaint the trouble is due not so much to ignorance as to indifference. The responsible head of a department does not take the trouble to look into the matter as he would into some detail of his own product, but instead of that he immediately calls upon the builder, summarily condemning the machine and its designer. Usually the customer will back up his own man. If, however, he would call the responsible person sharply to account there would probably be fewer complaints.

Some machinery builders make it a practice to detail a special man to set up each machine or group of machines in the customer's works. It is an excellent practice, a wise safeguard, especially where there is something radically new in the tool or its application. The customer pays the bill because the additional expense must be reckoned in with the other items of general cost. But even after a machine has been installed by an expert and its operator carefully instructed, the possibilities of trouble are by no means eliminated. Changes are made or directions disregarded and the builder receives a complaint that the machine is not working up to expectations. This has been known to happen after a year or more of successful operation, and, though the customer be in the wrong, he still expects, or at any rate claims, that he should not be called upon for any of the expense, or at most that the builder should share it.

In this connection it may be stated that some machinery builders and dealers are altogether too easy with their customers. They are fearful of losing future orders. As a matter of fact, sound business methods pay in dealings with buyers. A business man respects the house established on a basis of principles by which it stands. Occasionally a customer is heard to comment on this fact, relating his own experiences. A product is sometimes "sized up" by the lax system of its manufacturer; the presumption is created that this weakness extends to the manufacturing department, and consequently to the goods. The machine builder should always be quick to remedy defects for which he is responsible, but resolute in refusing to meet expense for the cause of which he is not to blame.

A Latent Strength in the Business Situation.

A matter of constantly accelerating interest to manufacturers in many branches of the metal trades is the extraordinarily numerous inquiries which they are receiving from all parts of the country, but which usually bring no immediate results in orders. It makes little difference where the seeker for information may go, the answer of the manufacturer is nearly always the same. He tells of an unusual volume of inquiry—requests for prices and for general information concerning his products—but of the failure of the most persistent follow-up methods to convert inquiries into orders. Naturally the opinion prevails that customers are simply holding off for a little while until they can see more clearly into the future of their business. Usually the conventions of the great political parties are named as the probable turning point, or the Presidential election itself, with its simultaneous choice of the next House of Representatives. It is the universal hope that after the nominations are made the result may be discounted, with beneficent results in restoring confidence and converting inquiries into the tangible reality of new business.

The older manufacturers assert that there is no precedent for this widespread revelation, during a period of business inactivity, of actual wants of customers. To be sure, not all of the inquiries can be considered as being backed by a serious intention of buying later. Customers, however, have had the time to think of many things in connection with their business to which a year or so back they could give little heed, while their works were rushed to the extreme of production. Now they are figuring on possible improvements, such as additions to equipment or the replacing of the old; or they may be studying the matter of raw materials with the idea of improving the quality or reducing the cost or extending the scope of their products. In investigating their individual conditions they must seek information regarding many things, and hence a certain number of such requests will never develop into orders. But probably by far the greater percentage of inquiries means plans actually made to buy.

It is conservatively stated that if three-quarters of the inquiries received since January 1 should all at once materialize into orders, say during April, a most powerful impulse would be given to manufacturing. It is certain that if this impression of the ultimate conversion of inquiries into orders is a correct one, a great latent strength exists in the situation in this known business alone.

Car Statistics Less Unfavorable.

BY E. T. ARDREY.

The latest bulletin of the American Railway Association, issued under date of April 1, to show car surpluses and shortages of all railroads on March 18, indicates that the traffic of the country is slowly recovering from trade depression. The total number of idle cars reported was 297,042, compared with a total of 343,928 February 5, the date when the carriers reported the largest surplus.

The Character of the Surplus Cars.

The number of idle or surplus cars March 18 was equal to about 15 per cent. of the total equipment, as the roads have in service about 2,000,000 cars. This statement should be qualified by the explanation that the railroads have a larger number of bad order cars than under ordinary conditions. Cars requiring only slight repairs, which can be made on the tracks, are reported in the surplus, but "shop" cars are not included, and it is understood that the carriers have about 5 per cent. more than the normal number of cars awaiting shop repairs. The following table shows the character of the surplus cars reported March 18:

Box cars	103,509
Flats	25,122
Coal, gondola and hopper	119,205
Other kinds	49,206
Total	297,042

The railroads have approximately 1,000,000 box cars in service, and the reports would indicate that the surplus is only 10 per cent. of the total. Allowing an additional 5 per cent. for cars awaiting shop repairs, in excess of the normal number, it would appear that 85 per cent. of the box car equipment of the country is in service. This is a far more favorable showing than the public has been led to infer from the publication of these reports in the daily press. Shippers who have personally observed the large accumulation of idle cars, especially in the Eastern and Central States, may be inclined to question the accuracy of the figures, as it would not be unusual, even under ordinary trade conditions, for the railroads to have 15 per cent. of idle equipment at this season of the year. These statistics, however, are compiled with unusual care.

Why the Statistics Are Reliable.

The American Railway Association is the most important organization of railroad interests in the country, comprising all the lines of any magnitude. The active members are the high operating officials of the roads,and the business of the association is to fix the standards and rules which are universally followed in railroad operation. The Committee on Car Efficiency, which compiles car statistics, has expended more than $100,000 in the past year in collecting data regarding car movement and management. The purpose of this investigation, which began a year ago in January, was to obtain all the facts relative to "car shortage," and with this end in view the experts in the employ of the committee have obtained at regular periods from all the railroads data regarding the number of cars in service the daily average movement and car earnings on each line, the surplus and shortage of cars, and many other points of great importance in railroad operation.

The statistics of car surplus and shortage are handled with especial care, with a view to promoting traffic by making the idle cars of one road or district available in other territory where there may be a shortage. Incredible as it may seem, especially in iron and steel circles, it must be accepted as a fact that only 15 per cent. of the car equipment of the country is idle at the present time. There may be reasons for accepting the prediction of Commissioner Lane at Washington that there will be a car shortage in October.

The Suffering Iron and Lumber Industries.

The iron and lumber industries have suffered the most acutely from the depression of recent months. These two industries furnish directly about 15 per cent. of the total tonnage carried by railroads, and indirectly the iron industry controls a large additional tonnage of coal and coke. The depression in these industries will come very near to accounting for the surplus of idle cars and a corresponding loss of the railroads in gross earnings. Looking a little farther, we find that the railroads use almost as large a share of the production of lumber as they use of iron and steel. Sales of lumber for railroad use in the first three months of the present year are estimated at less than 10 per cent. of the value for the corresponding period a year ago.

During the calendar years 1906 and 1907 the railroads placed orders for more than 450,000 freight cars, along with corresponding expenditures for other renewals and improvements. The ordinary expenditure for maintenance of way and structures and for maintenance of equipment amount to more than $600,000,000 a year, without including new construction or additions to equipment. In view of these facts, it is not difficult to locate the reason for the 15 per cent. of idle cars, and the depression in the iron, steel and lumber industries, and the sympathetic distress in other lines.

After ordering 450,000 cars in two years, the railroads, as shown by statistics of the American Railway Association, were short some 90,000 cars in October, 1907. Next fall they will have fully 100,000 less cars in service, allowing for the number that will have been scrapped by that time, and also for the number that will go to pieces under the heavy strain of moving the crops. In the past couple of years the grain crops have fallen a little below the average in tonnage, and in the ordinary course of nature, with the interest of the farmer stimulated by the high prices that have prevailed for corn and wheat, crops may be considerably larger than the average this year. Winter wheat has come through the trials of the winter and spring months in good condition.

New Control of the Bristol Company.

Prof. Wm. H. Bristol, inventor of the recording instruments, steel belt lacing and other products which have been manufactured by the Bristol Company, Waterbury, Conn., since it was first organized in 1889 as "Bristol's Mfg. Company," has acquired control of that company, now owning the majority interest, and assumed active charge of the management Friday, March 28. Two years ago Professor Bristol withdrew from the presidency of the company, and since has developed several new inventions, including electric pyrometers and smoked chart recorders. The business established at New York to handle these under the name of Wm. H. Bristol will be consolidated with the Bristol Company, giving the latter what is probably the most complete line of recording instruments in the world for pressures, temperatures, electrical measurements, &c. The standard Bristol recording thermometers cannot be successfully used for temperatures above 600 degrees F., but supplemented by the Wm. H. Bristol pyrometers, which are suitable for temperatures of from 600 degrees to 2600 degrees F., instruments will be available for a much wider range. The new lines of Wm. H. Bristol pyrometers are fitted with special movements made by the Weston Electrical Instrument Company, and are designed for extremely accurate measurements. Professor Bristol has taken out a number of patents during the last three years on new instruments. One of these, which will soon be put on the market, is a long distance electric thermometer, designed especially for indicating and recording at some central station refrigeration, atmospheric and drying temperatures at several distant points.

The Metallurgy of Iron and Steel.*

A book on iron and steel works practice, bearing a 1908 imprint, has a distinction in being able to deal with development through an unusual period in a most important field. But Professor Stoughton's work is unique in a more important way, for it is the first to cover fully the processes of both iron and steel manufacture and the constitution of these metals. The author set out to produce an iron and steel text book for students in metallurgy. He has succeeded well in that purpose and has also furnished a comprehensive reference work for those engaged in related fields of engineering. With all the literature on iron and steel the past seven or eight years have produced, there was a place for one more work. Turner's "Metallurgy of Iron" and Harbord's "Metallurgy of Steel," with its section by Hall on the "Mechanical Treatment of Steel," were excellent, and along with Campbell's "Manufacture and Properties of Steel," carried forward the record of Henry M. Howe's monumental work on steel published 18 years ago. With all the large space given by Turner and Harbord to American practice, their atmosphere and view point were essentially British. Campbell's work left little to be gathered up by those who came after him, particularly any attempting to deal with open hearth development. Yet Professor Stoughton judged rightly the field that remained for an iron and steel text book. His experience as adjunct professor of metallurgy in Columbia School of Mines, which acquainted him with the need, also contributed much to his ability to meet it. Those who help to make history on the operating side of the industry rarely make literature. Sir Lowthian Bell was one of few conspicuous exceptions.

To meet the mechanical limitations of a text book price, as well as the editorial demand for compression into text book proportions, put no small task upon the author of the present work. Occasionally an illustration is inadequate, through reduction to too small a scale, but there are more than 300 of them, and as a rule they are creditable, and type and paper are good.

The mechanical features of iron and steel manufacture are given an important place in the description of processes. This is true of the iron and steel foundry as well as of the blast furnace, steel works and rolling mill. One chapter of 50 pages is given to the "Mechanical Treatment of Steel." The introduction deals with "Iron and Carbon," and contains a number of important definitions. Then comes a chapter on the "Manufacture of Pig Iron," in which naturally prominence is given to blast furnace construction, the reactions in the furnace, charges, slag, &c. As illustrating the method of treatment, the following extract is made, being the author's summation of the development with dry blast, without doubt the most noteworthy advance of late years in blast furnace operation:

Drying the Blast.—The water vapor, blown into the furnace derived from the moisture of the air, is equivalent to from ½ to 2 gal. of water per 10,000 cu. ft. of blast, or 1½ to 8 gal. per minute, depending on the humidity of the atmosphere. Though this steam is as hot as the blast, it materially cools the smelting zone of the furnace by dissociating there:

$$H_2O = H_2 + O \text{ (absorbs 58,060 calories)},$$

or 1 lb. of steam absorbs 7,110,000 calories. The hydrogen and oxygen reunite in a cooler part of the furnace and return the same amount of heat, but this does not compensate for that taken away from the smelting zone, where it is most needed. For this reason a few American plants, and at least one in England, have adopted James Gayley's expedient of drying the air by refrigeration before it is drawn into the blowing engine. This results in greater regularity of furnace working and valuable saving in fuel. In fact, so great is the economy shown in this respect that there was a tendency at first to receive the results with skepticism. J. E. Johnson, Jr., has explained this saving, however, in a very ingenious and skillful manner, by showing that every blast furnace has a certain "critical temperature," below which it will not perform any smelting, and that the theoretical temperature of combustion of the smelting zone is only a little above this "critical temperature." To increase this small interval between the two, therefore, greatly increases the "available heat," though the [illegible] temperature be small. If further explanation of this argument is needed it may be found in the following simile: Water boils at 212 degrees F. If the temperature of a boiler is 262 degrees there is a certain pressure of steam; if we increase the temperature 50 degrees we double the pressure; yet 50 degrees appears small in comparison to 262 degrees.

The Conversion of Pig Iron.

Under the caption, "Purification of Pig Iron," is a chapter introductory to the detailed descriptions of processes resulting in the manufacture of steel and wrought iron. The author estimates that about 3 per cent. of the pig iron produced in the United States is remelted and converted into malleable cast iron, and that about 20 per cent. is remelted and cast as gray iron. Thus 77 per cent. undergoes purification to become wrought iron, Bessemer steel, open hearth steel or crucible steel. Taking the pig iron output of the country for 1906—namely, 25,307,192 tons—a diagram is given showing that of the estimated 77 per cent. entering into steel and wrought iron, 52 per cent. passed through Bessemer converters, 20 per cent. went to basic open hearth furnaces, 2 per cent. to acid open hearth furnaces and 3 per cent. to puddling furnaces. Of this last 6 per cent. is assigned to crucible steel production. The amounts of scrap employed in the various processes are estimated at 25 per cent. in the iron foundry and 50 per cent. in the open hearth process, while 800,000 tons of pig iron is assigned to wrought iron for a production of rolled iron products reaching in 1906 a total of 2,186,557 gross tons. This would mean that of the rolled iron product of that year 40 per cent. was from muck bar iron, a figure doubtless above the actual, for the scrap pile is more than a 60 per cent. factor here. On the other hand, the allowance of 500,000 tons of pig iron for 1,321,613 tons of acid open hearth steel seems small.

The chapters on the various steel making processes give an excellent presentation of essential features. The special processes, the Talbot, Monell, Campbell No. 2, Bertrand-Thiel and the Duplex are treated briefly. It is stated that while the first 200-ton Talbot furnace at the Jones & Laughlin Steel Company's plant cost $1,000,000 to build, with the present experience they can be installed for about one-fourth that sum. What is said of the Duplex process, which is now worked with pronounced success at Ensley, Ala., will require some revising in future editions. The Ensley practice has upset the theoretical calculations that the waste of iron is almost double what it would be in one process if worked alone. Moreover, independence of the scrap market was a necessity at Ensley, and the "method adopted of getting the equivalent of steel scrap" is not "costly," as the author intimates, in comparison with what would be encountered in the employment of the open hearth process by itself. It may be said also that the results at Pueblo, Colo., confute the theoretical figures as to loss of iron from the joint use of the converter and the open hearth furnace.

Iron and Steel Founding.

Professor Stoughton presents a better résumé of American foundry practice than is contained in any preceding work dealing generally with the metallurgy of iron and steel. The illustrations are sufficient to give a comprehensive idea of molding operations. The author's experience with Bessemer steel casting plants prompts him to give a relatively fuller statement of the case of the small converter and the long tuyere modification that has somewhat reduced the waste of metal. There is no disposition, however, to minimize the greater loss in the Bessemer than in the open hearth steel foundry, the Tropenas converter being charged with 17 to 20 per cent. loss of the metal going into the cupola, while the long tuyere side blown converter is said to reduce this to a range of 14 to 16 per cent. Malleable cast iron also receives fuller treatment than in any previous general work, particular attention being given to the composition of the pig iron and the effect of changes in the various metalloids. The expansion of malleable castings under annealing is referred to in an interesting paragraph: "When malleable cast iron is annealed and the temper carbon precipitates, the casting expands to an amount approximately equal to that which would have occurred

* "The Metallurgy of Iron and Steel." By Bradley Stoughton, adjunct Professor of Metallurgy, School of Mines, Columbia University, New York. Pages, 560; 6 x 9 in. Illustrations, 309; tables, 34. Price, $3. Published by the Hill Publishing Company, New York.

if the graphite had separated during solidification, and gray iron had been produced in the first instance. In other words, the temper carbon, although in a very finely powdered condition, occupies about the same amount of space as an equal weight of graphite and causes about the same ultimate difference in size between the original pattern and the annealed casting as when gray cast iron is made."

Heat Treatment and Alloys.

A particularly interesting part of the book is that comprising the chapters on the "Solution Theory of Iron and Steel," "Heat Treatment of Steel," the "Constitution of Steel," "Alloy Steels," "Corrosion of Iron and Steel" and those dealing with electro-metallurgy and metallography. The results of recent investigations in the field first covered in any permanent publication by Professor Howe's "Iron, Steel and Other Alloys," are presented lucidly and comprehensively. The most recent theories of the properties of steel as affected by impurities are explained, and the importance of the structure of steel emphasized.

In the chapter on corrosion the author takes issue with some of the popular teaching as to the relative corrodibility of iron and steel. To the general belief that steel corrodes much more rapidly than wrought iron, he opposes the results of many scientific tests showing the difference between the two to be very small, though favorable to wrought iron in the case of sea water and alkaline water and to steel in the case of acids and acidulated water. The assertion that manganese in steel causes an increase in the rate of corrosion, he says, is based on no reliable evidence. Referring to the usual method of testing corrosion, by noting the loss of weight of the metal, the author suggests that the pitting to which badly made material is subject is not sufficiently taken account of in such comparisons, since one thin spot might be disastrous, though representing a relatively small loss in weight.

On electric smelting the author's statements are properly conservative, though he gives full validity to the claims made for electric refining furnaces as competitors of the crucible steel process. As to the cost of electric production of pig iron, this is said:

> It seems unwise to quote figures except where the full circumstances and conditions are described, although we may estimate that the cost of smelting may be as low as $10 per ton of pig iron produced under the most favorable circumstances and up to $20 per ton where ore and water power are not so cheap. The expense depends chiefly upon the cost for the production of electricity, and this is so large that electric smelting is practically never advisable except where impure ore and water power for the production of electricity are very cheap, and where pig iron, coke and pure ore are expensive. Besides the advantages of being able to produce a very pure pig iron and to employ very impure ores, we can use electric smelting even where coke is not available by the use of charcoal as a reducing agent.

A chapter on "Chemistry and Physics Introductory to Metallurgy" is given at the end of the book, for the benefit of those who take it up without technical training.

The index is scarcely as full as might be expected. The Taylor gas producer is indexed, for example, but not the Taylor-White process for high speed steels, though a page is given to the latter. "Recalescence" is not indexed, and so far as our reading goes, is not defined in the book. Moreover, confining our reading to the passages on "critical temperature" cited in the index, we find a less clear and adequate elucidation of the subject than one would expect in a text book. But perhaps points relatively so unimportant ought not to be brought forward, when the author has produced a work that in its length and breadth is so commendable and represents such command of the best practice in the manufacture of iron and steel.

The Electrochemical Society's Meeting.—The annual meeting of the American Electrochemical Society will be held Thursday, Friday and Saturday, April 30 to May 2, at Albany, N. Y. Many interesting papers have been announced. Friday will be spent in Schenectady in an inspection of the General Electric Company's works and Saturday in Troy. The headquarters will be at the Hotel Ten Eyck. Further particulars may be had from Alois von Isakovics, secretary-treasurer, Monticello, N. Y.

Labor Legislation in 1907.

The Massachusetts Bureau of Statistics of Labor gives in its *Bulletin* for March and April a summary of labor legislation in the United States in 1907. In that year, it is stated, such legislation probably exceeded in volume, importance and diversity the record of any previous year. In the 43 States and Territories in which legislative sessions were held last year 397 labor measures were passed, of which 245 were new acts and nearly all the remainder amendments of earlier statutes. Measures for the employment of children were passed in 28 States, and eight legislatures passed acts governing the employment of women. The new child labor laws passed in Alabama, Arkansas, Florida, Idaho, Minnesota, Missouri, Montana, Nebraska, North Carolina, South Carolina and Tennessee indicate a disposition on the part of these States to come into line with the movement for legislation regulating the employment of children in the manufacturing States of the country.

Much of the legislation affecting the hours of labor of employees related to child labor and employment of women; but eliminating such acts 23 legislatures passed laws regulating the hours of labor of other employees. In 11 cases acts were passed limiting the hours of labor of employees engaged in the movement of trains. In nine States the maximum was fixed at 16 hours and in two States at 14 hours. In 10 States the hours of labor of railroad, telegraph and telephone operators and train dispatchers were limited by new statutes. Laws and amendments restricting the hours of labor of public employees were passed in eight States and Territories; hours of labor in mines, in two States; hours of labor of drug clerks, in one State.

A considerable number of acts was passed relating to the inspection of factories and the protection of workmen. In 19 States laws were passed relating to employers' liability and to the procedure for recovering damages, the majority of these acts referring particularly to the liability of railroads. Acts for the encouragement of immigration were passed in Minnesota, Nevada, New Mexico, South Dakota, Tennessee, Wisconsin and Wyoming. In 13 States acts were passed relating to technical education, these being in four cases for the establishment and maintenance of a particular school of high order, while in four other States permissive acts provided for the establishment of local technical or trade schools. Special educational commissions were appointed in Illinois and Massachusetts. Legislation relative to the payment, assignment and garnishment of wages of employees and the establishment of wages as preferred claims was enacted in 19 States.

The Milwaukee Car Mfg. Company has recently completed its new plant at Milwaukee, Wis., and has commenced the manufacture of freight cars, being equipped with facilities to turn out eight cars a day. It has a main building 82 x 286 ft., separated into two sections by a fire wall, in which are located the wood mill and machine shop, as well as the erecting shop; a smith shop, 50 x 61 ft.; a power house, 44 x 71 ft.; a store room and office building, 32 x 90 ft., and an additional building, 27 x 29 ft. The buildings are of substantial construction with steel truss roofs. The most modern machinery has been installed. The smith shop equipment consists of large shears and punches and heavy forging machinery, including a 1500-lb. steam hammer and a Bradley hammer. A complete outfit of specially designed furnaces has been installed, in which crude oil is used for fuel. A receiving tank of a capacity of 12,000 gal. has been provided for the storage of the crude oil. The company starts with good orders on its books.

Charles G. Smith & Co., Park Building, Pittsburgh, have secured the agency in the Pittsburgh District of the Prentice Brothers Company, Worcester, Mass., for its line of radial drills, drill presses, &c.

The Alabama Consolidated Coal & Iron Company.

The eighth annual report of the Alabama Consolidated Coal & Iron Company presents the following statement of earnings for the fiscal year ending October 31, 1907:

Gross sales (to the public)			$2,585,541.55
Manufacturing and producing cost and operating expenses, including regular provisions for blast furnace relining and repairs amounting to $39,017.24			1,948,505.41
Gross profit			$637,036.41
Miscellaneous earnings and other income:		$92,542.38	
Commissary net earnings:			
Gross sales	$886,227.15		
Cost of merchandise	454,525.15		
Gross earnings	$131,802.30		
Less expenses	39,259.92		
Net earnings as above		92,542.38	
Rents received (gross)	$56,056.92		
Less expenses	33,166.50	22,890.42	
Unclaimed wages and miscellaneous credits		2,931.85	118,364.65
Total earnings and income from all sources			$755,401.06
Less expenses and miscellaneous charges:			
Selling commissions and other expenses		$65,311.13	
Commercial interest and discount		3,553.15	
Legal expenses		7,246.63	
Bad debts and reserve for doubtful accounts		2,116.25	
Bond discount and expenses written off, less premium on bonds redeemed		972.50	
Examining properties and prospecting		12,877.07	
Adjustment of inventory values and flood expenses written off		5,338.44	97,415.17
Net earnings from operations			$657,985.89
Deduct — fixed and provisional charges:			
Provision for depreciation and accruing renewals		$150,000.00	
Provision for exhaustion of minerals		35,832.62	
Bond interest		113,775.00	
Dividends on preferred stock		87,500.00	386,607.62
Surplus net earnings for the year			$271,378.27

The balance sheet, as of October 31, 1907, is as follows:

Assets.			
Land, buildings, plant and machinery acquired	$4,739,028.23		
Less proceeds from land sales	55,731.73	$4,683,296.50	
Expended since organization on new construction, additional equipment and permanent improvements, to October 31, 1906	$2,043,881.06		
For the year ending October 31, 1907	526,162.31	2,570,043.37	$7,253,339.87
Coosa Pipe & Foundry Company stock			10,000.00
Cash in hands of trustees for first consolidated mortgage			72.50
Inventories:			
Raw materials and furnace supplies	$100,346.39		
Materials in transit	8,596.50		
Pig iron	8,941.56		
	$117,884.45		
Commissary merchandise	78,862.94	$196,747.39	
Accounts receivable (net)		427,120.88	
Bills receivable	$38,851.64		
Less bills discounted	38,431.64	420.00	
Cash on hand in banks and in transit		108,872.14	733,160.41
Mine development expenditures and slope improvements		$59,781.11	
Discounts on bonds:			
Balance October 31, 1906 (adjusted)	$47,600.00		
Less—annual proportion written off	1,700.00	45,900.00	
Prepaid insurance		8,304.12	113,985.23
Total			$8,110,558.01

Liabilities.			
Preferred stock issued		$1,250,000.00	
Common stock issued		2,500,000.00	$3,750,000.00
First mortgage extension and improvement 5% gold bonds, issued	$500,000.00		
Less—redeemed and cancelled	59,000.00	441,000.00	
First consolidated mortgage 6% 40-year gold bonds issued			
Less—redeemed and cancelled		1,741,000.00	1,182,000.00
Bills payable		$129,812.25	
Accounts payable		419,064.64	
Employees' pension and miscellaneous credits		12,782.14	
Bond interest, accrued		56,735.00	618,414.03
Depreciation, improvement and replacement, balance at Nov. 1, 1906	$244,152.17		
Add special appropriations from surplus	$175,392.55		
Provision out of Earnings for the year ending Oct. 31, 1907	150,000.00	325,392.55	
	$569,544.72		
Less expenditures to date previously charged to betterments and now written off	410,644.72	$158,900.00	
Blast furnace relining and miscellaneous repairing		16,632.00	
Exhaustion of minerals and ore properties		211,270.00	116,802.59
Balance at October 31, 1906		$1,165,109.97	
Less special appropriation for depreciation, improvement and replacement fund (as above)	$175,392.55		
Other adjustments to write off extraordinary and operating expenditures previously carried in suspense	117,754.70	293,147.25	
		$871,962.72	
Net surplus earnings for the year, per income account		271,378.27	1,143,340.99
Total			$8,110,558.01

From President Joseph H. Hoadley's accompanying statement the following extracts are taken:

The past year has been very largely devoted to construction work with the usual difficulties attending construction and operation by the same forces at the same time, making it impossible to get the best results.

During the year we have expended on the property in this improvement and development work $561,763.74, in addition to the usual repairs which were made and charged directly into the cost of iron. In my opinion the property is to-day 100 per cent. better off as to efficiency than it was a year ago, and I believe that you can confidently look forward to getting back the money you have spent so liberally this year, in the ensuing years. Moreover, during the year we have completed the new furnace at Gadsden, upon which work had been progressing for 18 months. The company thus has four furnaces, all of them now in fine condition—one completely new, two thoroughly overhauled [illegible] while the fourth, our smallest furnace, was in fair condition at the beginning of the year, and did not need much repair work.

It was deemed wise and in fact necessary to carry on considerable exploration work on the ore and coal properties. At Ironaton we have found a large quantity of brown ore not known before, which adds very greatly to the value of that property. At Gate City we put a diamond drill down 1200 ft., about one mile from the out-

crop, and found the ore in place, thus proving what was before only a surmise, as to the continuity of the red ore field of Birmingham, and giving us on that property a very great quantity of ore, making this one of the most valuable iron ore properties in the district. On the coal properties similar work has been in progress with equally satisfactory results.

OBITUARY.

EDWIN C. TERRY, Hartford, Conn., founder of the Terry Steam Turbine Company, died April 5, aged 58 years. He was a native of Terryville, Conn. He was graduated at the Sheffield Scientific School of Yale University in 1871, and became an expert in hydraulic and mechanical engineering. He was an inventor of note, among the mechanical ideas that he developed being the steam turbine which bears his name. He was best known perhaps for the strong influence he exerted in the original development of electrical power transmission, which he early put into practical use by taking the power generated at Farmington, Conn., to Hartford, organizing the Farmington River Power Company for the purpose. He was secretary of the company until his death. He was a member of the American Society of Civil Engineers. He leaves a widow and a son, James Terry, who is secretary and treasurer of the Terry Steam Turbine Company.

The Bituminous Coal Situation.

INDIANAPOLIS, IND., April 7, 1908.—(*By Telegraph*).—The first important official act of Thomas L. Lewis, who has succeeded John Mitchell as president of the United Mine Workers of America, was an effort to re-establish the joint interstate relations between operators and miners in the four chief competitive fields—Ohio, Indiana, Illinois and western Pennsylvania. On the first day of his term of office he sent telegrams to the chief representatives of both sides, asking if they would meet in Indianapolis, April 6, in an informal conference to discuss the revival of the interstate agreement. With reference to this action, he said it appeared to him that his first duty was to try to bring order out of chaos, caused by thousands of miners being out of employment as a result of the strike following the expiration of contracts with operators in the large producing fields.

When the conference met it was composed of representative operators of western Pennsylvania, Ohio, and Indiana. They have issued a call for delegates to a joint wage convention at Toledo, Ohio, beginning next Tuesday. It may result in the revival of the interstate agreement for the three States. Illinois operators were not represented, though the miners were. These operators are opposed to an interstate agreement this year, as they are now in conference with the miners of their State making a contract for the year. It is said that at the Toledo convention there will be no wage demands made by either side, but that the contest will be over working conditions at the mines.

The Western Iron & Supply Company, St. Louis, Mo., has changed its name to the W. G. Hagar Iron Company. The officers and management will remain the same as heretofore.

Thomas D. West, president of the American Anti-Accident Association, Sharpsville, Pa., has in preparation a pamphlet of some 70 pages to be entitled "Accidents—Their Causes and Remedies." It will be ready for distribution shortly, and will be for sale at a nominal price to assist in the work which is now being prosecuted by the organization in which Mr. West is the leading spirit. He writes that the country is waking up surprisingly on the subject of preventing accidents, almost every day bringing new developments encouraging him in his campaign against carelessness. He is now advocating the creation of local antiaccident boards under State authority with power to enter upon any premises to investigate complaints and follow up the remedying of conditions found to be conducive to accidents. He would have the local boards subject to State boards, with a national bureau for antiaccident work at Washington.

PERSONAL.

Charles E. Hyde, whose present address is New London, Conn., announces that he has resigned as president and general manager of the New London Marine Iron Works, and no longer has any connection with that company.

F. R. Chinnock will sever his connection with the B. F. Sturtevant Company on May 1. He has had charge of the electrical department of the company through its New York office. He is a pioneer in that line of business, having been associated for 18 years with the General Electric Company. It is his intention to enter the field of construction work, and his office will be located in the Taylor Building, 39 Cortlandt street, New York.

H. C. Holthoff, who has long been prominent in the mining machinery trade, has accepted an appointment from the Allis-Chalmers Company as manager of the new office which the company is establishing at Mexico City. Mr. Holthoff's office will be fully equipped to answer inquiries from prospective buyers of all classes and to furnish literature and quote prices on all lines of Allis-Chalmers machinery, including not only mining, crushing and cement making machinery, but also steam engines, steam turbines, gas engines, hydraulic turbines, electrical machinery, saw mill and flour mill equipments, pumps and pumping engines, transmitting machinery, air brakes, &c.

Alexander E. Brown, vice-president and general manager of the Brown Hoisting Machinery Company, Cleveland, who recently suffered a stroke of paralysis, is reported considerably improved, and his recovery is expected after a period of rest.

Wm. O. Vilter, secretary of the Vilter Mfg. Company, Milwaukee, Wis., has gone to Europe for a two months' business trip.

Charles H. Norton of the Norton Grinding Company, Worcester, Mass., has returned from a business trip to Europe.

J. D. Crosby, formerly superintendent of the Jersey City plant of the Crucible Steel Company of America, is now associated with the Henry Company, Providence, R. I., where he is organizing a department for flattening wire to be used in the construction of curtain rods.

The permanent address of Prof. H. M. Howe of Columbia University will hereafter be McLean Road, Bedford Station, New York.

Charles Greer, for some years assistant district manager of the tin plate plants of the American Sheet & Tin Plate Company in the New Castle and Sharon districts, has resigned, and will give his time to his personal interests. He is interested in a large cement plant soon to be erected in New Castle, Pa., and this will take much of his time.

Charles A. Clarke, head of the machinery house of Hill, Clarke & Co., Inc., will sail from New York for Europe April 16. It will be a business trip, covering England, France, Holland, Germany and possibly Russia and Sweden.

E. H. Webster, who has had several years' experience in the mechanical line, and has a large acquaintance, has accepted a position with the American Steam Gauge & Valve Mfg. Company, and will make his headquarters at its Chicago office.

William H. Donner has been elected vice-president of the Westinghouse Machine Company, Pittsburgh, which was taken out of receivers' hands a few days ago. It is understood that he is the choice of the large creditors. President George Westinghouse has issued a circular making the announcement of Mr. Donner's election, and stating that the latter will have direct responsible charge of all the company's activities. Mr. Donner's brilliant history in connection with the tin plate trade and the Union Steel Company is so well known that it is unnecessary to refer to it in detail.

The Aluminum Situation.

A fairly well defined sentiment exists in the metal trade that with the expiration of the Hall patents this year considerably lower prices may be named on aluminum. While at one time these patents were undoubtedly the backbone of the industry, it must be observed that the Bradley patents are also valuable and will not expire for two years. All these patents are controlled by the Aluminum Company of America.

In the latter part of 1906 and early in 1907, in connection with the rapidly advancing market for copper, aluminum was almost unobtainable and at one time the company above named had its wire drawing capacity contracted for several months in advance. With the diminishing demand for copper the demand for aluminum also fell off, although not in the same proportion as copper, because its price had not been forced to such an unreasonable hight as that of copper. Notwithstanding this, the price gradually declined through 1907, and late in the year the general quotation of the principal producer was 33 cents for No. 1 ingots in ton lots. Since then there has apparently been a greater disposition on the part of foreign producers to sell in this country. Although it is not positively known that there has been an international agreement by which European producers would not sell in this country, and the United States producer would not invade European territory, there has been a pretty definite opinion that this was the case. Statistics of imports and exports bear out this view. Recently, however, aluminum has been offered from abroad with more or less freedom at prices approximately the same as those of the American producer, despite a duty of 8 cents per pound on ingots. This may, however, be remelted scrap or American metal for resale.

American Production a Monopoly.

The production of aluminum in this country is practically a monopoly, and the Aluminum Company of America has taken steps to intrench its position by securing favorable water power and building large and economical plants. In fact, it is believed to have nearly doubled its producing capacity in the last two years. In addition to the ownership of essential patents, the known domestic deposits of bauxite are controlled by this company.

The various uses of aluminum have been along lines considerably different from those generally credited to it. Steel manufacturers are quite extensive consumers, using it as a deoxidizer in their converting departments. A large manufacturer of structural shapes and plates is said to take not less than 50 tons per month for this purpose. Where weight is a factor in the construction of machinery, such as automobiles and motor boats, aluminum in the form of an alloy is largely used. The difficulty of soldering aluminum sheets has heretofore prevented its general adoption for a wide range of usage, but with more general experimenting it is reasonable to suppose that some better method of fastening pieces together than riveting will be found. Although its electrical conductivity is high it has not yet been extensively used as a substitute for copper in that field. One reason, perhaps, is that there has not been enough inducement in cost. In California, however, it has been used more than in any other section, largely because of climatic conditions and of the long distance lines, one being 180 miles long. This use as well as the use in alloys may reasonably be expected to increase.

Prices Have Steadily Been Reduced.

The price of aluminum has shown almost a continuous downward trend. When first made, the price was practically prohibitive, the metal being regarded more or less as a curiosity. In 1884 the price was $12 a pound. A decade later it had been reduced to 50 cents, and another decade brought it to 33 cents. With the worldwide advance in the price of copper and the general inflation in metals in 1906 a temporary advance to around 40 cents was made, but within the last few months the price has receded to the quotation of 33 cents by the American producer, while in Europe aluminum over 99 per cent. pure can be had at lower figures. Foreign manufacturers are now stated to be willing to accept large orders for American delivery on a basis of 30 cents a pound, absorbing the duty of 8 cents per pound. In some quarters a more open market is expected after the basic patents expire. New productive capacity may not then be available for some time, however, as the farsighted policy of the principal producer may deter large interests from competing.

Had the extravagant claims of many of the early users of aluminum been realized, production must certainly have increased at a far more rapid rate than it has done to keep up with the demand. Production, nevertheless, has increased by leaps and bounds. While American producers made about 1800 tons in 1901, and the whole world approximately 3400 tons, this was doubled in 1902, when the American production increased to 3300 tons and the world's output to 7800 tons. By 1907 the production had again doubled. While the output of that year has not been accurately figured, 6000 tons was made in the United States in 1906 and the world's production was 14,500 tons.

The Status of Four Leading Railroad Projects.

Information has been gathered recently by the *Railroad Gazette* concerning the status of the various railroad construction projects now in hand in the United States. While nothing of large importance has been started in a good many months, there are several noteworthy undertakings by strong companies on which further work will be done in 1908. It is found that present costs of labor and materials are about 30 per cent. less than those of 1905 and 1906, when these large pieces of construction were begun. The four leading operations are the extension of the Chicago, Milwaukee & St. Paul to the Pacific Coast, the Western Pacific, the Denver Northwestern & Pacific and the Spokane, Portland & Seattle. The following details are given as to the status of each:

Chicago, Milwaukee & St. Paul.—Extension from Glenham, S. D., west via Butte, Mont., to Seattle, Wash., 1372 miles, with a branch from Black River Junction south to Tacoma, 20 miles. There will be seven steel bridges aggregating 5725 ft., with steel approaches 3425 ft. long; 1500 ft. of steel trestles; four tunnels with a total length of 15,630 ft., and later at Snoqualmie Pass a tunnel about 2 miles long. All steel bridges and trestles will be erected by the company's men. Track laid on January 1 from Glenham west to Ives, N. D., 183 miles, and on 144 miles in Montana, out of 731 to finish the line to Butte. It is expected that construction will be completed to Butte by May and to the coast by the end of 1908, except for the Bitter Root Tunnel in Montana.

Western Pacific.—Building from Salt Lake City, Utah, west to Oakland, Cal., 929 miles, of which 122 miles are in Utah, 427 in Nevada and 380 in California. Up to February 20, 1908, grading finished on 620 miles and track laid on 275 miles, including the section from Salt Lake City west to the crossing of the Nevada Northern at Shafter, Nev., and in California from Stockton east 35 miles, and from Marysville east 34 miles. There will be 43 tunnels aggregating 45,342 lineal ft., three of which are to be over a mile long and a fourth over 4287 ft. Tunnel work about 55 per cent. finished. There are to be 75 steel bridges, a total of 15,535 ft. long; seven of these have been finished.

Denver Northwestern & Pacific.—Contract let to extend this line from Yarmony, Colo., west to Steamboat Springs., 68 miles. The line is being built from Denver, Colo., west to Salt Lake City, Utah, 490 miles. In operation from Denver to Yarmony, 147 miles, leaving 343 miles to finish the line to Salt Lake City.

Spokane, Portland & Seattle.—This road, formerly the Portland & Seattle, is a joint project of the Northern Pacific and Great Northern, to give them a direct low grade line to Portland, Ore. Building from Portland up the north bank of Columbia River and to Spokane, Wash., with branch east along the Snake River to Texas Ferry, Wash., a total of 415 miles. From Vancouver, Wash., to Kennewick, opposite Pasco, 220 miles, finished in 1907. Work under way on double-track steel bridges over the Columbia and Willamette rivers. The line between Pasco and Spokane, 145 miles, and the branch to Texas Ferry, 41 miles, also the 10 miles from Vancouver south to Portland is expected to be finished by August.

Members of the Molders' Union at Youngstown, Ohio, are stated to have prepared a bill to provide for State inspection of all establishments where metal castings are made. The bill is to be introduced in the present session of the State Legislature, and its ostensible purpose is to reduce danger of accidents to men who are employed in foundries. An effort is being made to have the bill indorsed by molders throughout the State.

How Pittsburgh Treats Railroads.*

BY ROBERT MATHER, PRESIDENT ROCK ISLAND COMPANY.

It is not because of the extent of Pittsburgh's commerce, vast as it is, nor because of its historic associations, absorbing as they are, that a discussion here of the subject of railroad regulation peculiarly appeals to me. It is rather because here, where a greater tonnage moves than anywhere else in the country, there is less of controversy between shipper and carrier than anywhere else in the land.

Pittsburgh Makes No Complaint About Railroad Treatment.

I am told that here in the country's nerve center of traffic, out of all the multiplied millions of transactions between merchants and railroads, there has never been found a cause of complaint to present to the Interstate Commerce Commission. This does not mean that the railroads have never been wrong or unreasonable or exacting or inefficient, or that the shipper has never demanded what he ought not to have received. I have no doubt that in the weakness of human nature many of these things, on both sides, have occurred. But there has been found a way in Pittsburgh to move an unparalleled tonnage in spite of all such discouragements and conflicts with satisfaction to both shipper and carrier, without the intervention of courts or commissions. I hold that fact to be of great significance in these days of clamor for increased regulation of the business of transportation, and I deem it worthy of our serious thought.

I appreciate fully that, in this respect, no miracle has been wrought in Pittsburgh. I yield to you gentlemen of the Traffic Club high praise for the achievement I am extolling, but I still believe you to be an ordinary lot of men uninspired, except by the spirit of good sense. I understand that you proceed upon the very human and rational theory that the interests of producer, transporter and consumer are alike and mutually dependent; that without production there can be no transportation, and that unless the combined efforts of producer and transporter can lay down your product before the consumer upon a basis that the consumer can afford your commercial activities are doomed to failure.

Go Directly to the Railroads for Relief.

So when you find that a consumer or a community that in view of all other commercial conditions ought to be taking your product is not taking it, you look for the cause in the rates or practices of the railroad that carries your product to that place. If you find that a change in rates will secure the customer or the community, or that an improvement in train service, or some addition to the carrier's facilities will move the traffic, instead of filing a complaint at Washington, you go to the railroads directly and ask them to help you, and at the same time to help themselves, by making the change that will produce the result. And so willingly have the railroads met and co-operated with you that, in the working out of the myriads of such problems that your teeming commerce has presented, you have not yet been denied a request the denial of which could give you ground for legal complaint.

I believe that this Pittsburgh plan of conference and co-operation between railroads and shippers should be given wider scope before we become finally wedded to the alternative plan of governmental compulsion. What you have done in conducting your manifold and stupendous dealings with the railroads, not only without clamor for additional restrictive laws against them, but without even invoking such laws as exist, can and ought to be done elsewhere.

A Suggestion That Might Help Settle Knotty Questions.

More than this, not only the carrier and the shipper, but the representatives of the regulating power of the Government should meet on this platform of mutual confidence and co-operation. It is perfectly feasible in every commercial center like Pittsburgh for the railroad traffic associations to hold open meetings with the representatives of the shippers, to make up their docket of subjects to be acted upon not only from the requests of their members, but from the suggestions of their customers, and to place the docket in the hands of all entitled to attend a reasonable time in advance of the meeting.

It is further not only practical, but in my judgment highly desirable that a member or a representative of the Interstate Commerce Commission should not only attend those meetings, but even preside over their deliberations and umpire their disputes, with possibly some provision for appeal to the Commission itself. Thus would we revert to the example of Washington when he and the Colonial commissioners met in peace and not in strife to solve by mutual helpfulness the national problem of transportation.

* Extract from an address before the Traffic Club, Pittsburgh, April 3.

The Treatment of Chilling Iron with Nickel.

R. C. Totten, Pittsburgh, Pa., has been granted a patent on a new composition of casting metal comprising chilling cast iron and nickel. In order to chill the cast iron must contain 0.5 per cent. of combined carbon. The invention is based on the affinity of nickel for the combined carbon and on the fact that by varying the proportion of nickel to combined carbon the depth of chill may be regulated. The inventor says that the amount of nickel alloyed with the iron is made to follow approximately the proportion of combined carbon in the iron. If there is 1 per cent. of combined carbon in the chilling iron, 1 per cent. of nickel may be used. But by varying the proportion of nickel the depth of the chill may be varied, since the nickel has a tendency to reduce the chilling properties of the combined carbon. For instance, if a chilling iron containing a certain percentage of combined carbon has added thereto, say, 1½ per cent. nickel and produces a casting having a chill 1 in. thick, then by using exactly the same iron and increasing the percentage of nickel the depth of the chill will be decreased, or, by decreasing the quantity of nickel, the depth of the chill will be increased. This possibility of regulating the depth of the chill by varying the quantity of nickel used is of special importance in the utilization of scrap from car wheels, chilled rolls, &c. If such scrap is remelted and recast there is a large increase in the proportion of combined carbon, giving an abnormally deep chill and rendering the article very brittle. By the use of nickel a chill of the desired depth is obtained and the strength and ductility of the nickel are greatly increased.

The buildings and site of the Western Malleable & Grey Iron Mfg. Company, Milwaukee, Wis., have been sold to Thomas J. Neacy, president of the Filer & Stowell Mfg. Company. The plant is located on Chase street and occupies a two-acre tract of land, with 700 ft. of railroad frontage. Mr. Neacy says the purchase was made in the interest of the Milwaukee Valve Company, owned by him, and which has heretofore occupied leased quarters. The plant will be moved to the property just purchased and the Western Malleable & Grey Iron Mfg. Company will move its business back to Port Washington, Wis., where it was originally conducted.

The report that the Seattle Electric Company, Seattle, Wash., is contemplating the expenditure of $1,500,000 for extensions and new equipment at its Georgetown power plant is erroneous. While plans are not fully developed for the year, they will include no additions to the power plant. The Pacific Coast Power Company, an allied company, will soon begin work on the development of a large water power plant on the White River, which will have an ultimate capacity on minimum flow of 50,000 hp.

The Niagara Forged Steel Company, Buffalo, N. Y., manufacturer of track equipment and railroad and general forgings, has appointed the W. R. Beatty Machinery & Equipment Company, 613 House Building, Pittsburgh, its agent for western Pennsylvania, eastern Ohio, and West Virginia.

More Pig Iron in March.

February Daily Rate Exceeded.

Active Capacity Falls Off at the Close of the Month.

Returns from the blast furnace companies show that in March production of coke and anthracite pig iron increased. The total for the month was 1,228,204 gross tons, or at a daily rate of 39,619 tons, as compared with a total of 1,077,740 tons and a daily rate of 37.163 tons in February. However, through the blowing out of a number of furnaces in the last week in March, notably four Edgar Thomson stacks and two at Ensley, the weekly capacity active April 1, namely 265,590 tons, shows a falling off from the capacity active March 1. Twelve furnaces blew in last month and 11 blew out. Below is given a statement of the daily output of steel works and merchant furnaces in the past three months, showing that the latter have made some increase in the past month:

Daily Rate of Production of Steel Works and Merchant Furnaces Gross Tons.

	Steel works.	Merchant.	Total.
January	27,132	12,286	39,418
February	25,717	11,446	37,163
March	27,145	12,474	39,619

The table below gives the production of coke and anthracite furnaces in March and the four months preceding:

Monthly Pig Iron Production—Gross Tons.

	Nov. (30 days)	Dec. (31 days)	Jan. (31 days)	Feb. (29 days)	March. (31 days)
New York	111,407	80,993	82,462	65,567	49,231
New Jersey	24,079	22,555	22,447	19,880	23,243
Lehigh Valley	61,969	54,881	47,538	39,732	39,105
Schuylkill Val.	43,876	37,747	24,002	22,338	29,104
Lower Susquehanna and Lebanon Val.	47,683	31,090	20,323	19,363	23,907
Pittsburgh Dis.	409,024	258,412	304,521	324,418	325,953
Shenango Val.	124,159	76,086	69,149	68,919	76,377
West. Penn.	130,192	105,671	60,355	51,283	62,782
Md., Va., and Kentucky	79,293	61,433	30,621	27,775	41,452
Wheeling Dis.	76,014	12,051	0	12,961	18,988
Mahoning Val.	129,334	68,776	64,437	93,332	105,310
Central and North. Ohio.	149,362	84,087	52,297	75,137	94,952
Hocking Valley and Hanging Rock	28,017	15,658	8,404	12,296	20,108
Mich., Minn., Mo., Wis., Colo.	59,697	48,950	38,172	36,129	39,327
Chicago Dis.	200,309	148,951	120,874	99,289	147,014
Alabama	118,190	94,810	81,541	91,209	114,295
Tennessee, Georgia and Texas	55,520	29,488	17,967	18,112	17,656
Totals	1,828,125	1,234,279	1,045,250	1,077,740	1,228,204

Production of Steel Companies.

Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Republic, Youngstown Sheet & Tube Company, Jones & Laughlin, La Belle, Bethlehem, Calumet, Inland, Colorado and Tennessee (Ensley) companies show the following totals of product month by month. We give separately a statement of the output of spiegeleisen and ferromanganese, which is included for each month in the total production:

Production of Steel Companies. Gross Tons.

	Pig.—Total production.— 1906.	1907.	1908.	Spiegeleisen and ferromanganese. 1907.	1908.
January	1,358,015	1,406,397	664,415	21,477	20,254
February	1,226,760	1,317,923	745,802	19,444	9,402
March	1,400,395	1,424,827	841,502	31,091	13,750
April	1,333,591	1,446,788		26,527	
May	1,372,423	1,470,080		28,822	
June	1,293,437	1,457,230		30,942	
July	1,323,391	1,452,557		25,343	
August	1,237,485	1,445,685		23,696	
September	1,264,380	1,417,153		30,270	
October	1,452,200	1,514,521		35,105	
November	1,411,350	1,084,114		21,861	
December	1,445,728	659,459		19,480	

Capacity Active April 1 and March 1.

The following tables give the weekly capacity of coke and anthracite furnaces in blast April 1 and March 1:

Coke and Anthracite Furnaces in Blast.

Location	Total number completed	April 1. Number in blast	April 1. Capacity per week	March 1. Number in blast	March 1. Capacity per week
New York:					
Buffalo	14	6	11,298	7	9,785
Other New York	10	2	2,751	2	2,920
New [illegible]	8	4	5,241	4	4,748
Spiegel	2	0	0	0	0
Pennsylvania:					
Lehigh Valley	25	8	8,232	9	9,220
Spiegel	2	1	142	1	145
Schuylkill Valley	14	5	6,041	4	4,692
Spiegel	1	1	755	1	702
Lower Susquehanna	7	2	2,854	1	2,010
Spiegel	1	0	0	0	0
Lebanon Valley	10	3	2,584	3	2,659
Pittsburgh Dist.	45	21	58,491	27	75,047
Spiegel	2	1	1,274	1	624
Shenango Valley	20	8	18,062	7	18,344
West. Penn.	27	9	14,175	9	15,680
Maryland	4	2	3,616	1	1,931
Wheeling Dist.	14	2	4,287	2	3,850
Ohio:					
Mahoning Valley	18	10	23,258	10	23,906
Central and North and Michigan	22	8	22,456	8	18,787
Hocking Valley and Hanging Rock	12	6	4,542	6	4,620
Illinois and Indiana	23	13	33,082	12	27,003
Spiegel	2	1	903	0	0
Minnesota	1	0	0	0	0
Wisconsin	6	2	2,611	2	2,425
Missouri	1	0	0	0	0
Colorado	6	3	6,093	3	5,831
The South:					
Virginia	23	8	6,023	7	4,885
Kentucky	7	1	1,155	1	710
Alabama	46	16	21,340	18	23,175
Tennessee	18	7	4,320	6	3,598
Georgia and Texas	6	0	0	0	0
Totals	396	151	265,590	150	267,437

A Record of Active Capacity.

The active weekly capacity in coke and anthracite iron has shown the following fluctuations since January 1, 1903:

	Capacity per week.		Capacity per week.
April 1	265,590	August 1	410,088
March 1	267,437	July 1	408,617
[illegible]	241,925	June 1	443,092
January 1, 1908	232,652	May 1	452,031
December 1, 1907	347,372	April 1	439,564
November 1	491,436	March 1	403,157
October 1	511,397	February 1	405,792
September 1	507,768	January 1, 1905	377,879
August 1	513,471	December 1, 1904	357,846
July 1	528,170	November 1	334,249
June 1	523,220	October 1	319,249
May 1	524,538	September 1	291,573
April 1	496,456	August 1	246,092
March 1	511,035	July 1	272,301
February 1	492,359	June 1	336,107
January 1, 1907	507,397	May 1	368,244
December 1, 1906	513,860	April 1	337,257
November 1	500,580	March 1	308,751
October 1	469,665	February 1	273,692
September 1	441,426	January 1, 1904	185,636
August 1	449,908	December 1, 1903	244,156
July 1	460,570	[illegible]	[illegible]
June 1	472,622	October 1	353,142
May 1	484,031	September 1	360,197
April 1	484,240	[illegible]	[illegible]
March 1	479,737	July 1	384,825
February 1	482,156	June 1	388,178
January 1, 1906	463,673	May 1	373,496
December 1, 1905	475,814	April 1	386,215
November 1	460,449	March 1	347,424
October 1	445,468	February 1	335,239
September 1	412,563	January 1, 1903	346,073

Furnaces Blown In or Blown Out.

The list of furnaces blown in in March includes one Lackawanna at Buffalo, Keystone and one Warwick in the Schuylkill Valley, Clinton in the Pittsburgh District, Hall in the Shenango Valley, one Paxton at Harrisburg, Victoria in Virginia, one Sparrows Point in Maryland, Dover in Ohio, two South Chicago in Illinois and Embree in Tennessee.

Among furnaces blown out last month or banked in the month and remaining so on April 1 were the Detroit Furnace Company's stack in Michigan, one Brooke in the Schuylkill Valley, one Crane in the Lehigh Valley, four Edgar Thomson and two Carrie in the Pittsburgh District and two Ensley in Alabama.

NEWS OF THE WORKS.

Iron and Steel.

No. 2 furnace of the Central Iron & Steel Company, Harrisburg, Pa., was put in blast March 10.

Dover Furnace of the Penn Iron & Coal Company, Canal Dover, Ohio, was blown in March 16.

The No. 7 furnace at the South Works of the Illinois Steel Company was blown in March 1 and the No. 5 furnace of the same group went in March 15.

Vanderbilt Furnace of the Birmingham Coal & Iron Company, Boyles, Ala., made a record product in March, with a total of 4219 tons.

No. 1 furnace of the Alabama Consolidated Coal & Iron Company at Gadsden, Ala., was blown in at the beginning of the present week.

The furnace of the Embree Iron Company, Embreeville, Tenn., was blown in March 23, after a shutdown of 90 days.

The No. 3 stack of the E. & G. Brooke Iron Company, Birdsboro, Pa., which had been active since November 15, 1907, was blown out March 25. The other stack of this company has been idle since December 31.

One of the Crane stacks of the Empire Steel & Iron Company, Catasauqua, Pa., was blown out March 31, leaving one stack active.

The new No. 1 furnace of the Shenango Furnace Company, Sharpsville, Pa., is not yet ready for operation. The No. 3 furnace of this group is the only one now active. It was started up March 16.

The proceeds from the $5,000,000 bond issue recently voted by the Alabama Consolidated Coal & Iron Company, Birmingham, Ala., will be largely utilized in making extensions to the plant. The company spent $600,000 last year rebuilding its furnaces at Ironaton, completing its new furnace at Gadsden, rebuilding the short line of railroad to its Lewisburg mines and in installing new machinery in several of its collieries.

The Chesapeake Nail Works, Harrisburg, Pa., is running all its departments, having started in full last week after a period of partial operation.

The Pennsylvania Steel Company is relining its No. 3 furnace at Lebanon, Pa. The company's No. 3 furnace at Steelton, which was recently improved, is making a record, having recently produced 435 tons in a single day.

On April 1 three of the 11 Edgar Thomson furnaces of the Carnegie Steel Company at Bessemer, Pa., were in blast and eight idle. Furnace J was blown out March 24, G March 27, K March 28 and I March 29. No. 5 Carrie stack at Rankin was blown out March 29.

Clinton Furnace of the Clinton Iron & Steel Company at Pittsburgh has blown in on foundry iron.

The Lackawanna Steel Company, Buffalo, N. Y., reopened its rail mill No. 1, the largest of the plant, on April 6, giving employment to about 2000 men in the mill and other departments that will resume operations incidental to the reopening of the rail mill, and bringing the total present working force up to 4500 men. The resumption of work in the rail mill, which has been shut down since December, is due to the receipt of the New York Central Railroad Company's order for 24,000 tons of steel rails, one of smaller tonnage from a Pennsylvania railroad and various small orders from different sections of the country, assuring sufficient business to keep the mill in operation for some time to come. The structural and slab mills have been running for some time.

The No. 7 furnace of the Lackawanna Steel Company, Buffalo, N. Y., which was banked February 29, started again March 30. The No. 1 furnace, which has also been banked for some weeks, went in blast this week.

Two furnaces at the Tennessee Coal, Iron & Railroad Company's Ensley, Ala., plant, have been blown out for repairs.

The plant of the Birmingham Foundry & Machine Company, Birmingham, Ala., has been put in operation after a suspension for some months.

General Machinery.

The Luitwieler Pumping Engine Company, Los Angeles, Cal., is considering a proposition from the city of Santa Monica, Cal., for the removal of its plant to that place, and the prospects for a favorable termination of the negotiations now pending are said to be good. Under the plan covering the proposed change new and larger shops will be erected and the manufacturing facilities of the company largely increased. A recent addition to its line of pumps and pumping machinery is a self-propelling fire engine, which it is now making.

The plant, equipment and property of the Southern Foundry & Machine Works, Fredericksburg, Va., will be sold at public auction April 29.

The Empire Lime & Stone Company, Moundsville, W. Va., intends to purchase crushing machinery for a large crushing plant it is to install. An extensive lime plant will also be erected.

The Hemsley Patent Adjustable Top & Tire Bolting Machine Company, Trenton, N. J., will erect a plant to manufacture the Hemsley tire bolting machine, the invention of Joseph Hemsley. The machine is simple in construction and is used to screw and unscrew tire bolt nuts.

The Thornton Machinery Company, Providence, R. I., dealer in machinery and supplies, has gone into bankruptcy.

Power Plant Equipment.

Bids will be received for construction of a two-story power house for the city of Juneau, Wis., until April 18. W. G. Kirchoffer is consulting engineer, Madison, Wis.

The Atchison Railway, Light & Power Company, Atchison, Kan., which has been reported as contemplating the reconstruction of its plant, states that this work will not be undertaken during the present year. Some new machinery will, however, be installed this season, but the extent of these purchases has not been fully determined.

The Columbus Light, Heat & Power Company, Columbus, Neb., has been incorporated, with a capital of $150,000, by William C. Ross, John L. Burke and John W. Parish.

The capital stock of the Knoxville Power Company, Knoxville, Tenn., has been increased from $100,000 to $150,000. The chief engineer of the company is John Bogart, New York.

The Memphis Ice & Electric Company, Memphis, Texas, is preparing to enlarge its electric light plant, for which machinery has already been ordered. The new installation will probably be in operation by June 1.

The town of Lynden, Wash., is contemplating the installation of a water works system, comprising a steam pumping plant, a 50,000-gal. tank on a 60-ft. tower, and about 10 miles of 6-in. and 4-in. mains. Plans for this installation have been prepared by Fuller & Manley, Tacoma, Wash.

The Falls Light & Power Company, Sheboygan Falls, Wis., has been incorporated, with a capital stock of $25,000. The officers are O. B. Weisse, president, and John Van Onwerpeck, secretary and treasurer.

The E. G. Whitacre Boiler Company, Wellsville, Ohio, has been reorganized by the election of the following officers: I. N. DeNoon, president, Pittsburgh; C. V. Shoub, vice-president, Wellsville, Ohio; W. C. Dellamyer, secretary and treasurer, Wellsville. The present name of the company will be retained, and it is the intention in the near future to increase the output of hot water and steam boilers, radiators and heating supplies.

Thomas C. Beggs and W. H. Johnson, Terre Haute, Ind., have bought a site at Brazil, Ind., for an artificial ice and cold storage plant, estimated to cost $80,000.

Foundries.

The Hardwick Foundry & Machine Company, Dallas, Texas, has increased its capital stock from $50,000 to $80,000.

The Yakima Iron Works, having demonstrated that in central Washington there is a large field for its operations, has completed plans for a foundry, in addition to its present machine shop, at North Yakima, Wash. With the foundry and new machinery ordered the investment in this plant will aggregate $20,000.

The A. W. Findlay Company, Inc., Philadelphia, Pa., has recently booked a number of orders for lamp posts, while a number of proposals for work of this class are still being estimated on. Business in this branch of its foundry trade has been better during the last three months than for any like period for a number of years, municipalities in both the East and West having considerable work of this character under way. One of the recent orders taken was for 125 ornamental electric lamp posts for Seattle, Wash. These are of special design and very massive in appearance. A duplicate order is expected to be received for the same quantity in the near future.

The Lackawanna Steel Foundries, recently incorporated, has purchased the plant recently erected by the Sims-Kent Company on Salem street, Dover, N. J., which it will place in operation within a few days, manufacturing gray iron, brass and bronze castings. The new company, whose New York office is at 74 Broadway, begins business with the assurance of many orders, and expects to make improvements to the plant as soon as business shall warrant. George Pierson is president; Henry E. Dixey, vice-president; L. C. Hillard, second vice-president and sales manager; J. H. Muributt, treasurer; J. D. Brooks, secretary, and James W. Kent, manager. These officers and Haverley Brooks Swart constitute the Board of Directors.

Bridges and Buildings.

The Dravo Construction Company, Lewis Building, Pittsburgh, Pa., has received the contract for the masonry work to support the new two-track bridge at Beaver, Pa., to be erected by the Pittsburgh & Lake Erie Railroad. It is expected that bids for the structural steel for this bridge, 12,000 to 14,000 tons, will be asked for in a short time.

Fires.

The rolling department of the Milton Mfg. Company, Milton, Pa., was damaged $50,000 by fire March 30.

The plant of the Hygeia Ice Company, Englewood, N. J., was burned April 2, the loss being about $25,000.

A. M. Danbury's foundry and machine shop at Ripley, Ohio, were burned April 1, with a loss of $10,000.

The pattern shop of the American Steel Foundry Company, Pittsburgh, Pa., was damaged $5000 by fire March 30.

Hardware.

The Delaware Marine Supply Mfg. Company, Wilmington, Del., manufacturer of marine hardware, car trimmings, ship fittings, port lights, hinges, hex nuts, ferrules, &c., states that the past winter season has been a very busy one. Among other contracts were complete outfits for 17 vessels, including about 3000 ft. of overhead parcel racks of the style used in Pullman cars, air ports and other fittings.

Miscellaneous.

The capital stock of the Trussed Concrete Steel Company, Detroit, Mich., has been increased from $1,000,000 to $1,200,000.

The A. D. Baker Company, Swanton, Ohio, builder of traction engines and separators, is finding that last fall's campaign of demonstration at the county fairs and meetings in agricultural districts has begun to bear fruit and some very good business is coming in.

The Forged Steel Wheel Company, Pittsburgh, Pa., has increased its capital stock to $1,750,000.

Coincident with a change of management that has recently taken place in the Atlantic Gas & Fuel Company, Atlantic, Iowa, it has been decided to make extensive improvements in the plant, which will include numerous extensions of mains and the installation of equipment, but the company does not, as has been reported, intend to enter the electric lighting field.

The Cooper Oven Thermometer Company, Terryville, Conn., has been incorporated under Connecticut laws to carry on the business founded by the late David G. Cooper. The Connecticut Trust & Safe Deposit Company, Hartford, as administrator of the estate, is the organizer of the company, as directed by the will of Mr. Cooper, and will have general oversight of the business for the present, though Albert E. Whittier, a practical manufacturer and inventor, who has been manager of the business for several years, will continue in the same capacity. The company will manufacture but the one article, the oven thermometer, carrying out the general policy laid down by the founder of the business.

The San Francisco Citizens' Health Committee has received a report from the special committee appointed to inquire into the subject of incinerating plant. Four such plants are recommended.

Tate, Jones & Co., Inc., Empire Building, Pittsburgh, works at Leetsdale, Pa., manufacturer of Kirkwood oil burners and oil furnaces, has received a contract from the A. Leschen & Sons Rope Company, St. Louis, for a complete outfit of three oil furnaces, with pumping apparatus, &c.

Plans for the construction of a mechanical filtration plant for Evansville, Ind., have been completed by F. W. Witherell, Pittsburgh, Pa., and have been submitted to the trustees of the water works of Evansville.

The Susquehanna Smelting Company, Philadelphia, Pa., has secured the buildings at Lockport, N. Y., formerly occupied as the molding shops of the Holley Mfg. Company, and will improve and equip them for the smelting of copper. A contract has been closed with the Lockport Light, Heat & Power Company for 1000 hp., to be delivered by the Niagara Falls transmission line, for the operation of the plant.

I. A. Aldrich, proprietor of the Aldrich Mfg. Company, Buffalo, N. Y., manufacturer of copper and brass goods, has purchased the old plant of the Kellogg Iron Works, at Illinois and Mary streets, now occupied by the Day Foundry Company, and will erect a six-story factory building of reinforced concrete on the site. The new building will be equipped for operating in connection with the company's present plant on the opposite side of Illinois street.

The St. Clair Air Brake Company has been organized at Indianapolis, Ind., by E. F. Claypool, Henry Schurmann, W. C. Shoemaker, Augustus St. Clair, Robert Stimson, Newton Claypool, F. R. Judson, J. R. Francis and Henry Wetzel. The brake to be manufactured differs from those now in general use in that the air pressure holds the brake open and applies it when the air is released, the reverse of the present system in common use, although it is interchangeable with that system.

The International Iron Works, Seattle, Wash., has been incorporated, with a capital stock of $100,000, by F. E. Hawksworth, A. J. Henry and C. J. Young.

The Railroad & Car Material Company has recently been incorporated and has opened offices in the Bessemer Building, Pittsburgh, Pa. The company will handle railroad equipment and supplies, and will also deal in wholesale lumber. J. W. Scull, formerly purchasing agent of the Pressed Steel Car Company, is president; C. W. Cantrell, formerly Eastern sales manager of the Herman H. Hettler Lumber Company, Chicago, vice-president, and W. H. Coyle, identified with real estate interests in Pittsburgh, secretary.

The Daisy Automatic Dryer Company, 253 Grant street, Pittsburgh, Pa., is arranging to incorporate and to build a plant for the manufacture of the Daisy gravity feed sand and mineral dryer. The machine is a new invention, and those which were built for demonstrating are said to have proved very successful on trial.

The New Pig Iron Contract.

As a result of the meeting held at Dayton, Ohio, April 2, by the Iron Buyers' Association, a new contract for the purchase of pig iron will be presented for transactions between the users and manufacturers of iron in Cincinnati territory. Vice-President G. H. Gorman of the Davis Sewing Machine Company presided at the meeting, which was well attended. The proposed uniform contract was unanimously adopted, with two slight changes from the original draft printed in *The Iron Age* of January 30.

The item "Grade, clause B," now reads "By analysis as specified." The definite stating of each of the elements in the contract seemed to be a source of misunderstanding on the part of the furnacemen, who thought that because all the elements were given in the contract they would be required to furnish iron analyzing all of these elements. This, according to an official of the association, was not the original intention. To the clause referring to disputed weights is added: "Cost of reweighing to be charged to the party in error."

S. M. Blackburn of the John B. Morris Foundry Company, Cincinnati, chairman of the Contract Committee, was heartily congratulated for his earnest and painstaking work in the interests of the new form. He also explained the method of buying pig iron warrants, which came up for general discussion.

The report of the Traffic Committee, of which Commissioner E. E. Williamson of the Receivers' & Shippers' Association of Cincinnati is chairman, was read and accepted. It was felt that the preliminary work in the interests of a lower freight rate from the Birmingham District has been well done, and that the outlook is hopeful.

The resignation of President Wm. Fetzer was an incident of the meeting. Other important incidents were the words of cheer and promises of co-operation from the Central Association of Stove Manufacturers and the Southwestern Foundrymen. The "Revised Sales Contract," as the new form will be known, is now in the hands of the printer. As soon as finished Secretary Wm. Gugenheim, Springfield, Ohio, will mail them to all members of the association and buyers of pig iron in the Cincinnati District.

The Andrews Steel Plant Started.

The Andrews Steel Company started its new plant in Newport, Ky., on Saturday, April 4. In *The Iron Age* of February 20 a description was given of this plant, which consists of open hearth furnaces, blooming mill and sheet bar mill. The first heat of steel was poured at 6.42 a.m., 8 hr. and 42 min. after the commencement of the charging of furnaces. The blooming mill rolled the first ingot at 9.12 a.m. Each ingot was successfully rolled into billets without loss of a single one and without a cobble. The company regards this achievement with considerable satisfaction inasmuch as similar experiments have seldom resulted in the making of good steel and rolling them into billets without cobbles or other losses on the first trial. The mill is now being operated continuously, running mainly on orders for sheet bars from the Newport Rolling Mill Company. After filling a large order for this source, which is expected to take two weeks, the Andrews Steel Company will probably have part of its product to dispose of in the open market.

Russia plans to build four battleships having a displacement of 21,000 tons each and a speed of 21¼ knots. Two are to be completed in three years and two in four years.

The Iron and Metal Trades

The feeling among manufacturers of Iron and Steel is that prices should be maintained, although it is admitted that this is likely to be more difficult during the next few months than during the period after the panic, because merchants and consumers have now worked off stocks purchased at old prices, for which they claimed and got protection. It is understood that if a lowering of prices should become desirable—a contingency which the manufacturers admit—then no action will be taken by the leading interests without prior consultation. In other words, the Iron and Steel trade is committed to an orderly adjustment of values.

The statistics of coke and anthracite Pig Iron collected by *The Iron Age* show that the output in March was 1,228,201 gross tons, as compared with 1,077,740 tons in February, a short month. Still, we entered the month of April with a reduced capacity at work, it being 265,590 tons on April 1, as compared with 267,437 on March 1. This is due chiefly to the fact that a number of large Steel works furnaces in the Pittsburgh District blew out toward the end of March. The unknown factor in the situation, so far as the merchant furnaces are concerned, is the question of stocks. It is well known that there has been a considerable accumulation. Some very large figures are being talked, but in the absence of reliable data these statements must be received with reserve.

The Iron trade is watching with keen interest, and some misgivings as to their success, the efforts being made to bring about greater co-operation among the Pig Iron manufacturers. No news as to the mission of prominent interests to Birmingham has been received as yet. In the meantime the volume of business has been light, and the markets for Pig Iron in different parts of the country have been unsettled.

Outside of a round lot of Steel Rails for shipment to New South Wales the week has been barren of new business in the Rail trade. New orders for Billets are scarce and there is some shading by merchants who have made conversion arrangements.

The outlook for Structural Material is fair, to judge from the considerable tonnage which will be required for undertakings which are pretty sure to be carried out. Unfortunately many of them drag. The Brooklyn subway will call for about 40,000 tons, the Whitehall Building in New York 10,000 to 12,000 tons, Chicago track elevation for 7000 tons and the Great Falls smelter for 3000 tons.

The trade in Iron Bars, both East and West, is not in a satisfactory condition, and sharp competition is waging for what little new business is coming up. New prices have just been established on Shafting.

The makers of Cast Iron Pipe have quite a good deal of business in sight. Among the orders upon which they are figuring are 7000 tons for Manila, an aggregate of 18,000 tons for Cuban points and some round lots for South America.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Apr. 8, 1908.	Apr. 1, 1908.	Mar. 11, 1908.	Apr. 10, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	*$17.75*	$17.75	$18.25	$24.50
Foundry No. 2, Southern, Cincinnati	*15.25*	15.25	15.75	24.75
Foundry No. 2, Local, Chicago	*17.35*	17.50	17.50	26.00
Bessemer, Pittsburgh	*17.65*	17.75	17.90	23.35
Gray Forge, Pittsburgh	*15.40*	15.65	15.90	21.60
Lake Superior Charcoal, Chicago	*20.50*	20.50	21.50	26.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	30.00
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.00
Open Hearth Billets, Phila	*29.20*	29.20	30.40	31.50
Wire Rods, Pittsburgh	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	*12.00*	12.00	12.25	18.00
Steel Rails, Melting, Phila	*12.75*	12.75	13.00	18.75
Iron Rails, Chicago	*15.00*	15.00	15.75	25.00
Iron Rails, Philadelphia	*17.00*	17.00	18.00	27.00
Car Wheels, Chicago	*14.00*	14.50	15.50	25.00
Car Wheels, Philadelphia	*14.00*	14.00	16.00	24.00
Heavy Steel Scrap, Pittsburgh	*12.75*	13.00	13.00	18.00
Heavy Steel Scrap, Chicago	*11.85*	11.25	11.50	16.00
Heavy Steel Scrap, Philadelphia	*12.75*	12.75	13.00	18.50
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.65	1.65	1.65	1.93½
Common Iron Bars, Chicago	1.65	1.65	1.65	1.81½
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.74½
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.70	1.70	1.70	1.90
Skelp, Sheared Steel, Pittsburgh	1.80	1.80	1.80	2.00
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	1.90	1.90	1.90	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	**13.12½**	13.25	12.62½	24.50
Electrolytic Copper, New York	**12.87½**	13.00	12.50	24.00
Spelter, New York	*4.70*	4.70	4.75	6.85
Spelter, St. Louis	*4.52½*	4.55	4.60	6.65
Lead, New York	**4.00**	3.97½	3.75	6.15
Lead, St. Louis	**3.85**	3.80	3.60	5.95
Tin, New York	**31.75**	31.25	29.25	40.85
Antimony, Hallett, New York	*8.75*	8.75	9.00	22.25
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, April 8, 1908. (*By Telegraph.*)

While the opening week of April has developed a little more business in some lines, the Steel trade, as a whole, is decidedly quiet. The local finishing mills, with but one or two exceptions, are provided with specifications sufficient only to warrant starting up for a run of a week or two at a time. The standard Rail mill at the South Works of the Illinois Steel Company is one exception, it having enough specifications on hand, and tonnage in sight to keep it going at around 70 per cent. of its capacity until near July 1. Structural orders are coming out slowly, but there is good reason to believe that a number of important contracts now being figured on will be closed soon. Fabricators are expecting the closure within a week or 10 days of about 21,000 tons of material, included in building projects and track elevation work on which provision for construction has been made. New Rail purchases are limited to small lots for prompt delivery. Among transactions of this character reported are 800 tons of high T-Rails for an electric transportation road and 700 tons of standard section Rails for a steam road; the latter being taken by the principal interest which also secured an aggregate of 5000 kegs of Bolts and Spikes during the week. A little more active buying by jobbers in the Northwest resulted in a moderate increase in business for Merchant Pipe, but Boiler Tubes move slowly and are extremely quiet. The demand for Sheets, both Black and Galvanized, is somewhat disappointing, and instead of showing improvement is hardly up in volume to the record of recent weeks. As a result of the sharp bidding among

Cast Iron Pipe founders for the small amount of tonnage in sight prices are weaker, and are quoted $1 below last week's figures. As a matter of fact, these prices are only nominal, since in bidding each interest is governed by its own individual standards of value. Trade in Old Material is given over almost exclusively to dealers, there being no buying of consequence by consumers. Although the market is in no sense strong, it is holding fairly steady, considering the depressing influences that surround it.

Pig Iron.—The market continues dull and listless, with no spirited demand from any quarter. The transactions of last week were principally composed of small lots ranging from car lots to a few hundred tons, and most of this business was for prompt or nearby delivery. Consumers are seemingly as much disinclined to buy for forward delivery at the bottom level so far reached as they were when Iron was worth $3 or $4 a ton more than it is now. Not long since $12, Birmingham basis, for No. 2 Foundry was the point fixed by many consumers at which they would come into the market. Now they talk of $11 and even $10, Birmingham, as the prospective bottom to which prices will settle before permanent reaction takes place. At the present time, however, prices for second quarter delivery still hold around $12, Birmingham, for Southern and $17.35, Chicago, for Northern Iron. The leading Southern furnaces continue to quote $12.50 to $13, but strict adherence to the latter figure means practical withdrawal from the market. One sale of 1000 tons of Northern Iron was made during the week to a Milwaukee consumer in competition with Southern Iron. The number and character of inquiries now coming out do not indicate the probability of the near approach of material improvement, and in the absence of effective support prices have a sagging rather than a rising tendency. The following prices are for April, May and June delivery, f.o.b. Chicago:

Lake Superior Charcoal	$20.50 to $21.00
Northern Coke Foundry, No. 1	17.85 to 18.35
Northern Coke Foundry, No. 2	17.35 to 17.85
Northern Coke Foundry, No. 3	16.85 to 17.35
Northern Scotch, No. 1	18.35 to 18.85
Southern Coke, No. 1	16.85 to 17.35
Southern Coke, No. 2	16.35 to 16.85
Southern Coke, No. 3	15.85 to 16.35
Southern Coke, No. 4	15.35 to 15.85
Southern Coke, No. 1 Soft	16.85 to 17.35
Southern Coke, No. 2 Soft	16.35 to 16.85
Southern Gray Forge	14.35 to 14.85
Southern Mottled	14.10 to 14.60
Malleable Bessemer	17.00 to 17.50
Standard Bessemer	19.40 to 19.90
Jackson Co. and Kentucky Silvery, 6 %	17.90 to 18.40
Jackson Co. and Kentucky Silvery, 8 %	19.90 to 20.40
Jackson Co. and Kentucky Silvery, 10 %	21.90 to 22.40

(*By Mail.*)

Billets and Rods.—No inquiries of any consequence for Forging Billets are reported in the market. The few sales that have been effected during the week comprise what may be termed filling in requirements. The adoption of the new schedules of delivered prices noted last week has been productive of no results in stimulating trade, but on what business is moving prices are reported to be rigidly maintained. We quote Forging Billets at $31.50 to $32.50, Chicago. Wire Rods continue in fair demand, with prices firm at the following quotations: Bessemer, $35; Basic, $36; Chain, $37, all at Pittsburgh.

Rails and Track Supplies.—The existing quietness in standard section Rails is unbroken by any orders of significant tonnage, and developments in this direction are not foreshadowed by inquiries that promise immediate results. There is some business coming out from time to time in light Rails, but in the aggregate the tonnage thus secured is far short of mill capacities. Prices in light Rails continue to be shaded from $2 to $3 a ton by the rerolling mills. A sale of 800 tons of high T Rails for an electric road is reported. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.80c. to 1.90c., according to delivery; Track Bolts, 2.25c. to 2.35c., base, Square Nuts; and 2.40c. to 2.50c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—While there is a considerable tonnage of material represented in active projects which seem about ready to come into the market, the past week has been pretty quiet so far as the closures of contracts is concerned. Milliken Brothers secured a contract for about 700 tons from the Central Colorado Power Company for transmission line towers; about 150 tons, let by the Methodist Book Concern at San Francisco, was taken by Dyer Brothers of that city. An order for 1600 tons of concrete reinforcing Bars for the Corn Products Company's new plant was awarded to the Inland Steel Company. Bids are in on an aggregate of over 21,000 tons, on the greater part of which closure is expected within the next week or 10 days. Included in this amount are 7000 tons of track elevation material, required by roads entering Chicago; 3000 tons for the Boston & Montana Smelter; between 7000 and 8000 tons for the La Salle Hotel, and about 4000 tons for the Corn Products Company. Besides these, figures are being submitted on 1700 tons for the Scanlon Building, Houston, Texas, and about 1500 tons for the Equitable, Birmingham, Ala. The Structural mill of the Illinois Steel Company, which was shut down for about 10 days, is scheduled to start up about next week, but unless there is considerable improvement in the receipt of specifications it will have but a short run. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—Plates continue extremely dull. Jobbers are devoting their energies chiefly to reducing stocks and are buying only what is imperatively needed to preserve fair assortments. What new business is being offered comes in scattering lots for prompt shipment. Enough of these, however, have been received to enable the Sheared Plate mill of the South Works to run all of last week; it will probably clear up orders on hand during the present week. Prices are reported to be firmly held, save for concessions of from $1 to $2 a ton made by some mills on narrow Plates. We quote for mill shipments as follows: Tank Plates ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—Business in Sheets is hardly as active as it was a week or two ago. The demand is somewhat spasmodic and irregular. The policy of buying only for immediate wants still prevails, but the hope is expressed by both mills and jobbers that some improvement will follow when weather conditions become more settled. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 to 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—No improvement is apparent in either Iron or Steel Bars. Mills continue to run intermittently, none of them being able to continue in operation more than a week or 10 days at a stretch. The Sylvan Mills of the Republic Iron & Steel Company, at Moline, are shut down this week, while those at east Chicago are running. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—Some improvement in the general volume of business is noted, but there is no change in the character of buying, which continues to be for current requirements. A little better demand is reported from the jobbers throughout the Northwest, which has helped to swell the average above that of recent weeks. Local trade is extremely quiet, yet the slow but steady reduction of jobbers' stocks gives promise of more activity when replenishment orders begin to come in. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 71 per cent. on Black Steel Pipe, ¾ to 6 in. From two to three points above these prices is asked for Iron Pipe.

Boiler Tubes.—The demand for Merchant Tubes is of a desultory character and consists almost wholly of small lots for actual needs. Jobbers are placing no stock orders, and even their requirements for the maintenance of stock assortments are extremely light. Outside of a few unimportant concessions made by one or two outside mills, we are advised that prices are firm and unchanged. Mill quotations for future delivery, on the base sizes, are as follows: 2⅜ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and

2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
[illegible] in.	55	35	35
[illegible] 2 in.	50	35	35
[illegible]	52½	35	35
[illegible]	60	47½	47½
[illegible] and larger	50	35	..

Merchant Steel.—The small shops are coming in for a moderate amount of material, indicating more activity in repair work, but the larger manufacturing interests, whose orders at this season of the year furnish the main support of the market, are buying very little. Assortment orders from the jobbers add somewhat to the total, but all in all the demand is far from satisfactory. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.9Sc.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1⅛ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 54 per cent. off in car lots; 48 per cent. less than car lots, base territory delivery.

Cast Iron Pipe.—Last week's transactions include only a few small lettings of from 200 to 400 tons. A fair amount of miscellaneous orders was received, but in the aggregate business is extremely quiet. No prospective lettings of any consequence are reported for the near future, although quite a number of small municipal contracts are hinging upon the disposal of bond issues. The pressure of competition has resulted in another reduction of $1 a ton, and we quote, nominally, per net ton, Chicago, as follows: Water Pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25; with $1 extra for Gas Pipe.

Old Material.—Aside from a moderate tonnage taken by rolling mills, there have been practically no sales made to consumers the past week. There is some trading among dealers seeking material to apply on contracts; but, including all such transactions, the business has been exceedingly quiet. In fact, there has not been enough doing to test the market, and prices are practically unchanged. It is a peculiar feature of the present condition that offers considerably under the present market attract no speculative buying, and, on the other hand, when material is actually needed there is no difficulty in securing the market price. The railroad offerings for this week include 300 tons from the Wisconsin Central, 925 tons from the Wabash and 3400 tons from the Santa Fé. We quote, per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$15.00 to $15.50
Old Steel Rails, rerolling	12.25 to 12.75
Old Steel Rails, less than 3 ft.	12.00 to 12.50
Relaying Rails, standard sections, subject to inspection	20.50 to 21.50
Old Car Wheels	14.00 to 14.50
Heavy Melting Steel Scrap	11.25 to 12.00
Frogs, Switches and Guards, cut apart	11.50 to 12.00
Mixed Steel	9.00 to 9.50

The following quotations are per net ton:

Iron Fish Plates	$13.50 to $14.00
Iron Car Axles	16.00 to 16.50
Steel Car Axles	14.75 to 15.25
No. 1 Railroad Wrought	11.00 to 11.50
No. 2 Railroad Wrought	10.00 to 10.50
Railway Springs	11.00 to 11.50
Locomotive Tires, smooth	14.00 to 14.50
No. 1 Dealers' Forge	9.00 to 9.50
Mixed Bushelling	7.00 to 7.50
Iron Axle Turnings	6.00 to 6.50
Soft Steel Axle Turnings	6.00 to 6.50
Machine Shop Turnings	6.00 to 6.50
Cast Borings	4.75 to 5.25
Mixed Borings, &c.	4.75 to 5.25
No. 1 Mill	7.00 to 7.50
No. 2 Mill	6.00 to 6.50
No. 1 Boilers, cut to Sheets and Rings	7.00 to 7.50
No. 1 Cast Scrap	12.25 to 12.75
Stove Plate and Light Cast Scrap	10.25 to 10.75
Railroad Malleable	10.50 to 11.00
Agricultural Malleable	9.50 to 10.00
Pipes and Flues	8.00 to 8.50

Metals.—In the local market there is practically no change reported in Copper prices, but sales for the week show a slight improvement. Consumers continue to confine their orders to current needs, and there is in consequence no buying of round lots. Spelter is somewhat easier, but other metals hold reasonably steady with a moderate demand. We quote as follows: Casting Copper, 13¼c.; Lake, 13¾c. to 14c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 33c.; small lots, 31½c.; Lead, Desilverized, 4c. to 4.25c., for 50-ton lots; Corroding, 5.35c. to 5.45c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 12½c., and other grades, 10½c. to 11c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 11c.; Copper Clips, 11c.; Red Brass, 12½c.; Yellow Brass, 10¼c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 25c.; Block Tin Pipe, 27c.

Pittsburgh.

PARK BUILDING, April 8, 1908.—(*By Telegraph.*)

Pig Iron.—Conditions in the Pig Iron trade are very quiet, purchases being very light and for actual needs. Consumers are buying Pig Iron just as they require it, and are not willing to contract ahead. Only 5 of the 19 merchant blast furnaces in the Mahoning and Shenango valleys are in operation—namely, one Andrews & Hitchcock and Girard running on Foundry, while Shenango No. 3, Stewart and Youngstown Steel are on Bessemer. Stocks of unsold Pig Iron in the two valleys held by the merchant furnaces are given on April 1 as about 60,000 tons, against 75,000 tons on March 1. We quote standard Bessemer Iron at $16.75 to $17; Northern No. 2 at $15.25 to $15.50; Basic about $15.50, all at Valley furnace. Northern Forge is about $14.50, Valley furnace, or $15.40 Pittsburgh, but there have been no recent sales.

Steel.—The market continues somewhat quiet, inquiries being only for small lots for actual needs. The Republic and Youngstown Sheet & Tube Bessemer plants at Youngstown are in operation this week with a fair amount of work ahead. We quote Bessemer Billets at $28, at Pittsburgh, and $28.50, at Youngstown or Wheeling, Sheet and Tin Bars taking an advance of $1 a ton over these prices. Forging Billets are about $30, Pittsburgh.

(*By Mail.*)

Reports gathered this week as to whether the improvement in general conditions in the Iron trade, reported in the latter part of March, is being maintained, are somewhat conflicting. Some manufacturers report a small but steady increase in the volume of new tonnage being entered, while others say they have observed a decided falling off in new business, and insist that general conditions are not as encouraging by any means as they were in March. The active blast furnace capacity of the Steel Corporation is about 10 per cent. less now than it was early in March, but this is largely due to the fact that four or five of the Edgar Thomson furnaces were blown out in the latter part of March, on account of the small tonnage of Rail orders on hand. This week the three Edgar Thomson Rail mills are down for lack of work, but are scheduled to start again to partial capacity next week. The buying trade has pretty generally adopted the policy that nothing is to be gained by ordering ahead, and is placing orders only for small lots and actual needs. This condition will likely continue for some time. The situation in Pig Iron does not show any encouragement, consumers still buying only small lots for prompt shipment. There are several fair sized inquiries for Pig Iron in the market, but the ideas of the furnaces and the buyers as to prices are so widely apart that it is next to impossible to close up any large business. The statement is made that there has not been 3000 tons of Standard Bessemer Iron sold by Valley furnaces since the first of the year, and this gives a clear idea of the practically lifeless condition of the market. There is some demand for Basic and Foundry Iron, but the limited tonnage being sold is at such low prices that most of the large furnace interests refuse to meet them. The Billet trade is very quiet, only small lots being sold. Prices are being maintained by the large Steel interests, but some of the smaller mills that can roll certain sizes of Billets are still making conversion deals for Pig Iron with dealers who then market the Steel at somewhat less than regular prices. Only a limited run of orders for Finished Iron and Steel is being secured by the mills, but it is hoped that April will show some improvement over March. Coke and Scrap continue extremely dull, with not enough of either material being sold to test prices thoroughly. On the whole, the situation is not as encouraging as two or three weeks ago, but sometimes the unexpected happens, and it is possible that April will make a better record than anticipated.

Ferromanganese.—Only an occasionally small lot of Ferro is wanted. We quote 80 per cent. at $43 to $43.50, seaboard, or $44.95 to $45.45, Pittsburgh. A sale of a carload, or about 25 tons, is reported at the latter price.

Muck Bar.—Absolutely nothing is being done in the way of new sales, and we continue to quote best grades of Bar made from all Pig Iron, at nominally $27 to $27.50, Pittsburgh. If any tonnage was offering probably these prices would be shaded.

Skelp.—The general Skelp market is quiet, with all the mills badly in need of specifications. We quote nominally as follows: Grooved Steel Skelp, 1.60c.; Sheared Steel Skelp, 1.70c.; Grooved Iron Skelp, 1.80c., and Sheared Iron Skelp, 1.90c., f.o.b. Pittsburgh.

Rods. A fair amount of business is being done in small lots, and prices are reported as quite firm. We continue to quote Bessemer Rods at $35, Open Hearth $36, and Chain Rods $37, Pittsburgh.

Steel Rails.—Speaking from the standpoint of new orders, the situation in Rails is practically lifeless. If the plans for financing the Erie Railroad prove successful, contracts for 40,000 to 50,0000 tons of Rails will likely be given out by this road in the near future, part of this tonnage to come to the local interest. Two or three other leading lines are also stated to have their finances so arranged that they will be able to place their contracts for Rails this month. In the past week the Carnegie Steel Company took orders for about 1500 tons of Standard Sections and close to the same tonnage in Light Rails. It is stated that prices on new Light Rails are a little stronger, but nevertheless they are still being shaded by the Rerolling Rail mills about $3 a ton. Regular prices on Light Rails are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—Practically all the new business in Plates is in small orders for actual needs. The Steel car interests are about out of it as buyers of Plates, and the same is true of the lake boat builders, who have practically no orders on their books. Some tonnage in Plates is coming in in Structural orders, but this is also very limited in size, and the immediate outlook for the Plate trade is not encouraging by any means. A few small mills are still shading regular prices $2 to $3 a ton. Regular prices are as follows: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼ in. to and including 3/16 in. Plates on flats edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than ¾ in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell grade of steel, as shaved ends	

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—The situation is a little more encouraging from the fact that a good deal of work has come up in the past week, with the probability that some large tonnage will soon be placed. The Oliver Building on Smithfield street, which has been talked of for more than a year is now up, the architect being the L. H. Burnham Company, Chicago. It is proposed to go ahead with part of this building at once, and then take up the Smithfield street frontage after April 1 of next year, when the leases of the present tenants expire. Bids have been asked on 10,000 to 12,000 tons of Steel for this structure, and at least part of this is expected to be placed soon. The contract for the piers of the Lake Erie Bridge at Beaver has been placed with the Dravo Construction Company, and it is expected that bids on the Steel, about 14,000 tons, will be asked for within the next two or three months. The Second National Bank Building at Connellsville, Pa., 420 tons, is to be placed this week. The McClintic-Marshall Construction Company has taken about 600 tons of Steel for the State Fair Buildings at Syracuse, N. Y., and about 300 tons for the Chanute Cement & Products Company, Chanute, Kan. Some other work is in sight. Complaint is still heard of the low prices that are being made on the tonnage that is being placed. The mills are able to make prompt deliveries, and in fact are shipping in material faster than the Structural concerns can take care of it. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—A fair amount of new business is being placed in Black and Galvanized Sheets, but the situation in this trade at this time is disappointing in the fact that the demand is not as large as the mills expected. The demand for Roofing Sheets is improving, but it is estimated that somewhat less than 50 per cent. of the entire Sheet capacity is idle. Prices are being fairly well maintained, few concessions being reported. Regular prices are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—General conditions in the Tin Plate trade are better than on any other line of finished products, the actual demand in the past month having increased materially. The American Sheet & Tin Plate Company is operating this week above 85 per cent. of its Tin mill capacity, and is having a good run of new business. The independent Tin Plate mills report their demand showing betterment, and it is expected that the summer will be quite active in this trade. It is stated that regular prices are being well maintained. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Iron and Steel Bars.—Specifications against contracts are coming in sparingly, while the new business in Iron and Steel Bars being placed with the mills continues light. Buying is of a hand to mouth character, consumers placing only small orders for actual needs. Reports that prices on Bar Iron are being materially shaded are denied. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further west. Steel Bars remain very firm, at 1.60c., Pittsburgh.

Hoops and Bands.—No new orders are being placed and specifications against contracts are coming in at only a fairly satisfactory rate. Regular prices are as follows: Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60, base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Spelter.—Buying is quiet, but it is stated there are more inquiries in the market than for some time. Prime grades of Western Spelter are quoted at 4.50c. to 4.55c., East St. Louis, to which a freight rate of 12½c. to Pittsburgh should be added.

Railroad Spikes.—Reports current here that several Western railroads have placed orders for 60,000 kegs of Spikes are not confirmed, and it is not believed that such orders have been placed. General buying is light and all the Spike mills are badly in need of orders. We quote: Standard sizes, 4½ x 9-16 in., at $1.70, and the smaller sizes at $1.80 per 100 lb. in carloads and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Merchant Steel.—Last week new prices on Shafting were adopted as follows: On contracts for 100 tons or over, 57 per cent. off; carloads, 56 per cent. off, and less than carloads 52 per cent. off, on which carload freight is allowed within base territory. The demand for Shafting is limited, and the few orders being placed are for small lots only. Very little new business is going in Merchant Steels and this trade continues extremely quiet. We quote: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 2.10c. to 2.15c. Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron, finished, 1½ in. and wider, 1.60c.; under 1½ in., 1.75c. Planished Tire Steel is 1.80c., all f.o.b. at mill.

Boiler Tubes.—The demand is light, but some business in Railroad Tubes is pending which is expected to be placed in a short time. Prices are being fairly well maintained, but concessions are being made by one or two mills. Discounts on Merchant Tubes for small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes	Iron	Steel
1 to 1¼ in.	42	37
1½ to 2¼ in.	42	37
2½	42	37
2¾ to 3 in.	42	37
3½	42	37
4 to 5 in.	42	37
6 to 13 in.	42	37

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra
2¾-in. and larger, over 22 ft. long, 10 per cent. net extra.

Pipes and Tubes.—Orders for a good tonnage in Line Pipe have been placed in the past week, with considerably more pending, which is expected to be given out in a short time. The Oklahoma Natural Gas Company has bought 15 miles of 8¼-in. Casing of the Youngstown Sheet & Tube Company. The latter company has also secured a contract for 10 miles of 4-in. Line Pipe and another for 10 miles of 12-in. Line Pipe, the latter for a Kansas gas company. The Barnsdall interests have placed an order for 5 miles of 6-in. Line Pipe, while another contract for 20 miles of 3-in. Line Pipe is pending, which is expected to be placed in a short time. The demand for Tubular goods from the general trade is showing slight betterment. General conditions in this trade are better than on some other lines of Finished Prod-

ucts. We are advised that prices are being absolutely maintained. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 74 and 5 per cent. off list, while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black.	Galv.
⅛ to ¼ in	65	49
⅜ in	67	53
½ in	69	57
¾ to 6 in	73	63
7 to 12 in	70	55
Extra strong, plain ends:		
⅛ to ⅜ in	58	46
½ to 4 in	65	53
4½ to 8 in	61	49
Double extra strong, plain ends:		
½ to 8 in	54	43

Discounts on Genuine Iron Pipe are as follows:

	Black. %	Galv. %
⅛ and ¼ in	62	
⅜ in	65	51
½ in	67	55
¾ to 6 in	71	61
7 to 12 in	68	53
Extra strong, plain ends:		
⅛ to ⅜ in	56	44
½ to 4 in	63	51
4½ to 8 in	59	47
Double extra strong, plain ends:		
½ to 8 in	52	41

Iron and Steel Scrap.—This trade continues extremely quiet, and, owing to the dull demand, prices have gone off to some extent, and are weaker now than at any time for the past month or more. It is stated that consumers will agree to take in a moderate amount of Scrap, but the prices they offer for it are so much below the ideas of sellers that very little actual tonnage can be closed up. We have reduced our prices somewhat, and now quote per gross ton: Heavy Steel Scrap, Pittsburgh, Sharon and Steubenville delivery, $12.75 to $13; No. 1 Railroad Wrought Scrap, $13.75 to $14; No. 1 Cast Scrap, $15 to $15.25; Cast Iron Borings, $7.75 to $8. Bundled Sheet Scrap is probably the weakest article on the whole list, and is offered at $9 a ton or lower. Steel Axles are $16.50 to $17; No. 1 Busheling Scrap, $12 to $12.25; No. 2, $9 to $9.25; Sheet Bar Crop Ends, $16.50 to $17; Iron Axles, $19 to $19.50; Low Phosphorus Melting Stock, $16.25 to $16.50; Rerolling Rails, $14 to $14.25; Old Steel Rails, short pieces for Open Hearth use, $12.75 to $13; Machine Shop Turnings, $8 to $8.50; Railroad Malleable Scrap, $12.25 to $12.50; Grate Bars, $13.25 to $13.50; Heavy Air Furnace Cast Scrap, $13.75 to $14. On April 3 the Pennsylvania Lines West sold a fairly large tonnage of Scrap, prices paid for the grades named being as follows: Heavy Steel Scrap, $13.10; Railroad Wrought Scrap, $13.75; Old Car Wheels, $14; Axle Turnings, $9.25; Cast Iron Borings, $7.50; Old Steel Rails, long lengths, $14.25, all f.o.b. Pittsburgh. We also note sales of about 2000 tons of Bundled Sheet Scrap for deliveries at Eastern points of consumption at $11.25, which is equal to about $8.50 at shipping point.

Coke.—This trade is almost lifeless, there being practically no new demand for either Furnace or Foundry Coke. Good grades of Furnace Coke are offered for prompt shipment, at about $1.60, and best grades of 72-hr. Foundry Coke at about $2.25, at oven, to consumers. Other grades of Furnace and Foundry Coke, not so high in quality, are offered at still lower prices. The output of Coke last week in the Upper and Lower Connellsville regions was 139,663 tons, a decrease over the previous week of more than 20,000 tons. Coke operators are making no efforts to start idle plants, and those that are operating are running intermittently, some of them cutting down working time to one and two days a week, while others run three or four days a week, as demand may require. It is stated that Furnace Coke loaded on cars, and which had to be moved, has been sold as low as $1.50 a ton and even lower in some cases.

Birmingham.

BIRMINGHAM, ALA., April 4, 1908.

Pig Iron.—The active capacity in this district for producing Foundry Iron has been increased approximately 65 per cent. since January 1, and reports of sales agents show the present output warranted by order book requirements. One of the leading interests reports sales for the past two months equal to the output of capacity in operation for three months. The decrease in stock accumulations conforms with statements as to condition of order books, and makers that have been independent of price agreements are believed to be practically out of the market for second quarter deliveries. However, the prices agreed upon have not been maintained, and from $12 to $12.50 is now generally considered the market price for No. 2. No sales are reported at such figures, but quotations have been made upon that basis and an offer of $11 per ton for 1000 tons is known to have been considered. A sale of 500 tons at $13, Birmingham, is reported, and carload lots of High Manganese Iron for immediate shipment are reported sold at $14. Some inquiries are pending, the principal ones being for lots of 1000, 750 and 500 tons, respectively. The attitude of purchasers as to speculative buying is apparently unchanged, and the small percentage of tonnage booked that represents such transactions is notable. The improvements in all foundry trades, though material, are gradual, and melters are inclined to increase the proportions of their engagements in a like manner. One or more inquiries previously reported for round tonnages did not result in sales, by reason of the fact that requirements as anticipated by prospective purchasers did not develop, but, with few exceptions, the tonnage engaged is being delivered according to specifications originally submitted.

Cast Iron Pipe.—The volume of business in sight increases, and the fact that contracts for export are among those to be awarded is very encouraging. The proposed improvements by the Government in the Philippine Islands are of especial interest to Southern producers. In addition to 7000 tons of Water Pipe for the city of Manila, approximately 18,400 tons is to be placed for Cuban points, and one or more contracts for round tonnages are to be placed for points in South America. Oswego, N. Y., is to take 5000 tons, and a Western railroad is to place a contract for 54 miles of Water Pipe within 60 or 90 days. The idle local capacity has been decreased during the week, and recent movement of stock accumulations is satisfactory. Low figures continue to be reached on large contracts, but for small lots quotations as appended are firm. We quote Water Pipe, per net ton, f.o.b. cars here, as follows: 4 to 6 in., $27; 8 to 12 in., $25; over 12 in., average, $24, with $1 per ton extra for Gas Pipe.

Old Material.—The market is without an encouraging feature. Indications for the resumption of operations at plants of large consumers have not materialized, and the demand continues very unsatisfactory. Some contracts have been placed, but figures have been exceptionally low, with the business going principally to dealers who have accumulated stocks since the depression. A criterion of prices is hardly offered, and we quote nominally as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$16.50 to $17.00
Old Iron Axles	15.50 to 16.00
Old Steel Axles	14.50 to 15.00
No. 1 Railroad Wrought	13.00 to 13.50
No. 2 Railroad Wrought	10.00 to 10.50
No. 1 Country Wrought	11.50 to 12.00
No. 2 Country Wrought	9.50 to 10.00
Wrought Pipe and Flues	10.00 to 10.50
No. 1 Steel	11.50 to 12.00
No. 1 Machinery	10.50 to 11.00
Stove Plate and Light Cast	9.50 to 10.00
Cast Borings	6.00 to 6.50

Cincinnati.

CINCINNATI, OHIO, April 8, 1908.—(*By Telegraph.*)

Summing up the local market situation, one finds little encouragement. In finished products the most meager buying prevails. The Coke situation is weaker, if anything, than on the opening of the month. Pig Iron is dragging at the most attractive prices, and Scrap dealers find no department of the business capable of producing any sort of reasonable sale of tonnage, save perhaps a little No. 1 Wrought and some Heavy Melting Steel Scrap, a few sales of both of which have been made in this market at a slight advance over quoted prices for spot delivery. Local dealers are watching with considerable interest the outcome of the dinner of Iron men at the Hillman Hotel, Birmingham, Wednesday night, at which President Corey of the Steel Corporation and other prominent men will be guests. In the machine tool markets there is the same story to tell—a dearth of orders and little or nothing in the inquiries that have come from all over to suggest business within three or four months. There has been a little activity in the lathe and milling machine line, and business with woodworking machinery concerns has improved materially since the first of the year.

Pig Iron.—Consumers are taking Iron on contract a trifle better, and there have been some sales of Foundry and analysis Iron for immediate needs at the market quotations, but the chief topic of discussion in local Iron circles is the reputed break of the market in the Valley District and sales of No. 2 Foundry on a basis of $15 and $15.25, at furnace. The closeness of the Valley product to the center of consumption is undoubtedly at this time a factor in the situation. So closely contested is this competition that all sorts of expedients are resorted to, it is said, to close the breach between buyer and seller without actually exposing the transaction to charges of rebating. In the Ironaton District price cutting does not seem to be so flagrant, and the admission that No. 2 Foundry may be bought at $15.50, at furnace, is qualified, "in certain territory." It is not apparent that Southern Foundry Iron is selling in this district at less than $12, Birmingham, which is an open quotation, although it is reported that $11.75 has been done. Along with these incidents it is only fair to say that sales of Northern Iron are recorded 1 day at $16, at furnace for No. 2, and some

$12.50, and even $13. Iron has been sold here for quick shipment. A small lot, 50 tons of high Manganese No. 3, was sold to a Detroit melter for $17.25, delivered. Interest to-day has centered in Detroit, where a stove concern is expected to contract for 3000 to 5000 tons of analysis Iron for the last half of the year. An Ohio melter is figuring on 300 tons for last half Foundry Iron. Basic is a little stronger, and $15.50 is the best price heard to-day. An inquiry for 300 tons of Malleable is from a Michigan melter. An Eastern consumer is feeling the market for a 2000 ton lot of Basic, and an Ohio melter is said to be willing to take some also at better than $15.50. In actual transactions there is nothing moving over a few carloads at a time, outside of contracts, and large dealers talk of still lower prices before the close of the second quarter. For immediate delivery and balance of this quarter we quote f.o.b. cars, Cincinnati, as follows, the freight rates being $3.25, $1.80, and $1.20, from the Birmingham, Valley and Hanging Rock districts, respectively:

Southern Coke, No. 1	$15.75 to $16.25
Southern Coke, No. 2	15.25 to 15.75
Southern Coke, No. 3	14.75 to 15.25
Southern Coke, No. 4	14.25 to 14.75
Southern Coke, No. 1 Soft	15.75 to 16.25
Southern Coke, No. 2 Soft	15.25 to 15.75
Southern Coke, Gray Forge	13.75 to 14.25
Southern Coke, Mottled	13.25 to 13.75
Ohio Silvery, 8 per cent. Silicon	20.20 to 20.70
Lake Superior Coke, No. 1	17.20 to 17.70
Lake Superior Coke, No. 2	16.70 to 17.20
Lake Superior Coke, No. 3	16.20 to 16.70
Standard Southern Car Wheel	23.25 to 23.75
Lake Superior Car Wheel	22.00 to 22.50

(*By Mail.*)

Coke.—Reports of continued curtailment of the Furnace product come to this market, and sales are confined almost entirely to Foundry grades, which, if anything, are a trifle stronger, indicating a gradual increase in the melt. The fields most affected by this curtailment are the Connellsville and Pocahontas. Connellsville Furnace grades are quotable still at $1.70 to $1.90; Pocahontas about the same; New River, $2.40 to $2.60, all at oven. Foundry Cokes are in some isolated instances bringing fancy prices for quick shipment where melters have allowed their stocks to run bare. Choice grades of Connellsville Foundry are selling at $2.25 to $2.50; Pocahontas, $2 to $2.25; New River, $2.75 to $3.

Finished Iron and Steel.—Store stocks are low and prices are unchanged. There is very little activity in any line of Finished product. Some Structural Shapes are going South, and Iron Bars are a little stronger than last month. Dealers are generally in a rather chaotic state of mind as to future possibilities, and while anticipating business some time within the limitations of the current year, are watching carefully for indications of price cutting, which tends to keep stocks to the lowest level. Collections are improving somewhat. Dealers quote, f.o.b. cars, Cincinnati, as follows: Iron Bars, carload lots, 1.65c., base, with half extras; small lots from store, 1.85c., base, half extras. Steel Plates, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c. Blue Annealed Sheets (Heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.25c. No. 12, carload lots, 2c.; small lots from store, 2.35c. Sheets (Light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Old Material.—The Scrap market is as hard to gauge as for the past several months, and a fair average of prices is quite difficult to obtain. There being no normal or even moderate demand for any line of Old Material, it might well be called a buyer's market. The larger dealers are still buying, believing that the present levels are attractive. As nearly as it can be determined, the local market is about as follows, prices being f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$11.00 to $11.50
Cast Borings, net ton	4.50 to 5.00
Heavy Melting Steel Scrap	11.00 to 11.50
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Iron and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	15.00 to 16.00
Old Iron Rails, gross ton	14.00 to 15.00
Old Steel Rails, long, gross ton	11.00 to 12.00
Old Steel Rails, short, gross ton	11.00 to 12.00
Relaying Rails, 56 lb. and up, gross ton	20.00 to 21.00
Old Car Wheels, gross ton	13.00 to 13.50
Low Phosphorus Scrap, gross ton	13.00 to 14.00

The American Sheet & Tin Plate Company has started up eight more hot mills at its Vandergrift Works, and the entire 37 hot sheet mills in this plant are now in full operation. Of the 10 open hearth furnaces five are being operated, while the blooming and sheet bar mills are also running.

Philadelphia.

PHILADELPHIA, PA., April 7, 1908.

The demand for both crude and finished materials has been somewhat less active, and the situation is probably not as strong as it would appear on the surface. The hopeful feeling which has prevailed for some months still exists, but it is not as pronounced, inasmuch as busines which was expected to develop with the opening of spring has failed to materialize. The tonnages booked recently have been comparatively small, in fact, the smallest since the middle of January. While it is expected that there will be enough business to maintain about the present rate of production, not much hope for any genuine betterment before early fall is expressed. In some directions the present dullness is believed to be but temporary, as consumers have been taking small tonnages only, to meet early needs, and it is believed that a more active buying period will be seen in the course of a few weeks.

Pig Iron.—This market has been particularly dull. Buyers seem to take very little interest, and sales for the week have probably been the lightest for any like period for some months. Inquiry has not been as good as it was. Melters in many cases seem to have their immediate needs supplied, and are in no hurry to enter the market. The bulk of the current buying is in car load lots, with occasional orders running up to a few hundred tons. The foundry trades are still the most active buyers, and competition for such business as is offered has been very sharp. The independent furnaces continue to take the greater part of the business; and while their prices are quotably unchanged, and range from $17.75 to $18, delivered, for No. 2 X Foundry, it is believed that lower prices are being made on private terms. Southern, Virginia and Ohio Irons are now entering this market in competition with the independent furnaces, but when prices are shaded the facts are kept carefully guarded. Eastern Pennsylvania furnaces making standard grades are maintaining the established prices, based on $18.25, delivered, in this territory, for No. 2 X Foundry, but the tonnage taken on this basis is extremely small, and these producers are reported to be piling Iron quite rapidly. That this will result in the early further curtailment of production is likely, as a number of these producers say they will blow out rather than sell Iron under the established price. While there have been no sales reported of Southern Iron in any large quantity, it could be had at $12, Birmingham, for No. 2 Foundry. On small quantities some sellers hold, however, at $12.50 to $13, Birmingham. There has not been much business done in this territory by the Virginia furnaces. Recently small lots of Foundry Irons have been sold at $17.50 to $17.75, delivered, while a lot of several hundred tons of off Iron was sold for pipe making purposes. The pipe makers are still taking some moderate tonnages of both Northern and Virginia Irons. The inquiry for 4000 tons on the market last week is said to be still unclosed, while a further inquiry for 1000 tons of No. 2 X Iron is reported. Sales of 500 tons each of Coke and Charcoal Malleable are reported. Forge Iron has been extremely dull. Sales have been few and confined to small tonnages for prompt delivery. Some of the Steel mills have been coming into the market quietly for Basic Iron and it is understood that one round lot at the established price, $17.25, delivered, has recently been closed. Prices show no quotable change, the inside figures in the tabulated prices below (with the exception of Low Phosphorus Iron) being those at which business has been done by the independent furnaces, while the outside figures represent the agreed prices of the Eastern makers for delivery in buyers' yards, eastern Pennsylvania, and adjoining territory, during the second quarter:

No. 2 X Foundry	$17.75 to $18.25
No. 2 Plain	17.25 to 17.75
Gray Forge	16.25 to 16.75
Basic	17.25
Low Phosphorus	23.50 to 24.00

Ferromanganese.—There has been some inquiry for small tonnages, and sales of carloads and broken lots are again reported. The available supply of spot Ferro is said to be materially decreased. Prices, however, are unchanged, $43 to $44 Baltimore, being quoted for small lots.

Steel.—The demand continues light, and mills are unable to gain any in production. Sales recently have been confined to small lots for prompt shipment, buyers as a rule showing no disposition to anticipate their wants. Prices are unchanged. We quote, for delivery in Philadelphia and vicinity, $29.20 for ordinary Rolling Billets, and $31.20 for Forging Billets, with the usual extras for high carbons and large sizes.

Plates.—There has been no improvement in the demand. Orders are more plentiful, but the individual tonnage is small and covers only consumers' immediate needs. An order for 750 tons of Tank Plates was booked by one mill during the week, but the bulk of the business is of a miscellaneous character. Mills are able, however, to maintain their rate of

production, and prices are being fully maintained, quotations for delivery in this territory being as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼ in and heavier. The following extras apply:

	Extras per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—There is a fairly even demand, largely of a miscellaneous character, and mills maintain an average output of about 50 per cent. of their capacity. Inquiries are fairly good, but confined mostly to small propositions, although one or two fair sized buildings are being figured on. Quotations are unchanged, 1.85c. to 2c. being named according to specification.

Sheets.—Orders come out but slowly, and are confined to small tonnages for prompt shipment. No disposition is shown by buyers to anticipate the future. Inquiries are not so numerous, and are somewhat slow in developing into orders. Prices are being fully maintained, the following range being quoted for mill shipment, with a tenth extra for small lots: Nos. 18 to 20, 2.50c.; No. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—Specifications on old orders are reported to be coming out somewhat more freely, although new business continues extremely quiet. Mills are running irregularly and not gaining very extensively in tonnage. Dealers who have Bars due them at old prices are reported to be underselling about one-tenth; leading mills, however, maintain the established price, 1.65c., delivered, in this territory.

Old Material.—Not enough business has been transacted to establish prices. The demand is at a standstill, mills taking only odd lots. Prices are not considered strong, but in the absence of business are unchanged. We quote nominally as follows for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory:

No. 1 Steel Scrap and Crops	$12.75 to $13.25
Low Phosphorus	17.50 to 18.00
Old Steel Axles	17.50 to 18.00
Old Iron Axles	20.00 to 21.00
Old Iron Rails	17.00 to 18.00
Old Car Wheels	14.00 to 15.00
Choice No. 1 R. R. Wrought	15.00 to 15.50
Machinery Cast	15.00 to 15.50
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	8.75 to 9.25
Stove Plate	11.00 to 11.50
Cast Borings	7.50 to 8.00
Grate Bars	11.75 to 12.25

Coke.—No particular change is to be noted in the demand for Coke. There have been some few contracts made for partial requirements of Foundry Coke for the remainder of the year. Some little business has also been done for prompt shipment. Furnace Coke is inactive. Foundry Coke is quoted at $2.25 to $2.50 at oven, with $1.75 to $2 at ovens named for Furnace Coke. For delivery in the Philadelphia territory the following range of prices is quoted:

Connellsville Furnace Coke	$3.90 to $4.15
Foundry Coke	4.40 to 4.65
Mountain Furnace Coke	3.50 to 3.75
Foundry Coke	4.00 to 4.25

Cleveland.

CLEVELAND, OHIO, April 7, 1908.

Iron Ore.—But little more Ore is being shipped from the docks than a month ago. There are no inquiries for Ore, and merchant firms are not expecting to make any sales before May. A large share of the furnace interests have enough left over from last year to run them until September, and some will not need this season's Ore until considerably later than that. There seems to be a disposition among furnacemen to wait until well along in the summer before buying any 1908 Ore. Few vessels will start out with the opening of navigation. The package freighters will not be started until April 25. Indications are that there will not be much activity in lake shipments before June 1. Boats managed by the Ore firms will not be placed in commission until well along in May. We quote Ore prices at Lake Erie docks for 1908 delivery, per gross ton, as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.20; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Coke.—There is some demand for Foundry Coke in small lots, but no sales of Furnace Coke are reported. We quote Connellsville Furnace Coke for spot shipment at $1.60 to $1.75, at oven, although there are reports of its being offered at $1.55. We quote Connellsville 72-hr. Foundry Coke at $2.25 at oven.

Pig Iron.—The intricate system of prices adopted by the Cleveland conference several weeks ago has fallen to pieces. Local furnaces maintained the prices for some time, in spite of the fact that Valley furnaces were selling much below the schedule, but no pretense is now being made to maintain the price agreement. Northern No. 2 Foundry Iron is quoted at $15 to $15.50, Valley furnace, but there are reports of a lower price quoted for shipments outside of the immediate territory. One small sale was made by a Valley furnace to a local consumer at $16.25, delivered, or $15.35, at furnace. Only one sale of any size is reported by a local furnace. That was of several hundred tons of No. 2 Foundry for shipment outside this territory at a price not made public. Shipping orders on contracts show no improvement over last month, and some of the largest consumers are taking no Iron. There is a disposition among large melters who carried heavy stocks of Pig Iron during busy times, when deliveries were slow, to buy only small lots for immediate delivery. The furnace of the Cleveland Furnace Company will go out of blast April 9. This furnace runs mostly on Foundry Iron. The Upson Nut Company, which had under consideration the question of blowing out its River Furnace, has decided to keep it in blast. There is little inquiry for Southern Iron, and no demand for Bessemer or Basic. For prompt shipment and for the second quarter we quote, delivered, Cleveland, as follows:

Bessemer	$17.75
Northern Foundry, No. 1	$16.50 to 17.25
Northern Foundry, No. 2	16.00 to 16.75
Northern Foundry, No. 3	15.50 to 16.25
Southern Foundry, No. 2	16.35 to 16.85
Gray Forge	15.65

Old Material.—The market shows no improvement. Consumers are limiting their purchases to small lots for immediate needs, dealers seldom getting an inquiry for over a carload. Dealers are complaining of the small margin between the buying and selling price. Prices are unchanged from a week ago, but quotations are largely nominal, and consumers often succeed in picking up what they want at a little lower than the quotations given. Dealers are doing no speculative buying for their stock yards except occasionally when some Scrap is offered them at a very low figure. Dealers' prices to the trade are as follows, per gross ton, f.o.b. Cleveland:

Old Steel Rails	$11.00 to $11.50
Old Iron Rails	15.00 to 16.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	13.00 to 13.50
Relaying Rails, 50 lb. and over	21.00 to 22.00
Heavy Melting Steel	11.00 to 11.50
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	7.50 to 8.50

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	7.00 to 8.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Bushelling	10.50 to 11.00
No. 1 Railroad Wrought	12.00 to 12.50
No. 1 Cast	12.00 to 12.50
Stove Plate	10.00 to 10.50
Bundled Tin Scrap	8.00 to 9.00

Finished Iron and Steel.—While the improvement over a month ago is slight, a somewhat better feeling seems to prevail. Nearly all orders that are being placed are for small lots for immediate needs. Both the local Bar Iron mills are running this week, but from present indications will be closed down for the next two weeks. The mills of the Otis Steel Company, which had been shut down for a week, and of the Cleveland Steel Company are running this week. The latter plant was running three weeks in March, and a slight improvement in orders for Light Sheets indicates that it will be able to increase its output this month. While the price of 1.50c., Pittsburgh, is being fairly well maintained by the mills, concessions on Iron Bars are still being made by jobbers. Concessions of $2 a ton are being made by some of the smaller mills on Light Plates. The price of Steel Bars is being firmly maintained. The demand for Plates is light. Lake shipbuilding interests have specified for the greater part of the Plates and Shapes needed for the boats under construction for this year's delivery, and the demand from that source from now on is expected to be very limited. The general Structural situation is very quiet, and the prospects for much improvement in the demand are not very bright. Jobbers report a fair demand for Blue Annealed Sheets, but little improvement in the demand for other material. We quote Iron Bars at 1.50c. to 1.60c., Cleveland, for car lots; Steel Bars, 1.70c., Cleveland, for car lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼-in. and heavier, 1.80c., Cleveland. We quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. The store price on Steel and Iron Bars is 1.75c. to 1.80c. The lower price, however, is being shaded in some cases for good orders. Warehouse

prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

New York.

NEW YORK, April 8, 1908.

Pig Iron.—Outside of one lot of 5000 tons of Basic Pig there have been no transactions of any magnitude. Buying is confined to moderate lots, nearly all the business being taken by Southern and independent makers. We quote at tidewater as follows: No. 1 Northern Foundry, $18 to $18.50; No. 2 Foundry, $17.25 to $18.25, and No. 2 Plain, $17 to $17.50. Alabama Irons are $17.25 to $17.50 for No. 1 Foundry, and $16.25 to $16.50 for No. 2 Foundry.

Steel Rails.—An order for 6000 tons of standard Rails for the Government of New Zealand has been taken by the Pennsylvania Steel Company, the Rails to be rolled at Sparrow's Point. The Interborough Rapid Transit Company has not yet placed the contract for 1000 tons of Bessemer and 500 tons of Open Hearth Rails, on which bids were received a short time ago. Some little business in Light Rails has been done in the past week.

Structural Material.—Gauged by the amount of work that has been figured on or for which plans are known to have been prepared, the Structural situation is nearer normal than that in other departments of the market. However, it is the postponement of actual contracts that causes the Structural market to drag, so that bookings, meantime, are at a rate less than 50 per cent. of that of last year. The decision of the Public Service Commission to call for bids for the construction of the Fourth Avenue Subway in Brooklyn is interesting to Structural works, as 40,000 tons of Steel will be required. The line will run from the Brooklyn terminal of the Manhattan bridge to Ashland place, and thence under Fourth avenue as far as Forthy-third street. The work will be divided into six sections, and bids on all will be opened May 8. The estimated cost is $15,000,000. An important building enterprise for which plans are in readiness for early contracting is the erection of a 36-story structure at Washington and West streets by the Chesebrough interests, owners of the present Whitehall Building. From 10,000 to 12,000 tons of Steel will be needed. In the past week the factory building of Blanchard & Co., Brooklyn, 1200 tons of Steel and Iron, including 400 or 500 tons of Cast iron columns, was let to the receivers of Milliken Brothers. The Pennsylvania Steel Company has taken six small bridges for the Lehigh Valley—400 to 500 tons—and 500 tons for this road's viaduct over the Central of New Jersey is still pending. We continue quotations, as follows, for tidewater deliveries on mill shipments: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—The Bar Iron market is quite unsettled, as the smaller mills are apparently anxious for business, and are making prices more attractive to customers than the 1.50c., Pittsburgh basis, which is the nominal price of Eastern makers. The little business now being done is on the basis of about 1.50c., New York. Even the concessions, which are now being made, are not bringing out many orders. It is stated that the consumption has fallen to such low proportions that those who usually require up to 500 tons a month are doing well if they take a carload. Steel Bars are unchanged at 1.60c., Pittsburgh, or 1.76c., tidewater.

Plates.—The market continues quiet, with only an occasional order for a small lot. The largest transaction reported called for something over 100 tons for a shipyard. Prices are still held as follows on standard sizes of Plates at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—The city of New York bought 1000 tons on Friday at about $24 per ton delivered. No other local business of any importance is in sight, while inquiries for small lots are not plentiful. The Pipe trade quickly feels the influence of fluctuations in the price of Pig Iron, and as Pipe makers have observed some stiffening in Southern Iron the past week they have accordingly advanced their prices on Pipe. Quotations on carload lots of 6-in. are now $24.50 to $25 per net ton at tidewater. It is deemed likely that this slight stiffening in prices may hasten Pipe buyers to place orders for their necessary requirements.

Old Material.—Steel Scrap is in somewhat better demand, but only in small lots and without any improvement in prices. Borings and Turnings are a trifle more active, but Foundry stock is quiet. Stove Plate appears to be a drug, as important consumers in this line are doing little or nothing in turning out new work. Practically no demand for Wrought Scrap is experienced by the dealers, as railroad companies have for a long time been forcing accumulations of Old Material on the market, much of which has been purchased directly by mills. Heavy railroad lists are again coming out, showing that the companies continue their policy of endeavoring to convert everything available into cash. It is stated that some important manufacturing establishments are following the example of the railroads and are scrapping their worn out machinery. Old Car Wheels are in very little demand, but are offered in such quantities that prices are lower. Relaying Rails are in some demand in small quantities, with an occasional sale as large as 1000 tons. They are still in ample supply. Dealers report that the local yards are not showing much of an accumulation of Scrap, notwithstanding the long continued slack demand. From the manner in which Scrap is being forced for sale by railroad companies, it would seem likely that when an improvement in business does take place prices will jump rapidly, as the supply will be short. We quote as follows per gross ton New York City:

Old Carwheel & Rolled Steel Wheels	$13.50 to $14.00
Heavy Melting Steel Scrap	10.50 to 10.75
Old Steel Rails, rerolling lengths	10.50 to 11.50
Relaying Rails	19.00 to 20.00
Old Iron Rails	14.50 to 15.00
Standard Railroad Iron Car Axles	16.00 to 17.00
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	11.50 to 12.50
Iron Track Scrap	9.50 to 10.50
No. 1 Yard Wrought, long	10.50 to 11.50
No. 1 Yard Wrought, short	9.50 to 10.50
Light Iron	5.00 to 6.00
Cast Borings	4.50 to 5.50
Wrought Turnings	6.00 to 7.00
Wrought Pipe	9.00 to 10.00
Old Car Wheels	14.00 to 15.00
No. 1 Heavy Cast, Stove Plate	13.50 to 14.50
Stove Plate	10.50 to 11.50
Locomotive Grate Bars	10.00 to 11.00
Malleable Cast	11.50 to 12.50

Iron and Industrial Stocks.

NEW YORK, April 8, 1908.

The stock market has been exceedingly quiet for several days, with slight fluctuations. A deterring influence on speculative movements has been the uncertainty regarding the outcome of the Erie Railroad Company's financial complications. Fear that the company might be placed in the hands of receivers, and thus cause apprehensions of a similar fate overtaking other railroad companies, has undoubtedly pervaded financial and investment circles. The range of prices on active iron and steel stocks from Thursday of last week to Tuesday of this week has been as follows: United States Steel common 32⅝ to 34⅛, preferred 97⅜ to 98½; Car & Foundry common 31¼ to 33; Locomotive common 42¼ to 44¾, preferred 91¼, ex-dividend, to 93¼; Steel Foundries preferred 30; Cambria Steel 28¼ to 29; Colorado Fuel 22⅞ to 24⅞; Crucible Steel common 5⅛ to 5¼, preferred 36¼ to 37; Pressed Steel common 23 to 23¾, preferred 76 to 79; Railway Spring common 32¾ to 34; Republic common 17⅝ to 18¾, preferred 68½ to 70⅞; Sloss-Sheffield common 44½ to 46½; Cast Iron Pipe common 23⅝ to 25⅛, preferred 68 to 69; Can common 4¾ to 4⅞, preferred 49½ to 50. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 33¾, preferred 98⅛, bonds 95⅛; Car & Foundry common 32¾, preferred 94½; Locomotive common 44½, preferred 91½; Colorado Fuel 23¼; Pressed Steel common 23, preferred 79; Railway Spring common 33¼; Republic common 18¼, preferred 69⅛; Sloss-Sheffield common 44½; Cast Iron Pipe common 24, preferred 68; Can common 4⅞, preferred 49¾.

L. A. Cole, president of the National Lead Company, in his annual report to stockholders says the volume of business for the year 1907 exceeded that of any in the company's history, notwithstanding the paralyzed condition of trade in the months of November and December. The financial statement shows net earnings of $2,942,245, an increase of $442,613, and a balance after preferred dividends of $1,236,513, an increase of $132,625. The company disbursed $981,131 among holders of the common stock, an increase of $361,469. This brought the surplus for the year down to $255,382, a decrease of $228,844. The total surplus now stands at $1,204,204. Concerning the outlook, President Cole says: "At this writing a comparison so far this year with the unprecedented volume of business done last year at the same time shows a shrinkage of 13½ per cent., which we hope to overcome as the season progresses, in view of the constantly improving conditions."

The committee for the readjustment of debt of the Westinghouse Electric & Mfg. Company, of which James N. Jarvie is chairman, has given notice that a majority of the convertible bonds, collateral notes and bills payable, and a large amount of the debenture certificates and accounts payable having been deposited under the plan and agreement of January 20, it has extended the period limited for the deposit of obligations and claims to May 15, with the Bankers' Trust Company of New York, the First Trust and Savings Bank of Chicago, the First National Bank of Pittsburgh, and the

National Shawmut Bank of Boston. The new plan for reorganization does away with the issue of mortgage bonds and reduces the amount of assenting stock to which stockholders must subscribe from $7,000,000 to $6,000,000. Under the new plan $10,000,000 of stock will be issued, but of this amount $4,000,000 will be taken care of by the merchandise creditors.

The net profits of the Canadian Westinghouse Company for the fiscal year ended December 31, 1907, were $427,058, an increase of 23 per cent. over the preceding year, according to a report from Hamilton, Ont., where the annual meeting of the stockholders was held March 31. Dividends paid during the year amounted to $215,221; $200,000 was set aside as reserve for depreciation and $20,000 as reserve for inventory. The deficiency of $8168 was deducted from previous surplus, and a balance of $391,284 was carried forward to profit as of January 1, 1908.

Dividends.—The Morse Twist Drill & Machine Company, New Bedford, Mass., has declared a quarterly dividend of 2½ per cent.

Metal Market.

NEW YORK, April 8, 1908.

Pig Tin.—More activity in trade, with a larger tonnage, was recorded in the last week than any time since the October panic. It is estimated that the week's turnover amounted to 1000 to 1200 tons, much of which, however, was for future shipment. The activity at the Tin Plate mills, of course, is responsible for a large share of this, although there is some mystery as to whether a considerable proportion of the business was speculative or was for consumption. Price changes during the week for 5-ton lot spot delivery New York, have been as follows:

	Cents.
April 2	31.50
April 3	32.10
April 6	32.10
April 7	31.50
April 8	31.75

Business of the week was largely confined to buying in New York City, there being no general demand from a large number of widely separated consumers, such as often springs up. Arrivals so far this month aggregate 980 tons, and there are afloat for American ports 1576 tons. The two London steamers sailing on April 8 and April 13 bring only small cargoes, and no steamer will sail on the 18th, so a shortage is foreshadowed during the latter part of the month, particularly if this present demand should keep up. The London market has been firm and not subject to the wild manipulations recorded in the previous week. That market closes to-day about £1 15s. above last week's close at £143 for Spot and £142 for Futures, Futures having moved up more in proportion than Spot.

Copper.—Prices are undeniably lower, but there seems to be a stubborn resistance to the decline. Lake is relatively the firmer, and held at more of a spread above Electrolytic than usual, being quotable at 13.12½c. to 13.25c., while Electrolytic is obtainable at 12.87½c. and possibly ⅛c. under for foreign shipment. Casting can be had at 12.75c., although there is an odd lot in the market that probably could be bought for 12.62½c. Some export business was done Tuesday within these limits, and American consumers were likewise offered Electrolytic at 12.87½c. Lake producers apparently have reduced their surplus more than the other sellers, but even they still have considerable metal on hand. It is estimated that beginning with May there will be an accumulation of nearly 10,000 tons of Copper monthly, unless either the European demand or consumption should pick up. This, of course, takes into consideration the increased production from the Butte District, and also some increase in Nevada. Foreign consumers have done very well in buying, exports so far this month aggregating 5068 tons. It is pointed out that whenever prices have declined to low figures European consumption has increased rapidly, and with subsequent higher prices the consumption has never fallen back to the previous level. Some interesting figures on the supplies of foreign Copper into Germany are given by L. Vogelstein, agent for Aaron Hirsch & Sohn, Halberstadt, Germany, those for January and February, 1908, being 28,400 tons, and in the corresponding time the previous year 16,044 tons. This is the German supply, according to Custom House returns, and while there is said to have been an increase in Copper melting in Germany no one believes that it has been as great as this, nearly 80 per cent. It really means that whereas during 1907 supplies both visible and invisible were down to a low figure Germany is now piling up stocks. The London market is but little changed from last week, closing to-day at £58 17s. 6d. for spot and £59 7s. 6d. for futures.

Waterbury Average.—The Waterbury average for March was 15c.

Lead.—The market is firm, with Desilverized Lead scarce, and all grades held firmly at 4c., New York. The St. Louis market is likewise firmer at 3.85c. Several inquiries have been in the market for good sized lots, and the demand continues to improve.

Spelter.—The cutting which has prevailed in the Spelter market for months continues more or less, and taken altogether the conditions in New York are unsatisfactory, as so much metal is still held here that was bought at considerably lower prices. The St. Louis market is quoted nominally at 4.55c., but 4.52½c. probably could be done. In New York the market is quotable at 4.70c. to 4.75c.

Nickel.—Prices are unchanged at 45c. for ton lots and 50c. to 60c. for smaller quantities.

Antimony.—Business is very dull, but prices are unchanged at 8.75c. for Hallett's, 8.75c. to 9c. for Cookson's and 8.50c. for outside brands.

Ferroalloys.—The price of 80 per cent. Ferromanganese has again weakened, and $42.50, seaboard, has been done. There is little business from dealers in 50 per cent. Ferrosilicon, and the market is nominally quoted at $80, Pittsburgh.

Tin Plate.—The Bright Tin Plate trade has recovered its equilibrium more quickly than any other branch of the Iron or metal trades. Terne Plates continue to lag, however, because of unsatisfactory conditions in the building trades. The consumption of Tin Plates by oil exporters is at a record breaking pace. Prices are unchanged at $3.89, New York, and $3.70, Pittsburgh, for 100-lb. IC Coke Plate. In Swansea Welsh Plates are unchanged at 12s. 7½d.

Old Metals.—Little change is observed, except a slight easing in the price of Heavy Copper and Copper Wire. Trade is dull, although a sprinkling of small orders keeps up a semblance of activity. Dealers' selling prices are as follows:

	Cents.
Copper, Heavy Cut and Crucible	12.50 to 12.75
Copper, Heavy and Wire	12.25 to 12.50
Copper, Light and Bottoms	11.50 to 11.75
Brass, Heavy	9.50 to 9.75
Brass, Light	7.50 to 7.75
Heavy Machine Composition	11.75 to 12.00
Clean Brass Turnings	8.25 to 8.50
Composition Turnings	9.00 to 10.00
Lead, Heavy	3.80
Lead, Tea	3.55
Zinc Scrap	3.50

B. A. Wallingford, Jr., of the firm of Walter-Wallingford & Co., Pig Iron and Coke, who has recently moved from Cincinnati to take charge of that firm's office in Pittsburgh, has been elected vice-president of the United Iron & Steel Company. Walter-Wallingford & Co. have been appointed agents for the sale of Cherry Valley Pig Iron made by the United Iron & Steel Company in all territories except New England and the East. Harry O. Price, resident agent for Walter-Wallingford & Co., remains with that firm in the same capacity as heretofore.

The Iron City Steel Company, Bessemer Building, Pittsburgh, dealer in new and Relaying Rails, has increased its capital stock, and is arranging to move into larger quarters in the same building, when it will be in a better position to care for the new departments in Bars, Shapes, Sheets, Pig Iron, &c., which it recently added.

The suit of the Babcock-Wilcox Company against the receivers of the New York State Steel Company, Buffalo, to recover possession of a battery of five boilers installed by the former in the new plant of the steel company, has been decided in favor of the plaintiff. The receivers for the steel company claimed that the boilers, after being installed and bricked in, became part of the realty of the company, but the finding of the special master in the case was that the title had not passed from the plaintiff, that there was no delivery or acceptance of the property, and awarded the boiler company possession. The amount involved was $41,000.

The Ajax Mfg. Company, Cleveland, Ohio, builder of forging machines and bulldozers, reports a very satisfactory increase in its foreign business the past two weeks. The company has taken orders for three machines for Korea, two for Egypt and several for England. An improvement is also seen in domestic inquiries. The company's plant is now being operated at about 70 per cent. of its full capacity.

McCoy & Brandt, manufacturers' agents, 619 Ferguson Building, Pittsburgh, have secured the agency in the Pittsburgh District for the sale of steam pumps made by the Vance Steam Pump Company, Battle Creek, Mich.

Customs Decisions.

Corundum Ore.

It has been decided by the Board of United States General Appraisers that corundrum ore imported by the American Cutlery Company, Chicago, must stand duty at the rate of 1 cent per pound as assessed by the Collector of Customs. The protestants claimed free entry, either under paragraph 671 or 550, or that duty should have been assessed at the rate of 10 per cent. as an unenumerated unmanufactured article. After a consideration of the testimony the board reaches the conclusion that the classification as imposed is correct.

Dross Composed of Tin and Lead.

The General Board has decided that dross composed of tin and lead is not entitled to free entry as "black oxide of tin," or "grain tin," but is dutiable properly as "metals unwrought, not specially provided for," at the rate of 45 per cent. ad valorem. In overruling the protest, which is filed by Kahn Brothers, New York, the board refers to previous decisions having a bearing on the case at issue, and points out that there appears to be no reason to extend the court's ruling holding 38.39 per cent. is controlling. The decision says that tin dross contains no lead and is composed of metallic tins. The plea is made in all of the importers' papers that the merchandise should be returned free of duty under the provisions in the tariff law for "black oxide of tin," or "grain or granulated tin." The board holds that the correct claim was not made, and the protest is accordingly overruled.

Planished Copper Plates.

Importers of so-called planished copper plates have been defeated in an effort for free entry or lower duty on the articles. The test case before the board stood in the name of B. F. Drakenfeld & Co., New York, but other firms are reported to have a direct interest in the question of classification. The Custom House authorities returned the plates for duty at 45 per cent. as being manufactures of metal. On the other hand, the importers maintained that the merchandise should be granted free entry under the tariff provision for "copper plates not manufactured." Several alternative claims are made, among them that the plates are dutiable at 25 per cent. as composition metal "plates engraved or lithographed for printing." Other claims are that the article is entitled to enter under the provisions for "copper in rolled plates," or "composition metal." None of the contentions raised are regarded by the board as controlling and they are accordingly overruled. General Appraiser Fischer, who writes the decision for the board, discusses the tariff classification of merchandise of this kind at considerable length. In part, he says:

> That the articles are copper plates not manufactured is the claim most seriously relied upon by the importers in this case. It appears that these plates are planished, and in this advanced state they are ready for engraving. It further appears from the evidence before us that a somewhat elaborate process of grinding and polishing which greatly enhances the value of the articles is necessary in order to make the plates ready for the engraver's use. In other words, in their condition as imported, the plates have been advanced by a process of manipulation—a patented process—from the status of copper in plates not manufactured. . . . We believe that paragraph 532 is to be read so as to include only such things as are crude or plate forms of copper obtained either by casting or rolling, and is not to be construed so as to include plates of copper which have been subjected to further processes resulting in an article advanced beyond such forms. In our opinion, the qualifying words "not manufactured," as found in that paragraph were intended to specifically limit such provisions to plates which, like all the other articles mentioned in the paragraph, to wit: "bars, ingots or pigs," are crude or raw materials, and not articles advanced beyond that state.

Table Steels.

A protest by the Flagg Cutlery Company, New York, protesting against the imposition of a high duty on table steels without handles was overruled and the classification imposed by the collector affirmed.

The National Transit Company has started work on an addition to its plant at Oil City, Pa., to cost about $300,000. The company makes pumps and machinery for pumping stations in the oil fields of different States, and when running full employs about 500 men in its shops.

Trade Publications.

Kno-Burn Steel Lath. Northwestern Expanded Metal Company, Chicago. Booklet. Gives data and information relative to the use of expanded metal for steel laths, reinforced concrete and general construction work. Attention is called to the fact that the cost between combustible and incombustible building construction material is gradually but steadily narrowing, and necessary precaution against fire demands the extended use of steel and concrete in building construction. Diamond mesh Kno-Burn lath is made of No. 24 gauge steel, 21 to 24 in. wide and 96 in. long, and is packed nine sheets in a bundle. D. D. lath is made of 24 to 27 gauge and is packed nine sheets in a bundle containing 24 yards. A special beam clip and suspension bar for suspending ceilings from solid rolled beams or concrete slabs is described and illustrated.

Feed Water Regulators. Williams Gauge Company, Pittsburgh, Pa. Circular. Delivers an argument for applying economy in general and facts establishing its accomplishment in particular where the Williams safety automatic feed water regulators, pump governors and steam traps are used. The feed water regulators are claimed on the average to pay for themselves in six months. A leaflet inclosed with the circular gives facsimiles of duplicate orders received, aggregating in all 71 of these regulators.

Portland Cement.—Lawrence Cement Company, 1 Broadway, New York. 1908 catalogue of Dragon Portland cement. Size, 5 x 8 in.; pages, 126. The early history of Portland cement is interestingly outlined, and the uses and economy of it. Dragon Portland cement, as the catalogue continually repeats, has been used over 18 years. Directions for testing cement and reports of tests on the Dragon cement are included, and a large number of illustrations show buildings and bridges in which it has been used. A list of other places in which it has been used and a number of testimonial letters are appended.

Lathes.—Seneca Falls Mfg. Company, Seneca Falls, N. Y. Catalogue No. 21B. Size, 6 x 9 in.; pages, 31. Refers to the company's line of Star and Seneca Falls lathes. The first are made for foot or power, in sizes from 9 to 11 in. swing. The Seneca Falls screw cutting engine lathes are made in 12, 14 and 16 in. swing. Speed lathes, wood turning lathes, and attachments and accessories are also illustrated and described. The latter include tool holders, milling and gear cutting attachments, rests, chucks, dogs, tools, &c.

Electrical Apparatus.—Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. Folders and catalogues. The seven folders deal respectively with Westinghouse 250-volt direct current arc lamps, Westinghouse precision meters, Westinghouse alloy No. 18 for babbitted bearings, electro-static voltmeters, Wattmeters. Westinghouse motors and mill motors. One catalogue is devoted to an article on gas-driven electric power systems as exemplified in the Warren & Jamestown Street Railway, and the other gives illustrations and descriptions of electric drive in textile mills.

Concrete Piles.—Foundation Company, 115 Broadway, New York City. Catalogue. Size 6 x 9 in.; pages 88. Concerns the Simplex concrete pile foundation, wharf and trestle systems of the Simplex Concrete Piling Company, Tacony, Philadelphia, Pa. Illustrations show various installations of these piles, buildings which have been built on them, and tests of carrying capacities. The descriptive matter pertains to the two principal methods of putting in Standard Simplex piles, these being the alligator form and the cast iron point driving form. In the first method after the form has been driven to the desired depth and the concrete has been deposited by means of buckets, the alligator point is pulled up with the driving form; the other method differs only in that the cast iron point remains in the ground. Shell, molded, jointed and composite piles are also dealt with. Some testimonial letters are included.

Motors.—Barriett Electric Mfg. Company, Cincinnati, Ohio. Bulletin No. 106. Refers to polyphase induction type N motors, which are made in all sizes from ½ to 50 hp. for two or three phase circuits and are supplied for all standard voltages. A table of code words and ratings is given.

Boilers.—Rust Boiler Company, Pittsburgh, Pa. Pamphlets. One gives a report of tests on a Rust water tube 335-hp. boiler, and the other contains descriptive matter and sectional views through types B and C Rust boilers.

Gas Engines.—S. M. Jones Company, Toledo, Ohio. Catalogue. Deals with Rathbun vertical gas engines, which are built in two and three cylinder types in sizes from 50 to 300 hp., and twin three-cylinder engines in sizes from 150 to 600 hp. The parts are described separately and illustrations show the different types.

Water Gauges. Automatic Steam Appliance Company, Allegheny, Pa. Circular. Pertains to the Reliable self-closing and tempering protective water gauge for use on locomotives, stationary and marine boilers, steam separators, pressure tanks, &c.

Indicators and Appliances.—Trill Indicator Company, Corry, Pa. Catalogue. Size 6 x 9 in.; pages 31. Gives illus-

[illegible] the company's Triumph steam engine indicators. Faultless reducing wheels, improved planimeters, Triumph cord take-up, indicator cocks and supplies, and carrying cases. Several pages give information on the taking and reading of indicator cards.

Mining Machinery.—Chalmers & Williams, Chicago. Catalogue No. 1, section 1, first edition, devoted chiefly to a description of the Kennedy gyratory crusher, a new design of this type recently brought out. It also contains description and illustrations of auxiliary equipment for ore and rock crushing plants, with outline drawings showing the manner of installation best adapted to such machinery.

Gauge Testers.—Crosby Steam Gage & Valve Company, 16 Dey street, New York. The March issue of the *Crosby* contains illustrated descriptions of the Crosby pressure gauge tester, Crosby vacuum pump, Crosby fluid pressure scales, Nos. 1 and 2, a boiler test pump, Crosby bench test pump, and inspector's test pump.

Oiling Devices.—Wm. W. Nugent & Co., Chicago. Catalogue No. 7, January 1, 1908. Size, 6 by 9 in., 96 pages. Paper covers. Embraces a very complete line of oiling and lubricating devices which include designs adopted for the oiling of crank and cross head pins, eccentrics and guides on all types of engines. The method of attachment in various positions is shown in a large number of drawings and illustrations. The catalogue is prefaced by an interesting article on how to oil an engine, which is written from a practical viewpoint, and embraces the experience of the writer as an operating engineer as well as that gained in designing oiling devices. Diagrams for piping the direct pressure oiling system on high-speed center crank engines and cross compound Corliss engines are shown in a supplemental sheet in the back of the catalogue.

Ferroalloys.—Western Foundry Supply Company, Cliff and John streets, New York City. Pamphlet. Deals with the use of ferroalloys in the foundry, including 80 per cent. ferromanganese, ferrosilicon and ferrochrome, explaining their advantages and how to obtain the best results with them. For brass foundries 30 per cent. manganese-copper and manganese-oxide are similarly discussed. Prices are appended.

Spiral Pipe, &c.—American Spiral Pipe Works, P. O. Box 485, Chicago, Ill. Catalogue. Contains descriptions and illustrations of spiral riveted pipe, forged steel pipe flanges, and hydraulic and exhaust steam supplies. Installations of spiral riveted pipe and results of tests are shown.

Gas, Gasoline and Oil Engines. St. Marys Machine Company, St. Marys, Ohio. Catalogue. Size 6¼ x 9¼ in.; pages 32. Pertains to the construction and operation of the company's engines, and gives illustrations and descriptions of duplex engines, kerosene oil engines, traction engines, electric light engines, stationary, portable and pumping engines. Unique engines with fire pumps, engines for mining and hoisting purposes, Unique engines with pumping jacks, semiautomatic engines and Lukens clutch pulley.

Coal and Ashes Handling Machinery.—Jeffrey Mfg. Company, Columbus, Ohio. Catalogue. Size 6 x 9 in.; pages 56. Illustrates installations of Jeffrey coal and ashes handling machinery in power houses, breweries, engine works, distilleries, mills, gas and electric plants, refineries, office buildings, &c.

Electrical Apparatus.—Fort Wayne Electric Works, Fort Wayne, Ind. Three bulletins. No. 1097, superseding No. 1060, pertains to the type KM-1 portable Wattmeter calibrators. No. 1099, superseding No. 1029, deals with the type DCM-form C inclosed direct current multiple arc lamps for 110 and 220 volts. No. 1101, superseding No. 1082, refers to the company's multiple system of alternating current inclosed arc lighting for street service.

Steel Car Underframes.—Ralston Steel Car Company, Columbus, Ohio. Pamphlet. Shows various types of steel underframes which have been designed for baggage, mail and passenger coaches, as well as box and gondola cars and cabooses.

Hoisting and Haulage Engines.—Litchfield Foundry & Machine Company, Litchfield, Ill. Catalogue No. 6. Size 6¼ x 10¼ in.; pages 32. Illustrates and describes the company's various types of first motion hoisting and haulage engines, geared hoisting engines, compound geared endless rope haulage engines; electric-driven haulage machine, tandem drum geared tail rope engine, stationary engines, auxiliary engine for steam reverse, mine ventilating fan and engine, and sheave wheels.

Drills and Saws.—Robertson Mfg. Company, Buffalo, N. Y. Pamphlet. Pertains to Robertson's 12-in. sensitive drill, 21-in. universal drill press, 24-in. sliding head drill, and Nos. 1 to 7 rapid cut power saws.

Truss Reinforcement.—American Rolling Mill Company, Middletown, Ohio, and the Truss Metal Lath Company, 147 Fourth avenue, New York City. Catalogue. Size 7½ x 9½ in.; pages 39. Describes the company's truss method of concrete reinforcement and shows buildings in which it has been applied. A report of a fire and water test made at Columbia University upon truss metal lath partitions is included.

Structural Steel.—John Eichleay, Jr., Company, South Twentieth and Wharton streets, Pittsburgh, Pa. Booklet. Size, about 4 x 6½ in.; pages 80. Includes numerous illustrations of structural work that the company is prepared to handle, and the raising, lowering, moving, shoring and underpinning of structures or heavy objects. Useful tables of dimensions, weights, capacities, &c., are given.

Dry Kilns.—American Blower Company, Detroit, Mich. Catalogue. Pages 78. Contains an interesting discussion of the theory of lumber drying and illustrates and describes the A B C moist air dry kiln and blower apparatus. It similarly deals with dry kiln specialties and gives examples of important installations. Accompanying the catalogue are two pamphlets, one devoted to blowers for mines and the other to the Scott kiln drying system.

Flexible Steel Conduit and Flexible Steel Armored Conductors.—Sprague Electric Company, New York. Pamphlet. Confined to flexible steel conduit and flexible steel armored conductors and tools and fittings used in their installation.

Automobile Parts.—High Wheel Auto Parts Company, Muncie, Ind. Booklet. Given principally to sectional views of automobile parts.

Vacuum Valves.—Norwall Mfg. Company, Chicago, Ill. Booklet. Concerns automatic air and vacuum valves, particularly adaptable for radiators.

Railroad Electrification.—General Electric Company, Schenectady, N. Y. Bulletin No. 4546. Gives detailed description of the electrification of the West Shore Railroad between Utica and Syracuse, with sectional views of power house and road bed construction.

Gears.—The Fellows Gear Shaper Company, Springfield, Vt. Booklet. Size 6 x 9 in.; pages 23. Describes in detail the construction and advantages of the Stubb tooth gear, with an increased angle of obliquity. Also contains interesting diagrams showing comparisons of maximum arc of action in various types of gears.

Feed Water Heaters.—Harrison Safety Boiler Works, Philadelphia, Pa. Pamphlet. Describes the advantages of heating boiler feed water where the main engine is run condensing, and gives illustrations of the Cochrane feed water heater.

Friction Pulleys.—Garvin Machine Company, New York. Folder. Describes friction pulleys in detail, with illustrations.

Concentric and Inverted Diffusers.—General Electric Company, Schenectady, N. Y. Bulletin No. 4542. Describes use of diffusers on arc lights and illustrates many of their applications.

Positive Pressure Blowers.—Gilmer Crowell, 292-296 Graham street, Brooklyn, N. Y. Booklet. Pages 28. Describes and illustrates the Crowell line of positive pressure blowers and rotary compressors. Contains valuable directions as to setting up and operating, prices, &c.

Separators.—Sturtevant Mill Company, Boston, Mass. Bulletin Series 105. Explains the Newaygo separator, which was described in *The Iron Age*, October 10, 1907, and is essentially an inclined vibrating screen fed by a spiral conveyor. It is adaptable for use in cement plants, fertilizer plants, mining plants, &c.

Water Tube Boilers.—Rust Boiler Company, Pittsburgh, Pa. Bulletin. Contains report of tests on Rust boilers and a short description of the boiler construction.

High Speed Steel.—Carpenter Steel Company, Reading, Pa. Catalogue describing Zenith high speed steel and twist drills. Gives results of tests, illustrations of the company's drills, price tables and valuable hints for working tool steel. This matter is accompanied by a catalogue describing the company's automobile steels. The latter includes a table showing the elasticity of the company's steel and a description of the company's laboratory.

Electric Motors.—General Electric Company, Schenectady, N. Y. Bulletin No. 4545. Covers the product of the company's small motor department. Includes illustrations of assembling motors, sectional views and a general description.

Electric Locomotives.—General Electric Company, Schenectady, N. Y. Bulletin No. 4537. Describes a large number of present and proposed representative types of electric locomotives built by the company. Contains sketches of locomotives ranging from 17 to 150 tons for all classes of service, electrical and mechanical data and a brief preface describing the reasons for the growing demand of electric traction.

Storage Batteries.—Westinghouse Machine Company, Pittsburgh, Pa. Pertains to storage batteries for portable use and contains illustrations of storage batteries adaptable for lighting, heavy vehicle driving, automobile ignition and for switch service for lighting and power, together with tables giving dimensions, capacity and other necessary information.

Valves.—Nelson Valve Company, Philadelphia, Pa. Catalogue H. Pages 52. Contains matter relating to the company's full line of valves and fittings. The book is profusely illustrated, showing valves and unassembled parts, together with necessary descriptive matter, price-lists and dimension tables.

High Speed Saws.—United Engineering & Foundry Company, Pittsburgh, Pa. Catalogue, 21 pages. A well illustrated book, showing the company's line of hot and cold metal saws for use in rolling mills and a varied assortment of such equipment.

The Machinery Trade.

NEW YORK, April 8, 1908.

Business appears to be in a rather unsettled condition and the railroads and larger industrial companies are not inclined to come into the market for more than the few tools that are actually needed. Projected improvements of any size are also being held up, awaiting some quickening in business. As a result of the hesitancy on the part of the larger interests to come into the market there was no noticeable increase in the demand for machinery the past week, and few sales or inquiries for lots of any size were reported. Little has developed to afford much encouragement to machinery houses, and many of them are of the opinion that there will be no material increase in the demand for tools for some time. The construction of the Fourth Avenue Subway in Brooklyn will proceed rather slowly and it will be many months before the trade will derive much benefit from the purchase of machinery for that work. It is understood that the tools on the list issued in the West by the Chicago, Lake Shore & Eastern Railroad will not be purchased until summer. A refreshing feature of the trade is the manner in which the important machine tool builders of the country are maintaining prices, a large manufacturer having only last week refused to make a slight reduction to secure a good order. We are able to announce this week that two machine tool manufacturers have recently advanced prices 10 per cent.—one a manufacturer of radial drills and the other a maker of screw machines.

The season for purchasing sugar machinery for Cuba and Porto Rico is now on and the buying from those sources is sufficiently large to cause gratification among machinery men who cater to that class of trade. While there is only one large enterprise of the kind before the trade, many of the companies holding big interests on those islands are doing considerable in the way of replacing old equipment and making small additions to their plants, which has resulted in some good business for the power equipment houses, as well as those who make a specialty of sugar mill requirements. The largest sugar mill enterprise before the trade is that of the N. P. Pratt Laboratory, Atlanta, Ga., which some weeks ago secured the contract for sugar mills in Cuba which aggregate an expenditure of $1,000,000. Part of this work has been let to the Fulton Foundry & Machine Company, Atlanta, Ga., which is an operating company of the N. P. Pratt Laboratory, and other orders for necessary equipment have been placed in the trade.

The New York Central Railroad, which has for the past few months done considerable scattered buying, last week sent out inquiries for the following machine tools: One 30 in. by 14 ft. lathe, one 30 x 30 in. by 12 ft. planer, one 20-in. drill press, one 30-in. emery grinder, one motor driven bar shear, one 24-in. shaper, one bulldozer, one 42-in. vertical boring mill and one 42-in. upright drill.

The report that the Michigan Central Railroad has purchased a large tract of land at Kalamazoo, Mich., as a site for new shops is erroneous.

The Colonial Steel Company, Pittsburgh, Pa., has some inquiries in the market covering machinery equipment to be used in a new composite metal department. The requirements include rolling mill equipment, one slitting machine, two straightening machines, &c. The purchases, it is understood, will be closed very shortly, as it is the intention to get the new department in working order as soon as possible.

The International Engineering Company, Carter Building, Scranton, Pa., will shortly be ready to take up the purchase of machinery for equipping its new plant. The list of machinery required is not quite completed, but it will cover such machines as are usually installed for general boiler and engine work. The company has selected a location for its new plant and plans for the construction of the buildings will be completed shortly. The company was organized for the manufacture of traction, stationary and small locomotive engines, tubular, upright, stationary, locomotive, traction, portable boilers, general sheet iron plate and machine work, and is managed by practical mechanics and business men. H. F. Jeffrey is president; E. R. Kyler, vice-president and secretary; I. R. Miller, vice-president and consulting engineer; O. J. Hall, treasurer; F. C. D. Wilkes, mechanical engineer, and H. W. Miller, general superintendent.

The J. W. Rosenbaum Company, 239 Centre street, New York, manufacturer of art metal novelties, has purchased a plant 50 x 85 ft., two stories, in Newark, N. J., and expects to move there shortly. It is understood that before long an extensive addition will be made to the plant, and work will be begun at once on a small extension to comprise a new boiler and engine house. The amount of horsepower the company will use has not been decided as yet, but it will be purchased shortly. It is also expected that some additional new equipment will be purchased for making metal specialties in brass, iron and composition. The machinery expenditures, it is said, will amount to about $10,000.

The Frevert Machinery Company, 18 Dey street, New York, has received a nice order for machine tools from Chicago, covering some heavy lathes.

The Uncas Power Company, 49 Shetucket street, Norwich, Conn., has awarded a contract to Tucker & Vinton, 103 Park avenue, New York, for the construction of a dam and hydraulic power plant on the Shetucket River, in the town of Scotland, near Norwich. The power equipment will include three sets of duplex turbine wheels, to develop about 2500 hp. The dam will be 225 ft. long and about 70 ft. wide at the base. A transmission line will be constructed to convey the power developed from Scotland to Norwich. The buying, it is understood, will be done from the company's power office in the latter city, and it is expected that these details will be closed shortly, as it is hoped to complete the plant by fall.

McClave-Rimmer & Co., 90 West street, New York, have sold to J. Herbert Newburg, Goshen, N. Y., a Ridgway engine and dynamo to develop 140 hp.

The Public Service Commission will receive bids until May 8 for the construction of the Fourth Avenue Subway in Brooklyn, and it is probable that awards for some of the work will be made within two or three weeks after the date set for opening bids. The route for which bids will be asked extends from the Brooklyn terminal of the new Manhattan Bridge to Fourth avenue and Forty-third street, and the work is divided into six sections. Bids for each section will be received separately or a bidder may put in estimates on all of the sections, but owing to the financial condition of the city it is not likely that the contract for more than one or two of the sections will be undertaken this year. The entire cost of the six sections is estimated at $15,000,000, and the contracts to be let will cover only the construction of the subway, it being the intention to secure bids later for the equipment. Bids will also be asked for the construction of galleries along the entire roof, but they must be submitted separately from the bids for the subway work. Contractors on each section will be given two years from the date of contract in which to complete the work, and partial payments are to be made from month to month as the work progresses. Each bid must be accompanied by a certified check for $12,000 for each of the sections, except the two between Willoughby and Sackett streets, those to be accompanied by checks for $15,000 each.

The Superintendent of Public Works, Albany, N. Y., will receive bids until April 21 for making the following improvements to the Erie Canal: Contract No. 20, for dredging a channel in the Mohawk River, length 53 miles; contract No. 45, for the construction of a dam in the Oneida River at Caughdency; contract No. 64, for the improvement of the canal from the west end of contract No. 9 to 100 ft. east of Gasport Bridge.

The D. H. C. Company has been organized, with temporary offices at 27 East Twenty-seventh street, New York, to manufacture and deal in a newly patented brand of metallic packing. The company has been formed under the laws of New York State, with $200,000 capital, and the directors are Nathaniel Huggins, William B. Claflin and Edward M. Dalley. After May 15 the company will occupy offices in the Hudson Terminal Building and for the present will contract for the manufacture of its product. Later on it is expected that a plant will be built near New York.

Frank MacGovern, formerly vice-president and general manager of Rossiter-MacGovern & Co., and J. Warren Archer, formerly manager of the sales department of the same company, have organized the firm of MacGovern-Archer & Co., with offices at 114 Liberty street, New York. The new firm will deal in electrical and steam machinery, the same class of business as was carried on by the old company.

Catalogues Wanted.—The El Campo Machine Company, El Campo, Texas, incorporated with a capital stock of $10,000, will in addition to repairing gasoline engines manufacture a line of centrifugal pumps. Some additional machinery will be required for this work, and the company desires catalogues from makers of machinery for this purpose.

Chicago Machinery Market.

CHICAGO, ILL., April 7, 1908.

If there has been any increase in the machinery trade of the past week it has not been of notable extent. Manufacturers of electrical equipment, however, see in the increasing number of inquiries, coming from various power plant projects throughout the country, the promise of better business as soon as plans are more fully developed. Included in these enterprises are quite a number of municipal plants for which funds must be provided by the sale of bonds. The issues of such securities, when not too large to be taken care of locally, are readily absorbed, and the necessary funds provided without difficulty; so that the smaller plants are able to, and are, coming into the market for equipment. This

business, while entirely acceptable, is, of course, insufficient in volume to supply the manufacturing capacities, which will not be fully occupied until the larger interests begin buying more freely. Western advices indicate considerable activity in new plant construction and extensions requiring motive power and machinery equipment. These for the most part do not involve extensive requirements, but they seem to be more numerous than elsewhere.

The machine tool houses are still principally engaged on pickup orders. Aside from the recent list of tools comprised in the Chicago, Milwaukee & St. Paul requirements, recently published in these columns, there are no equipment orders of considerable size in the market. One house reports the sale of three good sized lathes within the past week; another states that its total sales for March equal those of January and February combined, while others have either held about even or made slight gains. It would seem, on the whole, therefore, that in general volume, trade is at least holding its own. While nearly all dealers have full stocks of new machines some of them are running pretty low on good second-hand tools. At least two houses have recently purchased several lots of second-hand tools to replenish their stocks. As is usually the case in times of depression buyers exhaust the possibilities of the second-hand market before turning their attention to new tools, but at the same time they are much more critical in their demands as to quality than was the case a few months ago. Dealers, therefore, find it necessary to limit their purchases of second-hand machinery to first-class tools.

Among the recent railroad purchases were a few boiler shop tools bought by the Big Four Road for installation in the Beachgrove shops at Indianapolis.

Machinery Requirements of Chicago, Lake Shore & Eastern Railroad.

The machinery houses are figuring on the following list of tools submitted last week by the Chicago, Lake Shore & Eastern Railroad, on which deliveries are required not later than July 1. It is understood that this equipment is to be installed in the new shops recently constructed by this road at Gary, Ind., for which the purchase of a considerable list of tools was made last Fall.

One 42-in. engine lathe, motor driven; one 16-in. engine lathe, motor driven; one 30 x 30 in. by 8 ft. motor driven planer, two heads; one double head bolt machine to cut bolts from ⅜ to 1½ in., with full set of dies; one 24-in. vertical drilling machine; one 66-in. radial drill, motor driven; one cylinder boring bar machine to bore cylinders from 16 in. to 32 in.; one double head punch and shears with 36-in. throat, to shear 1 x 6 in. plate and to punch 1-in. holes through 1-in. plate; one set bending rolls, 7 ft. between housings, to bend ½-in. plate; one flue welding machine; one 1½-in. Ajax bolt heading machine; one No. 6 punch and shear, to shear ¾ x 3 in. bars, with angle shear attachment to shear ⅜ x 3 x 3 in. angles; one 33-in. car wheel boring machine; one 200-ton hydraulic wheel press to press on car wheels; one single head axle lathe; two yoke riveters; one radial drill with 12-ft. arm.

Plans have been completed by the Acme Engine Company, Spokane, Wash., for large extensions to its present plant during the coming summer. The reconstructed plant will consist of a machine shop and a foundry with 600 sq. ft. of floor space, together with the addition of a large blacksmith shop. The boiler shop and pattern shop will also be enlarged, and a considerable amount of new machinery and equipment will be required for distribution through the various departments. The blacksmith shop will be supplied with drop forge hammers, power trip hammers, bolt forger, and the facilities of the boiler and pattern shop will be materially increased by the installation of new machines.

The Triumph Gear Company, Detroit, Mich., which, under the management of W. G. Morley, has for over a year been manufacturing the Triumph marine reversing gears and machine specialties, has been incorporated with a capital stock of $25,000, and has removed from Sixth and Congress streets, its former location, to 226-228 Abbott street. Additional capital and added facilities for manufacture were made necessary by the constantly increasing demand for the Triumph marine reversing gear, which constitutes the company's chief specialty. It is stated that the company will be in the market for machine tools from time to time as business demands.

The Yampa Smelting & Refining Company, Bingham, Utah, recently placed a contract with the Allis-Chalmers Company, Milwaukee, Wis., for a large equipment of machinery for converting copper matte into blister copper, consisting of two electrically operated converter stands with six 84 x 126 in. converter shells. The contract includes the furnishing of all accessories such as copper molds and cars, ladles, tamping machinery, a complete silica crushing plant for converter lining, with electric motors, and a cross compound blowing engine for furnishing the blast to the converter.

The Cutler-Hammer Mfg. Company, Milwaukee, Wis., has been awarded the contract for the electric turret-turning gear of the United States Steamship Delaware, now under construction at Newport News. This company designed and built the electric turret-turning gear installed in the port, after turret of the Indiana, the crew of which holds the world's record for marksmanship, 10 shots in two and one-half minutes, all hits.

The city of Centralia, Ill., has decided to expend $13,000 in the improvement of its waterworks system. The improvements include a new pump of 3,000,000 gal. None of the machinery or material required has yet been purchased.

Bids will be received by the city of Ligonier, Ind., until April 21, for the equipment of an electric light plant, including engine, boilers, transformers, meters and line material.

The Childress Ice & Light Company, Childress, Texas, has been incorporated with a capital stock of $40,000, and has begun the construction of a new plant, which it expects to have in operation by July 1. The equipment purchased includes a Wolfe-Linde ice machine of 25 tons daily capacity: 100-kw. Fort Wayne direct connected exciter dynamo; one 16 x 36 in. Ohio Corliss, and one 14 x 36 in. Hamilton Corliss engines, and two 150-hp. Keeler water tube boilers.

Cleveland Machinery Market.

CLEVELAND, OHIO, April 7, 1908.

The condition of the machinery market shows practically no change. Dealers continue to pick up a few scattering orders for small sized single tools, but the volume of their sales as compared with the past few weeks shows no improvement. No inquiries for a good sized order of tools are coming into the market, and none of the few of such inquiries that were received last month has resulted so far in a sale. A dealer who asked how matters stood in regard to one of the largest of these inquiries received word a few days ago that it had been decided to postpone indefinitely the proposd purchase of several thousand dollars' worth of machinery and machine tool equipment.

Machine tool builders report no improvement in their domestic orders, but some concerns that have a foreign trade report a better foreign demand for their products, and orders that they have taken for export during the past few weeks have enabled them to increase considerably the capacity at which their plants have been operated. While builders of heavy power machinery have nothing to report in the way of sales, they report some improvement in inquiries in this territory and expect some fairly good orders to be placed within the next few weeks. A more hopeful feeling seems to prevail among manufacturers, but general conditions among concerns engaged in the metal trades are far from uniform. Some plants no longer feel the effects of the depression and are running at practically full capacity, while others are running on half time or less, with no increase of orders over the first of the year. The local automobile industry is looking fairly good at present. Some good orders have come in and at least two plants are running at about full capacity. Engineering firms report considerable improvement in the outlook for construction work in some lines, but little work is in sight in the way of designing and erecting industrial plants.

The general financial situation is still far from satisfactory. Collections are quite bad and prospective borrowers complain that banks are asking too high rates of interest for loans. The hesitancy of buyers of machinery and tools to place orders for plant additions and improvements is attributed partly to the condition of the money market.

A large number of second-hand tools are now being offered to dealers, but the demand is limited and dealers are slow in stocking up with used tools.

Jobbing foundries report some improvement in the demand for light castings and local plants are being operated at an average of about 50 per cent. The demand for heavy castings, however, is very light, and there is more price cutting among makers of heavy castings than among foundries that make light castings.

The Union Steel Screw Company, Cleveland, reports considerable improvement in orders and is in receipt of encouraging reports from its traveling men in the West and Southeast. The company is now operating its plant with full force 40 hr. per week.

The Bronson-Walton Company, Cleveland, maker of steel hollow ware, has increased its capital stock from $100,000 to $200,000, to provide more working capital for the extension of the business. No additions to the plant are contemplated for the present.

The Packard Electric Company, Warren, Ohio, has closed a contract for the erection of a new plant. The building will be of brick, 48 x 84 ft. and two stories high.

Reports from Niles, Ohio, state that the Standard Electric Company of that city has practically decided to build a large factory for the manufacture of Tungsten lamps.

The Osborn Engineering Company, Cleveland, has awarded the following contracts for the foundry equipment for the new plant of the Bay View Foundry Company, Sandusky,

Ohio: Cupola, crane, hoist and tumbling barrels to the Northern Engineering Works, Detroit; generator, Westinghouse Electric & Mfg. Company, Pittsburgh; compressor, Bury Compressor Company, Erie, Pa.; blower, grinder and other equipment, Central Foundry & Supply Company, Columbus, Ohio.

The directors of the American Roll & Foundry Company, Canton, Ohio, have called a meeting of the stockholders for April 30 to take action on a proposed increase of the capital stock from $200,000 to $300,000.

The Royal Foundry & Machine Company, Canton, Ohio, has been incorporated, with a capital stock of $15,000, by Paul Browsky, W. J. Putnam, G. P. Browsky, George F. Edel and A. P. Mouer.

The American Case & Register Company will erect a large plant at Salem, Ohio. One of the building contracts has been closed and the work will be started at once.

George B. Dusinberre, 517 Electric Building, Cleveland, Ohio, has been appointed representative of the Duplex Metals Company, New York, for the sale of Monnot copper clad wire and other products. Mr. Dusinberre's territory will be the States of Ohio, Indiana and Michigan. In addition to the already large demand for this wire for telephone and kindred uses, there is a growing appreciation of its value for many mechanical applications where the strength of the steel with the protective qualities of the welded copper covering are desirable.

Cincinnati Machinery Market.

CINCINNATI, OHIO, April 7, 1908.

Intermittent buying, and in lots of from two and three to a dozen or more tools, has marked the flight of the week, and the charge of total or even partial stagnation of business in this market which discouraged ones affected to foresee for the second quarter is refuted by the records. The lathe makers, who for some time have admittedly seen and experienced the limit of buying inactivity, now forge to the head of the column, for lathes have undoubtedly been most active the past week, with milling machines and shapers a close second.

There is a better feeling among manufacturers of all standard tools and the tone is more healthy. One manufacturer of lathes quoted on 10 distinct inquiries in Saturday morning's mail. The disposition to drive for bargains, to court extra discounts so characteristic of the earlier year, seems to be relaxing, and buyers and sellers are gradually closing up the gap. One of the largest concerns making a specialty of lathes sold during the week the best bill of tools handled by the organization since the beginning of the slump in October, the aggregate of sales of the week looking for the first time like a normal week of middle 1907. All this business was domestic and about evenly divided between direct and agency, one order being the outcome of an inquiry six weeks old and all of it having its origin during the new year. The major part of inquiries now being received are domestic, there being comparatively little from Europe.

Tool manufacturers are still running on short time, ranging from 30 to 44 hr., and with reduced forces. Jobbing foundries see little change for the better, although they anticipate some castings contracts soon because of the improvement shown in the demand for tools, which must soon develop into buying.

Considerable local interest is manifest in the awakening and investment of capital in steelmaking establishments, two of which in this territory are the new Andrews steel plant in Newport and the old Ashland sheet mill at Ashland, Ky. The taking off of the first successful heat in the former occurred on Saturday morning. For the present sheet bars will be the product, the full capacity being engaged gradually and as the demand warrants. The greater part of this output will be taken by the Newport Rolling Mills, an affiliated concern, whose stocks of sheet bars have been allowed to run low in anticipation of the new source of supply.

The old Ashland sheet mill at Ashland has been taken over, with privilege of purchase, by E. J. Job of Niles, Ohio, and workmen have commenced to clean up the plant preparatory to starting operations about the middle of the month. This is a six-mill plant. The new organization will be known as the Job Iron & Steel Company and will be capitalized for $200,000.

Through a little real estate transaction by which the Lodge & Shipley Machine Tool Company of this city acquires a leasehold on some property adjoining the plant on the north side, it has been erroneously reported that the company would build an addition to its plant. The property was leased simply to give an easement and to avoid the necessity of building an expensive wall.

Bernard Schaefer, proprietor of the Cincinnati Artistic Wrought Iron Works, 2736 and 2738 Colerain avenue, has found his present quarters inadequate and has acquired the property at 2941 and 2943 Eastern avenue, with three-story brick buildings on a lot 60 x 100 ft., and will immediately put them in order to accommodate the machinery and appliances of his plant.

The Cincinnati Chuck Company is now fully installed in its new quarters at Spring Grove avenue and Sassafras street and is running full time, 55 hr., with a full force making up stock. This company will eventually build several different types and style of chucks.

The J. M. Robinson Mfg. Company, Spring Grove avenue, maker of presses, forming tools, cornice brakes, shears and special machinery for sheet metal workers, is for the first time in many months engaged on machinery for stock, its bookings of special machinery having made stock work impracticable for several years. The die department is the busiest in the establishment. This is the company which is building large rolls for West Virginia parties.

Some changes are pending in the official management of the Elmwood Castings Company, an enterprise about a year old, in which the Staceys of the Stacey Mfg. Company are largely interested. The directors have accepted the resignation of S. W. Spear, who was recently elected vice-president and general manager. Mr. Spear will remain here for the present and is undecided as to his future plans.

At the plant of the Cincinnati Horse Shoe & Iron Company a full force, averaging about 100 men, is working full time, and the capacity is at the present time about 360 kegs a day. The company has confined its market to the Central States so far, but will eventually extend its lines to take in other boundaries. Inadvertently the name of the old general manager, William Eynon, was used in last week's reference in this correspondence to pending matters of the company. The general direction of the business is in the hands of the Executive Committee, of which Henry R. Meyers is chairman. Secretary and Treasurer Walter C. Renaker is in charge of the city offices and sales departments.

An interesting visitor of the past week was Y. Kamimura, a lieutenant in the Imperial Japanese Navy. The visitor was looking over the machinery field. He spent some time at the plant of the Niles Tool Works Company in Hamilton.

Following closely upon the annual meeting and convention in New York of the National Metal Trades Association, whose general offices and executive heads are here, comes the official announcement from the University of Cincinnati of inauguration of the test and research laboratories by the College of Engineering department of that institution. The plan has been outlined before in *The Iron Age* and is reasonably familiar to the machine tool manufacturing world. Says the circular in part: "The completion of the new annex to the College of Engineering has enabled us to install our testing machinery, so as to make it available for a more extended use. Additional machinery has been purchased, so that the physical test of various materials may be accurately and quickly made. The research laboratories in physics and chemistry have also been equipped to meet any general demands for physical and chemical testing or research." The university invites manufacturers to bring to the heads of the scientific departments any problems which may need expert attention or the expert use of the machines. The university will do testing in all departments, but not to compete with any commercial testing that is done in the city.

The Vulcan Iron Works Company, Toledo, Ohio, is reported to have increased its capital stock from $75,000 to $525,000. This company recently erected a large plant on Dorr street, in that city, for the manufacture of steam shovels.

W. P. Deppe, vice-president and general manager of the Mabou & Gulf Coal Company, Ltd., Mabou, Cape Breton, N. S., has been in this section a week or so buying locomotives, cars and other equipment for his company. He is a former official of the Big Four Railroad.

The industrial situation in Dayton, Ohio, has improved materially within the past week. The National Cash Register Company, which was closed down for a time, is again in operation, with a force of 3000, a trifle over half the normal. President F. T. Huffman of the Davis Sewing Machine Company reports that 1700 people are now employed at that plant and that order books are in good shape. Secretary Joseph F. Campbell of the Dayton Motor Car Company, maker of the Stoddard automobile, states that 1050 men are now on the pay roll at that institution, the largest force it has ever had, with orders enough to warrant a steady run for three months. The Computing Scale Company reports business improving and that it is running a full force. O. O. Ozias of that company, who has recently been abroad, brought back some good orders and is quite well pleased with the outlook in that branch of the business. Vice-President E. F. Platt of the Platt Iron Works talks encouragingly of the future and says that his company is working 400 men, with prospects for more soon.

New England Machinery Market.

WORCESTER, MASS., April 7, 1908.

Business conditions are changing very little, this statement applying equally well to manufacturers and dealers. A few machines are being sold, but inquiries continue numerous. Such orders as are received are small. In general

manufacturing a slight improvement is noted in individual cases, and perhaps the total volume of orders is greater. There is said to be a very slight improvement in the demand for textile machinery.

The great hardware industries of New Britain are feeling more encouraged as to the immediate future of their business. In certain instances, notably the Stanley Rule & Level Company, business is not so far below the normal level as is the common experience, production equaling that of three years ago, though materially below the high level mark of the past two years. The experience of the great branches of the American Hardware Corporation, including P. & F. Corbin, Russell & Irwin Mfg. Company and the Corbin Screw Corporation, is that reports received from representatives and connections all over the country agree as to numerous inquiries and indications of activity, but without materialization into orders. These large manufacturers are doing little buying themselves, pursuing a hand to mouth policy in this respect.

In connection with the assignment of the Thornton Machinery Company, Providence, R. I., dealer in machine tools and textile machinery, it is stated in the local press that it is not planned to resume the business.

The plant of the Agnew Auto Mailing Machine Company, Boston, Mass., sold at auction, last week, was bid in by parties interested in reorganizing the business, and consequently the machinery not already sold will not come on the market for the present.

A slight increase is noted in the amount of work which the railroad repair shops are doing. Announcement of a material increase in working force and hours at the Concord shops of the Boston & Maine Railroad is the most encouraging indication of this character. It is unofficially stated that the New York, New Haven & Hartford Railroad will not insist upon the adoption of the piece work system in its shops, the announcement of which threatened to result in serious labor troubles. But it is believed that when men are taken back after the layoff now in progress many of them will accept the new piece work system, precedent for which already exists in these shops.

The Worcester Pressed Steel Company, Worcester, Mass., is to build an addition to its plant this spring to be 30 x 60 ft., one story. It will be devoted to annealing and case hardening. The company will be in the market for a large annealing furnace for the building. The rolling mill equipment, which had been planned for last year, will be installed this season, and the company would like to receive quotations on this class of machinery. The specifications call for a mill to roll steel up to 16 in. wide, no thinner than 0.015 and up to 0.250 in. The Gem Mfg. Company, Everett, Mass., has recently been acquired by George F. Higgins, Worcester, and interests identified with the Worcester Pressed Steel Company, and the two plants will be operated in co-operation, though they are entirely independent concerns. The Worcester factory will devote its energies to heavy, deep drawing, while the Everett plant will handle lighter and larger work exclusively, including a number of specialties. Mr. Higgins is manager of the newly acquired business.

Charles H. Norton of the Norton Grinding Company, Worcester, Mass., who has just returned from a business trip to England, Scotland and Germany, states that Germany seems to have recovered from the sharpest of its business depression, but that manufacturing business in Great Britain has fallen flat in the past few weeks. Everywhere he went in England and Scotland business men laid the blame of their slackened conditions to the United States.

The New Departure Mfg. Company, Bristol, Conn., manufacturer of automobile and bicycle sundries and other metal specialties, will at once complete the large additions to its plant, consisting of a three-story building 40 x 70 ft.; steel ball hardening shop, 40 x 50 ft., and a new engine room, 30 x 40 ft. The two first named buildings will be used exclusively for the manufacture of the company's annular ball bearings.

The Norton Grinding Company, Worcester, Mass., is building on order a cylindrical grinding machine which will take work 16 ft. long and 20 in. in diameter. Its purpose is to grind steel shafts weighing 9000 lb.

The Taylor & Fenn Company, Hartford, Conn., has added to its line of machinery a new automatic screw slotter.

The Walter H. Baker Company, Boston, is finishing up its new machine shop and is buying a few tools to complete its equipment.

The Royal Motor Works, Inc., Worcester, Mass., has started the manufacture of a new motor cycle. C. A. Persons is the president and treasurer of the company, and Eveleth Hill is the works manager.

The Powell Tool Company, Worcester, Mass., of which A. M. Powell is the head, has completed the equipment of its shop and has begun the manufacture of the first planer of a new type which will be a special feature of the company's line. It will be known as the accelerating cut planer, with increase of speed in the cut rather than in the return, and is designed to plane long forged pieces. A special mechanism, patents on which are now pending, provides the accelerating feature of the tool. This machine will be in addition to a standard type of high speed planer. The first machine will be a 24-in., and is intended for demonstrating the new idea in planer practice.

The new hydraulic electrical plant which the Barre Wool Combing Company, Barre, Mass., will establish in that town, will be equipped to generate 320 hp.

Philadelphia Machinery Market.

PHILADELPHIA, PA., April 7, 1908.

The month of March, which is usually a pretty satisfactory one in the machinery trade, showed less activity than was generally expected, and in some instances the volume of business placed fell below that for the previous month. While sales in the past week show a continuance of the dull conditions which have characterized the market for some time, a little better inquiry has developed, so that the trade is inclined to feel more hopeful. There should be an improvement, under ordinary circumstances, during the spring months, although no great volume of new business is anticipated. Railroad buying is at a standstill, the local roads showing no inclination to come into the market, but some inquiry is expected to develop from one of the roads in the northern part of the State in the near future.

The placing of some small orders with the carbuilders imparts encouragement to the situation, although as far as the local roads are concerned, a very large number of idle locomotives and cars are on their tracks, and work at these companies' shops has been pared down to the minimum.

The demand is still confined closely to single tool propositions. One exception was to be noted, however, when bids were asked on quite a good line of general shop equipment. This matter is still in a somewhat indefinite state, and until approximate costs of the equipment are known it will be uncertain as to whether the order will be placed or held up for the time. Some few special tools have been sold, but there has been nothing done in the way of the larger standard tools.

Makers of specialties seem to have picked up a little more business, but plants are seldom running over from 40 to 50 per cent. of their capacity. Manufacturers of large power equipment report a better inquiry, and some business is expected shortly to develop in this line.

The demand for second-hand machinery holds up quite well. Dealers report a fair volume of business on certain classes of tools, mostly of the smaller sizes. Prospective buyers are looking the second-hand machinery market over pretty fully before placing orders, and frequently find tools which meet their requirements at costs considerably below that of new equipment. Machinery merchants in some cases have been doing considerable business in second-hand tools.

The demand for both iron and steel castings continues slow, and foundries show but little improvement; in fact, in some instances a further recession of business is reported. Buyers of castings place orders sufficient for their immediate needs only. Tool builders' requirements are not very urgent, while the building trades show but little of the expected spring activity. Foundries are operating irregularly, dependent to a great extent on daily orders, there being practically no contract business around, and specifications are very light on such business already in hand.

The Schuylkill Navigation Company, 420 Ternimal Building, has commissioned J. W. Ledoux to prepare plans for a waterpower plant, to be built at a point along the line of the Pennsylvania Railroad. The plans will provide for a brick and concrete structure 70 x 140 ft.

A charter has recently been granted the Philadelphia Terminal Transfer Company, of which E. B. Colket is president, to build a connecting railroad, tapping the various railroads entering the city as well as the suburban electric lines. The road is to carry freight, and to be established in connection with the Philadelphia & Western Traction Company and the Philadelphia & Western Railway. While no authoritative statements will be given out at present, it is understood that the route will begin near Lafayette Station on the Philadelphia & Reading, 11 miles from Philadelphia, on the Schuylkill River, and extend southward to the Delaware River at a point near Essington. Surveys are now being made, and considerable property for terminal stations has, it is said, been purchased.

It is now reported that the plans of the Susquehanna Power Company, which proposes to erect a large dam and power plant near Conowingo, Md., and build a canal along the Susquehanna River from Port Deposit, Md., to Columbia, Pa., are likely to be consummated. Legislation regarding this project will probably be passed at an early date, and it is expected that plans for the work will be made directly thereafter. The cost of this enterprise is estimated at $18,000,000.

The American Pulley Company reports only a fair volume of new business during the past month. The foreign demand is not much more than holding its own, while domestic trade in the East and West has been active. More

business has developed, however, in the Southern territory. Orders for export recently have been confined to the European countries, and shipments, while fairly good, are not very large individually. The plant of this concern continues to operate at about 60 per cent. of its normal capacity.

The Philadelphia Roll & Machine Company reports an improvement in the demand for both sand and chilled charcoal iron rolls. Orders have been somewhat scattered, but are of sufficient volume in the aggregate to keep the plant running from four to five days per week.

Government Purchases.

WASHINGTON, D. C., April 7, 1908.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until April 21 for three steel pressure blowers, one guillotine shear, one tumbling barrel; and until April 28 for one milling machine, one centrifugal pump and one turbine pump, for the Eastern navy yards.

The Isthmian Canal Commission will shortly ask bids for one 18-in. engine lathe, one 9-in. bench lathe, one 3½-in. bolt cutter, one 36-in. upright drill, one 24-in. shaper, one 26-in. emery grinder, and other shop equipment.

The following bids were opened March 31 for machinery for the navy yards:

Class 61.—One set standard plate bending rolls—Bidder 17, Bethlehem Steel Company, South Bethlehem, Pa., $1500; 17, Betsch & Co., Cambridge City, Ind., $1212; 28, Baird Machinery Company, Pittsburgh, Pa., $940; 49, Cleveland Punch & Shear Works, Cleveland, Ohio, $1275; 65, Drew Machinery Agency, Manchester, N. H., $1076; 73, Frevert Machinery Company, New York, $1298; 77, Fairbanks Company, New York, $997.77; 95, Hilles & Jones Company, Wilmington, Del., $1124; 153, Niles-Bement-Pond Company, New York, $1200; 161, Prentiss Tool & Supply Company, New York, $1295; 183, Sculley Steel & Iron Company, Chicago, Ill., $1233; 221, Wickes Bros., Saginaw, Mich., $985.57.

Class 62.—One combination grinding machine—Bidder 71, W. H. Foster Company, New York, $3200; 73, Frevert Machinery Company, New York, $2975; 161, Prentiss Tool & Supply Company, New York, $2895; 205, Tindel-Morris Company, Eddystone, Pa., $2550.

Class 108.—One portable electric grinder—Bidder 47, Cincinnati Electrical Tool Company, Cincinnati, Ohio, $43.34; 50, Chicago Pneumatic Tool Company, New York, $55; 73, Frevert Machinery Company, New York, $60 and $56; 76, Fairbanks Company, New York, $65; 83, R. W. Geldart, New York, $65; 89, Hisey-Wolf Machine Company, Cincinnati, Ohio, $65; 127, Manning, Maxwell & Moore, New York, $65; 139, Manhattan Supply Company, New York, $65; 152, National Electrical Supply Company, Washington, D. C., $59; 159, S. M. Price Machinery Company, Norfolk, Va., $56; 161, Prentiss Tool & Supply Company, New York, $59; 173, J. B. Roach, Brooklyn, N. Y., $65; 178, Sherman, Brown, Clements Company, New York, $65; 211, Tucker Tool & Machine Company, New York, $65; 232, Excelsior Equipment Company, Pittsburgh, Pa., $65.

Class 111.—One portable boring bar—Bidder 214, H. B. Underwood & Co., Philadelphia, Pa., $660.

Class 141.—Four ammunition hoist motors—Bidder 85, General Electric Company, Schenectady, N. Y., $2400.

Class 142.—Fourteen semi-inclosed variable speed motors—Bidder 53, Cushman Electric Company, Concord, N. H., $5895; 68, Electro Dynamic Company, Bayonne, N. J., $6581; 85, General Electric Company, Schenectady, N. Y., $6399; 139, Manhattan Supply Company, New York, $8200; 150, Northern Electric Mfg. Company, Madison, Wis., $5816.53 and $5916.53; 175, Roth Bros. & Co., Chicago, Ill., $8152 and $7939; 227, Western Electric Company, New York, $7939.95; 230, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., $6805.15.

Class 181.—One turbine blower—Bidder 43, Conveying Machinery Company, New York, $2085 and $1300; 61, Dravo, Doyle & Co., Philadelphia, Pa., $1505; 199, Sirocco Engineering Company, New York, $1536; 217, Vermilye & Power, New York, $1505.

The following bids were opened March 30, circular No. 429, for rock drills, &c., for the Isthmian Canal Commission:

Class 1.—Twenty-five rock drills and spare parts—Bidder 23, Chicago Pneumatic Tool Company, New York, $7529.25; 53, Ingersoll-Rand Company, New York, $8316.14; 54, International Electric & Engineering Company, New York, $6859; 109, Sullivan Machinery Company, Chicago, Ill., $8316.14.

The following bids were opened March 28 for two boilers, &c., for the Bremerton navy yard:

Hallidie Machinery Company, Seattle, Wash., $37,400 for work complete. Babcock & Wilcox Company, Philadelphia, Pa., $30,001 for B. & W. boilers; $33,757 with Foster superheaters; deduct $2322 for substituting Weber steel concrete stack; $33,330 for B. & W. boilers, steel stack and flue with Foster standard superheaters; add $2322 for substituting Weber steel concrete chimney; deduct $613 for substituting B. & W. standard superheaters; $33,000 for Sterling boilers, steel stack and flue and Foster special superheaters; deduct $2322 for substituting Weber steel concrete chimney; deduct $427 for substituting Foster standard superheater; deduct $613 for substituting Sterling standard superheater. Risdon Iron & Locomotive Works, San Francisco, Cal., for two boilers, superheaters, piping stack and flue with enlarged stack base, $41,600; without enlarged base, $40,900; if grates are reduced 86½ sq. ft., deduct $100; for No. 18 copper Astragel to stack, add $500; if boilers are supported on front and rear walls, deduct $600. Elliott Bay Iron Works, Seattle, Wash., work complete, $38,935; if asbestos molded block is used for flue covering instead of 85 per cent. magnesia, deduct $900; if flue covering is omitted entirely, deduct $3000.

The Pusey & Jones Company, Wilmington, Del., has been awarded contract for one 125-hp. boiler for the Key West Barracks, Fla., at $2800.

The following awards have been made by the commanding officer of Augusta Arsenal, Ga., under opening of February 26 for machinery:

Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., item 2, two motor generator sets, $819.12 each; item 3, one 25-hp. induction motor, $317.54; item 4, one 15-hp. induction motor, $373.39; item 5, one 15-hp. direct current motor, $488.04; item 6, one 10-hp. direct current motor, $324.28; item 7, three 5-hp. induction motors, $119 each; item 8, one 2-hp. induction motor, $65.95.

Lincoln Motor Works Company, Cleveland, Ohio, item 9, one 5-hp. motor and drive for lathe, $545; item 10, one 3-hp. motor and drive for lathe, $410.

General Electric Company, Schenectady, N. Y., item 11, portable testing instruments, $270.

Maris Bros., Philadelphia, Pa., item 12, one 5-ton 2-motor crane, $1850; item 13, one 5-ton 2-motor crane, $1340.

Newton Machine Tool Works, Philadelphia, Pa., item 36, one cold saw cutting-off machine, $1098.

Cotton States Belting & Supply Company, Atlanta, Ga., item 37, one plain milling machine, $1950; item 38, one hand milling machine, $240; item 50, one rapid reduction lathe, $2270; item 54, one tool grinding machine, $280.

Niles-Bement-Pond Company, New York, item 38, one horizontal boring and drilling machine, $3148; item 40, one 5-ft. radial drill, $1545; item 41, one 15-in. crank slotting machine, $1975; item 42, one 13-in. sensitive drill press, $47; item 59, one 1100-lb. pneumatic hammer, $1065.

Pratt & Whitney Company, Hartford, Conn., item 45, one 10-in. toolmakers' lathe, $680; item 49, one 15-in. engine lathe, $1717.

Jones & Lamson Machine Company, Springfield, Vt., item 46, one turret lathe, $1605.

Manning, Maxwell & Moore, New York, item 43, one hand screw machine, $789; item 57, one bolt header, $39; item 66, one planing, matching and surfacing machine, $644.

Brown & Sharpe Mfg. Company, Providence, R. I., item 51, one universal grinding machine, $949.

Baird Machinery Company, Pittsburgh, Pa., item 55, tinsmith's shears, $62.

Independent Pneumatic Tool Company, Chicago, Ill., item 56, one portable pneumatic hammer, $61.50.

Riehle Brothers, New York, item 60, 50,000-lb. testing machine, $1015.

Oliver Machinery Company, New York, item 61, one wood mortising machine, $1290; item 65, one dimension wood planer, $2200.

Atlantic Works, Philadelphia, Pa., item 67, one band saw, $325.

The following awards have been made for machinery for the navy yards, bids for which were opened March 3:

American Wood Working Machinery Company, New York, class 31, one timber planer, $2866.40.

William R. Mershon, Saginaw, Mich., class 32, one combination hand resaw and rip saw, $1314.94.

Under opening of March 24, for machinery for the navy yards, J. B. Roach, Brooklyn, N. Y., has been awarded class 136, six hydraulic jacks, $253.20.

Cumulative Voting for New York Corporations.

A correspondent calls attention to the fact that a bill is now pending in the New York Legislature which is meeting with strong objection from many corporations. He says:

Assembly Bill No. 1665, now in the hands of the Assembly Committee on the Judiciary, aims to amend the general corporation law of New York in a way which should secure the attention of every corporation affected. The amendment states that, unless the certificate of incorporation provides otherwise, each stockholder shall be entitled to as many votes as shall equal the number of his shares of stock multiplied by the number of directors to be elected, and that he may cast all of such votes for a single director or may distribute them among the number to be voted for, or any two or more of them, as he may see fit; which right, when exercised, shall be termed cumulative voting.

Under the existing law, there must be a provision in the certificate of incorporation to entitle stockholders to this right. If this amendment becomes a law, it will seriously affect many corporations, and will give unusual power to the minority stockholders. Cumulative voting is designed to give the minority stockholders the right to representation on the Board of Directors, but, inasmuch as it is common usage for the majority interest to control the policy of a business, the new method would undoubtedly lead to considerable friction, and would even make it possible for the minority interest to elect a majority of the Board of Directors.

If a corporation had 2000 shares of stock, with five directors to be elected, the amended law would permit 10,000 votes to be cast. If the majority interests controlled 1200 shares, they would cast the votes equally for the five directors, each director receiving 1200 votes. The minority stockholders would control 800 shares, giving them the right to cast 4000 votes. If they divide these among three persons, each receiving 1333 votes, they will elect three out of the five directors to be chosen. The amendment is regarded as objectionable for these reasons.

Our correspondent evidently assumes that the majority interests in corporations arrogate the right to themselves to elect every member of the Board of Directors. If, owning a bare majority of the stock, they were to proceed on this plan of operations, with a cumulative law in effect, they would certainly run the risk of being ousted by the minority. The proposed cumulative method of voting, however, would not prevent the majority interests from retaining the control of the board if they forestalled the minority by themselves using that method in casting their votes.

HARDWARE

MANY Hardware and other manufacturers in their effort to keep prices steady and prevent a demoralized market are seriously embarrassed by the so-called anti-trust laws now in force. Under the terms of these laws and the construction properly given them by the courts, any agreements or understandings which aim at the control of prices or the limiting of production are in restraint of trade, and the parties entering into such agreements are liable to heavy penalties. While these laws were enacted with the laudable purpose of curbing mischievous combinations they have the effect of making illegal agreements and understandings between manufacturers and merchants which are reasonable, and indeed necessary unless there is to be absolutely uncontrolled competition with the multitude of evils that follow in its train. The American Hardware Manufacturers' Association has put itself on record as favoring a modification of the law so that it would prevent only unreasonable restraint of trade. A similar position has been taken by the representatives of nearly every branch of business, indicating the general recognition of the necessity for revision of the laws in question. It is certainly to be hoped that this matter will not escape the attention of Congress and that the changes called for may be made. This is a subject on which it would be in order for those interested to communicate with their Senators and Representatives.

One of the latest bills for the benefit of the residents on the rural routes is referred to in our Washington letter in this issue. While the proposed bill incorporates a provision for a parcel post on such routes, this part of the service which it would secure is entirely subordinate to the more dignified work of transporting passengers in a thoroughly modern and up to date manner. The project is for nothing less than an Auto-Post-Coach Service which will carry passengers, baggage, mail and general merchandise. Everything connected with this service is to correspond with its high sounding title. The automobiles or post coaches are to be sufficiently capacious to carry 10 passengers and nearly a ton of baggage or merchandise. They are not to run on common country roads, but on macadamized and well kept highways, along which are to be erected post cabins, which appear to be stations for the shelter of the public and to facilitate the collection and delivery of baggage and merchandise. For all this style and comfort the charges can scarcely be characterized as exorbitant: Adults are carried over the route, whether its length be 10 miles or 30 miles, for 10 cents, while, presumably to encourage education and at the same time curry favor with the boys and girls, school children will be permitted to make the round trip for 5 cents.

It is not, however, to be supposed that the carriage of parcels and merchandise of considerable bulk is overlooked. The dominant idea in the plan is evidently the carrying of persons, and when it comes to describing the packages that may be transported, the law finding it difficult to break away entirely from the human side of enterprise, makes the fundamental standard of size the dress suit case, which is, however, supplemented by peach baskets and barrels. The price, too, for conveying merchandise is deserving of attention: A package one-eighth of the size of a suit case, 3 x 6 x 12 in., no matter what its weight, is to be carried for 1 cent. In the presence of such a project which aims to confer such benefits on the rural communities it would be ungracious and impertinent to attempt to figure the cost of installing and maintaining this auto post coach service, which, it is safe to say, would hold an absolutely unique position in the administration of the postal departments of the world. Is this postal progress gone mad, or is some one poking fun at the impracticable schemes before Congress?

Condition of Trade.

There is little change to report in the main features of the situation, conditions being substantially the same as referred to in the last review of the market as given in these columns and in the special letters from representative jobbing houses in the principal trade centers. The advance of the season brings with it naturally increased activity in summer goods and at the same time the prevalence of fine weather has a stimulating effect on business generally. There is, perhaps, on the whole, a more liberal movement of merchandise, giving the railroads more to do and helping to put them in a position to make repairs and betterments which they have as much as possible been deferring. The reports in regard to the crops, too, are decidedly encouraging and the prospects for a good yield so far as it can be estimated at this early date are excellent. The gradual clearing of the financial skies and the return to normal conditions tends to restore public confidence, especially when taken in connection with the comparatively few failures in commercial and manufacturing circles. The extent to which values are maintained in Iron and Hardware products is giving the merchants and manufacturers an opportunity to dispose of their stocks of high priced material or goods and justifies them in covering their early requirements. In this condition of things there still continues to be conservative buying, care being exercised not to purchase in larger quantities than the business in sight seems to call for. The trade are regarding with interest and appreciation the efforts which are being made by so many manufacturers, including the largest producers of the cruder products, to maintain prices, and confidence is thus inspired, that even if a readjustment should be deemed advisable or be forced upon them by the exigencies of trade a conservative policy would still be pursued, mitigating the severity of unrestrained competition and keeping the market from going utterly to pieces. A good many changes are taking place in the price of products in the Hardware and closely related lines, most of them being reductions, but here and there advances are announced. It is a trying time for combinations—if the understandings between the manufacturers may be designated by this term which is outlawed under existing statutes—and some lines of goods which have been characterized by a good deal of regularity in price are selling at materially lower prices. Where manufacturers have quantity discounts there is a tendency in view of the limited volume of trade to reduce the quantities so as to put them within the reach of a greater number of houses. Another effect of a manufacturing capacity which is in excess of demand is to induce manufacturers to accept orders from smaller merchants more freely than has

been the case heretofore, and in some important lines where a differential is theoretically made between the jobbing and the retail trade it is easier for the latter to purchase at prices which closely approximate those established for the wholesale houses if not at practically identical prices. In this way the present situation militates somewhat against the jobbers, but on the other hand the disposition of retail merchants to buy more frequently and in smaller quantities than usual is decidedly in their favor, and on the whole they are unquestionably holding their own admirably as the great distributors of Hardware and allied goods.

Chicago.

The chill winds and frosty weather that have marked the opening days of April have had a retarding influence upon trade, which has been the more noticeable because of the prevailing practice of buying only for actual needs as they develop from time to time. It naturally follows under such circumstances that fluctuations in the general consumptive demand are quickly reflected in the rising and falling volume of orders coming from the retail dealers who, as a rule, are trimming their stocks as closely as possible to present rather than prospective requirements. It is encouraging to find some improvement in March over the preceding month, even if somewhat disappointing in extent, and it is hoped that the showing for April will prove not only relatively but positively stronger. The volume of business in Wire and Nails, while still of fair proportions, has not increased much of late, but when outdoor building construction of all kinds is fully under way in all sections of the country and the stocks in dealers' and jobbers' hands begin to move more freely there should be enough business coming out to keep the mills comfortably employed on these products. Owing to the prolongation of the closed season for game in several of the Western States the movement of Hunting and Fishing goods is somewhat retarded, and in some sections will delay active trade in these lines for 30 days beyond the usual season. The demand for Baseball goods bids fair to be exceptionally good and will develop rapidly with the entrance of settled spring weather. Building permits issued in Chicago for the month of March show a decline in cost of a little more than 18 per cent. over the corresponding month of last year, but record an increase in the number of buildings of about 10 per cent. This means the construction of more small buildings, such as apartments, dwellings and small factory plants, which will call for builders' Hardware of the commoner grades. The few building projects involving estimates of considerable size for builders' Hardware are attracting vigorous competition from manufacturers, to whom such orders are particularly desirable at the present time.

NOTES ON PRICES.

Wire Nails.—Market conditions have shown little change during the week. The demand is continuous, but for conservative quantities, and not infrequently orders to mills are accompanied by requests for prompt shipment. This is the result of the course which buyers have pursued for the past six months of purchasing only enough to cover near-by requirements. The action has prevented accumulation of stocks, and mills are able to make prompt shipments. Under trade conditions now ruling the difference in price to wholesale and retail carload buyers is not always enforced. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

New York.—Buyers are purchasing in small quantities, and only for immediate requirements. Regular quotations are on the basis of $2.40 per keg for small lots at store.

Chicago.—New business is coming out in fair volume and there is no halt in the steady forwarding of shipments. The promptness with which the mills are able to execute orders precludes the necessity of anticipating wants far in advance, and the result is that buyers are far more conservative in their purchases than was the case last year. While jobbers' stocks are as a rule adequate to the demand they are by no means large, and their steady movement will mean continued replenishment. Prices are reported to be unwaveringly held at established prices. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—New orders for Wire Nails being placed with the mills are fairly large, but the trade is restricting purchases largely to near-by requirements, as buyers see no necessity for anticipating purchases. There is no early probability of a change in prices, and the mills are able to make prompt deliveries. A notable feature of the Wire Nail trade is that new orders are almost invariably accompanied with the request for prompt shipment, showing that stocks in merchants' hands are very much lighter than usual at this season of the year. The mills are absolutely maintaining prices, but in some cases jobbers are offering slight concessions on Wire Nails, when sold with other Hardware products. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

Cut Nails.—Manufacturers are still hopeful that demand will show improvement in the future, although there are no indications of change in this respect at present. Mills are still restricting output to correspond as nearly as possible to the requirements of the trade. Concessions are being made on regular Steel Nail quotations, which are as follows: $2.05 base, per keg for carload lots at mill. Iron Nails generally should command about 10 cents more than Steel.

New York.—The demand for Cut Nails in the local market is comparatively light. Regular quotations are on the basis of $2.30 per keg, for small lots at store.

Chicago.—The situation in Cut Nails is unrelieved by any improvement, the demand continuing extremely sluggish and inactive. In contrast with conditions in the Wire Nail market, prices are susceptible of shading and concessions of 10 cents a keg are being made by the jobbing trade. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; Steel, to jobbers, in carloads, $2.28; to retailers, $2.33.

Pittsburgh.—We continue to report a very light demand for Cut Nails, and there is no improvement in the market either in demand or prices. It is hoped that when building operations are under full sway again demand for Cut Nails will improve, especially for Shingle Nails. The mills are running light in an endeavor to keep stocks of Cut Nails as low as possible. Regular prices on Cut Nails are being shaded about 10 cents a keg. We quote Steel Cut Nails at $1.90 to $1.95, f.o.b. Pittsburgh, for carload lots, and about $2 for small lots, to which freight to point of delivery is added. Iron Cut Nails are about $2.05, at maker's mill.

Barb Wire.—An improvement is reported in the volume of orders received by the mills. It is not anticipated that spring demand will equal that of last year, but that there will be some increase over present requirements is not doubted. Prices are being maintained at regular quotations, according to information from the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—The past week or 10 days has developed some increase in the volume of new business, and the mills are now fully occupied in meeting the demands of consumers for prompt shipment. Now that Fence building operations are active both North and South, the prospects for a fair season's trade are most promising. Prices are reported firm and unchanged. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized,

$2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The favorable weather has permitted the resuming of Fence building, and this is reflected in an improved demand for Barb Wire from practically all sections of the country. It is confidently believed that still further betterment in demand will come, and that while spring trade this year will not be as large as last year, it is expected to show up fairly well. We are advised that regular prices are being maintained by the mills, but in some cases jobbers are shading prices slightly on Barb Wire, when sold in connection with other goods. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2 55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—When placing contract orders early in the season, manufacturers of Wire Fencing did not buy as heavily as for 1907. Indications now point to additional requirements as the season progresses. Prices are reported as being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Chicago.—With the Fence trade developing in fairly good volume, there is reason to expect some additional purchases of tonnage from manufacturers who bought sparingly when placing their contracts earlier in the season. Indications of a fair amount of fencing orders are good, especially throughout the West. Prices are reported to be firmly maintained. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—A fair volume of new business is being placed by the Fence trade, but this is not as heavy as at this time last year. Buyers are pursuing the policy of placing orders only for nearby requirements, knowing that the mills are in position to meet any heavier business promptly that may develop. The mills are firmly maintaining prices, and the tone of the market is strong. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

The Stanley Works. The Stanley Works, New Britain, Conn., and 79 Chambers street, New York, has issued discount sheet No. 15 under date of April 1, relating to catalogue of February, 1906. The changes are moderate and mainly to equalize prices on the less important lines of Butts, ornamental Hinges, Bolts and miscellaneous goods, rather than on the more staple lines.

Sash Cord.—The announcement by leading manufacturers of a reduction of 3 cents per pound on Sash Cord took the trade by surprise. Lower raw material is mentioned as the occasion of the change, but it is hinted by some that makers of standard brands find it desirable, in view of the moderate volume of business, to put Cord on a basis where there will be little temptation to cut prices. The market for Sash Cord may now be represented by a quotation of 21 cents per pound base.

Tacks.—The Tack situation seems to be somewhat improved, as the manufacturers are making an effort to put the goods on a level about 10 per cent. higher than the figures announced a short time ago.

Leather Belting.—Partly on account of the general business reaction leading to a reduced volume of orders, as well as because of the low price of Leather, the market for Leather Belting has for some time shown weakness. Manufacturers have been quoting lower prices on their standard grades of Belt than have prevailed for quite a long period, in competition reaching from 70 and 10 to 75 per cent. discount and even somewhat better on especially desirable orders. The present tendency is slightly toward improvement, as hides have recovered from 1 to 2 cents from their bottom price. Lacing may be quoted in a general way at 50 and 10 to 60 per cent. discount for cut and 20 to 22 cents per square foot for sides.

Pipe Cutters.—The working understanding which has for some time existed among manufacturers of competitive Pipe Cutters, Barnes and Saunders pattern, is disrupted and prices on these goods have been drastically reduced.

Wire Cloth.—Ruling prices and terms on Screen Wire Cloth have been extended to cover deliveries up to July 1. The market for Hardware grade Cloth and Poultry Netting also remains unchanged.

Brass Cocks and Bibbs.—A slight tendency to improvement is observed in the market for Brass Cocks and Bibbs, which have been selling at prices said to be close to cost. Quotations of leading manufacturers have been advanced about 5 per cent. Compression Bibbs may be quoted in a general way at a discount of 70 per cent. and Hardware Cocks at 75 per cent.

Wire Coat and Hat Hooks.—The market for Wire Coat and Hat Hooks is not firm and low prices are being made to competition. Some makers are not meeting the lowest quotations, but the market may be represented in a general way by a discount of 80 per cent.

Wood Screws.—Manufacturers of Wood Screws have reduced the amount which it is necessary to purchase to secure the maximum quantity rebate from $5000 to $3000. The quantity rebates now in force are as follows:

On purchases of $500 worth of Screws invoiced between January 1 and June 30, 1908, 2½ per cent.
On purchases of $1000 worth of Screws invoiced between January 1 and June 30, 1908, 5 per cent.
On purchases of $3000 and over worth of Screws invoiced between January 1 and June 30, 1908, 7½ per cent.

Copper Products.—The prices of Copper and Brass materials are still in the same unsettled condition, fluctuating slightly one way or the other on moderate trading, with slight recessions in price at present. Such orders as are placed are wanted for immediate delivery, and prompt service is insisted on. There appears to be no feeling in the trade that much higher prices will be made in the near future, with the increased production at some of the principal mines. Sheet Copper still remains at 17 cents, base, fixed February 27, with such modifications in actual rates as can be agreed on between buyer and seller.

Solder.—The price of Solder has been moving up for the past two weeks, and has now advanced close to 2 cents per pound.

Cast Iron Fittings.—A better tone is observed in the market for Cast Iron Fittings and slight advances have been made in the quotations of manufacturers, and revised quotations range from 5 to 7½ per cent. higher than a short time ago.

Radiators.—Manufacturers of Radiators have made a slight reduction in prices. The market is quiet, as usual, at this season.

Rope.—Business continues below normal, and demand is estimated at 35 to 50 per cent. of what is usually expected at this season. Following quotations for base sizes represent the market: Pure Manila, 10¼ to 11 cents; B quality grades down to 8 to 9 cents; Pure Sisal, 7½ to 8 cents; lower grades Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¾ cents.

Window Glass.—The more settled weather conditions have not brought the demand for Window Glass up to expectations. Continued dullness may result in a reduction of production by the hand operated factories. In New York and vicinity business is very quiet. The minimum prices recommended by the Eastern Window Glass Jobbers' Association are as follows: Single strength, 90 and 25 per cent.: double strength, 90 and 30 per cent. discount from jobbers' list. These prices are, however, not closely adhered to.

Linseed Oil.—While there is some improvement in demand with the advance of the season, there is an absence of active spring buying. Local quotations are as follows: In 5-barrel lots, State and Western Raw, 40 to 42 cents; City Raw, 43 to 44 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—The manipulation of the South-

ern market came to an abrupt termination the last of the past week, which resulted in a marked drop in prices. This has unsettled the New York market to some extent, especially as the Southern market is not steady. At this point buying is of a hand-to-mouth character, at considerable lower prices than a week ago. The New York market is represented by the following quotations: Oil Barrels, 50½ to 51 cents; Machine Made Barrels, 51 to 51½ cents. Locally, demand is light.

Four New Parcel Post Bills.

FROM OUR SPECIAL CORRESPONDENT

WASHINGTON, D. C., April 7, 1908.

THE parcel post campaign has been marked by numerous interesting developments during the past week. The very serious illness of Senator Penrose, chairman of the Senate Post Office Committee, has resulted in the postponement of the consideration of the annual post office appropriation bill in committee at least until the 20th inst., and the advocates of the rural parcel post scheme have taken advantage of the delay to deluge the Senate with petitions and memorials in its favor. Nearly all these appeals have come from subordinate organizations of the National Grange, Patrons of Husbandry, and it is obvious that the real beneficiaries of this project are using this organization of farmers with considerable effect.

The parcel post promoters are not relying upon amending the annual post office appropriation bill, however, for they appreciate fully the parliamentary difficulties in the way, but are laying the foundation for a campaign at both ends of the Capitol to secure favorable reports upon independent measures as soon as the big supply bill has been disposed of. The Burnham and Kean bills, heretofore introduced in the Senate and now before the Senate Post Office Committee, have been selected as the basis of operations in that body, while in the House no less than four measures have been presented during the past week, the varying terms of which indicate a shrewdly conceived plan to unite upon a composite measure to be framed in committee all the advocates of postal changes, ranging from a general parcel post to penny postage.

The Bennett Bill.

The most comprehensive of these measures has been presented in the House by Representative Bennett of New York. It provides for a complete parcel post system based on the European plan, but differing in several important particulars from either the Hearst or Henry bills heretofore introduced, the modifications being designed apparently to bring it into line with the more modern postal methods in use in this country. This bill is as follows:

Be it enacted, &c., That the third and fourth classes of mail matter be, and are hereby, consolidated under the title of "merchandise," with a weight limit of 11 lb., with rates as follows: On parcels up to 3 oz., 1 cent; over 3 oz. up to 6 oz., 2 cents; over 6 oz. up to 9 oz., 3 cents; over 9 oz. up to 12 oz., 4 cents; over 12 oz. up to 1 lb., 5 cents; for each additional pound or fraction thereof, 2 cents, making the rate on an 11-lb. parcel 25 cents. No parcel shall be more than 3½ ft. in length or occupy more than 2 cu. ft. of space.

That this service shall cover all documents styled commercial papers by the Universal Postal Union, including "all instruments or documents written or drawn wholly or partly by hand, which have not the character of an actual and personal correspondence, such as papers of legal procedure, deeds of all kinds drawn up by public functionaries, waybills or bills of lading, invoices, the various documents of insurance companies, copies of or extracts from deeds under private signature, written on stamped or unstamped paper, scores or sheets of manuscript music, manuscript of books or of articles for publication in periodicals, forwarded separately, corrected tasks of pupils, excluding all comment on the work"; provided, however, that such documents be so mailed as to admit of easy examination.

That the service determined by this act shall include free delivery and collection, house to house, of all parcels handled by the Post Office Department, wherever a wagon or car collection and delivery service is now or may hereafter be established. Wherever there may be only a foot service the postman shall not be required to receive or deliver any parcel of greater weight than 5 lb. In the absence of a collection and delivery service the rates of this act shall only apply to the service between post offices, but the notice of arrival of parcels shall in such cases be given to the addressees.

That on all unregistered prepaid mail matter without declared value an indemnity up to $10 shall be paid by the Post Office Department for such actual loss or damage as may occur through the fault of the postal service, and this without extra charge. Certificates of posting shall be provided on demand. On registered packages of declared value and on [illegible] for registration, insurance and postage have been duly prepaid, the Post Office Department shall pay the full value of any direct loss or damage that may occur through any fault of the postal service. The fees for insurance and registration shall be as follows: For registration and insurance up to $25, 2 cents. No claim for compensation will be admitted if made more than one year after the parcel was posted.

Mr. Bennett declines to stand sponsor for this measure, and in presenting it in the House endorsed it as having been introduced "by request," but this formal presentation has served to make it a public document, which after being printed at public expense, can be sent broadcast throughout the country under any Congressional frank.

Mr. Cockran's Auto-Post-Coach Service Bill.

The most remarkable rural parcel post project thus far brought to the attention of Congress has been introduced by Representative Cockran of New York, also "by request." This is a bill "for the establishment of an experimental auto-post-coach rural service." As the title indicates, this bill proposes not only to establish a rural parcel post, but a fully equipped coach or stage service with special facilities for taking children to and from school. The measure provides as follows:

Be it enacted, &c., That the sum of $60,000 be and is hereby appropriated for the establishment of an experimental auto-post-coach service for the coming year, on a number of rural routes, to be determined by the Postmaster-General.

That these experiments are to be made on routes well graded and macadamized, and are to start from post offices at or adjacent to a station on a railroad or trolley line. It is to be a further condition of this service that, for the convenient collection and delivery of merchandise and baggage and for the shelter of travelers, the rural public on the proposed experimental lines shall provide post cabins satisfactory to the Postmaster-General at points on the highways near their respective homes, the postmen and the owners of the cabins to have duplicate keys.

That at least twice a day, morning and afternoon, at hours convenient to the public, two auto-post-coaches equipped for the transport of merchandise, baggage and passengers shall make trips in opposite directions from the same post office over the same course. Sunday services and additional week day services may be provided, as the Postmaster-General deems advisable. The speed capacity of each post coach shall be at least 100 miles per day, and one coach may be made to serve two or more routes. The carrying capacity of each post coach shall not be less than 10 passengers and 1500 lb. of merchandise or baggage.

That all mail matter collected and delivered within the different rural routes shall be in one class, and the rates charged for transportation within each route shall be as follows: On merchandise and baggage, parcels up to one-eighth of the standard suit case, a box 3 x 6 x 12 in., or similar cubic contents, 1 cent; larger parcels up to one-half the standard suit case, a box 6 x 12 x 12 in., or similar cubic contents, 5 cents; larger parcels up to the full standard suit case, a box 6 x 12 x 24 in., or capacity of the standard peach basket, 10 cents; larger parcels up to the capacity of a bushel, 15 cents; larger parcels up to the capacity of a half barrel, 100 lb., 20 cents; larger parcels up to the capacity of a barrel, 200 lb., 25 cents; weight limit, 200 lb.; no carrier to be obliged to carry a parcel over 6 ft. in length. Passenger fares per trip within each route: Adults, 10 cents; children, ordinary single trips, 5 cents; children, to and from school, round trip, 5 cents.

The promoters of this particular measure are counting upon securing the assistance of all organizations interested in improving the public highways, including the National Grange, the various automobile associations, highway commissions, &c. The bill will be urged as a purely experimental measure which "does not commit the Government to anything," an argument that was used very effectively to bring about the establishment of the present rural free delivery service.

Penny Postage.

The popularity of the penny postage proposition is being utilized to help along the rural parcel post projects in every conceivable way. Of course, the parcel post promoters know perfectly well that it would be impossible to put both these innovations into operation at the same time, as penny postage would undoubtedly result

in a temporary reduction in revenue, while a parcel post would well nigh bankrupt the Government; nevertheless it is regarded as a shrewd move to couple them as "desirable reforms." Several of the authors of parcel post bills have therefore presented penny postage measures of a more or less comprehensive character. Representative Griggs of Georgia, whose rural parcel post bill was voted down when offered in the House as an amendment to the post office appropriation bill, has introduced a measure "to establish 1 cent postage on rural routes," which provides that from and after July 1, 1908, the drop letter privilege now existing at post offices not entitled to free delivery service shall be extended to all rural routes. It is not at all clear what Mr. Griggs means, but it is assumed that he intends to prohibit the employment of the 1 cent rate for letters intended for transmission from the terminus of one rural route to the terminus of another route; that is to say, it could not be used for conveying letters between towns which are not connected by rural routes.

Representative Bennett of New York has presented a straight penny postage bill, but, as this measure was received from the same source as the parcel post bill introduced by him, he has also marked it as having been presented by request. It remains to be seen whether the parties who have been instrumental in securing the introduction of this bill can utilize it to aid the campaign for parcel post. Retail merchants everywhere should scrutinize carefully any petitions or memorials offered for their signature which appear to advocate the Bennett bill, and in this connection it may be as well to warn merchants against utilizing stereotyped forms of petitions, except such as may be supplied by their own trade organizations. The most effective way of reaching Congress is through urgent personal letters addressed to the Representatives of the Congressional districts in which the writers reside.

TRADE ITEMS.

J. W. McMANUS, Dallas, Texas, secretary of the Texas Retail Hardware and Implement Association, has issued a circular under date, 19th ult., to every merchant in the State in which he urges those who are not now members of the association to affiliate with it. He also takes occasion to refer to the parcel post campaign in Congress and the necessity of merchants being active in combating and opposing this measure. Merchants are requested to have business organizations in their towns take official action in the way of resolutions protesting agaist this sort of legislation and sending copies of such resolutions to their Senators and Representatives and also to the chairman of the Senate Committee on Post Office and Post Roads.

AFTER 31 years of active connection with the Atlantic Screw Works, Hartford, Conn., during the past 21 years of which period he has been the sole owner and manager, David Tilton has presented the entire plant and business to his son, Fred N. Tilton, to own and manage in his own right. The Atlantic Screw Works was established in 1875 at Castleton, N. Y., and two years later the plant was moved to Hartford, the business being then under the management of George W. Bruce. In 1887 Mr. Tilton succeeded to the sole proprietorship, and in 1902 the present factory, a modern and substantial brick structure completely equipped, was built. Fred N. Tilton has followed very closely in the footsteps of his father in the business. He has been associated with it for about 20 years and knows its every detail.

THE fourteenth semiannual meeting of the American Hardware Manufacturers' Association will be held concurrent with the eighteenth annual convention of the Southern Hardware Jobbers' Association at Hot Springs, Ark., on June 9, 10 and 11. The headquarters will be at the Arlington Hotel. All applications for reservation of rooms should be addressed direct to the hotel.

THE BAUSCH & LOMB OPTICAL COMPANY and the Bausch, Lomb, Saegmuller Company, both of Rochester, N. Y., and the Carl Zeiss Optical Works, Jena, Germany, have been consolidated under the style of the Bausch & Lomb Optical Company. It is the intention to manufacture certain products of the Zeiss Works in the United States, but the business in Jena will continue under the old style.

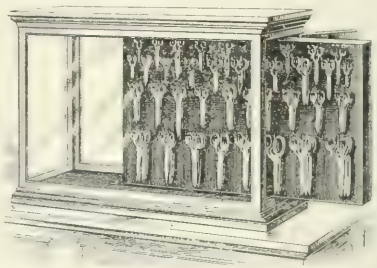
THE PAPE-THIEBES CUTLERY COMPANY, St. Louis, Mo., has been incorporated with a capital stock of $5000, the incorporators being Walter Pape, Henry Thiebes and Margaret Thiebes.

M. D. HALPIN, 62 Reade street, New York, is marketing the improved Chatham Fireless Cooker, manufactured by the Manson Campbell Company, Detroit, Mich., which was illustrated and described in our last issue.

THE Boston office of Landers, Frary & Clark, New Britain, Conn., has been removed to 157 Summer street.

CUTLERY SHOWCASE.

THE attractive glass case here illustrated stands on the end of a counter in the store of J. R. Gladwin, Westfield, Mass. It is perhaps 4 ft. long by 1 ft. wide, and between 3 and 4 ft. high. The top and base are finished with a heavy molding, and all the sides are of glass. Within is a frame or sample board, large enough to fill the inside of the case studded with hooks. On one side of the board Scissors and Shears are kept, and on the other Razors and Razor Strops. As the hooks are long



Cutlery Showcase.

enough to hold several articles of the same size, the case affords facilities for both display and selling stock. In showing or handling the goods in the case the sample board is pulled out at one end, as indicated in the illustration. It runs easily on Sash or Trunk Rollers set into the floor of the case.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM THE BURBANK COMPANY, Berlin, N. H., whose Hardware and Plumbing establishment was destroyed in the fire that visited that city in February.

FROM WOLSFELD-BROWER HARDWARE & IMPLEMENT COMPANY, which has been incorporated at Oriska, N. D.

FROM FOREST CITY HARDWARE COMPANY, Rockford, Ill., which has recently been incorporated to deal in general Hardware, Stoves, Sporting Goods, &c.

FROM ENYEART BROTHERS HARDWARE COMPANY, which has recently opened a store at Hanford, Wash. The company's post office address is Fordnah, Wash.

FROM W. E. STREET, who is erecting a new building in Seneca, Mo., to be occupied by his stock of Shelf Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, Roofing and Guttering.

Logan Bros., Havensville, Kan., have sold their Hardware, Stove, Implement and Vehicle business to Witter & McKee.

System for the Retailer.

Ninth Article.

SPECIAL ORDERS AND SPECIAL PRICES.

BY JOHN A. MANSON, BURLINGTON, VT.

THE wide awake Hardware merchant carries a stock of goods well adjusted to the demands of the trade in his locality, and is continually studying those demands and adding to or cutting down his stock accordingly. Considering the great variety of goods that are manufactured in the Hardware line it is surprising how comparatively little of that variety the average Hardware

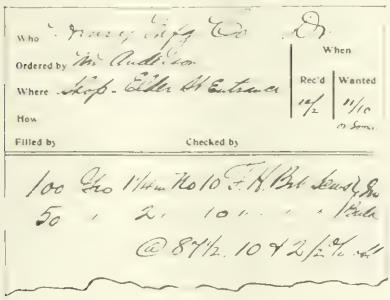


Fig. 1.—Special Order for Local Customer.

store requires. The experience and study of the merchant is brought sharply to task to select wisely what his trade requires, so that his stock will be moving profitably all the time. From experience the merchant acquires a general knowledge of the various goods made by the leading Hardware manufacturers, and can take orders intelligently for many goods which he does not carry in stock, ordering them especially for his customers. These special orders include all kinds of regular factory stock articles, some of which the merchant may carry to a limited extent in his regular stock and some of which he may not stock at all, but for which he may have a periodical demand or an unusually large occasional de-

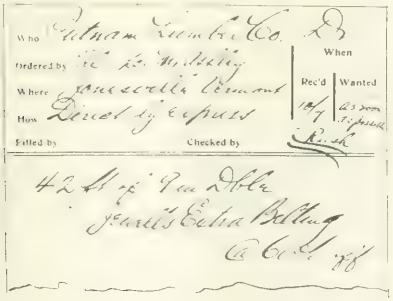


Fig. 2.—Special Order for Factory Shipment.

mand from a customer. Frequently these special orders are for goods not carried by the manufacturer, but which the merchant knows how to order and get through from the factory in a satisfactory manner. Special orders should be taken on the regular order slips and carried on a special file. Fig. 1 is an illustration of a special order for a local customer.

Particular attention should be given to "When wanted," and the goods hurried forward accordingly. When the goods are billed in to the merchant the special order should be attached to the invoice, and on the arrival of the goods in the store the special order should go through as a part of the day's business, being entered up in the delivery record, delivered accordingly and becoming one of the routine transactions. Fig. 2 shows a special order for goods shipped direct from factory to an out of town customer.

As soon as the merchant receives the factory invoice the goods should be charged up to the customer and a bill sent, on which would be noted when and how the goods were shipped from the factory. A record of prices on special orders should be kept—an indexed book serves

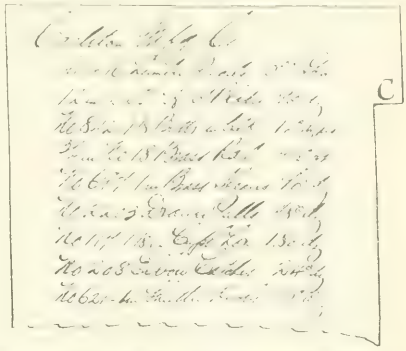


Fig. 3.—Record of Prices on Goods Ordered Specially for Regular Customers.

the purpose—Fig. 3 being an example of a page from such a book. Herein are special prices, representing some goods that are not carried in stock by the merchant and some goods which are carried in stock, but used in unusually large quantities and specially ordered. On these the customer is entitled to special consideration.

McNUTT & MUSGRAVE BROS., Huntsville, Ill., recently issued their third annual catalogue which was mailed to every farmer within a radius of 8 or 10 miles of the town. The catalogue is 9½ x 6½ in., and contains nearly 50 pages. It has a striking red cover, with cord for hanging, and the typographical make-up and printing is very creditable. At the top and bottom of each page are the sentiments, "You'll find it pays to trade at McNutt & Musgrave Brothers," and "the old Hardware store on the corner where good goods are sold right." An index to the catalogue is supplied on the inside of the front cover, the contents including, besides the representation of Hardware and related lines, several pages giving useful tables of weights and measures, information about Seeds, and "some things worth remembering." Several days in advance of the catalogues postals were sent out calling attention to it, and cordially inviting the recipients to make the store headquarters when visiting the town.

WILLIAM J. LA ROCHE, president of the Metropolitan Hardware Company, New York City, died at his home in Brooklyn on the 5th inst. Mr. La Roche was a son of Dr. William Pell La Roche, and was born in New York in 1853. He began his business career with a dry goods house, but later became interested in the Hardware line, eventually becoming a member of the firm. In 1889 the business was reorganized under the name of the Metropolitan Hardware Company, and as a result of its advertising methods, a special feature being made of display and sales outside the store, an extensive trade has been built up. Mr. La Roche was a member of many clubs, a conspicuous sportsman, and was well known and highly esteemed.

J. C. McCARTY & Co., 21 Murray street, have been appointed sales agents for the United States, outside of the New York metropolitan district, and Canada, for the Acme Ball Bearing Sales Company, 56 Warren street, New York, manufacturer of Acme Ball Bearing Casters.

THE Baumann Hardware Company, Wausau, Wis., has been incorporated with a capital stock of $25,000, the incorporators being R. Baumann, Henry Seim, Jr., and Anna Bobrinz.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

SIDNEY SILLS SCRAPER COMPANY, Sidney, Ohio: Illustrated catalogue No. 9, referring to Haslup Wheel and Drag Scrapers, Contractors', Railroad and Grading Plows, Barrows, Trucks, &c.

A. J. HARWI HARDWARE COMPANY, Atchison, Kan.: Illustrated catalogue No. 52, referring to Harness, Saddles, Horse Collars and Strap Work.

STANDARD MFG. COMPANY, Shelby, Ohio: Illustrated circulars of Double Acting Door and Floor Springs, and Washing Machines.

BUTLER BROTHERS, New York: "Our Drummer," catalogue, No. 660, for April, containing illustrations and net prices of a large variety of goods suitable for the retail Hardware merchant.

KNAPP-SPENCER COMPANY, Sioux City, Iowa: New pages to be inserted in its ninth edition loose leaf catalogue.

A. J. HARWI HARDWARE COMPANY, Atchison, Kan.: Spring catalogue No. 53, devoted to Farm and Garden Tools, Lawn Mowers, Haying Tools, Harness, Creamery Supplies, Ice Cream Freezers, &c.

WM. FRANKFURTH HARDWARE COMPANY, Milwaukee, Wis.: Extra gummed pages, for insertion in its catalogue, devoted to Lock Sets, Store Door Handles and Locks, Push Plates, &c.

MASBACH HARDWARE COMPANY, 84 Warren street, New York: Condensed catalogue and price-list of 145 pages, containing 1800 illustrations of good selling articles.

ELECTRIC SAD IRON COMPANY, Detroit, Mich.: Illustrated folder, describing the Superior Electric Flat Iron.

MCMASTER-CARR SUPPLY COMPANY, formerly McMaster-Davis Supply Company, 174-176 Lake street, Chicago, Ill.: Catalogue No. 14, devoted to steam specialties and general supplies for mills, mines, railroads, contractors, engineers, steam fitters, machinists, millwrights, &c. The catalogue is fully illustrated with list prices and has an index covering 10 pages.

S. W. CARD MFG. COMPANY, Mansfield, Mass., New York office, 132 Liberty street: Catalogue No. 25, devoted to Taps, Dies, Screw Plates, Die Stocks, Tap Wrenches, &c. The catalogue lists Machine Screw Taps and Round Dies to the new A. S. M. E. standard with complete tabular information. Changes have been made in the cutting sizes and threads in some Screw Plates, and a complete line of Taps, Dies and Screw Plates has been added to conform to the new A. L. A. M. standard and to the French standard (metric system) for automobile manufacturers and repairers.

H. CHANNON COMPANY, Market and Randolph streets, Chicago, Ill.: Manufacturers and distributors of machinery and general supplies, catalogue No. 33. This relates to goods for steam and electric railroads, contractors, bridge builders, stone quarries, machine shops, factories, mines, blacksmiths, saw, paper, flour and cotton mills, elevators, electric light plants, water works plants, &c. The catalogue describes more completely than former editions, the lines of goods handled by the company.

SARGENT & CO., New Haven, Conn., and 94 Center street, New York, four extra pages, 946 A, B, C and D for 1901 catalogue, describing, with illustrations, their complete line of Steel Squares, grouping all numbers in the various finishes.

BETTES & EBSEN, 62 Reade street, New York, have recently established themselves at this address, where they will conduct a business in factory, mill and machinists' supplies, handling Hardware, Machinery, Chucks, Shafting, Hangers, Pulleys, Belting, &c. They are making a specialty of Hard Fiber in sheets, tubing, Rods, Washers, &c.

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DO LOCAL RETAIL MERCHANTS EMPLOY RURAL CARRIERS?

THE rules now regulating the rural free delivery branch of the Post Office Department permit carriers to handle packages at the instance of persons living on their routes and to receive remuneration therefor. If it could be shown that the opportunity thus afforded was made use of to a considerable or increasing extent and was proving a convenience and advantage to country merchants, no little force would be added to the argument of parcel post advocates for their proposed legislation. Readers of *The Iron Age* are aware of the claim of the so-called postal reformers that merchants will benefit through the formal establishment of a service by which they can deliver packages through their local post office, especially since they will have a decided advantage in rate over mail order houses and others who must use the general mails before reaching the rural route.

The converse, however, is equally true. If it appears that the opportunities now existing are made little use of and merchants are lukewarm regarding the proposed service or actually opposed to it, the argument referred to loses much of its force. This is the view which our extensive correspondence and somewhat thorough investigation would indicate as the correct one. Of the many small merchants whom we have heard from in districts which would seem to be the best fields for such service, very few make more than semioccasional use of the rural carriers and the majority do not employ them at all. This applies to the general run of merchants as well as to the Hardware trade. The following are fair samples of the advices received:

FROM A NEW HAMPSHIRE TOWN: Our rural carrier says he does a very small amount of business in the way of delivery of goods.

FROM AN INDIANA TOWN: I do not find rural carriers of much use in delivering goods. It is very seldom a farmer sends in for anything to be brought out by them. The small charge of 10 or 15 cents is too much for them.

FROM A TOWN IN FLORIDA: We find that the rural carrier is little or no use to us in the way of making deliveries.

FROM A MERCHANT IN NORTH DAKOTA: The merchants do not use the rural route here for delivering goods. We do not find that it builds up our trade.

FROM A WEST VIRGINIA MERCHANT: The R. F. D. carriers have never handled anything for us.

FROM A TOWN IN ILLINOIS: I have not used the rural carriers to deliver goods.

FROM A TOWN IN KANSAS: We find that merchants here are not using this means of delivery very much.

Some of our correspondents write at greater length and make interesting suggestions which throw valuable side lights on the subject and add much to the force of their advice. A village merchant in Michigan writes:

Never Did Us Any Good.

This is a village of about 1000 population; one-half mile from here is another village of 1200 people. From this place there are five R. F. D. routes, and from our neighboring village there are two R. F. D. routes. We do a cash business and sell at exceedingly low prices, in competition with the catalogue houses, and have no reason to complain as to the volume of our business. But the R. F. D. has never done us any good. We have never received to exceed a half-dozen orders to be sent out by the mail carriers, and these for very small items. The present system of R. F. D. certainly does not help the small merchant, and the parcel post would in a short time put most of them out of business.

Not Half a Dozen Packages a Year.

FROM A TOWN IN TEXAS: We have 8 or 10 rural routes going out from our town, and we do not find the carriers useful for delivering goods to our farmer friends. They very seldom have more than room enough in their wagon to carry the mail, much less a few packages of merchandise. None of them like to deliver packages. We do not average sending out a half-dozen packages in 12 months.

Occasionally Used by the Druggist and the Doctors.

FROM A TOWN IN IOWA: My observation has been that the merchants of my town do not use the rural carrier to any great extent. The druggist and the doctor make use of this method, occasionally paying the carrier a nominal price for the accommodation. Merchants generally, however, resort to this plan only in extreme cases.

Carriers Don't Want to Be Bothered.

FROM A SOUTH CAROLINA TOWN: The rural carriers do not want to be troubled with merchandise, but sometimes they don't mind a very small package. As a rule they say their mail is all they want. It seems if such a thing should be put in practice it should in independent. We *don't want it.*

Present Regulations Misunderstood.

Many merchants seem to attach so little importance to the opportunities of delivery by rural carriers that they have not taken the trouble to investigate the possibilities or become familiar with the existing regulations. Even the carriers and postmasters themselves show little interest in the subject and are not at all conversant with the present rules. Some do not even know that carriers are now permitted to handle packages for dwellers on their routes. This is shown by such letters as the following:

Package Returned.

FROM A TOWN IN MICHIGAN: We have made use of rural carriers on different occasions, but not to any great extent. The last package we left at post office for them to take was returned to us by the postmaster who said it was against the rules, and required us to pay regular rate of postage, which we did. Since then, about two or three months ago, we have not used this method for country delivery.

Thought It Prohibited.

FROM A MARYLAND MERCHANT: We have never used the rural carriers for delivering goods on their routes. We always understood the mail carriers were prohibited by the Department. We think the prohibition feature well considered on account of the time it would take from the prompt delivery of the mail. I do not think the rural carriers deliver any goods in this zone.

Some of the Practical Considerations

relative to this sort of service which present themselves to representative merchants are brought out in the folowing letters. It will be noted that all are in the nature of objectionable features, such as the frequent difficulty in sending just what is wanted and resulting dissatisfaction, the confusion and trouble arising from soiled, broken or lost packages, on which the merchant would always be expected to stand the loss, the necessity of making small charges which would often be hard to collect, &c.:

Causes of Dissatisfaction.

FROM A TOWN IN WISCONSIN: We think we voice the sentiment of all the merchants in our vicinity, that rural delivery is a detriment to the small town, and as for using the carriers for delivering packages we do send something once or twice during the entire summer, and even this is not satisfactory, for should it happen we did not send just what the farmer ordered, he is dissatisfied. (The farmer is not a business man and is very exacting.) On the other hand, if we did not substitute as best we could they would not like it, so in consequence we do not cultivate the rural delivery trade.

Makes Small Troublesome Accounts.

FROM AN ILLINOIS TOWN: While we do deliver some goods by rural carriers, our trade from that line will not amount to $25 a year, and it makes a lot of small accounts that are often hard to collect. We find it more trouble to us than the good we get from it.

Use of Telephone and Trolley Lines.

FROM A TOWN IN ILLINOIS: Our business with rural carriers is next to nothing, due perhaps to the fact our country trade is limited. We have five interurban railroad lines entering our place, which carry express, and we do more or less with them. Many times farmers will telephone and we send via electric line. We understand that the dry goods stores do considerable business in small articles through rural carriers.

The Most Important Consideration

and that most frequently referred to by our correspondents is that the use of a rural delivery tends to keep the farmer at home. This is obviously a bad thing for the merchant, as it tends to reduce his trade; it also increases the difficulty of keeping in touch with his customers and talking with them face to face, which is by far the most satisfactory way to do business. It is also a bad thing for the farmer, tending to make his purchases less intelligent, to deprive him of the broadening influence of the town and to keep him out of touch with conditions and events in the world about

Keeps Farmers at Home.

him. These important points are brought out in the following letters:

Can Do More Business on the Spot.

FROM A TOWN IN DELAWARE: Very little use is made of the rural carriers by the merchants of this town. We do not think it of very much advantage. We believe it is better to have the country trade come to your stores, as we can do more business with them on the spot than at a distance. They will buy more goods than if they order by mail and have goods delivered by carrier.

No Special Benefit to Anyone.

FROM A MINNESOTA TOWN: We are doing business in a small town and it has only happened a few times that customers have telephoned us for goods to be taken out by the rural carriers, so I do not see any special benefit in this way of delivering goods. I would rather have the customer come to my store and do business face to face. In my opinion the rural free delivery is only an expense to the Government and no special benefit to any one.

Tends to Keep Farmers at Home.

FROM A TOWN IN VERMONT: We are very well satisfied with the present rules in regard to rural carriers taking packages to customers. Sometimes it is convenient for the customers and they have to pay possibly 5 to 10 cents for the service, and a good many times they make no charge. We do not think that the rural mail is very much benefit to the merchants in small towns, as it tends to keep the farmers home, and it is not necessary for them to come to town as often as it was before the rural routes started.

We are very much opposed to any change in the postal rates on merchandise, and we are in favor of reducing letter postage to 1 cent for one-half ounce or fraction of half ounce. We believe this change would benefit the most people.

A Great Injury to the Towns.

FROM A TOWN IN VIRGINIA: I very seldom have calls to send goods to the county by rural carriers. I don't think that in our county they carry merchandise very much. I don't hear of our merchants sending goods by them, as the mails about fill their wagons. My opinion is that this R. F. D. does a great injury to the towns, in that they keep the country people at home. Not having to come to town for their mails we don't see them as often as before.

Would Close Up the Country Stores.

FROM A MERCHANT IN WEST VIRGINIA: We feel satisfied that rural delievries would not prove to be practical for this locality and, furthermore, would be an injury to business generally. The matter would cause a great deal of confusion, packages would be broken up and soiled and sometimes lost, and then the parties to whom the goods were addressed would want to hold the merchant good for the loss, and it would cause all kinds of confusion. If that practice should become general it would close up all the country stores and also be a great detriment to the business in the smaller towns along the railroads.

As a rule our people in the country come into the towns to do their trading; they prefer it, and we as merchants encourage that, because it is more satisfactory to both parties. This is my opinion, and I think it is the sentiment of the majority of the business people of this locality.

Not a Single Merchant Has Used the System.

A merchant located in a small city in Ohio, who has made a thorough investigation in his locality, sends the following interesting and comprehensive statement:

At no time since the institution of the rural delivery have we ever been called upon to use, or in any way made use of, the system for any delivery whatever. The writer has personally made inquiries along this line and has not been able to locate a single merchant of any class who has used at any time this system. If they are so permitted, there is either ignorance of it in this section or our people have been extremely indifferent in the matter. The postmaster of this city advises me that practically nothing along this line is done, beyond the outputs that have been made at different times by the mail order houses, at first partially successful, but at this time forbidden. We think this statement will cover largely the situation in Ohio at all points.

Used Only by Catalogue Houses.

G. W. Hoover, Audubon, Ia., has sold the Hardware and Implement departments of his business to Christensen & Lang.

Sharpening Stone Window Display.

THE PIKE MFG. COMPANY, Pike, N. H., recently arranged an effective window display in the new single pane window of its New York branch, 151 Chambers street, containing Sharpening Stones and accessories of its own production. In part this exhibition is a practical demonstration or example for the retailer, showing the possibilities of even so prosaic a line of merchandise as Sharpening Stones. In the group, tastefully arranged, were India, Washita, Turkish and Arkansas Oil Stones, Razor Hones, Knife Sharpeners, Scythe Stones, with Desk, Automobile and Sportsmen's Knife Stones, Silver Mounted Carving Knife Hones and the Kantbreak



Sharpening Stone Window Display.

Indestructible Corundum and Emery Knife Hones, the latter in a unique display stand of natural finished wood. There was also a new cabinet assortment, with glass top and sign; also some of the company's Stonoil, of high grade, for sharpening purposes and for light work, such as guns, clocks, &c. Exhibits of such character invariably attract more attention if action of some kind is added. In this instance a Pyko Grinder was fitted up easily and inexpensively by utilizing the fan motor, by taking the smallest cogwheel of another Pyko and attaching to the axle of the motor, using an extra long chain with which to connect the motor and Grinder, the wiring detail being the same as for a fan or any light service. A long slicer or carving knife was suspended so that by a slight addition to the Grinder the blade was struck at every revolution to attract the attention of passersby. An accompanying inscription read thus: "There's a place for this Pyko Grinder in your home or your shop. Does the work quickly, accurately. Don't have dull knives on the table; dull tools in the shop. Use a Pkyo." The hanging clock consisted of a 16-in. Corundum Wheel, with Arabic numerals to form a dial, with hour and minute hands operated by an inexpensive eight-day clock movement at the back to give actual time.

THE PORTABLE CONSTRUCTION COMPANY, 16 South William street, New York, has issued a circular containing descriptions and illustrations of its "Permanent" bungalows and cottages. These are offered in five styles and sizes, B, C, D, E and G, varying in size from 10 x 22 ft., with approximate weight 2500 lb., and containing one or two rooms, to 20 x 36 ft., with approximate weight 15,000 lb., and containing seven rooms, all with front porch. It is stated that with the aid of simple and comprehensive instructions furnished by the company the bungalows can be erected in from one to three days, the latter time being required in connection with the largest size. The company furnishes the paint and hardware for the cottages, so that when erected and painted they look new and fresh, and show no dirt spots or transportation marks or scratches.

THE COMMONWEALTH OF AUSTRALIA AND THE DOMINION OF NEW ZEALAND.

IV.

BY JOHN L. SARDY

New South Wales.

NEW SOUTH WALES is the oldest settled State of the Commonwealth, having been made a colony in 1790. Sydney is the capital, with a population of about 500,000. The total population of the State is about 1,496,000, and the area over 310,000 square miles. Like Niagara Falls Sydney Harbor is world famed, and the people of New South Wales take as much pride in it as though they had made it themselves, instead of its being the handiwork of Dame Nature, which more often than not they forget.

There are over 3000 miles of railway in the State and interstate connection exists with Victoria, South Australia and Queensland. The total trade of the State is somewhat more than £66,000,000, the value of the exports running close to £37,000,000.

Sydney is, of course, the largest city in the State, but Newcastle from a coal shipping point of view is one of the important towns in New South Wales.

Victoria.

Victoria, except Tasmania, is the smallest territorially of the six States, although larger than England, Wales and Scotland combined, the area being 87,000 square miles. At one time it was part of New South Wales, but was made a separate colony in 1851. It was in this State that the great and at that time unheard of wealth of gold was discovered.

Melbourne, the largest city in the State, with a population about the same as Sydney, is more like an American city than the latter, which is built after the English style. Melbourne boasts of its cable line, which has been running, it is said, for years without ever a breakdown. At any rate the management is excellent. The total railroad mileage in the State is about the same as in New South Wales, but the trade is less, being about £45,000,000, exports exceeding by £400,000.

As in Sydney, there are many wholesale and retail Hardware establishments carrying full lines, mostly made in England, the United States and Germany. A good many of them occupy fine, up to date buildings, and it may be said pretty well all of them understand their business.

One of the largest Hardware firms perhaps in Australasia, with its head office in London, having extensive establishments in Melbourne, Sydney and the chief business points in New Zealand, import American Hardware nearly as extensively as English, and very much more than German. It will not be gratifying to our Wood Screw manufacturers to learn, however, that this firm, and others as well, prefer the English Screw, the American make being looked upon with disfavor because it is said the heads break off. The Wire Netting imported by this firm is all of English manufacture, but German Netting is coming in, being cheaper. The Wire Netting maker has to thank "'Brer Rabbit" for this large Australian trade. Firms think nothing of carrying 100 miles or more in stock.

Queensland.

Queensland, like Victoria, was at one time part of the old colony of New South Wales. It comprises the whole of the northeast portion of Australia, covering an area of 686,000 square miles, providing for a population of 503,000 and capable of sustaining many thousands more.

The northern part is separated from New Guinea by Torres Straits passing between the Arafura Sea and the Coral Sea, and is only about two degrees south of the equator, so it is exceedingly hot. At the same time it is a fertile country and capable of development in the hands of an enterprising people, but here the labor element comes in. White men cannot or will not work in North Queensland. The yellow race is the one for that job, but the white race won't have them, and so this great tract of land remains undeveloped.

Brisbane is the capital, situated at the head of Moreton Bay on the river from which it derives its name. The railroads cover about 3000 miles and the state trade amounts to about £18,000,000, exports making up £12,000,000 of this sum.

South Australia.

This immense state of over 900,000 square miles, extending from the Southern to the Indian oceans, and distant from Sydney over 1000 miles, gives some idea of the magnitude of Australia, but the population is sparse—378,208 in 1905. It is a great fruit country. We pride ourselves upon our peaches, but South Australia can give us cards and spades and beat us both in quality and price and as for grapes she is a rival beyond compare! Think of great, luscious grapes, big as plums, for 3 or 4 cents per pound! As a wine producing country South Australia leads all the other commonwealth states. In 1861 the production was 182,000 gal., in 1906 it was 2,655,947 gal.

Adelaide, the chief city and capital, is about 10 miles distant from Port Adelaide, where the over-sea steamer docks. Thence the traveler proceeds by rail. There are nearly 2000 miles of railroads in the state and the last report shows an annual trade of over £19,000,000, of which total imports form less than half, to the extent of £1,000,000.

Western Australia.

Western Australia, sometimes called Westralia, is about one-third of all Australia in size, containing nearly 976,000 sq. miles, with over 2000 miles of railroads within its boundaries. It is not so many years ago when this great state was scarcely explored, but the discovery of gold changed all that. To-day the population is about 250,000, and the gold output per annum is nearly £8,000,000. The annual trade is about £17,000,000, £10,000,000 of which consists of exports.

Perth, the capital and chief city, has a population of about 46,000, and is reached by sea to Fremantle, the port, 14 miles distant by rail. Kalgoorlie is now the gold field. At one time no regular water supply existed, but the government carried through a huge water pipe line from Perth, 350 miles away, and now the supply is ample. The piping is not cast iron, but steel, known as patent locking bar joint, one-half of which was made in Germany and the other half in the United States. The total cost of construction was £2,710,000.

Perth is a modern city, with good hotels and fine business buildings. One of the latest and perhaps most up to date and substantial in all Western Australia has been constructed and is owned and occupied by a well-known Hardware importer. Skyscrapers are not constructed in Australia, hence this structure is not more than four stories high, well built of brick and stone, and it is worthy of note that almost all the material used was produced in the State. The building is lighted throughout by both incandescent, gas and electricity, and on the third floor is a commodious bathroom, provided with a modern plunge and shower bath. There are two elevators, one for passengers, the other for goods, both being supplied by the Otis Company of New York. The city is well equipped with electric car lines, and besides the regular passenger cars a water wagon or car provided with four spouts, two at each end is regularly run over the line to water the streets.

Barrett Hardware Company's Fire.

IN the disastrous fire which occurred last week at Joliet, Ill., the establishment of Barrett Hardware Company was totally destroyed. The company announces that it desires to receive catalogues, price-lists, &c., from firms which it has been patronizing, and especially requires duplicate invoices of goods shipped since March 1.

THE PRITCHARD-STRONG COMPANY, Rochester, N. Y., is distributing a pamphlet showing attractive window displays of its Prisco Lanterns, in which the Uncle Obediah advertising device figures prominently. The company now has a small sample assortment of Lanterns, with which is given free a life size lithographed cut-out of Uncle Obediah.

MR. CORNISH'S ADDRESSES AT THE BUFFALO CONVENTION.

IN presenting the address on Paint legislation which appeared in our issue, 26th ult., as having been delivered at the recent annual meeting of the New York State Retail Hardware Association at Buffalo, we were in error in ascribing its authorship to E. J. Cornish, president of the Carter White Lead Company, Chicago. The address was that of G. B. Heckel, Philadelphia, secretary of the Paint Manufacturers' Association of the United States. The error was peculiarly unfortunate, inasmuch as the views expressed by Mr. Heckel are at variance with those held by Mr. Cornish, who is the head of a concern which emphasizes the fact that it manufactures nothing but a strictly pure White Lead, and is doing all in its power to educate customers to a realization of this. Mr. Cornish's views on the subject of "Pure Paint Laws" are expressed in the following address which was delivered at the banquet of the New York State Association:

While corroders are commonly believed to be in favor of Pure Paint laws, and the grinders of Mixed Paint against such laws, I personally doubt the necessity of any legislation upon this subject in order to bring about the reform desired.

There was a time when corroders were as guilty of adulterating White Lead as some of the Mixed Paint manufacturers are to-day. All of these substances formerly known as adulterants, later as "inert extenders," and at the present time called "reinforcers," were formerly used by White Lead corroders to cheapen the product. If barytes, silica, china clay and such like substances really improve White Lead, corroders themselves would use them at the present time. These substances are much cheaper than White Lead, and their use would mean a greater profit to the corroder if he could use this cheap material without injuring his product.

Pure White Lead.

The label you read on the White Lead keg is in itself evidence of the practice pursued by corroders at one time. You read there, "Strictly Pure White Lead," why not "White Lead" or "Pure White Lead?" I will explain: At one time corroders adulterated their White Lead with these so-called "inert extenders" or "reinforcers," as they are now termed. The results were not satisfactory to the consumer. Painters found that their jobs would not stand as they formerly did when nothing but straight pure White Lead and Linseed Oil were used, consequently painters demanded a pure product—they wanted material which would guarantee results to their customers, and as a result of this demand some corroders began to put out a brand of "Pure White Lead."

At this time the better corroders ceased manufacturing all but "Strictly Pure White Lead." The corroders, who continued to adulterate their product, failed in business. To-day there is not a corroder in the United States to my knowledge who sells a brand of White Lead which is not strictly pure. Corroders are striving to improve the quality of their products. The method of corrosion is being improved upon. Modern methods have been adopted. We are making Lead to-day of superior whiteness, and the result is that corroders are now turning out better White Lead than ever before.

Public Demand.

This then is the history of the growth of trade in the manufacture of white lead without any law whatsoever regulating the matter. I personally believe the same would result in the Mixed Paint business in time, but whether necessary or not the public is demanding pure food laws and pure Paint laws, and, whether willing or unwilling, the Mixed Paint grinders must yield to this public demand. The question, as at present presented, relates solely to the form of the label.

Shall the maker of adulterated Paints give the trade name by which various adulterants are commonly known, or the scientific name? Shall they say barytes, or sulphate of barium? The former will be known at once, the latter will permit a few more years of deception.

Care should be taken in framing pure Paint laws so as not to injure any person or stop invention. If any substance can be found that is a better pigment than white lead its use should be encouraged. If any substance can be found that when mixed with white lead cheapens the cost without injuring very much the quality of the product the public should have a part, at least, of the benefit of the cheaper cost. It ought not to be sold as white lead.

Barytes versus White Lead.

Expert chemists have testified that oleomargarine is better than butter—it does not turn rancid—keeps better and is equally as palatable. Without questioning the truth of their statements, if oleomargarine costs from 5 to 7 cents a pound and butter from 30 to 40 cents, it is manifestly unfair to the public to sell them oleomargarine as butter at the butter price. In like manner we had some expert chemists testify that barytes is a better pigment than white lead. Even if this were true the public ought not to be compelled to pay white lead prices for barytes, which costs about $15 a ton, and to sell barytes as white lead is a manifest fraud upon the public. Barytes has been used as an adulterant for many years, but its virtue, if it has any, never became known to anybody except corroders and grinders of Mixed Paints, because it has been sold not as barytes, but as white lead.

Whoever heard of any expert chemist or manufacturer alleging that barytes was better than white lead until the advent of these pure Paint laws? If barytes, silica, china clay and other so-called "inert extenders," or, to be more up to date, "reinforcers," really possess the virtues claimed for them, these substances are indebted to the pure Paint laws for allowing their worth to become known to the world. For certainly no one ever made such claims for them while they were masquerading as white lead.

If the term "reinforced pigment" was used to indicate that white lead is utilized to reinforce barytes, silica, chalk, clay, &c., it would be nearer the truth. White lead needs no reinforcing.

White Lead and Its Manufacture.

We also take pleasure in giving the following extracts from Mr. Cornish's interesting address at one of the sessions of the convention on the subject of White Lead and its process of manufacture:

I am greatly honored in being invited to address you upon the methods by which dark metallic Lead and dark coke or tan bark are transformed in a product, remarkable for its whiteness, that has become the standard white pigment of the world. Changing water into wine does not appear more miraculous than the changes that are daily wrought in the manufacture of Lead pigments. Pure metallic Lead, subjected to heat in a furnace, takes up oxygen from the air and forms Red Lead, brilliant in color, perpetuating in appearance the flame in which it was born, and pronounced by the experts of the United States Government as better than galvanizing or any other known preservative of iron and steel.

The same Pig Lead, subjected to a little higher heat taking up a little less oxygen, produces yellow litharge—useful in many ways, but most remarkable in being necessary in the manufacture of Glass of the greatest clearness and transparency.

Burn the carbon out of ordinary White Lead, add oxygen, and there is produced a substance identical with Red Lead in chemical composition, but in some mysterious way a beautiful orange in color, giving it the name of orange mineral.

Why the oxides of Lead should be red, yellow or orange, the hydroxide, carbonate, sulphate and sulphite of Lead white and the sulphide of Lead black, while the pure metallic Lead is blue, are questions the scientists cannot answer, any more than the father can answer the inquiry of his child, "why sheep ate grass and grew wool, and cows ate grass and grew hair."

There is surprisingly little in the technology of corroding that can be called established. Book writers and learned authorities have made many mistakes and advanced theories that have led corroders into many expensive errors. In the manufacture of White Lead today, much is empirical. The tendency of corroders is to follow safe, approved customs, rather than to embark upon proposed improvements that may prove deceptive.

Pure Metallic Lead.

In the manufacture of White Lead, only the purest metallic Lead is used. It must not contain over .003 per cent. of copper, iron, zinc or bismuth, .005 per cent. of antimony and 1 ounce of silver to the ton of Lead. If any of these ingredients are present in excess of the amount mentioned they will manifest themselves in low percentage of corrosion or defective color of the finished product. Extreme whiteness indicates perfect corrosion. The whiter the Lead, the more value it has as a Paint pigment, because of its ability to produce the softest, clearest tints.

Corroding Processes.

Several hundred patents of processes or improvements in processes for making White Lead have been taken out in this country and Europe. They may all be divided into three classes:

1. The old Dutch or Stack process. Probably four-fifths of the White lead made is by this process.

2. Chamber processes in which the conditions of the Stack are sought to be reproduced in chambers. The Carter process has been the most successful of this type.

3. Precipitation processes. There are two plants in the United States using these processes, both of which I believe are reasonably successful, but neither of which can I describe.

Dutch Process.

In the Dutch process the Pig Lead is melted and run into "buckles" or perforated disks about 6 or 8 in. in diameter and ⅛ to ¼ in. thick. These buckles are placed in earthen jars, in the bottom of which is acetic acid or vinegar. These jars are placed in layers and covered with tan bark—first, a layer of jars, then a layer of tan bark, &c., giving to this process its name of "Stack" process. When the stack is complete it begins to heat and ferment, in a manner similar to an ordinary manure pile, thereby generating carbonic acid gas and causing the acetic acid to evaporate. The acetic acid attacks the Lead, forming, as chemists tell us, basic acetate of Lead, in which condition the Lead will take up carbon from the carbonic acid gas, release the acetic acid and form the carbonate of Lead. After 100 to 120 days the stack is uncovered, and the buckles which went in dull blue lead come out of their grave immaculate in their whiteness. The Lead is then washed to free it from the acetic acid, dried and sold either in that state or ground in oil.

We are indebted to Dutch process corroders for having produced the product that has established White Lead as the best white pigment known. It is their product that has fixed White Lead as the standard by which all other white pigments and White Lead made by all other processes are gauged. For centuries it has stood the test of time and criticism. The Government and commercial bodies of France, having no important Lead mines of their own, have attacked it in vain. Substitutes have been produced, claimed to have special virtues, but one by one have fallen back and found in their lesser market value the verdict of the world as to their respective virtues. White Lead stands to-day as the highest priced white pigment, and substitutes approach it in cost and intrinsic worth in direct proportion to the extent they have supplemented their own defects by the addition of White Lead itself. For all this we are indebted to the Dutch process corroder.

Carter Lead.

Having exhausted my vocabulary in praise of a rival product I hope I will not give offence in saying the Carter Company long since accepted this standard and unhesitatingly undertakes to furnish a better Lead, more uniform in quality, having the same ideal of perfection, produced by more modern and scientific process—the product of American inventive genius. The Carter process does not differ chemically from the Dutch process. It differs in the physical means adopted to bring the chemical agents into contact. The same Pig Lead is used. It is melted, but instead of being run into buckles it is caught by a jet of steam and blown a distance of 35 to 40 ft., falling in a powdered form resembling in size and appearance ordinary gun powder. In this form it is placed in cylinders (2 tons to a charge) that revolve once every 14 min., thus bringing all the small particles of Lead continually in contact with the corroding agencies. The Lead is sprayed with acetic acid and water, by means of which the rapidity of chemical action and temperature are regulated. The carbonic acid gas instead of being made from tanbark is made from coke, which is burned under one of the boilers, the waste product of combustion being used to generate power for the factory. The fumes from the burning coke are conveyed through iron oxide to take out any sulphurous acid gas they may contain. From thence they are conveyed into the cylinders where the corrosion takes place. The Lead is at all times in view of the workman and subject to control, thereby securing complete corrosion and uniformity of product. In 10 days to two weeks the corrosion is complete. The cylinders are then emptied, the product washed, dried and ground, as in the Dutch process.

Recent Criticisms of White Lead.

It has been said that we are incurring much expense and labor for no useful purpose. Expert chemists have recently asserted with great positiveness that acetic acid in the finished product is not injurious, but acts as a drier, and there is no reason whatsoever to go to the large expense of washing the acetic acid out of the lead. In like manner, if the fumes from the coke contains any sulphur whatsoever it is in the form of sulphurous acid gas, which, when brought into contact with the lead, will make lead sulphate, or lead sulphite, or both. These products are both white in color, and are themselves sold to manufacturers of Mixed Paints as white pigments. Sublimed lead and zinc lead are two trade names for these products. Some chemists have pronounced these products as equal or superior to the white lead of commerce. If so, we are incurring a large unnecessary expense in producing carbonic acid gas free from sulphurous gases. But nothing is more conservative than an established business, and until all experts are agreed and time has proved their claims it is safe to say that white lead corroders will not risk the reputation of their brands by experimenting along these lines.

Pulp Ground Lead.

Recently also, we have had chemists criticize White Lead, in that it has an affinity for Oil, claiming that the so-called inert substances that are not affected in any manner when brought into contact with Linseed Oil, are for that reason superior as a pigment. What is meant by "affinity" I can explain best by describing the process by which pulp ground Lead is manufactured. When the White Lead is being washed it is in the state of pulp, weighing 12 to 20 lb. to the gallon. To this pulp is added the necessary amount of refined Linseed Oil. It is then churned much as you churn cream to make butter, and in a little while the Oil and the Lead having what the chemists call an affinity for each other, unite and fall, to the bottom of the churn, while the perfectly clear water rises to the top and is drawn off. The Lead in Oil separated in this manner from the water is packed in kegs, in the form with which you are familiar. I had always thought that this affinity between it and Oil was the peculiar virtue of White Lead. Wood unprotected rots. That is to say, the oxygen of the air under normal conditions of heat and moisture has united with the carbon of the wood, forming carbonic acid gas which has disappeared in the air. In process of time, if you weigh the wood you will find it has lost in weight. If you burn it you will find it gives forth less heat units, and a greater percentage of its weight consists in the remaining ash.

What takes place speedily when burned has taken place slowly in the process of decay. If you soak the wood in oil it will keep out moisture and protect the wood for a longer time against the action of the elements, but the oil itself will, in a short time, oxidize, and little by little lose its protective power. If, however, White Lead and Oil is applied the same affinity that makes the Lead leave the water and unite with the Oil in the pulp mill makes the combination resist longer the action of the elements. The fine particles of Lead fill the pores of the wood and protect the Oil while the Oil in turn holds the Lead in place, and the two, indissolubly connected, each supplementing the other, produce a combination superior to either alone and the best protective known.

But "this too shall pass away." Within the sound of Niagara Falls, that for ages has been slowly wearing its way back through the rocks, we are forcibly taught that nothing can resist the action of time and the elements. As long as the Lead and Oil last they do effective work, and when the wood is at last exposed they leave a surface that can easily and cheaply be repainted, without burning or scraping—a virtue possessed by White Lead alone.

Cleveland Screw Companies to Merge.

THE UNION STEEL SCREW COMPANY, Cleveland, Ohio, will be absorbed by the National Screw & Tack Company, Cleveland, provided that action approving the merger, just taken by the directors of the former company, is approved by the shareholders at a meeting called for April 30. Economy in operation and reduction in the cost of production are given as reasons for the proposed merger.

The National Screw & Tack Company is capitalized at $1,000,000 and the Union Steel Screw Company has $542,500 in stock outstanding. The National Company agrees to take over the Union Company for $461,125, payable in 6 per cent. cumulative preferred stock of the former to the par value of $461,000, the stock to be redeemable at any time at the option of the National Company at par and accrued interest. On this basis the holders of the Union Steel Screw stock will realize 85 per cent. for their stock with an income of 5.1 per cent. on the par value of their present holdings. By the terms of the transfer the National Company will take over all the property and business and good will of the Union Company.

The officers of the National Screw & Tack Company are W. D. B. Alexander, president; Dallas Elliott, vice-president; David Auld, Jr., treasurer, and C. W. Brainard, secretary. The officers of the Union Steel Screw Company are W. C. Bruce, president; Alvah S. Chisholm, vice-president, and Gustav von den Steinen, secretary.

North & Judd Mfg. Company's Catalogue.

THE NORTH & JUDD MFG. COMPANY, New Britain, Conn., has issued a new catalogue, No. 81, referring to its large line of Harness Hardware. It is an attractive and substantially bound volume of 500 pages, conveniently arranged and indexed and handsomely illustrated. Among the more important classes of goods covered are Buckles, Rings, Dees, Halter and Bridle Trimmings, Cockeyes, Trace Hooks, Team and Hame Trimmings, Saddle Trimmings, Snaps and Blanket Hardware, Bits of all kinds, Spurs and Stirrups. The company also issues separate catalogues of Razor Strop Trimmings, Belt Buckles, Baggage Hardware, Automobile Hardware and Belt Trimmings, &c., including Belt Buckles, Fob Buckles and Pendants, &c., in various metals and finishes.

All Steel Factory Chair.

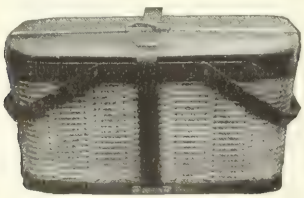
The accompanying cut shows an all metal substitute for a wooden chair with back, to be used in manufacturing plants of all kinds, especially where women are employed or where a chair with a back is required, such as watch, optical, jewelry, typewriter, lamp, hardware factories, &c. These chairs are strongly built and can be subjected to the hardest usage, being designed to meet not only reasonable but unreasonable tests for wear and durability. The legs are of angle iron of heavy stock, securely fastened with strong rivets to the pressed steel seat of good diameter, which is drawn from heavy gauge steel. There are two sets of Bessemer rungs, which make the under structure of this chair extremely rigid. The back rest is made of pressed steel of a heavy gauge, supported by an angle iron standard, securely fastened to the angle iron leg, thus furnishing a strong and comfortable back. The chairs are made in various hights and styles by the Manufacturing Equipment & Engineering Company, 209 Washington street, Boston, Mass.



All Steel Factory Chair.

Hawkeye Refrigerator Basket.

For the use of tourists and outing parties the Burlington Basket Company, Burlington, Iowa, is offering the Hawkeye refrigerator basket, here illustrated. It is represented as a strong light weight basket, made of rattan and fitted up on the inside like a refrigerator. Between the inside metal lining and the rattan body is a layer of felt and asbestos packing, which furnishes effective insulation. There is a small compartment in one end of the basket for holding ice, which may be easily removed for cleaning. The lids and bottom are insulated in the same manner as the body of the basket and all joints are carefully lined, so that when closed the basket is practically airtight. The metal lining is described as rust proof, and the top and bottom are made of hardwood, the lids being polished with oil and the bottom coated with heavy paint to guard against dampness. The basket is provided with handles made of tough wood, securely riveted to the sides. It is furnished on 30 days' trial, the guarantee being that the purchase price will be refunded if found unsatisfactory.



Hawkeye Refrigerator Basket.

Stall Cleaner.

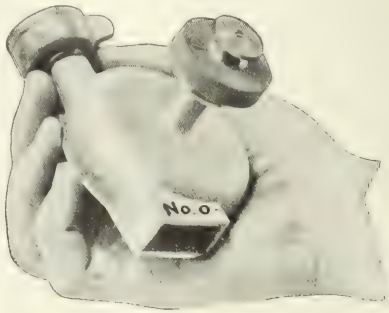
George S. Prescott, New London, N. H., is manufacturing the combination stable stall cleaner here shown. It includes short fork, hoe and drain cleaner, all in one tool, its use in any form in nowise interfering with the other attachments. The short fork is said to be just the right size and shape to separate bedding from manure so that the bedding is not wasted and will dry quickly. The drain cleaner is strong and hangs at the right angle. The maker states that the tool saves much time, enabling a man to clean a stall perfectly without changing tools or stepping out of his tracks.



Prescott's Stall Cleaner.

The Baby Water Motor No. 0.

A. C. Lippincott, Newark, N. J., is offering the water motor shown herewith. It is only 3 in. outside diameter, has a coupling to fit an ordinary threaded faucet and a 2-in. emery wheel. The emery wheel flange is formed into a small pulley, which with suitable water pressure is said to run a sewing machine or other device requiring equal power. The manufacturer states that under good city water pressure the motor makes nearly 7000 rev. per min., and that it is capable of doing all the grinding



The Baby Water Motor No. 0.

necessary about the house, such as hatchets, carving knives, screw drivers, &c.

The Deck Gravity Level.

The accompanying illustrations give various views of the gravity level put on the market by the T. F. Deck Gravity Level Company, Ohio Building, Toledo, Ohio. The level is simple and durable in construction and so arranged as to automatically indicate horizontal and vertical positions and the angle of any deviation cor-



Fig. 1. The Deck Gravity Level.

rectly without any adjusting. Fig. 3 shows the interior of the level—A is the pinion; B the multiple gear; C the roller bearings and D the pendulum and weight. As the name implies, the level is operated by the law of gravitation as exemplified in a plumb. The plumb bob or pendulum is suspended from a shaft which rotates in roller bearings. It is explained that this arrangement of the pendulum, shaft and roller bearings produces 75 per cent. more power than is lost by friction, so if one end of



Fig. 2. Level Graduated Same as Rule or Square.

a 24-in. level stock is raised 1-16 in. the indicator will instantly move 1-16 in. on the graduated dial, which is graduated the same as a rule or square. Fastened on the shaft is a multiple gear wheel of brass, in which are cut 150 teeth, so accurately spaced as not to vary one-half thousandth of an inch. The teeth of this gear wheel mesh in a pinion; to one end of the pinion staff is attached an indicator which points to the graduations on the dial, showing whether the work is level or plumb. A

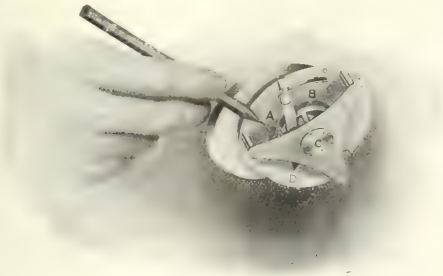
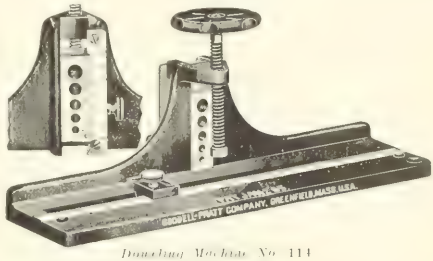


Fig. 3. Interior of Level Movement.

brake is also provided which operates upon the shaft in such a manner that pressing on the lock button which is on top of the level stock will at once stop the swinging of the pendulum and indicator; while pressing the lock button and giving the button a quarter turn will lock the movement. It is pointed out that notwithstanding the extreme sensitiveness of the instrument, it is wholly practical and extremely durable. The line includes levels for the use of carpenters, masons, millwrights and machinists; also a special level for leveling line shafting and machinery.

Doweling Machine No. 114.

The accompanying illustration represents a doweling machine put on the market by Goodell-Pratt Company, Greenfield, Mass. The machine is designed to make accurate boring of doweling holes possible. Front and rear views are given, showing the graduation by which the hight of the gauge block can be readily determined and

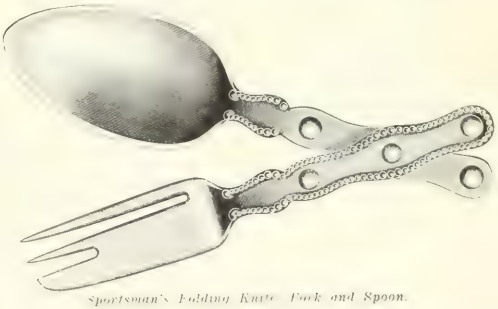


Doweling Machine No. 114.

set at any desired point. The gauge block is provided with holes 1/4, 5-16, 3/8, 7-16 and 1/2 in. in diameter. The face of the machine has a graduated strip running 7 in. in each direction from the center, making possible the location for dowel holes practically perfect. All of the graduated strips are engine divided, and the whole tool is referred to as being well made and attractively finished. The machines are packed, one each in wooden boxes, and thus packed weigh 13½ lb. The net weight of the machine is 10½ lb.

Sportsman's Folding Knife, Fork and Spoon.

The Hart Mfg. Company, Unionville, Conn., is putting on the market the folding knife, fork and spoon shown



Sportsman's Folding Knife, Fork and Spoon.

herewith. It is made in tin plate, nickel silver and silver plate finishes. The device can be carried in the pocket, in a tin pail or in a sportsman's kit.

Bathroom Accessories.

Included in the line of bathroom accessories manufactured by Forsyth Mfg. Company, Buffalo, N. Y., are the match safe and soap tray shown herewith. The match



Match Safe



Soap Tray

Bathroom Accessories.

safe is rigidly formed of nickel plated and polished sheet metal, with oval front and a large match holding capacity. The bottom is concaved, which permits the easy

removal of even the last match, and on the underside of the bottom is a match scratcher. The nickel plated and polished soap tray has a specially designed curved bracket with a circular wall plate. The tray is also made with a bracket for attaching to the underside of a shelf.

New Dietz Lanterns.

The R. E. Dietz Company, 60 Laight street, New York, is showing in its new catalogue, No. 40, the New Vesta railroad lantern for kerosene, shown in Fig. 1, which is said to afford a great saving in operating expense over standard railroad lanterns burning signal oil and at the same time giving more light. It burns only 2 6-10 gills of kerosene oil in 18 hr. It is a tubular cold blast lantern, with hinged top. The wick is regulated from the outside, and the oil pot locks in with a bayonet catch and holds oil to burn 16 hr. Another addition to the company's line is the Protector track walkers' lamp, the feature of which is a patent folding bail, permitting it to be carried at arm's length close to the rail. It has a 3-in. ruby semaphore lens in the back, normally covered

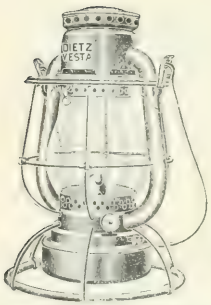


Fig. 1. New Vesta Railroad Lantern.

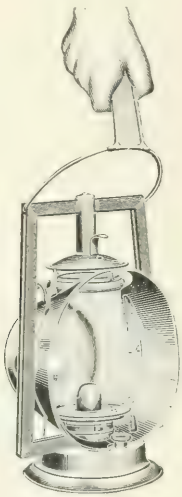


Fig. 2.—Dietz Protector Lamp.

by a slide. When the slide is lifted the light shines through the ruby semaphore lens, forming a powerful danger signal. The lamp has a bright tin hood 6 in. deep, the back of which is formed into a 5-in. reflector. The fount holds oil to burn 20 hr.

Duntley Electric Vacuum Cleaner.

The widespread use of electricty for lighting in dwellings has paved the way for its application to power service in the home as well as the factory. An example of such adaptation is presented in the accompanying illustration, which represents the Duntley electric portable vacuum cleaner, a recent electric appliance developed by the Chicago Pneumatic Tool Company, Chicago. This machine is designed to supplant the broom and dust cloth and other old style means of household cleaning. It consists of a small wooden cabinet, standing 3 ft. high by 2 ft. wide, with a depth of 1 ft. Vacuum is created by a bellows operated by a small electric motor, driven by current from an ordinary lamp socket. All of the mechanical apparatus is contained within the cabinet. The power required to drive the machine is equal to that consumed by four 16 candle power lamps, the cost of which is estimated at 3 to 4 cents per hour. Dust and dirt are drawn up inside of the case through a hose attached by a sleeve joint to a fixture at one end of the machine and are deposited in a dust drawer. The latter is easily removable, and its contents may be safely carried outside for emptying without danger of being scattered about to settle again. The auxiliary tools required for the successful performance of work consist of nozzles with slotted openings and specially designed furniture brushes



Duntley Electric Vacuum Cleaner.

fitted to the operating end of the hose. These when drawn over surfaces to be cleaned suck up the dust, effectually preventing its dissipation through the atmosphere. The entire machine weighs about 70 lb., and is provided with rubber tired rollers and handles, by means of which it is easily portable from room to room.

Standard Expansion Pump Bucket.

The Cleveland Galvanizing Works Company, Cleveland, Ohio, manufacturer of pump chain, &c., is making the Standard expansion pump bucket shown in the accompanying illustration. It is a two-piece bucket and expands to 1 13-16 in. diameter. The bulk of rubber at the wearing point is 7-16 in. thick. It is claimed that the rubber cannot strip off the links. There is a strong coarse thread on both rubber and link, making expansion quick and sure. The thread being cast in both members is consequently galvanized over the thread on the links, making a zinc to rubber union, which, it is said, will turn easily, no matter how long in service. The bucket can be expanded at any time without the aid of tools and without removing the bucket from the chain by simply grasping the chain at the point where it joins the links and holding firmly while rotating the rubber on the link with the other hand. The bucket is furnished in standard sizes and in one grade of gum only—the best obtainable, it is stated.



Standard Expansion Pump Bucket

Steel Vehicle Gears.

The Wagner Mfg. Company, North Milwaukee, Wis., manufacturer of vehicle hardware, is putting out a line of steel gears for go-carts, baby carriages, folding carts,

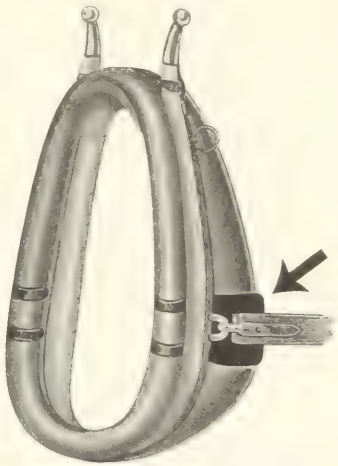


Steel Vehicle Gears.

&c., which are made in a great variety of sizes and adapted to all purposes from the smallest doll carriages to the largest boys' express wagons. The illustration herewith shows reclining folding go-cart equipped with gears made by the company, which makes all of the steel parts used in its construction with the exception of the wheels as a whole. These, however, are furnished with patent stamped steel hubs, which are made in a great variety of sizes and furnished to manufacturers. The construction of the hubs facilitates the assembling of the parts, so that by their use a light, strong wheel can be economically built. Other gears of more elaborate design and heavier construction are also made, with handle bars of ½-in. round steel rods, which may be drilled for regular wood cross bars or furnished with threaded holes for metal grip cross bars. In addition to its line of vehicle gears the company makes a specialty of sheet metal stampings of various kinds to take the place of malleable iron castings.

Horse Collar Protector.

The Black Diamond Mfg. Company, Cincinnati, Ohio, is manufacturing the horse collar protector herewith illustrated. It is a metal plate having two spring hooks like those used on collar pads. The protector is placed over the collar and under the hames at the point where the traces are fastened to the hames, and prevents the hame tugs and traces breaking down and wearing out the collar. It is not necessary, it is explained, to take the protector off the collar when removing the harness from the horse, or at any other time, but it may be slid up or down on the collar or taken off and put on another collar if desired. The point is made that many collars are thrown away while perfectly good, except where they are



Horse Collar Protector.

worn out or broken down by the hame tugs. The protector is designed to prevent collars wearing out from this cause.

Feldmeier & Moore have established themselves in the Hardware business in Grand Junction, Colo.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₰ gal.
Linseed, [illegible]	
Raw	
Cod, Brown	
Cod, Pale	
Lard, Extra	
No. 1	47 @52
Neatsfoot, Extra	
Strained	
No. 1	
Tallow, Acme	
Menhaden, Brown, Strained	40 @..
Light Pressed	
Northern	
Southern	
Cocoanut, Ceylon	
Cochin	
Cod, Domestic, Pale	
Newfoundland	
Red Bone	
Sperm, Natural	
Olive, Yiod	
Neatsfoot, Pure	
Palm, Lagos	6½

Mineral Oils—

	₰ gal.
Black, [illegible]	
Lard	
Summer	
Cylinder, Dark	
Dark	
Paraffine, 23@25	
903	
583	10½@12
Red	14

Miscellaneous—

Barytes:	
White, Powder	$30 50
Alum	
Copperas	

	₰ lb
Chalk, in bulk	80@ 2.40
China Clay, Imported, ₰ ton	11.50@18.00
Cobalt, Oxide	100 lb 1.35@ 2.60
Whiting, Commercial	100 lb .42@ .52
Gilders	60@ 65

Putty, Commercial—₰ 100 lb

In Barrels	$1.5
In Bbls.	
In Kegs	
In 12½ to 25 lb cans	1.5

Spirits Turpentine—₰ gal.

In Oil Mills	
In Casks	

Glue—

	₰ lb
Cabinet	12 @15
Brown	
Extra White	18 @24
Fish, liquid, 50 gal. bbls., per gal.	.80
Foot Stock, White	12 @14
Foot Stock, Brown	
German Common Hide	10 @12
Glauber's Hide	
French	
Irish	
Low Grade	12
Medium White	14 @17

Gum Shellac—

	₰ lb
Black, J. C.	
Button Dry	
Button	
Garnet, J. J.	
Fine, Orange	
A. C. Garnet	
G. A. J.	
Knot, Bottle	
D. C.	48 @49
Octagon, B.	38 @40
T. N.	
T. S. O.	46 @48

Colors in Oil—

	₰ lb
Black, Lamp	12 @14
Ivory	
Blue, Prussian	32 @36
Ultramarine	
Brown, Vandyke	14
Green, Chrome	12 @16
Green, Paris	@24
Sienna, Raw	
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	@14

White Lead, Zinc, &c.—

	₰ lb
Lead, English white, in Oil	10½@10¾
Lead, American White:	
Extra	
No. 1	
No. 2	
No. 3	7¾
Lead, White, in oil, 12½ lb tin	
Lead, White, dry	

Lead, American. Terms: On lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice.

Zinc, Dry—

	₰ lb
American	5@ 5½
Red Seal (French process)	6¾@ 7
Green Seal (French process)	7¼@ 7½
Green Seal	7¾@ 7¾
White Seal	
Extra White	
Green Seal	7¾@ 7¾
White Seal	
Extra White	
Green Seal	10½@10¾

Dry Colors—

	₰ lb
Black, Carbon	6¾@10
Black, Drop, American	2½@ 8
Black, Drop, English	5 @15
Black, Ivory	16 @20
Lamp, commercial	4 @ 6

	₰ lb
Blue, Celestial	4 @ 6
Blue, Chinese	31 @33
Indigo	1
Prussian	19
Brown, Vandyke	1
Carmine, No. 40	4.5
Green, Chrome, ordinary	3½@ 5
Green, Chrome, pure	17 @25
Imperial	
Paris	
Ochre, French	
Orange Mineral	
Orange Mineral, English	10 @11
Extra	
Golden	
Vermilion	
Imperial	
Paris	9¼
Pink	
Red, Indian	
Red, Venetian, American	₰ 100 lb $1.50@1.25
Spanish	.60
Sienna, Raw	
Burnt	
Imperial	9
American	7
Antique	9
Talc, American	1.00
Asbestine	1.00
Terra Alba	.80
Domestic	.80
Turkey, Raw and Powdered	2½@ 3
Umber, Raw	
Burnt	
Vandyke	
Yellow Chrome, Pure	13 @15
Yellow, American	.25
Ochre	.05
Ochre	.05
Paris	.05
Lithol	.50
Zinc	.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Tapin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers ₱ doz. pairs, Nos. 1, $3.75; 2, $4.50; 4, $5.00; 5, $6.50.
Fernald Quick Shifter, ₱ doz. pairs .....$2.00@$3.00

Anvils—American—

Eagle Anvils .....₱ lb @8½¢
Hay Budden, Wrought.....9½@9¾¢
Trenton .....₱ lb 9½@9¾¢

Imported—

Swedish, Solid Steel Swage, Superior, 6 to 11 .....10¢@10½¢
Peter Wright & Sons, ₱ lb, 84 to 349 lb 11¢; 350 to 699 lb, 11½¢.

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....10%

Augers and Bits—

Com. Double Spur.....75&10@80%
Jennings' Pat., Bright.....65&10@70%
Black Lip or Blued...65@65&5%
Boring Mach. Augers.....70%
Car Bits, 12-in. twist.....40&10%
Ford's Auger and Car Bits.....40&5%
Ft. Washington Auger Co., Cincinnati 35%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, 25&7½%
No. 30, R. Jennings' list.....50%
Russell Jennings .....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Pugh's Black.....90%
Pugh's Jennings' Pattern.....35%
Snell's Gauge Bits 60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's Pattern, No. 1, ₱ doz. $28; No. 2, $18 .....60&10%
Ford's, Clark's Pattern.....66⅔&5%
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $36.00.....60&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz...$6.50@7.00
Ames .....35&10%
Universal 20%

Ship Augers and Bits—

Ship Augers.....40&10@—%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' .....33⅓&7½%
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhilled, Shldered...gro.63@66¢
Unhandled, Patent...gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. $1@$1.4
Unhdled, Shldered..gro. 65@70¢
Scratch Awls.
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per pound.
Extra Quality .....14 75@15.50
Second Quality.....$1.25@1.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles— *Iron or Steel*

Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose.....3¾@4¼¢
No. 1½ Com., Nave Style..4½@5 ¢
No. 2 Solid Collar.....4½@5 ¢
Half Patent:
Nos. 7, 8, 11 and 12...65@65&10%
Nos. 13 to 14.....65@65&10%
Nos. 15 to 18.....70@70&10%
Nos. 19 to 22.....70@70&10%

Boxes, Axle—

Common and Concord, not turned lb., 5@6¢
Common and Concord, turned. lb., 6@7¢
Half Patent.....lb., 9½@10¢

Bait—Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chattillon's:
Light Spg. Balances.....50@55&10%
Straight Balances.....40@40&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb per lb, —@2½@2¾¢

Towel -

No. 10 Ideal, Nickel Plate..₱ gro. $8.50

Beams, Scale—

Scale Beams.....40%
Chattillon's No. 1.....35%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₱ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ₱ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned.....₱ doz. $1.50

Beaters, Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.35; No. 8, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Duver, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.50

Bellows—

Blacksmith, Standard List.
Split Leather.....60&10@65%
Grain Leather.....50@50&10%

Hand—

Inch..	6	7	8	9	10
Doz...	$5.00	5.50	6.00	6.50	7.50

Net Prices.

Molders—

Inch..	10	12	14	16
Doz...	$7.50	9.00	12.00	15.00

Bells—Cow—

Ordinary Goods...75&5@75&10@75%
High grade.....70@10@75%
Jersey .....75&10%
Texas Star.....50%

Door—

Home, R. & F. Mfg. Co's. .....55&10%

Hand—

Polished, Brass.....70@10@60%
White Metal.....50@10@10@65%
Nickel Plated.....70@5%
Series .....50@5%
Cone's Globe Hand Bells.....33⅓@35%

Miscellaneous—

Farm Bells.....lb., 2¼@2½¢
Church and School.....60@60@5%

Belting—Leather—

Standard .....70@10@70@10@5%
Light .....75@10%
Cut Leather Lacing...50@10@60%
Leather Lacing Sides, per sq. ft. 20@22¢

Rubber—

Competition (Low Grade), 70@10@75@5%
Standard .....60@10@60%
Best Grades.....50@50@60%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Spokes.....50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden.....75@75&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....75%
Embossed 35%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread): ⅜ x 6 and smaller.....75@—
Larger and longer.....70@—%
Phila. Eagle, $3.00 list...50@—
Bolt Ends.....70@—%
Machine (cut Thread): ⅜ x 4 and smaller.....75&5@—%
Larger and longer.....70@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob.

Inch.....	3	4	5	6	8
Per doz..	$0.30	.35	.45	.60	.80

Cast Iron Spring Foot, Jap'd:

Inch.....	6	8	10
Per doz.....	$1.20	1.50	2.25

Cast Iron Chain, Flat, Japanned:

Inch.....	6	8	10
Per doz.....	$1.00	1.30	1.65

Cast Iron Flat Shutter, Jap'd., Brass Knobs:

Inch.....	6	8	10
Per doz.....	$0.75	.85	1.25

Wrought Barrel Japd..80@80&10%
Barrel, Bronzed.....60&10%
Spring .....70@10@70@10@10%
Shutter .....50@50@50@10@5%
Square Neck.....75@75&10@10%
Square .....70@10@10%
Ives' Patent Door.....55%
Ives' Wrought Metal.....45%

Expansion—

Richards Mfg. Co .....50&10%
Steward & Reimann Mfg. Co.:
Style No. 13, Double.....55%
Style No. 1, Single.....55%
Style No. 100, Dbl. Jaw, Single 50%
Lag Screw 66⅔%

Plow and Stove—

Plow .....65&5@70%
Stove .....80@80&5%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '94...80%
Eagle Phila., list Oct. 16, '94....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '94...80%
Eagle Phila., list Oct. 16, '94....82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '94....80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99.....80%
Phila., Eagle, list Oct. 16, 1884..82½%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch.....	1¼	1½	1¾	2
Per doz...	$4.80	5.60	6.40	8.00
Inch	2¼	2½		
Per doz.....	$8.65	11.50		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme .....15&10%
Perfection 40%
Seavey 45%

Braces—

Common Ball, American.....$1.50
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 415 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat..50%
Mulleable Ball Braces.....25&10%
P., S. & W. Co., Peck's Pat..60&10%

Brackets—

Wrought Steel.....70&10@75&10%
Bradley Metal Clasp..80&10@80&10&5%
Griffin's Pressed Steel.....75@75&10%
Griffin & Folding Brackets.....70&10%
Taplin Victor Handy Egg Beater Bracket .....₱ doz. $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Wire Goods Co.....75%

Buckets, Galvanized—

M't'g'r's list, price per gross.

	Quart.	10	12	14	
Water, Rem		25.35	28.00	32.00	10&5%
Water, Hem		45.35	48.00	52.00	
Fire, Rd. Btm.		32.00	34.65	38.65	
Well		37.35	41.35	45.35	

Bull Rings—See *Rings, Bull*

Butts—Brass—

Wrought, High List, Oct. 26,'06.55%
Cast Brass, Thebaut 40%

Cast Iron—

Fast Joint, Broad.....40@10@50%
Fast Joint, Narrow.....40@10@50%
Loose Joint.....70@10@75%
Loose Pin.....70@10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—

Bright

Light Narrow, Light Reversible	70&5%
Reversible and Broad	70&5%
Loose Joint, Narrow, Light Inside Blind, &c.	70%
Back Flaps, Table Chest	65%
Japanned	
Light Narrow, Loose Pin	70&5%
Light Narrow, Ball Tip	60%
Broad	40&5%
Steeple Tipped	70%
Ball Tipped	70%

Extra 10%

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list, 1200, 15", 2300, 3000, 3900 ..... 50%
Hendryx Bronze, Series 3000, 5000 ..... 50%
Hendryx Imitation 25

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 to 2½ in., per lb. ..... 4½¢
Sharp, 1 to 2½ in., per lb. ..... 4½¢
Barbed, 1 to 2½ in., Sterling ..... 4½¢
Lumber, Barbed, 1 to 2½ in., Sterling ..... 4½¢
Peraltic Bound, 1 to 2½ in., Sterling ..... 4.25¢

Can Openers—

See Openers, Can.

Caps, Percussion—

Ely's C. B. ..... 88¢@$1
G. D. ..... *per M* $1.35¢
G. L. ..... *per M* $1.45¢
G. E. ..... *per M* $1.50¢
Musket ..... *per M* 62½@65¢

Primers—

Berdan Primers, 4 to M ..... 25@65
Primer Shells and Bullets ..... 15@10
All other primers per M $1.35@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Bank Cartridges:
32 C. F. ..... 10@5%
38 C. F. ..... 10@5%
22 cal. Rim, $1.50 ..... 10@5%
32 cal. Rim, $2.75 ..... 10@5%
B. B. Caps, Rim Fire, Bird Shot $1.00
B. B. Caps, Round Ball $1.45
Central Fire 25%
Target and Sporting Rifle ..... 15@5%
Primed Shells and Bullets ..... 15@10%
Rim Fire, Sporting 50%
Rim Fire, Military ..... 15@5%

Casters—

Bed ..... 60@10%
Plate ..... 60@10%
Philadelphia ..... 60@10%
Axle, Bed ..... 60@10%
Gem, Bed ..... 60@10%
Steel Gem ..... 60@10%
Standard Ball Bearing 45
Your Price While You Wait ..... 60@10%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:
⅜ to ¾ in., per 100 lb. $5.75
⅞ to 1 in., per 100 lb. $5.50
1¼ to 1½ in., per 100 lb. $5.25
1¾ to 2 in., per 100 lb. $5.00
In cask lots, deduct 25c.
German Coil ..... 60@10@5%
German Patent Coil,
6 to 1 in. ..... 70@5 and 10@10%
2 and 2½ in. ..... 60@10@5%
3, 3½ and 4 in. ..... 50@10@5%

Halter—

Halter Chains ..... 60@10@5%
German Patent Halter Chains, last quoted ..... 60@10@5%
Covert Mfg. Co.
Halter ..... 35@5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6 3, Straight, with ring $28.00
6½—6 2, Straight, with ring $29.00
6½—8 2, Straight, with ring $42.00
6½—10 2, Straight, with ring $57.00
NOTE—Add 2c per pair for Hooks. Twist Traces, add per pair for No. 1, 2 and 3, 4c; No. 5, 6c; Concave or Straight Tug.
Eastern Standard Traces, Wagon Chain, &c. ..... 60@10@10@5%

Miscellaneous—

Jack Chain, list July 10, '93.
Iron ..... 60@10%
Brass 60%
Safety and Plumbers' Chain, ... 60@10
Gal. Pump Chain ..... list, 70@5
Bridgeport Chain Co.:
Trump 50
Triumph, Dog ..... 50 & 60
Bench Hook 60
Covert Mfg. Co.
Brass, Halter Heel Rein Stallion 40%
Oneida Community:
American Halter, Dog and Key Chain ..... 40@10%
Niagara Dog Leads and Key Rod Chains ..... 40@5@5
Wire Goods Co.:
Dog Chain 70%
Universal Db. Jointed Chain 50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain 60
Pullman:
Bronze Chain 60%, Steel Chain 60
Sash Chain Attachments per pr. 25c
Aluminoy Sash Ribbon per pc. 25c
Sash Ribbon Attachments, per set 8c

Chalk—From Jobbers

Carpenters' Blue ..... *gro.* 50@15¢
Carpenters' Red ..... *gro.* 45@10¢
Carpenters' White ..... *gro.* 40@15¢

Checks, Door—

Bardsley's 45%
Pullman, per gro $54.00
Russwin 33½%

Chests, Tool—

American Tool Chest Co.:
Boss $22.00
Yankee Chests, each $1.00
Gem Tool Chests, each $1.00
Farmers', Carpenters' etc., Chests, with Tools 30
Mechanics' and Pipe Fitters' Chests, Empty 15
Tool Cabinets 15
Lathe, Screw & Gear Machinists' Tool Chests 15

Chisels—

Socket Framing and Firmer

Standard List ..... *Net List*
Ives & Bliss 30%
C. E. Jennings & Co. 25%
Socket Firmer No. 1 ..... 25 & 5%
Socket Framing No. 15 ..... 25 & 5%
Stanley
L. & I. J. White Co. ..... 30@30&5%

Tanged—

Tanged Firmers ..... 30@10@5%
Ives & Bliss 30%
C. E. Jennings & Co. Nos. 121, 181, 25
L. & I. J. White Co. ..... 25&5%

Cold—

lb.

Cold Chisels, good quality ..... 15@15¢
Cold Chisels, fair quality ..... 11@11¢
Cold Chisels, ordinary ..... 9@10¢

Chucks—

Almond Drill Chucks 35%
Almond Turret Six Tool Chuck 40%
Bonn Drill, each $6.00 ..... 30&5
Empire 25%
Blacksmiths' 25%
Jacobs Drill Chucks 35%
Pratt's Positive Drive 25%
Superior Patent Chucks:
Independent Lathe Chucks 35%
Universal Receding Jaws 25
Combination Receding Jaws 25
Drill Chucks 25
Standard, 45%; Skinner Pat., 25; Positive Drive 10
Planer Chucks 20%
Face Plate Chucks 5
Standard Tool Co.:
Improved Drill Chuck 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21 ..... 35%
Scroll Combination, Nos. 83 and 84 ..... 30%
Geared Scroll Nos. 33, 34 and 35 ..... 25%
Independent Iron, Nos. 18 and 318 ..... 35%
Independent Steel, No. 64 ..... 25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104 ..... 35%
Union Czar Drill 25%
Universal, 11, 12, 16, 17, 13, 14, 15 ..... 40%
Universal, 42, 43 ..... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50 ..... 35%
Steel Face Plate Jaws, Nos. 70 and 72 ..... 50%
Westcott Patent Chucks:
Lathe Chucks 50%
Little Giant Auxiliary Drill 50%
Little Giant Double Grip Drill 50%
Little Giant Drill, Improved 50%
Oneida Drill 50%
Special Combination Lathe 50%
Whitaker Mfg. Co.:
National Drill 25

Clamps—

Adjustable, Hammers' ..... 20@20&5%
Carriage Makers' P. S. & W. Co. ..... 50&10%
Body Parallel ..... 33⅓&10%
Myers' Hat Rack 15
Lineman's Swedish Neverturn 65%
Wood Workers' Hammers ..... 40&10%
Saw Clamps, see Vises, Saw Filers

Cleaners, Drain—

Iwan's Champion, Adjustable 50%
Iwan's Champion, Stationary 40%

Sidewalk—

Star Socket, All Steel, ₰ doz. $4.05 net
Star Shank, All Steel, ₰ doz. $3.24 net
A. & C. Shank, All Steel, ₰ doz., 7½ in., $3.00; 8 in., $3.25

Cleavers, Butchers'—

Foster Bros. 30%
Fayette R. Plumb 30%
L. & I. J. White Co. 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each, $10.75
20th Century Horse, each, $5.00
Lightning Belt Horse, each $15.00
Chicago Belt Sheep, each $20.00
Stewart's Enclosed Gear Horse, each $8.75
Stewart's Patent Sheep Shearing Machine, each $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each $9.75

Clips, Axle—

Regular Styles, list July 1, '05, ... 50&10&10%

Cloth and Netting, Wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Packing, Liquor, Bathing, &c. ..... 70@—%
Compression Bibbs ..... —%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list 40%
Leather, Walter B. Stevens & Son's list 40%

Compasses, Dividers, &c.

Ordinary Grades ..... 70@10@75%
Wm. Schollhorn Co.:
Excelsior Dividers 60%
Lodi Divider ..... 70&10%

Conductor Pipe,—

Coal and Charcoal Iron
Eastern ..... 75¢
Pittsburgh ..... 80¢
Southern ..... 75¢
Western ..... 70¢
Tennessee ..... 70¢
Southwestern ..... 70¢
Southern ..... 75¢

Terms, 60 day, 2% cash, draft 10 days; shipments generally delivered.

See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:
Cans ..... 1 gal. $5.00, 2 gal. $5.50
Galvanized Iron Cans ..... 1 gal. $4.00, 2 gal. $4.50
Each $3.00 $3.50 $4.00 $4.50
White Enamel 10%
Agate Lined 10%

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 to pair and heavier ..... 18¢ to 20¢
Soldering Coppers, lighter than 3 lb. to pair ..... 22¢ to 27¢

Cord—Sash—

Braided, Drab ..... *lb.* 35¢
Braided, White, Com. Nos. 8 to 12, 28¢; No. 7, 24¢; No. 6, 22¢. *In lots of 1 case, or over, 1 cent less per pound.*
Cable Laid Italian, lb., No. 18.. 37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India ..... *lb.* Drab 14¢
Cotton Sash Cord, Unbleached ..... 12¢
Patent Russia ..... *lb* 24¢
Cable Laid Russia ..... *lb* 21¢
India Hemp, Br'd'd ..... *lb* 21¢
India Hemp, Twisted ..... *lb* 21¢
Patent India, Twisted ..... *lb* 17¢
Peail Braided, Nos. 8 to 12, 26¢; 7, 25¢; 6, 24¢.
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 25¢; 6, 24¢.
Harmony Cable Laid Italian, Nos. 7 to 12 ..... ₰ lb. 25¢
Pullman:
Wire Sash Cord 10%
Sash Cord Attachments, per doz. 10¢
Samson, Nos. 8 to 12:
Braided, ₰ lb. Drab Cotton, 55¢; Italian Hemp, 40¢; 50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord ..... 50¢
Massachusetts, White ..... ₰ lb 40¢
Massachusetts, Drab ..... ₰ lb 45¢
Phoenix, White, Nos. 8 to 12, 27¢;
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen ..... 57½¢
See also Chain and Ribbon.

Wire, Picture—

List July 19, 1906 ..... 90&10%
Hendryx Standard Wire Picture Cord, old list, 85&10%
Turner & Stanton Co. Wire Picture Cord ..... S.&I.

Cradles—

Grain ..... 40¢@12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers.
Zelnicker's Lumber, ₰ gro
White and Purple, Indelible $7.50
Blue, Red, Green, Yellow 1
Terra Cotta, Sepia, Drab 54
Giant Lumber, 5¾ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks $10.00
Genuine Soapstone, Metal Wrapped, 5 in. x ¼ in. Round, $2.50; 5 in. x ¾ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¾ x 3-16 ..... $2.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $5.50; Light 4.50

Crow Bars—See *Bars, Crow*

Cultivators—

Victor Garden 50%

Cutlery, Table—

International Silver Company:
No. 12 Medium Knives, 1847, ₰ doz. $3.50
Star, Rogers & Hamilton and Another ..... ₰ doz. $2.50
Wm. Rogers & Son ..... ₰ doz. $2.50

Cutters—Glass—

H. B. Mayhew Co. 40%
Red Devil 50
B. Mfg. Co. 50
Wonderful 50

Meat and Food—

American:
No. 40 40 40 40 40 40 40
Each $3 $4 $5 $6 $8 $9 $10
Enterprise:
No. 10 12 22 32 42 52
Each $1 $1.25 $1.50 $1.75 $2 $2.50 $3
No. 200 ..... $1.50 ..... 40&2½%
Food Chopper:
No. 1 ..... $2.50
No. 2 ..... $3.00
No. 3 ..... $3.50
Enterprise:
No. 1 ..... $2.50
No. 2 ..... $3.00
No. 3 ..... $3.50
Hand ..... 1 size
Holes ..... 6 & 8
Lever Grinder ..... 1 size
No. 5 ..... $20
No. 8 ..... $30
New Triumph, No. 6 ..... $24.00
No. 8 ..... $30.00
Russwin Food, No. 1, $24.00; No. 2, $27.30 ..... 45&10%
No. 3 ..... $15.00 $18.00
Enterprise Beef Shavers ..... 25@30%

Slaw and Kraut—

Hobart Mfg. Co.:
No. 1 ..... $15.00
No. 2 ..... $20.00
No. 3 ..... $25.00
No. 4 ..... $30.00
No. 5 ..... $35.00
No. 6 ..... $40.00
No. 7 ..... $45.00
No. 8 ..... $50.00
No. 9 ..... $55.00
No. 10 ..... $60.00
No.

Fasteners, Blind—

Z.....50&10%
W.....40%
U.....40%

Cord and Weight—

Iver and Tobin.....33⅓

Corrugated—

Acme Corrugated Fasteners.....

Faucets—

Cork Lined.....50&10@60%
Metallic Key, Leather Lined, 60&10&10@70%
Red Cedar.....40&5@40&10@45%
Petroleum.....70&10@75%
B. & L. & P. Co.:
Metal Key.....60&10%
Star.....60%
Wood Lock.....50&10%
John Sommer's Perfect Tin Key.....40%
John Sommer's Boss Tin Key.....60%
John Sommer's Victor Mtl. Key.....50&10%
John Sommer's Dupuex Metal Key.....60%
John Sommer's Diamond Lined.....40%
John Sommer's I.X.L. Cork Lined.....50%
John Sommer's Reliable Cork Lined.....

John Sommer's Chicago Cork Lined.....60%
John Sommer's O. K. Cork Lined.....50%
John Sommer's No. Brand, Cedar.....50%
John Sommer's Perfection, Cedar.....40%
Self Measuring
Enterprise, ₱ doz. $36.00.....40&10%
Lauer & Co. $36.00.....40&10%
National Measuring, ₱ doz. $36.00&10%

Felloe Plates—

See Plates, Felloe.

Files— Domestic—

List Nov. 1, 1899.

Best Brands.....70&10@75&10%
Standard Brands.....75&10&10%
Lower Grade.....75&10&10@&10&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97.....*33 1-3@40%*

Fixtures, Fire Door—

Allith Underwriters' Approved.....50%
Richards Mfg. Co.:
Universal, No. 133; Special, No. 104.....$3.75
Fusible Links, No. 96.....60%
Expansion Bolts, No. 107.....60&10%

Grindstone—

Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.60*	*3.85*	*4.15*	*4.65*

P., S. & W. Co.....25%
Reading Hardware Co.....60%

Fodder Squeezers—

See Compressors.

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at their prices.

Iowa Dig-Eze Potato.....60&10%
Victor, Hay.....60&15&10%
Victor, Manure.....66⅔%
Victor, Header.....65%
Champion.....66⅔%
Champion, Header.....65%
Champion, Manure.....65&15&10%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Shawseye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated—See Spoons.

Frames— Wood Saw—

White, S'g't Bar, per doz. 75@80¢
Red, S'g't Bar, per doz. $1@$1.25
Red, Dbl. Brace, per doz $1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.25*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp	*$2.75*
Cotton	*3.20*
Waterproof Sgl. Taped..	*3.65*
Waterproof Dbl. Taped..	*4.40*
Waterproof Tpl. Taped..	*5.15*

Extra 10&10%

Gates, Molasses and Oil—

Stebbins' Pattern.....*80@80&5%*

Gauges—

Marking, Mortise, &c..50@50&10%
Bullard Gauge Co.:
Mortise, Marking & Mortise, &c. 67½%
Pattern Makers' & Sharpe's.....33⅓%
Mortise Gauges.....70%
Pike P., S. & W. Co.....33⅓%

Gimlets— Single Cut—

Numbered assortments, per gro.

all, Metal, No. 1. $2.00;	*2. $2.80*
pike, Metal, No. 1. $4.00;	*2. $4.80*
all, Wood Handled, No. 1, $2.00;	*2. $2.80*
pike, Wood Handled, No. 1, $3.00;	*2. $4.60*

Glass, American Window

See Trade Report.

Glasses, Level—

Stanley Rule & Level Co.....65@65&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush.....*25&10@50%*
Snells.....40%

Grease, Axle—

Common Grade.....*gro. $6.00@6.50*
Dixon's Everlasting, 1-lb. pails, ea. $6.00; in tubes, ₱ doz., 1 lb. $1.25, 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—

Pine Mfg. Co.....33⅓@33⅓&10%

Grinders—

Royal Mfg. Co.:
Aluminum Grinding Machines, each, No. 0, $1.75; 1A, $2.50; 10, $5.00.....30%
Aluminum Sickle Grinders, each, No. 2, $5.00; 20A, $6.00; 20A Combined, $6.50.....30%
Alum. Lath Disc Grinders, each, $2.....33%

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., $2.00.....33⅓%
Richards Mfg. Co., Elk and Cyclone Ball Bearing, mounted.....45%

Grips, Nipple—

Perfect Nipple Grips.....40&10&2%

Halters and Ties—

Cow Ties.....*40&5@60&10%*
Bridgeport Chain Co.:
Triumph Coil and Halters..35&2½@40%
Brown Coil and Halters...45@50&5%
Brown Cow Ties.....50&10&5%
Brown Tie Outs.....75&10@75&5%
Carter Mfg. Co.:
Web.....30&2%
Jute Rope.....35%
Sisal Rope.....35%
Cotton Rope.....45%
Hemp Rope.....45%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters..45@50&5%
Niagara Cow Ties...45&6@50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists'...55&10@55&10&5%
Heller Tinners'.....40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel.....50%
Farriers'.....40&10&5%
Riveting.....50%
Machinists', revised list.....66⅔&5%
Blacksmiths'.....50&5%
Lavette R. Plumb:
A. E. Nail.....40&2½@40&12½%
Eng. and B. S. Hand..50&10&5@60&5%
Machinists' Hammers.....60@60&10%
Rivet and Tinners'.40&7½@40&12½@&5%

Heavy Hammers and Sledges—

Under 3 lb., per lb., 40¢...80&10%
3 to 5 lb., per lb., 30¢...80&10%
Over 5 lb., per lb., 30¢
Over 5 lb., per lb., 30¢..80&10&10%

Handles—

Agricultural Tool Handles

Axe, Pick &c......*60&10@60&10&5%*
Hoe, Rake, &c......*40%*
Fork, Shovel, Spade, &c.:
Long Handles.....*40%*
D Handles.....*40%*

Cross-Cut Saw Handles—

Atkins.....40%
Champion.....50%
Disston.....50%

Mechanics' Tool Handles

Auger, assorted.....*gro. $3.00@$3.50*
Brad Awl.....*gro. $1.65@$1.75*
Chisel Handles, Ass'd, per gro.: Tanged Firmer, Apple, $2.40@ $2.65; Hickory.....*$2.15@2.40*
Socket Firming, Apple, $1.75@ $1.85; Hickory.....*$1.60@$1.75*
Socket Framing, Hickory.....*$1.60@$1.75*
File, assorted.....*gro. $1.30@$1.40*
Hammer, Hatchet, &c......*60&10@60&10&5%*
Hand Saw, Varnished, doz. 80@85¢; Not Varnished.....*65@75¢*
Plane Handles:
Jack, doz. 30¢; Fore, doz. 45¢.
Chapin-Stephens Co.:
Carving Tool.....50&10&5%
Chisel.....50&10&10%
File and Awl.....60&10&10%
Saw and Plane.....30&10&10%
Screw Driver.....30&10&10%
Millers Falls Adj. and Ratchet Auger Handles.....50&10%
Nicholson Simplicity File Handle ₱ gro. $0.85 to $1.50

J. I. Case.....
Indestructible File and Tool ₱ gro., No. 1, $8.00; No. 2, $8.50; No. 3, $9.00; No. 4, $9.50; No. 5, $10.00.....gro. lots 10%
W. A. Zelnicker Supply Co.:
Hammer, ₱ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.50; 18 in., $2.50; 20 in., $2.75; 22 in., $2.90; 24 in., $3.20; 26 in., $3.50; 30 in., $3.80.
Sledge, ₱ doz., oval, 30 in., $7.80; octagon, 30 in., $8.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe, ₱ doz., 28 to 31 in., $5.60; 36 in., $7.80.
Adze, ₱ doz., 36 in., $5.80; 36 in., $7.80.
Pick, ₱ doz., R. R., 36 in., $8.00; each, 34 in., $3.80.
Hatchet, ₱ doz., 12 to 14 in., $2.00.

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.
Allith Mfg. Co.:
Regular Nos. 1 and 2; Allith, No. 3; Adjustable, No. 6; Reliable Parlor Door.....50%
Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chamolin & Moore Mfg. Co.:
Baggage Car Door Hanger.....50%
Elevator.....30%
Railroad.....50%
Crook & Carrier Mfg. Co.:
Loose Axle.....60&10&2%
Roller Bearing.....70&2½%
Groth Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, 60&10%
Roller Bearing, Ex. Hy. No. 21, $18.00.....60&10%
Ball Dog, $.4.....60%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.30; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion.....
Barn Door, Standard.....
Hinged.....
Covered.....
Special.....
Lawrence Bros.:
Advance.....
Cleveland.....
Clipper, No. 75.....
Crown.....
Cyclone, No. 40.....
Tandem, No. 50.....net $7.50
New York.....
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2.....
Anti-Friction.....
Hinged Hangers, Ring Charm.....
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 6&5%
Pioneer Wood Track, No. 3.....$2.25
Roller B'r'g St'l Track No. 2.....$2.25
Roller B'r'g St'l Track No. 15.....$2.50
Roller B'r'g, Nos. 39, 41, 42, 75&10%
Hero, Adj. Track No. 19.....50&10%
Adjustable Track Tandem Trolley Track No. 16.....35&10%
Steel, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22.....50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150.....$2.50
Safety Undertakers F. D. No. 101.....50%
Tandem No. 41 2¼ and 3 6&10%
Palace Adjustable Track No. 132.....50&5%
Royal, Adjustable Track No. 125.....50&10%
Ives Wood Track No. 1.....$2.25
Trolley B. D. No. 2.....10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&2½%
Anti-friction, No. 42, No. 44, sizes 2½ and 3.....60%
Hinged Tandem No. 48.....50&5%
Folding Door B. B. Swivel No. 135.....40%
Taylor & Boggis Foundry Co.'s Kidder's Roller Bearing 50&15&10&5%
Myers' Stayon Hangers.....60%

Hangers— Garment—

Pullman Trouser, ₱ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Nickel Enameled, $7.50; 1 pair Wood Clamp, $13.50. Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $10.50; Garment Hanger Loops, Round Nickeled, per gro.....$10.50
Victor Folding.....₱ gro. $9.60

Gate—

Myers' Patent Gate Hangers, ₱ doz. net.....$4.50

Joist and Timber—

Lane Bros. Co.....30%

Hasps—

Grimes Security Hasp.....50&10%
McKinney's Perfect Hasp, ₱ doz..60%

Hatchets—

Regular list, first qual..30¢@25¢—
Second quality.....*50¢@40¢—*

Heaters, Carriage—

Clark, No. 5, $1.15; No. 5B, $2.00; No. 5 $2.25; No. 6D, $2.75; No. 7D, $3.00; No. 8B, $3.75; No. 9, $4.50.....25%
Clark Coal, ₱ doz., $0.75.....20%

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*½*	*5*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutter: (L. & P., O. S., Acme, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic B'ind Fixtures No. 2 for Wood, $9.00; No. 3 for Brick, $11.50.....10%
Charles Parker Co.....70@35%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges.....20%

Extra 10&5% often given.

Extra 10% often given on most of these Hinges.

Hale's Blind Awning Hinges, No. 110, for wood, $2.00; No. 111, for brick, $2.....20%
Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, No. 1641½, ₱ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&5%
Acme, Lull & Porter.....75
Queen City Reversible.....75%
Shepard's Nonsense, Nos. 1, 2, 55.....75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&5%
Tip Patent, No. 1.....75&10%
No. 3.....75&5%
Buffalo Gravity Locking, No. 1, 2, 3.....70&10&5%
Shepard's Double Locking.....75%
Champion Gravity Locking.....75&5%
Pioneer.....75&10%
Eagle.....65%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L't'ch's	*$2.00*	*2.70*	*5.00*
Hinges only.....	*1.40*	*2.05*	*3.80*
Latches only.....	*.70*	*.70*	*.85*

New England:
With Latch.....*doz. ...@$2.00*
Without Latch.....*doz. ...@$1.60*
Reversible Self-Closing:
With Latch.....*doz. ...@$1.75*
Without Latch.....*doz. ...@$1.35*
Western:
With Latch.....*doz. $1.75*
Without Latch.....*doz. $1.15*
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3.....70%

Pivot Hinges—

Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....60%

Spring Hinges—

Holdback, Cast Iron.....*$6.75@$7.00*
Non-Holdback, Cast Iron$6.00@$6.75

J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....40%
Bardsley's Patent Checking.33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor..40%
Bommer Spring Hinges.....40%
No. 999 Wrot, Steel Hold Back, ₱ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges...50%
Chicago Ball Bearing Floor..50%
Garden City Ball Bearing House.....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American.....30%
Columbia, ₱ gr., No. 14, $9.00; No. 18, $25.00.....
Columbia, Adj., No. 7, ₱ gr. $12.00
Columbian Hinges.....60&10%
Gem, new list.....30%
Clover Leaf.....₱ gr. $12.00
Oxford, new list.....30%
Floor Spring Hinges.....65&10%
Lawson Mfg. Co. Matchless.....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges.....40%
Shelby Spring Hinge Co.:
Buckeye, All Steel, Holdback Screen Door.....₱ gr. $9.00
Chief Ball Bearing Floor Hinge.....50%
Ball Bearing Door.....50%
No. 777, Sheet Steel Holdback, ₱ gr. pr.....$9.00
Stanley Mfg. Co.:
Champion Double Acting Door Hinge.....25&10&10%
Standard Double Acting Floor Hinges.....25&10&10%
Superior Spring Hinge Co.:
Superior Floor Hinges.....33⅓%

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges	*50¢*	*10%*
Heavy Strap Hinges	*60¢*	*5%*
Light T Hinges	*50¢*	*5%*
Heavy T Hinges	*40¢*	*5%*
Extra Hvy. T Hinges	*50¢*	*10%*
Hinge Hasps	*33⅓¢*	*2%*
Cor. Heavy Strap	*60¢*	*5%*
Cor. Ex. Heavy T	*50¢*	*10%*

Extra 10&7½%

Screw Hook and Strap. { *6 to 12 in., lb. 3½¢* / *13 to 18 in., lb. 3¢* / *22 to 36 in., lb. 3¢* }

Screw Hook and Eye.

¾ to 1 inch	*lb. 6½¢*
1¼ inch	*lb. 7½¢*
1½ inch	*lb. 8½¢*

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—

Mfg'r's list, price per gross.

Inch	*15*	*16*	*17*	*18*
Galv. Open	*$35*	*$39*	*$42*	*$46*
Jap. Open	*36*	*38*	*41*	*45*
Galv. Funnel	*42*	*46*	*50*	*55*
Jap. Funnel	*33*	*36*	*39*	*43*

Extra 10&10%

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick No. 162.....each $1.05
Steel Mortar, No. 158.....each $1.35

Hoes— Eye—

Scovil and Oval Pattern.....*60&10%@60&10&10%*

Grub, list Feb. 28, 1899.....*70&10@70&10&10%*

Handled

NOTE—Manufacturers are striking from the list of September 1, 1904, and placing on their shelf catalogues all numbers, sizes, or styles of tools not specifically quoted, viz.:

Garden Weeders, No. 1, $2.25; No. 2, $3.
Star Double Bit ..... No. 2, $3.
Iron Mountain Hoes ..... No. 2, $3.
Iron Mountain Cultivator Hoe ..... No. 2, $3.
Iron Mountain Mattock Hoes ..... No. 2, $3.
Regular Weight ..... No. 2, $3.
Star ..... No. 2, $3.
Ft. Madison Sprouting Hoe, ... No. 2, $3.
Ft. Madison Dixie Tobacco Hoe ..... No. 2, $3.
Kretsinger's Cut Easy ..... 45&10
Warren Hoe ..... 45&10
A. & J. Cultivator Hoe ..... 45&10
B. B. Cultivator Hoe $3.50
B. B. ..... per doz. net, $3.35
W. & C. L. Swing Shuffle Hoe, ... $3.25

Hoisting Apparatus—

See Machines, Hoisting.

Holders— Bit—

Augusr, ₰ doz. $24.00 ..... 45&10%

Door—

Bardsley's, Iron, 40%; Brass and Bronze 35%
Empire 50%
Pullman 35%
Richards Mfg. Co.; No. 111, Everready, 45%; Nos. 112, 113, Sure Grip 35%
Superior 33⅓%

File and Tool—

Nicholson File Holders and File Handles ..... 33⅓&40%

Fruit Jar—

Triumph Fruit Jar Holder, ₰ gross, $10.80; ₰ doz. $1.25

Trace and Rein—

Fernald Double Trace Holder, ₰ doz. pairs $1.35
Dash Rein Holder, ₰ doz. pairs, $1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50; 33⅓

Hooks—Cast Iron—

Bird Cage, Reading 40%
Clothes Line, Reading List 40%
Coat and Hat, Reading ..... 45&10
Coat and Hat, Wrightsville 60
Harness, Reading List 40%

Wire—

Belt 80%
Wire Cloth Hooks ..... 75&10&5
Brassy Metal Cloth Wire, Coat and Hat, 5 ..... 70&10%
Coltman Hdw. Co., Gem 45
Parker Wire Goods Co., King, Goods Co., ... 70&10%
Acme, 60&10%; Chief, 70; Crown, 75; Star, 65; V Brace, 75; Gear Hangers, 50&10
Wrought Iron—
Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton ..... *doz. $1.05@$1.25*
Wrought Staples, Hooks, &c. See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench. Bush, Light, doz.* $6.20; *Medium,* $6.75; *Heavy,* $7.65
Grass, best, all sizes, per doz. $1.00
Grass, common grades, all sizes, per doz. $1.50
Wire Shelves ..... lb. 4½¢
Hooks and Eyes:
Brass ..... 60&10 & 10
Malleable Iron ..... 70&10&10
Covert Mfg. Co. Gate and Wagon ..... 60&10
Bloomfield ..... 40&10%
Ft. Madison Cut-Easy Corn Hoes ..... per doz. $3.50
Turner & Stanton Co., Cup Grease ..... 50&10%
B. B. ..... Bench Stops
Cut Hooks—See Knives, Corn.

Horse Nails—

See Nails, Horse.

Horseshoes—

See Shoes, Horses.

Hose, Rubber—

Garden Hose, ¾-inch:
Competition ..... *ft. 5¢ 6¢*
3 ply Guaranteed ..... *ft. 8¢ 9¢*
4 ply Guaranteed ..... *ft. 10¢ 11¢*
Cotton Garden ..... in., complete
Low Grade ..... *ft. 8¢ 9¢*
Fine ..... *ft. 10¢ 11¢*

Irons— Sad—

Drop, ¼ to ½ ..... *lb. 8¢@9¢*
B. B. Sad Irons ..... *lb. 3¼@3½¢*
Mrs. Potts' cuts per set
No. 50 55 60 65
Japid Tops 85 90 95
Tinned Tops 90 95 1.00
New England Pressing ..... *lb. 3¼@4¢*

Bar and Corner—

Richards Mfg. Co., Bar 50%
Corner 50%

Pinking—

Pinking Irons ..... *doz. 60¢*

Irons, Soldering

See Coppers.

Jacks, Wagon—

Covert Mfg. Co.:
Acme Screw ..... 30&2%; Steel, 45%
Lockport 50%
Lucas Steel ..... 50&5%
Richards Pitch Nuts, No. 1 ..... 50&5%
Smith & Hemenway Co's 25%

Ladder—

Richards Mfg. Co., Ladder Jacks 50%

Kettles—

Brass, Spun, Plain ..... 20@25%
Enamored and Cast Iron See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros. Butcher & 60%
Wilkinson Shear & Cutlery Co. 60%

Corn

Columbian Cutlery Co., Wilcut Braud Knives and Hooks 60%
Wilkinson Arms ..... ₰ doz. $2.65;
Dent, $2.25; Asp, Serrated, $2.50; Serrated, $2.00; Tabbee No. 1, $1.50; Tabbee No. 2, $1.15

Drawing—

Standard List ..... *doz. 45¢*
C. Jennings & Co., Nos. 4 to 6, ... doz. 45¢
Jennings & Griffin, Nos. 4 to 6, ... doz. 45¢
Swan's ..... 66%&10%
Watrous ..... 60%&10%
L. & J. White ..... 20&5&25

Hay and Straw—

Serrated Edge, per doz. $3.50@3.75
Iwan's Spoke Edge ..... ₰ doz. $5.50
Iwan's Serrated ..... ₰ doz. $10.00

Miscellaneous—

Farmers' ..... doz. $2.65@3.25
Western Tool ..... ₰ doz. $3.00@3.25

Knobs—

Base, 2½ inch, Birch, or Maple, Rubber Top ..... gro $1.25@1.40
Carriage, Jap., all sizes ..... gro. 40@45¢
Door, Mineral ..... doz. 65@70¢
Door, Por. Jap'd ..... doz. 70@75¢
Door, Por. Nickel ..... doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—

See Belting, Leather—

Ladders, Store, &c.—

Aluth Mfg. Co., Reliable 50%
Latta's Steel 35%
Myers' Noiseless Step Ladders 50%
Richards Mfg. Co.:
Improved Noiseless, No. 112 ..... 50%
Climax, No. 113 ..... 50%
Trolley, No. 108 ..... 50%

Ladles, Melting—

L. & G. Mfg. Co., (low list) 20%
P. S. & W. ..... 40&10%
Reading 60%

Lanterns—Tubular—

Regular, No. 1 ..... doz. $3.75@4.50
Side Lift, No. 0 ..... doz. $4.00@4.75
Hinge Globe, No. 0 ..... doz. $4.00@4.75
Other Styles ..... doz. $4.00@10.75

Bull's Eye Police—

Small ..... doz. $2.25@4.50

Latches— Thumb—

Roggin's Latches, with screw .. doz. 35¢@40¢

Door—

Aluth Mfg. Co., Reliable and Alleghany, 50; Reliable Cold Storage, 50%
Cross & Carter Mfg. Co., No. 101, ... per doz. $3.00
Richards' Bull Dog, Heavy, No. 125 ..... 50&5%
Richards' Trump, No. 127 ..... $1.50

Leaders, Cattle—

Small ..... doz. 50¢; large, 60¢
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 35%

Leathers, Pump—

See Pumps—

Lifters, Transom—

R. & E. 13%

Lines—

Wire Clothes, Nos. 18 19 20
Per foot $2.50 2.25 2.00
25 feet $2.00 1.80 1.65
Samson Fibre Wove 40%
Solid Braided Chalk, Nos. 0 to 3 ..... 40%
Solid Braided Masons' 30%
Silver Lake Braided Chalk, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ..... ₰ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 24, $1.50; No. 5, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 5½, $2.50; No. 4, $3.50 ..... 20%
No. 4½, $4.50 ..... 20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 ..... 20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft. $5.25 ..... 20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines 40%
Clothes Line, White Cotton, Shade Cord, Cotton or Linen 20%

Locks— Cabinet—

Cabinet Locks $11.25

Door Locks, Latches, &c.

NOTE—Not Price-makers, see Lists of these goods.
Bennett Hardware Co. 40%
R. & E. Mfg. Co. 40%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass ..... 75&5%

Sash, &c.—

Iron Pulleys ..... 50&5%
Bronze and Brass ..... 65% Crescent, 60%; Eclipse, 60%; Low Ventilating, 40&20%; Robinson Pat. Ventilating Sash Lock 75%
Pulley Patent Weight Hooks 40%
Reading Sash Locks 40%

Machines—Boring—

Com. Upright, without Augers. $2 ..... 2 25
Com. Angle, without Augers. $2.25@2.50
Swan's Improved ..... 40&10%
Jacklass 40%
Nonpareil 40%
Steel's, Unrivaled, $5.00, Angular, $5.00

Corking—

Reisinger Improved Hand Power ..... ₰ doz. $15.00

Fence—

Williams' Fence Machines ..... each, $5.50

Hoisting—

Moore's Anti Friction Chain Hoist 30%
Moore's Hand Hoist, with Link 30%
Moore's Cyclone, High Speed Chain Hoist 30%

Ice Cutting—

Chandler's 12½%

Washing

Boss Washing Machine Co.: ..... Per doz.
Boss No. 1 ..... $57.00
Boss Rotary $57.00
Champion Rotary Barmer No. 1 ..... $36.00
Standard Champion No. 1 ..... $39.00
Standard Perfection $27.00
Cincinnati Square Western $33.00
Uncle Sam American, Round $36.00

Mallets—

Hickory ..... 45&5&50%
Lignumvitæ ..... 45&5&50%
Tinners' Hickory and Apple wood ..... doz. 45&5@50%

Mangers, Stable—

Swett Iron Works 50%

Mats, Door—

Acme Leather Specialty Co. 50%
Elastic Stair Tread, W. G. Co., new list 50%

Mattocks—

See Picks and Mattocks.

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co. ..... 20@25%
National Meat Jar, 1 ..... 30%
Parker's Columbian and Vise 50%
Parker's Band and Side ..... 50&10%
Swift, Lane Bros. Co. 30%

Motors, Water—

Dunne's Red Devil 30%
Lippincott's 30%

Mowers, Lawn—

NOTE—Net prices are generally quoted
Cheapest, 10-in., $2.00; 12-in., $2.10, etc.
Cheap, 10-in., $2.25; 12-in., $2.45, etc.
Better Grade, 10-in., $3.00; 12-in., $3.25, etc.

	12	14	16	18-in.
High Grade	$4.50	4.75	5.00	5.25
Continental				60
Great American				10
Great American Ball Bearing, new list				70%
Quaker City				70
Pennsylvania				60
Pennsylvania, Jr.	Ball	Bearing		5 &10
Pennsylvania Golf				30
Pennsylvania Hi-Speed				30&5
Pennsylvania Perfect				40&5
Granite State:				
Style A, Low Wheel				70%
Style B, Low Wheel				70%
Style C, High Wheel, spcl. list				70%
Style D, High Wheel, spcl. list				70%
Philadelphia				70%
Styles M., S., C., K., T.				70&10&5%
Style A, all Steel				60&10&5%
Style B, all Steel				70&10&5%
Drexel and Gold Coin, special list				40%
Horse				40&5%
Pony				40&5%
Semi-Horse				70&5
Eagle Horse				70&5
I. X. L. Horse				50

Nails—

Wire Nails and Brads, Miscellaneous ..... See Price-list
Cut and Wire. See Trade Report.
Hungarian, Finishing, Upholsterers &c. See Tacks.

Horse—

	Nos.	6	7	8	9	10
Anchor		23	25	27	28	10&5%
Coleman		13	13	13	13	5
New Haven		13	13	13	13	1 &5
Putnam		13	13	13	13	5
Western		13	13	13	13	5
Jobbers' Special Brands ..... per lb. 9@10¢						

Picture—

	1½	2	2½	3	in.
Brass H'd	45	55	65	75	85
Por. Head	1.10	1.10	1.10	..	gro

Nippers—

See Pliers and Nippers.

Nuts—

Cold Punched: ..... Off list.
Tapped ..... Thin ..... Jam
Hexagon, Blank or Tapped
C. T. & D.
Hot Pressed:
Square, Blank ..... 7.80¢
Hexagon, Blank ..... 7.90¢
Square, Tapped ..... 8.00¢
Hexagon, Tapped ..... 5.90¢

Oakum—

Jute ..... *lb.* 6½¢
Ship ..... 6¢
Navy ..... 6¢
Spun Yarn ..... 6¢
Spun Spunyarn ..... 6¢

Oil Tanks—See Tanks, Oil.

Oilers—

Steel, Copper Plated 3
Brass, Nickel Plated 3
Brass and Copper 4
Zinc 2
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
Ajax 4
Acme, Nos. 1 4
B. B. 4
Boss 4
Magic Can 4
Monarch 4
Rival 4

Openers— Can

Sprague, Iron Handle 50%
Sprague, Wood Handle 50%
Sardine Scissors ..... $1.75@$3.00
Yankee Can and Bottle Opener, ₰ doz. list $2.50
Gem ..... ₰ doz. list $2.50

Egg—

Hartigan Nickel Plate, ₰ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope ..... 20@25¢

Rubber—

(Fair quality goods.)
Sheet, C. L. ..... 11@12¢
Sheet, C. O. S. ..... 11@12¢
Sheet, C. B. S. ..... 12@13¢
Sheet, Pure Gum ..... 30@35¢
Sheet, Red ..... 40@45¢
Jenkins' ₰ lb. list 25%

Miscellaneous—

American Packing ..... lb. 7@11. ¢
Cotton Packing ..... lb. 16@25 ¢
Italian Packing ..... lb. 9@12½¢
Jute ..... lb. 4@5¢
Russia Packing ..... lb. 8@11 ¢

Pails, Water, Well, &c.—

See Buckets.

Pans— Dripping—

Standard List ..... 65@71½&5 %
Edwards, Royal Blue ..... 60&5 %

Fry—

Common Lipped:

	No.	1	2	3	4	5
Per doz.		$0.75	0.80	0.90	1.10	1.30

Refrigerator, Galva.—

Inch	12	14	16	18
Per doz.	$1.75	2.25	2.80	3.15

Paper—Building Paper

Asbestos: ..... lb.
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft. 3½@5¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft. ..... 6¢
Mill Board, Sheet, 40 x 40 in., 1-32 to ⅛ in. ..... Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll ..... 75¢
Medium weight, 30 lbs. to roll ..... 85¢
Heavy weight, 40 lbs. to roll $1.00
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening, 1 ply, 9, 6 and 4½ sq. ft. to the roll ..... 85¢
Red Rope Roofing, 250 sq. ft. per roll $1.75

Tarred Paper—

1 ply (roll 400 sq. ft.), ton ..... $
2 ply, roll 200 sq. ft. 6
3 ply, roll 108 sq. ft. 80
Slater's Felt (roll 500 sq. ft.) .80

Sand and Emery—

Flint Paper and Cloth. 50&10@—%
Garnet Paper and Cloth 33⅓
Emery Paper and Cl'th. 50&10@60%

Parers— Apple—

Gendell Co.:
Imperial ..... each $
Improved ..... each $
New Lightning ..... ₰ doz.
Triumph ..... each $
Turn ..... each $
Universal ..... each $
Eureka Improved ..... each $20
New Century ..... each $20

Livingston Nail Co.:
Imperial ..... each $
Improved ..... each $
Triumph ..... each $
Universal ..... each $

Reading Hardware Co.:
Imperial ..... each $
Improved ..... each $
Triumph ..... each $
Universal ..... each $

Potato—

Spalding ..... ₰ doz. $
Wade Manufacturing ..... ₰ doz. $

Picks and Mattocks—

(List Jan. 1, 1908.)
List ..... 50&10&5@10&10%
Crook's Hot Pad Garden Mattock, ₰ doz. No. 2 $2.50, No. 3 $2.10.

Pinking Irons—
See Irons, Pinking.

Pins, Escutcheon—
Brass ..... *50@50&10@5%*
Iron, list Nov 11, '85 .. *60@60&10@5%*

Pipe, Cast Iron Soil—
Standard, 2-6 in ..... *60@60&10%*
Extra Heavy, 2-6 in ..... *70@70&10%*
Fittings, Standard and Heavy ..... *75@10%*

Pipe, Merchant—

	Consumers, Carloads.			
	Steel.		*Iron.*	
	Blk	*Galv*	*Blk*	*Galv*
	%	%	%	%
⅛ & ¼ in	67	58	62	52
⅜ in	69	61	64	56
½ in	69	65	66	61
¾ to 6 in	72	65	70	60
7 to 12 in	69	61	67	52

Pipe, Vitrified Sewer—
Carload lots
Standard Pipe and Fittings, 4 to 24 in., f.o.b. factory:
First class ..... *75@7.5%*
Second class ..... *80@84%*

Pipe, Stove—

	Per 100 joints.	
Edwards' Nested	C. L.	L. C. L.
5 in., Standard Blue..	$6.25	$7.25
6 in., Standard Blue....	6.75	7.75
7 in., Standard Blue....	7.75	8.75
5 in., Royal Blue.....	7.00	8.00
6 in., Royal Blue.....	7.50	8.50
7 in., Royal Blue.....	8.00	9.00
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color	$6.15	$7.15
6 in., Uniform Color..	6.65	7.65
7 in., Uniform Color..	7.65	8.65

Planes and Plane Irons—

Wood Planes—
Bench, first qual ..... *30@30&10%*
Bench, second qual ..... *40@40&10%*
Molding ..... *25@25&10%*
Cleveland Stevens Co.:
Bench, First Quality 50%
Bench, Second Quality 40
Molding and Miscellaneous 25
Toy and German 40%
Union 40

Iron Planes -
Chapin's Iron Planes ..... 50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list
Dec. 12, '06 ..... 25%
Buck Bros 30
Chapin-Stephens Co 50
Ohio Tool Co 50%
L. & I. J. White ..... 20&6@25%

Planters, Corn, Hand—
Keller's Eclipse ..... ₱ doz. $8.00

Plates—
Lelloe ..... *lb. 4@4½¢*

Pliers and Nippers -
Button Pliers ..... *75&5@77&10&5%*
Gas burner, per doz., 5 in., $1.25 to $1.50; 6 in., $1.45 @ $1.50.
Gas Pipe ..... *7 10 12-in.*
$2.00 $2.25 $2.75 $3.50
Acme Nippers ..... 50&5%
Cross & Corner Mfg Co.:
American Button 80%
Improved Button ..... 75&10
Cross 60%
No 80 Lineman's 50
Stub's Pattern 45%
Combination and others 35
Heller's Farriers' Nippers, Pincers and Tools ..... 40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Pexto, 35%; Elm City, 35%;
Paragon, 50%; Lodi, 55%
Stevens-Duryea Lap and Diagonal Cutting Pliers 60%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels ..... 30&5@5%
Chapin's Iron Brass Cor.. 40&10&10%
Pocket Levels ..... 30@50&10%
Extension Sights ..... 20&5&10%
Mitre Box Levels ..... 40@40&10%
Disston's Plumbs and Levels.. 6&10%
Disston's Pocket Levels ..... 60&10%
Stanley's Duplex 35%
Wood's Patented 33⅓%

Points, Glaziers'—
Bulk and 1 lb papers ..... *lb. 9 ¢*
½ lb papers ..... *lb. 9½¢*
¼ lb papers ..... *lb 10 ¢*

Police Goods—
Manufacturers' Lists ..... *25@25&5%*
Tower's 25%

Polish—Metal, Etc—
Peerless Liquid, No. 1 (¾ pt.) ₱ doz., $3.00; No. 2 (1 qu.), $9.00 40%
Prest-line Paste 60%
George William Hoffman:
Cross Metal Polish, Paste, 3 oz. boxes, ₱ doz., 50c.; gro $4.50; ½ lb boxes, ₱ doz $1.25, 1 lb boxes ₱ doz $2.25 ..... 50%
Liquid, 8 oz. cans, ₱ doz., $1.25. ..... 50%
Reckitt's Friend Metal Polish, ₱ doz., $1.75. ..... 50%

Stove—
Black Eagle Benzine Paste, 5 lb cans, ₱ lb 10¢
Black Eagle, Liquid, ½ pt cans, ₱ doz. 75¢
Black Jack Paste, ¾ lb cans, ₱ gr $9.00
Black Kid Paste 5 lb can ..... each, $0.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon's, ₱ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ₱ lb 8¢
Fireside ..... ₱ gr $2.50
Gem, ₱ gr. $4.50 ..... 10%
Japanese ..... ₱ gr. $3.50
Jet Black ..... ₱ gr. $3.50
Peerless Iron Enamel, 10 oz. cans, ₱ doz. $1.50

Poppers, Corn—
1 qt Square ..doz $0.80; gro $8.75
1 qt. Round ..doz $0.90; gro $10.00
1½ qt. Square .doz $1.00; gro $11.00
2 qt. Square ..doz $1.25; gro $13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts ..... each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled ..... *35&10%*
Tinned ..... *30&10%*

Powder—
In Canisters:
Duck, 1 lb ..... *each 15¢*
Fine Sporting, 1 lb ..... *each 15¢*
Rifle, ½ lb ..... *each 15¢*
Rifle, 1 lb ..... *each 25¢*
In Kegs:
12½ lb. kegs *$3.50*
25 lb. kegs *$4.50*
Kings Semi-Smokeless:
Keg 25 lb (bulk) $6.50
Half Keg, 12½ lb (bulk) $3.50
Quarter Keg, 6¼ lb (bulk) $1.75
Case 24 1 lb cans (bulk) $5.50
Half case 12 lb cans bulk $3.00
King's Smokeless: Shot Gun Rifle, Keg 25 lb (bulk) $12.00
Half Keg, 12½ lb (bulk) 6.25 7.75
Quarter Keg (6¼ lb bulk). 3.25 4.00
Case 24 1 lb cans bulk .. 14.10 17.00
Half case 12 (1 lb c. bk).. 7.25 8.75

Presses—
Fruit and Jelly—
Enterprise Mfg Co ..... 20@25%.

Seal Presses—
Morrill's No. 1, ₱ doz., $20.00 ..... 50%

Pruning Hooks and Shears
See Shears.

Pullers, Nail—
Cyclops 50%
Miller's Falls, No. 3, ₱ doz., $12.00 ..... 50%
Morrill's No. 1, Nail Puller, ₱ doz. $27.00 ..... 50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 ..... 50%
The Scranton Co, Case Lots:
No. 2B (large) $5.50
No. 1B $5.00
Smith & Hemenway Co.:
Diamond B 70
Gem 50
Spike Pullers, Utica and Dewey 60%

Pulleys, Single Wheel—

Inch	*1½*	*1¾*	*2*	*3*
Awning or Tackle, doz	*$0.50*	*.45*	*.60*	*1.05*
Hay Fork, Swivel or Solid Eye, doz., ¼ in., $1.25; 5 in., $1.55				
Inch		*2*	*2¼*	*2½*
Hot House, doz	*$0.65*	*.85*	*1.20*	
Inch	*1¼*	*1½*	*1¾*	*2*
Screw, doz	*$0.20*	*.19*	*.25*	*.30*
Inch	*1¾*	*2*	*2¼*	*2½*
Side, doz	*$0.25*	*.50*	*.55*	*.60*
Inch	*1½*	*1¾*	*2*	*2½*

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in ..... *17@20¢*
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in ..... *20@18¢*
Acme, No. 25, 2 in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain Axle ..... 75&10
Wrought Steel Eagle 17½2c
Fox-All-Steel, Nos. 3 and 7, 2 in. 50%
Grand Rapids All Steel Nos. 2 ..... 50%
Niagara, No. 25, 1¾ in., 19¢; 2 in., 20½¢
No. 26 Tool, 1¾ in., 18½¢; 2 in., 16½¢
Star, No. 26, 1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See *Blocks.*

Pumps—
Cistern *60%*
Pitcher Spout ..... *75&5@75&10%*
Wood Pumps, Tubing, &c *50%*
Barnes Dbl. Acting Plow Bolt. 40&5%
Barnes Pocket Spout ..... 45&10%
Bettendorf's Rubber Diaphragm 50
C. B. & L. Black Cu $16.00
Daisy Spray Pump ..... ₱ doz. $6.50
Flint & Walling's Last Mark Hard Low list ..... 40&10%
Flint & Walling's Last Mark (high list) ..... 40&10%
Flint & Walling's Tight Top Pitcher 50%
National Specialty Mfg Co. Measuring Nos. 2 $6.00, 3 $5.50 ..... 30%
Myers' Pumps (low list) ..... 10&5%
Myers' Power Pumps ..... 10&5%
Myers' Spray Pumps ..... 10&5%

Pump Leathers—
Plunger and Valve Leathers. Per doz:
No. *1 2 3 4 5*
$5.00 6.00 7.00 8.00
Cup Leathers—Per doz *$0.75*
Inch *1½ 2 2½ 3*
$0.60 0.80 1.00 1.20

Punches—
Saddlers' or Drive, good ..... *doz. 50@75¢*
Spring, single tube, good quality *$1.75*
Revolving (4 tubes) ..... *doz. $3.50*
Bemis & Call Co.'s cast St'l Drive 60
Miller's Nos. 1AA, 1A, 1B, 1C, 1D, $5.00 50
Hercules, 1 die, each $5.00 ..... 50%
Niagara Hollow Punches 40
Niagara Solid Punches ..... 35&10
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35; Paragon, 50%; Lodi 55%
Timers' Holden, P., S. & W. Co. 40%
Timers' Small, P., S. & W. Co. ₱ doz., $1.44 ..... 40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron ..... *2¼@2¾¢*
Sliding Door, Wrought Brass, 1⅝ in., lb. ..... *16¢*
Allith Mfg. Co.: Reliable Hanger Track 50%
Cranes:
Double Braced Steel Rail..₱ ft. 3½¢
O. N. T. Rail ..... $.42
Grilles:
XXX, ₱ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged ..... 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ₱ 100 ft $3.45
O. N. T., ₱ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard 1¼ in. ..... 1¼ in. list + 10%
Lawrence Bros.:
1 x 3-16 in., ₱ 100 ft., $7.50; 1¼ x 3-16 in., $8.50.
M. Kenyon:
Hinged Hanger Track, ₱ ft., 11¢, 6&5%
1 x 3-16 Track ..... 35&5%
Myers Sagua Distr. ..... 60&5%
Richards' Mfg. Co.:
Common, 1 x 3-16 in., $3.25; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Grooved Hanger Track ..... 6&10%
Lag Screw Rail, No. 65 ..... 50%
Gauge Hanger Irons, ₱ 14 50
No. 50 ..... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE — Many goods are sold at net prices.
Fort Madison Red Head Lawn.... $3.25
Fort Madison Blue Head Lawn .. $.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80; Nutt Pat., 50&5%
Queen City Lawn, ₱ doz., 20 inch, $2.85; 24, $3.00 ..... net
Anticlog Lawn, ₱ doz $4.00
Mulching ..... net
Ideal Steel Garden, ₱ doz., 12 teeth, $15.00; 14, $16 00; 16, $18.00 ..... 80%
Kohler's:
Lawn Queen, 20-tooth ..₱ doz. $3.15
Lawn Queen, 24-tooth ..₱ doz. $3.25
Paragon, 20-tooth $2.70
Paragon, 24-tooth $2.75
Steel Garden, 14-tooth ..₱ doz. $2.40
Malleable Garden, 14-tooth ..₱ doz. $4.00 & 2.25

Rasps, Horse—
Disston's 75%
Heller Bros ..... 70&5@70&10&5%
Lister Bros.' Gold Medal 70&10@75%
McCaffrey's American Standard ..... 60&10&5%
New Nicholson ..... 70&10@75%
See also Files.

Razors—
Lions, Lovejoy 60%
Fox Razors, ₱ doz., No. 42, $9.00; No. 44, $9.00, No. 82, Platina, $25.00 ..... 33⅓%
Red Devil 65%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9½, M 16, Q 16, A 16, B 16, 4008, Rubber, Popular Nickeled Popular 20%
Aluminum German Silv., Bronze 25, 1240 N, 124 ..... 20%
3014 N, 06 N, 6 RM, G 9 ..... 25%
4 N, 6 PN, 24 N, 26 PN 20%
2904 P, 3314%, 2904 PN, 3314%, 0024 N, 3314%, 02004 N, 3314%, 002904 PN, 3314%, 802 N, 3314% 20%
986 PN, 2901 N, 974 PN 25%
5000 PN, 5000 N 20%
Competitor 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20%
304 P, 304 PN, 00304 P, 00304 PN, 3314% 20%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed ..... *25@25&10@5%*
White Porcelain Enamel ..... *50@10%*
Solid Brass or Bronze Metal *40%*

Revolvers—
Single Action ..... *$5¢@$1.00*
Double Action, except 44 cal *$2.00*
Double Action, 44 caliber *$2.00*
Automatic *$3.00*
Hammerless *$4.50*

Riddles, Hardware Grade
16 in ..... *per doz $2.50@$2.75*
17 in ..... *per doz. $2.75@$3.00*
18 in ..... *per doz $3.00@$4.25*

Rings and Ringers—
Bull Rings—

	2	2½	3 inch
Steel	*$0.70*	*0.75*	*0.80 doz*
Copper	*$1.20*	*1.25*	*1.65 doz.*

Hog Rings and Ringers—
Hill's Rings, gro. lots ..... *$4.25@$4.50*
Hill's Ringers, Gang Tool, doz ..... *90@75¢*
Hill's Rings, Malleable Iron, doz ..... *80@85¢*
Blair's Rings, per gro ..... *$5.00@$5.50*
Blair's Ringers, per doz ..... *.75@90¢*
Brown's Rings per gro ..... *$4.25@$5.50*
Brown's Ringers, per doz ..... *.75@90¢*

Rivets and Burrs—
Copper *50%*
Carriage, Coopers', Tinners, &c.: Black ..... *70&10%*
Metallic Tinned *70%*

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard, 50 count ..... *23¢@24¢*
Tin boxes, 100 count, 29¢@32¢.
Tubular, per doz. boxes, 50 count, 29¢@32¢; 100 count, 51¢@58¢.

Rollers—
Chapin-Stacy, No. 50 ..... $1.00
Chapin-Stacy, No. 55, $0.90; No. 56, $0.75; No. 60 ..... $0.75
Lane's Stay 40%
Richards' Stay:
Hand Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57 ..... 50%
Underwriters', Nos. 59, 60 ..... 50%
Favorite, No. 54 ..... 60%

Rope—
Manila, 7-16 in. diam. and larger: Pure ..... *lb. 10½@11¢*
Sisal, 7-16 in. diam. and larger: Pure ..... *lb. 7½@8¢*
Sisal, ½ in. diam. and larger, No. 2 quality ..... *lb. 6½@7¢*
Sisal, Hay, Hide and Bale Ropes, Medium and Course: Mixed ..... *lb. 6½@7¢*
Pure ..... *lb. 7½@8¢*
Sisal, Tarred, Medium Lath Yarn, Course and Untarred Mixed ..... *lb. 5½@6¢*
Pure ..... *lb. 6½¢*
Cotton Rope Best, ½ in. and larger.. 18¢@20¢
Medium, ¾ in. and larger.16@17¢
Common, ¼ in. and larger..10¢
In coils, ½¢ advance.
Jute Rope: Thread, No. 1, ¼ in. & up, lb. ..... *6½¢*
Thread, No. 2, ¼ in. & up, lb. ..... *5½¢*

Wire Rope—
Galvanized ..... *37½@42½%*
Plain ..... *45@52½%*

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal 20%

Rules
Boxwood ..... *60@60&10%*
Ivory ..... *35&10@35&10&5%*
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory ..... 75@75&10%
Miscellaneous ..... 50&5%&10%
Stephens' Combination 55%
Stationer's ..... 50&5%&10
Keuffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel ..... 33⅓&10%
Lufkin's Steel ..... 50&10%
Lufkin's Lumber ..... 50&10%
Union Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See Balance, Sash.

Sash Locks—See *Locks, Sash.*

Sash Weights—
See Weights, Sash.

Sausage Stuffers or Fillers
See Stuffers or Fillers, Sausage.

Saw Frames—
See Frames, Saw.

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 45
Band ..... 50@50&10
Butcher Saws 60
Cross Cuts 60
One-Man Cross Cut 4
Narrow Cross Cut 4
Hand, Rip and Panel ..... A
Mitre Box and Tenoner ..... A
Mulay, Mill and Drag 45
Wood Saws ..... 10&10
Chapman Saws Co.:
Tilting Saws and Frames ..... A&I
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....30&10&10%
Disston's:
Circular Solid and Inserted Tooth 50
Band, 2 to 18 in. wide 60
Band, ¾ to 1¾ 60
Crosscuts 50
Narrow Crosscuts 50
Mulay, Mill and Drag 50%
Framed Wheelsaws 25%
Woodsaw Blades 25%
Woodsaw Rivets, Tinned 15
Hand Saws, Nos. 12, 99, 9, 16, d130, D8, Leg 16 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c. 25%
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 10%
Butcher Saws ..... 20&10%
Compass and Key Hole Saws, 25 & 5%
Framed Wood Saws 10%
Hand Saws 12½
Wood Saw Blades ..... 20&10%
Miners Tools:
Butcher Saws ..... 15&10
Set Saw Blades ..... 15&10
Massachusetts Saw Works:
Victor Kitchen Saws ..... 10&10&50%
Butcher Saws Blades ..... 30&10
Peace & Richardson's Hand Saws..30%
Simonds':
Circular Saws 45%
Crescent Ground Cross Cut Saws..30%
One-Man Cross Cuts ..... 10&10
Gang Mill, Mulay and Drag Saws.15%
Band Saws 50
Back Saws ..... 30&5%
Butcher Saws ..... 30&5%
Hand Saws ..... 30&5%
Hand Saws, Bay State Brand..... 45%
Compass, Key Hole, &c. ..... 25&5%
Wood Saws ..... 10&5%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A..25%
Disston's:
Concave Blades 25%
Keystone Blades 35%
Hack Saw Frames 30%
Simonds File Co. 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180.....10&5%
Hack Saws, Nos. 175, 180, complete, each, No. 2 ..... 10&10%
Grobelli's Hack Saw Blades ..... 10&10
Griffin's Hack Saw Frames ..... 30&5&10
Griffin's Hack Saw Blades.....35&5&10%
Star Hack Saw and Blades ..... 15&10%
Sterling Hack Saw Blades.....30&10&5%
Sterling Hack Saw Frames..30&10&10%
Sterling Power Hack Saw Machines, each, No. 2, $25.00; No. 2, $30.00..5&10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%
Whitaker Mfg. Co.:
National Hand Blades 10
National Hand Frames ..... 30&5
National Power Blades 10

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20..... 20%
Lester complete, $11.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00... 15&10%

Scales—

Family, Turnbull's.....30@30&10%
Counter:
Hatch, Platform, ½ oz. to 4 lbs. .....doz., $5.50
Two Platforms, ½ oz. to 8 lbs. .....doz., $7.50
Union Platform, Plain $1.70@1.90
Union Platform, Stpd.$1.85@2.15
Chatillon's:
Family 35
Counter 10
Counter Trip Scales 60%
The Standard Portables 40%
The Standard R. R. and Wagon ..... 50&10%

Scrapers—

Box, 1 Handle....doz. $2.00@2.25
Box, 2 Handle....doz. $2.50@2.60
Ship.....Light, $2.00; Heavy, $1.50
Chapin-Stephens Co., Box...30@30&10%
Richards Mfg. Co., Box 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1¼ to 2, $3.25; 2¼ to 3, $5.50@5.75
Bench, Wood .....20@20&10%
Hand, Wood....70&10@70&10&10%
Chapin-Stephens Co., Hand ..... 70@70&10&2½%

Coach, Lag and Hand Rail—

Lag, Cone Point .....50@50&5%
Coach, Gimlet Point.....75@75&10&5%
Hand Rail.....70@70&10%

Jack Screws

Standard List .....70&10@75%
Millers Falls ..... 70&10&10%
Sweet Iron Work ..... 70@75%

Machine—

Cut Thread, Iron, Brass or Bronze:
Flat Head or Round Head, 50@50&10%
Fillister Head.....40@40&10%
Rolled Thread, F. H. or R. H. Iron ..... 75@75%
F. H. or R. H., Brass, New 8 to 14 ..... 65@10%

Set and Cap—

Set (Iron).....75@75&2½%
Set (Steel), net advance over Iron 5%
Set Head Cap ..... 50@50%
Hex. Hd. Cap ..... 50@50&2½%
Rd. Hd. Cap ..... 50@50%
Fillister Hd. Cap ..... 60@60&2½%

Wood—

List July 24, 1905
Flat Head, Iron ..... 85@85@...%
Round Head, Iron.....85@85@...%
Flat Head, Brass ..... 80@80...%
Round Head, Brass..77½@77½@...%
Flat Head, Bronze.....75@75@...%
Round Head, Bronze ..... 70@70...%
Drive Screws.....87½@87½@...%

Scroll Saws—

See *Saws, Scroll.*

Scythes—

Per doz
Grass, No. 1, Plain ..... $7.00@7.50
Clipper, Bronzed Web ..... $7.50@8.00
No. 3 Clipper, Polished Web ..... $7.50@8.00
No. 6 Clipper and Solid Steel ..... $7.75@8.25
Bush, Weed and Bramble, Nos. 11, 12 and 13 ..... $7.25@7.75
Grass, No. 1 ..... $9.00@9.50
Bronzed Web, No. 1 ..... $8.25@8.75
Nos. 3 and 4 Clipper, Grain, $9.50@10.00
Solid Steel, No. 6.....$10.00@10.50

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
Millers Falls Awl Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18..20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ₱ doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 30%
Cannon's Diamond Point, ₱ gro, $12, net
Mayhew's ..... ₱ gr. $9.00
Snell's Corrugated, Cup Pt.....40&10
Snell's Knurled, Cup Pt.....40&10
Victor Knurled Cup Pt....₱ gro. $7.50

Rivet—

Regular list.....75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut....$20.00
No. 5, and Hack $20.00
Nos. 10, 11, 95 ..... $15.00
No. 1 Old Style $10.00
Special $16.25
Giant Royal Cross Cut.....₱ doz. $8.00
Royal, Hand ..... ₱ doz. $4.50
Tainter Positive ..... ₱ doz. $6.75

Shaving—

Fox Shaving Sets, No. 30 .....
₱ doz., net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₱ doz $1.00
Mounted Kitchen Sand Stone, ₱ doz $1.50
Natural Grit Carving Knife Hones, ₱ doz $3.00
Quick Cut Emery Carving Knife Hones, ₱ doz $1.50
Quick Cut Pocket Knife Hones, ₱ doz $2.50

Skate—

Smith & Hemenway Co., Eureka..50%

Shaves, Spoke—

Iron ..... doz. $1.25
Wood ..... doz. $2.00
Bailey's Stanley R & L. Co. 15
Garin-Stephens Co. ..... 30@30&10%
Goodell's, ₱ doz. $3.00.....4 ..... 15&10%

Shears—

	7	8	9 in.	
Cast Iron..				
Best	*$16.00*	*18.00*	*20.00*	*gro.*
Good	*$15.00*	*17.00*	*19.00*	*gro.*
Cheap	*$5.00*	*6.00*	*7.00*	*gro.*

Straight Trimmers, &c.:
Best quality lap ..... 70@70&10%
Best quality, Nickel..60@60&10%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40&10&5
Heinisch's Tailor Shears 30
Wilkinson Shear & Cutlery Co.:
Sheep, 1900 list ..... 30&10&5%
Grass 40
Horse or Mule ..... 50&10%
J. Wiss & Sons Co.:
Best Quality, List ..... 60&10
Best Cast Steel, Nickeled ..... 50&10
Tailors' 25

Tinners' Snips—

Steel Blades ..... 20@35@20&10%
Steel ¾ ¼d Blades ..... 40@40&10%
Forged Handles, Steel Blades, Best 50%
Heinisch's Snips 30
Jennings & Graham Mfg. Co. 30
Kayser & Co. 30
Niagara 30
Pexto & W. Barnes Handles 30
Pexto & W. Handles ..... 10&10
J. Wiss & Sons Co. 30
Wiss Handles 25

Pruning Shears—

Clark's Hand Scissor 50%
Clauss Sweet Harvest Shear 50%
Disston's Combined Pruning Hook and Saw 50%
Disston's Pruning Hook only, ₱ doz. $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shear all grades 4
Pruning Saw ..... 10&10
Columbian Cutlery Co.:
Hedge Weeder Brand ..... 70&10
Lawn and Border, Wilcut Brand ..... 60&10%

Sheaves—Sliding Door—

Reading 40
R. & E. list 15

Sliding Shutter—

Reading list 40
R. & E. list 10

Shells—Shells, Empty—

Brass Shells Empty:
Climax, 10 and 12 gauge ..... 65&10%
Club, Rival, 65&5%; First Quality, 60&5
Paper Shells Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, 25&5%
Union, League, 12 and 12 gauge; Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%

Shells, Loaded—

Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40%
Nitro Club, Smokeless Powders.40&5%
Arrow, Smokeless Powders.40&10&10%
Winchester:
Smokeless Repeater Grade.....40&5%
Smokeless Leader Grade...40&10&10
Black Powder 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted.	Galv
14 x 20	$4.25	$6.00
10 by 14	3.25	5.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 7 x 20 in.	4.25	5.50
Dixie, 10 x 14 in.	3.75	6.00
Dixie, 7 x 10 in.	5.00	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron .....per keg, $4.10
Steel .....per keg, $3.85
Burden's, all sizes.....₱ keg $3.90

Shot—

25-lb. bag.
Drop, up to B $1.85
Drop, B and larger 1.80
Buck 2.10
Chilled 2.10
Dust 2.00

Shovels and Spades—

Association List Nov. 15, 1902..40%
Avery Stamping 40%

Snow Shovels—

Long Handle ..... $3.25@3.50
Wood and Mall. D. Handle ..... $3.75@$4.00

Sieves and Sifters—

Hunter's Imitation .....
gro. $9.50@10.00
Hunter's Genuine .....
per gro. $12.00@12.50

Sifters, Ash—

Acme Ball Bearing Sifter Co., Acme Automatic Ash Sifter $3.50
₱ doz $39.00

Sieves, Seamless Metallic

——Per dozen.——

Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested .....doz. $0.90@0.95
Mesh 20, Nested .....doz. $1.00@1.05
Mesh 24, Nested .....doz. $1.30@1.40

Sinks. Cast Iron—.

Painted, Standard list:
12 x 12 to 22 x 36 in. 60%
20 x 24 to 24 x 30 in. 50%
24 x 30 to 24 x 120 in. 40%
Barnes' low list:
[illegible] 70%
[illegible] 40

NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron ..... 70@70&10%
Steel ..... 40@40&15%

Slates, School—

Factory Shipments.
"D" Slates .....doz. $1.00
Eureka, Unframed, Value .....
60@65 ten
Victor A, Noiseless, not framed, doz. $1.00

Slaw Cutters—See *Cutters.*

Snaps, Harness

German ..... List 40@10
Chapin-Stephens Co.:
Roller, 30&2% 30
Heavy Grade, D. Pattern 10
Jennings 25

Snaths—

Scythe ..... 50@50%

Snips, Tinners—See *Shears*

Spoons and Forks—

Silver Plated—

Good Quality ..... 50@50&10&5%
Cheap ..... 60@60&10
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton 40
Rogers & Bro., William Rogers' Eagle Brand 40
Anchor, Rogers Brand..... 60
Wm. Rogers & Son ..... 60&10

Miscellaneous

German Silver .....60@60&5%

Tinned Iron—

Teas ..... per doz., 50@50&10
Tables ..... per gro. 50@50&10

Springs— Door—

Bardsley's Spring and Check 40%
Chicago (Coil) 40
Gem Coil 40
Pullman Coil 30
Reliance (Coil) ..... 40&10%
Star (Coil) 30%
Torrey's Rod, 30 in. ..... ₱ doz. $1.00

Carriage, Wagon, &c.—

Pl. in. and Wider: Per pound
Black ..... $3.25@3.50
Half Bright ..... $3.50@3.60
Bright ..... $3.25@3.50
Painted Seat Springs:
1¼ x ⅜ x 26 ..... per pr. 1.50@2.00
1¼ x ½ x 28 ..... per pr. 2.00@2.50

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Canton, O., Japanned ..... No
tional, ₱ doz. $12.00
Enterprise 30
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated ..... List Jan 5, 1900
Steel and Iron, A ..... Sweets
Rosewood Hdl. Try Squares and T-Bevels ..... 30&10&10%
Iron Hdl. Try Squares and T-Bevels ..... 40&10&10&10%
Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel 15%

Squeezers, Lemon

Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.25
Iron, Porcelain Lined ..... doz. $1.75

Staples—

Barbed Bland ..... Sweets
Fence ..... Sweets
Fence Staples, Plain, $2.15; Galvanized $2.45
Poultry Netting Staples .....
per lb. 3 cts.

Steels, Butchers'—

Dicks 30%
Foster Bros 30

Steelyards— ....30@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%
Curtis Reybile Ratchet Die Stock 25
Derby Screw Plates 25
Green 25%
Lightning Screw Plate 25
Little Giant 25
Reece's New Screw Plates..... 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones—Oil, &c.

Pike Mfg. Co., 1907 list:
Arkansas Stone ..... 8 in. $4.00
Arkansas St. No. 1, ... 8 in $3.50
Arkansas Stone No. 1, ... $4.00
Lily Whetstone ..... 8 in 60¢
Rose Red Whetstone ..... 8 in 60¢
Washita St., Extra, 4 to 8 in..50¢
Washita St., No. 1, 4 to 8 in..40¢
Washita St., No. 2, 4 to 8 in..25¢
Lily Whetstone ..... 6 in 40¢
Rose Red Whetstone ..... 6 in 40¢
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 60¢
Washita Slips, No. 2 ..... 40¢
Wells Oil Stones (entire list)...33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit 40
Quickcut Emery and Corundum Axe Stone, Double Grit 40
Quickcut Emery Rubbing Bricks 40
Hindostan No. 1 Right ..... 8 in. 40¢
Hindostan No. 1 Small ..... 6 in. 30¢
Axe Stone, 3 kinds 40
Turkey Oil Stones, Extra, 5 to 8 in ..... ₱ doz. 80¢
Indis Oil Stones, 4 to 8 in ..... 20¢
Queer Creek Slips 40
Queer Creek Stone, 4 to 8 in ..... 20¢
Sand Stone ..... 6¢

Scythe Stones—

Kane Mfg. Co., list list:
Black Diamond S. S., ℔ gro. $12.00
Medium S. S., ℔ gro. $11.00
White Mountain S. S., ℔ gro. $9.00
Green Mountain S. S., ℔ gro. $6.00
Extra Indian Pond S. S., ℔ gro. $5.50
No. 1 Indian Pond S. S., ℔ gro. $5.00
No. 2 Indian Pond S. S., ℔ gro. $4.50
Leader Red Lid S. S., ℔ gro. $4.50
Monk's Cowl S. S., ℔ gro. 33⅓%
Pure Corundum, ℔ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%.
Electro (Artificial), ℔ gro. $12.00 ..... 33⅓%
Lightning (Artificial), ℔ gro. $18.00 ..... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.....℔ gro. $9.00

Stops—Bench—

Millers Falls.....15&10%
Morrill's, ℔ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....50@50&10%

Plane—

Chapin-Stephens Co.....20%

Straps—Box—

Acme Embossed, case lots..20&10&10%
Cary's Universal, case lots.....20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. .75c
All Steel Sockets, doz. $2.00@$4.25
Excelsior Stretcher and Tack Hammer Combined, ℔ doz. $6.00.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1902 .....30&5%
P., S. & W. Co.....40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ℔ doz.
Superba, Crotch Mahogany.....$6.00
Triumph, Fancy Veneers.....$33.00
Crystal, Glass Top, Rosewood..$36.00
Elite, Hardwood Ash $24.00
Am. Queen, Fig Mahogany....$27.00
Ideal, Bird's-Eye Maple.....$25.00
Grand Rapids, Nickel.....$24.00
Japan $22.00
Standard, Nickel, $22.00; Japan,$20.00
Crown Jewel, Nickel, $21.00; Jap.$19.00
Crystal, Glass Top, Rosewood..$36.00
Grand, 17 in. wide.....$36.00
Club, 24 in. wide.....$54.00
Hall, 28 in. wide.....$60.00

NOTE.—Rebates: 30c per dozen on three dozen lots; $1 per dozen on five dozen lots; $2 per dozen on two dozen lots; $2.50 per dozen on twenty-five dozen lots

Tacks, Finishing Nails, &c.

American Carpet Tacks....90&40%
American Cut Tacks.....90&40%
Sunday Cut Tacks.....90&40%
Sunday Tinglasters.....40%
Gimp Tacks.....90&40%
Lace Tacks.....90&40%
Trimmers' Tacks.....90&40%
Looking Glass Tacks.....40%
Bill Posters' and Railroad Tacks. 90&40&10%
Hungarian Nails.....80&40%
Finishing Nails.....20%
Trunk and Chest Nails.....80&40%

NOTE.—The above prices are for straight Weights.

Miscellaneous—

Double Pointed Tacks.....
.....90&7 lots 40—7
See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
120	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather.....25@30&5%
Steel.....
Chesterman's.....25@25&5%
Kenffel & Esser Co.:
Favorite, Duck and Leather.....
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Stanley:
Asses' Skin.....40&10@50%
Metallic .....35@35&5%
Patent Bend, Leather....25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓@35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 3H, etc. 25%
Chesterman's Steel, No. 1038I, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger, per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c. .....30@33⅓%

Ties, Bale—Steel Wire—

Single Loop .....85&10&5%
Monitor, Cross Head, &c..70&2—%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Haying—

Myers' Hay Tools.....45%

Miniature—

Smith & Hemenway Co.'s, Davidson, ℔ doz. Nickel Plated $1.50; Gold Plated.....$2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida.....75&10%
Newhouse .....45@45&5%
Hawley & Norton.....65%
Victor .....35@35&10%
Oneida Community Jump.....60%
Hector .....25@35&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ℔ doz., $13.25..$11.50 doz.
No. 3, Rat, ℔ doz., $6.50.... $5.75 doz.
No. 3½, Rat, ℔ doz., $5.25. $4.70 doz.
No. 4, Mouse, ℔ doz., $3.85.. $3.00 doz.
No. 5, Mouse, ℔ doz., $3.00. $2.25 doz.
Oneida Community:
Out o' Sight, Mouse, ℔ doz.....$0.60
Out o' Sight, Rat, ℔ doz.....1.25
Easy Set, Mouse, ℔ doz.....35
Easy Set, Rat, ℔ doz.....1.00
Wood Choker, Rat, ℔ doz. holes, .12
Pedmad Tin Chuck, 3 hole, ℔ doz. traps.....75

Trowels—

Disston Brick and Pointing.....25%
Disston Plastering.....20%
Disston "Standard Brand" and Garden Trowels.....30%
Kohler's Steel Garden Trowels, ℔ gro., 5 in., $4.80, 6 in., $6.00.
Never-Break Steel Garden Trowels.. ℔ gro. $6.00
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B & L. Block Co:
New York Pattern.....50&10%
Western Pattern.....50&10%
Handy Trucks.....℔ doz. $16.00
Grocery .....℔ doz. $15.00
McKinney Trucks.....each, net $10.00
Monn Stove Trucks.....℔ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.
No. 0 1 2 3
Galvanized 867 839 889 899 1.03

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls 2⅓@2¢
No. 12, ¼ and ½-lb. Balls .21@2¢
No. 18, ¼ and ½-lb. Balls.18@19¢
No. 24, ¼ and ½-lb. Balls.
.....17½@19¢
No. 36, ¼ and ½-lb. Balls.17@19¢
Chalk Line, Cotton Balls .....26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz......11@19¢
Cotton Wrapping, 5 Balls to lb., according to quality...15½@25¢
American 2-Ply Hemp, ¼ and ½ Balls .....15½@16½¢
American 3-Ply Hemp, ¼ and ½-lb. Balls .....15½@16½¢
Indian 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) 10½@11½¢
Indian 3-Ply Hemp, ¼-lb. Balls
.....10½@11½¢
Indian 3-Ply Hemp, 1½-lb. Balls
.....10@11¢
2, 3, 4 and 5-Ply Jute Balls .....13½@14½¢
*Mason Line, Linen, ½-lb. Bls.*47¢
No. 365 Mattress, ¼ and ½-lb Balls, according to quality.
.....30@60¢
Wool, 3 to 6 ply....B 9¢; A 10¢

Vises—

Solid Box.....50@50&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard 40
Amateur 35
Columbian Hdw. Co.....40%
Fisher & Norris Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00.
Fulton Mach. & Vise Co.:
Reed, Swivel.....25%
Star, Solid Jaw.....40%
Hollands':
Machinists' .....40-10&5%
Keystone .....65&5@70
Lewis Tool Co.:
Adjustable Jaw.....30%
Monarch, 50....; Solid Jaw.....50%
Massey Vise Co.:
Clincher 40%
Perfect, 15%; Lightning Grip....15%
Merrill's 20
Millers Falls Oval Slide Pattern 60&10%
Parker's:
Victor, 20@25%; Regulars.....20@25%
Vulcan's .....40@45
Combination Pipe.....55@60
Peerless .....20@25
Rock Island 25%
Snedeker's X. L.....33⅓%
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ℔ doz., $24.00, 30%; Clamps.....30%
Perfection Saw Clamps, ℔ doz....$4.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed .....
Star 40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect.....15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.50; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 50&5%; No. 870 .40%
Rock Island Pipe.....25%

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10.....1.25
P. E., 8.....1.50
P. E., 7.....1.50
Ely's B. E., 11 and larger $1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Dis. 15 & 5

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled .....45&10%
Ground .....30&5%
Plain or Unground.....60%
Country Hollow Ware, per 100 lbs......$3.00
White Enameled Ware:
Maslin Kettles.....65&10%
Colored Ware:
Tinned and Turned.....35&10%
Enameled .....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....33⅓%
Iron Clad Ware.....70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	.45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60%
Pittsburgh .....5%@35&10%
Never Break Spiders and Griddles.....
.....65&5%
Never Break Kettles.....60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ℔ doz
Crescent, family size, bent frame $4.15
Rival Star, family size, stationary or reflector $4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $3.75
Cole Q. T., family size, stationary protector.....$3.60
Single Zinc Surface:
Nanaf, family size, open back, perforated $3.00
Single Saginaw Globe.....$2.85
Brass Surface:
Brass King, Single Surface, open back $4.05
Nickel Plate Surface:
No. 1001 Nickel Plate, Single, Surface $3.60
Glass Surface:
Glass King, Single Surface, open back $3.95
Enamel Surface:
Enamel King, Single Surface, ventilated back.....$3.95

Washers—Leather, Axle—

Solid .....90@90&10%
Patent .....90@90&5%
Coil: ⅞ 1 1⅛ 1¼ inch
90. 100. 110. 170. per box

Iron or Steel—

Size bolt.... 5/16 ⅜ ½ ⅝ ¾
Washers.... $4.90 4.00 2.70 2.50 2.30

The above prices are based on $6.50 off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots.....
per lb. 1¾@2¢

Wedges—

Oil Finish.....lb.. .@3¢

Weights—Hitching—

Covert Mfg. Co.....30&2%

Sash—

Per net ton, f.o.b. factory:
Eastern District.....$35.00@$38.00
Southern Territory.$32.00@$34.00
Western and Central Districts .....$32.50@$38.50

Wheels, Well—

8-in., $2.00; 10-in., $2.45; 12-in., $3.25; 14-in., $4.45.

Wire and Wire Goods—

Bright and Annealed:

6 to 9	72½&10&7½%
10 to 18	72½&10&10%
19 to 26	75&10&10&2½%
27 to 36	77½&10&7½%

Galvanized:

6 to 9	72½&10%
10 to 14	72½&10&5%
15 to 16	72½&10&5%
17 to 18	72½%
19 to 26	70&5&2½%
27 to 36	65&10&10%

Coppered:

6 to 9	65&10&10%
10 to 14	70&10&5%
15 to 18	65&10&10&10%
19 to 26	70&5&2½%
27 to 36	72½&10&2½%

Tinned

6 to 18	67&10&10%
Brass	17¼¢ lb., base
Copper	32¢ lb., base
Cast Steel Wire	.50%

Spooled Wire—

Annealed and Tinned,
70&10&10&10%
Brass and Copper...60&10&10&10%
Retailers' Assortments, per box, $2.10@$2.40

Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods.....90&25&—%
Brass Wire Goods.....90@90&10%
Brass Cup and Shoulder Hooks, 80&15%

Wire Cloth and Netting—

Galvanized Poultry Netting,
80&25&5@ 80&67½&—
Painted Screen Cloth, 100 ft., $1.35
Standard Galv. Hardware Grade: Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh.....$2.75
Nos. 4 and 5 Mesh.....$3.00
No. 6 Mesh.....$3.25
Nos. 7 and 8 Mesh.....$3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural.....80&10%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches....
70&5@70&10%
Drop Forged S.....45@45&5%
Acme .....60&10%
Alligator Pattern, 70%; Bull Dog .70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright .40%
Steel Handle Nut.....50%
Combination Back.....40&5%
Merrick Pattern.....
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle.
.....10&10&5&5%
Coes' "Mechanics'".....40&10&10&5&5%
Do nohue's Engineer.....40&10%
Eagle 71%
Gem Packet.....
Hermetos 10%
Wm. & B. Machinist:
Case lots.....50&5%
Less than case lots.....50%
W. & B. Railroad Special:
Case lots.....50&5%
Less than case lots.....45&5%
Solid Handles, P. S. & W.....50&10%
Full cases.....55&10&5%
Stillson 65%
Uwanta Wrench Co.:
Tubular Special, Iron Handle, ...40&10&5%
Other Wrenches 50%
Vulcan and Acrippa Chain.....50
Whitman & Barnes:
Case lots.....50&10%
Less than case lots.....50%

Wrought Goods—

Staples, Hooks, &c., list March 17, '02.....85&10&10%

Zinc—*(Cask lots at mill.)*

Sheet.....*per 100 lb.* $7.00

THE IRON AGE

New York, Thursday, April 16, 1908.

Casting Pipes in Permanent Molds.*

Details of a Process and Apparatus Used by the Tacony Iron Company—Interesting Discoveries in the Development of the Invention.

BY EDGAR A. CUSTER, PHILADELPHIA.

The writer of a recent article on foundry practice, in speaking of the limitations of molding machines, made this statement: "A mold that molten iron will not destroy or one that will not cause the evils of unequal heating and cooling to show on the finished article, is as far removed as the philosopher's stone." The purpose of this paper is to describe a method and an apparatus using permanent molds that the hottest iron attainable from the cupola does not destroy, and that produces cast iron pipe in which the supposed evils of unequal heating and cooling not only do not appear but do not exist.



Fig. 1. Apparatus Employed by the Tacony Iron Company, Tacony, Pa., for Casting Pipe in Permanent Molds.

So-called permanent molds are not new. For many years small iron castings have been successfully made in iron molds, and this without great detriment to either the casting or the mold. These castings, however, were invariably very small and were chilled to extreme hardness. Fortunately it was not necessary to machine them. This limited the use of such molds very materially. Some years ago the Latrobe Steel Company cast car couplers in iron molds. Within a few months an article has been published describing a successful method of making brake shoes in this manner. These shoes weighed about 20 lb. each and with the exception of steel ingots and car couplers were the heaviest castings made in iron molds. So far as can be learned this is about the extent of the art. It has been the dream of every foundryman whose trade requires a large number of duplicate castings to make these castings in molds that would not only survive the process but would also produce castings not only marketable but easily machined.

* From the *Journal* of the Franklin Institute. A paper read before the Institute March 26, 1908. Mr. Custer is president of the Tacony Iron Company, Tacony, Pa.

Ordinary Soil Pipe Manufacture.

The method before us relates only to soil, water or gas pipe. Probably all are familiar with soil pipe making. Iron flasks, a cope and drag, are rammed with sand over a metal pattern; a green sand core is introduced and the cope and drag are clamped together. The pipe is then poured, with the pipe in a horizontal position, and after cooling the pipe is removed from the flask and carried to the end of the floor, where the cores are removed. Then it is carried to the cleaning room, where the sand is rattled off, the gates and fins are removed and after inspection it is ready for shipment. Altogether the pipe has to be handled 10 times. In this process the loss is very great. So much depends upon the condition of the sand. It may be too wet or too dry. The molder may ram carelessly, or may pour his iron negligently, so that the foundry loss often reaches 12 to 15 per cent. In summer weather the output is decreased 25 to 40 per cent., due to the inability of human beings to stand the exacting and exhausting labor. Only one heat a day can be poured in any season. In fact, with very few improvements, and these relating mainly to making cores, we are making soil pipe in precisely the same manner and with just as much labor per pipe as was the practice 50 years ago. It is true that the workman of to-day makes more pipe in one day than his grandfather did, but this is due more to the fact that the present day workman is working piecework and has become infinitely more skilled in saving the seconds of time for each particular operation and avoiding the useless motions in performing them. Any process that would save the use of sand for the mold and would produce pipe capable of being easily cut would

of necessity be very desirable. If in addition it would obviate cleaning and chipping and could be run continuously night and day, it would very nearly meet the conditions of an ideal business.

First Tests of Iron Molds.

When experiments to discover and perfect such a process were undertaken, the first mold made was closely modeled from the flasks in use in the sand process. In fact, all the traditions of foundry practice were closely not surprising that the experiments were approached with considerable trepidation. The first mold made consisted of a cope and drag, each 6 ft. long, 10 in. wide and 6 in. thick, with gates cut into the drag, as shown in Fig. 2. This mold was cast of very soft iron and the pipe shape bored out. The pouring holes were tapered so that when the cope was removed the iron in them could be easily knocked out. In order to avoid as far as possible all traces of moisture the mold was heated to 500 degrees F, an ordinary green sand core was inserted and four men

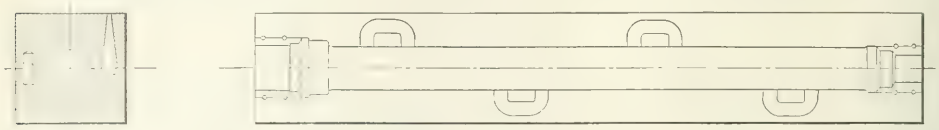


Fig. 2.—Form of Mold Originally Used.

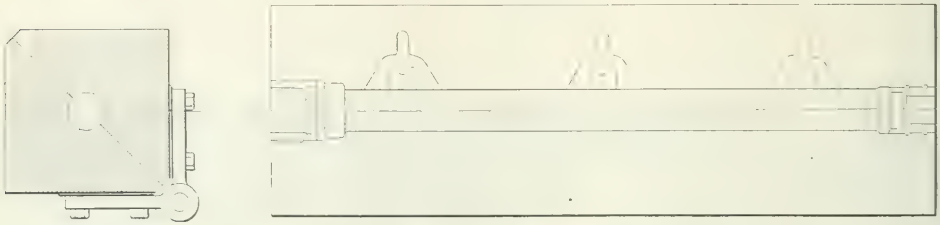


Fig. 3.—Form of Mold Now in Use.

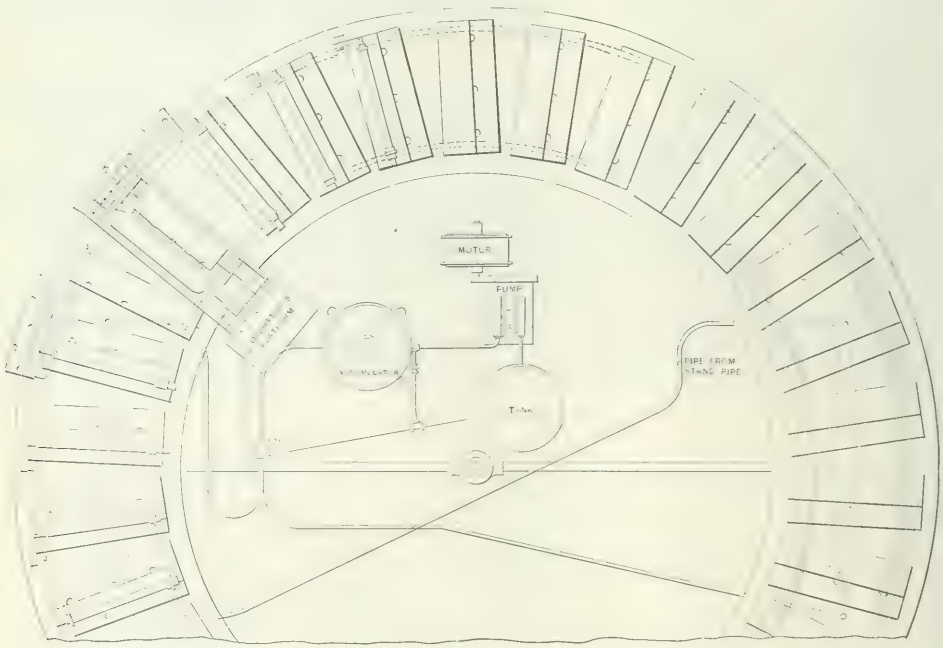


Fig. 4.—Plan of Table Carrying Permanent Molds, Showing Also Arrangement of Apparatus for Rotation.

followed. The apparent danger of pouring molten iron into iron molds incasing a damp sand core was considered to be serious, and the problem of disposing of the resultant gases was expected to prove a great one. Again, the pipes were less than ¼ in. thick, and it was necessary to pour the iron very quickly. So far as was known, no one had successfully poured a complete pipe in an iron mold, and such attempts as had been made had destroyed the mold very quickly. A mold 6 ft. long would be permanently warped in a short time, hence it is poured molten iron into the gates. These men wore goggles and were swathed completely in wet clothes. We did not then know what would happen. As it turned out nothing happened, not even a semblance of pipe; the gates were too small. A short session with a hammer and chisel made them larger and on the second attempt a complete pipe was poured. It was not a remarkable pipe except for its defects. It was streaked with cold shot; the top was filled with flat spots where the gases had been trapped, and it was as hard as flint.

Casting Experiments with Another Mold.

After an infinite number of experiments the mold now in use (Fig. 3) was evolved. A complete description of this mold as it appears on the machine will be given later. After 50 or 60 pipes had been cast in it, it became badly cracked around the gates and as the process of casting was continued these cracks extended into the barrel of the mold. This we attempted to obviate by casting into a new mold very thin strips of mica, extending

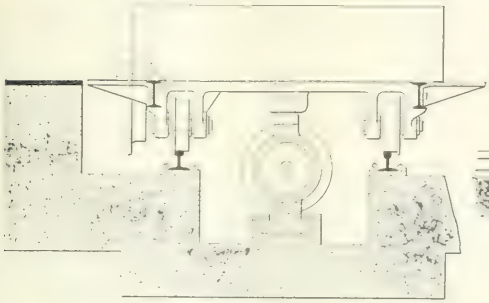


Fig. 5.—Section of Table Truck, Showing Driving Mechanism.

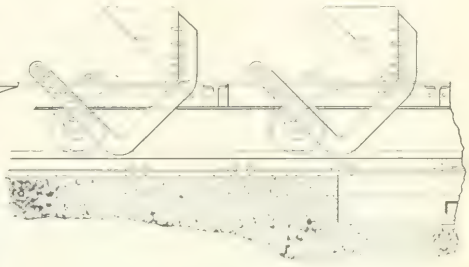


Fig. 6.—Arms with Rollers at Ends for Opening and Closing Molds.

throughout its length and placed radially at intervals around the barrel or mold cavity. The cracks we found in this mold would start as before, but would stop when the mica was reached. A good illustration of this effect is shown by the fact that a small hole drilled at the extremity of a crack in a sheet of plate glass immediately stops the further extension of the fracture. In time the whole face of the mold would show a collection of fine

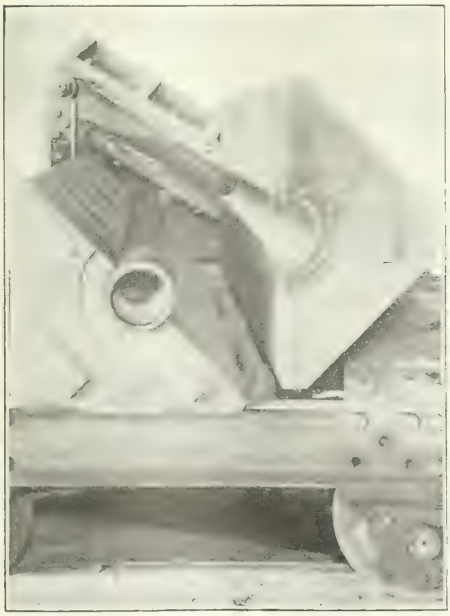


Fig. 7.—The Method of Closing the Mold.

cracks, most of which could only be seen with a magnifying glass. They rarely ever were more than 1-16 in. deep. After probably 200 pipes had been cast the surface of the mold in contact with the molten iron resembled an extremely hard graphite. It was dull black in color but did not scale or shell off. In order to test the mold thoroughly the ends were stopped up with sand and the entire barrel, without a core, was filled with molten iron. This was done 30 or 40 times without any appreciable distortion of the outline. The only care exercised was to take the casting out before heavy shrinkage set in.

In order to test it still further, the mold was heated to a temperature of about 1100 degrees F. in a furnace, but it was found impossible to produce pipe under these conditions. The molten iron danced in the mold like water on a hot griddle, and the resultant pipe was a collection of closely knit globules. It was found that the safe casting heat of the mold was about 700 degrees F., but that in a practical working, 250 to 400 degrees F. was the highest heat the molds reached. The actual time in which metal set was carefully noted and the behavior of the cast metal at extremely high temperatures was observed. Irons high and low in silicon, sulphur, carbon and phosphorus, respectively, were cast a great many times and copious notes were taken in each case. A small chemical laboratory was established for this work. In all over 4600 pipes were cast in a 4-in. pipe mold, 2700 in a 2-in. mold and over 1100 in a 6-in. mold. Not one of these molds shows any signs of deterioration over and above the first cracking, as described before; in fact, they are in a far better condition than at the start. Each one has been purposely abused and submitted to treatment that never occurs in practice. A straight edge laid in the barrel to-day shows the surface to be perfectly straight, and the mold in which 4600 pipes were cast shows the original marks of the boring out tool.

It was found that an iron running from 2 to 2.25 per cent. silicon and high in carbon, produced the greatest number of perfect pipes, and when cast iron of this silicon had a comparatively low sulphur content the result was still better. Further experiments showed that powdered ferromanganese when added to the molten iron immediately combined with the sulphur as a manganese sulphide, and rose to the top of the liquid mass as a slag. An excess of manganese, however, produced a hardening effect as it formed with the carbon a carbide, which in itself is an extremely hard substance. These features made it possible to use a high sulphur cast iron, providing its other contents approximated the figures given above.

A Temperature Investigation.

It was then noted that pipes that remained in the mold until a dull red heat was reached were very hard and in most cases were too hard to cut. When they were taken out at a bright yellow heat and allowed to cool normally they were perfect in texture. It was further noticed that when the dull red pipes were piled with the very hot bright yellow pipes an annealing process was set up that brought the iron in the dull red pipes into a workable condition. This feature of temperature was the subject of a long and patient investigation and the causes leading thereto may be now briefly stated.

Pure iron possesses no fluidity, or the property of low shrinkage, nor does it possess varying degrees of hardness. It is obvious then that the characteristics of cast iron, which possesses these qualities in a high degree, are due to the presence of impurities such as carbon, silicon,

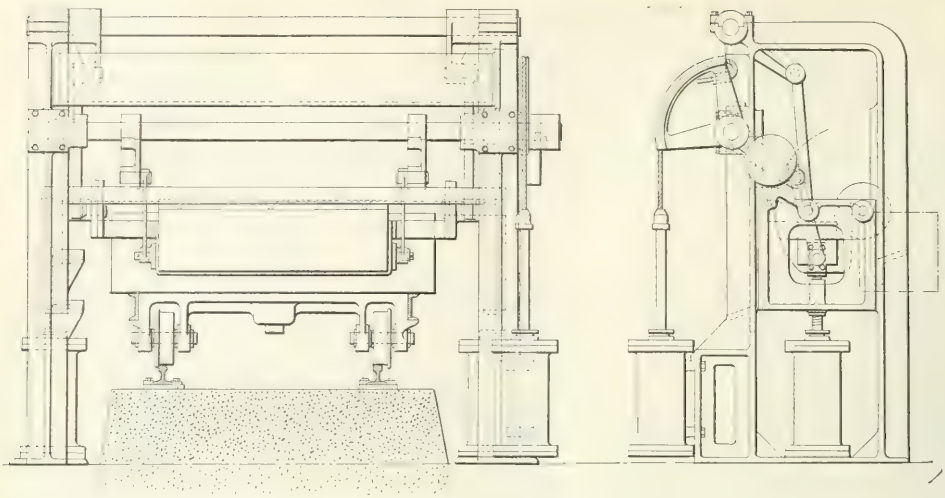


Fig. 8.—End and Side Elevations of Present Form of Pouring Device.—This Is More Stable than the Original Device Shown in Fig. 9 and Permits of Running the Whole Machine with One Man Instead of Three.

phosphorus, &c. Carbon is the main element and exists in cast iron as combined and free carbon. The amount of free carbon, which is the principal softener of cast iron, depends principally upon the rate of cooling. If molten iron high in carbon be cooled slowly the free carbon separates out in the form of graphitic carbon. If this same iron be suddenly cooled, the carbon is caught before it has time to separate and is held in an atomic condition by the enormous pressure of the surrounding iron. Therefore, the fracture of a pig of iron is generally an index of the rate at which it is cooled. If the suddenly cooled iron be remelted and slowly cooled, it will assume all the characteristics of soft iron. The graphitic carbon will become plainly separated and large crystals will be formed. It may be stated that cast iron in a molten state is a solution of carbon and iron and the mass is homogeneous.

Silicon in itself confers no benefit on cast iron. It is only its influence on the carbon contents that produces beneficial results. On the other hand, an excess of silicon renders cast iron absolutely unfit for use, making it very hard and brittle. A small quantity, through its action on the carbon, reduces shrinkage, increases strength and increases fluidity. Given, then, cast iron comparatively high in carbon, with the proper amount of silicon and the ideal conditions are obtained. The uses of phosphorus and manganese are too well known to require discussion and play no part in this method, except as correctives. Keeping these facts in mind, it may be stated that an ordinary foundry iron very nearly fulfills these conditions, with the exception of sulphur. Molten cast iron is therefore a solution of carbon in iron with the addition of silicon, phosphorus, sulphur and manganese, all forming a homogeneous fluid mass. Now, if this mass be suddenly cooled, it is still homogeneous, the different elements not having time to segregate. If the cooling be continued at the same rapid rate until a temperature of about 1600 degrees F. is reached the iron becomes very

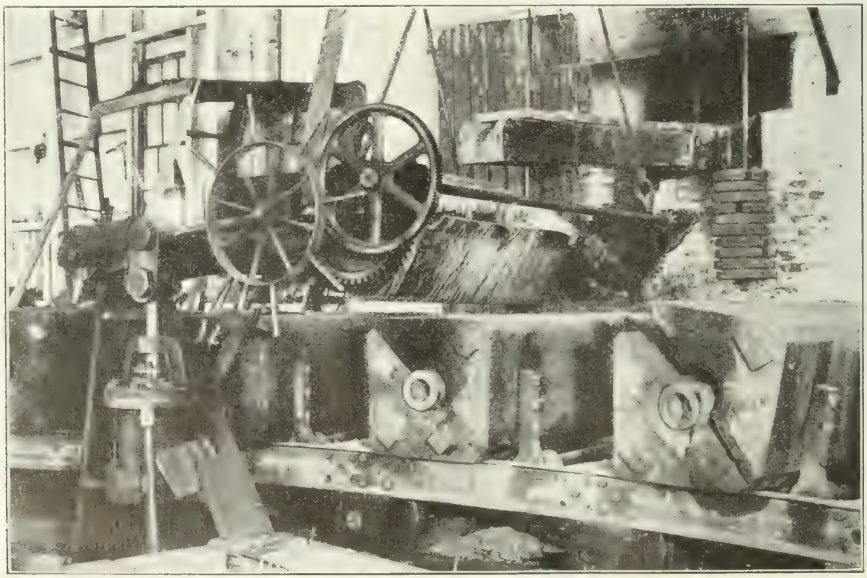


Fig. 9.—View of Original Pouring Apparatus.

hard and brittle. But if this sudden cooling is carried out only until the iron is set and it is then removed from the cooling influences, allowing it to lose its heat normally, the result is a structure whose fracture shows a very fine, close grain. It is tough, since all its particles are thoroughly interlaced, and it is strong because very nearly all the carbon is held in the combined state. In other words, it is homogeneous. Now, let us try to make this vital point plainer.

The "Evil Period" After Pouring.

In a casting, such as a thin pipe, when cast in an ordinary sand mold, it requires about 1 min. to cool from the temperature of molten iron to the point at which the metal is set. It is in this period that the detrimental effects as shown in cold cast iron are produced. Phosphorus and sulphur and carbon segregate, and graphitic carbon is formed. Bear in mind that in this period the iron is in a liquid state with all its elements free to move. We may call this the evil period. Once the casting is set, all segregation ceases, and the remaining carbon begins its beneficent work. As the iron loses its heat at a normal rate, annealing and carbide carbon are formed, both of which improve the quality of the metal. Consequently we can call this the beneficent period. Now, if we suddenly shoot the molten iron into an iron mold it sets very quickly and the evil period is reduced in time from 60 sec. to 2 sec.—so short a time, in fact, that all the impurities are held in the position they occupied in the molten mass. The evils of sulphur and phosphorus are reduced to a minimum, since they are in practically an atomic condition and are distributed evenly throughout the casting; and since no graphitic carbon is formed all the carbon exists as combined carbon, with a corresponding increase in its power for improvement. If the casting, after it has passed the evil period, is removed from the cooling influence, in this case the iron mold, and allowed to cool normally, the ideal conditions are obtained. Chilling cast iron to the point of extreme hardness is purely a mechanical process and the point to which the process of sudden cooling can be carried can be determined to an absolute certainty. It is simply a question of time. The data collected show that a 2-in. pipe can be removed 2 sec. after pouring and should not remain in the mold more than 6 sec. A 6-in. pipe can be removed in 6 sec. after pouring and should not remain more than 12 sec. This time depends upon the thickness of the pipe walls. Very thin pipe would require not only a short time in the mold, but should be cast of iron higher in silicon. The reason for this is that silicon, by its action on the carbon, keeps the iron in a fluid state longer than normal. Every foundryman knows there are irons in which it is impossible to produce a chill and there are others in which it is impossible to prevent it. The same limitations apply to making pipe as to the making of other iron products. A suitable iron must be provided if the very best results are to be obtained. This statement applies to any branch of the foundry business and is not set out as a new discovery. What is claimed and demonstrated is that a poor iron is improved and rendered suitable for the work in hand.

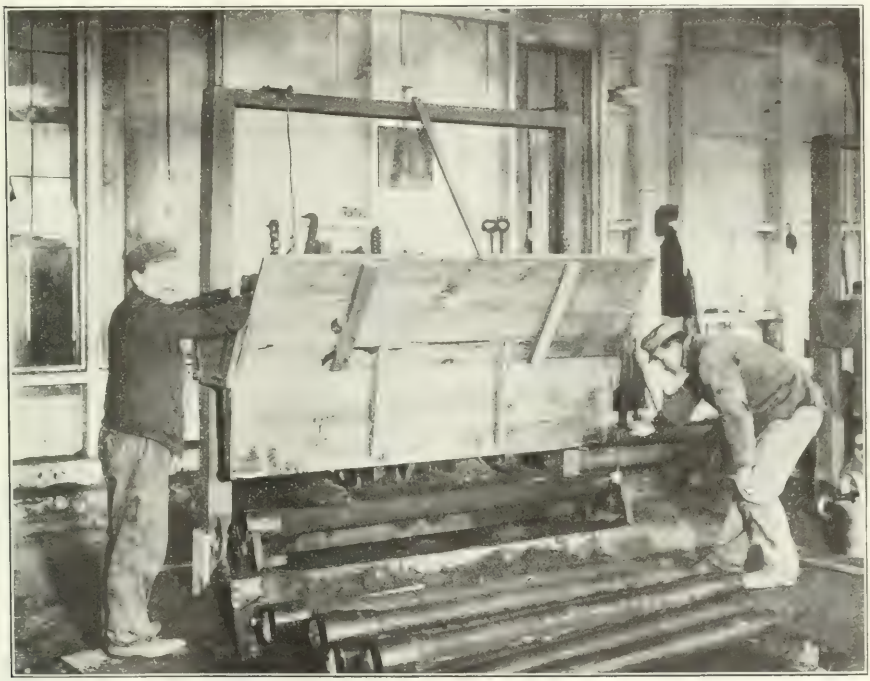


Fig. 10.—Making a Core.

Designing the Pipe Casting Machine.

With the data obtained the work of designing a machine that would operate continuously was begun. The experiments had shown that when pipes were cast in a mold every 8 min. the temperature of the mold never rose above 450 degrees F., even if the operation were continued for hours. If pipes were poured every 2 min. the temperature of the mold rose rapidly, and at 900 degrees F. it began to warp. In order to follow the best conditions and avoid the worst the apparatus shown in the accompanying illustration was designed.

The machine consists of an annular table, Figs. 1 and 4, approximately 40 ft. diameter outside, carrying 30 molds, arranged at equal intervals thereon. The table is constructed of two concentric rings of channel beams, connected with 30 cross pieces or trucks, each of which has two wheels having roller bearing axles. These wheels are arranged to run on concentric circular tracks set in concrete foundations. The tracks are arranged as if on the surface of a cone, and by this means is created a tendency of the table to resist any movement other than rotating about its center. Either outer or inner track may be the higher, as the effect is the same in either case.

Each truck or cross bar of the table carries a steel pin working loosely in a vertical hole (Fig. 5) and of such length as to allow about 2 in. of pin to project below the bottom line of the truck, but admitting of being pushed up until flush with the bottom of the truck.

Under the table or ring, at two diametrically opposite points, as shown in Fig. 4, are arranged two hydraulic cylinders, which slide in ways similar to a planing table, the pistons within the cylinders being held stationary and the cylinder moved back and forth by the operation of a four-way valve controlling the admission of water, alternately to each end of the cylinders. The stroke of the cylinders is of such length as to be slightly more than

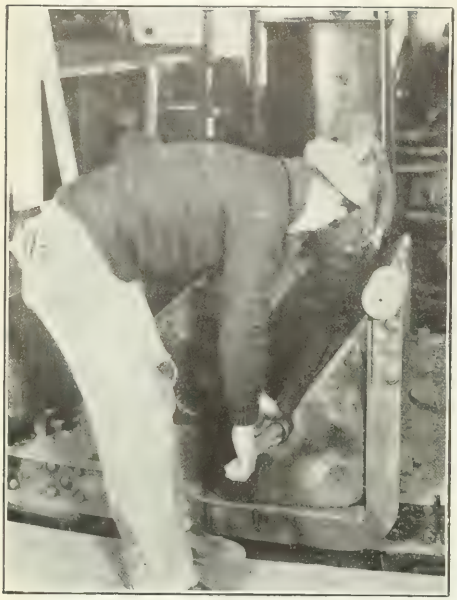


Fig. 11.—Setting a Core.

the spacing of molds carried by the table; and projecting from the top of cylinder is an inclined plane surface designed to lift the pins in the trucks, when the cylinders move in a direction opposite to the required motion of the table, and to allow a pin on each side to fall, after the inclined surface has passed. This occurs at or near the end of the backward stroke of the cylinders, and when the controlling valve is so moved as to cause the cylinders to move forward the pins which have been lifted and allowed to fall are brought in contact with the projections on the cylinders and hence the table is carried forward by the motion of the cylinders, a distance equal to the spacing of the molds, and the cylinders are ready for another return or back stroke to engage the next pins, thus intermittently moving the table ahead one space at each cycle of the cylinders.

The center of the table is left open for the location of hydraulic pumps, operating valve reservoirs, &c., required in imparting motion to the table. This table makes one complete revolution every 7½ min. and consequently produces 30 pipes in that time, or 240 pipes per hour. At certain points about the table are arranged closing and opening devices, which are designed to close the mold (Fig. 7), or bring the cope side down to its place on the drag side without shock, after the cores are set in place, and to open the mold or lift the cope after the pipe has been poured.

Between the closing device and the opening device is located a pouring device, Figs. 8 and 9, adapted to receive the molten metal from the cupola and pour it into the molds.

The Mold.

Each mold consists of a rectangular block of cast iron approximately 18 in. wide and 18 in. high, by 6 ft. long, parted on a diagonal line across the corners, and provided with hinges at the lower edge of the parting so as to allow the upper portion or cope to be swung up and back from the lower portion or drag. These molds weigh about 6500 lb. complete. At the center of the mold is the cavity into which the metal is to be poured to form the pipe. Thus one-half of the pipe is formed in the upper and one-half in the lower portion of the mold. Gates are cut in the face portion of the lower part or drag of such size and shape as to receive the molten metal from the ladle and guide it into the mold. Three such gates are used, each dividing into two portions, and so entering the cavity of the mold at six points.

These gates are so shaped as to receive the shock of the falling stream of molten metal at a point outside of the mold cavity, and convey it into the mold quickly but gently, so that the core is not damaged by a rush of molten metal against it. At the highest point of the barrel of the mold a small groove is cut, extending throughout the entire length of the barrel. This groove, which is quite small, being only ⅛ in. wide and deep, is intended to receive any gases or air which may be trapped in the mold, and so avoid the formation of flat spots at the top of the pipe. The resultant ridge not

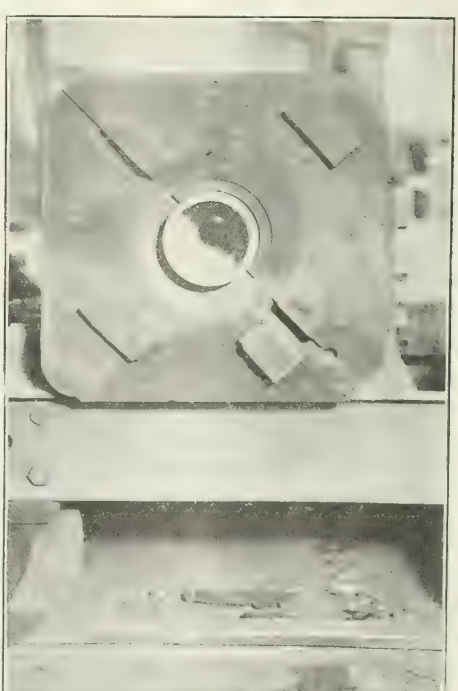


Fig. 12.—A Closed Mold.

being prominent is not an obection, but rather adds to the strength of the structure.

On one end of each mold is carried an arm rigidly attached to the upper or movable half (Fig. 6). This arm extends under the mold and is of such form that, when the mold is open, it forms a rest for the movable half, holding it in such position as to allow of any work, such as getting cores, removing finished pipes, cleaning, &c. On the end of this arm is a steel roller, which is caused to travel down an inclined plane by the rotation of the table carrying the mold. This inclined plane is arranged to receive the roller at its higher position when the mold is open, and to guide it smoothly to its lower position, by

this means closing the mold without shock or jar to disturb the core. This inclined plane constitutes the closing device.

The Making of Cores.

Each end of the mold is provided with rings or bushings, which are used to support the core arbor in a precisely central position in the cavity of the mold, so that the pipe when finished shall have uniform thickness of metal at every point. The core arbor consists of a cast iron hollow cylinder somewhat longer than the pipe to be cast and about ¾ in. less in diameter than the inside diameter of the pipe. It is perforated throughout most of its length by small holes to allow any gases formed by contact with the molten metal to pass into the arbor and so have free vent to the air through the ends of same. Each end of the arbor is accurately machined to fit the rings or bushings in the ends of the molds.

The core is made by placing the core arbor in the core machine. Fig. 10, which consists of a support for the ends of the arbor, semicircular in form, and of a diameter to fit the arbor ends; a shaking screen arranged to sift sand and a guide to drop it upon the arbor, and a knife, so shaped as to form the sand to the outline of the inside of the pipe.

The core arbor after being wet thoroughly is placed in the end supports and rotated by a crank-shaped piece of iron held loosely in one end by an operator. At the same time another operator shakes a sieve suspended over the arbor and previously filled with sand, tempered to the proper degree with water. This sieved sand is caused to fall directly upon the wet, rotating arbor and clings to it. The surplus sand is scraped away by a steel knife held at the proper distance from the arbor to make the finished core of the diameter and shape required. When sufficient sand is on the arbor to make a full and complete core (which requires about 5 sec.) the core is lifted from its supports and is ready for use. No further treatment of any kind is needed, and the core is placed in position in the mold (Fig. 11), which is then caused to pass the closing device, bringing the upper portion down in place, and the mold is ready to receive the metal (Fig. 12).

The Casting Operation.

A ladle is provided to receive the metal as it flows from the cupola. This ladle is arranged so that it can take a position high enough to allow the molds to pass freely under it, or it can be lowered into a position between two adjacent molds, so that the pouring spouts or lips of the ladle are very close to the pouring holes of the mold. As the table rotates and brings a mold, which has passed the closing device, into pouring position the ladle automatically drops into this latter position with the lips close to the pouring holes (Fig. 13). It is then tilted to pour by the operator, but in tilting it rotates around a center line which passes through the pouring lips, and hence the points of pouring do not move. The streams of metal are guided directly into the pouring holes through the various gates into the mold and fill it completely, compressing any air or gas which may be trapped into the groove provided at the highest point for that purpose. If no gases are trapped—and this, strange as it may seem, is usually the case—this groove is also filled with metal and forms a slight rib running the length of the pipe. When the pouring operation is complete and the operator tilts the ladle back it automatically rises to its higher po-

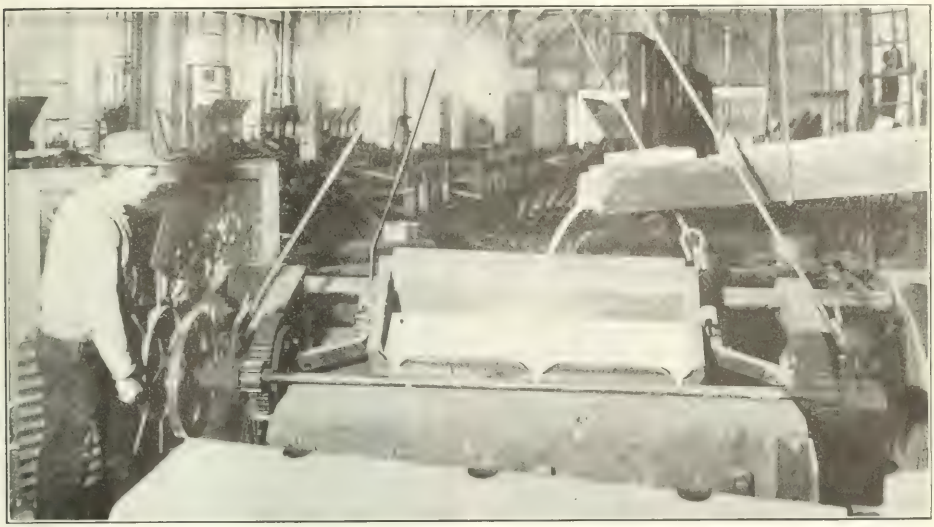


Fig. 13.—Pouring a Pipe.

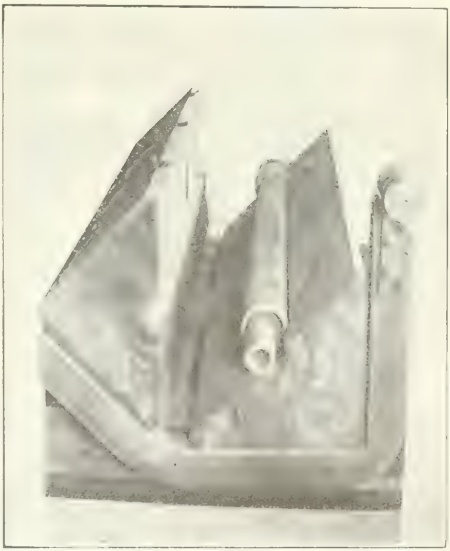


Fig. 11.—A Pipe Mold.

sition, so that the next mold may pass under it and assume the pouring position.

The mold being now filled with metal, is held long enough to allow the metal to set enough to hold together, and then opened by passing the opening device, which is just the reverse of the closing device. The roller on the end of the arm or mold is guided up an inclined plane, thereby lifting the upper half, or cope side, and swinging it away from the lower or drag side. The pipe (Fig. 14), which is still a bright orange color, is lifted from the mold and placed, after the removal of the gates, with those previously cast in piles to cool slowly. The core arbor is then withdrawn and returned to the core machines to be used again. After the removal of the finished pipe from the mold the loose sand which falls from the core during the handling of the pipe and any other dirt, loose gates, &c., which may be left in the mold are swept out by air blasts or hand brushes and the mold is ready for another core and another filling with metal.

The method of pouring is very important. In fact, the success of the whole operation hinges very closely upon properly carrying out this scheme. By it are secured equal velocity and equal pressure of the molten metal as well as simultaneous action. Too much stress cannot be laid upon this feature. The difference between a good pipe and a bad one is the difference between good and bad pouring.

Corrigan, McKinney & Co. Deny Sale Rumors.

We have received the following communication from Corrigan, McKinney & Co., Perry-Payne Building, Cleveland, Ohio:

"The statement published in your issue of April 9, regarding the sale of our properties to the United States Steel Corporation, has been widely copied and is likely to result in considerable injury to us, as the statement is absolutely untrue and absolutely without any foundation. There is no negotiation and has been no negotiation for the sale of our properties to the United States Steel Corporation or to anybody else."

James B. Clow & Sons' New Pipe Foundry.

An important undertaking in new plant construction is now being contemplated by James B. Clow & Sons, Chicago, which comprises the erection of a large pipe foundry, machine shops and finishing departments at Coshocton, Ohio, and the ultimate abandonment of the present pipe plant at Newcomerstown, Ohio. A site of 50 acres has been secured at Coshocton for the establishment of the new plant, which will have about three times the capacity of the Newcomerstown plant. The tract is accessible to the Pennsylvania and Wabash systems, and will afford convenient shipping facilities.

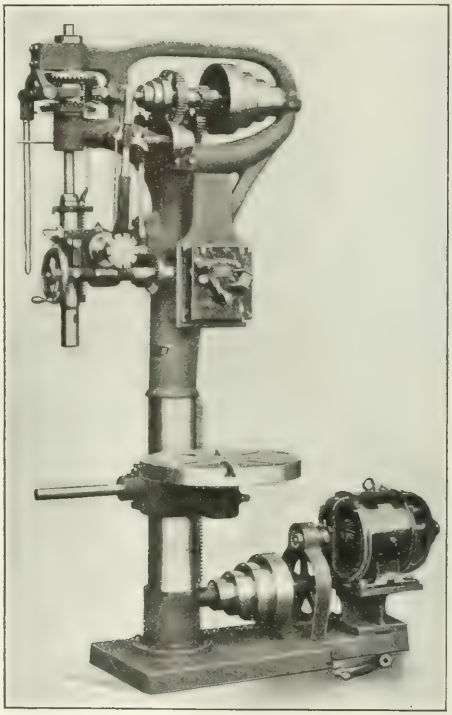
The buildings include two pipe foundries, one 125 x 700 ft., and the other 100 x 400 ft., with six cupolas; two large machine shops, assembly shops, pattern shops, storage warehouse and a commodious office building. All of these buildings are to be of reinforced concrete, including the roof, and will be supplied throughout with modern machinery and equipment. This will be furnished in part from the Newcomerstown plant, which will be dismantled when the new buildings are completed. A large amount of new machinery will, however, be needed in addition thereto, it being the purpose of the firm to provide every means for the economical production of its output. About 25,000 barrels of cement will be required for buildings and foundations. It is estimated that $1,000,000 will be expended in this enterprise, and the owners expect to have the plant in running order by next fall.

According to statistics compiled by the New York Life Insurance Company, automobiles killed or injured 1568 persons last year. A daily paper that contains no mention of some kind of an accident due to an automobile would be a novelty.

A Special Cincinnati Drill.

The upright drill illustrated is specially equipped for drilling wagon and carriage wheels, but is otherwise the standard tool built by the Cincinnati Machine Tool Company, Cincinnati, Ohio. It is a 21-in. back geared drill, fitted with hand wheel and lever hand feed, power feed and automatic stop and patent gear tapping attachment, and is driven through gears by a ¾-hp. direct current constant speed motor mounted on the base.

Many light drills have been put on the market for drilling carriage and wagon wheels, but there appears to be a lack of drills suitable for heavier work of that class. It was with the special purpose of providing for such work that this new drill was perfected. The base is of special design—viz., short in the front, so as to permit a large pit for the wheel in front of the drill. The table arm is provided with a spindle, as shown, to carry the wheels. These spindles can be varied in diameter for the different size wheels to be drilled. By swinging the table arm around and bringing the table in position under the drill the machine is converted into the ordinary standard upright drill.



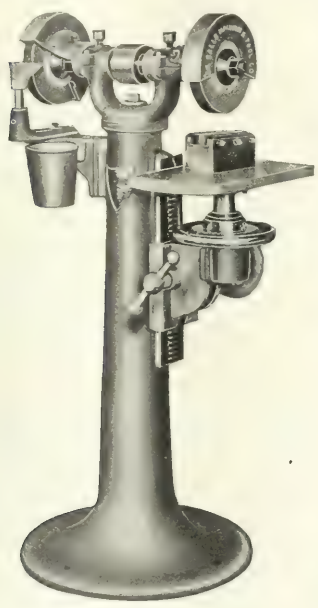
A Drill Built by the Cincinnati Machine Tool Company for Heavy Drilling on Wagon and Carriage Wheels.

Hill, Clarke & Co., Inc., Chicago, have established a branch in Cleveland, Ohio, at 711 St. Clair avenue, Northeast. The purpose in opening this branch is to exhibit and demonstrate a new line of high speed machine tools, which have not heretofore been shown in that territory. Facilities will be provided in the store for demonstrating the machines by actual operations, so that prospective buyers can see just what each tool can do. The demonstration of tools in a practical way has been found to yield results profitable alike to the seller and buyer, since a tool sold under such conditions is not likely to prove disappointing to the user. The Cleveland office will be under the charge of S. E. Hale.

The La Salle Combined Plain and Surface Grinder.

In the development of machine tools improvement is nowhere more marked than in grinding machines. This is true not only of tools designed for special work, but equally of machines adapted to general shop service. Of the latter class is the grinder herewith illustrated, which is made by the La Salle Machine & Tool Company, La Salle, Ill. This tool carries two wheels and is arranged for both plain and surface grinding.

For accurate surfacing, such as is required in fitting keys, sharpening punches and dies, and work of like character, an adjustable table, fitted with a micrometer feed, is attached to the right of the supporting column. The table head is raised and lowered by a rack and pinion movement through a vertical hand wheel, and is securely clamped in position by the hand nut, as shown in the illustration. Mounted on a solid post the table moves vertically in the knee, and is held from turning by a feather lock. The depth of cut is regulated by a horizontal hand wheel encircling the post, which it engages by means of a screw thread. Carried on the hub of this wheel is a large dial graduated in thousandths of an inch, with division marks 5-32 in. apart, so that finer adjustments may be readily estimated.



The No. 1 Combination Plain and Surface Grinder Built by the La Salle Machine & Tool Company, La Salle, Ill.

The elevating screw and post bearing are protected from dust and grit by a dust ring fastened to the upper end of the feather, and fitting round this ring is an index ring supplied with a pointer, which may be set and fixed at any given dial division by a knurled set screw. A weight suspended on the inside of the column counterbalances the knee and the table. The table is 8 x 14 in. and has a vertical travel on the guides of 12 in., which is lengthened ¾ in. by the micrometer adjustment, bringing it within 2 in. of the spindle center. Although 7-in. wheels are regularly furnished and recommended, 9-in. wheels may be used.

The tool may also be used for buffing and polishing by lowering the knee and protecting the table from dust and dirt with a suitable cover. For holding pieces too small or irregular to be slid on the table a vise is furnished which holds work up to 2 in. wide. The wheel spindle is of steel and runs in reamed cast iron bearings at a speed of 3000 rev. per min.

The principal dimensions of the tool are as follows: Hight to spindle center, 40 in.; distance between the wheels, 15 in.; spindle bearings, 1 1-16 x 3½ in.; pulley, 3¼ x 2⅛ in.; floor space, 18 x 24 in.; net weight, 300 lb.

The Exposition of Safety Devices.

The opening exercises of the Exposition of Safety Devices and Industrial Hygiene were held on Saturday afternoon, April 11, in the McGraw Building, 239 West Thirty-ninth street, New York, preliminary to a private view of the exposition. It was thrown open to the public on Monday, April 13, and will continue for six weeks.

Dr. W. H. Tolman, the director, spoke on the scope and object of the exposition, while Walter C. Kerr of Westinghouse, Church, Kerr & Co., pointed out the achievements and aims of "The Modern Engineer." Prof. F. R. Hutton, who has taken a keen interest in the exposition, expounded the moral aspects of the duties of the engineer, and Prof. Charles G. Lucke, the head of the department of mechanical engineering of Columbia University, presented a keen analysis of the relations of employers and employees in the mechanical industries. Dr. Josiah Strong, president of the American Institute of Social Service, made an impassioned address, in which he compared the casualties in the great wars and battles with the annual sacrifice of life and limb in conducting modern industries and transportation. He pointed out how much greater in number and in mortality are the accidents in this country than they are in European industrial lands. T. C. Martin, editor of the *Electrical World*, who was to speak, was unable to be present. The chairman of the meeting, C. Kirchhoff, stated, as illustrating how the modern large consolidations are able to take up effectively work which smaller plants must neglect, that the United States Steel Corporation has recently appointed a special committee, whose duties are to study safety devices and prepare the way for their introduction into all the plants of the subsidiary companies.

The installation of all the exhibits is not quite completed, so that there are still gaps in the show, which occupies the fifth floor of the McGraw Building, 239 West Thirty-ninth street, New York.

The Mexican Customs Tariff.

There is a possibility that the tariff rates upon certain classes of merchandise imported into Mexico will be increased at the coming session of the Mexican Congress. A movement is on foot to obtain such an increase among a number of native manufacturers who find themselves unable to compete with foreign makers of goods of a like character to that which they turn out. The iron and steel schedules may be revised, although no actual move has yet been made beyond the presentation of petitions to the Minister of Finance urging action in the matter. The present status of the agitation is reflected in the press of the capital, one of the leading journals saying:

> While individual petitions have been received at the Finance Department from manufacturers asking that a protective tariff be passed for the protection of goods manufactured in this country, the concerted action which was expected has not yet been taken, or at least has not reached the department in question. The individual applications are now under consideration by the officers of the Finance Department, and their conclusions will be reached in time to submit to Congress in April any suggestions which Minister Limantour may see fit to make. Action can only be taken by Congress, the authority of the Finance Minister being restricted to submitting the matter to that body.
>
> In the event of the manufacturers hoping to obtain wholesale concessions from the Government during the session of the coming Congress, it will be necessary for them to take immediate action, as the matter will have to be studied by the Finance Department and the necessary bills prepared before the opening of Congress. If action is delayed beyond a fortnight the matter cannot be treated by this Congress, but must be held over until the next session.

There have been no changes in the Mexican tariff for three or four years.

The Bethlehem Steel Corporation.

The third annual report of the Bethlehem Steel Corporation makes the following presentation of the financial results of its business for the year ending December 31, 1907, as compared with the previous year:

Comparative Surplus Account.

	1907.	1906.
Net manufacturing profit	$2,569,252.33	$1,859,353.36
Less share of extraordinary losses on uncompleted ship contracts, &c.	.....	647,192.96
	$2,569,252.33	$1,212,160.40
Other income:		
Dividends and interest on investments, &c.	$39,543.87	$93,867.85
Miscellaneous, rents on properties, &c.	30,161.10	58,147.13
	$69,704.97	$152,014.98
Total income	$2,638,957.30	$1,364,175.38
Interest and other charges:		
Interest on notes and advances	$112,330.28	$44,122.26
Interest on bonds & notes of subsidiary companies:		
Bethlehem Iron Company first mortgage bonds, retired	5,629.16	67,550.00
Bethlehem Steel Company purchase money bonds	447,675.00	444,480.00
Bethlehem Steel Company first extension mortgage bonds	304,829.53	45,273.74
Bethlehem Steel Company gold notes	50,746.09	.....
	$921,210.06	$601,426.00
	$1,717,747.24	$762,749.38
Excess of book value over amounts realized on sale of investments in subsidiary companies	98,958.50	.....
Net income for year	$1,618,788.74	$762,749.38
Surplus at close of previous year	593,421.30	1,843,619.32
Totals	$2,212,210.04	$2,606,368.70
Extraordinary losses and reserves (not considered properly chargeable against operations of given year):		
Loss by earthquake and fire at Union Iron Works, San Francisco	.....	$118,401.09
Loss by fire at Bethlehem Steel Company	.....	60,000.00
Share (proportional to work remaining to be performed January 1, 1905) of the loss in excess of provision in 1905 on Government cruisers contracted for by the United States Shipbuilding Company	.....	439,092.64
Balance of estimated loss on uncompleted ship contracts taken since the formation of Bethlehem Steel Corporation, January 1, 1905, after charging against net income for the year the proportion applicable to 1906	.....	500,973.67
	.....	$1,118,467.40
	$2,212,210.04	$1,487,901.30
Dividends paid during year on preferred stock	111,810.00	894,480.00
Surplus at close of year	$2,100,400.04	$593,421.30

Following is the consolidated balance sheet as of December 31, 1907:

Assets.

Property account January 1, 1907	$37,857,260.93	
Additions during year	6,593,620.08	
		$44,450,881.01
Inventories:		
Raw materials and supplies	$3,620,864.44	
Worked materials and contracts in progress, less bills rendered on account and reserve for probable losses	3,079,147.12	
Total	$6,700,011.56	
Accounts and notes receivable	3,486,381.75	
Miscellaneous investments	337,992.00	
Proceeds due on disposal of 6 per cent. gold notes on deposit under an agreement of sale	322,217.79	
Cash in banks for coupons payable	94,170.00	
Cash in special deposit and accrued interest thereon	202,968.63	
Cash in banks and on hand	735,520.63	
		11,879,262.36
Deferred charges to operations:		
Including discount on realization of Bethlehem Steel Company bonds and 6 per cent. gold notes and expense of issue		1,953,835.18
Total		$58,283,978.55

Liabilities.

Noncumulative preferred stock	$15,000,000.00	
Less 920 shares in treasury	92,000.00	
		$14,908,000.00
Common stock	$15,000,000.00	
Less 1380 shares in treasury	138,000.00	
		$14,862,000.00
		$29,770,000.00
Funded debt of subsidiary companies:		
Bethlehem Steel Company purchase money mortgage 6 per cent. gold bonds, maturing August 1, 1998	$7,500,000.00	
Less in treasury	21,000.00	
	$7,479,000.00	
First extension mortgage 5 per cent. gold bonds, maturing January 1, 1926	12,000,000.00	
Six per cent. gold notes, in three series, maturing July 1, 1910-1911-1912	$2,500,000.00	
Less in treasury	613,000.00	
	1,887,000.00	
		21,366,000.00
		$51,136,000.00
Current liabilities:		
Notes payable	$2,362,706.52	
Accounts payable, including payrolls and accrued liabilities	1,912,697.22	
Bond interest accrued	75,000.00	
Coupons payable	94,170.00	
		4,444,573.74
Reserves:		
For depreciation	$400,000.00	
For relining furnaces, &c.	164,085.91	
For contingencies	38,918.86	
		603,004.77
Surplus		2,100,400.04
Total		$58,283,978.55

From the accompanying statement by C. M. Schwab, president and chairman of the board, the following extracts are taken:

The total estimated value of orders booked by the corporation during the year aggregated $15,615,018.69, with an estimated value of unfilled orders on hand December 31, 1907, of $8,425,736.88. The number of employees December 31, 1907, was 9783, as compared with 13,423 December 31, 1906, 13,354 December 31, 1905, and 9461 December 31, 1904.

Bethlehem Steel Company.

During the year two of the new mills referred to in previous reports were completed, together with the open hearth furnaces and the boiler, pumping and electrical plants, railroads, &c., necessary for their operation. The first rail was rolled on the new rail mill September 3, 1907, and to December 31, 1907, there had been produced on this mill 33,754 tons of open hearth steel rails. The first beam was rolled on the special structural mill January 9, 1908, and this mill is now operating successfully. These mills began operations with an unusual absence of the difficulties customarily encountered on starting up a new plant, and their performance has been highly satisfactory. The 28-in. standard structural mill is now being completed, and is expected to be ready to begin rolling about July 1. The improvements on the old plant contemplated at the time of the first extension mortgage bond issue being also practically completed, the following statement is presented of the expenditures to December 31, 1907, on the additions and improvements for which this issue was created:

Original plant:	
Reimbursement as provided under the mortgage for expenditures during the latter part of 1905 on original plant	$1,000,000.00
Expenditures during 1906-07	3,638,778.12
Total	$4,638,778.12
New plant:	
Expenditures to December 31, 1907	8,322,215.08
Total expenditures	$12,960,993.20

The items on which these expenditures were made are as follows:

NEW PLANT.

This expenditure covers the purchase of about 250 acres of land, and the erection of a complete plant for the manufacture of structural material and rails, comprising 10 60-ton open hearth furnaces; a 46-in. blooming mill, 48-in. intermediate mill and 48-in. finishing mill for the manufacture of special structural shapes; a 40-in.

blooming mill, serving a 28-in. standard structural mill and a 28-in. rail mill; structural finishing shop; heating furnaces; storage yards; shipping yards; electric light and power plant; water pumping station; locomotives and cars; scrap breaking plant and complete equipment.

ORIGINAL PLANT.

Blast Furnace Department.—Additional blast furnace with hot blast stoves; four additional hot blast stoves for existing furnaces; increasing hight of existing hot blast stoves; new raw material storage yard, including car dumper, storage crane and complete equipment, with trestle and stock bins to serve all furnaces; three new blowing engines; 8000-hp. boiler plant; new iron and cinder ladle cars and an additional pig casting machine.

Open Hearth Plant No. 1.—Seventy-five ton electric crane, crane runway.

Steel Foundry.—Building for cleaning castings, with necessary overhead cranes and machines; new open hearth furnace; four additional core ovens; additional annealing furnaces; new cranes and crane runways, and general extension to foundry and equipment.

Iron Foundry.—Additional buildings, cranes and crane runways and equipment for the manufacture of tunnel segments; additional pattern sheds and general equipment.

Brass Foundry.—The installation of a brass foundry department for the manufacture of brass, bronze and special alloy castings for finished machinery, gun works, &c.

Crucible Steel Department.—Entirely new department, comprising one 5-ton open hearth furnace, two 30-pot crucible furnaces, and forging plant with equipment.

Rolling Mills.—Eight puddle furnaces; additional shear; additional boilers at puddle and heating furnaces; cold saws for existing 12-in. and 22-in. mills; new 12-in. staybolt fill, with entirely new equipment; new 8-in. mill, with entirely new equipment for rolling tool steel; new crane and runway to serve all mills.

Drop Forge Department.—Entirely new plant and equipment for the manufacture of automobile and miscellaneous drop forgings.

Projectile Department.—Entirely new plant and equipment for the manufacture of projectiles.

Shops.—New three-story machine shop (No. 6), with machinery and equipment; additional machine tools for machine shops Nos. 2, 3 and 4; additional equipment for smith shops; new carpenter and pattern shop with new equipment; additional boiler and structural shop with new equipment.

General.—Six thousand horsepower boiler plant with steam lines to new department; electric light and power station; additional water main for fire protection; 25 steel dump cars; 50 broad gauge steel cars, 1 broad and 1 narrow gauge locomotive; broad gauge locomotive cranes; new scrap drop; 65 additional workman houses; new general office building.

The wisdom of the step taken in the erection of this new plant, in order to offset the anticipated decrease of Government orders, as pointed out in our last report, has been fully justified, as is shown by a comparison of the total work on hand for the Government at the close of the last three years, as follows:

December 31, 1905	$4,455,469.83
December 31, 1906	4,056,061.81
December 31, 1907	2,635,056.24

While the new plant, as originally contemplated in design, has been practically completed, it will become desirable to make still further expenditures to attain the full efficiency and economy for the plant, although these expenditures will not involve any very great outlay and can be undertaken as conditions warrant.

While the effect of the recent financial depression has been felt considerably in the past few months, and is reflected in the diminished orders booked for miscellaneous work, the directors believe that the increased earning power of the new mills will, in a large measure, offset the natural decrease in the earnings from the old plant.

ORE MINES.

The mines of the Juragua Iron Company, a subsidiary company to the Bethlehem Steel Company, have been in continuous operation during the year, producing 181,063 tons of Bessemer ore, all of which has been shipped to the Bethlehem Steel Company. Development work, which has been carried on for some time, shows constantly increasing tonnages of ore proved up, and the mines are now shipping about 30,000 tons of ore per month, which will be gradually increased with the installation of new equipment and the opening of further ore bodies. The ownership of these iron ore mines constitutes a most valuable asset to the Bethlehem Steel Company, assuring as it does an independent source of supply for a large proportion of our ore requirements at a cost very much below that at which a similar quality of ore could be purchased in the open market. The further development of this property and the contemplated acquisition of new properties will place the company in a practically independent position as to its ore supply.

Union Iron Works Company.

This company has completed six of the seven ships, losses on which were provided for in the report of 1906, the seventh being practically completed and to be delivered in April or May, 1908. These ships have been completed at somewhat less loss than that anticipated and provided for last year. The results of the operation of this plant for the year have been very gratifying, resulting in a considerable profit realized, principally on repair work.

Samuel L. Moore & Sons Corporation.

The Eastern Shipbuilding Corporation has been sold, and, in order to provide a simpler and more economical organization, the Crescent and Carteret plants have been consolidated with the Samuel L. Moore & Sons Corporation. This plant has made progress in the development of special lines of machinery, and it is expected will show a profit from these operations during the current year.

Harlan & Hollingsworth Corporation.

While the effects of the recent depression have been felt at all of the Bethlehem Corporation's plants, they have been particularly noticeable in the case of the Harlan & Hollingsworth Corporation. Up to the last few months the operations at this plant were very successful, and while it closed the year with a satisfactory profit, the figure was reduced by the losses due to the comparative idleness of the plant during the latter part of the year.

Institute of Metals.

The adjourned meeting of copper and brass manufacturers, engineers and others held at the Midland Hotel, Manchester, England, March 10, decided to form an organization under the name of Institute of Metals. References have several times been made to the expectation that the proposed organization would adopt the name of Copper and Brass Institute. It was decided, however, that the name first mentioned above is more suitable for the designation of the society, as the object is to cover all metals except iron and steel. It is the intention of those who are prominent in the movement to hold semi-annual meetings. Practical and scientific subjects relating to the manufacture, working up and use of the nonferrous metals will be discussed, and it is probable that twice a year a volume will be published of abstracts of papers and books on metallurgical subjects which will make a comprehensive bibliography of work in these lines not only in England but in other countries. It is the expectation of those who have attended the preliminary meetings that the membership will be as world wide as the membership of the Iron and Steel Institute, on whose lines it will be formed. An effort is now being made to interest Americans in the objects of the new institute. William H. Johnson, managing director of Richard Johnson, Clapham & Morris, Ltd., Manchester, England, has undertaken to act as secretary of the society during the indisposition of Professor Carpenter, who has been selected for this position. A special meeting is to be held in London at the Institute of Mechanical Engineers, Westminster, June 10, at which Mr. Johnson hopes to be able to submit the names of as many American supporters of the society as possible.

American Standard Feed Water Heater.

The American Standard feed water heater shown in Fig. 1 is the improved type B of its builder, the Whitlock Coil Pipe Company, Hartford, Conn. It is designed to meet conditions as they exist with large units of power, and is especially suitable for central station work and for other large installations. It is regularly built in sizes of 1500 hp. or greater. The largest to date is one of 8000 hp., now in process of construction for the Edison Electric Illuminating Company, Boston, Mass.

The special feature of novelty in this new heater design is the manner of uniting the several coils into a common inlet and a common outlet for connecting to the external water piping as indicated in Figs. 2 and 3. In the older styles of coil heater this was accomplished by manifold fittings of cast bronze, which were located within the shell, and to which the coil ends were solidly brazed, one fitting serving for the inlet and one for the outlet. These manifold fittings were connected through the side of the shell to the external water piping. This is an excellent construction for heaters of relatively small size, but for the larger units the new type B design offers many advantages, both from the structural and from the operative standpoints.

The details of the new header are shown in Fig. 4. The feed water inlet and outlet consist of a patented form of external tube sheet header riveted to the side of the shell. The coil ends are turned outward and pass through holes in the header bottom, or tube sheet, into which they are securely expanded. The header is provided with an easily removable cover plate opposite the tube ends. The feed pipe connections may be made to either end of the headers, the other ends being blank flanged.

From the structural standpoint this design has the following advantages. Each coil is made up as a single unit and is placed in the shell by itself, the outside coil first, then the next coil, or sets of coils, and so on down to the smallest. This method of assembling, which lends itself readily to the new design, facilitates the building of large heaters, where it would be extremely difficult to handle the nest of coils as a whole. Not only does the new construction make it possible to build larger heaters,



Fig. 1.—The Type B American Standard Feed Water Heater Made by the Whitlock Coil Pipe Company, Hartford, Conn.

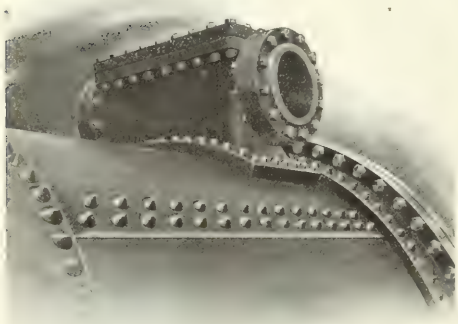


Fig. 2.—An External View of the Type B Water Connection.

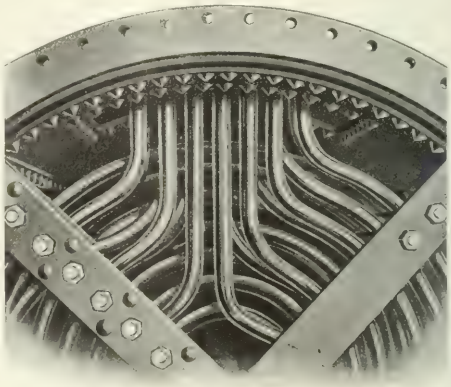


Fig. 3.—An End View of the Heater with the Head Removed.

but by providing a flexible end connection instead of a rigid casting it adds to the life of the coil, reducing the danger of trouble from vibration, water hammer or other causes. The company has never experienced any trouble

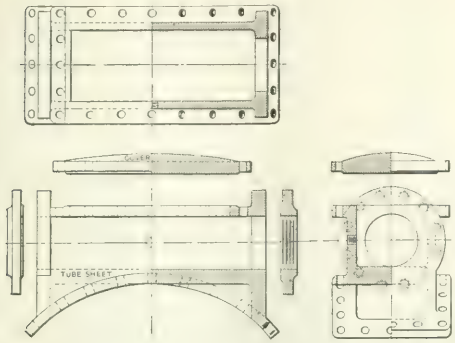


Fig. 4.—Details of the Header for the Water Connections.

with a heater of this construction and considers that mechanically it is the best ever devised for coil heaters of any size or capacity, although especially adapted to large ones.

From the operative standpoint the new design also has advantages as compared with the older type, especially in large heaters, in that it allows access directly to the end of each tube for inspecting or for plugging a defective tube in case of accident. It will be seen in the illustrations that this is accomplished by removing a cast iron cover plate from the tube header, thus opening the water chamber and exposing the ends of the tubes. It might happen that one of the tubes of a heater having 20 or 30 tubes would spring a leak at a time when it would be impossible to shut down long enough to make repairs, and in such a contingency the advantage of being able to plug the defective tube at both ends so as to go on operating the heater with the remaining tubes is very important. The only necessary preliminary to the task would be to remove the cover plates and by-pass the heater. The plugged tube may be left permanently out of use, as the loss of one tube out of a large number would effect the efficiency of the heater very little.

The shells of the heater are regularly made of steel plates riveted to cast iron flange rings at the ends. Cast iron shells are furnished if specified. The heads or covers are of cast iron, of heavy dished pattern. The coils are of seamless drawn copper tube, brazed into continuous lengths from inlet to outlet. Each tube is designed of proper length relative to the diameter of its coil, so as to do its share of the heating and to distribute the work uniformly. The coils are held in position by being securely clamped at least twice in every convolution to wrought iron through braces, which are secured at the ends to cross bars in the ends of the shell. The spiral form of the coils relieves them from excessive strains due to expansion and contraction with temperature changes.

Youngstown Industrial Cars.

The question of intra-factory handling of materials is always of great importance. In laying out a new plant attention needs to be given to the economic arrangement of the various departments to minimize the cost of routing the product through the factory. Likewise, old plants when added to, to meet increasing demands, must consider this problem of factory transportation. The usual means for transporting may be roughly divided into three classes: cars, cranes and conveyors, and of each there is a great variety of types according to the service required of them. Particularly is this true of the first, a line of which is now built by the Youngstown Car Mfg. Company, Youngstown, O. Of the more common type, platform cars and dump cars, examples are herewith illustrated. A more or less universal form of factory car. It is built in capacities of from 1 to 15 or 20 tons, and for all gauges of track, from 18 in. to standard gauge, but generally the 24 in. and 30 in. gauges are preferred. For lighter work a car, Fig. 1, of somewhat similar construction is built, which is provided with a flexible wheel base allowing it to be operated around curves of very short radius. Fig. 2 illustrates a rotary dump car which dumps in any direction and is convenient for handling loose materials in loads up to 1 cubic yard capacity. Many other standard styles of dump cars are built by the Youngstown Car Mfg. Company, and it is also prepared to furnish special cars for almost any conditions.

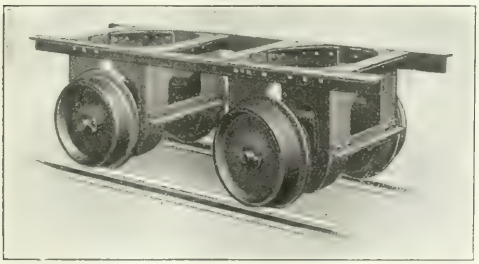


Fig. 1.—A Platform Car.

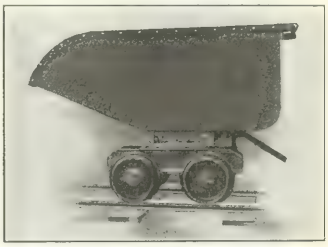


Fig. 2. A Rotary Dump Car.

Industrial Cars Built by the Youngstown Car Mfg. Company, Youngstown, Ohio.

The Ideal Concrete Machinery Company, South Bend, Ind., which moved to that city about three years ago from Auburn, Ind., has outgrown its present quarters. In about two weeks it will occupy the three-story brick building of the old Singer plant. In addition to the 18,000 sq. ft. of floor space available in the new location, arrangements have been made whereby more room can be secured when needed. Pending removal the new quarters are being remodeled with special reference to the requirements of the manufacturing, shipping and office departments. Beginning with the small local demand, the company has enlarged its operations until its business now extends not only throughout the United States, but includes an important export trade. It recently secured an order for concrete machinery from Berlin, Germany, and another, amounting to $150,000, will go to Austri-Hungary. Besides these it has in course of execution orders for concrete block machines for shipment to Brazil, China and other foreign points.

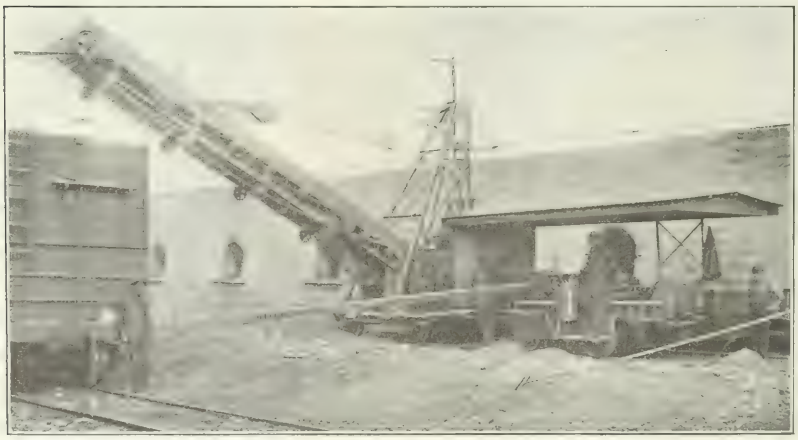
The movement to mark up railroad freight rates has begun, as announcement is made that the New York, New Haven & Hartford, Central Vermont and Maine Central have advanced rates on certain classes of freight, to take effect May 1 and May 10, and the leading Eastern lines are preparing to make higher rates for hauling grain to the seaboard.

The Covington Coke Extractor.

As an interesting application of electric power the *General Electric Review* for February describes a coke drawing and loading machine built by the Covington Machine Company, Covington, Va. The illustrations are machines of later type than those shown in *The Iron Age* August 10, 1905,* so that permission has been obtained to reproduce them here. The views are of an installation at the Wynn plant of the H. C. Frick Coke Company, Pittsburgh, Pa. The manufacture of coke in beehive ovens is familiar to readers of this journal, and the operation of the machine is essentially the same as that described in the issue referred to, so that detailed descriptions of these are unnecessary at this time. The purpose will be rather to treat particularly of the electrical features and the more recent improvements in the machine.



A Covington Coke Extractor at the Wynn Plant of the H. C. Frick Coke Company, Pittsburgh, Pa.



An Extractor Serving a Facing Line of Ovens, with the Positions of the Conveyor and Extractor Cars Reversed

Electric drive, on account of its flexibility of application and control, is important to the successful operation of machines for drawing coke. This will be better understood without referring to the previous article by briefly reviewing the principal parts of the Covington extractor. It consists essentially of a ram carrying a wedge, thin at the front and high at the back, which rests on the oven floor. Pressure on the ram forces this wedge under the coke, detaching it and causing it to fall back of the ram head, which withdraws it, after the manner of a rake, on its return stroke. The reciprocation of the ram is effected through the ram bar, which has teeth on the side and is driven by a steel pinion mounted on a vertical shaft. The motor is a 20-hp. inclosed series type, and is controlled by a controller having five steps forward and reverse. To sweep the ram through all parts of the interior of the oven the ram bar is pivoted, so that it may be swung to any angular position by a hand wheel. Recently a small power device has been added to machines of this type for turning the carriage, which makes it more easily handled and requires one man less to operate the machine.

The extractor travels on rails parallel to the front face of the line of ovens, and the ram or extractor proper is mounted on a car separate from but connected by a draw bar to a second car which carries the conveyor. As the coke is withdrawn from the ovens it is dropped into a trough parallel with the oven wall, and is moved by a chain and flight conveyor to a point where it is taken up by a transverse conveyor. The latter raises it to a point over the car to be loaded and drops it into a trap. At regular intervals of accumulation the trap discharges the coke into the car. This method has the advantage of reducing the amount of breakage. The conveyor system is driven by a 15-hp. slow speed compound wound motor. To make the motors proof against injury from the dry

* "A Coke Drawing Machine for Beehive Ovens," by George T. Wicks, Covington, Va., a paper read at the Washington meeting of the American Institute of Mining Engineers, May, 1905.

coke dust, which is always in the air in the vicinity of these machines, both motors are entirely inclosed. Between operations of withdrawing coke the two cars are propelled from oven to oven by the same motor that operates the extractor ram. At such times the motor is disconnected from the latter and thrown into engagement with the axles of the truck. The entire electrical equipment of these machines is supplied by the General Electric Company, Schenectady, N. Y.

While it is possible to reach any part of the oven with the extractor, there will always remain a small quantity of coke which it is expedient to remove by hand. This is done by one man following the machine, who cleans out this remnant and also puts the oven in shape to receive the new charge. The machine as made to-day has an extension on the conveyor which runs along in front of the oven, so that while the machine is drawing coke from the second oven the small amount of coke remaining in the preceding oven may be pulled directly on the conveyor.

The advantages of a mechanical coke extractor are those of any machine method over hand operation—namely, a reduction in labor required and a saving in time. For example, it is stated that the average cost of hand drawing is about $1.17 per oven, as compared to a total of not more than 52½ cents per oven for machine work. Some 35 to 50 ovens may be drawn in one day by a machine, whereas with hand drawing from 3 to 4 hr. is consumed in the drawing of each oven. The machine as ordinarily operated requires four men, who take the places of from 15 to 20 men where the hand method is in use. An incidental advantage of the greater rapidity of machine drawing is that the ovens are open for a shorter time and hence do not become so cool between the times of discharging and recharging. A larger amount of residual heat therefore remains in the oven to ignite the new charge of coal, and each charge has a few more hours in which to produce a more complete separation of the fixed carbon and volatile matter. The machines also do away with the need of elevating the ovens above the level of the tops of the railroad cars in which the coke is to be loaded, hence a saving of practically half the cost of the construction of a bank of ovens is effected.

Eighty-five students and six professors of the engineering department of the Wisconsin State University visited the plants of the Allis-Chalmers Company at Milwaukee and West Allis on April 10, and left that evening for Niagara Falls, where they separated into two parties, the mechanical engineers going to Pittsburgh and the electrical engineers to Schenectady.

The Conrad & Muller Gas Regulator.

A new gas regulating valve, known as the Conrad & Muller gas regulator and for which patents are now pending, is being made by the Reinforced Brazing & Machine Company, 2525 Liberty avenue, Pittsburgh, Pa. Tests have proved, it is claimed that by the use of this regulator a saving of from 10 to 15 per cent. in gas consumed can be effected through the accurate regulation of its flow. The valve is simple in its operation, and being set at predetermined points allows only the required amount of gas to pass. It can be set at the point of the greatest consumption of a plant, and if for any reason less gas should be required the valve will adjust itself automatically to the requirements.

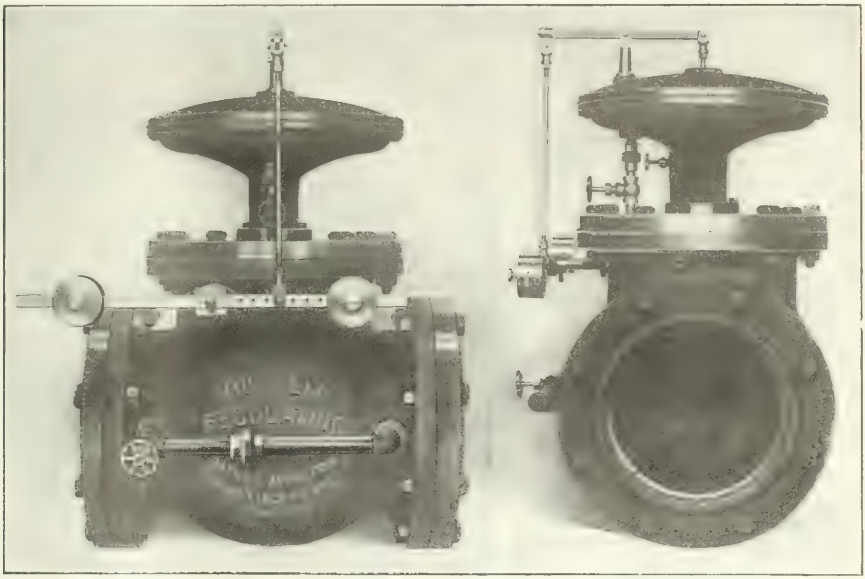


Fig. 1.—Side View. Fig. 2.—End View.

The Conrad & Muller Gas Regulator Made by the Reinforced Brazing & Machine Company, Pittsburgh, Pa.

Fig. 1 is a side view of the valve, showing the counterbalance weights and connecting rod to the diaphragm, which constitute the automatic features. At the base of this diaphragm, which is more clearly shown in Fig. 2, is a dashpot, which is necessary on large valves when used on engine lines where there is a great suction, so that the rate of flow will not fluctuate unduly. To this dashpot is attached a needle valve to regulate its dampening influence on the movement of the diaphragm. Should the regulator be set at a given point and for any reason the pressure increase, the excess gas will pass upward through the by-pass leading from the low pressure side to the base of the diaphragm. This causes the diaphragm to rise and, being connected by rods to the arm with the counterbalanced weights, forces down the valve and brings it back to the starting point. These movements take place immediately on any change in the consumption of the gas and cause the valve to operate with precision within the minimum and maximum points. For safety the valve has a by-pass running from the high to the low pressure side that admits sufficient gas for pilot lights when the valve is closed.

The valves are made of cast iron, with steel and brass fittings, in all sizes and have flange connections, and are constructed to operate on vertical or horizontal gas lines.

The English Tin Mines.

With the exception of husbandry, there is no British industry that is older than tin mining. In the earlier centuries none had more to do with the building up of Britain's commercial importance, and none has a more interesting political, economic and social history. All these phases of the famous industry of Devon and Cornwall—its ancient history, its long and unbroken direct connection with the crown, its place in the commerce of medieval England, and its economic and social aspects—are treated in scholarly detail and in a lucid and authoritative style by Dr. George Randall Lewis in his monograph on "The Stannaries: A Study of the English Tin Miner."* Months, if not years, of thorough, patient and well directed research have gone into the production of the book, which cannot fail at once to take its place as the standard history of tin mining in England. And the subject was worthy of the labor that Dr. Lewis has bestowed upon it, and of the conscientious care that has gone to the admirable marshalling of the data on which his comprehensive history of the industry is based.

Political Aspect of the Industry.

In enumerating the aspects of the industry treated by Dr. Lewis, the political aspect has been placed first, because out of the connection of the industry with the crown were evolved other characteristics—characteristics which have marked the industry for century after century, and which exist to-day. The stannary administration, which has always been an outstanding feature of the industry, dates back in the form in which it is now known to English political and economic history, only to the closing years of the twelfth century.

Before that time the crown was directly connected with the industry; but the sole connection between the Devon and Cornish mines and the crown seems to have been the collection of the annual tax of the stannaries, and an occasional use of the royal right of pre-emption—the right to purchase the product of the mines. The terms on which this right was exercised varied from time to time, but a typical instance was the exercise of the right by Gilbert Brokehouse in the reign of Edward VI. Brokehouse paid an annual rent of 3000 marks to the king, and in consideration of this payment he had the right to purchase at the ordinary market rate all tin brought into the stannary towns for stampage. The important condition of Brokehouse's covenant was that for three days he must be ready to sell tin to all comers at a profit of a half penny on each pound. At the end of three days he might sell or transport tin as he pleased.

A Royal Metal.

Tin from time immemorial has been a royal metal in England. It has ranked with gold and silver. Unlike coal and iron ore, the right to mine tin has never been inherent in the owner of the soil. The crown has always had a direct interest in the yield of tin. Out of this interest arose many of the peculiar privileges of the tin miners; for it was continuously to the advantage of the crown to have as many men as possible engaged in tin mining and smelting. There were times when men could be impressed for this work, much as until in the past century men could be impressed in England for service with the royal navy.

Before the crown appointed wardens to oversee the industry—an appointment first made by Richard I in 1198—there had grown up a customary law not only for tin miners but also for smelters and dealers in tin. The most important of these customary laws was that governing bounding or freely searching for tin whenever it might be suspected, regardless of the rights of the owner of the soil. In the chartered towns of medieval England there was a customary law under which a villein if he could maintain himself within the municipal area for a year and a day was thereafter free of his lord. An even shorter cut to freedom existed in connection with the tin mines of Devon and Cornwall; for if a villein succeeded in finding tin, laid out a claim, and registered its boundaries in the stannary courts his lord thereafter lost all title to his services.

Extraordinary Powers Given a Royal Representative.

De Wrotham, who was the first warden of the stannaries, was invested with extraordinary powers by Richard I. He had legislative as well as executive powers, and issued ordinances at pleasure for the regulation of mines and miners which had all but the force of law. As yet the famous stannary courts—the courts in which all cases affecting the tin miners and most of the legal issues affecting miners were tried—were nonexistent. But Wrotham summoned to his assistance juries drawn from the miners of the two-shire moots of Devon and Cornwall, and with their aid in the collection of the old law rectified the weights used for the official measurement of tin blocks; appointed collectors, controllers and treasurers, and promulgated a stringent code intended to bring all tin under the view of the royal officials. Three years later, 1201, King John issued the first charter of the stannaries. It confirmed the old rights of free mining, which had been enjoyed under customary law, and freed the miners from the jurisdiction of magistrate or coroner or any other king's officer save the warden of the stannaries, or his deputy.

The Stannary Courts.

It was under this charter that the stannary courts came into existence—one for each of the eight judicial divisions of the mining area—and also the tinners' parliaments. There was at one time a tinners' parliament for each county. In the sixteenth century the two parliaments were elected on different franchises. Members of the Cornish parliament were nominated by the mayor and council of the stannary towns of Lostwithiel, Truro, Launceston and Helston, much as municipal councils before the act of 1832 elected members to the House of Commons at Westminster.

In Devon, on the other hand, the franchise for the tinners' parliament was democratic, as it was for the election of members of parliament for populous centers, such as Northampton and Southwark. There were four stannary towns in Devon—Chagford, Tavistock, Ashburton and Plympton; and from each of these places 24 members of the Devon tinners' parliament were elected. All classes of tinners, including bounders, owners of tin work, adventurers and laborers, had a vote at these elections; and the 96 representatives met at Crockerntorro on the open hillside, for the transaction of business. Procedure was much on the lines of procedure in the House of Commons at that time. There was what corresponded to the speech from the throne—a speech from the warden in which he outlined the business that was to come before parliament. Next a speaker was elected who had to be approved by the warden. A clerk and a sergeant-at-arms were afterward chosen, and then the tinners' parliament was organized for business.

In general, the business of such a parliament was "to consult, inquire and take into deliberation and to resolve upon such orders 'as in the judgment of the parliament' shall be thought expedient for the redressing or amending of any inconveniences or abuses within the stannaries, and to reduce things in question and doubtful touching liberties and customs to a certainty." The tinners' parliaments continued to be convened until the reign of George II. The last was held in 1752; but, as Dr. Lewis shows, some of the ordinances of the parliament, such, for instance, as a very early one that tin miners must not also be smelters of tin, are materially affecting the organization of the tin industry in this first decade of the twentieth century.

Economic and Financial Aspects.

The organization of the industry in its economic and financial aspects is traced out by Dr. Lewis with much interesting detail. Not a phase of any of these has escaped his attention and exposition. Stream work, open mining, and shaft mining, each in the order of its development, are treated by Dr. Lewis; as is the incoming of new equipment with the deeper mining and the expansion of the industry and its consequent organization on a capitalistic basis. The improvements in the methods of

*"The Stannaries: A Study of the English Tin Miner." By George Randall Lewis, Ph.D. Harvard Economic Studies. New York: Houghton, Mifflin & Co. Pp. xviii, 299.

smelting tin, and the changes in the methods of marketing it in England and Europe, are also fully described. So are the labor conditions, which have always been peculiar, and are peculiar to-day; for notwithstanding the fact that tin mining is a skilled industry, tin miners at the present time earn on an average little more than $5 a week—less than half the pay earned by coal miners in the Midland and Northern counties of England. When Dr. Lewis is writing of labor and social conditions in the stannaries, he has a vivid sureness of touch not unworthy of Green; and in these chapters of his monograph he has made a noteworthy addition to the social history of England.

Old Customs Persistent.

For nearly half a century—to be exact since 1862—it has been possible to organize mining companies under the limited liability companies law. But old customs and usages are so persistent in the English tin mining country that to-day most of the tin mining companies of Cornwall are still organized and worked on the cost book system—a system that is valid solely by virtue of stannary law and custom. Under this system two or more men secure the lease of a property. Next they induce some others to join them; and if the property seems promising these men will include a banker, a smelter, merchants handling iron, timber, candles and cordage, and possibly a dealer in new and second-hand machinery.

This loose organization, with no articles of association such as govern an English liability company, then registers under the cost book a company of perhaps 512 shares, and is ready for business. A purser is chosen from the group to take charge of the mine accounts, a mine captain is engaged and a call is made on each shareholder for £1 a share. A month later there is another meeting of the adventurers and perhaps another call of £1 a share, and so on until one of three developments is reached—the mine becomes self-supporting, it earns a profit, in which case a dividend is declared; or there comes a call for more capital to which one of the adventurers refuses to respond. Then, if the others refuse or are unable to take up the shares of the defaulting associate, the company is wound up, and the lease and the mine equipment are sold. If the proceeds of the sale are not sufficient to liquidate the liabilities the adventurers are called upon to contribute pro rata, and as long as there is one moneyed man among them the creditors are sure of recovering. This is a form of organization that has come down from old times.

In the same way there has survived the old custom under which one group of men mine the ore and another group engage in the business of smelting. With this survival there have persisted numerous perquisites to the smelter at the expense of the miner, all of which add largely to the profits of the smelter, so obviously and at times so unfairly that in any business not governed by medieval customs the whole system of dealing with the smelters would have been reorganized and put on a modern basis at least three-quarters of a century ago.

The bibliography which Dr. Lewis has furnished will be peculiarly useful to students interested in the general mining codes of England, Germany and other countries of Europe. A good bibliography invariably characterizes these Harvard economic studies, and Dr. Lewis', in its comprehensiveness, fully maintains the standard in this respect of other works in the series and also of those in the Harvard historical studies. E. P.

An important extension of hydro-electric power development is involved in the plans of the Nevada-California Power Company, whose general offices are at Denver, Colo., the generating plants being located at Bishop, Cal. The company has already installed at Bishop Creek generators of 6000 kw. capacity, and has let contracts for 5500 additional kilowatt generators, which are to be installed during the coming summer in a new tandem plant farther up the stream from the present generators. Contracts have also been let for 3000 ft. of 48-in. riveted steel pressure pipe under a head of 870 ft., and 2 miles of 52-in. wood stave pipe conduit line. In addition to this there is contemplated the expenditure of $150,000 on reservoirs. Contracts for all of the work have been let.

British Pig Iron Production in 1907.

Returns collected by the British Iron Trade Association show that the production of pig iron in the United Kingdom in 1907 was 9,923,856 gross tons, which compares with 10,149,388 tons in 1906, 9,592,737 tons in 1905 and 8,562,658 tons in 1904. The production of the year by districts and the corresponding figures for the three preceding years are shown in the following table:

District.	1907. Tons.	1906. Tons.	1905. Tons.	1904. Tons.
Scotland	1,403,447	1,451,068	1,378,391	1,339,740
Durham	1,100,501	940,741	1,030,709	981,197
Cleveland	2,433,567	2,639,964	2,507,715	2,234,345
West Cumberland	859,454	939,754	872,478	551,341
Lancashire	589,159	678,657	580,909	522,925
South Wales and Monmouth	911,160	883,660	886,686	779,625
Lincolnshire	410,756	422,311	366,717	321,454
Northamptonshire	282,480	282,110	231,175	223,932
Derbyshire	433,495	417,686	306,055	292,473
Notts and Leicestershire	292,505	296,520	335,162	310,838
South Staffordshire	431,241	424,876	415,792	373,196
North Staffordshire	305,670	296,550	258,651	246,037
South and West Yorkshire	332,530	335,853	289,667	263,415
Shropshire	50,264	52,055	47,782	47,597
North Wales, &c.	87,627	96,583	84,848	74,545
Totals	9,923,856	10,149,388	9,592,737	8,562,658

The production of the different kinds of pig iron in 1907 and the three preceding years is given below in gross tons:

	1907.	1906.	1905.	1904.
Forge and foundry	4,512,985	4,587,606	4,276,943	3,841,975
Bessemer	3,776,797	3,990,820	4,070,222	3,362,883
Basic	1,406,038	1,263,317	1,057,999	1,192,120
Spiegel, ferro, &c.	228,036	307,645	187,573	165,680
Totals	9,923,856	10,149,388	9,592,737	8,562,658

The Cleveland District leads in the production of forge and foundry iron with a total of 1,341,005 tons. Other large producers of these grades were Scotland with 645,240 tons, Durham with 541,032 tons and Derbyshire with 433,495 tons. In Bessemer or hematite iron South Wales leads with 821,373 tons, followed by West Cumberland, 771,156 tons; Scotland, 677,502 tons, and Cleveland, 541,681 tons. The Cleveland District is the largest producer of basic iron; with a total of 483,652 tons, and Lancashire is the largest producer of ferro and spiegel, with a total of 81,677 tons, followed by Cleveland with 67,229 tons and West Cumberland with 65,268 tons.

In the first half of 1907 the total production was 5,194,712 tons, and in the second half, 4,729,144 tons, or 465,568 tons less. The average number of furnaces in blast in 1907 was 366 out of a total in the United Kingdom of 507. The average production per furnace in blast last year was 27,096 tons, as compared with 27,598 tons in 1906. Records show that in 1839 with 377 furnaces in blast the average product was 3300 tons per furnace. In 1860, when 664 furnaces were in operation, the average increased to 8979 tons and in 1870 it had reached 19,000 tons a year.

The reduction of pig iron stocks was the feature of the pig iron market last year. In the Cleveland District the total on hand in public stores was 89,600 tons at the end of the year, as against 538,154 tons at the end of 1906 and 704,900 tons at the end of 1905. In the Cumberland District stocks were 36,242 tons, 102,050 tons and 77,567 tons at the end of 1907, 1906 and 1905, respectively. These figures for the Cumberland District include stocks in makers' hands, as do also the figures for Scotland, which were 96,043, 90,548 and 91,935 tons, respectively.

The Nova Scotia Steel & Coal Company has posted notice at its works at Sydney Mines that unless trade conditions improve it will on May 1 make a 10 per cent. reduction in the pay of all employees receiving over $1.50 per day. This will affect some 600 men in the blast furnace, open hearth and coking departments, but will not affect the collieries. The company has a large stock of steel ingots on hand, whereas orders for finished products from the mills at Trenton, N. S., have been very meager this spring.

New Pennsylvania Rail Sections.

The Specifications Adopted by the Company's Investigating Committee.

A statement was given in *The Iron Age* of February 13, 1908, page 526, concerning the investigations carried on by Pennsylvania Railroad officials for a number of months into the manufacture of steel rails and their behavior in service. Two important steel companies cooperated in the work of this committee, on which the Pennsylvania Railroad's representatives were the following:

Theo. N. Ely, chief of motive power, lines East and West, chairman.
A. C. Shand, chief engineer, lines East.
L. R. Zollinger, engineer maintenance of way, lines East.
A. W. Gibbs, general superintendent motive power, lines East.
C. B. Dudley, chemist, lines East.
T. H. Johnson, consulting engineer, lines West.
Robt. Trimble, chief engineer maintenance of way, lines West.
W. C. Cushing, chief engineer maintenance of way, lines West.
J. C. Bland, engineer of bridges, lines West.
D. F. Crawford, general superintendent motive power, lines West.

The object of the inquiry was to develop an improved steel rail, one that should reduce the expense of maintenance and provide increased resistance, in view of the growing requirements of road service. It was also the desire of the Pennsylvania Railroad to secure uniformity in the rail practice of the Lines East and the Lines West of Pittsburgh.

The rail sections developed by the committee's work are believed by the Pennsylvania Railroad to be a distinct improvement upon those it has heretofore used.

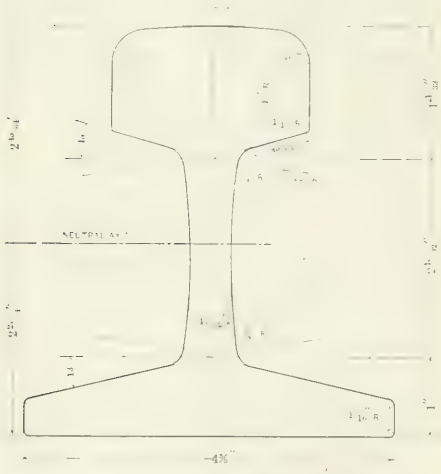


Fig. 1.—85-Lb. Rail Section of Pennsylvania Railroad.

Area of head	3.57 sq. in.	42.2 per cent.
Area of web	1.51 sq. in.	17.8 per cent.
Area of base	3.39 sq. in.	40.0 per cent.
Totals	8.47 sq. in.	100.0 per cent.
Moment of inertia		29.1
Section modulus, head		10.77
Section modulus, base		12.02
Ratio periphery head to area head		1.73
Ratio periphery web to area web		3.81
Ratio periphery base to area base		2.69
Ratio total periphery to total area		2.48

Details are given in connection with the accompanying Figs. 1 and 2. As a practical test of the committee's work the company placed last December an experimental order for 10,000 tons of rails—an unspecified part of its 1907 order—to be rolled according to the new sections and specifications. The experience with these orders has resulted in some slight changes in the specifications, but no change has been made in the sections as originally adopted. The Pennsylvania System has adopted as a standard for its 1908 orders the new sections and the specifications as revised February 4, 1908. These specifications and sections are now made public. It will be noticed that no differences in chemical content are provided for varying weights of rails; in fact, only 85-lb. and 100-lb. rails are contemplated in the specifications. The Bessemer carbons show a return to moderation, 0.55 per

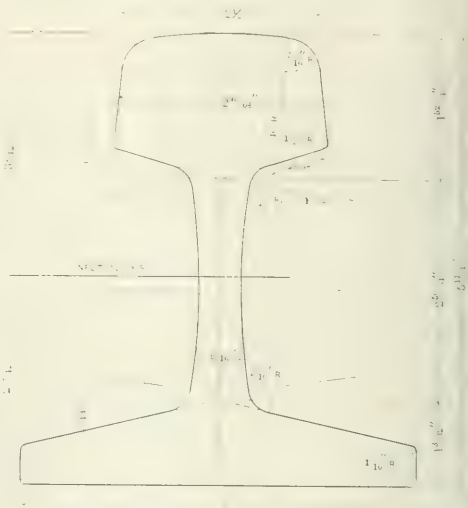


Fig. 2.—100-Lb. Rail Section of Pennsylvania Railroad.

Area of head	4.09 sq. in.	41.0 per cent.
Area of web	1.85 sq. in.	18.6 per cent.
Area of base	4.03 sq. in.	40.4 per cent.
Totals	9.97 sq. in.	100.0 per cent.
Moment of inertia		41.9
Section modulus, head		13.71
Section modulus, base		15.91
Ratio periphery head to area head		1.59
Ratio periphery web to area web		3.58
Ratio periphery base to area base		2.43
Ratio total periphery to total area		2.39

cent. being the maximum, whereas the Civil Engineers' proposed specification calls for 0.55 per cent. as a minimum, with a maximum of 0.65 per cent. There is no mention of discard, but a drop test for every heat is required, whereas the American Society for Testing Materials specification specifies a test for every fifth heat. The latter specification provides that the rail piece so tested shall be from the top of the ingot, whereas the Pennsylvania specification says that it may "from any position in the ingot." But as the selection is made by the inspector the presumption is that it would be from the top of the ingot. The requirements as to shrinkage allowances in the rails as they come to the hot saws are different in the Pennsylvania specification from those of any other specification now in effect or that has been under consideration in the past year. The new specification is as follows:

Pennsylvania Railroad System—Specifications for Steel Rails.

Chemical Composition.

1. The steel of which the rails are rolled shall conform to the following limits in chemical composition:

BESSEMER STEEL RAILS.

	Lower limit.	Desired composition.	Upper limit.
Carbon	0.45	0.50	0.55
Manganese	0.80	1.00	1.20
Silicon	0.05	0.12	0.20
Phosphorus	..	...	0.10

OPEN HEARTH STEEL RAILS.

Carbon	0.70	0.75	0.80
Silicon	0.05	0.12	0.20
Manganese	..	....	0.80
Phosphorus	..	...	0.03

Process of Manufacture.

2. Ingots shall be kept in a vertical position until ready to be rolled, or until the metal in the interior has had time to solidify.

3. No "bled" ingots shall be used. ("Bled ingot"—One from the center of which the liquid steel has been permitted to escape.)

4. There shall be sheared from the end of the bloom formed from the top of the ingot sufficient discard to insure sound rails. (All metal from the top of the ingot, whether cut from bloom or rail, is the top discard.)

5. In reheating, care shall be taken to avoid burning the steel, and under no circumstances shall a "cinder heat" be used. ("Cinder heat"—One in which the scale on the sides of the ingot becomes fluid.)

6. The number of passes and speed of train shall be so regulated that on leaving the rolls at the final pass the temperature of the rail will not exceed that which requires a shrinkage allowance at the hot saws, for a rail 33 ft. in length, of 6¼ in. for 85-lb. section, and 6½ in. for 100-lb. section. These allowances to be decreased at the rate of 0.01-in. for each second of time elapsed between the rail leaving the finishing rolls and being sawed. The bars shall not be held for the purpose of reducing their temperature, nor shall any artificial means of cooling them be used between the leading and finishing passes, nor after they leave the finishing pass.

Mechanical Requirements.

7. The name of the maker, the weight and type of the rail, and the month and year of manufacture shall be rolled in raised letters and figures on the side of the web, and the number of the heat shall be plainly stamped on each rail where it will not subsequently be covered by the splice bars. A letter shall be stamped on the web to indicate the portion of the ingot from which the rail was rolled.

8. The section of rail shall conform as accurately as possible to the templet furnished by the railroad company. A variation in hight of 1-64 in. less or 1-32 in. greater than the specified hight, and 1-16 in. in width of flange, will be permitted; but no variations shall be allowed in the dimensions affecting the fit of the splice bars.

9. The weight of the rails specified in the order shall be maintained as nearly as possible, after complying with the preceding paragraph. A variation of ½ of 1 per cent. from the calculated weight of section, as applied to an entire order, will be allowed.

10. The standard length of rails, at a temperature of 60 degrees F., shall be 33 ft. Ten per cent. of the entire order will be accepted in shorter lengths, varying as follows: 30 ft., 27½ ft. and 25 ft.; and all No. 1 rails less than 33 ft. long shall be painted green on ends. A variation of ¼ in. in length from that specified will be allowed.

11. The rails must be free from injurious mechanical defects and flaws; shall be sawed square at the ends, a variation of not more than 1-32 in. being allowed; and burrs shall be carefully removed.

12. The rails shall be smooth on the heads, straight in line and surface, and without any twists, waves or kinks; particular attention being given to having the ends without kinks or drop.

The hot straightening shall be carefully done, so that gagging under the cold presses will be reduced to a minimum. Any rail coming to the straightening presses showing any sharp kinks or greater camber than that indicated by a middle ordinate of 4 in. in 33 ft. will be at once marked as a No. 2 rail, and only accepted as such. The distance between the supports of rails in the straightening presses shall not be less than 42 in.

13. Circular holes for splice bars shall be drilled to conform accurately in every respect to the drawing and dimensions furnished by the railroad company, and must be free from burrs.

Tests and Inspection.

14. One drop test shall be made on a piece of rail not less than 4 ft. and not more than 6 ft. long, selected by the inspector from each heat of steel, from any position in the ingot.

The test piece shall be placed head upward on solid supports, 5 in. radius, 3 ft. between centers, and both 85-lb. and 100-lb. sections shall be subjected to an impact test from a weight of 2000 lb., falling 15 ft.

The deflection for No. 1 classification rails must not exceed that indicated by a middle ordinate of 2 in. in 3 ft. for 100-lb. section, and 2¼ in. for 85-lb. section.

Test pieces shall be tested to destruction.

The temperature of the test pieces shall be between 60 and 120 degrees F.

(*a*) If a test piece breaks without showing physical defect, all rails made from that heat shall be rejected absolutely.

(*b*) If, however, the test piece broken under test "*a*" shows physical defect, the top rail from each ingot of that heat shall be rejected; and

(*c*) A second test shall then be made of a test piece selected by the inspector. If this second test piece breaks, the remainder of the rails of the heat shall also be rejected. If this second piece does not break, the remainder of the rails of the heat will be accepted as either No. 1 or No. 2 classification, according as the deflection is less or more, respectively, than the prescribed limit.

(*d*) If the test piece, test "*a*," does not break, but when tested to destruction shows pipe, the top rail from each ingot shall be rejected. The remainder of the rails of the heat will be accepted as either No. 1 or No. 2 classification, according as the deflection is less or more, respectively, than the prescribed limit.

(*e*) If the test piece, test "*a*," does not break, and when tested to destruction does not show pipe, the rails of the heat will be accepted as either No. 1 or No. 2 classification, according as the deflection under test "*a*" is less or more, respectively, than the prescribed limit.

Note.—The drop test and the deflection requirements may be modified if considered advisable by the railroad company.

15. The drop-testing machine shall have a top of 2000 lb. weight, the striking face of which shall have a radius of not more than 5 in. The anvil block of the drop testing machine shall weigh at least 20,000 lb., and the supports shall be part of, or firmly secured to, the anvil. The foundations for the anvil block shall be such as will meet the approval of the railroad company.

16. No rails shall be accepted which contain any physical defects that impair their strength.

17. Rails improperly drilled, or straightened, or from which the burrs have not been properly removed, shall be rejected, but may be accepted after being properly finished.

18. No. 2 rails to the extent of 5 per cent. of the whole order will be received. All rails accepted as No. 2 rails must have the ends painted white, and must be kept separate from No. 1 rails, and be shipped in separate cars.

19. Rails will be accepted and billed according to actual weights.

20. All rails must be loaded in the presence of the inspector.

21. The makers shall furnish the inspectors with the carbon determination of each heat, and also two complete analyses which shall represent the average steel of each day's work, before the rails are shipped. These analyses will be checked from time to time by the railroad company's chemist, and, on request of the inspector, the makers shall furnish a portion of the test ingot for check analyses.

22. Inspectors representing the railroad company shall have free entry to the works of the makers at all times when the contract is being filled, and shall have reasonable facilities afforded them by the makers to satisfy them that the finished material is furnished in accordance with these specifications. All tests and inspection shall be made at the place of manufacture prior to shipment.

A New System of Rail Records.

To strengthen still further the future practice of the Pennsylvania Railroad and to insure that whatever changes are made shall be based upon accurate data, a revised and uniform system of blanks and reports of wide scope has been devised whereby a full history of all rails purchased by the company shall be fully recorded. One series of blanks will cover information obtained at the mill during the process of manufacture. A second series will relate to rail statistics to be prepared by division officers, including a complete record of rail failures in main track. A third series will provide for statistical compilations of rail failures. A final series is to provide reports of actual measurements of rail sections laid in the track at stated periods, in order to determine the relative wear of rails of different composition and manufacture. These reports, together with the very careful inquiries and observations of the standing committees appointed to keep continually in touch with the art of rail making, are expected to supply the company with data that will enable it to secure the best rails which, at the time of any order, it is possible to manufacture.

The Pennsylvania committee considered very carefully the advisability of changing the weights of the rail sections from those which have been the standard of the system. It had been suggested that the increasing severity of service would probably call for the use of a rail of greater weight per yard. The committee concluded, however, that the sections should continue to be of the same weights as those already in use, although a change of radical character was made in apportioning metal to the different parts of the rail. The design in these changes has been so to distribute the metal as to reduce to a minimum the strains encountered in manufacture, and to secure the greatest possible resilience and wearing qualities.

The Committee on Mines and Mining of the National House of Representatives has agreed to recommend the passage of a bill, drawn by a subcommittee, for the establishment of a Bureau of Mines in the Department of the Interior. By the terms of this bill it shall be the province and duty of the new bureau to foster, promote and develop the mining industries of the United States; to make diligent investigation of the methods of mining, the safety of mines, &c. Provision is made for the government of the bureau, under the Secretary of the Interior, by a commissioner, to be appointed by the President at an annual salary of $6000.

The Sturtevant Turbine Driven Blower.

The method of driving a blower for supplying air to a foundry cupola is important. A foundry supplied with steam, but not with electricity, must choose between a reciprocating engine or a steam turbine. Direct connection is impossible with the former because its speed is much slower than that of the blower, and often it is necessary to use a countershaft to get sufficiently increased speed without an unduly large ratio between the driving and driven pulleys. Disadvantages of the reciprocating engine are liability to break down, due to the many parts that require renewal and repair; the continual decrease in economy as the valve gear, piston and cylinder become worn, and the danger from entrained water in the cylinder.

These difficulties are not found in a steam turbine. The type made by the B. F. Sturtevant Company, Hyde Park, Mass., is designed for speeds and powers, suitable for driving cupola blowers directly, thus avoiding belts and gears, as in the set shown in Fig. 1. It is simple in construction and operation, since there are but few parts, and these are readily accessible and can be easily renewed. There are no valves to set or eccentrics to adjust. Water in the steam simply slows down the turbine until it has been expelled into the exhaust. Although the reciprocating engine is more economical than the steam turbine in steam consumption, its ultimate economy, taking into consideration repair expense, deterioration, replacing of worn or broken parts, &c., is claimed to be not as good as that of the turbine.

When a foundry is provided with electric current, a motor is generally used, and may be direct connected or belted to the blower. Direct connection is not always satisfactory, due to the lack of flexibility of the set and the great variation in both volume and pressure of air required. A motor cannot be designed to operate economically under all these conditions, especially when the area through which the air is delivered and the resistance imposed is unknown or cannot be accurately determined. The repair expense is also to be considered; many foundries do not have facilities for repairs. A motor deteriorates rapidly from the heat and dust found in foundries, and must, therefore, be placed at some distance from the cupola, and be either of inclosed type or separately housed. The steam turbine, since it is entirely inclosed and dust proof, can be placed near the cupola, thus shortening the length of pipe and reducing the friction losses.

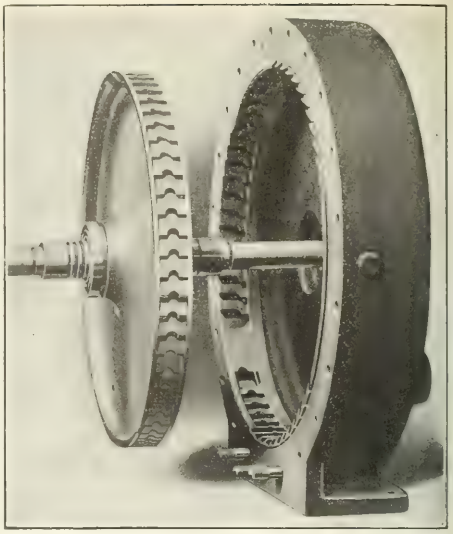


Fig. 2. The Turbine Casing Opened and the Wheel Partly Withdrawn.

All things considered the turbine driven blower appears to be the best combination for foundry service. It may be operated continuously with little attention, other than a weekly filling of the oil cups, hence a turbine blower is well adapted for large cupolas which are in constant operation, such as those for supplying iron to converters. Because of the ease with which the power may be regulated to suit the conditions, it is desirable

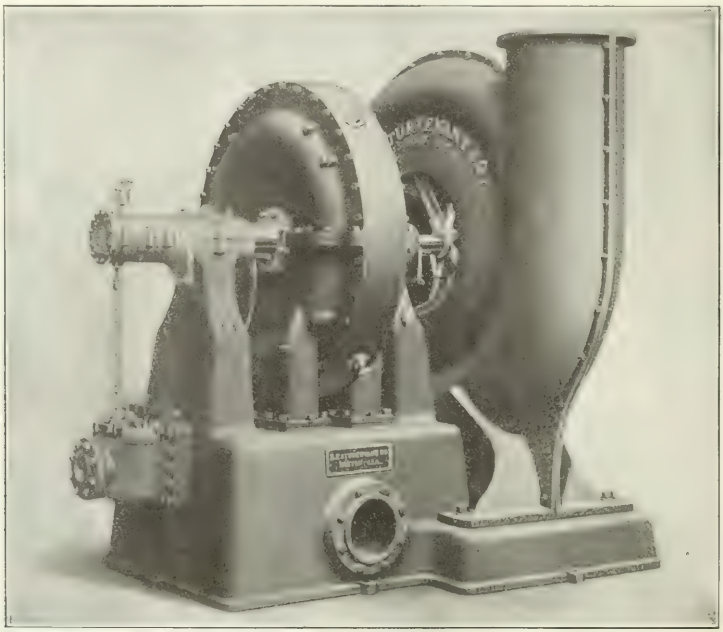


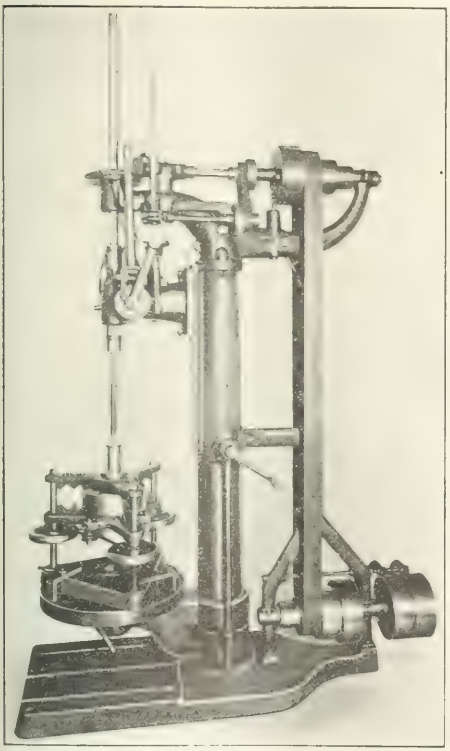
Fig. 1.—A Steam Turbine and Cupola Blower Set Built by the B. F. Sturtevant Company, Hyde Park, Mass.

where flexibility is required, as in small foundries requiring blast but a few hours a day.

The Sturtevant turbine, which has already been described in *The Iron Age* (October 31, 1907), is especially designed for durability. Instead of being separate pieces, the buckets are cut in the forging, which forms the bucket wheel, as shown in Fig. 2. This wheel differs from that of the turbine previously described in that the buckets are cut in the face instead of the sides of the wheel rim. The turbine requires no internal lubrication, and for small powers has but one bucket wheel. As the steam is returned again and again to this bucket wheel by stationary buckets in the reverse guide ring, moderate speeds are possible for a given power, and the efficiency is high, since all available energy is taken from the steam before it escapes to the exhaust.

The Rockford Drilling Chuck.

As a quick means for centering pulley castings for hub boring and reaming operations the chuck illustrated has



A Pulley Centering Chuck Made by the Rockford Drilling Machine Company, Rockford, Ill., and Applied to One of Its Upright Drill Presses.

been designed and patented by the Rockford Drilling Machine Company, Rockford, Ill. This chuck is used in connection with an upright drill press, and consists essentially of an upper plate and a lower plate, the facing sides of which have a series of V-shaped jaws. The jaws of each plate are turned in a lathe at the same time that the center hole is bored, making them absolutely true with the line of the bushing which is placed in the center hole. The upper plate is held stationary on the top of three stationary studs, on each of which is cut a reasonably coarse pitch thread. The lower plate is practically a duplicate of the upper one, with the exception that instead of being stationary it is adjustable vertically on the three stationary studs by three hand wheels, the hubs of which are threaded. Fastened to the hub of each hand wheel is a sprocket, and the three hand wheels are connected by an endless chain working around the sprockets, the slack of the chain being taken up by idlers.

In operating the chuck the turning of any one of the three hand wheels will lower the bottom plate. The pulley is then laid in place on the V ways of the lower plate, and one of the hand wheels is turned to the right, which raises the lower plate and pulley until the rim of the pulley meets the V ways of the upper plate. Just before tightening the chuck a pin is dropped through both plates and between two of the spokes of the pulley to form a stop to prevent the pulley from turning while the boring and reaming operations are being done.

The chuck as constructed will take pulleys from 4 to 14 in. in diameter. It can be operated on a single spindle drill press, first running through a lot of the pulleys completing the boring operation and then changing the tool and running the lot through, completing the reaming operation. A better way is to use two chucks on a two-spindle drill, one spindle drilling or boring and the other spindle reaming. A separate bushing is required when the reamer is in use. This chuck is claimed to center a pulley casting, so that an absolutely concentric hole can be bored in the hub.

Hearings on Patent Bills.

WASHINGTON, D. C., April 13, 1908.—The House Patent Committee on April 8 gave a preliminary hearing on the two bills recently introduced by Representative Currier, chairman of the committee. These bills are H. R. 15,839, which provides that "any patent issued to a citizen or subject of a foreign country shall be upon the same conditions and for the same term as are patents issued by such country to citizens of the United States," and H. R. 17,869, which provides that "at any time not less than four years after the date of a patent and not less than one year after the passage of this act, any person may apply to the Commissioner of Patents for the revocation of the patent on the ground that the patented article or process is manufactured or carried on exclusively or mainly outside the United States or its territorial possessions."

Both these bills were advocated by representatives of the National Association of Retail Druggists on the ground that they would impose wholesome restrictions upon foreign owners of patents on drugs and chemicals manufactured abroad but protected by United States patents and sold in this country at many times the price obtained for them abroad. One or two individual patent attorneys also favored the bill providing that patents issued to a citizen or subject of a foreign country shall be upon the same conditions and for the same terms as are patents issued by such country to citizens of the United States, but a large delegation of attorneys representing the Patent Bar Association of Washington strongly opposed both bills on the ground that they represent backward steps in the development of what is regarded as the most liberal patent system in the world, and one which foreign countries are using as a model for new enactments. Chairman Currier suggested to the delegation that Great Britain within the past year had adopted a working clause in her patent system, to which the spokesman of the delegation replied that it was the opinion of the ablest English patent experts that the new law, the enactment of which had been secured by the ultra protectionists, would speedily be repealed.

Referring to the bill discriminating against foreign inventors, the point was made by the attorneys that it would be impossible for the Patent Office to apply its provisions in case a joint application for a patent should be received from the citizens or subjects of two foreign countries maintaining different patent systems, but Chairman Currier replied that the bill could easily be amended to meet such a condition and the commissioner could be authorized to elect, or permit the inventors to elect, the country under the laws of which the patents should be issued.

It is understood that further hearings will be granted before any action is taken on the two bills, but the present disposition of the committee appears to be favorable to both measures. W. L. C.

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Iron Castings from Metallic Molds.

An interesting contribution to foundry literature is the paper of Edgar A. Custer, recently read before the Franklin Institute, Philadelphia, and given elsewhere in this issue. It deals with a subject that has had a growing amount of attention of late—the production of iron castings by the use of metallic molds. Efforts in this direction are not new, but we do not recall any account of them that goes so thoroughly into the problems involved as does the present paper. Since the presentation of the subject by John H. Shaw, New Haven, Conn., at the 1907 convention of the American Foundrymen's Association, and the appearance of articles in the British engineering journals a few months ago, describing the Szekely process of casting in metallic molds, as carried out in London, a good many foundrymen have been looking into the matter. Machine molding has greatly reduced the cost of duplicate castings made in large numbers, and for small castings multiple molds have been employed effectively. But the possibilities of iron molds that will not suffer from rapid and repeated heating and cooling and that will permit of making castings not too hard to be machined, and requiring a minimum of work to fit them for use, have become especially attractive.

The very full data presented in Mr. Custer's paper show that the question of heat treatment is of commanding importance, given an iron comparatively high in carbon and of moderate silicon content. In the making of cast iron pipe for sanitary uses, the particular line of manufacture for which the process was developed at Tacony, Pa., the noteworthy features are the rapidity with which the molten iron is introduced into the mold, the short time within which it sets and the speedy removal of the casting from the chilling influence of the iron mold. In the case of the Szekely process it was claimed that no special mixture was necessary, and that with ordinary foundry iron the resultant casting would be better than could be obtained from sand molds with the same iron. Under both processes the absence of shrinkage is noteworthy. The coating of the mold with chalk and paraffin is one of the features of the Szekely process, and considerable stress is put upon this as essential to successful results. In the Shaw process for the production of brake shoes, as described at the Philadelphia convention of the American Foundrymen's Association, the occasional coating of the mold with a mixture of graphite and crude oil was referred to as prolonging the life of the mold in unchanged form.

While heretofore castings of fair bulk, like brake shoes and car couplers, have been about the extent of operations with metallic molds, it would appear from the results described in Mr. Custer's paper that thin sections may be successfully molded, and that a wider field may ultimately be commanded by the process. It is even claimed that from a comparatively low silicon iron, castings may be produced in such condition as not only to be easily machined but to have greater strength and better structure than castings of similar irons from sand molds.

The World's Production of Pig Iron.

Returns of pig iron production in 1907 are available from countries which in 1906 produced more than 93 per cent. of the world's total. These returns take the form of substantially final figures in the case of the United States, Germany, Great Britain and Canada; of unofficial figures in the case of France and Belgium, and of the estimate of the current production of Austria, Hungary and Bosnia made last fall before the Iron and Steel Institute by W. Kestranek. For Russia, Sweden, Spain, Italy and Japan, there is nothing to do but assume production unchanged from 1906 (1905 in the case of Japan), which does not materially affect the showing, as production in these countries does not involve as much as 7 per cent. of the world's total, and does not vary much from year to year. The production in the past three years by countries is given in the following table:

The World's Pig Iron Production.

	1905. Gross tons.	1906. Gross tons.	1907. Gross tons.
United States	22,992,380	25,307,191	25,781,361
Germany	10,813,979	12,280,879	12,839,593
Great Britain	9,592,737	10,149,388	9,923,856
France	3,028,089	3,266,580	*3,532,233
Russia	2,672,155	*2,599,976	†2,599,976
Austria-Hungary	*1,560,000	*1,575,000	*1,900,000
Belgium	1,290,400	1,354,033	*1,405,374
Canada	468,003	541,957	581,146
Sweden	518,967	595,231	†595,231
Spain	387,402	373,248	†373,248
Italy	140,818	133,158	†133,158
Japan	47,613	†47,613	†47,613
Other countries	200,000	200,000	200,000
Total	53,712,543	58,424,254	59,912,789

* Not final.
† Assumed [illegible] Year.

In this table gross tons are used throughout, it being considered objectionable to follow the not uncommon practice of adding gross and metric tons together, as this involves an error of some 375,000 tons in the total.

The world's production of pig iron has been as follows:

Years.	Gross tons.	Years.	Gross tons.
1850	4,400,000	1903	46,000,000
1890	27,000,000	1904	45,050,000
1895	28,700,000	1905	53,700,000
1900	40,200,000	1906	58,400,000
1901	40,200,000	1907	59,900,000
1902	43,400,000		

These totals are given to the nearest 50,000 tons, greater accuracy than this being impossible, as some minor countries must be estimated, such estimates of sporadic production ranging from 10,000 tons in 1850 to 100,000 tons in 1890 and to 200,000 tons in recent years.

Statistics of pig iron production prior to the latter part of the nineteenth century do not furnish an index to the production of iron in its generic sense, on account of the widespread use of direct processes, not employing pig iron as an intermediate form. The use of such direct processes is now inconsequential. The use of iron ore in the open hearth furnace is important, but the use of scrap is still more important. Nevertheless, an index to the consumption of steel in merchant forms is not furnished by steel statistics, since these usually relate to ingots and include the large tonnage of scrap made in the finishing operations. This leaves pig iron as the best guide available.

The United States contributed a larger percentage of pig iron to the [illegible] production in 1906 than in

1907, or, of course, than in any preceding year, its percentage in 1906 being 43.3 per cent. and in 1907 43 per cent. Had there been no curtailment in production anywhere toward the close of 1907 the United States would have been able to contribute a little more than 44 per cent. to the enlarged total. With the new erection under way the United States is making toward a contribution of between 47 and 48 per cent.

During the period in which the production of the United States has increased so rapidly, other countries have not stood still. While our production has almost tripled in 17 years, the production of 9,202,703 tons in 1890 constituted about 34 per cent. of the world's then total. The United States was even then well in the lead of any other country. From 1890 to 1907 the United States increased its production by 180 per cent.; the rest of the world by 92 per cent. In 1850, although the comparison is not particularly instructive, Great Britain furnished about 52 per cent. of the world's total pig iron, the United States making less than 13 per cent.

Prior to 1890 the three principal producing countries were, in order, Great Britain, the United States, Germany, other countries being in substantially their present alignment. In 1890 the United States passed to first place, thereafter yielding the position, to Great Britain, only in the two years, 1894 and 1896. Germany passed Great Britain in 1902, and has since held second place. The geographical lines on the Continent are so artificial, when compared with the lines separating the coal and ore workings, that comparisons between the different European countries are not especially instructive.

The American Salesman in England.

English newspapers are giving rather caustic attention to an article on the failure of the American salesman in England, published in a recent number of an American periodical. This article attributes the better success of the patient, plodding, ultra-courteous English salesman to an inherent antagonism toward the more aggressive methods of his American contemporaries who invade the insular field. The British press approves the arraignment. American manufacturers who have been abroad recently also state that, from their own observations and experience, there is much truth in the general proposition. The salesman trained in America lacks the patience and indomitable perseverance necessary to obtain an audience with the average British business man. And if successful to this point he introduces too much of the atmosphere of the United States into the interview.

Evidently there must be something radically wrong with American methods of salesmanship as applied to the older country. It may be argued that the business man of England is permitting a prejudice to interfere with his own success, and that the older manner of salesmanship to which he and his forebears have been accustomed fails to bring best results to his own business as well as to those who have goods to sell to him. Doubtless the trouble with American salesmen in England lies in a combination of reasons. Men who have been eminently successful in their own country have failed completely abroad. Their training naturally had been entirely along lines as laid down in their own country. It had been bred into them that the most aggressive tactics are generally the most successful. They had been trained in tact and adaptability with the American trade only in mind. In England it was difficult for them to conform to wholly unfamiliar ways, the outgrowths of many generations of business practices and traditions. It was in many instances the spirit of an easy conquest ahead that destroyed the chances of success. This illusion dispelled, they could not adapt themselves to a more conservative people.

Probably the growing practice among American manufacturers of attaching their representatives abroad to agencies handling their products is a better way of developing new trade. The imported salesman is given a directing hand to guide him away from his own natural tendencies. He is trained over again, so to speak, until he has adapted himself to his new surroundings. He loses something of his aggressiveness; he goes slower. He learns how to humor his customers in conformance with their own ways of doing business. He readjusts his sense of tact to serve his purpose in the new environments. He loses something of those characteristics that were essential in his work at home. He has become an Anglicized American salesman. By this method of establishing representatives the mistake is not made of jumping into a trade hedged about with long established customs, in the assumption that the method which has succeeded best with one people must of necessity be best with another. Wherever the business man of any country may go he must first study the people, their manner of living and their prejudices, and seek out their weaknesses, their vulnerable points, before he can presume to be in position to get their trade. This must be particularly true where the other people are much like his own, but firmly established in their conviction that they should be the teachers, not the pupils in business. Trade rivalry is another factor. It may be indirect, even remote, but it is nevertheless important where business houses of one country are asked to spend their money with those of another country.

There is the other side of the question already alluded to. The progressive American business house has learned the lesson that the salesman who seeks its custom bestows a distinct benefit. The calls of traveling representatives are welcomed. New ideas, new tools with which to manufacture, new materials, general information of the trade are constantly sought by the buyer, just as his custom is sought by the seller. It is not lost sight of that dealings with several houses, through their salesmen, mean a more intimate knowledge of current and future prices, constituting a highly important advantage in buying. The American manufacturer or his representative of the purchasing department is accessible. In England the salesman very often has difficulty in obtaining an audience. This must work to the disadvantage of the buyer. His familiarity with market conditions, including prices; his opportunities for improving his product or lessening its cost, or both, cannot be so great as is the case with his American competitor. In a manner he repels the information that would seek him out. From the American point of view he permits the customs of former generations to stand in the way of his own better success, although there are some exceptions to the rule.

In the evolution of salesmanship in Great Britain, which has already begun, and which must become more and more pronounced with the closer contact of the two great English speaking nations, the outgrowth should be a pretty good sort of salesman—a man well bred, courteous, patient, and combining with these excellent qualities the practical and thorough training of his American cousin, with his full knowledge of the goods he has to sell, down through the processes of manufacture, and of how to sell them to the best advantage. The American in the England of the present day can make considerable headway, if, as has been frequently pointed out, he does not lay too great a stress on his own nationality, and

especially if he will constantly endeavor to adapt himself, always remembering that no radical innovation of method will be tolerated.

Contracts for Freight Rates.

Railroads Can Break Contracts by Filing New Rates.

BY R. L. ARDREY.

A shipper can no longer rely upon a contract with a railroad to fix for any definite time the rates that will be charged on interstate shipments. The railroad or its connecting lines may abrogate such a contract at any time by filing new rates with the Interstate Commerce Commission and the shipper has no redress, even in a suit for damages. This is the vital point in a very important decision handed down by the United States Supreme Court last month.

It has been a custom among prudent business men before making any considerable investment in a new plant or in the enlargement of an old industry to safeguard their interests by making contracts with the railroads regarding the rates which they are to enjoy, these contracts often specifying a considerable term of years during which certain rates are to remain in effect. The State courts have almost invariably enforced these contracts, because there is a valid consideration moving to the railroad in the increased traffic it will receive as a result of the investment which the shipper proposes to make. While the case before the United States Supreme Court did not involve this particular question, it was fully considered in the opinions rendered, and the Supreme Justices have declared that the responsibility rests upon Congress and not upon the courts.

The Case Which Brought Out the Decision.

The case was that of the packing houses at Kansas City and the Chicago, Burlington & Quincy Railroad, involving shipments made at a contract rate after a tariff naming a higher rate had been filed with the Interstate Commerce Commission by Eastern connections of the Burlington. In June, 1905, the packers made contracts with the Wilson line for certain shipments of provisions from New York to European ports. There was then in effect, filed with the commission, a tariff from Kansas City to New York in which the roads east of the Mississippi received 23 cents per 100 lb. as their proportional of through export business. The packers showed their steamship contracts to representatives of the roads, and the Burlington entered into a contract to carry the shipments to New York until December 31, 1905, a period of six and a half months, at a rate based on the proportional of 23 cents east of the Mississippi. In tariffs filed August 6 the Eastern roads raised their proportional to 35 cents east of the Mississippi. The Burlington road stood by its contract with the packers, and accepted shipments, prepaid, at the contract rate. In a subsequent prosecution at Kansas City in the Federal Court the road and each of the packers were fined under the Elkins law, and the case was carried up to the United States Supreme Court.

There were many technical points of law involved in the case which received careful consideration. The two points of especial interest to shippers were the right of contract, and whether a shipment from an interior point to a foreign country came within the requirements of the Interstate Commerce act as to publishing and observing tariffs. The shipments were made on through export bills of lading, and the entire rate, including the steamship rate, was prepaid at point of shipment. The steamship contract was made directly with the packers, but was accepted by the railroad, and the entire service was performed as one continuous shipment by the railroads and the steamship line. The court held that the inland rate, from the initial point to the seaboard, must conform with the law. Justice Day, in the majority opinion, said:

The Majority Opinion.

What reasonable ground is there for supposing that Congress intended to exercise no control over such commerce if it happens to be billed through to a foreign port? Such construction would place such important commerce shipped in the United States to a port for transshipment abroad wholly outside the restrictions of the law, and enable shippers to withdraw such commerce from the regulations enforced against other interstate commerce by the expedient of a through bill of lading. Take the present case. The through rate is obtained by adding the ocean rate to the inland rate. There is no contractual relation between the railroad carrier and the ocean carrier. The ocean rate is uncertain and variable, depending upon time of sailing and available space. The accommodaion for ocean shipment was obtained by the shipper and by it made known to the inland carrier. We think the language of the statute, read in the light of the manifest purpose of its passage, shows the intent of Congress to bring interstate commerce within the control of the provisions of the law up to the time of ocean shipment. This construction is reinforced by the broad provisions of section 6 of the act as to publishing schedules, showing rates, fares and charges, and filing the same with the Interstate Commerce Commission. That such rates, notwithstanding through bills of lading, were subject to the provisions of the act, was held, upon full consideration, and rightfully, as we think, by the Interstate Commerce Commission. Re Tariff vs. Export and Import Traffic, 10 I. C. C. Rep. 55.

The right of contract which the shippers claimed in this case had peculiar force, because at the time the contract was made, and for two months afterward the rate which it provided for complied with all the requirements of the law. The contract was broken by Eastern connecting lines, which arbitrarily raised their proportional east of the Mississippi from 23 to 35 cents. The Supreme Court refused to recognize the claim that this contract was valid for the short period it was to remain in force, and said:

It may be, as urged by the petitioner, that this construction renders impossible the making of contracts for the future delivery of such merchandise as the petitioner deals in, and that the instability of the rate introduces a factor of uncertainty, destructive of contract rights heretofore enjoyed in such property. This feature of the law, it is insisted, puts the shipper in many kinds of trade at the mercy of the carrier, who may arbitrarily change a rate, upon the faith of which contracts have been entered into. But the right to make such regulations is inherent in the power of Congress to legislate respecting interstate commerce, and such considerations of inconvenience address themselves to the law making branch of the Government. New Haven Railroad Company vs. Interstate Commerce Commission, 200 U. S., 399.

It may be that such contracts should be recognized, giving stability to rates for limited periods; that the contracts being filed and published and the rate stipulated and known and open to all, no injustice would be done. But, as we have said, such considerations address themselves to Congress, not to the courts. It is the province of the judiciary to enforce laws constitutionally enacted, not to make them to suit their own views of propriety or injustice. The statute being within the constitutional power of Congress, and being in force when the contract was made, is read into the contract and becomes a part of it. If the shipper sees fit to make a contract covering a definite period for a rate in force at the time, he must be taken to have done so subject to the possible change of the published rate in the manner fixed by statute, to which he must conform or suffer the penalty fixed by law.

A Vigorous Dissenting Opinion.

Justice Brewer, with the concurrence of the Chief Justice and Justice Peckham, gave a vigorous dissenting opinion, based upon the grounds that there was no objection to the reasonableness of the rate named in the contract; that the time during which it was to run was brief, less than seven months, and but for the legislation of Congress there would be no question of its validity. He said:

I want to emphasize this matter. The railroad company and the packing company entered into a fair and reasonable contract for transportation. Independently of the statute it was valid in all respects, and could have been enforced by the packing company against the railroad company, but according to the ruling of the court the railroad company was authorized arbitrarily to break the contract, raise the amount to be paid for transportation, thus unsettling the business of the shipper, even it may be to the extent of wholly destroying it. Sustaining under those circumstances the power of the carrier and punishing the shipper shocks my sense of justice, and I cannot impute to Congress an intent by its legislation to make possible such a result.

It has been one of the boasts of our jurisprudence that it upholds the sacredness of contracts. By constitutional provision a State is estopped from passing a law impairing the obligation of a contract, and again and again has this

court stricken down legislation having such effect. While there is no such restriction upon the power of Congress, yet Congress has in this case broken no contract. It has simply, as held by the court, given permission to a carrier, arbitrarily and without inquiry or decision by any tribunal, to repudiate its contract.

Again, we have held that in "enacting the statutes establishing the Interstate Commerce Commission, the purpose of Congress was to facilitate and promote commerce." Texas & Pacific Railway vs. Interstate Commerce Commission, 162 U. S., 197, 198. But to deny to parties the power of agreeing upon rates of transportation for a reasonable time tends to destroy and not promote commerce. One of the conditions of successful business—one of the things which induces new industries—is the ability to provide in advance for certainty of expenditures, including among them the cost of transportation. Who will engage in any new enterprise or invest money in a manufacturing industry when he knows that he cannot make a definite contract for rates of transportation to and from his factory, but is advised that whatever contract he makes may, at the whim of the carrier, upon 10 days' notice, be set aside and a higher rate imposed?

It may be said that the remedy of the shipper is to pay the increased rates and then sue the carrier for the excess. But upon what ground can such an action be maintained? If the contract is no longer valid, if it has been destroyed by the mere action of the carrier in publishing a new tariff, and the rates of the latter are in themselves reasonable, although in excess of the contract provisions, how can a shipper recover damages? The contract is gone, has ceased to be valid, the new rates are reasonable, and the shipper must abide by the consequences of the arbitrary act of the carrier.

A Court of Patent Appeals Proposed.

WASHINGTON, D. C., April 14, 1908.—The House Committee on Patents has made a favorable report on the bill, H. R. 14,047, to establish a United States court of patent appeals. In view, however, of the fact that the proposed new tribunal would be composed of judges drafted from the United States district and circuit courts, the Patent Committee recommends the consideration of the measure by the House Judiciary Committee before being voted upon.

A Single Court of Last Resort Needed.

The purpose of this bill is to establish a single court of last resort in patent causes. Prior to the passage of the so-called circuit court of appeals bill in 1891, the Circuit Courts of the United States had jurisdiction of patent causes, and from the decisions of these courts there was an appeal to the Supreme Court of the United States, so that ultimately a single tribunal dealt with patent causes, thus providing uniformity of final decisions. The Circuit Court of Appeals act, however, eliminated the right of appeal to the Supreme Court, and that court now has jurisdiction to hear a patent cause only on a writ of certiorari. The Supreme Court is so burdened with work that it is very reluctant to take a patent cause on certiorari, although it not infrequently happens that the decision of the Circuit Court of Appeals in one circuit differs from that of a Circuit Court of Appeals in another circuit as to the validity and scope of the same patent. As illustrating the anomalous conditions that have arisen under the act of 1891, the report of the Committee on Patents on this bill says:

In a suit brought for the infringement of the Grant patent for a rubber tired wheel, a decision was rendered by the United States Circuit Court for the Eastern district of New York in December, 1898, sustaining the patent. This decision was followed by other courts, among others by the United States Circuit Court for the Northern district of Ohio, in the case of the Rubber Tire Wheel Company v. Goodyear Tire & Rubber Company, which decision, on appeal, after elaborate argument and consideration, was reversed by the United States Circuit Court of Appeals for the sixth circuit, and the patent held invalid, and a petition to the Supreme Court for certiorari was denied. This was in 1902. In a subsequent suit the Circuit Court of Appeals for the second circuit in January, 1907, held the patent valid.

Nine Courts of Last Resort at Present.

Since the Circuit Court of Appeals act was passed we have in this country nine courts of last resort in patent causes, and if in any one circuit the court holds a patent invalid, the inventor has no protection in that or any other circuit, for any one can manufacture the patented article in the circuit where the patent was held invalid and send his goods into all the other circuits. If suit is brought on a patent in each of the nine circuits, and the patent is declared valid in eight of the circuits and invalid in one circuit, and the Supreme Court voluntarily takes the case up on certiorari and declares the patent valid, the infringer who won in the ninth circuit may still send his goods all over the United States as if he were a licensee under the patent. Kessler v. Eldred, 206 U. S., 285. If the patentee succeeds in one circuit, no other circuit is bound by that adjudication except as between these particular parties and their privies, and infringers in all the other circuits have a right to make an independent defense in their circuits. The public is as much interested in having this faulty system corrected as is the inventor. Now, when a patent is declared invalid in one circuit, people in the other circuits cannot be sure that they have any right to manufacture, sell or use the patented article, for the plaintiff may go into every other circuit and bring suits against alleged infringers. It is of the utmost importance to both the inventor and the public that the question whether a patent is valid or invalid and its scope should be settled as speedily as possible, and settled by a court whose decision will be final, not in one circuit alone, but throughout the entire country.

It is conceded on all hands that were conditions such as to make it practicable to restore the right of appeal in patent causes to the Supreme Court of the United States, that would be the best possible solution of the question. All familiar with the work of the Supreme Court realize, however, that that court has not the time to consider and decide patent appeals, and that to impose upon that court this duty would result in putting the court years behind its calendar. If we are to have uniformity of decisions in patent causes, if we are to have a system which will enable the public and the inventor to know what the rights of each are as the result of a decision in a single cause, we must have one court of last resort instead of nine. A court established having jurisdiction of this class of causes only would seem to be justified by the fact, as one eminent authority has put it, that the subject of patents goes not to any particular trade, not to any particular class, but it goes to the whole nation and every man, woman and child in it, and particularly every man engaged in business of any kind.

The life of a patent is comparatively brief, and the inventor has a right to know as speedily as possible whether his patent is valid or not, and as a patent excludes all the people of the United States for a time from its use without the consent of the inventor, the public has a right to know as soon as possible whether or not it may use the article, and the decisions of the courts of last resort show that more than one-half of all the patents issued are invalid.

Composition of Proposed Court.

The court created by the pending bill, which has the indorsement of the American Bar Association and of the Association of the Bar of the City of New York and other associations of lawyers, is to consist of five judges, of whom only the chief justice is to be appointed by the President, with the advice and consent of the Senate, to hold his office for life. The other four are to be Federal judges in office either as circuit or district judges designated for service on the court of patent appeals for stated periods in the manner set forth in the bill. This plan of organization, in the opinion of the committee, would provide "a selection of judges without parallel and would be superior in the decision of causes in a patent court to any court that ever sat in the world, for there is no country which has a bench made up by the double process of selection by which the Federal judges themselves are secured from the whole masses of the people and put into a place where they are skilled in the patent law and where they acquire experience, and then a second selection of a few from that number to sit as a final court of last resort; it is the perfection of machinery for securing perfection among judges."

It is believed that the passage of this bill would so relieve the United States Circuit Court of Appeals from all consideration of patent causes that in most circuits the assignment of a judge for service to the patent court of appeals would not necessitate the appointment of an additional judge in that circuit to take his place. As only four judges are to be taken for the patent court of appeals and as there are upward of 100 Federal judges in the circuits and districts, it is doubtful if the withdrawal of so small a number for this special service would in any way affect the efficiency of the existing courts.

W. L. C.

The Proposed Anti-Trust Law Amendment.

The Hepburn Amendment of the Sherman Anti-Trust Act Analyzed.

Henry R. Towne, president of the Yale & Towne Mfg. Company, who is also president of the Merchants' Association of New York, has recently had occasion to give much thought to the pending Hepburn amendment to the Sherman Anti-Trust act. He has made the following analysis of the proposed amendment, which will undoubtedly be read with interest by all concerned:

1. Before the Sherman act of 1890 there was no statutory restriction on combinations affecting interstate commerce. Those entering into such combinations were amenable to the common law of the several States, and by taking legal counsel, could inform themselves in advance with some certainty as to the legality of their proposed action.

2. The Sherman Anti-Trust act of July 2, 1890, prohibited all combinations and agreements in restraint of interstate commerce.

3. The provisions of the Sherman act, under the decisions of the courts, especially the recent decisions of the Supreme Court, have been held to apply to combinations by labor as well as to combinations by employers and producers.

4. The Hepburn amendment now proposes to modify the Sherman act by enacting that, upon compliance with certain conditions, combinations, whether of employers or employees, which are not held to be in "unreasonable restraint of trade or commerce among the several States or with foreign nations," will be permitted. This proposal thus recognizes the existence of such combinations, and seeks to legalize such of them as conform to some standard hereafter to be defined.

5. The proposed line of demarkation between what is permitted and what is forbidden is the reasonableness or unreasonableness of each combination or agreement in restraint of interstate commerce. Lawyers assert that legislation on this basis is unknown and impossible, and quote a recent decision in which the court held that any agreement voluntarily entered into between two parties is "reasonable" *inter se*, but whether reasonable or unreasonable as to the public the court could not say, having no basis of law as a guide. In other words, the law must either define accurately what is forbidden, or, if this is left wholly or partly to the discretion of the courts, must set up some rule for the guidance of the latter in determining whether or not the law has been violated. No such rule has yet been laid down as to what constitutes reasonable or unreasonable restraint of interstate commerce.

6. It would appear, therefore, that those who desire to have the Sherman law amended should now address themselves to an effort to formulate some definition, which can be embodied in a statute law, of the line which, in a broad sense, marks the division between combinations, whether of employers or employees, which are reasonable and those which are unreasonable. It seems probable that some clearness and convenience may result if, in this attempt, combinations of employers are dealt with separately from combinations of employees, not because of any inequality of rights, but because of the difficulty of covering in one statement or law conditions which, while identical or similar in kind, differ widely in degree and application. Another distinction may properly be made between public corporations—that is, those holding grants from the State, which to a greater or less degree are monopolistic, such as common carriers, and all other public service corporations, and private corporations and individuals whose business is not based on such grants or franchises from the State.

7. As to private corporations and persons, it would seem that the fundamental fact at issue is the right of two or more to combine to control the prices at which they sell their product or their merchandise. Under early English law even a partnership of two persons was prohibited, whereas to-day all persons are free to unite under partnerships or under corporations for the prosecution of undertakings. Long before the passage of the Sherman act in 1890, as well as ever since, individuals, firms and corporations have entered into agreements for the regulation of prices. The Sherman act makes these illegal in interstate commerce. What is sought now is to legalize such acts where found not to be "unreasonable," and thus to bring the law into conformity with the usages of the people. The difficulty to be overcome appears to be the formulating in clear and unequivocal language of a definition as to what is "reasonable or unreasonable," or what is good and what is bad in the matter of trade agreements.

8. Before the passage of the Sherman act this question rested with the courts as to each litigated case, and the parties concerned, or their counsel, had as a guide the body of the law and previous decisions relating to adjudicated cases of this kind. Under the Sherman Act all combinations affecting interstate commerce are forbidden. The proposed Hepburn amendment is in effect an invitation to corporations and others to submit to the Commissioner of Corporations (the head of a bureau of the Department of Commerce and Labor), such information concerning its financial condition, its contracts and its corporate proceedings as may be called for under rules hereafter to be prescribed by the President, and in return, at the discretion of the commissioner, to receive a certificate of registry entitling the parties concerned to the benefits and immunities of the Hepburn act.

9. This plan, therefore, proposes to substitute for the courts, the tribunal heretofore having jurisdiction of these matters, an officer of one of the administrative departments of the Government. In this respect it would seem to be revolutionary and contrary to the fundamental principles on which our Government heretofore has been based.

10. The Hepburn bill provides that these decisions shall be made by the Commissioner of Corporations, "with the concurrence of the Secretary of Commerce and Labor," but it is obvious in advance that the vast volume of documents to be reviewed and the infinite number of questions which would arise under this plan, would be beyond the power of any one person to deal with, and that, therefore, in practice, the work would of necessity be distributed among a number, probably a vast number, of clerks and other subordinates of the commissioner. If so, it would follow that each of the latter would in effect have the power of deciding as to each case referred to him, whether the business operations of the parties concerned were reasonable or unreasonable, and whether they should be sanctioned or forbidden.

11. The plan thus indicated is suggestive of a national "bargain counter," where those desiring to conduct their business on certain lines must apply and negotiate for permission, where the decision would be vested in a minor governmental employee, and where opportunities and inducements for corrupt practices would be rampant. The change would imply the substitution of a bureaucracy for the judiciary as the source of authority, control and decision in regard to all of the vast interests at stake.

12. In effect the Hepburn bill divides those whom it would affect into three classes—namely: 1. Those who register and whose contracts are approved. 2. Those who decline to register, and who, therefore, would not come under the provisions of the act. 3. Those who register by filing the required information concerning their affairs, but whose contracts are disapproved. These three classes may be defined as the sheep, the goats and the foxes. The sheep, being within the fold, are protected. The goats, being without the fold, are exactly where they stand to-day, and liable to the same penalties, neither more nor less. The foxes, however, having filed with one department of the Government detailed information available to another department of the Government (the Department of Justice), on which they are liable to prosecution, are fair game for the guardians of the law, and could not complain when the latter engaged in the chase which [illegible] makes it their duty to pursue.

13. Clearly the starting point for any new constructive legislation must be the definition of a standard or rule for the guidance of the courts in the interpretation of the law, whereby they may be enabled to determine whether a specified contract or agreement in restraint of trade, as shown by the evidence submitted, is lawful or unlawful. The Hepburn bill does not define or create any such standard. It merely transfers adjudication on these questions from the courts to a departmental bureau, and then lays down no rule for the guidance of that bureau in making its decisions on the vast number of questions which would come before it, and which would affect vitally every great business interest of the country. The bill shirks this point and shifts upon the President the law making function which the Constitution vests in the Congress. Instead of fixed and definite laws we would have a set of rules made by an individual, to wit, the President, subject to change without notice by him or by his successors at pleasure and because of any passing sentiment or whim. In brief, we would have personal government and instability in place of law and order.

14. As an indication of what appears to be called for in the way of a definition in relation to combinations to control prices, the following, without pretending to be practicable or adequate, is offered as an example:

That it shall be unlawful for two or more persons or corporations to agree upon the minimum price at which either shall sell a specified article within a specified territory, provided that within the territory to which such agreement applies the article so specified is procurable from not less than an equal number of other persons or corporations not parties to such agreement.

Such a law would establish a standard for the guidance of the courts in determining whether or not the facts in any given case did or did not constitute a violation of the law; that is, whether or not they reasonably conformed to the requirements. Now if those interested can formulate and agree upon some such statement, setting forth the fundamental and essential conditions which they believe should be permitted and sanctioned by the law, the way would be cleared for the commencement of constructive legislation. Until this is done no progress seems possible. If it cannot be done, there would seem to be no alternative but to retain the Sherman law as it stands or to annul it entirely. What is sought is a middle course between these extremes whereby contracts and agreements in restraint of trade shall be permitted and legalized if reasonable, and be forbidden if unreasonable. To do this it is indispensable that some rule shall be formulated defining in broad terms the median line between the two extremes.

15. The foregoing reasoning relates to agreements between employers or between producers and distributors. What employees should have is similar freedom for two or more to combine to control the prices at which they shall sell the product of their hands or brains. What organized labor is now demanding goes far beyond this and includes the boycott, that is, the right of two or more to combine to injure a third party. The law should not and will not give any such right either to employee or to employer.

16. In view of the conditions thus indicated of the complexity and vast importance of the problems they involve, and of the consequent need of careful and deliberate constructive work, based on preceding investigation sufficient to bring out most, if not all, of the fundamental facts which the question involves, it would seem clearly expedient to oppose any attempt at hasty legislation during the current session of Congress, and that the wiser course would be for Congress to appoint a competent commission, which, during the recess, shall collect evidence, study the problem and report its conclusions as a basis for constructive legislation during the session of Congress which will begin next November.

The 1909 Convention of the A. F. A.—A formal invitation to hold the convention of the American Foundrymen's Association for 1909 in Cincinnati was extended last year at Philadelphia. Recently the Cincinnati League, representing the business men of that city, arranged for H. M. Lane, secretary of the Foundry Supply Association, to go to Cincinnati and look over the ground. It was found that the old Machinery Exhibit Building connected with Music Hall will afford ample facilities for the foundry equipment exhibit and the meetings for the reading of papers. This building is located centrally in Cincinnati, being within 12 minutes' walk of principal hotels. It is probable that a special car bearing Cincinnati foundrymen and other manufacturers will go to the foundrymen's convention at Toronto in June to renew the invitation already extended. Several Cincinnati firms will be represented by exhibits at Toronto.

The Kentenia Corporation.

A most interesting publication, relating to the Kentenia Corporation, is being distributed as a supplement to the Harlan *Enterprise*, Harlan, Ky., dated April 10. This supplement is 15 x 31 in. in size, comprises 42 pages, and is a magnificent specimen of high class printing and superb engraving by the John A. Lowell Bank Note Company, Boston. The engravings comprise portraits of the officers and directors of the corporation and views of the scenery in southeastern Kentucky, where the operations of the corporation are to be conducted.

The Kentenia Corporation is organized under the laws of Virginia, with extensive powers for mining, manufacturing, real estate development, &c. Its primary object is to acquire mineral lands in Harlan and Bell counties, Kentucky, and its policy will be to mine lease its lands, now comprising 75,000 acres. Development will be by other organizations and with other capital, resulting in making the shares of the Kentenia Corporation equivalent to underlying or guaranteed securities. The authorized capital stock is divided into 100,000 shares of a par value of $100 each, making a total of $10,000,000. The statement is made that the corporation will not use its cash capital to acquire additional acreage not already contracted for, but lands will only be purchased for stock in the corporation, and the supplement to the Harlan *Enterprise* is addressed to the local land owners for the purpose of inducing them to exchange their mineral lands for stock.

The president is Charles Henry Davis, a widely-known engineer, whose office is at South Yarmouth, Mass. Associated with Mr. Davis as a trustee is Warren Delano, Jr., a prominent coal operator, whose office is at 1 Broadway, New York. Others prominent in the management of the affairs of the corporation are Frederick Bertolette, Mauch Chunk, Pa.; Rutherford S. Pierrepont and Robert P. Bowler, 2 Rector street, New York; Thomas D. Jones, Hazleton, Pa., and Horace F. Taylor, Buffalo, N. Y.

An unusual feature of this publication is the space devoted to the personal affairs of men interested in the corporation, or who have been employed by it in various capacities. This makes rather interesting reading. For instance, among the biographies is one of Andrew S. McCreath, Harrisburg, Pa., who made analyses of coal from the various seams controlled by the corporation. In a similar manner portraits and biographies are given of other experts employed in making investigations of the value of its property.

Corrections for the Mietz & Weiss Oil Engine Compressor Test.—Three typographical errors appeared in the article, "Test of a Mietz & Weiss Oil Engine Air Compressor," printed in last week's issue. The fraction $\frac{a\ c}{c\ c}$ at about the middle of the left hand column on page 1168 was inverted and should have been $\frac{c\ c}{a\ c}$. The fourth line from the bottom of the same column gave V as the quantity of air pumped where it should have been v, or as appeared in the formula immediately following. It was obvious that V had already been taken to represent the the volume of the tank. On page 1169 in the eighth line of the left hand column v was again misprinted as u. In this case also the formula which followed indicated the mistake.

Trade Publications.

Elevating, Conveying and Mining Machinery, &c.—C. O. Bartlett & Snow Company, Cleveland, Ohio. Catalogue No. 18. Size 6 x 9 in.; pages 324. Contains numerous illustrations representing examples of the company's labor-saving elevating, conveying, mining and milling machinery, together with descriptions of their operation and construction and tables of dimensions and prices. Some of the products listed are steam and direct heat dryers, cement machinery, crushers, shellers, feed mills, pearling machinery, paint mills and mixers, chain belting, sprocket wheels, rope transmission machinery, coal tipples, drop forged chain, &c.

Constant Speed Milling Machines.—Brown & Sharpe Mfg. Company, Providence, R. I. Booklet entitled "Why the Constant Speed Drive Milling Machine?" Gives a few arguments in support of this type of drive as developed by the company. The details of the machines of this type have been described at various times in *The Iron Age*. The booklet is attractively illustrated.

Flexible Shafting.—Coates Clipper Company, Worcester, Mass. Catalogue. Gives details of the application of the flexible shaft to numerous mechanical purposes, where flexible transmission is desirable. Portable drills, buffers, grinding machines, including the patent multiplier, which gives very high speed for small drils; sanders, polishers, eraser for use in drafting room, and a multitude of uses have been developed for this mechanism. The catalogue includes details of the Coates angle drive for shafting, and a list of Coates special carborundum wheels.

Mining Machinery.—Traylor Engineering Company, New York. Catalogue. Size 7 x 10 in.; pages 23. Contains illustrations and data regarding the Traylor concentrating table, with detailed drawings showing the dimensions and directions for installing, together with illustrations of stamp mills, converters and other mining machinery.

Molding Machines.—Arcade Mfg. Company, Freeport, Ill. Catalogue. Shows the Modern molding machine, which is designed to handle light castings. The book contains testimonials and accompanying it is a folder describing the Modern molding machine No. 2, designed for flasks up to 12 x 30 in.

Foundry Equipment.—J. D. Smith Foundry Supply Company, Cleveland, Ohio. Circular. Shows model bellows and ingot mold for use in foundries.

Rock Crushers.—Sturtevant Mill Company, Boston, Mass. Pamphlet. Devoted to steel plate roll jaw crushers, with illustrations and descriptive matter.

Electric Drills.—Cincinnati Electrical Tool Company, Cincinnati, Ohio. Bulletins Nos. 4 and 5. Describe air-cooled portable electric drills and accessories and electrical tool box grinders, respectively. Both pamphlets are well illustrated and the tools and their uses are comprehensively described.

Steam Specialties.—Ashcroft Mfg. Company, New York. Folder. Describes low water detector and alarm, with illustrations.

Threading Tools.—Oster Mfg. Company, Cleveland, Ohio. List No. 38. Consists of 32 pages, showing and describing stocks and dies and drilling tools, with price-lists and tables covering the use of the tools.

Steam Specialties.—Lagonda Mfg. Company, Springfield, Ohio. Illustrated booklet on "Boiler Scale and Its Removal." A treatise on the accumulation of boiler scale and the damage done by it. Illustrates and describes the Weinland mechanical boiler tube cleaner, the Weinland motor cleaner and other Lagonda specialties.

Switches and Frogs.—Independent Switch & Frog Company, Springfield, Ohio. Catalogue. Size 9 x 12 in.; pages 81. Cloth binding. Deals with switches and frogs and elaborates switching systems adaptable for railroads, street railroads and industrial railroads.

Paper Machinery.—Chambers Brothers Company, Philadelphia, Pa. Catalogue L. Describes paper feeding, paper folding and paper varnishing machinery, and includes a folder devoted to special machinery along the same lines.

Machine Tools.—Newton Machine Tool Works, Philadelphia, Pa. Catalogue No. 45. Size 6 x 9 in.; pages 303. Cloth binding. A general catalogue of the company's products, including machines for all kinds of boring, drilling, milling, shaping, planing, gear curting, cold sawing, &c. Nearly every page contains an illustration, and directly beneath it a brief description with dimensions in many cases or a reference as to where they will be found. A table of contents and an appended index facilitate locating a particular machine.

Steam Turbines.—Dake-American Steam Turbine Company, Grand Rapids, Mich. Booklet describing and illustrating the Dake steam turbine and containing sectional views of parts of the machine.

Boilers and Radiators.—H. B. Smith Company, Philadelphia, Pa. Steam fitters' handbok, combining information as to assembling the company's product and a catalogue of its line. The book contains rules and practical data and is illustrated with a number of line drawings of radiators, boilers and parts.

Roll Turning Lathes.—United Engineering & Foundry Company, Pittsburgh, Pa. Catalogue. Size 8½ x 10 in. Covers the company's various sizes of roll turning lathes, which range from 16 to 44 in., illustrating both belt and motor driven forms. A partial list of users is included.

Brick Machinery.—Chambers Brothers Company, Philadelphia, Pa. Catalogue. Pages 152. Embraces an extensive line of brick machinery, supplies, &c., with inserts illustrating some of the company's larger machines and numerous smaller illustrations. The catalogue is particularly comprehensive, showing about everything that goes to make a fully equipped brick making plant. Several folders referring to some of the company's special machinery accompany the catalogue.

Cranes.—Cleveland Crane & Car Company, Wickliffe, Ohio. Vandyck-Churchill Company, 91 Liberty street, New York, Eastern agents. Catalogue. Size 9½ x 12 in.; pages 46. An especially attractive catalogue, containing numerous illustrations of crane installations, including an insert showing a large installation in the Elmira, N. Y., plant of the American Bridge Company, as well as some line drawings of some of the company's special coal and ash handling equipment. A page of details helpful in making intelligent inquiries for crane bids and a table showing the clearance that should be allowed in erecting a traveling crane in a new building.

Ore Furnaces.—Pennsylvania Salt Mfg. Company, Philadelphia, Pa. Catalogue. Size 7 x 9½ in. Contains a comprehensive description of the Wedge furnace, which is adaptable for mechanically roasting pyrites, sulphuret ores, &c., where ore production demands treatment in a furnace. In addition to describing the company's product and illustrating installations, the book contains a plausible argument in favor of the use of large mechanical roasting furnaces.

Industrial Mine Cars.—Kilgore-Peteler Company, Milwaukee, Wis. Catalogue. Size, 6x9 in.; pages, 56. Covers a line of industrial cars of all the accepted types, as well as a number of special dumping cars. Includes price-lists of wheels, axles contractors' buckets and data regarding the weights of rails of various sizes.

Steam Turbines.—B. F. Sturtevant Company, Hyde Park, Mass. Bulletin 151. Contains matter describing the Sturtevant steam turbines, including illustrations of unassembled parts and sectional drawings showing principal dimensions.

Railway Supplies.—Railway Specialty & Supply Company, Chicago, Ill. Loose leaf folder to be added to the company's series of printed matter. Describes pin and block joints for making connections from railroad tracks to batteries and their advantages. These consist of a pin similar to the usual channel pin and a block of steel drilled to accommodate the pin. The pin is grooved to admit the introduction of wires.

Pumping Machinery.—Blake & Knowles Steam Pump Works, 114 Liberty street, New York. Catalogue K-800; 6 x 9 in.; 173 pages. Covers the full line of Knowles pumping machinery, which includes all kinds of steam and power pumps for water, air, ammonia, &c.; high duty pumping engines, condensers, and parts and accessories. The brief descriptions of each are accompanied by tables of capacity, pressure, sizes, weights, &c., and sectional views are given in many cases to show special features of construction. Bulletin B-808 gives a list of parts of Blake pumps.

Shears.—George A. Hogg Iron & Steel Foundry Company, Pittsburgh, Pa. Catalogue. Pertains to heavy shears for cutting scrap, bars, billets, &c. Most of the company's important machines in this line are illustrated and specifications accompany each picture. Machines capable of cutting sections up to 5-in. square billets are shown, the largest being the No. 7½ high knife scrap shear, illustrated in *The Iron Age* March 19, 1908.

Steel Castings.—Atha Steel Casting Company, Newark, N. J. Bulletins Nos. 3 and 4. No. 3 refers particularly to Titan steel motor gears and illustrates a few railroad castings. No. 4 treats of steel castings for railroad cars more fully, showing views and drawings of bolsters, cars equipped with them, driving wheel centers and motor frames.

Concrete Machinery.—Nodamp Machinery Company, 415 Andrus Building, Minneapolis, Minn. Catalogue. Illustrates and describes Nodamp concrete block machines and other concrete working equipment.

Wire Rope.—A. Leschen & Sons Rope Company, St. Louis, Mo. Catalogue. This is a 48-page book, entitled "Half a Century of Rope Making," and in addition to containing a history of the company, it includes a catalogue of its lines of wire rope and cable tramways and haulage systems. There are some interesting views of installations where the rope is used in construction work, logging, excavating, and for cable ferry lines and suspension bridges. Sections of wire cables are shown, and full information as to prices and sizes given.

Finished Machine Keys and Steel Specialties.—Standard Gauge Steel Company, Beaver Falls, Pa. Catalogue; 4 x 6½ in.; 109 pages. Pertains to finished machine keys, con-

necting rod keys, gibs and keys, finished machine racks, compressed steel elevator guides, compression shaft couplings, &c. There are numerous price-lists, tables, figures and formulæ containing valuable information.

Crucible Steel. Samuel Brothers, 132 Front street, New York. Agents for Cammell, Laird & Co., Sheffield, England. Folder devoted to the latter company's line of high speed tool steel and turning, planing, slotting and boring tools.

Hydraulic Jacks.—Richard Dudgeon, Columbia and Broome streets, New York. Loose leaf circulars; 8½ x 11 in. One series of eight refer respectively to a universal hydraulic jack with flanged head and rack and pinion movement to the ram; the same with a thrust collar; the Star hydraulic testing pump; a hydraulic jack with independent double pump; the universal horizontal hydraulic jack; a recapitulation of the new Dudgeon universal jack and hydraulic pump, showing also a hydraulic ram combined with a force pump; a universal hydraulic claw jack, and a universal hydraulic railroad jack with independent claw. Circular No. 30 describes the universal double pump square base horizontal hydraulic jack; No. 31, the same with round base; No. 32, the same with removable claw; No. 33, the same with reinforced cistern and removable claw, and No. 34 is an elaboration of the advantages of the universal double pump horizontal hydraulic jack. Each circular gives an exterior view and several contain sectional views also, so that with the very complete descriptions given the principles of construction and operation are made perfectly clear.

Ice Making Machinery, Gas Engines, &c. -N. C. Davison Company, Pittsburgh, Pa. Booklet. Shows ice and refrigerating machinery, including pumps and gas engines particularly adapted for refrigerating plants in large packing houses, &c., as well as illustrating a complete unit for small refrigerating plants.

Steam Pumps.—A. S. Cameron Steam Pump Works, foot of East Twenty-third street, New York. Catalogue; 6 x 9 in.; 157 pages. This is a particularly comprehensive book, showing the Cameron line of pumps, including air, deep well, fire, hydraulic, steam, marine, mining and other pumps for practically every industrial use. The book is thoroughly indexed and contains tabulated specifications and other tables illustrating the capacity of the various sizes of pumps, besides information useful in connection with pump installations.

Steam Specialties.—Hayden & Derby Mfg. Company, New York. Bulletin; 51 pages. Describes in detail various models of the Metropolitan conveyors and Hayden-Derby ejectors, water heaters and jet apparatus fittings. This booklet contains some valuable suggestions regarding the selection of such fittings and directions for pipe opening and making repairs.

Centrifugal Pumps.—American Well Works, Aurora, Ill. Catalogue. Describes in detail the company's line of pumps, including pumps with horizontal shafts, both belt and gear driven and connected to engines or motors. Contains numerous illustrations, tables of dimensions, and data, such as speed tables for pumps of various sizes, tables of friction of water in pipes and elbows and other useful hydraulic information.

Coke.—Jamison Coal & Coke Company, Pittsburgh, Pa. Circular. Advances the contention that the coke it manufactures is the equivalent of any Connellsville coke ever produced, and contains a month's records on ash and sulphur determinations of the product.

Asbestos Pipe Coverings.—Philip Carey Mfg. Company, Cincinnati, Ohio. Catalogue; 6 x 9 in.; 70 pages. Embraces the line of Carey's asbestos coverings for steam pipes, boilers, furnaces, locomotive parts, &c., and illustrates installations. Also describes and illustrates other asbestos specialties, such as aprons, asbestos cement, asbestos cord, gloves, leggings, &c.

Pulverizer Mills.—Lehigh Car Wheel & Axle Works, Fullerton, Pa. Catalogue; 9 x 12 in. Contains comprehensive description of the Fuller-Lehigh pulverizer mill, with general sectional views of 33 and 42 in. mills, and a list of parts which are designated on the illustrations by letters and numbers.

Saws.—Champion Saw & Machine Company, Pittsburgh, Pa. Wood saw catalogue B 22. Contains price-lists of Champion circular solid tooth saws, inserted tooth saws and band saws.

Electric Heating and Cooking Devices.—General Electric Company, Schenectady, N. Y. Bulletin No. 4523. Contains interesting data and illustrations of electric cooking apparatus adapted to marine use.

Electrical Instruments.—General Electric Company, Schenectady, N. Y. Bulletin S. No. 4549, superseding No. 4420, is on the subject of meter testing and describes the Thomson high torque induction test meter, type IB-2. No. 4550, superseding Nos. 4330, 4348, 4386, 4410 and 4436, describes and illustrates carbon break circuit breakers, type C., forms G, P and K. Form P is particularly adapted for use in railroad and power systems, which are frequently subjected to severe short circuits and heavy overload. These are made up to 12,000 amp. capacity. No. 4551, superseding No. 4384, is concerned with Thomson horizontal edgewise instruments, type H, for switchboard service, including ammeters, voltmeters, single phase wattmeters, polyphase wattmeters, frequency indicators and power factor indicators. No. 4552 refers to direct current indicating instruments, type D, for switchboard use.

Machinery and General Supplies.—H. Channon Company, Market and Randolph streets, Chicago. Catalogue No. 33. Size 7 x 9½ in.; pages 832. Cloth bound. Compiled for manufacturers and distributers of machinery and general supplies, and deals principally with equipment used by steam and electric railroads, contractors, bridge builders, quarries, machine shops, factories, mines, blacksmiths, sawmills, paper mills, flour mills, cotton mills, elevators, electric light plants, water works plants, &c. Considerable space is given to railroad contractors' supplies, and nearly everything in the way of tools and equipment for construction work of every kind is illustrated, listed and described. The concluding 65 pages refers to tents, awnings and pleasure boat equipment.

Steel Sheeting.—George W. Jackson, Inc., Chicago-New York. Catalogue. Size 7 x 10 in.; pages 69. Contains interesting views of cofferdams and shaft work in the course of construction. Detail drawings of the steel sheeting shapes used in this work are shown. Various designs of interlocking steel sheeting are covered by the August Simon and George W. Jackson patents, owned by the company, and include steel driving points, which are illustrated. The catalogue also contains testimonial letters.

General Supplies.—McMaster-Carr Supply Company (formerly McMaster-Davis Supply Company), Chicago, Ill. Catalogue No. 14. Size 6 x 9¼ in. Cloth covers. Embraces descriptions and price-lists of a large variety of steam specialties and general supplies used by mills, mines, railroads, contractors, engineers, steam fitters, machinists, millwrights, &c. It has been carefully revised and brought up to date and contains many improved mechanical specialties lately introduced.

Gyratory Stone Crushers.—Smith & Post Company, Milwaukee, Wis. Booklet. Deals with the Symons gyratory crusher, for which a number of advantages are claimed, among them compactness, large receiving opening, automatic lubrication, absence of bolts in the frame, easily replaced parts, and an eccentric which it is stated requires no rebabbitting. Sectional views of the machine and its parts are shown, and a portable installation with a folding elevator attachment. Dimensions, weight, capacities and required power of the various size machines are tabulated.

New Publications.

The Copper Handbook. Volume VII. By Horace J. Stevens. 8vo., 1228 pages. Published by the author, Houghton, Mich. Price, $5.

The delay in publishing the handbook for 1907 was, as explained by the author in his preface, occasioned by a fire in the printing establishment where the previous book had been prepared and a long continued and serious illness of the author and his daughter. Much of the matter regarding mining properties and statistical tables has been reprinted in the present volume without change of form; in fact, the descriptions of the mines throughout the world are unchanged from the previous volume. A number of new chapters, however, have been added, dealing on mining, metallurgy, preparing metal for the market, alloys of copper and brands of copper. That portion of the book dealing with the copper production and possibilities in various sections and copper camps of the world has been entirely re-written, revised and brought to date. Mr. Stevens has in the present work as in former volumes assiduously pursued the promoters of fake or doubtful schemes.

The Independent Steel & Wire Company, House Building, Pittsburgh, Pa., with plants at Monessen, Pa., and Cuyahoga Falls, Ohio, manufacturer of round and flat steel wire and coiled steel springs, has opened a New York office at 2 Rector street, United States Express Company Building, which is under the management of F. E. Whitehouse, who was for several years sales manager of the Crucible Steel Company of America at the Spaulding & Jennings Works, Jersey City, N. J., for many years previously with the American Steel & Wire Company.

The Magee Furnace Company, Boston, Mass., whose works are in Chelsea, is advising the trade by circular that its shops and foundries fortunately, though by a narrow margin, escaped the flames which devastated the latter city on Sunday, April 12.

Fuel Tests in a Producer Gas Power Plant.

The accompanying table, published by permission of the Director of the United States Geological Survey, shows the results obtained on a wide range of fuels tested by its technologic branch, under the direction of Joseph A. Holmes, expert in charge, and Robert Heywood Fernald, engineer in charge. These tests were made at St. Louis, Mo., at the fuel testing plant which was located on the grounds of the Louisiana Purchase Exposition. At the time this plant was erected there were few gas producer power plants in the country burning any class of bituminous coals, and many prominent engineers were in doubt as to the possibility of operating a gas engine on gas produced from coals such as are mined in the Central and Western States.

This branch has done a valuable service to the country in demonstrating the possibility of burning nearly all classes of low grade fuels with good economy. As will be noted in the table, the poorer coals required a correspondingly greater quantity of the fuel to produce a horsepower. The equipment used was a 250-hp. pressure producer with a centrifugal tar extractor and gas holder. A 235-hp. three cylinder vertical gas engine belted to a generator produced power which was measured by electric instruments connected with the switchboard. As will be seen the results obtained are much better than those from steam plants of corresponding size.

Table of Data and Results on Representative Fuels Burned in a Producer Gas Plant at the Fuel-Testing Plant of the Technologic Branch, U. S. Geological Survey.

Fuel.	Proximate analysis, per cent. Moisture.	Volatile matter.	Fixed carbon.	Ash	B.t.u. per pound of fuel. As fired.	Dry.	Cubic feet standard gas produced per pound of equivalent[a] fuel consumed by producer plant. As fired.	Dry.	B.t.u. per cubic foot of standard gas.	Pounds of equivalent[a] fuel per B.h.p. hour. As fired.	Dry.
Florida peat	21.00	51.72	22.11	5.17	8,127	10,289	28.5	36.1	175.2	2.57	2.03
Average of four lignites	35.05	28.96	27.72	8.27	7,164	11,138	26.3	40.3	169.9	2.43	1.73
Average of four Illinois coals	11.51	31.81	43.46	13.22	10,651	12,030	49.6	56.1	153.2	1.66	1.47
Average of four Pennsylvania Coals	3.47	19.68	67.31	9.54	13,651	14,136	71.4	74.0	141.6	1.16	1.12
Average of four West Virginia coals	2.47	32.12	60.24	5.17	14,248	14,610	77.5	79.5	149.6	1.03	1.00

[a] Equivalent fuel includes that used in the producer and also the amount required to generate the steam necessary for operating the producer.

Of the four Pennsylvania coals tested, two came from the lower Kittanning bed, one from the Lower Freeport and the fourth from the Pittsburgh bed. Of the West Virginia coals, one came from the Ansted bed, another from the Eagle, both of these being in the New River District; a third from the Pittsburgh and the fourth from the Keystone bed.

South American Notes.

SAN JUAN, C. A., March 31, 1908.—Acre, in the central part of South America, is progressing so fast that the inhabitants of that new region have asked the government to make special new laws for the province, regulating the ownership of mines, lands, &c. This is the territory which a few years ago caused so much friction between Argentina, Brazil and other nations, and in which a number of Americans were interested. It is now opening up a great trade in rubber, precious woods, gold and silver mining, and it might be well for our business men to keep well informed as to its requirements, as Acre is rapidly increasing in inhabitants and imports as well.

The Banque Agricole, or Agricultural Bank of Sao Paulo, Brazil, has been opened with a subscribed capital of 25,000,000 francs. Foreign exchange will be one of its principal branches and agencies will be established in Rio de Janeiro and in Santos, the great coffee port.

At the Buenos Aires National Bank a check for 2,500,000 francs has just been received from the government treasury, to be applied to the conversion fund. The Argentine conversion fund is now $112,250,000, gold.

M. Benard is on his way from Europe to Buenos Aires as representative of an industrial syndicate in Paris, to negotiate for the building of the Belgrano and other port works, docks, &c. He will also go to Pernambuco, to meet the government agents and make bids for the port works there. This syndicate is backed by the Netherland Bank, Banque de Paris and the Union Bank.

One hundred and seventy-two kilometers of the railroad to Matto Grosso has been inaugurated; this line now reaches Avanhandava, Sao Paulo. When this railroad penetrates the heart of Matto Grosso province, a vast region, as large as the Mississippi Valley, will be opened up to commerce. So far communication with the section has been difficult, because the rivers, though large, are very shallow. Rubber is one of the chief exports, but eventually and with increasing population, nearly all the semitropical products will be obtained there in great abundance. Germany has a staff of men studying this rich section of central South America, and it would not be strange if the Germans would make out of it quite as great a commercial plum as they have of Rio Grande, Brazil.

The Argentino-Pacifico Railway is now operating its line from Rivera to Saliqueto, it having been approved by the government. This opens up a huge section of the Pampas region, so prolific in cattle and sheep, that it has become the principal rival of our Western plains. C.

Large Contracts for Piping Equipment.—The Best Mfg. Company, Twenty-fifth street and Allegheny Valley Railway, Pittsburgh, has been awarded the important contract for piping the Youngstown Sheet & Tube Company's plant extensions at East Youngstown, Ohio. The order calls for all the steam, exhaust boiler feed, blow off and other high pressure piping, valves and fittings for two new blast furnaces and power plants, where 20 additional boilers are being installed. The specifications call for 15-in. boiler headers and 10-in. connections, while Best patented gate valves, with one-piece bronze stems, will be used throughout on all the high and low pressure piping. The joints will be rolled steel shrunk and pieced as per Julian Kennedy's specifications. The contract is to be completed within four months. Other contracts taken by the Best Company include power plant piping and its erection for high pressure steam lines for the Schlitz Brewing Company, Milwaukee, Wis., and high pressure equipment for the Copper Queen Copper Mining Company, Bisbee, Ariz., and for the Tindel Morris Company, Philadelphia.

The New York *Journal of Commerce* says: April 10 is the date on which retail merchants settle their accounts with manufacturers and wholesalers for goods purchased during the first quarter of the year. Owing to the bad times, considerable apprehension was felt as to how bills would be met. This uneasiness was proved to have been unjustified. From every quarter the most encouraging reports have been received.

The processes referred to in the article on "Gröndal Concentrates and Briquettes" which appeared in *The Iron Age* of April 9 are controlled in the United States by the American Gröndal-Kjellin Company, 45 Wall street, New York, which has prepared considerable literature on the subject of concentrating and briquetting, as well as on the operation of the Kjellin electric furnace.

PERSONAL.

A. W. Thompson, formerly president of the Republic Iron & Steel Company, was last week elected president of the Inland Steel Company, Chicago. He succeeds Charles Hart, who resigned April 1.

James L. Gerry has resigned from the position he has occupied for many years in the Treasury Department at Washington as chief of the Division of Customs. It is understood that his resignation has been accepted and that on May 1 he will become a member of a new law firm, to be known as Brown & Gerry, 12 Broadway, New York, whose practice will be particularly along lines relating to customs, revenue and pure food cases.

The manager of sales of the Carnahan Tin Plate & Sheet Company, Canton, Ohio, is G. T. Thomas and not G. F. Thomas, as recently stated in these columns.

A. Appleton Packard of the firm of Burgess & Packard, designers and builders of boats, Boston, has been elected president and general manager of the New London Marine Iron Works, New London, Conn., to succeed Charles E. Hyde.

J. L. Osgood of Buffalo, N. Y., will sail for England April 22, to establish the production of his indestructible tool handles under his patents of England, Germany and France.

P. H. Griffin, manager of the New York Car Wheel Company, Buffalo, N. Y., has withdrawn from that connection.

E. E. Keller, for over 20 years connected with the Westinghouse interests and for 14 years vice-president of the Westinghouse Machine Company, having completed his duties as receiver and general manager, severed his connection with the management of that company April 1.

W. J. Turner has been elected a Circuit Judge for Milwaukee County, Wis. He has had large financial interests in the Western Malleable & Grey Iron Company of Milwaukee and Port Washington, and two years ago was president of the Milwaukee Metal Trades Association. He has practiced law in Milwaukee for many years.

W. H. von Mengeringhausen has retired as manager of the Catasauqua Castings Company, Catasauqua, Pa., and John F. Hoy, formerly manager of the Allentown Foundry Company, has taken charge as general manager. Mr. von Mengeringhausen has not decided what he will do in the future, but it is likely that he will remain in the foundry business as broker and manufacturers' sales agent.

Alfred H. Schütte of Cologne, Germany, importer of American machinery and tools, arrived in New York April 7. He is here on a business trip and expects to remain about a month.

R. B. Carr, Pacific Coast sales manager for the Carnegie Steel Company, and I. B. Williams, who occupies a similar position with the American Tin Plate & Sheet Company, are visiting Pittsburgh on business.

W. C. Cronemeyer, who is now president of the Chamber of Commerce, McKeesport, Pa., delivered a scholarly and exhaustive address on "Workmen's Protective Insurance Systems" before the Emerson Club of that city on March 24. The address has been printed in pamphlet form for distribution.

Arthur Reiche of the Arthur Koppel Company, Pittsburgh, builder of mine and industrial cars and portable railroad equipment, has returned from a two months' trip to Europe.

W. P. Snyder, president of the Shenango Furnace Company, Pittsburgh, has returned from a two months' trip to Florida.

R. B. Woodworth, an engineer with the Carnegie Steel Company, Pittsburgh, will read a paper before the Railway Club of Pittsburgh, on the evening of April 24, on "New Uses for Steel."

John Pauley has been appointed superintendent of the machine shops of the Youngstown Sheet & Tube Company, Youngstown, Ohio.

Samuel E. Duff, for 12 years manager of the bridge and structural works of the Riter-Conley Mfg. Company, Pittsburgh, has resigned. He will engage in general consulting engineering practice and the development of his patents relating to continuous steel track support.

Judge Elbert H. Gary, chairman of the United States Steel Corporation, was elected president of the Automobile Club of America at the annual meeting of that society held in New York on the evening of April 14.

OBITUARY.

LOUIS Y. SCHERMERHORN of Philadelphia, an engineer, who was president of the Engineers' Club of that city, died April 2.

HENRY V. HARTZ of H. V. Hartz & Co., Cleveland, Ohio, died March 28, aged 71 years. He was born in Germany, but had resided in Cleveland about 40 years. He possessed exceptional mechanical talent, and was the inventor of a tackle block and a flue welding machine. He leaves a widow and two daughters.

FRITZ KINTZLE, the general manager of the Rothe Erde Steel Works, at Aix-la-Chapelle, Germany, died March 19. He was born at Harlingen, Luxemburg, January 19, 1852, was graduated at Aix-la-Chapelle in 1876, was first employed at Ougrée in Belgium, and in 1879 joined the engineering staff of the Rothe Erde Works. In 1900, on the retirement of Jules Magery Mr. Kintzle became works manager, and in 1907, upon the consolidation of the Aachener Verein and of the Gelsenkirchen Company, was appointed general manager of the plants of the former company. He was very active in the introduction of basic Bessemer steel for structural purposes, and was a member of several important committees for preparing standard specifications of steel.

WILLIAM R. JENKINS, treasurer and general manager of the Howard Iron & Tool Company, Bellefonte, Pa., died April 9. He had won a reputation as an inventor.

FRITHROF LUNDAHL, chief engineer of the Bethlehem Steel Company, died of heart failure in the Pennsylvania Hospital at Philadelphia, April 11, aged about 54 years. He was a native of Sweden, and was educated in Swedish schools, preparing himself as a draftsman. He had been in this country for more than 25 years. He had been employed by the Carnegie Steel Company before going to Bethlehem.

FRANK H. CHAMBERLAIN, president and general manager of the J. D. Smith Foundry Supply Company, Cleveland, Ohio, died April 9, aged 38 years, after an illness of three weeks with meningitis.

The Bollinger-Andrews Construction Company, with offices in the Empire Building, Pittsburgh, and plant at Verona, Pa., has been awarded a contract calling for 750 to 1000 tons of structural steel and tank work, to be used in rebuilding the plant of the Large Distillery Company, Large, Pa., and has other orders on its books for miscellaneous structural work aggregating 1600 tons. During the past year the Bollinger-Andrews Company has bought additional land, and it now owns 20 acres, while its capacity has also been increased about 3000 tons per month.

In spite of unsatisfactory conditions in the steel trade the amount of work in development of iron ore mines and in stripping, &c., on the Mesaba range is increasing as the season grows warmer. At Eveleth the mines of the Oliver Iron Mining Company are quite active, and stripping and sinking are proceeding with double shifts in many cases. The Adams, Gilbert and Fayal mines are very busy, and will be heavy producers whenever there is a demand for ore.

The Adjustable Steel Centering Company, 330 Frick Building, Pittsburgh, has been incorporated under the laws of Delaware with a capital stock of $50,000 for the manufacture of adjustable steel forms for curved surfaces, the plant being located at Dayton, Ohio. J. Rogers Flannery is president and treasurer; James E. Wood, vice-president, and Wm. F. McNabb, secretary.

NEWS OF THE WORKS.

Iron and Steel.

In March the No. 3 furnace of the Wharton Steel Company, Wharton, N. J., made the best month's record for this group of furnaces, its output being 11,187 tons.

Victoria Furnace of the Goshen Iron Company, Goshen, Va., was blown in March 25. It has been idle since December 18 and in the interval repairs were made.

The Genesee Furnace of Corrigan, McKinney & Co., at Charlotte, N. Y., was blown out April 6.

The Josephine Furnace of Corrigan, McKinney & Co., at Josephine, Pa., was blown out April 11 and will remain idle for some time.

Furnace B of the Buffalo Union Furnace Company, Buffalo, N. Y., was blown in April 6. Furnace A of this group, which was blown out March 16, is being relined.

The Cleveland Furnace Company, Cleveland, Ohio, blew out its furnace April 9.

The No. 2 furnace of Joseph E. Thropp, at Saxton, Pa., was blown in April 9.

The new Vanderbilt Furnace of the Birmingham Coal & Iron Company, at Boyles, Ala., will be blown in April 20. The furnace now in operation at the Vanderbilt plant will be blown out at that time.

No. 3 furnace of the Warwick Iron & Steel Company, Pottstown, Pa., was blown out April 14. This leaves but one stack, No. 1, of this company in blast.

General Machinery.

The E. Killing's Molding Machine Works, Davenport, Iowa, has recently purchased the plant of the Simplex Washing Machine Company in West Davenport, and will move its business to that location. This company succeeds the Killing Molding Machine Company.

Batcheller, Clark & Batcheller, New York, dealers in machinery, have incorporated with a capital stock of $20,000.

The Buick Motor Company, Flint, Mich., is to enlarge its plant by the erection of an addition, 74 x 756 ft., three stories, the building to be completed in the early fall. As soon as the new building is ready for occupancy the equipment located in the company's plant at Jackson, Mich., will be installed in it and no new machinery will be required.

Some equipment will probably be purchased a little later by the Conestoga Traction Company, Lancaster, Pa., for equipping its new barn. While the company has not yet completed plans for the new building, its approximate dimensions will be 117 x 400 ft., and the mechanical equipment that will be required has not yet been decided upon.

The Idaho & Washington Northern Railroad, Spirit Lake, Idaho, is now preparing plans for its new shops and roundhouse in that city

Foundries.

The Milwaukee, Wis., Stove & Foundry Company has amended its articles of incorporation, changing its name to the Milwaukee Stove Works and increasing its capital stock from $25,000 to $75,000. The company's business is developing at a rapid rate and is an outgrowth of the Speich Stove Repair Company, still in existence. The officers are A. Speich, president, and J. C. Bradley, secretary.

Kennedy's Foundry and the Baltimore Malleable Iron & Steel Castings Company, Baltimore, Md., has been incorporated to continue the foundry business which has been conducted for a number of years by the late Patrick Kennedy. The company manufactures malleable iron and steel castings and soft gray iron castings of every description. The business will be conducted on the same lines as in the past, and careful attention will be given to all inquiries regarding the making of castings of any description.

The Keystone Steel Foundry Company, Avonmore, Pa., is installing additional open hearth equipment which will increase its capacity and give it an output of 20 to 25 net tons of steel castings per day.

Power Plant Equipment.

The Cotton Plant Light & Power Company, Cotton Plant, Ark., is contemplating the enlargement of its plant by the erection of a new brick building and the installation of $8000 worth of machinery. The total expenditures for improvements planned will aggregate $15,000. It is also the purpose of the company to install a 10-ton ice plant in the near future. E. P. Ford is engineer and manager.

The Board of Directors of the Westmoreland County Home, Greensburg, Pa., will receive bids until May 1 for the erection and equipment of a boiler house at the County Home.

M. Griffin O'Neil, Dallas, Texas, president of the O'Neil Engineering Company, has secured a franchise from the city of Waurika, Okla., for the construction of an electric light and ice plant, work upon which will be begun at once.

The Bear Lake Electric Light & Power Company, Paris, Idaho, expects to make improvements to its plant which will require the expenditure of about $12,000. These include a pipe line to convey water from a spring at the head of Paris Creek to the present power house. It is also proposed to construct a new power house, and when these plans are carried out the plant will generate 1000 hp., which will be distributed through the valley for lighting purposes and will supply current for the operation of an electric railroad from Montpelier to the lake.

The Schaefer Mfg. Company, Berlin, Wis., organized for the manufacture of engines, has been incorporated with a capital stock of $50,000. The incorporators are C. E. Bellis, H. R. Laing and W. E. Schaefer.

At the municipal election held in Milwaukee April 7, the people of that city voted in favor of proceeding with the erection and installation of a municipal lighting plant. Some time ago bonds were voted for that purpose, but with the creation by the State Legislature of a public utilities act governing the management of all city utility corporations, there was a decided sentiment in favor of abandoning the plan of having a municipal lighting plant.

It is the intention of the Utica Electric & Water Company, Utica, Mich., to increase the present capacity of its 200-kw. plant to about 900 kw., in order to take care of an increased demand for light and power.

The plant of the Lawrenceville Water & Light Company, Lawrenceville, Ill., is undergoing changes and improvement, for which the material and equipment required have already been purchased. Among the changes being made is that of substituting an alternating current system of distribution for the direct current now in use. In addition to the work now under way the company contemplates an extension of its transmission lines to two neighboring towns, and expects to install additional generating machinery later in the year.

Bridges and Buildings.

The Dodd Steel & Iron Works, Des Moines, Iowa, has recently completed and now has in operation a plant for the fabrication of structural steel. The shop building is 32 x 72 ft., one story high, and is equipped with an overhead system of derricks and hoists. All of the machinery that will be required for the present has been installed.

Miscellaneous.

The city of Anamosa, Iowa, has decided to purchase the private water system supplying the town, and will remodel and improve it.

The Rhinelander Lighting Company, Rhinelander, Wis., has been incorporated with a capital stock of $100,000, the incorporators being E. A. Forbes, C. A. Wixson and others.

The question of issuing bonds for the building and equipment of a water works system will this month be submitted to the voters of Yuba City, Cal.

The Horton Boat, Engine & Supply Company, Rochester, N. Y., which was recently incorporated with a capital stock of $75,000, will continue the business which was started a few years ago with small capital and has grown so rapidly as to necessitate increased capital. The company manufactures marine and stationary gasoline engines, and engine sundries, launches, motor boats, &c., and carries considerable stock of its various products.

The New Jersey Motor Company, Rutherford, N. J., recently incorporated with a capital stock of $10,000, will deal in automobiles and motor boats, and is establishing a new plant for the manufacture of parts of cars and boats and for general repair work. A lathe, drill press and shaper have been installed. H. W. Kuhl is president, and W. E. Walter, secretary and treasurer.

The C. I. F. Company, New York, has sent out inquiries for a considerable amount of water works material for export, including hydrants, tees, bends, valves, various sizes of pipe, &c.

Brick drying installations are being furnished by the Massachusetts Fan Company, Watertown, Mass., as follows: L. L. Stevenson, Birmingham, Ala., one 90-in. three-quarter housing fan in connection with direct heat furnace system; Peoria Brick Company, Peoria, Ill., one 160-in. three-quarter housing fan to exhaust waste heat from kilns and force into drier; Dillonvale Brick & Tile Company, Dillonvale, Ohio, complete drying outfit, consisting of one 120-in. exhaust fan, direct connected engine, heater and complete equipment.

P. E. Hunter and N. D. Yant of N. D. Yant & Co., Allegheny, Pa., fabricators of structural steel, have taken over the business of the National Mfg. Company, manufacturer of welded annealing boxes equipped with the Johnson patent protected strips. The company until recently operated a plant on Allegheny avenue, Allegheny, Pa., but the entire equipment is being removed to the plant of Yant & Co., where the annealing boxes will be manufactured on a larger scale. It is stated that this annealing box has given very satisfactory results in annealing steel sheets, &c., one of the principal advantages claimed for it being that it can be renewed. Its prolonged life makes the use of this box economical.

The Iron and Metal Trades

The reports of sales of Alabama Pig Iron to Italy, in a quantity variously estimated at 100,000 to 150,000 tons, do not appear to have any basis of fact. The largest Birmingham merchant interest did sell 10 days ago a lot of 10,000 tons to Genoa, and the second largest interest, in tonnage of Merchant Iron, has during the last few weeks sold in small lots a total of about 5000 tons, in addition to 3000 tons shipped some time ago.

The merchant furnace companies of all parts of the country have been invited to attend a general meeting tomorrow, at which it is proposed to place sales in the hands of district committees.

In the meantime the volume of business offering is very light, and with the exception of one inquiry for 12,000 tons, which may or may not be serious, the larger consumers are holding off. Prices, while not quotably lower, are easier, since even small lots are being sold at inside prices.

The Steel markets are very quiet, and some uneasiness is developing in some of the branches of finished Iron and Steel. Concessions are being made on Iron Bars, with 1.35c., Pittsburgh, being openly quoted, and that in turn is affecting Steel Bars.

From Chicago comes the announcement that the Illinois Steel Company has closed for 31,000 tons of Steel Rails for the New York Central system. One or two other fair lots are coming out.

Bids are going in on the 14,000-ton Beaver bridge, the largest contract now in sight.

During the week there have been placed 2800 tons for trade elevators, with more to come; 1100 tons for the Corn Products plant, 1400 tons of bridge work for the St. Paul Pacific Coast extension, and 1000 tons for a building in Seattle. Some low figures are being made by fabricators, one instance in Chicago cropping up where business was taken at $44 per ton. The Plate trade is particularly dull.

California oil interests are in the market for an important 8-in. line, which would furnish a considerable tonnage.

There has been some buying of Rerolling Rails in the Chicago District, which has caused some interest. In Heavy Melting Scrap there has been some business in the East, but generally speaking the markets in Old Material have been lifeless and inclined to be weak.

Copper has eased off again and Electrolytic is available at 12¾c. It remains to be seen, however, whether the floods in Montana, by cutting off electric power, may not lead to a serious enforced curtailment.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

Actuals, or Asks, one month and one year back:

	Apr. 15, 1908.	Apr. 8, 1908.	Mar. 18, 1908.	Apr. 17, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	*$17.75*	$17.75	$18.25	$24.50
Foundry No. 2, Southern, Cincinnati	15.25	15.25	15.25	24.75
Foundry No. 2, Local, Chicago	*17.37*	17.35	17.50	26.00
Bessemer, Pittsburgh	*17.65*	17.65	17.90	23.35
Gray Forge, Pittsburgh	*15.40*	15.40	15.90	21.85
Lake Superior Charcoal, Chicago	*20.50*	20.50	21.50	26.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	30.00
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.00
Open Hearth Billets, Phila	*29.20*	29.20	30.40	31.50
Wire Rods, Pittsburgh	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	*12.00*	12.00	12.25	18.00
Steel Rails, Melting, Phila	12.75	12.75	12.75	19.00
Iron Rails, Chicago	15.00	15.00	15.00	25.00
Iron Rails, Philadelphia	17.00	17.00	17.00	27.00
Car Wheels, Chicago	*13.00*	14.00	15.50	25.00
Car Wheels, Philadelphia	14.00	14.00	14.00	24.00
Heavy Steel Scrap, Pittsburgh	*12.75*	12.75	13.00	18.00
Heavy Steel Scrap, Chicago	*11.00*	11.25	11.50	15.50
Heavy Steel Scrap, Philadelphia	12.75	12.75	12.75	19.00
FINISHED IRON AND STEEL.				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	*1.50*	1.65	1.65	1.93½
Common Iron Bars, Chicago	1.65	1.65	1.65	1.81½
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.70	1.70	1.70	1.85
Skelp, Sheared Steel, Pittsburgh	1.80	1.80	1.80	1.90
SHEETS, NAILS AND WIRE.				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	1.90	1.90	1.90	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	13.00	13.12½	13.00	24.50
Electrolytic Copper, New York	*12.75*	12.87½	12.87½	24.00
Spelter, New York	*4.65*	4.70	4.80	6.80
Spelter, St. Louis	*4.50*	4.52½	4.60	6.65
Lead, New York	4.00	4.00	4.00	6.12½
Lead, St. Louis	3.85	3.85	3.85	5.95
Tin, New York	**32.00**	31.75	30.50	40.50
Antimony, Hallett, New York	8.75	8.75	9.00	22.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, April 15, 1908. (By Telegraph.)

In point of new business the tonnage developed in Iron and Steel mill products so far this month is somewhat below that of the corresponding weeks of March. As long as buyers can secure prompt execution and delivery of their orders, and with the chances of any change that may occur in prices being downward rather than upward, there is no incentive for the investment of capital in surplus stocks. Jobbers and manufacturers are accordingly considering only immediate requirements in their purchases and, save in those lines fostered by an agricultural demand, there is no improvement in the aggregate volume of such orders. Radical betterment of the situation waits upon the action of the railroads, which consume more than half of the normal tonnage. Of the additional Rail tonnage placed by the New York Central, 31,000 tons was awarded to the Illinois Steel Company. Orders for lots of a few hundred tons are being placed by some of the smaller lines for immediate shipment, but considering Rail making capacities the tonnage they afford is of little consequence. There is a large amount of prospective business in Structural Shapes which will undoubtedly sooner or later be placed, but closures of contracts are deferred from week to week, evidently in the hope of securing concessions on prices of material. Fabricated work is being taken at prices near the vanishing point of profit. A recent contract for a building structure was let at $44 a ton, which is the lowest price reported on such work. Plates and Bars are extremely quiet, but Merchant Pipe shows some improvement. The fact that buyers in all lines are urgent

in their demands for prompt shipment is an encouraging feature, since it assures a prompt reflection on any increase that may appear in consumptive demand. It is estimated by those close in touch with the Pig Iron situation that not more than 30 per cent. of the Gray Iron, 14 per cent. of the Malleable, and less than 10 per cent. of Steel Casting Foundry capacities in the Middle West are in operation. There is no change in Pig Iron either as to price or demand. The question of an advance of 25c. a ton in freight rates on Cast Iron Pipe to apply in central territory north of the Ohio River is again up for consideration. The proposed action is being strongly opposed by the Pipe interests.

Pig Iron.—Whatever may be the final outcome of efforts being made by the leading interests to secure a better understanding and more uniformity among producers as to prices, there is nothing in the present state of the market indicating the accomplishment of anything definite in this direction. The aggregate of tonnage changing hands from week to week is very small, and for the past week is rather under than over recent averages. Despite the pressure put upon the market by continued inactivity, the general level of prices still holds close around $12 to $12.50, Birmingham, for No. 2 Foundry. Practically all the business offered is for prompt shipment, there being little or no inquiry for deliveries extending through the second half. While a number of furnaces are willing to make low prices for nearby delivery, there is on all hands more or less hesitation when it comes to extensive commitments reaching through the year. Some encouragement is derived from the fact that stocks in foundry yards have been gradually whittled down until with very few exceptions they are extremely low. This is evidenced in instructions urging prompt shipment which almost invariably accompany orders. It is also apparent from the small tonnage included in these orders that melters are only anticipating their requirements by days and weeks instead of months and quarters as heretofore. The production of Northern Merchant Iron is now limited to the output of three furnaces, and there is, therefore, no tonnage of consequence being piled in this district. Very little Northern Iron is being offered in price competition with Southern brands, and trade in the former is limited to purchasers who are willing to pay the difference for a specific brand. The following prices are for April, May and June delivery, f.o.b. Chicago:

Lake Superior Charcoal	$20.50 to $21.00
Northern Coke Foundry, No. 1	17.85 to 18.35
Northern Coke Foundry, No. 2	17.35 to 17.85
Northern Coke Foundry, No. 3	16.85 to 17.35
Northern Scotch, No. 1	18.35 to 18.85
Southern Coke, No. 1	16.85 to 17.35
Southern Coke, No. 2	16.35 to 16.85
Southern Coke, No. 3	15.85 to 16.35
Southern Coke, No. 4	15.35 to 15.85
Southern Coke, No 1 Soft	16.85 to 17.35
Southern Coke, No. 2 Soft	16.35 to 16.85
Southern Gray Forge	14.35 to 14.85
Southern Mottled	14.10 to 14.60
Malleable Bessemer	17.10 to 18.00
Standard Bessemer	19.40 to 19.90
Jackson Co. and Kentucky Silvery, 6 %	17.90 to 18.40
Jackson Co. and Kentucky Silvery, 8 %	19.90 to 20.40
Jackson Co. and Kentucky Silvery, 10 %	21.90 to 22.40

(By Mail.)

Billets and Rods.—The market continues inactive so far as new business is concerned. There is very little demand for Forging Billets, nor are there any inquiries in the market for lots of considerable size. Outside of the few odd lots being picked up for special requirements, it would seem that the needs of the principal buyers are covered by uncompleted contracts, against which specifications are being made in a moderate way. Prices are reported to be firmly maintained. We quote Forging Billets at $31.50 to $32.50, Chicago. Wire Rods are somewhat more active, and a fair volume of business is being done in small lots, with prices firm at the following quotations: Bessemer, $35; Basic, $36; Chain, $37, all at Pittsburgh.

Rails and Track Supplies.—An allotment of the New York Central Rail tonnage, amounting to 31,000 tons, has been placed with the Illinois Steel Company. This comprises the chief transaction in Standard Sections for the week, though a few small lots from various sources for immediate shipment have been entered. The local mill has enough business on hand and in sight to keep it occupied at moderate capacity up to and possibly beyond the first half. New business in Light Rails is developing slowly, and Rerolled Rails continue irregular in price, being shaded as much as $4 a ton from regular quotations. No new orders of notable size for Fastenings are included in the scattering transactions reported in this line. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.80c. to 1.90c., according to delivery: Track Bolts, 2.25c. to 2.35c., base, Square Nuts, and 2.40c. to 2.50c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—The tonnage of business actually closed during the week, while somewhat in excess of that of the recent weeks, fell below expectations. A number of important deals that seemed to be completed up to the point of contracts still hang fire, and in several instances hesitation is due to expectancy of lower prices. The principal tonnage of the week was that of the Corn Products Company, amounting in all to 4100 tons, which was taken by Vierling, McDowell & Co. Of this about 500 tons was Castings, the remaining 3600 tons being Structural Shapes. On a reletting of 200 tons, declined by the original contractor, for the Skagit River bridge at Mt. Vernon, Wash., the proposal submitted by the American Bridge Company has been accepted; the same interest also secured a contract for 1000 tons for the Leary Building, Seattle, Wash. Of the 2300 tons of bridge and viaduct material let by the Chicago, Milwaukee & St. Paul, 1800 tons were taken by McClintic-Marshall Construction Company; 500 tons being distributed between the Chicago Bridge Company and the Minneapolis Steel & Machinery Company. The Boley Building, Kansas City, 650 tons, was taken by the Kansas City Structural Steel Company, Kansas City, Mo. Plans for a building to be constructed by M. Born, Chicago, include 1000 tons, and are in the hands of fabricators for figures. There are also quite a number of new projects coming up from week to week, which seem to represent definite rather than speculative plans; but, following the prevailing tendency to hold off, few of them are being closed. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—Plate tonnage continues to accumulate very slowly. With the practical cessation of new car building, one of the largest sources of Plate business is cut off, and other users, such as boiler and tank shops and shipyards, are likewise running light. Under the circumstances, therefore, no active buying movement in Plates can reasonably be expected until the principal consumers are considerably busier than they are at present. Prices are unchanged and firm at regular quotations, except for concessions of $1 or $2 a ton, which continue to be made by some mills on narrow Plates We quote for mill shipments as follows: Tank Plates, ¼- in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—Specifications against contracts are being furnished in about the same volume as in March, but new business is not holding up to the record of last month. Buyers show no disposition to depart from the practice of buying from hand to mouth for current requirements, and jobbers' stocks are being reduced as far as possible. Prices from both store and mill are unchanged and are reported to be evenly held at current quotations. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 to 26, 2.53c.; No 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—A little improvement is noted in the volume of specifications for Iron Bars, but it is not reflected in the movement of Steel Bars, which are extremely quiet. The mills of the Interstate Iron & Steel Company have been running pretty steadily for the last two weeks, and are scheduled for operation throughout the present week with the exception of one day. A large tonnage of Steel Bars is reported to have been offered from a source outside of this territory at a cut of $4 a ton, but so far as is known the offer was not entertained by the mills. Prices generally are reported to be firmly maintained at regular prices. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—The demand for Merchant Pipe seems

to be increasing slowly, but it is apparent from the tonnage involved that orders include nothing more than what is needed for current requirements. Jobbers' stocks are reported to be very much reduced, and any increase in the consumptive demand will, therefore, be quickly reflected in mill orders. Local trade shows but little gain, but the outlook for a better movement is considerably more encouraging. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 71 per cent. on Black Steel Pipe, ¾ to 6 in. From two to three points above these prices is asked for Iron Pipe.

Boiler Tubes.—No departure is noticed from the hand to mouth buying that has characterized the trade in Merchant Tubes for some time past. Shop requirements are to a large extent being supplied by the jobbers from warehouse stocks. We are advised that prices are being regularly maintained, except by one or two outside producers of limited tonnage. Mill quotations for future delivery, on the base sizes, are as follows: 2¾ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	35	35	35
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2¾ to 3 in.	60	47½	47½
6 in. and larger	50	35	...

Merchant Steel.—Shafting discounts, which for some time have been persistently shaded, are revised, having been increased by two points on car lots and four points on less than car lots. Very little business is being offered and orders are, as a rule, for small lots only. New business in miscellaneous Shapes and Tire sizes has fallen off somewhat as compared with that of March. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1¼ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 56 per cent. off in car lots; 52 per cent. less than car lots, base territory delivery.

Cast Iron Pipe.—About 1000 tons was comprised in the aggregate of small lettings awarded last week. Founders report no lots of attractive tonnage in sight for the immediate future, and it is evident that municipal estimates are generally being closely pruned to meet only imperative improvements. Routine orders for maintenance service are fairly plentiful, but in the absence of heavier business the tonnage they afford does not go far in supplying plant capacities. There is no demand of consequence for Gas Pipe, though a few gas plant interests have signified their willingness to buy if satisfactory extensions of payment dates could be arranged. We quote, nominally, per net ton, Chicago, as follows: Water Pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25; with $1 extra for Gas Pipe.

Metals.—While the Copper market is nominally weaker on advices from the central selling agencies, there is practically no change in the local situation. This is due mainly to the fact that nothing but small lots is being asked for. Consumers are buying what they need for the present and nothing more. Other Metals are practically unchanged as to price, and share the general inactivity of the market. We quote as follows: Casting Copper, 13¼c.; Lake, 13¾c. to 14c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 33c.; small lots, 33½c.; Lead, Desilverized, 4c. to 4.25c., for 50-ton lots; Corroding, 5.35c. to 5.45c., for 50-ton lots; in car lots, 2½c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 12½c., and other grades, 10½c. to 11c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 11c.; Copper Clips, 11c.; Red Brass, 12c.; Yellow Brass, 10½c.; Light Brass, 6½c.; Lead Pipe, 3½c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 25c.; Block Tin Pipe, 27c.

Old Material.—About the only material in which consumers have shown any interest during the past week was Rerolling Rails, for which there have been some inquiries. One lot of 2000 tons was purchased by a local mill, and in the present state of the market this transaction was sufficient to stiffen the price slightly. As a rule, however, both mills and the melters are buying only what they actually need for current use, and even tempting offers fail to elicit purchases for forward requirements. Only a moderate amount of tonnage was offered by the railroads last week, and most of this went at fairly good prices as measured by the present level of values. One lot of Rerollers included in these offerings brought $13. Owing to the sagging condition of the Pig Iron market, Foundry grades are somewhat weaker and the demand from melters is extremely light. Inquiries for a moderate tonnage have been received from Steel foundries, but nothing of consequence has developed in the way of orders. The only list of railroad material so far reported for disposal this week is about 400 tons from the Frisco System. We quote, per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$15.00 to $15.50
Old Steel Rails, rerolling	12.75 to 13.50
Old Steel Rails, less than 3 ft.	12.00 to 12.50
Relaying Rails, standard sections, subject to inspection	20.50 to 21.50
Old Car Wheels	12.00 to 12.50
Heavy Melting Steel Scrap	11.00 to 11.50
Frogs, Switches and Guards, cut apart	12.50 to 13.00
Mixed Steel Scrap	9.00 to 9.50

The following quotations are per net ton:

Iron Fish Plates	$18.50 to $14.00
Iron Car Axles	16.00 to 16.50
Steel Car Axles	14.75 to 15.25
No. 1 Railroad Wrought	11.00 to 11.50
No. 2 Railroad Wrought	10.00 to 10.50
Railway Springs	11.00 to 11.50
Locomotive Tires, smooth	10.75 to 11.25
No. 1 Dealers' Forge	9.00 to 9.50
Mixed Bushelings	7.00 to 7.50
Iron Axle Turnings	5.75 to 6.25
Soft Steel Axle Turnings	5.75 to 6.25
Machine Shop Turnings	5.25 to 5.75
Cast Borings	4.50 to 5.00
Mixed Borings, Axle	4.50 to 5.00
No. 1 Mill	6.75 to 7.25
No. 2 Mill	5.75 to 6.25
No. 1 Boilers, cut to Sheets and Rings	7.00 to 7.50
No. 1 Cast Scrap	12.00 to 12.50
Stove Plate and Light Cast Scrap	10.00 to 10.50
Railroad Malleable	10.00 to 10.50
Agricultural Malleable	9.50 to 10.00
Pipes and Flues	7.75 to 8.25

Philadelphia.

PHILADELPHIA, PA., April 14, 1908.

The demand for finished products continues on rather narrow lines, but there has been some slight improvement in orders for crude material. Not enough new business has developed in any direction, however, to indicate any general betterment in the demand. Consumers appear to be somewhat unsettled by the discussion that has been going around regarding a probable reduction of prices. Producers are of the opinion that there will be no reductions, at least for the time. The demand for finished products about holds its own, and it is believed that no great volume of business would develop at this time if prices were reduced. There is, nevertheless, some hesitancy displayed by consumers in placing orders, the inclination being to wait to see what developments will take place. The financial situation is better, but business does not respond. The railroads still withhold business, but it is believed that the time is not far distant when buying will be necessary in order to maintain the efficiency of some of the roads.

Pig Iron.—A somewhat more active inquiry has developed recently for Foundry Iron. Buyers are evidently getting pretty bare of Iron, and are asking for prices on small tonnages for third quarter delivery. Most of the actual business transacted has been for prompt shipment, and some further low prices by independent producers have been talked of. There seems to be less disposition on the part of some outsiders to name lower prices, and they do not seem inclined to contract for heavy tonnages for extended deliveries at the prices which have recently prevailed. Considerable interest is shown in the result of the meeting of the Eastern Pig Iron Association, to be held in New York on the 15th inst., while a still greater interest is shown in the probable outcome of the meeting of the producers of Foundry Iron from practically all sections of the country, which is also to be held in the same city on the 16th. What the result of these meetings will be, particularly as far as prices are concerned, is anxiously awaited, and will no doubt have a considerable bearing on the Pig Iron situation. The rumor of the sale of 100,000 tons of Alabama Iron for export to Italy has been received with interest by the trade, as such a sale would, it is believed, have a beneficial influence, but at this writing we have been unable to confirm the report. The bulk of the business done during the week has been confined to small lots for early shipment. Sales of Foundry Irons range from carloads up to lots of a few hundred tons. A sale of 500 tons of No. 2 X Foundry for delivery in the next three months is reported at full figures, while a lot of 100 tons of the same grade has been reported sold at a price somewhat under the usual quotations made by outside interests. The Schuylkill and Lehigh Valley furnaces are firmly maintaining the $18.25, delivered, basis, for No. 2 X, but sales are reported as being comparatively small. The outside interests hold about the former range of prices from $17.50 to $18 for No. 2 X Foundry, delivered, in this territory. While sales have not been large, the bulk of the business is taken by these producers. Southern and Virginia Irons have not been very active during the past week. Several inquiries for 1000-ton lots of Foundry Iron, one of which is for Pipe making purposes, for prompt and third quarter delivery, which have been before the trade recently,

will, it is expected, go to these interests, who can undersell Northern producers on the present basis, from $1 to $1.50 a ton. The demand for Forge Iron has been extremely quiet. Some little inquiry has developed, however, for Basic Iron, one melter being in the market for 1500 tons for third quarter delivery, while another wants 500 tons for early delivery. Northern producers are holding firm at $17.25, delivered, for this grade, but Virginia Iron could, no doubt, be had at a concession from this price. Low Phosphorus Irons continue dull. The inquiry for this grade has been very light for several weeks. Owing to conditions under which a number of sales have been effected, quotations on Foundry grades are hard to make. Secret cutting has undoubtedly been engaged in, in some cases, but the appended range of prices represents the general run of sales in this territory. We quote for delivery in buyers' yards during the remainder of the first half of the year, eastern Pennsylvania, and adjoining territory as follows:

Eastern Pennsylvania, No. 2 X Foundry	$17.75 to $18.25
Eastern Pennsylvania, No. 2 Plain	17.25 to 17.75
Virginia, No. 2 X Foundry	17.50 to 17.75
Virginia, No. 2 Plain	17.00 to 17.25
Gray Forge	16.25 to 16.75
Basic	17.25
Low Phosphorus	23.50 to 24.00

Ferromanganese.—Sales have been confined to broken lots, with no inquiry at the time for large tonnages. Quotations are unchanged, $43 to $44, Baltimore, being named for small lots for prompt shipment.

Steel.—The bulk of the business is confined to small lots up to 50 tons, with an occasional larger lot. Mills in this vicinity are unable to gain any on their output, which remains at about one-third their capacity. We quote for delivery in Philadelphia and adjoining territory, $29.20, for ordinary Rolling Billets, and $31.20, for Forging Billets, with the usual extras for high carbons and large sizes.

Plates.—Inquiries are good, but are mostly for small tonnages for prompt delivery. No large propositions are before the trade. Orders are of a miscellaneous character, and aggregate on the whole sufficient tonnage to enable mills to maintain a production of about 50 per cent. of their capacity. Prices are unchanged. For delivery in this territory we quote as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼ in. and heavier. The following extras apply:

	Extra per 100 lb.
3/16 in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—Small propositions constitute the greater part of the business. Some fairly large orders are being figured on, but develop slowly. Orders taken have been of a miscellaneous character and of sufficient quantity to enable mills to about maintain the same percentage of production as has been the case for several months. Prices show no change, being firmly maintained, at 1.85c. to 2c., according to specifications.

Sheets.—The demand continues fairly even. Practically all of the business is in small lots for prompt shipment, buyers declining to anticipate their requirements. Mills continue to operate on a 50 per cent. basis. Prices are unchanged, the following range being quoted for mill shipment, with a tenth extra for small lots: Nos. 18 to 20, 2.50c.; No. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The business offered is very light. Consumers take small quantities only, to meet immediate requirements. Mills are not very active. Prices as a rule are being maintained by producers, but merchants and dealers who made contracts when prices were down undersell mills in many cases. Quotations therefore show some variation, and while mills quote 1.65c. for Refined Iron Bars, delivered in this territory, sales by dealers on a basis as low as 1.40c., Eastern mill, are reported.

Coke.—Scattered sales of Foundry Coke are reported, but the demand for Furnace Coke is extremely light. Most of the business done has been for prompt shipment. Quotations are unchanged, the better grades of Foundry Coke being quoted at $2.25 to $2.50 at oven, with Furnace Coke at $1.75 to $2 at oven. For delivery in the Philadelphia territory the following range of prices is quoted:

Connellsville Furnace Coke	$3.90 to $4.15
Foundry Coke	4.40 to 4.65
Mountain Furnace Coke	3.50 to 3.75
Foundry Coke	4.00 to 4.25

Old Material.—With the exception of several thousand ton lots of Heavy Melting Steel, which were sold at $12.75 to $13.25, delivered, the business transacted has been exceedingly small. The demand is weak and in many grades not enough business has been done to establish quotations. We quote nominally as follows for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory:

No. 1 Steel Scrap and Crops	$12.75 to $13.25
Low Phosphorus	17.50 to 18.00
Old Steel Axles	17.50 to 18.00
Old Iron Axles	20.00 to 21.00
Old Iron Rails	17.00 to 18.00
Old Car Wheels	14.00 to 15.00
Choice No. 1 R. R. Wrought	15.00 to 15.50
Machinery Cast	15.00 to 15.50
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	8.75 to 9.25
Stove Plate	11.00 to 11.50
Cast Borings	7.50 to 8.00
Grate Bars	11.75 to 12.25

Pittsburgh.

PARK BUILDING, April 15, 1908.—(*By Telegraph.*)

Pig Iron.—A little more inquiry for Basic Pig Iron and continued reductions in stocks of Pig Iron held by the merchant furnaces in the two valleys are the encouraging features of the Pig Iron situation this week. Dover Furnace of M. A. Hanna & Co., at Canal Dover, has gone in, and this furnace, with No. 3 Shenango, Stewart and Youngstown Steel Company are on Bessemer Iron, while Girard and one Andrews & Hitchcock are running on Foundry and Gray Forge. Bessemer Iron remains nominally at $16.75, at Valley furnace, but there are reports that this price has been shaded. Basic is about $15.50, and No. 2 Foundry $15.25 to $15.50, at Valley furnace. Forge is nominally $14.50, Valley furnace, or $15.40, Pittsburgh.

Steel.—Fairly heavy shipments of Sheet and Tin Bars on contracts and new orders are being made by the mills, but the demand for Billets is very dull. Persistent reports that regular producers of Billets and Sheet and Tin Bars were shading regular prices are strongly denied. Sales are reported of 500 tons of Tin Bars and 1000 tons of Sheet Bars at regular prices. We quote Bessemer Billets at $28, at Pittsburgh, and $28.50, at Youngstown or Wheeling. Sheet and Tin Bars taking an advance of $1 a ton over these prices. Forging Billets are about $30, Pittsburgh.

(*By Mail.*)

A large number of the sales agents of the Carnegie Steel Company were in Pittsburgh last week for one of the conferences held by them every three or four months. They reported that prospects for a revival in business in the West and Northwest are bright, but in Eastern territory conditions are not so favorable, and the outlook is not encouraging. Speaking from a strictly local standpoint, it may be said that conditions are not as good as they were two or three months ago. The railroads are not buying, and large founders and other concerns that make railroad equipment have cleaned up what work they had on hand when the slump came and are now practically bare of orders. It is hoped that after the Presidential nominations are out of the way, and with good crops assured, some revival may be seen in general business, but any marked improvement is not likely to take place for the next three or four months at least. Pig Iron continues excessively dull, and prices have reached the point that certainly leave little, if any, profit to the furnaces that are still making Iron from high priced Ores of last year, and from Coke much higher in price than it is at present. Trade in Billets is light, but there is a fair tonnage moving in Sheet and Tin Bars. Reports that one or two of the Steel companies were shading prices on Sheet and Tin Bars have been absolutely denied. Scrap and Coke are quiet, and the Coke output is down to one-third of what it was a year ago. There is a moderate amount of business moving in Tin Plate, Sheets, Pipe and Wire Goods, but the demand for Structural Steel, Plates and Bars is very light.

Ferromanganese.—Only a fair small inquiry is in the market, and reports are that some low prices are being made on the limited tonnage that is coming up. We quote 80 per cent. foreign Ferro at $42.50 to $43, seaboard, the rate to Pittsburgh being $1.95 a ton.

Muck Bar.—This material is absolutely neglected, and has been for a long time. We continue to quote best grades of Bar made from all Pig Iron at nominally $27, Pittsburgh. This price would likely be shaded on a firm offer for any considerable tonnage.

Skelp.—There is some inquiry for Steel Skelp, in which a few orders are likely to be placed in the near future. Prices are somewhat weak, and we quote nominally as follows: Grooved Steel Skelp, 1.60c.; Sheared Steel Skelp,

1.70c.; Grooved Iron Skelp, 1.80c., and Sheared Iron Skelp, 1.90c., f.o.b. Pittsburgh.

Rods.—There is a fairly good demand for Rods, due to the activity in the Wire trade, and sales are being made involving a fairly large tonnage. The American Steel & Wire Company and the Youngstown Sheet & Tube Company continue to quote Bessemer Rods at $35, Open Hearth at $36 and Chain Rods at $37. The other leading producer in this district, the Pittsburgh Steel Company, has not been a seller of Wire Rods in the open market for some time.

Steel Rails.—Nos. 1, 2 and 3 Rail mills of the Carnegie Steel Company at the Edgar Thomson mills, which have been down for several weeks for lack of orders, are scheduled to start Sunday night, April 19, with a fair tonnage in specifications ahead. Standard Sections are rolled on Nos. 1 and 2 and Light Rails on No. 3, but none of these mills will be operated full, running only to 30 to 35 per cent. of capacity. As yet no large contracts for Standard Sections have been placed, but it is expected that any day two or three of the leading roads will give out some tonnage. There is a fair demand for Light Rails, the Carnegie Steel Company having taken 1400 tons in the past week. Low prices continue to be made by mills for rerolling Rails, and it is stated that 25 to 45 lb. sections have been sold as low as $23 at mill. Regular prices on Light Rails, which continue to be shaded from $3 to $4 a ton by rerolling mills, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—The amount of new business being placed with the mills is pitifully small. Jobbers are reducing stocks as much as possible, believing that a reduction in prices may be made before long, but nothing official about this has been given out. New orders are only for small lots for prompt shipment, consumers not desiring to buy ahead. Prices are being well maintained, excepting on the narrower sizes on which some mills are making concessions of $1 to $2 a ton. Regular prices are as follows: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edges	$0 10
Gauges Nos. 7 and 8	.15
Gauge, No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell grade of steel is abandoned	

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—To-day bids have gone in on the Pittsburgh & Lake Erie bridge at Beaver, calling for about 14,000 tons. A complication has come up in regard to the proposed Oliver Building on Smithfield street, which may put this over until next year. The projectors of the building want the city to vacate an alley, and until this request is granted nothing definite will be done in regard to placing contracts. The Steel for the addition to the Fort Pitt Hotel, about 1800 tons, is still hanging fire, and also for the Second National Bank Building at Connellsville, about 420 tons. It may be said that considerably more work is in sight, but owing to existing conditions, especially the difficulty in getting money to finance projects, it is feared that some of it will not be given out for some time, and possibly not this year. It is stated that fabricated material ready for erection is being sold at lower prices than for a long time. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Cotton Ties.—The season in Cotton Ties has opened, and prices have been reduced 10c. a bundle as compared with last year. We quote as follows: 3000 bundle lots and over, 85c.; less than 3000 bundle lots, 88c., f.o.b. Pittsburgh.

Sheets.—It had been hoped that with the arrival of good weather there would be a heavy increase in the demand, but this has not been the case. It is true that more business is being placed with the mills than two or three months ago, but nevertheless the volume of trade is below expectations. It is estimated that only 45 to 50 per cent. of the Sheet capacity of the country is active. Prices are occasionally shaded. A meeting of the independent Sheet mills west of the Allegheny Mountains will be held in the Hotel Lincoln, Pittsburgh, on April 15, but it is not expected that any important action will be taken. Regular prices are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—The demand is steadily showing betterment, and this product is probably the most active of the whole finished list. All the leading mills of the American Sheet & Tin Plate Company are active, and it is estimated that fully 75 per cent. or more of the Tin Plate capacity of the country is in operation at present. We are advised that regular prices, in the main, are being observed. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Hoops and Bands.—No new business has been placed, but consumers are specifying against contracts at a fairly satisfactory rate. Regular prices are as follows: Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60, base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Iron and Steel Bars.—Reports are current, and are believed to be well founded, that the regular price of 1.50c., Pittsburgh, on Steel Bars is being materially shaded. The demand does not show much betterment, and mills rolling Iron and Steel Bars are running only intermittently. Consumers are placing orders only for small lots for actual wants, and there is no buying ahead. Our quotation on Iron Bars does not represent the actual market and is being shaded. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further west. Steel Bars remain very firm, at 1.60c., Pittsburgh.

Railroad Spikes.—Reports that heavy orders for Spikes have been placed by some of the leading Western roads are untrue. Several roads have inquiries in the market for a large tonnage, but have not yet closed. The demand is light, and is only for small orders for absolute needs. We quote: Standard sizes, 4½ x 9-16 in., at $1.70, and the smaller sizes at $1.80 per 100 lb. in carloads and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Pipes and Tubes.—A California oil interest is in the market for a very large tonnage in 8-in. Line Pipe for the building of an oil line in California, and it is expected the order will be placed in a short time. So far this month the general demand for Tubular Goods is a little heavier than in March, and it is believed April when ended will show a material gain. The favorable weather is expected to start the building of a number of gas and oil lines for some of which the Pipe has not yet been bought. We are advised that prices on both Iron and Steel Pipe, which are now guaranteed against decline by the mills until May 15, are being well maintained. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 74 and 5 per cent. off list, while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers' discounts Steel. Black.	Galv.
½ to ¾ in.	[illegible]	[illegible]
⅞ in.	[illegible]	[illegible]
1¼ in.	69	57
[illegible]	[illegible]	[illegible]
7 to 12 in.	70	55
Extra strong, plain ends:		
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
Double extra strong, plain ends:		
[illegible]	[illegible]	[illegible]

Discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
[illegible]	[illegible]	[illegible]
⅞ in.	65	51
1 in.	67	55
¾ to 6 in.	71	61
7 to 12 in.	68	53
Extra strong, plain ends:		
[illegible]	[illegible]	[illegible]
½ to 4 in.	63	51
4½ to 8 in.	59	47
Double extra strong, plain ends:		
½ to 8 in.	52	41

Spelter.—The market is quiet, and prices seem to be weaker. We quote prime grades of Western Spelter at 4.50c., East St. Louis, equal to 4.62½c., Pittsburgh. On a firm offer this might be shaded.

Merchant Steel.—The lower prices on Steel Shafting recently adopted by the manufacturers do not seem to have stimulated the demand to any extent, which is still only for small lots. In Merchant Steel a fair business is being placed by small consumers, but the large implement and wagon builders, who usually make contracts at this season of the year, have so far bought very little, not caring in the face of present conditions to carry any stocks. We quote Cold Rolled Shafting, on contracts for 100 tons and over, 57 per cent. off; carloads, 56 per cent. off, and less than carloads, 52 per cent. off, on which carload freight is allowed within base territory. Nominal prices on Merchant Steel are as follows: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 2.10c. to 2.15c. Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron. finished, 1½ in. and wider, 1.60c.; under 1½ in., 1.75c. Planished Tire Steel is 1.80c., all f.o.b. at mill.

Boiler Tubes.—The demand is closely confined to small lots for actual needs, jobbers not placing any stock orders, while their requirements for stock assortments are also very light. Reports are current of a material reduction in the price of Tubes, but this is officially denied, and we can state on good authority that the plans of the mills now are that no change will be made in the next two or three months at least. Prices are fairly well maintained, being occasionally shaded by one or two small mills. Discounts on Merchant Tubes for small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in.	42	47
1¾ to 2¼ in.	42	59
2½ in.	47	61
2¾ to 3 in.	52	65
3 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Iron and Steel Scrap.—There is no improvement in demand or in prices, this trade being at present about as dull as at any time since the slump started last October. The large Steel interests, who are the heaviest buyers of Scrap, are operating their mills only part time and are therefore buying very little in comparison with what they usually take. Prices are weak all along the line. Consumers will take in only such Scrap as they absolutely need. Probably the weakest item on the whole list is Bundled Sheet Scrap, which has been offered as low as $8 a ton at point of shipment. Dealers quote about as follows per gross ton: Heavy Steel Scrap, Pittsburgh, Sharon and Steubenville delivery, $12.75 to $13; No. 1 Railroad Wrought Scrap, $13.75 to $14; No. 1 Cast Scrap, $15 to $15.25; Cast Iron Borings, $7.75 to $8. Steel Axles are $16.50 to $17; No. 1 Busheling Scrap, $12 to $12.25; No. 2, $9 to $9.25; Sheet Bar Crop Ends, $16.50 to $17; Iron Axles, $19 to $19.50; Low Phosphorus Melting Stock, $16.25 to $16.50; Rerolling Rails, $14 to $14.25; Old Steel Rails, short pieces for Open Hearth use, $12.75 to $13; Machine Shop Turnings, $8 to $8.50; Railroad Malleable Scrap, $12.25 to $12.50; Grate Bars, $13.25 to $13.50; Heavy Air Furnace Cast Scrap, $13.75 to $14.

Coke.—The output of Coke is steadily falling off, due to the continued stoppage of ovens by producers, who have no orders for their product. Last week the Upper and Lower Connellsville regions made only 132,418 tons, their smallest output for some years. Of the 37,584 ovens in these regions only 14,100 were active last week, or a little more than one-third. The Frick Coke Company laid off 900 ovens last week, and the running time at most of its plants is four days and at some works even less. It is the intention of the company to stop more ovens between now and May 1. Good grades of Furnace Coke are freely offered as low as $1.55 at oven for prompt shipment, and it is stated that some grades have sold as low as $1.30, but this Coke does not run as high in quality as Klondike and other grades. Foundry Coke is offered all the way from $1.90 up to $2.25 a ton at oven, depending on quality.

Matthew Addy & Co. have been appointed sales agents in this country for the Pyle & Blaina Works, Ltd., England, manufacturer of Ferromanganese and Spiegeleisen. This broadens the lines of Matthew Addy & Co. in foreign Ores, Pig Iron, Alloys and Fluorspar.

The office of D. J. Joseph, representing Joseph Joseph & Brothers Company and the Railway Supply & Mfg. Company, Cincinnati, has been removed from room 718, Park Building, to room 711, Farmers' Bank Building, Pittsburgh.

Cincinnati.

CINCINNATI, OHIO, April 15, 1908.—(*By Telegraph.*)

There is little to report as to actual transactions, either in crude or finished products, the same lethargy characterizing the markets as has been noted in these reports for several weeks. There is, however, an undercurrent of interest among the producers and sellers of Pig Iron over developments of the past few days that promise to keep all factors employed in conjecturing. The passage through the city early this week of officers and directors of Southern furnaces bound to New York has indicated that something of no inconsiderable importance is on among those who control the supply. The results of the meeting in that city on Thursday will be awaited with impatience. Among the factors of Finished Iron and Steel the results of the second week in April have not been as encouraging as they anticipated from the strong close of March. Specifications have fallen off several points, and the spot buying is of the most meager hand to mouth variety. On the other hand, the power equipment people report a perceptible improvement in the situation.

Pig Iron.—The market is dull and listless, with transactions still running on carload shipments for immediate use. Opinions differ as to the outlook. One sales agency had an inquiry to-day for something like 6000 tons for immediate or nearby delivery. Others report no inquiry. The Detroit inquiry mentioned last week developed but a 1000-ton order, and this was bought at what might be termed bargain prices. It included some Southern No. 2 off Iron, some Northern Foundry from a nearby furnace, at about $17, delivered, and some Jackson County Silvery at less than $19 for 8 per cent. The Pipe companies seem to be temporarily out of the market. A Michigan inquiry accredited to a stove foundry for 5000 tons for the last half did not materialize. Although rumors of better than $12 on No. 2 Southern Foundry are heard, nothing better than that figure can be located to-day. A price of $18.50 at furnace on 8 per cent. Ohio Silvery is authorized by a prominent producer in that field. On Malleable $16.75 at Valley furnace is reported as having been done. Indications are that furnacemen are reducing stocks rapidly in this territory. Specially interesting at this time is the long deferred announcement of the Hamilton Iron & Steel Company, at Hamilton, Ohio, that its stack, with a capacity of 250 tons daily, will blow in about July 1 for the manufacture of Foundry, Standard Bessemer, Malleable Bessemer and Basic Iron. Its location should make it a formidable competitor for business in Merchant Irons in this field. Local employing foundrymen held a meeting on Monday at the Grand Hotel, presumably to talk over the situation and agree on a basis of wages for the balance of the year. The local melt is, on an average, not more than one-third of the regular capacity. For immediate delivery and balance of the second quarter we quote, f.o.b. cars Cincinnati, with freight rates of $1.20 from the Hanging Rock and $3.25 from the Birmingham District, as follows:

Southern Coke, No. 1	$15.75 to $16.25
Southern Coke, No. 2	15.25 to 15.75
Southern Coke, No. 3	14.75 to 15.25
Southern Coke, No. 4	14.25 to 14.75
Southern Coke, No. 1 Soft	15.75 to 16.25
Southern Coke, No. 2 Soft	15.25 to 15.75
Southern Coke, Gray Forge	13.75 to 14.25
Southern Coke, Mottled	13.25 to 13.75
Ohio Silvery, 8 per cent. Silicon	19.70
Lake Superior Coke, No. 1	17.20 to 17.70
Lake Superior Coke, No. 2	16.70 to 17.20
Lake Superior Coke, No. 3	16.20 to 16.70
Standard Southern Car Wheel	23.25 to 23.75
Lake Superior Car Wheel	22.00 to 22.50

(*By Mail.*)

Coke.—If there is any improvement over last week it is not discernible. The market is unquestionably quiet, and reports from the ovens indicate that production is being still further curtailed. Choice grades of Foundry Coke from most of the fields except New River are now obtainable at $2.25 at oven for spot shipment. In the Furnace grades practically nothing is doing.

Finished Iron and Steel.—The same condition prevails at stores as was reported last week. Selling agents, however, note a letting up in specifications since the beginning of the second quarter. There was a gradual increase from the first of the year in this regard until at the close of March, it was felt that conditions were slowly but surely resuming their normal sway; now the largest factors are at sea again. Reports of cutting on Iron Bars in and about the Indianapolis District are not confirmed here. Store prices remain unchanged. Dealers quote f.o.b. cars, Cincinnati, as follows: Iron Bars, carload lots, 1.65c., base, with half extras; small lots from store, 1.85c., base, half extras. Steel Plates, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c. Blue Annealed Sheets (Heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and

heavier, carload lots, 1.95c.; small lots from store, 2.25c. No. 12, carload lots, 2c.; small lots from store, 2.35c. Sheets (Light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Old Material.—There is nothing new to report in the Scrap market save that within the past few days there has been a little activity in Relayers and old Steel Rails. Some fairly good shipments have been made to the Far West and Southwest, and Rails are a little stronger. Consumers of miscellaneous Scrap are still limiting their purchases to small lots. The larger dealers are all heavily stocked, but profess faith in the future, and are consequently still buying. Prices are about as follows and are f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$11.00 to $11.50
Cast Borings, net ton	4.00 to 5.00
Heavy Melting Steel Scrap	11.00 to 11.50
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	15.00 to 16.00
Old Iron Rails, gross ton	14.00 to 15.00
Old Steel Rails, long, gross ton	11.00 to 12.00
Old Steel Rails, short, gross ton	11.00 to 12.00
Relaying Rails, 56 lb. and up, gross ton	21.00 to 22.00
Old Car Wheels, gross ton	13.00 to 14.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00

Birmingham.

BIRMINGHAM, ALA., April 13, 1908.

Pig Iron.—The events of the week are the visit of prominent officials of the United States Steel Corporation for the inspection of properties acquired by the purchase of the Tennessee Coal, Iron & Railroad Company, and the subsequent agreement with Southern Pig Iron producers to attend a meeting, to be held in New York, for the consideration of prices and rates of production. The call for the meeting will be issued from New York City, and the date fixed is Thursday, April 16. It is understood that all Foundry Iron producers in the United States will be requested to attend, and in view of the fact that all Southern interests are believed to be in favor of such a meeting the result will be awaited with much interest. The favorable comments by the visiting Steel Corporation officials as to the value of their properties and the statement of President Corey that plans formerly adopted by the Tennessee Company will be carried out without change, in addition to which will be other improvements involving the expenditure of millions of dollars, are received with satisfaction by Southern producers. The inference generally drawn from statements authorized by these officials is that the output of Pig Iron by the Tennessee Company will eventually be consumed by subsidiary companies, thus relieving the market of the largest production in the South. The present status of the Pig Iron market is not encouraging. The aggregate of sales reported for the week does not compare favorably with reports for some weeks previous. Purchasers are apparently as chary of negotiations as at any time for some months, without indicating that further concessions by producers would change their attitude. With the absence of a firm offer, it cannot be definitely stated just what price could be had on a round tonnage. Small lots have sold for $12, Birmingham, but it is believed that this basis would be shaded for larger quantities. The inquiries that are pending do not reach large proportions.

Old Material.—The unsettled condition of the Pig Iron market has affected the demand materially and prices are weaker. The transactions reported principally involve Steel Scrap, and despite the fact that quotations on practically all Steel products have been maintained, prices of this grade have suffered a further decline. Dealers are conservative as to their purchases and are disposed to await developments. We revise nominal quotations as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$16.50 to $17.00
Old Iron Axles	15.50 to 16.00
Old Steel Axles	13.50 to 14.00
No. 1 Railroad Wrought	13.00 to 13.50
No. 2 Railroad Wrought	10.00 to 10.50
No. 1 Country Wrought	11.50 to 12.00
No. 2 Country Wrought	9.50 to 10.00
Wrought Pipe and Tires	10.00 to 10.50
No. 1 Steel	11.00 to 11.50
No. 1 Machinery	10.50 to 11.00
Stove Plate and Light Cast	9.50 to 10.00
Cast Borings	6.00 to 6.50

Cast Iron Pipe.—No large contracts have recently been awarded, but inquiries are frequently received and the proposed bond issues by large municipalities for the extension of water works systems are encouraging. In addition to lettings for export recently advertised, indications are favorable for contracts to cover significant tonnages for Mexico. Some evidence is offered that prices now existing are attractive, but to secure a large contract unusual terms of payment are often necessitated, and producers manifest a disposition to prefer negotiations in the regular way although tonnage be limited. Prices have not declined since last report, but we are informed of lettings at that time at such figures as to warrant a revision of quotations. Nominal quotations on Water Pipe, per net ton, f.o.b. cars here, are as follows 4 to 6 in., $23; 8 to 12 in., $22; over 12-in., average $21, with $1 per ton extra for Gas Pipe. On large contracts these quotations have been shaded.

St. Louis.

ST. LOUIS, MO., April 13, 1908.

As is well known, St. Louis is relatively a conservative city, and for that reason is bound to be governed by prevailing conditions. The development which has taken place just before and since the closing of the Louisiana Purchase Exposition has provided the city with hotels, theaters and office buildings very nearly if not quite up to the demand for such structures. There are, however, several important edifices of a public or semi-public character which will be built in the near future, among which may be mentioned the Roman Catholic Cathedral, the Carnegie Public Library, the Coliseum, the branch post office, the La Salle office building (19 stories high, to cost in the neighborhood of $600,000) and also some city public buildings. Besides these some others are planned, and a vigorous attempt is being made to finance them. While St. Louis is feeling the effects of the financial disturbance of last fall in common with other centers, the belief is general that a gradual improvement will be witnessed.

Coke.—A very light demand is ruling at present. We quote Connellsville 72-hr. Foundry Coke at $2.25 to $2.50, f.o.b. oven. The rate to East St. Louis is $2.80. Virginia Coke is $2.50 to $2.75, f.o.b. oven.

Pig Iron.—For Southern Iron we quote $12 for No. 2 Foundry, f.o.b. Birmingham, with some furnaces holding for $12.50. We understand there is one furnace company naming $13 as its limit, and if the market will not pay it will go out of blast. No. 3 Foundry is held at $11.50; Gray Forge, $11, Birmingham. There is an inquiry out for 1000 tons of No. 2 Soft for shipment over the last quarter of the year, the Iron being intended for winter shipment, but no definite terms have been set for closing bids. The inquiry is now more general and shows some improvement over the previous week, but actual buying has not increased materially.

Finished Iron.—The demand is light for all finished products. There is some special inquiry and requisitions are out for Plates, assorted Bars and Shafting, which would indicate that the market is showing signs of improvement as compared with the past two months. Among the railroads, however, there is very little call for material. In Boiler and Tank Plates trade is dull.

Structural Material.—The market at the present time is dull. While there are some large structures under way, the material has already been contracted for. In the near future, however, some large edifices which have been determined upon and financed will be on the market.

Bars.—Such activity as exists is for small shapes. Large jobbers are replenishing stocks, which is an indication of better business as the building season opens and stock taking is completed.

Rails.—The demand for Rails from small railroads is increasing. Light Rails in particular, occasioned by the fact that the weather conditions now are more favorable and the financial situation is easier. Investors, contractors and managers are beginning to realize that the cost of construction now is from 25 to 40 per cent. less than six months ago.

Old Material.—Trade in the manufactured product is ruling so quiet that the demand for Old Material is slow. A little better movement is noted in Rails for rerolling. As certain buyers are always in the market, this furnishes a basis for prices and we quote as follows, f.o.b. St. Louis, per gross ton:

Old Iron Rails	$13.00 to $14.00
Old Steel Rails, rerolling	10.00 to 11.00
Old Steel Rails, less than 3 ft.	10.00 to 11.00
Relaying Rails, standard sections, subject to inspection	23.00 to 25.00
Old Car Wheels	12.00 to 14.00
Heavy Melting Steel Scrap	10.00 to 11.00
Frogs, Switches and Guards cut apart	10.00 to 11.00
Mixed Steel	9.00 to 10.00

Following quotations are per net ton:

Iron Fish Plates	$11.00 to $12.00
Iron Car Axles	15.00 to 16.00
Steel Car Axles	12.00 to 13.00
No. 1 Railroad Wrought	10.50 to 11.50
No. 2 Railroad Wrought	9.50 to 10.50
Railway Springs	10.00 to 11.00
Locomotive Tires, smooth	12.00 to 13.00
No. 1 Loading Forge	9.00 to 10.00
Mixed Borings, &c.	4.00 to 5.00
No. 1 Boilers, cut to Sheets and Rings	7.00 to 8.00
No. 1 Cast Scrap	11.00 to 12.00
Stove Plate and Light Cast Scrap	9.00 to 10.00
Railroad Malleable	9.00 to 10.00
Agricultural Malleable	8.00 to 9.00
Pipes and Flues	7.50 to 8.50

We learn of the sale by the Vandalia Line of 1000 tons

of Relaying Rails to the Cal. Hirsch & Sons Iron & Rail Company.

The Handlan-Buck Mfg. Company reports that conditions are looking better; in fact, there is more doing with railroads than daily newspaper talk would lead to expect. Some business is coming from the Government for supplies for Panama Canal operations and for the navy yards. Some buying is also being done by machine shops. The best demand at present is for supplies to southwest Texas.

F. A. Goodrich of the F. A. Goodrich Iron & Steel Company is disposed to take an optimistic view of the situation, and is encouraged to do so by the fact that there is more doing. He commends the policy of the Steel interests in holding up the market, in contrast with the lumber manufacturers, who have brought about a slump in prices. While business is likely to be comparatively slow until the meeting of the conventions and the political situation clears up somewhat, consumption is going on and stocks are being reduced.

The Johnson-Robinson Machine Company reports an improvement in the inquiry, both by mail and personally, for engines, boilers, sawmill machinery and contractors' equipment.

J. W. Wright & Co. state there is a better inquiry, coming mainly from agricultural sections, for machinery of various kinds.

San Francisco.

SAN FRANCISCO, CAL., April 8, 1908.

Some betterment is noted in the demand in nearly every branch of the Iron and Steel trade. In the oil fields of California the conditions have been steadily improving for several months, and an increased demand for oil well supplies may be expected before long. In the mining districts the spring awakening has been slow, but there is now a decided increase in the demand for machinery, repair parts and supplies of every description. Long delayed orders are coming in. Several of the large smelters are preparing to resume operations involving considerable development, work now being in progress in the mines of California and other Pacific Coast States. There has been no rain for a month, however, and unless there is some precipitation in the next few weeks the farming and fruit growing districts will suffer. This would in time react upon business of all kinds in the State. Manufacturing is in fairly good condition, but there is much room for improvement. The protracted dullness in the lumber trade all over the Coast has had a depressing effect. The manufacturers and dealers in sawmill machinery are not doing much. Shipbuilders and marine engine manufacturers are almost through with their contracts for the construction and equipment of the new steam schooners, which are always in demand when the coasting lumber trade is active. Low prices for lumber and other materials are favorable to the erection of buildings, but money is still scarce for future construction projects. However, much building work is still under way and before it is finished more money will undoubtedly be available. In fact, several large life insurance companies have announced that they have commenced making loans on inside San Francisco property and intend to loan large sums within the current year. Several additional Steel frame buildings have been started and everything looks favorable for a good year in construction work, although the total may not quite equal that of last year. The pressing demand for new buildings of every kind downtown, to replace those that were burned, made the past year a phenomenal one. However, if money could be obtained readily at moderate rates of interest there would be great increase in the number of building contracts. During the month of March the total valuation of buildings for which building permits were issued considerably exceeded $2,000,000 and was a little larger than for February. The announcement has been made that the Senate Committee on Public Buildings has approved a bill appropriating $500,000 for the erection of a new Sub-Treasury Building in San Francisco.

Structural Materials.—The continued fine weather has facilitated the erection of Steel frames for a number of large buildings in this city. Not many new class A buildings are being commenced just now, and there are few new contracts to report for Structural Steel. There are several inquiries that are still held up in local architects' offices. A slightly increased demand is noted for Steel Bars for reinforced concrete buildings. The American Bridge Company recently closed a contract for 500 tons of Structural Steel for a five-story and basement building, which is to be erected at once on Post street, near Kearny, for the Barron Estate, from plans by Reid Bros. It will be occupied by O'Connor & Moffitt. The same company has also taken a 275-ton contract for Steel for the six-story Maskey Building, at 28 Kearny street, Havens & Toepke, architects. Some more Steel work is in prospect, coming up in rather small lots. Several lots of Steel are coming on by rail in good time, including 1000 tons for the Royal Insurance Company's 10-story building, which will be erected on the corner of Pine and Sansome streets and will be a model fireproof structure. All of the Steel has been delivered for the Emma Rose Building, on Sutter street, requiring 1800 tons. The heavy Steel frame of the Roebling Construction Company's new five-story and basement warehouse, on the northeast corner of Hawthorne place and Folsom street, has been completed. The reinforced concrete floor construction is exceptionally strong, so as to admit of the storage of large quantities of the heavy materials that will be carried in stock by this company.

Pig Iron.—Inactivity still rules the market and dealers have recorded few large transactions of late. Some small lots have been disposed of from time to time to supply the immediate needs of local foundries. No arrivals of English Pig Iron by sea have been reported this week, and no additional Chinese Pig Iron has been received at this port. Local foundries have good inquiries, and their consumption of Pig Iron will undoubtedly increase during the next few months. No. 1 English, No. 1 Scotch and Chinese Pig Iron are quoted in this market at about $28 to $29 per ton, ex-yard.

Cast Iron Pipe.—Few contracts have been closed for Cast Iron Pipe this week, but inquiries continue for small lots scattered all along the coast. The management of the Spring Valley Water Company is still delaying work on much needed repairs and extensions in San Francisco, and the Board of Fire Underwriters has issued a scathing report on the conditions. The plant has been offered to the city for $32,000,000. A special election will be held at Lodi, Cal., May 5, for a popular vote on the proposed bond issue of $126,000 for water, light and sewer systems. At San Diego, Cal., the municipal issue of bonds, which was tied up for months, has been ordered released. The bonds were legalized by a Supreme Court ruling. The Los Angeles City Council has authorized an additional issue of $240,000 of the 4 per cent. aqueduct bonds. About $320,000 worth of bonds have been subscribed out of the $23,000,000 which will have to be floated in order to complete the projected aqueduct, which is to supply Los Angeles with water. The recent compromise between the People's Water Company and the city of Oakland binds the company to install a much larger system of mains in several districts. Prices of Cast Iron Pipe, f.o.b. cars Pacific Coast terminals, are about as follows per net ton: 6, 8, 10 and 12 in., $38; 4-in., $39.

Merchant Pipe.—There has been some improvement in the demand for Merchant Pipe. Stocks in jobbers' hands are depleted in this city. Prices are well sustained on Fittings, with advances probable on some items. Discounts on Steel Pipe are about as follows on jobbers' carloads:

	—Steel.— Black.	Galv.
	%	%
⅛ to ¼ in.	58.5	42.5
⅜ in.	60.5	46.5
½ in.	62.5	50.5
¾ to 6 in.	66.5	56.5
7 to 12 in.	63.5	48.5
Extra strong, plain ends:		
⅛ to ¾ in.	51.5	39.5
1 to 4 in.	58.5	46.5
4½ to 8 in.	54.5	42.5
Double extra strong, plain ends:		
1 to 8 in.	47.5	36.5

Oil Well Supplies.—As everything is looking up in the California oil districts, it seems only a question of a little time until there will be a better demand for Casings, Pipe, Fittings, Well Tools, &c. Numerous new wells are being drilled and several new companies have been incorporated. Tankage is being steadily increased. Some very fine specimens of oil-sand and shale have been found nearer San Francisco than any of the present oil fields, and it is possible that there will be quite a sensation when the reports of the tests and the exact location are made public.

Bar Iron.—A drop of 20c. per 100 lb. in Merchant Bar was announced this week, making the present base $2.25, and large consumers are already taking advantage of the reduction to replenish their stocks. Jobbers' stocks are in only fair condition, and the Coast production has not been heavy of late. Increased activity is hardly to be expected in the production of Bars until the improvement in California trade is more marked.

Coke.—No Coke has arrived at this port in the past two weeks, but dealers have at least 9000 tons in stock, much of which was purchased at high prices. Notwithstanding the opportunities to secure Coke at bargain prices, buying is limited to actual needs of consumers. This applies to both smelters and foundries, with few exceptions. Very little Coke is now afloat for San Francisco, owing to the inactivity that has prevailed for some time in manufacturing and smelting at most of the plants on the Coast. Several of the smelters will soon resume operations, and when their present stocks of Coke become depleted there will be more of a buying demand. German Syndicate Coke for smelters is selling at about $10 to $10.50 per ton for May, June and July shipment, and Australian Coke at $1 less. Eastern Coke is worth about $13 per ton, laid down here, and English Foundry Coke is sold almost as low as that in order

to meet the possible competition. As a matter of fact, very little Eastern Coke is actually used here.

The Union Iron Works has completed for the American Hawaiian Steamship Company the 6000-ton freight steamer Isthmian, which will be turned over to the owners this week. The new freighter, which has all of the latest appointments, will be operated between New York and the Isthmus of Tehuantepec. President McGregor of the Union Iron Works will arrive this week from the East, where he has been in consultation with C. M. Schwab regarding the details of the extensive improvements projected at the Shipbuilding plant.

The German Iron Market.

BERLIN, March 31, 1908.

Reports from the Iron trade throughout the month have been uniformly bad, and they have grown worse as the month has drawn to its close. The newspapers print every few days items about the shutting down of furnaces, the restriction of business in other departments of the trade, dismissal of workmen, or reduction of hours of work or wages. Some concerns have tried to avoid discharging laborers by reducing the hours of work. Nothing indicates more strikingly the changed conditions now prevailing as compared with those of a year ago than the over supply of men seeking work in the Iron districts, whereas a year ago employers were generally complaining that it was impossible to find enough workmen to meet their requirements.

Restricted Purchasing by Consumers.

It is everywhere admitted that domestic consumers are buying the smallest amounts of Iron and Steel that will satisfy their wants for the immediate future. Few are placing orders for more than three months in advance. The Prussian Railway authorities, indeed, placed contracts a month or two ago for Rails and other railroad supplies for three years in advance, and this at considerably higher prices than the Steel Works Association was able to get from its private customers; but everybody is now either laughing at or scolding the government's agents for binding themselves for so long a time at a moment when prices were crumbling on all sides. The railroad authorities of Bavaria and the smaller states have shown a great deal more shrewdness than the Prussian Government did; they have been reported for several months as in negotiations with the Steel Association, but they are still hanging off, demanding price concessions. There has even been some talk that they would import Belgian Rails in place of German, but this will hardly be done. Even the Prussian authorities, however, are disappointing the Rail mills, for they have canceled orders for about 100,000 tons of Rails for the current year. This means probably that the delivery of the amount named will be postponed to next year, or two years hence.

One of the grounds assigned for the unsatisfactory position of mills dependent upon other works for supplies of Steel is that the Steel Association has this month refused to make a further reduction on Billets. A reduction had been demanded and expected by the trade, and the refusal of the association was received with much disappointment and not a little bitterness of criticism. The February shipments of this specialty by the association were somewhat above the remarkably low figures for December and January. In March, too, the movement underwent a further slight gain after it became known that no price reduction would be ordered. Nevertheless, specifications on orders are coming in very slowly and for quite limited amounts.

Details of the Steel Trade.

Business in Beams and other structural forms is very quiet. Shipments in February, indeed, were considerably larger than the extremely low January figures; but there is almost nothing doing in the building trades, and there is absolutely no prospect for an improvement until the money market returns to normal conditions of cheapness. Under these circumstances, as the latest report given out by the Steel Works' Association admits, dealers are not accumulating stocks of structural goods for the summer building campaign, as is their usual practice. The shipments of Rails in February reflected for the first time the general weakness of trade conditions. Shipments in December and January had been the largest ever known, but February showed a considerable drop, and the association admits that a further reduction is to be looked for, since it is meeting with sharp competition from Russian Rails in various outside markets. It is known, too, that the association is making very liberal terms in outside markets wherever Russian Rails come into competition with its product. The association further says that business in Street and Mining Rails is still suffering from the unfavorable state of the money market; and sharp competition is met with in neutral markets from English and Belgian makers.

The Bar market is in a demoralized condition owing to overproduction. The reduction a year ago of the allotments in Billets, so as to permit the mills to roll greater quantities of Bars themselves, was accompanied by a very large increase in the allotments in the latter. Moreover, as the demand for all kinds of finished products diminished, the tendency with the great mixed works has been to turn to rolling Bars, in order to keep their force employed. Thus there arose a very sharp competition in this specialty, the price of which is not regulated by the association; hence prices have run down very close to that of Billets, and in many cases it is asserted that no profit remains for independent rolling mills compelled to buy their Steel supplies in the market. The price of Bars last quoted on the Duesseldorf Exchange was 108 to 110 marks, but these prices, it is maintained in trustworthy market reports, exist only on paper, whereas ordinary Bars can be bought at 105 marks and even lower. One report mentions 95 marks as the bottom price. On the other hand, the prices of Billets range between 85 and 105 marks. The price of Beams, which is fixed by the association, is still 125 to 135 marks, which is regarded as a great anomaly in view of the low prices reached by other goods. The market for Wrought Iron Bars for some months after the changed position of the general market began last year, remained remarkably steady, but during the past three or four months it has been sharply affected. The total drop in this line is now given at 35 marks.

All sections of the Plate and Sheet market are in a bad way. Prices are said to be so low as just to cover the costs of production, and there is still great pressure among the mills to find orders even at such low terms. The price of soft Steel Plates ranges between 115 and 118 marks; thin qualities command about 125 marks, but as high as 130 is quoted. The shipyards are taking only limited amounts of Heavy Plates, and rollers of Boiler Plate are eloquent in their complaints of bad business. The locomotive and engine shops are buying little, and the export trade is very unsatisfactory, owing to the sharp competition of foreign works.

The Pig Iron Trade.

The production of Pig Iron kept up till the end of February, doing remarkably well, considering the weakness of the general situation. The make for that month was 994,000 metric tons, or about 16,000 tons more than in February, 1907. In March, however, the rate of production has been considerably affected through the blowing out of the various furnaces, and it is expected that the production figures for the month will show a marked decline. In the Siegen District, where the principal part of the German output of Spiegeleisen is made, a restriction of 50 per cent. in production was voted about a week ago. The restriction had been hitherto 30 per cent., but one market report asserts that the orders on hand there amount to barely 30 per cent. of the capacity of the furnaces.

The leading Pig Iron syndicate of the country, that of Duesseldorf, about a week ago rejected a motion to make a further reduction in the prices of puddling and Steel making qualities of Pig, which leaves the price of the former at 74 and the latter at 76 marks. The ground assigned for holding fast to prices was that the Coal Syndicate maintained the prices of coal and coke inflexibly, which rendered it impossible to reduce the cost of producing Pig Iron. On the other hand, the association of Pig Iron consumers in the Rhenish-Westphalian District has just voted to dissolve in order to get rid of its obligations to buy directly from the syndicate, and to permit its members to obtain their supplies of Pig from independent furnaces and foreign agents at lower prices.

The Luxemburg Syndicate has fixed the price of Iron at 52 to 52.50 marks for the next quarter, which is the same as for the quarter now closing. At the latest meeting of the Duesseldorf Exchange, Luxemburg Puddling Iron was quoted at 52.80 marks, which compares with 52.80 to 53.60 marks earlier in the month. At the same time English Bessemer was quoted at 65 marks, duty unpaid, being 1 mark cheaper than at the end of February; Basic Bessemer was quoted at 64.80 marks. On the other hand, Basic Bessemer Iron—probably a different quality—is offered in the Luxemburg region at 53 to 53.50 marks.

The Hardware and Machinery Markets.

The latest reports from the Hardware trade indicate that the situation has grown considerably worse. The dropping off of American orders is felt all the more severely since home consumption is also declining to a marked degree. The reduction in American business in the Rhenish-Westphalian District is described as enormous. In consequence of this there is a great scarcity of work, and the shops have to exert themselves to their utmost, even at greatly reduced prices, to obtain orders sufficient in amount to avoid shutting down. The condition of the Hardware trade is felt all the more severely, since manufacturers did not succeed during the great boom now ended in raising their prices sufficiently to make up for the increased costs of material. In Building Hardware, orders are particularly light. In the Solingen District there is deep prostration of business with the Cutlery makers, owing to the prodigious shrinkage of American orders, and home business has also grown worse.

Machine tool shops, which had been doing a pretty satisfactory trade up to a recent date, now report that orders are falling off. The great Iron manufacturers, shipyards and other consumers of machine tools are feeling the effects of the general decline in prosperity and are ordering few or no new supplies of tools. The American crisis is also being felt in this part of the trade. American machine tools are coming into Germany in larger quantities and are offered at greatly reduced prices. Complaints over this turn in the state of the market have been heard at recent meetings of machine tool builders.

The Ludwig Löwe Company of Berlin, which is known to all American manufacturers of machine tools as the leading German adapter of American models and methods, has again declared a dividend of 16 per cent. on its capital of 7,500,000 marks. Its gross earnings showed a gain of 358,000 marks, but the net profits were slightly less than for 1906.

Cleveland.

CLEVELAND, OHIO, April 14, 1908.

Iron Ore.—The Lake Carriers' Association, at a meeting held in this city April 9 decided to enforce the open shop in the operation of lake boats. Over 80 per cent. of the tonnage of the lakes is enrolled in the association and 91 per cent. of this membership was voted at the meeting. The matter was thoroughly discussed and when a vote was taken there was not a dissenting voice. In the resolutions adopted it was stated that experience for the past few years had demonstrated the necessity of the open shop principle in order to give that control and direction of the ships required for the equal good of the owners, employees and dependent trade. Although it was not stated in the resolutions, no change will be made in last season's scale of wages. The action of the Lake Carriers' Association in declaring for an open shop means that no more conferences will be held with labor organizations and that agreements in regard to working conditions will be done away with. All the men employed on the boats of the association except the captains and mates are organized, and for years the vesselmen have made contracts with the various unions. The engineers of the Pittsburgh Steamship Company and those of several other fleets have already signed individual contracts for the season. Some of the union officials declare that the enforcement of the open shop will result in a strike. It is reported that no fight will be made at the start, but that later in the season, when the boats are all busy, a demand for a closed shop will be made, and the union men will be called off the boats. The executive committee of the Marine Engineers' Beneficial Association has been in session here the past two days and sent notices to all its lodges warning its members from signing individual contracts until further advised. The Ore market is still dead, there being no inquiries. The movement from the docks to the furnaces is still very light, although somewhat better than last month. Prices for 1908 delivery at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.20; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—The market is very quiet and prices appear slightly weaker. No attempt is being made by interests that are anxious to sell Iron to maintain uniform prices, and there are scarcely enough sales to establish a fair market basis. No. 2 Northern Foundry is being quoted at $15.25 to $15.50, Valley furnace, but it is very probable that a consumer wanting a fair tonnage could buy it at $15. Local foundries are asking $16.35 to $16.50 for No. 2 Foundry, delivered, Cleveland, and $16 at furnace for outside shipment, but these prices would probably be shaded a little. A few furnace interests are not disposed to make sales in competition with the low prices that are being quoted, and are holding their No. 2 Foundry Iron at $16, at furnace. They do not expect to make any sales at that price except in the immediate territory, and are virtually out of the market until prices become firmer. The melt in this territory shows no improvement, and large consumers still have plenty of Iron in their stock piles and are not in the market. With the exception of one 100-ton lot at $12.25, Birmingham, for No. 2 to an Ohio consumer, no sales of Southern Iron are reported. According to reports, No. 2 Southern Iron is being offered as low as $11.50 and $11.75, Birmingham. There are no inquiries for Bessemer or Basic Iron. For prompt shipment we quote, delivered, Cleveland, as follows:

Bessemer	$17.65
Northern Foundry, No. 1	$16.50 to 17.00
Northern Foundry, No. 2	16.00 to 16.50
Northern Foundry, No. 3	15.50 to 16.00
Southern Foundry, No. 2	16.10 to 16.60
Gray Forge	15.40

Coke.—There is a limited demand for Foundry Coke for spot delivery, and there are occasional inquiries for small contracts covering the balance of the year. We quote 72-hr. Foundry Coke at about $2.25, at oven. One producer is holding at $2.50. There is no demand for Furnace Coke. We quote Connellsville Furnace Coke for spot shipment at $1.60 to $1.75, at oven.

Finished Iron and Steel.—There seems to be a slight improvement in the demand. All the orders, however, are still for small lots of material for immediate needs, there seldom being an order for over a carload. Jobbers report a slight improvement in warehouse orders as compared with last month, but the volume of their mill orders remains about stationary. The demand for Iron Bars shows no improvement. Little buying is being done by the railroads, and only in small lots. Local mills are quoting the Pittsburgh base price, but this is still being shaded to 1.40c. by jobbers. Both of the local Bar Iron mills are shut down this week and may not start up for two weeks. The demand for Plates is light and prices are being shaded $2 a ton by some of the smaller mills. Steel Bars remain firm, with the demand light, both on current orders and specifications. The Structural situation shows no improvement. With only a small amount of building work projected in this territory that would require Steel, the Structural outlook is unsatisfactory. Few manufacturers that use finished products are increasing their output, and those whose stocks need replenishing are buying only for their immediate needs, in the expectation that prices may be lower. We quote Iron Bars at 1.50c. to 1.60c., Cleveland, for car lots; Steel Bars, 1.70c., Cleveland, for car lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼-in. and heavier, 1.80c., Cleveland. We quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. The warehouse price on Steel and Iron Bars is 1.75c. to 1.80c., the former price being shaded on desirable orders. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipes, base sizes, 67 per cent. discount.

Old Material.—The market is almost at a standstill. Consumers are taking little Scrap, and there is practically no trading among dealers. Old orders are pretty well cleaned up, and dealers are covered for unfilled orders which consumers are allowing to drag along. There have not been enough sales recently to establish prices, and quotations are largely nominal. Dealers look for lower prices before conditions improve, but they are unwilling to make sales for future delivery at present rates. Yard dealers are well stocked up and are holding their Scrap for better prices. The railroad offerings this week include 4000 tons from the Baltimore & Ohio. Dealers' prices to the trade are as follows, per gross ton, f.o.b. Cleveland:

Old Steel Rails	$11.00 to $11.50
Old Iron Rails	15.00 to 16.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	13.00 to 13.50
Relaying Rails, 50 lb. and over	21.00 to 22.00
Heavy Melting Steel	11.00 to 11.50
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	7.50 to 8.50

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	6.00 to 7.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	10.50 to 11.00
No. 1 Railroad Wrought	12.00 to 12.50
No. 1 Cast	12.00 to 12.50
Stove Plate	10.00 to 10.50
Bundled Tin Scrap	8.00 to 9.00

Metal Market.

NEW YORK, April 15, 1908.

Pig Tin.—Following the good business of a week ago, the market turned very dull, and trade has been light. Some buying of future positions has been in evidence, and likewise deliveries have been made directly from arriving steamers on account of former contracts. The following prices ruled during the week for lots of 5 tons and over:

	Cents.
April 8	31.70 to 31.75
April 9	32.00
April 10	31.80
April 13	31.35
April 14	31.70
April 15	32.00

Even talk of a strike among the longshoremen at Singapore and Penang caused no stir among consumers who evidently are satisfied with the statistical position from their viewpoint. Stocks in this country are not large, being about 500 tons concentrated in strong hands. These will likely increase before the end of the month for, in addition to arrivals of 1770 tons, there are afloat for American ports 2051 tons. A dull market is to be expected for several days, as the London Exchange will close Thursday noon, and not reopen until Tuesday morning. Prices in London have gained about £1 since last week, and the market there closes to-day at £144 5s. for spot and £143 for futures.

Copper.—A further easing of prices, due largely to the small demand, brings the quotations for Lake to 13c. to 13.12½c.; Electrolytic, 12.75c. to 12.87½c.; and Casting, 12.62½c. to 12.75c. All the above prices are for lots of not less than 50,000 lb. for domestic consumption, delivered 30 days. Exporters can secure Electrolytic at 12.62½c., for which payment is made against delivery of documents. Little buying from domestic consumers is in evidence, and melters in Europe also show a disposition to delay purchase, hoping for lower prices. The exports continue very favorable, amounting to 12,445 tons for the first 14 days of April. The melting of Copper in Europe is large, which is favorable for a continuance of these exports. Considerable interest is manifested in the report that the selling contract between the American Smelting & Refining Company and the United Metals Selling Company, which expires June 1, may not be renewed. A report from Butte this morning is to the effect that the Boston & Montana smelter at Great Falls is menaced by the high water which carried away the Great Horse dam. The London market closes about 10s. lower than last week, at £58 7s. 6d. for Spot, and £58 17s. 6d. for futures.

Ferroalloys.—Only a light demand is experienced for Ferromanganese, and prices are irregular. Consumers who desire prompt shipments, however, are paying about $43.50 to $44, seaboard. Resale lots are sometimes offered at concessions. So unsatisfactory is trade that some English works are closing. The market for 50 per cent. Ferrosilicon is dull, dealers quoting about $80, but this price has been shaded in several transactions.

Lead.—The market is firm, but dull. The American Smelting & Refining Company is selling at 4c., New York, and independent interests are not competing, asking higher prices. The St. Louis market is also firm at 3.85c. Considerable Lead is in the market, bought at lower prices, but holders show no disposition to go after business.

Spelter.—Prices are again easier, and Prime Western brands can be had at 4.50c., St. Louis, and 4.65c., New York. The large amount of metal bought at lower prices and still held is given as the cause of the present weakness. Business, however, is dull.

Nickel.—The unchanged price of 45c. is named for ton lots and 50c. to 60c. for smaller quantities.

Antimony.—Prices are more or less nominal, Cookson's being quoted at 8.75c. to 9c., Hallett's at 8.75c. and outside brands at 8.50c.

Tin Plate.—Business continues active, the booking of orders for Bright Plates going on in undiminished volume. Prices continue firm at $3.89, New York, and $3.70, Pittsburgh, for 100-lb. IC Coke Plates. In Swansea Welsh Plates are in active demand at the unchanged price of 12s. 7½d.

Old Metals.—So little business is ruling that it is very difficult to quote the market. Dealers' selling prices are, however, lower, as follows:

	Cents.
Copper, Heavy Cut and Crucible	12.25 to 12.50
Copper, Heavy and Wire	12.00 to 12.25
Copper, Light and Bottoms	11.25 to 11.50
Brass, Heavy	9.00 to 9.25
Brass, Light	7.25 to 7.50
Heavy Machine Composition	11.50 to 11.75
Clean Brass Turnings	8.25 to 8.50
Composition Turnings	9.00 to 10.00
Lead, Heavy	3.80
Lead, Tea	3.55
Zinc Scrap	3.50

The world's production of Copper, according to estimates of Henry R. Merton & Co., Ltd., London, was 716,435 tons of 2240 lb. in 1907, compared with 714,100 tons in 1906. The principal increases were in Australasia, Japan and Russia, with decreases in Mexico and the United States.

Iron and Industrial Stocks.

NEW YORK, April 15, 1908.

Dullness has characterized the stock market for some little time, and the fluctuations of the week have not been important. The range of prices on active iron and steel stocks from Thursday of last week to Tuesday of this week has been as follows: United States Steel common 33⅜ to 34⅝, preferred 98¼ to 99⅛; Car & Foundry common 32¼ to 33½; Locomotive common 44¼ to 46, preferred 91½ to 91¾; Steel Foundries common 5⅜ to 6, preferred 30⅜; Cambria Steel 29 to 29⅞; Colorado Fuel 22⅞ to 24⅞; Pressed Steel common 23½ to 24⅝; Railway Spring common 32½, ex-dividend, to 34; Republic common 17¾ to 18⅝, preferred 67¾ to 69; Sloss-Sheffield common 43½ to 46; Cast Iron Pipe common 24⅛ to 25⅝, preferred 69 to 69¼; Can common 4¾ to 5¼, preferred 50 to 53. Last transactions up to 1.30 p.m. to-day are as follows: United States Steel common 34¼, preferred 99⅛, bonds 95⅞; Car & Foundry common 33¼, preferred 94½; Locomotive common 44½, preferred 91⅝; Colorado Fuel 23⅝; Pressed Steel common 23½, preferred 79; Railway Spring common 33; Republic common 18⅜, preferred 68½; Sloss-Sheffield common 44; Cast Iron Pipe common 25½, preferred 69; Can common 5¼, preferred 52.

Dividends.—The American Rolling Mill Company, Middletown, Ohio, has declared a quarterly dividend of 1½ per cent. on its preferred stock.

The International Steam Pump Company has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable May 1.

The Ames Shovel & Tool Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock.

New York.

NEW YORK, April 15, 1908.

Pig Iron.—Outside of one or two lots of 1000 tons each, which went to outside interests at concessions, very little business has been done. There are now in the market one inquiry for 6000 tons for delivery at Buffalo, and a like amount in New Jersey, but otherwise the market is dull. The Eastern Pig Iron Association is holding a meeting in the city to-day. We quote at tidewater as follows: No. 1 Northern Foundry, $18 to $18.50; No. 2 Foundry, $17.25 to $18.25; No. 2 Plain, $17 to $17.50. Alabama Irons are $17.25 to $17.50 for No. 1 Foundry, and $16 to $16.50 for No. 2 Foundry.

Steel Rails.—The largest Rail order of the week is 31,000 tons from the New York Central, which goes to the Illinois Steel Company. This is in addition to 24,000 tons let some time ago to the Lackawanna Steel Company. It is understood that the same system will place several thousand tons additional for this year. One Steel company has booked about 3000 tons in scattering business in the past week, and there is pending a transaction involving about 8000 tons.

Structural Material.—On the whole, the aspect of the Structural Steel market is rather more favorable. A good many building projects are being figured on, which offset the continued quietness in railroad bridge construction. It is stated that two or three fabricating companies that have been noteworthy for low bids on work that has come up in the past three months are now practically filled up to the end of the year. Some of the prices made, if normal profit for the fabricating company were figured, would seem to be based on a price for Structural Material $6 to $8 a ton less than the 1.70c., Pittsburgh level; it is contended, therefore, that even if a reduction in Structural Steel should be made (of which the manufacturers have no present purpose), it has been discounted by certain Steel construction companies. It is known that in some cases contracts for Shapes made when the price was 1.60c., Pittsburgh, were extended last year so far as unspecified tonnage was concerned, but the total of such Steel is said not to be large. Last week there was a temporary stir among fabricating companies over the apparent revival of interest by the New York Central in its long delayed contract for Steel to go into its Grand Central terminal construction. Fully 20,000 tons is needed for this work. However, the business is still unplaced. Its financing seems to be the only hitch. Some Western railroad work has just been let, including 2800 tons for the Northwestern road's track elevation at Chicago, and 1400 tons for Idaho bridges on the St. Paul extension to the Pacific Coast. At Spokane, Wash., the Palace Investment Company placed 400 tons for a new building, and the 200 tons required for the Skagit River bridge near Seattle was taken by the American Bridge Company. In New York City building contracts calling for about 30,000 tons are immediately in sight. The Lackawanna Railroad has placed 300 tons of bridge work with the American Bridge Company. We continue to quote as follows, for tidewater deliveries on mill shipments: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—Conditions continue unsatisfactory in the Bar Iron trade. Middlemen are quoting lower prices than the leading mills, being enabled to do this by contracts placed during the period of open competition for orders. It cannot be learned that any business of consequence is coming out, but buyers of small lots find no difficulty in covering their requirements at much under the nominal price of 1.50c., Pittsburgh, quoted by the leading Eastern makers. It is understood that 1.50c., New York, can be shaded. Steel Bars are still unchanged, at 1.60c., Pittsburgh, or 1.76c., tidewater.

Plates.—The market is quiet, with only an occasional order, which is seldom for more than a carload. Prices are maintained as follows on standard sizes of Plates, at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—Current business is of small proportions. Inquiries have shrunk, and the promising developments of the past fortnight appear to have faded. Foundries, on the other hand, have again become more eager for business and competition for the small trade now coming up is quite

sharp. Nominal quotations on carload lots of 6-in. are $24.50 to $25 per net ton at tidewater.

Old Material.—Some Heavy Melting Steel Scrap has been sold, possibly 2000 to 3000 tons. Rolling mills are still able to get Old Material from railroad companies at low prices, and dealers are therefore doing practically nothing in Wrought Scrap. They have had some demand for Borings and Turnings. Cast Scrap is weaker, as the demand is quite limited, and although stocks are not large they seem to be more than ample. Stove Plate continues neglected and quotations are lower. Virtually no demand is noted for Old Car Wheels, with large quantities pressed for sale. We quote as follows per gross ton New York City:

Old Girder and T Rails for melting	$9.50 to $10.50
Heavy Melting Steel Scrap	9.50 to 10.50
Old Steel Rails, rerolling lengths	10.50 to 11.50
Relaying Rails	19.00 to 20.00
Old Iron Rails	14.00 to 15.00
Standard Hammered Iron Car Axles	16.00 to 17.00
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	11.50 to 12.50
Iron Track Scrap	9.50 to 10.50
No. 1 Yard Wrought, long	10.50 to 11.50
No. 1 Yard Wrought, short	9.50 to 10.50
Light Iron	5.00 to 6.00
Cast Borings	4.50 to 5.50
Wrought Turnings	6.00 to 7.00
Wrought Pipe	9.00 to 10.00
Old Car Wheels	14.00 to 15.00
No. 1 Heavy Cast, broken up	13.00 to 14.00
Stove Plate	9.00 to 10.00
Locomotive Grate Bars	9.50 to 10.50
Malleable Cast	10.00 to 11.00

The National Tube Company, Clifton Wharton, Jr., manager of sales, announces that on and after April 15 new offices will be occupied in the Hudson Terminal Building, 30 Church street, New York City.

The American Sheet & Tin Plate Company, Frank Dickerson, manager of sales, is now occupying its new offices on the eleventh floor of the Hudson Terminal Building, 30 Church street, New York City.

The Cumberland Steel Company's New Shafting Works.

The Cumberland Steel Company, Cumberland, Md., has nearly completed the construction of its new plant for the manufacture of turned and ground shafting, and expects to be in a position to fill orders within the next six weeks for high grade shafting accurate to size, high finish and as straight as it is possible for a shaft to be made. The building, which was constructed by the McClintic-Marshall Construction Company, Pottstown, Pa., is L-shape, and has a frontage on William street of 227 ft. and a depth of 280 ft.

The shafting works are 84 x 258 ft., one story and basement; storage and shipping room, 78 x 143 ft., with basement; boiler room, 43 x 74 ft.; boxing and lumber room, 25 x 43 ft.; office, three stories high, 23 x 83 ft. The walls are of steel and brick and the floors of reinforced concrete. Traveling cranes cover the entire shafting works, storage racks and shipping room, special steel racks 180 ft. long and 8 ft. high having been installed for the storage of shafting, with a capacity of over 5,000,000 lb. The principal machines for turning, grinding and straightening were made by Merwin McKaig from new and improved designs furnished the company by W. J. Muncaster. These machines are considered among the best ever designed for the rapid and accurate manufacture of shafting.

The Foundry Exhibit at Toronto.—Plans for the exhibit of foundry supplies and equipment at the convention of the American Foundrymen's Association, the Brass Founders' Association and the Associated Foundry Foremen, at Toronto, June 8-12, have been developing steadily. So many members of the Foundry Supply Association, which is the organization making the exhibit, have applied for space in the exhibit buildings that over 75 per cent. of the Machinery Hall floor has already been reserved and a large amount of space in the Process Building. In order that he may look after the details of installing the exhibits H. M. Lane, the secretary of the Supply Association, goes to Toronto this week, and will be there from April 18 until after the convention. His address will be in care of the Toronto Foundry Company, Ltd., Toronto, Ont. For the first time in the history of the trade all branches of the iron and brass foundry will be fully represented in operation, including core ovens and cupola and brass melting furnaces. The still exhibits, which will occupy the Process Building, will also be unusually attractive.

A number of Detroit members of the American Foundrymen's Association recently formed the Detroit Foundrymen's Association, which starts with a membership of about 50. The association expects to be well represented at the coming Toronto convention of the national organization. The following officers have been elected: President, W. M. Corse, Detroit Lubricating Company; vice-president, J. J. Wilson, Cadillac Motor Car Company; secretary, A. P. Henry, Standard Pattern Works; treasurer, A. T. Waterfall, Russel Wheel & Foundry Company. The Executive Committee consists of the president and vice-president and the following: James S. Keightly, Great Lakes Engineering Works; Thomas F. Meek, Detroit Steel Casting Company; W. T. Putnam, Detroit Testing Laboratory.

The Dominion Iron & Steel Company has all departments working full time, as it obtained a good part of the rail orders for the new Grand Trunk Pacific Railway. President Plummer and General Manager Frank Jones will shortly sail for England to be on hand when the final appeal of the Dominion Iron & Steel Company versus the Dominion Coal Company comes up to the Privy Council, which will decide who pays the big expense and damage bill and also as to the upholding of the old contract, giving the steel company very low priced coal ($1.27 per ton), which the coal company claims is confiscatory.

A meeting of the Board of Directors of the Merchants' Association of New York has just been held, at which, by unanimous vote, resolutions were adopted vigorously opposing the proposed amendments to the Sherman anti-trust act, as contained in the Hepburn and Warner bills, and urging the enactment of legislation providing for a commission. In conformity with the resolutions, the association will be represented at the hearing before the House of Representatives Committee on the Judiciary, April 16, to oppose the Hepburn bill and to urge the creation of a commission.

The American Society of Mechanical Engineers held a general meeting on the evening of April 14 in the Engineering Societies Building, New York, to consider the conservation of our natural resources, in response to the invitation of the President of the United States to the national engineering societies, to co-operate in securing the ends desired. Addresses were made by prominent engineers on the conservation of waters and woods, the nation's fuel supply and stream flow, water power and navigation.

When at Birmingham, Ala., last week, W. E. Corey, president of the United States Steel Corporation, announced that he would recommend the following improvements of the Tennessee plant at Ensley after the present programme has been completed: The remodeling of blast furnaces Nos. 1, 2, and 3; the building of two additional tilting open hearth furnaces and of two open-top open hearth furnaces, to handle heavy scrap, and a second 600-ton mixer.

The annual convention of the National Association of Manufacturers will be held May 18, 19 and 20 at the Waldorf-Astoria, New York, the annual banquet of the organization taking place May 20.

The Carnegie Steel Company, Pittsburgh, has received a contract for a large armor plate vault for the Dollar Savings & Trust Company, Youngstown, Ohio.

The Standard Steel Car Company, Pittsburgh, has received orders for 500 steel mine cars for use in coal mines in the Pittsburgh District.

The Machinery Trade.

NEW YORK, April 15, 1908.

The improvement in business that was expected this spring has not yet developed, and judging from the curtailing of office forces and cutting down of expenses by some of the larger industrial corporations they, at least, are not in receipt of sufficient orders or inquiries to indicate a resumption of activity for some time. During February and March there was a better demand for machinery than in January, due to some extent to the foreign business received, but trade in April thus far, and the month is half gone, has been very light, and many houses report a further recession of business to the level of that in January. The past week was a very quiet one with both manufacturers and dealers. The transactions reported were of minor importance, though a few encouraging sales were made. With such a small volume of business offered, the total of that received weekly by machinery houses fluctuates considerably. Inquiries continue slow in closing and those that are received, with few exceptions, emanate from the smaller plants and cover only a few tools each. A small machinery list has, however, been sent out within the past few days by the Delaware, Lackawanna & Western Railroad.

The recent activity in building operations in New York has encouraged dealers in power equipment suitable for hotels, apartment houses, &c., as directly following the issuance of a large number of building permits last week inquiries for equipment for small installations have been coming in. It is also gratifying to the trade to note inquiries are invariably from parties who intend to operate the buildings they are constructing rather than from speculative builders who make inquiries with a view to ascertaining the probable cost of a building enterprise.

Trade Organization Notes.

Arrangements for the joint convention of the Southern Supply and Machinery Dealers' Association, the National Supply and Machinery Dealers' Association and the American Supply and Machinery Manufacturers' Association, to be held at Richmond, Va., in the Jefferson Hotel, May 13, 14 and 15, have been practically completed. The first day's session will be devoted to an executive meeting in the morning and a joint open meeting in the afternoon, at which the Hon. William H. Taft, Secretary of War, will speak on "The Value of Trade Organization." At the second day's session separate executive meetings will be held in the morning, and in the afternoon a special meeting, confined only to the machinery members of the association, will be held. In the evening the three organizations will join in a banquet, at which the principal speaker will be Charles A. Moore of Manning, Maxwell & Moore, who will talk on "Commercial Fraternity." Ex-Governor A. J. Montague of Virginia will speak on "The Possibilities of Trade Relations Between the United States and South America," and it is expected that Robert Wuest, commissioner of the Metal Trades Association, will deliver an address on "Benefits to Be Derived from Trade Organization."

The spring meeting of the National Machine Tool Builders' Association will be held at the Hotel Chalfonte, Atlantic City, N. J., May 19 and 20.

It is expected that the quarters of the Machinery Club of New York in the Hudson Terminal Building, 50 Church street, New York, will be opened to the members the first week in May, and the Board of Governors at its last meeting decided to hold a formal opening celebration on May 21. F. H. Stillman, president of the club, will appoint a Committee on Plan and Scope to decide on the character of the opening exercises and make the necessary arrangements. The House Committee has completed the more important arrangements for the opening of the club, and all the necessary furniture, tableware, &c., is ready to be installed as soon as the building is completed, which is expected to be within the next three weeks.

During the past week machinery houses have received a small list of machinery requirements from the Delaware, Lackawanna & Western Railroad. The list covers mostly the smaller class of equipment, though it includes several cranes, all of which are to be installed in the company's shops being constructed at Scranton, Pa. At that point the railroad company has in course of construction some large buildings, for which considerable equipment has been purchased. It is understood that the future requirements for these buildings will cover principally such machinery as will be needed to complete the equipment. The large machine shop to be constructed at the plant has not yet been undertaken, and it will probably be a year or more before the list of machinery required for this building will be placed before the trade.

Gould & Eberhardt, Newark, N. J., have received an order for an automatic shaper from the New York Central Railroad for its shops at Depew, N. Y., and an order for a grinder from the Delaware, Lackawanna & Western Railroad for the shops at Scranton, Pa. Another recent order placed with this company is for an especially large gear cutter for Chicago. The New York Central has also placed several orders of late in the New York market for shop equipment for a number of its larger repair plants.

Considerable interest is attached to the application made to the Public Service Commission by the Coney Island & Brooklyn Railroad Company, Brooklyn, N. Y., asking approval of an issue of bonds to the amount of $462,000, as practically the entire amount to be secured from the bond issue will be devoted to construction work. Of this amount $83,000 is to be used in reconstructing the power house.

In order to devote more attention to its metal sawing machines, cranes, hoists and car stamps, the Quincy, Manchester, Sargent Company, Plainfield, N. J., has decided to discontinue the manufacture of the line of pneumatic compression riveters that was acquired at the time it purchased the business of the Pedrick & Ayer Company, and has disposed of this entire line to the Hanna Engineering Company, Chicago. The Hanna Engineering Company will improve the line and will be in a position to furnish repair parts for such riveters as have been sold in the past.

The Department of Water, Oswego, N. Y., will receive bids until April 21 for a 5,000,000-gal. high duty horizontal compound condensing crank and flywheel engine, and until April 22 for a direct connected multistage centrifugal pump and steam turbine for the lake water extension.

As a result of the action taken by the Public Service Commission last week a material change in the plans for the subway loop between the East River bridges is likely to be made, and that system, a part of which is now being constructed, will probably be entirely independent of both the Brooklyn Rapid Transit Company's lines and the proposed Fourth Avenue Subway in Brooklyn. The resolution adopted by the commission recommends the construction of a new tunnel under the East River, making the loop system entirely independent by having the trains run across the Williamsburg Bridge, south through a portion of the loop new building to the neighborhood of Beekman street, and thence back to the East River and under it by a tunnel.

Business Changes.

During the past week many machinery houses in New York have moved into new quarters, and others will within the next few weeks be located in new and larger offices. Those who have rented space in the new Hudson Terminal Buildings are moving in, and visitors to New York will now find many of their friends in new quarters.

The Chicago Pneumatic Tool Company, 95 Liberty street, New York, will move its offices April 16 to the Fulton Terminal Building of the Hudson Companies, where it will occupy the sixteenth floor.

The New York offices of the Emerson Electric Mfg. Company, St. Louis, Mo., formerly located at 136 Liberty street, have been moved to more convenient and commodious quarters on the fourteenth floor of the new Hudson Terminal Fulton Building, 50 Church street. The company will continue to maintain a large warehouse stock in New York, consisting of fans and small motors, and all regular types of apparatus in original packages can be shipped promptly from the New York warehouse, but the New York office now has no facilities for receiving motors or parts to be returned. Any apparatus hereafter shipped to New York can only be reconsigned to the St. Louis factory at additional expense for freight.

The Curtis & Company Mfg. Company, manufacturer of pneumatic machiery and cranes, will open a branch office in room 530, Hudson Terminal Building, 30 Church street, New York, which will be under the management of A. E. Hoermann, who has for some time maintained an office at 41 Park row, where he has represented the Curtis & Company Mfg. Company and other concerns.

The Crocker-Wheeler Company will move its New York office April 24 to the Cortlandt Building, Hudson Terminal, 32 Cortlandt street, which is across the street from its present location. The new location is of especial convenience to the company, as it brings its New York office into closer touch with the main office and works at Ampere, N. J.

J. J. McCabe, the well-known machinery dealer, who for many years has been located at 14 Dey street, New York, will remove May 1 his office headquarters to the new Hudson Terminal Building, 30 Church street. The stock of machinery carried in the New York showrooms will be exhibited to better advantage in the new showrooms at the present warehouse, Tenth and Buswick streets, Jersey City, N. J.

The Lenher Engineering Company, 39 Cortlandt street, New York, has been incorporated under the laws of New Jersey to take over the copartnership of S. J. Lenher and C. N. Walsh. The company, which will move into larger offices in the Singer Building Tower about May 1, has the sole agency for the Taylor gravity underfeed stoker and the Flory hoisting machinery and cableways. The officers of the company are S. J. Lenher, president; G. H. Stephens, vice-president, and C. N. Walsh, secretary and treasurer. These men also form the directorate of the company.

Catalogues Wanted.—The Smith & Watson Iron Works, Portland, Ore., is preparing plans for a new brick machine shop to be served with a 20 traveling crane, in addition to which the company will be in the market for machinery for the manufacture of saw mill and transmission machinery. Catalogues of the latest designs of machinery for equipping the shop are desired.

C. O. Morgan has opened a machine shop at Northfield, Minn., for general machine and repair work, and desires catalogue and circulars from manufacturers of tools and machines for shop use.

Chicago Machinery Market.

CHICAGO, ILL., April 14, 1908.

Governed by conditions which are in no respect materially changed, the machinery trade continues quiet, though here and there short lived spurts of moderate activity develop from week to week. There are practically no large orders for equipment coming out, the trade in all lines being made up, as for some months past, of orders individually small, which are supplied in large part by the less important manufacturing interests. Scattered about in the towns and cities of the Middle West are a large number of small shops and factories of various kinds, which have felt the effects of the present commercial depression very much less than those in some other sections of the country; and while the requirements of these interests considered separately are generally limited to a few tools of moderate size and cost, yet even under existing circumstances they form in the aggregate a considerable volume of business. Although no important transactions are reported by the machine tool houses for the past week, a moderate amount of business has been secured. Some of them have taken more business than others, but all are far short of a normal average. Dealers are experiencing some difficulty in replenishing their stocks of second hand tools, for the reason that only the more modern and little used machines are now marketable; and these, as a rule, cannot be obtained at prices that will permit of a profit on resale. It is worthy of note in this connection that there have been very few shop equipments thrown upon the market in recent months through bankruptcy or failure, notwithstanding the stress of conditions that would seem to invite such results. Manufacturers of electrical machinery continue to receive a fair number of orders for motors and generators, but they generally include only small units. The inquiries for this class of machinery, however, seem to be slowly improving.

With plant capacities in nearly all manufacturing industries only partly engaged, it is but natural that the purchase of machinery equipment should be restricted and a permanent buying movement can hardly be looked for until existing plants are at least normally busy. Confidence in the ultimate restoration of business to a normal level is unshaken, but just how soon it will take place cannot, of course, be foreseen. A great majority of the plans for plant expansion and the organization of new enterprises which were in the course of preparation at the beginning of 1907, were arrested by the adverse financial conditions suddenly precipitated later in the year, and have been held in abeyance since that time. Realizing that lower costs of material and the increased efficiency of labor resulting from the present depression are favorable to the economical construction and equipment of plants, some manufacturers with an eye to future developments are preparing to revive and carry out original extension and improvement plans. Where funds necessary to finance such operations are available, the wisdom of such a course can hardly be questioned, but a general movement of this kind must perforce await the freer offering of cheap money.

The Royal Electric Company, Milford, Ind., has been organized with a capital stock of $20,000, and is now building a factory at Milford, Ind., for the manufacture of specialties in electrical apparatus and mechanical appliances. In the manufacture of its products the company will use among other material, sheet, wire and tube brass and German silver. Included in the machinery required to equip the plant will be a 15 hp. gasoline engine, line shaft, pulleys, belting, punch presses and other light tools. The directors are Levi M. Neher, A. Leroy Miller and J. B. Neff.

Among the recent sales of heavier tools reported was one made by Jos. T. Ryerson & Son, Chicago, to the Worden-Allen Company, Wilwaukee, Wis., which included several punches and shears to be installed in the latter's fabricating plant. The Worden-Allen Company was recently awarded the contract for the construction of viaducts in Milwaukee, which involve a considerable tonnage of fabricating material, and to take care of this and other work this additional equipment was required.

The Baker Machinery Company, Des Moines, Iowa, has been incorporated with a capital stock of $15,000, and the new corporation has taken over the Baker Machinery Company, of which Wm. Henry Baker was proprietor. The reorganization thus effected will result in increasing the scope of the company's business, which consists in the manufacture of freight and passenger elevators and dealing in power machinery and engineers' supplies.

The Filer & Stowell Company, Milwaukee, Wis., is manufacturing a complete saw mill outfit to be shipped to Australia, for a mill at Melbourne.

Roth Bros. & Co., Chicago, manufacturers of dynamos and motors, recently furnished 40 direct current motors ranging from ½ to 15 hp. for installation in the new plumbing supply plant of the Federal Company, Halsted and Fulton streets. The company has also secured a contract for 100 small motors to be used on the Comptograph adding machines.

Figures are being taken on four horizontal tubular boilers by the Chicago, Burlington & Quincy Railroad, Chicago, for its shops at Aurora, Ill.,

The Chicago office and warehouse of the Chapman Valve Mfg. Company, the former now in the Monadnock Building, and the latter at 24-26 South Clinton street, will after the first of May be consolidated at 120-122 Franklin street, where the company has secured quarters on the street floor of the new Adams Building. The facilities afforded in the new location will permit the company to carry a larger stock than heretofore, to which some new lines will be added. The company is now going into the manufacture of globe valves, and will make cast steel as well as cast iron fittings for high pressure work.

H. A. Stocker, president of the H. A. Stocker Machinery Company, has sold his 99 year leasehold and building located at 20 and 22 South Clinton street, Chicago, to the Chicago & Northwestern Railroad, and which will comprise a part of the new $20,000,000 depot, situated between Canal and Clinton streets, fronting on Madison street and extending north to Lake street. The H. A. Stocker Machinery Company will move about May 1 to the new fireproof building located at 85, 87, 89 and 91 West Randolph street, corner of Jefferson street, one block west of its present location, where it will be pleased to see all of its old customers and many new ones.

Cleveland Machinery Market.

CLEVELAND, OHIO, April 14, 1908.

The volume of orders received by the local machine tool dealers shows no improvement. The condition of the market has remained practically stationary for the past six weeks. The sales in the past week have about all been small single tools to small shops. Orders from large metal working plants for tools for additions and to replace worn out equipment are very scarce. The majority of these plants are running at reduced capacity and have many idle tools, and those that need new machinery are buying only what they absolutely cannot get along without. There are few inquiries of any size coming into the market. Few new industrial projects that would require machinery equipment are being projected in this territory and engineering firms that make a specialty of iron and steel mill work and designing and erecting manufacturing plants have little work in sight for the coming season.

An occasional order for machinery is received from makers of agricultural implements. Implement makers have not been seriously affected by the period of depression, and the majority of their plants are running at about full capacity.

The quantity of second-hand tools that is being offered has largely increased during the past two weeks, and many of the used tools thrown on the market are in very good shape. Purchases of second-hand tools by dealers are not large, however, being limited to what they can pick up at low prices.

Manufacturers of machine tools report very little, if any, improvement in the demand, although the outlook is somewhat better. In some manufacturing lines, however, conditions are steadily growing better. Builders of industrial cars report improvement in their orders and inquiries, and there is a better demand for hoists, mills and other equipment for mines. Crane builders report no improvement in orders. About the only inquiries are for small single cranes, and there is lively competition among builders to capture small orders. As a result prices are being cut a great deal. Another line in which very low prices are being quoted is pneumatic tools. Builders of these tools are getting few orders, and owing to the limited amount of work being done in structural and other shops that use pneumatic tools they do not regard the outlook for a fair volume of business during the coming few months as very promising.

The local foundry situation shows no change, no improvement being noticed in the demand for castings.

The Terry Cap & Set Screw Company, Cleveland, which recently increased its capital stock from $50,000 to $100,000, announces that the latter capitalization was provided for the purpose of adding some new machinery to increase the output, and also that an addition will probably be built to the present plant. The new equipment to be added will be large special machinery. The company, which started in business last summer, reports that it has been very successful from the start. Orders have enabled it to keep its plant running during the depression at full capacity.

The John F. Byers Company, Ravenna, Ohio, maker of hoisting engines and derricks, has completed several large additions to its plant, making it up to date in every particular, and largely increasing its capacity. The company held a largely attended reception for the inspection of its new buildings on the evening of March 30. The new buildings include an erecting shop, 45 x 100 ft.; forge room, 40 x 60 ft.; stock room, 24 x 85 ft.; foundry, 75 x 100 ft., equipped with a six-ton cupola; fire-proof pattern room, 30 x 50 ft., and engine and boiler room. The company is capitalized at $150,000. Its officers are W. S. Krake, president; F. P. Chapman, vice-president; Marvin Collins, secretary and treasurer, and I. L. Collins, superintendent.

The Hydro-Electric Company, Warren, Ohio, has been organized with a capital stock of $100,000 by C. M. Wilkins, O. D. Morgan, D. E. Hoover, C. R. Seigfried and Henry Herbert. The purposes of the company as set forth in the charter are owning and developing water power; generating, transmitting and furnishing electric current; operating of electric plants for furnishing light and power; to construct, lease and operate line or lines of electric railroad.

The Imperial Electric Company, Akron, Ohio, which was recently incorporated with a capital stock of $180,000 to take over the plant of the Akron Electrical Company, has effected its organization and the transfer of the property has been completed. The officers of the new company are Fred E. Smith, president; A. C. Linzee, vice-president; John Hearty, secretary and treasurer. The company will make motors, generators and electric elevator machinery.

The Wellman-Seaver-Morgan Company, Cleveland, reports considerable improvement in the demand for hoists, mills and other machinery equipment for mines. This company has recently received a number of orders from mining companies in the West, Mexico and South Africa.

E. M. Lyman, who was principal stockholder of the Lyman Mfg. Company that operated a plant in Chardon until recently, has decided to build a new plant in Warren for the manufacture of oyster and candy pails. A plant to cost from $15,000 to $20,000, including the equipment, will be erected.

The plant of the Independent Tack Company, which was started in Cuyahoga Falls last year, has been moved to Kent, Ohio, residents of that place and Ravenna having purchased a large interest in the plant. The plant will continue to be operated by E. O. Gross, the inventor of the tack machines.

With a capital stock of $25,000 the Service Pump Company, Canton, Ohio, has been incorporated by E. W. Conkell, John C. Hermann, Alonzo G. Wiley, James E. Horton and Andrew Hollinger.

The Board of Public Affairs, Wellington, Ohio, is in the market for a 300-hp. engine and dynamo for the municipal water works plant.

Cincinnati Machinery Market.

CINCINNATI, OHIO, April 14, 1908.

From the viewpoint of the machine tool builder the market has little or no interest. The sales records of the week show such slight proofs of returning business that he is perforce compelled again to fall back on hope as the most conspicuous factor in the trade, and patiently wait the setting in of the buying tide which he feels cannot now be much longer delayed. It was confidently expected by the larger manufacturers in this district who keep a close and careful watch on the trend of trade that April 1 would see some signs of delayed and held up business, not only on account of the great increase of inquiries in the mails, but because of the vastly improved financial situation. This buying movement, it is only fair to say, has not developed—except in spots.

A few special lots of lathes, shapers and milling machines have been sold for immediate shipment. Some good orders for upright drills, one or two at a time, have been received at one of the largest establishments in this section making a specialty of these machines. Probably the most satisfactory business was that on power equipment. All companies making a specialty of such equipment have been fairly busy since the opening of the month. One of the best orders in this line was received by the Houston, Stanwood & Gamble Company, Covington. From 25 to 40 outfits of boilers and engines will go to a large concern in Dallas, Texas, for installation in a ginnery plant, the amount involved being between $30,000 and $40,000. The same company has also sold some nice outfits to go to the Florida phosphate fields. The Southern business of this company has been improving steadily since the first of the year, showing that the industrial South has weathered the period of business depression in excellent shape and is rapidly getting back into line.

Alfred H. Schütte, the prominent machinery dealer of Cologne, Germany, is now visiting Cincinnati. He will be here the greater part of the week, and is accompanied by his general sales manager, A. Siems of Cologne; his New York sales manager, W. Yeager, and his engineer and manager of the automatic department, O. Vogel. A number of diversions are being arranged for him by the machinery builders. He represents abroad quite a number of the machinery concerns in this territory. It is not his first visit to Cincinnati.

Little improvement is shown in the foundry melt, although there are two or three makers of castings in the Cincinnati District that have run through the past few months of depression on almost full time and forces. These have been engaged mostly on castings for woodworking machinery and for the ice machine and motor and dynamo manufacturers.

Anticipating the revival which, however long it may be delayed, is a sure thing some time, the purchasing agents of a few of the largest manufacturers of tools have made new contracts with the foundries for castings needed. One of the largest of these has made a contract calling for seven months' deliveries on a heavy tonnage of castings, the foundry to make them up as rapidly as possible, the manufacturer agreeing to take them as needed later. The points argued as favoring the foundryman were the specially advantageous labor conditions at the present time and the comparatively low price of iron. Selling castings on the sliding scale basis, the foundryman would get the advantage of the higher price of iron and at the same time make specially advantageous deliveries of castings. These contracts, it may be noted, are made with outside foundries—that is, foundries located in smaller towns in Ohio and Kentucky. So far as known no similar arrangements have been made by local foundrymen, one of whom, interviewed in the matter, said that it could scarcely be satisfactory, since the tool builders' patterns change so frequently and so many little questions involving material and finish of castings arise which are frequently unexpected.

Notwithstanding the retarded condition of the machinery trade and the consequent inactivity of the jobbing foundries, some improvements and additions to the business are constanly being made. There is a feeling on the part of the Trustees in charge of the Weber Foundry plant, which was forced to suspend late last year, that a sale will be effected April 15, when it is to be put up at auction. The required selling price, something like $19,000, is considered quite attractive, considering the fact that it cost nearer $35,000. Quite a number of outsiders have inspected the foundry and have been particularly pleased with its equipment of modern machinery.

The Central Foundry Supply Company, Columbus, Ohio has taken a contract for the complete equipment of a new plant to be located at Sandusky, Ohio, operated by a corporation to be known as the Bay View Foundry Company. The order includes a 10-ton traveling crane, cupola, blower, rattlers, grinding machinery, &c.

Manufacturers of fire department apparatus report a better feeling, and for the past six weeks business has been with most of them in this territory quite promising. The Seagrave Company, Columbus, Ohio, recently shipped five of its combination hose wagons to the Canal Zone fire brigade—an order from the Government—and has also filled some important orders for trucks from the Pacific Coast.

The new forged steel washer made by the Capitol Lock-Nut & Washer Company, Columbus, O., is being tested by the New York Central system, with a view to its adoption if found in every way practical. It is reported that the St. Louis & San Francisco Railroad has adopted the washer for its entire system.

Cloyd Marvin, Findlay, Ohio, has a working model of what he terms a combination power plow and pulverizer, and arrangements will be made soon for putting the machine on the market. The model was made at the plant of the Findlay Foundry & Machine Company. The implement is simple in construction, is to be operated by a gasoline motor, and the one just completed and tested is equipped with an engine of 6 hp.

President H. A. Lanman of the Columbus Machine Company, Columbus, Ohio, reports conditions improving at his plant, with prospects very good for a steady increase in business. Recent orders include three large gas engines, two of which are for installation in flouring mills.

In the line of equipment for the mining sections the Jeffrey Mfg. Company, Columbus, Ohio, finds inquiries increasing and prospects good for an early resumption of business. Some very good business has been booked since April 1.

The Kelly Machine Works, Mt. Gilead, Ohio, will be en-

largod and improved this summer. An addition will be built 50 x 60 ft.

Some important improvements have been made in the plant of the Irwin Auger Bit Company, Wilmington, Ohio, covering a period of two years. The company is at present remodeling part of its old plant. A letter from Secretary F. S. Colvin has an optimistic flavor.

Philadelphia Machinery Market.

PHILADELPHIA, PA., April 14, 1908.

A slight improvement in buying is noted. Several dealers report a more active business although sales are still confined to the medium and smaller tools. While the volume is hardly sufficient to influence the situation to any extent, a buying movement, however small, is encouraging. Single tool propositions still predominate. Announcements of sales to be noted include a few lathes, drill presses, an occasional slotter, milling machine or a grinder. The smaller specialties also come in for a share of the business, while one equipment of small tools was bought for a newly established firm of instrument makers. Heavy tools are in light demand, while special tools show a very slight improvement.

On the whole, the trade feels a little more encouraged, and while no large volume of business is anticipated in the near future, it is believed that prospective buyers will take hold a little more aggressively than has been the case in the past few months. Irregular buying, however, is apt to continue, as there is hardly enough new business around to maintain any very even degree of activity. The larger industrial concerns are still unable to get any great volume of business, and until they become more active cannot be expected to come into the market for anything beyond actual necessities. The railroads show no inclination to make any purchases worth mentioning and some business which was expected to develop last week has not yet made its appearance. New projects are few, and are confined to the smaller propositions. Anything which requires extensive financing seems to be indefinitely deferred, pending more definite information regarding business in the future.

Manufacturers report unchanged conditions. Business is largely of a week to week character, enough orders being thus picked up to enable plants to be run at 40 to 60 per cent. of their capacity, which represents about the average in this territory. Occasionally a plant is to be found that has crept up to 75 or 80 per cent., but these are exceptional and are counterbalanced by such plants as are able to run only at about one-third their normal capacity.

The foreign demand shows practically no change. There is no demand for the standard lines of tools, although some little business has been done in certain classes of special equipment. Manufacturers of power transmission specialties report a slight falling off in the volume of orders.

The second-hand machinery market holds up fairly well. Prospective buyers, particularly those in the market for the medium and smaller tools, look this market over carefully as a rule before buying new tools. Sales are reported as fairly good, although the volume of business is by no means as satisfactory as might be desired, even in dull times. Boilers and engines have been in moderate demand and some sales of equipment in the medium horse powers have been made, while some of the heavier type are pending.

The iron and steel casting plants show but little change. Foundries are being operated on short time, and the business coming out is comparatively light. Day to day orders, for prompt delivery, make up the bulk of the business, there being no disposition on the part of consumers to anticipate their wants.

Bids will be received by the Building Committee for material of varied character to be used in erecting a nurses' home for men at the State Hospital for the Insane, at Norristown, Pa. The cost will be about $75,000. Bids must be in hand April 23. Further information regarding the above may be obtained from John L. West, steward, State Hospital, Norristown, Pa.

The Superintendent of the United States Mint, Philadelphia, Pa., will receive proposals until noon, May 9, for the general supplies required during the fiscal year, July 1, 1908, to June 30, 1909, under the usual conditions, in accordance with schedules and specifications, copies of which, together with other information, may be had on application to John H. Landis, Superintendent United States Mint, Philadelphia, Pa.

The Baldwin Locomotive Works does not note any material improvement in the demand for locomotives. The bulk of the orders received come from individual concerns, who order in small quantities, usually single engines. Some little business has developed for mine engines, but the railroad demand is practically nil. It is expected that it will be some time before the railroads become active buyers, and it is thought likely that the Western roads will enter the market first. Export business is very quiet. At the time the Baldwin Works has a total of about 6000 employees on its rolls, the average time being 30 hr. per week.

The American Railways Company, while denying that plans have been completed, as announced in the daily press, for a new power station, for the Scranton Railway Company, one of its properties, to be located along the Lackawanna River, states that it has the proposition under consideration, but as yet no plans have been drawn.

The Iszard-Warren Company, Inc., which was recently granted a Pennsylvania charter, with a capital of $50,000, will engage in the manufacture of engineering instruments, engineers' field equipment and drawing room outfits and supplies, at 1122 Vine street, in this city. C. F. Iszard, who is president of the company, was formerly secretary-treasurer of Queen & Co.; while J. Henry Warren, who is the secretary-treasurer of the concern, was formerly in charge of the engineering department of Queen & Co. A complete machine shop equipment will be installed. Orders for the majority of the tools have just been placed.

The Merchant & Evans Company, Philadelphia, Pa., reports an increasing demand for its products to supply which it has been necessary to secure additional shop room and greatly extend its machine tool equipment. The company now has one of the most completely equipped modern machine tool shops in the country for work of precision with a complement of the leading makes of machine tools of all sizes with which it can manufacture at a minimum shop cost and maximum of excellence, according to the best American practice, and is able to make prompt deliveries. To further increase its facilities it is contracting for an expensive double action heavy press equipment for the manufacture of large and deep steel stampings of every description. One of the important specialties manufactured is the Hele-Shaw clutch, which is extensively used in automobile construction, but which has been largely and successfully employed in a wide range of mechanical drives of every description abroad. The English manufacturer, from whom the Merchant & Evans Company has secured the exclusive rights under American patents for the manufacture of the clutch, has installed about 25,000 hp. in the past four years in England and Europe in over 50 different applications ranging from 1 to 1000 hp. This clutch is claimed to have remarkable qualities of efficiency, smoothness of action and endurance, combined with great compactness and comparatively small size, making it especially suited for heavy duty in a small space. In addition to its wide range of specialized engineering work, the company is putting out a complete line of automobile parts for industrial and pleasure cars, such as rear axles and transmissions, front axles, four-cylinder motors with or without clutch for motor boats, as well as car use, and the Star stamped metal tire case.

New England Machinery Market.

WORCESTER, MASS., April 14, 1908.

The general business situation shows little change. The mercantile agencies report a better feeling taking industry as a whole. Collections are improving slowly. In the machine tool trade the apathy continues, brightened by an occasional order booked by dealer or manufacturer and by a continuation of active though generally unfruitful inquiries. The foundry business is better in spots; occasionally a foundryman reports an increase in orders that necessitates larger production. An instance of this is the Baush Machine Tool Company, Springfield, Mass., which has begun to operate its foundry six days a week.

The direct effect of last year's good crops in the West and South is now being felt by Eastern manufacturers. There appears to be just as great a demand from this trade as last year, and an even better demand is reported from some sections of the West. The Eastern farmer is a good customer also, though his crops did not average up to those of his confreres of other parts of the country. The Wire industry has had an exceedingly good trade from the agriculturist and stockman, and has been helped out of what would otherwise have been much more serious stagnation. The same is true of a wide variety of manufacturing lines more or less close to the machine tool business. The effect of the distribution of the enormous sums received for the crops has by no means reached its hight.

The great fire which wiped out the business section and a large residential area of Chelsea, Mass., a suburb of Boston, should have a very marked effect upon business in Boston. The 1230 buildings that were destroyed will for the most part have to be replaced, which will be of great benefit to dealers and manufacturers of hardware, plumbing goods and all other building supplies. Considerable manufacturing property is included in the list of property burned, the losses being total in all cases, and considerable machine and power equipment will have to be replaced. The great plant of the Magee Furnace Company providentially es-

caped, the fire was approaching to close proximity. Many small repair shops lost machinery; the stocks of several hardware stores were destroyed, comprising those of Wright Howard, Richardson & Co., S. S. Tukey & Co., and Everett L. Way. Manufacturers affected, according to the published lists, include the W. A. Snow Iron Works, machinists; George F. Peck Mfg. Company, pump specialties; Circular Loom Company, machinery; the Chelsea Carburetor Company, gasoline engines, and the Buckley Trap Company, plumbers' supplies. Nearly a dozen plumbing establishments were destroyed. The total loss is very conservatively estimated by the insurance companies at $5,000,000, with insurance rising above $3,500,000. In replacing the city, including most of its public buildings, it is estimated that more than double the amount of the insurance will be spent, much of it this year. The loss does not begin to represent the cost of reconstruction, for most of the burned buildings were old and of poor construction, and they will have to be replaced under the restrictions of modern building ordinances.

The Gray & Prior Machine Company, Hartford, Conn., manufacturer of universal joints, soda kettles, &c., is to build an addition to its main building, to replace an old wooden structure. The ground floor will be about 25 x 35 ft., and the second story 25 x 50 ft. The first floor will be used for an assembling room and the second for the office. A frame shed for the storage of castings and other rough stock will also be built.

The Portsmouth Forge Company, Portsmouth, N. H., manufacturer of heavy forgings, has resumed operation after several weeks' shutdown.

A dispatch from Pittsfield, Mass., states that the Triumph Voting Machine Company of that place is preparing to begin production on a large scale.

The Hampden Machine Screw Company, Greenfield, Mass., is the latest addition to the industries of that town. It has been indorsed by the local Board of Trade, and has engaged manufacturing space. It is stated that it will manufacture general screw machine products.

The Baush Machine Tool Company, Springfield, Mass., manufacturer of multispindle drills and boring mills, has recently shipped to the new Saucon plant of the Bethlehem Steel Company 10 carloads of drilling machines, totaling 284 drill spindles. The equipment consists of four vertical and eight horizontal machines. Its purpose is to drill the solid structural steel produced by the plant under the Gray process.

The Lipscomb Disc Screw Calk Company, 106 Park street, New Haven, Conn., has begun the manufacture of shoe and boot calks, wrenches, chucks, braces, &c. A. B. Lipscomb is the president and W. H. Bartello the manager.

The receivers of the National Steel Foundry Company, New Haven, Conn., have reported to the Superior Court that they have received no offer for the property, the appraised valuation of which is $256,000, less an estimated shrinkage of 20 per cent., due to the protracted shutdown and the fact that the company has ceased to be a "going" concern.

The Nevels Mfg. Company, Hartford, Conn., has been organized under a Connecticut charter to manufacture an automatic coin controlled electric driven clothes brushing machine. A. L. Nevels, the inventor of the device, is the president; I. G. Cranton, vice-president, and Frank J. Knox, secretary and treasurer. Manufacturing plans are not yet completed.

A paragraph published in this correspondence last week regarding contemplated purchases of machine tools for a new repair shop should have read Walter Baker & Co., Ltd., Boston, instead of Walter H. Baker & Co.

Government Purchases.

WASHINGTON, D. C., April 14, 1908.

The Isthmian Canal Commission will receive bids until May 4, circular No. 436, for electric motor, lathes, bolt cutter, upright drill, shaper, emery grinder and other supplies.

The following bids were opened April 7 for supplies for the navy yards:

[illegible] Industrial Works, Bay City, Mich., $508; [illegible] Company, New York, $543; [illegible] Company, New York, $1,089; Charles E. Robidoux, St. Louis, Mo., $110.

[illegible] Company, Boston, $1,499; Schuyler, [illegible], N. Y., $499.24; [illegible] Mfg. Company, St. [illegible], Mo., $480.50; [illegible] Mfg. Company, Pittsburgh, Pa., $515; 114, Western Electric Company, New York, $582.75.

[illegible] Motors, Buffalo, N. Y., $2,950; [illegible], N. Y., $2,950; Wagner Electric Mfg. Company, St. Louis, Mo., $2,977.50; 114, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., $2995; 114, Western Electric Company, New York, $3148.85.

The following bids for furnishing one 6-ton crane for the Rock-of-Ages, Mich., light station, were opened by the engineer of the eleventh lighthouse district, Detroit, Mich., on March 19, as follows:

Industrial Works, Bay City, Mich., $1365, accepted.
Northern Engineering Works, Detroit, Mich., $1589.
Pawling & Harnischfeger, Milwaukee, Wis., $1600.

Under opening of February 24, circular No. 421, for supplies for the Isthmian Canal Commission, the Industrial Works, Bay City, Mich., has been awarded class 1, one 15-ton locomotive coaling crane, $6535.

The Buffalo Steam Pump Company, Buffalo, N. Y., has been awarded class 1, two centrifugal pumps, $4189, bids for which were opened March 2, circular No. 423, at the office of the Isthmian Canal Commission.

Under bids opened March 10 for supplies for the navy yards, the R. B. Carter Company, New York, has been awarded class 171, one single acting, triplex gasoline engine driven pump, $961.

Under bids opened March 24 for machinery for the navy yards, Wickes Bros., Saginaw, Mich., have been awarded class 81, one motor driven punch, $829.

The following awards have been made for machinery for the navy yards, bids for which were opened March 31:

Cincinnati Electrical Tool Company, Cincinnati, Ohio, class 108, one portable electric grinder, $43.34.
H. B. Underwood & Co., Philadelphia, Pa., class 111, one portable bar, $660.

The Riverside Engine Company, Oil City, Pa., manufacturer of gas engines, air and gas compressors, has moved its Pittsburgh office from the Empire Building to the new Keenan Building. F. Louis Eagan has been appointed sales agent for the company's product for Indiana and Illinois, with headquarters at 1130 Congress street, Indianapolis, and the Brown-Russell Company, Pittsfield, Mass., has been appointed agent for the New England States. L. E. Safford, formerly Pittsburgh sales manager for Clark Brothers, Belmont, N. Y., and later general sales agent for the United States Engine Company, Parkersburg, Va., has joined the sales department of the Riverside Engine Company.

The Chicago Railway Equipment Company.

The following balance sheet, as of December 31, 1907, verified by chartered accountants, has been issued by the Chicago Railway Equipment Company, whose general offices are on Forty-sixth street, between Lincoln and Robey streets, Chicago:

Assets.

Real estate, buildings, machinery, patents and good will		$4,114,194.88
Office furniture and fixtures, Chicago, Detroit and Jersey City		3,910.03
Material on hand, Chicago, Detroit, Jersey City, Grand Rapids, Marion, Montreal and Walkerville		764,241.21
Accounts receivable and cash		1,004,042.35
Total		$5,886,388.47

Liabilities.

Capital stock:		
250,000 shares of $10 each	$2,500,000	
Less held in treasury	20,000	
		$2,480,000.00
Five per cent. mortgage bonds:		
First issue canceled.		
Second issue	$500,000	
Less canceled	300,000	
		200,000.00
Bond guarantee fund (reserve set aside to guarantee bonds)		500,000.00
Accounts payable		119,688.23
Working profit and surplus account		2,586,700.24
Total		$5,886,388.47

The dividends paid during 1907 and charged to surplus account aggregated $173,002.06.

The officers are as follows: E. B. Leigh, president and general manager; John P. Ahrens, vice-president; F. T. De Long, second vice-president; E. T. Walker, secretary and treasurer; P. B. Harrison, general superintendent.

The new stack of the Hamilton Iron & Steel Company, Hamilton, Ohio, having a capacity of 250 tons per day, will be blown in about July 1, and will make foundry, standard Bessemer, malleable Bessemer and basic iron. George L. Pearson is president of the company; Edwin H. Ohl, vice-president, R. E. Field, secretary, and treasurer. Walter-Wallingford & Co., Cincinnati, have been appointed exclusive selling agents.

W. J. Wilder has purchased at sheriff's sale for $1550 the plant of the Iron & Steel Aluminum Coating Company, South Connellsville, Pa. He intends to take up the manufacture of sheet aluminum under a patent recently granted to him.

HARDWARE

A CORRESPONDENT, whose letter is given in another column, is apprehensive that the Hardware trade of the country will be held responsible for the resolution in favor of national legislation in the interest of good roads, which was adopted by the National Retail Hardware Association at its recent convention in St. Louis. This action he regards as unfortunate, because it puts the Hardware trade in a false position, in as much as the care of the roads belongs to the States and not to the general government. He apparently regards it as a reproach on an exceptionally intelligent and broad minded body of merchants that they should appear to advocate so impractical a project as national control in such matters.

While the action taken at the St. Louis convention may be subject to the criticism of our correspondent, we do not think there is much likelihood that the trade as a whole will be regarded as favoring a national good roads law. There will be general agreement that this is a subject which lies outside the jurisdiction of Congress, and must be left to the management of the different States. It would indeed require some strange forcing of the constitution to find a theory on which such legislation could be justified and put in a form that would stand the scrutiny of the courts. It is significant that while several of the State Hardware associations adopted resolutions in favor of good roads, these resolutions took the perfectly sound position that this is a matter to which the States, not the federal government, should give attention. Most of them, however, passed the matter by without making any deliverance in regard to it, and apparently without giving it any consideration. It is thus, as far as the action of the State associations is concerned, quite clear that the Hardware trade is not to be quoted as on the side of a national care over the highways and byways of the country.

In regard to the action taken by the National Association, which is made up of delegates from the State associations, it is a mistake to suppose that resolutions expressing the opinion of these delegates must be accepted as representing the entire trade. Whether they should be invested with this dignity and regarded as voicing the sentiment of Hardware merchants at large would depend on the subjects to which the resolution related, and the manner in which they came up to the national body. When the catalogue house competition was the subject of resolutions and memorials in almost every State convention, and the trade was substantially a unit in the position they took in regard to it, the National Association was entitled to speak authoritatively for the great body of the associated merchants. If, however, at St. Louis there had been put through a resolution in favor of a revision of the tariff, for example, a matter about which no State Association has, we believe, given a deliverance, the public would have no right to hold the Hardware trade responsible for such resolution. It would express simply the individual opinion of the gentlemen who voted for it. This is the way in which the St. Louis resolution in favor of a national good roads law is to be regarded. It voices the opinion of a majority of the 80 or more delegates in attendance, assuming that they were present when it was passed, and took pains to understand what they were doing when they adopted, possibly without discussion, the report of the Resolutions Committee. In this respect, however, they acted in their individual capacity, and not as the representatives of the trade at large.

Condition of Trade.

The progress of the trade toward improvement is gradual, and like the advance of a backward season intermittent, and to those who are watching with some solicitude not as rapid as might be desired. Business in the Hardware field is of fair volume in many agricultural sections, and jobbers who are supplying this trade find little reason for complaint in regard to business. The cities and manufacturing towns are not in so satisfactory a condition, largely because of the number of persons out of employment. While there is a constant revision of prices going on with a gradual settling of values in various lines, the market is remarkably steady and the manufacturers are entitled to credit for the degree of self-control they are exercising in refraining from breaking prices more radically than they do. The wisdom of pursuing a conservative policy in this regard is recognized, but the temptation to make concessions to secure attractive orders in a slow market is not always easy to resist. Buyers also are conservative and are not disposed to tempt the manufacturers with very liberal orders. There are, however, instances of free buying in a demoralized line, regarded as a safe purchase. The smaller merchants, some of whom are doing a good business, are in present conditions enabled to buy at prices nearly approaching those to which the jobbers only are theoretically entitled. Merchants and manufacturers are now for the first time in several years able to count on prompt deliveries of materials or goods, and business is thus free of some of the vexation which characterized it during the times of greatest activity. There is also more opportunity than heretofore for a careful getting of things into shape, making improvements in methods, and perhaps deciding upon and making use of new and better measures in the conduct of business.

Chicago.

A review of results in the Hardware market for the past week reveals no changes of importance, either in the volume or character of demand. Some lines, influenced by the requirements of the season, are moving a little more freely, while others are inclined to halt, but on the whole business maintains about the same degree of activity that has prevailed in recent weeks. It is noticeable, however, that the attitude of consumers and distributors is becoming more clearly defined and positive respecting the central issues involved in the present situation. While prices generally have been thus far reasonably well maintained the continued absence of an adequate demand is unquestionably adding to the burden of their maintenance. During the period of stock liquidation, which has been in uninterrupted progress since the precipitation of the financial panic last October, the sentiment among merchants, large and small, and perhaps a majority of manufacturers, was strongly in favor of the measures taken to prevent a sudden slump in values. The time afforded by conservative action in this respect for the gradual adjustment of affairs to changed conditions was regarded as essential to the welfare of all interests; and results have seemingly justified the wisdom of the course pursued. It has, however, all along been conceded that unless supported by the restoration of something near a normal demand an

ultimate readjustment of prices would sooner or later be not only advisable, but necessary. The fact that this contingency now confronts the trade cannot be ignored, and to some extent at least influences the restriction of purchases to minimum present requirements. Stocks are on all hands admittedly low, but there is no disposition, either on the part of jobbers or retailers, to increase them beyond the point of current needs, irrespective of prospective future demand; nor is there likely to be any change in the views dictating this policy until better confidence in a reasonable stability of values is established. With the advent of warmer weather 10 days ago Wire Cloth and Poultry Netting orders began to come in more freely, but a succession of cold days has had an adverse effect upon the movement.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—General trade conditions in surrounding sections of the country can hardly be looked upon as equal to the same months in 1906 and 1907, but they are quite equal, and even better than the same period in 1905. The temporarily diminished trade should not be discouraging, but present conditions should be considered hopeful for the future.

We admit that the changeable weather conditions of the country during a portion of the last two weeks have restricted and reduced trade somewhat, but the recent change to normal spring conditions has already somewhat increased the retail trade, and has given encouragement to their buyers.

The demand for leading seasonable Hardware goods during the early spring season is, we think, realized by the trade generally, and, therefore, we naturally look for improvement during the entire months of April and May. The financial conditions of the country are certainly improving, bank deposits are increasing and rates on money decreasing, so that many manufacturers feel like increasing their production over and above the orders they have on hand.

We find also that throughout our section of the country many retail dealers feel that when Congress has adjourned the excitement which existed from October, 1907, to March, 1908, will greatly decrease, and great encouragement in trade will follow.

The financial conditions of the country have largely improved, and are no doubt far better than it was feared by many they would be at this time. The present Government predictions of agricultural products of the country for 1908 are especially encouraging. We therefore look forward to future trade with confidence.

New Orleans.

WOODWARD, WIGHT & CO.—The last two weeks have witnessed very little activity in any department of business here. There is a regular line of orders coming in to all the Hardware trade from drummers and by mail, but absolutely for nothing more than enough to cover the customer's requirements. There is a fairly good contractors' trade both in the city and country. Cotton people are cheerful, and sugar planters have every prospect for a good year. Rice planters have their business practically arranged for the coming year. The lumber industry is not feeling as hopeful as it was two weeks ago. The output of the small mills can be readily sold but at heart breaking prices. Larger mills are having pretty fair demand from the retailers and getting, in comparison with the small mills, fairly good prices.

Compared with last year, business is not at all attractive. The labor expense has been cut practically in half, while the living expenses of the men have not been reduced at all. There is also a fairly good accumulation of stock in the yards of some of the pine mills.

The financial condition of the city is good, and the banks are loaning freely to their regular line of customers on the basis of their doing a reduced business from what they did the year before. The great factor in New Orleans at present is the large amount of work that is still being done in draining and sewering the city. This, of course, helps out the trade in the city itself very materially.

Collections are coming in much better than they have been in the past, and there are very few amounts outstanding back into 1907 except in some cases where definite terms were made to carry their business on account of being in need of funds; but the great majority of the trade are now paying up better than they have at any time since last November. The uncertainty, however, in regard to prices in the Hardware business keeps all the retailers on a hand to mouth policy.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—March, 1907, was probably the record month in the Hardware business of this country. Manufacturers were behind in filling orders, the railroads of the country staggered under the traffic, jobbing houses worked night after night.

It is not surprising nor unexpected, neither is it a cause for uneasiness, when we look over the figures of March, 1908, to see we have fallen behind somewhat in sales. This year we find the manufacturers are filling orders very promptly, and we are having no difficulty obtaining cars to carry away our merchandise. We are not doing any night work, and occasionally when the sun shines all of us take a Saturday afternoon off. Nevertheless, the decrease in business as compared with last year is not as great as we feared earlier in the season. We are steadily and comfortably busy.

In analyzing our business by States we find in some sections very nice increases over last year. In those States where we have only a few salesmen our increase or decrease in business might be due to changes in salesmen or to what might be called the personal equation, but when there is an increase or decrease in a State where we employ a large number of salesmen working the State thoroughly, the general law of averages comes into play and the results must indicate accurately the condition of business in that State.

Therefore when we find our business in March shows an increase in such States as Missouri, Illinois, Iowa, Oklahoma, Tennessee, Arkansas, Mississippi, &c., it would seem these great agricultural States, taken as a whole, must be in fairly good condition.

On the other hand, we regret to note quite a heavy decrease in our Texas sales. As we have a large number of salesmen in Texas we naturally feel the loss of this business, and it cuts quite a figure in our general results for the month. We of course are familiar with the unfavorable factors that have had and still have such a serious bearing upon the Texas situation.

Crop reports from Texas at present are exceedingly favorable; in fact, crop reports from all directions are very good. It is especially interesting to note the Government report gives the winter wheat average on April 1 as 91. If favorable weather continues it would seem we will this year have bumper crops in all parts of the country. If we do have these crops not even a Presidential election or all the reformers can hold down the business of this country.

The daily papers are giving a large part of their space to political news. The managers are building a fire under the political kettle and are trying to get it to the boiling point. Is the mass of the reading public as much interested in politics as the daily papers seem to think? Are not the guiding minds of our newspapers somewhat more interested in politics than the people themselves? Do they not give more space to politics than the people want or care for? Do the people acutally want all the scandal, divorces, murders, &c., served up to them in such detail with their soft boiled eggs for breakfast? Are not many of us forming the habit of skimming a whole lot of this sort of stuff hunting for news that is actually interesting? Has not the newspaper pendulum swung too far in this direction?

The writer was recently mailed a paper published in Memphis in 1852. It struck me as being a better paper than those published to-day. It certainly was written in very much better English and had more real literary merit, even if there were a number of advertisements for lost, strayed or stolen slaves.

This, however, is a digression. What we started out to say is we trust the political agitation of this summer will not have a serious effect upon business, notwith-

standing the efforts of the newspapers to throw everything else into the background. We wonder how much the newspapers make out of politics. Is all the space they give pure philanthrophy? When a distinguished president of one of our great colleges makes an address in this city on an important topic before a large gathering, if he receives a notice in the daily papers of 10 or 15 lines he is in luck, but when Mr. Jones, seeking a $600 per annum political position in Podunk, Hoop Pole Township, Mo., makes a talk, he gets a column.

We have been very much interested in the tariff situation. We note the filibustering in Congress on this issue. Like Banquo's ghost, the tariff question "will not be downed."

In the meantime the expected reduction in Nails and Wire has not materialized, and we are informed by the large interests it has been indefinitely postponed.

Those who control the interests of Galvanized Tubs and Buckets have announced a reduction. Some manufacturer gave an inside price to somebody and now, for that, you can all sell Tubs cheap.

There also seems to be a merry war on Agricultural Wrenches, and low prices on these goods are the order of the day.

As might be expected, sales of Axes are very light. Merchants are slow placing future orders. At present prices Axes are surely a bargain. It would be interesting if some morning the trade woke up and found Axes had suddenly advanced $1 per dozen. Then what a rush there would be to place orders and get under cover. "Anything is liable to happen in the Axe business." Axes can now be bought with a fall dating, and it is a sure thing no one can lose any money at present figures.

With the exception of these and a few other items, the general market seems to be very well sustained.

That the retail trade are buying carefully and often is indicated by the fact that our mail order department is holding its own better than any other part of our business.

Cleveland.

THE W. BINGHAM COMPANY.—Local trade conditions are quite satisfactory; city trade is very fair, and in the farming districts, from which we have enjoyed a large trade so many years, trade has also been quite good since the first of the year. The manufacturing districts seem to be more affected with apathy than any other, but we can see a little improvement all the time. Quite a good many inquiries are coming from the manufacturing districts for material of all kinds, and some orders are being placed, whereas some customers are holding back the placing of orders for what they may think a more propitious time. This is wrong, for the manufacturers of general Hardware are not piling up goods at their factories, and some dealers may find that they have made a mistake in not placing their orders early for future or fall goods, especially for staple articles that they have sold for years and will continue to sell as they have heretofore when their season comes around.

Now the manufacturers are guided a good deal in making up these season goods by the orders that they receive in advance, and if retailers and jobbers do not anticipate their wants far enough ahead there may be a shortage on some goods when they want them, because you cannot always get certain goods on the "drop of the hat" or just when you think you want them. When retailers can place their orders with reputable jobbers who will take care of them in good shape and give them good prices and terms, they run no risk in placing their orders with the right party.

From the Government and other reports it would seem that the future grain crop is in good condition and bids fair to be a large one.

The Ohio State orchard and nursery inspector reports that the fruit prospect in this State is splendid, and our wheat fields are going to show up well, and if we have any kind of favorable weather during the coming months it is stated the total crop of fruit and wheat in Ohio will exceed last year's. So we feel that our surroundings are good and we are very hopeful as to the future.

As the tendency of the times is toward conservatism and saving and eliminating extravagance, we will accumulate a large fund which when let loose into business channels will go a long ways to stimulate trade. If more of our people would get wise and not be carried away by the flaming advertisements of cheap stocks (something they know nothing about when they get them) and attend more to their own legitimate business how much happier, prosperous and contented we all might be.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—Business conditions in this part of the country are just about the same as in our last letter, and improvement in trade is still slow, but we think the conditions are gradually getting better.

Both jobbing and retail dealers are carrying small stocks, and are buying light. Some orders are now being placed for fall shipment, and we look for a very fair business during the coming summer and fall.

From all over the South the reports that we are beginning to get in indicate that crop prospects are very good, although, of course, it is rather early to make any definite prophecy. Prices are being very well maintained, and we do not hear of any cutting in any lines.

Collections are very good.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—All indications point to an excellent demand for goods as the season advances with prospects for a very large trade during the coming months. A large amount of building is in progress throughout the entire trans-Missouri territory, consequently labor of all kinds can find ready employment at good wages. The whole situation would seem to indicate that business will continue steadily and uninterruptedly.

With the Western people a good deal depends upon the size and value of the coming season's crops, but it is too early yet to form an opinion on this important feature that would be anything further than guesswork. At the present time all conditions are in excellent shape. If any weak spots are exposed later on they will develop in the East, either by the extraction of more water out of the inflated securities or by a slump in the metal market, which has been so long in the hands of the sellers and been worked by them to a finish. Coming events usually cast their shadows before, and the trend of the general market will be closely watched with a great deal of interest.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—It is pleasant to be able to report an improved market. Each week seems to do a little better than its predecessor, and this without the artificial stimulus of prompted communications to trade papers which call for optimistic expressions whether the writer can really believe what he is saying or not. The improvement is unmistakable, and the volume is certainly on the increase.

But there is no such thing as arbitrarily holding prices when the market does not justify. The oft repeated argument, that just as much is sold when prices are high as when they are permitted to assume the normal level, is simply fallacious. Low prices do stimulate use, and more will be bought when the price is felt to be a safe one than when it carries the hazard of being out of proportion to the conditions of the market. Even the efforts of the most well ordered trust or corporation cannot beat the great army of buyers when they are all headed one way and led by that mistress of Fates—namely, one's own self interest.

We have been interested in a leaflet put out by one of the trade papers, headed "Act Now—Get Ready for Good Times." The main argument is that labor is cheap and abundant; that is one of the first premises. The fact is that labor is not cheap, but in each of the building trades here at least is the highest known in its history. A few years ago plasterers got $3 per day for 10 hr., they now get $5 for 8 hr. Plumbers got $2.50 for a day of 10 hr., they now get $4 for 8 hr. Bricklayers got $3 per day of 10 hr., they now get $4.80 per day of 8 hr., or 60 cents

per hour. These are just a few examples of what might be quoted on the labor market.

How absurd to claim then labor is cheap. It is abundant, as stated in the article, but the abundance does not make it either cheap or efficient. Fear of doing too much in the eight-hour day seems to be the pervading principle; so while we are perfectly willing to join the optimistic ranks for the coming campaign, we should never base our argument on the fact that at the above figures labor could be called cheap. We do not want it cheap for one thing, we want it reasonably high priced or at least well rewarded, and then for its own sake and the employer's sake duly efficient.

It would be interesting to get at the experience of any one who has had an opportunity to observe lately the effects produced by the long period of active demand for so-called skilled labor. We believe, however, that with the reduction of numbers forced by lack of demand a high efficiency will be encouraged and demanded. Those who are engaged to oversee work have much responsibility in this regard. The unwillingness of the average workman to use labor saving devices is well recognized, and ought to be met by intelligent direction so as to bring about the greatest results with the lowest possible outlay of human muscle—viz., with least necessary fatigue. This abuse of opportunity is seen more frequently in work done for the city or for great public utilities where politics cuts a figure. A man who is being rewarded for his vote does not feel obliged to step lively or to carry much of a load, except possibly that which the neighboring saloon may furnish.

Money is growing easier, and tempting rates of discount are now the order of the day. This should do much to promote new enterprises, which were necessarily cut off when rates from 8 to 10 per cent. were demanded by those fortunate people who had money to lend.

The increased cost of collection of local checks is attracting much attention. The New Orleans banks have been urged by the business men and commercial organizations there to arrange for a clearing of checks within limited territory at least, so that the arbitrary high charges now prevalent for some time may be avoided. Some such plan is in operation in Boston for the New England States, but we have not heard of its successful operation elsewhere. A great many banks have been established within the past few years whose officers have lacked the necessary education for their calling. It seemed to be the idea of many of the small country banks that much money was to be made out of their town correspondent somehow in addition to that which was had by discounting notes and loaning money in the ordinary process of business. This has resulted in charges for collection which are really burdensome.

The question of the currency and finance is quite as lively a one here as elsewhere. We are hoping that nothing will happen, either in Washington or elsewhere, to disturb finances or business as sorely as was done last fall.

Portland, Oregon.

FAILING, HAINES & MCCALMAN.—Business conditions in this part of the world continue to improve, and, while business in general is rather quiet, we do not think that this is due to the late unpleasantness, but to the usual slowness during Presidential year. As far as our territory is concerned, prospects are unusually bright, as all crops are well advanced for this early in the season. There are also prospects of almost immediate resumption in the work of railroad building, and if all of the rest of the country is in as good condition as the Pacific Northwest the calamity howls which we see in the Eastern papers are unjustified, but to judge from what we hear this part of the country is exceptionally favored this year.

Boston.

BIGELOW & DOWSE COMPANY.—Trade in farming communities is about normal, but in mill towns merchants complain of dull times. The sales of Wire products keep well up to last year's, but there is a slight falling off in the sales of general Hardware. Sales in 1907 were abnormally large and are not a fair comparison, taking into account many reduced cost and other demoralizing conditions.

The good times talked of the first of the year do not realize as quickly as many hoped, but still there is a feeling of cheer and a happy resignation in the thought that if we wait a bit longer the great wealth and prosperity of the farmers of this country will come to the front and drive away the trouble which seems to be wholly a lack of confidence. In times like these we can all do our part to bring things right again, and the more united we are in finding the bright side the more optimistic we will be. Buy goods if you need them and can pay for them. Keep your stock in shape to supply your customers' wants. Use a bit of "Christian science" and you will soon find things coming your way.

Yesterday our neighboring city of Chelsea (across the river) was visited by a terrible conflagration, with a fire loss of from $7,000,000 to $10,000,000, which left 15,000 people homeless and without shelter. To-day the whole community is planning relief, which is flowing in from every source. Such calamities serve to show the grit and stability of our American people, for in good works they are unequaled.

Remittances, like business, are off a little.

NOTES ON PRICES.

Wire Nails.—Orders continue to be for quantities which indicate that they contemplate only near-by requirements, as they are usually of moderate volume. Requests for prompt shipment not infrequently accompany orders, which further emphasizes ruling conditions. Under trade conditions now ruling the difference in price to wholesale and retail carload buyers is not always enforced. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

New York.—Demand keeps up in about the same volume as last month, but comparatively less than usual at this season. Regular quotations are on the basis of $2.40 per keg for small lots at store.

Chicago.—Specifications against contracts are being furnished in good volume, and the mills are making shipments with promptness that contrasts favorably with the delays that were experienced at this time last year. Jobbers' stocks are reported to be unusually low considering the season, but the availability of supplies for quick replenishment favors conservatism in this respect. New orders are coming out in fair volume, but under the circumstances they are restricted to nearby needs. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—Conditions in the Wire Nail trade show little change, demand being of a hand to mouth character, and the mills are only fairly busy. Orders being placed, while small in volume, are often accompanied with a request for prompt shipment, showing that stocks held by jobbers are light, and the character of the order also shows that the large trade is not disposed to buy ahead. There is no incentive to do so as the mills are able to make prompt shipments. Prices in the main are being well maintained, but the differential in price to the wholesale and the retail carload buyers is not being rigidly enforced. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

Cut Nails.—There is nothing of particular interest to report in the Cut Nail market. Demand continues along moderate lines, which mills have no trouble in supplying promptly, even with their limited output. Concessions are being made on regular Steel Nail quotations, which are as follows: $2.05, base, per keg for carload lots at mill. Iron Nails generally should command about 10 cents more than Steel.

New York.—Business is light, comparatively few car

Nails seeming to be required at present. Regular quotations are on the basis of $2.30 per keg, for small lots at store.

Chicago.—Continued dullness characterized the demand for Cut Nails. Usually, before this time, there is an active trade in Shingle Nails, but it has not as yet materialized. It seems probable, however, that under the influence of favorable building weather it will develop to some extent before long. Prices continue more or less irregular on what business is moving, and regular prices are shaded to the extent of 10 cents a keg by the jobbing trade. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; Steel, to jobbers, in carloads, $2.28; to retailers, $2.33.

Pittsburgh.—Demand is almost stagnant, and the few orders being placed for Cut Nails are only for small lots, representing actual needs of the buyer. The mills are steadily restricting output, which is very light, and in a large measure they are preventing accumulation of stocks. Prices are being shaded from 10 to 15 cents per keg, even on the small amount of business that is being placed. We quote Steel Cut Nails at $1.90 to $1.95, f.o.b. Pittsburgh, for carload lots, and about $2 for small lots, to which freight to point of delivery is added. Iron Cut Nails are about $2.05, at maker's mill.

Barb Wire.—The amount of business coming to the mills is by no means taxing their productive capacity Indications are that the season's trade will be fairly satisfactory, taking general trade conditions into account. Prices are being maintained at regular quotations, according to information from the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—The activities in fence building throughout the West are now at their hight, and as a result dealers are clamoring for instant shipment of their orders. As a result some of the mills are, for the present, taxed to meet these demands. The sections from which orders are backward in coming out are the extreme northern points, where jobbers have not yet moved their held over stocks. The total volume of business will probably fall short of last year's record, but it is expected to reach quite satisfactory proportions. Prices are generally well maintained. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—A moderate amount of new business is being placed, demand having been stimulated to some extent by the recent favorable weather. Prospects for the season's trade are fairly encouraging, but it is evident that tonnage will be very much lighter than at this time last year. Prices in the main are being observed by the mills, but there is some shading being done by the jobbers. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—Mills are in a position to make prompt deliveries, as orders are confined to the actual requirements of purchasers. Orders are for small quantities which necessitates their more frequent placing. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Chicago.—A fair amount of new business is being supplied by orders from manufacturers. The same conditions which counsel conservative purchases elsewhere are operative here, and as a result contract tonnages are not so large as was the case last year. Buyers are cautiously guarding against over estimating their requirements, but the prospects are good for a relatively large business. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—The amount of tonnage being placed in new orders does not compare favorably with this time last year, when the mills were congested with business. Consumers are disposed to limit their purchases to actual needs, and are buying in small lots, but are placing orders more frequently. The mills are able to make prompt deliveries, and with no probability of an advance in prices, there is no incentive to buy ahead. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Vitrified Sewer Pipe and Fittings.—Owing to active competition among representative manufacturers of Vitrified Sewer Pipe and Fittings, prices have fallen during the past month until the market is in a badly demoralized condition. As the present selling price is near the cost of manufacture, the view is expressed that present conditions may be of limited duration. The Eastern market is very quiet and carload business is a rarity. Requirements are met by buying in small lots from yard. In the West and South some good contract orders have been placed with manufacturers. The following quotations for carload lots, f.o.b. factory, fairly represent the market:

Standard Pipe and Fittings, 3 to 24 in.:

First-class	87 %
Second-class	90
Stove Pipe, Bonnets and Thimbles	87 %
Pipe Linings	90 %
Chimney Tops	77

Asbestos.—The price on Asbestos Wick and Rope Packing has been advanced to 20 cents per pound in any quantity, which is an advance of 5 cents per pound over the March price in lots of 500 lb. or over, there being no limitations as to weight at the current prices. Some lower quotations probably based on the recent prices are, however, reported. Roll Board or Building Felt, 6 to 30 lb. per 100 sq. ft., has been sold as low as 2½ cents per pound in carload lots, and the same material 3-32 and ⅛ in. gauge, 45 to 60 lb. per 100 sq. ft., is being quoted at $70 per ton. Mill Board Sheet, 40 x 40 in., 1-32 to ½ in. thick, can be bought as low as $2.75 per 100 lb. in carloads, and in moderate quantities at 3 cents per pound.

Binder Twine.—The good condition of winter wheat, as reported by the Government, is calculated to strengthen the Twine market, as the showing on April 1 was better than that on December 1, 1907. A large yield is indicated, as the crop has apparently come through the winter in good condition. A larger acreage of oats has been seeded than usual, according to the belief of those in a position to know. The Twine market is reported as being unfavorably affected to some extent from manufacturers' standpoint by the continual offering of plain tag or unidentified Twine, the supply of which is regarded by some as being in excess of the combined rejections of all the mills combined. The output of Twine is supposed to be smaller than usual at this time of the year, a condition which is favorable to manufacturers. Demand is of fair volume at unchanged quotations as follows:

	Cents per pound.
Sisal	8¼
Standard	8¾
Standard Manila	9¾
Manila	11¼
Pure Manila	13

Carload lots, ¼ cent less; 5-ton lots, ⅛ cent less, central delivery, fall terms.

Apple Parers.—It would appear that there will be few changes in quotations on Apple Parers for this season's business. Some, however, are making one or two additions to their line. In a general way it may be said that the demand for Parers depends so much on the prospect for the apple crop that it is too early to gauge the amount of business that will be done. This is especially true this season, when jobbers are not disposed to anticipate their requirements to any great extent. On the other hand, it should be remembered that the apple grow-

ing industry is developing in all parts of the country where the fruit can be raised. The number of trees is increasing rapidly, and when one section is not favored with a good yield other localities may be more fortunate, thus increasing the chances for at least an average crop each year and making the Parer business more stable than in times gone by. The opinion is expressed that stocks of Apple Parers carried over from last season by the trade were not large.

Carriage and Machine Bolts.—At the monthly conference of leading manufacturers of Carriage and Machine Bolts a moderate reduction was made in published prices. There is no apparent change in the general condition of the market.

Axes.—Kelly Axe Mfg. Company, Charleston, W. Va., and 23 Warren street, New York, announces that its prices on Axes are withdrawn and an advance of 50 cents per dozen has been made, to take effect at once. It has been well understood that a movement to improve the Axe situation was under way, and was strongly supported by representatives of the National Hardware Association.

Rope.—Conditions in the cordage market do not show the improvement manufacturers desire, as demand continues much below normal. The following quotations, for base sizes, fairly represent the market: Pure Manila, 10¼ to 11 cents; B quality grades down to 8 to 9 cents; Pure Sisal, 7½ to 8 cents; lower grades Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¾ cents.

Sash Cord.—The competition with cheaper quality of Braided White common Cotton Sash Cord, made of inferior stock, which has been distributed quite largely at low prices, has caused manufacturers of regular quality cord generally to quote their regular goods, for the present, on the basis of 19 cents per pound for Nos. 8 to 12 in lots of 12 dozen and upwards. Manufacturers of the regular goods are said to be willing to accept orders for Braided White Common Sash Cord down to 15 cents, basis, for instance, for Nos. 8 to 12, simply to hold their trade. In this respect Sash Cord is following the course of Cordage, quality being sacrificed for price. The trade, with these facts before them, will satisfy customers better by demanding quality rather than cheapness, as the cost of replacing poor cord in windows with the good article is out of all proportion to the small additional cost of better cord at the start.

Window Glass.—The American Window Glass Company is reported as having made a reduction in the price of both single and double strength Glass of 5 per cent. It is understood that if the sliding scale is adhered to, this means that wages in hand operated factories will at once be reduced 10 per cent. The opinion is expressed that if this reduction in wages goes into effect it will result in the closing of many of the hand operated plants, as the workmen are already much dissatisfied with the comparatively small wages they are receiving. It is stated that manufacturers of hand blown Glass have refused to meet the cut in prices. Demand from both manufacturers and jobbers is light, as conditions offer no inducement for stocking up beyond requirements. In New York and vicinity business is very quiet. The minimum prices recommended by the Eastern Window Glass Jobbers' Association are as follows: Single strength, 90 and 25 per cent.; double strength, 90 and 30 per cent. discount from jobbers' list. These prices are, however, not closely adhered to.

Linseed Oil.—The announced reduction of 1 cent per gallon in Oil is more nominal than real, as but few sales have been made for some time at figures higher than those now quoted. The market cannot be regarded as firm, as Oil in carloads has been offered at, perhaps, a cent lower than present quotations. Demand is still along conservative lines and confined to nearby requirements. Local quotations are as follows: In 5-barrel lots, State and Western Raw, 40 to 42 cents; City Raw, 42 to 43 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—The local market has been rather short on Turpentine for a few days, and for that reason prices have held firm. Supplies are expected to arrive before the end of the week. The Savannah market is easier on a reported manipulation to depress prices. Demand at this point is moderate. The New York market is represented by the following quotations: Oil Barrels, 51½ to 52 cents; Machine Made Barrels, 52 to 52½ cents. Locally, demand is light.

LETTERS FROM THE TRADE.

Do Local Retail Merchants Employ Rural Carriers?

To the Editor: We notice in the last issue of *The Iron Age* the experiences of different Hardware merchants over the country as to the benefit derived from R. F. D. carriers in taking packages back to the farmers on their routes. We have two routes out from this place, two routes out from our ——— branch and two routes out from our ——— branch, and we do not consider they are worth anything to us, as the farmers in this section will not send by them for anything they wish, preferring to come to town and select for themselves. For the Government to adopt the parcel post bill will be snow in the hats of the catalogue houses, as nearly every farmer in the country has one of these large catalogues, which give a glowing description of everything that is used on the farm. Of course the farmers think every word is so, and they just order direct from them without even coming to see what the local Hardware merchant could do on the same line of goods.

Instead of adopting penny postage we would rather see postage on everything except letters and newspapers advanced 100 per cent. This would go as far as anything else to drive out catalogue house competition. We do not think they should be allowed to send their goods into our State and into our county where we have to pay license and taxes to live and do business, and they do not pay one penny. Let the States tax merchants doing a retail business over the whole United States, and this will help the local Hardware dealers. VIRGINIA.

A National Good-Roads Law?

To the Editor: I am sorry to see that the Hardware trade, according to your report of the meeting of the National Association at St. Louis, has put itself on record as favoring a national good roads law. All of us, of course, want good roads, but it occurs to me to ask why the Hardware trade should look to the national Government to make them. Is not that work that belongs to the State instead of the national Government? I cannot help thinking, too, that the authorities in Washington are sufficiently enterprising in reaching out for control of things in general and have enough to do without looking after the roads.

I regret the action of the Hardware Association at its recent meeting because it seems to me that it puts the trade in poor light before the country, when it is known that it takes such a stand. This action will certainly tend to make people think less of the good judgment of Hardware merchants. CONNECTICUT.

THE J. STEVENS ARMS & TOOL COMPANY, Chicopee Falls, Mass., is sending out a new edition of its abridged catalogue, which will be furnished in liberal quantities imprinted with firm name and address to merchants who will pay transportation charges. The booklets are equally well adapted for circulation by mail or over the counter. All the company's staple numbers are illustrated and described, special attention being directed to Repeating Gallery Rifles, Nos. 80, 81 and 82, and the new Double Barrel Shot Gun fitted with check hook and patent cross bolt through extension rib. As heretofore, the company furnishes a target with each box containing a Stevens' Rifle.

THE G. M. YOST MFG. COMPANY maker of an extensive line of Vises, is removing its main office from Mechanicsburg, Pa., to Meadville, Pa., where it has erected and equipped a large new factory building. All correspondence should now be addressed to Meadville.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM H. D. BACHTELL, who is opening a retail store in Waterloo, Iowa, and will handle Shelf and Heavy Hardware, Stoves, Tinware, Paints and Sporting Goods. New shelving has been installed and the appearance of the interior of the building otherwise improved.

FROM N. W. BRAMMELL, who is opening a new retail store in Ozawkie, Kan., and will carry a stock of Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints and Sporting Goods.

FROM ROGERS HARDWARE COMPANY, which has been incorporated in Rogers, Ark., with a capital stock of $100,000, of which $50,000 has been subscribed, to carry on a wholesale business. The company will handle Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Sporting and Athletic Goods, Buggies, Wagons and Harness.

FROM MULBERRY HARDWARE COMPANY, which has been incorporated in Mulberry, Ark., with a capital stock of $10,000, to conduct a retail business. It will handle Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, Sporting Goods, Field Fencing, Buggies, &c.

FROM T. O. ROTRAMEL, Benton, Ill., who has recently sustained a $2000 loss by fire. He handles Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils and Sporting Goods.

FROM HALBERT & WEBBER HARDWARE COMPANY, Wenatchee, Wash., in which an interest has recently been purchased by A. V. Sheppard.

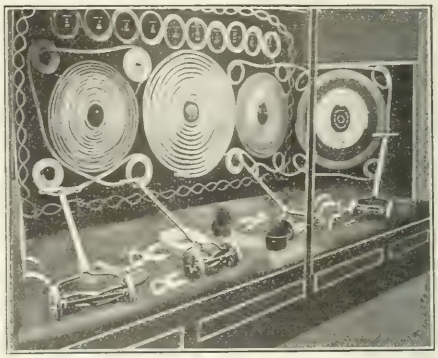
International Motor Cyclopedia.

THE INTERNATIONAL MOTOR CYCLOPEDIA, just from the press, is a compact, serviceable, red leather bound volume of 1140 pages, 7 x 10 in., published by E. E. Schwarzkopf, *Times* Building, New York. The matter is concentrated on Sport, Industry and Trade, in relation to Automobiles, Motorcycles, Motor Boats and Aeronautics as a year book for the period, March, 1908, to March, 1909. Section I, white paper, 528 pages, is replete with Technological References, including technical terms, names of manufacturers, jobbers and retailers, clubs, publications, officials with addresses, and portraits of prominent persons. Section II, white paper, 164 pages, covers Club, Contest and Touring matter. Section III, pink paper, 222 pages, is a classified trade directory, alphabetically arranged. Section IV, blue paper, 226 pages, covers the preceding field, geographically arranged. Between sections I and II is a table of contents on yellow paper, with a list of abbreviations. Other helpful features, in part, are: A compilation of calendar of Automobile Events, Club Members, Laws of the United States and Foreign Countries, Touring Information and Customs Regulations, Competitions both American and Foreign, Tables of all 1908 Cars, Body Styles and Tables of Horsepower. The purpose of the book is to furnish in condensed form as much available information as possible, to classify and arrange it so as to answer inquiries quickly, finding the topics with the minimum of hesitation and delay, whether concerning automobiles, boats or aerial vehicles.

THE LEFEVER ARMS COMPANY, Syracuse, N. Y., manufacturer of Shotguns, is announcing to the trade that hereafter it will give added protection to the retail merchants by never quoting to consumers direct from the factory at a price less than approximately 10 per cent. higher than its established minimum retail price, terms f.o.b. Syracuse, cash with order. The company realizes that there are sections in which the retail dealers should secure more than the minimum price to offset freight rates and other local conditions.

WINDOW DISPLAY OF LAWN GOODS.

THE enterprising Hardware house of Harry Mead Company, Shawnee, Oklahoma, pays much attention to its window displays, and has just sent us a photograph, reproduced in the accompanying illustration, of a spring display of Garden Hose, Lawn Mowers, &c., recently installed. The arrangement of the window needs little or no description, as the picture clearly shows how the Hose



Window Display of Lawn Goods by an Oklahoma House.

is coiled in a graceful design on the back and sides of the window, with Lawn Mowers, Grass Hooks, Grass Shears, &c., in the foreground. In the floor of the window, which represents a lawn, two circles of sand were made, and artificial flowers were set in, giving the effect of garden beds. The most attractive feature of the window which cannot be brought out in our illustration was its coloring, the grass being made of excelsior colored green with diamond dyes, and the artificial flowers of course added brighter colors. The Lawn Mowers themselves were handsomely painted, and the Hose comprised white and red varieties arranged to form a pleasing contrast.

A FIRE last week on the sixth floor of the Franklin Building, 9-15 Murray street, New York, caused considerable water damage and a great deal of annoyance to the tenants on the lower floors, among whom are Wiebusch & Hilger, Ltd., Yale & Towne Mfg. Company, and P. & F. Corbin. Wiebusch & Hilger, Ltd., and P. & F. Corbin were just preparing to move into their new quarters in the Hardware Building, at the corner of Lafayette and Walker streets, and excepting for the delay in making insurance settlement are not greatly inconvenienced.

THE fifth annual dinner of the New York Iron & Steel Association was held at the Hotel Plaza on Saturday evening, April 11. It was a brilliant and successful occasion, under the efficient direction of the dinner committee, consisting of John B. Carse, John O. Williams, Arthur J. Lockwood and L. Victor Froment. A number of gentlemen prominently identified with iron and metal interests were present as guests of the association.

THE PITTSBURGH AUTOMATIC VISE & TOOL COMPANY, Pittsburgh, Pa., has arranged with R. C. McCully, St. Louis, Mo., to act as its representative in that locality. He will have an office and wareroom on Oliver street, where a stock will be carried, so that the requirements of local customers can be immediately supplied.

RETAIL HARDWARE CONVENTIONS.

MISSISSIPPI ASSOCIATION, Greenwood, May 11 and 12. Secretary, John E. Sommers, Clarksdale.

GEORGIA ASSOCIATION, Indian Springs, May 19, 20, 21. Secretary, Gary Vinson, Waynesboro.

ALABAMA ASSOCIATION, Montgomery, May 28, 29. Secretary, L. G. Smith, Ensley.

ARKANSAS ASSOCIATION, Hot Springs, June 9, 10 and 11. Secretary, Chas. E. Taylor, Little Rock.

CAROLINAS ASSOCIATION, Wrightsville Beach, N. C., July 8, 9, 10. Secretary, Paul W. McLure, Greenwood, S. C.

OKLAHOMA ASSOCIATION, Oklahoma City, July 14, 15 and 16. Secretary, D. C. Patterson, Oklahoma City.

MICHIGAN ASSOCIATION, Detroit, August 13, 14, 15. Secretary, A. J. Scott, Marine City.

Mississippi Retail Hardware Association.

The Mississippi Retail Hardware Association has issued its programme for the second annual convention, which will be held at Greenwood, May 11 and 12. In addition to Question Box discussion, there will be a number of formal addresses on practical topics as follows: "Benefits to Be Derived by Membership in the Association;" "Can the Hardware Business Be Successfully Conducted on a Cash Basis," and "Railroad Rates and Classifications." A place on the programme has also been assigned to the traveling men who will thus have an opportunity to speak from their standpoint. Provision has been made for the accommodation of Hardware exhibits by manufacturers and jobbers. The officers of this youthful organization, which was formed last summer, are as follows: P. E. Pegues, Winona, president; D. H. Hale, Aberdeen, vice-president; Mallory Davis, Itta Bena, second vice-president, and Jno. E. Sommers, Clarksdale, secretary-treasurer.

Arkansas Retail Hardware Association.

The Executive Committee of the Arkansas Retail Hardware Association has decided on June 9, 10 and 11 as the time, and Hot Springs as the place for the ninth annual convention. These are the dates of the conventions of the Southern Hardware Jobbers' and American Hardware Manufacturers' associations, which will also be held at Hot Springs. A great gathering of Hardwaremen from all over the State, as well as from the South and other sections of the country is looked for. The programme for the retail convention has not yet been determined on.

Oklahoma Retail Hardware Association.

The fifth annual convention of the Oklahoma Retail Hardware and Implement Dealers' Association will be held at Oklahoma City July 14, 15 and 16, and promises to be the most important in its history, especially on account of questions of legislation that merchants will have to bring up from the fact that Oklahoma has become a State and is enacting many new laws. The business sessions will be held in the assembly room of the auditorium, and exhibits will occupy the remainder of the building on two floors. Threshers, Hay Presses and other lines of Heavy Machinery being placed in a large space arranged especially for them adjoining the building.

Russell & Erwin Mfg. Company's No. 7 Price-List.

THE RUSSELL & ERWIN MFG. COMPANY, New Britain, Conn., and 94-98 Lafayette street, New York, has just issued price-list No. 7 applying to catalogue No. 9, the various changes in discount, &c., harmonizing with the reductions in Builders' Hardware made January 16 last. It contains 277 pages and also includes the items of new goods brought out since the last price-list was published.

SLEDGE & BARKLEY, Lawrenceville, Va., have incorporated under the style of the Sledge & Barkley Company, Inc., J. D. Barkley being president and general manager. The company will continue the wholesale and retail business in Hardware, Agricultural Implements, Wagons, Mill Supplies, &c. A Buggy repository has recently been added to the establishment, which has a frontage of 63 ft., with depth of 90 ft., three floors and basement. The total floor space is now 30,000 sq. ft., as compared with about 2000 sq. ft. when the firm commenced business 10 years since.

AUSTRALIAN NOTES.

FROM OUR SPECIAL CORRESPONDENT.

MELBOURNE, March 16, 1908.

GENERALLY satisfactory is the term which describes the trade conditions of this country at present. And this applies, not to Hardware only, but to every class of trade. Local drawbacks are always with us, but they are generally represented by local labor troubles or temporary lack of rainfall. Rainfall conditions have been curiously reversed this year. Generally speaking the Southern States, from their geographical position and territorial formation, are the most favored and fertile by reason of plenteous rain. But this season it is the most southerly State of Victoria which is the driest, while Queensland, New South Wales, and even the dry plains of Central Australia have had abundant rain. Victoria is hoping for a wet winter, failing which the outlook, even to the city dweller, will be serious, as our reservoir is exceptionally low.

But even this is only a local and temporary trouble which is not likely to affect our annual trade to any apparent degree, unless to show us the necessity for spending more money and thus increasing the turnover of traders in Tools and labor for further water conservation.

The public finances were never better; public confidence never higher or stronger than now. These facts are exemplified in the official returns of the Department of Trade and Customs. Taking the past seven years our imports and exports have shown a steady and healthy growth, as shown in the following round figures in pounds sterling:

	Exports.	Imports.
1901	£40,000,000	£44,000,000
1902	41,000,000	42,000,000
1903	48,000,000	38,000,000
1904	57,000,000	37,000,000
1905	57,000,000	38,000,000
1906	50,000,000	44,500,000
1907	72,500,000	51,800,000

Iron and steel imports show a decided increase right down the list. Good prices are being generally maintained, and there can be no doubt that Australia is on the crest of a wave of prosperity.

But with it all we can never forget that our primary industries are so absolutely dependent on the weather conditions of a capricious climate that it is wisest not to depend absolutely on a continuance of good seasons.

American Manufactures.

In spite of our increasing trade there is no appreciable increasing attempt on the part of American manufacturers to capture a greater share of it. Possibly your home trade is all-sufficient. Yet, given good seasons, our requirements are going to jump ahead within the next few years, now that our Legislature is tackling the immigration problem in real earnest. Country development is proceeding even now in a way undreamed of a few years ago, and buildings, railroad construction, &c., are proceeding rapidly. Various lines are being pushed ahead in the different States.

The Victorian Hardware Assistants' Association forges ahead with all the enthusiasm of young Australia itself. Its premises are now situated in Little Collins street, the very heart and home of the Melbourne Hardware world. The attractive clubrooms occupy the ground floor and two floors above. Billiard rooms, sample rooms for travelers, reading room, private rooms, bathrooms, and all the conveniences that the soul of a reasonable Hardwareman can desire are provided. The club itself is a splendid tribute to the energy and enthusiasm of Melbourne's Hardware assistants, backed up by the friendly interest of their employers, and is a financially strong institution as well.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

BOSS MFG. COMPANY, Kewanee, Ill.: Catalogue No. 3, illustrating and describing an extensive line of Cloth and Leather Work, Gloves and Mittens, Husking Pins, Wrist Bands and Husking Hooks.

ACME STEEL GOODS COMPANY, 28 Elm street, New York: Price-lists of Box Strapping, Flexible Clasps, Crate Straps, Bung Tins, Wire Hinges and Corrugated Fasteners.

TOCH BROS., 320 Fifth avenue, New York: Booklets, circulars, &c., referring to Waterproof Paints, Sanitary Cement Floor Paints, Milo Fresco Colors, Cold Water Paints, &c.

INTERNATIONAL TIME RECORDING COMPANY, Flatiron Building, New York: Illustrated catalogues of Dey Time Registers, Rochester Time Card Recorders, &c.

HENRY MAURER & SON, 420 East Twenty-third street, New York: Illustrated and descriptive catalogue of Herculean Flat Arch Terra Cotta, Phœnix Hollow Wall Construction, Fireproof Columns, Partitions, Roofing Tiles, Fire Brick, &c.

TWISTED WIRE BOX STRAP COMPANY, 451-453 Greenwich street, New York: Illustrated price-list of Box Strapping, Box Bands, Clasps, Tub Fasteners, Corner Irons, &c.

A. G. BUTLER, 284-286 Pearl street, New York: Illustrated price-list circular of White Metal Pattern Letters, for iron and brass castings, reversed letters, leather and wood fillet, automatic numbering machines and cabinets for blue prints, electrotypes, &c.

ESTEY WIRE WORKS COMPANY, 59 Fulton street, New York: Illustrated Catalogue No. 17 referring to Wire Cloth and Wire Goods, including Riddles, Screens, Netting, &c.; also Iron Railing and Brass and Iron Work for banks, offices, &c.

WILLIAM JOHNSON, Newark, N. J.: Illustrated price-list Catalogue No. 27, dated March, 1908, referring to Plumbers', Gas Fitters' and Machinists' Tools.

AMERICAN EMERY WHEEL WORKS, Providence, R. I.: Illustrated catalogue covering an extensive line of Emery and Corundum Wheels and Abrasive Specialties, and containing valuable information, tables, suggestions, &c.

R. D. LANE PACKING COMPANY, 168 Centre street, New York: Illustrated catalogue and price-list of Steam, Ammonia and Hydraulic Packings.

JOHN MAXWELL'S SON, 259 Pearl street, New York: 1908 illustrated catalogue of Bird Cages and Bird Sundries.

JOSEPH BARDSLEY, 147-151 Baxter street, New York: Illustrated catalogue for 1908 of Oil Door Checks and Springs, Checking and other Floor Spring Hinges, Door Holders, Wood Door Knobs, Door Stops, &c.

GEORGE P. CLARK COMPANY, Windsor Locks, Conn.: Advance illustrated catalogue and price-list of Hand, Platform and Special Trucks, Patent Rubber and Iron Wheel Truck Casters, &c.

H. W. JOHNS-MANVILLE COMPANY, 100 William street, New York: Illustrated booklet, referring to Kearsarge Sheet Packing, Jointless and Flange Joint Gaskets and High Pressure Ring and Spiral Packings, &c.

CHICAGO SCREW COMPANY, Chicago: Illustrated price-list catalogue for 1908, referring to Set and Cap Screws, Machine Screws, Studs, Coupling Bolts, Planer Head Bolts and Washers, Boiler Patch Bolts, Thumb Screws and Thumb Nuts, Taper Pins, Taps, Cold Punched Nuts and Specialties.

CORBIN MOTOR VEHICLE CORPORATION, New Britain, Conn.: Attractive illustrated circular, referring to Corbin Motor Cars and giving records of what they have done in competitions.

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THE REVISED MARSHALL HONEST PAINT LAW.

FROM OUR SPECIAL CORRESPONDENT

WASHINGTON, D. C., April 14, 1908.

As the result of an extended hearing accorded to prominent representatives of the Paint trade by the House Committee on Interstate and Foreign Commerce on the 7th inst. a new Federal honest Paint bill has been framed and introduced in the House by Representative Marshall of North Dakota, the author of the original measure relating to this subject presented early in the present session. The perfected bill meets so completely the views of practically all interests in the trade that it is likely to encounter little or no opposition, and Mr. Marshall feels encouraged to believe that it will be enacted into law during the present Congress.

Those present at the hearing included George L. Gould, president, and John M. Peters, chairman of the Legislative Committee of the National Oil, Paint and Varnish Association; William E. Lucas, president, and George B. Heckel, secretary, of the Paint Manufacturers' Association of the United States; Arthur Somers, representing the Eastern Paint Manufacturers' Association; John Dewar, president of the International Association of Master House Painters and Decorators; W. W. Lawrence, vice-president of the National Lead Company, and a score of other men of prominence in the trade. Prof. E. F. Ladd, the well-known North Dakota Paint expert, and Dr. Harvey W. Wiley, chief of the Bureau of Chemistry of the Department of Agriculture, were also present.

Two bills were before the committee—namely, the original Marshall bill and the Dalzell bill, the latter having been introduced on March 27 at the request of the Paint Manufacturers' Association of the United States and the International Association of Master House Painters and Decorators. A complete outline of the Dalzell bill appeared in *The Iron Age* for April 2. With few exceptions those representatives of the trade who addressed the committee advocated a Federal law as affording protection, not only to the merchant, the master painter and the property owner, but also the manufacturer, who, as the result of the movement now on foot to secure the passage of drastic State laws, is obliged to prepare and pack his product in a great variety of styles and with varying labels to meet local requirements.

Objections to the Original Bill.

The discussion developed the fact that the general principles underlying the original Marshall bill were favored by the trade and that the objections were of a minor character and could be summarized under four headings: The failure of the bill to provide adequately for stocks on hand upon the taking effect of the proposed law; the requirements concerning varnish, which were held to be impracticable because of the impossibility of making quantitative analyses of this product; the vagueness of the prohibition against the use of "materials of inferior quality" in the section defining adulterations; and the impracticability of the requirements regarding the labeling of coloring materials.

Upon the conclusion of the formal hearing Representative Marshall announced his entire willingness to amend his bill to meet the views of the trade as stated to the committee, and an informal conference followed at which the draft of a new bill was perfected and on the following day introduced in the House. The new measure, which has thus received the indorsement of the leading trade organizations and which is strongly favored by the principal manufacturing and jobbing houses in the Paint industry, is now in a fair way to be enacted, and therefore a brief outline of its provisions will be of interest.

Brief Outline of Provisions.

Section 1 makes it unlawful for any person to manufacture within any Territory or the District of Columbia any Paint, Turpentine or Linseed Oil which is adulterated or unlabeled within the meaning of the act and imposes penalties for each offense.

Section 2 makes it a misdemeanor for any one to introduce into any State or Territory or the District of Columbia from any other State or Territory or the District of Columbia or from any foreign country or to ship to any foreign country any Paint, Turpentine or Linseed Oil which is adulterated or unlabeled, subject to the following proviso:

> Provided, that any Paint, Turpentine and Linseed Oil shall not be deemed adulterated or required to be labeled within the provisions of this act when intended for exportation to foreign countries and when not in conflict with the laws of the foreign country to which intended to be shipped; but if any of said articles shall in fact be sold or offered for sale for domestic use or consumption then this proviso shall not operate as an exemption from any of the other provisions of this act; and provided further, that nothing in this act shall prohibit a manufacturer of Paint, Turpentine or Linseed Oil to sell upon a written contract to a consumer, for use only on products of his own manufacture, goods unlabeled as to their ingredients but bearing conspicuously the printed statement that they are made in accordance with a private formula; provided, that no Paint, Turpentine or Linseed Oil made in accordance with a private formula, under a written contract, shall be sold by the consignee or used upon any buildings.

Section 3 of the bill makes it the duty of the Secretaries of the Treasury, Agriculture and Commerce and Labor to make uniform rules and regulations for carrying out the provisions of the act, and specifically requires them to make "provision for fair disposition of stocks on hand at the time this act takes effect," this feature having been included in the measure to meet the criticism of the original bill.

Section 4 authorizes the Bureau of Chemistry of the Department of Agriculture to test specimens of Paint, Turpentine and Linseed Oil as found on the market, and if it shall appear from any such examination that any of these goods are adulterated or improperly labeled the Secretary of Agriculture is directed to cause notice thereof to be given to the party from whom the sample was obtained, who shall be given an opportunity to be heard. If the law appears to have been violated, the Secretary is directed to certify the facts to the proper district attorney.

Section 5 makes it the duty of any district attorney to whom the Secretary of Agriculture shall report a violation of the act to cause appropriate proceedings to be commenced and prosecuted in the proper courts of the United States.

The most important changes made in the Marshall bill occur in Sections 6, 7 and 8, which define the terms "Paint," "Linseed Oil" and "Turpentine," construe "adulteration" and lay down the rules for the labeling of all products coming within the scope of the proposed law.

Adulteration and Improper Labeling.

According to Sec. 7 an article shall be deemed to be adulterated:

> If any substance be present other than those mentioned on the label.
>
> If any material contained in the article be of inferior quality to that claimed on label.
>
> If any substance has been substituted in whole or in part for any ingredient claimed to be present.

According to Sec. 8 an article shall be deemed to be improperly labeled:

> If it be an imitation of or offered for sale under the name of another article.
>
> If the contents of the package as originally put up shall have been removed, in whole or in part, and other contents shall have been placed in such package, or if the package fails to bear a statement on the label of the quantity or proportion of each ingredient contained therein.
>
> If in package form and the contents are not stated plainly and correctly in terms of net weight or measure on the outside of the package.
>
> If the package containing it or its label shall bear any statement, design or device regarding the ingredients or the substances contained therein, which statement, design or device shall be false or misleading in any particular.

Section 9 of the perfected Marshall bill provides that "no person shall be prosecuted under the provisions of this act when he can establish a guaranty signed by the wholesaler, jobber, manufacturer or other party residing in the United States from whom he purchases such articles to the effect that the same are not adulterated or improperly labeled within the meaning of this act designating it." Such guaranty to afford protection must contain the name and address of the party or parties making the sale of such articles to such person and such parties shall be amenable to the prosecutions, findings and other penal-

ties which would attach in due course to such person under the provisions of the act.

Section 10 provides the procedure for the seizure and forfeiture of goods which fail to meet the requirements of the law.

Imported Paint, Turpentine and Linseed Oil.

Section 11 authorizes the Secretary of the Treasury, upon request of the Secretary of Agriculture, to take samples of imported Paint, Turpentine and Linseed Oil, and "if it appear from the examination of such samples that any such article offered to be imported into the United States is adulterated or misbranded within the meaning of this act, or is of a kind forbidden entry into or forbidden to be sold or restricted in sale in the country in which it is made or from which it is exported, or is otherwise falsely labeled in any respect, the said article shall be refused admission, and the Secretary of the Treasury shall refuse delivery to the consignee, and shall cause the destruction of any goods refused delivery which shall not be exported by the consignee within three months from the date of notice of such refusal under such regulations as the Secretary of the Treasury may prescribe."

By the terms of Section 12 the word "Territory," as used in the act, is made to include the insular possessions of the United States, and the word "person" is to be construed to include corporations, companies, societies and associations.

Section 13 of the bill provides that the proposed law shall take effect one year from the date of its passage. The original Marshall bill gave but six months' notice.

It is understood that the Marshall bill will be referred to a subcommittee of the Committee on Interstate and Foreign Commerce, and it is probable that additional hearings will be granted upon it hereafter with a view to so perfecting its details that it will not only admit of comparatively easy enforcement in the light of the experience of the Federal Government under the Pure Food and Drug law, but will impose no hardship upon any one in the trade engaged in the production of properly labeled Paints.

THE COMMONWEALTH OF AUSTRALIA AND THE DOMINION OF NEW ZEALAND.

V.

BY JOHN L. SARDY.

TASMANIA.

TASMANIA, the Garden State of the Commonwealth, named after Tasman, the discoverer in 1642, who originally called it "Van Diemen's Land," in honor of Anthony Van Diemen, Governor of the Dutch possessions in the East Indies, is an island separated from Australia by Bass' Straits. Launceston, the nearest port from Melbourne, is only 13 hr. distant by steamer. Thus this fertile island, being nearer to the mainland, possesses an advantage over New Zealand, its larger rival, and furthermore as Tasmania is one of the States of the Commonwealth, there are no customs difficulties to contend with in entering from Australia.

Delightful Climate.

The climate is excellent, and although about the same number of degrees south of the equator as New York is north of it, the temperature is never so high as New Yorkers experience in the summertime. This is accounted for by the elevation of the island and the cooling influence of the South Pacific Ocean. The average reading of the thermometer throughout the year would be about 54 degrees F.

Besides its good climate, Tasmania boasts of its fine apples and pretty girls, both being adorned with rosy cheeks. The former are largely exported to England, but the Tasmanian man willing to export his apples draws the line at the well formed, bright eyed Tasmanian lassie and marries her on the proceeds of his exportation of apples.

Exports.

Gold, tin, silver and copper lead among the exports, the last available figures being £1,665,093, say about $8,300,000. Next in importance come fruit, jams and vegetables, which reached a total of £882,955, or almost $4,250,000. Exports exceed imports by over a million sterling. The total trade is over six million pounds sterling.

Hobart and Launceston.

The area in square miles of Tasmania is something over 26,000, and the total population about 180,000. From a business point of view, so far as American trade is concerned, there are only two cities to visit, Hobart the capitol, situated on the southern part of the island, with a population of about 30,000, and Launceston, sometimes called the "Commercial Capitol," on the north, possessing a population of about 20,000. Neither of course can be called a metropolitan city, but considering the size of the island and its distance from parts of the world other than Australia, they are certainly creditable.

In Hobart there are four good importing Hardware firms, and in Launceston there are six, besides which in both places there are additional smaller concerns, buying locally from the importers, to say nothing of the Hardware dealers throughout Tasmania, who derive their supplies from either Hobart or Launceston.

Tasmania should not be neglected by American travelers visiting Australasia in quest of business. It is directly en route from Australia to New Zealand or vice versa, and 10 days or a fortnight spent there should not be without results.

"The Plough Inn."

One of the leading Hardware firms in Tasmania started business in Launceston in 1846, occupying small unpretentious premises long since demolished. After several years of success the business was moved to a building formerly known as "The Plough Inn." This historic public house was started in the forties by a man named Harris, but better known as "Billy Waterloo," one of the most noted characters of the day. It became the leading "Pub" of the town and the resort of all kinds of sports, who indulged in betting and gambling to their hearts' content and sometimes to that organ's discontent. Those were the days when the colony was a convict settlement and the worst characters representing the scum of London were to be found there. The old "Plough Inn" still exists, its rough hewn beams testifying to its age, and if the walls of some of the original rooms could speak, no doubt many a tragic tale would be heard.

There is nothing to remind one of an inn now except perhaps the Iron Bars, for the place is stocked with Heavy Hardware of all kinds, being still utilized by the firm as a warehouse, in addition to the fine modern building erected by the firm four or five years ago, where an extensive business is carried on in mining tools and requisites for the mining industry which abounds in the State, besides a complete line of Builders' and Household Hardware, Tools, and, in fact, everything to be found in an up to date Hardware establishment.

The distance by rail between Launceston and Hobart is 133 miles, taking about 5½ hr. to accomplish. This of course is the main line of railroad and now owned by the Crown Government, the cost being over a million pounds sterling. The first through train from Hobart to Launceston ran on November 1, 1876. The total railroad mileage open to traffic up to 1905 was 618, the cost of construction and equipment being over five million pounds sterling. The number of passengers carried during the year was nearly 1,000,000, probably less than the men, women and children crossing the bridges and ferries every day for New York from Brooklyn and suburban places.

NORVELL-SHAPLEIGH HARDWARE COMPANY, St. Louis, is using effectively a house organ called "The Gimlet," which was started a few months ago. A Gimlet is prominently defined on the cover of the little paper as "a small instrument with a point." Pointedness is also characteristic of many of the ideas advanced by the editor which are practical and stimulating and frequently tinged with humor. Editorial paragraphs are suggested by timely topics and events, and several pages in each issue are devoted to advertising the company's brands of Hardware. A special souvenir number containing programme was issued in recognition of the National Retail Hardware convention held in St. Louis.

Business Methods in a Hardware Store.

IN the report of the annual meeting of the Minnesota Retail Hardware Association, given in our columns several weeks since, reference was made to the address of W. H. Stepanek, Cedar Rapids, Iowa, on "Business Methods in a Hardware Store." Mr. Stepanek was also credited with making some remarks concerning selling schemes and plans which should have been attributed to another speaker. Mr. Stepanek dealt with the question of salesmanship aided by an exact system in the store to reduce friction in the treatment of customers by avoiding the extremes of red tapeism and valueless simplicity. The immense amount of detail involved in making inventory, so often discouraging to Hardwaremen, was referred to, but, nevertheless, to be master of his business the merchant should make comparisons every day, week and month.

He sketched the relief a merchant finds for the more important larger matters, when he can safely leave most of the minor details to bookkeeper and clerk. The proprietor then finds more time for planning new ventures and campaigns. He emphasized the importance of getting clerks thoroughly interested in the business, especially by adding their own personality to the work and submitting ideas, thus becoming a constant source of help, instead of a perpetual irritation to the employer by negativeness and dependence on him for every petty detail.

Referring to the matter of prices, Mr. Stepanek said that "no business man can ignore the importance of having every piece of goods marked with both cost and selling prices, and prices should always be kept uniform. Under no circumstances should the clerks be allowed to make special prices. As they have no excuse for not knowing the regular price, a customer may be sure of being charged the same price for any article or any quantity, no matter by whom served."

Mr. Stepanek then referred in a general way to the system he had devised and used in his store for the past 10 years. This system comprehends details of sales whether cash or charge, invoices, credit memoranda, goods returned, continuous inventory, recapitulation of departments, expense reports, reports on salesmen, tin shop transactions, &c. This system once organized and put into operation, he said, would entail the expenditure of very little time daily.

Gray & Dudley Hardware Company's February Sale.

A WASHINGTON Birthday sale has for many years been an annual event with the Gray & Dudley Hardware Company, Nashville, Tenn. The company's leading brand is Washington, and this name is used in connection with its best quality of Hardware. It also appears on the best Saddles, Harness and Bridles, as well as Stoves, which the company manufactures. The special Washington sale covers the whole month of February, and prizes are awarded to the most successful salesmen, and 10 of them placed on the honor roll.

The company divides its salesmen into two classes: A, the salesmen who work the larger towns, and B, the salesmen who work the smaller towns and country trade. The winner of the first prize in each class is awarded a Washington gold fob, the front of which bears in relief the bust of George Washington, copied from a famous portrait. The reverse side gives the name of the winner, the date and the words, "Washington Birthday Sale, Gray & Dudley Hardware Company." The second man in each class receives a prize in gold. The first two men in Class A and the first two in Class B, together with the six next ranking salesmen constitute the Washington Honor Roll, and this honor roll makes the cover page for the company's weekly general letter.

This year's sales contest, we are advised, proved to be a greater success than any of its predecessors. The winners in Class A were A. C. Brest, first prize, and A. W. Kennedy second prize. The Class B winners were S. P. Shannon, first prize, and A. M. Shofner second prize. As a result of winning the fobs, Messrs. Breast and Shannon will be known as Geo. Washington Breast and Geo. Washington Shannon, respectively, until April 1 next, at which time the winners of the 1909 contest will be made known. The six other salesmen obtaining a place on the roll of honor are: J. T. Powell, E. C. Cunningham, A. E. King, E. P. Harper, T. O. Murray and J. M. Prickett.

The following merchants also received prizes because of their interest in the Washington Birthday Sale and their purchases of Washington Hardware during this sale: Cato & Askew, Lebanon, Tenn.; Watertown Hardware Company, Watertown, Tenn.; Corpus Christi Hardware Company, Corpus Christi, Texas; Watkins Hardware Company, Henderson, N. C.; Roos Mercantile Company, Victoria, Texas; Ellis, Threadgill & Co., Lexington, Tenn.; Franklin Hardware Company, Franklin, Ky.; I. T. Littleton, Hartsvile, Tenn.; Cunningham Bros., Center Star, Ala.; Drake Mercantile Company, Haleyville, Ala.; Davis Bros., Americus, Ga.; Dadeville Hardware Company, Dadeville, Ala.; Charlotte Mercantile Company, Charlotte, Tenn.; W. B. Roberson, Wright, Ala.; W. B. Walker, Fairfield, Tenn.

Assortments of Spring Cotters.

The Whitman & Barnes Mfg. Company, Chicago, has recently increased its line of spring cotter assortments for special classes of trade. Assortment No. 1 consists of 100 cotters, 10 each of the following sizes:

[illegible] x ¾ in.	3/16 x 1¼ in.	5/16 x 2 in.
[illegible] x 1 in.	[illegible] x 1½ in.	5/16 x 2½ in.
⅛ x 1 in.	¼ x 1¾ in.	
⅛ x 1¼ in.	¼ x 2 in.	

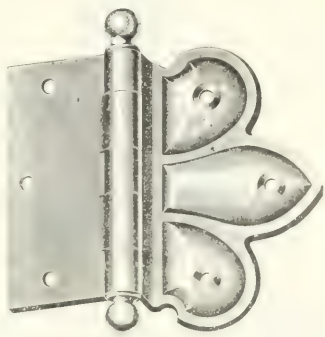
These are intended for the agricultural trade. Assortments Nos. 2 and 3 are similar but smaller, containing 50 and 25 cotters, respectively. Agricultural assortments are packed in neat pasteboard boxes, 12 boxes to the carton. Assortment No. 4 is especially made up for the automobile trade, which is now a large consumer of these goods. It consists of 100 cotters, as follows:

15	[illegible] x 1¼ in.	5	1/8 x ½ in.	5	⅛ x 2 in.
15	[illegible] x [illegible] in.	5	1/8 x 1 in.	15	5/32 x 1 in.
15	[illegible] x 1½ in.	20	1/8 x 1¼ in.	5	3/16 x 1½ in.

This assortment is packed in a lithographed tin box, 12 boxes to the carton. The company calls attention to the fact that it is thus supplying the merchant with neat packages for carrying on his shelves, saving the waste and annoyance of broken stock, as well as furnishing the consumer a convenient method of purchasing and keeping cotters on hand.

Fleur-de-Lis Surface Butt.

The Griffin Mfg. Company, Erie, Pa., has recently brought out the Fleur-de-Lis surface butt here illustrated.



Fleur-de-Lis Butt.

The butts are referred to as ornamental, and it is explained that a door can be hung on them with the greatest ease. It is only necessary to mortise and fasten the

square part of the butts in the jamb, placing the door in position and fastening the ornamental part of the butt on the surface of the door. This, it is claimed, any handy man can do in a very short time. The butts may be reversed for right or left hand doors by unscrewing the knob and placing it on the other end. They are made in a variety of electro-plated and japanned finishes and are packed with screws and printed directions one pair to the box.

Clouser's Conveyor and Drive Chain Belt.

S. F. Clouser, New York, whose sales agents are Patterson, Gottfried & Hunter, 146 Centre street, New York, has just put on the market Clouser's conveyor and drive chain belt, two views of which are here given. It is made from rolled sheet steel, regularly in Nos. 12, 16 and 18 gauges, and to order from other suitable thicknesses, according to specification, contingent on duty required. The regular links are ½, 1 and 1½ in. for tensions of 500 to 1000 lb., 1000 to 4000 lb. and 5000 to 10,000 lb., respectively. The maker recommends it for all kinds of conveying, whether by buckets, hooks or other suitable devices which may readily be attached to it. By a simple but ingenious operation the two ends of any length can be so connected as to form an endless belt, without either adding to or taking from the chain and without impairing its strength or efficiency. In this way an endless or continuous belt is formed, and the point of connection can be marked for identification in case of need. It will be seen that the chain is so formed as to run smoothly over a sprocket wheel channeled in the center.

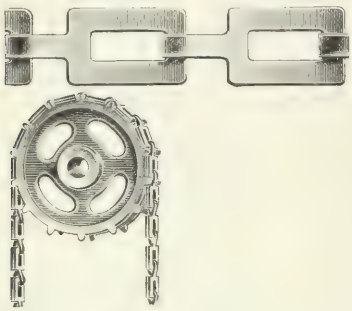


Fig. 1.—Clouser's Conveyor and Drive Chain Belt.

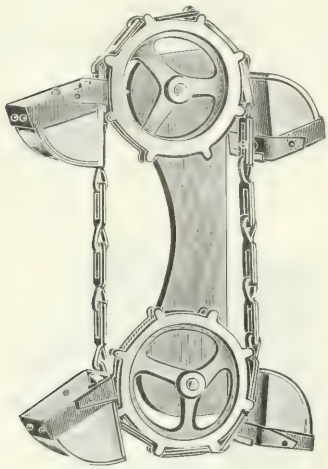


Fig. 2. Chain Belt with Buckets Attached.

Sterling Garden Barrow No. 20.

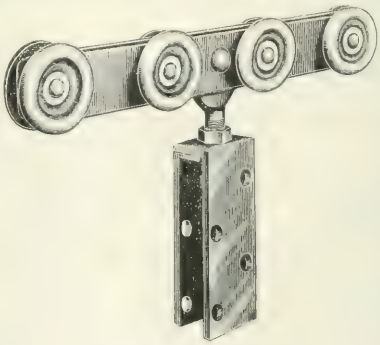
The Sterling Wheelbarrow Company, Milwaukee, Wis., Chicago repository 20 South Canal street, has recently brought out a new garden wheelbarrow styled the Sterling roller bearing. The bearing, which is designed for general utility service, is referred to as being especially strong and durable. The only wood used in its construction is the frame, which is made of selected maple. The legs are formed of bent steel angles, an extension of which form sockets into which the rear ends of the steel sides fit; the sides are of 16 gauge reinforced steel. The end and bottom of the bed is also of steel, and are securely fastened to the maple frame work. A feature particularly emphasied is the easy running qualities of the barrow secured by the use of roller bearings on which the steel wheel is mounted. A bright red finish on the woodwork and decorations and jet black for the steel parts give the barrow an attractive appearance. Its dimensions are as follows: Length of bed, 28 in.; width at handles, 24 in.; width at wheel, 22 in.; depth at wheel, 14 in.; weight, 60 lb.



Sterling Garden Barrow No. 20.

Trolley Barn Door Hanger.

The McCabe Hanger Mfg. Company, 425-427 West Twenty-fifth street, New York, has added to its line of hangers the carriage illustrated herewith for sliding doors in trolley car barns. In installing track for these door hangers it is necessary to leave a break for the admission of the trolley wire, and the carriage referred to is of sufficient length to support the door across this space. It has four wheels, and in crossing the openings the first wheel will enter the farther track before the second one is disengaged on the other side; thus there are always three wheels on the track, which are sufficient to support the door across the opening. The carriage is used in connection with the company's No. 4 track.



Trolley Barn Door Hanger.

THE MANHATTAN ELECTRICAL SUPPLY COMPANY, 17 Park place, New York, extending through the block to Murray street, will open a branch depot at 110 West Forty-second street on or about May 1.

One Minute Churn.

The Standard Churn Company, 127 Franklin street, New York, is putting on the market the One Minute churn, here illustrated. The household sizes are model A, Fig. 1, of 1 qt. capacity, and special household size No. 1, Fig. 2, holding 1 gal. Other sizes soon will be of 2, 3, 4, 5, 9, 11 and 13 gal. capacities, and even larger

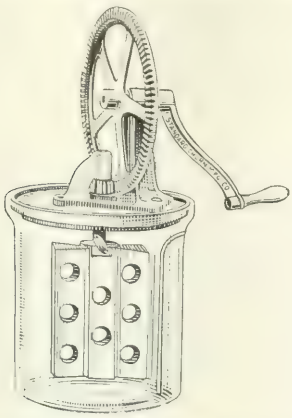


Fig. 1.—Household Size, Model A, One-Minute Churn, Quart Jar.

sizes will be made to order. In churning the jar or tub is but half filled, the gallon size churning a ½ gal. of cream at a time. Model A has a glass jar 5¼ in. outside diameter at top, 6 in. deep and 4⅛ in. wide inside. A glass rib 4 x ¼ in. extends from the bottom upward, against which the cream is thrown by the hardwood maple dasher, 3½ x 2½ in., beveled backward from each front edge. In the dasher are 11-16-in. holes, bored at a certain angle on one side and exactly reversed in direction on the other, the proper distance of dasher from bottom being about ⅛ in. On this size the geared flywheel is 4¾ in. in diameter, and all of the metal parts are nickeled. There is a horizontal groove at the top, in

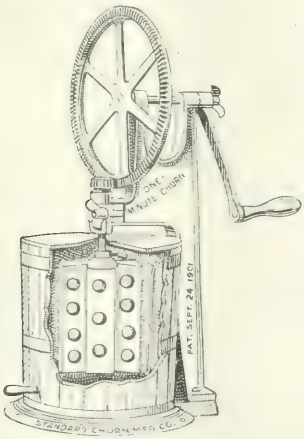
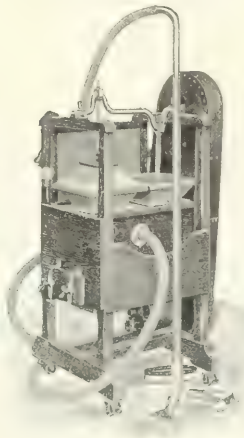


Fig. 2.—Special Household Size, Holding a Gallon of Cream.

which fits a rubber ring or gasket to insure a close joint. Fig. 2 illustrates the gallon size, No. 1, and the necessarily stronger construction for churning four times the quantity, there being adequate metal support for the operating mechanism extending from the base, and wood tub with bottom spigot for emptying the by-product after the butter is taken out. The company directs attention to some of the following advantages for the consumers of butter using the smaller sizes: First, clean, sweet butter can be made in less than 1 min., using sweet cream or sour cream, as preferred. If sweet cream is used the residue remaining after the butter is removed is said to nearly equal in quality ordinary milk and can be used as such. Using sour cream, at much less cost and from which most butter is made, the by-product is buttermilk, costing ordinarily in cities 6 cents per quart. Based on city cream prices and reckoning the value of the by-product, the finest of butter can be easily and quickly made on the premises at about the price of store butter. Best results are accomplished with cream at 60 degrees F., for the determination of which long slender glass thermometers are furnished with the churn at nominal cost. Obviously the quantity and quality of butter depends on the grade of cream used, but with good material from responsible sources we are advised that a little more than 1 lb. of butter can be got from 1 qt. of cream. Thus the likelihood of rancid, renovated or unclean butter is avoided, not to mention the deleterious foreign coloring ingredients, more or less poisonous and valueless intrinsically. The butter is also free from injurious preservatives, including formaldehyde, saccharine, salicylic acid, fluroids, &c. Butter so made can be eaten sweet within a reasonable time after it is churned, or salted and packed to be consumed at will.

A Portable Dustless Cleaning Machine.

A portable dustless cleaning machine has been put on the market by the Dustless Cleaning Company, 39 West Twenty-first street, New York City, and is shown in the



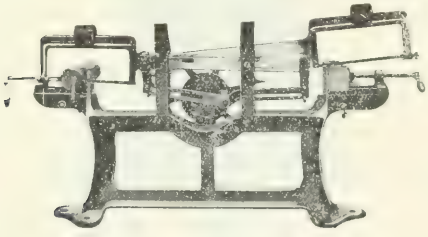
A Portable Dustless Cleaning Machine.

accompanying illustration. The machine is made in two styles to be operated by electricity, or by hand when a suitable wheel and crank for operating it is provided. The machine, designed to be operated by an electric motor, requires so little power that it may be connected with the ordinary electric light socket, as it needs less than 1-6 hp. requiring about 1.2 amperes of electricity to secure a revolution of the fan of about 90 turns per minute and creating a vacuum of about 12 in. The small power required enables the use of the ordinary electric light wire without creating a resistance that will overheat and possibly start a fire. Thus the convenience of the machine may be enjoyed wherever an electric light system is in use. The machine is 18 in. square, 3 ft. 6 in. high, and weighs about 78 lb., so that it can be readily moved from one part of the building to another for cleaning purposes. It is provided with 25 ft. of 1¼-in. wire wound hose, so that a distance of 50 ft. may be cleaned without moving the machine. It operates somewhat similarly to the ordinary bellows, with check valves so arranged that the vacuum can be maintained. By having two compartments the dust drawn into the machine is

allowed to settle, and the air which comes in with the dust passes off through a wire screen. Several different forms of receivers are provided for use on the end of the hose, some with larger openings adapted for use on tile floors that will take up cigar ends, matches or similar refuse, and others for loosening dirt in carpets or rugs, and still others for cleaning window sills and walls, and in use the cleaner has been found excellent in carrying away cockroaches and similar insects from crevices which they frequent. Special receivers are provided for cleaning office desks of business men, and the books in libraries. The strong suction exercised upon the tops of books standing upright takes away the dust as can be done in no other way. These receivers are long and narrow, adapted for books of all sizes, and also for insertion into pigeonholes of the desks of business men.

Two-in-One Tandem Power Hack Saw.

The Buffalo Specialty Company, Buffalo, N. Y., is manufacturing the tandem power hack saw here illustrated. Although it comprises two saws in one it is said to be simple in mechanism and to contain an unusually small number of parts. The parts, however, are reinforced wherever strength is demanded, thus insuring rigidity and freedom from vibration, preventing the breakage of saw blades and making it possible to secure a smooth, straight cut. The bearings are all bushed with bronze and fitted with brass oil cups, excepting the ways, which are babbitted throughout. This is said to secure perfect alignment and great durability with a minimum of attention. While ordinarily run at a speed of 85 revolutions the tandem machine has been operated at a speed of 110, cutting 2-in. tool steel with practically no evidence of wear on the saw blades. This work is accounted for by the flexible or accommodating feed of the tandem, together with the lifting motion of the saw frame and arm on the return motion. An automatic shutoff is provided, which stops the saw the instant the cut is through; there are also vises for holding the material being sawed, arranged with swivel jaws, which adjust themselves to grip iron or steel of any shape, whether



Two-in-One Tandem Power Hack Saw.

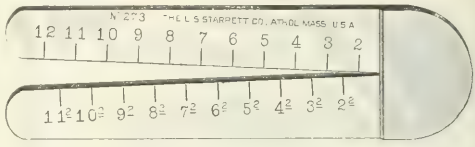
straight or tapering. Among the economic reasons urged for the use of this tandem saw are that the price of the tandem is less than the price of two good single machines of the same capacity; that it requires but one belt, and therefore saves one belt, one pulley and often an entire countershaft. It also saves floor space, power and cost of installation, as well as the wear and tear of an additional machine. The two saws of the tandem may be operated together or separately as desired.

Carpenter's Portable Tool Case.

C. E. Jennings & Co., 42 Murray street, New York, have just brought out the No. 340 carpenter's hand tool case, resembling in appearance somewhat a dress suit case. The essential difference between this case and one of similar character they have had on the market for some time is its smaller size. It is made of chestnut, varnished natural, and has paneled sides. There is a leather handle for carrying and rings for shoulder strap when so carried. The corners are protected by brass corner plates and there are two brass suit case catches for holding the hinged parts together. One side is hinged midway horizontally and the saw rack will accommodate four saws. The case outside is 31 x 14 x 6 in. and the removable tray is 30 x 4½ x 1 in. Accompanying the case are one each 26-in. A 7½ hand saw and 26-in. A 7½ rip saw, with an 18-in. blued steel square, having 18-in. blade and 12-in. tongue, much smaller in size than the regular large squares, and both lighter and better adapted to this service. When the case is sold without tools the number becomes 34, to obviate possible confusion in ordering.

Sole Gauge.

The L. S. Starrett Company, Athol, Mass., and 132 Liberty street, New York, has recently added to its lines of gauges for innumerable purposes the Sole Gauge, No. 273, here shown. It is made of steel, well finished, grad-

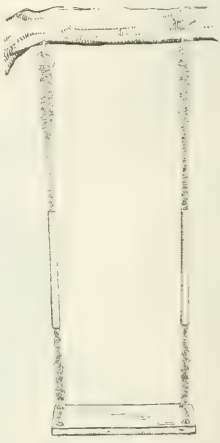


Shoe Manufacturers' Sole Gauge.

uated to determine the thicknesses of soles and taps in forty-eighths of an inch. It is figured to show "irons" and "half irons," technical terms well known in that field of manufacture.

Old Apple Tree Swing.

In connection with its well-known line of chain the Oneida Community, Oneida, N. Y., is now supplying the complete swing shown in the accompanying illustration. It is designed for attachment to a tree limb or any convenient horizontal timber, and is made of strong chain, galvanized to prevent rusting. The swing is furnished with seat and screw eyes complete, and handles of rubber hose for the swinger to hold on to. The chains are adjusted by simply moving the hooks from link to link, and the manufacturer states that the swing is so easily put up that any boy can do it.

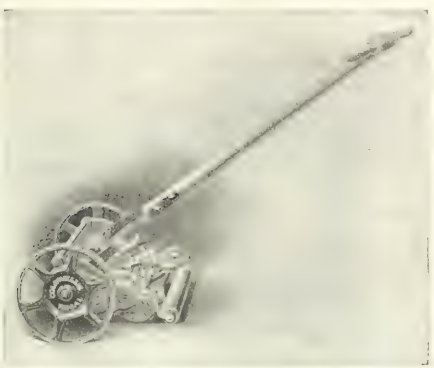


Old Apple Tree Swing.

THE GLIDDEN VARNISH COMPANY, Cleveland, Ohio, manufacturer of Jap-a-lac and other varnish specialties, is now attaching to the closure of each can of Glidden's Architectural Finishes a metal coupon on which is shown the brand of the goods and the quantity in the can. This may be shown to the owner or architect of a building, so as to prove that the required quantity of the varnish specified has been used on the work. The system has been devised and patented by the company, so that owners and architects may be assured of good faith on the part of the painting contractors without personal supervision of each can of varnish that comes on the job. This system also protects honest contractors against those who bid low and figure on substituting cheap materials.

Regal Lawn Mower.

The Coldwell Lawn Mower Company, Newburgh, N. Y., is offering the new lawn mower shown herewith. This machine has ball bearings in the drive wheels, not in the revolving cutter journals. It is stated that there is no friction bearing down on the drive wheels, whereas there is between the revolving cutter and the bottom knife. The drive wheels are locked fast to the opposite ends of a steel shaft. The ball bearings are fitted with adjustable cones, so that the wheels can always be made to run true, no matter how much the machine is worn. When the drive wheels are adjusted it brings the drive gears back to original center. The mower has five revolving blades, and the company's latest improved double edge bottom knife. The machine is driven by a train of gears,

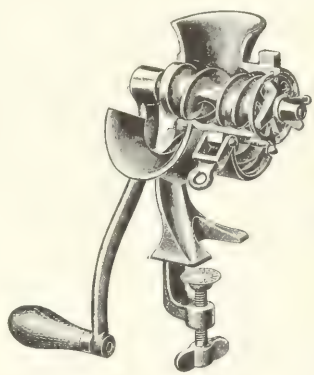


Regal Lawn Mower.

the intermediate gears being on a separate tool steel stud, which is screwed fast to the side frame, so that it can be renewed when necessary. It is explained that the machine having ball bearings where the wheels are attached steel renewable brass bushings where the revolving cutter is attached and the renewable stud on which the intermediate gears runs obviates the necessity of purchasing a whole new side frame, as a new stud can be substituted when the old one is worn out. Unless some serious accident happens to the machine, the manufacturer states that it should run for 25 years. The mower is painted attractively in red and gold.

Russwin Food Cutter.

The Russell & Erwin Mfg. Company, New Britain, Conn., and 94-98 Lafayette street, New York, is putting on the market the Russwin food cutter shown in the accompanying illustration. The machine is referred to as unusually simple, having practically but two parts, the case and the roll. The case is hinged in the middle so that it can be opened wide and easily rinsed and wiped, at the same time permitting the roll with cutter and disk attached to be removed bodily and taken apart for cleaning. There is a gutter below the case which conveys to the dish any escaping juices and prevents their dripping.



Russwin Food Cutter.

Four knives are supplied with each machine: for coarse cutting, fine cutting, pulverizing and making nut butter, respectively. One knife can be substituted for another without taking the cutter apart or removing its contents. It is asserted that the knives cut the food and do not tear, grind or mash it. Working against the steel disk they sharpen themselves and so constantly preserve their edge. Cutters are nickel plated and all other parts of the machine except the disk are heavily tinned. Three sizes are offered, cutting 2, 3 and 5 lb. of meat, respectively, per minute. Each machine is packed in a pasteboard box, six to the case.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, State and Western, raw, in bbls.	@40
City, Boiled, in bbls	43 @44
City, Raw, in bbls	42 @45
Raw, Calcutta, in bbls	50 @
Lard, Prime, Winter	65 @70
Extra No. 1	55 @57
No. 1	47 @52
Cotton-seed, Crude, f.o.b. mill	31 @35
Summer Yellow, prime	43 @43½
Summer White	45 @46
Yellow Winter	45 @46
Tallow, Acidless	50 @55
Menhaden, Brown, Strained	40 @..
Light Strained	40 @..
Northern	@..
Southern	@..
Cocoanut, Ceylon	₱ lb. 6 @6½
Ceylon	₱ lb. 5 @5¾
Cod, Domestic, Prime	41 @44
Newfoundland	44 @46
Red, Elaine	9 @10
Saponified	₱ lb. 7½ @11
Olive, Yellow	67 @69
Neatsfoot, Prime	75 @98
Palm, Lagos	₱ lb. 6¾ @6¾

Mineral Oils—

Black, 29 gravity, 25@30 cold test	₱ gal. 12½ @13½
26 gravity, 15 cold test	13½ @14
Summer	12 @12
Cylinder, light, filtered	20½ @21
Dark, filtered	17 @19
Paraffine, 907-707 sp. gravity	13 @15
903 sp. gravity	13½ @14
883 sp. gravity	11 @11½
Red	13½ @14

Miscellaneous—

Barytes:	
White, Foreign	₱ ton $18.50@20.50
Amer. floated	₱ ton 14.00@21.00
Off color	₱ ton 13.00@16.50
Chalk, in bulk	₱ ton 3.00@3.40
China Clay, Imported	₱ ton 11.50@18.00
Cobalt, Oxide	₱ 100 lb. 1.15@2.60
Whiting, Commercial	₱ 100 lb. .42@.52
Gilders	₱ 100 lb. .55@.60
Ex. Gilders	₱ 100 lb. .60@.65

Putty, Commercial—₱ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.45
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—₱ gal.

In Oil bbls	53½@54
In machine bbls	54 @54½

Glue—

	₱ lb
Cabinet	12 @15
Common Bone	7½@9
Extra White	18 @24
Fish, liquid, 50 gal. bbls., per gallon	.60 @1.20
Foot Stock, White	12 @14
Foot Stock, Brown	9 @11
German Common Hide	10 @12
German Hide	12 @13
French	10 @10
Irish	13 @16
Low Grade	10 @12
Medium White	14 @17

Gum Shellac—

	₱ lb
Bleached, Commercial	@20
Bone Dry	@25
Button	16 @20
Diamond I	17 @18
Fine Orange	20 @22
A. C. Garnet	20 @24
G. A. L	18 @19
Kalu Button	17 @..
D. C	18 @19
Octagon B	18 @19
T. N. C	21 @22
V. S. O	17 @18

Colors in Oil—

	₱ lb
Black, Lampblack	12 @14
Blue, Chinese	28 @30
Blue, Prussian	32 @36
Blue, Ultramarine	15 @16
Brown, Vandyke	11 @14
Green, Chrome	12 @16
Green, Paris	@24
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, English white, in Oil	10½ @10¾
Lead, American White:	
Lots of 500 lb or over, in Oil	@6¾
Lots less than 500 lb, in Oil	@7¼
Lead White in oil, 25 lb tin pails	@7¾
Lead, White, in oil, 12½ lb tin pails	@7¾
Lead, White, in oil, 1 to 5 lb assorted tins	@8¾
Lead, American. Terms: On lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice.	₱ lb

Zinc, Dry—

American dry	5½@5¾
Red Seal (French process)	6¾@7
Green Seal (French process)	7@7¼
German Red Seal (French process)	6¾@7
Green Seal	7@7¼
White Seal	7½@7¾
French Red Seal	8@8½
Green Seal	10½@11¾

Dry Colors—

	₱ lb
Black, Carbon	6¼@10
Black Drop, American	3½@8
Black Drop, English	5 @15
Black, Ivory	16 @20
Lamp, commercial	4 @6
Blue, Celestial	4 @6
Blue, Chinese	31 @33
Blue, Prussian	29 @31
Blue, Ultramarine	3½@15
Brown, Spanish	₱ 100 1
Carmine, No. 40	$3.10@3.25
Green, Chrome, ordinary	3½@5
Green, Chrome, pure	17 @25
Lead, Red, bbls., ½ bbls., kegs	@6¾
Litharge, bbls., ½ bbls., kegs	@6¾
Ocher, American	₱ ton $8.50@16.00
American Golden	2½@3½
French	1½@2
Foreign Golden	2@4
Orange Mineral, English	10 @11
French	3½@4
German	3@3½
Am. finish	3@3¾
Red, Indian, English	4½@6
American	3@3¼
Red, Turkey, Extra	9@10
Red, Turkey, Fine	8@10
Red Venetian, Amer.	₱ 100 lb $0.50@1.25
English	$ 1.75@1.60
Sienna, Italian, Raw	2@3
Burnt	2@3
Prepared	2@3
Roth, Raw	2@3
Roth, Burnt	2@3
American, Raw	1½@2
American Burnt and Pow'd.	1½@2
Talc, French	₱ ton $18.00@25.00
American	15.00@25.00
Tuscan, Amer. Extra	₱ 100 lb .90@1.00
English	₱ 100 lb .80@1.00
American, No. 1	.50@.80
American	₱ 100 lb, No. 2 .60@.85
Umber, Turkey, Burnt & Pow'd.	2@3
Turkey, Raw and Powdered	2@3
Burnt, American	1½@2
Raw, American	1½@2
Yellow Chrome, Pure	13 @15
Vermilion, American	1.60 @1.75
Quicksilver, Bulk	65 @70
Quicksilver, Bags	.66
English, Imported	65 @70
Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓%
North's 19%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ₱ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ₱ doz. pairs .....$2.00@$3.00

Anvils—American—

Eagle Anvils .....₱ lb. @8¼¢
Hay-Budden, Wrought.....9½@9¾¢
Trenton .....₱ lb 9½@9¾¢

Imported—

Swedish Solid Steel Sisco, Superior, ₱ lb.....10@10½¢
Peter Wright & Sons, ₱ lb, 84 to 349 lb. 11¢; 350 to 600 lb, 11½¢.

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....10%

Augers and Bits—

Com. Double Spur.....75&10@80%
Jennings' Pats., Bright.65&10@70%
Black Lip or Blued.....60&65&10%
Boring Machine.....70%
Car Bits, 12-in. twist.....40&10%
Ford's Auger and Car Bits.....40&5...
Ft. Washington Auger Co., Conard's 45%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, 25&7½%
No. 30, R. Jennings' list.....50%
Russell Jennings .....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....40%
Pugh's Blacksmith.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's Pattern, No. 1, ₱ doz. $28; No. 2, $18.....60&10%
Ford's, Clark's Pattern.....66%&5%
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $26.00.....60&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$6.50@7.00
Ames .....35&10%
Universal 20%

Ship Augers and Bits—

Ship Augers.....40@10%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' .....33⅓&7½%
Snell's 40%

Awl Hafts— See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdld, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdld, Shldered..gro. 55@70¢
Scratch Awls:
Handled, Com....gro $3.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles— *Iron or Steel*

Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar..4¾@5¼¢
No. 1 Common, Loose....3¾@4¼¢
No. 1½ Com., New Style..4½@5 ¢
No. 2 Solid Collar.....4½@5 ¢
Half Patent:
Nos. 7, 8, 11 and 12..65@65&10%
Nos. 13 to 14.....65@65&10%
Nos. 15 to 18.....70@70&10%
Nos. 19 to 22.....70@70&10%

Boxes, Axle—

Common and Concord, not turned lb., 5@6¢
Common and Concord, turned. lb., 6@7¢
Half Patent.....lb., 9½@10¢

Bait— Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances— Sash—

Caldwell new list.....50%
Pullman .....50&10%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....50@55&10%
Straight Balances.....40@40&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire— See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb.....per lb., —@2¼@2¾¢

Towel—

No. 10 Ideal, Nickel Plate..₱ gro. $8.50

Beams, Scale—

Scale Beams.....40%
Chatillon's No. 1.....30%
Chatillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₱ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ₱ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned.....₱ doz. $1.50

Beaters, Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $6.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. $6.50

Bellows—

Blacksmith, Standard List.
Split Leather.....60&10@65%
Grain Leather.....50@50&10%

Hand—

Inch...	*6*	*8*	*9*	*10*
Doz...	*$5.00*	*5.50*	*6.00*	*6.50*	*7.50*

Molders—

Inch	*10*	*12*	*14*	*16*
Doz.	*$7.50*	*9.00*	*12.00*	*15.00*

Bells— Cow—

Ordinary Goods...75&65@75&10&5%
High grade.....70&10@75%
Jersey .....75&10%
Texas Star.....50%

Door—

Home, R & E Mfg. Co's.....55&10%

Hand—

Polished, Brass.....70&10@60%
White Metal.....50&10@50&10&5%
Nickel Plated.....50&5%
Swiss .....50&5%
Cone's Globe Hand Bells.....33⅓@35%

Miscellaneous—

Farm Bells.....lb., 2¼@2½¢
Church and School.....60@60&5%

Belting— Leather—

Standard .....70&10@70&10&5%
Light .....75&10%
Cut Leather Lacing...50&10@60%
Leather Lacing Sides, per sq. ft. 21@22¢

Rubber—

Competition (Low Grade), 70&10@75&5%
Standard .....60&10@60%
Best Grades.....33⅓&5@40&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Spokes.....50%
Tubes 40%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden.....75@75&5%
B & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....55%
Embossed 55%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread): ⅝ × 6 and smaller.....75&5% —%
Larger and longer.....70% —%
Phila. Eagle, $5.00 list...80% —%
Bolt Ends.....70% —%
Machine (Cut Thread): ⅝ × 4 and smaller.....75&5% —%
Larger and longer.....70% —%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:
Inch 3 4 5 6 8
Per doz.$0.50 .55 .45 .60 .80
Cast Iron Spring Foot, Jap'd:
Inch 6 8 10
Per doz.....$1.20 1.50 2.25
Cast Iron Chain, Flat, Japanned:
Inch.....6 8 10
Per doz.....$1.00 1.40 1.65
Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch.....6 8 10
Per doz.....$0.75 .95 1.25
Wrought Barrel Japd..80@80&10%
Barrel Bronzed.....60@60%
Spring .....70&10@70&10&10%
Shutter .....50&55@50&10@65%
Square Neck.....75@75&10%
Square .....70&10@10%
Ives' Patent Door.....55%
Ives' Wrought Metal.....45%

Expansion—

Richards Mfg. Co.....50&10%
Steward & Romaine Mfg. Co.
Style No. 13, Double.....55%
Style No. 15, Single.....55%
Style No. 100, Dbl. Jaw, Single 70%
Lag Screw.....56½%

Plow and Stove—

Plow .....65&5@70%
Stove .....85@85&5%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84..80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84..80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84....80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99....80%
Phila., Eagle, list Dec. 16,1884..82½%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch				*2½*
Per doz.				*$8.65 11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme .....15&10%
Perfection 45%
Seavey 45%

Braces—

Common Ball, American.....$1.50
Barber's .....50&10&10@60&10%
Fray's & Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat..60&10%

Brackets—

Wrought Steel.....70&10@75&10%
Bradley Metal Clasp..80&10@80&10&5%
Griffin's Pressed Steel.....75@75&10%
Griffin's Folding Brackets.....70&10%
Taplin Victor Handy Egg Beater Bracket .....₱ doz. $1.50

Bright Wire Goods— See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Wire Goods Co.....75%..

Buckets, Galvanized—

M'f'gr's list, price per gross.

Quart.....	*10*	*12*	*14*
Water, Reg...	*25.35*	*28.00*	*32.00*
Water, Hvy...	*35.35*	*38.00*	*52.00*
Fire, Rd. Btm.	*32.00*	*34.65*	*38.65*
Well	*37.35*	*41.35*	*45.85*

Bull Rings— See *Rings, Bull*

Butts— Brass—

Wrought, High List, Oct. 26,'06.57%
Cast Brass, Tiebout 40%

Cast Iron—

Fast Joint, Broad.....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70&10@75%
Parliament Butts.....70@70&5%

Wrought Steel—

Bright,
Light Narrow, Light Reversible .....70&5%
Reversible and Broad. 70&5%
Loose Joint, Narrow, Light Inside Blind, &c.....70%
Back Flaps, Table, Chest..65%
Japanned
Light Narrow, Loose Pin, 40&5%
Light Narrow, Ball Tip..60%
Broad .....40&5%
Steeple Tipped.....70%
Ball Tipped.....70%

Extra 10¢ per lb.

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list: 1200 15%; 200, 300, 900 ..... 30%
Hendryx Bronze, Series 700, 800 ..... 35%
Hendryx Enameled 35%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb., 4½@4¾¢
Sharp, 1 prong, per lb., 4¾@5¼¢
Badger's Blunt 1¼"c., Sharp, 4½@4¾¢
Lumber, Blunt, 1¼"c., Sharp, 4½@4¾¢
Verbius, Blunt, per lb. 3.65¢; Sharp, 4.15¢

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Boxer's B. B ..... 68@35¢
G. D. ..... *per M* 34@35¢
E. L. ..... *per M* 40@42¢
G. E. ..... *per M* 48@50¢
Musket ..... *per M* 62½@65¢

Primers—

Berdan Primers, 65 per M ..20@35%
Primer Shells and Bullets ..15@10%
All other primers per M $1.52@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:
32 C. F., $5.50 ..... 10@5%
38 C. F., $7.00 ..... 10@3%
22 rel. Rim, $1.50 ..... 10@5
32 rel. Rim, $2.35 ..... 10@3%
B. B. Cap, Round Ball, Stegd. $1.90
B. B. Caps, Round Ball $1.49
Central Fire 25%
Target and Sporting Rifle ..15@5%
Primed Shells and Bullets ..15@10%
Rim Fire, Sporting 50%
Rim Fire, Military ..... 15@3%

Casters—

Bed ..... 65@40%
Plate ..... 60@40%
Philadelphia ..... 70@40%
Acme, Ball Bearing 50%
Gem (Roller Bearing) ..70&10@40&5
Steel Gem 20%
Standard Ball Bearing 45%
Vale (Double Wheel) low list..40&10%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

(American Coil, Straight Link:
3-16 ⅛ 5-16 ⅜ 7-16 ½ 9-16 ⅝
$6.15 5.55 4.80 4.55 3.75 3.65 3.55
Net list 1¼ to 1¾ inch.
$3.45 3.55

In cask lots, deduct 25¢.
German Coil ..... 60@10&5%
German Pattern Coil:
5-16 to 1 ..... 70@5&10@10%
2 and 2½ ..... 60@10&10@10&10@10%
2¾, 3 and 3½ ..... 50@10@10&5%

Halter—

Halter Chains ..... 60@10&5%
German Pattern Halter Chains, list July 24, '97 ..... 60@10&7%
Covert Mfg. Co.
Halter ..... 35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Straight, with ring ..$28.00
6½—6-2, Straight, with ring ..$29.00
6½ 8 2, Straight, with ring ..$32.00
6½ 10 2, Straight, with ring ..$37.00

NOTE.—Add 2c per pair for Heads 1and 2 ears; add 3c per pair for No. 3 and 3, 2 ears; add 4c per pair for No. 4 and 4, 2 ears; add 5c per pair for No. 5 and 5, 2 ears; add 10c per pair for Straight Link.
Eastern Standard Traces, Wagon Chain, &c. ..60@10@10@10&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron ..... 60@10%
Brass 60%
Safety and Plumbers' Chain ..... 60&10
Gal. Pump Chain ..... lb. 12½¢
Kleinert's Chain 50%
Trump Hardware 50%
Triumph Dog ..... 50&10@60
Brass, Halter and Tie 50%
Good Mfg. Co. 50%
Hooks, Halter, Heel, Rein, Stud and Tie 50%
Hooks, Community:
American Halter, Dog and Kennel Chains 50%
Niagara Dog Leads and Kennel Chains ..... 45&5%
Wire Goods Co.:
Dog Chain 70%
Universal Dog Jointed Chain 50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain 60%
Pullman:
Brass Chain 60%
Copper and Steel Chain 60%
Sash Chain Attachments, per set 8¢
Aluminum Sash Ribbon, per yard 6¢
Sash Ribbon Attachments, per set 8¢

Chalk—(From Jobbers.)

Carpenters' Blue ..... gro. 5.55¢
Carpenters' Red ..... gro. 45¢
Carpenters' White ..... gro., 40@45¢

Checks, Door—

Bardsley's 45%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools 50%
Youths' Chests, with Tools 35%
Gentlemen's Chests, with Tools 25%
Farmers', Carpenters,' etc., Chests, with Tools 20%
Machinists and Pipe Fitters Chests, Empty 45%
Tool Cabinets 45%
C. E. Jennings & Co's Machinists Tool Chests 7½%

Chisels—

Socket Framing and Firmer

Standard List ..... 50&10%
Buck Bros. 30%
C. E. Jennings & Co.:
Socket Firmer No. 10 ..... 25&2½%
Socket Framing No. 15 ..... 25&2½%
Swan's ..... 60&10%
L. & I. J. White Co. ..... 30@30&5%

Tanged—

Tanged Firmers ..... 50&5@37½%
Buck Bros. 30%
C. E. Jennings & Co. Nos. 191 193 195 ..... 25%
L. & I. J. White Co. ..... 25&5%

Cold—

lb.
Cold Chisels, good quality ..15@15¢
Cold Chisels, fair quality ..10@10¢
Cold Chisels, ordinary ..... 9@10¢

Chucks—

Almond Drill Chucks 35%
Almond Turret Six-Tool Chuck 40%
Beach Pat., each $8.00 ..... 35&5%
Empire 25%
Blacksmiths' 25%
Jacobs' Drill Chucks 35%
Pratts' Positive Drive 25%
Skinner Patent Chucks:
Independent Lathe Chucks 25%
Universal, Reversible Jaws 35%
Combination, Reversible Jaws 35%
Drill Chucks, New Model, 25%; Standard, 45%; Skinner Pat. 25%; Positive Drive 10%
Planer Chucks 20%
Face Plate Jaws 35%
Standard Tool Co.:
Improved Drill Chuck 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21 ..... 35%
Scroll Combination, Nos. 53 to 81 ..... 40%
Geared Scroll, Nos. 33, 34 and 35 ..... 30%
Independent Iron, Nos. 18 and 318 ..... 30%
Independent Steel, No. 61 ..... 25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104 ..... 35%
Union Car Drill 25%
Universal, 11, 16, 17, 13, 14, 15 ..... 40%
Universal, No. 42 ..... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50 ..... 35%
Steel Face Plate Jaws, Nos. 70 and 72 ..... 30%
Westcott Patent Chucks:
Lathe Chucks 60%
Little Giant Auxiliary Drill 50%
Little Giant Double Grip Drill ..50%
Little Giant Drill, Improved 50%
Oneida Drill 50%
Scroll Combination Lathe 50%
Whitaker Mfg. Co.:
National Drill 25%

Clamps—

Adjustable Hammers' ..... 20@20&5%
Carriage Makers', P., S. & W. Co. ..... 50&10%
Beals' Parallel ..... 33⅓&10%
Myers' Hay Rack 45%
Lineman's Swedish Neverturn 65%
Wood Workers, Hammers ..... 40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion; Adjustable 50%
Iwan's Champion, Stationary 40%

Sidewalk—

Star Socket, All Steel, ₰ doz. $4.05 net
Star Shank, All Steel ₰ doz. $3.74 net
W. & J. Shank, All Steel, ₰ doz., 7½ in. $3.90, 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros. 30%
Fayette R. Plumb 30%
L. & I. J. White Co. 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Flexible Horse, each..$15.00
Chicago Belt Horse, each..$20.00
Stewart's Enclosed Gear Horse, each $8.75
Stewart's Patent Sheep Shearing Machine, each $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75

Clips, Axle—

Regular Styles, list July 1, '05, ... 50&10%

Cloth and Netting, Wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Backing, Liquor, Bottling, &c 60%
Compression Bibbs 50%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list 40%
Leather, Walter B. Stevens & Son's list 40%

Compasses, Dividers, &c.

Ordinary Goods ..... 70&10@75%
Wm. Schollhorn Co.:

Conductor Pipe,—

	Gal. Steel.	*Charcoal*
	L. C. L. to Dealers	
Eastern	70&10	50&10&5%
Pittsburgh	70&10	60
Central	65&10	60&5
Northwestern	70	60
	70&10	60
Western	70&12½	50&12½
Tennessee	70&10	50&12½
Southern	70	50&12½
Southwestern	70	50&5

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:

Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	3	4	5	6	8
Each	$2.40	$2.15	$4.40	$3.30	$4.15
White Enameled					11
Agate Lined					10

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 22@25¢; lighter than 3 lb. to pair ..... 24@27¢

Cord— Sash—

Braided, Drab ..... lb. 35¢
Braided, White, Com., Nos. 8 to 12, 21¢; No. 7, 21½¢; No. 6, 22½¢. In lots of 12 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India ..... lb., 17@11¢
Sutton, Sons & Co., Ltd. Red Label Patent Russia ..... 20¢
Cable Laid Russia ..... lb...21¢
India Hemp, Br'd'd ..... lb...21¢
India Hemp, Twisted, lb. 18¢
Patent India, Twisted ..lb...17¢
Peerless Cotton, No. 6, ₰ lb., 27½¢; No. 7, 26½¢; Nos. 8 to 12, 26¢
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 26½¢; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to 10 ..... ₰ lb 23 ¢
Pullman:
Wire Sash Cord 10%
Sash Cord Attachments, per 100..$2.00
Samson, 5 to lb.:
Braided, ₰ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White 6 to ton, 50¢; Spot Cord ..... 50¢
Massachusetts, White ..... ₰ lb 40¢
Massachusetts, Drab ..... ₰ lb 45¢
Phoenix, White, Nos. 8 to 12, 27¢;
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen, 50¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906 ..... 90@—%
Hendryx Standard Wire Picture Cord, old list 85&10%.
Turner & Stanton Co. Wire Picture Cord ..... 50&10

Cradles—

Grain ..... 40@12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber, ₰ gro.
White and Purple, Indelible...$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black $4.50
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Black $10.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ⅜ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16 ..... $3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $5.50; Light $5.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden 50%

Cutlery, Table—

International Silver Company:
No. 8 Meriden Rogers, ₰ doz. $3.50
Star, Eagle, Rogers & Hamilton ..... ₰ doz. $2.50
Wm. Rogers & Son ..... ₰ doz. $2.50

Cutters— Glass—

H. H. Magnew Co. 40%
Bed Rock 50%
B. Mfg. Co. 40%
Woodward 50%

Meat and Food—

American:

No.	1	2	3	4	5
Each	$2	$2	$2	$2	$3

Enterprise:

No.	10	12	20	22	32	42
Each	$2	$3	$2.75	$1.50	$6	$25@25&7½%

P., S. & W. Co.:

No.	1	2	3	4	5	6
Each	$2	$2	$2	$2	$3	$3

Fasteners, Blind—

Zimmerman's ..... 50&10%
Woodhead's ..... 40&10%
Upson's Patent 40%

Cord and Weight—

Iron and Tinned 33⅓%

Corrugated—

Acme Corrugated Fasteners 70%

Faucets—

Cork Lined ..... 55@10&60@10%
Metallic Key, Leather Lined, 60@10@70%
Red Cedar ..... 40&5@40&10&5%
Petroleum ..... 70&10@70%
B. & L. B. Co.:
Metal Key ..... 60&10%
Star 60%
West Lock ..... 50&10%
John Sommer's Peerless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Mfg. Key ..... 50&10%
John Sommer's Duplex Metal Key 60%
John Sommer's Duplex Lock ..... 50&10%
John Sommer's I.X.L. Cork Lined 60%
John Sommer's Reliable Cork Lined ..... 50&10%
John Sommer's Chicago Cork Lined 60%
John Sommer's O. K. Cork Lined 60%
John Sommer's No Brand, Cedar 50%
John Sommer's Perfection, Cedar 40%
Self Measuring:
Enterprise, ₱ doz. $36.00 ..... 40&10%
Lane's, ₱ doz. $36.00 ..... 40&10%
National Measuring, ₱ doz. $36.40 ..... 40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List Nov. 1, 1899.

Best Brands ..... 70&10@75&10%
Standard Grade ..... 75&10@80%
Lower Grade ..... 75&10&10@50&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 ..... 33 1-3@40%

Fixtures, Fire Door—

Allith Underwriters' Approved 50%
Richards Mfg. Co.:
Universal No. 103; Special, No. 104 ..... $3.75
Fusible Links, No. 96 ..... 50%
Expansion Bolts, No. 107 ..... 60&10%

Grindstone—

Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.66*	*3.85*	*4.45*	*4.65*

P., S. & W. Co. 25
Reading Hardware Co. 60%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig Ex Potato ..... 60&10%
Victor, R. ..... 60&15&2½%
Victor, Manure 66⅔%
Victor, Header 65%
Champion, Hay 66⅔%
Champion, Manure 65%
Champion, Manure ..... 60&15&2½%
Columbia, Hay ..... 60&20%
Columbia, Manure 70%
Columbia, Spading ..... 70&12½%
Hawkeye Wood Barley 40%
W. & C. Potato Digger ..... 60&10%
Acme Hay ..... 60&10%
Acme Manure, 4 tine ..... 60&10&5%
Dakota Header ..... 60&20%
Jackson Steel Barley ..... 60&20%
Kansas 60%
W. & C. Favorite Wood Barley 40%
Plated.—See Spoons

Frames— Wood Saw—

White, S'g't Bar, per doz. ..$1.80@
Red, S'g't Bar, per doz. ..$1.00@1.25
Red, Dbl. Brace, per doz. $1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*3*	*5*	*6*
Each	*$1.25*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Pressos—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp $2.75
Cotton 3 80
Waterproof Sgl. Taped.. 3 65
Waterproof Dbl. Taped.. 4 40
Waterproof Tpl. Taped.. 5.15

Extra 10&7½%.

Gates, Molasses and Oil—

Stebbins' Pattern ..... 80@90&5%

Gauges—

Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c. ..... 50&50&10%
Disston's Marking, Mortise, &c. ..67½%
Wire, Brown & Sharpe's 33⅓%
Wire, Morse 25%
Wire, P. S. & W. Co. 33⅓%

Gimlets— Single Cut—

Numbered assortments, per gro.

Nail, Metal, No. 1, $2.00; 2, $2.50
Spike, Metal, No. 1, $4.00; 2, $4.50
Nail, Wood Handled, No. 1, $2.50; 2, $2.60
Spike, Wood Handled, No. 1, $3.50; 2, $3.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co. ..... 65@65&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush..

Grease, Axle—

Common Grade....gro. $6.00@6.50
Dixon's Everlasting, 10-lb pails, ea. $4c., in boxes, ₱ doz., 1 lb., $1.20; 2 lb. $2.00
Hemet Hard Oil 25%

Griddlet, Soapstone—

Pike Mfg. Co. ..... 33⅓@33⅓&10%

Grinders—

Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 ..... 30%
Alundum Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A Combined, $6.50 ..... 30%
Alundum Disc Grinders, each, $2.50 ..... 30%

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., $2.00 ..... 33⅓%
Richards Mfg. Co., Eli and Cyclone Ball Bearing, mounted 40%

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... 60&5@60&10%
Bridgeport Chain Co.:
Triumph Coil and Halters..35&2½@40%
Brown Coil and Halters..35@50&5
Brown Cow Ties..50&5@50&10&5
Brown Tie Outs..70&10@75&5
Court Mfg. Co.:
Web ..... 30&2%
Jute Rope 35%
Sisal Rope 20%
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am. Coil and Halters..40@40&5%
Am. Cow Ties..45@50%
Niagara Coil and Halters..45@50&5%
Niagara Cow Ties..45&5@50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists'..55&10@55&10&5%
Heller's Farriers'..50&5@50&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel 50%
Farriers' ..... 10&10&2%
Riveting 30%
Machinists', revised list..... 66⅔&5
Blacksmiths' ..... 50&5%
Fayette R. Plumb:
A, E, Nos. ..... 40&2½@40&12½%
Eng. and B. S. Hand..50&10&5@60&5
Machinists' Hammers..... 60@60&10
Rivet and Tinners'..40&7½@40&12½&5%

Heavy Hammers and Sledges—

Under 3 lb. per lb. ..40c...80&10%
3 to 5 lb. per lb. ..6c..... 80&10%
Over 5 lb., per lb., 30¢.....
Over 5 lb., per lb., 30¢..80&10&10%

Handles—

Agricultural Tool Handles

Ax, Pick, &c..... 60&10@60&10&5%
Hoe, Rake, &c..... 40%
Fork, Shovel, Spade, &c.:
Long Handles 40%
D Handles 40%

Cross-Cut Saw Handles—

Atkins' 40%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—

Auger, assorted...gro. $3.00@$3.50
Brad Awl..... gro. $1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged and Apple, $2.00; $2.65; Hickory ..$2.15@2.40
Socket Firming, Apple, $1.75@ $1.95; Hickory..... $1.60@$1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted..... gro. $1.50@$1.40
Hammer, Hatchet, &c. 60@10@60&10&5%
Hand Saw, Varnished, doz. 80@85c; Not Varnished..65@75¢
Plane Handles:
Jack, doz. .30¢ ; Fore, doz. .45¢.
Clapp-Grimmons Co.:
Carving Tools ..... 30@30&10%
Chisel ..... 60@60&10%
File and Awl ..... 60@60&10%
Saw and Plane ..... 30@30&10%
Screw Driver ..... 30@30&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 10&10%
Nicholson Simplicity File Handles ₱ gro. $0.85@$1.50
J. L. Osgood:
Indestructible File and Tool, ₱ gro., No. 1, $9.00; No. 2, $8.50; No. 3, $9.00, No. 4, $9.50; No. 5, $10.00..... gro. lots 10%
W. A. Zelnicker Supply Co.:
Hammer, ₱ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 in., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $4.00 ..... 30%
Sledge, ₱ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval 36 in., $4.00; octagon, 36 in., $4.00.
Axe, ₱ doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze, ₱ doz., 36 in., $5.80; 36 in., 57.80.
Pick, ₱ doz., R. R., 36 in., $8.30; oval, 34 in., $5.80.
Hatchet, ₱ doz., 12 to 14 in., $2.00

Hangers—

NOTE.—Barn Door Hangers are gen-

Allith Mfg. Co.:
Reliable, Nos. 1 and 2; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 50%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60&2½%
Roller Bearing ..... 70&2½%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, ... 60&10%
Roller Bearing, Ex. Hy No. 22, $18.00 ..... 60&10%
Bull Dog, $24.00 ..... 70%
Lane Bros. Co.:
Parlor, Ball Bearing, $1.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard ..... 60&10%
Hinged ..... net $6.08
Covered ..... 60&5%
Special ..... 70&5%
Lawrence Bros:
Advance ..... 55&10%
Cleveland ..... 70&7½%
Clipper, No. 75 ..... 60%
Crown ..... 55&10%
Cyclone, No. 10 ..... net $6.50
Tandem, No. 50 ..... net $7.50
New York ..... 55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2..70%
Anti-Friction 60%
Hinged Hangers, King Charm..60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, ... 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12 $2.20
Roller B'r'g St'l Track No. 13 $2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16 ..... 50&10%
Seal, Steel Track, No. 3 ..... $2.25
Auto Adj. Track No. 22..—50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150 ..... $2.50
Safety Underwriters F. D. No. 101 ..... 50%
Tandem No. 41 2½ and 3 60&10%
Palace, Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 122 ..... 50&10%
Ives' Wood Track No. 1..... $2.25
Trolley B. D. No. 29 ..... 50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2 70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3 ..... 60%
Hinged Tandem No. 48..... 60&5%
Folding Door B. B. Swivel No. 135 ..... 40%
Taylor & Boggis Foundry Co.'s Kidder Roller Bearing 50&15&10&5%
Myers' Stayon Hangers 60%

Hangers— Garment—

Pullman Trouser, ₱ gro., No. 1, $9.00; No. 4, $24.00; No. 5, $16.50; No. 6, $27.50; No. 10, $21.00; No. 12, $8.00; No. 15, Rods, $9.00; No. 18, Loops $10.00
Victor Folding ..... ₱ gro. $9.60

Gate—

Myers' Patent Gate Hangers, ₱ doz net $4.50

Joist and Timber—

Lane Bros. Co. 30%

Hasps—

Griffin's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, ₱ doz..60%

Hatchets—

Regular list, first qual..10&2½@—
Second quality ..... 50&5%—

Heaters, Carriage—

Clark No. 5 $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D $2.75; No. 7D, $3.00; No. 5E, $2.25; No. 7, $3.50 ..... 25%
Clark Coal, ₱ doz., $0.75 ..... 20%

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutters: (L. & P., O. N., Acme, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Charles Parker Co. ..... 70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 1 ..... 20%

Extra 10% often given.

Stanley's Steel Gravity Blind Hinges, No. 1647½, ₱ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co:
O. S., Lull & Porter ..... 75&5%
Acme, Lull & Porter 75%
Queen City Reversible 75%
Shepard's Noiseless, Nos. 60, 65 ..... 75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&5%
Tip Pat'n, No. 1 ..... 75&10%
No. 3 ..... 75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 70&10&5%
Shepard's Double Locking 75%
Champion Gravity Locking ..... 75&5%
Pioneer ..... 75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L't'ches.	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.35*

New England:
With Latch ..... doz. ..@$2.00
Without Latch.. doz. ..@$1.60
Reversible Self-Closing:
With Latch ..... doz. ..@$1.75
Without Latch.. doz. ..@$1.35
Western:
With Latch ..... doz. $1.75
Without Latch ..... doz. $1.15
Wrightsville Hardware Co:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 ..... 70%

Pivot Hinges—

Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—

Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, Cast Iron $6.50@$6.75

J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 40%
Bardsley's Patent Checking 33⅓%
Bommer Bros.
Bommer Ball Bearing Floor 40%
Bommer Spring Hinges 40%
No. 999 Wrot. Steel Hold Back, ₱ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor 50%
Garlock City Engine House 25%
Keene's Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 25%
American 30%
Columbia, ₱ gr., No. 14, $9.00; No. 18 ..... $25.00
Columbia, Adj., No. 7, ₱ gr. $12.00
Columbian Hinges ..... 60&10%
Gem, new list 30%
Clover, new list ..... ₱ gr. $12.00
Oxford, new list 30%
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co., Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye and Steel Holdback Screen Door ..... ₱ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door 25%
No. 777, Sheet Steel Holdb'k, ₱ gr. pr $9.00
Stanley Mfg. Co.:
Champion Double Acting Floor Hinge ..... 25&10&10%
Standard Double Acting Floor Hinge ..... 25&10&10%
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓%

Extra 10% often given on most of these Hinges

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges..50&10%
Heavy Strap Hinges..60&5%
Light T Hinges 50%
Heavy T Hinges 30%
Extra Heavy T Hinges..50&10%
Heavy Strap Hinges 33⅓%
Cor. Heavy Strap ..... 60&5%
Cor. Ex. Heavy T ..50&10%

Extra 10&7½%.

Screw Hook and Strap. { *6 to 12 in..lb. 3½¢* / *13 to 20 in..lb. 3½¢* / *22 to 36 in..lb. 3 ¢*

Screw Hook and Eye:
¾ to 1 inch ..... lb. 6¼¢
1¼-inch ..... lb. 7½¢
1½ inch ..... lb. 8½¢

Extra 10&7½%.

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—

M'f'gr's list, price per gross

Inch	*15*	*16*	*17*	*18*
Galv. Open	*$35*	*$39*	*$42*	*$46*
Jap. Open	*36*	*38*	*41*	*45*
Galv. Funnel	*45*	*48*	*52*	*56*
Jap. Funnel	*.53*	*.56*	*.59*	*.65*

Extra 10&7½%&2%

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick, No. 182 ..... each $1.05
Steel Mortar, No. 158 ..... each $1.35

Hoes— Eye—

Scovil and Oval Pattern ..... 60&10@60&10&10%
Grub, list Feb. 24, 1900 ..... 70&10@70&10&10%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding, No. 1 & 2.00, No. 2 & 2.50
Star Double Bit.....$2.50
Ft. Madison Cotton Hoe.....70&10
Ft. Madison Crescent Cultivator Hoe.....70&10
Ft. Madison Mattock Hoes:
Regular Weight.....doz. 40&5
Junior Size.....doz. $4.50
Ft. Madison Sprouting Hoe.....doz. 60&10
Ft. Madison Dixie Tobacco Hoe.....75&10&5
Kretsinger's Cut Easy.....70&10
Warren Hoe.....45&10
W. & C. Tranhoe.....55&10
B. B. 6 in., Cultivator Hoe.....$3.50
B. B. 6½ in. Cultivator Hoe.....$3.50
Acme Weeding.....doz. net, $4.35
W. & C. Lifting Shuffle Hoe.....doz. $3.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular.....doz. $2430.....45&10%

Door—

Bardsley's, Iron, 40.....Brass and Bronze.....50
Lancaster.....50%
Pullman.....50
Richards Mfg. Co.: No. 117, Everready, 40.....Nos. 118, 119, Sure Grip.....50
Superior.....33⅓%

File and Tool—

Nicholson Fine Holders and File Handles.....33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, gross, $10.80, doz.....$1.25

Trace and Rein—

Fernald Double Trace Holder, doz. pairs.....$1.25
Dash Rein Holder, doz. pairs, $1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50.....German.....33⅓

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Clothes Line, Reading Lite.....40%
Coat and Hat, Reading.....45&20
Coat and Hat, Wrightsville.....60&10
Harness, Reading List.....40%

Wire—

Belt.....80%
Wire (A. H. Hooks.....50
Bradley Metal Clasp Wire, Coat and Hat, 70&10%; Ceiling.....70&10
Columbian Hdw. Co., Gem.....70&5
Parker Wire Goods Co., Ring..70&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—
See Wrought Goods

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Rush, Light, doz., $6.20; Medium, $6.75; *Heavy,* $7.65
Grass, best, all sizes, per doz.$1.50
Grass, common grades, all sizes, per doz......$1.50
Whiffletrees.....lb 3½@4c
Hooks and Eyes:
Brass.....60@60&10%
Malleable Iron.....70@70&10%
Coves, Adj. to Gate and neutral Hooks.....40%
Ft. Madison Cut-Easy Corn Hooks, doz. $3.25 net
Turner & Stanton Co., Chain Shoulder.....80&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾ inch:
Competition.....ft. 5½@6c
3 ply Guaranteed.....ft. 8@9c
4 ply Guaranteed.....ft. 11@11c
Cotton Garden, ¾ in., coupled
Low Grade.....ft. 8@9c
Fair Quality.....ft. 10@11c

Irons— Sad—

From 4 to 10.....lb. 3½@4c
R. B. Sad Irons.....lb. 11@12c
Mrs. Potts', cents per set:
Nos. 50 55 60 65
Jap'd Tops.....85 90 95 99
Tin'd Tops.....88 95 98 99
New England Pressing.....lb. 7@7½c

Bar and Corner—

Richards Mfg. Co.: Bar.....
Corner.....

Pinking—

Pinking Irons.....doz. 60c

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30@2° : Steel 45
Lockport.....
Lane's Steel.....30&5%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co's.....

Ladder—

Richards Mfg. Co., Ladder Jacks..50

Kettles—

Brass, Spun, Plain.....20@25%
Enamelled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros. Butcher &.....30
Wilkinson Shear & Cutlery Co.....60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60
Wilmington, Acme, doz. $2.65; Dent, $2.75; Adj. Serrated, $2.50; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....50&10&5
C. E. Jennings & Co., Nos. 45, 46, 50&5
Jennings & Griffin, Nos. 41, 42, 66%&5
Swan's.....66%&10
Watrous.....16%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge, per doz. $4.50@5.75
Iwan's Sickle Edge.....doz. $9.50
Iwan's Serrated.....doz. $10.00

Miscellaneous—

Farriers'.....doz. $2.50@4.35
Westenhoim's.....doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber Tip.....gro. $1.25@$1.40
Carriage, Jap., all sizes.....gro. 40@45¢
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel, Colors, No. 02@2.15
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable.....50%
Ladder Store.....40%
Myers' Noiseless Store Ladders.....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....20%
P. S. & W.....40&10%
Reading.....60%

Lanterns—Tubular—

Regular, No. 0.....doz. $3.35@4.50
Side Lift, No. 0.....doz. $3.60@4.75
Hinge Globe, No. 0 and 2.....doz. $4.00@4.75
Other Styles.....doz. $4.00@6.00

Bull's Eye Police—

3 inch.....$4.25@4.50

Latches— Thumb—

Roggin's Latches, with screw.....doz. 35@40¢

Door—

Allith Mfg. Co., Reliable and Alligator, 50%; Reliable Cold Storage, 50%
Cronk & Carrier Mfg. Co., No. 101, doz. $2.00
Richards' Bull Dog, Heavy, No. 0, 1.5.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....doz. 50¢; *large, 66¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Steel, 30%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E.....10%

Lines—

Wire Clothes, Nos. 18 19 20
per foot.....$2.50 2.25 2.00
75 feet.....*3.10 1.80 1.65*
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....gross 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, Nos. 3½, $1.80; No. 6, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4½, $2.25; No. 4½, $2.75; Linen, No. 12, $1.50, No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 120 ft., $5.25.....20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....4
Clothes Lines, White Cotton.....20%
Shade Cord, Cotton or Linen.....20%

Locks— Cabinet—

Cabinet Locks.....33⅓ %

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....10
R. & E. Mfg. Co.....10%

Padlocks

R. & E. Mfg. Co., Wrought Steel and Brass.....75&10%

Sash, &c.—

Iron Pat.:
Bronze and Brass 75&10: Crescent, 60%; Iron, 60; Window Ventilating, 40&20; Reversible Pat. Ventilating Sash Lock, 33⅓

Pullman Patent Ventilating Lock, 25
Reading Sash Locks.....10

Machines—Boring—

Com. Upr't, without Augers, $2.00@2.25
Com. Angl'r, without Augers, $2.25@2.50
Swan's Improved.....40&10%
Jennings', Nos. 1 and 4.....25&7½%
Millers' Falls.....5.75
Snell's, Upright, $2.60; Angular, $2.90

Corking—

Reisinger Invincible Hand Power.....doz. $18.00

Fence—

Williams' Fence Machines.....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Cyclone, High Speed Chain Hoist.....25%

Ice Cutting—

Chandler's.....12½%

Washing

Boss Washing Machine Co.: Per doz.
Boss No. 1.....$57.00
Boss Rotary.....$57.00
Champion Rotary Banner No. 1.$57.00
Standard Champion No. 1.....$50.00
Standard Perfection.....$27.00
Cincinnati Square Western.....$33.00
Uneeda American, Round.....$33.60

Mallets—

Hickory.....45@5@50%
Lignumvitæ.....45@5@50%
Tanners' Hickory and Apple wood.....doz. 45@5@50%

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Acme Flexible Steel.....50%
Elastic Steel (W. G. Co.), new list.50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....20@25%
National list June 1, 1900.....30
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side.....50&10%
Swift, Lane Bros. Co.....30

Motors, Water—

Dirnie's Red Devil.....30%
Lappanotti's.....30

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; 12-in., $2.10, etc.
Cheap, 10-in., $3.25; 12-in., $3.45, etc.
Better Grade, 10-in., $3.00; 12-in., $3.25, etc.

	12	14	16	18-in.
High Grade	$4.50	4.75	5.00	5.25
Continental				60%
Great American				40
Great American Ball B'r'g, new list				70%
Quaker City				70%
Pennsylvania				60
Pennsylvania, Jr., Ball Bearing				50&10&5
Pennsylvania Golf				50
Pennsylvania Horse				33⅓&5%
Pennsylvania Pony				40&5%
Granite State:				
Style A, Low Wheel				70
Style B, High Wheel				70
Style C, High Wheel, spcl. list, 70&1				
Style D, High Wheel, spcl, list				70%
Philadelphia:				
Styles M., S., C., K., T.				70&10&5%
Style A, all Steel				60&10&5%
Style E, High Wheel				70&10&5%
Drexel and Gold Coin, special list				40%
Horse				40&5%
Pony				40&5%
36-in. Horse				30&10
Eagle Horse				30&5%
I. X. L. Horse				50&5%

Nails—

Wire Nails and Brads, Miscellaneous.....87½@87½@87½
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos	6	7	8	9	10	
Anchor	23	20	19	18	18	40&5%
Coleman	13	12	12	11	11	net
New Haven	22	21	20	19	18	10&5
Livingston	19	18	17	16	16	50%
Western						80 & 5

Jobbers' Special Brands per lb. 9@10¢

Picture—

	1½	2	2½	3	in.
Brass H'd	45	55	60	70	...
Por. Head	...	1.10	1.10	1.10	... gro

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched:
Square, Blank and Tapped.....
Hexagon, Blank and Tapped.....
Square, Blank or Tapped.....
C. T. & F......
Hexagon, Blank or Tapped.....
C. T. & F......6.2.0
Hot Pressed:
Square, Blank.....5.80¢
Hexagon, Blank.....6.30¢
Square, Tapped.....5.80¢
Hexagon, Tapped.....5.90¢

Oakum—

Best.....lb. 6½¢
U. S. Navy.....lb., 6¢
Navy.....lb. 5¢
Plumbers' Spun Oakum.....25% @ 5¢

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated.....75%
Chain or Hanging.....
Brass and Copper.....50&10%
Zinc.....65&10%
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....50@50&10%
Railroad Oilers, &c.....60@60&10%
Maple City Mfg. Co.:
Spring Bottom Cans.....50&5&10%
Railroad Oilers, &c.....50&10%

Openers— Can— *Per doz.*

Sprague, Iron Handle.....50@35¢
Sprague, Wood Handle.....50¢@
Saratoga Scissors.....$1.75@$3.00
Yankee Can and Bottle Opener.....
doz., net, $0.75, Little Gem.....
doz., net.....$0.65

Egg—

Hartigan Nickel Plate, doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope.....20@25¢

Rubber—

(Fair quality goods.)
Sheet, C. L......11@12¢
Sheet, C. O. S......11@12¢
Sheet, A. B. S......12@13¢
Sheet, Pure Gum.....40@45¢
Sheet, Red.....40@50¢
Jenkins' '96, lb. 80¢.....25%

Miscellaneous—

American Packing.. lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@12½¢
Jute.....lb. 4½@5½¢
Russia Packing.....lb. 8@11 ¢

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.....65&7½@70%
Edwards, Royal Blue.....65&7½%

Fry—

Common Lipped:

Nos.	1	2	3	4	5
Per doz.	$0.75	0.80	0.90	1.10	1.30

Refrigerator, Galva.—

Inch	12	14	16	18
Per doz.	$1.75	2.25	2.80	3.15

Paper—Building Paper

Asbestos:	lb.
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.	3½@5¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.	6¢
Mill Board, Sheet, 40 x 40 in., 1-32 to ⅛ in.	40@5¢
	Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll	40@38¢
Medium weight, 30 lbs. to roll	50@70¢
Heavy weight, 40 lbs. to roll	75@85¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.	
Dead'ng Felt, 9, 6 and 4½ sq. ft. to the ton.....$3.50	
Red Rope Roofing, 250 sq. ft. per roll.....$1.75	

Tarred Paper—

1 ply (roll 400 sq. ft.), ton.....$37.00@$38.00)
2 ply, roll 108 sq. ft......65¢
3 ply, roll 108 sq. ft......88¢
Slater's Felt (roll 500 sq. ft.).80¢

Sand and Emery—

Flint Paper and Cloth.....
Garnet Paper and Cloth.....25%
Emery Paper and Cl'th..50&10@60%

Parers— Apple—

Goodell Co.:
Family.....$15.00
Improved Bay State.....doz. $36.00
New Lightning.....
Turn Table.....
White Mountain.....
Bonanza Improved.....each $7.50
Handy.....
Extra.....
Reliable.....
Rapid.....$25.00
Livingston Nail Co.:
Family.....$1.00
Peerless.....
Improved.....
Ideal.....$6.25
Reading Hardware Co.:
Acme.....$1.00
Rapid.....
Reading 78.....doz. $6.25

Potato—

Saratoga.....doz. $7.00
White Mountain.....doz. $6.00

Picks and Mattocks—

(List Jan. 1908.)

List	70&10	10&5	70&10	10&5	10%

Cronk's Handled Garden Mattock, doz. No. 2, $2.60, No. 3, $6.40.

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass .....50@50&10%
Iron, list Nov. 11, '85 ..60@60&10%

Pipe, Cast Iron Soil—
Standard 2-6 in .....60&50%
Extra Heavy, 2-6 in .....70&50% —½
Fittings, Standard and Heavy, 75&50% —½

Pipe, Merchant —

	Consumers, Carloads. Steel. Blk.	Galv.	Iron. Blk.	Galv.
	%	%	%	%
2 and 2½ in.	65	48	62	—
3 in.	66	52	64	50
3½ in.	68	56	66	54
4 to 6 in.	72	62	70	60
7 to 12 in.	69	54	67	52

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 8 to 24 in., f.o.b. factory:
First-class 87%
Second-class 90%

Pipe, Stove—

	Per 100 joints. C. L.	L. C. L.
Edwards' Nested:		
6 in., Standard Blue	$6.25	$7.25
6 in., Standard Polish	6.75	7.75
7 in., Standard Blue	7.75	8.75
6 in., Royal Blue	7.00	8.00
7 in., Royal Blue	7.50	8.50
8 in., Royal Blue	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
6 in., Uniform Color	$6.15	$7.15
7 in., Uniform Color	6.65	7.65
8 in., Uniform Color	7.65	8.65

Planes and Plane Irons—
Wood Planes—
Bench, first qual .....30@30&10%
Bench, second qual .....40@40&10%
Molding .....25@25&10%
Chapin-Stephens Co.:
Bench, First Quality 30%
Bench, Second Quality 40%
Molding and Miscellaneous 25%
Toy and German 50%
Union 60%

Iron Planes—
Chaplin's Iron Planes .....50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06 .....25%
Buck Bros 30%
Chapin-Stephens Co 25%
Union 50%
L. & I. J. White .....20&5@25%

Planters, Corn, Hand—
Kobler's Eclipse .....⅌ doz. $8.00

Plates—
Felloe .....lb. 4@4¼¢

Pliers and Nippers—
Button Pliers .....75&50@75&10&5%
Gas burner, per doz., 3 in., $1.25 @ $1.30; 4 in., $1.45 @ $1.50.
Gas Pipe .. 7 8 10 12-in.
$2.00 $2.25 $2.75 $3.50
Acme Nippers .....50&8%
Cronk & Carrier Mfg. Co.:
American Button 80%
Improved Button .....75&10%
Cronk's 60%
No. 80 Linemen's 50%
Stub's Pattern 45%
Combination and others .....30&10%
Heller & Farriers' Nippers, Pincers and Tools .....40&8@40&10&5%
P., S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 35%; Elm City, 35%; Paragon, 50%; Lodi, 55% .....30&10%
Swedish Side and Diagonal Cutting Pliers 60%
Utica Drop Forge & Tool Co.: Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels .....30@30&10%
Chaplin's Imp. Brass Cor .....40@40&10%
Pocket Levels .....30@30&10%
Extension Sights .....30@30&10%
Machinists' Levels .....40@40&10%
Disston's Plumbs and Levels .....60&10%
Disston's Pocket Levels .....60&10%
Stanley's Duplex 30%
Woods' Extension 33⅓%

Points, Glaziers'—
Bulk and 1-lb papers .....lb. 9 ¢
½-lb papers .....lb. 9½¢
¼-lb. papers .....lb. 10 ¢

Police Goods—
Manufacturers' Lists .....25@25&5%
Towers 25%

Polish—Metal, Etc—
Prestoline Liquid, No. 1 (1½ pt.) ⅌ doz., $3.00; No. 2 (1 qu.), $5.00. 40%
Prestoline Paste 40%

George William Hoffman:
(1 Metal Polish Paste, 3 oz. boxes, ⅌ doz. 50¢; ⅌ gro. $4.50; ½ lb boxes, ⅌ doz. $1.25; 1 lb boxes ⅌ doz. $2.25.
U. S. Liquid, 8 oz. cans, ⅌ doz., $1.25.
Barkeepers' Friend Metal Polish, ⅌ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ⅌ lb 10¢
Black Eagle, Liquid, ½ pt. cans, ⅌ doz. 75¢
Black Jack Paste, ¾ lb cans, ⅌ gr. $9.00
Black Kid Paste, 5 lb can.....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon's, ⅌ gr. $5.75 .....10%
Dixon's Plumbago .....⅌ lb 8¢
Fireside .....⅌ gr. $2.60
Gem, ⅌ gr. $4.50 .....10%
Japanese .....⅌ gr. $3.50
Jet Black .....⅌ gr. $3.50
Peerless Iron Enamel, 10 oz. cans, ⅌ doz. $1.50

Poppers, Corn—
1 qt. Square, doz. $0.80; gro. $8.75
1 qt. Round, doz. $0.90; gro. $10.00
½ qt. Square, doz. $1.00; gro. $11.00
2 qt. Square, doz. $1.25; gro. $13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts .....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled .....35&10%
Tinned .....30&10%

Powder—
In Canisters:
Duck, 1 lb .....each 45¢
Fine Sporting, 1 lb .....each 75¢
Rifle, ½-lb .....each 15¢
Rifle, 1-lb .....each 25¢
In Kegs:
12½ lb. kegs $3.50
25 lb. kegs $4.60
King's Semi-Smokeless:
Keg (25 lb bulk) $6.50
Half Keg (12½ lb bulk) 3.50
Quarter Keg (6¼ lb bulk) 1.90
Case 24 (1 lb cans bulk) 8.50
Half case (1 lb cans bulk) 4.50
King's Smokeless: Shot Gun. Rifle.
Keg (25 lb bulk) $12.00 $15.00
Half Keg (12½ lb bulk) .. 6.25 7.75
Quarter Keg (6¼ lb bulk) .. 3.25 4.00
Case (1 lb cans bulk) .. 14.00 17.00
Half case 12 (1 lb c. bk).. 7.25 8.75

Presses—
Fruit and Jelly—
Enterprise Mfg. Co .....20@25%

Seal Presses—
Morrill's No. 1, ⅌ doz., $20.00 .....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 60%
Miller's Falls, No. 3, ⅌ doz., $12.00 .....33⅓&10%
Morrill's No. 1, Nail Puller, ⅌ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 .....50%
The Scranton Co., Case Lots:
No. 45 (large) $5.50
No. 315 (small) 5.00
Smith & Hemenway Co.:
Diamond B 70%
Giant 50%
Staple Pullers, Utica and Dayton 60%

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye. doz., ¼ in., $1.25; 5 in., $1.55				
Inch	2	2¼	2½	
Hot House, doz.	.40	.65	.85	1.20
Inch	1½	1¾	2	
Screw, doz.	.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz.	.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in .....17@20¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in .....20@21¢
Acme, No. 35, 1¾ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain Axle .....50&10%
Wrought Steel Eagle .....17@20¢
Fox-All-Steel, Nos. 3 and 7, 2 in. ⅌ doz. 50¢
Grand Rapids All Steel Noiseless 50%
Niagara, No. 25, 1¾ in., 19¢; 2 in., 20½¢
No. 26, Trade, 1¾ in., 11½¢; 2 in., 13½¢
Star No. 26, 1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher, Spout .....75&65@75&10%
Wood Pumps, Tubing, &c. 50%
Barnes Pitcher Spout (new list) .....40&5%
Barnes Pitcher Spout .....75&10%
Contractors' Rubber Diaphragm No. 2, R. & L. Rock Co $16.00
Daisy Spray Pump .....⅌ doz. $6.50
Flint & Walling's, Fast Mail Hand, (low list) 50%
Flint & Walling's Fast Mail (low list) 50%
Flint & Walling's Tight Top Pitcher .....75&10%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50 .....30%
Myers' Pumps (low list) .....40&5%
Myers' Power Pumps .....40&5%
Myers' Spray Pumps .....40&5%

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No.	1	2	3	4	
	$5.00	6.00	7.00	8.00	50%
Cup Leathers—Per Inch	2½	3	3½	4	
	$5.00	7.00	9.00	12.00	50%

Punches—
Saddlers' or Drive, good .....doz. 50@75¢
Spring, single tube, good quality $1.75
Revolving (4 tubes) .....doz. $3.50
Bemis & Call Co.'s Cast Steel Drive 50%
Morrill's Nos. 11AA, 1A, 1B, 1C, 1D, $15.00 .....50%
Hercules, 1 die, each $5.00 .....60%
Niagara Hollow Punches .....50&10%
Niagara Solid Punches .....55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35%; Paragon, 50%; Lodi 55%
Tinners' Hollow, P., S. & W. Co 40%
Tinners' Solid, P., S. & W. Co., ⅌ doz., $1.44 .....40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron .....2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢ 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..⅌ ft. 3¼¢
O. N. T. Rail $3.12
Griffin's:
xxx, ⅌ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ⅌ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ⅌ 100 ft. $3.45
O. N. T., ⅌ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in., ⅌ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ⅌ 100 ft., $7.50; 1¼ x 3-16 in., $8.75 .....55&7½%
McKinnes':
Hinged Hanger Track, ⅌ ft., 11¢, 60&5%
1 x 3-16 Track .....55&7½%
Myers' Stayon Track .....60&5%
Richards' Mfg. Co.:
Common, 1 x 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¾ x 3-16, $3.50.
Special Hinged Hanger Rail .....60&10%
Lag Screw Rail, No. 65 .....50%
Gauge Trolley Track, ⅌ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50 .....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn $3.25
Fort Madison Blue Head Lawn $2.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor .....80&5%
Queen City Lawn, ⅌ doz., 20 teeth, $2.85; 24, $3.00 .....net
Anticlog Lawn, ⅌ doz $1.00
Multiclog Garden .....70&10%
Ideal Steel Garden, ⅌ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00 .....80%
Kobler's:
Lawn Queen, 20-tooth .....⅌ doz. $3.15
Lawn Queen, 24-tooth .....⅌ doz. $3.25
Paragon, 20-tooth .....⅌ doz. $2.70
Paragon, 24-tooth .....⅌ doz. $2.75
Steel Garden, 14-tooth .....⅌ doz. $2.40
Malleable Garden, 14-tooth, ⅌ doz. $2.00@2.25

Rasps, Horse—
Disston's 75%
Heller Bros .....75&5@75&10&5%
Liverpool Bros.' Gold Medal .....70&10@75%
McCaffrey's American Standard .....60&10&5%
New Nicholson .....70&10@75%
See also Files.

Razors—
Liana Bro's 60%
Fox Razors ⅌ doz., No. 42 $20.00; No. 44 $20.00, No. 82, Platina, $25.00 .....33⅓%
Red Devil 65%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo Nickeled Populo 20%
Aluminum Germ Silv., Bronze 25%
1200 N, 1204 N 20%
3004 N, 06 N, 6 RM, G 9 .....25%
4 N, 6 PN, 24 PR, 08 PN 20%
2904 P, 2334 P, 2904 PN, 2334 P, 2904 N, 2334 P, 02904 N, 2334 P, 002904 PN, 2334 P, 3024 N, 2334 P 25%
986 PN, 2004 N, 974 PN 25%
5009 PN, 5009 N 20%
Competitor 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20%
304 P, 304 PN, 00304 P, 00304 PN, 2334 P 25%

Registers—*List July 1, 1903.*
Japanned Electroplated and Bronzed .....70@70&10%
White Porcelain Enamel .....50&10%
Solid Brass or Bronze Metal 40%

Revolvers—
Single Action .....95¢@$1.00
Double Action, except 44 cal $2.00
Double Action, 44 caliber $2.00
Automatic $3.00
Hammerless $3.50

Riddles, Hardware Grade
16 in .....per doz. $2.50@$2.75
17 in .....per doz. $2.75@$3.00
18 in .....per doz. $3.00@$3.25

Rings and Ringers—
Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.40	1.25	1.65 doz.

Hog Rings and Ringers—
Hill's Rings, gro. boxes $4.50
Hill's Ringers, Gray Iron, doz. .....60@75¢
Hill's Ringers, Malleable Iron, doz .....80@95¢
Blair's Rings, per gro .....$5.00@$5.50
Blair's Ringers .....per doz. 75@90¢
Brown's Rings, per gro .....$5.00@$5.50
Brown's Ringers .....per doz. 75@90¢

Rivets and Burrs—
Copper 50%
Carriage, Coopers', Tinners, &c.:
Black .....70&10%
Metallic Tinned 70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, 23@25¢; Tin boxes, 100 count, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—
Cronk's Stay, No. 50 .....$1.00
Lewis Buckenstoll .....50, $0.60; No. 56, $0.75; No. 60 .....$0.75
Lane's Stay 40%
Richards' Stay:
Handy Adj. and Reversible No. 53 .....75¢
O. K. Adj. and Reversible No. 58 .....80¢
Lag Screw, Nos. 55 and 57 .....50%
Unthreaded, Nos. 59, 60 .....50%
Favorite, No. 54 .....60%

Rope—
Manila, 7-16 in. diam. and larger: Pure .....lb. 10½@11¼¢
Sisal, 7-16 in. diam. and larger: Pure .....lb. 7½@8¢
Sisal, 5 16 in. diam. and smaller, No. 1 quality .....lb. 6½@7¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed .....lb. 6½@7¢
Pure .....lb. 7½@8¼¢
Sisal, Tarred, Medium Bath Yarn, Coarse and Untarred: Mixed .....lb. 5½@5¾¢
Pure .....lb. 6¼¢
Cotton Rope:
Best, ¼ in. and larger .....18@20¢
Medium, ¼ in. and larger .....16@17¢
Common, ¼-in. and larger .....10¢
In coils, ½¢ advance.
Jute Rope:
Thread, No. 1, ¼-in. & up, lb. .....6¼¢
Thread, No. 2, ¼-in. & up, lb. .....5¾¢

Wire Rope—
Galvanized .....87½@2½%
Plain .....45¢@2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35% ; Sisal 20%

Rules
Boxwood .....60@60&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory .....25@25&10%
Miscellaneous .....50@50&10%
Stephens' Combination 55%
Stanley 30%
Keuffel & Esser Co.:
Folding, Wood .....35&10%
Folding, Steel .....33⅓&10%
Duplex Steel .....50&10%
Lufkin's Lumber .....50&10%
Unson Nut Co.:
Boxwood .....40@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 45%
Band ..... 50@50&10%
Butcher Saws 50
Cross Cuts 35
One-Man Cross Cut 40%
Narrow Cross Cut 50%
Hand, Rip and Panel ..... 35&5
Miter Hand and Compass 40
Mulay, Mill and Drag 45
Wood Saws ..... 10&10%
Chapin-Stephens Co.:
Turning Saws and Frames. 30&30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth. 50%
Band, 2 to 18 in. wide 60%
Band, ⅝ to 1¾ 60%
Crosscuts 45%
Narrow Crosscuts 50%
Mulay, Mill and Drag 50%
Framed Woodsaws 15
Woodsaw Blades 15
Woodsaw Rods, Tinned 15
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, F, 8, 7 ..... 15&10%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c. 25%
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 10%
Butcher Saws 5%
Compass and Key Hole Saws 5%
Framed Wood Saws 5%
Hand Saws 5%
Wood Saw Blades 5%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws ..... 45&10&50%
Butcher Saws Blades ..... 30&10
Peace & Richardson's Hand Saws ..30%
Simonds':
Circular Saws 15
Crescent Ground Cross Cut Saws ..30%
Onedalia Cross Cut Saws ..... 40&10%
Gang Mill, Mulay and Drag Saws. 45%
Band Saws ..... 50&10%
Back Saws ..... 35&10&5%
Butcher Saws ..... 35&10&5%
Hand Saws ..... 25&10&5%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. ..... 25&10%
Wood Saws ..... 10&5%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A ..25%
Disston's:
Concave Blades 25%
Keystone Blades 35%
Hack Saw Blades 30%
Simonds File Co. 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 ..... 40&10%
Hack Saws, Nos. 175, 180, complete, ... 40&10%
Goodell's Hack Saw Blades ..... 40&10%
Grifin's Hack Saw Frames. 35&5&10
Griffin's Hack Saw Blades ..... 35&5&10%
Star Hack Saws and Blades ..... 35&10%
Sterling Hack Saw Blades ..30&10&5%
Sterling Hack Saw Frames. 30&10&10%
Stirling Power Hack Saw Machines, each, No. 1, $250; No. 2, $300. In. 20%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%
Whitaker Mfg. Co.:
National Hand Blades 10
National Hand Frames 30
National Power Blades ..... 30&10%

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 60%
Barnes' Velcipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $21 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00 .. 15&10%

Scales—

Family, Tarbell's ..... 50@50&10%
Counter:
Hotch, Platform, ½ oz to ¼ lbs. ..... doz., $5.50
Tiva Platforms, ½ oz to 8 lbs ..... doz., $16.00
Union Platform, Plain, $1.70@1.90
Union Platform, Stpd. $1.85@2.15
Chatillons:
Eureka 50
Favorite 10
Counter, Tip Scales 10
The Standard Portables 10%
The Standard R. R. and Wagon ..... 5&10

Scrapers—

Box, 1 Handle ..... doz. $2.00@2.25
Box, 2 Handle ..... doz. $2.50@2.80
Ship ... Light, $2.00; Heavy, $4.50
Chapin Stephens Co., Box ..30&30&10%
Richards Mfg. Co., Box 30

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@ 2.75; 1¼, $3.00@3.25; 1½, $3.50@3.75
Reed & Ward ..... 2&2&10
Hand, Wood ..... doz., $1.00@1.10
Chapin Stephens Co., Hand ..... 10&10&10%

Coach, Lag and Hand Rail—

Lag, Cone Point ..... 60@65%
Coach, Gimlet Point ..... 75@70&5%
Hand Rail ..... 75@70&5%

Jack Screws—

Standard, List ..... 50@10&5%
Myers, List ..... 40&10
Sweet Iron Works 50

Machine—

Cut Thread, Iron, Brass or Bronze:
Flat Head or Round Head ..... 85@85&10%
Fillister Head ..... 10@10&10%
Rolled Thread, F. H. or R. H., Iron ..... 75@10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65&10%

Set and Cap—

Set (Iron) ..... 75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70&10&7½%
Hex. Hd. Cap ..... 70&10&7½%
Rd. Hd. Cap ..... 50&7½%
Fillister Hd. Cap ..... 60&7½%

Wood—

List July 23, 1903.
Flat Head, Iron ..... 87½&65@..%
Round Head, Iron ..... 85&65@..%
Flat Head, Brass ..... 80&65@..%
Round Head, Brass ..77½&65@..%
Flat Head, Bronze ..... 75&60@..%
Round Head, Bronze ..72½&60@..%
Drive Screws ..... 87½&65@..%

Scroll Saws—

See *Saws, Scroll.*

Scythes—

Per doz.
Grass, No. 1, Plain ..... $7.00@7.50
Clipper, Bronzed Webb ..$7.25@7.75
No. 3 Clipper, Pol'd Webb $8.00
No. 6 Clipper and Solid Steel, ... $7.50@8.25
Bush, Weed and Bramble, Nos. 11, 12 and 13 ..... $7.50@7.75
Grain, No. 1 ..... $9.00@9.50
Bronzed Webb, No. 1 ..$9.25@9.75
Nos. 3 and 4 Clipper, Grain, ... $8.00@8.50
Solid Steel, No. 6 ..... $9.00@9.50

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18. 20&10%

Garden Tool Sets—

Ft Madison Three Plows, Hoe, Rake and Shovel ..... ₱ doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 10
Cannon's Diamond Point, ₱ gro, $12, ... 10
Mayhew's ..... ₱ gro $3.00
Snell's Corrugated, Cup Pt. ..40&10%
Snell's Knurled, Cup Pt. ..... 40&10
Victor Knurled Cup Pt. ..₱ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Tri-umph 30%
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut $20 60
No. 5, Mill $30.00
Nos. 10, 11, 35 ..... $8.00
No. 1 Old Style $10.00
Special $16.2
Giant Royal Cross Cut ..... ₱ doz. $8.00
Royal, Hand ..... ₱ doz. $4 50
Taintor Positive ..... ₱ doz. $6.75

Shaving—

Fox Shaving Sets, No 30 .....
₱ doz., net, $24.00
Smith & Hemenway Co.'s 75

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₱ doz. $1.50
Mounted Kitchen Sand Stone, ₱ doz $1.50
Natural Grit Carving Knife Hones, ₱ doz. $3.00
Quick Cut Emery Carving Knife Hones ₱ doz. $1.50
Quick Cut Pocket Knife Hones, ₱ doz. $2.50

Skate—

Smith & Hemenway Co., Eureka..50%

Shaves, Spoke—

Iron ..... doz. $1.25
Wood ..... doz. $2.00
Bailey's Stanley R & L Co. 15
Chapin-Stephens Co. ..... 30&10&5%
Goodell's ..... ₱ doz. $3.00 ..... 15&10%

Shears—

Cast Iron..	7	8	9 in.
Best	$16.00	18.00	20.00 gro.
Good	12.00	13.00	17.00 gro.
Cheap	5.00	6.00	7.00 gro.

Straight Trimmers, &c.:
Best quality Jap ..... 70@70&10%
Best quality, Nickel ..60@60&10%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 10&10&5%
Hutchinson Tailors Shears 10%
Wilkinson Sheer & Cutlery Co.:
Sheep, 1900 list ..... 30&10%&5%
Genuine 10
Horse or Mule 10
J. Wiss & Sons Co.:
Best Quality, List 60
Best Quality, Nickel 50
Tailors' 25

Tinners' Snips—

Steel Blades ..... 20@20&10%
Steel Tinned Blades ..... 10&10&5%
Forged Handles, Steel Blades, Berlin 50%
Heinisch's Snips 40
Jennings & Griffin Mfg. Co.'s 6 to 10 in. ..... 33&7½%
Niagara Snips 30
P. S. & W. Forged Handles 25
W. R. W. ..... 40&10%
J. Wiss & Sons Co.:
Wire Edged Steel 25

Pruning Shears—

Cronk's Hand Shears 33⅓
Cronk's Wood Handle Shears 33⅓
Disston's Combined Pruning Hook and Saw ₱ doz. $18.00 25
Diston's Pruning Hook only, ₱ doz. $... 25
John T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
C. W. Co. ..... 10&10
Columbian Cutlery Co.:
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand. 50

Sheaves— Sliding Door—

Reading 40%
R. & E. list 15%

Sliding Shutter—

Reading list 40%
R. & E. list 10%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge ..... 65&10%
Club, Rival, 65&5%; First Quality, ... 60&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge ..... 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, ... 25&5%
Union League, 12 and 12 gauge; Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade. .20%

Shells, Loaded—

Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade ..... 40&5
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club Blank Powders 40
Nitro Club, Smokeless Powders. 40&5%
Arrow, Smokeless Powders. 40&10&10%
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Leader Grade. .40&10&10
Black Powder 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	6.25	8.50
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20	$4.25	$5.50
Dixie, 10 x 14	5.50	6.75
Dixie, 7 x 10	5.10	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg, $4.10
Steel ..... per keg, $3.85
Burden's, all sizes ..... ₱ keg $3.90

Shot—

	25-lb. bag.
Drop, up to B	$1.85
Drop, B and larger	2.10
Buck	2.10
Chilled	2.10
Dust	2.30

Shovels and Spades—

Association List Nov. 15, 1902, 40%
Avery Stamping Co. 10

Snow Shovels—

Long Handle ..... $3.25@$3.50
Wood and Malt. D. Handle ..... $3.75@$4.00

Sieves and Sifters—

Hunter's Imitation ..... gro. $9.50@10.00
Hunter's Genuine ..... per gro. $12.00@12.50

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each, $3.25; ₱ doz 30

Sieves, Seamless Metallic

——Per dozen.——

Mesh	14	16	18	20
Iron Wire	$1.05	1.05	1.10	1.20
Tinned Wire	$1.15	1.15	1.20	1.30

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... doz. $0.90@0.95
Mesh 20, Nested ..... doz. $1.00@1.05
Mesh 24, Nested ..... doz. $1.80@1.40

Sinks, Cast Iron—

Painted, Standard list:
12 x 12 to 22 x 36 in. 60%
20 x 20 to 24 x 30 in. 50%
24 x 24 to 24 x 120 in. 40%
Barnes' low list:
No. 1 15
No. 2 15
NOTE—There is not entire uniformity in discounts on high prices.

Skeins, Wagon—

Cast Iron ..... 70@75&10%
Steel ..... 40@45%

Slates, School—

Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless. ..... 60&5 ten
Victor A, Noiseless. 60&½ tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40@40&10%
Corbet Mfg. Co.:
Dorlon, Yankee 3 & 4; Yankee Roller, 30&2%.
Hogan, Grade 47; Tr... 40
Jersey 25

Snaths—

Scythe ..... 50&10%

Snips, Tinners—See *Shears*

Spoons and Forks—

Silver Plated—

Good Quality ..... 50&10&10&5%
Cheap ..... 60@60&10
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton ..... 40&10
Rogers & Bro., William Rogers Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60
Wm. Rogers & Son ..... 60&10

Miscellaneous

German Silver ..... 60@60&5%

Tinned Iron—

Teas ..... per gro. 50@75
Tubes ..... per gro. $0.50@$1.00

Springs— Door—

Bardsley's Spring and Check 40
Chicago Co. ..... 10&10
Gem (Coil) 20
Hollister Bros. and Gate 10%
Reliance (Coil) ..... 40&10%
Star Co. 10
Torrey's Red, 33 in. ..... ₱ doz $1.00

Carriage, Wagon, &c.—

Bed, Axle and Wagon. Per 100 lb.
Bed, ... Sq. Spring
Half Bright ..... $3.50@
Bright ..... $3.25@$3.75
Painted Seat Springs
1 2 3 4 5 6 ..... per pr. 40@45c
1 2 3 4 5 6 ..... per lb. 71@75c

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cotton, Japanese, Ta... Na...
Tinned, ₱ doz. ..... $12.
Enterprise ..... 20&10%
Florence No. 1, ₱ doz. $12.... 30
2, $15; No. 3, $20 30

Squares—

Nickel plated.. } List Jan. 5, 1900
Steel and Iron.. } Nov. 1905
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70
Iron Hdl. Try Squares and T-Bevels ..... 50@50&10&10
Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel 15

Squeezers, Lemon

Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.25
Iron, Porcelain Lined ... doz. $1.75

Staples—

Barbed Bland ..... Standard List
Fence ..... Standard List
Fence Staples, Plain, $2.15; Galvanized $2.45
Poultry Netting Staples ..... per lb. 3½@3¾¢

Steels, Butchers'—

Dick's 30
Foster Bros 30

Steelyards— ....30@30&10%

Stocks and Dies—

Blacksmiths ..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock. 25%
Lucky Screw Plates 25
Green River 25
Lightning Screw Plate 25%
Little Giant 25
Reversible New Screw Plates 25

Stoners, Cherry—

Enterprise ..... 25@30%

Stones—Oil, &c.

Pike Mfg. Co., 1907 list: ₱ ...
Arkansas St. No. 1, 3 to 5 ... 2 ...
Arkansas St. No. 1, 5½ to ... in 3 ...
Arkansas ... $1.
Lily White Washita, 4 to 8 in 60¢
Rosy Red Washita, 4 to 8 in. .60¢
Washita St., Extra, 4 to 8 in 50¢
Washita St., No. 1, 4 to 8 in 40¢
Washita St., No. 2, 4 to 8 in .25¢
Lily White ... 40¢
Rose Red ... 30¢
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 70¢
Washita Slips, No. 2 ..... 40¢
Washita Slips, Small ..... 10¢
Quickcut Emery and Corundum Oil Stone, Double Grit ..... 40¢
Quickcut Emery and Corundum Axe Stone, Double Grit ..... 40¢
Onkcut Emery Rubbing Brick ..... 10¢
Hindostan No. 1 Regular ₱ ...
Hindostan No. 1, Small ₱ ... 10¢
Axe Stone, Galt Rinds ..... 35¢
Turkey Oil Stones, Extra, 5 to 8 in. ₱ ...
Queen Creek Stones, 4 to 8 in ...
Queer Creek Slips ..... 40¢
Sand Stone ..... 6¢

Scythe Stones—

Pike Mfg. Co., 1901 list:

Black Diamond S. S.	@ gro. $12.00
Lamoille S. S.	@ gro. $11.00
White Mountain S. S.	@ gro. $9.00
Green Mountain S. S.	@ gro. $6.00
Extra Indian Pond S. S.	@ gro. $7.50
No. 1 Indian Pond S. S.	@ gro. $7.00
No. 2 Indian Pond S. S.	@ gro. $4.50
Leader Red End S. S.	@ gro. $4.50
Quaker Cut Emery	@ gro. $10.00
Pure Corundum	@ gro. $18.00
Crescent	$7.00
Emery Scythe Rifles, 2 Coat.	$8
Emery Scythe Rifles, 3 Coat.	$10
Emery Scythe Rifles, 4 Coat.	$13
Balance of 1901 list	33⅓%
Electro (Artificial),	@ gro. $12.00 — 33⅓%
Lightning (Artificial),	@ gro. $18.00 — 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers..... @ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, @ doz. No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....50@50&10%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Acme Embossed, case lots..20&10&10%
Cary's Universal, case lots.....20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 55¢
All Steel Stretcher.....doz. $2.00@2.25
Excelsior Stretcher and Tack Hammer Combined, @ doz. $6.00.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1, 1902.....35%
P., S. & W. Co.....40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.:	@ doz.
Superba, Frotch Mahogany	$36.00
Triumph, Fancy Veneers	$33.00
Parlor Queen, Fig. Rosewood	$30.00
Elite, Hungarian Ash	$29.00
Am. Queen, Fig. Mahogany	$27.00
Ideal, Bird's-Eye Maple	$25.00
Grand Rapids, Nickel, Japan	$24.00; $22.00
Standard, Nickel, $22.00; Japan	$20.00
Crown Jewel, Nickel, $21.00; Jap.	$19.00
Crystal, Glass Top	$36.00
Grand, 17 in. wide	$56.00
Club, 21 in. wide	$54.00
Hall, 28 in. wide	$60.00

NOTE.—Rebates: 50c *per dozen on three dozen lots:* $1 *per dozen on five-dozen lots:* $2 *per dozen on ten-dozen lots;* $2.50 *per dozen on twenty-five dozen lots.*

Tacks, Finishing Nails, &c.

American Carpet Tacks....90&40%
American Cut Tacks....90&40%
Swedes' Cut Tacks....90&40%
Swedes' Upholsterers....90&50%
Gimp Tacks....90&40%
Lace Tacks....90&40%
Trimmers' Tacks....90&40%
Looking Glass Tacks....65%
Bill Posters' and Railroad Tacks, 90c/50c&10%
Hungarian Nails....80&20%
Finishing Nails....70%
Trunk and Clout Nails....80&10%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks..... 90c& tens @ —%
See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin....60@—%
Patent Leather....85@80&85%
Steel....35 1-3&5%
Chesterman's....25@25&5%
Kenffel & Esser Co.:
Favorite, Ass. Skin....40&10@50%
Favorite, Duck and Leather....25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Asses' Skin....40&10@50%
Metallic....30@30&5%
Patent Bend, Leather....25&5@25&10%
Pocket....10@10&5%
Steel....33⅓@35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L, etc....25%
Chesterman's Steel, No. 1038L....35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c......30@33⅓%

Ties, Bale—Steel Wire—

Single Loop.....80&10&5%
Monitor, Cross Head, &c..70&62½%

Tinners' Shears, &c.—

See Shears, Tinners', &c.

Tinware—

Stamped Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See Benders and Upsetters, Tire.

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Haying—

Myers' Hay Tools.....45%

Miniature—

Smith & Hemenway Co.'s, Davidson, @ doz., Nickel Plated, $1.50; Gold Plated.....$2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida.....75¢&10%
Newhouse.....45@45&5%
Hawley & Norton.....65%
Victor.....75@75&10%
Oneida Community Jump.....50%
Hector.....75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire. doz. 85¢@90¢

Marty French Rat and Mouse Traps (Genuine): @ doz., $13.25..$11.50 doz.
No. 1, Rat, @ doz., $6.50.... $5.75 doz.
No. 2, Rat, @ doz., $5.25. $4.70 doz.
No. 3½, Rat, @ doz., $5.25. $4.70 doz.
No. 4, Mouse, @ doz., $3.85. $3.00 doz.
No. 5, Mouse, @ doz., $3.00. $2.25 doz.
Oneida Community:
Out o' Sight, Mouse, @ doz....$0.60
Out o' Sight, Rat, @ doz..... 1.25
Easy Set, Mouse, @ doz..... 35
Easy Set, Rat, @ doz..... 1.00
Wood Choker, Rat, @ doz. holes..12
Premier Tin Choker, 5 hole, @ doz. traps..... .75

Trowels—

Disston Brick and Pointing.....25%
Disston Plastering.....20%
Disston "Standard Brand" and Garden Trowels.....30%
Kohler's Steel Garden Trowels, @ gro., 5 in., $4.80; 6 in., $6.00.
Never Break Steel Garden Trowels.. @ gro. $6.00
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern.....50&10%
Western Pattern.....60&10%
Handy Trucks..... @ doz. $16.00
Grocery..... @ doz. $15.00
McKinney Trucks.....each, net $10.00
Model Stove Trucks..... @ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.
No. 0 1 2 3
Galvanized. $67 $79 $89 $99 10&10%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls.....23@23¢
No. 12, ¼ and ½-lb. Balls.....21@23¢
No. 18, ¼ and ½-lb. Balls.....18@20¢
No. 24, ¼ and ½-lb. Balls.....17½@19½¢
No. 36, ¼ and ½-lb. Balls.....17@19¢
Chalk Line, Cotton Balls.....26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz......11@19¢
Cotton Wrapping, 5 Balls to lb. according to quality.....15½@23¢
American 3 Ply Hemp, ¼ and ½-lb. Balls.....15½@16½¢
American 3-Ply Hemp, 1-lb. Balls (Spring Twine).....15½@16½¢
Indian 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).....10½@11½¢
India 3 Ply Hemp, 1-lb. Balls.....10½@11½¢
India 3 Ply Hemp, 1½-lb. Balls.....10¢@11¢
2, 3, ¼ and 5-Ply Jute 1-lb. Balls.....13½@14½¢
*Mason Line, Linen, ½-lb. Bls.*47¢
No. 20½ Mattress ¼ and ½-lb. Balls, according to quality......50@60¢
Wool, 3 to 6 ply.....B 9¢; A 10¢

Vises—

Solid Box.....50&5@50&10&5%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard.....25%
Amateur.....25%
Columbian Hdw. Co.....40%
Fisher & Norris Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00
Fulton Mach. & Vise Co.:
Reed, Swivel.....25%
Star, Solid Jaw.....40%
Hollands':
Machinists'.....41@40&5%
Keystone.....65&5@70%
Lewis Tool Co.:
Adjustable Jaw.....50%
Monarch, 50%; Solid Jaw.....50%
Massey Vise Co.:
Cincher.....40%
Perfect, 15%; Lightning Grip.....15%
Merrill's.....20%
Millers Falls Oval Slide Pattern.60&10%
Parker's:
Victor, 20@25%; Regulars.....20@25%
Vulcan's.....40@45%
Combination Pipe.....55@60%
Prentiss.....30@35%
Rock Island.....40%
Snediker & X.....33⅓%
Stephens'.....33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, @ doz., $24.00, 30%; Clamps.....30%
Perfection Saw Clamps, @ doz....$4.80
Reading.....60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed.....25%
Star.....40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect.....15%
Wyman & Gordon Quick Action, 6 in., $6.00; 9 in., $7.00, 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.
Rock Island Pipe.....25%

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10..... 1.25
P. E., 8..... 1.50
P. E., 7..... 1.50
Ely's B. E., 11 and larger.$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Dis. 15%

Ware, Hollow—Cast Iron, Hollow—

Stove Holloww Ware:
Enameled.....45&10%
Ground.....50&5%
Plain or Unground.....50&5%
Country Hollow Ware, per 100 lbs......$3.00
White Enameled Ware:
Maslin Kettles.....65&10%
Covered Wares:
Tinned and Turned.....85&10%
Enameled.....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....33⅓%
Iron Clad Ware.....70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45¢	50¢	65¢	65¢

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60%
Porcelained.....50&10&5&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles.....60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc:	@ doz.
Crescent, family size, bent frame	$4.05
Red Star, family size, stationary protector	$4.05
Double Zinc Surface:	
Saginaw Globe, family size, stationary protector	$3.55
Cable Cross, family size, stationary protector	$3.60
Single Zinc Surface:	
Naiad, family size, open back, perforated	$2.90
Single Saginaw Globe	$2.85
Brass Surface:	
Brass King, Single Surface, open back	$4.05
Nickel Plate Surface:	
No. 1001 Nickel Plate, Single Surface	$3.60
Glass Surface:	
Glass King, Single Surface, open back	$3.95
Enamel Surface:	
Enamel King, Single Surface, reticulated back	$3.95

Washers—Leather, Axle—

Solid.....90@90&10%
Patent.....90@90&5%
Coil: ⅞ 1 1⅛ 1¼ *Inch.*
9c. 10c. 11c. 15c. per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers....$4.65 3.75 2.45 2.25 2.05
The above prices are based on $65.70 per list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots... per lb. 1¾@2¢

Wedges—

Oil Finish.....*lb., .@3¢*

Weights—Hitching—

Covert Mfg. Co.....30&2%

Sash—

Per net ton, f.o.b. factory:
Eastern District.....$35.00@$38.00
Southern Territory.....$32.00@$34.50
Western and Central Districts.....$32.50@$33.50

Wheels, Well—

8-in., $2.00; 10-in., $2.45; 12-in., $3.25; 14-in., $4.45.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....72½¢&10%
10 to 18.....72½¢&10&10%
19, to 26.....75¢&10¢&10&2½%
27 to 36.....77½¢&7½%
Galvanized:
6 to 9.....72½¢&10%
10 to 18.....72½¢&10&5%
15 to 16.....72½¢&10&5%
17 to 18.....72½%
19 to 26.....70¢&5&2½%
27 to 36.....65¢&10&10%
Copperas.
6 to 9.....65¢&10&10%
10 to 14.....70¢&10&5%
15 to 18.....65¢&10¢&10&10%
19 to 26.....70¢&5¢&2½%
27 to 36.....72½¢&10¢&2½%
Tinned
6 to 18.....67¢&10&10%
Brass.....17½¢ *lb., base*
Copper.....32¢ *lb., base*
Cast Steel Wire.....50%

Spooled Wire—

Annealed and Tinned,
70¢&10¢&10¢&10%
Brass and Copper...60¢&10¢&10&10%
Retailers' Assortments, per box, $2.10@$2.50

Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods.....90¢&25@—%
Brass Wire Goods....90¢&90¢&10%
Brass Cup and Shoulder Hooks, 80¢&15%

Wire Cloth and Netting—

Galvanized Poultry Netting,
80¢&2½@80¢&7½%
Painted Screen Cloth, 100 ft., $1.35
Standard Gage Hardware Grade:
Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh....$2.75
Nos. 4 and 5 Mesh.....$3.00
No. 6 Mesh.....$3.25
Nos. 7 and 8 Mesh.....$3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural.....80&10%
Alligator or Crocodile..70¢10@75%
Baxter Pattern S Wrenches... 70¢&5@70¢&10%
Drop Forged S.....45@45&5%
Acme.....60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut.....50%
Combination Black.....40&5%
Merrick Pattern.....40%
Boardman's.....40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"....40&10&10&5&5%
Crowhue's Engineer.....40&10%
Eagle.....70%
Gem Pocket.....30%
Hercules.....10%
W. & B. Machinist:
Case lots.....50&5%
Less than case lots.....50%
W. & B. Railroad Special:
Case lots.....50%
Less than case lots.....40&10&5%
Solid Handles, P., S. & W.....50&10%
Stillson.....50&10&5%
Uwanta Wrench Co.:
Uwanta Special, Iron Handle, 40&10&5%
Other Wrenches.....50%
Vulcan and Acrippa Chain.....50%
Whitaker Machinists':
Case lots.....50&10%
Less than case lots.....50%

Wrought Goods—

Staples, Hooks, &c., list March 17, '02.....85¢10&10%

Zinc—*(Cask lots at mill.)*

Sheet.....*per 100 lb.* $7.00

THE IRON AGE

New York, Thursday, April 23, 1908.

The Hebb Coke Drawing Machine.

Engineers connected with beehive coke oven plants have expended a vast amount of effort in recent years on the development of machines for drawing coke. The desideratum is naturally a machine that will be adapted to such plants as ordinarily constructed and the operation of which will not be injurious to the ovens, while at the same time a maximum proportion of the coke is removed without the employment of hand labor. Several coke extractors have been described previously in these columns. The present article deals with the Hebb coke drawing machine, the invention of John A. Hebb, Uniontown, Pa.

The first trial of the Hebb machine was made at the plant of the Stewart Iron Company, Ltd., near Uniontown, Pa., in 1900. Six years before that time Mr. Hebb had begun working on the idea of machine drawing of coke. The test referred to was not satisfactory, and the next was made a few months later at the Hero Coal & Coke Company's plant, Smock, Pa. After some changes the machine was taken to the Brownfield plant of the H. C. Frick Coke Company in September, 1901. Six months later, after a remodeling, it was tried at the Oliver plant of the Oliver & Snyder Steel Company in the spring of 1902. Soon after a heavier machine, weighing about 7 tons, was built and taken to the Continental No. 1 plant of the H. C. Frick Coke Company. While its operation was successful, the construction was such as to necessitate considerable repairing. A new design was then brought out and a machine constructed for the Jones & Laughlin Steel Company. It had greater weight and strength than any of its predecessors, while retaining certain features of the old machine, and for some time has been operating successfully in extracting and loading coke at the Second avenue plant in Pittsburgh of the Jones & Laughlin Steel Company.

Views of the Hebb machine are given in Figs. 1 and 2. In Fig. 3 is an elevation of the machine, and Figs. 4 and 5 show different positions of the scraper in the coke oven preliminary to the drawing of the coke. The machine combines an extractor and conveyor mounted on a single truck. The various operative portions of the machinery are carried by a turntable mounted on a circular track on the upper part of the steel framework. The principal working member is a beam supported from the turntable and having at its forward end a pivotally attached scraper head. The scraper folds back under the beam as it is pushed forward into the oven over the top of the coke. It is extended at practically a right angle with the beam by the tension of a spring on the back end of the beam, a rod fastened to the scraper running through the spring. The forward end of the beam has a shoulder against which the body portion of the scraper bears under tension of the rod, thus limiting its movement. When the scraper end of the beam has been pushed to the innermost part of the oven and lowered on the coke the beam is rapidly reciprocated and a crevice is opened in the coke into which the scraper is lowered, as in Fig. 5. The beam is then withdrawn and a large portion of the coke is pulled out on the conveyor, which carries it directly

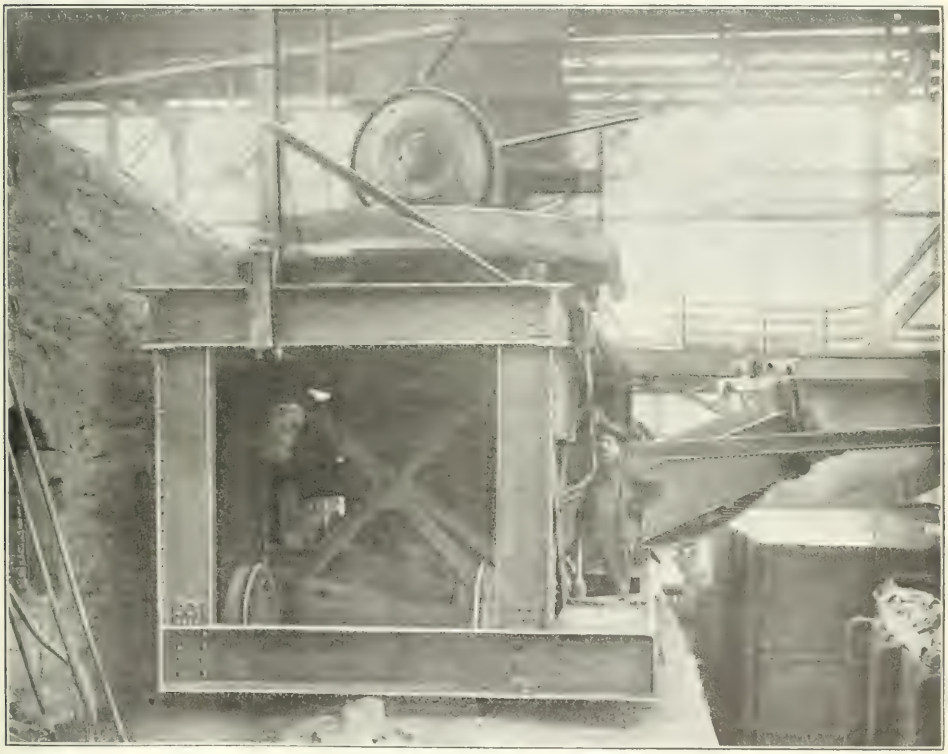


Fig. 1.—The Hebb Coke Drawing Machine in Working Position

back from the oven door and drops it into cars. The breakage is thus very slight. The beam is then advanced again into the oven and the operation repeated until the coke is drawn.

The aim has been to provide the mechanism for all the movements of the human coke drawer. Three motors supply the power for the operation. One gives motion to the extractor, another drives the conveyor and through a third the machine is moved along the track in front of ing it, swinging it from side to side, as well as moving the machine forward and backward on the track and controlling the operation of the conveyor. Emphasis is put on the strong construction of the machine and its simple arrangement. Spur gears are used in all cass, with the exception of one pair of miter gears. All the machinery except the conveyor chains is out of the dragging dust. The frictions on the machine make it less liable to damage the ovens than any positive application of power.

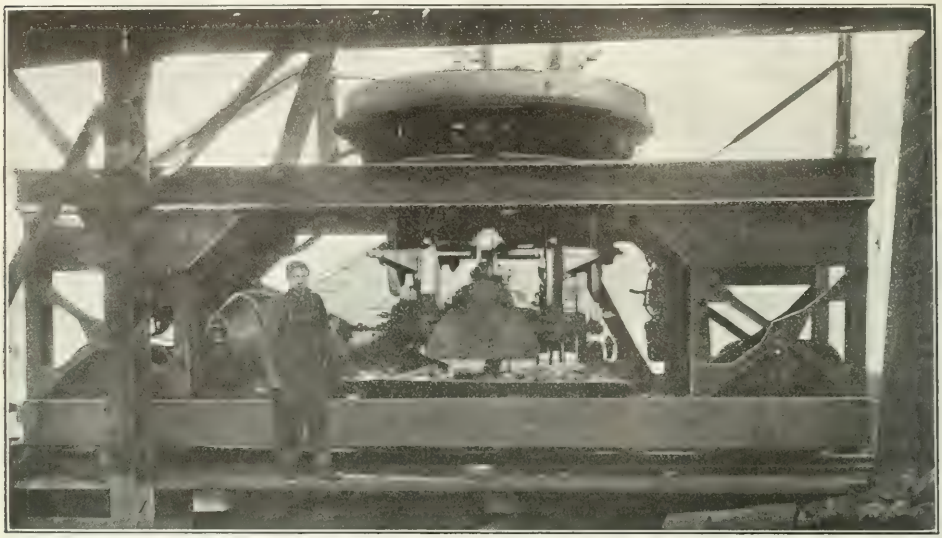


Fig. 2.—Front View of the Machine, Showing Scraper.

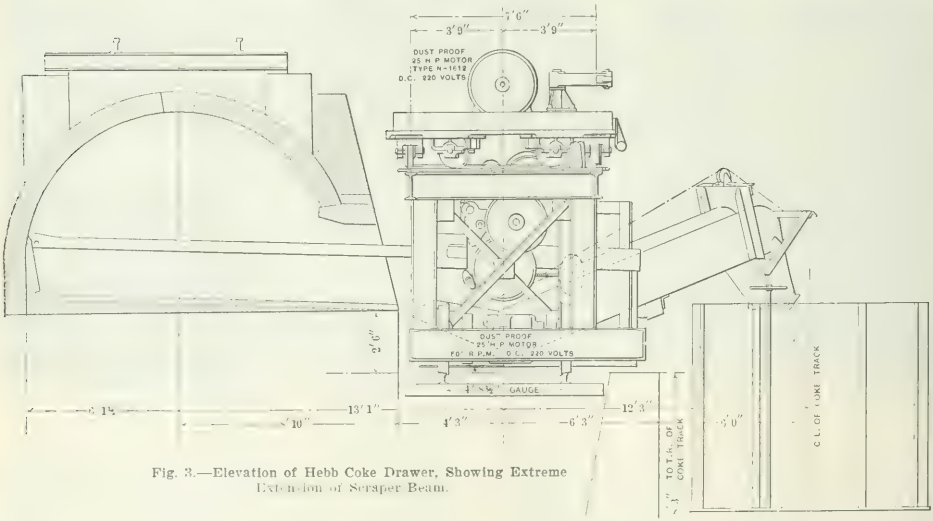


Fig. 3.—Elevation of Hebb Coke Drawer, Showing Extreme Extension of Scraper Beam.

the oven. The conveyor consists of an inclined trough mounted, as shown, on the same truck as the extractor. It consists of a series of slats carried by sprocket chains. Through the spaces between the slats the ashes and fine coke drop, and near the upper end of the trough is a short ash chute for this refuse. The conveyor has a chute overhanging the car, and this can be raised or lowered to deliver coke at any angle. This is done by a roller with a rope attachment, and thus adjustment can be made to different hights of cars. The operator makes these adjustments. One person controls the mechanism for raising or lowering the beam, advancing or withdraw-

Based on its performance thus far, it is estimated that the Hebb machine will draw an average of five ovens an hour. The principal advantages referred to are the reduced cost of coke manufacture made possible, the increase of production through the saving of time in drawing, and prompt ignition through the saving of heat retained in the oven and thus a saving of time in burning; there is also the large independence of hand labor made possible, an advantage particularly emphasized in the summer season, when the work at coke ovens is most exhausting and workers are often obtained with difficulty. Under the best conditions work at coking plants is try-

ing, and on this account the coke drawing machine, like the pig iron casting machine, is a highly desirable innovation. For the Hebb machine economy of labor in operation and of maintenance is claimed, and the further advantages of drawing the coke in its natural size as coked, of meeting the ordinary conditions of yards and ovens, of delivering the coke in a straight line from oven door to cars in good condition, of removing substantially all the coke from the oven, and of causing no more wear and tear upon the structure than results from hand drawing. The builder of the machine is the Hebb Coke Drawer Company, Uniontown, Pa., L. L. Hiller, Pittsburgh, president.

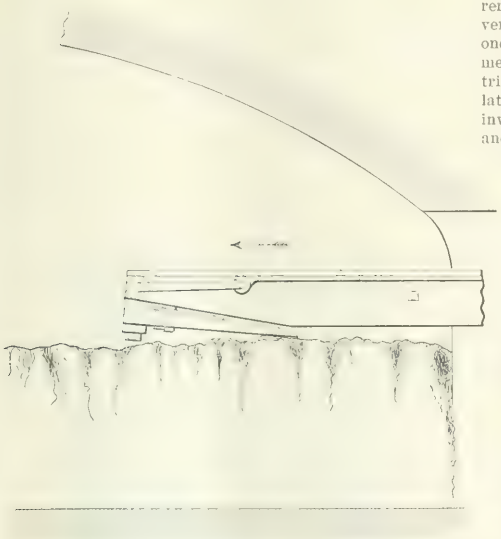


Fig. 4.—The Scraper Depressed Backward, as it Comes in Contact with the Coke on Entering an Oven.

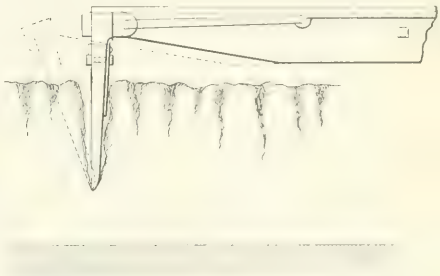


Fig. 5.—The Scraper Extended at Approximately a Right Angle to the Beam and in a Position to Draw.

The Protection of Workmen Against Accidents.*

BY CHARLES E. LUCKE, COLUMBIA UNIVERSITY, NEW YORK.

There is ample proof that the number of personal injuries and deaths from accidents in this country is unusually large. Any movement that has for its object the protection of the person, whether directed toward those engaged in their daily occupations or toward the general public, should receive the support of every good citizen. In order, however, to justify such support the remedies proposed should be sane, reasonable and free from mere sentimental impulse. It must be shown that some accidents are avoidable and that the preventive measures are not oppressive. This broad problem is not by any means a simple one, and its solution involves a divisional classification. One of these groups of cases in which I am more particularly interested is concerned with the protection of workmen engaged in producing and operating machinery. All work with tools or machinery or that involves the moving of heavy weights, the inhalation of harmful dust or gases is by its very nature essentially dangerous. The source and nature of the danger is, moreover, best known to the interested parties; that is, to employer and employee, and needs no demonstration by statistics or by kind hearted philanthropists.

It appears, therefore, that a reduction of accidents to workmen of these classes may be brought about most easily by common consent of both parties to adopt preventative measures, and one strong contributing factor to this co-operative action is the existence of such a museum of possible devices as is here in course of establishment. It may be, and probably will be true, that in many cases employer and employee cannot agree. The workman may refuse to use a device that would protect him, because it may be annoying to him in his work, and he prefers to take the chance of injury rather than be bothered, or it may be on the other hand, that means for rendering the occupation of his men more safe will involve a prohibitive cost on the part of the employer. He is in business distinctively to make money, and if he cannot make money or should his profits be reduced by prohibitive appliances or methods he will close his works. Between these two extremes of refusal to accept a remedy on the part of the workman, and the refusal to adopt the remedy on the part of the employer, I believe there is a very large middle ground, involving perhaps a forcing of one or the other party, perhaps by gentle educational means, perhaps by legal enactment. This museum contributes to the former, employers' liability laws to the latter, but perhaps better than either of these alone, but involving both of them, is the means offered by liability and accident insurance.

If the insurance companies can be induced to grant to the employer lower liability rates and to the workman lower accident rates for the use of this or that device, it will appeal most decidedly to the employer as it touches his earnings, on the one hand protecting him from damage suits and on the other hand giving him his protection for lower rates to permit the purchase and maintenance of the safety appliance, and it will appeal to the man carrying accident insurance in an equally obvious way. Before any safety device is adopted its true nature—that is to say, the precise extent of the protection it affords, must be determined. Safety appliances may be more harmful than useful when by lulling into a false security by promises of protection, there results a relaxation of vigilance that is the surest protection, with perhaps a failure of the appliance at a critical time. A safety appliance is not a safety appliance because its inventor asserts it to be such, but becomes a safety element only when it has been proved and tested and when it has by use proved to be absolutely reliable. To accomplish this a series of tests must be made by a thoroughly reliable and disinterested party, such as are made, for example, on fire protection appliances in the laboratories of the Fire Underwriters and at the laboratories of various technical schools, but whatever tests are made the results must be widely published for the general information of the entire public. To sum up the problem as it appears to me as a mechanical engineer, there is no necessity for the proving of the danger of the occupation to either the man engaged in it or to his employer. Every sort of appliance for removing danger must be invented, tried, tested, results made public and the successful appliance placed on exhibition, together with the results of the test to assist in bringing about common consent for its use between employer and employee. Without common consent, one or the other may be forced, and in this forcing process educational policies, employers' liability laws and accident or employees' liability insurance practice are, I think, the most potent factors.

* An address delivered at the opening exercises of the Exposition of Safety Devices, New York, April 11, 1908.

The Whitlock Double Lap Pipe Joint.

The joint for high pressure steam piping shown in the illustrations is of the class in which the pipe itself is flanged outwardly to form the contact surfaces and requires no gasket. Loose rings surrounding the pipe and backing the flanges, when drawn together by bolts, clamp the flange faces, forming a tight joint. The joint is distinguished from others of its kind by the extra thickness of the flange, whence is derived the name—double lap joint. While the process of forming this flange is not made public by the manufacturer, the Whitlock Coil Pipe Company, Hartford, Conn., what it accomplishes may be described as consisting of double lapping the end of the pipe. During the flanging process the metal is upset at the root of the flange, so that the flange itself is stronger than the body of the pipe. This method of flanging provides the strength necessary in high duty service. The flanged portion is made wide enough to extend to the bolt

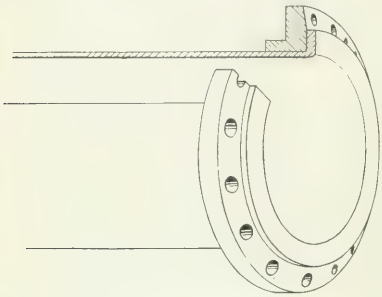


Fig. 1.—The Double Lap Flanged Pipe Made by the Whitlock Coil Pipe Company, Hartford, Conn.

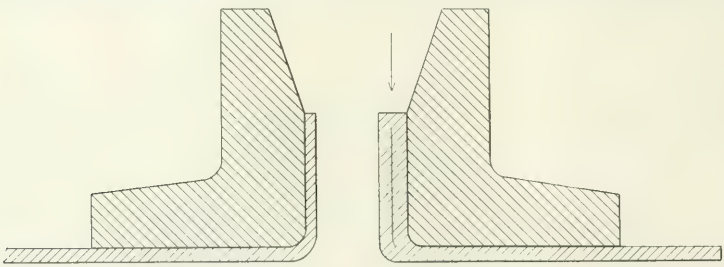


Fig. 2.—Diagram Showing the Difference Between the Ordinary Single Lap Pipe Flange and the Whitlock Double Lap Flange.

holes, as shown in Fig. 1, and is machined on both surfaces, the back being made parallel with the face.

Fig. 2 contrasts the usual, or single, lap joint with the double lap joint. It will be seen that after finishing, the root of the flange, as well as the flange itself, is thicker than the original pipe. This eliminates the tendency of pipe joints to become distorted after being under pressure for some time. For certain classes of service this joint makes it possible to use lighter pipe, no allowance having to be made in the thickness of the metal for its thinning at the joint in the process of flanging.

The Whitlock flanges are usually furnished in full weight steel pipe for working pressures up to 250 lb. per square inch.

The Litchfield Foundry & Machine Company, Litchfield, Ill., on April 2 purchased and took over the entire equipment of the Ætna Foundry & Machine Company, Springfield, Ill., including all drawings, patterns and templets, for the manufacture of the complete line of engines, sheaves, box car loaders, cage fans, and everything used in the manufacture of mine equipment. The company has also secured the records and specifications for all engines furnished by the Ætna Foundry & Machine Company and is prepared to duplicate orders or furnish repair parts with promptness. This addition to its already complete line of mine equipment places a large variety of products at the disposal of purchasers, and those desiring Ætna machines will be assured of the same high grade work and material as is used in the Litchfield engine.

E. G. Acheson Receives Rumford Medals.

The American Academy of Arts and Sciences has conferred upon Edward Goodrich Acheson of Niagara Falls the Rumford medals. The presentation took place at a meeting of the society at the Algonquin Club, Boston, Mass., where the membership met on invitation of Prof. Elihu Thomson. It was a very notable gathering, made up of the heads of a score or more of the scientific departments of colleges, independent scientific investigators, distinguished legal lights and men of letters.

In an introductory address Prof. Charles R. Cross, chairman of the Rumford Committee, spoke of the twin trusts reposed by Count Rumford in the Royal Society of London and the American Academy, whereby awards were to be given for important discoveries in light and heat. It was his pleasure to observe that the award to Mr. Acheson was one distinctly in the line of the useful arts. The formal presentation of the medals was made by Prof. John Trowbridge, vice-president, and to his words Mr. Acheson made a feeling response. He told how, as a boy, he had heard of Rumford, and later of his provision for medal awards. His ambition to win the honor was fired. "To-night my dream has come true," he said, "and I value the medal as being the highest token of the appreciation of the scientific world." The medals are two in number, in gold and silver, struck from the same dies. On the obverse side are the words, "Benjamin, Count Rumford, Born 1765; Died 1814;" also an embossed portrait of Count Rumford. On the reverse side is the inscription: "Rumford Medal for Discoveries in Light and Heat. Awarded by the American Academy of Arts and Sciences to Edward Goodrich Acheson for New Industrial Products of the Electric Furnace." These products are carborundum, siloxicon, artificial graphite and deflocculated graphite.

The American Rolling Mill Company, Middletown, Ohio, devotes an eight-page leaflet to its "American ingot iron" and the rust resisting sheets manufactured from such iron. The product was developed in the effort to furnish sheets with a maximum resistance to corrosion to meet the demands of the manufacturers of corrugated metal culverts. The above name was chosen by the company to distinguish its ingot iron sheets from steel, puddled iron or charcoal sheets, and it is added that the iron from which the sheets are rolled is made in ingot form and is guaranteed to have an iron analysis. Statements are given of the results of analyses, showing the comparative losses from corrosion of submerged sheets of American ingot iron, of steel and of charcoal iron in a saturated solution of salt water containing 2 per cent. sulphuric acid. The analysis of the ingot iron sheets is said to compare closely with that of Swedish charcoal iron.

An Australian Iron Pioneer.

William Sandford and the Industry He Established.

William Sandford was born in Devonshire, England, and went to Australia in 1883 as the representative of John Lysaght, Ltd., for which firm he erected and managed wire netting works on the Parramatta River, Sydney, New South Wales. In 1886 he leased the Mittagong Iron Works, at Mittagong, about 50 miles south of Sydney, which works had been in existence since 1848 and consisted of one blast furnace and a rolling mill. They had been idle since 1877. Mr. Sandford intended to rework rails for the Government, but although the mill was remodeled, it was found after five or six months' operation that the project was not profitable, so he gave it up and went to Lithgow, some 60 miles west of Sydney, where, after seeing what a decided advantage this latter town had over Mittagong as an iron producing center, he leased the Eskbank Iron Works. These works were



WILLIAM SANDFORD.

started in December, 1875, and then consisted of a blast furnace, a small foundry, six puddling furnaces, one ball furnace and two mill furnaces and a steam hammer. The blast furnace had been dismantled just previous to Mr. Sandford's taking over the works. In fact, between the years 1882 and the early part of 1907 there was no pig iron whatever produced in Australia.

On taking over the Eskbank Works in 1886, Mr. Sandford commenced making merchant iron, the output at that time for the first three months being 157 tons. Some years after this he purchased outright the iron works, colliery and estate comprising at that time most of the land on which Lithgow now stands. Here on January 15, 1894, the first sheet mill ever erected in Australia was started. This plant consisted of a rolling mill, annealing furnaces and galvanized and corrugating departments. Steel was first made in Australia on April 24, 1900, when Mr. Sandford erected a small Siemens acid open hearth plant. The second sheet mill was erected about the middle of 1901, but was soon shut down on account of the duty on sheet iron being taken off. The difficulties in these works that have been experienced and overcome, chiefly through the alterations and uncertainties of the tariff, cannot be realized by one who has not gone through the experience.

On May 10, 1902, Mr. Sandford formed a company in London with a capital of $3,650,000 to acquire his own works at Lithgow and erect two blast furnaces, steel furnaces and rail and plate mills. The project, however, came to nothing on account of the failure of the "iron bonus bill" to pass the Federal Parliament in Australia, and the refusal by the same Parliament to encourage the establishment of the industry by placing duties on imported iron and steel. He nevertheless continued his operations at Lithgow and erected one small 14-in. mill and a guide mill, together with the necessary auxiliaries. In 1904 a steel foundry was erected for making steel castings. A large engineering shop was also established about this time for making switches and crossings for the Government railroads. This shop also contained punching, shearing, drilling, planing and plate bending machines for general engineering work.

During all this time Mr. Sandford had never lost sight of his ambition of being the first to erect a successful blast furnace in Australia, so that when at the end of 1904 the Government of New South Wales solicited bids for the supply of all iron and steel required by this State for a period of seven years, he saw at once that the time had come when, if he procured this contract, he would have sufficient security for his outlay to build a blast furnace. These bids were called for in every country in the world and yet, when the time limit expired on September 1, 1905, it was found that the only proposal submitted was that of W. Sandford, Ltd., as the firm was then called, for Mr. Sandford had made his works into a small limited company in 1902.

The contract was signed October 21, 1905. Almost immediately work was begun to get the plant ready. An up to date blast furnace was designed by Joseph Harrison of Middlesbrough, England, and P. G. Pennymore of Blaenavon, Wales, went to Australia to erect and work the furnace. Other extensions to the plant were a 15-ton Siemens open hearth basic steel furnace, a new rolling mill and new puddling furnaces. Many alterations were made in the plant.

The blast furnace was erected and is now in successful operation. It is a 17 x 75 ft. furnace. It has four (three erected) Cowper hot blast stoves, 22 x 74 ft.; four Babcock & Wilcox boilers with patent chambers to allow of the gas burning most efficiently, and two blowing engines. One of these engines is a steam turbine which will blow 30,000 cu. ft. of air per minute at a pressure of 15 lb. per square inch; the other is a vertical reciprocating engine held in reserve. The whole plant is lighted by electricity and everything of the most approved style has been used.

As a result of this contract, W. Sandford, Ltd., at the end of 1907, was supplying pig iron to every iron foundry in Australasia. The importation of foreign pig iron into Australia has almost ceased, and Mr. Sandford had realized his ambition of erecting and working a successful blast furnace, making a foundry iron equal to the best Scotch irons, and above all instilling into the minds of Australians that they not only have as good raw material as any country in the world, but also that they now have the basis of all industry and national defence—pig iron. He has always advocated the development of the iron and steel industry in the southern hemisphere, for he believes Australia should be able to do what Japan is doing, *i. e.*, build her own ships and provide all her own armament for defense. Thus, by erecting a successful blast furnace and making an excellent pig iron he has taken a decided step for the advancement of his country. When Mr. Sandford took over the Eskbank Iron Works he had 45 men working for him, at the end of 1907 there were over 1000 men in his employment.

Now comes the sad end to the story. When the contract was taken with the Government of New South Wales there was an overdraft on the plant of $175,000. When the blast furnace and other alterations were completed, an overdraft of $775,000 was the result—the estimated cost of the alterations having been far below the real figures. One of the reasons for this was unforeseen alterations in the tariff which made dutiable almost all the imported machinery for the plant. Consequently, when the firm needed a comparatively small working capital to carry it safely through the mire until a return could be made on the large outlay, the bank suddenly called for payment. After several unsuccessful attempts to get money, Mr. Sandford was forced to accept an offer from G. & C. Hoskins, large pipe founders in Sydney, to buy out the works, and this was done early in January, 1908. Therefore, Mr. Sandford has retired from taking

an active interest in the iron and steel industry of Australasia. He has attained his ambition and established this iron and steel industry without the help of either a duty or a bonus, which has never been done in any other country in the world. He is now on his thirteenth trip to England, resting on his laurels. B. W. S.

In the two weeks between March 18 and April 1 the number of idle railroad cars in the United States and Canada increased from 297,042 to 306,507. The high point this year was reached on February 5 at 343,928, from which there was a gradual decrease up to March 18.

Milling Automobile Cylinders.

Two machines specially fitted for milling automobile engine cylinders, recently furnished a large automobile manufacturer by the Ingersoll Milling Machine Company, Rockford, Ill., are illustrated herewith.

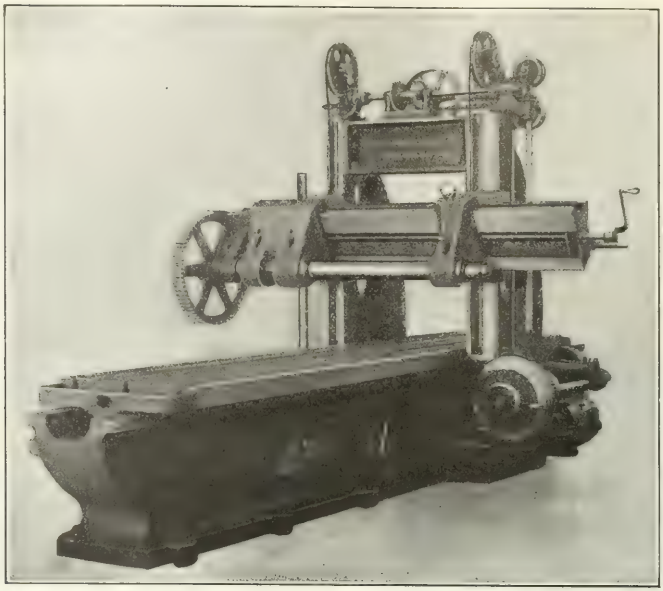


Fig. 1.—The 24 x 24 In. by 10 Ft. Horizontal Ingersoll Milling Machine Used for the First and Second Operations.

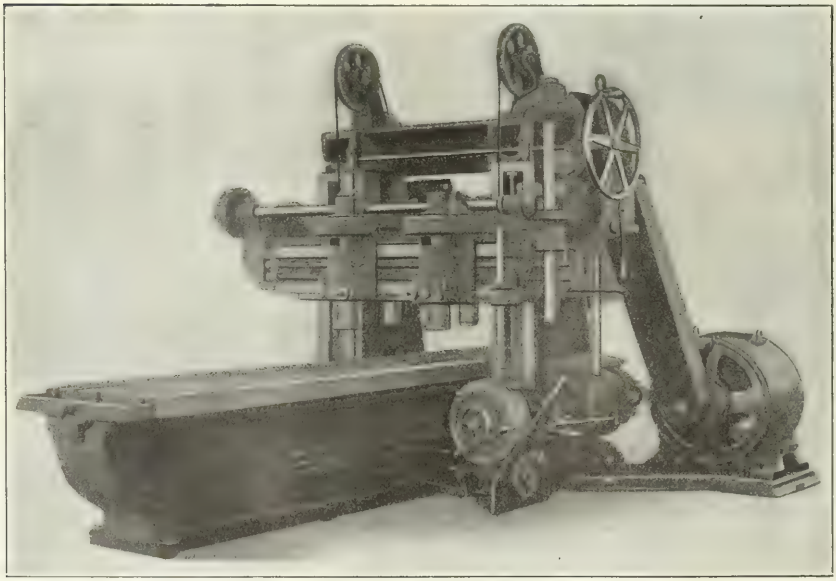


Fig. 2.—The Special Four-Head Ingersoll Milling Machine Which Performs the Finishing in the Third Operation.

The horizontal machine, Fig. 1, is one of the company's standard 24 x 24 in. x 10 ft. machines, and is used for milling the crank case cover seats, in performing what is indicated as the first operation in Fig. 4, and also for milling the tops of the cylinders, and at the same time the intake and exhaust connection seats, which is

shown as the second operation. Cutters *f* and *g* mill the tops of the cylinders, and *e* and *h* the intake and exhaust connection seats. A fixture is fitted to the table of the machine for holding a table load of these cylinders, two rows at one time. The second operation is a roughing operation only.

For finishing these cylinders a special four-head machine, front and rear views of which are given in Figs. 2 and 3, was furnished. This machine has two vertical spindles on the front of the rail for finishing the tops of the cylinders, while simultaneously two vertical spindles on the back of the rail finish the seats for the faces of the valve bushings. All of this work is done in one pass through this special machine—that is, the finishing cuts are taken as shown by the third operation in Fig. 4, where *a* and *b* represent the spindles on the front of the rail and *c* and *d* those on the rear.

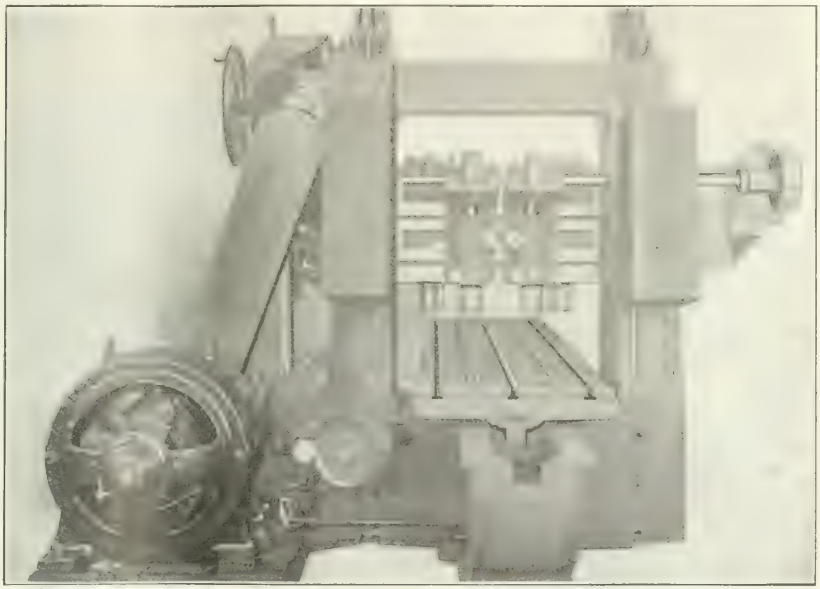
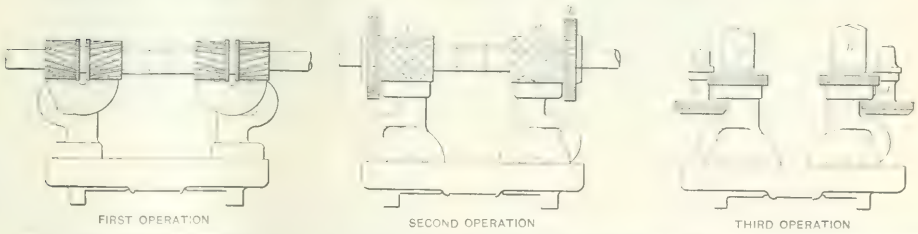


Fig. 3. A Rear View of the Four-Head Machine, Showing the Spindles on the Back of the Rail and the Motor Drive.



Figs. 4. Diagram of the Three Operations.—Milling the Crank Case Cover Seats; Milling the Tops of the Cylinders and the Intake and Exhaust Connection Seats, and Finishing the Tops of the Cylinders and the Seats for the Faces of the Valve Bushings.

Both of these machines are motor driven. A 10-hp. variable speed motor drives the horizontal machine and a 15-hp. variable speed motor the four-head machine. The rear view of the latter, Fig. 3, shows the arrangement of the motor drive. The cross rail on each of these machines is counterbalanced.

An Architectural Exposition.—The first annual National Architectural Exposition will be held during the week of September 14 to 19 at Madison Square Garden, New York City. By the combination and co-operation of all departments in architecture, engineering, painting, sculpture, the trades, manufacturing and craftsmanship pertaining to the construction, equipment and decoration of buildings, as well as landscape and garden effects, this will be a radical departure from the usual form of exhibitions. It will be the first exhibition of its kind held in this country. It is announced that no space will be allotted to exhibits of ordinary character which possess no special features of novelty, utility, originality or beauty. Many of the foremost architects will aid and co-operate, and will exhibit in the Salon models, casts, drawings and photographs of unusual interest. The Salon will be a separate and distinct department of the exposition, occupying the huge elevated promenade platform 20 ft. wide surrounding the entire arena. On this platform there will be 40 studios of equal size, about 16 x 7 ft., affording three walls in each studio for hanging and ample room in the center of each studio for models. Application blanks and floor space diagrams can be had from Alfred Chasseaud, general manager, 1 Madison avenue, New York City.

The Cleveland Cap Screw Company, Cleveland, Ohio, has changed its name to the Electric Welding Company. It manufactures vise screws, gas engine valves, cam shafts, spindles, cap screws, &c., under the resistance electric welding process, for which McCoy & Brandt, 619 Ferguson Building, Pittsburgh, are agents.

The steel car plant of the Pressed Steel Car Company, at New Castle, Pa., has closed down temporarily for lack of orders.

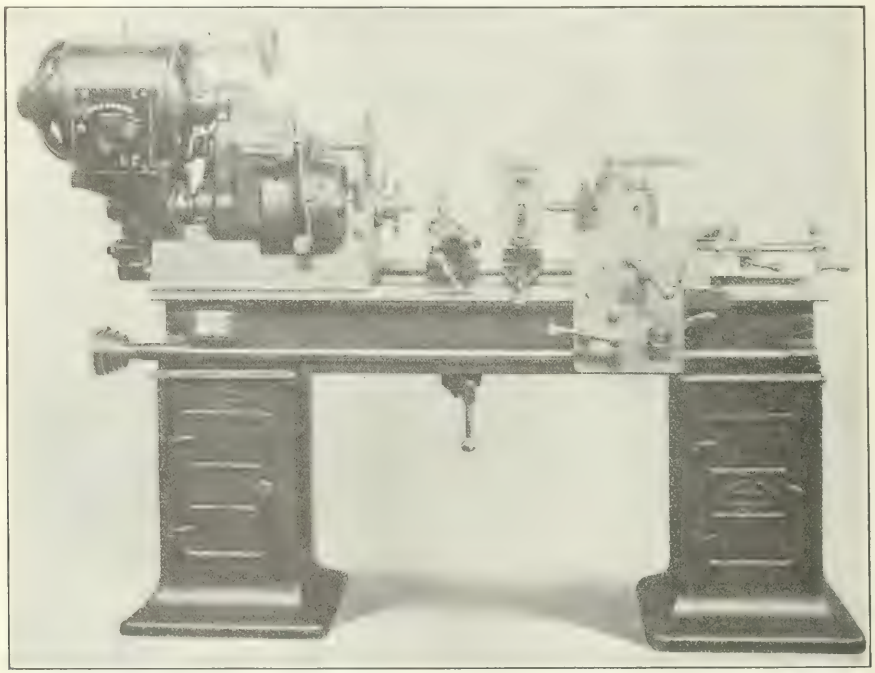
A Springfield Motor-Driven Lathe.

The engraving herewith shows the latest motor drive which the Springfield Machine Tool Company, Springfield, Ohio, has applied to its brass working turret lathes. It employs a Lincoln variable speed motor, connected to an all geared head lathe. The motor is arranged for a variation of 6 to 1, and is controlled by the handle shown at the top of the motor. By turning this handle the armature of the motor is drawn either into a stronger or weaker field, thus increasing or diminishing the speed of the machine.* The starting box is placed within convenient reach of the operator, and is automatic in its release, when the power is turned off. The double throw switch on the bed of the machine provides a simple means of reversing the rotation of the motor.

The head of the machine is compact and rigid, and is arranged with an all geared drive for transmitting the power from the motor to the spindle. All gears are inclosed. The head affords four mechanical changes of speed; two are obtained through sliding gears manipulated by the handle directly back of the friction handle and are doubled by the back gears. The lower hand wheel, the one on the headstock, is used to revolve the spindle by hand, as when bringing the tool to the end of a square thread ending in a drilled hole, or similar operations. The large handle seen in the vertical position is the lever operating the friction head. All the journals in the head are self-oiling, and contain large reservoirs, which need only infrequent filling.

The carriage and turret arrangement of the machine is very complete. The turret, which is large and heavy, has bushed holes, and is indexed by the handle shown above it. The indexing mechanism is unique and substantial. By the backward movement of the handle the locking pin is withdrawn from the turret base and held there while a forward movement of the handle brings the next turret tool in position, when the locking pin enters and securely locks the turret. By returning the handle to its first position the turret is still further clamped to the carriage. This insures perfect alignment and absolute rigidity. The handle at the rear of the machine engages the screw feed to the turret, when delicate feeds are necessary. When more rapid movement is desired the handle at the front of the turret carriage may be used by unlocking the sleeve in which the screw operates.

The turret is furnished with a taper attachment, the taper bar of which is contained in the center of the bed, and is adjustable so that a taper of 4 in. to the foot can be obtained. The slide on the taper attachment bar is gibbed to take up wear. When the taper attachment is not in use the cross slide is held to the carriage in central position by a taper pin at the rear of the cross slide to insure alignment. The entire turret, cross slide and apron, are fitted with taper gibs throughout. The turret has cross feed, like the ordinary compound rest, and can be run either side of the center or to a stop, which is provided so that the turret may be brought to central position.



An 18 In. by 6 Ft. Springfield Turret Lathe with Friction Head and Lincoln Variable Speed Motor.

The apron is provided with power feed of three variations. The feed is engaged by the friction handle at the front of the apron and may be reversed by the lever at the side of the apron. When the power feed is not in use and other movements are desired the carriage is clamped to the bed by a rigid clamping device at the right of apron.

The chasing bar is arranged in the usual manner, and can be thrown out of the way when not in use. Its tool post is provided with a down feed and is adjustable so that the tool may be placed either ahead or back of center. The chaser bar is of heavy construction, and is supported by brackets. Taper threads may be chased with the tool by tilting the slide in which the forward part of the chasing bar rests when in position. The different pitches of thread are obtained by the usual follower and leader device, and either right or left hand threads can be chased without changing any gears. A handle on the rear of the head throws in a tumbler gear, which reverses the direction of rotation of the leader. This feature is valuable and avoids the need of a large

* For description of the Lincoln variable speed motor see *The Iron Age*, March 1, 1906.

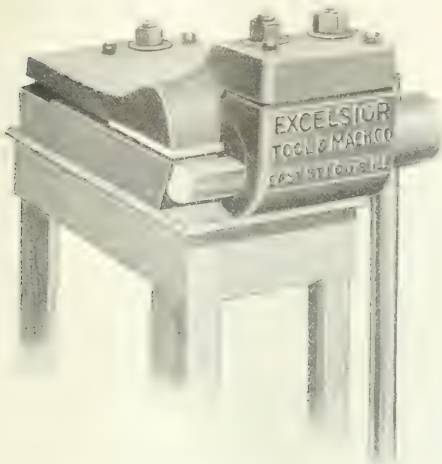
number of leaders for the various right and left hand threads to be chased. The follower is kept in contact with the leader by a heavy spring, which insures uniform lead to the thread being cut.

The compound rest is unique and can be operated in nearly every position. It is made interchangeable with the hand rest, and has considerable movement in any direction. The compound rest is graduated in degrees, and, after swiveling to position, may be securely clamped by a small screw at the front.

This machine is also built regularly in the four-step cone type, with friction head, as well as the five-step cone, without friction head.

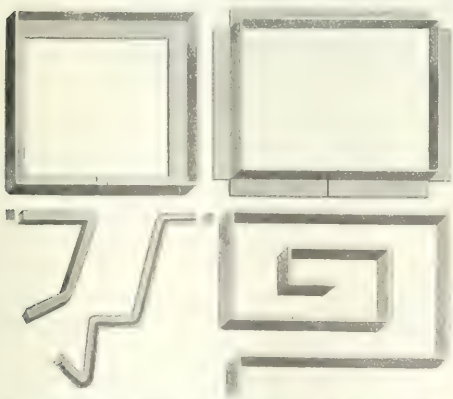
The Excelsior Band and Angle Iron Brake.

An original design of open end brake for bending band and angle iron, and bars, built by the Excelsior Tool &



The No. 13 Band and Angle Iron Brake Made by the Excelsior Tool & Machine Company, East St. Louis, Ill.

Machine Company, East St. Louis, Ill., and samples of the work that can be formed on this machine, are shown in the illustrations herewith. It will handle up to ¼ x 1½



Examples of Work Which Can Be Formed on the Excelsior Band and Angle Iron Brake.

in. band or angle iron and up to ½-in. square or round bars. It is a very useful tool for iron workers and is extensively used in range and cornice shops, saving much time and the use of the larger machines which must otherwise be applied to this kind of work. The top of the machine is adjustable for work of different thicknesses, from 1-16 to ½ in., and is constructed so that the material can be inserted and removed from the side, which is very desirable, especially when long bars are used. The work can be set to adjustable gauges or stops when duplicate bends are to be made. The lever handle at the right is adjustable and can be set to bend a variety of angles. The lower or removable jaw and the face of the upper jaw are made of hardened steel. The machine weighs 40 lb. and its design, material and workmanship are claimed to be such as to make it very rigid and durable.

Tin Deposits at Spokane, Wash.

WASHINGTON, D. C., April 20, 1908.—A bulletin is about to be published by the United States Geological Survey giving a description of a body of tin ore at Silver Hill, near Spokane, Wash., which has been examined for the survey by Arthur J. Collier. The tin bearing mineral, cassiterite, was identified as such in the summer of 1906. The deposits are situated on an interurban railroad within half an hour's ride from the center of the city. Tin ore has been found at four localities in this area.

The ore body in the principal workings was first developed by an open cut 150 ft. long, in which a mass of pegmatite and quartz was uncovered. The tin bearing rock dips to the southwest at an angle of about 45 degrees and lies between well defined walls. The maximum thickness of ore found at any point was probably not less than 10 ft. From the point where the richest ore was found a shaft has been sunk to a depth of 125 ft. on an incline of approximately 45 degrees. Some cassiterite was found to a depth of 50 ft., although it gradually decreases in amount below the bottom of the cut. Below the 100-ft. level the walls of the ore body come together, and for some distance the vein or dike is not well defined, although large nodules of tungsten ore have been found. On the 100-ft. level drift is partly in barren quartz and partly in the pink pegmatite regarded as tin bearing rock. About 35 ft. from the shaft this rock contained a notable amount of cassiterite, and part of it was rich enough to be regarded as tin ore. The excavations have gone far enough to show that the tin bearing intrusion is of irregular form; that the tin is not uniformly distributed through it, and that it may be confined to an ore shoot pitching to the northwest.

In the course of these excavations the tin ore has been carefully selected from the barren rock and piled on the dump, where, at the present time, there is probably from 100 to 200 tons. It consists of pieces varying in size up to 100 lb. or more, in which the cassiterite is unevenly distributed in grains from the size of a pin head to several pounds in weight. From an inspection of the dump Mr. Collier is of the opinion that the cassiterite or black tin contained is about 6 per cent. The cassiterite is reported to be remarkably free from impurities.

Veins and dikes of pegmatite are not uncommon elsewhere in the metamorphic rocks of this region, which are continuously exposed for several miles to the east and outcrop at intervals for at least 40 miles to the south. No cassiterite has yet been found in these rocks except at Silver Hill, but such discoveries are to be expected.

The developments at Silver Hill indicate that the tin ore is to be found in detached masses whose relations to each other cannot yet be forecast, and the economic value of the deposit will depend to a considerable extent on the amount of excavation necessary to locate other ore bodies. This can be determined only by experience involving a further outlay of capital and possibly requiring several years' time, but the discoveries already made are of sufficient value to warrant such investigations.

W. L. C.

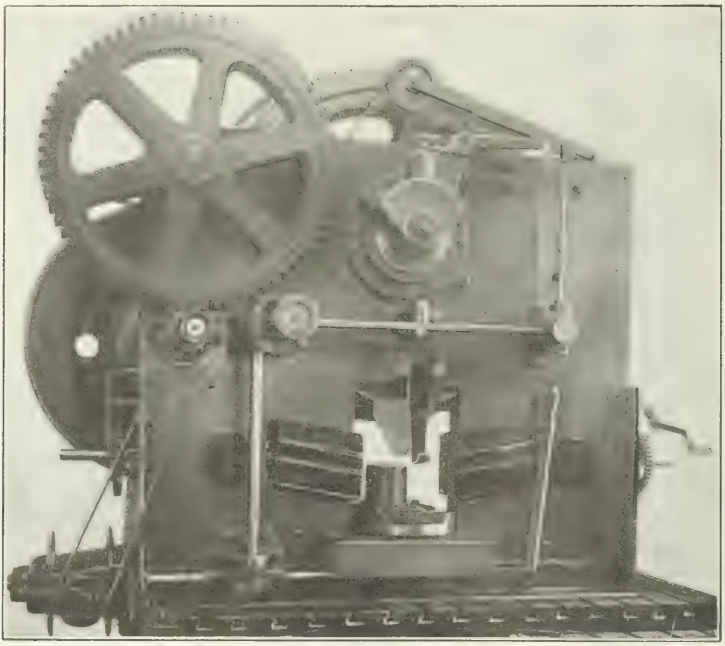
The Standard Metal Mfg. Company, 43 Canal street, Chicago, has taken over the Acme Bearing Journal Company, and will remove about May 1 to 8 and 10 Canal street. Besides the S. T. B. composition bearings, which formerly comprised the sole product of the company, it is now prepared to manufacture and furnish all kinds of brass and other metal bearings for cars, trucks, &c.

The Pels One-Stroke Beam Shear.

The one-stroke gear driven beam shear known as the type R T T, shown in the accompanying engraving, is an addition to the line of steel plate frame punching and shearing machinery built by Henry Pels & Co., 68 Broad street, New York City. It is built in five sizes, with capacities from 3 in., 5½ lb., to 24 in., 100 lb., I-beams, and all sections of channels, angles, tees, &c. With this new tool a section may be sheared in one setting—*i. e.*, after inserting the material in the throat of the machine no further handling is required. This is radically different from the old practice, in which half of a section was sheared and then the piece turned over to complete the cut.

The method of operation is simple and is as follows: The beam is placed in the throat, and the side knives are screwed against the flanges, thus clamping the material in place. The upper knife holder is the shape of an inverted triangle, of which the knife is the lower apex. At each of its upper corners the knife has bearings through which sliding bolts are alternately inserted automatically to control the movement of the knife. When the machine is thrown in action the left-hand bolt is in position and the right-hand bolt withdrawn. The rotation of the eccentric on the shaft then causes the upper knife to swing through a quarter circle to the left, on the left-hand bolt as a center, thus shearing the left half of the section. On the return movement the left-hand bolt is withdrawn and the one on the right inserted, and the next revolution of the eccentric causes the upper knife to move in a corresponding quarter circle to the right, completing the cutting operation, which requires less than 20 sec. on the heaviest section. The lower knife holder revolves on its center and automatically follows the movement of the upper knife and adjusts itself to all sections. In shearing plain angles, bulb angles, tees, &c., the upper knife works only to the left and the lower and side knives are stationary.

All parts are easily accessible and the shear may be worked by unskilled labor. As in all other types manufactured by this firm, the flywheel is the only cast iron used in the construction. The frame is formed of heavy rolled steel plates, the gears are of semisteel of heavy design, and the various shafts, connecting rods, &c., are open hearth steel forgings.



The New One-Stroke, Gear-Driven, Type RTT Beam Shear Built by Henry Pels & Co., New York.

The Coal Mines Conference Agrees on Old Terms.

At the joint conference held in Toledo April 17, the miners and operators of the central competitive field completed their labors by adopting the report of the Scale Committee unanimously. The report provided for a resumption of mining April 20; that the rate for mining in vogue up to April 1, 1907, be reaffirmed; that the various districts settle internal differences, and that all screens shall be not less than ⅝-in. surface. The block coal district may continue the use of the diamond screen of present size, with the privilege of run of mine coal. A week's work is to consist of 48 hr. This shall be exclusive of the time required to reach the working places.

The men are to be paid for 2 hr. when they enter the mines, even if the mine does not work 2 hr. thereafter they are to be paid by the hour. This refers to the laborers. The contract expires March 31, 1910. The present agreement is to be referred to a referendum vote of the miners. A resolution is attached condemning speedy action by miners or operators resulting in a premature strike, and that the present joint convention adjourn to meet on the first Tuesday in February, 1910, in Toledo.

The Illinois coal fields are not included in the above agreement. The operators and miners in that State are endeavoring to settle their own differences.

The F. C. Richmond Machinery Company, Salt Lake City, Utah, has been organized to handle a general line of machinery, but making a specialty of mining machinery. The new company is incorporated with a capital stock of $100,000. F. C. Richmond, president of the company, was for many years general manager of the mining machinery department of the Salt Lake Hardware Company. The company has secured the sales agency of a number of important lines of machinery, chief among which are the Chicago Pneumatic Tool Company and the Almo Mfg. Company.

The Improved Ajax Bulldozer.

To give better control of the machine and increase facility of operation the Ajax Mfg. Company, Cleveland, Ohio, has redesigned its bulldozers and is now building larger sizes equipped with double friction clutches. The new machines provide a variable stroke of the cross head and such perfect control that it may be reversed at any point in its stroke. An additional advantage claimed for these double friction clutches is that they economize time by giving only a partial back travel of the cross head, from which point it can be started forward to make shallow bends or to punch or shear plates. When setting dies the double friction clutch is useful, as it permits the operator to bring the cross head forward by degrees or stages, and thus determine and effect the proper setting of the dies.

In the smaller sizes of bulldozers, No. 3 to No. 6 inclusive, the Ajax Mfg. Company is still using the single friction clutch and a band brake, since the double friction clutches are not regarded as so important on these smaller sizes. The larger sizes, No. 7 to No. 12 inclusive, have the double friction clutches, but if preferred they can be furnished with the single friction clutches and the band brake, like the smaller sizes.

Another important change in the redesigned Ajax bulldozer is the substitution of direct gearing for the former worm and worm gear drive. Cut gears are now used throughout. The precise meshing of the gears reduces the power necessary to operate the machine and also increases the uniformity of duplicate bending work. Two other changes have been made which, it is claimed, materially improve the Ajax bulldozer. One of these is the fixing of two long steel adjusting gibs to the cross head, by which the cross head is maintained in perfect alignment and adjustment. The other is the furnishing of a loose filler piece, T-slotted and fitted in between the seats of the die space to facilitate the handling of the dies.

The demand for the largest bulldozers is confined principally to the large car building and car repair shops.

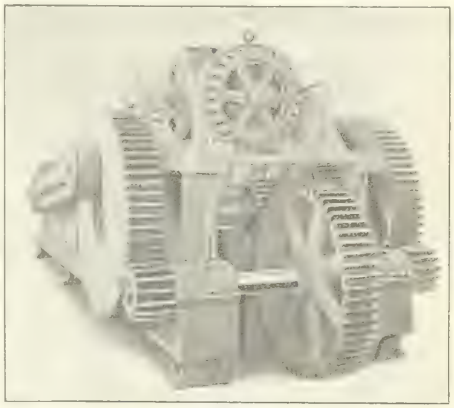


Fig. 2.—Rear View of No. 12 Ajax Bulldozer, Showing the Driving Motor.

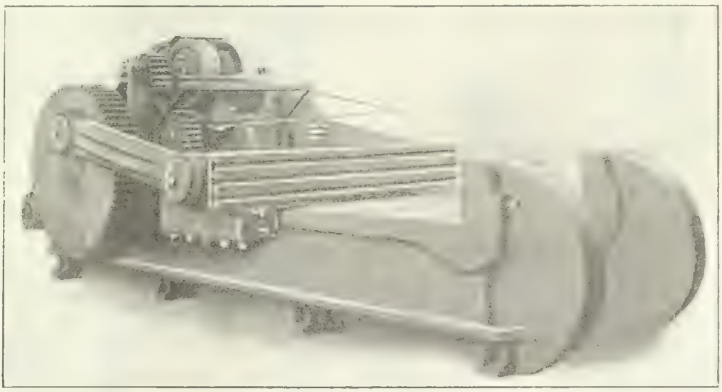


Fig. 1.—The No. 12 Bulldozer Built by the Ajax Mfg. Company, Cleveland, Ohio.

The Ajax Mfg. Company has recently built and installed in the shops of the Pennsylvania Railroad at Altoona, Pa., one of its No. 12 machines. This is the largest bulldozer ever made by the Ajax Company, and is said to be the largest one ever built. The accompanying illustrations are of this machine, one showing the working side and the other a rear view in which the motor and driving gears can be seen. With the exception of the dimensions this machine is similar to the smaller Ajax bulldozers, which are equipped with the double friction clutches.

The approximate weight of the No. 12 bulldozer is 140,000 lb.; the bed casting alone weighs 86,500 lb. The principal dimensions are as follows: Floor space, 23 x 10 ft.; face of cross head, 16 x 108 in.; travel of cross head, 30 in.; die space when cross head is forward, 72 in.; ratio of gearing, 80 to 1.

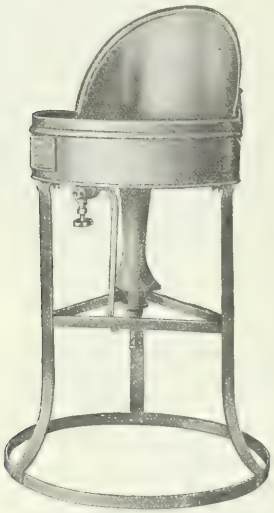
The machine is driven by a 40-hp. motor, which is directly geared to the shaft carrying the two friction clutches, which are controlled by the cross handle lever shown in the center of the machine. This arrangement is convenient and accessible to the operator in starting the cross head forward and in stopping and reversing it. All the gears and pinions are cut from solid blanks. The bed plate is cast with two heavy ribs, not shown in the illustrations, running below the floor line, thus giving enormous strength and rigidity to the machine.

The Rust Boiler Company.—The engineering department of this company now occupies part of the fifth floor of the German National Bank Building, Pittsburgh, Pa., while the general offices are on part of the sixth floor, but on and after May 1 they will be consolidated and will occupy the entire fifth floor of the building. The company reports business moderately active, while inquiries are more numerous. Orders booked within the last month on which early deliveries are to be made are as follows: Pulaski Iron Company, Pulaski, Va., 311 hp.; Ohio & Texas Sugar Company, Brownsville, Texas, 1016 hp.; Wellston Iron & Steel Company, Wellston, Ohio, 608 hp.; Cummer Lumber Company, Jacksonville, Fla., second order, 704 hp.; Westmoreland Coal Company, Irwin, Pa., 608 hp.; Temple Iron Company, Temple, Pa., 506 hp.; Marshalsea Poor Farm, Marshalsea, Pa., 1020 hp.; North American Lead Company, Fredericktown, Mo., 592 hp.

A Buffalo Compressed Air Forge.

In line with the trend toward compactness, simplicity and high efficiency in machinery and mechanical appliances in general is the compressed air forge recently developed by the Buffalo Forge Company, Buffalo, N. Y. This, the No. 22-C forge herewith shown, is constructed principally of sheet steel and angle irons which makes it simple, neat, strong and durable.

More in detail the forge consists of a sheet iron bowl 18 in. in diameter and 6 in. deep, mounted on three-angle iron legs and equipped with a removable sheet steel dash. The hight from the floor line to the top of the fire pan is 32 in., and the total weight 35 lb. These figures indicate that the forge is not intended for extremely heavy forge shop work, but is suitable for heating rivets, small tools and doing light work which is ordinarily handled with portable forges. The complete forge is of practically cylindrical contour, there being no parts which project beyond the largest circumference. This reduces the chance of injuring it by rough handling, particularly since all but one or two parts are made of steel or



The No. 22-C Compressed Air Forge Made by the Buffalo Forge Company, Buffalo, N. Y.

wrought iron. The tuyere is of cast iron, but is in a protected position. The injector shaped nozzle is also cast iron, but being located underneath the forge is shielded by the legs and the bracing. The compressed air connection is just underneath the bowl and does not project beyond it. The three angle iron legs slope outward, and instead of resting directly on the floor, giving only three points of contact, are riveted to a circular ring of 1 x ¼ in. bar iron 42¼ in. in diameter. At 14 in. above the floor line the legs are braced by a triangular band of iron riveted to each leg.

The compressed air which furnishes the blast is introduced through a double nozzle or injector. The smaller nozzle is of brass and is fitted with a needle valve to regulate the amount of compressed air supplied. This valve is fixed in adjustment by a lock nut on the valve stem, and further regulation is obtained by a valve in the air connection just underneath the bowl of the forge. In operation a small amount of compresed air issuing from the needle valve at high velocity through the nozzle shaped opening above it creates a vacuum which draws in surrounding air. The combined jet repeats this action through the final nozzle, drawing in more free air, so that about 60 times the volume of free air escaping from the first nozzle is supplied to the fire in the forge. The equivalent of 0.3 cu. ft. of air at atmospheric pressure suffices to deliver 20 cu. ft. at the tuyere, showing a marked economy compared with a direct blast or a combination of compressed air and fan blast.

Molybdenum Ore.

Some molybdenum ores found in Maine, Utah and California are described by Frank L. Hess, one of the geologists of the United States Geological Survey, in an advance chapter from Bulletin No. 340, which forms Part I of "Contributions to Economic Geology, 1907."

The Maine ore is molybdenite and is widely distributed. The principal deposits are in Washington and Hancock counties, and these have been brought into more or less prominence through the several companies that have been formed to exploit them. The California ore described is also molybdenite and was discovered during 1906 in a granite quarry about 4½ miles northeast of Corona, Riverside County. The granite is cut by pegmatite dikes ½ to 2 in. wide, and molybdenite in flakes up to ½ in. across accompanies the dikes in small quantities. The Utah deposit is wulfenite (lead molybdate) and occurs at Alta, one of the older mining camps of the State. Its presence has been known for years, but the ore has always been sold for its lead content, as aside from this it had merely a mineralogical interest. It is only within recent years that wulfenite has acquired importance as a source of molybdenum.

Most molybdenite deposits are too small to justify the erection of expensive machinery, and the present market would probably be unable to handle any great increase in output; but, on the other hand, if a constant supply was available at prices within reach of manufacturers, it is probable that the demand would increase considerably, for uncertainty in obtaining a regular supply of ore seems to have been one factor in preventing the extensive use of molybdenum in steel, in which it is said to have much the same effect as tungsten, even when employed in much smaller quantity.

Molybdenum in the form of ammonium molybdate is used to determine phosphorus in iron, several tons a year being applied to this purpose in the United States alone. In Europe ammonium molybdate is employed as a fireproofing material and it is said to be a strong germicide, being used as a disinfectant for cloth in railroad passenger coaches and for other similar purposes. The lead molybdate, wulfenite, is more easily saved than molybdenite, but it is produced in only a few localities and in very small quantities, and it often carries so many impurities that it is almost impossible to use it.

Steel Production in Germany.

According to the statistics compiled by the Verein deutscher Eisen und Stahl Industrieller, 102 works in Germany and Luxemburg produced the following quantities of steel in 1907, in metric tons:

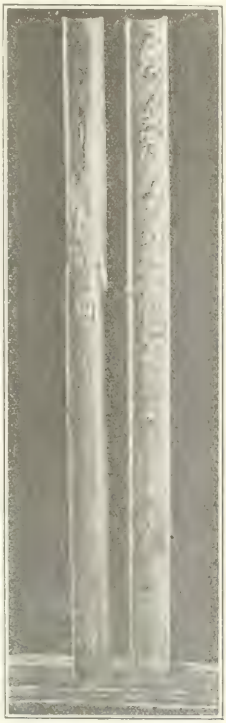
	Acid. Tons.	Basic. Tons.	Total. Tons.
I. Ingots:			
(a) Converter	387,120	7,212,454	7,599,574
(b) Open hearth	212,620	4,039,940	4,252,560
II. Steel castings	85,421	126,077	211,498
Totals, 1907	685,161	11,378,471	12,063,632
1906	715,952	10,591,855	11,307,807
1905	655,495	9,411,058	10,066,553
1904	610,697	8,319,594	8,930,291
1903	613,399	8,188,116	8,801,515
1902	517,996	7,262,686	7,780,682
1901	465,040	5,929,182	6,394,222
1900	422,452	6,223,417	6,645,869

In 1907 six works made acid Bessemer and 22 works basic Bessemer steel, while 16 works produced acid open hearth and 64 works basic open hearth steel. Acid steel castings were made in 38 establishments and basic steel castings in 36 works.

The total number of immigrants to the United States in March was 32,517, as compared with 139,118 in March, 1907, a decrease of 76 per cent. From March, 1906, the decrease was 77 per cent.

Aluminum Condenser Tubes.

In many localities the life of the tubes of a surface condenser is quite brief, as they are rapidly corroded by the cooling water. Along the Monongahela River, in the Pittsburgh District, for example, surface condenser tubes of brass or copper are sharply attacked by the sulphuric acid and sulphates resulting from the coal mining operations carried on in the valleys of the river and its tributaries. The trouble from this cause is so great that surface condensers are usually avoided there, jet condensers being used in spite of the fact that with surface condensers the water of condensation could be returned to the boilers, thus avoiding the necessity of feeding the boilers with river water, which of course is decidedly detrimental to the boilers.



Corrosive Effect of Monongahela Water on Copper Condenser Tubes.

One large manufacturing establishment has been compelled to abandon the use of brass tubes entirely and resort to pure copper tubes, which are found to have a greater life than the brass tubes, the increase in durability being sufficiently great to justify the use of the more expensive tubes. Even with pure copper tubes, however, the life is brief. The accompanying illustration, reproduced from a photograph, shows the condition of these copper tubes after they have been in service some time, and plainly indicates the injurious effect of the cooling water upon them.

About a year ago one of the condensers at this plant was fitted with an installation of tubes which promises to overcome this difficulty. These tubes consist of a copper tube drawn down on an aluminum tube, so that the cooling water does not come in contact with the copper. Aluminum resists the corrosion of sulphuric acid and sulphates better than any of the other common metals and for this reason gives longer service. Commercial aluminum, however, contains minute quantities of iron and copper as impurities, and these impurities are occasionally segregated in spots. On making an experiment with pure aluminum tubes, it was found that the cooling water attacked these impure spots, perforating the tube and rendering it useless. A bi-metallic tube was then constructed, as above described. The aluminum interior of this tube being very resistant to the cooling water, the corrosion in it is slow. When the cooling water finally perforates the aluminum interior (for the reason above described), it is prevented from attacking the copper by reason of the fact that the aluminum, being the electro-positive member of the galvanic couple formed by the two metals protects the copper from corrosion, just as galvanizing protects iron. No corrosion of the copper will then take place until the aluminum has been entirely carried away for a considerable distance around the perforation, thus leaving a perfect copper envelope for a much longer time than is the case when copper is used alone. This installation of tubes was made about a year ago, and not a single tube has yet failed.

These tubes are made in all the standard sizes used in condensers, and possess the advantage that, on account of the high heat conductivity of aluminum and copper, they are superior to brass in heat conducting properties. At the same time they cost approximately the same amount as brass condenser tubes, thus combining long life with low first cost. In most situations where condenser tubes fail through corrosion by the cooling water, tubes of this character will considerably reduce the operating cost of the power plant using surface condensers. These tubes are manufactured by the Aluminum Company of America, Pittsburgh, Pa.

The Lake Superior Iron & Chemical Company.

The authorized mortgage indebtedness of the Lake Superior Iron & Chemical Company, Detroit, Mich., is now $1,700,000. The mortgage for $6,000,000 given by the company under date of May 1, 1907, has been discharged and the bonds secured thereby have all been canceled. Only $2,675,000 of these bonds were ever issued, and these have been exchanged for an equal amount of 7 per cent. preferred stock. The stock now consists of 7 per cent. cumulative preferred stock, $2,675,000, and common stock, $5,350,000; total authorized share capital, $8,025,000. The $1,700,000 of new bonds are intended for collateral purposes only, and will not be sold. They consist of $1,250,000 authorized, covering manufacturing plants and connected real estate, of which amount $1,013,000 has been issued, and $450,000, all issued, covering certain timber lands in Alger, Delta and Schoolcraft counties. The stockholders of the following companies received preferred and common stock in the Lake Superior Iron & Chemical Company in exchange for their holdings, the late Joseph H. Berry of Detroit, having a large interest in most of them:

Ashland Iron & Steel Company, Ashland, Wis.
Manistique Iron Company, Manistique, Mich.
Michigan Iron Company, Newberry, Mich.
Northern Charcoal Iron Company, Chocolay, Mich.
Boyne City Iron Company, Boyne City, Mich.
Furnace and chemical plants of Elk Rapids (Mich.) Iron & Chemical Company.
Burrell Chemical Company, Manistique, Mich.
Superior Chemical Company, Newberry, Mich.

The Lake Superior Iron & Chemical Company has six blast furnaces using charcoal as fuel, iron mines at Bessemer, Mich., and Tyler Forks, Wis., and a large acreage of hardwood timber. Its total pig iron capacity is 205,000 tons a year. The officers are the following: Elisha H. Flinn, president; W. G. Sharp, vice-president; W. G. Smith, treasurer; John Christian, secretary; W. H. Hinkle, chairman Executive Committee.

The Morgan Engineering Company, Alliance, Ohio, has received an order from the Indiana Steel Company, Gary, Ind., for a 24-in. continuous billet mill, complete, and for seven cranes. The orders received by the Morgan Company for the week ending April 11 included 14 cranes as follows: Indiana Steel Company, one 15-ton,-58 ft. 6 in. span; two 5-ton, 37-ft. span; one 40-ton 4-motor, 60-ft. span; one 25-ton 4-motor, 60-ft. span; two 5-ton wall; Bethlehem Steel Company, South Bethlehem, Pa. (for new Saucon plant), one 100-ton 4-motor Morgan electric ingot stripper, 50-ft. span; one 10-ton crane, 5 ft. 10 in. span; two 10-ton 56 ft. 3 in. span; one 25-ton 4-motor 59 ft. 10 in. span; San Francisco Railway & Power Company, San Francisco, Cal. (through Ford, Bacon & Davis, engineers, New York), one 50-ton 4-motor crane, 10-ton auxiliary hoist, span 47 ft. 1 in.; Union Steel Casting Company, Pittsburgh, Pa., one 10-ton 3 motor, span 36 ft. 9 in., for new machine shop.

The Youngstown Iron & Steel Roofing Company, Youngstown, Ohio, manufacturer of iron and steel roofing and siding, black and galvanized iron and steel sheets, sheeting and expanded metal lath, bridge and fireproof flooring, is operating four hot mills in its plant, and expects to be able to keep them in operation.

Malleable Castings by a New Process.

The Melting of Wrought Scrap in the Crucible and in the Open Hearth Furnace.

At the November and December meetings of the West of Scotland Iron and Steel Institute a paper was under discussion, presented by E. C. Ongley, under the title, "The Production of Malleable Castings by the Fusion of Wrought Iron in Crucibles." As will be noticed, there was some dissent from the statements of the author, and exception was taken to the fact that some details of the process were not divulged. However, since the chief raw material employed is said to be "wrought iron," while the resulting castings do not require to be annealed, and have desirable physical properties, the paper is of interest, albeit the author replied but generally to direct requests for light on the matter of the additions made after the melting of his mixture and preliminary to pouring the molds. It would seem, moreover, that the old materials made use of are largely steel to begin with, in spite of the designation "wrought iron" used by the promoters of the process. A synopsis of the paper is given below, together with the substance of the facts developed in the discussion:

Malleable Castings from the Crucible.

The new process has for its object the production of a metal for making castings, with the properties of steel; also of forged iron, but, unlike the latter in that when fused it can be cast into molds, producing castings with a carbon percentage of 0.05 to 0.07. The raw material, scrap and wrought iron, consisting of scrap nails, bolts, chippings of plates and punchings, is filled into crucibles of plumbago with a cover, and is then placed on a disk pedestal resting on the fire bars of the furnace [the arrangement of the furnace being shown], which is then filled with coke. The four-cornered shaft furnace has a double iron casing, and is lined with firebricks; the blast is heated by circulating in the hollow space round the hot furnace, which is placed in a pit. The process of fusion of the first charge requires about two hours from the time of lighting up, whereas the following charges are ready for casting in about one and one-half hours. The standard furnace can take four crucibles of 100 lb. capacity each, and with four charges daily the weekly output of one furnace would be about 3 tons of castings, as castings, or in the shape of ingots. The waste is very inconsiderable, but the marketable product is about 65 to 75 per cent. of the raw material, the gates and runners, which can be remelted, making up the 100 lb. of each crucible. When the melting process is completed, which can be ascertained by a testing rod after the crucible cover has been taken off, the molten material appears quite white, sometimes slightly boiling; but on the addition of certain materials it is at once quieted, and must be then poured into the mold with as little delay as possible, as the high temperature of about 2700 degrees F. of the metal is an essential feature for the success of this process. The castings do not require annealing.

The sand of the molds, by a suitable addition of refractory materials, ganisters, &c., is prevented from burning on, so that the castings have a smooth, clean surface, and are also sound, free from blowholes, and perfectly homogeneous.

The temperature of 2700 degrees F. must be uniformly maintained to secure the fluidity of the metal, so that it can run out into the finest lines down to 3-16 in. of any pattern, of machine parts, of boiler fittings, valves, &c., which can thus be made lighter than is possible with any other metal with such high tensile strength.

The cost of production is low, as it depends on the price of a raw material, which is a by-product of engineering work, and which consists entirely of waste and scrap of malleable iron and mild steel containing 0.05 to 0.2 carbon percentage: besides this, the cost of the plumbago crucibles—which are good for four or five charges—the consumption of fuel, the wages of the furnace attendant, the additions and general expenses, make a total cost of about £10 to £12 per ton for the material as it runs out of the crucibles into the molds. The wages for molding have to be added.

Some results of tests are as follows:

	Tensile strength per square inch.	Elongation.—Bars of 3½ in. Per cent.
Forgeable quality	22 tons.	32.3
Forgeable and weldable quality	23 tons.	32.2
Mild steel	24 tons and more.	24.3
Hard steel	45 tons and more.	19.5 to 12

On being machined it is found that the surface of these castings does not consist of a hard skin, but is simply of a sound homogeneous material, offering no more difficulty to the cutter or cutting tool operating on it than when a forging is machined. The work of machining is much reduced as compared with forgings, as the margin for tooling can be made very small in the pattern. A shrinkage of 2 per cent. has to be allowed on the patterns. The tensile strength can be varied to suit requirements, by adjusting the composition of the additions to the molten metal. The castings are used for marine engines, boiler mountings and motor car parts. Their high permeability has brought them into use for dynamo work, having higher capacity than cast iron with reduced weight.

The cost of 1 cwt. of metal from the crucible is given as follows. To this is to be added the cost of molding.

	s.	d.
Wrought iron and mild steel scrap with 0.05 to 0.25 per cent. carbon	3	6
Cost of pebbles	2	6
Coke consuming iron, 2 cwt.	2	6
Wages	1	6
Furnace expens	0	6
Crucible ma	0	6
Additions	0	6
Total	11	6

Malleable and Steel Castings by a Special Open Hearth Process.

Castings are produced on the most favorable commercial scale in the open hearth furnace by melting wrought iron scrap in connection with a special process for the treatment of the molten metal. These castings can be large or small, of soft ingot metal with all the properties of wrought iron, ranging up to hard steel, suitable for parts of machinery subject to heavy wear, or for tools, milling cutters, drills, stamps and dies, valves, gear wheels, &c. The raw material consists chiefly of wrought iron scrap, to which a slight addition of hematite pig iron is made up to 15 per cent., to procure the quality to be produced. The oxides which are developed in the liquid bath are reduced by a corresponding addition of deoxidizing materials; when the liquid metal is ready for casting, certain additions, which constitute the special process, are made to the molten metal in the furnace. The additions are made just before the molten metal is to be tapped, so that its quality can be decided on or changed just before the metal leaves the furnace. By this means the important advantage is secured that castings can be produced at the very last moment to suit urgent requirements, without causing any inconvenience or increased cost. The special process enables the production of castings for all purposes, soft and tenacious, like best wrought iron for shipbuilding, for stern posts, &c., as well as the production of mild steel for machinery, and of steel suitable for tools and other purposes.

The metal is dense and of homogeneous structure, free from blowholes and sponginess. It has been tested with the following results:

Wrought iron quality, tensile strain 20 to 30 tons per square inch; elongation, 18 to 27 per cent.; contraction, 46 to 52 per cent.

Mild and hard steel, tensile strain 25 to 50 tons per square inch; elongation, 10 to 28 per cent.; contraction 20 to 30 per cent.

The following items show the actual cost of production of this metal up to the pouring of the mold for 1 cwt.:

	s.	d.
Wrought iron and mild steel scrap, bolts, nails, &c.	2	6
Hematite pig iron	1	6
Deoxidizing materials	0	6
Coal, attendance, &c.	2	0
Additions	1	0
Total cost for 1 cwt.	7	0

The average cost would be $7 per ton of the metal as it leaves the furnace to be run into the molds. This cost is reduced to $5 and $4 per ton, when the production is on a large scale. The molds have to be coated with a wash of refractory materials to make them stand the high temperature of the metal without being burnt on, so that the castings have a clean and smooth surface. The cores are also specially treated so that they easily part from the castings, thereby insuring a clean surface to the hollow spaces of the castings as well as to their outward surface.

Discussion.

Some skepticism was expressed by those who discussed Mr. Ongley's paper as to any revolutionary features of his process. More light was asked on the matter of the additions. The alloying of iron with aluminum or with silicon was familiar, one of the speakers urged, so that if these alloys were used the process in this respect presented no novelty. The president of the institute said that the heat of 2700 degrees referred to was not unusual. Referring to the low carbon and low silicon material employed in the process, which had been spoken of in the paper as malleable steel or malleable iron, the speaker thought it was rather malleable cast iron. While not employing the process described in the paper he had used scrap with a low percentage of graphitic carbon, phosphorus and sulphur and melted it in a cupola. After annealing the product made first-class malleable castings, almost like steel, which could be forged into tools. He questioned if more than this was done in the practice described.

Mr. Ongley, in reply to the comments of those who discussed his paper, said that the use of the process in connection with the open hearth furnace had gone on for six years and that 18 plants in Germany were employing it, chiefly in making castings for motor car work. Answering the statement that the process was not novel, he said that no works in England melted wrought iron in pots, securing a temperature of 2700 degrees. In Sheffield they melted at about 2000 degrees F. Several West of Scotland firms had sent representatives to Brussels to see the new process at work. The composition of the additions to the molten metal was not generally disclosed, as this was a commercial detail. The materials employed are aluminum, spiegel, iron, nickel, molybdenum, vanadium, tungsten, silicon, wolfram and various other metals known to those in the trade. The proportion of these materials used to the amount of molten metal was not stated, as the object of the paper was not to give full directions for applying the process. When he used the words "special ingredients," he took it for granted that the nature of the materials would be generally known to those engaged in manufacturing steel, and that they would also be aware that nothing of a secret or charlatan nature could have been meant. The furnace described enabled the high temperature to be obtained for keeping the molten metal fluid, and the materials mentioned are added to the metal for the purpose of keeping up its temperature and removing the gases in it. Sound castings as thin as 3-16 in. could be produced. The president's remarks on producing malleable iron from the cupola in Harrington refer only to the production of malleable castings; which have to be annealed before they can be used.

It is rumored in Canadian iron circles that an important legal battle is likely to occur, almost equaling the suit between the Dominion Iron & Steel and Dominion Coal companies. The parties are the Nova Scotia Steel & Coal Company and the Dominion Iron & Steel Company. The dispute is over certain submarine areas at Wabana, Newfoundland. It will be remembered that about six years ago the Nova Scotia Company sold about half of the iron ore areas at Wabana to the Dominion Company for $1,000,000. After this sale the former company took up additional areas at a considerable distance from the shore, and has been driving a tunnel 1700 ft. long through the Dominion property to reach these distant areas. It seems that some misunderstanding exists as to the correctness of the old surveys, and that the whole matter may be taken to court. Being an extremely technical matter, involving the determination of the location of ore bodies some distance out under the sea bottom, it is expected to require the brightest legal and technical talent.

Curtis Turbine Business.

A number of interesting facts are revealed in the statement received from the General Electric Company of Curtis turbine sales, which follows:

	Number of plants. Capacity 1,000 kw. and less.	Capacity above 1,000 kw.	Total number of plants.	Average kw. cap. of plants.	Total kw. capacity.
Orders to December 31, 1907:					
Central station and railroad traction...	71	190	261	3,778	986,020
Industrial plants and Miscellaneous	243	45	288	305	87,675
Totals.....	314	235	549	1,956	1,073,695

	Number of machines.	Average kw. capacity per machine.	Total kw. capacity.
Instalations to December 31, 1907..	943	857	807,610
Orders on hand December 31, 1907.	153	1,739	266,085
Total sales to December 31, 1907.	1,096	980	1,073,695
Orders for fiscal year ending February 1, 1908.....	325	890	286,320

The most noticeable single item is the total capacity sold to December 31, 1907, which is 1,073,695 kw., or about 1,556,000 b.h.p. This is the strongest indication of the advance of the steam turbine generating unit that has ever been published. That this advance is accelerating rapidly is shown by the amount of the sales of Curtis turbine generators for the past fiscal year of the General Electric Company—286,320 kw. capacity, or more than 25 per cent. of the total sales since the Curtis turbine was introduced.

Another fact of considerable interest is the large number of plants for which the Curtis turbine has been selected as prime mover. The large range of sizes in which this turbine in sold is probably responsible for the great variation in average sizes of plants in which it is used. The large central stations and electric traction enterprises with an average size of 3778 kw. plant capacity strikingly differ from the industrial plant of 305 kw. average capacity.

Purdue Students Visit Chicago Plants.

A body of 175 students from Purdue University, La Fayette, Ind., under the leadership of Prof. C. H. Benjamin, dean of the engineering schools of that institute, visited Chicago April 14-16 for the purpose of visiting some of the large industrial plants in the city and vicinity. Upon arrival at Chicago the party was divided into three classes, comprising the mechanical, electrical and civil engineering divisions. Among the plants visited by the first division were the South Works of the Illinois Steel Company, works of the Pullman Palace Car Company, foundry of the Griffin Car Wheel Company and the Fraser & Chalmers shops of Allis-Chalmers Company. The electrical division inspected the equipment of the Chicago Telephone Company, Edison storage battery plant, Commonwealth Electric power station and Illinois Tunnel & Telegraph Company's tunnels. The section of civil engineers visited the water works cribs, Chicago River bridges, shipyards of the Chicago Shipbuilding Company, American Bridge Works and other points of interest. Establishments generally regarded as closed to technical visitors were freely opened to the visiting students, and local guides were furnished to explain mechanical operations and processes. On the same dates a similar party of students from the University of Illinois were in the city engaged in a like tour of inspection under the leadership of professors J. P. Brooks, Ira O. Baker and F. O. Du Four.

A Chicago dispatch says it is estimated that by June 1 the railroads centering in that city will require more than 100,000 laborers for repair work, both on tracks and in shops.

Malleable Iron Castings.*

Comparison of Furnaces Used and Methods of Annealing.

BY C. H. GALE.

Malleable iron is melted in the reverberatory furnace, the open hearth furnace and the cupola. The reverberatory furnace is the most extensively used, about 85 per cent. of the entire output of the United States being melted by this process. But little change has been made in this type of furnace since its adoption by the earlier manufacturers, beyond a marked increase in capacity. Prior to about 1885 the standard furnace was one of 5 tons capacity. This has been increased from time to time, until at the present time we have furnaces of 25 and 30 tons capacity, though furnaces of from 10 to 15 tons capacity are the most popular, and give more uniform results than those of larger capacity.

The adoption of the open hearth furnace for malleable iron dates back about 15 years. This type of furnace is now used largely and successfully in this district, more than 50 per cent. of the malleable iron made by the open hearth furnace being produced in the Pittsburgh District. This success, which has not always followed the introduction of this furnace in the malleable foundry, can be attributed to the local familiarity with this type of furnace from its extensive use in our steel mills.

The Several Types of Furnace Compared.

The open hearth furnace has many advantages over the reverberatory furnace, especially where the output is large, and orders guarantee a long, steady run, the chief advantages being cost of repairs and period of operation. A run of 300 to 400 heats without the loss of a single day for repairs is not uncommon. Then will come a shutdown of a week's duration for minor repairs and cleaning out, putting the furnace in condition for another like run. This long, uninterrupted run, to the operator of the reverberatory furnace, when customers are calling for deliveries, and who at the the most can get but a week of uninterrupted service, or 12 to 18 heats from his funace, seems like the dawn of the millennium.

After 1200 or more heats the open hearth furnace will need a general repair requiring four or five weeks, and here in the length of time required to make these repairs is where the reverberatory furnace has the advantage, it being a not uncommon practice during a busy season to rebuild the side walls, repair bridge walls and put in an entirely new bottom with the loss of one or at most two days' time. During a very busy season these repairs are frequently made on Sunday, thus avoiding the loss of a working day. Moreover, the reverberatory furnace can be charged within a few hours after these repairs are completed, while the open hearth furnace requires as many days to be brought to the required temperature before receiving the charge.

A heat of iron, after being melted and brought to the proper condition for casting, can be held in the open hearth furnace without injury for a much longer period than in the reverberatory furnace, not being subjected to the intense oxidizing flame of the latter, especially that produced by the use of the top blast.

Cupola melted iron does not possess the tensile strength nor ductility of iron melted in the reverberatory or open hearth furnace, due partly to the higher carbon and sulphur caused by the metal being in contact with the fuel. This feature is rather an advantage than otherwise, as most of the product of cupola melted iron consists of pipe fittings—castings that are not subjected to any great stress or shock. These castings are threaded, and a strong, tough maleable iron does not cut a clean, smooth thread, but rather will rough up under the cutting tool.

Annealing.

The annealing process for malleable castings differs from that of steel castings in that in the case of steel when recalescence, or the refining temperature, has been safely reached, it is needless or rather unwise to prolong the heat, while in malleable iron the annealing process has at this period but begun. This heat must be maintained for from two to four days, depending upon the thickness of sections of the castings under treatment and the compactness with which the castings or annealing boxes are placed in the furnace. The annealing temperature, 1550 to 1600 degrees F., is, however, not absolutely essential to thoroughly anneal malleable iron. This can be accomplished at a temperature as low as 1300 degrees, but the time required will be at least twice that of the higher temperature.

There are but few concerns engaged in the business for any considerable time with whom there has not been tried out the process of annealing without surrounding the castings with a packing material, but the heavy scale formed on the castings and their general unsightly appearance, together with a refusal of acceptance on the part of the customer, soon convinces the experimenter of the folly of continuing the process. Malleable castings can be annealed without the aid of any packing material and still preserve their appearance, and without the formation of scale by placing them in an airtight receptacle excluded from the flame and gases in the furnace; however, as economy of production is the objective point sought, this process has nothing to commend it.

Material Used for Packing.

Until recent years the material in which castings were packed for annealing was composed of hammer and rolling mill scale, turnings, borings, &c. This was treated with a solution of sal-ammoniac or muriatic acid to form a heavy coating of oxide. This method has, however, been nearly superseded by the use of slag. The slag that is skimmed from the bath of the melting furnace, when ground to pea size and smaller in a tumbling barrel, makes an excellent packing material. Care should be taken to cool this slag with water as it is being skimmed from the melting furnace, it being the custom in some foundries to use old sand with which to deaden the heat. Better results can be obtained from this slag in the annealing furnace if kept quite free from sand and dirt.

Many malleable foundries in the vicinity of blast furnaces, where granulated slag can be had at a small cost, use this for annealing, it being probably the most economical. Fire sand and fire clay are also used, fire sand being an excellent material where the castings are very light and of intricate shape. Such castings, when packed in sand, will retain their shape, even though the furnace be overheated. This sand, however, deteriorates very rapidly if not renewed. Experiments conducted without the addition of new sand gave the following results: First and second times of using gave good, well annealed castings; third and fourth times of using gave castings with a fair anneal, but showed a tendency to weakness; fifth time showed a still weaker casting, while the sixth and seventh times the sand was used produced castings of but little more strength than the original hard iron, and they had to be returned for reannealing. After the seventh time of using the sand resembled a heavy wood ash.

The theory of oxidizing the scale and borings that was adhered to so long was that the castings would become decarbonized by the oxygen in the packing material combining with the carbon in the castings, the large percentage of iron oxide in the furnace slag, about 50 percent., being the principle that first led to its substitution for scale and borings, but that the presence of a large percentage of this oxide is not essential is proved by the results obtained when annealing with materials containing little or no oxide. Many malleable foundries where scale and borings are still used have discontinued the oxidizing of this material with sal-ammoniac or acids.

Physical Characteristics.

The physical characteristic that gives malleable iron its greatest value, and wherein it differs from gray iron, lies in its ability to resist shocks and an increased tensile strength. The degree of malleability in light and

* A paper read before the Pittsburgh Foundrymen's Association, April 6. Mr. Gale is superintendent of the Pennsylvania Malleable Company, Pittsburgh.

heavy castings varies. In a light casting ¼ in. thick and less, it means a soft, pliable condition and the ability to withstand considerable distortion without fracture, while in the heavy sections, ½ in. and over, it means the ability to resist shocks without bending or breaking.

The tensile strength of malleable iron varies with the thickness of the metal, the lighter sections having a greater strength per square inch than the heavier sections. This fact is now being recognized by engineers and at least one Eastern railroad, which requires its malleable castings made in accordance with specifications, designates the tensile strength desired in its castings to be as follows: Sections ⅜ in. thick or less should have a tensile strength of not less than 40,000 lb. per square inch.; those of ⅜ to ¾ in. thick, not less than 38,000 lb. per square inch, and those over ¾ in. not less than 36,000 lb. per square inch. In recent tests along these lines, test bars ⅝ and ⅞ in. in diameter were made in the same mold and poured from the same ladle, thus insuring equality of metal, and annealed together. The average tensile strength of five pairs of bars so treated, representing five heats, was: ⅝ in. bars, 45,095 lb. per square inch; ⅞ in. bars, 41,316 lb. per square inch. Average elongation in 6 in.: ⅝ in. bars, 5 3-10 per cent.; ⅞ in. bars, 4 2-10 per cent.

A very high tensile strength can be obtained approaching that of cast steel, but at the expense of the malleability of the product. The writer has seen malleable test bars having a tensile strength of between 60,000 and 70,000 lb. per square inch, but the ductility and ability to resist shocks of these bars were not equal to that of bars breaking at 40,000 to 45,000 lb. per square inch.

The Strength Not in the Skin.

It was formerly the general belief that the strength of malleable iron was largely in the white skin always found on this material, but it has frequently been demonstrated that the removal of the skin does not proportionately lessen the strength of the casting.

The process of annealing is one of conversion of carbon, there being practically no change in the other elements. The carbon in the original cast state is all in the combined form, this being converted by the heat treatment to graphite. This graphitic carbon, however, differs from that present in pig iron or gray iron castings, a difference that is readily noticed by the chemist. Instead of being present in crystals or grains distributed throughout the metal, it presents itself in an amorphous state, extending through the metal in minute filaments.

Besides the conversion of carbon, there is also a partial elimination of carbon, the loss being greatest in the white skin, the carbon content of which will vary from 0.10 to 0.20, while the interior of the casting will have a total carbon of about 2 per cent. The percentage of loss of carbon is, however, not constant, varying with the material with which the castings are packed for annealing. With a carbonaceous material, as coke, the carbon loss is less than with slag or scale, while castings annealed in coke have a higher sulphur content than before annealing, due to the absorption of this element from the coke.

The following analysis will give a good average of the changes in the elements during the annealing process, slag and coke being used:

	Si.	S.	P.	Mn.	C. C.	G. C.
Hard iron	0.65	0.043	0.147	0.21	2.54	Trace
Annealed in slag	0.61	0.049	0.145	0.21	0.24	1.85
Annealed in coke	0.61	0.095	0.150	0.21	0.25	2.00

The casting of direct malleable iron, thus eliminating the tedious and expensive annealing process, is a very alluring proposition to the manufacturer, but despite the best efforts of the founder and metallurgist it still remains an iridescent dream, holding in abeyance the fame and fortune of its discoverer until the solution of its fellow problem, the conversion of iron into gold.

The commissioners of Allegheny County, Pittsburgh, have granted petitions for two bridges, one over the Ohio River at Sewickley, and one over the Allegheny River at Oakmont, the two structures to cost about $500,000 each.

The Fort William Car Works.

TORONTO, April 18, 1908.—An act relating to the city of Fort William is among the measures passed at the session of the Ontario Legislature that has just risen. A section of this act enables the municipal corporation of Fort William to give effect to a by-law passed by the City Council last winter and approved by a majority of the ratepayers. The by-law in question is one to establish an agreement between the City Council and the Fort William Car Company. Of itself the by-law lacked force because the majority in favor of it did not amount to two-thirds of the total number of ratepayers in the municipality. Hence the Legislature was invoked to give it validity. This the new legislation referred to does, but it also adds conditions over and above those embodied in the preliminary agreement between the city and the company. First, the by-law is not to be finally passed until the company furnishes satisfactory evidence that it has actually sold $1,200,000 of its authorized bond issue. The company must further show that 10 per cent. of its authorized capital stock is paid up in cash and deposited in some chartered bank. It is also required to secure two reputable Canadians of financial standing to become substantially interested in its affairs and take places on its Board of Directors. If the company fulfils these conditions before the first of January next, then the by-law may be passed and acted on by the City Council. The City Council may then enter into the agreement attached to the act and may raise and pay over the $50,000 called for by that agreement. This bonus is to be a contribution to the cost price of the company's site. It is not to be paid, however, until the company has expended $500,000 in the erection and equipment of its plant. The agreement further requires the city to exempt from municipal taxation all the company's Fort William property in excess of $100,000. In the third place the municipality agrees to guarantee the interest at a rate not exceeding 6 per cent. on $600,000 of the company's bond issue. The guarantee is to be affixed on each $100,000 of the bonds after an equivalent expenditure in each case upon construction. The city has the right to appoint one director.

On the company's part the agreement calls for a plant to cost $500,000, exclusive of the value of the site, such plant to have a capacity of 24 freight cars per day and one passenger car. The freight car capacity is to be reached within 18 months of the date of the agreement, and the passenger car part of the works is to be completed within three years. By the end of the first year of operation the company is to have 500 hands at work, and this number is to be increased by 250 annually until 1500 men are employed. In time the works are to be enlarged for an output of 60 freight cars per day and two passengar cars.

The agreement in which the parties are to join under the act contains the substance of the original agreement, entered into in October last and signed by Albert H. Sissons, Ralph Waldo Morrison and Redpath & Co. Mr. Sissons and Mr. Morrison are understood to be connected with the St. Louis Car Works. They are to be directors of the company. Redpath & Co. are of Montreal. Two other Montreal men named in the agreement of directors are S. H. Ewing and Samuel Carsley. The two latter or Canadians of equal financial status are required by the act, as well as named in the agreement, to serve on the company's board. The company has a Dominion charter, and its authorized capital is $1,500,000, a bond issue of equal amount being also authorized. C. A. C. J.

The Clark Novelty Company, Rochester, N. Y., has added to its equipment a thoroughly modern nickel plating plant. For lack of sufficient room in the factory, this long felt want had not been installed. The company is now in position to do its own work in this line, and expects also to contract for outside work. Its products are going to every country on the globe. While its line is principally the manufacturing of metal specialties and special devices, machinery and tools, it makes and markets a line of brass faucets and other goods made of brass and iron castings, brass and steel rods, &c.

German Machines and Tools.*

Special Tools Not Made in the United States.

Special Agent Capt. Godfrey L. Carden of the United States Revenue Cutter Service, now investigating trade opportunities for the sale of machine tools, sends from Berlin, under date of February 11, the following description of certain tools made by a German firm:

The machine tool manufacturing plant of Ludwig Loewe is turning out three special tools of a type not made in America. Two are backing-off lathes, the third a circular milling machine. Still another special appliance of this firm is an automatic indexing apparatus for universal milling machines.

One backing-off lathe has automatic cross feed and is designed for backing off formed milling cutters with straight flutes. The cutters are first roughly formed and grooved, the number of teeth ranging from 3 to 25. This is a stiffly built lathe, and backs off without much vibration. The backing-off tool is moved forward by a cam and returned rapidly by springs. The movement is regulated by change gears and cams to correspond with the number of teeth on the cutter. Each tooth is so relieved that it retains its form, although nearly ground away by repeated sharpening. The bed is of box form, cast in one piece with the headstock. The spindle is hollow, has hardened and ground bearings, and runs in bronze boxes, which are scraped by hand to a fit, the front box being provided with means for compensating for wear. The drive is by a three-step cone through a worm gear, so that the machine will take a steady cut when working on broad surfaces. The cross slide is so arranged that the tool is automatically fed in at each revolution of the work spindle, the idea being to enable one man to look after more than one machine.

The other backing-off lathe has a greater capacity than the tool above described. It is furnished with a lead screw and feed rod, and will back off taps, spiral cutters and worm gear hobs, either right or left hand, as well as the ordinary form of backed-off cutter, having from 3 to 26 teeth. This tool has a taper attachment and a complete set of change gears for screw cutting. The bed rests on legs of box form. The spindle is as above described. The belt feed has six changes and is reversed by a lever on the apron. The headstock has an attachment by which the pitch of thread obtained by the change gears can be increased twelvefold. On the tool post there is a screw adjustment for bringing the backing-off tool into exact position.

The circular milling machine is designed to take the place of the lathe for work of such forms as can be produced by milling cutters—viz., gear wheel blanks, either spur or bevel, grooved pulleys, hand wheels, flange pulleys with crown face, &c. The claim is made that one man can easily keep as many as five machines in operation, and that if the cutters are made with backed-off teeth, not only is uniformity in the shape of the work secured, but the parts are machined more cheaply than on the lathe. The cutter spindle is of steel, has hardened and ground bearings, and runs in long bronze boxes, of which the front one is adjustable for wear. The spindle is provided with a draw in bolt for the cutter arbor, and is driven by back gears having a ratio of 1 to 7. The outer end of the cutter arbor is supported by a movable tailstock, which must be taken away before milling internally. The cutter and the work are brought to a standstill simultaneously at each complete revolution of the latter by an automatic stop. The head is adjustable in both directions horizontally. It can be clamped firmly in place, and an adjustable stop is provided which insures the head being brought back to the same point for duplicate work. The work spindle is driven by a worm gear, which can be disconnected and the spindle directly revolved by a hand wheel; changes of feed are made by means of change gears. The outboard bearing supporting the outer end of the work arbor is carried on a knee, which can be swung aside when putting in or removing the work.

* From *Daily Consular and Trade Reports*, issued by the Bureau of Manufactures of the Department of Commerce and Labor.

What the Loewe Works Produce.

In addition to the above the Loewe works manufacture plain milling machines, with and without automatic feed of table, parallel and vertical, and with and without back gears; automatic screw machines, cutting-off machines, vertical milling machines with rapid turning spindles, automatic spur gear cutting machines, semi-universal automatic bevel gear cutting machines, automatic pin and stud machines, turret lathes, and screw cutting lathes for copper stay bolts.

In design the Loewe machines follow American practice more closely than European, although they are in nearly every case heavier than the usual American type. The different features which they present, while said to be dictated by European demands and methods, would not always agree with what is deemed best in America.

The Loewe people lay great stress on grinding work. All important cylindrical parts are finished on the grinding machine. Sliding surfaces are finished by hand scraping. They have interested themselves in the Norton machines and will undertake producing that type of grinder in Germany. While they naturally rate their own products high, they concede that the most advanced chucking machines, radial drills, upright drills, circular and universal grinding machines, and bevel gear shaping machines are to be found in America. There is a very complete physical and chemical laboratory at Loewe's, and it is because of the thoroughness of the laboratory work the firm is able to ship a good many castings to America. These are mostly cylinders for automobiles and locomotives.

The Borsig Works.

In the Borsig machinery plant, located at Tegel, near Berlin, 5300 men are employed, and it stands in the first rank in Germany in point of shop efficiency. The American who wishes to become acquainted with German progress in machinery can see nothing finer than is offered at the Borsig shops. The methods in vogue are practically those followed in similar large works in the United States. In the shops there are many old tools which will probably be gradually replaced with tools of late make. Only one English tool is in service; all others are either German or American make. The American makers represented are: Potter & Johnston Machine Company, Pawtucket, R. I.; G. A. Gray & Co., Cincinnati, Ohio; Prentice Brothers Company, Worcester, Mass.; Garvin Machine Tool Company, New York City; J. E. Snyder & Son, Worcester, Mass.; Brown & Sharpe Mfg. Company, Providence, R. I.; Norton Grinding Machine Company, Worcester, Mass.; Gisholt Machine Tool Company, Madison, Wis., and the Niles Tool Works, Hamilton, Ohio. Among the principal German makes are those of Ludwig Loewe and Deutscher-Niles, Berlin; Ernst Schiess and de Fries & Son, Düsseldorf; Reinecke, Chemnitz; Dortmunder Maschinen Fabrik, Dortmund, and Schmaltz, Offenbach-on-Main.

The Borsig firm is building at present locomotives, hydraulic presses, steam engines, ice machines, boilers and compressors. The tendency is to specialize. Not long ago this firm dropped the building of gas engines. The same plant manufactured tools to a limited extent, but does not engage in that work now, except for its own use. Aside from the locomotive work, its specialty may be said to be hydraulic presses. This firm has devised and uses an air testing machine, by which all pneumatic tools offered for sale are tested to ascertain the expense of operation. This fact may not be known to some American manufacturers, and it is interesting to observe that the Borsigs are only using at present American pneumatic tools. These tools would not have been bought did they not show superior merit to the tools offered from German and other sources, and all of these tools were subjected to test before being purchased.

The writer learned that some Saxony firms have recently been making substantial purchases of machine tools, and that American manufacturers having machines in stock here have benefited by these orders. The automobile manufacturers are heavy buyers of American machine tools, but this trade is quiet now, owing to the general situation of the money market. The grinding machines of American make are, perhaps, having a better

run during the present quiet times than most American machines, and the tendency here seems to be in the general direction of greater use of grinding tools than heretofore. So far the American machine of this type is recognized as unquestionably superior to those of German make.

Aid for Canada's Tin Plate Industry.

TORONTO, April 18, 1908.—Tin plate is to become subject to the anti-dumping duty on May 1. Until quite recently the Government was not convinced that the conditions entailing this special duty existed in the case of tin plate. Of course no article can be assessed for this duty unless such article is shown to have been bought by the Canadian importer at a price below that current in the country whence it came. Very possibly the Government was satisfied that tin plate for Canadian use was being purchased in the United States and in England at lower prices than those ruling there, but it had its doubts that the home manufactured supply of tin plate was adequate. The section of the Tariff act prescribing the dumping duty requires that the articles subject thereto be "of a class or kind made or produced in Canada." It is further provided that in the regulations which the Minister of Customs is empowered to make for carrying out the anti-dumping duty law, he may temporarily exempt from this special duty articles of any class which he is aware is not made in Canada "in substantial quantities and offered for sale to all purchasers on equal terms under like conditions, having regard to the custom and usage of trade." As the works of the Tin Plate & Sheet Steel Company at Morrisburg were the only ones turning out tin plate in Canada, as their operation began only last December, and as their output was for a time suspended as a consequence of fire, the Government did not see its way to declare tin plate subject to the anti-dumping duty. It has now apparently been pursuaded that in quantity and quality the company's tin plate is satisfactory, and the anti-dumping duty is to come into effect on May 1. That duty cannot exceed 15 per cent., no matter how great the disparity between the price paid by the importer and the current price in the market of purchase.

That there has been price cutting by American sellers in Canada seems unquestionable. Quotations on English tin plate to Canadian buyers are reported as low as $3 to $3.10, and it is alleged that American makers have competed. An English manufacturer of tin plate is credited with the statement that Canada is the cheapest tin plate market in the world. That, to be sure, is satisfactory to Canadian consumers of tin plate, whose aggregate demand is quite large, it being estimated that 75,000 tons of steel is made into tin plate, galvanized sheets and Canada plate for the use of this country. That the price cutting on the part of American and English sellers in Canada was for the purpose of underselling the Morrisburg company appears obvious from the fact that prices were put up 30 cents a box immediately after the fire at the company's works.

But the benefit of the anti-dumping duty is not all the company asks. It wants a bounty of ½ cent a pound on its product. It seeks a bounty because the Government's answer in 1906 discouraged the expectation of a protective duty. It would have caused no surprise had Mr Fielding announced among the tariff changes inaugurated in November that of a duty on tin plate, but he took the ground that a commodity entering so largely into the necessaries of life ought not to be made dutiable for the advantage of one company. He yielded, not to the importunity of the company, but to the outcry raised by the salmon packers of British Columbia, the fruit and vegetable packers of Ontario and Quebec, and the lobster packers of the Maritime Provinces. At the same time in his budget speech the Minister admitted the desirableness of having another development of the steel industry of the country. That the company will obtain the bounty it is applying for is possible, but does not seem probable. True, the bounty method of aiding industry seems to commend itself to the present Government more than the method of protective duties. But the popular feeling toward bounties is one of growing antipathy. That is particularly so in Ontario, the province whose consumption of merchandise and whose contributions to the revenue are the greatest. The last renewal of the iron and steel bounties provoked an agitation that does not subside. Possibly if the company had asked for a 15 or 20 per cent. duty it might have persuaded Mr. Fielding, but a 35 per cent. rate was more than he could countenance. C. A. C. J.

Brass and Copper Rolling Mills.

The geography of the metal rolling industry, particularly of brass and copper mills, is reviewed as follows by the *Metal Industry:*

The distribution of the metal rolling mills of the United States indicates how the manufacturers of brass and copper have followed the various industrial centers after the establishment of the industry in Connecticut some 100 years ago. The foremost district has been and is the Naugatuck Valley, with the city of Waterbury, Conn., as its center. Here are located the greatest number and the largest mills, and additions and new mills are built year after year, despite the fact that about the only raw material of any account found in the State of Connecticut which is used in the manufacture of metals is chestnut wood. The industry has been founded, developed and expanded by the metallurgical and mechanical genius of the Connecticut Yankee, not from its nearness to the base of supplies. The establishment of the metal rolling mill industry in this section of the country has also brought a host of various metal goods manufacturers, or cutting-up shops, as they are known, and also many machinery builders to make the tools and machines required in all of the metal working factories. That the works of all of these various manufacturers are still growing is evidenced by the improvements and expansions of the last few years.

Leaving Connecticut the metal rolling mill industry goes West almost in parallel lines. First comes the State of New York, with plants in New York City, Hastings-on-the-Hudson, Rome and Buffalo, all representing large works with modern equipment and each having developed, or promising to develop, notably Rome and Buffalo, the usual subsidiary shops. The next rolling mill center in the Western advance is Detroit. Plans have been under way some time for the organization of a rolling mill company at Chicago, but they have not materialized and in the meantime Detroit has forged ahead, with two tremendous mills, a number of metal goods factories, and is the greatest brass foundry and finishing city of the country, having some extremely large works devoted to founding and finishing.

The last center West in the brass rolling mill industry is Kenosha, Wis., which has a notable plant, besides the usual number of metal goods shops. This, like the rest of the mill sites, is a growing center and promises further development. Besides the great brass and copper mills outlined above, there are scattered through the industrial section of the country a number of large mills which roll copper only and many small mills which draw small sized tubing and roll silver, lead and other metals. The copper mills are located mainly in New Bedford, Taunton, Belleville, N. J.; Baltimore, Pittsburgh and Lisbon, Ohio, and the small tube works and other mills are all in the States of Rhode Island, Connecticut, New York and New Jersey. Besides the metal rolling mills mentioned there are the aluminum rolling and drawing mills located at different points in the States of Pennsylvania and New York.

The only industrial section of the country which has not yet been invaded is the Pacific Slope, and no doubt the growing metal needs of that section of the country will be sufficient at some distant day to make it profitable to establish a mill on the Pacific seaboard.

Andrew Carnegie has offered to give $3,000,000 additional to the Carnegie Technical Schools in Pittsburgh, provided the city of Pittsburgh purchases more ground adjoining the present schools, which will perhaps cost $1,000,000. The offer of Mr. Carnegie is now under consideration by the Pittsburgh city officials.

THE IRON AGE

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The South and Industrial Investments.

The progress of the South from the conditions of 40 years ago to those of to-day, as has been said over and over, is a marvel of growth and has few parallels. This must be granted, in spite of the fact that much of the testimony of the Southern champions of the industrial South has been given in the future tense and in the superlative degree. There have been times in this 40-year period, and not so far back as to be forgotten, when any writer who told the exact truth about Southern industries, and applied to them the same yardstick used in making similar measurements in the North, was classed as hostile. If glowing predictions were not forthcoming, that was *prima facie* ground for search to discover the reason of the writer's antagonism. The calculations of the early exploiters of the South—many of them, too, learned the promoting trade north of the Ohio and the Potomac—made the shortest cut between "natural resources" and dividends; and many investors in the North learned again that no climates and no soils have any exemption from old fashioned economic laws.

What is said above is with no thought of reviving unpleasant chapters in Southern development, but to emphasize a contrast with the present. To-day the plainest spoken critics of the South are within the South. It is now coming home to many citizens there that much more than mineral wealth and forests and large cotton acreage is needed. Addressing the Greensboro, N. C., Chamber of Commerce 10 days ago, Richard H. Edmonds, of Baltimore, said: "Dormant natural resources may fill our hearts with pride, but they will not fill our pockets with money. The South of all sections can least afford to participate in any agitation against corporations, and especially railroads. Of all sections it can be most benefited in every respect by leading in the suppression of this agitation." The fact that the South has not equaled the pace of the rest of the country in the industrial race was commented on, and the need of the South was said to be more men and more money from outside. The word must go out, it was argued, that men and capital will find it profitable and pleasant to make their home within its borders. It was made plain by the speaker that railroad baiting must cease and that the South, more than any other section, can gain by reassuring investors who have made her railroads possible.

If any proof were required that the free investment of money in the South needs to be encouraged the iron industry can supply it. Ordinarily regarded as one of the chief props of the industrial South, iron and steel manufacture there has been by no means a road to wealth. Millions have been poured into the South to open iron and coal mines and to build coke ovens, blast furnaces and steel works, but in comparison the amount thus far taken out in dividends on these investments has been pitifully small. In the case of the largest company the call for new money has been unending. Not only has practically all that has been earned in good times been turned back into the property, but to-day, after two years of steady outlay on new work calling for $6,000,000 to $7,000,000, a further campaign of expenditure is announced, and that is certain to be followed by another. But the record of the Tennessee Company in the absorption of capital is not unique. Just now another Alabama iron company is floating a bond issue to cover improvements completed and projected. A third Alabama iron and steel company, which has been in receivers' hands for some months, requires $2,500,000 to $3,000,000 to pay off obligations, make improvements and supply working capital. A fourth company is reorganizing, after a friendly receivership suit, and the new plan provides for additional capital, the reduction of bonded indebtedness and thereby the lessening of burdensome fixed charges. In the case of a fifth enterprise, a blast furnace plant built by men of experience in the iron trade, and put in operation in time to get the benefit of the large profits possible in the past five years, is now idle and the investments of the original stockholders are a total loss. The above examples of the extent to which Southern iron properties draw upon the resources of those who invest in them are well known and belong to the present or the immediate past. By drawing upon information not so generally public property the list might be lengthened. And if history were gone into—but that is a record which friends of the new South are willing to forget.

It is not the purpose of this article to discuss the reasons for the long delay in the fulfillment of the abundant promises of profit made for the Southern iron industry. They are various. It is enough to say that the counsel of those who see how legislation has added to the disabilities of the South should be heeded while there is time. In the recent flood tide of prosperity the inadequate facilities of the Southern railroads was a constant handicap to the profitable operation of iron and steel plants. In the South alone the new track that should be provided would keep the rail mill at Ensley busy for two years at a stretch. The "money from outside," which it is the Southern habit to look for for all great industrial development, will not be tempted from its place of security while legislatures and governors in that section maintain a war footing against railroads. It is high time that the serious aspect of this situation had recognition; for unless needed millions are soon secured for the proper extension and equipment of railroads the growth of the South may be stunted for years.

The Shrinkage in International Trade.

The statistics of the foreign commerce of the United States in March, taken in connection with reports from the leading exporting countries of Europe, show the settling of the world's trade into narrower channels. In Germany, in particular, the developments of the past few months have followed quite closely in the wake of the liquidation that has been under way in the United States. There, as here, the supply of capital proved inadequate to the requirements of a great industrial expansion. While the distrust created in the United States by the disclosures concerning high financiers was not paralleled in Germany, there is no doubt that in that country, as well

as in England, the American situation has been and will be for some time a distinctly untoward influence.

The March exports from the United States were valued at $141,397,578, and the imports at $89,113,830. The former show a decline of $64,375,000 from January and $26,360,000 from February, while from March, 1907, the decline is $20,288,000. The imports were $4,117,000 above the record of January and $4,358,000 above that of February. From March, 1907, the decline in imports is $43,997,000. The quarter ending March 31 showed exports of $514,927,000 and imports of $258,867,000, the former being $4,428,000 more and the latter $123,836,000 less than for the first quarter of 1907. The heavy decline in imports gives the unprecedented balance of trade for the March quarter of $256,059,807, the nearest approach to it being $164,060,645 for the first quarter of 1901. The falling off of $20,000,000 from the March exports of last year was almost entirely in agricultural products, cotton alone showing a decrease of about $18,750,000. The decline of nearly $44,000,000 in imports compared with March, 1907, is largely in luxuries.

Statistics of Great Britain's foreign iron and steel trade are available, showing that in the first quarter of the year the exports were 989,259 gross tons, as against 1,268,135 tons up to March 31, 1907. The falling off is about 279,000 tons, or 22 per cent. Of the decrease about two-thirds is contributed by pig iron, which fell off 181,000 tons, or from 483,000 tons to 302,000 tons. The flatness in the iron trade of the United States accounts for most of this, our imports of British pig iron in the first quarter of 1907 having been 180,273 tons and in the same period this year only 10,643 tons. Germany took 7000 tons less this year than last, to March 31, Belgium 15,000 tons less and Canada 13,000 tons less, while Italy increased its shipments from 41,000 to 48,000 tons, besides taking a few thousand tons this year from the United States. The principal declines in British exports of finished iron and steel for the quarter were 15,000 tons in rails, 15,500 tons in steel bars and angles, 34,000 tons in galvanized sheets and 24,000 tons, or 33 per cent., in plates.

Early in the present depression in American iron and steel a tremor went through the British iron trade in view of the possibilities of dumping. In the first quarter of this year anxiety gradually gave way to the belief that nothing serious in that direction was in store. In the past few weeks, in view of the disappointing course of both the American and German iron trades, the bugaboo of competition from both countries is once more conjured up by British pessimists.

A Notable Result of a Great Fire.

The city government of Chelsea, Mass., has voted to enact rigorous building laws before the erection of new structures shall begin to replace those destroyed. An exceptional opportunity for progressive action in this direction is afforded, constituting an outcome of the great fire of April 12 which should be far reaching in its effects as an example to other communities when their own ordinances are amended in keeping pace with the times. Chelsea is hemmed in between thickly built sections of the immediate suburbs of Boston, a location that has its duplications in all of the larger cities, especially those old enough to contain a large percentage of the ramshackle construction which characterized the buildings of the period before the means of fireproofing had been provided for.

A great area, approximating a square mile, thickly covered with buildings, has been completely destroyed, so that practically every wall will be razed before new construction can begin. There will be little difference between the old and the new city as to proximity of buildings, unless it be that density will be increased. Therefore the necessity for the application of the most modern ideas of fireproof or slow-burning construction is imperative. Anything but the strictest of building laws, founded on the most recent lessons taught by the science of design and materials, will result in the deteriorating influences which would again subject the city to the peril of conflagration should a combination of unfavorable conditions unite with fire. The opportunity exists to advance beyond the usual limits of building ordinances. Baltimore and San Francisco have done this as large cities. Chelsea can do it as a smaller community. The new construction will include factory, business and residential buildings, probably in somewhat haphazard combination as to location. Laxity of laws governing the building of one class of property will threaten those erected on better principles.

Modern progress in fireproofing materials and architecture has been very rapid. Concrete and metal have taken important places, while the difference in cost as compared with wood has grown less, partly because of the increase in price of lumber and partly because fireproof materials are less expensive, all things considered. The item of roofing alone shows a vast betterment.

With evidences of the great catastrophe on every hand, the city authorities must be impelled by circumstances if by no other motive to proceed with a strong hand in framing their new laws. Doubtless owners of property will co-operate with them, each to protect his own interests. A city built on the lines as suggested would benefit in many ways. Its class of tenants, both residential and industrial, would be higher. Insurance rates would correspond with the degree of fire risk. Property would deteriorate less rapidly. The cost of maintenance would be less.

Some impetus will be given the metal trades, directly and indirectly, by the rebuilding of Chelsea. Even if the new building laws do not depart from the ordinary, as compared with those of other cities, the benefit to trade will be considerable. But the greatest good, considered from all standpoints, business and otherwise, will come with modernizing the city's construction to the limit of judicious effectiveness as to protection from fire.

The Iron and Steel Works Directory.

The American Iron and Steel Association, 261 South Fourth street, Philadelphia, has issued the seventeenth edition of its invaluable *Directory to the Iron and Steel Works of the United States*, corrected to March 1, 1908. This edition of the directory embraces 516 pages, including the index, and forms a larger volume than any of its predecessors. It maintains the arrangement of the previous editions, giving a complete list of the blast furnaces, rolling mills and steel works in the United States. Classified lists are given of wire rod mills, rail mills, structural mills, plate mills, sheet mills, skelp mills, tin and terne plate works, Bessemer, open hearth and crucible steel works and steel castings plants.

This work from its inception has had a peculiar value in iron trade literature. It has been a fountain of information regarding the various plants of the country, and the new edition faithfully carries out the scheme which has always been in view. Whenever possible the history of each plant has been preserved, giving the date of its erection, with all subsequent additions to the plant, changes in ownership, if any, &c. In many instances the equipment of the plants has been more fully described than in previous editions and more attention has been given to the organization of companies, including the

capitalization and list of officers. An exact system of cross references, adopted in previous editions, shows the relation of each plant to other plants under the same ownership. The alphabetical arrangement of previous editions is retained. A comprehensive table of contents and a complete index are among the valuable features. The statement is made that in the preparation of this edition of the directory the services of four experienced clerks have been constantly engaged for 18 months. As the book is larger than any of the previous editions, the price has been advanced to $12 per copy.

Number and Capacity of Iron and Steel Works.

The following table gives the number and annual capacity of the various classes of iron and steel works as given in the *Directory* of 1904, compared with the figures in the present edition. The capacities are in gross tons:

	November, 1907.	June, 1904.
Number of completed blast furnaces (338 coke, 60 anthracite and coke, 50 charcoal)	448	428
Electric plants (pig iron, ferrosilicon, &c.)	7	2
Blast furnaces building and rebuilding	28	17
Capacity of completed blast furnaces	34,833,900	28,114,000
Capacity of charcoal furnaces (included above)	760,000	851,600
Completed rolling mills and steel works	598	572
Building and rebuilding rolling mills and steel works	15	13
Single puddling furnaces (a double furnace counting as two)	2,635	3,161
Heating furnaces	3,971	3,995
Capacity in finished products of completed rolling mills, double turn	31,599,930	25,978,050
Cut nail works connected with rolling mills	20	23
Cut nail machines in these works	1,765	2,302
Completed standard Bessemer steel works	30	32
Completed standard Bessemer steel converters	71	75
Capacity of standard Bessemer steel converters (built and building) in ingots and direct castings	14,818,000	13,551,000
Completed Tropenas steel works	20	10
Completed Tropenas converters	29	14
Completed Robert-Bessemer steel works	2	2
Completed Robert-Bessemer converters	3	3
Completed Clapp-Griffiths, Bookwalter, Wills, Zenzes and other special Bessemer steel works	18	7
Completed special Bessemer converters	28	11
Capacity of all kinds of Bessemer converters (built or building) in ingots and castings	15,020,200	13,628,600
Completed open hearth steel works	159	135
Open hearth steel works building	13	5
Open hearth steel furnaces (691 completed, 97 building and 3 partly built)	791	577
Capacity of these furnaces in ingots and castings	18,824,900	11,335,100
Crucible steel works (including two now building)	79	57
Steel melting pots in crucible steel works	4,573	3,606
Capacity of these pots in ingots and castings	295,385	226,610
Tin plate and terne plate works (two building in 1904)	43	55
Forges making iron blooms, &c., direct from ore	....	1
Capacity in blooms, double turn	....	6,000
Pig and scrap bloomaries which make iron blooms, billets, &c., for sale (one building in 1904)	11	9
Capacity of above in blooms, double turn.	64,200	41,300

Trade Publications.

Switches and Frogs.—Indianapolis Switch & Frog Company, Springfield, Ohio. Catalogue. Size 9 x 12 in.; pages 84. Cloth binding. Deals with switches and frogs and elaborates switching systems adaptable for railroads, street railroads and industrial railroads.

Ventilating Apparatus.—Warren Webster & Co., Camden, N. J. Folder. Describes the Webster air washer and humidifier, for cleaning and moistening the air supplies for heating and ventilating systems. It enables the air inlet to the fan to be connected to any convenient opening or window at the ground level, obviating the necessity of carrying air shafts to the roof.

Valves and Fittings.—Golder, Anderson Valve Specialty Company, Fulton Building, Pittsburgh, Pa. Catalogue No. 10. 5½ x 8 in.; 56 pages. Illustrates cushioned nonreturn valves, emergency check and hand stop valves, pressure reducing valves, Clean Seat valves, tilting steam traps, and controlling altitude valves which maintain a uniform quantity of water in steam pipes, reservoirs and tanks.

Recording Gauges.—Ashcroft Mfg. Company, New York. Circular. Illustrates and describes the Edson pressure recording gauge for recording steam, air, gas, water, ammonia and all fluid pressures.

Iron Castings.—Maher & Flockhart, 60 Polk street, New York, N. Y. Catalogue. Shows examples of work done, including various designs of sewer and park castings, which are a specialty in addition to the regular line of light and heavy machinery castings.

Corliss Engines.—Murray Iron Works Company, Burlington, Iowa. Pamphlet, Series D, No. 7. Entitled "Nomenclature of Murray Corliss Engines." Illustrates standard engines by half-tones and particularly complete line drawings, with the name of each part designated.

Mining Machinery.—The Christman Company, Massillon, Ohio. Catalogue. 6 x 9 in.; 100 pages. Contains illustrations of a number of the company's oil, gas and water well drilling machines, tools and accessories, mine cars, conveying apparatus and mining supplies.

Upright Drills.—J. E. Snyder & Son, Worcester, Mass. Catalogue; 6 x 9 in.; 51 pages. Illustrates various types and sizes of upright drills, ranging from 20 to 30 in., showing standard drills with tapping attachments, automatic stop, power feed, back gears and motor drives, separately and in combination. Also illustrates the Currier reaming machine described in *The Iron Age*, December 26, 1907.

Water Tube Boilers.—Franklin Boiler Works Company, Troy, N. Y. Catalogue; 7 x 10 in.; 32 pages. Briefly describes the Franklin boiler, showing longitudinal sections and contains interesting information, such as how to ascertain the space necessary for installing Franklin boilers of a given horsepower, and illustrates methods of installing boilers in partly constructed plants.

Heavy Milling Machines.—Ingersoll Milling Machine Company, Rockford, Ill. Catalogue No. 16; 6 x 9 in.; 64 pages. Illustrates various types of heavy milling machines with from one to four spindles in sizes from 20 in. wide up to 10 ft. wide, suitable for all kinds of very light to very heavy milling. The catalogue is mostly pictorial, giving over 50 illustrations, and only brief descriptions of each different machine.

Motors and Generators.—Mechanical Appliance Company, Milwaukee, Wis. Bulletins. No. 60 describes very completely the Watson multipolar motor and generators, and No. 61 is an album of motor applications to various types of machinery, including machine tools, ventilating fans, vacuum cleaning pumps, laundry machinery, linotypes, &c.

Gas, Gasoline and Alcohol Engines.—Dean Gas Engine & Foundry Company, Newport, Ky. Catalogue No. 7; 6 x 9 in.; 40 pages. Describes Dean engines suitable for operating on gas, gasoline or alcohol, and made in 5, 8, 15, 25 and 35 hp. sizes. This book is novel in that it contains a series of questions which have been asked from time to time by prospective consumers, with answers made by the company, and these questions cover nearly every important point that comes up in the purchase of a gas engine. A point is also made of giving the cylinder sizes as evidence that the engines are not overrated in their power capacity.

Portable Engines and Sawmills.—Enterprise Mfg. Company, Columbiana, Ohio. Catalogue. Shows different sizes of portable engines, with tabulated specifications, and sawmills, also gives directions and advice as to setting up and operating mills.

Automatic Engines.—Enterprise Mfg. Company, Columbiana, Ohio. Pamphlet. Illustrates standard types of automatic engines and contains tabulated specifications of engines of from 25 to 225 hp. capacity.

Electric Pyrometers.—William H. Bristol, 45 Vesey street, New York. Catalogue No. 20, including bulletins 20 to 24. Describes electric pyrometers for blast furnaces used for indicating and recording hot blast and top gas temperatures. Illustrations show various recording instruments made by the company and specimen records, scales and charts. The bulletins are devoted to testing equipments for laboratory use.

Steel Split Pulleys.—Pennsylvania Pulley Company, Pittsburgh, Pa. Folder. Treats of steel split pulleys from 12 to 60 in. in diameter and contains price-list and a few illustrations of larger sizes.

Culverts.—Isham Miller Company, Butternut, Mich. Booklet. Devoted to the company's line of cast iron expanding culverts, which are made in sections, with expansion joints, the sides being locked to the bottom with angle points, leaving the culvert free to expand at the top, which is protected with a cap to exclude rubbish and small stones.

Chain Hoists.—Reading Chain Block Company, Reading, Pa. Folder. Describes multiple gear chain hoists and illustrates various sizes.

New Low Cost Copper Mines.

The Boston *News Bureau* believes that a new era in copper is at hand, and makes the following statement regarding current developments in copper production:

It was only five years ago that it was discovered that the big porphyry deposits in the Bingham-Utah camp, for years regarded as waste rock, could be treated at a commercial profit and an average of 25 lb. of copper per ton of rock recovered, and now the Utah Copper Company, controlling this vast deposit, is turning out nearly 4,000,000 lb. of copper per month, and should soon be outputting 5,000,000 lb., enlarging its plant to a capacity even greater than the latter figure. About three years ago the big porphyry deposits of Ely, Nev., were discovered, since which time the Nevada Consolidated Copper Company and the Cumberland-Ely Company (both controlled by the Guggenheims) owning these deposits, have expended $15,000,000 in preparation for mining. Production should commence within a comparatively few weeks.

Four Cents Below Last Year's Average Cost.

These big deposits in Bingham and Ely have been the only large sources of new copper supply discovered in the past five years, and their development has been watched with great interest by the mining world. It opens a new era in copper, for it means an enormous production at a figure about 4 cents per pound lower than the average cost of a majority of the producing mines last year. A minimum cost is, of course, the aim of all the mining companies, yet with the old producers, especially at Lake Superior and in Butte, as depth has been attained costs have been creeping upward, until in many instances they are now as high as 12 cents per pound. It stands to reason that in times of restricted consumption and necessity for low costs the deep mines of Butte and Lake Superior, which, combined, have been contributing well over 500,000,000 lb. of copper per annum, are at some disadvantage in comparison with the low cost producers in Ely and Bingham.

One of the leading interests in the Bingham and Ely properties figures out that these three Guggenheim properties within two years will be producing at the rate of 300,000,000 lb. of copper per annum, for it is not a question of ore, but of the building of reduction works. Rarely, if ever, in the history of copper mining have there been plans of such magnitude as those prepared by the Guggenheim engineers, which, if carried out, will result in the smelting end of the Guggenheim business being made subservient to the mining end.

By the fall of 1908 the Utah Copper, Nevada Consolidated and Cumberland-Ely companies should be producing copper at the rate of 110,000,000 to 120,000,000 lb. per annum, and this copper will come on the market no matter at what price the metal is selling. The Utah Copper Company is now handling 6000 tons of ore per day, and producing copper at the rate of over 40,000,000 lb. per annum, and yet only nine sections out of 12 in its 6000-ton concentrator at Garfield are in operation.

The Ely Companies Soon to Be Producing.

As the success of the Utah Copper Company seems assured, attention is diverted somewhat to the Ely companies, which are fast approaching the producing stage. The big Steptoe Valley reduction works, owned jointly by the Cumberland-Ely and Nevada Consolidated companies, should go into commission the early part of May, when the first section of the concentrator will start up and treat 1350 tons of ore per day. By July the entire present concentrator capacity of 4000 tons should be in operation, and also the 2000-ton smelter, and the indications are that the capacity of these works will be doubled during the coming year.

The Nevada Consolidated has already blocked out in its 850 acres 14,450,000 tons of ore, which will average 40 lb. of copper to the ton. Churn drills have also proved up wholly or partially many million additional tons. The Cumberland-Ely Company, with its 498 acres, has not been developed to the same stage as the Nevada Consolidated. Its principal work has been upon what is known as the Veteran claims, but this development of but a year has brought into sight about 4,000,000 tons of ore, of which 1,800,000 tons have been blocked out on three sides, the average assay of the entire ore body showing a possible recovery of between 50 and 60 lb. of copper to the ton.

Both these companies are now prepared to furnish 2000 tons of ore per day to the Steptoe plant, and when the works are in position to take such a tonnage, some time in July, the Cumberland-Ely should be producing copper at the rate of 30,000,000 lb. per annum and the Nevada Consolidated from 20,000,000 to 25,000,000 lb.

A Profitable Ely Railroad.

The Nevada Consolidated and Cumberland-Ely own jointly the Nevada Northern Railroad. Earnings from this railroad and profits from the treatment of custom ores are expected to return the companies net profits of $1,750,000 per annum, independent of the price of copper. This sum would be equal to 75 cents per share for the Cumberland-Ely Company, with its 1,300,000 shares, and 50 cents per share for the Nevada Consolidated Company, with its 1,600,000 shares (assuming the conversion of the recent issue of $3,000,000 of bonds into 300,000 shares of stock). It is planned eventually to extend the railroad to Goldfield, which extension would add materially to earnings.

The campaign of development which has been pursued by the Utah Copper Company in Bingham and the Cumberland-Ely and Nevada Consolidated companies in Ely has been on a tremendous scale. Steam shovels and four compartment shafts are contributing factors in putting these companies in position to place millions of pounds of new copper production on the market at a cost of 8 cents per pound.

Mexican Chambers of Commerce.

The Mexican Government is about to take a radical and paternalistic step in the direction of promoting commerce and industry, by assisting local business men in the most important cities in the formation of chambers of commerce, whose functions will be of a varied and somewhat complicated character. The members will act in a co-operative way with the Department of Finance, which will decide as to the number of the members forming the local associations according to conditions in each locality. The chambers are to be known as Camaras Nacionales de Comercio. Their efforts will be directed as follows:

To promote and direct commercial exhibitions.

To establish, either under their own or the Government's auspices, commercial museums in and out of the country.

To establish and maintain commercial relations with the other chambers of commerce at home and abroad.

To promote the celebration of conferences at which all the different chambers will be represented.

To act as arbitration courts to decide on litigations among merchants which may be submitted to them.

To give their friendly mediation in cases of trouble among employers and employees.

To execute liquidations in an unofficial way.

To promote commercial, industrial and maritime education, providing lectures, publishing studies, granting prizes to the best works on commerce and transportation; giving subsidies to students and sending them on instruction trips.

To issue periodicals containing all the local and foreign information which may be of interest to the merchants, and especially all the regulations, orders, &c., issued by the Federal and local governments.

To form, at the beginning of each year, a list of experts, who will be selected by judges, to report on commercial affairs.

To organize information bureaus in order to give the merchants all the information obtainable on commercial affairs.

The idea originated with the resourceful Minister of Finance, José Y. Limantour, who believes that by the method indicated, the commerce of the country can be greatly increased, and many obstacles which at present exist can be overcome.

The Railroad & Car Material Company, 802 Bessemer Building, Pittsburgh, has been appointed general sales agent for E. R. Caldwell & Co., Bradford, Pa., manufacturers of brake shoes and gray iron castings, and has also secured the agency for the Timm's patent dust guard, manufactured by the American Dust Guard Company, Columbus, Ohio.

Traffic Clubs.*

BY W. B. EVEREST.

A little more than six years ago the Traffic Club of Pittsburgh was organized. Its charter members were imbued with the spirit of co-operation, which was before that time abroad among the local traffic representatives of the carriers and the shippers. The object of the club, as briefly stated in its by-laws, is "to promote good fellowship among its members and close relationship between the steam transportation and industrial organizations in the Pittsburgh District." Adhering strictly to this principle we have not taken issue with any questions which have disturbed the business of the country. We have rather given our first thought to home culture, and, like the home missionary, we seek to do first the work found waiting at our doors

The Industrial Traffic Man Works Directly with the Railroads.

While thus avoiding aggressive work on the outside, the marked individual interest of each member in the success of the club and its principles has won for us a place in our own community of which we may be justly proud. It is a notable fact that while others are employing counsel or seeking aid through trade organizations, placing their grievances in the hands of special committees, appealing to the Interstate Commerce Commission, or through State commissions, the Pittsburgh traffic man usually adjusts his troubles at home by conferential discussion as between man and man.

Without permanent quarters we claim the great Pittsburgh District as home. The club is not self-centered, but has been eager to discuss questions of live interest to the traffic world at large. The club councils and the family circle meetings have been looked upon as events always helpful to those in attendance. A marked fraternal spirit has pervaded the membership, and the hand offered in greeting is felt to have had the heart behind it. The furthering of the club's aims and principles has benefited and relieved distressed business conditions times without number. At our bimonthly meetings we have not turned to light entertainment, but have been instructed and directed by men of prominence, who have addressed us on many topics touching our daily business lives. In all this we have sought and feel assured of the approbation of our superior officers, who are favoring us with their presence here to-night.

It has been recognized more and more that direct representation in traffic matters on the part of the shippers is quite as necessary as commercial representation by the railroads. No shipper handling a traffic of any magnitude can regulate the many difficulties arising outside the horizon of the local line agent without the assistance of the commercial representative or the traffic officials, who may find it necessary to make a ruling which, in the eyes of the line agent, would appear to be a violent fracture of what is to him as the laws of the Medes and Persians, because he works only by the book, which instructs him to receive, forward and deliver under fixed rules or conditions.

Co-operation Work Through Traffic Clubs.

There are registered in accessible form to all interested the names and connections of over 3000 industrial traffic managers throughout this country. Many of the railroad and industrial representatives are to-day enjoying the benefits and aiming at co-operative work through traffic clubs, which have been formed in other cities following the same lines of organization and declaring for like principles and purposes as the Pittsburgh Club, the first in the field. In New York, Chicago, St. Louis, Cleveland, St. Paul, Toledo, Kansas City and Philadelphia the traffic club spirit we confidently expect will accomplish the same results as in Pittsburgh, and we count it a special pleasure to welcome any of those among our guests who have come to us from those other clubs, and beg that you will take home with you from Pittsburgh a message of good fellowship.

We believe traffic clubs are institutions created out of the necessities of the times, and their description and plan of procedure might be likened to a railroad system:

The line along which they travel, the national highway of mutual interests;

The roadbed founded on the commerce clause of the Constitution of the United States, and

The right-of-way hemmed in by guard rails of the Cullom-Hepburn-Elkins and Sherman pattern.

The two main terminals are freedom of commerce and commercial expansion. The vehicle is co-operation, and the operators are the carriers and the shippers, who should each ask the other—Is there anything we have failed to do that we should have done? What is our duty? Have we done anything that we should not have done, or what is it that in justice and reasonableness to both sides is yet required?

We have always before us many problems for mutual consideration, among which are the following:

Proper methods of marking and packing.
Uniform car service rules under like conditions.
Proper station facilities.
Sufficient terminal service.
Reasonable rules and regulations.
A clearing house for overcharge claims.
Water and canal competition.
Preparation for future expansion.
Uniform bill of lading.
Instrumentalities of transportation.

We of the Pittsburgh Traffic Club realize that men and things are usually in the end estimated at their true value. We know that any factor in the world's work is measured by the principle and purpose at its center. We stand firmly on the doctrine of co-operation between carriers and shippers, and believe it to be essential to commercial peace and progress.

Our work here will continue, not only in spirit, but in action, along the lines of co-operative team work. We confidently hope that, added to the group of clubs throughout the country, other traffic clubs will rise and shine, each a particular star in the firmament of our world of industry and transportation. When all our ambitions and aspirations belong to the past, when the fulfillment of all things is accomplished, when the last pages of the book of time are reached and the tale of man's little moment of flickering activities shall culminate in that history recording all our deeds, after the place is reached showing the sum total of all our successes and all our failures, no brighter page will be found than that recording the lives of those who have in their relations to others always practiced unselfish co-operation.

* Extract from an address before the Traffic Club of Pittsburgh, April 3. Mr. Everest, who is traffic manager of the Westinghouse Electric & Mfg. Company, is president of the club.

The A. S. M. E. Papers.

A partial list of the papers to be presented at the semiannual meeting of the American Society of Mechanical Engineers in Detroit, Mich., June 23 to 26, has been announced. It includes "A Method of Cleaning Gas Conduits," by W. D. Mount; "A Method of Checking Conical Pistons for Stress," by Prof. George H. Shepard; "Clutches, With Special Reference to Automobile Clutches," by H. Souther; "Horsepower, Friction Losses, and Efficiencies of Gas and Oil Engines," by Prof. L. S. Marks; "Some Pitot Tube Studies," by Prof. W. D. Gregory; "The Thermal Properties of Superheated Steam," by Prof. R. C. H. Heck; "A Journal Friction Measuring Machine," by Henry Hess; "A By-Product Coke Oven," by W. H. Blauvelt, and "Tests of Some High Speed Steam Engines," by F. W. Dean. As has already been stated, there will also be a symposium on conveying machinery. The Society for the Promotion of Engineering Education and the Society of Automobile Engineers will hold their annual meetings in Detroit at this time.

The Wheeler Condenser & Engineering Company, Carteret, N. J., has arranged with Charles S. Lewis & Co., Granite Building, Fourth and Market streets, St. Louis, Mo., to handle its products in the State of Missouri.

The Ore Trade Still Quiet.

DULUTH, MINN., April 18, 1908. The lakes are free from ice, and the season is unusually advanced for the Northwest. Package freight ships will be moving from both ends of the lakes in a week, as soon as insurance is on, but there is still no move toward the ore trade. No outfitting has begun anywhere for ore vessels. As far as can be ascertained here there are no inquiries for ore, no sales and no tonnage contracts for any ports. The cities near iron mining districts are filling up with mining men, engineers and superintendents, chiefly from independent companies, who are out of work, their mines having been closed. The Oliver Iron Mining Company is retaining most of its engineers and superintendents and is carrying on the customary amount of preparation, but few others are doing any work that it is not necessary.

Curtailment on the Menominee.

In the Stambaugh District of the Menominee Range there has been a severe curtailment of operations the past week. The mines to close include four properties of Oglebay, Norton & Co.—the Chatham Nos. 1 and 2, the Berkshire and the Lenox—as well as the Youngs, belonging to the Huron Mining Company. Other mines may close soon. These five reduce the operating force in the district by about 275 men. In the Crystal Falls District, close beside Stambaugh, the Corrigan, McKinney & Co. properties are running very slowly, and the Bristol will make a second and drastic curtailment this week. The Commonwealth and Traders will close soon. Neither of these has been doing much this winter.

At Norway the old Norway mine is closing down, but temporarily only, in order to give opportunity for the installation of the new electric pumping and hoisting system that the General Electric Company has been installing. While the mine is idle the married men working there will be employed at the properties of the same company nearby.

Mines of the Menominee Range which have not closed, and, so far as can be determined, do not expect to, will not resume shipments any earlier than those of the Mesaba—that is, about June 1 to 15. Indeed, this is true of all districts along Lake Superior.

Mine Improvements.

The Foundation Company, New York, which has been putting down a concrete reinforced shaft at the Smith mine of the Cleveland-Cliffs Company at Gwinn, is to sink two similar shafts for the same company in the same district. It is about 100 ft. to ledge where these will go down, and the surface is very wet and quick. These concrete shafts are costly, running from $500 to $750 a foot, but they are sure, and so far the Foundation Company has met with no failures in the Lake Superior region, though it has sunk three very difficult shafts to date.

Butler Bros. have commenced stripping the Virginia Oliver property, leased to M. A. Hanna & Co., and will take off about 1,000,000 yards. The contract will not be completed for some years. There is no great depth of overburden, but the mine is a fairly large one and covers considerable area. Tracks have already been laid to the property, which lies just northwest of the Oliver Company's Alpena, and the removal of dirt with one shovel will commence in a few days. On account of the configuration of the ground it will be impossible to use more than a single shovel for some time, and no shipments will be made this season. Aside from some of the work of the Oliver Company in stripping and development at its western Mesaba mines, this is the most important stripping operation under way on the range.

Diamond drill exploration is to begin once more, on what is supposed to be a western extension of the Vermilion Range, some 20 miles north from Hibbing, in T 60-20, and 21. There is no question that ore exists there, but to what extent and of what quality has not been satisfactorily determined. As far back as the year when State Geologist Winchell made a report on the Mesaba, in 1892, he noted the presence of low grade iron ore in these townships, and at various times since then explorations have been carried on there, always with no success. Some of these were well backed with funds, the Great Northern Railroad having been one of the exploring syndicates.

While the Nassau mine of the Pittsburg Iron Ore Company will not operate this year its La Rue will be operated heavily. A contract for stripping and mining on this property has recently been let to Butler Bros., and they are assembling materials for the work.

Water Difficulties in Some Mines.

It is stated that Pickands, Mather & Co. will attempt to enjoin certain head of the lake lumber interests from raising the water in flowage dams on the Embarras River, on account of the fact that this water backs up into the Bangor and Syracuse mines, and makes it impossible to operate them economically. It may be impossible for the mining company to secure an injunction if the lumber company has State laws or legislative rights for its dam, as is extremely probable. The lumber company had its dams there many years prior to the opening of these mines, and would be considered to have prior rights, if under the law. The fact remains that the operation of these mines is exceedingly precarious on account of the immense volume of water troubling the company, and it is evident that the water backs up into both mines through the heavy quicksands and boulders connecting them. It is impossible to pump out the river or the dam, when filled for the flowage of logs, and it is a serious problem for the mining company. The mining company has been making experiments tending to determine that the water that has bothered them comes directly from the lake formed by this dam, and claims to be amply assured of this point.

On account of the lack of work, especially for them, the various labor agitators of the Western Federation of Miners who have been on the Mesaba since the close of their last year's strike have about all left for greener pastures, and the range is at last free from any of their talk. This is one of the gains from a dull season.

The Oliver Iron Mining Company put a large force of men at work in its Blue mine at Negaunee this week, and will open extensively underground. The mine has been under repairs for some time, and will ship heavily when the season opens.

In regard to the possibility of a transfer of the Corrigan, McKinney & Co. mines to the Steel Corporation, it will be remembered that this was given in this correspondence as a mere rumor, and so distinctly stated. No direct statement that such a sale was made or was in contemplation was ever printed in *The Iron Age*.

D. E. W.

Moose Mountain to Have a Railroad.

TORONTO, April 18, 1908.—In the closing days of the session that has just ended, the Ontario Legislature passed an act authorizing the Government to give the guarantee of the province that the principal and interest of a 40-year 3½ per cent. bond issue of the Canadian Northern Ontario Railway Company will be paid. The total amount of the issue is to be $2,500,000. The phase of the transaction that makes mention of it specially interesting is the fact that the Moose Mountain iron deposit is the objective of one of the short branches for whose construction the bond issue is to provide. The main line from Toronto to Sudbury was built with the proceeds of a bond issue guaranteed by the Ontario Government up to $20,000 a mile. When the extension to Moose Mountain and Garson mines is completed the railroad will be in a position to ship ore to Toronto or any other point on its system. Since the money stringency began little has been heard as to the company's plans for building great iron and steel works in Ashbridge's Marsh, Toronto. Another point to which a short branch line, covered by this new bond issue, is to be extended is Key Inlet on Georgian Bay. At the company's terminus there ore might be loaded on vessels to be carried up or down the lakes, or it might be smelted in furnaces there, as has been suggested. In the Legislature the utility of the new branches for the developing of the iron ore deposits was strongly dwelt on by the Government.

C. A. C. J.

PERSONAL.

Walter H. Jenkins has been added to the sales force of the Youngstown Car Mfg. Company, Youngstown, Ohio, in charge of the Chicago office, rooms 934-935 Monadnock Building.

Dr. M. E. Wadsworth, dean of the school of mines and professor of mining and geology in the Pennsylvania State College, was elected last year dean of the school of mines and professor of mining geology in the Western University of Pennsylvania. The call was accepted with the understanding that he was to hold both positions and to discharge the necessary duties of both until September 15, 1908, when he would take up his permanent residence in Pittsburgh. This was done so as to give the authorities of the Pennsylvania State College sufficient time to select a suitable successor. The Western University having purchased a new site near the Hotel Schenly, Carnegie Institute, and the Technical Schools, Dr. Wadsworth has completely reorganized the school of mines, and prepared plans for the new $175,000 mining building, which is to be erected next summer.

Alfred Sang, vice-president of the Garland Nut & Rivet Company, Pittsburgh, Pa., is making a tour of England and France. Mr. Sang is the inventor of a galvanizing process.

Dr. Charles S. Howe, president of Case School of Applied Science, has been elected president of the Chamber of Commerce, Cleveland.

Archibald Johnston, president of the Bethlehem Steel Company, is expected back from Europe this week.

W. J. Culletin, superintendent of the Broad Ford Valley plants of the H. C. Frick Coke Company, has been appointed superintendent of the company's new Phillips plant, which is now nearly complete.

H. B. McMasters has resigned his position as secretary of the General Fireproofing Company, Youngstown, Ohio, effective May 1.

E. E. France has resigned as treasurer of the Seneca Chain Company, Kent, Ohio. M. G. Garrison will act as treasurer until the annual meeting.

P. N. Guthrie, Jr., has been appointed general sales manager of the Longmead Iron Company, Drexel Building, Philadelphia, whose tube works are at Conshohocken, Pa. He has heretofore been Pittsburgh representative of the company.

The class day address to the class of 1908 of the Michigan College of Mines, Houghton, Mich., will be delivered Friday, May 1, at the college gymnasium by Dr. Charles Richard Van Hise, president of the University of Wisconsin. The class dinner will take place the following evening.

Herbert J. Burrough of the Builders' Iron Foundry, Providence, R. I., has returned from a three months' European trip.

Eliot A. Kebler, in addition to being manager of the Pittsburgh office of Matthew Addy & Co., Farmers' Bank Building, Pittsburgh, has been made manager of sales for that firm, with headquarters in Cincinnati.

David Halstead, treasurer of the Carver File Company, Philadelphia, sailed from New York, April 18, for a two months' trip abroad.

The Philadelphia Roll & Machine Company, Philadelphia, has appointed Charles R. Bryson its Western agent, for the sale of sand and chilled rolls, rolling mill equipment and charcoal iron air furnace castings, with headquarters at 501 Curry Building, Pittsburgh.

Rust Preventives.—In a communication to the *Engineering Record*, Dr. Allerton S. Cushman, assistant director, Office of Public Roads, Department of Agriculture, Washington, D. C., refers to the suggestion in his recent pamphlet on the corrosion of iron that slightly soluble chromates should be theoretically the best protectives to apply to iron and steel surfaces. It is found, however, that owing to included impurities many commercial chrome pigments stimulate rather than inhibit corrosion. Zinc chromate and a pigment made by precipitating barium and calcium chromates give good results in the absence of impurities, and Prussian blue has been used effectively. Referring to the fact that patents have been applied for on a combination of zinc chromate with linseed oil as a coating for iron and steel, Mr. Cushman says that in view of the general publication of the results of his experiments he does not think such a patent would be justified, and adds that it would be a mistake, in case these inhibitive formulæ prove of high protective value, to have their general use tied up by individual patent claims.

OBITUARY.

William L. Grout, Greenfield, Mass., for many years a prominent figure in the sewing machine industry, and for a long time head of the New Home Sewing Machine Company, Orange, Mass., died April 15. He was born in Winchendon, Mass., in 1833, and passed his early years on a farm. He started the manufacture of sewing machines at Templeton, Mass., in 1860, in company with Thomas White, founder of the great sewing machine business that bears his name. They did not remain together long, but both continued in the industry. Mr. Grout established a number of factories at different times. Shortly after the Philadelphia Centennial Exposition he purchased the Home sewing machine patents and in 1878 went to Orange and assumed charge of the business. The Grout Automobile Company, Orange, was named for him. He was noted as an inventor. He was twice married and leaves four sons and two daughters.

Andrew H. McNeal, Burlington, N. J., who has been prominently identified with the manufacture of cast iron pipe for a number of years, died at his home in Ashbourne, Pa., April 17, aged 67 years. Mr. McNeal and his father operated the pipe works at Florence, N. J., which was later purchased by R. D. Wood & Co. He was for some years prominently connected with the United States Cast Iron Pipe & Foundry Company, Burlington, N. J., and later assisted in the formation of the Standard Cast Iron Pipe & Foundry Company, Bristol, Pa., with which he was connected at the time of his death. He leaves a widow and four daughters.

Lester A. Pelton, inventor of the Pelton waterwheel, died at Oakland, Cal., March 15, aged 78 years. He built the first wheel to develop power for mining work in California.

A. L. Boughton, secretary of the Standard Sand & Machine Company, Cleveland, Ohio, died April 12 of pneumonia, aged 37 years.

S. B. Rawson, a prominent manufacturer of Elyria, Ohio, and president of the Dean Electric Company in that city, died April 9, aged 60 years.

Major Charles D. Rhodes, for the past two years, until last January, Cleveland sales agent of the Lackawanna Steel Company, died April 16 at a hospital in Sharon, Pa., aged 62 years. While in New York on January 22 last he suffered a stroke of apoplexy. When he had partially recovered from that attack he went to Sharon to live with a daughter.

The Pickands-Magee Company, Frick Building Annex, Pittsburgh, will add to its present list of coke operations a 40-oven plant, located on the Sewickley branch of the Pennsylvania Railroad. This plant adjoins the Mammoth and Calumet properties of the H. C. Frick Coke Company, in the old Connellsville basin. The company will operate it as the Magee Coke Company and will produce high grade foundry coke. Shipments will be commenced early in May.

At the annual meeting of the Providence Branch of the National Metal Trades Association, Herbert J. Burrough, Builders' Iron Foundry, was elected president; Henry D. Sharpe, Brown & Sharpe Mfg. Company, vice-president, and John G. Aldrich, New England Butt Company, treasurer.

NEWS OF THE WORKS.

Iron and Steel.

The Knoxville Iron Company, Knoxville, Tenn., after being closed down during the dull spell, has resumed regular running.

Announcement is made by the management of the Fort Worth Iron & Steel Company, Fort Worth, Texas, that the entire force has been taken back and work resumed for at least three days of the week for the immediate future.

The Republic Iron & Steel Company banked its Hall Furnace in the Shenango Valley last week. It had been in blast since March 1, after an idleness of several months. The company's No. 1 Haselton furnace in the Mahoning Valley was banked last week. It now has in operation two Haselton furnaces and two pioneer furnaces at Thomas, Ala.

Furnace B of the Northwestern Iron Company, Mayville, Wis., has gone out of blast for repairs to the lining.

Furnace B of the Buffalo Union Furnace Company, and Dover Furnace of the Penn Iron & Coal Company, Canal Dover, Ohio, have recently been equipped with new blowing engines and condensers.

The furnace of the Sloss-Sheffield Steel & Iron Company, at Florence, Ala., has been blown out for relining.

The trustees of the Quinn Furnace Company, Gadsden, Ala., recently appointed by the Federal court, will operate the plant. Repairs have been commenced, and the furnace will probably be in operation within 90 days.

The Tidewater Steel Company's blast furnace at Chester, Pa., which the Pennsylvania Steel Company has been operating under lease since January, 1907, in the production of spiegeleisen, was blown out April 17. The lease has expired, and the furnace property reverts to the receivers of the Tidewater Steel Company.

General Machinery.

A new plant is in course of construction at South Houston, a suburb of Houston, Texas, for the Tandem Gas Engine Company of that city, which has been incorporated with a capital of $50,000, of which $25,000 is paid in.

The Wilmington Iron Works, Wilmington, N. C., is in the market for a pulley molding machine and a machine for turning and boring pulleys.

Couch & Duff, Booneville, Ky., will place on the market the Little Giant well drilling machine, the invention of J. E. Couch. The parts of the machine will be made by contract by the Eagle Casting Company, Winchester, Ky., and will be assembled at Booneville.

The Coal-Briquette Machine Company, Oshkosh, Wis., has increased its capital stock from $5000 to $10,000. The company has developed a new briquette machine, which weighs 7 tons and has a rated capacity of 100 tons of briquettes in 24 hr. It is designed to exert a compressive force of 4000 lb. to the square inch. The machine is the invention of W. H. Wymao. The officers of the company are Leander Choate, president; W. J. Hay, vice-president; W. W. Waterhouse, secretary; R. C. Brown, Jr., treasurer.

The Canton Valve & Mfg. Company, Canton, Ohio, has been incorporated with a capitalization of $10,000, by James L. Amerman and others.

Power Plant Equipment.

The Tofte Boiler & Sheet Iron Works, Houston, Texas, has been incorporated, with a capital stock of $40,000, by H. H. Tofte, Frank Wilberg and W. E. Nicholson.

The Sherbrooke Power, Light & Heat Company, Sherbrooke, Que., Canada, whose plant is now operated by two 500-kw. 60 cycle generators, direct connected to water wheels of 875-hp. capacity each, expects within a few months to install another unit of the same kind and size. A. Sangster is superintendent of the company.

An issue of $50,000 has been voted by the citizens of Ruston, La., to provide funds for making improvements and extensions to the light and water plant. J. S. Bond is Mayor.

Plans are being prepared by M. A. Earl & Co., Muskogee, Okla., for water works systems at Deshler, Neb., to cost about $16,000; Hildreth, Neb., $15,000, and Blomington, Neb., $14,000. Figures will be taken on all of this work in the near future.

The town of Dixon, Tenn., has through the sale of bonds provided a fund of $25,000 for the construction of a system of water works. Plans and specifications for this improvement have not yet been drawn, nor has any of the material been purchased.

The N. & S. Electric Company, Seattle, Wash., has been incorporated with a capital stock of $24,000, the incorporators being Robert Wilhelm and Wilson Niedergesaess.

A bond issue of $42,000 has been authorized by the citizens of Concordia, Kan., for the purpose of making important improvements and extensions to its water works system. Plans include the purchase of about 4 miles of 6 to 12 in. water pipe, 25 or 30 fire hydrants, water gates, large service pump, 1,000,000 gal. capacity or over; one new boiler, and a stand pipe 25 to 35 ft. diameter, 75 to 100 ft. high. The erection of a large brick smokestack is also included in the proposed improvements. W. C. Whipp is Mayor.

Bids will be received until May 4 by the clerk of Milan, Mich., for constructing a water works system, including storage reservoir complete, elevated steel tank, power house and power equipment, about 25,000 ft. of cast iron pipe, valves, hydrants, &c.

The Parker Boiler Company, Philadelphia, Pa., has recently completed installations of two 198-hp. boilers for the George Zeigler Company, Milwaukee, Wis.; 202-hp. boiler, Walter Brewing Company, Pueblo, Colo.; two 411-hp. boilers, Colorado Ice & Cold Storage Company, Denver, Colo.

Foundries.

The Pratt & Letchworth Company, Buffalo, N. Y., is erecting a modern pattern shop, 60 x 150 ft., of iron, brick and cement, making it practically fireproof. The company is also erecting a fireproof vault for the storage of patterns.

The Central Foundry & Mfg. Company, Collinsville, Ala., is erecting a building, 50 x 150 ft., for the manufacture of wagons, plows, sad irons, grates, &c. In addition a general foundry business will be conducted. The shop will be ready for operation in about 60 days. The greater portion of the equipment has been secured.

The Union Steel Casting Company, Pittsburgh, is making some large additions to its plant, including the erection of an extension, 45 x 180 ft., to its finishing shop, and a new pattern and storage building, doubling the capacity of this department. Extensive changes are being made in the power plant, including the installation of a compressor to supply power for air tools throughout the plant; and two 140-hp. gas engines will be included in the new installation. A special planer for machining the heads of locomotive frames will soon be placed in position. A 10-ton electric crane will serve the new finishing shop. The cost of the new improvements will be between $50,000 and $60,000.

Bridges and Buildings.

The Southern Structural Steel Company, San Antonio, Texas, has been organized with a capital stock of $100,000 for the purpose of manufacturing structural steel and iron. The incorporators are B. F. Youngblood, G. L. Youngblood and W. M. Cornett.

Fires.

The plant of the Pembroke Light & Power Company, Pembroke, Maine, was damaged $10,000 by fire, April 11.

The pumping station of the water works at Newport, Ky., was burned April 12, the loss being about $12,000.

The edge tool factory of the Whitman & Barnes Mfg. Company at St. Catharines, Ont., was badly damaged by fire April 16.

The foundry of the Washburn Steel Casting & Coupler Company, Minneapolis, Minn., was damaged $6000 by fire, April 15.

Miscellaneous.

The Comee Metallic Packing Company, Stevens Point, Wis., recently organized for the manufacture of metallic packings especially adapted for service on railroad locomotives, has been incorporated with a capital stock of $50,000. The officers are C. H. Curtis, president, and J. F. Comee, vice-president and general manager.

The freight car repair department of the Atlantic Coast Line Railroad at Waycross, Ga., has opened up its new shops with 100 men. Tools and material are being rapidly transferred, and it is regarded as probable that the entire shops will be open in a few days, when 2000 men will be employed in all departments.

The firm of Oltmans Schmidt & Co., Peoria, Ill., iron and wire workers, has been incorporated with a capital stock of $7500. The incorporators are Herman Oltmans, Charles J. Schmidt, Antonio F. Voelker.

A contract has been let by the Portland Gas Company, Portland, Ore., for the construction of a 13,000-bbl. oil tank.

The H. H. Clough Company, Elyria, Ohio, has incorporated with a capital stock of $1,000,000 to manufacture concrete specialties under patents of H. H. Clough. The company will erect a plant at Amherst, Ohio, for which a 150-ton hydraulic press has been purchased for making the steel molds in which the concrete is formed. A feature of the business will be the manufacture of the specialties on a series of railroad cars at the place for which the product is required.

R. G. Wright & Co., manufacturers of dairy machinery, Buffalo, N. Y., will erect a five-story factory and warehouse at Eagle and Oak streets, and equip it for an increased output of their products.

We are advised that the report that the Youngstown Car Mfg. Company, Youngstown, Ohio, had received a contract for 40 coal cars for the United States Naval Coal Depot, California City Point, is untrue.

The McKinnon Iron Works Company, Ashtabula, Ohio, of which State Treasurer W. S. McKinnon is president, has been reorganized and reincorporated with a capitalization of $150,000. H. A. McKinnon is vice-president, secretary, treasurer and general manager.

The Iron and Metal Trades

There has been no improvement in the Iron industry, and the feeling of discouragement is spreading. In those branches in which the majority of manufacturers are acting in harmony, the reports of moderate concessions are being received with indifference since there is really not enough doing to test the markets seriously. Manufacturers point to the fact that in the lines in which there is an open market, for instance, in Bolts and Nuts and in Shafting, the low prices are not stimulating business, and that therefore nothing is to be gained as yet by any revision of prices.

At the fairly attended meeting of the Foundry Iron makers of the three leading districts last week a somewhat radical course was at first adopted, but on reconsideration the action proposed was kept in abeyance for two weeks, and former prices were reaffirmed. The ranks were kept intact, but there were no accessions, particularly from the South, which are most important. For the present, therefore, the associated furnaces are in the same position as before, accumulating the greater part of their much reduced make, while the outsiders are taking what little business is being done.

In the Central West and in the South the markets are a little weaker, with Iron available on the basis of $15, at furnace, for No. 2 in the Central West, and of $11.50 in Birmingham.

For the Chicago street roads there have been placed orders for 8000 tons of Girder Rails and 500 tons of Guard Rails, while Pittsburgh reports a lot of 2200 tons for export. Steel Billets are being offered by merchants at a concession of about $1 per ton, without tempting consumers.

The Plate trade is exceedingly dull, the only transaction of interest being the sale by an Eastern mill of a lot of 2000 tons, for export to Newfoundland. The same enterprise will take 1500 tons of Structural Material. The Chicago & Northwestern road has distributed one order for 600 50-ton Ore cars, and the Northern Pacific has placed 500 refrigerator cars. An important tonnage of material which is coming up is the 20,000 tons of Steel Plates which will be needed for the Steel Pipe extension of the Brooklyn water works. Two bridges, calling for 1500 tons, have been given out to an Eastern Steel works by the Lehigh & New England road. Among the structural work coming up is some tonnage for the Staten Island ferry terminal and 3500 tons for the American Tobacco Company in Chicago.

The Eastern Bar Iron manufacturers have reaffirmed prices on the basis of 1.65c., Philadelphia, but merchants and jobbers are taking what orders there are at about 1.40c.

The Tin Plate industry continues the most active of all. It is estimated that the leading interests have 85 per cent. and the independent mills 75 per cent. of the capacity in operation. The Merchant Pipe trade is somewhat better.

The Copper market is quite steady, with Electrolytic at 12.75c.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Apr.22, 1908.	Apr.15, 1908.	Mar.25, 1908.	Apr.24, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	*$17.50*	$17.75	$17.75	$24.50
Foundry No. 2, Southern, Cincinnati	15.25	15.25	15.25	24.75
Foundry No. 2, Local, Chicago..	*17.35*	17.35	17.50	26.00
Bessemer, Pittsburgh	*17.25*	17.65	17.75	23.85
Gray Forge, Pittsburgh	*15.40*	15.40	15.90	21.85
Lake Superior Charcoal, Chicago	*20.00*	20.50	20.50	26.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh....	28.00	28.00	28.00	30.50
Forging Billets, Pittsburgh.....	30.00	30.00	30.00	36.00
Open Hearth Billets, Phila.....	29.20	29.20	29.20	32.00
Wire Rods, Pittsburgh.....	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago...	12.00	12.00	12.00	18.00
Steel Rails, Melting, Phila.....	12.75	12.75	12.75	19.00
Iron Rails, Chicago.....	15.00	15.00	15.00	24.50
Iron Rails, Philadelphia.....	17.00	17.00	17.00	27.00
Car Wheels, Chicago.....	*13.50*	13.00	15.50	25.00
Car Wheels, Philadelphia.....	14.00	14.00	14.00	24.00
Heavy Steel Scrap, Pittsburgh..	*12.75*	12.75	13.00	17.75
Heavy Steel Scrap, Chicago....	*11.00*	11.00	11.25	15.50
Heavy Steel Scrap, Phila.....	12.75	12.75	12.75	18.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia.	*1.50*	1.50	1.65	1.83½
Common Iron Bars, Chicago....	1.65	1.65	1.65	1.76½
Common Iron Bars, Pittsburgh.	1.50	1.50	1.50	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh.....	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh.....	1.70	1.70	1.70	1.70
Beams, Tidewater, New York...	1.86	1.86	1.86	1.84½
Beams, Pittsburgh.....	1.70	1.70	1.70	1.70
Angles, Tidewater, New York...	1.86	1.86	1.86	1.84½
Angles, Pittsburgh.....	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	*1.55*	1.70	1.70	1.85
Skelp, Sheared Steel, Pittsburgh.	*1.65*	1.80	1.80	1.90
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh.....	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh.....	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh.....	1.90	1.90	1.90	2.05
Barb Wire, Galv., Pittsburgh...	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York.....	*13.00*	13.00	13.25	25.00
Electrolytic Copper, New York..	*12.75*	12.75	13.25	24.00
Spelter, New York.....	*4.65*	4.65	4.75	6.75
Spelter, St. Louis.....	*4.50*	4.50	4.55	6.60
Lead, New York.....	4.00	4.00	4.00	6.10
Lead, St. Louis.....	3.85	3.85	3.85	5.95
Tin, New York.....	*31.70*	32.00	32.25	42.00
Antimony, Hallett, New York...	*8.75*	8.75	9.50	22.00
Nickel, New York.....	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York...	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, April 22, 1908.—(*By Telegraph.*)

The Iron and Steel mills of this district, outside of those engaged on Wire products, are less active than at any time in the past two months. At the South Works of the Illinois Steel Company all finishing mills are down except the No. 1 Rail mill. None of the mills of the Bayview plant is running but the demand for Nails and Wire is furnishing enough tonnage to keep the works at Joliet in operation at fair capacity. Now that old contracts in heavier materials are practically completed, mill schedules are almost wholly dependent upon new business, and because of its slow development uninterrupted operation is impossible even at part capacity. Steel Bar mills are started at intervals of a week or two when enough specifications have been secured to run for a few days. The only one of the local group in commission this week is the Moline mill of the Republic Iron & Steel Company. The demand for Iron Bars is relatively stronger, though by no means of satisfactory volume. Only a small part of the Structural tonnage on which awards of fabricating contracts were expected was closed last week. At the same time it is believed that most of the building projects on which bids have been tendered will be put through before long. No further purchases of considerable Rail tonnage by steam roads are reported, but an order for 8000 tons of Girder Section Rails and 500 tons of Guard Rails has been placed by the Chicago Railways Company with the Lorain Steel Company. There has been some falling off in Sheets and recent developments indicate that

prices are not being maintained. With jobbers reducing stocks and nothing doing in the Plate using industries, the demand for Plates is extremely dull. An order placed by the Chicago & Northwestern for 600 all Steel Ore cars of 100,000 lb. capacity has been divided between the Pullman Company and the American Car & Foundry Company and in addition to this the latter company has secured an order for 500 refrigerator cars from the Northern Pacific. The only item in Scrap for which there is any demand is re-rolling Steel Rails. Some recent purchases made and others in contemplation have resulted in a slight firming up of prices. The Pig Iron situation is unchanged save that Southern Iron is somewhat weaker. There is not enough tonnage being offered to test the market, but for No. 2 Foundry as low as $11.50, Birmingham, has been done.

Pig Iron.—The few inquiries coming into the market continue to be for small lots for immediate shipment. Some sales of this character ranging from car lots up to 500 tons have been made during the week, but in the aggregate the amount of tonnage being moved serves only to emphasize the scant requirements of consumers. Purchases made by melters in almost every case represent specific tonnage required to cover casting contracts that have been secured. Both the furnacemen and consumers are watching the progress of negotiations in the furtherance of proposed plans for holding Pig Iron against the effects of demoralizing competition. Producers, while agreeing that the accomplishment of the object aimed at in this movement is highly desirable, do not hesitate to express their serious doubt of its success. Instead of showing greater firmness prices have developed a weaker tendency as is evidenced by recent sales made on a basis of $11.50, Birmingham, for No. 2 Foundry. It is not believed that any large amount has changed hands at this figure, but the fact that it has been made on comparatively small lots leaves it an open question as to what might be done on a round tonnage offer. None of the furnaces shows any inclination to contract for second half business at present prices, and as consumers interpret market conditions they find nothing in them to indicate the advisability of anticipating their wants beyond the present quarter. Under such circumstances the demand is naturally limited to what is needed for current consumption. With a spread of $1 or more a ton which now exists between Northern and Southern Irons, only such lots of the former are being sold as are required for specific use that will not admit of substitution. While continuing this week to quote Southern Iron on a basis of $12, Birmingham, it is fair to say that the spread of 50c. above this price in the outside column is purely nominal. The principal producers are holding at $12 flat, and whatever variations there may be are below rather than above this price. The following prices are for April, May and June delivery, f.o.b. Chicago:

Lake Superior Charcoal	$20.00 to $20.50
Northern Coke Foundry, No. 1	17.85 to 18.35
Northern Coke Foundry, No. 2	17.35 to 17.85
Northern Coke Foundry, No. 3	16.85 to 17.35
Northern Scotch, No. 1	18.35 to 18.85
Southern Coke, No. 1	16.85 to 17.35
Southern Coke, No. 2	16.35 to 16.85
Southern Coke, No. 3	15.85 to 16.35
Southern Coke, No. 4	15.35 to 15.85
Southern Coke, No. 1 Soft	16.85 to 17.35
Southern Coke, No. 2 Soft	16.35 to 16.85
Southern Gray Forge	14.35 to 14.85
Southern Mottled	14.10 to 14.60
Maleable Bessemer	17.50 to 18.00
Standard Bessemer	19.50 to 19.65
Jackson Co. and Kentucky Silvery, 6 %	17.90 to 18.40
Jackson Co. and Kentucky Silvery, 8 %	19.90 to 20.40
Jackson Co. and Kentucky Silvery, 10 %	21.90 to 22.40

(By Mail.)

Billets and Rods.—There is practically no business in the market, nor are there any inquiries that indicate either positive or passive interest on part of consumers. Prices, however, are seemingly unaffected by the lack of movement, and are reported to be firm and unchanged. We quote Forging Billets at $31.50 to $32.50, Chicago. Owing to the continuance of a fair demand for Wire products, there is corresponding activity in Wire Rods, but users are purchasing conservatively. Prices are held without change at the following quotations: Bessemer, $35; Basic, $36; Chain, $37, all at Pittsburgh.

Rails and Track Supplies.—Not only has the week developed no new business in Standard Sections Rails, but inquiries indicating the likelihood of additional purchases of round lots by important railroads are likewise lacking. Among the small Rail orders recently placed, of which a few are coming in from time to time, was 500 tons purchased by the Manistee & Northeastern Railroad; also 400 tons of high T rails were taken by the Pennsylvania Steel Company. The work of rehabilitating the Chicago street car lines has so far this year resulted in the placing of 16,000 tons of Rails and track material. Of this tonnage 8000 tons of Girder Section Rails were placed last week, together with 500 tons of Guard Rails, all of which went to the Lorain Steel Company. Some improvement is noted in Light Rails, though the aggregate tonnage is still light; among the bookings of the week were 2000 tons taken by the Illinois Steel Company. The demand for Track Fastenings is only moderate, and no purchases of noteworthy importance are reported. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.80c. to 1.90c., according to delivery; Track Bolts, 2.25c. to 2.35c., base, Square Nuts, and 2.40c. to 2.50c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—The tardy development of Structural projects has resulted in the closure of but few contracts of inconsiderable tonnage during the week. Included in these were 660 tons for the St. Regis apartment building, St. Louis, and 400 tons for the Schmeidel Building, San Francisco, contracts for which were awarded to the American Bridge Company. Plans for the construction of a large building for the American Tobacco Company, which have been held in abeyance for several months, have been revived and fabricators are figuring on the 3500 tons of material involved. Bids are in for several other building structures on which early lettings are expected. Bids were received last week on 600 tons required for the Polk street bascule bridge, but it is understood that the contract has not yet been definitely awarded. A fair amount of business in railroad bridge and viaduct work is in sight, but nothing of importance in this line was included in the week's transactions. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—An order for 300 tons of Plates for harbor work at Superior, Wis., has been placed with an Eastern mill. Outside of this transaction the new business entered consists of routine orders for immediate consumption. Both the Sheared and Universal Plate mills at the South Works are at present idle awaiting the accumulation of sufficient tonnage to warrant starting up. Regular prices are being generally adhered to, save for the concessions of $1 or $2 a ton, which continue to be made on narrow sizes by some of the smaller mills. We quote for mill shipments as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—There has been considerable slowing up in new business. Though it is apparent from the quick shipments desired by consumers that stocks in the hands of jobbers and manufacturers are low, there is no buying ahead by either interest. Store business is exceedingly quiet, both on Black and Galvanized Sheets. Some shading of prices is reported. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 and 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—Of the Steel Bar mills in this district, only the Sylvan mills of the Republic Iron & Steel Company are this week in operation. The accumulation of specifications is too slow to permit any of them to run more than a few days at a time. Iron Bars are a little more active, but most of the mills continue to run intermittently. Some very low prices have been made on Scrap Steel Bars, and the regular prices of Bar Iron are not being uniformly maintained. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—While advancing very slowly, some gain is reported in the general demand, and, in the aggregate, this month's business is expected to overreach that of March. It is evident, however, from the way jobbers are

buying, that stocks are nowhere being increased. Even the largest concerns, which ordinarily buy 5 to 10 cars at a time, are ordering in single carload lots. The coming of open weather has not resulted in the degree of improvement expected. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 71 per cent. on Black Steel Pipe, ¾ to 6 in. From two to three points above these prices is asked for Iron Pipe.

Boiler Tubes.—There is no business in Tubes save in small lots for immediate delivery. Warehouse stocks are much reduced, and there is no disposition or incentive to increase them. Locomotive Tubes are moving slowly, the principal demand being for such repair work as is absolutely necessary to maintain motive power equipment. What irregularity in price has developed is restricted to concessions made by one or two unimportant mills. Mill quotations for future delivery, on the base sizes, are as follows: 2⅜ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1¼ in.	35	35	35
1⅜ to 2⅜ in.	50	35	35
2½ in.	52½	35	35
2¾ to 5 in.	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—Trade in miscellaneous shapes and the various grades of Merchant Steel used by implement makers is practically dormant. No new business of any consequence is being offered, and the volume of specifications coming out is disappointingly small. In the absence of any particularly attractive tonnage, calculated to test the market, prices are reported to be even and undisturbed, except for possible shading of Shafting discounts. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1⅛ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 56 per cent. off in car lots; 52 per cent. less than car lots, base territory delivery.

Cast Iron Pipe.—The placing of 2200 tons of Water Pipe at Cincinnati, which was awarded to the Dimmick Pipe Company, constitutes the chief transaction for the week. The sizes included in this tonnage ranged from 4 in. to 24 in., and the successful bid was a flat price of $21.70 a ton. The city of St. Louis is expected to come into the market about May 1 for between 4000 and 5000 tons; this is the only municipal letting of considerable size reported for the near future. The city of Collinsville, Ill., is scheduled to open bids for about 350 tons on April 23. The amount of tonnage developing from small orders is fairly good, the principal interest having booked between 4000 and 5000 tons of such business within a week. We quote, nominally, per net ton, Chicago, as follows: Water Pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25; with $1 extra for Gas Pipe.

Metals.—While Copper prices are practically unchanged, there has been considerable falling off in the demand from all sources. Notwithstanding the shrinkage of values, which has cut last year's maximum prices in half, buyers are not disposed to buy ahead of their actual needs; corresponding lethargy of movement is noted in other Metals, and the demand for Old Metals is extremely inactive. We quote as follows: Casting Copper, 13¼c.; Lake, 13⅜c. to 14c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 33c.; small lots, 33½c.; Lead, Desilverized, 4c. to 4.25c., for 50-ton lots; Corroding, 5.35c. to 5.45c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 12½c., and other grades, 10½c. to 11c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 11c.; Copper Clips, 11c.; Red Brass, 12c.; Yellow Brass, 10¼c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 25c.; Block Tin Pipe, 27c.

Old Material.—Extreme dullness rules the market throughout, save for a moderate spurt of activity that has developed in Rerolling Steel Rails. Owing to the small amount of relaying being done by the railroads there are fewer Old Rails being offered than usual, and this fact, coupled with the known requirements of some of the rerolling mills, has had a tendency to firm up the market slightly on this material. Cast Scrap is almost wholly neglected, there being practically no demand from the Iron foundries. A few sales of moderate tonnage to consumers of Heavy Melting Steel are reported. Railroad offerings for the past two weeks have been unusually light. Only a few hundred tons were closed last week, and but one lot of about 4500 tons is announced for the present week. We quote, per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$15.00 to $15.50
Old Steel Rails, rerolling	13.00 to 13.50
Old Steel Rails, less than 3 ft.	12.00 to 12.50
Relaying Rails, standard sections, subject to inspection	20.50 to 21.50
Old Car Wheels	13.50 to 14.00
Heavy Melting Steel Scrap	11.00 to 11.50
Frogs, Switches and Guards, cut apart	11.50 to 12.00
Mixed Steel	9.00 to 9.50

The following quotations are per net ton:

Iron Fish Plates	$13.00 to $13.50
Iron Car Axles	16.00 to 16.50
Steel Car Axles	14.75 to 15.25
No. 1 Railroad Wrought	11.00 to 11.50
No. 2 Railroad Wrought	10.00 to 10.50
Railway Springs	11.00 to 11.50
Locomotive Tires, smooth	13.25 to 13.75
No. 1 Dealers' Forge	9.00 to 9.50
Mixed Busheling	7.00 to 7.50
Iron Axle Turnings	5.75 to 6.25
Soft Steel Axle Turnings	5.75 to 6.25
Machine Shop Turnings	5.25 to 6.25
Cast Borings	4.50 to 5.00
Mixed Borings, &c.	4.50 to 5.00
No. 1 Mill	6.75 to 7.25
No. 2 Mill	5.75 to 6.25
No. 1 Boilers, cut to Sheets and Rings	7.00 to 7.50
No. 1 Cast Scrap	12.00 to 12.50
Stove Plate and Light Cast Scrap	10.00 to 10.50
Railroad Malleable	10.00 to 10.50
Agricultural Malleable	9.50 to 10.00
Pipes and Flues	7.75 to 8.25

Cleveland.

CLEVELAND, OHIO, April 21, 1908.

Iron Ore.—Many of the blast furnace interests that a few weeks ago were in favor of maintaining last year's prices on Ore have changed their position on the matter and are now urging the merchant Ore firms to make a reduction in prices. Although last season's prices were reaffirmed at a meeting of the Ore and furnacemen, held in this city last February, the matter could be taken up again with the view of determining whether a reduction in prices should be made. Ore shippers, however, are disposed to stand by the established prices, and for the present at least will do nothing about reopening the price question for the reason that they realize that nobody wants to buy any Ore now. As weeks pass the time when consumers will come in the market for Ore does not appear to grow any nearer. A buying movement had been expected in April or May at the latest, but no Ore has been sold as yet and present indications are that very little will be bought next month, and that there will be little for the lake freighters to do in the way of carrying Ore at the first of June, when it was generally understood that shipments would begin. There are very few consumers who will not have enough of last season's Ore to last them until well along in the fall, and it is believed that a large share of the furnace interests will wait until the middle of summer before buying any. By that time they can tell more accurately the amount they will need to last them until the opening of the 1909 season of navigation, and they will not have to begin paying for this season's purchases so soon. Conditions have changed the estimates of the amount that will be required this season, and Ore men who a few weeks ago placed the amount at 25,000,000 tons now make a maximum estimate of 20,000,000 tons. The Marine Engineers' Beneficial Association, the lake engineers' union, has taken official action opposing the open shop on lake boats, but the chief engineers have continued to sign individual contracts with the vesselmen, and it is now estimated that fully 400 engineers have signed contracts for the season. No labor troubles are expected as far as the engineers are concerned. On May 1 the two-year contract between the Lake Erie dock managers and the 'longshoremen who handle the Ore and Coal will expire. It is believed that the open shop policy will be adopted this season by the dock managers. Engineers of 12 of the largest boats of the Pittsburgh Steamship Company reported for duty at their boats yesterday, and the work of fitting out the boats was started. They will be ready to sail in about two weeks. The owners and managers of the independent freighters have reached an agreement not to start their boats before May 12. Another meeting will be held on that date, and unless business conditions warrant the starting of the boats at that time a later date will be set for placing the boats in commission. Ore shipments from the docks are still very light. The expected increase in shipping orders has not materialized, and some dealers are shipping less this month than in March. Prices for 1908 delivery at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.20; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—The market continues weak and inactive. Low prices that have been quoted on Foundry Iron in the past two weeks have not stimulated any buying, although it seems to be the opinion that prices are about at the bottom. The only inquiries of any size noted were one for 200 tons for Ohio delivery, and another for 500 tons for delivery in

Chicago territory. Furnacemen have ceased to place much importance in inquiries for the reason that a few good sized inquiries recently have resulted a week or two later in an order for a single car lot. The sales of the week have been limited to a few car lots, and the demand has been insufficient to test the market thoroughly. No. 2 Foundry Iron is still being quoted nominally at $15.25 to $15.50, Valley furnace, but this price is being shaded to $15, and there are reports that No. 2 Iron is being offered below $15. Local furnacemen are asking $16.35 to $16.50, delivered, Cleveland, and $16, at furnace, for No. 2 for outside shipment, but these prices would be shaded considerably to meet competition. The local melt shows little, if any, improvement. There are still thousands of tons of Iron sold on contract last year at a price averaging about $22, awaiting shipment from furnace stock piles. The furnace of the Detroit Iron & Steel Company has gone in blast. Reports received by local Ore firms indicate that at least three more merchant furnaces in the Middle West will go out of blast within the next few weeks. Southern Iron is reported to have been offered as low as $11.25, Birmingham, for No. 2. There is no inquiry for Bessemer or Basic Iron. For prompt shipment we quote, delivered, Cleveland, as follows:

Bessemer	$17.65
Northern Foundry, No. 1	$16.00 to 17.00
Northern Foundry, No. 2	15.60 to 16.50
Northern Foundry, No. 3	15.50 to 16.00
Southern Foundry, No. 3	15.85 to 16.35
Gray Forge	15.40

Coke.—The market is very quiet and prices are weaker. We quote Connellsville Furnace Coke for spot shipment at $1.50 to $1.75, at oven, and 72-hr. Foundry Coke at $2 to $2.25, at oven, for spot shipment. One producer who has been asking $2.50 has reduced his price to $2.40.

Finished Iron and Steel.—The market is quiet in all lines and sales of small lots even are quite limited. Specifications continue about as they have for several weeks, being all for small tonnages. The demand for Iron Bars has not improved and local mills are running scarcely half the time. The Bar Iron market continues weak and in some cases the usual price of 1.40c., Pittsburgh, is being shaded to 1.35c. A few mills are attempting to maintain the regular price of 1.50c. The mill price on Steel Bars is being firmly maintained, but in some cases low prices, below these quoted, have been named by jobbers for Steel Bars out of warehouse. The demand for Plates and Sheets shows no improvement and is still very light. Independent mills are shading the price of the narrower sizes of Plates $2 a ton and are making concessions of from $1 to $2 a ton on Sheets. The Structural outlook shows no improvement. With the exception of specifications for a small tonnage for railroad bridge work there has been no activity in this line, and there is no work in sight that will require a good sized tonnage. Consumers of all kinds of Finished Material continue to specify only for their immediate requirements, which in most cases are light. We quote Iron Bars at 1.50c., Cleveland for car lots; Steel Bars, 1.70c., Cleveland, for car lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼-in. and heavier, 1.80c., Cleveland. Dealers quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Jobbers quote Steel and Iron Bars at 1.70c. to 1.80c. Beams and Channels out of stock are 2.10c. to 2.15c., base. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount. Jobbers report a fair demand for Shafting, but no improvement in other lines.

Old Material.—The market seems to grow duller from day to day, and is fully as inactive as it has been at any time in the past six months. With some of the mills shut down and others running only part of the time, the consumption is light and there are few inquiries even for small lots of Scrap to supply immediate needs. Prices are weak but the absence of sales makes all quotations largely nominal. Among the railroad offerings this week are lists from the Lake Shore and the Nickel Plate. The former road will sell from 1200 to 1500 tons of Scrap. Dealers' prices to the trade are as follows, per gross ton, f.o.b. Cleveland:

Old Steel Rails	$11.00 to $11.50
Old Iron Rails	15.00 to 16.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	13.00 to 13.50
Relaying Rails, 50 lb. and over	21.00 to 22.00
Heavy Melting Steel	11.00 to 11.50
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.00 to 11.50
Light Bundled Sheet Scrap	7.50 to 8.50

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	6.00 to 7.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	10.50 to 11.00
No. 1 Railroad Wrought	12.00 to 12.50
No. 1 Cast	12.00 to 12.50
Stove Plate	10.00 to 10.50
Bundled Tin Scrap	8.00 to 9.00

Cast Iron Pipe.—The Board of Public Service, Youngstown, Ohio, has awarded a contract to the Massillon Iron & Steel Company, Massillon, Ohio, for 500 tons of Cast Iron Water Pipe, at $21.60 per ton.

Cincinnati.

CINCINNATI, Ohio, April 22, 1908. (By Telegraph.)

In all divisions of the Iron and Steel trade, from crude to finished product and including Old Material as well, the minimum of action and interest seems to have been reached this week, for the various factors for the first time in this territory this year confess to something like actual stagnation. What buying is going on is of the rush order and for absolutely current needs, and for those needs only. Nothing is heard of the last half; everybody seems inclined to let that part of the year take care of itself. From the nature of inquiries received it seems that there is quite a volume of business in sight, but that consumers are simply holding off, and, in the case of Pig Iron at least, for lower prices. The financial situation is so much improved that the excuse for retarded developments must be laid to other causes. Certain it is that business does not respond.

Pig Iron.—Whatever may have been accomplished by the furnace people in the way of a better understanding and in the interests of harmony at the recent meeting in New York, it certainly is not in evidence in this market. Rumors of price cutting are more numerous, and agents seem to be more aggressive than ever in soliciting offers. The situation seems to portend a further blowing out of furnaces; in fact, since our last report one of the Sloss stacks is out, the Philadelphia at Florence, Ala., and furnaces in other districts, it is said, are to be blown out on signs of further recessions. It is reported that another of the largest interests in the Birmingham District has very little Iron to offer prior to July 1. There is a generally firm adherence by agents to $12, Birmingham, in quoting on Southern Iron, but so much is heard of this price being shaded that it is practically certain a round tonnage for this quarter's delivery would bring out $11.50, and perhaps $11. There are rumors heard of $11.50 on a modest tonnage for Chicago consumption. The largest Pipe interest has, it is thought, purchased a 1500 ton lot of No. 2 Soft and Nos. 3 and 4 Foundry for immediate delivery to its Tennessee plant, at a specially attractive price. It is conceded that there is little southern Ohio Iron moving at the present price in competition with Southern Irons. While there is undoubtedly some heavy cutting going on in the Valley District for delivery in that territory, it does not affect the business of the Ironton furnaces to this territory. Reports of $15 on the former are frequent, but $15.50 is about the lowest heard on the Ironton product. Apparently confirming the statement that there is a scarcity of low grade Irons on Southern furnace yards, a prominent agency has declined an offer of $10.80 on 2000 tons of No. 4 Foundry. There seems to be no demand for Basic nor in fact anything outside the hurry orders from Foundry and pipe interests for small lots. Eight per cent. Ohio Silvery is still quotable at $18.50, at furnace. Standard Southern Car Wheel Irons are a little off, and it is understood that $19, at furnace, has been done. The foundry melt is improving, but very slowly, and local foundrymen are buying occasionally, but only as needed, and the aggregate of this business would not total a fair-sized tonnage in normal times. For immediate delivery and balance of the second quarter we quote f.o.b. Cincinnati, with freight rates of $3.25 from Birmingham, and $1.20 from the Hanging Rock District, as follows:

Southern Coke, No. 1	$15.75
Southern Coke, No. 2	15.25
Southern Coke, No. 3	14.75 to $15.25
Southern Coke, No. 4	14.25 to 14.75
Southern Coke, No. 1 Soft	15.75
Southern Coke, No. 2 Soft	15.25
Southern Coke, Gray Forge	14.75 to 15.25
Southern Coke, Mottled	13.25 to 13.75
Ohio Silvery, 8 per cent. Silicon	19.00
Lake Superior Coke, No. 1	17.20 to 17.70
Lake Superior Coke, No. 2	16.70 to 17.20
Lake Superior Coke, No. 3	16.20 to 16.70
Standard Southern Car Wheel	19.00
Lake Superior Car Wheel	22.00 to 22.50

(By Wire.)

Coke.—The leading sellers in this market report Coke undeniably quiet, with some exceedingly attractive inducements for spot buyers. Some agencies claim a satisfactory movement in Foundry grades, although very little contracting is being done on any kind of Coke. Connellsville 72-hr. Foundry is quoted by one interest at $2.15 to $2.40; Pocahontas, $2.15 to $2.25; Virginia grades, choice, $2.25 to $2.40; New River, best price heard, $2.75, all at oven. On Furnace grades as low as $1.40 is heard, with open quotations of $1.65 to $1.75 at oven; on forward deliveries about $1.75 to $2.

Finished Iron and Steel.—Store prices remain unchanged, and there seems to be a trifle more business going than last week, although buying is still in very small lots, as needed. There is a little more interest in Iron Bars. Inquiries from Southern districts indicate that with any kind

of improvement in the general situation inducing a feeling suggestive of restoration of confidence in Governmental regulations in commerce and trade, the second half should open with something like a normal condition in that section. Dealers quote, f.o.b. cars Cincinnati, as follows: Iron Bars, carload lots, 1.65c., base, with half extras; small lots from store, 1.85c., base, half extras. Steel Plates, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c. Blue Annealed Sheets (Heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.25c. No. 12, carload lots, 2c.; small lots from store, 2.35c. Sheets (Light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Old Material.—The local market is, if possible, weaker than ever. There is no interest in any line of Scrap. The few requirements of Steel mills in this section were supplied early in the year, and there is no indication of any needs for some time to come along these lines. The inquiry at the present time is referred to by dealers as being the lightest in their experience of a decade or more. Prices, as nearly as they can be gauged from an uninterested market, are about as follows, and are f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$10.50 to $11.50
Cast Borings, net ton	4.00 to 5.00
Heavy Melting Steel Scrap	11.00 to 11.50
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	14.50 to 15.50
Old Iron Rails, gross ton	13.00 to 14.00
Old Steel Rails, long, gross ton	11.00 to 12.00
Old Steel Rails, short, gross ton	11.00 to 12.00
Relaying Rails, 56 lb. and up, gross ton	21.00 to 22.00
Old Car Wheels, gross ton	12.00 to 13.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00

Pittsburgh.

PARK BUILDING, April 22, 1908.—(*By Telegraph.*)

Pig Iron.—With the market on Pig Iron practically open and no improvement in the demand, which is still for small lots for prompt shipment, prices seem to have further weakened, and reports are that all grades of Pig Iron are being sold at lower prices than have ruled at any time since the decline in the market started. The top of the market on Bessemer Iron is $16.50, Valley furnace, but several sales of 100 ton lots have been made at $16.35, equal to $17.25, Pittsburgh. Basic Iron is nominally $15.50 at furnace, but $15.25 or lower could be done on a firm offer and for any considerable tonnage. Specifications against contracts for Basic Iron are coming in more freely, and shipments this month by the Valley furnaces will be much heavier than in March. We note a little more inquiry for Foundry Iron. One local consumer is inquiring for 300 tons for April, May and June, and a sale has been made of 250 to 300 tons of Northern No. 2 Foundry analysis Iron at $15, Valley furnace, or $15.90 Pittsburgh. We quote Northern No. 2 Foundry at $15.25, Valley furnace, but for any considerable tonnage and to desirable customers $15 could be done.

Steel.—The American Sheet & Tin Plate Company and independent Sheet and Tin manufacturers are specifying quite freely against contracts for Sheet and Tin Bars, shipments by the Steel mills being heavier at present than for some time. Reports are still current that both Billets and Sheet Bars are being offered at $1 to $2 a ton less than regular prices, but these reports continue to be strongly denied by the leading Steel mills, who insist that they are absolutely maintaining prices. We quote Bessemer Billets at $28, Pittsburgh, and $28.50, Youngstown or Wheeling. Sheet and Tin Bars take an advance of $1 a ton over these prices. Forging Billets are about $30, Pittsburgh.

(*By Mail.*)

General conditions are about as quiet as they have been at any time this year. On some lines, such as Tin Plate, Pipe and Wire Products, the demand is heavier but the increased buying in these lines is offset by the falling off in Plates, Structural Material and Steel and Iron Bars. There are persistent reports of cuts in prices on Finished lines, but these are strongly denied. The fact is that hardly enough tonnage is being offered to test the market thoroughly on anything. It is now the general belief that with the assurance of good crops this year and the Presidential nominations out of the way, the Iron trade will show betterment. It is confidently expected that the last half of the year will make a better showing than the first half.

Ferromanganese.—There is practically no inquiry, and prices are weak. We quote best grades of foreign 80 per cent. Ferro at $42, seaboard, or $43.95, Pittsburgh. We have not heard of any sales in this market in the last week or two.

Muck Bar.—One or two small inquiries are in the market, but the tonnage has not yet been closed. The nominal price of best grades of Muck Bar made from all Pig Iron is $27, Pittsburgh, but on a firm offer there is no doubt that this price would be materially shaded.

Skelp.—A sale of about 1000 tons of Sheared Steel Skelp is reported on the basis of about 1.65c., Pittsburgh. There is a little more general inquiry, but the tonnage of actual orders placed with the mills for some time past has been light. We quote Grooved Steel Skelp, 1.55c. to 1.60c.; Sheared Steel Skelp, 1.65c. to 1.70c.; Grooved Iron Skelp, 1.75c. to 1.80c.; Sheared Iron Skelp, 1.85c. to 1.90c., Pittsburgh.

Rods.—There is more inquiry for Chain Rods, but the demand for Rods for Wire purposes has been light for some time. Regular prices on Rods are unchanged, being $35 for Bessemer, $36 for Open Hearth and $37 for Chain Rods, f.o.b. Pittsburgh.

Steel Rails.—The Carnegie Steel Company took last week a contract for 2235 tons of Standard Sections for export, and has received specifications against old contracts sufficient to warrant starting up the three Edgar Thomson Rail mills, which was done on Sunday night, April 19, but these mills are gaited to about 30 per cent. of capacity. The demand for Light Rails is only fair. Regular prices on Light Rails continue to be shaded about $3 a ton on most of the tonnage that is being placed. One mill in particular that rerolls Rails is a very aggressive seller, and is held responsible for the low prices ruling on Light Sections. Regular prices on Light Rails, which continue to be shaded from $3 to $4 a ton by rerolling mills, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Structural Material.—The Second National Bank Building, at Connellsville, about 460 tons, is to be placed April 27, and an addition to the Court House, at Ebensburg, Cambria County, Pa., is also to be placed this week. Nothing has been heard as yet from the proposed Lake Erie bridge at Beaver, about 14,000 tons, or the addition to the Fort Pitt Hotel, about 1800 tons. The projected Oliver Building has practically gone over until next year. The mills are able to make practically spot shipment on the small amount of new business that is being placed. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—With the Steel car interests and the Lake boat builders out of the market as buyers of Plates, the only orders coming in are for small lots from the boiler makers and the other general trade, but this is only sufficient to give the Plate mills about 25 per cent. of what they require to keep them running to full capacity. There are reports of material concessions having been made in prices of Plates, but these are officially denied, the statement being made that the only cutting being done is by a few small mills, mostly on the narrow sizes, and does not exceed $1 to $2 a ton. Regular prices are as follows: Tank Plates, ¼-in. thick, 6½ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell grade of steel is abandoned.

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes. 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Sheets.—There has been a material increase in the demand for both Black and Galvanized Sheets, while consumers like the Westinghouse Electric and others are taking out a larger tonnage of electrical Sheets than for some time. The American Sheet & Tin Plate Company is increasing its active Sheet mill capacity, and the American Rolling Mill Company is operating its works at Middletown, Ohio, practically full, and expects to start its Zanesville plant within a week. Prices, in the main, are being observed, but are occasionally shaded by some mills that absorb part of the freight. Regular prices are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.;

Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Cotton Ties.—A fairly large tonnage has been placed in Cotton Ties since the season opened about two weeks ago, but it is not believed the trade this year will be as heavy as last year, largely owing to the general business depression. We quote as follows: 3000 bundle lots and over, 85c.; less than 3000 bundle lots, 88c., f.o.b. Pittsburgh.

Hoops and Bands.—A fair tonnage is being specified for against contracts, but practically no new business is being placed. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Tin Plate.—This is probably the most active in demand of any article on the entire list of Finished Iron and Steel, and the outlook for the next two or three months is regarded as quite satisfactory. The American Sheet & Tin Plate Company is operating about 85 per cent., and the independent mills about 75 per cent. of Tin Plate capacity. We are advised that prices are being maintained, reports that cutting is being done being strongly denied by leading producers. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Iron and Steel Bars.—As yet new business in either Iron or Steel Bars does not show any improvement, orders being for small lots for actual needs. It is estimated that not more than 25 per cent. of the total capacity in Iron and Steel Bars is active at the present time. It is strongly denied that Common Iron Bars are being generally offered by leading producers as low as 1.35c., Pittsburgh. On the contrary, it is claimed that this is being done by only a few small mills that have a limited capacity and that do not cut much figure in the Bar Iron trade. It is also stated that the tone of the market on Iron Bars is stronger now than it has been for some weeks. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further west. Steel Bars remain very firm, at 1.60c., Pittsburgh.

Railroad Spikes.—Local makers report that purchases are confined to small orders for actual needs. We quote: Standard sizes, 4½ x 9-16 in., at $1.70, and the smaller sizes at $1.80 per 100 lb. in carloads and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Spelter.—The market is quiet, but prices are fairly strong and are practically unchanged. We quote prime grades at 4.50c., East St. Louis, but on a firm offer it is probable that 4.45c., East St. Louis, equal to 4.57½c., Pittsburgh, could be done.

Merchant Steel.—This trade continues quiet, and so far the lower prices recently made on Shafting have not stimulated the demand. There is a fair inquiry for Tire and Spring Steel, but practically all the tonnage being placed, and it is not heavy by any means, is in small lots for actual needs. We quote Cold Rolled Shafting, on contracts for 100 tons and over, 57 per cent. off; carloads, 56 per cent. off, and less than carloads, 52 per cent. off, on which carload freight is allowed within base territory. Nominal prices on Merchant Steel are as follows: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 2.10c. to 2.15c. Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron, finished, 1½ in. and wider, 1.60c.; under 1½ in., 1.75c. Planished Tire Steel is 1.80c., all f.o.b. at mill.

Coke.—The Coke trade continues in a most unsatisfactory condition, and additional ovens in the Connellsville and outside regions have been blown out. It is stated officially that at present about only 25 per cent. of the ovens in the most prominent Coke regions are active. We quote best grades of Furnace Coke for prompt shipment from $1.55 to $1.60, but other grades not so favorably known have sold as low as $1.40, at oven, or even lower in some cases. Foundry Coke is held at $1.85 up to $2.25 a ton, at oven, the latter price for Connellsville grades. The Upper and Lower Connellsville regions made last week only about 140,000 tons.

Pipes and Tubes.—In a general way the Pipe trade is showing betterment, the demand being fairly active and representing probably 50 per cent. of capacity. It is reported, but not confirmed, that a leading interest has recently placed an order for over 100 miles of 8-in. Line Pipe. A number of other such projects are in the market, which, if placed, will total a heavy tonnage. Spang, Chalfant & Co., Inc., will start up in a few days their puddling department to make Muck Bar for their Skelp mills. It is stated that prices on both Iron and Steel Pipe, which are guaranteed against decline until May 15, are being absolutely maintained by the mills. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 74 and 5 per cent. off list, while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black.	Galv.
⅛ to ¼ in.	65	49
⅜ in.	65	53
½ in.	69	58
¾ to 6 in.	73	63
7 to 12 in.	70	55
Extra strong, plain ends:		
⅛ to ⅜ in.	58	46
½ to 4 in.	65	53
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

Discounts on Genuine Iron Pipe are as follows:

	Black. %	Galv. %
⅛ and ¼ in.	66	..
⅜ in.	65	51
½ in.	67	55
¾ to 6 in.	71	61
7 to 12 in.	68	53
Extra strong, plain ends:		
⅛ to ⅜ in.	56	44
½ to 4 in.	63	51
4½ to 8 in.	59	47
Double extra strong, plain ends:		
½ to 8 in.	52	41

Boiler Tubes.—There is only a fair amount of new business being placed, no large contracts by the railroads having been given out for some time. Prices are occasionally shaded. Discounts on Merchant Tubes for small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in.	42	47
1¾ to 2¾ in.	42	59
2¼ in.	47	61
2½ to 5 in.	52	65
6 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Iron and Steel Scrap.—This trade is practically neglected, consumers taking in only such material as they absolutely need, and the amount of tonnage moving is very light. It is pointed out that Scrap dealers who have yards of their own and are in position to buy Scrap and hold it for a time will certainly realize higher prices later on. Bundled Sheet Scrap continues excessively weak, there being an overproduction of this material, and it is being offered at very low figures. In the absence of definite sales on which to base prices, we quote the different grades of Scrap nominally as follows, per gross ton: Heavy Steel Scrap, Pittsburgh, Sharon and Steubenville delivery, $12.75 to $13; No. 1 Railroad Wrought Scrap, $13.75 to $14; No. 1 Cast Scrap, $15 to $15.25; Cast Iron Borings, $7.75 to $8. Steel Axles are $16.50 to $17; No. 1 Busheling Scrap, $12 to $12.25; No. 2, $9 to $9.25; Sheet Bar Crop Ends, $16.50 to $17; Iron Axles, $19 to $19.50; Low Phosphorus Melting Stock, $16.25 to $16.50; Rerolling Rails, $14 to $14.25; Old Steel Rails, short pieces for Open Hearth use, $12.75 to $13; Machine Shop Turnings, $8 to $8.50; Railroad Malleable Scrap, $12.25 to $12.50; Grate Bars, $13.25 to $13.50; Heavy Air Furnace Cast Scrap, $13.75 to $14.

Birmingham.

BIRMINGHAM, ALA., April 18, 1908.

Pig Iron.—More inquiries are reported, and the sentiment of all parties concerned appears to have improved, yet the transactions recorded are not unlike those of last week's report, and the aggregate of sales is but slightly in excess. The agreement reached at the recent New York meeting to maintain quotations on a basis of $12, Birmingham, for No. 2 Foundry, is believed to have been made in good faith, and producers generally are of the opinion that a decline from such a basis will not be suffered. The fact remains, however, that all Southern interests did not enter the agreement, and there are no indications that the demand will be stimulated in the near future to such an extent that concessions on the part of independent concerns, though the producing capacity represented be comparatively small, would be without a material effect. Within the week carload lots have sold for $12, but no sales are reported at lower figures. The quotations made on the recent inquiry for 12,000 tons cannot be ascertained, and the only sale known to have resulted was 150 tons on a basis of $12, Birmingham. A lot of 500 tons

for delivery during May, June and July brought $12.25 for No. 2, and 100 tons for delivery within the next 30 days was sold at the same price. An offer of $12.25 for 500 tons to be delivered during the third quarter is known to have been refused. The sale of approximately 5000 tons of High Manganese Iron is reported at $13. By fracture, this sale would represent a price of from $12 to $12.50 for No. 2 Foundry. As to the reported sale of approximately 100,000 tons by a Southern concern for export, inquiry at local offices fails to result in a confirmation, and the fact that the concern to which the sale is accredited could not fill such an order without the operation of capacity now idle further removes the likelihood of its having been made.

Cast Iron Pipe.—As the season advances, the prospects for new business are brighter. The ability to dispose of municipal bonds at a greater advantage is noted, and by reason of the fact that more satisfactory terms of payments can be arranged, the large contracts now in sight are of especial interest. Among the cities reported to be contemplating extensions in the near future are Atlanta, Ga., Council Bluffs, Iowa, and Hope, Ark. It is also stated upon good authority that the bond issue for the proposed improvement and extension to water works at San Francisco, Cal., is practically certain, while reports from Cuba favor lettings of consequence in addition to those recently advertised. The production has been increased materially within the week, and the active capacity in the immediate vicinity is now close to normal. Prices continue to cover a wide range, but we do not consider revision of quotations warranted. Nominal quotations on Water Pipe are as follows, per net ton, f.o.b. cars here: 4 in. to 6 in., $23; 8 in. to 12 in., $22; over 12-in., average $21, with $1 per ton extra for Gas Pipe. These quotations are probably shaded on large contracts.

Old Material.—An increase in the number of sales received is noted, and more sales have resulted. Purchasers are still inclined to limit their engagements to actual requirements, however, and the aggregate does not reach large proportions. Prices received have covered a wide range, with a tendency to weaken, but a revision of quotations is not authorized, and we quote nominally as follows, per gross ton f.o.b. cars here:

Old Iron Rails	$16.50 to $17.00
Old Iron Axles	15.50 to 16.00
Old Steel Axles	13.50 to 14.00
No. 1 Railroad Wrought	13.00 to 13.50
No. 2 Railroad Wrought	10.00 to 10.50
No. 1 Country Wrought	11.50 to 12.00
No. 2 Country Wrought	9.50 to 10.00
Wrought Pipe and Flues	10.50 to 10.50
No. 1 Steel	11.00 to 11.50
No. 1 Machinery	10.50 to 11.00
Stove Plate and Light Cast	9.50 to 10.00
Cast Borings	6.00 to 6.50

Philadelphia.

PHILADELPHIA, PA., April 21, 1908.

The outcome of the deliberations of the producers of Foundry Pig Iron from the East, South and West, and the result of the regular monthly meeting of the Eastern Pig Iron Association, both occurring in New York City the latter portion of last week, have been the leading features before the trade. Opinions differ as to the maintenance of the present policy of upholding prices in face of the strong outside competition, and some have expressed themselves in favor of an open market. Under existing conditions it is difficult to determine which policy would be the better to pursue, and therefore prices were reaffirmed pending the call of a further meeting to be held in the near future. The trade under the circumstances is marking time, awaiting developments, and until some definite action is taken regarding the position of producers of crude material buying will likely continue along very narrow lines. The Lehigh & New England Railroad, through the Lehigh Coal & Navigation Company, has placed further orders for both motive power and rolling stock. Five locomotives were ordered from the Baldwin Locomotive Works and the Cambria Steel Company was given an additional order for 50 Steel coal cars. Several bridge orders were also placed by this company, and plans for others are being made, contracts for which will likely be placed in the course of a month or so. The cost of the orders placed will aggregate $500,000. Outside of this work the railroads have largely maintained their policy of keeping out of the market.

Pig Iron.—The result of the meetings of the Pig Iron producers last week was awaited with interest by the trade, and it was expected that some policy which would relieve the present tension of the market would be adopted. The determination to maintain the former range of prices has had little effect on the trade, which will continue to maintain a waiting policy. Stocks on furnace banks are undoubtedly accumulating, but in the absence of any definite data the effect of the accumulation cannot be estimated. The Eastern furnaces are restricting production still more, and if business continues as dull as it has been recently further curtailments are not unlikely. The Virginia furnaces, which are not affected by any price arrangement, are maintaining their present prices, but extra efforts will probably be made to get them in line with Eastern producers. The Southern situation is probably the most difficult one, and much will depend on the possibility of getting all of these furnaces to agree to methods or policies which would be satisfactory to themselves and the Eastern producers. The outcome of the further deliberations of the Foundry Iron producers will therefore be awaited with interest. While the Eastern furnaces reaffirm their basis of $18.25, delivered, for No. 2 X Foundry, there is still enough outside Iron floating around to meet current consumption, and which can be had at 50c. to $1 under the established rate. That some of the Northern furnace owners, who were cutting pretty heavily heretofore, have again come into the fold and withdrawn all previous quotations, and are now naming the full price, is considered encouraging. In other instances, makers who have been taking considerable Iron at low prices are getting pretty nearly as much tonnage as they want at those figures, and while they will sell small quantities for early delivery quite freely, they are not inclined to take orders for heavy tonnages for forward delivery at to-day's low prices. The business transacted has been extremely light. The bulk of the business has been done in the Foundry grades. There have been more sales of No. 2 Plain Iron, which in a number of cases is replacing No. 2 X buyers, endeavoring to obtain Iron of an analysis just outside of the No. 2 X grade. Eastern furnaces have sold some little Iron at full figures, but the bulk of the business has been done at lower figures. There is again some inquiry around for Pipe Irons, one local maker being in the market for 2500 tons for April and May delivery. Pipe foundries continue taking small lots of off grades of Iron at bargain prices, but the aggregate tonnage is not large. A little better demand has developed for Forge Iron. A sale of a 500-ton lot at full prices has been reported, with several small inquiries still before the trade. Steel making Irons are still uncalled for. The tonnage in Virginia Irons taken in this territory in the past week has been small. Sales of Southern Iron have also been light, although some fair inquiries are before the trade. Prices show little change. Some of the outside interests have been selling Iron in isolated cases at somewhat lower figures, but the following range of prices represents the general run at which sales have been made for second quarter delivery in buyers' yards, eastern Pennsylvania and adjoining territory:

Eastern Pennsylvania, No. 2 X Foundry	$17.50 to $18.25
Eastern Pennsylvania, No. 2 Plain	17.00 to 17.75
Virginia, No. 2 X Foundry	17.50 to 17.75
Virginia, No. 2 Plain	17.00 to 17.25
Gray Forge	16.00 to 16.75
Basic	17.25
Low Phosphorus	23.50 to 24.00

Ferromanganese.—There is but little demand, and what business has been done is confined to small and broken lots. Prices are unchanged, $43 to $44, Baltimore, being named for small lots for prompt delivery.

Steel.—Notwithstanding that mills are running at reduced capacity, business does not come out fast enough to take the output, and in instances mills are piling ingots. The demand is irregular and individual sales are small and for prompt shipment. Prices are unchanged, and buyers show no interest in the market and would probably not buy for future delivery, even at shaded prices. For delivery in the Philadelphia territory ordinary Rolling Steel is quoted at $29.20, with Forging Steel at $31.20, with the usual extras for high carbons and large sizes.

Plates.—While there is a fairly good number of orders coming out, the aggregate tonnage is small. Larger propositions appear to be held up, and buying is largely of a miscellaneous nature to cover immediate needs of consumers. Prices are being fully maintained, the following range being named for delivery in this territory:

	Carload. Cents.	Part carload. Cents.
Tank, Brand and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼ in. and heavier. The following extras apply

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—The heaviest individual tonnage placed in this territory last week went to the Pennsylvania Steel Company. It included two bridges, one over the Delaware River at Portland, near Easton, Pa., the other over Paulins Kill, near Hainesburg Junction, N. J., which together will require 1500 tons of material. The orders for these were placed by the Lehigh & New England Railroad Company, which also has plans in preparation for a new bridge, requiring some 600 tons of material, over the Delaware River at Slatington, Pa. Outside the above, the orders

taken by the trade have been largely of a miscellaneous character, although several fair sized propositions are under consideration. Prices remain unchanged, 1.85c. to 2c., according to specification, being named.

Sheets.—There has been a little better demand for Sheets recently. No tendency has been shown on the part of buyers to anticipate their wants, but seasonable business for prompt delivery shows an increased volume. Mills, however, do not seem to be able to increase their production. Prices are being fully maintained, the following range being quoted, for mill shipment, with a tenth for small lots: Nos. 18 to 20, 2.50c.; No. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The meeting of the Eastern Bar Iron Association last week resulted in the reaffirmation of the established basis, 1.65c., delivered, in this territory, for Refined Iron Bars, notwithstanding the fact that merchants who have tonnage still due them on old contracts at much lower figures quote as low as 1.40c., Eastern mill. It is understood that orders for 10,000 tons of Bars at the low range of prices are still unspecified on makers' books, and until these are disposed of there is little chance of mills doing much business at the higher figures. The demand is reported light, buying being almost entirely of a hand to mouth character.

Coke.—Small sales of Foundry Coke are reported, with practically nothing being done in Furnace Coke. Prices are weaker and the business done has been largely for prompt shipment. Foundry Coke is quoted at $2.15 to $2.40, at oven, with Furnace Coke at $1.65 to $1.85, at oven. For delivery in the Philadelphia territory the following range of prices is quoted:

Connellsville Furnace Coke	$3.80 to $4.00
Prompt Furnace	4.30 to 4.55
Mixed Furnace	3.40 to 3.60
Foundry Coke	3.80 to 4.10

Old Material.—The market continues extremely quiet. Sales are few and confined to odd carload lots. Mills show no interest in the market, and prices, while not quotably lower, are weaker. We quote nominally as follows for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory:

No. 1 Steel Scrap	$12.75 to $13.25
Low Phosphorus	17.50 to 18.00
Old Steel Axles	17.50 to 18.00
Old Iron Axles	20.00 to 21.00
Old Iron Rails	17.00 to 18.00
Old Car Wheels	14.00 to 15.00
Choice No. 1 R. R. Wrought	15.00 to 15.50
Machinery Cast	15.00 to 15.50
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	8.75 to 9.25
Stove Plate	11.00 to 11.50
Cast Borings	7.50 to 8.00
Grate Bars	11.75 to 12.25

St. Louis.

ST. LOUIS, Mo., April 20, 1908.

A meeting of members of the Merchants' Exchange will be held April 21, for the purpose of promoting the movement to inaugurate the resumption of traffic on the Mississippi River between St. Louis and New Orleans. It is proposed to establish a line consisting of 30 steel barges and four towboats. The proposition involves the raising of $2,000,000. Certain St. Louis parties about a year ago took out a charter for the Grain Growers-Exporters Transportation Company, to serve as a nucleus for the barge project. It is a Missouri corporation, with $50,000 authorized capital.

Old Material.—There is some improvement in the demand for Old Material and prices on certain classes are stronger to a trifle higher. There is quite a demand springing up for Relaying Rails, doubtless owing to some railroads being in better financial position and resuming the building of track, but desire to purchase as economically as possible. We quote as follows, f.o.b. St. Louis, per gross ton:

Old Steel Rails	$11.00 to $11.50
Old Steel Rails, rerolling	11.00 to 11.50
Old Steel Rails, less than 3 ft	11.00
Relaying Rails, standard sections, subject to inspection	22.00 to 23.00
Old Car Wheels	14.50 to 15.00
Heavy Melting Steel Scrap	11.50
Frogs, Switches and Guards, cut apart	11.50
Mixed Steel	10.50
Following quotations are per net ton:	
Iron Fish Plates	$12.50
Iron Car Axles	16.50
No. 1 Railroad Wrought	$11.50 to 12.00
No. 2 Railroad Wrought	10.50 to 11.00
Railway Springs	11.50
Locomotive Tires, smooth	13.00
No. 1 Dealers' Forge, nominal	9.00 to 10.00
Mixed Borings, &c	4.00 to 5.00
No. 1 Boiler, cut to Sheets and Rings	8.50
No. 1 Cast Scrap	12.00
Stove Plate and Light Cast Scrap	10.50
Railroad Malleable	10.00
Agricultural Malleable	9.00
Pipes and Flues	8.00 to 8.50

Metal Market.

NEW YORK, April 22, 1908.

Pig Tin.—The dullness in trade which characterized the report of last week continued during the week under review. Consumers apparently need little, and this, with the closing of the London Exchange, made business exceedingly dull. Fluctuations during the week have been within narrow limits, and sharp competition has ensued for any business offering. The range of prices during the week has been as follows:

	Cents.
April 15	31.95 to 32.00
April 16	31.90
April 17	31.90
April 20	31.95
April 21	31.90
April 22	31.70

Some little pressure was observed in the selling of Minnehaha Tin, as over 900 tons arrived on this steamer yesterday. This business was taken on an average of 15 to 20 points below the spot market. Gossip from London is to the effect that one of the leading bull operators is actively manipulating the market, and reports are that Tin is to be put up considerably. It is a fact that with all the world-wide liquidation and prices in many commodities cut in two, Tin is now ruling at a higher figure than at any time previous to the latter part of 1905 and the two following years. Exception, however, must be taken to spasmodic advances above 32c., such as occurred in 1899 and 1900, but these were very very short lived. The arrivals so far this month have been large, amounting to 2985 tons, and there are afloat for American ports 1481 tons. Price changes in London during the week have shown a decline of 15s., the London market closing to-day at £143 17s. 6d. for spot, and £142 15s. for futures.

Copper.—Despite falling quotations in London, and the absence of large business in this country, prices remain unusually stubborn. A careful search was made during the early part of the week for Electrolytic and nothing was found under 12.75c., net cash, New York City. Export orders could, of course, have been placed at slightly less. Lake is just as firm, at 13c., and Casting Grades at 12.62½c. The holidays in London put a damper on buying from that point as well as continental Europe, but purchases for foreign consumers seem to be going on steadily, although an absence of large speculative buying is noted. This may be expected to resume if prices should recede further. The exports continue to be the main stay of the market, and European consumers are taking liberal supplies, the exports so far this month amounting to 20,776 tons. This makes over 100,000 tons of Copper exported so far this year. If to this is added 100,000 tons exported during the last three months of 1907, it shows that in the short space of less than seven months over 200,000 tons of Copper have been exported. The highest exports heretofore were in the year 1904, when so much metal was sent to China, and slightly less than 250,000 tons was then exported. It should be recalled, too, that the supplies of Copper to American consumers are being cut down in another way; that is, imports since September have shown a marked falling off. The London market closes 10s. lower than last week, at £58 for spot, and £58 10s. for futures. The Boston & Montana smelter was saved from the flood last week, but transportation facilities and power supplies having been cut off ore will necessarily be diverted to the Washoe smelter.

Lead.—Prices continue firm, the American Smelting & Refining Company being the cheapest seller at 4c., New York. Lead can be had in St. Louis, at 3.85c.

Spelter.—Little or no change is observed in the price of Spelter, and business has been unusually light. Prime Western Brands are salable at 4.50c., St. Louis, and 4.65c., New York.

Nickel.—Prices are unchanged, at 45c., for ton lots, and 50c. to 60c. for smaller quantities.

Ferroalloys.—The demand from consumers continues light, much of their requirements being supplied through resale lots. When consumers, however, are in urgent need of prompt shipments they are compelled to pay about $43.50 to $44, seaboard, for Ferromanganese. Prices on 50 per cent. Ferrosilicon are more or less nominal, at $80.

Old Metals.—Practically no change is observed either in prices or the volume of business. Dealers' selling prices are as follows:

[illegible]	[illegible]
Copper, Light and Bottoms	11.25 to 11.50
Brass, Heavy	9.00 to 9.25
[illegible]	[illegible]
Heavy Machine Composition	11.50 to 11.75
Clean Brass Turnings	8.25 to 8.50
Composition Turnings	9.00 to 10.00
Lead, Heavy	3.80
Lead, Tea	3.55
[illegible]	[illegible]

Antimony.—Prices are largely nominal. Cookson's being quoted at 8.75c. to 9c., Hallett's at 8.75c., and outside brands at 8.50c.

Tin Plate.—While the booking of new contracts is not so active as a few weeks ago, still specifications on large

orders are coming in freely. Prices are steady, at $3.89, New York, and $3.70, Pittsburgh, for 100 IC Coke Plates. In Swansea business is active and Welsh Plates are unchanged, at 12s. 7½d.

New York.

NEW YORK, April 22, 1908.

Pig Iron.—At the meeting of the Eastern Pig Iron Association held last week, its was decided to maintain prices for the present, and one selling agency has withdrawn some of the lower figures quoted. The market, however, is dominated by the Southern makers, some of whom have sold at figures in this territory which are equivalent to $11.75 for No. 2 at Birmingham. We quote at tidewater as follows: No. 1 Northern Foundry, $18 to $18.50; No. 2, Northern Foundry, $17.25 to $18.25; No. 2 Plain, $17 to $17.50; Alabama Irons are $17.25 to $17.50 for No. 1 Foundry and $16 to $16.50 for No. 2 Foundry.

Steel Rails.—The distribution of the 31,000 tons of rails bought for Vanderbilt lines, as announced last week, is as follows: Lake Shore & Michigan Southern, 20,000 tons; Michigan Central, 8000 tons; Chicago, Indiana & Southern, 2000 tons; Lake Erie & Western, 1000 tons. Scattering orders amounting to 2000 tons have been booked by one company.

Structural Material.—Some railroad bridge work has come out in the past week, but there are no large contracts. The St. Paul placed 700 tons with the American Bridge Company for its Pacific Coast extension; the Pennsylvania Railroad awarded 600 tons for bridges to the Pennsylvania Steel Company, and a contract for 500 tons is reported to have been let by the Boston Elevated. The Dock Department of the city of New York will open bids on May 7 for the Steel structural work at the Staten Island ferry terminal. In addition to the riveted Steel pipe line for which it has recently bought Steel, the Anglo-Newfoundland Development Company's improvements in Newfoundland call for 1500 tons of Structural material on which several local construction companies have figured recently. On a recent Brooklyn contract for a manufacturing plant for which Cast Iron columns are to be used, the fabricating work being of a simple character, a price of $42 is said to have been made. The low prices persist, and it is becoming more apparent that the fabricating business will show a surplus of capacity for a long time to come. The extent to which some of the smaller concerns have loaded up on profitless contracts is commented on. The general feeling is still rather hopeful, in view of the increasing tonnage of new work that is being figured on, but the work actually in hand is more and more in contrast with conditions a year ago. We continue to quote as follows on mill shipments, f.o.b. tidewater: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—The Eastern Bar Iron manufacturers held their usual monthly meeting in this city last week and unanimously decided to maintain prices at 1.50c., Pittsburgh, or 1.66c., New York. It is stated that consumers requiring a full range of sizes or who desire Bars made by mills of good standing are placing some orders at these rates. The volume of business, however, is quite small and most of it is still being taken by jobbers or brokers who have lower priced Iron purchased some time ago, which they are selling at about 1.50c., New York. It is claimed that the quantity of Bar Iron purchased in this locality when prices were demoralized was not large, and the fact that some of it is still to be had shows how limited the demand has been. Steel Bars continue unchanged at 1.60c., Pittsburgh, or 1.76c., tidewater.

Plates.—The largest order recently taken by Eastern sales agents was for export to Newfoundland, and comprised about 2000 tons, to be used in the construction of a Pipe line connected with a pulp works. While current business is usually confined to lots of the size of a carload and a little larger, more figuring is now being done than for some time, and prospects are growing a little brighter. It is stated that the Steel Pipe line required for the extension to the Brooklyn Water Works, which will require about 20,000 tons of Plates, will certainly come in the market within the next two months. Prices are maintained, as follows, on standard sizes of Plates, at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—Some lettings are now being made by municipalities in Pennsylvania, but these usually do not call for a definite quantity of Pipe, but are for the season's requirements. Outside of business of this character, little is now being done. Local sales are confined to an occasional carload. The city of New York is expected to be in the market next week for 1500 to 2000 tons. Quotations on carload lots of 6 in. are continued, at $24.50 to $25, per net ton, at tidewater.

Old Material.—The market is almost lifeless. Foundries are buying sparingly, being able to supply their requirements for Pig Iron at such reasonable prices that they are using probably less than the normal mixture of Scrap. Rolling mills are only running spasmodically and appear to be able to purchase the small supply of Old Material needed directly from the railroad companies at lower prices than dealers are willing to name. The Steel works are running to so low a percentage of their capacity that when they purchase a few thousand tons of Scrap they retire from the market for some considerable time. Accumulations of stock are noted in some lines, especially in Old Car Wheels, which now are completely neglected. Quotations are continued, as they represent about what consumers would be obliged to pay if they were purchasing from dealers. We quote as follows, per gross ton, New York City:

Old Girder and T Rails for melting	$9.50 to $10.50
Heavy Melting Steel Scrap	9.50 to 10.50
Old Steel Rails, rerolling lengths	10.50 to 11.50
Relaying Rails	19.00 to 20.00
Old Iron Rails	14.00 to 15.00
Standard Hammered Iron Car Axles	16.00 to 17.00
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	11.50 to 12.50
Iron Track Scrap	9.50 to 10.50
No. 1 Yard Wrought, long	10.50 to 11.50
No. 1 Yard Wrought, short	9.50 to 10.50
Light Iron	5.00 to 6.00
Cast Borings	4.50 to 5.50
Wrought Turnings	6.00 to 7.00
Wrought Pipe	9.00 to 10.00
Old Car Wheels	14.00 to 15.00
No. 1 Heavy Cast, broken up	13.00 to 14.00
Stove Plate	9.00 to 10.00
Locomotive Grate Bars	9.50 to 10.50
Malleable Cast	10.00 to 11.00

The offices of Rogers, Brown & Co., pig iron merchants, have been removed from the Trinity Building to the Hudson Terminal Building, 30 Church street, New York.

Iron and Industrial Stocks.

NEW YORK, April 22, 1908.

The period covered since our last report has been broken by two holidays, so that transactions have been much smaller than usual. The market, however, has been fairly firm, notwithstanding some adverse influences, such as the beginning of a gold exporting movement. Republic prices were particularly affected on Monday and Tuesday by reports regarding the possibility of the passing of the preferred dividend. The range of prices on active iron and steel stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 33¾ to 35⅝, preferred 98¼ to 99⅜; Car & Foundry common 32 to 33⅛, preferred 92½; Locomotive common 44¼ to 45⅞, preferred 92 to 94½; Steel Foundries common 6 to 6½, preferred 30½ to 31; Cambria Steel 29 to 29½; Colorado Fuel 23¼ to 24⅞; Crucible Steel common 5, preferred 37¼; Pressed Steel common 23½ to 24¼, preferred 77½ to 78½; Railway Spring common 33; Republic common 16¼ to 18, preferred 64 to 68⅝; Sloss-Sheffield common 43 to 44½; Cast Iron Pipe common 24, preferred 69½ to 70; Can common 4⅞ to 5, preferred 51 to 51½. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 35⅜, preferred 99¼, bonds 97⅛; Car & Foundry common 33, preferred 93½; Locomotive common 45¾, preferred 94⅝; Colorado Fuel 24¼; Pressed Steel common 24⅜, preferred 78½; Railway Spring common 33½; Republic common 16⅞, preferred 66⅝; Sloss-Sheffield common 43; Can common 4¾, preferred 51.

Of the outstanding 6 per cent. bonds of the Wellman-Seaver-Morgan Company, Cleveland, Ohio, the balance of $43,000 has been called for payment at 105 and interest on May 1. The new issue of 5½ per cent. bonds, dated September 15, 1905, of which $920,000 is outstanding, matures at the rate of $40,000 every six months.

The Ingersoll-Rand Company.—The annual report of this company for the year ended December 31, 1907, shows net earnings of $1,788,601, an increase of $149,664, and a final surplus of $458,880, an increase of $174,551. The detailed income account shows the following changes:

	1907.	Changes.
Net earnings	$1,788,601	Inc. $149,664
Depreciation	433,983	Inc. 64,276
Net for year	$1,354,618	Inc. $85,388
Interest on bonds	100,000	.....
Balance	$1,254,618	Inc. $85,388
Preferred dividend	285,738	Inc. 15,837
Surplus	$968,880	Inc. $69,551
Special reserve for patents, licenses, inventories, &c.	*510,000	Dec. 105,000
Net surplus	$458,880	Inc. $174,551
Previous surplus	461,752	Inc. 284,329
P. and L. surplus	$920,632	Inc. $458,880

* Includes special inventory reserve of $500,000.

The surplus after preferred dividends, $968,880, before

charging off special reserves for patents, licenses and inventories, is equal to 32.27 per cent. earned on the $3,000,000 common stock. Charging surplus with the $510,000 so reserved, the surplus, $458,880, would be equal to 15.27 per cent. on the common stock.

Dividends.—The United States Cast Iron Pipe & Foundry Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable June 1.

The Pennsylvania Steel Company has declared a semi-annual dividend of 3½ per cent. on the preferred stock, payable May 1.

Proposed International Beam Agreement.—The effort recently made to bring together the structural steel manufacturers of Great Britain, Germany and Belgium has had no definite outcome as yet, though it is stated the negotiations are still under way. The German Steel Syndicate is understood to have taken the initiative and a meeting was held in London. It is stated that the position of Great Britain is rather more favorable in the international beam trade. Its imports were 88,905 tons last year, as against 136,600 tons in 1906. Belgium shipped 92,000 tons into Great Britain in 1906, but only 53,400 tons in 1907. The exports from Great Britain were 106,353 tons in 1907 and 107,115 tons in 1906, showing a considerable advance from the record of 63,965 tons in 1905.

The New England Foundrymen's Association.—At the April meeting of this society, held at the Exchange Club, Boston, a resolution was adopted that the association should unite with the New England Stove Manufacturers' Association in adopting a uniform form of contract for purchasing pig iron, as read to the meeting. The death of Patrick Shields, Shields Foundry Company, Mansfield, Mass., was reported, and a committee was appointed to prepare resolutions. T. E. Byrnes, vice-president of the New York, New Haven & Hartford Railroad, gave an interesting talk on the transportation needs of New England.

The Pennsylvania Engineering Works, New Castle, Pa., has lately moved into its new office building adjoining the plant, and now has the necessary room to carry on its business. The building is two stories high, but is intended for future extension, as heavy walls have been provided on which another story can be added at some future time. The first floor is used for offices of the management and general and bookkeeping departments, while the second floor is occupied by the drafting and estimating departments. The building is built of steel, brick and fireproof material, has electric lights and is steam heated. The basement and both floors have each its own fireproof vault for storing records, tracings and blue prints. The building is handsomely furnished and is connected to the plant by a small bridge. This company recently completed the erection of a new blast furnace for the Wisconsin Steel Company, South Chicago, Ill. Deliveries have been started on an order from the Indiana Steel Company for 30 90-ton ladles and 30 40-ton hot metal cars for shipment to Gary, Ind.

An interesting diagram has been issued by John Birkinbine, consulting engineer of Philadelphia, representing graphically the relations for a series of years between the population, the currency circulation and the pig iron production of the United States. The record for 18 years, as indicated by the diagram, shows that while the population of the United States augmented 36 per cent., the domestic pig iron output was almost trebled, the per capita production doubled, and with the available currency per inhabitant expanded 41 per cent., the pig iron industry apparently demanded in 1907 nearly two and one-half times as much money as in 1880.

The Mesta Machine Company, Pittsburgh, is making this week shipment of a 32 and 56 x 50 in. twin tandem compound reversing engine, the approximate weight being about 800,000 lb., to the Bethlehem Steel Company, South Bethlehem, Pa. It is intended to drive the 28-in.structural mill. The Mesta Machine Company is also building at its works at West Homestead two high pressure and two low pressure long cross head vertical engines, high pressure cylinders 44 and 84 x 60 in., and low pressure cylinders 84 and 84 x 60 in., for the Cleveland Furnace Company, Cleveland, Ohio.

The Ferroalloy Duty.

Another chapter in the long drawn out controversy between importers and the Government regarding the classification to be accorded ferrochrome, ferrotungsten and ferrovanadium was written April 16, when the Board of United States General Appraisers made a new decision on the subject. The ferro issue has engaged the attention of both the Board of Appraisers and of the Federal courts for several years. Throughout the various suits the Government has maintained that the ferros are dutiable properly at the rate of 20 per cent. under the provision for "metallic mineral substances in a crude state, and metals unwrought." On the other hand, the importers contend that the ferros are entitled to assessment at the rate of $4 per ton under paragraph 122, by similitude to ferromanganese.

General Appraiser Fischer, who writes the latest decision for the lower customs tribunal, takes notice of the fact that the United States Circuit Courts of Appeals, both at New York and at Philadelphia, have passed upon the question at issue. Unfortunately for the termination of litigation the decisions of the two courts were conflicting. Under these circumstances it was decided to bring a new case before the board, and on a more complete record carry the issue into the courts for final determination.

In the earlier proceedings standing in the name of the Roessler & Hasslacher Chemical Company, the Circuit Court of Appeals for this circuit upheld the contention of the importers. Under that ruling, the court held that ferros are not capable of being wrought, and limited the application of the provision for "metals unwrought," to such metals as are susceptible of being wrought. The opinion in that case referred to ferros as substances fit merely to be thrown into the crucible to be melted up with other ingredients to produce another and distinct product. The decision excluded such substances from the provision for unwrought metals and held them to be dutiable by similitude to ferromanganese. Just the opposite conclusion was reached by the Appellate Court in Philadelphia, when a protest of the William Cramp & Sons Shipbuilding & Engine Company was under consideration. This decision held the ferros to be "metals unwrought," as alleged by the Government.

Acting on the basis of a more complete record in the latest case, the Board of Appraisers now overrules the claim of the importers in the present case, which stands in the name of E. J. Lavino & Co. and others of New York and Philadelphia, including the Midvale Steel Company. The effect of the board's ruling is to indorse the decision arrived at by the Philadelphia Appellate Court in the Cramp case. As the issue now stands, the Government is the victor, although it is understood that the importers will appeal to the courts, where a strong fight will be made in behalf of the lower duty. In finding against the importers, General Appraiser Fischer says in part:

> The illustrative exhibits demonstrate that these ferroalloys, though they may be imported to be used merely as substances to be melted up with other materials in a crucible in the manufacture of certain kinds of steel, are nevertheless not incapable of use otherwise. They may be wrought, and the proof presented indicates that they may have been used for practical purposes as metal. Witness Heany testified that he has used the various ferroalloys in making electrodes, resistance wire, and in the manufacture of utensils which he uses in the manufacture of tungsten filaments for electric incandescent lighting. These ferros are imported in their crudest form, and we hold, following the Cramp case, that they are within the provision for "metals unwrought," as that term is used in paragraph 183 of the tariff.

Founders' Day exercises at the Carnegie Institute, Pittsburgh, will be held on April 30 this year. Ambassador Bryce will speak on the subject of "The Influence of Modern Science Upon Modern Thought." W. T. Hornaday, the eminent naturalist, will make an address on "The Educational Value of a Popular Museum," while Henry E. Krehbiel, the musical critic of the New York *Tribune*, will talk on the subject of "The Orchestra as a Teacher of Music." It is not expected that Andrew Carnegie will attend the exercises this year.

The Machinery Trade.

NEW YORK, April 22, 1908.

The machinery trade is watching the railroads for lists and it is thought that it will not be long before the Eastern trade will get some business from that source. The Western railroads have been buying liberally of late, and the Chicago, Milwaukee & St. Paul Railroad, particularly, has been a heavy purchaser. Men who watch the railroad purchasing departments and operating departments closely say that there are many freight cars which were used a great deal during the good trade of last year which are in urgent need of repairs, and it is thought that it will be but a short time until a number of shops in the East which are inadequately equipped for this work will be put in shape, and the result will be some fair lists of machine tools for the trade to bid on. Generally speaking, the last week has not been a discouraging one to the New York machinery trade, as there has been some fairly steady buying, not in large lots, but the result of the week's sales with most of the houses was nothing to complain of considering present conditions. The Standard Oil Company is still buying for its Bayway plant, and an order was placed last week with the Vandyck-Churchill Company for 18 jib cranes, and some orders for other conveying equipment, it was understood, were placed with other houses. The New York Central Railroad has been buying somewhat more briskly than for a number of weeks, and although no lists were sent out a fair quantity of business was placed in scattered orders with a number of firms. The trade in second-hand machinery has been dull and manufacturers of steel castings have not been particularly successful for getting long time contracts for machine castings with the trade in general.

The R. W. Herfurth Company, 39 Cortlandt street, New York, has been incorporated with an authorized capital of $125,000 to manufacture metal working machinery and to do a general business as a machinery dealing firm. The company will spend about $30,000 in fitting up a plant in Jersey City, and some machinery equipment will be purchased. The buying will include machine tools and power equipment to develop about 60,000 hp., besides some machine tools and other general manufacturing equipment. It has not been decided whether gas or electricity will be used for power. The machinery the company will manufacture will be made from patents formerly owned by R. W. Herfurth, who has turned them over to the company. Besides operating a plant in Jersey City the company will have storehouses and offices in Hartford and Philadelphia which will be used for storing and marketing not only the company's product, but a general line of machinery equipment. R. W. Herfurth is president and general manager of the company, and he and George Surand and Benjamin S. Morehouse are the incorporators. It is understood that the purchasing of the machinery required for the Jersey City plant will be begun in about 60 days.

A number of inquiries placed in the market lately indicate that the Corn Products Company intends doing some buying in New York for its new plant at Summit, Ill., which is now in course of construction. The company is building an unusually large plant, comprising about 33 buildings, ranging in hight from 1½ to 14 stories, and, although some large orders have been placed in the West for equipment for the plant, it is not thought that the buying has by any means been completed. It is understood that great progress has been made in the construction of the plant, and it is expected that it will be in operation before the year is out.

The C. I. F. Company, 11 Broadway, New York, has received the following inquiries from foreign sources on which it will be pleased to receive specifications, prices and other information: Inquiry No. 51, machines for making duplex steam pumps, for boring, facing, drilling, milling, &c.; inquiry No. 52, drawing and stamping press, power driven, to stamp 20 gauge sheet copper, with suggestions as to annealing of material prior to drawing, prevention of crimping, &c.; inquiry No. 53, brass foundry equipment for making brass fittings, core making machines, molding machines, &c.; inquiry No. 54, machine tools for working brass; inquiry No. 55, milling and grinding machine for making dies in sectional form for punching out segments for electric work; inquiry No. 56, woodworking machinery.

The Brooklyn Union Gas Company, 180 Remsen street, Brooklyn, N. Y., will probably need some machinery equipment for a new plant to be erected in Brooklyn for manufacturing and repairing gas meters. The structure will be 75 x 100 ft. in size, two stories in hight and contract for the construction of the buildings has been let to Richard Deeves & Son, 305 Broadway, New York. The construction of the building will be superintended by W. C. Lane.

Business Changes.

The new Hudson Terminal Buildings have been opened and many tenants are moving in. Among them are the following firms engaged in the machinery trade and allied industries: At 30 Church street: Adams & Westlake Company, American Brake Shoe & Foundry Company, American Bridge Company, of New York, American Gas & Electric Company, American Locomotive Company, American Steel Foundries, Atlas Engine Works, Ball & Wood Company, Boekelman Construction Company, Carbon Steel Company, Cleveland Varnish Company, Cockburn Barrow & Machine Company, Crocker-Wheeler Company, Charles Engelhard, Fairbanks, Morse & Co., Fort Wayne Electric Works, Alfred Fowle, Jr., commissioner for valve and fitting manufacturers and malleable iron fitting manufacturers; General Electric Company, Godwin Construction Company, Jacobs & Davies, Keystone Seal & Press Company, H. G. Kotten & Co., Lambert Hoisting Engine Company, J. J. McCabe, Monarch Machinery Company, Monarch Ventilator Company, Nelson Valve Company, Ohio Brass Company, Railroad Supply Company, Railway Steel Spring Company, Robins Conveying Belt Company, Rogers, Brown & Co., Tonopah Extension Mining Company, Tuohy Bros. Company. At 50 Church street: Abendroth & Root Mfg. Company, Ajax Mfg. Company, American Clay Machinery Company, American Diamond Blast Company, American Machinery & Export Company, American Mason Safety Tread Company, American Spiral Pipe Works, American Steam Users Economic Company, Brown Hoisting Machinery Company, W. H. Bundy Recording Company, H. W. Caldwell & Son Company, Ralph B. Carter Company, H. M. & H. F. Chase, Chicago Pneumatic Tool Company, Composite Board Company, Conolly Iron Sponge & Governor Company, Connersville Blower Company, Consolidated Railway & Light Company, Crown Castings Company, Cutler-Hammer Mfg. Company, Davies & Thomas Company, Dayton Hydraulic Machinery Company, Electric Controller & Supply Company, Electric Service Supplies Company, Emerson Electric Mfg. Company, Exeter Machine Works, Walter H. Foster Company, A. N. Frecker, Fromme Bros., E. G. Gautier & Co., General Contracting & Engineering Company, Harper Machinery Company, Harris Automatic Press Company, Independent Engineering Company, International Auxiliary Company, Interstate Engineering Company, David Lupton's Sons Company, Machinery Club of New York, McIntosh, Seymour & Co., Mesta Machine Company, Morse Chain Company, Thornton N. Motley & Co., Oliver Machinery Company, Ephraim S. Pease, Providence Engineering Works, Riter-Conley Mfg. Company, Rust Boiler Company, Schoen Steel Wheel Company, Schutte & Koerting Company, Security Register & Mfg. Company, Sherwin-Williams Company, H. B. Smith Machine Company, Star Engineering Company, Tyler Tube & Pipe Company, Wagner Electrical Mfg. Company, Watson-Stillman Company, Wellman-Seaver-Morgan Company, Wendell & MacDuffie, Western Wheeled Scraper Company.

In order to more fully designate the name of its products, the General Pneumatic Tool Company, Montour Falls, N. Y., changed its name May 18 to the Shepard Electric Crane & Hoist Company. The company, which manufactures Shepard electric traveling cranes, electric hoists, pneumatic hoists and riveters, is at the present time producing more than 200 distinct types and sizes of electric hoists, in capacities ranging from ½ to 20 tons, for practically every variety of service. On April 22 the New York office was moved from the Singer Building to more desirable quarters in the Fulton Building, Hudson Terminal.

The executive offices of the Westinghouse Electric & Mfg. Company, formerly at 111 Broadway, New York, and its New York sales offices and export offices, at 11 Pine street, were removed on Monday to the new City Investing Building, 165 Broadway, New York.

Chicago Machinery Market.

CHICAGO, ILL., April 21, 1908.

Business for the past week in machinery lines has developed a moderate amount of routine orders which continue to be individually small, yet are on the whole quite acceptable at the present time. Indeed, if business of this character were large enough to swell the volume to normal proportions it would prove more desirable and profitable than the larger orders for extensive equipment which, in times of active buying, comprise the requirements of more important industries. The attention of the machinery trade is generally centered upon Western territory, which continues to supply the bulk of the miscellaneous orders now coming into the market. Reports of salesmen returning from Western trips agree in the statement that the small shops and factories throughout the territory embraced in the Mississippi and Missouri River valleys, supplying trade supported by the agricultural interests, are nearly all doing close to a normal business. This, of course, does not include any of the larger manufacturing plants, which are dependent directly or indirectly upon the railroads for the consumption of their product. Outside of the Chicago, Milwaukee & St. Paul Railway,

which has not diminished its activity in the construction and equipment of its Pacific Coast extension, the railroads are not at present an important factor in the machinery market. At the same time, it is to be borne in mind that instead of making lump purchases of a lot of tools at one time, as has been their custom, the railroads are buying a few tools here and there from month to month as necessity demands; and their purchases being scattered in this way perhaps aggregate more than is realized from a cursory view of the situation. There is a fairly good demand for pneumatic tools, which has been reinforced by some late export orders of fair size. Among recent domestic sales reported was one including a number of tools furnished to a large pressed steel car works. The nature of the tools ordered indicated that they were required for use in connection with passenger car construction, and it is presumed that some important contracts of this nature have either been secured or are in sight. As a result of the extensive and growing development of hydro-electric power plants in the West, it is noticed that electricity is playing a more and more important part in the motive power of mining machinery and apparatus. Electrically driven drills, for instance, are growing in favor where such power is available, and the use of motors and other electrical machinery is being extended in mining fields.

The Chicago, Milwaukee & St. Paul Railway Company, Chicago, has issued the following list of miscellaneous tools and equipment on which the trade is now submitting bids. This list is supplemented to one recently submitted, which was published in these columns on March 26, and is also designed for the equipment of shops along the line of the new Pacific Coast extension:

One 5 x 6 x 10 ft. vacuum pump; one 500-hp. open feed water heater; one 500-ton hydraulic wheel press; one 30-in. turret head boring and turning mill; one 24 in. x 24 in. x 6 ft. planer; one planer vise 12-in. jaws; one 48 in. x 48 in. x 16 ft. planer; one planer vise 24-in. jaws; one 72-in. vertical boring and turning mill; one Yankee style "F" wet twist drill grinder; two wet emery wheel grinders; one 18-in. slotting machine; one heavy double axle lathe; one independent feed four-spindle drill; one 42-in. steel tired car wheel lathe; one 78-in. guide bar grinder; one 8-ft. full universal radial drill press; one 20-in. back geared drill press; one 52-in. heavy car wheel boring machine; one 42-in. triple geared engine lathe; one 4-jawed 30 in. diameter chuck for above lathe; one 18 in. x 12 ft. double head back geared shaper; one locomotive cylinder boring bar; one 24-in. quick change gear lathe; one 1½-in. 6-spindle nut tapping machine; one 3 x 26 in. flat turret lathe, belt driven; one flue welder; one 6-spindle independent feed drill; one double punch and shears with 36-in. throat; one single punch with 42-in. throat; one power plate bend rolls; one 100-lb. helve hammer; two 1600-lb. single frame hammers, cylinders 13 x 33 in.; one 2½-in. heading and forging machine; one single bolt and bar shear; one sash and door tenoning machine; one 30-in. automatic knife grinder; one large car rip saw table to take up to a 36-in. saw; one 42-in. wheel band saw; one 4-spindle horizontal boring machine; one sash mortiser with boring attachment; one small iron frame rip saw; one No. 15 extra range heavy vertical hollow chisel mortiser with 2 H. C. universal boring attachments; one solid frame variety woodworker, 12-in. planing head; one heavy automatic cutoff saw; one 12 in. x 24 in. planer matcher and size complete; one small double spindle shaper, spindles 24 in. apart; one surface planer to cut 30 in. wide; one wood turning lathe, 16-in. swing.

The Steinle Turret Machine Company, Madison, Wis., has increased its capital stock from $60,000 to $100,000, and has added two new members to its Board of Directors, increasing the number from three to five. In pursuance of this action, the capacity of the present plant will be enlarged and important additions will be made to its equipment of machine tools. The company builds heavy turret lathes, its particular lines being the design known as the full swing side carriage turret lathe, which was originated and developed by G. A. Steinle. Its distinctive feature is the increased swing provided in front of the carriage tools, permitting the use of short tools on the turret, and thus shortening the leverage so that the chattering effect incident to the use of broad shaving turret tools is obviated. No change has been made in the personnel of the company, the officers being G. A. Steinle, president; Wm. R. Bagley, vice-president; J. A. Steinle, treasurer; A. M. Bagley, secretary.

The St. Paul Union Stock Yards Company, South St. Paul, Minn., has under consideration a plan for converting its 110-volt system into a 220-volt system, which if carried out will include the purchase of a 50-kw. engine generator unit; a 60-kw. belted unit, together with motors, switchboards and other necessary apparatus, including a centrifugal pumping plant. While the contemplated changes will probably be made, no definite action has yet been taken.

The city of Liberty, Ind., desires the substitution of electricity for the present gas system of street lighting, and wishes to communicate with some persons or company willing to install such a plant and furnish lights. G. E. Stevenson is chairman of the Light Committee.

The Allis-Chalmers Company of Milwaukee has received orders for two high pressure and one low pressure blowing engines from the Wickwire Steel Company, Buffalo, N. Y. They are of the standard vertical long crosshead type.

The Western Engineers' Supply Company, M. J. Tearney, manager, and the Comet Motor Works, have removed from 47 South Canal street to the corner of Madison and Canal streets, where they will jointly occupy the storeroom, 72-74 South Canal street. The former concern carries a line of engineers' supplies and manufacturers' vertical steel tubular house heating boilers; the latter builds Comet gasoline motor boat engines.

Cleveland Machinery Market.

CLEVELAND, OHIO, April 21, 1908.

The local machine tool market is still very quiet, although some of the dealers report a slight improvement in orders and inquiries. While conditions show very little change, the indications are that the aggregate volume of business during April will slightly exceed that of March. The buying, as it has been since the first of the year, is mostly in small single tools, although occasionally a dealer gets an order for three or four tools. The buying is nearly all for small manufacturing plants or for new enterprises that are starting up but need very few tools. During the past week, however, some inquiries have come in from large factories that are planning the overhauling of their plants and the putting in of more modern equipment. Dealers report some improvement in the demand for mill supplies.

A large quantity of second-hand tools is still being offered to dealers, but they are buying used tools only when they can secure them at fairly low prices. The demand for second-hand tools seems to have fallen off somewhat, the majority of the inquiries now being for new tools.

Manufacturers of some lines of machinery report considerable improvement in orders and inquiries. This cannot be said, however, of the makers of machine tools, with whom conditions are about stationary.

One large crane builder in this territory reports an improvement in the demand for electric cranes, having taken orders for 14 large cranes in one week, 12 of which were for new steel making plants. The demand for locomotive cranes from industrial plants has improved, but orders from railroads are still very scarce. Although there are some reports of price cutting on locomotive cranes, prices are being quite well maintained.

The demand for electrical machinery is light, orders being mostly for small units. There is an improvement in inquiries for heavy power equipment and the outlook is more favorable. Makers of twist drills and kindred products report a gradual improvement in orders. Plants making sheet metal products are well filled with orders, and there is a fair demand for stamping machinery and presses for sheet metal work and specialties.

Pattern makers report a good demand for stove, automobile and machinery patterns, although in the case of machine patterns builders are going slow and it often takes some time before inquiries materialize into orders.

The Service Pump Company, Canton, Ohio, which has been incorporated with a capitalization of $25,000, announces that it will equip a plant modern in every detail, in which it will make a new and improved straight line duplex steam pump, pneumatic pumps and controllers for all other makes of air pumps. The company is now looking for a site. The company has effected its organization by the election of the following officers: Elias W. Conkell, president; Andrew Hinten, vice-president; John C. Hermann, secretary and treasurer. The officers and William Berg, E. A. Kaufman, J. J. Hein and Dr. J. H. Beatty comprise the Board of Directors.

The Browning Engineering Company, Cleveland, reports considerable improvement in the demand for locomotive cranes. The volume of the company's business last month was 70 per cent. of normal, and a further improvement is expected this month. While few orders are being received from railroads, the company is finding a fair outlet for its cranes among industrial concerns.

The plant of the Sandusky Grille & Mfg. Company, Sandusky, Ohio, will be offered at public sale on April 25 by Vern K. McBride, trustee in bankruptcy. In addition to the buildings there will be sold the personal effects of the company, consisting of line shafting, planers, lathes and about 150 woodworking tools.

With its old work and new orders recently taken the Alliance Machine Company, Alliance, Ohio, still has enough work on hand to keep its plant running at full capacity night and day.

The W. Pattison Supply Company, Cleveland, has purchased the machinery equipment of the Universal Steel Wheel Company, Toledo, which has gone out of business. The outfit consists of lathes, drill presses, power presses, shapers and milling machines.

The Forest City Railway Company, Cleveland, will add to its power plant equipment and has purchased of the Norfolk & Portsmouth Street Railway Company, Norfolk, Va., three 22 x 24 x 48 Allis-Chalmers cross compound engines.

directly connected with 800-kw. General Electric generators.

Reports from Ashland, Ohio, state that F. E. Myers & Bro. of that city, makers of pumps, &c., have just received an export order amounting to $40,000.

The Ravenna Furnace & Heating Company, Ravenna, Ohio, will erect a warehouse 60 x 80 ft. adjoining its plant. The plant is well filled with work and is running on full time.

The Cleveland Castings Pattern Company reports that it has been able to keep its plant running at full capacity all winter, and that orders are now coming in as fast as the work can be turned out. The orders include all kinds of patterns.

The C. O. Bartlett & Snow Company reports an improvement in the demand for coal handling and mill machinery. The company's plant is now running at 80 per cent. of its capacity, 10 hr. per day, and it is expected that it will soon be running at full capacity.

Cincinnati Machinery Market.

CINCINNATI, OHIO, April 21, 1908.

Extremely difficult is it at this time to estimate correctly, or, rather, justly, the market in machinery lines. For instance, the investigator encounters shops running practically on full time, with a complement of help, while across the street or in the next block is a concern which is almost totally shut down. Conditions appear to be governed by the general character of work manufactured. It is the special machinery men and makers of portable drills, small grinders and the like who are busiest and least feel the effects of the times; while with the makers of such tools as lathes, heavy drills, shapers and planers it is a case of wait, and meanwhile suffer a gradual reduction of forces and restriction of output. There is little, if any, improvement in the situation, taking the whole of it into consideration. Business comes in spurts, for with several large concerns in this district two days of last week furnished some nice business, a buying movement seemed imminent, but the prized third day failed to develop and things reverted to the monotonous grind of the times.

The European visitors, Alfred H. Schütte and his assistants, left the city on Thursday, having spent a delightful four days of sightseeing and renewing of old acquaintances. As far as can be ascertained they imparted nothing of importance to the general situation; they were not buying, being well stocked up at headquarters, and they seized upon the time to visit America because of the dullness at home, which permitted of their absence at this time. It is said that they felt the situation on futures and would have been pleased to make some new contracts at lower prices.

The local tool manufacturing interests keep fairly well apprised of conditions in this country, both in the extreme East and the extreme West, for representatives of the largest concerns have during the earlier months of the year visited their agents and the dealers in both sections, and estimated opportunities and conditions to a nicety. These do not feel any reason to hope for anything big or promising until after the Presidential election. There will be some excursions into trade territory of Latin America by the tool and general machinery manufacturers of this section some time in the fall, and preparations are already under way to this end. J. B. Doan, vice-president and general manager of the American Tool Works Company, will leave New York on the Mauretania on Wednesday morning for Europe, and will spend three months abroad taking careful note of conditions in all the European markets save Russia. European business, which has always been big with this locality, has fallen off to such a remarkable degree that it is believed that the depression which is felt so severely in this country has a serious reflection in Europe.

In second-hand machinery there is not the demand that might be expected at this time; some few sales are being made, but these are figured very closely. Dealers are offered some specially good bargains in used machinery, and these offerings have of late been in unusually large volume, from which it is argued that some manufacturers contemplate replacing with new machines and tools later on.

Inquiries of the banks develop the statement that there is plenty of money available at an average of about 5½ per cent. on approved security, but there does not seem to be any special need of financial assistance on the part of the machinery concerns; in other words, there are none seriously crippled by the trade depression, but there must be some sort of improvement soon, else the price cutting evil will have to be reckoned with. In fact, there is talk now of some shading of prices on tools for immediate delivery.

The foundries are not materially improving their melt. The sale of the Weber Foundry to Henry Weber, the original owner, at $10,000 (his bid on the occasion of its offering at auction sale April 15), will come up before Referee Whitaker April 22. The upset price on the property is about $17,000, and the Weber offer was so low that the trustee decided not to act without the authority of the special bankruptcy officer.

A new machinery enterprise for Sidney, Ohio, which city already has an almost international reputation for the number and prominence of its concerns manufacturing folding machines, is the Van Etten Machine Company, located at Fair avenue and Water street. It makes newspaper, job and pamphlet folders.

The Central Brass & Fixture Company is a new enterprise for Mechanicsburg, Ohio, which has just been incorporated for $10,000, by D. S. Cramer, E. Horr, John M. Maddux, Joseph F. Mumma and E. L. Dyers.

The next meeting of the Manufacturers' Club of Cincinnati will be held May 11, at the Queen City Club. At the annual meeting and election April 15 C. R. Houston of the Houston, Stanwood & Gamble Company, Covington, Ky., was elected president, succeeding Harry T. Atkins; E. H. Hargrave of the Cincinnati Tool Company, first vice-president, and C. Gordon Neff of the Bradford Belting Company, second vice-president; W. F. Robertson of the Robertson Iron & Steel Company, treasurer, and Charles McFarland, secretary *pro tem.* Col. E. P. Wilson, who has handled the duties of the secretaryship for many years, is ill in Daytona, Fla.

Copies of the seventh annual report of the Industrial Bureau of Cincinnati, of which W. L. Finch is secretary and manager, are being mailed to members and interested parties. The text of this report, which was delivered by Secretary Finch at the annual dinner a few weeks ago at the Business Men's Club, contained such interesting and valuable data that many requests were received for copies, and the directors determined to have a large number printed for distribution. A recent achievement of the bureau, which is being generally complimented by the many interested, is the reception of a promise from President Kenan of the Cincinnati Gas Company that manufacturers are to have 30-cent gas within a year.

George K. Elliott, chief chemist of the Lunkenheimer Company, Cincinnati, delivered an address on "Metallurgical Considerations in the Manufacture of Steam Valves and Fittings" before the members of the Engineers' Club of Cincinnati on the evening of April 17.

At the annual meeting of the Buckeye Steel Castings Company, Columbus, O., April 10, the directors declared the regular quarterly dividend of 1½ per cent. on the preferred and 1 per cent. on the common stock. The directors authorized the erection of a modern pattern shop, which will be fully equipped with the latest machinery. Work on the new building, which will be after the general style of the company's present buildings, will be pushed to early completion. The company has at present one steel furnace in operation on double turn to take care of orders on hand.

It is stated that the largest consignment of machinery shipped by an Ohio concern for a number of years is that made up by the C. & G. Cooper Company, Mt. Vernon, for a wall paper manufacturing concern of London, England, and consisting mostly of engines. The shipment requires a 28-car train.

Congratulations are coming in from all directions to the Barney & Smith Car Company, Dayton, Ohio, which on April 10 celebrated in unique style. On that evening a banquet was tendered those employees who have been with the concern continuously for 25 years or more. One hundred and seventy-eight responded in this division, and, what is still more remarkable, the average length of time that these men had been with the company was a little more than 32 years. Two of those present had been with the company more than 50 years, one of them for 54 years. Of the number present 163 own their own homes. One of the most important facts brought out at the dinner was that in the 60 years in which the company has been building cars it had never had a strike.

The Capitol Commissioners at Frankfort, Ky., are considering plans for the erection and equipment of a new power house and other work for the State capitol buildings. Architect Frank M. Andrews, Dayton, Ohio, is in charge of the work.

The United States Tool Company, Vincennes, Ind., is now installed in the building formerly occupied by the Fyfield Woolen Mill Company on Barnett street, in that city, moving from the old plant of the Edgington Tool Company in North Vincennes. The company manufactures a variety of oil and gas drilling tools and will greatly enlarge its capacity.

E. E. Porter, Bellevue, Ohio, is interested in the promotion of a foundry company to operate in connection with the Runyan Company at Canal Dover, Ohio.

Joseph Goldberg, Crawfordsville, Ind., whose fertilizer factory was burned recently, has determined to rebuild at once with two large steel buildings, which will be equipped with the most modern machinery, including steam driers, tanks and boilers.

W. D. Garrett & Co., 136 Liberty street, New York, are the general Eastern agents of the Locke Regulator Company, Salem, Mass., manufacturer of Locke engine stop valves, damper regulators, pump governors, pressure reducing valves and underwriters' fire pump governor; Templeton Mfg. Company, Boston, Mass., manufacturer of Sterling

steam traps; Berry Engineering Company, Chester, Pa., manufacturer of Berry feed water regulators; Manzel Bros. Company, Buffalo, N. Y., manufacturer of Manzel automatic sight feed oil pumps; Sims Company, Erie, Pa., manufacturer of Sims boiler feed water heaters, steam separators, oil extractors, exhaust heads and oil filters. Garrett & Co. maintain a showroom wherein all of their specialties that are practical to exhibit are set up in working order for demonstration, which has the advantage of showing a prospective buyer the actual apparatus in operation.

Philadelphia Machinery Market.

PHILADELPHIA, PA., April 21, 1908.

Business in the local machinery market showed a slight recession during the past week. Buying appears to be somewhat irregular, the demand fluctuating from week to week. At times there will be a pretty fair buying movement on, when manufacturers will book orders for a few tools, and dealers will find it possible to close up a few of the pending inquiries. Such improvements in the demand seem to be followed by a week or two during which buying is almost at a standstill, and just about the time when the trade begins to feel that conditions look like continued inactivity a little business comes out and encourages them to greater effort, which usually results in more sales. Under existing general conditions no great improvement, however, is anticipated, and it is to be expected that buyers will make purchases, in many cases, only when they are actually compelled to do so. Some little business has developed from small plants, which have been recently established to make some of the smaller specialties, but no business worth speaking of has come from the medium or larger sized plants. The railroads show no disposition as yet to enter the market, particularly as regards machine tools. For maintenance of way purposes there has been a shade more buying, but nothing of any size has recently developed in motive power or rolling stock from the railroads in this territory.

The financial situation is better, but business fails to respond, and it is hardly anticipated that any real improvement will be noticeable until after the Presidential nominations are disposed of. In the meantime, it is believed, business will continue more or less irregular.

Inquiries during the week quieted down to some extent. New propositions requiring any extensive equipment are out of the market. The demand, which is largely of a day to day character, is confined almost entirely to single tool propositions. In nearly every instance tools inquired for are wanted for prompt shipment, and we learn of cases where both inquiries and the placing of orders have been deferred, even for new equipment, until the last possible moment.

Manufacturers report trade irregular. Some little improvement has been noted for some classes of tools, but not enough business has come out to increase working hours to any extent. A manufacturer of pneumatic tools, whose plant has been operating irregularly for some time, started in on full day turn last week, which, from present indications, is expected to be maintained for some time.

The export demand shows no improvement. Inquiry for the general line of tools is very quiet, although there has been a little scattered business offered in special equipment.

The second-hand machinery trade continues to transact a fair volume of business. In fact, there seems to be more activity in this line than for new tools. Sales of metal and wood working machinery of the medium classes are reported, but there is no particular activity in the demand for tools of the heavier classes. The second-hand boiler and engine trade is not active. There has been some demand for the medium powers, but nothing extensive has come out. Builders of the higher power engines report that inquiry is rather quiet, while they are rapidly catching up with the business on their books.

The foundry trades are dull. The absence of any material demand from the machinery and building trades is being felt, and foundries in most cases are not being operated much over one-third their capacities. Steel casting plants are running irregularly and find it next to impossible to book orders for forward delivery. The demand on the whole is largely of a day to day character, and some of the smaller jobbing foundries are dependent entirely on this class of business to enable them to run.

The Pottsville Union Traction Company has decided, it is understood, to construct a new bridge to replace the present bridge over the Philadelphia & Reading Railroad tracks in that city. Plans have been completed and await the approval of the borough engineer.

The Frankford Arsenal, Bridesburg, Philadelphia, will receive proposals until May 15, for supplies to be furnished during the fiscal year ending June 30, 1909. These include seamless copper tubing, iron and steel, tin, lead, zinc, antimony, cartridge metals, electrical supplies, belting, tools and miscellaneous articles. Proposal forms and specifications, as well as general information regarding the materials and equipment desired, may be obtained from the commanding officer, Frankford Arsenal, Philadelphia.

Bids will be opened to-morrow by the Department of Public Works, city of Philadelphia, for five bridges, the estimated cost of which is $230,000. At the same time bids for five concrete piers for the proposed Passayunk avenue bridge, over the Schuylkill River, will be opened. This work is expected to cost $200,000. The list of bridges for which proposals will be opened is as follows: Rockland street over the Pennsylvania Railroad, Hunting Park avenue over the Philadelphia, Newton & New York Railroad, Ontario street over the Richmond branch of the Philadelphia & Reading Railroad and Sedgewick avenue over the Chestnut Hill branch of the Philadelphia & Reading. The Department is having plans completed for a number of additional bridges, and it is expected that the cost of work of this character, which will be contracted for in the next few months, will aggregate $1,000,000.

E. Allen Wilson, architect and engineer, has completed plans for the building of a large factory building at Third and Spruce streets for Bayuk Brothers, cigar manufacturers. The building will measure 80 x 101 ft., and be five stories high, of the slow burning type of construction. It is understood that all the modern improvements in connection with the manufacture of cigars will be installed.

St. Louis Machinery Market.

ST. LOUIS, April 18, 1908.

The city of St. Louis advertises for proposals until May 1 for four 350-hp. boilers, with Roney mechanical stokers, Foster superheaters, settings, valves and other necessary fittings and breeching to the smoke flue of present stack at Boiler House No. 2, Bissell's Point.

The Meramec Portland Cement & Material Company, Bank of Commerce Building, is asking for proposals for machinery, structural steel and appliances for its new plant at Sherman, Mo. (near the city of St. Louis), among which are the following items: Kilns, dryers, tube mills, crushers, electric material, ball and tube mills, coal bunkers, coal conveying machinery, boilers, engines, pumps, structural work, shafting, pulleys, bearings &c.

The Heine Safety Boiler Company, Commonwealth Trust Building, reports the following boiler contracts recently entered on its books: N. K. Fairbanks Company, Chicago, one 500-hp.; Ashton Valve Company, Boston, one 150-hp. and one 75-hp. of 400-lb. working pressure for testing under steam pressure its steam gauge safety valves; Buffalo Water Works, four 618-hp.; Cambria Fuel Company, Cambria, Wyo., one 400-hp.; Citizens' Railway & Light Company, Fort Worth, Texas, two 366-hp.; city of Denton, Texas, one 290-hp.; Torresdale Filtration Plant, Philadelphia Water Works, six 327-hp.; Ebensburg, Pa., Light, Heat & Power Company, one 300-hp.; Mechanics' Art High School, Boston, three 142-hp.; General Roofing Company, East St. Louis, two 416-hp.; Heil Packing Company, St. Louis, two 206-hp.; new Soldan High School, St. Louis, three 250-hp.; Little Rock, Ark., Brewing & Ice Company, two 312-hp.; Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, two 448-hp.; Portland (Ore.) Iron Works, for U. S. dredgeboat, two 220-hp.; U. S. Post Office and Custom House, Cleveland, Ohio, three 250-hp.; U. S. Sugar & Land Company, Garden City, Kan., one 450-hp.; new Bank of Commerce Building, St. Louis, two 300-hp.; U. S. Navy Yard, Norfolk, Va., two 350-hp.; U. S. Navy Yard, Charleston, S. C., four 350-hp.; Keihan Electric Railway, Japan, two 300-hp.

Fairbanks, Morse & Co. state that during the past two months they have been enabled to keep the volume of their business well abreast of last year, owing to the excellent demand in particular for gas producers and producer gas engines, the sales of which have been made principally in the Southwest, for city plants and power plants. They have just installed three good sized plants in Texas to run on Texas lignite. Gas production is receiving growing attention on the part of engineers. In electrical machinery quite a satisfactory business has recently been done in St. Louis. It has been found in the oil producing sections of Kansas and Oklahoma that a product known as the first refining, costing less than 5 cents per gallon, can be used quite as economically as gasoline.

The N. O. Nelson Mfg. Company states that covering a period of the past four months it finds it has been doing about 75 per cent. as compared with the corresponding time last year. The fact, however, that its trade has not fallen off to the extent experienced by most concerns is doubtless largely owing to its having taken in more territory by establishing new branches, having last year opened up in Oakland, Cal., and the year previous in Los Angeles. The company is now arranging to remove its branch from Pueblo to Denver, Colo., and will largely increase the volume of goods carried in stock. Prices on its line average 20 per

cent. lower. In respect to tonnage, there is no falling off compared with last year. The company has secured the contract to furnish all the plumbing supplies for the new American Theatre and Hotel on Market and Seventh streets, and the new Third National Bank Office Building, Broadway and Olive street, and is furnishing some material for the new addition to the Bank of Commerce Building. The main contract for the latter building has not yet been let.

The Missouri Bridge & Iron Company, Chemical Building, states that its plant has been operating right along on full time, mostly on contract work.

H. S. Wells, secretary of the Otis Elevator Company, Security Building, states that business was quite good with the company during January and February, but is a little slack at present, most of the work being for comparatively small structures.

The city of Farmington, Mo., has just purchased an electric light plant of the Commercial Electric Company.

New England Machinery Market.

WORCESTER, MASS., April 21, 1908.

The Boston machinery dealers are philosophically accepting the condition of trade and by incessant work are making the most of the situation. In the aggregate a good many tools are being shipped. A large proportion of purchases are of second-hand machines, yet the total of new tools is worthy of consideration. Of course, orders are small, consisting of single machines, and not many of them are of the high priced variety. But, taken as a whole, business is rather better than it was earlier in the year. The railroads and other large customers are doing little buying. With the railroads curtailments of expenses promise unusually large expenditures for repair work later. The shops have been running with greatly reduced forces for some time, and necessary repairs have been avoided to such an extent that depreciation of rolling stock has been exceptionally rapid. The price for this condition must be paid later on, and the known inadequacy of the repair shops would seem to indicate that increased equipment will become an imperative necessity when railroad business shall revive. The railroad shop men agree as to this result of the policy which their companies have deemed best to follow.

The woodworking machinery trade reports a noticeable increase in business. One dealer reports the present month as at least equaling the corresponding period of 1907.

One of the great express companies is experiencing a marked increase in its volume of business as compared to the first quarter of the year. Some of its New England offices are nearly equaling their records of last year. In a few instances, notable among them Springfield, Mass., last week exceeded the same week of 1907. This is attributed partly to the increasing number of small shipments which go with buying in small lots instead of by carloads, but on the other hand, during the rush of a year ago a large tonnage of express business resulted from haste to make deliveries already long overdue. At any rate, the express company officials consider their increasing business to indicate a betterment in general trade conditions.

The consistent demand from the agricultural sections for all kinds of products, alluded to last week, has an interesting example in such concerns as the Farm Machinery Company, Bellows Falls, Vt., which is rushed to full capacity and has been hiring new men. Similar reports have been received from builders of agricultural tools and machinery all over the country.

A bill before the Massachusetts Legislature provides for an appropriation for the Lowell Textile School, Lowell, Mass., a portion of which will go for the equipment of a machine shop, should the bill become a law.

The American Locomotive Company has discontinued the building of locomotives at its Providence, R. I., plant, and has moved a large part of the machinery, distributing it among its other works. J. P. Williams, 811 Industrial Building, Providence, has purchased the best of the tools which were not moved, comprising about 10 carloads, and is placing them on the market.

Orrin S. Hammack & Co., pneumatic and electric tools and appliances, and the New England Supply Company, Wing's turbine fans, blowers and exhausters, have established offices in the Boston Machinery Exchange, Oliver Building.

The Armstrong Mfg. Company, Bridgeport, Conn., has brought out a new ratchet attachment which makes of the Armstrong stock a ratchet stock and die, and a new pipe cutter.

The Walton Company, Hartford, Conn., has been organized to manufacture small tools, and has purchased as a nucleus of its line, the extractor of broken taps manufactured by the Atlas Machine Company, Providence, R. I. A factory has been established at 308 Pearl street. It is manufactured in sizes for taps ranging from No. 4 to 1¼ in. Ward W. Jacobs is president of the company and Ward S. Jacobs treasurer.

The Hampden Machine Screw Company, Greenfield, Mass., which is to establish works for the manufacture of machine screw products, has secured an option on the automatic screw machinery of the F. E. Wells & Son Company, Greenfield. Space has been taken in the George M. Burnham factory on Arch street.

The business of the R. E. Colton Combination Tool Company, Easthampton, Mass., manufacturer of the Colton combination lathe, planer and shaper tools, will be enlarged to manufacture on an increased scale. A new corporation has been formed with a capital stock of $50,000. R. E. Colton remains at the head of the business.

Government Purchases.

WASHINGTON, D. C., April 21, 1908.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until May 5 for three motors for the New Orleans Navy Yard, and until May 12 for four motor generators for the Puget Sound Navy Yard.

The Isthmian Canal Commission will shortly purchase a 1100-lb. steam hammer, 60-in. radial drill, 30 x 30 in. planer, 16 in. x 19 ft. engine lathe, 24 in. x 22 ft. engine lathe, double punch and shears with 36-in. throat, 24-in. crank shaper, 20-in. sliding head drill press, 6-in. pipe cutting and threading machine, 2½-in. single head bolt cutter, cold saw, drill grinder, duplex emery grinder, two portable cylinder boring machines, portable boiler testing pump, valve reseating machine, two boiler feed pumps, three 20-ton locomotive coaling cranes and other supplies.

Proposals will be received until May 6 by the Quartermaster, West Point, N. Y., for stone crushing plant, steam engine and boiler.

The following bids were opened April 14 for supplies for the navy yards:

Class 1.—Six vertical steam pumps—Bidder 25, Blake & Knowles Steam Pump Company, New York, $7050; 53, A. S. Cameron Steam Pump Works, New York, $10,500; 66, M. T. Davidson Company, Brooklyn, N. Y., $7560; 68, D'Olier Engineering Company, Philadelphia, Pa., $15,960; 71, Drew Machinery Agency, Manchester, N. H., $8847.60; 72, George E. Dow Pumping Engine Company, San Francisco, Cal., $6426; 74, Effing-Carpenter Company, Pittsburgh, Pa., $6394; 94, R. H. Grey, Oakland, Cal., $9900; 115, Harron, Rickard & McCone, San Francisco, Cal., $8725.50; 178, National Electrical Supply Company, Washington, D. C., $7722; 252, C. H. Wheeler Mfg. Company, Philadelphia, Pa., $7470; 265, Warren Steam Pump Company, New York, $4800; 271, Excelsior Equipment Company, Pittsburgh, Pa., $9150.

Class 31.—One 10-hp. motor—Bidder 87, General Electric Company, Schenectady, N. Y., $238; 253, Western Electric Company, New York, $336.25; 262, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., $319.

Class 61.—One vertical adjustable spindle drill—Bidder 111, Hill, Clarke & Co., Boston, Mass., $1225; 160, Manning, Maxwell & Moore, New York, $1250; 186, Prentiss Tool & Supply Company, New York, $1120 and $1245; 193, Pratt & Whitney Company, Hartford, Conn., $1935.

Class 71.—One toolmakers' engine lathe—Bidder 107, Hendey Machine Company, Torrington, Conn., $1045; 193, Pratt & Whitney Company, Hartford, Conn., $1413.25.

The following bids were opened April 14 for a 12-in. centrifugal pump for the Isthmian Canal Commission:

General Electric Company, Schenectady, N. Y., motor only, $420. R. D. Wood & Co., Philadelphia, Pa., complete equipment, $1400. D'Olier Engineering Company, Philadelphia, Pa., direct connected pump and motor, $1095. Manning, Maxwell & Moore, New York, for pump motor and belt, $1241, or complete with pipe and all fittings, $1668. Buffalo Steam Pump Company, Buffalo, N. Y., for pump, motor and belt, $1233.

Under bids opened February 25 for machinery for the navy yards, the B. F. Sturtevant Company, Hyde Park, Mass., has been awarded class 212, two 7½-hp. motors, $614.

The Tindel-Morris Company, Eddystone, Pa., has been awarded class 101, one crank shaft lathe, $2400, under opening of March 3 for machinery for the navy yards.

The following awards have been made for machinery for the navy yards, bids for which were opened March 24:

Chicago Pneumatic Tool Company, New York, class 71, 15 pneumatic scaling hammers and spare parts, $935.60; class 72, five pneumatic hammers and spare parts, $119.90; class 73, three pneumatic hammers and spare parts, $65.90; class 74, six pneumatic drilling machines and spare parts, $230.25; class 76, one pipe yoke riveter and spare parts, $214.70.

Independent Pneumatic Tool Company, Chicago, Ill., class 75, six pneumatic wood boring machines and spare parts, $277.86.

Thomas Andrews Mfg. Company, Rockaway, N. J., class 77, one pneumatic tube cleaner and spare parts, $235.20.

Hilles & Jones Company, Wilmington, Del., class 101, one motor driven gate shear, $4985.

Under opening of March 31 for machinery for the navy yards, Wickes Bros., Saginaw, Mich., have been awarded class 61, one set standard plate bending rolls, $985.57.

The following awards have been made for motors for the navy yards, bids for which were opened April 7:

General Electric Company, Schenectady, N. Y., class 51, four electric motors and one oil circuit breaker, $499.21.

Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., class 61, seven 25-hp. induction motors, $2995.

HARDWARE

NOTWITHSTANDING the marked advance there has been in the business and accounting methods of manufacturing plants, there is still much to be accomplished in this field. While there are many factories in which costs are ascertained and recorded with sufficient accuracy, there are many others in which this important matter is neglected, to the serious detriment of the interests of the business. Not a few manufacturers are adhering to antiquated methods, which were general a few years ago, but have now in most well ordered and up to date concerns been superseded by cost and accounting systems which show the profit or absence of profit in the production of any given line of goods. Unless the actual cost of goods is definitely and systematically ascertained there is a large probability that manufacturers will be mistaken in regard to the profits they are realizing, and that many products supposed to be profitable are really made at a loss.

Very few manufacturers confine their productive energies to the making of a single line of goods, and it not infrequently happens that the losses sustained on some goods are concealed by the profits made on others, the good line bearing the burden of carrying along the poor one. An illustration of this occurred in a recent conversation with the head of a large and long established corporation. The subject of the cost of manufacturing was introduced, and the inquiry made as to what methods he pursued to obtain his costs. The reply was, "We do about as we have always done. First we set down the net cost of material used, then to that we add the labor cost as near as we are able to figure it, and to the total of material and labor add a certain percentage for all indirect expenses. We then take the price for which the goods are sold, deduct the cash discount allowed and the estimated cost of selling the goods, and it usually shows a net profit of from 20 to 25 per cent." Further inquiry, however, developed the fact that while on this method of figuring the cost there was apparently such a substantial profit, the total net profit at the end of the year was in the neighborhood of 8 per cent. In going into the matter subsequently it was discovered that one important line was manufactured at an actual and sometimes a heavy loss.

One serious defect in the cost system of this manufacturer, who is indeed a type of many, was that the percentage added for his indirect or overhead expense was reached by an erroneous method. It so happened that the base of the principal material used by this manufacturer was copper, the price of which, as has recently been so emphatically illustrated, is liable to wide fluctuations. Where the material, and especially a material which is of unstable price, is included in the base on which is computed the percentage for indirect expenses, the result will be of little value, so far as obtaining reliable and satisfactory figures is concerned. Had productive labor or productive working hours been made the basis the mistake into which this manufacturer was led would have been avoided. Coupled with that improvement of method there should have been installed also a system of factory accounting which would show the cost of each of the various products, so that it would be known whether or not one department or line of goods was bearing the burden of another. It may sometimes be necessary to put goods on the market without profit, but in such cases the manufacturer should know what he is doing.

Condition of Trade.

A characteristic of the season's trade thus far is the number of small orders which are placed with those who have goods to sell, whether manufacturers or jobbers. This indicates the disposition of merchants to keep stocks down and to purchase very carefully for actual requirements, while the promptness with which as a general thing orders can be executed makes it quite feasible for them to pursue this conservative course. While on general principles this is a wise policy and one which should be continued, it necessarily entails a good deal of labor and some expense at both ends. This is illustrated in the experience of more than one jobbing house who, in view of the quietness of trade and the desirability of economizing, considered the feasibility of getting rid of some of their employees whose services might be dispensed with. It was found, however, on looking into the matter closely that this could not well be done, as there was nearly as much work for the force under present conditions as when the volume of business was 25 or 30 per cent. larger. The fact that both the wholesale and retail trade are pursuing this policy puts upon the manufacturers more than of late the burden of carrying stocks from which shipments can be drawn without delay. The reports from the country at large in regard to building are perhaps taken all in all reasonably satisfactory. A careful survey of the field shows that during the first quarter of the year there has been a large shrinkage in building operations in the country as a whole, January showing a falling off of 44 per cent., February of 41 per cent., and March of 40 per cent. A large part of this decrease is to be charged to cities, the reports from smaller places being much more favorable, while in some agricultural communities there is comparatively little ground for complaint. There is perhaps some comfort in the fact that these percentages of curtailed building show a slight improvement in each successive month. The general features of the market, as regards prices and movement of merchandise, are practically the same as in our last review. Changes which have occurred during the week are not radical or important. There is a good deal of revising of quotations and getting the prices of many goods on a slightly lower level. The iron market continues to be remarkably well sustained, especially in view of the moderate volume of current business. The indications for crops are excellent, and the country enjoys the substantial advantage of having a fine balance of foreign trade in its favor.

Chicago.

The intermittent recurrence of unseasonably cold days is held to be responsible to some extent for the tardy development of trade in some lines of seasonable goods. Weather conditions of this sort would perhaps ordinarily have no such appreciable effect, but with the limited stocks now carried by merchants the influences that accelerate or retard consumptive buying are properly reflected back to the jobber and manufacturer. Some reorders for Wire Cloth and Poultry Netting are beginning to come in, but the demand is not as active as it should be. It seems highly probable, however, that the buying season

will be more prolonged than usual; in fact, if merchants continue to restrict their purchases to immediate needs, as they have been and are doing, it will be coextensive with buying by consumers. Supplemental orders for steel goods and Lawn Mowers are also beginning to make their appearance, but hardly in the volume that was expected in view of the known meagerness of first orders placed. Still the fact that the weather has not been of a sort calculated to stir the trade in Northern territory may account in part for the lack of expected seasonable activity. With the final disappearance of cold rains and chill winds there is every reason to expect a decided improvement in the movement of these goods. Stocks of Wire Nails in the hands of jobbers and retailers are not large enough to admit of extended delay in the shipments of replenishment orders, and for this reason the demand for prompt shipments is on all hands urgent. Notwithstanding this the mills, not only of the principal interest, but those of some independent producers, are beginning to lag a little, and from a week to 10 days now intervenes between the receipt and shipments of orders. The numbers of building permits being taken out in this city foreshadows a better demand locally for Builders' Hardware when the active work of construction begins. While the great majority of these permits are of a character that will require cheap and medium grades of goods there are a few large buildings for which the Builders' Hardware has not been let, notably the La Salle Hotel and the University Club. Of a different character, but requiring a large amount of Builders' Hardware of various kinds, is the new plant of the Corn Products Company, now in course of construction, which will comprise 25 or 30 buildings in all.

NOTES ON PRICES.

Wire Nails.—Buyers continue to order in small lots and are not contracting ahead. It is feasible to keep stocks complete under present conditions as mills are making shipments promptly enough to meet all requirements. No intimations have been forthcoming of any immediate change in price. The market is steady, except that the difference in price to wholesale and retail buyers is not always enforced. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

New York.—Business continues along moderate lines, orders being for small lots for immediate requirements. Regular quotations are on the basis of $2.40 per keg for small lots at store.

Chicago.—While new business is still being offered in moderate volume and the demands upon the mills for shipment are heavier than at any time during the present season, it is probable that the crest of the spring buying movement has been reached. Just now shipments from mills of the principal interest and some independent producers are from a week to 10 days behind, but bookings do not run far ahead and this is regarded as a temporary condition. The demand from agricultural sections will likely slacken somewhat as soon as seeding operations are well under way throughout the country. Buyers continue to consult present requirements in placing orders and are keeping stocks as low as possible. While not anticipating any immediate revision of prices the feeling prevails that should any change occur it will be toward a lower rather than a higher level. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—Orders for Wire Nails being placed with the mills are for small lots only, buyers taking in only such quantities of Nails as are necessary to keep their stocks complete, but are not disposed to contract ahead. The mills are making prompt shipments, so that there is no delay in receiving Nails, and with no prospects of higher prices for some time at least, there is no incentive for consumers to buy ahead. The market is firm, with the exception that the differential in price between wholesale and retail buyers of carloads is not always observed. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

Cut Nails.—The movement of Nails from mill continues light, although from some sections where more or less building is under way, a larger demand is experienced. The market is irregular, and concessions of about 10 cents are being made on regular Steel Nail quotations, which are as follows: $2.05 base, per keg for carload lots at mill. Iron Nails generally should command about 10 cents more than Steel.

New York.—Demand for Cut Nails is small, and does not average up to the usual proportion with Wire Nails. Regular quotations are on the basis of $2.30 per keg, for small lots at store.

Chicago.—Though somewhat belated, the usual seasonable demand for Iron Shingle Nails is beginning to make its appearance, but in diminished volume. Some fair orders have been coming in from outside jobbing centers, where building activity is increasing with the advance of spring. Outside of this demand trade is extremely quiet. Regular prices are no longer representative of values since quotations are openly made on a lower basis. The prices, as herewith revised, are in some cases shaded and should a widening spread between Cut and Wire Nails develop, the result would naturally be to stimulate the demand for the former. Chicago quotations are nominally as follows: Iron Cut Nails, carloads, to jobbers, $2.23; to retailers, $2.28; Steel, to jobbers, in carloads, $2.03; to retailers, $2.08.

Pittsburgh.—Demand continues very light, buyers placing only small orders for actual needs. It is hoped that the favorable weather, with the increased building operations, will stimulate demand for Cut Nails in the near future. Prices continue to be shaded from 10 to 15 cents per keg over the official prices. We quote Steel Cut Nails at $1.90 to $1.95, f.o.b. Pittsburgh, for carload lots, and about $2 for small lots, to which freight to point of delivery is added. Iron Cut Nails are about $2.05, at maker's mill.

Barb Wire.—An increased demand is showing itself with the advance of the season, but orders, while numerous, are for small quantities with requests for prompt shipment Jobbers are evidently keeping their stocks down to modest proportions, so as not to accumulate an undesirable quantity of Wire. Prices are being maintained at regular quotations, according to information from the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—The effect of favorable weather during the past few days has been to bring out an increased volume of business from Northern points, where it has been somewhat backward in developing. A fair amount of new business is being entered, but the insistent demand for prompt shipment clearly indicates that the orders placed are designed to supply only immediate requirements, and do not include stock provisions for anticipated future trade. In this respect it differs from the buying of a year ago, and while it will not equal the volume of that period it is not likely to prove disappointing in view of present conditions. Mill prices are reported to be firmly maintained. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The volume of new business being placed with the mills is increasing, and dealers are insisting on prompt shipments, showing that the Wire is going into actual use. Jobbers are disposed to keep their stocks

down to a minimum, with the result that they are buying more freely, but in much smaller quantities than was the case this time last year. Spring trade this year will be much less than last year, which was exceptionally heavy in the Wire trade. Prices on the whole are being maintained by the mills, but there is some little shading by some of the jobbers. Quotations are as follows, f.o.b. Pittsbrugh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—As mills are in a position to make prompt shipments there is no necessity for buyers to contract ahead. The amount of Wire being purchased probably represents the actual consumption, as it is not desirable to accumulate stocks. Prices are reported as being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Chicago.—No material change has developed in the character or volume of orders, which continue to represent only the immediate requirements of manufacturers. In some sections of the country the demand for woven and other forms of Wire Fencing is nearly normal, but in the aggregate it is considerably below that of last year. The tonnage being shipped by the mills represents very closely the measure of actual consumption, since manufacturers are not accumulating stock but are depending upon prompt shipment from the mills to supply their wants. Quotations are as follows: In car lots, to jobbers, $2.68, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—Orders for Plain Wire continue to be small and for actual needs of the buyers. There is no disposition on the part of the trade to contract ahead, as the mills are able to make prompt shipments, in sharp contrast to conditions at this time last year, while it is not likely prices will be any higher for some time at least, so that there is no incentive to contract ahead. We are advised that the mills are absolutely maintaining prices, but that some of the jobbers are shading the regular market to some extent. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Bolts and Nuts.—The tendency to lower prices is still observed in the market for Bolts and Nuts, although many of the leading manufacturers who are acting in harmony are endeavoring to hold quotations as steady as possible. On small Carriage Bolts a discount of 75 and 10 per cent. is obtainable by average trade and 70 per cent. on larger sizes. The corresponding level of Machine Bolts may be represented by a quotation of 75, 10 and 5 per cent. discount on smaller and 70 and 10 on larger. Nuts are not firm, and it should be remembered that in both Hot Pressed and Cold Punched varieties blank and tapped Nuts are now selling at the same price. Stove and Tire Bolts do not participate in the downward movement, being practically steady, although on a fairly low level.

Jack and Safety Chain.—Several manufacturers of Jack and Safety Chain have sent out lower quotations, the reductions being particularly noticeable on Safety Chain and on brass Jack Chain. The special discounts which have formerly been reserved for quantity orders are now offered on purchases of moderate size. The market may be represented in a general way by the following discounts: Iron Jack Chain, 60, 10 and 7½ per cent.; Brass Jack Chain, 65 per cent.; Safety and Plumbers' Chain, 75 per cent.

Cotton and Canvas Belting.—Buyers of Cotton and stitched Canvas Belting are finding prices on these lines fairly stiff, in spite of the reduced volume of business and the weakness of raw cotton. Concessions are of course occasionally made in the endeavor to clinch orders which are needed at the mills, but on the other hand manufacturers' costs are but little if any lower, as they are still working on material contracted for at comparatively high prices. The market for Cotton Belting may be represented by discounts of 60 and 10 per cent. on cut lengths and 70 per cent. on full rolls; on Canvas Belting, ruling quotations are 70 and 5 per cent. discount on cut and 70 and 10 per cent. on full rolls.

Leather Belt Lacing.—Steps have recently been taken by the Lace Leather manufacturers' association to publish the fact that members of the association guarantee full measure on all side or cut Lace manufactured or sold by them. It was felt necessary to take such action in view of the increasing laxity of a few manufacturers in putting up bundles of cut Lace supposed to contain 100 ft. and in stamping the measurements of Lacing Sides. In this way they have been able to undersell more scrupulous manufacturers who were particular that their customers should get what they paid for. Unfortunately the practice has been winked at by some jobbers, who did not feel called upon to check the manufacturers' measurements in reselling the Lace, especially as retailers and consumers rarely take the trouble to find out exactly what quantity they receive. The association is to be commended for coming out strongly against this abuse and the trade should co-operate with them by guarding against the purchase of short measure Lace, which may continue to come on the market.

Axes.—Generally speaking, the Axe market may be said to be in somewhat better shape, owing to the fact that some of the manufacturers have announced advances in their base prices. We are advised, however, that no change has been made by the American Axe & Tool Company, Glassport, Pa. Other manufacturers have not yet announced what they will do. Whatever may be the course of the market there is no doubt that many orders were entered at the low figures, so that if an advance should be established at this late date it would not put the market back to where it was before the break. If the price could be maintained on a higher level than is justified by the manufacturers' present selling prices, it would certainly be advantageous for those who have already purchased and for those who have carried goods over from last year, the sale of which was so greatly interfered with by the financial disturbance which culminated about the time that Axes should be moving freely. It is, however, apparently going to be a difficult matter to accomplish this.

Sash Cord.—It is to be regretted that the competition on Sash Cord threatens to result in a more general putting on the market of goods of inferior quality, selling at prices based on the diminished cost of their manufacture. As noted in our last issue, some manufacturers of common White Braided Sash Cord, the quality of which as a general thing has been so well maintained by the old and well-known makers, have offered to make Cord of various lower qualities and to sell it at corresponding concessions in price, even to the extent of quoting 3 or 4 cents a pound less than the regular standard goods. It is to be hoped that this will not be done and that inferior goods will not take a prominent place in the market. It is certainly undesirable that quality should be sacrificed in goods, the replacing of which is attended by so much inconvenience and expense.

Brass Cocks.—The market for Brass Cocks and Bibbs, which a couple of weeks ago was reported to be in somewhat better shape, is showing renewed weakness, in sympathy with the decline in Copper and Brass. Quotations to the smaller trade are perhaps no lower, but concessions are again being offered to larger handlers of these lines.

Agricultural Wrenches.—The sharp competition for orders for Agricultural Wrenches is still going on, and in some instances lower prices have been made than those quoted two or three weeks ago. A discount of 80, 10 and 10 per cent. may be named without touching on the concessions obtainable by jobbers and other large buyers.

Paris Green.—Manufacturers of Paris Green have, as yet, announced no prices, though it is expected that they will not defer so doing much longer. Makers of Green state that the raw material market is not in enough of a settled condition to justify them in making prices at present.

Rope.—During the early part of this week some good

sized orders were received, indicating that stocks have become depleted in jobbers' hands to such an extent that they have been forced to replenish. The usual run of orders have, however, been for small quantities, and while the volume of business has not fallen off for the last few weeks there has been no general increase. With the moderate amount of business usually offered, there is little incentive to shade prices. The stability of the market is tested when a carload buyer submits specifications, as quotations are sometimes made which are nearly equivalent to changing one dollar for another, especially when he is an old customer, whom it is desirable to retain for more prosperous times. The following quotations, for base sizes, fairly represent the market: Pure Manila, 10¼ to 11 cents; B quality grades down to 8 to 9 cents; Pure Sisal, 7½ to 8 cents; lower grades Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¾ cents.

Cotton Rope.—The regular grades of Cotton Rope are being held at about the prices which have ruled for some time. There are on the market, however, grades of Rope made of inferior or mixed stock, on which quotations of 7¾ cents per pound, basis, on reels, and 8¼ cents per pound, basis, in coils, have been made.

Window Glass.—The new schedule of prices, 90 and 35 per cent. discount, for single and 90 and 40 and 5 per cent. discount for Double Strength Glass, recently made by the American Window Glass Company, has not resulted in the shutting down of any hand operated factories, according to available information. It is reported that about 40 per cent. of the hand factories are meeting the above prices, and in rare cases a 2½ per cent. commission is being added, while the rest of the factories are trying to get something better than 90 and 30 per cent. discount for single and are meeting the American's price on double. These discounts are for factory shipments, based on manufacturers' list. Most of the hand made factories are supposed to be working on a sliding scale of wages, so that the lower price of Glass has had the effect of reducing the workmen's earning capacity. Under ruling conditions the Glass being produced is said to be of rather inferior quality. Demand from both manufacturers and jobbers is light, as conditions offer no inducement for stocking up beyond requirements. In New York and vicinity business is very quiet. The minimum prices recommended by the Eastern Window Glass Jobbers' Association are as follows: Single Strength, 90 and 25 per cent.; Double Strength, 90 and 30 per cent. discount from jobbers' list. These prices, are, however, not closely adhered to.

Linseed Oil.—The reduction of 1 cent per gallon in the price of Oil, announced last week, is regarded by some in the trade as an ill advised move. It is believed that if crushers had maintained prices a little longer buyers would have been more willing to place larger orders. The result of the lowering of price has been to engender a distrust in the future stability of the market. The falling off from the quantity of Oil purchased last spring has been very marked. Demand is still along conservative lines and confined to nearby requirements, both on contract specifications and new business. Local quotations are as follows: In 5-barrel lots, State and Western Raw, 40 to 42 cents; City Raw, 42 to 43 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—The market has steadily declined, the easier tone, resulting from more plentiful supplies as the new crop is now coming in. Demand at this point is light, especially from manufacturing interests. The New York market is represented by the following quotations: Oil Barrels, 48½ to 49 cents; Machine Made Barrels, 49 to 49½ cents.

The Forest City Hardware Company, Rockford, Ill., capitalized at $5000, about May 1 will open up in business, carrying a line of Builders' and General Hardware, Sporting Goods, Bicycles, &c. The officers of the company are Otto C. Hultberg, president; Henry Hultberg, vice-president; Oscar Hultberg, secretary and treasurer.

LETTERS FROM THE TRADE.

THE BUSINESS SITUATION AND OUTLOOK.

To the Editor: On the 6th inst. we addressed the following letter to several hundred of our larger customers:

"Will you favor us with a brief statement of your opinion as to the present condition of business, and the outlook for the immediate future, especially so far as that opinion is based on present conditions and prospects in the territory in which you operate and with which you are most familiar?

"Anticipating your response, we will state, as to ourselves, that the volume of our Hardware business thus far in 1908 is about two-thirds that for the corresponding period in 1907, that the period of the greatest decline appears to have been passed, that the volume of incoming orders appears to be increasing slowly but steadily, that the character of the orders indicates that the stocks carried by our trade customers are small and need replenishing (a fact which many of them confirm), that in placing orders our customers show increasing confidence as to the return of business to more normal conditions, and that from the indications reaching us from these and many other sources, we feel much confidence ourselves that the worst is over, that business will steadily, even if somewhat slowly, improve, and that if no unforeseen or untoward events occur during the coming six months, the close of the presidential campaign will see the business interests of the country on a satisfactory basis of volume, prices and profits. In brief, we are conservative optimists."

We have received 195 replies to this letter, many of them from leading houses. The general tone is one of substantial accord with the statements set forth in our letter, the agreement being especially apparent on the following points:

1. That the worst is over.
2. Conditions already somewhat improved.
3. Confidence that further improvement will be steady, even if slow.
4. Stocks light, but not exhausted; present buying for immediate wants.
5. Collections generally normal, except those from speculative builders.
6. General hopefulness and confidence as to the future.
7. As to prices, doubt if reductions would stimulate consumptive demand; preference for stability and patience.

Many of the letters deal with these questions at much length and contain much valuable information, especially as to local conditions, but the foregoing is a consensus of the views which they express, and which fairly may be regarded as those of the Hardware trade at this date.

YALE & TOWNE MFG. COMPANY,
HENRY R. TOWNE, President.

NEW YORK, April 21, 1908.

MANUFACTURERS SELLING RETAILERS AND CONSUMERS.

To the Editor: There are many complaints among wholesale Hardware and Cutlery merchants all over the country with reference to trade as not up to the average of former years. If most of the manufacturers and agents representing manufacturers continue selling many of our customers, meaning the retail merchants and large consumers, we may expect business to be still poorer. I find in this section of the country that where there exists a medium size Hardware and Cutlery house, some of the manufacturers and their agents are after them. While it is admitted some will not sell as low in price as they do to the wholesale catalogue houses and jobbing houses whose business is largely with retail merchants, department stores, railroads, mills, &c., they will sell to our customers as low as to us or at a slight advance. In some cases retailers and others are charged higher prices than the jobbers offer. The merchant is misled by the manufacturers' salesmen frequently, asserting that as agents or representatives of manufacturers they can offer the goods at factory prices. The storekeeper not being thoroughly posted concerning prices, often gives the salesman an order at a higher figure than the wholesale trade would sell the goods.

All manufacturers and manufacturers' agents are not included in this accusation, but, nevertheless, numbers of

them do call on the customers of the regular jobbers and of the wholesale catalogue houses who sell only to merchants in the trade. Another trade abuse is the employment of a cheap grade of salesmen by some jobbers who run down competitiors' goods. CHARLES WEILAND.

New York, April 20, 1908.

AMONG THE HARDWARE TRADE.

Hunt & Schuetz, Sioux City, Iowa, handling Hardware, Sporting Goods, Furnaces, Stoves, Butchers' Supplies, Guns, Ammunition, Sheet Metal Work, Cornices, &c., was recently incorporated with a capital stock of $25,000. The officers of the company are as follows: Walter D. Hunt, president; Charles N. Schuetz, vice-president and treasurer; John A. Jacobs, secretary.

J. C. Wooldridge, Hedley, Texas, has put in a line of Builders' Hardware in connection with his lumber business.

Cole & Nafus are about to engage in the Hardware business at Hayti, S. D., and will erect a new building in the spring.

The H. B. Lay Hardware Company, Itasca, Texas, organized to handle Implements, Wagons, Buggies, Harness, Hardware and Saddlery, has been incorporated with a capital stock of $10,000. The officers of the company are as follows: F. B. Lay, president; J. C. Reese, vice-president; R. H. Brown, secretary.

L. H. Mason, Republic, Wash., has closed out his Hardware, Stove, Implement, Paint and Sporting Goods stock to Stack Supply Company.

The Chipman, Hancock Hardware Company, El Dorado, Ark., organized by T. N. Chipman, E. D. Chipman and B. A. Hancock, has lately opened up in business.

A. E. Carlson, who has been an employee of N. D. McCutcheon & Co., Ltd., Idaho Falls, Idaho, Hardware and plumbing, has purchased a third interest in the company, and will take charge of the contract department.

J. H. Tenhopen, Grand Rapids, Mich., has been succeeded by Begler & Cox, who have purchased his stock of Hardware, Tin, Sheet Iron and Copper work, which business they will continue at the former location.

Linton Hardware Company, Esbon, Kan., has opened another store at Lebanon, Kan., and will handle general Hardware, Stoves, Implements, Paints, Sporting Goods, Harness, Vehicles, &c.

G. E. Kelly, Effingham, Kan., has sold a one-third interest in his Hardware and Implement business to D. D. Reece. The firm will be known as G. E. Kelly & Co.

Hurdland Hardware Company, Hurdland, Mo., has been incorporated with a capital of $9000, to handle Shelf Hardware, Stoves, Implements, Vehicles, Harness, Paints and Sporting Goods.

R. J. Anthony nd H. L. Balcorn, Waycross, Ga., have petitioned to incorporate in the Hardware, Stove and Paint business, under the style of R. J. Anthony Hardware Company.

The Kerr Hardware Company, Union City, Ind., has been incorporated with $10,000 capital stock, to conduct the retail business. The directors are Wm. Kerr, C. F. Kerr and J. H. Morris.

As a recognition of 14 years' able service, T. C. Iler has been admitted to the Hardware firm of A. E. Bonesteel & Co., Troy, N. Y.

William Collard, Palouse, Wash., has entirely remodeled the store occupied by his Hardware, Stove and Implement business.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

F. O. SCHOEDINGER, Columbus, Ohio: Illustrated catalogue of Metal Interior Ornamentation, including Ceilings, Side Walls, &c.

JOHN L. GAUMER COMPANY, Philadelphia, Pa.: Mailing card referring to Wrought Iron Lighting Fixtures with attached card, which can be mailed, requesting complete catalogue.

CRONK & CARRIER MFG. COMPANY, Elmira, N. Y.: 1908 illustrated catalogue of Hardware Specialties, including Barn Door Hangers and Rail, Garden Tools, Pliers, Screw Drivers, Pruning Shears, &c.

HOLT-LYON COMPANY, Tarrytown, N. Y.: March, 1908, illustrated catalogue of Egg Beaters, Carpet Beaters, &c.

YOUNG BROTHERS, Worcester, Mass.: Illustrated catalogue of Ladders and Wooden Ware, including Pole, Extension and Cleaning Ladders, Step Ladders, Painters' and Masons' Trestles, Wall and Roof Brackets, Roof and Gutter Hooks, Lawn and Piazza Furniture, Ironing Tables, Clothes Dryers, Wagon Jacks, Baskets, &c.

BAKER MFG. COMPANY, Chicago: Illustrated booklet referring to Twentieth Century Graders.

CLEVELAND TWIST DRILL COMPANY, Cleveland, Ohio: Illustrated circular referring to Paradox Adjustable Reamers.

MATTHEWS MFG. COMPANY, Worcester, Mass.: Illustrated catalogue covering an extensive line of Sheet Metal Stampings, which are made to order in a variety of finishes.

H. B. FULLER, St. Paul, Minn.: Illustrated catalogue of Steel Adjustable Scaffolding, Step Ladders, Cold Water and Asbestos Dry Paste, Wall Cleaner, &c.

MARSHALL-WELLS HARDWARE COMPANY, Duluth, Minn.: Catalogue of Spring Sporting Goods, illustrating and listing an extensive line. Some illustrations are in colors.

WIRE GOODS COMPANY, Worcester, Mass.: Spring supplement to be added to Catalogue No. 6, giving changes in discounts, discounts on new goods and illustrating and listing numerous Wire Novelties which have been added to the company's line.

GLIDDEN VARNISH COMPANY, Cleveland, Ohio: Illustrated booklets and price-list circulars referring to Japa-Lac and other Varnish Specialties.

CHAS. E. MILLER, 97-101 Reade street, New York: Annual Automobile Catalogue No. 10 for 1908, containing 216 pages, illustrating and listing Motor Car, Motor Boat and Motor Cycle Parts, Fittings, Sundries, Tools and Clothing, together with American and European novelties. The catalogue will be mailed free on application.

Unique Agricultural Tool List.

UNDERHILL, CLINCH & CO., 94-96 Chambers street, New York, wholesalers of Hardware, Tools and allied merchandise, have just issued a unique price-list of agricultural tools carried by them in stock. It consists of stapled printed leaves of Forks, Hooks, Hoes, Rakes, Floral Sets, Barrows, Scythes, Snaths, Scythe and Grind Stones, and a multitude of other lines, kindred in character, without illustration, but having well chosen descriptive matter as to name, pattern, finish, handles, weights, &c., with the last column blank for the insertion of prices, more often net, but sometimes list and discount. The advantage of such a list is that all or any portion of it can be sent quickly according to the requirements of the merchant soliciting prices, the method of fastening the sheets together enabling the recipient to keep his prices down to date by taking out obsolete matter and substituting the latest advices.

NATIONAL HICKORY ASSOCIATION.

THE annual meeting of the National Hickory Association was held at the Sinton Hotel, Cincinnati, Ohio, on the 14th inst. The meeting was the largest and most interesting of any held under the auspices of this or any other like organization, indicating that the work of the association since it was launched has aroused public sentiment to the point that not only has the association been able to interest the Government and secure its assistance in carrying out the objects of the organization, but that those engaged in business which involves the manufacture or consumption of hickory are alive to the situation, and understand that in order that their present interests may be protected great activity must be exercised and that there must be an economical use of the remaining supply of hickory to insure against its entire destruction.

The Secretary, F. A. Curtis, Chicago, made a report covering in a general way the work of the association, the objects for which its exists and what it has so far accomplished. This report indicated that practical measures had been taken to economize in the supply and that organized bodies, such as the National Wagon Manufacturers' Association and the National Hardwood Lumber Association, jointly with representatives of the Forestry Service and the secretary of the National Hickory Association, had appointed committees who conferred on the matter of grading hickory vehicle products, such as hickory Axies, hickory Eveners, Singletrees, Neck Yokes, Bolsters, Reaches, &c. With the idea in mind of using all the material that could possibly be used, rather than of excluding all that could possibly be excluded, a standard of grades had been evolved which it is calculated will govern the production and consumption of these hickory products for all time, and while these grades have not been finally approved by the associations, there is no doubt they will be in the near future.

Mr. Curtis also said that the Forestry Service at Washington had taken up the commercial study of hickory, and at much expense and effort on the part of the Forestry Service, hickory had been secured from various parts of the country, cut under the direction of the Forestry Service men, after studying the conditions under which the hickory was grown, and samples from the various parts of the country had been tested, to the end that information was at hand indicating the relative strengths of the various kinds of hickory and the adaptability of the various species for different purposes, which information is now available to all.

The following resolution was adopted:

Whereas, It is the sense of the National Hickory Association that a census of the standing timber of the country is not only desirable but essential to the future welfare of the woodworking industries of the nation; therefore, be it

Resolved, That an appeal be made to the Senate and House of Representatives of the United States for an appropriation to make a census of the standing timber of all varieties in the country, to be made in connection with the forthcoming census report.

The officers chosen for the ensuing year are: John W. Herron, Royer Wheel Company, Cincinnati, president; E. W. McCullough, vice-president; W. A. Snyder, Pioneer Pole & Shaft Company, Piqua, Ohio, treasurer; F. A. Curtis, secretary, Chicago, and O. B. Bannister, Muncie Wheel Company, Muncie, Ind., chairman Executive Committee.

TRADE ITEMS.

E. C. ATKINS & Co., 64 Reade street, New York, manufacturers of Saws for numerous purposes, will about May 1 remove to 43 Warren street, where they will have the street floor and two lower floors, each 25 x 75 ft.

THE Retail Merchants' Association of Princeton, Ill., which was organized in August, 1906, with 50 members, has now 85 firms on the roll. Besides promoting co-operation and loyalty among the members, the object of the association is to advance the business interests and welfare of the city. In this connection the association has been largely instrumental in the getting out of a mammoth issue of the *Bureau County Record*, under date 1st inst., in which the various interests are featured and attention called to the home and business advantages possessed by Princeton. The Hardware members of the association are the Priestley Hardware Company, T. C. Cowley and H. D. Gibbs & Son.

M. W. HANSCOM has retired from the Hanscom Hardware Company, Haverhill, Mass., having disposed of his interest to John S. Mason, formerly with the Treat Hardware Company, Lawrence, and Urban W. Leavitt, bookkeeper for the Hanscom Company. Mr. Hanscom retires after more than 40 years' successful identification with the Hardware business, he, with his brother, having formed a partnership in 1865 and establishing the business at about its present location. The new owners will continue under the same style, but will incorporate the business under the laws of the State of Massachusetts, Mr. Mason becoming president and Mr. Leavitt treasurer. The present floor space occupied by the company aggregates about 35,000 sq. ft., including two stores at 28 and 30 Main street, four stories high and basement, and eight two and three story warehouses situated elsewhere. A large and complete line of general Hardware, Agricultural Implements, Seeds, Sporting Goods, Blacksmiths', Painters', Machinists', Factory and Mill Supplies, &c., is carried at wholesale and retail.

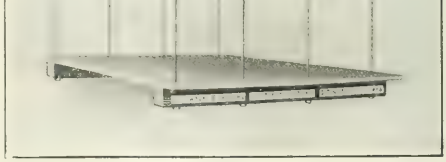
SEVERAL large new additions to the plant of the Union Metallic Cartridge Company, Bridgeport, Conn., have just been completed. On the 20th inst. the office force moved to the new four-story building at 739 Barnum avenue, where it will occupy an entire floor. The office of the sales agent, M. Hartley Company, will continue to be located as, at present, at 313 Broadway, New York City.

SUPPLESS, DUNN & Co., 68 and 70 South Canal Street, Chicago, manufacturers' agents, will remove about May 1 to 162 East Lake street. The company will occupy the ground floor and basement at this location and will carry stock for the prompt execution of orders.

WE are advised by the Diamond Chain & Mfg. Company, Indianapolis, Ind., that some manufacturers are marketing an imitation of the Diamond Repair Link, for replacing Links in Transmission Chains, even to the extent of copying the company's package and using its registered trademarks. It is stated that the imitation is poorly made, and is apt to break when under a considerable load. The company is prosecuting the infringers, but in the meantime desires to caution the trade against buying the substitute.

HANGING PLATFORM FOR STEEL GOODS.

THE accompanying illustration shows the method of storing Steel Goods employed by J. Russell & Co., Holyoke, Mass. This firm does a jobbing as well as a retail business, carrying an extensive stock of these goods when in season. They may be found on an upper floor in the spacious warehouse occupying a hanging platform built for their accommodation. The frame of the platform is constructed by suspending two 2 x 4 in. timbers from the joists overhead by means of long Bolts about 4 ft. apart. On these timbers the floor of the platform is laid, the Bolts forming all the division necessary between bins, as the Implements are long enough to extend past them at either end. The outside timber affords space for marking the contents of the bins as indicated in the illustration.



Platform for Steel Goods.

A MARYLAND FIRM'S TRADE EXHIBITION.

THE enterprising firm of J. M. Davis & Sons, Oakland, Md., recently conducted a trade display or exhibition which proved to be exceedingly attractive and successful. As indicated in the very much reduced reproduction of poster issued in connection with the exhibition given herewith, the show continued for a period of two business weeks, beginning on Monday, March 9, and ending on Saturday, March 21. During this time the store was crowded with people from Oakland and surrounding territory. Both floors of the Davis establishment were given up to the display, the operation of many of the goods being demonstrated, so that the advantages and merits possessed by them could at once be grasped by the visitors. Four young women were engaged to show and explain the kitchen and household articles, and in this connection the washing of dishes with a dish washer, the making of cream in an ice cream freezer, the cooking of patty crisps on a range, steam cooking and baking, &c., were demonstrated. Several nights during the exhibition crisps were served filled with ice cream. On the second floor were demonstrations of washing machines, wringers, churns, sewing machines, cream separators, hay carriers, gasoline engines, &c. An acetylene lighting plant was installed specially for the occasion, and with the electric light regularly used the illumination at night was particularly fine. This system of lighting also attracted much attention. A large line of chinaware was displayed in connection with a great variety of 10 cent goods, and this feature proved of more than ordinary interest to those who visited the store. Music for the occasion was furnished by an Edison phonograph operated by a young woman.



Poster Issued by J. M. Davis & Sons in Connection with Their Trade Exhibition.

AD. LEEWITZ, managing director of Markt & Co., 107, avenue Parmentier, Paris, is about to return to France, after a visit to this country covering several weeks. This is in accordance with his custom at stated periods, in the interest of the well-known house of which he is the head; principally to maintain close touch with market developments here largely in connection with the smaller tools used by mechanics, together with lines of Shelf Hardware. The business of this house is almost entirely that of marketing goods of American production in France, much of which is as representatives of manufacturers especially in the introduction of goods comparatively new to the French.

Chas. Rounds, Yale, Mich., has been succeeded in the general Hardware business by Rounds Hardware Company, of which Mr. Rounds is president; C. E. Richards, secretary, and H. M. Ferguson, treasurer.

Joseph F. McCoy Company's New Catalogue.

THE JOSEPH F. McCOY COMPANY, 157 Chambers street, New York, importers of and dealers in foreign and domestic Hardware, Cutlery, Chains, Tools, Machinery and Supplies for railroads and mines, has issued illustrated catalogue No. 10, containing 285 pages in loose leaf binder. Duplicate pages will be supplied on request, and as supplementary pages are issued in the future they will be sent for insertion in the binder, thus keeping the matter strictly up to date. The business of this house dates back to 1796, when it was established by William Irving. The company is sole agent for the Irving Mfg. & Tool Company, Monarch Cutlery Company, L. Gueutal & Sons, French Pliers, Nettleton Mfg. Company, Nippers and Pliers, Ducharmes & Co., small Tools, Peugeot Freres, Saws, &c., Tangyes, Ltd., Jacks, Wm. Eades & Co., Pulley Blocks, Weiller & Co., Brass Wire Cloth, Francis Parker & Sons, Needles, Cocker Bros., Music Wire. It also represents in the New England States Geo. E. Gay, Screw Drivers, and Goodell Mfg. Company, Miter Boxes.

THE DOMINION OF NEW ZEALAND.

I.

BY JOHN L. SARDY.

LIKE Canada, this picturesque, fertile and prosperous country, now rejoices in being a Dominion instead of a British colony. Abel Jansen Tasman, the great Dutch navigator, gave the first authentic account of the discovery of New Zealand. After discovering Tasmania he steered an easterly course and on December 13, 1642, sighted what to-day is known as New Zealand. After Tasman's departure there is no record of any visit until the arrival of Captain Cook, who sighted the land on October 6, 1769. After the occupation of New Zealand by the British it became a dependency of the Colony of New South Wales, but was made a separate colony on May 3, 1841. Nothing is actually known as to the origin of the Maori natives. They were probably Polynesian immigrants and landed in New Zealand over 500 years ago.

Three Islands.

New Zealand is composed of three main islands—the North, the Middle or South and Stewart islands, in addition to which there are several groups of small islands, some distance from the main ones. The main islands have a total zig-zag coast line 4330 miles in length, the North Island being 200 miles longer than the Middle Island. Stewart Island is only 130 miles long, and not worth visiting by an American Hardware traveler, unless he wants to get some of the best oysters in the world, bar none.

The North Island, with an area of over 44,000 square miles, population over 476,000, and the Middle Island, with over 58,000 square miles and population over 411,000, are the two places for business.

The total white population of the Dominion, according to the census up to April, 1906, was somewhat over 888,000, in addition to which there were about 5000 Chinese and half castes, and over 47,000 Maoris, the latter having increased about 8000 in the 10 years between 1896 and 1906.

The estimated private wealth of the Dominion is £240,000,000 sterling.

Imports and Exports.

In 15 years the imports have more than doubled, amounting in 1905 to the value of nearly £13,000,000 sterling.

Hardware, including Iron and Steel, Nuts and Bolts, Cutlery, Agricultural Implements, Nails, Tools, Lanterns, Lamps, &c., easily leads, showing importation to the value of £1,500,000 sterling, a good proportion of which is American, Canada coming in for her share on account of the preferential tariff. For instance, Canadian Wire Nails are knocking out those made in the United States, the tariff on Nails other than British make being higher to the extent of one-half of the duty paid on Canadian Nails.

The total value of exports exceeds imports by about £3,000,000, Great Britain taking over £12,000,000, while the United States takes considerably less than £1,000,000 sterling.

Wool forms the leading article, from 140,000,000 to 150,000,000 lb. being annually exported. Frozen meat, butter, cheese, kauri gum, phormium fiber and gold and silver come next.

Imports from the United States rank next to England, Germany being out of it in comparison. American Hardware and kindred articles run into the most money, kerosene and tobacco coming next.

Total present annual imports from the United States amount to about £1,500,000. New Zealand sends us kauri gum, phormium fiber, wool, &c., to the extent of about £800,000 per annum.

Government Railroads.

With the exception of only somewhat over 100 miles, the New Zealand railroads are owned by the Government. In 1890 the length open was 1842 miles, which served to carry nearly 3,500,000 passengers and over 2,000,000 tons of freight. Sixteen years later there were 2407 miles in operation, transporting 9,000,000 passengers, and about 4,500,000 tons of goods, of which minerals amounted to not much under 2,000,000 tons, and wool, timber and grain over 1,500,000, to say nothing of live stock.

Principal Cities.

The four principal cities in New Zealand are Wellington and Auckland in the North Island, the former with a population of over 63,000, and the latter over 82,000.

In the Middle Island are Christchurch, population about 68,000, and Dunedin with over 56,000. Just south of Dunedin is Invercargill, a town noted for having a lamp post nearer to the South Pole than any in the world.

All these cities are go-head places, especially Wellington, the seat of government, which has advanced wonderfully in the last 10 years, and to-day very likely exceeds Auckland in the volume of trade done.

In all four there are numerous well appointed Hardware establishments doing a thriving trade in all kinds of goods usually stocked by modern Hardware firms.

Christchurch is perfectly flat, with fine, even roads and remarkable for the great number of bicycles in use. There is no place of its size in the world where so many are to be seen. Every one, men, women and children, are wheel devotees. Even the chimney sweeps carrying their tools of trade, do so on wheels. According to the last available custom's report the value of bicycles imported into New Zealand was over £70,000 sterling, while the importation of materials for bicycles ran into more than £120,000 sterling, which would indicate that a large part of the machines are assembled locally.

C. I. F. Company.

THE C. I. F. COMPANY, 11 Broadway, New York, is issuing trade literature and circular letters, price-list sheets, &c., to the trade abroad, so prepared as to be conveniently filed in binders, provided by it for that purpose. This company, established about a year ago, has been located since the beginning of the current year at the above address, and is in a position to quote c.i.f. prices, including commission, as export commission merchants to buyers abroad on machinery, Tools and allied merchandise. This system is a practical recognition of the innumerable perplexities with which foreign merchants are frequently confronted in figuring prices based on our form of discounts and the numerous expenses inseparable from purchases accruing between source of supply and outport or inland market, as the case may be. The distinguishing feature of this enterprise is so to quote in regular form that the information may be systematically kept intact for instant reference, divested of the incidentals, enabling the foreigner to know at a glance what the goods will cost laid down at any port or place for which through bills of lading can be obtained. The system includes the giving of much detailed information in regard to weights and measurements, representation in catalogues, list prices, &c., so as to facilitate as much as possible the intelligent placing of orders by foreign buyers.

MARTIN A. JOHNSON, Stoughton, Wis., a prominent Farm Wagon manufacturer, banker and merchant, died suddenly on 8th inst. Mr. Johnson was born on a farm near Stoughton, May 26, 1862. While still a boy he removed with his parents to Stoughton, where his father was engaged in the mercantile business. With the death of his father Mr. Johnson took charge of the business, in which he continued until 1891, when he was elected president and general manager of the Stoughton Wagon Company, in which capacity he served for 10 years. He was heavily interested in this company and served as a director from the time of its organization in 1883 until his death. In 1903 he was made cashier of the First National Bank of Stoughton. Mr. Johnson was also largely interested in the department store of Melaas, Johnson & Co. of Stoughton and owned a half interest in a similar store at Parker, S. D. F. Johnson Vea and M. M. Johnson Vea, now respectively president and treasurer of the Stoughton Wagon Company, are brothers of the deceased.

SUCCESS IN SPITE OF THE PANIC.

BY MISSOURI.

Merchants everywhere and of every class are now considering the problem, How long will the business depression last? How slow will the wheels turn? How will the readjustment thus called for affect the merchant's business?

When we speak of panic in the ordinary use of the word, we mean the depression or economic crisis which is sure to follow. Now, this crisis may be turned to a man's advantage if he understands and will apply the fundamental laws of business and credit to his own interests.

Credit and Money

which are directly and summarily affected by the panic, do not of themselves bring a man success or failure. They are useful mediums and stays, but they are not the essence of trade. Trade is the exchange of one surplus for another. It is supplying the need of one man with the overplus of another. It is an exchange for mutual good. The keynote of trade, then, is service.

We do business not with money, and it may be said now that the banks have got back to their normal condition it will be no more a question of money that will affect trade, it will be a question of credit. It is to this, through the banks, that we are to look for our mainstay. Credit makes the wheels turn, it furnishes the sinews for new enterprises, it carries us over hard times. Credit will be a somewhat diminishing quantity for perhaps a year. But this is one of the things that we cannot control, since the banks losing their volume of deposits because of a reduction in the volume of business, lower prices and a curtailment of loans, must curtail their accommodations. The merchant and manufacturer will be able to borrow for their legitimate needs, but it is well for them to understand that a law over which the banker has no control will force the latter to curtail loans for new enterprises.

The Merchant Must Shape His Business

to meet this new condition of the commercial and financial world. In a time of contraction the first thing to do is to trim the sails to meet the storm, let it be light or heavy. To do this the individual must get ready to be independent of credit asking. Let no man expect the same accommodations in the near future he has had in the past. Pay bills and get ready to ask only that which is necessary, and which will supply the needs of a business conducted economically, and with a view to present conditions. After this the study of the business man must be the wants and needs of his immediate vicinage.

Necessity for Curtailment.

The reason for this drawing in of enterprise on the part of the merchant and manufacturer is apparent. The consumer may or may not have as high wages, may or may not make as much money in the next few months as he has in the past. To get ready for a heavy trade that will not come, and borrow money to do so, is the very rock on which the ship will sink. He who has not strained his credit is the man who has a chance left to meet any untoward condition that may come. He who has borrowed to the last notch will find that when diminishing prices and idle labor are staring the banker in the face he may be compelled to call his loan. The merchant and manufacturer will look well to the credit department, because it will not do to make goods and sell them on a possible decline, pay high rates for money to do so, and then have the goods bring no returns. The first thing then is, get the decks clean. And an essential part of the house cleaning is not to hold depreciating stock for a higher price. Better let the consumer have it and get his money rather than carry it.

The Way to Save

is to economize. The consumer will study this first. He will leave articles of luxury to one side now that he is in expectation of a possible lower wage. But the man who keeps in advance of the wants and needs of his customer is the man who succeeds. It is he who can hold his own in the game of uncertainties. He does this by sticking close to his business, watching the trend of his individual trade, turning his money as often as he can, and keeping watch on his customers. They are an index to his own success, and from them he can construe his line of conduct. There is no use in expecting the miners in a given district in a strike to spend as much as they would if all were at work. Apprehension will be enough to make them hesitate about the nonessentials.

Readjustment means bringing life down to a basis of rational, frugal and wholesome living. To meet this condition requires study on the part of the business man who deals with the masses. Success in spite of the panic comes to him who makes service his motto through all the deviations of his business.

Keeping at It.

There is no need for a man to get the blues and sell his business because of a time like this. There is more to business, anyway, than the mere accumulation of dollars. Commerce is the great civilizer. The man who performs his task well in trade has helped humanity. This is the noblest end of living. The dollars merely measure activity and good work for self and others. Therefore, it is the best for man to keep a spirit above the ups and downs of trade. He may be as happy during the next year as he has during the past if he will only fix his mood and life to this principle of service.

A Buoyant Spirit.

To serve is to help. And the serving man is one who studies the interests of those he comes in contact with. There is in this a buoyant feeling that will give the business man a clear eye and a steadfast manner. It will give him a gentle heart and a kindly disposition. The man who believes he is doing a good work, no matter that he is not making much money, will never grow oppressive in business. This may seem a far cry to some who look little on the philosophic side of business. But it has in it an element of success of which we little dream.

Industrial crises come because men in their eagerness to get rich, and to enjoy power and wealth, overstrain the capacity of credit to serve, and over expand the possibilities of commerce. There is no trouble about a lack of money. There is enough and plenty. There is no trouble about the banks; they will grant credit as usual for the legitimate needs of business safely and sanely conducted. This condition in which we find ourselves is but one of the results of our own overdoing, of our own overliving. The consumer is a gauge on the business of the world. When everything is flush all along the line men are prone to have the best. When wages and profits are reduced they may buy the same at the lower level, but it is inevitable that they must select the needful and pass by the luxuries.

Here Is the Safety and Security

of those who are in ordinary lines of business to-day. They are in the legitimate. Whatever may come to other lines there will always be a modicum of trade in the necessaries. Let the profits be less if they must, the readjustment will carry all things down together to the proper level. Trade, let it be for the best interests of man, it will have a proper volume. He will succeed who commands it as it comes and goes. And while the man is going on, studying the day's need and the year's outcome, lo! the lowering clouds have disappeared, and men are no longer talking about depression. The sun of a better prosperity is shining; and as he counts his profits at the end of the year they are as much or nearly as much as before.

TWITCHELL IRON COMPANY, Kansas City, Mo., has issued catalogue No. 10 devoted to an extensive line of Metal, Paper and Felt Building Materials, of which it is an important jobber. The book contains price-lists, illustrations, &c., of Sheets and Tin Plate, Eaves Trough and Conductor Pipe, Elbows, Cornices, Skylights, Metal Ceilings, Finials, Crestings, &c. The company was established in 1886 as the Kansas City Roofing & Corrugating Company, the name having been changed last fall. It owns and occupies a large modern warehouse, several views of which are given in the catalogue. Among the company's prominent specialties are Berger Metal Ceilings, for which it is general Western agent, and Elk Rubber Roofing.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM W. W. STORM, who has engaged in the Shelf and Family Hardware, Stove, Paint and Sporting Goods business, at Seattle, Wash.

FROM LAWSON-PETERSON HARDWARE COMPANY, successor to Lawson & Peterson, 619 Seventh street, Rockford, Ill., which has been incorporated with a capital stock of $10,000, to do a retail business.

FROM HENDERS HARDWARE COMPANY, successor to N. T. Henders, Unionville Center, Ohio, which has been incorporated with a capital stock of $5000. The company handles a retail stock of Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils and Sporting Goods.

FROM JOS. A. SEDLACEK, Bremen, Kan., who has suffered loss by fire estimated at $6500. A new building will be erected, 34 x 60 ft., with basement. The lines handled include Shelf and Heavy Hardware, Paints, Oils and Sporting Goods.

FROM CHAS. H. GARDNER, successor to Gardner & Jorgenson, Toledo, Ore., who is handling Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, Harness, Sash and Doors.

FROM L. E. LARSEN SUPPLY COMPANY, which has recently engaged in business in Crookston, Minn. A retail stock is handled, including Shelf Hardware, Stoves, Tinware, Paints and Sporting Goods. The company has repaired and improved the store building which it occupies.

FROM AULTS HARDWARE COMPANY, which has recently opened a retail store in Mt. Blanchard, Ohio.

FROM W. S. WOOLEY, who has recently engaged in the retail Hardware business in Dalton, Neb.

FROM W. CHRISTENSEN, Centralia, Wash., who has moved his Hardware, Stove, Paint and Sporting Goods business into a new store with modern windows, shelving and fixtures.

FROM BLANKENSHIP & HAHNENKRAUT, Downs, Kan., who have formed a partnership to carry on a Hardware, Stove, Paint and Sporting Goods business.

FROM WUST BROS. HARDWARE COMPANY, St. Mary's, Ohio, which has been incorporated with a capital of $20,000, and will handle Shelf and Heavy Hardware, Stoves, Paints and Sporting Goods. The company has a remodeled store equipped with modern fixtures.

FROM GEO. B. WAITH COMPANY, Ellington, N. Y., which has recently opened a Hardware, House Furnishing Goods and Agricultural Implement store.

FROM LEONARD HARDWARE COMPANY, Springfield, Mo., which has been incorporated with a capital of $15,000 to deal in Shelf and Heavy Hardware, Stoves, Implements, Paints and Sporting Goods.

FROM CHARITON HARDWARE COMPANY, Keytesville, Mo., which has just embarked in the general Hardware, Stove, Tinware, Harness and Building Material business.

Ricker & Landes have purchased the business of Hicks & Smith, Eureka, Kan., including Shelf and Heavy Hardware, Stoves, Tinware and Agricultural Implements.

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Death of Charles Merrill.

CHARLES MERRILL died at his home, 316 Clinton avenue, Brooklyn, N. Y., Friday, April 17, of apoplexy, after about a week's illness. Mr. Merrill was born at Hallowell, Maine, in July, 1829. He went to San Francisco in 1857 and remained in California about 12 years. He became associated with what is now Holbrook, Merrill & Stetson, when the house, then Brittan, Holbrook & Co., was located in Sacramento, the main portion of the business later locating in San Francisco, where it still continues with branches in Oakland and Los Angeles, Cal., and New York City. He was five years with the old firm, when Mr. Brittan died and Mr. Merrill became a partner, under the style of Holbrook, Merrill & Stetson. The business, established in 1850, was incorporated August 28, 1882. Mr. Merrill had always been vice-president of the house, and was in charge of the branch in New York for about 40 years, most of that period at 218 Water street, but for some years at 256-257 Broadway. The house is one of the largest on the Pacific Coast wholesaling Stoves, Ranges, Metals, Housefurnishings, Pumps, Wind Mills and kindred lines. Mr. Merrill was of a kindly and sociable disposition, and belonged to several clubs, including the Brooklyn, Montauk and Crescent Athletic, in Brooklyn, where he has resided since about 1868. He is survived by a widow and three daughters.

Lee & Underhill.

LEE & UNDERHILL, 35 Warren street, New York, compelled by the marked growth of their business, will on or about May 1 occupy much larger quarters at 98 Chambers street. They will manufacture several of their own specialties on the premises, including the L. & U. patent slotted Tennis and Squash Rackets, patent socket Golf Clubs and Caddy Bags. They also represent as agents Crawford, McGregor & Canby Company, Golf Clubs; F. J. Bancroft, Tennis Rackets; R. T. Ederer Company, Tennis Nets; Sportsman's Supply Company, Canvas and Leather Goods, and the Rainbow Amusement Company, Roller Skates. In addition they distribute the Black Diamond, Kempshall, Haskell and Silk Pneumatic Golf Balls, and are United States agents for Gibson & Logan, Scotland, hand forged iron Golf Heads.

Display Board of Night Latches.

THE RUSSELL & ERWIN MFG. COMPANY, New Britain, Conn., and 94-98 Lafayette street, New York, is now furnishing the trade assortments of night latches on display boards, as shown in the accompanying

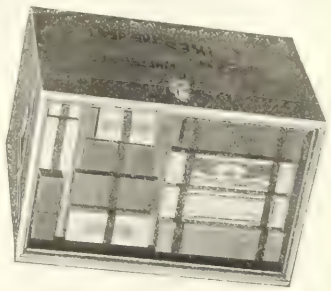


Display Board of Night Latches.

illustration. The boards are 1⅜-in. solid oak, antique finish, and will be sold at the regular price of the latches plus a reasonable charge for the board and mounting. Six different Latches are shown in working condition and demonstrate the action and appearance of stock carried. If desired a Latch may be removed from the board and sold, as boxes and directions are furnished for the Latches so mounted.

Pike's New Assortments of Stones.

THE PIKE MFG. COMPANY, Pike, N. H., has made several additions to its Oil Stone and Scythe Stone assortments, one of which is shown herewith. These are smaller than the original assortments, and are intended for Hardware merchants who wish to carry small but well assorted stocks of Oil and Scythe Stones and Razor Hones. The company claims that the assortments invariably increase sales on account of the careful selec-



Pike's Oilstone Assortment No. 1.

tion of stones to meet the needs of all users of edge tools, besides making an attractive display. They also afford a convenient and compact method of carrying stocks of these different kinds of Stones.

One Minute Washer.

The One Minute Washer Company, Sandusky, Ohio, is manufacturing the washer shown in the accompanying illustration. The tubs are constructed of tongued and grooved clear grain Southern cypress, each stave being curved and fluted. Being thoroughly kiln dried before use the wood is declared to be almost impervious to heat or water

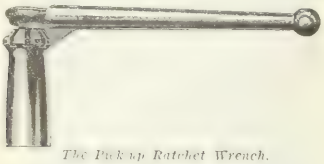


One Minute Washer.

exposure. The staves in each tub are bound with two 1½-in. steel hoops at the top and bottom, and later when mounting the castings a round steel hoop is put on the center. The castings are of best quality, and reinforced with ribs at the points of greatest strain. Each casting is handsomely enameled. The dolly is turned from hard maple, and adjusts itself up and down to suit the amount of clothes in the tub. The cover is double, the lower half resting inside the machine. The tub is well finished with one coat of filler and two coats of varnish. It is claimed for the washer that the flywheel underneath the tub maintains an even and continued motion, while the compound lever furnishes a smooth and easy stroke at the same time affording the maximum of power and preventing loss of motion. The operator may stand in an easy, natural position or by the use of the foot attachment may run the machine sitting down, as shown in the illustration. Because of its agitation of the clothes at high speed the washer is said to clean very thoroughly, since currents of hot, soapy water are forced through the fabric removing the dirt, but without wear on the garments.

The Pick-up Ratchet Wrench.

The Pick-up ratchet wrench shown in the accompanying illustration is of very simple construction, consisting of only two parts, the socket end with a series of peripheral teeth and a lever handle with an engaging lug. It is at once right and left handed without change of any kind, and can be used to advantage in inaccessible places.



The Pick-up Ratchet Wrench.

It is manufactured by the New Britain Mfg. Company, New Britain, Conn. At present it is made sizes 4, 6, 7, 10, 14, 18 and 24 in., with full line of square and hexagonal sockets in sets for the capacity of each size lever handle. The tool may be used as an automobile and motor boat spark plug wrench, with set of sockets for coach screws, for millwrights and carriage builders; for structural steel workers; for installing transmission gear with coupling and pulley bolts, and in sets for toolroom use, locomotive and automobile assembling and repairing and in many other directions. A large auto set, put up in a wooden case, contains a ratchet handle, 31 sockets, a universal joint, two screw driver blades, one 1¾-in. extension and one 9½-in. extension.

The Dietz Power Washing Machine.

Fig. 1 of the accompanying illustrations shows the dasher used in connection with water motor in the

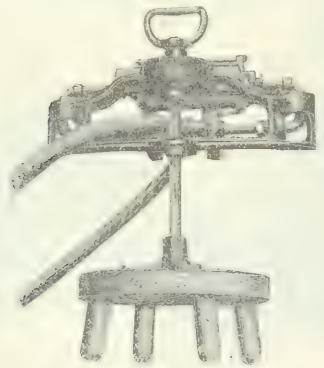


Fig. 1.—Dasher of the Dietz Power Washing Machine.

washing machine made by John Dietz Mfg. Company, Fifteenth and Plum streets, Cincinnati, Ohio. The tub

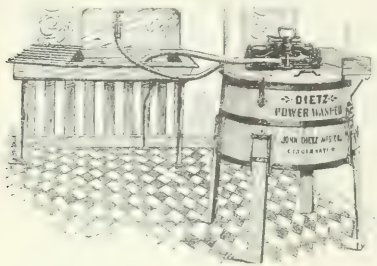
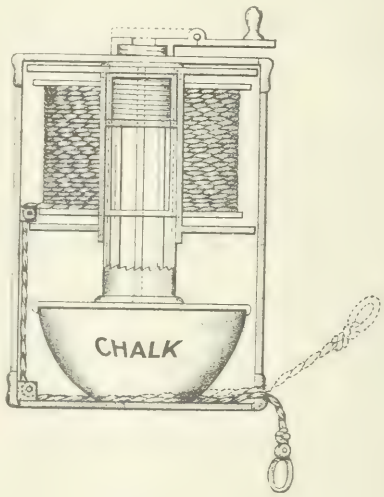


Fig. 2.—The Dietz Power Washing Machine.

of the washer is made of red cypress. The machine is said to develop an efficient working power under water pressure as low as 18 to 20 lb., and to be economical of water under high pressure, especially where the supply is measured by meter. The motor is operated by connecting the inlet hose to a faucet and putting the exhaust hose in the sink, as shown in Fig. 2. The dasher has no projecting post or holes and does not float. It is fastened to the end of a grooved shaft which slides in a gear with a keyway, allowing the dasher to adapt itself to any amount of clothing in the tub. It is pointed out that the dasher cannot tear the clothes, as there is no center dasher post. The gear and rack are completely shielded to prevent injury to operator. The motor is at the center of the cover, so as to avoid lifting a heavy weight when opening the washer. The motor can be attached to any hand operated machine of the same type.

Self-Chalking Chalk Line.

The Cecil-Jones Company, Parkersburg, W. Va., is putting on the market a self-chalking chalk line outfit, the construction of which is shown in the accompanying illustration. It is made of IX tin, and is neat and compact,



Self-Chalking Chalk Line.

being 3 in. long by 3 in. in diameter. The line is wound on a reel in the top of the box, and runs through two small pulleys, one near the top and the other at the bottom. By drawing the line through an opening in the box opposite the bottom pulley it is forced to rub against the revolving chalk sufficiently to thoroughly chalk the line. Standard ball chalk is used, and chalk or line can easily be replaced by either cap, which is held in place by a lock groove. The line is especially recommended by the manufacturer for bridge builders, house and shop carpenters, sign painters, paper hangers, &c.

The Smiley Tomato Knife.

The Graves-Humphreys Hardware Company, Roanoke, Va., as sole selling agent, is offering the device shown herewith, for the use of canners of tomatoes and peaches. The blade is hand forged from steel, in spoon shape, with



The Smiley Tomato Knife.

a long sharp point to facilitate the economical removal of stem and other objectionable portions from tomatoes or the pits from peaches. It is pointed out that this is accomplished with less loss of fruit than with a straight knife.

Heinisch Vulcan Pattern Snips.

R. Heinisch's Sons Company, Newark, N. J., and 155 Chambers street, New York, has increased its already extensive line of shears, scissors, &c., by the introduction of the Heinisch Vulcan pattern ring handle tinners' snips, here illustrated. This snip differs from the regular styles for either straight or circular cutting by reason of the peculiarity in the shape of the blades, both of which are exactly alike, being beveled toward the back on two sides. The blades are 1 1-16 in. thick and ⅝ in. high, the ground back surface of each blade tapering from 7-32 in.

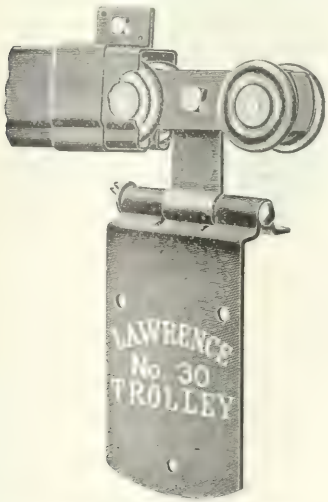


Heinisch Vulcan Ring Handle Tinners' Snip.

at the back to 1-16 in. at the point. The blades when closed thus serve to punch a small hole through sheet metal, which can be enlarged to a 1 1-16 in. diameter by a reamer-like action, from which to start cutting. The blades are steel laid and so ground as to enable the individual to cut either straight or curved lines and any kind of irregular figures in otherwise inaccessible places with one tool. They are recommended by the manufacturer as especially handy and serviceable in connection with cornice work. This snip, No. 9, is 13 in. total length, 4 in. from center of pivot to point of blade, with a full 3-in. practical cutting edge. The handles are drop forged and finely japanned, and, it will be noticed, can be used equally well by either right or left handed people.

Lawrence Trolley Barn Door Hanger.

The trolley barn door hanger shown in the accompanying illustration has recently been brought out by Lawrence Brothers, Sterling, Ill. Strength and durability are the



[illegible] Barn Door Hanger.

features especially emphasized by the makers in referring to the hanger. In order to test their qualities in this respect, we are advised that a pair of them were placed on a door weighing 250 lb. and were kept in continuous operation without oil for 187 hr., running at the rate of 96 ft. per minute, the total distance traveled in this time being somewhat over 1,000,000 ft. When taken down for inspection the only effect observed as the result of the severe test was in the wear of the bearings, the track having suffered no impairment whatever. In examining the make up of the hanger it will be noted that it is constructed in two parts, consisting of the trolley carriage and the hanger strap. These are joined together by a removable pin, which greatly simplifies the work of swinging the door, and provision is made for lateral adjustment to suit various thicknesses of doors, thus bringing them up close to the building. Turning freely on the top hinge connecting the door plate with the suspension strap, the door can be swung out and raised to a perfect right angle with the rail. The rail is made on machines especially designed for this purpose, which not only secure perfect alignment, but turn them out uniform in all respects. The offset provided in the rail adds to its strength and prevents side friction of the hanger. Among the claims advanced for this equipment is that it is sleet, storm and bird proof.

Wing Screw Calks.

The accompanying cuts represent calks, with different kinds of points, for use in boots and shoes, with accompanying wrench, offered by North & Pfeiffer Mfg. Company, New Britain, Conn. The wings projecting from



Fig. 1.—Wing Screw Calks.

the disk afford a place for the wrench to catch when screwing the calks into the soles. The wings also strengthen both the disk and spike, and increase the effectiveness of the calk to prevent slipping. The gimlet point increases the ease with which the calks can be inserted, or removed and replaced when they become blunt. It is pointed out that the broad disk prevents the calk bending over or driving through into the foot, also that the calks hold in wet or poor leather, making the use of expensive leather unnecessary. If the sole shrinks on drying, the calks may be tightened by a half turn with the wrench. The No. 00 calk is blunt and may take the place of the hob nail for general use by miners, quarrymen, golf and cricket players, sportsmen, &c. The No. 4 has a short, sharp spike, for use by surveyors, timber cruisers, &c. The No. 5 is for lumbermen's use when river driving, giving a secure footing on hard timber. Nos.

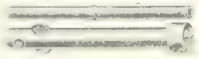
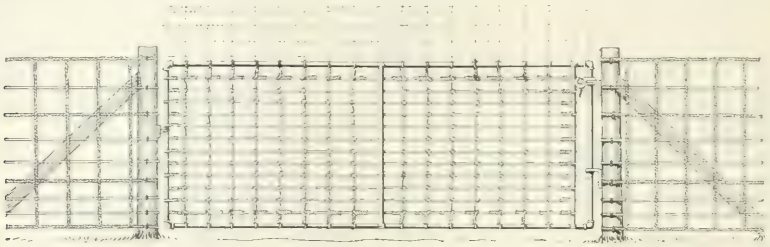


Fig. 2.—Wrench for Wing Screw Calks.

7 and 8 are for use by ice cutters, log peelers, mountain climbers, laborers on embankments or for any purpose where a deep penetration is desired. The longer sizes may be used in the heel and the shorter sizes in the sole. It is explained that all sizes are made as hard as the required strength will permit, being hard enough to wear well on rocks and yet sufficiently tough to stand a hard kick without breaking. They are packed 50 calks and a wrench to a box, 10 boxes to a carton. The company furnishes a neat leather covered velvet lined sample case with hinged cover, containing a leather strip in which is inserted one of each size of the calks, with the size numbers stamped on the leather. The case also contains a complete wrench, the whole making an attractive and convenient outfit. The wrench is so arranged that it may be used in a bit brace.

Ajax Field Fence Gate.

The Rochelle Wire Mfg. Company, Rochelle, Ill., has brought out the field fence gate here illustrated. The gate frame is made of 1-in. pipe, covered with heavy mesh wire, and is described as being rigidly constructed with a view to withstanding the heavy strain and wear incident to such service. Particular attention is invited to the provision made for raising and lowering the gate. The hinge used, as will be noted by reference to the illustration, is of a pattern that allows the gate to be raised to a hight of 21 in., and it is securely held at intermediate points in this distance by the binding action of the top hinge. The dotted lines in the illustration show the position of the gate when raised to its top limit of 21 in. The advantage of this arrangement is apparent in that it allows the gate to swing over obstacles, such as drifted snow or uneven ground, thus avoiding needless strain. To raise or lower the gate the small lever on the top hinge is pressed back until its grip on the frame post is disengaged; then by slightly raising the front end of the gate it can be raised or lowered into the next succeeding notch. In erecting the posts they should be set 3 in. farther apart than the width of the gate and the lower hinge should be placed 21 in. from the ground, while the upper hinge is secured to the top of the frame post when the bottom of the gate is 2 in. from the ground. All standard gates are made 50 in. high, the adjustable patterns being from 10 to 14 ft. in width.



Ajax Field Fence Gate.

The Jointless Refrigerator.

As the name suggests the line of refrigerators built by the Jointless Refrigerator Mfg. Company, Milwaukee, Wis., are constructed with seamless interior walls. The linings are molded in one piece, like a bathtub, and are finished inside with a smooth white enameled surface. Fig. 1 represents the lining as it comes from the molds before being fitted in the wooden case. The advantages claimed for this form of construction are immunity from leakage into the surrounding insulation and the absence of cracks, angular corners and crevices that invite the lodgment of dust, dirt and mildew, giving rise to unpleasant odors and unsanitary conditions. The rounded corners facilitate cleaning of the interior. The linings are not metallic, but are made of a hard stonelike composition, which is at once impervious to moisture and a nonconductor of temperature. A finished refrigerator designated as No. 40, shown in Fig. 2, is described as being built of thoroughly seasoned selected oak lumber, the doors being lined with solid slabs covered with enamel and fitted with heavy solid brass nickel plated hinges and locks, the latter insuring tight and secure closure of the door by simply pressing down the lock lever. It is stated that the material used for enameling contains no white lead, oil or turpentine, and the contents are therefore free from danger of taint that might come from the use of such ingredients. To insure perfect circulation of dry air the ice pan is suspended and completely surrounded by an air space, and to the same end wire shelving is used, which besides offering no obstruction to the circulation of air is easily removed and cleaned. The refrigerators are provided with a self-closing drip cup with an apron front to allow the use of a large drip pan. All of the interior fittings are of galvanized steel. The open refrigerator shown in Fig. 2 is of the following dimensions, which are extreme outside measurements, including casters: Hight, 62 in.; width, 29 in.; depth, 23 in.; ice chamber, 15½ x 24 x 18 in.; provision chamber, 32 x 24 x 18 in.; ice capacity, 125 lb., and shipping weight, 415 lb. Besides its regular line of household refrigerators the company manufactures linings and fittings for built in refrigerators, which will be shipped so that they can be put in by local carpenters.

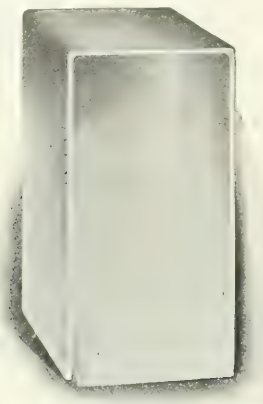


Fig. 1.—Lining of Jointless Refrigerator.

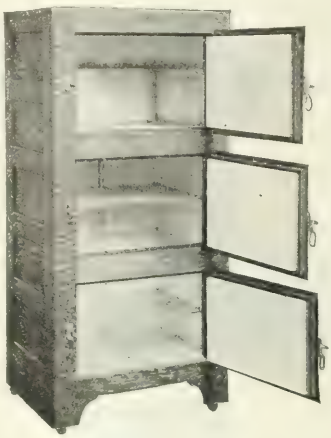


Fig. 2.—Jointless Refrigerator No. 40.

Boss Adjustable Hook Huskers.

The Boss Mfg. Company, Kewanee, Ill., which makes a large line of husking pins, hooks, glove combinations and wrist bands, has brought out the two new patterns

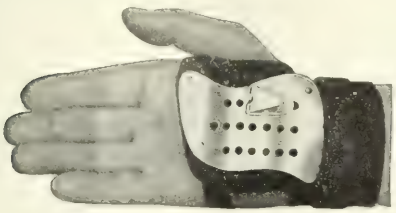


Fig. 1.—Steel Adjustable Hook Husker No. 48.

of hook huskers herewith illustrated. Fig. 1 represents a single hook husker, which is catalogued as style 48. It has a wide wrist band of sufficient length to fasten twice around the wrist, which together with the palm piece is made of heavy chrome leather and is fastened with nickel plated buckles. The heavy steel plate attached to the palm is nickel plated and polished, and

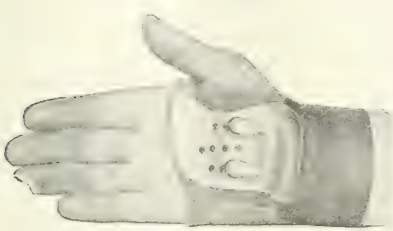
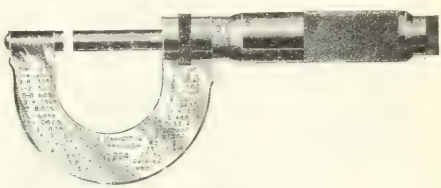


Fig. 2.—Boss Adjustable Hook Husker No. 54.

carries a single hook. The chief feature of these huskers is the provision made for the adjustment of the hook to different positions by means of perforations in the plate. It can thus be changed to any position desired. The hook is stiffened to prevent bending by a corrugation running across the top. Style 54 is shown in Fig. 2 and has a leather piece of the same material and similar construction as Fig. 1, except the wrist band is extra wide. The metal plate carries twin spurs, which are adjustable to 14 positions. The fastenings consist of three straps, with nickel plated buckles. These huskers are packed one dozen in a box.

Quick Adjusting Micrometer.

The L. S. Starrett Company, Athol, Mass., and 132 Liberty street, New York, has put on the market the Quick Adjusting micrometer, here illustrated. The notable feature of the tool is the rapidity with which it can be opened or closed to any point within its capacity of 1 in., without, it is asserted, impairing its accuracy or sensitiveness. This advantage is apparent when it is realized that 40 complete revolutions of the screw



Quick Adjusting Micrometer.

must be made to open or close an ordinary 1-in. micrometer its full length, consuming in time approximately 20 sec. In manipulating this micrometer a finger pressure against the end of the plunger immediately releases the nut, disengaging it from the screw, when any adjustment within an inch may be instantly made. Discontinuing the pressure causes instant engagement of nut with screw, when fine adjustments may be made in the customary way. This micrometer likewise has the Starrett patented sleeve and new lock, as well as the ratchet stop, the latter, it will be recalled, serving to prevent injury to the tool from turning too strongly on the article being measured, as the knurled thumb piece begins to ratchet as soon as contact occurs. Two styles of the Quick Adjusting micrometer are made, both of 1 in. capacity, No. 204 recording by thousandths and No. 205 by ten thousandths of an inch. The micrometers are sent singly in leatherette cases at a slight additional charge for case.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils

Cotton-seed, Crude, f.o.b. mill.31 @35

Mineral Oils—

Summer .....12½@13

Miscellaneous—

Whiting, Commercial, ₱ 100 lb .42@ .52

Putty, Commercial—₱ 100 lb

Spirits Turpentine—₱ gal.

In Oil bbls..... @49½

Glue—

₱ lb

Cabinet .....12 @15

Fish, liquid, 50 gal. bbls., per gal.

German Common Hide.....10 @12

Gum Shellac—

₱ lb

Bleached, Commercial..... @20

Fine, Orange.....29 @32

Kala Button.....17 @18

Colors in Oil—

₱ lb

Blue, Prussian.....32 @36

Green, Chrome.....12 @16

Sienna, Burnt.....11 @14

Umber, Burnt.....14

White Lead, Zinc, &c.—

₱ lb

Lead, English white, in Oil..10½@10¾

Lead, American White:

Lots less than 500 lb. in Oil.. @ 7½

Lead, White, in oil, 12½ lb tin

Lead, White, in oil, 1 to 5 lb

Lead, American. Terms: On lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice.

Zinc, Dry—

Red Seal (French process).. 6¾@ 7

Green Seal (French process). 7¼@ 7½

Dry Colors—

₱ lb

Black, Carbon.....6½@10

Black Drop, American.....3½@ 8

Black, Ivory.....16 @20

Lamp, commercial..... 4 @ 6

Red, Indian, English.....4½@ 6

Red, Venetian, Amer. ₱ 100 lb $1.50@1.25

Talc, French.....₱ ton $18.00@25.00

American .....₱ ton 13.00@25.00

Umber, Turkey, Bnt. & Pow.. 2¾@ 3

Turkey, Raw and Powdered. 2¾@ 3

Burnt, American..... 1½@ 2

Raw, American..... 1½@ 2

Current Hardware Prices.

General Goods.—In the following quotations General Goods—such as those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the **ordinary** type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by two of the symbol *@*. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Common and Domestic 50%
Zahn & Bro. 10
Zahnbrand's—See Fasteners, Band

Window Stop—

Iron Patent 35%
Bronze Perforated 35

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—

Bell Mfg. Co. Burton Anti-Rattlers, Parts Nos. 1, 2, 3, 4, 5, 6 ..... 50%
Reliance Quick Shifter, per doz 1.00

Anvils—American—

Eagle Anvils ..... 9½ @ 10½ ¢
H. Boker & Co. ..... 9½ @ 10½ ¢
Trenton ..... 9½ @ 10½ ¢

Imported—

Swedish Solid Steel Sisco, Superior, Extra Quality ..... 9½ @ 10½ ¢
Refined Cast Steel ..... 9½ @ 10½ ¢

Anvil, Vise and Drill—

Mixed Lots ..... 15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Leather ..... Net

Augers and Bits

Gem Double Spur ..... 75&10&10%
Common Carpenters' Solid Shell 70%
Bench Top or Pump Auger 70%
Boring Machine Augers 70
Car Bits, taper twist ..... 40&10%
Car Bits, taper lip ..... 40&10%
The Wormgearless Auger Co., Car Bits 25%
Ewbank Pat. Auger Bits 25%
Gem Pump Bits 40%
No. 1 to 30, R. Jennings' list.
No. 30, R. Jennings' list 50%
Russell Jennings' Pattern 45%
Ill. Manufg. Co. Car Bits 15%
Mayhew's Countersink Bits 45%
Irwin Bros. ..... 10&5%
Peck, Stow & Wilcox Pattern 35
Snell's Auger Bits 60%
Snell's Bro. Hanger Bits 60%
Snell's Car Bits, 12-in twist 60%
Snell's Ring Auger Bits 50%
Wright's Jennings' Bits 60%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Cabinet Maker's, No. 1 to 12 ..... 25%
No. 1 to 12 ..... 40&10%
Improved Cabinet 40%
Expansive Bit, Pat., small size, $18.00; large size, $24.00 ..... 40&10%
Screw 50%

Gimlet Bits—

Per gro.
Common Dove Tail Cut ..... $3.00@3.25
German Pattern, No. 1 to No. 12 ..... $4.25 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz. ..$6.50@7.00
Jennings' ..... 40&10
Jones' 20%
Ship Augers and Bits—
Ford ..... 40&10
Jennings & Co. ..... 40&10
Russell 6
Swan ..... 40&10
Wright 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled ..... gro. $2.75@3.00
Unhandled, Shidered ..... gro. 65¢@$1.00
Unhandled, Patent ..... gro. 65¢@70¢
Pegging Awls:
Unhandled, Patent, gro. $1.00@$1.25
Unhandled, Shidered, gro. 65¢@70¢
Saddlers' Awls:
Handled ..... gro. $2.50@3.00
Unhandled, Shidered, gro. $11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality ..... $4.75@5.00
Second Quality ..... $3.25@4.50
Double Bit, base weights:
First Quality ..... $7.00@7.50
Second Quality ..... $6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles—*Iron or Steel*

Concord, Loose Collar 4½@5 c
Concord, Solid Collar ..4½@5½ c
No. 1 Concord, Loose ..5½@6 c
No. 1½ Concord, Nose Solid 6 c
No. 2 Solid Collar ..... 6½ c
Inlaf Patent.
Nos. 7, 8, 11 and 12 ..65@65&10%
Nos. 1, 2, 3, 4 ..... 70@70&10%
Nos. 1, 2, 3, 4S ..... 70@70&10%
Nos. P, S, 2S ..... 70@70&10%

Boxes, Axle—

Common and Concord, not turned
lb. 5½c
Common and Concord, turned
lb. 6@7c
Half Patent ..... *lb.*, 9½@10¢

Bait—Fishing—

Hendrix 20%
B Bait 25%
Competitor Bait ..... 20&5%

Balances—Sash—

Caldwell new list 50%
Pullman ..... 35&10%

Spring—

Spring Balances ..... 50¢@10&60%
Counter:
Light Spg. Balances ..... 50&50&10%
Straight Balances ..... 40&10&10%
Circular Balances ..... 50&10%
Large Dia. 30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb. ... per lb., —@2½@2¾¢

Bars—Towel—

No 10 Ideal, Nickel Plate..$9 gro. $8.50

Beams, Scale—

Scale Beams 40%
Chattillon's No. 1 ..... 30%
Chattillon's No. 2 ..... 40%

Beaters, Carpet—

Hyde-Lyon Co.
No. 12 Wire Coppered ₰ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ₰ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned ..... ₰ doz. $1.50

Beaters, Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85. No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.: T. & S. Dover $6.50

Bellows—

Blacksmith, Standard List..
Split Leather ..... 60&10&10%
Grain Leather ..... 50&10&10%

Hand—

Inch.. 6 7 8 9 10
Doz... $5.00 5.75 6.50 7.50 8.50

Molders—

Inch.. 10 12 14 16 18
Doz... $5.50 9.00 12.00 16.00 20.00

Bells—Cow

Ordinary Goods ..75&10&10&10%
Hand Bells ..... 70&10&10%
Lyons ..... 25&10%
Lyon Star 50%

Door—

11 inch, R. & E. Mfg. Co's. ..... 55&10%

Hand—

Nickel Plated Brass ..... 70&10%
Yellow Metal ..... 70&10&10%
Nickel Plated ..... 50&10%
Swiss 70%
Cook's Glide Hand Bells ..... 35&10%

Bit—Fishing—

Hendrix 20%
B Bait 25%
Competitor Bait ..... 20&5%

Balances—Sash—

Caldwell new list 50%
Pullman ..... 35&10%

Spring—

Spring Balances ..... 50¢@10&60%
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Light Spg. Balances ..... 50&50&10%
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Steel Crowbars, 10 to 40 lb. ... per lb., —@2½@2¾¢

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Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85. No. 6, Jap'd, $1.65.
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Inch.. 10 12 14 16 18
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Bells—Cow

Ordinary Goods ..75&10&10&10%
Hand Bells ..... 70&10&10%
Lyons ..... 25&10%
Lyon Star 50%

Door—

11 inch, R. & E. Mfg. Co's. ..... 55&10%

Hand—

Nickel Plated Brass ..... 70&10%
Yellow Metal ..... 70&10&10%
Nickel Plated ..... 50&10%
Swiss 70%
Cook's Glide Hand Bells ..... 35&10%

Miscellaneous—

Farm Bells ..... *lb.*, 2¼@2½¢
Church and School ..... *lb.*, 2¼@2½¢

Belting—Leather—

Standard ..... 70&10&10&10%
Light ..... 70&10%
Oak Tanned Extra ..... 50&10%
Leather Lacing Sides, per lb. ..... 45¢@50¢

Rubber—

Competition (Low Grade).
Standard ..... 50&10&10%
Best Grades ..... 50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Spokes 50%
Tubes 60

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden ..... 75&10&10%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined 55
Embossed 55

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co. 35%

Bolts—

Carriage, Machine, &c.—

Common Carriage ..... 60&10&10%
Plough and Sleigh ..... 60&10%
Plain, Eagle, &c., list 50%
Bolt Ends 50%
Machine (Cut Threads):
Common and Small ..... 60&10%
Larger and Longer 50%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob
Inch 3 4 5 6 8
Per doz. $0.80 .... 1.15 1.65 2.50
Cast Iron Spring Foot, Jap'd:
Inch 8 10
Per doz $1.20 1.75 2.25
Cast Iron Chain, Flat, Japanned:
Inch 6 8 10
Per doz $1.30 1.70 1.85
Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch 6 8 10
Per doz $1.35 1.45
Wrought Barrel Japd with Cast Barrel Bronzed ..... 60&10%
Sperry ..... 70&10&10&10%
Shutter ..... 50&10&10%
Kenyon Neck ..... 75&10&10%
Squatter ..... 70&10&10%
Ives' Patent Door 55%
Ives' Wrought Metal 45%

Expansion—

Barnard, Mfg. Co. 50%
Stewart & Romaine Mfg. Co.
Style No. 13, Double 55%
Style No. 1, Single 50%
Style No. 1, Double 50%
Lag Screw 60%

Plow and Stove—

Plow ..... 65&50&10%
Stove ..... 50&50&5%

Tire—

Common Iron 80%
Norway Iron 80%
American Screw Company:
Norway Phila., list Oct. 16, '84.. 80%
Eagle Phila., list Oct. 16, '84.. 82½%
Bay State, list Dec. 28, '99..... 80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84.. 80%
Eagle Phila., list Oct. 16, '84.. 82½%
Eclipse, list Dec. 28, '99..... 80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99..... 80%
Norway Phila., list Oct., '84..... 80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99.. 80%
Phila., Eagle, list Oct. 16, 1884.. 82½%
Union Nut Co. 70%
Tire Bolts 72½%

Borers, Bung—

Borers Bung, Ring, with Handle:
Inch 1¼ 1½ 1¾ 2
Per doz. ..$4.80 5.60 6.40 8.00
Inch 2¼ 2½
Per doz. ..$8.80 11.20
Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each 25%

Boxes, Mitre—

C. E. Jennings & Co. 25%
Landon ..... 15&10%
Landon and Large Improved, 24x11 .. Landon
Acme ..... 15&10%
Perfection 10
Seavey 15%

Braces—

Common Ball, American $1.50
Barton's ..... 50&10&10&60&10
Fray's Genuine Spofford's 60%
Fray & No. 10 to 120, 81 to 123, 207 to 414 ..... 60%
C. E. Jennings & Co. ..... 50&5%
Mayhew's Improved 60%
Mayhew's Quick Action Hay Pat.. 50%
Millers Falls Drill Braces ....25&10%
P., S. & W. Co., Peck's Pat..60&10%

Brackets—

Wrought Steel .....70&10@75&10%
Bradley Metal Clasp, 8&4&10&10&10%
Griffin's Pressed Steel..... 75@75&10%
Griffin's Iron Brackets 70%
Tyler Tool Handy Egg Beater Bracket ..... ₰ doz $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co. ..... 75&20%
Wire Goods Co. 75%

Buckets, Galvanized—

M'f'gr's list, price per gross.

Quart	*10*	*12*	*14*
Water, Red	2.00	2.80	3.60
Water, Blue	2.75	3.50	4.50
Fire, Rd. Btm.	$2.00	$3.65	$8.65
Well	$7.35	$1.85	$5.35

Bull Rings—See *Rings, Bull*

Butts—Brass—

Wrought, High Fast, Oct. 26, '86 .. 75%
Cast Brass Tip Butts 40

Cast Iron—

Fast Joint, Broad ....40&10@50%
Fast Joint, Narrow ....40&10@50%
Loose Joint ..... 70&10@75%
Loose Pin ..... 70&10@75%
Mayer's Hinges ..... 70@70&5
Parliament Butts ..... 70@70&5

Wrought Steel—

Bright.
Light Narrow, Light Pin ..... 70&5%
Light Narrow, Loose Pin ..... 70&5%
Loose Joint and Broad ..... 70&5%
Loose Joint, Narrow, Light ..... 70&5%
Inside Blind, &c. 70%
Back Flaps, Table Chest &c., Japanned 70%
Light Narrow, Loose Pin ..... 70&5%
Light Narrow, Ball Tip &c., Japanned ..... 70&5%
Steeple Tipped 70%
Ball Tipped 70%

Net Prices

Cages, Bird—

Hendryx Brass Screw Jaw Cages, list 12&10 13" 2.00 2.00
Hendryx Brass Screw Jaw Cages, list 12&10 13" 2.00 2.00

Calipers—See Compasses.

Calks, Toe and Heel

Bright, C. B. ... per M $2.25@2.50
Bright, C. B. ... per M $2.25@2.50
Bright, C. L. ... per M $2.40@2.50
Bright, C. E. ... per M $2.40@2.50
Bright, C. E. ... per M $2.40@2.50
Vehicle, C. E. ... per M $2.40@2.50
Vehicle, C. E. ... per M $2.40@2.50
Market ... per M $2.40@2.50

Can Openers—

See Cutlery, Table.

Caps, Percussion—

Eagle, C. B. ... $2.25@2.50
G. D. ... per M $2.25@2.50
E. L. ... per M $2.40@2.50
G. E. ... per M $2.40@2.50
Musket ... per M $2.40@2.50

Primers—

Eagle, C. B. ... 100 for 1.00
Eagle, C. E. ... 100 for 1.00
Eagle, C. L

Fasteners, Blind—

Zimmerman's ..... 50&10%
Wedge ..... 40&10%
Upson Patent 40%

Cord and Weight—

Ives and Titan 33⅓%

Corrugated—

Acme Corrugated Fasteners 70%

Faucets—

Cork Lined ..... 50&10@60%
Metallic Key, Leather Lined, new list 70%
Red Cedar ..... 40&5% off 40&10@5%
Petroleum ..... 70&10@75%
B. & L. B. Co.:
Metal key ..... 60&10%
Star 60%
West Lock ..... 50&10%
John Sommer's Cherry Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Mill Key 50&10%
John Sommer's Dupex Metal Key 60%
John Sommer's Diamond Lock 40%
John Sommer's I X L Cork Lined 50%
John Sommer's Reliable Cork Lined, 50&10%
John Sommer's Chicago Cork Lined 60%
John Sommer's O. K. Cork Lined 50%
John Sommer's No Brand, Cedar 50%
John Sommer's Perfection, Cedar 40%
Self Measuring
Enterprise, ₱ doz. $36.00 ..... 40&10%
Lane's, doz. $36.00 ..... 40&10%
National Measuring, ₱ doz. $36.40&10%

Felloe Plates—

See Plates, Felloe.

Files— Domestic—

List Nov. 1, 1899.
Best Brands ..... 70&10@75&10%
Standard Brands ..... 75&10@80%
Lower Grade ..... 75&10&10@80&10%

Imported -

Stubs' Tapers, Stubs' list, July 24, '97 ..... 33 1-3@40%

Fixtures, Fire Door—

Austin Underwriters' Approved 50%
Richards Mfg. Co.:
Universal, No. 103, Special, No. 134 ..... $3.75
Fusible Links, No. 96 ..... 60%
Expansion Bolts, No. 107 ..... 60&10%

Grindstone—

Net Prices:
Daisy 15 17 19 21
Per doz. ..... Stock 4.65 4.45 4.65
P. S. & W. Co. 5%
Reading Hardware Co. 60%

Fodder Squeezers—

See Compressors.

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Tug Rev Potato ..... 60&10%
Victor, Rad. Mature ..... 60&15&10%
Victor, Mature 60%
Victor, Header 65%
Champion, Hay 60%
Champion Header 65%
Champion, Mature ..... 60&15&10%
Columbia, Hay 60%
Columbia, Mature 70%
Columbia, Spading ..... 70&12½%
Harvest Wood Barley 40%
A. & C. Potato Digger ..... 60&10%
Acme Hay ..... 60&20%
Acme Mature, 4 tine ..... 60&10&5%
Dan Patch Header 60%
Jackson Wood Barley ..... 60&20%
Kansas Header 65%
W. & C. Tip Pie Wood Barley 40%
Plated, See Catalog.

Frames— Wood Saw—

White, Sq't Bar, per doz. 30@30¢
Red, Sq't Bar, per doz. $1.00@1.25
Red, Dbl. Brace, per doz. $1.40@1.50

Freezers, Ice Cream—

Qt. 1 2 3 4 6
Each $1.25 $1.60 $1.90 $2.30 $2.80

Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—*See Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped.. 3.65
Waterproof Dbl. Taped.. 4.40
Waterproof Tpl. Taped.. 5.15

Gates, Molasses and Oil—

Stebbins' Pattern ..... 80@80&5%

Gauges—

Marking, Mortise, &c. 50@50&10%
Combination Scratch 50%
Marking, Mortise &c ..... 50&5&10%
Double's Marking, Mortise, &c. 60%
Wire Brown & Sharpe's 33⅓%
Mortise 60%
Wire P. S. & W. Co. 33⅓%

Gimlets— Single Cut—

Numbered assortments, per gro.
Nail, Metal, No. 1, $2.60; 2, $2.80
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled No. 1, $2.80; 2, $2.60
Spike, Wood Handled, No. 1, $4.00; 2, $4.60

Glass, American Window

See Trade Report.

Glasses, Level—

Classic Stephens Co. ..... 65&10&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush 25¢ more per gal.
Elastilite 10%

Grease, Axle—

Common Grade....gro. $6.00@6.50
Dixon's Everlasting, 10-lb pails, ea. 8½c. in boxes, ₱ doz., 1 lb. $1.20, 2 lb. $2.00
Helmet Hard Oil 25%

Griddles, Soapstone—

Pike Mfg. Co. ..... 33⅓@33⅓&10%

Grinders—

Royal Mfg. Co.:
Alundum Grinding Machines, each, No. 1, $1.75, 1A, $2.50, 10, $5.00 ..... 30%
Alundum Sickle Grinders, each, No. 2, $5.00, 29A, $6.00, 29A Combined, $6.50 ..... 30%
Alundum Disc Grinders, each, $2.50 ..... 30%

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., $2.04 ..... 33⅓%
Richards Mfg. Co.: Eli and Cycle, Ball Bearing, mounted 40%

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... 60&5@60&10%
Bridgeport Chain Co.:
Triumph Coil and Halters..35&2%&10%
Bridge Coil and Halters..45&5@50&5
Brown, Cow Ties ..... 50&5@50&10&5
Brown, Tie Outs ..... 70&10@75&5
Comfort Mfg. Co.:
Web ..... 30&2%
Jute Rope 35%
Sisal Rope 45%
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am. Coil and Halters..... 40@40&5%
Am. Cow Ties ..... 45@50%
Niagara Coil and Halters. 45@50&5%
Niagara Cow Ties....45&5@50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists'....55&10@55&10&5%
Heller's Farriers' ..... 40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Carolina Stone 5%
Bartlett ..... List A
Riveting 5%
Machinists', revised list..... 66⅔&5%
Blacksmiths 5%
Fayette R. Plumb:
A. E. Nail ..... 40&2%&10&2%
Engineers, Hand, A1 & Special 40%
Machinists' Hammers, Solid Face, Hand and Turned ..... 40&5%

Heavy Hammers and Sledges—

Under 3 lb., per lb. ..... Stock
3 to 5 lbs., per lb. ..... Stock
Over 5 lb., per lb., 30¢
Over 5 lb., per lb. ..... Stock 2½%

Handles—

Agricultural Tool Handles

Axe Pole, &c. ..... 60&10@60&10&5%
Hoe, Rake, &c. 40%
Fork, Shovel, Spade, &c.:
Long Handles 40%
D Handles 40%

Cross-Cut Saw Handles—

Ames 40%
Champion 50%
Disston 50%

Mechanics' Tool Handles—

Augers, assorted ..... gro. $3.00@$3.60
Brad Awl ..... gro. $1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory ..... $2.15@2.40
Socket Firming, Apple, $1.75@ $1.95; Hickory ..... $1.60@$1.75
Socket Framing, Hickory ..... $1.60@$1.75
File, assorted ..... gro. $1.30@$1.40
Hammer, Hatchet, &c. ..... 60&10@60&10&5%
Hand Saw, Varnished, doz. 80@85¢; Not Varnished ..... 65@75¢
Plane Handles:
Jack, doz. .80¢; Fore, doz. .45¢.
Chapin-Stevens Co.:
Carving Tool ..... List A1
Corner Tool ..... List A1
Tile and Awl ..... List A1
Saw and Plane ..... List A1
Screw Driver ..... List A10
Millers Falls Adj. and Ratchet Auger Bits ..... List
Nicholson Simplicity File Handle ..... List, $3.45 $4.50

J. L. Osgood:
Bobbin and Shuttle ..... List A1
Fancy No. 1 ..... List A1
No. 2 ..... List A1
No. 3 ..... List A1
No. 4 ..... List A1
No. 5 ..... List A1
No. 6 ..... List A1

W. A. Zelnicker Supply Co.:
Hammer ₱ doz. 12 in. $2.00; 13 in. $2.20; 14 in. $2.40; 15 in. $2.50; 16 in. $2.70; 22 in. $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Screw Driver, oval 30 in., $3.60; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe ₱ doz. 18 in., $5.60; 24 in., $5.80; 28 in., $6.00; 30 in., $6.20; 36 in., $6.40.
Adze ₱ doz. 36 in., $5.80; 36 in., $7.80.
Pick, Miners, R. R. 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ₱ doz., 12 to 14 in., $3.00

Hangers—

NOTE—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable, Nos. 1 and 2; Allith, No. 3, Allith Adjustable, No. 6; Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60&2½%
Roller Bearing ..... 70&2½%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00 ..... 60&10%
Roller Bearing, No. 11, $15.00 ..... 60&10%
Roller Bearing, Ex. Hv. No. 22, $18.00 ..... 60&10%
Ball Dog, $24.00 ..... 70%
Lane Bros. Co.:
Parlor, Ball Bearing, $1.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80, New Chamber $2.25
Barn Door, Standard ..... 60&10%
Hinged ..... net $6.50
Covered ..... 60&5%
Special ..... 70&5%
Lawrence Bros.:
Advance ..... 55&10%
Cleveland ..... 70&5%
Clipper, No. 60
Crown ..... 55&10%
Cyclone, No. 40 ..... net $6.50
Tandem, No. 50 ..... net $6.50
New York ..... 55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2 ..... 70%
Anti-Friction 70%
Hinged Hangers, King Charm 60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, ... 60&5%
Pioneer Wood Track, No. 3, $2.35
Roller B'rg St'l Track No. 12, $2.20
Roller B'rg St'l Track No. 13, $2.50
Roller B'rg, Nos. 39, 41, 43, 45, ... 70&7½%
Hero, Adj. Track No. 19 ..... 50&10%
Adjustable Track Tandem Trolley Track No. 16 ..... 50&10%
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22 ..... 50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150 ..... $2.50
Safety Underwriters F. D. No. 101 ..... 5%
Tandem No. 41, 2½ and 3 ..... 60&10%
Palace Adjustable Track No. 122 ..... 50&5%
Royal, Adjustable Track No. 122 ..... 50&10%
Ives' Wood Track No. 1 ..... $2.25
Transit R. D. No. 24 ..... net
Trolley B. D. No. 24, $1.30; No. 27, $1.40, No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2..70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3 ..... 60%
Hinged Transom No. 45 ..... 60&5%
Folding Door B. B. Swivel No. 135 ..... 60%
Taylor & Boggis Fry Co.'s Kidder's Roller Bearing ..... 65&10&5%
Myers' Stayon Hangers 60%

Hangers— Garment—

Pullman Trusses ..... List No. 1
No. 1 ..... List A1
No. 2 ..... List A1
No. 3 ..... List A1
No. 4 ..... List A1
No. 5 ..... List A1
No. 6 ..... List A1
No. 15 ..... List A1
Victor Folding ..... ₱ gro. $9.60

Gate—

Myers' Patent Gate Hangers, ₱ doz net $4.50

Joist and Timber—

Lane Bros. Co. 30%

Hasps—

Griffin's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, ₱ doz. 60

Hatchets—

Regular list, first qual. ..... 70&21%—
Second quality ..... 50&5%—

Heaters, Carriage—

Clark No. 5, $1.15; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50 ..... 25%
Clark Coal, ₱ doz., $0.75 ..... 20%

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind: (Victor; National; 1868; O. P. Niagara; Clark's; O. P. Clark's Tip; Buffalo.)
No. 1 1½ 2
Doz. pair $0.75 1.35 2.70
Mortise Shutter: (L. & P., O. S., Acme, &c.)
No. 1 1½ 2 2½
Doz. pair ..... $0.70 .65 .60 .55
Mortise Reversible Shutter (Buffalo, &c.):
No. 1 1½ 2
Doz. pair ..... $0.70 .65 .60
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3 for Brick, $11.50 ..... 10%
Charles Parker Co. ..... 70&7½%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 70%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111 for brick 70%
Reading's Gravity 60%

Stanley's Steel Gravity Blind Hinges, No. 1647½, ₱ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter ..... 15&5%
Acme, Lull & Porter 75%
Queen City Reversible 75%
Shepard's Noiseless, Nos. 60, 65, 55 ..... 15&5%
Niagara, Gravity Locking, Nos. 3 & 5 ..... 75&5%
Tip Pat'n, No. 1 ..... 75&10%
No. 3 ..... 75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 70&10&5%
Shepard's Double Locking 75%
Champion Gravity Locking ..... 75&5%
Pioneer ..... 75&10%
Emmert 65%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 90&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

	1	2	3
No.			
Hinges with L'tches $2.00	2.70	5.00	
Hinges only 1.40	2.05	3.80	
Latches only ..... .70	.70	.35	

New England:
With Latch ..... doz. ...@$2.00
Without Latch ..... doz. ...@$1.60
Reversible Self-Closing:
With Latch ..... doz. ...@$1.75
Without Latch ..... doz. ...@$1.35
Western:
With Latch ..... doz. $1.75
Without Latch ..... doz. $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 ..... 50%

Pivot Hinges—

Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—

Holdback, Cast Iron ..$6.75@$7.00
Non-Holdback, Cast Iron $6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 40%
Bardsley's Patent Checking 33⅓%
Bommer Bros.
Bommer Ball Bearing Floor 40%
Bommer Spring Hinges 40%
No. 999 Wrot, Steel Hold Back, ₱ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor 50%
Garden City Engine House 25%
Reverse Saloon Door 50%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 20%
American 20%
Columbia, ₱ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ₱ gr. $12.00
Columbian Hinges ..... 60&10%
Gem, new list 30%
Clover Leaf ..... ₱ gr. $12.00
Oxford, new list 40%
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co. Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen, ₱ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door 25%
No. 777 Sheet Steel Holdback, ₱ gr. $9.00
Standard Mfg. Co.:
Champion Double Acting Door Hinge ..... 25&5%
Standard Double Acting Floor Hinge ..... 50&10%
Superior Spring Hinge Co.:
Improved Floor Hinges 33⅓%

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges ..... 70&10%
Heavy Strap Hinges ..... 60&5%
Light T Hinges 70%
Heavy T Hinges 70%
Extra Heavy T Hinges 50%
Cor. Hinges, Strap ..... 60&5%
Cor. Ex. Heavy T ..... 50&10%

Screw Hook and Strap	*4 to 12 in. lb.*	*3½¢*
	1 to 3 in. lb.	*4½¢*
	3½ to 6 in. lb.	*5½¢*
Screw Hook and Eye:		
¾ to 1 inch ..... lb.		*6¾¢*
1¼ inch ..... lb.		*7½¢*
1½ inch ..... lb.		*8½¢*

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—

M't'gr's list, price per gross

Inch	*15*	*16*	*17*	*18*
Galv. Open	*$35*	*$39*	*$42*	*$46*
Jap. Open	*26*	*28*	*31*	*35*
Galv. Funnel	*43*	*48*	*52*	*56*
Jap. Funnel	*33*	*36*	*39*	*43*

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick, No. 162 ..... each $1.05
Steel Mortar, No. 178 ..... each $1.35

Hoes— Eye—

Scoril and Oval Pattern ..... 60&10@60&10&10%
Grub, list Feb. 24, 1899 ..... 70&10@70&10&10%
D. & H. Scoril 65%
Am. Fork & Hoe Co. (Scoril Pattern) 60%

Extra 10&7½%

Extra 10&7½%

Extra 10%, often given on most of these lines

Extra 10%, often given

50%

Handled—

NOTE—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit $3.20
Ft. Madison Cotton Hoe ..... 70&10%
Ft. Madison Crescent Cultivator Hoe, ₰ doz. ..... 70&10%
Ft. Madison Mattock Hoes:
Regular Weight ..... ₰ doz. $10.65
Junior Size ..... ₰ doz. $9.00
Ft. Madison Sprouting Hoe, ₰ doz. $9.00
Ft. Madison Dixie Tobacco Hoe ..... 75&10&2%
Kretsinger's Cut Easy ..... 70&10%
Warren Hoe ..... 45&10%
W. & C. Ivanhoe ..... 75&2%
B. B. 6 in., Cultivator Hoe $3.40
B. B. 6 in., Hoe $3.50
Acme Weeding ..... ₰ doz. net, $4.35
W. & C. L'ning Shuffle Hoe, ₰ doz. $5.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ₰ doz. $24.00 ..... 45&10%

Door—

Bardsley's, Iron, 4½; Brass and Bronze 50
Empire 50
Pullman 50
Reinhold Mfg. Co.'s No. 117, Ever Ready, 4½; Nos. 1-3, Flat Screw Grip 50
Superior 33⅓%

File and Tool—

Nicholson File Holders and File Handles ..... 33⅓&40%

Fruit Jar—

Triumph Fruit Jar Holder, ₰ gross, $10.80; ₰ doz. $1.25

Trace and Rein—

Fernald Double Trace Holder, ₰ doz. pairs $1.25
Dash Rein Holder, ₰ doz. pairs, $1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 20" Grimalo 50

Hooks—Cast Iron—

Bird Cage, Reading 40%
Clothes Line, Reading List 40%
Coat and Hat, Reading ..... 45&10%
Coat and Hat, Wrightsville 60
Harness, Reading List 40%

Wire—

Belt 80%
Wire Goods & H. Hooks 50
Bradley Metal Clasp Wire, Coat and Hat, 70&10; Ceiling ..... 70&10
Columbian Hdw. Co., Gem ..... 50&5
Parker Wire Goods Co., King ..... 70&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.60.
Cotton ..... *doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Rush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz. $3.00
Grass, common grades, all sizes, per doz. *$1.50*
Whiffletrees ..... *lb. 5½@6c*
Hooks and Eyes:
Brass ..... *60%10&10%*
Malleable Iron ..... *70&10&10%*
Coe-s Mfg. Co. Gate and Scuttle Hooks 40%
Ft. Madison Cut-Easy Corn Hooks, ₰ doz. $3.25 net
Turner & Stanton Co. Cup and Shoulder ..... 30&10
Bench Hooks. See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition ..... *ft. 5@ 6¢*
3 ply Guaranteed ..... *ft. 8@ 9¢*
4 ply Guaranteed ..... *ft. 10@11¢*
Cotton Garden, ¾-in., coupled
Low Grade ..... *ft. 8@ 9¢*
Fair Quality ..... *ft. 10@11¢*

Irons— Sad—

From 4 to 10 ..... *lb. 5½@5½¢*
R. H. Sad Irons ..... *lb. 5½@5½¢*
Mrs. Potts', cents per set:

Nos.	50	55	60	65
Japid Tops	88	80	98	91
Tinid Tops	88	85	98	95

New England Pressing ..... *lb. 8½@9¢*

Bar and Corner—

Richards Mfg. Co., Bar ..... 60&10%
Corner 60

Pinking—

Pinking Irons ..... *doz. 40¢*

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw ..... 30&2%; Steel 45
Lockport 50
Lane's Steel ..... 30&5
Richards' Tiger Steel, No. 130 ..... 50&10%
Smith & Hemenway Co.'s 25

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Kettles—

Brass, Spun, Plain ..... *20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros. Butcher &c. 30%
Wilkinson Shear & Cutlery Co. 60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks 60
Wilmington Acme, ₰ doz. $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List ..... *Sod 10&5 — ₰*
C. E. Jennings & Co., Nos. 45, 46, 25&5%
Jennings & Griffin, Nos. 41, 42, 60&5%
Swan's ..... 60—10
Watrous 10%
L. & L. J. White ..... 20&50&25%

Hay and Straw—

Serrated Edge, per doz. $3.00@4.75
Iwan's Sickle Edge ..... ₰ doz. $9.50
Iwan's Serrated ..... ₰ doz. $10.00

Miscellaneous—

Farriers' ..... *doz. $5.00@6.25*
Westenholm's ..... ₰ doz. $4.00@5.25

Knobs—

Base, 2½ inch, Birch, or Maple, Rubber Tip ..... *gro. $1.25@1.40*
Carriage, Jap., all sizes ..... *gro. 40@45¢*
Door, Mineral ..... *doz. 65@70¢*
Door, Por. Jap'd ..... *doz. 70@75¢*
Door, Por. Nickel ..... *doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable 50%
Lane's Nurse 25
Myers' Wireless Store Ladders 50
Richards Mfg. Co.:
Improved Noiseless, No. 112 ..... 50%
Climax Shelf, No. 113 ..... 50%
Trolley, No. 109 ..... 50%

Ladles, Melting—

L. & G. Mfg. Co., dow list 20
P. S. & W. ..... 40&10
Reading 60

Lanterns—Tubular

Regular, No. 0 ..... *doz. $3.40@4.50*
Side Lift, No. 0 ..... *doz. $4.60@4.75*
Hinge Globe, No. 0, doz. $4.50@5.25
Other Styles ..... *30&10&10%*

Bull's Eye Police—

8 inch ..... *$4.25@4.50*

Latches— Thumb—

Roggin's Latches, with screw ..... *doz. 35@40¢*

Door—

Allith Mfg. Co., Reliable and Alleghany, 55; Reliable Wood storage, 50
Cook & Carrier Mfg. Co., No. 101, ₰ doz. $2.50
Richards' Bull Dog, Heavy, No. 125 ..... 50&5%
Richards' Trump, No. 127 ..... $1.50

Leaders, Cattle—

Small ..... *doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E. 10%

Lines—

Wire Clothes, Nos. 18 19 20
100 feet *$2.50 2.25 2.00*
75 feet *$2.10 1.80 1.65*
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons' 30%
Silver Lake Braided Chalk, No. 0, $6.00, No. $6.50, No. 2, $7.00; No. 3, $7.50 ..... net
Masons' Lines, Shade Cord &c.:
White Cotton, 3½, $1.50; No. 4, $2.00; No. 5, $2.50. Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.00 ..... 20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 ..... 20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25 ..... 20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines 40
Clothes Lines, White Cotton 40
Shade Cord, Cotton or Linen 20%

Locks— Cabinet—

Cabinet Locks *33⅓%*

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods
Reading Hardware Co. 40
R. & E. Mfg. Co. 10

Padlocks—

R. & E. Mfg. Co., Wrought Steel and Brass ..... 75&2½%

Sash, &c.—

Iron, Patent
Bronze and Brass, 75&5%; Crescent 60%; Iron, 60; Window Ventilating, 40&20%; Robinson Pat. Ventilating Sash Lock, 25%.
Pullman Patent Ventilating Lock 25
Reading Sash Locks 10

Machines—Boring—

Com. Up'rt, without Augers. ..... *$2.00@2.25*
Com. Ang'r, without Augers ..... *$2.25@2.50*
Swan's Improved ..... 10&10%
Jennings', Nos. 1 and 4 50
Morris, Jr. 50
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Invincible Hand Power, ₰ doz. $16.00

Fence—

Williams' Fence Machines ..... each, $5.80

Hoisting—

Moore's Anti-Friction Chain Hoist 30%
Moore's Hand Hoist, with Load Brake 30%
Moore's Cyclone, High Speed Chain Hoist 25%

Ice Cutting—

Chandler's 12½%

Washing

Boss Washing Machine Co.:	Per doz
Boss No. 1	$57.00
Boss Rotary	$57.00
Champion Rotary Banner No. 1	$57.00
Standard Champion No. 1	$57.00
Standard Perfection	$57.00
Cincinnati Square Western	$33.00
Uneeda American, Round	$36.00

Mallets—

Hickory ..... *45&50&50*
Lignumvitæ ..... *45&50&50*
Tanners' Hickory and Apple wood ..... *doz. 45&65&50%*

Mangers, Stable—

Swett Iron Works 50%

Mats, Door—

Acme Flexible Steel 50
Elastic Steel (W. G. Co.), New list..50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co. ..... 25@25
Nelson Mfg. Co. 50
Parker's Columbia and Victoria 33⅓
Parker's Box and Side ..... 50&10%
Swett, Lane Bros. Co. 50

Motors, Water—

Divine's Red Devil 30%
Leffel, ft. 25

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; 12-in., $2.10, etc.
Cheap, 10-in., $2.25; 12-in., $2.45, etc.
Better Grade, 10-in., $3.00; 12-in., $3.25, etc.

High Grade	*10 in.*	*12 in.*	*14 in.*	*16 in.*
	$4.50	*4.75*	*5.00*	*5.25*

Continental 60
Great American 70
Great American Ball Bear'g, new list..70%
Quaker City 70
Pennsylvania 60
Pennsylvania, Jr., Ball Bearing, 50&10&5%
Pennsylvania Golf 30
Pennsylvania Horse ..... 33⅓&5%
Pennsylvania Pony ..... 40&5
Granite State:
Style A, Low Wheel 70
Style B, Low Wheel 70
Style C, High Wheel, spcl. list, 70&5%
Style D, High Wheel, spcl. list..70%
Philadelphia:
Styles M., S., C. K., T. ..... 70&10&5%
Style A, all Steel ..... 60&10&5%
Style L, High Wheel ..... 50&5%
Drexel and Gold Coin, special list.40%
Horse ..... 40&5
Pony ..... 40&5
36-in. Horse ..... 30&10
Eagle Horse ..... 30&5
L. N. L. Horse 50

Nails—

Wire Nails and Brads, Miscel. ..... *Sod 10&5&10&10%*
Cut and Wire, See Trade Report.
Hungarian Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos	6	7	8	9	10	
Anchor	20	21	20	19	18	..40&5%
Coleman	13	12	12	11	11	..net
New Haven	23	21	20	19	18	..40&5%
Livingston	19	18	17	16	16	..15
Western						₰ lb Steel

Jobbers' Special Brands .....
per lb. 9@10¢

Picture—

	2½	2¾	3	*in.*
Brass H'd	45	55	60	70
Por. Head	*1.10*	*1.10*	*1.10*	*gro*

Nippers—

See Pliers and Nippers.

Nuts—

Cold Punched ..... *Off list*
Square Blank or Tapped ..... *5.80¢*
Hexagon Blank or Tapped ..... *5.80¢*
Square Blank or Tapped.
C. T. & F. ..... *5.80¢*
Hexagon Blank or Tapped
C. T. & F. ..... *5.80¢*
Hot Pressed
Square Blank ..... *5.80¢*
Hexagon Blank ..... *5.80¢*
Square Tapped ..... *5.80¢*
Hexagon Tapped ..... *5.90¢*

Okum—

Rope ..... *lb., 6½¢*
U. S. Navy ..... *lb., 6¢*
Navy ..... *lb., 5¢*
Plumbers' Spun Oakum ..... *2½@3¢*

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated *75%*
Chase or Paragon
Brass and Copper ..... *50&10*
Zinc ..... *65&10*
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Can ..... 50&10
Railroad Oilers & Sprinklers ..... 50&10
Mayo City Mfg. Co.:
Spring Bottom Can ..... 50&10
Railroad Oilers, &c. ..... 50&10
Reinhold Mfg. Co. 50

Openers— Can— *Per doz.*

Sprague, Iron Handle ..... *30@35¢*
Sprague, Wood Handle ..... *35@40¢*
Sardine Scissors ..... *$1.75@$3.00*
Yankee Can and Bottle Opener ₰ doz., net, $9.75, Little Gem, ₰ doz., net $0.65

Egg—

Hartigan Nickel Plate, ₰ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope, any quantity ..... *30¢*

Rubber—

(Fair quality goods.)
Sheet, C. P. ..... *11@12¢*
Sheet, C. C. S. ..... *11@12¢*
Sheet, C. B. S. ..... *12@13¢*
Sheet, Pure Gum ..... *30@32¢*
Sheet, Red ..... *40@50¢*
Jenkins' '96, ₰ lb. 80¢ 25%

Miscellaneous—

American Packing ..... *lb. 20@30 ¢*
Cotton Packing ..... *lb. 16@25 ¢*
Italian Packing ..... *lb. 9@12½ ¢*
Jute ..... *lb. 4@ 7½¢*
Russia Packing ..... *lb. 8@11 ¢*

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List ..... *65&5½@70%*
Edwards, Royal Blue ..... 60&2½%

Fry—

Common Lipped:

Nos.	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*$0.80*	*$0.90*	*$1.15*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.75*	*2.25*	*2.80*	*3.45*

Paper—Building Paper

Asbestos: ..... *lb*
Roll Board or Building Felt, 1 to 10 lbs., per lin. sq. ft. ..... *2½@3c*
Roll Board or Building Felt 3-32 and ⅛ in., 45 to 60 lb per lin. sq. ft. *3c*
Mill Board, Sheet, ½ to 1 in., per lb *3c*
Per doz.
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll ..... *45@55c*
Medium weight, 30 lbs. to roll ..... *56@70c*
Heavy weight, 40 lbs. to roll ..... *$1.00@1.25*
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton *$75.00*
Red Rosin Roofing, 250 sq. ft. per roll *$1.75*

Tarred Paper—

1 ply (roll 400 sq. ft.), ton ..... *$35.00@38.00*
2 ply, roll 400 sq. ft ..... *65¢*
3 ply, roll 400 sq. ft ..... *88¢*
Slater's Felt (roll 500 sq. ft.) ..... *80¢*

Sand and Emery—

Flint Paper and Cloth ..... *5@10@ —%*
Garnet Paper and Cloth *25%*
Emery Paper and Cl'h ..... *50&10%@60%*

Parers— Apple—

Goodell Co. 40
Ideals, No. State ..... ₰ doz. $15.00
Imperial Bay State ..... ₰ doz. $36.00
New Lightning ..... ₰ doz. $7.00
Turn Table ..... ₰ doz. $6.00
Whip Master ..... ₰ doz. $5.00
Reading Improved ..... ₰ doz. $6.00
Daisy ..... ₰ doz. $5.00
Enterprise Improved ..... ₰ doz. $20.00
Sun Dial ..... ₰ doz. $20.00
Ranger ..... each $25.00
Livingston Nail Co.:
Daisy ..... ₰ doz. $4.00
Lightning ..... ₰ doz. $6.00
Bay State Tool ..... ₰ doz. $6.00
Reading Hardware Co.:
Acme ..... ₰ doz. $4.00
Daisy ..... ₰ doz. $4.00
Rival ..... ₰ doz. $5.00
Reading ..... ₰ doz. $6.25

Potato—

Saratoga ..... ₰ doz. $7.00
White Mountain ..... ₰ doz. $6.00

Picks and Mattocks—

Clint Jan. 1908

List ..... *70¢ 10% 10&5% 10&10%*
Cronk's Hot Bed Garden ..... net
₰ doz. No. 2, $2.50; No. 3 ..... lb.

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass ..... 50@50&10%
Iron, list Nov. 11, '85.. 60@60&10%

Pipe, Cast Iron Soil—

Standard .....
Extra Heavy, 6 in. & over .....
Fittings, Standard and Heavy .....
Turned 12

Pipe, Merchant—

	Consumers, Carloads. Steel. Blk.	Galv.	Iron. Blk	Galv.
	%	%	%	%
In. & 1 in.	61	48	62	50
1 in.	65	52	64	50
1 in.	67	54	66	52
2 in. & 2 in.	68	56	68	54
2 in. & over	69	58	69	52

Pipe, Vitrified Sewer—

Carload lots
Standard Pipe and Fittings, 8 to 24 in., f.o.b. factory:
Extra Heavy .....
Second-class 90%

Pipe, Stove—

	Per 100 joints.	
Edward's Nested	C. L.	L. L.
5 in., Standard Blue	$ 6.25	$ 7.50
6 in., Standard Blue	7.25	8.75
7 in., Standard Blue	8.50	10.00
5 in., Royal Blue	7.00	8.40
6 in., Royal Blue	8.50	10.00
7 in., Royal Blue	10.00	12.00
Wrought Iron, Nested	C. L.	L. L.
5 in., Standard Blue	5.00	6.25
6 in., Standard Blue	6.25	7.50
7 in., Standard Blue	7.50	9.00

Planes and Plane Irons—

Wood Planes—

Bench, first quality ..... 30@30&10%
Bench, second quality ..... 40@40&10%
Jointers ..... 25@27&10%
Jointers, second quality .....
Beech, First Quality .....
Beech, Second .....
Mahogany and Miscellaneous .....
Transit German .....
Union 60%

Iron Planes—

Chatillon Iron Planes ..... 5&10%
Union 10%

Plane Irons—

Wood Bench Plane Irons, list Jan. 12, '06. 25
Buck Bros. 30
Chapin Stephens Co. 50
Ohio Tool Co. .....
Sandusky Tool Co. .....
Stanley Rule & Level Co. .....
Union .....
Ward & Payne .....
Wells & Co. .....
Winterbottom Book Cloth Co. .....
Worden, W. L., Co. .....
Worden, W. L., Co., Nos. 1 & 2 .....
Worden, W. L., Co., Nos. 3 & 4 .....
Worden, W. L., Co., Nos. 5 & 6 .....
Worden, W. L., Co., Nos. 7 & 8 .....
Worden, W. L., Co., Nos. 9 & 10 .....
Worden, W. L., Co., Nos. 11 & 12 .....
Worden, W. L., Co., Nos. 13 & 14 .....
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Worden, W. L., Co., Nos. 597 & 598 .....
Worden, W. L., Co., Nos. 599 & 600 .....
Worden, W. L., Co., Nos. 601 & 602 .....
Worden, W. L., Co., Nos. 603 & 604 .....
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Worden, W. L., Co., Nos. 635 & 636 .....
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Worden, W. L., Co., Nos. 707 & 708 .....
Worden, W. L., Co., Nos. 709 & 710 .....
Worden, W. L., Co., Nos. 711 & 712 .....
Worden, W. L., Co., Nos. 713 & 714 .....
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Worden, W. L., Co., Nos. 719 & 720 .....
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Worden, W. L., Co., Nos. 767 & 768 .....
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Worden, W. L., Co., Nos. 995 & 996 .....
Worden, W. L., Co., Nos. 997 & 998 .....
Worden, W. L., Co., Nos. 999 & 1000 .....

Post Hole and Tree Augers and Diggers—

See also Diggers, Post Hole, &c.

Posts, Steel—

Steel, Line, Plate each, 5 ft., 42¢; 6 ft., 50¢; 7 ft., 58¢.
Steel, H. Ring Posts ..... *each $1.30*

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled ..... 35&10%
Enamel ..... 30&10%

Powder—

In Canisters:
Rifle, 1 lb ..... *each 45¢*
Rifle, Sporting, 1 lb ..... *each 75¢*
Rifle, ½ lb ..... *each 15¢*
Rifle, Fish ..... *each 25¢*
In Kegs:
1 to 25 lbs *$3.50*
25 lbs *$4.50*
Injector Sand Shot Screens:
Duck *$6.00*
Hunt Reg. (6 lb bulk) *$6.50*
Quarter Keg (1½ lb bulk) *$1.50*
Standard 1 lb cans (bulk) *$5.50*
Half case (1 lb cans bulk) *$4.50*
Injector Sunproof ..... *Shot Gun Rifle*
Keg (25 lb) *$12.00* *$15.00*
Hunt Keg (12½ lb bulk) *6.25* *7.75*
Quarter Keg (3 lb bulk) *2.25* *4.00*
Case (24 1 lb can bulk) *14.00* *17.00*
Half case (12 1 lb cans) *7.25* *8.75*

Presses—

Fruit and Jelly—

Enterprise Mfg. Co. ..... 20@25%

Seal Presses—

Merrill's No. 1, ⅌ doz. *$5.00* 50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Nail—

Cyclone 50%
Miller's Falls, No. 3, ⅌ doz., $12.00.....
No. 1 ..... 50%
Merrill's No. 1, Nail Puller, ⅌ doz. $6.00 ..... 50%
Universal, No. 1, Cyclone Spike Puller, each 50%
Peck Stow & Wilcox Co., Case Lots:
No. 1 ..... *$5.50*
No. 1½ *6.00*
Seymour & Hungerford Co:
Universal 70
Gem 50%
Staple Pullers, Utica and Dayton 60%

Pulleys, Single Wheel—

Inch	*1¼*	*2*	*3*
Awning or Tackle, per doz	*$0.50*	*.55*	*60*	*1.05*
Hay Fork, Swivel or Solid Eye, doz., ¼ in., $1.25; 5 in., $1.55			
Inch	*2*	*2¼*	*2½*
Hat House, doz	*$0.65*	*.85*	*1.20*
Inch	*1¼*	*1¾*	*2*
Screw, doz	*$0.16*	*.19*	*.23*	*.30*
Inch	*1¾*	*2*	*2¼*	*2½*
Side, doz	*$0.25*	*.40*	*.55*	*.60*
Inch	*1½*	*1¾*	*2*	*2½*

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1¾ and 2 in. ..... *17¢@20¢*
Auger Mortise, no Face Plate, per doz, 1¾ and 2 in. ..... *21¢*
Axle, 2½ in. to 3 in., 2 in., 25¢.
American Pulley Co.:
Wood ..... *American Plate*
Axle *1¾* *2*
Wrought Steel Eagle ..... *15¢@16¢*
Fox-All-Steel, Nos. 3 and 7, 2 in.
..... ⅌ doz *50¢*
Grand Rapids All Steel Noiseless 50%
Nonpareil, No. 25, 1¾ in., 19¢; 2 in. ..... *20¢*
No. 27, 1¾ in., 18¢; 2 in., 20¢
Lawn Rollers, see Rollers.

Pumps—

Cistern 60%
Force and Lift ..... *75¢@$1.75* 40%
Wood Pumps, Tubing, &c. 50%
Barnes Dbl. Acting (low list) ..... 40&5%
Beckley-Cardy Co. ..... 50&10%
*Bucket Force, Rotary

Saws—

Hack Saw Blades and Frames—

Scales—

Scrapers—

Screws—Bench and Hand

Coach, Lag and Hand Rail

Jack Screws—

Machine—

Rivet—

Saw—

Scroll—

Shaving—

Skate—

Sharpeners, Knife—

Shears—

Tinners' Snips—

Wood—

Scroll Saws—

Scythes—

Seeders, Raisin—

Sets— Awl and Tool—

Garden Tool Sets—

Sets, Nail—

Set and Cap—

Pruning Shears—

Sheaves—Sliding Door—

Sliding Shutter—

Shells—Shells, Empty—

Shells, Loaded—

Shingles, Metal— Per Sq.

Shoes, Horse, Mule, &c.—

Shot—

Shovels and Spades—

Snow Shovels—

Sieves and Sifters—

Sifters, Ash—

Sieves, Seamless Metallic

Sieves, Wooden Rim—

Sinks. Cast Iron—

Skeins, Wagon—

Slates, School—

Slaw Cutters—See *Cutters.*

Snaps, Harness—

Snaths—

Snips, Tinners—See *Shears*

Spoons and Forks—

Springs— Door—

Carriage, Wagon, &c.—

Sprinklers, Lawn—

Squares—

Squeezers, Lemon

Staples—

Steels, Butchers'—

Steelyards— . . . .30@30&10%

Stocks and Dies—

Stones—Oil, &c.

Stoves—

Tinned Iron—

Skeins, Wagon—

Scythe Stones—

Pike Mfg. Co., 1903 list:
Black Diamond S. S. ..... gro. $12.00
Lumberman S. S. ..... gro. $11.00
White Mountain S. S. ..... gro. $9.00
Green Mountain S. S. ..... gro. $6.00
Extra Indian Pond S. S. ..... gro. $7.50
No. 1 Indian Pond S. S. ..... gro. $7.00
No. 2 Indian Pond S. S. ..... gro. $4.50
Leader Red End S. S. ..... gro. $4.50
Quick Cut Emery ..... gro. $1.00
Pure Corundum ..... gro. $18.00
Crescent ..... gro. $7.00
Emery Scythe Rifles, 2 Coat. $8
Emery Scythe Rifles, 3 Coat. $10
Emery Scythe Rifles, 4 Coat. $12
Reduction of 1904 list 33⅓%.
Electric Articulated ..... gro. $12.00 ..... 33⅓%
Lightning Articulated ..... gro. $18.00 ..... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers..... gro. $9.00

Stops— Bench—

Miders Falls ..... 15&10%
Morrill's doz. No. 1, $10.00..... 50%
Morrill's, No. 2, $12.50..... 50%

Door—

Chapin-Stephens Co ..... 50@50&10%

Plane—

Chapin-Stephens Co..... 20%

Straps— Box—

Acme Embossed, case lots ..... 20&10&10%
Cary's Universal, case lots..... 20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 75c
All Steel Socket ..... doz. $2.00@2.25
Excelsior Stretcher and Tack Hammer Combined. doz. $6.00..... 20%

Stuffers, Sausage—

Enterprise Mfg. Co..... 25@25&7½%
National Specialty Co., list Jan. 1, 1902..... 50&5%
P., S. & W. Co..... 40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: doz.
Superba, Crotch Mahogany... $36.00
Triumph, Flattop Sweeper..... $45.00
Parlor Queen, Fig. Rosewood.. $30.00
Elite Hungarian Ash $25.00
Am. Queen, Fig. Mahogany..... $27.00
Ideal, Bird's-Eye Maple $28.00
Grand Rapids, Nickel, $24.00, Japan $22.50
Standard Nickel, $22.00, Japan $20.00
Crown Jewel, Nickel, $21.00; Jap. $19.00
Crystal, Glass Top..... $36.00
Grand, 12 in. wide..... $66.00
Parlor Grand..... $48.00
Club, 24 in. wide..... $72.00
Hall, 28 in. wide $60.00

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five dozen lots, $2 per dozen on ten dozen lots $2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks...90@40%
American Cut Tacks..... 90@40%
Swedes' Cut Tacks..... 90@40%
Swedes' Upholsterers'..... 90@50%
Gimp Tacks..... 90@50%
Lace Tacks..... 90@50%
Trimmers' Tacks..... 90@40%
Looking Glass Tacks..... 75
Bill Posters' and Railroad Tacks..... 90@50&10
Hungarian Nails..... 80@20%
Finishing Nails..... 70%
Trunk and Clout Nails..... 80@10%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks..... 90@60 tens@ —%

See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gas. line	Oil
30	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather..... 25@10&5%
Steel..... $3 | 35&5%
Chesterman's..... 25@25&5%
Kendall & Esser Co.:
Linen Tape, Skein ..... 1-4@10%
Linen Tape, Hook and Loop ..... 35&5%
Metallic and Steel Tape, list, 35@35&5%; Pocket, 35@35&5%.
Loftin's:
Asses' Skin ..... 40&10@50%
Metallic ..... 30@30&5%
Patent Bend, Leather..... 25&5@25&10%
Pocket ..... 40@40&5%
Steel ..... 33⅓@35%
Wesbach & Hilger:
Chesterman's Metallic, No. 341, etc 25%
Chesterman's Steel, No. 1038L, etc 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c...... 50@33⅓%

Ties, Bale—Steel Wire—

Single Loop..... 80&10@5%
Monitor, Cross Head, &c. 70@25&2½%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White..... 20@20&5%

Haying—

Myers' Hay Tools..... 45%

Miniature—

Smith & Hemenway Co.'s, Davidson, doz. Nickel Plated $1.50, Gold Plated..... $2.00

Saw—

Atkins' Cross Cut Saw Tools.... 35&5%
Simonds' Improved..... 33⅓%
Simonds' Crescent..... 25%

Ship—

L. & I. J. White..... 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon Globe or Acme, doz. $1.15@$1.25; gro.... $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@15.50

Game—

Imitation Oneida..... 75&10%
Newhouse ..... 15@10&5%
Hawley & Norton..... 65%
Victor ..... 75@75&10%
Oneida Community Jump..... 50%
Hecker ..... 75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine): doz.
No. 1, Rat, doz., $13.25..$11.50 doz.
No. 3, Rat, doz. $6.50.. $5.75 doz.
No. 3½, Rat, doz., $5.25, $4.70 doz.
No. 4, Mouse, doz., $3.85. $3.00 doz.
No. 5, Mouse, doz., $3.00. $2.25 doz.
Oneida Community: Dis. 15%
Out Sight, Mouse, doz....$0.60
Out Sight, Rat, doz..... 1.25
Easy Set, Mouse, doz..... 35
Easy Set, Rat, doz..... 1.00
Wood Choker, Rat, doz. holes. .12
Premier Tin Choker, 5 hole, doz. traps..... .75

Trowels—

Disston Brick and Pointing..... 25%
Disston Plastering..... 20%
Disston "Standard Brand" and Garden Trowels..... 30%
Kohler's Steel Garden Trowels, gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels.. gro. $6.00
Woodrough & McParlin, Plastering 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern..... 50&10%
Western Pattern..... 50&10%
Handy Trucks..... doz. $16.00
Grocers' ..... doz. $15.00
McKinney Trucks..... each, net $10.00
Model Stove Trucks..... doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.
No. 0 1 2 3
Galvanized $67 $59 $50 $39 10&10%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls 27@32¢
No. 12, ¼ and ½-lb. Balls 21@23¢
No. 15, ¼ and ½-lb. Balls 16@20¢
No. 24, ¼ and ½ lb. Balls 15@16¢
No. 36, ¼ and ½-lb. Balls 17@19¢
Chalk Line, Cotton each, Balls 26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz...... 11@19¢
Cotton Wrapping, 5 Balls to lb., according to quality... 15½@23¢
American 2-Ply Hemp, ¼ and ½-lb. Balls..... 14½@15½¢
American 3-Ply Hemp, 1-lb. Balls..... 15½@16½¢
Indian 2-Ply Hemp, ¼ and ½-lb. Balls 4 Spring Twine 10½@11½¢
India 3-Ply Hemp, 1-lb. Balls..... 10½@11½¢
India 3-Ply Hemp, 1½-lb. Balls..... 10@11¢
2, 3, 4 and 5-Ply Jute 1-lb. Balls..... 13½@13½¢
Mason Line, Linen, ½-lb. Bls. 17¢
No. 2½ Mattress, ½-lb. Balls, according to quality..... 30@60¢
Wool, 3 to 6 ply.... B 9¢; A 10¢

Vises—

Solid Box..... 50@50&10@10&5%

Parallel—

Athol Machine Co.:
Simpson's Adjustable..... 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co. 40%
Fisher & Norris Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00..... 40%
Fulton Mach. & Vise Co.:
Reed, Solid 25%
Star, Solid Jaw..... 40%
Hollands':
Machinists' ..... 40&10%
Rapid ..... 65&65@70%
Lewis Tool Co.:
Adjustable Jaw..... 30%
Monarch, 50" Steel Jaw 50%
Massey Vise Co.:
Clincher 40%
Perfect, 15%; Lightning Grip..... 15%
Morrill 20%
Millers Falls Oval Slide Pattern 60&10%
Parser's:
Victor, 20@25%; Regulars..... 20@25%
Vulcan's ..... 40@45
Combination Pipe..... 55@60%
Peerless ..... 20@25%
Rock Island 25%
Snediker & K. L. 25%
Stephens' 33⅓%

Saw Filers

Disston's D. 3 Clamp and Guide, doz., $24.00, 30%; Clamps..... 30%
Perfection Saw Clamps, doz.... $4.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed 25%
Star 40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect..... 15%
Wyman & Gordon's Quick Actions, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe..... 40%
Parker's Combination Pipe: 87 Series, 60%; 187 Series, 60&5%; No. 407..... 40%
Rock Island Pipe..... 25%

Wads—*Price per M.*

B. E., 11 up..... .60¢
B. E., 9 and 10..... .70¢
B. E., 8..... .80¢
B. E., 7..... .80¢
P. E., 11 up..... $1.00
P. E., 9 and 10..... 1.25
P. E., 8..... 1.50
P. E., 7..... 1.50
Ely's B. E., 11 and larger $1.70@1.75
Ely's P. E., 12 to 20.... $3.00@3.25

Dis. 15%

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled..... 55&10%
Ground..... 50@55
Plain or Unground..... 60%
Country Hollow Ware, per 100 lbs...... $3.00
White Enameled Ware:
Mashin Kettles..... 65&10%
Covered Wares:
Tinned and Turned.... 55&10%
Enameled..... 65&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware..... 33⅓%
Iron Clad Ware..... 70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	.45¢	.50¢	.55¢	.65¢

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles..... 60%
Parcelaned ..... 50&10&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles..... 60%
Solid Steel Spiders and Griddles 65&5%
Solid Steel Kettles..... 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone.... 40@40&10%

Washboards—

Solid Zinc: doz.
Crescent, family size heat frame $4.05
Red Star, family size, stationary protector $4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector..... $3.35
Cable Crescent, family size, stationary protector..... $3.60
Single Zinc Surface:
Naiad family size, open back perforated $2.00
Single Saginaw Globe..... $2.85
Brass Surface:
Brass King, Single Surface, open back $4.05
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.60
Glass Surface:
Glass King, Single Surface, open back $3.95
Enamel Surface:
Enamel King, Single Surface, ventilated back..... $3.95

Washers—Leather, Axle—

Solid..... 90@90&10%
Patent..... 90@90&5%
Coil: ⅞ 1 1¼ 1½ Inch.
90c. 1oc. 11c. 12c. per box

Iron or Steel—

Size bolt.... 5/16 ⅜ ½ ⅝ ¾
Washers.... $4.65 3.75 2.45 2.25 2.05
The above prices are based on $6.50 list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add 1½¢ to list.

Cast Washers—

Over ½ inch, barrel lots per lb. 1¾@2¢

Wedges—

Oil Finish..... lb., .6@8¢

Weights—Hitching—

Covert Mfg. Co. ..... 30&2

Sash—

Per net ton, f. o. b. factory:
Eastern District..... $25.00@$28.00
Southern Territory.....$22.00@$24.50
Western and Central Districts..... $23.00@$28.50

Wheels, Well—

8-in., $2.00; 10-in., $2.45; 12-in., $3.35; 14-in., $4.40.

Wire and Wire Goods—

Bright and Annealed:
6 to 9..... 72½@72½&10%
10 to 18..... 72½@70&10%
19 to 26..... 75@70&10&2½%
27 to 36..... 77½@72½&10%
Galvanized:
6 to 9..... 72½@70%
10 to 14..... 72½@70&5%
15 to 16..... 72½@70&5&2½%
17 to 18..... 72½@
19 to 26..... 70@65&2½%
27 to 36..... 65@65&10%
Coppered:
6 to 9..... 65@70&10%
10 to 14..... 70@70&5
15 to 18..... 65@70&10&2½%
19 to 26..... 70@70&2½%
27 to 36..... 72½@70&2½%
Tinned:
6 to 18..... 67½@70&10%
Brass..... 17½¢ lb., base
Copper..... 32¢ lb., base
Cast Steel Wire..... 50%

Spooled Wire—

Annealed and Tinned,
70@70&10@10
Brass and Copper..... 60@60&10%
Retailers' Assortments, per box..... $2.10@$2.50

Wire Clothes Line see Lines
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods.... 90@25&— %
Brass Wire Goods.... 90@90&10 %
Brass Cup and Shoulder Hooks..... 80@15%

Wire Cloth and Netting—

Galvanized Poultry Netting,
50@25&2½@50&7½%
Painted Screen Cloth, 100 ft., $1.35
Standard Gale Hardware Grade.
Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh.... $2.75
Nos. 4 and 5 Mesh..... $3.00
No. 6 Mesh..... $3.25
Nos. 7 and 8 Mesh..... $3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural..... 80&10%
Alligator or Crocodile.. 70&10@75%
Baxter Pattern S Wrenches.... 70@55@70&10%
Drop Forged S..... 45@45&5%
Acme ..... 60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bonnes & Calles:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut..... 50%
Combination Black..... 40&5%
Merrick Pattern..... 50%
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes' Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"..... 40&10&10&5&5%
Donohue's Engineer..... 40&10%
Eagle 75
Gem Pocket 50
Hercules 60
W. & B. Machinist:
Case lots ..... 50&5%
Less than case lots 50%
W. & B. Railroad Special:
Case lots 50%
Less than case lots ..... 40&10&5%
Solid Handles, P., S. & W., 50&10%; full cases ..... 5%&10&5%
Stillson 65
Uwanta Wrench Co.:
Uwanta Special, Iron Handle ..... 60&10&5
Other Wrenches 50
Vulcan and Acrippa Chain 50
Whitaker Machinists':
Case lots ..... 50&10
Less than case lots 5

Wrought Goods—

Staples, Hooks, &c., list March 17, '02..... 85@10&10%

Zinc— (*Cask lots at mill.*)

Sheet..... *per 100 lb.* $7.00

THE IRON AGE

New York, Thursday, April 30, 1908.

The Improved Universal Screw Machine.

The illustrations show the improved type of multiple-spindle automatic screw machine built by the Universal Machine Screw Company, Hartford, Conn. It contains a number of radical changes from the original machine brought out by the company, which was described in *The Iron Age* February 1, 1906. Notable among the improvements is the single belt from the countershaft which provides power for all the mechanical operations of the machine, replacing the three belts of the first model, which drove the spindle, camshaft and pump, respectively. The drive of the cam shaft by a straight belt from a worm countershaft, which itself is driven direct from the main driving shaft permits the spindles to run independent of the cam shaft.

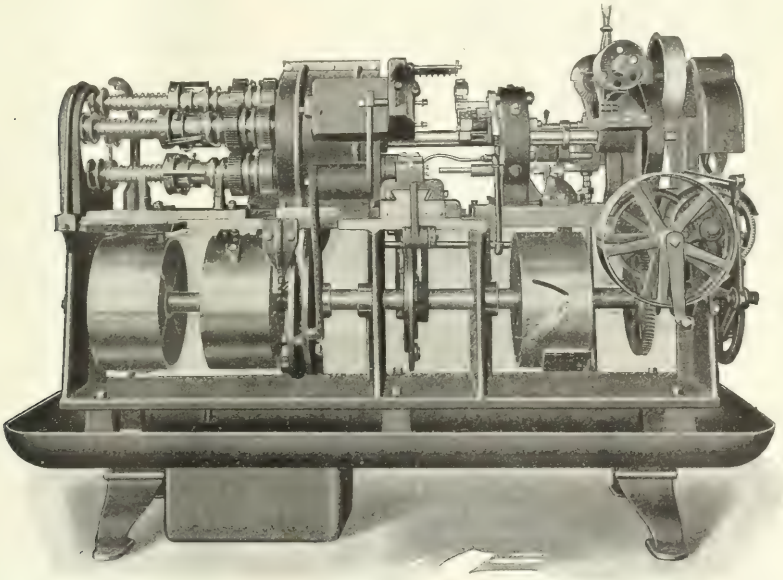


Fig. 1.—The Improved Universal Multiple Spindle Automatic Screw Machine, Built by the Universal Machine Screw Company, Hartford, Conn.

The driving mechanism of the five spindles causes each in turn, when indexed to the threading position, to reverse with slackened speed. A hand lever controls the cam shaft and affords an easy means of setting-up when feed by power is desired. Hand feed is applied by a crank fitting on the squared end of the worm shaft. The spindles are driven by positive clutches, and the locking bolt of the turret is of new design. The pump is gear driven. The machine shown is the No. 3 size, which takes work up to 1½ in. diameter, machines lengths up to 5 in., and feeds to 6 in. It is also built in two smaller sizes, the No. 1 has a capacity up to ⅝ in., and the No. 2 to ¾ in.

The single driving pulley is shown at *a*, Fig. 2. Fastened to the driving shaft is the pinion *b*, which meshes the large gear *c*, keyed to the center sleeve *d*, which drives the spindles. The ratio of gearing is 3 to 1, giving largely increased power. The worm countershaft *e*, from which the drive is transmitted to the camshaft through the medium of belt and worm shaft, is driven by the bevel gear *f* on the end of the main driving shaft, meshing the bevel gear *g*, the ratio between the gears being 2 to 1. On the end of the worm countershaft is the friction pulley *h*, which is engaged and disengaged, to start and stop the cam shaft instantly, by the shifting of the hand lever *k*, having the brake *l*, which acts directly upon the friction pulley. A collar on the end of the shaft takes the thrust of the pulley while it is engaged. The short straight belt from the worm countershaft connects the friction pulley with two pulleys on the wormshaft, the outer driving the camshaft directly for rapid indexing and for the quick advance of the tools, while the other pulley, to which the belt is shifted automatically, gives slower drive, through the medium of change gears, for feeding the tools. This arrangement also provides easy means of hand feed in setting up, the end of the wormshaft being squared for the use of a crank, shown in position in Fig. 1. The design of the camshaft drive is a departure from the common practice of driving the camshaft by a quarter turn belt and the spindles from a cross belt, both from the countershaft.

The gear driven threading mechanism is an important feature of the machine. Power is transmitted from a gear on the end of the main driving shaft to the gear *m* on the end of the center shaft *n*, through an intermediate change gear *o* on a stud in the arm *p*, which swings on a stud, the arrangement being similar to that of the common type of engine lathe. By changing this intermediate gear the operator is able to regulate the speed of the spindle while threading, to that required for any size or kind of stock. During the threading operation the spindle is revolved and the die held stationary, which permits of the cutting of a perfectly concentric screw. It will be

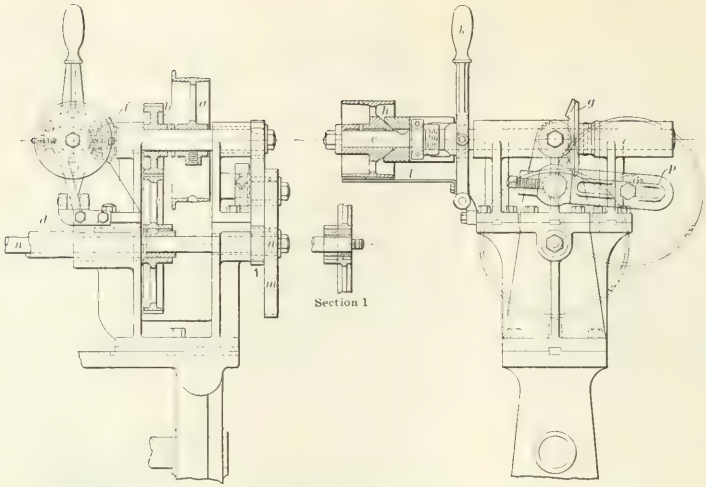


Fig. 2.—Detail of the Drive of the Improved Universal Screw Machine.

noted that no cross belts are necessary, the reverse motion being obtained through the spur gears which are always running in one direction. Neither are die pins required, as the length to be threaded is determined by two sliding collars on the center sleeve, which may be quickly adjusted.

The gear-driven pump which supplies oil to the cutting tools has a gear meshing with the large gear *c* on the center sleeve, thus doing away entirely with belt drive, the idea being to avoid any slip which might result from a belt becoming impregnated with oil, with the result of decreasing the flow of lubricant to the tools.

Another new feature of the machine is the locking pin, details of which are shown in Fig. 3. Formerly the cylinder was held in each of its five positions by a round tapered bolt. This has been replaced by the oblong shaped bolt *r*, tapered on its bottom surface and straight on the top, the unusually ample bearing surface being from 2 to 3 in., according to the size of machine. The bolt is of tool steel, hardened and ground. The pin slide, actuated by the lever *s*, acts between the cap *t* and the tapered gib *v*, thus providing for quick, parallel adjustment for wear, accomplished by means of the screw *u*, so that any play of the pin resulting from constant use may be easily corrected. The five spindles have been equipped with positive drive clutches, eliminating the possibility of slipping while threading or when the die is backing off. In addition to the five box tools there are three cross slides which act simultaneously with them, making it possible to complete almost any piece of screw machine work within the time required for the longest single operation.

The No. 3 machine illustrated occupies a floor space of 7 ft. 1 in. by 2 ft. 6 in., and weighs, with the countershaft, about 5000 lb. The two smaller machines, Nos. 1 and 2, respectively, measure 4 ft. 6 in. and 6 ft. long, 1ft. 10 in. and 2 ft. 4 in. wide, and weigh 1500 and 3100 lb., including their countershafts.

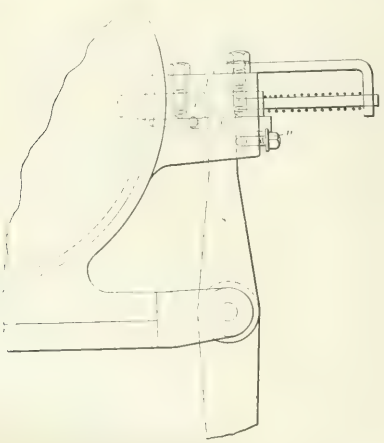


Fig. 3.—Detail of the Locking Pin.

Great Britain's Production of Open Hearth Steel.

The statistics of production of open hearth steel in Great Britain in 1907 have been gathered by the British Iron Trade Association. The total for the year was 4,663,489 gross tons, as against 4,554,936 tons in 1906 and 3,838,072 tons in 1905. The Bessemer steel statistics have not yet been published, but the open hearth output will probably prove to be as heretofore quite a little more than two-thirds of the total steel production in Great Britain. Unlike the United States, Great Britain produces much more acid than basic open hearth steel. The total of the former last year was 3,384,780 tons and of the latter 1,278,709 tons. The figures for 1906 were 3,378,691 tons and 1,176,245 tons, respectively. For 1905 they were 3,042,834 tons and 795,238 tons, respectively. It will be seen, however, that basic open hearth has made a larger proportionate increase than acid open hearth steel. Some of the principal forms into which the open hearth output of 1907 was rolled are given below, as compared with the production in 1906:

	1907.	1906.
Blooms and billets (marketed as such)...	580,961	498,656
Plates and angles.....	1,769,855	1,734,446
Bars and tin plate bars.....	950,938	939,087
Steel rails.....	79,532	94,626
Structural shapes.....	266,821	198,380

No separate returns are given of the output of open hearth axles, forgings and steel castings. The average number of open hearth furnaces in operation in Great Britain in 1907 was 392, of which 305 produced acid steel and 87 basic steel. Fourteen new furnaces were under construction at the end of 1907 and 107 furnaces were either unemployed or only occasionally employed in the year. In the production of open hearth steel ingots in 1907 but one works exceeded 300,000 tons output, two produced between 200,000 and 300,000 tons, 14 between 100,000 and 200,000 tons and 22 between 50,000 and 100,000 tons. The average output of steel ingots per furnace in 1907 was 11,896 tons.

The New Barnes Drill.

A new design in drill construction is presented in the 20-in. upright drill just brought out by the Barnes Drill Company, Rockford, Ill., which is a completely new organization headed by B. F. Barnes. The substitution of geared speed changes and positive power feeds for the usual cone pulleys and belts constitutes the chief distinguishing feature of this tool. The peculiar disposition of the gear mechanism, which is noteworthy because of its convenience and compactness, suggests "the Knapsack drill" as a good name for the machine. Strength and rigidity are increased by the reinforcing back brace of the frame, which at the same time furnishes support for the drive.

The diagonal shaft carrying the change speed gears is driven from the main shaft through bevel gears. Four changes of speed are obtained without back gears, and may be quickly made by a convenient shifting lever without stopping the drill. Back gears double the range of speed changes. The levers controlling these movements are within easy reach of the operator standing in front of the drill and the required feed and speed changes are made without change of position. The economical advantage of this arrangement is apparent since no time is lost in leaving the work to shift belts.

The spindle is machinery steel, is double splined and ground to size, and is fitted with a special ball thrust bearing of unusual strength. The spindle is counterbalanced, and the nose is extended to bring the drift hole below the sleeve.

The mechanism controlling the feed changes is distinctive in design, and is aimed to increase its utility and efficiency. It provides positive feeds ranging from 0.001 to 0.025 in. per revolution, any of which may be instantly secured while the drill is in motion through the medium of the small index lever directly in front of the operator. An automatic stop is also provided. The star wheel hand feed lever also differs radically from the feed devices heretofore supplied for drill feeds. It operates through a pinion meshing an internal gear, mounted on the cross spindle which carries the pinion engaging the rack on the spindle sleeve. The effect is a greatly increased leverage. The star wheel also acts as the quick return lever, eliminating the use of a ball handle for that purpose.

Although regularly furnished with a round table, as shown in the illustrations, a square table with oil channel can be substituted when desired. The table is raised and lowered by a screw and miter gears operated by a crank. When the machine is to be used for tapping, reversible and friction pulleys are substituted for the tight and loose pulleys. The drill is designed to drill holes up to 1 in. in steel without back gears, and 1½-in. holes when

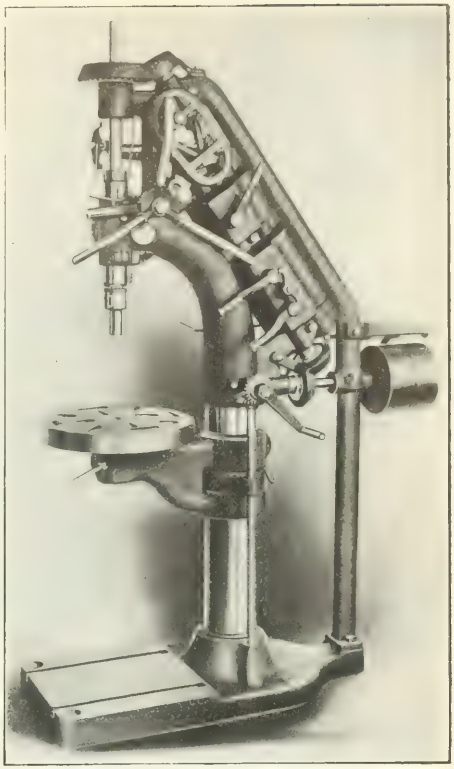


Fig. 1.—The New Upright Drill Built by the Barnes Drill Company, Rockford, Ill., with Complete Equipment.

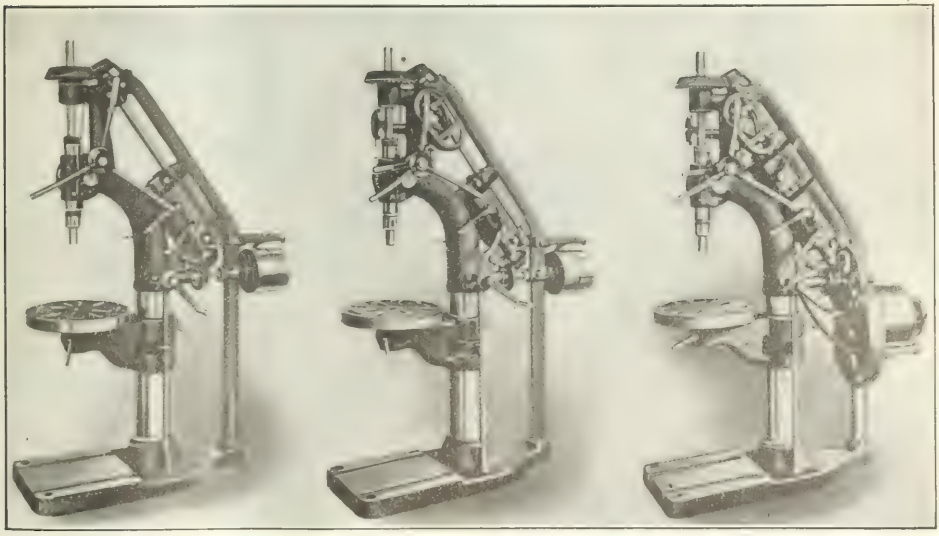


Fig. 2.—The Machine with Plain Wheel Feed and Back Gears.

Fig. 3.—The Same with the Addition of Positive Feed.

Fig. 4.—A Complete Machine Provided with Motor Drive.

VARIOUS WAYS IN WHICH THE NEW BARNES DRILL IS FURNISHED.

back geared. Although not recommended for such heavy duty regularly it will stand the occasional use of 2-in. drills. A feed of 2 in. per minute in steel and 3 in. per minute in cast iron, with 1 in. high speed twist drills can be maintained when the drill is running 190 rev. per min. without the back gears engaged. All the speed and feed changing and driving gears are inclosed in iron cases.

Fig. 1 shows the standard completely equipped drill, and Figs. 2 and 3 drills furnished with part equipment. The machine in Fig. 2 has the plain star wheel lever feed

New Hendey All-Geared Drive Lathes.

The two engine lathes illustrated are equipped with all geared drive heads of different design, and constitute recent additions to the line of the Hendey Machine Company, Torrington, Conn. Fig. 1 is a 20-in. machine, the head of which is exposed in Fig. 2. From a constant speed drive a range of nine feeds are obtained in geometric progression. Three speeds are afforded by the group of sliding gears on the driving shaft meshing in-

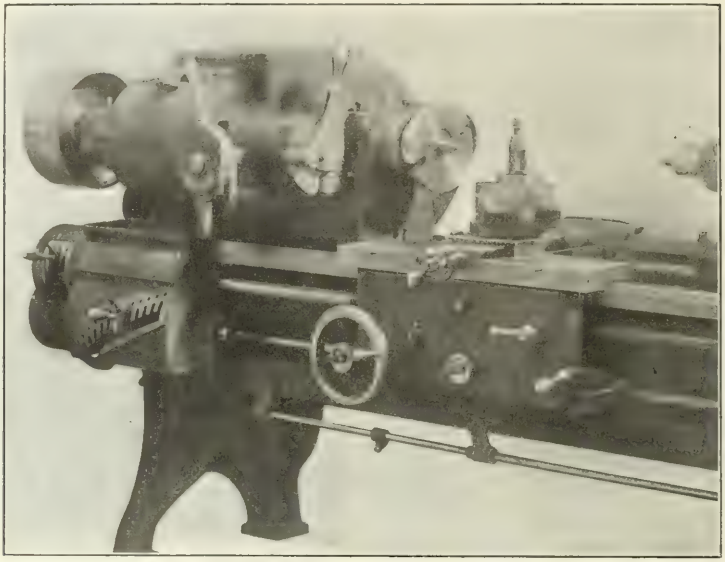


Fig. 1.—A 20-In. Lathe with the New All Geared Head, Built by the Hendey Machine Company, Torrington, Conn.

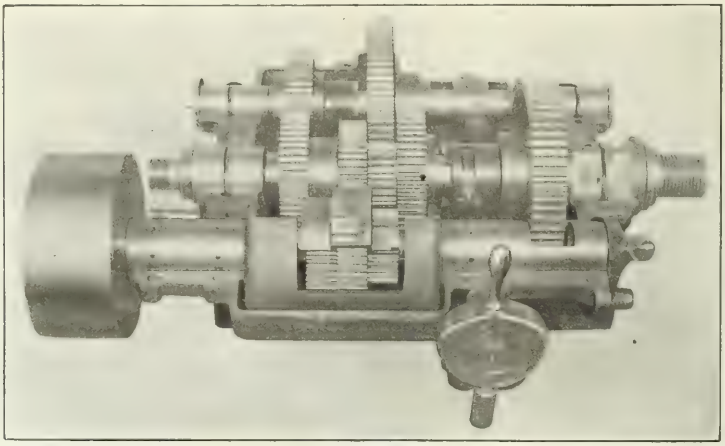


Fig. 2.—The Headstock with Cover Removed, Showing the New All Geared Drive.

and back gears. The same with the addition of the positive power feed is illustrated in Fig. 3, while Fig. 4 represents the complete machine equipped with geared motor drive.

The principal dimensions of the drill are: Hight, 70 in.; distance from column to center of table, 10¼ in., maximum distance from spindle to base, 42 in.; diameter of column, 5¾ in.; diameter of table, 16 in.; diameter of spindle, 1 7-16 in.; vertical travel of spindle, 10 in.; vertical travel of table, 16 in.; ratio of back gears, 4 to 1. Exclusive of tight and loose pulleys the tool occupies a floor space of 37½ x 16 in., and weighs 680 to 740 lb., according to the equipment.

dividually with their respective gears on the spindle, and thus giving the three highest speeds. Through the medium of two positive clutches operated by a double cam at the front of the head, two different series of three speeds each are had through fast and slow back gears.

In this machine, in common with all others built by the Hendey Company, both speeds of the countershaft are used in the working direction, because the carriage reversing mechanism overcomes the necessity of running the lathe backward, and consequently the nine working speeds are increased to 18, giving a series, in a typical instance, of from 10 to 324 rev. per min. of the spindle. The spindle is started and stopped by means of this con-

trolling cam, the double cam already mentioned, instead of relying upon the countershaft for the purpose, which means a saving of time when frequent changes of work on lathe centers are called for. The base of the head affords a reservoir for an oil bath to insure smooth running of the gears and lessen their wear.

The driving shaft pulley is 12 in. in diameter, and carries a 5-in. double belt. At the highest spindle speed the belt travels 3.14 ft. to one revolution of the spindle and at the slowest speed 81.5 ft. to one revolution of the spindle. In comparing this effectiveness with a 20-in. cone-pulley lathe, it is found that with the latter in addition to reducing the belt width to 3 in., the respective amounts of belt travel are 1.24 and 37 ft., a difference in belt power of about 4 to 1 in favor of the new drive.

The motor driven 14-in. lathe, Fig. 3, mounted in oil pan, has an all-geared head design differing from that of the 20-in. machine. In this type the rocker gears working on the driving shaft are controlled by a lever operating on the principle of the Hendey-Norton change gear box, having locating notches for the lever and locking holes for the plunger pins. There are four direct speeds and four through backs gears, all in geometric progression, with the driving shaft running at constant speed. The large lever at the front of the head controls a single positive clutch on the main spindle, and is used to stop and start the machine in the same manner as in the 20-in. machine. A variable speed motor is substituted for the countershaft drive, and with its finer graduations of speed through a 20-point controller the operator is able to adjust the speed to within very close limits of the capacity of the cutting tool. Power is transmitted from the motor to the driving shaft through a silent chain and sprockets inclosed in a guard. It will be noted that the motor is solidly mounted direct to the head with no overhang, and may be readily dismounted if occasion should require.

Special attention has been paid to providing ample lubrication of the bearings and gearing. The spindles have taper journals running in annular bearings, and these with the driving shaft and back gear bearings are fitted with ring oilers feeding from oil pockets in the casting. Exceptions are the 20 and 24 in. heads, in which the driving shaft runs in Babbitt lined bearings, formed in each end of the sliding gear cradle or rocker. All bearings of free gearing and clutches in the 20 and 24 in. heads, are oiled automatically from the oil bath already mentioned, while in other sizes the same result is obtained without stopping the machine.

These geared head lathes are built in all sizes from 12 to 24 in., inclusive, in the Hendey-Norton line.

Turbine Activities in the Far East.

No less than 10 machines, aggregating 25,000 hp., are included in a large shipment of Westinghouse turbo-electric power equipment to the Far East. One of the first machines to be put in service will be a 1500-kw. turbine unit for Manila, to be installed in a station with four other machines of like construction put into service several years ago. Past experience with these machines has resulted in the recent extension. It will be recalled that this railroad system was engineered and constructed by the American engineering firm of J. G. White & Co. Hardly second in importance is the turbine station of the Osaka Electric Company, Osaka, Japan, now building. This will be one of the largest power stations in Japanese territory, and will contain for the present 15,000 kw. in five units. Three of these machines are now being shipped from East Pittsburgh. The remainder will follow as fast as they can be built and tested. The Osaka installation is under direct charge of Takata & Co. of New York and Tokio.

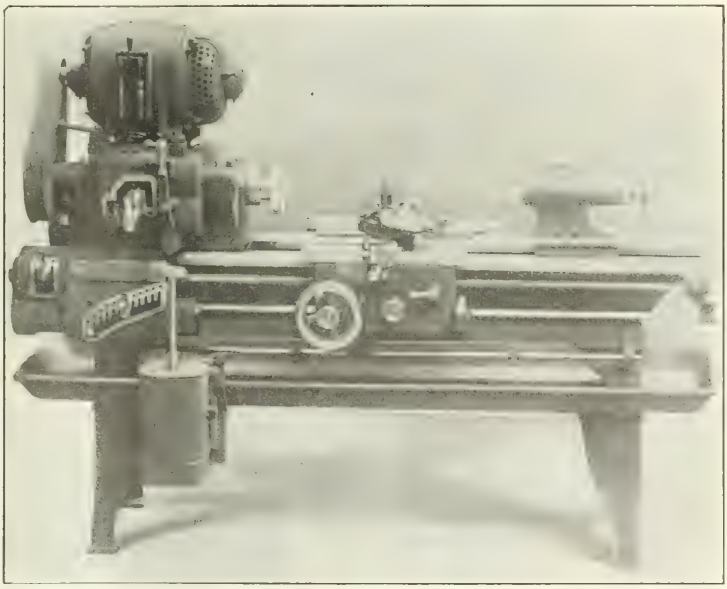


Fig. 3. 14-in. Motor Driven Hendey Lathe with Different Type of All Geared Head.

In the strictly manufacturing field, there are two installations in process of erection, one for the Imperial Steel Works of the Japanese Government and the other for the ship yards of the Hakkaido Tanko Steamship Company. Two 500-kw. Westinghouse-Parsons turbo units will comprise an initial installation in each of these plants. This gratifying reception of American motive power machinery in the Far East, especially Japan, may be regarded as an index of future operations where Government inspection is exceedingly rigid and is exercised along lines much more detailed than in this country.

The Chemische Fabrik Griesheim-Elektron of Frankfurt-a-Main, Germany, is introducing the use of magnesium as a deoxidizer in making iron castings, and has shown good results in uniformity of product and increased mechanical qualities. The amount of magnesium added is 0.05 to 0.1 per cent.

The Cincinnati Gear Cutter.

Rigidity, large wearing surfaces and simplicity of parts are regarded as the principal features of the new line of gear cutters now built by the Cincinnati Shaper Company, Cincinnati, Ohio. These are essential to a highly efficient and accurate machine in order to maintain its alignment and prevent cutter chatter. To this end the bed and driving shafts have been made as short as possible, and the shafts of large diameter. Shortening the bed has reduced the weight, but added to the stockiness and rigidity of the machine, and, on account of the design of the cutter carriage, has not reduced its capacity or the length of bearing of the cutter slide on the bed.

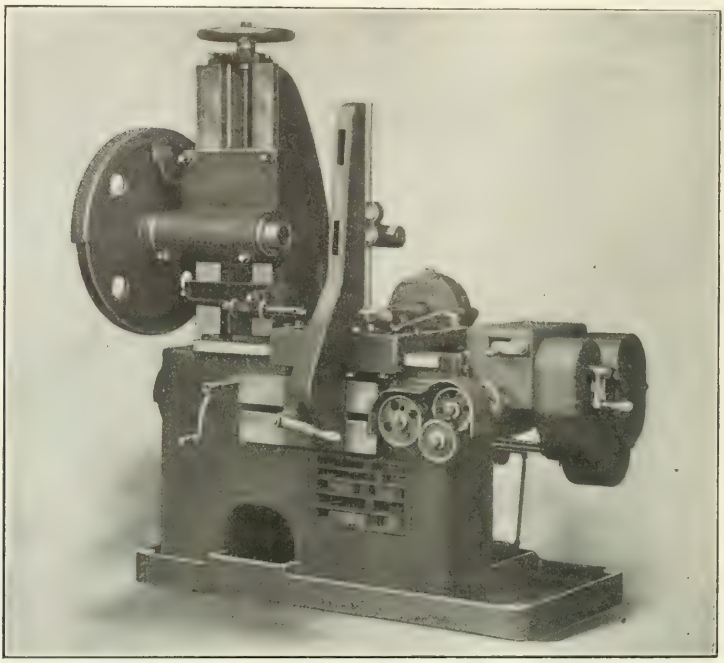


Fig. 1.—The New Gear Cutter Built by the Cincinnati Shaper Company, Cincinnati, Ohio.

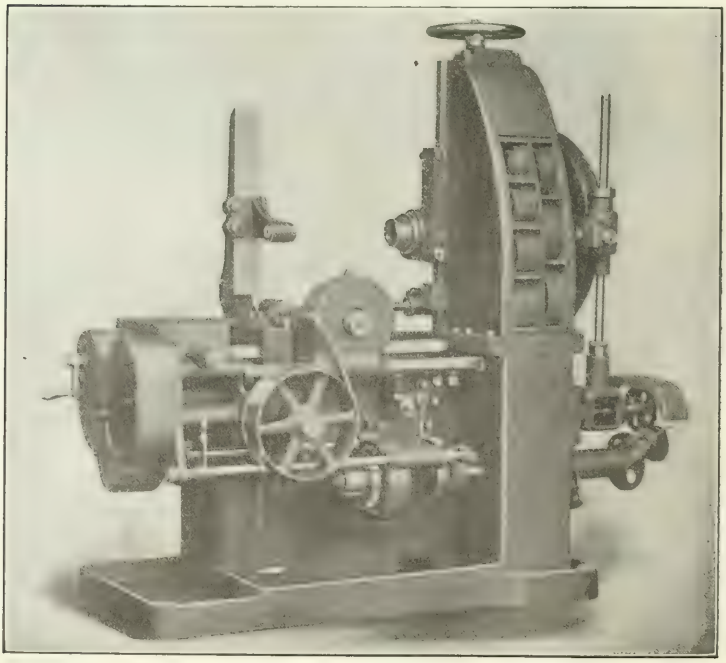


Fig. 2.—A Rear View of the New Cincinnati Gear Cutter.

The guiding surfaces of the cutter slide and work saddle are rectangular, with long and narrow bearings, to lessen the binding action of a wide bearing, and both have full length taper gibs adjustable endwise. All drives are obtained from one constant speed pulley, shown in the rear view, Fig. 2, and the changes of speed and feed are effected by transposing conveniently located gears. The movements are entirely automatic, each being dependent on the preceding one and started only at the completion of that one.

The cutter slide is fed forward and returned through a positive clutch, and the return clutch is cushioned to prevent undue shock. The dogs for limiting the cutter slide travel are adjusted from the working side of the machine, that shown in Fig. 1 by means of a crank; an index plate indicates the direction of movement of the dogs. The construction and working of the dog moving device are particularly unique, and are easily understood from the drawings given in Fig. 3, which include a side elevation, end elevation and plan of the complete machine and detail plan and end elevation of the device.

Referring to Fig. 3 it will be seen that *a* and *b* are two screws placed parallel with the bed of the machine, and *c* and *d* are spiral gears incased in a bracket, *e*, and meshing two spiral gears, *f* and *g*. Secured to these are two shafts, *h* and *i*, respectively, which are made to fit a crank wrench on one end. Screws *a* and *b* are splined on the ends adjacent to the spirals *c* and *d*, and pass through and are feathered to them, but are free to slide through them lengthwise.

The adjustable dogs are *j* and *k*, and strike a retractable tappet, *l*, secured to the reciprocating cutter slide, limiting its travel by moving the clutch lever *m*. Dog *j* is threaded to engage screw *b*, and has a clearance hole to allow screw *a* to pass through. Dog *k* is threaded to engage screw *a*, and has a clearance hole to allow screw *b* to pass through. Screws *a* and *b* are turned smaller on ends that pass through a back dog, *n*, forming a shoulder for it. The rod *o*, carrying the spool *p*, is bored to receive the end of a screw and is secured to it, forming a collar for dog *n*.

A hook for releasing the indexing mechanism is shown at *q*. Screws *a* and *b* pass through this hook and two collars, *r* and *s*, secured to screw *a*, hold it in position. At *t* is a tie block through which *a* and *b* pass, and are secured in place by shoulders on one side, and collars *u* and *v* on the other. The spool *p* engages the clutch shifting lever *m*.

From the preceding explanation it is seen that when the shaft *i* is rotated by a wrench the screw *b* will be rotated through the spiral *d*, and the dog *j* can be drawn to any position on the screws. Likewise, if shaft *h* be rotated screw *a* will rotate with it, and dog *k* will be moved to any position. When the screws *a* and *b* are rotated, members *n*, *q* and *t* being collared to the screws, do not change their relative positions to the screws lengthwise. The dog *n* rests on a slide, *w*, secured to the bed of the machine to steady the screws. When the cutter slide tappet *l* strikes the dogs the screws will be moved

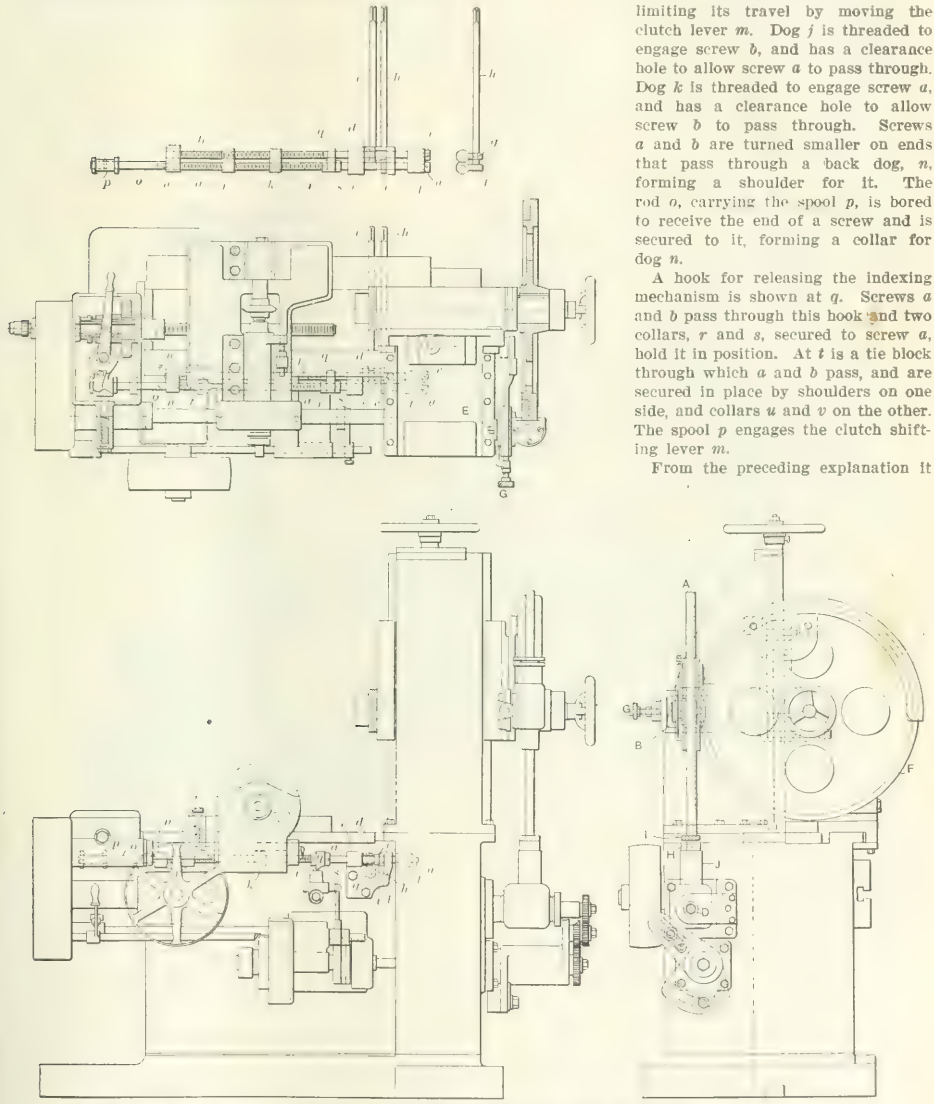


Fig. 3.—Plan and Elevations of the Cincinnati Gear Cutter and a Detail of the Dog Adjusting Device

through the spiral gears in the direction of the cutter slide travel until the clutch lever is reversed, when the cutter slide will move in an opposite direction until the tappet *l* strikes the other dog, and will reverse in a like manner; the amount of travel is regulated by the shafts *h* and *i*. The adjustable dog *j* is made lower than the dogs *n* and *k*, so that the retractable tappet *l* will strike the dog *j* in its lower or normal position, but will clear it in its retracted position and still strike dogs *n* and *k*; the object of this arrangement is to allow the cutter slide to be run back to its extreme position on the bed without changing the setting of the dogs.

The dogs can be easily set before the machine is started by moving the cutter slide to the extreme forward position desired and running dog *k* against the tappet until the reverse lever throws the clutch over to engage the reverse side, and then moving the cutter slide back by hand until the desired back position is obtained, and running dog *j* against the tappet until the clutch is thrown over to engage the feed side. Thereafter the cutter slide will reverse at these positions.

The indexing mechanism is simple and free from complicated parts; it operates without shock, and is easily accessible. This mechanism is so interlocked with the feed screw that the cutter cannot enter the work unless the indexing has been completed. The index worm is disengaged from the wheel in a novel way, dispensing with the extra shaft and two spur gears common to other gear cutters.

By referring to Fig. 3 it will be seen that the splined worm shaft A pases through the index worm B. The box J incloses two miter gears and swivels about the shaft D, and by loosening nut E the worm B can be swung out of mesh with the worm wheel F. The stud G is set for the proper engagement of the worm with the wheel, so that the worm always goes back to the same position. H is a friction, and when loosened the shaft A and the worm can be rotated by the disk I when setting work. The arm for supporting the outer end of the work arbor is clamped to its bearing by a lever, so that it can be quickly loosened and drawn back when putting in and taking out work.

The cutter slide has 10 changes of feed, ranging from 1 to 7¼ in. per minute. Change gears for faster feeds can be furnished if desired. The cutter spindle is journaled in a bronze bearing that is adjustable endwise for centering the cutter to a gauge furnished with the machine. There are six changes of cutter spindle speed, ranging from 28 to 146 rev. per min. Index change gears are furnished to cut all teeth, from 12 to 100, and, with the exception of prime numbers and their multiples, from 100 to 450. Special gears for cutting other numbers of teeth can be had when required. With the machine is included a countershaft having 14 x 4½ in. tight and loose pulleys and intended to run at 280 rev. per min. Instead of the countershaft the machine may be equipped with motor drive, the motor being mounted on an extension to the base. The belt driven machine occupies a floor space of 72 x 38 in. and weighs, including the countershaft, about 4000 lb.

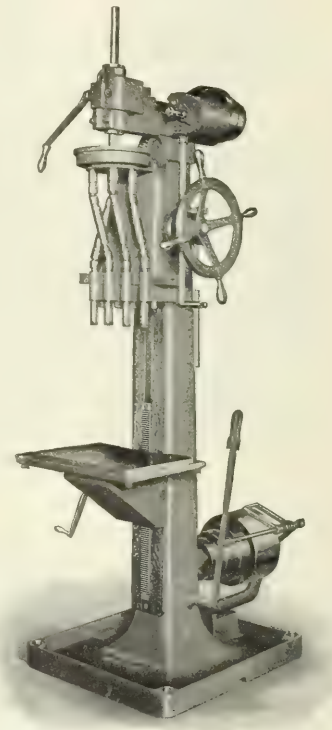
The first machine of this type has been in constant service at the builder's shop for the past six months, and is reported to have given very satisfactory results. It has accurately cut gears of three-pitch in cast iron at the maximum feed of the machine, 7¼ in. per minute, without previous stocking.

Alice Furnace of the Youngstown Sheet & Tube Company, Youngstown, Ohio, has gone out of blast. At present, only five of the merchant blast furnaces in the Mahoning and Shenango valleys are in blast, these being the No. 3 of the Shenango Furnace Company, one stack each of the Youngstown Steel Company and Stewart Iron Company, both running on Bessemer iron; the Girard Iron Company's furnace and one stack of the Andrews & Hitchcock Iron Company, which are running on foundry and gray forge. Dover Furnace, of M. A. Hanna & Co., at Canal Dover, Ohio, recently went in blast. It is probable that Mattie Furnace of the Girard Iron Company, Girard, Ohio, and Midland Furnace of the Midland Steel Company, Beaver, Pa., will be blown out within the next two weeks.

A Gardam Adjustable Multiple Drill.

One of a series of adjustable machines recently designed by William Gardam & Son, 45 Rose street, New York, to take the place, for manufacturing purposes, of the ordinary multiple drilling machines, with fixed spindles now most generally used, is shown in the accompanying engraving. They are substantial machines, adapted for drilling at one time a number of small holes up to ½ in. in the parts of automobiles, automobile accessories, typewriters, electrical devices, hardware products, &c., and the ease with which they may be handled and with which the changes can be made from one series of holes to another, renders them as useful for general work as for long runs.

They are made with a varying number of spindles,



A New Adjustable Multiple Drilling Machine Built by William Gardam & Son, New York.

which have an adjustment forward and back of 3 in. and sideways of 15 in., the minimum distance between any two spindles being ordinarily 1¼ in. Each spindle is capable of adjustment vertically to allow for the use of drills of different lengths, and has a No. 1 Morse taper hole. Chucks can be fitted direct to the spindles if desired. The rail or head which carries the spindles is counterbalanced by a weight within the column. The table is 16 x 12 in., and is supported on a rigid inclosed box knee to insure accuracy in drilling. It is adjustable by rack and pinion, and has an ample working surface surrounded by an oil groove; the size and shape can be adapted to special needs. The knee of the table and head bearings are scraped and provided with gibs to take up wear. The base is made with a rim to prevent overflow of oil, chips, &c.

The countershaft is attached to the base, is fitted with tight and loose pulleys and has self-oiling bearings. The driving gears and spindles are made of carbon steel. The machines can be had with or without direct connected all

gear feed and with or without a tapping attachment. They can easily be adapted for individual motor drive.

These machines are suitable for working in gangs, several of them being mounted on a common base and arranged to work together or independently in groups. When set up in this way one attendant can easily take care of and operate several machines.

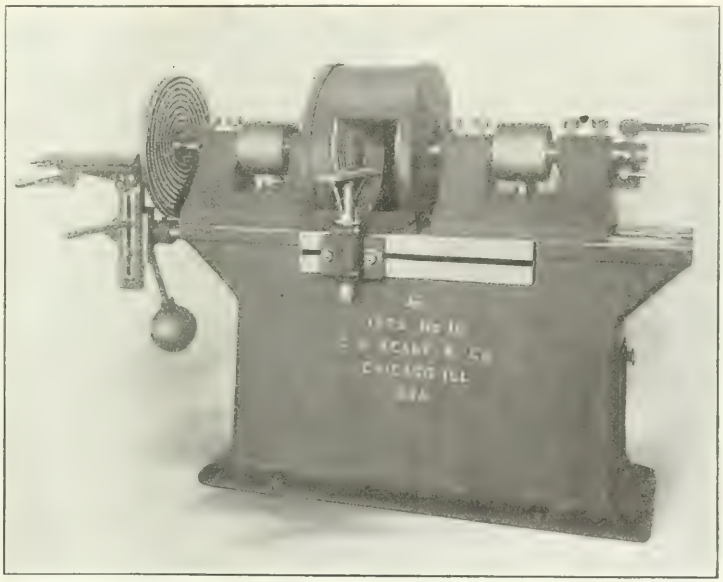
A New Besly Heavy Spiral Disk Grinder.

A heavy, powerful and rigid spiral disk grinder built by Charles H. Besly & Co., Chicago, Ill., is herewith illustrated. It is known as the new 1905 model No. 16, and is one of 60 or more different types built by this company. Good design and proportions as well as strength, rigidity and accuracy were features which it has been sought to embody in this machine.

An important feature is the third disk on the left hand end of the machine. Below this disk is a shaft fitted into the base of the machine, absolutely parallel with spindle, on which the tables are supported. The upper table is a geared lever feed table and is used for a large variety of grinding operations, the top of the table being so designed that jigs and fixtures can be readily attached to it. This table can be made stationary by clamping it to the shaft, or can be oscillated across the face of the disk. The table top can be inclined to an angle of 30 degrees from its horizontal position. The table has a powerful feed mechanism, which is easily operated by a short lever, and is equipped with a micrometer adjusting screw. A very long bearing is provided on the shaft, and the end thrust is taken on collars which are clamped to the shaft and are so constructed that dust or grit cannot get into the bearings.

Another feature of this machine is the telescopic dust hood which covers the gap where the work is inserted between the disks, and opens and closes automatically according to the size or width of the work. The right end of the hood being attached to the movable head is always in position to narrow the opening as the right hand head is moved toward the face of the opposite disk. This hood is hinged at the rear side of the machine so it can be instantly thrown back, giving free access to the disks. The dust pocket in the base of the machine is made tight, so that a suction can be maintained when an exhaust fan of suitable size is connected to the machine the air surrounding it is kept entirely free from dust. A hood is also provided for the third wheel on the left hand end of the machine. This, however, is not shown in the engraving.

The machine as shown here is equipped with 20-in. diameter spiral disk wheels, 13-16 in. thick. End thrust is taken on hardened and ground steel thrust collars of large area. The spindles are driven by 6-in. belts, with a belt speed of about 3000 ft. per minute, thus insuring ample driving power. The bearings are long and are protected from dust and grit. The bearing bushings are fitted into bored and reamed holes in the heads, thus ensuring perfect alignment, and the bushings when worn out can be easily replaced. The sliding or movable spindle is reciprocated through a rack and pinion by a handle giving a considerable leverage, and is equipped with a micrometer adjusting stop screw. The spindles are of crucible machinery steel, ground all over, and special attention has been given to the lubricating of the spindle bearings. The machine illustrated is equipped with solid oil cups.



The New 1905 Model No. 16 Heavy Spiral Disk Grinder Built by Charles H. Besly & Co., Chicago, Ill.

The heads of this machine are carried on V-ways, to which they are secured by large bolts. Thus when the heads are clamped to the base the whole is securely bound together. On the front of the base is cast a pad, having a tee slot its entire length, on which the work rest bracket is secured or to which any other fixture may be attached. With this machine are furnished 10 work rests of various widths, a countershaft, an assortment of Helmet spiral circles and a setting up press for securing the latter to the machine's disks. Solid wheel chucks can be furnished for this machine if desired. The net weight of this machine and all accessories is 3600 lb.

The Youngstown Car Mfg. Company, Youngstown, Ohio, has received an order from the Bethlehem Steel Company, South Bethlehem, Pa., for six 40,000-lb. steel cars for use in hauling ore on its Cuban property. The Youngstown Company is also building 200 all steel coal mine cars for shipment to the Pittsburgh District. These orders, with others recently taken by the company, will enable it to run its plant full time for at least two months.

WESTINGHOUSE GAS ENGINES.

Notable Development in this Branch Made by the Westinghouse Machine Company.

In the 10 years that the gas engine business has been actively engaged in by the Westinghouse Machine Company, East Pittsburgh, Pa., it has assumed remarkable proportions. There are now in operation or on order 1054 engines, aggregating about 140,000 hp., or an average of 140 hp. per unit, and stock orders bringing the total up to about 160,000 hp. In point of number these are mostly vertical engines, but although those of horizontal type are in the minority, they represent a large part in the total horsepower, the 49 now in operation or ordered totalling 51,000 hp., or over 1000 hp. each. It is with these engines that the present article is principally concerned. They are of the four-cycle tandem double-acting type and constitute probably the most important showing that American design has made in the field in which Germany has so decidedly taken the lead.

marked is the advantage when the fuel is already in gaseous form. One of the greatest difficulties has been the proper cleaning of blast furnace gas* to secure satisfactory engine operation, but this seems to be practically overcome in the very effective cleaning apparatus which is now available.

The operation of two or more gas engine driven electric units in parallel is no longer impracticable as a speed regulation within 2½ per cent. from no load to full load is now possible, and the actual cyclic variation is also claimed to be within that of standard Corliss engine practice. The efficiency is largely independent of the size which is an important advantage of gas engines wherever used, since large units are not necessary for the sake of operating economy. Also the efficiency is substantially independent of the kind of gas used, since the weaker

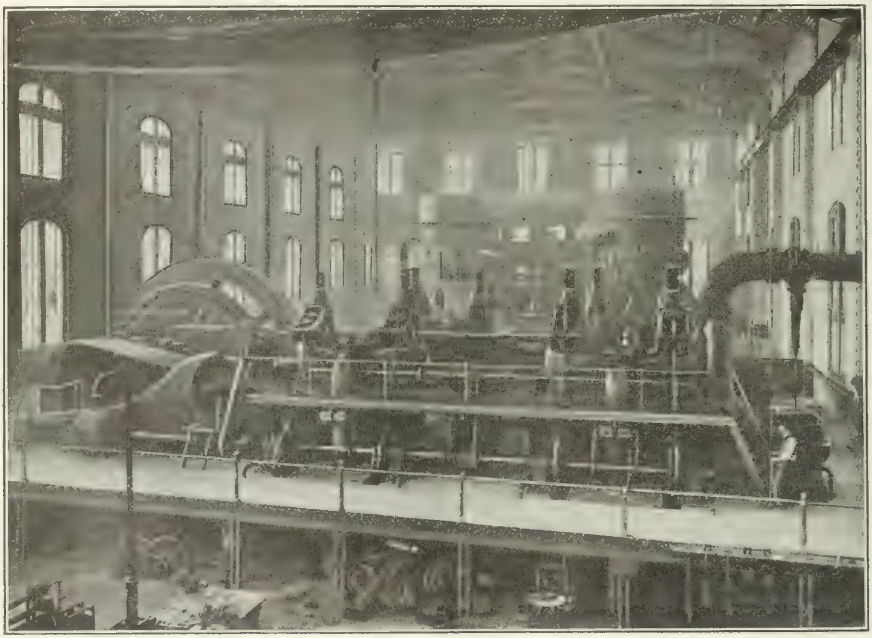


Fig. 1.—A View in the Edgar Thomson Works of the Carnegie Steel Company at Bessemer, Pa., Showing a Westinghouse Gas Engine and Direct Connected Generator.

The Westinghouse engines as a whole have gone into all fields, electric railroads, central stations, pumping plants and industrial plants of all kinds, but their relation to the iron and steel industry is particularly interesting because there is perhaps no more important problem facing metallurgical engineers than that of most economically using blast furnace gas. Approximately 25 or 30 per cent. of the gas is required in the hot blast stoves; the remainder is available for power or other purposes.* In many plants this is now burned under boilers to generate steam for the power plant, but to utilize it directly in gas engines means to realize a greater efficiency by cutting out the unavoidable losses in the extra transformation. The thermodynamic efficiency of the process of converting the heat in coal to power through steam boilers and steam engines is less than that through gas producers and gas engines, but even more

gases will stand higher compression. The same type of engine is used with all fuels in spite of their variable calorific value. These include blast furnace gas, oil distillate gas, anthracite and bituminous producer gas, by-product coke oven gas and illuminating gas.

The Westinghouse vertical engines are built in sizes up to 300 hp., and the horizontal engines in from 500 to 4000 hp. sizes. The horizontal engines are all adapted to tandem or twin tandem arrangement. The largest engines so far undertaken are those for the Inland Steel Company at Gary, Ind., which have cylinders 42 in. in diameter by 54 in. stroke. These are blowing engines, and will operate at from 60 to 75 rev. per min. On blast furnace gas these engines are rated at from 2900 to 3000 hp., and on natural gas they would develop 4000 hp. On all Westinghouse engines the guaranteed maximum capacity is 10 per cent. more than the rated capacity, and the actual maximum is claimed to considerably exceed this.

At the Edgar Thomson Works of the Carnegie Steel

* A very comprehensive analysis of the possibilities in this direction was given in *The Iron Age* December 28, 1905, in an article entitled "Electric Power from Blast Furnace Gas," by H. Freyn. Also of interest in this connection are the two articles on "Gas Power Economics, with Special Reference to the Iron and Steel Industry," by F. E. Junge, which appeared April 26 and May 3, 1906.

* This subject was thoroughly treated in *The Iron Age* in two articles, August 20 and September 6, 1906, also by F. E. Junge, on "Cleaning Blast Furnace Gas."

Company, at Bessemer, Pa., there are three horizontal twin tandem gas engines installed. One drives an electric generator and is installed in the power house where it is operated in multiple with Corliss steam engine generator units. Fig. 1 is a view of this unit. The other two are blowing engines, direct connected to Slick air tubs, and are located in a separate building. A view of a similar unit on the erecting floor in the builder's shops is given in Fig. 2, showing the blowing tubs in the foreground. The blowing engines have 38 x 54 in. cylinders, and operate normally at 60 to 75 rev. per min. The electric unit has 40 x 54 in. cylinders, and runs at 75 rev. per min. The capacity depends somewhat upon the richness of the gas. With blast furnace gas it is 2000 hp. for the blowing and 2400 hp. for the electric unit. With natural gas the capacities would be 2500 and 3100 hp., respectively. The Slick air tubs each have a cylinder diameter of 60 in. and a capacity of 25,000 cu. ft. of free air per minute. They work against a blast pressure of 18 lb. normal or 25 lb. maximum. The generator is a direct current 250-volt 1500-kw. machine, with its armature mounted directly on the engine shaft.

The gas fuel is obtained from two or more of the Bessemer group of furnaces. A special cleaning plant is now in service to remove the dust, which can deliver gas to the engines cleaner than the surrounding air. This plant comprises dry dust catchers, vertical wet scrubbers and rotary cleaners, and has proved entirely successful. The composition of the gas is approximately 25 per cent. carbon monoxide, 10 per cent. carbon dioxide, 63 per cent. nitrogen and 2 per cent. hydrogen, and ranges in calorific power from 70 to 100 B.t.u. per cubic foot. It is claimed that, although only about 25 per cent. of this gas is combustible, fully as high an operating efficiency may be obtained as when using natural gas, which is 98 per cent. combustible.

Since the Westinghouse horizontal gas engines are of the four-stroke cycle double-acting type with cylinders in tandem, the single engines have two power strokes each revolution and the double or twin engines four power strokes. Fig. 3 gives end and side elevations of a typical single tandem engine and its foundation. Engines up to about 1000 hp. are mounted above the floor level on pedestals, with space between so that the exhaust valves are accessible from the floor level. For the larger engines a space is also left between the pedestals supporting the cylinder ends, but the engine is mounted flush with the floor and the exhaust valves are reached from the basement floor beneath.

The front housing or main frame is a single box girder casting heavily ribbed to resist the transverse strains imposed by the side crank construction. The box girder completely surrounds the crank pit, forming a rectangular bed which is anchored at the corners. The crosshead may be reached through openings in the side of the housing, and the depression formed by the crank pit serves as an oil well from which the used oil is drained and filtered, to be returned to the lubricating system. The center and rear housings are approximately cylindrical, with the top cut away to expose the crosshead. Two removable steel struts are supplied on the center housings to distribute the strain evenly between the cylinders.

For the smaller engines the cylinders are single symmetrical castings supported at the ends only, but they have only their own weight to carry, since the pistons float, the rods being supported at both ends. There are openings in the jacket walls of the cylinders at the center to avoid shrinkage strains, and a split jacket band fitted with a water tight joint closes this opening, but permits free expansion and contraction of the cylinder. By removing this jacket the water spaces are exposed for cleaning. The cylinders are anchored to the foundations only at the forward end, and slide in machined ways in the center and rear housings to give unrestricted longitudinal expansion with all temperature changes. Through the valve openings access is had to the interior of the cylinder. Compression spaces of variable volume to suit different gases are obtained without altering the design of the cylinder, pistons, or the positions of the valves. The cylinders of the larger engines are cast in halves, divided perpendicularly, and these are securely held together at their ground joints by arrow heads shrunk to bind the flanges together.

Fig. 4 shows one of these cylinders partly assembled. This view also shows well the exhaust discharge at the bottom and the seats for the inlet valves at the top. The openings in the sides of the cylinders are those which receive the ignitors. At the left end of the cylinder may

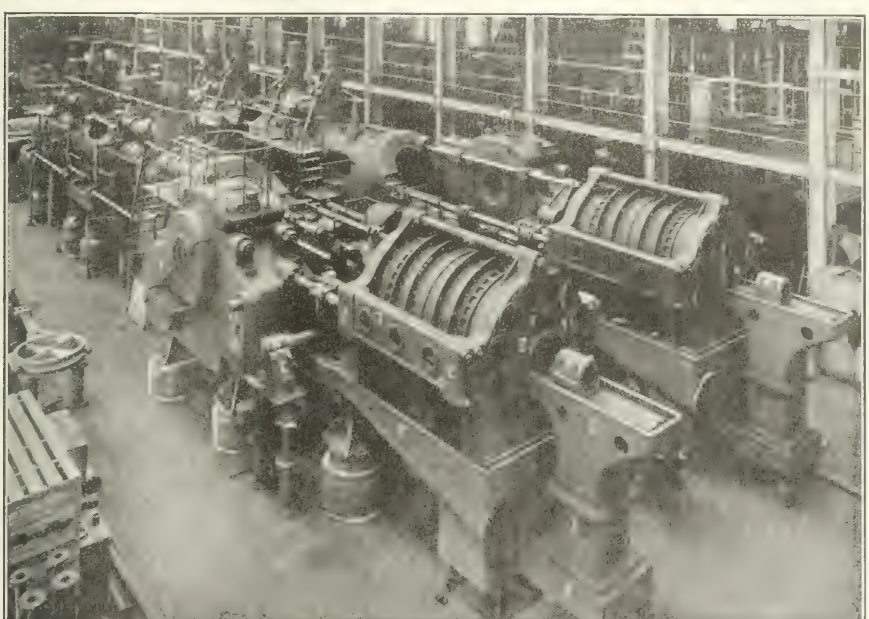


Fig. 2.—A Double Tandem Gas Blowing Engine on the Erecting Floor at the Westinghouse Machine Company, East Pittsburgh, Pa.

be seen the short studs which hold the cylinder head and the longer studs which connect the cylinder to the frame.

The side crank construction calls for only two bearings which are easily aligned. These on the smaller engines are composed of three parts and are of the usual engine types. Those of the larger engines are in four parts, two of which are adjustable by wedges. The cap of this bearing instead of having external lips has internal lips, and the housing is tied together by two heavy rods, which put the metal of the housing in compression, hence the thrust on the shaft is distributed equally between both sides of the bearing housings. A large central opening in the bearing cap makes the shaft visible while the engine is rotating. The shafts are solid and have cast steel cranks mounted upon them, having crank pins cast integral to eliminate straining the metal of the crank disk between the pin and shaft by making press fits.

Fig. 5 shows the crankshaft for a double tandem blowing engine, with the flanges or hub plates for the flywheel, the spur gears driving the main lay shaft, and the massive crank disks. The casting of the crank disk and pin in one piece presents something of a problem for the foundry. In the rough it weighs about 18,400 lb., and it must be poured relatively cold. To insure the metal flowing into the parts where the greatest strength is needed it is cast with the crank pin down, and the end of the crank pin is cored with a hollow which seems to insure better structure in the pin. In the casting there is a web extending from the pin to the center of the crank disk to form a runner, which is afterward machined off. This aids the metal reaching the outer end of the pin and gives a solid, perfect casting at that point. A large gate is also provided at the top to give plenty of head of metal to fill all parts of the mold. Roughly the dimensions are: Thickness at the hub, 21½ in.; thickness at the face of the disk, 15 in.; length of crank pin, 16½ in.; diameter of crank pin, 17½ in.; radius from the center of the shaft to the large end of the disk, 44½ in.

The pistons are continuous symmetrical castings, with no sharp corners to cause preignition. They are centered from the inside to insure uniform thickness of metal at all points. The pistons are permanently mounted on a rod by a pressed fit, and the retaining nut is turned off flush with the piston. The piston rods are bored out and are made in two parts, which are removable front and rear, so that only half the usual building clearance is required to remove the pistons. Sectional metallic rod packings are used, which float on the rods, and the weight of the rod is supported by springs. The packings are water cooled, and receive their oil supply at the center to properly distribute it.

There is perhaps no more interesting feature in the engine than the inlet valves. These are of a design that combines the functions of inlet, mixing and governor valves in a single mechanism. An advantage is that the gas and air are mixed at the point where they enter the cylinder and in quantity only as needed by the engine. Thus quantities of idle mixed gases are avoided and the governor has absolute control of the engine, whereas with one mixing valve for the entire engine a large volume of gas would be involved should preignition occur and the governor would not have such effective control. There is a slight constant movement of the valve mechanism which prevents the governor valve from sticking when the engine runs for a long time under constant load.

The bonnet of the mixing valve contains a closely fitting cast iron sleeve, which slides vertically and is free to revolve on the admission valve stem under the influence of the governor. One set of ports for gas and one for air in this sleeve, register with coresponding openings in the valve bonnet. As the sleeve is reciprocated by the valve mechanism it opens and closes the air and gas ports, and its angular position, controlled by the governor through reach rods, determines the amount of the mixture admitted to the cylinder, but always preserves a constant ratio of air to gas. The mixture at each end of the cylinder is independently controlled by the governor which is believed to give the best possible regulation. It is claimed to be so nearly perfect that no difficulty is experienced in operating 25, 40 or 60 cycle alternaters in parallel.

Fig. 6 shows the centrifugal fly ball governor, the drive of the oil pump which furnishes the oil pressure for the transmission of the governing movements and the reach rod extending toward the valves. The governor is a relay type; that is, its direct control extends only to the oil valve admitting oil to one side or the other of the piston in the oil cylinder. The pressure as controlled by this valve moves the piston giving the rocker arm just in front of the governor an angular movement, which is communicated through a reach rod to other levers and rods leading to the various inlet valves. The governor itself is therefore not affected by the motion of the reach rods nor the force required to move them. To prevent hunting on fluctuating loads the governor is provided with a dash pot. The governor is driven direct from the main shaft at a point near the front of the engine where it is not affected by any twisting movements to which the lay shaft may be subjected.

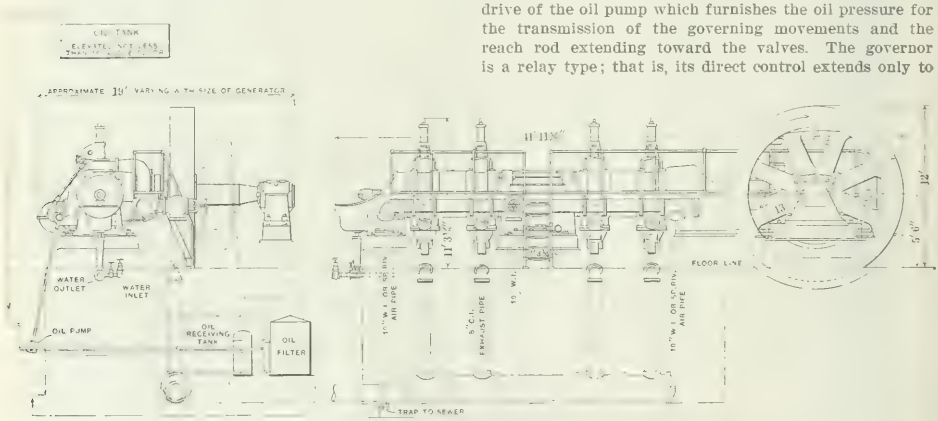


Fig. 3.—End and Side Elevations of a Westinghouse Single Tandem Gas Engine and Its Foundation.

The exhaust valves are hollow and air cooled, and are either cast iron or steel. Cooling water is supplied to the outside of the valves, so that the coolest water is in contact with the valve stem, and the outlet is through a pipe extending to the top of the valve, keeping it always full of water and preventing air pockets. Both the inlet and exhaust valve stems are lubricated at a point above the middle of the valve bushing to insure ample oil over the entire surface.

To allow water jacketing the valve covers and cylinder heads are cast hollow, and are provided with openings to admit cleaning all parts of sediment or scale. Gas tight joints are made at the inner end of the valve covers to expose a minimum surface to the heating action of the burning gases and insure cool valve seats. The location

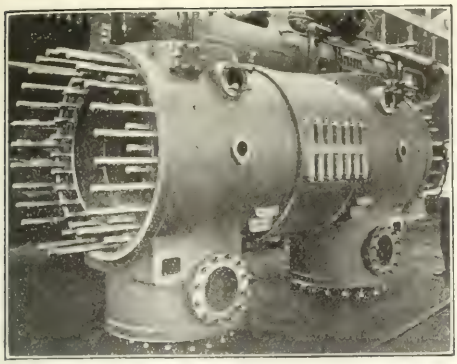


Fig. 4.—A Gas Engine Cylinder Partly Assembled.

of the exhaust and inlet valves diametrically opposite one another on the compression space gives a maximum distance between the two resulting in minimum dilution of the incoming mixture by exhaust gases, more efficient combustion and higher mean effective pressure. It also avoids the heating of the incoming gases by the exhaust parts and materially increases the capacity of the engine.

The gear which operates the inlet and exhaust valves is driven from the main shaft by a spur and bevel geared lay shaft. Spur gearing is used rather than spiral gearing, for the reason that it avoids back lash when the gears are worn, and does away with end thrust. In the latest engines one eccentric at each end of the cylinder is used for operating both the inlet and exhaust valves where formerly a separate eccentric was used for each, as in the engine illustrated in Fig. 1. From the diagrams given in Fig. 7 which were made from the engine in operation it is apparent that a very wide and rapid valve opening is secured. The valve is almost full open throughout the inlet and exhaust strokes which reduces the velocity of the gases and the resistance through the passages in the valves, considerably increasing the capacity of the cylinders. The valve operating mechanism resembles that of the rolling cam type seen on side wheel steamboat engines. An advantage as applied to gas engines is that there is a great leverage when the valve is first opened which relieves the shaft of severe strain, and that rapid closing of the valve is obtained without hammering the valve seats. The faces of the wiper cams are broad and well lubricated to reduce friction and wear.

The simplest and most positive method of instantly cutting off the power of the gas engine, namely, to interrupt the ignitor circuit, has been adopted. The safety stop consists of a spring balanced pin in the rim of the flywheel, which when forced outward by centrifugal force if the speed exceeds a predetermined limit, strikes a pawl that in turn releases a weight attached to a knife switch; the weight falling opens the circuit. Another safety stop may be provided to automatically open the ignitor circuit in case of failure of the jacket water supply. This consists of a diaphragm subjected to the cooling water pressure, which operates a trip releasing the weight when the pressure is reduced.

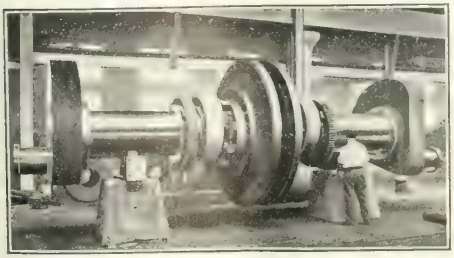


Fig. 5.—The Crank Shaft of a Double Tandem Blowing Engine.

The make-and-break system of ignition has been adopted as the only practical one for engines using gas under high compression. The ignitor contacts are of cast iron or special bronze, which has been found to wear well with the low current required for ignition. No Westinghouse engines are equipped with less than two ignitors, and some have three, equal distances apart around the circumference of each end of the cylinder. The principal benefit is insured reliability, as it is improbable that all will fail to act at any one time, and when all act there is a very material acceleration of flame propagation, so that complete and uniform combustion takes place very promptly. It is stated that an increase in power amounting to about 4 per cent. on the average is obtained by this means. Each ignitor circuit is connected through a small magnetic indicator which gives a visible and audible indication of whether or not the ignitors are operating properly. An ignitor can be removed while the engine is in operation, by first shutting off the gas supply to the affected cylinder and blocking open the exhaust valves.

There are two systems used for operating the ignitors, one of which is mechanical and the other electrical. The mechanical is operated by a second lay shaft gear driven from the main lay shaft and carrying cams which operate the ignitor tripping mechanism. Advancing or retarding the spark is effected by changing the angular relation of the ignitor and main lay shafts, thus gases of varying richness may be provided for. The device consists of a

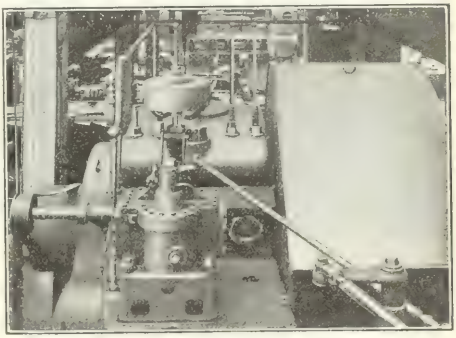


Fig. 6.—The Old Relay Centrifugal Fly Ball Governor.

sleeve having internal spiral grooves, which engage pins on the ignitor lay shaft. This sleeve revolves with the ignitor lay shaft, and can be moved backward and forward by a calibrated hand wheel to change its angular position. To avoid advancing or retarding the ignition unintentionally by twisting of the main lay shaft, the ignitor lay shaft is driven from the former at a point near the forward end of the engine.

The electrical ignition gear employs a timer or contactor for making and breaking the ignitor circuit. Instead of the knockoff cams used on the mechanical gear, an electrical knockoff device is employed. One of these is shown in Fig. 8 with case removed. It will be seen to have an S-shaped armature pivoted between two electro magnets, and carrying a hammer which, when the magnets are energized by the contact made in the timer, cause the hammer to strike the ignitor, tripping it and producing the spark in the cylinder. The ignition is easily advanced and retarded, and all the ignitors at one end of a cylinder are bound to operate simultaneously.

Oil for lubricating purposes is obtained from a continuous gravity system, equipped with filters. This embraces all of the bearings, crank pins, crossheads, &c. The cylinders are supplied by timed force feed lubricators, Fig. 9, which delivers oil to four points in each cylinder during the suction stroke only. There are two working strokes at low temperature during which the cylinder oil is distributed over the entire surface of the cylinder. Even distribution is insured, since the pistons do not touch the cylinders at any point; the piston rings form recesses which distribute the oil uniformly. The

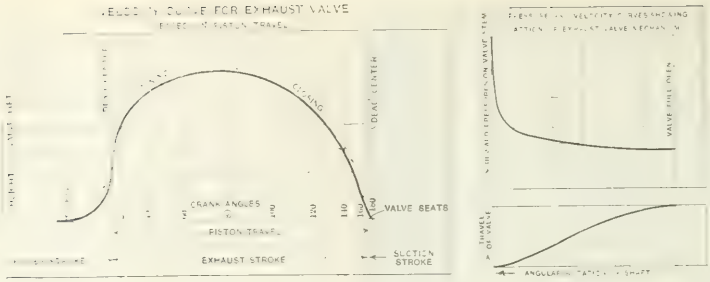


Fig. 7.—Valve Diagrams from a Westinghouse Horizontal Gas Engine.

lubricators are driven by eccentrics on a shaft which is driven through gears from the main lay shaft just beneath it. One valve controls this system so that it is not necessary to disturb the individual adjustment of the lubricators. All important parts of the engine are lubricated through sight feed oilers.

At one end of the lubricator shaft is a coupling con-

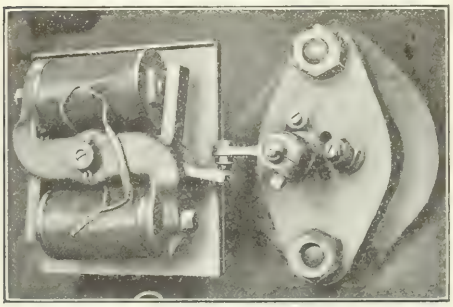


Fig. 8.—The Electrical Knock-off for Actuating the Make-and-Break Ingitor.

necting to the contactor or commutator, which directs the ignition of the various cylinders. To advance or retard the spark the case of the contactor may be revolved by the handle shown, which carries the stationary contacts to positions where they are touched by the revolving contact at later or earlier points in each revolution. Graduations beside the lever, which revolves the contactor case, show the relative positions, and the

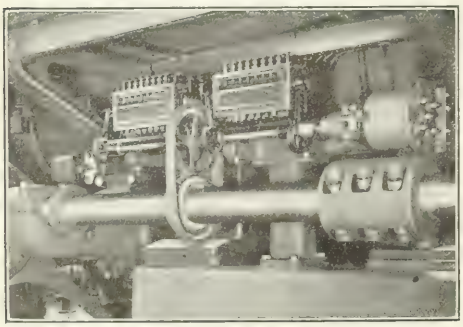


Fig. 9.—The Force-Feed Cylinder Lubricators and Ignitor Timer.

handle at one side locks the setting. At the left of the lubricators may be seen one of the magnetic ignitors.

For starting gas engines of the horizontal type an automatic air starting system is employed. An air supply pipe fitted with an unbalanced poppet valve is connected to each end of each cylinder; each valve is located directly under an air knock-off cam, mounted on the main lay shaft. To start the engine the main air valve is turned on, which causes the poppet valves to close. When one of these valves is held open by the air cam air is admitted to one end of the cylinder causing the engine to turn over. The air is admitted to the cylinder during the power stroke, and the exhaust valves are opened on the succeeding stroke permitting the escape of the air from the cylinder.

A Car Wheel Conference.

A meeting was held at the Waldorf-Astoria, New York, April 21, of the joint committee of the chilled car wheel manufacturers and the Master Car Builders' Association, preliminary to the preparation of a report for the next convention of the latter association. An informal discussion took place of the results obtained from the new M. C. B. type of wheel in the past year, as well as of the general subject of wheel wear and wheel failures. Data were presented by J. E. Muhlfeld, superintendent of motive power of the Baltimore and Ohio Railroad and by A. S. Vogt of Altoona, Pa., mechanical engineer in the motive power department of the Pennsylvania Railroad. It appeared that over 60 per cent. of the removals of wheels in the period covered by the statistics were for flange wear and flange failures. The prospect of relief by the use of steel wheels in heavy service was discussed, and the statement was made that thus far the solid wheels turned out had not sufficiently thick treads to admit of turning; but if this difficulty were removed there was still the considerable item of expense involved in the turning of such wheels, and the maintenance of plant to do this work.

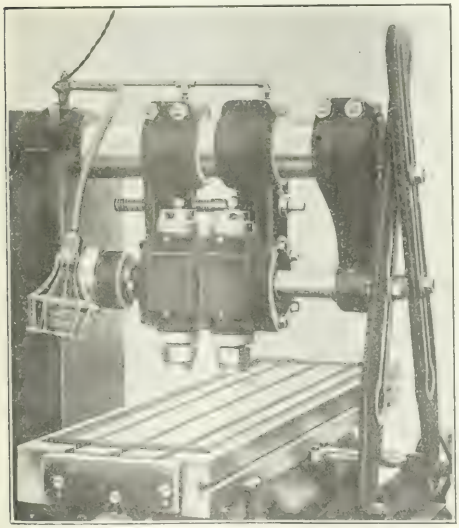
Suggestions for the improvement of the chilled wheel were offered. On behalf of one road a change was advocated in the standard M. C. B. design, so as to permit the use of brackets having a greater curve. On the question of car wheel mixtures it was said that many of the defects of chilled wheels as now made were due to the use of coke pig iron and inferior scrap wheels. Ferromanganese was added to furnish the needed strength to resist the drop and thermal tests, but service results were unsatisfactory. One of the speakers suggested that the more general use of charcoal iron would eliminate the cracks in the tread and flange of car wheels which had been much in evidence in heavy service.

On behalf of the car wheel manufacturers P. H. Griffin made a brief statement. He said that besides the use of proper mixtures there must be knowledge and experience in car wheel manufacture; a fair price for wheels to permit of maintaining a high standard in mixtures and in foundry practice; also a proper attention to conditions of service, with a recognition of the fact that the severer service of to-day requires new practice, and that on the part of the railroads it should mean more than throwing such matters upon the car wheel makers in the effort to impose greater guarantees. Excellent results, the speaker observed, had come from the attention given to wheel questions in joint conferences of the manufacturers and railroad representatives, and undoubtedly further progress would be made by further co-operation.

The Milwaukee Double Vertical Milling Attachment.

An attachment for the horizontal milling machine which the maker of the Milwaukee milling machines, the Kearney & Trecker Company, Milwaukee, Wis., has found very convenient for certain classes of work, is provided with two vertical spindles adjustable in their distance from one another. The illustrations show the general appearance of the attachment and a sectional view of it, and are almost self-explanatory. On an arbor that is inserted in the main spindle are two spiral gears which drive smaller spiral gears on the vertical spindles. The relative sizes of the gears made it possible to make the angle of the spirals favorable to a drive of this kind; it is 54 degrees for the driving gears and 36 degrees for the driven ones.

The work to be milled is held in a chuck or vise on the table and is fed to the left under or between the cutters, or both, as in the cases where the machine is doing the kind of work for which it was particularly designed, the machining of horizontal surfaces with vertical shoulders between them. For this reason the spindles are revolved in opposite directions so that both cutters run against the cut on the vertical shoulders. The adjustability of the spindles is desirable even though the intended function may be the milling of duplicate parts which, for the sake of interchangeability, must have a fixed standard distance between the finished vertical faces, to allow for regrinding the cutters or using cutters of different diameter. This adjustment is provided by the screw shown. The fine adjustment after the machine is once set up amounts to ¼ in., but it is evident that this could be greatly increased by arranging for the spiral

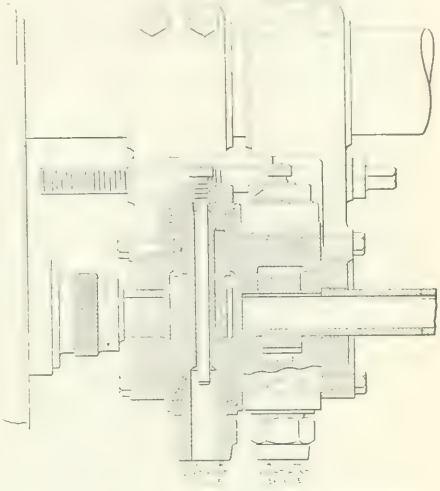


The Milwaukee Double Vertical Milling Attachment Made by the Kearney & Trecker Company, Milwaukee, Wis.

gear on the arbor to take its end thrust against the bearings in the housing instead of against the arbor itself, which would require leaving the arbor without arbor collars.

The castings containing the vertical spindle bearings are made separate from the brackets which are clamped to the overhanging arm, to facilitate setting the spindles square with the top of the table. The cutters and arbors used in these spindles have straight shanks and are backed up by the screws shown extending through the hollow spindles. These permit slight vertical adjustment of one spindle with respect to the other to bring them both on an exact level, or different levels if that should be desired.

It is incidentally interesting to notice in the accompanying half-tone a typical example of the electric lighting fixtures used in the company's shops to provide artificial illumination where it is needed around machine tools. The lamp is supported by a piece of Almond flexible tubing which may be bent to hold it where it is most useful. The tube is attached to the machine in a little casting designed for the purpose. The arrangement has



Sectional View of the Milwaukee Double Vertical Milling Attachment.

been found to be the most satisfactory yet tried to bring the light in the best relation to the work and the cutters.

The United States Reclamation Service.

A recent decision of the Department of the Interior relating to purchases for the United States Reclamation Service is of especial interest to Western manufacturers, inasmuch as it will bring them into closer touch with the extensive requirements of important development projects in charge of this branch of public work. It has been determined after a six months' trial to make the Chicago office of the Reclamation Service, in charge of Engineer E. T. Perkins, the permanent agency for the purchase of material and equipment, and hereafter all requisitions will accordingly be handled and purchases made through this office. About $40,000 a month is being expended for supplies required in the furtherance of the several irrigation and power development projects now under way; these being located in the far West can be served with greater dispatch by shipments from Western points and, as experience has proved, with no loss of economy in price.

Preliminary surveys are now being made on a new project at Eagle Pass, about 120 miles south of El Paso, Texas, on the Rio Grande River. This work contemplates the expenditure of about $6,000,000, and will necessitate the purchase of 309,000 barrels of cement in addition to a large amount of machinery equipment, including the possible installation of a stone crushing plant.

The Westinghouse Electric & Mfg. Company, Pittsburgh, in addition to securing an order for the equipment of the municipal electric lighting plant at Auckland, one of the principal cities in New Zealand, has been awarded a contract for the power plant of the Takapuna Tramways & Ferry Company. This company is to establish a ferry service from Auckland to O'Neil's Point, across the Bay of Auckland, and an electric traction system from there to Lake Takapuna, a popular local resort.

The Hulett Moving Car Dumper.

In disposing of ore and limestone received at blast furnace plants, it is necessary to handle a great many cars of various sizes and shapes each day during the busy seasons, to provide for immediate needs, and also to accumulate stock for the winter and emergencies. Car dumpers have been used at the larger plants for several years, but these are fixed in one position, usually at one end of the property. The ore or stone from the standard railroad cars is dumped through these car dumpers into transfer cars, which are hauled down the yard, and the ore transferred by the bridges to the stock piles. A simpler system involves the use of a new car dumper on wheels, which combines the function of the transfer cars since it can be moved parallel with the yard until opposite the particular storage pile into which the ore or stone is to be deposited, and there dumped. In connection with these car dumpers the stocking bridge, equipped with an automatic bucket, is still used, and this bridge extends over the car dumper. The car dumper deposits the material on the near side of the pile and the bridge being brought to this point, picks the material up and carries it across, filling up the balance of the stocking space. The bridge is also used to rehandle the material as required. One of these car dumpers, which are built under the Hulett patents by the Wellman-Seaver-Morgan Company, Cleveland, Ohio, has been in operation at the Cambria Steel Company's plant at Johnstown, Pa., for over a year and a half, with marked success, having reduced the cost of handling material.

A new and similar installation has just been completed at the National Tube Company's plant at McKeesport, Pa. The engravings herewith illustrate this machine. Figs. 1, 2 and 3 being views from various sides, and Fig. 4 drawings giving details of the construction. This machine dumps the contents of a car over a wall 10 ft. high. It weighs approximately 650,000 lb. and is operated by direct current of 220 volts. Three motors are used, two of 130 hp. each for the tipple motion and one of 75 hp. for traveling the machine. It has a traveling speed of from 75 to 100 ft. per minute and is capable of handling 175 cars in 10 hr. without crowding.

Two sets of counterweights assist the motor in hoisting and controlling the rotating cradle. One set automatically holds the car in its position on the platen when inverted; the other set tends to lift the platen when it is down and hold it from overturning too far and also tends to pull it back so that the work on the motors is very much reduced. In other words, the machine empty is very nearly counterbalanced, so that the work done by the motors is simply the handling of the car and its contents. The cars are put on the machine by a locomotive which pushes them up a specially constructed approach track having cast steel shoes resting on the railroad track. To prevent shock as the car strikes the approach, the shoe castings extend on the inside below the heads of the rails so as to engage the flanges of the wheels first and lift the treads over the more or less blunt ends of the casting. The grades are such that the locomotive can



Fig. 1.—The Hulett Moving Car Dumper Built by the Wellman Seaver-Morgan Company for the McKeesport Plant of the National Tube Company.

pass through and over the car dumper when desired.

As a maximum the machine will accommodate cars 50 ft. long, over all, 11½ ft. wide by 12 ft. high; it will also take cars as short as 28 ft., as low as 6½ ft., and as narrow as 9 ft. No adjustment of the clamping mechanism is necessary for various sizes of cars. Steel hopper cars or short gondolas are handled with equal dispatch. In this machine special attention has been paid to the arrangement of blocking and clamping, so that it is practically impossible to damage a car even through carelessness.

The machinery is all mounted in the house on top of the machine, and is easily accessible and protected from the weather. The operator's cage is similarly enclosed. Only one operator is required, and the levers he has to handle are few, as the rotating of the cradle is controlled entirely by electric power both up and coming down. Automatic safety guards in the way of cutouts are provided, so that it is impossible to overtravel the machine in any direction.

The motor for traveling the car dumper to position at the side of the required stock pile is located in the machinery house, and is geared to a horizontal shaft. At the ends of this shaft are bevel gears driving horizontal lateral shafts, each end of which in a similar way, that is, through bevel gears, drives a vertical shaft with universal joint connection which is geared at the bottom to one set of truck wheels at each of the four corners. The weight of the entire machine is distributed on 32 truck wheels. The first main horizontal shaft carries a magnetic brake and is operated after the manner of the traveling shaft of an ordinary overhead crane.

The cradle is dumped by the hoisting mechanism operated from the other two motors shown in the sectional plan of the machinery house. These, together, are geared to a horizontal shaft, carrying a solenoid brake and driving at the center a second horizontal shaft which carries spur gears at each end driving hoisting drums. The ropes from these drums connect to the base of the rounded outer ends of the cradle floor trusses, that is, where the arcs of the circles are tangent with the base of the cradle girders. This has the effect in the dumping of raising the cradle over the center so that for the remainder of the dumping the weight of the loaded car is

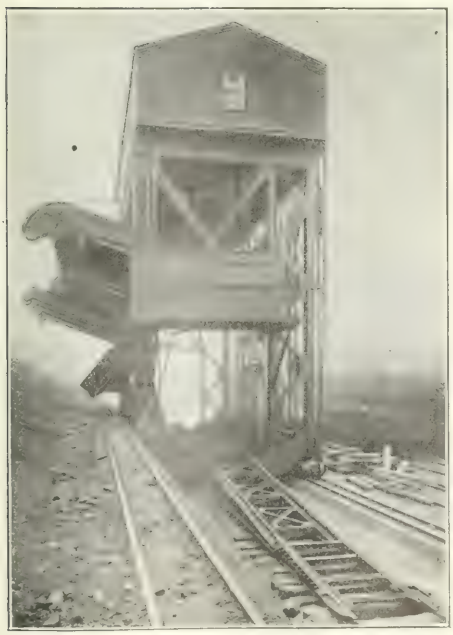


Fig. 2. End View of the Machine in Dumping Position, Showing Open of the Inclined Track Approaches.

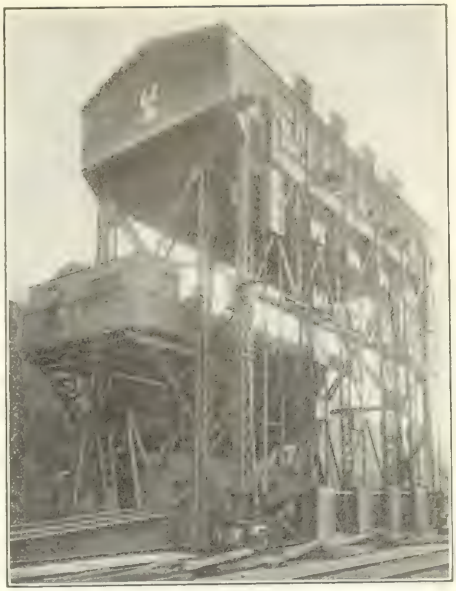


Fig. 3. A Three-quarter View, Showing the Side Carrying the Counterweights.

sufficient to carry the cradle over to its extreme dumping position, when the drums are allowed to lower slightly. On the return in pulling back, the center of gravity is changed, the load being now discharged, and when the ropes have pulled taut and the drums wound as far as they can the center of gravity is on the opposite side of the line of centers, and the cradle is restored to normal position by reversing the hoisting drums.

The cradle and the car clamps are counterweighted for the condition when there is no car in the machine. The clamp counterweights are arranged to be successively picked up as the weight upon the clamps increases when the car is reversed in position. For example, at the beginning there is only the weight of the clamps themselves to be counterweighted. As the top of the car gradually weighs heavier and heavier upon the clamps one after another of the clamp counterweights is picked up to counterbalance it. The cradle counterweights are those seen at the extreme ends of the framework, and the clamp counterweights the series of four intermediate between the cradle counterweights.

The car platen has lateral motion on rollers to give the car rigid support against the side wall of the cradle while dumping. The car comes to this position—that is, against the side wall without shock as the dumping movement proceeds. A spring and stop restores the platen when the car is returned empty, so that the rails on the platen register with those of the two approaches. Another stop on the opposite side of the platen arrests its travel in that direction when there is no car on the cradle. The spout mounted on the cradle serves to guide the discharging contents of the cars over the separating wall.

It has been stated that the clamps adjust themselves automatically to any size of car. The way in which this is done is interesting, and may be traced out by a little study of the details given in Fig. 4. There are four of these clamps, and since the hights of cars vary the clamps must be supported, so that they will come to a position parallel with the cradle platen anywhere within the distances from the platen corresponding to the maximum and minimum car hights. The clamps therefore have sliding supports at their pivoted ends to allow the required up and down motion. When the dumper receives a car the clamps must be elevated sufficiently to admit it. The outer ends are taken care of by the clamp counterweights, and the inner ends are positively raised by a rope and sheave system when the cradle is brought to

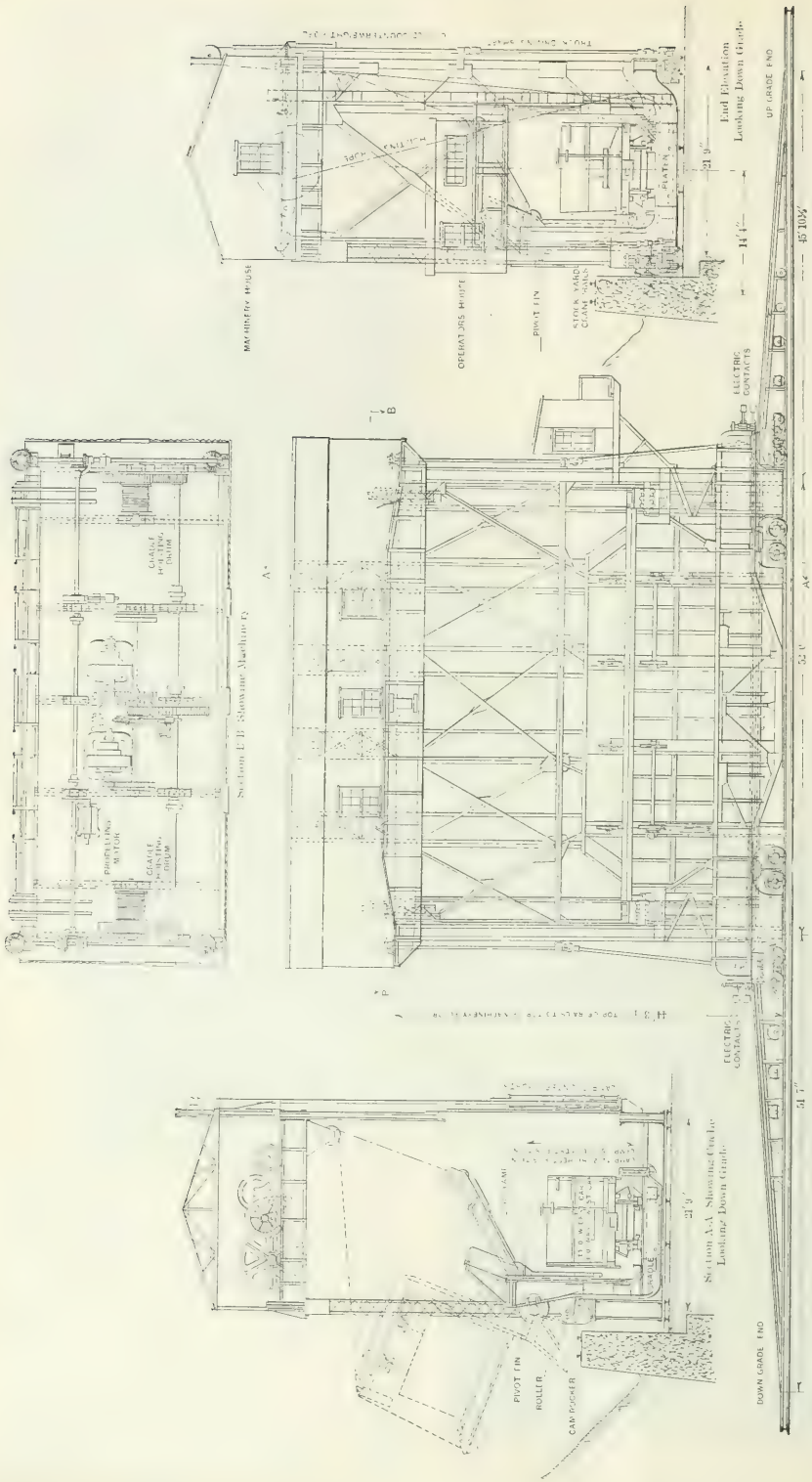


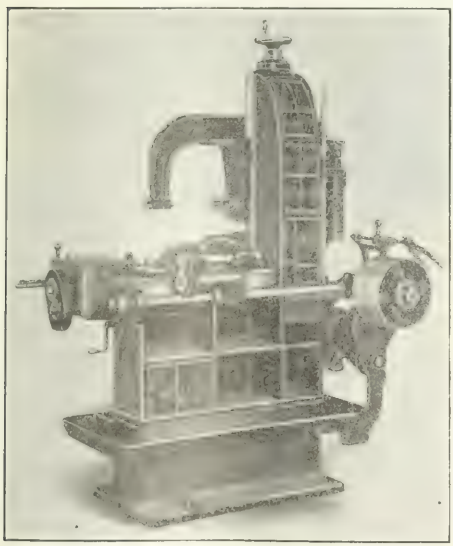
Fig. 1. Horizontal and Vertical Sections and Side and End Elevations of the Hulett Moving Car Dumper.

normal or receiving position. Ropes supporting the clamp slides pass over pulleys above them and down to a short hoisting shaft, one for each two clamps, and each hoisting shaft is in turn connected by a chain to a cam rocker pivoted on the main frame of the machine. A roller carried by a bracket on the cradle deflects this cam rocker when the cradle is down, drawing taut the chains which lead to the hoisting shafts. As the cradle begins to revolve the roller is withdrawn allowing the inner ends of the clamps to settle into contact with the top of the car by their own weight. When the cradle is revolved through an angle of roughly 60 degrees and before there is any tendency of the car to leave the rails, the clamp counterweights take effect, binding the clamps at both ends securely to the car. Each clamp rope is attached to the cradle on its vertical side below the lowest position of the clamp slide, and then passes over a sheave on the inner end of the clamp and between two sheaves on the outer end which keep the rope in position when the angular direction of the pull changes with the changing position of the cradle. As the cradle is further raised the counterweight rope is drawn tight around the sheaves of both ends of the clamp holding it firmly against the car. The clamps are held in this position until the car has been dumped and has been nearly returned to its normal position. The counterweight ropes first release the outer end of the clamps when the cradle is almost down and just before it comes to rest the rollers on the cradle arms deflect the cam rockers, and the clamp hoisting mechanism draws the inner ends of the clamps to their upper position. The car is then free to be drawn out and another one introduced.

The current supply to the machine is taken from conductor rails mounted one above the other on the concrete retaining wall separating the car dumper tracks from the stock pile. Duplicate sets of shoes carried at the two ends of the dumper make contact with these rails.

The Eberhardt Bros. No. 2-A Gear Cutter.

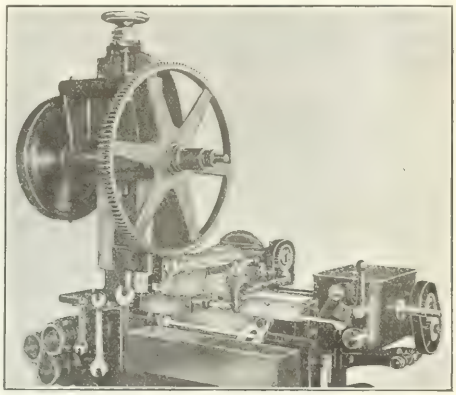
The illustrations herewith show the latest machine which the Eberhardt Brothers Machine Company, Newark, N. J., has placed on the market. It is designed to



Rear View of the No. 2-A Spur Gear Cutter Built by the Eberhardt Brothers Machine Company, Newark, N. J.

cut spur gears only, and is the smallest of the company's line of machines. Primarily it is intended for light and medium work, such as the cutting of change gears used on machine tools, its capacity including up to 8 diametral pitch in steel and 6 in cast iron. In the builder's shop one of these machines is kept running almost continuously on change gears of from 20 to 6 diametral pitch. As the first cost of the machine is moderate, and its operation is entirely automatic, it is considered an economical manufacturing tool.

On most work the overhanging arm is used to support the outer end of the work arbor. On gears over 17 in. in diameter, the arm is not used, and is easily removed. One of the engravings shows a 24-in. diameter gear being cut. The strain of the cut is taken by the rim rest. The work arbor has a taper shank, which fits the taper



The Machine Cutting a 24-In. Gear with the Overhanging Arm Removed.

hole in the steel work spindle. A bolt is provided at the rear of the work spindle for drawing in and forcing out the arbors without hammering.

A pair of centers is furnished, to be used for the frequent jobs where the gear blank is on a lathe mandrel, or a solid pinion is to be cut. As this size machine is used for many odd jobs as well as for manufacturing, it has been a special point in the design and construction to make it easy to set up for any work. The operator can easily set up for any ordinary work within 15 min., and usually in much less time.

The rear view shows the drive very clearly, and shows the tight and loose pulley arrangement which is self-contained on the machine itself. All the movements are entirely positive. The front view is not given, because it is substantially the same as that of the No. 2-B, illustrated in *The Iron Age* June 27, 1907. The principal difference between the two machines is that the No. 2-A, as explained at the outset, cuts only spur gears, while the No. 2-B cuts both spur and bevel gears. The two are of the same size, but the No. 2-B has the swivel slide and an extra slide for setting in and out for different lengths of hubs. It has been found that by omitting the bevel features and giving a longer cutting face that the machine was in demand, where otherwise the bevel gear machine would be too expensive. There are many shops which do not require the bevel slides, and the new machine is offered for such shops.

At the annual meeting of the Standard Roller Bearing Company, Philadelphia, March 25, new officers and several new directors were elected, in view of the transfer of control from Philadelphia to New York interests. The officers are the following: Samuel S. Eveland, president; W. B. Osgood Field and Lenox Smith, vice-presidents; William M. Baldwin, treasurer. The new directors representing New York interests are W. B. Osgood Field, Malcomb D. Sloane, John H. Hammond, Lenox Smith, Henry de Forest Baldwin and Herbert Du Puy. The Philadelphia directors re-elected are John C. Winslow, Edward B. Smith, George H. B. Martin and Samuel S. Eveland.

It was decided to ask the wheel manufacturers to express their views on the question of mixtures and general practice and to hold another meeting of the joint committee in May to discuss the communications received in answer to this request.

Manganese Steel Gears for Electric Traveling Cranes.

Makers of electric traveling cranes, in order to reduce the cost of manufacture, frequently equip the machinery with cut tooth gears and pinions made of gray iron. The experience with such a crane in the shops of one manufacturer, at least, has been rather disastrous, the teeth in the main gear having broken several times. The last breakage of teeth resulted in putting the crane out of service for some weeks until a portion of the crane could be rebuilt and steel gears applied. But the severe service caused even the steel gears to wear rapidly, and failures became frequent, due to the worn teeth.

A material has been found, however, manufactured in this form exclusively by the Atha Steel Casting Company, Newark, N. J., which will give greater life. The shops referred to above have been equipping all their cranes with manganese steel gears and pinions, and these are wearing fully five times as long as cut tooth gears and pinions made of another grade of steel. This means a great saving in locomotive and car shops equipped with overhead electric traveling cranes. It also applies to steel mills, foundries and factories using heavy machinery of any kind where gears are used. Not only have the manganese steel gears and pinions been found economical for this class of service, but they have demonstrated great economy in electric railroad service as motor gears and pinions.

The Becker-Brainard Horizontal Milling Attachment.

The scope of application of the vertical milling machine built by the Becker-Brainard Milling Machine Company, Hyde Park, Mass., has been increased by the horizontal attachment which the company has recently brought out. With it the machine is capable of cutting worms and worm gears, spirals, hobs and racks, as well as general work, such as would ordinarily be done on a horizontal machine. The attachment is fastened by bolts in T-slots to the lower end of the sliding head, concentric with the spindle, as shown in Fig. 1.

From the detail of the attachment given in Fig. 2, it will be seen to consist of two principal parts, the upper of which is stationary, while the lower may be revolved in a horizontal plane; graduations at *f* provide for accurate adjustment of the horizontal spindle to any angle. This spindle is supported at both ends, and carries a bevel gear, *a*, which is driven by a gear, *b*, mounted on a tapered stem inserted in the vertical spindle. End play of the horizontal spindle is taken up at one end by a nut and check nut, while at the other end there is provision for securing a cutter, *c*, either by a key and clamping nut, or by a taper shank arbor inserted in end. A cutter, *d*, for general use, but more particularly for cutting spirals, may be inserted at the intersection of the center lines of the two spindles, as shown. It is held between two nuts, one of which, *e*, is graduated so that adjustment having been made for any thickness of cutter, it may be duplicated for the same cutter.

The No. 6 vertical miller shown in Fig. 1 illustrates the practical application of a horizontal attachment of slightly different construction but of the same principle. It is cutting the axial buckets in a Sturtevant steam tur-

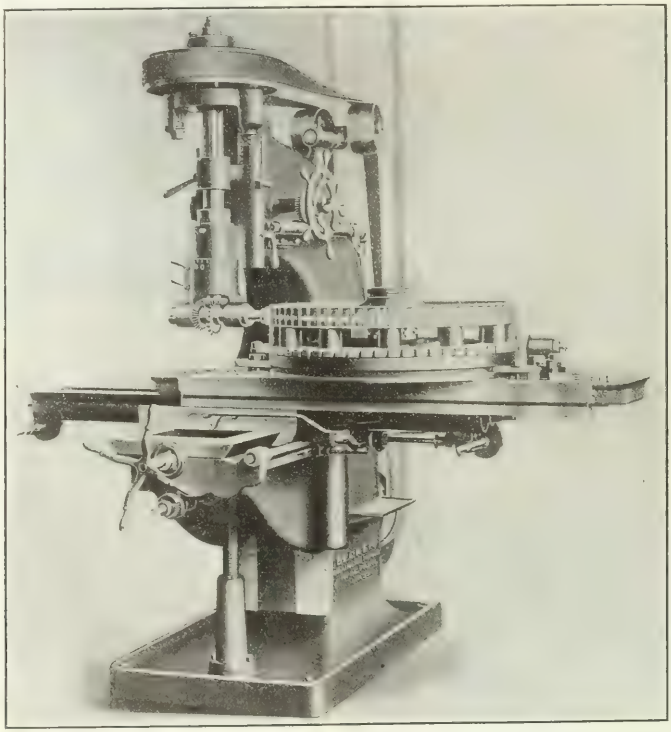


Fig. 1.—The No. 6 Vertical Milling Machine Built by the Becker-Brainard Milling Machine Company, Hyde Park, Mass., Equipped with the New Horizontal Milling Attachment.

bine disk,* which is mounted upon and clamped to a circular slotted edge jig plate that revolves freely about a pin projecting from a circular base plate clamped to the platen. The diameter of the pin is the same as that of the turbine shaft, while the slots in the jig plate correspond in number and spacing to the buckets to be milled in the disk. A spring pawl or pin holds the ring in place,

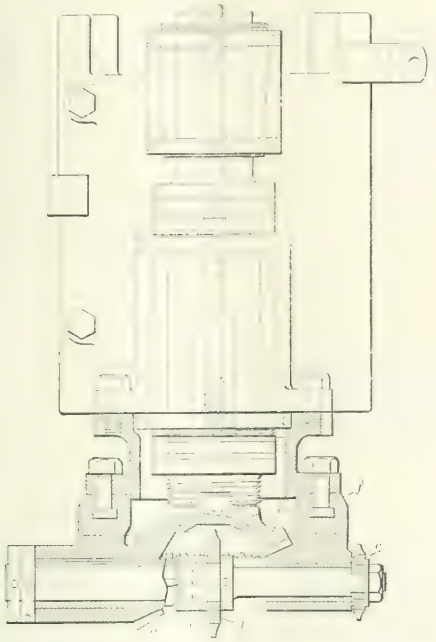


Fig. 2.—Detail of the Becker-Brainard Horizontal Milling Attachment.

while each bucket is being milled. Ample room for the work is provided because of the great distance between the neck of the machine and the center of the vertical spindle, in which particular this type of machine has an advantage on many kinds of horizontal milling.

The Zimmerman Steel Company.—This company, successor to the Monarch Grubber Company, Lone Tree, Iowa, has recently added to its works a complete steel making plant, with a capacity of about 3 tons to a heat for making crucible steel castings. This is said to be the only steel plant of the kind in the State of Iowa, and its product is largely used in the manufacture of parts for the Monarch grubbing machine, scales, feed grinders, &c., made by the company. It is the intention of the company to make a regular line of farm scales out of all crucible steel, except the frame, which will be of rolled material. Starting with a purely local demand, the Monarch grubbing machines are now being shipped not only to every part of this country, but to foreign countries as well. The company is represented by branches in the leading cities of the United States and in Mexico, Porto Rico, Chile, Austria, Columbia and Argentina. The company is officered, and its business managed by Mr. Zimmerman and his five sons.

The N. C. Davison Company, representing the Riverside Engine Company, Oil City, Pa., has moved its offices from the Empire Building, Pittsburgh, to larger quarters in Rooms 1710-1711 Keenan Building.

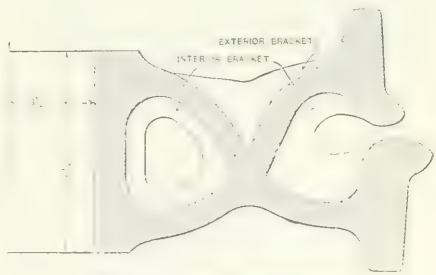
* In connection with this illustration it may be interesting to refer to Fig. 2 of the article, "The Starboard Steam Turbine," in *The Iron Age*, October 31, 1907, which shows a vertical Becker-Brainard milling machine cutting buckets in the side of a different type of turbine wheel.

A Double Tread Car Wheel.

A new type of chilled car wheel has been invented by P. H. Griffin, Buffalo, N. Y., in which a second or inner chilled tread is provided upon which brake applications are made, thus relieving the outer tread of the severe wear and damage due to excessive friction and heating from brake service. The new tread is slightly smaller than the present one and is connected with the body of the wheel in exactly the same manner as the outer tread. The line section and curvatures of the inner tread being the same as those of the outer tread no new conditions arise relative to efficiency or the result of brake applications. The inventor argues that by removing the friction of the brakes from the load bearing tread the life of the latter will be much increased, and relief will be obtained from the defects caused by the severe heating of the part of the wheel upon which safety depends. It is stated that the new wheels can be used for centers for steel tired wheels in passenger service with equally good results. While the standard section of 33-in. chilled wheel weighing 700 lb., as now used by the railroads, seems to have sufficient strength in the body, even for service under 50-ton cars, there has been an increasing number of failures of wheels in heavy service because of troubles with tread and flange. These arise largely from severe braking friction.

It is stated that foundry practice in the manufacture of the double tread wheel would not be much more difficult than with the present single tread wheel, the division between the treads being made with a pan core in the way employed for the division of the double plates for the ordinary type of wheel. In the case of a 700-lb. standard wheel it is estimated that the inner tread would add about 200 lb. to the weight of the wheel. While this means additional cost it also means increased scrap value. The accompanying illustration shows a flange on the inner tread to keep the brake shoe from touching the other flange, but the wheel may be made without the second flange.

The Griffin Double Tread Car Wheel Company, Buffalo, N. Y., has been incorporated with a capital of $200,000 to introduce the manufacture and use of the double tread wheel. The company will have its general



The Griffin Double Tread Car Wheel.

office in Buffalo, but does not contemplate the manufacture of the double tread wheel. For the present the company will confine its operations to making arrangements with railroads and chilled car wheel makers by which this wheel can be readily obtained. It requires from 15,000 to 20,000 new wheels a day to maintain repairs in the United States alone, and since by the advent of the 50-ton car, wheel failures have been increased greatly, the new company considers that it has a large field for operation. The officers of the company are the following: Henry F. Griffin, president; C. W. Cuthell, treasurer, and W. A. Griffin, secretary.

The Upson Nut Company, Cleveland, will greatly improve its River blast furnace property by the erection of a 900-ft. reinforced concrete dock along the river front. The contract has been awarded to the Great Lakes Dredge & Dock Company.

The Taylor & Fenn Screw Slotter.

The Taylor & Fenn Company, Hartford, Conn., has added to its line of machinery a new screw slotter, designed to slot screws automatically up to ⅜ in. diameter at the rate of from 16 to 28 per min., according to their size. Its builder has departed from the common practice of slotting toward the center of the turret. Instead, the cutter travels in a plane tangent to the turret circumference, so that slight inexactness of indexing cannot affect the central location of the slot. This method also gives a slot the bottom of which is concave.

The camshaft and the hopper mechanism, producing all feeding movements, are driven from a pulley that is not keyed to the shaft, but is held between two friction disks, one at each end of the hub, which are adjusted so that the machine will perform its work except under abnormal conditions, such as the clogging of blanks, in which case the pulley would slip before the mechanism could be damaged. On the driving shaft is a wide faced pinion from which power is transmitted to the camshaft through a train of gears, and also to the hopper shaft. The cutter is driven by a separate belt.

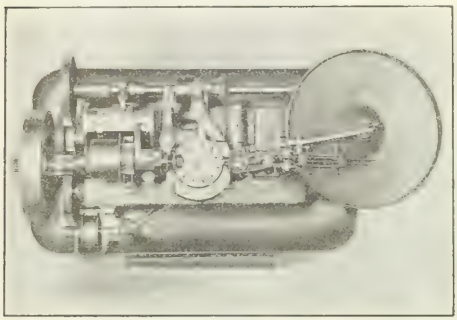


Fig. 1.—Top View.

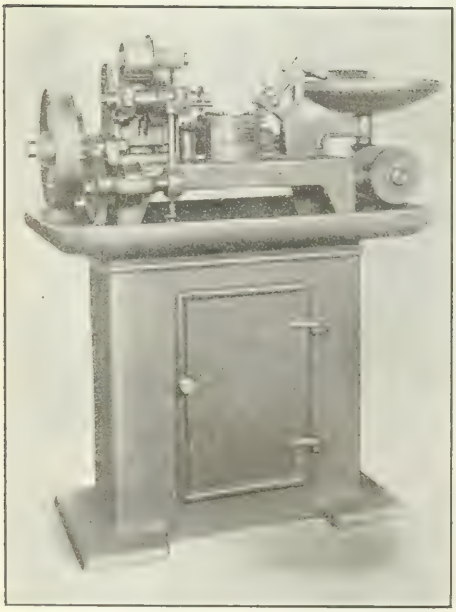


Fig. 2.—Front View.

The New Screw Slotter Built by the Taylor & Fenn Company, Hartford, Conn.

The blanks are delivered from the magazine to the turret, one at a time, this being assured by the action of the escapement mechanism, operated through the lever *a* by a cam on the camshaft, as shown in the line drawing, Fig. 3. This lever has adjustment for different sizes of blank through the screw *b*. When the turret indexes the escapement opens, permitting the delivery of one blank only.

The turret has six cylindrical holders, one of which is seen at *c*. Each contains grooves for various sizes of blanks, and is fixed solid in the turret by a screw. To adjust the machine for a different size blank it is only necessary to loosen the screw of each holder and rotate it until the desired groove is in position. After the blank has been delivered from the escapement the same cam motion brings the stiff spring *d* against it, holding it in place in the groove until it enters the slot formed between the turret and the guide piece *e*. The guide piece is adjustable to give the widths of slot required for different sizes of screw.

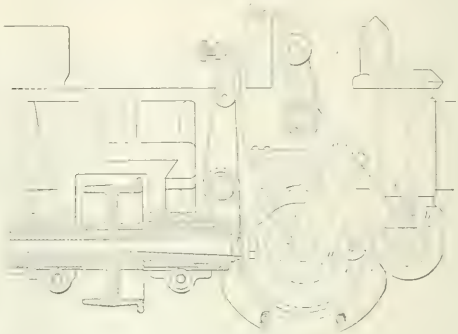


Fig. 3.—Detail Plan of the Turret and the Feeding Mechanism.

At the instant that the blank leaves the slot, after being indexed to the cutting position, a clamping lever *f*, actuated by a cam on the camshaft, comes against it, holding it solidly against the body of the turret until the slotting operation is completed.

After the screw blank has been clamped in position for slotting the cutter slide cam comes into action, and the cutter arbor is moved downward. This cutter slide cam is so shaped that the cutter is moved down to the work very quickly and then takes up the proper feed for cutting to the predetermined depth, a slot the bottom of which is concave, conforming to the curvature of the cutter. When the cut is completed the cutter is instantly withdrawn, the slide being lifted by springs at the moment that the feed cam has rotated to release the pressure on the lever. Fine adjustments for depth of slot are obtained by a shoe operated by a screw, which raises or lowers the end of the slide lever. All the cam levers in the machine have this means of adjustment. The cutter may be located central with the blank by a fine longitudinal adjustment of the arbor. The different speeds required for the various sizes of work are derived through change gears.

The mechanism for indexing the turret contains a number of interesting features. The power is transmitted through a series of bevel gears from the camshaft, the central line of which is at *g*. The pinion *h* meshes a gear on shaft *j*, on which is the arm cam *k*. On the under side of the turret and integral with it are the gear shaped cam *l* and the index plate *m*. The notches in the index plate and the teeth in the gear-shaped cam correspond in number with the cylinder holders of the turret. The arm cam *k* has two functions. As it rotates, approaching the gear-shaped cam, it engages the shoulder *n* on the locking pawl *o*, which pivots on the stud *g*. This action withdraws the pawl from the notch of the index plate, and holds it until it rests inoperative against a neutral space of the plate. The drawing shows the mechanism in this position. The arm cam *k*, continuing to rotate then engages a tooth of the gear-shaped cam.

moving it through the index distance. This accomplished, the locking pawl enters the next notch under spring pressure.

The hopper is of the standard type for this class of work, differing only in that the guides are adjustable for different sizes of screws, and the guides and magazine are hinged to make the latter longer than is usual. All working parts are protected from fine chips, and from the entrance of loose blanks.

Class Freight Rates to Be Advanced.

BY E. L. ARDREY

The railroads east of Chicago, in the territory of the Trunk Line Association and the Central Freight Association, have practically decided upon the advance that will be made in their class rates. Strenuous efforts will be made to have the new tariffs ready so that they can become effective July 1, although it may not be found possible to complete the task so soon. The basis of the new rates in this territory will be advances in class rates, between New York and Chicago, of 10 cents first class and 9, 7, 5, 3 and 2 cents on the lower classes.

The New Class Rates.

The new rates between New York and Chicago, both east and west bound, will compare with existing rates as follows:

	Cents per 100 lb.	
	Present rates.	New rates.
First class	75	85
Second class	65	74
Third class	50	57
Fourth class	35	40
Fifth class	30	32
Sixth class	25	27

All class rates in the territory east of Chicago and St. Louis and north of the Ohio River, both east and west bound, are based upon the New York-Chicago rates. The change in the base rates therefore changes all class rates. The map of this territory, from New England to the Mississippi, is divided into groups or districts, and each group of stations and towns takes a percentage of the New York-Chicago rate. The rate clerks who compile the new books of class rates have merely a routine task in calculating the percentages of the new basing rates.

Commodity Rates.

Pig Iron, billets, muck bar, scrap and about a dozen other crude forms of iron and steel are carried in this territory at commodity rates, so that they will not be affected by this change in class rates, but hardware and more than 200 articles of iron and steel which appear in the iron and steel list in the Official Classification will be affected by the increase. The articles in this list which are used by manufacturers as raw materials usually take the fourth-class rate in carloads, and fifth-class in less than carloads, but the lighter or more valuable forms of iron and steel are placed in the higher classes.

The story has been current among traffic men in the iron trade that the railroads would not include in this advance any important articles on which the rates have been advanced within the past year or two. It was understood that an exception would be made of such articles by putting them in a comprehensive commodity tariff which would maintain the rates now in effect. Well informed railroad men, however, say that this report is not well founded, as it would be impracticable for them to make any wholesale exception of iron and steel articles in the proposed advance.

Nature of the Advances from 1899 to 1907.

Less than a year ago, effective June 1, 1907, some 170 important articles of iron and steel were advanced half a class in the Official Classification. There was a similar advance of half a class in 1899, when the Official Classification raised these articles a full class, but afterward authorized a reduction which was maintained by the railroads in the form of an "exception tariff" until last year, when the roads withdrew or canceled the exception sheet and made these articles subject to the regular ratings of the classification; that is, subject to the original increase of a full class, which had been provided for in 1899. All of these articles, from 1899 to 1907, were carried at rates 10 per cent. above sixth class, carloads, but were raised to fifth class. In less than carloads they had been carried at 10 per cent. above fifth class, but were raised to fourth class.

In addition to this advance of a full class in the rates, in 1899 and 1907, there was also a general increase in the minimum weights of iron and steel articles required in a carload, effective in the Official Classification of August 1, 1907. Articles which had been subject to the minimum of 24,000 lb. were generally raised to 30,000, and those which had been rated at 30,000 were increased to 36,000. On many products like agricultural implements the minimum was arranged on a sliding scale, the specified minimum being for a car not longer than 36 ft. 6 in., but running up to 60,000 lb. for the largest cars. This change in minimum weights did not affect the rate, and proved no hardship to those who buy in large quantities, but many dealers, jobbers and small industries found it embarrassing.

No General Revision of Class Rates for 20 Years.

The class rates which it is now proposed to increase have not been changed for 20 years, since the original Interstate Commerce law forced a general re-alignment of class rates to conform with the long and short haul clause. Railroad men connected with the movement insist that an advance is absolutely necessary to cover the increase in operating expenses in recent years, and to enable them to make provision for the future growth of traffic. Wages have advanced for all classes of labor employed in building and operating the roads, and it has been found impossible to make any general readjustment in the period of depression which the country has passed through. Coal and all the supplies used cost more than in former years, taxes have been growing by leaps and bounds, and terminal expenses absorb more and more of the revenue. There is a general need among railroads for better terminal facilities, but real estate values in all the cities where more tracks are needed have arisen to figurs out of all proportion to the improvements that have been made on the property. It has also become a necessity, involving the outlay of enormous sums, to elevate railroad tracks wherever they pass through a city of any size.

Along with this increase in operating expenses and cost of construction has come a corresponding increase in the cost of money. A few years ago many bond issues were floated by railroads at 3½ per cent., but now the best roads, to obtain capital, must commit their credit for a long period of years, at rates running all the way from 4 to 5 per cent. Roads which represent a large share of the total mileage of the country have actually exhausted their credit, on the basis of their present earnings. For several years practically all the important systems have resorted to the expedient of borrowing on two and three year notes, hoping that before maturity they would be able to refund with low rate bonds, but they have been disappointed in this respect, and have accepted the necessity of paying higher rates on their funded debts.

The Situation as to Commodity Rates.

As stated recently in *The Iron Age* the traffic managers of the railroads have not been in sympathy with this advance, and generally disapprove of any increase in a time of business depression. Few of them have been consulted, or even informed of the advance, which has been made under orders from the financial management. It is understood that this revision of class rates will be followed by a general overhauling of the commodity tariffs, which cover the heavy materials used by industries, but the work of revision has not proceeded far enough to disclose the extent of the advance.

While class rates, as stated, have not been changed in 20 years, there has been a general advance in the past 10 years in the charges on commodities. The greater part of this general advance was accomplished by the withdrawal of discounts and readjustments, which were generally allowed to industries prior to the passage of the Elkins law; but there has also been an almost con-

tinuous advance in the printed rates, which in some cases are 100 per cent. higher than the charges actually paid 10 to 20 years ago. Many consumers are paying 50 per cent. higher charges on pig iron, and rates on other important commodities have been raised, altogether, 25 to 50 per cent. above the basis that prevailed 10 to 15 years ago.

Railroads Will Be Purchasers of Supplies.

It is understood that the announcement of the new rates will be followed or accompanied by a renewal of activity in the purchasing departments of the roads. In the past six months purchases have been limited to imperative necessities. Car and locomotive repairing and track work have been practically suspended, until the roads have an accumulation of more than 200,000 "bad order" cars awaiting shop repairs, besides an equally large or larger number awaiting repairs which can be made on track.

There are prospects for large crops this fall, and this accumulation of repair work must be taken care of, as well as track work for the heavy traffic of the fall and winter months. Many careful observers believe that the general business of the country will return to practically a normal basis whenever the railroads resume buying, repair and construction work. It will undoubtedly modify the opposition of business men to the proposed advance in rates, if it is accompanied or immediately followed by a revival of trade.

The Richmond Foundry & Mfg. Company.

The Richmond Foundry & Mfg. Company, Richmond, Va., was organized in April, 1902. Its business soon grew to such proportions that it was necessary to secure larger quarters. A tract of 10 acres was purchased on the northern side of the city, adjacent to the Seaboard Air Line Railway and the Richmond, Fredericksburg & Potomac Railroad. On this land an extensive plant has been erected. The work of construction commenced in the spring of 1906, and the plant was completed and equipped early in 1907.

The buildings comprise a foundry, blower house, pattern vault, mill room, grinding room, casting storage house, machine shops, warehouse, shipping room, &c. These building are so arranged that the progress of work through the plant is continuous and in one direction; the raw material entering at one end of the plant and the finished product leaving at the other. Private spur tracks run from the railroad to the material yard and to the shipping department.

The foundry, which is 80 x 320 ft., is constructed of steel with a brick curtain wall. The main windows rise to the eaves line and form a continuous line of glass on all sides of the building. These windows, with the monitor lights, flood the building with an abundance of daylight. The charging platform and the roof over the platform and adjacent to the cupolas are constructed of reinforced concrete. In the case of the platform this concrete is supported by heavy I-beams. An industrial track runs from the material yard to an elevator and on the platform. The iron and coke are carried on cars directly to the cupolas. The cupolas are blown by means of a Root blower driven by a variable speed Westinghouse motor. The foundry will accommodate 80 molders, who are engaged principally on bench work and light floor work. A double overhead trolley track runs down the center of the building, and a single track continues on through the plant to the shipping department.

In connection with the foundry there is a roomy fireproof pattern vault, having heavy brick walls and a reinforced concrete roof, and provided with a heavy double door of steel running in vertical guides. The mill room is 80 ft. square, with a capacity of 35 mills, leaving abundant space for handling castings and cleaning such work as cannot be cleaned in the mills. The grinding and inspecting department and the pattern storage room are each 40 x 80 ft. The former is fitted with heavy and light grinders and sorting tables, and the latter with bins and racks for castings.

The machine shops are 80 x 160 ft. The warehouse is a three-story building, having about 29,000 sq. ft. of floor space. This building is of very heavy construction; the upper floors being so designed that they can at any time be used for extra machine shop space.

Standing within the angle formed by the foundry and other buildings is a brick building, 50 x 65 ft., surmounted by a brick tower upon which is placed a water tank. In this building are the pump room and the lavatories for the company's employees. Each man is provided with a Merritt steel locker. A plentiful supply of shower baths, porcelain washbasins, closets and other toilet necessaries, besides both hot and cold water is furnished. The labor employed by the company is of a high class, and the provision made in every direction for the comfort and cleanliness of the men is greatly appreciated.

The principal work of the company is the making of fine gray iron castings for manufacturers, light and medium machinery castings and stove plate. It also makes a specialty of computing and other scales. The company also conducts a line of special machine work to order. The officers of the company are as follows: Arthur Scrivenor, president and general manager; R. G. Rennolds, vice-president, and J. Stuart Reynolds, secretary and treasurer.

The Iron and Steel Institute.

The annual meeting of the Iron and Stel Institute will be held at the Institution of Civil Engineers, Westminster, London, May 14 and 15. Among papers to be read are the following:

"Cast Iron in the Construction of Chemical Plant," by F. J. R. Carulla.

"An Experimental Electric Furnace for the Smelting of Iron," by Prof. B. Igewsky.

"The Pyrometric Installation of the Ordnance Factories at Woolwich," by J. Wesley Lambert.

"Improvements in Plate Rolling Mills," by A. Lamberton.

"The Application of Color Photography to Metallography," by E. F. Law.

"The Department of Metallurgical Chemistry in the National Physical Laboratory," by W. Rosenhain.

"The Utilization of Blast Furnace Slag for Portland Cement," by C. von Schwarz.

"A New Fatigue Test for Iron and Steel," by T. E. Stanton.

"The Physical Qualities of Steel in Relation to Its Mechanical Treatment," by James E. York, New York.

The Canadian Mining Institute is arranging for an excursion in September this year to the mineral areas of eastern Canada, including the silver cobalt ore region, the nickel mines and the iron ore mines of Ontario, the asbestos and chromite region of the Province of Quebec and possibly the coal and iron districts of Nova Scotia. The members of the Iron and Steel Institute have been invited to take part in this excursion.

The Acheson Graphite Works.—The International Acheson Graphite Company, Niagara Falls, N. Y., is about to make extensive additions to its works. The total cost will be about $100,000. The improvement will consist of a new furnace room, a new grinding and storage building and a new switchboard house. The furnace room will be a one-story building, 100 x 120 ft., the frame to be of steel and the walls of brick. It will afford room for 12 furnaces, which will about double the capacity of the plant. The new grinding and storage building will be 50 x 100 ft., three stories. The frame will be of steel and the walls of brick. This structure will absorb the present grinding room. A portion of this building will be used for storing graphite and stock goods generally, particularly electrodes. The switchboard house will be 20 x 36 ft. This building will contain all receiving and distributing panels, and the present switchboards will be transferred to it on completion. Last year the company erected a fine steel and brick building 55 x 112 ft., and this is now well occupied. On the first floor electrodes are received and shipped, while the second floor is applied to grinding and storing graphite for lubricating purposes. The third and fourth floors are used as a factory for Oildag, the name given by Mr. Acheson to his new lubricant, consisting of deflocculated graphite that remains suspended in oil.

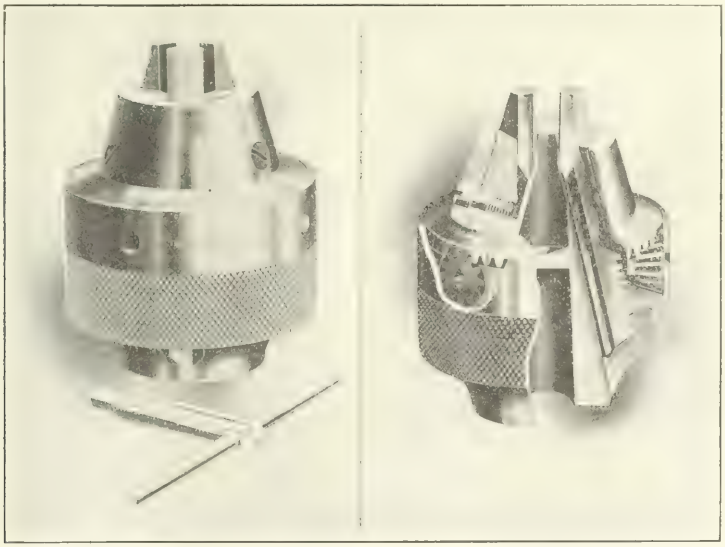
The Skinner New Geared Pattern Drill Chuck.

The illustrations herewith show an improved form of the Skinner New Model drill chuck, made by the Skinner Chuck Company, New Britain, Conn., and designated as the "geared pattern." The new model chuck was operated by hand, and when a very strong grip was desired it was obtained by the use of a spanner wrench. This means of tightening the chuck is sometimes objectionable on a light drill where the spindle has a tendency to turn when the spanner wrench is used. In the geared pattern chuck, by rack and pinion gears, it is possible to operate the chuck by hand as before, and with a common form of key wrench the chuck may be tightened sufficiently to drive a high speed twist drill to its limit, and in tightening the chuck in this manner there is no strain, tending to revolve the spindle of the lightest machine. As this chuck is tightened the pinion travels on the rack gear, giving a very powerful grip, but the wrench is used only to make the final grip and for loosening the chuck; all adjustments for different sizes of tools are more quickly made by revolving the chuck by hand.

Attention is called to the long bearing of the jaw in the solid threaded nut, and to the form of the jaw where it travels on the inclined bottoms of slots milled in the chuck body. The jaws are supported in these milled slots and have no tendency to turn or rotate under the strain of holding the tool. The first geared pattern chucks were made up with only one pinion, but shortly the construction was changed and two pinions are now furnished in each chuck. This insures longer life of the gearing, gives two places instead of one to apply the wrench, and in case a pinion should break the chuck would still be serviceable with one pinion.

From its past experience in the manufacture of chucks the company decided to continue to make the jaws of the chuck from the same brand and make of steel that has been used for years. To further insure uniformity each chuck is hardened at exactly a uniform heat in an electric furnace, and the chucks are tested before leaving the works. Errors and inaccuracies amounting to 0.002 in. or over are sufficient to cause the chuck to be rejected, which results in a uniform quality and accuracy of the output. All gears are hardened, and the jaws and cap are hardened and ground.

This chuck can be furnished with a hole through the center the full capacity of the chuck for use on a hollow spindle machine. It is readily taken apart to clean and oil, the only tool necessary being a screwdriver. The appearance of the chuck is neat; there are no projections to injure either the work or the workman. Two sizes are now ready for delivery, and other sizes will be furnished later.



The Geared Pattern New Model Drill Chuck Made by the Skinner Chuck Company, New Britain, Conn.

The Strength of Chain Links.

Bulletin No. 18, on the above subject, by G. A. Goodenough and L. E. Moore, has just been issued by the Engineering Experiment Station of the University of Illinois. A series of experiments on chain links and circular rings, covering a period of two years, has been made for the purpose of confirming or disproving a theoretical analysis of the stresses in links and rings. A comparison of calculated and measured distortions affords the desired test. The result of the experiments is a complete confirmation of the analysis. Having a reliable theory, the bending moments and maximum stresses are calculated for links of various forms, and the results of such calculations are applied to the formulas for the loading of chains given by Unwin, Bach and Weisbach. It is shown that the usual formulas for chain loads give maximum tensile stresses of 33,000 to 40,000 lb. per square inch, and maximum compressive stresses of 60,000 lb. per square inch. New formulas for safe loads are proposed. The bulletin is concluded with four appendices giving in full the theoretical discussion, which is the basis of the experimental work.

This bulletin will be of special interest to all engineers and manufacturers who are concerned in any way with hoisting and transmission. Copies may be obtained upon application to the director, L. P. Breckenridge, Engineering Experiment Station, Urbana, Ill.

Announcement is made of the eleventh annual meeting of the American Society for Testing Materials, which will be held at the Hotel Traymore, Atlantic City, N. J., Tuesday to Saturday, inclusive, June 23-27. By lengthening the time from three days, as heretofore, to five days the necessity of holding sessions of different sections concurrently will be avoided, and provision can be made for periods of recreation and special social features. The membership of the society has increased since the last annual meeting from 925 to 1005.

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Large and Small Interests in the Iron Trade.

A new edition of the Directory of the Iron and Steel Works of the United States, such as has just come from the press, gives one a fresh sense of the commanding character of American iron and steel industries, measured alongside those shown in the lists of other countries. The great aggregations of capital represented in our iron and steel works and their foundations of mineral wealth become more imposing when catalogued in a single volume. But the Directory does not give evidence that centralization of control of the iron industry has gone on in any marked way since the last Directory was issued, in 1904. It is true that the opportunity to embark upon iron and steel manufacture has been narrowing through the taking up of the desirable and accessible iron ore supplies of the country. It is also true that the large consolidations have made most of the important additions to iron and steel works capacity since 1904. But it is noticeable that the smaller independent interests have not been eliminated in recent years, and a number of them have extended their operations in the period between the Directories of 1904 and of late 1907.

In the last issue of *The Iron Age* a summary was given of the various classes of iron and steel works in the United States as shown by the new volume, and a comparison was made with the Directory figures of 1904. The total number of rolling mills and steel works in 1904 was 572; in November, 1907, it was 598, an increase of 26. At first sight this increase might suggest that the number of smaller interests is greater to-day than four years ago. An analysis of the figures shows that the number of rolling mills has actually decreased, and that the increase is under the "steel works" head, being entirely due, moreover, to the building of small steel casting plants, since there has been no increase in the number of steel works with which rolling mills are connected. This will appear from the following table:

Steel Works in the United States in November, 1907, and June, 1904.

	Steel works (including foundries).		Steel foundries.	
	1907.	1904.	1907.	1904.
Open hearth	159	135	101	84
Standard Bessemer	30	32	43	20
Special Bessemer	40	19		
Crucible and miscellaneous	79	57	55	30
Totals	308	243	199	134

The table shows that the number of steel foundries increased by 65 in the interval of nearly three and a half years between the two Directories. This is also the exact difference between the first two columns in the above table, indicating that the building of new steel plants for the production of rolled material must have been exactly balanced by the dismantling of plants of this character.

Referring again to the totals of "rolling mills and steel works" in 1907 and 1904—namely, 598 and 572—it appears that if the number of steel works increased by 65 there must have been a net loss of 39 in the number of rolling mills. A reference to the list of abandoned works shows that the mortality has indeed been great. This has not been due as much as might be supposed to the disappearance of the small manufacturer. Many of the abandoned plants belonged to large companies. For example, the Republic Iron & Steel Company abandoned 15 rolling mills, the American Sheet & Tin Plate Company abandoned five plants, and the American Steel & Wire Company, Carnegie Steel Company and Crucible Steel Company of America, two each. In these cases the process was simply one of readjustment through the elimination of works whose operation was uneconomical, or that would require an unwarranted outlay for rehabilitation and modernizing.

It is known that the important additions made to the plants of the large producers in recent years have made the output of the smaller manufacturers who buy their steel in the market a relatively smaller factor than formerly. It would be interesting to know, however, whether these smaller interests have even maintained their actual output in the face of high prices for semi-finished steel and moderate prices for the finished product. In the sheet and tin plate trades the hardships under which the smaller manufacturers have worked in the past few years have frequently been a matter of comment. In the wire trade independent manufacturers began several years ago to provide their own steel supply by building open hearth works. This was done to some extent in the sheet and tin plate trades, but there is still such a dependence upon large steel producers for supplies of sheet bars as to constitute a problem under the present alignment of prices. In the bar trade the price of billets and the efficient continuous mills of the large producers have made steel bars rolled from purchased billets a negligible factor.

While the capacity ratings given in the Directory have a value in permitting of comparison with those in previous issues they differ quite widely in many cases from the actual output of the plants mentioned. It would be interesting to know from year to year what proportion of the output of finished iron and steel in the United States is furnished by the large interests which have their own fuel and ores. Last year the United States Steel Corporation marketed 758,699 tons of blooms, billets, slabs and sheet and tin plate bars. Deducting this amount from its total of rolled products leaves 9,618,043 tons of finished iron and steel which it put on the market. Only one of the large independent companies gives similar statistics, but it is well known that all sell a certain tonnage of semifinished steel, which is worked up in the mills of small producers. While no basis exists for an exact calculation it would be fair to say that the steel products marketed in finished form by the Lackawanna, Cambria, Jones & Laughlin, Pennsylvania and Maryland, Republic, Colorado and Bethlehem companies last year were something more than half the total for the United States Steel Corporation.

In 1906 the total output of rolled iron and steel in the United States was 19,588,468 gross tons. Last year's total was not far from this amount. It would appear, therefore, if we allow 14,500,000 to 15,000,000 tons for the finished output of the Steel Corporation and the other large companies, that the total produced by the various

steel companies not named above, and by smaller rolling mills buying their scrap or their steel billets in the open market was nearly 5,000,000 tons, or about 25 per cent.

Most significant of all the comparisons made between the Directories of 1904 and 1907 is that which refers to open hearth steel capacity, the increase being from 11,335,100 tons in June, 1904, to 18,824,900 tons in November, 1907, or nearly 70 per cent. The Bessemer capacity, by contrast, increased only about 10 per cent., or from 13,628,600 tons to 15,020,200 tons. Noteworthy figures apart from the above are those which show declines. For example, the annual capacity of charcoal blast furnaces decreased from 851,600 tons to 757,800 tons, and that of furnaces using anthracite or anthracite and coke, from 3,019,900 tons to 2,315,400 tons. The number of puddling furnaces declined from 3161 to 2635, and of heating furnaces from 3995 to 3971.

Perhaps the strongest impression carried away from a close examination of the new Directory is that with all the remarkable expansion of the leading iron and steel interests of the country there is still a very vigorous and enterprising collection of smaller units whose hold upon the trade must not be underestimated.

Steel Prices and the Ore Supply.

A lack of information seems to exist relative to conditions in the steel trade following the panic of 1893. Quite a number of writers who treat the present condition of business as one which involves the application of pure economic laws are endeavoring to draw parallels between the situation in the steel trade at that time and conditions which are found at present. It is inferred that as prices on all kinds of steel products were exceedingly low in the depressed period following the panic of 1893 a similar course of prices should be witnessed at this time. The assumption is made that prices in that former period were reduced perforce by steel manufacturers for the purpose of stimulating business. The following quotation from a financial article in the New York *Evening Post* of April 25 is a sample of the general line of reasoning:

> Improved access to foreign markets, and solidarity of industry through consolidations, have undoubtedly created a very different situation from that of 1893. The test of their actual value lies immediately before us. The great revival of home and foreign trade, in 1897 and 1898, came not only through great economies in production, but through fixing of prices low enough to undersell the outside world and enlarge consumption. That process was begun in the steel trade, which is just now persisting in an exactly opposite policy.

The writer of the above extract, who is here taken as the representative of a class of writers on trade conditions, is evidently not aware that the steel trade in the depression of the '90's was operating on a revolutionary basis of values. The manufacturers of steel were then enabled to appreciate fully the opening up of the vast deposits of iron ore on the Mesaba Range in northern Minnesota. These deposits, comprising high grade steel-making ores, were being worked by steam shovels, the operations being conducted by quite a number of strongly competitive companies, all striving to secure the largest share of a limited demand. The ore was delivered to Lower Lake ports at such low prices that steel making irons were produced from these ores at lower cost than had ever been known. In consequence of the cheapness of the raw material, prices of steel products sagged all along the line. It was this fact which enabled the steel makers of this country to undersell their competitors in all parts of the world, even in localities where steel had previously been produced cheapest. It was this fact, therefore, which caused our exports of all highly finished iron and steel products to increase to such an unprecedented extent at that time.

It will be seen that conditions at that time were very different from those now prevailing. Since then our consumption of iron ore has increased enormously, owing to the very great expansion of our iron and steel industries, and we are exhausting our ore supplies at a rate far in excess of anything deemed likely ten years ago. No new discoveries of iron ore of importance have recently been made in this country, and certainly nothing approaching the great discovery of the Mesaba deposits in the early '90's. We have therefore nothing of this sort to warrant a correspondingly heavy reduction in the price of steel products.

The Combustion Engine and Shop Heating.

The heating of a shop driven by gas engines or electric motors requires an auxiliary heating system. Instead of depending upon exhaust steam, or steam directly from the power boiler when the engine is shut down, boilers must be provided for heating alone, of adequate capacity to comfortably warm all rooms and in some cases furnish heat for manufacturing processes. It is the same condition that existed where mills were operated by water power before auxiliary steam power plants were considered necessary as reserves. In the meantime the science of steam heating has advanced and far more economical systems have been evolved.

Some believe that the exhaust gases of combustion engines will be utilized for heating purposes. One practical engineer proposes passing the exhaust from the engine through coils in a water chamber, and thus generate the steam for heating. An objection to this is that the coils would be likely to clog, especially when there is, as frequently, imperfect combustion in the engine. But greater difficulties than this have been overcome. It is fair to presume that with further development of the newer types of engine, more perfect and even combustion will be secured. For the present, however, the steam and occasionally the hot water system will be employed generally.

Heating engineers are working out improved applications of old principles to secure better results in industrial buildings of all descriptions, with special attention to economy as well as efficiency. The problem presents itself frequently in connection with ventilating systems. Mill engineers are deeply interested in the subject, but it is not given sufficient attention in some cases, where, as is quite common, the plans for new construction are made in the manufacturer's drafting room. Neglect of this sort is likely to prove costly, in inadequacy or wastefulness or both, and is most common in small shops and factories using a combustion engine or electric motors operated on purchased power. In figuring the economy of such a solution of the power question, it should be remembered that the works must be heated nearly if not quite six months of the year in most parts of the country, and unless an economical heating system can be installed, it is probable that the cheaper power may be in the end the more expensive.

The problems presented differ in individual plants, and it seldom happens that special study of the question of heating does not prove profitable. The apparatus available offers a wide selection, and the best for the purpose can generally be found. For example, the vacuum systems often possess advantages worth investigating, for

they have been used to excellent advantage in many manufacturing plants.

The builders of combustion engines have not worked out this phase of the selling end of their business to the degree that its importance deserves. It is a strong argument of the steam engine salesman, that the heating plant must be taken as a part of the engine equipment. To meet this the combustion engine advocates should study the problem of auxiliary heating in all its aspects, that they may supply prospective customers with expert assistance. Co-operation between them and the builders of low pressure heating systems and appliances might result in mutual advantage.

CORRESPONDENCE.

An English Revival of the Mitis Process.

To the Editor: I have read with interest the paper entitled "Malleable Castings by a New Process" in your issue of April 23, page 1312. [A paper before the West of Scotland Iron and Steel Institute by E. C. Ongley.] This looks like a revival of the old "Mitis Process of Producing Wrought Iron Castings," which made quite a stir in the world over 20 years ago. I have before me an elaborate and beautifully illustrated brochure having the foregoing title, compiled by W. F. Durfee, M. E., general manager U. S. Mitis Company, 26 Broadway, New York, 1886, describing the process in detail and showing photographs of perhaps 100 articles, such as horseshoes, wrenches, pulleys, chains, gears and other machine parts, together with many ornamental castings of great beauty and delicacy—viz., medals, coats-of-arms in relief, plaques, and even an Achilles shield, evidently a faithful copy from the famous original. I remember the exhibit and was particularly impressed with a casting resembling a coarse brush, the "bristles" and back all cast in one piece, and each bristle could be bent back and forth with the finger readily! The title page of the pamphlet contains the following imposing list of officers of the U. S. Mitis Company: President, Robt. H. Sayre, Bethlehem, Pa.; vice-president, Peter Ostberg, Stockholm, Sweden (inventor); treasurer, Frederic A. Potts, New York; secretary, Pedro G. Salom, Philadelphia, Pa. The directors were (in addition to the officers already named): John Fritz, Bethlehem, Pa.; John T. Morris, Philadelphia, Pa., and Henry Howard, Providence, R. I.

You are doubtless familiar with the history of this company and its long litigation in which it was eventually successful in obtaining large royalties from various steel manufacturing companies, now controlled by the United States Steel Corporation for the use of a small quantity of aluminum in their steel bath, this being the basis of the Mitis patents, which have since then expired. One of the features of the Mitis castings similar to the claims made in the article in *The Iron Age* of April 23 was that they did not require any annealing.

ALEX. E. OCTERBRIDGE, JR.

PHILADELPHIA, PA., April 25, 1908.

The Cassier Magazine Company announces the removal of its New York offices from 3 West Twenty-ninth street to 12 West Thirty-first street. The new home of *Cassier's Magazine* is in the office building just erected on the site of the former house of the American Society of Mechanical Engineers, a location especially convenient of access from the new railroad terminals and easily reached by the various systems of local transport from all parts of the city.

Mackintosh, Hemphill & Co., Pittsburgh, are furnishing a 46-in., three-high blooming mill and a 28-in., three-high finishing mill, to be installed in the new open hearth steel plant of the Pittsburgh Steel Company, Monessen, Pa. Shipments on both contracts are being made as fast as possible. It is the intention of the Pittsburgh Steel Company to put its new steel plant in operation not later than July 1.

PERSONAL.

F. K. Rhines, who since January 1 has been assistant to W. H. Foster, treasurer and general manager of the General Fireproofing Company, Youngstown, Ohio, has taken up the work in the sales department of H. B. McMaster, who recently resigned to accept a position in the wire department of the Youngstown Sheet & Tube Company.

C. J. Morgan, vice-president of the Taylor & Boggis Foundry Company, Cleveland, returned home last week from a three months' trip to the Mediterranean.

Taylor Alderdice, third vice-president of the National Tube Company; Samuel A. Benner, manager of sales of the Carnegie Steel Company, and J. B. Laughlin of the Jones & Laughlin Steel Company, have been elected directors of the South Side Trust Company, Pittsburgh.

Benjamin Talbot of Middlesbrough, the well-known inventor of the continuous open hearth process, will be the recipient of the Bessemer gold medal at the Iron and Steel Institute meeting on May 14.

Among those proposed for membership in the Iron and Steel Institute of London are Robert L. Ahles of Williamsport, Pa.; R. F. Boehler of Columbia University, New York; Norman F. Harriman of the Union Pacific Laboratory, Omaha, Neb., and Knox Taylor of the Taylor Iron & Steel Company, High Bridge, N. J.

Frederic F. Hartigan, superintendent of the work on one of the sections of the Culebra division of the Panama Canal, with headquarters at Baso Bisbo, is at the Holland House, New York. He will spend a six weeks' vacation in this country.

E. H. Darrach, secretary and treasurer of the Interstate Car Company, Brightwood, Ind., has returned from a trip to Cuba, where he has been investigating conditions and arranging for the marketing of his company's product.

Charles A. Maher, who is now and has been since its formation vice-president of the National Car Wheel Company, has associated himself with Otis, Bonnell & Co. as sales manager of the car wheel department, with offices at 408, 409, 410 Cuyahoga Building, Cleveland, Ohio. J. E. Rawson will continue as sales manager of the steel department. Wm. F. Bonnell will devote his time largely to the interests of the Securities Corporation, Ltd., 40 Wall street, New York, and the Guanajuato Development Company, Guanajuato, Mexico.

Theodore F. Dredge, formerly representing the Crane Company in San Francisco and London, has taken the management of the engineering and heating supply department of the Geo. H. Tay Company, San Francisco.

The Board of Directors of the United States Steel Corporation on Tuesday re-elected the former list of officers as follows: Elbert H. Gary, chairman; William E. Corey, president; James Gayley, first vice-president; William B. Dickson, second vice-president; Francis J. Filbert, comptroller. President Corey sails for Europe on Thursday for a two months' vacation.

An interesting lesson in economy is contained in a recent publication issued by the Electric Controller & Supply Company, Cleveland, Ohio, concerning the uses of its line of powerful lifting magnets. The publication relates that a steel foundry, where one of the magnets was in use, recently received a car for loading purposes which had been used for shipping pig iron. A magnet used in the company's yard was lowered to within 3 in. of the car floor and swept over its surface. It picked up over 600 lb. of pig iron chips and dust which were loaded into a charging box. With pig iron at $20 a ton, which was then the prevailing price, the company figured that it had been presented by some one with $6 worth of iron.

The Meehan Boiler & Construction Company, Youngstown, Ohio, has received the contract for all the iron work for repairs to the Mary Furnace of the Ohio Iron & Steel Company, Lowellville, Ohio.

New Steel Rail Specifications.

The Report of the American Railway Association's Committee.

At the semiannual meeting of the American Railway Association held in New York April 22 the Committee on Standard Rail and Wheel Sections submitted its report, which represents the results of months of investigation of the steel rail problem. At the October meeting of the association the same committee made a report of progress and presented new rail sections, which were illustrated and described in *The Iron Age* of November 28, 1907, page 1540. They were designated as "Type A" and "Type B" Series, each having five different weights—namely, for 60-lb., 70-lb., 80-lb., 90-lb. and 100-lb. rails. Both differ from the A. S. C. E. sections in putting more metal in the flange. Type A being a modification of the Dudley, or stiff girder, section, while Type B has a slightly better distribution of metal than Type A, and the width of the head is a trifle less. After the October meeting the committee, as requested by the association, continued its investigations, holding meetings as follows: In New York, October 29, 1907; in Pittsburgh, November 21; in Baltimore, December 19; in New York, January 10, 1908, and in Chicago, March 2 and 3, 1908. The members of the committee are the following:

G. L. Peck (chairman), general manager, Pennsylvania Lines West of Pittsburgh.

J. T. Richards, chief engineer of maintenance of way, Pennsylvania Railroad.

F. A. Delano, president, Wabash Railroad.

R. Montfort, consulting engineer, Louisville & Nashville Railroad.

Wm. Garstang, superintendent motive power, Cleveland, Cincinnati, Chicago & St. Louis Railway.

R. L. Ettenger, consulting mechanical engineer, Southern Railway.

W. E. Fowler, master car builder, Canadian Pacific Railway.

P. H. Dudley, inspecting engineer, New York Central Lines.

J. W. Kendrick, second vice-president, Atchison, Topeka & Santa Fe Railway.

We give the report almost entire below:

In compliance with the request contained in the resolution adopted at the October meeting of the association, the committee has continued its investigation of the question of proper specifications for the manufacture of steel rails, and has called to its assistance a number of disinterested experts. The committee has also conducted a series of tests at the different rail mills in connection with its investigation of the discard and other problems.

The Amount of Discard.

With regard to the discard question, the committee has always been of the opinion that it would be preferable to test the finished product rather than specify as to details of mill manufacture, and the chairman, in his circular letter of May 27, 1907, addressed to the executive officers of the steel companies, stated that "the natural way for the railroads to overcome these difficulties would be to insist upon such tests—physical, chemical and microscopical—as would result in giving them the kind of material they require for their purposes, and such as are universally required in the case of material for bridges, axles, &c."

The difficulties which have stood in the way of applying this theory in connection with the manufacture of steel rails have been caused by the fact that rails are generally ordered in very large quantities and the product of a rail mill is turned out at a very rapid rate. A system of detailed tests which would answer in the case of axles and other material where the product is not so rapidly turned out would not be practicable in the case of rails, because of the lack of time to complete the tests without curtailing the output of the plant. It was this difficulty which led to the adoption of specifications covering the details of mill practice, especially in connection with the discard.

In pursuing its investigation of this discard question, the committee received a suggestion from William Metcalf, to the effect that it would be reasonably practicable to apply the above theory to the manufacture of rails by arranging to test to destruction a number of rail butts representing a certain proportion of the total output, and to base rejections on the results of these tests. In order to determine the practicability of this suggestion, the committee arranged for a trial lot of rails to be rolled from the ingot without any discard whatever, except such as was necessary to enable the bloom to enter the rolls, and after these rails had been cut into small pieces they were broken under the hammer and the fracture examined. This test proved to the satisfaction of the committee that if "pipes" or other physical defects were present they could be detected by this means. The test also proved quite conclusively that it is possible to so conduct the process of manufacture that the "pipes" or other physical defects will be reduced to a minimum, and that these defects may not occur at all, even in rails rolled from the top portion of the ingot.

In order to avoid an unnecessary waste of good material, the committee set about to devise means by which the rejection of defective material could be insured without requiring an arbitrary and definite percentage of discard in every case, and a committee of the Pennsylvania Railroad pursuing the same line of investigation adopted a tentative specification which provided for a physical test of this nature, and which further provided that when physical defects were discovered, all top rails of the heat should be rejected. This would result in a discard of about 25 or 30 per cent. of the entire metal in the heat whenever physical defects were discovered, and it was felt that a requirement of this nature would not only provide for the rejection of defective material, but would insure the greatest care on the part of the manufacturer. A trial lot of rails, of a section corresponding to Type B, submitted with the committee's report of last October, was recently rolled under this specification as to discard, and the results convinced the committee that a development of this idea would prove the best solution of the discard problem.

Rejection of Segregated Metal.

Some of the advocates of a fixed and arbitrary discard have argued that the mere provision of a discard to insure the elimination of "piped" rails, or rails containing physical defects, was not sufficient, and urged the rejection of a fixed percentage from the top of the ingot, because of the well known fact that segregation occurs in the upper portion. This question of segregation was given careful consideration by the committee, and while it is a fact that, due to the rearrangement of the constituent parts of the metal during the process of cooling and solidifying in the ingot mold, an analysis of the metal in the finished rail will often show a wide departure from the analysis required by the specifications, it is also true that an analysis of the metal taken from the different parts of the finished rail will frequently show similar wide variation. This discrepancy is due to the fact that the test ingot referred to in the specifications, and upon which the chemistry specification is based, is taken from the ladle before the metal is poured into the ingot mold, and consequently before the segregation takes place.

It has been assumed that, because of this variation from the standard composition of the metal in the finished rail, the rejection of all segregated metal would be warranted. But, on this assumption, it would be necessary to discard more than a third of the upper part of the ingot to be on the safe side, as the segregation frequently extends that far, and while our knowledge of the subject is not as complete as we could wish it to be, we have a great deal of evidence that rails of good physical condition can be made from the upper portion of the ingot. Furthermore, the analyses of a large number of rails taken after years of service indicate that these wide variations in chemical composition may occur without apparently affecting the safety or wearing quality of the rail, and since it is impossible to check the analysis of the finished rail with that of the test ingot, the question arises as to what limits should be placed on the variation which will be permissible. None of the experts consulted are ready to say what this limit should be, and all admit that no facts are available as the result of actual experience which would warrant the adoption of any fixed limit to govern the rejection of material. The provision in the new specifications for stamping the rails to show their position in the ingot will enable us to obtain more definite information on this point in the future.

The attention of the committee has been called to the fact that certain railroads have been keeping this information for some years past and that the results show an excess of failures in the top rails. This information, however, is not conclusive for the purposes of the present investigation, for the reason that these rails were rolled under the old specifications as to discard, and we will be unable to determine definitely the effect of segregation until after we can observe the results of rails rolled under the new specification which will eliminate the rails containing physical defects.

Phosphorus in Bessemer Rails.

In the matter of chemistry specifications for Bessemer steel rail, statistics were obtained from the officers of the Lake Superior Iron Ore Association which convinced the committee that it would be impossible for the mills to furnish more than a small percentage of the total rail requirements of the railroads with a phosphorus specification less than 0.10.

The optional specification for 0.085 phosphorus, prepared by the joint committee of manufacturers and railroad men

is now in the hands of all members, and is therefore available for use by those who are able to obtain low phosphorus Bessemer rails. It is not considered proper, however, to require less than 0.10 phosphorus in a specification intended for general use. Members desiring to obtain low phosphorus rails will have the further option of using open hearth steel. The committee conferred with a number of disinterested experts on both the discard and phosphorus questions, and among the principal authorities consulted were William Metcalf, of Pittsburgh; Robert Forsyth of Chicago, and Prof. Henry M. Howe of Columbia University. These gentlemen all agreed that it would be preferable to test the finished product rather than specify a fixed percentage of discard, and they also agreed that it would be unreasonable to require less than 0.10 phosphorus in a specification for Bessemer rails intended to cover purchases for all American railroads.

The committee has prepared separate specifications for the manufacture of Bessemer and open hearth steel rails, with revised clauses covering discard and chemistry, and the same are submitted herewith.

The New Section.

In the matter of rail sections, the committee, after considering the criticisms and suggestions received in reply to circular No. 768, and after visiting the mills and witnessing the rolling of rails of both the new types of section, are confirmed in their opinion that a change from the A. S. C. E. section is necessary in order to obtain the best results in manufacture, and while they feel that it will be desirable to unite on a single type as the standard of this association, the views expressed by the various members in reply to Circular No. 768 indicate that it will be necessary to provide two types as originally suggested, at least for the present, and pending the time when both of these types can be tried out in actual service.

Some of the replies to Circular No. 768 indicate a fear on the part of certain members that the narrowing of the base proportionate to the hight, made necessary to balance the section and secure work on the head at a lower temperature, would tend to reduce the stability of the rail and increase the cutting of the ties. These points were considered in designing the sections, and it was determined that so far as stability is concerned the sections are well within the limits of safety, and with respect to the cutting of the ties it was felt that the increasing wheel loads of modern traffic necessitate the use of tie plates on curves and soft wood ties in any event.

Ten Pound Intervals.

In considering the necessity for different weights of section, the committee decided in the beginning that it would be sufficient for all reasonable purposes to submit designs for five different weights, increasing from 60 to 100 lb. per yard by 10-lb. increments. The replies to Circular No. 768, however, indicated a desire on the part of a number of the large roads to retain the 85-lb. standard now in quite general use, and such strong demands were made for a section of this weight that the committee felt at one time that it might be necessary to yield on this point, and thus double the number of weights to meet the views of individual members as they had previously doubled the number of types of section for the same cause. Recently, however, some of the important lines have shown a disposition to drop the 85-lb. standard, and as the committee has again been urgently importuned by the manufacturers to hold the railroads in line on this matter, in order to prevent the multiplication of sections which will surely result unless the association takes a firm stand at this time, your committee has determined to hold to its original recommendation in the matter of weights of section, and trusts that the members will see the importance of subordinating personal preferences to the general good. It is quite generally recognized that all reasonable demands can be met by the series of sections herewith submitted, and for roads now using an intermediate weight it will surely be no great hardship to change, when it is considered that they have the option of going either higher or lower than their present standard.

The committee feels that this is an opportune time for action which will tend to reduce the number of types and weights to the minimum, and that if such action is not taken now it will be increasingly difficult to accomplish anything along these lines in the future.

With regard to the relation of the rail to the wheel in its bearing surfaces, the committee had the fullest information from both the mechanical and maintenance of way view points as to results of experience under all conditions, before designing the sections submitted, and while the replies to Circular No. 768 indicate that a few members still favor an increase in the top corner radius, it is believed that the association will be safe in following the recommendation of the committee in this particular.

The committee feels that the main objects of the investigation have been accomplished in the work already done, and that members are now in a position to secure the best rails which can be manufactured in the present state of the art. The adoption of the new and better balanced sections will enable the manufacturers to roll the rails at lower temperatures, thus insuring a finer grain and better wearing quality, as well as reducing the internal stresses. The nearest approach to a single standard type has been arrived at consistent with present engineering knowledge and opinion. Provision has been made for the rejection of all rails containing dangerous physical defects, and means have been provided for keeping accurate records of the rails rolled from different parts of the ingot, and for uniform reports of rail failures, so that accurate information as to the cause of failure will be available in the future.

It will be noted that no reference is made in the specifications submitted to the deflection under drop test, as definite figures can only be inserted after the new sections have been actually rolled and tested. The committee endeavored to obtain this information before submitting the specifications to the association, but a sufficient tonnage of rails of the different weights of each of the new types has not been rolled as yet, and the tests already made indicate that it will be necessary to give the subject quite exhaustive study.

It has been suggested also that the drop test might be made to more nearly approximate conditions obtaining in actual service, and that a further standardization of the details of the apparatus would be desirable. In this connection, the committee has recommended the adoption of a new standard type of anvil which is very much heavier than those used heretofore, and a further revision of the drop test specification may be found necessary after observing the results of a sufficient number of tests under the conditions resulting from this change.

The development of these details, and the following up of the results in service of the new types of section rolled under the new specifications, will require considerable time and much careful study, and, in the opinion of your committee, work of this character can be more efficiently and appropriately handled by the American Railway Engineering and Maintenance of Way Association than by a committee of this association.

In connection with the investigation of the cause of the excessive wear of rails in the London "tubes" since the installation of electric traction, certain experiments have been made in England, both on electric and steam lines, with the high silicon rails advocated by C. Peter Sandberg. The results of these experiments seem to be quite favorable, and the subject should be followed up by the committee of the American Railway Engineering and Maintenance of Way Association.

In conclusion the report makes the following recommendation which the association adopted. It is estimated that about two years will be required for conclusive results in the use of the Type A and Type B sections:

Your committee respectfully recommends that the series of sections of types A and B, and the specifications for Bessemer and open hearth steel rails, submitted with this report, be adopted as the recommended practice of the association, and that the sections and specifications be referred to the American Railway Engineering and Maintenance of Way Association, with the request that they follow up the question of determining the details as to drop test, &c., by observing the actual results of rails rolled under the new sections, and that they also arrange to collect from the different members and tabulate all information as to comparative wear of rails rolled from the different parts of the ingot, and all other information necessary to a proper study of the problem. That they be further requested to keep careful record of the comparative results in service of rails of types A and B, and to prepare and submit to this association a single type of section which will embody their ideas as to the best type that can be designed for use as a single standard to be adopted by this association, giving due weight to every factor entering into the problem.

The specifications for Bessemer steel rails are given below:

Specifications for Bessemer Steel Rails.

The entire process of manufacture and testing shall be in accordance with the best current state of the art, and special care shall be taken to conform to the following instructions:

1. *Process of Manufacture.*—(*a*) Ingots shall be kept in a vertical position until ready to be rolled, or until the metal in the interior has had time to solidify.

(*b*) "Bled" ingots shall not be used. ("Bled ingot": One from the interior of which the liquid steel has been permitted to escape.)

(*c*) There shall be sheared from the end of the bloom formed from the top of the ingot sufficient "discard" to insure sound rails. (All metal from the top of the ingot, whether cut from the bloom or the rail, is the "top discard.")

2. *Chemical Composition.*—The chemical composition of the steel from which the rails are rolled shall be within the following limits:

Bessemer Steel Rails.

	60-lb.	[illegible]	[illegible]	[illegible]	[illegible]
Carbon	0.37 to 0.47	[illegible]	[illegible]	[illegible]	[illegible]
Manganese	0.80 to 1.10	0.80 to 1.10	0.80 to 1.10	0.85 to 1.15	0.90 to 1.20
Silicon	0.10 to 0.20	0.10 to 0.20	0.10 to 0.20	0.10 to 0.20	0.10 to 0.20
Phosphorus, not to exceed	0.10	0.10	0.10	0.10	0.10
Sulphur, not to exceed	0.075	0.075	0.075	0.075	0.075

(When lower phosphorus is used, a proper proportionate increase in carbon should be made.)

3. *Shrinkage.*—The number of passes and speed of train shall be so regulated that, on leaving the rolls at the final pass, the temperature of the rails will not exceed that which requires a shrinkage allowance at the hot saws, for a 33-ft. rail of 100-lb. section, of 6½ in., and ⅛ in. less for each 10 lb. decrease of section. No artificial means of cooling the steel shall be used between the "leading" and "finishing" passes, nor after the rails leave the finishing rolls; neither shall rails be held before sawing for the purpose of reducing their temperature.

4. *Drop Test.*—The drop testing machine shall have a tup of 2000 lb. weight, the striking face of which shall have a radius of 5 in. The anvil block shall be adequately supported and shall weigh 20,000 lb. The supports shall be a part of or firmly secured to the anvil. The test piece shall be placed head upward on solid supports, 5 in. top radius, 3 ft. between centers, and subjected to impact tests, the tup falling free from the following heights:

60, 70 and 80 lb. rail....16 ft.
90-lb. rail....17 ft.
100-lb. rail....18 ft.

One drop test shall be made on a piece of rail rolled from the top of the ingot, not less than 4 ft. and not more than 6 ft. long, selected by the inspector from each heat of steel. Special or additional tests may be made at the discretion of the inspector. The temperature of the test pieces shall be between 32 and 100 degrees F.

(*a*) If the test piece breaks without showing "pipe" or physical defect, all rails from that heat shall be rejected absolutely.

(*b*) If, however, the test piece broken shows "pipe" or physical defect, the top rail from each ingot of that heat shall be rejected, and

(*c*) A second test shall then be made of a test piece selected by the inspector from a rail other than that from the top of the ingot. If this second piece breaks, the remainder of the rails of the heat shall also be rejected. If this second piece does not break, the remainder of the rails of the heat will be accepted. If the test piece does not break under the drop test, it shall then be tested to destruction, and

(*d*) If, when so tested to destruction, the test piece shows "pipe" or physical defect, the top rail from each ingot shall be rejected; the remainder of the rails of the heat will be accepted.

(*e*) If, when so tested to destruction, the test piece does not show "pipe" or physical defect, all the rails of the heat will be accepted.

5. *Section.*—The section of rail shall conform to the template furnished by the purchaser as accurately as possible consistent with the paragraph relative to specified weight. An excess of 1-32 in. in hight of rails, and a variation of 1-16 in. in width of flange will be permitted, but no variations will be allowed in dimensions affecting the fit of the splice bars.

6. *Weight.*—The weight of the rail shall be maintained as nearly as possible, after complying with the preceding paragraph, to that specified in the contract. A variation of one-half of 1 per cent. from the calculated weight of section, on an entire order, will be allowed. Rails will be accepted and paid for according to actual weight.

7. *Length.*—The standard length of rails shall be 33 ft. Ten per cent. of the entire order will be accepted in shorter lengths varying as follows: 30 ft., 28 ft., 26 ft. and 24 ft. A variation of ¼ in. from the specified length will be allowed. All No. 1 rails less than 33 ft. long shall be painted green on both ends.

8. *Drilling.*—Circular holes for splice bars shall be drilled in accordance with specifications of the purchaser. They shall in every respect conform accurately to drawing and dimensions furnished and must be free from burrs.

9. *Straightening.*—Care must be taken in hot-straightening when finished—final straightening being done while cold. They shall be sawed square at ends, variations to be not more than 1-32 in., and prior to shipment shall have the burr caused by the saw cutting removed and the ends made clean.

10. *Branding.*—The name of the maker, the weight of the rail and the month and year of manufacture shall be rolled in raised letters and figures on the side of the web. The number of the heat and a letter indicating the portion of the ingot from which the rail was made shall be plainly stamped on the web of each rail, where it will not be covered by the splice bars. Rails to be lettered consecutively "A," "B," "C," &c., the rail from the top of the ingot being "A." In case of a top discard of 20 or more per cent., letter "A" will be omitted. All rails marked "A" shall be kept separate and be shipped in separate cars.

11. *No. 1 Rails.*—No. 1 rails shall be free from injurious defects and flaws of all kinds.

12. *No. 2 Rails.*—Rails which, by reason of surface imperfections, are not classed as No. 1 rails, shall be considered No. 2 rails, but No. 2 rails shall not be accepted for shipment which have flaws in the head of more than ⅛ in., or in the flange of more than ¼ in., in depth, and these shall not, in the judgment of the inspector, be, in any individual rail, so numerous or of such a character as to render it unfit for recognized No. 2 rail uses. Both ends of No. 2 rails shall be painted white, and shall have two prick punch marks on the side of the web near the end of the rail, so placed as not to be covered by the splice bars. They must be kept separate from No. 1 rails and be shipped in separate cars.

13. *Inspection.*—(*a*) Inspectors representing the purchaser shall have free entry to the works of the manufacturer at all times while the contract is being executed, and shall have all reasonable facilities afforded them by the manufacturer to satisfy them that the rails have been made in accordance with the terms of the specifications.

(*b*) The manufacturer shall, before the rails are shipped, furnish the inspector daily with carbon determinations for each heat, and a complete chemical analysis every 24 hr. representing the average of the other elements contained in the steel for each day and night turn. These analyses shall be made on drillings taken from small test ingots. The drillings for analysis shall be taken from the ladle test ingot at a distance of ¼ in. beneath the surface.

(*c*) All tests and inspection shall be made at the place of manufacture prior to shipment, and so conducted as not to interfere unnecessarily with the operation of the mill. On request of the inspector the manufacturer shall furnish drillings for check analysis.

Specifications for Open Hearth Steel Rails.

Apart from the section relating to chemical composition, the specification for open hearth rails is identical with that for Bessemer rails, with two exceptions. In Section 10 on "Branding," the following sentence precedes what is given above:

All open hearth rails must be marked O. H. to distinguish them from Bessemer rails when in track.

In paragraph (*b*), Section 13, on "Inspection," the first sentence is changed to the following:

The manufacturer shall, before the rails are shipped, furnish the inspector with a complete chemical determination for each heat.

Section 2 in the open hearth specification is as follows:

2. *Chemical Composition.*—The chemical composition of the steel from which the rails are rolled shall be within the following limits:

Open Hearth Steel Rails.

	60-lb.	70-lb.	80-lb.	90-lb.	100-lb.
Carbon	0.50 to 0.60	0.55 to 0.65	0.60 to 0.70	0.65 to 0.75	0.70 to 0.80
Manganese	0.75 to 1.00	0.75 to 1.00	0.75 to 1.00	0.75 to 1.00	0.75 to 1.00
Silicon	0.10 to 0.20	0.10 to 0.20	0.10 to 0.20	0.10 to 0.20	0.10 to 0.20
Phosphorus, not to exceed	0.04	0.04	0.04	0.04	0.04
Sulphur, not to exceed	0.06	0.06	0.06	0.06	0.06

(When higher phosphorus is used, a proper proportionate reduction in carbon should be made.)

rails, and it must result in their being left in such condition that they shall not vary throughout their entire length more than 3 in. from a straight line in any direction when delivered to the cold-straightening process. Those which vary beyond that amount, or have short kinks, shall be classed as second quality rails, and be so marked. Rails while on the "hot" beds shall be protected from coming in contact with water or snow. The distance between supports of rails in the gagging press shall not be less than 42 in.; supports to have flat surfaces. Rails shall be straight in line and surface and smooth on head

In accordance with a bill in equity filed by Bertha M. Amsler, W. O. Amsler and A. C. Davis have been named as receivers for the Amsler Engineering Company, engineer and contractor, Diamond Bank Building, Pittsburgh, capitalized at $100,000. It is stated that the company has assets valued at $54,000 and liabilities of $29,950; but, owing to existing financial conditions, it is not able to meet these liabilities at present.

United States Steel Corporation's Earnings.

The statement of the United States Steel Corporation's earnings for the quarter ending March 31, 1908, makes the following showing, as compared with the corresponding period of 1907:

	1908.	1907.
January	$5,052,743	$12,838,703
February	5,709,428	12,145,815
March	7,466,834	14,137,974
Total after deducting all expenses incident to operations, including those for ordinary repairs and maintenance of plants, and interest on bonds and fixed charges of the subsidiary companies	$18,229,005	$39,122,492
Less charges and appropriations for the following purposes:		
Sinking funds on bonds of subsidiary companies	$291,518	$288,607
Depreciation and reserve funds	1,771,227	3,865,914
Special improvement and replacement funds	.....	1,000,000
	$2,062,745	$5,154,521
Net earnings	$16,166,260	$33,967,971
Deduct interest for the quarter on U. S. Steel Corporation bonds outstanding	$6,000,987	$5,685,615
Sinking funds for the quarter on U. S. Steel Corporation bonds:		
Installments	1,012,500	1,012,500
Interest on bonds in sinking funds	298,476	238,848
	$7,311,963	$6,936,963
Balance	$8,854,297	$27,031,008
Dividends for the quarter:		
Preferred, 1¾ per cent	$6,304,919	$6,304,919
Common, ½ per cent	2,541,513	2,541,513
Surplus for the quarter	$7,865	$18,184,576
	Tons.	Tons.
Unfilled orders on hand, March 31	3,765,343	8,043,858

From the surplus of the March quarter of 1907, a special appropriation of $14,500,000 was made for new construction, &c., leaving $3,684,576 as balance of surplus.

The unfilled orders on hand December 31, 1907, were 4,624,553 tons.

The Washington Water Power Company, Spokane, Wash., is extending its 60,000-volt transmission lines to towns in the so-called Big Bend country, west and southwest of Spokane, which in all will include about 92 miles of transmission line. These extensions are designed to furnish power and lighting service to the towns of Reardan, Davenport, Harrington, Sprague, Ritzville and Paha. The work of construction is now under way and will be fully equipped and in operation by the end of the summer. In addition to this work the company is enlarging the capacity of its steam relay power station at Spokane to 20,000 hp., the equipment consisting of Curtis steam turbines. A fifth unit of 3000 hp. is being added to the hydraulic station at Post Falls, Idaho, on the Spokane River, and two 1500-kw. motor generator sets are being installed in the Spokane power station, together with numerous minor additions to the plant equipment.

The Dominion Steel-Coal companies' dispute, which has occupied much attention in the courts of the Dominion of Canada in the last several years, may be settled soon if propositions suggested by London capitalists looking to this end are found favorable and agreeable to both interests. A dispatch from Sydney, N. S., states that the idea of forming a powerful holding company, with a capital of not less than $35,000,000, which will take over both the steel and coal companies and conduct them as one enterprise, is included in a recent announcement from London to parties interested on this side.

Corrigan, McKinney & Co. have decided to begin at once the erection of a new blast furnace to replace their old Scottdale (Pa.) Furnace, which went out of blast last December and has since been torn down. The new stack will have a daily capacity of about 300 tons, and it is expected that it will be ready to blow in about September 1. The contract for the greater part of the construction work has been awarded to the Variety Iron & Steel Works Company, Cleveland.

The Customs Administrative Laws.

Important Amendments Reported to the House.

WASHINGTON, D. C., April 27, 1908.—Half a score of measures proposing changes in the customs administrative statutes have been brought forward in Congress within the past two years, but both House and Senate leaders have been reluctant to take action on any of them in view of the fact that a comprehensive revision of the tariff has seemed to be imminent. The Ways and Means Committee has decided, however, that a substitute bill covering the more important desired reforms in the administrative act of June 10, 1890, should be passed without further delay.

The provisions of the bill thus reported to the House of Representatives extend the time within which a protest against an assessment of duty may be filed from 10 to 15 days; authorize boards of three general appraisers to order rehearings in their discretion; permit appeals to be taken from the Board of General Appraisers directly to the Circuit Court of Appeals, thus eliminating reviews by the circuit courts; require both the importer and the Government to present all evidence to the Board of General Appraisers in the trial of the case before that tribunal; strengthen the tenure of the members of the Board of General Appraisers by forbidding their removal from office except for cause, and after due inquiry; increase the compensation of general appraisers from $7000 to $8000 per annum and clothe the board with power to compel the attendance of witnesses and the production of papers and authorize it to punish witnesses refusing to testify.

The extension of the time within which protests against assessments of duty may be filed from 10 to 15 days is a step in the right direction that will be fully appreciated by importers. It is possible that before the bill is finally acted upon the protest limitation may be increased to 30 days. The authorization to boards of three general appraisers to order rehearings is regarded as absolutely necessary in the interest of justice. Under the present law the decisions of the several subboards are final as to all matters embraced within their jurisdiction, subject only to appeal to the Circuit Court, the full board having no power to correct mistakes other than manifest clerical errors. The power to grant a rehearing is nothing more than the power to correct such errors as the subboards may have committed, and it is believed that in many cases rehearings would promptly and satisfactorily determine issues which can now be settled only after costly litigation in appellate proceedings. The provision that appeals from the board shall be taken directly to the Circuit Court of Appeals has long been advocated by the board and by the Treasury Department. Only questions of law would be carried to the Court of Appeals, and the findings of the board would be final on all questions of fact. The requirement that the importer and the Government shall both present all their evidence to the Board of General Appraisers in the first instance would work a sweeping and most desirable reform. Under the law as it now stands either party may take testimony after an appeal from the board has been taken, and make an entirely new case on evidence which has never been prosented to the attention of the board.

The proposition that the board shall be given power to compel the attendance of witnesses and the production of papers and to punish for contempt has long been contended for by the board, and is approved by the Treasury Department. While importers are not likely to be unanimous in advocating this change, it is a well-known fact that at present the board is powerless to maintain order at its sittings, and cannot compel the attendance of witnesses or the production of evidence, as it cannot enforce such penalties as it may impose.

It is probable that this bill will pass the House before the summer recess, which it is now believed will be taken about May 15, but it is unlikely that it will go through the Senate before next session. W. L. C.

NEWS OF THE WORKS.

Iron and Steel.

Sheridan Furnace, at Sheridan, Lebanon County, Pa., has been blown in after extensive repairs.

The Empire Steel & Iron Company will install six new boilers at its furnace at Topton, Pa. Other improvements are also to be made.

Hall Furnace of Republic Iron & Steel Company, Sharon, Pa., has been banked, having been put in blast on March 1. No. 1 Haselton furnace, in the Mahoning Valley, has also been banked, the company now having only two Haselton furnaces in operation.

It is stated that Struthers Furnace of the Struthers Furnace Company, at Struthers, Ohio, which is now banked, will be blown in at an early date.

General Machinery.

At the annual meeting of the American Machine & Mfg. Company, Charleston, N. C., J. W. Conway was elected president; W. H. Flint, general manager and treasurer; F. W. McComb, assistant secretary, and D. A. Tompkins, consulting engineer. The company is increasing its forces in both foundry and machine shop.

The Jenney Electric Mfg. Company, Indianapolis, has selected a site of 10 acres at Anderson, Ind., near the tracks of the Big Four Railroad and the Indiana Union Traction Company, where it will erect a new plant, the main machine shop of which will be 100 x 400 ft.

Power Plant Equipment.

The Menominee Light & Traction Company, Menominee, Mich., has acquired the necessary rights and will build a hydro electric plant at Shappee Rapids, the estimated cost of which is $400,000. The current developed from this plant will be transmitted to Menominee, Mich., and Marinette, Wis., for light and power purposes.

The Cobalt Light, Power & Water Company, Ltd., Cobalt, Ont., Canada, has been incorporated with a capital of $10,000. This company is controlled by the Cleveland-Cobalt Silver Mines, Ltd., which furnishes current for the new light plant. The power plant of the Cleveland-Cobalt Silver Mines consists of two 200-hp. Wood & Co. gas producers, three 100-hp. Westinghouse gas engines and one 100-kw. General Electric generator, the latter now being installed. The officers of the new company are A. D. Crooks, president, Toronto, Ont.; S. H. Bradford, vice-president, Toronto, Ont., and F. L. Cody, secretary, Cobalt, Ont.

The Murphysboro Railway, Light, Heat & Power Company, Murphysboro, Ill., has been organized and incorporated with a capital of $36,000, for the purpose of taking over the Murphysboro Street Railway Company, and substituting electric power for the horse traction system now in use. The improvements contemplated will include the extension of the system and the construction of a power plant, with the necessary equipment, all of which must be completed within one year.

From the sales of bonds the city of Alameda, Cal., has provided a fund of $305,000 to be devoted to public improvements. Among the projects embraced in the plans are the building and equipment of a new electric light plant, for which the expenditure of $50,000 is authorized; the construction of a fire engine house, the purchase of fire apparatus, the equipment of reading room in public library with steel shelving, and the erection of a public school building.

The Allis-Chalmers Company, Milwaukee, Wis., which has already installed between 300 and 400 vertical steam driven blowing engines and nearly as many more of the horizontal type for blast furnaces, is installing a new 44 x 84 x 60 in. long cross head blowing engine in the plant of the Tonawanda Iron & Steel Company, North Tonawanda, N. Y., and a unit of the same size in the plant of the Pennsylvania Iron & Coal Company, Cleveland, Ohio. The Republic Iron & Steel Company is installing four pairs of these engines at its Pioneer plant, Thomas, Ala.

The Bedford Power Company has been organized at Indianapolis, Ind., with $50,000 capital stock, which, the incorporators say, will soon be increased to $400,000. The company plans to dam White River near Williams, Ind., and erect a power plant to generate electricity for use at the Bedford Cement Company's plant and at the stone quarries. Among the incorporators are Harry S. New, H. A. Mansfield, James B. Nelson and John W. Holtzman of Indianapolis, Ind.

It is stated that the chief engineer for the Charity Hospital, New Orleans, La., will receive bids until May 20 for the erection of a power house and installation of the necessary boiler capacity to furnish light, heat and power for the hospital.

The Borough Council of Etters, Pa., intends to establish a hydraulic electric plant on the Little Conewago Creek to furnish light. About $9000 has been appropriated to erect the plant and install machinery.

The city of East Grand Forks, Minn., has authorized a $50[illegible] issue of bonds, the proceeds of which shall be applied to the construction of a system of water works. Plans and specifications for this improvement are now being prepared.

The Grand River Light & Power Company, Fort Gibson, Okla., recently organized, has under construction a new electric plant, which will be completed about June 1. The building is of brick, 30 x 50 ft., and motive power will be developed by a producer gas engine equipment.

A contract let April 17 by the city of Farmington, Mo., for the construction of a municipal electric light plant was secured by the Commercial Electrical Supply Company, the price for the plant complete being $23,120. Thomas B. Carter is the engineer in charge.

The installation of a water works system is being contemplated by the city of Winterset, Iowa, and W. K. Palmer, Kansas City, Mo., has been authorized to investigate the water supply and to prepare plans and specifications for the construction of the plant.

Foundries.

The Eaton Rapids Foundry Company, Eaton Rapids, Mich., incorporated with a capital stock of $10,000, has been organized to do a general foundry business and manufacture house heating furnaces. The officers are W. L. Stoddard, president; L. F. Hosler, vice-president and general superintendent; Bert Littell, secretary and manager; H. C. Minnie, treasurer.

Geo. Barcus & Co., Wabash, Ind., have now under construction an important addition to their manufacturing plant, comprising a foundry building, 60 x 220 ft. long, affording about three times the floor space available in their present plant. It is expected that the new building will be completed and ready for occupancy about June 1. The firm does all kinds of gray iron castings and makes a specialty of automobile castings.

W. G. McKenney & Co., Twenty-ninth and Smallman streets, Pittsburgh, are equipping a foundry at Avonmore, Pa., to make sash weights, cast iron washers and other cheap grades of castings. The shop will have a daily capacity of about 30 tons.

The New Phœnix Foundry & Machine Company, Springfield, Mo., is adding a building to its plant, which when completed will practically double its output capacity. Work on the improvement has been begun, and will be pushed to completion. It is the purpose of the company to make the plant modern in every respect, and while equipment for machine shop and foundry is already provided, improved machines will be added from time to time when the remodeled plant is in operation.

Fires.

The sash and blind factory of the Wilbur Corporation, New Haven, Conn., was burned recently, with a loss of $20,000.

Bridges and Buildings.

The McClintic-Marshall Construction Company, Pittsburgh, has nearly completed the erection of a new mixer building at the Bessemer steel plant of the Youngstown Sheet & Tube Company, Youngstown, Ohio.

The Pittsburgh Steel Construction Company, Pittsburgh, Pa., has increased its capital stock from $150,000 to $300,000.

Hardware.

The Consolidated Mfg. Company, room 507, Connecticut Mutual Building, Hartford, Conn., has been incorporated in Connecticut to manufacture specialties, the leading line being the Sanitary crystal ice cream freezer, which has been manufactured for the past two years by the inventor, George H. Fox, Bangor, Me.

The Owosso Mfg. Company, Owosso, Mich., is preparing to enlarge its plant by the erection of a three-story brick building, 80 x 100 ft., to take the place of a one-story frame building to be torn down. Work on this improvement will be begun within the next four weeks.

The A. C. Williams Company, manufacturer of hardware specialties, Ravenna, Ohio, reports its volume of business as very satisfactory. The company's plant is being operated to its full capacity.

The Heffner Mfg. Company, Warren, Ohio, has been incorporated, with a capital stock of $5000, by Harry Heffner and others, to manufacture fireproof thimbles and other specialties.

Herbert Smith, New Haven, Conn., recently manager of the National Wire Corporation, has purchased the finished and unfinished product in the works and is disposing of it to the trade.

Within the next 60 days the American Seeding Machine Company expects to move the entire business of the Kentucky Drill Company Division from Louisville, Ky., to Richmond, Ind., where it will be merged into the Indiana Division at that place. With a view to this change $200,000 has been spent in enlarging and improving the Richmond plant within the past year. The business of the Louisville factory having outgrown the plant facilities, it became merely a question of building a new factory at Louisville or consolidating the business with one of the larger factories of the company. Being desirous of concentrating its plant operations as much as possible, the company chose the latter alternative.

Miscellaneous.

Volkommer & Co., 1004 Empire Building, Pittsburgh, manufacturers of enamels and supplies for enameling plants, report considerable improvement in the volume of business being taken. During April more orders were received than in the whole of the three preceding months, which is no doubt due to the opening of spring trade, many of the enameling plants preparing to manufacture their products on a much larger scale.

The Adrian Gas Company, Adrian, Mich., having been reincorporated, a bond mortgage has been issued authorizing $200,000 in bonds, of which $131,000 will be used to take up existing bonds and provide for improvements and extensions, which will be undertaken at once. All contracts in connection with the work contemplated have been arranged for.

The business of the Bridgeport Safety Emery Wheel Company, Bridgeport, Conn., which has been placed in the hands of a receiver, is being conducted by Hobart E. French, the receiver, who announces that orders will have the same careful and prompt attention as heretofore.

The National Sanitary Company, recently granted an Ohio charter with a capitalization of $200,000, has purchased 20 acres of land at Salem, Ohio, opposite the Fort Wayne Railroad station, on which it will erect a plant for the manufacture of a complete line of bathtubs, lavatories and other enameled ware. Ground has been broken for two 100 x 450 ft. main buildings, to be of concrete block construction. The boiler equipment will consist of 400 hp. tubular type and the generating equipment of three four-valve Russell automatic engines, direct connected to Northern generators. The plant will embrace a foundry, chipping, enameling and shipping departments, in which all of the machinery will be driven by Northern electric motors. The foundry will have a capacity for melting 35 tons per day.

The American Case & Register Company, Alliance, Ohio, has made plans for building a manufacturing plant at Salem, Ohio. The factory will be of concrete building block, one story in hight, 200 x 500 ft., and there will be an office building 100 ft. square and one story high.

The Trussed Concrete Steel Company, Youngstown, Ohio, made shipments in the past week of about 300 tons of steel in the shape of concrete frame work. Some of this material has been shipped to the Florida East Coast Railroad on its Key West construction, and also for other important work in different localities where solidity of foundation and fireproof construction have been required.

The Scott National Radiator Company, Cambridge, Ohio, has changed its name to the Scott Stove & Furnace Company.

The Irwin Mfg. Company has been organized at Indianapolis, Ind., with $10,000 capital stock, to manufacture automobile accessories. The directors are R. J., M. J. and J. M. Irwin.

The American Paving & Mfg. Company has been organized at Indianapolis, Ind., with $50,000 capital stock, to manufacture paving machinery and appliances. The directors are M. J. Ready, W. J. Mooney and J. G. Mueller.

The capital stock of the Ravenna Gas & Electric Company, Ravenna, Ohio, has been increased from $60,000 to $120,000.

The National Press & Printing Company has been organized at Indianapolis, Ind., with $200,000 capital stock, to manufacture a four-color press, the invention of G. K. Henderson of that city. Associated with him are J. K. Bain, Chas. C. Kuhn and Wm. McBeath.

F. Bowers & Co., Ft. Wayne, Ind., said to be the largest manufacturers of oil tanks in the world, have issued $300,000 of preferred stock to increase their working capital, expecting to do $1,500,000 of business this year.

Bonds in the sum of $40,000 have been authorized by vote of the citizens of Waurika, Okla., for the construction of a water works and sewerage system.

The Ohio-Indiana Pipe & Junk Company, Robinson, Ill., has been incorporated, with a capital stock of $50,000, to deal in oil well supplies and machinery and operate oil and gas wells.

The Rockford Light & Fuel Company, Rockford, Ill., has recently been incorporated by John A. Johnson, Anton E. Carlson and William Johnson. The company manufactures a gasoline gas producer making gas from gasoline for cooking, lighting and power purposes. This equipment is styled the Home gas light machine.

The prohibition wave that has swept over a number of States in the past year has made itself felt in the steel trade. Manufacturers of hoops say that there has been a considerable falling off in the demand for that commodity traceable directly to the lessened operations of breweries and distilleries.

The plant of the Standard Connecting Rod Company, Beaver Falls, Pa., which has been running on short time, has started on a 9-hr. day schedule, with fair prospects ahead.

OBITUARY.

EBEN H. BOURNE, Cleveland, a director in the Bourne-Fuller Company, died April 24 of paralysis, aged 68 years. He was at one time a manufacturer of bolts and nuts, being senior member of the firm of Bourne, Damon & Knowles, formed in 1866. In 1881 this concern was changed to the Bourne & Knowles Mfg. Company, and Mr. Bourne became its president. He was also president of the Cleveland Spring Company and the Columbia Spring Company. In 1884 he became cashier of the Union National Bank and served in that capacity until he succeeded the late Senator M. A. Hanna as president after the latter's death.

ALFRED HABETS, for 30 years the editor of the *Revue Universalle des Mines* of Liege, Belgium, is dead. Born at Liege in 1839, M. Habets graduated with honors in 1863, was appointed tutor of metallurgy at the Ecole des Mines in 1865 and of mining engineering a year later. In 1879 he became professor of mining engineering, a post which he filled to his death. He was closely identified with the Association des Ingenieurs, was a juror at nearly all the great exhibitions and was appointed editor of the Ecole des Mines in 1877. He was secretary for many years of the Union of collieries, mines and metallurgical works of the Province of Liege and was an active member and president of the Geological Society of Belgium.

Dr. EDWIN J. TOOF, New Haven, Conn., president and treasurer of the Edwin J. Toof Company, manufacturer of sewing machines and sewing machine attachments, died April 18, aged 79 years. He was a native of St. Albans, Vt., and studied dentistry, which profession he practiced in Iowa until he went to New Haven in 1870. But a strong bent for mechanics, coupled with inventive genius, led him to move to New Haven in 1870 that he might have manufactured a sewing machine attachment. He became associated with F. P. Pfleghar in manufacturing, the connection being maintained until the establishment of the Edwin J. Toof Company in 1902. He recently disposed of valuable patents to the Greist Mfg. Company, New Haven, but his company continues to manufacture other sewing machine devices. He leaves one daughter.

EUGENE MUNSELL, New York, died early on Saturday morning, April 25, as the result of what is believed to have been an accident. Having been troubled with insomnia for a short time, and feeling the oppression of the weather, he went to the window on the seventh floor of his hotel, and those who knew him best feel sure that through some accident he fell to the pavement, where immediate death ensued. Mr. Munsell came to New York City as a young man to take a place in the stove business which had been conducted for years by his father, and was identified with the stove trade during his entire life, being a large stockholder in the Manhattan Stove Company at the time of his death. His principal interest, however, was a mica business conducted under the name of Eugene Munsell & Co., which had expanded so as to absorb practically his entire attention.

JOSEPH CHRISTOPHER, founder of the Christopher & Simpson Architectural Iron & Foundry Company, St. Louis, died April 22, aged 81 years. He was born in Alsace-Lorraine. For 20 years he was superintendent of the Pullis Brothers Iron Company, now out of existence. He founded the establishment of which he was head in 1873.

Development of water power on the Wolf River, 24 miles from Antigo, Wis., is to be undertaken by the Langlade Power Company, Rhinelander, Wis., which was recently organized by E. A. Forbes, C. A. Wixson, A. W. Shelton and E. D. Sherry. The 4000 hp. which this project is designed to develop will be used to supply current for power purposes, for the transmission of which to Antigo a transmission line will be built.

An employment bureau connected with an important metal trades association refers to the larger number of men called for last week by the shops on its list than for some time. It is suggested that this may mean an expansion of business.

The Iron and Metal Trades

The success of the Pennsylvania Railroad financing, even when allowance is made for exaggerated subscription statistics, has given much encouragement to the Iron trade. It is regarded, with other similar recent transactions as the first tangible proof of returning confidence and as such indicates that more extended buying of materials and supplies by the railroads may soon follow. Leaders in the industry, however, utter the warning that it may take a month or two before the effect is felt in the Steel trade.

The Iron industry is facing problems of its own. The continued pressure to sell Pig Iron, notably in the Central West, which is the principal battle ground of the Western and Southern producers, is creating a serious situation. The proposal made and withdrawn two weeks ago to put Southern Foundry Iron squarely down to $10, at Birmingham, for No. 2, indicates the attitude of some important interests and has had its effect in weakening the market further.

At the meeting at that time it was understood that if developments called for it, there would be a further meeting on the 30th. Instead, a meeting of the Pig Iron and Ore Committees has been called for May 7, and in the interval the majority of the furnaces co-operating are holding to the prices agreed and are selling very little. What Iron is being marketed is at lower prices, and the conviction is growing that prices may drift to the point fixed as likely to check the decline and prepare a sturdy buying movement. As a matter of fact, reports are current even now that $10.25 at Birmingham has been done for a 10,000-ton lot of Pig Iron.

Bessemer Pig has sold in moderate quantities at $16.75 delivered at Pittsburgh, and low figures have been made on Basic Pig. The significance of these developments in the Pig Iron markets is that they may react upon prices of Finished Iron and Steel, since with cheap Scrap and Melting stock they offer inducements to smaller Steel plants and rolling mills.

Aside from one lot of 14,000 tons, which it is expected will be placed at an early date, there is little doing in the Rail trade, and the Plate trade is particularly quiet. A good deal of figuring is going on in Structural Material, but there is some deferring of the contracts, which in some instances is attributed to the hope on the part of the buyers that prices may be lower.

The Tin Plate industry is best employed of all. The American Sheet & Tin Plate Company has 90 per cent. of its capacity in operation, while the other makers are running at the rate of 75 to 80 per cent. There is a better demand, too, for Roofing and Electrical Sheets.

The Copper trade is quiet, the metal selling on the basis of 12.75c. for Electrolytic. The test of stability must come soon, and will depend upon the ability of an increased domestic demand to take up the larger prospective output. The foreign markets have done their share and little more can be expected for a long time to come.

There is a movement among Spelter producers to get rid of a round block of metal abroad, and thus relieve the congestion. Lead has been advanced from 4c. to 4.10c., New York.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date of Week [illegible] month and one year previous.

	Apr. 29, 1908	Apr. 22, 1908	Mar. 25, 1908	Apr. 24, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	[illegible]	$17.50	$17 [illegible]	[illegible]
Foundry No. 2, Southern, Cincinnati	*15.00*	15.25	15.25	24.75
Foundry No. 2, Local, Chicago	*17.35*	17.35	17.50	26.00
Bessemer, Pittsburgh	*17.15*	17.25	17.75	23.85
Gray Forge, Pittsburgh	*15.40*	15.40	15.90	21.85
Lake Superior Charcoal, Chicago	*20.00*	20.00	20.50	26.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	30.50
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.00
Open Hearth Billets, Phila	29.20	29.20	29.20	32.00
Wire Rods, Pittsburgh	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	12.00	12.00	12.00	18.00
Steel Rails, Melting, Phila	12.75	12.75	12.75	19.00
Iron Rails, Chicago	15.00	15.00	15.00	24.50
Iron Rails, Philadelphia	17.00	17.00	17.00	27.00
Car Wheels, Chicago	*13.00*	13.50	15.50	25.00
Car Wheels, Philadelphia	14.00	14.00	14.00	24.00
Heavy Steel Scrap, Pittsburgh	*12.75*	12.75	13.00	17.75
Heavy Steel Scrap, Chicago	*10.75*	11.00	11.25	15.50
Heavy Steel Scrap, Philadelphia	12.75	12.75	12.75	18.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	*1.46*	1.50	1.65	1.83½
Common Iron Bars, Chicago	1.65	1.65	1.65	1.76½
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	*1.55*	1.55	1.70	1.85
Skelp, Sheared Steel, Pittsburgh	*1.65*	1.65	1.80	1.90
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	1.90	1.90	1.90	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	*13.00*	13.00	13.25	25.00
Electrolytic Copper, New York	*12.75*	12.75	13.25	24.25
Spelter, New York	*4.70*	4.65	4.75	6.75
Spelter, St. Louis	*4.57½*	4.50	4.55	6.60
Lead, New York	**4.10**	4.00	4.00	6.10
Lead, St. Louis	**4.00**	3.85	3.85	5.95
Tin, New York	32.25	31.70	32.25	42.00
Antimony, Hallett, New York	8.75	8.75	9.50	22.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, April 29, 1908.—*(By Telegraph.)*

Aside from the entry by the principal interest of a fair sized order from the Lake Shore & Michigan Southern for Track Fastenings and an aggregate of 3000 tons of Rails made up of small lots from steam and traction roads, nothing of special interest has developed in railroad purchases. That the roads cannot continue indefinitely to restrict buying as closely as they are now doing is certain, and each week brings nearer the time when they must begin preparations for the coming crop movement. It is generally believed that activity in this direction will give a strong forward impulse to trade in all lines, and signs of its development are therefore being eagerly looked for. The volume of Structural business has fallen off considerably notwithstanding the number of building and bridge projects which are known to be scheduled for construction during the present year. The contracts taken by fabricators last week included only a few small lots, and the chief prospective business developed was the building of piers and wharf sheds by the Government at Fort Mason, San Francisco, which will require about 2000 tons. Plates continue dull and inactive, and the demand for Sheets is not so strong as it has been. In Merchant Pipe the new business entered for the month of April holds about even with that of March, but both Merchant and Locomotive Tubes are extremely quiet. While there are few large requirements for Cast Iron Pipe in sight, there is an increasing number of small orders comprising lots of a few hundred tons coming into the market from the less important towns and cities [illegible]

1800 tons of Rerolling Rails placed by a local mill has infused some strength into this division of Scrap material; otherwise the market is weak and sagging and is unsupported by a firm demand from consumers. Despite the many rumors of impending changes in Pig Iron, the situation is not materially altered. There is unquestionably some selling of Southern Iron at below $12, Birmingham, but it is evident from efforts that have been made to place orders at $11.50 that there is not much strictly No. 2 Iron available at this price.

Pig Iron.—In small orders, the bulk of which were under 500 tons, an aggregate of around 3000 tons changed hands in this market during the week. While there was nothing of significance in actual transactions, the number and comparative importance of inquiries received formed the basis for a stronger feeling of encouragement. Among these were one for 1500 tons and one for 1000 tons, which, together with a number of smaller lots, aggregated over 5000 tons, and it is believed that most of these inquiries represent nearby requirements for which purchases must necessarily be made before long. The situation as to prices has undergone no marked change. For No. 2 Foundry $12, Birmingham, continues to be the accepted standard for the majority of Southern producers, although there is some tonnage available at 25c. and possibly 50c. below this figure. Up to the present time, however, the furnaces generally have not been actively seeking business below $11.75, and but few, if any, manifest a desire to contract even at $12 for deliveries extending through the entire second half. One lot of 500 tons of No. 2 Foundry offered at $11.50 resulted in a sale of 200 tons at $12, the buyer withholding the balance of the tonnage in the hope of securing a lower price. Two sales of 100 tons each of Malleable Bessemer are reported, which it notable only because recently there has been absolutely nothing doing in this grade. The Northern furnace situation remains unchanged, with only three blast furnaces active in the Chicago District. These are producing about 750 tons a day, which represents practically 20 per cent. of the capacity of this group. Notwithstanding this reduction, the output is in excess of the demand. The following prices are for May and June delivery, f.o.b. Chicago:

Lake Superior Charcoal	$20.00 to $20.50
Northern Coke Foundry, No. 1	17.85 to 18.35
Northern Coke Foundry, No. 2	17.35 to 17.85
Northern Coke Foundry, No. 3	16.85 to 17.35
Northern Scotch, No. 1	18.35 to 18.85
Southern Coke, No. 1	16.85 to 17.35
Southern Coke, No. 2	16.35 to 16.85
Southern Coke, No. 3	15.85 to 16.35
Southern Coke, No. 4	15.35 to 15.85
Southern Coke, No. 1 Soft	16.85 to 17.35
Southern Coke, No. 2 Soft	16.35 to 16.85
Southern Gray Forge	14.35 to 14.85
Southern Mottled	14.10 to 14.60
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	19.50 to 19.65
Jackson Co. and Kentucky Silvery, 6 %	18.90 to 19.40
Jackson Co. and Kentucky Silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky Silvery, 10 %	22.90 to 23.40

(*By Mail.*)

Billets and Rods.—An extremely quiet demand for the product of forge shops is reflected in the practically stationary condition of Forging Billets, which continue without change as respects either movement or prices. No sales of or inquiries for Billets of any kind are reported, save an occasional lot of insignificant tonnage. We quote Forging Billets at $31.50 to $32.50, Chicago. There is a moderate demand for Wire Rods, but buyers are not disposed to make commitments far ahead of actual requirements. Prices continue without change at the following quotations: Bessemer, $35; Basic, $36; Chain, $37, all at Pittsburgh.

Rails and Track Supplies.—While there have been no further Rail purchases of large tonnage by the principal lines, the past week has developed quite a number of small inquiries from the less important roads and branches, including some traction lines. Several orders of this character booked by the principal interest aggregate 3000 tons, besides which there are pending other requirements ranging from a few hundred up to 1000 tons. It is believed that the imperative needs of maintenance will bring out an increasing number of such orders as the season advances. Some improvement is noted in the demand for Light Rails, and following the recent purchase of rails for the New York Central Lines, some fair sized orders for Fastenings from the Lake Shore & Michigan Southern have been entered by the Illinois Steel Company. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.80c. to 1.90c., according to delivery; Track Bolts, 2.25c. to 2.35c., base, Square Nuts, and 2.40c. to 2.50c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—Last week's additions to tonnage in the hands of fabricators were light, there being but few of the pending contracts closed, none of which was of considerable importance. Among the minor jobs taken were 700 tons of bridge material from the Chicago, Milwaukee & St. Paul Railway, and two 200-ft. span bridges for California points secured by the American Bridge Company. The general contract for construction of a Y. M. C. A. Building, at Portland, Ore., was taken by J. A. Bowles; the building is to be of reinforced concrete, and will require 500 tons of Steel reinforcing Bars. Most of the inquiries received concern small building projects, but even these are developing slowly. The only new prospective business is a piece of Government work at San Francisco, which involves about 2000 tons for the building of piers and wharf sheds at Fort Mason. The dilatoriness displayed in the placing of several important contracts, known to be fully developed, can only be accounted for upon the theory that they are being held back in the hope of securing the benefit of a reduction in prices. It also seems probable that deferred purchases of Structural Material will have to be made in the near future by some fabricating interests whose commitments will not permit of much longer delay. In the meantime the mills are accumulating specifications slowly, and the local plant is still idle. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—Orders for Plates are not only scarce, but of small tonnage. In fact, there is no buying either by jobbers or manufacturers of anything more than is required for present use. Notwithstanding this condition of affairs, regular prices continue to be maintained except for some concessions that are being made by a few small mills rolling narrow sizes. We quote for mill shipments as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—In so far as it was expected that April would show a decided increase in new business over that of the preceding month, the results are disappointing. It is estimated, however, that while there have been no gains the final summing up of totals will show no considerable loss. The demand continues to be solely for small lots for quick shipment. Jobbers report a moderate demand in small orders, but stocks are on the whole moving slowly and are steadily being reduced. Store prices, we are advised, are being fairly well maintained; the only irregularity in mill quotations reported are from one to two small outside producers. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 and 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—The Bar situation shows no improvement as to demand. Steel Bars are extremely quiet, though specifications on Iron Bar contracts are coming out a little better, with a result that the mills of the Interstate Iron & Steel Company have now been in uninterrupted operation for nearly four weeks. Rerolling mills have been taking some business at extremely low prices, but it is reported that a little more firmness now exists among these interests. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—The tonnage of new business for April will not vary appreciably from that of March, and whatever difference there may be will be on the side of gain. Hand to mouth buying is still being practiced by both jobbers and consumers. Filling in orders of carload lots constitute the average purchase of even the largest distributers. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 71 per cent. on Black

Steel Pipe, ¾ to 6 in. From two to three points above these prices is asked for Iron Pipe.

Boiler Tubes.—All of the principal builders of boilers are working very short handed, and the demand for Merchant Tubes is therefore sharply curtailed. The railroads are likewise taking but few Locomotive Tubes, buying from this source consisting of small lots for repair work. No irregularities of importance are noted in prices, except for some shading done by one or two small mills. Mill quotations for future delivery, on the base sizes, are as follows: 2⅜ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	55	35	35
1½ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2¾ to 5 in.	50	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—There is little doing in any of the several lines included under this head. New business is confined to a few scattering orders of small tonnage, and specifications are being offered in a halting, reluctant way that indicates no pressing needs on part of manufacturers and jobbers. There is not enough business in Shafting to test fairly the stability of prices, which are reported to be somewhat firmer since the recent revision of discounts. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1¼ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 56 per cent. off in car lots; 52 per cent. less than car lots, base territory delivery.

Cast Iron Pipe.—The bulk of the business now being entered is coming from the smaller municipalities and water works plants, whose requirements rarely exceed a few hundred tons. Owing to the facility with which bonds for such enterprises can now be negotiated locally, a good many improvements of this nature are going forward. Several small lots aggregating about 1000 tons will be up for letting this week in Oklahoma towns. The general contract for the installation of about 350 tons required by the city of Collinsville, Ill., was let last week to T. C. Brooks & Son, Jackson, Mich. No action has yet been taken regarding the proposed advance of 25c. a ton in the rate of freight on Cast Iron Pipe in central territory north of the Ohio River. We quote, nominally, per net ton, Chicago, as follows: Water Pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25; with $1 extra for Gas Pipe.

Metals.—The entire list of Metals is dull and inactive, there being no demand from any source other than for small lots for immediate consumption. Prices have not sensibly declined, mainly because no attractive business has appeared to tempt concessions. Offerings of Old Metals are light, and, like new material, find a very limited demand from consumers. We quote as follows: Casting Copper, 13¼c.; Lake, 13¾c. to 14c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 33c.; small lots, 33½c.; Lead, Desilverized, 4c. to 4.25c., for 50-ton lots; Corroding, 5.35c. to 5.45c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 10½c., and other grades, 9¾c. to 10¼c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 11c.; Copper Clips, 11c.; Red Brass, 12c.; Yellow Brass, 10¼c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 25c.; Block Tin Pipe, 27c.

Old Material.—Practically all of the 4500 tons offered last week by the Great Northern Railroad is reported to have been taken by one dealer at prices close within the range of present quotations. About the only item in the list which exhibits firmness sustained by consumptive demand is Re-rolling Steel Rails; some round lots of this material have recently been purchased by local mills, one of which last week brought between 1500 and 1800 tons at $13.50, mill delivery, which is equivalent to practically $13.25, Chicago. Another small lot brought $13.50, Chicago. Influenced by the downward tendency of Pig Iron prices and the scant demand from melters, Cast Scrap is slightly weaker. Because of the absence of transactions in Car Wheels it is difficult to get a line on the true level of prices. One Western road is offering 3400 Wheels on which it has signified its willingness to accept $14 a ton, but so far without result. It is evident from the tenders of Melting stock being made by country dealers that they are becoming anxious to unload their holdings. Within the past few days one dealer has received offers on upward of 5000 tons of such material from outside sources. Much of this stock has been held for some time in the hope of realizing on an advance, but the present eagerness to sell would indicate that these interests are losing faith in the appearance of early improvement. No tonnage is being offered this week by the railroads. We quote, per gross ton, f.o.b. Chicago, as follows:

Old Iron Rail	$15.00 to $15.50
Old Steel Rails, rerolling	13.00 to 13.50
Old Steel Rails, less than 3 ft.	12.00 to 12.50
Relaying Rails, standard sections, subject to inspection	20.50 to 21.50
Old Car Wheels	13.00 to 13.50
Heavy Melting Steel Scrap	10.75 to 11.25
Frogs, Switches and guards, cut apart	11.50 to 12.00
Mixed Steel	9.00 to 9.50

The following quotations are per net ton:

Iron Fish Plates	$13.00 to $13.50
Iron Car Axles	16.00 to 16.50
Steel Car Axles	14.50 to 15.00
No. 1 Railroad Wrought	11.00 to 11.50
No. 2 Railroad Wrought	10.00 to 10.50
Railway Springs	11.00 to 11.50
Locomotive Tires, smooth	13.00 to 13.50
No. 1 Steers' Forge	9.00 to 9.50
Mixed Buckling	7.00 to 7.50
Iron Axle Turnings	5.75 to 6.25
Soft Steel Axle Turnings	5.75 to 6.25
Machine Shop Turnings	5.25 to 6.25
Cast Borings	4.50 to 5.00
Mixed Borings, &c.	4.50 to 5.00
No. 1 Mill	6.75 to 7.25
No. 2 Mill	5.75 to 6.25
No. 1 Boilers, cut to Sheets and Rings	7.00 to 7.50
No. 1 Cast Scrap	11.75 to 12.25
Stove Plate and Light Cast Scrap	10.00 to 10.50
Railroad Malleable	10.00 to 10.50
Agricultural Malleable	9.50 to 10.00
Pipes and Flues	7.75 to 8.25

The Chicago offices of Rogers, Brown & Co. have been moved from the Monadnock Block to the new Corn Exchange Bank Building, northwest corner of La Salle and Adams streets. A suite comprising rooms 1515 to 1530 on the fifteenth floor will be occupied by the firm.

Pittsburgh.

PARK BUILDING, April 29, 1908.—(*By Telegraph.*)

Pig Iron.—A feature of the market is the scarcity of Basic Iron for prompt shipment, and the price of $15.50, Valley furnace, is firmer than it has been for some time. Only one stack in the two valleys is running on Basic, and the consumption seems to be larger than the supply. Sales of Bessemer Iron continue to be only small lots for prompt shipment, but in a general way there is more inquiry. We quote Bessemer Iron at $16.25, Valley furnace, or $17.15, Pittsburgh. There have been some fair sized sales of Foundry Iron, but at low prices. The Westinghouse Electric & Mfg. Company has bought 300 tons of Foundry on the basis of $14.70, Valley furnace, for No. 2, while we note other sales of about 1200 tons of Northern No. 2 Foundry at $14.75, Valley furnace, or $15.65, Pittsburgh. We quote Northern No. 2 Foundry at $14.75 to $15, Valley furnace, some sellers refusing to shade the higher price. We quote Northern Forge Iron nominally at $14.50, Valley furnace, or $15.40 Pittsburgh.

Steel.—The Carnegie Steel Company and other makers of Sheet and Tin Bars report they are quite busy on these, but there is no demand for Billets and specifications against contracts are only fair. Regular prices, which the mills insist are being maintained, are $28, Pittsburgh, and $28.50, Youngstown or Wheeling, for Bessemer or Open Hearth Billets, while Sheet and Tin Bars take an advance over these prices of $1 a ton. Forging Billets are very dull, and are nominally $30, Pittsburgh.

Ferromanganese.—In the last few days the market has advanced about $1 a ton, and best grades of foreign 80 per cent. are now held at $43, at seaboard, or $44.95, Pittsburgh. There is a greatly improved inquiry.

(*By Mail.*)

Reports from agents in the West and Northwest of local Steel companies are to the effect that conditions in the Iron trade are showing betterment, but in the territory east of Chicago there has been no improvement. However, an encouraging feature is that there are more inquiries and consumers of Pig Iron are writing in asking for quotations on fair sized lots for delivery three or four months ahead. This is the first time in some months that this has been the case, and indicates clearly that consumers are more interested in the market. As yet actual sales of Pig Iron are mostly of small lots, although in the past week one local foundry has bought 1000 tons and another 300 tons of Foundry Iron, but at very low prices, lower than have been made in this market at any time since the decline started. Shipments of Pig Iron from the valleys for some weeks have been slightly larger than the output, and stocks have been gradually decreased. There is practically no demand for Billets, but the Carnegie Steel Company and other producers are fairly busy on Sheet and Tin Bars. In Finished Iron and Steel new business continues disappointing. While the demand for Tin Plate, Sheets, Pipe and Wire products is fairly active, this is offset to a large extent by the falling off in Structural Shapes, Plates and other forms of Finished Steel. The Coke trade is nearly stagnant. While some Scrap is moving, it has

been at the expense of prices, which are lower than for some time. The most encouraging feature in the general situation is the successful marketing of bonds by railroads, indicating that the financial situation has decidedly improved. The agricultural outlook is promising, and if the hope of good crops is realized it will do much to help the Iron trade as well as general business.

Muck Bar.—Spang, Chalfant & Co. have started up their Muck Bar mill, but will not sell any of the product in the open market, using it in their own Pipe mills. We do not hear of any sales of or inquiry for Muck Bar. We quote best grades made from all Pig Iron at nominally $27, Pittsburgh, but if any business was offering this price could be shaded.

Skelp.—The market is quiet, but there is fair specifying against contracts. Quite a number of Pipe mills are shut down for lack of orders, and this naturally decreases the demand for Skelp, which has been dull for some months. We quote Grooved Steel Skelp, 1.55c. to 1.60c.; Sheared Steel Skelp, 1.65c. to 1.70c.; Grooved Iron Skelp, 1.75c. to 1.80c.; Sheared Iron Skelp, 1.85c. to 1.90c., Pittsburgh.

Rods.—There is only a light inquiry, and sales are in small lots for nearby requirements. We continue to quote Bessemer Rods at $35, Open Hearth at $36 and Chain Rods at $37, f.o.b., Pittsburgh.

Steel Rails.—No orders of moment either for Standard Sections or Light Rails have been placed during the week. The three Edgar Thomson Rail mills of the Carnegie Steel Company, at Bessemer, are in operation, but are gaited to 35 per cent. or less of capacity. Regular prices on Light Rails, which continue to be shaded from $3 to $4 a ton by rerolling mills, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—Only routine orders for actual needs are being placed, the amount of new business going to mills being light. Inquiries for some Plates for Riveted Pipe for water lines are in the market. Prices are well maintained on wide Plates, but on narrow sizes are shaded $1 to $2 a ton by some mills. Regular prices are as follows: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼ in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in	.05
Plates over 110 to 115 in	.10
Plates over 115 to 120 in	.15
Plates over 120 to 125 in	.25
Plates over 125 to 130 in	.50
Plates over 130 in	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell grade of steel is abandoned.

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—A fair amount of work is in sight, but it is developing slowly. Reports are that very low prices are still being made on fabricated material, and that in some cases it has been furnished at very close to regular prices of plain material. We quote Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—There has been a perceptible increase in the demand for roofing and electrical Sheets, shipments of the mills on these grades being heavier than for some time. The demand for Black and Galvanized Sheets is also showing a slight betterment. Prices in the main are being held, but are sometimes shaded by a few mills that absorb part of the freight. Regular prices are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Cotton Ties.—Purchases of Cotton Ties do not compare favorably in volume with last year, and it is not believed that the demand will be equal to that of 1907. A good many contracts have been placed on which buyers are now specifying. We quote as follows: 3000 bundle lots and over, 85c.; less than 3000 bundle lots, 88c., f.o.b. Pittsburgh.

Hoops and Bands.—A fair tonnage against specifications is being received by the mills, but practically no new orders are being placed, buyers having covered themselves last January, when the mills guaranteed prices against decline. Regular prices are as follows: Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60, base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Tin Plate.—The American Sheet & Tin Plate Company has started its Demmler Works, at McKeesport, Pa., because of the heavier demand for Tin Plate, and is now operating upward of 90 per cent. of its total capacity. The independent mills are also doing better and are operating on an average of 75 to 80 per cent., so that present conditions in the Tin Plate trade, when compared with other lines, are quite satisfactory. Persistent reports that prices of Tin Plate were being shaded by rebates from the mills and other ways are strongly denied, the statement being made that official prices are being absolutely maintained. The outlook is for a good fruit year, and if nothing untoward happens to blight the prospects of business from the canning trade the Tin Plate mills expect that the demand for their product will be equal to or larger than that of last year. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Iron and Steel Bars.—A slightly better demand for both Iron and Steel Bars is noted, and we are advised by one or two leading mills that specifications against contracts are coming in much better. It is estimated that about 40 per cent. of the entire capacity of the country in Iron and Steel Bars is active at present, this being somewhat larger than in the early part of the year. The demand is mostly for small lots for actual needs of consumers, there being no disposition on the part of the large trade to contract ahead. While it is possible that a few small mills are shading the price of Iron Bars, it is stated that the leading producers are absolutely adhering to regular prices. There is also a report that the price of 1.60c., Pittsburgh, on Steel Bars is being shaded, but if this is true it is only by small mills that do not make a full assortment of sizes. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further west. Steel Bars remain very firm, at 1.60c., Pittsburgh.

Spelter.—Business is unusually light, and the tone of the market is weak. We quote prime grades of Western Spelter at 4.45c., East St. Louis, equal to 4.57½c., Pittsburgh.

Railroad Spikes.—The expected betterment in demand has not materialized, and new business in Railroad Spikes is quite small. We quote: Standard sizes, 4½ x 9-16 in., at $1.70, and the smaller sizes at $1.80 per 100 lb. in carloads and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Merchant Steel.—New business is confined to small, scattering orders, while specifications against contracts are light and disappointing. Not enough is being sold to test prices, which on the whole are weak. We quote Cold Rolled Shafting, on contracts for 100 tons and over, 57 per cent. off; carloads, 56 per cent. off, and less than carloads, 52 per cent. off, on which carload freight is allowed within base territory. Nominal prices on Merchant Steel are as follows: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 2.10c. to 2.15c. Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron, finished, 1½ in. and wider, 1.60c.; under 1½ in., 1.75c. Planished Tire Steel is 1.80c., all f.o.b. at mill.

Boiler Tubes.—There is a little more business being placed with the mills, actual orders in April showing a slight increase over March. Discounts on Merchant Tubes for small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in	42	47
1¾ to 2¼ in	42	59
2½ in	47	61
2¾ to 5 in	52	65
6 to 13 in	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Pipes and Tubes.—The demand for Galvanized Merchant Pipe is better than for some time. The large jobbing trade has been notified that there will be no change in prices for some time, and with this assurance from the mills new business is being placed a little more freely. Several fairly large Pipe lines are in the market, but the difficulty of getting these projects financed is holding them back. In some

cases mills have been offered payment in notes and other securities for projected Pipe lines that they have turned down. We are advised that regular prices are being maintained. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 74 and 5 per cent. off list, while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel P[illegible]

Merchant Pipe.

	Jobbers, carloads. Steel. Black.	Galv.
⅛ to ¼ in.	75	49
⅜ in.	77	53
½ in.	79	57
¾ to 6 in.	74	62
7 to 12 in.	70	55
Extra strong, plain ends:		
⅛ to ¼ in.	58	46
⅜ to 4 in.	62	50
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

Discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
⅛ and ¼ in.	63	49
⅜ in.	65	51
½ in.	67	55
¾ to 6 in.	71	61
7 to 12 in.	68	53
Extra strong, plain ends:		
⅛ to ¼ in.	56	44
⅜ to 4 in.	63	51
4½ to 8 in.	59	47
Double extra strong, plain ends:		
½ to 8 in.	52	41

Coke.—The output of Coke last week was about the same as in the previous week, the product of the Upper and Lower Connellsville regions having been 147,786 tons. There are 37,474 ovens in these two regions, of which 14,265 were active last week. In the Coke districts outside the Connellsville region the percentage of ovens in blast is much less and is not over 25 per cent. There is practically no demand for Furnace Coke, but occasionally some is sold for spot shipment, mostly Coke that is loaded on cars and has to be moved. Best grades of Furnace Coke for prompt shipment can be bought at $1.50 to $1.60, but other grades made outside the Connellsville region are sold as low as $1.35 to $1.40 at oven. Foundry Coke of the best grades is $2.10 to $2.25, and other makes are offered as low as $1.90, at oven. It is stated that a number of Coke concerns have about decided to blow out their ovens and keep them down until the demand materially improves.

Iron and Steel Scrap.—There is no improvement in demand, and the tone of the market is weak. Large consumers of Scrap like the La Belle Iron Works, Sharon Steel Hoop Company, Republic and others are running their finishing mills only intermittently, and this reduces very much the consumption of Scrap. One leading consumer came in the market recently and bought a fairly large tonnage for delivery over the next two or three months at relatively low prices. There has been an accumulation of Bundled Sheet Scrap, due to the fact that the Sheet mills are making better time than other Scrap producing plants, with the result that some low prices have recently been made. It is estimated that in the last month there have been sales of upward of 15,000 tons of Bundled Sheet Scrap sold by mills to Open Hearth plants at prices equal to about $8.50 at shipping point. Dealers quote other grades of Scrap as follows, per gross ton, at Pittsburgh, except as otherwise noted: Heavy Steel Scrap, Pittsburgh, Steubenville or Sharon delivery, $12.75 to $13; Cast Borings, $7.25 to $7.50; No. 1 Railroad Wrought, $13.25 to $13.50; No. 1 Cast, $14.25 to $14.50; Bundled Sheet Scrap, $8.50 to $9, at shipping point; Sheet Bar Crop Ends, $16 to $16.50; No. 1 Busheling Scrap, $12 to $12.25; No. 2, $9 to $9.25; Iron Axles, $19 to $19.50; Steel Axles, $16.50 to $17; Low Phosphorus Melting Stock, $16; Old Steel Rails, short pieces for Open Hearth use, $12.75 to $13; Rerolling rails, lower in price, $13.50 to $13.75; Machine Shop Turnings, $8 to $8.25; Grate Bars, $12 to $12.50; Railroad Malleable Scrap, $11.25 to $12. We note sales of upward of 1000 tons of No. 1 Busheling Scrap at a price equal to about $12, Pittsburgh; about 500 tons of No. 2 at about $9.25, Pittsburgh; 800 to 1000 tons of No. 1 Railroad Wrought Scrap at a price equal to about $13.25; 500 tons of Machine Shop Turnings at $8, Pittsburgh, and about 600 tons of Cast Borings at a price equal to about $7.75, Pittsburgh.

St. Louis.

ST. LOUIS, MO., April 27, 1908.

In a general way, it may be fairly stated that the situation is a little brighter, though far from normal. The consensus of opinion, however, is in the direction of a slow but steady gain.

Coke.—There is no material change in the demand, though contract customers are taking Coke faster in specifications. For future shipment, however, there is some improvement.

Pig Iron.—The inquiry is better, and the actual tonnage placed last week was larger than had been booked for some time. The Medart Patent Pulley Company, it is reported, placed an order for 1200 tons of Southern No. 1 Soft for shipment over last half. It is reported that an order for 1000 tons was closed for the vicinity of St. Louis, and an inquiry is out for 500 tons for third quarter.

Finished Steel.—The inquiry for finished product in any line is only for special requirements. The requisitions for assorted Bars and Shafting are light. Some of the railroads, it is said, are sending out dummy requisitions not representing actual needs, but for the purpose of getting prices. There being but little new work, the call for Tank and Boiler Plates is light, though there are indications of more doing in the near future. For Structural Material there is a quite a satisfactory inquiry, but no large tonnage is involved, being rather the aggregate of a number of small structures. The orders for the larger new jobs have not yet been placed. Bar specifications are now coming in better, owing to jobbers replenishing stocks, both as regards the local and outside trade. The inquiry for Rails is much larger than has been the case for some months.

Old Material.—The demand is in better shape, especially for Old Rails. Rerolling Rails are in good demand and railroads are offering less stock than the manufacturers are consuming at the present time. There is also a better demand for Car Wheels. With respect to Rails, it is reported that, in part, the demand is from dealers to cover sales made earlier in the season. We understand a leading St. Louis house has purchased about 2500 tons of 56-lb. Relaying Rails from a trunk line for Western delivery. Quotations are as follows, f.o.b. St. Louis, per gross ton:

Old Iron Rails	$15.25 to $15.75
Old Steel Rails, rerolling	11.50 to 12.60
Old Steel Rails, less than 3 ft.	11.50 to 12.00
Relaying Rails, standard sections, subject to inspection	22.50 to 23.50
Old Car Wheels	14.50 to 15.00
Heavy Melting Steel Scrap	11.50 to 12.00
Frogs, Switches, cut apart	11.50
Mixed Steel	10.25

Following quotations are per net ton:

Iron Fish Plates	$12.50 to $13.00
Iron Car Axles	16.00 to 16.50
No. 1 Railroad Wrought	11.75 to 12.25
No. 1 Railroad Wrought	10.75 to 11.25
Railway Springs	10.50 to 11.00
Locomotive Tires, smooth	12.75 to 13.25
No. 1 Dealers' Forge	9.00 to 10.00
Mixed Borings	7.50 to 7.60
No. 1 Boilers, cut to Sheets and Rings	8.50 to 9.00
No. 1 Cast Scrap	11.50 to 12.00
Stove Plate and Light Cast Scrap	10.00 to 10.50
Railroad Malleable	9.50 to 10.00
Agricultural Malleable	8.50 to 9.00
Pipes and Flues	8.75 to 9.25

Birmingham.

BIRMINGHAM, ALA., April 27, 1908.

Pig Iron.—Producers are more encouraged by reason of favorable reports on the condition of foundry trades and the fact that such reports are substantiated by larger proportions of inquiries, but the transactions recorded fail to indicate that the feeling of uncertainty as to prices, which has been such a prominent feature for months past, has disappeared. With the exception of one of the largest concerns, which has been practically out of the market for some time past, the schedule of $12, Birmingham, for No. 2 Foundry is established by all producers, but numerous reports are rife of offerings at lower figures, and in the absence of a firm demand for tonnage sufficient to test the strength of the market it cannot be definitely stated just what price could be had. Carload lots of No. 2 are frequently sold for $12, but lower grades have brought figures that would indicate $12.50 on a No. 2 basis. The instances referred to are a sale of Gray Forge at $10.75, furnace delivery, and an offer for 750 tons of No. 4 Foundry, which was declined by reason of a difference of 25c. per ton between the parties. It is to be noted that practically all accumulations of low grades in the district have been depleted. The sale of approximately 2100 tons of High Manganese Iron is reported at figures equivalent to $12 to $12.50 for No. 2 Foundry, and a recent sale of Charcoal Iron was made at $20 at furnace. The quantity engaged was 300 tons. Among the inquiries for Foundry Iron now pending are 3000 tons for delivery during the next three months, 2000 tons for third quarter delivery, and 1000 tons for delivery covering the remainder of the year. The only quotation known to have been made so far was on the first lot mentioned, which was $12, Birmingham. The concern that made the quotation, however, has practically no stock on furnace yards, and its order books are believed to be in good shape for advanced deliveries.

Cast Iron Pipe.—Within the week the tonnage placed in this district was comparatively small, but the outlook is still favorable, and there is no indication that capacity recently

put in operation will be suspended. The announcement that $5,000,000 in bonds will be issued by the city of San Francisco May 11 for water works extensions is received with satisfaction by Southern producers, and specifications for the material required will be awaited with interest. There are also three orders aggregating a significant tonnage for Cuban points to be placed upon satisfactory arrangement as to finances. The tonnage soon to be placed for Mexico is attractive, the points expected to enter the market being Pueblo and San Luis Potosi. A change in quotations is not authorized, and nominal quotations on Water Pipe are as follows, per net ton, f.o.b. cars here: 4 to 6 in., $23; 8 to 12 in., $22; over 12-in., average $21, with $1 per ton extra for Gas Pipe. These quotations are probably shaded on large contracts.

Old Material.—The Wrought and Cast Scrap as well as Stove Plate required by local foundries reaches fair proportions, but the demand for other grades is exceptionally light. Dealers manifest no disposition to force a market by making concessions, but in view of a declining Pig Iron market, the maintenance of present quotations is hardly probable. The absence of transactions prevents a revision of quotations. We quote nominally as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$16.00 to $16.50
Old Iron Axles	15.00 to 15.50
Old Steel Axles	13.50 to 14.00
No. 1 Railroad Wrought	13.00 to 13.50
No. 2 Railroad Wrought	10.00 to 10.50
No. 1 Country Wrought	11.50 to 12.00
No. 2 Country Wrought	10.50 to 11.00
Wrought Pipe and Flues	9.50 to 10.00
No. 1 Steel	11.00 to 11.50
No. 1 Machinery	10.50 to 11.00
Stove Plate and Light Cast	9.50 to 10.00
Cast Borings	6.00 to 6.50

Philadelphia.

PHILADELPHIA, PA., April 28, 1908.

Buying of both crude and finished materials during the past week has been practically at a standstill. Consumers who have not been compelled from necessity to make purchases have been withholding their business pending further action regarding the price of Pig Iron, the general opinion being that lower prices will prevail, and should this take place a readjustment of prices all along the line is anticipated. The ease with which the Pennsylvania Railroad has floated its $40,000,000 bond issue and the city of Philadelphia an issue of nearly $6,000,000 is encouraging from a financial standpoint. While a large portion of the railroad funds is to be applied for the completion of work already under way, that for the city will include a good share of new work. Hope is expressed that the success of these flotations will result in awakening interest on the part of railroads and industrial concerns as far as the completion of some of the work held up last fall is concerned.

Pig Iron.—The market has been extremely dull and buying, except in cases where it is absolutely necessary, has been pretty generally held up. Melters are inclined to withhold placing business, even for moderate tonnages, until the question of prices becomes more settled. Under the existing circumstances these cannot go higher, and if there is a reduction, of which there seems to be a strong probability, consumers wish to be in a position to take advantage of the lower price. Producers in the Schulykill and Lehigh valleys are still holding the base price, $18.25, delivered, for No. 2 X Foundry, and would not be able to meet the prices suggested recently by some of the Southern interests, and should the prices made by the latter prevail most of the few furnaces still in blast in this territory would be forced to blow out. Outside interests continue to take the bulk of the business offered at prices, which are practically unchanged, and which range from 50c. to $1 below the regular prices. We learn of no further shading on the part of the outside furnaces in the East nor of the Virginia furnaces. What would be done, however, if a good tonnage came out would be difficult to say, but it is intimated that if further concessions were necessary to land desirable specifications there would no doubt be furnaces that would shade their present rates. The Southern furnaces dominate the market at the present time. While there has been no very large business offered, it is reported that some Southern interests would be willing to cut $12, f.o.b. Birmingham, 50c. a ton for desirable orders. The Pipe interests are in the market for their usual tonnages of a few thousand tons, which at to-day's prices are generally taken by the Southern interests. The greater proportion of the orders taken in this territory has been for Foundry Irons, usually small lots of No. 2 X and No. 2 Plain, sales of which grades have been made by both inside and outside interests. There has been a little inquiry for Forge Iron, but no business of any moment has resulted. The Steel making Irons are a drug on the market. Until there is something more definite available regarding prices, the market for Pig Iron will no doubt continue dull and uninteresting. Prices during the week show but little change, the market not having been seriously tested. We quote the following range for delivery during the remainder of the second quarter, in buyers' yards, eastern Pennsylvania and nearby territory:

Eastern Pennsylvania, No. 2 X Foundry	$17.50 to $18.25
Eastern Pennsylvania, No. 2 Plain	17.00 to 17.75
Virginia, No. 2 X Foundry	17.50 to 17.75
Virginia, No. 2 Plain	17.00 to 17.25
Gray Forge	16.00 to 16.75
Basic	17.25
Low Phosphorus	23.00 to 23.50

Ferromanganese.—The demand has been extremely light, and buyers show but little interest. What business has been done was confined to odd lots for prompt shipments. Prices ranging from $43 to $44, Baltimore, are named, but it is believed that these would be shaded if desirable orders were to be had.

Steel.—New orders are few, and specifications on contracts are comparatively light. Mills are just about holding their own, although in some cases stocks are increasing materially. Practically all the business taken is for prompt shipment. Prices are being maintained for Philadelphia delivery, $29.20 being named for ordinary Rolling Steel, and $31.20 for Forging Steel with the usual extras for high carbons and large sizes.

Plates.—The business coming out is small. Orders are fairly numerous, but still confined to small quantities, individually, so that mills do not gain any in tonnage on their books. Large orders are scarce, and the outlook is hardly as good as it was some weeks ago. Prices are unchanged. We quote the following range for delivery in this territory:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼-in. and heavier. ing extras apply:	The follow- Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—A fairly even run of business continues to come out, most of which, however, is small. The Belmont Iron Works received a contract for the Structural work in connection with the Athletic Baseball Club's new grand stands, requiring some 500 tons. Other contracts were taken by the same company for bridge work in connection with the elevation of the tracks of the Pennsylvania Railroad in Camden, N. J. Inquiry has shown a little improvement, and revised estimates are being asked in some cases for work which was held up last fall. There is some talk of the erection of a large hotel in Atlantic City, N. J., but definite information is not yet available. The actual volume of new business is small and mills are not making any material gains in tonnage. Prices continue unchanged, 1.85c. to 2c. being named, according to specifications.

Sheets.—Business continues largely of a day to day character, and mills are just about able to maintain their output of 50 per cent. of the capacity. Orders are mostly for prompt shipment, there being practically no buying for forward delivery. Quotations range as follows, for mill shipments, with a tenth extra for small lots: Nos, 18 to 20, 2.50c.; No. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—Specifications on some of the low priced contracts for Bars have been coming out a little more freely, but very little business is being taken by mills at the established basis of 1.65c., delivered, for Refined Iron Bars. Quotations as low as 1.40c., Eastern mill, are still being made by merchants, and orders are reported as being taken at from 1.46c. to 1.57c., delivered. Mills are not very actively engaged, and have but little business ahead, buyers taking only such quantities as are needed for immediate use.

Coke.—Coke has been particularly quiet. Some few sales of Foundry Coke have been made at prevailing prices, but Furnace Coke is in light demand. Foundry Coke is quoted at $2.15 to $2.40 at oven, and Furnace Coke at $1.65 to $1.85 at oven. We quote the following range of prices for delivery in the Philadelphia territory:

Connellsville Furnace Coke	$3.80 to $4.00
Foundry Coke	4.30 to 4.55
Mountain Furnace Coke	3.40 to 3.60
Foundry Coke	3.80 to 4.10

Old Material.—The demand is light. Sales have been confined to odd lots for prompt shipment. Mills are taking no interest in the market and the trade is practically at a standstill. Not enough business has been done to establish quotations, and the tendency, if anything, is weaker. We

quote nominally for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory, about as follows:

No. 1 Steel Scrap and Crops	$12.75 to $13.25
Low Phosphorus	17.50 to 18.00
Old Steel Axles	17.50 to 18.00
Old Iron Axles	20.00 to 21.00
Old Iron Rails	17.00 to 18.00
Old Car Wheels	14.00 to 15.00
Choice No. 1 R. R. Wrought	15.00 to 15.50
Machinery Cast	15.00 to 15.50
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	8.75 to 9.25
Stove Plate	11.00 to 11.50
Cast Borings	7.50 to 8.00
Grate Bars	11.75 to 12.25

Cleveland.

CLEVELAND, OHIO, April 28, 1908.

Iron Ore.—Several rather indefinite inquiries for Ore have been received by the merchant firms during the past week, but it is believed that the inquiries were made more for the purpose of testing the market than with the idea of making any purchases at present. Efforts are still being made by some of the furnace interests to induce shippers to reduce the price of Ore, but with conditions as they are the Ore men do not expect much if any buying before well along in June, and for the present at least will not take up the matter of reconsidering prices. Those who are most active in urging lower prices are the furnace interests that have been able to keep their stacks in operation, and do not have a large quantity of last season's Ore still on hand. As an argument in favor of lower prices they say that with a reduction of $1 a ton on Ore the Northern furnaces will be able to meet any competition on the part of Southern producers should the latter decide to make further reductions in the price of Pig Iron. Navigation has opened on the lakes, but only a few boats have been started. The large freighters have not yet been fitted up, and according to the present outlook the movement of Ore down the lakes will not start until about July 1. It had been the intenion to begin shipments about June 1, but it does not look as if there would be any cargoes ready by that time. Vesselmen say that even if the start is delayed until July 1 the boats will have no trouble in bringing down all the Ore that is needed before the close of navigation. Nothing has been done as yet in regard to fixing the Ore carrying charges for the season. Following the action of the dock managers at Lake Erie ports last week declaring for the open shop on the Ore and Coal docks, there has been considerable increase in the shipments of Ore from the docks to the furnace yards. The agreement between the dock managers and the 'longshoremen expires May 1, and the open shop policy goes into effect on that date. In view of a possibility of labor troubles, some of the furnace interests have been rushing considerable Ore from the docks to the furnace yards during the past few days. Prices for 1908 delivery at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.20; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—There is no improvement in the demand. The $15 price of No. 2 Northern Foundry, Valley furnace, has been shaded slightly in some sales. A report that appeared in another publication last week to the effect that a Cleveland foundry had bought 1000 tons of Northern No. 1 Foundry on the basis of $14.45, Valley furnace, for No. 2, proves incorrect. There is practically no demand for Foundry Iron in this territory, even in car lots, but a few good inquiries have come into the market during the week from other territories. There is one inquiry for 2000 tons of No. 2 Northern Foundry from a consumer in the Buffalo District, the delivery of 500 tons wanted per month for four months. There have also been several inquiries for Foundry Iron for last half delivery. Some of these inquiries have come from the East, others from Ohio, and one from western Pennsylvania. Some of these inquiries, however, are believed to have been made for the purpose of testing the market. In reply to inquiries a local furnace is quoting No. 2 Foundry at $16, furnace, for last half delivery. Furnaces are not disposed to quote the present low prices for delivery to cover the balance of the year. For Cleveland delivery local furnaces are asking $16.35, delivered, for No. 2. The melt in this territory shows no improvement, and shipping orders on old contracts are still light. No sales of Southern Iron are reported. For prompt shipment we quote, delivered Cleveland, as follows:

Bessemer	$17.25
Northern Foundry, No. 1	$16.10 to 16.85
Northern Foundry, No. 2	15.90 to 16.35
Northern Foundry, No. 3	15.40 to 15.85
Southern Foundry, No. 2	15.85 to 16.35
Gray Forge	14.90 to 15.40

Coke.—The market continues quiet, the only sales during the week being small lots for spot shipment. Some low prices are reported. We quote Connellsville Furnace Coke for spot shipment at $1.50 to $1.60, at oven. A local furnace bought a small tonnage at the former price. We quote Connellsville 72-hr. Foundry Coke at $2 to $2.25, at oven, for spot shipment.

Finished Iron and Steel.—Although a few of the mills report a little improvement in small orders and specifications, the situation remains practically unchanged and the demand is still quite light. The Union and Empire rolling mills, Cleveland, started up this week after a shutdown of two weeks, having accumulated enough orders to keep them running this week and possibly next. Although some Iron Bars are being sold on the basis of 1.40c., Pittsburgh, the majority of the mills are firmly maintaining the base price of 1.50c., Pittsburgh. Steel Bars are firm at 1.60c., Pittsburgh. Specifications are expected in a few days from the Lake Shore Railroad for 10,000 kegs of Spikes on an order given last year which was not completed. Prices on the narrower sizes of Plates are being cut $2 a ton and price concessions of $1 to $2 a ton are being made on Sheets by some of the smaller mills. The demand for Sheets and Plates shows no improvement. The American Shipbuilding Company has nearly all boats under contract for 1908 delivery practically completed, and specifications from that company are about cleaned up for the season. The demand for Structural Material is light. The building outlook in this territory is unsatisfactory and few buildings will be erected this season that will requre much Steel in their construction. The general contract for two bank buildings to be erected in Youngstown has been awarded to the Thompson-Starrett Company, New York, and the order for the Structural Material will be placed in that city. About 600 tons will be required. Warehouse business is still light, but jobbers' stock sales in April will show up slightly better than in March. Warehouse prices are unchanged. We quote Iron Bars at 1.50c. to 1.60c., Cleveland, for car lots; Steel Bars, 1.70c., Cleveland, for car lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼-in. and heavier, 1.80c., Cleveland. We quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Jobbers quote Steel and Iron Bars at 1.70c. to 1.80c. Beams and Channels out of stock are 2.10c. to 2.15c., base. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—The market continues stagnant, there being no demand for any kind of Scrap outside of an occasional sale of a car lot. As a result of the starting up of the local rolling mills this week some demand is looked for from this source, but the buying is expected to be only in limited amounts for immediate needs. Local foundries are buying no Cast Scrap, and the demand from outside melters is very light. Prices seem to remain about stationary, but in the absence of definite sales on which to base prices all quotations are mainly nominal. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$11.00 to $11.50
Old Iron Rails	15.00 to 16.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	13.00 to 13.50
Relaying Rails, 50 lb and over	21.00 to 22.00
Heavy Melting Steel	11.00 to 11.50
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	7.50 to 8.50

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	6.00 to 7.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	10.50 to 11.00
No. 1 Railroad Wrought	12.00 to 12.50
No. 1 Cast	12.00 to 12.50
Stove Plate	10.00 to 10.50
Bundled Tin Scrap	8.00 to 9.00

Cincinnati.

CINCINNATI, OHIO, April 29, 1908.—*(By Telegraph.)*

To the close observer of the markets it is apparent that the first month of the second quarter closes a little better in inquiry and sales, but considerably weaker in price, than it opened. The gulf that divides the halves of the year is none the less difficult to bridge, however, and if anything there is less conjecture on the part of the consuming interests, which seem to be resting on a confidence born of a feeling that prices on everything will go off considerably during that period. On finished material there is less disturbance in this market probably than in any other part of the country. In Pig Iron the Southern producers undoubtedly hold the key to the situation. The hand to mouth policy still prevails with buyers, and such inquiries as are coming out are confidently classed as feelers, and actual transactions are scarce. There is no difficulty experienced in obtaining money. The worst feature of the prevailing lassitude among tool manufacturers is the almost total absence of interest among buyers, there being no trouble in labor ranks nor price cutting evils to contend with as far as can be ascertained.

Pig Iron. A majority of the dealers acquiesce in the opinion that the melt is increasing slightly. Iron is being moved a little more freely on contract, but reports indicate [illegible] business made by producers in the valley districts during the past week. A sale of about 1000 tons of Basic to a southern Ohio Steel maker is accredited to a valley interest at something like $16.50, delivered. Another sale of 100 tons each of Nos. 1, 2 and 3 Foundry to a prominent Pittsburgh interest at $14.70, Valley furnace, is reported. While several of the larger Birmingham furnace interests are holding for $12 and even $12.50 on No. 2 Foundry, it is conceded that $11.75 is being done and even $11.50 is reported. It is difficult to secure a price on the lower grades for the reason that there is a scarcity of Forge and Mottled on Southern yards, while the demand is practically nil. There is plenty of talk of $10 Iron for the second half, but sellers speaking with apparent authority say that practically all of the Southern furnaces still in blast will be blown out on the approach to such a price. There seems to be some interest in High Silicons, with the Southern product most in evidence on a basis of about $18 at furnace for 8 per cent. Jackson County Silveries are still quotable at $18.50 for 8 per cent. A northern Ohio melter is asking for a price on 900 tons of Malleable covering six months' delivery, but this is generally regarded as a feeler. A central Ohio consumer wants 100 tons of No. 4 Foundry for prompt shipment, and a Detroit melter is figuring on 300 or 400 tons of Foundry Iron for early delivery. A 30 days' option on 500 to 1000 tons of analysis Iron asked by a Chicago melter is not expected to develop a price, as furnaces generally evince a determination to avoid this class of business. For immediate delivery and balance of the second quarter we quote f.o.b. Cincinnati, freight rates being $3.25 from the Birmingham and $1.20 from the Hanging Rock District, as follows:

Southern Coke, No. 1	$15.50 to $16.00
Southern Coke, No. 2	15.00 to 15.50
Southern Coke, No. 3	14.50 to 15.00
Southern Coke, No. 4	14.00 to 14.50
Southern Coke, No. 1 Soft	15.50 to 16.00
Southern Coke, No. 2 Soft	15.00 to 15.50
Southern Coke, Gray Forge	13.50 to 14.00
Southern Coke, Mottled	13.00 to 13.50
Ohio Silvery, 8 per cent. Silicon	19.70
Lake Superior Coke, No. 1	16.70 to 17.20
Lake Superior Coke, No. 2	16.20 to 16.70
Lake Superior Coke, No. 3	15.70 to 16.20
Standard Southern Car Wheel	22.25 to 22.75
Lake Superior Car Wheel	22.00 to 22.50

(By Mail.)

Coke.—From reports received in this market the opinion is offered that only 35 to 40 per cent. of the ovens in the Coke fields producing the bulk of the supply for the entire country are in blast; but that these figures do not represent the output, which is still less, comparatively speaking. If there is any Furnace Coke in demand or selling it is not in evidence in this market. From $1.70 to $1.85, at oven, is given as the price on Connellsville Furnace grades, as near as it can be estimated on a listless market. Choice Foundry grades range from $2.10 to $2.40, at oven, for favorite brands, except New River, which is quotable at $2.75 to $3.

Finished Iron and Steel.—Dealers are feeling a little better, as inquiries on some lines are improving materially. In this class are specifications on Structural Shapes, which come principally from the South. The assurances of the Carnegie Steel Company guaranteeing prices on Steel Bars to the close of the year have apparently had a stimulating effect on that commodity. Iron Bars are unsettled, but as all the interests in this section have been lined up successfully, it is felt that the situation will improve steadily. There is a good demand here for Boiler Tubes, and mill prices are as follows: 1¾ to 2¼ in., 57.50, with 5 off; 2½ in., 59.50, with 5 off; 2¾ to 5 in., 63.50, with 5 off. Prices are carload lots and f.o.b. Cincinnati. For stock shipment the 1¾ in. is quoted at 54, the 2½ in. at 56 and the 2¾ in. at 63. Dealers are confidently expecting a good movement on Boiler Plates within 30 days. Orders from stock on other lines are filled by local dealers at the following prices, which are f.o.b. Cincinnati: Iron Bars, carload lots, 1.65c., base, with half extras; small lots from store, 1.85c., base, half extras. Steel Plates, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2c. Blue Annealed Sheets (Heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.20c. No. 12, carload lots, 2c.; small lots from store, 2.30c. Sheets (Light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.20c.

Old Material.—The Scrap market is, if possible, still weaker, with dealers beginning to show a disposition to push sales at slight recessions. The mills are still disinclined to buy, and all dealers are heavily stocked. The feeling, however, is that when the revival does come they will be well recompensed for holding their purchases. Prices, as nearly as they can be gauged from the existing situation, are as follows and are f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$10.50 to $11.50
Cast Borings, net ton	4.00 to 5.00
Heavy Melting Steel Scrap	11.00 to 11.50
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	14.50 to 15.50
Old Iron Rails, gross ton	13.00 to 14.00
Old Steel Rails, long, gross ton	11.00 to 12.00
Old Steel Rails, short, gross ton	11.00 to 12.00
Relaying Rails, 56 lb. and up, gross ton	21.00 to 22.00
Old Car Wheels, gross ton	12.00 to 13.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00

New York.

NEW YORK, April 29, 1908.

Pig Iron.—There has been little demand, and outside of one sale of about 2000 tons to a Pipe interest, there have been no transactions of any importance. The majority of the leading furnace companies are adhering to the prices established some time since, but there is enough outside Iron offering at considerably lower prices to take care of the current demand. Another meeting is to be held on the 7th of May of the Pig Iron and Iron Ore committees. We quote, at tidewater, as follows: No. 1 Northern Foundry, $17.75 to $18.50; No. 2 Northern Foundry, $17.25 to $18.25; No. 2 Plain, $16.75 to $17.25. Alabama Irons are $17 to $17.50 for No. 1 Foundry, and $16 to $16.50 for No. 2 Foundry.

Steel Rails.—One mill reports scattering orders, amounting to 3000 tons for the week. No new large business is under consideration, apparently, though it is understood that the New York Central has still some business to place for 1908.

Structural Material.—The manufacturers of Structural Steel find signs of betterment in the amount of new work on which estimates are being asked. It is believed that as the money situation and the matter of confidence have had more to do with the cutting down of construction than has the price of Steel, the fact that more money is now being invested than at any time since the October panic will have a favorable effect upon the Structural market. In New York City two important contracts that have been pending for some time are likely to be closed at an early day, and new school house work, long delayed, will be taken up in the next few months, through the passing of the necessary bond legislation last week. Considerable Steel will be needed for these buildings. In bridge work the week has brought out some business in the East, the American Bridge Company taking the Lehigh Valley viaduct over the Central of New Jersey—600 tons—and a 600-ton addition to the B. & O. contract for the Havre de Grace, Md., bridge. The Lake Erie & Western has placed 200 tons with the same company. In the West the principal bridge work pending is in additional amounts for the Chicago & Northwestern and the Chicago, Milwaukee & St. Paul. At Princeton, N. J., 600 tons of Steel will be required for a new geological and biological laboratory. For the month of April, which has seemed one of meager business in comparison with the 100,000-ton months of a year ago, it is expected that the principal fabricating company will book about 20,000 tons, while it will probably be found that outside interests have booked as much. On mill shipments, delivery at tidewater, our quotations are as follows: Beams, Channels, Angles, and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—Jobbers and brokers continue to supply buyers of Bar Iron at 1.50c., New York, or even lower, so that mills are taking but little business at the nominal standard price of 1.50c., Pittsburgh, or 1.66c., New York. The consumption is still light, and the mills that are active are only running at part capacity. Some quite important mills in this territory have not turned a wheel for a month or more. Steel Bars are held at 1.60c., Pittsburgh, or 1.76c., tidewater.

Plates.—Although local sales agents are receiving a rather larger number of inquiries than last month, buyers are slow to close and sales are far apart. Prices are firmly held as follows on standard sizes of Plates, at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—The city of New York will this week advertise for about 4000 tons of Water Pipe for Manhattan and Brooklyn. The municipality is buying much less this year than usual. Current transactions appear to be confined to small quantities, it being only occasionally that a lot is purchased as large as 200 or 300 tons. On quantities of even this moderate size competition is keen and prices are made close to foundry costs. Carload lots of 6-in. can be had at $23.50 to $24 per net ton, at tidewater.

Old Material.—The local market is in about the same condition that has characterized it for the past 30 days.

Some grades are perhaps a trifle firmer, but the market is slightly firmer. About all the business now being done is in lots of one or two carloads. Steel Scrap at low figures is possibly in better demand than other classes of Old Material. The Steel works are ordering shipments on contracts rather more freely than some time ago. Heavy Cast Scrap and Stove Plate are exceedingly dull, and will perhaps remain so as long as Pig Iron can be had at such reasonable prices. No. 1 City Wrought is quiet, but the accumulations in local yards are light. The rolling mills are practically out of the market, as they are either idle or are purchasing stock directly from railroad companies. It is observed that speculative interest in Old Car Wheels is manifesting itself, as this class of material is considered cheap at present prices. As the Car Wheel foundries are doing little or nothing, the railroad companies are obliged to part with their Old Wheels at the best offers received from speculative buyers. Cast Borings and Wrought Turnings are in somewhat better demand, and can be sold at a trifle more than the prices prevailing two weeks ago. These grades of Scrap are in lighter supply than usual, as a result of the inactive condition of machine shops and factories. Quotations are about as follows per gross ton, New York City:

Old Girder and T Rails for melting	$9.50 to $10.50
Heavy Melting Steel Scrap	9.50 to 10.50
Old Steel Rails, rerolling lengths	10.50 to 11.50
Relaying Rails	19.00 to 20.00
Old Iron Rails	14.00 to 15.00
Standard Hammered Iron Car Axles	16.00 to 17.00
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	11.50 to 12.50
Iron Track Scrap	9.50 to 10.50
No. 1 Yard Wrought, long	10.50 to 11.50
No. 1 Yard Wrought, short	9.50 to 10.50
Light Iron	5.00 to 6.00
Cast Borings	4.50 to 5.50
Wrought Turnings	6.00 to 7.00
Wrought Pipe	9.00 to 10.00
Old Car Wheels	14.00 to 15.00
No. 1 Heavy Cast, broken up	13.00 to 14.00
Stove Plate	9.00 to 10.00
Locomotive Grate Bars	9.50 to 10.50
Malleable Cast	10.00 to 11.00

Owing to the growth of its scrap iron and steel business, the Morton B. Smith Company, 243 Front street, New York, has found its present offices too small for this department, and has rented offices in the Market & Fulton National Bank Building, 81-83 Fulton street, where this branch of the business will be carried on after May 1. The metal business will remain in its present location with offices and warehouse at 243 Front street.

The Warren Foundry & Machine Company has removed its New York offices from 170 Broadway to the Trinity Building, 111 Broadway.

Metal Market.

NEW YORK, April 29, 1908.

Pig Tin.—The market was very dull until Tuesday when business picked up, and about 300 tons were sold on that day alone. To-day prices have advanced ¾c. Rumor has it that the American Sheet & Tin Plate Company is buying. It would certainly seem as if the Tin Plate manufacturers were in need of metal, as that business is very active. Price changes during the week moved toward lower levels, until to-day, as follows:

	Cents.
April 22	31.70 to 31.75
April 23	31.90
April 24	31.85
April 27	31.75
April 28	31.40 to 31.50
April 29	32.25

It is difficult to measure the statistical position as estimates of deliveries into consumption in April run all the way from 3000 to 3400 tons. Taking into consideration the good volume of business yesterday, however, it would not be surprising if they were between 3300 and 3400 tons. The arrivals so far this month are 3280 tons and the afloats 1881 tons. The London market closes firm and higher at £144 5s. for spot and £143 for futures.

Copper.—Some business has been done on a slightly lower basis, but prices do not recede without marked resistance. Sales were reported on Tuesday at 12.62½c., net cash for Electrolytic, and on the same day in another quarter 12.75c. was refused for delivery, 30 days. The general market, however, is 12.75c., net cash. Lake appears to be very firmly held at 13c., but there is little or no business doing. It looks as though there was an effort being made to sustain the Lake prices. Casting grades are quotable at 12.50c. to 12.62½c. The market has been under pressure now for about a month, and it has been hard to drive prices down to the old low figures in spite of the increased production which is bound to come from the Butte camp during the last half of the year. Consumption in this country has apparently not increased much, and there are many conflicting reports about the amount of metal held by consumers. The consensus of opinion is that they have not bought much on speculation, and have little metal on hand. Authorities vary as to consumption, but it is estimated that 30,000,000 lb. a month would cover the domestic melting. Six months have passed since the panic, and while industrial conditions are worse instead of better, financial conditions have improved materially, and there is no danger of loans on Copper metal being called now as was the case last year. Months ago it was pointed out that no permanent upward movement could be expected until after financial conditions changed to permit railroads obtaining funds on more satisfactory terms. Although the first corner has been turned, it does not necessarily follow that all will be able to so satisfactorily obtain the funds for improvements not as urgent now as a year ago. The exports of Copper may reach 30,000 tons this month, as 26,620 tons were reported up to April 28. The stocks of Copper which are held, and no one denies that the stocks are large, are not concentrated in any one country, considerable being in Continental Europe, a large amount in the United States and quite a little in Japan. It is inconceivable that the scattered holders, all of whom are now in a strong financial position, would attempt to sell at the same time. The London market is 12s. 6d. lower than last week at £57 7s. 6d. for spot and £58 for future. There is some Electrolytic in London at £59, but this is Japanese, and American Electrolytic is there quoted at £60.

Lead.—The American Smelting & Refining Company advanced prices 10 points April 28, making its price in New York 4.10c. This interest has been the cheapest seller for weeks, and ouside producers who had been quoting 4.05c. promptly advanced their price to 4.10c. The St. Louis market is very firm at 4c.

Spelter.—An advance of 5 to 10 points in the Spelter market is largely attributed to rumors that some large producers of common Western brands are seeking to test the foreign market. Since the formation of the Spelter Syndicate on the Continent prices in Europe have been fairly steady, and the present quotation for Spelter in London is £21, equivalent to about 4.62c. With Prime Western brands quoted at 4.57½c., St. Louis, there would have to be considerable concessions, but should the movement be accomplished it would work for higher prices in this country. Some conferences have been held in New York this week between producers and exporters with that view in mind. Domestic business is dull, and, as stated, Prime Western brands are quoted at 4.57½c., St. Louis, and 4.70c., New York.

Ferroalloys.—Prices of Ferromanganese are quoted higher, at $44 to $45, seaboard, but there has not been sufficient business to really test the market, and perhaps lower figures could be secured either for round lots or at a firm offer. A Buffalo steel company has inquiries in the market for 1200 tons, but this may be more to test the market than for actual requirements. Prices of 50 per cent. Ferrosilicon are again lower, and $75 has been done for stray lots. Importers, however, are asking $80.

Nickel.—Prices are without change, at 45c., for ton lots, and 50c. to 60c., for smaller quantities.

Antimony.—The unsatisfactory conditions continue, and prices are without change at 8.75c. to 9c., for Cookson's; 8.75c., for Hallett's, and 8.50c., for outside brands.

Tin Plate.—Business is maintained in good volume, and prices are firm. For 100-lb. IC Coke Plates, $3.89 is quoted, New York, and $3.70, Pittsburgh.

Old Metals.—The demand is light, and dealers' selling prices are lower, as follows:

	Cents.
Copper, Heavy and Crucible	12.00 to 12.25
Copper, Heavy and Wire	11.75 to 12.00
Copper, Light and Bottoms	11.25 to 11.50
Brass, Heavy	9.25 to 9.50
Brass, Light	7.25 to 7.50
Heavy Machine Composition	11.50 to 11.75
Clean Brass Turnings	8.25 to 8.50
Composition Turnings	9.00 to 9.50
Lead, Heavy	3.90
Lead, Tea	3.65
Zinc Scrap	3.50

Removals in the Metal Trade.

The American Smelting & Refining Company has moved to the City Investing Building, 165 Broadway.

Robert W. Conklin, sales agent of the Granby Mining & Smelting Company, has moved to Room 1412, City Investing Building, 165 Broadway.

W. A. Locke has moved to 99 John street.

Iron and Industrial Stocks.

NEW YORK, April 29, 1908.

A sharp upward turn in all security prices followed the announcement in the past week of the successful placing of several bond issues of which the principal one was that of the Pennsylvania Railroad Company for $40,000,000. This was accepted as an emphatic indication of returning confidence among investors, and hailed as a harbinger of better

times. The advance in a number of stocks was strikingly large. The range of prices on active iron and industrial stocks from Thursday of last week to Tuesday of this week was as follow: United States Steel common 34⅞ to 37, preferred 99¼ to 101¾; Car & Foundry common 33 to 34⅝, preferred 94½ to 96½; Locomotive common 45⅞ to 47½, preferred 97⅞ to 100; Steel Foundries common 6¾, preferred 32¾ to 34; Cambria Steel 29½ to 30½; Colorado Fuel 24 to 25⅛; Crucible Steel common 5⅛ to 5⅜, preferred 37¼ to 39¼; Pressed Steel common 23½ to 30, preferred 80 to 86; Railway Spring common 33⅞ to 35; Republic common 16¾ to 18⅛, preferred 66¼ to 68¾; Sloss-Sheffield common 43⅛ to 46; Cast Iron Pipe common 24½ to 26, preferred 71⅛ to 72¾; Can common 5 to 5¼, preferred 50⅞ to 56. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 36⅜, preferred 101, bonds 97¼; Car & Foundry common 35½, preferred 96⅜; Locomotive common 47½, preferred 100; Colorado Fuel 24⅝; Pressed Steel common 30, preferred 85; Railway Spring common 37¼; Republic common 17⅜, preferred 67⅞; Sloss-Sheffield common 45¼; Cast Iron Pipe common 25½, preferred 71⅜; Can common 5, preferred 55.

Dividends.—The Warwick Iron & Steel Company has declared a semiannual dividend of 3 per cent., payable May 15.

The Western Electric Company has declared a quarterly dividend of 2 per cent., payable May 1.

The Pressed Steel Car Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable May 27.

The United States Steel Corporation has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable June 1, and ½ per cent. on the common stock, payable June 30.

The La Belle Iron Works, Steubenville, Ohio, has declared a quarterly dividend of 2 per cent., payable May 1.

The Sault Rail Mill Shuts Down.

TORONTO, April 25, 1908. Since Saturday last the open hearth plant, the Bessemer plant and blooming mill of the Algoma Steel Company, Sault Ste. Marie, have been out of operation, and their closing down was shortly followed by that of the company's rail and finishing mill. The reason officially given for the suspension is the condition of the rail market. Though there is to be much railroad building in Canada this year, intending buyers have not been forward with their orders. A twelvemonth ago the situation was very different. At that time and for two years previous, railroad companies were glad to get rails at almost any price, certainty and promptness of delivery being then of more moment than lowness of price. Now, however, instead of a dearth there is apparently a surplus of rails. Railroad companies have advantageous offers from makers outside of Canada, and Canadian makers must give up some of the benefit of their protection to get the business. On American rails the duty is $7 a ton, and on British rails it is $4.66 2-3. It is believed that the placing of contracts for a large tonnage will not be long deferred, now that the season for the opening of navigation has arrived. The railroad builders in this country are not crippled by lack of funds. The Canadian Pacific Railway Company's cash resources are particularly ample, and its credit is high. The Grand Trunk Pacific has all the money it needs, its latest offering of bonds being readily underwritten in London. As the builder of the Eastern Division of the National Transcontinental Railway, the Dominion Government has the excellent credit of Canada to draw on.

That the Algoma Steel Company is confident that rail orders will be forthcoming may be inferred from the fact that its blast furnaces are continuing in operation. They will go on turning out pig iron for the steel plant. There is little danger of an excessive accumulation of pig iron, for the company's steel plant has a consumptive capacity beyond the limit of the blast furnaces' output. To keep the rail mill going steadily for any long period the company is obliged to supplement its own supply of pig iron by purchases. At the present time, when rail orders are being held back, the company does not consider it advisable to import pig iron and pay the duty thereon. To add thus to the cost of producing the rails before it can be known whether high or low prices await the rails, might not be prudent. At all events the company prefers to accumulate pig iron of its own make to accumulating rails made partly from imported pig iron.

On the main line of the National Transcontinental Railway construction is to be pushed this season, both in the East and in the West. The Government has placed under contract the long section between Winnipeg and the point at which the company's branch from Fort William is to be met. On that branch the steel is to be laid this summer. Other sections of the Eastern Division will be made ready for the rails this year. On the Western Division a large tonnage will be laid. Besides the main line, there are tributary lines to be built. The Railroad Committee of the Canadian House of Commons recently reported in favor of the granting of two years' extension of time to the Grand Trunk Pacific Branch Lines Company for the building of its feeders to the main road. Altogether these feeders are to have a trackage of 5000 miles. In the act incorporating the company, in 1903, it is provided that the work shall be under way in five years. The time is now practically up, and the company has asked two years more, which, being recommended by the Railroad Committee, will probably be granted. Representatives of the company stated to the committee that contracts are to be let this summer for five of the branch lines in the Northwest. C. A. C. J.

Hardening High Speed Steel.—At a recent meeting of the Liverpool Engineering Society, Liverpool, England, H. H. Hill read a paper on "High Speed Steel," in which he called attention to some of the most recent advances in its application. His remarks with regard to hardening were especially interesting. He said there were several points to be closely observed if uniformly good results were to be obtained, and the critical temperatures could only be caught with precision by the aid of a pyrometer. In large furnaces the thermo-electrical, the most simple of the electric pyrometers, had but a limited sphere of usefulness, as it could only indicate the temperature of the area where it happened to be fixed, a temperature which would probably bear no relation to the other areas of the same furnace. A simple form of sentinel pyrometer offered many advantages, and by suitably arranging the hearth with a number of maximum and minimum sentinels the whole series of varying hardening areas could be controlled in the same furnace at the same time; an advantage which could not be overestimated where large furnaces were used. For intermittent hardening they were also an ideal arrangement. A tool hardened on these absolute lines would do three times the work of one which had only been approximately correctly heated.

The old iron ore mines in the vicinity of Boyertown, Berks County, Pa., may be reopened for the supply of Schuylkill and Lehigh valley furnaces. These mines, which have been operated at intervals for over 150 years, yield a fair quality of ore, and extensive tests are said to indicate a greater area than hitherto imagined. Over 1000 acres of farm land have been put under option, the mineral rights being mentioned expressly.

The Standard Bridge Tool Company, 709-10 Curry Building, Pittsburgh, is building a Thomas No. 2 spacing table for the Dominion Bridge Company, Montreal, Canada, a similar machine for the Modern Steel Structural Company, Waukesha, Wis., and a large spacing table for the Chicago Bridge & Iron Works, Chicago, for use on large work.

With a view to constructing a hydro-electric power plant the Little Wolf Power Company, Oshkosh, Wis., has been incorporated with a capital of $250,000. The promoters expect in the near future to develop this project and transmit current to Oshkosh. Leander Choate is president; Casper Faust, vice-president; F. H. Josslyn, secretary; E. H. Steiger, treasurer.

The National Association of Brass Manufacturers will hold its semi-annual meeting in Toronto, Canada, on Tuesday and Wednesday, June 9 and 10, which is the week during which the American Foundrymen's Association and foundry supply interests will meet in that city.

The Goshen Iron Company announces that its offices have been removed from Wilmington, Del., to its blast furnace at Goshen, Va.

The Machinery Trade.

NEW YORK, April 29, 1908.

A hopeful view of the future is the most encouragement afforded the machinery trade in this district; the general conditions prevailing and the amount of business being transacted are such as to indicate no immediate improvement from the present dullness. In the past week no developments were reported that would stimulate trade, and some important interests say that nothing is in sight in the way of projects that will require the purchase of a considerable amount of machinery this spring, aside, of course, from Government work. Both dealers and manufacturers are doing but little business and the majority of them report a small volume of orders and inquiries, with the aggregate no larger than that of the previous weeks. The opinion is that no marked increase in business can be expected for some months. It is certain that the larger interests will have to come into the market before trade shall become more active. The railroads, which are such an important factor in the machine tool trade, are still adhering to the retrenchment policy. Among the roads which are being followed closely is the Pennsylvania Railroad, which will require a great deal of mechanical equipment for its New York improvements. It is hoped that part of the proceeds from the new $40,000,000 bond issue will be used for the work.

There has been quite a demand for equipment for canning factories in this market of late, and some houses that make special machinery in that line have done a fair month's business. The power men, of course, have been getting some business from that source too. Much of the purchasing has been done for plants on the Western coast, and the machinery has principally been sent to fruit canning establishments.

Although the Panama Canal Commission has about completed its large purchases of machine tools and similar shop equipment, it is expected that it will not be long before some large buying will again be done, although purchasing will be for a different line of equipment. Judging from specifications which are now being prepared, according to machinery men who are watching the future closely, bids will soon be asked for on a large amount of cement making and construction equipment. This will, of course, include some power apparatus, conveying machinery and like equipment, and as the concrete work to be done in the canal zone will be extensive the buying will necessarily be large. The machine tool buying in the future will be confined to repair orders and orders for emergency equipment for shop additions, &c., and it is not probable that there will be any very large lists issued, as most of the machine shops now installed on the Isthmus are considered inadequate to take care of the future work.

Delaware Lackawanna & Western Railroad Machinery List.

The machine tool list issued by the Delaware, Lackawanna & Western Railroad, to which we referred in these columns two weeks ago, is probably the most important inquiry now before the trade and is being figured on by the important houses. The machines on this list are intended for the new shops nearing completion at Scranton, Pa., and include one 6000, one 1600, one 800, one 450 and one 1500 lb. steam hammer, three upright shears for cutting bolts ⅛ to ¾ in., 1 to 1¼, and 1 to 1¾ in., respectively; three bolt headers, one each for bolts of ½, 1 and 1½ in. diameter; one bolt cutting and threading machine for ½ to 1½ in. bolts, one bolt cutting and threading machine for ⅜ to 1½ in. bolts, one double spindle bolt pointer for bolts ¼ to 1¼ in. diameter, one motor driven alligator shear, to shear bar iron 4 x 4 in. and round iron 4 in. diameter; one heavy punch and shear, 15-in. throat, to punch 1¼-in. plate and shear 3-in. round bar; one cold saw cutting-off machine, one single end locomotive axle lathe for turning axles up to 10 in. diameter, one 5-ft. radial drill, one vertical drop forge trimmer, to be used in connection with 1500-lb. drop hammer; one 50,000-lb. spring testing machine, one combination taper machine and rolls, one spring punch and shear, one hydraulic banding press, one grinder for bolt headers, one die grinder, four 3, one 1 and four 4 ton jib cranes, with spans ranging from 12 to 23 ft.; one electric hoist and track and three blowers for forges. These machines, with the exception of the steam hammers and the bolt cutting and pointing machines, are to be operated by independent motors, the bolt cutting and pointing machines to be operated in group by motor. Quite a little additional equipment will be purchased for these shops, including the furnaces, the specifications for which have not been entirely completed because the kind of fuel to be used has not yet been decided upon. It is expected that this matter will be settled shortly and the specifications sent out within the next few weeks. It will be remembered that the large machine shop and some other buildings for this group will not be constructed for a year or more, and when these are taken up the principal machine tool equipment will be purchased.

Because of the growth of business in Canada and the extension of present railroad systems and building of new roads, a number of new enterprises are being brought forward to manufacture rolling stock and supplies used by railroads. Of the several projects under consideration one that is likely to materialize shortly is that of the Imperial Locomotive Works of Montreal, which is understood to have purchased 100 acres of land opposite Lachine Station, Que., as a site for a new locomotive plant. It is understood that work of construction is to be started this spring and that Colonel Edye, commissioner in Montreal of the Trust & Loan Company of Canada, is interested.

The Canadian Crocker-Wheeler Company, Ltd., has been organized for the manufacture and sale in Canada of the well-known Crocker-Wheeler electrical apparatus and has opened offices in the Street Railway Chambers, Place d'Armes Hill, Montreal, Que. The dimensions of the buildings to be erected and the machinery to be installed have not yet been decided upon. F. E. Lovell, president of the new company, is a member of the old established lumbering firm of H. Lovell & Sons, Conticocke, Que., which has extensive interests in mill and timber lands throughout the Province of Quebec. Russell Stinson and F. J. Bell, vice-president and secretary-treasurer, respectively, have been identified with the manufacturing, construction and sale of electrical apparatus in Canada for the past 15 years and are particularly well known in Montreal. The Crocker-Wheeler Company, Ampere, N. J., manufactures all types of direct current and alternating current motors and generators, and has developed a special line of motors for machine tool and printing press drive and steel mill work. Crocker-Wheeler alternating current generators up to 2000 kw. capacity have been in successful operation in Canada for some years.

The Eagle Pencil Company, New York, has some inquiries out for equipment for a large pencil plant, to be erected near London, England. The plant will include equipment for manufacturing metal accessories for pencils and also machinery for working lead.

The Garrett Color Company, 114-116 West Twenty-seventh street, New York, has been purchasing machinery of late for a color plant which is being installed at that address. The company has also been buying equipment for manufacturing collapsible tubes, both for its own use and for the trade. W. H. Walker is president; E. H. Garrett, vice-president, and D. D. Dana, secretary.

The Sewerage and Water Board of New Orleans, La., will receive bids until June 30 for the following machinery for the Algiers sewerage station C: Two 100-kw. 250-volt direct current generators, two 75-hp. 250-volt motors, one 2,500,000-gal. turbine pump to work against a 125-ft head, direct connected to an electric motor; one 1,000,000-gal. triplex pump to work against a 125-ft. head, geared to an electric motor; one 2,000,000-gal. centrifugal pump unit to work against a 20-ft. head, two 4,000,000-gal. centrifugal pump units to work against a 20-ft. head, two 5-hp. 250-volt motors, one surface condenser, capable of condensing 6500 lb. of steam per hour, together with air pump and other appurtenances.

Inquiries are in the market for about $14,000 worth of power equipment for a lighting plant for the Borough of High Bridge, N. J. The equipment will include about 80 hp. of engines, electrical equipment and boilers to match.

Proposals will be received by the Board of Water Supply, city of New York, at its office, 299 Broadway, on May 12, for the construction of the Wallkill pressure tunnel, which is a section of the Catskill aqueduct. This work will entail the construction of a pumping plant and will include considerable rock drilling. Air compressors, tank grouting machines, concrete machinery and general contracting machinery will be required on the work, so it is probable that the successful bidder will be a large purchaser of machinery.

Charles A. Schieren, Jr., of the Charles A. Schieren Company, leather belting manufacturer, returned last week from Europe, where he spent a month in looking over the business situation in England and Germany. Although business is fairly steady there, Mr. Schieren says the demand for equipment is not what it was a year ago. There is nothing alarming in the business outlook, however, and there seems to be no reason why the trade should not pick up as an optimistic feeling prevails in those countries among manufacturers in general. Mr. Schieren makes a business trip through the countries mentioned above every year and is in close touch with the situation.

The Lees-Williams Company, 806 House Building, Pittsburgh, has recently secured agencies as follows: John Davis Company, Chicago, steam traps, &c.; Gardner Governor Company, Quincy, Ill., high and low pressure and general service pumps; Trill Indicator Company, Corry, Pa., Triumph steam and gas engine indicators. The Lees-Williams Company is also the exclusive distributing agent for Shelby seamless cold drawn tubes, made by the National Tube Company, Pittsburgh, and carries a large and complete stock of these tubes in the Terminal Warehouse, S. S., Pittsburgh,

enabling it to fill orders promptly for any sizes and quantities.

Catalogues Wanted.—The George H. Tay Company, Nineteenth and Minnesota streets, San Francisco, will be pleased to receive catalogues and quotations from manufacturers of engineering and heating supplies and specialties.

Philadelphia Machinery Market.

PHILADELPHIA, PA., April 28, 1908.

New business comes out slowly, and the volume taken during the past week will not aggregate any greater total than that transacted during the previous one. The demand is still confined to single tool propositions, and no specifications covering any extended equipment are before the trade. A hopeful attitude prevails, however, and many of those in the trade believe that more active conditions will develop before a great while. At the time, however, purchasers will not take on any further equipment than is absolutely needed for their specific purposes, as conservative policies are still largely being enforced and purchases are cautiously made. More shopping around for requirements is to be noted, and inquiries are frequently made to a considerable extent, even though the tools required be small. The railroad interests show no indication of coming into the market, although the $40,000,000 bond issue of the Pennsylvania Railroad is taken as an encouraging sign, and while nothing beyond the completion of its New York terminals and further work on some improvements and extensions, which were held up last fall, is announced by the company, it is believed that the action taken by this road will have an awakening tendency on the part of other railroads and industrial concerns, which held up operations so extensively last fall.

Manufacturers continue to book a small volume of business, and are able for the most part to keep plants operating on the same restricted basis at which they have been running for some months. In a few instances some improvement is to be noted, but the increase is irregular and frequently what is gained in one week is lost in another.

There is a fair demand for second-hand tools, both standard and special. The larger proportion of inquiry is for those of the medium and smaller sizes. Sales of equipment of several plants which have become financially embarrassed recently have developed some rather good buying, particularly from individual buyers who, it is reported, have paid prices for tools beyond that which would have been paid by dealers, and, in instances where tools have been little used, not much below what new tools could have been purchased for. Boilers and engines are not active. Prospective business in the way of large equipment is still held up, although in some of the smaller power equipment more business has been done.

The foundry trade still shows a dull tendency. Users of castings continue to place their requirements in a hand to mouth fashion, and both steel and gray iron foundries are running on a much restricted basis. Contract work is scarce, and most of the business is of a day to day character. Prices are not strong and some pretty low figures have been named by some foundries in order to get enough work to keep them going.

The Wm. Steele & Sons Company has been awarded a contract for two large coal pockets, storage sheds, offices and stables for the Philadelphia & Reading Railroad, extending from Berks street to Norris and from Ninth street to the railroad tracks, embracing an area of 200 x 400 ft. The work includes the erection of two trestles, running the entire length of the yard. The estimated cost was about $240,000.

The State Board of Health has approved plans for a water works and filter plant having a daily capacity of 2,000,000 gal., to be erected by the Paxtang Consolidated Water Company on the Swatara Creek at Hummelstown, Pa.

Ballegern & Perrot, engineers, have completed plans for an additional three-story and basement manufacturing building for J. D. Lit at 233 South Fifth street. The new building will be 28 x 112 ft., and is to be of slow burning construction. Tower fire escapes, freight elevators and other modern factory installations are to be provided.

Wilson, Harris & Richards, engineers, are receiving estimates for a valve house, 71 x 80 ft., and foundations for a 3,000,000 cu. ft. gas holder, to be built at Atlantic and Venango streets, in this city, for the United Gas Improvement Company.

The liveliest kind of bidding was brought out the past week for bridge and sewer work, to be done for the city of Philadelphia, the aggregate cost of which will involve the expenditure of nearly a million dollars. For the five bridges to be built there were an average of 15 bidders on each bridge. The bridge work involves an expenditure of $400,000. The following awards for a portion of this work have been announced by the director: Bridge on the line of Sedgwick avenue over the Reading Railway, $26,561; bridge on the line of Ontario street, under the Richmond branch of the Reading, $33,714; bridge over Hunting Park, on the Philadelphia & Newtown branch of the Reading, $37,545, all to Thomas F. Reilly. Bridge on Rockland street over North Penn Railroad, to McGraw & Gray, $23,400. Bridge on Twenty-ninth street over the Pennsylvania Railroad, to Filbert Paving & Construction Company, $32,159.

Dodge & Day, engineers, report business rather quiet. Plans have been completed by them for a considerable amount of work, but a good share has been temporarily held up, pending a return of more active business conditions. One of the recent propositions for which they are now engaged on plans and specifications is for a large manufacturing plant for the Lee Hat Mfg. Company, Danbury, Conn., details regarding which are not yet completed. The cost of the plant and equipment will be about $150,000.

Deinelt & Eisenhardt, Inc., report a slight increase in the demand for dead stroke hammers, orders having been recently taken for four of different sizes, one 100-lb. hammer being for the Parkersburg Iron Company, Parkersburg, Pa. The demand for hydraulic jacks is light, the railroads, which are usually large buyers, being out of the market. A number of old contracts for special tools are still on the books, but not enough business has developed to enable the various departments of the plant to be run on full time.

Cleveland Machinery Market.

CLEVELAND, OHIO, April 28, 1908.

Business in the local machinery market has improved slightly during the past week. Builders of machine tools report a little improvement in orders and a considerably better volume of inquiries. Some improvement is also noted in export orders. With two or three exceptions no inquiries are being received as yet from railroads, and tool builders are looking to other sources for a market for their products. With the limited domestic demand more attention is being paid than usual to the foreign trade. There are more inquiries for heavy machinery and the placing of some good orders for coal and handling machinery is expected soon. A local machine tool builder who has visited a number of Canadian points during the past few days reports that he found the Canadian situation looking a great deal better, and he expects that the volume of orders from that country will soon reach normal.

With the local machine tool dealers the market remains about stationary, although the little change that has been noticed during the past week has been for the better. The sales are nearly all single tools in small sizes. The buyers in most cases are men who are starting up small machine shops. Very little buying is being done by large manufacturing plants and there are but few inquiries from new concerns for machinery equipment for new plants. A number of new projects have been launched to engage in manufacturing in the metal trade lines in this territory during the past few months, and it is expected that some of these will be carried out and create a demand for machinery and tools as soon as industrial conditions show sufficient improvement. The offerings of second-hand tools are still large, a large share of these tools being in first-class condition, but they are moving slowly, the prices that are asked in most cases being more than dealers are willing to pay. The demand for second-hand tools is light.

Makers of street railway equipment report a very fair volume of orders. Street railways have not been affected much by the depression, and their purchases to keep up their equipment have not been curtailed to any extent. Manufacturers of hardware products used largely by the farmers report a good demand for their goods but the orders are mostly for small lots for the reason that the jobbers are unwilling to carry large stocks.

The foundry situation shows no improvement. The demand for castings is very irregular. For a few days the jobbing plants will have a fair run of orders and then the demand will almost disappear for a while. Practically all orders for castings are for small lots for immediate delivery. Consumers are unwilling to contract ahead. The local jobbing foundries are running at from one-third to one-half of their capacity.

Foote, Burt & Co., makers of single and multiple spindle drills and bolt cutters, report that the machine tool outlook has improved considerably with them during the past two weeks. They have taken some good foreign orders, and have received some very good domestic inquiries.

The Merwin Mfg. Company, Cleveland, recently incorporated with a capital stock of $10,000, has started a plant on Merwin street for the manufacture of eave trough, conductor pipe, &c. It is the intention of the company to eventually erect a new plant. R. E. Curtis is president, and W. E. Lutton, secretary.

The Gordon Propellor Company, Cleveland, has been in-

corporated with a capital stock of $100,000, by F. O. Gordon, John Huber, C. R. Vernon, J. O. Schmitt, and William H. Runnels. The company will make propellors for small boats. A plant is being fitted up on West Third street.

At a meeting of the Ravenna Furnace & Heating Company, Ravenna, Ohio, held a few days ago, Albert Dietrich was elected secretary, treasurer and general manager in place of W. A. Hammond, who will retire from the company on May 1. F. C. Park remains as president.

The McCaskey Register Company, Alliance, Ohio, has been taken over by a new company, of which A. G. Ryley, an officer and large stockholder in the Carnahan Stamping & Enameling Company, Canton, has been elected president. Several other Canton men are also prominently interested in the new company, which is capitalized at $400,000. The other officers are S. S. Kurtz, vice-president and general manager; S. G. Zimmerman, secretary and treasurer, T. Uran, assistant secretary and treasurer.

The Summit Foundry Company, Akron, Ohio, recently incorporated, will not build a new plant, but has leased a foundry on Kelley avenue and Railroad, East Akron. The company will do a general jobbing business.

The Jewett Stamping & Enameling Company, Jewett, Ohio, has been incorporated with a capital stock of $25,000 by Fred Spriggs, J. C. Landkrohn, H. W. Hermann, G. W. Dankworth, and C. H. Dankworth.

The city council of Lima, Ohio, has refused to renew a lighting contract with a commercial company, and has taken action toward the issuance of $80,000 in bonds for building a municipal lighting plant.

A plant for furnishing heat, light and power will be erected in Mogadore, Ohio, by the Mogadore Electric Light & Power Company, which has just been granted a franchise by the council of that village.

The Brown-Cochran Company, Lorain, Ohio, manufacturer of Brown gas engines, marine motors, refrigerating machinery, &c., has reorganized its sales and engineering departments and made other necessary changes to take care of its expanding business. William H. Maxwell, formerly manager at Des Moines, Ia., where he succeeded J. C. Compton, has been appointed general sales manager. J. O. Brown, president of the company, who has heretofore had charge of the sales department, will in the future devote himself exclusively to the executive affairs. The same staff of assistants will be retained in the sales department. C. I. Longenecker has been appointed chief engineer and he, with Mr. Brown, are collaborating in the production of a gasoline traction engine and gasoline hoist, both of which will be placed on the market in the near future. It is the intention to establish additional branch houses and materially increase the company's business in foreign markets. The company is experiencing a good demand for its ice and refrigerating machinery, and has twelve plants in process of erection, including marine installations. A satisfactory demand for marine engines is also reported, and the officials of the company state that the demand for Brown power engines has been uniformly good, and is increasing in many sections of the West.

The Independent Tack Company, Kent, Ohio, will double the capacity of its plant with the intention of manufacturing a more complete line of staples and tacks, and with the increased capacity will be in a position to take care of its business more satisfactorily than it has been able to do in the past.

New England Machinery Market.

WORCESTER, MASS., April 28, 1908.

Business goes on in the machinery trade with little change for better or worse. The dealers continue to sell some tools, the larger part of the orders being for used machinery. The machine tool builders of New England are certainly no busier, with a few exceptions. In Worcester the larger shops are laying off more men, having accumulated sufficient stock for the present. Similar reports are received from other centers of the industry. At Fitchburg the Putnam Machine Company is busy, but few others of the machinery people are running full time and with full force.

Outside of the machine tool industry the indications are brighter. Scattered about this territory are quite a number of manufacturers who are running full with unreduced forces. A few examples are the Warren Steam Pump Company, Warren, Mass.; Blanchard Machine Company, Cambridge, Mass., which does contract work; Meisel Press Company, Boston, manufacturer of printing presses; Gillette Safety Razor Company, Boston; Critchley Machine Tool Company, Worcester; John L. Parker Company, Worcester, manufacturer of pressed metal goods; Worcester Pressed Steel Company, Worcester; New Departure Mfg. Company, Bristol, Conn., and Morgan Construction Company, Worcester. These do not by any means complete the list. Their names were gathered at random without special search. Many works have a good deal to do in supplying customers with repair parts, this constituting a part of the general task of overhauling and rearranging machinery, as the opportunity is taken to prepare for a resumption of business on a large scale. Most works will be in much better shape to take advantage of a good market for their products than they were during the recent period of great demand.

The Crompton & Knowles Loom Works, Worcester, Mass., manufacturer of textile machinery, has awarded the contracts for large additions to the works, to total in cost $155,000. There will be an administration building and factory combined, a large machine shop and a foundry. The factory building will be 60 x 246 ft., five stories. One end will be extended to give a frontage of 60 ft. to that part of the building where the offices will be located. The machine shop will be between the present shops for the same purpose and will be 54 x 184 ft., four stories. The foundry, which will in part replace old buildings, will be 225 x 225 ft., one and two stories, the upper floors to be devoted to supply rooms. The company states that it will be in the market later for a large amount of new machinery and other equipment for the new buildings, which will greatly increase the producing capacity of the great shops. The new plans are the direct outcome of the permission, long withheld, to bridge a public street to connect present buildings with the proposed factory and office building. Upon this depended the location of the new works in Worcester. Had an adverse decision been reached by the Massachusetts Legislature the new buildings would have been located at Providence, R. I., where the company has a branch factory.

George B. Allen, engineer, Providence, R. I., is preparing plans for a new factory plant for clients the name of which he is not yet at liberty to divulge. The plans call for a brick building, 60 x 250 ft., with ell 40 x 60 ft., and three stories throughout.

Richards & Co., North Attleboro, Mass., have started work on enlargements and alterations of their factory in that place, J. E. Judson, 155 Main street, Pawtucket, R. I., being the engineer in charge of the work. The plans call for a new building 40 x 250 ft., one story. The building will be rented to manufacturing jewelers.

The C. G. Garrigus Machine Company, Inc., Bristol, Conn., recently organized to manufacture special machinery, blanking, piercing, stamping, forming, cutting and drawing tools, has elected Clarence G. Garrigus, president and treasurer; A. F. Rockwell, vice-president; W. L. Barrett, secretary, all of Bristol, and L. G. Judd, New Britain, assistant secretary. The site for the new shop has been purchased and the intention is to build some time during the summer. The company has begun to manufacture in W. L. Barrett's shop.

The Middletown Electric Light Company, Middletown, Conn., has purchased a tract of land in that place, and plans to erect a modern plant, with improved generating equipment.

The Waterbury Clock Company, Waterbury, Conn., has awarded the contract for a new factory building, to be 40 x 176 ft., five stories.

The Warren Steam Pump Company, Warren, Mass., manufacturer of steam pumps, has gone on a full time schedule with full force of men, owing to recently received orders.

The Rathbun-Jones Engineering Company, Toledo, Ohio, builder of producer gas engines, has established a Boston office at 79 Milk street. Alexander W. Doe has been made the representative of the company in the New England field.

The North & Judd Mfg. Company, New Britain, Conn., manufacturer of harness hardware, has increased its capital stock from $200,000 to $500,000. The increase was brought about by capitalizing $300,000 of the surplus.

Chicago Machinery Market.

CHICAGO, ILL., April 28, 1908.

Expectations of a marked improvement in the machinery market during the month of April have thus far failed of realization; for it is evident from the results of the past two weeks that, generally speaking, trade is lighter than at the beginning of the month. As is always the case when, as at the present time, the volume of business moving is insufficient to go round, it is being unevenly distributed. A few plants here and there may be found which are fairly busy, while others in the same or similar lines are either shut down or working to very short capacity. The same is true of dealers and is especially noticeable among the machine tool houses. Some report a fairly good trade for the week while in the experience of others it has been extremely dull; these conditions may be reversed the succeeding week. Outside of the tools comprised in the two lists of the Chicago, Milwaukee & St. Paul Railroad recently published in these columns there are no extensive requirements engaging the attention of the trade. None of this business has yet been placed, but it is believed that purchase will be

made without much delay since the vigorous prosecution of work on the Pacific Coast Extension indicates that it will be needed for shop equipment on that line before long. The meager amount of available business has developed a stress of competition that is bearing heavily upon the efforts of manufacturers and dealers to maintain prices. The wide range of prices in bids tendered on some recent public lettings demonstrates that some interests are willing to make deep cuts in order to secure the business. On a punch and shear of specific size and capacity required for a Chicago manual training high school ten bids were submitted, the highest of which was $1029, and the lowest $510; offers on other tools in the same list also exhibited wide differences. As a further indication of the trend of values it is this week reported that two important machine tool manufacturers are openly quoting reduced prices. All interests admit that continued dullness, with the strenuous competition it engenders, is a heavy handicap to the maintenance of prices; and as a matter of fact each interest is guided by its own individual views and circumstances in its efforts to secure business.

What is said to be the largest contract ever placed for like apparatus has been awarded by the Chicago Railways Company to the National Brake & Electric Company, Milwaukee, Wis. This contract comprises the air brake equipment for the 1200 new street cars which, in accordance with the Traction Ordinance the Chicago Railways Company, owning all of the West Side street railroads, will purchase and place in service within the next three years. The company expects to put about 550 new cars into service this summer, and orders for 400 of these cars have already been placed with the car builders. A large number of the cars on the South Side lines are now equipped with National air brakes and the placing of the present order may be taken as indicating their satisfactory service.

The motors for these cars will be supplied by the General Electric Company, Chicago, which has secured the contract for furnishing the equipment for 400 cars. Four motors of 40 hp. each are required for each car, making a a total of 1600, all of which will go into service during the present year. In addition to the machinery and equipment already purchased for the rebuilding of these lines considerably more will be required as the work proceeds, and it is not expected that it will be completed inside of three years.

Bids are being asked and proposals will be received up to May 4 by the city of Milan, Mich., on material, equipment and construction of a waterworks system. The specifications call for one 75,000 gal. metal tank and tower; two compound steam pumps of 500 gal. per min., or two triplex steam pumps of the same capacity, and two 50 hp. gasoline engines. About 367 tons of pipe will be required, together with 28 hydrants, and 29 gate valves from 2 to 10 in. The Riggs & Sherman Company, Toledo, Ohio, is the engineer in charge of the work.

Final plans and specifications for a waterworks system to be installed at Gratiot, Wis., are being prepared by Preston T. Hicks, engineer, Decatur, Ill., and will be ready within a few weeks. The system will consist of 300 ft. 8 in. well; deep well pump; engine of 10 to 15 hp., probably gasoline; 50 ft. steel tower, with 40,000 gal. cypress tank, located on a hill 102 ft. above the principal street; 5269 ft. of 6 in. and 681 ft. of 8 in. water mains; 17 hydrants, and six 6-in. gate valves. The estimated cost of the system is a little over $10,000.

Proposals will be received by Canon City, Colo., until May 20 for the furnishing of material and construction of about 8 miles of 26 or 30 in. conduit, to be made of either steel or continuous wood stave pipe; also a settling basin, filters, two clear water reservoirs, and other accessories required for the improvement of the Canon City waterworks system. Specifications for this work may be obtained at the offices of the city clerk on and after May 4.

The O. L. Packard Machinery Company, Chicago, has secured the Western agency for the Abrasive file sharpener made by the American File Sharpener Company, New York.

Bids are being taken by the Chicago Board of Education on the following tools, which are required for additional equipment in the manual training department of the Austin High School: Six speed lathes, two bearing head stock; one band saw, 36-in.; one power grindstone, with truing device.

Cincinnati Machinery Market.

CINCINNATI, OHIO, April 28, 1908.

While conditions have not improved, and indeed with some machine tool manufacturers are worse, investigations conducted with a special view to determining just what is being done in the selling markets develop the fact that machinery sales agents and supply dealers have during the month booked a fair volume of business.

The president of one of the largest of these companies, in summing up the results of the year so far, stated that he had done more business since the first of April than for the entire three months of the first quarter, and that his sales had been of practically all new machinery for shop equipment and for installations of municipal electric lighting and power developing plants. All local machinery dealers visited report an increasing demand for second-hand equipment, and nearly all accompanied by requests for special and additional discounts which were in but very few and special cases allowed. As a straw indicative of the attitude of the most representative dealers in this section on the subject of rebating and price cutting, one prominent agent had put up to him by a customer a bill of $2400 worth of machinery which he agreed to take if allowed an extra discount of 5 per cent. The manager refused, but got the order. Instances of this kind are numerous, and the dealers and manufacturers in this section who cut prices are very few. The philosophic members of the toolmaking districts argue that the demand just now is so extremely light that the few sales to be made at asked discounts would produce but a small income at a time when there appears no necessity to make sacrifices, and balanced against the difficulties to be encountered in restoring prices again by a raise suggest strongly the desirability of remaining firm.

Local sales agents have recently booked some excellent orders for municipal lighting and power equipment plants. Among these are a $30,000 plant for Troy, Ohio; machinery and equipment for a $10,000 lighting plant and for a $35,000 waterworks system for Madisonville, Ohio, a recently added suburb and part of Cincinnati, and $10,000 worth of lighting equipment for Carthage, another suburb of Cincinnati. Another municipal order that is expected to be placed soon is for the new lighting plant to be built in Lima, Ohio.

Manufacturers of dynamos, motors and ice manufacturing machinery report improvement in inquiries and sales, principally from the West. One large local concern, the Triumph Electric & Ice Machine Company, is going ahead with elaborate plans for its new plant in Oakley, where some six or seven of the largest tool manufacturing and other establishments are building new and modern plants. The company's improvements will cost in the neighborhood of $250,000 for buildings and equipment.

In the line of special machinery there is an improvement in tone, especially marked in the line of pumping machinery for mines and municipal plants. The John H. McGowan Company has just booked orders for two large pumping engines of 2,000,000 gal. capacity each, to be installed in mining districts; also an export order of 10 special hydraulic machines for the manufacture of plug tobacco, having a capacity for producing 8000 lb. of tobacco daily. The machinery goes to one of the largest tobacco manufacturing establishments in the world, and is to be installed in an extension of the plant. Suggesting the feeling of improvement in trade closely related to manufacturers of products along this line, this company reports that work is now going ahead on two orders for two large pumping engines, shipment of which had been held up during the months of the depression.

Local tool manufacturers are making preparations to entertain an annual visitor to this market from South America —Mr. Robert, representing Mantell & Co. of Buenos Ayres. He is expected in New York on April 30 and will make his headquarters with David S. Hayes in the Bowling Green Building. He spent but one day in Cincinnati, April 28. While here he met several representatives of large tool manufacturing concerns, who desired to learn more of the South American markets with a view to establishing agencies in the principal cities.

In the line of portable electric drills, local establishments report a fair demand with an increasing tendency. The Hisey-Wolf Machine Company, making a specialty of this line, is now thoroughly installed in its new plant at Cormany avenue and Township, Camp Washington, and is running on an average of 48 hr. per week, with a two-thirds force.

Lathe manufacturers view the situation variously. While some of the large establishments are practically, if not completely, shut down, others are running on a reduced schedule, and note an increase in both inquiries and sales. One of these during the week has sold a couple of good sized bills through a local machinery sales agent.

The Dean Gas Engine & Foundry Company, Newport, Ky., has assigned for the benefit of creditors. The two leading proprietors made personal assignments, with assets of $20,000 in each case, and combined liabilities of $16,500.

The Cincinnati section of the Associated Foundry Foremen held an enthusiastic meeting on Saturday evening, April 25, at the Palace Hotel in Cincinnati. Chemist George K. Elliott of the Lunkenheimer Company gave an address on "Notes in Alloys for Steam Valves and Fittings:" Chemist P. F. Wehmer talked on "Metal Fluxes," and John C. Burns of the Samuel C. Tatum Company told of "A Method of Making a Bonnet Valve with the Aid of Hard and Soft Metal in One Casting."

Some important improvements have recently been finished at the plant of the Edwards Mfg. Company, metal manufacturing specialists, Cincinnati. A new departure of this enterprising concern is the making of metal boats in 14, 15 and 16 ft. sizes for lake and river use.

H. E. Frazier of Rogers Brown & Co., Cincinnati, who at a recent meeting of the Board of Directors of the Ameri-

can Steel & Iron Company of Norwalk, Ohio, was elected vice-president and general manager, will move to that city and take active charge of a department of the works about June 1. There will be some changes made in the plant which will make possible a greater range in product and increase the output. A smaller bar mill will be built and some changes made in the furnaces. The new president, Charles R. Brown, will also move to Norwalk, it is stated. It is understood that the signatures of a majority of the creditors of the Norwalk Steel & Iron Company and the William Kavanaugh Company, from which the new company was formed, have been secured and the agreement is operative.

The Delphos Mfg. Company, Delphos, Ohio, is being enlarged and remodeled to accommodate the rapidly increasing business of the company which manufactures patent pump oil cans, dust pans, lanterns, galvanized iron and water spouting, &c. A building, 60 x 80 ft., is nearing completion. A large office building is to be erected also.

The Knecht Bros. Company, Cincinnati, founder and manufacturer of tools, has increased its capital stock from $50,000 to $75,000.

St. Louis Machinery Market.

ST. LOUIS, Mo., April 28, 1908.

The encouraging factor of an increase of a marked character in the inquiry for various kinds of machinery is reported by some of the manufacturers and dealers, though in case of the latter, it is to some extent for second-hand machines. With some manufacturers of small supplies, there is a disposition to manufacture for stock. In many of the large shops, a feature is the considerable volume of repair work in hand. The largest manufacturers are affected more by the depression on account of the large capacity of their plants, and those dependent on railroad equipment report business as very quiet.

The Central Shale Brick Company, Benoist Building, will require for its new plant, for which Peruque, Mo., is the shipping station, two dry clay brick presses, two dry pans, boiler, engine, screens, and steam shovel.

The Hall & Brown Woodworking Machine Company was awarded the contract to furnish for the new plant of the Gulf Lumber Company, at Fullerton, La., 23 machines, to be electrically driven from individual motors. The contract for the electrical equipment was awarded to the General Electric Company. The inquiry from saw mills and furniture companies has improved.

The Fulton Iron Works reports that it is in receipt of so many inquiries, it is kept busy figuring, but not many are closed up, for one reason or another. The company has received some business for export, among which is an engine for a sugar mill, one for Armour & Co., one for Racine, Wis., and three for the United Railway Company, St. Louis. It is getting a large percentage of local repair work, fully as much as last year.

The Marshall & Huschart Machine Company states that while there is at present very little demand, the prospects are better than at any time this year, and it expects within 30 days to see quite a revival in trade. A feature of the situation is considerable inquiry for second-hand machinery.

The O'Brien Boiler Works Company has just shipped three down draft smokeless furnaces to the Bower Heating Company, Milwaukee, for the Milwaukee Water Works. The company is getting out two 250 h.p. water tube boilers for Sedalia, Mo., Water, Ice, Light & Power Company; three 350 h.p. water tube boilers, Desloye Lead Company; 350 h.p. boiler, new Maryland Hotel, St. Louis; two 272 x 18 in. tubular boilers, Insane Asylum, Farmington, Mo. As inquiries are now coming in pretty lively, it expects to do more in the near future.

John Rohan & Co. are at work on some boilers for the Gray Construction Company, East St. Louis, and are making a marine boiler for United States Engineering Department, at Mobile, Ala., for steamer Pearl. The outlook is growing better, judging from numerous inquiries.

The American Brake Company reports some foreign business, mostly from the Continent and France in particular, though not up to last year. The demand is mainly for its locomotive driver brake, which is shipped to all countries.

The title of the Western Iron & Supply Company has been changed to W. G. Hagar Iron Company, and the capital stock increased from $150,000 to $200,000. The company will soon remove to its new home on Second street, between Clinton and Monroe streets, extending through an entire block to Main street. The new corporation will broaden its scope of operations and carry in stock, as heretofore, many thousand tons of iron and steel.

Government Purchases.

WASHINGTON, D. C., April 28, 1908.

The Isthmian Canal Commission will receive bids until May 18, Circular No. 438, for locomotive coaling cranes, shop machines, pumps and other supplies.

The Isthmian Canal Commission will soon ask bids for six 8½ x 12 in. reversing hoisting engines.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until May 12 for motors and until May 19 for drills, milling machines, &c.

The following bids were opened April 21 for machinery for the navy yards:

Class 1.—One turret lathe—Bidder 62, Compressed Air Machinery Company, San Francisco, Cal., $1318.30; 81, Frevert Machinery Company, New York, $754; 108, Harron, Rickard & McCone, San Francisco, Cal., $829.15; 185, Pacific Tool & Supply Company, San Francisco, Cal., $865; 254, Warner & Swasey Company, Cleveland, Ohio, $865.

Class 2.—One flat turret lathe—Bidder 114, Henshaw, Bulkley & Co., San Francisco, Cal., $1795; 182, Pratt & Whitney Company, Hartford, Conn., $2450; 185, Pacific Tool & Supply Company, San Francisco, Cal., $2150.

Class 11.—One motor driven lathe—Bidder 62, Compressed Air Machinery Company, San Francisco, Cal., $1081 and $881; 81, Frevert Machinery Company, New York, $788; 92, Garvin Machine Company, New York, $1190; 108, Harron, Rickard & McCone, San Francisco, Cal., $1091 and $1131; 114, Henshaw, Bulkley & Co., San Francisco, Cal., $1055; 145, Manning, Maxwell & Moore, New York, $1200; 185, Pacific Tool & Supply Company, San Francisco, Cal., $1285; 220, Springfield Machine Tool Company, Springfield, Ohio, $968.

Class 111.—One 3-ton hand traveling crane—Bidder 25, Brown Hoisting Machinery Company, New York, $975; 30, Alfred Box & Co., Philadelphia, Pa., $760; 53, Case Mfg. Company, Columbus, Ohio, $650; 58, Cleveland Crane & Car Company, Wickliffe, Ohio, $450; 105, Hoisting Machinery Company, New York, $490; 145, Manning, Maxwell & Moore, New York, $570; 161, Niles Bement Pond Company, New York, $923; 164, New Jersey Foundry & Machine Company, New York, $572; 169, Northern Engineering Works, Detroit, Mich., $575; 240, Vermilye & Power, New York, $730 and $760.

Class 121.—Two turbo generator sets, one motor and one switchboard—Bidder 91, General Electric Company, Schenectady, N. Y., $9705.

Class 132.—One gasoline or kerosene engine—Bidder 67, Drew Machinery Agency, Manchester, N. H., $2950; 80, Fairbanks, Morse & Co., New York, $3600; 87, G. & W. Mfg. Company, New York, $2482; 152, Model Gas Engine Works, New York, $1625; 163, National Electrical Supply Company, Washington, D. C., $2235; 171, August Mietz, New York, $3400; 173, Otto Gas Engine Works, Philadelphia, Pa., $2045.

Class 131.—One swing lathe—Bidder 85, Fitchburg Machine Works, Fitchburg, Mass., $950.

Class 132.—One automatic bevel gear planer—Bidder 98, Gleason Works, Rochester, N. Y., $1550; 265, Emil Callinan & Co., New York, $700.

Class 133.—One rivet spinning machine—Bidder 56, Thomas Crowther & Co., Boston, Mass., $115; 63, De Zouche, Hansen & Co., Philadelphia, Pa., $115.25; 145, Manning, Maxwell & Moore, New York, $114; 180, Prentiss Tool & Supply Company, New York, $115; 232, Tucker Tool & Machine Company, New York, $106.90.

Class 134.—One hand milling machine—Bidder 29, Becker, Brainard Milling Machine Company, Hyde Park, Mass., $230; 83, Fox Machine Company, Grand Rapids, Mich., $198.50; 145, Manning, Maxwell & Moore, New York, $190 and $195; 180, Prentiss Tool & Supply Company, New York, $215; 182, Pratt & Whitney Company, Hartford, Conn., $282.

Class 135.—One vertical milling machine—Bidder 29, Becker, Brainard Milling Machine Company, Hyde Park, Mass., $1083; 145, Manning, Maxwell & Moore, New York, $1135; 180, Prentiss Tool & Supply Company, New York, $1140.

Class 141.—One boring, drilling and milling machine—Bidder 136, Lucas Machine Tool Company, Cleveland, Ohio, $2075.

Class 161.—One guillotine frame bar shear—Bidder 54, Cleveland Punch & Shear Works, Cleveland, Ohio, $950; 116, Hilles & Jones Company, Wilmington, Del., $991; 184, Henry Pels & Co., New York, $1467; 225, Scully Steel & Iron Company, Chicago, Ill., $1350; 285, Barclay, Libby & Co., Charleston, S. C., $1545.

Class 162.—Three pressure blowers—Bidder 23, Brewster Engineering Company, Hoboken, N. J., $2494; 91, General Electric Company, Schenectady, N. Y., $2100; 187, P. F. & H. M. Roots, New York, $2494; 206, Sirocco Engineering Company, New York, $2850; 226, B. F. Sturtevant Company, Hyde Park, Mass., $1966; 267, D'Olier Engineering Company, Philadelphia, Pa., $1727; 283, Buffalo Forge Company, Buffalo, N. Y., $1853.

The following bids were opened April 20, Circular No. 434, for supplies for the Isthmian Canal Commission:

Class 1.—One tandem compound engine—Bidder 13, Ball Engine Company, Philadelphia, Pa., $4325; 60, G. & W. Mfg. Company, New York, $3562; 64, General Electric Company, New York, $3491; 72, International Electric & Engineering Company, New York, $5540; 110, Phœnix Iron Works, Meadville, Pa., $4800; 151, Williams & Wells Company, New York, $6733.

Class 3.—One belt driven punch—Bidder 47, Drew Machinery Agency, Manchester, N. H., $535; 56, Fox Bros. & Co., New York, $495 and $697; 72, International Electric & Engineering Company, New York, $811.13; 117, Prentiss Tool & Supply Company, New York, $729; 126, Joseph T. Ryerson & Son, Chicago, Ill., $765; 128, Scully Steel & Iron Company, Chicago, Ill., $630.

Class 4.—One power shears—Bidder 20, Bertsch & Co., Cambridge City, Ind., $400; 47, Drew Machinery Agency, Manchester, N. H., $385; 56, Fox Bros. & Co., New York, $317 and $465; 64, Frevert Machine Company, New York, $894; 72, International Electric & Engineering Company, New York, $1116; 93, Motley, Green & Co., New York, $607.50 and $680; 102, Niles-Bement-Pond Company, New York, $444 and $529; 108, Henry Pels & Co., New York, $600; 117, Prentiss Tool & Supply Company, New York, $478; 126, Joseph T. Ryerson & Son, Chicago, Ill., $355; 128, Scully Steel & Iron Company, Chicago, Ill., $728.

Class 2, one power hammer, has been awarded to the Erie Foundry Company, Erie, Pa., at its bid of $310.

Under circular bulletin opening of April 14 the Buffalo Steam Pump Company, Buffalo, N. Y., has been awarded contract for one centrifugal pump and accessories, $1232.

Under bids opened March 3 for machinery for the navy yards the C. H. Wheeler Mfg. Company, Philadelphia, Pa., has been awarded class 21, two duplex boiler feed pumps, two duplex underwriter fire pumps, one duplex pump and receiver, $1959.

HARDWARE

NOTWITHSTANDING the objectionable features of department store business, there is no doubt that this method of distribution not only holds its own, but continues to increase. It may with unquestionable truth be alleged that these stores interfere with the small merchants in practically every line and often drive many of them out of business; that they generally make use of inexperienced, unintelligent and low priced help, and that in many cases they sell a cheap and inferior class of goods. They seem, however, to serve the public convenience and to attract people. They certainly sell goods, and in a commercial way are successful. Fortunately or unfortunately this is a final answer to objections that may be brought against them.

The attitude of the business man in regarding these great concerns should not be that of a critic, dwelling on their defects and emphasizing the manner in which they clash with vested interests and long established methods of trade. There is nothing suggestive or productive in fault-finding. The critical spirit does not promote initiative or enterprise or activity. The merchant who regards the growth of department stores and their intrusion perhaps into his own territory should look at them if he can impartially, and in something of the spirit of a disinterested student of trade methods and conditions, so that he may discover the reasons for their success and learn from them lessons which can be applied in his own business.

Without attempting to refer to the various admirable methods of these houses or the features in their management which are deserving of study by merchants who adhere more closely to the old ways, it is interesting to note, as a suggestive illustration, the manner in which records of sales are kept, and utilized in stimulating efforts in the various departments with a view to increasing the volume of business. This feature of the management of these stores is connected with the subdivision of responsibility, as the charge of different departments, of which there are ordinarily many, is entrusted to persons who are given large discretion in the conduct of their departments and are held responsible for results. In this way, indeed, many men who have not been able to carry on a business of their own along the old lines are often given good positions and opportunities for the display of their ability. With the records of daily sales which are kept, as described in another column, the department manager is constantly confronted with what has been done, and he is expected to make a record which will look well in the comparison. If, for example, in the first week of May, 1907, whether the department made a poor showing or a good showing it is up to him to make the corresponding week in 1908 justify his administration. If the sales last year were small he is expected this year to make them large. If last year they were large he is expected this year to make them larger. To accomplish this he does not wait until the end of April, but the purchase of goods, the advertising of the firm, the display made in the store and the prices to be charged, have all to be arranged for beforehand with a view to making good. Allowance will, of course, be made by the firm for the falling off in sales, on account of dull times, but woe to the manager whose record looks badly when compared not only with past figures, but more especially with what has been accomplished by the managers of other departments which are presumably subject to the same general influences as his is. Success or failure of his administration is shown in the cold mathematics of tabulated results, in which appear not only the aggregate volume of sales, but the profit which has been realized upon them. It is applying in the retail store methods which have long been used in great manufacturing establishments where the responsible manager is expected to break the record in lowering costs and increasing output. It is a severe test, but seems to have much to do with the success of the department store business.

In all this there is more than one lesson for Hardware merchants. An essential part of this system is the detailed and accurate records which are not only kept but used. Underlying its general adoption is the recognition of the fact that business in any particular line can be increased by well directed efforts. There is the cultivation of trade rather than waiting for it. There is also the utilization of the ability of responsible managers, so that the establishment gets the benefit of their skill and energy, in the use of what they deem the wisest and most resultful methods, and of whatever originality or ingenuity they may be able to make use of in the direction of the departments.

Condition of Trade.

Things are apparently righting themselves in the mercantile and financial worlds. Reasonable progress in the movement towards normal conditions is to be noted. The marked success which attended the putting on the market of the Pennsylvania Railroad bonds as well as other securities of similar character has had an excellent effect on the public, as indicating that confidence is returning and capital seeking investment where a short time ago it was distrustful. This recalls the familiar fact that in the country at large there is a great deal of money waiting to get busy, and a great deal of energy which is simply looking for an opportunity to employ itself in safe and profitable enterprise, commercial or industrial. This waiting attitude, in which it is necessary to repress impatience, is certainly doing good work and giving the business world a chance to recover from the effects of extreme activity and a too rapid pace. There is no doubt that the time is well made use of in working off high priced goods and material, collecting accounts, discharging indebtedness and generally getting things in shape. At the same time every concern has enough to do in the care of its current business, and in maturing plans and methods for its future operations. One indication of the feeling of manufacturers and the way in which they are endeavoring to improve their freedom from an inexorable pressure of orders which overtaxed their capacity is seen in the number of new goods which are being put on the market. Many of these are specialties or regular articles to be added to the manufacturers' assortments which have been in preparation for some time, but were held back for an opportunity to get them ready for the market and make due announcement. An illustration is also given in this of the confidence with which manu-

facturers are looking forward to a return to healthful business conditions.

Chicago

It is now quite evident from the general trend of trade that the progressive gain made through the months of the first quarter will not be repeated in the present month; on the contrary, a final summing up of totals will doubtless show a decline in the aggregate volume of April business as compared with that of March, both as respects jobbers and manufacturers. The demand from consumers has not developed in the measure that was expected, even in the comparatively unaffected country districts where there has been no appreciable curtailment of purchasing power. The sentimental effect of outside conditions has spread a feeling of conservatism through the country that has operated to restrict buying. Several Eastern representatives, traveling through the Middle West, have recently reported that some of the Hardware jobbing houses outside of the principal centers are enjoying trade very nearly equal to that of the same months a year ago. Reports of this character from seven concerns represented the average business for the first quarter to be 95 per cent. of what it was for the same period last year. Even allowing for the known advantages in the present situation of the Western trade, this at first glance would appear to be quite out of line with current conditions; it may, however, be accounted for as a direct result of these conditions. Last year, when dealers were buying in round lots for future delivery, the time factor was not important, except as it related to promptness of delivery at an agreed date, and many ambitious buyers began to reach out to more distant markets; this meant the diversion of a certain amount of business from the nearby jobber to the manufacturer, or a more remote but large distributor, a defection that was unmarked in the midst of last year's overflowing business. Now that the dealer is supplying his wants by small purchases from day to day or week to week, it is important that his orders be executed and delivered with as little delay as possible. Under such circumstances he naturally looks to the nearest source of supply, which is the nearest jobber. It is not at all surprising, therefore, that augmented in this manner, the business of certain favorably located wholesale concerns should make the gratifying showing above indicated. No radical price revisions are reported, but in some lines of goods prices are by no means firmly maintained. Cast Hardware has felt the weakening influence of steady declines in Pig Iron, the end of which has apparently not yet been reached.

NOTES ON PRICES.

Wire Nails.—The mills are in receipt of more business than for a long time, as demand is causing jobbers to order more frequently, although the orders are not large, being restricted to actual needs. There is practically no delay in shipments, as manufacturers are in a position to fill orders promptly. Quotations continue as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

Chicago.—A fairly active demand for Wire Nails continues, but as the season advances and the attention of farmers is being diverted to seeding operations it is diminishing somewhat. However, the tonnage booked by the principal interest in April will be almost identical with that of March. Orders now coming in represent actual needs, and quick shipment is almost invariably demanded. In spite of reports to the contrary it is declared by those in position to know that the demand from consumers has not been overestimated by jobbers or dealers whose stocks have moved about in accordance with jobbers' estimates. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The volume of business in Wire Nails which is being placed with the mills is gradually getting heavier, and while jobbers are not placing large orders, they are buying frequently, and the mills are entering more tonnage than for some time. There is no change in prices, but we are advised that the market is firm and that regular prices are being absolutely maintained. The mills are able to fill orders promptly, and there is no delay in shipments. Buyers continue to restrict orders to actual needs, and are keeping stocks as low as possible. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

New York.—Local demand shows a slight improvement, but is still along very moderate lines. Regular quotations are on the basis of $2.40 per keg for small lots at store.

Cut Nails.—Some mills are shut down and others are running on part time, to restrict accumulation of stock. Demand is disappointing, as there is little doing, notwithstanding the opening of the building season. The market is irregular, and concessions of 10 to 15 cents are being made on regular Steel Nail quotations, which are as follows: $2.05 base, per keg for carload lots at mill. Iron Nails generally should command about 10 cents more than Steel.

Chicago.—Small orders only are being placed, and these are not coming out in sufficient number to relieve the situation from dullness that amounts to almost complete stagnation. It was hoped that with the opening of building weather the demand would sensibly improve, but so far these expectations have had but scant realization. About the only signs of improvement discernable are in a slightly better demand for Iron Shingle Nails, but this is by no means up to normal. Regular prices are being shaded from 5 to 10 cents per keg. Chicago quotations are nominally as follows: Iron Cut Nails, carloads, to jobbers, $2.23; to retailers, $2.28; Steel, to jobbers, in carloads, $2.03; to retailers, $2.08.

Pittsburgh.—There is a somewhat better demand for Shingling Nails, but otherwise the Cut Nail market continues very dull and demand is small. Expectations of a heavier volume of business in Cut Nails with the opening of the building season have not been realized, and the tonnage moving from the mills is small. Prices continue to be shaded and the market on Cut Nails is practically open. We quote Steel Cut Nails at $1.90 to $1.95, f.o.b. Pittsburgh, for carload lots, and about $2 for small lots, to which freight to point of delivery is added. Iron Cut Nails are about $2.05, at maker's mill.

New York.—No improvement is seen in demand for Cut Nails in the local market. Regular quotations are on the basis of $2.30 per keg, for small lots at store.

Barb Wire.—The orders which are being placed with the mills show an increase over those earlier in the season. They are, however, with few exceptions, small, and cover immediate requirements only. Prices are being maintained at regular quotations, according to information from the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal
Jobbers, carload lots	$2.20	$2.[illegible]
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—The demand for Barb Wire shows no diminution, and is, if anything, growing a little stronger. Orders from the extreme North and Northwest, which on account of backward weather have been slow in coming out, are now being added to the general volume from other sections. Buyers are evidently not anticipating their requirements far in advance, since prompt execution and shipment of orders is uniformly required. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—As the season advances demand for Barb Wire is showing betterment, and the volume of business being booked by the mills is heavier now than for some time. However, the trade continues to place small orders for actual needs, but these are frequent and represent a fairly heavy tonnage. We are advised the market is firm and that regular prices are being absolutely maintained by the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—Orders continue to cover actual requirements, but amount to a fairly large demand. As mills are able to make prompt shipments there is no incentive to order beyond immediate demand. Prices are reported as being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Chicago.—While there is a fairly good demand for Fencing, manufacturers are keeping close to actual present requirements in placing orders. And as long as conditions do not favor an upward trend of prices and prompt shipment can be had from mills, the present policy of buying for needs as they develop will be continued. Prices are reported to be firmly maintained by the mills. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—A fair volume of new business is being placed, demand for Woven and other kinds of Wire Fencing being fairly heavy, but it is much below what it was at this time last year. Orders received by the mills are small for actual needs and aggregate a fairly large tonnage. With no indication of any change in prices jobbers are pursuing the policy of keeping stocks as low as possible. We are advised that the mills are maintaining regular prices. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Rope.—Manufacturers of Cordage regard the amount of business for April equal to, if not somewhat in excess of, that for March. It is light, however, in comparison with the corresponding months of last year. While prices are steady in the main resourceful buyers are usually able to obtain concessions from regular quotations, especially if conversant with market conditions. Prices of Hemp continue low and manufacturers are supposed to have about worked up the higher priced stock that they had on hand. The following quotations, for base sizes, fairly represent the market: Pure Manila, 10¼ to 11 cents; B quality grades down to 8 to 9 cents; Pure Sisal, 7½ to 8 cents; lower grades Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¾ cents.

Nuts.—In our last issue it was inadvertently stated that in both Hot Pressed and Cold Punched varieties, blank and tapped Nuts are selling at the same price. We should have said that they are quoted at the same discount, since they are, of course, selling on different lists as heretofore.

Borax.—The prices of Borax remain about as they have been since late in January last. The market is represented by the prices given below, the differentials being governed by the quantities purchased, viz.: Carloads of 18 tons or more, refined crystals, in bags, 4½ cents per pound; in barrels, a ¼ cent advance, or 4¾ cents, and powdered, in barrels, 4¾ cents. Ton lots, refined crystals, in bags, 4¾ cents, and in barrels, 5 cents per pound. Powdered Borax in barrels is 5 cents per pound. The leading interest, which until recently has controlled the market in this country, in consideration of a yearly contract with it, shade the above quotations ¼ cent per pound, and if purchases are confined solely to that single source, the following further concessions are made, as follows: On a total of 5 tons, 1 per cent.; 25 tons, 2 per cent.; 50 tons, 3 per cent., and 100 tons and over during the year, 5 per cent. discount; the rebates being allowed after the close of the year's business.

Cotton Goods.—The weakness of the Cotton market has naturally had some unfavorable effect on miscellaneous lines of Cotton Goods handled by the Hardware trade, such as Clothes Lines, Mops, Twine, &c. Prices on these commodities are not firm and manufacturers have been announcing somewhat lower quotations.

Galvanized Ware.—Following reductions in Galvanized Pails, Tubs and Coal Hods recently made by leading manufacturers, a reduction of 5 per cent. has been announced in the balance of the Galvanized Ware line, including Ash and Garbage Cans, &c. A discount of 10, 7½ and 5 per cent. may be named to represent the market on these goods in a general way, although in the East some further concessions are obtainable.

Expansion Bolts.—Several manufacturers of Expansion Bolts, which are sold on the standard list, have sent out new discount sheets quoting prices effective after May 1.

Conductor Pipe and Eaves Trough.—Another new schedule of prices on Conductor Pipe, Eaves Trough, &c., has just been sent to the jobbing trade, representing changes which affect Eastern territory mainly. This district has now been subdivided into Northeastern and Eastern territories, the former including New England and the section immediately around New York, and the latter the balance of the territory formerly designated as Eastern, with the exception of North and South Carolina, which have been transferred to Southern territory. In the Northeastern District the prices recommended remain about the same, Conductor being quoted at 70 and 10 per cent. discount and Trough at 75, 10 and 15 per cent. For Eastern territory a lower figure has been named, which, however, does not represent much change from ruling prices. On Pipe the discount is 75 per cent. and on Gutter 80 and 2½ per cent. No quotations are given on Ridge Roll and Formed Valley for these territories, but it is expected that they will rule a little higher. In Central, Southern and Western districts prices remain practically unchanged. On Copper Pipe and Trough no prices are named, the market being irregular, although it may be represented in a general way by discounts of from 50 and 10 to 60 per cent.

Paris Green.—Manufacturers of Paris Green announced prices which took effect April 27, the base price being lower than that of 1907. The prevailing price of Arsenic is 4¼ cents and Sulphate of Copper is quoted at 5 cents. These values are unusually low and buyers of Green might think that the price of Paris Green should have been put on a lower basis than it is, in view of these facts. These low prices for raw material are, however, quite recent, while manufacturers of Green placed their orders some months ago, before the financial stringency developed, and at much higher than present prices. In connection with price it is interesting to recall that the base price announced on January 5, 1905, was 12 cents. The 1908 prices are as follows, subject to change without notice, f.o.b. New York, terms, 30 days net, or 1 per cent. cash in 10 days:

	Kegs. 100 to Arsenic 175 Kegs.	Kits. 14- 28-56 lb.	Boxes. 2 & 5 lb.	Boxes. 1-lb.	Boxes. ½-lb.	Boxes. ¼-lb.
10,000 lb. and over	21½	22	23	23½	24½	25½	26½
5000 to 10,000 lb.	22	22½	23½	24	25	26	27
1000 to 5000 lb.	23	23½	24½	25	26	27	28
500 to 1000 lb.	24	24½	25½	26	27	28	29
Less than 500 lb.	25	25½	26½	27	28	29	30

Window Glass.—In most sections only a fair demand for Window Glass is noted, notwithstanding more favorable weather conditions. Buyers do not appear inclined to stock up even though prices are low. Factory prices are not generally published, which would lead to the belief that buyers can practically name their own price, if sellers are anxious to dispose of their Glass. In New York and vicinity business is very quiet. The minimum prices recommended by the Eastern Window Glass Jobbers' Association are as follows: Single Strength, 90 and

25 per cent.; Double Strength, 90 and 30 per cent. discount from jobbers' list. These prices, are, however, not closely adhered to.

Linseed Oil.—The strength of the Linseed Oil market lies in the fact that stocks in the hands of sellers and manufacturing consumers are light, and that crushers are carrying comparatively light stocks of seed and Oil. Crushers are therefore not anxious to accept orders for delivery beyond June 1. There is more of an inclination on the part of large buyers to buy somewhat further ahead than they have been doing, though orders covering immediate requirements predominate. Local quotations are as follows: In 5-barrel lots, State and Western Raw, 40 to 42 cents; City Raw, 42 to 43 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—The trend of the market has been downward during the week under review, and this has had the effect of keeping consumers out of the market. The falling off of price is attributed to heavy receipts of Turpentine at Savannah. The 30,000 barrels of tank stores held by the independents continue to be an uncertain factor in the market's future. The New York market is represented by the following quotations: Oil Barrels, 45½ to 46 cents; Machine Made Barrels, 46 to 46½ cents.

UNDERSELLING MAIL ORDER HOUSES.

GEORGE B. SPROWLS, who operates a good sized store in Claysville, Pa., is an intelligent, up to date merchant, who, by his enterprising methods, is able to do a very large business for a town of the size in which he is located. Besides the usual Hardware lines, he handles Bicycles, Sewing Machines, Paints and Varnishes, Implements, Vehicles and an extensive variety of allied specialties, which add much to the profits of the business. Mr. Sprowls is not worrying himself about hard times, as the recent volume of his business shows a 10 per cent. increase over the same period last year. This of course has only been accomplished by hard work. Another matter which he does not allow to trouble him is catalogue house competition. He has ideas of his own as to how this should be met, which perhaps may best be expressed in his own words. He writes as follows:

An Aggressive Policy.

We meet the catalogue houses on their own ground. They hire the best advertising writers to make people believe that they are giving greater bargains than we do. Now let any Hardwareman take their catalogue—he should keep one in the store all the time—look it over carefully, and he will be surprised to find that they are high in many things, so that he can easily meet their prices, counting nothing for freight, &c., and still make a good margin of profit. I have prepared a small folder showing about 110 items that I sell cheaper than they do. These I have mailed out to my customers, and have had good results from same. Lots of people have told me that they were ready to send away, but on comparing prices, found that they could not afford to do so.

Increasing the Volume of Business.

I believe in handling more goods at less profit and depending on volume of business to help out. I try to show my customers that I can do better by them than any mail order concern. It does not count with people to tell them that they should patronize home trade instead of sending away for goods. People don't want to pay the price of a local dealer when they can buy goods in adjoining towns or even far away at much less money. The day of old time profits has gone by. Forty or 50 per cent. will drive trade out of any community. Let merchants try to do two or three times as much business at less profit and see how quickly their trade improves. It is better to do this than have the money sent out of the community.

The comparison of prices referred to in Mr. Sprowls' letter is contained in a four page circular with the following statement on the front:

Believing that all parties will be glad to know how our prices compare with large catalogue houses in the cities, I have taken the latest catalogue and find our prices average very much lower than theirs. Of course they don't attempt to compete with us on Wire, Barb Wire, Nails, Lime, Cement, Plaster, &c. We recognize the fact that all parties are wanting to deal where their money will go farthest. Below will be found a comparison of prices which demonstrate conclusively that our prices average lower than any catalogue house in the United States, not counting anything for freight, &c.

On the succeeding pages is a list of over 100 items with Mr. Sprowls' price and the catalogue house price quoted side by side. This list is so interesting that we give it below, just as it appears in the circular:

	Our price.	Cat. house price.
5 shovel Lever Cultivator with outside [illegible] braces	$2.50	$3.03
14-tooth Lever Harrows (cultivator)	2.75	3.08
Double Shovel Plows	1.90	1.95
Wing Shovel Plows	2.00	2.34
Garden Cultivators	.40	.43
Mattock	.30	.34
Grub Hoes	.25	.26
Pruning Shears	.50	.54
Bush Snaths	.65	.66
Bush Scythes	.15	.19
Clipper Corn Cutters	19.00	19.85
7-ft. Steel Land Rollers, three sections	20.00	21.25
8-ft. Steel Land Rollers, three sections	18.75	19.95
Disk Harrows	9.50	9.78
U Bar 60 tooth cast Smoothing Harrow	6.00	6.25
Weeders	21.50	25.95
Triple-geared ball bearing Feed Grinder	1.75	1.98
Outside solid bronze oval beaded Door Locks	.50	.52
Inside Door Lock to match, bronze plated	1.85	2.10
Double sliding Door Locks, to match	.65	.70
Sash Cord, per hundred feet	.03	.04
Galvanized Fence Staples, per pound, any quantity	.40	.47
Barn Door Hangers, roller bearing, per pair	2.85	3.00
Hay Carriers	.95	.99
Long double Harpoon Forks	.15	.17
Hay Carrier Pulleys, used with hay Rope	.85	.87
Jackle, Block Hoists and Wire Stretcher	1.85	2.04
Jack Screws, 2 x 10 screw, 20-ton capacity	1.65	1.79
Burr Steel Safety Lifts, No. 4	2.00	2.29
Burr Steel Safety Lifts, No. 5	.10	.11
Victor Steel Traps with chain No. 1, each	1.50	1.70
Best 10 in. ball bearing Ratchet Brace	3.00	3.05
Pedal mounted Grindstones	.95	.99
No. 1 Pipe Cutters	2.50	2.80
Perfection Wire Cutting Nippers	.35	.40
Copper Rivets, per pound	.95	1.15
Blued Steel Squares	7.50	7.65
Standard Buggy Wheels, per set, with tires	8.00	8.80
22 oz. Rubber Buggy Tops, fitted on buggy	.60	.83
Silver and Ohio King round point Shovels	.50	.56
Grain Scoops (scoop shovels)	.50	.54
Grass Catchers for lawn mowers	.60	.65
Standard Clipper Scythes	.20	.25¼
No. 778 Hog Fence, similar to theirs, per rod	.23	.28⅛
No. 832 Hog Fence, similar to theirs, per rod	.25	.31¼
No. 939 Hog Fence, similar to theirs, per rod	5.85	5.98
12-ft. single drive Gates	7.50	7.58
600-lb. Platform Scales	.75	.92
¾-in. Brass Bibb Cocks	.30	.31
⅝-in. Brass Globe Valves	.03½	.04
¾-in. black Gas Pipe, per foot	.04⅔	.06
1-in. black Gas Pipe, per foot	.02½	.03
⅝-in. best grade Manila Rope, per foot	6.00	6.99
Same grade Saddle, Morgan tree	14.50	15.45
Same single strap Runabout Harness	15.00	16.79
Same solid Nickel Breast Collar Harness	20.00	22.86
Low down Handy Wagon, same quality	55.00	59.50
Same quality Buggy	44.00	44.95
Same quality Buggy	60.00	61.05
Same quality rubber tired Runabout	55.00	56.50
Same automobile seat Buggy	15.00	15.75
Same quality Sewing Machine, automatic	12.00	13.95
Same quality Sewing Machine	11.00	12.86
16 in. Hot Blast Stoves	1.25	1.26
Heavy Cast Sinks, 18 x 30	5.00	5.45
Round Rotary Washers	12.15	15.12
Best 2-cylinder Force Pump complete with 30-ft. well	2.95	3.20
Anti-freezing Lift Pumps	5.50	5.67
Low down Tank Pumps	.25	.29
Cramped Leathers for low down Tank Pumps	4.10	4.53
4-qt. Enterprise Lard Presses and Sausage Stuffer	.10	.15
Best grade Harness (shoe thread) Thread, per ball	.85	1.05
Double bow Sheep Shears, per pair	.20	.21
Halter Chains, No. 1000	.50	.72
Breast Collar Straps, 7/8 in. per pair	3.00	3.25
3 in. Breast Collar with 1¼ in. traces	4.00	4.39
Double team Breeching with 4-in. side straps	2.75	2.93
Buggy Hames with 1¼-in. Traces attached	.75	.94
1 in. Side Straps, per pair	.12	.15
1 in. Hame Straps sewed with two loops	.75	.88
1¼ in. Leather Neck Halters	.50	.60
3-buckle Overdraw Checks	1.50	2.13
Single Buggy Lines, 1 x 1¼ round edge S. B	2.75	3.25
Best grade heavy 3/4 in Brass Team Bridles	2.75	3.49
Check lines, 1 in. by 18 ft	3.00	3.71
Check Lines, 1 in. by 20 ft	6.75	7.37
Same kind of Side Saddle	12.00	12.33
Same quality Texas Saddle	.85	.93
Mrs. Potts' Sad Irons, per set, nickel plated	.03	.04
⅜ in. bent Malleable Elbows	.04	.05
⅜-in. black Malleable Elbows	.03	.04
⅜-in. wrought iron Couplings	.05	.06
1 in. wrought iron Couplings	.08	.09
⅜ Malleable Unions	.02	.03
⅜ Bushings	.50	.55
Rough Brass Stop Cock, T handle, ¾	.20	.21
Tiny Rats-tip No. 6	4.75	4.82
H & R nickel plated Hammer Revolver	5.25	5.45
H & R nickel plated Hammerless Revolver	2.85	3.09
Dry back Hunting Coats	.07	.08
Mouse Traps, three for	.70	1.05
18-in. Butcher Saw	2.00	2.08
Pearl Tang best grade Razors	.50	.54
Trimer Clippers	.15	.18
Storm Glass Thermometers	.15	.21
3½ x 3½ Old Copper Butts, per pair	.05	.06
Old Copper Sash Locks	3.00	3.05
Double Door Hangers and Track [illegible] parlor doors	.08	.10
Malleable Screw Pin Clevises, 2 x 4		

R. R. Roberts, Dunning, Neb., is establishing a new Hardware, Stove, Tinware, Implement, Paint, Sporting Goods and Harness store.

A Handsome Fishing Rod Case.

AMONG the many noteworthy features attracting the attention of a visitor in the splendid Hardware store of the John E. Bassett & Co., New Haven, Conn., is the wall case for the accommodation of Fishing Rods, a portion of which is shown in the accompanying illustration. The case is perhaps 8 ft. long and 4 ft. high. It has sliding glass doors in front and is also illuminated by incandescent lights with reflectors inside. The Rods rest on light brackets made for the purpose, a pair of which are shown in Fig. 2. Strips of felt glued on are used to cover the upper edges of the brackets. This keeps them from scarring the Rods, which are naturally put up and taken down frequently during the season in the course of handling and showing stock. The brackets are fastened to the back of the case by screws inserted through projecting shoulders, as shown. Advantages possessed by this case are not only the attractive effect of the Rods as a whole, showing the size and variety of the stock, but the fact that each separate Rod may be distinctly seen and easily got at, if desired. Another good feature is the fact that each Rod lies in a good bright light, there being nothing solid to obstruct the light of the electric reflectors disposed about the case. These lights are of course on a switch, which may be turned on when the Rods are being shown.

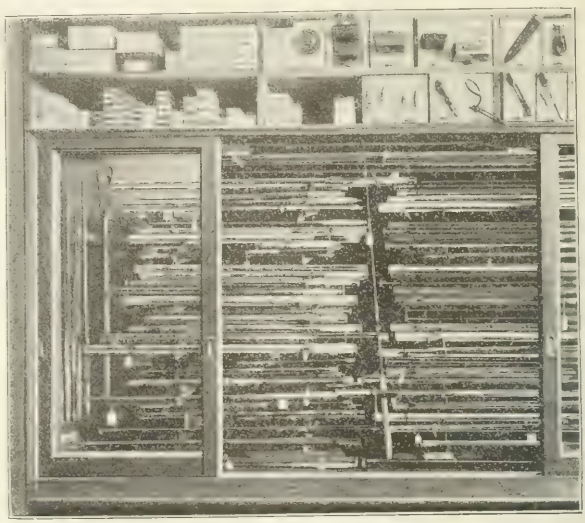


Fig. 1. Wall Case of Fishing Rods.

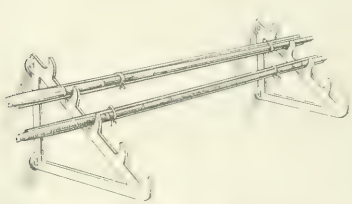


Fig. 2. Brackets in Wall Case Accommodating Rods.

Delaware Marine Supply Mfg. Company's Catalogue.

IN the catalogue of Marine Hardware, Car Trimmings, Ship Fittings, Port Lights, Hinges, Hex Nuts, Ferrules, &c., issued by the Delaware Marine Supply Mfg. Company, Wilmington, Del., special attention is merited by the price-lists of Fast Joint, Loose Joint and Loose Pin Butts. Great care has been taken by the company to make these lists as complete as possible, including in them all information desirable from the viewpoint of a buyer. The arrangement and scope of the lists will be clear from the accompanying reproduction. Finishes are lettered and described, and the size of Screws is given, together with the amount to be added to the list if Screws are furnished with the Butts. Hinges are made in seven different finishes, from A to F, and Hinge tables giving the number and size of Screws required for each Hinge, together with the price for same if they are to be furnished.

Syndicate Buying Litigation.

SYNDICATE buying, an institution which seems to have become pretty firmly established in the Hardware trade has for some time, as is generally known, been under the regulation of the National Hardware Association, which has taken the position that only the larger jobbing houses are entitled to buy direct from the manufacturers and at prices obtainable by this method. It has been the practice of the leading purchasing agents who are located in New York to submit from time to time to the secretary of the association lists of their clients and to secure his approval of new accounts which they proposed to take on, the result being to restrict the scope of their business and limit their service to merchants whose standing as jobbers was recognized by the leading wholesale houses. The task thus assumed by the National Hardware Association of exercising supervision over the business of others must be regarded as a difficult one, involving many decisions which call not only for fairness and impartiality, but for a thorough knowledge of the facts which may often be difficult to obtain. Considerable friction has resulted and dissatisfaction has frequently been felt by the parties affected by various rulings which operated against the syndicate buyers or their prospective patrons. A short time ago the firm of W. B. Fox & Brother, New York, a syndicate buying house of many years' standing and enviable reputation for honorable dealing, notified the secre-

PRICE LIST FOR LOOSE PIN BUTTS.

NOTE.—Prices are for one dozen pairs of butts and do not include screws. If screws are wanted add the number of dozens of butts ordered to the number of screws as given in the table. The prices for screws are net.

Size of Butts	Size of Screws	C Dull Pin Yellow Brass	D Dull Pin Bronze	E Polished Yellow Brass	F Polished Bronze	G Nickel Plated	H Antique Brass	K Antique Copper
1½ x 1½	5 x ⅜	$ 1 10	$ 1 47	$ 1 77	$ 1 83	$ 5 10	$ 5 32	$ 5 32
	Add for Screws	2	24	30	34	38	38	38
1½ x 1½	5 x ½	4	1 58	1 69	$ 1 91	5 28	5 50	5 50
	Add for Screws	23	28	33	38	42	42	42
1½ x 1½	5 x ⅝	4 42	4 73	4 82	5 20	5 46	5 68	5 68
	Add for Screws	23	28	33	38	42	42	42
1½ x 1½	5 x ¾	4 55	5 02	96	5 42	5 66	5 88	5 88
	Add for Screws	23	28	33	38	42	42	42

Portion of Price-List from Catalogue of Delaware Marine Supply Mfg. Company.

tary of the National Hardware Association that it would no longer recognize his supervision, stating, however, that it did not propose to deviate from the conservative lines on which its business had been conducted in the past. The firm, indeed, maintains that its list of clients remains substantially the same and contains the names of no houses which would not pass as jobbers under a consistent interpretation of previous rulings. Following this declaration of independence, the firm has evidence that letters calculated to prejudice its standing as a representative of jobbing interests have been sent to manufacturers by a number of prominent jobbers. These letters allege that the firm is representing retail merchants and quotes to them extreme jobbing prices. This statement W. B. Fox & Brother deny, and as they regard it as intended to injure their business, they have authorized their attorneys to bring suit on this ground against a prominent jobbing house.

Texas Hardware Jobbers' Association.

THE annual meeting of the Texas Hardware Jobbers' Association was held in San Antonio on the 17th and 18th inst. A larger percentage of the members and a greater number of manufacturers' representatives were in attendance than at any former gathering. It was, in fact, the most interesting and profitable meeting the association has ever held. There was considerable discussion during the convention on such subjects as terms, cash profits, freight rates and railroad legislation and accounts. Prominent among visiting representatives of manufacturing interests was Frank Baackes, vice-president of the American Steel & Wire Company, who made an address which was listened to with much interest and attention. Brief addresses were also made by a number of traveling salesmen, including E. F. Cooper, S. H. Roberts, W. E. Mayo, Frank Lowe, S. Reimers, Henry J. Turner, R. J. Jackes, J. C. White, Fred Huggins, G. R. Stafford, George M. Baker and Fred W. Devy.

The following officers were elected for the ensuing year: Chas. E. Nash, president; E. A. Peden, first vice-president; Jno. L. Keith, second vice-president; R. F. Bell, secretary-treasurer. Executive Committee: F. A. Heitmann, G. A. Trumbull, W. L. Sanford, R. L. Penick.

The selection of time and place for the next annual meeting was left to the Executive Committee.

The members of the association present included the following houses: H. S. Bettes Hardware Company, Paris; Nash Hardware Company, Ft. Worth; E. L. Wilson Hardware Company, Beaumont; Penick-Hughes Company, Stamford; Peden Iron & Steel Company, Houston; McLendon Hardware Company, Waco; Roberts-Sanford-Taylor Company, Sherman; Huey & Philip Hardware Company, Dallas; Bering-Cortes Hardware Company, Houston; Heusinger Hardware Company, San Antonio; Morrow-Thomas Hardware Company, Amarillo; San Antonio Hardware Company, San Antonio; Joseph Myer Company, Houston; Wm. Henry & R. E. Bell Hardware Company, Ft. Worth; Moroney Hardware Company, Dallas; Tatum Hardware Company, Corsicana; Adoue-Blaine Hardware Company, Houston.

Among the manufacturers who were represented at the meeting were the following: Henry Disston & Sons, Philadelphia, Pa.; E. C. Atkins & Co., Indianapolis, Ind.; M. Hartley Company, New York City; Harrington & Richardson Arms Company, Worcester, Mass.; Enterprise Mfg. Company, Philadelphia, Pa.; Phœnix Horse Shoe Company, Chicago; Pike Mfg. Company, Pike, N. H.; Gandy Belting Company, Baltimore, Md.; American Steel & Wire Company, Chicago; American Sheet & Tin Plate Company, Pittsburgh; Colorado Fuel & Iron Company, Denver, Col.; Ludlow-Saylor Wire Company, St. Louis, Mo.; National Enameling & Stamping Company, St. Louis, Mo.; Sargent & Co., New York City; E. I. Du Pont De Nemours Powder Company, Wilmington, Del.; American Fork & Hoe Company, Cleveland, Ohio; United States Graphite Company, Saginaw, Mich.; Peters Cartridge Company, Cincinnati, Ohio; Youngstown Sheet & Tube Company, Youngstown, Ohio; Jackes-Evans Mfg. Company, St. Louis, Mo.; Winchester Repeating Arms Company, New Haven, Conn.; American Screw Company, Providence, R. I.; Schlueter Mfg. Company, St. Louis, Mo.; Landers, Frary & Clark, New Britain, Conn.; American Wringer Company, New York City; U. S. Hame Company, Buffalo, N. Y.; Columbian Hardware Company, Cleveland, Ohio; Lamson & Sessions Company, Cleveland, Ohio.



Members and Manufacturers' Representatives at the San Antonio Meeting of the Texas Hardware Jobbers' Association.

A. A. Peterson, formerly of Maple Park, Ill., has purchased the Hardware stock and business of H. T. Janssen, Sterling, Ill., which has been organized under the name of the Sterling Hardware Company. It is the purpose of the new company to remodel the store now occupied and enlarge the stock.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

BRAINERD MFG. COMPANY, East Rochester, N. Y.: 1908 supplement No. 1 to 1907 catalogue, referring to special brass, bronze and steel Hardware, including hinges, hasps, side stops, corners, chest handles, catches, hook lifts, &c.

PENN HARDWARE COMPANY, Reading, Pa.: Price-list circulars, referring to Screen Door trimmings, and Penn window stop adjusters.

CONSUMERS' COMPANY, Chicago: Illustrated booklet, referring to Useeit water coolers and accessories.

A. G. SPALDING & BROS., 124-128 Nassau street, New York: Handy catalogue of spring and summer athletic goods for the season of 1908.

DAVID BRADLEY MFG. COMPANY, Bradley, Ill.: Illustrated booklet, referring to MacKinnon Farm Wagons, gears, parts, &c.

I. N. BURDICK, 136-144 Wooster street, New York: Illustrated circular, showing a varied line of Lock Corner Trays, Store and Shop Furniture, including Counters, Pigeon Hole Cases, Drawer Cabinets, Portable or Sectional Shelving, &c.

AMERICAN FILE SHARPENER COMPANY, 296 Broadway, New York: Illustrated catalogue of its American File Sharpening Machine, by means of which, with a blast and carbo flynt, a patented abrasive furnished in bulk, used files can be resharpened several times. A partial list given of users of the machines contains names of some of the leading manufacturers of the country.

CRESCENT TOOL COMPANY, Jamestown, N. Y.: Catalogue illustrating a new line of Lineman's Pliers recently added to the line of Combination Pliers, which the company has manufactured for the past six years.

W. H. COMPTON SHEAR COMPANY, Newark, N. J.: Illustrated catalogue of Shears, Scissors, Tinners' Snips, Razors, &c.

AUTOLIGHT & MOTOR SUPPLY COMPANY, Philadelphia, Pa.: Illustrated catalogue of Automobile Accessories and Tools.

MAST, FOOS & CO., Springfield, Ohio: Illustrated catalogue, No. 34, describing line of Imperial Windmills and Galvanized Steel Towers.

YALE & TOWNE MFG. COMPANY, 9-15 Murray street, New York, has had printed in leaflet form photographic reproductions of its show window, which at frequent intervals has been artistically dressed with examples of the numerous kinds of Builders' Hardware made by the company. Recognizing the importance of tasteful displays and to assist the merchant in city or town the arrangements have been of such character as can be readily reproduced, the detail being sufficiently clear to enable clerks with a taste for such work to follow the scheme or modify any one of perhaps 20 along original lines. The prints are full page size, and for gratuitous distribution on application.

ROBERT H. INGERSOLL & BRO. have removed from 51 Maiden lane, New York, to the new Frankel Building, 45-49 John street, where they have an entire floor for business offices and sample rooms, in which their numerous styles of Watches are shown, from the dollar quality to more expensive grades.

C. C. PUTNAM & SON, Putnamville, Vt., have placed an agency for the sale of Putnam Spring Clothes Pins with the Robert F. Haight Company, 6 East street, San Francisco, Cal., who will have a stock of the Pins on hand and be able to make deliveries from that city.

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Final Assault of the Postal "Reformers."

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., April 28, 1908.

THE advocates of parcel post and other so-called reform measures related to the postal service are planning a final assault upon Congress in the closing days of the present session, which it has been practically decided will terminate May 15. A mass meeting of the "reformers" will be held in this city on May 5, the objects of which are set forth in the following notice published here at the instance of the Postal Progress League:

A mass meeting of all organizations and individuals favoring postal reforms has been called to meet in this city Tuesday night, May 5, under the auspices of the Postal Progress League. It is announced that Postmaster-General Meyer will address the meeting, which will be for the purpose of impressing upon Congress and the President the importance of enacting legislation which has been urged by the post office officials.

The Postmaster-General has recommended to the present Congress the establishment of a local rural parcel post, as a means of eliminating the postal deficit, and as being of great value to 4,000,000 patrons of rural routes. He also urged the immediate establishment of postal savings banks. Consolidation of the third and fourth classes of mail matter at the old rate of 1 cent for each 2 oz. has been urged by the Department for many years.

Mr. Cowles' Open Letter to Congress.

The members of the Senate and House upon whom pressure is to be brought at the coming mass meeting are already in receipt of communications from James L. Cowles, the secretary-treasurer of the Postal Progress League, who has prepared what he styles an open letter addressed to all members of the Sixtieth Congress. In this letter Mr. Cowles says:

Postmaster-General Meyer calls attention to the fact that a cheap local rural parcel post could be made to eliminate the postal deficit. We call attention to the fact that such a service would prove an infinite convenience to 4,000,000 voters who, with their families, live on our rural routes. For the lack of legislation easily within your power these voters are now subjected to great and unnecessary inconvenience and expense. The vehicles for the performance of the proposed service are at hand, and the public is paying for them.

You have stated that "upon the postal service more than upon anything else does the general economic, social and political development of the country depend." In view of these facts, we trust that immediate consideration may be had upon the various bills before the Postal committees of the House and Senate and that from them some bill may be chosen or some other bill be formulated and enacted into law.

We also ask your immediate and favorable action upon H. R. 257, providing for the consolidation of third and fourth class mail matter at the third-class rate, as urged upon Congress by the Post Office Department for the last 17 years.

This proposal has been indorsed by the legislatures of Connecticut, Rhode Island and Massachusetts, by the National Grange and by the American Federation of Labor. It simply asks that our parcel service shall be brought up to where it was in 1874. It simply asks that blank books and other general merchandise shall be posted within the United States as cheaply as printed books are posted round the world. Failure on the part of the Postal committees of the House and Senate to grant hearings on the various postal bills before them leaves us only this method of making known to you the wishes of the public whom we represent.

A Carefully Selected Date.

The selection of May 5 as the date for holding a mass meeting in this city exhibits considerable shrewdness. The annual Post Office Appropriation bill, which passed the House more than a month ago, has been held up in the Senate Post Office Committee owing to the serious illness of Chairman Penrose. Senator Penrose is now convalescent and is expected to return to Washington during the first week in May, when the consideration of the appropriation bill by the Senate committee will be begun. It is apparent, therefore, that the postal reformers are counting upon making a demonstration in this city while the postal bill is under consideration in the Senate committee, relying upon creating sentiment for the rural parcel post amendment heretofore presented in the Senate by Senator Simmons, who is a member of the Post Office Committee. The Burnham and Kean bills, which respectively embrace the Postmaster-General's two projects of rural parcel post and the reduction in the general merchandise rate from 16 to 12 cents per pound, are also before the committee and could be added to the appropriation bill if a sufficient number of votes could be mustered.

The Opponents of Parcel Post

must be prepared to meet the pressure now being brought to bear upon Congress by the advocates of these schemes and must be in position to act promptly and effectively in the event that the Senate committee reports favorably any of the parcel post propositions as riders to the appropriation bill. Such amendments will be subject to the point of order that new legislation cannot be added to appropriation bills except by unanimous consent, and it will only be necessary, therefore, that some Senator be induced to raise the point of order to eliminate them from the pending measure. If the committee adopts them, however, it will require strong and well directed effort to induce even one Senator to oppose the action taken, and for this reason it may be a difficult task.

Should the bill pass the Senate with a parcel post rider it will mean a hard fought battle in the conference committee which will then be appointed to harmonize the differences between the two bodies. This committee will consist of the three ranking members of the Senate and House Post Office Committees. The present disposition of the House committee is hostile to all these projects, but if the Senate should incorporate any of them in the bill there would be an even chance that they would be retained in the measure as finally signed by the President.

The point to be emphasized is that the crisis has been reached in the year's campaign. All the planning and the active work that has been done by the organizations in the trades opposed to parcel post will go for naught unless prompt action is taken at this time. Neglect now may mean the incorporation of a rural parcel post amendment to existing law that in another year will be enlarged into a general parcel post provision which no amount of work will prove sufficient to wipe off the statute books for at least a generation.

Position of New York Merchants' Association.

Considerable curiosity is expressed here by members of the House with regard to the underlying purpose of the Merchants' Association of New York in memorializing Congress in the interest of the rural parcel post. The association has no direct interest in booming the rural parcel post scheme, and the solicitude shown for the welfare of the country merchant is entirely unprecedented. One member of the House suggested to the correspondent of *The Iron Age* that a general parcel post would probably prove of advantage to the merchants of the big cities and that if Congress should favor the country retailers this year with a rural parcel post it could not logically refuse next year to extend the same facilities to the business men in the great commercial centers of the country.

Personal Letters Effective.

The opponents of the parcel post should bear in mind that they can be of great assistance to their friends in Congress at this crisis if they will write personal letters to them setting forth the reasons for their opposition to the rural parcel post, which is now being advocated so strongly by individuals who could not hope to profit directly by it, and yet who are not given to wasting much effort in purely philanthropic enterprises.

THE C. W. GAUSE COMPANY, San Francisco, Cal., on April 25 removed its office and salesroom to 718 Mission street, occupying room 305 of the Herman-Weil Building. This company acts as sales agent for a number of prominent manufacturers of Hardware and kindred products for domestic and export trade, and also maintains a Portland, Ore., office at 306 Oak street.

HENRY B. SPERRY, who for 15 years operated the Alexander silica brick plant at Akron Ohio, and more recently has been manager of the fire brick department of the Robinson Clay Product Company at Akron, is now devoting all his attention to the Spirit Level Works of the Baker-McMillen Company, Akron, of which he is president and treasurer.

KEEPING STOCK.

A PAPER BY H. C. MEYER, ROCKDALE, TEX.

THE subject, "Keeping Stock," is very important in its nature, yet little can be said on the question, it being one of action, one of work, rather than of words.

The arrangement of a Hardware store and the allotment of space to the different goods will depend largely upon the location of the store, its size, whether large or small, and the variety of goods carried; on the size of the salesroom and the extent of other accommodations for storing goods, such as warehouse, &c.; the class of trade whose wants are to be studied and supplied, and the individual taste and judgment of the merchant. Manifestly there is no single method of arrangement which can be recommended or followed in all cases, for each merchant has a different problem to solve, the elements of which are given in the special circumstances under which he is carrying on his business. Then again, the proper arrangement and display of goods depends on the location of counters, if any, shelving, racks, &c., and the expense which of necessity must be considered.

The Position in the Store

which should be assigned to the different kinds of goods should have careful consideration. In some stores this matter is apparently overlooked, and the manner in which the goods are distributed in the different locations is inconvenient and in many ways objectionable.

It is obvious that in every store there are locations which are more prominent than others for the keeping and the displaying of goods, and the merchant should be careful to use such conspicuous places to the best advantage. It is generally a good rule to assign such places to attractive goods, as, for example, Cutlery, Silverware, fine China, Baseball, Tennis and other Sporting Goods, or such other articles the sale of which is specially facilitated by their display. In this class of articles belong the large variety of House Furnishing Goods and Hardware specialties, which, attracting the attention of the observer and customer, often lead to purchases.

Goods a Little Outside Hardware.

If you are carrying goods which are not likely to be thought of as sure to be found in a Hardware store, it is desirable that they be given places where they will be seen, as your patrons may not otherwise be aware of the fact that you are carrying them, while such goods as Nails, Screws, Bolts and kindred articles which belong distinctly and solely to a Hardware stock can be given a less conspicuous position. It is also desirable and necessary to have

Seasonable Goods Near the Front

of the store, where they will be seen by all who enter, and the same principle applies to any line of goods the sale of which is to be specially pushed. If you have no show window and are, as is the practice in a good many places, displaying goods in front of the store, you should be careful to display such goods to good advantage, and especially should you see to it that these goods are fresh and clean. The best and proper way is to always sell the sample and replace with a new one after customer leaves the store. Frequently I see samples, such as Washing Machines with hoops off and weather beaten, Wash Kettles rusty from age, Plows and other implements rusty and paint beaten off, steel goods with rusty blades and handles clearly showing age, as well as other articles too numerous to mention, displayed in a dilapidated condition, all of which shows a bad taste, and I cannot imagine a more unseemly sight from a display point of view, and it clearly shows a lack of taste and enterprise and of good judgment.

Similar Goods Together.

Another general principle which should be followed is to keep similar goods together as far as possible; for instance, Builders' Hardware should be together, and so should Carpenters' Tools and Blacksmiths' Tools, &c. In the application of these principles there is opportunity for much careful planning, but time thus spent will cer-

Division of Shelving.

The shelving on one side should be for Hardware such as is usually bought by men, and on the other for household goods, such as are usually bought by women. The shelving on the Hardware side should be assigned to goods as follows: Guns and Ammunition and kindred goods, Builders' Hardware, Carpenters' Tools, Blacksmiths' Tools, Paints, Varnishes and Brushes, &c. The class of goods on the household goods furnishing side is made up of the following: Lamps and Lamp Goods, Tin and Granite Ware, China and the long list of household specialties. In addition to the general outline mentioned, it should be the aim of a merchant and his employees to make goods on shelves always look fresh and so arrange them that the shelves always look well filled, which can easily be done. Dust should never be allowed to settle on goods or shelving.

The Show Window.

It has been said "You could not hire the services your show window will give you for the price of two clerks, if you use it right." In some instances this may be overdrawn, while in others it is true; hence the best possible use should be made of it. Many merchants do not give this method of displaying and showing their goods the amount of attention they should, and do not seem to realize its full value. Many think it unnecessary labor and expensive. With these ideas I cannot agree. Personally I believe that window display is one of the most valuable methods of advertising, and frequently the appearance of a merchant's show window is an index to his business ability.

Many seem to think that it is a difficult matter to dress up a window in a Hardware store. I believe it requires a great deal of ingenuity to get a really attractive window, but in this, as in many other things, "practice makes perfect." The large variety of goods handled in a Hardware store gives a

Wide Range for Attractive Displays.

It is well to leave this to one person, who will soon begin to take a pride in the matter and turn out windows that will be a surprise and prove to be trade getters. A window display can be greatly strengthened and be made more effective by the use of show cards, which should call attention to the display in a brief and clear manner, and it is essential to have neat price cards showing the price of each article. Keep windows clean and change your display often. This is very important. If you leave a display too long people will lose interest in your windows, and as a result you will lose the advertising value of your display.

How to Keep Stock Complete.

Akin to stock keeping is the buying of goods, for without judicious buying your stock will necessarily be broken. Many merchants depend on traveling salesmen to call their attention to goods needed, and in fact depend on the salesman to say what he should keep and sell. This is a condition a merchant should never allow himself to get into.

When there are a number of clerks employed the best plan I can suggest is to supply salesmen with pocketbooks with perforated sheets, and when an article becomes low or entirely out it should be the duty of the salesman at once to note this in his pocketbook, and tear out the sheet on which such notation is made and send same to the office, either noting thereon goods that are needed, or in case the salesman is in doubt as to what is wanted, he should take an inventory of such articles as are on hand, from which the buyer can make his order. For instance, should the salesman note that the stock on Monkey Wrenches was running low, he could take an inventory of the stock of Wrenches, send such list to the office, stating that such represented what was on hand. In a well regulated house these orders should go to the factory or jobber in first mail. Never wait for to-morrow. This is too important and necessary if you want to keep your stock complete.

The Traveling Salesman.

It is well, and common courtesy requires, that you treat

orders when on file, everything being equal, but you should never disregard your own interests. Your own interest and that of your patronage should stand prominently above all. Many contend that they need the salesmen to keep them posted. This is not altogether true. There are other methods by which you can keep yourself posted, and it should be your aim to have prices before you at all times. My experience has shown the best method to be a card index, which should be on your desk for ready reference and should be kept up to date at all times.

THE DOMINION OF NEW ZEALAND.

II.

BY JOHN L. SARDY.

New Customs Tariff.

LAST July a new customs tariff went into effect in New Zealand. Some of its changes are as follows:

Surgical and Dental Instruments free under the old tariff were advanced to 20 per cent. ad valorem, whereas Automobiles paying 20 per cent. ad valorem were made free under the new tariff. Instruments being of vital importance to poor and rich alike and Automobiles not of vital importance to either, but essentially a rich man's game, there has been so much fuss the law will probably be changed to the old tariff.

Handbills, programmes and printed advertising matter are raised from 20 per cent. ad valorem to 3 pence per pound. Cash Registers are advanced to 20 per cent. in place of 10 per cent. as before.

Hydraulic Cranes, which were free, are now 20 per cent. Iron Pipes over 5 in. diameter are raised to 20 per cent., former rate being 5 per cent. Locomotives, formerly free, are now classified as Steam engines at 20 per cent.

And so it goes on. There is a general advance all along the line.

The preferential schedules in favor of Great Britain are largely extended, but the percentage remains as before. This preference is fairly drawn out. It not only applies to any country forming part of the British dominions, reducing or abolishing or proposing to do so, the duty on any product of New Zealand, but also applies to any country, whether British or not. The only difference is that the Governor is absolutely authorized to make negotiations in the case of British dominions, but with other countries he can only do so subject to or by virtue of a treaty with the British crown. In both cases Parliament must ratify.

It is reciprocity fair enough. No treaty will be entered into, even with a British colony, unless a *quid pro quo* be given.

Any country desiring to play tit for tat with New Zealand can do so. Her preferential tariff policy is a simple one. For instance, if a country charges duty on wool or any other New Zealand product, the New Zealand Government sees no reason why that country's productions should not be taxed to an equal amount, when imported within its boundaries.

Food at Cost Price.

The dignity of labor appeals to all sound thinking men, but here is an example of the silliness of it.

The conference of trades and labor councils, sitting in Wellington, carried this resolution:

That whereas [illegible] benefits accruing from labor legislation in the past have been nullified by the action of the capitalist class in [illegible] out of proportion to the increase in wages, and whereas the reason for this lies in the uncurbed power of the capitalists, this conference strongly urges the people of New Zealand to make a stand, and demand legislation that will initiate a system of producing the necessaries of life and of supplying them to the people at cost price.

This New Zealand ideal would hardly appeal to our business men and the great American trusts, who are not engaged in the business of selling the "necessaries of life" at cost price.

An American Traveler's Experience with the Income Tax.

An American traveler the day before his departure from Melbourne met at one of the Melbourne clubs a gentleman who had recently been in New Zealand for business, and when he found out the American was going there, and above all things taking a big collection of samples, he told him such a tale of woe about the red tape, trouble and expense in connection with the Income Tax law, experienced traveler that he was, our American was perturbed, but he went to New Zealand all the same.

Briefly, the law is this: Any nonresident commercial traveler entering New Zealand must obtain a license to do business, for which the usual fee is a deposit of £10 sterling, as a guarantee that he will truthfully declare the profits made on the orders taken in the Dominion. On such profits a tax of 5 per cent. is levied. Upon arrival at the first port, which in this case was Dunedin, the American went to the Custom House, deposited £10, obtained his license and went about his business. There was no trouble about that.

After finishing his work in Dunedin he proceeded to Wellington. As this latter place is the seat of government, a few days before he was ready to leave he called upon the income tax collector, whom he found to be a polite and reasonable gentleman. The traveler explained it was quite impossible for him to declare profits, as he rarely obtained any actual orders, the firms he called upon merely inspected his samples and made notes of such articles as they would probably order when sending out their regular American indents or orders. The collector said he would consider the matter, and asked the traveler to return in a day or two.

Upon his return the collector said that no doubt his efforts would serve to increase trade in New Zealand for his principals, but as the actual increase could not be ascertained he had arrived at the conclusion that the fairest way would be for the Government to retain one-half of the deposit and return the other half, an arrangement to which the traveler at once assented, and without any delay or red tape there and then received the money.

Now note the difference. The man at the club in Melbourne was a Yorkshireman and inclined to be pugnacious. He thought he could tell the New Zealand Government what to do, and started in to make the trouble himself, with the result that the Government not only gave him plenty of it, but made his deposit £20, all of which was retained. Politeness always counts, but especially when dealing with Government officials.

The Business Men of Australia and New Zealand

are more like ourselves than any other men of affairs in the world. Many of them are self-made and none of them put on airs. The head of a firm is always approachable unless engaged, and this without the circumlocution of any formal introduction, which in many cases is so necessary in England. The Australasian possesses that excellent faculty of knowing he does not know everything. He is eager to find out what he does not know, hence commercial travelers representing lines of interest to him are always welcomed. Appointments to inspect samples are kept. Time is not wasted in superfluous talk. Business is the object in view and is strictly attended to. They do not rush about the way we do, but in other respects we are alike.

Prosperity reigns throughout Australasia, notwithstanding its tariff and labor laws. The country without any protective laws at all has abundant protection in Dame Nature, who gives this wonderfully productive part of the world a golden fleece in which gold and wool form a large part.

JOHN LUCAS & Co., Philadelphia, who have for the past 12 years maintained a sales branch in Chicago, have purchased a plant at Sixteenth and Morgan streets for the manufacture of Paints. This step is the outgrowth of an extensive development of the company's Western business and will materially add to the facilities of the Chicago branch. The recently acquired plant is being remodeled and the necessary machinery installed. The business will be continued as heretofore under the management of R. S. Lucas, and the railroad sales department will be in charge of Harry C. Quest, who formerly represented the Heath & Milligan Mfg. Company in a like capacity, with offices at 708 Marquette Building.

A Large Silverware Contract.

WHAT is probably one of the largest silverware contracts ever given out has just been awarded to the Meriden Britannia Company (International Silver Company), Meriden, Conn. The contract covers all of the silverware that will be used by the various railroads and steamships, as well as hotels and restaurants, comprising the so-called "Harriman lines," as follows: Union Pacific Railroad Company, Oregon Short Line Railroad Company, Oregon Railroad & Navigation Company, Southern Pacific Railroad Company; Northwestern Pacific Railroad Company, Illinois Central Railroad Company, Southern Pacific Company's Atlantic Steamship lines, as well as probably the Pacific Mail Steamship Company. In addition to the ware to be furnished for new equipment, there is also a great deal that will have to be supplied to take the place of that now in use, which must gradually be replaced to conform to standard designs. Following out W. V. S. Thorne's plan as director of purchases, the Harriman lines have adopted a standard style or design in silverware, which they will use throughout their system, and the arrangements as now made will run for a number of years. This contract, which the Meriden Britannia Company has been successful in securing in competition with other makers, shows the high standard attained by goods produced by this company, as conditions attending silverware for dining car, hotel or restaurant use are the most severe possible.

Clever Retail Advertising.

W. A. GUENTHER & SONS, Owensboro, Ky., recently had one of their plate glass windows broken by thieves, who got away with four Pistols worth about $30. Knowing that there was no use crying over spilt milk, the firm immediately proceeded to fill the window with Smith & Wesson, Colt and other high priced Guns. With these was shown the stone which broke the window marked:

"THIS IS THE ROCK THAT GOT FOUR GUNS LAST NIGHT."

On another card partially covered with silver dollars was printed:

"THESE ARE THE ROCKS THAT IT WILL TAKE TO GET EVEN ONE GUN HEREAFTER.

SIGNED, W. A. GUENTHER & SONS."

The window attracted so much attention that probably several thousand people came to view the broken glass and laugh at the joke, the result being that the firm turned their misfortune into an advertisement, which helped to recoup at least a portion of their loss.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM CURRIER LUMBER CORPORATION, Glamorgan, Va., which has recently incorporated and has opened up a new and up to date machine shop and two general stores handling General Hardware, Mill Supplies, Machinery, &c.

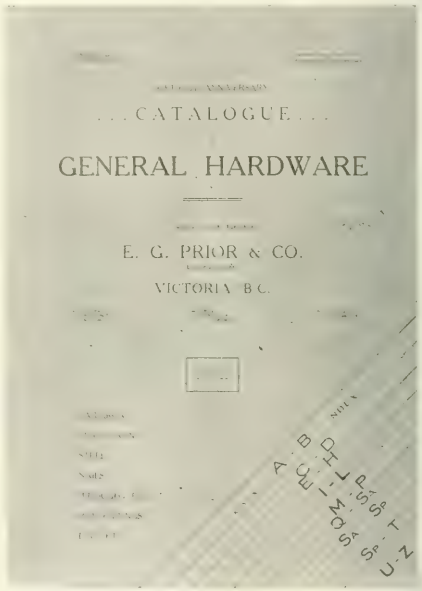
FROM TORNBLAD & PEDERSON, Kenyon, Minn., whose Hardware, Stove, Paint and Sporting Goods store has been destroyed by fire.

FROM ELLINGBOE HARDWARE COMPANY, Milaca, Minn., which has been incorporated with a capital of $50,000 by T. W. Caley, E. K. Evens and K. Ellingboe.

AT a meeting of the Board of Directors of the Merchants' and Traders' Association of Philadelphia, held April 23, F. W. Huff of the Supplee Hardware Company, who is widely known and honored in the Hardware trade, was elected president. Other officers chosen were: J. H. Cummings, first vice-president; G. L. Mitchell, secretary; and Theodore Voorhees, treasurer. The association is engaged in advancing the commercial interests of Philadelphia in the dissemination of a knowledge of its resources, its manufacturing and industrial advantages and its importance as a distributing point.

A British Columbia Catalogue.

E. G. PRIOR & CO., Victoria, B. C., claim the distinction of issuing the first large general Hardware catalogue published in the province of British Columbia. They have lately completed and are now distributing to the trade a volume of over 650 pages, 8 x 11 in. in size and containing some 3500 illustrations, covering a complete line of Hardware and kindred goods which are in demand in that section of the country. A noteworthy feature of the book is its complete and convenient index, which itself is alphabetically indexed by the novel method shown in the accompanying illustration. We are advised that a considerable staff, under the direction of Theodore Korb, has been engaged for about a year in getting out this catalogue, and that the better part of one of the largest printing plants in Victoria was occupied for a



Unique Index of British Columbia Catalogue.

like period on the printing and binding. The firm of E. G. Prior & Co. was established in 1859 and the new publication is appropriately styled their fiftieth anniversary catalogue. Not many business houses in British Columbia have reached the half century mark, and this house is among the pioneers who have proved and profited by their confidence in the future of that province.

THE TERRE HAUTE FURNACE & SHEET METAL COMPANY, Terre Haute, Ind., recently incorporated with a capital stock of $10,000, has taken over the stock and business of the Terre Haute Stove & Furniture Company. The new corporation consists largely of the stockholders of the latter company. As a result of the reorganization the sale of Stoves has been discontinued and the new company will give its entire attention to steam and hot water heating and the manufacture of Galvanized and Copper Cornices and general sheet metal work. The officers of the company are Herbert Briggs, president; T. F. O'Herron, secretary and superintendent; Thomas G. Love, vice-president; S. C. Brown, treasurer and man-

AMONG THE HARDWARE TRADE.

S. I. Posson & Co., Altus, Ark., Hardware merchants, are putting in a branch store at Ozark, Ark.

H. D. Meek, Centre Hall, Pa., has purchased the business formerly conducted by the College Hardware Company. The entire interior of the store will be remodeled and a new stock purchased.

Walton Bros. & Montfort have purchased the Hardware portion of Harry Litton's stock of goods in Blaine, Wash.

H. G. Kroncke Hardware Company, Madison, Wis., has been incorporated with a capital of $37,000 to deal in Shelf Hardware, Stoves, Tools, &c.

The Hardware store of James Murrison, Balaton, Minn., has been destroyed with a loss of about $6000, partially covered by insurance.

The Boyes-Beck Hardware Company, Ltd., has succeeded Boyes Hardware Company, Caldwell, Idaho, handling Shelf and Heavy Hardware, Stoves, Tinware, Paints, Oils and Sporting Goods. The new company is incorporated with a capital stock of $10,000. The incorporators are Fred. C. Boyes, George Beck and E. H. Plowhead.

Fred L. Schroeder has purchased the Hardware department of the Metz Mercantile Company, Kiowa, Kan.

The Crescent Hardware Company has purchased the business of the Wakefield Hardware Company, in Greensboro, N. C., and will continue the business at 229 South Elm street. The company is incorporated with $50,000 capital stock, $14,000 being paid in.

The Belle Plaine Implement Company has succeeded J. H. Butts & Son, Belle Plaine, Kan., whose stock was recently damaged by fire.

Elvie W. Adt, Torrington, Conn., has purchased the Hardware store of James J. Dwan of that place, and will continue the business. Mr. Adt was formerly with W. V. Barber.

S. J. Metcalf & Sons, Oneida, Ill., are successors to Metcalf Brothers, Hardware merchants and manufacturers of Harness. A. D. Metcalf, the senior partner of the old firm, is retiring from active business, having disposed of his interest in the business to his two sons.

J. L. Keny of the Hardware firm of Keny & Cox, Maryville, Tenn., has bought the interest of J. L. Cox, and will in future conduct the business under his own name.

The Hibner-Hoover Hardware Company has purchased the business of Frank W. Prothero, in Du Bois, Pa. The company will handle Hardware, Stoves, Doors, Sash, Cutlery, Paints, Oils, Buggies, Wagons, Harness, &c.

D. B. Robertson has opened a store at Silver City, N. M., and handles Shelf Hardware, Stoves, Tinware, Agricultural Implements, Paints and Sporting Goods. Heavy Hardware will be added to the stock later.

D. P. Hayes has succeeded W. F. Pool as manager of the John Smith Hardware Company, Waitsburg, Wash. The company handles Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements and Paints. Attention is also given to plumbing and tinning.

W. A. Henry & Co., formerly with M. C. Warren & Co., 9 Dock square, Boston, have opened a new Hardware store at 7 Union street, in the same neighborhood.

The Shipley Hardware Company, Meyersdale, Pa., which was formerly a partnership, has been incorporated with an authorized capital stock of $75,000 as the Shipley Hardware Company, Inc., and will conduct both a wholesale and retail business. The directors elected are J. T. Shipley, B. E. Shipley, J. Milton Gnagey, E. J. Weld and S. B. Philson, J. T. Shipley being president; B. E. Shipley, treasurer, and J. Milton Gnagey, secretary.

Death of Stephen D. Neal.

STEPHEN D. NEAL, Southington, Conn., the only surviving son of Roswell A. Neal, so long and favorably known to the Hardware trade as the president of the Peck, Stow & Wilcox Company, died at his home on April 21. Mr. Neal was born January 1, 1861. He was educated at the public schools of his home town, graduated at the Lewis Academy and afterward at the Connecticut Literary Institute at Suffield, Conn. In his young manhood, while his father was alive, he was for a short time secretary of the Peck, Stow & Wilcox Company. After the death of his father he became general manager of the Ætna Nut Company at Southington, which place he retained until the time of his decease. He was married in 1884 to Miss Grace Selden, a sister of Mrs. Armour of Chicago.

Mr. Neal was one of the prominent citizens of Southington, and until within the last few months had been considered in the most robust health. He had held many local political offices, was warden of the borough and very popular in the association known as Red Men, and at the time of his death was the State Great Prophet, having previously held all the offices, including that of Great Sachem. He was a member of the Masonic fraternity, Knights of Pythias and other organizations. A wife, a son and a sister survive him. The funeral ceremonies were held on Friday, 24th inst., at the First Baptist Church in Southington.

Rural Free Delivery Mail Box.

The accompanying illustrations show a rural free delivery mail box, open and closed, offered by the Beaver Mfg. Company, Beaver, Pa. The box has been approved



Fig. 1. Rural Free Delivery Mail Box.

by the Post Office Department. It is of galvanized steel, 18 in. long, 7 in. wide, 9 in. deep in the rear and 5 in. deep in front, and is guaranteed to be weather proof, all joints being both seamed and soldered. The box con-



Fig. 2. Rural Free Delivery Mail Box.

tains a letter holder and change tray on the inside, as shown in Fig. 2, so as to avoid the necessity of fumbling around on the bottom of the box when the fingers are

cold trying to pick up change or letters. The letter slot is placed in such a manner as to be thoroughly protected from the weather, and yet is always open for the admission of mail without having to raise any flap. It is pointed out that the signal cannot possibly be tampered with by mischievous persons, it being controlled by the lid of the box, and cannot be raised or lowered without opening the lid. When this is done the signal falls to its place without being touched by the hand. The locks are referred to as being of the best combination master keyed grade, no two alike, each lock being provided with two keys for the owner's use, a master key being also supplied for the carrier's use. Lock is furnished with chain to attach to box, or without chain, as desired. The boxes are finished with aluminum bronze.

The Toscot Flat Flexible Metallic Belt Coupling.

The Toscot flat flexible metallic belt coupling, manufactured by the Tostevin & Cottie Mfg. Company, 635 Kent avenue, Brooklyn, N. Y., and on which a patent is

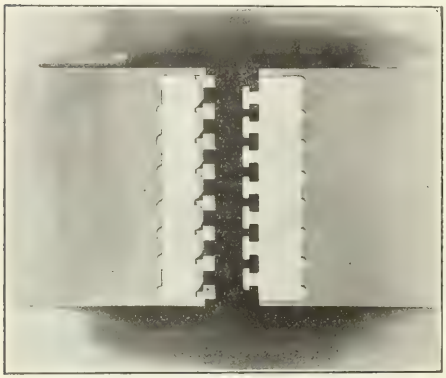


Fig. 1.—Outside View of the Toscot Flat Flexible Metallic Belt Coupling, Showing the Two Parts Before Hooking.

pending, is illustrated herewith. Fig. 1 gives an outside view of the coupling applied to belt, and shows the two parts of the device before hooking, while Fig. 2 presents a view of the inside of the coupling and belt after hooking. The special feature of this coupling is its flex-

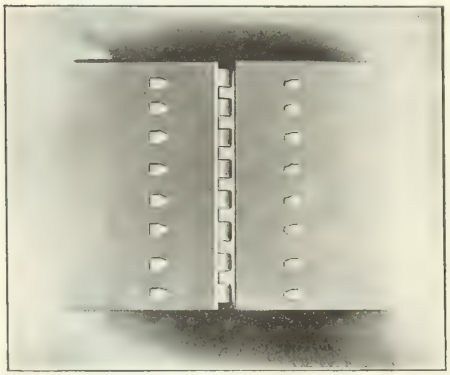


Fig. 2.—View of the Inside of Belt and Coupling After Hooking.

ibility at the point where the ends of the belt meet, the construction permitting the coupling to set close to the surface of the pulley so that there is no strain on the edges of the coupling, causing the belt to crack. Among other points made in behalf of the coupling are that it is easy to attach, will not tear out and that the belt may be taken apart readily at any time. The couplings may be used on the smallest size of pulleys, as well as on the heaviest machinery and power transmission. The couplings are drawn from cold rolled sheet steel and are manufactured in all standard belt sizes. They are made slightly shorter than the width of the belt for which they are used, which is considered an advantage.

Glass Board and Sundry Cabinet.

W. C. Heller & Co., Montpelier, Ohio, manufacturers of steel shelf boxes, &c., have added to their line the cabinet with glass board lop, front and rear of which are shown

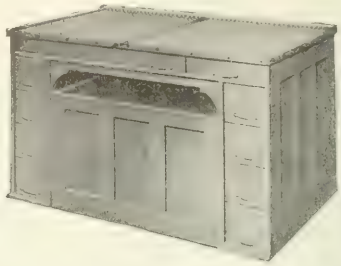


Fig. 1.—Glass Board and Sundry Cabinet, Front View.

in the accompanying illustrations. The board is strongly made of well seasoned lumber and, it is said, will always remain true. It is ruled both ways in inches, with steel rule on front end graduated in inches and eighths, and can be instantly adjusted to cut glass of any size. The straight edge or rule is adjustable, being fitted at each end with adjustable gauges connected by a rod so as to move simultaneously equal distances. As it is impossible to move one end more than the other, an absolutely straight line is secured. The rule has a wedged point at the top end and a lug at the bottom and readily fits into 1 in. spaces provided at the top and bottom of the board and at any point desired. For cutting even inches the



Fig. 2.—Glass Board and Cabinet, Back View.

connecting rod is turned back as far as it will go and secured there by a set screw. It is then dropped into the 1-in. space at the top and bottom of the board and is thus firmly held in place and ready for the cutter. The rule is fitted with a very simple device by which it can be moved forward and backward and set for cutting fractions of an inch. When several lights of glass of the same size are to be cut, after the screw is once set every light will be of exact size. The long drawer at the top under the board may be used for the rule, glass cutters, points, &c., and the other drawers are just the right size for one and three-quarters reams of sandpaper. The large movable box setting under the long drawer is paneled to match the ends of the cabinet and is fitted with roller bearing casters. It is used for cuttings or broken glass, sweepings, &c. The back of the cabinet (Fig. 2) contains 15 large drawers, each holding 25 lb. or more of dry colors or other goods. It has a solid oak exposure finely paneled, fitted with strong handles and card frames and finished in antique finish.

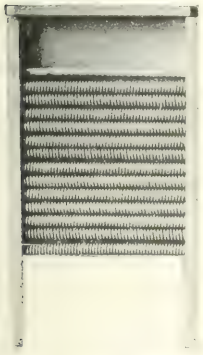
Lee & Underhill Patent Socket Golf Clubs.



Patent Socket Golf Clubs. Unwrapped at Joint, with End of Shaft Before Insertion in Head.

Lee & Underhill, 98 Chambers street, New York, are now putting on the market, made in their own works, on the premises, the Lee & Underhill patent socket Golf Club, here shown. The intent of this form of construction is to assure in the event of fracture of the shaft, the insertion of a new one without difficulty and yet obtain the same "lie" of the head. This is accomplished by drilling the head and slotting it lengthwise or parallel with the direction of the shaft, when made originally. The end of the shaft entering the socket is also prepared in shape so that when necessary to remove the portion remaining in the socket, it can be readily withdrawn after steaming over a kettle to soften the glue, after the wrappings have been removed and without reboring the hole or altering the direction of it. The heads are made of persimmon wood, the shafts of hickory and the grips are of a specially prepared horsehide.

Roller Bearing Washboard.

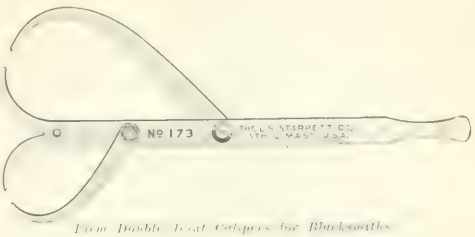


Roller Bearing Washboard.

The Abingdon Mfg. Company, Abingdon, Ill., is offering a washboard known as Hubbards' roller bearing washboard, which is somewhat of a departure from the usual types with which the trade is familiar. The board is constructed of a series of cylinders, eleven in number, mounted in the frame on steel pins. Each of the cylinders is corrugated with running screw threads, which are cut alternately right and left, making 52 corrugations or threads on each roller. The effect of this arrangement is to produce a side rubbing motion on both downward and upward stroke by the opposing tendency of the rollers. It is claimed that the additional friction thus brought to bear upon the clothes quickens the process of cleansing and lessens the labor necessary to accomplish the result. The board has no back, and the dirty water passing freely between the rollers finds no lodgment back of the rubbing surface. It is said to be of durable construction and easy on both hands and clothes.

Double Joint Blacksmith's Calipers.

The L. S. Starrett Company, Athol, Mass., and 132 Liberty street, New York, is manufacturing the firm double joint calipers for blacksmiths, No. 173, here illustrated. It is 22 in. long, over all, one caliper having a capacity of 6 in. and the other 12 in. The difference in length of arms serves to prevent confusion in use where there are but slight variations in diameters and a marked advantage is the fact that with this tool both rough and finished sizes can be determined comfortably and with



Form Double Joint Calipers for Blacksmiths.

less inconvenience than ordinarily, on either hot or cold forgings and with much saving in time.

Small Package of Steel Wool.

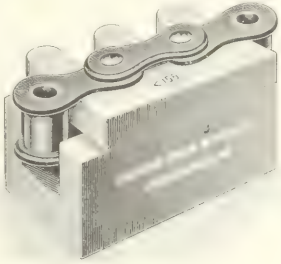


Package of Steel Wool for Household Use, &c.

The American Steel Wool Mfg. Company, 451-453 Greenwich street, New York, has recently put on the market Steel Wool in small packages for convenient handling by the trade, as shown in the accompanying illustration. It takes the form of a pasteboard roll about 8 in. long and between 3 and 4 in. in diameter, neatly labeled and marked with the retail price, 10 cents. This product is especially recommended for many domestic uses, such as cleaning and polishing kitchen utensils, bathroom fixtures, floors, furniture, brass, iron and wooden ware, &c. Four grades are offered, ranging from No. 0, the finest, to No. 3. The company also makes a coarser product called Steel Shavings, which are recommended for cleaning and polishing hardwood floors and bowling alleys, for removing old paint, varnish, rust and grease and for general rough work.

The Diamond Chain Repair Block.

The accompanying illustration represents a roller chain repair block put on the market by Diamond Chain & Mfg. Company, Indianapolis, Ind. The tool is small enough to be carried in the pocket, and is alluded to as making the insertion of a new link a very small matter. The operation is described by the manufacturer as follows: By placing the chain in the block, as shown, and giving both rivet heads a light tap with a hammer and another with a center punch, the side bar may be lifted,



The Diamond Chain Repair Block.

the repair link inserted and the chain drive is in working order in less than 10 min. If it is desirable to use the old link again, it is only necessary to put the link and side bar back into place and flatten out the two rivet ends with the hammer. It is stated that with the use of the repair block the link can be changed without taking the chain off its sprockets.

Wagner Hay Rack Fixtures.

The Wagner Mfg. Company, Waterloo, Iowa, has recently added to its line of hardware specialties the hay rack fixtures herewith illustrated. One of the chief objects aimed at in the production of the fixtures was to overcome the annoyance and damage occasioned by con-



Fig. 1.—Wagner Hay Rack Fixtures.

tact of the front wheel with the front bottom cross piece of the rack. When the latter is unprotected it is subject to rapid wear, necessitating frequent renewal, and sometimes catches in the wheel, breaking out spokes. To guard against these results the fixtures include an iron rub plate fastened to and extending across the front end piece, to which attention in called in Fig. 1. Another feature contributing to convenience in handling the rack is found in the provision made for removal of the top.

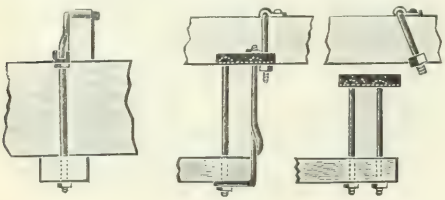


Fig. 2.—Suspension Bolts in Place.

This, as will be seen by reference to Figs. 2 and 3, is accomplished by simply loosening the nuts of the suspension bolts; this done, the parts are separated by swinging the bolt back out of the yoke slot and the detached top can be lifted off. This operation does not require the removal of the nuts, which need only be loosened and are therefore not liable to be misplaced and lost; they are also always ready and in position when it is desired to put the top on again. The separable arrangement of the top and bed of the rack not only facilitates its removal, of the bed for trucking but also permits the use purposes. It is suggested that in putting the rack together care should be taken to have the slotted angle pieces placed half on one side and half on the other, as indicated in Fig. 1, in order to prevent the rack slipping forward or backward. The holding nut on the swing bolts is secured by a jam nut to guard against its working loose. The fixtures are made in three sizes, No. 114 for 2 x 8 bed sills and 2 x 6 cross pieces, No. 116 for 2 x 8 bed sills and 2 x 6 cross pieces, No. 118 for 2 x 10 bed sills and 2 x 6 cross pieces, all of which are furnished with four swing bolts, one at each corner, using loops for the center. If it is desired to substitute the swing bolts for the center loops eight of the former will be furnished at slight additional cost. The average weight per dozen sets is about 175 lb.

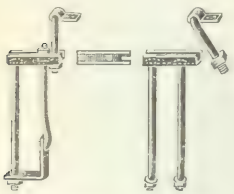
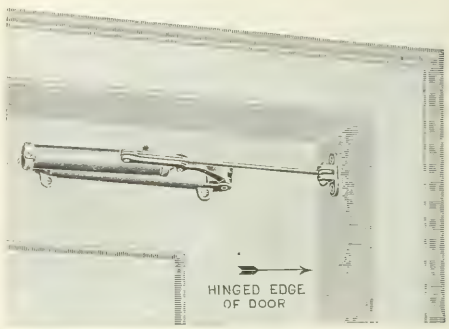


Fig. 3.—Detail of Suspension Bolts.

The Bardsley Air Check and Spring.

The spring and check here shown has been devised by Joseph Bardsley, 147-151 Baxter street, New York, for screen door purposes. It may be applied on the inside of the door and to either hand of door. It is at present made in two sizes, the smaller, No. 1 A, being suitable for screen doors of ordinary size, and requiring 3 in. of space, and the larger size, No. 2 A, being suitable for heavy screen doors or ordinary interior doors, and requiring 4 in. of space back of the door. The parts swing on pivots, and since the pull on the spring is central and direct there is a reasonable freedom from friction. The spring, which is of the round wire compression type and sufficient length to insure durability, is covered by the casing against the door, and its tension is regulated by means of a screw at the outer end. Should a spring break a new one can readily be put in. The plunger is



Bardsley Air Check and Spring.

a leather cup, which can also be easily replaced if necessary. The cylinder is brass and the two caps of pressed steel, the one at the outer end having a hinge joint formed on it at one side, and on the outer side a U-shaped spring through which passes the vent regulating screw holding the screw from shaking loose. The lever is of malleable iron, and the back casing of cast iron. To free the check so that the door can be removed, it is only necessary to lift the pin from the jamb bracket. The manufacturer states that samples of this device have been well tested on doors in actual use, and have proved their durability. It is neat in appearance, and being applied on the jamb side of the door is not conspicuous.

The Andrews Bread Toaster.

Among the hardware specialties manufactured by the Andrews Wire & Iron Works, Rockford, Ill., is the bread toaster shown in the accompanying illustration. It is designed to effect the uniform delivery of heat generated and at the same time keep the toast from direct contact with the fire. To secure this result the ends of the bot-

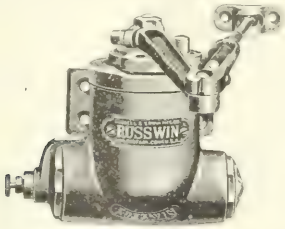


The Andrews Bread Toaster.

tom plate are dished upward from the center so as to spread the heat to the outside and evenly distribute it over the toasting surface. The flame is restrained from curling over the edges by the V-shaped feet which support the toaster. Funnel shaped holes are provided in the bottom plate for the passage of heat, but the perforations are too small to admit the passage of the flame. The bread rest, which is 9 in. square, is made of bright finished wire, the body of the toaster being constructed of planished steel with a turned wire handle. It is claimed that besides toasting quickly and evenly, the device is especially economical in the consumption of gas because it utilizes practically all of the heat generated.

Russwin Liquid Door Check.

The Russell & Erwin Mfg. Company, New Britain, Conn., has made a number of changes in its Russwin door check, the new model of which is illustrated herewith. Attention is particularly called to its neat and unobtrusive appearance. The working parts are of malleable iron and drop forged steel machined to a perfect fit, all parts being interchangeable in the same size of check. The coil wire spring, which is used in preference to a flat band spring, is said to have proved capable of meeting the demands of the most severe service. The liquid in

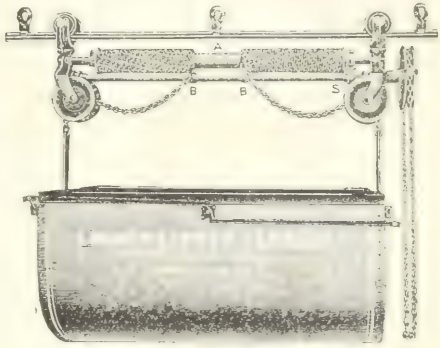


Russwin Liquid Door Check.

the check is a nonfreezing oil in which the main working parts are immersed, reducing friction to a minimum. By the use of gland and washers it is declared that the possibility of leakage has been eliminated. The gland is made in one piece and gives a long bearing to the spindle, preventing buckling of the spindle and consequent wearing on the ratchet and cover. There is but one piston, with short bearings on a long carriage. This gives a perfectly smooth and even action. The escape of the compressed liquid is through the valve and overflow chamber into the piston chamber, and there is, therefore, no great pressure on the gland and washer surrounding the spindle. For this reason it is also stated that the check will work equally well if the chamber is only half full of liquid. Expansion and contraction of the liquid have no effect on the working of the check. Ball and socket joints are used, and the arm will not bind. By means of a valve screw the checking power is easily adjustable. The check is easy of application, being applied to right or left hand doors without reversing either the arm or spring. This avoids labor and trouble and also the possibility of mistake in reassembling, with consequent damage to the check. Six sizes are offered for doors, ranging from screen and light inside doors to extra heavy outside doors and large doors operated ... strong drafts.

High Lift Chain Elevator.

The Louden Machinery Company, Fairfield, Iowa, is making the high lift chain elevator shown in the accompanying illustration by which litter carriers or other receptacles may be raised or lowered as desired. The regular sized elevator is fitted with chains to raise or lower the receptacle 7 ft. If a greater range is desired chains of the proper length will be furnished at slight additional cost. The hoisting drums are provided with sprockets to fit the chains. Referring to the illustration, the pipe or hollow cylinder A is mounted upon the pipe which connects the trucks and is rotated thereon by means of the screw S. The chains are attached to the opposite ends of the cylinder A, and as the receptacle is elevated they are wound up so as to take up the slack, as indicated. Guides B B are used to insure the even winding of the chains on the cylinder, following back and forth as the chains are wound or unwound. With the elevator the company's overhead carrier is very convenient where material is to be lifted from one floor to



High Lift Chain Elevator.

another in the same building and carried to some remote part of the floor. It will also be found efficient for use in stone quarries, deep ditches and other places where it is necessary to handle heavy material, lifting the load quite a distance and then carrying it to one side for loading or dumping.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils— ₱ gal.

Linseed ...

Mineral Oils—

Miscellaneous—

Barytes:

Whiting, Commercial, ₱ 100 lb .42@ .52

Putty, Commercial— ₱ 100 lb

Spirits Turpentine— ₱ gal.

Glue— ₱ lb

Fish, liquid, 50 gal. bbls., per gal.

Gum Shellac— ₱ lb

V. S. O.....47 @48

Colors in Oil— ₱ lb

Lamp Black.....12 @14

Ochre, American, ₱ ton $8.50@16.00

French .....

American Burnt and Pow'd. 1½@ 2

Terra Alba, French, ₱ 100 lb .90@ 1.00

Turkey, Raw and Powdered. 2½@ 3

Yellow Chrome, Pure.....13 @15

Prussian Blue.....

Ultramarine.....13 @16

Vermilion, American.....

Sienna, Burnt.....12 @15

Raw .....

Umber, Burnt.....12 @15

White Lead, Zinc, &c.— ₱ lb

Lead, English white, in Oil..10½@10⅝

Lead, American White:

Lead White in oil, 1 to 5 lb

500 lbs. and over 2% for cash if paid in 15 days from date of invoice.

Zinc, Dry—

Red Seal (French process)..6½@ 7

Dry Colors— ₱ lb

Chrome Green, Medium.....

Chrome Green, Light.....

Chrome Green, Dark.....

Chrome Yellow, Medium.....

Chrome Yellow, Light.....

Chrome Yellow, Dark.....

Indian Red, Domestic.....5 @15

Indian Red, Imported.....

Lampblack, Commercial.....1 @ 6

Brown, Spanish.....½@ 1

Green, Chrome, pure.....17 @25

Current Hardware Prices.

General Goods.—In the following quotations General Goods that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol *&c.* Thus 33⅓ *&c.* 33⅓ & 10 signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic ... 33⅓
Norris ... 10
Zimmermans—See Fasteners, Blind

Window Stop—

Ives' Patent ... 25
Tajan's Patent ... 25

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—

Ermold Mfg. Co. Burton Anti-Rattlers, 12 doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Ermold Quick Slider, 12 doz. pairs ... $2.00@$3.00

Anvils—American—

Eagle Anvils ... 7½ lb. ... 8¢
Hay Budden, Wrought ... 9½@9¾¢
Trenton ... 7½ lb. 9½@9¾¢

Imported—

Swedish Solid Steel Sisco, Superior, 7½ lb. ... 10@11¢
Peter Wright & Sons, 4 lb. 8¼ to 349 lb. list, 350 to 699 lb. 11¢.

Anvil, Vice and Drill—

Millers Falls Co. ... $18.00 ... 15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co. ... 10

Augers and Bits—

Com. Double Spur ... 75&10@80
Jennings' Patn., Bright 65&10@70
Black Lip or Blued ... 65@65&5
Boring Mach. Augers ... 70
Car Bits, 12-in. twist ... 50@10
Ford's Auger and Car Bits ... 40&5
Ft Washington Auger Co., Cincinnati ... 25
Forstner Pat. Auger Bits ... 25&75%
C. E. Jennings & Co.:
No. 10 ext. lip R. Jennings' list
No. 30, R. Jennings' list
Russell Jennings' ... 25&10@25&2½%
L'Hommedieu Car Bits ... 15%
Mayhew's Countersink Bits ... 45%
Pudlo's Auger Bits ... 20
Pudlo Jennings Pattern ... 35
Snell's Auger Bits ... 60
Snell's Roll Hangers' Bits ... 60
Snell's Car Bits, 12-in. twist ... 60
Snell's King Auger Bits ... 50
Wright's Jennings' Bits ... 50

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Clark's Pattern, No. 1, ₰ doz. $26; No. 2, $18 ... 60&10
Ford's Clark's Pattern ... 66⅔&5
C. E. Jennings & Co., Steer's Pat. ... 25%
Lavigne Pat., small size, $18.00; large size, $26.00 ... 60&10
Swan's ... 60

Gimlet Bits—

Per gro.
Common Dbl. Cut ... $2.00@$2.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz. ... $6.50@7.00
Ames ... 25&10
Underhill ... 4

Ship Augers and Bits—

Ship Augers ... 50@60&10
Ford's ... 25&65
C. E. Jennings & Co.:
R. Hemm Bits ... 6
Solid Bits ... 33⅓&7½
Snell's ... 15

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled ... gro. $2.75@3.00
Unbolted, Shblevel ... gro. $3.50
Unhandled, Patent ... gro. 60@70c
Pegging Awls:
Unhandled, Patent ... gro. $1@1¾
Unbolted, Shblevel ... gro. 65@70c
Scratch Awls:
Handled, Com. ... gro. $2.50@3.00
Handled, Socket ... gro. $11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality ... $7.75@8.00
Second Quality ... $5.25@5.50
Double Bit, base weights:
First Quality ... $7.00@7.50
Second Quality ... $6.50@6.75

Axle Grease—

See Grease, Axle.

Axles—Iron or Steel.

Concord, Loose Collar ... 4½@5 ¢
Concord, Solid Collar ... 4½@5½ ¢
No. 1 Common Axles ... 3½@3½¢
No. 1½ Com., New Style ... 4½@5 ¢
No. 2 Solid Collar ... 4½@5½ ¢
Half Patent:
Nos. 7, 8, 11 and 12 ... 6½@6¾&10%
Nos. 13 to 14 ... 6½@6¾&10%
Nos. 15 to 18 ... 5½@5¾&10%
Nos. 19 to 22 ... 5½@5¾&10%

Boxes, Axles—

Common and Concord, not turned ... lb., 5½@6
Common and Concord, turned, lb., 6½@7¢
Half Patent ... lb., 9½@10¢

Bait—Fishing—

Hendryx:
A Bait ... 20%
B Bait ... 25%
Competitor Bait ... 20&5%

Balances—Sash—

Caldwell new list ... 50%
Pullman ... 50&10

Spring—

Spring Balances ... 50&10@60%
Chatillon's:
Light Spg. Balances ... 50@50&10%
Straight Balances ... 45@45&10%
Circular Balances ... 50&10
Large Dial ... 30

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb., per lb., 4@4½@4¾¢

Towel—

No. 10 Ideal, Nickel Plate ... ₰ gro. $8.50

Beam, Scale—

Scale Beams ... 40
Chattillon's No. 1 ... 30%
Chatillon's No. 2 ... 40

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₰ doz. $0.80; Tinned ... $0.85
No. 11 Wire Coppered ₰ doz. $1.15; Tinned ... $1.20
No. 10 Wire Tinned ... ₰ doz. $1.50

Beaters Egg—

Holt-Lyon Co.:
Hdl. per doz. No. 5, Jap'd, $0.90; No. 6, Jap'd, $1.15; No. 8, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro. No. 60 $8.00; No. 75, $8.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T & S, Dover ... $6.50

Bellows—

Blacksmiths' Standard List:
Split Leather ... 50@10&65%
Grain Leather ... 50@10&10

Hand—

Inch.	6	7	8	9	10
Doz.	$5.00	5.50	6.00	6.50	7.50

Molders—

Inch.	10	12	14	16
Doz.	$7.50	9.00	12.00	15.00

Bells—Cow—

Ordinary Goods ... 75&50@75&10@
High grade ... 50@10@
Jones ... 75&10
Texas Star ... 50

Door—

Home, R. & E. Mfg. Co.'s ... 55&10%

Hand—

Polished, Brass ... 50@10@60@
White Metal ... 50@10@50@10@
Nickel Plated ... 50@65%
Steel ... 50@5
Cattle Gl. be Hand Bells ... 75&10@5

Miscellaneous—

Farm Bells ... lb. 35@35¢
Church and School ... 60@60&5%

Belting—Leather—

Standard ... 20@10@25@10@5%
Light ... 25@10
Cut Leather Lacing ... 50@10@60
Leather Lacing Sides, per sq. ft. 21@22¢

Rubber—

Competition (Low Grade),
70@10@75@5
Standard ... 60@60@10
Best Grades ... 33⅓@40@10%

Bench Stops—

See Stops, Bench

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters ... 20

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list:
Chain, Parts, Spokes ... 50%
Tubes ... 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden ... 75@75&5%
B. & L. B. C. ... 75%
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%
Lane's Patent Automatic Lock and Jumper ... 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined ... 55%
Embossed ... 55%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Kentfel & Esser Co. ... 33⅓

Bolts Carriage, Machine, &c.—

Common Carriage cent threads:
⅜ & 6 and smaller ... 75&10&—%
Larger and longer ... 70@—
Phila. Eagle, $1.00 list ... 50@—
Bolt Ends ... 70@—%
Machine Cut Thread:
⅜ and smaller ... 75&10@—%
Larger and longer ... 70@—

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knobs:

Inch	4	5	6	8
Per doz.	$0.50	.65	.75	.90

Cast Iron Spring Foot, Jap'd:

Inch	6	8	10
Per doz.	$1.20	1.50	2.25

Cast Iron Chain, Flat, Japanned:

Inch	6	8	10
Per doz.	$1.00	1.25	1.65

Cast Iron Flat Shutter, Jap'd, Brass Knobs:

Inch	6	8	10
Per doz.	$0.75	.95	1.25

Wrought Barrel Jap'd ... 80@80&10%
Barrel Bronzed ... 60&10
Spring ... 70@70@70@10
Shutter ... 70@75@70@10
Square Neck ... 75@75@10
Square ... 70@10@10
Ives' Patent Door ... 55
Ives' Wrought Metal ... 45

Expansion—

Richards Mfg. Co. ... 55&10%
Stuart & Richards Mfg. Co.:
Style No. 13, Double ... 55%
Style No. 1, Single ... 55%
Style No. 130, Dbl. Jaw, Single ... 50
Lag Screw ... 60

Plow and Stove—

Plow ... 75@75@70
Stove ... 75@75@5

Tire—

Common Iron ... 80%
Norway Iron ... 80%
American Screw Co.:
Norway Phila., list Oct. 16, '84 ... 80%
Eagle Phila., list Oct. 16, '84 ... 82½%
Bay State, list Dec. 28, '99 ... 80
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84 ... 80%
Eagle Phila., list Oct. 16, '84 ... 82½%
Eclipse, list Dec. 28, '99 ... 80
Rhode Island Bordsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99 ... 80%
Norway Phila., list Oct. '84 ... 80
Eagle ... 82½
Shelton Co.:
Tiger Brand, list Dec. 28, '99 ... 80%
Phila. Eagle, list Oct. 16, 1884 ... 82½%
Upson Nut Co.:
Tire Bolts ... 72½%

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch	1¼	1½	1¾	2
Per doz.	$4.80	5.60	6.40	8.00
Inch	2	2½		
Per doz	$8.65	11.50		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.50; No. 3, $2.50 each ... 25%

Boxes, Mitre—

C. E. Jennings & Co. ... 25%
Langdon, New Langdon and Langdon Improved ... 50&10 : Langdon Acme ... 15&10
Perfection ... 40%
Seaver's ... 15%

Braces—

Comman Ball, American ... $1.50
Barler's ... 50&10@50&10@60&10
Fray's Genuine Spofford's ... 60%
Fray's No. 70 to 120, 81 to 123, 207 to 211 ... 60%
C. E. Jennings & Co. ... 50&65%
Mayhew's Ratchet ... 60
Mayhew's Quick Action Hay Pat. ... 50%
Millers Falls Drill Braces ... 25&10%
P., S. & W. Co., Peck's Pat. ... 60&10%

Brackets—

Wrought Steel ... 70@10@75&10%
Bradley Metal Clasp ... 80&10@80&10&5%
Griffin Fruit Steel ... 75@75&10%
Griffin's Folding Brackets ... 70&10%
Taplin Victor Handy Egg Beater Bracket ... ₰ doz. $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co. ... 75&20%
Wire Goods Co. ... 75%

Buckets, Galvanized—

Mfr's list, price per gross.

Quart..	10	12	14
Water, Reg.	$3.75	$4.50	$5.50
Water, Heavy	4.75	5.00	5.50
Fire, Rd. Btm.	32.00	34.65	38.65
Well	32.00	34.65	37.35

Extra 10%

Bull Rings—See *Rings, Bull.*

Butts—Brass—

Wrought, High List, Oct. 26, '06 ... 55%
Cast Brass, Tehoot ... 40

Cast Iron—

Fast Joint, Broad ... 40@10@50%
Fast Joint, Narrow ... 30@10@50%
Loose Joint ... 70@10@75%
Loose Pin ... 70@10@75%
Maner's Hinges ... 70@70&5
Parliament Butts ... 70@70&5

Wrought Steel—

Bright.
Light Narrow, Light Reversible ... 70&5
Reversible and Broad ... 70&5
Loose Joint, Narrow, Light Inside Blind, &c ... 50
Back Flaps, Table Chest ... 65%
Japanned.
Light Narrow, Loose Pin, Light ... 70&5
Light Narrow, Ball Tip ... 60%
Broad ... 70&5
Steeple Tipped ... 50
Ball Tipped ... 70%

Extra 10%

Cages, Bird—

Hendrick Brass, Solid ... 100 net list ... 12
Hendrick Brass, Solid ...
Hendrick Nickeled ...

Calipers—

Calks, Toe and Heel—

Blued, 1 pound in ...
Sharp, 1 pound in ...
Lightning Blued ...
Lightning Bright ...
Prime Bright ...

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Eley's E. B. ...
G. D. ...
E. C. ...
G. C. ...
Musket ...

Primers—

Berdan Primers, $2 per M ...
Primer Shells and Ball ...
All other primers per M $1 ...

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:
... M ...
... M ...
38 C. F. Short ...
22 cal. Rim, $1.50 ...
32 cal. Rim, $2.50 ...
B. B. Caps, Can Ball ...
B. B. Caps, Round Ball.....$1.40
Central Fire:
Pistol and Sporting Rifle ...
Pistol and Sporting Rifle ...
Rim Fire, Standard ...
Rim Fire, Military ...

Casters—

Ball ...
Plate ...
Philadelphia ...
Acme Ball Bearing ...
Gem Ball Bearing ...
Steel Swivel ...
Standard Ball Bearing ...
Yale Double Wheel ...

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:
... to ...
... to ...
... to ...
German Coil ...
German Pattern Coil:
... to ...
... and ...
... and ...

Halter—

Halter Chains ...
German Pattern Halter Chains, list July 1, '07 ...
Covert Mfg. Co.:
Halter ...

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Mason Standard Pattern:
... *Straight, with one ...*
... *Straight, with two ...*
... *Straight, with three ...*
... to 2, *Straight, with ...*
NOTE—Add 2 per cent. to ... Trace Trees—add per cent. to ... and 2, 5, 10 and 15 ...
Standard Leads ...
Eastern Standard Tugs ... on Chain, &c., list ...

Miscellaneous—

Jack Chains, list July 1 ...
Log ...
Rees ...
Safety and Plough ...
Gal. Pump Chains ...
Packages ...
Tug Holder ...
Trident ...
Trojan ...
Cow Tie ...
Breast Halter ...
Halter ...
Ox ...
Ayrshire ...
Halter ...
Nose ...
Halter ...
Web ...
Dog Coupler ...
Universal ...

Chain and Ribbon, Sash—

Oneida ...
Steel Chain.....60%
Pullman:
Brass ...
Copper ...
Steel ...
Adjustable ...
Brass ...
Steel ...

Chalk—

Carpenters' Blue ...
Carpenters' Red ...
Carpenters' White ...

Checks, Door—

Barrister ...
Pullman, per ...
Reliance ...

Chests, Tool—

American Tool Chest Co.:
... Lined ...
... Lined ...
Gentlemen's Chests, with Tools..25%
...
...
...
C. E. Jennings & Co.'s Machinists ...

Chisels—Socket Framing and Firmer

Socket Framing ...
Socket Firmer ...
C. E. Jennings & Co.:
Socket Framing ...
Socket Firmer ...
...
L. & I. J. White ...

Tanged—

Tanged Firmers ...
... 12in.
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White Co.....25&3%

Cold—

lb.
Cold Chisels, good quality ...
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary.... 9@10¢

Chucks—

... Drill ...
Almond Turret Six-Tool Chuck.....40
... Bit ...
... Bit ...
... Drill ...
... Drill ...
Sawyer Patent Chucks:
Independent Lever Chucks.....35*
Universal Reversible Jaws ...
Combination, Reversible Jaws....35%
Drill ...
... Drill ...
25%: Positive Drive.....40*
... Drill ...
Face Plate Jaws.....35
Standard Tool Co.:
... Drill Chucks ...
Universal Drill Chucks ...
Combination, Nos. 1, 2, 3, 4, 5 ...
... Drill ...
Scroll Chucks, Nos. 3 and 4 ...
Geared Scroll, Nos. 33, 34 and 35..30*
Independent Iron, Nos. 18 and 318.35*
... Drill ...
Union Drill, Nos. 000, 00, 100, 101, 2 ...
Union Czar Drill.....25
Universal, 11, 12, 16, 17, 13, 14, 15..10*
Universal, 12 ... Grip Drill...50*
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50.....35*
Steel Face Plate Jaws, Nos. 70 and 72 ...30*
Westcott Patent Chucks:
Lathe Chucks.....50*
Little Giant Auxiliary Drill....50
Little Giant ... Grip Drill....50*
Little Giant Drill, Improved.....50*
Oneida Drill.....50*
Scroll Combination Lathe.....50*
Whitake Mfg. Co.:
National Drill.....25%

Clamps—

Adjustable Hammers ...
Carriage Makers', P. S. & W. Co. ...50&10%
Besly, Parallel ...33⅓&10%
Myers' Hand Screw ...15%
Lightning Speed Screwdriver ...
Wood Workers' Hammers ...10&10
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain,

Iwan's Champion Absorbine ...
Iwan's Champion Sanitizer ...

Sidewalk—

Star Steel. All Steel ... 34.95 net
Star Shank. All Steel, ₱ doz. $3.21 net
W. & E. Shank. All Steel, ...
... 3in. ...

Cleavers, Butchers'—

Foster Bros. ...30%
... R. Pound ...
L. & I. J. White Co. ...30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Co.:
1902 Chicago Horse, each..$10.75
20th Century Horse, each...$5.00
Lightning Horse, each,$15.00
Chicago Belt Horse, each...$20.00
Stewart's Enclosed Gear Horse ...75
Stewart's Patent Sheep Shearing Machine, each.....$12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75

Clips, Axle—

Regular Styles, list July 1, '05.

Cloth and Netting, wire

See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c ...
Compression Bibbs ...

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's ...

Compasses, Dividers, &c.

Compasses, Spring ...
Wing ...
Inside ...
Lock ...

Conductor Pipe,—

	Gal. Steel.	*Charcoal.*
Eastern ...		
Pittsburgh ...		
Central ...		
Northwestern ...		
...		
...		
...		
...		
...		

Coolers, Water—

Lee & Co. Mfg. Co. ...
Galvanized, ea. $1.85 $2.00 $2.25 $2.50 $3.00 $3.90
Galvanized, Lined, side handles.
Gal..... 2 3 4 6 8
White Enameled ...10*
Acme ...

Coppers' Tools—

See *Tools, Coppers'.*

Coppers, Soldering—

Soldering Coppers, ½ lb. to pair and heavier, 24¢25¢; lighter than ½ lb. to pair ...25¢

Cord—Sash—

Braided, Drab ... lb. 35¢
Braided, White, Nos. 8 to 12, ... lb.; Nos. 6, 7, ... lb.; No. 5, ... lb. Rods at 12 doz. or ... 1 cent less per pound
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., 4, No. 18, 25¢; B, 22¢
Common India ...lb.. 11@11½¢
Cotton Sash Cord, Tw'ted, 18@20¢
Pearl, White ...
Cable Laid Russia ...lb...21¢
India Hemp, Br'd'd ...lb...21¢
India Hemp, Twisted...lb.13@14¢
Patent India, Twisted...lb...17¢
Pearl Braided, cotton, No. 6, ₱ lb. ...
... lb. ...
Harmony Cable Laid Italian, Nos. 7 ...
Pullman:
Wire Sash Cord.....10%
Sash Cord Attachments, per 100..$2.00
Samson, Nos. 8 to 12—
Braided, ₱ lb., Drab Cotton, ...
... lb. ...
... White ...
ton, 50¢; Spot Cord.....50¢
... Wire ...
... Drab ...
... Nos. 8 to 12 ...
Silver Lake, per lb.:
A, Drab, 40¢; B, White, 35¢; ...
See also Chain and Ribbon.

Wire, Picture—

List July 1, '08 ...
Hendrx Standard Wire Picture Cord, old list, 85&10%
Turner & Stanton Co. Wire Picture Cord .....85&10%

Cradles—

Grain ...

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers.
Zelnicker's Lumber: ₱ gro.
White and Purple, Indelible....$7.50
Indelible ...
Terra Cotta, $6.50; Black.....$4.50
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indel. $13.00; Blacks.....$10.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ... Square ...
... 3½ ...
... 3½ ...

Crooks, Shepperds'—

Fort Madison, per doz., Heavy, $5.50; ...

Crow Bars—

See *Bars, Crow.*

Cultivators—

...

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....₱ doz. $3.00
...

Cutters—Glass—

H. H. M. ...
K. D. ...
B. M. ...
Woodward 50

Meat and Food—

...
Enterprise ...
...
No. 202, $1.50 ...
P., S. & W. Co.: ...
No. ...

$14.00	$17.00	$19.00	$20.00
...	...	...	...

Little Giant.....₱ doz. 40&50

$35.00	$48.00	$44.00	$72.00	$68.00

New Triumph No. 605, ₱ doz. $24.00; ... 40&10%
Rosswin Food, No. 1, $24.00; No. 2, ...

$15.00	$18.00

Slaw and Kraut—

Henry Disston & Sons:
... Is ...
... .30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....₱ doz. $3.00
Combined Slaw Cutter and Corn ...

Tobacco—

All Iron, Cheap...doz, $4.25@4.50
...
National, ₱ doz., No. 1, $21; No. 2, ...

Diggers, Post Hole, &c—

Disston's:
...
Samson, ₱ doz., $34.00.....25%
Iwan's Imp'ved Post Hole Auger. 40%
Vaughan Pattern Post Hole Augers, ₱ doz., $7.00 ...
... Post ...
Split Handle Post Hole Diggers, ₱ doz., $7.75 ...
Hercules Pattern, ₱ doz.....$10.00
Kohler's, ₱ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer.....$7.50
New ...
...

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers Emery Wheel—

Stover ...
Stover ...

Drills and Drill Stocks—

Blacksmith's Common Drilling Machines ...
Barnes ...
Blake ...
Goodell Automatic Drills 50&10&60&
Millers Falls Automatic Drills,33⅓&
Ratchet, Curtis & Curtis.....2
Ratchet, ...
Ratchet, Weston's.....40%
Ratchet, Weston's, Style H Improved ...
Ratchet, No. 012.....40%
Ratchet, Celebrated.....40%
Ratchet, Whitney's, P., S. & W., ...
Whitney's Hand Drill, No. 1, $10.00; ...

Twist Drills—

Bit Stock ...70@70&5%
Taper and Straight Shank ...

Drivers, Screw—

Screw Driver Bits, per doz. ...
Balsey's Screw Holder and Driver, ₱ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9 ...50*
Buck Bros.' Screw Driver Bits... 70
...
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers....40&10
Gay's Double Action Ratchet.....35%
Goodell's Auto.....65@62&10%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40%
Millers Falls, Nos. 20 and 21.....25&10%
Millers Falls, Nos. 11, 12, 41, 42...15&10%
Smith & Hemenway Co., Never-Slip ...
... 30&10%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, ... 40&10%

Eave Trough, Galvanized—

	Territory...Gal. Steel,	*Iron.*
Eastern ...		
Pittsburgh ...		
Central ...	*80&10&10&2½%*	*65&10%*
Northwestern ...		
...		
...		
...		
...		
...		

Elbows and Shoes—

Factory shipments, all territories Galv. Steel and Galv. C. I.
...
...
...
...
No. ...

Elbows, Stove Pipe—

Eagle ...
Royal ...
Royal ...

Emery, Turkish—

... to ... ½ to ... 46: 220: Flour ...
...
...
...
10-lb. cans, less ...
...
...
...

Extractors, Lemon Juice—

See *Squeezers, Lemon ...*

Fasteners, Blind—

...5c&10%
...10%
...10

Cord and Weight—

...30%

Corrugated—

...

Faucets—

...
...
...

Handled—

NOTE—Manufacturers may secure from the Iron Age Publishing Co. a list of cutlery manufacturers, 1898.

Cumberland Valley Handle Co.
Star Handle Co.
Standard Handle Co.
Empire Handle & Novelty Co.
Hoe Manufacturing Co.
Hoe Handle Manufacturing Co.
Regular Wood.
Ft. Madison Handle Co.
Ft. Madison Drawn Handle Co.
Kretsinger's Cut Easy
Winner Hoe
W. & L. Improved
B. B. Co.
B. B. Co.
Acme Wood
W. & C. Long Shank Hoe

Hoisting Apparatus—

See Machines, Hoisting.

Holders— Bit—

Augwar, ₱ doz. $24.0

Door—

Bardsley's, Rich, Brass and
Brass
Lingle
Pullman
Reading Mfg. Co.'s No. 115, Easy-Hand Lift, Nos. 115, 116, Sure Grip
Superior

File and Tool—

Nicholson File Holders and File Handles

Fruit Jar—

Triumph Fruit Jar Holder, ₱ gross, $10.80; ₱ doz.

Trace and Rein—

Fernald Double Trace Holder, ₱ doz. pairs
Dana Rein Holder, ₱ doz. pairs.

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50c.; German

Hooks—Cast Iron—

Bird Cage, Reading
Clothes Line, Reading List
Coat and Hat, Reading
Coat and Hat, Wrightsville
Harness, Reading List

Wire—

Belt
Wire C. & H. Hooks
Bradley Malleable Iron Coat and Hat, 70&10; Ceiling, 70&10
Columbian Hdw. Co., Gem
Parker Wire Goods Co., King, 70&10%; Acme, 60&10%; Chief, 70%; Crown, 75; Czar, 65; V Brace, 75; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton, per doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see Stops, Bench.
Rush, Light, doz., $0.20; Medium, $0.75; Heavy, $1.05
Grass, best, all sizes, per doz. $3.00
Grass, common grades, all sizes, per doz.
Wheelbarrows
Hooks and Eyes:
Brass
Malleable Iron
Coburn Mfg. Co. Gate and Scuttle Hooks
Ft. Madison Cut Easy
Turner & Stanton Co. Cupboard Shelf
Bench Hooks—See Bench Stops.
Corn Husk See Knives, Corn.

Horse Nails—

See Nails, Horse.

Horseshoes—

See Shoes, Horses.

Hose, Rubber—

Garden Hose, ¾-inch:
Competition
3-ply, Guaranteed
4-ply, Guaranteed
Cotton Garden, not coupled
Low Grade
Fair Quality

Irons— Sad—

Three ¼ to 10
B. B. Sad Irons
Mrs. Potts', cents per set:

	No. 55	57	60	65
Japed Tops	88	89	93	94
Tinned Tops	88	89	93	95

New England Pressing

Bar and Corner—

Richards Mfg. Co. Bar
Corner

Pinking—

Pinking Irons

Irons, Soldering

See Coppers.

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw, 30&2%; Steel, 45%
Lockport
Lane's Steel, 30&5
Richards' Tiger Steel No. 130, 50&10%
Smith & Hemenway Co.'s

Ladder—

Richards Mfg. Co., Ladder Jacks

Kettles

Brass, Spun, Plain 20&25%
Tinplated and Cast Iron See ware, Hollow

Knives—

Butcher, Kitchen, &c.—

Lister Bros. Butcher Knives
Wilkinson Sheet & Cutlery Co.

Corn—

Columbian Cutlery Co., Wilcut
Brand Knives and Handles
Wilmarth & Morgan
Dort, $2.75. Arc, Serrated, $2.50; Serrated, $2.1. Yankee No. 1, $1.50; Yankee No. 2, $1.25

Drawing—

Standard List
C. E. Jennings & Co., Nos. 1 to 8
Jennings & Gratia, Nos. 1 to 12, C. & J.
Swan's
Watrous
L. & I. J. White

Hay and Straw—

Serrated Edge, per doz. $3.00@3.75
Swan's Sickle Edge
Swan's Serrated

Miscellaneous—

Farriers'
Westernholm's

Knobs—

Base, 2¼-inch, Birch, or Maple, Rubber Tip
Carriage, Jap., all sizes
Door, Mineral
Door, Por. Jap.
Door, Por. Nickel
Bardsley's Wood Door, Shutters, &c.

Lacing, Leather—

See Belting, Leather.

Ladders, Store, &c.—

Allith Mfg. Co., Reliable
Lee's Step
Myers' Noiseless Store Ladders
Richards Mfg. Co.:
Improved Noiseless, No. 112
Climax Shelf, No. 113
Trolley, No. 109

Ladles, Melting—

L. & G. Mfg. Co. (low list)
F. S. & W.
Reading

Lanterns—Tubular—

Regular, No. 0
Side Lift, No. 0
Hinge Globe, No. 0
Other Styles

Bull's Eye Police—

5-inch

Latches— Thumb—

Roggin's Latches, with screw...

Door—

Allith Mfg. Co., Reliable and Alligator
Crane & Cartier Mfg. Co.
Richards' Bull Dog, No.
Richards' Trump, No. 127

Leaders, Cattle—

Small
Covert Mfg. Co.:
Cotton, 45; Hemp, 45; Jute, 35; Sisal

Leathers, Pump—

See Pumps—

Lifters, Transom—

R. & E.

Lines—

Wire Clothes, Nos. 18 19 20
100 feet
75 feet
Sutton, Corbiere Wares:
Solid Braided Chalk, No. 0 to 3
Solid Braided Manila
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50
Masons' Lines, Shade Cord, &c.:
White Cotton, ½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 4, $2.50; No. 4½, $3.00; No. 4½, $4.50
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50
Clothes Lines, White Cotton: 50 ft., $2.75; 50 ft., $3.50, 70 ft., $4.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25
Turner & Stanton Co.:
Solid Braided Chalk, Manila and Vacuum Cores
Clothes Lines, White Cotton
Shade Cord, Cotton or Linen

Locks— Cabinet—

Cabinet Locks

Door Locks, Latches, &c.—

NOTE—*No prices are very often made on these goods.*
Reading Hardware Co.
R. & E. Mfg. Co.

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass

Sash, &c.—

Iron Patent
Bronze and Brass, 55&5%; Crescent, 60%; Iron, 60%; Window Ventilating, 40&20%; Robinson Pat. Ventilating Sash Lock,

Machines—Boring—

Com. Cap'y, without Adjustment
Com. Angl'r, without Adjustment, $2.25@2.50

Corking—

Reisinger Lever and Hand Power

Fence—

Williams' Perfection, each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist, 30%
Myers Hand Hoist, with Link
Myers Cyclone, High Speed Chain Hoist

Ice Cutting—

Chandler's

Washing

Boss Washing Machine Co.: Per doz.
Boss No. 1
Boss Rotary
Champion Rotary Banner No. 1, $57.00
Standard Champion No. 1
Standard Perfection
Cincinnati Square Western, $33.00
Uncle Sam Avenue, Round

Mallets—

Hickory
Lignum Vitæ
Tinners' Hickory and Apple wood

Mangers, Stable—

Swett Iron Works, 50%

Mats, Door—

Acme Flexible Steel
Elastic Steel (W. G. Co.), new list, 50%

Mattocks—

See Picks and Mattocks.

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co., 20@25
National, each, 1, 12
Parker's Columbia and Victoria, 33⅓
Parker's Box and Side, 50&10
Swift Lake Blow, Co.

Motors, Water—

Divine's Red Devil, 30%
Lippincott's

Mowers, Lawn—

NOTE—*Net prices are generally quoted*
Cheapest, 10-in., $2.00; 12-in., $2.10, etc.
Cheap, 10-in., $2.25; 12-in., $2.35, etc.
Better Grade, 10-in., $3.00; 12-in., $3.25, etc.

	12	14	16	18-in.
High Grade	$4.00	4.75	5.00	5.25
Continental				6.00
Great American				5.00
Great American Ball Bear'g, new list				7.00
Quaker City				7.00
Pennsylvania				6.00
Pennsylvania, Jr., Ball Bear'g				5.00
				5&10&5%
Pennsylvania Golf				50%
Pennsylvania Horse				33⅓&5%
Pennsylvania Pony				40&5%
Granite State:				
Style A, Low Wheel				70%
Style B, Low Wheel				60%
Style C, High Wheel, spcl. list				70&10%
Style D, High Wheel, spcl. list				70%
Pennsylvania:				
Styles D, S., C., K., T.				70&10&5%
Style A, all Steel				60&10%
Style E, High Wheel				50&5%
Drexel and Gold Coin, special list				40%
Horse				40&5%
Pony				50%
36-in., Horse				50%
Bantam, Horse				40&5%
I. X. L., Horse				50%

Nails—

Wire Nails and Brads, Manufacturers
Cut and Wire, See Trade Report
Hungarian, Finishing, Upholsterers' &c. See Tacks.

Horse—

Nos.	6	7	8	9	10
Acme					
Columbian	13	12	12	11	
New Haven	20	21	20	18	
Lancaster	13	13	12	12	
Western					

Jobbers' Special Brands per lb.

Picture—

	1½	2	2½	3	4in.
Brass Head					
Por. Head	1.10	1.10	1.10		gro

Nippers—

See Pliers and Nippers.

Nuts—

Cast Pressed
Square, Blank or Tapped
Hexagon, Blank or Tapped
Square, Blank or Tapped, C. T. & D.
Hexagon, Blank or Tapped
C. T. & D.
Hot Pressed:
Square, Blank
Hexagon, Blank
Square, Tapped
Hexagon, Tapped

Oakum—

Bags
1-lb. Spool
Foil

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Tipped
Chain or Link
Brass and Tinned
Zinc
Monarch
11, 12 and 13, 29; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans
Regular Cans
Maple City Mfg. Co.:
Spout
Brass
Rockford

Openers— Can— *Per doz.*

Sprague, Iron Handle
Sprague, Wood Handle
Sardine Scissors
Yankee Can and Bottle
₱ doz., net, $0.75; Little Gem, ₱ doz., net

Egg

Hartigan Nickel Plate, ₱ doz., $2.00; Silver Plate,

Packing—

Asbestos Packing. Wick and Rope, and quotations

Rubber—

(Fair quality goods.)

Sheet, C. C.
Sheet, C. O. S.
Sheet, C. B. S.
Sheet, Pure Gum
Sheet
Jenkins' '96, ₱ lb. 80c

Miscellaneous—

American Packing
Cotton Packing
Italian Packing
Jute
Russia Packing

Pails, Water, Well, &c.—

See Buckets.

Pans— Dripping—

Standard List
Edwards, Royal Blue

Fry—

Common Lipped:

Nos.	1	2	3	4	5
Per doz.	$0.75	0.80	0.90	1.10	1.30

Refrigerator, Galva.—

Inch	12	14	16	18
Per doz.	$1.55	2.25	2.80	3.15

Paper—Building Paper

Asbestos: *lb.*
Roll Board or Building Felt, 5 to 30 lb., per 100 sq. ft.
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.
Mill Board, Sheet, 40 & 50 in., 1-32 to ⅛ in.
Per ton
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll
Medium weight, 30 lbs. to roll
Heavy weight, 40 lbs. to roll
Black Water Proof Sheathing 500 sq. ft., 1 ply, 65c; 2 ply, 85c; 3 ply, $1.15; 4 ply, $1.25
Deafening Felt, 9, 6 and 3½ sq. ft. to the lb.
Red Rope Roofing, 2 sq. in per roll

Tarred Paper—

1 ply (roll 400 sq. ft.)
2 ply, roll 108 sq. ft.
Slater's Felt (roll 500 sq. ft.)

Sand and Emery—

Flint Paper and Cloth
Garnet Paper and Cloth
Emery Paper and Cloth

Parers— Apple—

Goodell Co.:
Improved Bay State, ₱ doz.
Ideal
Reading Hardware Co.:
New Century, each
Lovell
Livingston Nail Co.:
Reading Hardware Co.:

Potato—

Saratoga, ₱ doz.
White Mountain, ₱ doz.

Picks and Mattocks—

(List Jan. 1908)

List
Cook's Hardled Garden Mattock, ₱ doz., No. 2, $2.60; No. 3

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass.....50@51@10%
Iron, list Nov. 11, '85...6@6@10%

Pipe, Cast Iron Soil—
[illegible]

Pipe, Merchant—
	Consumers, Carloads. Steel.	Iron. Blk	Galv.
[illegible]			
[illegible]			
[illegible]			
[illegible]			
[illegible]			
[illegible]			

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
Plain [illegible]
Second [illegible]

Pipe, Stove—
	Per 100 joints. C. L.	L. C. L.
Edwards' Nested.		$7.25
5 in., Standard Blue....	$6.25	7.75
6 in., Standard Blue....	6.75	8.75
7 in., Standard Blue....	7.75	9.75
5 in., Royal Blue.....	7.50	8.00
6 in., Royal Blue.....	7.50	8.50
7 in., Royal Blue.....	8.50	9.50
Wrought Iron Pipe, Nested.		
5 in., Uniform Color	$6.25	$7.25
6 in., Uniform Color	6.50	7.65
7 in., Uniform Color	7.65	8.65

Planes and Plane Irons—
Wood Planes—
Beech, first quality.....50@55@10%
Beech, second quality.....40@45@10%
Mahogany.....25@25@10%
Cooper's Shaving Stock Planes—
Bench, First Quality.....35%
Bench, Second Quality.....25%
Molding and Miscellaneous.....25%
Tool and Outfit.....60%
Union.....60%

Iron Planes—
Chapin's Iron Planes.....50&10%
Union.....60%

Plane Irons—
Wood Beach Plane Irons, list Dec. 12, '06.....25%
Buck Bros.....30%
Chapin-Stephens Co.....25%
Lamb.....50%
L. & J. Witte.....20&5@25%

Planters, Corn, Hand—
Keller's Eclipse.....$ doz. $8.00

Plates—
Fehot.....lb. 4@4¼¢

Pliers and Nippers—
Button Pliers....75@75@75@10@5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe.....7 8 10 12-in.
$2.00 $2.25 $2.75 $3.50
Acme Nippers.....50&5%
Cronk & Carrier Mfg Co.:
American Button.....80%
Improved Button.....75&10%
Cronk's.....60%
No. 80 Linemen's.....50%
Stub's Pattern.....45%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....14&5@14&5%
F. N. W. Tinners Cutting Nippers.....40%
Wm. Schollhorn Co.:
Barnard's, Elm City, 35%; Pierced, 5 Inch, 35%
Seaming, Side Lap and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels.....20@20&10%
Carpenters' Brass Cap Levels.....40&10%
Pocket Levels.....30@30&10%
Mitre.....30%
Machinists' Levels.....40%
Bench Plumbs and Levels.....60&10%
Disston's Pocket Levels.....60&10%
Stanley's Duplex.....38%
Various Patterns.....33⅓%

Points, Glaziers'—
Brad and tack points.....*lb.* 9¢
Clout points.....*lb.* 9¢
Sprig points.....*lb.* 10¢

Police Goods—
Manufacturers' Lists.....25@25&5%
Tower's.....25%

Polish—Metal, Etc—
Prestolyte Liquid, No. 1 (2 pt.) $ doz. $3.00; No. 2 (1 qu.), $9.00.....40%
George William Hinman:
No. 5 Metal Polish Paste, 3 oz. boxes, $ doz. 50 c., $ gro. $4.50, ¼ lb. boxes, $ doz. $1.25, 1 lb. boxes, $ doz. $2.25.....
No. 5 Liquid, 8 oz. cans, $ doz., $1.25.....
Brownsers' Friend Metal Polish, $ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ¼ lb. 10¢
Black Eagle, Liquid, ½ pt. cans, $ doz. 15¢
Black Lead Paste, ¼ lb cans, $ gr. $5.30
Black Lead Paste 5 lb cans, each, $0.65
Lamb's Black Beauty Liquid, per 100 tins.....$6.75
Oxeph Polishing Cloths, $ gr. $5.75.....10c
Dixon's Plumbago.....¼ lb 8¢
Fireside Polish, $ gr. $2.50
Gem, $ gr. $1.50.....10%
Japanese, $ gr. $3.50
Jet Black, $ gr. $3.50
Peerless Iron Enamel, 10 oz cans, $ doz. $1.50

Poppers, Corn—
1 qt. Square...doz. Sizes; gro. $8.75
1 qt. Round...doz. Sizes; gro. $9.00
2 qt. Square...doz. Sizes; gro. $11.00
2 qt. Square...doz. Sizes; gro. $11.00

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft. 48¢; 7½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled.....35&10%
Tinned.....30&10%

Powder—
In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½ lb.....each 15¢
Rifle, 1 lb.....each 25¢
In Kegs:
12½ lb. kegs.....$3.50
25 lb. kegs.....$4.50
King's Semi-Smokeless:
Keg 25 lb. kegs.....$4.50
Half Keg, 12½ lb. bulk.....$2.50
Quarter Keg, 6¼ lb. bulk.....$1.50
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50
King's Smokeless Shot Gun Rifle.
Keg 25 lb bulk.....$12.00 $15.00
Half Keg (12½ lb bulk)... 6.25 7.75
Quarter Keg (6¼ lb bulk). 3.25 4.00
Case 24 (1 lb cans bulk).. 14.00 17.00
Half case 12 (1 lb c. bk).. 7.25 8.75

Presses—
Fruit and Jelly—
Enterprise Mfg. Co.....20@25%

Seal Presses—
Morrill's No. 1, $ doz. $20.00.....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops.....50%
Miller's Falls, No. 3, $ doz., $12.00.....33⅓&10%
Morrill's No. 1, Nail Puller, $ doz. $20.00.....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
The Scranton Co. Case Lots:
No. 2B coarse.....$5.50
No. 3B medium.....$5.00
Smith & Hemenway Co.:
Diamond P.....70
Giant.....50%
Staple Pullers, Utica and Davis.....60%

Pulleys, Single Wheel—
Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., 4 in., $1.25; 5 in., $1.55				
Inch		2	2¼	2½
Hot House, doz.	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz.	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz.	$0.25	.40	.55	.80
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz. 1¾ and 2 in.....17@20¢
Auger Mortise, no Face Plate, per doz. 1¾ and 2 in.....20@21¢
Acme No. 85, 1¾ in., 19¢; 2 in., 20¢
American Pulley Co.:
Improved Steel, American Plate Axle.....50%
Wrought Steel, Eagle.....50%
Fox-All-Steel, Nos. 3 and 1, 2 in..... $ doz. 50%
Grand Rapids All Steel Noiseless, 50%
Standard, No. 25, 1¾ in., 19¢.....
No. 35, 1¾ in., 19¢; 2 in., 20¢.....20½¢
No. 45, 1¾ in., 19¢; 2 in., 20¢.....
Star, No. 27, 1¾ in., 19¢; 2 in., 20¢
Taylor Blocks—See Blocks.

Pumps—
Cistern.....60%
Pitcher Spout.....75%&5@75&10%
Wood Pumps Tubing, &c.....50%
Barnes Dbl. Acting (low list)...40&5%
Barnes Plunger Steam.....35&10%
Contractors' Rotary Diaphragm No. 2, Rotary Diaphragm No. 3, Rotary Diaphragm No. 4, Rotary Diaphragm No. 5, Rotary Diaphragm No. 6, Rotary Diaphragm No. 7, Rotary Diaphragm No. 8, Rotary Diaphragm No. 9, Rotary Diaphragm No. 10, Rotary Diaphragm No. 11, Rotary Diaphragm No.

Saws—

Atkins:
Cut Off 45
Hand ..... 20&10
Buck's Saws 50
Clipper 50
One Man Cut 50
Narrow Cross Cut ..... 50&10
Hand Rip 50
Mill Rip 50
Meaty Nose 50
Wood 50
Chapin-Stephens Co.
Turning Saws and Blades 50
Disston & Sons, Henry:
Sterling Kitchen Saws ..... 40&10
Disston:
Back Saws 50
Band 50
Buck 50
Compass 50
Crosscuts 50
Nutmeg 50
Pruning 50
Rip 50
Wood 50
Framed Wood Saws 50
Hand 50
Wood Saw Blades 50
Mantle Lamps:
Bridgeport Saws ..... 15&10
Star Saw Blades ..... 10&10
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10
Miller Saw Blades ..... 25&10
Peace & Richardson's Hand Saws 30
Simonds:
Cabinet 40
Crescent Ground Cross Cut Saws 30
Cut Off 50
Gang Mill, Mulay and Drag Saws 50
Hand Saws 50
Rip Saws 50
Butcher Saws 50
Band Saws 50
Hand Saws, Bay State Brand 45
Compass Key Hole, & ..... 25@&10
Wood Saws 50
Wheeler, Madden & Clemons Mfg. Co.'s Chain Cut Saw 50

Hack Saw Blades and Frames—

Athas' Hack Saw Blades A A A 25
Disston's:
Circular Blades 35
Keystone Blades 35
Hack Saw Frames 35
Simonds' Hack Saw Co.:
Hack Saw Blades, Nos. 175, 180 ..... 40&25
Hack Saw Nos. 175, 180, complete ..... 40&25
Goodell's Hack Saw Blades ..... 1 A 1
Grimes' Hack Saw Frames 50
Grimes Hack Saw Blades ..... 50&10
Star Hack Saw Blades ..... 15&1
Sterling Hack Saw Blades ..... 2 &10&5
Sterling Hack Saw Frames ..... 30&10&10
Sterling Power Hack Saw Machines, each ..... 50&10
Victor Hack Saw Blades 50
Victor Hack Saw Frames 40
Wilcox & Mfg. Co.:
Nicholson Files 40
Nicholson Hack Blades 40
Nicholson Hack Frames 40

Scroll—

Barnes, No. 7, $15 25
Barnes' Saw Blades 40
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 15&10
Lester Simplex, $10 ..... 15&10
Rogers, complete, $3.50 and $4.00 ..... 15&10

Scales—

Fairbanks, Morse & Co.:
Counter:
Hotch, Platform, ... to 1 ton
Do ... over 1 ton
Two, Platform ... doz. $16.00
Do ... doz. $15.00
Union Platform, Plain, $1.70@1.90
Union Platform, Stpd. $1.85@2.15
Chatillon:
Counter ... 50
Platform ... 50
Crocers' Trip Scales 50
The Standard Parlor 10
The Standard R. R. and Way 10

Scrapers—

Bos. 1 Handle ... doz. $2.00@2.25
Bos. 2 Handle ... doz. $2.75@3.00
Ship ... Light $3.00, Heavy $3.50
Chapin-Stephens Co., Bos. ..... 50&10
Richards, Mo. 50

Screws—Bench and Hand

Bench, Iron ... doz. 1 in. $2.50@3.00; 2 in. $3.00@3.75
Bench, Wood ... doz. 1 in. $2.50@3.00; 2 in. $3.00@3.75
Hand, Wood ... 70&10@70&10&10
Chapin-Stephens Co., Hand 70

Coach, Lag and Hand Rail

Lag, Case Point ... 65&5
Lag, Gimlet Point ... 65&5
Hand Rail ... 70

Jack Screws—

Standard List ... 60&10@70
Morse, Williams & Co. 40
Swett Iron Works 40

Machine

Cut Thread, Iron, Case or Brass:
Flat Head or Round Head ... 50&5
Fillister Head ... 60@60&10
Rolled Thread, F. H. or R. H., Iron ... 50&5
F. H. or R. H., Nos. 8 to 24 ... 50&10

Set and Cap—

Set, Iron ... 70&10&5
Set (Steel), not advance on Iron ... 25
Nut and Cap ... 50
Hex Head, Cap ... 50
Hex Head, Cap ... 50
Fillister Hd. Cap ... 60&10&2

Wood—

List July 25, 1902.
Flat Head, Iron ... 85&5@... %
Round Head, Iron ... 85&5
Flat Head, Brass ... 85&5
Round Head, Brass ... 85&5
Flat Head, Bronze ... 75&5@... %
Round Head, Bronze ... 75&5
Drive Screws ... 85&5@... %

Scroll Saws—

See *Saws, Scroll.*

Scythes— *Per doz.*

Grass, No. 1, Plain ... $7.50
Clipper, Bronzed Webb ... $7.25@7.75
No. 5 Clipper, Pol'd Webb ...
No. 6 Clipper and Solid Steel ...
Bush, Weed and Bramble, Nos. 11, 12 and 13 ... $7.25@7.75
Grass, No. 1 ... $8.50@9.00
Bronzed Webb, No. 1 ... $9.25@9.75
Nos. 3 and 4 Clipper, Gram ... $9.50@10.00
Solid Steel, No. 6 ... $10.00@10.50

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; No. 2, $15 50
Miller Bros. Awl Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18 ..... 20&10

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... doz sets $9.00

Sets, Nail—

Octagon ... gro. $3.50@3.75
Huss, Hemenway 50
Cannon's Diamond Point, gro. $12, ... 4&2
Mayhew's ..... gro. $2.50
Snell's Corrugated, Cup Pt. ..... 40&10
Snell's Knurled, Cup Pt. ..... 40&10
Victor Knurled Cup Pt. ..... gro. $7.50

Rivet—

Regular list ... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Vanguard 40%
Disston's Star, Monarch and Trimmer 30%
Morrill's No. 1 ..... $15.00
Nos. 3 and 4 Cross Cut $2.50
No. 5, Mid $2.00
Nos. 10, 11, 95 ..... $5.00
Nos. Odd Style $6.00
Special $16.25
Giant Royal Cross Cut ..... doz. $8.00
Royal, Hand ..... doz. $4.50
Taintor Positive ..... doz. $6.75

Shaving—

Dox Shaving Sets, No 30 ..... doz., net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones ..... doz. $1.50
Mounted Kitchen Sand Stone ..... doz. $1.50
Natural Grit Carving Knife Hones ..... doz. $3.00
Quick Cut Emery Carving Knife Hones ..... doz. $1.50
Quick Edge Pocket Knife Hones ..... doz. $2.50

Skate—

Smith & Hemenway Co., Eureka ..50%

Shaves, Spoke—

Iron ... doz. $1.75
Wood ... doz. $2.
Disston & Sons, Henry:
Chapin-Stephens Co. ..... 30&10&10%
Goodell Co. ..... 50&10

Shears—

Cast Iron	7	8	9 in.
Best	$16.00	18.00	20.00 gro.
Good	$13.00	15.00	17.00 gro.
Cheap	$5.00	6.00	7.00 gro.

Straight Trimmers, &c.:
Best quality Jap ... 70@70&10%
Best quality, Nickel ... 60@60&10%
Tailors' ... doz. $4.00@4.50
Acme Cast Steel 50
Acme Steel 50
Wilkinson Sword & Cutlery Co. 50
Gem 50
Heinisch's Manicure 50
Jennings & Griffin Mfg. Co.'s 50
Perfection 50
Pike Mfg. Co. 50
W. R. W. 50
Wilcox & Mfg. Co. 50

Tinners' Snips—

Steel Blades ... 20&5@20&10%
Steel and Bolt Blades ... 20&10@20&10%
Forged Handles, Steel Blades, Berlin ... 50%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s 6½ to 50
Pike Mfg. Co. 50
Pike & W. R. W. 50
Wilcox & Mfg. Co. 50

Pruning Shears—

Chapin-Stephens Co. 50
Crook's Wood Handle Shears ..... 35&5
Disston's Combined Pruning Hook and Saw, doz. $18.00 ..... 25%
Disston's Pruning Hook 50
John T. Henry Mfg. Co.:
Pruning 50
P. S. & W. Co. ..... 10&10%
Columbian Cutlery Co. 50
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand 50

Sheaves— Sliding Door—

Reading 40
R. & E. list 15%

Sliding Shutter—

Reading list 40
R. & E. list 10%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, Nickel Plated ..... 25&5
Club, Rival, 65&5%; First Quality, ... 25&5
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, ... 25&5
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader Grade, ... 25&5
Paper Shells, Loaded and Unloaded:
Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Independent Grade 20%

Shells, Loaded—

Loaded with Black Powder ... 40%
Loaded with Smokeless Powder, medium grade ... 40&5%
Loaded with Smokeless Powder, high grade ... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40
Nitro Club, Smokeless Powders ..... 40&5%
Arrow, Smokeless Powders ..... 40&10&10
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Grade ..... 40&10&10%
Black Powder 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted	Gvd.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 9	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20	4.25	5.5
Dixie, 10 x 14	4.50	6.
Dixie, 7 x 9	4.75	6.5

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ... per keg $4.10
Steel ... per keg $4.85
Burden's, all sizes ..... keg $...

Shot—

25-lb. bag
Drop, up to B ... $1.85
Drop, B and larger ... 2.10
Buck ... 2.10
Chilled ... 2.10
Dust ... 2.10

Shovels and Spades—

Association List, Nov. 15, 1902. 40%
Avery Stamping Co. 50

Snow Shovels—

Long Handle ... $1.25@$2.50
Wood and Malt. D. Handle ... $1.75@$2.50

Sieves and Sifters—

Hunter's Imitation ... gro. $9.50@10.00
Hunter's Genuine ... per gro. $12.00@12.50

Sifters, Ash—

Ames Plow Co. 50
Vulcan 50

Sieves, Seamless Metallic

—Per dozen.—

Mesh	14	18	28	30
Iron Wire	$1.05	1.05	1.10	1.20
Tinned Wire	$1.15	1.15	1.20	1.30

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ... doz. $0.90@0.95
Mesh 24, Nested ... doz. $1.00
Mesh 24, Nested ... doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard List:
Enterprise 60%
Gem 60%
Gem, Jr. 60%
Barnes' low list:
Nos. 1 to 4 50
Nos. 5 to 8 50
Nos. 9 to 12 50
NOTE—There is no effective uniform list for sinks and lavatories.

Skeins, Wagon—

Cast Iron ... 70@75&10%
Steel ... 60&10&10%

Slates, School—

Factory Shipments.
"D" Stamps ... doz. $1.10
Eureka, Unexcelled Noiseless ... 60&5 tens
Victor A, Noiseless ... 60&5 tens &5%

Slaw Cutters

See *Cutters, Slaw.*

Snaps, Harness—

German ... 50
Covert Mfg. Co.:
Plain 50
Roller, 3/4 50
Hamilton 50
Lion 50

Snaths—

Scythe ... 50

Snips, Tinners— See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality ... 50&10&10
Cheap ... 50&10
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Bro. 50
Rogers, Lee & Bro., William Rogers' Extra Brand 50
Anchor, Rogers Brand 60%
Wm. Rogers & Son 50

Miscellaneous

German Silver ... 60&10

Tinned Iron—

Tea ... per gro. $1.50
Tablets ... per gro. $1.50

Springs— Door—

Bardsley Spring and Check 40
Cook 50
Corn 50
Pullman Door and Gate 10%
Reliance 50
Star (Coil) 30%
Torrey, R. I. ..... 40&10&5

Carriage, Wagon, &c.—

Nos. 1 in. and Wider: Per 100 lb.
Bands $4.00
Half Bands $4.00
Hoops $4.00
Painted Seat Springs:
Under 28 in. ... per gro. $2.00
28 in. and over ... per gro. $2.50

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; Nautilus 50
Enterprise 50
Leader 50
Lombard Iron Works, No. 1, $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated ... List Jan. 5, 1900.
Steel and Iron ... List Jan. 5, 1900.
Rosewood Hdl. Try Squares and T-Bevels ... 60&10&10&10%
Iron Hdl. Try Squares and T-Bevels ... 50&10&10&10%
Disston's Try Squares and Bevels, Rosewood Handle, 60&5%; Iron Stock and Bevel 15%

Squeezers, Lemon

Wood, Porcelain Lined:
Cheap ... doz. $1.00
Good Grade ... doz. $1.25
Tinned Iron ... doz. $1.00@1.25
Iron, Porcelain Lined ... doz. $1.75

Staples—

Barbed Iland ... 50&10&10&10
Electrogalvanized ... 50&10&10&10
Fence Staples, Plain, $2.15; Galvanized ... $2.45
Poultry Netting Staples ... per lb. 3½@3¾¢

Steels, Butchers'—

Dick's 30
Foster Bros 30

Steelyards— ... 50&10&10%

Stocks and Dies—

Blacksmiths ... 50&10&10
Chapin-Stephens Co. ..... 50&10
Curtis & Curtis Ratchet Die Stocks 50
Derby Screw Plate 35
Great Neck 50
Lightning Screw Plate 25%
Little Giant ..... 25&10
Reece's New Screw Plates 25%

Stoners, Cherry—

Enterprise ..... 25&30%

Stones—Oil, &c.

Pike Mfg. Co.:
Arkansas $0.50
Arkansas Slips, No. 1 ..... $1.50
Arkansas Slips No. 2 ..... $1.00
Lily White Washita, 4 to 8 in. 50
Red Rock Washita 50
Washita, Extra, 4 to 8 in. 50
Washita, 4 to 8 in. 40
Washita, 1 to 8 in. 30
Lump 50
Rose Red Slips 50
Washita Slips, Extra 50
Washita Slips, No. 1 40
Washita Slips, No. 2 30
India Oil Stones (entire list) 33½
Quickcut Emery and Corundum Oil Stones 50
Quickcut Emery and Corundum Axe Stones 50
Quickcut Floors Rubbing Bricks 40
Hindostan No. 1, R Clear 50
Hindostan No. 1, Small 10
Axe Stones 50
Turkey Oil Stones, Extra 50
No. 1 10
Queer Creek Stones 4 to 8 in. 50
Queer Creek Slips 50

Scythe Stones—

Ike Mfg. Co., 1901 list:
Black Diam'd S. S., per gro. $12.00
Emmell's S. S. ..... per gro. $9.00
White Mountain S. S. ..... per gro. $7.50
Green Mountain S. S. ..... per gro. $6.00
Lake Champlain S. S. ..... per gro. $4.50
No. 1 Indian Head S. S. ..... per gro. $3.00
No. 2 Indian Head S. S. ..... per gro. $2.50
Red Jacket S. S. ..... per gro. $1.75
Quick Cut Emery ..... per gro. $10.00
Pure Corundum ..... per gro. $15.00
Crescent ..... per gro. $7.00
Emery Scythe Rifles, 2 Coat, per gro. $8.00
Emery Scythe Rifles, 3 Coat, per gro. $10.00
Emery Scythe Rifles, 4 Coat, per gro. $12.00
Redge of Mill bar Stone ..... per gro.
Electro Artificial ..... per gro. $1.50
Lake Champ Artificial ..... per gro. $18.00 ..... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers ..... per gro. $9.00

Stops— Bench—

Millers Falls ..... 15&10%
Morrill's, per doz., No. 1, $10.00 ..... 50%
Morrill's, No. 2, $12.50 ..... 50%

Door—,

Chapin-Stephens Co. ..... 5@50&10

Plane—

Chapin-Stephens Co. 20%

Straps— Box—

Acme Embossed, case lots, 20&10&10%
Cary's Universal, case lots....20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 55¢
All Steel Socket... doz. $2.00@2.25
Excelsior Stretcher and Tack Hammer Combined, per doz. $6.00 ..... 20%

Stuffers, Sausage—

Enterprise Mfg. Co. ..... 25@25&7½%
National Specialty Co., list Jan. 1902 ..... 30&5%
P., S. & W. Co. ..... 40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: per doz,
Superba, Crotch Mahogany.... $36.00
Triumph, Fancy Veneers $45.00
Parlor Queen, Fig. Rosewood. $30.00
Elite, Hungarian Ash $25.00
Am. Queen, Fig. Mahogany.... $27.00
Ideal, Bird's-Eye Maple $25.00
Grand Rapids, Nickel, $24.00; Japan $22.00
Standard, Nickel, $22.00; Japan $20.00
Crown Jewel, Nickel, $21.00; Jap. $18.00
Crystal, Glass Top $36.00
Grand, 17 in. wide $36.00
Regal, 19 in. wide $48.00
Chief, 24 in. wide $60.00
Hall, 28 in. wide $60.00

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten dozen lots; $2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks... 90&10&10%
American Cut Tacks... 90&10%
Swedes' Cut Tacks... 90&10%
Swedes' Upholsterers'... 90&10%
Gimp Tacks... 90&10%
Lace Tacks... 90&10%
Trimmers' Tacks... 90&10%
Looking Glass Tacks... 90&10%
Bill Posters' and Railroad Tacks... 90&10&10%
Hungarian Nails... 80&10%
Finishing Nails... 70%
Trunk and Chest Nails... 80&10%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks.....
Single Pointed Tacks.....
See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
50	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather... 25&10&5%
Steel... $3.1-$4.5%
Chesterman's... 25&12½&5%
Kenyon & Esser Co.:
Favorite Asses' Skin ..... 10&10&50
Favorite, Duck and Leather ..... 25&5%
Metallic and Steel, Lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Asses' Skin ..... 40&10&50%
Metallic ..... 30&10&5%
Patent Bend, Leather.... 25&5&25&10%
Pocket ..... 40&10&5%
Steel ..... 33⅓&10%

Wickersham & Hilger:
Chesterman's Metallic, No. 34L, etc. 25%
Chesterman's Steel, No. 1036L, etc 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, etc. ..... 50@60%

Ties, Bale—Steel Wire—

Scraps Loop ..... $23.40 ton
Monitor, Cross Head, &c. 25

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White ..... 20@20&5%

Haying—

Myers' Hay Tools 45%

Miniature—

Smith & Hemenway Co.'s, Davidson, Nickel Plated, $1.50; Gold Plated $2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simonds' Improved 33⅓
Simonds' Crescent 25%

Ship—

L. & I. J. White 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.... $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida ..... 75&10%
Newhouse ..... 40&10&5%
Hawley & Norton 65%
Victor ..... 75&75&10%
Oneida Community Jump 50%
Hector ..... 33⅓&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85¢@90¢

Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, per doz., $13.25..$11.50 doz.
No. 2, Rat, per doz., $6.50.. $5.75 doz.
No. 3½, Rat, per doz., $5.25, $4.70 doz.
No. 4, Mouse, per doz., $3.85, $3.00 doz.
No. 5, Mouse, per doz., $3.00, $2.25 doz.
Oneida Community:
Out o' Sight, Mouse, per doz....$0.60
Out o' Sight, Rat, per doz 1.25
Easy Set, Mouse 55
Easy Set, Rat, per doz 1.00
Wood Chicker, Rat, per doz, holes .12
Premier Tin Choker, 5 hole, per doz. traps ..... .75

Trowels—

Disston Brick and Pointing... .....25%
Disston Plastering 20%
Disston "Standard Brand" and Garden Trowels, ... 30%
Kohler's Steel Garden Trowels, per gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels.. per gro. $6.00
Woodrough & McPartlin, Plastering..25

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern ..... 50&10%
Work Pattern ..... 40&10%
Handy Trucks ..... per doz. $16.00
Grocery ..... per doz. $15.00
McKinney Trucks ..... each, net $18.00
Model Store Trucks ..... per doz. $18.50

Tubs, Wash—

M'f'gr's list, prices per gross.
No. 0 1 2 3
Galvanized 8@ 8.50 8.80 10@10

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls 24¢@25¢
No. 12, ½ and ½-lb. Balls. 21¢@24¢
No. 15, ¼ and ½-lb. Balls. 18¢@20¢
No. 24, ¼ and ½ -lb. Balls. 15¢@16¢
No. 36, ¼ and ½-lb. Balls. 17¢@19¢
Chalk Line, Cotton Balls ..... 26¢@31¢
Cotton Mops, 6, 8, 12 and 16 lb. to doz. ..... 11¢@19¢
Cotton Wrapping, 5 Balls to lb., according to quality... 15½¢@25¢
American 2-Ply Hemp, ¼ and ½-lb. Balls ..... 14½¢@15½¢
American 3-Ply Hemp, ½-lb. Balls ..... 15½¢@16½¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) 10½¢@11½¢
India 3-Ply Hemp, ½-lb. Balls 10½¢@11½¢
India 3-Ply Hemp, 1½-lb. Balls 10¢@11¢
2, 3 and 5-Ply Jute ¼ and ½ Balls ..... 13½¢@14½¢
Mason Line, Linen, ½-lb. Bls. 47¢
No. 264 Mattress, ¼ and ½ lb. Balls, according to quality. 30¢@36¢
Wool, 3 to 6 ply... B 9¢; A 10¢

Vises—

Solid Box ..... 50¢@50&10&5%

Parallel—

Atlas Machine Co.:
Simpson's Adjustable 40%
Standard 40%
Amateur 40%
Columbian Hdw. Co. 40%
Fisher & Norris Double Screw, net, each 3½, $15.00; 3, $18.00; 4, $20.50; 5, $27.00 ..... 33⅓
Fulton Mach. & Vise Co.:
Reed Swivel 25
Star Solid Jaw 40
Hall 40
Machinists' ..... 10&10&5
Keystone ..... 65&5&70%
Lewis Tool Co.:
Adjustable 50
Monarch, 50; Steel Jaw 50
Massey Vise Co.:
Climber 40%
Perfect, 15%; Lightning Grip 15%
Merrill's 50
Millers Falls Oval Slide Pattern. 60&10%
Parker's:
Victor, 20@25%; Regulars..... 20@25%
Vulcan's ..... 1 and 15
Combination Pipe ..... 65@60
Prentiss ..... 20@25
Rock Island 25
Snedeker's X. L. 33⅓%
Stephens' 33⅓%

Saw Filers

Disston's D 3 Clamp and Guide, per doz., $24.00, 30%; Clamps 30%
Perfection Saw Clamps, per doz.... $4.80
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.: ...
Reed 25%
Star 40
Massey Vise Co.:
Lightning Grip, 15%; Perfect..... 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00, 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe..... 40%
Pierce's Combination Pipe.....
87 Series, 60%; 187 Series, 60&5%; No. 870 40%.
Rock Island Pipe 25%

Wads—*Price per M.*

B. E., 11 up ..... 60¢
B. E., 9 and 10 ..... 70¢
B. E., 8 ..... 80¢
B. E., 7 ..... 80¢
P. E., 11 up $1.00
P. E., 9 and 10 ..... 1.25
P. E., 8 ..... 1.50
P. E., 7 ..... 1.50
Ely's B. E., 11 and larger $1.70@1.75
Ely's P. E., 12 to 20.... $3.00@3.25

Dis. 15%

Ware, Hollow— Cast Iron, Hollow—

Stove Hollow Ware:
Enameled ..... 45¢&10%
Ground ..... 50¢&5%
Plain or Unground 60%
Country Hollow Ware, per 100 lbs. $3.00
White Enameled Ware:
Muslin Kettles ..... 65¢&10%
Covered Ware:
Tinned and Turned ..... 35¢&10%
Enameled ..... 45¢&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware..... 33⅓%
Iron Clad Ware ..... 70&10%
Lava and Volcanic, Enameled..10&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	*45¢*	*50¢*	*65¢*	*65¢*

Steel Hollow Ware—

Atery Spiders and Griddles ..... 60&5&5%
Atlas Kettles 60
Perfection ..... 5 & 10%
Never Break Spiders and Griddles ..... 65&5%
Never Break Kettles 60%
Solid Steel Spiders and Griddles..65&5%
Solid Steel Kettles 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: per doz.
Crescent, family size, bent frame.$4.05
Rock Star family size, stationary protector $4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $3.55
Cable Crest, family size, stationary protector $3.60
Single Zinc Surface:
Naiad, family size, open back, perforated $2.90
Single Saginaw Globe $2.85
Brass Surface:
Heyn King, Single Surface, open back $4.05
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.60
Glass Surface:
Glass King, Single Surface, open back $3.95
Enamel Surface:
Enamel King, Single Surface, ventilated back $3.95

Washers—Leather, Axle—

Solid ..... 70@70&10%
Patent ..... 90%&90&5%
Coil: ⅝ 1 1¼ 1½ Inch.
90c. 1.10c. 1.40c. per box

Iron or Steel—

Size bolt.... ⅜ ⅝ ¾ ⅞ 1 1¼
Washers.... 2.25 2.40 2.50 2.75 3.25
The above prices are based on $6.25 off list.
In lots less than one keg add ½¢ per lb.; 5 lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Wedges—

Oil Finish ..... lb., ..@3¢

Weights—Hitching—

Covert Mfg. Co. ..... 30&2%

Sash—

Per net ton, f.o.b. factory:
Eastern District... $25.00@$28.00
Southern Territory $22.50@$24.50
Western and Central Districts ..... $22.50@$23.50

Wheels, Well—

8-in., $2.00; 10-in., $2.75; 12-in., $3.25; 14-in., $4.45.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 ..... 72¢&10¢&7½%
10 to 14 ..... 74½¢&10¢&10%
15 to 16 ..... 75¢&10¢&12½%
17 to 18 ..... 77½¢&10¢&15%
19 to 26 ..... 79¢&10¢&17½%
27 to 36 ..... 82½¢&10¢&20%
Galvanized:
6 to 9 ..... 72½¢&10%
10 to 14 ..... 74½¢&10&5%
15 to 16 ..... 75½¢&10&7½%
17 to 18 ..... 77½¢&10&10%
19 to 26 ..... 79¢&10¢&12½%
27 to 36 ..... 82½¢&10¢&15%
Coppered:
6 to 9 ..... 65¢&10¢&10%
10 to 14 ..... 67½¢&10¢&5%
15 to 18 ..... 65¢&10¢&10%
19 to 26 ..... 70¢&10¢&12½%
27 to 36 ..... 72½¢&10¢&12½%
Tinned:
6 to 18 ..... 67¢&10¢&10%
Brass ..... 17½¢ lb., base
Copper ..... 32¢ lb., base
Cast Steel Wire 50%

Spooled Wire—

Annealed and Tinned, 70¢&10¢&10%
Brass and Copper... 60¢&10¢&10%
Retailers' Assortments, per box, $2.10@$2.40

Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods.... 90¢&25¢&10%
Brass Wire Goods.... 90¢&90¢&10%
Brass Cup and Shoulder Hooks, 80¢&15%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80¢&25¢&10¢&7½%
Painted Screen Cloth, 100 ft., $1.35
Standard Galv. Hardware Grade: Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh.... $2.75
Nos. 4 and 5 Mesh $3.00
No. 6 Mesh $3.25
Nos. 7 and 8 Mesh $3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ..... 80¢&10¢&10%
Alligator or Crocodile.. 70¢&10¢&75%
Baxter Pattern S Wrenches... per 100 lbs. $7.00&10%
Drop Forged S ..... 45¢&15&5%
Acme ..... 60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut 50%
Cleveland Steel ..... 40&5%
Merrick Pattern 50
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle ..... 40&10&5&5%
Coes' "Mechanics'"... 40&10&10&5&5%
Donohue's Egpineer ..... 40&10%
Eagle 70%
Gem Pattern 50
Hercules 10%
W. & B. Machinists':
Case lots ..... 50&5%
Less than case lots 50%
W. & B. Railroad Special:
Case lots 50%
Less than case lots ..... 40&10&5%
Solid Handles, P., S. & W., 50&10%; full cases ..... 50&10&5%
Stillson 65%
Urania Wrench Co.:
Urania Special, Iron Handle ..... 40&10&5%
Other Wrenches 50%
Vulcan and Acrippa Chain 50%
Whitaker Machinists':
Case lots ..... 50&10%
Less than case lots 50%

Wrought Goods—

Staples, Hooks, &c., list March 17, '02 ..... 85&10&10%

Zinc— *(Cask lots at mill.)*

Sheet ..... per 100 lb., $7.00

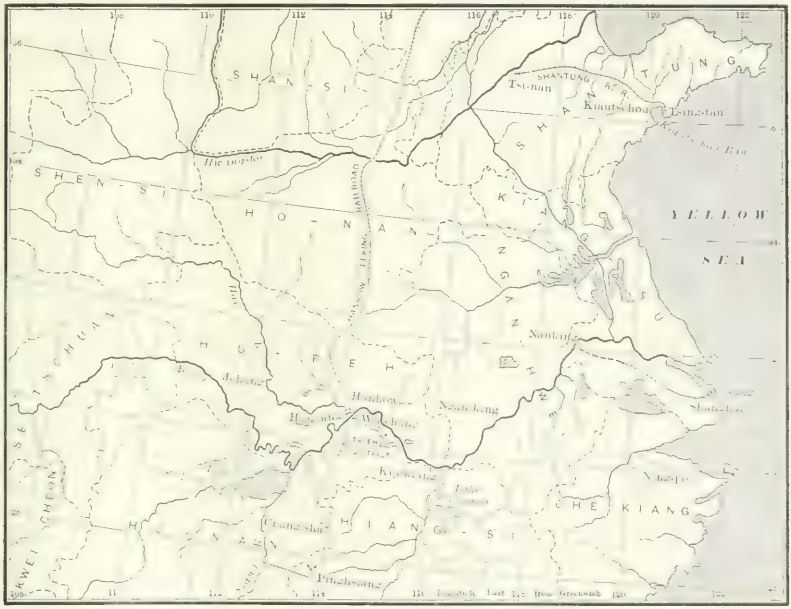
THE IRON AGE

New York, Thursday, May 7, 1908.

THE IRON INDUSTRY OF CHINA.

Description of the Hanyang Iron & Steel Works.

Our importations of pig iron from China have attracted the attention of the trade to the industry of that country, and therefore much interest attaches to reliable data published in *Stahl und Eisen* by C. Blauel of Duesseldorf-Obercassel, Germany, formerly chief engineer of the Hanyang Iron & Steel Works, the only plant of any consequence in China. It is located at the confluence of the Han and Yangtse rivers, close to Hankow, the largest and most promising commercial town on the great inland waterway of the East, the distance from the sea being 750 miles. The accompanying map shows the location.



Map of China, Showing the Location of Its Iron Industry.

The enterprise was started in 1891, when English engineers put in the plant purchased chiefly in England by Chang-Chi-tung, then recently made governor of the province of Hu-Peh. It consisted of two 50-ton blast furnaces with two Cowper stoves each; 20 puddling furnaces with two hammers and a muck mill; two 5-ton Bessemer converters; one 12-ton basic open hearth furnace; a 30-in. combination blooming and rail reversing mill with three stands; a 13¾-in. three-high bar mill and a two-high plate mill, the two latter driven by a common engine. There were also a foundry, a forge with a structural shop, a machine shop, a bolt and nut factory and a plant for manufacturing fire brick.

The works took five to six years to build, the erection being in charge of engineers and foremen from a large Belgian company which at that time had business relations with the Hanyang Iron & Steel Works. About 80 Chinese were first trained for a year at the Belgian works.

Early Operations Unsatisfactory.

The blast furnace plant has been running since 1894, with interruptions, and in the earlier years only one furnace was usually in blast. By enlarging the hot blast stove equipment and making other improvements, the daily production was increased to 70 to 100 tons per day according to the grade of iron made. The puddle mill ran only for a short time and was stopped on account of the large consumption of fuel.

Toward the end of the '90s the Bessemer plant made steel, from cupola metal, for the rails for the Hankow-Peking Railroad, which was built from 1900 to 1905 with rails chiefly made at the Hanyang Iron & Steel Works. Incidentally, both the Bessemer plant and the open hearth furnace, which latter worked with 30 per cent. of pig iron, produced steel for the bar and plate mills. The total output of rolled products at that time is not supposed to have exceeded 15,000 to 20,000 tons per annum, and during the greater part of that time was below these figures.

The layout of the plant and the use of poor coke and coal did not permit of making a profit, in spite of high prices, and the enterprise suffered at times from lack of funds. It was on such an occasion, prior to 1900, that a contract was made with the Japanese works at Wakamatsu, against the advice of the engineers, to deliver, for 30 years, 100,000 tons per annum of the best low phosphorus magnetites at the price of about $1.50 per ton, f.o.b. loading station. This contract imperiled the future of the Bessemer plant, because a part of the other easily reached ores contained too much phosphorus—from 0.1

to 0.25 per cent.—in order to produce pig iron in adequate quantities for the acid Bessemer converters. The fact must also be taken into account that a large part of the coke contains small quantities of phosphorus.

In 1904 the greatest interest in the works came into the possession of Sheng-Kung-pao, the leading member of the syndicate which had acquired the company in 1896 from Chang-Chi-tung. In order to adapt the plant to working all the magnetites and specular ores of the Tajeh District, it was decided to raise money to put up an open hearth plant and a large modern rolling mill. It was the plan to increase the number of blast furnaces and open hearth furnaces to keep pace with the demand, provided the enterprise proved profitable. The managers appointed by Sheng-Kung-pao visited the United States, England and Germany, in order to purchase the new equipment.

The Iron Ores.

Before describing the new works, some reference may be made to the supply of raw materials. The iron ores of the Tajeh District, which is located about 60 miles southeast of Hankow on the right bank of the Yangtse River, are red hematite and magnetic which carry from 58 to 68 per cent. of iron, 3 to 7 per cent. of silica, 1 to 2 per cent. of alumina, 0.2 to 0.4 per cent. of manganese, 0.04 to 0.25 per cent. of phosphorus, 0.05 to 0.1 per cent. of sulphur and 0.05 to 0.25 per cent. of copper. There are also brown iron ores carrying 6 to 9 per cent. of manganese. It is estimated that there are available of the two principal grades of ore over 100,000,000 tons. The ores occur in an uninterrupted ridge of about 7.5 miles. The vein dips sharply and averages about 235 ft. On the section of the deposit where lower phosphorus ores are found, the vein is in contact with almost pure limestone in very large quantities. This locality is certainly one of the future centers of the iron industry of China, because there is coupled with the wealth of ore and of limestone the existence of coal suitable for cooking. It occurs in workable quantity, at a moderate depth, and is only distant 20 to 25 miles from the iron ore.

The ore mines are connected by a 15-mile standard gauge road with a loading station on the Yangtse River. The ore and limestone are conveyed from the loading station to the works by lighters hauled by tugboats owned by the company, the distance being about 75 miles. The ore for the Japanese market is shipped directly in steamers. The loading and unloading are done by coolies, whose low wages, about 7 cents per shift, make elaborate loading appliances unnecessary.

Coal and Coke.

During the first years of their existence the works used a coke of good quality from Kaiping, located northeast of Tientsin. Later, coke from the owned collieries at Man-gan-hsan, province of Hupeh, and at Peng-hsiang, province of Kiang-si, was employed. Incidentally, there was also used the so-called native coke made by Chinese methods—usually a bad material high in ash—which was delivered from the province of Hunan. Now the collieries at Ping-hsiang having been equipped with coal washers, and having opened good seams, have reached the point that a firm coke is made with an average of 12 to 15 per cent. of ash and 0.8 per cent. of sulphur. The production is large enough to operate the Hanyang furnaces exclusively with this coke. Ping-hsiang lies in the western part of the province of Kiang-si, close to the border of the province of Hunan. Coke and coal are carried over a standard gauge road about 60 miles long to the Siang River, where it is loaded by coolies on lighters which are towed down the river through Lake Tung-ting to the Yangtse River and to the works. A great drawback is the cost of the haul from the mines to the works. Since the route is over 250 miles long it occupies much time and the price of the coke is increased by the duties to be paid on the coke for its passage through the province of Hunan. The Ping-hsiang coals are not as suitable for gas making as the Japanese coals, so that the latter are preferred unless the price is not much higher than that of their own coals.

The cost of the raw materials, which was formerly considerably higher, is about 75 cents per gross ton for ore, 50 cents for limestone, $6.25 to $7.50 for coke and $4.50 for coal, all delivered at the furnaces. It is assumed that these prices will be lowered considerably in the near future, owing to the increased consumption.

The New Plant.

In undertaking to rebuild and enlarge the plant the question was given consideration of moving the works or of erecting the new parts at the iron deposits, but serious reasons overruled the plan. The first step was to develop an open hearth plant suitable for working up the pig iron, and next to enlarge and modernize the rolling mill. With this object there were purchased in Germany and in England, from 1904 to 1906, three 30-ton open hearth furnaces, a gas heated 150-ton mixer, a gas producer plant, two traveling casting cranes of 50-ton and 35-ton capacity, 20 and 15 ton auxiliary cranes, a stripping plant, iron ladle cars, casting ladles, ingot cars, locomotives, &c. There were also purchased three large reversing mills with electrically driven tables and rolls, one being a 43-in. blooming mill, one a plate mill with two stands for 98-in. plates and the third a 33.5 in. beam and rail mill with three stands. The equipment included gas heated pit furnaces, a steam hydraulic bloom shear, an electrically driven billet and slab shear, a large electrically driven plate shear, edge milling machines, roll lathes, three electrically driven traveling cranes, two charging cranes, a boiler plant of 10 two-flue boilers and five water tube boilers, a dynamo plant for operating cranes, &c.

For the new buildings the structural material was purchased in standard lengths and the greater part of the rivets was bought. The shop work was done at Hanyang. The steel shop was new while the old puddle mill and rolling mill buildings were used, with some additions.

Later, toward the beginning of 1907, there were ordered in Germany a third 300-ton blast furnace with four Cowper stoves, 12 two-flue boilers, a 600-kw. electric plant, a Parsons turbo-blower, &c. A fourth and fifth open hearth furnace and a second mixer are to be built and there is to be a fourth blast furnace of 300 tons capacity, on the foundations of which work has already begun. During the building of the new plant the old blooming and rail mill and the bar mill were again put in order and the old Bessemer plant and the puddle mill with its hammers and muck mill and the intermediate plate mill were torn out. A new bar mill took the place of the latter. The two old blast furnaces were equipped with a gas cleaning plant.

The status of the plant at the close of 1907 was that the two old blast furnaces were making basic and foundry pig iron and the old 12-ton open hearth furnace, the old rolling mill, the new bar mill and the mill for flats and a part of the electric plant were in operation. The new steel works and the new rolling mills were being started and it was expected that the third blast furnace would be soon in operation.

Chinese Labor.

All the labor in construction and operation connected with masonry, erection, riveting, with the blast furnaces, open hearth furnaces, rolling mills, &c., was done by Chinese exclusively without the aid of foreign erectors or foremen. They worked under the direction of the European engineers; these directions, it is true, being more detailed than is usual elsewhere. The Chinese are not careful on contract work and often waste a good deal of time. While the wages of the coolies are 6 to 8 cents per shift, the wages of the more skilled workmen who are paid by the month are considerably higher. According to age and ability, the following wages are paid for about 25 to 28 shifts of 10 hr. each, per month: Patternmakers, $5 to $17.50; molders, $4 to $25; locksmiths and lathe hands, $5 to $17.50; roll turners, $10 to $22.50; erectors, $10 to $25, and machinists, $3.75 to $20. Foremen and head men at furnaces, rolling mills, shops, &c., are paid varying sums, their salaries ranging between $10 and $47.50 per month.

The Future.

Blauel states that it is difficult, in view of the inability to calculate the bearing of the questions involved,

to express a correct opinion as to the future of the Hanyang Iron & Steel Works. The prospects of success are now better than ever because the plant is more suitable and far better, because the working population has been trained to some extent, and chiefly because the question of the supply of raw materials has been settled. The production of steel and of rolling mill products may reach 40,000 to 50,000 tons this year unless unexpected difficulties intervene. In 1909 or 1910 it may rise to 100,000 tons per annum. It may be assumed that a profitable development of the works will have a favorable effect upon the entire iron industry of China, provided there be at the head of the new operations men of the type of the present general manager, V. K. Lee. The technical management of the plant has since the beginning been in the hands of European engineers, Englishmen, Belgians, Germans and Frenchmen alternating. Generally, however, like the present time, the staff is international.

Climatic Conditions.

The long tropical summer of the middle Yangtse Valley renders residence acceptable to only few Europeans. At this season the temperature, corresponding to the continental location of Hankow, ranges for weeks, day and night, above 86 degrees, F., even up to 100 degrees. In July and August it becomes too hot even for the Chinese, so that hitherto work at the steel plant and rolling mills has been suspended for some weeks. With the better arrangements and the new higher buildings these disturbing stoppages may cease.

The product of the blast furnaces, which in the years 1905 to 1907 consisted chiefly of foundry iron, steel making iron and high grade spiegeleisen, was used at the works themselves, in Japan, in the Chinese ports and in the United States. Shipments are made by steamer directly from the dock of the works.

The Yangtse River, with its enormous traffic, is navigable for the largest ocean steamers up to Hankow from April to October, while in winter the stage of the water permits the movement of vessels drawing 10 to 13 ft. The difference in level between high and low water is at Hankow 37 to 50 ft. every year. Thirty-five river steamers of 1000 to 3000 tons take care of the traffic between Shanghai and Hankow and the intermediate larger ports. Above Hankow navigation is not so favorable. At high water small ocean steamers run up to Ichang, 375 miles up stream. At other times there are only shallow draft river steamers of 300 to 600 tons which ply on the river, including a branch line from Hankow to Chang-sha on the Siang River. The Ping-hsiang collieries are 75 miles distant from the latter point. Above Ichang the rapids of the Yangtse prevent further navigation, except for junks, which are drawn over them by hundreds of coolies. Further up, the river is navigable for hundreds of miles.

Mineral Wealth of the District.

While the territory of the middle and upper Yangtse River has been little explored as to its mineral wealth, it may be assumed from the finds made that besides rich gold, copper, silver, lead and antimony deposits, there are coal and iron on a large scale. Rich iron ore has been opened in the provinces of Kweicheou and Kiang su; brown ore carrying about 20 per cent. of manganese has been found in large quantity on Lake Poy and about 150 miles below Hankow, and ore containing 45 per cent. of manganese exists in the vicinity of Ping-hsiang. When account is taken, outside of the Yangtse District, of the rich iron ore deposits of Shan tung, Hunan, Kuang tung and Kuangsi, and of the extremely rich beds of Tongking, then it is realized that the iron ore resources of China are not much inferior to those of the United States. While coking coals are not equal in quality or in quantity to those of the latter country named, they are abundant enough to hold out the promise of a brilliant development of the iron industry, under normal conditions, for the distant future.

Conditions are most favorable for the development of the iron industry of China in the Yangtse District, on account of its water transportation. Besides the Hanyang Iron & Steel Works, the government arsenals at Shanghai, Hanyang, Fouchow and Tientsin have built steel works with open hearth and crucible furnaces which were bought in England, France and Germany. Aside from the fact that the building of the works took an extraordinary amount of time, the operations were stopped after a longer or shorter period because it was found that the profit and loss account was most favorable when they were idle.

Early in the '90s an effort was made to start an iron plant in the province of Kwelcheou. A small blast furnace, purchased in England with its equipment, was to be started by Chinese who had studied blast furnace practice for a few months at an English plant. They believed that they could do it without the aid of foreign engineers, and therefore were much disappointed when the furnace froze on them while blowing in. Since that time the furnace has stood, filled with its charges, deserted, as a striking monument to the Chinese dislike of foreigners and their science.

The Ore Docks of the Great Lakes.

The Duluth & Iron Range Railroad Company has issued its annual statement of ore dock changes, covering the year ending with May 1. This shows three important changes in the past year. The chief of these is the addition of No. 6 dock at Two Harbors, which, though not put into totals in the statement, might as well have been. It adds 37,360 tons to the storage capacity of Two Harbors, and gives that port an annual shipping capacity of nearly 10,000,000 tons. The second is the addition of capacity by the Chicago & Northwestern at Ashland, by the reconstruction of its No. 2 dock there, an increase of 16,380 tons storage, and a far greater relative increase in capacity, for the new dock is of modern lines and hight while the former was too low to handle ore to the modern freighters. The third is the reduction of the Duluth, South Shore & Atlantic's capacity at Marquette by the razing of its No. 1 dock, reducing its theoretical capacity by 27,000 tons. But this reduction is merely apparent and is not real, for the dock was long since relegated to oblivion on account of its dimensions being much too small for modern shipping. It is doubtful if a single ore ship that will ply the lakes this year could have loaded there, except at great cost of time and trouble.

There are now on the lakes 24 ore shipping piers, containing more than 6000 pockets, of an average storage capacity for 214 tons, some as high as 350, and others, of oldest design, of about 150. The total storage capacity of the 24 piers is 1,327,000 gross tons, and their annual shipping capacity, given fair dispatch and plenty of cars and ships, not far from 50,000,000 tons, to be covered in the lake season of about eight months. The investment in these piers cannot be much less than $15,000,000.

The various railroad systems show dock capacities, in gross tons, as follows: Chicago & Northwestern, at Escanaba, 188,383, at Ashland, 84,240; Great Northern at Allouez bay, near Duluth, 283,500; Duluth, Missabe & Northern, at Duluth, 269,034; Duluth & Iron Range at Twin Harbors, near Duluth, 225,770; Chicago, Milwaukee & St. Paul, at Escanaba, 113,900; Duluth, South Shore & Atlantic, at Marquette, 78,000; Wisconsin Central, at Ashland, 48,356; Lake Superior & Ishpeming, at Marquette, 36,000; Algoma Central, at Michipicoten, no storage, but 12 shipping pockets.

The Pittsburgh Construction Company, Diamond Bank Building, Pittsburgh, is completing the erection of a highway Scherzer rolling lift bridge over Swan Creek, Toledo, Ohio, for the Lake Shore & Michigan Southern Railroad. It will have an 83-ft. span and 30-ft. roadway, with sidewalks, and 200 tons of structural steel were used. The bridge was fabricated in the plant of the King Bridge Company, Cleveland. This is the first bridge of its type to be erected in Toledo. The Pittsburgh Construction Company also lately completed a double track 102-ft. span plate girder type of 150 tons to replace an old 100-ft. through pin connected span, for the Baltimore & Ohio Railroad at Darby, near Philadelphia. The company also recently received a contract for the erection of a 150-ft. double track riveted truss bridge for the Baltimore & Ohio Railroad at Chester, Pa., to replace an old span of similar construction.

The Queen City Shaper Gear Box.

Borrowing, in a measure, from automobile practice in change gear devices, the Queen City Machine Tool Company, Cincinnati, Ohio, has developed an improved gear box for shapers. Figs. 1 and 2 show it applied to a 20-in. back geared crank shaper. In its design and construction it has been the aim to avoid the faults common to many devices of the sort which have been tried on machine tools, such as weak or complicated parts likely to get out of order, or a mechanism subject to shocks and jars, shortening not only its own life, but that of the whole machine.

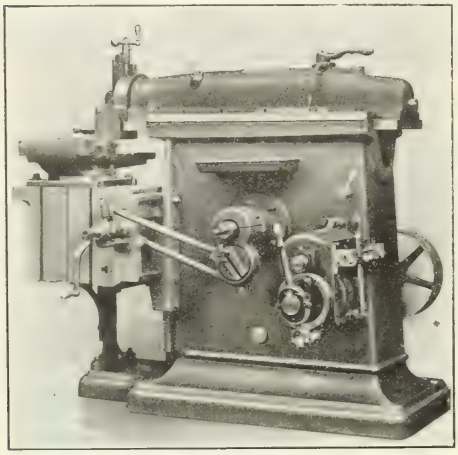


Fig. 1.—A 20-In. Back Geared Crank Shaper Built by the Queen City Machine Tool Company, Cincinnati, Ohio, and Equipped with the Improved Gear Box.

The advantage of a satisfactory form of change gear device is acknowledged; it allows a single pulley drive using a wide belt that it might be impracticable to shaft, or a constant speed motor, and it renders the changing of speeds so easy that it is not likely to be neglected when the work requires it. The similarity in principle of this new gear box and those used on automobiles is apparent from the accompanying drawings, Figs. 3 and 4, but its construction is considerably modified and its particular application is entirely new.

The operation will be understood from the drawings, Fig. 3, gives a sectional view from the front of the shaper, and Fig. 4 end and rear elevations and a plan of the lever latching devices. The driving pulley in Fig. 3 is mounted on the gear box shaft, which extends through the shaper, and at its opposite end carries the expanding member of a friction clutch operated through a sliding cone by the lever at the right. The other member of the clutch is integral with a sleeve on the gear box shaft, which has keyed to it four gears, *a*, *b*, *c* and *d*. Almost vertically over this shaft is an intermediate shaft carrying three sliding sets of two gears each. *e f*, *g h* and *i j*. By means of the gear shifting lever of Fig. 4 gears *e* and *f* may be alternately engaged with gears *a* and *b* or

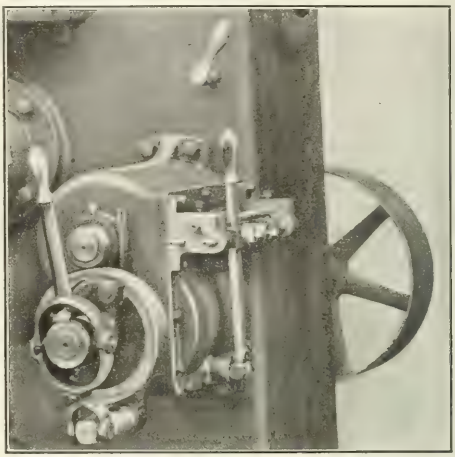


Fig. 2.—Detail of the New Queen City Shaper Gear Box.

gears *g* and *h* with gears *c* and *d*. The latch mechanism shown in Fig. 4 permits only one of these two sets of gears to be engaged at a time. The shifting fork of gears, *e* and *f*, is attached to the sliding rod *k*, and that of gears, *g* and *h*, to the sliding rod *l*. Between the sliding rods are two fixed stop rods which prevent the gear shifting lever from being transferred from engagement with one set of shifting forks to the other, except when each set is in its neutral position, so that none of the gears *g*, *h*, *e* and *f* are in mesh.

The gear shifting lever will be seen to have two motions lateral and in and out. When thrown toward the

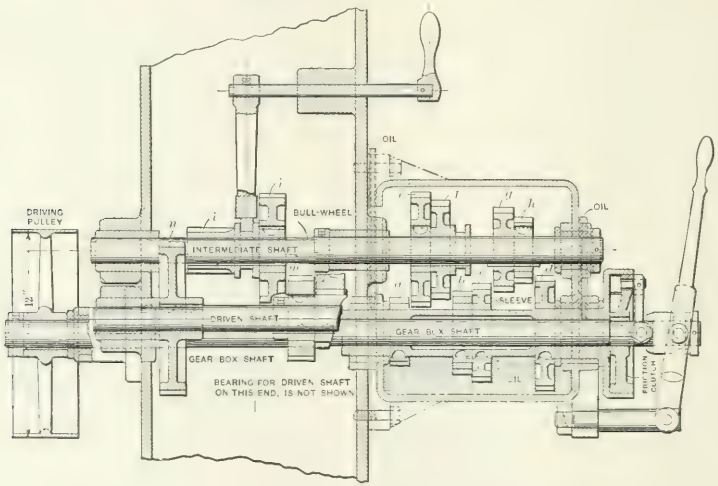


Fig. 3.—Sectional View of the Gear Box from the Front of the Shaper.

gear box it comes between the shifting forks of the gears *g* and *h* and a stop on the sliding rod *l*. If now the lever is thrown to the left, as seen in Fig. 4, the gear *h* engages with the gear *d* of Fig. 3, and if thrown to the right the gear *g* is engaged with the gear *c*. To shift the gear set *e f* the lever is moved outward or away from the gear box, passing between the fixed rods, until the stops on the sliding rod *k* are engaged, when shifting to the right engages the gear *e* with the gear *a* and shifting to the left the gear *f* with the gear *b*. None of these changes are made with the friction clutch engaged and the driving shaft running. Before a change is made the friction clutch is disengaged, so that the gears on the sleeve *a*, *b*, *c* and *d* are stationary until the change has been made; then the friction clutch is re-engaged to start the drive.

The four changes, which it will thus be seen are made through the gear box are doubled by the back gears *i* and *j* on the intermediate shaft, which are operated by the sliding rod and shifter above them, as in the company's standard machine. These changes are also made while the gear box shaft is disengaged through the friction clutch. The gear *j* may be engaged with the gear *m* on the driven shaft, giving one series of four speeds through the other changes in the gear box, or the gear *i* may be engaged with the gear *n*, also keyed to the driven shaft, to give a second series. The driven shaft carries a pinion which meshes the bull wheel of the shaper.

In the drawings the clutch and all the gears are shown disengaged, and it will be noticed that the length inside of the box is only equal to the sum of the gear faces; the floor space required does not exceed that of the cone drive. The expanding clutch and all gears are automatically and independently locked in their different working and idle positions by spring actuated plungers entering sockets. When it is desired to shift the gears for a new speed, after throwing out the clutch the driving shaft alone is running and the sleeve continues to creep slowly around without force, facilitating the meshing of the desired gears. Since in all cases of speed changing the load is off, no shock occurs, although the power when the drive is engaged is much greater than with a cone pulley drive. When using a constant speed motor the changes can be made without stopping it. When the shaper pulley is belted direct to a line shaft so as to run at 315 rev. per min. the following cutting strokes per minute are obtained: 7.2, 10.96, 15.4, 23.5, 34.8, 53.1, 74.7 and 114. An index plate shows how to obtain the proper speeds.

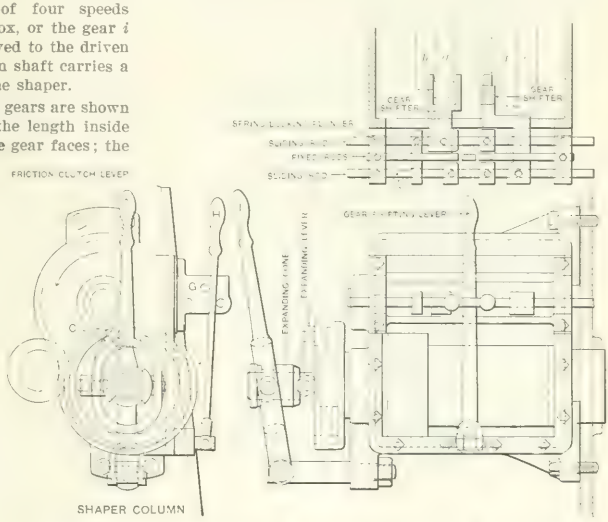


Fig. 4. End and Rear Elevations of the Gear Box and Plan of the Lever Latching Devices.

The gear box proper is a pressed fit in the column, besides being firmly bolted to it. All parts are easily accessible for inspection without taking the box from the column. The gear box can be fitted to all sizes of shapers and no special column is required. The provision for lubricating the gears in the gear box and various shafts is indicated in Fig. 3. There is an oil reservoir in the bottom of the gear box, into which the gears *a*, *b*, *c* and *d* dip and carry lubricant up to the other gears with which they mesh. The sleeve of the gear box shaft and other journals are lubricated through the oil tubes as indicated.

The Pacific Metal Trades League Organized.

On April 25 the Pacific Metal Trades League was organized in Portland, Ore., at a convention of representatives from four large metal associations of the Pacific Coast. It amounts to a huge federation of manufacturers in the iron and steel industries covering California, Oregon, Washington and British Columbia. On April 28 the Executive Committee of the California Metal Trades Association of San Francisco voted to become a member of the new organization. The league is the strongest employers' association on the Pacific Coast in numbers and resources, including the various metal trades and founders' associations from Los Angeles, Cal., to Vancouver, B. C. Members of the California Metal Trades Association state that the joining of the league is by far the most important step that has ever been taken by the metal trades operators of the Coast. After considerable planning the efforts to bring all of the manufacturers together in one united association finally came to a head at the recent convention.

Prominent among the organizers were: Harry F. Davis, secretary, and James W. Kerr, vice-president of the California Metal Trades Association, and W. H. Corbett and Charles M. Gunn of the United Metal Trades Association of the North Coast cities. Harry F. Davis of San Francisco was chosen as secretary of the Pacific Metal Trades League. The headquarters of this organization will probably be in San Francisco. The president and remaining officers will be chosen at a later meeting.

The four associations represented at the Portland convention are: The California Metal Trades Association of San Francisco and Oakland; the United Metal Trades Association of Oregon, Washington and British Columbia; the Employers' and Founders' Association of Los Angeles, and the Pacific Foundrymen's Association of Seattle, Wash. Among the prominent firms in the organizations that have joined the league are: The Union Iron Works, Risdon Iron Works, Vulcan Iron Works, United Engineering Works and 80 other iron and steel firms in San Francisco and vicinity; the Willamette Iron and Steel Works, Phœnix Iron Works, Smith Bros. & Watson, Pacific Iron Works, Oregon Brass Works and Columbia Steel Company of Portland; Moran Bros. Company, Vulcan Iron Works, Eagle Iron Works, Heffernan Engine Works and Puget Sound Iron & Steel Works of Seattle and Tacoma; Sumner Iron Works of Everett, Wash., and Letson & Burpe of Bellingham, Wash.

The purpose of the great organization of metal manufacturers described above is to strengthen and more completely unify the iron and steel interests of the Coast, as well as to bring about the satisfactory adjustment and settlement of such labor disputes as may arise. The attitude of the league toward labor interests, however, will be cordial. It is recognized that cases will arise where a method of settling labor demands in one section would not apply in another manufacturing center. In such an event league members are to meet and discuss the points at issue with representatives of the labor unions in an endeavor to bring about an amicable agreement.

The Effect on Coal of Water and Fine Crushing.

BY H. M. CHAPMAN AND EDWIN BARNHART, SPARROWS POINT, MD.

In the past two years many tests have been made with finely ground coal in by-product coke ovens. These have demonstrated that finely ground or pulverized coal will give the strongest and most homogeneous coke. The result has been to cause a great demand for fine coal 90 to 95 per cent., of which would pass through a screen with ¼-in. meshes. The effect of water on this fine coal has apparently not been recognized.

The writers have made a large number of tests at the plant of the Maryland Steel Company, Sparrows Point, Md., which prove conclusively that a cubic foot of wet coal up to 7 per cent. of water weighs less than a cubic foot of dry coal, and that the finer the coal the greater is the decrease in weight, the percentage of water remaining the same. Tables 1, 2, 3 and 4 give in detail the variations in weight due to fine crushing and an increased per-

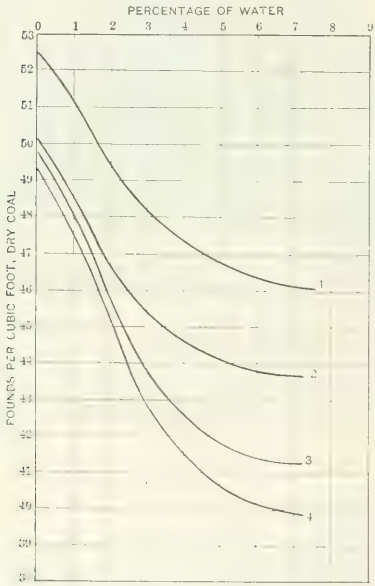


Diagram Showing Weight of Wet Coal Compared with that of an Equal Bulk of Dry Coal.

centage of water. The same mixture of coals was used in all the tests, and was made up as follows: Forty per cent. of a good gas coal averaging 33 per cent. volatile matter and 60 per cent. of a coal averaging 26 per cent. volatile matter. The analysis of the mixed coal was as follows:

	Per cent.
Volatile matter	28.8
Fixed carbon	61.7
Ash	9.50

The Method of Making Tests.

All the tests were conducted exactly alike. The coal was first dried thoroughly at 210 degrees F. It was then allowed to run from a fixed hight into a copper cylinder, the capacity of which was exactly 0.4 cu. ft. Particular care was exercised in filling the cylinder, so as to prevent any error due to irregular packing of the coal, and also to obtain as nearly as possible the conditions under which an oven is charged. The cylinder was filled level full, and then both cylinder and coal were weighed (the weight of the empty cylinder being deducted). One per cent. of water by weight was then added, intimately mixed and the coal then allowed to stand until the water had thoroughly penetrated it. The coal was then run into the copper cylinder until level full. A similar procedure was followed with the subsequent additions. Data as to the fineness of the coal and the weight as affected by additions of water are given below:

Table 1.

	Per cent.
Through 1-mesh screen	100.00
Through 4-mesh screen	48.15
Through 8-mesh screen	27.05
Through 10-mesh screen	21.85
Through 20-mesh screen	12.00
Through 40-mesh screen	6.95
Through 60-mesh screen	5.10
Through 100-mesh screen	3.30

Amount of water added.	Weight of coal and water. Pounds per cubic foot.	Lb. of dry coal in a cubic foot of coal and water.
None	52.45	52.45
1 per cent.	51.69	51.17
2 per cent.	50.35	49.34
3 per cent.	49.60	48.11
4 per cent.	49.30	47.33
5 per cent.	49.16	46.70
6 per cent.	49.16	46.21
7 per cent.	49.52	46.05

Table 2.

	Per cent.
Through 4-mesh screen	65.35
Through 8-mesh screen	42.15
Through 10-mesh screen	35.87
Through 20-mesh screen	21.97
Through 40-mesh screen	13.10
Through 60-mesh screen	9.85
Through 100-mesh screen	5.85

Amount of water added.	Weight of coal and water. Pounds per cubic foot.	Lb. of dry coal in a cubic foot of coal and water.
None	50.09	50.09
1 per cent.	49.02	48.53
2 per cent.	47.59	46.62
3 per cent.	46.72	45.32
4 per cent.	46.43	44.57
5 per cent.	46.39	44.07
6 per cent.	46.55	43.76
7 per cent.	47.01	43.72

Table 3.

	Per cent.
Through 4-mesh screen	93.30
Through 8-mesh screen	69.50
Through 10-mesh screen	60.40
Through 20-mesh screen	38.95
Through 40-mesh screen	23.35
Through 60-mesh screen	17.10
Through 100-mesh screen	8.00

Amount of water added.	Weight of coal and water. Pounds per cubic foot.	Lb. of dry coal in a cubic foot of coal and water.
None	49.73	49.73
1 per cent.	48.64	48.15
2 per cent.	46.67	45.74
3 per cent.	45.23	43.87
4 per cent.	44.31	42.54
5 per cent.	44.07	41.87
6 per cent.	44.01	41.37
7 per cent.	44.36	41.25

Table 4.

	Per cent.
Through 4-mesh screen	100.00
Through 8-mesh screen	75.80
Through 10-mesh screen	65.20
Through 20-mesh screen	39.60
Through 40-mesh screen	23.00
Through 60-mesh screen	15.80
Through 100-mesh screen	8.00

Amount of water added.	Weight of coal and water. Pounds per cubic foot.	Lb. of dry coal in a cubic foot of coal and water.
None	49.18	49.18
1 per cent.	47.80	47.32
2 per cent.	46.04	45.12
3 per cent.	44.06	42.73
4 per cent.	43.39	41.65
5 per cent.	42.83	40.69
6 per cent.	42.77	40.20
7 per cent.	42.96	39.96

Test 1 was started with coarse coal, about 52 per cent. of which was above ¼ in. in size. With the addition of water there was a decrease in weight of a cubic foot until 6 per cent. had been added. Further addition of water

had no appreciable effect on the weight of coal per cubic foot.

The coal after being used in test 1 was thoroughly dried, and then crushed for test 2, so that about 35 per cent. was above ¼ in. in size. The weight of a cubic foot of this coal when dry was 2.36 lb. less than the weight of the dry coal in test 1. This was due to the coal being crushed finer. With the addition of water the decrease in weight of a cubic foot was in very nearly the same ratio as in test 1.

For test 3 the coal was crushed so that about 7 per cent. remained above ¼ in. in size. With the addition of water the decrease in weight of a cubic foot was much more rapid than in tests 1 and 2.

The coal used in test 4 was all below ¼ in. in size. The weight of the dry coal was 0.55 lb. less than the weight of the dry coal in test 3.

Lessened Weight of Wet and Fine Coal.

Plotting these values, figured on dry coal, we get the curves 1, 2, 3 and 4 shown in the diagram, corresponding to tests 1, 2, 3 and 4, respectively. As will be seen from the foregoing data, the addition of water to the coal and the fine crushing had a like effect—an increase in the volume. When the coal and 7 per cent. of water were placed in the cylinder and the final weight was taken, the cylinder contained nearly 24 per cent. less of dry coal than the original weight taken. This surplus of 24 per cent. could not be put into the cylinder, even by jarring it down. It was necessary to stamp the coal in order to get it all in again.

The decreased weight due to finer crushing is fully explained by the increased voids, which are the direct result of crushing. The decrease caused by the addition of water is the result of adhesion of the water to the fine particles of coal, which prevents the finer pieces from filling up the voids between the larger ones. The similarity of the curves in the diagram is very marked. They all show a sharp decline until 4 per cent. of water has been added. From there to 6 per cent. the decline is moderate, and beyond 6 per cent. the curve is practically a straight line.

Since August 1, 1907, the average oven charge per day has been determined as follows: A sample was taken of the coal charged on both day and night turns. The percentage of water and the weight of a cubic foot of the wet coal was then determined. From the latter the weight of water present was deducted, and this value multiplied by the cubical capacity of the oven gave the weight of coal charged into each oven. An average of 1000 tons of coal per day was used. Part was unloaded from cars and part brought in from stock. Altogether 15,000 tons was taken from stock. When the pile was cleaned up the difference between the amount put in and the amount taken out (figured according to the weight of a cubic foot, as explained above), was only 100 tons, or 0.7 per cent.

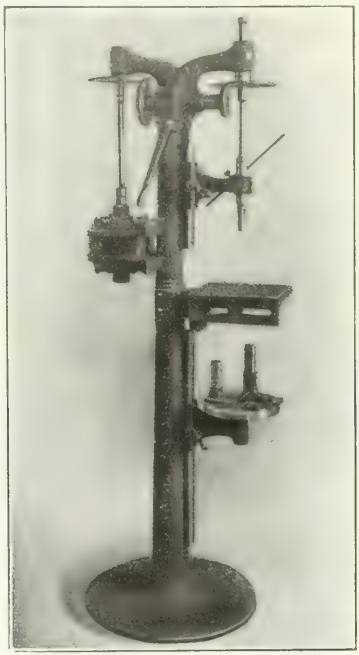
In actual practice the variation in the percentage of water in the coal from day to day is entirely due to atmospheric conditions, and is much higher during the winter months than in summer. The amount of water ranges from 2.25 per cent. to 6.05 per cent. With coarse dry coal the oven charge has been as high as 19,500 lb., while with wet, fine coal, it has been down to 15,400 lb., a difference of 4100 lb., or 21 per cent. With fine coal the average oven charge was 17,000 lb., or nearly 13 per cent. less than is possible with coarse coal. The value of 13 per cent. more product, namely, coke, ammonia, gas and tar, must certainly be considered.

It is a question if the superior quality of the coke obtained from finely crushed coal counterbalances the increased cost of manufacture due to running a plant under capacity.

The Iron City Steel Company, which has moved into more commodious quarters at 717, 718 and 719 Bessemer Building, Pittsburgh, has taken the exclusive agency in the Pittsburgh District of the Interstate Iron & Steel Company, Cambridge, Ohio, and will handle all the products of that mill. C. H. Daker will be in charge of the selling.

The W. P. I. Motor Driven Drill.

The new sensitive drill recently brought out by the Washburn shops of the Worcester Polytechnic Institute, Worcester, Mass., which was described in *The Iron Age* April 2, 1908, is shown in its motor driven form in the illustration. The motor is bolted to the rear of the column, just high enough to clear the square table when this is swung aside for the use of the round table, crotch or cup centers, and be above the reach of chips brushed from the table. A constant speed alternating current motor is used, the speed variations of the machine being



A New Type of Motor Driven Sensitive Drill Built by the Washburn Shops of the Worcester Polytechnic Institute.

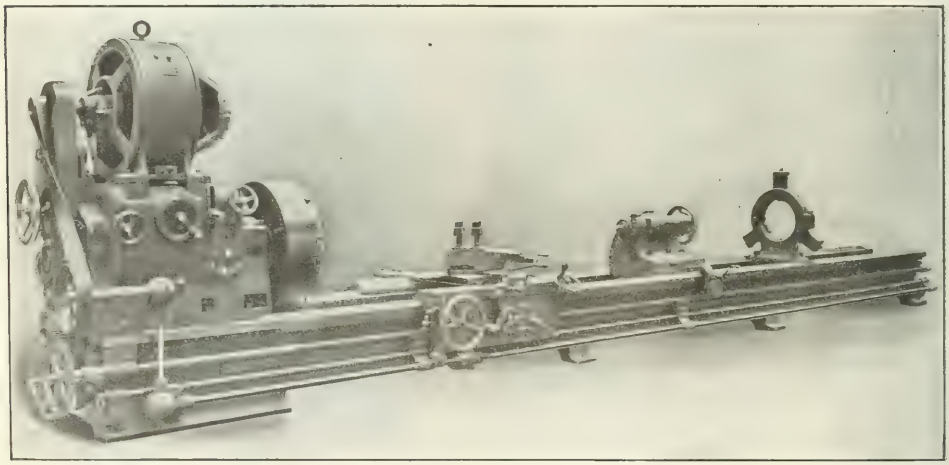
mechanical. The motor runs at 1200 rev. per min., which gives a variation of from 400 to 1600 revolutions of the spindle through the medium of the double disk friction. The spindle is stopped without stopping the motor by throwing the speed lever to its extreme or neutral position when the driver disk is out of contact with its roll, the latter resting opposite a recess in the disk. Consequently the motor is started without a load. When the roll is thrown into contact with its disk little power is required to run the machine, as the normal pressure on the roll is slight until the drill is in use, when the pressure increases or decreases with the demand made upon the tool. The induction motors regularly furnished are wound for 110 and 220 volts, two or three phase, 25, 40 and 60 cycles.

Of the 57 miles of Paris underground railroads authorized, 32 miles are in operation and work is in progress on the remainder. At present the travel averages 350,000 passengers a day. There are two tracks parallel to the Seine and serving the traffic of the central portions of the city, a circular line surrounding the city and situated between the central quarters and the fortifications, occupying somewhat the position of the outer boulevards, and lastly, two transverse lines at right angles to the course of the river. The system has a double track tunnel throughout, except where it crosses under the Seine, through two iron lined tubes, each 16.4 ft. inside diameter. These subaqueous tunnels are being excavated under pressure by the shield method.

A Bridgeford Motor Driven Geared Head Lathe.

One of three lathes recently built for the new shops of the Jones & Laughlin Steel Company, at Woodlawn, Pa., by the Bridgeford Machine Tool Company, Rochester, N. Y., is illustrated herewith. It is a 36-in. motor driven patent geared head lathe, with a 32-ft. bed and has several special features. The design throughout is such that it will give the service that would be required of it in a modern shop where high speed steel tools are used.

The drive is from a 15-hp. Westinghouse motor having a speed variation of from 300 to 900 rev. per min., connected to the driving shaft of the lathe through a rawhide intermediate gear. There are 15 changes of speed ranging in geometric progression, and obtained through a speed variator in the headstock. When the lathe is belt driven the gear on the driving shaft is replaced by a pulley running at a constant speed of 300 rev. per min., and the ratios of the gearing are such that one revolution of the face plate is obtained with from 2 to 98.1 revolutions of the pulley; or, in other words, the spindle speeds range from 3 to 150 rev. per min., which are sufficient for all purposes. A variable speed motor, however, adds to the efficiency of the tool, since it enables the operator to obtain a wide range of speeds without leaving his position at the carriage; the controller with its resistance is mounted on the back of the bed, but is operated through a splined shaft from a lever mounted on the apron.



A 36 In. Patent Geared Head Lathe with Motor Drive, Built by the Bridgeford Machine Tool Works, Rochester, N. Y.

All driving gears within the head are steel and run in oil, and the bearings are arranged to receive a constant supply of oil to insure good mechanical efficiency and minimum wear. The lathe is designed to give a pulling effort on a 36-in. diameter of 20,000 lb., which is about four times that of the average cone driven lathe of equal size.

A feature, which is of especial advantage on a lathe of the length of this one, is the rapid power traverse by which the carriage may be moved at the rate of from 15 to 45 ft. per minute, according to the speed of the motor. It is driven by a splined shaft, and operated by the vertical lever on the left end of the apron, which controls two friction clutches. The latter with the gearing run in oil.

The lead screw, motor control shaft and rapid traverse shaft are supported by automatic carriers, which slide in a planed strip on the foot of the frame. One of these always remains at the center of travel, while the other is pushed along by the carriage. This is an improvement over supporting them from the top of the frame, as it allows free travel of the tailstock.

The total weight of the machine shown is about 2900 lb., but it can be built with any length of bed desired, and furnished with all regular attachments. Motors varying from 15 to 25 hp. are used, according to the requirements. A constant speed motor may be used, although a variable speed is preferable. This type of lathe is built with 26, 32, 36, 42 and 48 in. swing.

Pennsylvania's Abandoned Canals and Railroads.

The Pennsylvania State Railroad Commission has begun an inquiry into the status of all abandoned canals and railroads in the State, under the provisions of a resolution adopted by the last Legislature, which had in mind the recommendation of such legislation as may restore them to transportation. The investigation is expected to occupy a year, and bids fair to be one of the most important ever undertaken in Pennsylvania, as there are over 100 charters of canals on the statute books and possibly twice as many railroad charters. In many instances these charter rights were never exercised, but in others the canals or railroads were built and became inoperative from various causes. The investigation will be made into the terms of the charters, the work done and the present ownership and condition of the properties.

When this information is collected the commission is charged with the duty of recommending laws "as shall enable the State to take any existing canals which are now parts of abandoned canal systems and to recover, as far as may be lawfully done, the aforesaid abandoned canals and restore them to the highways of transportation, and to establish, under proper and liberal laws, canal companies independent of railroad control, to recommend legislation whereby the aforesaid railroad franchises, so abandoned, and any work which may have been done under them, may be taken and sold to an independent and competitive railroad company." The commission is to report to the Governor, and there is a legislative provision that the Attorney-General shall take steps to secure the charters of the abandoned railroads.

Reports are current that the American Steel & Wire Company is dismantling its plant at New Haven, Conn., recently purchased from the National Steel & Wire Company. It is officially stated that such is not the case. The plant is idle, but the only machinery that has been removed is one large machine which was transferred to Cleveland, where its services could be better employed. The works at New Haven have been cleaned up, and upon the resumption of a large demand for wire products they will undoubtedly be opened by the new owner.

Gisholt Turret Lathe Work.

This is the third article under the above title printed in *The Iron Age* dealing with methods of finishing gas engine parts in accordance with the practice of the Gisholt Machine Company, Madison, Wis. The first, which appeared January 30, 1908, described two methods of finishing flywheels. The second, in the March 5, 1908, issue, covered a method of machining gas engine pistons and one for forming piston rings. The present article

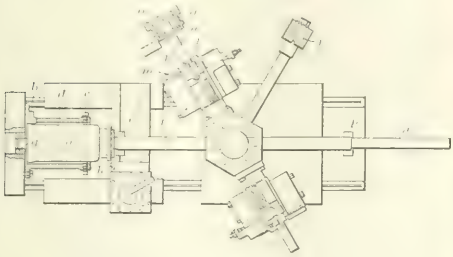


Fig. 1.—The Setting for the First Operation of Finishing Gas Engine Cylinders in a Gisholt Turret Lathe.

deals with cylinders, Figs. 1 and 2 showing a method of finishing them in two settings, and Fig. 3 the manner of chucking a different type of cylinder.

Referring to Fig. 1, it will be seen that the piece *a* is centered and held by the chuck jaws *b*, while at its outer end it is further supported by the set screws *c* in the chuck bonnet *d*. This bonnet is bolted to the chuck and has slots to allow the chuck jaws to be moved in and out as necessary. While the cylinder is rough bored with the cutter *e* in the boring bar *f*, which is supported in the chuck bushing *g*, the scale is broken on the end of the piece by the tool post tool *h*. The boring bar *i*, carrying the cutter *p*, is used for finish boring, being supported in the bushing *g* the same as the bar *f*. The hole is then brought to size with the floating reamer *j*. It is considered by some to be better to do the reaming during the second operation so as to allow the cylinder time to cool, but the design of the cylinder has much to do with this, and there may be no benefit to be derived from that

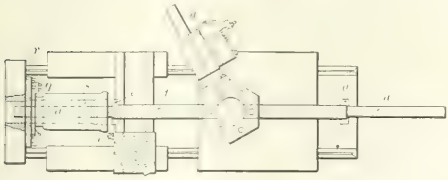


Fig. 2.—The Setting for the Second Operation.

procedure. For finishing the end of the cylinder and the counterbore, the cutters *k*, *l* and *m* in the facing head are used, and the head is supported by the arbor *n* inserted in the bushing *o* in the finished hole.

For the second operation the piece is held, as shown in Fig. 2, by the clamps *q* to the face plate *r*, which is bolted to the face of the chuck. The piece is centered by a counterbore in the chuck plate having the same size as the hole in the crank case. The bushing *s* in inserted in the piece for supporting the boring bars *t* and *u*, and the counterbore is finished with the cutters *v* and *w* shown in the boring bars. The end of the piece is roughed off with the tool post tool *x* and is finished with the cutter *y* in the facing head, which is supported by the arbor inserted in the bushing *s*. The cutter *y* is a serrated cutter giving a rough face to the end of the cylinder for holding the packing. If it was decided to be best to ream the bore on the second operation, the reaming would follow the finishing of the counterbore.

Fig. 3 shows the method of chucking a different shape of gas engine cylinder and employs a device consisting of a special bonnet bolted to the face of the chuck. As illustrated the hinged strap is shown thrown back to allow removing the finished cylinder. When a new piece of work is inserted, this strap is swung down over the piece and bolted in place. As may be seen, set screws

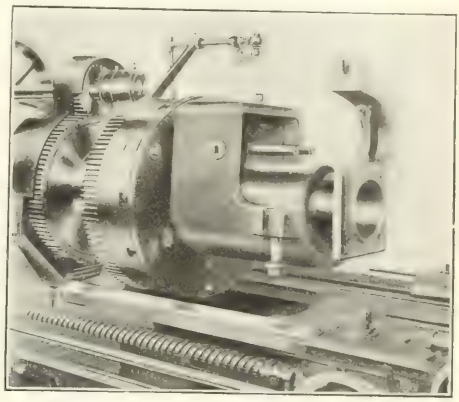


Fig. 3.—A Special Bonnet for Chucking a Different Type of Cylinder.

are used to compensate in the adjustment for slight variation in the size of the castings.

A Cupola Demonstration.—Arrangements have been made by J. de Clercy, Montreal, Canada, agent for the Société Anonyme d'Exploitation des Brevets Cubilot A. Baillot, to exhibit a cupola in operation in connection with the convention of the American Foundrymen's Association and the exhibit of the Foundry Supply Association to be held in Toronto June 8-12. This cupola is now being erected at Toronto in a temporary building adjoining Machinery Hall. The blast for the cupola will be furnished by a Sturtevant blower operated by a steam turbine. It is the intention to put on the blast in the morning and to pour iron for an hour and then to bank the cupola for two hours at lunch time. Later it will be running in the afternoon for two hours or more. The point to be demonstrated is the possibility of furnishing a small amount of iron continuously for a long period with only a moderate consumption of fuel, and also the possibility of starting and stopping the cupola at will. Arrangements have been made for pouring a large number of molds for light, delicate castings.

A. S. M. E. Monthly Meeting.—The monthly meeting of the American Society of Mechanical Engineers to be held Tuesday evening, May 12, in the Engineering Societies Building, New York, will be given to the presentation of a paper by Henry Souther of the Henry Souther Engineering Corporation, Hartford, Conn., on the subject of "Clutches," with special reference to the types used on automobiles. Their development will be shown by lantern slides. The meeting will be important not only to those directly interested in automobile construction, but to all who have to do with the use of clutches for machine tool work, power transmission, hoisting machinery, textile and other classes of machinery. The paper will be followed by a discussion of their design and use, to be continued at the semiannual meeting of the society at Detroit, Mich., June 23-26.

The Kansas City Steel Casting Company, Kansas City, Mo., has completed a new foundry plant designed especially for making steel castings, of which it has capacity to turn out 10 tons per day. The first heat will be taken off this week. The members of the new company are F. R. Strunk, H. F. Hamacher and G. R. Strunk.

Wisconsin Ore Lands Bought by the Steel Corporation.

Important Baraboo Range Deal.

DULUTH, MINN., May 2, 1908.—The Oliver Iron Mining Company (United States Steel Corporation) has taken over all the lands on the Baraboo range, in south central Wisconsin, that have been gathered together and in part explored by Messrs. La Rue and Whitesides of Duluth, excepting such as they had disposed of some time ago to the International Harvester Company and to Rogers, Brown & Co. This deal was closed after thorough examination and exploration by the Oliver Company, in which it found the ore lenses wide, long and persistent. The Baraboo District has been described in *The Iron Age*, but at the risk of repetition the following may be briefly stated:

The iron ore deposits of this district lie wholly in the iron bearing member of the Freedom formation, which member has a thickness of some 500 ft., with a gray slate below and a dolomite above, while beneath the slate is a quartzite, quite similar to those of the Lake Superior region. This quartzite forms a trough, and the development of the iron deposit has been along the exposed southern edge. The iron bearing member is a continuous formation and extends many miles along the valley, so that its possibilities of ore are tremendous. Indeed, it is quite certain that a vast tonnage will be mined there of varying grades of ore, some of which may not now be available. The thickness of that part of the deposit containing about 53 to 55 per cent. of iron is not far from 15 to 25 ft., and lies on the upper side of the iron bearing rock. In addition to this a thickness of leaner ore, perhaps some time suitable for mining, is variable and in places tested well above 200 ft. All ore must be mined from shafts, and there is considerable water coming down from the limestone above, which in its turn is overlaid by a heavy capping of sandstone, underneath glacial drift.

The Oliver Iron Mining Company in its lease has agreed to take up development at once, and will doubtless begin the sinking of working shafts at an early date, in preparation for mining ore the coming year.

About 200 Miles from the Gary Works.

The district is some 200 miles from Gary, Ind., and is reached from there by the Chicago & Northwestern Railroad for about 100 miles of the way and the Elgin, Joliet & Eastern Railroad, belonging to the United States Steel Corporation for the remaining distance. The Northwestern road has an effective rate of 70 cents a gross ton from the district to Chicago, and has been hauling ore at that rate from the Illinois mine of the International Harvester Company to that concern's works at Chicago at the rate of about 1000 tons a week for three years. It will not be surprising if the road gives a better rate when the Oliver Company begins work, on account of the larger tonnage likely to be mined.

The haul to Gary is to be compared with the 80 miles of rail from the Mesaba range to Duluth and the 800 miles of lake and the haul by rail from lower lake ports to furnaces, whatever that may be, depending on where these furnaces are situated. In the matter of transportation from Baraboo, there is no need of stock piles at docks, for the winter is no great bar to shipments, and there is no transshipment from cars to ships and back again, giving the new district an advantage that goes far to compensate it for more expensive mining costs. The royalties are lower than on the Mesaba or than in most parts of Lake Superior.

Three important consuming interests are now concerned in the district—namely, the United States Steel Corporation by this lease and by the further purchase of additional lands that will make its holdings quite extensive, the International Harvester Company in its Illinois mine, and the furnace firm of Rogers, Brown & Co. in its Iroquois mine, which has not been opened. Individuals connected with the Pittsburgh Steel Company have considerable holdings of lands on the range, and have spent large sums, possibly $250,000, in exploration and purchase, but are doing nothing at present. The new deal of the Steel Corporation marks an innovation in the term of leases, being for 99 years. To the best of the writer's recollection there is no lease on the Mesaba that runs longer than 50 years, and the 50-year lease is a thing of quite recent years, except in the case of the State as lessor and for a few private individuals.

Marquette Range Activities.

On the Marquette range the Oliver Iron Mining Company is completing important surface improvements at its Section 21 mine, and will be able to make a big tonnage there when desired. These consist of additional steam capacity, a complete underground electrical tramming system, a new and consolidated pumping plant to carry all water to surface by one shaft, &c. Underground the mine has shipped nothing for 18 months, but development has carried two shafts down another level, one to 860 and the other to 750 ft. Drilling west from Ishpeming has been proving the formation good there, and additional mines will probably result, to the lasting benefit of both Ishpeming and Negaunee, which years ago supposed their life limited to what was then in sight. The persistence of the Lake Superior formations is well shown by the fact that not only are these new finds being made, but several mines of the utmost importance have already been opened and are mining in that field, then considered of no value for exploratory purposes.

The Cleveland-Cliffs Iron Company has for some time been drilling on a large tract of land lying west of Ishpeming. In addition to work on its own land, the company has taken many options and has explored some of them. In the course of this work excellent indications have been met with at various points, and several seams and lenses of ore of fair to good quality have been cut. One of these is on the shore of North Lake, in township 47-28, where a presumably good body of ore is being found. It is of sufficient importance to call for a shaft, and this will be sunk at once; buildings for men and material are under way. The field is a new one, and therefore very indefinite and problematic, but the company will explore thoroughly, and to this end a shaft and drifts and crosscuts are needed. Drill holes, while good in their way and of much value in determining formations and indications, do not rank with actual underground openings in revealing the real situation. The ore bearing formation extends west from Ishpeming at least as far as L'Anse, but the actual discoveries of merchantable deposits of iron ore there have been few. This may be due as much to faulty and incomplete exploration and development as to the absence of ore, and it may be that present operations carefully and completely done, as they are sure to be, will result to the great advantage of all concerned. For this reason the work now under way is of especial importance.

On the Menominee.

A good deal of work has been done recently in that portion of the Menominee range that lies north and west of the main mineral belt, and toward the Republic fold of the Marquette, and it is not impossible that it will show a connection between the two. Pickands, Mather & Co. and Duluth parties are working there with some success and material encouragement. This is the so-called "red rock" section. A heavy overburden of drift exists there, and exploration is slow and somewhat in the dark. The Republic mine, though opened to about 2000 ft., and a large and persistent producer of good ore, has been alone in its district, though attempts have been made at various times to produce other mines. For a long time there has been a feeling that mines should be descovered in the neighborhood, and it is possible that this new work will prove them.

At the Pewabic mine a recent raise in No. 1 workings encountered a cavern, or vug, of about 65 ft. length, 35 ft. width and 25 ft. average hight. This cave was entirely lined with calcite crystals and iron pyrites, and presented a most beautiful spectacle. At No. 1 shaft the installation of a new hoist has compelled the retimbering of the shaft, and work has been stopped there for the time being. Both Nos. 1 and 2 shafts have now been sunk another level, and the fine steel shaft house at No. 1 is completed. Men taken from the work in No. 1 have

found places elsewhere in the same mine. This property will make good shipments this year, though not so large, of course, as usual.

Cuyuna District Operations Meet Difficulties.

Sinking operations in the Cuyuna District, by the Rogers-Brown Ore Company, are constantly meeting serious obstacles. The shaft was started as a drop, and after getting to hard pan some time ago, it was decided to change the method and timber below in the customary manner. A few feet had been made in this way, when the hard pan came in with a tremendous rush of water and the shaft was drowned. Pumping capacity was not great, and it was impossible to cope with the difficulty for some weeks. But a short time ago the bottom timbers were gotten into place and sinking was slowly resumed, the drop shaft method being once more adopted, after considerable difficulty in starting. But with a drop of 2 ft. in the shaft there was another severe boil of quicksand, filling the shaft about 20 ft. with material and covering part of the pumps. The shaft was drowned out about two weeks ago, but work has been resumed. The total depth is about 91 ft., which has been accomplished by hard work continued for more than six months. The shaft is now closed to ledge.

This is the second shaft sunk in the district. The first was by Pickands, Mather & Co., and in that little trouble was experienced from water and sand. It was sunk to the desired depth of something more than 115 ft., and a drift extended as desired. But the ore formation was found streaky and uneven, and was much leaner than the drill hole results had given the operators reason to look for, so the operation was abandoned. Rogers-Brown operations are on another portion of the formation, where the drill holes had shown remarkably good ore, and, apparently, a considerable tonnage of it.

With the commencement of sinking for this shaft, drill operations throughout the district have ceased in part. Most of the larger operators are idle, awaiting results. That the Rogers-Brown Company is not disheartened by the delay is shown by the fact that it has started sinking a second shaft in section 30, T 46-28, about 9 miles southwest from the present shaft, and 1½ miles from the main line of the Northern Pacific Railway, and 8 miles from the village of Deerwood. The ground is not supposed to be so wet, nor to consist of quicksand, though it is a region of drift, with many lakes and small streams.

An interesting and significant fact in connection with the water level in the Rogers-Brown work is that when the shaft is drowned the water stands several feet higher than that of the adjacent lakes and ponds. It would almost appear as though there might be some connection, by sand and gravel strata, with the Mississippi River at a higher level, in which case the water problem is a serious one.

Miscellaneous Notes.

Not long ago a land broker of St. Paul, holding some State leases lying about half a mile north of the north line of the Mesaba formation in section 16-58-20, advertised the organization of a company to explore for iron ore, and accompanied the advertisement by an engineer's report to the general effect that the land was likely to be valuable for its iron ore deposits, that it was on the Mesaba formation, and might make as good a mine as some that were mentioned. The facts are that this land lies some distance north of outcroppings of the underlying quartzites, and is therefore not on the Mesaba iron bearing formation at all. Should any ore be found in the granite of this tract it could not be on the Mesaba range, and the general consensus of opinion among mining men was that to search for ore there was practically useless. How successful the sale of stock proved is unknown, but the company was withdrawn from the lists a short time ago. There has been almost an entire absence of wild catting on the Mesaba since 1892, and it has been singularly free from the presence of the uninformed and the dishonest promoter, which is a fact that mining men of the region have prided themselves upon.

The Cleveland-Cliffs Iron Company is pushing the installation of its new town site of Gwinn, on the Cascade Range, and has recently published a map of the town, which gives a good idea of what it will be. This work is carried on with the most advanced ideas of beautification and landscaping, and is under careful and expert direction. It will be the most tasty place on the old ranges, and will vie with the new Oliver town of Coleraine, on the west Mesaba, in everything that tends toward comfort and higher opportunities for living.

The instances in which mine operators have as yet received notification of what will be expected of them this year—or if anything at all is wanted from them—are few. Nearly all the independent companies, as well as the Oliver Iron Mining Company, are utterly in the dark as to what will be required in the way of shipments. Most of them have reduced their force to the lowest limits practicable, and few, aside from the Oliver Company, are doing anything other than in the way of carrying forward development that is either necessary to secure some other work, or will be required for any mining they may conduct later.

Several stripping jobs on the Mesaba, suspended last fall, have recommenced, and are in full progress with plenty of men, willing, this year, to work steadily and without too much supervision. The cost of doing work has been materially lessened this spring. D. E. W.

The National Treasury.

The first 10 months of the fiscal year closed April 30 with a deficit in the United States Treasury of $51,645,829. Of this deficit, $15,970,678 is due to the excess of expenditures over receipts in the month of April alone; that is, the Government expended in April an average of $500,000 each day more than it took in. It is probable that the deficit for the fiscal year, which will end June 30, will be not less than $75,000,000. It may go as high as $80,000,000. On May 1, last year, there was a surplus in the Treasury amounting to $56,474,886.

Since the beginning of this fiscal period the receipts from customs have been less than in the corresponding 10 months of last year by $34,000,000, and the internal revenue receipts have been $14,000,000 less. In April the customs returns were $7,000,000 less than in the same month of 1907, and the internal revenue receipts $2,600,000 less. On the other hand, the expenditures of the Government in the last 10 months have been $67,000,000 more than in the same months of the fiscal year 1907, in the month just ended the expenditures were nearly $12,000,000 more than in April of last year.

A New Canadian Pacific Rail Section.—The Canadian Pacific contract for 40,000 tons of 85-lb. Bessemer and open hearth rails with the Dominion Iron & Steel Company and the Algoma Steel Company calls for a new section which is quite similar to the Series A section recommended by the committee of the American Railway Association and shown in *The Iron Age* of November 28, 1907, page 1540. It differs from the Series A rail in taking more metal from the head to add to the base, while the web has been reinforced. It is required that carbon average between 0.57 and 0.59 per cent. for Bessemer rails, and the limits are 0.56 and 0.66, with an average of not less than 0.60 per cent. for open hearth rails. The limit of phosphorus is 0.08 per cent. for Bessemer and 0.06 for open hearth rails. The manganese limits are 0.80 and 1 for all rails. For the drop test a section of rail is to be tested from every third Bessemer heat, and the weight is to fall 18 ft. If a heat is rejected similar tests shall be made of rails from the preceding and succeeding heats. For open hearth rails three sections of rail taken from the top of the first, middle and last ingots of each 50-ton heat are to be tested. The heat is to be rejected unless two of the tests stand. The *Railroad Gazette* says that from reports made to the company by its inspectors the new rail requires less cold straightening and less camber. It is also stated that the temperature is more uniform throughout the rail after leaving the rolls than in the old A. S. C. E. section.

Stockholders' Gains from the Canadian Bounties.

The iron and steel industry in Canada on a modern scale dates only from 1896. Before 1896 there was a 125-ton furnace at Londonderry, Nova Scotia. There was second furnace of a similar capacity at Ferrona, near New Glasgow, also in the Province of Nova Scotia; and there were three small charcoal iron furnaces using bog ore—two at Drummondville and one at Radnor, both in the Province of Quebec. All these furnaces were earning Dominion tonnage bounties under the act of 1883, and the continuing enactments passed by the conservative governments which were in power at Ottawa from 1879 to 1896. But the aggregate capacity of the five furnaces was not more than 300 tons a day, and up to 1896 no steel had been made in the Dominion of Canada.

Prodigality of Bounties Since 1896.

The Liberals when they came into power in 1896 at once infused new life into the industry by the prodigality of the bounty system which they established. Under the Liberal government $1000 has been paid out for every $10 expended by the Conservative governments between 1883 and 1896. The Liberals found the national policy well estblished, and they determined to go even further than the Conservatives. In no department of Canadian industry has this been more obvious than in the iron and steel business. Between 1896 and January 8 of this year the large sum of $10,947,690 was paid in Dominion bounties to 13 iron and steel companies in Quebec, Nova Scotia and Ontario. In addition to the direct payments out of the public revenue, iron and steel companies of Nova Scotia have had the advantage of specially low freight rates over the Government railroad—the Intercolonial system by which the three maritime provinces are brought into connection with Montreal and western Canada. They have also had the advantage of tariff duties on pig iron, steel billets, structural steel and steel rails; and in 1904 the anti-dumping law was enacted to give additional protection to the wire rod mill at Sydney.

These are the advantages direct and indirect which have been lavished on the industry since 1896. But although bounties alone have figured for nearly $11,000,000 in the receipts of iron and steel companies, the Hamilton Iron & Steel Company is the only one of the Canadian companies in which the directors have publicly "cut a melon" for their shareholders. In the case of the two largest concerns—the Dominion Iron & Steel Company and the Algoma Steel Company—the holders of common stock have not received a cent as a return on their investments.

The Hamilton Company's Prosperous Career.

The Ontario Rolling Mill Company and the Hamilton Blast Furnace Company, both of which in 1900 were absorbed by the Hamilton Steel & Iron Company, were the first of the Ontario undertakings to go on the bounty list. They were scheduled there by 1897, and the bounty payments to the present company since the absorption of the two older companies have ranged from $167,470 in the fiscal year 1900-1901 to $224,546 in the calendar year 197. From the beginning of the fiscal year 1898-1899 until the end of 1907 these companies had received in round figures $1,500,000 from the Dominion treasury, in addition to some smaller bounties which for a few years were paid by the Government of the Province of Ontario.

Dividends were not paid for some little time previous to 1907, and in that year the Hamilton Steel & Iron Company added a 250-ton blast furnace to its plant. At this time its capital stock stood at $1,513,000. At the end of the year back dividends were paid, and a rearrangement of its capitalization was agreed upon by which a goodly stock dividend was to be distributed. No other company in the iron and steel business in Canada, whose accounts are made public, has done so well as the Hamilton Company. It has done so astonishingly well that Ontario newspapers whose proprietors are not directly interested in the Hamilton plant, or in the plants of the Nova Scotia Steel & Iron Company, are insisting that it was a mistake on the part of the Laurier government to extend the bounty system to 1912, as was done at the time the tariff was revised in November, 1906.

The Dominion Iron & Steel Company's Record.

The Dominion Iron & Steel Company last year received $1,223,200 in bounties, and all the taxation—municipal, provincial or Dominion—it paid was the customs duties on any equipment it imported. It has received nearly $5,000,000 since it went on the bounty list at Ottawa in 1900. The company is capitalized at $35,000,000. Its bonds aggregate $10,000,000, its preferred stock $5,000,000, and its common stock $20,000,000. Interest on the bonds has been regularly paid. The preferred stockholders for two years, 1901-1903, also received a dividend, but this was paid out of capital, under an act of the Provincial Legislature at Halifax, which authorized such a payment for a period of two years, while the plant at Sydney was being completed.

Payment of dividends to preferred stockholders ceased in April, 1903, more than a year before the rail mill was at work, and since then neither the preferred nor the common stockholders have received any dividends. Most if not all of the favors bestowed on this company by the Dominion, the provincial and the municiipal governments seem to have been regarded as personal to the little group of promoters who in 1899 organized the company. These favors, moreover, seem to have been capitalized on a fairly lavish scale; so lavish, in fact, that the earnings of the company and the bounties it has had from the Dominion Government have never been sufficient to pay any dividends on the common stock.

The Nova Scotia Steel & Iron Company Does Well.

The Nova Scotia Steel & Coal Company, whose iron and steel plant is on the opposite side of Sydney Harbor to the plant of the Dominion Iron & Steel Company, has done much better for its preferred and common stockholders. As its share of the bounties disbursed by the Ottawa government since 1896, the Nova Scotia Iron & Steel Company and the Nova Scotia Steel Company, which it absorbed in 1900, have received not less than $1,030,000. The amount annually received by the company under its present title has ranged from $138,456 for the fiscal year 1900-01 to $179,210 in 1907. The company is now capitalized at $9,838,000. Its 6 per cent. bonds aggregate $3,838,000; its 8 per cent. preferred stock, $1,030,000, and its common stock, $4,970,000. It is exclusively a Canadian undertaking, both as regards its promotion and its directorate. It has paid interest continuously on its bonds; its preference stockholders have had their 8 per cent., and dividends on the common stock in recent years have ranged from 5 to 6 per cent.

Last year was the best in the history of the company as regards its iron and steel business. In February, 1908, the dividend on the common stock was at the rate of 6 per cent. per annum. The coal and ore business of the company in 1907 was not so good as in 1906, but the profits from mining and the manufacture of iron and steel totaled $944,790, including the $179,210 from the Dominion government paid in bounties on pig iron and steel ingots. Of the iron and steel companies whose accounts are made public, the Nova Scotia Company, next to the Hamilton Company, has earned most for its shareholders. Its bounty payments since 1898 must well nigh have paid for the 250-ton furnace, the four open hearth furnaces and the by-product coke ovens which between 1903 and 1908 were installed at Sydney Mines, where the company established its new plant after it had come into possession of the ore deposit in Wabana Island, Newfoundland. For two years past its old furnace at Ferrona has been out of blast.

What Other Companies Have Done.

About $1,200,000 has gone to the Algoma Steel Company, which did not get on the bounty list until 1902. Its receipts for bounties last year were $556,268 on pig iron and steel ingots. Unlike the Dominion Company, the Algoma Company has no rod mill and has consequently had no advantage from the $6 bounty on wire rods. The steel plant at the Sault is one of eight or nine Clergue enterprises. Some of them are not fully developed. As yet they are not all making money, and no dividends to ordi-

nary stockholders are traceable in the stock exchange annals which concern themselves with the earnings and dividend distributions of Canadian industrial companies.

Until 1900 the Canada Iron Furnace Company, which now owns a charcoal furnace at Radnor, Quebec, and a coke furnace at Midland, Ontario, was on the bounty list only in respect of the Radnor furnace. In 1900, however, the furnace at Midland began to make iron, and since then there have been years when as much as $98,000 has been paid at Ottawa on the output of the Radnor and Midland plants. The company's share in the bounty disbursements since 1896 has aggregated a little more than $500,000. Last year it received $13,850 on iron made at Radnor and $32,577 on iron made at Midland. The Radnor Furnace uses Canadian ore exclusively, and was consequently paid on the higher bounty scale of $2.10 a ton. The Midland Furnace is run principally on American ore, and is accordingly on the lower scale, $1.10 a ton. The company is controlled by two or three Montreal capitalists. Details of its earnings and of its dividend distributions do not find their way into the financial pages of the Montreal or Toronto newspapers, but the fact that it is adding a 250-ton furnace to its iron making equipment at Midland is proof that, like the Hamilton Company, it has thriven well.

The 125-ton furnace of the Londonderry Iron & Mining Company at Londonderry, Nova Scotia, first went on the Dominion payroll just a quarter of a century ago, when its only companions on the bounty list were the two small charcoal furnaces at Drummondville, in Quebec, owned by the Macdougall Company of Montreal. It is the historic furnace of Canada, because it was to relieve the company which owned it in the early '80s that in 1883 the present bounty system was established. But the Londonderry Furnace has not been continuously on the list. It was off from 1897 to 1902 and its share of Dominion bounty payments has not exceeded $120,000.

The Government Does Not Concern Itself About Stockholders.

The Dominion Government is very easy with the recipients of its industrial bounties. It exercises not the least control over the capitalization of the iron and steel companies which claim a place on the bounty list. It leaves it to investors to look to themselves when promoters are putting out preferred stock or common stock, and are emphasizing in their glowing prospectuses the largesse that the concern can draw from the Dominion treasury. The Government, moreover, has been utterly indifferent to the earnings of the iron and steel companies during the 25 years over which the bounty system has now extended. It has never made a regulation that earnings and profits shall be reported to the State Department, that pays out the bounties. All that is necessary for these payments by the Government is a certificate of production, setting out quantities and the description of ore used—Canadian or imported. The result is that when an iron and steel company's stocks are not largely dealt in on the exchanges of Montreal and Toronto, no details of its earnings and dividends find their way into the newspapers, the financial annuals, or any of the official reports of the Dominion Government. It is thus possible to trace in the stock exchange annuals the earnings and dividends of only three of the 13 iron and steel making companies that are on the bounty list—the Dominion Company, the Nova Scotia Company and the Lake Superior Corporation, of which the Algoma Company is a subsidiary undertaking.

It is just as well for the peace of mind of the Government at Ottawa that it calls for so little information from its beneficiaries, that it asks no questions about capitalization, earnings and dividends, for when the news of the proposed "cutting of the melon" at Hamilton found its way into the newspapers there were complaints in and out of Parliament that the handsome stock dividend there was proof that the bounty business was being overdone. Ontario farmers, in their granges and other provincial organizations, have for years been protesting with much vigor and persistence against the bounty system, and the developments at Hamilton have resulted in a renewal of the farmers' demand made before the Tariff Commission of 1905-6—that "the iron tubs, like all other tubs, should stand on their own bottoms."

E. P.

Steel and Wrought Iron Production in France.

The Comité des Forges de France has just published the statistics of the production of steel and wrought iron, obtained directly from the works. The figures for previous years are the official data gathered by the Ministry of Public Works.

France is progressing rapidly in the manufacture of steel, having made 2,677,805 metric tons of ingots in 1907, as compared with 2,436,322 tons in 1906 and 2,240,284 tons in 1905. More than one-half is produced in the District of Meurthe-et-Moselle, with 1,406,841 tons in 1907 and 1,260,736 tons in 1906. The Nord and Pas-de-Calais follow with 606,462 tons and 515,562 tons, respectively, and the Centre, once the greatest district in France, with 231,522 tons and 197,486 tons, respectively. Out of the total production of ingots 2,606,920 tons was used in 1907 at the works, producing the steel, and only 70,885 tons was shipped to other plants. The make was distributed as follows:

Production of Steel Ingots.

	1907. Tons.	1907. Per cent.	1906. Tons.	1906. Per cent.
Acid Bessemer	77,421	2.9	107,978	4.4
Basic Bessemer	1,630,511	60.7	1,494,667	61.4
Open hearth	955,555	35.7	833,677	34.2
Crucible and electric	14,318	0.5		
Totals	2,677,805	...	2,436,322	...

The materials used in the manufacture of steel in 1907 comprised 35,000 tons of iron ore, 91,152 tons of Bessemer pig iron, 1,852,506 tons of Thomas pig iron, 61,179 tons of manganiferros iron, 203,927 tons of forge iron, 143,621 tons of special pig iron, 35,750 tons of muck bar and 581,055 tons of old material.

The production of blooms was 982,170 tons and of billets 538,104 tons, there being delivered to other than the producing plants 290,270 tons of blooms and 162,399 tons of billets. It is interesting to note that out of the total of 1,224,373 tons of blooms and billets credited to the Bessemer converter 290,315 tons were made by the duplex process.

The production of finished products was as follows:

Production of Finished Steel.—Metric Tons.

	1907.	1906.	1905.
Rails	297,762	328,474	303,475
Tires	43,845	41,657	22,959
Beams	107,488		
Various shapes	320,295*		
Merchant bars	397,621		
Machinery	95,302	891,034	754,894
Wire	57,803		
Tubes and pipe	34,737		
Tin plate	36,578		
Sheets and plates	352,042	366,080	312,712
Forgings	33,570	29,773	22,762
Castings	31,505	26,549	25,269
Totals	1,808,548	1,683,567	1,442,071

* Out of this total returns aggregating 160,144 tons lump together beams, shapes and bars, and 69,318 tons cover various finished products not specified.

The Meurthe-et-Moselle District produced 690,150 tons of the total in 1907, while the Nord is credited with 472,448 tons and the Centre with 216,130 tons.

The production of wrought iron and welded steel was 687,249 tons, as compared with 747,900 tons in 1906 and 669,841 tons in 1905, the details being as follows:

Production of Wrought Iron.—Metric Tons.

	1907.	1906.	1905.
Bars	498,758		
Beams	12,878		
Various shapes	15,180	652,300	584,702
Wire	57,153		
Tubes	11,800		
Forgings	2,643	6,100	4,136
Sheets and plates	108,252	89,500	81,003
Totals	687,249	747,900	669,841

Included in the total of 498,758 tons of bars made in 1907 are 45,735 tons of different products, the details of which are not available. Over one-half of the total output of wrought iron is made in the Nord District, the quantity being 354,654 tons, of which 65,800 tons were sheets and plates.

The Clark Boiler Flue Cleaner.

A machine that planes all scales, rust, soot and dirt from the interior of tubular boiler flues without occasioning any interruption in the operation of the boiler is likely to interest those who appreciate how desirable it is to keep the flues of boilers free from such foreign matter. The true importance of so doing is often lost sight of in comparison with the trouble of thoroughly cleaning when that entails the shutting down of the boiler, because it is not commonly realized how great is the loss of efficiency when the flues are dirty. The accumulated material on the flues is a poor conductor of heat, and it is stated that 1-32 in. of soot will increase the amount of heat required to evaporate a given amount of water, 15 per cent., while ¼ in. of soot will require 70 per cent. more heat.

The machine illustrated and recently patented by the Fred Clark Boiler Cleaning Company, 93 Nassau street, New York City, is one which is claimed to do just what was stated above. Its operation as applied to the particularly difficult problem of cleaning upright boilers is especially interesting, for it is believed to be the first practical method of cleaning such boilers thoroughly. The usual method of blowing live steam through the flues seldom removes more than the loose soot, and the moisture introduced tends to add to the incrustation. To pass steel brushes through the flues means putting the boilers out of commission, taking off the dome, and at the best a dirty, tedious and unsatisfactory job, as it is seldom that the brushes can entirely remove rust and scales. Again this method has very little effect on the deposit produced when water in combination with soot bakes upon the interior of the flues.

Fig. 1 shows an interrupted compressed view of the complete apparatus. The frame is made up of separable sections of 1-in. tubing connected by couplings, including a handle, a long straight slotted tube and a curved tube terminating in a spider at D. The straight section of the tube carries a sliding handle A, an adjustable stop B and an adjustable supporting leg C, which is pivoted so that the apparatus may be folded and more easily carried when taken apart. When in use the supporting leg C rests on the floor just outside of the firebox, the curved part of the tube is in the furnace and the spider D is pressed against the lower end of the flue. The middle section varies in length according to the length of flues to be cleaned. Through the slot on the side the handle A is connected by a screw to a cylindrical block approximately fitting the inside of the pipe. This block is connected by two steel tapes, portions of which are shown in various places, reaching through the forward end to the cleaner head.

An enlarged detail of the head, represented in a section of flue, is given in Fig. 2. It is this head which does the actual work of cleaning the flue, and is the essential feature of the apparatus. The remainder of the parts are simply means of sliding the head up and down through the flue. The head consists of pivoted blades with cutting

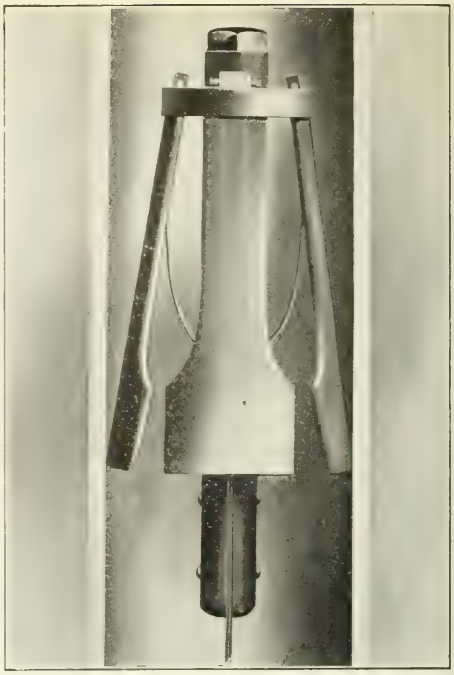


Fig. 2.—The Head as It Appears When Inside of a Flue.

edges at their free ends which are disposed at such an angle that they have no tendency to cut into the metal of the flues, and in fact are not sharp enough for that, but nevertheless get back of and in under the incrusted matter, removing it after the manner of a chisel. As the head is pushed upward through the flue the blades yield, but on the downward movement the springs which tend to hold the blades outward cause them to take hold.

To guard against the trouble which would be experienced if the head was pushed clear through the flue, the apparatus is first made ready by substituting for the head a spring device which can be brought back after it is shoved clear through the flue. This is roughly the size and shape of the head, except at the lower end where the springs, instead of ending in sharp edges, are bent inward toward the center and down again parallel with the center supporting rod. When this device is passed up a flue it is easy to detect when the top is reached by the expanding of the springs. This, then, is the extreme hight to which the head should later be pushed, and the stop B on the slotted section of the cleaner holder is set,

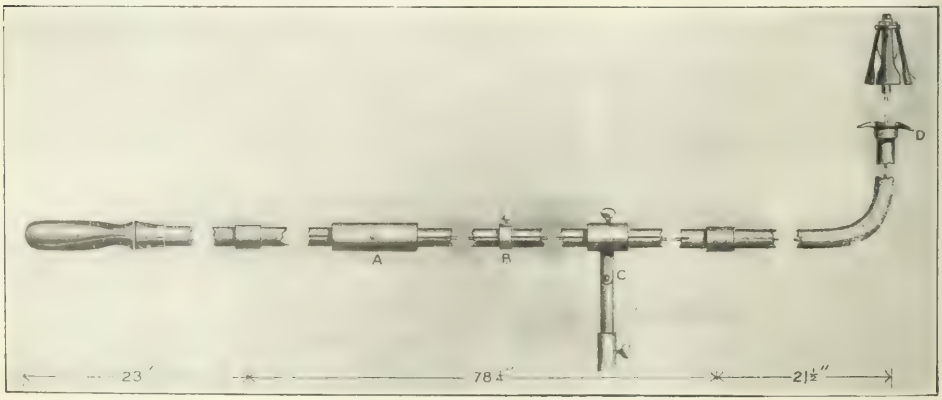


Fig. 1.—An Interrupted Compressed View of the Clark Boiler Flue Cleaner.

so that the reciprocating movement of the handle A cannot exceed this limit. The other end of the stroke of the handle is permanently limited by the head itself, which cannot pass the spider D on the top of the curved portion of the holder.

The operation of using the cleaner after the preparatory setting has been made and the cleaner head replaced, is to pass the head once or twice through the flue, and then by swinging the holder slightly in a horizontal plane to repeat the operation, causing the blades to pass over the strips of surface missed on the first operation because of the spaces between the blades. Aside from the rapidity and thoroughness of this method of cleaning (it is claimed to take only about 20 min. to clean the average upright boiler), the principal advantage is that it is not necessary to draw the fires, and it may even be possible to dispense with banking them.

Horizontal boilers can be as readily cleaned with an even simpler apparatus, based on the same principle. The head in such cases is simply attached to a ½-in. rod which is made in sections for convenience in transporting, and is pushed directly back and forth through the flues until they are free of incrusted material.

It is not the business of the Fred Clark Boiler Cleaning Company to sell these machines, but as its name implies, to clean boilers, and with them it has special facilities for doing such work. The company will, however, sell rights to use either of these machines in territory outside of New York and its vicinity.

Engineering courses, laboratory practice and research work will be given in the coming summer season of the University of Wisconsin, beginning June 22 and continuing six weeks. Departments are maintained in chemical, electrical, hydraulic and steam and gas engineering, in mechanical drawing, mechanics and testing of materials and in shop work. The last named includes pattern making, machine work, forging and treatment of carbon and high speed steels. In addition the eighth annual session of the Artisans' School will be held in the same period, instruction of more elementary type being given in most of the above subjects, adapted to students who have common school training or practical experience. Bulletins describing the courses of study may be obtained from F. E. Turneaure, dean of the College of Engineering, Madison, Wis.

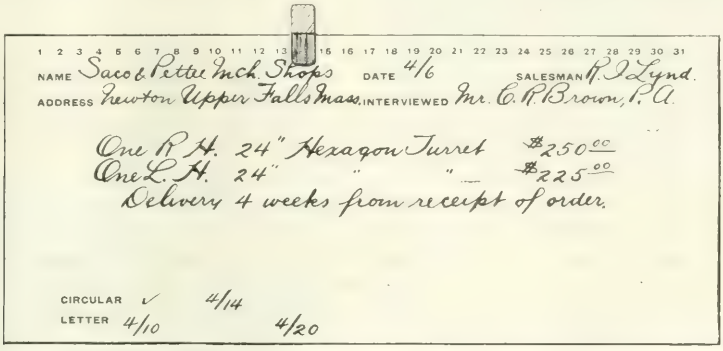
The General Fireproofing Company, Youngstown, Ohio, has been awarded the contract for furnishing all the steel reinforcement for the new car house to be erected at 146th street and Lenox avenue, New York City, by the New York City Railway Company. The building will be of reinforced concrete, and will be 600 x 1000 ft. in size, four stories. Cars are to be stored on the first and second floors, and on the upper stories there will be work shops and offices. The building is to be completed in about four months.

The Goldschmidt Thermit Company, 90 West street, New York, announces the establishment of an office and works at 103 Richmond street, W., Toronto, Canada. The new branch was opened for business May 1, and is under the management of E. C. Rutherford of Toronto, who was for several years manager of the Magann Air Brake Company and of the Canadian Brake & Supply Company. A complete stock of thermit and appliances will at all times be carried at Toronto, and a fully equipped repair shop will be in operation.

A Simple Follow Up System.

The machine tool department of the Chandler & Farquhar Company, Boston, Mass., has developed a follow-up system which, while exceedingly simple in its details and operations, has proved to be wholly effective. A single form of card is required, shown herewith, together with a box and a quantity of clip tabs of different colors, one color for each salesman, including the manager of the department.

The essential feature of the card is the row of numerals along the upper edge, corresponding to the days of the month. Whenever an inquiry is received, or information obtained that a concern is in the market for machinery, or is interested with the possibility of buying later, one of these cards is filled out with the name and address of the concern, the man interviewed, or to be seen or written to, and the name of the salesman handling the matter. There follows the list of machinery required and notes as to prices to quote, deliveries to promise, &c. In the blanks beside the words "Circular" and "Letter" are inserted the dates when each are to be sent out, and these serve as reminders to the clerk having charge of the index and to the salesman concerned.



Facsimile of Card Used by the Chandler & Farquhar Company, Boston, Mass., for Following Up Business Prospects.—Actual Size, 3 x 7 In.

The clerk files the slip in the box, which is arranged alphabetically by cities and towns, and he places the clip on the date when attention must next be given the matter. As an example of the use of the card the one illustrated was filled out April 6, and the clip was put over the date 10, at the top, to indicate that a letter is to be sent on that date. When this has been done the date at the bottom is checked, and the clip moved along to the date 14, when a circular is to be mailed, and so on.

Each day the clerk takes every card in the box tabled for that date and sorts them by the tab colors and places them in a basket on the manager's desk. By looking them over he keeps in touch with affairs, and may give directions as to the handling of certain matters. The cards are then distributed to the salesmen for their attention. Each card of a concern with which there is still prospect of doing business is put back in the box, tabbed for the next date to give it attention. As soon as a matter is closed the card is stamped "Remove card," and goes to a permanent index, where it serves as a part of a directory of customers, an all important record in a machinery establishment. Once a week all cards in the index are inspected by the manager and afterward by the salesmen.

The system is employed for other purposes than keeping track of prospective customers, being exceedingly useful in following up complaints from customers, such as failures to receive goods when promised, and the like.

The Westinghouse Mill Motor.

For driving auxiliary machinery in steel mills electric motors are particularly adaptable if they are designed for the conditions met with. They must be rugged, mechanically and electrically, capable of withstanding high temperature, proof against the entrance of dust and moisture, able to carry loads varying rapidly between wide limits, and to be frequently reversed, and above all must give uninterrupted service even though operated practically continuously. These requirements are fulfilled, it is claimed, by the mill type of direct current motor re-

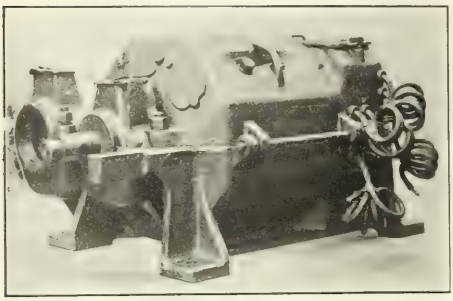


Fig. 1.—The New Mill Type Motor Made by the Westinghouse Electric & Mfg. Company.

cently produced by the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.

The general appearance of the motor is illustrated in Fig. 1, and Fig. 2 shows it opened, so that the armature may be inspected or removed. The motor frame is divided horizontally and the upper half is hinged to allow it to be swung back. The heavy section of the frame makes for rigidity and freedom from vibration. Hand holes in the frame permit inspecting the commutator and windings, but the tightly fitting covers exclude dust. The bearing housing is extended beyond the bearing, and is made dustproof by a steel washer and felt lining.

The shaft is large, and although the keyways are

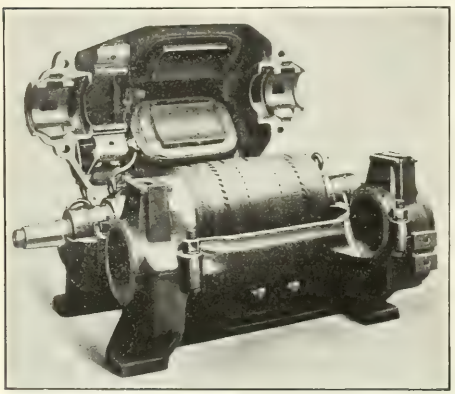


Fig. 2.—The Westinghouse Mill Motor with the Upper Half of the Frame Raised.

ample, there is little likelihood of its bending or breaking. The shaft extensions on both ends are tapered and of the same dimensions, consequently the hub bores of pinions and brake wheels can conform to one standard, so that they can be easily replaced. Large wearing surfaces in the bearings insure slow wear, and since the air gap between the fields and the armature is considerable, it would be a long time before the revolving and stationary parts could rub. Special provisions prevent oil from being drawn into the armature and from creeping along the shaft. The bearings are split and made interchangeable for either end of the motor. Lugs cast with the bearings keep them from turning, making dowel pins unnecessary. An eyebolt on each bearing permits of ready handling of the armature.

The commutator and brushes have sectional areas permitting low current density, which tends to reduce heating. The commutator being mounted on the same spider as the armature laminations, the shaft may be readily removed. The carbon brush holder, Fig. 3, is substantial and so constructed that by removing one bolt the entire holder can be removed from the motor as one piece. The insulation is thoroughly protected from moisture and mechanical injury.

Throughout the insulation of the motors is of heat resisting character—asbestos, mica, porcelain or an insulating compound. The coils are treated with the compound and then baked at a temperature much above that created in normal service. The armature coils are of strap copper insulated with mica tape, hand wound. This form of coil can be easily repaired by the user, whereas wire wound coils are useless if the insulation becomes badly damaged. The coils are secured by hard fiber wedges and bands recessed in the surface of the laminations. The rear end of the armature has an end bell upon which the ends of the armature coils are banded.

Simplicity and accessibility of all parts for repair or

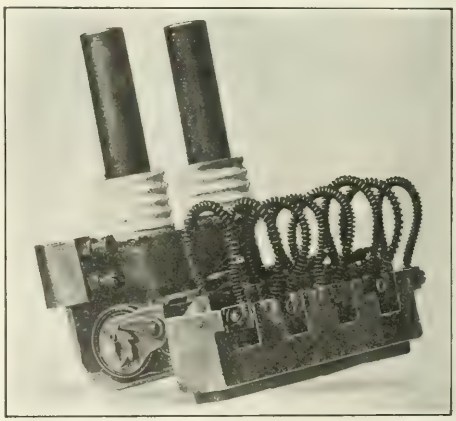


Fig. 3.—Brush Holder and Brushes of the Mill Type Motor.

removal are prime features of the motors, contributing to quick changes with little loss of time. This improved design of motor, it is stated, has been approved by steel mill engineers, and highly satisfactory results have followed from the use of the motors.

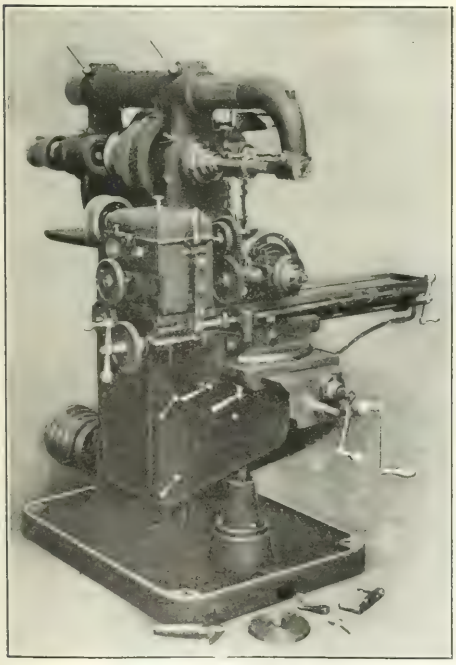
The Pennsylvania Railroad last week achieved the distinction of running a passenger train from Pittsburgh to Chicago in 7 hr. and 42 min. The special train used was made up of two 60-ft. baggage cars and two sleepers and carried a theatrical company. The distance covered was 468 miles, so that the average speed was a fraction under 61 miles an hour, including stops. It is said that never before has such a high average speed been maintained for so great a distance by a passenger train. In its remarkable flight the special overhauled the Pennsylvania 18-hr. New York-Chicago train, the fastest regular train it operates, and one of the two fastest long distance trains in the world. The run is said to have an important bearing on the company's future service. As soon as its tunnels under the North River and Manhattan Island are in operation, admitting its trains into the new New York depot, it is understood that the company will reduce the time of its fastest train to 16 hr. between New York and Chicago.

The Boston Belting Company, Boston, Mass., has been allowed by the Treasury Department the full 99 per cent. drawback on the duties paid on imported iron and steel rolls when exported in the form of rubber covered rollers.

A German Automatic Indexing Mechanism for Milling Machines.

In the article, "German Machines and Tools," printed in *The Iron Age*, April 23, 1908, and abstracted from a communication in *Daily Consular and Trade Reports* from Special Agent Capt. Godfrey L. Carden, mention was made of an automatic indexing apparatus for universal milling machines made by the firm of Ludwig Loewe, Berlin. A later copy of the *Reports* contained an illustrated description of this device, from which the following is taken:

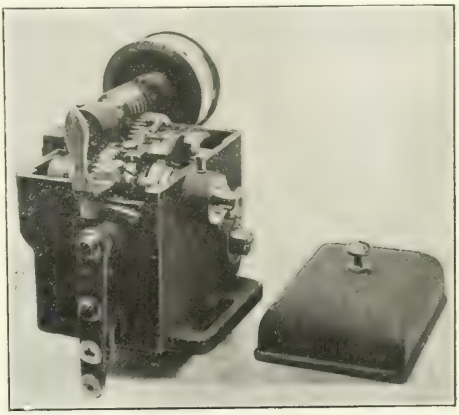
German machine tool makers have, in a number of instances, obtained work from American machines which was not contemplated by the original designers. Ludwig Loewe is making a specialty of an automatic indexing apparatus for universal milling machines. This is an attachment for standard millers, which, it is claimed, effects a saving of 50 per cent., if not more, in wages alone. Generally speaking, the dividing head in use at the present time on universal milling machines does not meet the modern demand for automatic action, as the actual division has to be done by hand. This often gives rise to mistakes which inevitably mean spoiled work. The workman must also stand idly by the machine to reverse the table and effect the next division. With the automatic indexing apparatus the universal milling machine is converted into an automatic gear cutter, without in any way affecting the utility of the machine as a universal milling tool. The part performed by the indexing apparatus is to automatically control the division, and also the change and return of the table. This permits of an operative attending to several machines at the same time, and it is on this basis of calculation that a saving of 50 per cent. is estimated. When not required the automatic attachment is removed from the machine.



A Universal Milling Machine with the Automatic Indexing Mechanism Made by Ludwig Loewe, Berlin, Germany.

In appearance the apparatus is like an inclosed gear box, which is attached to the table next to the dividing head. It is connected to this dividing head by a train of gears, while a further train on the opposite side operates the table feed. The apparatus is driven by a belt from the countershaft, which necessitates disconnecting any existing feed driving arrangement. This means that the countershaft must be provided with a longer shaft to take an extra pulley. Ordinarily, the pulley on the indexing apparatus is run at 400 to 600 rev. per min. The width of this pulley is 6 in., which corresponds with that of the belt tightener rolls.

One of the accompanying illustrations shows the indexing apparatus as applied to a universal milling machine. The apparatus can be readily detached from the machine, as shown in the other engraving, in which the cover is removed to expose the mechanism, and is capable of use with many of the well-known standard makes of millers.



The Automatic Indexing Attachment with Cover Removed.

The automatic feed of the table with quick return is brought about by means of change gears which connect the apparatus with the table feed, and the ratio of these change gears determines the amount of feed per revolution of the work arbor. The return speed of the table is eight times that of the working speed. The travel of the table is regulated by adjustable dogs, which are attached to an adjustable horizontal bar, and strike against a fixed stop. The bar is connected to the reversing lever in such a manner that by changing the position of a screw, the direction of feed and return, respectively, can be reversed enabling either right or left hand cutters to be used. The automatic division takes place at the end of the returning motion. The driving gear of the train between the apparatus and the dividing head makes exactly one revolution each time.

Any division which is possible with the available change gears can be made. The ends of both spindles of the apparatus are detachable, so that they can be turned to suit the bore of the change gears.

The apparatus can only be used on a machine provided with a dividing head and change gears, and is intended for work which is not revolved while the cutter is in operation. The spindle of the dividing head can be arranged horizontally, vertically or tilted to any desired angle. The apparatus permits of adjusting to universal milling machines of various makes, provided the general dimensions are approximately the same as the machines made by Ludwig Loewe.

The apparatus is made in two sizes, one 9¼ in. long, and one 10½ in. long, the latter being a heavier pattern and capable of heavier work. The writer understands that the tool is used on both the Becker-Brainard and Cincinnati types of milling machines, and when so applied the pulley of the apparatus is in front, while the reversing bar is on the back.

The first Japanese emigrants to Brazil, 783 in number, have just sailed for that country from Tokio. They will work on the Brazilian railroads. Brazil pays two-thirds of their passage money, and after six months will give each a grant of land to induce him to settle.

Heating and Ventilating Storage Battery Rooms.

In connection with the electrification of the New York Central & Hudson River Railroad terminal at New York an interesting problem was heating and ventilating the storage battery stations at Lexington, Yonkers, Kingsbridge and Bronx Park. The storage batteries were guaranteed for 10 years, provided the temperature was maintained at 70 degrees. This necessitated a heating plant for cold weather and a means of cooling in warm weather, as well as proper ventilation at all times.

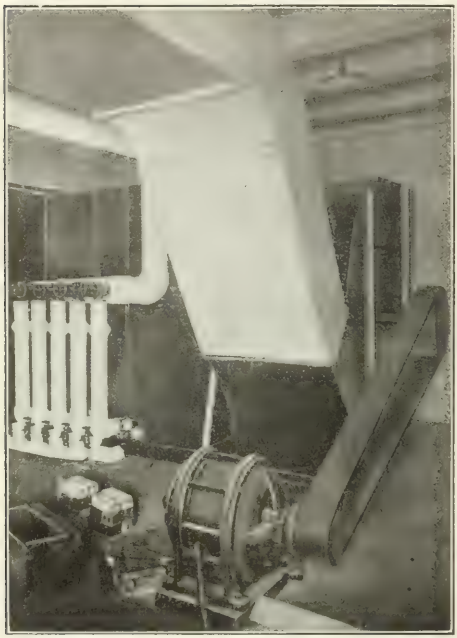


Fig. 1.—The Heating and Ventilating Equipment in the Yonkers Power House of the New York Central & Hudson River Railroad Company.

The batteries emit acid fumes which precluded the possibility of heating by direct radiation, as the fumes would attack and destroy the radiators and pipe lines. Hence a blower system was adopted and the entire heating plant is centralized in a detached building. The air is delivered to the various parts of the building through ducts, protected so as to resist the corrosive action of the acid fumes.

So far five of these stations have been equipped, including the power station at Yonkers, N. Y., which has its battery rooms, buss bar chambers, corridors, stair halls, controller chambers, &c., heated and ventilated by a blower system. The air is circulated through a sectional pipe heater by a steel plate fan which is driven by a belted motor as shown in Fig. 1. Steam is supplied to the heater by a small low pressure boiler, which is located in an adjacent room.

Two methods of distribution have been employed. In the Yonkers power station carefully protected galvanized iron ducts are used as shown in Fig. 2. In the substation battery rooms there is no piping, the air being admitted at one end through tile conduits terminating at registers made of 95 per cent. lead and 5 per cent. antimony.

The results have been equally as satisfactory by blowing in at one end of the battery rooms as when the air is distributed throughout the room by ducts with branches therefrom at frequent intervals. An advantage is the absence of the ducts on the ceiling, which, though they do not occupy space available for any other purpose, do not add to the appearance of the room, are costly to install and require frequent attention to keep them in a condition to resist the acid fumes.

The blower system is compact, easily accessible and under perfect control at all times, and is moderate in cost, easily installed and economical in operation and maintenance. Another feature is the flexibility, it being possible to deliver the air at any temperature without diminishing the volume, so that thorough ventilation is provided for the battery rooms while the batteries are being charged.

The heating and ventilating systems for these stations were designed by the American Blower Company, Detroit, Mich., and the apparatus was installed by John Hankin & Bro., heating contractors, New York City.

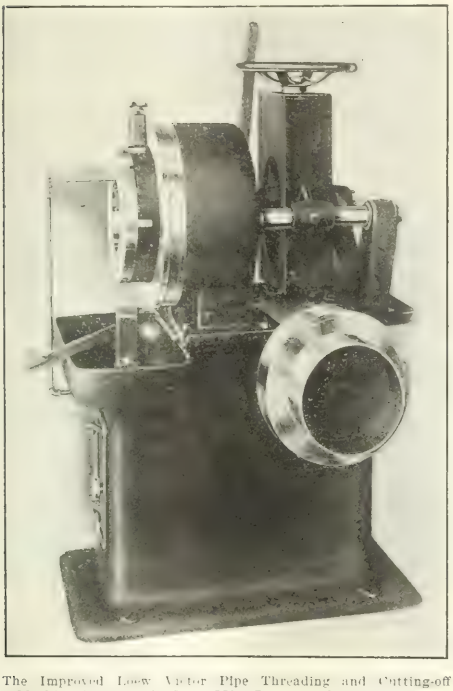
At a meeting of the directors of the New York Car Wheel Company held in Buffalo, N. Y., April 30, the resignations of W. G. Smith, Dr. Edwin Lodge and Herbert E. Boynton were accepted, and Frederick L. Colby, Oscar C. Shimmel and Herbert E. Payne were elected to serve in their stead. The new Board of Directors elected the following officers: Solomon Ginsburg, president; Bernard Ginsburg, vice-president; Edward W. Pendleton, secretary; James A. Venable, treasurer and general manager.



Fig. 2.—The Battery Room in the Yonkers Power House, Showing the Air Distributing System.

The 1908 Model Loew Victor Pipe Machine.

The Loew Victor pipe machines, made by the Loew Mfg. Company, Cleveland, Ohio, have been on the market for somewhat over two years, and in that time a number of both hand and power types have been added to the line. Of all these the principal features are the self-locking die head, which is designed on the principle of a universal chuck, and is free from wing nuts or other independent locking devices; the automatic die releasing attachment, which releases the dies after the thread is cut and removes the burrs from the thread at the same time, and the method of transmitting power through worm and worm wheel with ball thrust bearings, which insures a maximum amount of power and renders the machine noiseless in operation. All of the machines are now being equipped with cut-off attachments. These extend down through the solid part of the die head after



The Improved Loew Victor Pipe Threading and Cutting-off Machine Built by the Loew Mfg. Company, Cleveland, Ohio.

the manner of the dies. When the cut-off is in use the pipe is centered by an adjustable self-locking guide, similar to the self-locking feature of the die head, which obviates the necessity of using bushings.

One of the new styles just placed on the market is the 1908 model, an example of which is herewith illustrated. This machine is capable of cutting and threading pipe from 1½ to 6 in. in diameter. The principle of operation is in general the same as that of other machines made by this company and described in *The Iron Age* March 29, 1906, and April 11, 1907, so that it need not be entered into again at this time. The machine is claimed to embody all of the advantages of previous designs and in addition to be more efficient and durable.

More fully stated, the important points of this new machine, in addition to those already mentioned as characteristic of the original line, are strong and substantial construction, with the weight distributed where most effective, absence of gearing on the outside of the machine, which improves the appearance and eliminates the danger to the operator, and a self-locking adjustable guide which holds the pipe rigidly. This machine is offered in competition with machines of the lathe-bed type. Being only about one-third the size of the usual lathe-bed machine it is cheaper to manufacture, and it is claimed to do the same work.

A crank is furnished so that the machine can be operated by hand as well as by power. For power operation a 1-hp. motor is sufficient to drive the machine at full load. It may be mounted on the machine and preferably connected through a silent chain drive. The cast iron base contains a compartment for tools, dies, &c.

Above all else it was the object in the new machine to make it sufficiently strong and durable to withstand the same hard service which is expected of lathe bed machines. To this end the length of the base has been increased 8 in. and the diameter of the head and its bearing surface have also been increased. These enlargements and the new oil pan have added about 450 lb. to the weight of the machine.

Quietness in the British Iron Market.

Apart from foreign demand the British iron trade is very quiet. Stocks of pig iron in public stores continue to decrease, but the expectations of both buyers and sellers are indicated by the fact that for future delivery prices are from 1 to 2 shillings less than for early delivery. No. 3 Cleveland pig iron has sold recently at 51 shillings 6 pence for prompt delivery, while for June the price is 50 shillings 6 pence, and for the second half of the year 49 shillings 6 pence. Cleveland warrants can be had at about 3 shillings less for delivery three months ahead than for prompt. The stocks in Connal's stores, Middlesbrough, are smaller than in four years. On April 21 the stocks of No. 3 iron were 62,685 tons, a decrease since April 1 of 9967 tons. Export demand has apparently called for more than the current make available for that trade.

The situation in the shipbuilding trade is not encouraging, the amount of work on hand being small, and in addition there is little prospect that the strike at the shipyards will be settled at an early day. Many employees were locked out by the shipbuilding companies on May 2. At Barrow-in-Furness, a center of the hematite pig iron trade, the Barrow Company closed down its steel works last month because of the condition in the shipbuilding trade, and the prospect is that the plant may not be active again for six months. A steel plant in the Middlesbrough District may also be shut down for the same reason. While there is a fair demand for rails, the price has declined and the quotation of £5 15s. is now made.

British manufacturers of tubes recently participated in a conference at Düsseldorf, attended also by representatives of tube manufacturers in the United States and Germany. Some trouble had arisen over business in neutral markets. It is stated that a better understanding has now been arrived at relative to this trade, and that the agreement is still maintained. A movement is on foot to organize a number of the smaller tube manufacturers in Scotland into one large company with a capitalization of over £3,000,000.

The Pittsburgh Foundrymen's Association.—The regular monthly meeting of this association was held in the Hotel Henry, Pittsburgh, on the evening of May 4, the business session being preceded by a dinner. Dr. Richard Moldenke, secretary of the American Foundrymen's Association, and E. H. Mumford, president of the Foundrymen's Supply Association, were present and gave the members considerable information relative to the coming convention of the American Foundrymen's Association, to be held in Toronto, Canada, in June. The paper of the evening was on the subject of "Core Binders," and was presented by E. D. Frohman, Pittsburgh representative of the S. Obermayer Company of Cincinnati, Ohio.

We are officially advised that the report that the National Tube Company, Pittsburgh, would erect another blast furnace at its National Department, McKeesport, Pa., is untrue. This company has four blast furnaces at McKeesport, but has no present intention of increasing the number.

A Shaw 100-Ton Wrecking Crane.

A new railroad wrecking crane recently built by the Shaw Electric Crane Company, Muskegon, Mich., for the Illinois Central Railroad Company, is shown in the accompanying engraving. While it is in the main similar to the standard types, it is claimed to have distinctive advantages by virtue of the disposition of its parts. For example, an important feature, and one which gave rise to several improvements over former practice, is the placing of the engines in the reverse of the usual position, the cylinders being well back toward the rear, instead of toward the front of the crane. This position of the engine makes it possible to put the side frames farther apart and keep the machinery low, resulting in a lower center of gravity and giving the engineer a good view of the work without placing him in a dangerous position. It also allows short direct piping, isolated from the machinery and out of the way of the engineer's head.

The steam pipe branches at the throttle and extends down to the engine cylinders at each side just in front of the coal bin and water tank. The exhaust pipes pass underneath and up to a separator on the back of the boiler, from which the exhaust steam escapes through tubes inside of the boiler to the stack. The pipes thus located are entirely out of the way, and are not subjected to strains by any shocks that may cause deflection or vibration of the part of the frame carrying the boiler.

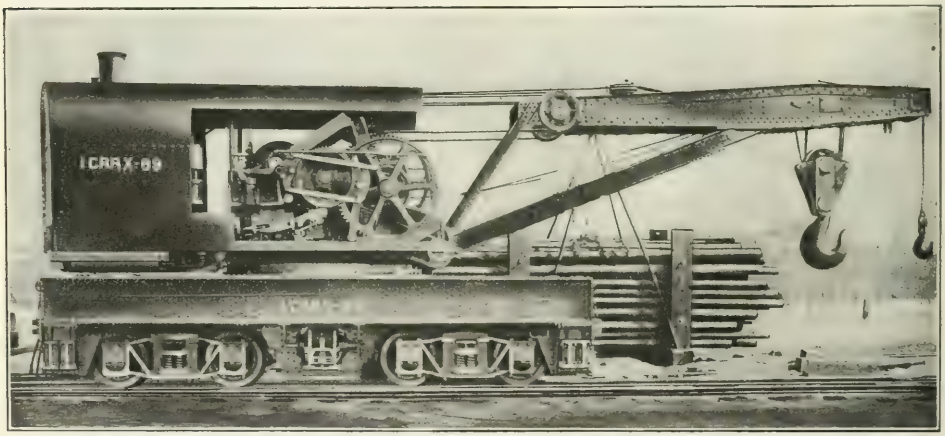
Another improvement is the use of steam to supply the main and auxiliary hoist brakes in addition to the usual hand applying mechanism. The auxiliary hoist is unusually powerful, having a capacity of 20 tons on a single line and 40 tons by the use of one sheave block. The main and auxiliary hoist parts are interchangeable, including clutches, all brake parts, gears, shafts, drums and ropes.

The jib is a departure from customary forms. The new design avoids the combined bending and compression strains of the old type, and gives a lighter and stiffer structure, adding to the safety and stability of the crane. An unobstructed passage for the engineer to and from the cab has been provided on both sides of the machine.

The engines have an improved Walschaert valve gear, which gives smooth action at all speeds and is easily reversed under load. Important features of the steam generating outfit are: forced draft, telescoping stack, shaking and dumping grates and dumping ash pan. The boiler has good reserve capacity and a special arrangement of the tubes permits easy cleaning of the crown sheet. A dry pipe is provided and every precaution taken to secure dry steam under all conditions.

The crane is self-propelling through gears driving to one axle of each truck, but this gearing in no way interferes with the free movement of the trucks when the crane is hauled by a locomotive. A friction drive is provided in the gearing to each truck, so that any inequality in the diameters of the driving wheels is taken care of. Self-lubricating center and side bearings make the crane superior to most rolling stock for taking sharp curves. These avoid the danger of derailing, which is inseparable from the use of rigid pedestals carried by the car body, sometimes used on self-propelling cranes. As the car is driven from both tracks, it will drive equally well with the load suspended at either end.

The crane has a complete air brake equipment, both automatic and straight air. By means of permanent pipe connections from the crane to the car, the straight air system affords means of complete control by the crane operator. The crane is principally of steel, very little cast iron entering into the construction. All requirements of such a machine have been considered in the design, and the workmanship is of the same quality that characterizes all products of the Shaw Electric Crane Company, for which Manning, Maxwell & Moore, 85 Liberty street, New York City, are sole selling agents.



A 100-Ton Wrecking Crane Built by the Shaw Electric Crane Company, Muskegon, Mich., for the Illinois Central Railroad Company.

The Technical Publicity Association, at its annual meeting April 30, elected the following officers to serve during the ensuing year: President, C. S. Redfield, advertising manager Yale & Towne Mfg. Company, New York; first vice-president, Rodman Gilder, publicity manager Crocker-Wheeler Company, Ampere, N. J.; second vice-president, C. N. Manfred, manager advertising department H. W. Johns-Manville Company, New York; secretary, H. H. Kress, publicity department A. S. Cameron Steam Pump Works, New York; treasurer, H. M. Davis, advertising manager Sprague Electric Company, New York. Members of Executive Committee: F. H. Gale, in charge of advertising General Electric Company, Schenectady, N. Y., and C. W. Beaver, special representative Yale & Towne Mfg. Company, New York. Twenty new members have joined the association since the last annual meeting.

R. Daae & Co., House Building, Pittsburgh, Pa., have been selected engineers for the United States Metal Recovery Company's new plant at Frisco, Pa. This plant, which is now being erected, is for the purpose of extracting rare metals from the crude ore.

England is beginning to build skyscrapers. The corporation of the city of Liverpool has authorized the construction of an office building 300 ft. high, opposite the Prince's landing stage on the bank of the Mersey.

Labor Measures in Congress.

The Eight Hour Bill Postponed But Anti-Injunction Bill May Pass.

WASHINGTON, D. C., May 5, 1908.—The developments of the past week in connection with pending pro-labor legislation have been of unusual interest. On the one hand, the movement to secure the passage of a Federal eight-hour law applying to private establishments has received a serious check, while on the other distinct progress has been made in the campaign having for its objects the curtailment of the power of the courts to issue injunctions in labor disputes and the amendment of the Sherman Anti-Trust law so as to exempt labor organizations from its provisions.

The Eight Hour Bill.

The House Committee on Labor, before which the so-called Gardner-Gompers eight-hour bill has been pending since the holiday recess, has finally disposed of the measure for the present session by referring it to a special sub-committee, with instructions to make a thorough investigation as to the constitutionality of its provisions. This sub-committee will probably not report until Congress meets again next December. When the bill was first taken up for hearings it was referred to a sub-committee of five members, two of whom were known to favor it, while two were believed to be opposed to it, Chairman Gardner, the fifth member, holding the balance of power. Upon the conclusion of the hearings accorded to the manufacturers and employers, a number of attorneys presented arguments in which the question of the constitutionality of the proposed law was raised with such effectiveness that the sub-committee decided to report the bill to the full committee without recommendation, but with the suggestion that its constitutionality should receive further consideration. This suggestion was adopted by the full committee, and Chairman Gardner thereupon appointed Messrs. Haskins of Vermont, Norris of Nebraska and Rainey of Illinois, all of whom are lawyers, with instructions to decide the question as to whether any feature of the measure is repugnant to the Constitution. The friends of the bill offered a motion that the sub-committee be instructed to report in a week, but this motion was lost, a fate which also befell a second motion directing a report within a fortnight. In view of this action the sub-committee stands without instructions as to the date of its report and its members have no present intention of attempting to decide before the end of the present session the important question delegated to it. The Congressional leaders are planning to adjourn for the summer recess on or about May 15.

Amendments to Naval Bill Rejected.

Unsuccessful attempts to force an 8-hr. provision into all contracts for warships and naval supplies were made in both Houses during the recent consideration of the annual naval appropriation bill. Mr. Hughes of New Jersey, a minority member of the House Labor Committee, offered the following amendment to the provision of the bill relating to the proposed increase of the navy:

> That none of the amount herein appropriated for such construction shall be expended where any laborer or mechanic doing any part of the work contemplated by the contract, in the employ of the contractor or any subcontractor contracting for any part of said work contemplated, shall be required or permitted to work more than eight hours in any one calendar day upon such work, except upon permission granted by the Secretary of the Navy during time of war or a time where war is imminent, or where any great national emergency exists; and provided further, that the contractor contracting with the United States shall, in the event of the violation of said covenant as to hours of labor, forfeit to the United States the sum of $5 for each laborer or mechanic for every calendar day for which he shall have been required or permitted to labor more than eight hours upon the work under such contract.

Chairman Foss of the House Naval Committee made the point of order against this amendment that it would change existing law and was therefore "new legislation," which, under the rules of the House, cannot be added to an appropriation bill except by unanimous consent. Mr. Hughes contended that his amendment merely operated as a limitation on an appropriation, but the chair sustained the point of order on the ground that the amendment clearly operated to modify the general laws under which naval construction is now carried on.

When the bill reached the Senate Mr. Culberson of Texas offered a duplicate of the Hughes amendment, but again it was ruled out. No further opportunity is likely to be presented for the consideration of any similar proposition.

The Anti-Injunction Bills.

The revival of interest in the proposition to limit the power of the courts to grant injunctions in labor disputes and to exempt labor unions from the operation of the Sherman Anti-Trust law is due to the special message forwarded to Congress on April 27 by the President. Immediately thereafter several new anti-injunction bills were submitted, the most significant of which was introduced by Mr. Payne of New York, chairman of the Ways and Means Committee and the majority floor leader. Mr. Payne's bill provides that "no preliminary injunction or restraining order shall be granted by any judge or court without notice to the party sought to be enjoined or restrained, unless it shall appear to the satisfaction of the court or judge to whom application for injunction or restraining order is made that the immediate issue of such injunction or restraining order is necessary to prevent irreparable damage." The measure also stipulates that "any such injunction or restraining order shall contain a rule on the opposite party to show cause within five days why such injunction or restraining order shall not be continued." This bill is said to have been modeled upon the rules of the State courts of Pennsylvania and is offered by Mr. Payne as a compromise measure. It is undoubtedly the most conservative of the bills heretofore presented in either House, and it is understood that it will be supported by the President if the labor leaders are willing to accept it as a compromise. Speaker Cannon, who has stoutly opposed the passage of any measure that would materially restrict the power of the courts in this regard, has intimated his willingness to permit the Payne bill to go through. There is much opposition to the measufe in the House, however, and many experienced lawyers in that body declare that the power of the courts in the matter of issuing injunctions is inherent and absolute, and that any measure restricting their authority will be held to be unconstitutional by the United States Supreme Court.

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To Amend the Sherman Law.

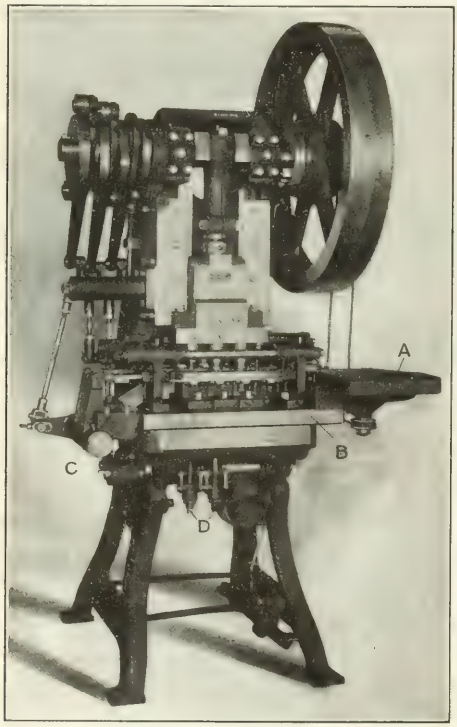
Extraordinary efforts are being made by the administration to force through at the present session the bill drafted by the National Civic Federation providing for the amendment of the Sherman Antitrust law, which was recently introduced in the House by Mr. Hepburn of Iowa, chairman of the Committee on Interstate and Foreign Commerce. A duplicate of this bill was presented in the Senate by Mr. Warner of Missouri, and the two measures are now pending before the House and Senate Judiciary committees, respectively. Hearings have been held upon these bills, but the leading members of both committees have expressed the opinion that the bill is crude and contains many unwise provisions. The subject is so important that it is not regarded as practicable to frame and pass a satisfactory law before the summer recess. Notwithstanding these views, however, the President is making a systematic campaign to secure the amendment of the Sherman act before the recess, and it is among the possibilities that legislation of some kind will be enacted at this session. Several bills containing but a single section exempting labor organizations and farmers from the operation of the Sherman act have been brought forward, and an attempt is being made to secure a compromise on one of these bills. The best lawyers in both houses take the position, however, that any such exemption would be unconstitutional. W. L. C.

The district office maintained by the Allis-Chalmers Company at San Francisco, with H. D. Scribner, manager, has been removed from the Atlas Building to the Phillips Building, which is near by, at 599 Mission street.

A Special Bliss Automatic Gang Press.

For a wide range of small articles from sheet brass, tin, copper and aluminum, a new special automatic press, shown in the accompanying illustration, has recently been built by the E. W. Bliss Company, 11 Adams street, Brooklyn, N. Y. It has three sets of punches and dies for performing successive operations on shells previously cut and partly formed in another press. The three sets act simultaneously on different pieces of work, so that a completed piece is discharged at each stroke.

The operation of the machine is entirely automatic. The drawn shells on which the die operations are to be performed are laid on the revolving friction dial A, right side up. This continually revolving dial is driven by a round belt from a groove in the hub of the flywheel and carries the shells up to a stop from which they are automatically released, one at a time, and gripped by the lateral feed B. This places the shell in position under the first operation die, after which operation it carries the shell from this through the subsequent operations, finally discharging it into the chute C, from which it falls into a receptacle placed to receive the finished articles. After the first three revolutions a finished blank is produced at each revolution of the press. The lateral feed is operated by cams on the end of the crank shaft through the medium of connecting levers and cranks shown on the side of the press. The positive knockouts D for the dies are operated in the same manner.



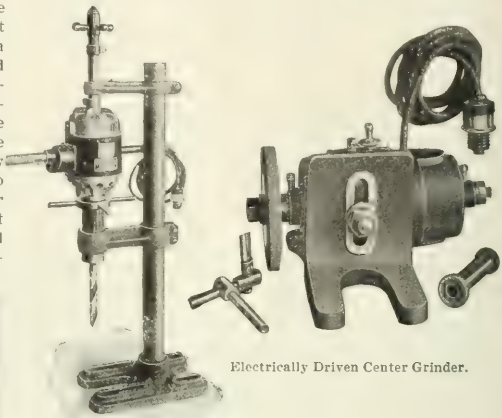
A Special Triple Operation Press Built by the E. W. Bliss Company, Brooklyn, N. Y.

The main slide is adjustable, allowing the use of dies for a variety of articles and providing for different hights of dies, as well as allowing for the wear on them. The lateral feed is adjustable in every way. An important feature not to be overlooked is the fact that at no time is it necessary for the operator to have his hands near the dies, thus doing away with all possible danger of accident to the operator.

The press runs at the rate of 75 to 100 strokes per minute, depending on the size and shape of the shell on which the operations are to be done, performing from 225 to 300 operations per minute. Since it entirely eliminates handling between operations it is claimed to be economical of time, labor and shop room.

Two New U. S. Electric Tools.

Two new products of the United States Electrical Tool Company, Cincinnati, Ohio, are presented in the accompanying illustrations. One is in a measure a combination tool, being an electric drill that can be held either in the hands or in the standard. In either sense it is portable, since it can be carried to the work and applied in any position. The other tool is a center grinder primarily, but may be used anywhere that a mounting is afforded for the supporting angle plate.



Electrically Driven Center Grinder.

Stand and Electric Drill.

Two New Products of the United States Electrical Tool Company, Cincinnati, Ohio.

The drill is capable of drilling holes up to 1¼ in. in diameter in steel, and has a positive feed of 3 in. extent. The idea of its combination with an adjustable stand with slotted feet for clamping bolts is to save the time of rigging up an "old man," and it is also more convenient since it supports the drill so that it cannot slip when starting the hole nor fall out of position when the hole pierces the work. The drill can be taken out of the stand and used as a portable electric drill, and is operated from an ordinary incandescent lamp socket on a current of 110 or 220 volts. The motor is of the air-cooled type.

Some special advantages are claimed for the center grinder. It is made with an angle plate which straddles the tool post of the lathe, and this angle plate is tightened by a simple manipulation of the tool in the tool post. This method of holding the motor makes the grinder very rigid and there is not the vibration that occurs when the motor is attached to a shank held in the tool post. The grinder can be raised and lowered on the angle plate to bring it in line with the centers and can be set at any angle. The bearings are adjustable for wear and are dust proof. The motor in this case also is of the air-cooled type.

M. Braudy & Sons, Grand Rapids, Mich., dealers in scrap iron and mill supplies, have purchased a 13-acre site on the line of the Pere Marquette Railroad at Detroit, and will construct warehouses and yards thereon at a cost of between $75,000 and $100,000. This branch of the business will be in charge of M. Braudy, while the original business at Grand Rapids will be continued by Samuel and Louis Braudy, junior members of the firm.

When Are Freight Claims Outlawed?

BY R. L. ARDREY.

Confusion appears to prevail in the minds of shippers and railroad claim agents regarding the time when claims for overcharges are barred or outlawed under the Hepburn law. Many shippers who have had correspondence with the Interstate Commerce Commission have understood that a claim must be filed with the commission within two years from the date of delivery of the shipment; that if not filed within this time it becomes invalid and the railroad cannot legally pay it, even though it may be willing to settle.

The average shipper, especially in the iron trade, has a large number of claims, often involving considerable amounts, which have been pending unsettled for more than two years. The shipper has been reasonably diligent in pressing these claims, but the railroad claim agent has found so many excuses for delay and further investigation that it may require several years more of persistent effort by the former to recover what is justly due him. It has not been uncommon in the past for claims to be paid after four or five years of correspondence, and there have been cases where shippers have brought suit and recovered claims after waiting with patience for eight or 10 years. State laws allow all the way from five to 10 years or more, under the statutes of limitation, before an account of this nature becomes barred or outlawed.

Section 16 of the Interstate Commerce law, as amended by the Hepburn act, reads as follows:

> All complaints for the recovery of damages shall be filed with the commission within two years from the time the cause of action accrues, and not after, and a petition for the enforcement of an order for the payment of money shall be filed in the Circuit Court within one year from the date of the order, and not after; provided, that claims accrued prior to the passage of this act may be presented within one year.

The Interstate Commerce Commission has held that old claims, which accrued prior to the passage of the Hepburn law, should have been filed prior to August 28, 1907, one year after the law went into effect. In Tariff Circular 15 A, Rule 81, the commission says:

> Claims filed since August 28, 1907, must have accrued within two years immediately prior to the date upon which they are filed; otherwise they are barred by the statute. Claims filed with the commission on or before August 28, 1907, are not affected by the two years' limitation in the act. The commission will not take jurisdiction over any claim for reparation or damages which is barred by the statute of limitation, as herein interpreted, and the commission will not recognize the right of a carrier to waive the limitation provisions of the statute.

Loss and Damage Claims Not Affected.

The claim agents of some of the roads are making very profitable use of this rule of the commission. While there are some claim agents who try fairly to get at the facts, and who pay promptly when they get the evidence to justify payment, there are others who act upon the theory that their duty is to evade the shipper as long as possible, even on a claim they know to be just, and they are making such free use of Rule 81 that they even quote it on loss and damage claims.

The commision, however, only has authority over claims relating to "rates, fares and charges," and it has declined to receive or consider claims from shippers for loss or damage. The rule above quoted, therefore, refers only to claims for reparation where unjust or unreasonable rates have been collected. The term "damages" in the law is used in the legal sense, to denote money recovered. The laws of the States fix the time when claims for loss or damage to property in transit become outlawed.

The paragraph which has been quoted from Rule 81 of Tariff Circular 15 A is entitled "Statute of Limitation," and it conveys to the ordinary layman or shipper the impression that an overcharge claim is outlawed after two years; and it then becomes an unlawful act for the railroad to pay it. This would be a remarkable provision of law. In the ordinary course of the business of railroad claim departments, a large proportion of claims are not paid within two years, and scarcely one shipper in a thousand has known how to prepare the papers for filing a claim with the commission without employing an attorney, so that, by the act of bringing proceedings before the commission, the claim might be kept alive. The railroad which does not want to pay claims would only need to delay the shipper for two years, by one pretext or another, when it could plead that the law did not permit it to pay after two years.

Overcharge Claims Not Outlawed.

Lawyers seem to understand Rule 81, and it is unfortunate that the language used is not clear to the layman. The rule is not a "statute of limitation" in the ordinary sense of the term, and it does not make a claim invalid after two years, nor make it a crime for a railroad to pay a claim more than two years old. It merely limits the "jurisdiction" of the commission, without affecting the validity of a claim, or the right of the shipper to collect it by other means than through the commission, after the two years have expired. Section 22 of the Interstate Commerce act expressly says: "Nothing in this act contained shall in any way abridge or alter the remedies now existing at common law or by statute, but the provisions of this act are in addition to such remedies."

Advantages of Filing Claims with the Commission.

Congress has created, in the Interstate Commerce Commission, the most "business like" tribunal in the world. When a business man brings suit in court he must pay costs, employ an attorney, obtain personal service on the defendant through a court officer and comply with all the ancient forms of court procedure. Ordinary business documents are not accepted by a court as evidence until they have been identified and proved by living witnesses, under oath, and at every step tedious formalities must be complied with under penalty of losing the case on a technicality. Good lawyers always advise a business man to keep out of court.

This advice, however, should not apply to the Interstate Commerce Commission. It is a very simple matter to submit an "informal" complaint. It is not necessary for the commission to give a public, formal hearing unless the shipper or the railroad demands it, and the shipper does not need an attorney. The greater number of the complaints brought to the attention of the commission are considered informally, by the consent of the parties interested, and this makes the proceeding as simple as an ordinary case of arbitration before a committee of business men or an old time proceeding before a guild committee under the law merchant. The shipper submits his papers and facts just as he would submit them to the railroad claim agent, and the commission is able to handle an enormous amount of business in this informal manner without any red tape or expense to the shipper.

A circular which any shipper can obtain explains how to present a claim to the commission, and an informal complaint is so easily presented by correspondence that it might be a useful precaution for shippers to watch their claim files, and present claims to the commission when they are nearing the age of two years, merely to keep them within the jurisdiction of the commission, so as to take advantage of this simple procedure in case it becomes necessary.

A Doubt About Old Claims.

The Hepburn law has not been in effect two years, so there is no difficulty about presenting complaints of overcharges since August 28, 1906. The commission, however, is declining to receive complaints regarding shipments prior to the passage of the law. It may be that in these cases the shippers who are disappointed have been barking up the wrong tree. Sections 15, 16 and 16a of the law, in connection with which the so-called "statute of limitation" appears in section 16, seem to deal entirely with the power of the commission to change a published tariff rate, and to give the shipper reparation or damages where it is found that a rate is unjust or unreasonable. Congress has provided that where the commission makes a new rate, after a complaint and hearing, its orders shall be limited to two years. It would be reasonable to provide in this connection that the commission should not have the power to go back farther than two years in requiring reparation by the carrier where a regularly published rate is condemned.

Practically all of the overcharge claims which shippers hold against the railroads are for money paid in excess of the regular and lawfully published tariff rates, or what the shipper understands to be the lawful rates. This is an entirely different proposition. The law makes it a criminal offense to overcharge the shipper, an offense that is not outlawed for three years. It would be a remarkable application of law to bar the injured party in two years from recovering his money, when the criminal offense is not barred for three years. Very few members of Congress are shippers, and the more reasonable view of the matter, from the standpoint of a layman, is that Congress knew nothing about what the shipper calls "overcharges," and intended only to limit the retroactive effect of the rate making power which was given to the commission.

The total of the capitalization and current liabilities of the directly operating street railroad companies in Pennsylvania in 1907 was $240,224,061, an increase of $56,570,620 over 1906. To this must be added $224,329,881 of capital stock and debt of companies leased and operated by other companies, making the total capitalization of street railroads in Pennsylvania $464,553,942.

The statement of the Pittsburgh Coal Company for the first quarter of the year makes the following comparisons, which reflect the unsatisfactory condition of general business:

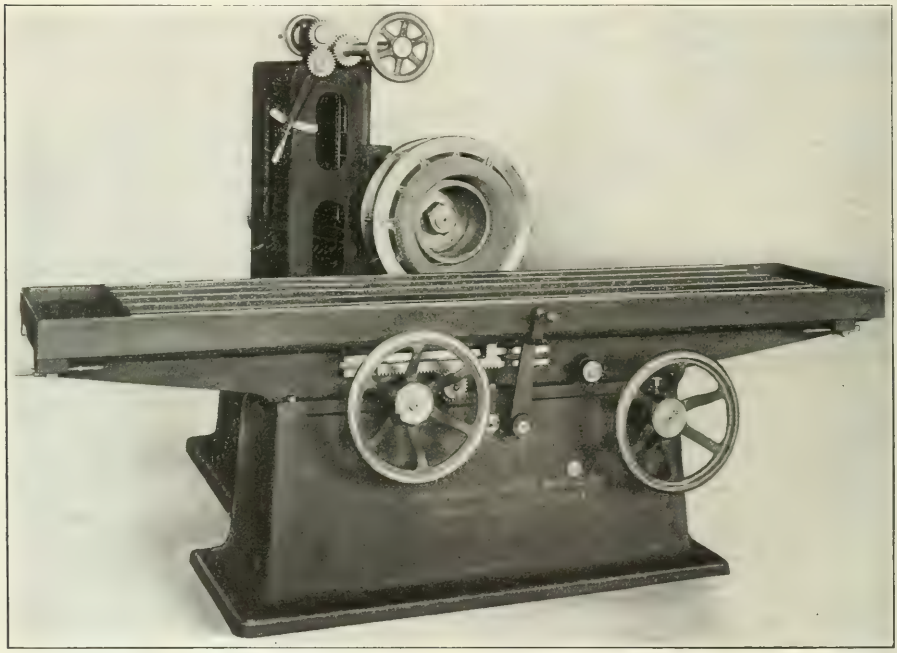
	Tonnage.		
Coal—	1908.	1907.	Decrease.
Pittsburgh District	2,704,873	3,637,163	932,290
Hocking District (Ohio)	205,599	219,715	14,116
Totals	2,910,472	3,856,878	946,406
Coke—			
Pittsburgh District	2,648	113,796	111,148
	Earnings.		
Gross earnings	$515,992.48	$1,025,429.54	$509,537.06
Allowance for depletion of coal lands	120,214.04	459,899.05	39,655.01
Allowance for depreciation of plant and equipment	257,837.27	255,236.52	*2,600.75
Accrued interest, first mortgage bonds	263,300.00	282,964.17	19,664.17
Net loss	125,388.83		
Net earnings		327,329.80	542,718.63

* Increase.

An Automatic Ring Wheel Edge Grinder.

For grinding from the rough the flat edges and surfaces of iron, steel and brass shapes, the Safety Emery Wheel Company, Springfield, Ohio, has recently perfected an automatic grinder, two views of which are shown in the accompanying illustrations. The need of economical production along these lines was the motive which prompted its design. Grinding is often the most rapid as well as the cheapest method for removing material. Not only is it possible to remove the rough stock, but a finer finish can be obtained than by any other method. In many instances a grinder replaces, to advantage, a planer, milling machine or shaper.

The grinder is of heavy and rigid construction throughout, and is entirely automatic in its operation. The base is a single casting, and extends back for the upright support of the wheel head. An extra long bed supports the carriage, which travels in one flat and one V way. The carriage is provided with a table or platen with T-slots to which the work can be clamped with suitable jigs or fixtures. The carriage is triple back geared; all gears and racks are cut from the solid.



The New Automatic Ring Wheel Edge Grinder Built by the Safety Emery Wheel Company, Springfield, Ohio.

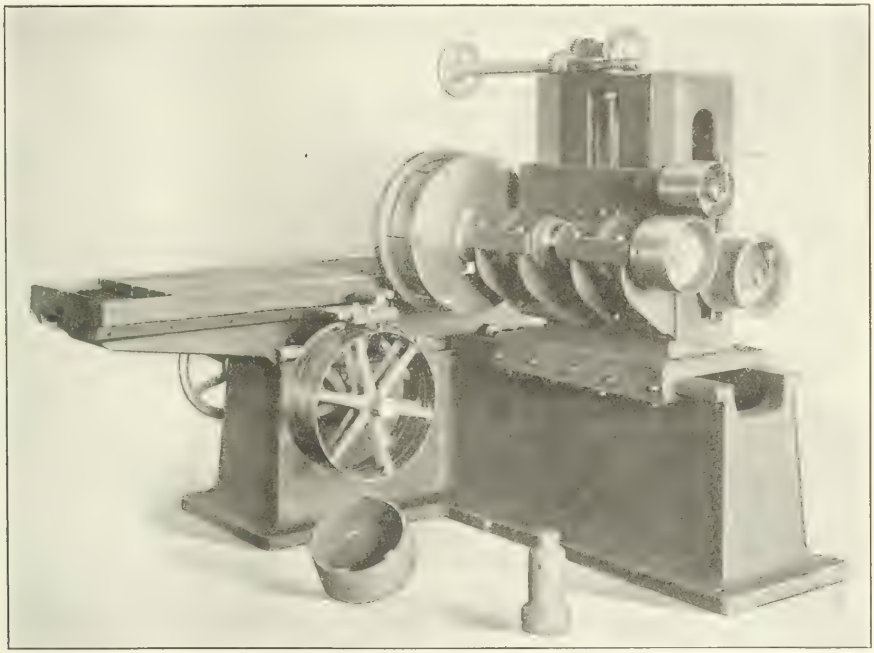
The grinding wheel is of the ring or cylinder shape, and is held firmly in the company's patent safety chuck, which permits without danger the high speeds so essential to fast cutting. A full line of wheels is also manufactured by the company. The wheel spindle is supported in heavy bracket bearings, which in turn are fastened to the sliding head on the upright. Thrust bearings are provided and means for taking up end play. The vertical adjustment of the wheel is 12 in., and is operated by hand or power feed as desired.

The wheel head and the upright slide on gibbed ways; the wheel is fed to or from the work by a large feed screw operated automatically by dogs at the extremes of the carriage travel. The dogs, as shown in the front view at each end of the carriage or table, are threaded pins providing fine adjustment. At the extremes of travel these dogs operate on a sliding rack, which in turn is connected through a train of gears to a gear and ratchet plate sleeve on the feed screw. This ratchet plate is directly behind the large hand wheel at the left. The hand wheel is secured to the feed screw and acts as a driver when feed-

ing automatically by the engagement of a pin located on the hub; when feeding by hand this pin is disengaged. By properly adjusting the dogs, any desired feed from 1-1000 to ⅛ in. may be secured. All ways are hand scraped to proof staffs to insure accuracy.

The motion of the carriage is under the complete control of the operator, and can be stopped at any desired point by throwing the reverse lever to its central or neutral position, or can be run back and forth by operating the lever by hand, or by means of the large hand wheel at the front. Reversal of the carriage or table is accomplished by the action of the solid dogs on the reverse lever, as shown projecting up toward the surface of the table. This lever is connected by a link and crank mechanism through the base to a cam plate in the rear, directly above the driving pulleys. The table is driven by a rack, which is triple back geared to the center driving pulley. The cam plate operates belt loops which guide the belts, one straight and one cross belt, from the countershaft, the same as on a planer. All the operating mechanism is at the front and within easy reach from one position. The machine is fitted for supplying water to the grinding wheel when so desired, as is necessary when grinding steel, &c. The rear base serves as a reservoir for water from which it is delivered to the wheel by a centrifugal pump. A heavy knife bar, such as is used on the company's standard line of knife grinders, can also be furnished, which can be bolted to the table for grinding any length of knife up to the capacity of the machine, and readily removed when not needed.

The sizes of table working surfaces vary from 17 x 50 in. wide up to 17 x 130 in. wide; the larger sizes have a central base with pedestal end supports for the bed. The other style of machine, carrying a larger wheel with solid head, is recommended for heavy work, such as guide bar grinding, &c.



Rear View, Showing the Drive of the Automatic Ring Wheel Grinder.

On May 8, the New York office of the Ohio Brass Company, whose main offices and works are at Mansfield, Ohio, will be removed from its present location in the Wall Street Exchange Building, 43-49 Exchange Place, to room 1022, Hudson Terminal Building, with entrances at 32 Cortlandt street and 30 Church street. The company's Chicago office was removed May 1 to suite 508, Fisher Building, corner Dearborn and Van Buren streets, one block north of its old location at 321 Dearborn street.

Scrap Classification to Be Standardized.

At a meeting of the Railroad Storekeepers' Association, to be held in Chicago, May 25, the question of unifying the different scrap classifications of the various Western railroads will be taken up with a view to securing an agreement upon a single classification, which shall be adopted as a standard by all lines. To this end a compilation of the several classifications used by nine of the leading Western roads has been prepared in which the individual classification of each road is shown. This has been submitted to the principal scrap dealers, whose suggestions as to the preferable grouping of material are invited. Considering the unlimited opportunity for misunderstandings and controversy that present methods of independent classification afford, it is highly desirable that the efforts of the association shall yield tangible results.

A meeting of the committee having this matter in charge will be held next week for the purpose of considering the suggestions offered and compiling data for presentation at the regular meeting of the association. This committee is comprised as follows: J. P. Murphy, general storekeeper, Lake Shore & Michigan Southern; J. M. McCarthy, purchasing agent, Chicago, Rock Island & Pacific; G. R. Ingersoll, purchasing agent, Lake Shore & Michigan Southern; A. C. Mann, chief clerk purchasing agent, Illinois Central; T. J. Frier, general storekeeper, Chicago, Burlington & Quincy; H. E. Rouse, general storekeeper, Chicago & Alton.

The H. K. Porter Company, having general offices in the Union National Bank Building and works at Forty-ninth and Railroad streets, Pittsburgh, has recently taken an order for six of its 18-in. gauge air locomotives for gathering purposes in the mines of the Homestake Mining Company, Lead, S. D.

THE IRON AGE

Established in 1855.

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The Steel Corporation's Earnings in 1908.

The United States Steel Corporation's report for the first quarter of the year has been variously commented on, and differences of opinion are natural at a time when the general disposition is to find favorable signs, even though current business is at the lowest point for the year. There is not much call for analysis of the statement. The outstanding fact in it is that at $18,229,005 the earnings were about 45 per cent. of the average in 1907, when the total was $160,964,673, or at the rate of about $40,000,000 a quarter. Knowing that in the main the prices realized on the business of the first three months of this year were up to the average for 1907, it may be inferred that the shipments of the first quarter were about 45 per cent. of the average for a 1907 quarter. For the entire year 1907 the corporation's production for shipment was 10,578,433 gross tons, or an average of 2,644,608 tons per quarter. Forty-five per cent. of this amount would be 1,190,073 tons.

Turning now to the statement of unfilled orders on hand March 31, the total is reported to have been 3,765,343 tons, or 859,210 tons less than on December 31, 1907. We have not attached the significance to these statements of unfilled orders that in some quarters has been given them. For one thing, no explanation has been published of the way in which continuous sliding scale contracts are reckoned in making up these totals. However, on their face the last two statements of orders on hand, when taken in connection with the approximation made above of the tonnage of rolled material shipped in the three months ending with March, would indicate that the new business booked in the first quarter of the year was but a small fraction of the corporation's capacity.

The smallness of the deductions made from the first quarter's earnings for sinking fund on bonds of subsidiary companies and for depreciation and extinguishment funds has been a matter of comment. The amount so deducted was $2,026,745 ($291,518 for sinking fund and $1,771,227 for depreciation and reserve). This compares with $4,154,521 for the March quarter last year and $6,723,230, $7,109,180 and $6,177,798, respectively, in the subsequent quarters. As between a statement showing that the common dividend was not wholly earned and one making a small deduction for depreciation, the latter alternative was evidently chosen.

It is to be remembered in connection with any analysis of the Steel Corporation's financial statements that the policy in prosperity is to make deductions for depreciation, replacements and new property that at such times seem inordinate to holders of common stock. Last year the amounts set aside for new construction reached a total of $54,000,000, and in 1906 they were $50,000,000. These amounts were in addition to $3,500,000 for special replacement and improvement funds and $15,560,237 which the annual report designated as "the regular provision for the year" for extraordinary replacement funds. It is to be recalled, also, that before the total earnings, $160,964,673, for 1907 were arrived at, deductions had been made by the various subsidiaries for "ordinary repairs and maintenance," amounting approximately to $35,000,000.

In the light of the exceedingly heavy, even drastic, deductions made in good years, the statements of the corporation in years like 1908 seem to be entitled to a less pessimistic judgment than has been passed by some reviewers.

British Manufacturers and the Campaign Against Free Trade.

Until the split in English political parties over Gladstone's Home Rule bill in 1886 British iron and steel manufacturers were mostly of the Liberal party. Up to that time, by tradition and association, most manufacturers in England were with the Liberal party. Thousands of them changed their political alignment in 1886 and threw in their lot with the Liberal Unionists. This change soon came to mean that they were of the Conservative party, for only in a few places since 1895 have the Liberal Unionists maintained their political organizations and sought to hold themselves apart and distinct from the Conservatives, with whom for more than 20 years they have been so closely allied. What proportion of English iron and steel manufacturers is now prepared to act with the Conservatives and support the movement for tariff reform is almost impossible of ascertainment, but if conditions in one important iron and steel district are any guide, the tariff reform movement as it is now being pressed on the British electorate must be receiving considerable support from these interests.

Warrington, which is the town in mind, is one of the oldest and one of the largest centers of the iron and steel industry in Lancashire. There are three great plants there, which for many years have enjoyed a world wide distinction for their output. The men in control of two of these plants are to-day among Chamberlain's strongest supporters, although the father of one of them, who was one of the founders of the largest plant, was actively associated with Cobden in the movement which resulted in 1846 in the adoption of free trade in England. Long before the United States began to export iron and steel, Warrington had to meet with much competition from Belgium and Germany; and it is probable that this competition has had more to do with bringing Warrington iron manufacturers into line with the Chamberlain movement than any competition which the old established industries of the town have had to meet from this side of the Atlantic.

Most of the Warrington men who have identified themselves with the Chamberlain movement are active in the political life of the constituency—a constituency which is now represented in the House of Commons by a free trader. But in industrial England employers have little influence over the votes of their work people. This influence has decreased with the successive extensions of the Parliamentary franchise, with the growth of population in the industrial centers, and, in recent years with the organization of the Independent Labor party, which has now some 30 representatives in the House of Commons. If Warrington is taken as typical of the iron and steel

centers of England and Scotland, and the proportion of iron and steel manufacturers in favor of the abandonment of free trade is as large at each of them as it is at Warrington, the Chamberlain party can count on the votes of the individual manufacturers. They can control few Parliamentary votes other than their own, however, although they may be able to subscribe pretty liberally to the funds by which the present vigorous and persistent Chamberlainite propaganda is being maintained.

The Health of Industrial Employees.

The health of employees in manufacturing establishments constitutes a factor in economical production which is highly worthy of consideration. The workman who has to be absent a part of the time because of bodily ailment must necessarily upset shop routine; if his work is highly specialized, so that it is difficult to fill his place temporarily, the result may be serious in disturbing the balance of manufacturing. Even if a man continues his employment despite impaired health his usefulness depreciates perceptibly.

Progress in shop sanitation has of late been rapid. Good light, ample ventilation, better heating apparatus and approved toilet conveniences have been carefully provided. Manufacturers have kept pace with the general movement to better the condition of those whose days must be spent in factories. Environments have been made satisfactory in most trades. To-day science is going beyond this point. The workman is receiving individual attention from his employer and from those who frame laws. An important step in this direction was toward protection from contagion, especially from tuberculosis. Such pioneer movements as that inaugurated at Providence, R. I., some two years ago have served as powerful examples to other communities, for so excellent have been the results that the initial work of the Brown & Sharpe Mfg. Company and one of the large textile mills of the city has now extended to include 35 employers of labor, with thousands of employees on their payrolls. Under this system the shop management maintains the right to suggest the examination of any employee who may have symptoms of tuberculosis, while the employee may forestall the suggestion and seek the services, free of charge, of a highly trained specialist who is co-operating in the work. Victims of the disease are assisted as far as possible in securing employment out of doors or in seeking a more congenial climate. No tuberculosis patient is permitted to remain in the works. The movement is spreading elsewhere. In Connecticut a commission is investigating the general subject of tuberculosis with the purpose of recommending State laws to govern its control, including its presence in manufacturing establishments.

The modern tendency to look after the health of individual employees is shown in another aspect in a new movement in this country, following one that has been in progress abroad for several years. It has been started by the Dental Hygiene Council, recently organized by delegates representing several American dental organizations of the highest rank, including that of Harvard University. Its special purpose is to furnish literature designed for popular education and to further advance the science of the hygiene of the mouth. A specific purpose is to co-operate with organizations working to check and control tuberculosis. Physicians agree that many of the evils that come to the human body are due directly or indirectly to failure to care for the teeth properly. Malnutrition alone is a frequent outcome of such negligence. As a means of infecting the system with the bacilli of disease, especially tuberculosis, typhoid and diphtheria, ill cared for teeth have no superior in the whole anatomy.

An excellent beginning in this direction is being made in the public schools by instruction in the hygiene of the body and by a system of medical and dental inspection. Many cities employ physicians to inspect the schools regularly for cases of sickness, defective hearing and sight, &c. In a few places high class dentists are provided to make compulsory examination of the teeth of children and to furnish treatment free of charge or at small cost. If this system spreads through the country, as it is believed it will, the workman of the future will be blessed. It is advocated that the education of employees, especially of young persons, in this direction would bear profitable fruit. In a small way this sort of work is already going on. The foreman who takes an interest in those under him will advise skilled treatment for any trouble that comes to his attention, especially if it causes the employee to lose time. It is confidently prophesied that the general modern movement will go much farther than the point it has now reached as the employer assumes a more direct interest in his working people, impelled by the combined motives of human kindness and the practical business advantage that comes with the services of employees in the full possession of their health. If this condition is brought about it will be but following along the same line as that of the shop surgeon of the present day, a side of industrial management which is becoming common, and which is supplemented in large works by well equipped private hospitals. Already there has grown out of this practice the employment of a regular shop physician who looks after employees when they are ill as well as when they have been injured. The best of the cotton mills of the South are said to have adopted this system as a most important element in keeping together their communities of workers.

It is not difficult to see where a judicious system of education of employees in the various sides of hygiene might be profitable. Probably many employers would answer that such seed would fall on barren ground; that literature and lectures, and even advice from heads of departments or other administrative officers, would receive scant attention. Yet there must always be a percentage of receptive minds, especially among the younger element, who have not formed prejudices against the teachings of modern medical science, who would materially profit by a work of this kind. Light and ventilation and sanitary plumbing do not constitute everything in making shop or factory environment wholesome and healthful. Individual hygiene among employees is as important. The danger of infection, one from another, must be guarded against, a matter of special importance where contagious disease is epidemic, as it is occasionally in industrial communities. Attention to these details must not be regarded by the business man as a philanthropy alone, although it is occasionally applied with that end only in view. It is a matter of economics. There can be little doubt that the normal, healthy workman does better work and more of it during a given period of time because he is strong of body, clear of mind and happy of spirit.

In certain lines some manufacturers of highly finished products, who have been taking business at exceedingly low prices in anticipation of cheaper steel, have evidently become convinced that no reduction is to be expected in the near future, and are covering at least part of their requirements. This is a development of considerable im-

portance, as it tends to allay the suspicion that the low prices referred to would not have been made if these manufacturers had not had the backing of some of the steel makers. It is possible that the disposition to "go short" on raw material has been quite extended, and that for this reason the maintenance of prices may soon lead to much more buying as delivery dates draw nearer.

The Waterways of the United States.

Associations of business men from various parts of the country have been pressing upon the attention of Congress proposals for waterway improvements which would involve the expenditure of about $500,000,000. Many of these proposals have great merit, and the majority of them would prove good investments for the nation if they were all carried through to completion. The country has no national system of waterways, but if a few connecting links and river improvements were provided it would make a great difference in the cost of assembling raw materials for industries and the cost of carriage of other bulk freight.

At present the railroads carry more than 93 per cent. of the inland freight of the country. The Great Lakes carry about 5 per cent., the Ohio River less than 1 per cent., the Mississippi less than one-third of 1 per cent., and various canals and rivers contributing similarly small fractions. While waterways carry so slight a share of the tonnage of the country, they have been of great value in the past, and may be equally important in the future, in fixing the cost of materials.

Railroads Competing with Existing Waterways.

Pittsburgh, with no native iron ore on which to build up a great industry, has the cheapest coal in the United States, brought in by river or by rail, and by the latter at low rates to meet river competition. The low cost of carrying ore on the lakes has made the district between the Ohio River and Lake Erie the greatest iron producing center in the world. Fifty years ago, when railroads carried only passengers and package freight, no one dreamed that it would ever be possible for them to carry bulk freight at the low rates which prevail in the Pittsburgh-Lake Erie District; yet the railroads which have developed this traffic are the most prosperous in the country.

In the same manner the Erie Canal established a low area of raw material costs along the line from the Hudson River to and through the lakes, and great manufacturing cities have grown up along this line and in the area to the south of it, where the trunk lines from Chicago to the seaboard have made low rates to meet lake and canal competition. The most remarkable feature of this problem is that water competition makes railroads pay, because it builds up industries by making low rates for bulky materials. A casual glance at the map of the country will show that the railroads which have no water competition have very little industrial development.

The people of New York State seem to have had an instinctive understanding of this fact when they gave an overwhelming majority, five years ago, in a referendum vote, to the proposal for spending $100,000,000 in building a new Erie Canal. The engineers estimate that when the new canal is completed freight can be carried between New York and Buffalo at a cost of 25 cents per ton. The canal will take barges of 1500 tons capacity, and one boat with power can tow three, so that one crew will handle a maximum cargo of 6000 tons.

Government records based on more than 50,000,000 tons of freight passing through the Sault Ste. Marie Canal show that the average freight paid on all classes of lake traffic in 1906 was 0.84 mill per ton-mile. On the average haul of 842 miles this would be equal to about 70 cents per ton. This would make the cost of transportation about $1 per ton, or 5 cents per 100 lb., between New York harbor and ports on the lakes.

Proposed Important Waterways.

Barges adapted to the Erie Canal would not be strong enough to go on the lakes or the Atlantic, but they could use the proposed coast inland passage from Boston to Beaufort, S. C., which might be extended to Florida. This proposed passage would seem at first thought to be a useless expenditure of public funds, but it would afford a much wider range of usefulness to the canal barge and would bring a large industrial area into direct and cheap communication with the lakes. Only four artificial links are needed: A short canal from Massachusetts Bay to Long Island Sound, a new canal from New York Harbor to the Delaware River, one from the Delaware River to the upper end of Chesapeake Bay, and from the lower end of this bay to Albemarle Sound. The two last mentioned links are only 14 miles in length.

The taxpayers of Chicago, through a commission authorized by the State of Illinois, have expended $50,000,000 on a wide 22-ft. channel from Lake Michigan to Lockport, on the Des Plaines River, a short distance above the junction of the latter with the Kankakee to form the Illinois River. In the State election next fall the people of Illinois will vote on a proposal to expend $20,000,000 in extending this waterway to the head of navigation in the Illinois River, and to develop incidental water power. The water diverted from Lake Michigan has made a minimum depth of 8 ft. in the Illinois River below La Salle, but there are rapids and other obstacles to be overcome between Lockport and La Salle. Some years ago United States engineers made a survey which showed that it would only cost $23,500,000 to make a 14-ft. channel from Lockport to the Mississippi River, which is less than half the amount that Chicago has already expended.

Possibilities of the Mississippi River.

The Mississippi below Cairo has a minimum depth at the lowest stage of water of 10 to 12 ft., and a much greater depth for the greater part of the year. It carries a paltry 5,000,000 tons of freight annually, much of this coming from the Ohio River, compared with 100,000,000 tons carried annually on German rivers and 30,000,000 to 40,000,000 tons on the Rhine. From Cairo to St. Louis there has been a minimum of 8 ft. of water the past three years, but north of St. Louis, to St. Paul, there is a low water season when the depth does not exceed 5 ft. South of St. Louis there are few winters when the river freezes over.

The Missouri River has been neglected for many years by Congress, and is now full of sand bars and snags which make navigation dangerous, but the business men of Kansas City organized a barge line two years ago which they have been operating successfully. A large steel company in Chicago was puzzled last summer by the fact that a jobbing customer at Kansas City could sell merchant iron and steel in that territory at lower prices than cost and freight would apparently permit. Investigation disclosed the fact that the jobber was having his goods shipped to St. Louis by rail and from there to Kansas City by barge. There would be great possibilities in combinations of rail and river rates if the Mississippi and its tributaries were developed as highways for traffic, as illustrated in this instance.

The business men of Kansas City are working vigorously for the improvement of the Missouri as far as Sioux City. The river has sufficient volume for a minimum depth of 12 ft., and it is estimated that the cost of establishing a permanent channel of this depth would be about $50,000 per mile, while the river would have the capacity of many lines of railroad. It could be made navigable for more than 2200 miles from St. Louis.

The Ohio River, although plans adopted by Congress 30 years ago for a 6-ft. minimum depth have never been completed, carries 15,000,000 tons of freight annually. It has many navigable tributaries, and if these and the rivers flowing into the Mississippi were connected with the lakes at Chicago the West would have a great system of internal waterways.

Barge Capacity.

The capacity of barges in a canal is limited more by the width of the channel than by the depth, but on a

river large cargoes can be taken in a fleet of barges. One river steamer used as a towboat has taken a fleet of barges from Pittsburgh to New Orleans, carrying the enormous cargo of 70,000 tons of coal. A lumber company on the lower Mississippi uses a towboat and three barges, which take 10,000 tons up stream at the rate of 8 to 10 miles per hour. The barges on the Mississippi are usually lashed together in a triangular formation, with the towboat at the rear, so that 20 or more barges can be taken in one "tow."

River transportation is so much cheaper, mechanically as well as financially, than hauling by rail that it is surprising that more use is not made of the great river systems of the West. The improvement of the Ohio may lead to a larger development of this traffic. The shipping interests of the Ohio Valley are asking Congress for a 9-ft. channel, but if they were sure of a 6-ft. minimum at the lowest stage from Pittsburgh to Louisville they would make the Ohio the Rhine of America.

The national Government has expended hundreds of millions of dollars for harbor improvements and for works like the Sault Ste. Marie Canal and other lake improvements, all of which have proved valuable in promoting commerce. The advocates of interior waterways claim that equally great benefits would accrue from the expenditures which they propose. The freight tonnage of the country has doubled in the past 10 years, and if it goes on increasing at anything like this rate the existing railroads will be unable to handle it and provide for the growing interference of passenger with freight traffic.

Cincinnati Metal Trades Committees.

President John W. Neale of the Cincinnati Metal Trades Association has just named his standing committees for the year. The Cincinnati organization is one of the largest in the country, and in the distribution of work President Neale has selected his material carefully and included every branch of manufacturing concerned in the organization. The new committees are as follows:

EMPLOYMENT BUREAU: E. F. Du Brul, Miller, Du Brul & Peters; Oscar Mueller, Mueller Machine Tool Company; Rudolph Mueller, William Powell Company; H. M. Norris, Bickford Drill & Tool Company.

FINANCE: J. C. Hobart, Triumph Electric and Triumph Ice Machine companies; Fred A. Geier, Cincinnati Milling Machine Company; Samuel L. Moyer, Lunkenheimer Company; S. P. Egan, J. A. Fay & Egan Company.

MEMBERSHIP: P. G. March, Cincinnati Shaper Company; S. P. Egan, Fay & Egan Company; August Tuechter, Cincinnati Machine Tool Company.

TRANSPORTATION: C. Wood Walter, Cincinnati Milling Machine Company; C. P. Egan, Fay & Egan Company; William Hermann, Fosdick Machine Tool Company.

APPRENTICESHIP: J. H. Day, J. H. Day Company; C. H. Fox, Ahrens Fire Engine Company; Joseph Wolf, Hisey-Wolf Company.

TECHNICAL EDUCATION: Fred A. Geier, Cincinnati Milling Machine Company; J. C. Hobart, Triumph Electric and Triumph Ice Machine companies; J. H. Day, J. H. Day Company; William Lodge, Lodge & Shipley Company; S. P. Egan, Fay & Egan Company.

CO-OPERATIVE COURSE: A. E. Robinson, American Tool Works Company; George Langan, Cincinnati Planer Company; O. H. Broxterman, Steptoe Shaper Company; Isadore Rauh, Cincinnati Electrical Tool Company.

NEW TOOLS AND DEVICES: F. L. Swanberg, D. T. Williams Valve Company; William A. Greaves, Greaves, Klusman & Co.; William F. Pfau, Towsley Mfg. Company.

LEGISLATION: F. Pentlarge, Sr., U. S. Bung Mfg. Company; Geo. McG. Morris, John B. Morris Foundry Company; F. Johanningman, J. M. Robinson Mfg. Company; Philip Gaukel, Chas. R. Hoppe & Co.; John McNeale, John Douglas Company; Hugh Merrie, Merrie Company.

ENTERTAINMENT: E. H. Hargrave, Cincinnati Tool Company; P. O. Geier, Cincinnati Milling Machine Company; R. B. McGowan, John H. McGowan Company; E. Von Wyck, Von Wyck Machine Tool Company; S. C. Schauer, Cincinnati Machine Tool Company.

Experiences at recent meetings of the association and comparison of notes regarding business indicate that there is a better feeling among the members. The annual diversion in which the working forces from all the shops participate will be a feature of midsummer. The Cincinnati organization is the one which first agitated the subject of trade schools, and this subject will be a special study with the committee named on technical education.

March Exports and Imports of Iron and Steel.

Our iron and steel exports are showing a continuance of the increase noted in recent months, according to the report for March of the Bureau of Statistics of the Department of Commerce and Labor. The total value of such exports, not including ore, for the month of March, was $15,165,910, against $14,069,249 in February and $13,643,828 in January. Taking the commodities for which quantities are given, the March total is 96,437 gross tons, against 81,755 tons in February and 74,352 tons in January. The following table gives details of the exports of such commodities for March and for the nine months of the current fiscal year ending with March as compared with corresponding periods of the previous year:

Exports of Iron and Steel.

	March,		Nine months.	
	1908.	1907.	1908.	1907.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	2,528	7,291	38,823	63,490
Scrap	1,940	1,730	13,111	10,606
Bar iron	507	783	11,494	37,604
Wire rods	356	5,775	4,958	8,395
Steel bars	5,830	3,540	53,795	27,966
Billets, blooms, &c.	23,444	14,343	79,660	93,944
Hoop, band, &c.	181	667	7,784	5,195
Steel rails	10,107	25,310	231,252	220,945
Iron sheets and plates	2,761	2,736	32,642	20,000
Steel sheets and plates	4,982	9,190	47,116	71,899
Tin and terne plates	2,639	825	7,671	4,248
Structural iron and steel	13,185	11,778	107,047	90,075
Wire	12,252	13,576	120,873	123,820
Cut nails	582	342	4,326	5,352
Wire nails	3,235	4,268	30,390	29,082
All other nails, including tacks	340	680	4,723	5,085
Pipes and fittings	11,568	9,953	138,255	94,227
Totals	96,437	112,787	933,920	911,933

The imports of iron and steel show no recovery from the decline, which has been in progress for several months. The total value of imports of iron and steel and manufactures thereof, not including ore, for March was $1,696,800, against $1,697,525 in February and $2,076,766 in January. The decline is more perceptible in imports of commodities for which quantities are given, as the total of such imports for March was only 15,885 gross tons, against 19,054 tons in February and 28,008 tons in January. The following table shows the details of the imports of these commodities for March and for the nine months of the current fiscal year ending with March as compared with corresponding periods of the previous year:

Imports of Iron and Steel.

	March,		Nine months.	
	1908.	1907.	1908.	1907.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	5,711	55,692	186,773	392,381
Scrap	434	502	16,966	13,246
Bar iron	1,918	2,660	30,484	30,055
Rails	28	395	2,209	3,524
Hoop, band, &c.	151	....	437	4,058
Billets, bars and steel in forms n.e.s.	1,054	1,207	13,785	15,230
Sheets and plates	179	256	1,984	2,777
Tin and terne plates	5,343	7,268	42,384	45,407
Wire rods	1,025	1,459	11,125	13,134
Structural iron and steel	42	233	1,367	8,588
Totals	15,885	69,672	307,514	528,400

The imports of iron ore in March were 52,729 gross tons, against 80,094 tons in February and 75,997 tons in March, 1907. The imports of ore from Cuba were 48,990 tons, against 37,420 tons in March, 1907.

The total value of all kinds of exports of iron and steel, not including ore, for the nine months ending with March, was $145,565,259, against $132,025,706 in the corresponding period of the previous year, while similar imports were respectively $22,867,114 and $29,072,327.

The Daisy Automatic Dryer Company, 506 Grant street, Pittsburgh, manufacturer of automatic machines for drying sand, gravel and other minerals, is now building them in various sizes to suit requirements. The company has prepared a catalogue covering a description of the machine.

The Westinghouse Electric & Mfg. Company's Condition.

Stockholders of the above named company received last week a letter from George Westinghouse, president, in which the situation in the affairs of the company is plainly stated. After reviewing what has been accomplished since the appointment of receivers, October 23, toward harmonizing the interests of various creditors, he refers to the lack of response on the part of stockholders to the request for new capital made a year ago this month. In this connection he says:

In order to meet the situation resulting from this lack of support on the part of the stockholders, the Security Investment Company, with the aid of my personal resources (the Investment Company and myself owning together about 50 per cent. of the outstanding assenting and preferred stock), made large contributions to the company in an effort to maintain its solvency. These efforts resulted in the exhaustion of my own resources as well as those of the Security Investment Company. It is, however, my expectation that through a plan and agreement recently submitted to the creditors of the Security Investment Company, which has already been accepted, signed or agreed to by many of its large creditors, the assenting stock required to be taken by that company will be provided for as well as the stock required to be taken by me personally.

There have, however, already been deposited under the Readjustment Committee's plan of January 20 more than a majority of all of the creditors' claims, and this majority empowers the Readjustment Committee to determine the advisability of a sale of the company, so that a failure on your part to subscribe for one new share of assenting stock for each four shares or fraction thereof of preferred and assenting stock held by you will almost certainly result in a sale of your property for the benefit of creditors (and the elimination of all present stock interests), and will, in my judgment, entail losses to the property far in excess of the sum required to rehabilitate the company.

Should the usual course of a sale to a new company be adopted, there undoubtedly would be some provision for a participation by those stockholders who will submit to an assessment in order to retain their interest in a greatly depreciated equity; but this assessment will certainly be larger in amount and upon more onerous terms than the subscription now solicited.

Mr. Westinghouse presents the following reasons why sbtockholders should act promptly in making subscriptions to their pro rata number of assenting shares:

I believe the plan of the merchandise creditors, to which I have given my time and best thought and which has my unqualified approval, is the only plan which will restore the value of your interest in the company. If all stockholders subscribe, the merchandise creditors' plan will be made effective and the company placed on a strong financial basis, making the purchase of the new stock a safe investment besides restoring the value of your present holdings with an assurance of dividends after the restoration of general business to a normal basis.

If a sale of the property results from the inaction of the stockholders, no money invested in the purchase of a future interest as a result of a drastic reorganization can be anything like as safe and profitable an investment as the subscription to shares now asked for with a consequent uninterrupted operation of the company. Will not each stockholder assist the efforts being made by the Readjustment Committee, the Merchandise Creditors' Committee, numerous stockholders and many others interested in the situation to perpetuate a business of such great importance in the industrial world, and thereby protect his own interests? If you do not subscribe, you in effect vote for a sale of the property by the creditors and thus the elimination of all stock interests.

The Stockholders' Committee, composed of Charles Francis Adams, Charles J. Canda, George W. Guthrie, Alvin W. Krech and George T. Oliver, also addressed a circular to stockholders, in which they say:

We join with George Westinghouse, president of your company (to whose official and personal efforts you largely owe the forbearance of your creditors and the present opportunity to protect your investment), in again urging your immediate response to our circular of April 3. The failure of any stockholder to take his pro rata amount of the new stock affects, not only his own interests, but also those of all other stockholders.

Over 500 stockholders have already subscribed for the new stock at an average rate slightly above one share for every four shares of existing stock held by them. These subscriptions are exclusive of the very considerable amount already under agreement in the interest of the Security Investment Company. It rests with the stockholders to determine whether by promptly subscribing for the new stock, they will protect their property and save it from being sacrificed at forced sale by the creditors.

The Franklin Institute.

The April issue of the *Journal* of the Franklin Institute contains the text of a lecture delivered by Dr. Persifor Frazer before that society on the occasion of the reception held February 14 to inaugurate formally its reorganization. Founded in 1824, the institute has an admirable record of work performed by able and unselfish men in promoting the progress of the mechanic arts by exhibitions, by the publication of its *Journal*, by its lectures and school and by its library. It never received any aid from the Federal Government, from the State of Pennsylvania or from the city of Philadelphia. In recent years the average annual cost of running the institute has been about $20,000, of which less than one-tenth is covered by its income. Following are some interesting excerpts from Dr. Frazer's lecture:

In February, 1906, it was ascertained that although in the previous year the increased principal of the Franklin fund, less the £1000 set apart by the will, had been awarded by the Board of Wills Hospital and Minor Trusts to a body of citizens for the erection of an art gallery, yet no steps had in the meantime been taken to erect such a gallery, and the conditions of the gift being unfulfilled the appropriation was null and void.

A committee was appointed to solicit contributions for a new building. Alfred C. Harrison was a member of this committee, and in addition to his generous acts in connection with this and many other charitable institutions, he headed the list with a subscription of $50,000, to which the Baldwin Locomotive Works added $25,000. In a short time $100,000 was subscribed.

The city of Boston had managed the like sum of £1000 which Franklin had left to its care so much more successfully than the city of Philadelphia that it had grown to $418,000 in contrast with $125,000 here. The city of Boston determined to apply it to the erection of an institute, and to this end donated a plot of ground worth $100,000. Andrew Carnegie gave an amount equal to that derived from the Franklin bequest toward this end, making the fund $836,000, or with the city of Boston's contribution $936,000—close to a million dollars.

The Franklin Institute Committee proposed to the Board of Trustees to transfer to the city of Philadelphia a plot of ground secured for the Franklin Institute at the corner of Sixteenth and Arch streets, and to add the sum of $100,000 to be paid to the city on condition that the city would become trustee of the building fund, holding the building when erected exclusively for the uses of the Franklin Institute; and further, that the city would add the Franklin fund of $125,000 to the institute's contribution of $100,000 for the purpose of erecting the building. This offer was accepted April 16, 1907. While the ability of the Franklin Institute to raise the necessary amount of money agreed upon was still in doubt, Mrs. Anna W. Walker generously and most opportunely gave the princely subscription of $50,000 in memory of her father, Mr. Weightman, thus clinching the proposition and assuring the institute a new lease of life under greatly improved conditions. The amount now in hand is as follows:

Franklin Fund, from the city of Philadelphia	$125,000
Old Building Fund	20,000
Subscriptions to date	193,455
	$338,455
Add the value of the present building (say)	60,665
Total in round numbers	$400,000

At least $200,000 more is needed to provide a suitable building as a memorial to Benjamin Franklin, and the (Benjamin) Franklin Institute, and an additional sum to furnish an endowment for maintenance.

The general plan is to erect a four-story building with high basement, which latter is to contain the laboratories and an exhibition hall, seating about 500 people. The second floor will contain the balcony of the auditorium

and the committee rooms, secretary's room and a museum showing the developments of the arts. The fourth floor is for the library, in which it is proposed to use the combined alcove and stack system. If the building be erected at Sixteenth and Arch streets the auditorium entrance will be on Sixteenth street and the main entrance on the new boulevard.

Seattle Business Notes.

SEATTLE, WASH., April 29, 1908.—Each month in the Northwest shows an improved condition in the iron and steel trade, though affairs have not yet reached the high water mark credited to last year. Seattle representatives of the Carnegie Steel Company and its allied concerns say that a slight betterment is to be noticed in the trade of April, as compared with March, with regard to bars, sheets, &c., used by the general trade. Agents of the American Bridge Company also say the tendency is toward improvement. Two or three large steel buildings are under way in Seattle and others are contemplated.

Because of the uncertain condition of the lumber business, through the fight against the railroads before the Interstate Commerce Commission, little steel has been bought in the last six months for the extension of logging roads. If the lumbermen win the long struggle, to the degree of a victory for the 40-cent rate into Missouri River territory, activity in logging operations will be resumed on an extensive scale. A. F. Coates, one of the heaviest timber owners in Washington, has just ordered 400 tons of logging rails for the extension of his operations in southwestern Washington into a new timber belt.

J. P. Morgan and the Guggenheims, who are jointly interested in immense projects in Alaska, have about 3300 tons of 70-lb. rails in Seattle awaiting shipment to their base of operations near the mouth of the Copper River. A total of about 6700 tons has been forwarded to the North, indicating the magnitude of the syndicate's operations in the Copper River District. The railroad is known as the Copper River & Northwestern, and is building in from the coast to the Bonanza copper property. It is estimated by mining engineers that the copper from this district can be put on the market at as low as 6 or 8 cents a pound. Eventually it is the plan to extend this railroad across the interior of Alaska to the Yukon, Fairbanks and Dawson. The Copper River is a large stream, and because of a glacier must be crossed twice not far from the mouth. The first crossing will be made by the railroad temporarily with trestlework, so that the construction of a bridge may proceed at the second crossing. These bridges when completed will be large structures, with a length of 1200 to 1500 ft., with spans of 500 or 600 ft. While the railroad is building to the mines, three or more boats are to operate from the Bonanza mine on the river carrying out ore. This service is to be established as soon as weather conditions permit.

The broad scope of the Morgan-Guggenheim operations is not realized generally. So far the syndicate has expended considerably more than $5,000,000 in Alaska, in addition to immense sums in low grade mining properties and huge dredges in the vicinity of Dawson, in the Klondike District. Some of the largest dredges in existence are operated in the worked-over ground of the Klondike, and they bring great yields because of the low cost of operation. The Morgan-Guggenheim interests have obtained control of most of the boat lines to Alaska, they are close to the management of the White Pass & Yukon Railway, and by dominating other concerns have obtained what is virtually a monopoly of transportation to and from Alaska and in the district itself.

Seattle is the main base for the operations of the syndicate, which is generally known as the Northwestern Commercial Company. Annual meetings of this concern and its subsidiaries, the Northwestern Fisheries Company, the Katalla Company, the Alaska Steamship Company, &c., have just been held in Seattle, and have been attended by S. W. Eccles of New York. Mr. Eccles announces that three or more steel boats will be built to add to the Alaska fleet, and that the company's expenditures in Seattle hereafter will aggregate $4,000,000 to $5,000,000 annually.

Several million feet of lumber have been purchased on Puget Sound by the railroad syndicate, for the Alaska timber is not available for or suitable to the company's needs. In the fisheries operations the Northwestern Fisheries Company has sent north tin and sheet iron to the extent of 40 carloads. About eight canneries are to be operated this year.

Northwestern steel and iron men are interested in the awarding of contracts for the supply of iron and steel equipment by the Government for the Puget Sound Navy Yard and the Mare Island yard at San Francisco, bids for which are to be opened in Washington May 12.

The approaching visit of the battleship fleet to Puget Sound, scheduled for May 23, has stimulated activity at the Puget Sound Navy Yard, which has just completed a renovation of the Pacific squadron, consisting of a dozen battleships and cruisers. The navy yard now employs 2200 men.

Moran Brothers' ship yards at Seattle have launched what is said to be the most powerful tug on the Pacific. It is for the Southern Pacific Railway Company, and will be used for towing in San Francisco harbor and fire protection to the Harriman terminals in that city. The tug has been christened the Ajax, and will cost when completed approximately $100,000. It is 110 ft. long and has engines totaling 800 hp.

W. T. P.

Labor Notes.

The annual convention of the Amalgamated Association of Iron, Steel and Tin Workers began its sessions in the Tod House, Youngstown, Ohio, on Tuesday, May 5. P. J. McArdle, president of the organization, has appointed Wage Scale committees, with a vice-president as chairman of each, as follows: Boiling Division, Thomas Williams, Pittsburgh; Finishing Division, Ben. F. Jones, East Chicago; Sheet Division, Llewellyn Lewis, Martins Ferry; Tin Division, Walter Larkins, Martins Ferry. The convention will be important, as it is probable that the bar iron manufacturers will demand a lower wage scale, and also for the reason that the Republic Iron & Steel Company some time ago terminated the agreement by which its mills were to continue in operation after July 1, when the scale expires pending a settlement of any dispute by arbitration. It is not known at this time what the policy of this company will be toward the Amalgamated Association when the present scale expires on July 1, but it is likely that all the bar iron manufacturers will demand a reduction in puddling and finishing. It is not unlikely that the sheet and tin plate makers, in view of the lower prices ruling for sheets and tin plate, will also ask a reduction.

Members of the Iron Molders' Union who went on strike from the foundries of Milwaukee May 1, 1906, were given notice April 23 that they would not be paid any more strike benefits by the national union after May 5. The local union thereupon declared the strike at an end. It is said to be unlikely that any of the strikers can be given positions as it is the intention of the foundrymen to take care of the independent men, some of whom are idle at present on account of the depressed condition of business. The Milwaukee molders' strike was by far the largest of that craft in number of men and plants that has taken place in a single city in many years.

One of the important branches of the National Metal Trades Association reports that the number of men sent out by its employment bureau last week to take positions indicates a greater demand for competent men, and that many concerns report a gradual return to their former number of employees.

A firm of Boston, Mass., steam fitters, which maintains an open shop, made the lowest bid for work on a city hospital contract, but did not receive the award. Its attorney carried the matter to the Mayor, who decided against the hospital trustees, and took the position that reputable firms operating open shops must not be discriminated against.

PERSONAL.

Frederick D. Herbert, formerly of the Allis-Chalmers Company, is now manager of the New York office, 90 West street, of the Terry Steam Turbine Company, Hartford, Conn., builder of low speed steam turbines for direct connection to pumps, generators and fans.

Edward Bailey Cook, manager of the Warwick Iron & Steel Company, Pottstown, Pa., has gone abroad to visit blast furnace plants in England and Germany.

H. R. Fothergill, engineer and manager of the Scholl Engineering Company, Youngstown, Ohio, has resigned as general superintendent of the Greenville Traction Company, superintendent of the Greenville Gas & Electric Light & Power Company, and superintendent of the Paris Mountain Water Company, all of Greenville, S. C., being operations owned by the American Pipe Mfg. Company (syndicate), Philadelphia. The employees of these companies presented Mr. Fothergill with a fine gold watch, suitably engraved, as a testimonial of their esteem. Having won a high reputation as a constructor of power plants, he will devote most of his efforts in that direction.

The Electric Welding Products Company, which is the new name of the Cleveland Cap Screw Company, Cleveland, Ohio, announces that Edward Busby, formerly with the Midvale Steel Company, is now engaged in its selling department. He has a wide acquaintance among automobile, engine and machinery manufacturers.

W. R. Burrows, formerly purchasing agent for the Norfolk & Southern Railway, has taken charge of the railroad department of Topping Brothers, 122 Chambers street, New York, manufacturing ball bearing jacks, track drills, tool grinders and the Totten brake beam clamp invented by Eugene Totten of the New York Central Lines.

H. G. Perring, secretary of the Engineers' Club of Philadelphia, and formerly engineer with the Keystone Fireproofing Company, has been secured by the General Fireproofing Company, Youngstown, Ohio, as district manager at Philadelphia, with offices in the Drexel Building.

Simon C. Collin has resigned as chief engineer of the Cargo Fleet Steel Company, Middlesbrough, England, and has returned to this country, to engage as consulting engineer in designing steel plants and rolling mills. Mr. Collin's address is 5217 Ridge avenue, Philadelphia.

W. Sandford of Lithgow, New South Wales, pioneer in the Australian iron industry, arrived from Europe last week on the Lusitania, on his way to his home.

W. E. Frick of the Frick & Lindsay Company; W. T. Todd of Somers, Fitler & Todd, dealers in mill and mine supplies, and W. L. Rodgers, president of the Pittsburgh Gauge & Supply Company, will represent the Pittsburgh Chamber of Commerce at the national conference of Charities and Correction, to be held in Richmond, Va., May 6-13.

Edward S. Illig, San Francisco sales manager for the Bethlehem Steel Company, headquarters in the Sherwood Building, is visiting the Eastern States on business.

President R. T. Crane of the Crane Co. pany, Chicago, has been visiting in San Francisco.

Millard F. Bowen has resigned as secretary of the Manufacturers' Club of Buffalo, and has established himself as industrial lawyer at 730 Ellicott Square, Buffalo.

George E. Huggins, superintendent of the Valley Works of the Republic Iron & Steel Company at Youngstown, Ohio, has resigned and has been succeeded by Frank Cunningham, formerly superintendent of the company's Toledo Works.

C. H. Zehnder has resigned as president of the Allegheny Ore & Iron Company, to give closer attention to his interests in the Austen Coal & Coke Company, the Alma Cement Company and the Scranton Bolt & Nut Company.

The annual meeting of the Morse Twist Drill & Machine Company, recently held at New Bedford, Mass., resulted in the election of the following officers: Directors: Thomas M. Stetson, Gideon Alen, Jr., Herbert E. Cushman, Thomas S. Hathaway, Edward T. Pierce, Russell Grinnell; treasurer, Herbert E. Cushman; clerk, Thomas S. Hathaway. During the year $162,000 was paid in dividends, and about $4000 was carried to surplus. The treasurer's report of assets and liabilities was as follows: Assets—Real estate, $173,785; machinery, $494,775; merchandise, $136,232; cash, debts receivable, $181,490; total, $986,284. Liabilities—Capital stock, $600,000; accounts payable, $68,318; surplus, $121,956; profit and loss, $196,009; total, $986,284.

OBITUARY.

STEPHEN D. NEAL, Southington, Conn., manager of the Ætna Nut Company, died April 21, aged 47 years. He was the son of Roswell A. Neal, and was born in Southington, where his entire life was passed. After attending the public schools and the Connecticut Litreary Institute at Suffield he entered the employ of the Peck, Stow & Wilcox Company, of which his father was president, and later became the purchasing agent and secretary of the company. He went to the Ætna Nut Company 12 years ago as its manager. He was prominent in the affairs of the town, and took an active interest in fraternal societies. He leaves a widow and son.

BERNHARD KEISER died at Fullerton, Pa., April 30, aged 80 years. He was one of the early German engineers in this country, a foundryman and machinist, and designed a number of blast furnaces and much of the mining machinery then in use. He was engineer for the Thomas Iron Company, Hokendauqua, Pa., for many years, and later was one of the members of the firm of Barber, Keiser & Co., foundrymen, at Allentown, Pa. He retired from business some 20 years ago. He was the father of H. B. A. Keiser, formerly chief engineer for the Carnegie Steel Company, now retired and living at Cleveland, Ohio; Frank B. Keiser, Southern furnace superintendent for the Republic Iron & Steel Company, at Birmingham, Ala., and Edward H. Keiser, professor of chemistry, Washington University, St. Louis.

WILLIAM RANDOLPH GARBERSON died suddenly of heart failure at his residence in Chicago, April 29. He had attended to the duties of his business during the day. He was connected with Pickands, Brown & Co. in the capacity of sales agent, and had previously served Joseph T. Ryerson & Son in the same capacity in their New York office. Mr. Garberson was secretary of the Glen View Golf Club and a member of the Chicago Athletic Association. He is survived by a daughter and son, the latter being Harry W. Garberson, formerly assistant superintendent of the Zenith Furnace Company, Duluth, Minn., and now connected with the Semet-Solvay Company, Ensley, Ala.

The S. Keighley Metal Ceiling & Mfg. Company, 819 Locust street, Pittsburgh, manufacturer of the Keighley dust and airproof lock joint metal ceilings, has received an order for 100 squares of ceilings for a department store at Huntington, W. Va.; also an order for a carload of the same style for shipment to San Antonio, Texas, where it will be placed in a convent building. The company is working on some new designs of lock and lap joint ceilings, which it will have ready for the trade in about a month, at which time formal announcement will be made and printed matter issued showing the several styles.

The Jamison Coal & Coke Company, Pittsburgh, in a recent leaflet gives the averages of ash and sulphur determinations for its coke in the four months ending with March. The highest monthly average for sulphur was 0.92 per cent. and the lowest 0.88 per cent. The highest month's average for ash was 11.18 per cent. and the lowest 11.12 per cent. In December 36 determinations were made; in January 40, in February 33 and in March 40. The company has 1250 ovens in Westmoreland County, Pa., with a capacity of 60,000 tons a month of 72-hr. foundry and 48-hr. furnace coke.

Trade Publications.

Steel Springs.—Standard Steel Works, Harrison Building, Philadelphia, Pa. Catalogue. Presents views of the company's spring shops, describes method of testing springs and illustrates a number of elliptic springs designed for heavy locomotive service, coil springs for freight cars, &c. Several dimension sheets are given to facilitate ordering springs.

Lathes, Tools, and Supplies.—Sebastian Lathe Company, Covington, Ky. Catalogue No. 12. Covers products manufactured, engine lathes, foot lathes, speed lathes, and bench lathes, and products handled, shapers, planers, drill presses, attachments, tools and supplies. Lathes up to the 15-in. gap engine type are shown and considerable space is devoted to illustrating and describing wood turning tools, lathe sets, and attachments.

Pipe and Pipe Fittings.—Best Mfg. Company, Pittsburgh, Pa. Folder. Describes the evolutions of flange attaching and the making of pipe connections, by the company's method of welding. Also illustrates the Best gate valves.

Furnaces.—Murphy Iron Works, Detroit, Mich. Catalogue; 22d edition. Pertains to the Murphy automatic smokeless furnace which mechanically feeds and distributes coal, removes ash refuse and is adaptable to any type of boiler. This furnace is fed from coal magazines placed on each side, at the bottom of which are coking plates against which inclined grates rest. Coal is pushed out over the coking plate and travels down the grates toward a clinker grinder which removes the ashes. Sectional views of the furnace are shown and a number of installations are illustrated.

Milling Machines.—Garvin Machine Company, Spring and Varick streets, New York City. International catalogue, edition C; 6 x 9 in.; 96 pages. Gives descriptions in English, German and French of the company's various types of universal and plain milling machines, automatic slot milling attachment, motor-driven milling machines, vertcal milling machines, hand milling machines, die slotting machines, universal cutter and tool grinders, dividing heads, vertical spindle attachments, and a milling machine vise.

Power Transmission Appliances.—Oneida Steel Pulley Company, Oneida, N. Y. Catalogue No. 3; 6 x 9 in.; 121 pages. Contains illustrations, descriptions, and prices of the company's various types of wood, iron and steel, and steel center wood rim pulleys, and also shaft hangers, oiling boxes, countershafts, ball and socket hangers, post hangers and boxes, pillow blocks, wall frames, couplings, belt tighteners, belting, clutches, &c. Tables of weights, dimensions, and considerable data of practical utility are included. An inclosed folder shows an Oneida steel split pulley 80 in. in diameter by 24 in. face.

Boring Mill Accessories.—Bullard Machine Tool Company, Bridgeport, Conn. Catalogue E 14; 6 x 9 in.; 67 pages. This is somewhat of a novelty in trade publications in that it is devoted to boring mill accessories. It aims to show the users of the company's vertical boring and turning mills, how to realize their full producing capacity by providing adequate tool equipment. The accessories illustrated include boring, thread-cutting, chasing and combination boring and reaming bars, core drills, reamers, tool holders, standard boring mill tools, bushings, collets, standard tool equipments, &c., and face plate and table adjuncts, such as jacks, chucks, chuck jaws, &c.

Boiler Feed Regulator and Pump Governor.—American Boiler Economy Company, North American Building, Philadelphia, Pa. Catalogue. Describes the Copes boiler feed regulator and the Copes pump governor. The former operates by the expansion of a composition-metal tube with changes of temperature, which opens a check valve in the feed line when the water in the boiler is below the desired level. A weight closes the valve through a toggle joint when the required level is reached. The Copes pump governor consists of a throttling valve placed in the pump steam line and controlled by a piston one side of which is acted upon by the pressure of the water from the pump discharge tending to close the valve, while steam pressure from the boiler acts on the other side, tending to open the valve. A counterweight is so adjusted that the valve will just seat when the feed line pressure is at a predetermined excess over the boiler pressure.

Boring, Drilling and Milling Machines.—Lucas Machine Tool Company, Cleveland, Ohio. Leaflets entitled "The Mathematical Cook" and "The Nightingale," referring to the Lucas Precision boring, turning and milling machine.

Presses.—Ferracute Machine Company, Bridgeton, N. J. Folder. Briefly describes some of the company's stamping, drawing, embossing and punching presses.

Machine Tools.—Garvin Machine Company, Spring and Varick streets, New York. Catalogue; edition F; 4 x 6 in.; 96 pages. Devoted to hand lathes, grinders, milling machine tools and attachments, screw machine tools and attachments, pulleys and countershafts. A large part of this book is given over to illustrations and descriptions of the various attachments, with tables and other information covering their use.

Bond Wire Protectors.—Railway Specialty & Supply Company, Chicago, Ill. Bulletin S-1127. Describes a new device intended to prevent vibration in bond wires and hold them out of the way of tools used in working on railroad tracks. The device consists of a hook which is secured by the track bolt and which holds the wires well up on the angle bar away from the rail bolt.

Centrifugal Fans.—Jeffrey Mfg. Company, Columbus, Ohio. Leaflet. Describes fans adaptable for mine ventilation, special features of which are concave curved vanes which discharge the air in a radial direction, and conical scoops which it is claimed prevent the gushing of air from the inlet. There is a table of tests and information necessary for making inquiries.

Welding Apparatus.—Goldschmidt Thermit Company, 90 West street, New York. Folder. Shows method of welding broken motor castings by the Thermit process.

Foundry Flasks.—Brass Founders Supply Company, 20 Prospect street, Newark, N. J. Pamphlet. Illustrates interchangeable flasks, which it is claimed are lighter than the average and therefore more easy for workmen to handle.

Crank Shafts and Connecting Rods.—Standard Connecting Rod Company, Beaver Falls, Pa. Booklet. Devoted to finished crank shafts, connecting rods and valve stems. Contains a series of illustrations showing the process by which a crank shaft is made and illustrates several types of shafts.

Steam Heating System.—Warren, Webster & Co., Camden, N. J. Part V of general catalogue. Concerns the Webster system of steam circulation for heating and contains a comprehensive description of the system, accompanied by an illustration showing the relation of the various parts and in particular the Webster specialties. The discussion of principles of operation and advantages is instructive.

Automatic Drop Lifter.—Miner & Peck Mfg. Company, New Haven, Conn. Leaflet. Gives directions for ordering Peck's automatic drop lifter and line cuts of the various sections of the appliance.

Lifting Magnets.—Electric Controller & Supply Company, Cleveland, Ohio. Catalogue. A number of the latest types of magnets are shown in use in large plants where iron and steel are handled. There are numerous illustrations of installations, including some powerful magnets lifting ingots, scrap iron and steel, rail butts and billets, &c. A detailed drawing showing the method of operating the magnets as hoists and loaders is given and some interesting data regarding the varied uses to which they can be applied.

Engine Lathes.—Lodge & Shipley Machine Tool Company, 3055 Colerain avenue, Cincinnati, Ohio. Catalogue S; 6 x 9 in.; 107 pages. A description of the special features of the company's patent head, screw cutting engine lathes is followed with specifications and full page illustrations of the 14 to 48 in. standard lathes, and the 36 and 42 in. massive patterns. Similarly the cone headstock lathes are covered. The remainder deals with motor drive, turrets and accessories which can be supplied for all standard engine lathes. An 18 in. x 8 ft. turret chucking lathe is also shown.

Threading and Cutting Machines.—Standard Engineering Company, Ellwood City, Pa. Two circulars. One pertains to the standard mill-type 6-in. pipe threading and cutting machine with expansion ring dies, for 1¼ in. to 6 in. pipe, and the other to the standard Wieland 8-in. pipe threader and cutter, with adjustable expanding chasers for 2½ in. to 8 in. pipe.

Pin and Block Wire Joints.—Railway Specialty & Supply Company, Chicago, Ill. Bulletin No. S-2117. Refers to the Rapid pin and block wire joint which has been perfected to replace soldered joints, and consists of a pin with two or more grooves, according to the wires to be connected, and a block of cold rolled steel, drilled to accommodate the pin and wires when driven home.

Steam Traps.—Consolidated Mfg. & Supply Company, Fulton Building, Pittsburgh, Pa. Circular. Illustrates and describes the operation of the Vance steam traps, which are made in ¾, 1, 1¼, 1½ and 2 in. sizes.

Drop Forgings.—Park Drop Forge Company, East Seventy-ninth street and Gordon Park, Cleveland, Ohio. Two pamphlets. These are entitled, "Short Stories About Steel." One treats of the early history of iron making in England, and the kinds of steel used in modern drop forgings. The stories in the other are of Dud Dudley and the invention of smelting with coal, and common elements found in steel.

Transformers.—Wagner Electric Mfg. Company, St. Louis, Mo. Bulletin No. 78. Deals with Wagner transformers, which are made for all purposes, all frequencies of supply service and all transformation voltages. Installations are shown and tables of weights, capacities, &c., are included.

Generators and Motors.—Sprague Electric Company, 527 West Thirty-fourth street, New York. Three bulletins. No. 107 describes the construction and use of the continuous current direct driven type S generators, with illustrations of parts and completed installations. They are especially designed for hotels, office buildings and apartment houses. No. 224 (second

edition) describes type D direct current motors, which are made in nine sizes, ranging from 10 to 90 hp. for standard slow speeds, and from 15 to 105 hp. for moderate speeds. Parts are illustrated and motors are shown in operation in various plants. No. 310 covers the application of the company's round type direct current bipolar and multipolar motors to the driving of fans and blowers; the former are particularly adaptable to small ventilating systems and are made in sizes up to 7½ hp., while the multipolar motors range from 10 to 105 hp. and are adaptable for large blowers.

Alloys for Steel.—George G. Blackwell, Sons & Co., Ltd., Liverpool, Eng. Pamphlet. Size 4 x 5¾ in. Fifth edition. Discusses the uses and properties of ferrochromium, ferrotungsten, ferromolybdenum and other electric furnace ferroalloys.

High Speed Steel.—Firth-Sterling Steel Company, McKeesport, Pa. Pocket size catalogue, 3½ x 6¼ in.; pages 63. Prominence is given to Blue Chip high speed steel and to special tool steels, large stocks being carried by E. S. Jackman & Co., agents, Chicago. A view is given of Blue Chip hardening department at the Chicago warehouse. The chloride of barium process for treating taps, formed tools and others is illustrated. A graphite crucible is placed in a cylindrical gas or oil furnace, and the top is sealed so that gas of the furnace cannot reach the bath. The crucible is filled with barium chloride to which about 2 per cent. of soda ash is added.

Propeller Wheels.—Michigan Wheel Company, Grand Rapids, Mich. Catalogue G, issue 1908; 32 pages. Describes a complete line of propeller blades, reverse gears and accessories for motor boats. A number of types and patterns of propeller blades are shown, including a reversible propeller which controls the boat by changing the pitch of blades from full speed ahead to neutral, or to full pitch back for reversing or backing up. Another specialty noted is the Michigan weedless speed propeller, which it is claimed will not catch weeds of any kind, but owing to its peculiar shape allows the weeds to work off the ends of the blades. Particular attention is called to the Michigan special universal joint.

Flexible Steel Armored Hose.—Sprague Electric Company, 527 West Thirty-fourth street, New York. Bulletin No. 507. Refers to armored hose for steam or compressed air, and illustrates some special hose fittings. Views are given showing the hose as used to supply pneumatic drills and transmit steam.

Meters.—Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. Circular No. 1104; 53 pages. Treats of portable and precision meters, showing the various types, with detailed drawings of their construction and tables of standard capacity.

Machine Tools.—The Miami Valley Machine Tool Company, Dayton, Ohio. Booklet. Briefly describes the company's standard lathes and sensitive drills, illustrating a 13½-in. lathe, a 14-in. drill and attachments.

Terra Cotta Building Blocks.—Henry Maurer & Son, 420 East Twenty-third street, New York. Catalogue; 6 x 9 in.; 54 pages. Devoted to Herculean arch and Phœnix wall blocks. Some buildings constructed of this material are shown and various shapes and sizes of building blocks are illustrated.

Roller Bearings.—Hyatt Roller Bearing Company, Newark, N. J. Bulletin No. 31. Devoted to the Hyatt roller bearings, which have been standardized in over 300 sizes, each providing for different conditions of speed and load. Each bearing described or quoted has a capacity rating, and useful tables covering these conditions are given. An interesting introduction reviewing the development of the anti-friction problem is given, and some of the more important bearings are illustrated.

Chain Blocks and Portable Vises.—Schuchart & Schutte, 136 Liberty street, New York. Two circulars. One describes the Atlas worm gear chain blocks with automatic brakes, which are made in sizes up to 10 tons capacity. Several illustrations demonstrate the principal features of the block, which it is claimed is particularly adaptable for outside erection purposes. The other circular shows the Pioneer portable bench and pipe vises, which are mounted on a folding frame with a platform on which the workman stands to hold it firm. The whole contrivance can be folded compactly and easily carried about.

Electrical Equipment.—Fort Wayne Electric Works, Fort Wayne, Ind. Bulletins Nos. 1102 and 1103, to supersede 1088 and 1090, respectively. No. 1102 gives a list of plants operating direct current direct connected generators, types MP and MPL. These are built in sizes ranging from 4 to 1000 kw. No. 1103 discusses the Wood alternating current arc lighting systems and illustrates and describes the apparatus employed—constant current regulator, constant potential transformer, high tension switchboard, constant current alternating current arc lamps and horn type lightning arresters. These bulletins are accompanied by a bulletin index to supersede that dated January 1, 1907.

Portable Heaters.—Rockwell Engineering Company, 26 Cortlandt street, New York. Folder. Advocates an oil fuel heater for heating work that is too bulky or inconvenient to move to a furnace. It is particularly adaptable for annealing, hardening, expanding, bending, brazing, &c. Two types are made, one is self-contained and burns kerosene only, and the other requires a source of compressed air and burns either crude or refined oil.

Iron and Steel Tubular Poles.—Pittsburgh Pole & Forge Company, Pittsburgh, Pa. Catalogue. Illustrates a number of types of poles for electric wires, trolley poles and insulator pins, and gives price-lists. Also contains illustrations of rail benders, car forgings, &c., made by the company. A smaller circular refers exclusively to rail benders.

Adjustable Reamers.—William J. Smith Company, New Haven, Conn. Circular. Pertains to the One-Lock adjustable reamer, which was described in *The Iron Age* October 3, 1907. It consists of only three parts besides the blades—a shell, cam bolt and lock nut. The shell is bored and slotted to receive the cam bolt, and the blades have an angular sleeve to engage and lock the blades to their adjusted position.

Switchboard Instruments.—Weston Electrical Instrument Company, Newark, N. J. Two folders. These treat respectively of the new Weston alternating current switchboard volt meters and ammeters and the Eclipse direct current volt meters and ammeters.

Electrical Apparatus.—Crocker-Wheeler Company, Ampere, N. J. Four bulletins. No. 91 treats of induction motor panels; No. 92 of combined generator and feeder panels; No. 93 of small engine type direct current generators, and No. 94 of alternating current switchboard panels. All bulletins are illustrated and comprehensive drawings are shown clearly explaining the various apparatus.

Hydraulic Valves.—Dewhurst's Engineering Company, Ltd., Sheffield, England. Catalogue. Principally composed of drawings of hydraulic working valves. These are made to work up to a pressure of 5 tons per square inch, and several advantages are claimed.

Slag Ladles and Cars.—Dewhurst's Engineering Company, Sheffield, England. Bulletin. Shows types of Dewhurst side tipping and end tipping slag ladles and cars for use in steel works. These ladles are tipped by the pull of a locomotive on a tipping chain. They are made in sizes up to 15 tons capacity. The carriages are fitted with roller bearings.

Lubricator Boxes and Lubricants.—Olney & Warrin, 66-68 Centre street, New York. Folder. Pertains to the Howard lubricator box and Howard grease. The lubricator box is illustrated and it is claimed for the grease that it will not harden in the coldest temperature or liquefy at a temperature of 225 degrees.

Electrical Apparatus.—General Electric Company, Schenectady, N. Y. Nine bulletins. No. 4544, superseding No. 4387, treats of continuous current railroad switchboards. No. 4555 describes the application of electric drive to cement plants. No. 4556 explains the series luminous arc rectifier system. No. 4557 gives details of K-34, K-35 and K-36 controllers. No. 4558, superseding No. 4435, treats of the company's standard line of isolated plant switchboard panels with circuit breakers. No. 4559 describes direct current motor starting devices, rheostats and panels. No. 4562 shows mill type motors made to meet the demand for electrical motors for driving rolling mills, &c. No. 4563 shows switchboard indicators, type SI-104. No. 4564 is devoted to centrifugal air compressors for industrial air blast and exhauster service.

Thor Motorcycle.—Aurora Automatic Machinery Company, Aurora, Ill.; sales office, Chicago, Ill. Catalogue; 12 pages. Describes the Thor Motorcycle, the various parts of which are illustrated with clear engravings, which give an intelligent idea of their construction and operation. These machines, which have been on the market for the last six years, have been steadily improved and represent the forward strides that have been made in that time in vehicles of this type.

In the description in these columns April 16 of the catalogue issued by the Kilgore-Peteler Company, the address was incorrectly given. The company is located at Minneapolis, Minn.

A Maximum of Idle Cars in Mid-April.—The American Railway Association's report of the number of idle cars in the United States and Canada on April 15, published last week, shows a total of 375,624, as compared with 306,979 on April 1, 296,035 on March 18 and 342,828 on February 5. There was a net shortage of 86,811 cars on October 30, 1907. Of the increase in idle cars between April 1 and April 15, about 40,000 was in coal cars, 26,500 in box cars and 3000 in miscellaneous kinds. Idle flat cars fell off from 24,657 on April 1 to 23,804 on April 15.

The Youngstown Iron & Steel Roofing Company, Youngstown, Ohio, is now operating five hot sheet mills in its plant and reports the outlook as somewhat improved.

Pig Iron Production Declining.

Steel Works Furnaces Losing Ground.

Merchant Furnaces Gaining.

The returns from the pig iron producers show that the output for April was 1,148,691 tons, as compared with 1,228,204 tons in March, the falling off being due entirely to the steel works plants, whose daily production declined from 27,145 tons in March to 24,185 tons in April, while the merchant furnaces increased from 12,474 tons in March to 14,104 tons in April. The capacity operating on May 1 is lower than that of April 1, the figures being 262,857 tons per week at the former date, as compared with 264,890 tons on April 1.

Below is given a statement of the daily output of steel works and merchant furnaces for the past four months:

Daily Rate of Production.—Gross Tons.

	Steel works.	Merchant.	Total.
January	21,432	12,286	33,718
February	25,511	11,446	37,163
March	27,145	12,474	39,619
April	24,185	14,104	38,289

The table below gives the production of coke and anthracite furnaces in April and the four months preceding:

Monthly Pig Iron Production.—Gross Tons.

	Dec. (31 days)	Jan. (31 days)	Feb. (29 days)	March. (31 days)	April. (30 days)
New York	86,993	82,962	65,567	49,231	62,263
New Jersey	22,555	22,447	19,880	23,243	22,701
Lehigh Valley	54,881	47,538	39,732	39,105	28,919
Schuylkill Val.	37,747	24,002	22,338	29,104	28,654
Lower Susquehanna and Lebanon Val.	31,090	20,323	19,363	23,907	27,393
Pittsburgh Dis.	258,412	304,521	324,418	325,953	276,883
Shenango Val.	76,086	69,149	68,919	76,377	71,970
West. Penn.	105,671	60,355	51,283	62,782	54,221
Md., Va., and Kentucky	61,433	30,621	27,775	41,452	48,955
Wheeling Dis.	12,051	0	12,961	18,088	17,920
Mahoning Val.	68,776	64,437	93,332	105,310	94,780
Central and North. Ohio.	84,087	52,297	75,137	94,952	88,047
Hocking Valley and Hanging Rock	15,658	8,404	12,296	20,108	19,132
Mich., Minn., Mo., Wis., Colo.	48,950	38,172	36,129	39,327	36,808
Chicago Dis.	148,601	120,874	99,289	147,014	157,633
Alabama	94,810	81,541	91,209	114,295	94,754
Tennessee, Georgia and Texas	26,388	17,607	18,112	17,056	17,648
Totals	1,234,279	1,045,250	1,077,740	1,228,204	1,148,691

Production of Steel Companies.

Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Republic, Youngstown Sheet & Tube Company, Jones & Laughlin, La Belle, Bethlehem, Calumet, Inland, Colorado and Tennessee (Ensley) companies show the following totals of product month by month. We give separately a statement of the output of spiegeleisen and ferromanganese, which is included for each month in the total production:

Production of Steel Companies.—Gross Tons.

	Total production.			Spiegeleisen and ferromanganese.	
	1906.	1907.	1908.	1907.	1908.
January	1,358,015	1,406,397	664,415	21,477	20,254
February	1,226,760	1,317,923	745,802	19,444	9,402
March	1,490,209	1,424,827	841,502	31,091	13,750
April	1,333,591	1,446,788	725,548	26,527	12,363
May	1,[illegible]23	1,470,080	[illegible]	28,822	[illegible]
June	1,293,437	1,457,230	[illegible]	30,942	[illegible]
July	1,[illegible]01	1,452,557	[illegible]	25,343	[illegible]
August	1,237,485	1,445,685	[illegible]	23,696	[illegible]
September	1,264,380	1,417,153	[illegible]	30,270	[illegible]
October	1,452,209	1,473,205	[illegible]	31,105	[illegible]
November	1,411,350	1,084,114	[illegible]	21,861	[illegible]
December	1,445,528	659,459	[illegible]	19,480	[illegible]

It has become a very difficult matter to estimate blast furnace capacity in the case of some of the large groups because of the frequent banking and blowing out, so that the number in blast on one particular date does not give any fair indication of coming product. Thus of one group of furnaces three were in blast, both on March 1 and on April 1, the March product being 33,838 tons. On May 1 only two furnaces were in operation, and yet the April product ran up to 47,276 tons, or nearly 50 per cent. larger, in spite of a lessened number of stacks in operation. At some plants the practice has been adopted of banking toward the end of the week, and if the first of the month happens to fall into that period the furnaces are technically inactive. Yet they start up on the following Monday and turn out nearly full output during the month.

For the great majority of furnace plants, which in the aggregate make the greater part of the output, the production is so regular that the output for the coming month can be predicted very closely, barring accidents. Still, under the prevailing extraordinary conditions, capacity statistics based upon the number of stacks in operation are not as accurate a guide of current make as they usually are.

Capacity Active May 1 and April 1.

The table below gives the weekly capacity of coke and anthracite furnaces in blast May 1 and April 1:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	May 1 — Number in blast.	May 1 — Capacity per week.	April 1 — Number in blast.	April 1 — Capacity per week.
New York					
Buffalo	14	7	13,291	5	10,598
Other New York	10	1	1,237	2	2,751
New Jersey	8	4	5,297	4	5,245
Spiegel	2	0	0	0	0
Pennsylvania:					
Lehigh Valley	25	8	6,612	8	8,232
Spiegel	3	1	136	1	142
Schuylkill Valley	14	4	5,487	5	6,041
Spiegel	1	0	0	1	755
Lower Susquehanna	7	2	3,610	2	2,854
Spiegel	1	0	0	0	0
Lebanon Valley	10	4	3,199	3	2,584
Pittsburgh District	45	22	69,150	21	58,491
Spiegel	3	1	766	2	1,274
Shenango Valley	20	5	12,584	8	18,062
West. Pennsylvania	27	8	12,435	9	14,175
Maryland	4	2	4,126	2	3,616
Wheeling District	14	2	4,184	2	4,287
Ohio					
Mahoning Valley	18	9	21,026	10	23,258
Central and North. Michigan	22	8	21,669	8	22,456
Hocking Valley and Hanging Rock	12	6	4,464	6	4,542
Illinois and Indiana	23	13	36,781	13	33,682
Spiegel	2	1	1,379	1	903
Minnesota	1	0	0	0	0
Wisconsin	6	1	1,400	2	2,611
Missouri	1	0	0	0	0
Colorado	6	0	0	3	6,093
The South					
Virginia	22	9	6,470	8	6,023
Kentucky	7	1	172	1	1,155
Alabama	46	16	22,444	16	21,340
Tennessee	18	7	4,138	7	4,320
Georgia and Texas	3	0	0	0	0
Totals	396	142	262,857	150	264,890

A Record of Active Capacity.

The active weekly capacity in coke and anthracite iron has shown the following fluctuations since January 1, 1903:

	Capacity per week.		Capacity per week.
May 1	262,857	August 1	410,088
April 1	264,890	July 1	408,617
March 1	267,437	June 1	443,092
February 1	241,925	May 1	452,031
January 1, 1908	232,652	April 1	439,564
December 1, 1907	347,372	March 1	403,157
November 1	491,436	February 1	405,792
October 1	511,397	January 1, 1905	377,879
September 1	507,768	December 1, 1904	357,846
August 1	513,471	November 1	334,249
July 1	528,170	October 1	319,249
June 1	523,220	September 1	291,573
May 1	524,538	August 1	246,092
April 1	496,456	July 1	272,501
March 1	511,035	June 1	336,107
February 1	492,359	May 1	368,244
January 1, 1907	507,397	April 1	337,257
December 1, 1906	513,860	March 1	308,751
November 1	500,580	February 1	273,692
October 1	469,665	January 1, 1904	185,636
September 1	441,426	December 1, 1903	244,156
August 1	449,908	November 1	273,715
July 1	460,570	October 1	353,142
June 1	472,622	September 1	360,197
May 1	484,031	August 1	353,681
April 1	484,240	July 1	384,825
March 1	479,737	June 1	388,178
February 1	482,156	May 1	373,496
January 1, 1906	463,673	April 1	388,215
December 1, 1905	475,814	March 1	347,424
November 1	460,449	February 1	335,239
October 1	445,468	January 1, 1903	346,073
September 1	412,563		

Furnaces In and Out.

During April there were blown in B Buffalo, No. 2 Buffalo & Susquehanna, three Edgar Thomson, Saxton No. 2, Sheridan, Ivanhoe in Virginia, Detroit, No. 1 Gadsden and the new No. 2 Vanderbilt in Alabama.

There were blown out No. 1 Buffalo & Susquehanna, Genesee, Tidewater Steel, one Warwick, one Duquesne, one Edgar Thomson, Alice and South Sharon in the Shenango Valley, Josephine, Cleveland, B Mayville, No. 1 Vanderbilt and Philadelphia in Alabama. There were banked on May 1, Hall in the Shenango Valley and

Haselton. It is reported that Midland and Mattie furnaces are to blow out soon, while Struthers furnace has just started in on basic iron.

NEWS OF THE WORKS.

Iron and Steel.

The No. 1 Vanderbilt Furnace of the Birmingham Coal & Iron Company, Boyles, Ala., was banked April 27, so that connections could be made to the new No. 2 furnace. The latter was blown in a few days later. Furnace No. 1 will remain banked for some time.

The blast furnace of the Detroit Iron & Steel Company, Detroit, Mich., was blown in April 6, having been idle since December 13, 1907.

The No. 1 furnace of the Buffalo & Susquehanna Iron Company, Buffalo, N. Y., was blown out April 22 for relining. The No. 2 furnace was put in blast April 14 after relining.

The blast furnace of the Nittany Iron Company, Bellefonte, Pa., was banked April 13.

The blast furnace of the Ivanhoe Furnace Company, Ivanhoe, Va., was blown in April 16, having been idle since December 1, 1907.

Mattie Furnace of the Girard Iron Company, Girard, Ohio, is expected to blow out some time this month.

The No. 1 furnace of the Alabama Consolidated Coal & Iron Company, at Gadsden, Ala., was blown in April 14. The No. 2 furnace is still idle.

The one South Sharon Furnace of the Carnegie Steel Company which has been in blast for several months was blown out April 25.

The Algoma Steel Company of the Lake Superior Corporation, Sault Ste. Marie, Ont., is reported to have blown out its furnace No. 1. Furnace No. 2 is expected to go out this week.

The Canadian Steel Rolling Mills, Ltd., Campbellford, Ont., which is to construct a new plant at that place, has incorporated with a capital stock of $100,000.

Monongahela furnaces Nos. 1 and 4 of the National Tube Company, at McKeesport, Pa., were in operation during the entire month of April, while Nos. 2 and 3 stacks were idle.

The new No. 1 stack of the Shenango Furnace Company at Sharpsville, Pa., is about ready for blast and will be put in operation just as soon as the condition of the pig iron market warrants. The furnace will be equipped with an automatic skip hoist, which is being installed by the Brown Hoisting Machinery Company, Cleveland, Ohio.

On April 17 two more of the Edgar Thomson furnaces of the Carnegie Steel Company were put in blast, making five furnaces at this plant in operation at present and five stacks idle. Two of the Carrie stacks of the Carnegie Steel Company at Rankin were blown out on May 1, leaving three stacks in blast and four idle.

The plant of the Portsmouth Steel Company at Portsmouth, Ohio, has started up to partial capacity, after being closed for some time. The blooming and plate mills will run single time and the jobbing mill double turn. The company has a fair amount of orders ahead.

The furnace of the Struthers Furnace Company, Struthers, Ohio, which has been shut down since the middle of December, will go into blast this week on basic iron.

No. 1 City furnace of the Sloss-Sheffield Steel & Iron Company, Birmingham, Ala., has been put in blast, after having been banked since November 28.

At a meeting of the principal unsecured creditors of the New York State Steel Company, Buffalo, N. Y., the offer of the Pennsylvania capitalists to advance $500,000 to take over a controlling interest in the company and complete the plant, was withdrawn. Several plans for reorganizing the company have been advanced, but none has been carried out. It has been agreed to return to Corrigan, McKinney & Co., Cleveland, Ohio, $117,000 worth of ore bought by the company and unused. It was also agreed that the unsecured creditors should receive a payment of $25,000 on their claims, and that the bondholders should receive a payment of $75,000 instead of $300,000, in satisfaction of their present claims, pending a full adjustment of the situation.

General Machinery.

The Stecker Electric & Machine Company, 30-32 Larned street East, Detroit, Mich., is preparing to erect a new factory building near Woodbridge and Bates streets. The new building will be 50 x 91 ft., of stone and brick construction, and the company's urgent need of larger quarters will hasten the work of construction. The new factory will be equipped with motor drive throughout and is designed to be modern and complete in every respect.

The Republic Mfg. Company, Grant avenue and Boquet street, N. S., Pittsburgh, has recently completed arrangements with L. Weiscopf, New York, to install special machinery in its plants, and to hereafter manufacture machinery for filling bottles with liquids such as are used in packing establishments. The company carries on a general machine business and has equipment for manufacturing contract work for the Government, of which it has handled considerable in the past. It reports business to be improving.

The frame erecting shop of the Lloyd-Booth plant of the United Engineering & Foundry Company, at Youngstown, Ohio, is being replaced by a brick and steel structure, which will increase the capacity about 40 per cent. A new 30-ton electric traveling crane will be installed in this department.

Power Plant Equipment.

The Pittsburgh Valve, Foundry & Construction Company, Twenty-sixth street and Railroad avenue, Pittsburgh, manufacturer of complete piping equipment for power and industrial plants, has received a large contract for steam and exhaust piping, valves and fittings, in various sizes up to 18 in., for heaters, pumps, &c., for the plant of the Vesta Coal Company, California, Pa. The company is also furnishing six 48-in. and 16 28-in. of its gate valves for use on condensers in the Ohio Works of the Carnegie Steel Company, Youngstown, Ohio.

Bids will be received at an early date by the Board of Village Trustees, Germantown, Ill., for the installation of a water works plant, the estimated cost of which is $8000.

The Board of Light and Power Commissioners, Marquette, Mich., has authorized the preparation of plans and specifications for the construction of a new substation for the present electric system. It is probable that the new building will be of cement construction.

A bond issue of $196,000 has been authorized by the City of Jackson, Miss., for the purpose of making extensions and betterments to the city water works plant and other municipal improvements. In accordance with the provisions of the ordinance it is expected bonds will be issued at a meeting of the City Council to be held May 5.

The Jasper Water, Light & Power Company, Jasper, Ala., has in contemplation some plant extensions and improvements, plans for which have as yet not been fully developed. J. M. Cranford is president.

The Columbia Electric Street Railway, Light & Power Company, Columbia, S. C., has under consideration the installation of a 1000 kw. generator and other electrical machinery in its power plant.

The Westinghouse Machine Company, Pittsburgh, Pa., has recently booked a number of important orders for steam turbines and gas engines for shipment to Japan. In addition to those previously noted, equipment has been ordered by the Acadia Sugar Refining Company and others.

A fund of $120,000 has been provided by the sale of bonds for the establishment of a water works at Roswell, N. M. Plans for this installation have been prepared by Burns & McDonnell, Scarritt Building, Kansas City, Mo., and bids on the necessary equipment and construction work will be received May 22.

The installation of an electric power plant is being planned by the Ethel Mining Company, Nevada City, Cal., but it is stated that the work will not go forward until about July 1 next. A. Maltman is superintendent.

The City of Gadsden, Ala., has appropriated $100,000 for the construction of a water works system, the plans for which are now being prepared by James Nisbet Hazlehurst, Atlanta, Ga. The system will consist of a complete pumping plant, coagulating basin, filters, &c. Contracts will probably be let within the next 60 days.

Plant improvements contemplated by the Manitowoc Water Works Company, Manitowoc, Wis., include the installation of a new boiler, which is now under construction, the laying of additional cast iron pipe mains, and the probable building of a concrete reservoir with a capacity of between 500,000 and 750,000 gal. T. W. Gray is secretary.

The Hewes & Phillips Iron Works, Newark, N. J., is building a 1000-hp. engine for the National India Rubber Company, Bristol, R. I., and is installing in the same works three additional engines, aggregating about 1000 hp., together with three Crocker-Wheeler generators to be used in lighting and supplying power to the part of the plant where the small machinery is operated. The company reports a good demand for its products, and since the first of February has booked the following orders: Odell Mfg. Company, Groveton, N. J., two tandem compound engines aggregating 1400 hp.; Windham Mfg. Company, Willimantic, Conn., 1000 hp. engine, 500 hp. of boilers, 100 hp. generator; Solvay Process Company, Syracuse, N. Y., six pumping engines, and engines for the Standard Oil Company, Constable Hook, N. J.; Simpson-Crawford Company, and several local companies.

John D. Thompson, Wilmington, Del., is preparing plans for a power plant to be constructed at St. Georges for the Diamond State Rapid Transit Company, Smyrna, Del.

The Erie Forge Company, Erie, Pa., will resume work at once on its new one and two story power plant, 46 x 189 ft., which is to be of concrete block and steel construction.

The city of Cleveland, Ohio, has awarded to the Westing-

house Machine Company, Pittsburgh, Pa., for $34,725, the contract for a 1000-kw. turbine for the municipal lighting plant at South Brooklyn.

Foundries.

The Dutcher Company, Milwaukee, Wis., successor to the J. E. & P. E. Dutcher Company, manufacturer of steel castings, has made an assignment, with liabilities of about $100,000 and assets $150,000. The company's plant is one of the oldest in the city, and recently a large part of it was rebuilt. It did a good business, but suffered by reason of the molders' strike and the financial stringency last fall.

Fires.

The plant of the Milton Mfg. Company, Milton, Pa., was burned April 23, the loss being about $100,000. It is reported that works will be rebuilt as soon as possible.

The substation of the West Kootenai Power & Light Company and the municipal power plant at Nelson, B. C., were destroyed by fire April 25, the loss being about $50,000.

The plant of the Hubley Mfg. Company, Lancaster, Pa., was damaged $50,000 by fire April 22.

The foundry and pattern shop of Smith & Loughlin, Driggs avenue, Brooklyn, N. Y., was burned April 24, the loss being estimated at $50,000.

On April 20 fire damaged the plant of the Minneapolis Steel & Machinery Company, Minneapolis, Minn., to the extent of $25,000.

Hardware.

The National Projectile Works, Grand Rapids, Mich., has just been reorganized at Ontario, Cal., with a capital stock of $100,000, $80,000 of which has been paid in in cash and special machinery. The new company owns a factory building between the Southern Pacific and Salt Lake railroads, and expects to be in a position by the first of August to turn out all kinds of rifle ammunition under patents owned by the company for making lubricated wire patched bullets, which have been tried out at the experimental factory at Grand Rapids. The officers of the new company are: President, H. E. Swan; vice-president, S. G. Berger; treasurer, E. V. Caldwell; secretary and general manager, D. H. Armstrong.

The stockholders of the Union Steel Screw Company, Cleveland, Ohio, at a special meeting held April 30, ratified the proposal to merge with the National Screw & Tack Company, Cleveland. Under the terms of the consolidation the latter company acquires the plant of the former for $461,125, payment to be made in 6 per cent. preferred stock of the National. This liquidates the $542,500 stock of the Union company at $85 a share. The National Screw & Tack Company will increase its capitalization from $1,000,000 to $1,461,000. The plant of the Union company will continue in operation.

The plant of the American Bolt Company, Birmingham, Ala., has been put in operation after an idleness of some months.

Miscellaneous.

The Guthrie Iron & Metal Company, Guthrie, Okla., incorporated with a capital stock of $5000, has been organized to deal in scrap iron, metals and junk. The incorporators are N. H. Bunis, William Copeland, J. H. Milam, L. C. Gurney and R. Edmunds.

George E. Leonard has been appointed receiver for the Hendrick Hudson Iron & Steel Works, New York.

The proposed consolidation of the business of William H. Bristol and the Bristol Company, Waterbury, Conn., as outlined in these columns several weeks ago, has been effected. The result of this combination makes the Bristol Company manufacturer of the largest and most complete line of recording instruments for pressure, temperature and electricity.

The Brooklyn Union Gas Company, Brooklyn, N. Y., which is to construct a new meter repair shop, does not expect to install any new machinery, as the equipment in the present shop will be transferred to the new building.

The Pennsylvania Steel Pulley Company, North Side, Pittsburgh, closed its plant on March 15 to install additional machinery, but on account of receiving some very good specifications for Keystone steel pulleys the plant was started up April 27 and is now running full capacity. The company reports an exceptionally large amount of orders for pulleys booked during April.

The Glacier Metal Company, Richmond, Va., intends to erect a new plant about 40 x 100 ft., two stories, in Manchester, across the James River from Richmond. The new plant will be equipped for the manufacture of the Glacier antifriction metal, which is known throughout the world; copper tin bearing metal and other Babbit metals, and will have a capacity of about 25,000 lb. of metal per day

S. F. Bowser & Co., Fort Wayne, Ind., have issued $300,000 of preferred stock to increase their working capital. In the reference to this company in these columns last week the name was printed incorrectly.

The Scott National Radiator Company, which has changed its name to the Scott Stove & Furnace Company, is located at Cambridge City, Ind., and not at Cambridge, Ohio, as was incorrectly stated in these columns last week.

New Publications.

Formulas in Gearing.—Fifth Edition. Published by the Brown & Sharpe Mfg. Company, Providence, R. I. Size, 6 x 9 in.; pages, 183. Cloth. Price, $1.50.

Even those who are not familiar with the earlier editions of this book will infer from its title that it is not a treatise on gearing, nor does it exhaustively take up all the problems connected with them. The aim is rather to serve the draftsman's needs, giving him in a convenient form the information which is necessary in designing. It is practically a handbook for the problems met with in ordinary practice, and puts in readily accessible form the formulas and figures that enter all but the most exceptional calculations. Its usefulness is enhanced by its condensation. No attempt is made to deal with the transmission of power or the strength of gearing, and the mathematics involved requires only a knowledge of algebra and elementary trigonometry.

The nine chapters deal with the more common systems of gearing, spur, bevel, worm, spiral or screw, and internal gears with formulas for each, bevel gear cutting, indexing, lathe gearing for screw cutting, &c. More than half of the book consists of tables, including tooth parts; chordal thickness of teeth and distance from chord to top of tooth; diameter increments; angles of edge and face; cutters for bevel gears; solution of right angled triangles; natural sines, cosines, tangents and cotangents; angles for gashing worm wheels; prime numbers and factors; leads; decimal equivalents of parts of an inch, and table of data for indexing any number of divisions from 2 to 399, when using the spiral head of a Brown & Sharpe universal milling machine equipped for differential indexing. The last and the table of leads are part of the matter added since the last edition, and the subject of the differential indexing has been entirely revised. This edition is printed almost throughout from new plates.

Accidents: Their Causes and Remedies. A Treatise on the Development of Care and Faithfulness to Aid the Safeguarding of Life and Property. By Thomas D. West. Sold by the Competent Life Book Agency, Sharpsville, Pa. Paper covers; 95 pages. Price 25 cents.

This little work is dedicated "to the American Anti-Accident Association and the American Museum of Safety Devices and Industrial Hygiene, whose efforts in the interests of humanity should be assisted by every citizen who possesses any sympathy for America's great loss of life and property through accidents." It is probably the first publication of any importance designed for the specific purpose of calling attention to the desirability of inculcating greater care in the endeavor to prevent accidents which in so many instances lead to the loss of life or to serious physical injuries and damage to property. The author is intensely interested in this subject, and has for some time been conducting a campaign for increased care and caution in the various pursuits of life. He has brought together cogent arguments and incisive facts bearing on his question and has presented them in not only readable but striking shape.

Co-Operative Education.—Mayor James McMahon of Fitchburg, Mass., and F. Fosdick, president of the Fitchburg Steam Engine Works, representing the Chamber of Commerce of that city, have been in Cincinnati investigating the scheme of co-operative education advocated by prominent members of the Cincinnati Metal Trades Association in conjunction with Dean Herman Schneider of the University of Cincinnati, engineering department. The visitors were taken on a tour of the factories in which are university students taking advantage of the recently instituted system. This co-operative system admits two youths at the same time to university study, but on alternate days, so that while one is studying in the university the other is getting a practical knowledge of shop practice and earning money as well. The visitors were so pleased with the system that they will recommend it for adoption by the Fitchburg public schools.

The Iron and Metal Trades

The decline in volume of operations at the Steel works in April, as compared with March, is reflected in the Pig Iron production reported to *The Iron Age*. The total output of the coke and anthracite furnaces last month was 1,149,000 tons in 30 days, compared with 1,228,000 tons in March, in 31 days. The decline in the daily output from 39,619 tons in March to 38,289 tons in April is due largely to the Steel works furnaces, whose product fell off from 27,145 tons to 24,185 tons daily, leaving the respective figures for the merchant furnaces at 12,474 tons and 14,104 tons. However, it must be taken into consideration that the merchant furnaces have been accumulating some Iron during the month. There has been some further decline in the active capacity, May opening with a weekly rating of 262,857 tons, as compared with 264,890 tons on April 1.

Interest centers in the meeting of the Pig Iron and Ore men in this city to-day. There is little prospect that anything tangible will be done as to prices of Pig Iron, although the organizations will probably continue for statistical purposes and an interchange of data. The Southern makers were together on Monday, but one company was not represented. The Eastern makers are holding a preliminary meeting, some being in favor of a sufficient reduction in the price to permit some metal to be marketed.

A good deal hinges on the attitude of the lake Ore selling companies who were together on Friday last. It is understood that the general feeling is against any concession in the prices. These interests are very strong, and even an increase in the offerings of Ore at concessions, now being made by second hands, would not materially affect the situation. The maintenance of Ore prices will put furnace companies who do not control their own Ore supply in a very serious position, in competition with Southern makers and with Northern stacks that melt wholly or partly Ores mined by themselves.

There has been a little more activity in Pig Iron in the Central West, buyers showing more interest as the result of widespread reports of coming sharp reductions. The markets have weakened a little more, but there is a good deal of the resistance which grows out of despair.

Among some of the melters of Foundry Iron demoralization is rampant. This is true notably of the Cast Iron Pipe industry, the largest single consumer of Pig Iron. Prices have been savagely cut, and Pipe has been sold at Western and Eastern points down to $21.50 per net ton, delivered. The pace is getting too hot for some of the shops, however.

Structural work is coming out slowly, but in fair volume. Like in other lines contracts which at ordinary times would be given out at one letting are coming out piecemeal, which creates the impression that there is less large work than the facts warrant. The new subway, on which bids are to go in on Friday, will call for 26,000 tons of fabricated work and 13,000 tons of concrete Bars. The Harriman lines are expected soon to be in the market for 10,000 tons of bridge work, and other railroads will need a fair tonnage.

In the metal trade the price of Lead has been advanced to 4.20c., New York. Copper is quiet, and is selling at 12⅝c. for Electrolytic.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	May 6, 1908.	Apr. 29, 1908.	Apr. 1, 1908.	May 1, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	*$17.50*	$17.50	$17.75	$24.50
Foundry No. 2, Southern, Cincinnati	*15.75*	15.00	15.25	24.25
Foundry No. 2, Local, Chicago	*17.35*	17.35	17.50	26.50
Bessemer, Pittsburgh	*17.00*	17.15	17.75	23.85
Gray Forge, Pittsburgh	*14.90*	15.40	15.65	21.85
Lake Superior Charcoal, Chicago	*20.00*	20.00	20.50	27.00
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	30.50
Forging Billets, Pittsburgh	*29.00*	30.00	30.00	36.00
Open Hearth Billets, Phila	29.20	29.20	29.20	32.50
Wire Rods, Pittsburgh	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	12.00	12.00	12.00	18.00
Steel Rails, Melting, Phila	12.75	12.75	12.75	19.25
Iron Rails, Chicago	*14.75*	15.00	15.00	24.50
Iron Rails, Philadelphia	17.00	17.00	17.00	27.25
Car Wheels, Chicago	*12.50*	13.00	14.50	25.00
Car Wheels, Philadelphia	14.00	14.00	14.00	24.00
Heavy Steel Scrap, Pittsburgh	*12.75*	12.75	13.00	18.00
Heavy Steel Scrap, Chicago	*10.50*	10.75	11.25	15.50
Heavy Steel Scrap, Philadelphia	12.75	12.75	12.75	18.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	*1.46*	1.46	1.65	1.83½
Common Iron Bars, Chicago	1.65	1.65	1.65	1.76½
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	*1.55*	1.55	1.70	1.85
Skelp, Sheared Steel, Pittsburgh	*1.65*	1.65	1.80	1.90
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	1.90	1.90	1.90	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	*12.87½*	13.00	13.25	25.00
Electrolytic Copper, New York	*12.62½*	12.75	13.00	24.37½
Spelter, New York	*4.65*	4.70	4.70	6.60
Spelter, St. Louis	*4.50*	4.57½	4.55	6.45
Lead, New York	**4.20**	4.10	3.97½	6.10
Lead, St. Louis	**4.10**	4.00	3.80	5.92½
Tin, New York	*31.05*	32.25	31.25	43.05
Antimony, Hallett, New York	*8.50*	8.75	8.75	21.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, May 6, 1908.—(*By Telegraph.*)

A noteworthy development last week was a spurt of activity in Pig Iron, transactions aggregating 10,000 tons or more, comprised principally of lots of 1000 to 2000 tons. These sales included one of 2000 tons of Basic and another of 1000 tons of Malleable Bessemer, the latter being especially notable because of the exceedingly scant demand that since the beginning of the year has left this grade practically without movement. Tentative offers from consumers of tonnage at $10 to $11, Birmingham, are quite frequent, but no acceptances below $11.50 are heard of and none at this price for extended delivery or of significant tonnage. With a possible radical reduction in price suggested by recent developments, buyers are not inclined to make forward commitments until a more stable level of values is established. Besides 1000 tons in miscellaneous fabricating orders booked by the American Bridge Company, the 'Frisco System placed 1000 tons of bridge material, taken by the Pennsylvania Steel Company, and the Chicago, Milwaukee & St. Paul 6000 tons of Guard Angles, the contract for which was secured by the Kenwood Bridge Company. The selection of reinforced concrete construction for two large Chicago buildings will switch the metal requirements from Structural Shapes to Steel reinforcing Bars, of which a considerable tonnage will be required. Rail orders were this week limited to one of 800 tons high T sections, taken by the Pennsylvania Steel Company. A slight improvement is noted in the demand for Plates. After a shutdown of several weeks the Sheared Plate mills will probably start up on Monday of next week. The de-

mand for Iron and Steel Bars continues quiet, the mills being able to operate only intermittently. Lettings of Cast Iron Pipe for the week aggregate over 7000 tons, the most important of which was a lot of 5000 tons for the city of St. Louis. Bids received on some of these transactions demonstrate the sharpness of competition which has reduced prices to an extremely low level. Only in Rerolling Rails does the Scrap Iron market show any vitality. Other grades are weaker, and a total of 18,000 tons of railroad material to be offered this week will bear heavily upon the market.

Pig Iron.—Not less than 10,000 tons of Iron changed hands in the past week, which was, perhaps, the most active of any like period since January. The bulk of the tonnage included in these sales was of Northern Iron. Particular interest attaches to the sale of 1000 tons of Malleable Iron, which probably exceeds the entire sales of this grade made in this market since the first of the year. The price is reported to have been close to $17. Among other sales were 2000 tons of Basic Iron, sold by the Inland Steel Company to the Grand Crossing Tack Company, 1500 tons of Southern Foundry Iron at $12, Birmingham, and 2000 tons of Northern Foundry at a shade under $17, at furnace. In addition to these transactions there are inquiries for 2000 tons in the market for delivery through the second half, which will be closed in a few days if acceptable prices are offered. The persistent rumor of a probable decline in Southern Iron to a $10, Birmingham, basis has developed a large number of tentative inquiries, which seem to indicate the willingness of important consuming interests to buy not only for present but future needs should such a recession in values take place. The expectancy of a decline to this point has been materially strengthened by the reported results of the recent New York Pig Iron conference. It is evident that a good many buyers are deferring purchases until after the second meeting, which is scheduled for May 7. At the same time this hesitancy may be attributed more to cautious conservatism than to a prevalent belief that radical action will be taken. Meanwhile, market conditions have not changed, and while a few small sales of Southern Iron have been made at $11.75, and even as low as $11.50, they are surrounded by circumstances and conditions that hardly warrant the acceptance of these figures as representative of the market. The following prices are for May and June delivery, f.o.b. Chicago:

Lake Superior Charcoal	$20.00 to $20.50
Northern Coke Foundry, No. 1	17.85 to 18.35
Northern Coke Foundry, No. 2	17.35 to 17.85
Northern Coke Foundry, No. 3	16.85 to 17.35
Northern Scotch, No. 1	18.35 to 18.85
Southern Coke, No. 1	16.85 to 17.35
Southern Coke, No. 2	16.35 to 16.85
Southern Coke, No. 3	15.85 to 16.35
Southern Coke, No. 4	15.35 to 15.85
Southern Coke, No. 1 Soft	16.85 to 17.35
Southern Coke, No. 2 Soft	16.35 to 16.85
Southern Gray Forge	14.35 to 14.85
Southern Mottled	14.10 to 14.60
Malleable Bessemer	17.35 to 17.85
Standard Bessemer	19.50 to 19.65
Jackson Co. and Kentucky Silvery, 6 %	18.90 to 19.40
Jackson Co. and Kentucky Silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky Silvery, 10 %	22.90 to 23.40

(*By Mail.*)

Billets and Rods.—As far as new business is concerned, the market is stagnant, there being not only no sales of any consequence, but an absence of inquiries, indicating an entire lack of interest in the market. We continue to quote Forging Billets at $31.50 to $32.50, Chicago, which prices, it is insisted, are being resolutely maintained by the mills. Wire Rods are not moving so freely as was the case some weeks ago, although a fair amount of business is reported at regular prices, which are as follows: Bessemer, $35; Basic, $36; Chain, $37, all at Pittsburgh.

Rails and Track Supplies.—The past week has only produced in the way of new business an order for 800 tons of high T-Rails for a traction line, taken by the Pennsylvania Steel Company. The Chicago, Indianapolis & Louisville Railway is reported to be in the market for 1000 tons of Standard Rails, but the order has not yet been placed. There is not much doing in Light Rails, and what business is going is subject to sharp competition, which has resulted in considerable irregularity in prices. Some recent sales have been made of Billet Rails in competition with rerolling mills at concessions of $4 to $5 per ton below the regular prices. The prices herewith quoted can therefore only be considered as the nominal values of Billet Rails. The inactivity in railroad supplies is reflected by a decline of 15c. per 100 lb. on Angle Bars, prices of which are herewith revised. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.50c.; car lots, 1.60c. to 1.70c.; Spikes, 1.80c. to 1.90c., according to delivery; Track Bolts, 2.25c. to 2.35c., base, Square Nuts, and 2.40c. to 2.50c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—Notwithstanding the increasing number of inquiries that are coming in for estimates on various Structural projects, only a small proportion of them is developing into orders. Careful investigation of the character of this prospective business would indicate that most of the enterprises which they represent have substantial financial backing, and will sooner or later go forward to completion. The only reason assigned for delay is the expectancy of lower prices. The principal fabricating interest has bids out for at least 20,000 tons, on what is regarded as live propositions, which include several on which preliminary work of construction has already begun, although contracts for Structural Material are still withheld. A contract for 1000 tons of bridge material let by the 'Frisco System was taken by the Pennsylvania Steel Company, and the Kenwood Bridge Company secured 6000 tons of Guard Angles placed by the Chicago, Milwaukee & St. Paul. Reinforced concrete construction has been decided upon for the 12-story building to be erected by M. Born & Co., Chicago, the contract for which was awarded to the Alling Construction Company. This will involve the purchase of a considerable tonnage of reinforcing Bars. It is also reported that the contemplated building for Spaulding & Merrick, branch of the American Tobacco Company, will likely be of concrete. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—The run of Plate orders for the week shows a little improvement, the principal interest having booked an aggregate of about 1200 tons. The general character of the demand, however, is unchanged, there being no buying except for actual present needs. The principal mills are generally adhering to regular prices, but some business in the narrower sizes continue to be placed at concessions of $2 a ton. The Plate mill at the South Works, which has been idle for several weeks, is scheduled to start up next Monday. We quote mill shipments as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—Relatively considered, there is a fair demand for Sheets, especially in the lighter gauges. There is, however, no disposition on the part of jobbers or consumers to exceed their immediate requirements, and small orders for quick shipment are the rule. Regular price schedules are generally observed, although there is some cutting by a few mills. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 and 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—The tonnage of new business being entered is extremely light, and the fact that only two or three of the mills in this district are being operated makes it evident that specifications are coming out very slowly. Due, possibly, to the differential of more than $2 a ton between Iron and Steel Bars, there is a slightly better demand for the former. Although prices on Steel Bars are being held by the leading mills, there is some shading being done by the smaller interests. The situation in Iron Bars is hardly as strong as in Steel; this was demonstrated by a recent offer in this market of 1000 tons by a Western mill at a little under 1.50c., Chicago. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—Though not showing marked improvement, the demand for Merchant Pipe is at least holding its own. The totals of sales for April show a little gain over March, but not enough to signify decisive forward progress. The extreme demoralization of prices that existed some weeks ago in the local jobbing trade has disappeared and prices are now pretty evenly held at the current quotations. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2.

These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 71 per cent. on Black Steel Pipe, ¾ to 6 in. From two to three points above these prices is asked for Iron Pipe.

Boiler Tubes.—There is but a scanty demand for Merchant Tubes, either from mill or store. Railroads are restricting their purchases of Locomotive Tubes to what is required for repairs, and their needs are sharply curtailed by the large amount of motive power equipment now idle. Mill quotations for future delivery, on the base sizes, are as follows: 2⅜ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	35	35	35
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2½ to 5 in.	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—There is little interest in the market, consumers placing occasional small orders and straggling specifications against existing contracts. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1⅛ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7½c. to 8c., and still higher prices are asked on special grades. Shafting, 56 per cent. off in car lots; 52 per cent. less than car lots, base territory delivery.

Cast Iron Pipe.—A letting of 5000 tons, comprising the requirements of the city of St. Louis, was awarded to the United States Cast Iron Pipe & Foundry Company. Contracts for 1000 tons of 16 and 24 in. Pipe let by Saginaw, Mich., at $21.75 and $21.50 per ton, respectively, on a $2 freight rate, and 700 tons by Jefferson, Ohio, 4 in., 6 in. and 8 in., at $21.70 per ton, were taken by the Massillon Iron & Steel Company. Besides these lots there was a letting on Monday of between 300 and 400 tons at Milan, Mich. Except on small routine orders the market as to values is practically an open one, and it would seem from some of the low prices brought out on competitive bids that prospective reductions in Pig Iron were being discounted. We quote, nominally, per net ton, Chicago, as follows: Water Pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25; with $1 extra for Gas Pipe.

Metals.—A feature of the Metal market is the placing of small orders in the local market by large concerns which ordinarily buy at first hands in round lots. These purchases represent current requirements which are of course exceedingly meager. On such business prices hold without change. There is not enough doing in Old Metals to influence prices one way or the other. We quote as follows: Casting Copper, 13¼c.; Lake, 13¾c. to 14c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 33c.; small lots, 33½c.; Lead, Desilverized, 4c. to 4.25c., for 50-ton lots; Corroding, 5.35c. to 5.45c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 10½c., and other grades, 9¾c. to 10¼c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 11c.; Copper Clips, 11c.; Red Brass, 12c.; Yellow Brass, 10¼c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 25c.; Block Tin Pipe, 27c.

Old Material.—With the exception of Rerolling Rails, all grades of Scrap are weaker, though with few exceptions the decline has not exceeded 25c. a ton. Lack of demand from consumers is a characteristic feature of the situation. The rolling mills, running only intermittently, are reducing their stock piles slowly, and consequently making few purchases. What they do buy is generally secured at a shade from ruling prices, which are thus sagging under continued pressure. A lot of about 3400 Car Wheels, sold by the Chicago, Rock Island & Pacific, brought $12.50 per gross ton. The railroad offerings scheduled for the present week, include the Santa Fé, 3700 tons; Chicago & Northwestern, 2800 tons; Pennsylvania, 4000 tons; Baltimore & Ohio, 5200 tons; Big Four, 1500 tons, and a small lot by the Erie, aggregating in all upward of 18,000 tons. A large portion of this tonnage will naturally be diverted to this market, and will doubtless have a depressing effect upon values. We quote, per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$14.75 to $15.25
Old Steel Rails, rerolling	13.00 to 13.50
Old Steel Rails, less than 3 ft.	12.00 to 12.50
Relaying Rails, standard sections, subject to inspection	20.50 to 21.50
Old Car Wheels	12.50 to 13.00
Heavy Melting Steel Scrap	10.50 to 11.00
Frogs, Switches and Guards, cut apart	11.50 to 12.00
Mixed Steel	8.50 to 9.00

The following quotations are per net ton:

Iron Fish Plates	$13.00 to $13.50
Iron Car Axles	15.75 to 16.25
Steel Car Axles	14.50 to 15.00
No. 1 Railroad Wrought	10.75 to 11.25
No. 2 Railroad Wrought	9.75 to 10.25
Railway Springs	10.75 to 11.25
Locomotive Tires, smooth	12.50 to 13.00
No. 1 Dealers Forge	9.00 to 9.50
Mixed Busheling	7.00 to 7.50
Iron Axle Turnings	5.50 to 6.00
Soft Steel Axle Turnings	5.50 to 6.00
Machine Shop Turnings	5.00 to 5.50
Cast Borings	4.00 to 4.50
Mixed Borings, &c.	4.00 to 4.50
No. 1 Mill	6.50 to 7.00
No. 2 Mill	5.50 to 6.00
No. 1 Boilers, cut to Sheets and Rings	6.75 to 7.25
No. 1 Cast Scrap	11.50 to 12.00
Stove Plate and Light Cast Scrap	10.00 to 10.50
Railroad Malleable	9.75 to 10.25
Agricultural Malleable	9.25 to 10.25
Pipes and Flues	7.50 to 8.00

Cincinnati.

CINCINNATI, OHIO, May 6, 1908.—(*By Telegraph.*)

There is no appreciable improvement in the local Iron market. In the machinery trade there is a little better feeling among manufacturers of engines, boilers and electric power generating machinery. A local concern is reported to have placed a good sized order of engines for shipment to Mexico.

Pig Iron.—It is generally conceded among the largest local sellers that most of the inquiries coming in are still to be classed as feelers. The buyers of the week have been confined almost entirely to the Pipe foundries, the Steel makers and manufacturers of agricultural implements. While there is no open quotation of $11.50, Birmingham, for Southern No. 2, at least two local representatives of Southern furnaces announce their willingness to accept business on that basis for spot shipment. There is a very good inquiry for low grades—one from a large Michigan car manufacturing concern for delivery in July and August for 1500 tons and another from an eastern Virginia consumer in tidewater territory for the same amount, comprising 500 tons of No. 3 Foundry, 500 tons of Forge and 500 tons of Mottled for early delivery. This business is being figured at about $10.50 for Forge and $10, Birmingham, for Mottled, although it is said both prices could be shaded slightly on a basis of the present weakness of No. 2 Foundry. It is reported that the southern Ohio inquiry for Basic resulted in some close competition between Valley and Virginia furnaces. The successful bidders secured business aggregating between 5000 and 6000 tons, and at a price approximating about $14 at Virginia furnace and $15 at Valley furnace. The melters had an offer of about $16.40, delivered, on an off Basic, but it was declined, it is understood, on the excuse that the price was too near that offered on standard Basic. Sales of Bessemer and Malleable Bessemer in this market record those grades as firmest during the week, the price having been well maintained at around $16.50, Ironton, on Malleable Bessemer. The Indiana inquiry for Foundry Iron developed a sale of about 100 tons of Valley, some Virginia and some Southern Iron, the first named at about $15, Valley furnace. We note an inquiry from a Michigan maker of Steel Castings for 300 tons of Low Phosphorus Iron for Acid Open Hearth furnace use, May, June and July delivery. Eight per cent. Ohio Silvery is still quoted at $18.50. Present prices rule for second and third quarter, but no figures are obtainable on the last quarter. On No. 2 Foundry, $14.50 at Valley furnace is frequently heard. The Wellston Iron & Steel Company, Wellston, Ohio, is tearing down one stack, and will rebuild, while its No. 2 is relining, and will go in blast soon. For early delivery and extending in third quarter we quote, f.o.b. Cincinnati, freight rates being $3.25 from the Birmingham and $1.20 from the Hanging Rock District, as follows:

Southern Coke, No. 1	$15.25 to $15.75
Southern Coke, No. 2	14.75 to 15.25
Southern Coke, No. 3	14.25 to 14.75
Southern Coke, No. 4	13.75 to 14.25
Southern Coke, No. 1 Soft	15.25 to 15.75
Southern Coke, No. 2 Soft	14.75 to 15.25
Southern Coke, Gray Forge	13.50 to 14.00
Southern Coke, Mottled	13.00 to 13.50
Ohio Silvery, 8 per cent. Silicon	19.70
Lake Superior Coke, No. 1	16.70 to 17.20
Lake Superior Coke, No. 2	16.20 to 16.70
Lake Superior Coke, No. 3	15.70 to 16.20
Standard Southern Car Wheel	22.25 to 22.75
Lake Superior Car Wheel	22.00 to 22.50

(*By Mail.*)

Coke.—The mails of Monday brought in inquiries or actual orders as much, in the case of the larger dealers, as all of last week. This suggests to close observers of melt statistics that the supply at foundries is very short, and melters are convinced that the minimum in price has been reached. One dealer sold on Monday a car of New River, special, for spot delivery, at $3, at oven. Standard New River is quotable at $2.75. Connellsville Foundry is obtainable at about $2 to $2.25, at oven; Wise County, $2.25;

Pocahontas, $2 to $2.10. Some new contracts are noted reading a year from May 1 for deliveries on Foundry grades at current prices for consumption in the New England States. Ordinarily, little contracting is being done at this time, as almost all forward delivery orders are made in January or July of each year. There is nothing heard of Furnace grades.

Finished Iron and Steel.—Beyond a little increased inquiry and sale to Southern builders of Structural Material, conditions in this market are the same as last week. Material for boilers and tanks is having a fair sale, especially Boiler Tubes, on which mill prices are as follows: 1¾ to 2¼ in., 57.50, with 5 off; 2½ in., 59.50, with 5 off; 2¾ to 5 in., 63.50, with 5 off, all in carload lots and f.o.b. Cincinnati. For stock shipment the prices are 1¾ in. at 54; 2½ in. at 56, and 2¾ in. at 62. Orders from stock are filled by dealers at the following prices, which are f.o.b. Cincinnati: Iron Bars, carload lots, 1.65c., base, with half extras; small lots from store, 1.85c., base, half extras. Steel Plates, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2c. Blue Annealed Sheets (Heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.20c. No. 12, carload lots, 2c.; small lots from store, 2.30c. Sheets (Light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.20c.

Old Material.—It would seem that the lowest levels had about been reached in Scrap, but dealers here confidently predict still lower prices ere the reaction sets in. There has been some inquiry for Relayers, and some scattering sales of Heavy Melting Steel Scrap, but in the main the inactivity is almost painful. Quotations are about as follows, per gross or net ton as indicated, and f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$10.50 to $11.50
Cast Borings, net ton	4.00 to 5.00
Heavy Melting Steel Scrap	11.00 to 11.50
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	14.50 to 15.50
Old Iron Rails, gross ton	13.00 to 14.00
Old Steel Rails, long, gross ton	11.00 to 12.00
Old Steel Rails, short, gross ton	11.00 to 12.00
Relaying Rails, 56 lb. and up, gross ton	22.00 to 23.00
Old Car Wheels, gross ton	12.00 to 13.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00

San Francisco.

SAN FRANCISCO, April 29, 1908.

The improvement in the jobbers' demand for Iron, Steel and Pipe continues, although the ordering is somewhat spasmodic in some lines. Stocks were greatly depleted during the dull season, and the present buying will replenish the broken lines. However, it may take some time yet for business to get up to the normal conditions of previous years. The tonnage moving from the East has lately increased. The conditions in the mining districts and oil regions are still improving, with some exceptions, and the market for Tool Steel, Steel Bars and Pipe has thus been benefited. The building situation in San Francisco is still quite active, notwithstanding the difficulty of securing money from the banks for construction work. Private individuals are loaning more money than formerly. There will be a great deal of building this summer, but whether this will hold good throughout the year remains to be seen. If the money situation improves after the Presidential nominations have been made, as many expect, the volume of building work will increase instead of diminish. The proposed bond issues, aggregating $18,000,000, which will be voted upon May 5, have been indorsed by representatives of the leading commercial bodies of the city at a mass meeting. The construction of a $5,000,000 salt water auxiliary fire system and the erection of new schools and public buildings are provided for.

Structural Materials.—Most of the Steel frames in course of construction in the city have been completed, and the Steel crews will find work rather slack until some additional buildings are started. Among the contracts pending for Structural Steel for large buildings in this city are those for the new Y. M. C. A. Building, which is to cost $500,000; the Olympic Club Building, and the new Army Transport Depot. The last named contract will involve more than 2000 tons of Steel of various kinds. Floor beams for a number of large wharves and roof trusses for the long warehouses, 40 ft. in width, are included in the specifications for this great enterprise, which is to cost more than $1,000,000. All of the work including piers, sheds, &c., is to be of the most substantial construction. The Thomson Bridge Company, of this city, has been awarded a contract to construct a Steel viaduct at Bernardino, Cal., for the Santa Fé Railroad Company. This company's bid per ton of Steel to be erected was the lowest.

Pig Iron.—Little improvement is noted in the demand for Pig Iron in this market. Brokers are hoping for a revival of business among the foundries and engineering works. The falling off in shipbuilding along the Coast has hurt the shops that formerly kept busy on the construction of engines for the numerous new steam schooners intended for the coasting lumber trade. Few arrivals of Pig Iron from England, Scotland or China have been reported recently and little is afloat for this port. Local foundries are still buying from hand to mouth and in small lots. While all of the warships of the Atlantic squadron, which is to arrive here next week, will be dry docked, little repair work will be done in private shops. No. 1 English, No. 1 Scotch and Chinese Pig Iron are quoted in this market at about $28 to $29 per ton, ex yard.

Cast Iron Pipe.—Good inquiries are still reported for Cast Iron Pipe and some important contracts are pending. Some progress is being made toward the carrying out of important municipal water enterprises on the Coast, and, altogether, things are looking better, although considerable time may elapse before large contracts will be closed for these projects. The prospect is encouraging for the securing of the proposed Lake Eleanor supply from the Sierras in connection with the proposition to furnish San Francisco with a supply of pure mountain water under a municipal system to be paid for by the issue of bonds. Engineer Marsden Manson is in Washington and has helped secure further water rights from the Government. More than $2,000,000 worth of Cast Iron Pipe will be required for the proposed salt water auxiliary fire protection system, according to the latest plans. Prices of Cast Iron Pipe, f.o.b. cars Pacific Coast terminal points, are about as follows, per net ton: 6, 8, 10 and 12 in., $38; 4-in., $39.

Merchant Pipe.—An improvement is noted in the demand for Merchant Pipe and an increased tonnage is moving. Prices are fairly well maintained. Discounts on Steel Pipe are about as follows on jobbers' carloads:

	Steel Black.	Steel Galv.
½ to ¾ in.	58.5	42.5
⅞ in.	60.5	46.5
1½ in.	62.5	50.5
2½ to 6 in.	66.5	56.5
7 to 12 in.	63.5	48.5
Extra strong, plain ends:		
¼ to ⅜ in.	51.5	39.5
½ to 4 in.	58.5	46.5
4½ to 8 in.	54.5	42.5
Double extra strong, plain ends:		
½ to 8 in.	47.5	36.5

Bars.—The conditions induced by local Iron mills producing Scrap Bar of indifferent quality, by reason of their recent reduction in prices, are making inroads into the Bar Steel trade materially. On account of the decided difference in prices there is an increase in the consumption of Bar Iron in place of Steel. General business conditions are also getting better, and the consumption of Bars is steadily increasing. Jobbers' stocks are low, this applying especially to the large jobbers. Iron and Steel Bars are now sold by merchants from stock at about 2.25c.

Coke.—With the starting up of the smelters, the demand for the lower grades of Coke has improved, while Foundry Coke is in better demand than Pig Iron. Stocks of Coke in the dealers' hands are still much larger than they would like to have and prices are not advancing. Arrivals of foreign Coke by sea have been very light throughout the past month. A gradual improvement in the coast demand for Coke may be expected as business increases at mines and foundries. English Foundry Coke is quoted at about $14 to $15 per ton, laid down here. German Syndicate and Australian Coke are somewhat lower.

Railroad Materials.—Business has been almost at a standstill for months as far as standard Rails are concerned, and other Railroad Materials are in very slack demand. No new railroad projects are being started in California, but one is on foot in the Puget Sound region. The Pacific & Southwestern Railway has been incorporated at Tacoma, with a capital stock of $15,000,000, by William H. Crocker and Templeton Crocker, of San Francisco, and George Crocker, James Searles and Thomas H. Hubbard, of New York City. It has been given out that the proposed 500-mile line from Tacoma to Walla Walla, Wash., will form a connection with a new transcontinental line. A. D. Shepard, general manager of the Pacific Improvement Company, filed the articles of incorporation and put surveyors in the field. Sixty acres of tide lands on the Tacoma water front have been acquired for a terminal. The United Railroads of San Francisco has purchased from the General Electric Company for immediate delivery an addtiional 5000-kw. three-phase, 13,200-volt generating unit for its North Beach power station in San Francisco. This Curtis steam turbine, set with the additional boilers required, means a large investment, but the demand for power for the opera-

tion of street cars is so great that the company was forced to increase its plant.

The contract for furnishing 6600 ft. of pipe and fittings and nine hydrants to be used in the extension of the Lovelock water system in Nevada was awarded to the Crane Company, San Francisco, whose bid of $2284.70 was the lowest of the five submitted.

Surveyor Guy McMurtry spent three days in San Francisco investigating the probable cost of a city water works for Yuba City, comprising a steel tower, 70 ft. high, set on concrete foundation, an 80,000-gal. tank, and 8 and 6 in. mains on every street in the city, and also a gasoline or steam engine and electric motor and connections. It is the intention of the trustees to call a special election at once for the purpose of voting the necessary bonds.

Judge Ellsworth has signed an order restraining the local Board of Public Works from entering into a contract with the Doak Gas Engine Company for the erection of a salt water plant in Oakland, Cal. The complaint is charged that the bid of the Fairbanks-Morse Company, of $28,420 was $150 lower than that submitted by the Doak Gas Engine Company. The matter will come up soon for a final settlement.

The contract for the construction of the eight-story building to be occupied by the Y. M. C. A., at Sixth and Taylor streets, in Portland, Ore., has been awarded to the Northwest Bridge Company of that city.

Pittsburgh.

PARK BUILDING, May 5, 1908.—(*By Telegraph.*)

Pig Iron.—The trade here is awaiting with much interest the outcome of the meeting of the Ore and Pig Iron Committee to be held in New York this week, and consumers are holding back orders for Pig Iron until the result of the deliberations are known. Bessemer Iron is nominally $16.25, Valley furnace, or $17.15, Pittsburgh, but if any business was offering it is likely that $16 could be done. It has sold in scattered lots below $17, Pittsburgh. Basic Iron is fairly strong at $15.50, Valley furnace, but one or two sellers outside the Valley districts are offering it for nearby points of delivery at a less price. Nothing is doing in Forge Iron, which is nominally $14 to $14.25, Valley furnace, or $14.90 to $15.15, Pittsburgh. A few small lots of Foundry Iron ranging from carloads up to 100 tons are being sold on the basis of $14.75 to $15, Valley furnace, or $15.65 to $15.90, Pittsburgh and we quote the market on Northern No. 2 Foundry at that price.

Steel.—Practically no new buying is being done in Billets, and only a fair tonnage is being specified for against old contracts. In Sheet and Tin Bars the mills are fairly busy, the Carnegie Steel Company shipping out quite a heavy tonnage to the American Sheet & Tin Plate Company, and to some of the independent Sheet and Tin Plate mills. Leading producers of Steel claim that regular prices are being maintained, which are $28, Pittsburgh, and $28.50, Youngstown or Wheeling, for Bessemer and Open Hearth Billets; Sheet and Tin Bars taking $1 advance. Forging Billets are very dull, and are nominally $29 to $30, Pittsburgh.

Pipes and Tubes.—Published reports that the National Tube Company and other Pipe interests would make a material cut in prices of Tubular Goods prior to May 16 are officially denied and without foundation. No such action is contemplated by leading Pipe interests at this time.

(*By Mail.*)

A difference of opinion prevails as to whether actual improvement can be expected until the Presidential election is out of the way. It is pointed out that the summer months will soon be here when the Steel business always falls off, and that after the hot weather is over it will be so close to the time for holding the election that consumers will continue to wait until they find out whether a new party will come into power. Others believe, however, that with the nominations made and assurances of good crops business in the second half of the year will show an improvement over the first half. The conviction is almost universal, nevertheless, that 1908 is going to be a lean year. General conditions in the Iron trade to-day are very little, if any, better than they were last October when the slump came. There is no heavy buying in sight. A meeting of the leading Ore interests was held in Cleveland last Friday, and it is stated that they agreed unanimously to maintain last year's prices on Ore for this year. It is reported that some of the leading Southern producers of Pig Iron are now more closely allied in the matter of maintaining prices, but as far as the Northern producers are concerned the Pig Iron market is wide open, and prices are lower to-day than they have been at any time since the decline started last October. There is very little demand for Bessemer and Basic Iron, and while there is more buying of Foundry Iron, this is due to the fact that some of the furnaces are naming very low prices. Bessemer Iron has sold below $17, Pittsburgh, in small lots, while Basic is fairly strong at $15.50, Valley furnace. Only one furnace in the Shenango Valley is now making Bessemer Iron, this being No. 2 stack of the Shenango Furnace Company, at Sharpsville, the blast furnace of the Stewart Iron Company, at Sharon, having recently gone on Low Phosphorus. In the Mahoning Valley the Republic Iron & Steel Company is running two furnaces at Hazelton, while Struthers, Girard, and one Andrews & Hitchcock stack, are running on Foundry and Basic. Practically no orders are being placed for Steel Rails, and the demand for Billets is light. A fair business is being done in Sheet and Tin Bars, particularly in the latter. In Finished Iron and Steel conditions are no better, and in some lines the demad has fallen off as compared with March. Coke is offered at the lowest prices that have ruled for some years. The Scrap trade is slow and prices are weak.

Steel Rails.—The tonnage in both Light Rails and Standard Sections taken by the Carnegie Steel Company in the past week was light, only a few small orders having been placed. The three Edgar Thomson Rail mills at Bessemer are in operation this week, and will be running next week, but only to about 35 to 40 per cent. of capacity. Regular prices on Light Rails, which continue to be shaded from $3 to $4 a ton by rerolling mills, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Ferromanganese.—The firmer feeling referred to in this report last week continues, and to-day prices are fully $1 a ton higher than two weeks ago. Consumers realize that Ferro is low in price, and in some cases are trying to buy for delivery over the balance of this year and into next, but sellers refuse to contract so far ahead. We quote 80 per cent. foreign at $43, seaboard, or $44.95, Pittsburgh, and note sales of about 75 to 100 tons at this price.

Ferrosilicon.—The demand is fairly active, and we quote 50 per cent. at $70, f.o.b. Pittsburgh.

Muck Bar.—The market continues quiet, and we do not hear of any inquiries. A little more Muck Bar is being made in the Pittsburgh District than for some time, but it is being worked up into finished material by the producers. We quote best grades, made from all Pig Iron, at nominally $26.50 to $27, but there is no business offering to test the market.

Skelp.—Fair shipments are being made by the mills on specifications against contracts, but new orders are only for small lots. We quote: Grooved Steel Skelp, 1.55c. to 1.60c.; Sheared Steel Skelp, 1.65c. to 1.70c.; Grooved Iron Skelp, 1.75c. to 1.80c.; Sheared Iron Skelp, 1.85c. to 1.90c., Pittsburgh.

Rods.—No important inquiries are in the market, actual sales being confined to small lots for prompt delivery. Consumers are not disposed to buy ahead, believing that prices may be lower. Bessemer Rods are held at $35. Open Hearth at $36 and Chain Rods at $37, f.o.b. Pittsburgh.

Plates.—Buying is only in small lots for actual needs. Neither jobbers nor consumers are disposed to order ahead, feeling that prices will not be any higher, but that if any change is made it will be in the direction of lower values. None of the mills is operating more than 50 per cent. of capacity, and in some cases to only 25 per cent., and there is little business on their books. In spite of lack of demand prices are being well maintained, but there is some shading in narrow sizes by certain mills of $1 to $2 a ton. Regular prices are as follows: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in.	
Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell grade of steel is abandoned.	

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—New work is coming out slowly, and no large contracts have been placed in this district for some time. In the past week the A. & S. Wilson Company has taken the contract for the Second National Bank Building, at Uniontown, and the Steel, about 450 tons, will be furnished by the Jones & Laughlin Steel Company. Three or four other jobs, the largest of which is the Pittsburgh & Lake Erie bridge at Beaver, about 14,000 tons, are hung up. Prices on the small amount of fabricated work that is being placed are very low, in some cases work being taken at less than actual cost. A meeting of the Steel Erectors' Association was held in Pittsburgh on Tuesday.

but no action of importance was taken. We quote Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—The month of April in the Sheet trade was only fairly satisfactory. The expected increase in business was not realized, that month showing only a small gain over March. The demand for Black and Galvanized Sheets is only fair, and is altogether for small lots for actual needs. A little more is doing in Roofing Sheets, but on the whole the Sheet trade is disappointing. Prices are well maintained, being only slightly shaded by two or three small mills. Regular prices are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Cotton Ties.—Buyers are specifying fairly well against contracts, but the tonnage placed so far this year is much lighter than in the corresponding period of 1907. We quote as follows: 3000 bundle lots and over, 85c.; less than 3000 bundle lots, 88c., f.o.b. Pittsburgh.

Hoops and Bands.—No new business is being placed, but consumers are specifying fairly liberally against contracts placed in January this year, at the time prices were guaranteed by the mills. Regular prices are as follows: Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60, base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Tin Plate.—The United States plant of the American Sheet & Tin Plate Company at Demmler was started up on Monday, and this company is now operating 213 hot mills out of a total of 252 hot mills, some of which, however, will probably not be operated again. All the Tin Plate concerns have a fair amount of tonnage on their books for delivery over the next five or six months, but practically all of the business for this season's fruit trade has been placed, and is not as heavy as the tonnage last year. While prospects are good for a large fruit crop, indications are that the consumption of Tin Plate this year may fall slightly below the figures of last year. It is stated that prices are being absolutely maintained by the mills. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Iron and Steel Bars.—The situation in both Iron and Steel Bars as regards new business shows no improvement whatever. Orders are few and only for small lots for actual needs. Specifications on contracts for Iron Bars are possibly coming in a little more freely, but none of the mills is able to operate to more than 50 per cent. of capacity, and some of them to much less. It is stated that prices on Steel Bars are being absolutely maintained, but on Iron Bars are being shaded by a few small mills. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further west. Steel Bars remain very firm, at 1.60c., Pittsburgh.

Spelter.—Prices have advanced from 5c. to 10c. in the past week or 10 days, due to reports that heavy contracts for Spelter have been taken for foreign shipment. We quote prime grades of Western Spelter at about 4.55., East St. Louis, equal to 0.67½c., Pittsburgh.

Railroad Spikes.—Little new business is being placed and the general situation is quiet. We quote: Standard sizes, 4½ x 9-16 in., at $1.70, and the smaller sizes at $1.80 per 100 lb. in carloads and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Merchant Steel.—Purchases are confined to a few small orders for actual needs. Prices are largely nominal, not enough new business being offered to test the market. We quote Cold Rolled Shafting, on contracts for 100 tons and over, 57 per cent. off; carloads, 56 per cent. off, and less than carloads, 52 per cent. off, on which carload freight is allowed within base territory. Nominal prices on Merchant Steel are as follows: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 2.10c. to 2.15c. Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron, finished, 1½ in. and wider, 1.60c.; under 1½ in., 1.75c. Planished Tire Steel is 1.80c., all f.o.b. at mill.

Pipes and Tubes.—Reports are current that the Hope Natural Gas Company, an identified interest of the Standard Oil Company, is in the market for 100 to 150 miles of 16 to 18 in. Line Pipe, but this has not been officially confirmed. Buyers are placing orders only for small lots for actual need. The tonnage entered in April is reported as having been slightly larger than in March. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 74 and 5 per cent. off list, while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black.	Galv.
⅛ to ¼ in.	65	49
⅜ in.	67	53
½ in.	69	57
¾ to 6 in.	73	63
7 to 12 in.	70	55
Extra strong, plain ends:		
⅛ to ⅜ in.	58	46
½ to ¾ in.	65	53
1 to 6 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

Discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
⅛ and ¼ in.	63	45
⅜ in.	65	51
½ in.	67	55
¾ to 6 in.	71	61
7 to 12 in.	68	53
Extra strong, plain ends:		
⅛ to ⅜ in.	56	44
½ to 4 in.	63	51
4½ to 8 in.	59	47
Double extra strong, plain ends:		
½ to 8 in.	52	41

Boiler Tubes.—Orders for Merchant Tubes continue to be small, and the same is true of Locomotive Tubes, railroads having bought very little for some time. Discounts on Merchant Tubes for small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ in.	42	47
1¼ to 2¼ in.	42	59
2½ in.	47	61
2¾ to 5 in.	52	65
6 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Connellsville Coke.—It is announced that the H. C. Frick Coke Company will build a model Coke plant on the Hogsett tract of Coal below New Salem, in the Connellsville region, near the Buffington plant. The new works will contain about 600 ovens of the beehive type, and a shaft will be sunk about 500 ft., and a modern steel shaft will be erected. The output of Coke was increased last week, due to the fact that the Frick Coke Company operated most of its ovens six days, instead of four and five days, as heretofore. General conditions are unchanged, the demand for both Furnace and Foundry Coke being light, and no contracts are being placed. Prices continue low, best grades of Furnace Coke being offered for prompt shipment at $1.50 to $1.60, and 72-hr. Foundry Coke from $2.10 to $2.25 a ton at oven. Other grades of Furnace and Foundry Coke made outside the Connellsville region, and not as high in quality as Connellsville, are being offered at much lower prices. The output of Coke last week in the Upper and Lower Connellsville regions was 164,858 tons, an increase over the previous week of about 17,000 tons.

Iron and Steel Scrap.—The demand for Scrap continues dull, consumers buying only in small lots for actual needs. None of the large consumers of Scrap are buying to any extent, and the actual tonnage being sold is very light, while the tone of the market is weak. The heavy movement in Bundled Sheet Scrap noted before is about over, and no large sales of this material have been made in the past week. Dealers quote about as follows, per gross ton: Heavy Steel Scrap, Pittsburgh, Steubenville or Sharon delivery, $12.75 to $13; Cast Borings, $7.25 to $7.50; No. 1 Railroad Wrought, $13.25 to $13.50; No. 1 Cast, $14.25 to $14.50; Bundled Sheet Scrap, $8.50 to $9, at shipping point; Sheet Bar Crop Ends, $16 to $16.50; No. 1 Busheling Scrap, $12 to $12.25; No. 2, $9 to $9.25; Iron Axles, $19 to $19.50; Steel Axles, $16.50 to $17; Low Phosphorus Melting Stock, $16; Old Steel Rails, short pieces for Open Hearth use, $12.75 to $13; Rerolling rails, lower in price, $13.50 to $13.75; Machine Shop Turnings, $8 to $8.25; Grate Bars, $12 to $12.50; Railroad Malleable Scrap, $11.25 to $12. We note sales of 300 tons of Cast Iron Borings on the basis of about $7.50, Pittsburgh.

D. D. Williams & Co. have opened offices at 509-510 Bakewell Building, Pittsburgh, and will be sole agents in this country for Cammell, Laird & Co., Ltd., Sheffield, England, producers of high grade steel and armor plate. The firm will also handle Ferromanganese, Spiegeleisen and other alloys.

Charles R. Bryson, 501 Curry Building, Pittsburgh, has been appointed Western agent of the Philadelphia Roll &

Machine Company, Philadelphia, Pa. He will have charge of the sale of sand and chilled rolls, rolling mill equipment, and charcoal air furnace castings.

St. Louis.

ST. LOUIS, May 4, 1908.

The heavy business interests of this city are making a vigorous concerted movement to promote a full return of confidence, claiming that conditions warrant greater activity. There is a steady gain in building operations, but the feature is rather in the number than in the size. With the railroads, however, except the improvement in sentiment, there is with the large ones no material change. In the case of small Southwestern roads some buying of material and supplies is being done.

Coke.—An improvement is reported in the demand, and we hear of the sale of 2000 tons of Foundry Coke for shipment one year from July.

Pig Iron.—Dealers are in receipt of orders for Pig Iron running from car lots to 150 tons for Southern No. 2 Soft at $11.75, Birmingham, both for prompt and next three to five months' shipment. It is reported that some sales have been made at $11.50. The situation is regarded as improving, since inquiries are more numerous.

Structural Material.—There being but few contracts closed with general contractors, the spot demand for Structural Material is limited. The prospects for more activity in building in the near future have improved, and it is known that some contractors are soon to place orders for Steel.

Bars.—Specifications are coming in slowly. Some demand is noted from jobbers to keep up assortment, and manufacturers are buying only as needs require.

Spelter.—Business has improved slightly, and the market for Spelter is firmer. The inquiry is mostly from consumers. We quote $4.55 to $4.60.

Old Materials.—There are no lists out this week from any of the railroads, and it is practically a dealers' market. There is some demand for Relaying Rails, mostly from lumber and mining interests. Car Wheels and Cast Scrap are ruling very dull. We quote, f.o.b. St. Louis, per gross ton:

Old Iron Rails	$14.00 to $14.50
Old Steel Rails, rerolling	11.25 to 11.50
Old Steel Rails, less than 3 ft	11.00 to 11.25
Relaying Rails, standard sections, subject to inspection	21.00 to 22.00
Old Car Wheels	13.00 to 13.25
Heavy Melting Steel Scrap	10.75 to 11.00
Frogs, Switches and Guards, cut apart	10.75 to 11.00
Mixed Steel, country	9.00 to 9.50

Following quotations are per net ton:

Iron Fish Plates	$11.50 to $12.00
Iron Car Axles	15.00 to 15.50
No. 1 Railroad Wrought	11.00 to 11.25
No. 2 Railroad Wrought	10.00 to 10.25
Railway Springs	9.75 to 10.00
Locomotive Tires, smooth	12.50 to 13.00
No. 1 Dealers' Forge	9.50 to 10.00
Mixed Borings, &c	3.50 to 3.75
No. 1 Boilers, cut to Sheets and Rings	7.50 to 8.00
No. 1 Cast Scrap	10.50 to 10.75
Stove Plate and Light Cast Scrap	9.00 to 9.50
Railroad Malleable	9.50 to 10.00
Agricultural Malleable	8.50 to 9.00
Pipes and Flues	7.25 to 7.50

The American Car & Foundry Company is of the opinion that of the idle cars at least half are in bad order. With regard to locomotives that have been laid off, in the case of one road some 50 locomotives have been drawn upon to patch up the ones in use. This will lead to busy times with the repair shops within 60 days.

The Koken Iron Works state their recent deliveries of Structural Material in St. Louis are upward of 700 tons. For outside contracts they are furnishing Steel for the addition to the United States Post Office at Ogden, Utah.

Birmingham.

BIRMINGHAM, ALA., May 4, 1908.

Pig Iron.—The circulation given to the report that large Southern interests would endeavor to have the schedule of prices lowered at the coming meeting of Pig Iron and Ore committees in New York has had a material effect upon the trade. Inquiries pending at the time of the last report resulted in the sale of a comparatively small tonnage, and all recent transactions have been of a mandatory nature. The indications of a disposition to negotiate for anticipated requirements, recently noted to some extent among producers, has practically disappeared, and the percentage of order book requirements representing speculative buying has not been increased. The schedule of $12, Birmingham, for No. 2 is being adhered to, and in the case of producers whose output is believed to be well sold up, the quotations are firm, yet such a basis has not been maintained, and $11.50 is believed to be nearer a correct representative of the market price. One concern reports the sale of approximately 3000 tons at figures around $12, but the tonnage reported is the aggregate of small lots. A quotation of $11.75 per ton for 500 to 800 tons of No. 2 did not result in a sale, and a lot of 1000 tons of No. 3 Foundry is reported sold at $11, Birmingham. It is understood, however, that the company making the sale has no No. 2 to offer for early deliveries. As to the probable result of the meeting of the committees, information obtainable does not elicit the anticipation of lower prices by producers. All producers report a favorable comparison of order books with present output, and there is no disposition manifested other than to continue the policy of limiting production to order book requirements. In accordance with such a policy, one of the largest companies has found it necessary to blow in an additional furnace. A meeting of all Southern interests will be held in Birmingham to-day, and in view of the New York meeting, May 7, parties most conversant with the situation are of the opinion that marked developments are imminent.

Cast Iron Pipe.—In addition to buying expected for Cuban, South American and Mexican points, as well as a contract for San Francisco, there is now in sight an attractive tonnage for Porto Rico. The principal letting reported during the week is 5200 tons of Water Pipe for the city of St. Louis, Mo. This contract was awarded the United States Cast Iron Pipe & Foundry Company, and it is stated that keen competition resulted in exceptionally low figures, but the price at which the contract was placed is not given out. In the absence of definite information relative to decline in prices, quotations are not revised and we quote Water Pipe nominally as follows, per net ton, f.o.b. cars here: 4 in. to 6 in., $23; 8 in. to 12 in., $22; over 12 in. average, $21, with $1 per ton extra for Gas Pipe. These prices are probably shaded on large contracts.

Old Material.—There is practically no market at present. Consumers apparently anticipate a further decline in prices by reason of the weakness in the Pig Iron market, and are deferring negotiations accordingly. Dealers are still indisposed to make concessions, which is no doubt due to lack of demand, but are pursuing a conservative course as to stock accumulations. A revision of quotations is not authorized, and we quote nominally as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$16.00 to $16.50
Old Iron Axles	15.00 to 16.00
Old Steel Axles	13.50 to 14.00
No. 1 Railroad Wrought	13.00 to 13.50
No. 2 Railroad Wrought	10.00 to 10.50
No. 1 Country Wrought	11.50 to 12.00
No. 2 Country Wrought	10.50 to 11.00
Wrought Pipe and Flues	9.50 to 10.00
No. 1 Steel	11.00 to 11.50
No. 1 Machinery	10.50 to 11.00
Stove Plate and Light Cast	9.50 to 10.00
Cast Borings	6.00 to 6.50

Cleveland.

CLEVELAND, OHIO, May 5, 1908.

Iron Ore.—Representatives of some of the merchant Ore firms have been calling on the blast furnace interests to which they usually make sales and have picked up some small orders. Few consumers, however, are ready to buy as yet. There is still the feeling among many of the furnacemen that present prices will not be maintained, but the Ore men are firm, and some of them, at least, are willing to guarantee their price on the kind of Ore that they sell. While some scattered buying is looked for during May, it is not expected that there will be much activity for several weeks. Shipments from Lake Erie docks have fallen off somewhat as compared with a month ago. It is estimated that there is at present 6,000,000 tons of Ore on the docks, as compared with 7,385,000 tons on December 1. There is no improvement in sight in the lake trade and few boats have started. Some that were chartered for early grain cargoes are being laid up. Two cargoes of Ore, the first to be shipped this season, will be landed at the head of the lakes this week for the Inland Steel Company, Indiana Harbor. Not many cargoes will be shipped to Lake Erie ports during May. Another meeting of the vessel owners will be held in Cleveland, May 12, to fix the time for the general start of the lake fleet. It is probable that the start will be further postponed until June 1. The Steel Corporation is fitting up some of its largest boats, but they will probably not be placed in commission soon. Managers of other lines are doing little toward fitting out their boats. No trouble has resulted from the inauguration of the open shop policy by the dock managers, which went into effect May 1. Some of the Ore handlers at Fairport, Ashtabula and Conneaut have made contracts with the dock managers for two years under the open shop plan. The wages will be the same as last year, and there will be no important changes in working conditions. Prices for 1908 delivery at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.20; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—The market is as quiet as it has been at any time this year. The few sales have mostly been car lots at

low prices. The inquiries a week ago for Foundry Iron for the last half delivery failed to result in any contracts. In view of the present unsettled condition of the market, melters are disposed to buy only in small lots for their immediate requirements. The only sale of any size reported by local interests was 200 tons of No. 2 Foundry at a price under $15, Valley furnace. We quote Northern No. 2 Foundry at $14.75 to $15, Valley furnace. One local furnace is asking the latter price for outside shipments. Three of the largest furnace interests are refusing to make the low quotations now prevailing, and by holding their Iron at $16, at furnace, are virtually out of the market. Little Iron is being taken on contracts, so that stock piles of furnaces out of blast are being reduced but slowly, and one or two furnaces that went in blast in the past few weeks are rapidly accumulating Iron. There is a possibility that these furnaces will go out of blast again when they have accumulated enough Iron to fill outstanding contracts. The melt in this territory shows no improvement. Most of the local foundries have good sized stocks on hand. For prompt shipment we quote, delivered, Cleveland, as follows:

Bessemer	$17.15
Northern Foundry, No. 1	$16.15 to 16.50
Northern Foundry, No. 2	15.65 to 16.00
Northern Foundry, No. 3	15.15 to 15.60
Southern Foundry, No. 2	15.85 to 16.35
Gray Forge	15.00

Coke.—A local furnace interest that will place its stack in blast this week has closed a contract for its Furnace Coke requirements for the next five months, amounting to 9000 to 10,000 tons per month. The price made was $1.55, at oven, for first class Connellsville Furnace Coke. Some contracts for Foundry Coke for the last half of the year were closed at about $2.25, at oven, for 72-hr. Connellsville Foundry Coke. We quote the best grades of Foundry Coke at $2 to $2.25, at oven, for spot shipment and $2.25 to $2.40 for last half.

Finished Iron and Steel.—A slight improvement is seen in the demand for Structural Material and Plates both on contracts and in new orders from fabricators, but otherwise the situation shows little change. The stocks of some of the large manufacturing plants are becoming depleted, but the only orders they are giving are for small lots for immediate needs. The Bar situation shows no improvement, the demand for both Iron and Steel Bars being light. The Union Rolling Mill is running about full this week, and the Empire Rolling Mill Company is running one of its mills. The mill of the Cleveland Steel Company started up Monday after a short shutdown. While the larger producers are adhering to the price of 1.50c., Pittsburgh, for Iron Bars, the price is still being cut to 1.40c., and in some cases to 1.35c., Pittsburgh, by one or more small producers. The price of Steel Bars is being firmly maintained. The demand for Plates is light. Prices are being well maintained on the wide sizes, but on the narrow sizes price concessions of from $1 to $2 are being made. The demand for Sheets shows no improvement, and some of the smaller mills are making concessions. Contracts were closed for two buildings that will require a fair tonnage in Structural Material within the next few weeks. One is a factory building for the Cleveland Worsted Mills Company, and the other a local store building. The demand for Light Rails has fallen off. Warehouse business is light. We quote Iron Bars at 1.50c. to 1.60c., Cleveland, for car lots; Steel Bars, 1.70c., Cleveland, for car lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼ in. and heavier, 1.80c., Cleveland. Dealers quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Jobbers quote Iron and Steel Bars out of stock at 1.80c., but this price is being shaded, particularly on Iron Bars. Beams and Channels out of stock are 2.10c. to 2.15c., base. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in. are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—This branch of trade shows no improvement, there being practically no demand for any kind of Scrap. Local mills are running, but they have enough Old Material on hand to supply their immediate needs, and are not in the market. Scarcely any call for Cast Scrap is coming from melters. Very little trading is noted between dealers. Yard dealers are buying some mixed Scrap when they can pick it up at very low prices. The market is slightly weaker, but owing to the absence of sales prices are still largely nominal. Among the railroad offerings this week is a list of about 2500 tons by the Pennsylvania. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$11.00 to $11.50
Old Iron Rails	14.50 to 15.50
Steel Car Axles	16.00 to 17.00
Old Car Wheels	12.50 to 13.00
Relaying Rails, 50 lb. and over	21.00 to 22.00
Heavy Melting Steel	11.00 to 11.50
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	7.50 to 8.50

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	6.00 to 7.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	10.50 to 11.00
No. 1 Railroad Wrought	12.00 to 12.50
No. 1 Cast	11.50 to 12.00
Steel Turnings	10.00 to 10.50
Bundled for Sheets	8.00 to 9.00

Philadelphia.

PHILADELPHIA, PA., May 5, 1908.

New business comes out very slowly. Buying in nearly every line is practically at a standstill, pending probable action in the near future regarding prices. It has been a long time since buyers were so completely out of the market, but under existing conditions consumers will take on no further supplies, except in cases of absolute necessity, until they are satisfied that prices have reached the bottom. The meetings of the Iron and Steel committees, to be held in New York the present week, are therefore being looked forward to with considerable interest, as it is believed that the action taken, whether it be in favor of maintaining or reducing prices, will result in the placing of some of the business which has been temporarily held up. The volume of business which would come out, however, in either case is hardly expected to be large owing to the many other perplexing problems which still confront the trade at this time, and, until these have in a measure been taken care of, no genuine improvement in the Iron and Steel trades is anticipated. The financial situation is more encouraging, and the readiness with which the recent large loans have been placed is considered in a most favorable light.

Pig Iron.—The demand for Pig Iron has been confined strictly to requirements for immediate consumption, and sales during the week have been the lightest on record for a long period. There has been considerable feeling of the market, but there is absolutely no inclination to buy for forward delivery under existing conditions. Hope is expressed that some definite action regarding the prices of Pig Iron may be taken at Thursday's meeting of the Pig Iron and Ore Committee. The Eastern Pig Iron Association will hold a meeting on Wednesday to outline a plan to be presented at the meeting in New York, but it is difficult to say what the outcome will be. Some producers believe that it would be the best policy to maintain the present basis of prices; others favor a moderate reduction, while still others believe that an open market would be the best solution. It is also said that should the Eastern producers make any change in their present basis, it would not likely be with the idea of meeting the low figures talked of for Southern Iron, but rather to make an adjustment on which they would be able to take a fair share of the business naturally belonging to the producers in this territory. In any event, it is doubtful if any very extensive buying movement would set in. Consumers would probably take enough Iron for immediate needs and partly fill up deficiencies in their stocks, but unless the general business of the country shows some signs of material improvement, consumers will hardly be likely to make any heavy purchases for forward delivery in anticipation of their needs. The Eastern furnaces, which have maintained the basis of $18.25 delivered for No. 2X Foundry, have made few sales during the past week. Outside interests have, as far as we can learn, made no further concessions, but have taken the bulk of the little business floating around at prices ranging from $17.50 to $17.75, delivered, for No. 2X Foundry. The tonnages sold have been small, ranging from carloads up to 50 tons for spot delivery. One of the pipe interests which was reported in the market for 2000 tons last week is understood to have bought 500 tons of Southern Iron against that inquiry, at a price under the basis of $12, Birmingham. The same interest is in the market this week for 1500 tons of pipe iron. Sales of Southern Iron have been light. Sellers in some cases are not so willing to take lower figures, and we are told that a number of firm offers for fair tonnages on the basis of $11.50, Birmingham, for No. 2 X Foundry, have been declined. Virginia Irons show but little activity, producers holding pretty firmly at the recent range of prices. There has been only a slight demand for Forge Iron, as the Bar mills are running irregularly, and what tonnages have been sold have been for prompt delivery. A sale of 300 tons is reported at full prices. Steel making Irons show no appreciable change. An inquiry is out for 500 tons of Low Phosphorus Iron. Basic Iron is quiet, there being no demand for this grade at the time. Prices show no change; in fact, hardly enough business has been done in any grade to establish quotations. The following range is named for delivery in buyers' yards, eastern Pennsylvania and adjoining territory, for the remainder of the second quarter:

Eastern Pennsylvania, No. 2 X Foundry	$17.50 to $18.25
Eastern Pennsylvania, No. 2 Plain	17.00 to 17.75
Virginia, No. 2 X Foundry	17.50 to 17.75
Virginia, No. 2 Plain	17.25
Gray Forge	16.00 to 16.75
Basic	17.25
Low Phosphorus	23.00 to 23.50

Ferromanganese.—Little new business has developed. Available stocks at seaboard have become quite small, and quotations are now mostly made subject to prompt shipment from abroad. Prices are still held at $43 to $44, Baltimore, although some importers will not sell at these figures.

Steel.—No improvement has developed in the demand. Orders coming in are for small tonnages, and mostly for prompt delivery. Specifications on old orders are light. Prices continue to be fully maintained. Ordinary Rolling Steel for delivery in this territory is quoted at $29.20, with Forging Steel at $31.20, the usual extras for high carbons and large sizes applying.

Plates.—Business still comes out slowly and is confined almost entirely to small lots for miscellaneous purposes. Some of the mills show a reduction in output for April, as compared with the previous month. Propositions requiring large tonnages are comparatively few, and while the trade is hopeful the outlook is scarcely as good as it was. Prices are unchanged. We quote as follows, for delivery in this territory:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—No large contracts have come out, although there has been a fair number of small orders and mills continue to operate on a fairly even basis. More inquiry seems to have come up for medium and small work, but nothing further than what has been pending has developed in the way of larger propositions. Quotations remain unchanged at 1.85c. to 2c., according to specifications.

Sheets.—A slight improvement is to be noted in the demand for sheets. Orders show no increase in tonnage, but are in larger number. Consumers' stocks are reported as being very low, and orders received are for the greater part for urgent delivery, there being no buying for forward shipment. Quotations range as follows for mill shipment, with a tenth more for small lots: Nos. 18 to 20, 2.50c.; No. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The demand is light and the market is dull. Specifications on low price Bars come out slowly, while fresh business is practically at a standstill. With low price Bars still on the market, not much business can be expected to develop at the established basis. Quotations for refined Iron Bars range from 1.46c. to 1.65c., delivered in this territory.

Coke.—Business comes out slowly and sales during the week have been small and confined almost entirely to Foundry Coke. Owing to the inactivity of blast furnaces, the demand for Furnace Coke is almost nil. Foundry Coke is quoted at $2.15 to $2.40 at oven, with Furnace Coke at $1.65 to $1.85 at oven. For delivery in this territory the following range of prices is quoted:

Connellsville Furnace Coke	$3.80 to $4.00
Foundry Coke	4.30 to 4.55
Mountain Furnace Coke	3.40 to 3.60
Foundry Coke	3.80 to 4.10

Old Material.—Business is practically at a standstill. Mills in this territory show no interest in the market, although some small lots of cheap Scrap have been taken. Borings are a little stronger, due to purchases made in other territories, which have reduced the immediate supply. The general tendency of the market, however, is not strong, and prices are quoted nominally for prompt shipment, delivered in buyers' yards, eastern Pennsylvania and adjoining territory, as follows:

No. 1 Steel Scrap and Crops	$12.75 to $13.25
Low Phosphorus	17.50 to 18.00
Old Steel Axles	17.50 to 18.00
Old Iron Axles	20.00 to 21.00
Old Iron Rails	17.00 to 18.00
Old Car Wheels	14.00 to 15.00
Choice No. 1 R. R. Wrought	15.00 to 15.50
Machinery Cast	15.00 to 15.50
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	8.75 to 9.25
Stove Plate	11.00 to 11.50
Cast Borings	7.75 to 8.25
Grate Bars	11.75 to 12.25

The firm of Frank Samuel, Harrison Building, Philadelphia, has purchased the two blast furnaces of the Lehigh Steel & Iron Company, at Allentown, Pa., and will dismantle them.

Metal Market.

NEW YORK, May 6, 1908.

Pig Tin.—The statistical position viewed from the standpoint of holders of the metal is less promising. The total visible supply throughout the world on April 30 was 13,241 tons compared with 9839 tons the same date last year. It is true, however, that visible supplies have decreased approximately 2000 tons since the end of March. The computed deliveries into consumption in the United States in April were figured as 3000 tons. The deliveries for the last four months show a decrease of 4000 tons compared with the same period last year, and in the same time European deliveries have shown an increase of approximately 400 tons. Stocks in the United States April 30 were figured as 1135 tons. Business during the week has been small, and consumers apparently have covered their requirements for some time. Price changes have been toward lower levels, as follows:

	Cents.
April 29	32.20 to 32.25
April 30	31.80
May 1	31.55 to 31.65
May 2	31.75
May 4	31.75
May 5	31.45
May 6	31.05

Stocks here are ample for present requirements; the arrivals this month amounting to 1145 tons. There are afloat for American ports 1768 tons. The London market declined sharply to-day, closing at £139 15s. for spot and futures.

Copper.—Little change is observed in the market. Electrolytic is available for domestic consumption at between 12.60c. and 12.70c., net cash. Lake, although firmly held by some producers at 13c. is offered by other producers and second hands at 12.87½c. Domestic buying has been small, but there are numerous inquiries in the market at a shade under present quotations, and if the metal recedes much toward the average cost of production, 12c., there is likely to be considerable buying by consumers in this country. It is observed also that melters here are buying from tired second-hand holders. The surprising thing about the situation is the large consumption in Europe, it having exceeded the expectations of practically everybody, and even now after the phenomenal exports for some time, European melters are buying for early shipments. A fair European demand also exists for Copper Scrap and considerable has been exported. Those interests would probably come into the market and buy freely if metal should be offered at any great concessions from prevailing prices. The statistical situation in Copper is undoubtedly improving. Production in North America is running from 60 to 70 per cent. of normal, and the stocks held are no longer a great depressing factor. Prices are so near the cost of production that there is immeasurably less danger of carrying supplies. The carrying cost is only one-quarter of what it was a year ago—that is, Copper is now selling at half what it was a year ago and interest rates are also one-half of last year's figure. Not only that but funds can be readily obtained. The needed thing in the Copper market, however, is some better figures of production and stock on hand. To publish these figures from trustworthy sources would have no detrimental effect on prices at this time and would serve to keep the market steadier. Exports during April were large, amounting to nearly 32,000 tons. The total exports this year aggregate 111,000 tons, against 57,000 tons in the same period last year. Some manipulation is evident in London from the large transactions. Prices there are about 5s. higher than last week at £57 12s. 6d. for spot and £58 7s. 6d. for futures.

Waterbury Average.—The Waterbury average for April was 13c.

Spelter.—The plan to export Spelter has flattened out. While it would have been easy to have shipped 5000 or perhaps 10,000 tons, this would have had no great effect on the accumulated surplus of metal, which is evidently between 40,000 and 50,000 tons. Moreover, the producers of the better grades, while loudly applauding the action of the others, would do little or nothing to aid them. Conditions are, therefore, little changed from a month ago. Prime Western brands are quotable in New York at 4.65c. to 4.70c., and in St. Louis at 4.50c. to 4.55c. Brass Mill Special is held at 4.75c. to 4.80c.

Lead.—The consumption of Lead is good, and prices have been advanced another 10 points, 4.20c. being now quoted in New York and 4.10c. in St. Louis. A rather peculiar thing is that the European market is declining as this is advancing, and present quotations there, £13 15s., are the lowest of the year. The American Smelting & Refining Company is taking the bulk of the business. This interest is not booking orders for delivery beyond the middle of June at to-day's prices. The market was strong this afternoon, and there is a possibility of a further advance.

Nickel.—Quotations continue unchanged, at 45c., for ton lots, and 50c. to 60c., for smaller quantities.

Antimony.—Prices of this metal are low, and in spite

of higher quotations abroad, the American market continues irregular. Cookson's can be had at 8.75c. to 8.87½c.; Hallett's at 8.50c. to 8.75c., and outside brands at 8.25c. to 8.50c.

Tin Plate.—Business continues in good volume and prices are firm. For 100-lb. IC Coke Plates $3.89 is quoted, New York, and $3.70, Pittsburgh. Welsh Tin Plates are 1½d., lower in Swansea at 12s. 6d.

Ferroalloys.—The demand for Ferromanganese has improved. Some orders for round lots as well as smaller quantities were taken last week at $43.50, seaboard, and about $45.50, Pittsburgh. Although some of this was for last half delivery, the bulk was for prompt shipment. Importers are unwilling to make contracts at prevailing prices for large second half deliveries. Inquiries have likewise been more numerous. The market for 50 per cent. Ferrosilicon is quite unsettled, and as low as $70 is heard.

Old Metals.—Prices are easier. The domestic demand is small, but foreign consumers are buying Scrap freely. Dealers' selling prices are as follows:

	Cents.
Copper, Heavy and Crucible	12 00 to 12 25
Copper, Heavy and Wire	11.75 to 12.00
Copper, Light and Bottoms	11.00 to 11.25
Brass, Heavy	9.00 to 9.25
Brass, Light	7.00 to 7.50
Heavy Machine Composition	11.50 to 11.75
Clean Brass Turnings	8.00 to 8.50
Composition Turnings	9.00 to 9.50
Lead, Heavy	3.90
Lead, Tea	3.55
Zinc, Scrap	3.50

Baker & Co., Inc., platinum, gold and silver refiners, of Newark, N. J., and New York City, announce the removal of their New York office to the sixth floor of the Cortlandt Building, Hudson Terminal, with entrance at 30 Church street.

New York.

NEW YORK, May 6, 1908.

Pig Iron.—The market has been exceedingly quiet, and the tone is easier. The feature continues the offering of Southern Iron at prices considerably below those of the Northern producers. We quote, at tidewater, as follows: No. 1 Northern Foundry, $17.50 to $18.50; No. 2 Foundry, $17.25 to $18.25, and No. 2 Plain, $16.50 to $17. Alabama Irons are $16.50 to $16.75 for No. 1 Foundry, and $15.75 to $16.25 for No. 2 Foundry.

Steel Rails.—Aside from some sales of Steel Rails for export, there has been no business. The fact is being observed that the same railroad companies are not, as usual, placing orders for the year's requirements at once, but are negotiating for only that part which they expect to use in the following few months.

Structural Material.—Business in this line appears to be improving. Small orders have been increasing in number, and a better disposition is shown by those who have important contracts to place. The impression seems to be gaining ground that no advantage is to be secured by waiting for reduced prices. It is noteworthy that some of the fabricators who have been making lowest prices on finished work are beginning to cover their requirements for plain material. They are evidently becoming convinced that Steel prices are not to be reduced. The bridge over the Lehigh River, to be built by the Lehigh & New England Railroad, requiring about 1400 tons, was secured by the Pennsylvania Steel Company. The Baltimore Bridge Company has taken the contract for furnishing and erecting the Steel work of the Baltimore Masonic Temple, 620 tons. Some bridge work is shortly to come out for the Chicago & Northwestern and for the Chicago, Milwaukee & St. Paul. The Harriman lines will shortly be in the market for their season's bridge work requirements, probably exceeding 10,000 tons. The first section of the New York Central terminal improvement in this city, requiring 3500 tons of Steel, will probably be undertaken soon, as the American Bridge Company has been asked to execute the formal contract. This company secured a total of about 19,000 tons of fabricated work for the month of April, which is the best month's business so far this year. The mills report orders for plain material considerably better than for several weeks. On mill shipments, delivery at tidewater, quotations are as follows: Beams, Channels, Angles, and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—Prices of Iron Bars show no improvement. Dealers and brokers appear to have enough unfilled orders on hand to enable them to supply the limited current demand at about 1.50c., New York, although the mills are quite generally maintaining their quotation of 1.50c., Pittsburgh, or 1.66c., New York. Steel Bars are held at 1.60c., Pittsburgh, or 1.76c., New York.

Plates.—Local trade is light and mills are receiving few orders from this vicinity. Prices are firmly held as follows on standard sizes of Plates, at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—The city of New York is advertising for water works extensions which will require about 2800 tons of 30-in. Pipe, on which bids will be opened May 13. The city will not purchase the Pipe directly from manufacturers, as the work will be let to contractors, who will buy the material. General business is exceedingly dull, being apparently restricted to an occasional carload or two. This branch of trade is now in about the worst condition experienced since the panic. It is likely that some foundries that have hitherto been quite active will shortly close if trade does not improve. Carload lots of 6-in. are quoted at $23.50 to $24, per net ton, tidewater.

Old Material.—The market shows little improvement. Possibly Cast Scrap is slightly more active, as foundries appear to be doing more in New England, where the machine shops are running a little better. Old Car Wheels, singularly enough, are weaker than Cast Scrap, and prices of these materials are steadily getting closer together. A very large accumulation of Old Car Wheels is pressing on the market. Some improvement has been observed in the demand for Relaying Rails. Rerollers are wanted, but at very low prices. Steel Scrap is quiet, the demand being restricted to small lots. Quotations are about as follows, per gross ton, New York City:

Old Girder and T Rails for melting	$9.50 to $10.50
Heavy Melting Steel Scrap	9.50 to 10.50
Old Steel Rails, re-rolling lengths	13.50 to 14.50
Relaying Rails	19.50 to 20.50
Old Iron Rails	14.00 to 15.00
Standard Hammered Iron Car Axles	15.50 to 16.50
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	11.50 to 12.50
Iron Track Scrap	9.50 to 10.50
No. 1 Yard Wrought, long	10.50 to 11.50
No. 1 Yard Wrought, short	9.50 to 10.50
Light Iron	5.00 to 6.00
Cast Borings	4.50 to 5.50
Wrought Turnings	6.00 to 7.00
Wrought Pipe	9.00 to 10.00
Old Car Wheels	14.00 to 15.00
No. 1 Heavy Cast, broken up	13.00 to 14.00
Stove Plate	9.00 to 10.00
Locomotive Grate Bars	9.50 to 10.50
Malleable Cast	10.50 to 11.50

Iron and Industrial Stocks.

NEW YORK, May 6, 1908.

The market on iron and industrial stocks has been quite firm, but at a somewhat lower range than during the previous week. The fluctuations have been comparatively narrow. The range of prices on active stocks from Thursday of last week to Tuesday of this week has been as follows: United States Steel common 35⅞ to 36⅞, preferred 100 to 102⅜; Car & Foundry common 34¼ to 36; Locomotive common 46⅛ to 48¾, preferred 100 to 100¼; Steel Foundries common 6⅞, preferred 31 to 32¼; Cambria Steel 29½ to 30; Colorado Fuel 24 to 25¼; Crucible Steel common 5 to 5⅜, preferred 38 to 39¾; Pressed Steel common 27¾ to 29½, preferred 84 to 87; Railway Spring common 35 to 36½; Republic common 17 to 18, preferred 66½ to 67¾; Sloss-Sheffield common 44¾ to 45¾, preferred 89¾ to 93; Cast Iron Pipe common 24⅝ to 25⅛, preferred 72 to 73; Can common 5⅛, preferred 54 to 55. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 36¾, preferred 100⅝, ex-div., bonds 95⅜; Car & Foundry common 36½, preferred 96⅜; Locomotive common 50½, preferred 101; Colorado Fuel 25¼; Pressed Steel common 30⅝, preferred 87, ex-div.; Railway Spring common 35; Republic common 18, preferred 67½; Sloss-Sheffield common 46¾; Cast Iron Pipe common 25, preferred 73.

Dividends.—The Roane Iron Company, Chattanooga, Tenn., has declared the regular quarterly dividend of 1½ per cent.

The American Radiator Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable May 15, and 1 per cent. on the common stock, payable June 30.

The Association of American Steel Manufacturers.—The annual meeting of this association was held May 2 at the Lincoln Hotel, Pittsburgh. It is composed of the leading steel manufacturers, and interests itself in technical matters pertaining to the business. Among the topics considered, it was resolved to renew the effort that was made some years ago to dispense with all systems of numbered gauges in specifying the thickness of all light rolled sections and to encourage the use of micrometer measurements. The following officers were elected: President, W. A. Bostwick, metallurgical engineer, Carnegie Steel Company; vice-president, A. A. Stevenson, superintendent, Standard Steel Works Company; secretary-treasurer, Jesse J. Shuman, inspecting engineer, Jones & Laughlin Steel Company, Pittsburgh, Pa.

The Rail Business in Canada.

TORONTO, May 4, 1908.—Blast furnace No. 1 of the Algoma Steel Company's plant was blown out on Saturday, and No. 2 is to be put out of blast this week. That means a complete cessation of productive work at this plant. The company's explanation of the stoppage is that the railroads are not offering business enough to keep the works going, and the reserve of the railroad people in the matter is attributed to financial conditions.

Financial conditions, however, cannot be the deterrent, for, as was stated last week in these columns, Canadian railroad building has received no discouragement from the money market. So far as the grand features of current railroad enterprise are concerned, they are well supported. In the case of the Grand Trunk Pacific the national credit is pledged, and that the national credit is high is shown by the success of the Dominion Government's recent loan of £300,000. These 3½ per cent., 42-year bonds, were sold at par, and the issue was much oversubscribed, not withstanding that at the time of the transaction a state of ease had not yet come to the London money market. Besides the $14,600,000 thus raised, $16,600,000 has been raised since August by the sale of Treasury bills and on short term loans. Much of this will have to be funded in the near future, and another loan of £4,500,000, which matures in November, will have to be renewed. It is understood the Government has good reason to expect that its forthcoming issues will receive at least as good a demand as the spring issue had. Up to the close of the fiscal year on March 31 the Government had expended $26,000,000 on the National Transcontinental Railway. For the current fiscal year an appropriation of $30,000,000 for the National Transcontinental Railway has been voted. As for the Grand Trunk Pacific division of that highway, the company has the backing of the Grand Trunk Railway Company and has the guarantee of the Dominion Government on its bonds. If the National Transcontinental Railway is not now affording a demand for rails it is not because of financial disability.

The Canadian Pacific Railway Company's financial position is at the present time particularly strong, as indicated by the success of its latest flotations and its very large cash surplus, the high level at which its stock stands. At the outset of the season of growth the prospects of the West never looked brighter. Seeding has come three weeks earlier than it did last year, and the weather is daily reported to be ideal. Settlers flocked in from the United States this spring the same as if there had been no crop disappointment or financial stringency in the Canadian West last fall. The Canadian Pacific Railway people are in good heart, and can have no anxiety as to ways and means for improvements and the new construction it has mapped out.

Public credit largely underlies the Canadian Northern Railway Company, whose bonds have the guarantee of the Provincial governments and in some cases of the Dominion Government. Its lands are a splendid asset, inasmuch as they are bound to advance in value rapidly. It is possible the company may not spend much in extension, but will put more money in terminal improvements and equipment, as it has need of large expenditure on both accounts.

Robert W. Hunt & Co., engineers, Chicago, have established an analytical chemical laboratory in connection with their St. Louis office, 1445 Syndicate Trust Building. In addition to general analytical work, particular attention will be given to analyses of and advice on iron foundry mixtures. This work and the laboratory will be under the direction of J. B. Emerson, who for several years has had charge of the metallurgical part of the wheel foundry of the Mt. Vernon Car Company.

Third Vice-President O'Leary of the Iron Molders' Union, who has been canvassing the locals throughout the United States, is reported as stating that only about 30 per cent. of the iron molders are employed.

The Ways and Means Committee to Gather Tariff Data.

WASHINGTON, D. C., May 5, 1908.—Formal action looking toward the comprehensive revision of the tariff early in the Sixty-first Congress was taken April 30, when Mr. Payne of New York, chairman of the Ways and Means Committee and the majority leader on the floor of the House, introduced a resolution authorizing his committee to sit during the coming recess to gather information to be made the basis of a general overhauling of the tariff schedules. The text of this resolution is as follows:

Resolved, That the Committee on Ways and Means is authorized to sit during the recess of Congress and to gather such information, through Government agents or otherwise, as it may deem fit, looking toward the preparation of a bill for the revision of the tariff; and said committee is authorized to purchase such books and to have such printing and binding done as it shall require, and, in addition to requiring the attendance of the committee stenographers, is authorized to employ an additional stenographer and to incur such other expenses as may be deemed necessary by said committee; and all the expenses of said committee shall be paid out of the contingent fund of the House on the usual vouchers as now provided by law.

Mr. Tawney of Minnesota, chairman of the House Committee on Appropriations, is the prime mover among the Republican members of the House in the campaign to commit the majority to the revision of the tariff in the Sixy-first Congress. Several weeks ago he drafted a resolution authorizing the Ways and Means Committee to sit during the recess, and soon induced the Speaker to recognize the advisability of giving the public some pledge of the intentions of the majority. Subsequently he induced Chairman Payne and Mr. Dalzell of Pennsylvania to accept the same view, and Mr. Payne thereupon agreed to present the resolution himself.

Broad Scope of the Resolution.

It will be noted that the resolution introduced by Mr. Payne does not hamper the committee by specific instructions, but leaves it free to pursue any line of investigation that may be deemed appropriate and advisable. The resolution was sent to the Committee on Rules, which is composed of the Speaker, Messrs. Dalzell of Pennsylvania and Sherman of New York, Republicans; Mr. Underwood of Alabama, a member of the Ways and Means Committee, and Mr. De Armond of Missouri, Democrats. It will undoubtedly be adopted before the summer recess. The Senate Finance Committee will also be authorized by a special resolution to sit during the coming recess, but as the House must originate tariff legislation the burden of the preliminary work will fall on the Ways and Means Committee.

Whether hearings on the tariff will be granted to representatives of the various industries during the coming recess has not yet been determined, but it is improbable that any such hearings will be held before the November elections. The committee may take the testimony of members of the Board of General Appraisers, Treasury officials and other experts before the schedules are considered in detail and before either manufacturers or importers are invited to give their views. It will be noted, however, that the committee will be fully equipped under the resolution to pursue any line of inquiry that may be deemed advisable.

Administrative Laws May Be Amended.

As the result of representations made to prominent members of the Senate Finance Committee by members of the Board of General Appraisers and others, it is probable that an effort will be made to amend the customs administrative laws before the adjournment for the summer recess, which has now been postponed until approximately June 1. A bill providing for a number of important changes in the customs administrative act of June 10, 1890, was recently reported from the Ways and Means Committee and has just been passed by the House. The general provisions of this bill were recently fully described in this correspondence.

The measure as passed by the House was not altogether satisfactory to the Treasury Department and to the Board of General Appraisers, however, and as the

leading members of the Finance Committee deemed it advisable to defer action until after the next general revision of the tariff the bill was pigeonholed. Within the past few days, however, representations have been made to the committee that certain features of the administrative laws should be modified at the earliest practicable date, and the committee is now disposed to take action, especially in view of the deferred adjournment of Congress. It seems probable that the Finance Committee will redraft the House bill and report it as an amendment or substitute. If recommended by the committee the Senate will pass the bill without delay and it is believed the Ways and Means Committee will accept it in lieu of the measure which has already gone through the House.

W. L. C.

Customs Decisions.

Dutiable Status of Mexican Zinc Ores.

The United States Circuit Court at Laredo, Texas, has handed down a decision in a case between the Government and the importers, which has attracted much attention. It involved the dutiable status of various zinc ores imported from Mexico. The smelting companies in the United States, headed by the New Jersey Zinc Company, insisted that these ores should be free of duty. The zinc miners of the United States, on the other hand, headed by the interests in Joplin, Mo., insisted that they should pay 20 per cent. ad valorem as a protection to the domestic industry. The Treasury Department took the view of the miners and levied the duty accordingly. The court now upholds the contention for free entry and overrules the Government's claim for a 20 per cent. duty.

The case was sharply contested before the Board of General Appraisers, the Government being represented by special counsel retained by the Joplin people, while the New Jersey Zinc Company and others interested on that side were also represented by counsel. The trial before the Board of Appraisers occupied several days, and the case was finally decided against the Government and in favor of the importers. Thereupon the Government brought suit in several different districts of the United States, and during April of last year the case was elaborately argued by counsel on both sides, who went from New York to Houston, Texas, for the purpose. The case was heard by Judge Burns, in the United States Circuit Court, and it must have been a perplexing problem, for over a year has elapsed without a decision. He has now rendered the decision indicated above, and as the matter is one of great importance to both sides there is no doubt that the Government will appeal the case to the United States Circuit Court of Appeals, and it probably will be argued next winter in New Orleans.

The smelting interests were represented in this litigation by Wm. Wickham Smith and by Howard T. Walden of New York, and the special counsel who tried the case for the Government was Everit Brown, also of New York. Mr. Brown was asked to make a statement in the matter, and said: "I presume that the court felt itself to some extent bound by a prior decision in a higher court which involved one of the legal questions in this very complicated case. If this is the fact it is no surprise to the Government, and was anticipated at the commencement of the litigation. The Government started this matter with the expectation of carrying it to the higher courts and will be by no means dismayed by any decision of lower tribunals."

It is said that in detail the merchandise is of two kinds. One kind, which is claimed to be calamine, is carbonate of zinc ore, and the other kind is sulphide ore (or "blende"), which has been concentrated. These were all assessed for duty at 20 per cent. ad valorem as metallic mineral substances in a crude state. The importers claim the carbonate of zinc to be free of duty under the provision in the free list of the tariff for "calamines," and they also claim that all the ores of both kinds are in any event free of duty under another provision in the free list, which reads: "Minerals, crude or not advanced in value or condition by refining or grinding, or by other process of manufacture, not specially provided for in this act."

Lace Curtain Machinery.

The Board of United States General Appraisers has decided that parts of lace curtain and other machines, drilled, bored, planed, fitted and finished, cannot be admitted under the customs classification for "castings," as contended for by the Lehigh Mfg. Company, the North American Lace Company and others. Under the plea of the importers the parts would stand a duty of only eight-tenths of 1 cent per pound. It was the contention of the Government, however, that the articles should stand duty at the rate of 45 per cent. under the provision in the tariff for "manufactures of metal." General Appraiser Fischer, who writes the decision for the board, is unable to sustain the claim of the importers. He says in part:

We regard the collector's assessment as correct, and as in accordance with the rulings of the courts and this board. As finished parts of machinery the so-called castings are something more than the "castings of iron, not specially provided for," under paragraph 148 of the tariff. That provision has been limited to articles which are complete after the process of casting, and does not include such as are further manipulated, or which have been subjected to a finishing process subsequent to being cast. We hold, therefore, that they are not classifiable as castings, and overrule the protests.

Sundry Decisions.

It has been decided by the United States Circuit Court of Appeals at New York that pulverized corundum ore must stand duty at the rate of 1 cent a pound, under paragraph 419 of the tariff act, by similitude to emery. It was maintained by F. W. Myers & Co., the importers, that the commodity should be admitted free of duty as "manufactured sand."

The Board of Appraisers in refusing to reduce the assessment of duty on water pails and sprinkling pots imported by John Wanamaker of New York and Philadelphia, lays down the rule that articles of utility cannot be regarded for dutiable purposes as "toys." The Treasury Department exacted duty on the articles as manufactures of metal at 45 per cent. The contention of the importer for duty at 35 per cent. is overruled.

The John A. Roebling's Sons Company has won a contention with the Government for lower duty on importations of round steel wire valued over 4 cents per pound. Duty was assessed on the merchandise at the rate of 2 cents per pound, whereas a claim was made for assessment at 40 per cent.

Sale of the Tula Iron Works, Mexico.—According to a press dispatch dated April 16 from Guadalajara, Jalisco, Mexico, the iron ore mines and iron works in the Cocula District of the State of Jalisco, through a transaction just closed, have been transferred to Daniel Ochoa, a capitalist and shoe manufacturer of the city of Guadalajara. The dispatch adds: "On several occasions in the last few years the sale of the properties to American interests appeared probable, but in each instance the deal failed of consummation. It is stated that Mr. Ochoa will now devote his attention principally to the manufacture of iron, and that the Tula product will be exported through the port of Manzanillo, as well as supplied to the domestic markets. In the transfer the iron mines and works were considered to be worth $900,000." A few months ago negotiations were opened for the purchase of this property on behalf of American capitalists. The preliminary steps ended in a lawsuit in the Mexican courts.

Beginning on Saturday, April 25, the navies of several countries have had a string of accidents. On that day the American liner St. Paul sunk the British second class cruiser Gladiator off the south coast of England, resulting in the drowning of 23 of the British crew. On the following Tuesday, while a British fleet was maneuvering off the English coast, the cruiser Attentive rammed and crippled the torpedo boat destroyer Gala, and sheering off collided with and knocked a hole in the destroyer Ribble. On the same day a boiler exploded on the British battleship Britannia, injuring three men. On Wednesday, while the German battleship Elsass was at practice off Kiel, a cartridge exploded prematurely, killing two and injuring six men. On Thursday the Japanese cruiser Matsushima was sunk by an explosion in its magazine while anchored off the Pescadores Islands, near Formosa, causing the loss of over 200 lives.

The Machinery Trade.

NEW YORK, May 6, 1908.

The business transacted the past week was not of sufficient volume to show an improvement in the demand for machinery over that of the previous weeks, and was of a character to indicate no immediate betterment. The important interests are still out of the market and no large projects have developed. Consequently the orders cover small lots of tools, and in most cases those of the lighter class. With a few houses these small orders have slightly increased in number, but with others trade is as dull as it has been at any time since the spurt in March; in fact, some report business at the opening of the month more quiet and fewer orders in sight. The inquiries now before the trade are not of an encouraging nature, and these, coupled with the reports of further curtailment of forces or cutting down of hours in some of the representative plants, are not indicative of a change from the present dullness. Bids for large excavation work will soon be opened, notably the Fourth Avenue Subway in Brooklyn, and manufacturers are awaiting the award of contracts for the latter work, as it will necessitate the use of a great deal of mechanical equipment. Manufacturers and dealers have figured up their sales for April and with few exceptions find that their business fell off considerably from that of March, in some cases to the level of that of February.

Convention Notes.

The programme for the joint convention of the Southern Supply and Machinery Dealers' Association, the National Supply and Machinery Dealers' Association and the American Supply and Machinery Manufacturers' Association, to be held at Richmond, Va., May 13, 14 and 15, has been arranged. On Wednesday morning, May 13, separate executive sessions will be held by the organizations and on Wednesday afternoon there will be a joint open session, at which an address will be made by C. H. Briggs, president of the Southern Supply and Machinery Dealers' Association. Remarks will also be made by George Puchta, president of the National Supply and Machinery Dealers' Association; M. W. Mix, president of the American Supply and Machinery Manufacturers' Association, and the address of the day will be delivered by William H. Taft, Secretary of War. A smoker and vaudeville performance will take place that evening. On Thursday morning a joint executive session will be held, when the following papers will be read: "Resale Prices," by F. A. Hall, Yale & Towne Mfg. Company, New York; "Salesmanship," W. E. Gerow, Atlantic Supply Company, Jacksonville, Fla.; "Plain Talks to Jobbers," D. K. Swartwout, Ohio Blower Company, Cleveland, Ohio.; "Advantages of Co-operation in Supply and Machinery Business," W. M. Pattison, W. M. Pattison Supply Company, Cleveland, Ohio. On Thursday afternoon there will be two executive sessions one of which will be attended by members of the Southern Supply and Machinery Dealers' Association and the National Supply and Machinery Dealers' Association, who are engaged in the machinery business, and the other will be for members of the American Supply and Machinery Manufacturers' Association. At the banquet in the evening the following addresses will be made: "Commercial Fraternity," C. A. Moore, president Manning, Maxwell & Moore, New York; "Benefits Derived from Trade Organizations," Robert Wuest, commissioner National Metal Trades Association, Cincinnati, Ohio; "The Ladies," Hon. John Garland Pollard, Richmond, Va. Separate executive sessions will be held on Friday morning, at which officers of the respective associations will be elected, resolutions and reports disposed of, and other trade matters threshed out, and joint executive sessions will be held in the afternoon. Trolley rides and luncheons have been arranged for the entertainment of the ladies accompanying the members.

The spring convention of the National Machine Tool Builders' Association will be held on Tuesday and Wednesday, May 19 and 20, at the Hotel Chalfonte, Atlantic City, N. J. A large contingent of the members of the association have signified their intention of attending, and it is expected that the convention will be a large one.

From all accounts the New York Central & Hudson River Railroad will shortly do some machinery buying for improvements at a number of its shops. An expenditure of over $900,000 is contemplated for improvements at Buffalo and points in western New York. This will include some additional purchasing for a boiler shop in course of construction at Depew, and about $9000 will be spent for a boiler plant at West Lockport. A coaling station will be erected at Depew, and other improvements are to be made at West Batavia, East Buffalo and Buffalo. In addition to machinery purchases, it is understood that some signal equipment will be bought.

Considerable machinery will be required for equipping the new garage to be erected by the New York Taxicab Company, 546 Fifth avenue, New York. Contract for the construction of the garage, which, it is claimed, will be the largest in the country, has been awarded. It will be located on Fifty-seventh street, near Eleventh avenue, at a cost of several hundred thousand dollars. The building will be 144 x 250 ft., five stories and basement, of steel, concrete and brick construction, and will be provided with inclined planes running from the street to the floors. Half of one of the floors will be used exclusively as a repair shop, this space being about 72 x 125 ft., and it will be equipped with lathes, milling machines, drills, presses and such tools as are generally used in the repair and manufacture of automobiles. The building will have accommodations for 1000 taxicabs.

A number of orders for machinery equipment have been placed in this market by Seymour & Whitlock, machinists, New Jersey Railroad avenue, Newark, N. J. This company has spent about $17,000 in construction work, which has about doubled its plant, and machinery equipment is now being installed. The firm manufactures special machinery and acts as consulting and designing engineer.

A number of purchases have been made in this market of late of equipment for developing oil properties in Mexico, and there are inquiries out now for machinery for projects of the kind. The Oil Fields of Mexico Company, which has large properties in that country, is arranging to construct a railroad from its works at Furbero, Vera Cruz, to the Port of Tuxpan, a distance of 50 miles. An oil pipe line which will parallel the railroad is also to be constructed, and this will necessitate the purchase of considerable pumping machinery and the like. The company's New York office is at 43 Exchange place and Percy N. Furber is president.

Plans for the new plant to be built by the International Engineering Company, Carter Building, Scranton, Pa., are progressing, and it is expected that they will be in shape so that the erection of the buildings can be commenced shortly. The company has secured an excellent site at Erie, Pa., where the buildings are to be constructed, and will soon be ready to take up the matter of equipment purchases.

The Hudson Structural Steel Company, 136th street and Southern boulevard, New York, whose new shop, 60 x 103 ft., was mentioned in these columns some time ago, has purchased the greater portion of the equipment for this shop. Some few tools have not yet been decided upon and they will probably be purchased this week.

The State Department of Public Works, Albany, N. Y., has awarded Barge Canal contract No. 45, which includes work at Baldwinsville, to Scott Brothers, Atlanta, Ga., at their bid of $467,514.

The Gibbs Gas Engine Company, Peters' Building, Atlanta, Ga., has been organized to manufacture gas and gasoline engines for marine, automobile, electric lighting and general power work. It is the intention to install a new plant, but as plans have not been perfected the company has not yet decided upon the machinery that will be required.

Business Changes.

The Standard Gauge Mfg. Company, Syracuse, N. Y., manufacturer of indicating gauges for all purposes, has moved its New York branch from 141 Broadway to room 1770, Hudson Terminal Building. The change was made in order to obtain more spacious quarters for the display of a large line of engineering specialties, as well as to be in the center of the engineering district. The Western branch of the company is located in the Monadnock Building, Chicago, Ill.

Perkins & Frecker, 136 Liberty street, New York, dealers in machine tools, have been appointed Eastern agents for the Cincinnati Chuck Company, Cincinnati, Ohio, manufacturer of high grade independent and universal lathe chucks.

The New York office of the Morgan Engineering Company, Alliance, Ohio, formerly located in room 507 Trinity Building, 111 Broadway, has been moved to room 1106 City Investment Building, 165 Broadway. E. J. Parker still retains the management of the company's New York office.

Chicago Machinery Market.

CHICAGO, ILL., May 5, 1908.

Features of important interest are wholly lacking in the machinery trade. The past week has brought out nothing more than a scattering lot of pickup orders, such as have constituted the majority of transactions for some time past. It is quite evident to manufacturers that as long as railroad retrenchment holds purchases within present limits there will be no fundamental improvement, and until this occurs the larger industries will have no need for additional equipment. Notwithstanding the discouragements of the present situation, hopes of early betterment are bolstered by the belief entertained by many that the railroads will soon be compelled to relax their extreme policy of curtailment and buy more freely. It is reasoned that the time is not far distant when preparations will have to be made for moving the future crop, and this will involve at least a large amount of car repair work; for it is well known that a large part of

the idle rolling stock is composed of bad order cars, which will require extensive repairs before being put into service. When this work begins it will certainly exert a beneficial influence upon the machinery trade, which will be measured by the extent of such activity. For the present, however, no new business of moment is coming from the railroads. There is, perhaps, a little better demand for motive power equipment and pumping machinery than is noted in other lines. This is due chiefly to the requirements of small municipal electric light and water works systems throughout the West, of which there are quite a number now in the market. Makers of large sized units in boilers and engines are finding little new business.

A project for the establishment of car shops at Ralston, Neb., formerly known as Seymour Park, six miles southwest of Omaha, is under way. This enterprise is being undertaken by the firm of Ralston & LeBaron, Fisher Building, Chicago, and contemplates the erection of four buildings, which will include an erecting shop, 100 by 300 ft.; wood work mill, 50 by 100 ft.; blacksmith shop and engine house, 50 by 100 ft., and a storeroom, 45 by 80 ft. The buildings are to be of wood frame sheeted with corrugated iron. It is designed to equip the shops throughout with modern machinery suitable for repair work and the building of new cars. While it is expected that in the beginning the shop will be run principally on repair work, it is the intention to develop gradually into the car manufacturing business. The promoters of this industry state that the preliminary work of organization has been completed and that within the next 30 or 60 days the work of construction will be in progress.

Manufacturers and dealers interested in boiler shop equipment are figuring on a set of plate bending rolls required by the Illinois Steel Company for installation in the North Works.

The Milwaukee Steel Fence Post Company, Milwaukee, Wis., recently incorporated with a capital stock of $25,000 to manufacture tubular steel fence posts with detachable driving points, is in the market for a gear press with 2-in. stroke, capable of punching 1 in. hole through ½ in. iron. A second hand tool, if in good condition, would meet the requirements.

Proposals for motive power and electrical equipment being asked for by the city of Calgary, Alberta, Canada, comprise the following units for installation in the municipal electrical generating station: One 1000 hp. reciprocating engine; one 750 kw., 3 phase, 60 cycle, alternating current generator; one direct connected steam driven excitor set, direct current, 120 volts, 30 kw.; one Tirrill automatic voltage regulator; switchboard of two panels; one station watt meter, daily recorder; alternate bids on one 750 kw. turbo generator, complete in all details. Bids will be received up to May 15, and detailed information can be had respecting this equipment by addressing V. Hill, city engineer.

A new electric light and water plant will be built at Spencer, Ind., by the Spencer Light, Power, Heat & Water Company, under the supervision of the Reliance Engineering Company, Cincinnati, Ohio. The equipment to be purchased for this installation includes two 100 kw. direct connected a. c. 2300 volt, 60 cycle, 3 phase generating units with automatic engines; one 72 in. by 16 ft. horizontal tubular boiler; a motor driven centrifugal pump of 700 gal. per minute capacity, against 100 lb. pressure; a direct acting compound duplex pump of 400 gal. per minute capacity against 50 lb. pressure; approximately 300 tons cast iron pipe in sizes ranging from 4 to 8 in.; 40 fire plugs with twin connections, fittings, &c.

J. J. and R. A. Nichols, owners of the local electric light plant at Soulsbyville, Cal., have recently installed a new 30 kw., 250 volt, direct current, Western Electric generator. Further equipment required will include one 30 hp. engine, for which the firm will be in the market soon.

Proposals for furnishing material, machinery and labor required in the construction of a water works system for the village of Deshler, Neb., will be received up to May 12 at the office of the village clerk. The equipment will include one tubular well, one deep well power pump, one gasoline engine, a steel tank and tower, together with the necessary pipe for distribution.

The Wilson & Friend Company, Chicago, Ill., has moved into larger quarters at 3130-3136 South Canal street, where it has floor space aggregating 30,000 sq. ft., which enables it to handle its increasing business with facility and dispatch.

The George H. Tay Company, San Francisco, is arranging to greatly increase its facilities for supplying all requirements of the engineering and heating trade, and will carry a complete stock of brass and iron valves, malleable, cast iron and drainage fittings, &c. It is also preparing to install an up to date machine shop and will shortly be fully equipped to cut and make up all sizes of pipe to sketch. This department is under the management of Theodore F. Dredge, for many years representing the Crane Company in San Francisco and elsewhere.

To improve its facilities the Sargent Steam Meter Company, Chicago, Ill., has moved its office and laboratory to 271-285 East Madison street.

Cincinnati Machinery Market.

CINCINNATI, OHIO, May 5, 1908.

The advent of May finds little improvement in the general situation, as to the output and sale of machinery and machine tools, but a reversal of April's debut which was most marked for an increase in inquiries with light sales, the sales being now a little freer, while inquiries have slumped off considerably. Many manufacturers are now putting out tools on consignment, and some whose shipments have been held up weeks and months are getting orders to forward them. Small and medium sized tools still have the call, but metal and wood working machinery, medium and small size units in power generating machinery represent the class most in evidence.

A number of large manufacturers whose specialties are tools have inaugurated a sort of renovation and repair régime in the shops and are making necessary improvements. Reports from other parts of this district, replies to questions propounded by *The Iron Age*, indicate that the situation with specialty manufacturers and structural steel and iron makers is very much improved, while little or no improvement is shown by returns of the steel and iron founders and tool manufacturers.

Nearly all the larger manufacturers of heavy and medium sized tools are able to offer what might be denominated bargains in slightly used or resale types. Dealers are finding a better and quicker response to offers and less difficulty is experienced in closing sales. If there is any cutting going on in this field the fact is very zealously guarded, and as a rule prices are being maintained.

The Cincinnati Punch & Shear Company is engaged on some special metal working machinery for large local and foreign concerns. This company has just delivered to the Globe-Wernicke Company, manufacturer of office supplies, a 10,000-lb. gate shear for motor drive, electric attachments furnished by the Triumph Electric Company of Cincinnati. It will be used in the manufacture of special metal fittings requiring the highest degree of accuracy. The company is now working on a heavy double 36-in. throat power punch, belt driven, for a concern in Seattle, Wash., and is finishing up a special wire forming machine for the Cincinnati Pump Company.

Shapers have led the past week in point of activity, several of the concerns making a specialty of that machine having sold good orders. The Queen City Shaper Company reports a sale during the week of five in one order—two 16, two 20 and one 24 in.—and another of six machines through a dealer—two 16, two 20 and two 24 in. This company is running on a schedule of 45 hr. per week, with but a small percentage less than normal force, having made it a rule throughout the period of depression to retain all its skilled workmen.

The G. A. Gray Company, Cincinnati, manufacturer of planers and other tools, has been making some improvements in all departments of its plant, including the foundry, in which new cranes have been installed.

The J. A. Fay & Egan Company, manufacturer of woodworking machinery, reports the sale to the United States War Department of 22 machines, including band saws, planers, &c., for shipment to the Philippines. The order was received on the last day of April, rounding out the best month of the year in that line.

A new type of clay cutting machine has been placed on the market by the Buckeye Traction Ditcher Company, Findlay, Ohio. The new machine is designed for work especially in marshy land where an open ditch is desired. The claimed advantages include an ability to run the 12-ton machine on land that would not support a team of horses through the utilization of automatic board walk that is available when the machine is running and is out of the way at other times.

The shops of the Hamilton Mfg. Company, Columbus, Ohio, are promised a steady run on a new coal storage machine which has just been successfully demonstrated in the coal and coke yards of the United States Steel Corporation at Gary, Ind. The machine is said to do the same amount of work in handling coal or coke in 10 min. that would require 10 men 10 hr. The company recently sold a machine to the Nova Scotia Iron & Steel Company for use in its Canadian shops.

A report from Lima, Ohio, says that the new Ohio Steel Castings Company, which has been shut down some months, is now in operation, with prospects good for a continuance.

A new safe and vault plant will be built by Chauncey and Walter Gross and George Cooper, Hillsboro, Ohio, capitalists. It is expected to have the plant in operation by July 1.

President E. S. De Tramble and Manager G. W. Lentz of the Union Embossing Machinery Company and the Speed Changing Pulley Company, Indianapolis, Ind., have announced the early beginning of operations on their new buildings, to be located on a 6-acre site at the crossing of the Big Four Railroad and St. Charles and Pitts streets in Anderson, Ind. The consummation of the company's plans

are dependent on the Anderson public's purchase of a number of building lots in the vicinity.

The Capital Lock-Nut & Washer Company, Columbus, Ohio, will hold its annual meeting and election May 14. This company has been in successful operation over two years. A. M. Gaines is general manager and William Singleton secretary.

E. J. Johnson and Frank Curry, superintendent and assistant superintendent, respectively, of the Block-Pollak Iron Company at Carthage, Cincinnati suburb, have resigned. It is announced that the active management of the plant will now devolve upon Morris and Julius Pollak, sons of President E. Pollak. It is understood that Mr. Johnson will make a European trip and that Mr. Curry will embark in the real estate business in Tennessee. Employees of the company on Saturday gave Mr. Johnson and Mr. Curry a surprise dinner, with Mayor W. W. Birch of Carthage as chairman, and the former was presented with a diamond ring and the latter a handsome watch fob.

The new foundry building of the Fort Wayne Electric Works at Ft. Wayne, Ind., is practically completed, and operations are to be commenced as soon as possible.

It is stated that the Montpelier Cut & Metal Works, Montpelier, Ind., has made some large shipments of West's sanitary fruit gatherers, and that the factory is busy to capacity making up stock for next season.

The Hubbard Foundry Company, Warren, Ohio, will begin operations soon with William Crowe, who was for a time superintendent of the Aetna Foundry & Machine Company, of Warren, as general manager.

Patents on a new rotary cutter to be used in the making of rugs from old carpet have been granted G. A. Bauer, manager of the Valley Mfg. Company, Springfield, Ohio, and the company has decided to manufacture the device on an extensive scale.

Cleveland Machinery Market.

CLEVELAND, OHIO, May 5, 1908.

The condition of the local machine tool market remains practically stationary, although some of the dealers see a slight improvement due to picking up of some scattering orders during the past week. While the outlook for business is slightly better than a month ago, the prospects, in view of the general industrial conditions, cannot be said to be very encouraging. Dealers, however, find some satisfaction in the fact that the volume of their sales during April was somewhat larger than for March, and that whatever change occurs from week to week, although it is small, is toward an improvement. The demand is almost entirely for single tools in small sizes, although several orders were placed during the week for two tools. About the only buying that is being done by large manufacturing plants is in cases where old tools are being thrown out and replaced with more modern equipment. Purchases by new concerns are mostly for small plants that need very few tools. Second-hand tools are moving very slowly. Plenty are being offered, but the demand is quite limited and dealers are not buying many.

The situation shows but little improvement with the tool builders, and manufacturers, as a rule, report only a slight improvement in their volume of orders. As a result their plants are running on about the same limited capacity that they have been for the past few months. While orders for heavy machinery show no improvement, inquiries are better. Prospective purchasers are very slow, however, in placing contracts. A number of Ohio towns will shortly install municipal lighting plants and other towns have such plants under consideration, so that there is a fair outlook for business in lighting plant equipment.

Activity in the building of new industrial plants and additions to existing plants shows some improvement. Local engineering firms are receiving more inquiries along that line, and contracts for the erection of large additions to two Ohio industrial plants were closed last week. A number of projected plants, however, are being held up until conditions grow better.

The local jobbing foundry trade is still about as dull as it could be. Users of castings are buying in very small lots for their immediate needs. While some foundries are holding up prices, others are making low quotations in their eagerness to get business to keep their plants running.

The Owen Bucket Company, Cleveland, has been incorporated, with a capital stock of $10,000, to manufacture a new clam shell bucket, the invention of Owen W. Callaghan, who is president. W. H. Botten is vice-president; Herman Zirn, treasurer; J. H. Nieding, secretary, and C. T. Denly, general manager. The company will not erect a plant, but will make the buckets at the plant of the Zeman Iron Works Company, with which some of the officers are associated. The offices will be at the Zeman plant, 6824 Union avenue. It is claimed for the new bucket that it is the only one made that will handle clay. It is also designed to handle coal, ore and, in fact, everything except rock and shale. The bucket will be made for the present in 1, 1½ and 2 yd. sizes. The company has already taken a number of orders for the new bucket.

The American Seeding Machine Company, Springfield, Ohio, maker of agricultural implements, will soon begin the erection of large additions to its plant, plans and specifications for which are being prepared by the Osborne Engineering Company, Cleveland. The additions will include a foundry 150 x 200 ft. and a manufacturing building 50 x 250 ft., three stories high. No additional power equipment will be bought, but the company will probably be in the market for some machinery.

The Cleveland Chain & Mfg. Company, which recently started in operation with a new plant at the Pennsylvania Railroad and Henry street, reports that orders are coming in very satisfactorily and that it is able to keep its plant running full time with a full force of men. The company makes machine and hand made welded chains, its products including steel loading chain and coil, crane, dredge and conveyor chains. The company announces that it is making a specialty of high grade chain and that its facilities for handling big business are unexcelled. The chain is made on patented hammers, with special straightening devices. The company's office is at 7625 Broadway.

At a meeting of the Fover Steel Stamping Company, Painesville, Ohio, a few days ago, it was decided to change the name to the Ohio Wheel Toy Company and to increase the capitalization from $60,000 to $100,000. The company will discontinue steel stamping work and engage in the manufacture of metal toys and specialties. About $20,000 worth of new machinery will be added to the plant, a large part of which has already been contracted for.

A company is being formed in Cuyahoga Falls, to be known as the Peerless Match Company, to erect a match factory in that place. Plans have been prepared by Architect Frank Moore of Cuyahoga Falls for a saw tooth building, 80 x 150 ft., and a boiler and engine room. T. L. Childs of Akron is the promoter of the enterprise.

The Hydro-Electric Company, Warren, Ohio, recently organized, with a capital stock of $100,000, to furnish light and power, has effected its organization by the election of the following officers: President, O. D. Morgan; vice-president, C. M. Wilkins, secretary and treasurer, Henry Herbert. The officers, with Roy Seigfried and D. E. Hoover, comprise the Board of Directors. Plans are being prepared for a power house and it is expected that work will be started soon.

With a capitalization of $25,000 the Railway Saftey Appliance Company, Akron, Ohio, has been incorporated by C. R. Grant, E. L. Mitchell, A. Le Croix, Jacob Brown and W. R. Price.

The concentric Engine Company, Columbus, Ohio, has been incorporated, with a capital stock of $50,000, to build engines of a new pattern, the invention of F. M. Lechner. The incorporators are Joseph Segale, Charles J. Segale, F. M. Lechner, A. J. Lind, George W. Moling and J. B. Karns. A plant may eventually be built.

The Nute Foundry Company, Cuyahoga Falls, will erect an addition to its plant 25 x 45 ft. for cleaning castings. The company will install a sand blast.

The complete list of the machine shop and woodworking equipment for the new Technical High School, Cleveland, mention of which was previously made in this report, has been prepared by James F. Barker, principal of the school. Bids will be received by the Board of Education until June 1, and the tools must be delivered not later than July 1. The lists are as follows:

Machine Shop Equipment.—One universal milling machine, 8 x 34 in.; one 30-in. boring mill; 10 lathes, 14 in. x 6 ft., five of which are to have taper attachment; one lathe, 14 in. x 6 ft., direct connected and motor driven; one 14 in. x 6 ft. tie bar pattern Hendey Norton screw cutting engine lathe; one Warner & Swasey No. 1 hollow hexagon turret lathe; one solid head, back geared turret lathe, capable of taking stock of 1¼ in. diameter, 7 in. motion to slide and 15 in. from end of spindle to turret; one universal grinding machine, 12 x 30 in.; one motor driven grinder with spindle for ¾ x 8 in. wheel; one universal cutter and tool grinder, 6 x 16 in.; one portable, electric tool post center grinder with ¼-hp. motor; one drill grinder; one sensitive drill; one hand power arbor press; 22 10-in. 4-jaw reversible chucks; 17 8-in. 4-jaw reversible chucks; one 6-in. 3-jaw universal chuck; one 8-in. 3-jaw geared scroll chuck; three 7-in. 2-jaw universal chucks; eight sensitive drill chucks; one magnetic chuck; one gas furnace.

Woodworking Equipment.—Four 36-in. band saws, two scroll saws, one box frame universal saw bench, provided with two cast steel saw arbors, driven from a swinging yoke, and a two-section sliding table; one single cylinder double belted surfacer, 7 x 24 in.; 25 motor driven speed lathes, approximately 12 in. by 4 ft., each lathe to be provided with a direct connected motor, capable of a speed range of from 800 to 2400 rev. per min., and not less than ½ hp.; 31 wood turning speed lathes, 12 in. by 4 ft.; one jointer, 7 ft. by 8 in.; one 18-in. pattern maker's lathe, four iron frame power grindstones, four wood trimmers, one foot-power mortiser, one heavy foot-power mortiser.

Philadelphia Machinery Market.

PHILADELPHIA, PA., May 5, 1908.

The aggregate volume of business transacted by a number of manufacturers and merchants in the machine tool trade was hardly as large during the month of April as was hoped for. Gains over the previous month were few, but losses were not heavy, and, as a rule, the volume of business taken was pretty closely up to that of March and represents on the whole from 40 to 50 per cent. of normal business. The outlook for the coming month is believed to be much more favorable. While but a very small portion of the new funds can be expected to benefit the machine tool trade, the wholesome effect of the successful bond issue of the Pennsylvania Railroad cannot be overlooked. Some other forward movement by the railroads is to be noted in the appearance of the specifications of the Delaware, Lackawanna & Western Railroad for the equipment of its new shops at Scranton, Pa., which includes the expenditure of some $30,000 for blacksmith shop equipment. These developments afford considerable encouragement to the trade, but it must be remembered that some time must elapse before any extensive plans or purchases can be made. The number of idle tools in industrial plants is large, the railroads have great numbers of idle cars and locomotives on their sidings, and until at least a fair percentage of these are again placed in active use we can scarcely look forward to any heavy buying movement as far as machine tools and equipments are concerned. Many tools undoubtedly are being used which would, were conditions better, be condemned and new equipment purchased, but under existing circumstances these are retained in service as long as possible. As soon as there is a definite revival in business a considerable volume of new orders can be expected to develop from these sources.

Manufacturers have been taking some few orders, principally for single tools. Plants are being operated on a very conservative basis, and the prospect for any marked increase in production in the near future is not strong. Orders taken cover a miscellaneous character of tools, mostly in the medium sizes. The foreign trade shows no change. Standard tools are in light demand, although there has been a little more business offering in specialties.

Second-hand machine tool dealers report a fair volume of business. This branch of the trade holds up pretty well, there being more inquiry for both metal and wood working machinery. Sales have been pretty well scattered, but reach a fair volume in the aggregate. The boiler and engine trade, both new and second-hand, is reported rather quiet.

Foundries have not taken on much tonnage, and what orders come out are for prompt shipment. Buyers are not placing contracts for future delivery, even at lower prices, and the greater proportion of the iron and steel casting plants are running irregularly and on a hand to mouth basis.

W. B. Powell, city architect, City Hall, is completing plans, it is understood, for a new pumping station, 95 x 195 ft., which the city proposes building at Sixth street and Lehigh avenue for high pressure fire service.

The E. H. Mumford Company reports a moderate betterment in the demand for foundry molding machines. Sales of jolt ramming machines particularly have recently been made, as have also several of the ordinary type. One 10-in. jolt ramming machine has just been shipped to the Cambria Steel Company, Johnstown, Pa., and an order has been booked for a 16-in. machine of the same type for Wisconsin parties. A new mold table of the vertical type, which is now being made by the Mumford Company, and for which patents are pending, is also attracting considerable attention in the trade. This company is now equipping a complete molding machine demonstration plant, which is rapidly approaching completion, at its office and salesrooms, 1223-1225 Spring street, in this city.

The J. G. Brill Company has acquired the plant of the Danville Car Company, Danville, Ill., and will operate it under its present name. The Danville plant was completed about one year ago, and occupies a tract of 217 acres. The buildings provide for 10 distinct departments. The erecting shop is 150 x 350 ft.; the freight car shop, 90 x 320 ft.; woodworking department, 60 x 120 ft.; truck and machine shops, 120 x 120 ft., and the office building, 30 x 120 ft. The company will build street cars of every description, as well as steam railroad coaches, freight cars, trucks and electric locomotives.

The Picatinny Arsenal, Dover, N. J., will receive proposals until May 25 for supplies to be furnished during the year ending June 30, 1909. These include steel, iron, hardware and general equipment. Information regarding the requirements may be had from the commanding officer at the above address.

Bids are being taken by the Market Street Elevated Railway Company of this city for three stations to be erected on the route along Delaware avenue. One of these will measure 27 ft. by 59 ft. 10 in., another 27 ft. by 73 ft. 9 in. and the third 14 ft. 1 in. by 54 ft. 2 in. Platforms extending over 500 ft. are also to be built, while stairs and ferry approaches are included in the plans. A signal tower is also to be erected at one point on the line.

The Standard Pressed Steel Company notes an increase in the volume of business and is now running its plant on full time. The export demand for pressed steel hangers has been particularly good, orders for 300 hangers having been received from Holland, 250 from Switzerland, 250 from Barcelona, Spain, and several hundred each from France and Germany. Large sales of pillow blocks and other specialties have also been made in European countries. The domestic trade does not show as much activity as the foreign. Orders are numerous, but the quantities taken are small, there being no disposition on the part of the trade to order beyond what is needed for immediate use. Business in the Eastern States, however, is reported better than that from the West.

New England Machinery Market.

WORCESTER, MASS., May 5, 1908.

April showed a slight improvement over March in business transacted by the machinery dealers, taking New England as a whole. The totals of March were greater than those of February, and February was better than January. Yet April was by no means a good month, judged by recent standards. The degree of betterment was more pronounced in the machinists' supply trade, though this branch of the business is not very active. The acceleration is considered to be due to the season rather than to a change in business conditions. Trade is apt to reach a climax in the spring, especially in mill and mechanics' supplies, and under depressed as well as normal times April and May are usually good months in comparison with their predecessors, and with the summer following. The dealers continue to receive orders, and the anticipation is that the month will show a gain. With the machinery manufacturers, business does not appear to improve. There are exceptions to the rule of radical reductions from normal production. Among them are the Bath Grinder Company, Fitchburg, Mass., and Fay & Scott, Dexter, Maine, both of which concerns are running full, the former on its standard line of grinders, and the latter, it is understood, on special machinery, as well as on its regular products. As a whole, production is decreasing among the machine tool builders. Complete shutdown is not a common experience, but reduced working forces and short hours continue to be the usual necessity.

The dealers state that buyers are showing signs of greater courage. A few orders have been booked from the larger concerns included in the list of those who have been making promising but hitherto unproductive inquiries during the past month or two. Some encouragement has resulted from the demonstrated success of some railroads in securing loans and in placing bond issues, because a material part of the money will go directly or indirectly to the machinery trade. But confidence in the immediate future does not exist. It is of a broader sort, dealing with the future that will follow the turn of the tide from the present dullness, whenever that will be, the general belief being that it will come with the close of the Presidential campaign. There are those who expect a sharp, sudden, radical change. Others look for a gradual improvement, accelerating as it goes on. Everyone agrees in the opinion that the next upward wave of the curve of business will be the highest yet.

The list of machine tools which will be required by the Lowell Textile School, Lowell, Mass., will include two 14 in. by 6 ft. engine lathes, an 18 in. by 10 ft. engine lathe, two 11 in. by 5 ft. speed lathes, a 24 x 24 in. by 6 ft. planer, universal milling machine, sensitive drill, upright drill, wet grinder, dry grinder, power hack saw and minor tools. The school is to establish a machine shop, instruction in which will be included in the curriculum. The funds for the purpose are included in an appropriation now pending in the Massachusetts Legislature.

Benjamin J. Davis, 35 Westminster street, Worcester, Mass., is planning to establish a steam boiler business in that city. The purpose is to equip a boiler shop of moderate size, for which an entire equipment will be required, including punch, shears, rolls, flange punch, upright drills, &c. No location has been decided upon; in fact, the plans have not yet passed the tentative stage. Mr. Davis desires catalogues of machinery suitable for boiler building. He was until recently superintendent of the works of the Wm. Allen & Sons Company, Worcester, boiler manufacturer, with whom he had been connected for many years.

The Chandler & Farquhar Company, Boston, Mass., is selling out the entire stock of new and second-hand machinery that was damaged by water during the progress of a fire in the upper part of the building in which was located the company's warehouse. The list of new tools includes 17 engine lathes, a turret lathe, 24 sensitive drills, 19 upright drills, 13 milling machines, 6 screw machines, 3 shapers, 5 gear cutters, 13 grinding machines and a variety of other machinery. The second-hand list is a comprehensive one.

It is stated that the Danielsonville Thread Company, Danielson, Conn., is to build a large dam at Pomfret Landing, Conn., for the purpose of developing water power to operate an electric plant which will furnish power for a new

mill which will be built in the near future, as well as for the existing plant.

The J. W. Lathrop Company, Mystic, Conn., manufacturer of gasoline engines, is making inquiries for new machinery for its shops.

The Mechanical Toy Movement Company, 35-37 Randall avenue, Bridgeport, Conn., has incorporated under Connecticut laws with an authorized capital stock of $50,000. It will manufacture mechanical movements, such as moving picture machines for home use, and medium grade talking machines, and the secretary, Albert M. Vack, states that the company will probably be in the market for new machinery in the near future. The other incorporators are John F. Kopp and George S. Flather.

It is stated in local railroad circles at Danbury, Conn., that the New York, New Haven & Hartford Railroad will soon begin the erection of a new machine shop and roundhouse in that place.

The recent report of the receivers of the Pope Mfg. Company, Hartford, indicates that the condition of business with the company is satisfactory. Similar favorable reports come from other large manufacturers of automobiles and their accessories, the demand upon them being greater than was anticipated, although not equalling the unparalleled record of last season and the year before.

The Crompton & Knowles Loom Works, Worcester, Mass., will not require so much new machinery in connection with its large new buildings, referred to in this column last week, as has been anticipated. The foundry equipment will be new throughout, and will include all modern improvements in the manufacture and cleaning of castings, but as the work is chiefly light, there will be no need for an extensive crane system. As to the machine shop and general manufacturing buildings their equipment will include the tools in the plant of the Crompton & Thayer Loom Works, the business of which company was recently acquired. The new buildings mark the beginning of a policy of concentration, it is understood. Some new tools will doubtless be needed, though at the present time no idea can be obtained of what the list will include. The new buildings, which will cost about $155,000 under the contract already awarded, will consist of a factory and office building, 60 by 246 ft., and with extended front at one end; machine shop, 54 by 184 ft., and four stories, and a foundry 225 by 225 ft. A large amount of steel is called for in the building specifications. An overhead trolley hoist will be installed for loading and unloading between the machine shop and the railroad. The company operates plants at Providence and Philadelphia, as well as the works to which the additions are to be made, formerly known as the Knowles Loom Works; the plant formerly operated as the Crompton Loom Works, and the Crompton & Thayer plant, all of Worcester.

The Skinner Chuck Company, New Britain, Conn., is sending out its new 1908 price-list, which illustrates and describes the company's line of lathe drill and planer chucks. The new list shows its 1908 pattern independent lathe chuck, also its geared pattern new model drill chuck, both of which were recently put on the market.

St. Louis Machinery Market.

ST. LOUIS, MO., May 5, 1908.

The general business siuation shows little change, but sentiment is improving. In some lines the cold and rainy weather which has prevailed in excess of the normal for the month has had an unfavorable influence. With manufacturers and dealers in electrical machinery and supplies come very favorable reports of satisfactory demand for their specialties. The demand for heavy machinery continues dull, and but little business is being received from the railroads, particularly the large companies. They admit they need material and supplies, but claim the falling off in revenue prevents their coming into the market.

The Curtis & Co. Mfg. Company reports a fair number of orders for steel castings, and is about to ship a carload of gypsum kettle bottoms. For pneumatic tools there is at present little inquiry, while only a limited demand is found for traveling cranes, air compressors, saws and sawmill machinery. The plant is running on half time.

The J. A. Fay & Eagan Company, Bank of Commerce Building, reports it is in receipt of a considerable number of inquiries for woodworking machinery, but only a limited number result in orders. Its factory at Cincinnati is working with two-thirds of the usual force.

The Rumsey Mfg. Company states that while most lines of machinery manufactured or handled by it are dull, there has been considerable call for gasolene engines, principally for use in small portable sawmills, which lumber mills have found to be desirable and economical.

The Wesco Supply Company reports quite a revival in its trade. It had earlier in the year in case there was no improvement contemplated cutting down its force in both the factory and the office April 1, but this was not done. The company has lately sold an equipment for a 240-kw. alternating current plant and two 50-kw. direct current plants. The demand for small apparatus has improved considerably, and is in fact better than was the case a year ago, especially from the Northwest and Southwest.

Government Purchases.

WASHINGTON, D. C., May 5, 1908.

The Isthmian Canal Commission will receive bids until May 25, Circular No. 440, for hoising engines, car tenoning machine, automatic car gaining machine and other supplies.

Proposals will be received until May 12 at the West Point Military Academy, West Point, N. Y., for coal conveying apparatus.

The Bureau of Supplfes and Accounts, Navy Department, Washington, will receive bids until May 19 for a grinding machine, drill and hydraulic pump.

The Isthmian Canal Commission will soon ask bids for one 10,000-lb. interchangeable crane and buggy geared ladle, one large pneumatic sand shaker, one 750-gal. duplex water pump, one 1250-gal. multistage horizontal turbine pump, one power hammer, etc.

Circular No. 438 of the Isthmian Canal Commission, asking bids until May 18 for a quantity of supplies, covers class 1, three locomotive coaling cranes; class 2, one steam hammer; class 3, one radial drill; class 4, one planer; class 5, one engine lathe; class 6, one engine lathe; class 7, one double punch and shears; class 8, one universal crank shaper; class 9, one sliding head drill press; class 10, one pipe cutting and threading machine; class 11, one single head bolt cutter; class 12, one cold saw; class 13, one drill grinder; class 14, one valve reseating machine; class 15, one duplex emery grinder; class 17, two portable cylinder boring machines; class 18, one portable hydraulic crank pin and small wheel press; class 19, one set of test pumps; class 20, one portable boiler testing pump; class 21, two boiler feed pumps; class 22, 30 sand pumps; class 26, one band saw and one circular saw.

The Isthmian Canal Commission will shortly ask bids for boiler equipment for two power plants on the Isthmus, each to consist of six 400-hp. water tube boilers, one feed water heater, two boiler feed pumps, two induction draft fans, one fan motor, one fan turbine, one air compressor and other accessories.

The following bids were opened April 28 for machinery for the navy yards:

Class 107.—One vertical milling machine—Bidder 23, Becker-Brainard Milling Machine Company, Hyde Park, Mass., $1625; 45, De Zouche, Hanson & Co., Philadelphia, Pa., $1800; 154, L. W. Swind, Philadelphia, Pa., $1625.

Class 111.—One 10-in. centrifugal pump—Bidder 1, Alberger Pump Company, New York, $1064; 20, Buffalo Forge Company, Buffalo, N. Y., $1650; 21, Blackall & Baldwin Company, New York, $1265; 32, Camden Iron Works, Camden, N. J., $1095; 50, D'Olier Engineering Company, Philadelphia, Pa., $1340, $1430 and $1406; 111, National Electrical Company, Washington, D. C., $1600; 128, H. A. Rogers Company, New York, $1320; 176, Henry R. Worthington, New York, $1425; 184, Central Metal & Supply Company, Baltimore, Md., $1080; 186, Lake City Engineering Company, Erie, Pa., $957.

Class 112.—One motor driven turbine pump—Bidder 1, Alberger Pump Company, New York, $1490; 20, Buffalo Forge Company, Buffalo, N. Y., $2250; 32, Camden Iron Works, Camden, N. J., $2045; 50, D'Olier Engineering Company, Philadelphia, Pa., $1820, $2190 and $1850; 139, H. A. Rogers Company, New York, $1690; 176, Henry R. Worthington, New York, $2135.

The following bids were opened April 25 by the chief signal officer of the army for telephone motor generators:

Item 1.—One telephone motor generator—National Electrical Supply Company, Washington, D. C., $350; Holtzer-Cabot Electric Company, Brookline, Mass., $221.54; Crocker-Wheeler Company, Ampere, N. J., $140; Dean Electric Company, Elyria, Ohio, $312.87; Roth Brothers, Chicago, Ill., $352.

Item 2.—One telephone motor generator—National Electrical Supply Company, Washington, D. C., $440; Holtzer-Cabot Electric Company, Brookline, Mass., $276.48; Crocker-Wheeler Company, Ampere, N. J., $175; Dean Electric Company, Elyria, Ohio, $383.22; Roth Brothers, Chicago, Ill., $440.

Under bids opened January 28 for machinery for the navy yards, the Niles-Bement-Pond Company, New York, has been awarded class 4, one boring and drilling machine, $3900.

The following awards have been made for supplies for the Isthmian Canal Commission, bids for which were opened March 14. Circular No. 430:

Ball Engine Company, Philadelphia, Pa., class 1, one cross compound four-valve Corliss noncondensing engine, $10,500.

General Electric Company, Schenectady, N. Y., class 2, one 400-kw. generator, $4845; class 3, one engine driven exciter, $1245.

Under bids opened March 31 for machinery for the navy yards, the Tindel-Morris Company, Eddystone, Pa., has been awarded class 62, one combination grinding machine, $2250.

General Electric Company, Schenectady, N. Y., class 141, four ammunition hoist motors, $2400.

The Warren Steam Pump Company, New York, has been awarded class 1, six vertical steam pumps, $4800, under opening of April 14 for supplies for the navy yards.

Under bids opened April 21 for machinery for the navy yards, the Cleveland Crane & Car Company, Wickliffe, Ohio, has been awarded class 114, one 3-ton hand traveling crane, $450.

Under opening of April 20, circular No. 434, for supplies for the Isthmian Canal Commission, the Ball Engine Company, Philadelphia, Pa., has been awarded class 1, one tandem compound engine, $4325.

HARDWARE

MANUFACTURERS, not only in Hardware, but in other branches, are confronted by conditions which bring up many questions in regard to the policy to be pursued in the making of prices. When there is a very heavy volume of current business and practically all are able without difficulty to dispose of their product there are comparatively few perplexities in regard to prices. It is true that with a steady market and the absence of any general reason for reductions the question as to the advisability of making advances must be canvassed, but action in this direction must be taken cautiously, because in the experience of the trade advances, while in themselves attractive, are attended by certain perils. While there is the immediate advantage of increased profit—unless the jobbers are let in too liberally at the low prices—there is, on the other hand, the encouragement of competition and the establishment of a level of prices from which sooner or later there must be a descent. When, however, the tide of prosperity begins to ebb and business is slow, when factories are only partially employed and the indications point to lower prices in general, the manufacturer must do a good deal of thinking. He must determine upon his policy in view of the new conditions. The problem calls for a balanced judgment in reaching a decision. Similar conditions, however, have often been encountered in the past, and perplexities of this character are indeed inseparable from business.

It certainly contributes to his peace of mind as well as to the healthfulness of the market if a manufacturer can be content with his share of the business going, and is able without distress or heartburning to see his competitor taking orders which he would like to have. There must be a cheerful recognition of other makers and their right to as much business as they secure by legitimate competition. Efforts to drive competitors from the field are usually bad policy. The tendency of up to date business is to secure success along other lines.

In the strife for business there are frequent times when in self defense or as a measure of strengthening one's position in the market it is good policy and in a trade sense necessary to make a deep cut in prices. There is, however, a probability bordering upon certainty, that when the merchant or manufacturer acts under the stress of personal animosity for the purpose of injuring his competitor he does something foolish. Our readers will recall many instances in which bad blood is to be credited with much unbusinesslike competition and many an unwise cutting and slashing of prices.

Fortunately or unfortunately, some of the fundamental questions in regard to prices are often settled by the general condition and tendency of the market, to the pressure of which the manufacturer is obliged to a large extent to yield. When prices generally are advancing and his own costs increasing he must exercise a rare and commendable self-restraint in resisting the tendency to announce higher prices, but the pressure is often practically irresistible, and he must move in the same direction. On the other hand, when the trend is downward he may be able for a while to hold his ground and refuse to revise his quotations, but it is a fight against the laws of trade which sooner or later will have their way. The question then is how soon and by what steps the descent is to be made.

Condition of Trade.

In this issue our readers will find material of exceptional scope and value for forming an estimate of the feeling in the trade in regard to the business situation. The review of the Iron and Metal trades given on a preceding page furnishes a compact summary of the conditions which prevail in the raw material market, which at this time is being watched with so much interest and solicitude. The jobbers are represented in letters from our regular correspondents in the principal centers, from which an admirable report of the situation is given as it is seen by these merchants of recognized ability and position. There are also extracts from many letters from Hardware manufacturers of various lines whose contact with the market for raw material on the one hand and with the distributors, wholesale and retail, on the other, gives them exceptional opportunities for gauging the temper and tendency of the trade. The general effect of these advices will be reassuring as justifying confidence in the essential soundness of the business situation, indicating as they unquestionably do a better financial and commercial condition than prevailed even a month or two ago, with a prospect of a gradual return of normal business. The question as to the extent to which prices will be maintained is much canvassed in the trade, but the volume of current business is certainly limited by the feeling that sooner or later lower prices may develop. Changes in price in Hardware and its allied fields are as a rule being made conservatively. Two most important features in the situation are the undoubted improvement in financial matters and the promising outlook for the crops.

Chicago.

Sensitively responsive to influences tending to check consumptive buying, trade, both wholesale and retail, has been sensibly retarded by the unseasonably cold and backward weather of the past week, with the result that the opening days of May have not marked the expected upward turn in the declining volume of business. But, while there is nothing in the general outlook of the immediate future on which to base confident hope of rapid acceleration, conditions seem to favor improvement rather than further retrogression. There will, in all probability, be no change in the prevailing policy of hand to mouth buying now pursued in all branches of the trade this side of July, at least, but that orders of this character should develop in greater numbers is a fair presumption. Statements to the effect that the heavier lines, such as Nails, Barb Wire, Black and Galvanized Sheets, and the like, in the hands of jobbers and retail dealers have not moved according to expectations, thereby creating overstocks, are met by firm denial by those directly in touch with the situation. The frequent reorders now being received by mills and jobbers for Nails and Fence Wire, accompanied by urgent requests for prompt shipment, is pointed to as evidence that distributors have generally underestimated rather than overanticipated their requirements. Considering the extreme degree of conservatism inspired by the untoward developments of the past six months, it is quite unlikely that many merchants have been betrayed by over sanguine hopes into making unwarranted stock purchase commitments. It has been the common aim of all dealers, large and small, to reduce stocks to the lowest point consistent with current trade requirements

and the pursuance of this object could only result in diminishing warehouse stores. The beginning of a fair demand for Garden Hose has been temporarily checked by the recent cold rains, but the movement of Lawn Mowers on the other hand has been favorably affected by the same conditions. Whether or not there is positive permanent improvement in Builders' Hardware is difficult to determine because of the intermittent and somewhat erratic character of demand. Orders will come in quite briskly for a time, inspiring hopes of lasting betterment, only to drop off again in a few days to almost nothing. Still everything seems to favor more active business in this line, as building projects now taking form get actively under way. Heavy Hardware reflects the quietness prevailing in manufacturing industries using Bars, Sheets, Wood Stock, &c. The demand for Steel and Iron Bars is limited to small orders required for immediate use. As respects prices no radical changes are observed in any line, though in some directions a tendency toward further weakness is noted.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—Buying continues on a conservative basis. Orders are numerous, but quantities are moderate. This makes the handling of business more laborious and expensive than when it was the rule to buy full cases and boxes.

As we suggested in our last article, it seems that Axes are about to be advanced. Several manufacturers have announced an advance of 50 cents per dozen. No doubt the jobbing trade would welcome some agreement among the Axe makers that would give steadiness to this important line.

It is announced in the press that there will be a general meeting of the United States Steel Corporation May 21. It is hardly to be expected that prices will be advanced, and it is well known that a very influential party are in favor of a considerable decline in their products, not only on Wire and Nails, but on all their lines. It is, therefore, wise to buy these goods only for pressing needs until the decisions of this meeting are announced.

The Padlock manufacturers have got together and advanced prices. All the leading makers are interested.

In Builders' Hardware the association makers must be feeling the inroads of the outsiders. Comparisons lead to the belief there has been a very snug profit for some years past for the manufacturers on this line. It is not the feeling of jobbers that the Builders' Hardware makers have been overgenerous to the jobbing trade when they had things all their own way. Not only have differentials been very small, but the Builders' Hardware manufacturer has set no lines upon the classes of trade he sold. Jobber, retailer or consumer, all seemed to look alike to him.

The leading interests in Shells and Metallic Ammunition do not now receive their mail in the same office. Outside makers are steadily growing. There will soon have to be some adjustments here. No doubt the same wisdom that has conspicuously guided the affairs in this line is still at the helm.

So might one go from item to item and line to line. It is all an interesting study. It seems to us that in a number of lines recessions are a necessity under existing conditions, and all we can ask is that the retreat—if we may call it such—be conducted in an orderly manner.

Early in the season we did not hesitate to oppose reductions, believing the trade needed time to recover from financial troubles. The manufacturers have helped the situation by rare self-control. The trade as a whole now have had time to recover their strength, and we believe any adjustments manufacturers consider necessary should be made *now*, so we can go into the fall trade believing prices are in a large measure fixed.

Baltimore.

CARLIN & FULTON.—The spring season is now well advanced, and while purchases by the retail trade from the beginning of the year have not been in large quantities at any one time, orders have been frequent and the volume of business aggregates considerable, though, of course, not equal, as a general thing, to the sales of last year. This can be accounted for by the lack of speculative value to goods, the fear of possibly some reduction in prices and the fact that money still circulates slowly in many sections, making collections difficult; the shutting down of cotton mills in some sections and the lack of activity in the lumber and mining regions, resulting in a decreased demand for labor, and consequently in a lessened demand for goods as the purchasing power is smaller.

On the other hand, the agricultural sections have done well. Cotton has undoubtedly depreciated in value, and the planters have been greatly criticised for attempting to hold their crops for 15 cents per pound as an ideal figure. This, of course, was unobtainable, as it has resulted; but had the entire crop been marketed early in the season without regard to market conditions the reduction in price would have occurred almost immediately, and while the price of 15 cents was never reached, yet the crop has been worked off gradually until the present figures apply to probably a small percentage of the full crop. From what we hear the acreage this year will be increased over that of 1907, and the growing crop has had no setback as last year, when weather conditions compelled a replanting several times, which made last year's crop a costly one to raise. The grain sections have had both satisfactory crops and prices, and cattle has also done well; so upon the whole the average farmer is in as good a condition financially as, if not better than, he has ever been.

According to the financial columns of the daily press bank reserves are increasing every day, and in New York City the surplus is greater, with one exception, than has ever been known before. Nevertheless, throughout the rural sections complaint is made that the banks are still holding their money, and until it is circulated more abundantly both collections and business are apt to drag.

The stock market has shown wonderful recoveries in values, in spite of the decreased earnings reported by the great railroad and manufacturing corporations of the country. This seems anomalous, for dividends depend upon earnings, and the great financiers of the country must anticipate a great resumption of business following a depression which they can consider but temporary, and which will continue probably no longer than the uncertainty as to the next Presidential election.

The prices of manufactured goods have been wonderfully well sustained, and while there have been in some few goods silght concessions, a decline is the exception and shows great wisdom on the part of the manufacturing interests. The curtailed production with no accumulation of old stocks has kept the market from being glutted, and the daily consumption of goods, though seemingly small, is still sufficient to absorb generally the present output of the factories.

New Orleans.

WOODWARD, WIGHT & CO., LTD.—The last few weeks have not shown any change in conditions or any increased activity in our different lines. The crop reports continue good. An abundance of rain in the past few weeks has benefited cotton in Texas, which has been in need for some time, and also the sugar country. All indications point to large crops in these lines.

The demand for lumber is still very slack. Several additional mills have closed down. This need not be wondered at, as it is very evident from reports, such as the last quarterly report of the United States Steel Corporation, that the industrial output of the whole country has run down less than one-half. The net earnings of the Steel Corporation shrinking from $33,900,000 in the first quarter of 1907 to $16,100,000 in the past quarter, as well as the increased number of idle cars over the record report of February 5, 1908, show that the largest and usually most active industries are sorely feeling the effects of present conditions. Both jobbers and retail dealers in this vicinity are carrying small stocks and buying lightly.

A recent cyclone which passed over a small part of the lumber territory did a vast amount of damage in several towns and considerable damage to sawmills and timber property, but fortunately its track was a narrow one and

many of the most valuable timber tracts, even in the immediate vicinity of the cyclone, were untouched. The blowing down of quite a number of trees will necessitate some of the mills cutting up more lumber than would otherwise be the case, and may disturb lumber market prices somewhat in moving it off.

It is to be hoped that the improvement in financial conditions noted in the East will enable the railroads to enter the market with further flotations of bonds and stocks, giving them the necessary capital to make needed repairs and improvements, as business from the railroads and car building trade to the lumber industry in particular is sorely needed, and if it should come around to anything like its former proportions will put a different aspect on the lumber situation.

Collections continue very fair and, under present conditions, are all that could be expected.

Portland, Oregon.

FAILING, HAINES & MCCALMAN.—The writer continues optimistic regarding the conditions on the North Pacific Coast. Within the last two or three weeks he has seen a number of the other dealers from the immediate vicinity of Portland and from other points tributary both to Portland and Puget Sound, and they all report that conditions are improving, that money is easier and that all prospects point to a prosperous year provided nothing untoward happens.

The crops, from the bulletin issued by the railroads in this territory, promise exceedingly well. However, it is, of course, rather early to depend very strongly upon them. Should we, however, have merely a fair crop at a fair price there is no reason why this country should not be as prosperous as last year, if not more so. Of course we are to some slight extent affected by the financial depression, which we are told still prevails east of the Rocky Mountains, but, to tell the truth, if we did not have the newspapers to tell us about it we would never know it.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—The April trade has generally been satisfactory. Of course it might have been still larger, but it was quite an improvement over March and has shown conclusively that the conditions here are steadily growing better; and, indeed, we would say, with the conditions here as they now exist, that if they were equally favorable throughout the country the effects of the financial disturbance of the last few months had largely passed by.

Of course speculation is not "in the air," but this is not bad for regular business. Customers are buying only for what they consider actual wants. This is not bad either, so long as actual wants are not excessively small. Future prices may also give some concern, but prices are holding fairly well. Rates of interest are now on a fair footing for both borrowers and lenders.

The chief point of interest in the Northwest for the next three or four months will be the growing crops. Thus far the condition is satisfactory. Most of the small grain has been sown and it starts out in fine condition, but the hard pull is ahead and the outcome of the crops no one knows. Our reliance is in the general average of the years. For the last quarter of a century the writer has been a deeply interested observer yearly of the crops in the Northwest, and in these 25 yr. there has been none in which the crops were generally so poor as to make it a wholly unprofitable year for commercial business. In some years profits were small, but there was something left on the right side unless some outside trouble, such as the panic of '93, interfered.

This very fortunate experience may not always last, but we take courage from it and keep it screwed up to the point necessary to hold our place in the "firing line," and we shall trust that 1908 will not reverse this order of things. We also firmly believe that conditions throughout the whole country generally are improving and promise to continue to grow better.

Confidence is certainly being restored. Business houses have been adjusting themselves to the new conditions. Stocks of merchandise are generally not large, and in but few cases excessive, and the tremendous consumptive requirements of the country will do the rest. It is not at all probable that the issues at stake in the Presidential election this year will seriously disturb business.

Cleveland.

THE W. BINGHAM COMPANY.—How to keep the dinner pail full is the all absorbing topic of the present day. Let us resolve to do all we can to keep our factories busy, capital invested and railroads running, and send the muck racker to the rear and drop the demagogue, and do all we can to inspire confidence, permit no arbitrary ruling by any Government department to handicap any legitimate business enterprise and the full dinner pail will have another chance.

In the country in the farming district trade in general Hardware is good; merchants buy light but often, and in the aggregate the country trade is about normal.

There is some readjustment of prices, but no very radical changes are taking place and confidence is gradually being restored. Our banks have plenty of money for legitimate trade that can be had by the old line of responsible houses simply for the asking.

Spring goods, such as Lawn Mowers, Rubber Lawn Hose, Refrigerators, Ice Cream Freezers, Galvanized Tubs and Pails, Shovels and Spades, Picks and Mattocks, mechanics' tools of all kinds and small Hardware are going forward in good volume. Considering the times and trials business men have had to contend with the general Hardware trade is very good. Transportation companies are giving good service.

Early spring has come with abundant rains to swell the seeds and crops are well on the way growing splendidly, and there is a fair prospect of a heavy harvest. It is a well-known fact when the farmer is prosperous the world makes money. So let us cheer up, for the best is yet to come.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—We had hoped by this time to turn in a more cheerful report of market conditions, but this specific hope must be deferred since it cannot be truthfully pronounced realized. It is more or less like those troublesome notes that the trade had falling due last autumn—they simply had to be renewed, no matter what the rate of interest was at the time—and so we now renew our hope and hopeful expressions.

Present conditions are interesting enough in their economic features, and tempting to speculate upon as offering entirely new possibilities. We had word of a prosperity convention in Baltimore some months ago, when it was resolved that nothing was the matter except that people were not whooping things up enough. Whether anybody did any extra whooping by reason of these resolutions is doubtful. If they did, the echo was too faint to be heard far. Now comes the press report from St. Louis announcing the fact that another prosperity meeting has been in session there for several days, and that it had been decided by several gentlemen in that great business center that prices and wages are not to change, and that people are making a mistake in not buying liberally, not to say extravagantly, and in not conducting business of to-day as though we were selling twice as much and as though the Steel Corporation had 8,000,000 tons ahead unfilled orders on its books instead of 3,000,000. And then there are more resolutions and more efforts to tack the pendulum up at the optimistic limit of its swing. Here is where the scientific interest comes in. Is the new tack, peg or other device strong enough to overcome the more natural tendency for the said pendulum to swing back its own old fashioned way? We do not believe that either lasting sentiment or business can be manufactured in this way. It comes when it gets good and ready, and not before; it comes when the great multitude of buyers are supplied with cash or credit, which they are tempted to use by the suggestion of new wants. Readjustments have to be made before then, and a man has to be permitted to call himself a fool a few hundred times before he is willing to take the back track and begin over again.

The report of numbers of failures and of the operations of the Clearing Houses over the country would go to in-

dicate that business is certainly contracted. As for the money situation, it is such as to induce expansion were such expansion justified by insistent demand. Commercial paper has all at once come into great favor. Those who loaned money on it last year were entirely satisfied with the outcome, for they suffered no shrinkage, but at maturity received their own with usury. Hence, now the brokers' letters are not an inconsiderable part of the morning's mail, and we are willing to believe in all cases that now, in the present juncture, their facilities are unsurpassed. We are out of the woods and whistling at a great rate both of us.

Among the meteorological performances that attracted attention was the tremendous storm which swept through Louisiana, Mississippi, Alabama and even Georgia. There was quite a loss of life and much damage done. Locally we were treated to a heavy wet snow on April 30, when our trees are in full leaf and many plants in bloom. Nature goes about its pruning ruthlessly and is satisfied by no half-way measure. Tender vegetables and fruits suffered badly. However, there will no doubt be enough to go around.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—The month of April closes with trade conditions in the trans-Missouri region in a very favorable position. The volume of business shows up satisfactorily. A season of continuous rough and cool weather has retarded farm work, particularly planting. With the advent of warm and genial weather a different aspect would surround the situation.

There is nothing in the general business situation at the present time, nor any developments in sight, calculated to disturb the satisfactory volume of business that is now going on.

It is expected that the present status of the situation will remain about where it is during the next few months; after that everything will depend on the extent and value of the crops.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Business continues to show an increasing demand for seasonable goods, due to the almost ideal weather conditions that have prevailed for the past two weeks in this immediate territory.

One marked and distinctive characteristic of this year's business over that of several seasons past is the increase in the number of orders and decrease in the quantity of almost every item specified. It is safe to say that the speculative feature has been wiped out, and while merchants are fairly busy, they still have time to look more carefully into the details of their business and to introduce economies that were never thought of before.

This thought was suggested by a letter the writer received this morning from the president of one of our State Hardware associations, urging the influence and co-operation of our firm and local association to secure for merchants, and the letter writing public generally, a reduction in the first class postal rate to 1 cent per ounce. This matter, when viewed in the light of the greatest good to the greatest number, appears so obviously just and fair that it would seem almost an insult to the intelligence of our legislators to suppose that we (who pay almost 90 per cent. of the total revenue of the Postal Department) should be required to petition for it, or that it is conceivable that before granting it the service would be further loaded with work which would greatly increase the deficit.

It is sometimes said that there is great advantage in numbers, but this is an instance where the exception proves the rule. It cannot be possible that there are not more people directly affected by first-class postal rates than by all others put together. Yet the interests of the farmer are tenderly nursed by the free rural delivery, and attempts are constantly made to increase this service by the further burden of the parcel post. The newspaper and publishers' interests are furthered by a 1 cent per pound rate for transportation of their merchandise, while other manufacturers and merchants pay 16 cents per pound for merchandise and about $1 per pound for letter postage. We find by actual test that our letter mail runs about 55 letters to the pound.

It is further proposed to help out the aforesaid needy manufacturers by reducing or abolishing the tariff on part of their raw material; but we hear of no effective work being done for the long suffering public, who for years have been held up by this disproportionate first-class rate, which unduly taxes the social and business correspondence of every one of us, from the fond announcement of the stork's latest arrival to the sad message of condolence at the other end of the trip.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—Trade conditions seem to be more normal at this writing than they have been since last fall. The best part of the jobbing trade for spring is over. May and June are always quiet months in the jobbing Hardware business in this section. Trade does not seem to be much more quiet than usual at this season of the year. One feature of the situation, which is very encouraging, is that collections are fully as good as at this season in former years. The opinion seems to prevail among business men of all classes that when another good crop is assured there will be a great awakening in business.

Up to this time crop prospects are most excellent. The prospects for a wheat crop are particularly good. The prospects are good for an early vegetable crop, which is the first one that produces money. A much larger acreage of cantaloupes and tomatoes have been planted in this State than in any previous year. The raising of fine poultry, for which our climate seems well adapted, has become a great industry and is a great money producer.

It is the general opinion of merchants and manufacturers, and the people generally, that our country is in better condition than it ever was before, and as great efforts are being made to produce another good crop we have strong hopes for the future prospects of the Southland.

NOTES ON PRICES.

Wire Nails.—The business being received by the mills is of about the same volume as during the last few weeks. Orders are largely confined to small lots for immediate shipment, indicating that stocks are generally low. The possibility that prices may be lower no doubt exerts some influence upon the trade, causing them to place orders covering near-by needs only. Quotations for base sizes continue as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

New York.—The slight improvement in local demand, to which reference was made last week, still results in a moderate business. The demand is irregular, being better some days than on others. Regular quotations are on the basis of $2.40 per keg for small lots at store.

Chicago.—Shipments for April by the principal interest were slightly less than for March. While a moderate amount of new business is coming in it is comprised mainly of small orders for quick shipment. The number of reorders that are included in the general volume of business indicates that stocks are pretty generally well reduced, and the uncertainty that exists as to the future maintenance of present price levels will effectually prevent accumulations until it is evident that the trend of values is upward rather than the reverse. Present prices are reported to be pretty regularly held, save for slight concessions by some of the smaller interests. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—As noted in this report last week, the orders for Wire Nails, which are being entered by the mills, show some increase, due to the heavier demand for Nails made upon jobbers by consumers. The mills are able to fill orders promptly, and have a fair tonnage ahead on their books. Reports are that the American

Steel & Wire Company is operating its plants to about 75 per cent. of aggregate capacity. Demand is mostly for small lots, and quick shipment is usually wanted, showing that stocks held by jobbers are very light. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

Cut Nails.—A limited number of small orders only is being received at the mills, none of which are operating full time. Some mills are entirely closed down. The market is irregular, and concessions of 15 cents or more are being made on regular Steel Nail quotations, which are as follows: $2.05 base, per keg for carload lots at mill. Iron Nails generally should command about 10 cents more than Steel.

New York.—Demand for Cut Nails continues extremely light in the local market. Regular quotations are on the basis of $2.30 per keg, for small lots at store.

Chicago.—Transactions as far as jobbers are concerned are restricted to occasional orders of small lots from miscellaneous sources. The principal users, such as the car shops, are practically out of the market, and the requirements of the building trades are largely restricted to Iron Shingle Nails. Regular prices are not being closely observed either by mills or jobbers. Chicago quotations are nominally as follows: Iron Cut Nails, carloads, to jobbers, $2.23; to retailers, $2.28; Steel, to jobbers, in carloads, $2.03; to retailers, $2.08.

Pittsburgh.—Only a few small orders are being placed for Cut Nails, and the situation in this trade approaches very closely to complete stagnation. Some Cut Nail mills are closed down entirely, while others are running to partial capacity to take care of the small orders that are being placed. The market is irregular, and concessions of 15 cents or more are being made from the regular prices of Cut Nails. We quote Steel Cut Nails at $1.90 to $1.95, f.o.b. Pittsburgh, for carload lots, and about $2 for small lots, to which freight to point of delivery is added. Iron Cut Nails are about $2.05, at maker's mill.

Barb Wire.—There is little change in the volume of business being received by the mills, and orders are restricted to actual requirements as nearly as they can be gauged. The trade, not being disposed to accumulate heavy stocks, are placing orders for small lots. Prices are being maintained at regular quotations, according to information from the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—The demand for Barb Wire is relatively stronger than for Nails, and in addition to the heavy shipments going forward from the mills, quite a fair volume of new business is coming out. Orders, though satisfactory in number, aggregate less tonnage than those offered earlier in the season, and, since the active fence building period is now well advanced, it is probable that within the next few weeks a considerable falling off in demand will be noted. Regular prices are reported to be firmly maintained. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Demand for Barb Wire is showing some improvement, and while orders are only for small lots for early needs, the aggregate of orders being placed is larger than for some time. Buyers continue to restrict purchases to actual needs, and are not disposed to carry any heavier stocks than are absolutely necessary to fill orders. Mills report that they are absolutely maintaining prices and that there is no cutting whatever. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—New business continues to be received by the mills in a fairly large volume, but buyers are still confining orders to nearby requirements. Prices are reported as being maintained. Quotations per 100 lb. to jobbers in carload lots are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the price to retailers being 5 cents additional:

Nos.	6 to 9	10	11	12A	12½	13	14	15	16
Annealed	$1.90	1.95	2.00	2.05	2.15	2.25	2.35	2.45	
Galvanized	$2.20	2.25	2.30	2.35	2.45	2.55	2.95	3.05	

Chicago.—The expectation that the conservative first buying by manufacturers would be followed by a liberal amount of reorders is being realized in a fair degree. At the same time there is no disposition to purchase ahead of actual requirements, the result being that frequent ordering of small lots is the rule. The ability of the mills to promptly furnish and ship material as wanted makes this method of buying both practicable and convenient. Regular prices continue to be firmly held by the mills. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—New tonnage being placed is fairly heavy, but jobbers are restricting orders for small lots for actual needs. There is no prospect of an early advance in prices, and no incentive to carry large stocks, as the mills are able to make prompt shipments on all orders. We are advised that the mills are firmly maintaining prices. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Brass.—There was a decline of ¼ cent per pound from the printed base prices of Brass in Sheets, Rods and Wire on May 4.

Binder Twine.—The market appears to be in a very satisfactory condition, as under favorable crop conditions buying has become more active than earlier in the season, when the amount of Twine ordered was not as great as usual. Some manufacturers are reported as having disposed of their entire output. In the Northwest seeding is said to be progressing under favorable conditions, and there is a prospect for a large acreage of spring wheat. Prices remain unchanged, as follows:

	Cents per pound.
Sisal	8¼
Standard	8¼
Standard Manila	9¾
Manila	11¼
Pure Manila	13

Carload lots, ¼ cent less; 5-ton lots, ⅛ cent less, central delivery, fall terms.

Twine and Mops.—Cotton Twine and Mops are lower, and the market in a general way is represented by the following quotations:

	Cents per pound.
Cotton Wrapping Twine, 5 balls to lb., according to quality	13½ to 19
Cotton Mops, 6, 9, 12 and 15 lb. to dozen	8½ to 19

Flax Twine has fallen off about 2 cents per pound from recent quotations, while American and Indian Hemp Twines are also correspondingly lower in price.

Bright Wire Goods.—An easier tone is felt in the market for Bright Wire Goods, which is particularly evidenced by lower quotations on Brass Cup and Shoulder Hooks. A discount of 85 and 10 per cent. is easily obtainable in these goods.

Axes.—Following the revision of prices announced by some manufacturers of Axes, as reported in these columns, the market may be said to show a somewhat improved tone. There has also been an appreciable increase in activity, as buyers who have received low quotations are disposed to get their specifications in promptly and thus avoid the risk of having to pay higher prices. While the advances made must of course be regarded as nominal, so far as the jobbing trade is concerned, they will doubt-

less tend to increase slightly the price of Axes to retail merchants.

Conductor Pipe and Eaves Trough.—Since our last issue, in which we referred to the new prices and territorial limits recommended to jobbers of Conductor Pipe, &c., the usual circular letter has been sent out, defining the districts into which the country has been divided and quoting the prices prevailing. As stated last week, the new feature of the schedule is the subdivision of the East into northeastern and eastern territory, the latter taking somewhat lower prices than the former on Galvanized Steel Pipe and Gutter. The complete schedule is as follows:

Article.	Northeastern territory. Per cent.	Eastern territory. Per cent.	Pittsburgh territory. Per cent.	Cental territory. Per cent.	Northwestern territory. Per cent.	Western territory. Per cent.	Tennessee territory. Per cent.	Southern territory. Per cent.	Southwestern territory. Per cent.
Conductor Pipe:									
Galvanized Steel, standard sizes and gauges	70-10	75	75-10-5	75-10	75-7½	70-12½	70-10	70	70
Galvanized Steel, irregular sizes and gauges	70-10-5	75	75	75	75	70-10	75	70-10	70
Galvanized C. C. Iron, standard sizes and gauges	50-10-7½	50-10-7½	60	60	60	50-12½	50-12½	50-12½	50-5
Galvanized C. C. Iron, irregular sizes and gauges	70-5	70-5	70-5	70-5	70-5	70	70-5	70	65-10
Eaves Trough:									
Galvanized Steel, standard sizes and gauges	75-10-5	80-2½	80-20	80-10-10-2½	80-10-10	80-10	80-5	80	75-10-2½
Galvanized Steel, irregular sizes and gauges	75	75	75	75	75	70-10	75	70-10	70
Galvanized C. C. Iron, standard sizes and gauges	60-20	60-20	65-10	65-10	65-10	60-10-5	60-10-5	60-10-5	60-5
Galvanized C. C. Iron, irregular sizes and gauges	70-5	70-5	70-5	70-5	70-5	70	70-5	70	65-10
Plain Ridge Roll and V. Ridge Cap:									
Galvanized Steel Crated	....	....	80-20	80-10-10-2½	80-10-10	80-10	80-5	80	75-10-2½
Galvanized Steel wired in bundles	....	....	80-20-5	80-10-10-5	80-10-10-2½	80-10-2½	80-5-5	....	75-10-7½
Galvanized C. C. Iron Crated	....	....	65-10	65-10	65-10	60-10-5	60-10-5	60-10-5	60-5
Formed Valley:									
Galvanized Steel	.....	....	70-10-10	70-20	75	60-20-10-5	70-2½	60-20-5	60-10-7½
Galvanized C. C. Iron	....	....	50-5	50-5	50-5	40-10	40-10	40-10	40-2½

Sash Cord.—The market for Cotton Braided Sash Cord is steady at the present time, and may be represented by a quotation on the standard grade produced by all leading manufacturers of 20 to 21 cents per pound, base. There are the usual special concessions for quantity and to the jobbing trade who have been buying rather freely at this level to cover their requirements for a reasonable time. Leading makers assert that none but adulterated Cord is being offered below the extreme price now generally established.

Rope.—Business keeps along on about the same plane as it did in April, with perhaps a slight improvement in the size of orders. All handlers of Rope are carrying light stocks, and not ordering a single coil more than they expect to have demand for. Some manufacturers are still working up raw material bought at much higher prices than now rule, so that every pound of Rope sold at present prices represents something of a loss. A sharp increase in demand might enable manufacturers to advance prices. The following quotations, for base sizes, fairly represent the market: Pure Manila, 10¼ to 11 cents; B quality grades down to 8 to 9 cents; Pure Sisal, 7½ to 8 cents; lower grades Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¾ cents.

Window Glass.—One of the American's machine made Glass factories has closed for repairs, and a hand blown factory has put out its fires. It is assumed that several other factories of this class will go out of blast in the near future, and more will stop work as warm weather becomes continuous. The quantity of Glass which has been and is now being produced is largely in excess of demand, and the indications are that production must be curtailed or prices reduced, as but few of the manufacturers are in a financial condition to carry their surplus Glass, according to reports. It is rumored that two new plants with newly patented machines are making and boxing Glass, and that another new machine factory is likely to be started soon. It appears that there is nothing encouraging in the prospective future for hand blown factories. Demand is very light and prices irregular, so much so that it is impossible to name quotations which would represent the market.

Linseed Oil.—Purchases, as a rule, do not anticipate requirements beyond the immediate future, either by carload buyers or those who require smaller quantities. Deliveries are being made on outstanding contracts, and the demand for small jobbing lots is moderate. Local quotations are as follows: In 5-barrel lots, State and Western Raw, 40 to 42 cents; City Raw, 42 to 43 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—The market is slightly stronger in sympathy with the Southern market where buying for export has been a feature. The new crop of Turpentine is coming into market in fairly large quantities. The local market is comparatively quiet, and manufacturers are buying in small quantities. The New York market is represented by the following quotations: Oil Barrels, 46 to 46½ cents; Machine Made Barrels, 46½ to 47 cents.

Trade Items.

At the recent meeting of the Texas Hardware Jobbers' Association at San Antonio, it was decided to join the retail Hardware and Implement merchants of Texas in attacking the law passed by the last State Legislature by which all merchants in the State handling Firearms are taxed to the extent of 50 per cent. on sales of this line. This law, since it became effective last year, has practically prohibited the sale of Firearms by Texas merchants. It is the intention of the jobbers and retailers to make a test of the constitutionality of the law. It is said that in several instances some merchants have evaded the law by leasing Pistols for a period of 50 years or more and obtaining the regular price for them. It is also stated that during the period of 9 or 10 months during which the law has been in operation only two Pistols have been sold in Texas, according to the tax receipts records of the State Comptroller's office.

The O. C. White Company, Worcester, Mass., maker of White Standard Adjustable Incandescent Lamp Fixtures, has appointed Frederick Rall, 16 Murray street, and 19 Park place, New York, as New York selling agent. He will carry a complete line of samples and a sufficient stock of leading styles will be maintained in the New York stockroom to insure prompt deliveries.

A slight fire occurred on the 2d inst. in the basement and subbasement of Neal & Brinker Company's store, 18 Warren street, New York. The damage done was covered by insurance and was confined to a few heavy goods kept in that part of the building. The conduct of the business was not interfered with in any way.

The Gleason Peters Air Pump Company has recently increased its capital from $10,000 to $75,000, and removed from 181 Mercer street, New York, to a new plant at 256-261 Classon avenue, Brooklyn, where it enjoys increased facilities for conducting its growing business.

Phillip Gross, president, and Charles E. Mueller, secretary and treasurer of the Phillip Gross Hardware Company, Milwaukee, Wis., arrived at Naples, Italy, April 16, in company with Mrs. Mueller. They will tour Europe for a few months and also visit manufacturing centers well known in the production of Cutlery, Hardware and Kitchen Furnishing Goods.

Sheet Metal Ware Automobile.

THE CHAS. F. HAUCK COMPANY, Springfield, Ohio, has sent us the photograph reproduced herewith of an ingenious and effective window display recently used. It represents an automobile made of kitchen utensils and other articles usually carried in a Hardware store. The comment aroused by the clever affair was such that the company got out a souvenir postal card reproducing it, which has proved a telling advertisement. Explaining and describing the display, the company writes us interesting detail, as follows:

Our window floor is low, being 18 in. from the sidewalk. It is 8 ft. wide and 6 ft. deep. The floor was covered with Paroid Roofing, on which was placed the automobile in a diagonal position. In the rear corner of window we displayed Paroid Roofing, and in the front corner we used Butcher Knives to represent the curb and Table Knives for the sidewalk.

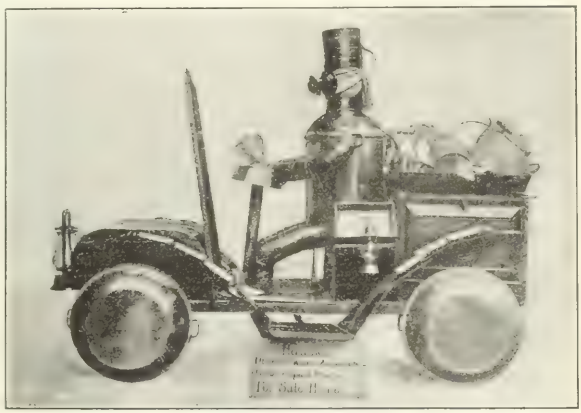
The automobile was constructed by nailing three narrow boards onto the cross pieces, which formed the axles. On the ends of the latter were nailed two strips crosswise, on which we fastened Rinsing Pans to represent the wheels. The upper front section consisted of two Copper Wash Boilers, with a Lantern in front. Originally we had a Searchlight Lantern with an incandescent light, which was lighted at night. This gave out such a bright light that on the last day of the exhibit we were entirely sold out of these Lanterns and had to replace same with a Dashboard Lantern, as photograph shows. The guard in front of the man is a large size Window Screen. The rear section is composed of two Gasoline Stove Ovens side by side, with two Dripping Pans on top, in which we displayed promiscuously different cooking utensils. The auto floor is covered with paper lined Stove Boards. The seat is made of Bread Boxes, on the side of which are placed Bread Pans, with a small House Lantern for a side light. On behind we hung our store number, 59, made with house numbers fastened on a piece of sheet iron.

For steering apparatus we used two center tube Cake Pans, connected by a piece of 2-in. Conductor Pipe, with a Funnel for a horn and an Oiler inserted in the small end to represent the bulb. On the right hand side of automobile were placed Stove Pokers to represent the levers.

The tin man is made as follows: Body, a 10-gal. Milk Can; legs, 5-in. Adjustable Elbows; feet, Flour Scoops; arms, 3-in. Adjustable Elbows; hands, Garden Weeders; head, two White Enameled Mixing Bowls, with Lantern Wicks pasted thereon to represent hair. The goggles are made from two Tin Tea Strainers fastened together with a Tea Kettle Lid Knob, using Gate Hooks for the side fasteners. His hat is a graduated gallon measure.

This exhibit, with the sign shown in the photograph, attracted a great deal of attention. People whom we thought seldom passed our store would remark about the display. So many suggested taking a picture of the auto that we decided to get it out as a souvenir postal card, and it has taken like wild fire.

Our local papers gave us a write-up on the display, which helped to advertise it the more, and, all in all, we consider it the best display we ever had, and we give a great deal of attention to our window displays, as we find it to be our best paying advertisement. As to our store, we have a room 200 ft. deep, and in the fall we display as many as 200 different styles and sizes of Stoves. We carry a full line of Kitchen Furnishings, Cutlery, Sewing Machines, &c. In addition to our store we conduct a shop in which we do all kinds of sheet metal work, tile and slate roofing. We are believers in newspaper space and use a liberal amount.



Sheet Metal Ware Automobile.

AMONG THE HARDWARE TRADE.

The stock of F. F. Wagenschuetz & Co., 230 Oliver street, North Tonawanda, N. Y., was recently damaged by fire and water, to the extent of $1500, fully covered by insurance. The firm handles a retail stock of Shelf Hardware, Stoves, Tinware, Agricultural Implements, Paints and Oils. They also carry on plumbing, tinsmithing and furnace work.

The Jordan Hardware Company, Willimantic, Conn., wholesale dealers in Hardware and Sporting Goods, has increased its capital stock from $54,000 to $100,000, the purpose of the new money being to take care of the company's expanding jobbing trade.

Milton A. Benson has succeeded M. A. Benson & Co., Saranac, Mich., in the Hardware business.

The Scott Hardware Company, Sullivan, Ind., has been organized and incorporated with a capital stock of $22,000 to succeed the Hardware firm of Scott Bros. Walter Scott, who was the active manager of the old firm, will continue with the new company in the same capacity. Among those interested in the newly organized company are A. D. Scott, J. H. Gordon, Wilkey Herbert, E. C. Thomas, Solon Brokaw and R. W. Akin.

The Leonard Hardware Company, Springfield, Mo., heretofore a copartnership, has been incorporated with a capital stock of $15,000. The company has recently moved into a larger and more convenient store and has added considerably to its stock.

The Lee Hardware Company, Fort Gibson, I. T., has been incorporated with a capital stock of $15,000, and will deal in Hardware and Implements, Wire and Field Fence, Harness, Stoves, Sewing Machines, Paints and Oils. Among those interested are Earl Hartman, R. Lee and J. C. Howell.

Linton Hardware Company of Esbon, Kan., has opened a branch store at Lebanon in the same State. The line handled includes Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, Sporting Goods, Incubators, Harness and Vehicles.

Humboldt Hardware Company, Humboldt, Tenn., C. C. Peal, manager, has been incorporated with a capital of $4000.

COMING RETAIL HARDWARE CONVENTIONS

MISSISSIPPI ASSOCIATION, Greenwood, May 11 and 12. Secretary, John E. Sommers, Clarkdale.

GEORGIA ASSOCIATION, Indian Springs, May 19, 20, 21. Secretary, Gary Vinson, Waynesboro.

ALABAMA ASSOCIATION, Montgomery, May 28, 29. Secretary, L. G. Smith, Ensley.

ARKANSAS ASSOCIATION, Hot Springs, June 9, 10 and 11. Secretary, Chas. E. Taylor, Little Rock.

CAROLINAS ASSOCIATION, Wrightsville Beach, N. C., July 8, 9, 10. Secretary, Paul W. McLure, Greenwood, S. C.

OKLAHOMA ASSOCIATION, Oklahoma City, July 14, 15 and 16. Secretary, D. C. Patterson, Oklahoma City.

MICHIGAN ASSOCIATION, Detroit, August 13, 14, 15. Secretary, A. J. Scott, Marine City.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM J. T. JOHNSON, Kingston, N. Y., whose stock of Shelf and Heavy Hardware, Paints, House Furnishing and Sporting Goods, Factory, Mill and Blacksmiths' Supplies was destroyed by fire April 30. The loss is estimated at from $40,000 to $50,000, with insurance amounting to $32,000.

FROM CUBBEDGE-REDDING HARDWARE COMPANY, Macon, Ga., which has been incorporated with a capital stock of $25,000. The company does a wholesale and retail business in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, Sporting Goods, Crockery and Glassware.

FROM DOAK-MACKEY HARDWARE COMPANY, Wetumka, Okla., which has added to its stock Furniture and Undertakers' Supplies.

FROM HOWELL & TOYER, who have recently opened a store in Rupert, Idaho, handling Shelf Hardware, Stoves, Tinware, Sporting and Athletic Goods.

FROM ARMSTRONG-BARROWS HARDWARE COMPANY, formerly J. B. Armstrong & Co., which has recently been incorporated with a capital of $10,000, to conduct a wholesale and retail business in Norfolk, Va., at 111 Commercial place. The company carries Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, Glass, &c. Extensive improvements have been made in the store.

FROM ANDREW J. LA FLEUR, who has opened a plumbing, gas fitting and heating shop at 355 Walnut street, Springfield, Mass.

FROM C. M. BULGER, Aurora, Mo., whose store was recently badly damaged by fire, the stock including Shelf, Hardware, Stoves, Tinware and House Furnishings. Business was resumed the day after insurance was adjusted. The burned building is being repaired and Mr. Bulger is erecting a new building adjoining the one that was burned, which he will also occupy.

FROM MERRY HARDWARE COMPANY, which has purchased the business of the Fraser-Moore Hardware Company, Stillwater, Okla. The new company handles Shelf and Heavy Hardware, Stoves, Tinware, Sporting and Athletic Goods, Harness, Saddlery, Wagons, Buggies, &c.

FROM JOHN S. MENAGH COMPANY, 134 Newark avenue, Jersey City, N. J., which suffered a loss by fire on May 1, estimated at $100,000, partially covered by insurance. The company will resume business as soon as alterations can be made in the newly rented building, 143 Newark avenue. Until such time the company's headquarters will be at 191 Morgan street. The lines handled included Shelf and Heavy Hardware, Paints, Oils, Cordage, House Furnishings, Electrical, Mill and Contractors' Supplies, &c.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

CHASE FOUNDRY & MFG. COMPANY, Columbus, Ohio: Catalogue No. 8 devoted to Trucks and Cars. The line is most complete, including a large variety of Trucks for various uses; also Cars for industrial purposes, contractors' and General Purpose Cars, Track and Switches, Wheels and Axles, Boxing and Repairs, &c.

BUTLER BROTHERS, Chicago, New York, St. Louis and Minneapolis: Mid-spring catalogue, No. 664, covering a large line of goods appropriate for the Hardware trade.

SEARLS MFG. COMPANY, Newark, N. J.: Catalogue No. 20, relating to Nickel Plated Bathroom Fixtures, including Towel Racks, Sponge, Soap, Tumbler, Tooth Brush and Toilet Paper Holders, &c.

MONARCH GRUBBER COMPANY, Lone Tree, Iowa: Annual catalogue devoted to Monarch Stump Pullers, Royal Pitless Wagon Scales, Royal Gasoline Engines and Royal Cement Block Machines.

UNITED STATES CARTRIDGE COMPANY, Lowell, Mass.: Score book in stiff binding for Caliber .30 Military Rifle Shooting.

CREAMERY PACKAGE MFG. COMPANY, Rutland, Vt.: Illustrated price-list of De Laval Cream Separators and a variety of dairy apparatus and supplies.

J. E. PORTER COMPANY, Ottawa, Ill.: Illustrated catalogue of Feed and Litter Carriers, Overhead Switches, Barn Door Hangers, Hay Carriers for circular track and fixtures, etc.

THE steady growth of his business having made necessary larger and more commodious quarters, James L. Neefus, manufacturers' agent, removed May 1 to 103 Chambers street, New York. At the new location Mr. Neefus will carry a larger and more complete stock than formerly of Lincoln-Williams Twist Drill Company's Carbon and High Speed Drills, Bay State Tap & Die Company's Taps, Dies and Screw Plates, Chisholm & Moore Mfg. Company's Cyclone, Moore, Standard Screw and Direct Differential Chain Hoists in all sizes from ¼ ton to 10 tons' capacity. He will thus be in a position to fill orders complete on receipt.

WIEBUSCH & HILGER, LTD., formerly located at 9-15 Murray street, New York, have sent out to the trade a circular announcing their removal to the new Hardware Building, corner of Lafayette and Walker streets, New York. The company's offices are on the second floor and may be entered by a private entrance on Walker street or from the elevator entrance on Lafayette street. The circular bears a picture of the building and also a map of the lower end of Manhattan, showing the comparative position of the new location and the most convenient methods of transportation by which it may be reached.

L. J. BARWOOD COMPANY, Boston, Mass., manufacturer of Leather and Fiber Specialties, is calling special attention to the extent of the line of Leather Washers which it manufactures, and has issued a clever illustration showing a Washer 3 ft. 7 in. in diameter, held by a workman who is looking through the hole in the hide from which it was cut. In his other hand the workman holds fully 1000 little Washers, measuring less than ¼ in. in diameter. The design affords a striking illustration of the scope of the company's line.

CATALOGUE FILE OF N. T. BUSHNELL COMPANY.

THE problems presented by the catalogue department of an enterprising Hardware store are numerous and to many merchants decidedly perplexing. They include not only the accommodation of catalogues, price-lists, circulars, &c., in some convenient and easily accessible way, but also efficient methods of keeping track of incoming printed matter, classifying and indexing goods, compiling lists of manufacturers, &c.

Problems Involved.

There is, perhaps, no class of merchants who, in the conduct of their business, require as great a number of

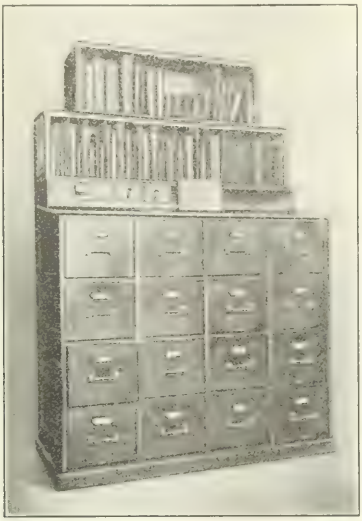


Fig. 1.—Catalogue File of N. T. Bushnell Company.

catalogues as Hardwaremen, or have occasion to refer to them as frequently. The scope of the Hardware business, which in many instances includes supply lines, is so great that even in regard to regular goods frequent reference to catalogues is necessary. There are also a great many goods which, because of infrequent demand or for some other reason, it would not be economical to carry in stock, but which are occasionally called for. Such articles a merchant can sell from the printed description and illustration, securing them by special order from the manufacturer or jobber with whom he deals. Thus it is important not only that

An Efficient System Needed.



Fig. 2.—Section in Catalogue File.

catalogues should be accessible on requirement, but that it should be arranged to keep some record of their contents.

The accompanying illustration (Fig. 1) represents the catalogue filing case used by N. T. Bushnell Company, New Haven, Conn., and built to its order. The main body, in which the drawers are contained, is about 5 ft. wide by 4½ ft. high and 2 ft. deep. The upper shelves contain bound volumes, &c., which because of their size and the frequency with which they are referred to are kept ready at hand. Between these shelves and the working desk will be observed three drawers. The wide one at the left has nothing to do with the catalogues, being used to accommodate an alphabetical file of current invoices, covering incoming shipments. The two smaller drawers contain card indexes, one under goods and the other under firm names. Sample cards from both indexes are reproduced in Figs. 3 and 4. The reader will appreciate that while the index under firm names is easily made and kept up by adding cards for new concerns whose catalogues are received, the index of goods is much more difficult to handle, involving, as it does, questions of classification

Cross Index.

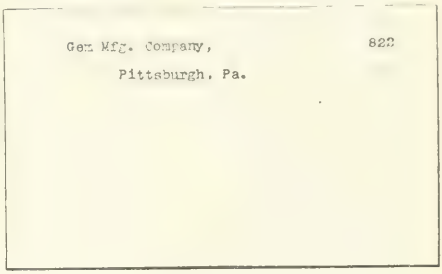


Fig. 3.—Card from Index of Manufacturers.

and the selection of specific articles from almost every catalogue. For instance, it must be decided whether steel goods shall be treated under one classification or whether separate cards should be made out for Hoes, Rakes, Forks, &c. Again, it must be decided to what extent subclassification shall be carried —that is, whether different varieties of the same article shall be kept on the same or on different cards. These questions the merchant would, of course, have to decide according to his peculiar requirements and his facilities for keeping up the catalogue department.

Methods of Classification.

The drawers for the accommodation of the great bulk of catalogues, circulars, &c., are divided by tab

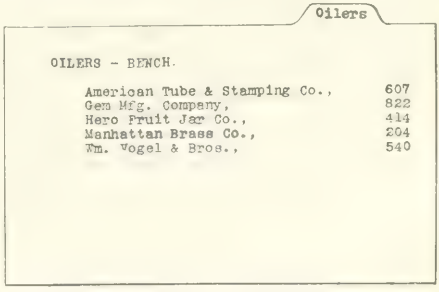


Fig. 4.—Card from Index of Goods.

sheets, such as are used in what is known as the vertical filing system, Fig. 2. The sheets are numbered consecutively, running in Bushnell Company's file to upward of 1500. Corresponding numbers are put on the outside of each catalogue, with a paster like that appearing on the catalogue which lies on the shelf in Fig. 1. But one catalogue or circular is kept between sheets except in instances where a manufacturer issues several publications referring to different lines, in which case they are kept together. On the outside of the drawers are card

Use of Drawers.

rames showing the range of sheet numbers which the rawers contain.

From the above the reader will doubtless understand hat in looking up the catalogue, for instance, of the Gem Mfg. Company it is only necessary to get their number from their card in the manufacturers' index and turn to it in the proper file drawer. If, on the other hand, Oiler manufacturers are wanted, without knowing just which one, they can readily be found and their catalogues looked up by reference to the other index under goods.

Death of Thomas B. Rayl.

THOMAS B. RAYL, head of the T. B. Rayl Company, died at his home in Detroit, Mich., April 26, of Bright's disease, after an illness dating back four years, which had necessitated his retirement from active business. Mr. Rayl was born in Wooster, Ohio, January 26, 1838, his genealogy going back to colonial days. He began his business career early, in a Hardware store in Wooster, where his ability, integrity and obliging disposition made him indispensable to his employer, who finally took him into partnership. The new firm was Donnelly, Rayl & Co., of which Mr. Rayl had the entire management. In 1872 he went to Detroit, engaging in the commission business, but in 1875 a Hardware store on Woodward avenue being for sale, Mr. Rayl, with Dudley W. Smith, bought out Arthur Glover, the proprietor, and the T. B. Rayl Company was established, continuing under the same style ever since. In a tribute paid to his memory Mr. Smith, his partner, said that Mr. Rayl was "a gentleman by nature, full of the milk of human kindness, thinking no evil, charitable always in speech and thought, pure minded, generous hearted. He possessed the affection and esteem of the employees of the company always and without exception."

The International Rifle Contests at Bisley.

OWING to lack of funds to cover the expense it has been understood that no American Rifle team would be sent to represent the United States this year at the International Rifle Contests at Bisley, England. In this juncture, however, the United States Cartridge Company has offered to pay the entire expense of such a team. This contest forms a part of the Olympic games which will be held in the Olympic stadium in London, but the shooting competitions under the management of the National Rifle Association of Great Britain will be held as heretofore at Bisley. Gen. James A. Drain, president of the National Rifle Association of America, has acknowledged the company's generous offer, and at a meeting of the Executive Committee called for this purpose the proposition was accepted with thanks and a committee appointed to proceed with the organization of a team.

L. KERREMANS is now in New York for a stay of about two months, his headquarters while here being with Henry W. T. Mali & Co., 73 Fifth avenue, New York. Mr. Kerremans is the representative of H. & P. Giros, Ancerville (Meuse), France. The object of his visit is to arrange with American manufacturers for representation of their products in French and Belgian markets. In addition to marketing lines of goods made from various metals, the house has its own factory in France, employing several hundred people, and this has facilities for undertaking the production of patented specialties of American origin under suitable agreements as to royalties or shop rights. We are informed by Mr. Kerremans that his principals are manufacturers of various kinds of goods made from steel and brass; that they also make Sewing Machines, and are Gun makers to the French Government, having business relations also with other foreign governments in Firearms.

THE FAITH IRON COMPANY, Kansas City, Mo., has increased its paid-up capital from $150,000 to $225,000. Its authorized capital was $200,000, of which only $150,000 was paid up, the actual increase therefore being $75,000.

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Hardware Manufacturers on the Business Situation and Outlook

With a view to ascertaining the impression of manufacturers in regard to the volume of business thus far in 1908 and the outlook for the next few months, we have within a few days addressed a number of prominent manufacturers in Hardware and allied lines. Extracts from some of the advices thus called out are given below. They will be of interest as reflecting conditions during the first third of the year, and indicating the opinions of our correspondents, who are peculiarly well qualified to form an accurate judgment in regard to the outlook for business.

CONFLICTING REPORTS AS TO APRIL BUSINESS.

FROM A TWIST DRILL MANUFACTURER: Business with us, perhaps, shows a slight improvement as compared with January, February and March, but this improvement is very slight; in fact, we don't anticipate much of an improvement soon—at least until the fall.

FROM A MANUFACTURER OF BUILDERS' HARDWARE: Business for the first third of the year of 1908 has been about 65 per cent. of the sales for the same period in 1907 and 1906. Since the middle of April business has improved, and we are of the opinion that it will continue to improve as the situation politically, financially, agriculturally and crop-wise warrants improvement.

FROM A NEW ENGLAND MANUFACTURER: Although business has been quiet during the first three months of the year, we have been able to continue to run practically a full force upon regular schedule time. During the last fortnight, however, orders have fallen off considerably and we are anticipating a decidedly slow summer, and, no doubt, will be compelled to go upon short time within a week or two.

FROM A MANUFACTURER OF GENERAL HARDWARE: Our business shows only a slight improvement since the year opened. This, to us, is quite disappointing, particularly for the month of April, when we had hoped to see a marked improvement. We are of the opinion that there will be no radical change for the next three or four months, expect a slight increase from month to month unless some new disturbing element should appear.

FROM A MANUFACTURER OF BOLTS AND NUTS: While business is far from satisfactory to us, we are pleased to be able to state that there has been a steady improvement each month during the current year. December was our lightest month. A slight increase showed during January, February and March, and a very decided improvement during the month of April. We think the steady, though possibly slow, improvement will continue during the summer months. One of the striking features of the present business is that while the great bulk of purchasers are ordering in comparatively small quantities, they are ordering frequently and desire shipments made immediately upon receipt of order, showing the demand to be legitimate and the stocks in the hands of consumers small. Collections are very good and, taking it altogether, we think the conditions are encouraging.

Frequent Orders and Rush Shipments.

FROM A MANUFACTURER OF TWIST DRILLS: The situation as it appears to us is somewhat mixed at the present time. During March our orders were exceptionally good, and it seemed as though business had begun to come back. During April, however, results have been somewhat disappointing. We think the general feeling is rather optimistic and the development of the past few days would perhaps be responsible for this condition. For the next few months, however, we do not look for any resumption, as in all probability it will take some little time to get over the policy of ordering from hand to mouth. Like others, we are hoping every day that business will show a material improvement.

Resumption Will Be Slow.

FROM A MANUFACTURER OF MECHANICS' TOOLS: Considering the general state of business, we have had no cause to complain of not getting our share during the first three months of the present year. Our sales have been about 60 per cent. of what they were for the corresponding months of last year, when they were abnormally high. Generally, March is by far the biggest month in the year with us, and April sales usually drop off considerably from March. This year, however, April sales have been about the same as March sales. We have been getting about the same number of orders as usual, and our salesmen get orders from almost all of our old customers they call on and send about the usual amount of new business, but the orders are smaller than last year. We expect that there will continue to be a fair amount of business during the present year, and that unless something unforeseen happens, business will show a decided improvement in the first part of next year.

Orders Numerous but Smaller.

FROM A PENNSYLVANIA MANUFACTURER: During the first two months of this year our shipments ran behind those of last year, but March went slightly ahead and April will about equal last year. Our business at the present time seems to be just about as good as it has been in former years. We, of course, make a large line of goods which are sold only during the spring months, and as we are constantly producing new articles, we believe that our business would keep up to its usual average, where a great many concerns that are making standard lines, would not. We also find that collections are better than they were a couple of months ago, although we do not believe they are quite as good as a year ago. We look forward to a good business until July 1, but after that time it is somewhat of a problem, although we see no reason why after the political situation is settled a little, business should not resume to a certain extent its former condition, owing to the fact that we find very few people in any line that have much stock on hand to speak of.

Collections Are Better.

A FALLING OFF IN BUSINESS OF FROM 15 TO 33 1-3 PER CENT. SO FAR IN 1908.

FROM AN OHIO MANUFACTURER: We have been fairly busy all along, but the volume of business has been considerably less, anywhere from 15 to 20 per cent. than last year during the same period. Buyers order frequently in small quantities, and every one is in a hurry. Our business is seasonable and we do not look for much improvement this season, which will end about August.

FROM A MANUFACTURER OF FILES: During the past four months there has been a gradual improvement in the demand for goods, but the volume has only been 75 per cent. of what it was during the same four months of 1907. We anticipate a gradual increase month by month during the balance of the year, but we do not expect business to become normal until after the Presidential election, and if the proper man is elected we see no reason why the volume of business should not return, as the crop indications are quite favorable.

FROM A MANUFACTURER OF TAPS AND DIES: Since January 1 we have received about two-thirds of the amount of business we had during the same period in the years 1906 and 1907. At the present time indications are not very bright, and the outlook for the future is a hard proposition to answer and one we could not give much information on.

FROM A MANUFACTURER OF SHEARS: Sales during the first third of the year have fallen off practically 15 per cent., which we consider a very low percentage when the general condition of the country is taken into consideration. From what we know we believe that for our business the conditions during the first third of the year are very apt to continue during the balance of this year, expecting probably during the last two months of 1908 a brighter prospect.

FROM A MANUFACTURER IN OHIO: Buyers are purchasing our goods very cautiously. The prospect for the next two months will depend somewhat on the hay crop. Our business is from 20 to 25 per cent. less than one year ago, which was our banner year.

FROM A NEW ENGLAND MANUFACTURER: Our business year dates from August 1 last, and for the period ending May 1 our business will show a falling off of about 20 per cent. from corresponding period a year ago. Based upon our orders from August 1 last to May 1, with a conservative estimate of the business we shall probably secure for the next three months, we estimate our business for the year at about 85 per cent. of what it was last year, and rather more than an average for five years past, including 1907. We are inclined to the opinion that general business will gradually but very slowly improve during the next six months, but we do not

Politics and Crops Factors.

look for any radical improvement until after the political situation is much clearer than at present, and the crop prospects for 1908 fairly well determined.

AN EASTERN MANUFACTURER'S VIEW OF BUSINESS AFTER A TRIP TO THE WEST AND SOUTH.

The writer has just returned from a long business trip and is giving your inquiry immediate attention.

Our sales during January and February were 61 per cent. of last year.

During January, February and March they were 72 per cent. of last year.

During January, February, March and April they were 80 per cent. of last year.

April itself showed a few dollars more than the corresponding month last year in dollars and cents. Since prices have gone down, it is apparent that we moved more goods in April this year than a year ago.

The writer has recently been in conference with a majority of the manufacturers of the country in his line, and has just swung round the Mississippi Valley, returning up the Gulf and Atlantic Coast. During this time he talked with a number of prominent merchants, and found a comparatively unanimous verdict on the following propositions:

Concensus of Opinion.

1. That business during the past month has greatly improved.

2. That prospects for business during the next couple of months are comparatively bright.

3. That stocks of goods in the hands of jobbers are very low—insufficient to last more than a month longer at the outside.

4. That a large fall business is anticipated, especially between the Mississippi and the Rocky Mountains, the Southwest being particularly prosperous at present.

It is worthy of note that a large Western jobbing house has given orders to its factories to proceed at once on full time, making goods for the fall trade.

The average business done by people in our lines throughout the territory visited seems to be about 60 per cent. of last year.

BUSINESS LARGE ENOUGH TO TAX CAPACITY OF SOME PLANTS.

FROM A MANUFACTURER OF HOLLOW WARE: So far as we are concerned, business has been for the most part satisfactory. Our factory has been running full all winter and there has been no dearth of orders at any time and at the present we are running full. We cannot say how long these conditions will last, but there are no indications to warrant our taking a pessimistic view of things so far as we are personally concerned. We do not care to make any predictions as to future business, but have great hopes of continuing in our healthy state for some time to come.

FROM A MANUFACTURER OF LAWN MOWERS: While we believe the country has been passing through a period of financial and industrial depression, we can truthfully say that it has not affected us in the least. We have run our factory to its fullest capacity and the outlook for future business was never better. We anticipated that we would "get ours" next fall when we went after business for 1909, but the last 10 days or two weeks has dispelled that notion, for many of our largest jobbing customers are sending us supplementary orders, which indicates that they have sold their stock and are obliged to buy again, and assures us of an empty market next fall. All of this, of course, is very gratifying to us, and we presume the same conditions prevail with our competitors. We hope so.

Empty Market Next Fall.

FROM A NEW ENGLAND MANUFACTURER: The total volume of orders for —— has more than equaled our record for 1907. There is a decided distinction, however, in that both wholesalers and retailers are extremely reluctant to specify in advance for their requirements. The result is that we are constantly receiving a great quantity of rush orders. Dealers apparently wait until they have actual orders on hand, or at least every evidence that orders will be received immediately, before placing specifications. They then, of course, want the goods without delay. A number of them want them the day before they order.

FROM MANUFACTURERS OF SCREW CUTTING MACHINERY: We can give you nothing except a most encouraging report of the present condition of trade. Although our business has not returned to a normal state, it is so near so that we feel as though the conditions are in a much more healthful state than they were even before the financial distress of last October, for at that time we were doing business at a high pressure and the conditions were far from healthy as far as trade was concerned. We are now doing as large a business as we were in the early months of last year, and the prospects for the future seem to be gradually improving. We therefore have reason to congratulate ourselves that the apparent "hard times" are passing and that business soon will be in a most healthy condition.

"Hard Times" Are Passing.

BUSINESS IN THE AGRICULTURAL IMPLEMENT LINE HAS BEEN EXCELLENT.

FROM A PENNSYLVANIA MANUFACTURER: The first third of the new year's business has been very satisfactory, and, strictly speaking, we have nothing to complain of, and should business continue with us as it is we will certainly be ahead of last year's business. At present we see no signs of letting up.

FROM AN EASTERN MANUFACTURER: Our business up to April 1 showed an increase over that of last year, and we hope for as much business during the next few months.

FROM AN OHIO MANUFACTURER: For our part we will say that the Implement business has been very good this season, in fact, surprisingly good, though there was quite a lull in buying from October to December 1. Trade has picked up since that time and the volume of business is somewhat larger than during the corresponding period of the preceding year. In fact, our factory was compelled to work 22 hr. a day to keep up with the rush orders. The Implement business, however, would not suffer as much as other businesses at such a time, owing to the fact that there have been no short crops, conditions have been favorable in general, and the farmer is generally considered very prosperous. We understand, however, from various sources that the Implement business taken as a whole is not up to the average, and, considering this, a largely increased trade is looked for this coming fall and spring. There may be a tendency to hold off buying until prices of raw material have been determined for the coming year, but we do not believe this will be general. Every indication points to prices being held on present basis, at least, throughout another year.

Working Overtime on Rush Orders.

ADVANTAGE OF HAVING AN ESTABLISHED EXPORT BUSINESS.

FROM A MANUFACTURER OF FILES: Trade, especially domestic, at the present time is rather dull with us; in fact, if it were not for our export trade we would be on half or three-quarter time, but are now working full time and full handed. Of course we are gradually catching up on export trade, and if our domestic orders do not increase in the near future, we may be compelled to go short time. The outlook at the present time is rather peculiar; from some sources it looks as if trade is reviving, while from others it looks as if trade will continue the way it is now until after the Presidential election. Considering the condition as a whole, we feel buoyed by the outlook and are going to do our very best to keep full time until conditions become normal.

FROM A MANUFACTURER OF PUMPS: During January and February our business was about 60 per cent. of normal. During March it was over 80 per cent., and during April it has been about normal. We are running our plant full force every day and are nearly four weeks behind orders, and we feel very much gratified with these conditions. It is, of course, difficult to tell what the future outlook will be, but if business continues with us as it is now we certainly will have no cause for complaint. Our export business so far this year has been the best of any period in our history. We are making a high grade line of Pumps and Enameled Ware, and we attribute very largely the fact that we are having a satisfactory business to the quality of our goods. We believe that a large portion of the trade are paying more attention to quality than a few years ago. Prices on some of our goods are too low, but taking everything into consideration, we are well satisfied with conditions.

Quality Cuts a Figure.

JOBBERS AND RETAILERS ARE CARRYING LIMITED STOCKS.

FROM A CONNECTICUT MANUFACTURER: Business fell off to a very considerable extent in the months of December and January, but we gained somewhat in the months of February and March. Even now, however, we are a long way from normal. There is abundant evidence

that jobbers are running their stocks as low as possible. They are ordering in quantities much smaller than usual and want the shipment of their orders rushed.

FROM A MANUFACTURER OF HEAVY HARDWARE: In the past four months we have done about 70 per cent. business, that is, 70 per cent. of a normal year's business, which is less than 60 per cent. of 1907 business. Our factory has run on an average, during the last four months, of about 36 hr. per week, as against 52 hr., under normal conditions. Until within the last two weeks we have not laid any of our men off, excepting a day or two occasionally, deeming it wiser to employ the full force and run shorter hours than would otherwise be necessary. As to the future, we cannot foresee anything for the next four months, as under "normal" conditions May and June are always light months with us. We are at present working "from hand to mouth," depending on the mails and our agents to send us orders from day to day to enable our factory to run along. However, we feel optimistic as to better conditions, everything being in favor of an early resumption to normal conditions, especially if the Presidential conventions should result in strong conservative men being nominated by both parties. There are very little stocks in the market in our line among the jobbing trade, and even with the retail trade we find that the stocks are reduced considerably. We are not increasing our stock in the factory, so that any movement for increased trade will be felt immediately all along the line.

Favorable Conditions.

FROM A FIREARMS MANUFACTURER: Our business has been materially reduced since November 1 last. Our dullest months were December, 1907, and January, 1908; February showed an improvement over January, March was better than February, and April is still a little better. We figure that we are doing about what was a normal business of three or four years ago, but we are off a little bit from 1906 and still more from 1907, which was an abnormally good season. Our production has been curtailed in proportion to our sales, so that we have not accumulated an overstock for the time of year, and the best information that we can gather is that stocks in jobbers' and retailers' hands are only about 70 to 75 per cent. of what they were a year ago, so that the total stock of our goods throughout the country is much smaller than it was last year at this time. As each month so far has shown an improvement, and as we are now pretty close to a normal business, we hope and expect that this fall will develop a good demand, and if it does and the jobbers and retailers get their courage back and put their stocks into normal condition, there is a decided probability that there will be a shortage of our goods. In the expected event of a good fall crop we shall be much disappointed if we do not have all we can do in the fall of 1908 and spring of 1909.

Shortage of Goods in the Fall.

FROM A MANUFACTURER OF HEAVY HARDWARE: Our shipments for the four months ending to-night are almost exactly 50 per cent. of what they were in the busy months of the first third of 1907; consequently, all things considered, we are fairly well satisfied, as we think we have got our full share of the business. As to the outlook for the next few months, we look for the usual midsummer dullness for May and June, with probably some increase in July after the political nominations shall be made and knowledge had of actual crop conditions. From all reports in our diversified trade throughout the entire country, we find that buyers for six months have been reducing their stocks and will probably continue to do so until late midsummer or early fall; but in the last quarter of this year I am looking for a very considerable business—larger than the last quarter of last year.

Year Will Close with a Rush.

CONSIDER OUTLOOK FOR BUSINESS SOMEWHAT UNCERTAIN.

FROM WIRE GOODS MANUFACTURER: We are sorry to say that the outlook is not very encouraging. There is, we think, a fair volume of business, which we expect will continue throughout the year. Were it not for the fact that we have just passed through two or three years of splendid business our present shipments would be quite satisfactory. As compared, however, with the business of the last two years it shows a constant tendency to decrease rather than increase. We do not look for any change until after election this fall.

FROM MANUFACTURERS OF WIRE: Our business during the first third of the year has been fairly good in several departments. In some departments, however, we have been obliged to run only half time. The outlook at present seems to be rather discouraging, and business has dropped off with us considerable during the past few weeks, but it may be on account of some seasonable goods which we manufacture more than from any other cause. In a few of our smaller lines we think we can see some improvement during the past month.

FROM A NEW JERSEY MANUFACTURER: During the first three months of the year our business was fairly good, but the outlook for the next few months is not very encouraging.

FROM A MANUFACTURER OF MECHANICS' TOOLS: We of course suffered a reduction in our business as compared with last year. At the same time we had already discounted the future. As a matter of fact, our trade has kept up much better than we anticipated. As to the future outlook, would say that we do not believe that there will be much improvement in business until after the Presidential election. It will all depend upon who is the successful candidate. While we are not pessimistic and believe in the future of this country, yet we do think that it is very unfortunate that such a continual agitation is kept up in the name of "reform," because in spite of all the good intentions of the would-be reformers their methods are extremely disturbing to business and will continue to be so. What the country needs is a return to common sense and peace of mind. There is very little resumption thus far throughout the Western and Southern country in commercial enterprises, and we doubt if there will be until agitation is checked. A large number of lumber plants are still closed, and many other large manufacturing institutions are running on short time.

Reform Agitation Very Disturbing.

FROM A MANUFACTURER OF CARRIAGE HARDWARE: The volume of our business during the first four months of 1908 is practically one-half what it was a year ago during the same period. Prices have been fairly maintained, but the demand has been very light, and the outlook for the next few months is rather dubious, we regret to say. The financial situation seems clearer, and money is more easily obtained, but the demand for goods is very small. However, indications are that no one is carrying any stock, and should there be any improvement in business the general trade of the country would make heavy demand on the manufacturers. We do not look for this, however, during 1908. The political situation is too complex, and it takes time to recover from these periods of depression. We don't like to be pessimistic, but the outlook to us is far from encouraging for a business revival during this year.

FROM AN OHIO FOUNDRY: Our foundry business for the first quarter was about 80 per cent. of the business we did last year, and for the first four months averaged about 78 per cent. of the business of last year. This is in dollars and cents. The tonnage is probably about 83 per cent, of last year. We consider ourselves, however, very fortunate, as the foundries in this section have not had such good business as we have been fortunate enough to obtain. The outlook for the second quarter of the year, or for the next two months, is not as good as that which we have experienced during the last four months. We have closed up recently some fairly good tonnage contracts, probably enough to keep us fairly busy for five weeks, but the prices have been chopped down to very close margins, and the profits will not look as nice as we have been in the habit of seeing during the last three years. However, we are not pessimistic, and we believe that things have about touched the low ebb of volume. The pig iron market is weak, and if this gets down to a much lower basis, it will closely approach cost to the furnaces, and we think will stimulate buying and will loosen up several large contracts that so far have been held up. We do not think that this will reduce the percentage of profits to the foundries, but will tend to liven up business considerably.

Profits Not So Nice as Formerly.

Pig Iron Market a Consideration.

FROM A MANUFACTURER OF MECHANICS' TOOLS: While we presume general conditions have improved somewhat during the past two months, an analysis of our sales would indicate a falling off. We anticipated when the panic struck us that the first signs of improvement would be followed by a relapse, and this has proven to be the case. The relapse, however, has been more serious than we anticipated it would be, and while we are not pessimistic, we can see no indication of an increased demand. The first three months of the year showed a falling off of about 21 per cent. as compared with 1907. The first four months of the year will show a falling off of about 25 per cent. so far as we can figure

Much Depends on Crop Output.

months are concerned, we do not have great expectations. As soon as a good crop is assured we believe the West will commence to purchase more freely; in such an event we look for a gradual return to a normal condition, which should prevail after the first of the coming year. If, however, the crops are not up to the standard, we cannot predict just when an improvement will occur.

FROM A MANUFACTURER OF DROP FORGINGS: So far as our experience is concerned, we have detected but very slight improvement in the general trend of business during the past two or three months. But while orders have increased to no perceptible extent, we think we notice a sort of indirect undercurrent tending to show that purchasing agents are becoming a little more interested, preparatory to coming into the market, and do not appear to have the same confidence in securing lower prices through a waiting policy. We do not, however, look for any normal business conditions for some little time yet.

FUTURE OUTLOOK REGARDED WITH CONFIDENCE.

FROM A MANUFACTURER OF MECHANICS' TOOLS: Business during the first third of the year has been about two-thirds of what it was during 1907. Although we do not think that business at any time during 1908 will be as good as last year we do look for some improvement in the near future over the conditions of the past few months.

FROM A MANUFACTURER OF TWIST DRILLS: We find business getting gradually a little better. Collections are also improving. We feel that owing to the depleted stocks in the country and a better feeling existing it will continue to improve little by little, but nothing of any moment until after the Presidential election. We are running full time with about two-thirds of our 1907 force. Take it all in all, we have an optimistic feeling for the future.

FROM A MANUFACTURER OF BRASS GOODS: Our business in January was better than December, and each succeeding month has brought us a larger volume than the preceding one. Our full running time is 60 hr. per week, and since January we have run from 50 to 55 hr., with sales averaging about the same as 1905, and 1906. Jobbers appear to have large stocks and the retailers are inclined to buy sparingly, consequently all orders are very small. Regarding the outlook for the next few months, we believe that stocks with both jobbers and retailers are much reduced and that all have more confidence, and that the worst is over. In our line business is usually quiet through May, June and July, and it looks as though it would be unusually so this year, but we look for a fairly good fall trade.

Monthly Improvement.

FROM A MANUFACTURER OF SASH WEIGHTS: Trade conditions during first third of 1908 have been better with us than we expected. Prices have been fairly well maintained, and orders have been considerably in excess of some years, when there was not nearly so much talk of business depression. The outlook during the next few months has very much to encourage, there will not be a boom nor an advance in price, but there will be some orders coming along all the time and the very low stock carried by the dealers puts the market in shape for good business later. Last year, notwithstanding Government reports to the contrary, the crops were not a success, and this fact, I think, did more to affect railroad business than anything else. Our present report on the crop situation shows prospects of a tremendous crop, and if present favorable weather conditions continue the railroad companies' rolling stock will all be employed before the end of the year, and as soon as this happens business will boom.

Low Stocks Will Help Market.

FROM A MANUFACTURER OF BELTING: In our opinion recovery has started in. We think business will steadily improve and will be in fairly full swing by July 1. The one thing that will do more than anything else to create business activity will be the cut that the United States Steel Corporation will have to make in the price of its products. A cut of $1 or $2 a ton would create a buying demand, and enough orders probably would be placed to keep the mills all over the country running 60 to 90 days. By that time the worst features of the political campaign would be discounted and business would be almost on a normal basis. The weather conditions have been very favorable to large crops. The accumulation of money in the banks, and the lower prices on building material will create a condition warranting new construction work. The American people are too rich and prosperous to allow their money to stay for any continued time in the banks without trying to get some profit on it. Confidence is steadily being restored. The railroads have held off their buying for practically a year now. The fact that the Pennsylvania had its bond issue over subscribed so many times will hurry the other railroads to put out bond issues to try to get the benefit of this loose money. This will mean a resumption in buying on the part of the railroads. These few reasons and a lot of others will bring about a very rapid resumption of business when once confidence has got its head high enough above water to take a long breath.

Recovery Has Started.

Money Will Be Put to Work.

FROM MANUFACTURERS OF BOLTS AND NUTS: We see a gradual increase of business since January—each month a little better than its predecessor. Prices are necessarily low, with the small demand. The railroads are the greatest economizers just now; when they commence to buy their full needs, business will be active in iron and steel.

FROM A MANUFACTURER IN CONNECTICUT: We find business improving to a slight extent. The percentage of each month since January 1 shows a slight increase when compared with sales of 1907. It should be stated, however, that we have not used nearly our usual efforts to sell, we might almost say, made no effort to sell, so a comparison cannot be made to show properly. We believe that the advance of the season will show a decided improvement.

FROM A MANUFACTURER OF HOUSEHOLD SPECIALTIES: We are still hopeful of better business conditions at an early date. It would seem as though monetary conditions were now almost, if not quite, normal, and this should bring an early resumption of purchasing by railroads and other large corporations. According to our experience, however, current orders and actual volume of business now on the books show little evidence of activity.

FROM A NEW ENGLAND MANUFACTURER: While the sales in our line have fallen off to quite an extent during the past four months, we are still optimistic and are hoping for a revival. We believe that had we not experienced the extraordinary business conditions of 1906 and 1907 we would feel well satisfied with the present outlook, but, comparatively speaking, the present year is rather unsatisfactory. We really do not look for a revival until after the Republican convention, or, possibly, until after election. At the present time we are hopeful that business will revive very materially. We are taking advantage of dull times to clean house, so to speak, and to put our organization and equipment in such shape as they should be in order to take care of present conditions and to lay a solid foundation for the future.

A Good Time to Lay Foundations.

FROM A CONNECTICUT MANUFACTURER: As far as the volume of trade is concerned, with us, there has been a falling off of about 25 per cent. as compared with the corresponding four months of last year. The market during the past four months has been unsteady and somewhat erratic. It has reflected the conditions of what we call the "times." Trade has been like a staunch ship in a great fog. While the vessel is known to be staunch in every respect and well manned, the navigator finds it necessary to go slowly and with great caution, not knowing what may happen. As to the future outlook, we are very hopeful. We think the fog is not as dense as it was and we can go a little faster. We feel, however, that the improvement in trade will be gradual and that this period of depression will have taught both employer and employee, rich and poor, some very useful lessons, and that the revelations that have been incidental will have led to preventive legislation for the future, and that we shall understand and regard better the rights of each other, and that, perhaps, trade in the future will be done on higher principles and with more regard to what is due to each other.

A Ship in a Fog.

Useful Lessons.

LEADING MANUFACTURERS of Door and Window Screens are suggesting to merchants that they can increase their Screen business by calling the attention of the public to the sanitary importance of proper screening. Flies are now recognized as disseminators of filth and disease germs and the manufacturers are furnishing their customers with advertising matter on this subject, including circulars quoting news items and a reproduction of a newspaper clipping with a magnified illustration of a fly for pasting in the show window.

Diamond Edge Scissors and Shears Case.

THE NORVELL-SHAPLEIGH HARDWARE COMPANY, St Louis, Mo., has just brought out a patented Shear and Cutlery Case, which is not offered for sale, but is furnished gratis to merchants handling the company's Diamond Edge line. Case A, illustrated in Fig. 1, contains two sets of upper arms for Scissors and two sets of lower arms for Shears, over 18 dozen Scissors and Shears being accomodated. The case is 25 in. wide, 24 in. high and 13 in. deep. The arms and brackets are full nicked plated. Fig. 2 affords a back view of the

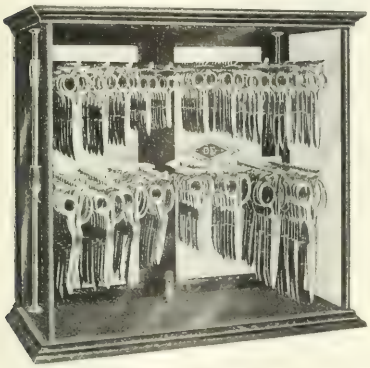


Fig. 1.—Scissors and Shears Case, Front View.

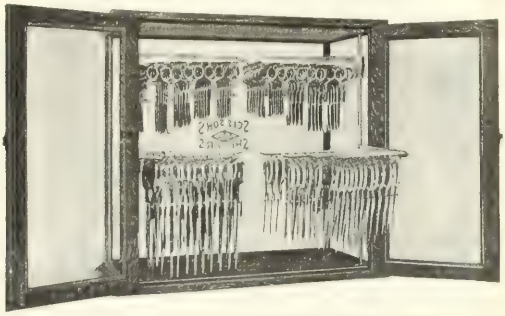


Fig. 2.—Scissors and Shears Case, Back View.

case, with the doors open, showing how the brackets swing out clear of the case and permit convenient handling of the goods. The construction and operation of the brackets are more clearly shown in Fig. 3. They are hung on a vertical rod, and are adjustable up and down to

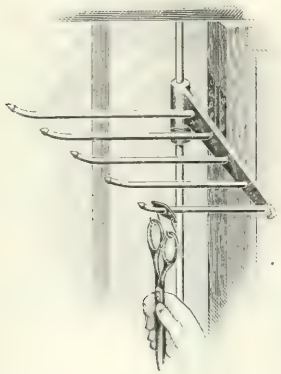


Fig. 3.—Bracket in Scissors and Shears Case.

accommodate any length of Shear. The company also makes a combination Cutlery Case, Style C, which is 36 in. high., 26½ in. wide and 20½ in. deep. It will accommodate 12 dozen Scissors and Shears and 5 dozen Razor Strops. The base contains bins for 42 patterns of Pocket Knives and 12 patterns of Razors. On top of the bins are plush lids with partitions for displaying the same number of items.

Cow-Ease.

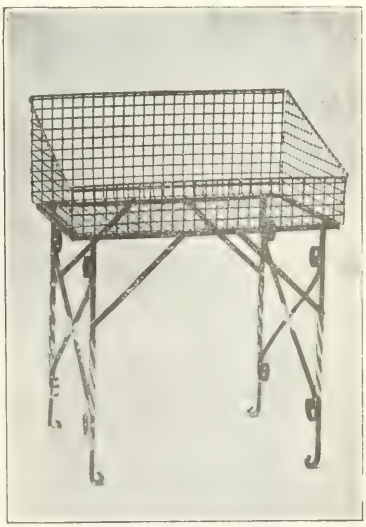
CARPENTER-MORTON COMPANY, 77 Sudbury street, Boston, Mass., is manufacturing a preparation known as Cow-Ease, designed to prevent flies annoying horses and cattle. The preparation is referred to as being a clean, clear, nonpenetrating liquid, which does not gum up the hair or blister the skin, as containing nothing injurious and as being absolutely harmless. It is pointed out that keeping flies from annoying cows allows them to feed at peace in pasture, increases the quality of milk and aids in its flow. The preparation is alluded to as killing lice and vermin; also as driving away flies where it is used. Thus it is spoken of as a desirable preparation to use in spraying the interior of horse stalls and bedding; also in hen houses. The company offers a sprayer, especially made for applying Cow-Ease.

The Willard Steel Ranges.

Wm. G. Willard, 316-320 Chestnut street, St. Louis, Mo., manufacturer of the Willard steel ranges, has added to his 1908 series Nos. 8-18, 8-20 and 9-20, which have right hand flush top, porcelain lined reservoir, full nickel trimmings, nickel tea shelves, register and corner columns, left hand pouch feed, side draft register and large top warming closet with rolling front. The oven is made in one piece of No. 16 gauge cold rolled steel, dustproof. A 40-page catalogue illustrates the entire line of ranges on the right hand pages, the opposite pages containing illustrations and descriptions of the various parts. The catalogue has a space on the last page for address and stamp, avoiding the necessity of using a wrapper for mailing.

The Perfection Metal Bargain Table.

The tray of the bargain table illustrated herewith is made of flat steel, woven 1-in. mesh, while the supports



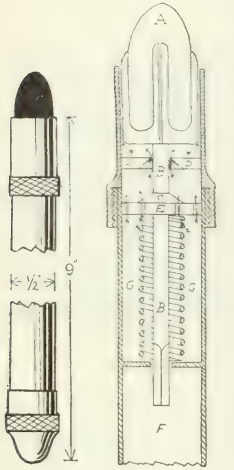
Metal Bargain Table.

are of polished and twisted steel. The tray is 18 x 24 in. in size, and the table is 34 in. high. It is finished either

in oxidized copper or painted a dead black, and is alluded to as being strong, handsome and durable. The table is shipped knocked down and can be put together quickly. Special sizes will be made to order by the manufacturer, the Standard Wire Company, New Castle, Pa.

The Dexter Marker.

A. J. Maier & Co., 234 La Salle street, Chicago, have perfected and are offering a new automatic fountain marking device, shown herewith, for use in marking boxes and packages for shipment and for writing window signs and show cards. It is designed to obviate the unpleasant features connected with the use of the common marking pot and brush by affording a cleanly, reliable and always ready instrument for card writing and shipping room marking. The accompanying illustrations show its form and internal construction. It is composed of a nickel plated brass barrel 9 in. long by ½ in. in diameter furnished with a felt marking tip. A principle of construction which is emphasized as new in this connection is the positive feed provided by the automatic pump plunger E in the sectional view. Instead of depending on gravity flow the ink is driven downward by pressure exerted on felt tip A, when used for marking, which compresses the ink in pump chamber G, forcing it out through holes in plunger disk E in the direction indicated by the arrows. The tip and pump mechanism with which it is connected are prevented from turning by the squared shank extending through a square opening in the bottom of the pump chamber. The marking tip is made of prepared felt, and is said to be very durable, but when worn can be easily replaced by a new one at a trifling cost. When the marker is not in use the ink ceases to flow, and the tip is covered with an air tight cap. For convenience in filling, the end of the barrel opposite the tip is provided with a valve so that ink can be poured in from the spout of a can. Gallon cans, with faucets at the bottom from which the marker can be filled are furnished when desired; any fluid marking ink that will not solidify and contains no ingredients severely injurious to metals can be used. Two styles of marking tips, one for heavy and one for light marking, are furnished with each marker.



The Dexter Marker.

Self-Setter Mouse Trap.

The Evan L. Reed Mfg. Company, Sterling, Ill., is offering a mouse and rat trap, the principal feature of which is found in the provision made for its automatic setting and release. The trap is made of wire and steel,


Fig. 1.—Mouse Trap, Set by Hand.

the base being formed of galvanized steel as a protection against rust. To set the trap it is only necessary to press the lever top with the thumb, as shown in Fig. 1; it is similarly released without endangering the fingers. The rat trap, which is of the same pattern but of larger


Fig. 2.—Rat Trap, Set with Foot.

size, may be set by pressing the lever with the foot, as shown in Fig. 2. Since the spring strikes only in a forward direction there can be no danger either to the finger or foot in setting these traps. They are put up in special counter display boxes handsomely illustrated in a manner to call attention to the striking features of the trap.

The Perfect Double Tang Socket.

In Fig. 1 is illustrated taper shank sockets, put on the market by Cleveland Twist Drill Company, Cleveland, Ohio. The sockets hold taper shank tools, so that the tangs cannot twist off, and old tools with tangs broken off can be ground or milled with new tangs sockets and will give longer service than with their original tangs. The sockets are referred to as having no parts to get out of order or to wear out, and as fitting any spindle having a regular taper hole. They take the same list as regular taper sockets. Any taper shank tool can be easily fitted to these sockets by grinding or milling a second tang below the original tang. It is pointed out that the second and stronger tang fits into the secondary opening of the socket, and that the shank is thus held by two tangs that cannot be twisted off under the severest strains. In Fig. 2 is illustrated a double tang taper shank drill, made to fit the sockets. The company's drills and reamers can be had with double tangs to fit



Fig. 1.—The Perfect Double Tang Socket.


Fig. 2.—Double Tang Taper-Shank Drill.

Starrett Twin Gas Heater.

L. S. Starrett Company, Athol, Mass., and 132 Liberty street, New York, is manufacturing the Starrett twin gas heater No. 100, several adaptions of which are illustrated herewith. These patented double tube gas heaters have nickel plated burners and japanned bases, and with the attachments are effective in various mechanical arts. They are constructed so as to cause gas and air to become properly mixed for thorough combustion while passing



Fig. 1.—Starrett Twin Gas Heater.

through deflectors in the base of the tube. The tubes are so shaped as to cause the flames to penetrate each other at cross angles, thereby producing a clean intense heat, free from smoke and without waste of gas. The company recommends it for machine shop use for tempering small tools, melting lead and babbitt metals, &c., and as a forge for light work. It can be advantageously used also by plumbers, tinsmiths, electricians, jewelers, dentists, barbers, &c., in the laboratory and household, being capable of boiling a quart of water in six minutes. As will be noted in Fig. 2, burners of various capacities can be furnished in groups of several burners. There are also attachments for holding a melting ladle and dish. Soldering irons having short handles can be used without heating the handle. The two and three burner heaters are made with a graduated adjusting tube on the end to supply gas to one or more burners, according as figures coincide with index marks on the base. For household purposes an independent gas cock can be attached to a wall gas bracket, an iron gas pipe connected to it and with two elbows run out so that the burner without base can be screwed on in an upright position, and with the dish or kettle holder attachment, boil a kettle of water or otherwise use it for light work, without interfering with light at night from the same pipe. The dimensions of the burner shown in Fig. 1 are 3¾ in. high from base to top and 5 in. long front to back.



Fig. 2.—Groups of Burners and Attachments.

Accurate Parts for Automobiles.

The National Cycle Mfg. Company, Bay City, Mich., is making a specialty of manufacturing parts of automobiles to order for automobile manufacturers. The company issues a pamphlet showing some of the parts, individual designs of automobile manufacturers, which it has made. The company claims to do accurate machine work to blue print, to work to the half thousandth of an inch and to undertake no more work than it can produce accurately and on time. In addition the company manufactures the National bicycles, including a number of models.

The Zims Duplex Wire Stretcher.

The Zims duplex wire stretcher, manufactured by the Burgess-Norton Mfg. Company, Geneva, Ill., and here illustrated, is described as a simple, powerful and well constructed tool for stretching plain and bar wire. The body of the tool consists of a channel in which the two notched bars slide. At the left of the channel, as represented, is attached a chain with a wire clamp, which serves to secure the tool to post or wire. Attached to the ends of the two notched bars, at the right hand end of the stretcher, are wire clamps fastened to swivels, which permit the stretcher to work in any position without twisting the wire. To the vertical handle is attached two



The Zims Duplex Wire Stretcher.

pawls, which engages the notched slide bars, while the two other pawls at the right of the channel, block and hold the notched bars as they are drawn in. In operating the stretcher one notched rod is pulled out and the clamp fastened on the wire to be stretched; the pawl at *a* and *b* corresponding to this bar is then dropped into position, and by working the handle back and forth the bar is drawn in. After a few notches have been taken up the other draw bar is attached to the wire and brought into operation in like manner, thus releasing the first bar, and so by alternate action the stretching is continued until the wire is taut. The obvious advantage of this arrangement is that it does away with tying of the wire in order to take a new grip.

The King Fly Killer.

Included in the line of wire specialties made by the U. S. Wire Mat Company, Decatur, Ill., is the fly killer here illustrated. It is very simple in its construction and is said to be a most effective device for the extermination



Fig. 1.—The King Fly Killer.

of flies. The wire netting body is securely fastend to an enameled wood handle, and is 17½ in. in length over all by 5 in. wide. The wire paddle is reinforced to give it proper resiliency and prevent it from curling up. It is said to kill without crushing, thus avoiding the soiling of walls and fabrics. Fig. 2 illustrates the simple but



Fig. 2.—Display Stand for Fly Killers.

effective means provided for the display of the killers. The display stand is designed to hold six killers, which come packed two dozen in a carton, one rack being included in each carton. The cartons are packed in crates of 1, 3 and 5 gross each, and weigh respectively 25, 80 and 120 lb.

Square Deal and Flyer Washing Machines.

The latest additions to the line of washing machines, which now includes 15 different styles, made by the H. F. Brammer Mfg. Company, Davenport, Iowa, are the rotary washers shown in the accompanying illustrations. The Square Deal, Fig. 1, the more recent of the company's productions, is described as thoroughly reliable in every respect. Its tub has no bolt holes through the body, and consequently no bolts to catch the clothes or produce spots where leakage is likely to occur. The gearing of this machine is provided with anti-friction ball bearings and a simple but effective mechanism for producing the required reciprocating action of the dasher or stirrer block. It is also supplied with a large well balanced flywheel, which is designed to give five complete revolutions to one forward and backward stroke of the lever, each single stroke imparting approximately a three-quarter turn to the dasher. The momentum supplied by the flywheel secures evenness and regularity of movement, overcoming in a large degree the inertia of the dasher when reversing its action on the clothes. Particular attention is called to the fact that all of the mechanism is attached to the lid, obviating the necessity of bolting any of the parts to the tub. The tub is referred to as being constructed of the best Louisiana red cypress lumber, with staves and bottoms corrugated on the inner side, thus materially increasing the rubbing surface. The lid is of double thickness, and the four extension staves forming the legs are rigidly supported by cross braces. The machine is finished in the natural color of the wood, while the mechanism is aluminum bronzed. The chief feature of the Square Deal rotary shown in Fig. 2 is found in the unique gearing provided for its propulsion. The dasher is driven by a solid oscillating driving shaft operated by a heavy crank wheel. The gearing, which consists of peg tooth cogs on the vertical shaft, are entirely enclosed in an iron casing, thus guarding against the accidental mashing of a finger that might otherwise occur. The dasher operates on a well galvanized metal paddle and is strongly constructed of Southern hardwood. The tub itself is built and finished in the same manner as the one above described.



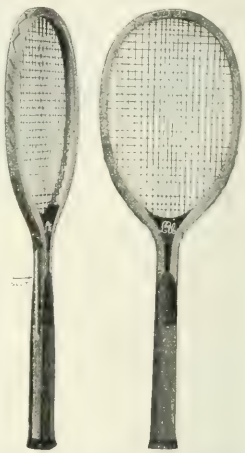
Fig. 1. Square Deal Rotary Washing Machine.



Fig. 2. Flyer Lever Rotary Washing Machine

L. & U. Tennis Racket.

Lee & Underhill, 98 Chambers street, New York, have just put on the market the L. & U. tennis racket, shown in Figs 1 and 2. The feature of the racket, aside from the fine materials and expert workmanship, is in the longitudinal slot about 3-16 in. wide and 5⅝ in. long on each side, affording by the method of cutting 4 in. clear length through the handle in its center. Experience has shown that this form of construction makes the racket particularly fast in serving and on ground strokes, the slight flexibility seeming to add speed to the stroke. The only stroke to which the racket is slower is said to be where it is held stationary, as in blocking or half volleying a low drive at the net. On account of the slight give of the racket in this case the ball does not appear to rebound as sharply as from the regular racket. This, however, is said not to be a disadvantage, as it aids the player in dropping a volley over the net "dead." The racket is made in three distinct shapes and four numbers, Models A, B, C, and D, including the popular elongated oval and the fuller curve commonly used for six or seven years back. As those informed know, ash is the best available wood for the frame, and the denser it is the more life it has, but at the same time the total weight must not exceed a certain prescribed number of ounces. While the slot has been adopted to transfer the effects of strain and shock to the handle, it serves the additional purpose of permitting the use of a heavier grade of stock without exceeding the required limits of weight. The attractive appearance of the racket is increased by the high polish and other decorative features in excellent taste, including a dark leather end with a trade monogram, L. & U., in gilt stamped on it. Model C has a cedar handle and D is fitted with a cane handle. The gut used is of the highest grade obtainable, made from sheep intestines, requiring, it is said, the product of 24 sheep to string one racket.



Two Views of the L. & U. Slotted Handle Tennis Racket.

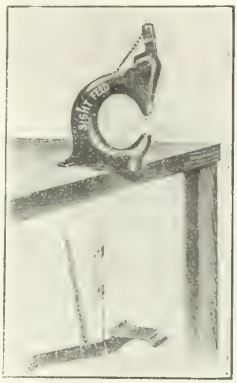
Keystone Nail Company.

The Keystone Nail Company, which for several years has conducted a plant for galvanizing nails, rivets, &c., in Philadelphia, Pa., removed on May 1 to its new plant at Rochester, Pa., which has been recently completed and fully equipped with its patented machinery. The new plant will have a capacity of 1000 kegs of nails per day, and will be devoted exclusively to producing the Keystone brand galvanized nails. The offices of the company are located in the Keystone Building, Pittsburgh, while

it will be represented in the Philadelphia territory by E. L. Hand & Co., 611 Market street, in that city, where a stock of galvanized nails will be maintained. The company has issued a handy booklet, entitled "Facts You Should Know About Galvanized Nails," referring to their advantages for many purposes and calling especial attention to the features of excellence in its own product. Keystone nails are described as heavily and properly coated, carefully finished and cooled by a process which does not harden them and make them brittle.

Sight Feed Riveter.

To supply the need for a simple, inexpensive and yet effective riveting machine for the use of harness repair shops, as well as manufacturers, the F. H. Smith Mfg. Company, Chicago, is offering the riveter here illustrated. It is of a form that permits the setting of rivets in places that are inaccessible to an automatic machine and derives the name of sight feed from the manner in which the rivet is held. The chuck which holds the rivet in place, it is said, occupies no more room than the ordinary straight plunger and is made to grasp the rivet firmly by the head, leaving the entire length of the rivet exposed to sight until driven in. The chuck is small enough in size to avoid interference with the accurate placing of rivets close to a buckle or other projections in the work. There is naturally more or less variation in the size of rivet heads of the same number and to provide for any reasonable irregularity in this respect allowance is made in the chuck trip, into which the rivet is fed by hand. In the use of tubular or bifurcated rivets the advantage of having the rivet in sight of the operator is obvious and is especially emphasized. To accomplish this result in a light machine of reasonable cost has been the particular aim of the company in the design of this tool. A loop anvil not shown in the illustration is furnished with each machine and interchangeable chucks and anvils for No. 1 and No. 3 rivets are regularly carried in stock. The machine has a depth of gap from center of rivet to rear of throat of 6 in., and an equal opening from top to bottom of gap; width from foot to rear of machine is 12⅜ in., and hight from top of lever to bench is 16 in. The extreme distance from bottom of plunger to top of anvil is 1⅝ in., and it will accommodate rivets 3-16 to ¾ in. in length, inclusive. All working parts are made of steel, and the weight of machine, complete, with foot power is 26 lb. The machines are furnished complete with foot power and necessary bolts for setting up, and are packed in individual wooden boxes, the shipping weight of which is 35 lb.



Sight Feed Riveter.

Double Acting Spring Floor Hinge.

The Standard double acting spring floor hinge here illustrated is made by the Standard Mfg. Company, Shelby Ohio. The hinge is let into the floor, the top coming level with the surface of the floor, with the socket shown let into the bottom of the door and secured with screws through the socket into the door. The socket has two set screws with which the door is brought to perfect alignment after it is hung. Means are provided for giving the spring more or less tension as is required for different doors, a finish plate being provided covering the top plate of the hinge. This can be removed when necessary to adjust the tension of the spring. The hinge can be used where steel beams come near the surface of the floor on account of the slight depth required to be cut into the floor, about 1½ in. for ordinary sized doors. All parts are made of steel, and cone, ball race and all wearing parts are hardened to prevent wear and assure long life. The spring is of the compression type, with spring



Double-Acting Spring Floor Hinge.

plunger guided by the spring, which forms a cushion to take up the side motion of the plunger at each swing of the door and makes the hinge, it is explained, practically noiseless in its action. The hold open feature is one of the points to which attention is called. A door hung with a set of the hinges will stay open when swung either way. This hold open feature is positive and is not a strain upon the hinge. The hinges are furnished to the trade in all finishes demanded in builders' hardware.

Portable Revolving Pedestal Lavatory.

The Humphryes Mfg. Company, Mansfield, Ohio, has lately brought out a line of porcelain enameled iron specialties, including lavatories, baths, sanitary tables, &c., for hospitals, asylums and institutions of similar character. Herewith is illustrated its portable multiple bowl lavatory. It is of the pedestal type, and is mounted on rollers, permitting its being quickly and easily moved if desired. A white enameled iron base supports a brass nickel plated column, which carries four semispherical

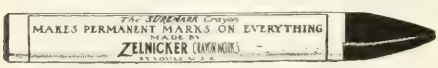


Portable Revolving Pedestal Lavatory.

bowls, arranged to revolve around a central axis. The bowls are hung on nickel plated arms with trunions, which permits, with a slight movement, the instant emptying of the contents. Being mounted on rollers the lavatory can be easily drawn close to the operating table, and such liquids as are required placed in the various bowls, any one of which is instantly available by a slight turning movement. When it is desired to empty the bowl it is turned from the operator, emptied and refilled by the assistant without interfering with the surgeon's work or interrupting him. The fitting, as shown, occupies a space 36 in. square and is 30 in. high. The bowls are 10½ in. in diameter at the top and 5½ in. deep.

The Suremark Crayon.

The Walter A. Zelincker Supply Company, St. Louis, Mo., is offering a new crayon, which is put on the market as a competitive line. It is shown, reduced in size, in the accompanying illustration. The actual size is 5 in.

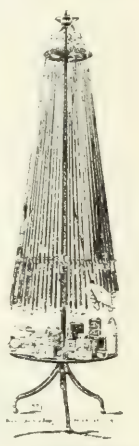


The Suremark Crayon.

long and 5/8 in. in diameter. It is made in four colors—blue, red, yellow and black—is waterproof and is suitable for all general uses, including marking on leather, paper, glass, china, tin, castings, boxes, sacks, &c.

Portable Revolving Whip Rack.

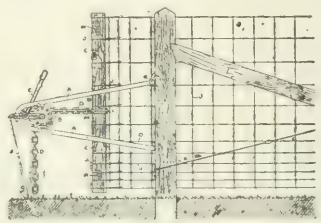
John H. Best, Galva, Ill., is manufacturing the portable revolving whip rack and display stand, shown in the accompanying illustration. The stand is of iron and steel throughout, the central support being made of wrought pipe in sections. The crown at the top is 14 in. in diameter and contains 144 notches, half of which are on the outside perimeter, and half on the inside circumference and radial arms. Holders are thus provided for 12 dozen whips when placed one in each notch; but by hanging more than one in a notch, as is sometimes done, as many as a gross and a half can be accommodated. The notches are so constructed, it is said, that no injury is done to the whips in placing and removing them. The spreader wheel above the display shelf is 28 in. in diameter and has 72 notches, the latter having a grip form which holds the whips firmly in place. The strong, substantial display shelf, 30 in. in diameter, is designed for trade accessories, which can thus be conveniently shown. The stand rests on three cast iron legs having a spread of 32 in.; they are clamped together upon the center shaft which, by this means, may be raised and lowered as desired, to make the over all dimensions of the stand from 8 ft. to 9 ft. 10 in. high. The stand is finished in dark olive green paint with gilt trimmings, all neatly varnished. The net weight of the stand is 80 lb.; when boxed for shipment, 100 lb.



Portable Revolving Whip Rack.

The Ideal Fence Tool Outfit.

The device herewith illustrated designed for stretching woven wire fence is made by the Abingdon Fence Tool Company, Abingdon, Ill. It is referred to as the improved 1908 double strength fence machine, comprising three separate and distinct appliances, which, working together, make the complete machine. These appliances consist of the Ideal anchoring device, Ideal rotary reversible straining device and the Ideal never slip clamping device, all of which are shown assembled and in working position in the accompanying illustration. The top leg of the bracket A forming the anchor is provided with a drive suspension hook by means of which it is secured to the anchored post. The bracket is further reinforced by a rigid wooden brace, or, as shown, by a flexible wire anchor, attached to the rear end; the former is, however, recommended. The third and most important feature of the device is the never slip clamp, which is composed of two bars held together by two eye bolts. By turning the eyes of these bolts parallel with slotted openings in the washers underneath, the bars are easily separated for adjusting the wire between them. An open ended clevis or hook is attached to the clamping bars near the center of pull, so that when the chain D is connected to the puller B and power applied, the bars will turn half round thereby wrapping the wires of the fence over one bar, making a hitch hold which, it is said, will withstand the severest strains. Extreme simplicity and ease of operation are claimed for the tool, which beside its use in connection with fence building can, it is stated, be successfully applied to the pulling of posts, straightening up old corn cribs, hay sheds, &c., as well as the stretching of barb wire strands above woven wire fence.



The Ideal Fence Tool Outfit.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, State and Western, raw, in bbls	.49 @.42
City, Boiled, in bbls	.45 @.44
City, Raw in bbls	.42 @.45
Raw, Calcutta, in bbls	.51 @
Lard, Prime, Winter	.67 @.70
Extra No. 1	.55 @.57
No. 1	.47 @.50
Cotton-seed, Crude, f.o.b. mill	.34 @.35
Summer Yellow, prime	.46 @.44
Summer White	.46 @.46½
Yellow Winter	.45 @
Tallow, Acid	.52 @.55
Menhaden, Brown, Strained	.40 @
Light Strained	.40 @
Cocoanut, Ceylon	₱ lb. .6¾ @ .6¾
	.5 cold test	₱ gal. .51 @ .54
Cod, Domestic, Prime	.42 @.44
Neatsfoot, unbleached	.44 @.46
Red Bleach	.58 @.60
Spermaceti	.70 @
Olive, Virgin	.67 @
Neatsfoot, Prime	.55 @.58
Palm, Lagos	₱ lb. .5¾ @ .5¾

Mineral Oils—

	₱ gal.
Black, 25 gravity, 25@30 cold	.13½ @
	.5 cold test	.11 @
Summer	.13 @
Crude, Bleach	.11 @
Dark, filtered	.18 @.19
Paraffine, 28 gravity	.11 @
	.32 @
	.11½ @
Red	.12½ @.14

Miscellaneous—

Barytes:	
White, Foreign	₱ ton $18.50@20.50
Amer. floated	.21.00@22.00
Off color	.13.00@16.50
Blanc Fixe, dry	.60.00@70.00
Pulp	.40.00@45.00
Pulp, 70%	.50.00@55.00
Pulp, 90%	.60.00@65.00
Blanc Fixe, Pulp	.60.00@70.00
Chalk, in bulk	₱ ton 3.00@3.40
China Clay, Imported	.11.50@18.40
Cobalt, Oxide	₱ 100 lb. 1.15@2.60
Whiting, Commercial	₱ 100 lb .42@ .52
Gilders	.90@1.00
Ex. Gilders	₱ 100 lb .60@ .65

Putty, Commercial—₱ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.45
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—₱ gal.

In Oil 1 bbls	.47 @.47½
In machine bbls	.47½@.48

Glue—

	₱ lb
Cabinet	.12 @15
Common Bone	.7½@ 9
Extra White	.18 @24
Fine Liquid, 50 gal. bbls., per gal.	.60 @1.20
Foot Stock, White	.12 @14
Foot Stock, Brown	.9 @11
German Common Hide	.10 @12
German Hide	.12 @18
French	.10 @10
Irish	.13 @16
Low Grade	.10 @12
Medium White	.14 @17

Gum Shellac—

	₱ lb
Bleached, Commercial	.30
Dry	.25
	.20 @40
Garnet	.17 @18
Orange	.25 @
Garnet	.23
G. A. L.	.18 @19
Ruby, Extra	.20 @
D. C.	.18 @19
Octagon, B	.18 @40
C	.17 @21
Superfine	.25 @

Colors in Oil—

	₱ lb
Black, Lampblack	.12 @14
Blue, Chinese	.36 @46
Blue, Prussian	.52 @56
Blue, Ultramarine	.15 @16
Brown, Vandyke	.11 @14
Green, Chrome	.12 @16
Green, Paris	.@24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, English white in Oil	.13½@13⅝
Lead, American White:	
Lots of 500 lb or more in Oil	@ 6¾
Lots less than 500 lb, in Oil	@ 7¼
Lead, White, in oil, 25 lb tin pails	@ 7¼
Lead, White, in oil, 12½ lb tin pails	@ 7¾
Lead, White, in oil, 1 to 5 lb tins	@ 8¾
Lead, American, Terms: On lots of 500 lbs and over 2% for cash if paid in 15 days from date of invoice.	

Zinc, Dry—

	₱ lb
American, dry	5½@ 5¾
Red Seal (French process)	@ 6¾
Green Seal (French process)	7¼@ 7½
German Red Seal (French process)	@ 7¾
Green Seal	@ 7¾
White Seal	8¼@ 8½
French Red Seal	@ 8
Green Seal	11¼@11½

Dry Colors—

	₱ lb
Black, Carbon	6½@10
Black, Drop, American	3½@ 8
Black, Drop, English	.5 @15
Black, Ivory	.6 @20
Blue, Celestial	.4 @ 6
Blue, Chinese	.31 @.3
Blue, Prussian	.29 @31
Blue, Ultramarine	.5@@15
Brown, Spanish	.1@@ 1
Carmine, No. 40	₱ 1oz .25
Green, Chrome, ordinary	.3½@ 5
Green, Chrome, pure	.17 @25
Lead, Red, 12½ lb kegs	@ 6¾
Litharge, bbls. & 112½ lb kegs	@ 6¾
Ocher, American	₱ ton $8.50@16.00
American Golden	.2½@ 3¼
French	.1¼ @ 2
Foreign Golden	.2 @ 3
Orange Mineral, English	.11 @11
French	.12½@13
German	.11 @11
American	.3 @ 3¾
Red, Indian, English	.12½@ 0
American	.3 @ 3¾
Red, Turkey, English	.4 @10
Red, Tuscan, English	.@10
Red, Venetian, American	₱ 100 lb $3.50@1.25
English	₱ 100 lb $1.15@1.60
Sienna, Italian, Burnt and Powdered	.3 @ 9
Italian, Raw, Powdered	.3 @ 7
American, Raw	.1½@ 2
American Burnt and Pow'd.	.1½@ 2
Talc, French	.$18.00@25.00
American	₱ ton 15.00@25.00
Terra Alba, French	₱ 100 lb .90@1.00
English	₱ 100 lb .80@1.00
American	₱ 100 lb, No. 1 .75@ .80
	₱ 100 lb, No. 2 .60@ .85
Umber, Turkey, Burnt & Pow'd.	.2½@ 3
Turkey, Raw and Powdered	.2½@ 3
Burnt, American	.1½@ 2
Raw, American	.1½@ 2
Yellow Chrome, Pure	.13 @15
Vermilion, American, Lead	.7 @25
Quicksilver, bulk	.65 @
Quicksilver, bags	.@66
English, Imported	.65 @

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10 & 10 signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers. For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic 33⅓%
Nettles 10%
Zimmerman—See Fasteners, Blind.

Window Stop—

Ives' Patent 35%
Taplex Perfection 35

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—

Ferrell Mfg. Co., Burton Anti-Rattlers, ⅌ doz. pairs, Nos. 1, 2, 3, 4, $1.00; 5, $1.25 ..... list
Ferrell Quick Shifter ..... list
Ives ..... $2.00@$3.00

Anvils—American—

Eagle Anvils ..... ⅌ lb. 6½@6¾c
Hay-Budden, Wrought 6½c
Trenton ..... ⅌ lb. 9½@9¾c

Imported—

Swedish Solid Steel Sisco, Superior, ⅌ lb. ..... 10@10½c
Peter Wright & Sons, ⅌ lb. 84 to 249 lbs. each, 350 to 600 lbs. each ..... 11c.

Anvil, Vice and Drill—

Millers Falls Co., Nos. 0 ..... 15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co. 10%

Augers and Bits—

Com. Double Spur ..... 75&10%@80
Jennings' Pats., Bright ..... 65&10@65
Black Lip or Dutch ..... 65@65&5
Boring Mach. Augers 50
Car Bits, Plain, twist ..... 30&10
Ford's Auger and Car Bits ..... 10&5
Ft. Washington Auger Co., Comstard's 33⅓
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, ... 20&10%
No. 20, R. Jennings' list 50
Russell Jennings ..... 25&10&5
L. Huntington Car Bits 15
Mathewson's Comstertisk Bits 10
Pugh's Black 20
Pugh's Jennings' Pattern 35%
Snell's Auger Bits 60
Snell's Bit Handles, Ellipse 50
Snell's Car Bits, plain, twist 50
Snell's King Auger Bits 50%
Wright's Jennings' Bits 50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's, Pattern, No. 1, ⅌ doz., $26; No. 2, $18; No. 3, $14
Ford's, Clark's Pat. 25%
C. E. Jennings & Co., Steer's Pat. 25%
Larigne Pat., small size, $18.00; large size, $26.00 ..... 60&10%
Snell's 50

Gimlet Bits—

Per gro.
Common Pat. Cut ..... $1.00@1.25
German Pattern, Nos. 1 to 10, 40 to 60 to 12, $2.75

Hollow Augers—

Bonner Pat., per doz. ..... $ 5.00@6.00
Ames 50%
Universal 50%

Ship Augers and Bits—

Ship Augers ..... list
Ford 40%
C. E. Jennings & Co.:
L. Huntington 40%
Ware 40%
Snell's 40

Awl Hafts—See *Handles, Mechanics' Tools.*

Awls—

Brad Awls:
Handled ..... $0.75@1.00
Unhdld., Shoemakers' ..... 40@40&5
Unhandled, Patent ..... 40@40&5
Pegging:
Unhandled, Patent ..... 30@30&5
Unhdld. Shoemakers' ..... 60@60&5
Scratch Awls:
Handled, Common ..... gro. $1.50@1.00
Handled, No. 1 to 3 ..... 12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality ..... $7.50@8.00
Second Quality ..... $5.50@4.50
Double Bit, base weights:
First Quality ..... $7.00@7.50
Second Quality ..... $6.50@6.75

Axle Grease—

See *Grease, Axle.*

Axles—Iron or Steel.

Concord, Loose Collar ..... ¼ pat. ¢
Concord, Solid Collar ..... 4¾@5¼¢
No. 1 Common, Loose ..... 3¾@4¼¢
No. 1½ Com., New Style ..... 3¾@4¢
No. 2 Solid Collar ..... 4½@5¢
Half Patent:
Nos. 7, 8, 11 and 12 ..... 6½@6¾&10%
Nos. 13 to 14 ..... 6½@6¾&10
Nos. 15 to 18 ..... 7@7¼&10
Nos. 19 to 22 ..... 7@7¼&10

Boxes, Axles—

Common and Concord, not turned ..... lb., 5½@6¢
Common and Concord, turned, lb., 6@7¢
Half Patent ..... lb., 9½@10¢

Bait—Fishing—

Hendryx:
A Bait 20%
B Bait 25%
Competitor Bait ..... 20&5%

Balances—Sash—

Caldwell new list ..... 50&10%
Pullman ..... 50&10

Spring—

Spring Balances ..... 50&10@60%
Chatillon's:
Light Sash Balances ..... 50@50&10
Straight Balances ..... 40@40&10%
Circular Balances ..... 50&10%
Large Dial 30

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb. ..... per lb., 2¼@2½¢

Towel—

No. 10 Ideal, Nickel Plate ..... ⅌ doz. $8.50

Beam, Scale—

Scale Beams 10
Chatillon's No. 1 30
Chatillon's No. 2 15

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ⅌ doz. $0.85; Tinned ..... $ .95
No. 11 Wire Coppered ⅌ doz. $1.15; Tinned $1.30
No. 10 Wire Tinned ..... ⅌ doz. $1.50

Beaters Egg-

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Japed, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per doz., No. 00, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tinned, $8.00; No. 150, Hotel, $15.00; No. 152, Hotel, Tinned, $17.50; No. 200, Tumbler Type, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover $6.50

Bellows—

Blacksmith, Standard List:
Split Leather ..... 60&10@65%
Grain Leather ..... 60&10@65%

Hand—

Inch .. 6 .. 7 .. 8 .. 9 .. 10
Doz. .. $5.50 .. 6.00 .. 6.75 .. 7.50 .. 8.50

Molders—

Inch .. 10 .. 12 .. 15
Doz. .. $7.50 .. 9.00 .. 12.00 .. Each

Bells—Cow—

Ordinary Goods ..... 75&5@75&10@65%
High grade ..... 75&10%
Eclipse ..... 75&10
Texas Star ..... 75&10

Door—

Hahn, R. & E. Mfg. Co. ..... 75&10

Hand—

Polished Brass ..... 70&10@60%
White Metal ..... 50&10@50&10&5%
Nickel Plated ..... 50@65%
Sicilian ..... 50&5
Cone's Globe Hand Bells ..... 33⅓@35%

Miscellaneous—

Farm Bells ..... lb., 25@25¢
Church and School ..... 60@60&5%

Belting—Leather—

Standard ..... 70&10@70&10&5%
Light ..... 70&10
Cut Leather Lacing ..... 50&10@50%
Leather Lacing Sides, per sq. ft. ..... 24@25¢

Rubber—

Competition (Low Grade).
..... 70&10@75&10%
Standard ..... 60&10@60&10
Best Grades ..... 33⅓@30&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list:
Chain, Parts, Spokes 50
Tubes 60

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks Tackle—

Common Wooden ..... 75@75&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75; Hollow Steel, 50&10; Star Wire Rope, 50; Taplex Metal Snatch, 50; Taplex New Style Steel, 50&10; Wire Rope Snatch, 50
Lane's Patent Automatic Lock and Jaw 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined 35
Embossed 15

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Kendall & Esser Co. ..... 33⅓&4

Bolts Carriage, Machine, &c.,—

Common Carriage (cut thread):
¾ x 6 and smaller ..... 75&5%—5%
Larger and longer ..... 70%—5%
Phila. Eagle, $3.00 list ..... 80%—5%
Bolt Ends 50%
Machine (Cut Thread):
¾ x 4 and smaller ..... 75&10%
Larger and longer 70%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knobs:
Inch ..... 6 .. 8 .. 10
Per doz. ..... $1.00 .. 1.25 .. 1.50
Cast Iron Spring Foot, Jap'd:
Inch ..... 6 .. 8 .. 10
Per doz. ..... $1.00 .. 1.25 .. 1.50
Cast Iron Chain, Flat, Japanned:
Inch ..... 6 .. 8 .. 10
Per doz. ..... $1.00 .. 1.25 .. 1.50
Cast Iron Flat Shutter, Jap'd, Brass Knobs:
Inch ..... 6 .. 8 .. 10
Per doz. ..... $1.00 .. 1.25 .. 1.50
Wrought Barrel Jap'd ..... 80@80&10%
Barrel Brass ..... 80@80&10%
Spring ..... 70&10@70&10&10%
Shutter ..... 50&50&10@10&5%
Sash 50
Transom ..... 50&10
Brass Pulley Door 50
Iron Window Sash 50

Expansion—

Bronze ..... 50&5
Screw & Rawl Plug ..... 50&5
Screw Eye 50
Style No. 1, Single 55%
Style No. 1, Double 60%
Lag Screw 60

Plow and Stove—

Plow ..... 65&10%
Stove ..... 50&5&5%

Tire—

Common Iron 80
Norway Iron 80
American Screw Co.:
Norway Phila., list Oct. 16, '84... 80
Eagle Phila., list Oct. 16, '84... 82½
Rue Staple, list Dec. 28, '99... 80
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84... 80
Eagle Phila., list Oct. 16, '84... 82½
Norway, list Dec. 28, '99... 80
Russell, Burdsall & Ward Bolt & Nut Co.:
Eagle, list Dec. 28, '99... 80
Norway Phila., list Oct. '84... 80
Eagle 82½
Shelton Co.:
Tiger Brand, list Dec. 28, '99... 80
Phila., Eagle, list Oct. 16, 1884.. 82½
Upson Nut Co.:
Tire Bolts 72½

Borers, Bung—

Borers Bung, Ring, with Handle
Inch ..... 1¼ .. 1½ .. 1¾
Per doz. ..$4.80 .. 5.60 .. 6.40 .. 8.00
Inch ..... 2¼ .. 2½
Per doz. ..... $8.65 .. 11.00
Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each 25

Boxes, Mitre—

C. E. Jennings & Co. 25
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme ..... 15&10
Peerless 10
Seavey 15

Braces—

Common Ball, American $1.50
Barber's ..... 50@50&10@10&10
Fray's Genuine Spofford's 60
Fray's No. 70 to 120, 81 to 123, 207 to 213 40
C. E. Jennings & Co. ..... 50&5%
Mayhew's Ratchet 60
Mayhew's Quick Action Hay Pat. 50
Millers Falls Drill Braces ..... 25&10%
P., S. & W. Co., Peck's Pat. ..... 50&10%

Brackets—

Wrought Steel ..... 70&10@75&10%
Bradley Metal Clasp ..... 80&10@80&10&5%
Griffin's Pressed Steel ..... 75@75&10%
Griffin's Folding Brackets ..... 70&10%
Taplin Victor Handy Egg Beater Bracket $1.30

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Wilcox Mfg. Co. ..... 75&5%
Wire Goods Co. 75

Buckets, Galvanized—

M'fr's list, price per gross.

	Gross	Per
Water, Reg.	25.35	28.00 32.00
Water, Ill.		
Fire, Rd. Btm.	32.00	34.65 38.65
Well		

Bull Rings—

Butts—Brass—

Wrought, Loose Pin ..... 70&10@75%
Wrought, Fast Pin ..... 70&10@75%
Parliament Butts 75

Cast Iron—

Fast Joint, Broad ..... 30&10@50%
Fast Joint, Narrow ..... 30&10@50%
Loose Joint 50
Loose Pin ..... 70&10@75%
Wrought 75
Parliament Butts 75

Wrought Steel—

Bright.
Light Narrow, Light Regular 60%
Reversible and Broad ..... 70&5%
Loose Joint, Narrow, Light 60%
Loose Joint, Broad 60%
Black Enamel and Japanned.
Light Narrow, Loose Pin. 60%
Light Narrow, Ball Tip 60%
Transom 60%
Steeple Tapered 60%
Ball Tapered 60%

ages, Bird—

dvan Brass: Series 3000 5000.
ood and Rat. 1288, 15 ; 240, 491.
dvan Bronze, Series 7.00, 800 ; 3
dvan Enameled.....

Calipers—See *Compasses.*

Calks, Toe and Heel—

ant, 4 prong, per lb. 4½@5c
arp, 4 prong, per lb. 3½@3½c
k, Blunt, 4-4 to 2, Sharp, per 100
tar Blunt, 1-4 to 2, Sharp, per 100
ains, Blunt, 3 to 3.50 ; Sharp
per

Can Openers—

See *Openers, Can.*

Caps, Percussion—

ic's E. B......52@55c
D......*per M* 4.50@5.50
I......*per M* 4.00@4.50
F......*per M* 3.50@4.00
sket.....*per M* 2.50@3.00

Primers—

rdan Primers, $2 per M.....20@25
ner Shells and Bullets, List 10
l other primers per M, $1.50@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

ank Cartridges:
22 C. F., $5.50.....10@15
38 C. F......10@15
22 cal. Rim, $1.50.....10@15
32 cal. Rim, $2.75.....10@15
B. Caps, Can Ball, Sized, $1.00
B. Caps, Round Ball.....$1.00
ntrol Fire.....25
rget and Sporting Rifle, 15@25
ard Shells and Bullets, List 10%
m Fire, Sporting.....50
m Fire, Military.....15@25

Casters—

d.....65@70
d.....60@65
inabelphia.....70@10
ss Ball Bearing.....55
m (Roller Bearings.....70&10&10&5
el Gem.....25
ankard Ball Bearing.....15
le (Double Wheel) low list.....40&10

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

nerican Coil, Straight Link:
in ¼ 5/16 ⅜
5 4.75 4.00 3.75 3.65 3.55
7/16 ½ to 1 inch.
3.50 3.55

In cask lots, deduct 25c.
rman Coil.....60@60&5%
rman Pattern Coil:
5-0 to 1.....70@56@70&10%
2 and 1.....60@60@60@60@60
⅝ 5 and 6.....50@10@50@10@5%

Halter—

alter Chains.....60@60@5%
rman Pattern Halter Chains
list July 1, '07.....60@60@5
ort Mfg. Co:
Halter.....35&5

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

ces, Wrought Standard, 100 pr
—6-3, Straight, with ring, $28.00
—6-2, Straight, with ring, $29.00
—5-2, Straight, with ring, $32.00
—4-2, Straight, with ring, $37.00
NOTE—Add 2 per cent. for Hooks
and Ties; add 4 per cent. for Nos. 3,
4, 5 and 6, 2 per cent. for No. 2,
and 1 per cent. for No. 1 in buying of
small bulk.

ustern Standard Traces, Wrought Chain, &c......60@10&10@10&5%

Miscellaneous—

ack Chain, list July 10 '07:
Iron.....60@10&5%
Brass.....65
ainters and Plumbers' Chain.....55
ol Pump Chain.....10&10
ndependent Chain Co.:
Stewart Halter and Coil.....25&10
Triumph Dog.....50&10&10
Brass Halter and Coil.....15@30&5
ort Mfg. Co.:
Dog, Halter, Heel, Rein, Stall, Tie.....40
Trace Connector.....10
Vagon Tongue Halter, Dog and Kennel
Chain.....
Weaver Dog Leash and Kennel
Chain.....15@30&5
Wilson & Co.:
Dog.....
Universal Dbl.-Jointed Chain.....50%

Chain and Ribbon, Sash—

Curtain Counterpoise.....
Sash Chain.....60
Brass.....
Brass Chain, 60%; Steel Chain, 10&10&10
Sash Cord and Chain, per set.....85
Sash Weights, Solid, per lb......2½
Sash Ribbon, All numbers, per roll.....$2.00@$5.00

Chalk—

Carpenters' Blue.....gro. .50@55c
Carpenters' Red.....gro. .45@50c
Carpenters' White.....gro. .30@35c

Checks, Door—

Brass.....45%
Bullman per gro.....$54.00
Russwin.....25&8

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....50
Youths' Chests, with Tools.....55
Gentlemen's Chests, with Tools.....25
Farmers', Carpenters, etc., Chests, with Tools.....20
Machinists' and Pipe Fitters' Chests, Empty.....45
Tool Cabinets.....45
C. E. Jennings & Co.'s Machinists' Tool Chests.....

Chisels—Socket Framing and Firmer

Standard List.....50@10&10
Buck Bros.....30
C. E. Jennings & Co.:
Socket Firmer No. 10.....25&7½%
Socket Framing No. 15.....25&7½%
Swan.....60&10
L. & I. J. White & Co......30@30&5%

Tanged—

Tanged Firmers.....30@50&5%
Buck Bros.....
C. E. Jennings & Co. Nos. 191, 181, 25%
L. & I. J. White Co.....25&5

Cold—

lb.
Cold Chisels, good quality.....13@15c
Cold Chisels, fair quality.....11@12c
Cold Chisels, ordinary.....9@10c

Chucks—

Almond Tool Chucks.....35
Almond Turret Six-Tool Chuck.....40%
Beach Pat. each $2.00.....25&5%
Empire.....25
Blacksmiths'.....25
Jacobs Drill Chucks.....35
Pratt Positive Drive.....25
Skinner Patent Chucks:
Independent Lathe Chucks.....35
Universal Reversible Jaws.....35
Combination, Reversible Jaws.....35
Drill Chucks, New Model.....25
Standard.....25 *Skinner Pat.*.....25 *Positive Drive*.....10
Planer Chucks.....20
Face Plate Jaws.....35
Standard Tool Co.:
Improved Drill Chuck.....45
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 15, 40.....No. 21.....55
Scroll Combinations, Nos. 83 and 84.....20
Geared Scroll, Nos. 33, 34 and 35.....25
Independent Iron, Nos. 18 and 318.....35
Independent Steel, No. 64.....25
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104.....35
Union Czar Drill.....25
Universal, 11, 12, 16, 17, 13, 14, 15.....10
Universal No. 42.....75
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50.....35
Steel Face Plate Jaws, Nos. 70 and 72.....30
Westcott Patent Chucks:
Lathe Chucks.....50
Little Giant Auxiliary Drill.....50
Little Giant Double Grip Drill.....50
Little Giant Drill, Improved.....50%
Oneida Drill.....10
Scroll Combination Lathe.....50
Whitaker Mfg. Co.:
National Drill.....25%

Clamps—

Adjustable Hammers.....20@20&5
Carriage Makers', P. S. & W. Co......50&10%
Iron Pipe.....35%&10
Morse Hay Rack.....15
Lineman's Swedish Neverturn.....65%
Wood Workers' Hammers.....10&10
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain,

Iwan's Champion, Adjustable.....50
Iwan's Champion, Stationary.....40%

Sidewalk—

Star Socket, All Steel, ₰ doz. $1.05 net
Star Shank, All Steel, ₰ doz. $3.24 net
W. & C. Shank, All Steel, ₰ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros......30%
Fayette R. Plumb.....30
L. & I. J. White Co......30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Co.:
1092 Chicago Horse, each $10.75
2003 Cyclone Horse, each $5.00
Lightning Belt Horse, each $15.00
Chicago Belt Horse each $20.00
Stewart's Enclosed Gear Horse, each, $6.75
Stewart's Patent Sheep Shearing Machine, each $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each $9.75

Clips, Axle—

Regular Styles, list July 1, '05.....50&5&10

Cloth and Netting, wire—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c.....75%
Compression Bibbs.....70

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list.....

Compasses, Dividers, &c.

Ordnance Goods.....70@10&15%
Wm. Schollhorn Co.:
Excelsior Dividers.....60%
Lock Dividers.....10&10

Conductor Pipe,—

C. L. L. to Dealers:

	Gal. Steel.	Charcoal.
Northeastern.....70@10%	50@10@7½%	
Eastern..... 55	50@10@7½%	
Pittsburgh.....50@10@5%	60	
Central.....55@10%	60	
Northwestern.....	50@7½%	60%
Western.....70@12½%	50@12½%	
Tennessee.....70@10%	50@12½%	
Southern..... 70%	50@12½%	
Southwestern..... 70	50@5	

Terms, sixty days. 2 cash to dealers. Freight allowed on carload delivered.

See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:					
Gal.....	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, - Gal.....	2		3		5
Each.....	$1.95	$2.15	$2.40	$3.30	$4.15
White Enameled.....					10
Agate Lined.....					10

Coppers' Tools—

See *Tools, Coppers'.*

Coppers, Soldering—

Soldering Coppers, 3 lb. to pair and heavier, 25@25c; lighter than 3 lb. to pair.....24@27c

Cord— Sash—

Braided, Drab.....lb. 35c
Braided, White, Com., Nos. 8 to 12, 21c; No. 5, 21½@c; No. 6, 22½c. In lots of 12 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18, 5c; 18, 22c
Italian, lb., 1, No. 18, 25c; 18, 22c
Common India.....lb., 10@11½@c
Cotton Sash Cord, Twisted, 18@20c
Patent Russia.....lb. .20c
Cable Laid Russia.....lb. .21c
Indian Hemp, Braided.....lb. .21c
India Hemp, Twisted.....lb. 18@19c
Patent India, Twisted.....lb. .17c
Pearl Braided, cotton.....No. 6, 18 lb. .25c; No. 7, 26½c; No. 8 to 12, 26c
Braided, Brass, Nos. 8 to 12, 26c; 7, 26½c; 6, 27½c
Harmony Cable Laid Italian, Nos. 7 to 10.....lb. 20c
Jutaman:
Wire Sash Cord.....10
Sash Cord Attachments, per 100.....$2.00
Samson, Nos. 8 to 12:
Braided, ₰ lb. Drab Cotton, 55c; Italian Hemp, 40c; 50c; Linen, 65c; White Cotton, 50c; Spun Cord.....30
Massachusetts, White, ₰ lb. 40c
Massachusetts, Drab, ₰ lb. 45c
Phoenix, White, Nos. 8 to 12.....27c
Silver Lake, per lb.:
A, Drab, 45c; A, White, 40c; B, Drab, 40c; B, White, 35c; Italian Hemp, 40c; Linen.....57½c
See also Chain and Ribbon.

Wire, Picture—

Full Length.....90@1 —%
Short Length.....30@40@1 —%
Hendryx Standard Wire Picture Cord, old list, 85&10%
Turner & Stanton Co. Wire Picture Cord.....85&10%

Cradles—

Grain.....40@42½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers.
Zechnicker's Lumber: ₰ gro.
White and Purple, Indelible.....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.50
Giant Lumber, 5¼ in. x 15-16 in. round, all colors $12.00. Indelibles, $10.00. Blacks.....$9.00
Genuine Soapstone, Metal Workers', 5 in. x ¾ in. Round, $2.50; 5 in. x ¾ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 5-16.....$2.00
Suremark, Black, $2.25; Blue, Red and Yellow.....$2.50

Crooks, Shepperds'—

Fort Madison, per doz. Heavy, $5.50; Light.....$5.00

Crow Bars—See *Bars, Crow.*

Cultivators

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ₰ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....$3.00, $3.00
Wm. Rogers & Son.....₰ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co......40
Red Devil.....60
R. Mfg. Co......40
Woodward.....50

Meat and Food—

American.....30%
Nos......401 402 403 404 405 406 407
Each.....$5 $7 $10 $12 $15 $20 $60
Enterprise:
Nos......5 10 12 22 32
Each.....$2 $3 $2.75 $4.50 $6 25@25&7½%
No. 292, $1.50.....40&7½
P. S. & W. Co.:
Dixon's.....75 doz. 35c
Nos......1 2 3 4
$14.00 $17.00 $19.00 $30.00
Ideal.....10@10&5
Hales.....40&10&5
Little Giant.....₰ doz. 10@50
Nos......305 310 312 320 322
$35.00 $48.00 $44.00 $72.00 $68.00
New Triumph No. 605.....₰ doz. $24.00, 40&10%
Russwin Food, No. 1, $24.00; No. 2, $27.00.....45&10&10
No. 3.....$15.00 $18.00
Enterprise Beef Shavers.....25@30

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters.....35%
Corn Graters.....30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife.....₰ doz. $3.00
Combined Slaw Cutter and Corn Grater.....₰ doz. $4.00

Tobacco—

All Iron, Cheap, doz, $1.25@1.50
Enterprise.....25@30%
National, ₰ doz., No. 1, $21; No. 2, $18.....40%

Diggers, Post Hole, &c—

Disston's:
Rapid, ₰ doz., $24.00.....25%
Samson, ₰ doz., $34.00.....25%
Iwan's Imp'ved Post Hole Auger.....40%
Vaughan Pattern Post Hole Augers, per doz......$7.00
Perfection Post Hole Diggers, ₰ doz......$8.75
Split Handle Post Hole Diggers, ₰ doz., $7.75
Hercules Pattern, ₰ doz......$10.00
Kohler's, ₰ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer.....$7.50
Never-Break Post Hole Diggers, ₰ doz., $24.00.....60%

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers Emery Wheel—

Sterling Emery Wheel Dressers.....35%
Sterling Wheel Dresser Cutters.....35%

Drills and Drill Stocks—

Blacksmith's Common Drilling Machines.....$1.50@1.75
Breast, Millers Falls.....15&10%
Breast, P., S. & W......33⅓%
Goodell Automatic Drills 50&10@60&10%
Millers Falls Automatic Drills 33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....10%
Ratchet, Weston's.....40%
Ratchet, Weston's, Style H Improved.....40%
Ratchet, No. 612.....40%
Ratchet, Celebrated.....40%
Ratchet, Whitney's, P., S. & W......50&5%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....70@70&5%
Taper and Straight Shank, 60@60@70%

Drivers, Screw—

Screw Driver Bits, per doz. .45@50¢
Balsey's Screw Holder and Driver, ₰ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9.....50%
Buck Bros.' Screw Driver Bits.....30
Champion.....50
Disston's.....70
Fray's Hol. H'dle Sets, No. 3, $12. 50
Ford's Brace Screw Drivers.....40&10%
Gay's Double Action Ratchet.....35%
Goodell's Auto.....60@65&10
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40%
Millers Falls, Nos. 20 and 21.....25&10%
Millers Falls, Nos. 11, 12, 41, 42.....15&10%
Smith & Hemenway Co., Nevertorn, 66⅔%; Elmora, 66⅔%; Star.....39&10%
Swan's:
Nos. 7565 to 7568, 50; No. 7540.....10&10%

Eave Trough, Galvanized—Charcoal.

	Territory.	*Gal. Steel.*	*Iron*
Northeastern	75@10&5		60@10%
Eastern	80@12½%		60@20%
Pittsburgh	80@5		65@10%
Central	80@10@12½%		65@10%
Northwestern	80@10@10%		65@10%
Western	80@10%		60@10@5%
Tennessee	80@5%		60@10@5%
Southern	80%		60@10@5%
Southwestern	75@10@2½%		60@5%

Terms, 2% 10 days. Factory shipments generally delivered.

Note. Lower prices are made in some sections.

See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories: Galv. Steel and Galv. C. I. Standard Gauge.....80@10&10%

No. 26.....	50
No. 24.....	25
No. 22.....	10%

Elbows, Stove Pipe—

Edwards, Standard Blue.....40&10&10%
Edwards, Royal Blue.....40&10&10%
Reeves, Dover, one piece.....40&10%

Emery, Turkish—

	½ to ⅝	¾ to 1¼	1½ to 2	Flour.
Kegs.....lb.	5 ¢	5½¢	3½¢	
½ Kegs.....lb.	7½¢	5½¢	4¾¢	
¼ Kegs.....lb.	8½¢	6 ¢	5 ¢	
10-lb. cans, 10 in case.....	8½¢	7 ¢	6 ¢	
5-lb. cans, less than 10.....	10 ¢	10 ¢	8 ¢	
Less quantity.....	10 ¢	10 ¢	8 ¢	

NOTE—To lots 1 to 5 tons a discount of 10% is given.

Extractors, Lemon Juice—

—See *Squeezers, Lemon.*

Fasterers, Blind—

Zimmerman's ..... 50&10%
Guilliss's 40%
Upson's Patent 40%

Cord and Weight—

Ives and Titan 33⅓

Corrugated—

Acme Corrugated Fasteners 70

Faucets—

Cork Lined ..... 50&10&10%
Metallic Key, Leather Lined, covered 70%
Red Cedar ..... 40&10&10&5%
Petroleum ..... 70&10%&75%
B. & L. B. Co.:
Metal Key ..... 60&10%
Star ..... 50&10%
Wrist Lock ..... 50&10%
John Sommer's Peerless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Mfd. Key ..... 50&10%
John Sommer's Duplex Metal Key 60%
John Sommer's Diamond Lock 40%
John Sommer's B. L. Cork Lined 50%
John Sommer's Reliable Cork Lined ..... 50&10%
John Sommer's Chicago Cork Lined 60%
John Sommer's O. K. Cork Lined 50%
John Sommer's No Brand, Cedar 50%
John Sommer's Perfection, Cedar 40%
Self Measuring:
Enterprise, ₱ doz $36.00 ..... 40&10%
Lane's, ₱ doz $36.00 ..... 40&10%
National Measuring, ₱ doz. $36.40 ..... 10%

Felloe Plates—

See Plates, Felloe.

Files— Domestic—

List Nov. 1, 1899.

Best Brands ..... 70&10&75&10%
Standard Brands ..... 75&10&10&50%
Lower Grades ..... 75&10&10&10&10%

Imported—

Stubs' Tapers, Stubs' List, July 24, '97 ..... 35 & 5@50

Fixtures, Fire Door—

Allith Underwriters' Approved 50
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 ..... $3.75
Fusible Links, No. 96 ..... 90%
Expansion Bolts, No. 107 ..... 60&10%

Grindstone—

Net Prices:

Inch	15	17	19	21
Per doz.	$3.60	3.85	4.15	4.65

P. S. & W. Co. 60%
Reading Hardware Co. 60%

Fodder Squeezers—

See Compressors.

Forks—

NOTE— Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Easy Potato ..... 60&10%
Victor, Hay ..... 60&10&10%
Victor, Manure 60%
Victor, Header 65%
Champion, Hay 60%
Champion, Header 60%
Champion, Manure ..... 60&10&5%
Columbia, Hay ..... 60&20%
Columbia, Manure 60%
Columbia, Spading ..... 70&10%
Hawkeye Wood Barley 40%
W. & C. Potato Digger ..... 60&10%
Acme Hay 60%
Acme, Lauter, 4 tine ..... 60&10&5%
Dakota Header ..... 6 & 30
Jackson Steel Barley ..... 6 & 30
Kansas Header 65%
W. & C. Favorite Wood Barley 40%
Plated—See Spoons.

Frames— Wood Saw—

White, S'g't Bar, per doz. ..... 75@80
Red, S'g't Bar, per doz. ..... $1.00@1.25
Red, Dbl. Brace, per doz ..... $1.40@1.50

Freezers, Ice Cream—

Qt.	1	2	3	4	6
Each	$1.25	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—*See Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp	$2.75
Cotton	3.20
Waterproof Sgl. Taped	3.65
Waterproof Dbl. Taped	4.40
Waterproof Tpl. Taped	5.15

Gates, Molasses and Oil—

Stebbins' Pattern ..... 80@80&5%

Gauges—

Marking, Mortise, &c. ..... 50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c. ..... 50&10%
Disston's Marking Mortise, &c. 67½
Wire, Brown & Sharpe's 33⅓
Wire, Morse's 25
Wire, P., S. & W. Co. 33⅓

Gimlets— Single Cut—

Numbered assortments, per gro.

Nail, Metal, No. 1	$2.00 & $2.50
Spike, Metal, No. 1	$4.00 & $4.50
Nail, Wood Handled, No. 1	$2.00 & $3 & 10%
Spike, Wood Handled, No. 1	$3.00 & $3.50

Glass, American Window—

See Trade Report.

Glasses, Level—

Chapin-Stephens Co. ..... 65&65&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush.

Elrell's ..... 25&10&50%

Grease, Axle—

Common Grade ..... gro. $6.00@6.50
Dixon's Everlasting, 10-lb. pails, ea. 85c., in boxes, ₱ doz., 1 lb. $1.20, 2 lb. $2.00
Helmet Hard Oil 25%

Griddles, Soapstone—

Pike Mfg. Co. ..... 33⅓&33⅓&10%

Grinders—

Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 00 oil, $1.75; 1A, $2.50; 10, $5.00 ..... 30%
Alundum Saddle Grinders, each, No. 1, $3; 2A, $6.00; 20A, Cushioned, $6.50 ..... 30%
Alundum Disc Grinders, each, $2.50 ..... 30%

Grindstones—

Pike Mfg. Co.
Improved Family Grindstones, ₱ inch, ₱ doz., $2.00 ..... 33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted 40%

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... 60&5&60&10%
Bridgeport Chain Co.:
Tie and Coil and 1 Halters ..... 35&2½&10%
Brass Coil and 1 Halters ..... 60&5%
Brown Cow Ties ..... 30&5&10&5%
Brown Tie Outs ..... 70&10&75&5%
Covert Mfg. Co.:
Web ..... 30&2%
Jute Rope 35%
Sisal Rope 20%
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am Coil and Halters ..... 40&10&5%
Am Cow Ties ..... 45&50%
Niagara Coil and Halters ..... 45&50&5%
Niagara Cow Ties ..... 45&5&50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists' ..... 55&10&55&10&5%
Heller's Farriers ..... 40&5&10&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel 50%
Farriers ..... 10&10&5%
Riveting 50%
Machinists', revised list ..... 65%&5%
Blacksmiths' ..... 50&5%
Fayette R. Plumb:
A, E and Nail ..... 40&2½&10&12½%
Edge and B. S. Hand ..... 50&10&10&5%
Machinists' Hammers ..... Cut&Cut
Riret and Tinners ..... 10&2½&12½&5%

Heavy Hammers and Sledges—

Under 2 lb., per lb. ..... 8@10%
2 to 3 lb., per lb. ..... 8@10%
Over 3 lb., per lb. ..... 8@10%
Over 3 lb., per lb. ..... 8@10&10%

Handles—

Agricultural Tool Handles—

Axe, Pick, &c. ..... 60&10@60&10&5%
Hoe, Rake, &c. 40%
Fork, Spade, &c.:
Long Handles 40%
D Handles 40%

Cross-Cut Saw Handles—

Atkins' 40%
Champion 50%
Disston's 40%

Mechanics' Tool Handles—

Auger, assorted ..... gro. $3.00@$3.50
Brad Awl ..... gro. $1.65@$1.75
Chisel Handles, Ash'd, per gro.:
Tanged Firmer, Apple, $2.40@$2.60 ..... Rosewood ..... $2.15@$2.40
Socket Firming, Apple, $1.75@$1.95; *Hickory* ..... $1.60@$1.75
Socket Framing, Hickory ..... $1.60@$1.75
File, assorted ..... gro. $1.30@$1.40
Hammer, Hatchet, &c. ..... 60&10@60&10&5%
Hand Saw, Varnished, doz. 80c@85c.; *Not Varnished* ..... 65@75c
Plane Handles:
Jack, doz. 30c.; Fore, doz. 45c.
Clauss Shoe Knife Co.:
Carving Tools ..... 20&10&10%
Chisel ..... 60&60&10%
File and Awl 60%
Saw and Plane 60%
Saw Drive ..... 50&10%
Mollet's Pads Ash and Rubber Adjust. Handles ..... 40&10%
Nicholson Simplicity File Handle, ₱ doz., $3.00@$3.50

J. L. Osgood:
Iron Mortise Pocket and Tool 50
Nos. 1, 2, 3 ..... No. 4 ..... No. 5, $4.00 ..... No. 4 ..... No. 5, $3.00 ..... 1 to 1
W. A. Zelnicker Supply Co.:
Hammer, 1 to 12 in. ..... $2.00; 14 in., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 28 in., $4.00; 30 in., $4.50; 32 in., $5.00; 34 in., $5.50; 36 in., $6.00 ..... 25&2%
Axe, 1 to 12 in. $5.60
26 in., $5.80.
Adze, 1 to 12 in. ..... $5.80, 36 in. $7.50
Pick, 10 in., R. R. 36 in., $8.00; coal, 31 in., $5.80.
Hatchet, 1 to 12 in. $2.00

Hangers—

NOTE—Barn Door Hangers are generally quoted per pair, without track and Pulley. Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable, Nos. 1 and 2; Allith, No. 3, Allith Adjustable No. 6; Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Box Tube 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Rail and 30%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60&2½%
Roller Bearing ..... 70&2½%
Grohe Mfg. Co.:
Solid Axle, No. 10, $12.00 ..... 60&10%
Roller Bearing, No. 11, $15.00, ... 60&10%
Roller Bearing, Ex. Hy ..... 60&10%
Ball Bearing, $4.00 ..... 70%
Lane Bros. Co.:
Parlor, Ball Bearing, $1.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard ..... 60&10%
Hinge ..... net $6.00
Covered ..... 60&5%
Special ..... 70&5%
Lawrence Bros.:
Advance ..... 55&10%
Champion ..... 70&5%
Clipper, No. 75 ..... 60%
Crown ..... 55&10%
Cyclone, No. 40 ..... net $6.00
Tandem, No. 50 ..... net $7.50
New York ..... 55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2, 70%
Adjustable 60%
Hinged Hangers, King Charm 60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, ... 60&5%
Pioneer Wood Track, No. 3 ..... $2.25
Roller B'r'g St'l Track No. 12 ..... $2.20
Roller B'r'g St'l Track No. 13 ..... $2.50
Roller B'r'g, Nos. 39, 41, ... 70&7½%
Hero, Adj. Track No. 19 ..... 50&10%
Adjustable Track Tandem Trolley Track No. 16 ..... 50&10%
Seal Stock Track, No. 21 ..... 50%
Auto Adj. Track No. 22 ..... 50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 122 ..... $2.50
Safety Underwriters F. D. No. 101 ..... 50%
Tandem No. 41 2½ and 3 ..... 60&10%
Parlor, Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 122 ..... 50&10%
Ives' Wood Track No. 1 ..... $2.25
Trolley B. D. No. 2 ..... $1.60
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 44, Sizes 1 and 2 ..... 70%
Antifriction No. 42, No. 44, sizes 2½ and 3 ..... 60%
Hinged Tandem No. 48 ..... 60&5%
Folding Door B. B. Swivel No. 129 ..... 50%
Taylor & Boggis Fty Co.'s Kidder's Roller Bearing ..... 50&15&10&5%
Myers' Stagger Hangers 60%

Hangers— Garment—

Pullman Trouser ₱ gro., No. 1, $4.00; No. 4, $4.50; No. 5, $16.50; No. 6, $18.00; No. 8, $7.50; No. $21.00; No. 12, $8.00; No. 15, Rods, $9.00; No. 18, Loops $10.00
Victor Folding ..... ₱ gro. $9 60

Gate—

Myers' Patent Gate Hangers, ₱ doz net $4 50

Joist and Timber—

Lane Bros. Co. 30%

Hasps—

Griffin's Security Hasp ..... 50&10%
McKinnon's Perfect Hasp, ₱ doz. 60%

Hatchets—

Regular list, first qual. ..... 10&2½&—
Second quality ..... 50&5&—

Heaters, Carriage—

Clark No. 5 $5.00 No. 7B $2.00 No. 8 $2.50 No. 9 $3.00 No. 10 $3.50 No. 11D, $3.50 ..... 25%
Clark Coal, ₱ doz. $0.25 ..... 20%

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	3	5
Doz. pair	$0.75	1.35	2.70

Mortise Shutter (L. & P., O. S., Acme, &c.)

No.	1	1½	2
Doz. pair	$0.75	.65	.60

Mortise Reversible Shutter (Buffalo, &c.)

No.	1	1½	2
Doz. pair	$0.70	.65	.60

North's Automatic Blind Fastener, No. 1, ₱ doz., $0.60; No. 3 for Brick, $11.50 ..... 10%
Charles Parker Co. 60%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinge 20%
Hale's Blind Awning Hinges No. 110, in wood, $3.00; No. 111, for brick, $9.00 ..... 20%
Reading's Gravity 60%

Stanley's Steel Gravity Blind Hinges No. 1847½, ₱ doz. sets, without screws $4.00; with screws, $4.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter ..... 75&5%
Acme Blind & Hinge 75%
Queen City Reversible 75%
Shepard's Noiseless, No. 6 ..... 75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&5%
Tip Pat'n, No. 1 ..... 75&10%
No 75%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 75&10%
Shepard's Double Locking 75%
Champion Gravity Locking 75%
Pioneer 75%
Empire 60%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with L't'ch's	2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.50	.70	.95

New England:
With Latch ..... doz. ..... @$2.00
Without Latch ..... doz. ..... @$1.60

Reversible Self-Closing:
With Latch ..... doz. ..... @$1.75
Without Latch ..... doz. ..... @$1.35

Western:
With Latch ..... doz. $1.75
Without Latch ..... doz. $1.15

Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 70

Pivot Hinges—

Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—

Holdback, Cast Iron ..... $6.75@$7.00
Non-Holdback, Cast Iron ..... $6.50@$6.75

J. Bardsley:
Bardsley's Non-Checking Mortise Floor 40%
Bardsley's Patent Checking 33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor 40%
Bommer Spring Hinges 10
No. 999 Wrot, Steel Hold Back, ₱ gr. $3 00
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor 50%
Garden City Engine House 25%
Keene's Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 25%
American 30%
Columbia, ₱ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 11, ₱ gr. $15.00
Columbian Hinges ..... 50&10
Gem, new list 30%
Globe Leaf ..... ₱ gr $12.00
Oxford, new list 30%
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co., Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40
Shelby Spring Hinge Co.:
Buckeye, All Steel Holdback Screen Door ..... ₱ gr. $9 00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door 25%
No. 777, Sheet Steel Holdb'k, ₱ gr, pr. $9.00
Standard Mfg. Co.:
Champion Double Acting Door Hinge ..... 25&10&10
Standard Double Acting Floor Hinge ..... 35&10&10
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓

Wrought Iron Hinges—

Strap and T Hinges, &c., December 20, 1904:
Light Strap Hinges ..... 70&10
Heavy Strap Hinges ..... 60&5
Light T Hinges 50
Heavy T Hinges 50
Extra Heavy T Hinges ..... 50&10
Hinge Hasps ..... 60&5
Cor. Heavy Strap ..... 60&5
Cor. Ex. Heavy T ..... 50&10%

Screw Hook and Strap	1 to 2 in.	3 in.
	1 to 2 in.	3 in.
Screw Hook and Eye:		
3 to 4 inch		.1h
5 inch		.1h
6 inch		.1h

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers ..... 30&2%

Hods— Coal—

M'f'gr's list, price per gross

Inch	15	16	17	18
Galv. Open	$3.75	$3.90	$4.05	$4.20
Tin	3.00	3.15	3.30	3.45
Copper	3.75	3.90	4.05	4.20
Tip Proof	3.75	3.90	4.05	4.20

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick ..... each $1.95
Steel Mortar, No. 178 ..... each $1.35

Hoes— Eye—

Scroll and Oval Pattern ..... 60&10&10&10%
Grub, list Feb. 28, 1898 ..... 70&10%&70&10&10%
D. & H. Scroll 70
Am. Fork & Hoe Co. (Scroll Pattern) 60%

Handled—

NOTE.—Many factories are selling the rest of September 1, 1904, but may open this fall using list of Oct. 1, 1899, or selling at net prices.

Nos. 2 Weeding, No. 1, $2.00; No. 2, $2.50
Nos. 1 Double Hoe.....$3.20
Nos. 1 Madison Hoe.....70&10%
Nos. 2 Madison Crescent Cultivator Hoe.....70&10%
Nos. 2 Madison Mortise Hoes:
Regular Weight.....₩ doz. 40&5%
Light for Sod.....₩ doz. $4.00
Nos. 1 Madison Sprouting Hoe, ₩ doz.....60&10%
Nos. 2 Madison Dixie Tobacco Hoe.....75&10&5%
Nos. 1 Messinger's Cut Easy.....70&10%
Nos. 2 Messinger's Cut Easy.....45&10%
Nos. 1 Hunter Hoe.....75&5%
Nos. 2 B. 6 in., Cultivator Hoe.....$3.40
Nos. 2 B., long in.....$3.60
Nos. 1 Wedding.....₩ doz. net, $4.35
Nos. 2 & C. L'ting Shuffle Hoe, ₩ doz.$5.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders—Bit—

Stellar, ₩ doz. $24.00.....45&10%

Door—

Brodsley's, Iron, 40%; Brass and Bronze.....25%
Clinmore.....50%
Clinmin.....25%
Richards Mfg. Co.: No. 115, Ever-ready, No. 115, No. 119, Sure Grip.....50%
Superior.....33⅓%

File and Tool—

Nicholson File Holders and File Handles.....33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, ₩ gross, $9.30. ₩ doz.....$1.25

Trace and Rein—

Arnold Double Trace Holder, ₩ doz. pairs.....$1.25
Arnold Rein Holder, ₩ doz. pairs..$1.25

Hones—Razor—

Case Mfg. Co., Belgian and Swaty, German.....35%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Coat and Hat, Reading.....45&20%
Coat and Hat, Wattsville.....60&10%
Harness, Reading List.....40%

Wire—

Adjt.....80%
Acme C. & H. Hooks.....80%
Bradley Metal Clasp Wire, Coat and Hat, 80&10%; Ceiling.....70&5%
Columbian Hdw. Co., Kemp.....70&5%
Decker Wire Goods Co., King..70&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Crab, 65%; Brace, 75%; Car Harness, 50&10%.

Wrought Iron—

Axle, 6 in., per doz., $1.90; 8 in., $1.25; 10 in., $2.50.
Bolt.....doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Dish, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Brass, best, all sizes, per doz.$3.00
Brass, common grades, all sizes, per doz.....$1.50
Shuffleboards.....lb. 5¾@6¢
Hooks and Eyes:
Steel, Mfg. Co.:.....60@60&10%
Malleable Iron.....70@70&10%
Trace Mfg. Co. Gate and Scuttle Hooks.....40%
Madison Cut-Easy Corn Hooks, ₩ doz. $3.25 net
Turner & Stanton Co. Cup and Shoulder.....80&10%
Trench Hooks—See Bench Stops.
Turn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....ft. 5¢@ 6¢
Triple Guaranteed.....ft. 8¢@ 9¢
Triple Guaranteed.....ft. 10¢@11¢
Garden Hose, ¾-in., coupled:
Low Grade.....ft. 8¢@ 9¢
Fair Quality.....ft. 10¢@11¢

Irons—Sad—

Irons, 4 to 10.....lb. 3¢@3½¢
Irons, Sad Irons.....lb. 3½@3½¢
Irons, Potts', cents per set:
Nos. 50 55 60 65
Japan Tops.....83 89 93 91
Tinned Tops.....88 85 98 95
Genuine England Pressing..lb. 3¾@4¢

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%; Corner.....60%

Pinking—

Pinking Irons.....doz. 80¢

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Anto Screw.....30&2%; Steel, 45% Rockport.....50%
Kane's Steel.....30&5%
Richards Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Ladder—

Richards Mfg. Co., Ladder Jacks..50

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros. Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60%
Witherstick's Acme, ₩ doz. $2.65; Dent, $2.75; Adj. Serrated, $2.90; Serrated, $3.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....80&10&10—%
C. E. Jennings & Co., Nos. 45, 46, 47.....25&5%
Jennings & Griffin, Nos. 41, 42, 66.....35%
Swan's.....66⅔@70
Wattrous.....16⅔
L. & I. J. White.....20&5@25

Hay and Straw—

Serrated Edge, per doz.$3.50@5.75
Iwan's Sickle Edge.....₩ doz. $9.50
Iwan's Serrated.....₩ doz. $10.00

Miscellaneous—

Farriers'.....doz. $2.60@ 3.55
Westenhoim's.....₩ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber Tip.....gro $1.25@$1.40
Carriage, Jap., all sizes.....gro. 40@45¢
Door, Mineral.....doz. 55&10%¢
Door, Por. Jap'd.....doz. 70&15¢
Door, Por. Nickel.. doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable.....50%
Lance & Stone.....25%
Myers Noiseless Store Ladders.....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50&10%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....20%
P. S. & W.....40&10%
Reading.....60%

Lanterns—Tubular—

Regular, No. 0.....doz. $4.35@4.50
Side Lift, No. 0.....doz. $4.60@4.75
Hinge Globe, No. 0.doz. $4.60@4.75
Other Styles.....40@40&10%

Bull's Eye Police—

5-inch.....$4.25@4.50

Latches—Thumb—

Roggin's Latches, with screw.. doz. 35@40¢

Door—

Allith Mfg. Co., Reliable and Alleghany, 50%; Reliable Self Storage, 50%
Cronk & Carrier Mfg. Co., No. 101, ₩ doz. $2.20
Richards' Bull Dog, Heavy, No. 128.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....doz. 50¢; large, 60¢
Sivert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E.....10%

Lines—

Wire Clothes, Nos. 18 19 20
100 feet.....$2.50 2.25 2.00
75 feet.....$2.10 1.80 1.65
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₩ doz.%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.30; Colors, No. 3½, $2.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.25; 60 ft. $2.50; 70 ft. $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft $5.25.....20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines, White Cotton.....20%
Shade Cord, Cotton or Linen.....20%

Locks—Cabinet—

Cabinet Locks.....33⅓ %

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass, 55&5%; Crescent, 60%; Iron 60%; Window Ventilating, 40&20%; Robinson, Pat. Ventilating Sash Lock, 33⅓%.
Pullman Patent Ventilating Lock.....25
Reading Sash Locks.....40

Machines—Boring—

Com. Upr't, without Augers. $2.00@2.25
Com. Angl'r, without Augers. $2.25@2.50
Swan's Improved.....40&10%
Jennings, Nos. 1 and 4.....
Millers Falls.....5.75
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Invincible Hand Power.....₩ doz. $18.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake.....25%
Moore's Cyclone High Speed Chain Hoist.....25%

Ice Cutting—

Chandler's.....12½%

Washing

Boss Washing Machine Co.: Per doz. Boss No. 1.....$57.00
Boss Rotary.....$57.00
Champion Rotary Banner No. 1..$57.00
Standard Champion No. 1.....$50.00
Standard Perfection.....$57.00
Cincinnati Square Western.....$57.00
Uneeda American, Round.....$57.00

Mallets—

Hickory.....45&5%&50%
Lignumvitæ.....45&5%&50%
Tinners' Hickory and Apple-wood.....doz. 45&5%&50%

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Acme Flexible Steel.....50%
Elastic Steel (W. G. Co.), new list.50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....20@25%
National Cost Jar, 1 qt.....50%
Parker's Columbia and Victoria.35%
Parker's Boss and Side.....50&10%
Swift, Lane Bros. Co.....30%

Motors, Water—

Dring's Red Devil.....30%
Lippincott's.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; 12-in., $2.10, etc.
Cheap, 10-in., $2.25; 12-in., $2.45, etc.
Better Grade, 10-in., $3.00; 12-in., $3.25, etc.

	12	14	16	18-in.
High Grade	$4.50	4.75	5.00	5.25

Continental.....60%
Great American.....40%
Great American Ball Bearing, new list.70%
Quaker City.....70%
Pennsylvania.....60%
Pennsylvania, Jr., Ball Bearing.....50&10&5%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel.....70%
Style B, Low Wheel.....70%
Style C, High Wheel, spcl. list, 70&10%
Style D, High Wheel, spcl. list..70%
Philadelphia:
Styles M., S., C., K., T.....70&10&5%
Style A, All Steel.....60&10&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.40%
Horse.....10&5%
Pony.....40&5%
36-in. Horse.....30&10%
Eagle Horse.....30&5%
I. X. L. Horse.....50%

Nails—

Wire Nails and Brads Miscellaneous.....40&10&5&2%
Cut and Wire. See Trade Report.
Hungarian, Finishing, Upholsterers' &c. See Tacks.

Horse—

Nos.	6	7	8	9	10	
Anchor	22	21	20	19	18	40&5%
Coleman	13	12	12	11	11	net
New Haven	23	21	20	18	18	40&5%
Livingston	19	18	17	16	16	10%
Western						₩ lb. 8½¢

Jobbers' Special Brands..... per lb. 9@10¢

Picture—

	1¼	2	2½	3	in.
Brass H'd	45	55	60	70	gro
Por. Head	1.10	1.10	1.10	1.10	gro

Nippers—

See Pliers and Nippers.

Nuts—

Blank or Tapped

	Off list.
Cold Punched:	
Square	7 & 5%
Hexagon	7 & 5%
Square, C., T. & R.	7 & 5%
Hexagon, C., T. & R.	7 & 5%
Hot Pressed:	
Square	6 & 5%
Hexagon	6 & 5%

Oakum—

Rope.....lb. 6½¢
U. S. Navy.....lb., 6¢
Navy.....lb. 5¢
Plumbers' Spun Oakum.....2% @3¢

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated.....75%
Chase of Paragon:
Brass and Copper.....50&10%
Zinc.....65&10%
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....60&10%
Railroad Oilers, &c.....60&10%
Maple City Mfg. Co.:
Spring Bottom Cans.....70&10%
Railroad Oilers, &c.....60&10%

Openers—Can—*Per doz.*

Sprague, Iron Handle.....30@35¢
Sprague, Wood Handle.....35@40¢
Sardine Scissors.....$1.75@$3.00
Yankee Can and Bottle Opener, ₩ doz., net, $0.75; Little Gem, ₩ doz., net.....$0.6

Egg—

Hartigan Nickel Plate, ₩ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope, any quantity.....20¢

Rubber—

(Fair quality goods.)

Sheet, C. I.....1/16@12¢
Sheet, C. O. S.....1/16@12¢
Sheet, C. B. S.....1/8@13¢
Sheet, Pure Gum.....1/16@45¢
Sheet, Red.....1/16@10¢
Jenkins' '96, ₩ lb. 80¢.....25%

Miscellaneous—

American Packing...lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@12½¢
Jute.....lb. 4½ @5¢
Russia Packing.....lb. 8@11 ¢

Pails, Water, Well, &c.—

See *Buckets.*

Pans—Dripping—

Standard List.....65&7½&70%
Edwards, Royal Blue.....65&7½%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	$0.75	0.80	0.90	1.10	1.30

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	$1.75	2.25	2.80	3.15

Paper—Building Paper

Asbestos: lb.
Roll Board or Building Felt, 5 to 30 lb., per 100 sq. ft. 2¾@3¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb. per 100 sq. ft.....3½¢
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in.....3¢
Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll. 48@58¢
Medium weight, 30 lbs. to roll. 56@70¢
Heavy weight, 40 lbs. to roll. 76@88¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....$35.50
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—

1 ply (roll 400 sq. ft.), ton..... $34.00@$38.00
2 ply, roll 400 sq. ft.....63¢
3 ply, roll 108 sq. ft.....89¢
Slater's Felt (roll 500 sq. ft.) .80¢

Sand and Emery—

Flint Paper and Cloth.50&10&1—%
Garnet Paper and Cloth.....25%
Emery Paper and Cl'h..50&10&10&60%

Parers—Apple—

Goodell Co.:
Family Bar State.....₩ doz. $15.00
Improved Bar State.....₩ doz. $36.00
New Model.....₩ doz. $45.00
Turn Table '98.....₩ doz. $6.00
White Mountain.....₩ doz. $5.40
Reliance Improved.....each, $2.50
Danby.....each, $10.00
Eureka Improved.....each $20.00
New Century.....each $20.00
Ranger.....each $25.00
Lightfoot Nail Co.:
Daisy.....₩ doz. $4.00
Little Star.....₩ doz. $5.00
Rocking Table.....₩ doz. $6.20
Reading Hardware Co.:
Advance.....₩ doz. $4.00
Baldwin.....₩ doz. $4.80
Rolling.....₩ doz. $5.25
Reading '78.....₩ doz. $6.00

Potato—

Saratoga.....₩ doz. $7.00
White Mountain.....₩ doz. $6.00

Picks and Mattocks—

(List Jan., 1908.)

List.....70&10&5&10&10%
Crow's Handled Garden Mattock, ₩ doz., No. 2, $2.60; No. 3, $6.10.

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass .....50@50&10%
Iron, list Nov. 11, '05..60@60&10%

Pipe, Cast Iron Soil—
Standard 2-6 in......60@50@ —%
Extra Heavy, 2-6 in...50@50@ —%
Fittings, Standard and Heavy.....
.....70&10@75%

Pipe, Merchant—

	Consumers, Carloads. Steel.	Iron.
	Blk Galv.	Blk Galv.
	% %	% %
⅛ & ¼ in...	67 48	62 ..
⅜ in.....	66 52	64½ 50
½ in.....	68 56	66 54
¾ to 1 in...	72 62	70 60
1 to 1¼ in...	69 57	67 52

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First class 85%
Second class 90%

Pipe, Stove—

	Per 100 joints. C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	6.75	7.75
7 in., Standard Blue	7.75	8.75
5 in., Royal Blue	7.00	8.00
6 in., Royal Blue	7.50	8.50
7 in., Royal Blue	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color	$6.15	$7.15
6 in., Uniform Color	6.65	7.65
7 in., Uniform Color	7.65	8.65

Planes and Plane Irons—

Wood Planes—
Bench, first qual.....50@50&10%
Bench, second qual...40@40&10%
Molding .....25@25&10%
Chapin-Stephens Co.:
Bench, First Quality.....30%
Bench, Second Quality.....40%
Molding and Miscellaneous.....25%
Toy and German.....30%
Union 60%

Iron Planes—
Chaplin's Iron Planes.....50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06 .....25%
Buck Bros.....30%
Chapin-Stephens Co.....25%
Union 50%
L. & I. J. Witte.....20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse.....⅌ doz. $8.00

Plates—
Tellow .....lb. 4@4¼¢

Pliers and Nippers—
Button Pliers.....75&5@75&10&5%
Gas Burner, per doz., 5 in., $1.25 to $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe.....7 10 12-in.
$2.00 $2.25 $2.75 $3.50
Acme Nippers .....50&5%
Cook & Carrier Mfg Co.:
American Button 80%
Improved Button .....25&10
Globes 60%
No. 80 Lineman's 50
Stub's Pattern.....45%
Universal and Slots 33⅓%
Heller Lathrop Nippers, Pincers and Tools.....40&5&10&5%
L. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard .....Lin. Cuts 35%
Parisian .....Lin. Cuts 35%
Sexton's Lineman's Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels .....30&5%
Chapin & Co.'s Improved Levels 30%
Pocket Levels 30%
Extension Scales 30%
Mason's Levels 30%
Disston's Plumbs and Levels...60&10%
Disston's Plumbs and Levels 40%
Stanley's Duplex 35%
Witte's Levels 33⅓%

Points, Glaziers'—
Bulk and 1-lb. papers.....lb. 2 ¢
½-lb. papers.....lb. 2½ ¢
¼-lb. papers.....lb. 10 ¢

Police Goods—
Manufacturers' Lists .....25@25&5%
Towers 25%

Polish—Metal, Etc—
Prest-to-Use Liquid, No. 1, ½ gal. ⅌ doz. $3.00; No. 2 (1 gal.) $6.00
Prest-to-Use Paste 60%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ⅌ doz. 50¢; ⅌ gro. $4.50; ½ lb boxes, ⅌ doz. $1.25; 1 lb boxes ⅌ doz. $2.25.
U. S. Liquid, 8 oz. cans, ⅌ doz., $1.25.
Barkeepers' Friend Metal Polish, ⅌ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ⅌ lb 10¢
Black Eagle, Liquid, ½ pt. cans, ⅌ doz. 75¢
Black Jack Paste, ¾ lb cans, ⅌ gr $9.00
Black Kid Paste, 5 lb can.....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's, ⅌ gr. $5.75.....10%
Dixon's Plumbago.....⅌ lb 8¢
Firmade .....⅌ gr. $2.50
Gem, ⅌ gr. $1.50.....10%
Japanese .....⅌ gr. $3.50
Jet Black .....⅌ gr. $3.50
Peerless Iron Enamel, 10 oz. cans, ⅌ doz. $1.50

Poppers, Corn—
1 qt. Square..doz. $0.80; gro. $8.75
1 qt. Round..doz. $0.90; gro. $10.00
1½ qt. Square..doz. $1.00; gro. $11.00
2 qt. Square..doz. $1.25; gro. $13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled .....55&10%
Tinned .....50&10%

Powder—
In Canisters:
Duck, 1 lb.....*each 45¢*
Fine Sporting, 1 lb.....*each 75¢*
Rifle, ½ lb.....*each 45¢*
Rifle, 1 lb.....*each 25¢*
In Kegs:
12½ lb. kegs.....*$3.50*
25 lb. kegs.....*$4.50*
King's Semi Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....3.50
Quarter Keg (6¼ lb bulk).....1.90
Case 24 (1 can bulk).....8.50
Half case (1 lb cans bulk).....4.50
King's Smokeless: Shot Gun. Rifle.
Keg (25 lb bulk).....$12.00 $15.00
Half Keg (12½ lb bulk)... 6.25 7.75
Quarter Keg (6¼ lb bulk). 3.25 4.00
Case 24 (1 lb cans bulk).. 14.00 17.00
Half case 12 (1 lb c. bk).. 7.25 8.75

Presses—

Fruit and Jelly—
Enterprise Mfg. Co.....20@25%

Seal Presses—
Morrill's No. 1, ⅌ doz., $20.00.....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 50%
Miller's Falls, No. 3, ⅌ doz., $12.00.....
.....33⅓&10%
Morrill's No. 1, Nail Puller, ⅌ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30 .....50%
The Scranton Co. Case Lots:
No. 2B carpet $5.50
No. 3B small 5.00
Smith & Hemenway Co.:
Diamond B 70%
Giant 50
Staple Pullers, Utica and Davison 60%

Pulleys, Single Wheel—

Inch	.....	1½	1¾	2 3
Awning or Tackle, doz.	.....	$0.30	.45	.60 1.05
Hay Fork, Swivel or Solid Eye, doz., 4 in., $1.25; 5 in., $1.55				
Inch	.....	2	2¼	2½
Hot House, doz.	.....	$0.65	.85	1.20
Inch	.....	1½	1¾	2
Screw, doz.	.....	$0.16	.19	.25 .30
Inch	.....	1¾	2	2¼ 2½
Side, doz.	.....	$0.25	.40	.55 .60
Inch	.....	1½	1¾	2 2½

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in......17@18c
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in......20@21c
Adams & Co.: 1¾ in., 30¢; 2 in., 35¢.
American Pulley Co.:
Anti-Friction Pulleys.....
Anti-Friction Pulleys.....
Wrought Steel.....
Fox-All-Steel, Nos. 3 and 4, 2 in.....
Grand Rapids All Steel No. 3.....
Niagara, No. 3, 1¾ in.....16¢
No. 4, 2 in.....16½¢
Star, No. 26, 1¾ in., 19¢; 2 in., 21¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Force and Lift.....75&5@75&10%
Wood Pump Tubing, &c......50%
Beach Pump Co.:
Brass Pumps .....
Cistern Pumps, Brass Trimmed No. 1 .....
Daisy Force Pump.....⅌ doz. $6.50
Flint & Walling's, Fast Mail Hand, (low list).....50%
Flint & Walling's Fast Mail Hand, Tank 50%
Flint & Walling's Tight Top Pitcher, ...75&10%
National Specialty Mfg. Co. Measuring, No. 2, $6.00; 3, $5.50.....50
Myers' Pumps, Low list.....
Myers' Power Pumps.....
Myers' Spray Pumps.....

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No.	1	2	3	4
	$5.00	6.00	7.00	8.00

Cup Leathers—Per 100:

Inch	2½	3	3½	4
	$5.00	7.00	9.00	12.00

Punches—
Saddlers' or Drive, good.....
.....*doz. 50@75¢*
Spring, single tube, good quality $1.75
Revolving (4 tubes).....*doz. $3.50*
Bemis & Call Co.'s Cast Steel Drive 50
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00.....40%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35%; Paragon, 50%; Lodi.....55%
Tinners' Hollow, P., S. & W. Co.....40%
Tinners' Solid, P., S. & W. Co., ⅌ doz., $1.41.....40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron.....
.....2½@2¾¢
Sliding Door, Wrought Brass, 1⅜ in., lb., 36¢.....30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cranes:
Double Braced Steel Rail..⅌ ft. 3¼¢
O. N. T. Rail.....$3.12
Grollin's:
xxx, ⅌ 100 ft., 1 x 3-16 in., $3.25, 1¼ x 3-16 in., $3.75.
Hinged Hanger, ⅌ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ⅌ 100 ft. $3.45
O. N. T. ⅌ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in. .....⅌ 100 ft $4.00
Lawrence Bros.:
1 x 3-16 in. ⅌ 100 ft., $7.50; 1¼ x 3-16 in., $8.75 .....55&7½%
McKinney's:
Hinged Hanger Track, ⅌ ft., 11¢
1 x 3-16 Track .....55&7½%
Myers' Stayed Track .....6 &5
Richards' Mfg. Co.:
Common, 1 x 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ⅌ ft., No. 31, 2¾ in. 3½ in. No. 33, 2¾ in. 3½ in. No. 50.....60&10%
No. 01, $3.30; 02, $3.35; 03, $3.90; 04, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn.... 3.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80; Victor.....80&25
Queen, Lawn, ⅌ doz., 20 teeth, $2.85; 24, $3.00.....net
Adjusting Lawn ⅌ doz. $1
Malleable Garden .....20&10
Ideal Steel Garden, ⅌ doz., 12 teeth, $15.00; 14, $16 00; 16, $18.00.....80%
Kohler's:
Lawn Queen, 20-tooth....⅌ doz. $3.15
Lawn Queen, 24-tooth....⅌ doz. $3.25
Paragon, 20-tooth.....⅌ doz. $2.70
Paragon, 24-tooth.....⅌ doz. $2.75
Steel Garden, 14-tooth....⅌ doz. $2.40
Malleable Garden, 14-tooth, ⅌ doz. $2.00

Rasps, Horse—
Disston's 75%
Heller Bros.....70&5@70&10&5%
Lamont Brown & Mott .....
McCaffrey's American Star .....
New Nicholson .....20&10%
See also Files.

Razors—
Ideal Razor .....
Fay Razors, ⅌ 1 .....
No. 41, $20.00; No. 82, Platina, $30.00 .....
Red Devil.....65%

Reels, Fishing—
Hendryx:
M 6 Q 6 A 6 B 6 M 8 M 10
P .....
A .....
Meek Reel Co.:
1 2 W 1 W 2 W 3 W 4
1 2 N 1 N 2 N 3 N 4 N
2 3 P 2 N 3 N PN
2 3 P 2 N 3 N PN
Meisselbach Reel Co.:
2 3 PN 2 N 3 N PN
2 3 PN

aws—

...45%
...50@50&10%
...50%
...35%
...40%
...50%
...35&5%
...15%
...40%
...10&10%
...30@30&10%
...30&10%
...50%
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...40&10&50%
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...25%
...35%
...35&5%
...25@25&7½%
...45%
...35@35&7½%
...25@25&7½%
...45%
...60%

Hack Saw Blades and Frames—

kins' Hack Saw Blades A A A A..25%

ston's:
...25%
...35%
...30%
...35%
...40&7½%

Hack Saws, Nos. 175, 180, complete, 40&7½%

Hack Saws, Nos. 175, 180, complete.
...40&7½%

odell's Hack Saw Blades....40&10%
...35&5&10%
...15&10%
...30&10&5%
...30&10%
...40%
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...15&10%
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...15&10%
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Scroll—

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...40%
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...50%
...60%

Scales—

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Scythe Stones—

Pike Mfg. Co., 1901 list:
Black Diamond S. S., ₱ gro. $12.00
Extra Fine S. S., ₱ gro. $11.00
White Mountain S. S., ₱ gro. $8.50
Green Mountain S. S., ₱ gro. $5.00
Extra Indian Pattern S. S., ₱ gro. $8.40
No. 2 Indian Pattern S. S., ₱ gro. $7.20
No. 2 Pike S. S., ₱ gro. $6.00
Leader Razor Edge S. S., ₱ gro. $4.80
Quick Cut Emery S., ₱ gro. $3.60
Pure Corundum, ₱ gro. $18.00
Crescent, ₱ gro. $7.20
Electric Steel Rifles 2 Coat, ₱ gro. $4.80
Emery Steel Rifles 3 Coat, ₱ gro. $3.60
Emery Scythe Rifles, 4 Coat, $13.20 ₱ gro.
Manufacturers' list, 25% off.
Lochs—Cattaraugus, ₱ gro. $12.00
Lightning, "Attleboro," ₱ gro. $18.00 — 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.....₱ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ₱ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....50@50&10%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Acme Embossed, case lots, 20&10&10%
Cary's Universal, case lots....20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 75¢
All Steel Socket, doz. $2.00@2.25
Excelsior Stretcher and Tack Hammer Combined, ₱ doz. $6.00.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1, 1902.....30&5%
P., S. & W. Co.....40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ₱ doz.
Superba, Grotch Mahogany.....$36.00
Triumph Fancy Varnish.....$30.00
Parlor Queen, Fig, Rosewood..$30.00
Euterpe, Hungarian Ash.....$27.00
Am. Queen, Fig, Mahogany....$27.00
Ideal, Bird's Eye Maple.....$25.00
Grand Rapids, Nickel, $24 ... 22.00
Standard, Nickel, $22.00; Japan $20.00
Crown Jewel, Nickel, $21.00; Jap. $19.00
Crystal, Glass Top.....$36.00
Crystal, Wing Wide.....$48.00
Parlor Grand, Fig, Mahogany....$48.00
Carpet, 27 in. wide.....$54.00
Hall, 28 in. wide.....$60.00

NOTE.—Rebates: 50¢ per dozen on three-dozen lots; $1 per dozen on four-dozen lots; $1.50 per dozen on five-dozen lots; $2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks.....90&10%
American Cut Tacks.....90&10%
Needles' Cut Tacks.....90&10%
Needles' Upholsterers'.....80&10%
Clasp Tacks.....80&10%
Lace Tacks.....80&10%
Trimmers' Tacks.....80&10%
Looking Glass Tacks.....80&10%
Bill Posters' and Railroad Tacks, 80&10&10%
Hungarian Nails.....80&10%
Finishing Nails.....70&10%
Trunk and Clout Nails...80&10%

NOTE.—The above prices are for straight Weights.

Miscellaneous—

Double Pointed Tacks.....
20&10&10&5%
See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather.....25&10&5%
Steel.....35&5&5%
Chesterman's.....25&10&5%
Metallic and Steel, Lower list, 25@35&5; Pocket, 25@35&5%.
Leather—
Asses' Skin.....40&10&5%
Metallic.....20&10&5%
Patent Bend, Leather...25&10&5%
Pocket.....10&10%
Steel.....33⅓&10%
Wetzsch & Hilger—
Chesterman's Metallic, No. 34L, etc.....
Chesterman's Steel, No. 1008T, etc.....35

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c.....30@33⅓%

Ties, Bale—Steel Wire—

Single Loop.....25&10%
Monitor, Cross Head, &c.....20&10%

Tinners' Shears, &c.—

See Shears, Tinners', &c.

Tinware—

Stamped Japanned and Pieced, sold very generally at net prices

Tire Benders, Upsetters, &c.

See Benders and Upsetters, Tire.

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Haying—

Myers' Hay Tools.....15%

Miniature—

Smith & Hemenway Co.'s, Davidson, ₱ doz., Nickel Plated, $1.50, Gold Plated.....$2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida.....75&10%
Newhouse.....45&15%
Hawley & Norton.....65%
Victor.....75@75&10%
Oneida Community Jump.....50%
Hector.....75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85¢@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ₱ doz., $13.25..$11.50 doz.
No. 3, Rat, ₱ doz., $6.50.....$5.75 doz.
No. 3½, Rat, ₱ doz., $5.25..$4.70 doz.
No. 4, Mouse, ₱ doz., $3.85..$3.00 doz.
No. 5, Mouse, ₱ doz., $3.00..$2.25 doz.
Oneida Community:
Out o' Sight, Mouse, ₱ doz.....$0.60
Out o' Sight, Rat, ₱ doz.....90
Easy Set, Mouse, ₱ doz.....1.05
Easy Set, Rat, ₱ doz.....1.00
Wood Chicken, Rat, ₱ doz. holes, .12
Premier Tin Chicken, 3 holes, ₱ doz. traps.....75

Trowels—

Disston Brick and Pointing.....25%
Disston Plastering.....20%
Disston "Standard Round" and Garden Trowels.....30%
Kohler's Steel Garden Trowels, ₱ gro., 5 in., $4.80; 6 in., $6.00.
Never Break Steel Garden Trowels, ₱ gro. $6.00
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern.....5%&10%
Western Pattern.....60&10%
Handy Trucks.....₱ doz. $16.00
Garden.....₱ doz. $15.00
McKinney Trucks.....each, net $10.00
Model Stove Trucks.....₱ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.
No. 0 1 2 3
Galvanized 867 859 880 899 100 120

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls 24@25¢
No. 12, ¼ and ½-lb. Balls 21@22¢
No. 18, ¼ and ½-lb. Balls 19@20¢
No. 24, ¼ and ½-lb. Balls.....17@18¢
No. 36, ¼ and ½-lb. Balls 17@18¢
Chalk Line, Cotton Balls.....26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....17@19¢
Cotton Wrapping, 3 Balls to ₱, according to quality...15¼@23¢
American 3-Ply Hemp, 1-lb. Balls.....17@21¢
American 3-Ply Hemp, 1-lb. Balls.....17@26¢
Domestic 3-Ply Hemp, 1-lb. Balls, Spring Twine.....17@21¢
India 3-Ply Hemp, 1-lb. Balls.....17@21¢
India 3-Ply Hemp, 1-lb. Balls.....19@21¢
2 and 3-Ply Jute, 1-lb. Balls.....15@17¢
Mason Line, Linen, ½-lb. Balls 47¢
No. 30, Hatteras, 1-lb. Balls, according to quality.....
Wool 3 to 6 ply.....B 9¢; A 10¢

Vises—

Solid Box.....50@5&5@10&5%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard.....40
Amateur.....25
Columbian, Hiw Co.....40%
Fisher & Norris Double Screw, list, each No. 2, $20.50; 3, $16.50; 4, $20.50; 5, $25.
Fulton, Mack & Vise Co.:
Reed, Swivel.....25
Star, Solid Jaw.....40
Hollands':
Machinists'.....11@10&5
Knockout.....65&5@70&5
Lewis Tool Co.:
Adjustable Jaw.....30%
Monarch, 50½; Solid Jaw.....50
Massey Vise Co.:
Cylinder.....40
Perfect, 15½, Lightning Grip.....15
Merrill.....
Millers Falls Oval Slide Pattern.60&10%
Parker's:
Victor, 20@25½; Regulars.....20@25
Vulcan's.....40@45%
Combination Pipe.....55%
Prentiss.....
Rock Island.....35
Stuebner's X. L.....
Stephens'.....33⅓%

Saw Filers

Disston's D. 3 Clamp and Guide, ₱ doz., $24.00, 30%; Clamps.....30
Perfection Saw Clamps, ₱ doz....$1.50
Reading.....60

Wood Workers—

Fulton Mach. & Vise Co.:
Reed.....25
Star.....40
Massey Vise Co.:
Lightning Grip, 15½, Perfect.....15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.50; 11 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe—
87 Series, 60%; 187 Series, 60&5%; No. 87½.....40
Rock Island Pipe.....25%

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10.....1.25
P. E., 8.....1.50
P. E., 7.....1.50
Ely's B. E., 11 and larger.$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Dia. list

Ware, Hollow—Cast Iron, Hollow—

Stove Holloware:
Enameled.....45@50
Ground.....30&5
Plain or Unground.....60
Country Hollow Ware, per 100 lbs.....$3.00
White Enameled Ware:
Maslin Kettles.....65&5
Covered Ware:
Tinned and Turned.....35&10%
Enameled.....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....33⅓%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60
Pittsburgh.....5 & 5
Never Break Spiders and Griddles.....
Never Break Kettles.....65&5%
Solid Steel Spiders and Griddles.65&5
Solid Steel Kettles.....60

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@44&15

Washboards—

Solid Zinc:
Glass Rubbing Surface, ribbed, ...
Glass Surface, ...
Double Zinc Surface:
Single Glass Surface, large size, ...
Cable Cross, family size, stationary.....
Single Glass Surface, ...
Bent Wood, ...
Enamel Surface:
Enamel Ring, Single Surface, ventilated back.....$2.95

Washers—Leather, Axle

Solid.....40&10%
Patent.....40&10%
Cork: ¾ in. 1 in. 1¼ inch
20c 15c 12c per box

Iron or Steel—

Size bolt. 5/16 ⅜ ½ ⅝ ¾
Washers .85¢ 1.15 2.25 3.25 4.65
The above prices are subject to $6.75 off list.
In lots less than one keg add ½¢ per lb.; 5 lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Wedges—

Oil Finish..... lb. 2½@2¾¢

Weights—Fitching

Covert Mfg. Co.....60&2

Sash—

Per net ton, f.o.b. factory:
Eastern District.....
Western and Central Districts.....$21 and $23.00

Wheels, Well—

8 in., $2.00; 10 in., $2.75; 12 in., $3.35; 14 in., $4.50.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....72&10&7½%
10 to 18.....72&10&10%
19 to 26.....70&10&10%
27 to 36.....70&10&10%
Galvanized
6 to 9.....72&10&5%
10 to 14.....72&10&5%
15 to 16.....72½&10&5%
17 to 18.....72&10&5%
19 to 26.....70&65&21½%
27 to 36.....70&10&10%
Copper
6 to 9.....65&10&5%
10 to 14.....65&10&5%
15 to 16.....65&10&5%
17 to 18.....65&10&5%
19 to 26.....65&10&5%
27 to 36.....65&10&5%
Tinned
6 to 18.....65&10&10%
Brass.....70¢ lb., base
Copper.....82¢ lb., base
Cast Steel Wire.....

Spooled Wire—

Annealed and Tinned,
Brass and Copper, 60&10&10%
Retailers' Assortments, per box.....

Wire Clothes Line see Line.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods.....60&10%
Brass Wire Goods.....60&10&10%
Brass Cup and Shoulder Hooks, 80&10%

Wire Cloth and Netting—

Galvanized Poultry Netting,
Per 150 sq. ft.
Painted Screen Cloth, 100 ft., $1.35
Standard Galv. Hardware Grade:
Per 100 sq. ft.
Nos. 2 to 5 each Mesh.....
Nos. 6 each Mesh.....
No. 8 Mesh.....
Nos. 9 each Mesh.....

Wire, Barb—See Trade Report.

Wrenches—

Agricultural.....50@10&5%
Alligator or Crocodile...70&10&5
Baxter Pattern S Wrenches... 70&10&10&5
Drop Forged S.....45&10&5
Acme
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%
Steel Handle Nut.....50
Combination Black.....40&5%
Merrick Pattern.....50
Boardman's.....40%
Coes' Genuine Knife Hdl..40&10&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes' Genuine Hammer Handle.....
Coes' Monkey.....
Dexter.....
Hart.....
W. & B. Machinist:
Bright.....
Less than case lots.....50%
W. & B. Railroad Special:
Case lots.....
Solid Handles, P., S. & W., 50&10%; full cases.....50&10&5%
Whitaker Machinists':
Case lots.....
Less.....

Wrought Goods—

Sheet, Hooks, &c., list Jan. 1, 1902.....50&10&10%

Zinc—

Sheet..... per 100 lb. $7.00

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1½ in. round and square ..... ₩ lb 2.00¢
1½ to 4 in. x ⅛ to 1 in. .....
1½ to 4 in. x ¼ to 5-16 ..... ₩ lb 2.20¢
Rod—⅝ and 11-16 round and square ..... ₩ lb 2.20¢

Angles: Cts ₩ lb

3 in. x ¼ in. and larger ..... 2.40¢
3 in. x 5-16 in. and ⅜ in. ..... 2.65¢
1½ to 2½ in. x ¼ in. ..... 2.45¢
1½ to 2¾ in. x 3-16 in. and thicker ..... 2.40¢
1 to 1¼ in. x 3-16 in. ..... 2.45¢
1 to 1¼ x ¼ in. ..... 2.50¢
⅞ x ⅛ in. ..... 2.65¢
2¼ x ¼ in. ..... 2.75¢
⅝ x ⅛ in. ..... 3.80¢
½ x 3-32 in. ..... 4.30¢

Tees:

1 in. ..... 3.75¢
1¼ in. ..... 3.55¢
1½ to 2½ in. ..... 2.45¢
3 in. and larger ..... 2.50¢

Beams ..... 2.40¢
Channels, 3 in. and larger ..... 2.40¢
Band—1 to 6 x 3-16 to No. 8 ..... 2.45¢
"Burden's Best" Iron, base price ..... 3.15¢
Burden's "H. B. & S." Iron, base price ..... 2.95¢
"Ulster" ..... 3.20¢
Norway Bars ..... 3.50¢

Merchant Steel from Store—

per ₩ lb

Bessemer Machinery ..... 2.10¢
Toe Calk, Tire and Sleigh Shoe ..... 2.50@3.00¢
Best Cast Steel, base price in small lots ..... ¢

Sheets from Store—

Black

	One Pass, C.R. Soft Steel.	R. G. Cleaned.
No. 14	₩ lb 2.85	2.90¢
Nos. 18 to 21	₩ lb 2.95	3.10¢
No. 27	₩ lb 3.15	3.40¢
No. 28	₩ lb 3.20	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment, W. Dewees wood ..... ₩ lb 11⅜@14½¢
Patent Planished ..... ₩ lb A, 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16 ..... ₩ lb 3.15¢
Nos. 22 to 24 ..... ₩ lb 3.35¢
No. 27 ..... ₩ lb 4.00¢
No. 28 ..... ₩ lb 4.25¢
No. 20 and lighter 36 inches wide, 25¢ higher.

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:
IC, 14 x 20 ..... $6.40
IX, 14 x 20 ..... 7.65
A. Charcoal:
IC, 14 x 20 ..... $5.45
IX, 14 x 20 ..... 6.55

American Coke Plates—Bessemer-
IC, 14 x 20 ..... 107 lb $4.45
IX, 14 x 20 ..... 5.45

American Terne Plates—
IC, 20 x 28 with an 8 lb. coating $8.60
IX, 20 x 28 with an 8 lb. coating 10.60

Seamless Brass Tubes—

List December 4, 1905. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List December 4, 1905. Base price 18¢

Copper Tubes—

List December 4, 1905. Base price 21¢

Brazed Brass Tubes—

List June 6, 1898. 20¾¢ ₩ lb

High Brass Rods—

14½¢ ₩ lb

Roll and Sheet Brass—

List June 6, 1898. 14½¢ ₩ lb

METALS—

Tin—

Straits Pig ..... ₩ lb 34 @35 ¢

Copper—

Lake Ingot ..... ₩ lb 14 @14¼¢
Electrolytic ..... ₩ lb 14 @14¼¢
Casting ..... ₩ lb 13⅝@13¾¢

Sheet Copper Hot Rolled, 16 oz ..... ₩ lb 17@..¢
" " " 14 " ..... " " 1 oz ¢
Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, 1¢ advance over Cold Rolled.
Sheet Copper Polished over 20 in. wide, 2¢ advance over Cold Rolled.
Bottoms, Pits and Flats ..... ₩ lb 21¢ basis
Planished Copper, 1¢ ₩ lb more than Polished.

Spelter—

Western ..... ₩ lb 5½@6 ¢

Zinc.

No 9, base, casks, ₩ lb 7.50¢ | Open ..... ₩ lb 8.00¢

Lead.

American Pig ..... ₩ lb 5 @5½¢
Bar ..... ₩ lb 6 @6½¢

Solder.

½ & ½, guaranteed ..... ₩ lb 21¾@22½¢
No. 1 ..... ₩ lb 19½@20¢
Refined ..... ₩ lb 17½@18 ¢
Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ..... ₩ lb ..@11¢
Hallletts ..... @11¢
Other Brands ..... @10¢

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting.
Small lots ..... 38¢
100-lb. lots ..... 36¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents—
Copper, Heavy and Wire	₩ lb 11.00@11.50¢
Copper, Light and Bottoms	₩ lb 10.25@10.50¢
Brass, Heavy	₩ lb 8.00@8.50¢
Heavy Machine Composition	₩ lb 10.25@10.50¢
Clean Brass Turnings	₩ lb 6.75@7.25¢
Composition Turnings	₩ lb 8.00@8.50¢
Lead, Heavy	₩ lb ...@8.00¢
Tea Lead	₩ lb ...@8.15¢
Zinc Scrap	₩ lb ...@3.00¢
No. 1 Yard Wrought, Long	$...@11.50
No. 1 Yard Wrought, Short	...@10.50
Wrought Pipe	...@8.50

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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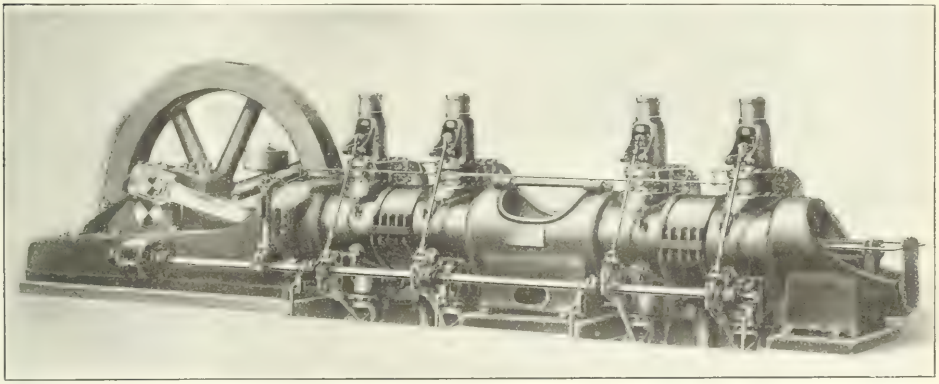
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THE IRON AGE

New York, Thursday, May 14, 1908.

The Mesta Gas Engine.

Large gas engines more nearly resemble their steam prototypes than do small ones, hence it is not as much of a departure for a builder of powerful Corliss and piston valve engines to take up the construction of heavy duty gas engines as it would be for a manufacturer of small engines, either gas or steam. The years which the Mesta Machine Company, Pittsburgh, Pa., has been engaged in designing and building engines of the largest sizes to meet the requirements of rolling mill and blast furnace work peculiarly qualify it for supplying gas engines to perform the same or equivalent service. Either form of engine requires as characteristic features massive and rigid construction and simplicity and accessibility of wearing parts. A knowledge of these requirements, based on experience, is a valuable advantage to this company in inaugurating its new line, but even more important is the possession of the proper equipment, both in foundries and machine shops. The plant has air furnaces supplying an iron of high tensile strength and superior wearing qualities so necessary in cylinder construction; open hearth furnaces for steel castings containing nickel or vanadium when these may be desired, and a complete brass foundry.



A 600-Hp. Horizontal Gas Engine Built by the Mesta Machine Company, Pittsburgh, Pa.

The accompany illustration shows the general arrangement of the 600-hp. 400-kw. direct connected unit now in process of construction in the works at West Homestead, and typifies the series of sizes called for in the designs as at present laid down. In this engine are embodied, it is believed, the best features of both European and American practice, and in addition improvements which tend toward more economical and successful operation under the exacting conditions of widely fluctuating load which are so frequently met in American practice. While natural gas as a source of power is at present available in many quarters, the realization that producer gas will eventually supplant it has caused careful attention to be given to the development of a design adapted to use producer, blast furnace or other by-product gases.

These engines are designed to operate on the four-cycle principal, and are built in either tandem or twin tandem arrangement. The placing of the two double acting cylinders in tandem results in two power strokes per revolution, giving very close regulation and making it perfectly feasible to operate 60-cycle generators in parallel without using any form of flexible coupling. Where the twin tandem type is employed the power strokes are doubled, and the same effective torque is obtained as in a cross-compound steam engine. The design throughout is massive to allow for the most severe operating conditions, but this necessary strength has not been obtained at the sacrifice of accessibility and simplicity. Following the American custom the overhung crank construction is used, and owing to the tandem arrangement every allowance has been made for longitudinal expansion, the cylinders being permitted to expand or contract with the varying temperature without affecting the engine alignment.

To make the valve gear more simple and reliable spiral gear drive for the lay shaft has been avoided by using spur and bevel gears, and both the inlet and exhaust valves at each end of each cylinder are operated from a single eccentric. All parts subject to wear are fitted with means for taking up such wear, and in all other particulars the aim has been to produce an engine capable of continuous operation day after day. For the development of this line of engines, ranging in capacity from 500 to 4000 hp., the Mesta Machine Company has secured the services of Frederick Ottesen, who has had experience both here and abroad in gas engine design and has spent over a year in the development of the design illustrated.

The Bethlehem Steel Company, South Bethlehem, Pa., in April produced at its new plant in eight open hearth furnaces 32,000 tons of open hearth steel, which was converted into 22,000 tons of rails and a quantity of special structural shapes. The rails had a large percentage of discard to insure the best wearing qualities. The company's new gray structural mill has been running on single turn for several months, and there is every prospect of the mill going on double turn in the near future, on account of the large number of orders being secured for Bethlehem special structural shapes. In April the company operated about 75 per cent. of its capacity.

An important merger of Western cement interests has been effected whereby the Cement Securities Company, Denver, Colo., has taken over the Portland Cement Company, Denver, Colo.; Union Portland Cement Company, Ogden, Utah; Three Forks Portland Cement Company, Triden, Mont., and Southwestern Portland Cement Company, El Paso, Texas. The officers of the Cement Securities Company are Chas. Boettcher, president; Whitney Newton, M. D. Thatcher and Jos. F. Smith, vice-presidents; James Pringree, secretary and treasurer; G. W. Bartholomew, assistant secretary.

The General Electric Company.

The sixteenth annual report of the General Electric Company makes the following income showing for the fiscal year ending January 31, 1908, as compared with the previous year:

	1907-8.	1906-7.
Sales	$70,977,168.46	$60,071,882.99
Royalties, dividends, &c.	1,498,040.67	532,246.19
Profit on sales of stocks and bonds	9,778.93	329,702.55
Net profits of security holding companies	.....	675,000.00
Total income	$72,484,988.06	$61,608,831.73
Cost of sales, including depreciation	$65,536,305.06	$53,106,594.04
Interest on debentures	362,029.63	74,395.01
Total expenses	$65,898,334.69	$53,180,989.05
Profit for the year	$6,586,653.37	$8,427,842.68
Patents written off	.....	999,999.00
Surplus	$6,586,653.37	$7,427,843.68
Dividends paid	5,183,614.00	4,344,342.00
Surplus carried forward	$1,403,039.37	$3,083,501.68
Previous surplus	15,110,796.77	12,027,295.09
Surplus at close of year	$16,513,836.14	$15,110,796.77

The allowance for depreciation of plant for the past year was $3,745,989.06, against $2,834,123.80 for the previous year. President C. A. Coffin says:

"Late in the year there was a sudden and severe shrinkage in the value of all merchandise and materials used by the company, notably copper. All materials, whether raw, manufactured, or in process of manufacture, which were on hand January 31, 1908, were inventoried at the lower prices then prevailing. The book value of such inventories was thereby reduced by about $2,000,000. In valuing the notes and accounts receivable, in amount the largest in the company's history, great care has been exercised and liberal reserves have been established to provide for possible losses thereon. These reserves, and allowances for depreciation of factory plants, and the shrinkage in inventory values have greatly reduced the profits of the company. As a result the amount in excess of dividends upon its share capital, which is carried forward to surplus account is relatively small.

"During the year all the assets and liabilities of the Stanley G. I. Electric Mfg. Company, Pittsfield, Mass., were taken over, and the factories owned by that company at Pittsfield are now a part of the factory plants of this company. In this practical liquidation of the Stanley Company there has been a considerable shrinkage in the valuation of its factory properties, inventories and other assets, thus adding to the otherwise large depletion in the profits for the year.

"In view of the then great expansion in business, the directors deemed it wise, early in 1907, to provide for future development at some point nearer the Central West, in preference to a further enlargement of the plants at Schenectady and Lynn. For this purpose the unencumbered fee of about 700 acres of land adjacent to the city of Erie, Pa., was purchased at a cost, including engineering and other expenses, of $232,301.53. In view of the existing depression the erection of buildings thereon is deferred for the present.

"The various securities included in the stocks and bonds account of the company have been carefully revalued, item by item, with the result that the book value thereof has been fixed at $18,000,089.85."

The Sales Department

reports that in the 10-year period ending January 31, 1908, sales billed increased from $12,396,093 to $70,977,168, an average increase of 19.8 per cent per year. The sales billed during the year 1907 increased 18.2 per cent. over the previous year. Many important orders received in 1907 are enumerated, and the following statement is made: "The use of electrical apparatus for industrial purposes is extending rapidly, and large purchases of our apparatus have been made during the year for completely equipping mills with turbine and engine driven generators for lighting and power, and with motors of standard and special design for driving machinery of every description." The company now has in process of manufacture for the Commonwealth Edison Company of Chicago and the New York Edison Company a number of turbine generators of 14,000 kw. capacity each, which will be the largest steam driven electrical units ever produced. The business of the foreign department has been well maintained.

Manufacturing.

Expenditures aggregating $6,350,576.74 were made during the year for real estate, erection of new factory buildings, extensions to existing buildings, additional machinery, patterns, special tools, fixtures, &c.

The following table shows approximately the total area of floor space and the number of employees, as of January 31, during the last five years:

	Floor space. Square feet.	Employees.
1903-4	3,700,000	17,000
1904-5	4,100,000	18,000
1905-6	4,350,000	22,500
1906-7	4,770,000	28,000
1907-8 (including Pittsfield Works, formerly Stanley G. I. Company)	6,460,000	20,000

The large reduction in orders during the last quarter of 1907 resulted in greatly curtailing the working force.

At the Schenectady Works a building for the manufacture of large apparatus, a blacksmith and boiler shop, an extension to the power house, a wood working plant and an addition for the manufacture of wire and cable, a storehouse and an addition to the porcelain factory were completed, while a building for the manufacture of wiring devices is nearly completed.

At the Lynn Works a building for the manufacture of stationary motors was completed, while a building for the production of meters and instruments, and another to be used as a carpenter shop, pattern shop and for pattern storage, are under construction.

At the Pittsfield Works buildings for the manufacture of transformers, lightning arresters, fan motors and switches were completed, while an iron foundry of 59,000 sq. ft. of floor space is under construction and will be completed and in operation early the coming summer.

The manufacture of incandescent lamps is now carried on at Harrison and Newark, N. J.; Fort Wayne, Ind., and Toledo, Ohio. Increased floor space aggregating 195,000 sq. ft. has been provided during the year, and buildings of 92,870 sq. ft. of floor space are now under construction and will be completed within the next four months.

Engineering.

On this subject Vice-President E. W. Rice, Jr., makes a report from which the following extracts are taken:

"During the first part of the last year our engineers were fully occupied in supervising the technical details of our greatly expanded business. Upon the decline in business which followed they have had more time to devote to improvements and economies in design of our apparatus. More attention has also been given to the design of special apparatus intended to meet novel conditions and to the extension of our business along profitable lines.

"Our engineers have devoted considerable attention to the design of a line of turbine generators for use with exhaust steam. Such steam turbines are so much more efficient than steam engines when operated by low pressure steam that they can be most usefully employed to supplement steam engines in existing installations. Their use will result in large increases in output without any increase in coal consumption.

"We have sold to the Great Northern Railroad Company four 100-ton three-phase electric locomotives designed to handle all trains traversing the 2½ miles of Cascade Tunnel in Washington. This installation will be especially notable as the first instance of the substitution of electricity for steam on a mountain division of one of the continental railroads. The traffic conditions are peculiarly difficult on account of the grades and tunnels. These electric locomotives, because of their increased speed and better control, will practically double the traffic capacity of the present steam locomotives. Electricity for their operation will be supplied from water power hitherto unused.

"A gas electric car which fully meets the requirements of steam railroad companies for service on branch lines has been perfected. The equipment consists of a gasoline engine driving an electric generator which furnishes current to standard railroad motors. The engine and generator are located in the forward end of an espe-

cially designed car conveniently divided into passenger and baggage compartments, making a complete self-contained unit.

"We have made many valuable improvements in the design of machinery for electric reduction of metals and in apparatus for various industrial applications.

"We have shipped several large motors of special design of about 10,000 hp. capacity each for driving rolling mills, and have received orders for additional euipments.

"Our new tungsten incandescent lamp, which gives more than double the illumination of the carbon filament for the same expenditure of power, has been further developed and has now become a standard commercial article."

Finances.

The financial report states that during the year there was expended in acquiring sundry patents, for licenses under patents and in patent litigation, $872,345.67. This amount has been charged to profit and loss, leaving the company's patents, franchises and good will standing at a nominal valuation of $1, the same as at January 31, 1907.

In the past 15 years the total allowance for depreciation and replacement written off has been $21,951,013.93.

The copper mining investment of $2,701,976, shown in the balance sheet, represents the full amount invested in copper mining and milling properties at January 31, 1908, of which $1,129,961.63 is represented by capital stock, and $1,572,014.37 by advances. The principal property therein is that of the Bully Hill Copper Mining & Smelting Company, Winthrop, Shasta County, Cal., including an interest in a railroad and valuable mills, which have recently been put in active operation.

The security holding companies whose stocks and bonds, valued at $5,979,250.17 are owned, are the United Electric Securities Company, Boston; Electrical Securities Corporation, New York, and Electric Bond & Share Company, New York.

The consolidated balance sheet of the company, comprising the Edison General Electric, Thomson-Houston Electric and Stanley G. I. Electric, as of January 31, 1908, is as follows:

Assets.

Patents, franchises and good will		$1.00
Cash		12,250,720.92
Stocks and bonds	$18,000,089.85	
Real estate (other than factory plants)	541,900.50	
Notes and accounts receivable	29,857,726.84	
Work in progress	1,276,294.22	
		49,676,011.41
Merchandise inventories:		
At factories	$18,339,652.06	
At general and local offices	2,422,678.59	
Consignments	234,725.16	
		20,997,055.81
Factory plants (including all lands, buildings and machinery)	$12,900,000.00	
Copper mining investment	2,701,976.00	
		15,601,976.00
Total		$98,525,765.14

Liabilities.

Five per cent. debentures of 1892	$55,000.00
Three and a half per cent. debentures of 1902	2,047,000.00
Five per cent. debentures of 1907	12,872,750.00
Accrued interest on debentures	108,791.67
Accounts payable	1,759,517.47
Unclaimed dividends	1,469.86
	$16,844,529.00
Capital stock issued	65,167,400.00
Surplus	16,513,836.14
Total	$98,525,765.14

The statement is further made that the company has no note payable nor is there any paper outstanding bearing the company's indorsement.

The balance sheet of affiliated companies shows assets of $9,149,985.73 and a surplus of $1,515,421.17.

Reviewing the foregoing report, the *Wall Street Journal* comments upon the manner in which the ratio of cost of production has increased in recent years. The sales of 1907-8 were the largest in the history of the company, but the net earnings were much less than in 1902-3, when the sales were a trifle over half as large. Says the *Journal*:

"The following table gives the sales, cost of sales and ratio of cost to sales of the General Electric Company over the last six years:

Year.	Sales.	Cost of sales.	Per cent.
1907-8	$70,977,168	$65,536,305	92.3
1906-7	60,071,882	53,106,594	88.4
1905-6	43,146,902	37,025,346	85.9
1904-5	39,231,328	33,528,135	85.5
1903-4	41,699,617	34,918,426	83.7
1902-3	36,685,598	28,844,881	78.7

"It is probable that the poor showing of the General Electric Company in this respect has been due largely to the higher cost of raw material entering into the manufacture of electrical equipment, and competition. If such is the case a turn for the better in the near future can be expected as it appears that the electric companies are now working along more harmonious lines."

The Mesaba Ore Belt West of the Mississippi.

DULUTH, MINN., May 9, 1908.—The limits of the Mesaba iron bearing belt are being gradually extended west of the Mississippi River. Merchantable ore has been found on section 34 of the township west of the west bank of Pokegama Lake, about 5 miles southwest of Grand Rapids, and considerable drilling is in progress west and south from there. This marks an important advance step in the geological knowledge of the Mesaba formation, for until recently no merchantable ore had been found west from Grand Rapids. Ore bearing formation outcrops were known to exist near Grand Rapids many years ago, and the first explorations ever conducted on that portion of the Mesaba now known to contain good ore were in this portion of the district. But these finds were unsatisfactory in quality. At the time there were no roads, and the tremendous finds in the Biwabik, Mountain Iron and Hibbing locations drove all though of the west range from men's minds. The western extension of the Mesaba to the Mississippi, as proved by the great finds taken by the Oliver Company around Coleraine, recalled to memory this early work, and for two years and more explorers have been busy west of the river.

It is well known that the Mesaba formation sinks under a heavy capping of drift on the west side of the river, and explorers naturally attempted to find it by sinking through this in the general south of west course shown so persistently east of the river. Thus a lot of work was carried forward many miles west, in Cass County and the swampy lake region of glacial till. This was not satisfactory.

More recently the theory has been advanced that the formation in the vicinity of Pokegama Lake bends sharply southward, and on this theory drilling is in progress along the west shore of the lake and reconnoisances have been and still are in progress down the great river itself toward the outcroppings of the Cuyuna District. The work so far done seems to tend toward a corroboration of the tentative theory advanced by the Geological Survey of an association of the Mesaba and Cuyuna as the limbs of a great syncline. The importance of this can hardly be overestimated.

A few miles west of Pokegama drills penetrated a thickness of 700 ft. of drift, though the holes were in the general strike of the range. Half a dozen tracts along the west shore of the lake are now either under option or lease to the Oliver Iron Mining Company and drills are at work. A lease taken a few days ago on the Cavenaugh tract, section 26, a State tract, is looking fairly well, while the Jordin tract, several miles south, is the limit of careful work so far. On the Cavenaugh ore grading up to 55 per cent. or better has been cut in considerable quantity, and it is hoped the other tracts mentioned will show as good. A few miles further west the Tioga Iron Company, composed of Duluth men, has taken lands abandoned by other Duluthians after exploration and a large tonnage of unmerchantable ore has been exposed. Explorations will be maintained in the hope of bettering the grades. D. E. W.

CLUTCHES.*

With Special Reference to Automobile Clutches.

BY HENRY SOUTHER, HARTFORD, CONN.

Clutches have been used since the earliest history of the mechanic arts. It would seem, however, that in general they attracted but little attention until recently, when they have been required in cotton mill machinery, printing presses, electric cranes, power plants and, most recently, in automobiles.

Positive Clutches.

The positive or jaw clutch can be used only where the inertia of the parts is small. Modifications are made in the angles of engagement between the jaws. The least positive form has the planes of engagement inclined from the direction of motion about 15 degrees. As its tendency under load is to disengage, it must be held to its work by axial pressure, which may be regulated to slip when overloaded. Positive clutches with engaging planes parallel to the axis of rotation must be held to their work to offset the tendency to jar out, but they present no safety features against overload. More positive yet is the undercut jaw clutch, which engages the tighter when loaded; and can be disengaged only when free from load, so as to be rotated slightly in a reverse direction.

In automobiles the positive clutch is used inside the gear box, and operated only while the friction clutch connecting the engine is disengaged. This clutch sometimes takes the form of an external meshing an internal spur gear. Automobile gear changing systems are used that keep all gears in mesh all the time. Each gear carries a positive jaw clutch to be engaged with a mate on the driving shaft. Some have accomplished the same thing by a sliding spline (or hardened ball) on the driven shaft, which engages with the gear hub internally. The starting crank of an automobile is an illustration of an under-cut positive clutch. When applied there is little danger of the clutch slipping off and wrenching the operator.

Classification of Friction Clutches.

There are a few basic types, involved in all clutches, but an infinite variety of detail of construction and manipulation. Rankine differentiates between friction clutches about as follows: Friction clutch (contracting band), friction cones, frictional sector (invented by Bodmer), friction disk (Weston's invention). Reuleaux illustrates the Ramsbottom clutch as used for rolling mill work. This is a friction coupling in which one flange is squeezed between frictional surfaces by being tightly bolted. The flange A, Fig. 1, is clamped between the wood-lined surfaces of B, adjustment of the bolts being such that the friction will resist normal torque but yield to abnormal. This is perhaps the simplest form of friction clutch.

Reuleaux shows as the next development a cone coupling, the two parts being forced into engagement by screw and handwheel B, as shown in Fig. 2. The angle of the cone should not be less than 10 deg., so that the parts may not become wedged together. With frictional surfaces of iron on iron a coefficient of friction of 0.15 is given. To keep the axial pressure within reasonable limits, he places the mean radius of the cone between three and six diameters of the shaft.

Following the single cone clutch in Reuleaux is a multi-cone, which as shown by Fig. 3, has a series of concentric cone-shaped rings with angles of 20 degrees. It is apparent that the collar would have to resist the pressure and wear due to the axial pressure necessary for proper engagement. Such wear is avoided in heavy machines, or high-speed automobiles by making the axial pressure self-contained on the rotating member, except when the clutch is being disengaged. This modification is shown in Fig. 4, where the screw wheel clamps the two halves A and B together, and the concentric double-faced cones furnish considerable friction at slight axial pressure.

The next clutch shown by Reuleaux, Fig. 5, he attributes to Koechlin. This is of the internal expanding type, three internal clamp pieces, A, fitted with bronze shoes, being thrust out against the enclosing cylindrical drum B, by lever and screw action. There is no danger of wedging in this clutch. Reuleaux next shows a form of axial friction coupling, Fig. 6, the Weston clutch, based on the principle of multiple plate friction. The plates are alternately wood and iron, the wooden ones engaging the outside cylindrical containing-case A, and the iron ones the shaft, B. The plates are pressed together by springs, D, and released by drawing back a collar, C, which releases the spring pressure.

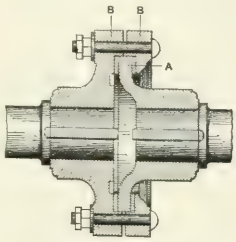


Fig. 1 Ramsbottom Clutch

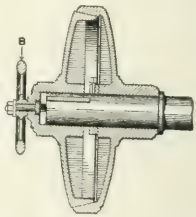


Fig. 2 Cone Clutch

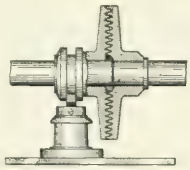


Fig. 3 Multi-cone Clutch

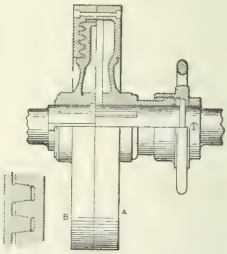


Fig. 4 Self-contained Thrust

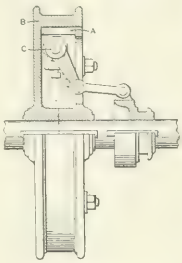


Fig. 5 Expanding Type

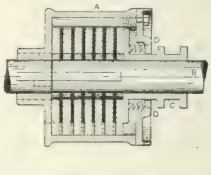


Fig. 6 Weston Clutch

Early Forms of Clutches That Are Typical of the Principles of Construction Still Used.

Machine Shop Clutches.

Perhaps the simplest machine shop clutch is that in which one flat disk presses against another, the surfaces being leather against iron, bronze against iron, or wood against iron, and the axial pressure enough to drive the maximum load, but yet allow slipping when the load is first applied, to prevent jar.

In Fig. 7 is a modification of the Weston type. It is not multi-disk, there being only one wooden disk, A, attached to the enclosing case B, which is gripped between two iron surfaces, C, keyed to the driving shaft. To prevent drag when disengaged, separating springs D, part the frictional surfaces.

* Abstract of a paper presented at the monthly meeting of the American Society of Mechanical Engineers, Tuesday evening, May 12, 1908, in the Engineering Societies Building, New York.

What was formerly known as the Frisby clutch is shown in Fig. 8. It is not unlike the last one described, except that a flat surface A and cone B are used. The gripping is accomplished in much the same way, and the frictional surfaces are separated by springs when disengaged. This clutch would require less axial pressure for given power transmitted than the foregoing type because of the cone.

The Dodge Mfg. Company, Mishawaka, Ind., has experimental data upon the capacity of its clutches here given. The results were obtained from clutches fitted with maple blocks and calculations are based on a coefficient of friction of 0.37 and a speed of 100 rev. per min.

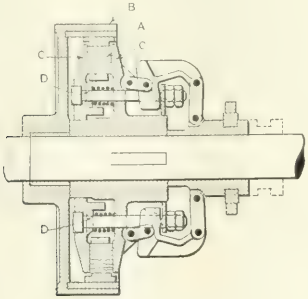


Fig. 7.—A Clutch Made by the T. B. Wood's Sons Company, Chambersburg, Pa.

Horse-power.	Block area.	Diameter at block. Inches.	Circumferential pull at block center.	Total pressure	Total pressure per square inch.
25	120	16	1,960	5,300	44
32	141	18	2,240	6,000	44½
50	208	21½	2,900	7,800	37½
98	280	27½	4,500	12,200	43½

A modern adaptation of the old Koechlin form of internal expanding clutch is shown in Fig. 9, which is from a catalogue of the A. & F. Brown Company, Elizabethport, N. J. It is largely used for very heavy work, being made as large as 48 in. in diameter, capable of transmitting 320 hp. at 100 rev. per min. The frictional surfaces are specially prepared wood, against iron.

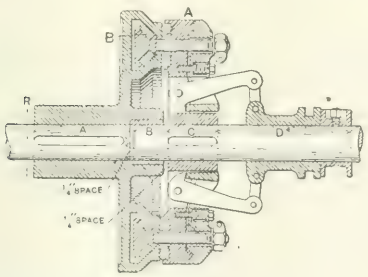


Fig. 8.—A Combined Cone and Flat Surface Clutch.

Clutches Used in Wire Drawing.

One of the oldest uses of clutches is in wire drawing. The iron drum around which the wire is wrapped, as a rule, contains a clutch within it. Probably the most recent development in this direction is made by the Morgan Construction Company, Worcester, Mass. It is a compound one, the main driving effort being furnished by a wrapping coil on a chilled iron surface, the initial engagement of which is produced by a modified cone or ring slipping down on a cone which drags the free end of the coil into engagement. Once seized, the wrapping continues until tight. In Fig. 10 A is the tapered friction surface of the chilled drum on which the friction ring bears, and below is the coil which is submerged in oil in an annular oil chamber. The drum is 12 in. diameter by 7 in. high, and the coil, which is of soft steel, is 1½ in. square at the large, or driving end and ⅝ in. by ⅝ in. at the small end. The outside diameter of the block is 25 in. It is very important to start wire into a die gradually and smoothly. The following from the manufacturers of this clutch fully describes the qualities and action of it:

> Electrically operated wire drawing machines in England have demonstrated that a wire can once be put into motion, and the speed increased gradually to prevent breaking the wire, the possible speed of the drawing is almost unlimited. The wire upon which all the work is done becomes exceedingly hot, but the dies remain quite cool.

In order to test the power of our block, we keyed the hub to the shaft. This hub was flattened on one side. On this flat surface we strapped an 8-in. I-beam about 14 ft. long, and at a distance of 12 ft. 6 in. from the center of the driving shaft we strapped a gear to this I-beam in which we could put small weights. We first strapped a ½-in. annealed crane chain around the block, fastening one end to the block and one to the machine, with a weight of 500 lb. at a distance of 12 ft. 6 in. from the center of the driving shaft. The chain broke with a clear fracture. All the links of this chain were strained beyond the elastic limit.

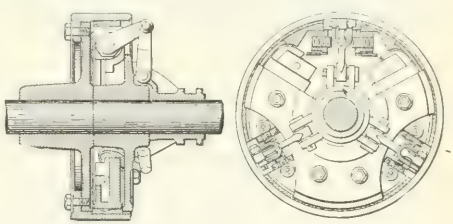


Fig. 9.—A Clutch Made by the A. & F. Brown Company, Elizabethport, N. J.

We next took a ¾-in. chain and fastened it in the same manner and added weight up to 600 lb., including the weight of the beam. At this point the cast iron quill, which had a bevel gear connected at one end and the chilled friction drum at the other end, ruptured, the crack extending from the top of the flange down the spindle a distance of 16 in. in a spiral of 1½ revolutions, as shown at B, Fig. 10, the fracture showing clean, close-grained iron. This cast iron quill was 5 in. in diameter and cast around a rough turned shaft 2 3-16 in. in diameter. It had a flange at the top 8¼ in. in diameter by 1¼ in. thick.

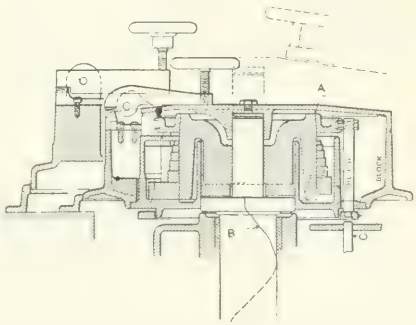


Fig. 10.—A Wire-Drawing Clutch Made by the Morgan Construction Company, Worcester, Mass.

This was the extent to which we carried out experiments, and under the above conditions the friction clutch did not slip after it had taken hold.

The following calculation gives the pounds pull exerted on the chain:

$$\frac{600 \times 150 - 40}{22 \times 12\frac{1}{2}} = 16{,}036 \text{ lb. (more or less.)}$$

The pull exerted on the large end of the coil would be equal to

$$\frac{16{,}036 \times 12\frac{1}{2}}{6} = 32{,}761 \text{ lb. (more or less.)}$$

The horsepower of the clutch at 100 rev. per min. under the above conditions would be

$$\frac{32{,}761 \times 3.1416 \times 100}{33{,}000} = 312 \text{ hp.}$$

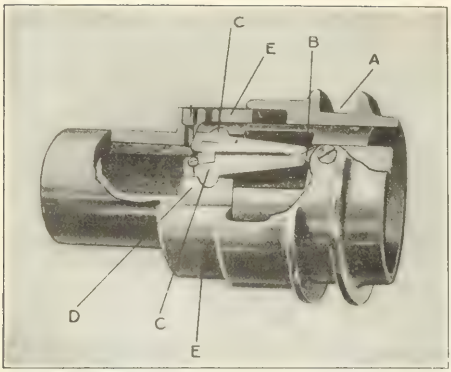


Fig. 11. A Small Diameter Clutch of Relatively Great Power.

A clutch of this kind has been in service some two years, drawing spring wire largely. No repairs or adjustments have been made during that time.

Clutch of Small Dimensions.

A demand has developed for a clutch of small dimensions for a given capacity. This has been met by using hardened tool steel frictional parts instead of cast iron or metal of ordinary strength, which permits exceedingly high normal pressures between the frictional surfaces. Fig. 11 gives a good idea of this form of clutch. It will be seen that the operating collar A forces wedge B between the long arms of the two levers C, spreading them in such a manner as to expand a hardened steel ring D against the hardened steel enclosing drum E. As much as 100 hp. has been transmitted at 1000 rev. per min. with a clutch containing friction rings 5¼ in. in diameter and 1½ in. wide. This form of clutch has been largely introduced into automatic machines, machine shop countershafts and launch engines.

Clutches with Cork Friction Surfaces.

In commercial clutches cork has recently been used and apparently with considerable success. It has a high coefficient of friction, probably double that of wood or leather on iron. Its behavior is peculiar because of its elasticity under compression. As a rule the corks are forced into cavities in one of the metallic frictional surfaces, after being previously softened by boiling. They normally protrude above the surrounding surface and engage first. If sufficient pressure is applied they are forced down flush with the metal surface and act with it in carrying the load. Two forms of cork are used, one in its natural condition, the other prepared by compressing small pieces into sheets and blocks of desired shape under very great pressure and enough heat to cause the natural gums of the cork to exude and act as a binder. This prepared cork is more enduring than the natural. Prof. I. N. Hollis of Harvard University has found that being stronger, firmer and yet possessing much elasticity, the coefficient of friction for cast iron on cast iron is about 0.16; for plain bronze on cast iron 0.14, and for cork on cast iron 0.33 to 0.37, the former, 0.33, being the value for the heavier loads. It is claimed that the coefficient of friction for cork is not very much less when lubricated. Cork is very slightly affected by moisture, as compared with maple blocks ordinarily used.

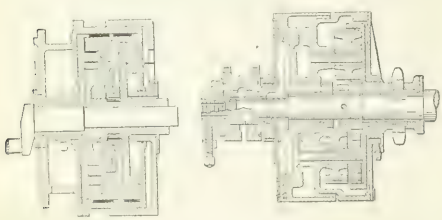


Fig. 12.—Types of Planetary Clutches for Automobiles.

Automobile Clutches.

There are almost as many ideas on automobile clutch construction as there are engineers. Adherents are found of the cone type, the expanding type and the multiple disk type; all are old, at least in principle. Perhaps the simplest form is that commonly used for small machines and in connection with the planetary system of gear change. This presses one disk against another, the frictional surfaces being leather, bronze, or copper against iron or steel. Fig. 12 shows two such clutches. The axial pressure is usually furnished by a spring disk; that is, the steel plate which carries the frictional surface, either leather or copper, is caused to operate like a diaphragm spring. The diameter of a clutch ordinarily used to propel a car of 7 or 8 hp. is from 5 to 10 in., the rubbing surfaces being about from one-half to three-quarters of the entire superficial area of the disk. The disk clutch connects with the engine direct and runs at engine speed, the planetary system being used only for low speed and reverse work, actuated by contracting band clutches.

For three or four speeds boxes are used of sliding or change gears, and the clutch must engage and disengage easily, requiring but small axial movement of the operating mechanism, or of the clutch itself. It must be entirely independent of centrifugal force, and able to slip for a reasonable length of time without being destroyed. An important feature in the clutch is the question of its

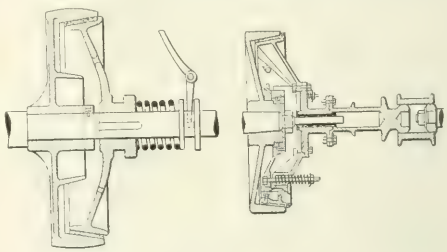


Fig. 13. Fig. 14.

Leather Faced Clutches.

weight, especially as affecting its inertia. A clutch having high flywheel effect spins to such an extent as to cause violent clashing of idle gears. Consequently, clutches are made as light as possible, and the smaller in diameter the better. Any automobile clutch must engage smoothly and without shock to be a success. Clutches exist that can be engaged suddenly and still not jar the passengers, but they do not pick up the load quickly enough on a hill to start the car forward after a change of gears, before the momentum of the car is materially lessened. The clutch designer is, therefore, between two fires; too little slip on one hand and too much slip on the other. It is doubtful if such a problem exists in connection with clutches anywhere else in the mechanical art. The customary location for an automobile clutch is within the flywheel or at least at the rear end of the engine, if the flywheel is at the front end.

The Cone Clutch.

The cone clutch, all things considered, is the best when properly designed and mounted. It has the advantage of engaging and disengaging with small axial motion. Axial pressure may be low because the normal pressure between frictional surfaces is multiplied by the angularity of the cone. Its weight may be small, as the male member may be of aluminum. Its engagement is entirely independent of speed and centrifugal force. No liquid lubricant is needed with attending viscosity, drag and change due to wear and temperature. Disengagement may, therefore, be made perfect. Proper engagment, however, has proved to be difficult, and has caused nearly all the rejections of the cone clutch. It may operate almost as savagely as a positive jaw clutch, or it may refuse to engage, if it does not have the proper combination of angularity, pressure

and lubrication. The cause may not be in the clutch proper; but in the surrounding mechanism. The cone clutch must be absolutely free to center itself and seat itself uniformly, and a pair of free working universal joints must be provided.

Leather riveted on an aluminum cone usually forms one of the rubbing surfaces and gray cast iron the other. It is desirable that the leather be kept soft by neatsfoot or castor oil. With leather ¼ in. to ⅜ in. thick, properly softened, engagement may be sufficiently mild, but an improvement is obtained by placing under the leather at six or eight points on the periphery of the cone flat or spiral springs that cause the leather to engage at these points a little bit before engaging elsewhere. In some instances rubber buffers have been used under the leather in place of springs. The other frictional surface bearing against the leather is, as a rule, a cast iron flywheel. The construction surrounding the clutch must be such that no unusual supply of lubricant can find its way to the frictional surfaces of the clutch. The leather surfaces gradually become dry and hard, requiring the application of castor or neatsfoot oil, but not very often. With proper usage, cone clutches with leather faces seem to last indefinitely.

There is a variety of opinion as to the proper cone angle. Various authorities have placed it all the way

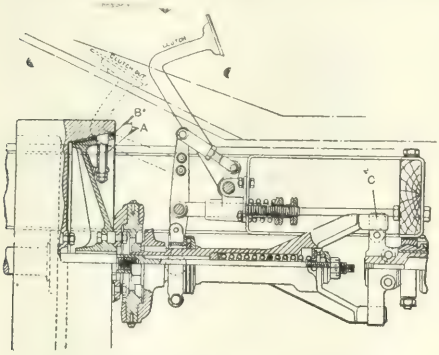


Fig. 15.—A Cone Clutch for a 50 Hp. Automobile

from 7 to 20 degrees. The metal-to-metal cone clutch is a good one. It may be made smaller in diameter and with a sharper angle, say 7 degrees, without seizing. Another form of cone clutch has an aluminum male member of about 12 degrees angle bearing against cast iron and with cork inserts in the face of the male member. This is not easily affected by a lubricant and may be run with copious lubrication.

Fig. 13 shows about the simplest form of leather-faced cone clutch. Modifications of this are many. Fig. 14 shows a clutch of the same principle, but in place of one strong actuating spring surrounding its axis, it has three weaker spiral springs nearer the periphery of the male member. Fig. 15 is a clutch used for a 50-hp. car, with a cone angle of 13 degrees, a diameter of about 16 in., a total frictional area of about 128 sq. in., and axial pressure of 375 lb. resulting from spring. The small spiral plunger spring, A, underneath the leather face, B, is to make it pick up its load more quietly and smoothly. A form of slip-joint back of the clutch is shown at C, which, although it does fairly good work, is not on the whole as satisfactory as the double-toggle universal joint.

In direct contrast to this clutch is the one shown in Fig. 16, where the diameter of the cone is very much less, not over 10 in. This is a clutch used in a car developing 30 hp., and at times as high as 36 hp. The clutch angle is 13 degrees, the frictional area 96 sq. in., and the spring pressure 400 lb. At the bottom of this engraving a sketch shows the spiral spring plungers underneath the leather.

Modifications of the Cone Clutch.

In the *Commercial Motor*, October 31, 1907, is shown what may be called a multi-cone clutch, Fig. 17. When

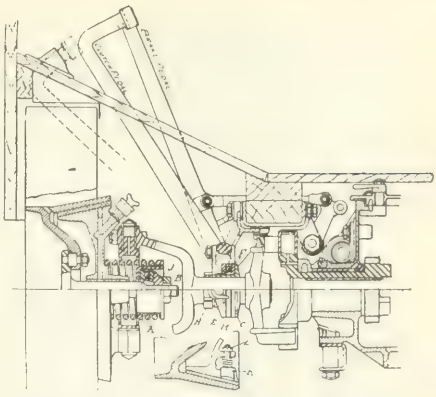


Fig. 16.—A Small Diameter Clutch for a 30-Hp. Car.

the clutch engages, the smallest cone seizes first, commences to revolve and twists the spiral spring between the next two clutches, which draws them together and brings the two outer cones into action; the idea is that the small clutch shall slip, tend to accelerate the car, the medium clutch do the same, and when the large clutch comes into play the three combined pick up the load and move the car. Another simple clutch embodies the tractrix curve, and is of such a form that the relation of pressures and peripheral speed should produce uniform wear at all distances from the center. It is claimed that the clearance required to complete the engagement is small; that there is no wedging action between the clutch members and no chance for it to bind, and that it is simple and particularly adaptable to metal-to-metal clutches. It is in effect a flat disk clutch which would certainly require heavy axial spring pressure. The so-called inverted cone clutch has a reversed cone contained in an extension, built on the flywheel. When the cone is disengaged it moves toward the engine, exactly reversing the action of the foregoing type. This clutch differs very slightly in its efficiency from the direct acting cone, and may be kept free from dirt and oil more perfectly than the other form.

Expanding Band Clutch.

The internal expanding band or ring clutch has had many exponents, but is open to centrifugal effects. At high engine speeds the operating levers have in many cases been so arranged as to lower the normal pressure between the frictional surfaces, resulting in a slippage and arbitrarily fixing a maximum limit of speed for the car on the high gear and of horse power possible to develop in low gear. Fig. 18 shows a clutch operating on the same principle, driving a 16-hp. car, the spring pull being 50 lb., the diameter of the clutch about 9.5 in., and the width of the band 2 in. This clutch operates very softly, but releases at high engine speeds. It operates best with a certain definite quality and quantity of lubricant, which, if varied to any great extent, causes slipping or sharp biting. Its tendency is to unwrap and expand against the enclosing cylinder as soon as friction is applied to it.

The successor of this clutch, shown in Fig. 19, is designed to overcome the centrifugal releasing effect of levers in the clutch shown in Fig. 18. The total area of

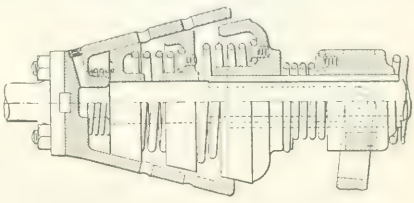


Fig. 17.—A Multi-Cone Automobile Clutch.

the clutch is 36 sq. in., and the two springs are of 125 lb. tension each. This clutch was a success, but was finally given up in favor of a simple cone.

Contracting Band Clutches.

Few approve the contracting band type of clutch, unless the contracting spiral be so classed, and perhaps it ought to be. Fig. 20 shows a contracting band characteristic of the Mors cars. A leather lined flexible steel band contracts against a steel cylindrical band bolted to the flywheel. Clutches of this character are seldom found, except in two-speed cars.

Fig. 21 shows a popular clutch which uses a wrapping spiral spring, of either hard or soft metal, shown in cross section, wrapping on a drum. The greatest difficulty of this clutch has been the adjustment of the clutching force. With too little lubrication it grips too savagely; with too much it will not pick up its load rapidly enough. The disengagement is not very complete at the best.

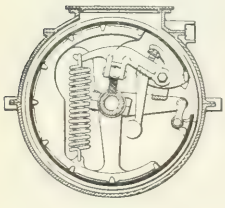


Fig. 18.

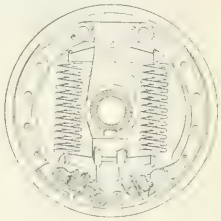


Fig. 19.

Expanding Band Clutches.

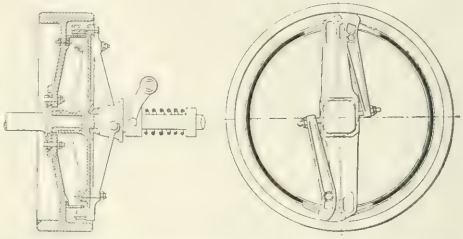


Fig. 20. A Contracting Band Clutch Used on the Mors Cars.

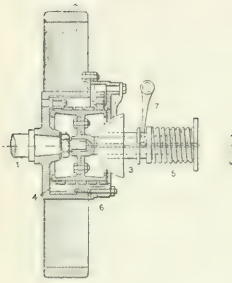


Fig. 21. A Contracting Spiral Band Clutch.

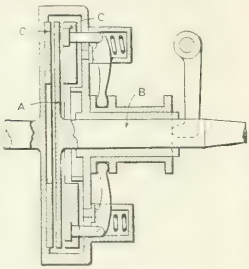


Fig. 22.—The De Dion Single Disk Clutch.

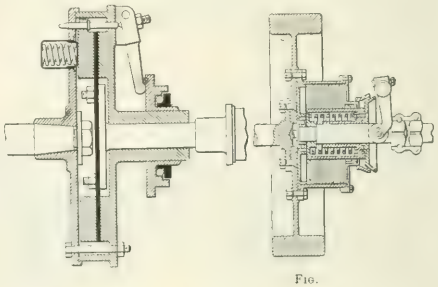


Fig. 23. Another Single Disk Clutch.

Fig. 24. A Multi-Disk Automobile Clutch.

Disk Clutches.

The De Dion single disk clutch has a disk, A, Fig. 22, on the driven member, B, which is clamped between two disks, C, on the driving member or flywheel. Separating springs make disengagement perfect, and either single or multiple springs cause the proper engagement. Fig. 23 shows the same kind of a clutch, in which the springs are on the front of the flywheel instead of the rear. Cork inserts are being used in this clutch to considerable advantage.

Another popular form is the multi-disk clutch; an elaboration of the Weston clutch already referred to. This is indicated clearly by Fig. 24, the alternate plates of bronze and steel are attached to the driving and driven parts, and are pressed together by a powerful spring. The principal problem in connection with the multi-disk clutch as a type is its proper lubrication. Cold and heat affect the operation, the lubricant in summer being thicker than can be permitted in winter.

One form of multiple disk clutch consists of steel disks rubbing against a special bronze rolled into sheets. The steel disks are provided with several small tongues on the outer periphery, bent one side sufficiently to come in contact with the next steel disk, for separating the disks and overcoming the drag when the clutch is disengaged.

Fig. 25 shows a nest of disks used in a well-known multi-disk clutch. The U-shaped separating springs are plainly visible. These force like disks apart when the spring pressure is released, overcoming the natural tendency of the oil to cause them to adhere. Some disk clutches are forced apart in a similar manner by little spring shaped strips struck up from the disks themselves. Another form of this same type of clutch is shown in Fig. 26. Comparatively few disks are used, and the spring pressure is very heavy. A type of disk clutch consisting of all steel disks with alternate ones faced with leather is operated without any oil, the leather being softened like that of the simple cone clutch. The slip required to start smoothly is often sufficient to create enough heat to destroy the leather, but this clutch is extremely efficient in transmitting power. In the matter of number of plates in the disk clutch designers differ. Some use as many as 50 or 60 thin plates, and others as few as six or eight.

One ingenious application of the multiple disk clutch has been made by the Sturtevant Mill Company, Boston; the pressure on the disks is brought about by centrifugal force acting on weights so arranged as to press the tighter with increased velocity. In Fig. 27 one of the weights is shown at W. This weight operates against a spring, A, which prevents it flying out and gripping at too low an engine speed. Once this spring pressure is

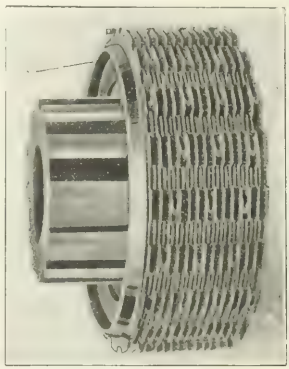


Fig. 25.—A Nest of Disks from a Hele-Shaw Multi-Disk Clutch.

overcome, the disks are pressed together. At low engine speeds the gripping tendency would be small. It would, therefore, not be possible to develop high torque at low speeds, but it is almost impossible to stall an engine by applying this clutch too quickly; it does its own releasing

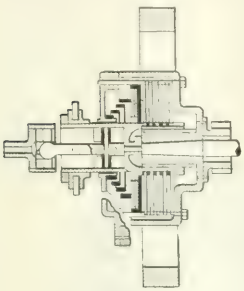


Fig. 26.

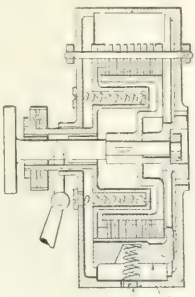


Fig. 27.—Sturtevant.

Multi-Disk Clutches.

so promptly and automatically. With the automatic Sturtevant multi-disk clutch it has been found experimentally that, for the maximum slip speed usual in automobiles, 15 to 20 lb. per sq. in. pressure is safe, and that lubricated cast iron disks scarcely wear out the tool marks after many thousands of miles' use.

A modification of the multi-disk clutch in which the cone and the disk are combined is the Hele-Shaw. Fig. 25 shows a set of disks from such a clutch. Careful

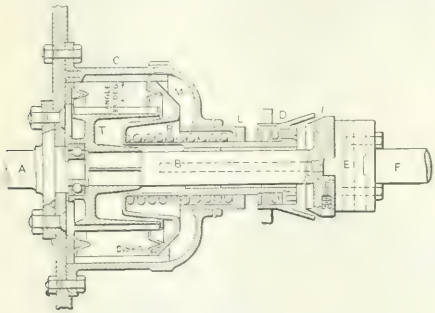


Fig. 28.—Section of the Hele-Shaw Clutch.

scrutiny reveals a V-shaped circular impression struck in the end disk. Fig. 28 better shows the V-shape of the disks. The female cone, D, bears on the male cone, *f*, when the clutch is thrown out, thereby checking the spinning tendency of this clutch, or, if the viscosity of the oil is heavy, holding it quiet during the changing of gears. In place of the entire surface of the disks bearing, only the V portions engage. This clutch is copiously lubricated and the engaging portions are perforated with holes so that the oil may circulate quickly as they are engaged and disengaged. The power transmitted by various spring pressures is given in Fig. 29, and Fig. 30 shows the character of the curve depending upon horse power and pressure of springs. One-thousand horse power is being transmitted by one of these clutches running at 700 or 800 rev. per min. and measuring 18 in. in diameter between the V's in the disks. The number of plates varies with the power transmitted, the diameters remaining the same within certain limits. The principle involved is that the thickness of the pack of plates shall not exceed the diameter of the plate. When this becomes necessary to transmit a load, the plates are increased in diameter, fewer of them being used.

The materials for disk clutches in general have been various; namely, steel on steel, steel on leather faced disks, steel on bronze and steel disks with cork inserts. Steel disks against steel have become badly heated and cut enough to make the clutches inoperative. Steel against bronze does not seem to cut.

A pneumatic clutch has been developed which has a plain leather-faced disk pressing a metal plate as indicated in Fig. 31. The clutch is located within the flywheel and the air is forced from the pump through a small air cushioning tank and from there it enters the clutch through the hollow crank shaft B and an air valve. The air deflects the leather diaphragm C, causing it to bear against the metal disk D, which can have a slight endwise motion, and forces it against the fiber disk E permanently riveted to the casing F, which latter is bolted to the flywheel. The maker, the Northern Motor Car Company, Detroit, gives the following in regard to the clutch and its air pump:

The lubrication of the pump became a problem, because we did not want the oil thrown into the air clutch, so an opening was left from the base of the pump into the upper part of the crank case, and this air seemed to be sufficiently oily to lubricate the walls of the pump without causing trouble in the air valves. This construction is extremely simple and cheap as far as the air clutch itself is concerned, but as a whole the air clutch is expensive, from the fact that it is necessary to build a very fine air pump and air valves, and conduct the air through

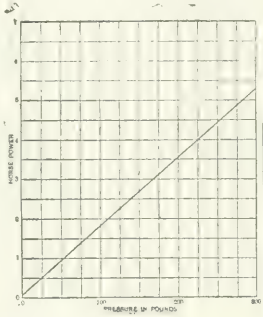


Fig. 29.—Power Chart for the Hele-Shaw Clutch.

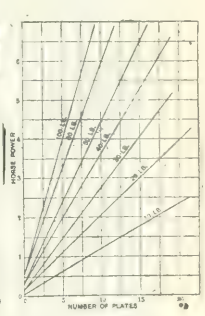


Fig. 30.—Chart for Spring Pressures and Horsepower.

tight joints in the piping, and also drill out the crank shaft throughout its entire length to admit the air into the clutch, all of which costs much more than a good cone clutch.

Hydraulic clutches have been used but are not popular. The magnetic clutch is in use and is fairly successful. One complication arises in the fact that one of the parts of the magnet has to rotate continuously, the gears being always in mesh; consequently the exciting current has to be carried to it by a brush. These

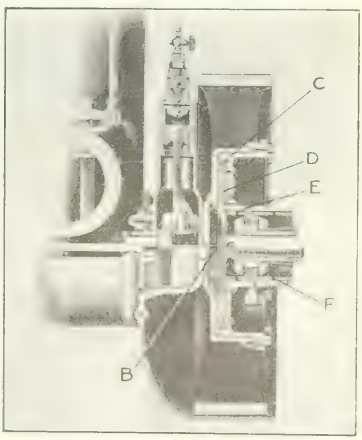


Fig. 31.—An Air-Operated Disk Clutch Made by the Northern Motor Car Company, Detroit, Mich.

clutches do not heat badly, but they seize rather savagely unless carefully controlled. A considerable current is also necessary on the car for the operation of the clutch. These complications rather interfere with its extended use.

Car Damage from Car Dumpers.

The use of car dumpers for unloading ore at blast furnace yards and for loading coal into vessels at Lake Erie ports is said to have resulted in frequent damage to cars. The *Railway Age* says, concerning the matter: "The use of the car dumper is becoming more general as new and larger docks are constructed, and there has been some co-operation between the car builders and the manufacturers of the dumping machines, having special reference to the unnecessary damage to the lading. It is found also that there are some points in the car construction which should be carefully looked after, so that they will go through the dumping operation without damage to projecting parts. This provision is sometimes neglected by car builders, who do not know of the difficulties with car dumpers in the past, and railroad companies which ought to have been informed have specified detail parts and appliances to be placed on cars which were later damaged or mutilated by the dumpers. While the matter is apparently of only local importance, yet it sometimes happens that a foreign car, not specially adapted to the dumping operation, is used for several trips with ore or coal in the lake trade, and it appears that specifications covering the special features in coal and ore cars which dumping service demands should be prepared for the use of the car manufacturers."

Recently 2500 tons of steel rails for use on the Grand Trunk Pacific Railroad, from the Prince Rupert end, were shipped by a long route. They were made at Pittsburgh and shipped to New York, thence across the Atlantic, through the Suez Canal and Indian Ocean and across the Pacific to Vancouver, B. C.

The Effect of Work and Time on the Properties of Mild Steel and Iron.

At the last two meetings of the Iron and Steel Institute papers were read by C. E. Stromeyer of Manchester, England, on "The Aging of Mild Steel." By means of extended and exhaustive tests, the writer showed that many steels deteriorate with age and tried, with only partial success, to develop some test that would disclose this aging property. A paper also bearing on this subject has recently been read before the Northeast Coast Institution of Engineers and Shipbuilders. The writer, John H. Heck, is vice-president of the institution and is actively connected with Lloyd's, and his paper is entitled "Notes on the Effect of Work and Time on the Properties of Mild Steel and Iron."

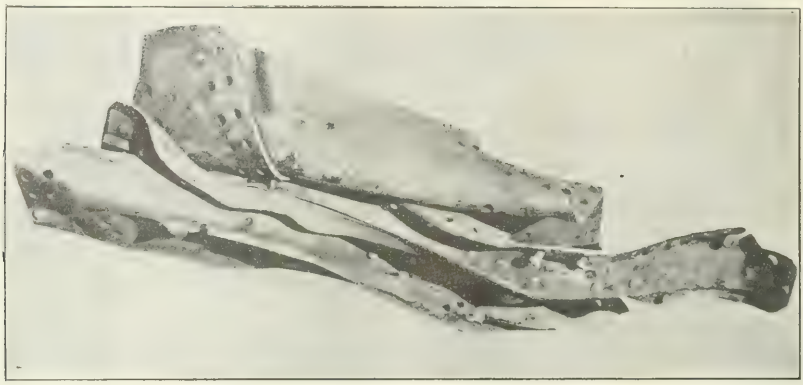


Fig. 1.—Damaged Ship Plate from Steamship Rotterdam.

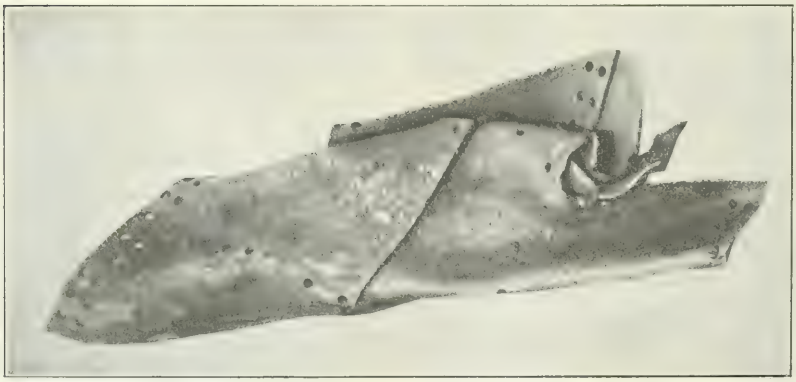


Fig. 2.—Damaged Ship Plate from Steamship Rotterdam.

In his introduction he speaks of the rapid growth in the use of mild steel for constructional work, and says it is greatly due to the care taken in manufacture and the uniform and regular testing to which it is subjected. The northeast coast of England is one of the largest shipbuilding districts and is also a very large repairing district. It is, therefore, a common experience to see on a large scale how well mild steel stands the test of time, severe damage, and wear and tear. Vessels come to the dry docks for repairs owing to damage caused by stranding, collision, or other causes, with plates and angles much bent and distorted. Examples are shown in Figs. 1 and 2, the steel looking like a sheet of crumpled note paper.

In connection with the steel boilers, working with high pressure, furnaces and plates are also found much

distorted and strained without any serious consequences having followed. Such a furnace is shown in Fig. 3.

The sight of such vessels and boilers, which have sustained such damage, brought safely into dry dock for repairs is a fact which speaks for itself. It compels one to feel that there can be no deterioration. In the early days of steel making in this northeast coast district, Mr. Heck says he was engaged in testing the material used in vessels and machinery registered under Lloyd's. From time to time tests have been made on samples of old steel which had been in use for years in different parts of the hull and machinery of steam vessels. The samples were sheared from plates, angles, bars, &c., which had been removed owing to damage, corrosion, pitting, wear and tear and other causes.

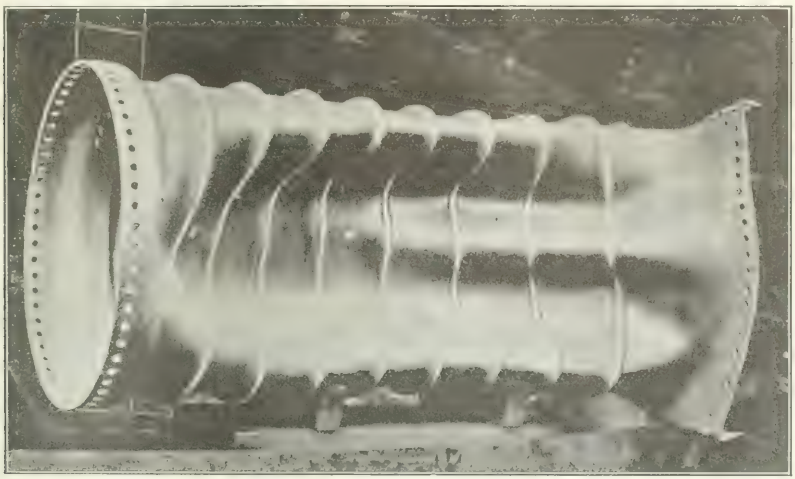


Fig. 3.—An Overheated Boiler Furnace.

In the two following tables are some of the results obtained, typical of the whole series:

Table 1.—Acid Open Hearth Boiler Steel.

No.	Description and cause of removal.	Age in years.	Ultimate stress.	Elongation in 8 in.	Cold bend test
5.	Furnace, overheating	12	63,168	22	180
6.	Furnace, overheating	12	58,912	27	180
7.	Firebox, corrosion	8	61,152	28	180
10.	Back end plates, new boiler fit'd.	25	62,048	27	180
11.	Back end plates, new boiler fit'd.	25	63,840	24	180
19.	Front tube plate, corroded	23	61,600	27	180
23.	Boiler shell, wasted	16	70,336	25	180
24.	Boiler shell, wasted	16	71,456	23	180
27.	Boiler shell, wasted	23	60,256	24	180

Table 2.—Acid Open Hearth Ship Steel.

1.	Forecastle shell, damage	9	65,632	20	180
3.	Flor plate, damage	11	62,944	19	180
4.	Floor plate, damage	11	61,600	19	180
7.	Shell plate, damage	9	62,048	10	180
8.	Shell plate, damage	11	64,064	10	180
10.	Shell plate, damage	12	67,424	24	.*145
12.	Deck plate, much corroded	13	58,688	14	180
13.	Deck plate, much corroded	13	61,376	12	180
16.	Shell plate, damage	11	62,888	20	180
20.	Shell plate, damage	18	63,392	20	180
22.	Shell plate, damage	13	57,344	18	180
27.	Shell plate, damage	8	63,392	22	180

* Broke.

It is of value to note that the samples give ultimate stress results practically within the limits according to which the material was made. The elongation results and the bend tests also show the good quality of the material, even after the lapse of so many years and such severe service.

G. B. W.

German Tests of Old Bridge Material.

Apropos of the above discussion, the *Engineering News* prints the following:

Tests of old bridge metal to determine whether any deterioration due to long service could be noticed have been made on several recent occasions by the German railroad systems. This has been done by taking tension test specimens from different parts of the webs and flanges of girders taken from bridges removed after long service. The specimens from the end of a flange, which had been subjected to very much lower stresses than those from the center, would, therefore, represent more nearly the original metal as concerns absence of deterioration due to stress, and thus some estimate of the service deterioration could be formed by comparing the results of tests from center and end of flange, &c. A recent set of tests was made by the Königsberg division of the Prussian State Railways on metal from bridges which had been in service for 47 years on a well traveled line. The results, reported in the *Zentralblatt der Bauverwaltung*, and transformed by us into American measure, are as follows:

Source of specimen.	Ultimate tensile strength. Pounds per square inch.	Elongation. Per cent.
Upper flange angle of floor beam:		
End of beam	47,000	15.0
Center of beam	46,700	11.7
Web plate of floor beam, at mid depth:		
End of beam	45,400	11.5
Center of beam	44,100	7.5
Lower flange angle of floor beam:		
End of beam	46,700	16.5
Center of beam	49,000	16.5
Upper flange angle of stringer:		
End of beam	48,800	18.3
Center of beam	49,200	20.0
Web plate of stringer, at mid depth:		
End of beam	43,200	8.5
Center of beam	41,600	6.5
Lower flange angle of stringer:		
End of beam	48,100	11.0
Center of beam	45,200	11.0

These results indicate no recognizable difference between the specimens most and least subjected to changes of stress in service, and like some preceding tests of the same kind made in the last few years by the German railroad administrations they indicate that no deterioration in physical properties was produced in service.

Nicholson & Co., operating the Pittsburgh Chain Works at Hawkins Station, near Pittsburgh, have completed the erection of a new 42 x 50 ft. shop, to be equipped with eight forges for making chain forgings. This building is designed for future growth and its equipment with the 26 forges in the old plant enables the firm to turn out quite a tonnage of hand made chain. Additional boiler capacity has been installed and two more coke ovens are in course of erection.

An Alliance Electric Cantilever Gantry Crane.

The freight which the railroads are required to handle differs widely in nature and often involves heavy and bulky pieces, such as fabricated structural members, large machines and castings, blocks of stone and marble, and an endless variety of other materials. The transportation, once the freight is on the cars, presents no especial difficulty, but the loading and unloading is often a problem, which, if one railroad is not equipped to cope with it, means the loss of business to another having better facilities. It is important that the cars be not compelled to stand long idle, for if they do the demurrage charges run up, and rapid means of charging and discharging the cars are essential. The shipper generally has the means of expediting the loading, but the facilities at the destination are not likely to be so good and it becomes desirable for the railroads to provide efficient means of transferring loads at all important centers. Probably the best means of loading and unloading freight is by an electric traveling cantilever gantry crane. The crane can unload a car of freight in a very short time and thus tends to relieve congestion in freight yards. In times when cars and tracks are in great demand and the consignee is not ready to receive his heavy freight, the cars can be unloaded and their contents piled up along side the railroad tracks until the consignee is ready to receive them, when they can be loaded on his trucks.



The Electric Cantilever Gantry Crane in the Lake Shore & Michigan Southern Railway's Toledo Freight Yards. Built by the Alliance Machine Company, Alliance, Ohio.

The illustration herewith is of a 25-ton electric gantry crane with double cantilever ends, designed and built by the Alliance Machine Company, Alliance, Ohio, for the Lake Shore & Michigan Southern Railway Company for use in its freight yards at Toledo. This crane spans two lines of railroad tracks between its supporting legs and leaves room for a wide double wagon roadway between these tracks, while the cantilever arms are each long enough to cover another track and a wagon roadway. The supporting legs are built in the shape of the letter A, but have a clear opening between the diagonal members, as is plainly shown, to permit the crane to pick up a piece of freight from a car on any of the railroad tracks and transfer it along the bridge, and, if necessary, through the supporting legs out on one of the cantilever ends to deposit it on a truck beneath. The supporting legs of the crane are designed so that no part projects more than 24 in. beyond the center of the runway rails, that proper clearance may be maintained between the railroad tracks. Local conditions, of course, may vary the relative location of railroad tracks and wagon roadways.

The crane is supported on eight track wheels mounted on equalizing trucks, so as to permit the crane to accommodate itself to irregularities of the runway tracks. The crane shown has a main hoist with a lifting capacity of 25 tons at 12 ft. per min. and an auxiliary hoist capable of lifting 5 tons at 60 ft. per min. The speed of the trolley is 125 ft. per min. and that of the bridge 250 ft. per min. The span, center to center of the runway rails, is 55 ft. and the length of the crane girders over all 103 ft. The distance from the under side of the crane girders to the top of the track rails is 23 ft.

These cranes are built to be operated on either direct or alternating current.

The Bethlehem Steel Company to Make Power Producing Machinery.

The Bethlehem Steel Company, South Bethlehem, Pa., announces that, in addition to its present lines of heavy hydraulic presses of all descriptions, pumping engines, large machine tools for special purposes, &c., it has engaged in the business of manufacturing power producing machinery of the internal combustion or steam turbine type, as the best needs of the market require. The company's facilities for the selection and control of needed materials are unequaled, due to the fact that it is the only American concern, in this line of business, which combines a large steel plant with great machine shops. Controlling its ore deposits, with its vast experience in the manufacture of all grades of steel, iron and alloy products, it is in a unique position for the selection of materials and the control of each step in the process of manufacture best adapted for the various parts of the machines.

The character and amount of special high grade work of all descriptions done by the Bethlehem Steel Company for the United States Government and for commercial lines have given it a reputation for fine workmanship that is not excelled in the United States. This should count heavily in its favor in entering the new field. The power department will be controlled, as manager, by Arthur West, who has had admirable engineering experience in this line, having been successively assistant chief engineer of the Allis-Chalmers Company, manager of the pumping engine department of the same company, and for the last four years chief engineer of the Westinghouse Machine Company.

Last week the courts at Pittsburgh handed down a decision awarding $40,000 to be divided equally between William G. Park and the Union Trust Company, for acting as receivers for the Clairton Steel Company. They had sued for $150,000 each for services.

The New Morgan Combination Pointer and Shear.

The machine for use in wire mills, shown in Fig. 1, is a new design which combines the functions of a rod pointer and a light shear, and costs but slightly more than would the latter alone. It will cut and point rods up to a maximum of 5/16 to 7/16 in. diame-

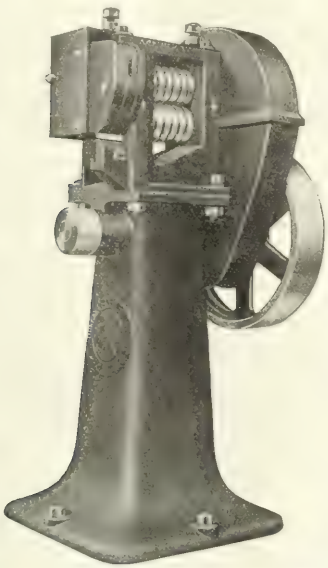


Fig. 1.—The New Combination Pointer and Shear Built by the Morgan Construction Company, Worcester, Mass.

ter, depending upon the stock. The machine, which is built by the Morgan Construction Company, Worcester, Mass., is self-contained and can be adapted for independent motor drive if desired. The rolls are of built up

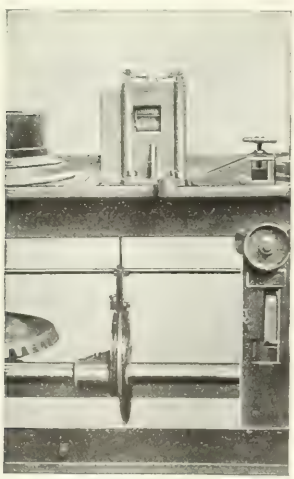


Fig. 2.—A Pointer Without the Shear Attachment, as Mounted on a Drawing Frame.

construction which permits the replacing of worn grooves by substituting new sleeves. The link motion of the shear is simple and permits of continuous running with freedom from repairs. Safety of operation has been effected by limiting the opening of the shear jaws and by protecting the working parts.

The main frame, mounted upon a pedestal, consists of a heavy housing at one side of which is cast the shear frame. The shear is of the direct plunger type operated from the end of one of the rolls by a mechanism designed particularly with reference to continuous operation. Both knives can be quickly removed for sharpening. The arrangement is such that it is impossible to introduce between the jaws a rod exceeding the capacity of the knives, a protection unusual in shears of the alligator jaw type. The window in the housing through which the rod is thrust between the rolls for pointing is within convenient working distance, and has been made as large as consistent with strength to give the operator plenty of freedom of action. The rolls are provided with sleeves which are grooved and then hardened and ground before slipping upon their arbors. New sleeves may be obtained when the grooves are worn and easily substituted for the old ones.

The drive is by belt either from an overhead countershaft or from a motor suspended from the ceiling or resting upon the floor. The power is applied to a belt wheel with a heavy rim for fly wheel effect by single gear reduction, which drives one of the arbors holding the roll sleeve. The gears are machine cut throughout and those of the first reduction are protected by a removable gear case while those on the roll arbors are enclosed within the housing. The operator is further protected by a shield surrounding the working parts of the shear.

The machine can be supplied with a driving mechanism giving a reciprocating motion to the rolls. The pointers are also built without the shear attachment in both rotary and reciprocating types for mounting on a drawing frame between the blocks, in which case they are driven from the gear shaft, as shown in Fig. 2.

Iron Freight Rates Not to Be Advanced.

Since the publication in *The Iron Age* of April 30 of details regarding the proposed advance in class rates in official classification territory it has been decided by the rate committees of the railroads that an exception will be made of all important articles of iron and steel. Rates will not be advanced on these articles. This change was decided upon at a meeting of the representatives of the various roads held in New York last week. They found the pressure from iron and steel shipping interests was too strong to be ignored, and that the opposition might endanger the general advance in class rates.

Commodity tariffs will be issued by the various roads, in which the rates on iron and steel articles will be maintained on the present basis. It is understood that these commodity tariffs will cover practically all the iron and steel articles that were formerly carried in the "special iron list" of the roads in official classification territory. These tariffs will include all the important jobbing and manufacturing points, so that the rates on iron and steel materials used by manufacturers or handled by jobbing interests will remain unchanged at the present figures.

Rates for short hauls, from the jobber to the retail dealer or the blacksmith, will be subject to the classification and will therefore be advanced, but it is claimed that the increase on these distributing rates will seldom be more than 1 to 2 cents per 100 lb., so that the change will not be felt by the trade or the public. These distributing rates were not affected by the increase of a year ago, when the articles on the "special iron list" were advanced half a class by canceling this special tariff and throwing the articles named in it back into the regular classification.

It is understood that it will require several months for the rate expects of the carriers to readjust all the commodity tariffs to the new basis contemplated. The tariffs to be reissued will be those on commodities which have not been advanced in recent years. It is stated by well informed railroad officials that there will be no general readjustment of soft coal rates until the end of the current "coal year," April 1 next. B. L. A.

Shop Methods on the Two Coasts.*

Owners Fare Better on the Atlantic Seaboard and Workmen in the Far West.

BY GEORGE W. DICKIE.

After spending 35 years in the practice of engineering on the Pacific Coast, I am now spending a year and a half superintending work of a similar character on the Atlantic Coast, and I find myself among new conditions and new methods. In this paper I will endeavor to compare, from an engineering standpoint, conditions as I find them there with those that obtain on the Pacific Coast.

The Atlantic States, which front on the long Eastern seaboard, have been five times as long under development as the Western States. Their population is much more numerous within a similar area. The markets for the products of their industries, both domestic and foreign, are correspondingly more extended and varied; their transportation facilities much more highly developed and convenient. Their great population supplies them with workmen, makes necessary the enterprises which demand the product of their engineering establishments, and their facilities for transportation put them in close touch with their markets. While the volume of business is so great, this is not so much because of new demands for new machines to obtain new results, but rather for the same machines to do the same thing in a new locality or to increase the output in the same locality. Consequently, we find mechanical engineering establishments devoted entirely to the production of one machine or class of machines, where every part has been standardized, special machines have been installed for the cheapest possible production of every part and special workmen have been trained to get the largest output possible from these special machines. This condition is possible only where there is a large market for a special type of machine.

Contrasts in Specializing.

On the Pacific Coast the conditions which would make such a system possible have not hitherto prevailed. Its manufacturing cannot be applied to the production of special machines, for the conditions which demand such a manufactory do not exist. The machines made there are not manufactured, but built one by one. Because of the variety of output which an engineering establishment must produce in order to live, special machines to produce any one part are out of the question, and workmen good at only one operation cannot be profitably employed. The Pacific Coast establishment is, therefore, an engineering shop and not a manufactory, and in it anything possible in mechanics can be designed and built with a very fair prospect of meeting all the requirements demanded of it, but all the engineering skill used in the design and construction of this one machine goes with it, although it is quite as great as that required in a manufactory for the production of a thousand such machines. Consequently the Western engineer must be constantly exercising his skill, experience and ingenuity in the design of new machines to keep his shop going, while his Eastern brother, having perfected a design to meet the general requirements of "the trade," may set his brain to work on eliminating all sources of loss in the system he has established for producing his machine at the lowest possible cost.

The principal difference, then, is this: That whereas the engineer in the West devotes his time and skill to meet the requirements of each customer, the engineer of the East perfects one machine to meet the requirements of all his customers and spends his time and energies in producing it at a cost that will insure it a ready sale in the open market. This difference results in the manufacturing mechanical engineer of the East being able not only to undersell his brother of the West in machines that the general market requires in manufacturable quantities, but in many cases to enter successfully the markets of Europe, where the unit price of labor is much less than that obtaining in his own establishment.

On the other hand, should a client approach an Eastern shop with the outline of some piece of mechanism to meet some new condition, the development of which requires thorough and general mechanical skill, and, after the plan is developed, individual skill on the part of the workman in the shop, to produce it, he will find great difficulty in getting a shop to undertake to carry out his ideas, and should he find one willing to serve him he would probably be surprised at the excessive cost of the undertaking. On the Pacific Coast this original class of work is continually being made and the engineer and his shop are by constant practice ever ready to take hold of and carry to successful completion anything possible in mechanics, and that at a cost not much if any greater than ordinary work of the same complexity.

Differences in Shop Organization.

The reason for this is to be found in the difference in shop organization brought about by the variance in the trade conditions between the one locality and the other. In the East a thoroughly organized and often very complex system, working harmoniously along lines that are the result of careful study and much experience, produces a machine as perfect as the system of which it is the embodiment, irrespective of the mechanical ability and general knowledge of the operators. The workmen acquire highly specialized skill, carrying out instructions according to the system; the staff becomes highly expert in applying and perfecting it. The system itself is or may be made perfect in obtaining the result for which it is intended. Applied to a new condition it loses its efficiency in a greater or less degree, according to the amount of the deviation from the beaten track. In the West, on the contrary, owing to the necessity of turning out a product as varied as the mechanical needs of a new and developing country, a shop cannot have any particular system, except that of a general organization which must be elastic enough to adapt itself readily to widely different kinds of product, where no foresight can possibly prepare for the work that must next be undertaken.

The planning may be and often is along original lines, without precedent or general experience to guide the designer, and when the design reaches the shop where it is to be made, its growth must be carefully watched, for often the thing in metal does not look like its image in ink. The working mechanic may often be able to save the reputation of the designer by timely advice, the result of his practical experience with metals and his skill in working them. Hence, not only must the designing staff be able to design any kind of a machine that a customer may require, but his workers must also be mechanics of great skill and general experience to bring safely into working form the design that has just been brought from the fertile brain of his chief.

In the one case a perfect system produces at the least possible cost a perfectly planned and experimentally adjusted design without any skill on the part of the workman other than that required to perform his part in the system. In the other case a machine to meet special conditions is designed as skilfully and as perfectly as the engineer's skill and experience enable him to design it; it is built by skilled mechanics under a system that enables the designer of the skilled workman to modify the design at any stage of the production should occasion require it.

Comparative Results to Owners and Workmen.

There are two principal points of view from which to observe the results that follow from the workings of these two radically different methods of production. They may be viewed from the position of the capitalist and from the position of the working man or operative, both of whom are involved. A shop with the system so much to be seen in the Atlantic States, looked at from the capitalist's position, is a profitable investment for his surplus or inheritance, and tends to create an upper class or controlling power in mechanical engineering.

Looking at it from the operative's position we see the extinction of all individual effort on the part of the me-

* A paper read before the Technical Society of the Pacific Coast, San Francisco, Cal.

chanic to improve the product of which his work forms a part; lack of interest in his work, due to the repetition of the same operation on the same parts of a machine that he never sees finished; no prospect of a better condition or increased pay. Above the workman we see an array of college graduates operating the system and assigning the work to the operatives; above these the controlling head, whose engineering skill contrived the system and the machinery through which it operates, the man who has the confidence of the capitalist and whose position is established as long as the supply of skill to operate the system is plentiful, and this is secured by the yearly turnout of the technical and other colleges.

The shop organization on the Pacific Coast from the capitalist's position is not so good. It shows no prospect of a large return to the investor, owing to the varied character of the product, each item of it involving new problems, which, when solved, have no application to those succeeding them. The controlling head of the work has not the same security in his place as his Eastern prototype, for every day brings a fresh problem, requiring new applications of mechanical engineering skill. His power to work out these new problems is his worth, in virtue of which he retains his position and its emoluments. The problem he solved yesterday is not in itself a solution of the problem of the future; he cannot sustain himself on the success of the past. When the continual strain has told on his store of brain energy and he begins to blunder, he can no longer hold his post and is replaced by a younger and fresher man. He has not an automatic system to fall back on; he himself is the system.

From the working mechanic's standpoint the Western methods of shop organization present a brighter prospect. The better paid positions must be filled by men who know the things they order made and who have learned in the school of experience. Those whom they work under must necessarily have traveled by the same way in which the mechanic now is. To his ambition the view is promising; his brains and mechanical skill are assets of great possible value; he feels that by perseverance he may better his condition and obtain the better fortune to which he aspires. It is, then, from the viewpoint of the man who is willing to think and work, to the progressive man, that the Western method appeals to us.

The economic effect of the system from the standpoint of cheap construction is undoubtedly good, for it reduces the cost of the machine to the lowest possible point obtainable with the current rates for material and labor, and thus enables the producer to reach markets that would otherwise be closed to him. It enables him to secure capital to extend his operations, because he can figure on the actual cost of production and the profits that can be secured. It is his system which enables him to eliminate the uncertainties of skilled labor and the difficulty of knowing how it will act. Much of the work that under the simple organization of the West is done by the works manager is done by a skilled force of computers, whom the system supplies with a great deal of more or less exact data, enabling them to figure just what each man may be expected to do.

The Slide Rule System and the Man.

In his very interesting and elaborate presidential address on "The Art of Cutting Metals," read before the American Society of Mechanical Engineers, F. W. Taylor gives a very complete history of the system that he has largely been the means of introducing, whereby the possible amount of work of any tool on any known character of material is computed on a special slide rule by a man trained and experienced in this work. This address, which amounts in its scope to a treatise, is undoubtedly of a high order of merit, and is the most valuable contribution to engineering literature that has been made of late years; but in some particulars I wish to take exception to the methods advocated by its author. The result as obtained by the slide rule is the work demanded of the operative. Mr. Taylor informs us that his greatest difficulties have been with skilled mechanics, men whose characters and abilities he had to respect, but who would not give up their habit of thinking for themselves. They refused to accept the decisions of the slide rule and had to give way to the man who was content to carry out instructions. As I thought of the result of this trial, like the men who had to be replaced, I could not help thinking—another way occurred to me whereby the same result was obtained without dismissing the thinking workmen. While studying the system in operation at some large establishments in England, wherein the workmen as a body contract to do all the labor involved in the production of any given piece of work, I happened to be looking through one which had for a long time practiced this method. Observing an old machinist, with an interesting face, at a large lathe, I talked with him about this system and asked him whether it stimulated the men themselves to think of the cost and the quickest way of doing their work. In replying, he pointed to a young man working a smaller lathe nearby, and said: "Now, there is a young man who came here from Glasgow some weeks ago; he is a good lathe hand, he knows everything that can be done with a lathe and does it well; we had to teach him only one thing, and that was how much a lathe can do." This method arrives at the same result as Mr. Taylor's slide rule in obtaining the maximum output from each machine, and its moral effect is good. The moral effect of the system that has enabled the American manufacturing engineer to secure and hold markets, not only in his own country, but also in foreign countries where the workman does not secure anything like the wages paid to the American mechanic, cannot be called good.

I have tried to observe the condition of the workman under the slide rule system as compared with the condition of those who work in shops where the varied nature of the work does not admit of a system that may be rigorously carried out, but where the results obtained, both mechanical and economical, depend largely on the individual mechanical ability and moral character of the working man. The tendency of the rule system is to deaden all individual effort on the part of the working man. His interest in his work ends with the accomplishment of the task worked out for him on the rule. His outlook is not brightened much, even if he succeeds in beating it, as this feat means only a few cents more in a given time. He receives no stimulus from the completion of any finished piece of mechanism that he has produced. He only sees gathering around him on the one side a pile of rough blanks all alike, which he, or rather the machine he operates, converts into another pile of finished parts all alike. That is all he sees and knows of the part he plays in a great industry. There is no nourishment in that work for the brain, and that man cannot grow. In fact, he loses the power to think and the desire to grow; he swiftly and surely becomes the automaton that fits so well into Mr. Taylor's slide rule system. Therefore, I say, the moral effect is not good. But how else is it possible to reach the market with a product that may be profitably sold at the price the market offers? The mechanical engineering establishments in the Eastern States have developed and perfected systems along these lines which are successful in making profits for the investors, but have an immoral tendency to destroy the independent, thinking mechanic.

Needed Changes in Pacific Coast Methods.

The time is fast approaching, if it has not already come, when the Pacific Coast engineering establishment must take special lines of work and perfect a system of manufacture that will at least secure for it the local market for its product; when that is secured, its growth will be commensurate with the growth of the population and commerce of the place. Is it possible to secure the economy of what I will call the slide rule system by some other method that will not displace the skilled mechanic? Is there, on the other hand, any system of management that will enable engineering establishments on the Pacific Coast to continue doing business under the conditions that now obtain, where time wages are higher than in any other part of the world, and where to offset this the economic conditions of operating are low as compared with any system that determines the amount

of production per unit of time? After careful study of conditions in the West, I am forced to the conclusion that unless a radical change is made in the method of doing work, mechanical engineering as a business will sink to the level of the small jobbing shop. These conditions, bad as they have been, are steadily growing worse. The workmen seem to forget that with modern means of transportation no section of this country, great as it is, can maintain conditions so radically different from those prevailing in other parts, as now attempted by them. The terrible condition of industrial engineering in this part of the country, where we were always proud of our high class workmen, is directly due to the forced and artificial value placed on labor by labor itself. It is hardly possible now to go back to old conditions of hours and wages. If we are to continue to produce what we require of machinery, those managing the establishments that are to produce it will have to find out honestly what part of the possible selling price can be given to the workmen who convert the raw material into the salable machine, and contract with them or their representatives to do all the work for that amount; in that case the men can work long or short hours, as it may suit them. Each man will be compelled by his fellows, who are his partners in the contract, to do his fair share of the work in order to obtain his pro rata of the reward.

I do not think that the methods I find so extensively adopted in the East can be put in operation on the Pacific Coast unless the present force of mechanics now usually on strike is entirely eliminated and a new race of operatives, willing to work under the slide rule system, is introduced. Either the slide rule system and a fresh supply of labor or the contract system and the present force must step in to save this struggling and now almost expiring industry.

Much Higher Costs on the Pacific Coast.

A few months ago I had occasion to purchase a number of machines of a type that I had perfected on the Pacific Coast to meet the special requirements there. The demand on the Coast required about 20 of these machines each year, and I used to make them in lots of 20 at a time, not so much for profit as for filling in and keeping the small tools in work. They were sold at $900 each, and at that price they paid for material, labor and a pro rata of general expenses. I required 16 of these same machines for the purpose I refer to and had the drawings from which they were made in San Francisco. The same machines I bought for $500 a piece at an establishment in Maine, where the facilities in tools and handling apparatus are not so good as in San Francisco. About 60 of these machines are now being made at the same establishment for the Pacific Coast trade, and the business of making them there is stopped. The labor cost of this machine in San Francisco was $530, while the labor cost in the East is $210. Adding the cost of transportation to this Eastern labor cost, and the amount available for wages to operatives in San Francisco, assuming, of course, that the general expense and profit amounted to the same thing in these two cases is $315. Since interstate commerce is free and unrestricted, the transportation charges represent the difference available in the possible prices obtainable in the East and the West for such a machine as a continuous manufacturing proposition.

To so alter your conditions in the labor market that you may compete with the Eastern States is a present necessity if you would secure in mechanical engineering future prosperity. A change must come in the relations of employers and employed; a more intimate connection and co-relation must be established. To make the mechanic understand that there are practical and economically impassable limitations to the achievement of short hours and high wages; to make him realize that the price of any article being fixed, the amount available for labor is also fixed; to bring the employers to believe that the only way to prevent strikes and secure a lasting industrial peace is to have a thorough understanding between themselves and their employees as to the amount in the cost of any product that may be applied to compensate the workman for his toil; to teach employers the justice of frankly figuring out with their employees the cost of materials, expense of operating, profit required and amount available for labor; in short, to establish a just balance and to apply the Golden Rule to industry—this is the great problem to be solved by those interested in the development of engineering industries on the Pacific Coast. Strikes and lockouts will never settle anything in industrial economics. Their object is to destroy, and in this their success is beyond dispute. As a means of settlement for any misunderstanding that may exist between employer and employed they should at once and forever be done away with, as entirely too crude for this age of enlightenment and progress.

The Peerless Polishing Wheel.

The polishing wheel, a sectional view of which is shown in the illustration, is designed for medium and heavy work, such as edge tools, tool handles, carriage hardware, stove trimmings, &c. The center is of wood with iron core and flanges, and the rim or cushion consists of pieces of leather set edgewise on the periphery of the wood. The pieces are strung together on a metallic band and glued to each other and to the wooden center. The thickness of the cushion gives elasticity to the wheel. It can be turned to fit any work desired, and



Sectional View of the Peerless Polishing Wheel Made by F. P. Pfleghar & Son, New Haven, Conn.

will not blister when used on heavy work. The best material is used in its manufacture, it is stated, and great durability is claimed for it. It is manufactured by F. P. Pfleghar & Son, New Haven, Conn.

A Western Molding Sand Plant.—The Illinois Valley Sand Company, Ottawa, Ill., has recently completed a plant for the preparation of molding sand. This plant, which was designed and constructed by the J. C. Buckbee Company, engineer, Chicago, has a capacity of about 1000 tons daily, and is the only one of its kind in that section of the country. A feature of the plant is its large storage capacity, which enables heavy stocks to be carried, from which quick shipments can be made at any time. It is also equipped with a system of driers so that dry sand can be furnished regardless of weather conditions. This is of great importance in the winter, since sand as it is taken from the bank, or green, as it is termed, will in cold weather freeze in the cars, making it extremely difficult to unload at its destination. The sand handled by the company contains 98 per cent. of silica, mixed with about 1 per cent. of clay, which makes it not only a desirable steel foundry molding sand, but equally serviceable for core work. All of the sand in passing through the plant is thoroughly screened, thus yielding a uniform product either in dry or green sand. A large part of the product is used by the American Steel Foundries for the requirements of its Western plants.

Core Binders.*

BY L. D. FROHMAN.

The ideal core compound is one that makes a good plastic core when green, strong, open, tough when dried, which will not swell when baked, but will fit right into the core box, nor will it break off from the rough usage and handling in the foundry, and when the iron is poured should break up and literally run from the mold and under no conditions will absorb moisture. Truly this is an ideal state, but it has not yet been reached, even if the average foundry supply salesmen think they have it. To accomplish this has been the aim, ambition and desire of every manufacturer. It is true that these conditions can be brought about where the question of cost does not enter, but in this every day world of commercialism, where cost is an ever important item of consideration, our ideal must be within the limits of reason and at a cost within reach of every foundryman. So much for ideal. Now let us take the individual raw materials which are used in the manufacture of cores in every day use in the foundry.

Flour and Resin.

No one will deny that more flour is used in the making of cores than any other single class of raw material. We will leave out the item of adulteration of flour, which is known to every foundryman to his great disadvantage and cost. It is only the pure, high grade flours that we will discuss, which are now high in cost and vary from day to day. Now let us study flour; first its action when green, when baked and when shaken from the mold. In the first place, when plenty of flour is used in making the core we have an excellent green sand core; but one of the greatest disadvantages where a large quantity of flour is used is the swelling when the core is baked, not to say anything of the serious objections of the castings being lost by blowing and their cleaning cost.

To blame the flour, when used in excess, because of blowing would not be fair, as blowing with any compound can be brought about by the strong arm of the coremaker. Should the coremaker ram the core too hard in spots, it is very apt to cause blowing. It may sound strange, but very often cleaning costs are advanced on account of the use of flour, the core not cleaning out as readily as one would suppose. Another of the great disadvantages of flour is its fluctuation in the market. The foundryman, figuring his coreroom cost one day at one price, to be true to himself must look at the daily flour market quotations and find where he stands, especially if he is a large user, and some of you use at least a carload a month.

Resin, formerly a residue in the manufacture of turpentine, now a by-product in the manufacture of turpentine from yellow pine, is undoubtedly one of the best materials for making cores, and approaches nearer to the formula given as an ideal core compound than any other on the market. The only objections I have been able to find are the smoke and baking, and the fact that the Standard Oil people need the money and have manipulated its selling price. This makes it a rarity for foundry use and places it on a pedestal of "what might have been." Resin surely makes a solid core when dry, and the addition of loam sand makes a good green core sand when dry, and it does certainly clean readily from the castings when the iron is poured, but the four letters, c-o-s-t, are rapidly eliminating resin for foundry purposes.

Dextrine and Patented Mixtures.

Dextrine makes a green, plastic core, and if used in proper proportions is all that can be desired. Again the item of cost comes into play, from the fact that pure dextrine is out of proportion in its cost for the use that it may be put to. When it is sold cheaply so that the foundry can use it, it is either in the form of adulteration or what is called floor dust, and contains various proportions of starch, dirt and what not, making it an expensive core compound. It must be watched exceedingly closely not to have too much of the dextrine, as absorbing moisture and blowing can only be avoided by having the right proportions to the sand in question; but if used properly it will clean out readily from casting and is of great value. The users of dextrine must watch their sand more closely than any other mixture that can be used.

Then we have patent mixtures consisting of treated flour or starch or a celluloid compound, so-called jellulose. This is simply flour treated with caustic soda or chemicals to convert the starch in the flour to dextrine, thus giving a greater green sand binding and the chemicals giving the sand great strength when baked. The cleaning cost is the only item that must be watched in a case of this kind, the chemicals burning in and preventing the sand from breaking from the mold.

Bitumen, Glue, Oils and Glutrine.

Bitumen, or asphalt, is absolutely no good when used by itself, as the bitumen bakes hard in the oven and when the heat of the iron strikes it the core does not break up as one would suppose, but becomes harder than ever. Many a time the writer has seen the cleaning floor worked for hours to clean out a core made with this class of material.

Glue itself may sound strange to the ordinary foundry. When dissolved in water and boiled and used in the proper proportions it makes a very good core. Absorbing the moisture, however, and blowing when the castings are poured offer two serious objections, and it must be watched exceedingly closely in order to give any good results whatsoever.

Now come the various oils. There is no question that linseed oil makes an exceptionally fine core and it is one of the best core compounds, but that ever used four-lettered word, cost, which must be heeded in the ordinary foundry practice of to-day, prevents its use. Linseed oil makes an exceedingly strong core when dry, but a very poor green sand core, and forms must be used with this as well as oil cores when baked. Another oil used to a great extent in the foundries in the East is fish oil. Its ill smelling properties make it obnoxious for many foundries to use, but it has excellent qualities and in many ways is equal to linseed. Corn oil is also an exceptionally good oil, having, however, its faults of not being quite as strong as fish oil and linseed oil and it will not spread over the sand like linseed oil. Therefore core oil manufacturers use small proportions of the various oils such as linseed oil for strength and corn oil and petroleum or mineral oils for spreading the oils over the various sands. It can be readily seen that by using different proportions of the various oils mentioned above, by figuring permutations and combinations, almost 100 mixtures of different kinds of oils can be placed upon the market, all having merits. Glutrine is a residue of paper mills. In the manufacture of paper the wood is treated with sulphite and magnesia sulphite in large digesters. The lime and magnesia sulphite eat out the resins from the wood and leave the jellulose, which is called the wood pulp. The liquors contain the resins of the wood which give the green sand binders, while the lime and magnesia give bond when the materials are baked. The sulphur in the compound is apt to affect the iron of the casting.

Esso and Kantbebeat.

Esso core binder is the juice of various plants treated with chemicals which will not absorb moisture. The juices of the plants give the green sand binder and the chemicals bind the core when baked. The extreme heat of the iron breaks up these chemicals and causes the core to clean readily from the sand. There are many advantages in this material. One is its cheapness and another is the readiness with which it can be used. It goes as far as 60 parts of sand to one of core binder, and the writer does know of the use of 100 parts of sand to one of core binder. Esso core binder, on this account, the writer considers one of the most modern and up to date core binders, and naturally would do so as it is a child of his own.

No doubt many other materials can be used in the

* Read before the Pittsburgh Foundrymen's Association, May 4. Mr. Frohman is Pittsburgh representative of the S. Obermayer Company.

manufacture of core compounds, but are excluded on account of cost. Now let us take the bitumen compounds, of which Kantbebeat is one manufactured by the writer's company. This contains one of the ideal materials spoken of before, as the highest quality of material for giving it a good green sand body; the bitumen giving it the bond or body when baked and having materials added to it which will burn up readily when the iron is cored. Permutations and combinations were tried in the laboratory of the company to the extent of over 200 different kinds of dry compounds until we found what was desirable. This material had to be manufactured so that it could b shipped large distances, so that it could be kept in stock from three to six months, and even a year, and not spoil; it had to be made so that it would be acceptable to almost all sorts of conditions of sand.

Kantbebeat core compound for heavy work is used with 10 parts old core sand, 10 parts loam molding sand, 10 parts sharp sand. The temperature for the mixture is about the same as for flour cores. The point aimed at is a core that must be well heated in order to have it cleaned easily and readily from the casting. If the heat is not of a high temperature the cores are apt to bake extremely hard. We have found that Kantbebeat is of extreme value to foundrymen in green sand work, when used at the ratio of 15 parts of molding sand to 1 part of Kantbebeat. It has the great advantage of not swelling or warping, and doing away with the sea coal facing generally used in the sand and also for skin dried work. This is especially of advantage where charcoal fires must be used for skin drying, and in this community, where gas is becoming a luxury, it would be of great assistance and value to the foundryman.

The Duty on Metal Statuary.

With a view to reducing the duty on metal statuary, a test case has been brought before the Board of United States General Appraisers, which it is intended shall reach eventually the Supreme Court. The statuary in question has been cast, but afterward finished or improved by the hand of the designer or sculptor. In brief, the question between the importers, B. Altman & Co., New York, and the Government, is whether the statuary in controversy is the "statuary" referred to in the Tariff act or whether the articles are to be regarded for the purposes of levying duty as "manufactures of metal." Section 3 of the tariff provides for the making of commercial agreements with foreign countries under which certain articles shall be permitted to be imported here at a reduced rate of duty. Among these articles is statuary, on which the duty is to be reduced from 25 to 15 per cent. The term "statuary," as used in Section 3 and in the commercial agreement with France and in the President's proclamation thereunder, is not accompanied by the qualifying phrase about being cut by hand from metal. The courts have recently decided that an article is cut by hand from metal, even though cast, if the finishing touches are made by hand under the personal supervision of the sculptor.

Bronze Bust from France.

The case now before the Board of General Appraisers relates to an importation of bronze busts from France. The importers brought testimony before the Board of Appraisers that such works were finished under the personal supervision of the sculptor and required finishing touches by hand. The Government is undertaking to show that all a sculptor has to do with bronze statues, even of the highest class, such as equestrian statues and statues in heroic size by distinguished sculptors, such as J. Q. A. Ward, MacMonnies, Ruckstuhl, St. Gaudens, and others, is to prepare a design and a plaster model, and that after they have done this it is exceedingly unusual for them to give any supervision whatever to the completion of the work, and that in some instances they never see it after it is finished or before its erection. The peculiarity of this situation consists in the fact that to prove these allegations the Government does not call these distinguished sculptors, or any of them, or any sculptors, but brings as witnesses foremen or superintendents from foundries where such works are constructed, and these men testify that the sculptor in general has nothing to do with the completion of a statue.

It is well known that when the sculptors are engaged to design these statues, their employment and their compensation are based largely upon their contention that in addition to preparing a design and a model they have to give personal supervision to the work of preparing the statue, so that if the testimony of these brass founders is to be accepted it apparently puts the sculptors in the position of having their scale of compensation determined and based upon an assumed amount of labor on their part, which they never in fact performed.

Antique Statues in Evidence.

The Board of Appraisers gave a hearing in this case May 8, at which in order to prove that there were in fact statues wrought by hand from metal, the Government offered in evidence copies of statutes produced by *repoussé* work, said to have been executed in the year 500 B. C. Counsel for the importers objected to these photographs upon the ground that proof that certain works of art were produced in a certain way 500 years before Christ did not tend to establish that they were produced in that way nearly 2000 years after Christ, but the testimony was admitted. W. Wickham Smith of the firm of Curie, Smith & Maxwell, who is acting as counsel for the importers, had this to say:

> The question at issue in this case is one of very general importance, because all large importers of bronze statuary are interested in the decision. The Supreme Court has never yet passed upon the question whether the terms "wrought by hand from metal" are to apply only to works that are not cast, but are entirely produced by hand. If the Government's contention on that point be correct, then practically no metal statuary would be covered by paragraph 454, as it is only in the case of one or two importations in a decade that statuary wrought by hand from metal has been brought into this country. The only well established instance of this kind that I know is that of the Bartholdi Staute of Liberty in New York Harbor. Of course, this statue was not charged with duty, as it was a present to the United States. In the case of almost all metal statuary imported into this country, it is cast, and the only hand work upon it consists of finishing touches, after the statue has been substantially completed by the brass founder. The importers are determined to procure a decision of the court of last resort upon this question.
>
> In the present case an appeal will doubtless be taken by either side from a decision of the Board of General Appraisers to the Circuit Court of the United States. If the decision of that court should be unfavorable to the importers the case will be taken directly to the Supreme Court of the United States by reason of the fact that a question is involved as to the consruction of a treaty.

The board is expected to make a decision in the matter shortly.

Allis-Chalmers Power Equipment for the Youngstown Sheet & Tube Company.—The Youngstown Sheet & Tube Company, Youngstown, Ohio, has placed a contract with the Allis-Chalmers Company, Milwaukee, Wis., for three large motor generator sets intended for operation in connection with two 1500-kw. Allis-Chalmers steam turbines and generators ordered some time ago. The equipment will also include two induction motor exciter sets, a balancer and transformers of the oil filled self-cooled type. The main motor generator sets each comprise 500-kw. 250-volt direct current generators and 750-h.p., 6000-volt, 25-cycle motors. This addition will give the plant electric current for lights, crane operation, furnace skip, &c. The added power, to provide which practically a new power house was required, was rendered necessary by the erection of two new blast furnaces. One of the turbines is designed to operate condensing and one noncondensing, with steam pressure of 150 lb. per square inch. The exhaust from the noncondensing turbine is to be utilized for heating boiler feed water in an open type heater. Julian Kennedy, Pittsburgh, Pa., acted as consulting engineer.

The corporate name of the United States Standard Electrical Works, Racine, Wis., has been changed to the Standard Electric Works.

The Rockwood Dry Pipe Valve.

The dry pipe valve shown in the illustrations constitutes the essential feature of a dry pipe automatic sprinkler system for the fire protection of buildings, where water in the pipes would freeze were it admitted. Air is maintained under pressure in the system, acting against the water pressure on the under surface of the valve. When the air pressure acting on the surface of the prim-

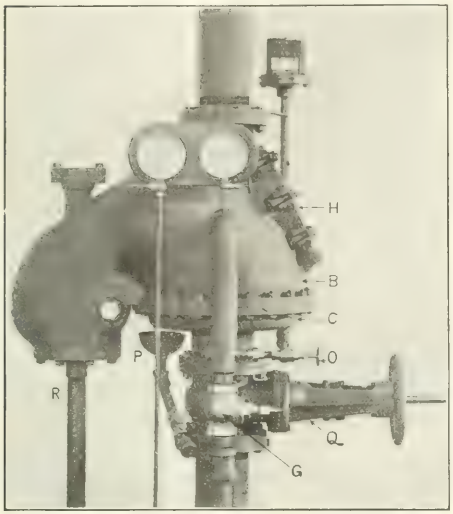


Fig. 1.—The Rockwood Dry Pipe Valve for Automatic Sprinkler Systems, Made by the Worcester Fire Extinguisher Company, Worcester, Mass.

ing water is relieved by the opening of a sprinkler, the upward pressure of the water causes the valve plate to lift, and an intermediate chamber fills with water, with the result that the entire force of the water, exerted over the full area of the plate, pushes it over to the wide open position and thus leaves a straight unobstructed passage for the water to the system. The valve is the invention

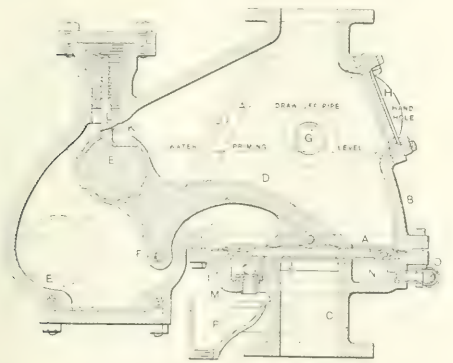


Fig. 2.—Sectional View of the Rockwood Dry-Pipe Valve.

of George I. Rockwood, and is built by the Worcester Fire Extinguisher Company, Worcester, Mass.

In the exterior view of the valve, Fig. 1, and the sectional view, Fig. 2, the same reference letters designate the same parts. The bronze valve plate A acts both to close the water inlet J, and to seal the air valve chamber by the contact of the rubber ring at its circumference on a block tin air valve seat, I. The valve plate swings in the upper part of the valve body, B. The lower part, C, of the valve body carries the air and water seats. The valve plate and a counterweight, E, are attached to the swinging arm, D, the whole swinging about the axis F as the valve opens to the position A' E' F. The counterweight is an iron ball filled with lead. When the valve is shut, the center of gravity is such as to hold the plate on its seat, but when the valve opens the center of gravity shifts to hold it in that position.

The ratio of the upper surface of the valve against which the air pressure acts and the under surface which receives the water pressure is such that with 50 lb. water pressure the limits of air pressure in the system are 15 and 25 lb.; at 75 lb. water pressure, 20 and 30 lb.; at 100 lb. water pressure, 25 and 35 lb., and at 150 lb. water pressure, 35 and 50 lb. air pressure.

As a means of precaution the projection K on the counterweight ball is adapted to engage a spring latch L, when the valve opens. Its purpose is to prevent the valve plate returning to its seat if the combination should occur of a feeble water supply, a corroded or jammed spindle F, and a reversal of flow after the riser has filled with water. Under normal conditions the latch has no part in the operation of the valve.

The ball seated swing check valve M is automatically held from its seat by the contact of its arm extension with the under side of the valve plate, and thus allows any water which may leak by J to run freely out of the intermediate chamber N, into the drip cup, P.

A jack, shown at R, is used for raising the lip of the upper body B over the flange of the under body C, when it is desired to remove the under body or the valve plate for repairs. A drain valve for emptying the entire system of sprinklers and piping is shown at G, and at O is a drip pipe for drawing the priming water left in the valve body after the system has been emptied. The valve has been approved by the Underwriters' Laboratories.

The American Welding Company.

The American Welding Company, a Pennsylvania corporation, with a capital of $100,000, which recently succeeded to the business of the Morton Iron Works, Greenpoint, Brooklyn, N. Y., has just completed the erection of a large plant at Carbondale, Pa. It comprises a machine welding shop 82 ft. wide, two stories, with central crane way of 200 ft. for an overhead traveling crane of 40 ft. span; a hand welding shop 38 x 123 ft., one story; a storage warehouse 22 x 41 ft., two stories; an office building, 43 x 27 ft., one story, with vault extension, 10 x 16 ft., and basement; a power house, 36 x 39 ft.; a fuel gas generating house 25 x 25 ft., and a gas holder in iron tank. The principal buildings are constructed of steel, brick and glass, and are practically fireproof.

The works occupy a site of four acres, located on the Delaware & Hudson Railroad in North Carbondale; it also has track connections with the Erie and the New York, Ontario & Western railroads, so that the shipping facilities are of the best. The plant is fully provided with overhead traveling cranes, air and hand hoists, an industrial railroad equipment, is lighted by electricity, and has a complete system of fire protection. The machinery is operated by electric and hydraulic power and all of it has been specially built for the particular work in view. A 200 hp. Wickes vertical boiler supplies the steam for power and heat.

The works are specially designed for the manufacture of welded steel tanks for ammonia, carbonic acid, chlorine and other gases under high pressures; shells, furnaces, steam drums, mud drums and headers for steam boilers; ice machine and refrigerating machine shells and tanks, paper pulp digesters, wood vulcanizing cylinders, chemical treatment cylinders, water pipe of large diameter and length, with welded on flanges and other work in which the use of riveted seams is either undesirable or impracticable.

The officers of the company are Chas. L. Rowland, president; Alfred P. Trautwein, vice-president; Frank A. Dempsey, secretary and treasurer. The company reports considerable work on hand and numerous inquiries that promise well for future business.

The Pennsylvania Steel Company.

The following report covers the operations of the mining, manufacturing and railroad companies owned or controlled by the Pennsylvania Steel Company of New Jersey for the fiscal year ending December 31, 1907:

Mining Companies.

The coal properties in Indiana County, Pa., belonging to subsidiary companies, the Penn-Mary Coal Company and the Possum Glory Coal & Coke Company, produced 428,000 tons of coal compared with 259,000 tons in 1906. These properties were further developed during the year by the opening of a new mine and the construction of a steel coal tipple.

The iron ore properties near Santiago, Cuba, belonging to subsidiary company, the Spanish-American Iron Company, which have been producing for many years, were operated to their full capacity during 1907. They mined 500,000 tons of iron ore during the year, and by explorations added more than this amount to their reserves. In last year's report, reference was made to the discovery on the north coast of Cuba by the company of large deposits of iron ore, the development of one of which near Mayari was then under consideration. This new deposit is of vast extent, and will supply all the needs of your manufacturing companies for many years to come. Its development was begun in June, 1907, and is being pushed as rapidly as circumstances will permit. It is hoped to have the development completed and the property ready to ship ore by the middle of 1909. To obtain the funds required for this development, the Spanish-American Iron Company has authorized the creation of a mortgage on the Mayari ore properties, railways and terminals, securing $5,000,000 20-year Sinking Fund Gold Bonds. These bonds are guaranteed as to principal, interest and sinking fund by your company, and $2,500,000 of them have been sold.

Manufacturing Companies.

These are the Pennsylvania Steel Company of Pennsylvania, with works at Steelton and Lebanon, Pa., and Maryland Steel Company, with work as Sparrow's Point, Md. Their production of pig iron in 1907 was 843,000 tons, compared with 809,000 tons in 1906. Of steel ingots, they made 932,000 tons in 1907, compared with 997,000 tons in 1906.

At the Steelton Works of the Pennsylvania Steel Company, the new open hearth plant, consisting of five 75-ton furnaces, which has been under construction for the last two years, was completed, the first steel having been made in May and the entire plant having been put in operation in August. This new plant has operated very satisfactorily, and has shown a considerable saving in costs over those obtained in the older open hearth plants at Steelton. During the year No. 3 blast furnace of the Steelton plant was remodeled and largely rebuilt. The results obtained from the new furnace have been satisfactory in the direction of both increased output and decreased costs.

A comprehensive plan for improving the methods of mining at the Cornwall Ore Banks, in which subsidiary company, the Pennsylvania Steel Company of Pennsylvania, owns a majority interest, was perfected during the year and the work begun, but owing to the existing financial conditions, further prosecution of this work has been postponed for the present.

At the Maryland Steel Company's plant, at Sparrow's Point, no changes or additions of special note were made during 1907, excepting the completion of the improvements to steam engines in the rolling mills, which had been begun in 1906.

The railroad companies, owned or controlled, were successfully operated during the year.

Earnings of All Companies.

In the annual report for 1906 the statement was made that a decrease in net profits might be expected in 1907 because of the increased costs of labor, supplies and raw materials. The almost entire suspension of manufacturing operations during the last two months of 1907, brought about by the October panic, has caused a still further reduction in profits.

The combined income accounts of all companies for the year ending December 31, 1907, are as follows:

Net earnings from operation	$4,161,319.08
Rents, income from investment and interest	314,395.28
Income from all sources	$4,475,714.36
Less interest on bonded debt	827,297.47
Net income	$3,648,416.89
Less charges to general and special depreciation of plants and equipment	1,267,327.27
Net profits	$2,381,089.62
Less dividends of operating companies	1,140,000.00
Balance of profits	$1,241,089.62

Out of the balance of profits of all the companies remaining after deducting interest charges, charges to general and special depreciation and dividends paid, subsidiary operating companies have transferred $755,472.46 to their reserves for future plant improvements. They expended during 1907, $1,529,876.73 for additions and improvements to plants, exclusive of the sums spent by the Spanish-American Iron Company on its new developments in Cuba. This entire amount was charged against the previously accumulated account for reserves for plant improvements.

The completion of coke oven plant and new open hearth plant of the Steelton Works of the Pennsylvania Steel Company were the principal items on which these expenditures were made.

The balance sheet of the Pennsylvania Steel Company (of New Jersey), and profit and loss account at the close of business on April 30, are as follows:

Assets.

Cash	$41,145.15
Loans to operating companies	2,440,810.61
Stocks and bonds	25,380,516.09
Total	$27,862,471.85

Liabilities.

Capital stock—preferred	$16,500,000.00
Capital stock—common	10,750,000.00
Profit and loss	612,471.85
Total	$27,862,471.85

Profit and Loss Account May 1, 1907, to April 30, 1908.

Expenses	$35,499.58
Net earnings	1,229,877.38
	$1,265,376.96
Dividends, 7 per cent. preferred	$1,155,000.00
Balance	612,471.85
Total	$1,767,471.85
Dividends from operating companies and miscellaneous interest received	$1,265,376.96
Balance May 1, 1907	$537,594.47
Net earnings brought down	1,229,877.38
Total	$1,767,471.85

Dividends amounting to 7 per cent. have been paid during the year on preferred stock. No dividend has been paid on common stock.

During 1908, no additions or expenditures of importance are contemplated at any of the plants with the single exception of those now being made by the Spanish American Iron Company for the development of the Mayari mines on the north coast of Cuba.

The outlook for the year 1908 is not encouraging. New business is small in volume and deliveries on the old orders already on your books are largely suspended.

W. N. Kratzer & Co., Pittsburgh, have secured a contract for the fabrication and erection of a 180 x 184 ft. 6 in. steel building, to contain coal bins, crane runways, &c., for a power house for the Titusville Iron Company, Titusville, Pa., and also an order for the erection of a steel bridge over the Pennsylvania Railroad at Graham street, East End, Pittsburgh. The bridge will cross the railroad by one span 72 ft. long, having passageway 8 ft. wide. The girders are made 5 ft. deep, with solid web. The firm also recently made a shipment of a 51 x 150 ft. steel building to the Ashland Iron & Mining Company, Ashland, Ky., to serve as a new cast house.

The Philadelphia Foundrymen's Association.

The one hundred and seventy-seventh regular meeting of the Philadelphia Foundrymen's Association, held at the Manufacturers' Club, in that city, on the evening of May 6, was the most largely attended meeting that the association has had for a long time. The attendance evidenced the interest which the foundry trade has displayed in the practical and commercial success which has been attained by the manufacture of cast iron soil pipe in permanent molds, by the Tacony Iron Company, Philadelphia. A paper on this subject was presented by Edgar A. Custer, president of the company. The process was fully described and illustrated in *The Iron Age* of April 16.

Thomas Devlin, president of the association, called the meeting to order at the usual hour. Petitions of the following named firms were presented for membership and favorably acted upon: John Wood Mfg. Company, Conshohocken, Pa., manufacturer of soil pipe and boilers; John H. Clay, 1320 Ridge avenue, Philadelphia, manufacturer of fire department supplies, represented by George B. Clay; and the Debevoise-Anderson Company, iron, coal and coke, New York City, represented by Nils Anderson.

The Short Weight Committee, through its secretary, A. A. Miller, reported that the discussion of the committee had been carefully edited and was now about ready to be printed. It is expected that copies will be ready for limited distribution at an early date.

Secretary Evans presented correspondence asking for the association's co-operation in combating objectionable legislation in Congress, particularly in connection with the anti-injunction bill, now before the Judiciary Committee, and after some discussion the association put itself on record as being opposed to this measure.

An invitation from the American Foundrymen's Association and Foundry Supply Association to attend the annual convention of the former and exhibit of the latter in Toronto, Canada, June 8 to 12, was received, and it is understood that the Philadelphia delegation will be quite a large one.

At the close of the business session, Mr. Custer read his paper on "Casting Soil Pipes in Permanent Molds." Lantern slides were used to illustrate the various stages of the process, and the presentation was on the whole one of the best that has been presented before the association for some time. He was given a unanimous vote of thanks by the association.

The Western Foundrymen's Association.

At Joplin, Mo., May 2, an enthusiastic meeting of foundrymen was held, at which practically all the foundries in western Missouri, Kansas, Arkansas and Oklahoma were represented. An organization was effected, to be known as the Western Foundrymen's Association, and the following officers were elected for the first year: President, Dr. A. D. Thomas, Thomas-Fordyce Mfg. Company, Little Rock, Ark.; vice-president, J. A. Rogers, Rogers-Conklin Mfg. Company, Joplin, Mo.; secretary and treasurer, H. T. Hornsby, United Iron Works Company, Springfield, Mo.

A prospectus of the new association has been issued, from which the following extracts are taken:

Its purpose is to take up and discuss at the meetings topics of general interest to the trade looking to the obtaining of better results in foundry practice; the adoption of a form of pig iron contract more advantageous to the foundrymen's interests; greater unity of action in the handling of the labor question; in fine, a full and free interchange of ideas among the members that cannot fail to be productive of the most beneficial results.

In the accomplishment of these ends the support of every foundryman west of the Mississippi River is solicited, assuring each one that he will be accorded the same treatment as his fellow member, as there are no special interests to be served, and every one will stand fairly on the same basis.

The next meeting of the association will be held at Joplin, Mo., June 13, at the new Connor Hotel. Every foundryman interested in the movement is requested to be present. The dues are $5 per year, and no salaries are paid to any of the officers.

The Machinery and Supply Conventions.

RICHMOND, VA., May 13, 1908. (*By Telegraph.*) During the last two days, while machinery and supply dealers and manufacturers from all parts of the country have been gathering here, the Executive Committees of the three associations which are to hold simultaneous and joint meetings here during the balance of the week, met and made final arrangements for the conventions. Reports and resolutions which will prove the framework for the conventions were received and put into shape, so that everything may proceed smoothly and a maximum amount of business may be dispatched when the delegates assemble this morning.

Keen disappointment is expressed over the fact that Secretary of War William H. Taft, who is now in Panama, cannot be here to deliver an address as arranged. James H. Hoard, Collector of Internal Revenue of the Philippines, will speak instead. He will speak on our trade relations abroad and is well equipped to handle his subject, as he has studied foreign trade conditions at close range, especially in the Orient. Another disappointment is occasioned by the absence of C. H. Briggs, president of the Southern Supply and Machinery Dealers' Association, who has been unable to leave his home for some time owing to ill health. J. C. Miller, first vice-president of the Southern Association, will officiate in Mr. Briggs' place.

Secretary F. D. Mitchell of the American Supply and Machinery Manufacturers' Association is in charge of the reception of delegates, and Secretary A. T. Anderson of the National Supply and Machinery Dealers' Association is working hard to make matters as pleasant as possible for everybody. There are indications that at this meeting the members of the association will display a keener interest in legislative matters, and will discuss ways and means of offsetting influences at work in Washington for the enactment of dangerous legislation. These efforts of the supply and machinery men will be directed against the Hepburn or similar anti-injunction matters, and against the adoption of a parcel post branch of the postal service, and efforts will be made to work up sentiment in favor of Federal sanction of trade agreements which are for the good of the industries at large and do not work injustice to the consumer. It is also probable that action will be taken urging manufacturers' names and brands.

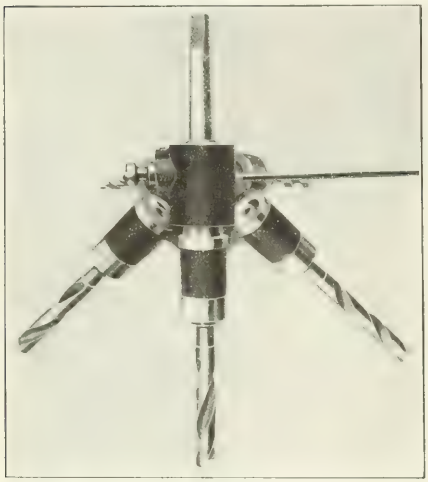
There is a good sized representation of the machine tool trade, and important topics affecting this branch of the work are scheduled for discussion. The three associations will meet in executive sessions this morning, and at 2 p.m. the formal public opening session will be held.

The Detroit Foundrymen's Association.—The newly formed Detroit Foundrymen's Association held a meeting April 30, which was devoted mainly to a consideration of the coming convention of the American Foundrymen's Association at Toronto, and a discussion of a proposal to invite the association to hold its convention of 1910 in Detroit. Remarks were made by a number of members and by H. M. Lane, secretary of the Foundry Supply Association. It was decided to extend the invitation, and a delegation will go to the Toronto meeting for that purpose. The ability of Detroit to take care of the large exhibit connected with the A. F. A. convention has been investigated and it has been decided to offer for the use of the convention and exhibit the State Fair grounds, where large buildings have recently been erected. The facilities are reported excellent for the requirements of the foundry exhibits. It is noteworthy that, whereas in former years there was often considerable difficulty in placing the conventions of the American Foundrymen's Association, to-day there is an active competition. Cincinnati has already spoken for the convention of 1909, and Pittsburgh will compete with Detroit for that of the following year. In case the decision is given to Detroit, Pittsburgh will ask for the convention of 1911.

The Patterson Turret Drilling Attachment.

An attachment by the use of which a single spindle upright drill is in a sense converted into a multiple spindle drill, is shown in the accompanying illustration as offered by the Patterson Tool & Supply Company, Dayton, Ohio. As is apparent from the engraving it does not provide a multiple drill of the kind in which two or more spindles are in simultaneous operation, but any one of the five spindles can be used individually and selectively. It even has an advantage over a multiple drill used to perform successive operations in that it is not necessary to change the position of the work, and yet it also saves time of taking out and replacing drills, taps, reamers or like tools for operation in the same hole. This attachment permits instant substitution, so that several operations can be performed successively and rapidly, without requiring the use of wrenches, drift keys, &c., and there is no need of stopping the drive of the machine while the change is made. The attachment is made in one size only, and will carry drills from ⅛ in. to ⅞ in. in diameter. The sockets are made to fit a No. 2 Morse taper, to receive drills, reamers, &c.

This turret attachment can also be used to advantage



The Five-Spindle Turret Drilling Attachment Sold by the Patterson Tool & Supply Company, Dayton, Ohio.

in engine lathes as well as on drill presses where drilling and reaming or drilling and tapping are to be done. When the work is mounted on the carriage of the lathe and the turret is placed in the headstock the only tool that rotates is the one that is in working position. The other tools and the body of the turret do not move, and stand in such a position that all of the tools are out of the way of the work. The body of the turret is of gray cast iron, the driving spindle is of steel and has a dowel pin in the center which brings the drill sleeve in perfect alignment with it. A driving pin is set in the end of each spindle which engages a milled slot in the drill sleeve when that spindle is in use. The spindle is engaged and disengaged by an eccentric, which is operated by a small lever that works very easily and can be manipulated with the thumb and finger.

A strong point is made of the time saving which can be effected with this attachment. On a test it is claimed to have saved more than 65 per cent. of the time required to do a certain piece of work on a single spindle machine and 25 per cent. of the time required to do it on a multiple spindle drill. An equally important advantage is that it does not require an expert to handle it. The turret weighs 19 lb. and can be used in any single spindle drill press without the necessity of adding to the counter balance of the drill head. In its construction there are no springs and its motion is positive.

The No. 6 Beaver Die Stock.

For threading small sizes of pipe, the Borden Company, Warren, Ohio, has added to its line of Beaver adjustable easy working die stocks, the No. 6, herewith illustrated, which, like its predecessors, has a range of four sizes, without removing and substituting other dies. This tool cuts threads on ¼, ⅜ ½ and ¾ in. pipe, while the two larger and older die stocks thread 1, 1¼, 1½ and 2 in., and 2½, 3, 3½ and 4 in. pipe, respectively.

To carry out the four-in-one idea in this smallest stock required an ingenious construction, for unlike the



Fig. 1.—The No. 6 Beaver Die Stock Made by the Borden Company, Warren, Ohio.

two larger ones, the four sizes of pipe it cuts do not have the same pitch of thread, so that it was not possible to allow for them by a simple in-and-out adjustment of the dies. The ¼ and ⅜ in. standard pipe threads have one pitch, and the ½ and ¾ in. another, so that two sets of dies were necessary, but these are both retained in the holder at all times, as may be seen in Fig. 1, and one or the other is brought into play by manipulating a single cam, which retracts one set while it advances the other. The cam has a series of eccentric slots and concentric slots so arranged that the set of dies not in use is retired, while the other is being adjusted to cut its respective sizes or any variation therefrom. There is no danger of conflict, for one set cannot get in the way of the other.

For the two sizes which can be cut with each set, the in-and-out adjustment is made as before and with the same cam. In common with the older stocks, threads over or under standard size can be cut by shifting the cam to alter the adjustment. The dies are held in posi-



Fig. 2.—Rear View, Showing the Universal Device for Centering All Sizes of Pipe.

tion by a lock of new construction, which it is claimed cannot slip. The only occasion for removing dies is to sharpen them. This is easily done, and the sharpening consists of merely grinding the edge after the manner of sharpening a chisel.

The other principal difference between the No. 6 and the larger die stocks is that the dies are of the ordinary taper form and not the receding short type. The advantage of the short dies which cut a taper thread by separating as the threading proceeds, is that the effort required is less because the friction is less, but this is not so important in cutting threads on small pipes. Another difference which is an innovation is the substitution of an adjustable pipe centering device for the bushings ordinarily used, shown in Fig. 2. This is provided with hardened tool steel jaws and does away with loose bushings, so that the tool is in all respects self-contained. The net weight of the complete stock is 8 lb.

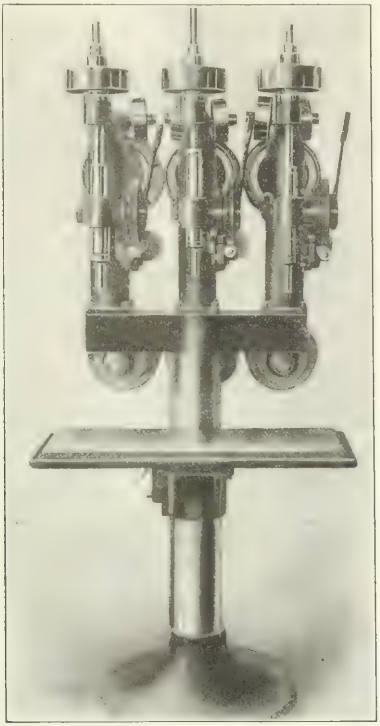
The Webb Motor Fire Apparatus Company Vincennes, Ind., has been incorporated, with a capital of $100,000, to manufacture and deal in motor fire apparatus designed by A. C. Webb, formerly of Joplin, Mo. The company has secured the plant formerly occupied by the Star Shovel & Range Company, which it is expected will shortly be put in operation. Most of the directors of this company were former members of the Star Shovel & Range Company.

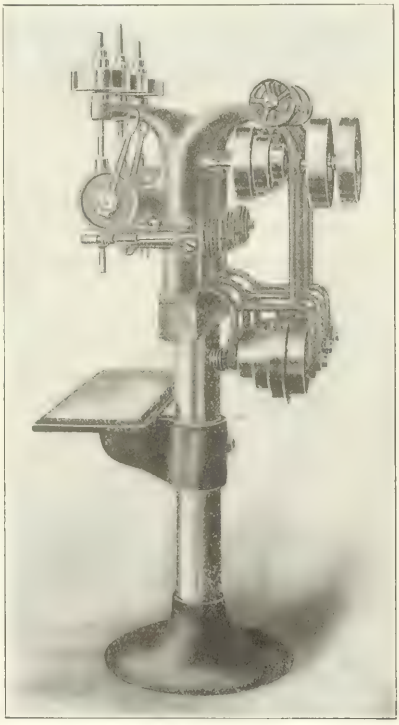
The New Corbin-Church Drill.

The Corbin-Church Company, Plainville, Conn., has brought out a new power feed manufacturers' drill, so designed that the feed will automatically knock out and re-engage itself, insuring no waste of time where the operator has duplicate work to perform. Combined with this feature is a device for automatically disengaging the feed should the drill point strike a hard spot or other obstruction to its normal progress through the work. The spindle drive is from a three-step cone pulley mounted at the back of the column. On a three-step secondary cone is a pinion meshing a gear on the worm shaft. The worm is loose on its shaft, and is held in engagement with it by a spring actuated positive clutch. When abnormal pressure is brought upon the drill point the worm travels on its gear, disengaging the clutch and letting the drill run free, until with the removal of the pressure the clutch flies back again into engagement.

On the worm gear are two cams. The worm shaft is hung on a pivot, and is held in engagement with its worm gear, except when it is knocked out by one of the cams. The second cam acts to place the worm and gear in engagement again. The cams are timed so that the drill will operate constantly and automatically.

The distance from center of each spindle to the column is 5⅝ in., and the greatest distance from the table to the spindles is 33 in. Each spindle has a vertical movement of 4½ in., for general work the recommended speed for the driving pulley is 500 rev. per min. The machine is furnished with three feeds for different sizes of drills, and has a capacity up to ¾ in. It is built with any number of spindles desired. The single spindle machine has a table 11 x 12 in. in size, and weighs 325 lb.





Two Views of the New Manufacturers' Drill (Triple-Spindle Pattern) Built by the Corbin Church Company, Plainville, Conn.

An error was made in the issue of *The Iron Age* of May 7 in stating that D. D. Williams & Co., Bakewell Building, Pittsburgh, Pa., had been appointed sole agents in this country for Cammell Laird & Co., Ltd., Sheffield, England. The sole agents in this country are Lionel & Montagu Samuel, 25 Cliff street, New York. Messrs. Williams & Co. have been appointed agents for western Pennsylvania only.

Jacob H. Schiff, the eminent banker, who has just returned to New York from an extended European trip, says: "Conditions in the United States appear to be to a large extent the determining factor over all. Everywhere eyes are turned to this country, and it is felt that prosperity can nowhere return until the United States has recovered from the recent crisis. I have stated that it is my opinion, in answer to many inquiries made to me in Europe, that we are not likely to return to normal conditions until—after the Presidential election—it can be fully seen what kind of tariff revision we are going to have, this being probably a more far-reaching economic question than any other before the country, not excluding even currency reform."

D. D. Pendleton has been appointed the Pittsburgh representative of the Wheeler Condenser & Engineering Company, Carteret, N. J., and will hereafter handle the sale of Wheeler specialties in that territory. He has during the past 15 years occupied various positions in the manufacturing, engineering and sales departments of the Westinghouse companies. His offices will be located in the Frick Annex.

The construction of a hydro-electric plant to develop 2000 hp. is in contemplation by the Martin Power Company, West Plains, Mo. It is proposed to build a dam and power plant on Big North Fork River at McCabe and transmit current for power and lighting to West Plains, 20 miles distant. It is stated that on account of delay in securing franchises work will not be begun for six or eight weeks.

The Commerce of the Great Lakes.

Little is known, even by that part of the public most directly interested, of the statistics of traffic on the northern lakes of America. The iron trade appreciates that over these lakes floats the ore for most of the nation's steel and knows that two-thirds of the lake traffic is ore. But of the vast extent and rapid growth of that trade ideas are remarkably hazy. The Government has just issued its annual statistical report of lake commerce, passing in and out of Lake Superior, supplementing it by figures and estimates of the traffic of the Detroit River, which includes not only most of the Lake Superior trade, but a large part of that originating on Lake Michigan. This report gives greater details than those presented in *The Iron Age* of January 2.

It is well to note that from the year 1855, when the first ship canal of modern times was constructed at the outlet to Lake Superior, and the year, too, when Lake Superior began to ship iron ore, there has been an average annual increase in Lake Superior traffic of about 20 per cent., and that the totals of traffic have gone from 14,503 tons in 1855, to 58,217,214 tons in 1907. The movement of freight to Lake Superior prior to 1855 was by portage around the rapids of Sainte Marie, and in 1851 this traverse amounted to 12,600 tons. There was, however, a prior canal, occupied in the eighteenth century, but destroyed on American conquest.

The year 1907 showed a traffic account as follows for the two canals, American and Canadian, and the three locks:

Total freight carried, tons	58,217,214
Total mile-tons	48,221,465,547
Average distance carried, miles	828.3
Value of freight transported	$569,830,188
Freight charges paid	$38,457,345
Value of vessels passing canals	$110,443,500
Average cost of transportation, ton-mile	$0.008
Passengers carried	62,758
Proportion of ships using American canal	73%
Average daily passages	86
Proportion of traffic in American ships	95%

The great item in freights was, as usual, iron ore, and statistics are as below:

Articles.	Tons.
Copper	89,959
All grains	3,939,079
Stone	898
Flour	687,127
Iron ore	39,594,944
Pig and manufactured iron	307,941
Lumber	1,105,811
Merchandise	1,022,654
Salt	68,626
Coal	11,400,095

Iron ore, it will be seen, formed two-thirds of the total traffic, both ways of Lake Superior.

All this business was done in 238 days, that being the period during which the Canadian Canal was open. The American Canal was open five days less.

During the year there was a marked increase in number of ships of the largest class, 500 ft. and over. In all 43 new ships, all steel, were put in commission during the year, and of these 25 are more than 500 ft. long, carrying from 9000 to 14,000 tons per cargo. The percentage of freight carried by vessels other than steamships is constantly diminishing, and in the year under review was down to 9 per cent. None of this was on sailing vessels, strictly so-called, but on tow barges and unrigged craft. None of these types were built during the year. The largest cargoes of the year were as follows: Steamship J. P. Morgan, 13,800 tons, on a single trip, 339,151 tons carried during the season and 43,296 miles run. Unrigged craft, John Smeaton, 9408 tons, 152,144 tons carried in the season and 27,039 miles run in year. Both these ships are in the fleet belonging to the United States Steel Corporation. In one day a total of 121 ships, carrying 487,649 tons, passed through the American canal. Ships spent in this canal, locking through and waiting for lockage, an average of only 129 min., and single ships have been locked through the lift locks in 8 min.

The figures of traffic through the Detroit River are not precise, as they are computed from the net registered tonnage of ships. This computation shows a freight tonnage passing up and down that river of 71,226,895 tons, of of a value of $697,311,302. There is, indeed, no other waterway with such a record. This is an increase of 7,418,324 tons for a single year, though accompanied by a decrease of 979 ships.

The cost of improvements at St. Mary's Falls, including locks and canals alone, has been $20,000,000. But this does not include the great cost of straightening, widening and deepening the channels from Lake Huron, at the detour, to the foot of the Falls, and which must represent an outlay at least as great. In this work is the tremendous rock excavation through the West Nebish, just made, and numerous other gigantic works carried on during many years. But a cost of $40,000,000 represents but a small portion of the annual saving in freights over what would be required to pay rail charges from the head of Lake Superior to the head of Lake Huron for the mass of goods carried.

D. E. W.

Washing and Coking Tests of Coal.

Coals which are in the raw state utterly unfit for steaming purposes can be made into fairly good steaming coals by washing; and coals quite unsuited for coking can be made available for such use by the same simple operation. The facts in relation to these coals, brought out by tests carried on at the fuel testing plant of the United States Geological Survey at Forest Park, St. Louis, are announced in a bulletin (No. 336) just issued by the Survey.

The tests of washing and coking coals and of the behavior of the resulting coke in cupola practice, reported in the bulletin, were made during the fiscal years 1905 and 1906 and were carried on in connection with investigations of the steaming and gas producing qualities of the same coals and of the possibility of improving such coals by briquetting. Preliminary tests of many of the coals as received from the mines showed them to be too high in ash, in sulphur or in phosphorus to make satisfactory metallurgical coke without prior treatment, and some coals possessed better coking qualities than others. It was found that the washing of some coals so reduced the percentage of ash and sulphur as to make available for the production of coke a coal which would otherwise have no value for this purpose. The reduction of the impurities by washing, of course, increases the percentages of fixed carbon and volatile matter over the amounts present in the raw coal.

Specific Results of Some Washing Tests.

Altogether 101 regular washing tests and 12 special tests were made. The results of these tests show an increase in moisture of 10 to 30 per cent., a reduction in ash of 20 to 60 per cent. and a reduction in sulphur of 10 to 50 per cent. For example: A raw coal containing 5.05 per cent. of sulphur contained after washing 2.47 per cent., a removal of 55 per cent. The ash in a raw coal containing 42.56 per cent. was reduced by washing to 29.67 per cent., a total removal of 65 per cent.; that in a raw coal containing 15.72 per cent. was reduced to 10.16 per cent., a total removal of 41 per cent., and that in a coal containing 9.81 per cent. to 5.38 per cent., a removal of 59 per cent. The cost of washing coal in Germany is said to range from less than 5 cents to 10 or 12 cents per ton; in the United States from 8 to 18 cents per ton.

The coking tests were made in ovens of regular beehive pattern, and the report covers 192 tests made on 100 coals, the samples having been collected from 17 States and one Territory. Of these tests, 100 were made on raw coal, 82 on washed coal, and 10 under miscellaneous conditions. In some of the tests it was found that the addition of pitch produced coke from coal which when tested raw gave either no coke or coke of inferior quality. In other tests the addition of pitch did not improve the quality.

After the dismantling of the plant at Forest Park in the spring of 1907 a new fuel testing plant, with much improved apparatus, was established at Denver. At this plant experiments in washing and coking will be made on coals mined in the Rocky Mountain region, with a

view to determine what can be done to make them available for the production of metallurgical coke.

Cupola Tests on Coke.

The cupola tests on the coke, which are reported by Dr. Richard Moldenke, were carried on along lines described in Professional Paper No. 48 of the Survey. The bulletin comprises the results of 170 tests, and the data concerning record of melt, taken in connection with the indications of the sources of the coals and the analyses of the corresponding coke, furnish interesting facts as to the melting ratio of iron to coke, the rate of melting per hour, and the amount of iron recovered. Equally interesting is the table giving the chemical effect on iron from cupola tests of cokes made from coals mined in various States.

The washing tests are reported by G. R. Delamater, the coking tests by A. W. Belden, and the report is prefaced with an introduction by Prof. Joseph A. Holmes, in charge of the technologic branch of the Survey.

The Matteson Friction Saw Sharpener.

A machine designed to simplify and facilitate the sharpening or dressing of friction metal saw disks has just been brought out by the Matteson Mfg. Company, Chicago. The accompanying engravings, one of which is an enlarged detail of the other, show a disk mounted on the carriage in position for grinding, and clearly illustrate the manner of using the machine and convey a fair idea of its general construction. The disks which it is intended to sharpen are such as are used for cutting structural shapes, rails, &c., either hot or cold, and are made of homogeneous steel without peripheral serrations. Depending wholly upon friction for their cutting qualities, it is essential that the circle be kept true and a square edge be preserved. The natural effect of wear is to round the edge and at the same time spread out an overhanging burr on each side. When this effect becomes pronounced the cutting power is diminished, and it then becomes necessary to restore a square edge on a true circle. Heretofore this has been accomplished in a lathe by cutting off the rim of the disk about 1 in. below the circumference; the overhang of the ragged burr makes it impracticable to cut closer to the edge. This means, while effective in its results, was not only slow, but added materially to the rapid reduction of the disk. It is claimed that the grinding machine, devised as a substitute for the turning process, not only turns up and dresses a disk with a cut only ¼ in. deep, but does it with great speed and accuracy.

The disk grinder is constructed upon the same general lines as the saw tooth sharpening machines built by the

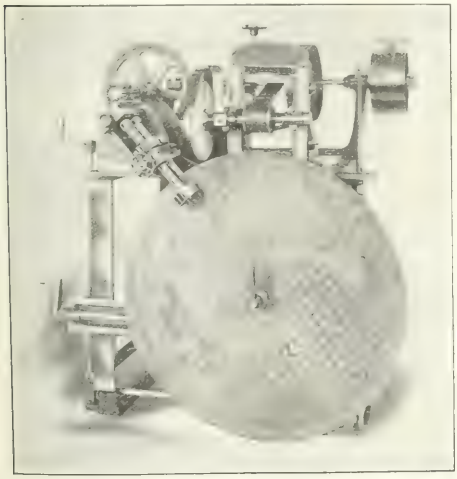


Fig. 1.—The New Friction Metal Saw Sharpener Built by the Matteson Mfg. Company, Chicago.

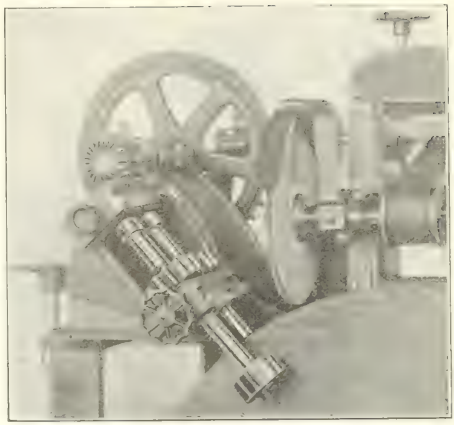


Fig. 2.—Enlarged Detail of the Working Mechanism.

company, one of which was illustrated and described in *The Iron Age* December 5, 1907. Some important modifications are, however, introduced to fit it for the special service required. The principal departure is found in the disk revolving mechanism, which operates continuously instead of intermittently. Two rollers mounted on the ends of inclined parallel shafts running in opposite directions bear against the two sides of the disk near its rim and revolve it by friction. One roller shaft is driven by spur gears from the other, which is in turn driven by bevel gears from a short horizontal shaft. The latter carries a sprocket wheel of 36 teeth, which is connected by a chain to an eight-toothed sprocket on a parallel shaft in the lower part of the frame and hidden from view in Fig. 1 by the disk. At right angles to the lower sprocket shaft, and connected with it by bevel gears, is another shaft carrying a two-step cone pulley, which is belted to a pulley located just back of the grinding wheel on the main driving shaft.

The tension of the friction rollers revolving the disk is regulated by hand wheels on the front side of the bearing boxes. Vertical and lateral adjustment of the disk is furnished by the carriage on which it is mounted, the movement being controlled by the crank levers seen at the left in Fig. 1. The emery wheel arbor brackets are attached to a movable gate, best shown in Fig. 2, which is raised and lowered to regulate the depth of cut by the hand screw at the top of the gate frame. A special centering cone provides quick and accurate adjustment of the disk in position for grinding. The machine is 3 ft. high, occupies a floor space of 31 x 26 in., will handle disks from 12 to 72 in. in diameter and weighs 800 lb.

The Senate Finance Committee has agreed to an amendment to the Customs Administrative bill, which has been passed by the House of Representatives, the effect of which is to continue the present routine appeal from the General Board of Appraisers to the Circuit Court in classification cases, with a change from the present arrangement to the extent of requiring all the evidence to be presented before the Board of Appraisers. As the bill passed the House it provided for appeals directly to the Circuit Court of Appeals, which aroused much objection from importers and others.

The Mesta Machine Company, Pittsburgh, Pa., recently shipped to the Youngstown Sheet & Tube Company, Youngstown, Ohio, a Helander barometric condenser, the condenser vessel being 114 in. in diameter, to serve blowing engines and other equipment aggregating 15,000 hp., and two Mesta tandem crank and flywheel dry air pumps, 14 and 34 x 24 in. stroke. The company also shipped to the Inland Steel Company, Indiana Harbor, Ind., a 38 in. and 72 x 60 in. Mesta tandem compound Corliss horizontal mill engine of 5000 hp., the shipment aggregating 715,000 lb.

THE IRON AGE

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The Machine Tool Builders and Their Prices.

The question of prices will hardly fail to be an absorbing topic of discussion during the gathering of the members of the National Machine Tool Builders' Association next week, at Atlantic City. While no price agreement can constitute a part of the action of the association as a body, yet, when manufacturers in the same general line from all parts of the country get together in these trying times, it may be safely assumed that they will not evade the exchange of opinion with one another on a subject of such vital importance. Undoubtedly they have all been subjected to severe pressure in withstanding the tendency to lower prices. Under the circumstances it is remarkable that they have been able to maintain prices so well with such restricted sales and diminished income.

It is known that some exceptionally strong influences have been brought to bear to effect a reduction in prices. A few of the American dealers believe that good results would come with a downward trend in the lists. The European dealers seem to be practically a unit in this theory. They have employed all the forces at their command to persuade the manufacturers whom they represent that such a course is the correct one. Orders have been offered at a reduction in the hope that they would be too tempting to resist, but have been declined. Some of these orders were placed later at unchanged prices, while others have been withheld. One manufacturer states that in two out of three such cases he received the business in spite of his refusal to grant concessions. The machine tool people have wisely kept to their lists, instead of yielding to the temptation of additional speculative orders at a time when they were most needed.

The influence of the National Association has been a very important one. It had been realized that the organization had worked out most beneficial results during times of prosperity. It has now been demonstrated that its effectiveness is just as great when business is dull and when a stiffening influence is most needed. If five years ago the prophecy had been made that during a period of dull business there would be no general cutting of prices it would have been regarded as ridiculously visionary. Before the day of the organization, competition took the extreme course; orders were sought by underbidding, almost regardless of costs, with the advantage all with the buyer. Yet the relative volume of orders was no greater, apparently. Customers have hardly become used to the new conditions. They have probably been nettled at their inability to secure bargains in equipment. Of course, some buyers have been holding off in the expectation of better prices, although it is doubtful if much business has been actually lost from this cause.

Now that the spirit of co-operation more thoroughly prevails, and manufacturers are more strongly inclined to commune with and take counsel from one another, it is likely that the result of the gathering at Atlantic City will be as beneficial as any meeting in good times. Even if the consensus of opinion should favor a reduction of prices, and the majority should thereafter name lower terms, despite the opposition of those who believe in making no concession to the spirit of depression, the opportunity offered at such a gathering as this to compare views and exchange opinions and experiences must operate to maintain cordiality among those in the trade and further promote the desire for harmonious action. An orderly reduction of prices, if that should seem to be desirable, would be far better than an indiscriminate scramble for business at any price, as in the old days when manufacturers seldom knew one another. Conditions would then be favorable for a rapid restoration of prices when business revives.

Manufacturers' Associations and Legislation.

Organized labor probably has never been so active in pressing its own programme upon Congress as in the past three years. With a President favorable to some, at least, of its demands, it has redoubled its efforts to win a majority in Senate and House to its proposals for the eight-hour day, an antiinjunction act, anticonspiracy act and an employers' liability law. This activity has served to give more prominence to the counter movements among employers of labor. Now that industrial conditions have prostrated the business of the walking delegate, the employers' associations have had more time and resources for combating the unions' legislative campaign. Employers have been waking up to the fact that in the absence of concerted effort to have their interests safeguarded, they have given the union lobby a good lead in its effort to upset by legislation some of the important findings of the courts. It has been the burden of many discussions at employers' conventions in the past two or three years that unless the union tactics at Washington were met by the manufacturers with equal aggressiveness, some legislation was likely to pass giving unions special exemptions from the law and a larger control of industry. The warning came none too soon. More recently the way the case of the manufacturer has been presented before congressional committees and individual Members and Senators shows that some leaves have been taken from the trade union book on legislative ways and means.

The question has come up in connection with all this activity, whether the association movement among manufacturers will maintain its present vitality? There are associations that need not be expected to survive the sifting process. Some of them the manufacturers have been led to join by the same persuasions the successful salesman employs. It is told that a manufacturer on being solicited to join a new co-operative movement looked up his memberships in various organizations, political, social and commercial. He found something like 60 to which he was a subscriber. Needless to say, the discovery made him proof against further appeals, no matter how meritorious the proposition.

The theory is that the manufacturer is too busy, and single handed too inconsequential, to wield any great in-

fluence outside of his own community. Thus has arisen the profession—at least it is more and more coming to be that—of the association secretary, commissioner or manager. A small army of such men is doing intelligently and with success work for which the employer has neither the time nor, oftentimes, the ability. Whether it be offense and defense against labor unions, whether it be opposing or advocating a definite piece of legislation or the carrying on of a campaign of education, either among workmen or the general public, it has been found that co-operation is the way to results. The practical questions come up, how many organizations a manufacturer can afford to support and how many can carry on their work without overlapping and without needlessly stirring up popular antagonism.

A few years ago the machinery and metal working and the foundry trades attempted to arrange an organic union of the two associations, largely on the ground of economy; but it was decided, after long consideration, that a merger was impracticable. However, the tendency is toward fewer organizations. Manufacturers now scrutinize more closely than ever propositions that involve the carrying on of propagandas. At this juncture they are disposed to concentrate on those that meet the labor union assault by the most direct and vigorous methods. In the present state of turmoil over economic and social questions the most revolutionary proposals are apt to get a hearing. The demands of the radical types of labor unions will be multiplied and all pressed at once in the hope of getting some. Meantime conciliation, arbitration, education, welfare work and all the better ways of progress in handling the labor problem stand aside. The labor unions' decision to enter politics in a way not attempted before has put upon manufacturers the necessity of prompt and energetic action. In such an emergency, an important asset is the machinery that has been put in such good working order in the formative years of the association movement.

Strikes Cloud the British Iron Trade Outlook.

The overshadowing influence in the British trade situation is the depression in shipbuilding. As has often happened when the outlook was unfavorable, the labor organizations are making a bad matter worse. For the past five months negotiations have been conducted between the shipbuilders and the officers of some of their employees' unions relative to a general reduction of wages except those of boiler makers. The cut proposed was 1 shilling 6 pence a week, which was the amount of a general advance made in March, 1906, when the yards were full of work. The Northeast Coast woodworkers refused the reduction, though it had been accepted in other districts and by other classes of workers in their own district. In January the employers agreed to make the immediate reduction 1 shilling a week and defer the 6 pence additional until March. Some of the woodworkers' unions agreed, but others refused and walked out. Then a lockout was ordered by the employers, effective February 1. It was postponed for a time and negotiations went on. The striking unions raised a new issue, that of providing for the prevention of strikes and lockouts in the future and for arbitrating the pending question. The employers replied that as a large portion of their employees had accepted the reduction, and as operations could not continue without it, it was not arbitrable. Meantime the men refused to give their officers authority to make a settlement, and a lockout was enforced by the owners on May 2, when 16,000 woodworkers were dismissed from shipyards in England and Scotland. As the metal workers at the shipyards cannot continue at work long after the woodworkers have stopped, the outlook is for a period of real distress in that great industry, unless the men accept the recommendations of their leaders in view of the change that has come over the industry in the past year.

At the end of the first quarter of this year 415 merchant vessels of 847,501 tons were under construction at British shipyards, as against 585 vessels of 1,306,087 tons at the end of March, 1907, a decline of 458,000 tons. The *Iron and Coal Trades Review* notes that no such decrease in 12 months has occurred since September, 1884, when the falling off from the previous September was 469,000 tons. All reviews of the situation agree that apart from labor troubles a long period of depression is ahead of the shipbuilding industry. Lessening foreign trade, overinvestment in floating property—over 2,600,000 tons of steam vessels having been added to the British merchant marine in two years—and a great increase in vessel construction by other countries, have caused the laying up on the Tyne, the Clyde and other rivers in Great Britain of hundreds of steamers that cannot find profitable employment.

Under the conditions described the stopping of practically all the shipyards in Great Britain through a labor dispute involving originally but a fraction of the men employed is deplorable. Added to this is a strike of very considerable proportions among members of the Amalgamated Society of Engineers, the leading union of machinists in Great Britain. Contrary to the advice of their officers, many of the machinists have struck. As stated by the union's leaders, the real question, so far as the organization is concerned, is "whether a section of the society is to be allowed at will to draw large sums of money without check from the funds of the society as a whole, and against the wishes and advice of the representatives of the society as a whole."

The prospect for the British iron trade, already declining from causes of international import, is far from bright, under the added weight of such ill-considered action by the labor unions.

The Prosperity Movement.

The National Prosperity Association, of which E. C. Simmons of St. Louis is president, is a working body. Usually a movement of this kind is merely sentimental and ends with the passage of resolutions or the adoption of an address to the public. The men who are back of this organization, however, are practical men who are accustomed to handling large affairs and who take hold of matters in a practical way. They are certainly working vigorously to bring about the restoration of confidence. As far as improvement in sentiment is concerned, that may go a long distance before tangible results are realized. But the association proposes to do much more than this. It is working energetically, and business interests will hope effectively, in endeavoring to check the baiting of railroads and industrial corporations. If the business interests of the various States can be induced to make a concerted effort in this direction, they would unquestionably be able to exert a strong influence in the abatement of hostile legislation against interests which bear a most important part in building up and sustaining the material welfare of the country. It is especially satisfactory that this movement toward securing business peace and ending disastrous agitation had its inception in the Southwest and not in the purlieus of Wall

Street. In fact, Wall Street has been disposed to scoff at the entire proposition, believing it to be chimerical. As it is now developing, however, more serious attention has been given it and those who were most skeptical are beginning to believe that something of benefit to the country may be accomplished.

Difficulty in Getting Prompt Shipments from Mills.

It would seem that in times like the present, when the volume of business offered is insufficient to supply mill capacities, there would be no difficulty in securing prompt execution and shipment of orders. While this is the case, generally speaking, in some lines the opposite prevails. For instance, tool steel, because of developments growing out of present conditions, cannot always be furnished as promptly by the makers as at other times. This is due in part to the fact that large producers have allowed their stocks to run lower than usual and it is not uncommon for them to be out of certain sizes. Then, too, special rollings are required to supply unusual sizes or special grades of steel in regular sizes, and these must await the accumulation of a sufficient quantity to justify rolling.

Ordinarily, this would not occasion much delay, but now that most of the mills are not running to exceed half time it takes perhaps twice as long to get through the complete range of sizes. This has worked somewhat to the advantage of certain mills making a practice of getting out special material, particularly those supplying agricultural grades. Having but limited reserve stocks on hand, and ordering in small lots for immediate requirements, buyers are naturally led to seek the nearest source of supply; and the result is that a good many orders heretofore placed with distant mills are being diverted to those closer at hand. Out of this grows the curious anomaly of a stagnant market and at the same time difficulty in getting prompt delivery of material required.

CORRESPONDENCE.

Coke Ovens for the North German Lloyd.

To the Editor: In an article appearing in your issue of February 27 on the "Von Bauer Coke Oven System," it is stated that the Gesellschaft für Erbauung von Hüttenwerksanlagen, in Düsseldorf, "is now building a steel works with a battery of Von Bauer ovens for the North German Lloyd interests." As I was rather dubious as to the accuracy of the statement, I addressed a letter to the North German Lloyd asking them to inform me whether the information was in accordance with the facts. From the inclosed retyped copy of my letter to the latter, and the reply I received thereto, of which I also inclose you a retyped copy [printed below], you will see that the Düsseldorf company is neither building a steel works nor a battery of Von Bauer ovens for the North German Lloyd interests, so that the statement is, to say the least, misleading to those of your readers who are really interested in the latest achievements of the various constructors of modern coke ovens, and who look to your valuable paper for information of a reliable character.

H. KOPPERS.

ESSEN-RUHR, April 24, 1908.

(COPY.)

BREMEN, April 21, 1908.

Heinrich Koppers, Essen (Ruhr).

Yours of the 10th inst. addressed to the board of the North German Lloyd has been turned over to us for reply. We can only advise you in answer to it that the article in *The Iron Age* certainly is based upon incorrect information, since for the present the Norddeutsche Hütte proposes to add a coking plant to the blast furnace plant which this company is building itself. At this time the selection of the system for the coke plant has not been made. Moreover, it is not likely to be made until the summer.

The Gesellschaft für Erbauung von Hüttenwerksanlagen in Düsseldorf has not been intrusted with the building of a steel plant, &c., by the North German Lloyd. (Signed) NORDDEUTSCHE HÜTTE ACTIENGESELLSCHAFT.

A Blast Furnace Operator on Ore Prices.

To the Editor: This communication is called forth by a remark in *The Iron Age* of May 7, under the head of "The Iron and Metal Trades," which is as follows:

The maintenance of ore prices will put furnace companies who do not control their own ore supply in a very serious position, in competition with Southern makers and Northern stacks that smelt wholly or partly ores mined by themselves.

This statement raises several questions:

Can the South as a general proposition get a reasonable or any profit out of present selling prices?

Is the profit in Lake Superior ores too high, considering everything—cost of production, royalties and all conditions pertaining to them?

What would be the results flowing from the reduction of the price of Lake Superior ores at this time?

To an independent pig iron maker, without any interest whatever in a financial way in ore mines, the correct answer to these questions is of serious importance. The assumption is, of course, that *The Iron Age* is of the opinion that the South can get a profit at present selling prices, and that the price of Northern ore is too high, either on this account alone or on account of there being too much margin of profit in it, or both.

I will not dwell on these matters to weary you, as you will catch my line of thought. A few weeks ago *The Iron Age* had an editorial touching the Southern situation in a very proper manner. The balance sheets of Southern plants over the past 5, 10 and 20 years do not show any abnormal dividends, notwithstanding the brilliant exploiting of the great natural advantages of that section, largely for the purpose of attracting Northern money and making a market for securities on the stock exchanges. As a usual thing there is a wide difference between making pig iron with a blast furnace and a lead pencil. If, however, the South has all the advantages some claim, and you seem disposed to admit, should the Northern ore producer be sacrificed to meet that condition if the selling price of his ore to the independent furnaceman is not now unnaturally and unreasonably high?

In the first place Southern iron is but a small part of the total production when normal conditions obtain. Can the South be expected to supply the requirements of this country on present low basis of selling price, or at any price? Will the high phosphorus, high silicon, weak iron of that section, displace the strong, low phosphorus Northern iron? In many instances the irons of the South and North are not interchangeable or competitive. That Northern producers relax prices and sell below cost is their own fault, occasioned by a softening of the backbone and not by the South.

If the South really can undersell the North, with all costs entering into pig iron at the North on a bedrock basis, then a partial solution of the matter may be found in freight rates from Southern furnaces to Northern consumers. Why not advance the rates to the North on Southern pig iron $1 to $2 per ton? This would be wiser and better than wiping the Northern ore and iron interests off the map, and would it be unfair or unreasonable? The South on its own evidence can stand it.

As a usual thing the raw material of the Northern blast furnaces, every pound of it, is hauled by the Northern railroads, affording an immense tonnage at fair rates, while the raw material of the South gives the railroads of that section but little business comparatively. Let the railroads of the North participate in extremely low freight rates from the South, distributing the pig iron of that section over their own territory without any reciprocal business, on rates less per ton than they give the plants for which they assemble raw material, and from which they haul the manufactured

article, with no other purpose, it would seem, than to kill the goose that lays their golden eggs. Here is food for reflection and a wide field for reform.

If, on the other hand, the price of Northern ore is too high and the independent (or rather, dependent) furnaceman is paying an unreasonable and unnatural price for it, which is not proved nor admitted, then the situation changes. But even with a changed situation it is extremely doubtful if it would be good policy to reduce the price of ore this season. As a general thing every blast furnace in the country using Lake Superior ores has from four to six months' stock of this material on hand, purchased in 1907, paid for, and carried over on account of the late panic and ensuing depression. Some furnaces also have large stocks of pig iron. To reduce the price of ore this year would simply drag down the price of pig iron correspondingly, still further demoralize the market, disturb returning confidence, and cause great loss on the ore and iron now in stock. There is no good reason why the furnacemen should be subjected to this loss. At $17 on board cars, furnace, they can all get out without loss and some with a profit, and this figure is low enough for pig iron, and low enough to suit consumers who do not want iron any cheaper, provided there is stability and that there is no donger of lower prices later.

Therefore, if the price of Lake Superior ores is too high, considering cost of production and the general conditions relating to them, there should be no reduction this year, and if made at all it should be so gradual as not to be harmful, sometime in the not near future. It would be demoralizing, foolish and almost criminal to make any reduction now, in the face of all that has been said on the subject and on account of the plans based on the assurance and statements that none would be made.

An early movement was inaugurated to maintain prices in order to prevent loss and bankruptcy, and has been fully justified. It would be worse than folly to throw up the sponge now. A few weak, smart and selfish pig iron producers, as well as producers in other lines, have "scabbed" and forced prices below the line of profit. It is always so in time of depression and slack demand. But a great industry should not be dragged down by such action. There should be more of the spirit and loyalty of the labor union man in the manufacturer. It would be better for all concerned, both laborer and employer. It would be better also if law and public sentiment did not designate all effort and co-operation on the part of manufacturers and railroads to prevent loss and remain solvent as "conspiracy in restraint of trade." The law protects and the public sentiment upholds the plumber, bricklayer and coal miner in any effort or means, legitimate or otherwise, to advance and maintain wages to extremes that are often absurd and unreasonable; but the manufacturer or merchant who follows more moderate lines is in danger of a fine or the jail if he simply seeks to escape ruinous competition by reasonable co-operation.

Every one knows that the high wage rate has more to do with the high price of commodities, the cost of living, building, and so forth, than anything else, and also that efficiency and discipline are lost through it and the causes that produce it, to the great detriment of all concerned. No one regrets the high wage in itself, only the results that flow from it, which in time may be tempered, let us hope and pray.

But why this discrimination on the part of the law and public opinion between labor and capital as regards co-operation for the betterment of conditions? Why is the one shielded and encouraged (even by the President of the United States), while the other is denounced and persecuted for doing the same thing? The only answer is: The labor union has the votes.

The Iron Age is in position to render the country great service by intelligent and fearless advocacy of what is right, practical and commonsensed.

FURNACEMAN.

Under the title "Struthers Cement" the Struthers Furnace Company, Struthers, Ohio, issues an unusually attractive pamphlet, 9¼ x 11 in. A series of large halftone plates illustrates some of the prominent construction contracts on which Struthers slag cement was used. These include blast furnace, steel works and coke oven construction, as well as foundation, retaining wall and column work. The company delivered at the Ohio Works of the Carnegie Steel Company last season 75,000 barrels of cement and a second contract has brought this amount up to nearly 100,000 barrels. At the new open hearth steel plant under construction at these works upward of 1000 barrels of cement a day was used at times, the forms being removed and rebuilt as rapidly as a force of 100 carpenters could do the work.

Canadian Rail Prospects.

TORONTO, May 11, 1908.—In the course of a few weeks it is said the Algoma Steel Company's plant will again be in full operation. The closing down is understood to have had some effect to hasten the placing of Government orders. Until the supplies before Parliament are voted through the funds will not be in hand for large orders, and the progress of the passage of the estimates has been momentarily checked by a conflict of the Government's bill in amendment of the Election act. Into the question at issue between the Government and the opposition in respect to this bill, it is not necessary to enter. Unless some concession is made to the opposition demands for modification of the bill, the passage of the estimates will be obstructed. The earlier the two sides come to an agreement for the ending of the deadlock the sooner will money be supplied for the Government's requirements.

It is reported that a large order to supply rails to the Government for the Eastern division of the National Transcontinental Railway has just been closed by the Dominion Iron & Steel Company.

Construction has begun at the Pacific end of the National Transcontinental line. A 100-mile section of main line, from Prince Rupert eastward, and a 60-mile branch line connecting with that section is now started upon by the contractors, who expect to have this $10,000,000 work completed in 18 months. Work on the 125-mile section west of Edmonton is also being pushed. Track laying between Winnipeg and Edmonton has been completed over 356 miles of the total 793 miles, the remainder of which is to have the rails laid upon it before the close of the summer. On the branch line from Fort William, which is 205 miles long, 120 miles has the steel upon it. It will only be by rushing operations that the section of the main line between Winnipeg and this branch will be made ready for traffic this year, for the difficulties of construction on that section are great. Labor, however, is no longer scarce. The Fort William *Herald* says that there will be received at Grand Trunk Pacific dock in Fort William this summer rails to lay 250 miles of new track. There should be more than twice that quantity received at the head of the lakes this summer, if all the track laying that is projected in the Canadian West this season is carried out. Possibly the docks of the Canadian Pacific there and those of the Canadian Northern at Port Arthur will receive as much, but the needs of the National Transcontinental alone call for more than the newspaper's advices show to be coming through the G. T. P. dock.

C. A. C. J.

President Edwin E. Bartlett of the Boston Branch, National Metal Trades Association, has appointed these committees: Entertainment, George F. Lawley, I. G. Marston, Winslow Blanchard; Finance, Fred F. Stockwell, Martin McLauthlin, John Becker; Membership, Winslow Blanchard, J. G. Blount, W. H. Phillips, J. Stark, J. W. Moore, E. P. Robinson, Fred F. Stockwell, W. J. Young, J. A. Murray; Superintendents' and Foremen's Club, H. F. Arnold, Thomas Hibbard, Frank Burgess; Labor Bureau, M. H. Barker, E. P. Robinson, Fred F. Stockwell; Legislative, E. P. Robinson, J. G. Morrison, H. 1. Illingworth.

The Foundry Exhibits at Toronto.

The work of installing the exhibits of foundry equipment and supplies for the convention of the American Foundrymen's Association at Toronto, Ont., June 8-12, is well under way. Nearly all of Machinery Hall has been reserved and the temporary building will be completely occupied. The cupola, which is being installed by J. de Clercy, of Montreal, will be in the temporary building where the brass melting furnaces and core ovens will also be found. Machinery Hall will contain molding machine exhibits by 10 or 12 different firms, and core making exhibits by two firms. Two exhibits will be made of machines for mixing and tempering sand, one of these being brought from France. The molds from the machines will be poured with metal from the cupola. The plan to run the cupola an hour or two in the morning, shutting down until afternoon, without dropping the bottom, then continuing the melting later for 2 hr., will be studied with interest by manufacturers who desire a small amount of iron at intervals throughout the day. Continuous melting and pouring would make it possible to take care of the output of the new varieties of molding machines which fill up the floors so rapidly that under the usual method of pouring all molds late in the day many must be carried a long distance from the machine to their place on the floor, or the machine must stand idle a considerable part of the time. Other melting exhibits will be the tilting crucible furnace made by the Monarch Engineering & Mfg. Company, the double chamber furnace of the Rockwell Engineering Company, the Schwartz furnace of the Hawley Down Draft Furnace Company, and the gyrating flame stationary crucible furnace of Kroeschell Bros. Company. The list of exhibits thus far arranged is as follows:

OSBORN MFG. COMPANY: Brushes and other foundry supplies. Wire brushes in operation cleaning castings.
BUFFALO FORGE COMPANY: Exhaust fan removing dust from polishing wheels.
W. W. SLY: Tumbling mills and similar equipment.
E. H. MUMFORD COMPANY: Mumford molding machines, Bonvillain-Ronceray molding machines, and a French sand mill.
HENRY T. PRIDMORE: Molding machines.
STANDARD SAND & MACHINE COMPANY: Sand mixing, handling and tempering machines.
BERKSHIRE MFG. COMPANY: Molding machines.
HAWLEY DOWN DRAFT FURNACE COMPANY: The Schwartz melting furnaces.
TABOR MFG. COMPANY: Molding machines.
HOLLAND LINSEED OIL COMPANY: Cores in process of manufacture.
J. DE CLERCY: An A. Baillot cupola in operation.
HERMAN PNEUMATIC MACHINE COMPANY: Molding machines.
MONARCH ENGINEERING & MFG. COMPANY: Oil melting furnaces.
ROCKWELL ENGINEERING COMPANY: Oil melting furnaces.
J. D. SMITH FOUNDRY SUPPLY COMPANY: Large core oven in operation.
JONES & MOORE: Electric generators furnishing direct current for use in the building.
MITCHELL-PARKS MFG. COMPANY, together with their agents, A. Buch's Sons and Ontario Wind Engine Company: Molding machines.
J. W. PAXSON COMPANY: Molding machines and general foundry equipment.
JOS. DIXON CRUCIBLE COMPANY: Crucibles.
CALUMET ENGINEERING COMPANY: Cupolas and equipment.
ARCADE MFG. COMPANY: Molding machines.
KILLING MOLDING MACHINE COMPANY: Molding machines.
DIAMOND CLAMP & FLASK COMPANY: Core machine.
FALLS RIVET & MACHINE COMPANY: Core machine.
CHICAGO PNEUMATIC TOOL COMPANY: Pneumatic chippers and other tools.
N. J. HOLDEN COMPANY: Air compressor and pneumatic tools.
KROESCHELL BROS. COMPANY: Gyrating furnaces for melting.
GREGG COMPANY: Wire straightening machinery.
INTERSTATE SAND COMPANY: Molding sand for the molding machines.

In the Process Building there will be the following:

CARBORUNDUM COMPANY: Grinding materials.
DOMINION FOUNDRY SUPPLY COMPANY: The firm's own apparatus and that of S. Obermayer Company and Whiting Foundry Equipment Company.
HILL & GRIFFITH COMPANY: Foundry supplies.
FRANCIS HYDE & Co., Montreal.
HAMILTON FACING MILL COMPANY: Reid molding machine, Wadsworth core machine, and exhibits of Ballou's White Sand Company and one or two other firms for which the Hamilton company is Canadian agent.
DETROIT TESTING LABORATORY: Its local branch, the Toronto Testing Laboratory, will make analyses of pig iron for the cupola in operation.
ROBESON PROCESS COMPANY: Core sand binder.
R. B. SEIDEL: Crucibles.
DETROIT FOUNDRY SUPPLY COMPANY: Webb molding machine.
W. W. LINDSAY & Co.: Chaplets, &c.
CLEVELAND WIRE SPRING COMPANY.
J. S. MCCORMICK COMPANY: Foundry supplies.
THE GOLDSCHMIDT THERMIT COMPANY: Thermit welding.
CANADIAN GAS POWER & LAUNCHES, Ltd.: Gas engines for driving a Crocker-Wheeler generator for furnishing current to exhibitors.
FREDERICK B. STEVENS: Foundry supplies.
BAIRD & WEST: Semet-Solvay coke.

A compressor will be installed to furnish air power for those requiring it. The running exhibits will include in addition to molding machines, a number of interesting economizing devices. Wire brushes for cleaning castings will be operated on the ground, and an exhaust fan will be used for removing the dust. The fan for the cupola will be driven by a steam turbine. Tumbling barrels will be shown in operation, together with a dust arresting system. A core room will be shown in full operation. In the Process Building several gas engines of recent design will be installed. A number of new devices will be shown for the first time in actual operation or by working models. Many of the exhibiting firms are preparing special features for the entertainment of their visitors.

It is planned to have a general registration desk at the association headquarters in the Process Building. There will also be headquarters in the same building for each of the leading local foundrymen's associations. These local headquarters will make it easier than it has been at other conventions to bring members into communication with their friends. Members of the various associations will be admitted free to all buildings by badge and ticket furnished at the registration desk. A small admission fee will be charged non-members. As at the last convention, the entertainment will be limited to members of visiting associations. The arrangement by which meetings will be held in the auditorium of the Dairy Building, located near the exhibit building, will make it possible for members to spend the entire day on the grounds, as ample facilities for securing lunch will be provided.

The creditors of the Security Investment Company, an identified interest of the Westinghouse Electric & Mfg. Company, have organized a committee which has taken charge of the company. It is proposed to extend all notes and raise $3,000,000 through the sale of new obligations to protect the Westinghouse Electric stock now held as collateral for loans. Well secured notes are to be extended three years and of all other creditors for five years. The balance sheet of the company shows bills payable of $17,649,396. The Security Investment Company's holdings had a market value of only $12,373,882 on February 29, as compared with a book value of $25,400,927 on October 23, 1907, when receiverships were appointed for the Westinghouse Electric & Mfg. Company and Security Investment Company.

The Tacoma Hoist & Derrick Works is a new concern that has been organized in Tacoma, Wash., for the manufacture of all sorts of hoists and cranes, but especially for turning out certain new designs and improvements in these devices. It is composed of Lynn H. Miller, known throughout the Northwest as a lumberman, and George E. Newcomb, a mechanical engineer of experience. Mr. Miller is secretary and treasurer of the new company, and occupies the same positions with the Pacific National Lumber Company. Mr. Newcomb is manager of the new concern, which has several orders for hoists and cranes, and during the year expects to build and equip a machine shop for their manufacture.

The Swallow Falls Electric Light & Power Company, Oakland, Md., of which H. P. Tasker is general manager, has increased its capital stock to $200,000, and expects to install a hydro-electric plant near Swallow Falls, 6 miles north of Oakland, to develop from 10,000 to 15,000 hp. The plant will be located in the heart of a coal, fire clay, building stone and wood pulp region of more than 90,000 acres, all within easy access of Pittsburgh, Pa.

OBITUARY.

DR. HERMANN WEDDING.

A cablegram announces the death of Dr. Hermann Wedding, the eminent German metallurgist. He was widely known in this country, having been one of the German commissioners at the Centennial Exhibition in 1876, and one of the distinguished foreign guests of the American iron trade in 1890.

Dr. Wedding entered the Prussian Government mining service, but soon became identified with the Berlin School of Mines, where he occupied the chair of metallurgy for many years. At that time Percy's "Metallurgy" was the great standard textbook on the metallurgy of steel. Dr. Wedding began a translation, but soon modernized and expanded it, with special reference to continental practice. When the German Patent Office was established he became its expert adviser, and continued that connection for many years. He was a voluminous and keen contributor to the proceedings of the technical societies, but was more closely identified for many years as secretary with the Verein zur Befoerderung des Gewerbfleisses in Berlin, a body whose splendid work in the whole field of technology is too little known and appreciated outside of Prussia.

He was an indefatigable worker, possessed an enormous fund of knowledge and was keen and alert to the last years of his long life. He was a kindly critic, and youthfully eager for information. The highest honors in the gift of his associates were showered upon him. He was an honorary member of the American Institute of Mining Engineers and of the Verein Deutscher Eisenhuettenleute, and was a Bessemer medalist of the Iron and Steel Institute.

MELLEN BRAY, Newton Center, Mass., manager and principal owner of the business of the Tubular Rivet & Stud Company, Wollaston, Mass., died May 8, aged 79 years. He was a native of Turner, Maine, where his early manhood was passed in his father's carding mill and as a partner in a country store. After a few years in Montreal he went to Boston in 1863 and bought a general machine shop. Two years later he perfected a machine for producing seamless metal boxes, and then came his invention of tubular rivet and lacing studs, which developed into an important business, now operated by the Tubular Rivet & Stud Company. He was prominent in the work of the Newton Hospital, and was the donor of the Founders' Memorial Building. He leaves two sons and a daughter.

JOSEPH W. RUSSELL died suddenly May 8, at Sharon, Pa., of heart disease, aged 71 years. He was born in Philadelphia, and learned the molder's trade. He went to Mercer County in 1856 and settled in West Middlesex. Enlisting in the Tenth Pennsylvania Volunteer Regiment he served three years in the Civil War. He afterward became a member of the Legislature. For years he operated an iron foundry in West Middlesex and Hubbard, moving in 1892 to Warren, Ohio, where he and others purchased the Etna Foundry & Machine Company. Mr. Russell was president of the company at the time of his death.

ALFRED MARTIN CASTLE, president of the A. M. Castle & Co., iron and steel house, Chicago, died May 8. Though in poor health for some time, the suddenness of his death came as a shock to his friends and associates. Born in Chicago, November 11, 1863, he entered the iron and steel business at an early age, his first connection being with W. F. Mallory & Co. In 1890 he organized the firm of A. M. Castle & Co., which in 1904 was incorporated under the same title. He was a member of the Chicago Athletic Association, the Illinois Athletic Club, the South Shore Country Club and fraternal societies. He leaves a widow and one son. His parents reside in Los Angeles, Cal. A. H. Castle, his father, is vice-president of the company and manager of the recently established Los Angeles branch.

ARTHUR KOPPEL, Berlin, Germany, according to a cablegram received May 13 by the Arthur Koppel Company, 66 and 68 Broad street, New York, has died suddenly, aged 57 years. He established the firm 30 years ago, and two years ago founded the township of Koppel, 30 miles west of Pittsburgh, where the company's new American plant is located.

PERSONAL.

Charles B. Crook of the Lidgerwood Mfg. Company, New York, sailed May 9 for the Isthmus of Panama, to be absent about four weeks.

R. de Temple, managing director, and Eugen Toennis, chief engineer, of Hartung, Kuhn & Co., manufacturers of machinery, at Düsseldorf, Germany, arrived last week on a visit to this country.

O. W. Emrich, engineer of the Republic Iron & Steel Company, Youngstown, Ohio, and O. E. Emrich, chief engineer of the Canton Works of the American Bridge Company, have sailed for Naples. They expected to go to Egypt, and later to visit the steel making districts of Germany and England.

Dr. Schuyler Skaats Wheeler, past president of the American Institute of Electrical Engineers and president of the Crocker-Wheeler Company, Ampere, N. J., addressed the Engineering Society of Columbia University May 4 on the subject of "Engineering Honor." He mentioned the three great duties of the engineer in the order of their importance: 1, The engineer's duty to his client; 2, to the public, and, 3, to his engineering society. He condemned strongly the publication of false scientific and false engineering statements in the newspapers, and declared that discoveries and inventions should be announced not in the daily papers, but through the technical societies or the technical press.

J. Sterning Eastwood, for a long time mill manager of the Thomaston plant of the Plume & Atwood Mfg. Company, Waterbury, Conn., has severed his connection with the business after 36 years of active service. S. Kellogg Plume has been appointed to succeed Mr. Eastwood.

Prof. Herman Schneider, dean of the College of Engineering, University of Cincinnati, addressed the machinery manufacturers of Fitchburg, Mass., May 7, and those of Worcester, Mass., May 8 on the co-operative engineering course as carried out at Cincinnati, the students alternating week by week in attendance at school and shop. It is proposed to establish this co-operative arrangement between the high schools and the shops in the cities named.

There are now in this country on a visit Wilhelm Altpeter and Berthold Nothmann, directors of the Oberschlesische Kokswerke und Chemische Fabriken, A. G. of Zabrze, Upper Silesia, one of the largest producers of furnace coke in Germany.

A. Tropenas, president of the Tropenas Steel Company, New Castle, Del., is now on his way to this country from abroad. He has recently taken out patents on a new converter process. The converters will have a capacity of ½ ton, and it is said that even working with this small quantity no difficulty is experienced in keeping the steel hot enough to handle in pouring light work.

J. Dix Fraser arrived from Sydney, N. S., a few days ago to take charge of the Atikokan Iron Company's blast furnace plant at Port Arthur, Ont. It is the intention of the company to resume operations as soon as possible.

W. C. Mitchell, superintendent of the Dominion Iron & Steel Company, Sidney, N. S., returned this week from a tour, lasting upward of a month, of iron and steel plants in the United States.

Samuel Groves, formerly of Pittsburgh, and in recent years connected with trade and engineering journals in Canada, has been appointed editor of the Canadian Geological Survey publications, with headquarters at Ottawa, Ontario.

Baron Yoshiro Sakatina, recently Minister of Finance of Japan; Masajiro Yokoyama, president of the Bank of Japan, two members of the firm of Mitsui & Co. of New York, together with 11 other prominent Japanese bankers and financiers, are expected to arrive in Pittsburgh, May 18, for the purpose of visiting the Homestead and Edgar

Thomson works of the Carnegie Steel Company and possibly other industrial plants in that city. The party will be guests of the Carnegie Steel Company and other steel interests.

Walter B. Snow, publicity engineer, has recently increased his facilities by removal to larger quarters at 170 Summer street, Boston, Mass., and the establishment of an addressing and mailing department in connection with which select mailing lists will be maintained for the special use of his clients.

The A. S. M. E. Monthly Meeting.

"Clutches, With Special Reference to Automobile Clutches," was the subject of the meeting of the American Society of Mechanical Engineers, held Tuesday evening, May 12, in the Engineering Societies Building, New York. The paper, abstracted in another part of this issue, was presented by Henry Souther of the Henry Souther Engineering Corporation, Hartford, Conn., and illustrated with lantern slides. The speaker emphasized his preference for cone clutches for automobile use, if properly mounted and connected to drive through two universal joints. That the paper had interest to other than automobile builders and users was apparent in the discussion from the repeated references to clutches for machine tool applications and power transmission.

The first speaker, E. H. Gabriel of the E. W. Bliss Company, Brooklyn, N. Y., offered a supplement to rather than a discussion of the paper, which treated of clutches as applied to power presses. Lantern slides shown illustrated the Fowler type of press clutch, old and improved Stiles clutches, a Johnson clutch and an improved form of it, several types of Bliss clutches, including those for slow and for high speeds, and the Waldron friction clutch for back geared presses. Particularly interesting was a clutch attached to a special press and arranged to disengage at the bottom of the stroke.

In similar manner, E. H. Neff, New York representative of the Brown & Sharpe Mfg. Company, Providence, R. I., showed three styles of clutches used by that company, these being a friction clutch intended for slow speeds, not exceeding 900 ft. per minute; a cone friction pulley intended for higher speed, 1500 ft. per minute, and a special reversing clutch for automatic screw machines.

Friederich Müller of Buffalo, N. Y., described and showed a model of a clutch in which the load controls the friction of the expanding ring. It runs only in one direction and is suitable for variable speed transmissions. The fast and slow gears are constantly in mesh and are selectively made active without shock by manipulating the clutch, which takes effect gradually.

Frank Mossberg of the company of that name, Attleboro, Mass., added to what had already been said concerning clutches for power presses and referred particularly to what he called a positive friction clutch which is used extensively in power presses.

Facts from the experience of the Garvin Machine Company, New York, bearing on points covered in the paper were cited by E. J. McClellen of that company. It has been found that an angle of 10 degrees appears to be the proper one for cone friction clutches which are engaged by a toggle mechanism, and an angle of 6 degrees for those engaged by springs, and that for countershafts expansion ring and contracting band clutches are suitable.

The Gilbert clutch particularly adapted for heavy power transmission as in hoisting machinery and dredges was described by Mr. Bellman. This is a contracting band clutch actuated through an auxiliary cone clutch so as to pick up its load gradually and is claimed to have the advantage over a cone clutch that it has no end thrust and occupies less space, and over steam or hydraulically operated band clutches that it is not necessary to have a hole through the shaft, and is less expensive.

Mr. Gay, representing the Sturtevant Mill Company, Boston, Mass., disagreed with the author about the inability of the Sturtevant clutch to get an automobile out of a ditch. He explained that because of a peculiar centrifugal effect when used with an explosive engine, it is very well qualified to meet such emergencies.

Another point of the author's paper was disputed by B. D. Gray of the American Locomotive Company. He did not concede the superiority of the cone clutch with leather friction for automobiles, declaring instead for multiple disk clutches and particularly those having a large number of light thin disks, preferably alternately bronze and steel. He described and gave the dimensions of the special clutch he had in mind and denied that variations in temperature produce trouble in such a clutch.

From blackboard sketches H. F. J. Porter, New York, explained some of the capabilities of a hydraulic transmission device, combining the functions of a clutch and a speed variator. It operates through radial cylinder combinations of oil pumps, by the valve controlled connections between which any speed from rest to that of the driving member may be secured. The apparatus is being used quite extensively by the navy in the operation of gun lifts and turrets.

In summing up the author refused to recede from his position that cone clutches are the best, all things considered, for automobiles, and gave additional reasons in support of his opinion, from experiences of his own and that of others of which he had knowledge.

Customs Decisions.

The Duty on Pewter Scrap.

In sustaining a claim filed by Knauth, Nachod & Kuhne, New York, the Board of United States General Appraisers has decided that paragraph 637 of the tariff free list, relating to "pewter and britannia metal, old, and fit only to be manufactured," includes clippings or turnings of pewter, produced in the manufacture of machine bearings. The local appraiser returned the merchandise as "pewter fit only to be remanufactured, free of duty." The collector did not accept this advisory classification, but assessed duty at the rate of 20 per cent. under the provision for "metals unwrought." In sustaining the contention of the importers, General Appraiser Fischer, who writes the decision for the board, says in part:

> It is conceded that the turnings or clippings are in fact of pewter. The only question in dispute is whether the waste falling off in the process of the manufacture of metal articles may be regarded as old metal. Speaking in the ordinary sense, an article is old only when, by reason of age or use, it has become useless or no longer serviceable for the purpose for which it was originally intended.
>
> In a tariff sense, however, an article may be old although not long in existence, or actually worn out by use. This is so where the article can no longer be used for the purpose for which it was made and by reason of that fact is capable of being employed only for the purposes of remanufacture. The pewter turnings here in question are clearly fit for no other use than to be remanufactured, and having outlived their usefulness and character as manufactured articles, they should have been classified, as claimed in the protest, as old pewter.

Swath Turners.

In overruling a protest filed by the Richardson Mfg. Company, Boston, the Board of United States General Appraisers holds that so-called swath turners are dutiable properly at the rate of 45 per cent. under the tariff provision for manufactures in chief value of metal. It was maintained by the importers that the articles should be admitted at 20 per cent. as being dutiable by similitude to horse rakes under paragraph 460, which provides for various agricultural implements. The decision, which is by General Appraiser Fischer, says in part: "The machine here in question is not provided for by name in paragraph 460, and, although the importers claim that it is similar in construction and use to a horse rake, the similitude clause cannot be applied in this case so as to bring it within that provision of the tariff. Is is a manufactured article made of metal not specially provided for, and we hold it to be properly dutiable under paragraph 193 as assessed."

The Mahoning Gas Fuel Company, Youngstown, Ohio, proposes to build a trunk line to new gas fields to cost $1,000,000, and will ask the City Council of Youngstown to allow it to increase the price of fuel gas from 27 cents to 30 cents net, per 1000 ft.

NEWS OF THE WORKS.

Iron and Steel.

The plant of the Kommeper Iron & Steel Company, Scranton, Pa., will be offered at public sale June 1 by the trustee. The company, which was recently declared a bankrupt, installed the plant on the site of the old mill of the Lackawanna Steel Company.

It is expected that Hamilton Furnace, at Hanging Rock, Ohio, will be blown in within ten or twelve days. This step is taken so that the company may get an assortment of iron on hand, though a very considerable part of the product may have to be piled.

The Hudson Wire Company, Ossinning, N. Y., has increased its capital stock from $50,000 to $125,000, all paid in, and has taken over the plant of Royle & Akin, manufacturers of fine wire of every description. Robert M. Akin is president and Joseph R. Royle general manager.

Rockdale Iron Company, Rockdale, Tenn., expects to change about the middle of the year from making foundry iron to the manufacture of ferrophosphorus. The company has recently sold a round lot of the latter product.

Operations have been suspended at the steel plant of the Tennessee Coal, Iron & Railroad Company at Ensley, Ala., for an indefinite period.

General Machinery.

Slater & Marsden, Beloit, Wis., have purchased the site and building formerly owned by Davidson Brothers in South Beloit, and will occupy it for the manufacture of woodworking machinery.

The Dominion Coal Company, Glace Bay, N. S., has asked bids for the rebuilding of its washing plant, which was recently destroyed by fire.

The Knoxville Iron Company, Knoxville, Tenn., intends to build a new machine shop, 50 x 80 ft., in which will be installed the machines in the present shop. When the company built its new works it put its machine shop in one corner of the warehouse, and it is to accommodate this equipment that the new shop is to be built; the company, therefore, will require no new machinery.

The Iberia Milling & Electric Company, Iberia, Mo., has been incorporated with a capital stock of $9000, for the purpose of building and operating a roller flour mill and electric light plant. The flour mill equipment has been purchased from the Nordyke & Marmon Company, Indianapolis, Ind., and motive equipment consisting of one 87-hp. engine and one 100-hp. engine is being supplied by the Frost Mfg. Company, Galesburg, Ill. The officers of the company are C. W. Farnham, president; J. S. Casey, treasurer; Frank Topping, secretary.

The Pennsylvania Railroad intends to improve its facilities at Conway, Ohio, for handling locomotives and making track repairs for freight cars. It is not the intention to build extensive shops at that point, but a roundhouse will probably be built, with coaling station and water plant and such small repair shops as are necessary in connection with the roundhouse. Extensions to the present yard tracks will be made from time to time to provide increased facilities for the more economical handling of its business. The company is not doing any work upon the project at the present time.

Power Plant Equipment.

The Central Indiana Lighting Company, Columbus, Ind., has in contemplation improvements which include the building of a new power plant and important work in the reconstruction of its street car lines. Plans for this work, however, have not as yet been fully developed.

Bids for the installation of a heating and power plant in the new Auditorium Building, Milwaukee, Wis., will probably not be invited before July. The cost of this installation, it is estimated, will be about $10,000.

The City Council of Dresden, Ohio, has authorized a $25,000 bond issue for the construction of a water works system. Plans and specifications are now being prepared by H. E. Munson, Zanesville, Ohio.

At an election to be held on May 25 the question of a water works bond issue of $250,000 is to be submitted to the voters of Tulsa, I. T. The vote will include a proposition to ratify or reject the contract for the purchase of the present plant and to supply funds for necessary improvements.

Plans are being prepared and estimates made by the city of Harrington, Wash., for a water works plant. In the meantime catalogues from manufacturers of water works supplies are desired and may be addressed to J. J. Cameron.

At the close of 1907 one of the largest orders ever placed for mechanical stoking equipment was received by the Westinghouse Machine Company, Pittsburgh, Pa., aggregating 14,400 boiler-horsepower. This was for one of the large Brooklyn power stations operated by the Transit Development Company, New York. The order comprises 24 stokers suited to 600 hp. boilers of the Babcock & Wilcox water tube type, and is the second large order placed by this company for Roney stokers, the result of a year's successful operation of the original 7200 hp. installation at the Kent avenue station. This station was originally equipped with flat grates for hand firing.

The Village Board of Manito, Ill., has voted bonds for $3500 to complete the construction of an electric light plant which was undertaken and abandoned by a private interest. The village is now accepting bids for the completion of the plant.

The General Engine Company, recently incorporated at Buffalo, N. Y., to manufacture the Hoffman patent rotary engines, has secured the new two-story brick factory, 60 x 120 ft., at Letchworth and Grant streets, and will equip it for the manufacture of a full line of the improved rotary engines.

Foundries.

Smith & Loughlin, foundry and pattern works, Brooklyn, N. Y., are rebuilding the part of their plant which was recently damaged by fire, and will require no new machinery. The firm uses electric power, and the damage to the motors was only slight.

The plant of the Sheffield Cast Iron Pipe & Foundry Company, at Sheffield, Ala., has been put in operation after several months' idleness.

Bridges and Buildings.

The Nashville Bridge Company, Nashville, Tenn., has secured a contract for the erection of a bridge over Smith Fork at Temperance Hall, in DeKalb County.

Frank Wyant and Benjamin Price have been appointed receivers for the New Jersey-West Virginia Bridge Company, Manasquan, N. J.

Fires.

The plant of the Frontier Engine Works, Buffalo, N. Y., was damaged $5000 by fire May 6.

The shops of the Chicago & Alton Railroad at Blomington, Ill., were recently damaged $25,000 by fire.

The plant of the Hotchkiss Foundry Company, Torrington, Conn., was recently burned, the loss being about $5000.

The plant of the Port Hope Electric Light & Power Company, Port Hope, Ont., was destroyed by fire May 8, the loss being about $50,000.

Hardware.

What is said to be one of the largest orders ever placed for steel lockers has recently been secured by the Durand Steel Locker Company, Chicago, Ill. It calls for 7000 lockers to be furnished to the New York City Railway for the equipment of its elevated and suburban stations and power houses in New York City.

Miscellaneous.

The Montpelier Iron & Metal Company, K. McClosky, manager, Montpelier, Ind., has been organized to deal in scrap iron and second-hand machinery.

The Holland Launch & Engine Works, Holland, Mich., which was organized the early part of last year, has decided to discontinue business and will dispose of its plant on West Eighth street.

The J. P. Devine Company, Buffalo, N. Y., manufacturer of vacuum drying apparatus, has leased the Seventh street factory of the B. F. Stinson Company, and is making alterations and extensions and equipping it to meet te increased requirements of its business.

The American Cyanide Company has commenced work on the large new plant which it is to erect at Niagara Falls, Ont.

The Everready Mfg. Company, Buffalo, N. Y., has been incorporated with a capital of $600,000 to manufacture fire extinguishers and fire fighting apparatus. The directors are Whitney G. Case, president of the W. A. Case & Sons Company; H. M. Poole and H. T. Voss of Buffalo. Factory premises have been leased at 40 Pearl street and will at once be equipped for the manufacture of the company's specialties.

The Wiliam H. Page Boiler Company, maker of the Allright, the Volunteer and the Monarch steam hot water boilers and radiators, has started its new factory at Meadville, Pa. The company will continue to maintain its warehouses at Norwich, Conn., as well as at Boston, to serve the Eastern trade. Its general offices are at 15 Murray street, New York.

The Garland Nut & Rivet Company, Bailey-Farrell Building, Pittsburgh, works at West Pittsburgh, Pa., will erect a new building at its plant, to be used as a galvanizing department.

The Traffic Club of Philadelphia, the recently formed organization of local transportation and shipping interests, held its regular monthly meeting, May 12, at the Manufacturers' Club in that city. The principal speaker of the evening was Hon. J. Hampton Moore, who made an address on the subject of "The Atlantic Deeper Waterways." Dr. F. G. Moore also presented an illustrated travel lecture on Mexico and the western part of the United States. Following the meeting, which was the last regular one preceding the summer vacation, an informal luncheon was served.

Aid for Canadian Shipbuilders Expected.

TORONTO, May 11, 1908.—It is expected that the Canadian Government will do something for the shipbuilding industry before the close of the present session of Parliament. Asked in the middle of the week as to the Government measures that were yet to be brought down, Sir Wilfrid Laurier enumerated bills that Ministers had then under consideration, and among these he mentioned one for the amending of the Customs Act. If, as is surmised, the amendments include changes affecting the shipbuilding industry, it would appear that it is only in this form that industry can expect anything at present, as in his summary of forthcoming governmental legislation no reference for a provision for a shipbuilding bounty was made. The remarks made in the Senate at about the same time by another minister, Sir Richard Cartwright, indicate that any disposition the Government may have to help the shipbuilding industry is rather in favor of taking duties off raw materials, structural forms, plates, &c., than to grant a bounty.

In the Senate the question of aiding shipbuilding was brought up on Tuesday by Senator Domville. A shipbuilding industry ought, he said, to be established in the Maritime Provinces, where in the days of wooden ships yards had flourished and the output of vessels went on increasing for years. He read a report that was made some time ago by a committee of the St. John Board of Trade, and a letter from Thomas Long, vice-president of the Collingwood Shipbuilding Company, both of which documents presented an argument for a governmental bounty. Speaking in reply for the Government, Sir Richard Cartwright, Minister of Trade and Commerce, said that the question deserved and would receive the Government's attention. It was not one, he said, that could be rashly undertaken, and the Government would have to be persuaded that the benefits hoped for would be realized. It was his opinion that the disadvantage at which Canadian shipbuilding is placed by duties on the parts involved in the fabrication of ships might very well be dealt with, though he did not wish to be understood as pledging the Government on the point.

Sir Mackenzie Bowell, on the opposition side, asked if a drawback of duty on shipbuilding parts is not now allowed. Sir Richard Cartwright answered that the law does provide for a drawback, but that customs regulations sometimes operate to prevent builders getting the benefit of it.

In what is probably to be the last session of Parliament before a general election, it would doubtless be considered good party tactics for the government to give some encouragement to the shipbuilding interests of the Maritime Provinces. The Provincial Legislature of Nova Scotia is on record as favoring the payment of a Dominion bounty on ships built in Canada. A few months ago the Provincial Government of New Brunswick was defeated at the polls. This was a serious reverse for the party that is in power in Ottawa, and points to a possible loss of seats there for the present Dominion Government. It would be in accordance with the rules of the political game as it is played in Canada if the Maritime Provinces were now humored in the matter of aid for the shipbuilding industry.

In a message delivered to the City Council last week the Mayor of Halifax urged that everything possible be done to secure the establishment of a shipbuilding industry in the harbor. C. A. C. J.

Cast Iron Pipe Prices for Twenty Years.

The accompanying table, reproduced from the *Municipal Journal and Engineer*, New York, May 6, gives the prices paid for cast iron pipe by St. Louis, Mo., during 20 years, as compiled by Wm. H. Bryan, from data furnished by W. E. Rolfe of the St. Louis Water Department:

Cast Iron Pipe Prices at St. Louis for 20 Years.

DATE OF ORDER	SIZES IN INCHES, AND QUANTITIES IN TONS												Price per ton 2,000 lbs. del. at yds.	Average Prices, by Years
	3	4	6	8	10	12	15	20	30	36	42	48		
——'88													$26.45	$26.45
2-19-'89			330	75		395							26.33	26.33
4- 2-'91						590							27.84	
7-28-'91			125			515							26.75	27.11
8- 9-'91			1,428	130		910	6			26			26.75	
2-10-'92			35			55		1,000	210				19.47	
4-25-'92						60					65		24.95	23.85
7-30-'92			1,440	40		720							25.48	
10-10-'92						5				685			25.48	
9-18-'93	10	30	1,400			1,560		2,035		450			19.40	19.40
8-21-'94			810			810	10	1,780	3,350	380			19.94	19.94
4- 1-'95			8			12			3,307	1,300			19.85	
5-23-'95		8	787			55							20.96	21.09
9-20-'95								950	5,400				22.47	
2- 8-'96	25	75	1,550	15		1,200							24.00	
8-12-'96			900			1,450		350					19.64	21.19
10-12-'96			5			30		155	2,015	6,905			19.94	
6-10-'97			750		6	1,400		1,044					14.57	
7-12-'97											53		16.50	16.30
9-29-'97				30		70	50	1,200	100				17.84	
3-31-'98			575			1,500	15	1,085		25			14.97	
7-25-'98			600			1,330		1,405				15	14.08	14.52
2-20-'99			650			2,700		350	400				18.80	
6-16-'99			600			1,075		1,120		1,305			24.40	21.60
4-23-'00			1,000			2,600		2,050					27.49	
8-14-'00			12			28				5,350			23.84	25.66
5- 4-'01			700			1,620		2,110	820	950			22.93	22.93
3- 8-'02			1,145			1,025		2,345	2,770	2,015			25.83	
5- 1-'02			830	175	225	550				1,580			28.93	27.38
3-30-'03		15	1,390			1,190	30	1,175	700				32.25	32.25
6- 4-'04		50	1,140			860		1,160	20	3,200			24.90	24.90
5- 1-'05			1,160										27.45	
5- 1-'05						1,360							26.45	26.53
5- 1-'05								375	840	153			25.70	
1-29-'06			2,200			2,650		1,650					28.90	
9-15-'06			1,350										30.75	29.82
9-15-'06						200		1,050					29.80	
5-14-'07			1,430			1,075		1,460		2,161			35.00	

During the spring of 1908 prices of $22.50 to $23 have been obtained in that section of the country on large orders.

The Iron and Metal Trades

All semblance of co-operation among makers of Foundry Pig Iron in maintaining prices has disappeared, and many of those who have steadily refused to meet the slowly declining market are now offering Foundry at the prices which have been really ruling for some time. In isolated instances even these prices have been shaded by producers who were acting in harmony with the others. The co-operative movement had its strongest adherents in the eastern Pennsylvania and in the Buffalo districts. Naturally they had accumulated considerable Iron, but the two groups are composed of financially sturdy concerns, who may decline to participate in a wild scramble for business. The Eastern furnaces particularly are hampered by high priced old contracts for Ore and Coke. The Buffalo group are better situated in that respect. The two meet in the territory north of Albany and in New England.

The pressure of the Southern makers is on all markets. No. 2 Foundry Iron at $11.25, Birmingham, which has been done, means $15.50 delivered at tidewater points. Philadelphia and New York, and $16 in New England harbors, which is $1 per ton and more below the lowest which eastern Pennsylvania furnaces have yet been willing to go. Of course, the latter are in a better position at interior points, and the question of quality plays some part. Southern Iron in the Central West meets Valley and other furnaces on the basis of $14.50 at Valley furnace.

The situation then is that there have entered the market a number of sellers who have the disposition to meet it. Just how far they must go, or are willing to go, is the question on the one side, while buyers must decide what price seems safe to them to contract for at least a part of their requirements for the third and fourth quarters. Some sellers do name prices for the latter delivery, but they are anywhere from 50 cents to $1 higher than those at which they are willing to book third quarter business.

There is one feature of the situation which should be frankly referred to, and that is the fact that a powerful interest made the proposal some weeks ago to clear the situation by an open drop to $10.50, at Birmingham, for No. 2 Foundry. That proposal, seriously made at the time, has been kept in mind by the trade and has raised the expectation that that figure represents the true, safe bottom. The impression at the time, however, was that it was a threat rather than the announcement of a future selling policy.

There has been a good deal more of interest among buyers during the past few days, and both makers and melters are feeling the market. Actual transactions are being closely guarded, but there are indications that they are more numerous and important than appears on the surface.

The finished trade on the whole is rather dull. Buyers are holding back to some extent in the hope that a readjustment of prices may soon be made, it being known that many of the active selling forces are no longer in sympathy with the policy of maintaining prices. In some instances, however, work which had been held back for months has been finally placed.

There has been some Rail business, the Lackawanna Steel Company having accepted 6000 tons from the Maine Central, 8000 tons from the Boston & Albany and 6000 tons from the Michigan Central. Thus far there has been put on the books of the Rail mills a total of 1,500,000 tons, including the orders carried over from last year.

The contract for the material for the La Salle Hotel at Chicago, a little over 8000 tons, has been finally placed with the American Bridge Company, after a long delay. Among the work being figured on are 5000 tons for the Lackawanna shops at Scranton, 4200 tons for a bridge over the Chicago drainage canal and 2000 tons for a Court House at Duluth.

Among the lighter lines Tin Plate still is the banner industry. Iron Bars are again demoralized in the East. The Wire industry has passed over the crest of its spring trade activity.

The largest contract placed for Cast Iron Pipe for some time is for 10,000 tons for Syracuse, secured by the United States Cast Iron Pipe & Foundry Company.

The export trade is enjoying a fair degree of prosperity and the outlook is more promising, since quite a number of undertakings throughout the world are rapidly progressing in the preliminary financing. Shipping orders were received lately on the 100,000 ton order for Sheet Bars, taken last year for delivery during the first half of this year. Some time since shipments were stopped.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	May 13, 1908.	May 6, 1908.	April 8, 1908.	May 8, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	*$16.75*	$17.50	$17.75	$25.50
Foundry No. 2, Southern, Cincinnati	*14.50*	14.75	15.25	24.25
Foundry No. 2, Local, Chicago	*17.25*	17.35	17.35	26.50
Bessemer, Pittsburgh	*16.90*	17.00	17.65	23.85
Gray Forge, Pittsburgh	*14.90*	14.90	15.40	22.85
Lake Superior Charcoal, Chicago	*20.00*	20.00	20.50	27.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	30.50
Forging Billets, Pittsburgh	*29.00*	29.00	30.00	....
Open Hearth Billets, Phila	29.20	29.20	29.20	32.50
Wire Rods, Pittsburgh	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	12.00	12.00	12.00	18.00
Steel Rails, Melting, Phila	12.75	12.75	12.75	19.50
Iron Rails, Chicago	*14.75*	14.75	15.00	24.50
Iron Rails, Philadelphia	17.00	17.00	17.00	27.25
Car Wheels, Chicago	*13.00*	12.50	14.00	25.00
Car Wheels, Philadelphia	14.00	14.00	14.00	24.00
Heavy Steel Scrap, Pittsburgh	12.75	12.75	12.75	18.00
Heavy Steel Scrap, Chicago	*10.50*	10.50	11.25	15.50
Heavy Steel Scrap, Philadelphia	12.75	12.75	12.75	19.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	*1.70*	1.40	1.65	1.85
Common Iron Bars, Chicago	1.65	1.65	1.65	1.70½
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.84½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	*1.55*	1.55	1.70	1.85
Skelp, Sheared Steel, Pittsburgh	*1.65*	1.65	1.80	1.90
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	1.90	1.90	1.90	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	*12.50*	12.87½	13.12½	24.87½
Electrolytic Copper, New York	*12.62½*	12.62½	12.87½	24.25
Spelter, New York	*4.60*	4.65	4.70	6.55
Spelter, St. Louis	*4.50*	4.50	5.52½	6.40
Lead, New York	*4.225*	4.20	4.00	6.00
Lead, St. Louis	*4.12½*	4.10	3.85	5.90
Tin, New York	*29.50*	31.05	31.75	42.25
Antimony, Hallett, New York	*8.50*	8.50	8.75	20.50
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	3.80	3.80	3.80	4.00

Chicago.

FISHER BUILDING, May 13, 1908.—(*By Telegraph.*)

Buyers are beginning to manifest a lively interest in Pig Iron, and are closely watching developments. As long as the market continues to sag they hesitate to cover for forward requirements, but many are becoming convinced that prices are nearing the line of production cost, which can be counted on to arrest the downward movement. This feeling is doubtless responsible for a number of new inquiries for considerable tonnage now in the market, but most of them are put out in the hope of securing offers somewhere near $10, Birmingham. While there are rumors of $11 having been done they are without confirmation, no price better than $11.50 on strictly No. 2 Foundry having up to this time been authentically established. It is evident that offers by the furnaces of anything below $11 would bring out some round tonnage business in Foundry Iron. The Structural Material contract for the new La Salle Hotel, amounting to about 7000 tons, which has been pending for several months, has just been awarded to the American Bridge Company. No other lots of important tonnage were entered by fabricators during the week, but bids are in on a number of bridge jobs, some of which will doubtless be closed in a few days, the aggregate of which is over 8000 tons. There was added to the Rail bookings of the mills in specifications and new business since last report a total of 7000 tons, of which 4500 tons of Standard Section Rails went to the Illinois Steel Company, and 1500 tons of high T Traction Rails going to the Pennsylvania Steel Company. The latter lot was purchased by the Milwaukee Electric Light & Railway Company.

There is little demand for Plates, but the Sheared Plate mill at the South Works was started up on Monday of this week at moderate capacity, and the Structural mill discontinued operation at the same time. Two lettings of Cast Iron Pipe advertised by the cities of Detroit, Mich., and Dayton, Ohio, aggregate 7000 tons, in addition to which there are a fair number of small lots coming up. Trade in Old Material is confined almost wholly to dealers, and though no material recession in prices is noted the market is essentially weak.

Pig Iron.—From the viewpoint of actual transactions last week's market was extremely quiet. Aside from the purchase of 2000 tons by the American Steel Foundries of Low Phosphorus Iron, no lots of considerable tonnage have changed hands. The purchase of 2000 tons of Malleable Iron made two weeks ago by a large local consumer has since been augmented by a purchase of 500 tons. Notwithstanding the meagerness of sales, it is quite evident that the present Pig Iron situation is awakening an active interest among consumers which may culminate in a buying movement at any time. Buyers are constantly testing the market with a view to developing a $10, Birmingham, price, but so far without success. The events of the past few weeks have fostered the belief that this price would eventually be reached, and it has been generally looked upon as the limit of the downward trend of values; but in spite of attractive tonnage offers at this price producers have shown no disposition to negotiate. Under the pressure that has been brought to bear the market has, however, weakened, and $11.50, Birmingham, for No. 2 Foundry, is now the general accepted price level. A prominent consumer was in the market last week with an offer to buy 4000 tons of No. 3 on a basis of $10.25, Birmingham, which as far as can be ascertained found no takers. An inquiry for 5000 to 10,000 tons of Basic Iron for a St. Louis Steel foundry plant is in the market, but it is regarded as unlikely that either the whole or a very considerable part of this tonnage will be placed immediately unless an exceptionally favorable price is offered. The impression that the market is now not far from bottom seems to be gaining ground, and as soon as buyers are convinced that no further reduction of a sensational nature can reasonably be expected there will undoubtedly be considerable tonnage placed. The following prices are for May and June delivery, f.o.b. Chicago:

Lake Superior Charcoal	$20.00 to $20.50
Northern Coke Foundry, No. 1	17.75 to 18.25
Northern Coke Foundry, No. 2	17.25 to 17.75
Northern Coke Foundry, No. 3	16.75 to 17.25
Northern Scotch, No. 1	18.25 to 18.75
Southern Coke, No. 1	16.35 to 16.85
Southern Coke, No. 2	15.85 to 16.35
Southern Coke, No. 3	15.35 to 15.85
Southern Coke, No. 4	14.85 to 15.35
Southern Coke, No. 1 Soft	16.35 to 16.85
Southern Coke, No. 2 Soft	15.85 to 16.35
Southern Gray Forge	13.85 to 14.35
Southern Mottled	13.60 to 14.10
Malleable Bessemer	17.25 to 17.75
Standard Bessemer	19.50 to 19.65
Jackson Co. and Kentucky Silvery, 6 %	18.90 to 19.40
Jackson Co. and Kentucky Silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky Silvery, 10 %	22.90 to 23.40

(*By Mail.*)

Billets and Rods.—There is practically no movement in Billets of any kind. Even the small orders in Rolling Billets, which for several months have constituted the full measure of transactions, are extremely scarce. Forging Shops are buying nothing save what is actually required for current engagements, and these are largely taken care of by stocks in hand. Prices on Forging Billets are unchanged, at $31.50 to $32.50, Chicago, and in face of the scant demand their maintenance at this figure is not questioned. Very little new business in Wire Rods is coming out and specifications against contracts are only fair. Prices continue firm and unchanged, as follows: Bessemer, $35; Basic, $36; Chain, $37; all at Pittsburgh.

Rails and Track Supplies.—The 1000 tons of Standard Rails, for which the Chicago, Indianapolis & Louisville Railway was stated in last report to be in the market has been placed with the Illinois Steel Company, and in addition thereto orders for about 500 tons from various sources have been entered. An order of 1500 tons of high T Open Hearth Traction Rails was taken by the Pennsylvania Steel Company, for which a premium of $2 a ton was secured. While there are no immediate prospects of large tonnage to be placed by any of the important systems considerable additions to purchases already made are looked for later in the year. A more encouraging feature is found in the fact that some specifications against suspended contracts are beginning to come in. An aggregate of about 4000 tons of such business has been entered during the week, and will probably be followed by further orders of like character. Orders for Track Supplies are coming out fairly well, and the Spike mills at Joliet are being operated at about 90 per cent. capacity. The situation as to Light Rails continues unchanged as to price; concessions of $4 to $5 a ton are still being made from regular quotations. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.50c.; car lots, 1.60c. to 1.70c.; Spikes, 1.80c. to 1.90c., according to delivery; Track Bolts, 2.25c. to 2.35c., base. Square Nuts, and 2.40c. to 2.50c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—While no contracts of notable tonnage are reported for the week, several lots of considerable size are in prospect, some of which will doubtless be placed within a few days. Among these are several bridges, which include 1350 tons for the Illinois Central Railway; 200 tons from the Chicago, Burlington & Quincy, bids on which went in on May 7; 4200 tons for the reconstruction and conversion of a bridge over the Chicago Drainage Canal into a Scherzer rolling lift bridge, contract for which is scheduled to be let on May 27, and 400 tons of bridge material for which the Chicago, Indianapolis & Louisville Railway is in the market. The general contract for the Tacoma Post Office, including 528 tons of Structural Shapes, was secured by W. H. Maxwell. Bids are being taken on the St. Louis County Court House, Duluth, Minn., comprising 2000 tons, which will probably be awarded on May 12. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—After a shutdown of several weeks during which time enough orders have accumulated to justify starting up, the Sheared Plate mill at the South Works began rolling Monday. The tonnage in hand is, however, not large enough to insure indefinite operation. With no new car building in sight and only a small part of the boiler and tank shop capacity engaged, there is little prospect of much new business of considerable tonnage in the near future. With the exception of some cutting to the extent of $2 to $3 a ton by mills making a limited range of sizes it is reported regular prices are being maintained. We quote mill shipments, as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72-in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—The demand for Sheets has for some time been relatively better than most other products, but has waned somewhat recently. Both jobbers and consumers are ordering frequently, but only in small lots required to maintain fair stock assortments or for actual shop requirements. Whatever irregularity there is in prices seems to be limited to a few small mills, so that in the main regular prices prevail. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 and 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—The volume of business in Bars, both Steel and Iron, shows no increase, and specifications and new orders coming to the mills in this district are sufficient to permit their operation only one or two weeks each month. Bar Iron, however, holds a slight lead over Steel, specifications for which are furnished a little more freely. Buyers of both are unwilling to purchase for forward requirements, and are closely restricting their orders to actual needs. While principal producers are reported to be still maintaining prices pretty evenly, some of the mills are taking business at concessions from the regular price. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—The nature of orders received from jobbers indicate that they are not anticipating future business by increasing stocks, but are only sorting up on broken sizes. No large orders are being placed, the largest buyers being content to order in carload lots. This policy is seemingly dictated, not only by the quiet condition of trade, but

also by the feeling that prices may be lower in the future. No deviation is being made from present prices. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 71 per cent. on Black Steel Pipe, ¾ to 6 in. From two to three points above these prices is asked for Iron Pipe.

Boiler Tubes.—No developments of significant interest are reported in the market, though the past week seems to have brought out a slightly better demand from jobbers, who are buying only what is needed to keep up stocks. A scattering run of small orders is all that is doing in Locomotive Tubes. Mill quotations for future delivery, on the base sizes, are as follows: 2⅜ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2¼ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron	Seamless.
1 to 1¼ in.	55	55	55
1½ to 2 in.	50	55	55
2½ in.	52½	55	55
2½ to 3½ in.	50	47½	47½
6 in. and larger	50	55	-

Merchant Steel.—Orders for Tire sizes from the carriage and wagon builders were offered a little more freely last week, but the demand for miscellaneous shapes and special grades shows no improvement. Nothing of importance is looked for in these lines until the agricultural interests are ready to negotiate for their coming season's requirements. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1½ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 56 per cent. off in car lots; 52 per cent. in less than car lots, base territory delivery.

Cast Iron Pipe.—The city of Detroit, Mich., is preparing to purchase 6500 tons, a letting of which will be held in the near future. The city of Dayton, Ohio, is also in the market for 500 tons. Besides these there are a number of small municipal contracts pending and in prospect, the aggregate of which will amount to a fair tonnage. There is some improvement in small lot inquiries, though altogether the tonnage coming out is far below foundry capacities, and so far as prices are concerned the market is an open one. It is naturally the opinion of those conversant with the trade that a more settled condition of the Pig Iron market would tend to greater stability in Cast Iron Pipe. We quote, nominally, per net ton, Chicago, as follows: Water Pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25; with $1 extra for Gas Pipe.

Metals.—Although there is no appreciable improvement in demand, and buyers show no disposition to depart from the existing policy of hand to mouth buying, prices have not been adversely affected. Such small lots of Copper as are being taken by consumers command prices closely within the range of current quotations. A fractional advance on Lead is noted, but it is unaccompanied by any marked improvement in demand. Old Metals are dull and unchanged. We quote as follows: Casting Copper, 13¼c.; Lake, 13¾c. to 14c., in car lots for prompt shipment; small lots, ⅛c. to ¾c. higher; Pig Tin, car lots, 32½c.; small lots, 33½c.; Lead, Desilverized, 4.35c. to 4.50c., for 50-ton lots; Corroding, 5.35c. to 5.45c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 10½c., and other grades, 9¾c. to 10¼c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 10½c.; Copper Clips, 11c.; Red Brass, 11½c.; Yellow Brass, 9¾c.; Light Brass, 6½c.; Lead Pipe, 4c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 25c.; Block Tin Pipe, 27c.

Old Material.—Practically all of the large railroad tonnage offered last week was taken by dealers, very little, if any, of it going to consumers. Neither the rolling mills nor melters are actively in the market, and no sales of significant tonnage to those interests are heard of. Continued buying by dealers under the present sluggish demand from consumers means accumulation of stocks, and there is a limit to their capacity to absorb offerings in the absence of an outward movement. Under the circumstances, therefore, the prospect for development of a firmer price situation in the immediate future is not particularly encouraging. It was erroneously stated in last week's report that the Chicago, Rock Island & Pacific sold 3400 car wheels at $12.50 gross ton; the sale in question was made as stated, but the price was $13 gross ton. The flurry on Rerolling Rails that has for several weeks held them correspondingly higher than other grades, has about spent its force. There are two railroad lists to be offered this week—one by the Chicago, Milwaukee & St. Paul, 3000 tons, and the other by the Southern Railway, 3300 tons; the former includes 250 tons of Iron and 400 tons of Steel Rails, and the latter 740 tons of Steel Rails and 400 Car Wheels. We quote, per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$14.75 to $15.25
Old Steel Rails, rerolling	13.00 to 13.50
Old Steel Rails, less than 3 ft.	12.00 to 12.50
Relaying Rails, standard sections, subject to inspection	20.50 to 21.50
Old Car Wheels	13.00 to 13.50
Heavy Melting Steel Scrap	10.50 to 11.00
Frogs, Switches and Guards, cut apart	11.50 to 12.00
Mixed Steel	8.50 to 9.00

The following quotations are per net ton:

Iron Fish Plates	$12.75 to $13.25
Iron Car Axles	15.75 to 16.25
Steel Car Axles	14.50 to 15.00
No. 1 Railroad Wrought	10.75 to 11.25
No. 2 Railroad Wrought	9.75 to 10.25
Railway Springs	10.75 to 11.25
Locomotive Tires, smooth	12.50 to 13.00
No. 1 Dealers' Forge	9.00 to 9.50
Mixed Busheling	7.00 to 7.50
Iron Axle Turnings	5.50 to 6.00
Soft Steel Axle Turnings	5.50 to 6.00
Machine Shop Turnings	5.00 to 5.50
Cast Borings	4.00 to 4.50
Mixed Borings, &c.	4.00 to 4.50
No. 1 Mill	6.50 to 7.00
No. 2 Mill	5.50 to 6.00
No. 1 Boilers, cut to Sheets and Rings	6.75 to 7.25
No. 1 Cast Scrap	11.50 to 12.00
Stove Plate and Light Cast Scrap	10.00 to 10.50
Railroad Malleable	9.75 to 10.25
Agricultural Malleable	9.25 to 10.25
Pipes and Flues	7.50 to 8.00

Cincinnati.

CINCINNATI, OHIO, May 13, 1908. (*By Telegraph.*)

There is a very unsettled feeling among Iron factors and manufacturers upon whom they depend in this market because of the many and conflicting statements published concerning the prices of Iron. While the rumored drop to a $10, Birmingham, basis for No. 2, is as far distant at this writing as a week ago prior to the New York meeting, there still exists the fear among buyers that some isolated interest in the South may, now that all restrictions are removed, unload a limited stock at a material concession, which would attract those in immediate need into the market in large numbers, and the price under the pressure of limited supply would be forced up abnormally all round. While stores and small dealers generally here are maintaining the published schedules on Finished Material, it is generally believed that the latter part of the month will see important reductions. Reports coming into the Cincinnati office of *The Iron Age* from manufacturers in central territory indicate a better feeling among makers of special machinery and patented specialties with the tool manufacturers about holding their own.

Pig Iron.—There is admittedly much feeling of the market on prices for future deliveries, particularly beyond the third quarter. A late inquiry from northern Ohio, coming from a heating and ventilating plant, for 2000 tons for the last half will be quoted on by several furnaces, and it is practically admitted that $12 may be done, although some interests will not quote at all, feeling that it lacks sincerity. Among the larger local interests the feeling is bullish, and the prediction is made that prices will on July 1 be from 50c. to $1 a ton higher. Not all Southern furnaces will meet the $11.50 price on No. 2, but enough of them have done so to take care of all inquiries out at the present time, and one in Alabama is said to have shaded this price a trifle. There is little doing in the Ohio field, the recent aggressiveness of the Valley producers, coupled with price reductions in the South which the Hanging Rock District could not possibly meet except at a loss, having put the producers in that district practically out of the running for the present. A visitor in this market to-day, at the head of one of the largest Iron interests in the Ohio field, intimated that in the face of the action of the Ore people and the present unsettled conditions in prices, the few furnaces remaining in blast would be promptly put out on signs of further cutting. An incident of interest among the Iron dealers is the inquiry from a northern Ohio Pipe maker who asks prices weekly for his needs of 1200 tons, divided into 400 tons each of Nos. 2, 3 and 4 Foundry. Figures are made up on Monday and sent him each week. It is understood that the Valley producers have filled the requirements up to the present time on a price of about $15.40, delivered, which would beat the Southern price of $11.50 just 45c. a ton. It is understood that the inquiry from the car manufacturing concern for Detroit delivery, 3000 tons, is still open. An inquiry of to-day is from an interior Ohio concern for 100 tons of Malleable for prompt shipment. A price of about $16, Valley furnace, will be made for this requirement. Jackson County Silvery 8 per cent. is still quoted at $18.50, at furnace. A sale of 50 tons of 6 per cent. was made at $17.50. Low grades still seem to lead in demand, and prices are firm, at $10.50, at furnace, on Forge, and $10 on Mottled. For early delivery and extending into third quarter, we quote f.o.b. Cincinnati,

freight rates being $3.25 from the Birmingham, and $1.20 from the Hanging Rock District, as follows:

Southern Coke, No. 1	$15.25 to $15.75
Southern Coke, No. 2	14.75 to 15.25
Southern Coke, No. 3	14.25 to 14.75
Southern Coke, No. 4	13.75 to 14.25
Southern Coke, No. 1 Soft	15.25 to 15.75
Southern Coke, No. 2 Soft	14.75 to 15.25
Southern Coke, Gray Forge	13.50 to 14.00
Southern Coke, Mottled	13.00 to 13.50
Ohio Silvery, 8 per cent. Silicon	19.70
Lake Superior Coke, No. 1	16.70 to 17.20
Lake Superior Coke, No. 2	16.20 to 16.70
Lake Superior Coke, No. 3	15.70 to 16.20
Standard Southern Car Wheel	22.25 to 22.75
Lake Superior Car Wheel	22.00 to 22.50

(*By Mail.*)

Coke.—Reports of decreased production continue to circulate in this market, with the same diminution of interest on the part of consumers. There is nothing heard of furnace business, although it is reported through one of the large selling agencies that an operator reported last week a contract from the ovens for 125,000 tons of Furnace Coke extending through the year. For spot shipment the statement is made that an offer of tonnage would bring out a very attractive price. Connellsville Foundry is quoted at $2 to $2.25 for spot delivery and $2.15 to $2.40 on contract; Virginia grades on contract about $2.25; for spot shipment, $2; New River Foundry $2.65 to $3, all at oven. A shipment of last week through this market was made up of 35 cars at a price of $3.

Finished Iron and Steel.—Dealers report the slightest perceptible increase in sales and inquiries over last month at the same time, and manage to extract some encouragement therefrom in anticipating the future. Where everything was in small lots and a carload was almost uheard of, there are some materials moving in carloads now, notably Structural Shapes, Boiler Tubes, Plates, &c. Dealers are given to understand, however, that the agitation which has been going on for some time in the matter of lower prices promised is having a strong deterrent effect on sales, and that buyers are holding off for these anticipated better prices. Mill prices on Boiler Tubes in this market are as follows: 1¾ to 2¼ in., 57.50, with 5 off; 2½ in., 59.50, with 5 off; 2¾ to 5 in., 63.50, with 5 off, all in carload lots and f.o.b. Cincinnati. For stock shipment the prices are 1¾ in. at 54; 2½ in. at 56, and 2¾ in. at 62. Orders from stock are filled by dealers at the following prices, which are f.o.b. Cincinnati: Iron Bars, carload lots, 1.65c., base, with half extras; small lots from store, 1.85c., base, half extras. Steel Plates, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2c. Blue Annealed Sheets (Heavy, No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.20c. No. 12, carload lots, 2c.; small lots from store, 2.30c. Sheets (Light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.20c.

Old Material.—There is a little better inquiry for certain lines of Scrap, and for the first time for many months dealers are beginning to feel a little encouraged. There have been some fairly good sales during the week of Heavy Melting Steel Scrap and some Relayers. Dealers are still buying, but there is comparatively little trading between and among dealers here. Quotations are about as follows, prices being f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$10.50 to $11.50
Cast Borings, net ton	4.00 to 5.00
Heavy Melting Steel Scrap	11.50 to 12.50
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	14.50 to 15.50
Old Iron Rails, gross ton	13.00 to 14.00
Old Steel Rails, long, gross ton	11.00 to 12.00
Old Steel Rails, short, gross ton	11.00 to 12.00
Relaying Rails, 56 lb. and up, gross ton	22.00 to 23.00
Old Car Wheels, gross ton	12.00 to 13.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00

St. Louis.

ST. LOUIS, MO., May 11, 1908.

Among the factors which are making for activity in certain lines are the heavy contracts being placed by the city of St. Louis. For instance, an order for 5000 tons of Cast Iron Pipe has been placed with the United States Cast Iron Pipe & Foundry Company. A leading house reports the sale of a round lot of Pig Iron, and one of the large companies finds a better demand for Structural Material. The American Car & Foundry Company will start up its rolling mill department early next month.

Coke.—Although there is no large business to report, yet Coke is moving steadily in filling prior contracts. In some instances orders for withholding shipment have been countermanded. New business is in lots of from 10 to 15 cars, shipment over the next four months up to the end of the year, and in one case the delivery covers a year from the present time. The price range for Foundry Coke is $2.15 to $2.50, f.o.b. oven, for scattered and future shipment, the lower price being for prompt shipment.

Pig Iron.—The market for Pig Iron is somewhat irregular as to price. Doubtless sellers are governed by quantity and time of delivery to some extent. The demand is much improved, however, and we learn that a local firm has just sold a round lot of 10,000 tons for June, July, August shipment, this being the largest transaction at St. Louis in Pig Iron since last fall. We hear of transactions in small lots aggregating 500 to 600 tons by one of the leading concerns during the week for immediate and future shipment, mostly at $11.75 to $12, Birmingham, though we understand a lot of 100 tons was contracted for at $11.50.

Finished Iron and Steel.—There is some improvement in Finished lines, at least inquiries for prices are coming in more freely. The demand for Structural Material has been more active, specifications coming mostly from local contractors. The market for Bars is not strong and specifications are light. The inquiry for Standard Rails has been better.

Old Material.—The market generally is weaker, as the mills are not buying. Trade is largely confined to the few leading dealers. We learn that one railroad has a list out this week of 1400 tons, while another is offering a lot of 500 tons Car Wheels. We hear of a sale of 1000 tons of Old Car Wheels at $12 per gross ton. Relaying Rails have advanced under scarcity and a more urgent demand. We quote, f.o.b. St. Louis, per gross ton, as follows:

Old Iron Rails	$14.00 to $14.50
Old Steel Rails, rerolling	11.25 to 11.50
Old Steel Rails, less than 3 ft.	11.00 to 11.25
Relaying Rails, standard sections, subject to inspection	22.00 to 23.00
Old Car Wheels	12.00 to 12.25
Heavy Melting Steel Scrap	10.75 to 11.00
Frogs, Switches and Guards, cut apart	10.75 to 11.00
Mixed Steel	9.00 to 9.50

The following quotations are net ton:

Iron Fish Plates	$11.50 to $12.00
Iron Car Axles	15.00 to 15.50
No. 1 Railroad Wrought	11.00 to 11.25
No. 2 Railroad Wrought	10.00 to 10.25
Railway Springs	9.75 to 10.00
Locomotive Tires, smooth	12.50 to 13.00
No. 1 Dealers' Forge	9.50 to 10.00
Mixed Borings, &c.	3.50 to 3.75
No. 1 Boilers, cut to Sheets and Rings	7.50 to 8.00
No. 1 Cast Scrap	10.50 to 10.75
Stove Plate and Light Cast Scrap	9.00 to 9.50
Railroad Malleable	9.50 to 10.00
Agricultural Malleable	8.50 to 9.00
Pipes and Flues	7.25 to 7.50

William B. Weston, manager of sales for the St. Louis District of the Carnegie Steel Company, Illinois Steel Company and Tennessee Coal, Iron & Railroad Company, announces the removal of the St. Louis offices of those companies from the Chemical Building to the Third National Bank Building.

Birmingham.

BIRMINGHAM, ALA., May 9, 1908.

Pig Iron.—There are no indications that developments during the week relative to the basis of Southern quotations have stimulated the demand. Purchasers are apparently willing to await further developments, both as to price and the urgency of their requirements, and transactions continue to involve comparatively small lots, although the aggregate for the past week compares favorably with previous report. Among the sales reported are lots of 300 and 200 tons, respectively. The prices received do not indicate a decline from a basis of $11.50, Birmingham, for No. 2, which is generally considered the market price. The sale of 750 tons of High Manganese Iron is also reported, but the analysis is such that the price received is not a criterion of values. As a result of the recent Ore and Pig Iron Committee's meeting producers are of the opinion that quotations will be strengthened, and a further decline is hardly probable; however, recent transactions evince a disposition by some interests to take care of their output even if further concessions in prices are necessitated, and the ability of such concerns to meet the anticipated demand is the source of much speculation. It is to be noted that the present largest producer reports sales so far this month in excess of the output, and all smaller concerns are believed to have very little tonnage to offer for prompt deliveries. The recent statement that a large Southern interest was making an effort to dispose of its stock accumulation by exporting to Europe at a material reduction appears to have no foundation. It is known that an effort to place 100,000 tons in the district at $10.50, Birmingham, was unsuccessful, and the company to which the export business is accredited is probably the only interest that could have furnished the tonnage as specified. The re-

ported sale of 10,000 tons at $11.25 is also unconfirmed. The production of Foundry Iron in the State is now represented by 13 furnaces.

Cast Iron Pipe.—It is learned that the city of Rosswell, N. M., is to award contract for 1800 tons of Water Pipe at an early date. The aggregate of tonnage recently placed does not reach large proportions, but within the week one idle plant has been put in operation and the output of another was increased materially. An order for 1500 tons of Gas Pipe has been placed with the United States Cast Iron Pipe & Foundry Company, for the gas works at Birmingham, Ala., and Nashville, Tenn., while the American Cast Iron Pipe Company has been awarded contract for 800 tons of Water Pipe for the city of Fairview, Okla. The figures at which these orders were placed are not made public, but in the absence of advices to the contrary, quotations are believed to have been maintained and we quote nominally as follows, per net ton, f.o.b. cars here: 4 in. to 6 in., $23; 8 in. to 12 in., $22; over 12 in., average $21, with $1 per ton extra for Gas Pipe. Above quotations are probably shaded on large municipal contracts.

Old Material.—The market is very weak, with hardly sufficient business offered to ascertain just what prices are current. The consumption of Steel Scrap has been materially decreased within the week, and the demand for other grades is at an exceptionally low ebb. A further decline in prices is generally conceded inevitable, but in the absence of transactions, a revision of more than 50c. per ton is unwarranted, and we quote nominally as follows, per gross ton, f.o.b. cars, here:

Old Iron Rails	$15.50 to $15.00
Old Iron Axles	14.50 to 15.00
Old Steel Axles	13.00 to 13.50
No. 1 Railroad Wrought	12.50 to 13.00
No. 2 Railroad Wrought	9.50 to 10.00
No. 1 Country Wrought	11.00 to 11.50
No. 2 Country Wrought	10.00 to 10.50
Wrought Pipe and Flues	9.00 to 9.50
No. 1 Steel	10.50 to 11.00
No. 1 Machinery	10.00 to 10.50
Stove Plate and Light Cast	9.00 to 9.50
Cast Borings	5.50 to 6.00

Philadelphia.

PHILADELPHIA, PA., May 12, 1908.

The immediate outcome of the meeting of the Pig Iron and Ore Committee in New York on Thursday last has been a decided lowering of Pig Iron prices on the part of a number of Northern and Virginia producers. It has been clearly evident for some time that all the producers would not take the same view of the price situation, and cutting of the established base price by outside interests has been general. That the committee adjourned without fixing any basis of prices puts the trade in the same position as it was previous to the depression, and each producer will decide the price for himself and be governed largely by individual conditions. This is hardly likely to result in any continued sharp cutting of prices, as many furnaces have been selling close to the actual cost of production, and rather than sell at lower figures will either pile Iron and wait for a better demand or blow out their furnaces. In the meantime buyers are feeling the market and are hardly likely to purchase extensively until they feel that the bottom has been reached, or until general conditions warrant purchasing for future consumption. Finished materials have been in light demand pending the action taken by Pig Iron producers. Prices are being maintained in this territory, but the trade looks for some adjustment should the prices of Pig Iron recede to any material extent. Meanwhile buying of all kinds is along very narrow lines, and the tendency on the part of buyers is to defer purchases pending some further settlement of prices.

Pig Iron.—The situation is rather complicated, and it is difficult to say what prices on some grades of Pig Iron are or what they will be in the immediate future. In a number of cases producers who have been holding to the established basis of $18.25 have decided, since the meeting in New York last week, to meet the low prices which have been quoted heretofore by the outside interests, and in some instances even those prices have been shaded. There is no tendency, however, to meet the reported basis of $10, Birmingham, for Southern No. 2 Foundry, which price seems to be without fact. As far as we can learn, Southern producers are not inclined to shade $11.50, Birmingham, for this grade, and even at this price the amount of business done has been extremely small. A wide range of prices prevails for Northern Irons, and furnaces are governed entirely by individual conditions in making quotations. Some furnaces have maintained the old $18.25 basis for No. 2X Foundry, delivered in this territory, but they are disposing of practically no Iron. Others have shaded that price from 50 cents to $1.50 per ton, and have at that taken but few orders. With the market in its present condition consumers will take, as a rule, but small tonnages for immediate use, and will buy conservatively until they feel certain that the bottom has been reached. There has been some feeling of the market, both for early delivery as well as for the second half of the year, but sellers as a rule refuse to sell at to-day's prices for forward delivery; the usual advance asked for delivery during the second half being about 50 cents a ton. Producers are not forcing the market at to-day's prices, as they firmly believe that prices will harden just as soon as there is any improvement in the demand. Sales have been small, and on some grades no business has been done since last week. Northern No. 2X Foundry has been sold in lots ranging from carloads up to 100 tons at prices ranging from $16.75 to $17.25, delivered. Some furnaces, however, will not sell at these figures and are asking from 50 to 75 cents above those prices. A number of producers, acting individually, appear to have fixed on $17 as the price for No. 2X for delivery during the remainder of the second and the third quarter, with $18 named for delivery during the last quarter, or $17.50 would be accepted for deliveries covering the entire second half of the year, but buyers are holding off and a waiting market prevails. No sales of Virginia Foundry Irons have been reported. Makers are not seeking business, but quotations on No. 2X Foundry have receded to $17, delivered in this territory for the standard grades. A marked decline is to be noted in the price of Forge Iron, and some few sales of small tonnages of medium grade Iron have been sold as low as $15.25, delivered. On other brands, however, quotations are firm at $16, delivered, but owing to the inactive condition of mills the demand is extremely light. Basic Iron shows no movement. Steel mills, as a rule, having good tonnages of Iron still due them at high prices, and consumption is much restricted. In the absence of business it is difficult to name a price for this grade, but sellers have expressed a willingness to accept business at from $16.25 to $16.50, delivered. An inquiry for 500 tons of Low Phosphorus Iron has been on the market, but it is believed to be still unclosed. Sellers are offering this grade at $21.50 to $22, delivered, without resulting in business. Quotations, therefore, are almost entirely nominal on all grades of Pig Iron and represents at the time largely those at which sellers would be willing to take business for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory. The range of prices would probably be as follows:

Eastern Pennsylvania, No. 2X Foundry	$16.75 to $17.25
Eastern Pennsylvania, No. 2 Plain	16.25 to 16.75
Nuggety, No. 2 X Foundry	17.00
Virginia, No. 2 Plain	16.50 to 16.75
Gray Forge	15.25 to 16.00
Basic	16.25 to 16.50
Low Phosphorus	21.50 to 22.00

Ferromanganese.—Prices have an upward tendency, although sales have been extremely small. Those having Ferro in stock at tidewater would probably sell small lots at $43.50 to $44, while quotations on material subject to importation range around $46, Baltimore.

Steel.—Business is still very quiet. Mills continue to operate on a greatly restricted basis, and orders are largely of a day to day character. New orders are few, and specifications on old contracts come out sparingly. Quotations are unchanged. Ordinary Rolling Steel for delivery in this territory is quoted at $29.20, with Forging Steel at $31.20, subject to the usual extras for high carbons and large sizes.

Plates.—No particular change is to be noted in the demand. Orders are of a miscellaneous character, and are mainly for small lots, ranging up to 100 tons, for prompt delivery. The outlook is not very encouraging, there being but little business for large tonnages or forward delivery around. Prices are being well maintained, the following quotations being made for delivery in this territory:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The following base prices for sizes and heads are subject to the following Extra per 100 lb.

3-16-in. thick	$0.10
No. 7 and B. W. G.	.15
No. 8 B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—A moderate run of orders continues. Individually they are not large, but are sufficient in the aggregate to enable mills to about hold their own regarding production. A number of the fabricators have been taking some small business ranging up to 50 and 100 tons. One or two somewhat larger propositions have also come out, but there is still considerable hesitancy displayed on the part of buyers in placing orders for heavy tonnages. Prices are being maintained, 1.85c. to 2c. being named, according to specification.

Sheets.—The demand is unchanged. Orders are largely of a day to day character, and usually for small tonnages for prompt shipment. Consumers are not anticipating their wants, and mills continue to operate on a restricted basis. Quotations range as follows for mill shipment, with a tenth

extra for small lots: Nos. 18 to 20, 2.50c.; No. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—While some mills are holding to the established basis of 1.65c. for Refined Iron Bars, delivered in this territory, they are taking practically no business at that price. Specifications on Bars, contracted for at lower prices, constitute the bulk of the business around and the majority of sales have been by merchants and brokers who can supply these low priced Bars. Actual sales are small, and for prompt shipment, and prices range from 1.46c. to 1.65c., delivered in this territory.

Coke.—The trade is very dull. Business comes out slowly and tonnages sold are light and confined almost entirely to Foundry Coke. Prices are unchanged, and range from $2.15 to $2.40, at oven, for Foundry Coke, and $1.65 to $1.85, at oven, for Furnace Coke. For delivery in this territory the following range of prices is quoted:

Connellsville Furnace Coke	$3.80 to $4.00
Foundry Coke	4.30 to 4.55
Mountain Furnace Coke	3.40 to 3.60
Foundry Coke	3.80 to 4.10

Old Material.—The market is extremely quiet. Sales have been confined largely to carload lots of miscellaneous material, no activity being shown in any particular grade. Railroad lists which recently came out show that the railroads are still holding large tonnages of Scrap, but mills are not bidding very extensively. There has been no special change in prices during the week, which are nominally quoted for prompt shipment, delivered in buyers' yards, eastern Pennsylvania and nearby territories as follows:

No. 1 Steel Scrap and Clips	$12.75 to $13.25
Low Phosphorus	17.50 to 18.00
Old Steel Axles	17.50 to 18.00
Old Iron Axles	20.00 to 21.00
Old Iron Rails	17.00 to 18.00
Old Car Wheels	14.00 to 15.00
Choice No. 1 R. R. Wrought	15.00 to 15.50
Machinery Cast	15.00 to 15.50
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	8.75 to 9.25
Stove Plate	11.00 to 11.50
Cast Borings	7.75 to 8.25
Grate Bars	11.75 to 12.25

Cast Iron Pipe.—A sale of nearly 10,000 tons of Cast Iron Pipe is reported by the United States Cast Iron Pipe & Foundry Company to the Syracuse Suburban Water Company, Syracuse, N. Y. The Pipe ranges from 8 to 24 in. in diameter, and delivery is to be completed by November 1. The price is understood to be a shade under $23.50, delivered.

Pittsburgh.

PARK BUILDING, May 13, 1908.—(*By Telegraph.*)

Pig Iron.—Buyers are still showing a disposition to place orders only for small lots for actual needs. The market is now wide open and prices on the whole are lower. We quote Bessemer Iron at $16, Valley furnace, or $16.90, Pittsburgh, but in some cases, and for only small lots, this price has been shaded 10c. to 15c. a ton. Basic Iron has declined squarely to $15, Valley furnace, two or three sellers offering it at that price. We note a sale of 200 tons at this figure. Struthers Furnace started up on Monday on Basic Iron. Northern No. 2 Foundry is about $14.75, Valley furnace, but this price has been shaded in some recent sales. There is no demand whatever for Forge Iron, and we quote Northern makes nominally at $14, Valley furnace, or $14.90, Pittsburgh.

Steel.—There is absolutely no new demand for Billets, but we are advised that consumers are taking out a little more tonnage on contracts. Sheet and Tin Bars are moving quite freely, and shipments by the Carnegie, Republic and Youngstown companies are fairly heavy. Leading producers of Steel are firmly holding at $28, Pittsburgh, and $28.50, Youngstown or Wheeling, for Bessemer and Open Hearth Billets; Sheet and Tin Bars taking $1 advance. Forging Billets are nominally $29 to $30, Pittsburgh.

(*By Mail.*)

Disappointment was felt last week in local Iron circles that nothing definite was done at the meeting of the Ore and Pig Iron Committee, held in New York last week. While the Ore interests insist that last year's prices on Ore will be held this year, there are some in the trade, among them consumers of Ore and Pig Iron, who believe that to start with Ore and make a reduction all along the line on Ore, Pig Iron, Steel and Finished Material would help the situation and stimulate buying. However, all indications up to this time are that the Steel Corporation and the other large Steel interests will continue to make every effort to hold prices where they are, believing that when the proper time comes the Iron trade will open up. There is undoubtedly a broadening of credit throughout the country, and this ought to result in the railroads and other industrial enterprises being able before long to get money on their securities and purchase material. The demand for Pig Iron continues dull. In the Mahoning and Shenango valleys and adjacent territory, Dover Furnace, of M. A. Hanna & Co. is running on Basic; Youngstown Steel and No. 3 Shenango on Bessemer; Stewart Iron Company on Low Phosphorus, and Girard and one Andrews & Hitchcock stack on Foundry. Struthers Furnace, which makes only Basic, will probably start this week. The nominal price of Bessemer Iron is $16, Valley, or $16.90, Pittsburgh, but this price has been slightly shaded in some cases. Basic Iron is slightly easier, and is being offered by two or three sellers at $15, at furnace. Very little is doing in Foundry Iron, and Northern No. 2 is about $14.75, Valley, or $15.65, Pittsburgh. Billets are moving a little more freely on contracts, but no new tonnage is being placed. The demand for Finished Iron and Steel is slowly getting better, Tin Plate and Merchant Pipe being more active than the other lines.

Ferromanganese.—The low prices ruling are bringing out some business, and there are more inquiries in the market than for some time. One local consumer has bought 800 to 1000 tons of foreign Ferro, deliveries extending over a year, on the basis of $43.50, seaboard, or $45.45, Pittsburgh. Another consumer is in the market for 150 tons for delivery over the last six months of this year. We quote 80 per cent. foreign Ferro for prompt delivery at $43, and for extended delivery at $43.50, seaboard, the freight rate to Pittsburgh being $1.95 a ton.

Steel Rails.—The Carnegie Steel Company took in the past week about 1400 tons of Light Rails, but aside from two or three orders for export nothing has been done in Standard Sections. Nos. 1 and 2 Rail mills of the Carnegie Steel Company, at Bessemer, are running this week, but are gaited to 35 or 40 per cent. of capacity, while No. 3 mill, on which Light Rails are rolled, is shut down. Regular prices on Light Rails, which continue to be shaded from $3 to $4 a ton by rerolling mills, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Ferrosilicon.—Not much inquiry is noted, and we quote 50 per cent. at $70, f.o.b. Pittsburgh.

Skelp.—Little new business is being placed, and specifications against contracts are only fair. We quote: Grooved Steel Skelp, 1.55c. to 1.60c.; Sheared Steel Skelp, 1.65c. to 1.70c.; Grooved Iron Skelp, 1.75c. to 1.80c.; Sheared Iron Skelp, 1.85c. to 1.90c., Pittsburgh.

Muck Bar.—No sales have been made in this market on which to base actual prices. We quote best grades of Muck Bar, made from all Pig Iron, at nominally $26 to $27.

Rods.—Only an occasional small order for actual needs is being placed. Nominal prices are $35 for Bessemer Rods, $36 for Open Hearth, and $37 for Chain Rods, f.o.b. Pittsburgh.

Plates.—Reports are that a large tonnage in Plates has been taken by a local interest for some new boats, but this has not been officially confirmed. Buyers continue to place orders only for actual needs. Narrow sizes are still shaded by some mills about $2 a ton. Regular prices are as follows: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell grade of steel is abandoned.	

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—It is expected that the addition to the Fort Pitt Hotel, about 1800 tons, will be given out this week. No contracts of moment have been placed in this district recently, and not much new business is in sight. The mills are able to make prompt shipments, and while official prices on plain material are probably being held, fabricating on some jobs is being done at less than cost. We quote Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck

Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—It is learned that a number of the large jobbers in Sheets have notified their customers not to buy any more than they absolutely need until July 1, advising them that a reduction in prices of Sheets is likely to be made between now and that date. This has brought out a statement from the independent Sheet manufacturers that no reduction in prices of Sheets is contemplated, and that consumers will not run any risk in placing their orders for delivery ahead at present prices. New business is light, but it is known a good deal of work is being held up as long as possible, in the belief that prices may be lowered. Regular prices, which are sometimes slightly shaded by only a few mills, are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Cotton Ties.—Fair orders have been placed by consumers since the season opened, but the volume is much less than at this time last year, which was an exceptionally good year in this trade. We quote as follows: 3000 bundle lots and over, 85c.; less than 3000 bundle lots, 88c., f.o.b. Pittsburgh.

Hoops and Bands.—Specifications against contracts are only fair, while new business is lacking. The prohibition movement which is sweeping over the country, and is particularly strong in some sections, has restricted considerably the demand for Hoops. Regular prices are as follows: Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60, base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Tin Plate.—The last two plants to be started up by the American Sheet & Tin Plate Company were the United States Works at Demmler and the Sabraton Works at Morgantown W. Va., which was closed about a week for repairs. This company is now operating practically all of its capacity, only three or four isolated plants being idle, and these will probably not be operated again, unless in times of excessive demand. The independent Tin Plate mills are not operating to as full capacity as those of the American Sheet & Tin Plate Company, and have only a fair amount of work on their books. The latter company gets a large tonnage from affiliated interests, notably the American Can Company, which is much the heaviest consumer of Bright Plates in the country. We are advised by the mills that regular prices on Tin Plate are being maintained. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Iron and Steel Bars.—This trade is in very unsatisfactory condition, new demand being very light, and only for small orders, while specifications against contracts are coming in slowly. The differential of $2 a ton in favor of Iron Bars is diverting some tonnage to the Bar Iron mills from customers who formerly used Steel. The large consumers, notably the Steel car interests and implement makers, are buying little, while small consumers are placing orders only for actual needs. It is estimated that not more than 25 per cent. of the entire capacity of the country in Iron and Steel Bars is active at present. A few mills that reroll Bars from old Rails are shading prices of Steel Bars, but they make only a few sizes, and some consumers refuse to use these Bars, preferring to pay the full price to regular makers. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47., Pittsburgh, for Chicago and points further west. Steel Bars remain very firm, at 1.60c., Pittsburgh.

Spelter.—Stocks of Spelter held by the smelters are reported to be unusually heavy, and the tone of the market is weak. The market is lower, and we quote prime grades of Western Spelter at 4.45c., East St. Louis, equal to 4.57½c., Pittsburgh. On a firm offer, this would probably be shaded.

Railroad Spikes.—Reports that the Erie Railroad was in the market for 10,000 kegs of Spikes were investigated, but it was found the road was only getting an estimate on some proposed improvements, and the order was not placed. It is also untrue that the New York Central recently bought 15,000 kegs of Spikes. Railroads are buying very little, confining their orders to carloads or less for repair work. There is a fair amount of new business in the smaller sizes, but this is mostly in small lots for actual needs. We quote: Standard sizes, 4½ x 9-16 in., at $1.70, and the smaller sizes at $1.80 per 100 lb. in carloads and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Merchant Steel.—The demand for Shafting and Merchant Steels is very light and only for small lots. We quote Cold Rolled Shafting, on contracts for 100 tons and over, 57 per cent. off; carloads, 56 per cent. off, and less than carloads, 52 per cent. off, on which carload freight is allowed within base territory. Nominal prices on Merchant Steel are as follows: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 2.10c. to 2.15c.; Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron, finished, 1½ in. and wider, 1.60c.; under 1½ in., 1.75c. Planished Tire Steel is 1.80c., all f.o.b. at mill.

Pipes and Tubes.—The aggregate of business booked by the mills in April showed a fair increase over March, and the outlook is that May will be larger than April. No large contracts are being placed, the trade pursuing the policy of giving small orders for actual needs, thus keeping stocks down to a minimum. Persistent reports that prices of Pipe would be reduced three points, or $6 a ton, on or before May 16, are emphatically denied by the leading makers, who state there is no foundation whatever for such reports. The Pipe mills as a whole are running to about 50 per cent. of capacity, which is a creditable showing when general conditions are considered. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 74 and 5 per cent. off list, while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black.	Galv.
	%	%
½ to ¾ in.	65	49
⅞ in.	66	50
1 in.	69	53
1¼ to 3 in.	73	57
4 to 12 in.	70	55
Extra strong, plain ends:		
½ to ⅞ in.	58	46
1 to 4 in.	65	50
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

Discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
	%	%
⅛ and ¼ in.	70	
⅜ in.	65	51
½ in.	67	55
¾ to 6 in.	71	60
7 to 12 in.	68	55
Extra strong, plain ends:		
½ to ⅞ in.	56	44
1 to 4 in.	61	51
4½ to 8 in.	59	47
Double extra strong, plain ends:		
½ to 8 in.	52	41

Boiler Tubes.—The railroads are buying practically nothing, while the general consumers of Merchant Tubes are placing only small orders for actual needs. There is some unevenness in prices, which are more or less shaded, depending on the order. Regular discounts on Merchant Tubes in small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ in.	42	47
1½ to 2¼ in.	42	51
2½ in.	47	61
2¾ to 3 in.	52	65
6 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Connellsville Coke.—The H. C. Frick Coke Company in the past two weeks has blown in a number of ovens, but it is understood this has been done largely to give employment to the men rather than for any actual needs for the Coke. A furnace interest is in the market for its supply of Coke for the last half of the year, and we understand has been quoted as low as $1.50 for good Furnace Coke, covering that delivery. We quote Connellsville Furnace Coke for prompt shipment at $1.50 to $1.60, and 72-hr. Foundry at $2 to $2.25, at oven. Outside makes of Furnace and Foundry Coke are being offered as low as $1.35 for Furnace, and about $1.85 for Foundry. The output of Coke in the Upper and Lower Connellsville regions last week was 166,175 tons, an increase over the previous week of 2000 tons.

Iron and Steel Scrap.—The market is practically lifeless as far as sales are concerned, and prices are weak. The Pittsburgh Steel Company, which has large Rod and Wire mills at Monessen, Pa.; and is building a new Open Hearth Steel plant to contain eight 60-ton furnaces, to be ready for operation in July or early in August, has no blast furnaces, and will buy its supply of Pig Iron and Scrap in the open market. It is understood the company has already bought a considerable tonnage of Scrap of various kinds and at relatively low prices. There is more pressure on the part of dealers to make sales, and on firm offers it is probable our

prices would be shaded from 25c. to 50c. a ton. Dealers quote about as follows per gross ton: Heavy Steel Scrap, Pittsburgh, Steubenville or Sharon delivery, $12.75 to $13; Cast Borings, $7.25 to $7.50; No. 1 Railroad Wrought, $13.25 to $13.50; No. 1 Cast, $14.25 to $14.50; Bundled Sheet Scrap, $8.50 to $9, at shipping point; Sheet Bar Crop Ends, $16 to $16.50; No. 1 Busheling Scrap, $12 to $12.25; No. 2, $9 to $9.25; Iron Axles, $19 to $19.50; Steel Axles, $16.50 to $17; Low Phosphorus Melting Stock, $16; Old Steel Rails, short pieces for Open Hearth use, $12.75 to $13; Rerolling Rails, lower in price, $13.50 to $13.75; Machine Shop Turnings, $8 to $8.25; Grate Bars, $12 to $12.50; Railroad Malleable Scrap, $11.25 to $12. We note sales of about 200 tons of Cast Iron Borings on the basis of $7.50, Pittsburgh, and about 500 tons of Heavy Steel Scrap at close to $12.50, Pittsburgh. Sales are also reported of 2000 to 3000 tons of Bundled Sheet Scrap at about $8.50 or less at shipping point.

The Iron City Steel Company, 717-718 Bessemer Building, Pittsburgh, has been appointed sales agent in the Pittsburgh District for John T. Church, who now operates the Glen Iron Furnace, making cold blast charcoal pig iron and located at Glen Iron, Pa.

Cleveland.

CLEVELAND, OHIO, May 12, 1908.

Iron Ore.—The first Ore cargo for a Lake Erie port this season will be shipped from Ashland about the end of this week. Shipments of only a few scattering cargoes are expected this month. With the exception of a few small trial lots, no sales of Ore were reported during the past week, and some of the Ore salesmen who have been visiting their trade find that furnacemen are not taking any interest in the Ore market at present, and will not think of buying for some time. The Merchant Ore firms are holding as firmly as ever to the established prices, and the feeling is becoming more general that prices will be maintained throughout the season. There is one report of the resale of some Bessemer Ore at the established price. Orders for the shipment of Ore from the docks to the furnaces have fallen off considerably since April, and little Ore is moving at the present time. No improvement has appeared in the lake situation. Another meeting of the vessel owners will be held in this city to-day to fix a date for a general start in navigation. Even at that time Ore cargoes will be scarce. Vesselmen say that if a general start is not made until July 15 all the Ore that will be needed can be brought down without trouble before the close of navigation. With the exception of a few of its largest boats, the Steel Corporation is fitting out none of its Ore freighters, and will probably not start many of its boats before June. A few of the boats managed in the office of M. A. Hanna & Co. are being fitted out, and may be placed in commission soon. Other Merchant Ore firms that operate boats are taking no steps to start them. The carrying charges for Ore for the season have not yet been fixed. A little chartering has been done with the understanding that the regular rate for the season shall be paid. Prices for 1908 delivery at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.20; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—Stimulated probably by lower prices, the Foundry Iron market has shown more activity the past week than for some time. Inquiries for good sized tonnages have brought out offers of Iron at low prices. A local foundry that is in the market for 1000 to 3000 tons of Foundry Iron to average 2.75 per cent. Silicon, generally considered as No. 1, has been quoted a price of $14.35 for the third quarter, and $14.85 for the fourth quarter, Valley furnace. While some lower priced Iron is being offered, a few of the furnaces are holding firmly to $14.75, Valley furnace, as their lowest price for No. 2, and others remain out of the market at the prevailing prices. We note the sale of one 500 ton lot of No. 2 on the basis of $14.85, Valley furnace, for No. 2, for last half delivery, and the sale of several car lots of No. 2 for spot shipment at $15, Valley furnace. Among the inquiries is one for 1000 tons of No. 2 for spot shipment for which a contract will probably be closed this week. There are also an inquiry for 2000 tons and two for 1000 tons each, for last half delivery. Southern Iron is weaker, and a leading producer that has been holding its price at $12, Birmingham, has reduced its quotation to $11.50 for No. 2. Southern No. 2 Iron has been offered at $11.15, Birmingham, or $15.50, Cleveland. An inquiry is out for 1200 tons of No. 2 Southern from a northern Ohio consumer. An improvement is noted in inquiries for Basic Iron. A local interest is holding Basic at $15.50 for spot shipment, but consumers are not willing to pay that price. Some of the furnace interests report a fair volume of shipping orders on Foundry Iron on contracts, but large consumers of Malleable Bessemer are taking little contract Iron. For early shipment we quote, delivered, Cleveland, as follows:

Bessemer	$17.00
Northern Foundry, No. 1	$15.35 to 16.00
Northern Foundry, No. 2	15.00 to 15.65
Northern Foundry, No. 3	14.50 to 15.15
Southern Foundry, No. 2	15.40 to 15.85
Gray Forge	14.90

Coke.—A little more activity is seen in Foundry Coke, and some contracts were closed during the week for the balance of the year delivery at $2.25, at oven, for 72-hr. Foundry Coke. Some inquiries are out for delivery until July 1, 1909. There is one good sized inquiry for Furnace Coke. For prompt shipment we quote Connellsville Furnace Coke at $1.50 to $1.60. We quote the same Coke on contract at $1.60 to $1.75. Foundry Coke for spot shipment is selling at $2 to $2.25.

Finished Iron and Steel.—A general feeling prevails among consumers that prices will be reduced in some lines, and this is resulting in a curtailment of purchases. A leading producer reports a larger volume of orders than for some time, but the orders are even smaller in size than they have been in the past few months, so that the tonnage has not increased. The only order of any size placed was given the Lorain Steel Company by the Municipal Traction Company for 2500 tons of Girder Rails for street railroad extensions in Cleveland. The general volume of new business remains about stationary, being light in all lines. The majority of the larger mills are maintaining prices, and reports of price cutting are no more frequent. The demand for Iron and Steel Bars shows no improvement and is still light, although a few of the mills report slightly better specifications, particularly on Steel Bars. Of the local mills the Union is running this week, but the Empire is shut down. Jobbers and small mills are still cutting the price of Iron Bars to 1.40c., Pittsburgh, and it is rumored that one mill is cutting Steel Bars to 1.50c., Pittsburgh. The demand for Plates is light, and price concessions of $2 a ton are being made on the narrow sizes. Sheets are in small demand and weak, the price being shaded $2 a ton, particularly on Black Sheets. Some good specifications were received from the Lake Shore Railroad for Spikes, Angle Bars and Bolts. The demand for Structural Material is light. A few sales of Billets in car lots are reported. We quote Iron Bars at 1.50c. to 1.60c., Cleveland, for car lots; Steel Bars, 1.70c., Cleveland, for car lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼-in. and heavier, 1.80c., Cleveland. Dealers quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Warehouse prices remain unchanged. Jobber quote Iron and Steel Bars out of stock at 1.70c. to 1.80c. Beams and Channels out of stock are 2.10c. to 2.15c., base. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in. are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—The market shows no improvement, being as dull as it has been at any time in the past few months. Mills are consuming but a limited amount, and the little buying they are doing is in car lots. Dealers are not looking for an improvement in conditions for some time, and are buying only to fill orders. The market is weak all along the line, but owing to the absence of transactions quotations are mainly nominal. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$11.00 to $11.50
Old Iron Rails	14.50 to 15.50
Steel Car Axles	16.00 to 17.00
Old Car Wheels	12.50 to 13.00
Relaying Rails, 50 lb. and over	21.00 to 22.00
Heavy Melting Steel	11.00 to 11.50
Railroad Malleable	11.00 to 11.50
Agricultural Malleable	11.00 to 11.50
Light Bundled Sheet Scrap	7.50 to 8.50

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	6.00 to 7.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	10.50 to 11.00
No. 1 Railroad Wrought	12.00 to 12.50
No. 1 Cast	11.50 to 12.50
Stove Plate	10.00 to 10.50
Bundled Tin Scrap	8.00 to 9.00

The German Iron Market.

BERLIN, April 30, 1908.—While the state of the Iron market remains unsatisfactory generally, in a few departments a slight improvement is reported. On the whole, however, consumers continue to pursue a waiting policy, buying as small quantities as possible in the hope that better prices will be offered them later on. The dearness of money continues to be felt as a restraining effect in all directions.

Production Falling Off.

The rate of production at the blast furnaces is being further reduced. The March make of Pig Iron amounted to 1,046,998 metric tons. This is about 52,000 tons less than

in March, 1907, and about 91,650 tons less than the high water mark touched in October. In view of the heavy reduction of the American production during the past six months, it may be justly said that Germany is still turning out Iron at almost full speed. How long this will continue to be the case, however, is quite uncertain, for consumption is slacking up still further, stocks are accumulating at the furnaces and with dealers, and furnaces are being blown out. From all indications it can safely be predicted that the rate of smelting will be further curtailed. The furnaces are meeting with greater and greater difficulties in disposing of their output, and competition in the Iron market is growing sharper for the Rhenish-Westphalian Pig Iron Syndicate. English Bessemer Pig Iron is being offered at cheaper prices in Germany, and Luxemburg-Lorraine Pig Iron is being substituted for the product of the syndicate wherever this is possible.

The Rhenish-Wesaphalian Syndicate has refused to yield to the many appeals for price reductions, assigning as its reason that the price of Coal and Coke is kept so high that it cannot sell Iron cheaper than at present. Its prices are as follows: Spiegeleisen, 85 to 87 marks; Puddling, 74; Steel making qualities, 65; Basic Iron, 64.80; German Foundry, No. 1, 76; No. 3, 71; German Bessemer, 80. On the Duesseldorf Exchange last Friday Luxemburg Puddling was quoted at 52 to 52.80 marks; English Foundry, No. 3, 71 to 72, and Soft Steel Bars, 105 to 110. These are reductions, but other prices were unchanged.

In view of the reduction of work at the furnaces the business in Ores is also sluggish. The mines in the Siegerland District have latterly been cutting down production pretty sharply, and miners have been discharged in considerable numbers. The importation of foreign Ores has also been checked, and even at the reduced prices at which they are now being offered there is little disposition to buy. The business in Ores in the Luxemburg-Lorraine District is very dull, and sharp restrictions of production are reported. In most of the private mines it is mentioned that the output has been reduced to about one-half.

The Steel Works Association.

From the stock market's standpoint the most favorable news from the Iron industry for several months was found in the March production report of the Steel Works Association. The shipments for the month rose to 486,348 tons, which compares with 420,508 tons in February and 508,309 tons in March, 1907. Shipments were thus only 22,000 tons less than a year ago. The better result of the month was due to several causes. The demand for Billets improved somewhat after the association refused to make another price reduction, and the demand for Structural Shapes was increased owing to increased building activity in a few parts of the country. Besides this, it is reported that the works made special efforts to finish up delivery of many orders by the end of March, when the business year of the association ends. Under these circumstances the shipments of Billets rose from 108,854 tons in February to 131,486 tons in March, and Structural Shapes from 104,092 to 155,521 tons. On the other hand, the movement of Steel Rails and Ties was lighter than for any month since October. Shipments reached only 198,840 tons, against 207,562 tons in February. The improvement in the movement of Billets and Structural Shapes was interpreted by speculators as indicating a considerable betterment in the tendency of the trade and Iron shares have recently been bought in considerable amounts at rising prices, but the leading newspaper of Essen has thought it necessary to turn a strong jet of cold water upon such premature optimism. It denies emphatically that there is any general and substantial improvement in the market situation.

The Bar Trade.

The most interesting section of the market continues to be that of Bars. The demoralization of prices in this line, described in a previous report, has continued. It is due to the fact that many of the great mixed works, as soon as their orders in Rails, Structural Shapes and Billets are worked off, turn to rolling Bars in order to avoid shutting down. The prices in the former class of goods are fixed by the association, but there is free competition in Bars, so far as prices are concerned. Strong efforts have been made recently to organize the Bar mills into a special kartell, and last week it was authentically reported that these efforts had been crowned with success. It appeared that all disputed points had been satisfactorily adjusted, allotments fixed, and prices arranged, ranging from 107.50 to 110 marks. One important concern, however, it was stated, still held out against joining, and to-day the news comes that the entire scheme has fallen through. The Wrought Iron Bar business is also in a bad way. It has not been possible to reduce the price of this specialty to keep pace with the reduction in Soft Steel Bars, owing to the high prices of Coal and Pig Iron; hence consumers are turning to Steel Bars wherever they can well be substituted for Wrought Iron.

Another department of the market in which negotiations looking toward a combination are in progress is that of Plates and Sheets. The preliminary work has so far proceeded that a general meeting has been called for about two weeks hence, when it is hoped that the organization will be effected. This applies, however, only to Heavy Plates, while the rollers of Light Plates are apparently not yet ready to organize. Only in a part of the Plate business is trade satisfactory. Ordinary Plates of Soft Steel have fallen to 115 marks, while Heavy Plates are sold down to 112.50 marks. Sheets command about 125 marks.

The Hardware Trade.

Conditions in the hardware trade are growing worse. Shops have less work to do than a month ago, and prices have been further marked down till they are now very near the point where profits cannot be earned. The export trade to the United States continues to be within very narrow limits, and other countries as well are taking lighter amounts of goods. Complaints are increasing among hardware manufacturers that the tariff treaties that went into effect two years ago are having a narrowing effect upon their foreign markets in Europe. Some of the treaty countries raised their duties against German hardware, and it is now observed that it is growing harder for German goods to compete in those countries. Shops have sprung up there which are successfully meeting German competition, not only in those countries themselves, but they are actually carrying their competition into outside markets.

In Solingen the cutlery trade is suffering more severely from the lack of American orders. Many of the shops have been compelled to curtail production and to discharge hands. Prices have further declined. The only part of the hardware trade that is doing fairly well is that for the manufacture of car fittings. Car shops are still well employed and their requirements in fittings have not abated.

The German Niles Tool Works, situated near Berlin, established eight year ago for the manufacture of heavy machine tools on American models, did better last year than usual. Every year hitherto had shown a deficit, but last year there was a profit of 330,800 marks from the factory. The sales department, however, absorbed 321,500 marks, and it was necessary to write off 292,000 marks on machinery and other property. Thus the loss shown on the balance sheet was only 270,000 marks. The total deficit now amounts to 5,780,000 marks.

British Iron and Steel Markets.

GLASGOW, April 30, 1908.

Beams and Tubes.—A conference has been held of makers of Rolled Steel Beams in the United Kingdom, Germany and Belgium for the purpose of endeavoring to arrive at a basis of agreement for regulating the export trade of the several countries. The international production of Steel Beams is enormous, and the competition is very keen for all contracts that come into the international market. Prices are at times severely cut. Large quantities of both German and Belgian Beams have been imported into Great Britain for many years, and they largely regulate prices in the trade. The conference was the suggestion of the German Verband, and the broad basis of a combination was agreed upon for securing to makers a certain measure of monopoly in their respective countries and districts, and for minimizing competition in the outside export markets. But in the trade in Great Britain not much faith is rested in the combination. Nor is there in negotiations that have been proceeding for the amalgamation of companies in the Scotch Tube trade, and for a selling agreement between them and the Continental producers. There is much talk, but little prospect of an effective combination.

Tin Plates and Bars.—At the quarterly meeting of the Midland Iron Trade there was a lack of confidence, and only hand-to-mouth buying is to be expected. Representatives of South Wales firms gave the only touch of animation to the market, and spoke more hopefully of their prospects. The increased cost of Tin has strengthened their hands, but makers of Staffordshire Tin Plate have not taken any advantage of it. The marked Bar makers decided not to touch the basis price, which was reduced 10s. in January, and since then the standard has been maintained at £8 10s. Makers of North Staffordshire Crown Bars have reduced 5s., making the basis £7, the second drop of 5s. this year. The South Wales Tin Plate market continues strong, and considerable business has been done in 14 by 18¾ oil sizes at 13s., while some makers for June-July delivery are making 1½d. to 3d. above this figure. Finished Black Plate has been advanced 5s., Siemens quality being from £9 12s. 6d. to £9 15s. There have been heavy arrivals of foreign Bars, the total imports for March from America and Germany being over 20,000 tons. There is a steady demand from Tin Plate makers, and most of the Welsh Steel works are well employed. Prices in Wales remain at from £4 12s. 6d. to £4 13s. 6d. for Siemens quality. Preparations have been made for the erection of a dozen additional Steel mills at Morriston. Welsh Hematite is steady at 62s. 6d. f.o.t. Cardiff.

Pig Iron.—Business is quiet in all departments of the home trade, and the labor troubles in the shipbuilding trade

are causing anxiety. Stocks of Pig Iron increase in makers' yards. Cleveland warrants are tightly held, and the holders exact heavy premiums for lending. The majority of dealers are afraid to operate either way in the present state of the market. Trade reports are pessimistic, and are not improved by the state of the speculative account, buyers continuing to restrict their purchases to immediate requirements, so that the outlook for the near future is not encouraging.

Scotch Iron and Steel.—In the Steel trade of Scotland the recent reduction in prices has had the effect of bringing out a small amount of work, but the volume has not been so large as was anticipated. A new arrangement regarding material for export includes Ship Plates, Angles and Bars, and it is anticipated that it will have the effect of stopping the cutting in prices which has been prevalent for some time. There has been a slight improvement in home demand in the Bar Iron trade, but the mills are running irregularly. The bulk of the export orders are being secured by Continental competitors. Canadian inquiries are not leading to much business, and the orders are going to Belgium. The home demand shows no improvement, and it is with difficulty that the Steel works in Scotland are kept employed. The Steel trade can hardly show material change until there is an improvement in the Clyde shipbuilding yards.

Bar Iron makers in the west of Scotland report that new business is extremely scarce, and specifications come to hand slowly and in small quantities. At a meeting of the associated makers it was decided to make an all round reduction of prices of 5s. per ton, the basis now being £6 10s. per ton for Crown Bars less 5 per cent. The north of England trade has been affected by this action, and minimum selling prices there are now based on £6 10s. per ton for Crown Bars less 5 per cent.

The Midlands.

There has been very little improvement in the Midland Iron trade circles of late. Many of the factories have been standing for a week, and there are few orders on the books, only one or two branches having been able to make a good start after Easter. Builders' brass goods are, however, selling more freely. Horticultural and plumbers' brass goods have also been selling briskly. The cycle and motor car makers have had a little spurt, but the business is below the average, and there are still scores of last season's machines undisposed of. Some of the Coventry motor works are on short time, and one concern has discharged nearly all its body hands.

A better demand is reported for Brass and Iron Wood Screws, and manufacturers are looking forward to a busy time. There is a fair inquiry for Bolts, Nuts and Rivets. Chain and Anchor makers are not doing well and ships' fittings generally are only in moderate request. Agricultural tools and implements are finding a better market. The demand for Corrugated Sheets has fallen off again. Makers of Scales and Weights have not done so well as they anticipated, as the result of the new Board of Trade regulations, though they have had a fairly good run.

The trade in Wrought Iron Tubes and Fittings has improved during the past week or two. Pipes for high-pressure heating and for the underwork of railroad cars are in excellent demand, but this is not a large business. Engineers and Ironfounders are not doing so much as at the beginning of the year, and there are a considerable number of men out of employment and on short time.

In Staffordshire, April has been the dullest month this year. The manufactured iron works were idle during the Easter holidays. The Steel trade is devoid of new business. Continental supplies are offered at £4 12s. 6d. for Sheet Bars and Billets, but English quotations are £4 12s. 6d to £4 15s. A large buyer would have no diffifficulty in getting English bars at £4 12s. 6d. per ton, delivered, but for smaller orders £4 15s. would be required. Ironmasters complain of the high price of coal, but colliery owners hold out little prospect to them of any ease.

Metal Market.

NEW YORK, May 13, 1908.

Pig Tin.—A week of excessive dullness was followed by a sharp decline to-day, the London market closing this afternoon at £132 10s. for spot and £132 5s. for futures, £7 under the price of last week. Stocks of Tin in this country are not large, and are concentrated in a few hands, but arrivals have been of good amount, aggregating 2035 tons so far this month. There are afloat for American ports 1553 tons. One of the reasons given for the sharp decline to-day was liquidation by Chinese holders, it being estimated that Tin is held speculatively in China and Penang to the extent of 3500 tons. Shipments from the Straits are expected to be large this month, and it would not be surprising if they exceeded 5000 tons. Price changes during the week have been toward lower levels, and are as follows:

	Cents.
May 6	31.00 to 31.05
May 7	30.75
May 8	30.55
May 11	30.60
May 12	30.40
May 13	29.50 to 29.75

The market early this afternoon was very much unsettled, and a wide difference of opinion exists as to the probable course of prices later.

Copper.—Prices are steady, Electrolytic being unchanged, at 12.62½c. to 12.75c., but Lake is a trifle lower, at 12.75c. to 12.87½c. Buying is small. Some of the larger American consumers who are bare of stocks are only coming into the market when they have orders to fill for their own products. Somewhat the same conditions prevail in Europe. Reports of finds of rich Ore at lower levels in Butte mines do not help the market for Ingot Copper. Active smelting operations have recently been started at several new properties, and this movement bids fair to continue. Among the uncertain features of the Copper market are the stocks held in Japan, and the fact that the Rio Tinto interests have not sold yet. One factor in the market which may have some influence on Copper prices in the future is the large cash accumulation by at least one of the prominent electrical machinery manufacturers. These idle funds may be used to buy round blocks of Copper if attractive prices are made. Exports so far this month are small, the total so far falling slightly below 7000 tons. Prices abroad are about 10s. lower than last week, at £57 2s. 6d. for spot, and £57 17s. 6d. for futures. Best Selected is held at £61. L. Vogelstein & Co., agents for Aron Hirsch & Sohn, Halberstadt, Germany, figure the German supplies of Copper for the first quarter of the year as 42,830 tons, as compared with supplies during the same period in 1907 of 24,393 tons.

Spelter.—The market for Spelter is easier. Prime Western brands can be had in St. Louis at 4.50c. to 4.52½c. and in New York at 4.60c. to 4.65c., although the inside price is available only for round lots. Brass mill special is held at about 4.70c. to 4.75c.

Pig Lead.—The market is firm. A steady advance in Lead prices has driven consumers in, and there has been a good demand. Prices are now steady at 4.25c., New York, and 4.12½c. to 4.15c., St. Louis.

Nickel.—Quotations continue unchanged at 45c. for ton lots and 50c. to 60c. for smaller quantities.

Antimony.—In spite of attempts to raise prices to a higher level, the market continues dull and nominally unchanged from last week at 8.75c. to 8.87½c. for Cookson's, 8.50c. to 8.75c. for Hallett's and 8.25c. to 8.50c. for outside brands.

Tin Plates.—Improvement is noted in the demand for Terne Plates, which heretofore have lagged, and the good business in Coke Plates continues. Prices are firm at $3.89, New York, and $3.70, Pittsburgh, for 100-lb. IC Coke Plates. Welsh Tin Plates are 1½d. lower at 12s. 4½d.

Old Metals.—Dealers' selling prices are steady and practically unchanged as follows:

	Cents.
Copper, Heavy and Crucible	12.00 to 12.25
Copper, Heavy and Wire	11.75 to 12.00
Copper, Light and Bottoms	11.00 to 11.25
Brass, Heavy	9.00 to 9.25
Brass, Light	7.00 to 7.50
Heavy Machine Composition	11.50 to 11.75
Clean Brass Turnings	8.00 to 8.50
Composition Turnings	9.00 to 9.50
Lead, Heavy	3.90
Lead, Tea	3.55
Zinc	3.50

Iron and Industrial Stocks.

NEW YORK, May 13, 1908.

The stock market has shown continuous strength in the period covered since our last report. While railroad stocks have displayed the strongest tendencies, the industrial stocks have been firm, and in some cases the prices realized have been the highest since the panic of last fall. The range of prices on active iron and steel stocks from Thursday of last week to Tuesday of the present week has been as follows: United States Steel common 36¼ to 37½, preferred 100⅜ to 102½; Car & Foundry common 36¼ to 38, preferred 97 to 98; Locomotive common 49¾, ex div. to 52⅝, preferred 102 to 103½; Steel Foundries common 6½, preferred 32 to 33; Cambria Steel 30 to 31; Colorado Fuel 26½ to 28¼; Crucible Steel common 5⅜ to 5½, preferred 39 to 40¼; Pressed Steel common 28¾ to 29¾; Railway Spring common 34½ to 35½, preferred 85; Republic common 17⅜ to 18⅝, preferred 67½ to 68¾; Sloss-Sheffield common 46 to 47¼; Cast Iron Pipe common 25⅛ to 26½, preferred 73 to 74⅞. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 37⅜, preferred 101¾, bonds 96¼; Car & Foundry common 37½, preferred 97; Locomotive common 51, preferred 103; Colorado Fuel 28¾; Pressed Steel common 29¼, preferred 84¾; Railway Spring common 35½; Republic common 18¼, preferred 68½; Sloss-Sheffield common 47½; Cast Iron Pipe common 26, preferred 73½; Can common 5⅛, preferred 56⅝.

The Merchandise Creditors' Committee of the Westinghouse Electric & Mfg. Company has until June 1 to proceed with the proposed reorganization plan. The plan provides for financing the debts of the company by the issuance of

$4,000,000 stock in payment of merchandise debts and $6,000,000 to stockholders at par to raise new capital. Up to last week merchandise creditors holding $3,500,000 claims out of a total of $4,000,000 had agreed to the plan. About 25 per cent., or $1,500,000 of the $6,000,000 stock to be taken by stockholders, has been subscribed for by about 500 of them.

Of the issue of $3,000,000 of 6 per cent, "first refunding mortgage gold bonds," made by the Inland Steel Company, Chicago, Ill., and dated April 1, 1908, $2,500,000 is reserved to retire the first mortgage 5's outstanding. The new issue consists of 20-year serial bonds, payable $150,000 a year.

The special meeting of the American Steel Foundries to act upon the plan for reorganizing the company's finances adjourned until June 4 at noon in Jersey City. Thus far 90 per cent. of the stockholders, it is said, have assented to the plan.

Dividends.—The Niles-Bement Pond Company has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable May 15.

The Pratt & Whitney Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable May 15.

The Ashton Valve Company, Boston, Mass., has declared the regular quarterly dividend of 1 per cent., payable May 15.

New York.

NEW YORK, May 13, 1908.

Pig Iron.—The market is now wide open, the understanding among the Eastern Pig Iron associations to abstain from selling below $18.25, tidewater, having ceased. The result has been that an increased number of sellers show a disposition to meet the market, and that sellers and buyers are busy testing the question what the market really is. Northern Iron is being offered at $16.75 for No. 2 Foundry, at tidewater, and at $16.25 to $16.50 for Basic Pig, delivered. We cannot learn that there have been any sales of any consequence, but it is probable that some covering of third and fourth quarter requirements will soon be done. We quote, at tidewater, as follows: No. 1 Northern Iron, $17.50 to $17.75; No. 2 Foundry, $16.75 to $17.25, and No. 2 Plain, $16 to $16.50. Alabama Irons are selling at $16.25 to $16.50 for No. 1 Foundry, and $15.50 to $15.75 for No. 2 Foundry.

Steel Rails.—Three contracts amounting to 20,000 tons are announced for the first time this week, though a part of the business was booked a short time before: Maine Central, 6000 tons; Boston & Albany, 8000 tons; Michigan Central, 6000 tons. All are for Bessemer Rails and were taken by the Lackawanna Steel Company. It is understood that roundly the Rail bookings for 1908, including business carried over, amount to 1,500,000 tons. About one-third of this was carried over from last year, and this portion doubtless includes some business that cannot be considered alive, though it stands uncanceled on the books of the manufacturers.

Structural Material.—Shipments of plain material from the mills are in fair volume, and while considerably short of the rate of last year are yet distinctly better than those of Plates. Fabricators still remark on the large volume of construction work on which figures are being asked—all of it apparently being seriously considered. In some cases the provision of capital is the occasion of delay; in others, there is an evident expectation of lower prices, or at least the belief that nothing will be lost by waiting. The American Bridge Company has just been awarded the La Salle Hotel at Chicago, about 8000 tons, by the United States Realty & Improvement Company. It is stated that the latter company has another building under contract that will require about 2000 tons of Steel. The Delaware, Lackawanna & Western Railroad has finally come into the market for the Steel for its new shops at Scranton, Pa., and will take upwards of 4000 tons. At Birmingham, Ala., the American Bridge Company has just taken the contract for the addition to the Brown-Marx office building, 1700 tons. Seattle, Wash., interests are figuring on Steel for the proposed Rainier-Grand Hotel. The contract may run up to 1200 to 1500 tons. In New York City the Snare & Triest Company has taken the general contract for the South Ferry municipal pier which will have seven slips and will require about 3000 tons of Steel. The Steel contract is not yet placed. The Pittsburgh & Lake Erie bridge, at Beaver, Pa., is still among held-up tonnage, and with 15,000 tons involved there is understood to be close figuring. It is not expected the award will be made this month. The past week was exceptional in that practically no railroad bridge work was awarded—the second such week this year, and the second also in the experience of large fabricating companies. We continue our quotations on mill shipments, delivery at tidewater, as follows: Beams, Channels, Angles, and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Ferroalloys.—A fair demand exists for Ferromanganese, prices being unchanged at $43.50, at seaboard. At this level, however, sellers are unwilling to make contracts for last quarter delivery. The market for Ferrosilicon is unsatisfactory, and the low price of $70 continues to be reported for resale lots. First hands are doing practically nothing in this market.

Bars.—Conditions in the Bar Iron trade appear to be growing worse. It may be possible that the low prices now ruling are still due to the efforts of dealers and brokers to market their purchases made some time ago, but the impression is growing that some of the manufacturers are now going after business a little more aggressively. Prices are reported on a basis of 1.45c. to 1.50c., New York, with rumors of lower figures having been made, although the regular price is still quoted by some mills of 1.50c., Pittsburgh, or 1.66c., New York. Steel Bars are held by the leading mills at 1.60c., Pittsburgh, or 1.76c., New York.

Plates.—An interesting occurrence of the past week was the placing of an order for 21 boilers for the city of New York with a boiler manufacturer in eastern Pennsylvania. The local boiler makers were exceedingly anxious to get this order, but the figures quoted by them were too high to secure it. As all shops working up Plates are now doing little, the demand is exceedingly light. Prices of standard sizes of Plates are maintained as follows, at tidewater: Sheared Plates, 1.86c. to 1.90c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—Bids are to be opened to-day on water works extensions for the city of New York, requiring about 2800 tons of 30-in. Pipe. It is stated that prices given to the contractors who are figuring on this work are in the vicinity of $23.50 per net ton. A little better inquiry is reported for carload lots, but the demand for larger quantities is decidedly quiet. It is stated that better prices are being received by foundries on contracts made with Pennsylvania municipalities than the rates ruling in this territory. The American Water Works Association is holding a convention in Washington this week which is being largely attended by representatives of Pipe interests. Carload lots of 6-in. are quoted at $23.50 to $24 per net ton, tidewater.

Old Material.—The sales of the past week included several lots of Steel Scrap aggregating about 3000 tons, some lots of Stove Plate, one of these comprising 500 tons, and scattering quantities of Cast Scrap. If any shortage is found in the line of Old Material, it is most likely to be in Steel Scrap of good quality. Steel works are inquiring for this class of material, but will only take it at a low price. The buyers of foundry stock are in the same way only taking any supplies when they can get them at low rates. A good demand is reported for Wrought Pipe, but it is wanted for special purposes, as the rolling mills are buying practically nothing from dealers. Relaying Rails are in rather better demand than other classes of Old Material. Car Wheels are especially dull and weak, as stocks are heavy. Quotations are about as follows, per gross ton, New York City:

Old Girder and T Rails for melting	$10.50 to $11.00
Heavy Melting Steel Scrap	10.50 to 11.00
Old Steel Rails, rerolling lengths	10.50 to 11.50
Relaying Rails	20.00 to 21.00
Old Iron Rails	14.00 to 15.00
Standard Hammered Iron Car Axles	15.50 to 16.50
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	11.50 to 12.50
Iron Track Scrap	9.50 to 10.50
No. 1 Yard Wrought, long	10.50 to 11.50
No. 1 Yard Wrought, short	9.50 to 10.50
Light Iron	5.00 to 6.00
Cast Borings	4.50 to 5.50
Wrought Turnings	6.00 to 7.00
Wrought Pipe	9.00 to 10.00
Old Car Wheels	13.50 to 14.50
No. 1 Heavy Cast, broken up	13.00 to 14.00
Stove Plate	9.00 to 10.00
Locomotive Grate Bars	9.50 to 10.50
Malleable Cast	11.00 to 11.50

Baughman & Neidermeier, Youngstown, Ohio, will erect the foundation and do the concrete work for the blast furnace to be erected at Scottdale, Pa., by Corrigan, McKinney & Co., Cleveland. The contract calls for concrete foundations for the stack, boiler house, cast house, new electric light plant, pump house, &c. The Variety Iron Works Company, Cleveland, Ohio, has been awarded the contract for the iron plate work. This company is erecting the two furnaces of the Youngstown Sheet & Tube Company.

Judge Lanning, in the United States District Court at Trenton, N. J., May 11, discharged Frank Wyant and Benjamin Pierce as temporary receivers of the New Jersey and West Virginia Bridge Company, and substituted Benjamin J. Parker of Shrewsbury as permanent receiver.

The Machinery Trade.

NEW YORK, May 13, 1908.

Several new propositions came before the trade the past week which are expected to bring considerable business shortly to the machinery houses, and as they show evidence of early closing they afford some encouragement to the trade, which continues dull. The most important of these new developments are probably the tool list issued by the Grand Trunk Railroad and the inquiries sent out by Westinghouse, Church, Kerr & Co. for equipment of the new shops, for which they are engineers, to be erected at Spirit Lake, Idaho, for the Idaho & Washington Northern Railroad. These inquiries, with those issued a few weeks ago by the Chicago, Milwaukee & St. Paul and Delaware, Lackawanna & Western railroads, which, we understand, have not been closed, make a fair aggregate of railroad business before the trade. Aside from this business there is very little in sight. The actual transactions were of minor importance and were not numerous enough to increase the light demand for machinery. Some branches of manufacture are more active and an increased demand for supplies is reported.

The formal opening of the Machinery Club, New York, will take place on May 21. The programme will be limited to an address by George A. Post, president of the Standard Coupler Company, and music. The Plans and Scope Committee, which is headed by W. P. Pressinger of the Chicago Pneumatic Tool Company, has arranged, in conjunction with the House Committee of the club, to serve a light luncheon, and about 100 well-known men in the machinery and metal trades will act as a Reception Committee. Invitations for the affair will be issued within the next few days.

Invitations have been issued for the formal opening of the Railroad Club of New York, on the twenty-first and twenty-second floors of the Cortlandt Building of the Hudson Terminals, 30 Church street, on May 18.

Grand Trunk Railroad's Machinery List.

Inquiries have been received from the Grand Trunk Railroad for a good sized list of machinery, on which bids are asked for at an early date. This road is making a number of improvements and, it is reported, will erect at Barrie, Ont., new shops, for which additional machinery will probably be required. The list, issued under date of May 5 by A. Butze, general purchasing agent, Montreal, Que., covers the following machine tools and equipment:

One 125-b.h.p. stationary two-crank compound engine, with 18-in. pulley by 13-in. face; two 150-hp. 130-lb. pressure return flue boilers, with fittings and grates; one hydraulic wheel press, capacity 300 tons, for wheels 90 in. in diameter, with double acting belt driven pump; one portable locomotive cylinder boring bar; one portable valve seat rotary planer for locomotives, capacity for 18 x 24 and 26 in. cylinders, 23 in. across corners of valve seat and 21¼ x 21¾ in. across studs, also 20 x 28 in. cylinders, 27 and 26½ x 27 in. across valve seat and studs, respectively; one steam driven air compressor, capacity 300 ft. free air per minute; one No. 6 steel blower, with bottom horizontal discharge; one tube welder, with necessary tools for welding, swagging and scarfing; one Ferguson tube welding furnace; one 10-ton jib crane, 20-ft. radius, compound geared, 20-ft. mast, 8-ft. lift; two 4-ton jib cranes, 15-ft. radius, 20-ft. mast, 8-ft. lift; one 2-ton jib crane, with carriage for chain block, 20-ft. mast, 8-ft. lift; one brass finishing lathe, 16-in. swing, with two and three jawed chuck; one three-spindle vertical wood boring machine to clear 13 in.; one 20-in. upright drill press, with square base, back geared, power feed, capacity to ¾ in.; one power hack saw, capacity 5 x 6 in.; one tube cutting machine; one pipe threading and cutting machine; one 24-in. back geared belt driven crank shaper, with heavy pattern vise and graduated base swivel; one 15-in. belt driven slotting machine aranged for future electric drive; one large size extra heavy ripping saw, carrying 32-in. diameter saw; one 5-ft. arm full universal radial drill, belt driven; one 20-in. engine lathe, 6 ft. between centers, belt driven; one emery wheel stand for 12 x 2 in. wheels; one 42-in. engine lathe, belt driven, 7 ft. between centers; one 42 x 42 in. by 10 ft. planer, belt driven, right and left heads; one 54-in. belt driven boring and turning mill, with 50-in. table, to take 36 in. under cross rail; one 42-in. car wheel lathe, belt driven; one duplex screw threading machine, with capacity from ⅜ to 2 in. dies and taps and extra head for staybolt threads; one 1500-lb. automatic double acting steam hammer; one 100-in. heavy driving wheel lathe, belt driven.

For some time the Idaho & Washington Northern Railroad has been preparing plans for its proposed new shops at Spirit Lake, Idaho, the approximate cost of which will be about $100,000. Because of the large amount of machinery required for the equipment of such shops the trade has been following the matter closely, and is especially interested from the fact that it is probable that the purchases of machinery will be made in this city. The contract for the construction and equipment of the shops has been placed with Westinghouse, Church, Kerr & Co., New York, who have within the past few days had inquiries in the market for some of the equipment. We understand from a reliable source that the engineering firm is to build and equip the shops completely, and as there are to be a number of buildings, including a machine and electric shop, freight car and repair shops, blacksmith shop, power house, &c., machinery houses in this district are likely to secure some nice orders for machinery for these shops. The buildings will be of brick and equipped with modern machinery, and, it is understood, will be erected as rapidly as possible with the view of their completion early next fall.

Some equipment will be required by the Cutler Mfg. Company, Rochester, N. Y., for equipping its new building, contract for the construction of which has been placed. The largest and most important machinery required are special machines for forming sections, which have been designed and built by special order. For the power plant not more than 75 hp. will be required; the type of power plant has not yet been decided upon, both steam and gas producer plants being under consideration. The new factory will be exclusively devoted to the manufacture of Cutler mail chutes and will be 126 x 128 ft., the front portion for a depth of 30 ft. to be two stories in hight, giving accommodation for the office force, draftsmen, superintendent, &c. The remainder of the building will be one story in hight, with saw tooth roof. It will be equipped for electro plating, enameling, buffing and polishing, glass grinding, &c. The executive offices will remain in the Cutler Building.

The Darley Engineering Company has been organized for the purpose of manufacturing and selling appliances for the hoisting and conveying of metals by suction and by air pressure. The company has acquired the sole rights for the United States to manufacture and sell the suction conveyor formerly controlled by the Economic Engineering & Construction Company of Chicago, and on May 1 the business of the latter company was taken over. The company will have offices at Pittsburgh in the Farmers' Bank Building, at 80 Broadway, New York, and the Monadnock Block, Chicago, Ill. W. W. Darley, president, will have charge of the Pittsburgh office. W. W. Stadelman, vice-president, and M. D. Chapman, secretary and treasurer, will be in charge of the New York office. W. A. Sharp, vice-president, will be in charge of the Chicago office.

Important Power and Tunnel Work.

The large amount of excavation work contemplated by the city, on which some bids have been received and others are to be opened shortly, will necessitate the installation of a considerable amount of contractors' machinery, and it is expected that the trade will shortly be benefited as awards for some of the work will undoubtedly be made within the next few weeks. On May 8 bids were opened for the construction of the Fourth Avenue Subway in Brooklyn and it was found that 34 companies bid on the six sections, only one contractor putting in a bid on the construction of the entire route. The six lowest bids for the subway proper and the pipe galleries show an aggregate cost only slightly above the chief engineer's estimate. It is the intention to construct only one or two sections at a time, the work to spread over a number of years, and it is hoped that the award will be made soon for at least the first section. In this connection the proposals for work on the city's new water shed up the State are of interest. On May 12 bids were opened for the construction of the Wallkill pressure tunnel, a little over 4 miles long, in Ulster County. The Board of Water Supply, New York, will receive bids until June 2 for the construction of a deep pressure tunnel, 14½ ft. inside diameter and about 23,600 ft. long, and other work in the vicinity of Rondout.

A contract for engineering and constructing a complete hydro-electric plant for the Central of Georgia Power Company has been awarded to J. G. White & Co., 49 Exchange place, New York. A plant which is to have a normal capacity of 12,500 kw., generated by water wheels under a 100-ft. head, will be built on the Ocmulgee River, about 36 miles above Macon, Ga., and will supply electricity to Macon and other points in the vicinity. The contract includes the construction of transmission lines, substations, &c. The crest of the dam to be built will be about 750 ft. Permission has been obtained by the Central of Georgia Power Company to issue $16,000,000 of bonds and $20,000,000 in stock. W. J. Massee is president and Charles F. Howe is chief engineer. The financial arrangements for the company were made by A. B. Leech & Co., 149 Broadway. The fact that this contract has been awarded to a company with New York headquarters is of particular interest to the trade, as it is highly probable that purchasing will be done from this city.

The City Commissioners of Galveston, Texas, will receive bids until May 28 for the mechanical equipment of an air lift pumping station at Alta Loma, Texas, consisting of one 1200 cu. ft. air compressor, one 700 cu. ft. air compressor, one 200-hp. water tube boiler and accessories, including 16,615 ft. of air pipe.

Chicago Machinery Market.

CHICAGO, ILL., May 12, 1908.

The opening week in May has developed no features in the machinery trade. Orders for equipment of various kinds continue to eminate largely from the less important interests. New industrial enterprises of important magnitude are rare, and while a few are in prospect they have not progressed farther than the stage of tentative plans and cannot be counted upon with any certainty to swell the volume of business for months to come. Some lines are, however, relatively more active than others; as a result of the increasing consumption of cement and the consequent use of crushed rock there is a fair demand for rock crushing machinery. The requirements for such machinery has in recent years been marked by a great increase in capacity, and instead of the comparatively small equipment formerly used crushers weighing upward of 200 tons, with a capacity of 600 tons of crushed stone per hour, are now being built. The outlook for trade, while not particularly inviting in any direction, is certainly more promising in stone crushing and cement machinery than in many other lines.

One of the results of the present period of depression will doubtless be to encourage export trade. When, as has been the case for several years, the domestic demand is sufficient to fill shop capacities to overflowing there is not much incentive for the manufacturer to cultivate outside fields; consequently very little attention has been given to foreign trade, but now that trade has fallen off so that home orders are holding insufficient to keep plants engaged machinery makers are finding time to investigate outside markets. Many new connections of this kind will probably be formed during this year, which will be not only of temporary but lasting advantage.

Outside of the miscellaneous orders which for several weeks have constituted the bulk of the business done by the machine tool houses nothing of importance is noted. In its general volume business in machine tools, though not increasing, is holding fairly even.

H. Brewer & Co., Tecumseh, Mich., who now occupy the foundry at Shawnee and Evans streets, have purchased a piece of land on which they will erect a modern and larger plant to provide for their increasing business. The contract for the construction of the plant has been let, the main building of which will be of brick, one story, 90 x 332 ft., and will contain the machine, woodworking and forge shops, office and warehouse. Adjacent to this building will be the boiler house, which will be equipped with a 5 x 16 ft. tubular boiler, supplying steam for two engines. In the rear of the main building will be erected the foundry, 60 x 100 ft., connected with which will be a cupola and blower house 30 x 30 ft. and a coreroom 25 ft. square. In the rear of the foundry will be a brick pattern house, 50 x 60 ft., and core bins, sand bins, oil houses and other smaller structures. The plant will be modernly equipped, the foundry being served by jib cranes, and spur tracks from the Lake Shore & Michigan Southern Railroad will connect all the buildings. Considerable new machinery will be required, the selections to be made by Davis Brown, superintendent, and the requisitions will be sent out by Charles Burridge, purchasing agent.

Advices received within the past week from a number of machinery manufacturers throughout the West, while noting the comparative dullness resulting from the general slack-up in business, reflect a spirit of hopefulness as to the development of a fairly good demand in the later months of the year. The opinion is generally expressed that though a return to the phenomenal activity of the past two years cannot reasonably be expected, yet material improvement over present conditions is looked for. Very few Western plants are idle, and some are quite actively engaged. In Rockford, Ill., all shops are operating part capacity at least, and the machine tool industries are running about 40 hr. per week.

Contracts have been let by the Elkhart Motor Car Company, Elkhart, Ind., for a two-story cement factory building, 40 x 120 ft., work upon which is now in progress. A part of the machinery equipment has been purchased, but more will be required when the new building is ready for occupancy, which will be about July 15.

Some of the long time delivery orders for machinery placed last year will help to swell the totals of this year's business. Shipments on such orders are being made by the Allis-Chalmers Company, Milwaukee, Wis., of blast furnace gas engines weighing 750 tons each, at the rate of three per month. These are principally for the United States Steel Corporation, being designed for the equipment of its central plants at Pittsburgh, Chicago, Cleveland, and Gary, Ind. Besides this equipment, which was contracted for last year to be delivered in 12 to 18 months, the company is working on and shipping other outfits for domestic and foreign trade, including mining and crushing machinery, also pumping machinery for various municipal water works systems.

The American Well Works, Aurora, Ill., reports progressive improvement in business, with prospects of a fair trade through the summer months. The total volume of business will, however, for the same period, fall below that of last year.

Owing to the recent death of its president, Geo. N. Black, and the early expiration of leasehold on its present site the Ætna Foundry & Machine Company, Springfield, Ill., is taking steps through J. W. Black, the administrator of the estate, to wind up and terminate the business.

Plans and specifications have been prepared for a new power house and additional boiler capacity by the Charity Hospital, New Orleans, La. The equipment required will include boilers of 600 hp., together with pumps and heaters, bids on which will be received by the Board of Supervisors until May 20. At a later day an electric lighting plant will be installed, at a cost of about $16,000. John Ponder is chief engineer.

In order to secure more commodious quarters the Pfanmueller Engineering Company, Chicago, has moved its offices from suite 1134 to 1003 First National Bank Building. The company reports some improvement in the demand for second-hand generative and motive power equipment, and among the sales recently made are included one 20 x 42 in. Corliss engine to a Western municipal electric light plant, one 14 x 36 in. engine for installation in a Detroit manufacturing plant, one 100-kw. direct connected engine and generator to the Devoe-Reynolds Paint Company, Chicago; one 12 x 36 in. Bates Corliss engine, with a 60-kw. Milwaukee generator, for a municipal lighting plant, and two 250-hp. Scotch marine internally fired boilers, with Morrison corrugated flue furnaces, to a Chicago manufacturing plant. The old power plant equipment of the Pabst Brewing Company, Milwaukee, which was supplanted by the installation of a new direct connected central power station, including 25 boilers and 14 engines, was recently purchased by the company; it was also the successful bidder on 12 engines and six dynamos sold by the State Prison, Jefferson City, Mo., to make way for a new plant.

The business interests of the H. W. Johns-Manville Company in Detroit and the territory adjacent thereto have increased to such an extent that a new branch is about to be opened by the company. This branch will be located at 72 Jefferson avenue, Detroit, under the management of Willard K. Bush, who is well and favorably known throughout that section of the country, having been connected with the Milwaukee branch of the company for a number of years. The company will carry a complete stock of goods at the Detroit branch, so that shipments can ordinarily be made direct from

Cleveland Machinery Market.

CLEVELAND, OHIO, May 12, 1908.

Taken as a whole, the local machinery market looks a little brighter. Although some builders of machine tools report conditions no better and their volume of orders very light, others notice a slight improvement. Some inquiries that came into the market two or three months ago have finally resulted in the placing of orders, and these have enabled a few builders to slightly increase the working forces in their plants. The volume of business transacted by machine tool dealers is still very light and seems to show no improvement. The buying is mostly single tools in small sizes. The demand for second-hand tools is slightly better. A considerable quantity is being offered to dealers.

Builders of heavy and special machinery report little improvement in the prospects, which are not very encouraging. There are three or four inquiries for large installations, one of these being from France, but with these exceptions little work is in sight in the way of heavy machinery equipment. Builders are figuring on a few coal handling plants, but in two cases where large plants were projected it has been decided to postpone the work until next year. With the exception of one list from the Grand Trunk Railroad, tool builders have received no inquiries from the railroads.

Builders of small motors report considerable improvement in orders as compared with earlier in the year. Much of the demand comes from shops that are substituting motors for belt drive. The demand for cranes shows no improvement and orders are scarce.

With some manufacturing plants business shows an improvement. Several of the large automobile plants in this city and Detroit are fairly busy. Within about 30 days they will complete their 1908 output and begin preparations for building their 1909 models. According to present plans at least two or three automobile builders will add considerably to their machine tool equipment during the summer.

The jobbing foundry situation is in a very unsatisfactory condition and shows no improvement. Buying is in small lots for immediate needs, and foundrymen who are tied up

with high priced pig iron say that they are unable to compete with the low prices that are being quoted by some foundrymen who have their old stocks well used up and can base the price of castings on the present market price of pig iron.

The local money market is still tight and banks are making very few loans. This condition is not favorable to the launching of new industrial enterprises, and a number are being held up until the financial situation becomes easier.

In addition to the machine tool equipment needed for the new Technical High School, a list of which was published in this report last week, the Cleveland Board of Education will receive bids until June 1 for the following motors for that school: One 20-hp., with a speed of approximately 900 rev. per min.; two 15-hp., speed 1000 rev.; one 15-hp., speed 900 rev.; one 5-hp., speed 1000 rev.; two 3½-hp., speed 800 rev.; three 5-hp., speed 800 rev.; one 1-hp., speed 1600 rev.; one 1½-hp., speed 900 rev.

The National Acme Mfg. Company, Cleveland, reports a satisfactory improvement in the demand for screw machines during the past few weeks, and the increase in the volume of business has enabled the company to increase its working force. The company has taken some fairly good orders for which it had inquiries some time ago, but which were slow in materializing. The improvement is in domestic orders, the foreign business still being light.

The Lincoln Motor Works Company has received an order for 14 motors from the Brooklyn Navy Yard. The motors will replace the belt drive on tools already installed. The company has just filled an order for 28 motors from the Youngstown Sheet & Tube Company, the motors to be used in driving pipe threading machines. With other scattering orders the plant of the company is well filled with work, and the prospects for a good volume of business all the year are very satisfactory.

The Lake Erie Forge Company, that was recently formed to manufacture tool steel die forgings, a general line of machine forgings, &c., has located its plant at 4922-4926 Hamilton avenue, in the building formerly occupied by the Lane Tool Company, and will begin operations in a few days. John A. Markley is president, and Walter H. Haker, secretary and treasurer.

The Brown Hoisting Machinery Company has taken a contract for building additional coke bins for the United States Steel Corporation at Gary, Ind. The company recently completed over 2600 ft. of ore bins at the Gary plant.

The Grant Automatic Machine Company, which was organized some time ago, is making preparations to begin the manufacture of a new four-spindle automatic screw machine, the invention of J. J. Grant. The company will not build a manufacturing plant for the present.

The Atlas Brass Company, recently organized, has opened a general brass foundry at 991 South Front street, Columbus, Ohio. The owners of the plant are John Wittman and I. H. Pleukharp.

Bucyrus, Ohio, has decided to issue $90,000 in bonds to build a municipal lighting plant.

Cincinnati Machinery Market.

CINCINNATI, OHIO, May 12, 1908.

Seriously considered, the situation in the machine tool line shows such little change over conditions that have existed for the past several weeks that it is scarcely worth denominating improvement; yet some local manufacturers would undoubtedly disapprove of this statement in its broad sense, for there has been a little break in the monotony with these, the railroads, which have been withholding orders so long, having shown a disposition to come into the market for some needed tools. A Western railroad has bought a bill of lathes, ranging from 36 to 42 in., for early delivery and approximating about $15,000, the second good sized order placed in this market this year with the same company for lathes, the other order, however, not being credited to the railroads. Aside from this and a fairly good run of orders on the books of manufacturers of special machinery, corrugating presses, metal working machinery, medium and small sized units in electric power, and a few medium and small size planers, the situation cannot be said to be any better, and, if anything, is worse. Working time is being cut to 20 and 40 hr. a week and forces are being gradually reduced, practically none but the skilled employees being retained. Returns from the surrounding manufacturing territory in the way of replies to questions propounded by *The Iron Age* indicate that the situation in the tool line is practically the same throughout; there is no buying, save for actual requirements, and such transactions are negotiated very conservatively.

The only foundries engaged are those making stoves and ranges. The jobbing foundries, such as are in operation, are running at a loss, taking off only one or two heats a week, except in rare cases, and watching carefully for any and all signs of improvement in the tool line, upon which most all the local foundries are largely dependent for their business.

Considerable interest is taken locally among manufacturers who are members of the National Association of Manufacturers in the coming thirteenth annual convention, to be held in New York on May 18, and the Cincinnati delegation is expected to be the largest in years. Articles printed in local newspapers have given the erroneous impression that delegates to this meeting would be appointed at the annual dinner of the Manufacturers' Club of Cincinnati at the Queen City Club on May 11. As a matter of fact, only members of firms which are members of the national organization could attend the New York meeting, and the Manufacturers' Club as an organization could not appoint delegates from within its membership without observing the first requirement. Among those who will attend the New York meeting are E. H. Hargrave of the Cincinnati Machine Tool Company, Thomas P. Egan of the J. A. Fay & Egan Company, C. Gordon Neff of the Bradford Belting Company, C. H. M. Atkins of the Warner Elevator Mfg. Company, J. C. Hobart of the Triumph Electric and the Triumph Ice Machine companies, Frederick A. Geier of the Cincinnati Milling Machine Company and R. A. Cowing of the Harkness & Cowing Company.

Members of the Iron Buyers' Association, which was recently formed in this territory to endeavor to bring about some reforms in contracts, methods of sale, &c., claimed to be necessary, are still agitating the matter, but so far as can be learned the new contract recently submitted to furnaces and selling agents has as yet had no signers. Selling agents are all in receipt of numerous opinions and arguments from the ironmasters, and with most of them absolutely repudiating the contract, a few holding off to get other opinions, none, so far as can be learned, has agreed to permit the use of the new form. The association is just now balloting by mail for a new president to succeed William Fetzer, resigned. The two candidates are G. H. Gorman of the Davis Sewing Machine Company, Dayton, Ohio, and George M. Verity of the American Rolling Mill Company, Middletown, Ohio.

Reports from the engineering and construction companies in this district are uniformly optimistic and indicate a better outlook for building. The Reliance Engineering Company has closed a number of good contracts, five of them for manufacturing lines. Some contemplated improvements in traction properties will also go ahead now, arrangements having been completed within the past few days.

The Concentric Engine Company, recently incorporated in Columbus, Ohio, with a capital stock of $50,000, to manufacture a new style of rotary steam engine, the invention of F. M. Lechner of that city, is installing a plant in Hickory street and expects to have its product on the market within a few months. The incorporators are Joseph Seagle, Charles J. Seagle, F. M. Lechner, A. J. Lind, George W. Molling and J. B. Karns. One of the engines has been in operation some time in the factory of the Joseph Seagle Company in Columbus, furnishing power for a large saw.

The Swink Printing Press Company, St. Marys, Ohio, organized for the manufacture of a new two-revolution cylinder printing press, is to move its business to Delphos, Ohio, where special facilities in the way of machine shop and warerooms have been secured from the Delphos Foundry & Mfg. Company. The company is buying machinery for installation in the new plant, a report giving the minimum amount as $10,000.

William Davidson and his two sons, Harry and John Davidson, of Evansville, Ind., are organizing a company in that city to erect a large plow factory. They were formerly connected with the Blount Plow Company, Evansville.

L. W. Fetzer and O. D. Kraft of Findlay, Ohio, have invented a traction oil well cleaning and pulling machine, which has been recently given an exhaustive trial and is said to have given excellent satisfaction.

Earl H. Turner, receiver of the Nutting Machine Company, Dayton, Ohio, will offer the entire property and assets, except the accounts receivable, at public auction at the company's offices in that city on May 22. A detailed list of assets is on file in the offices of Gottschall & Turner, attorneys, Beckel Building, Dayton.

An addition to the galvanized iron department of the Delphos, Ohio, can factory is being built, and a second story to the main structure will be another improvement. Plans have also been prepared for a large office building to be erected this summer.

The Vanduzen Bell & Brass Foundry Company, Cincinnati, is to reduce its capital stock from $75,000 to $15,000. The company, of which E. W. Vanduzen is the head, is one of the oldest in the manufacture of bells and chimes in this country.

Incorporation papers will soon be filed for the Acme Mfg. Company by John M. Cornish, George E. Brill, C. S. Nagel, Theodore Fischer and Ralph Talbot, all of Cincinnati. The location for the proposed plant is now being secured. The company will manufacture hardware and patented specialties, and the preliminary capitalization will be $10,000, which will be considerably increased as soon as the company gets the business well started.

Philadelphia Machinery Market.

PHILADELPHIA, PA., May 12, 1908.

Hardly enough business has been transacted in the local machinery market to record any change in the general situation. Quietness pervades every branch of the trade, and buyers of extensive or even moderate quantities of tools are out of the market. No indications of further activity on the part of the railroads are apparent, and it is hardly believed that any improvement will be noted in this direction for some time at least. The city placed contracts for a number of small tools for equipment of the Southern and Central manual training schools, but the original list was, we understand, considerably cut. With this exception most of the business placed during the past week has been of the single tool variety. More business appears to be doing in the lighter tools. For heavy tools, however, the demand is very meager.

Inquiries are not numerous, and are still largely confined to single tool propositions. Occasional demands for two or three tools are to be noted, but in these cases it is usually the smaller tools that are wanted.

Manufacturers report no change in conditions. The demand continues of an irregular character, and but few changes have been made in the operation of plant. Competition for business is sharp, but there appears to be no disposition to cut prices on the standard lines of tools, although on the less prominent makes an occasional shading of prices is reported. Special tool makers report no improvement in the demand. In some lines there has been a trifle more business, while in others business is, if anything, a little quieter.

There has been a better export demand for some of the power transmission specialties, particularly pressed steel pulleys and hangers, which have been more active recently. In the standard lines of machine tools no improvement in the foreign demand is to be noted, although there has been a little business offered in tools for special work.

The boiler and engine trade is dull. Builders of large tools have booked but few orders recently and are catching up pretty well with the work under way. There is little demand for equipment of the medium horse powers, and that for the smaller capacities is very dull. Second-hand boilers and engines are in light demand, reflecting the general condition of the trade.

The second-hand machine tool trade is fairly good, particularly when the general condition of the market is considered. There has been a good demand for some classes of tools; others, however, are neglected. Prices are reported as being good, particularly for the better classes of tools.

Little improvement in the demand for castings is to be noted, and foundries are still being operated on greatly restricted capacities. Consumers show slight inclination to place orders for either iron or steel castings beyond their immediate needs, and foundries are for a large part dependent on week to week, and in some cases day to day, orders.

Proposals have been taken by Wm. Daniels, chairman of the Water Committee, Bridgeton, N. J., for furnishing material and making repairs to the waterworks reservoir in that city. A considerable quantity of reinforced steel and a small quantity of structural steel are required, together with nearly 1000 cu. yd. of concrete work. Bids were opened on the 11th inst., and awards are expected at an early date.

The Tropenas Steel Company, New Castle, Del., has purchased a 150 kw. Harrisburg Foundry & Machine Works engine, directly connected with Bullock generator, for power purposes in connection with its new plant. Work on the new foundry and office buildings is going forward. All the structural steel work is on the ground, and it is expected that the plant will be ready to operate early in the fall. Purchases of the machinery equipment for the plant have not yet been made.

The Philadelphia Roll & Machine Company reports a slight improvement in the demand for both sand cast and chilled iron rolls; and several orders for large rolls, particularly of the latter class, for sheet mills have been taken. There is also a somewhat better demand for charcoal iron air furnace castings, for special machinery, and some inquiry is about for special mill machinery. This concern is now running its plant five days a week, and feels more encouraged as to the future.

The Hess Machine Works, manufacturer of file making machinery and special tools, has recently booked orders for several sets of file making machines for export to England and to other countries in Europe. Five sets of these machines have just been shipped to customers in Germany, while several have been furnished file makers in this country. The plant of this concern is being operated on a basis of four and a half days a week, but if the present apparent volume of business develops into orders this time will probably be increased before very long.

The Baldwin Locomotive Works notes a material increase in the volume of orders taken during April, when compared with that which came in during the previous three months. The greater proportion of the business was confined to orders for small numbers of engines from minor railroads. Some little export business was also closed. The Baldwin Works has for some months been running on reduced working hours, with greatly reduced forces. Beginning with this week the plant was put on five hours per day, but whether this is to be continued will depend on the volume of new business coming out. A pretty fair run of repair work is reported, and the opinion is expressed that a gradual improvement in locomotive buying will be noticeable in the near future.

New England Machinery Market.

WORCESTER, MASS., May 12, 1908.

A slight improvement in the machine tool trade is reported by some of the dealers and manufacturers, though this experience is not universal. The total of business booked is not noticeably greater, but there is a feeling that things look a little brighter. Quite a number of new concerns are establishing small works, and their inquiries and orders have had their effect. But the greater part of this business consists of second-hand tools.

New England will send its usual large delegation to the meeting of the National Machine Tool Builders' Association at Atlantic City next week. So far as can be learned the New England members are a unit for the maintenance of present prices. The dealers are not unanimous in this belief, but their arguments seem to have had little effect upon the manufacturers whose machinery they handle.

The International Paper Company has acquired the shops of the Turners Falls Machine Company, Turners Falls, Mass. The works will be devoted to the repair work for the company's several plants, and, it is understood, for the manufacture of new machinery. The works are well equipped with machinery, it is stated.

The Ideal Plating Company, 3 Appleton street, Boston, which manufactures bicycle and motor cycle specialties, and does a general plating and polishing business, has purchased a factory at Marlboro, Mass. The work of preparing the works for occupation will begin immediately, and they will be ready for occupancy July 1. The company states that it will manufacture other specialties as soon as larger facilities are available.

The J. M. Russell Mfg. Company, Naugatuck, Conn., has been incorporated under Connecticut laws with John M. Russell as president, George T. Wigmore, treasurer, and Clifford S. Russell, secretary; these officers with A. H. Dayton constituting the Board of Directors. The new name is the John M. Russell Mfg. Company, Inc. The management will be the same as when the business was conducted by John M. Russell, but the intention is to enlarge the business both in its hardware and plumbing specialties. The company also manufactures brass, bronze and composition castings.

The Carter & Hakes Machine Company, builder of machine tools, Winsted, Conn., is operating its shop on a 59-hr. schedule, manufacturing on orders.

The John T. Young Boiler Company, Norwich, Conn., has been incorporated under Connecticut laws with an authorized capital stock of $100,000. The company will manufacture steam and hot water heating boilers, and states that it will be in the market for equipment for its works. It is not yet decided whether a new plant will be erected, or some existing plant acquired for the purposes of the business. John T. Young is the president, and Augustus W. Dodge secretary of the company.

The bill providing funds for the equipment of a machine shop for the Lowell Textile School, Lowell, Mass., has become a law. The sum of $10,000 is available for the purpose.

The Massachusetts State Board of Education has asked the State for $75,000 with which to establish a manual training school at Fitchburg, Mass.

The Boston Gear Works, Norfolk Downs, Mass., is making inquiry for a cold saw to cut 6 to 8 in. round stock.

O. S. Bickford has established a machine shop at Greenfield, Mass., and will make a feature of light special machinery.

The Worcester Pressed Steel Company, Worcester, Mass., will include one or two presses of 500 tons pressure in its proposed increase in manufacturing facilities, especially in the line of heavy deep drawing of steel, mention of which has been made in this column. If two presses are installed one will be of the single action, the other of the double action type. The company is in the market for these machines, but is not yet decided on the general type which will be adopted.

The Smith & Winchester Mfg. Company, South Windham, Conn., manufacturer of paper mill, paper cutting and paper bag machinery, has purchased the business of the Elkhart Paper Bag Machine Company, Elkhart, Ind., and

is moving it to South Windham. The company states that later it will be necessary to enlarge the plant to take care of the addition to its line, but no decision has been reached as to how large a building will be required nor what machinery will be necessary for its equipment. The company is slowly making its calculations and rearranging matters so that it may know exactly what is required, and a decision may be reached in the course of the next two months. Plans may be influenced by the condition of business. The company has been very busy for the past few years, but at the present time the business is feeling the general dullness. Guilford Smith is president and treasurer; C. E. Oman, vice-president, and W. P. Barstow, secretary.

The engineering force of the transformer department of the General Electric Company has been transferred from Schenectady to Pittsfield, Mass., where the manufacture of transformers will be carried on exclusively hereafter. No new building will be undertaken this season, excepting those structures now in process of erection, which will largely increase the capacity of the works.

The Warren Steam Pump Company, Warren, Mass., continues to operate its plant on full time. This is one of the few New England concerns that has not curtailed production by shorter hours or reduced working forces during the recent months. In fact, in the 10 years of the company's existence there has never been a shutdown for vacation, and the number of employees has been constantly increasing.

The Water Commissioners of West Springfield, Mass., are to ask for a $50,000 bond issue for the improvement of the town's water system, which would include, according to the plans, the duplicating of the present pumping equipment, which consists of a 60-hp. gasoline engine and pump capable of handling 1,250,000 gal. of water each 24 hr.

The first steps have been taken toward the organization of the Enfield Power Company, which proposes to establish a hydraulic plant on the Connecticut River capable of developing 45,000 hp. for electric transmission to centers of consumption. Prominent men of the Connecticut Valley are interested in the project, which is an ambitious one. The purpose is to combine the development of water power with the scheme to make the river navigable to Holyoke, the present head of navigation being at Hartford. A dam would be built at Warehouse Point, a short distance above Windsor Locks, Conn., 38 ft. high, which would be sufficient to give a slack water pool to Holyoke of sufficient depth for river boats. The United States Government engineers have recommended a plan to make the river accessible to vessels, which comprises three locks between Hartford and Holyoke and the dredging of the rapids below the present dam that provides the necessary head for the canal that serves Windsor Locks. The new plan would include the dredging on the part of the Government and the building of a lock at the new dam. The proposed capital of $6,000,000 would include the cost of buying the privileges of the Connecticut River Company, which operates the canal to Windsor Locks, and other vested rights. The sum of $1,000,000 is estimated for electrical equipment. The plan is yet in its initial stage. Difficulties will have to be overcome, including the securing of the co-operation of the Government. A bill framed on the basis of the recommendation of the Government engineers will be presented to Congress at this session, it is understood, having received the favorable action of the Rivers and Harbors Board. Another bill, on the basis of the new plan, will be presented immediately. C. H. Tenney, Springfield, is president of the Enfield Power Company, and Ralph P. Alden, Springfield, treasurer. Alexander Clogher, New York, an engineer, is the originator of the idea.

The reopening of the Union Trust Company, Providence, R. I., after a suspension of more than six months, must have a reassuring influence on general business conditions of that city and the neighboring cities and towns. Several million dollars of deposits are released, including those of many manufacturing establishments, some of which have been more or less crippled in consequence. The company has been reorganized under a very conservative management, in which the industrial interests of the city have an important influence.

The manufacturing jewelry industry of Providence, R. I., and Attleboro, Mass., have got sufficiently in touch with the trade through their salesmen to feel confident that their season will be a very fair one, though not equalling that of last year, which was entirely beyond the ordinary. The factories have not yet felt the new influence to any great extent, though actual new business is greater than last month or March, and the feeling generally is better.

The railroad situation in New England is affected seriously by the contest going on as to the merger of the Boston & Maine system in the New York, New Haven & Hartford. It is further complicated by the decision of the Massachusetts Supreme Court last week that the holding of street railroad stocks by the New Haven road is illegal, a decision which may have its bearing upon the merger of the two railroads, it is claimed by the anti-merger element. Manufacturing concerns are deeply interested in the merger question. Many of them are served by both systems, and probably the majority of these are opposed to the change. On the other hand, there is a strong feeling that the Boston & Maine lines, which have been permitted to depreciate, would be renovated by the New Haven people in following their general scheme of improvement which has been carried out all over their system. The trade is interested, for the merger would mean a marked change in their dealings with the Boston & Maine system. Purchases would doubtless be on a much larger scale, but Boston dealers would have to sacrifice much of their share of the business if the purchasing department were concentrated at New Haven.

The local press states that the contract has been awarded for a factory to be erected in New London, Conn., by the W. D. Forbes Company, Hoboken, N. J., which, according to the report, is to remove its business to the Connecticut city. The company states that it is not yet in a position to give information on the subject. The published announcement includes the details that the shop will be located near Fort Trumbull and will be 50 x 100 ft. and two stories, with wing for a power plant 40 x 50 ft. The firm manufactures light engines.

Government Purchases.

WASHINGTON, D. C., May 12, 1908.

The Isthmian Canal Commission will receive bids until June 2, Circular No. 441, for turbine pump and motor, duplex water pump, power hammers, pneumatic sand shaker and other supplies.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until June 6 for one 5000 cu. ft. air compressor and accessories for the Bremerton Navy Yard.

The following bids were opened May 4, Circular No. 436, for machinery for the Isthmian Canal Commission:

Class 7, item 15-hp. motor: Bidder 44, General Electric Company, Schenectady, N. Y., $318; 113, Wagner Electric Mfg. Company, St. Louis, Mo., $345.50.

Class 8.—One 18-in. engine lathe: Bidder 25, Compressed Air Machinery Company, San Francisco, Cal., $863.87; 34, Fairbanks Company, New York, $720; 37, Fox Bros. & Co., New York, $804; 42, Garvin Machine Company, New York, $714; 63, Manning, Maxwell & Moore, New York, $670 and $725; 90, Rahn-Carpenter Company, Cincinnati, Ohio, $650; 111, Vandyck-Churchill Company, New York, $865 and $743; 116, Niles-Bement-Pond Company, New York, $733.

Class 7.—One bench speed lathe—Bidder 6, American Wood Working Machinery Company, Rochester, N. Y., $90; 34, Fairbanks Company, New York, $56.50; 37, Fox Bros. & Co., New York, $57; 63, Manning, Maxwell & Moore, New York, $92; 111, Vandyck-Churchill Company, New York, $60.

Class 8.—One bolt cutter—Bidder 30, Detrick & Harvey Machine Company, Baltimore, Md., $1074; 32, Drew Machinery Agency, Manchester, N. H., $799; 34, Fairbanks Company, New York, $758; 37, Fox Brothers & Co., New York, $695; 38, Frevert Machinery Company, New York, $773; 63, Manning, Maxwell & More, New York, $850; 79, C. T. Patterson & Co., New Orleans, La., $780 and $830; 86, Prentiss Tool & Supply Company, New York, $698; 98, Joseph T. Ryerson & Son, Chicago, Ill., $795; 102, William Sellers & Co., Philadelphia, Pa., $1428 and $1840; 108, Tucker Tool & Machine Company, New York, $789.47; 111, Vandyck-Churchill Company, New York, $732.

Class 9.—One upright drill—Bidder 25, Compressed Air Machinery Company, San Francisco, Cal., $831.44; 34, Fairbanks Company, New York, $682.40; 37, Fox Brothers & Co., New York, $649; 38, Frevert Machinery Company, New York, $653; 63, Manning, Maxwell & Moore, New York, $642 and $493; 111, Vandyck-Churchill Company, New York, $715; 116, Niles-Bement-Pond Company, New York, $471.

Class 10.—One 24-in. shaper—Bidder 25, Compressed Air Machinery Company, San Francisco, Cal., $816.85; 34, Fairbanks Company, New York, $640 and $460; 37, Fox Brothers & Co., New York, $565 and $495; 38, Frevert Machinery Company, New York, $520; 42, Garvin Machine Company, New York, $700; 63, Manning, Maxwell & Moore, New York, $665; 79, C. T. Patterson & Co., New Orleans, La., $642; 86, Prentiss Tool & Supply Company, New York, $755; 88, Queen City Machine Tool Company, Cincinnati, Ohio, $800; 111, Vandyck-Churchill Company, New York, $575; 116, Niles-Bement-Pond Company, New York, $710 and $523.

Class 11.—One hack saw—Bidder 14, Charles Bond Company, Philadelphia, Pa., $55; 32, Drew Machinery Agency, Manchester, N. H., $48; 37, Fox Brothers & Co., New York, $53.24; 38, Frevert Machinery Company, New York, $72; 63, Manning, Maxwell & Moore, New York, $51 and $185; 98, Joseph T. Ryerson & Sons, Chicago, Ill., $80; 108, Tucker Tool & Machine Company, New York, $54.95; 111, Vandyck-Churchill Company, New York, $33.

Class 12.—One duplex emery grinder—Bidder 34, Fairbanks Company, New York, $281; 37, Fox Brothers & Co., New York, $389; 63, Manning, Maxwell & Moore, New York, $436.

Class 30.—One blower—Bidder 32, Drew Machinery Agency, Manchester, N. H., $77; 37, Fox Brothers & Co., New York, $68.50 and $49; 63, Manning, Maxwell & Moore, New York, $47.52; 74, New York Blower Company, Bucyrus, Ohio, $58; 105, B. F. Sturtevant Company, Hyde Park, Mass., $33; 122, Buffalo Forge Company, Buffalo, N. Y., $47.

The following bids were opened May 5 for supplies for the Navy Yards:

Class 341.—Three motors—Bidder 30, Crocker-Wheeler Company, Ampere, N. J., $929; 50, D'Olier Engineering Company, Philadelphia, Pa., $788; 53, Diehl Mfg. Company, Elizabeth, N. J., $610.30; 69, General Electric Company, Schenectady, N. Y., $837; 79, Holtzer-Cabot Electric Company, Brookline, Mass., $668.53; 122, Northern Electric Mfg. Company, Madison, Wis., $613; 127, Ole K. Olsen, New Orleans, La., $601.10; 149, Sprague Electric Company, New York, $667; 163, B. F. Sturtevant Company, Hyde Park, Mass., $710; 183, Western Electric Company, New York, $539.

The following bids were opened by the chief signal officer,

United States Army, Washington, D. C., April 30 for 1-kw. telephone motor:

Dean Electric Company, Elyria, Ohio, $312.87. Crocker Wheeler Company, Baltimore, Md., $140, additional for starter and field regulator, $18; National Electrical Supply Company, Washington, D. C., $350; Holtzer-Cabot Electric Company, Brookline, Mass., $221.54; Roth Bros. & Co., Chicago, Ill., $352.

The following awards have been made for supplies for the navy yards, bids for which were opened March 3:

Vandyk-Churchill Company, New York, class 43, one extension gap lathe, $2380; class 44, one screw cutting lathe, $1092.

Potter & Johnson Machine Company, Pawtucket, R. I., class 45, one shaping machine, $856.

James Cogg, Jr., Electric Company, Louisville, Ky., class 47, one electrically driven sensitive drill, $143.50; class 48, one emery grinder, $141.

W. H. Foster Company, New York, class 49, one milling machine, $1055.

Brown & Sharpe Mfg. Company, Providence, R. I., class 50, one universal milling machine, $373.18.

Bentel & Margedant Company, Hamilton, Ohio, class 51, one mortising machine, $720.

Greenlee Bros., Chicago, Ill., class 52, one automatic cut-off saw, $795.

Niles-Bement-Pond Company, New York, class 53, one drilling machine, $1275.

Fairbanks Company, New York, class 54, five engine lathes, $5655; class 55, one patternmakers' lathe, $90.

William Sellers & Co., Philadelphia, Pa., class 56, one universal shaping machine, $1420.

Ajax Mfg. Company, Cleveland, Ohio, class 57, one bolt heading and forging machine, $8297.

Heine Safety Boiler Company, St. Louis, Mo., class 81, two 200-hp. boilers, $5388.

Under bids opened March 31 for machinery for the navy yards Vermilye & Power, New York, have been awarded class 181, one turbine blower, $1505.

The General Electric Company, Schenectady, N. Y., has been awarded class 31, one 10-hp. motor, $238, bids for which were opened April 14 for supplies for the navy yards.

The following awards have been made for machinery for the navy yards, bids for which were opened April 21:

Henshaw, Bulkley & Co., San Francisco, Cal., class 2, one flat turret lathe, $1795.

Springfield Machine Tool Company, Springfield, Ohio, class 11, one motor driven lathe, $968.

Gleason Works, Rochester, N. Y., class 132, one automatic beveled gear planer, $1550.

Tucker Tool & Machine Company, New York, class 133, one rivet spinning machine, $106.90.

Becker-Brainard Milling Machine Company, Hyde Park, Mass., class 135, one vertical milling machine, $1083.

Under bids opened April 28 for machinery for the navy yards the Becker-Brainard Milling Machine Company, Hyde Park, Mass., has been awarded class 107, one vertical milling machine, $1625.

The Vulcan Detinning Company.

The annual report of the Vulcan Detinning Company, 157 Cedar street, New York, makes the following financial showing for the fiscal year ending March 31, 1908:

Assets.

Cash, cash items and inventory	$113,384.18
Plants: land, tenements, patents, processes	3,832,977.45
Total	$3,946,361.63

Liabilities.

Accounts payable (not due)		$56,987.85
Capital stock, preferred	$1,500,000	
Capital stock, common	2,000,000	
		3,500,000.00
Surplus		389,373.78
Total		$3,946,361.63
Addition to surplus after deductions for depreciation and betterments		$15,781.04
Dividends of 1¼ per cent. each paid on preferred stock, April 20, July 20 and October 20, 1907, totaled		56,250.00

President Samuel R. Beardsley makes the following statement to the stockholders:

"The fiscal year just passed has been quite eventful for the company. Beginning with very promising conditions, prospects were further brightened through the final decision rendered in our favor by the Court of Errors and Appeals of New Jersey in our litigation against the American Can Company. By this decision the defendant company was permanently enjoined from using our secret process of detinning, and permission was given our company to apply to the Court of Chancery for further relief. An application is now pending before this court to compel the American Can Company to account to us for all the profits made in its detinning plants during the four years of their operation, and, furthermore, to compensate us for the damages sustained by us through its illegal use of our secret process of detinning. After the issuance of the injunction we licensed the American Can Company to continue detinning by our process for a period of six months, during which it has paid us a royalty on all material treated.

"On the other hand, the business of the company during the last eight months of the fiscal year suffered considerably, in common with the steel industry and the general metal trade, through the heavy and sharp decline in the value of our products caused by the financial crisis through which the country has just passed. Notwithstanding this adverse condition, the operation of the company during the fiscal year ending March 31, 1908, resulted, after making the usual deductions for depreciation and betterments, in a net profit of $71,152.30. Three dividends of 1¼ per cent. each were paid, amounting to $56,250, and the sum of $15,581.04 was added to the surplus.

"There is no indebtedness of whatever kind excepting for material purchased and not due. Our cash reserve has been considerably increased through the passing of two dividends. Our receipts of raw material, which, in consequence of the idleness of many factories, had been slight during the first months of 1908, have been gradually increasing since the early part of March, and both our factories have since been running full time, 22 hr. daily. The cost price of our raw material—tinplate scrap—has adjusted itself to the lower state of the market from the beginning of this year, and contracts have been made for the greater part of our requirements for the entire year of 1908 at reasonably low figures."

The Cleveland Manufacturers' Club, which was started a year ago and established a clubhouse at 1420 East Fortieth street, adjoining the East End manufacturing district, celebrated its first anniversary on May 9. During the year the club has increased its membership from 24 to 116. The following officers were elected for the ensuing year: President, W. D. Sayle, president of the Cleveland Punch & Shear Works Company; first vice-president, W. A. Comstock, secretary and treasurer of the Cleveland Wire Spring Company; second vice-president, W. F. Bilenstein, president of the National Iron & Wire Company; secretary, A. F. Schroeder, secretary of the Globe Machine & Stamping Company; treasurer, Charles F. Kurtz, secretary and treasurer of the Cleveland Store Fixture Company. These, with F. E. Pyle, W. H. Haywood and D. R. Davis, constitute the Board of Directors. J. W. Campbell is assistant secretary and treasurer.

The Associated Foundry Foremen of Philadelphia and vicinity held their regular monthly meeting in that city on the evening of May 11. The principal subject for discussion was presented by E. H. Mumford of the E. H. Mumford Company, Philadelphia, who described a new vertical mold table, which that company is preparing to place on the market. Announcement was also made regarding the meetings of the Associated Foundry Foremen to be held during the coming convention of the American Foundrymen's Association and its allied organizations, at Toronto, Canada, June 8 to 12, and it is probable that there will be a good representation of foundry foremen from Philadelphia territory.

The American Railway Association's statistics show a further increase of idle freight cars in the United States and Canada between April 15 and April 29. The total reported by 153 railroads with an aggregate freight car equipment of about 2,270,000 was 413,338 on April 29, an increase of 37,714 in two weeks. The total increase for April was 107,229 cars, and between March 15 and April 29 the increase was about 147,000 cars. In October, 1907, a shortage of about 87,000 cars was reported.

The long controversy between the Illinois bituminous coal miners and operators was ended Saturday, May 9, by the renewal of the old agreement for two years. The cost of firing the shots will fall on the miners. The mines in all of the soft coal districts are now covered by agreements, except in the Southwestern States.

A contract for the supply of 23,000 tons of steel rails for the Hamidié-Hedjaz Railway has been placed by the Turkish Government with the Sociedad de Altos Hornos of Bilbao, Spain.

HARDWARE

FROM our Washington letter, printed on another page, our readers will learn that the bill in the interest of pure Paints has encountered unexpected objections, as there are arrayed against it practically all the great manufacturing and distributing interests of the trade. The point is forcibly made that there is no reason why Paint should be singled out for legislation of this character, which would cause even honest manufacturers of high standing a great deal of annoyance and expense and throw around the making and marketing of Paint many difficulties. The people of the country undoubtedly suffer more from the manufacture and sale of goods which are sold as "all wool," in which there is comparatively little of this material, than they do from adulterated Paints. Why not have an all wool law, say the opponents of this Paint legislation, and guard the public against shoddy and cotton mixtures? There is unquestionably a good deal of inferior Paint put on the market—and the public wants it because it is cheap—but a similar statement might be made in regard to almost every kind of manufactured product.

In view of this fact the chief spokesman of the great body of Paint manufacturers who appeared before the Senate Committee in opposition to the bill was justified in making the point that there is no good reason for selecting the Paint business for this invidious legislation. If, however, a reform is to be undertaken in this field, the painters who compound their own Paints instead of buying them already prepared should not be lost sight of. If something could be done to compel them to buy a good quality of Mixed Paint or Lead, to use first quality materials for thinning it, and at the same time restrain them from making it too thin, it would be at least aiming at a more complete correction of the evils in question. In this connection it is significant that the argument in favor of the bill was made by an organization of the house painters from whose thin Paints of low quality the bill does not even attempt to protect the public.

There is also force in the argument that it would be an invasion of private rights to compel manufacturers to give to their competitors and to the world their secret formulas, many of which represent much expert knowledge and years of experiment. To force them to disclose these trade secrets is open to the objection that it is in spirit, if not in letter, contrary to the constitutional provision which forbids the taking of private property without due process of law.

It is a curious commentary on the feeling of business men in regard to legislation, national and State, that some manufacturers gave their adhesion to one or other of the pure Paint laws proposed, not because they approved of them, but because they were afraid that a more drastic law and one embodying still more objectionable features might be enacted.

Condition of Trade.

With the approach of summer weather and the quickening of activities generally there is little change in the general Hardware situation. The same conservatism which has made the trade both in the manufacturing and distributing branches careful of their purchases still continues, and in practically every part of the country this disposition is reflected. In the agricultural sections especially, and where even the farmers' trade is an important element of the retailers' business, there is less complaint than in the cities and manufacturing towns, where a good many are out of employment or working only part time. There is as a result of current business, which is after all of fair volume compared with ordinary years, a good movement of orders when estimated by their number, and the aggregate makes a respectable total. In factories and stores, however, the handling of such orders entails much additional labor, which is the more felt as some establishments have endeavored to dispose of help which they deemed unnecessary in view of reduced volume of business. One advantage which the manufacturers especially experience in the present juncture is the opportunity they are given to weed out undesirable workmen and thus increase the efficiency of their force. This is in many cases a substantial gain, as not a little was lost in efficiency during the period of heavy pressure on their productive capacity. The course of prices in the raw material and in the finished product continues to be an engrossing topic in the trade, where the question as to the course which will be pursued by the great iron interests is canvassed with a good deal of solicitude because of its bearing on the general situation. The condition of prices along nearly the entire Hardware line, with its background of uncertainty in the raw material markets, is far from strong, but while many revisions are made from day to day prices are pretty well sustained, all things considered, and in comparatively few lines does a demoralized condition prevail. The tone of the trade is hopeful, for it is realized that a much needed process of retrenchment and cleaning up is going on, in which will be found a fitting preparation for the good times, the coming of which is looked forward to. The magnificent position of the country agriculturally, the excellent financial condition of the farmers generally, and the prospect for good crops in the near future furnish the basis for confidence that prosperity cannot be very long delayed.

Chicago.

Cold driving storms of wind and rain, continuing almost without interruption through the week and extending over a wide extent of territory, have had a retarding effect upon trade, so that the opening days of May have proved somewhat disappointing. Some damage has been done by recent frosts and freezing weather to fruit and early plantings, but such results are usually overestimated in the beginning; at the same time the present effect is to minimize buying on the part of consumers. There is every reason to believe that the sharp drop in business that has been experienced by both retailer and jobber is but temporary, and that with the return of normal May weather conditions the lost ground will be recovered. Barring unforeseen developments the present month should at least hold even with April. Reorders for Woven Wire, Poultry Netting, Lawn Mowers and other seasonable goods, on which first orders were placed sparingly, are beginning to come out a little better, giv-

ing hope of an increasing demand of this character. The excellent prospect of a good hay crop in the Southwest has stimulated the movement of bale ties, orders for which are coming out in fair volume. Present conditions are exceptionally favorable to the development of a similar demand a little later in Northern territory. While there is no material change in nominal price schedules, some lines are quite unsettled, and even where agreed prices are being maintained on specific quotations, the low figures named on lump estimates reflect radical departures from recognized prices. This is particularly true of Builders' Hardware, in which there is eager competition for every order, large or small, that comes up. Chicago building permits for April show an increase both in number of buildings and cost over the same month last year, a fact that bespeaks future demand for building Hardware.

NOTES ON PRICES.

Wire Nails.—Business keeps up to about the same volume as has been recorded during the past month, and buyers are pursuing the same conservative course in sending orders to the mills. Orders are confined to small lots which amount in the aggregate to a moderate volume. Prices are firm and regularly maintained, except as back orders come unexpectedly to light, and retail buyers in carload lots are treated as jobbers by some manufacturers. Quotations for base sizes continue as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

GALVANIZED NAILS continue to command about the usual advance. Taking the country at large, the business done in these goods is of course small in comparison with the volume of the ungalvanized. There is some diversity in the charge for galvanizing. Some manufacturers charge about $1 extra per keg for galvanizing 20 to 6 d., $1.15 for 5 to 3 d. and an advance of about 50 cents for 2 d. and smaller. Other manufacturers charge the same for galvanizing all sizes.

New York.—Demand continues comparatively light and orders are confined to small lots. Merchants are keeping very close to actual requirements in their purchases. Regular quotations are on the basis of $2.40 per keg for small lots at store.

Chicago.—The measure of consumptive demand is pretty accurately reflected by the orders coming to the mills, since jobbers and retail dealers are gauging their purchases very closely to immediate requirements. Owing to the severe rainstorms of the past week there has been a slight reduction in the volume of orders entered. However, the total tonnage of business booked by the American Steel & Wire Company for the first week of May is within 4 per cent. of that of the same period last year. Some diminution in the demand for Nails is looked for within the next few weeks, as the season is now well advanced. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—A moderate volume of new business in Wire Nails is being received by the mills, but it continues to be confined to small orders for actual needs. Shipments are being made promptly by the mills, and there is no delay in deliveries. Prices are firm, and we are advised are being absolutely maintained. The new open hearth steel plant being erected by the Pittsburgh Steel Company at Monessen, Pa., the second largest manufacturer of Wire Nails, is nearing completion, and is expected to be ready for operation in July or early in August. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

Cut Nails.—The situation continues without change, orders being small and demand restricted to actual requirements. Mills that are in operation are running only part time, while others are closed down altogether. The market is irregular, and concessions of 15 cents or more are being made on regular Steel Nail quotations, so that about $1.90 for carload lots at mill is more representative of the market than $2.05. Iron Nails generally should command about 10 cents more than Steel.

New York.—Demand for Cut Nails is comparatively light and for small lots. There are some Nails of inferior material and imperfect in form which are sold for less than regular quotations. Regular quotations are on the basis of $2.30 per keg, for small lots at store.

Chicago.—Few lines are more dormant and inactive than Cut Nails. Occasional orders for stock assortment are all that are being placed by jobbers, and the demand from consumers is limited to small orders of a few kegs at a time. Market conditions are such as to invite price concessions, which are quite generally being made to the extent of 10 cents or more. Chicago quotations are nominally as follows: Iron Cut Nails, carloads, to jobbers, $2.23; to retailers, $2.28; Steel, to jobbers, in carloads, $2.03; to retailers, $2.08.

Pittsburgh.—Orders continue very light and are only for small lots for actual needs. Some of the Cut Nail mills are operating to 30 or 40 per cent. of capacity, while others are shut down, and every effort is being made by the mills to prevent accumulation of stocks, while present dull demand lasts. Regular prices on Cut Nails are being shaded 15 cents a keg or more. We quote Steel Cut Nails at $1.90 to $1.95, f.o.b. Pittsburgh, for carload lots, and about $2 for small lots, to which freight to point of delivery is added. Iron Cut Nails are about $2.05, at maker's mill.

Barb Wire.—A fair volume of business continues a feature of the Barb Wire market, in which there are small but rather frequent orders. The volume does not correspond very favorably with that of last year, but is more encouraging than in other lines of Wire products. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—Barb and other forms of Fencing Wire continue to be the most active of the various lines of Wire products. New business is coming in freely from northern territory where the farmers are not yet wholly occupied with seeding operations. Small but frequent orders are the rule which is being rigidly observed by all buyers, large and small, and the indications are that the season will close with but very small stocks in the hands of distributors. We are advised that no departures from regular prices are being made by the mills. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, jobbers, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—A fair volume of new business is being entered by the mills, while shipments on specifications against contracts placed some time ago are heavy. Tonnage so far this year in Barb Wire is somewhat less than in the corresponding period last year. Fence building by the farmers is pretty well over, and it is probable demand for Barb Wire will soon show a falling off. The mills advise us that regular prices are being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—Specifications on contract orders are being received in fair volume by the mills, and a moderate volume of new business is being placed. Small orders characterize the present situation. Prices are reported as being maintained. Quotations per 100 lb. to jobbers in carload lots are as follows, f.o.b. Pittsburgh, 60 days, or

2 per cent. discount for cash in 10 days, the price to retailers being 5 cents additional:

Nos.	6 to 9	10	11	12	12½	13	14	15	16
Annealed	$1.90	1.95	2.00	2.05	2.15	2.25	2.35	2.45	
Galvanized	$2.20	2.25	2.30	2.35	2.45	2.55	2.95	3.05	

Chicago.—A fair amount of new business is being entered by the mills the bulk of which is coming from Fence manufacturers, for whose product the demand is reasonably active. Makers of Wire specialties, however, are buying sparingly. There is no change in the general character of requirements, they being for small lots for prompt shipment. Prices are being firmly maintained. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—A moderate amount of new business is being placed, while specifications against contracts are coming in at a fairly satisfactory rate. Tonnage in Fence Wire so far this year has been somewhat less than last year, the trade pursuing the policy of buying small lots for actual needs, but are placing orders more freely than was the case last year. The mills are able to make prompt shipments on all orders, and we are advised prices are being held. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Rope.—The improvement in demand is so slight that it is difficult to say what the increase in volume amounts to. Requirements are much below normal, and the trade continue to order on the hand to mouth basis. The price of Manila Rope is about ½ cent lower than recent quotations have indicated. The following quotations, for base sizes, fairly represent the market for small lots, but are not always adhered to on large orders: Pure Manila, 10¼ to 10½ cents; lower grades Manila, 8 to 9 cents; Pure Sisal, 7½ to 8 cents; lower grade Sisal, 6½ to 7 cents; No. 1 Jute, 1-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¼ cents.

Wire Picture Cord.—There is undoubtedly a great deal of Wire Picture Cord of short length being sold at the present time, and it will be well for merchants to be on their guard against it. Those desiring to purchase full length goods of standard manufacturers will naturally be obliged to pay a somewhat higher price than for goods marked 25 yards but containing less. While full length goods are represented in a general way by discount of 90 per cent., those containing irregular lengths can be purchased for about 20 per cent. less.

Lace Leather.—The improving tendency in the Hide market is reflected in a slight but quotable advance in prevailing quotations on Belt Lacing. The market on Cut Lace is now represented by a discount of 50 and 10 per cent., and on Sides by quotation of 22 to 23 cents per square foot.

Cast Washers.—The demand for Cast Washers is light, and many manufacturers have reduced their production on this line to the minimum. Cast Washers are not handled to a large extent by the Hardware trade, but are in demand when any considerable amount of railroad structural work, bridge building, &c., is going on. The market price at the present time may be represented by quotation of 1½ to 1¾ cents per pound.

Picks, Mattocks, &c.—Some manufacturers of heavy tools, such as Picks, Mattocks, Crow Bars, &c., are said to be making moderate concessions on some lines. In a general way, however, it may be stated that prices on these goods have been surprisingly steady in view of the conditions and the light business to be had.

White Lead in Oil.—Continued advances in the price of Pig Lead have had the effect of strengthening the market on Lead products. The market for White Lead in Oil is very firm, and buyers are unable to obtain concessions on regular prices, as might have been possible some time ago. The improvement in demand is quite pronounced, though orders are for moderate lots. Quotations are as follows: In lots of 500 lb. and over, 6¾ cents per pound; in lots of less than 500 lb., the usual advance of ½ cent is charged.

Linseed Oil.—An advance of 1 cent per gallon has been made by crushers in the price of Oil as a result of the advancing seed market. The market is firm at the advance, but no desire to purchase more freely on account of higher prices has developed. Heretofore the trade has ordered what it has required, without regard to price, which has also been true of manufacturing consumers. Local quotations are as follows: State and Western Raw, 41 to 43 cents; City Raw, 43 to 44 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Window Glass.—Conditions remain about the same as for the past few weeks, while factories making Glass have experienced a slow market and low prices. Demand shows no improvement, and the majority of manufacturers are supposed to be having difficulty in finding purchasers even at lower prices. In a number of instances manufacturers have sacrificed quality for quantity, so that an unknown proportion of the Glass on the market is inferior in quality. Demand is very light and prices irregular, so much so that it is impossible to name quotations which would represent the market.

Spirits Turpentine.—Prices have fluctuated during the week to the extent of ½-cent per gallon at this point, reflecting conditions at Savannah. The receipts of the new crop have been heavy in the Southern market and demand light, causing the price to fall off ½-cent from last week's quotation. Later in the week the market recovered what it had lost, because of lighter receipts and better demand. Demand at this point has been of a hand to mouth character, despite the low price. The New York market is represented by the following quotations: Oil Barrels, 46 to 46½ cents; Machine Made Barrels, 46½ to 47 cents.

Paris Green.—The Paris Green market continues quiet and without interesting features. A limited quantity of Green was ordered previous to the announcement of prices, and since that time buyers have not appeared anxious to anticipate their wants to any great extent. This is in accordance with the policy generally being pursued in regard to other lines of goods. Quotations are without change, as follows:

	Arsenic Kegs.	175 lb.	28 56 lb.	2 & 5 lb.	Boxes. 1-lb.	Boxes. ½-lb.	Boxes. ¼-lb.
10,000 lb. and over	21½	22	23	23½	24½	25½	26½
5000 to 10,000 lb.	22	22½	23½	24	25	26	27
1000 to 5000 lb.	23	23½	24½	25	26	27	28
500 to 1000 lb.	24	24½	25½	26	27	28	29
Less than 500 lb.	25	25½	26½	27	28	29	30

Coil Chain.—The market for Coil Chain, which has long been in an unsettled condition, continues decidedly irregular. Although present prices are said to be close to cost, the tendency apparently is still downward, some producers having recently put out lower quotations. There is very little business doing, and competition for any orders in sight is exceedingly keen.

Sash Weights.—Quotations on Sash Weights are somewhat irregular, weakness having developed in some sections where prices have formerly been fairly well maintained. In the East low figures have been mentioned for a considerable period, the market level being about $21, except in New England, where better prices are obtained. In the Central and Western districts quotations have recently dropped a dollar or two a ton, and weakness in Southern territory is even more acute, verging on demoralization. A price of $22 may be named to represent the market in the West, and perhaps $21 in the South.

THE BRITISH COLUMBIA WHOLESALE HARDWARE ASSOCIATION at its annual convention at Vancouver last month changed its name to the Hardware and Metal Association of British Columbia. The officers elected for the coming year are: John Boyd (Boyd, Burns & Co.), Vancouver, president; J. A. Cunningham (Cunningham Hardware Company), New Westminster, vice-president; John Burns, manufacturers' agent, Vancouver, secretary-treasurer.

S. E. DRAKE COMPANY, Lexington, Ky., has incorporated with a capital of $10,000, to conduct a Hardware, Implement, Vehicle and Paint business.

COMING HARDWARE CONVENTIONS.

GEORGIA ASSOCIATION, Indian Springs, May 19, 20, 21. Secretary, Gary Vinson, Waynesboro.

ALABAMA ASSOCIATION, Montgomery, May 28, 29. Secretary, L. G. Smith, Ensley.

AMERICAN HARDWARE MANUFACTURERS' ASSOCIATION, Hot Springs, Ark., June 9, 10 and 11. Secretary, F. D. Mitchell, 300 Broadway, New York.

SOUTHERN HARDWARE JOBBERS' ASSOCIATION, Hot Springs, Ark., June 9, 10 and 11. Secretary, C. E. Kersey, Richmond, Va.

ARKANSAS ASSOCIATION, Hot Springs, June 9, 10 and 11. Secretary, Chas. E. Taylor, Little Rock.

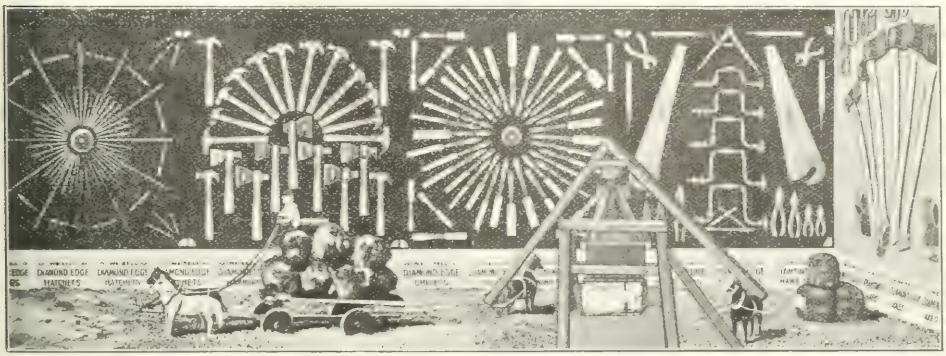
CAROLINAS ASSOCIATION, Wrightsville Beach, N. C., July 8, 9, 10. Secretary, Paul W. McLure, Greenwood, S. C.

OKLAHOMA ASSOCIATION, Oklahoma City, July 14, 15 and 16. Secretary, D. C. Patterson, Oklahoma City.

MICHIGAN ASSOCIATION, Detroit, August 13, 14, 15. Secretary, A. J. Scott, Marine City.

Window Display of Tools.

THE accompanying illustration reproduces a special tool window display, installed by Kyle Chandler, an enterprising Hardware merchant in West Point, Miss. The occasion of the display was a cotton carnival, and



"Window Display During Cotton Carnival"

the layout must certainly be regarded as highly appropriate. The floor of the window which is 15 ft. long and 4 ft. deep was covered with Cotton Seed. On the right hand side will be observed an old-time Compass Cotton Press, while on the left is a two-horse wagon loaded with seven bales of cotton. At the back and sides of the window are large sample boards, artistically arranged showing elaborate assortments of the brand of tools carried by the firm, the name being prominently featured by signs extending around the base of the sample boards.

Philadelphia Hardware Lunch Club.

THE HARDWARE LUNCH CLUB, Philadelphia, Pa., composed of a number of those prominently engeged in the wholesale Hardware trade in that city, held its eighth annual shad dinner at The Orchard, on the Delaware, Essington, Pa., Saturday, on the 9th inst. Thirty-five members and guests participated and a very enjoyable afternoon was spent. Wm. B. Charlton and Frank G. Drew had charge of the arrangements and their efforts were most successful. Among those present were the following: W. P. M. Braun, Francis J. Braun, Jas. S. Bonbright, Pennsylvania Lawn Mower Company, Philadelphia; H. B. Lupton, vice-president Oliver Iron & Steel Co., Pittsburgh; A. W. Stanley, Robt. N. Peck, Stanley Rule & Level Company, New Britain, Conn.; H. S. Leonard, Frank G. Drew, Winchester Repeating Arms Company, New Haven, Conn.; John L. Clayton, J. H. Van Newkirk, John Allen, Russell & Erwin Mfg. Company, Philadelphia; Chas. Ressinger, Franklin Hardware Company, Franklin, Pa.; E. F. Morse, A. J. Le Jambre, Morse Elevator Works, Philadelphia; T. B. Hendrickson, Reading Hardware Company, Philadelphia; Paul A. Griffith, Shields & Bro., Philadelphia; W. M. Brownback, A. S. Kille, John H. Connarrve, E. R. Vernier, Yale & Towne Mfg. Company, Philadelphia; Jos. Droescher, S. R. Droescher, New York City; Fred Allen, Cusack & Allen, Philadelphia; S. S. Reckefus, *The Iron Age*, Philadelphia; Daniel Stern, *American Artisan*, Chicago; N. A. Petry, Philadelphia; L. V. Wolf, Star Lock Works, Philadelphia; Jos. H. Grubb, Philadelphia; Jas. D. Green, Frank W. Huff, Geo. Spence, N. F. Cressman, N. D. Perine, F. R. Hall, Wm. B. Charlton, Walter S. Cook, John W. Weibley, Supplee Hardware Company, Philadelphia.

Trade Items.

H. G. OSBORNE has moved from 19 Park place to 74 Cortlandt street, New York. He is manufacturing in different diameters Shell Extension Brick and Stone Drills, threaded for screwing to an end of gas pipe, suitable in diameter, for drilling through brick, stone or concrete walls any thickness.

THE SPERRY & ALEXANDER COMPANY, and Robert Ogilvy, have jointly taken the store and two basements at 20 Warren street, New York, which they will occupy as they did similar premises at 300 Broadway. The Sperry & Alexander Company carries in stock assortments of Hardware, Cutlery, Manicure Specialties and Photographic Supplies, and were at the former location 10 years. Robert Ogilvy had been at the Broadway address since 1873, with the exception of nine months, during which a new building was in course of erection on the same site, into which he moved on completion. Mr. Ogilvy imports and wholesales Fishing Tackle, some kinds of which he manufactures also himself. The new premises are much larger, better lighted naturally, and with the fine new front and other improvements will add much to the business facilities of both houses.

S. F. HAYWARD & Co., handlers of Fire Fighting Supplies of all kinds, have removed from 20 Warren street to 39 Park place, New York, where they have the entire store floor and two basements.

THE CASSADY-FAIRBANK MFG. COMPANY, Chicago, has bought out three factories making Hardware specialties, and will move their tools, stock, &c., to the Chicago plant, where manufacturing will be continued on a larger scale. The factories purchased were the Foyer Mfg. & Steel Stamping Company, Painesville, Ohio; Chas. C. Bonar & Co., Evanston, Ill., and the stamping department of Bergman Bros., Buffalo, N. Y.

W. T. Matters Hardware & Vehicle Company, Neosho, Mo., has been incorporated with a capital of $10,000, to conduct a Hardware, Stove, Sporting Goods, Harness and Vehicle business.

Impressions of San Francisco.

GEORGE H. SARGENT, president of Sargent & Co., who has just returned from a two months' visit to the Pacific Coast, including Los Angeles, Pasadena, Santa Barbara, Monterey and San Francisco, was particularly impressed with what he saw of the new San Francisco in the 10 days he was there. In the rebuilding programme the effort has been principally confined to office and public buildings, hotels, &c., and there is comparatively little of renewal in the residential districts. Mr. Sargent said that standing on Market street and looking uptown reminded one of Broadway from the Post Office to the Battery, the buildings which are being erected are so imposing and substantial. He said it was surprising to see what had been done in two years, considering the multitude of difficulties which had to be surmounted. San Franciscans are proud of what they have done, are glad to have visitors come out and see what has been accomplished and are now looking forward with confidence and satisfaction to the future. Mr. Sargent said that California generally is in fine condition, with good prospects in regard to crops.

James D. Fleming, vice-president of the Lalance & Grosjean Mfg. Company, who returned recently from a business trip to San Francisco and Los Angeles, expresses himself as astonished at the visible progress undeniably made as a result of the two years' work since the destruction of the city, April 18, 1906. In his opinion a correct judgment of the rebuilding and other work accomplished can best be formed by persons who were in San Francisco immediately after the disaster, actual knowledge of which only affords a basis for intelligent comparison with present conditions. Mr. Fleming had seen the city a week after the conflagration, and judging by actual results accomplished in spite of fire insurance troubles, building and other strikes, scarcity of building materials for a great portion of the interval and other discouragements, he believes that in five years San Francisco will be one of the finest of American cities and in ten years some of its inhabitants will have come to regard the fire as a blessing in disguise. Everything is new and modern, the structures being of the most substantial character, built in the light of past experience, with foundations of the best construction and all in accordance with the new and strict building laws, a feature of which is the temporary duration of the emergency buildings put up for immediate use. Chinatown and other undesirable quarters were swept away, thus permitting a fresh start. Not a man was encountered who talked blue, every one apparently being up and doing with bright hopes for the future. Mr. Fleming says the people as a body are entitled to great credit for the stupendous task accomplished so far in the face of great discouragements, and attributes the great work done to an energetic, self-reliant and indomitable determination to surmount the misfortune.

THROUGH a committee appointed for the purpose the Missouri Retail Hardware Association has adopted resolutions relative to the recent death of William H. Hahn of the William H. Hahn Hardware Company, St. Louis, a former president of the organization. These resolutions indicate the high esteem and regard in which Mr. Hahn was held by the members of the association, in the affairs of which he had occupied a prominent place for a number of years.

J. T. JOHNSON, Kingston, N. Y., whose establishment was recently destroyed by fire, has secured quarters in another building which he will occupy until his new building, which is being erected on the old site, is ready. His retail department is already open, and by the 18th inst. it is expected to have the wholesale end of the business running.

THE NANZ CLOCK COMPANY, manufacturer of Watchman's Time Detectors, has removed its office, salesroom and repair shop from 127 Duane street to 178 Fulton street, New York.

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PARCEL POST AND PAINT LEGISLATION AT WASHINGTON.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., May 12, 1908.

THE Senate Post Office Committee has reported the annual post office appropriation bill free and clear of all parcel post or other features objectionable to the retail interests of the country. The outcome is believed to be due to the exceedingly energetic campaign conducted by the organization of retailers in the leading trades, including especially the Hardwaremen, the grocers and the druggists, who have stood shoulder to shoulder throughout the winter in opposing the populistic projects urged upon Congress by the Postal Progress League, the representatives of the mail order houses and the National Grange, Patrons of Husbandry.

Parcel Post Amendments Very Unlikely.

The bill will be taken up in the Senate in a few days, where, of course, an opportunity will be afforded for the presentation of parcel post amendments, but inasmuch as the point of order that new legislation can be added to an appropriation bill only by unanimous consent, will lie against all such propositions and will undoubtedly be urged, there is little prospect that the bill will be modified in this direction. In any event the conferees on the part of the House, who will include Chairman Overstreet and the two ranking members of the House Post Office Committee, will refuse to accept parcel post amendments and their ultimate rejection therefore seems certain.

Senate Recommends $4,000,000 Increase in Cost of R. F. D. Service.

The bill as reported to the Senate increases the already enormous appropriation for the rural free delivery service from $35,573,000 to $39,303,685, an addition to the burden of the taxpayers of nearly $4,000,000 per annum. This addition is made to cover an increase in the maximum annual salary of rural carriers from $900 to $1000. As the number of carriers in the service will approximate 40,000 before the end of the coming fiscal year, an increase of $100 per annum in salary represents a sum greater than the entire cost of the rural service during the early years of its existence. This increase in carriers' salaries is believed to be subject to the point of order, and even if adopted by the Senate must run the gauntlet of the Conference Committee.

Mass Meeting a Fizzle.

The "mass meeting" set for Tuesday, the 5th inst., and designed to concentrate pressure for parcel post legislation upon Congress at a time when the annual Post Office Appropriation bill was under consideration, proved to be a complete fizzle. Notwithstanding the fact that a large number of invitations were sent out under the official frank of a New England Congressman, only a corporal's guard could be mustered in a parlor of a local hotel when the meeting was called to order. The Postmaster-General, who was widely advertised to address the meeting, was "unable to be present, owing to an important social engagement." Even the authors of the Parcel Post bills pending in the House and Senate found their public duties so pressing they could not be present, and the only "representatives of an enlightened public sentiment" who attended were the officers of a few subordinate labor unions and farmers' organizations.

Legislation on Paint Opposed.

The movement looking to the enactment of a Federal honest Paint law has received a decided check as the result of a hearing granted by the Senate Committee on Manufactures, on the 8th inst., to more than a score of prominent representatives of the Paint trade. Despite the fact that an understanding was reached on the occasion of the recent hearings before the House Committee on Interstate and Foreign Commerce, between the representatives of all the prominent organizations in the Paint trade and Congressman Marshall, the author of the pending House bill, upon a modified measure subsequently introduced and almost identical with the Senate bill presented by Senator Heyburn, chairman of the Committee on Manufactures, all the Paint men present at the hearing on the 8th inst., with the exception of the master painters, vigorously opposed all Federal legislation, and especially that feature of the Marshall and Heyburn bills which requires the label on the unbroken package to show the ingredients of the goods.

The square reversal of position on the part of the Paint manufacturers was frankly conceded by them, and was attributed to "more careful deliberation," and to the discussion of the question of Paint legislation which took place at a trade conference held at Cleveland on the 28th ult. The result of the hearings before the Senate Committee on the campaign for a Federal honest Paint law cannot be accurately gauged at this writing, but if the Senate Committee decides to report a measure at the present session it is probable that it will not contain any provision requiring manufacturers to place formulas on their labels.

Many Protests Made.

Senator Heyburn's purpose in presenting an honest Paint bill in the Senate in advance of the passage of the Marshall measure in the House was to provide for the simultaneous consideration of the subject in both Houses with a view to expediting legislation. His bill followed so closely the revised Marshall measure, which was understood to have received the practical indorsement of the trade at large, that he was not prepared for the numerous protests against the bill, which were received by the committee soon after its introduction and reference.

The only advocates of the Heyburn bill in attendance at the hearing were Messrs. John Dewar, chairman of the Legislative Committee of the International Association of Master House Painters and Decorators; Robert L. Peters, Richmond, Va., and Charles Macnichol, Washington, D. C., members of the same committee. The delegation appearing in opposition to the bill included George L. Gould, Gould & Cutler, president of the National Oil, Paint and Varnish Association, and also representing the Paint and Oil Club of New England; Benjamin Moore, Benjamin Moore & Co., representing the Eastern Paint Manufacturers' Association; G. B. Heckel, secretary of the Paint Manufacturers' Association of the United States, and also representing the Eastern Paint Manufacturers' Association; Richard H. Lersner, Charles M. Childs & Co., representing the Paint, Oil and Varnish Club of New York, and the Legislative Committee of the Eastern Paint Manufacturers' Association; Arthur S. Somers, Fred L. Lavanburg, dry color manufacturer; W. B. Kilpatrick, National Paint Works; Harry Lauderbaugh, Lauderbaugh & Co.; Henry C. Stewart, S. P. Wetherill Co., representing the dry earth Paint industry; N. B. Arnold, president of the Varnish Manufacturers' National Association; R. S. Leonard, Glidden Varnish Company; Robert Cathcart, Atlantic Refining Company; Jerome W. Frank, Standard Varnish Works; H. P. Stephenson, Berry Brothers; Samuel K. Felton, Felton, Sibley & Co.; B. H. Shoemaker, Jr., Robert Shoemaker & Co.; Edward T. Longstreth, S. H. French & Co.; Samuel B. Bowen, Pecora Paint Company, and Howard E. Yarnall, H. E. & D. G. Yarnall.

Position of the Paint Manufacturers.

After the arguments put forward by the advocates of the Heyburn bill had been stated by Mr. Dewar, the views of the Paint manufacturers were set forth at length by President George L. Gould of the National Paint, Oil and Varnish Association, and by other members of the delegation. They are fairly reflected in the following extract from Mr. Gould's address:

I am placed in rather a peculiar position here. What Mr. Dewar has stated is partly true in reference to the stand taken by the National Paint, Oil and Varnish Association at the meeting last fall in Cincinnati, but this action related entirely to State legislation and not at all to national legislation. The bill, which was presented by the Joint Conference Committee, was recommended for adoption by the convention as an improvement upon any bill which had been presented before the various States in the West; and the understanding was that such legis-

lation was only to be pressed when there seemed to be a demand in the various States for legislation and for fear that worse legislation might be offered and enacted.

Since the recommendation of the Joint Conference Committee was adopted by the National Paint, Oil and Varnish Association, there has been a decided change in the views of the members of that association, as was fully developed at a joint conference held in Cleveland on Tuesday, the 28th ult. I want to state here that no one has authority to pledge the National Paint, Oil and Varnish Association for the Heyburn bill or for any national legislation, and if a vote were taken to-day I am positive the association would be decidedly against any federal legislation along the lines of the Heyburn bill.

We see no reason whatever for selecting the Paint business for such invidious legislation to the exclusion of all other lines, with the exception of such articles as affect the health and lives of our people. Furthermore, it is, in our opinion, an invasion of private rights to compel manufacturers to give to the world their secret formulae when no exigency as regards public safety requires such action. We object further, because it does not really protect house owners against unscrupulous painters who will be allowed under proposed legislation to use anything they may wish without being called to account, as the bill deals only with interstate shipment in unbroken packages.

Upon the conclusion of the hearing, Chairman Heyburn announced that several days would be allowed parties not present to submit their views in writing, after which the committee will take up the bill in executive session.

THE CLERK AND THE SHOW WINDOW.

A PAPER BY H. W. BEEGLE, CHICAGO, ILL.

THE large Hardware merchant must depend considerably on his assistants in the matter of carrying on the details of the store. That being the case the selection of assistants should be made so as to relieve the merchant of the greatest amount of detail work. The first of the details that can be most easily shifted is that of caring for the books. The last of the responsibilities to be shifted should be those of selling, buying and advertising, for it is the proprietor who must outline the policy and give his individuality to his business. Like attracts like and you get the kind of customers you work for. With the proper system in vogue your absence from the store, whether on a vacation or by reason of sickness, will never be a catastrophe.

Endeavor to Look at Your Assistants

through the eyes of your customers. No clerk should be retained whose unfortunate disposition or unhappy manner is calculated to drive trade away. Probably the first gauge that should be placed on the personality of the clerk is that of reliability and by the gradual process of eliminating those who work and do not think and also those who think but do not work, you will gradually get a corps of assistants who both think and work. With all of us hard work disguised under the name of play is much more attractive.

Business a Very Interesting Game.

You and your assistants should look at your business as a very interesting game, which is to be played with due adherence to the rules of square dealing and honesty, but is to be played with enthusiasm from start to finish. Even if you may lose one of your men when he becomes most valuable to you it is well worth the while to get him in the habit of thinking. From his collar down a man is never worth over $1.50 per day to you. What more he is worth depends upon what is above his collar. Supplement his own originality with the good things he can learn from trade journals.

A Bulletin Board

on which is posted short, descriptive matter of all new goods that come into the store and any other special news, as well as a clipping of your ad. from the newspaper, is a quick and inexpensive means for getting information before your assistants. Instructing your clerks by these methods, also by having salesmen of whom you buy goods inform them as to their special merits will be effective in multiplying your own abilities in the person of each of your helpers. The clerk must know your goods in order to be able to do justice to you. None but wooden men never make mistakes. Encourage the boys to attempt new things in the store and window. Before looking inside of the window let us look at the outside.

The Front of the Store Is Seen More Than the Inside.

Many store fronts to-day are little less than "crazy patchwork" billboards for the signs of people who want their goods advertised, yet do not want the expense of paying for the billboard. Many Hardwaremen have inadvertently loaned the most valuable part of their store to advertise goods that are on sale in a competitor's place. Frequently the very multiplicity of the signs defeat the intended purpose. There is a limit to what the mind can take in. What if the eye does see, if the mind does not grasp. You pay the cost of the building and you should seek yourself to get the benefit. It is you, yourself, your own goods, your own name, your own personality, that should be brought to the attention of the public.

For your store front two permanent signs are allowable, the one giving your name and the other your business. Do not bury them by signs advertising some one else unless he pays you for the space. Moths and mankind are attracted by light. Make the front of your store a bright spot at night. If you can have a novelty as an attraction so much the better. Remember you cannot get people inside if they are not first attracted to the outside.

Figure That Your Show Windows Are Worth One-Fourth the Value of Your Store Space

and make them earn it. It is not a museum for displaying monstrosities—it should never be an aquarium unless you are advertising Fishing Tackle—it should never be a Squirrel Cage unless advertising Sporting Goods—a mineral display, unless advertising Picks and Shovels. The success of a window is not in how much attention it attracts, but in how many goods it will sell. Make the window talk, but make it talk for you.

The Window Demonstration

is the up to date effective way to utilize the window, and will pay in any town of over 1000 population. Generalities in the window must be avoided, the same as they must be avoided in talking. No man ever entered your store to buy simply Hardware—that is any old kind of Hardware. When a man comes in to buy he wants something of a specific sort, a Saw or a Lock. So in talking your goods be specific, do not talk merely of your large line of Cutlery, but talk of a Knife and show its special merits. This is true in window dressing—what is everybody's business is nobody's business.

There Is Perhaps One Man About Your Store

who is ambitious to do things who will take pride in his window work. It may be that he is only the stock boy—give him a trial on the window.

The trade journals are to-day overflowing with suggestions and illustrations of good window trims. If he has the will he can make a success of your window. If he does not, find some one who can. When you find the right man, let it be considered his work to see that proper changes are made at proper times in the window. Follow the needs, not the whims of your people. Active, courteous clerks and convincing windows will be your main aids in winning the game.

BUTLER BROTHERS, wholesalers of general merchandise, have leased spacious quarters at both San Francisco, Cal., and Omaha, Neb., for extensive sample displays, which will be opened up about July 1. At San Francisco they have taken two floors, each 77 x 100 ft., in the new building at the corner of Mission and Second streets. At Omaha they have rented the entire ground floor at 1108 and 1110 Howard street, which is splendidly lighted and adapted for display purposes. In both cities the showing of holiday goods will be complete, exactly the same as in the company's houses in New York, Chicago, St. Louis and Minneapolis, and the display of general merchandise will be impressively large. As in all their sample displays, each article will be marked with a tag showing its price in plain figures, and the samples will be shown in a compact way, making it possible for the buyer to get over a lot of ground in little time.

Export Topics.

IMPORTANCE OF FOREIGN TRADE.

BY A MANUFACTURER.

First Article.

DURING periods of business depression in domestic markets, interest in the possibilities of export trade is greatly increased. Many manufacturers pursue the wise policy of constantly extending their interests in foreign markets even though the demands of the home trade during favorable periods yield them a satisfactory business. This policy of increasing trade opportunities provides against the necessity of any radical decrease in production, and the resultant loss of profits, during periods of temporary depression in some market; it also enables manufacturers to continue the production of articles at a desirable profit, when the competition in older established trade prohibits the necessary profit.

Making a Start.

The present business conditions are causing manufacturers who have not previously given export trade serious consideration, to investigate. To some, the question of how to obtain a start appears very difficult, but the writer's export experience of 10 years justifies the statement that the primary methods of seeking export trade need be very little different from those employed at home. As a rule, an article which finds ready sale in the United States can be successfully sold at a profit in other markets. The question of whether the article is low or high priced need have no serious bearing upon the result; in some market, a profitable trade can be developed if the proper methods are employed.

Government Information.

The development of the Bureau of Manufactures, Department of Commerce and Labor, at Washington, during recent years, enables manufacturers to obtain reliable and detailed information regarding the opportunities for business in and the shipments of the various countries of the world. United States Consuls throughout the world are constantly making detailed reports of trade opportunities. From this source can be obtained a general idea of which countries afford the best markets for any manufactured article, especially if a study is also made of the habits and customs of the people.

Trade Journal Co-operation.

Communication with leading trade journals published in the United States and circulated in foreign countries, will result in practical information of great value, as these journals maintain representatives abroad and conduct a very thorough bureau of information for the benefit of their advertisers.

The first step usually taken in seeking foreign trade is through advertising. The expenditure necessary is comparatively small, and in addition to the merits of an article being displayed throughout the world, frequently in various languages, the publishers of trade journals give advice, lists of foreign buyers, &c., that are of great value. Replies to advertisements are usually made by the larger merchants, as small or isolated business houses rarely interest themselves in trade journals or attempt to communicate direct with distant manufacturers. Advertising the writer purchased early in his export experience brought an inquiry from a thoroughly desirable merchant and established a connection which resulted in the merchant purchasing over $30,000 worth of goods within five years. A number of other large orders were obtained. Advertisements in leading journals are also desirable, for the reason that these journals are forwarded to United States Consuls, who use them as books of reference.

Traveling Representatives.

Students of export trade agree that the most effective method of obtaining results in the shortest time is to send traveling representatives into the foreign field and supplement their efforts by liberal advertising. The smaller manufacturers can obtain this representation through salesmen who are successfully acting as manufacturer's agents representing a number of nonconflicting lines. Some representatives of this class have headquarters in New York City, and make frequent trips into various foreign countries. Naturally, a salesman direct from the factory secures the best results. There is not the handicap in foreign traveling that is supposed to exist. The writer sent his best domestic salesman through Europe recently. The salesman had never traveled outside of the United States and spoke only English. He visited eight countries and obtained a successful business, experiencing no handicap because of being limited to the English language, as English was spoken by some one in authority at the various business houses. A foreign representative should be a man of education and familiar with the forms of good society, as the social element is a strong factor in foreign business transactions.

Visits from Foreign Buyers.

Another method used successfully by the large manufacturers is to have their largest foreign buyers come to the United States. The visitor is carefully instructed concerning the methods of manufacturing, development of new lines and the effectiveness of sales and general merchandising systems. The writer entertained a large foreign merchant last year who shipped to his home almost a carload of American business appliances and office systems, with which he equipped his office, undoubtedly to the disgust and dismay of his native clerks. This merchant returned home with an enthusiasm for American methods and goods that will not quickly disappear. He had also learned many new uses for articles he had been purchasing from the United States, which enabled him to more rapidly extend his trade.

In Regard to Catalogues.

The character of descriptive catalogues sent abroad is of greatest importance. Many of them are of little value to the recipients, as they are unintelligible, especially in what pertains to technical lines. Many terms we use for tools and common parts are as Greek to even an Englishman. Special care should be taken to use the metric system for all sizes and weights. The important parts of catalogues should be printed in more than one language. The commercial world can be covered by English, French, German and Spanish.

Quotation Wisdom.

Letters of quotations are often ineffective. They should contain some description of the line to partially offset the result of catalogue possibly going astray, and they should avoid trade phrases, although universally used in this country. The foreign merchant is not accustomed to letters of short sentences and paragraphs; and clearness of description or expression should not be sacrificed for the purpose of curtailing the length of the letter. All quotations should be made c.i.f.—that is, include "Cost, insurance and freight," so that the buyer will know what the total cost will be at his home port. Orders are frequently lost by quoting f.o.b., New York, to dealers who receive c.i.f. quotations from some other factory. The c.i.f. quotation removes all doubt as to the exact cost delivered. Avoid quoting the numerous discounts that are used at home on Hardware and kindred lines. These are of the greatest annoyance to foreign buyers, and while understood in the United States are very confusing to foreigners. Adopt a single discount for each line, or, better still, quote net prices, if the line is not too varied.

Packing Complaints.

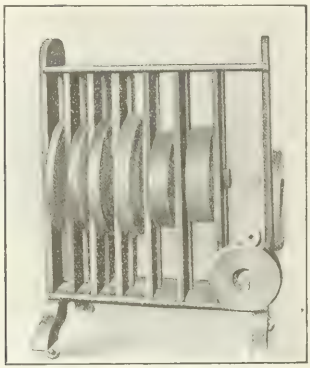
The most important part of foreign shipping is in relation to the packing, concerning which there is considerable complaint. Frequently proper protection is not given to the contents of cases, but as often the cases are not sufficiently strong. After 10 years' successful results with heavy shipments to almost all parts of the commercial

world the writer has found that cases should be made of 1 in. or 1¼ in. lumber, and be properly reinforced with box bands. In addition to protecting all parts to avoid breakage, a very careful study should be made to reduce each shipment to the least possible cubic feet to secure low ocean freights. Information should also be obtained as to the means of transporting from the various foreign ports, so that packages will not be too large to be carried by animals or received by narrow gauge railroads, as may be the custom.

(To be continued.)

Movable Rack for Accommodating Belting.

THE accompanying illustration shows a convenient rack or stand for accommodating Leather Belting constructed by the supply firm of Kasper & Koetzle, 565 Bushwick avenue, Brooklyn, N. Y. It is a comparatively light affair, even when loaded, and is mounted on casters so that it may easily be moved about as desired. It holds seven sizes of Belt, covering the widths regularly called for by the customers of the firm, but could easily be made to include more sizes if required. The rack is about 4



Movable Leather Belting Rack.

ft. high and is made of boards about 1 in. thick, its appearance being improved by a coat of varnish. In the center of each upright partition is a shoulder with a slot opening upward, into which may be set the axles of the different coils. The method of contriving these axles may be understood by referring to the illustration, which shows one of the coils removed. In the center of the coil are put two of the tapering plugs, which come in rolls of wrapping paper, one on each side, with the smaller ends toward the center. Through the holes in these plugs is run a round piece of wood like a broom handle, which forms the axle of the coil, with the ends resting in the slots on either side. The illustration shows one of the plugs in place with the round axle sticking through; the other is removed and placed on top of the coil to indicate the construction.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM SLOVER HARDWARE COMPANY, Bridgeport, Texas, which has been incorporated with a capital stock of $14,000. The company handles a retail stock of Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils and Sporting Goods.

FROM A. HOOD & SONS IMPLEMENT COMPANY, successor to W. T. Forkner, Columbus, Kan., carrying Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints and Sporting Goods.

FROM GEORGE G. CLEMENS, Magnolia, Ill., whose store has been destroyed by fire. He carried Shelf Hardware, Stoves, Tinware, Agricultural Implements, Paints and Sporting Goods.

FROM STEINER & VOEGTLY HARDWARE COMPANY, 230-234 Diamond street, Pittsburgh, Pa., which has been incorporated with a capital stock of $125,000. The company handles Shelf and Builders' Hardware, Heavy Hardware, Cutlery, Tools and Agricultural Implements at wholesale and retail.

FROM DAY & RICHARDSON, who have purchased the business of F. K. Blake, Monmouth, Maine, including Hardware, Crockery, Tinware and Agricultural Implements.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

SIMONDS MFG. COMPANY, Fitchburg, Mass., New York branch house, 40 Murray street: Mailing folder relating to the extensive line of Saws manufactured by the company, including Rip, Hand, Panel, Jointer, Hand Hack, Compass and Keyhole Saws, &c., and containing a convenient order blank.

BERGER MFG. COMPANY, Canton, Ohio: Catalogue of Berger Steel Office Furniture, including Steel Filing Devices and Office Equipment.

SCHUCHARDT & SCHÜTTE, 136 Liberty street, New York: Illustrated pamphlets referring respectively to the Initiative Revolution Counter, which registers from 0 to 10,000 and to portable tachometers.

P. J. CONROY COMPANY, Philadelphia, Pa.: Price-list 1908, illustrating and describing different styles and sizes of the Conroy Refrigerator Door Fastener.

GEO. KRAUSE HARDWARE COMPANY, Lebanon, Pa.: Handy illustrated catalogue addressed to retail Hardware merchants, referring to spring and summer goods for the season of 1908.

HENRY ADOLPH KIRCHER, senior member of the Hardware firm of Kircher & Son and one of the most prominent citizens of Belleville, Ill., died on the 1st inst., after a brief illness from pneumonia. Mr. Kircher was born in Cass County, Ill., November 10, 1841, and removed to Belleville with his parents when a mere boy. He served with distinction throughout the Civil War, and, returning to Belleville, was elected Circuit Clerk and Recorder. In 1868 he became interested in the Hardware business established in 1848 by his father, Joseph Kircher, and Henry Goedeking, with which he continued until his death. Mr. Kircher had served as Mayor of Belleville, and for a number of years was a member of the Board of Education. For 25 years he was a director of the Belleville Savings Bank, and became president in 1904.

THE directors of the Hardware Dealers' Mutual Fire Insurance Company of Wisconsin met in Oshkosh, on the 5th inst., this being the regular quarterly meeting. The report of C. A. Peck, Berlin, secretary, was a gratifying one, showing that the business written since January 1 amounted to about $1,200,000, the total fire loss for four months being less than $800. The company's risks now extend over 24 States, and it is stated that the prospects for continuing a large dividend were never better. The merchants present at the meeting expressed themselves as well satisfied with the manner in which spring business had opened up and are looking forward to a good trade.

Supplement to Russell & Erwin's Export Catalogue.

THE RUSSELL & ERWIN MFG. COMPANY, New Britain, Conn., and 94-98 Lafayette street, New York, has just issued a supplement to its export catalogue of 1904. The book contains upward of 100 pages, with alphabetical and numerical index, and treats not only of the Builders' Hardware, Padlocks, &c., manufactured by the company, but also covers many lines which the company handles as a jobber or agent, such as Stanley Works' Butts and Hinges, Bommer Spring Hinges, Swan's Chisels and Auger Bits, Yankee Tools, Nicholson Files, Stanley Rule & Level Company's goods, &c. These goods are listed in terms of English currency. The Russell & Erwin Mfg. Company has for many years maintained a London office and warehouse, with resident manager, where a stock is carried, and all its business with Great Britain is taken care of. The balance of its export business is handled from the main office in New York City.

RETAIL DELIVERY RECORD.

IN the busy, modern Hardware store of A. Douglas Law, Springfield, Mass., may be observed a convenient arrangement for keeping track of local deliveries. The device is simple and economical, being entirely home made.

On the wall by the rear door of the store, which opens on a private driveway, is a hinged shelf (Fig. 1), which, when not in use, swings up against the wall, out of the way. When let down for use the shelf serves as a desk top, and assumes a similar angle, being held in the proper position by the short piece of chain fastened to the wall and to the edge of the shelf, as indicated. It has been found that there is no need of supporting the shelf on both sides, as there is no particular strain or weight on it. A narrow strip of board nailed to the wall forms the base on which the shelf is hinged. Fig 2 shows one of the delivery record sheets, which are fastened on the shelf by means of thumb tacks. A new sheet is put on each day, but the old sheets are retained underneath until all the items on them have been delivered. The blank, which is merely ruled off and headed by hand, affords space for entering all desired information regarding a delivery. It greatly facilitates the work of the wagon driver and also immediately affords any information wanted by clerks or inquiring customers.

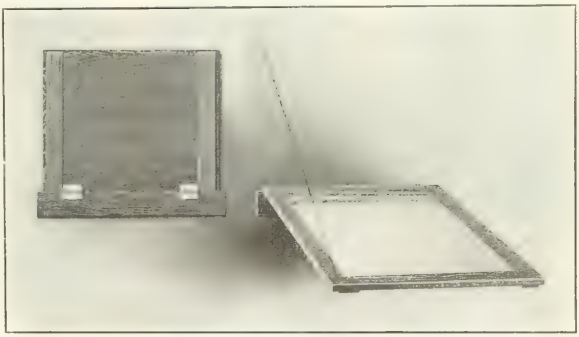


Fig. 1. Hinged Shelf Accommodating Delivery Sheets.

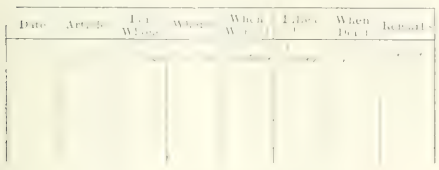


Fig. 2. Delivery Record Sheet.

ON MAY 1 the Messrs. McCleland retired from the T. McCleland Hardware Company, Jackson, Miss., and W. A. Scott, formerly president and manager of the Yazoo Hardware Company, Yazoo City, Miss., has taken entire charge of the business. The new officers of the company are: W. J. Davis, president; C. M. Huber, Crystal Springs, Miss., vice-president; A. C. Powell, secretary-treasurer, and W. A. Scott, manager. The directors are: W. J. Davis, C. M. Huber, W. A. Scott, A. C. Powell, W. Q. Cole, T. B. Gaddis and W. H. Watkins. The company will do a wholesale and retail business, and will employ three or four traveling men.

LETTERS FROM THE TRADE.

Our readers are invited to discuss in these columns questions of trade interests connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

SYNDICATE BUYING FOR SMALLER JOBBERS.

To the Editor: In your issue, April 30, there was a very interesting article to every retail Hardware merchant in regard to the larger "jobbers" trying to prevent the smaller dealer, who does both a jobbing and retail business, from getting goods through syndicate buyers at prices, of course, lower than what the "big jobbers" will sell to the average retail trade.

What makes this article the more interesting is that the average retail Hardware merchant throughout the country is at a loss to understand what really is meant by the term "Hardware jobber." In our section of the country we find that the so-called "big jobbers" are the worst competitors we have, barring no one, not even the catalogue house. We find that the small jobber is not near as bad as the big fellow who has an immense line of goods. We know of several instances where we have lost sales on Steel Ranges, Base Burners, Rifles and Shotguns on account of our "big jobbers." Their salesmen call on the druggist, butcher, clothing and shoe man, fruit dealer, and even the saloon man in quest of business, and if any of the above, their clerks and salesmen, should need a Stove, Gun or Rifle he gets it from the "big jobber" at wholesale price.

Is this fair business on the part of the "big jobbers?" Is not this the reason, more than anything else, which has forced the larger retail Hardware merchants in self-protection to go into the jobbing business in order to increase the quantity of goods handled by them in various lines, and in order to be in a better position to buy in quantities so as to get jobbing prices?

The conditions to-day in our vicinity are such that unless a merchant is in position to buy the heavier goods in car lots he is between the devil and the deep sea as to how to meet the competition of his brother, the "big jobber," and if he is not in that position the sooner he closes up shop the better off he is.

We are sorry that conditions are in this shape, but it is entirely the fault of the big jobbers, and it is up to them to remedy the present prevailing evil. As soon as they decide to cut out the business of the butcher, druggist, &c., and stick strictly to their own line of trade, Hardware, they will find that the retail Hardwareman will stick to him, but as long as they persist in selling every Tom, Dick and Harry, they cannot expect much loyalty from the retail Hardware merchant.

MICHIGAN.

THE W. L. Hubbard Company, Scottsburg, Ind., has been incorporated with $20,000 capital stock to do a Hardware and plumbing business. The directors are W. L. Hubbard, F. Hubbard and M. Hubbard.

BRITISH COLUMBIA HARDWARE ASSOCIATION.

THE annual meeting of the British Columbia Hardware Dealers' Association was recently held in New Westminster, delegates from the coast cities of Vancouver and Victoria being present. President L. B. Lusby, New Westminster, presided and addressed the members on the work done during the past year. The report of Secretary-Treasurer Burns showed a credit balance after all expenses had been met. Vice-President Snell, Vancouver, discussed the question, "Has the Association Been a Success, and Should it be Continued?" in an interesting paper. His conclusions were optimistic and were heartily endorsed by the meeting. Mr. Ogilvie of the Ogilvie Hardware Company, Victoria, also made an interesting and practical address on "Hardware Window Dressing."

Collection Department Established.

William J. Butt, the newly elected secretary, Mr. Burns having resigned, outlined the association work he has undertaken. He is organizing the different branches



CHAS. SNELL,
President.



WM. J. BUTT,
Secretary-Treasurer.

of the retail trade in British Columbia, with a view to uniting them in one provincial association. The organization will take in country and city houses, and he has plans whereby it will be of great help in overcoming many difficulties with which the average retail merchant has to contend. In connection with this work Mr. Butt has started a credit reporting and collection department. Through this department association members will be advised as to the names and addresses of "slow pay" and "dead beat" customers in city and country. Reports will be issued monthly to members, and special information can be secured at any time by communicating with the secretary. Through this department members may also have bad accounts collected at a nominal figure.

Mr. Butt also explained to the meeting that while he planned to invite every branch of the retail trade in British Columbia to join the Provincial Association, each branch would have its own officers and manage its own special business. There would, however, be a great saving in office expenses, salaries, &c., by all uniting in one central body and better and fuller information as to slow pay customers could be furnished by the credit department. He also suggested that a strong provincial association might also undertake the organization of a mutual fire insurace company, and thereby effect a considerable saving in rates.

Officers for 1908.

The officers elected were as follows:

PRESIDENT, Chas. Snell, J. A. Flett, Ltd., Vancouver.
VICE-PRESIDENT, J. Stearman, Hodgson-Stearman Company, Victoria.
SECRETARY-TREASURER, Wm. J. Butt, Vancouver.
EXECUTIVE COMMITTEE: L. B. Lusby, Anderson & Lusby, New Westminster; George Blakely, T. J. Trapp Company, New Westminster, and Mr. Henderson, George Hunter Hardware Company, Vancouver.

A vote of thanks to the retiring officers was carried unanimously, and it was decided to hold the next meeting at Vancouver. Following the meeting a very enjoyable banquet was held at the Russell Hotel.

AMONG THE HARDWARE TRADE.

The Creek Hardware Company, Muskogee, Okla., recently incorporated with a capital stock of $5000, will deal in Stoves, Ranges, Guns, Ammunition, Locks, Farm Supplies, Harness, Saddlery, and will also carry a small supply of Vehicles and Farm Implements. The company expects to erect a new store building in the fall. The incorporators are J. B. Wilson, W. H. Triplett and Wm. V. Hewett.

J. A. Hook has bought the business of Pierson Bros., Pierson, Ill.

The Hardware and Harness store of H. Tollefson, Bowdon, N. H., has been destroyed by fire, the loss being estimated at $21,000.

Rider & Cotton, Portsmouth, N. H., have disposed of their Hardware, Iron and Steel, Paint and Contractors' Supply business to Muchemore & Rider Company, which will continue in the same general line.

Lindahl & Swenson, Woodburn, Ore., have been succeeded in the Hardware, Stove, Tin and Paint business by M. J. Lindahl.

Thomas J. Tracy's Son has purchased the stock of William Clements & Son, 130 Milton avenue, Ballston Spa, N. Y., and will handle Shelf Hardware, Oils and Paints.

The Armstrong-Barrows Hardware Company, Inc., Norfolk, Va., succeeding J. B. Armstrong & Co., has lately been incorporated with a capital of $10,000. Mr. Armstrong is president, and R. N. Barrows, formerly of Newark, N. J., secretary and treasurer.

W. S. Coleman has succeeded to the Hardware business at Talmage, Neb., formerly owned by W. E. Carney.

Ricker & Landes have purchased the Hardware, Stove and Implement business of Hicks & Smith in Eureka, Kan.

J. H. Buker has entered the firm of W. F. Weigand & Co., Grass Valley, Ore., which handles general Hardware, Stoves, Agricultural Machinery, &c.

The Hunter-Stadleman Hardware Company, Blissfield, Mich., incorporated with a capital stock of $12,000, has succeeded the Phillips Company. The change involved is one of name only, the interests remaining the same.

The Charleston Hardware Company, Charleston, Ark., has been incorporated with a capital of $25,000 and will do a retail business in General Hardware, Stoves, Implements, Paints, Sporting Goods, &c.

D. R. Campbell has sold his interest in the Howard Hardware Company, Bellows Falls, Vt., to W. P. Abbott. The company deals in Shelf and Heavy Hardware, Agricultural Implements, Paints, Oils and Sporting Goods at wholesale and retail.

Durand Steel Lockers.

AMONG the furnishings of modern industrial buildings provided for the convenience and security of employees individual Steel Lockers are fast becoming a recognized necessity. A well appointed line of such Lockers, examples of which are shown in the illustrations herewith, is made by the Durand Steel Locker Company, Chicago. The body of these Lockers is made of No. 20 United States gauge steel; to withstand the slamming and knocks to which they are subjected the doors are somewhat heavier, being made of No. 16 United States gauge steel. For the purpose of ventilation the doors,

and if desired the backs and bottoms are perforated with holes, which, however, are not large enough to admit mice, and are without burrs and rough edges that might cut or damage clothing. These holes are too small to permit of articles being pulled through, or the insertion of wire cutters for making an opening. Each door is fitted with a multiple locking device by which it is secured at the top, middle and bottom, thereby leaving no opening for the entrance of a tool by which it might be pried open. The locking device is described as very simple in its construction and operation and not liable to get out of order. The Lockers are finished in furnace baked japan, hardened under a temperature of 400 degrees, which not only gives a durable gloss, but is attractive in appearance. Where solid sides and backs are used the clothes in one Locker are separated from those in the adjoining one, and in addition to being easily cleaned with a cloth they can be treated with disinfectants without damage to the fur-

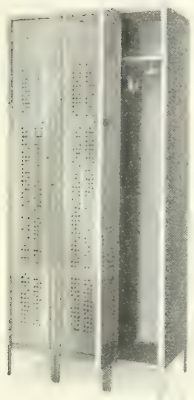


Fig. 1.—Diamond Steel Locker, Single Tier.

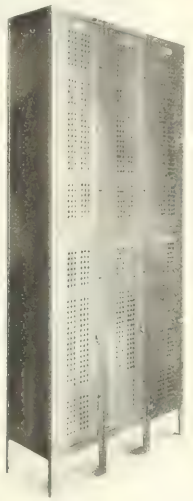


Fig. 2.—Diamond Steel Locker, Double Tier.

nace baked japan finish. All similar parts being interchangeable, no mechanical alterations or cutting are required to rearrange them in different groupings. As skilled labor is not necessary for erection, the Lockers are shipped knocked down to save freight. As an additional measure of security, the doors are hung on hidden hinges and cannot be tampered with from the outside. The Lockers are supplied in either single or double tier. The standard sizes carried in stock are, double tier, 12 x 12 x 36 and 42 in. high, and 15 x 15 x 36 and 42 in. high; single tier, 12 x 12 x 60 and 72 in. high, and 15 x 15 x 60 and 72 in. high.

Shelf or Assembling Trucks.

The George P. Clark Company, Windsor Locks, Conn., has added to its line the two styles of shelf or assembling trucks shown in the accompanying illustrations. No. 198, shown in Fig. 1, is intended for use in machine shops, bicycle, automobile, typewriter and clock factories, as well as for butcher shops, bakeries, hospitals, dining halls, &c. It is made of hardwood, nicely varnished, and has a large wheel mounted on a round axle in the rear, with swivel bracket casters in front. Its upright corner posts have holes bored in them 3 in. apart, making all shelves but the top one adjustable and removable by simply lifting up. The truck is regularly made with three shelves, but can be furnished with any number of shelves or in any style of mounting at additional charge. It will be shipped knocked down unless otherwise ordered. Truck No. 199 is intended for about the same purposes as No. 198, and is also made of hardwood, varnished, but has an iron handle. The top shelf is stationary and other shelves

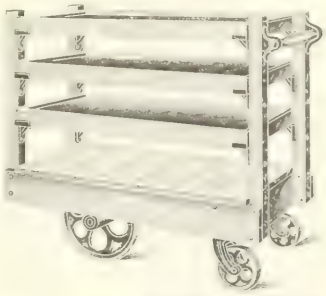


Fig. 1. Shelf or Assembling Truck, No. 198.

are adjustable and removable. It is made regularly with two shelves and mounted on wheels with 1⅛-in. square axle, 8-in. cast iron fifth wheel plate in front. Any num-

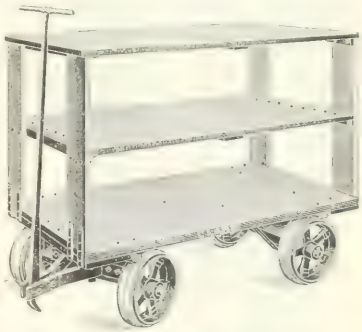
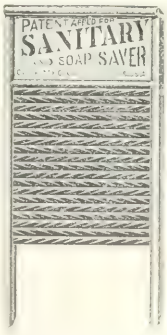


Fig. 2. Shelf or Assembling Truck, No. 199.

ber of shelves and any style mountings are furnished at additional charge. Both styles of trucks are mounted on iron or Clark's noiseless rubber wheels.

Sanitary Washboard.

The Cook Mfg. Company, St. Louis, Mo., is putting on the market the Sanitary washboard shown herewith. The entire board is constructed of No. 26 galvanized iron, especially made for this purpose, and comprises four separate pieces, which are put together with rivets, no solder being used in its construction. In connection with the board is a V-shaped galvanized iron bar for holding the soap, which is described as an economical device, so arranged that the drippings from the soap will run down over the rubbing surface. The legs of the board



Sanitary Washboard.

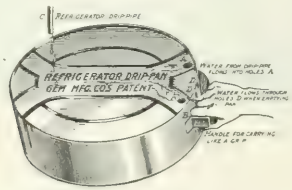
[illegible] soap board 6 x 11 in. and the rubbing surface 11 x 11½ in. The bottoms of the legs are lock seamed, and the upper parts are riveted to the rubbing surface. The soap board and rubbing surface are made in one piece. The back of the rubbing surface is braced with two galvanized rods, which are riveted to the legs. The company claims that the board is clean, because made entirely of metal; odorless, because metal will not absorb and hold odors and practically indestructible. It is stated that the boards weigh 40 lb. per dozen, and that they are sold at the same price as other washboards.

Testing Emery Wheels for Grade.

The American Emery Wheel Works, Providence, R. I., has designed and has in use mechanical grading machines for testing emery wheels for grade 1 which are designed to produce absolutely accurate results. This is referred to as an exclusive feature with these works. In the machines the pressure is always exactly the same, and the point coming in contact with the wheel is of a uniform thickness and width. A pointer indicates on a scale the exact resistance which the wheel offers to the tool, so that a variation of one-thirtieth of a grade may be read on the scale. It is remarked that not only are the manufacturers able to duplicate their wheels with exactness, but they can duplicate the grade of any sample sent them, or furnish wheels slightly harder or softer than the sample if so desired. It is pointed out that since wheels made on the same formula often vary in grade, owing to imperceptible chemical differences in the materials used or to the variation of a few degrees of heat in firing, it is obviously important to have an absolutely accurate method of grading.

The Gem Refrigerator Drip Pan.

The Gem Mfg. Company, Chelsea Station, Boston, Mass., is placing on the market the refrigerator drip pan, shown herewith. It is of unique construction, being a galvanized drum with two heads, an inlet, an outlet, and one handle. The drippings from the refrigerator waste pipe falling anywhere upon the head flow to the side, near the handle, into the inlet holes, which are depressed



The Gem Refrigerator Drip Pan.

½ in. When it is desired to empty, the handle is grasped with one hand and carried without effort in a natural upright position to the sink or other place, where it is emptied without spilling a drop, avoiding liability of spilling the contents over the floor. The pan will hold 4 gal. of water.

New Trammel Point.

We illustrate herewith a new trammel point, which is being placed on the market by the Economy Mfg. Company, 506 Commerce street, Philadelphia. The tool which



New Trammel Point.

is particularly adapted for pattern makers, sheet metal workers, cabinet makers and machinists, has a 3-16 in. square steel bar, 12 in. long, which is a unique feature and prevents the turning of the point, which is possible when a round bar is used. The bodies of the adjusting screws are of cast brass, nickel plated, and the points of tempered steel. The tool is well made and finished, and is being offered to the trade at a price to meet the demand for a high grade, moderate priced tool of this character.

IN the illustrated description of the Wagner Hay Rack Fixtures, made by the Wagner Mfg. Company, Cedar Falls, Iowa, in our issue, 30th ult., the address of the company was erroneously given as Waterloo, Iowa. The trade will please note the correction. The manufacture of hay rack fixtures is a recent addition to the company's line of hardware specialties.

The Perfection Lawn Sprinkler and Holder.

The Beaton & Bradley Company, New Britain, Conn., is offering the lawn sprinkler and holder shown herewith. The sprinkler is illustrated full size in Fig. 1, while a

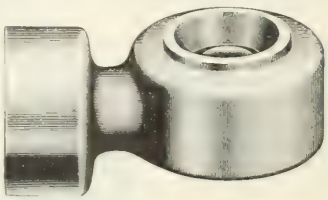


Fig. 1.—Perfection Lawn Sprinkler.

sectional view is given of it in Fig. 2. The brass knurled screw, shown directly under the opening in Fig. 2, is to regulate the fineness of the spray and the distance that

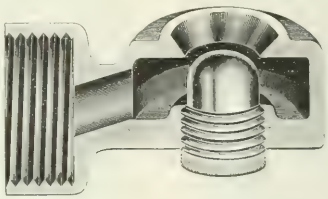


Fig. 2.—Sectional View of Lawn Sprinkler.

it may be thrown. The sprinkler is finished in black or green japan. The three-pronged standard, Fig. 3, insures a firm ground fastening for holding the sprinkler rigid. The swivel top permits the holder to be used as a hose

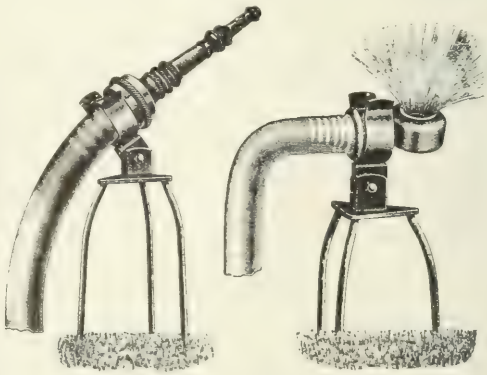


Fig. 3.—Perfection Sprinkler Holder. *Fig. 4.—Holder Used as a Hose Supporter.*

support, as shown in Fig. 4, allowing the nozzle to be tilted at various angles and swung about to the right and left as desired.

E. A. KEITHLY COMPANY, manufacturers' sales agent in plumbing and steam supplies, San Francisco, Cal., has removed its offices from 212 California street to the Metropolis Bank Building, corner of Market and New Montgomery streets.

Ingersoll Watches.

Robert H. Ingersoll & Bro., 15 Ann and 17 John streets, New York, have just offered to the trade two new styles of watches, as here illustrated. Fig. 1 is the Yankee, made in brilliant gun metal finish, with engraved initial on the back. They can be supplied in assorted lots or with any initials asked for. For the convenience of the merchant additional backs (which are friction tight and snapped on) will be forwarded on memorandum, so that sales can be made from a moderate stock by merely changing the back from such assortment of letters in reserve. The watches are both stem wind and stem set, with black dials and second hands, and are to be retailed at the strictly maintained price of $1.25 each. Figs. 2 and 3 reproduce the Ingersoll, Jr., watch. The novelty in this style is the small size and thin model. It is made in what jewelers recognize as 12 size, the diameter of which is 1 13-16 in., the illustrations being about three-quarter size. This thin model is made in solid nickel case and also in gun metal finish and gold plate. It is stem wind and stem set. The movement plate is damaskeened; the white dials have either Roman or Arabic numerals.



Fig. 1.—Ingersoll Yankee Initial Back Watch.

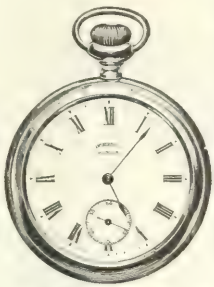


Fig. 2.—Ingersoll, Jr., Thin Model, Open Face.



Fig. 3.—Side View of Same Watch.

Pay Roll Check Writing Machine.

The Defiance Machine Company, Rochester, N. Y., manufacturer of check protectors and various other office appliances, is putting on the market the pay roll check writing machine here illustrated. It is recommended as a time saver and as a protection against check raising, and is said to prevent checking or calling off wrong amounts. The machine embosses in the body of the check with indelible acid proof ink the exact amount of the check up to $100. A companion machine is furnished which writes from $101 up to $200, with even cents. There are two dials, the left hand representing dollars and the right hand cents. Side and back



Pay Roll Check Writing Machine.

the amount line. For operating, the dials are set for the amount desired, the check is inserted in the machine against the [illegible] and a quick turn with the hand completes the work.

Sanitary Crystal Glass Ice Cream Freezer.

The Consolidated Mfg. Company, Connecticut Mutual Building, Hartford, Conn., is putting on the market the novel ice cream freezer shown herewith, which freezes without motion or labor. It consists of a glass jar with hole in the bottom and a glass cover held in place by a spring bail. There is also a push plate or false bottom



[illegible] Glass Freezer.

to fit in the jar when freezing cream. A push rod, bail and stopper, made of porcelain and rubber, with a rubber packing ring to go under the cover, complete the outfit. Following are the directions for use:

Having prepared the cream as per formulas, drop the plate or false bottom into the jar. Place the stopper in hole in bottom, allowing top of bail to incline to one side. Pour the mixture into the jar. See that the rubber packing ring is in position in groove in cover. Put on cover and spring bail up over it, being sure that it rests in opposite notches. This draws the bail tight and seals the jar at both top and bottom. Pack in a wooden pail or tub, using one part rock salt to three to five parts of finely pounded or chipped ice. When snow is available it can be used with equally good results. In either case use *plenty* around and on top of jar. Cover pail with blanket or rug, and set in a cool place. It will usually be ready to serve in 3 hr., but may be kept in pack as long as desired if ice and sale are renewed from time to time.



[illegible]

In serving, the jar is removed from the ice pack and washed in cold water, and bail and cover are removed. Then the push rod is inserted in the hole in the bottom of the jar and pressed against the push plate as shown in Fig. 2, until the frozen cream protrudes at the top. The whole mass can be pushed out at once and sliced, or it can be cut off in desired portions and the balance covered up and repacked. It is claimed for the freezer that it is labor saving, simple and cleanly, with no parts difficult to keep clean or machinery to rust or wear out, and that it makes cream of a superlative quality, which can be served in an attractive form.

The Neverust Portable Bath Set.

The H. & H. Mfg. Company, 554-562 West Twenty-fifth street, New York, is offering the portable bath set shown herewith. It provides a place for soap, towels, tooth brushes and tumbler. The back board is of enameled metal, in imitation of tile; it is 9 x 24 in. in size,

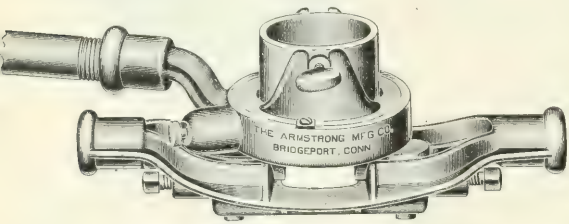


The Neverust Portable Bath Set.

and is held in place on the wall by two hooks which come with the set. The fixtures are fastened to the back securely by bolts. It is emphasized that the back board will not warp or break and is damp proof, and that as the fixtures are heavily nickel plated they will not rust.

The Model B Armstrong Ratchet Attachment.

The model B ratchet attachment shown in the illustration is so constructed that it converts into a ratchet stock and die any stock of its maker, the Amrstrong Mfg. Company, Bridgeport, Conn. It can be used either right or left by reversing pawl without removal from

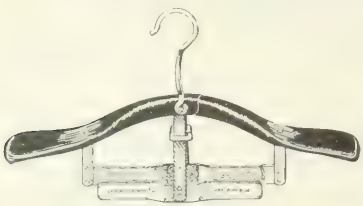


Model B Armstrong Ratchet Attachment.

the stock. It is not necessary to ratchet the die off the pipe. Instead one or two turns back permits the pawl to be disengaged by lifting and given a quarter turn; the stock is then turned and the ratchet remains idle. The attachment is so constructed that all the energy required to operate it is applied close to the center. The tool is made of malleable iron and is dust and chip proof.

Goodform Coat, Trousers and Skirt Hanger.

The Chicago Form Company, 115 Franklin street, Chicago, has brought out the new combination hanger No. 9, here illustrated. It is designed to hold an entire



Goodform Coat, Trousers and Skirt Hanger.

suit of either ladies' or gentlemen's clothing and economizes wardrobe space by the compact disposition of garments. The hanger is made of pressed steel and is enameled and nicked plated. The trouser clamps have an offset at the center about an inch in width, which allows for the extra thickness formed by the side seams on the bottom hem and, being flexible, they adapt themselves perfectly to the fabric. Having a slight outward curve at the ends, the clamps do not crease the edges of the hems, which they are made to grip by a sliding link on the upright straps that draws them tightly together. When the pressure is thus applied the ends first engage the cloth and stretch it taut enough to avoid wrinkles and shrinking, and so bring an even pressure along the inner plane of the clamp. The coat hanger is designed to preserve the garment in its form-shape and effectually obviates the distortion produced by hanging from hooks and pegs. The combination set is described as being substantially made, neatly finished, and is packed one-half dozen sets in a box.

Polar Star Freezer.

The Smith & Hemenway Company, 108-110 Duane street, New York, have put on the market the freezer here illustrated. It consists of a tin cylinder with beaded edge, with an inner can of the same metal. Inside of the can that contains the mixture there is a retinned dasher which does not revolve, but which in the process of freezing continually forces the material through the flanges and insures a smooth product. There are two steel con-



Polar Star Ice Cream Freezer.

tact points, retinned, fastened to the inside of large can and the bottom of receptacle for mixture to be frozen. After the inner can is filled the cover is put on, the can centered in the bearing, the hinged metal strap, 1¼ in. wide, snapped down and the handle, to which is affixed a 3-16-in. steel rod, slipped in and through the center of dasher into a groove at the bottom, so that the smaller can may be revolved. Two sizes are now ready for market, one to freeze two quarts and a smaller one for one quart, the latter really having an actual capacity of 1 1-5 quarts. The dimensions of the larger freezer are: Hight, 9½ in.; diameter, 7½ in., with an inner can 4⅜ x 8¼ in. The leverage of the handle to center of 1⅜-in. knob is 2¼ in., and but five minutes is required, it is said, to freeze cream. A list of recipes for various creams, sherbets, puddings, ices, frappés, &c., accompany each freezer. The can is packed with finely cracked ice and rock salt, covering sides and top in the customary way, there being a ⅜-in. hole in side of outer can to carry off any possible excess of brine due to carelessness, thus preventing any of it getting into the frozen mixture. After the cream is made the dasher can be removed and the can repacked in ice and salt, and if desired placed in a refrigerator for serving hours later if necessary. The same description applies to the one quart size, except that the inner can is 5¾ x 7½ in. and the outer one in proportion. A feature of this freezer is the moderate price at which it can be profitably retailed.

Tap Wrench and Adjustable Parallels.

The L. S. Starrett Company, Athol, Mass., and 132 Liberty street, New York, has added tap wrench No. 91 and adjustable parallels, No. 154, to its lines of mechan-



Fig. 1.—Tap Wrench, No. 91.

ical tools. The tap wrench is of new design and has other novel features. It is designed to hold securely square or round shank taps, and inside the knurled adjusting screw a spring, connected with the plunger, holds it back and causes instant movement with the screw. Fig. 2 illustrates a set of adjustable parallels to be used in connection with milling, planer and shaper vises. Each

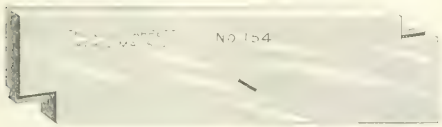


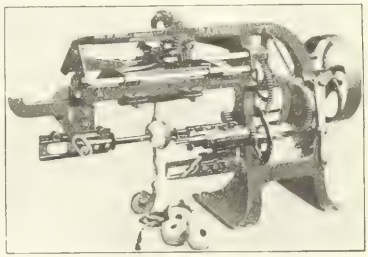
Fig. 2.—Adjustable Parallels, No. 154.

ing the place, it is said, of the large number usually required. They are also designed for leveling up work on planer, drill press, &c. Their capacity is from ⅜ in. to 2¼ in., and they are made in six sizes, the lengths of which run from 1¾ in. to 5 1-16 in., all 9-32 in. thick.

"The Creasey Ice Breaker and Ice Users' Handbook," published by Joseph S. Lovering Wharton, North Philadelphia Station, Philadelphia, Pa., while devoted primarily to the description of the Creasey ice breaker, contains, in addition, drawings showing arrangements for handling and breaking ice in refrigerator car icing stations, icecream manufacturing establishments, meat, fish and game shipping and packing houses, dairies, restaurants, hotels, hospitals, &c. It also contains short chapters on "Ice and Its Uses," "Cold Storage Temperatures," "Ice Cream Freezing" and "Refrigeration with Ice." It is shown that for refrigeration on a small scale it is often more economical and convenient to employ broken ice or broken ice and salt than to install refrigerating machinery, as uniform temperatures can be secured at a moderate cost with much less attention and with unskilled labor.

Ranger Apple Parer.

The Ranger apple parer shown in the accompanying illustration, is made by the Goodell Company, Antrim, N. H. It is a power machine which the company states is demanded by large bakers, canners, evaporators, mince meat makers and others who use a large quantity of apples. The machine is declared to be very economical, as it takes a thin paring and also in that it completely pares the ordinary apple, leaving scarcely any trimming to be done. There is no knuckle joint, and the coring spoon can be readily adjusted. Every bearing has a brass bushing which can be easily removed and replaced in case of wear. The stopping and starting lever is placed so that the operator has constant control of the machine.



Ranger Apple Parer.

Paring, core and apple are each dropped in a separate position, and the claim is made that the machine represents a maximum of capacity and durability.

The Brainerd Mfg. Company.

The Brainerd Mfg. Company, East Rochester, N. Y., has issued Supplement No. 1 to its 1907 catalogue showing only goods which it had formerly made in brass and is now making in steel. These include butts, hinges, support and side stop hinges, corners, mending straps, hasps, barrel bolts, chest handles, hook lifts, catches, corner ornaments and plates, key checks and hinge plates.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₰ gal.
Linseed, American Standard Weights	
Raw	41 @42
Old, Refined	44 @45
Old, Raw	41 @44
Raw, Calcutta	5 @
Boiled, Pure Warranted	47 @
Boiled, Imitation	44 @
No. 1	47 @52
Cottonseed, Crude	34 @
Summer Yellow	41 @
Summer White	45 @
Yellow, Winter	47 @
Teasel, Yellow	45 @
Menhaden, Brown, Strained	32 @
Lard, Extra	60 @
Bleached Winter	42 @..
Extra, Bleached Winter	
Cocoanut, Ceylon	17 @18
Cod, Domestic, Pale	37 @41
Newfoundland, Pale	44 @47
Red, Extra	35 @
Cocoa, Yellow	45 @
Neatsfoot, Pure	60 @
Palm, Lagos	₰ lb 5 @

Mineral Oils—

	₰ gal.
Black, 28 gravity	11 @12
30 gravity	12 @13
32 gravity	13 @14
Crude, Colored	18 @21
Paraffine, 32 gravity	17 @18
30 gravity	16 @17
Red	12½@14

Miscellaneous—

Barytes:	
White, Foreign	₰ ton $18.00@20.00
Domestic, floated	8.00@10.00
Off color	₰ ton 13.00@16.50
Chalk, in bulk	₰ ton 3.00@ 7.00
Cobalt, Oxide	₰ 100 lb 1.45@ 2.60
Whiting, Commercial	₰ 100 lb 1.20@ .50
Gilders'	
Ex. Gilders	₰ 100 lb 60@ 65

Putty, Commercial—₰ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.45
In 1 lb to 5 lb cans	.85 @1.05
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—₰ gal.

In Oil Mills	45 @46
In Turpentine Mills	44 @

Glue—

	₰ lb
Cabinet	12 @15
French, Pale	15 @
Brown, White	14 @
Dark, Liquid, 50 gal. bbls., per gal	80 @1.20
Jobs	60 @1.20
Foot Stock, White	12 @14
Brown	11 @13
German Common Hide	10 @12
Glue Pieces, White	13 @
Brown	12 @
Low Grade	10 @12
Medium White	14 @17

Gum Shellac—

	₰ lb
Fine Orange, Chemical	22 @
Fine Orange	20 @
Fine White, Chemical	22 @
Fine White	20 @
Low Orange, Chemical	17 @18
Low Orange	15 @16
Low White, Chemical	17 @18
Low White	15 @16
G. A. F.	18 @19
Kelly Regular	20 @
D. C.	48 @49
Orange, E.	38 @40
T. N.	20 @
V. S. O.	47 @48

Colors in Oil—

	₰ lb
Black, Lampblack	12 @14
Black, Carbon	47 @
Black, Prussian	47 @
Black, Ultramarine	47 @
Brown, Vandyke	11 @14
Green, Chrome	12 @16
Green, Pure	47 @
Sienna, Raw	12 @
Sienna, Burnt	12 @
Umber, Raw	11 @14
Umber, Burnt	11 @14

White Lead, Zinc, &c.—

	₰ lb
Lead, English white, in Oil	6½@ 7
Lead, American White	6½@ 7
Lead, Pure	6½@ 7
Lead, White, in oil, 25 lb tin	7½@
Lead, White, in oil, 12½ lb tin	7¾@
Lead, White, Ground in Water	6½@ 7
Lead, Pure	6½@ 7

500 lbs and over 2% for cash if paid in 15 days from date of invoice.

Zinc, Dry—

	₰ lb
American, No. 1	6½@ 7
Red Seal (French process)	6¾@ 7
Green Seal	6½@ 7
Special Red Seal	6½@ 7
Extra Red Seal	6½@ 7
White Seal	6½@ 7
Lehigh	6½@ 7
Special Lehigh	6½@ 7

Dry Colors—

	₰ lb
Black, Carbon	6½@10
Black, Ivory, American	35 @
Black, Ivory, English	5 @15
Black, Lampblack	5 @ 6
Lamp, Commercial	4 @ 6
Blue, Celestial	4 @ 6
Blue, Chinese	31 @33
Blue, Prussian	@
Blue, Ultramarine	3½@15
Brown, Metallic	@
Brown, No. 44	@ 5
Green, Chrome, ordinary	3½@ 5
Green, Chrome, pure	17 @25
Lead, Red, bbls., ½ bbls., kegs	@ 6¾
Lead, Red, Ground in Oil	@
Ochre, American	@
American, Ground in Oil	@
Ochre, French	@
Ochre, French, Ground in Oil	@
Ochre, Italian	@
Ochre, Italian, Ground in Oil	@
Red, Indian	@
Red, Tuscan	@
Red, Venetian, American	₰ 100 lb $0.50@1.25
Red, Venetian, English	₰ 100 lb $1.15@1.60
Sienna, Italian, Burnt and Raw	@
Italian, Raw, Powdered	2 @ 7
Sienna, Italian, Raw	@
Sienna, Italian, Burnt	@
Terra de Sienna, Burnt	@
Terra de Sienna, Raw	@
Umber, Burnt	@
Umber, Raw	@
Turkey, Raw and Powdered	2½@ 3
Umber, Turkey, Burnt	@
Vandyke Brown	@
Vandyke Brown, Ground in Oil	@
Quicksilver, bulk	65 @
Vermilion, English	@
Vermilion, Quicksilver	@

Current Hardware Prices.

General Goods.—In the following quotations General Goods means those which are made by more than one manufacturer and are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by [illegible] that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—
Lumber and Domestic [illegible]
Trade [illegible]
American [illegible]

Window Stop—
[illegible] Patent [illegible]
Ohio Patent [illegible]

Ammunition—See Caps, Cartridges, Shells, &c.

Anti-Rattlers—
Small Metal Brass Anti-Rattlers, ₱ doz. pairs, Nos. 1, [illegible]
Small Iron Anti-Rattlers, [illegible]
Large Iron [illegible] $2.00@$3.00

Anvils—American—
Single Anvils [illegible]
Double-Beaked, Wrought [illegible]

Imported—
Refined Solid Steel Straight [illegible]
Fine Wright & Sons' Solid [illegible]
Fine [illegible]

Anvil, Vice and Drill—
Black Falls Co. [illegible]

Apple Parers—See Parers, Apple, &c.

Aprons, Blacksmiths'—
Leather Nail Co [illegible]

Augers and Bits—
Ohio Double Spur [illegible]
Ohio Single Plate, Bright [illegible]
Jennings' Pattern, Bright [illegible]
Jennings' Pattern, Black Lip or Blued [illegible]
Jennings' Improved Mach. Augers [illegible]
Jennings' Bits, Bar Steel [illegible]
Jennings' Solid Cast Bits [illegible]
Russell Jennings' Pattern, Bright [illegible]
Russell Jennings' Pattern, Blued [illegible]
Russell Jennings' Pattern, Nickel [illegible]
Russell Jennings' Pattern, Japanned [illegible]
Russell Jennings' Pattern, Ball [illegible]
Russell Jennings' Car Bits, 12-in. [illegible]
Russell Jennings' Car Bits, 12-in. twist [illegible]
Russell Jennings' Ratchet Bits [illegible]
Wright's Jennings' Bits [illegible]

Bit Stock Drills—
See Drills, Twist

Expansive Bits—
Clark's Patent No. 1 [illegible]
No. 2 [illegible]
No. 3 [illegible]
Ohio Patent [illegible]
Russell Jennings & Co., Steer's Pat. [illegible]
Virgine Pat., small size, $18.00; large size, $26.00 [illegible]
Warren [illegible]

Gimlet Bits—
Peace [illegible]
Common Dbl. Cut [illegible]
Common Patterns, Nos. 1 to 14, [illegible]
Nos. 15 to 24, [illegible]

Hollow Augers—
Improved Pat., per doz. [illegible]
Nos. 1 to 24 [illegible]
Universal [illegible]

Ship Augers and Bits—
Ohio [illegible]
Russell Jennings & Co.'s [illegible]
Steer's [illegible]
L'Hommedieu's [illegible]
Nos. 1 to 14 [illegible]
Nos. 15 to 24 [illegible]

Awl Hafts—See Awls, Awl and Tool.

Awls—
Brad [illegible]
Hamilton [illegible]
Hamilton Solidsteel [illegible]
Hamilton Solidsteel, Patent [illegible]
Oval [illegible]
Peck's Patent [illegible]
Peck's Solidsteel [illegible]
Scratch [illegible]
Handled, Cone [illegible]
Handled, Oval [illegible]
Handled, Scratch [illegible]

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—
Single Bit, base weights: Per doz:
First Quality [illegible]
Second Quality [illegible]
Double Bit, base weights:
First Quality [illegible]
Second Quality [illegible]

Axle Grease—
See Grease, Axle.

Axles—Iron or Steel
Concord, Loose Collar [illegible]
Concord, Solid Collar [illegible]
No. 1 Common, Loose [illegible]
No. 1½ Com., New Stub [illegible]
No. 2 Solid Collar [illegible]
Half Patent:
Nos. 7, 8, 11 and 12 [illegible]
Nos. 13 to 14 [illegible]
Nos. 15 to 18 [illegible]
Nos. 19 to 22 [illegible]

Boxes, Axles—
Common and Concord, not turned [illegible]
Common and Concord, turned [illegible]
Half Patent [illegible]

Bait—Fishing—
Hendryx:
A Bait [illegible]
B Bait [illegible]
Combination Bait [illegible]

Balances—Sash—
Caldwell new list [illegible]
Pullman [illegible]

Spring—
Spring Balances [illegible]
Chatillons:
Light Spg. Balances [illegible]
Straight Balances [illegible]
Circular Balances [illegible]
Large Dial [illegible]

Barb Wire—See Wire, Barb.

Bars—Crow—
Steel Crowbars, 10 to 15 lb per lb. [illegible]

Towel—
No. 10 Ideal, Nickel Plate [illegible]

Beam, Scale—
Scale Beams [illegible]
Chatillon's No. 1 [illegible]
Chatillon's No. 2 [illegible]

Beaters, Carpet—
Holt-Lyon Co.:
No. 12 Wire Coppered ₱ doz. $0.80;
Tinned [illegible]
No. 11 Wire Coppered ₱ doz. $1.15;
Tinned [illegible]
No. 10 Wire Tinned ₱ doz. $1.50

Beaters Egg—
Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd [illegible] No. [illegible] $1.35.
Taylor Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 120, $8.50; No. 150, $9.00.
Hotel, $3.00. No. 192 Hotel Tin [illegible] $7.50. No. 200 Dandee [illegible] $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
Tin [illegible] Dozen [illegible]

Bellows—
Blacksmith, Standard List:
Split Leather [illegible]
Good Leather [illegible]

Hand—
Inch [illegible]
Doz. [illegible]

Molders—
Inch [illegible]
Doz. [illegible]

Bells—Cow—
Ordinary Goods [illegible]
High Grade [illegible]
Tower [illegible]
Tower Sets [illegible]

Door—
Hom. B. & E. Mfg. Co. [illegible]

Hand—
Polished, Brass [illegible]
White Metal [illegible]
Nickel Plated [illegible]
Nexus [illegible]
Cone's Globe Hand Bells [illegible]

Miscellaneous—
Farm Bells [illegible]
Church and School [illegible]

Belting—Leather—
Standard [illegible]
Light [illegible]
Oak Leather Lacing [illegible]
Leather Lacing Sides, per sq. ft. [illegible]

Rubber—
Competition (Low Grades) [illegible]
Standard [illegible]
Best Grades [illegible]

Bench Stops—
See Stops, Bench

Benders and Upsetters, Tire—
Green River Tire Benders and Upsetters [illegible]

Bicycle Goods—
John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Spokes [illegible]
Tubes [illegible]

Bits—
Auger, Gimlet, Bit Stock Drills, &c. See *Augers and Bits.*

Blocks Tackle—
Common Wooden [illegible]
R. & I. B. Co.:
Beebe's Wood Snatch, 50; Eclipse Steel, 75; Hollow Steel, 50&10; Star Wire Rope, 50; Tubular Metal Snatch, 50; Tubular New Steel Steel, 50&10; Wire Rope Snatch, 50
Lake's Patent Automatic Lock and Hook [illegible]
See also Machines, Block

Boards, Stove—
Paper and Wood Lined [illegible]
Embossed [illegible]

Boards, Wash—
See Washboards

Bobs, Plumb—
Keystone & Essex Co. [illegible]

Bolts
Carriage, Machine, &c.—
Common Carriage and Blank Bolts [illegible]
Screw and smaller [illegible]
Larger and longer [illegible]
Phila. Eagle, $3.00 list [illegible]
Bolt Ends [illegible]
Machine Coach Threads [illegible]
¾ and smaller [illegible]
Larger and longer [illegible]

Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knobs:
Inch [illegible]
Per doz. [illegible]
Cast Iron Spring Foot, Jap'd:
Inch [illegible]
Per doz. [illegible]
Cast Iron Chain, Flat, Japanned:
Inch [illegible]
Per doz. [illegible]
Cast Iron Flat Shutter, Jap'd, Brass Knobs:
Inch [illegible]
Per doz. [illegible]
Wrought Barrel Jap'd [illegible]
Barrel Bronzed [illegible]
Strong [illegible]
Shutter [illegible]
Square Neck [illegible]
Square [illegible]
Iron Pulley [illegible]
Ives' Wrought Metal [illegible]

Expansion—
Richards Mfg. Co. [illegible]
Steward & Romain Mfg. Co.:
Style No. 13, Double [illegible]
Style No. [illegible]
Style No. 100, Dbl. Jaw, Single [illegible]
Lag Screw [illegible]

Plow and Stove—
Plow [illegible]
Stove [illegible]

Tire—
Common Iron [illegible]
Norway Iron [illegible]
American Screw Co.:
Norway Phila., list Oct. 16, '84... [illegible]
Eagle Phila., list Oct. 16, '84... [illegible]
Bay State, list Dec. 28, '99 [illegible]
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84... [illegible]
Eagle Phila., list Oct. 16, '84... [illegible]
Eclipse, list Dec. 28, '99 [illegible]
Russell Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99 [illegible]
Norway Phila., list Oct. '84 [illegible]
Eagle [illegible]
Shelton Co.:
Tiger Brand, list Dec. 28, '99 [illegible]
Phila., Eagle, list Oct. 16, 1881 [illegible]
Upson Nut Co.:
Tire Bolts [illegible]

Borers, Bung—
Borers Bung, Ring, with Handle:
Inch [illegible]
Per doz. [illegible]
Inch [illegible]
Per doz [illegible]
Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each [illegible]

Boxes, Mitre—
C. E. Jennings & Co. [illegible]
Langdon, New Langdon and Langdon Improved, 20&10% [illegible]
Langdon Adjustable [illegible]
Peck-Dutton [illegible]
Seavey [illegible]

Braces—
Common Ball, American [illegible]
Barber's [illegible]
Enos Genuine Spofford's [illegible]
Enos No. 70 to 120, 81 to 123, 207 to 414 [illegible]
C. E. Jennings & Co. [illegible]
Mayhew's Ratchet [illegible]
Mayhew's Quick Action Hay Pat. [illegible]
Millers Falls Drill Braces [illegible]
P., S. & W. Co., Peck's Pat. [illegible]

Brackets—
Wrought Steel [illegible]
Bradley Metal Clasp [illegible]
Griffin's Pressed Steel [illegible]
Griffin's Folding Brackets [illegible]
Taplin Victor Handy Egg Beater Bracket ₱ doz. $1.50

Bright Wire Goods—
See *Wire and Wire Goods.*

Broilers—
Kilbourne Mfg. Co. [illegible]
Wire Goods Co. [illegible]

Buckets, Galvanized—
M'f'r's list, price per gross.

	Quart.	10	12	14
Water, Reg.	25.35	28.00	32.00	
Water, Heavy	[illegible]			
Low, Rd. Bilge	[illegible]			
Well	[illegible]			

Bull Rings—See *Rings, Bull.*

Butts—Brass—
Wrought High List, Oct. [illegible]
Cast Brass Template [illegible]

Cast Iron—
Fast Joint, Broad [illegible]
Fast Joint, Narrow [illegible]
Loose Joint [illegible]
Loose Pin [illegible]
Mason's Hinges [illegible]
Parliament Butts [illegible]

Wrought Steel—
Broad
Light Narrow, Light Weight [illegible]
Reversible and Broad [illegible]
Loose Joint Narrow, Light Inside Blind [illegible]
Back Flaps, Table Chest [illegible]
Japanned.
Light Narrow, Loose Pin. [illegible]
Light Narrow, Ball Tip. [illegible]
Broad [illegible]
Steeple Tipped [illegible]
Ball Tipped [illegible]

Cages, Bird

...900 ....30%
Hendryx Bronze: Series 700, ... .30%
Hendryx Brass: ... .35%

Calipers—See Compasses.

Calks, Toe and Heel—

Plain, 4 points, per lb.
Sharp, 4 points, per lb.
...

Can Openers—

See Openers, Can.

Caps, Percussion—

... per M
G. D. ... per M
F. G. ... per M
G. E. ... per M
Musket ... per M

Primers—

Berdan Primers, $2 per M
Primer Shells and Balls to ...
All other primers per M, $1 ...

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

Blank Cartridges:
32 C. F., $5.50 ...
38 C. F., $7.00 ...
... 10&5%
32 and 38 Rim, $1 ... 10&5%
B. B. Caps, Round Ball ... $1.40
Central Fire:
Target and Sporting Rifle ...
Primed Shells and Balls to ...
Rim Fire, Sporting ...
Rim Fire, Military ...

Casters—

Bed ...
Plate ...
Philadelphia ...
... Ball Bearing ...
... Roller Bearing ... 70&5 & ...
Steel Gem ... 20
Standard Ball Bearing ... 45
... Ball Wagon ... list ...

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:
... lb. ... lb. ...
... ...
... lb. to ... inch ...
... ...
In cask lots, deduct ...
German Coil, Straight Link:
German Pattern Coil:
6-0 to 1 ... 70&5%70&10%
2 and 3 ...
4 and 5 ...

Halter—

Halter Chains ...
German Pattern Halter Chains, list ...
... Halter Chain ...
Halter ... 35&5%

Cow Ties—

See Holders and Ties.

Trace, Wagon, &c.—

Traces, Western Standard ...
... *Straight, with ...*
... *Straight, with ...*
... *Straight with ...*
... *Straight with ...*
No. 11 ... Add ... per lb. ...
Logging Chains ...
Straight Link.
Eastern, Standard Proof Coil ...
... Chain, list ...
... Brass ...
Safety and Breaking ...
Cast Iron Logging ...
Bridgeport Chain Co.:
Triumph Halter and Coil ... 35&2%&10%
... Halter ...
... Halter ...
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stall ...
Oneida Community:
American Halter, Dog and Kennel ...
... Halter ...
Wire Goods Co.:
... Halter ...
... Halter ...

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain ... 60
Pullman:
Bronze Chain, 60%; Steel Chain, ...
Sash Chain Attachments, per set ... 8c
... Ribbon ...
Sash Ribbon Attachments, per set ... 8c

Chalk— (From Jobbers.)

Carpenters' Blue ... gro. ... 50&75c
Carpenters' Red ...
Carpenters' White ... gro. ... 40&45c

Checks, Door—

Brass ...
... list ...
Bronze ...

Chests, Tool—

American Tool Chest Co.:
... Chests ...
Youths' Chests, with Tools ... 35
Gentlemen's Chests, with Tools ... 25
Farmers', Carpenters, etc., Chests, ...
... Chests ...
Mechanics' and Pattern Makers' Chests, Empty ... 45
Tool Cabinets ... 45
C. E. Jennings & Co.'s Machinists' ...

Chisels—

Socket Framing and Firmer

Standard List ... 50&10&5
Buck Bros. ...
C. E. Jennings & Co.:
... Socket Framing ...
Socket Framing No. 15 ... 25&5%
...
L. & I. J. White & Co. ... 30@30&5

Tanged—

Tanged Firmers ... 30@35@37½
Buck Bros. ...
C. E. Jennings & Co. Nos. 191, 181 ... 25
L. & I. J. White & Co. ... 25&5

Cold—

lb.
Cold Chisels, good quality ... 13@15¢
Cold Chisels, fair quality ... 11@12¢
Cold Chisels, ordinary ... 9@10¢

Chucks

Almond Drill Chucks ... 35
Almond Turret Six-Tool Chuck ... 40
Empire Pat. each $5 ...
Jacobs' Drill Chucks ... 35
Pratt's Positive Drive ... 25
Skinner Patent Chucks:
... Independent ...
Universal, Reversible Jaws ... 35
Combination, Reversible Jaws ... 35
Drive ...
Standard, 45%; Skinner Pat. 25%; Positive Drive ... 40
Planer Chucks ... 20
Face Plate Jaws ... 35
Standard Tool Co.:
... Independent ...
Union Mfg. Co.:
Combination, Nos. 1, 2, ... 21 ... 35
... ...
$1 ... 30
Geared Scroll, Nos ...
Independent Iron ...
Independent Steel, No. ...
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104 ... 35
Union Czar Drill ... 25
Universal, 11, 12, 16, 17, 13, 14, 15 ... 40
Drive ...
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50 ... 35
... Face Plate Jaws ...
Westcott Patent Chucks:
Lathe Chucks ... 50
Little Giant Auxiliary Drill ... 50
Little Giant Double Grip Drill ... 50
Little Giant Drill, Improved ... 50
Oneida Drill ... 50
Scroll Combination Lathe ... 50
Whitaker Mfg. Co.:
... Drill ...

Clamps—

Adjustable Hammers ... 20@20&5
Carriage Makers', P. S. & W. Co. ... 50&10
Beck, Parallel ... 33½&10
Myers' Hay Rack ...
Lineman's Swedish Neverturn ... 65
Wood Workers' Hand ... 10&1
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain,

Iwan's Champion, Adjustable ... 50
Iwan's Champion, Solid ...

Sidewalk—

Star Socket, All Steel, ₱ doz, $1.05 net
Star Swivel ...
W. & C. Shank, All Steel, ₱ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros. ... 30
... Pat. ...
L. & I. J. White Co. ... 30

Clippers, Horse and Sheep—

Chicago Flexible Shaft Co.:
1902 Chicago Horse, each ... $12.75
20th Century Horse, each ... $7.00
Lightning Belt Horse, each $25.00
Chicago Belt Horse, each ... $20.00
Stewart's Enclosed ...
Horse each ... $6.75
Stewart's Patent Sheep Shearing Machine, each ... $12.5
Stewart Enclosed Gear Shearing Machine No. 8, each ... $9.75

Clips, Axle—

Regular Styles, list July 1, '05

Cloth and Netting, wire

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, ...
... Cocks ...

Coffee Mills—

... Mills ...

Collars, Dog—

Nickel Chain, Walter B. Stevens & ...
... Brass ...

Compasses, Dividers, &c.

... Compasses ...
Wm. Schedlbauer Co.:
... Compasses ...
... Dividers ...
... Pat. ...

Conductor Pipe,—

Galvanized Iron Pipe ...
Gal. Steel. Charcoal.
Northampton ...
Eastern ...
Pittsburgh ...
Central ... 75&10% 60%
Northwestern ...
Western ... 70&12½% 50&12½%
Terr. Gal. ...
Southern ...
Southwestern ... 45
Iron Pipe ...
Corrugated ...
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:
Galvanized ea. $1.85 $2.00 $2.25 $2.90 $3.90
Galvanized, Lined, side handles, Gal
Each ... $1.95 $2.15 $2.40 $3.30 $4.15
White Enameled ...
Agate Lined ...

Coppers' Tools—

See Tools, Coppers'.

Coppers, Soldering—

Soldering Coppers, 3 lb. to pair and heavier, 22@25c; lighter than 3 lb. to pair ...

Cord— Sash—

Braided, Drab ... lb. 35¢
Braided, White, Com., Nos. 8 to 12, 24¢; No. ... ; Nos. 6, 21½¢. In lots of 12 doz. or ... 1 cent less per pound
Colored Braided, lb., No. 12 ...
Italian, Drab, A., No. 12 ... lb. 25¢
Oiled and Tanned ... lb. *Hollow Cotton Sash Cord, Tan Red* ...
Patent Russia ... lb. ... 20¢
Cable Laid Russia ... lb. ... 21¢
Indian Hemp, Br'd'd ... lb. ... 21¢
India Hemp, Twisted ... lb. 13@14¢
Patent Italia, Twisted ... lb. ... 17¢
Pearl, Braided, cotton, No. 6, ₱ lb. ...
Eddystone, Braided, Nos. 8 to 12, ...
Hollow ... Lead Pipe ...
Pullman:
Wire ... Cord ...
Sash Cord Attachments, per 100 ... $2.00
... No. ... 12:
Braided, ₱ lb., Drab Cotton, ... Hemp ...
50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord ... 50¢
Massachusetts, Drab ...
Massachusetts, Drab, ... 45¢
Phoenix, White, Nos 8 to 12 ... 27¢
Silver Lake, per lb.:
... Braided, ... Wire ...
B. Drab, 40¢; B. White, 35¢
Italian Hemp, 40¢; Linen ... 57½¢
See also Chain and Ribbon.

Wire, Picture—

Full Length ... 90@—%
Short Length ...
Hendryx Standard Wire ... old list, 85&10
Turner & Stanton Co. Wire Picture ...

Cradles—

Grass ... 100

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but your prices made by jobbers.
Zelnicker's Lumber:
... gro.
White and Purple, Indelible ... $7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black ... $4.50
Giant Lumber, 5¾ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks ... $10.00
Genuine Soapstone, Metal Workers', 5 in. x ¾ in. Round, $2.50; 5 in. x ¾ in. Square, $1.75; 5 x ½ x 3-16, ...
Suremark, Black, $2.25; Blue, Red ...

Crooks, Shepperds'—

Pat. ...

Crow Bars—See Bars, Crow.

Cultivators -

Various ...

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ₱ doz. $3.30

Cutters— Glass—

... Pat. ...
... Pat. ...

Meat and Food—

Enterprise:
... Pat. ...
... Pat. ...
P., S. & W. Co.:
... Pat. ...
... Pat. ...
... Pat. ...
... Pat. ...
... 312
... 322
No. 605, ₱ doz. $21.00
Universal Food, No. 1, $24.00; No. 2 ...
... $15.00 $18.00

Slaw and Kraut—

Hand ...
Corn Graters ...
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife ... ₱ doz. $3.00
Cutters ...

Tobacco—

All Iron, Cheap ... doz. $1.25@1.3...
... Pat. ...
No. ...

Diggers, Post Hole, &c—

Iron ...
Ideal ... 25
Solid ...
Iron ... Post Hole Auger ... 40
Vaughan Pattern Post Hole Augers, ...
Post ... Hole Digger, ... doz. ... $8.75
Split ... Hole Digger ...
Hercules Pattern, ₱ doz. ... $10.00
Kohler's, ₱ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, ...
Post ... Hole Digger ...
No. ...

Dividers—See Compasses.

Drawing Knives—

See Knives, Drawing.

Dressers Emery Wheel—

Solid ... Wood Dresser ...
Star ... Wheel Dresser ... 35

Drills and Drill Stocks—

Blacksmith's Common Drilling Machines ... $4.50@$7.25
Breast, Millers Falls ... 15&10
Hand ...
Goodell Automatic Drills, 50&10@60&10
Millers Falls Automatic Drills, 33⅓&10
Ratchet, Curtis & C... 25
Ratchet, Parker's ...
Ratchet, Weston's ... 40
Ratchet ... Wood ... Handle ...
Ratchet, No. 012 ...
Ratchet, Celebrated ...
Ratchet, Whitney's, P., S. & W. ...
Wrought Head ...
Adjustable ...

Twist Drills—

Bit Stock ...
Taper Shank Straight Flute ...

Drivers, Screw—

Screw Drivers, per lb. ...
Balsey's Screw Holder and Driver, ₱ ...
Buck Bros.' Screw Driver Bits ...
Ideal ...
Fray's Hol. H'dle Sets, No. 3, ...
Ford's Brace Screw Drivers ...
Gay's Double Action Ratchet ...
Goodell's Auto ...
Mayhew's Black Handle ...
Millers Falls, Nos. 20 and 21 ... 25&10
Millers Falls, Nos. 11, 12, 41, 42 ... 15&10
Spirit ... & W. ...
... Handle ... Star ...
Yankee ...

Eave Trough, Galvanized—

	Charcoal.	
Territory	*Gal. Steel.*	*Iron*
Northampton	...	...
Eastern	...	...
Pittsburgh	...	...
Central	...	...
Western	80&10%	60&10%
Northwestern	...	...
Terr. Gal.	...	...
Southern	...	...
Southwestern	...	...

See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories: Galv. Steel and Galv. C. I.

Elbows, Stove Pipe—

Edwards, Standard Blue ... 40&10&5%
Edwards, ...
Elbow ...

Emery, Turkish—

5 to ... 55 to ...
... Pat. ...
... Pat. ...
... Pat. ...
10 in case ...
... Pat. ...
... Pat. ...
... Pat. ...

Extractors, Lemon Juice—

See Squeezers, Lemon.

asteners, Blind—

...50&10%
...40&10%
...40%

Cord and Weight

...33⅓

Corrugated—

...Fastenets...

Faucets—

...50&10&10%
...50&10%
...50&10%
...40%
...50
...60
...60
...50&10%
...40%
...50
...50&10%
...40%
...60
...50&10%
...40%
...60
...50&10%
...40%
...60

Handled—

NOTE—Manufacturers are selling from the list of September 1, 1903, but catalog numbers are changing issued August 1, 1908, are selling at net prices.

Crown's Wrecking, No. 1 ... net, $2.50
Star Double Bit ... $5.20
Ft. Madison Cotton Hoe ... doz. net
Ft. Madison Crescent Cultivator Hoe, ... doz.
Ft. Madison Mattock Hoe ... doz.
Regular Weight ... doz. net, $4.50
Handle Size ... doz. net, $4.80
Ft. Madison Spanning Hoe ... doz.
Ft. Madison Dixie Tobacco Hoe ... doz.
Kretsinger's Cut Easy ... 70&10%
Warren Hoe ... 45&10%
W. & C. Hoe ... 50&10%
B. B. 6 in. Cultivator Hoe ... $6.00
B. B., 6½ in. ... $6.00
Axe Weight ... per doz. net, $4.95
W. & C. Utility Scuffle Hoe ... doz. $3.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, per doz. $4.80 ... 45&10%

Door—

Bardsley's, Iron Face, Brass and Bronze ...
Eagle ... 50
Pelham ...
Reeves Mfg. Co.'s No. ... Each; Brass, 40c; Nos. ... each; Steel ...
Superior ... 30%

File and Tool—

Nicholson Tire Heaters and File Handles ... 33⅓&40

Fruit Jar—

Triumph Fruit Jar Holder, per gross, $1.25; per doz. ... $1.25

Trace and Rein—

Fernall Lever Trace Holder, per doz. Each ...
Dees Rein Holder, per doz. Each, $1.00

Hones—Razor—

Pike Mfg. Co., Bergman and Swaty, Germania ...

Hooks—Cast Iron—

Bird Cage, Reading ... 40%
Cotton Line Reading List ... 40%
Coat and Hat Reading ... 40&10%
Coat and Hat Adjustable ... 50%
Harness, Reading List ... 40%

Wire—

Belt ... 80%
Wire Co. & H. Hooks ... 50
Brokaw Metal Goods Wire, Coat and Hat, & ... Catalog ... 50&10%
Columbian Hdw. Co., Gem ... 50&10%
Parker Wire Goods Co., King ... 70&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 65 ... 50%; X Brace, 75 ... 50%
Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton ... *doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.— See Wrought Goods

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Rush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz. $...
Grass, common grades, all sizes, per doz. ... *$1.50*
Whalebone ... *lb 15@16c*
Hooks and Eyes:
Brass ... *6 3/4@8 1/2*
Malleable Iron ... *5@7 1/2*
Coe's Mfg. Co. Gate and Seattle Hooks ... 10%
Ft. Madison Cut-Rate Hooks, per doz. $3.25 net
Turner & Stanton Co., Cupboard ... 50%
Bench Hooks—See Bench Stops.
Coe Hook and Eye Co. ...

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾ inch:
Competition ... *ft. 5@6c*
Extra Guaranteed ... *ft. 8@9c*
Specially Guaranteed ... *ft. 11@12c*
Cotton Garden, ¾-in., coupled:
Low Grade ... *ft. 8@9c*
Fair Quality ... *ft. 10@11c*

Irons— Sad—

From ½ to 1 ... *lb 3½@4c*
H. B. Sad Irons ... *lb 3½@4c*
Wm. Potts' prices per set.
Nos. 50 55 60 65
Rapid Tops 85 90 95 01
Tin Heaters ... 85 90 95 01
New England Pressing ... *lb 3½@4c*

Bar and Corner—

Richards Mfg. Co. Bar ... 40%
Other ...

Pinking

Pinking Irons ... *doz. 60c*

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw ... 20&2?; Steel ... 25
Lever ...
Lever, Steel ... 20&5
Richards Tiger Steel ... 100 50&10%
Smith & Hemenway Co.'s ...

Ladder

Richards Mfg. Co., Ladder Jacks ...

Kettles—

Brass, Spun, Plain ... *20@25c*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Hunter Bros. Butcher & ...
Wilkinson Sheaf Cutlery Co. ... 60%

Corn—

Columbian Cutlery Co., Wilcut Bread Knives and Holder ... 60
Wilcox & Bass, ... doz. $...
Dent, $2.75; Adj. Serrated, $2.50; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.10

Drawing—

Standard List ... *80&10@—%*
C. E. Jennings & Co., Nos. 4 to ... 40%
Jennings & Gibbs, Nos. 41, 42 ... 40%
Swan's ...
Watrous ... 60
L. & J. G. Wade ... 20&5&5

Hay and Straw—

Scalloped Hay, per doz. $...@$3.75
Iwan's Solid Hay, per doz. $2.50; $3.00
Iwan's Serrated ... per doz. $10.00

Miscellaneous—

Fruit ... *doz. $2.00@$3.75*
Wheelbarrow ... *per doz $...@$6.25*

Knobs—

Base, 2½ inch, Birch, or Maple, Rubber Top ... *gro $1.25@$1.40*
Carriage, Jap., all sizes ... *gro. 40@45c*
Door, Mineral ... *doz. 65@70c*
Door, Por. Jap'd ... *doz. 70@75c*
Door, Por. Nickel ... *doz. $2.05@2.15*
Bardsley's Weed Boot, Shutters, &c. ...

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Aliith Mfg. Co., Reliable ... 50%
Ideal ...
Myers' Noiseless Store Ladders ... 50%
Richards Mfg. Co.:
Improved Noiseless, No. 132 ... 50%
Climax Step, No. 128 ... 50%
Trolley, No. 130 ... 50%

Ladles, Melting—

L. & G. Mfg. Co. ...
P. S. & W. ... 10&1
Reading ... 60

Lanterns—Tubular—

Regular, No. 1 ... *doz. $...@$4.50*
Side Lift, No. 0 ... *doz. $3.60@4.75*
Hinge Globe, No. 0, doz. $...@...
Other Sizes ... *...@...*

Bull's Eye Police—

Small ... *...@$2.25*

Latches— Thumb—

Roggins's Latches, with screw ... *doz. 55c@40c*

Door—

Aliith Mfg. Co., Reliable and All ...
Cross & Cartier Mfg. Co., No. ...
Richards' Bull Dog, Heavy, No. 225 ... 55&5%
Richards' Trump, No. 127 ... $1.50

Leaders, Cattle—

Small ... *doz. 50c; large, 60c*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E. ... 10%

Lines—

Braided Clothes, Nos. 15 to ... per foot ... *...@...*
Braided, Nos. 15 to ... per foot ... *...@...*
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3, ... 40%
Silver Lake Braided Chalk, No. 0, per doz. $6.50; No. 1, $7.50; No. 2, $8.50 ...
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 1, ...
White Cotton, $7.50; Drab Cotton, $8.50 ...
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; ...
Turner & Stanton Co.:
Braided, Nos. ... Manila ...
Braided, Nos. ... Sisal ...
Shade Cord, Cotton or Linen ... 20%

Locks— Cabinet—

Cabinet Locks ... 33⅓ %

Door Locks, Latches, &c.—

NOTE—Net ...
Cabinet Locks ...
Richards Mfg. Co. ...
R. & E. Mfg. Co. ...

Padlocks—

R. & E. Mfg. Co. ...
Brass ...

Sash, &c.—

Iron Patents:
Brass and Bronze ...
Iron ... Low Vault ...
Reg. 40&20?; Robinson Pat. Ventilating ...

Machines—Boring—

Com. Uprt, without Angles ... *$2.00@2.25*
Com. Angle, without Angles ... *$2.25@2.50*
Swan's Improved ... 10&5
Jennings', Nos. 1 and 4 ... 25&12½
Shell's, Upright ... Angular ...

Corking—

Reisinger Interchangeable Hand Power ... per doz. Sizes ...

Fence—

Williams' Fence Machines ... each, $5.50

Hoisting—

Moore's Anti Fr. ... Chain, Hoist ...
Moore's Hand Hoist, with Lock, Brass ... 20%
Moore's Cyclone, High Speed Chain Hoist ...

Ice Cutting—

Chandler ... 12½

Washing

Boss Washing Machine Co.: Per doz
Home ... $...
Boss Rotary ... $57.00
Champion Rotary Banner No. 1 ... $55.00
Standard Champion No. 1 ... $50.00
Champion Portable ...
Champion Steam Washer ...
Lincoln Automatic Washer ...

Mallets—

Hickory ... *45&10%*
Lignumvitæ ... *40&10%*
Timbers Hickory and Lignumvitæ ... *doz. 45&10@50...*

Mangers, Stable—

Swett Iron Works ... 50%

Mats, Door—

Jennings ... 50
Elastic Steel (W. G. Co.), new list ... 50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co. ... 20@25%
Nonpareil ...
Parker's Coffee and Spice ...
Parker's Lion ... 35&5
Smith Lion ... 35&5

Motors, Water—

Dimmes Red Devil ...
Lippincott ...

Mowers, Lawn—

NOTE—Net prices on catalogs quoted
Cheapest, 10-in., $2.00; 12-in., $2.10, etc.
Cheap, 10-in., $2.25; 12-in., $2.45, etc.
Better Grade, 10-in., $3.00; 12-in., $3.20, etc.
High Grade ... $4.50 ... 5.00 ... 5.25
Continental ... 60%
Great American Ball Bearing, new list ... 70
Pennsylvania ... 60%
Pennsylvania Golf ... 50
Pennsylvania ... 50
Pennsylvania ... 50
Granite State:
Style C, High Wheel, spcl. list, ...
Style D, High Wheel, spcl. list ... 70%
Styles M., S., C., K., T. ... 70&10&5%
Style A, all Steel ... 60&10&5%
Dayton ...
Dreadnaught ...
Hyde ...
Jewett ...
Jubilee ...
Eagle ...
I. X. L. ...

Nails—

Wire Nails and Brads, Maxi...
Cut and Wire, See Light Report
Hungarian, Finishing, Upholsterers' &c. See Tacks.

Horse—

Nos. 6 7 8 9 10
American ...
Common ...
New Haven ...
Putnam ...
Vermont ...
Jobbers' Special Brands ...
per lb. 9@10c

Picture—

Brass, Hd. ... *¾ ... ... in*
Por. Head ... *1.10 1.10 1.10 ... gro*

Nippers

See *Pliers and Nippers.*

Nuts

Square, C., T. & R. ... *7.00c*

Oakum—

Best ... *lb. 6½c*
U. S. Navy ... *lb., 6c*
Navy ... *lb. 5c*
Pure Manila Spun Oakum ... *30c*

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated ...
Cruse of Paragon ...
Brass and Copper ... *5@6½c*
Zinc ... *6@7½c*
Malleable, Hammers' Improved, Nos. 1, 2, 3, 50% ...
American Tube & Stamping Co.:
Spring Bottom Cans ... 70&10&12½%
Regular Cans ... 60&10%
Maple City Mfg. Co.:
Nos. ... 50
Regular ... 50

Openers— Can— *Per doz.*

Sprague, Iron Handle ... *.50@.55c*
Sprague, Wood Handle ...
Sardine Scissors ... *$1.75@$3.00*
Yankee ...
per doz., net, $0.75; Little Gem, per doz., net ... $0.65

Egg—

Hartman Nickel Plate ...
Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope, ...

Rubber

(Fair quality goods.)
Sheet, C. I. ... *11@12c*
Sheet, C. C. S. ... *11@12c*
Sheet, C. B. S. ... *12@13c*
Sheet, Pure Gum ... *14@15c*
Sheet, Red ... *40@50c*
Jenkins ... per ft. ...

Miscellaneous

American Packing ... *lb. 7@10c*
Cotton Packing ... *lb. 10@15c*
Hemp Packing ... *lb. 10@12½c*
Jute ... *lb. 8@10c*
Russia Packing ... *lb. 9@11c*

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List ... *65c@70c*
Edwards, Royal Blue ... 65&7½%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.75*	*2.25*	*2.80*	*3.45*

Paper—Building Paper

Asbestos: *lb.*
Roll Board or Building Felt, 5 to 30 lb., per 100 sq. ft.
Roll Board or Building ... 3-32 and ⅛ in., 45 to 60 lb. per 100 sq. ft. ...
Mill Board, Sheet, 40 x 40 in., ... Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll ...
Medium weight, 30 lbs. to roll ...
Heavy weight, 40 lbs. to roll ...
Black Water Proof Sheathing 500 sq. ft., 1 ply, 65c; 2 ply, 85c; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. per roll ... $1.00
Red Rope Roofing, 400 sq. ft. per roll ... $1.00

Tarred Paper—

1 ply (roll 400 sq. ft.), ton ...
2 ply, per roll ...
3 ply, per roll ...
Nameless 1 ply ...

Sand and Emery—

Sand Paper and Cloth ... *25%*
Garnet Paper and Cloth ... *25%*
Emery Paper and Cloth ... *50&10@60%*

Parers Apple

Enterprise ...
Ideal ...
Monitor ...
New Model ...
Reliable ...
Universal ...

Livingston Nail Co.:

Cut ...
Wire ...

Reading Hardware Co.:

Cut ...
Wire ...

Potato—

Sure Stop ... 50
Wrought ... 50

Picks and Mattocks—

Adze Eye ...
Cast Steel ...
Chicago ...
Common ...
Handled ...
Hunter Pick ...
Kelly Pick ...
Pick Mattocks ...
Pick Mattocks, Handled ...
Pick Mattocks, Handled, Hunter ...
Pick Mattocks, Handled, Kelly ...
Pick Mattocks, Handled, Reliable ...
Pick Mattocks, Handled, Special ...
Pick Mattocks, Handled, Standard ...
Pick Mattocks, Handled, Superior ...
Pick Mattocks, Handled, Universal ...
Pick Mattocks, Handled, Western ...
Pick Mattocks, Handled, Western Pattern ...
Pick Mattocks, Handled, Western Pattern, Hunter ...
Pick Mattocks, Handled, Western Pattern, Kelly ...
Pick Mattocks, Handled, Western Pattern, Reliable ...
Pick Mattocks, Handled, Western Pattern, Special ...
Pick Mattocks, Handled, Western Pattern, Standard ...
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Pick Mattocks, Handled, Western Pattern, Western Pattern, Western Pattern, Standard ...
Pick Mattocks, Handled, Western Pattern, Western Pattern, Western Pattern, Superior ...
Pick Mattocks, Handled, Western Pattern, Western Pattern, Western Pattern, Universal ...
Pick Mattocks, Handled, Western Pattern, Western Pattern, Western Pattern, Western ...

Pinking Irons—
See Irons, Pinking.

Pins, Escutcheon—
Brass ..... 50@55&10%
Iron, list Nov. 11, '85 ..... 60@60&10%

Pipe, Cast Iron Soil—
Standard ..... [illegible]
Extra heavy ..... [illegible]
Tubing, 5 ft. lengths ..... [illegible]

Pipe, Merchant—

	Consumers, Carloads.			
	Steel		*Iron.*	
	Blk.	*Galv.*	*Blk.*	*Galv.*
	%	%	%	%
In. and ½ in.	58	62	62	50
¾ in.	62	64	64	54
1, 1¼ and 1½ in.	68	66	66	54
2 in.	70	68	68	60
2½ to 4 in.	72	70	70	60
4½ to 6 in.	73	67	67	52

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in. f.o.b. factory:
Extra heavy ..... [illegible]
Special classes ..... [illegible]

Pipe, Stove—

	Per 100 joints.	
Edwards' Nested:	C. L.	L. C. L.
5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	6.75	7.75
7 in., Standard Blue	7.75	8.75
5 in., Royal Blue	7.00	8.00
6 in., Royal Blue	8.00	9.00
7 in., Royal Blue	8.50	9.50
Wemrich, Crimped or Nested:		
5 in., Uniform Color	$6.15	$7.15
6 in., Uniform Color	6.65	7.65
7 in., Uniform Color	7.65	8.65

Planes and Plane Irons—

Wood Planes—
Bench, first qual. ..... 50@50&10%
Bench, second qual. ..... 40@40&10%
Miscellaneous ..... 25@25&10%
Chapin-Stephens Co.:
Bench, First Quality ..... [illegible]
Bench, Second Quality ..... [illegible]
Miscellaneous ..... [illegible]
Type of Contract ..... [illegible]
Lists 60%

Iron Planes -
Clapham's Iron Planes ..... 50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list 25%
Iron Bench ..... [illegible]
Chapin-Stephens Co. 25%
Union 50%
Ward & Payne Manufacturing Co. 25%

Planters, Corn, Hand—
Keystone Eclipse ..... per doz. $8.00

Plates—
Follow ..... lb. 4@4½¢

Pliers and Nippers—
Button Fasteners ..... [illegible]
Gas pattern, per doz., 8 in., $1.25 @ $1.50; 6 in., $1.45 @ $1.50.
Gas Pipe ..... 7 in. 10 in. 12 in.
$2.25 $2.65 $2.75 $4.50
Acme Nippers ..... 5%&5%
Adjustable Nippers: Mfg. Co. ..... [illegible]
American Ball ..... [illegible]
Ball and Socket ..... [illegible]
Bent ..... [illegible]
Nippers ..... [illegible]
Straight Pattern 15%
Button Fasteners ..... [illegible]
Cutting Nippers ..... [illegible]
Gas Pipe ..... [illegible]
Side Cutting Nippers ..... [illegible]
Wire Nippers ..... [illegible]
Wm. Schollhorn Co.:
Button Fasteners ..... [illegible]
Nippers ..... [illegible]
Pliers ..... [illegible]
Side Cutting Nippers ..... [illegible]
Universal Cut ..... [illegible]
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 60%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels ..... [illegible]
Improved Level ..... [illegible]
Level ..... [illegible]
Plumb ..... [illegible]
Plumb and Level ..... [illegible]
Disston's Pocket Levels ..... 60&10%
Spirit Levels 25%
Plumbs ..... [illegible]

Points, Glaziers'
Brad awl, 1 lb. papers ..... lb. 9¢
Diamond ..... lb. 9¢
Wire points ..... lb. 10¢

Police Goods—
Manufacturers' Lists ..... 25@25&5%
Peters 25%

Polish—Metal, Etc—
Prentice Brand, No. 1, 1½ oz. in bottle, per doz. $3.00; No. 2, 6 oz. in box, per doz. $3.00; No. 3, 2 oz. in box, per doz. $1.50.
Prentice Paste 50%
Prentice Powder ..... [illegible]
Prentice Rouge ..... [illegible]
Prentice Soft Soap ..... [illegible]
Prentice Tripoli ..... [illegible]
Prentice Wheels ..... [illegible]
Prentice Wood Polish ..... [illegible]
Prentice Wood Polish Paste, 3 oz. boxes, per doz. 5¢; per gro. $4.50; 8 oz. boxes, per doz. $1.25, 1 lb. boxes per doz. $2.25.
Prentice Liquid 8 oz. cans, per doz., $1.35.
Prentice Liquid Metal Polish, per doz., $1.75.

Stove—
Black Eagle Bronze Paste, 5 lb cans, per lb 10¢
Black Eagle, Liquid, ½ pt. cans, per doz. 75¢
Black Kid Paste, ¾ lb cans, per gr. $9.00
Black Kid Paste, 5 lb can.....each, $0.65
Laddie's Black Beauty Liquid, per lb. tins $6.75
Lustro Dia-mond, per gr. $3.75 ..... 10%
Dia-mond Pumbago ..... per lb 8¢
Turcoidy ..... per gr. $2.50
Gem, per gr. $1.50 ..... 10%
Japanese ..... per gr. $3.50
Jet Black ..... per gr. $3.50
Peerless Iron Enamel, 10 oz. cans, per doz. $1.50

Poppers, Corn—
1 qt. Square...doz. $0.80; gro. $8.75
1 qt. Round...doz. $0.90; gro. $10.00
Big qt. Square...doz. $1.00; gro. $11.00
2 qt. Square...doz. $1.10; gro. $12.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft. 46¢; 7½ ft., 48¢.
Steel Hitching Posts ..... each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled ..... 85&10%
Tinned ..... 50&10%

Powder—
In Canisters:
Duck, 1 lb. ..... *each 45¢*
Fine Sporting, 1 lb. ..... *each 75¢*
Rifle, 1 lb ..... *each 45¢*
Rifle, ½ lb ..... *each 25¢*
In Kegs.
12½ lb kegs *$3.50*
25 lb. kegs *$4.50*
King's Semi-Smokeless:
Keg, 25 lb kegs $4.50
Half Keg, 12½ lb kegs $2.50
Quarter Keg, 6¼ lb bulk $1.40
Case 24 (1 lb cans bulk) $3.50
Half case (1 lb cans bulk) $1.50
King's Smokeless: Shot Gun. Rifle.
Keg, 25 lbs $12.00 $13.00
Half Keg, 12½ lb bulk 6.25 7.00
Quarter Keg, 6¼ lb bulk) 3.25 4.00
Case 24 (1 lb cans bulk) 14.00 17.00
Half case (1 lb c. bk) 7.25 8.75

Presses—

Fruit and Jelly—
Enterprise Mfg. Co. ..... 20@25%

Seal Presses—
Morrill's No. 1, per doz. $20.00 ..... 50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclone 60%
Monitor 6 Pattern, No. 3, per doz. $12.00 ..... 33⅓&10%
Morrill's No. 1, Nail Puller, per doz. $20.00 ..... 50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 ..... 50%
The Scranton Co. Case Lots:
No. 1 ..... $5.50
No. 3B (small) $5.00
Smith & Hemenway Co.:
Diamond B 70%
Oval ..... [illegible]
Staple Pullers, Lifting and Davis 60%

Pulleys, Single Wheel—

Inch	½	1¼	2	3
Awning or Tackle, doz	$0.50	.55	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., 4 in., $1.25; 5 in., $1.55				
Inch	1	2	2½	
Hot House, doz	$0.65	.85	1.20	
Inch	1¼	1¾	2	
Screw, doz	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Sash, doz	$0.25	.30	.35	.60
Inch	1½	1¾	2	2½

Sash Pulleys—

Common Frame; Square or Round End, per doz.	1¾	*and*	2	*in.* ..... 17@20¢
Improved Mortise, No Face Plate, per doz.	1¾	*and*	2	*in.* ..... 20@21¢
Mortise, No Face Plate, per doz.	1¾	*and*	2	*in.* ..... 23¢
American Pulley Co.:				
Inch	1¼	1½	1¾	2
Screw, doz	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Sash, doz	$0.25	.30	.35	.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz. 1¾ *and* 2 *in.* ..... 17@20¢
Improved Mortise, No Face Plate, per doz. 1¾ *and* 2 *in.* ..... 20@21¢
Mortise, No Face Plate, per doz. 1¾ *and* 2 *in.* ..... 23¢
American Pulley Co.:
Fox-All-Steel, Nos. 3 and 1, 2 in. ..... per doz. 50%
Improved Mortise, No. 1, 2 in. ..... 20¢
Mortise, No. 35, 1¾ in. ..... 19¢
Mortise, No. 35, 2 in. ..... 20½¢
Mortise, No. 1, 2 in. ..... 23¢
Star, No. 26, 1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Deep Well, Standard ..... 75&5@75&10%
Wood Pumps, Tubing, &c. 50%
Barnes Dbl. Acting (low list) ..... 40&5%
Beatty ..... [illegible]
Contractors' Rotary Diaphragm No. 8, 2 in. $16.00
Deisz Spray Pump ..... per doz. $8.50
Flint & Walling's, Fast Mail Hand, (low list) 50%
Hand Force ..... [illegible]
Hand ..... [illegible]
Flint & Walling's Tight Top Pitcher ..... [illegible]
Nathan's Specialty Mfg. Co. Measuring, Nos. 2, $6.00; 3, $5.50 ..... 30%
Monitor ..... [illegible]
Myers Power ..... [illegible]
Myers Spray ..... [illegible]

Pump Leathers—
Plunger and Bucket Leathers—Per gro.:
No. ..... [illegible]
Cup Leathers—Per 1.
Inch 2 3½ 4 5
Prices 9c 12c 14c 18c

Punches—
Saddlers' or Drive, good ..... doz. 50@55¢
Spring, single tube, good quality $1.75
Revolving or Tubular ..... doz. $3.75
Bemis & Call Co.'s Last Set 50%
Meriden, Nos. 13A, 14A, 15B, 16B, 17D, $15 ..... 50%
Hercules, 1 die, each $5.00 ..... 50%
Niagara Hollow Punches ..... 55&10%
Niagara Solid Punches ..... 55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard 35%
Belt and Ticket, Light ..... [illegible]
Tinners' Hollow, P., S. & W. Co. 40%
Tubular, P., S. & W. Co ..... [illegible]
Wad $1.41 40

Rail—Barn Door, &c.—
Sliding Door, Painted Iron ..... 2½@2¾¢
Sliding Door, Wrought Brass, list, dis., 50¢ 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail ..... per ft. 3¼¢
O. N. T. Rail ..... [illegible]
Steel ..... [illegible]
Griffin's:
Angle Iron ..... per ft. 1 x 3/16 in. $3.50
1¼ x 3/16 in., $3.75.
Hinge Iron ..... per ft. 1 x 3/16 in., $3.50; 1¼ x 3/16 in., $4.00.
Lane's:
Hanger Track ..... per 100 ft $3.45
O. N. T. Rail ..... per 100 ft. $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard Track ..... per 100 ft. $4.20
Lawrence Bros:
1 x 3/16 in. ..... per ft. 3¼¢; 1¼ x 3-16 in., $8.75 ..... 55&2½%
McKenney:
Hinged Hanger Track, per ft. [illegible]
Rail ..... [illegible]
1 x 3/16 Track 50%
Myers Strap Iron ..... [illegible]
Richards' Mfg. Co.:
Common, 1 x 3/16 in. $2.75; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Square Hanger Rail, 6-inch ..... [illegible]
Lap-Jew Rail, No. 63 ..... 50%
Gauge Plough Track, per ft., No. 31, 1¼ x 3/16 ..... 14¢
No. 50 ..... 60&10%
Nos. 64, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE—Many goods are sold at net prices.
Flint Maple ..... Red Head Lawn ..... $[illegible]
Flint Maple & Cane Head Lawn ..... $[illegible]
Cronk's:
Steel Garden: Champion, 75%; Diamond B, 80%; Victor ..... 60&25%
Queen City Lawn, per doz., 20 tooth, $2.85; 24, $3.00 ..... net
Anticlog Lawn, per doz $1.40
Malleable Garden 60%
Ideal Steel Garden, per doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00 ..... 80%
Keystone:
Lawn Queen, 20-tooth ..... per doz. $3.15
Lawn Queen, 24-tooth ..... per doz. $3.25
Paragon, 20-tooth ..... per doz. $2.70
Paragon, 24-tooth ..... per doz. $2.75
Steel Garden, 14-tooth ..... per doz. $2.40
Malleable Garden, 14-tooth, per doz. $[illegible]

Rasps, Horse—
Disston's 75%
Heller Bros. ..... [illegible]
Imperial Brass G. H. M. [illegible] 70%
McCaffrey's American Standard ..... [illegible]
New York ..... [illegible]
See also Files.

Razors—
Lyons Barbasol 60%
Fox Razors, per doz., No. 42 $4.80; No. 44, $5.40; No. 80, Platina $7.20, $25.20 ..... [illegible]
Red Devil 65%

Reels, Fishing—
Hendryx:
M, G, Q, 6, A, 8, B, 8, M, 9, M, 10, Q, 10, A, 12, B, 12, Ball-Bearing, No. 1, 1, Ball-Bearing, No. 2, 1, Aluminum German Silv., Bronze 25% 1240, N. 124 ..... 20%
2, 3, N, 2, 3, N, 2, RM, 3, G, 4, 4, 5, 5, 6, 6, 7, 7, 8, 8, 9, 9, 10, 10 ..... [illegible]
2904 P, 2904, 2904 PN, 2904 N ..... [illegible]
3312, 3312 P, 3312 PN ..... [illegible]
3312, 3312 N ..... [illegible]
886 P, 886, 886 N, 914 PN ..... [illegible]
5800 PN, 5800 N ..... [illegible]
Combination, 102, 102 P, 102 PN, 202, 202 P, 202 PN, 102, 102 PN ..... [illegible]
304 P, 304 PN, 00304 P, 00304 PN, 3314 P, 3314 PN, 3314, 3314 N ..... [illegible]

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed ..... 70@70&10%
White Porcelain Enamel ..... 50&10%
Solid Brass or Bronze Metal 40%

Revolvers—
Single Action ..... $5@$10
Double Action, except 44 cal. $2.00
Double Action, 44 caliber $2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grade
16 in. ..... *per doz. $2.50@$2.75*
17 in. ..... *per doz. $2.75@$3.00*
18 in. ..... *per doz. $3.00@$3.25*

Rings and Ringers—
Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.77	0.90 doz.
Copper	$1.10	1.25	1.65 doz.

Hog Rings and Ringers—
Hill's Rings, gro. boxes ..... $3.50@$4.50
Hill's Ringers, Gray Iron, doz. ..... 60@65¢
Hill's Ringers, Malleable Iron ..... doz. 90@95¢
Blair's Rings...per gro. $3.00@$5.50
Blair's Ringers...per doz. 75@90¢
Buckeye Rings per gro. $3.00@$5.50
Buckeye Ringers...per doz. 75@90¢

Rivets and Burrs—
Copper 50%
Carriage, Coopers', Tinners, &c.:
Black ..... 50&10%
Metallic Tinned 70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard cartons ..... 23@25c;
Tin boxes, 1 to 4 count ..... 28@32c.
Tubular, per doz. boxes, 50 count, 29@32¢; *100 count,* 51@58¢.

Rollers—
Crook's Stay, No. 50 ..... $1.30
O. K. Adj. Reversible, No. 55, $[illegible]; No. 56, $[illegible]; No. 60 ..... $[illegible]
Lane's Stays ..... [illegible]
Richards' Stays:
Handy Stay and Reversible No. 53 75¢
O. K. Adj. and Reversible No. 58, 50¢
Lag Screw, Nos. 55 and 57 ..... 50%
Underwriters', Nos. 58, 60 ..... 55%
Faultless, No. 54 ..... 60%

Rope—
Manila, 7-16 in. diam. and larger: Fair ..... lb. 10½@11½¢
Sisal, 7-16 in. diam. and larger: Fair ..... lb. 7½¢
Sisal, 7/16 in. diam. and smaller, quality ..... lb. 8½¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed ..... lb. 6½¢
Pure ..... lb. 7½¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred: Mixed ..... lb. 8½¢
Pure ..... lb. 9½¢
Cotton Rope: Best, ¼-in. and larger...18@20¢
Medium, ¼ in. and larger ..... 16¢
Common, ¼-in. and larger...10¢
In coils, ½¢ advance.
Jute, Fair: Thread, No. 1, ¼-in. & up, lb. ..... 6¾¢
Thread, No. 2, ¼-in. & up, lb. ..... 5½¢

Wire Rope—
Galvanized ..... 25%&5%
Plow ..... 45&5%

Ropes, Hammock—
Cotton Mills ..... [illegible]
Jute 35% Sisal 20%

Rules
Boxwood ..... 60@60&10%
Ivory ..... 45&10@45&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexible ..... [illegible]
Ivory ..... [illegible]
Metallic ..... [illegible]
Slide ..... [illegible]
Standard ..... [illegible]
Kendall & Eaton Co.:
Folding, Wood ..... [illegible]
Folding, Steel ..... 33⅓&10%
Lufkin Rule Co. ..... [illegible]
Lufkin Rule Co. ..... [illegible]
Union Nut Co.:
Boxwood ..... [illegible]
Ivory ..... 35&10@35&10&10

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw*

Saw Tools—See *Tools, Saw.*

Saws—

Circular 45%
Band ..... 50@50&10%
Butcher Saws 50
Cross Cuts 50
One Man Cross Cut 50
Narrow Cross Cut 50
Hack, Rip and Panel ..... 35&5
Miter Box and Compass 40
Mulay, Mill and Drag 45
Wood Saws ..... 10&10
Disston Saws—
Turned Saws and Frames ..... 30&30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Inserted Tooth 50%
Band, 2 to 18 in. wide 60%
Cross Cut 60%
Crosscuts 45
Narrow Crosscuts 50
Mulay, Mill and Drag 50
Framed Woodsaws 25
Wood Saw Blades 25
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 5, 7, 107, 107-0, 3, 1, 0 & Combination 30%
Compass, Key Hole, &c. 25%
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 10%
Butcher Saws ..... 35&5%
Compass and Key Hole Saws ..... 35-35&5-2
Framed Wood Saws ..... 25&5%
Hand Saws 12%
Wood Saw Blades ..... 33-35&5-2
Shurts Pats:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&5%
Butcher Saws Blades ..... 35&10&10%
Peace & Richardson's Hand Saws 30%
Riverside
Circular Saws 45%
Crescent Ground Cross Cut Saws 30%
Cross Cut Saw Blades ..... 40&10%
Gang Mill, Mulay and Drag Saws 45%
Band Saws 50
Pack Saws ..... 25@25&5%
Butchers' Saws ..... 35@35&5%
Hand Saws ..... 25@25&5%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. ..... 25@25&5%
Wood Saws ..... 40&5%
Wheeler, Madden & Clemsen Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A 25%
Disston's:
Covcare Blades 25%
Keystone Blades 35%
Jo. S. Blades 30%
Simonds Mfg. Co. 35%
C. E. Jennings & Co.'s
Hack Saw Frames, Nos. 175, 180 ..... 40&5%
Hack Saws, Nos. 175, 180, complete, per doz. ..... 40&5%
Goodell's Hack Saw Blades ..... 40&10%
Griffin's Hack Saw Frames ..... 35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..... 30&10&10%
Sterling Hack Saw Frames ..... 30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00 ..... 10%
Victor Hack Saw Blades 40%
Victor Hack Saw Frames 40%
Whitaker Mfg. Co.:
Nonpareil Hand Blades 40
Nonpareil Power Blades ..... 50&5
National Power Blades ..... 50&5

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes, Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Foster complete, $19.00 ..... 15&10%
Rogers, complete, $5.50 and $4.00 ..... 15&10%

Scales—

Fairbanks, Morse & Co.:
Fairbanks, Turnbull's ..... 50@50&10%
Counter:
Hutch, Platforms, ½ oz. to ¼ lbs. ..... doz. $5.50
Tea, Platforms, ½ oz. to 8 lbs. ..... doz. $16.00
Lever Platform, Plain, 2 feet 2.00
Lever Platform, Slpd. $1.20 ..... 1.50
Counter:
Beam 2
Dial 40
Computing, Tea Scales 50
Tea Standard Portables 40%
Tea Standard R. R. and Wagon ..... 50&10

Scrapers—

Bay 1 Handle ..... doz. $2.00@2.25
Box, 2 Handle ..... doz. $2.50@2.80
Hand, Light, $2.00; Heavy, $4.50
Cleveland Steel Goods Co., Box ..... 30&30&10%
Buffalo Mfg. Co., Box 30

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1¼, $3.50@3.75
Bench, Wood, 2 ..... 2.50@2.75
Hand, Wood ..... 50&10@50&10&10%
Chair Seating Co., Hand ..... 40&10%

Coach, Lag and Hand Rail—

Iron Cone Point ..... 50@50&10%
Gimlet Pointed Point ..... 50@50&5%
Hand Rail ..... 70@70&5%

Jack Screws—

Standard List ..... 70&10@70&5%
..... 50%&10&10%
Swett Iron Works ..... 70@75

Machine—

Cut Thread, Iron, Brass or Composition
Flat Head or Round Head, 50@50&10%
Fillister Head ..... 50@50&10%
Rolled Thread, F. H. or R. H., Iron ..... 75@10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65&10%

Set and Cap—

Set, (Iron) ..... 75@10&5%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70@10&5%
Hex. Hd. Cap ..... 70@10&5%
Rd. Hd. Cap ..... 70@5%
Fillister Hd. Cap ..... 60@5%

Wood—

List July 25, 1903.
Flat Head, Iron ..... 85%@5&5%
Round Head, Iron ..... 85&5&5%
Flat Head, Brass ..... 80&5&5%
Round Head, Brass ..... 75%@5%
Flat Head, Bronze ..... 75&5%
Round Head, Bronze ..... 70%@5%
Drive Screws ..... 85%@5%

Scroll Saws—

See *Saws, Scroll.*

Scythes— *Per doz.*

Grass, No. 1, Plain ..... $7.00@7.50
Clipper, Bronzed Webb ..... $7.25@7.75
No. 3 Clipper, Pol'd Webb ..... $7.50@8.00
No. 6 Clipper and Solid Steel ..... $7.75@8.25
Bush, Weed and Bramble, Nos. 11, 12 and 13 ..... $7.25@7.75
Grain, No. 1 ..... $9.00@9.50
Bronzed Webb, No. 1 ..... $9.25@9.75
Nos. 3 and 4 Clipper, Grain ..... $9.50@10.00
Solid Steel, No. 6 ..... $10.00@10.50

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
Millers Falls Adj. Tool Handles No. 1, $12; No. 4, $22; No. 5, $18 ..... 20&10

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ₩ doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 37½%
Cannon's Diamond Point, ₩ gro, $12, 40&1
Mayhew's ..... ₩ gro $2.00
Snell's Corrugated, Cup Pt. ..... 40&10%
Snell's Knurled, Cup Pt. ..... 40&10%
Victor Knurled Cup Pt. ..... ₩ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Annistable 40%
Disston's Star, Monarch and Tri-umph 30%
Morrill's No. 1 ..... $15.00
Nos. 3 and 4 Cross Cut $20.00
No. 5, Mill $30.00
Nos. 11, 35 ..... $15.00
No. 1, Old Style $10.00
Special $16.25
Grant Royal Cross Cut ..... ₩ doz. $8.50
Royal, Hand ..... ₩ doz. $4.50
Tantor Positive ..... ₩ doz $6.75

Shaving—

Fox Shaving Sets, No 30 .....
..... net, $23.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₩ doz. $1.50
Mounted Kitchen Sand Stone, ₩ doz. $1.50
Natural Grit Carving Knife Hones, ₩ doz $2.00
Quick Cut Emery Carving Knife Hones, ₩ doz. $1.50
Quick Edge Pocket Knife Hones, ₩ doz $2.50

Skate—

Smith & Hemenway Co., Eureka ..50%

Shaves, Spoke—

Iron ..... doz. $1.25
Wood ..... doz. $2.00
Buck's (Stanley R & L Co. 45
Chair Stephens Co. ..... 30&10%
Goodells ₩ doz. $9.00 ..... 15&10%

Shears—

Cast Iron..	7	8	9 in.
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Cheap	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality Jap.... 70@70&10%
Best quality, Nickel.. 60@60&10%
Tailors' Shears ..... 40@40&5
A me Cast Shears ..... 40@40&5
Beach's Tailors' Shears 10%
Wilkinson Shear & Cutlery Co.:
Sheep ..... 33&10&5
Grass ..... 50&10%
Hedge 50
J. Wiss & Sons Co.:
Best Quality Lined 60
Best Quality, Nickeled ..... 50&10
Tailors' 25

Tinners' Snips—

Steel Blades ..... 20@5%@20&10%
Steel Bevel Blades ..... 40@10@50%
Forged Handles, Steel Blades, Berlin 50%
Heinisch's Snip 40
Jennings & Griffin Mfg. Co.'s 6½ to 14 in. ..... 33⅓&5%
Norcross Snips 10
P. & W. Forged Handles 25
W. R. W. ..... 40&10%
J. Wiss & Sons Co. 25
Wood Forged 25

Pruning Shears—

Cronk's Hand Shears 33⅓
Ferris & Hamilton 50
Disston's Pruning Hook with Hand Saw ..... 25&5%
Disston's Pruning Hook with ₩ doz Saw 25
Pruning Shears, Pat. Lever 10
Pruning Shears, Pat. Lever 10
Cumberland Cutlery Co. 50
Hyde Mfg. Co. ..... 60&10%
Lawn and Rose Wood Brand ..... 60&10

Sheaves—Sliding Door—

Reading 40
R. & E. list 15

Sliding Shutter—

Reading list 10
R. & E. list 20

Shells—Shells, Empty—

Brass Shells, Loaded:
Climax, 10 and 12 gauge ..... 60&1
Club Rival, 6&8 ..... Loaded Quail ..... 60&5
Paper Shells, Loaded:
New Rapid, 10, 12, 16 and 20 gauge ..... 25&5
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge, Leader grade ..... 25&5
Union, League, 12 gauge; Rival Grade 10
New Gamay, Leader, 10, 12, 14, 16 and 20 gauge, Climax 10, 12 and 20 gauge, League 12 and 20 gauge, Rival 10 and 20 gauge, Repeater Grade 5
Challenge, Monarch, 10, 12 and 20 gauge, League, Leader, 10, 12 and 20 gauge, Repeater Grade 5

Shells, Loaded—

Loaded with Black Powder 30%
Loaded with Smokeless Powder, medium grade ..... 40@45%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40%
Nitro Club, Smokeless Powders ..40&5%
Arrow, Smokeless Powders ..40&10&10%
Winchester:
Smokeless Repeater Grade ..... 40&5
Smokeless Leader Grade ..40&10&10%
Black Powder ..... 40&5

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.25	$6.25
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20 in.	$4.25	$5.5
Dixie, 10 x 14 in.	4.50	6.00
Dixie, 7 x 10 in.	5.00	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg. $4.10
Steel ..... per keg. $3.85
Burden's, all sizes ..... ₩ keg $3.90

Shot—

25-lb. bag
Drop, up to B $1.85
Drop, B and larger 2.1
Buck 2.1
Chilled 2.1
Buck 2.5

Shovels and Spades—

Association List, Nov. 15, 1902. 40%
Avery Stamping Co. 40%

Snow Shovels—

Long Handle ..... $3.75@3.85
Wood and Mail, D. Handle ..... $3.75@3.85

Sieves and Sifters—

Hunter's Imitation ..... gro. $9.50@10.00
Hunter's Genuine ..... per gro. $12.00@12.5

Sifters, Ash—

Acme Bell Bottom Sifters 50
Acme Sifters 50
Acme Sifters 50

Sieves, Seamless Metallic

—Per dozen.

Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... doz. $0.90@0.95
Mesh 20, Nested ..... doz. $1.00@1.05
Mesh 24, Nested ..... doz. $1.10@1.20

Sinks, Cast Iron—

Painted, Strainboard list
12 x 16 to 22 x 30 in 60%
20 x 24 to 24 x 36 in 50%
24 x 30 to 24 x 120 in 30%
Barnes' low list
Low list ..... Ring 20 x 36 in. 50%
20 x 48 to 24 x 50 in 40%

NOTE.—These quoted entire uniformity indicate used by jobbers.

Skeins, Wagon—

Cast Iron ..... 70@75&10%
Steel ..... 40@45&5%

Slates, School—

Factory Shipments.
"D" Slates ..... 50&50&10%
Eureka, Unexcelled Noiseless ..... 60&5 tons
Victor A. Noiseless ..... 60&5 tons &5%

Slaw Cutters *See Cutters.*

Snaps, Harness—

German ..... 40&10&10%
Capt. Mfg. Co. 50
Derby, 25; Yankee, 30&2½; Yankee Rivets, 5&2
Hartford & Trojan 40
Lee 25

Snaths—

Scythe ..... 55&10

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality ..... 5 of 1 doz. @ Cheap ..... 6 of 1 doz. @ 10
Meriden Britannia Co.:
Wm. Rogers Bros. Mfg. Co.:
1847 Rogers Bros. ..... 50&10%
Eagle Brand ..... 50&10%
Wm. Rogers & Son ..... 60&10

Miscellaneous

German Silver ..... 60@60&5%

Tinned Iron—

Plain ..... per box 75@75c
Tinned ..... per box 85@1.00

Springs— Door—

Barnes's Spring and Check 40%
Hinge, Cast ..... 40&10%
Hinge, Steel 70
Lever, Door Check 10
Lever, Gate ..... 40&10
Screen 30
Torrey's Hod, 39 in. ..... ₩ doz. $1.10

Carriage, Wagon, &c.—

Leaf and Platform ..... Per 100 lb
Bright ..... $3.75@4.00
Half Bright ..... $3.75@4.00
Bright ..... $3.25@3.50
Painted Seat Springs
Regular sizes ..... per pr. 30@32c
Extra sizes ..... per pr. 35@37c

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 70%; Japanese, 70%; Nautilus, 70%
Enterprise 70
Fountain, No. 1, ₩ doz. $12, No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated ..... List Jan 5 1903
Steel and Iron ..... 50@50&5
Rosewood Hdl. Try Squares and T-Bevels ..... 60&10&10%
Iron Hdl. Try Squares and T-Bevels ..... 60&10&10%
Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel 15%

Squeezers, Lemon

Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.90@1.25
Iron, Porcelain Lined ..... doz. $1.75

Staples—

Barbed Wire ..... 55&5@55&10
Electric ..... Sold Flat Rate
Fence Staples, Plain, $2.15; Galvanized $2.45
Poultry Netting Staples ..... per lb. 3½@3½c

Steels, Butchers'—

Dick's 30%
Foster Bros. 30

Steelyards— ..... 30@30&10%

Stocks and Dies—

Blacksmiths ..... 50@50&10%
Cutter Ratchet Ratchet Die Stock ..25%
Derby Screw Plate 25%
Green Riser 25
Landers Screw Plate 25%
Lightning 25
Reece's New Screw Plates 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones—Oil, &c.

Pike Mfg. Co., 1907 list:

Arkansas Slips, No. 1, 3 x 5 in.	40c
Arkansas Slips, No. 2, 3 x 5 in.	$3.50
Arkansas Slips, No. 3	$1.00
Lily White Washita, 4 to 8 in.	50c
Rose Red Washita, 4 to 8 in.	50c
Washita St., Extra, 4 to 8 in.	50c
Washita St., No. 1, 4 to 8 in.	40c
Washita St., No. 2, 4 to 8 in.	25c
Lily White Slips	30c
Rosy Red Slips	30c
Washita Slips, Extra	30c
Washita Slips, No. 1	20c
Washita Slips, No. 2	10c
India Oil Stones (entire list)	33⅓%
Quinnesec Fine or Crandum Oil Stone	40%
Quinnesec Emery and Crandum Oil Stone, Double Grit	40%
Quinnesec Emery Rubbing Bricks	40%
Hindostan No. 1 Regular	30c
Hindostan No. 1, Small	20
Axe Stones (all kinds)	
Turkey Oil Stones, Extra, 5 in.	
8 in.	
Queer Creek Stones, 4 to 8 in.	20c
Queer Creek Slips	40c

Scythe Stones—

Pike Mfg. Co., 1901 list:
Black Diamond S. S. ... gro. $12.00
Lamoille S. S. ... gro. $11.90
White Mountain S. S. ... gro. $9.00
Green Mountain S. S. ... gro. $8.00
Extra Indian P. S. ... gro. $6.00
No. 1 Indian P. S. ... gro. $4.00
No. 2 Indian P. S. ... gro. $3.00
Leader Red Ends S. S. ... gro. $5.00
Quinn Cut Emery.... gro. $18.00
Pure Corundum.... gro. $12.00
Crescent ... $7.00
Emery Scythe Rifles, 1 Coat.$11.00
Emery Scythe Rifles, 2 Coat.$13.20
Balance of 1904 list, 33⅓%.
Leotro (Artificial) ... 25%
$12.00 ... gro.
Lightning (Artificial) ... gro.
$18.00 ... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.... gro. $9.00

Stops— Bench—

Millers Falls ... 15&10%
Morrill's, No. 1, $10.00 ... 50%
Morrill's, No. 2, $12.50 ... 50%

Door—

Chapin-Stephens Co. ... 50@50&10%

Plane—

Chapin-Stephens Co. ... 20%

Straps— Box—

Acme Embossed, case lots 2&1⅓&13⅓%
Cary's Universal case lots 2&1 &13⅓%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 75c
All Steel Socket ... doz. $2.00@2.25
Excelsior Stretcher and Tack Ham-
mer Combined, ... doz. $6.00 ... 50

Stuffers, Sausage—

Enterprise Mfg. Co. ... 25@25&7½%
National Specialty Co., list Jan. 1,
1902 ... 4&1 &5
P., S. & W. Co. ... 40&1 &5

Sweepers, Carpet—

Bissell Carpet Sweeper Co: ... doz.
Superba, Cratch Mahogany ... $36.00
Triumph, Cratch Mahogany ... $33.00
Parlor Queen, Fig. Ramwood ... $27.00
Elite, Ramwood, Ass't ... $27.00
Am. Queen, Fig. Mahogany ... $27.00
Ideal, Ebonized ... $25.00
Grand Rapids, Nickel, ... $21.00
Japan ... $20.00
Standard Sanitary, Japan ... $20.00
Crown Jewel, Nickel, $21.00, Jap $18.00
Crystal, Nickel ... $36.00
Grand, Nickel ... $18.00
Parlor Grand ... $54.00
Cottage, Nickel ... $60.00
Hall, Nickel ... $60.00

NOTE.—Rubber, 75c per dozen on the above; also $1 per dozen on two dozen lots; $2 per dozen on twenty-five dozen lots; $2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks ... 90@5 10%
American Cut Tacks ... 90@5 10
Swedes' Cut Tacks ... 90@5 10
Swedes' Upholsterers' ... 90@5 10
Gimp Tacks ... 90@5 10
Lace Tacks ... 90@5 10
Trimmers' Tacks ... 90@5 10
Looking Glass Tacks ... 60@5
Bill Posters' and Railroad Tacks ... 90@5&10
Hungarian Nails ... 80@20%
Finishing Nails ... 70%
Trunk and Coast Nails ... 80@10%

NOTE.—The above prices are for straight Weights.

Miscellaneous—

Double Pointed Tacks ... 90@85 tens@—%

See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.: Gal.	Gasoline	Oil
30	$2.75	$3.00
50	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ... 50@—%
Patent Leather ... 25@30&5%
Steel ... 33⅓&5%
Chesterman's ... 25@25&5%

Kendall & Esser Co.:
Favorite Ass Skin ... 10&1 &50%
Favorite Duck Cloth Leather ... 20&1 &5%

Metallic and Steel, lower list, 35@
35&5%; Pocket, 35@35&5%.

Lufkin's:
Asses' Skin ... 40&10@50%
Metallic ... 30@30&5%
Patent Bend, Leather ... 25&50@5&10%
Pocket ... 40@40&5%
Steel ... 33⅓&35%

Wiebusch & Hilger:
Chesterman's Metallic No. 34L,
etc. ... 25%
Chesterman's Steel, No. 1038L,
etc. ... 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger ... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c. ... 30@33⅓%

Ties, Bale—Steel Wire—

Single Loop ... $2.00@10
Monitor, Cross Head, &c. ... 70&2

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White ... 20@20&5%

Haying—

Myers' Hay Tools ... 45%

Miniature—

Smith & Hemenway Co.'s, David-
son, ... doz. Nickel Plated $5.50;
Gold Plated ... $2.00

Saw—

Atkins' Cross Cut Saw Tools ... 35&5%
Simonds Improved ... 30%
Simonds Crescent ... 40%

Ship—

L. & I. J. White ... 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon Globe or Acme, doz $1.15@$1.25; gro ... $10.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Onondo ... 75&10%
Newhouse ... 65%
Hawley & Norton ... 75&75&1
Victor ... 50%
Oneida Community Jump ... 50%
Hecker ... 75@75&10

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12c

Mouse, Round or Square Wire, doz. 85@90c

Marty French Rat and Mouse Traps
Genuine:
No. 1 Rat, ... doz. $10.25 $11.50 doz.
No. 1 Rat, ... doz. $8.25 $9.75 doz.
No. 2 Rat, ... doz. $6.25 $7.75 doz.
No. 4, Mouse, ... doz. $3.75 $5.00 doz.
No. 5, Mouse, ... doz., $3.00, $2.25 doz.
Combination Outfit ... $10.00
Rat and Mouse, ... doz. ... $8.00
Our Steel Rat Trap ... 1.25
Easy Set, Mouse, ... doz. ... 1.00
Easy Set, Rat, ... doz. ... 1.00
Wood Choker, Rat, ... doz. holes, .12
Improved Tip Choker, 5 hole, ... .75
Tin traps ... .75

Trowels—

Disston Brick and Pointing ... 25%
Disston Plastering ... 20%
Disston Standard Brand "and Gar-
den Trowels.
Kohler's Steel Garden Trowels, ... gro.
5 in., $1.80; 6 in., $6.30
Never Break Steel Garden Trowels, ... gro. $6.30

Woodrough & McParlin, Plastering ... 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern ... 50&10%
Western Pattern ... 60&10%
Handy Trucks ... doz $16.00
Grocery ... doz $15.00
McKinney Trucks ... each, net $10.00
Model Store Trucks ... doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.
No. 0 1 2 3
Galvanized $67 $79 $89 $99 10&10%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ⅓-lb. Balls ... 40@20c
No. 12, ¼ and ⅓-lb. Balls ... 50@20c
No. 18, ¼ and ⅓-lb. Balls ... 60@20c
No. 24, ¼ and ⅓-lb. Balls, 17½@17½c
No. 36, ¼ and ⅓-lb. Balls ... 15@17½c
Chalk Line, Cotton ½-lb. Balls ... 24@20¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz ... 8½@19¢
Cotton Wrapping, 5 Balls to lb., according to quality ... 13½@19¢
American 2-Ply Hemp, ¼ and ⅓-lb. Balls ... 12½@15¢
American 3-Ply Hemp, 1-lb. Balls ... 13½@16¢
India 2-Ply Hemp, ¼ and ⅓-lb. Balls (Spring Twine) ... 24@9¢
India 3-Ply Hemp, 1-lb. Balls ... 7½@9¢
India 3-Ply Hemp, 1½-lb. Balls, 7@8½¢
2, 3, 4 and 5-Ply Jute, ½-lb. Balls ... 9@11¢
Mason Line, Linen, ½-lb. Balls, 47¢
No. 864 Manufacturers' ¼ and ½-lb. Balls, according to quality, 30@60¢
Wool, 3 to 6 ply ... B 6¢; A 7½¢

Vises—

Solid Box ... 50@55@50&10@55%

Parallel—

Athol Machine Co.: ... 40%
Simpson's Adjustable ... 40%
Standard ... 25%
Amateur ... 40%
Columbian Hdw. Co. ... 40%
Fisher & Norris Double Screw, net,
each, Nos. 2, $15.50; 3, $16.00; 4,
$20.50; 5, $25.00
Fulton Mach. & Vise Co.: ... 25%
Reed, Swivel ... 40%
Star, Solid Jaw ... 40%
Hollands: ... 40&1 &5%
Machinists' ... 65&5 &70%
Keystone ... 30%
Lewis Tool Co.: ... 30%
Adjustable Jaw ... 50%
Monarch, 30", Solid Jaw ... 20%
Massey Vise Co.: ... 40%
Concher ... 15%
Perfect, 15", Lightning Grip ... 15%
Merrill's ... 33⅓%
Millers Falls Oval Slide Pattern 60&10%
Pittsburg: ... 30@25%
Victor, 20@25%; Regulars ... 40&15
Vulcan's ... 55&60
Combination Pipe ... 20@25
Prentices ... 25%
Rock Island ... 30%
Snedeker's X. L. ... 33⅓%
Stephens' ...

Saw Filers

Disston's Dot Clamp and Guide, ... $30
Saw, $24.00, 30%; Clamps ... 30%
Perfection Saw Clamps, ... doz. ... $1.50
Reading ... 60%

Wood Workers—

Fulton Mach. & Vise Co.: ... 25%
Reed ... 40%
Star ... 40%
Massey Vise Co. ... 15%
Lightning Grip, 15%; Perfect ... 15%
Wyman & Goddard's Quick Action, 6"
in., $6.00, 9 in., $7.50, 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe, 60@60&5%
Massey's Quick Action Pipe ... 40%
Parker's Combination Pipe ... 40%
87 Series, 60%; 187 Series, 60&5%; No.
487 ... 40%
Rock Island Pipe ... 25%

Wads—*Price per M.*

B. E., 11 up ... 60¢
B. E., 9 and 10 ... 70¢
B. E., 8 ... 80¢
B. E., 7 ... 80¢
P. E., 11 up ... $1.00
P. E., 9 and 10 ... 1.25
P. E., 8 ... 1.50
P. E., 7 ... 1.50
Ely's B. E., 11 and larger $1.70@1.75
Ely's P. E., 12 to 20 ... $3.00@3.25

Dis. 15%

Ware, Hollow—Cast Iron, Hollow—

Store Hollow Ware:
Enameled ... 45&10%
Grained ... 50&5
Plain or Unground ... 60%
Country Hollow Ware, per 100 lbs. ... $3.00
White Enameled Ware:
Muslin Lined ... 65&10%
Colonial Ware:
Tinned and Turned ... 35&10%
Enameled ... 45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware ... 33⅓%
Iron Clad Ware ... 20&10%
Lava and Volcanic, Enameled ... 10&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Spiders and Griddles ... 65@65&5%
Avery Kettles ... 60%
Perforated ... 5 &10%
Never Break Spiders and Griddles ... 65&5%
Never Break Kettles ... 60%
Solid Steel Spiders and Griddles, 65&5%
Solid Steel Kettles ... 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone ... 40@40&10%

Washboards—

Solid Zinc: ... doz
Crescent, family size, bent frame $4.05
Red Star, family size, stationary protector ... $4.05
Double Zinc Surface:
Saginaw Globe, family size, station-
ary protector ... $5.55
Cable Cross, family size, station-
ary protector ... $3.60
Single Zinc Surface:
Nand, family size, open back, per-
forated ... $3.00
Single Saginaw Globe ... $2.85
Brass Surface:
Brass King, Single Surface, open
back ... $4.05
Nickel Plate Surface:
No. 1901 Nickel Plate, Single Sur-
face ... $3.60
Glass Surface:
Glass King, Single Surface, open
back ... $3.95
Enamel Surface:
Enamel King, Single Surface, varni-
lated back ... $3.95

Washers—Leather, Axle—

Solid ... 90@90&10%
Patent ... 90@90&5%
Coil: ⅛ inch 1 inch 1¼ inch
9c. per box 10c. per box 11c. per box

Iron or Steel—

Size bolt. ... 5/16 ⅜ ½ ⅝ ¾
Washers ... $4.65 3.75 2.45 2.25 2.05

The above prices are based on $6.75 off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots ...
per lb. 1¾@2¢

Wedges—

Oil Finish ... lb., 2¼@2¾¢

Weights—Hitching—

Covert Mfg. Co. ... 30&2%

Sash—

Per net ton, f. o. b. factory:
Eastern District ...
Western and Central
Districts ... $21.00@$23.00

Wheels, Well—

8-in., $2.00; 10-in., $2.45; 12-in., $3.25; 14-in., $4.45.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 ... 72½@72½%
10 to 18 ... 72½@72½%
19 to 26 ... 75@75&2½%
27 to 36 ... 77½@77½%
Galvanized:
6 to 9 ... 72½@72½%
10 to 14 ... 72½@72½%
15 to 16 ... 72½@72½%
17 to 18 ... 72½%
19 to 26 ... 70@75&2½%
27 to 36 ... 65@72½@70%
Coppered:
6 to 9 ... 65@70&5%
10 to 14 ... 70@75&5%
15 to 18 ... 65@70&5%
19 to 26 ... 70@75&2½%
27 to 36 ... 72½@72½%
Tinned:
6 to 18 ... 67½@70%
Brass ... 17c. lb., base
Copper ... 32¢ lb., base
Cast Steel Wire ... 50%

Spooled Wire—

Annealed and Tinned,
Brass and Copper ... 60@70&10%
Retailers' Assortments, per box. ... $2.10@$2.20

Wire Clothes Line, see Lines
Wire Picture Cord, see Cord.

Bright Wire Goods—

Screen Wire Goods ... 90@25&10%
Brass Wire Goods ... 90@90&10%
Brass Cup and Shoulder Hooks, ... 85&10%

Wire Cloth and Netting—

Galvanized Poultry Netting,
per 150 sq. ft. ... 80@85@85&5%
Painted Screen Cloth, 100 ft., 84-in. Standard Galv. Hardware Grade: per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh ... $2.75
Nos. 4 and 5 Mesh ... $3.00
No. 6 Mesh ... $3.25
Nos. 7 and 8 Mesh ... $3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ... 80@10&10%
Alligator or Crocodile ... 70@10@75%
Baxter Pattern S Wrenches ... 70@55@70&10%
Drop Forged S ... 45@55@55%
Acme ... 60&10%
Alligator Pattern, 70%; Bull Dog, 70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe,
40%; Briggs Pattern, 40%; Combi-
nation Bright, 40%
Steel Handle Nut ... 50%
Combination Black ... 40&5%
Merrick Pattern ... 50
Boardman's ... 60%
Coes' Genuine Knife Hdl. 40&10&5&5%
Coes' Genuine Steel Hdl. 40&10&5&5%
Coes' Genuine Key Model. 40&10&5&5%
Coes', Genuine Hammer Handle ... 40&10&5&5%
Coes' "Mechanics'" ... 40&10&10&5%
Donohue's Engineer ... 40&10%
Eagle ... 70%
Gem Pocket ... 70%
Hercules ... 60&10%
W. & B. Machinist:
Case lots ... 50&5%
Less than case lots ... 50%
W. & B. Railroad Special: ... 50%
Case lots ... 40&10&5%
Less than case lots ... 50%
Solid Handles, P. S. & W. ... 55&5%
Stillson ... 65%
Uwanta Wrench Co.:
Uwanta Special, Iron Handle ... 50%
Other Wrenches ... 50%
Vulcan and Agrippa Chain ... 50%
Whitaker Machinists': ... 50&10%
Case lots ... 40%
Less than case lots ... 50%

Wrought Goods—

Staples, Hooks, &c., list March 17, '92 ... 85@10&10%

Zinc— (*Cask lots at mill*)

Sheet ... *per 100 lb. $7.00*



GENERAL VIEW AND PLAN OF THE ENSLEY, ALABAMA, PLANT OF THE TENNESSEE COAL, IRON & RAILROAD COMPANY.

THE IRON AGE

New York, Thursday, May 21, 1908.

The Duplex Steel Process at Ensley, Alabama.

The New Bessemer and Open Hearth Plant of the Tennessee Coal, Iron & Railroad Company, and the Connected Blast Furnaces of Modern Type.

(With Supplement.)

Just as the transfer of the Tennessee Coal, Iron & Railroad Company to the United States Steel Corporation was being completed in the late fall of 1907, the first steel was made at the new plant at Ensley, Ala., in which the then owners of the property had centered such large expectations. This beginning of operations was noteworthy since it marked the introduction of the duplex process on a large scale as a factor in American steel making. Moreover, the new plant takes a place of special prominence in that many of its features were worked out by the company's engineers on lines in which

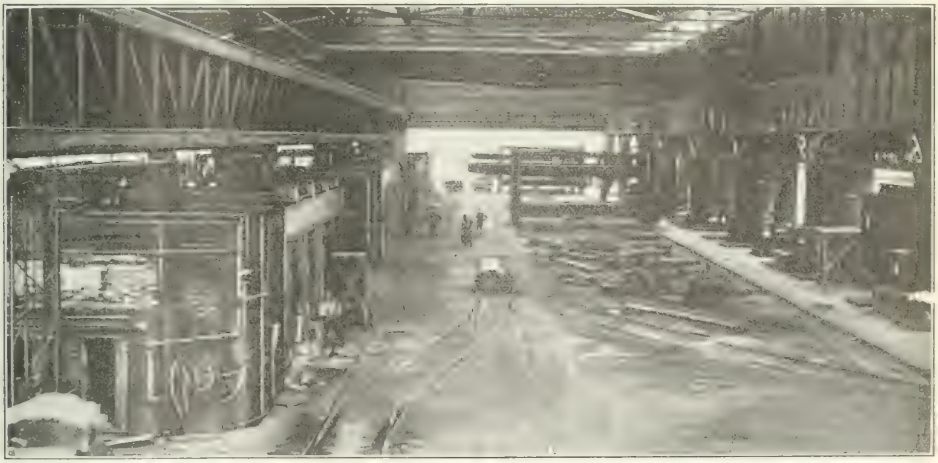


Fig. 1. Charging Floor of the New 100-Ton Open Hearth Furnaces of the Tennessee Coal, Iron & Railroad Company.

precedent was of little help. The results thus far have been a marked confirmation of early calculation, and announcement is now made of the decision of the new owners of the property to make further additions on similar lines.

The Tennessee Coal, Iron & Railroad Company has numerous important operations in the Birmingham District—steel works, blast furnaces, iron mines, coal mines, coke ovens, limestone and dolomite quarries. But Ensley, about 6 miles due west of Birmingham, has been for a number of years the chief center of its activities, and since the building of the steel works there in 1898 and 1899 the development of its raw material deposits has more and more converged upon Ensley. The present article has to do primarily with the new steel plant there and the features of the duplex process as now employed. In the same connection other important improvements made possible by the $7,000,000 expenditure of the past two years will be dealt with, particularly the modernizing of the blast furnace plant at Ensley—the whole representing the most elaborate programme of iron and steel works construction that has been carried out by a single company in an equal time, with the exception of the operation at Gary and the earlier one at South Buffalo.

The plant covers about 100 acres, on a hillside overlooking the town of Ensley. It consists of six blast furnaces, four new open hearth tilting furnaces (rated at 65 tons, but capable of 50 per cent. more); 11 50-ton open hearth furnaces (10 tilting and one stationary), which will be abandoned as indicated later; two 20-ton Bessemer converters at the new plant and one 15-ton converter at the old or No. 1 plant; a 250-ton primary furnace or mixer at each plant; a blooming mill, rail mill and finishing department; shops and various auxiliary departments. As will be referred to below, Ensley is particularly well located for the assembling of raw materials. The Birmingham Southern Railroad connects with all the railroads entering Birmingham and with all the company's properties in the district, including the foundry iron furnaces at Bessemer, and makes possible continuous service for all the mining and manufacturing operations. Two slopes of the company's Pratt coal mines and several batteries of coke ovens immediately adjoin the Ensley plant, while others on the Pratt seam and their connected cooking plants are from two to four miles distant. In Red Mountain, due south of Ensley, are the principal sources of ore supply, the haul ranging from 4 to 10 miles to Ensley furnaces. Brown ore comes farthest of all raw materials, the Greeley group of these mines being about 30 miles to the southwest. Dolomite comes principally from Ketona, about 10 miles northeast of Ensley, and limestone from Calcis and Vanns.

THE STEEL WORKS AND THE DUPLEX PROCESS.

In planning for the new steel plant at Ensley early in 1906, the Tennessee company's engineers had valuable data in the experience previously had there with the duplex process. The original steel plant consisted of ten 50-ton open hearth tilting furnaces of the forehearth type, the metal being poured directly from the furnace into the ingot molds. The forehearth system was given up later and the heats poured in ladle cranes. The in-

stallation of a converter of 10 tons capacity in 1904 marked the introduction of the duplex system, following some experiments in burning out a portion of the silicon and carbon in the basic pig previous to charging it into the open hearth furnace. It was found that with the large dependence of the company on its own pig iron in view of the scarcity of scrap in the Birmingham district, the employment of the Bessemer converter shortened considerably the time required in the open hearth furnace in view of the amount of silicon in the pig, and also reduced the outlay for fuel and lime. There were drawbacks, however, the waste of metal from various causes, some of them mechanical, being excessive.

The question of continuing the duplex process and that of the type of open hearth furnace to be employed required careful investigation. The isolated position of the Ensley plant in respect to scrap was one consideration. The lower fuel and lower lime cost with the use of direct metal and the converter was another. The possibility of larger output without corresponding increase in the waste of metal was another one.

The high first cost of plant was of course an important consideration on the other side of the account. There came up also the question of the stationary furnace as against the tilting furnace. The higher first cost of the latter was one element in the calculation. With some forms of the tilting furnace, where the center of tilting is not in line with the center of the ports, there is, of course, the loss of heat when the furnace is rolled over, cold air coming in at the ports, and where the ferromanganese additions are made in the furnace there may be some oxidation of the manganese by this inrush of air. The expense of tilting is a factor, also, though with a hydraulic system provided for, the cylinders for tilting represent the additional investment for this operation. The advantages of the tilting furnaces as they presented themselves to the Tennessee company engineers included the lower labor cost in doing away with the making up of troughs and closing and opening of tapholes. This last operation, when it proves unexpectedly difficult, may become additionally expensive by the oxidation of metal ready to be poured. The ability to pour off slag at any time is an advantage, and the tilting of the furnace at such times avoids the heavy slag loss at the back end of the furnace at a stage in the melting process when the slag is rich in iron, as may occur with the stationary furnace.

It is to be said that experience thus far at the new Ensley plant has given substantial evidence of the economies resulting from the construction adopted, 325 heats having been made without repairs on the furnaces and 200 heats without any outlay for repairs on ports.

An Unusual Bessemer Plant.

In the description following attention will be given first to the new steel plant as being most noteworthy, and to the Ensley practice with the duplex system. Features of the new blast furnaces will then be described, including the new bin system and the coke braize handling plant, and finally something will be said concerning raw material supplies and the improvements at iron and coal mining properties.

The prominent characteristics of the new construction at the steel works are its massiveness and adequacy. No risk was taken, apparently, of the replacement of any part of the equipment because of being unequal to the work imposed upon it. The great size of the Bessemer converters and the open hearth furnaces and the liberal proportions of the buildings containing them are at once impressive. In Figs. 1 to 5 are given photographic views in the new Bessemer and open hearth departments, while in the general plan view in the accompanying Supplement and in other illustrations the location and extent of the new buildings and their relation to the No. 1 open hearth plant are indicated.

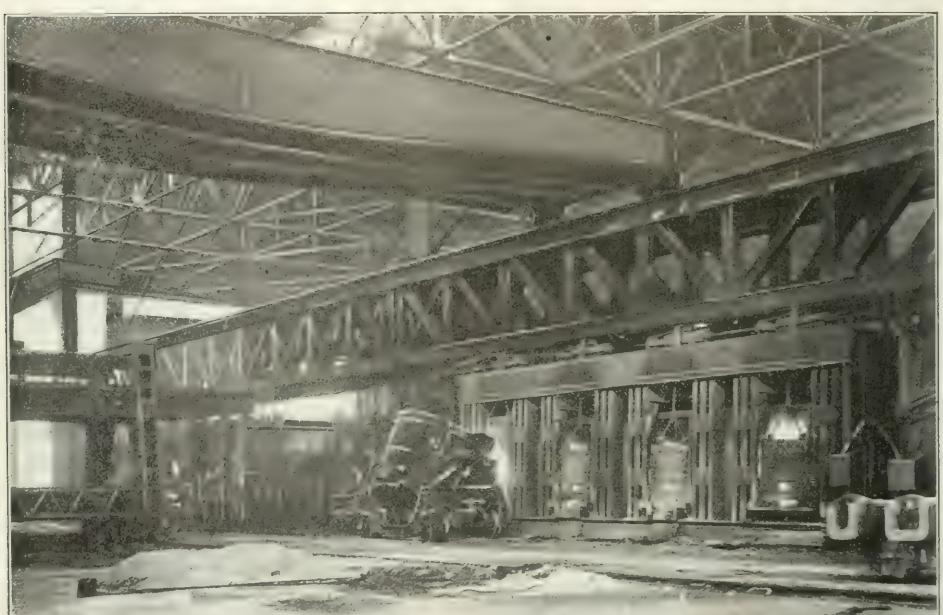


Fig. 2.—Charging a Ladle of Blown Metal.

The Bessemer building, which will be seen in the left hand portion of the general plan view, just at the right of the new steel works, is exceptionally large. The main proportions are 85 ft. in width, 262 ft. in length and 96 ft. 10¾ in. in hight to the apex of the ventilator roof. The converters and converter building floor are served by a 100-ton 6-motor double trolley electric traveling crane furnished by the Alliance Machine Company, Alliance, Ohio. This crane has a span of 80 ft. and the lift of the main hoist is 45 ft. 6 in.

A spare converter is provided and a relining pit as shown in Fig. 6 and a change of vessels is readily made by the aid of the crane, trunnions which can be caught by the crane hooks being provided on the upper portion of the converter. There are two 20-ton removable bottom converters with acid lining. They were built by the Pennsylvania Engineering Works, New Castle, Pa., after de-

advantage of the low pressure and the absence of oxide. signs by the Tennessee Coal, Iron & Railroad Company. The building contains also a 250-ton hot metal mixer built by the Variety Iron Works, Cleveland, Ohio. There are two 10-ton iron cupolas for melting scrap, and an adjacent bottom house of seven bottom ovens together with crushing and grinding machinery. By the use of the cupolas large scrap can be melted and thus labor saved at the skull cracker. The unusual size of the converters, Fig. 8, is a matter that received careful consideration at the outset. The 20-ton vessel was adopted since it offered economies in operation, decreasing refractory costs and reducing the expense of blowing. In the large converters the metal is shallow and thus high air pressure is not necessary to force the blast through it. Such high pressures cause loss by blowing out particles of iron. The experience at Ensley has demonstrated the [illegible] A [illegible] cross section of the plant are shown in Figs. 11 and 12, respectively. There are four basic open hearth tilting furnaces of the company's design built by Alex. Laughlin & Co., Pittsburgh. The hearths are each 15 ft. wide and 44 ft. 2 in. long inside measurement. The regenerative chambers are placed below the level of the furnace hearth and away from the furnaces under the charging floor. The air chambers are 14 ft. 8 in. wide and 20 ft. 6 in. high. The gas chambers are 8 ft. 7 in. wide by 20 ft. 6 in. high, and the ratio of air chamber to gas chamber space is about 6 to 1. Gas from the producers and the air are admitted to valves leading to the bottom of the regenerative chambers. The air and gas circulate through the checker brick work and pass through the slag pocket to the up-takes, the gas delivering into the hearth through two ports while the air after leaving the up-take sweeps down from the top of one

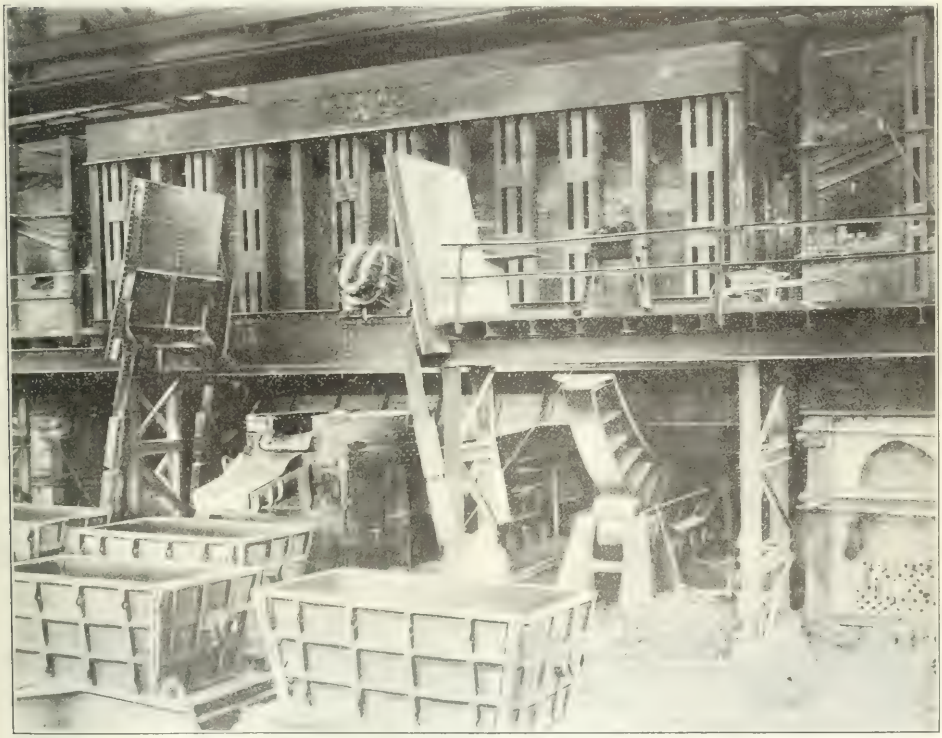


Fig. [illegible] Producer Side of the Open Hearth Furnaces, Showing Slag Cars and Ladle Trough in Place.

tion of metal at the close of the blow is noticeable. As an insurance against break downs the converters were made of very heavy design. They are operated hydraulically by a pair of vertical racks and operating pinions.

The arrangement of the air line, which is direct connected to the converter, is shown in Fig. 9 together with the valves and fittings, and details of the trunnions are shown in Fig. 10. Adjoining the converter building and connected to it are the cupola hoist and charging floor. Runners from the cupola are so placed that the ladle of hot metal may be stopped immediately under them on its way from the mixer to the converter and receive an addition of cupola metal.

The Open Hearth Furnaces.

The open hearth works, as shown on the ground plan, occupy a building adjacent to the converter works building, the latter being midway between the new and old open hearth plants, which are connected by railroad track. The new open hearth building is 459 ft. long, 156 ft. 2 in. wide and 101 ft. 3¾ in. high to the apex of the ventilator roof. A lean-to runs the entire length of the broad port. The gas and air reversing valves are of the mushroom type and are water cooled. As shown in Fig. 12 they are located below the charging floor. The design of the valves is such as to give long service without repair and to ensure them against carelessness of operatives. The products of combustion are carried off by four steel stacks 180 ft. high from base and 6 ft. 6 in. inside diameter of brick work, which pierce the roof of the lean-to.

The open hearth furnaces are exceptionally massive. Their axis of rotation is on the center line of the ports and provision is made to reduce the amount of cold air introduced into the furnace to a minimum, the clearance between the stationary port and the furnace ports being but 1 in. The bottoms of the uptakes are furnished with slag pockets and are easily cleaned after the removal of false arches. The charging side of the furnace is provided with four charging doors. These will be water cooled as soon as arrangements are completed for increasing the reserve water supply. There are no doors on the back of the furnace. All doors, jambs and chill plates at the port ends are water cooled. The doors are

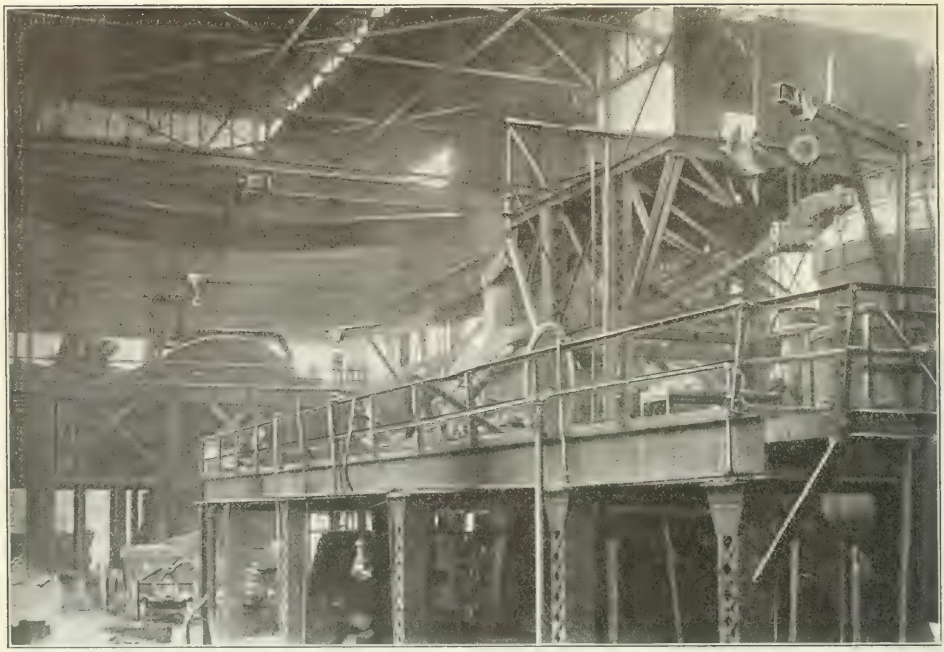


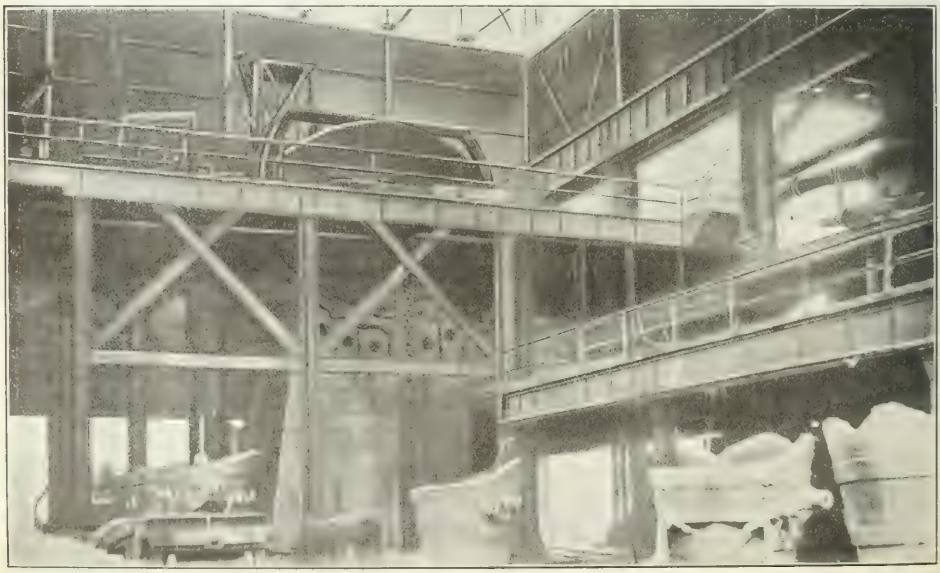
Fig. 4.—The Two 20-Ton Converters. Mixer Plant in the Background.

lifted by hydraulic cylinders on top of the furnaces operated from a nest of valves directly opposite each furnace.

The furnace hearth proper when lifted for pouring stands at an angle of 30 degrees and is operated by a hydraulic cylinder. The plunger of this cylinder rides a set of rollers and is attached to a heavy steel casting rack which meshes into a heavy gear segment rigidly bolted to cross girders below the furnace and directly underneath its center. These are massive parabolic girders built up of structural steel. Near their ends and bolted 26 ft. ½ in. apart are two heavy steel casting rockers. These ride on rollers which turn in large double bearing roller supports as shown in Figs. 3 and 12. The weight is carried by the end rockers and none comes on the rack to which the cylinder plunger is attached.

The heavy construction of this building, which was fabricated and erected by the Pittsburgh Steel Contruction Company, is noteworthy. The crane girders along the center column are 102 feet long and 11 ft. 3½ in. deep. This heavy construction is due to the unusual span required because of the length of the furnaces and the heavy crane loads. Each of these girders weighs 76 tons.

The level of the charging floor is 16 ft. above the pouring floor or sufficient to facilitate the handling of ma-



terial to the former which is also the floor of the furnace building. The raw materials to be charged into the furnaces, apart from the hot metal, are brought to the floor in charging boxes by means of a standard gauge railroad system. A departure from the usual plan is the construction of double tracks of standard gauge in front of the furnaces, the two tracks being connected up by crossovers at each end, and also by a switch from the blast furnace hot metal track. The purpose was to avoid interruptions or delays while charging the furnaces. The blown metal track is laid directly in front of the furnace and the second track is used in the charging of scrap and other material, neither interfering with the other. The hot metal is poured into the furnaces by the use of a spout, and the ladles are tilted by an overhead travelling crane. Two charging machines of the Wellman high type are used to lift the boxes from the cars and deposit the contents in the furnaces. The machines are electrically operated and have a long reach to span the two tracks.

For handling the ladles on the charging floor there are two 45-ton four girder cranes, with double trolley and five motors, furnished by the Alliance Machine Company. They have a span of 80 ft. and a lift of 35 ft. The main trolley has a 45-ton hoist operated by a 50-hp. motor and an auxiliary hoist of 10 tons capacity. The liberal dimensions of the charging floor side both as to hight and width afford excellent ventilation and add to the comfort of the workmen.

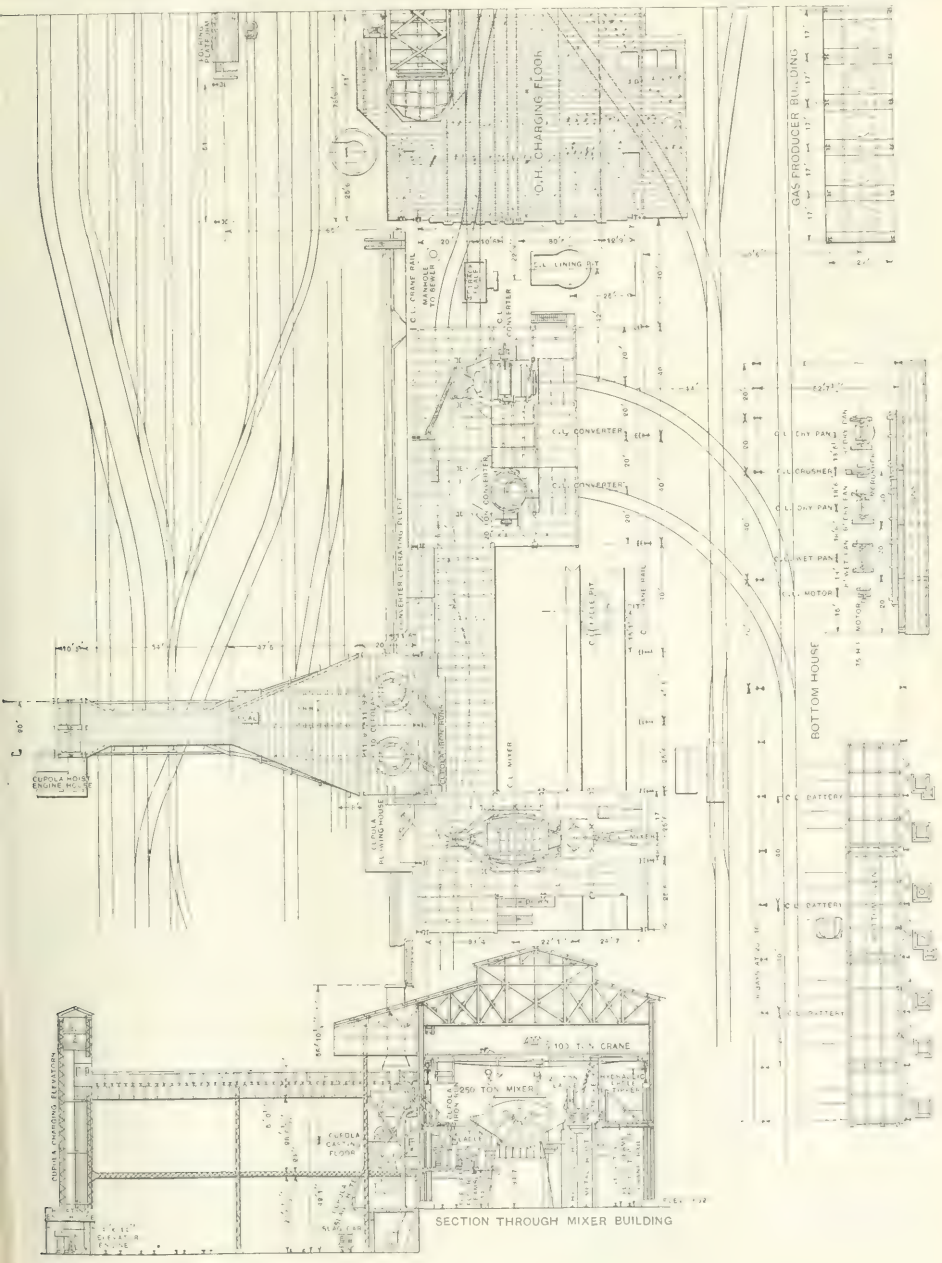


Fig. 6. Plan of the Bessemer Plant, with Section Through Mixer Building.

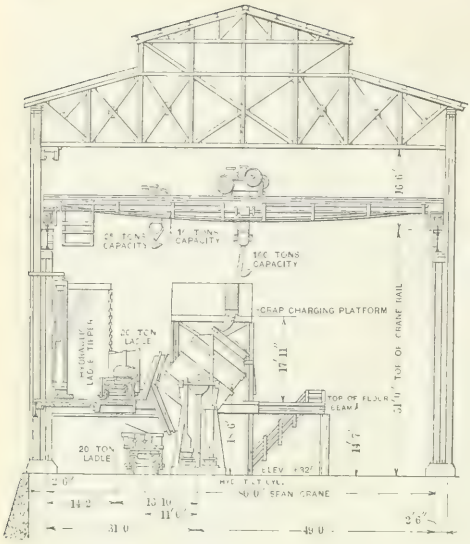


Fig. 7.—Section Through Converter Building.

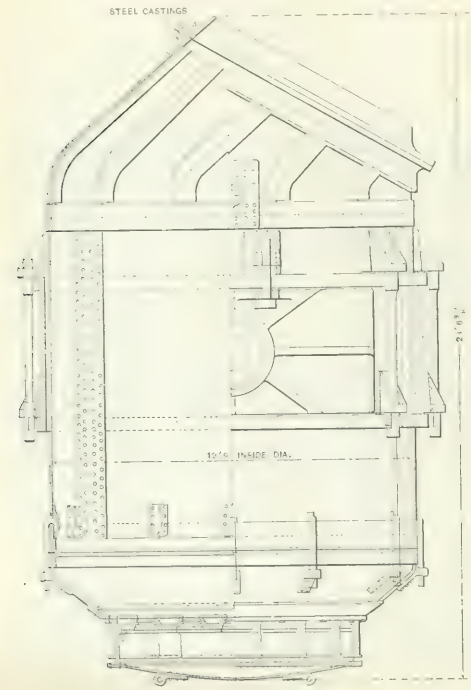
The Pouring Side.

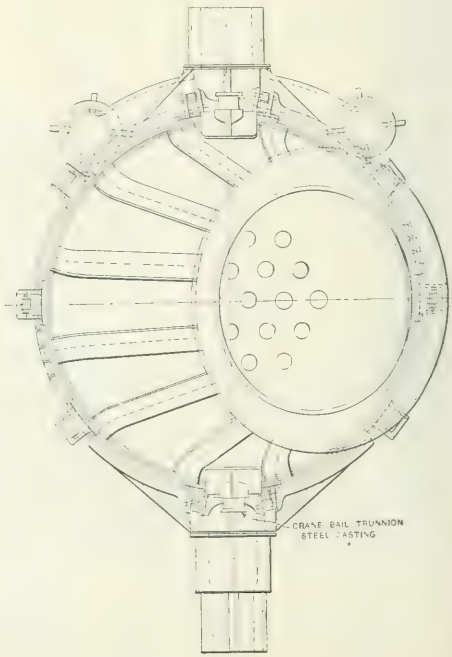
The pouring floor is 52 ft. wide and 459 ft. long. It is commanded by two four girder ladle cranes of 65 ft. span, each equipped with double trolley and six motors. The main trolleys are of 100 tons capacity and each crane has an auxiliary trolley of 25 tons capacity. The bridge travel is 200 ft. per minute and the track on which it runs is 29 ft. 6 in. above the level of the floor. The crane hoist has a 35-ft. lift.

From end to end of the building on the pouring side are three standard gauge steel tracks—a slag track and two tracks for ingot mold cars, for the carrying of skulls, ladles, &c., outside the buildings and for other purposes. The slag car track runs alongside the furnaces just outside the ladle pits. One of the economies introduced aims at the practical abolition of pit slag, which is not only expensive to gather up and remove, but keeps the plant in disorder. Fig. 3 shows a ladle cut down at the top for a space sufficiently large for fastening on a spout which conducts the slag into boxes placed on the slag car track. By running off the slag in this way the capacity of the ladles is utilized entirely for steel. For removing slag from the furnace during the process of melting a narrow gauge system is laid directly under the charging floor with spurs running underneath the furnaces. The slag cars are placed in position on these tracks and when the furnace is tilted at an angle of 15 degrees toward the charging side, the slag runs into the cars through spouts leading from two end doors on that side of the furnace. These cars are then removed through the subway to the yard. This is the only narrow gauge system about the plant.

There are two pouring platforms each 136 ft. long. The ladles are of 100 tons capacity. When one of these is filled with molten steel it is lifted from its rest by a crane and conveyed to the pouring platform. The same crane returns it to the stand or carries it to be repaired. The drums of the 100-ton trolley hoist are spread in such a way that their cables do not interfere with the travel of the auxiliary trolley the full span of the crane bridge, and the crane manipulator is thus able to tip the ladle in either direction.

Access is had to the tapping hole of each furnace by the unusually large extension of the charging floor back of the furnace. As seen in Fig. 3 a double lift platform raised and owered somewhat after the manner of a bascule bridge extends along the pouring side of the furnace directly opposite the pouring spout. The two sections of each platform are counterweighted and are raised and lowered by means of winches on each side of the spout. In their nearly upright position the sections of the platform act as shields to the men charging ferromanganese or other material into the molten metal in the





Figs. 8 and 9.—Side and Top Views of Converter.

ladle. The platform in each case is provided with a trap door through which the materials are thrown.

At the south end of the steel works yard is a skull cracker 150 ft. long and 80 ft. span, equipped with a 50-ton skull cracker crane with 25-ton auxiliary hoist. There is also a drop ball equipment and a lifting magnet 52 in. in diameter, the latter furnished by the Electric Controller & Supply Company, Cleveland, Ohio. The tracks are laid out for the convenient handling of material to and from the skull cracker and a track scale is located midway outside of the plant for the weighing of this material.

To the east of the open hearth building is the mold yard and directly west of the open hearth is the stock yard. Ore, scrap, limestone, dolomite and pig iron are brought in on standard gauge tracks and are stored in the proper bins and loaded directly into charging boxes. Charging box cars are weighed on track scales and transferred by locomotives to the charging floor of the open hearth works.

Practice with the Duplex Process.

Some details of the present method of operating under the duplex process at Ensley will be of interest: The hot metal from the blast furnaces is conveyed in 25-ton ladles to the north end of the mixer building, which is the end nearest the blast furnaces and about a mile distant from the farthest or No. 6 furnace. This metal runs 0.80 to 1.25 per cent. in silicon, 0.9 to 1 per cent. in phosphorus, and 0.3 per cent. in manganese. While the Ensley furnaces have for some years made iron within ordinary basic specifications, the duplex process makes it unnecessary to hold them strictly to such a specification. In the first place, the loss in the converter would be unnecessarily high if in developing a temperature sufficient to burn out the carbon there resulted any oxidation of iron. Again, the blast furnaces will run more smoothly and produce more iron when operating with the leeway indicated, instead of being held strictly as to silicon and phosphorus. Having been weighed on track scales just before entering the mixer building the ladle is set on a platform beneath which is a hydraulic cylinder, which lifts it to the pouring platform of the mixer, located 31 ft. 3 in. from the ground. The substitution of the hydraulic lift for the crane commonly used in serving metal mixers was with a view to greater safety. By means of a hydraulic ladle tilting device the contents of the ladle are emptied into the 250-ton storage vessel. On the other side the metal to be blown is poured from the mixer into 20-ton ladles, which traverse the converter charging floor between the mixer and converters. For pouring into the converter they are tilted by a hydraulically operated swinging crane. This floor is 15 ft. above that traversed by the 20-ton ladles which carry the blown metal from the converter to the open hearth charging platform. The time required for blowing the heats at the converter varies, depending on the silicon content of the iron, the blast pressure and other factors. Desiliconizing takes from 2 to 10 min. To decarbonize takes from 12 to 20 min.

With the open hearth furnace the proceeding is about as follows: Burnt lime and iron oxide, the latter as scale or ore or both, are charged into the furnace, together with scrap. Ordinarily about 15 per cent. of scrap is used—bloom crops, rail crops, pit scrap and skulls. A rabbling device is used in spreading the cold charge over the bottom of the hearth, the charging machine arm being used to manipulate it. All the hot metal is desiliconized in the converter and partly decarbonized. The percentage of carbon blown out depends on the amount of scrap originally charged in the open hearth furnace, the kind of finished steel, &c. Ordinarily half the hot metal charge, or two ladles, has been blown soft, while in the other half is left 2 per cent. or slightly more of carbon, with silicon and manganese practically eliminated in the shortened blow given in the converter. The analysis of the metal in the first and second of the four ladles which make an open hearth charge is as follows, as it comes from the converter: Carbon, 0.1 per cent.; phosphorus, 0.7 to 1.00 per cent.; manganese, 0.08 per cent. When these last two pots of metal are poured into the open hearth furnace a violent reaction takes place, throwing practically all the phosphorus into the slag. The new plant has been kept on steel for the rail mill since it was started up last fall, and the practice has been so well perfected that 98 per cent. of rail steel has been turned out as a monthly average. Recarbonizing of the steel at the end of a heat is not often found necessary, the practice making it possible usually to catch the carbon on the way down. The additions of ferromanganese are for the sake of the manganese. It is found that from 1 to 1½ hr. is required for charging the blown metal and an hour to finish the heat. The records thus far kept show a variation in the total time required in the open hearth furnace from 4 hr. to 8 hr. 5 min. While the furnaces were designed for 65 tons they have already made 85 tons at a heat, and it is expected that 100-ton heats will be reached.

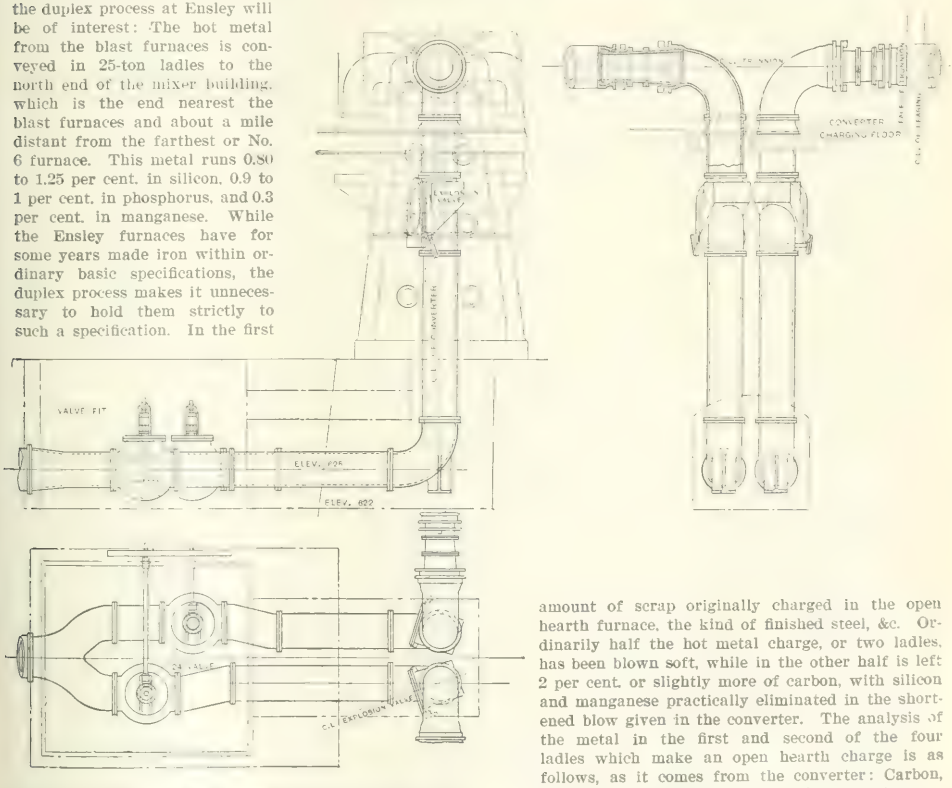


Fig. 9.—End, Side and Plan Views of Converter Blast Piping and Valves.

The size and design of the furnaces and the flexibility in the handling of slag and in pouring when the heat is ready, afforded by the tilting, have conduced to a number of economies. The distance between ports minimizes the destructive action of the gases on roofs and ports. A shallow bath is maintained, the surface being 18 in. below the bottom of the charging door, with a 21-in. depth of bath in the center of the furnace. While time will be required for the perfection of practice and for more detailed information as to just what the possibilities of the duplex method are, it is stated that much less than the theoretical loss of metal has been realized thus far. Part of this is due to the construction of the converter and the practice in that department. Analyses have shown also considerably less than the usual amount of iron in the slag from the open hearth furnaces.

Additional Open Hearth Furnaces.

The four 100-ton open hearth furnaces had been operated but a short time when it was decided that further extensions should be made on the same lines, this decision being made after the acquisition of the property by the United States Steel Corporation. Work is now under way on two new 100-ton tilting furnaces, the land adjacent to the old open hearth plant being utilized, as shown on the plan view in the accompanying supplement. After this work had been undertaken the scope of the plans was again enlarged and two furnaces of like size were added. This will give a second group of four 100-ton open hearth furnaces, with the new converter works midway between it and the completed group described above.

The installation of two stationary furnaces has also been authorized, and these are now being designed, for

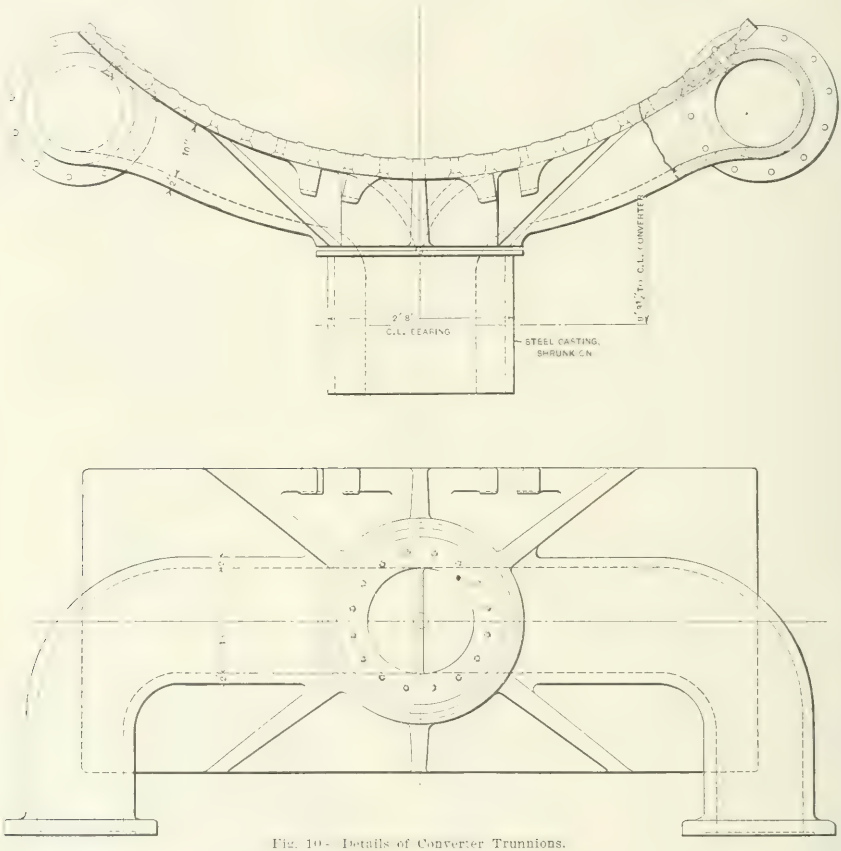


Fig. 10.—Details of Converter Trunnions.

Blooming Mill and Rail Mill.

A 44-in. blooming mill and four four-hole soaking pits were a part of the original steel plant, and later a 27-in. three-stand rail mill was installed. The first open hearth rail was rolled in November, 1902, and the Ensley rail, being of hard, tough, open hearth steel, has been so successful that the demand was greater than the capacity of the plant. Then came the designing and installation of the new open hearth and Bessemer steel works, described above, and the remodeling of the blooming and rail mills and the finishing department of the latter. The new rail mill and the auxiliary equipment give a capacity of 50,000 to 60,000 tons of rails per month. These installations will be described in a later article. The rail department was shut down April 1, to put in the new mill, and just 30 days later the first rail was rolled. Meantime the open hearth department has been idle, but it will start up June 15, when the rail mill will resume operations in full.

the handling of scrap. They are to be of 50 tons capacity each, with open and removable top. They will be located on the present site of the old open hearth furnaces, necessitating the dismantling of practically all of the old furnaces.

Hydraulic and Blowing Engine House.

Blast is supplied the Bessemer converters through a 30-in. air line by an Allis horizontal cross compound Corliss blowing engine, 46, 88, 84 and 60 x 84 in., which is located in a steel and brick building, separated from the Bessemer building by a battery of coke ovens, and by the bottom house. The engine house is 160 ft. long by 54 ft. wide, and is provided with a 20-ton traveling crane. It also contains two Laidlaw-Dunn-Gordon flywheel pressure pumps, 27 x 34 in., 34 in., 7¼ x 30 in., furnishing water for operating the hydraulic cylinders at 550 lb. pressure, the speed being regulated by an attachment to the accumulator. Steam is supplied by four

500 hp. Stirling boilers and four 300-hp. Wickes boilers, the latter being located at the coke ovens and using the waste gas as auxiliary fuel.

Gas Producers.

Gas for the open hearth furnaces is supplied through overhead gas mains from 20 gas producers, 10 ft. 6 in. in diameter, built and designed by Alex. Laughlin & Co., Pittsburgh, located in a building parallel with that containing the open hearth furnaces. This plant is provided with coal and ash handling and storage facilities, there being overhead storage bins into which the coal is deposited by bucket elevators of heavy design, operated as follows:

Run-of-mine coal is received in cars on a track alongside the building, deposited in coal receiving hopper and fed by a feeder of the apron or pan type to a Heyl & Patterson No. 3 coal crusher to reduce the coal to about 2 in. and under. Provision is made for by-passing the slack so as to put only the larger coal through the crusher. The product of the crusher, which has a capacity of 60 tons an hour, is gathered by a hopper and delivered to an elevator of the chain and bucket type, which lifts the coal 78 ft. vertically and conveys it 18 ft. horizontally to a 350-ton storage bin, erected about the center of the producer battery. The frame work of this bin is steel and the body is of reinforced concrete. The bottom is hoppered and is equipped with roller gates. The coal is drawn from this storage bin into 5-ton hoppers on electric traveling coal distributers, two of which, each operated by a boy, traverse the producer house from end to end, measure the coal by means of scales and deliver it to a portable hopper of 1500 lb. capacity over the different producers. The scale beam is located in front of the crane cage. The coal handling plant is operated by three motors. The first drives the apron feeder and crusher, the second the elevator and the third traverses the distributer.

The ashes from the producers are delivered to the ash storage bin as shown in elevation in Fig. 12, and in plan in Fig. 13. They are drawn from a water seal pit in the regular way and delivered to six 20 cu. ft. ash cars, which are pushed on tracks shown in the plan to a point about the center of the battery, where they are dumped into a 60 cu. ft. skip bucket. By means of an electric hoist this bucket is lifted about 60 ft. and the ashes discharged into the ash storage bin. This bin has a capacity of 2000 cu. ft. The frame is built of steel and the body of reinforced concrete; the bottom is hoppered and equipped with roller gates, through which the ashes are discharged into the return coal cars on the siding.

The gas from the producers is conveyed by pipes of large diameter to overhead receivers from which it is piped to the regenerative chambers. The arrangement of piping is shown in Figs. 11 and 12, which indicate that the gas passes on straight lines to the checker work and that the overhead pipes are equipped with dirt legs for the settling of solid matter carried over in the gas.

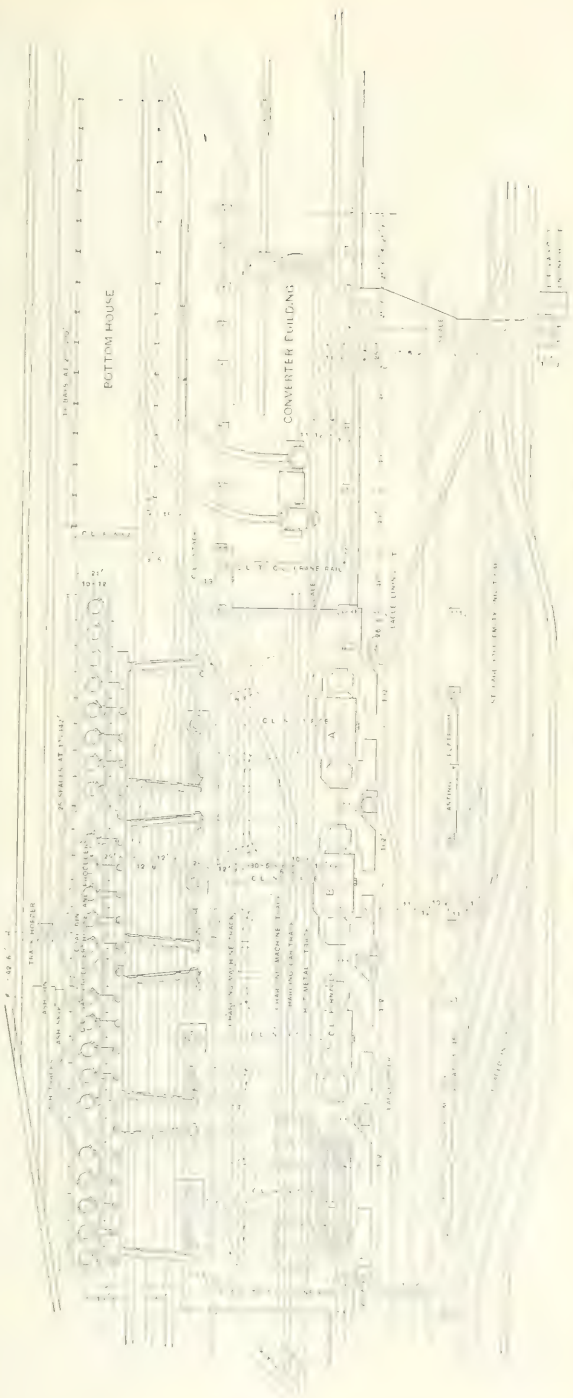


Fig. 11 Plan of Open Hearth and Producer Plant, with Bessemer Plant in Outline.

BLAST FURNACE AND OTHER NEW CONSTRUCTION.

The present Ensley blast furnaces consist of six stacks, three of which are of modern type, equipped with incline skips with steam hoisting engines, while three are hand filled furnaces. The reconstruction of these latter furnaces has been authorized, and they will be re-

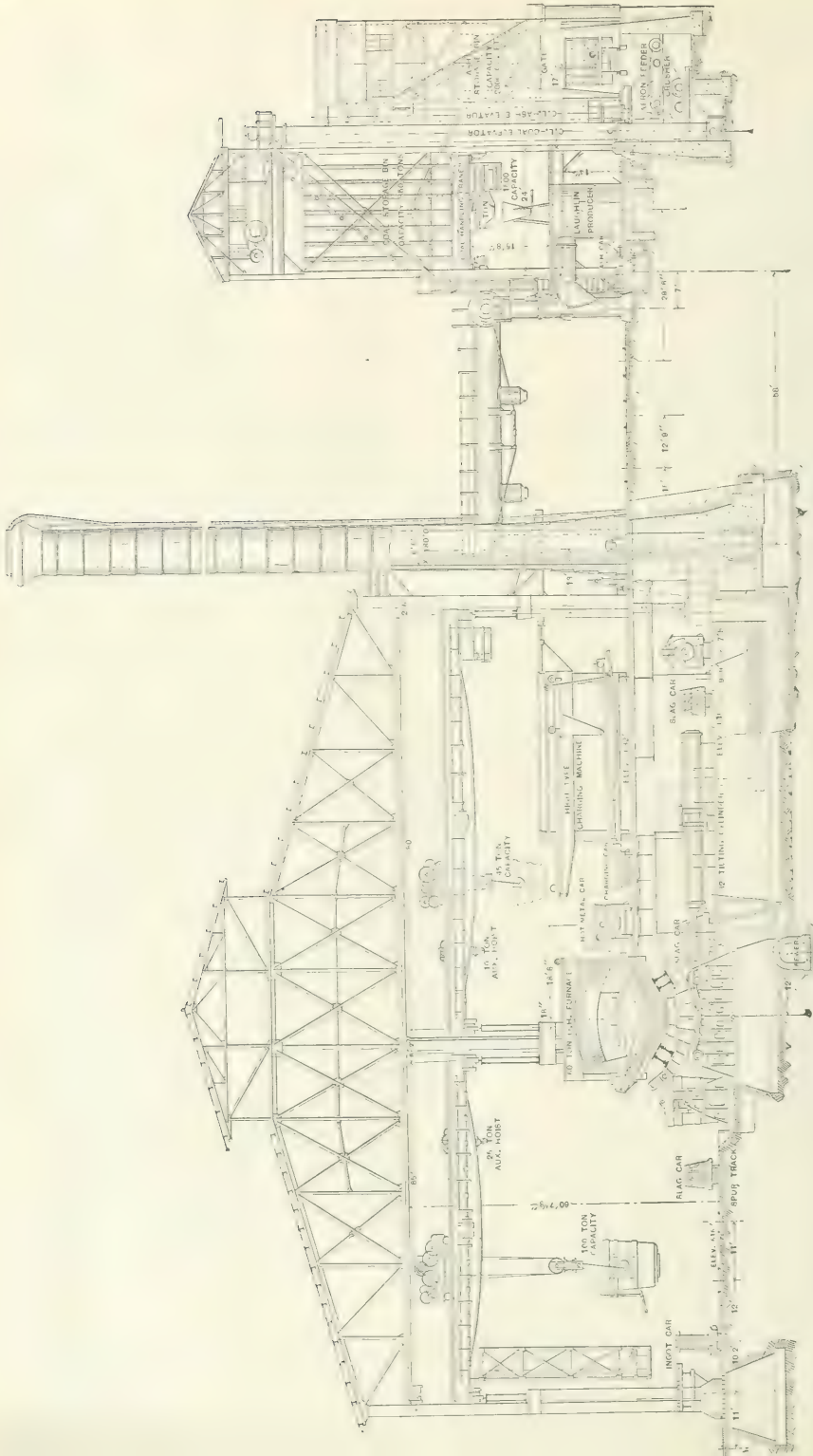


Fig. 12.—Cross Section of Open Hearth Building, Gas Producers and Coal and Ash Handling Equipment.

placed by three modern 400-ton capacity furnaces. The original plant consisted of four hand filled stacks, which were built in 1887 and 1889 by Col. Enoch Ensley. The first of these to blow in was No. 4 furnace. This is the last member of the group to be replaced by a modern equipped furnace of 350 tons capacity, the new No. 4 stack having been blown in in June, 1907. The new Nos. 5 and 6 furnaces were built in 1900 and 1903, respectively, and are also of 350 tons capacity each.

The new No. 4 furnace, a cross section of which is shown in Fig. 16, has the following principal dimensions: Hight, 84 ft., 9½ in.; hearth, 14 ft., 6 in.; bosh, 21 ft., 9 in.; stock line, 14 ft., 9 in. There are 11 tuyeres and 11 columns. This exact alternation of tuyeres and columns avoids the unhandy proximity of a tuyere to a column, as often seen. The general arrangement of the head frame has a number of improvements which have proved their value in operation. The arrangement of iron runners gives direct channels from the center of the furnace and the center of the cast house to three spouts which deliver the iron into hot metal cars inside the cast house, the tracks running immediately alongside of the center run. The track layout as a whole tends to eliminate the possibility of a blockade. This new No. 4 furnace made 11,261 tons in the month of March, on a mixture yielding about 39 per cent. metallic iron.

are of the Berquist parabolic design, and the coke bins are provided with screens for removing the fine coke. The braize handling plant and its operation are as follows, after the design of the Jeffrey Mfg. Company, Columbus, Ohio:

There are two Jeffrey rubber belt conveyers, an elevator, screen and structural steel storage bins, with facilities for loading railroad cars on two tracks by means of chutes. The main conveyor, of 10 tons per hour capacity, starts underneath the coke bins, where screening plates allow the smaller sizes of coke to fall upon it. This belt conveyor, which is 18 in. wide, with 1081 ft. centers, discharges the material on a second rubber belt conveyor, of 31 ft. centers. The coke is carried up an incline by this means, and discharged into a continuous bucket elevator of 66 ft. vertical centers, with buckets 12 in. x 12 in. x 8 in. This elevator is located at the braize storage bins, and empties its buckets into a 4 ft. diameter by 10 ft. Jeffrey revolving screen, which has ½ in. x 2 in. perforations running the long way around the screen. This screen delivers its products to one of two compartments of the braize storage bin, each compartment having a capacity of 110 tons. Four 9-ft. swing chutes, with roller valves on one side of the storage bin and four underneath, allow the braize to be loaded into railroad cars from either place, and in any mixture of

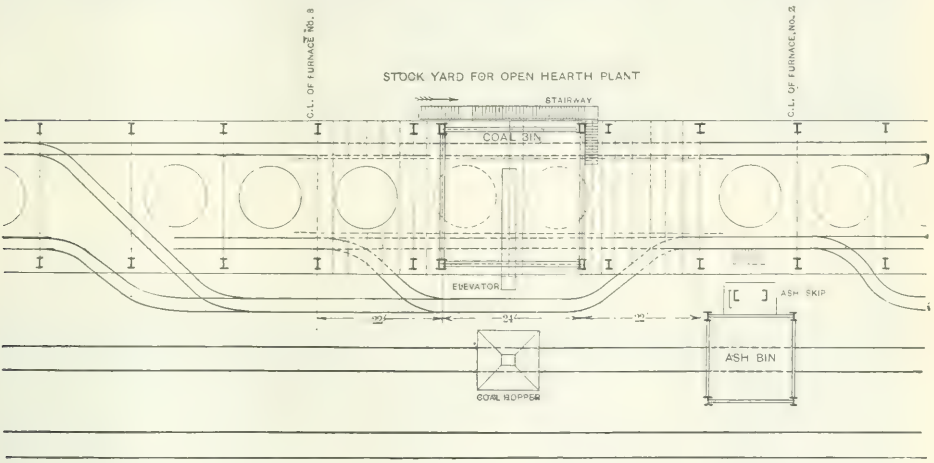


Fig. 13.—Enlarged Plan of Central Portion of Gas Producer House, Showing Location of Coal and Ash Handling Apparatus.

The three modern furnaces are provided with closed top and Brown distributer, and a double steam-operated skip hoist with 120 cu. ft. capacity skip cars. No. 6 furnace is equipped with four Kennedy two-pass stoves 21 ft. in diameter by 90 ft. high. Nos. 4 and 5 furnaces have four McClure three-pass stoves each, and are 21 ft. in diameter and 100 ft. high. Stoves of the latter type are now being constructed for blast furnaces Nos. 1, 2 and 3.

As a consequence of the hight of the furnaces above Village Creek and the lack of water at certain times, the water from the blast furnace boshes is returned to a reservoir of 1,000,000 gallon capacity, cooled by the Koerting system of spraying, and re-pumped by two 16 and 26 x 13 x 36 in. Prescott cross-compound Corliss pumping engines, the total capacity of the station being 20,000,000 gallons per day.

Coke and Ore Bin System.

Ore and limestone are delivered directly from mines and quarries on cars to stock bins alongside the blast furnaces, and, as the operations are continuous the year round, the large ore storage noticeable in Northern plants is unnecessary, only enough storage capacity being provided to tide over interruptions in the supply. The bin system consists of a continuous row of pockets 1072 ft. long, built of wood and iron. A second double row of steel ore and coke bins is now being constructed by the Pittsburgh Steel Construction Company. The ore bins

screenings and tailings desired. Two motors, of 20 hp. each, drive the entire equipment, one furnishing power for the two belt conveyers, the other for the elevator and screen. The screened coke braize will be utilized under boilers at various departments of the plant or sold for use in the manufacture of water gas.

The blast furnaces are supplied with two kinds of coke—namely, bee hive coke, which is supplied directly to the bins from the company's ovens located at the coal mines, two of the latter being inside the plant, and Semet-Solvay or retort coke. The Semet-Solvay plant consists of 240 by-product ovens located adjacent to the stock-house, and their coke is delivered to the bins by electrically driven scale cars with a minimum amount of handling. The coke is transferred from the bins and dropped into skip cars by electrically driven scale cars. These run on a single track underneath the new steel ore and coke bins and on a second track under the wooden bins. Chutes are arranged to deliver the material from the bins to scale cars, which are transferred by a system of cross-overs to the second track mentioned above. This is located directly over the several receiving bins located centrally to the furnaces, from which the material is delivered into the skip cars direct. The scale cars are of 130 cu. ft. capacity each, and are of the Pennsylvania Engineering Works design.

In addition to the above bin capacity, the installation

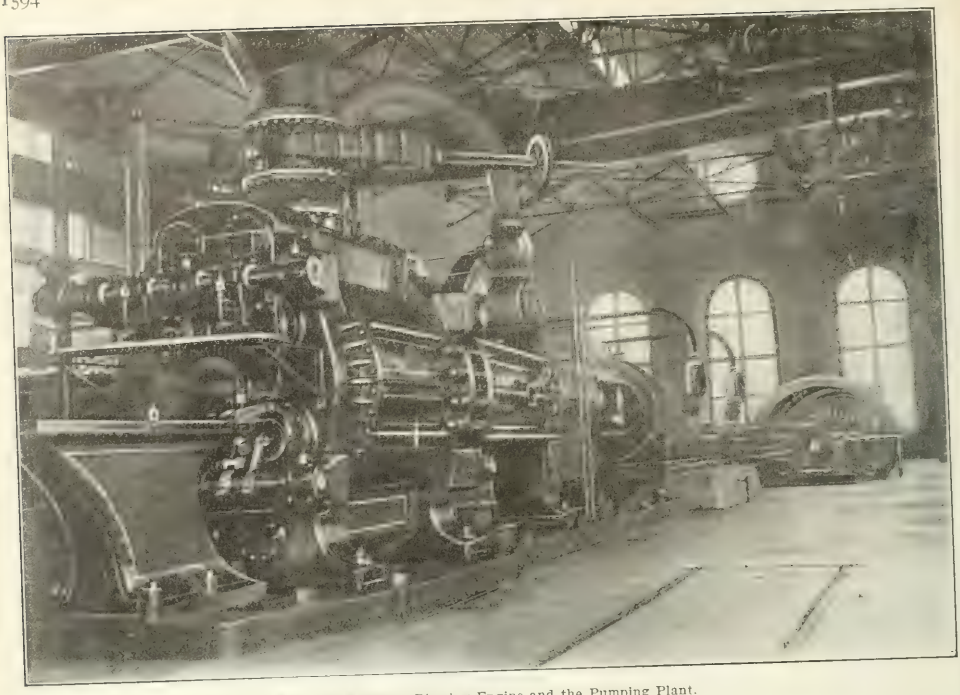


Fig. 14.—Bessemer Blowing Engine and the Pumping Plant.

of a bridge for the storage of brown ore has been authorized, utilizing the ground west of the present stock bins. This will necessitate an ore bridge equipment complete with a trolley and grab bucket of 5 tons capacity. The stiff leg of this crane will run along the ground, while the other leg will be carried on top of the new steel coke and ore bins. Bottom dump ore cars will deposit the ore in several pockets from which the grab bucket will handle

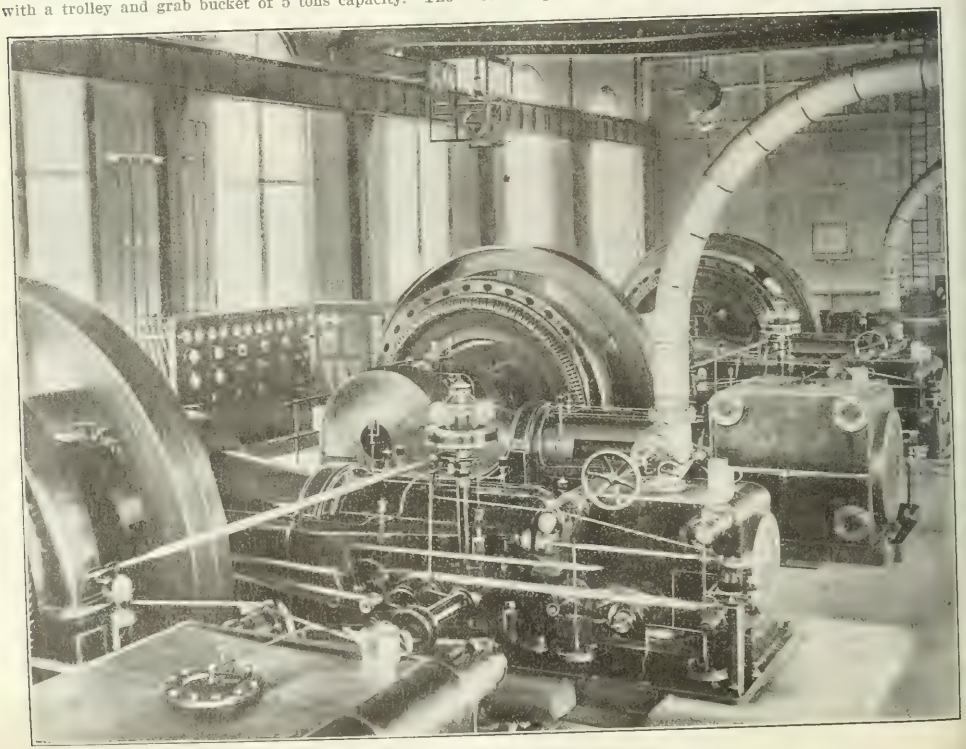


Fig. 15.—Central Electric Power House.

it to the space provided for piling, which will give a net storage capacity of 150,000 tons. From this pile the ore is placed in the bins with the same bucket. This equipment has not as yet been purchased.

A lime and dolomite burning plant is being designed which will handle 200 tons per day. It is proposed to install 20 kilns of 10 tons capacity each and three calcining cupolas for the burning of dolomite. Producer gas will be used for fuel for the kilns and cupolas. The arrangement of this plant is expected to be the most modern of its kind.

Blast Furnace Blowing Engines and Boilers.

The blowing engine equipment for blast furnaces Nos. 1, 2, 3 and 4 consists of 10 Mesta vertical long crosshead type independent compound Corliss engines, 44 and 84 in. by 60 in., and four 84 and 84 by 60 in. Three of these engines blow one furnace, with two high pressure engines as spares. Two additional low pressure engines are contemplated. The arrangement of steam and air piping allows considerable flexibility in operation. Equipment for blast furnaces Nos. 5 and 6 is located in a separate engine house, and consists of four 44 and 84 in. by 60 in. Mesta vertical long crosshead type, independent compound Corliss blowing engines, and three 84 and 84 in. by 60 in. Mesta engines, allowing one high pressure engine for reserve. These engines are duplicates of those at blast furnaces Nos. 1, 2, 3 and 4.

Steam is supplied to the blowing engines at furnaces Nos. 1 to 4 and the electric power house engines from 1200 hp. Wickes vertical boilers, 2500 hp. Cahall boilers and 3500 hp. Stirling boilers. There is also an old installation of horizontal fire tube boilers, which are not in service. It has been proposed to supply these plants with a more efficient type of water tube boilers. At blast furnaces Nos. 5 and 6 steam is furnished by 6400 hp. Wickes vertical boilers. A soft water treating plant has been provided for these boilers.

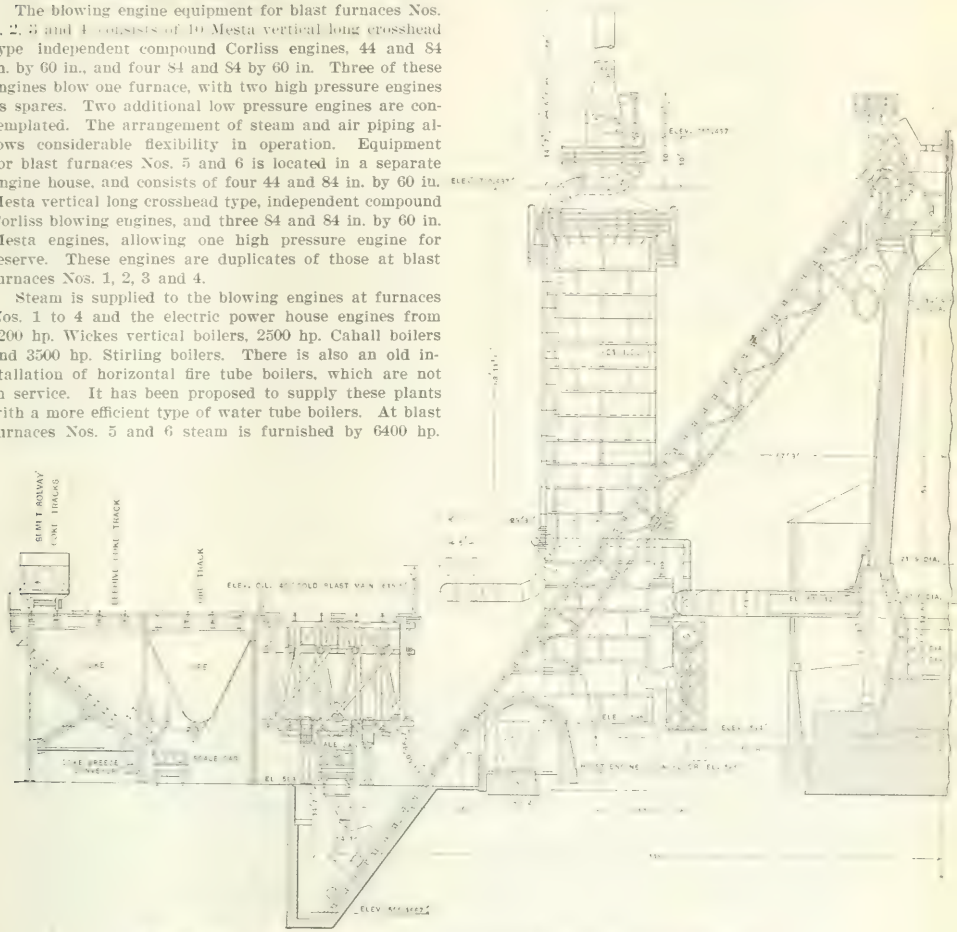


Fig. 2.—Section Through New Blast Furnace No. 4 and the Bar, Structural and Skelp Mills.

Pig Casting Machine.

Iron is delivered from the blast furnaces in 25-ton ladles of modern design, and ordinarily taken direct to the steel plant mixer, but during interruptions and on Sunday the surplus metal is handled by two Uehling type pig machines of two strands each. These machines are located between the furnaces and steel plant in order to insure good shipping facilities, and the handling of empty and loaded cars to and from the machines.

Electric Power House.

The conditions governing the power equipment of a steel plant are continually changing in the early stages of operations. A more commodious station with provisions for extensions has been erected, therefore, looking to the growing demands of the future. This new power station replaces a direct current power house and generates current at a high voltage, which is transmitted at a minimum loss to a sub-station. Here, by means of a simple reducing apparatus, consisting of rotary converters and transformers, the current is transmitted at 250 volts into the direct current system. The new alternating current electric power plant building is 54 ft. wide by 180 ft. long, is built of steel and brick, and is provided with a 20-ton electric traveling crane. The present equipment consists of three 600-kw. three-phase revolving field, 2200-volt alternating current Westinghouse engine type generators, direct connected to three 23 in. and 40 x 42 in. horizontal cross-compound Corliss Wisconsin engines, running at 107 rev. per min. One 75-kw. motor generator and one 75-kw. 125-volt direct current generator, direct connected to a 11 x 14 in. Buckeye engine, running at 275 rev. per min., furnish power for exciting the fields. The installation of two 500-kw. rotary converters, together with the several banks of transformers, has been authorized, and by this installation this equipment in its entirety will be brought up to the same capacity as the main power station.

Modern Shops and Other Improvements.

A structural shop and a foundry having one 15-ton open hearth furnace, iron cupolas and a brass department, have been provided for handling repair and construction work. They are located between the blast furnaces and steel works and a modern group of shops, all

new, consisting of a machine shop, blacksmith shop, carpenter and pattern shop have been recently installed. A further addition of an electrical repair shop of large dimensions is authorized to complete this group. A pattern storage building is now being erected and various other auxiliaries necessary for the successful operation of the steel plant are provided. The machine shop should be specially mentioned for its completeness of equipment for doing work correctly and with rapidity, having all

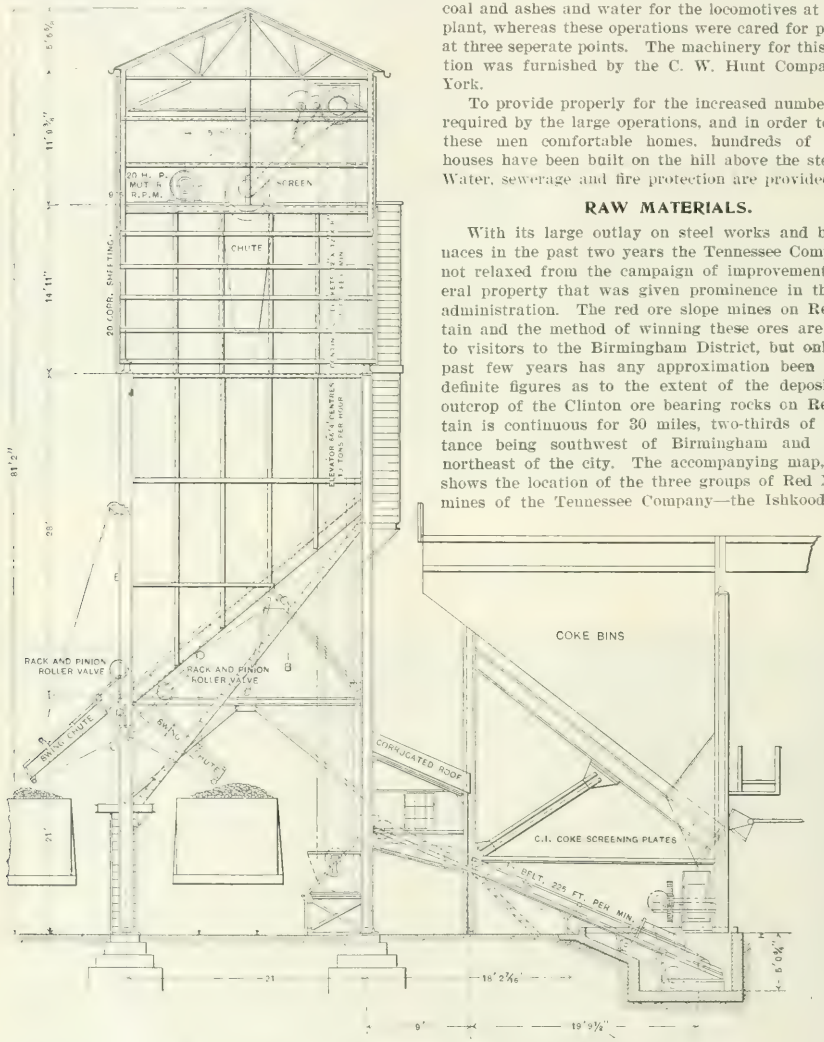


Fig. 17.—Section Through Coke Braize Screening and Conveying System.

tools necessary for the complete equipment of such a plant. This building is 200 ft. long by 100 ft. wide, with with main span of 50 ft., equipped with crane runway and 40-ton crane with auxiliary hoist of 15 tons, furnished by the Alliance Machine Company. In this span all the large tools are located, together with the erecting floor. The building has two lean-tos, 25 ft. span and 200 ft. long. Each lean-to is equipped with two revolving travel electrically operated jib cranes of 5 tons capacity. These facilitate the handling of all material, eliminating the awkward and numerous jib cranes often seen. The revolving cranes were designed by the company's engineers and built in the Birmingham District. The blacksmith shop, pattern shop and electric repair shop all have equipment of high efficiency.

A reinforced concrete reservoir 190 ft. in diameter by 25 ft. deep, holding 5,000,000 gal., is being installed on the hill above the plant, to insure a steady supply of water during temporary interruptions to the supply from Village Creek pumping station. Water is supplied from this plant by three pumps, the capacity of the station being 18,000,000 gal. a day.

A centrally located locomotive coaling station has been built, which has made possible the handling of coal and ashes and water for the locomotives at a central plant, whereas these operations were cared for previously at three seperate points. The machinery for this installation was furnished by the C. W. Hunt Company, New York.

To provide properly for the increased number of men required by the large operations, and in order to furnish these men comfortable homes, hundreds of tenement houses have been built on the hill above the steel plant. Water, sewerage and fire protection are provided.

RAW MATERIALS.

With its large outlay on steel works and blast furnaces in the past two years the Tennessee Company has not relaxed from the campaign of improvement of mineral property that was given prominence in the Bacon administration. The red ore slope mines on Red Mountain and the method of winning these ores are familiar to visitors to the Birmingham District, but only in the past few years has any approximation been made to definite figures as to the extent of the deposits. The outcrop of the Clinton ore bearing rocks on Red Mountain is continuous for 30 miles, two-thirds of that distance being southwest of Birmingham and one-third northeast of the city. The accompanying map, Fig. 20, shows the location of the three groups of Red Mountain mines of the Tennessee Company—the Ishkooda, Fossil and Muscoda. The average thickness of the ore seam at the Red Mountain outcrop is 8 to 9 ft. The dip of these beds is 20 to 25 degrees and the slopes are from 900 to 1800 ft. in length, most of them less than 1500 ft. The ore is brought to the surface in skips, and is crushed before loading into cars. In the Ishkooda group the company has been opening up to new slopes, both of which are expected to be producing, when needed, at the rate of 800 tons a day each. By the construction of 1½ miles of new company track connection has been made for these mines with the Louisville & Nashville Railroad, which, through its Birmingham Mineral Division, serves all the Red Mountain ore properties. It runs along the slope of the ridge, 150 to 350 ft. below the summit and passes from one side of the mountain to the other

through the gaps nature has provided. At some of the older iron mines the Tennessee Company has made considerable expenditures in the past year or more in installing additional compressors and boiler equipment.

In the Tennessee Company's brown ore field at Greeley extensive test pitting in the past year has developed some large ore bodies. Heavy stripping was carried on in the latter part of 1907, and the removal of the overburden of 12 to 20 ft. of sand put them in shape for increased production. In the manufacture of basic iron at Ensley it is desirable to use from 25 to 35 per cent. of brown ores. Their porosity gives faster travel of the furnaces, and they are desirable for their manganese content, though they carry a higher percentage of phosphorus than the red ores.

Estimates of the company's ore reserves have increased, as scientific methods have been applied to the measurement of the ore bodies. E. F. Burchard, as the result of his investigations for the United States Geological Survey, estimated 340,000,000 gross tons of red ore in the Birmingham District, workable under present conditions, while E. C. Eckel, also of the Survey Staff, estimated 1,000,000,000 tons of red ore in reserve in the State of Alabama. Since it is accepted that the Birmingham District contains 90 per cent. of the workable red ore of the State, it may be considered that Mr. Eckel's figures include a vast amount of ore now unworkable.

The Tennessee Company has estimated its ore at 700,000,000 tons, largely self-fluxing, and averaging around 38 per cent. in metallic iron. Similarly it reckons its coal in the ground at about 2,000,000,000 tons of which perhaps half is of coking quality. Its production of ore, with all properties active, is at the rate of 1,600,000 tons a year; of coal, 3,000,000 tons a year, and of coke, 1,300,000 tons a year.

The coal mines have received their full share of expenditure for improvements in the past two years. Machine mining has been employed to an increasing extent, dating from the strike of five years ago, and electric generators have been installed for operating pumps and coal cutting machines and for lighting. For the washing of coal modern jigging machines are now generally used, replacing the old time log and trough washers. In the Pratt field shaft No. 12, about three miles northwest of Ensley, is the latest to be opened up, its product being about 2000 tons daily. A steel head frame was built, the

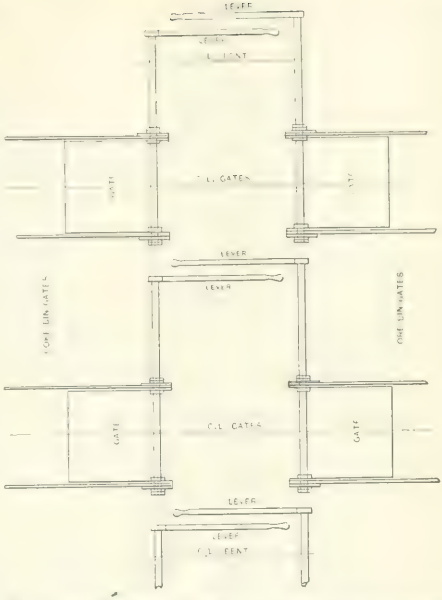


Fig. 18.—Arrangement of Levers for Coke and Ore Bin Gates.

first the Tennessee Company has erected, and electric coal cutters were installed. The headings are driven with the Morgan heading and loading machine, and to reduce the possibility of dust explosions a tight iron coal car is used exclusively.

A 500,000-Ton Ore Stock Pile.

Since the rebuilding of three of the Ensley furnaces it has been demonstrated what can be done under modern conditions at the blast furnace, reinforced by better results at coal mines and coke ovens and by a regular supply of iron ore. Among the appropriations made last fall for the Tennessee Company's properties was one for



Fig. 19.—View in Machine Shop.

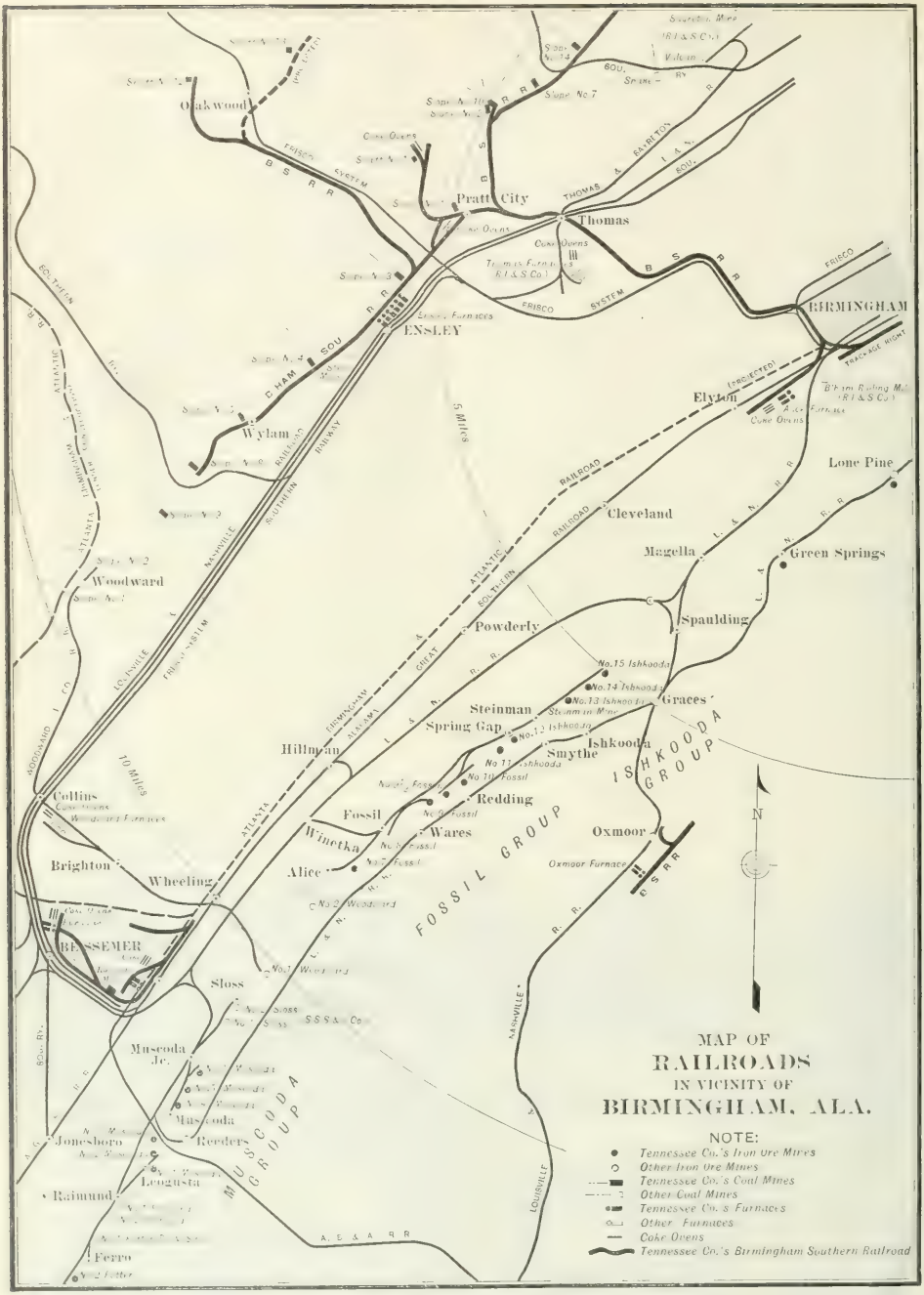


Fig. 20.—Location of Tennessee Coal, Iron & Railroad Company's Plants in the Vicinity of Birmingham and Connections Through Its Own and Other Railroads.—The Red Mountain Iron Mines Are Conspicuous, the Openings Being on a Line Extending Southwest from Birmingham.

the accumulation of ore stock piles on Red Mountain amounting to 500,000 tons, something never done before in Southern practice. The losses of output at Southern furnaces in the past years, due to the interruption of the supply of raw materials from one cause and another, would probably total enough to build a modern plant. The factors in the better results now secured at Ensley furnaces are several. Regular ore supply, coke with lower ash due to washing of coal, better stoves, and regular blast due to better engine efficiency are some of them. The improved status of the steam problem is a factor of betterment, moreover, whose results are apparent from end to end of the plant.

When the bin system at Ensley is completed it will

be possible to carry a week's supply of raw materials at the furnaces. After Furnaces 1, 2 and 3 have been reconstructed over 10,000 tons of raw materials a day will be charged into the furnaces, if all are in operation. The coke requirements, it should be noted, are not what they were in the old days, the present average being between 2700 and 2800 lb. to a ton of pig iron.

Birmingham's Water Supply.

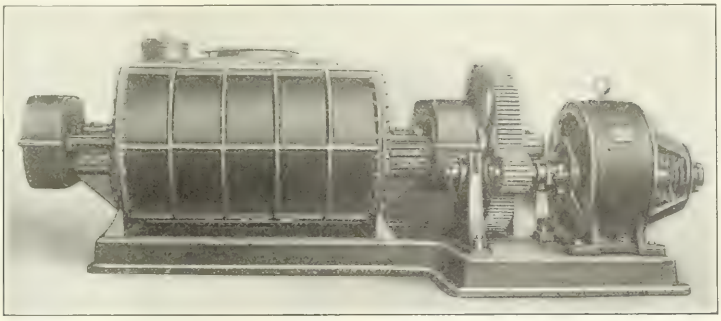
The question of water supply is one that Birmingham must give attention to if further additions to the steel industry in that district are expected. A report on the proposal to draw on the upper reaches of the Warrior River was prepared last year by Prof. Edgar B. Kay of the Department of Engineering, University of Alabama, Tuscaloosa, Ala. Professor Kay's investigations were particularly directed to the problem of locating and estimating the cost of an aqueduct of 100,000,000 gal. daily capacity. A depth of 5.25 ft. was figured on, with a width of channel at the water level of 22.5 ft. It was contemplated that this canal should empty at North Birmingham into Village Creek, the present source of supply of Birmingham industries. The beginning of the canal as proposed is in the Locust Fork, distant about 55 miles north of Birmingham. Provision was made in the plans for the construction of various reservoirs in the catchment area. The cost of the project was estimated at about $1,300,000. No steps have been taken as yet to carry out the plan, although there is a strong sentiment in favor of it and appreciation of the fact that the industrial future of Birmingham is contingent upon taking of early steps to provide an adequate water supply. While the condition of the city finances has not been regarded as favorable to such an undertaking, the large industrial companies in the district might be induced to aid the project to the extent of taking at least a part of the bond issue that will be required.

A Scherzer Rolling Lift Bridge for Egypt.—It is announced that a contract for the construction of a new bridge to cross the Nile River at Cairo, which will cost more than $1,500,000, has been signed by the Ministry of Public Works with the Compagnie de Fives-Lille of France, after an international competition in bidding for its construction. The new bridge, which will be located at the deepest part of the Nile River, and will lead directly to the site where the Boulac Museum stood, is to be built in accordance with plans prepared by the late Sir Benjamin Baker of London, the engineer of the great Forth Bridge, Scotland, and the Scherzer Rolling Lift Bridge Company, 220 Broadway, New York, the latter company also furnishing consulting engineering services during erection. The entire work is to be executed under the charge of the Ministry of Public Works of the Egyptian government, and it is expected that the new bridge will be completed and in service before the end of the year 1910. This bridge has a total length between abutments of 274.5 meters. The total width of the bridge will be 18 meters, divided into two footpaths of 3 meters each, a tramway track of 5 meters to carry double lines of electric tramway of 1 meter gauge and 7 meters of road clearance.

A Motor Driven Roots Foundry Blower.

Ordinarily a foundry blower needs to be operated only a short time in the afternoon, but it is very important that while a heat is in progress the supply of air be uninterrupted. In other words, the source of power must be absolutely reliable. As the demand is very heavy at this time and but small all the remaining time, as low an investment cost as possible is desirable. For these reasons electric motors are preferred by many, especially where current may be purchased from a central station.

The illustration shows a motor driven blower suitable for foundry work. The blower is manufactured by the P. H. & F. M. Roots Company, Connersville, Ind., and the motor by the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. The use of adjustable, self-oiling bearings is a particularly commendable feature of these blowers. The blowers are designed for a range of speed variation of approximately 1½ to 1 to allow a variation in the melt to be made if at any time such becomes necessary. For this purpose direct current motors are frequently used, as they permit the desired changes in speed, when specified in ordering the motor. In many installations it is not necessary to be able to adjust the speed of the blower, so that the constant speed characteristics of the induction motor permit its use where alternating current is available. A large number of applications have been made in this way, and are reported to have given entire satisfaction.



A Roots Positive Pressure Blower with Westinghouse Driving Motor

The approved method of driving is by gearing direct from the motor, permitting the use of a moderate speed motor, thus reducing the original cost, and doing away with belt drive. The size of the motor selected depends upon the conditions to be met in the foundry. In general a pressure of 16 ounces may be taken as the average maximum that the blower will be required to deliver against. As the motor will require a capacity of approximately 5 hp. for every 1000 cu. ft. of air supplied per minute at 16 ounces pressure, the proper size of the motor is readily determined when the capacity of the cupola is known. Usually 30,000 to 33,000 cu. ft. of air is necessary to melt 1 ton of iron. As the pressure may increase slightly above 16 ounces toward the end of the heat, the power required also increases, but the overload capacity of the motor is able to take care of this increase. If the pressure is to be materially more than 1 lb. for a long period, slightly greater capacity should be allowed for in the motor. The power will increase or decrease in direct proportion to the increase or decrease in pressure.

The Sharpe Machine Company, Inc., Quincy, Ill., manufacturing dies, presses and sheet metal working tools, was dissolved May 1. The business will be continued by the Sharpe & Becker Machine Company, a copartnership. The firm contemplates increasing its output capacity in the near future.

The Machinery and Supply Convention.

Joint and Concurrent Meetings of the National and Southern Dealers' and the American Manufacturers' Associations, Richmond, Va., May 13 to 15.

Richmond, Va., the capital, metropolis and historic centre of the Old Dominion, has added another to her long list of important events. The cry, "On to Richmond" was repeated last week but answered by men engaged in the pursuits of peace; peace, industrial and commercial.

In the South, everyone of sufficient importance to stop at the Jefferson Hotel is a general, colonel or major, but all were content to be captains of industry last week when they united with men bearing the same title from the North, coming to form with their Southern comrades, the great army for the upbuilding of the Machinery and Supply Confederacy of America.

It was a great gathering. Manufacturers and merchants making and selling machinery and supplies from all parts of the country mingled with each other, feasted together and discussed business problems for their mutual advancement.

Richmond, the city of the first successful electric railroad, with its many points of historic interest and beauty, appealed to the large number of visitors. Richmond had her Captain John Smith, but she now has her Alvin M. Smith, the hustling, genial secretary-treasurer of the Southern Supply and Machinery Association and president of the Smith-Courtney Company. To Alvin M. Smith belongs much credit for the excellent entertainment and hospitality provided the visiting delegates.

What Was Accomplished.

Looking back over the proceedings of the entire series of meetings, the following definite accomplishments come most prominently into view:

The three organizations went on record as opposing any reduction of prices at this time, contending that the resumption of business which is already under way can best be encouraged by a continuation of stability in values.

The associations reaffirmed their indorsement of the minimum resale price system on the rebate plan. This action was emphasized by both dealers' organization pledging themselves to assist the manufacturers in a rigid enforcement of the system wherever adopted.

Action was taken looking toward influencing the United States Government in requiring that all goods purchased by the Government shall be marked with the name of the manufacturer thereof.

Resolutions were passed opposing legislative action in behalf of the so-called anti-trust and anti-injunction measures and requesting legislation sanctioning the combination of manufacturers and merchants where such co-operation proves beneficial to the industries and trades affected and unharmful to the public.

The American Supply and Machinery Manufacturers' Association changed that section of its by-laws which provided that the organization should meet at the same time and place as the convention of the Southern Dealers' Association. It should be mentioned here that this was done without ulterior motive and simply because the Manufacturers' Association has grown so large and of such national scope that it was felt to be unwise that it should be tied down in any way to any other organization.

Members of the National Dealers' Association who are engaged in the machine tool business ratified the form of contract as formulated by the committee of its members and the committee of machine tool builders and the form contract to become effective, awaits but the ratification of the machine tool builders' organization, which holds its convention this week at Atlantic City. The machinery dealers also requested specifically that the manufacturers maintain prices.

WEDNESDAY, MAY 13.

Separate executive session of the three organizations were held in the morning. The order of business in each case consisted of routine matters, reports of officers and appointment of convention committees. The officers' reports showed gratifying increases in membership in every case and showed very substantial accumulations in the three treasuries.

The nominating committees appointed were as follows:

American Supply and Machinery Manufacturers' Association.—Samuel L. Moyer, J. H. Drury, John Trix, W. S. Paden and N. A. Gladding.

Southern Supply and Machinery Dealers' Association.—John G. Christopher, Thomas S. Bowles, H. C. Clark and J. D. Lombard.

National Supply and Machinery Dealers' Association.—George T. McIntosh, Charles H. Strelinger, George Vonnegut, W. A. Sommers, O. T. Webb.

In the meeting of the Manufacturers' Association action was taken changing Art. 10 of the by-laws, which provides that the annual meeting of the association shall be held at the same time and place as that of the Southern Dealers' Association. The change leaves the manufacturers free to meet wherever and whenever they please. While they are not longer compelled to meet with the Southern Association it is very probable that they will continue to do so as the benefits of co-operation through joint sessions are too great to make a change desirable. The manufacturers are now foot-loose, nevertheless.

The manufacturers also voted to have their fiscal year begin March 1. Charles F. Aaron, of the New York Leather Belting Company, introduced a resolution of regret and sympathy to the Southern Dealers over their loss during the last year of Captain George Smith, head of the Smith-Courtney Company, of Richmond.

S. P. Browning, of the Ohio Valley Pulley Works, Maysville, Ky., introduced a resolution directing that the regrets of the association be communicated by telegraph to C. H. Briggs, president of the Southern Dealers' Association, who was absent owing to sickness.

OPENING JOINT SESSION.

The Richmond convention of the Southern Supply and Machinery Dealers' Association, National Supply and Machinery Dealers' Association and American Supply and Machinery Manufacturers' Association was opened with a joint meeting at 2 p. m., Wednesday, May 13. It had been intended that C. H. Briggs, president of the Southern, the senior association, should preside at this meeting, which was in fact the only session to which every one, even the public, was admitted. J. C. Miller of the Miller Supply Company, Huntington, W. Va., first vice-president of the Southern organization, occupied the chair instead. After the invocation delivered by Rev. Robert W. Forsyth, rector of St. Paul's Episcopal Church of Richmond, and the singing of "America," Mr. Miller spoke a few words of welcome in lieu of President Briggs' address. President George Puchta of the National Association followed with an address, saying in part as follows:

President George Puchta's Address.

We are living in an age of organization and associations, and they are found in all parts of the world. Progress and changed conditions have brought them about; have made them necessary. Not so many years ago business was done by the individual or a partnership of individuals, but the company or corporation is rapidly replacing them, and the business signs of individuals or copartnerships are constantly decreasing.

NECESSITY FOR TRADE ASSOCIATION.

Business corporations, consisting of a greater number of individuals, are constantly increasing. Modern business methods, progress and incentive to do greater things have made this necessary, as well as beneficial in many ways, over old methods. We are agreed in this. Now, if such association and co-operation are necessary and proper for the pres-

ent conduct of business in individual concerns, is it not equally essential in a larger sense, as evidenced by the numerous trade associations? The associations represented here to-day are a manifestation of this necessity.

Our Government as never before is giving recognition to trade associations. Greater scope undoubtedly will be granted at an early date, thoroughly recognizing their necessity. This is shown by the recent discussions in Congress regarding amendments to the Sherman anti-trust law, the granting of increased powers to the Interstate Commerce Commission, &c.

Trade associations in Germany are numerous. Our consular reports of 1905 show the existence of about 450 associations, called kartells. Let us quote from our daily *Consular and Trade Reports*, Bureau of Manufacturers, Department of Commerce and Labor, of January 18, 1908:

The trust proper is less highly developed in Germany than in America, but nearly every branch of industry syndicates, agreements and combinations, or kartells, as they are termed, are controlling largely the business situation.

There is nothing in German law to forbid any agreement among manufacturers or dealers in regard to prices and terms, as long as it does not fall within the limits of the term "unfairness in trade," or is not "contrary to good morals."

Associations of this character are subject to the general laws requiring registration and publication of any changes in organization or object, &c.

The Supreme Court has declared that no valid objection could be made to them, only when a combination seeks to control a market for speculative purposes; to hinder the free play of economic forces, or upon an attempt to create a monopoly and exact exorbitant prices from consumers. It recognized the legality of combination in order to prevent losses in any branch, through excessive competition and underbidding. It clearly established the principle that "united action and agreements to affect production and control prices are not, *per se*, opposed to good morals."

Encouragement of trade associations unquestionably has a deterrent effect upon the formation of extremely large industrial corporations, or so-called trusts.

MANY QUESTIONS MUST BE HANDLED THROUGH ASSOCIATIONS.

Necessity is largely responsible for the development of these associations. Individually we are not as strong as formerly, but collectively we are a power, and that power must only be used for good. Many questions in the trade are constantly arising which cannot successfully be handled by the individual, and must therefore be taken up in associations.

They are for the benefit of all—the manufacturer, the dealer and the consumer. Their interests are mutual. The manufacturer and dealer are really one, because the dealer is the selling department, or distributer, for the manufacturer. This is an economic problem. The dealer in our lines, in most cases, reduces to the minimum the selling expense of the manufacturer.

The advantages of association are many. First of all, the opportunity is offered of personally knowing your competitor, with whom you have so much in common. After you know him, you regret such acquaintance did not formerly exist. Many mutual benefits and staunch friendships develop from such relations.

From this come interchange of ideas, correction of abuses in trade, information regarding credits, assistance in reducing and buying stocks, better methods of handling and distributing goods, and improved methods of accounting, by which every department may be analyzed and show the exact cost of goods and of doing business; better education of our salesmen and other employees, and, above all, of ourselves. A higher degree of business ethics is attained.

All of these things bring about good and profitable results. Intelligent competition, which is "the life of trade," is created, and "unintelligent competition, which is the death of trade," is discouraged.

BANKING ASSOCIATIONS PREVENT A GREAT PANIC.

Many more examples showing the advantages of association and co-operation could be given. Let me give you an additional illustration. When we met in Cincinnati in May, 1907, we had over 400 present from all parts of the United States, representing concerns whose aggregate ratings would total millions, and, when all was prosperity, we did not anticipate that at this time we would be called upon to face a great depression in business.

You are all familiar with the strained financial conditions recently experienced and the wholesome outcome. That result was accomplished by the bankers' and clearing house associations throughout our great land co-operating, with one great object in view—to prevent a panic. It was only by this wonderfully effective co-operation that a great panic was prevented. Such co-operation is also going on in other lines of business, and will undoubtedly reduce this depression to the minimum more effectively than by any other means.

Our associations during the few years of their existence have done much work, and already have much to their credit. With a membership extending from the Atlantic to the Pacific accomplishments are slow at times, but progress is constantly being made. There never was a time when understandings were better between the dealers in our lines. The same may be said of the manufacturers in our lines, as well as the dealers and manufacturers. Relations between them were never more pleasant.

These associations will continue to progress and prosper in the same proportion as each of us gives his assistance to this good work. Many have already freely and cheerfully given such assistance. Our past year has been a successful one for our association, and the particulars will be given in the executive sessions. May this good work go on, with energy guided by wisdom, speeded on by good will, tempered by justice to all, and it will add materially to our happiness, our experience and our revenue.

M. W. Mix of the Dodge Mfg. Company, Mishawaka, Ind., president of the American Supply and Machinery Manufacturers' Association, responded as follows:

President M. W. Mix's Address.

It may be well considered that, in view of the distressing business conditions of the past six months, there have been fewer commercial fatalities in the machinery and supply trade than in any other prominent line of business. No line of business has been more closely in touch with the actual industrial conditions, and in none other has there been a more noticeable patience and forbearance in maintaining a satisfactory business equilibrium. That this condition finds its inception and support in the close relations of competitive manufacturers and dealers, as they have been established through our many conventions and through the influence of our respective associations, I have no doubt.

It was stated at St. Louis that the test of our organizations was yet to come. When it did come it was met heroically and courageously. There was no stampede in prices, no destruction of values, incurring immense losses on stocks, nor any attempt to monopolize by destructive methods an unfair proportion of the going business.

CONGRATULATIONS TO THE MEMBERS OF THE TRADE.

I feel that I would be guilty of neglecting a favorable opportunity if I did not congratulate all associations here represented at the magnificent and creditable manner in which the situation was and is being met. In no better way than by organization, than by the exchange of ideas of policy, than by the recognition of the rights of our fellows in business, have we been able to show in our line of business a regard for stability that has no superior in the entire commercial field.

The tide has turned; things are on the mend, and there can be no doubt that in a short time affairs will have returned to a normal basis. "Stop your kickin'" clubs, prosperity leagues, "keep smiling" associations, are the order of the hour, and every business man should be a charter member and get off the lid.

You are going to have a great time here, and you will return home with a new energy and a new faith in the future, thankful withal that you belong to most excellent associations that are productive of a good fellowship and mutual understandings that preserve a normal business structure.

Appearing in place of Hon. William H. Taft, Secretary of War, who was called to Panama after accepting the invitation of the conventions to speak on the "Value of Trade Organizations," John Stryker Hord, Collector of Internal Revenue for the Philippine Islands, made an address, of which the following is a part, on

American Trade Opportunities in the Orient.

Much has been said against the free admission of Philippine sugar and cigars into the American market, but so far comparatively little has been said either for or against the free admission of American manufactured products and foodstuffs into the Philippine market. Yet in ignoring this important phase of the subject at least one-half—probably the more important half—of the problem has remained unstated. Reciprocal trade when it results, as it can usually be made to result, in increasing instead of impairing the industrial efficiency of each of the parties and of putting it within the income ability of each to enjoy certain necessaries of modern life and of which they had prior thereto been deprived, is shorn of much of its egoistic element, and, in final analysis, its net results will usually be found to have been as mutually beneficial to both parties as though their activities had in their inception been laid along altruistic lines pure and simple.

THE CASE OF PORTO RICO.

Whenever you choose to make a candid investigation into the substantial increase in American trade with Porto Rico and the phenomenal prosperity attained in that island during the last six or seven years as a direct result of trade free from customs' restrictions, such investigation will convince you that no American industry has been injured in the slightest degree by the free introduction of Porto Rican products into the United States, but, on the contrary, that certain American industries, which it was prophesied would

be adversely affected, have in fact, under the actual régime of free trade with Porto Rico, been benefited. Further investigation will also convince you that the free introduction of Philippine products into the United States to-day implies no more real threat to American industry than did the free introduction of Porto Rican products several years ago, and, furthermore, that there is no unknown factor of importance in the Philippine trade problem to-day presented to the American people for solution.

The opening of the Philippine market to American goods must at once be supplemented by the free introduction into the United States of Philippine products. Rather should it be first made possible for Philippine products to find a market in the United States. This for the reason that this populous and wealth country could readily assimilate without financial embarrassment all of the Philippine products that could be sent; whereas until a little prosperity is built up in the Philippine Islands, through the free entry of their products into the United States, it could not be reasonably expected that the Filipinos could increase in an appreciable amount the present volume of their purchases of American goods, even though such goods were made duty free.

I shall now submit to your consideration certain concrete facts and figures, easily provable by official publications, and which I hope you may find of interest.

THE TRADE TO BE BUILT UP IS MODERATE.

In the first place, we must not fall into the error of exaggerating the amount of American manufactures that would go to the Philippines nor the volume of their products that would come to the United States, and experience elsewhere has demonstrated that there would be a fairly regular balance of trade in the two amounts maintained. In determining what that volume of trade would be, our main reliance must be placed on the productive capacity of the Filipinos. Scarcity of capital and an almost complete dearth of work stock—which has been killed off by a series of epidemics during the last few years—will for many years to come greatly retard the production of crops of all kinds in the Philippine Islands.

The Philippines are to-day exporting three times as much hemp, about half as much sugar and about the same amount of tobacco and its manufactures as they did under the Spanish *régime*. The total value of all the exports range from $30,000,000 to $33,000,000 per annum, but over 60 per cent. of this represents the value of the hemp in which those islands possess a natural monopoly.

Not quite seven years ago the customs' barriers against trade between Porto Rico and the United States were razed. At that time the external commerce of Porto Rico amounted annually to $18,000,000; to-day it exceeds $50,000,000, and 33 per cent. of its imports come from the United States. To-day less than 20 per cent. of the imports into the Philippine Islands come from the United States. The total value of such American goods amounts annually to less than $4,500,000. The Philippines have about 30 times the area and eight times the population of Porto Rico. Conditions in the two localities are fairly analogous, and if the increase in Porto Rico's consumption of American goods since their free entry was permitted be used as a basis of comparison and the difference in the population in the two localities be taken into account, it would be quite reasonable to assume that within a few years after the free exchange of commodities between the United States and the Philippines was inaugurated $175,000,000 worth of American goods would go to the islands during an average year. Perhaps this figure is too great. I am of the opinion that somewhere between $100,000,000 and $125,000,000 would be nearer the true figure, and that even that maximum could not be reached in less time than five years after free trade was inaugurated.

THE MANILA MERCHANTS' STATEMENT.

Harold M. Pitt of the Manila Merchants' Association has faithfully set forth the merits of the Philippine's case in a pamphlet which I have found of great value in preparing the data now presented you. I shall make one excerpt from Mr. Pitt's pamphlet. "There is nothing produced for export in the Philippine Islands, and nothing that the country is adapted to produce, that is not at present required in the United States and imported from foreign tropical countries in quantities that would tax the capacity of these islands to yield. The foreign goods consumed in the Philippine Islands consist principally of cotton manufactures, foodstuffs and iron and steel with their manufactures. There are no articles on the entire list that are not produced and exported by the United States."

Only 17 per cent. of the imports into the Philippine Islands from all countries came last year from the United States. It is for the American manufacturer and dealer to see that he gets that percentage increased to somewhere near the 33 per cent. mark it now holds in Porto Rico.

PORTO RICANS USE CONNECTICUT CIGAR WRAPPERS.

About seven years ago, when it was first proposed to give Porto Rican cigars free access to the United States market, the American tobacco people clamored that their business would be ruined by such free entry. It has now been found that the maximum Porto Rican cigar output is equal to less than one year's normal increase of cigar consumption by the American people. The entire Porto Rican cigar output has disappeared in this vast market, been assimilated for all time and just about forgotton.

But there is one thing which I find that the American tobacco people have not forgotten and do not propose to forget. With the development of the cigar export business in Porto Rico came the demand for American wrapper leaf, which could not be raised in that island and which was needed to suit the American taste. To-day the Connecticut tobacco growers are sending each year to Porto Rico over $400,000 worth of their wrapper leaf, and to this they hold as tenaciously as they and their associates formerly held to the proposition that the free entry of Porto Rican cigars into the United States meant the ruination of the American industry. It is a sample of nonaltruistic trade strategy, but I for one do not blame them for their attitude.

The total cigar export trade of the Philippines to all countries is at present only about 60 per cent. of the Porto Rican cigar export trade to the United States alone. The United States takes now practically of the Porto Rican output less than one-half of 1 per cent. of the Philippine output. If the United States took the entire present Philippine cigar output it would not affect the American tobacco industry to any greater degree than it was affected by the assimilation of the Porto Rican crop seven years ago.

THE SUGAR SITUATION.

The hostile attitude assumed by the American sugar men toward the free entry into the United States of Philippine sugar is even more untenable than that assumed by the American tobacco men. Their attitude would be comic in the extreme were it not so diametrically opposed to all dictates of business expediency and almost a crime against common sense. It is you, the manufacturers of and dealers in machinery, as well as the cloth and food producing industries of the United States, who are paying for this myopia of the sugar and tobacco men, aggravated by the malicious activity of issue seeking politicians. I will endeavor to lay the proofs before you.

The annual consumption of sugar in the United States is now nearly 3,00,000 tons, and the increase in sugar consumption from year to year is a marvelous record. Forty years ago the per annum per capita consumption of sugar by the average American was 26 lb.; to-day it exceeds 70 lb. Not only has the increase in sugar consumption in the United States kept pace with the increase in population, but the individual increase in consumption per inhabitant has considerably more than doubled during the last 40 years. Forty years ago the American people produced 23,000 ton of the 454,000 tons they consumed, or about 5 per cent. To-day they produce about 600,000 tons of the 3,000,000 tons which they consume, or about 20 per cent. But comparing the actual amount of sugar imported by the American people, we find 431,000 tons imported 40 years ago as against over 2,600,000 tons imported now, or an increase of between 300 and 400 per cent.

As the figures now stand, of the total sugar consumption of the United States the American cane growers supply about 12 per cent., the American beet growers about 8 per cent., the Hawaiian cane growers about 12 per cent., the Porto Rican cane growers about 8 per cent., the Philippine cane growers about 1 per cent., and the remaining 59 per cent. is supplied by Cuba and other countries. Is the American consumer to send enough good American dollars abroad to purchase 1,750,000 tons of sugar, knowing that the bulk of the purchase money will be spent abroad and result in no benefit whatever to manufacturers of American goods, or will he be allowed to purchase as much sugar from the Philippines as those islands can supply, knowing that most of his money will, under reciprocal trade arrangements, be returned to the United States and expended in the purchase of American machinery, cloth, food products and other commodities?

We of the Philippines will continue our long protracted fight in the Congress of the United States for such tariff concessions, even though it be a compromise measure, as will secure access to the American market to such Philippine products as are now kept out by the customs bars. The Manila Merchants' Association asked the Governor-General that I be sent to Washington to aid in the fight, and by a joint resolution of both houses of the lately constituted Philippines Assembly I was detailed to assist the newly selected Philippine delegates to Washington in their presentation of the case at the session of Congress now on the eve of closing. We have spent the last three or four months in Washington, but have found the time most inopportune for a serious discussion of the merits of our case. But the fight will be continued at the coming session, with good assurances of success. The interests of American manufacturers and producers of articles suitable for export to the Philippine Islands are vitally involved in the general proposition that the lawmakers for the American people should no longer withhold from the Philippines such modest measure of pros-

perity as they can enjoy with absolutely no detriment whatever to any American industry.

The co-operation of the various machinery manufacturers' and dealers' associations throughout the United States will be most helpful to us in our fight, and our complete and speedy success will, I believe, be insured if you and through you the American manufacturers and producers of other commodities take prompt and concerted action in this matter. That co-operation I now earnestly ask you to render us.

The Smoker.

Pretty women, jovial men, smoke, steins, music and vaudeville filled the big auditorium of the Jefferson Wednesday evening, and long past midnight, when the auditorium became empty the men were full—of fun. The best theatrical talent in town at the time had been engaged for the amusement of the delegates and their ladies and excellently they did, but it was the organization talent that made the real hit. Herbert R. Wunder, the latest *protege* of Samuel L. Moyer, vice-president of the Lunkenheimer Company, was universally voted as a real wonder. He is an accomplished pianist and a good singer, and his parodies of popular music showed him to be not only a good verse writer but intimately acquainted with some of the personalities of prominent members of the associations.

THURSDAY, MAY 14.

The morning was given over to a Joint Executive Session of the three associations. F. A. Hall, of the Yale & Towne Mfg. Company, New York City, opened the proceedings with a paper, in part as follows, on

Resale Prices.

The subject of resale prices was ably discussed from several different standpoints at the joint conventions in Cincinnati a year ago. Without going over the same ground, I shall endeavor to present some considerations bearing on the desirability of fixed minimum resale prices from the standpoint of the consumer, the dealer and the producer.

THE GREATEST GOOD TO THE GREATEST NUMBER.

The effort of modern civilization is to reduce the waste of capital and labor due to duplication of effort, unfair competition, and warfare of every kind, industrial and physical. To the permanently successful, this effort must seek, through enlightened self interest, to produce the greatest good to the greatest number.

The continued welfare and prosperity of the manufacturing and distributing interests represented here, as well as of other business interests, are vital to the welfare and prosperity of every citizen of our country. Good profits and good wages are to the interest of all. The farmer and laborer are concerned in the prosperity of the merchant and manufacturer; these in the prosperity of the railroads; and the railroads in the prosperity of all. Who will say, at this time, that laws which permit the railroads to fix fairly remunerative rates which will provide or attract capital for future extensions are not to the benefit of all? And if laws are required to protect the railroad and the laborer, why not also the manufacturer and the merchant?

SUPPLY AND DEMAND.

Why should we end the study of political economy with the law of unregulated supply and demand, with its alternation of feast and famine, boom and panic?

The business of the manufacturer and the merchant is to solve this problem of regulation, by increasing and developing both supply and demand and equalizing their constant fluctuations. Steady industrial progress will be promoted by steady prices, rising or declining only as the result of permanent causes. The merchant should absorb temporary excess of supply, putting himself in position to care for a temporary shortage, and should find a profit in performing this service. This requires for its realization a means of fixing a fair selling price which shall be subject to adjustment for permanent causes and conditions but which shall, if possible, avoid sudden and temporary fluctuations.

The producer and consumer are in constant conflict, the one seeking high prices and the other low prices. The merchant and the banker should find their profit in preventing excess of supply or demand from working public injury through this conflict. In the great commodities of grain and cotton, the public exchanges of the world fix prices and serve as steadying influences. In oil, iron, lumber and coal, as in other commodities handled in bulk, where freights are a very important factor, secret discriminations have tended to foster monopoly; this in turn has not been without some public benefit in the steadying of prices and proper adjustment of supply to demand.

STABLE PRICES.

It seems clear that the fixing of resale prices which shall be fair alike to producer, distributer and consumer, will assist in steadying production and eliminating the tendency to force excessively high or destructively low with every slight departure from the exact balance of supply and demand.

It is within the power of every producer of articles which excel in useful qualities to fix more or less stable prices for his own product. His effort is naturally to fix prices at a level which will bring him the largest volume of business and therefore the largest aggregate profit. He must have due regard for the effect of existing competition and for the possibility of developing new competition. He must consider the cost of distribution, and the cost of maintaining a selling organization, with necessary advertising.

COST OF SELLING.

If the manufacturer can afford to limit his business to direct sales to large consumers who can be reached at small cost, he may avoid the problem of establishing a resale price. If he cannot thus obtain the volume of business necessary to economical production, he must extend his selling organization either directly or through merchant distributers to reach smaller consumers.

In the latter case, in fixing his prices to the consumer, he must consider the cost of selling and of reselling. He must consider the volume of business with the large consumer and whether it can be handled in wholesale lots with saving enough to justify wholesale prices to the few exceptionally large consumers. In all cases where the volume of business which can be handled directly with a moderate number of large consumers is not sufficient to support a manufacturer, he must cover a very considerable selling cost before he can take a profit. Whether he sells directly to the consumer or not, he must fix the consumer's price high enough to cover the cost of selling in whatever manner may be most economical.

SAVING OF COST BY SELLING THROUGH DEALERS.

Where merchants are making a business of selling an article, it is because the merchant can distribute the goods at smaller cost than is possible for the manufacturer dealing directly. In order to distribute the maximum product of such articles at the minimum cost, the manufacturer must insure the dealer a reasonable profit sufficient to keep the business of both in a vigorous condition. Consistent with this, the price to the consumer must be made as low as possible in order to encourage consumption and forestall competition by giving the greatest value to the consumer. In many cases, the manufacturer can best secure these results by fixing a uniform minimum resale price, which may, where necessary, be graded to allow for conditions affecting the cost of handling and delivery.

Where exclusive agencies are established with definite boundaries, there is less necessity for the manufacturer to establish resale prices, as much may be left to the enlightened self interest of the agent. Even here, a more healthy business results if the manufacturer fixes prices instead of leaving them subject to the natural desire to take all the business in sight, at any price that may be necessary, with the consequent necessity for taking advantage of a customer wherever possible in order to come out whole.

Where a standard product is sold through the trade in general, without exclusive agencies, and with a number of dealers in each large city, a fixed minimum price for resale becomes a necessity to healthy competition. The plan is not without its difficulties, but has its corresponding benefits. While it insures a fair and uniform price to the consumer and prevents the dealer from charging as high a price as might often be justified, it protects the dealer, on the whole, in obtaining the reasonable profit which is necessary to his existence.

BENEFIT TO ALL.

Benefit to the consumer results from obtaining quick delivery from his accustomed dealer at the lowest possible price. The benefit to the manufacturer comes through securing the active interest of a sufficient number of reliable dealers carrying stocks of his product to insure wide distribution and a large volume of business. By this means, the manufacturer reaches a majority of those consumers who may prefer to pass their business through some one particular dealer.

Where the plan is carried out with a sincere determination, on the part of the manufacturer, to confine his dealings to reputable merchants who will maintain established prices, each dealer will usually obtain the business of those consumers who prefer to deal with him and whom he regards as his regular customers. The dealer who makes a special effort to increase his sales, will find his effort reasonably rewarded and the manufacturer will benefit correspondingly.

Intelligent competition among a number of dealers in a large city, in selling the same article, increases its popularity with resulting larger aggregate sales. The dealer whose salesmen are most active as well as confident, but not bumptious, in adhering to prices will obtain the largest share

of the total business. Competition among the dealers is directed toward increasing sales, and building up a healthy business at reasonable profit, instead of toward finding out which salesman can shave profits the closest without throwing his employer into the court of bankruptcy.

GOOD GOODS AT RIGHT PRICES.

The consumer may be fairly certain that, when a large number of reputable dealers are handling the product of a reputable manufacturer, both the product and the prices must be right. The reputable dealer cannot afford to handle articles which do not satisfy the purchaser. His stock and methods must be good enough to make it unnecessary for him to buy business.

A first class dealer cannot afford to sell a second class article, and a second class dealer does not care to sell a first class article. The first class dealer must maintain a reputation for "good goods at right prices," while the second class dealer is only concerned to sell something of the cheapest passable kind at the highest obtainable price. It is needless to say that there are no self confessed dealers of the second class; but it is fair to ask, into which class do those dealers ultimately fall whose salesmen cannot sell unless they are allowed to make a lower price than their competitors? Those dealers who have a reputation for high prices may well be proud of the fact, for they could not live long and prosper without giving full value to their customers.

Penny wise economy in the purchase of cheap, but not lasting articles, will always furnish a precarious market for the second class dealer. His customers do not demand, and his salesmen do not know, how to demonstrate the economy of a first class article. His salesmen should never be asked to maintain a resale price unless for a second or third grade product.

THE NECESSITY OF GOOD SALESMEN.

Good salesmen are a part of the equipment of a first class dealer, and their intelligence furnishes an important part of the service which the first class dealer renders to his customer in return for the net profit he receives, which is usually less than 5 per cent.

The maintenance of resale prices, as of other sound business conditions, is dependent upon good salesmen who can obtain a fair price for a good article, and also upon good management. Good management is essential to preserve the confidence of the salesman in the soundness of his prices. The integrity of the merchant and of the manufacturer are pledged to maintain the justice and equity of their prices. The manufacturer of high standing must constantly strive to increase the excellence of his product and the dealer must place it in the hands of the consumer in the most economical manner at the lowest price, which, under average conditions, will yield a fair profit.

INDEPENDENT ACTION.

Each manufacturer must decide for himself how far he may, with benefit to all, establish resale prices by independent action based on the merit of his product. Without organization, an unbranded staple must find its own level, but a good brand will command its reasonable price.

Dealers may co-operate to support manufacturers of reliable brands, but here again it becomes a matter of individual selection, in the absence of organization based on laws recognizing the protection of reasonable profits as sound public policy. We may be permitted to hope for the millenium if the time shall come when manufacturers and merchants, like the railroads, are permitted to file public tariffs and incidentally become subject to prosecution for secret discriminations.

Publicity will then protect the consumer. The berth of the purchasing agent will then be a comfortable one. He will always be as sure of getting the lowest price as he is when buying a postage stamp, and competition will be confined to furnishing the most worthy article and giving the best service at the lowest fair prices without unfair discrimination.

HOW TO AVOID DIFFICULTIES.

And now, what of present conditions? What can you dealers do to encourage the manufacturer who has already fixed a resale price for your protection, believing this to be the fairest and most economical, as well as most effective, method of selling his product?

Such a manufacturer must, in self defense, confine his dealings to reputable merchants, none of whom will intentionally cut prices below a fair minimum without extreme provocation. Honest mistakes will occur occasionally. Neither these nor the constant efforts of buyers should be permitted to destroy the confidence of salesmen in the stability of prices.

If an error in quotations is made in competition between dealers, it is bound to come to the attention of the manufacturer unless the salesman making the error is closer to the customer than any other salesman. In that case, the salesman's employer is the only loser. The same is true if the "error" be an intentional one.

Right here, with this question of errors, and of misleading statements made by buyers, is the great difficulty with the whole plan of resale prices. Manufacturers and dealers must co-operate freely and frankly in investigating such occurrences. Loss of confidence must be prevented, else the manufacturer might as well depend upon dealers who are indifferent from lack of profits as from lack of confidence. In order to maintain firmly this confidence between competing dealers, it seems to be necessary that the dealer obtaining an order through an error made in his quotation, should give up his profit on the order, however honest and unintentional the error may have been.

ORGANIZATION AND CO-OPERATION.

The dealers, themselves individually or through organizations, should assume the burden of investigating alleged failures, by dealers, to maintain resale prices if manufacturers are to be encouraged in establishing them. Profits surrendered in cases of error in prices might properly be forfeited to such organizations as assume this burden, and manufacturers would usually prefer to turn over to the organizations of dealers such sums as they may feel compelled to exact from their best friends, regretfully risking the danger of losing both friendship and business, when honest errors occur. If the dealers' organizations represented here will provide and use suitable machinery for promptly investigating little difficulties on the spot, whenever they occur, the time and money so expended will be fruitful in preventing small or imaginary troubles from growing into large and real ones. Until such time as organization is perfected to deal with the little and big troubles, as they arise, the manufacturer establishing resale prices must bear this with his other burdens, and will be suitably rewarded, if he bears the burden well, by good results for himself and his customers.

Discussion of the Resale Price.

The subject was then thrown open for discussion, E. H. Hargrave, of the Cincinnati Tool Company, commenting upon the imperative need for absolute honesty and square dealing on the part of both manufacturer and dealer in order to insure success for the resale price.

E. E. Strong, of Strong, Carlisle & Hammond, Cleveland, Ohio, said he had found that the resale price with the rebate feature is the simplest method yet devised for overcoming the little errors and troubles incidental to the marketing of machinery and supplies. He said he believed the manufacturer has the moral right to say his goods shall not be sold at a price so low that his product may become an undesirable article of commerce. He cited the case of chucks, which, prior to the organization of the manufacturers constituted a profitless line for the dealer and manufacturer alike. Now, he said, this condition has been corrected and the dealer is willing to give chucks the attention they deserve.

John G. Christopher, of Jacksonville, Fla., expressed himself as being very much in favor of the general adoption of the resale price system. He added:

But I am frank to say that I do not think that the percentage allowed by the manufacturer is sufficient for the dealer. A manufacturer who allows a margin of 7½ per cent. on the resale price may feel the amount to be ample and that the dealer ought to be satisfied. Does he give proper consideration, however, to the dealer's cost of doing business? In some localities this cost is much greater than in others, but the manufacturer thinks that a flat percentage can suffice for all. Dealers in the South, as a rule, are far from manufacturing centers and as a result must carry large warehouse stocks in order to meet urgent demand promptly. This is an added burden to the Southern dealer. The latter must have many more men on the road than his Northern fellow dealer and in many districts the men must travel in private conveyance. Our livery bills for a man amount to from $5 to $8 a day. We simply cannot do business on 7½ or 10 per cent. margin. In fact, we cannot do it under 15 to 18 per cent. I think the manufacturer should set his resale price and allow sufficient margin for the dealer after a thorough consideration of the cost of handling and certainly with full recognition of the difference of selling expenses in the various localities.

George T. McIntosh, of the McIntosh Hardware Corporation, Cleveland, Ohio, declared that the resale price afforded the most intelligent way of doing business. He said that all the dealer wants for his investment is 5 per cent. profit, but that he wants that amount of active profit. He offered a resolution indorsing a wider adoption of the resale price.

After considerable discussion, participated in by F. A. Hall, George Puchta, A. T. Anderson, George A. Edgin, Henry Sharpe and Charles E. Carpenter, the resolution

was referred to the joint conference committee to be reported at the next joint session.

This resolution was reported at the session of Friday afternoon and adopted by the three associations. It is as follows:

Resolved, That it be the sense of this convention that minimum resale prices protected by the trade plan are applicable to many lines in which we are mutually interested; be it

Resolved, That our three associations jointly assembled indorse the resale price idea on such goods as are now being sold without adequate profit, and recommend its adoption on all such lines where practicable; and be it further

Resolved, That the Southern Supply & Machinery Dealers' Association and the National Supply & Machinery Dealers' Association recommend that their members offer to such manufacturers as adopt this plan any and all assistance possible in tracing violations thereof in so far as such assistance will not conflict with Federal and State statutes.

W. E. Gerow, Atlantic Supply Company, Jacksonville, Fla., read an address, in part as follows, on

Salesmanship.

I have been asked to speak on a subject that is of vital interest to each of us as business men: it is "Salesmanship." What an important part of modern commercialism this word covers! It is not a new art—it is as old as history and was a distinct part of the life of prehistoric man—for when did not man exchange the result of his skill or something he possessed for something else that seemed more desirable in his eyes? If this "exchange" resulted in mutual advantage and satisfaction was it not a successful "sale"? And was not the same principle used that is involved in every modern sale? When the Indians sold the island of Manhattan for some corn and rum, were they not convinced that what they were receiving was of equal value to that which they were giving?

While only a comparatively small number follow salesmanship as a vocation, still, it is true that the principle of salesmanship enters the daily life of almost everyone, and is essential to human relations. The thought that someone else needs what we can give and we need what they can give us in return is the incentive to the daily action of most people. Then of what does the art of doing this successfully consist?

THE PROCESS OF MAKING A SALE.

Every sale is first a mental process, something like this: You have something to sell, you select someone you think would buy it, you convince him he needs it, then you make the sale. Salesmanship, in the abstract, is the power of persuasion, therefore successful sales depend very largely upon the personality of the salesman, for in a man's personality lies his persuasive power, the power to convince another that what he says is honest and true, or in other words to inspire confidence. Confidence is absolutely essential to bring and to hold trade, in fact it is the corner-stone in building up right conditions and relations among mankind. Confidence is won only by a forcible, firm personality or character.

The time-worn adage, "salesmen are born, not made," is much to blame for the fact that the principle of salesmanship has not been more investigated. Business men, as a rule, have searched for so-called natural-born salesmen thinking that was the only variety. The true salesman is not the one who starts out thinking he is naturally fitted for it, but the one who studies his vocation from a scientific standpoint and knows how and why he sells goods.

THE BEST SALESMAN

is the one who develops his mentality and brings out latent potentialities of his mind. All men have the same sets of muscles but some of them develop certain sets and some few all of their muscles, to an unusual degree, through training. Just so all men have intellectual muscles which can be developed through activity or weakened through disuse, just the same as the physical muscles. The dormant mentality can be made available, for the intellectual muscles of every man can be educated to work for him, to advance him higher in the world and win for him success and power.

The would-be successful salesman should study salesmanship, or the power to make others think as you think and believe as you believe; and as he progresses, ingrafting into his experience the knowledge gained day by day. It is the man who realizes this that is qualified to accomplish the most in his chosen lines. No longer is it the "jolly good fellow" who sells the largest bill of goods but the clean-cut intelligent man who knows his goods and knows them to be good. The most successful man is the one who brings into activity all his reserve forces. This he can do by training his judgment, his memory, his reason and his faculty of observation and intuition. He must also have a good supply of ambition, self-reliance, enthusiasm and determination. He who is thus equipped is prepared to skilfully control situations, not only by taking advantage of favorable circumstances, but by being able to help smooth out the rough places in the business highway. For it is in coping with trying situations that the best qualities of a man are brought to the surface. The man who is the most manly, the one with the largest stock of admirable qualities, is the one most searched for and the most valued when found, both as an employer and as an employee. So why not cultivate such valuable assets? Business in general, but salesmanship in particular, depends upon the personality of the man. Personality can be cultivated.

OTHER FACTORS IN A SALE.

The other factors that are included in a sale are, besides the salesman, the customer, the goods and the business transaction called the sale. The salesman first finds his customer, then he must know how to read him, or, in other words "size him up": that is, find out all he can about him from external appearances. Here is his opportunity to use his intuition and observation. The next step is to get his attention and arouse his interest in the salesman and in his goods, and if he has effectively delivered a logical selling talk he has caused a desire for the goods. Then he has successfully handled his customer.

It is absolutely essential that he thoroughly understand the goods he is selling and be able to honestly recommend them. In his study to understand his goods he must analyze them into the points that will recommend them, or make selling points. It is here that a man's personality counts for much and is manifested in forceful expressions, persuasive manners and logical arguments. The wise salesman is not tempted by the desire to criticise another's goods. Such conduct does not sell goods for him. It is the man whose personality is built on the solid rock of honesty and intelligence whose calm strength and serenity cannot be overcome by crowding competitors or the rebuffs of customers. Last, but not by any means least, is getting the order signed and the sale is complete.

IN HARMONY WITH THE HOUSE.

Another important feature in salesmanship is the harmony that should necessarily exist between the salesman and his house. This can be divided into: 1. What the house expects of the salesman. 2. What the salesman expects of the house. The house expects the salesman, first of all, to be thoroughly up to date and reliable in every particular and at all times to have its interests at heart. For he has in his hands the power to add to or take away from its reputation. The house also expects him to keep well informed along all lines that will further its interests and to secure for it prestige in the business world.

It goes without saying that the salesman is expected first and last to sell goods. He should be to a great extent the credit man of his firm, so that in using his judgment and reason there will follow, as few as possible, cancellations, bad bills, debts and the like. The salesman expects the house to give him a square deal in every way and to give him a fair chance to use his personal ability, judgment and reason. He also expects the house to furnish him all information relative to the cost of goods and to keep him posted as to condition of its stock on hand and in transit.

If the salesman and his house work in perfect harmony as they should, the business and the customers are both well taken care of, and the principle of salesmanship is proved to be fundamental in business relations.

Discussion.

Discussing this paper, Henry Prentiss, of the Prentiss Tool & Supply Company, New York, who was called on for remarks, said:

To be a good salesman a man must be square, straightforward and must do intelligent thinking. He must be just and must not try to sell the customer goods which he does not believe the customer should have. He should never say his goods are better than they are and must never ask too high a price. He cannot have the confidence of a customer unless he is just in his dealings, and the customer's confidence, of course, is the prime essential. He should have a distinct understanding with his customer as to what the terms of sale shall be. The chief value of the sale to the house is its final return, and no chance should be left for a misunderstanding in this respect. I am sure that all here in selling or buying have found that this particular point of salesmanship is one of special importance.

George Puchta, of the Queen City Supply Company, Cincinnati, Ohio, said:

I believe that honesty and intelligence are the keynotes of salesmanship. It is on the latter feature, however, that I wish to speak. The principals and management of a house often need education as well as the salesman. As president of the National Supply and Machinery Dealers' Association I have come in contact with many dealers, and it has been a great surprise to me to find how many there are who do not know exactly what it costs to do business. If the management does not know this, how can the salesman know? Salesmen often believe sincerely that they are making money for their house, when as a matter of fact the house may not

know itself that they are not. I believe that if we are honest with ourselves and with our salesmen, and find out exactly what it costs to do business, we will not want to sell at a loss. One of the most important things for us to bring about is a more accurate system of accounting. This, I believe, if installed in the different departments of our business, will eliminate a great deal of trouble and will assist us in increasing the efficiency of our salesmen as well as benefiting our business in general.

D. K. Swartwout, president Ohio Blower Company, Cleveland, representing the American Supply and Machinery Manufacturers' Association, delivered an address, in part as follows, entitled

A Plain Talk to Jobbers.

While so called "gentlemen's agreements" for the maintenance of prices and for the correction of abuses which have crept unbidden into our commercial transactions are efforts in the right direction, they are of real value only when supported by right minded men. During the last few years the light has been turned upon large undertakings which has disclosed conditions so dishonorable as to seem almost beyond belief. Much good has doubtless been accomplished, but since lying, trickery, and underhanded methods are not exclusively confined to interstate commerce, much still remains for such associations as these to do.

LOW PRICES.

The lack of loyalty of jobbers to the lines they represent; the resale price, and the cash discount are, in my judgment, of little importance in comparison with the far reaching influence for evil of the campaign of the unwise jobber and manufacturer for low prices, which can only mean inferior quality.

One of the most discouraging things with which manufacturers who are trying to make honest goods have to deal is that altogether too numerous jobber who always talks low prices and rarely talks quality. We constantly hear such statements as "This market does not care for quality." "Our customers want cheaper goods, and we must sell them what they want." What we should hear is: "Your products are not good enough for this market." "When you improve your quality we shall be pleased to see you." As a matter of fact, it is entirely within the power of the jobber by intelligent and persistent effort to create a demand for goods of quality by talking quality, instead of dwelling altogether upon price. Never listen to that siren voice of the manufacturer who wants to induce you to palm off on your customers a substitute for the standard article of known quality, at a cheaper price.

One of the most favorably known jobbers in the country, who is present at this meeting, has been for many years a recognized agent in his city for a standard brand of wire rope. He tells me that the salesman of another brand made this amazing proposition to him: "We would like to have you sell some of our rope. It is much cheaper than the one you are handling. You can stock our rope, fill lots of those orders with it, your customer will never know the difference, and you will be so much ahead." This jobber was not tempted because he does not do business that way.

THE STAMP OF QUALITY.

The great manufacturers whose names are now famous have been those who have considered quality first and price of secondary consideration. When I speak of machine tools, wood working machinery, chain hoists, traveling cranes, rope transmission, emery wheels, engines, &c., certain names immediately flash through your minds as standard and others are only thought of by comparison. I believe it is clever to the interest of the jobbers to sell cheap things, and I believe firmly that the manufacturer who looks forward to the birth of a "sucker" every day to purchase his inferior wares is doomed to disappointment and early financial ruin.

The only real bargains are where you obtain a full dollar in value for every dollar expended, and if you buy low priced goods you invariably get inferior quality.

MAKING MONEY ON REPAIRS.

I am reminded of a story told me by an old New England friend of mine. Years ago before the prices of fire-engines were as steady as they are now reported to be, this gentleman was chairman of a council committee delegated to buy some fire engines for the city of Lynn, Mass. When the bids were opened all except one were comparatively close together. One bid was so much lower than any of the others that the suspicions of the committee were aroused. So they interviewed the representative, who was young and somewhat indiscreet, and the following dialogue took place:

Chairman: Now, young man, on price you are entitled to the order hands down but you are so far below the others that we want to be sure of the quality. Are your engines first-class—the equal of the others? We feel that either your engines are of inferior quality or you must be selling them at cost.

Salesman: Our engines are made from approved designs of the very best materials and by skillful workmen. Nothing could possibly be better, but we sell them at cost.

Chairman: But how can you make money and pay selling expenses if you sell your engines at cost?

Salesman: Oh, that is easy. *We make our money on our repairs.*

POWER OF GOOD EXAMPLE.

At our last annual meeting the distinguished, and may I say venerable, president of one of your associations, said, "Honesty is the only policy." I quite agree with him but believe a "good example" is of equal importance and should have the consideration of all business men.

The larger portion of mankind must serve those whose opportunities or capacity for leadership place them in command of enterprises as employers of Labor. Two-thirds of the waking hours of these employees are in the service of the employer and under the influence of his example; and since large numbers of these working people are in the receptive state of approaching manhood or womanhood, the employer's power for good or for evil is far reaching. The all important problem that confronts the thoughtful business man of to-day is the training of men for better things—character building. To do this we must sacrifice something for the improvement of society by giving time and influence to make men better. I know of nothing so well suited to serve this purpose as for the employer to live an honest, clean life himself. We must use our influence upon the young and guide them early into honest ways. The greatest traders on earth teach us this lesson. They inculcate ideas of trade into the boy. Why the mother in her lullaby to her babe in the cradle sings:

> Sleep baby sleep, vile ba-pa sells vatches.
> Buy low, sell high! Buy low, sell high!
> Sleep baby sleep, vile ba-pa sells diamonds.
> Buy low, sell high! Buy low, sell high!

We devote 21 years to develop a son and are very well satisfied if, when he approaches manhood, he has a minimum of vices, yet we are unwilling to give one minute a week to make a good man of the other man's boy who happens to be in our office or shop. Employment in an honest atmosphere among clean men promotes honesty and cleanliness. If these associations would strike hard at dishonesty and trickery, their power for good could not be estimated.

TWO EXAMPLES.

I want to tell you of two examples that were placed before employees last year. One was a manufacturer and the other a jobber. One had been making carload shipments to a distant point for some years on which freight was allowed to destination. The consignee when auditing his books discovered that on two cars the freight had not been deducted and wrote the consignor about it. The consignor told his bookkeeper "to look it up," and if he found it to be true to send the customer a check for the amount and to write a nice letter expressing his sincere regret that the mistake should have happened. The bookkeeper found on investigation that the consignee was right and looking back to the previous year found another car that had received similar treatment. So he told the proprietor and asked what he should do about the third car, receiving the reply: "Forget it! He may never find it."

Another party made a similar shipment, and, when the consignee paid promptly, overlooked and did not deduct the freight. The cashier in checking the remittance with the order noticed the error and called the president's attention to it. He said: "Write him at once for the freight bill and send him check." "But," said the cashier, "he will find it out later and notify us, won't he?" "Yes," said the president, "possibly, but he will then think that we are either dishonest or careless." That cashier will never tap the till.

SPECULATIVE BANKING.

We are slowly emerging from a limited period of depression in business generally referred to as the "financial stringency" that has resulted in great distress and anxiety among all classes of business men. Various causes have been assigned for this disturbance and numerous remedies suggested to prevent its recurrence. Bankers and so-called financiers have been submitting to interviews and addressing civic and commercial bodies, setting forth the causes of this disaster and prophesying a sure return unless the currency be reformed according to their recommendations.

There is a well grounded suspicion that this unfortunate condition was greatly intensified by the fact that too many bankers have departed from honest and safe banking methods, and have developed abnormally the speculative germ. They take long chances with the money intrusted to them for safe keeping, and finance many purely speculative enterprises. If they win, the private fortunes of the individual bankers are usually increased in value and the banks obtain a fair rate of interest. If the speculative pendulum swings against them, the bank loses, private fortunes are swept away, reputations are blasted, and homes wrecked. While it may be, and doubtless is true, that changes in our currency would be desirable and beneficial, the crying need is not the reform of the currency but the reformation of some of the bankers who handle the currency.

In the 10 years ending October 31, 1907, 106 national banks in the United States, with a combined capital stock of $14,565,000 failed. Out of these 106 failures 89, or 84 per

cent., were wrecked by fraudulent management, excessive loans to directors and others, dishonest cashiers, or injudicious banking; and the other 17 were "closed by run," "real estate investments," or "depreciation of securities." For the 10 years ending June 30 of the same year, 588 State banks failed, with combined liabilities exceeding $152,000,000. There was practically one bank failure for every five days during the entire period.

These data are taken from the 1907 annual report of Wm. B. Ridgely, former comptroller of the currency, who is now a bank president in a Western city; and I have purposely excluded bank failures since October 31, 1907, and during the depression from 1893 to October 31, 1897, so that the period covered should be under normal conditions.

This authority does not give the causes of the failures in the State banks, but, as little attention is given to the inspection and regulation of institutions of this character in many States, their management would probably not average any better, if as well, as that of the national banks.

The loaning of the funds of the banks upon merchants' notes is the safest possible kind of banking. Financial banking, where large loans are made on stocks and bonds, often of doubtful value, requiring close attention to the stock ticker, has long been recognized as a great source of danger.

Twenty-four years ago, in 1884, following a financial crisis in the city of New York, the comptroller of the currency in his annual report said: "There is little doubt that one of the causes which led to the local disturbance among banks, national and State, and private bankers, of the city of New York, was their intimate relation with the New York Stock Exchange, and the fact that a large portion of the loans by the banks and bankers of New York were based upon the security of stocks and bonds, often speculative in their character, which are dealt in and regularly called at the stock board."

But what has the banking business got to do with the supply and machinery business? Everything. An improper use of the banking system will disturb credits, and if continued will destroy any business, however well managed.

INTOXICANTS IN BUSINESS.

As I see it, there are only three stages to the liquor question—total abstinence, moderation and excess. All agree that excess should be avoided, and, as moderation precedes excess, the business man should seriously consider whether it is not to his interest to use his influence toward the only absolutely safe plan—complete abstinence. Some of our largest railroad systems are recognizing the fact that neither property nor passengers are safe in the hands of employees who use intoxicants, either on or off duty. I am a believer in clean entertainment and the greatest measure of good fellowship in business, but "John Barleycorn" never has secured an order and has lost many.

Two years ago, in returning from the Pacific Coast, I stopped a day or two in northwestern Minnesota with an old friend who travels for a large hardware house. He told me it was necessary to spend quite a bit of money in "liquid refreshment," as his customers were largely of foreign birth and liberal in their ideas. Now this young man was earning about $1900 per year and his annual sales were about $75,000. A few days later I related the story to the salesmanager of a competing house who had direct charge of 80 salesmen, and he replied: "There is not a word of truth in it. We have a man who travels the same territory, earns $2500 a year, and his sales exceed $100,000 a year. He does not use tobacco, does not know the taste of liquor, and goes down on his knees every night."

All of these things point to the great need of the hour—men; honest, clean, fearless men; men who fully appreciate their responsibility to the community in which they live, and are willing to sacrifice something for a principle. This meeting should inspire us to nobler things. We are convened on ground made memorable by sacrifice; where the tears of anguish mingled freely with the blood of men who fought and died for principles that they believed to be right. Yet we—shame on us—are too often unwilling to sacrifice one of those immediate dollars for right conditions that we know should be interwoven with our every-day affairs. In conclusion, I make an earnest appeal for a good example all along the line. We must not wait for the other fellow to reform. We must first reform ourselves.

When we return to our homes, let us hoist above our place of business a flag. On that flag write conspicuously:

OUR MOTTO.

1. A square [illegible]
2. Fair prices for honest quality
3. Clean methods and clean men.

Then call our employees together and say to them, in the words of that great divine, the author of "The Man Without a Country," "And for that flag, boy, never dream a dream but of serving her, though the service take you through a thousand hells. No matter who flatters you, or abuses you, never look at another flag, never let a night pass, but you pray God to bless that flag."

But you say this is idealism, to which I reply: Every one should have an ideal, and no nation can expect to endure without it cherishes an ideal. If we strive for ideals in business, ideals in our home lives, ideals in our conduct toward and treatment of all mankind, ideals in our religion, in the triumph of those ideals, we will enjoy life in its fullest sense and leave a heritage to posterity that will be worth while.

W. M. Pattison, W. M. Pattison Supply Company, Cleveland, Ohio, representing the National Supply and Machinery Dealers' Association, made an address, in part as follows, on

Advantages of Co-operation in the Supply and Machinery Business.

We are pleased to have with us here to-day a representative gathering of manufacturers. It is well that this is so. We recognize that our interests are mutual and that the success of the one is an important factor in the success of the other. I contend that a jobber is the selling end of the manufacturer's business, and as such is entitled to consideration and fair treatment. We trust that as a result of this meeting the manufacturers and jobbers may be brought into even closer touch with each other and a spirit of harmony and good fellowship developed that will profit all alike.

THE WORK OF THE ASSOCIATIONS.

We have assembled here to-day to complete the work of another important chapter in the history of our associations and to enter upon the work of a new year with its activities. Under these conditions it is quite natural that we should review their work in the past and to question how their success measures up with our anticipations. Have they made good? Have we been repaid for the time, effort and the money we have put into this work? Have we been able to accomplish some things through organized effort which otherwise would have been impossible? In other words, do these associations merit our continued support?

A membership in these associations is valuable for two reasons. You can value it strictly for the immediate and material benefits that it brings you or consider it from a sentimental viewpoint, where its worth is measured by the ties of friendship. I certainly would like to feel that the success of these associations is measured by some other standard than an appreciation of the almighty dollar. Our associations have accomplished some definite tangible results. Possibly not as much as we would like, nor as much as some of our members anticipated, but still we have in a measure been successful. Through them we have been enabled to approach the manufacturers with a solid front and in many cases have secured material concessions. Many of the machinery manufacturers have increased their commissions and others will undoubtedly do likewise. Prior to the last six months these manufacturers were so overwhelmed with orders as to make them somewhat independent, but conditions have changed materially since and it is quite possible that they will be more anxious to co-operate with us from now on. Other manufacturers have established resale prices, which is in line with our pronounced policy, and this has added very materially to our profits on such lines.

AN EXAMPLE OF THE BENEFITS REALIZED.

In the February issue of the house organ of a large manufacturing company the following notice was printed without further explanation: "In our new catalogue, shortly to be issued, no change from list prices in the present catalogue will be made." Ordinarily a notice of that kind would not mean much, but in this particular case its publication was the result of our efforts.

I might say in explanation that the company was about to issue a new catalogue and had revised its lists, so that one discount would apply to its entire line of iron body goods and another to its line of brass goods. The adoption of this plan would have worked an injury to the jobbing trade, to the extent that it would have reduced the profit on the company's entire line to that we now get on staples. Protests were filed by members of the associations represented here and by others. These had the desired effect, and in a personal letter to one of our members the company wrote as follows:

[illegible]

Those of our members who handle valves and fittings to any considerable extent will agree with me when I state that were these associations to accomplish nothing more than was accomplished in this case, such members would profit many times each year beyond the expense of their membership. I especially cite this, for I am certain that the company would not knowingly adopt a policy that would prove objectionable to our joint interests. When assured that the jobbers were opposed to its adoption, the company waived its own preference "in order to meet our views." Frequently it will only be necessary for the jobbers to express

themselves elsewhere, as was done in this case, to secure similar concessions, for I feel that as far as possible the manufacturers wish to please us.

CASH DISCOUNTS.

The question of cash discounts is one to which I would call your attention, for I am sure that, if we are persistent in our demands, in time the manufacturers must accede to our request and grant the customary cash discounts that prevail in the supply business. We are not asking this as an additional concession in price, but do ask them so to fix their selling price that with this additional cash discount they will realize as much as though sold net or with a discount less than the customary 2 per cent.

We will always have competition, so let us learn and practice friendly competition. Let us live and let live. It has been said that competition is the life of trade. This may have been true at one time, but to-day co-operation is the life of trade. We are learning that our interest is in concord rather than in discord. It is only necessary to refer to conditions as we knew them a few years since and prior to the formation of these associations. Our relations were quite different then. At that time our acquaintance in the trade was limited practically to a few local competitors, whose interests we felt were inimical to our own. We felt that their success was in a measure dependent on our failure, and trade conditions reflected this feeling. Where we lost an order, it brought some consolation that if we could so play the cards our successful competitor would perhaps make nothing on the transaction. We were quite likely to think that we were the only decent fellows in the business and the others in a measure were interlopers. We each followed his own inclination in the conduct of his business regardless of what others might do or think. Is it any wonder that under these deplorable conditions our business was demoralized? The only remedy was through the formation of the associations represented here to-day, and I say to you that our most valuable and profitable work is in bringing our members into closer business and social relations, where we may learn to know and appreciate each other.

THE MACHINERY SECTION.

On Thursday afternoon a joint executive session of members of the National and Southern Dealers' associations who are engaged in the machine tool business was held. The most important action was the adoption of the report of the Machinery Committee of the National Supply and Machinery Dealers' Association, submitted by Henry Prentiss, chairman. The report follows:

Machinery Committee's Report.

In a communication from our secretary-treasurer, under date of November 27, 1907, you have learned of the results obtained from the joint meeting of the Special Committee of the National Machine Tool Builders' Association and your Machinery Committee, held at New York, October 4, last. The selling agreement which was drafted at this meeting is now in the hands of the members of the two associations and, we believe, is meeting with general favor. We are informed that it is being used in making new selling agreements between manufacturer and selling agent. Your committee would recommend that the following preamble and resolution be adopted by this association:

Whereas, A selling agreement has been drafted which has the approval of your Executive and Machinery committees, and also of the Special Committee of the National Machine Tool Builders' Association appointed to consider this matter, and, whereas it is desirable that this agreement should be used whenever any existing selling agreement between manufacturer and selling agent is unsatisfactory, or whenever a new selling agreement is to be made, be it

Resolved, That this association recommends the use of this agreement in all its essential features by its members as provided in preamble hereinbefore mentioned.

We are glad to note that in the depressed condition of business, which has prevailed during the past eight months, prices have been well maintained. We must give much credit for this result to the manufacturers who have stood firmly to accomplish this. In this connection your committee is of the opinion that it would be wise to approve of the following preamble and resolution:

Whereas, A general reduction in prices of machine tools at the present time would have a demoralizing effect on trade; therefore, be it

Resolved, That this association, in convention assembled, does hereby emphatically protest against such action during the ensuing six months, coupled with the assurance that the dealers will co-operate with the manufacturers in every way possible for the maintenance of existing prices.

Your committee would urge all of our members who are interested in the sale of sheet metal working machinery to bring as much influence as possible to bear upon the manufacturers of said machinery to discontinue direct sales to the user, to increase the margin of profit to the dealer and to recognize and protect the regularly established machinery dealer.

Your committee believes that the work of this association should be conducted along broad lines, so that all members, whether in the machinery or supply lines, will feel that their interests are being carefully conserved and be strengthened in their purpose to employ only open, clean, unselfish and considerate methods in all their dealings, whether with the associates, manufacturers or patrons, realizing that such procedure promotes strength, harmony and merited success.

H. Prentiss, O. P. Meckel, W. J. McDowell, W. R. Colcord, A. J. Babcock, committee.

The uniform contract referred to in the report, it should be noted, is not presented to supersede immediately all existing contracts between the machine tool builder and the merchant, but is simply recommended as a desirable form for such parties as are at present dissatisfied with their contracts in force and is recommended to be placed in operation as old contracts expire. The contract is as follows:

AGREEMENT.

THIS AGREEMENT executed in duplicate and entered into this ..... day of .....190.., by and between ..... of ..... a ..... under the laws of the State of ..... party of the first part hereafter referred to as the manufacturer, and..... a ..... under the laws of the State of ..... party of the second part hereafter referred to as the agent.

WITNESSETH:

That, whereas, the manufacturer is desirous of securing representation in the following territory for the sale of his machines, it is agreed as follows by and between the parties hereto:

1. Outline of Territory. The agent is to have the exclusive right to sell the machines and attachments manufactured by the manufacturer in .....

.....

The agent shall have the right to sell in the following territory .....

.....

in connection with .....

The following territory to be open subject to withdrawal on thirty days' notice by the manufacturer .....

.....

2. Push Sale. The agent will diligently and vigorously push the sale, in the above named territory, of the manufacturer's machines.

3. Competing Machines. The agent agrees not to offer for sale any competing machine within the limits of the territory herein named, excepting as listed immediately below, unless the manufacturer has first been notified ..... days in writing:

.....

4. Advertising Material. The manufacturer is to supply, free of cost to the agent, in reasonable quantity, such catalogues, circulars, electrotypes and other advertising material of like nature as the manufacturer may regularly issue.

5. Stock. The agent shall carry in stock .....

.....

6. Terms of Payment. The agent agrees to pay all invoices upon the terms of .....

.....

All invoices are to be dated the day the machines are shipped or when ready for shipment, when machines are held at factory by instructions or for lack of shipping instructions from the agent. This is understood to cover machines held for attachments made by other manufacturers.

7. Exclusive Sale. During the life of this contract, the manufacturer will not sell in the territory above allotted to the agent, except as hereinafter provided, and agrees to refer all inquiries and orders from such exclusive territory to the agent. Should the manufacturer ship new machines of his make into the exclusive territory of the agent, then the manufacturer shall pay to the agent the regular commission on the agent's price of such machine or machines so shipped.

The agent agrees to confine himself strictly to the territory as named in the foregoing, and not to accept orders for machines and attachments for same made by the manufacturer, for shipment into territory other than his own, except with the written consent of the manufacturer or his authorized selling agent for this territory.

The manufacturer is hereby given the right to charge up to the account of the agent, a sum equal to the regular commission on the agent's cost price on any new machine or machines, or parts of machines, that the agent ships into territory other than hereinbefore agreed to, or for any new machine or machines (made by the manufacturer) reshipped into territory other than his own, and is hereby instructed to pay said amount to the agent in whose territory the machine or machines or parts of machines, are installed, excepting when there is a written agreement to the contrary between the interested agents, and a copy of said agreement has been filed with the manufacturer. The manufacturer hereby assumes the payment of this amount sixty days after shipment of the machines.

In case any new machine or machines made by the manufacturer be shipped or reshipped into the exclusive territory of the agent by the manufacturer of any one else, then the manufacturer will collect, if possible, from the offending party and pay over to the agent a sum equal to the regular commission on the agent's cost price on new machine or machines so shipped.

8. **Prices.**—Prices are as per list ..... hereto attached and forming a part of this agreement, subject to subsequent price changes as agreed upon in writing. The discount on price list ..... to agent is ..... per cent. (.....%) for the machines crated and delivered F. O. B. .....

9. **Price to Users.** The manufacturer agrees that all of his quotations in open territory shall be on a basis of not less than ..... per cent. (.....%) on above cost to the agent.

10. **Maintenance of Prices.** The agent hereby agrees not to sell at a lower price than the price established by the manufacturer, and agrees not to make any subsequent allowance of any kind whatsoever.

11. **Change in Prices.** Prices are to be changed by telegraphic notice to take effect at once, which shall be immediately confirmed by mail. Bona fide sales during following ten days on quotations already out shall be entered at the old price; agent shall notify the manufacturer promptly of such prospective sales.

12. **Prices and Cancellation of Unfilled Stock Orders.** It is agreed that no further stock orders are to be accepted after such notice. Unfilled stock orders are to be invoiced at the new prices. As soon as possible after change in prices the agent agrees to furnish the manufacturer a list of all unsold machines on stock orders. In the event that the said change is a reduction in price all unsold stock machines invoiced to the agent within the six months next prior to said notice, shall be subject to said reduction in price. Should there be an advance in price the agent has the right to cancel any or all unsold stock orders. It is agreed that the termination of this contract cancels all unsold and unfilled stock orders.

13. The manufacturer shall have the right to limit the number of machines for which he will accept stock orders.

14. **Warranty.** The manufacturer warrants that the machines he supplies will fulfill the conditions named in his literature and specifications, and are adapted for the work for which the literature and specifications recommend them.

15. **Workmanship and Material.** The workmanship and material of machines, if not as represented in the literature and specifications of the manufacturer, will be made good by the manufacturer; but no allowance will be made for any expense incurred in repairing or supplying any defective or missing parts, unless on the written consent of the manufacturer.

16. **Repurchase of Unsold Machines.** In case this agreement is terminated by the manufacturer in the manner provided, the manufacturer agrees to buy back at actual cost to the agent, including freight and drayage at warehouse of the agent, all new machines of his manufacture, excepting specials, as the agent may have on hand unsold purchased within nine (9) months next prior to said notice. In case this agreement is terminated by the agent in the manner provided, the manufacturer is hereby given the right to buy back at actual cost to the agent, including freight and drayage at warehouse of the agent, any or all of his machines on hand, unsold, with the agent. Terms are to be as per clause six.

17. It is mutually agreed, that should either of the parties hereto become involved in receivership, bankruptcy or insolvency proceedings, that this agreement may be terminated at once, at the option of the other party.

18. This agreement shall be binding on the successors or assigns of the parties hereto.

19. **Quoting Customers.** The manufacturer is hereby instructed by the agent ..... to quote any of his customers calling on the manufacturer on a basis of not less than ..... per cent. (.....%) advance, F. O. B. ..... over net cost of the machines to the agent.

20. **Termination of Agreement.** This agreement shall continue in force for.....year after date and thereafter, until terminated by either party giving the other party.....days' notice in writing.

IN WITNESS WHEREOF, said parties hereunto attached their hands and seals the day and year first above written.

[Seal].....

.....

[Seal].....

The manufacturer has appointed other selling agents as given below, and for the territory mentioned:

NOTE.—We believe a uniform agreement in the matter covered by Section 12 [illegible]; however, the manufacturers object to this to be an individual matter we will agree to it. Section 12 is intended to cover cases where the manufacturer on a rising market invoices stock orders at the price existing at the time of shipment without regard to price named in order and accepted by manufacturer when order was placed.—THE MACHINERY COMMITTEE

It was decided that it would not be [illegible] for the dealers to take up the subject of a standard form of contract between sellers of machine tools and the [illegible] summer. The suggestion was brought up in the form of a request made by a committee of machine tool builders.

The Banquet.

This was a brilliant affair, being attended by many ladies. Charles A. Moore, president of Manning, Maxwell & Moore, Inc., New York, was most enthusiastically received in the presentation of his speech, in part as follows, on

Commercial Fraternity.

Modern industrial and commercial civilization tends to eliminate unnecessary processes and cumbersome methods of doing business. Specialization along certain lines has grown more and more. It is, therefore, that the position of the merchant, the distributer of produce, has become more important and more well defined.

As the merchant was the earliest torch-bearer of civilization, and, more than all other forces, spread over the world and made common to all mankind arts and the products of industry, so is he to-day the most important factor in industrial civilization. He brings to the public at large—the purchasing public, of which every man is a part (member)—the articles of necessity or luxury which no man's individual effort could bring together without the greatest excess of time and money and labor.

By finding a market for products of merit and use, he enables the manufacturers thereof to produce, and produce at a profit, even greater amounts of merchandise. He collects the varied products of the whole world in such quantities and in so economical a way that every man in every walk of life may call on him for the handiwork of the universe, and get what he seeks.

THE MIDDLEMAN.

At different times certain theorists have predicted the elimination of the so-called middleman, and have pointed out great benefits to be derived from his elimination. But, as is the case with all theories proved unsound by practice, the theorists have not collected sufficient data to judge from. The merchant forms a distributing medium impossible to neglect. He does a legitimate service, for which he receives a legitimate (though very small) compensation.

No one familiar with manufacturing will deny that the purchases in bulk which the merchants make from the manufacturer expedite cheap production in quantity. No one who has ever sold goods will deny that the service rendered the manufacturer in the safe (or comparatively safe) credit of the merchant for goods bought in large volume is great. No one can deny that in taking on his shoulders the labor and responsibility for marketing the manufactured goods, taking the risks of credits on small sales, and reaching every possible purchaser in every possible locality, the merchant is invaluable.

The merchant is a local institution; he is confined to the area in which his own activities extend. He is local to a town, to a State, to a nation, to a continent, to the world, as his ability may extend. And he may only exist in his local area, as his ingenuity and enterprise and courage may enable him first to win and then to hold by actual marketing of goods he has bought outright from the producer the area he is active in.

MERCHANTS' COMPENSATION.

Merchants are not compensated excessively. Indeed, few pursuits require so much and give so little. But stability and a proper reward in the respect of those who know count often for more than money with many a man. And the merchant must take much of his reward in the satisfaction of good work well done—the best reward for the good fighter always.

I have often compared the relative necessity for perfectly accurate methods of thought, for the calmest of unprejudiced judgment and the greatest belief in one's self in many branches of human endeavor; and in no branch of science or philosophy or commerce are the conditions so exacting for success. Only 5 per cent. of us are permanently successful, and a small fraction of 1 per cent. eminently so. For we have not only a prize for success, but a penalty for failure, which is so severe that it is measured by one word—ruin. The race is not for a month or a year, but for a lifetime. And one day, after thirty years' success, may mean failure in the race, instead of success. Few pursuits are so hazardous and so fatal to bad judgment.

Much discussion has arisen lately regarding such matters as graft and expenditures of an extravagant and unjustifiable nature in many branches of business, unduly high salaries and the like. The merchant, doing business on the margin of profit he is forced to work on, and with the risk constantly to be faced, cannot indulge in such extravagances, if he has self-preservation well in mind. Along that road is quick elimination from the race.

RESALE PRICE.

It has appealed to me at times in some, I may say many instances, that to make a selling price for an article in our line of business was a signal for many buyers to begin an assault on that price, to try to break it, and, by so doing, demoralize the trade. This, I think, is largely the outcome of our business policy.

No one would think of asking Tiffany & Co. to accept a less price than that quoted by their salesmen on any article they have for sale, for the reason that it is absolutely a well-known fact that they are a one-price house. Further, they have the distinguished honor of being able to do business without a sign; I think the only concern in America that does do so, a fact to be well proud of.

If prices are made simply to be considered nominal, and an invitation to cut them, why not cut them down at first to the lowest point you are willing to accept? I am a believer in the old saying that the "laborer is worthy of his hire," and certainly a merchant is worthy of a fair and reasonable advance over cost on any goods he carries in stock or offers for sale to his customers.

If a manufacturer will state a price which he should receive for his goods that is based on good judgment and a fair profit, why should he practically say to the possible buyer: "This price is simply a starter; when you get ready to buy, make me an offer?" That has a very demoralizing effect in two ways, both upon the manufacturer and on the dealer—yes, I might say in three ways, and include the consumer.

UNFAIR COMPETITION.

I took occasion to write to a prominent commercial man in Germany in our line, asking him what the facts were regarding what might be their law against unfair competition. He writes me that the law is one part of their Civil Laws Code, and that the matter is handled in about the following manner:

If one person thinks another person harms his trade by misrepresentation, humbug or lies, personally or through travelers or agents, or by advertisements, etc., he can go to the public prosecutor (Staatsanwalt) and complain. This is a government official whose chief work is to follow any crime or act against the security of persons and the welfare of the State and its subjects which comes to his ear.

If you complain about unfair competition, you have to bring certain proofs against your competitor, and if the public prosecutor thinks them justified to a certain degree, he gives the whole case to the ordinary law courts (Strafkammer), in which the case is followed and judged as any other case, only that a certain person is not the plaintiff, but the Staatsenwalt, and his interference is free of any charge.

If you, as a plaintiff, think that the accused has caused you a loss by his unfair competition, which you can express in provable sums, you, at the same time, go to the law courts as secondary plaintiff (Nebenklager), and these two cases (the public and your private case), are judged together.

Unfair competition also is, if your competitor says in advertisements that he has already sold 5,000 machines, or if a newspaper says it has 50,000 copies a day, and if that is not true, you can complain. Or if a house advertises to sell its stock under cost prices, and if that is not true, you, as a competitor, can go to law, and so on.

But it is not considered to be unfair competition if, for instance, a good American machine is copied here, because everybody has the right and opportunity to protect himself by patents for new things and good ideas.

APPEALS TO HIGHER HONOR.

To have fair competition in anything—race, game, fight, trial of strength—every competitor must perform under exactly the same conditions. And insofar as our laws are just, they give every one an equal chance. Every sincere attempt at reform or enactment of new laws is prompted by the desire to have every man have an equal chance. And insofar as this end is sought, all agitation and disturbance of existing conditions are justified.

But laws can probably act only after an unfair advantage has been taken and detected. Laws cannot prevent much that goes on in the way of inequality of competition. What is better than all laws and checks is this—a spirit of "sportsmanlike" honor, such as prevails in all fields of clean, manly competition, such as we, as a nation, are proud to be called leaders in.

If you know a man well, know him personally as an individual, and not as a name on a sign or a letterhead, you care a great sight more what he thinks of you, and he cares a great sight more what you think of him. All moral standards (far more potent than statute laws) are made up of the sum total of neighbors' opinions.

COMMERCIAL FRATERNITY.

Two men who have put their legs under the same board and eaten from the same table are more potent judges of each other than any distant law court in the land. Many a man who can stand the adverse comment of thousands of unknown people in the press of the land could not, and would not, face the dislike of half a dozen men he has known and seen daily for 10 years. Disgrace is only thought of in terms of those whom we know as men and women. Abstract disgrace is as weak a thing as I know of.

And so commercial fraternity is a very real and very great blessing, and a very near and very great need. And the great power of commercial fraternity is that the man who doesn't play the game fairly cannot have that fraternity; and the man who does play the game fairly has it in abundance. Loneliness is the worst curse on earth—the punishment we give our criminals is only enforced loneliness—and no man can stand it, in or out of jail. Let us make our commercial fraternity something of a prize—and we shall no longer need paternal laws, so called, "in restraint of trade."

CIVIC PRIDE AND PATRIOTISM.

Politics, a word so sneered at by many, must be recognized as a great factor in the business man's career, as politics, directly or indirectly, enter into all business affairs of our active life. And I deem it a duty and an evidence of good citizenship to take an active interest in politics, and I mean by an active interest in politics beginning at the primaries and so on up—not to treat it lightly or sneeringly, as is unfortunately the fashion with many. I am one of those who believe, in slang parlance, of doing our "kicking inside the organization," or the party with which we are affiliated, and not outside, but play the game as earnestly and honorably as you follow your business.

It will pay you to do so, both in point of information, keeping you well in touch with the affairs of State, as well as those of commercial lines. They are so intricately interwoven that the more familiar we are with the laws of our land the less liable we are to violate them, and the better able we are to judge when our representatives in legislative halls have what concerns our business brought to their attention through the regular channels of legislative action.

GOOD WORD FOR YOUNG MEN.

Now I want to say a few words to young men. At no time in the world's history, in no place like America in the year 1908, is there such a magnificent opportunity for young men. I don't mean the one who is faultless in attire, with fine features or form. In business we must eat, sleep, dream and live it to succeed.

There are 195 boys in my office, and the most successful of all who have been there was the son of a deckhand on a ferryboat. You tell me that a young man can't get along? I am interested in them because they are necessary, because we have got to depend upon them. We have got to survive or sink by the character of the men who will be filling the positions in the next decade. There is every possibility for them. When they come to me I tell them not to come if they simply want a place to earn money for frivolous living. If a man is a mere automatic money making machine, he is a mere thing.

Young men, get into the game and play the limit, if you will permit me to use a technical term. Don't try any flimflaming or the art of Hungry Joe. Play it straight, so that you won't have to turn sharp corners to keep from meeting a fellow whom you have treated unfairly. I have been a long time on the turf. I started in lugging cotton, but I got the line I liked, and I stuck. If you don't like the game, stop it. Don't go into a business unless you love it. Get in the business you like, and that is half the battle. Make a careful selection in your life work and your wife; say it is your game, and play it to the finish. Never play favorites; play winners. That is what I do; I let the favorites alone.

It had been intended that Robert Wuest, commissioner of the National Metal Trades Association, should make an address, but he is suffering from overwork, and J. M. Manley, secretary of the Cincinnati branch of the Metal Trades Association, was permitted by Papa Hargrave to address the diners in Mr. Wuest's stead. Following is a large part of his address, which was on

The Benefits of Organization.

I am here to represent Robert Wuest, commissioner of the National Metal Trades Association, who was invited to address you because of his wide experience in trade organizations. . . . I could not understand, when I was told of the subject of which Mr. Wuest was to treat, why it was necessary to talk to this audience, or why they should expect any one to talk to them, about the benefits to be derived from any kind of organization.

SOME LESSONS FROM HISTORY.

It seems to me that the very name of Richmond, it seems to me that this very audience, makes the discussion of that question here unnecesary, when we consider that we can almost hear echoing within the walls of this building the immortal voice of Patrick Henry, saying, "I repeat it, sir, we must fight, and to do it we must organize." When we can hear that, why should we discuss the necessity of getting together in the matter of one of the country's prinicpal lines of business?

If we want to go back and get great examples of the

benefits of organization, we have only to point to the Bill of Rights upon which our Constitution was founded, and we there find a document modeled upon Magna Charta which the barons at Runnymede exacted from King John. That was one of the results of organization. Another was the Revolutionary War and its results, and the State of Virginia played her part in that organization. Only a few short months ago the throne of Russia was tottering, and nothing saved it but a splendid military organization. The splendid organization of this great government of ours enabled us quickly to avenge those gallant heroes whose eyes were closed in sleep eternal when the waters of the Atlantic closed over the martyrs of the Maine, and we point with pride to that time when Admiral Dewey made Liberty's rifle crack so loud that it was heard around the world. That was the result of organization, and nothing else. He was a specimen representative of the greatest organization that there is in the world.

There are so many things that an organization of this character can promote, so many things that work for good, that it is impossible at this late hour to devote much time to them.

Away back in 1777, the Continental Congress got together and ordained that religion, education and morality being necessary for good government and the happiness of mankind, schools and religious organizations should forever be encouraged. So I say that whenever an organization of American citizens is formed, I care not what the object, you are promoting, both directly and indirectly, religion, education and morality—those are the basic principles upon which this government was founded, and every time a body of law abiding American citizens get together, they promote and develop some of those basic principles of this government. That is a sufficient reason why you should organize, you do not need any other reason.

BROADENING EFFECTS OF ORGANIZATION.

To come closer to home, I believe every time a business man attends one of these meetings, he goes home a broader and a better citizen; he learns of the legion of good qualities that he thought were lying dormant in the heart or in the mind of some other man in the same line of business—the meeting brings them out; he learns what sort of a man the other fellow is, and the other fellow learns what he is; and it is well for you that he does learn what you are, because they say there are only two reasons why a man does or does not lend money to you, one because he knows you and the other because he does not know you.

There are a great many manufacturers who need to go through an annealing process; some of you have not become annealed and you want to go through an annealing process. The best place in the world for you to go for that is to one of the hot conventions; it is the very place for you to go. It makes you a better man, it makes you tougher, that is what annealing is.

PREPARATIONS FOR EARNING A LIVELIHOOD.

There are four vocations in which every man, woman and child in this government may find the opportunity of earning an honest livelihood—the professions, commercial life, industrial life, and domestic science, and I believe that in those four every living man is embraced. To come down to the educational feature, years ago, if your son wanted to become a professional man, it was necessary for him to go into the office of a minister, a lawyer, a doctor or a dentist; if he wanted to learn one of the commercial pursuits, if he wanted to become a banker or a grocer, he was apprenticed in a bank or a grocery, and he went in there and learned that business, and frequently he paid for the privilege of going in there and learning it; if he wanted to go into the industrial pursuits, he went into the factory and there learned the particular occupation or trade he wanted to follow. If a girl wanted to learn sewing, if a girl wanted to learn cooking, the only place to learn it was in the household.

Now what is the result of our growth and our development? The result is that in a great many States a young man can go in and learn 90 or 95 per cent. of all the professions at public expense: he can go in and learn the commercial pursuits at public expense; in our high schools a girl can go in and learn cooking, learn domestic science, how to keep a flat, how to keep house, at public expense. But a man who wants to learn a trade at public expense, how many schools have we got for them? Absolutely, you can count them on the fingers of one hand. Now why do not the organizations of the character of this, especially those composed of men in this line of business, devote more time to that educational feature? You are all interested in promoting that subject.

THE CINCINNATI CO-OPERATIVE COURSE OF ENGINEERING.

In Cincinnati, Professor Herman Schneider has started what is called a co-operative course of engineering. Young men go in to factory and work one week and the next week they get the theory in the university; they work in pairs and alternate in the shop and in the university. I just mention that because educators throughout the entire world are watching that movement in Cincinnati to-day. We have 75 of those young men in our shops, some of whom have been to Harvard College, one has been to Yale, and some to Cornell University. We have that class of students now working in our shops. That has only been made possible by virtue of the Metal Trades Assooiation, by virtue of an organization of manufacturers.

Now I want to tell you that I would not have a job, I would not be here, if it was not for that organization.

POLITICS.

There is another field of industrial life and business life in this country in which every citizen is keenly interested. Mr. Moore referred to it briefly and he called it politics. That particular part of politics which pertains to the making of laws is the one in which you are the most keenly interested, and it is absolutely as necessary for you to be organized to meet those issues as it is for you to know the price of your product. When a member of the Legislature comes to you and says, "What do you want us to do with this? Here is another fellow who says 'Do it this way.' What do you want us to do?"—he does not want the opinion of one man, he wants the opinion of the men of his district, he wants to make a law that will respond to the will of the people, and he can only learn what the will of the people is by your placing yourselves in such a position that you can keep in constant touch with him so that he will know what you want, and he will try to get that for you, and if he finds out what you don't want he will try to keep that from becoming a law. You will find that very thing is sufficient to warrant you in maintaining the organization you now maintain.

HOW MEMBERS OF AN ASSOCIATION STAND BY ONE ANOTHER.

I will give another little illustration. In Cincinnati there was a time when industry was stagnant some years ago, when the wheels in every factory in Cincinnati stopped turning, when the belts were taken off, there was no work. Two or three of the members of our association were indebted to a bank, they had notes that were coming due, and the bank said, "We want the money." These weak sisters said, "We have got to settle with the bank, we have got to do something." What did our organization do? They turned it over to our Finance Committee.

The Finance Committee went down to see Mr. Banker, and said, "Mr. Banker, we understand that Mr. So and So owes you some notes and you are crowding him for the money." "Yes, sir, that is true." The committee said, "Now, we will tell you; if you force him to pay those notes it means a tremendous loss to him and a big loss to you, and if those notes are not good to you we will give you our personal checks for them and we will take care of you in the future." That is an illustration that you can't beat of the value of organization. What was the result of that? The banker carried them, he said to those members, "You can have all the time you want." It made the big fellows, the financiers who went to see the banker, stronger and better men, and it made those members stronger and better men than they ever were before; it showed them there were benefits in organization that they never dreamed of, and that there are benefits in organization that can only be found out when the proper time arises.

THE CINCINNATI YEARLY OUTING.

There is another thing we do in Cincinnati that I believe is not done in any other city in the United States. We give an outing each year to all of our employees; 70 factories give an outing on the same day to 40,000 people. Now imagine that for one moment. We go out and buy a whole park, buy all the privileges, all the amusements, for one day, and turn that over to our employees, give them free tickets of admission and free passes to every amusement in the park. I wish you could see Sam Moyer, William Lodge, Fred Geier and all of those manufacturers of Cincinnati, going out there and breaking bread with their employees; I wish you could see Herbert Wunder, a trained athlete, go out there in his running suit, and I wish you could see the 500 entries in the athletic contests. I wish you could be present and look over those 40,000 people and see what a picnic it is. I wish you could see the American Tool Works Company's employees going in wearing the badge of the American Tool Works, the firm that employs them. I wish you could witness that era of good feeling; I wish you could hear them talking about it, both before and after the outing.

You may say, "But that takes time, the employees waste the time of their employers discussing this topic." That is true, it takes some time, it is bound to do it, but is it not better to have them discussing some subject like that than some subject which might mean much more to the manufacturer and take much more of his time? Now that is the result of organization, it could only be done by organization, that is one result.

LOOK FORWARD INSTEAD OF BACKWARD.

I believe that to be constantly looking backward to what was, or what might have been, instead of forward to what may be, is the greatest weakener of confidence that we have.

Yesterday is as far from you as if it were a million years, an eternity, behind you; it has gone forever; all of its sad hours, all of its dull business, all of its misfortunes, all of its success and happiness are gone forever from you. Turn all of your thought to the present and make of it a past that it will be a pleasure to you to look back upon; turn upon it a fuller light and truth so that you will be better equipped to fortify yourselves against the struggles that will confront you in the future.

I believe that an organization of this character is one of the grandest things to promote all the kinds of liberty that Americans believe in that there is in the whole country. We believe in the kind of liberty which proclaims to the foreigner and the sojourner, the first moment he touches the soil of America, that the ground on which he treads is holy, consecrated by the irresistible genius of emancipation; that no matter what complexion an Indian or African sun may have burned upon him, no matter with what solemnities he may have been offered on the altar of slavery, no matter what doom may have been pronounced against him, the first moment he touches the soil of America the shackles fall to the dust, his body bursts the chains around him, his soul walks in majesty and he stands redeemed. That is universal, by the irresistible genius of emancipation. That is the kind of liberty we believe in, it is the kind of liberty we stand for, and we believe that every organization of American citizens promotes and develops that belief and develops that liberty. And if every person identified with such organizations is true to himself, true to his own principles, then he cannot help but be true to his organization. In the words of the poet, I ask you to weigh them well,

> To thine own self be true,
> And it must follow, as the night the day,
> Thou canst not then be false to any man.

To the toast, "The Ladies," Hon. John Garland Pollard of Richmond responded in a charming manner.

FRIDAY, MAY 15.

The three associations met separately in the morning, the principal work being the

Election of Officers.

The elections resulted as follows:

Southern Supply and Machinery Dealers' Association.—President, J. C. Miller, Miller Supply Company, Huntington, W. Va.; first vice-president, E. A. Peden, Peden Iron and Steel Company, Houston, Texas; second vice-president, Percy G. Wall, Knight & Wall Company, Jacksonville, Fla.; secretary and treasurer, Alvin M. Smith, Smith-Courtney Company, Richmond, Va. Executive committee: C. H. Briggs, Briggs-Weaver Machinery Company, Dallas, Texas; J. A. Riechman, Riechman-Crosby Company, Memphis, Tenn.; E. T. Hartfelder, Hartfelder-Garbutt Company, Savannah, Ga.; H. C. Clark, Charlotte Supply Company, Charlotte, N. C. Manufacturers' and conference committee: W. H. Banks, Banks Supply Company, Huntington, W. Va.; A. M. Gibbes, Gibbes Machinery Company, Columbia, S. C.; J. C. Fischeser, Atlanta Machinery and Supply Company, Montgomery, Ala.; H. C. Clark, Charlotte Supply Company, Charlotte, N. C.

National Supply and Machinery Dealers' Association.—President, George Puchta, Queen City Supply Company, Cincinnati; first-vice-president, Henry Prentiss, Prentiss Tool and Supply Company, New York City; second vice-president, W. M. Pattison, Pattison Tool and Supply Company, Cleveland, Ohio; secretary-treasurer, A. T. Anderson, 41 Wade Building, Cleveland, Ohio. Executive committee: Chas. S. Farquhar, Chandler & Farquhar Company, Boston; James W. Wright, J. W. Wright & Co., St. Louis; W. L. Rogers, Pittsburgh Gage and Supply Company, Pittsburgh; F. B. Scott, Syracuse Supply Company, Syracuse, N. Y. Advisory Board: Edgar E. Strong, Strong, Carlisle & Hammond Company, Cleveland; George T. McIntosh, McIntosh Hardware Corporation, Cleveland; Chas. A. Strelinger, Chas. A. Strelinger Company, Detroit.

American Supply and Machinery Manufacturers' Association.—President, Chas. F. Aaron, New York Leather Belting Company, New York City; first vice-president, L. D. May A. Leschen & Sons Rope Company, St. Louis, Mo.; second vice-president, E. H. Hargrave, Cincinnati Tool Company, Cincinnati, Ohio; third vice-president, J. W. Gardner, Gardner Governor Company, Quincy, Ill. Executive committee: J. H. Drury, Union Twist Drill Company, Athol, Mass.; John Trix, American Injector Company, Detroit, Mich.; S. P. Browning, Ohio Valley Pulley Company, Maysville, Ky.; Carl A. Hubbel, T. R. Almond Mfg. Company, Brooklyn, N. Y.; E. Bertram Pike, Pike Mfg. Company, Pike, N. H.

The meeting of the manufacturers, on Friday morning, opened with the reading of resolutions. The following brought forth considerable favorable comment and was carried unanimously:

Resolved, That the association address the various departments of the Government, stating it is the wish of this association that the Government require all bids on specifications, as well as merchandise furnished under specifications, to be on goods with manufacturer's name and brand only, and that the manufacturer's name, address and brand be placed on all articles furnished.

The following resolution was also carried:

Whereas, The Congress of the United States is being strongly urged to pass anti-injunction legislation and also a bill known as the Hepburn Bill to amend the Sherman anti-trust bill act;

Resolved, That this association is unalterably opposed to such legislation; and be it further

Resolved, That a copy of this be sent to President Roosevelt and the proper committees of the House and Senate.

The afternoon of Friday was devoted to a joint session, the principal work being the ratification by the three associations of the resolution concerning resale prices, which was brought to the surface in the joint meeting of Thursday morning. E. E. Strong introduced the following resolution, which was unanimously passed:

Resolved, That it is the sense of this meeting that the manufacturers of machinery, tools and supplies, be encouraged as far as possible to maintain and not reduce prices at this time, believing the maintenance of present prices to be for the best interest of all concerned.

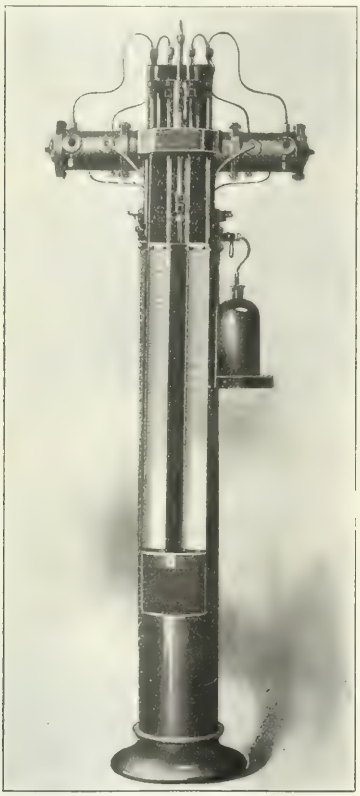
In introducing the new officers of the three organizations, J. H. Drury acquitted himself handsomely. Each of the officials responded with thanks and words of encouragement to the members, inviting them to work harder than ever. Samuel L. Mozer closed the proceedings by offering a resolution of thanks to all who had made the stay at Richmond one of so much pleasure.

Caution.—Iron and steel companies, machinery manufacturers, hardware merchants, &c., are cautioned against transacting business with a party who is floating worthless checks, and apparently making a specialty of the iron trade. His method of operating is to write for a catalogue. Later, he calls with the catalogue and perhaps with certain articles marked, asking to see the goods, and places an order for them, giving a fictitious address. He then asks if a deposit is desired on the transaction and fills out a check for $200 to $1500. Somtimes he gives a large check and asks for a certain amount, probably one-third or less, to be given him in cash for necessary expenses, as he has no one in the vicinity who can identify him in order to have a check cashed. He may use almost any name, but is known to have operated as K. S. Miller, H. B. Miller and P. P. Hilliard. He is described as being an American, 28 years of age, 5 ft. 7 in. tall, 160 lb. in weight, good build, dark hair, smoothly shaved and has a large burn scar on the left side of his face. Any information relative to the operations of this party that will be referred to the American Bankers' Association or to Pinkerton's National Detective Agency will receive prompt attention.

The Molybdenum Deposits of Norway.—George G. Blackwell, Sons & Co., Ltd., Liverpool, England, state that the oldest and largest molybdenum mine in the world is the Knaben mine, situated in Fjotland, Norway. This mine has been worked for many years, but was acquired some three years ago by the Blackwell's Development Corporation, Ltd., The Albany, Liverpool, England. Under the new ownership, active development work has proceeded and additional machinery has been erected so that the output has been kept up at a steadily increasing figure. The mine is now a thoroughly proved one, and as the demand for molybdenum is increasing the production will be larger. It is because of the improving demand for ferromolybdenum of high percentage that George G. Blackwell decided upon the purchase of the Knaben mine so as to secure a regular and reliable supply of the ore, as the use of molybdenum in the manufacture of steel had been retarded owing to the uncertainty of the supply.

The Improved Uehling Pneumatic Pyrometer.

Recent developments and improvements in the pneumatic pyrometer made by the Uehling Instrument Company, Passaic, N. J., tend to simplify its construction, diminish the amount of attention required to keep it adjusted, and reduce the cost without sacrificing its accuracy and reliability. The average life of the fire tube, the part exposed to the heat of the hot blast in blast furnace practice, for instance, is about one year, and failure is almost invariably caused by abrasion due to the sand blast action of the air carrying solid particles. Where this action exists to a slight degree only, fire tubes have lasted from three to five years, while in extreme cases they have been worn through in as many weeks.



A Four-Unit Pneumatic Pyrometer of the Improved Type Manufactured by the Uehling Instrument Company, Passaic, N. J.

The difficulty has been met quite effectively by substituting for the outer tube a hard special alloy of ample heat endurance to resist the highest hot blast temperatures met with, in place of the soft and easily abraded platinum. The benefit is two-fold in that the frequency of repairs due to abrasion and the cost of replacing tubes have both been greatly reduced.

In the early history of the pneumatic pyrometer each regulator served but one unit, and the first modification of importance consisted in one regulator controlling two units. This constituted the so-called double instrument with which the majority of blast furnaces have been equipped, indicating and recording the temperatures of both blast and gas of the furnace to which they were attached. Experiments have proved that with the proper modification as many as eight pyrometer units can be controlled by one regulator,* thus simplifying the installation very much, and at the same time reducing the first cost materially. The quadruple instrument, illustrated herewith, is one embodying the improvements herein referred to.

The Steinbart recording gauge, with which all the pneumatic pyrometers have been so far equipped, is claimed to have no superior for accuracy, and to be for some reasons preferable to a disk recorder. The record paper being a continuous strip need be replenished only once every four months, the records need not be removed on the same hour of the day, since one day's record cannot overlap that of the day following, the rectilinear records are more comprehensive and are more readily compared with one another than disk records, and the Steinbart has a very open scale. However, since many prefer the circular record, for the reason that most recording instruments are designed for such, and because they are more readily filed, this company has recently developed an accurate disk recorder which can be furnished in place of the Steinbart gauge if the circular record should be preferred.

The pneumatic pyrometer is based on a simple principle, and involves no delicate mechanism in its practical application. It is substantial throughout and therefore durable. It is not influenced by changes of the surrounding temperature and is quite independent of the molecular changes which necessarily take place in the parts exposed to the heat, which makes it accurate, and not likely to get out of calibration. The pneumatic principle permits observation gauges to be placed at one or more points so that the temperatures may be read by the attendant at the place most convenient. The pneumatic pyrometer also has a quality peculiar to itself. It has available force sufficient to actuate high and low temperature alarms, and to control mechanism for opening and closing the cold blast valve, thus automatically equalizing the temperature to any desired degree within the limits of the stove capacity.

* An eight-unit Uehling recording pyrometer was described in *The Iron Age*, January 10, 1907.

The Canadian Visit of the Iron and Steel Institute.

Bennett H. Brough, secretary of the Iron and Steel Institute, 28 Victoria street, London, announces that arrangements have been completed for the participation of that society in the summer excursion of the Canadian Mining Institute. It is propsed that the excursion shall start from Montreal, August 24. The party will proceed to British Columbia by the Canadian Pacific Railway, first visiting the coal mines of the Crow's Nest District; next, the Rossland District, including the Trail smelter; then the copper mines and smelter of the Boundary District. A visit will be paid to the town of Nelson, where a reception will be held. A reception and a meeting for the reading of papers will also be held in Victoria, the capital of the province.

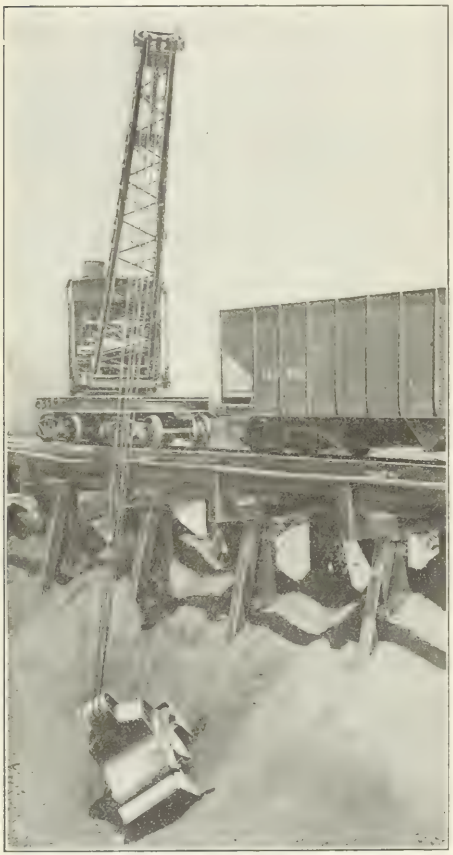
Returning after two or three days' rest the party will journey over the Canadian Pacific main line, through the Rocky Mountains, stopping at Banff Hot Springs. It is then proposed to journey back to the nickel copper district of Sudbury, via the Soo line, and, while in the Province of Ontario, to visit the cobalt district. A reception will then be held in Toronto. Returning to Montreal, the journey to the Maritime Provinces, taking in the Thetford asbestos region en route, will be made over the line of the Intercolonial Railway. It is estimated that the time necessary for the carrying out of this programme will be about six weeks. The Canadian Mining Institute is trying to arrange for exceptionally favorable terms with the railroad companies, which, if secured, will reduce the expenses of individual members of the party accordingly. Members of the Iron and Steel Institute desirous of availing themselves of the invitation are requested to communicate with H. Mortimer Lamb, secretary of the Canadian Mining Institute, 413 Dorchester street, West, Montreal, Quebec.

An International Mining Exposition is scheduled for four weeks at Madison Square Garden, New York, opening on Monday, May 25.

A Brown Hoist Locomotive Crane Equipment.

At the plant of the Girard Iron Company, Girard, Ohio, iron ore is being handled rapidly and economically by a locomotive grab bucket crane, furnished by the Brown Hoisting Machinery Company, Cleveland, Ohio. The crane travels on a standard gauge railroad track, and has a rated capacity of 15 tons. It is equipped with mechanism for operating a two rope grab bucket. This is a Brown Hoist ore grab bucket, having a capacity of 3000 lb. of ore.

Most of the ore is received in bottom dump cars, and these are run out on the trestle track and dumped on the stock pile. The principle duty of the grab bucket is to keep the ore stock bins filled. The method by which this is accomplished will be well understood by referring



A Brown Hoist Locomotive Crane with Grab Bucket Handling Ore at the Girard Iron Company's Plant.

to the accompanying illustration. As shown, the crane is taking ore from the stock pile. The grab bucket, after picking up a load, is swung around and dumped in a bottom dump car standing on the same track. Thirty-five tons of ore can be put in the car in this way in 15 min. When the car is loaded the crane is coupled to it and hauls the car to the storage bin, where it is dumped.

The crane is mounted on M. C. B. standard trucks and is equipped with M. C. B. couplers. The bucket operates at a maximum radius of 35 ft. Only one man is needed to operate the crane, so that the expense of this means of handling the ore is small. The same crane and bucket can be used to handle limestone and coke, and its equipment is such that if the slag pit whirly breaks down its duties can be performed by the crane until repairs are made.

Youngstown Industrial Cars.

As supplementary to the description of two cars which appeared under a similar title in *The Iron Age*, April 16, 1908, the illustrations herewith show two other cars built by the Youngstown Car Mfg. Company, Youngstown, Ohio, also adapted to the use of iron and steel works. Fig. 1 is a platform car, sometimes called a shop truck. The side and end sills and the middle longitudinal sills are of 8-in. steel channels, and cross sills are

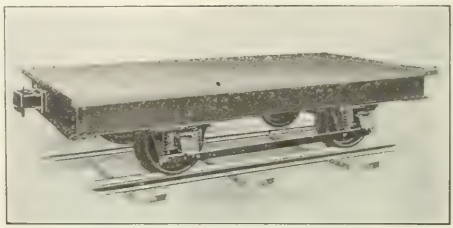


Fig. 1.—The Youngstown Platform Car or Shop Truck.

5-in. channels. All parts of the frame are strongly braced by steel angles and gusset plates. The wheels are 18 in in diameter and of chilled cast iron, and pressed on 3¼ in. axles. Plain outside journal boxes with brasses and springs are used. The general dimensions are as follows: Length, 10 ft.; width, 5 ft.; hight above rail, 24 in., and capacity, 8 tons. The top is of 2 in. plank.

Fig. 2 shows a car suitable for handling loose material, which is claimed to be especially well constructed and easily operated. By carefully proportioning the body it has been possible to combine a low loading hight with a very high angle of dump, so that the car is guaranteed to empty its contents completely. After discharging its load the body rights itself and is automatically latched in its upright position. The hopper is held vertical by two latch hooks placed diagonally at opposite ends of the car. This arrangement enables the operator to dump the car only toward the far side, which reduces the possibility of accident. The frame is composed of steel channels bent to form round buffers at the ends, a construction which combines lightness, simplicity and strength. The car is

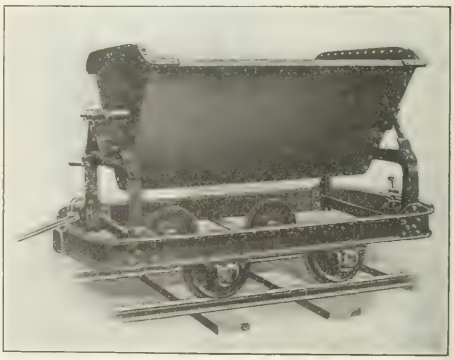


Fig. 2.—The Youngstown Side Dumping Hopper Car.

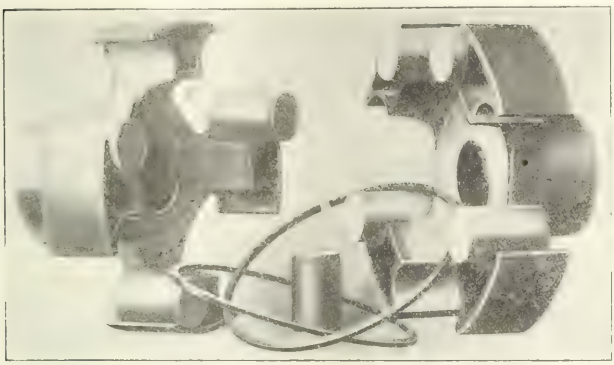
built in capacities up to 4 cu. yd., and in gauges as required.

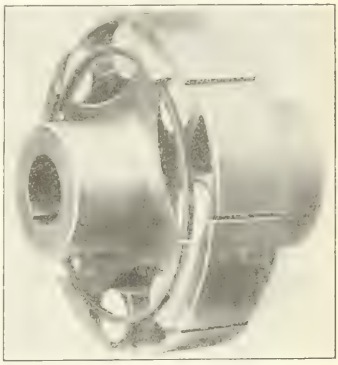
The Tennessee Coal, Iron & Railroad Company, which shut down its rail mill April 1 for the purpose of removing the old stands of rolls and installing the new mill, put its first rail through the latter April 30, making good the 30-day estimate of the management. At present all the open hearth furnaces at the Ensley plant are idle and they will remain so until June 15, when the rail mill will resume operations in full.

The Nuttall Flexible Insulated Coupling.

The illustrations show an improved flexible insulated coupling, manufactured by the R. D. Nuttall Company, Pittsburgh, Pa. The coupling consists of two cast iron interlocking spiders, which are insulated from one another by solid rubber cylinders. The only other parts are two steel rings used to hold the rubber cylinders in position. The rubber members provide ample insulation and at the same time give the desired flexibility. The couplings are made in sizes from 5 hp. up.

This flexible coupling is especially desirable where electric motors are direct connected to machinery which is subject to vibration, as, for example, a tube mill or a coal pulverizer in a cement plant, where the coupling relieves the motor from the shocks and jars of the machine. In addition, the end thrust of the crusher is overcome and the motor bearings run without heating.

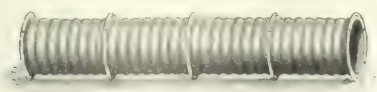




Unassembled and Assembled Views of a New Flexible Insulated Coupling Made by the R. D. Nuttall Company, Pittsburgh, Pa.

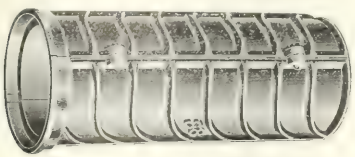
Galion Culvert Pipe.

The Galion Iron Works Company, Galion, Ohio, has placed on the market two new pipe products, illustrated herewith, on which a number of important improvements are claimed. The Sterling corrugated sheet metal culvert



Sterling Corrugated Sheet Metal Culvert Pipe.

pipe is claimed to be the strongest corrugated pipe made, having approximately 30 times the strength of plain pipe of the same thickness. It is made up in 2 ft. sections, each section having an angle flange 1 in. high turned up at each end. These sections are firmly attached by riveting the two flanges of the adjoining sections together. The whole culvert is thus riveted together from end to end, solidly, and in any length of even feet desired.



Perfection Cast Iron Culvert Pipe.

The other product, Perfection cast iron culvert pipe, is made in 4-ft. lengths and is ribbed. Extreme simplicity in construction combined with great strength and durability are the points claimed in this device. Each joint is constructed of two half-round longitudinal sections, each section having two lugs on each side and each part being an exact duplicate of the other. These sections are bolted together by the lugs with bolts of suitable size and this makes it a complete round pipe.

An Interesting Forge Installation.

A forge shop equipment differing from those usually installed in technical schools was recently furnished the Stuyvesant High School, New York City, by the Buffalo Forge Company through the Howe Engineering Company, contractors. The forges are of steel plate construction, and each frame contains two fires. They are designed primarily to economize floor space, although providing a large firepan and an efficient system of removing the smoke and gases. The firepan measures 5 ft. 4 in. by 2 ft. 6 in., giving about 5 sq. ft. of surface on the forge for each operator. The firepots are 12 in. in diameter, extra deep, and equipped with anticlinker dumping tuyeres.

These forges are mounted on a totally inclosed stand in the form of a frustrum of a cone, measuring 27 in. in diameter at its base. In this stand the blast and exhaust connections for both fires are concealed. They connect with the underground blast and exhaust system immediately below the forge. The hoods are of the Buffalo down draft type, constructed of cast iron and equipped with worm and gear attachment for adjusting to a fire of any size. One deep coalbox placed between the exhaust connections at the rear of the hoods is conveniently located for both operators. Separate water tanks located at the ends of the forge nearest the fires are provided.

To prevent frictional losses through long runs of piping two fans are used, each serving a battery of 30 fires. These are No. 9 Buffalo B volume blowers, and are direct connected to induction motors. The blast is delivered at 4 ounces per square inch when the blowers run at 1120 rev. per min., the blowers being of ample capacity for furnishing blast with all of the forges in operation at the same time. The smoke and gases are removed by two 70-in. steel plate exhaust fans, driven by induction motors at a speed of 560 rev. per min., giving a suction of 2 ounces in the exhaust system. These fans discharge about 30,000 cu. ft. of air per minute from the building, keeping the air in the shop fresh and cool.

Four single instructor's forges of a different design are installed. These are equipped with separate electric driven fans, enabling the instructors to use their fires for demonstration purposes without having to operate the larger fans.

The Buffalo Forge Company furnished the entire equipment; this forge having been designed especially for this school, and a number of ideas of the manual training instructor, C. B. Howe, were incorporated in the design.

Ore Properties and Ship Owners.

Ship Owners Buy Ore Mines.

DULUTH, MINN., May 15, 1908.—Duluth parties, headed by G. A. Tomlinson, associated with friends in the city and in the East, have taken over the old Volunteer mine, Cascade Range, and will thoroughly explore and develop it, with the idea that it has not been completely prospected, and that it may contain more and better ore than has ever been mined from there. Mr. Tomlinson is a shipping master, and has been desirous for some time of accumulating ore tonnage under his own control. The deal is interesting, chiefly from the light it sheds upon the ever changing and evolving situation on the lakes in the matter of freights. It is more and more necessary that the ship owner shall control freight either by close association with mine owners, coal companies or grain shippers, who may have stock in his vessel companies, or by the direct ownership of mines by the vessel concerns. The situation this season has brought this fact—long foreshadowed in this correspondence—directly to the front, and it is now patent to all shippers. A number of vessel concerns, without tonnage associations, will be unable to move their vessels this year, unless conditions materially improve during the next two months. Mr. Tomlinson does not happen to be among this list, for his affiliations with heavy shippers and controllers of tonnage are exceedingly close, but the fact that he is buying mine interests is even more interesting on this account.

The Volunteer has had a checkered career. It is the property of the Alger estate, and was active prior to 1896, since which time it has had various periods of exploration, option and shipment. It was first opened in 1891, and has shipped to this time about 1,420,000 tons. It was under option in 1899 to the Cleveland-Cliffs Iron Company, later to the Oliver Iron Mining Company, then to Jones & Laughlin, and to other parties, all of whom were discouraged by the grade of ore found. The mine is opened by three shafts, which are down to considerable depth; the ore is hard, requires crushing, and is of non-Bessemer grade, running from 55 to 62 per cent. iron. In spite of the various disappointments of explorers on this property, it is regarded as the most promising in its vicinity, and there is a general feeling that ore should be found there to repay a considerable outlay.

The Oliver Company and the Clark Mine.

In the case of various heirs against the Oliver Iron Mining Company for possession of the Clark mine, Mesaba range, the Supreme Court of Minnesota has just handed down a decision favorable to the Oliver Company. The title rested in a soldier's homestead and in a tax title, secured after the soldier's right was considered defective. The Oliver Company is defendant in a number of such suits, brought by parties who have been able to find, by delving through the old records and by such other means as are at the command of title attorneys, irregularities of more or less consequence, but it has been able to hold its own in most of the cases so far, and has several for trial this term of court. As long as iron ore properties are of value and there can be found interstices in the laws as to titles these suits will be continual, and a large part of the duty of the legal departments of iron mining companies will be to defend them. The value of iron lands has appreciated so rapidly, from a mere nominal consideration, at which time the question of flawless titles was of minor moment, that irregularities have naturally crept in, and these must now be remedied at more or less cost of time and money, as the case may be.

Mining Operations Reduced.

At the very commencement of the shipping season operations at the biggest mines of the Menominee, the Chapin and Arago, have been cut in two. The men are all kept on the payroll, and now work alternate weeks. The first shipments from that range to ore docks was from the Verona mine of Pickands, Mather & Co., and the Penn Iron Mining Company is also shipping a small amount daily. Iron County, on the Menominee, has been hit very hard by the present situation of the ore trade. Of the 27 mines in the county that were active last year only nine are now shipping or mining, and these nine are working about half time. In addition practically all the explorations, new developments, drill contracts, &c., have been stopped. This latter work was especially active on the west side of the county, in the vicinity of Iron River and Stambaugh, where there is nothing going on, and where a few months ago explorations were most active of any spot in the Lake Superior region.

The State of Minnesota is a growing factor in the ore trade by reason of its ownership in lands on the Mesaba. There are now outstanding, nearly 300 mineral contracts, running 50 years, and leases preliminary to these contracts, running one year. For the contracts a minimum of $1250 must be paid yearly, excepting in certain unusual conditions, and for the leases $25 for their term. On these lands not less than 125,000,000 tons of ore have been discovered, which will pay a royalty of 25 cents per ton to the State public school funds. More ore may be discovered on these lands with future explorations. If the Cuyuna District grows into a mining section, the State will doubtless derive a considerable benefit, for it has a large area there.

Ore Shipments Beginning.

Some slight shipments to docks have begun at several lake ports, in addition to the small tonnages forwarded by vessel from the Great Northern piers for the past two weeks. The Duluth, Missabe & Northern Railroad is receiving ore from several mines, and is filling its dock pockets; the Escanaba docks are taking in some ore and their longshoremen are at work; the Two Harbors and Ashland docks are active, but all in a small way, and with the idea merely of getting a start and relieving some mines, and giving loads to what ships are in commission. The big fleet has not begun to move, though most of the vessels are now outfitting and will be ready for business in a week or two.

The Mesaba mines to begin work are not alone those of the Steel Corporation, but include several independent companies. Most of the Vermillion range mines are shipping some ore, their stockpiling ground being well filled. It is the general fact that the grading of ore this year will be higher than last, and that lean stuff will be laid aside for the future. There are a few sales of ore, and some inquiry is made for various tonnages, but there is no desire to push things, and the actual selling of ore is confined to a very slight amount. As far as can be determined, there has been little or no shading of prices, and there has been no material reduction of mine costs, except such as may come from greater efficiency on the part of men. This is considerable. Men were unwilling to work last year, and it took 25 per cent. more labor to do any specified work than should have been required, while it was impossible for the bosses to hurry their men or to force a greater efficiency. The situation is now very different, and the men are doing a fair day's work for their pay, while the bosses are listened to with respect and in decency.

D. E. W.

The Wheeling Board of Trade, Wheeling, W. Va., has issued its year book of 1908, which gives the reports of officers, details of the membership and an interesting account of achievements accomplished by that body in promoting the welfare of the city. Accompanying the year book are a leaflet, setting forth the advantages of Wheeling for merchant, manufacturer and homeseeker, and a souvenir of the first annual excursion of the Board of Trade, which was given April 21 to 23, when visits were made to a considerable number of cities and towns in contiguous territory.

The Reorganization Committee of the Sheffield Coal & Iron Company has extended the time for the deposit of bonds and stock, and for making subscriptions to the new securities under the agreement of reorganization, to June 30. It is stated that practically all of the bondholders have deposited their securities, and so have a majority of stockholders.

Brooklyn Engineers' Club Excursion.

About 150 members and guests of the Brooklyn Engineers' Club and others specially invited by the Edison Portland Cement Company visited the works of that company at New Village, near Stewartville, N. J., Saturday, May 16. The trip was made by special train leaving Hoboken at 10:45 a.m. and reaching there on the return at about 7 p.m. Lunch was served on the train and just before arriving dusters and caps were distributed so that nothing might hinder the individual from going wherever his curiosity might lead him. This was indicative of the thoroughness with which the plans for entertaining the party were carried out. The visitors were divided into groups of ten and a guide provided for each to explain the processes and machinery and answer questions. The groups started on about two minutes headway, and all were conducted in the same order through the plant, that is, following the regular course of operations, and beginning with the quarry where the cement rock is obtained. With the party and acting in the capacity of hosts for the company were the inventor himself, Thomas A. Edison, who is general manager, and Vice-President W. F. Mallory.

The Edison plant is well known in the cement industry as peculiar of its kind in many particulars. It will not be necessary to describe it in detail as a very complete description was given in *The Iron Age* of December 24, 1903. It may be interesting, however, to review some of the special features, among which are the method of quarrying, and the subsequent methods of handling which are entirely mechanical; the crushing machinery, all of which was developed by Mr. Edison; the air separator system used instead of screens to separate the sufficiently fine cement from that which needs regrinding; the rotary kilns which are the longest in the world, and the methods taken to insure a uniform product which includes an automatic sampling system of the raw material and chemical analyses to insure the right percentage of ingredients.

In particular the crushing machinery is interesting because of its history. Some twenty years ago Edison interested himself in a more efficient means of concentrating low grade iron ores and spent over five years in developing special crushing and grinding machinery for a plant which he erected at Edison, N. J. Before this works was ready for operation the Mesaba iron ore deposits of Minnesota were opened up and this with the general business depression at the time so reduced the price of iron ore that the Edison machinery although mechanically successful was unprofitable commercially. The experience gained and work done, however, were turned to good account when the inventor gave his attention to the manufacture of Portland cement. Heavy rolls could be used for crushing rock as well as ore and duplicates of his special ore crushing machinery were installed in this new cement plant. The plant was designed for a capacity of 10,000 barrels per day, but other parts in the equipment limited it originally to about 1500 barrels per day. With the developments and enlargements which have been made since that time the capacity is now in the neighborhood of 8,000 barrels and will shortly be increased to that first intended.

Next to the crushing rolls perhaps the most interesting part in the plant is the calcining department which contains 10 of the long rotary kilns each 8 ft. in diameter, 150 ft. long and having a capacity of about 800 barrels in 24 hours. These revolving cylinders are inclined and the material works through them being burned in process by powdered coal fuel injected by compressed air and the product is discharged in the shape of clinker which has to be again ground before it becomes finished cement. It is on the final grinding that particular emphasis is laid. Cement authorities agree that on the fineness of the cement depends in a very great measure its value, as it is only the very fine particles that have cementing properties, the coarser being inert and merely acting like so much sand in the cement. The Edison cement is guaranteed to pass 85 per cent. through a 200-mesh sieve and 98 per cent. through a 100-mesh sieve.

Space will not permit of more than mere reference to many other interesting features of the plant, such as the automatic charging of the rock crushers; the automatic weighing of the crushed stone, and in accordance with the chemist's specifications to secure the right proportion of the limestone and cement rock, and the other equipment in handling provisions including the barrel and sack filling, the barrel assembling, &c. It is interesting, however, to refer to the buildings about the plant so many of which are of reinforced concrete construction. One of the latest practices is the use of concrete members made up on the ground and assembled after the manner of ordinary wood or iron structures rather than being poured in built-up forms. Columns and girders are made in this way and bolted together and reinforced slabs are secured to these to form the sides and roof.

To revert to the quarrying which was the first process witnessed by the visitors and in some respects the most impressive, there are here employed two 90-ton steam shovels which load the stone brought down by the blasts into hopper cars which are hauled in trains by locomotives to the crusher house. The rock is drilled by well drillers, each hole being 6 in. in diameter and 80 ft. deep, and the usual blast is from 40,000 to 60,000 tons of stone, to throw down which requires about 3 tons of 50 per cent. dynamite. The steam shovels are capable of handling single pieces as large as 8 tons and the giant rolls in the crusher house will take an equally large piece and reduce it to 6 in. size; by the time it has passed the third set of rolls it is in the form of ½ in. and smaller crushed stone.

The Copper Collapse of 1907.

The Boston *News Bureau* of May 15 quotes a director of the Amalgamated Copper Company as follows:

"It is quite possible that we last summer held to a fictitiously high price for our copper longer than we needed to have done. We recognized, however, that there was some consideration due those who had bought our copper at very high prices on long time deliveries. I violate no confidence when I say that some of the largest consumers of copper in this country were buying the metal at 25 cents in a mad delirium lest there would be a famine in the supply. We urged them repeatedly to go slow, but this advice seemed only to spur them on to greater recklessness. The consumers themselves were responsible for 26-cent copper, and when the collapse came had we suddenly dropped the price to, say, 15 cents per pound, or to any figure which would have moved the metal in quantity, the country might have witnessed the bankruptcy of many brass and copper manufacturing companies.

"We did not desire to see copper go above 20 cents per pound. We did all we could within reason to keep the price from going beyond that figure. We would have been amply satisfied with 18 cents, as we have been long enough in the business to know what happens in any line of industry when a manufacturer makes a profit of 200 per cent. over the cost of production. Twenty-five cent copper invited its own doom. Mining promotions without number were floated on the basis of the fact that copper mines were producing copper for 8 and 10 cents per pound and selling it for 25 cents. As was natural to expect, consumption was suddenly brought to a standstill, and the following financial panic, of course, greatly aggravated the situation and made it hazardous and unbusinesslike to pay excessively high rates of interest on a steadily accumulating pile of unsold copper.

"No one in the copper business, be he copper miner or brass manufacturer, can plume himself on any foreknowledge of the collapse which overtook the mining industry in the spring and summer of 1907. The demand for copper literally vanished over night and has not yet made its reappearance in anything like the volume which formerly existed."

The Mexican national congress, May 15, passed a bill extending for another year the exemption of mining and smelting machinery from the import duty of $1.65 per 100 kilos gross weight.

THE IRON AGE

Established in 1855.

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The Life of Our Iron Mines.

Some splendid work has been done at the conference on the Conservation of National Resources at the White House last week. The subject is a complicated one, both from the economic and the political point of view. It involves the effort to mark the limitation of power of the State over the private owner, the co-operation of the States among one another, the share of responsibility and power which should rest with the federal government, and the attitude of the latter to the discoverer of useful minerals on the public lands. It involves the gathering of facts as to the actual extent of our natural resources, and an expert investigation of the methods used in their exploitation.

The conference has accomplished a good deal by clearing the ground in a preliminary way. It has shown clearly of what vast importance it is for the future of the country to stop the criminal waste of our resources. We have ravished our forests, have impoverished our fields and have robbed our mines in the belief that they were inexhaustible and with the determination to secure the maximum profit in the minimum time and at the least expenditure of labor and of capital. It is true that in righteous indignation some very extravagant statements have been and are being made, and that we may expect some very "yellow" literature on the subject. The most sober and well-balanced summary of prevailing conditions and what they will lead to is contained in the paper read by J. J. Hill, president of the Great Northern Railroad.

So far as our mineral resources are concerned, upon which our manufacturing industries are now directly dependent, we must look to United States and State geological surveys for as close an estimate of our assets as conditions will allow. These conditions favor fairly accurate work in the case of our coals. They hold out less promise, even with the co-operation of private owners, of whom many have thoroughly explored their lands, in the case of iron ore, even less still so far as copper, lead and zinc are concerned, and seem hopeless for oil, natural gas, and the precious metals. The figures which are submitted at the present time, as measuring the known tonnage available, must be accepted with much reserve, while the estimates of future requirements as a second factor in determining the life of coal and iron mines are exceedingly unsafe. The impression is conveyed, by some of the statistics submitted, that a good scare it what is chiefly aimed at.

In discussing the draft upon our known resources of iron ore, one factor is apparently ignored by all writers. It is assumed that the iron ore mined is really consumed. It is not. A very large percentage of the finished iron and steel produced is put to uses which lead to absolute destruction of all or the greater part of the metal by wear, by rusting or by loss. Only a small part of the wire or of the sheets or tubes ever comes back. But a very large part of the rails and track material, of the metal in rolling stock, in structural material, in castings, etc., does ultimately return to be worked into new material. In fact a very large part of the ore mined during the last 20 years has not been consumed. It has been used to stock our railroad tracks and equipment, our structures of all kinds, with iron and steel. As the country becomes more fully supplied with means of transportation—taking that branch of consumption alone—its requirements for what might be called "stocking" the railroads fall off and are only partly offset by the increased wear of the larger mileage. In other words, the proportion needed for new construction to that required for replacement declines and with it the consumption for "stocking" our railroads with steel. We shall be able to depend to an increasing extent upon the old material which flows back to our works for conversion into manufactured products, and less upon fresh ore from the ground. We believe that this factor, thus wholly neglected in the discussion, will tend to increase the life of our iron ore mines.

Apprenticeship and Slack Business.

The apprentice system has been a source of considerable perplexity and some disappointment to manufacturers who have been compelled to curtail materially their production. Several elements have entered into the difficulty of the situation, among them the clause of the apprentice contract which provides that the young man shall be kept in the shop as long as there is any work to be done; the preventing of discontent when it has become necessary to shut down the works; and the maintenance of what may be termed the auxiliary side of the apprentice course as established in some plants.

Apprentice systems such as have been founded in many manufacturing establishments of late years, and especially during the recent period of scarcity of skilled workmen, have grown to be factors of much importance because of their size and their general relations to shop systems. Under ordinary conditions of business they would not be unwieldy. Nor is there any temptation to reduce them because of a temporary let-down in the demand for manufactured products. The present anxiety is to retain their organization complete. How to accomplish this has been a problem not at all simple, yet it has been solved with considerable success, everything considered, though in individual cases there has been some cause for discouragement.

The common apprentice contract provides that the indentured youth shall work a certain number of hours, aggregating two or three years or other period of continuous labor. A clause releases the employer from compulsory employment where a plant is shut down, yet at the same time the contract holds him to keeping the apprentice employed as long as there is work to be done. As a consequence, in shops where the system is established on a large scale the percentage of the number of apprentices to the total working force becomes abnormal. The auxiliary courses in subjects bearing upon shop work have usually been continued. Where apprentice associations exist for the purpose of cultivating *esprit du corps* and increasing general interest, the effort on the

part of the employer has been stronger than ever. But results have been such as to demonstrate that continuous work is necessary to maintain enthusiasm in a body of apprentices. They fret under idleness. A falling off in numbers has been noted; not large, to be sure, yet worthy of attention. Indentures have been broken, as the more adventurous spirits have sought other careers, causing the sacrifice to their sponsors, usually their parents, of the considerable money deposit made to guarantee the fulfilment of the contract. In one typical instance, where a manufacturer has given special attention to his apprentice course and where the system of training and the environments of the boys could hardly be improved, there is a marked difference between present conditions and those that prevailed a year ago. Several boys have run away, one of them yielding to a long-existing craving for service in the navy. The interest in the work of the apprentice association, founded and conducted at the cost of some money and a good deal of valuable energy, has seriously fallen off. And apparently the only reason is the impossibility under the present status of the machinery market to keep the boys employed continuously.

The existing ample supply of skilled workmen has no bearing on the matter. It is confidently believed that the time is not far off when the scarcity of good men will be greater than ever. The need which the revival of the apprentice system was aimed to meet has not changed. Consequently those who have gone in for the system in a large way feel keenly whatever degree of failure has been indicated by the exceptions that have not had the stamina to accept less propitious times. There is little precedent to go by in judging results, because in most establishments the apprentice system as it now exists had small place during like periods of the past.

No manufacturer, however, can hope to hold the services of all the young men whom he educates as mechanics. The graduate, the trained journeyman, often drifts away to other employment. It is a fair presumption that the kind of boy who gives up because he chafes under enforced partial idleness and reduced wages is just the kind who would be first to leave after he had completed his course. It is from such a beginning that the chronically discontented workman is developed. Every large group of boys has its undesirable members; good enough lads, perhaps, but lacking in the elements that would make them valuable to the employer who trained them after they had completed their course. Doubtless these are the boys who are rebelling because circumstances cannot always be favorable. The steady, earnest apprentice, the sort that as a man will be important in some industrial organization as superintendent or foreman, is probably sticking to his contract with little grumbling. Other apparent causes for disappointment are in a sense unimportant. Every apprentice course will survive the test of inactivity, and probably will be the better for the weeding out of those who quit for so trivial a reason. There will be plenty of others to fill their places, especially in those shops that are fair to their apprentices in the make-up of the course of training and in the interest and intelligence shown in the personal side of instruction, and particularly where, combined with these elements, the tone of the course is made to savor of the school rather than the routine learning of a trade. No one doubts that it will not be long until the boys of existing apprentice classes will constitute a valuable asset in a manufacturing plant, not only as graduate journeymen, but as apprentices who have developed under training into genuine productive usefulness.

The Stocks of Lake Ores Carried Over.

A financial article of the past week attempts to find some significance in the fact that the shipments of Lake Superior iron ore to the blast furnaces served from Lake Erie docks were the largest on record in the year ending May 1, 1908, being 31,692,446 gross tons, as ascertained by the *Marine Review*, compared with 30,099,769 tons in the year ending May 1, 1907, which was the greatest previous record. It is scarcely necessary to point out to those familiar with the Lake ore trade and with the machinery intermediate between iron mines and blast furnaces, that in large part the business referred to above resembles water that has turned the mill wheel and passed on. By itself it imparts no information concerning present conditions, particularly as the rate of consumption of these ores has undergone nearly a 50 per cent. reduction in the midst of the trade year preceding May 1, 1908.

As has been pointed out before, the statistics of iron ore stocks on Lake Erie docks at the close and at the opening of navigation each year have little meaning now that ore stock-piles are largely carried at furnace yards. From the standpoint of dock operations it may be interesting to know each spring how much dock space is occupied with ore, but by themselves the figures tell nothing of what the iron trade is doing. However, linked up with other facts something may be derived from them as indicated in what follows:

The total amount of Lake Superior ore shipped to Lake Erie ports in 1907 was 35,195,758 gross tons. These receipts at Lake Erie docks have constituted in recent years about 82 per cent. of the total shipments of Lake Superior ore.

Of the total pig iron production of the country about 80 per cent. is made from Lake ores. It may be reckoned that an average of 1.8 tons of Lake ore is required for a ton of pig iron.

In the ore year May 1, 1907, to May 1, 1908, the production of coke and anthracite pig iron in the United States, according to *The Iron Age's* statistics, was 21,118,898 gross tons. The production of charcoal pig iron would bring the total up to about 21,400,000 tons. Applying the usual 80 per cent. and the amount of pig iron made from lake ores in the period named appears to be 17,120,000 tons. At 1.8 ton of ore per ton of pig iron, the consumption of lake ores in the 12 months becomes 30,600,000 tons. Taking 82 per cent. of this, and the consumption of lake ores in the year ending April 30, in the districts supplied with those ores from lake docks, is found to be approximately 25,000,000 tons. Since according to the statistics recently collected the amount of ore forwarded to furnaces from Lake Erie docks in the ore year from May to May was 31,692,446 tons, the conclusion would be that these furnaces had on hand, of their 1907 ore receipts, at the beginning of this month, the difference between these two amounts, or about 6,700,000 tons. To this should be added the amount of ore in the yards of furnaces tributary to Lake Erie, on May 1, 1907, to get the total of lake ores in the same blast furnace yards on May 1 this year. If we estimate 2,500,000 to 3,000,000 tons for such furnace yard stocks one year ago, since furnaces then had pretty well cleaned up their old ores, we have now in the furnace yards of Ohio, Pennsylvania, New York and West Virginia from 9,000,000 to 9,500,000 tons. Adding Lake Erie dock stocks of 5,480,300 tons on May 1 and the total is 14,500,000 to 15,000,000 tons of Lake Superior ores ahead of the furnaces supplied from Lake Erie docks. Some of this ore is so located on docks

or at the foot of trestles at the furnaces and in out of the way places that it is not now and possibly never will be available for use.

But allowing for this and reckoning the average consumption of lake ores in the districts named at about 1,400,000 tons a month in the past five months, there is ore ahead of the furnaces in these districts that will carry them nearly to the end of the year. This is on the assumption that the production of pig iron remains the same, which is doubtless a too pessimistic view to take. It should not be concluded, moreover, that the shipments of ore this year will be only the four or five months' supply apparently required to carry through to next May. There must always be a considerable stock carried at Lake Erie docks and at furnaces as a governor to the trade and a safeguard against strikes, and at the average rate of Lake Superior ore consumption in recent years this must be much larger than was thought necessary when the yearly shipments were in the twenty millions.

CORRESPONDENCE.

The Voting Power of the Labor Unions.

To the Editor: In a communication in *The Iron Age* of May 14, under the heading "A Blast Furnace Operator on Ore Prices," the statement is made that "The labor union has the votes." The furnaceman who wrote this sentence is either misinformed or has not taken the trouble to study statistics on the labor situation. We write in opposition to his statement for the reason that we fear some of our already deluded lawmakers may take his answer to his own question to be a fact, while carefully gathered Government statistics show that less than 15 per cent. of the wage earners of this great country are affiliated with Gompers' misguided union crowd.

FILLMORE AVENUE FOUNDRY & IRON WORKS, INC.,
LYMAN P. HUBBELL, President.
BUFFALO, N. Y., May 15, 1908.

Clutches.

To the Editor: The writer notes that the article on "Clutches," by Henry Souther, in your issue of May 14, page 1517, states that "it would not be possible to develop high torque at low engine speeds." Mr. Souther is mistaken. At the lowest engine speeds at which it is possible for a gasoline engine to assume a load, the clutch has ample power to hold it. It is designed for this express purpose, and only when engine rotations drop below this point for which the clutch is designed and set can slip occur. We have explained this to Mr. Souther in a letter of which a copy is given herewith.

THOS. L. STURTEVANT.
BOSTON, MASS., May 18, 1908.

Henry Souther, Henry Souther Engineering Company, Hartford, Conn.:

Reading your article on "Clutches" with much interest, I note that you state that a serious defect of the automatic clutch system is that "at low engine speeds the gripping tendency would be small." This is a mistake. Every clutch is so designed that the grip of the clutch can hold the engine torque securely at the lowest speed at which the engine can be depended on to run without danger of stalling. Slip can never occur until the motor speed is reduced to that degree that its rotations are uncertain. The full torque of the engine is therefore sure to be taken up at the lowest speed at which any engineer would ask it to take a load. Slip is never a fault of the centrifugally controlled clutch at any motor speed, and the gripping power increases so rapidly with the revolutions that light weight and restraining means require to be used whenever fast motors are installed. The illustration (Fig. 27) represents a clutch that will hold any engine of 50 hp. at its strongest torque, and at the lowest speed it can be made to run safely. The time of grip and the strength of grip is determined for any properly designed centrifugal clutch by turning in or out the adjusting screws A.

T. L. STURTEVANT.
May 15, 1908.

Tariff Revision Preparations.

The United States Senate May 16 adopted the following resolution:

That the Committee on Finance is authorized in connection with investigations heretofore ordered by the Senate, with the view of promptly securing the information necessary for an intelligent revision of the customs laws of the United States, to call to its assistance experts in the executive departments of the Government and to employ such other assistants as it shall require, and it is especially directed to report what further legislation is necessary to secure equitable treatment for the agricultural and other products of the United States in foreign countries. It shall also, in the consideration of changes of rates, secure proof of the relative cost of production in this and in principal competing foreign countries of the various articles affected by the tariff upon which changes in rates of duty are desirable.

It is announced that the committee will begin its investigations shortly after the adjournment of Congress. The resolution is proposed to make unnecessary the appointment of a tariff commission and the purpose of it is to prepare the way for general tariff legislation at the next session of Congress.

On the same day the House of Representatives passed a resolution authorizing the Committee on Ways and Means to sit during the coming recess of Congress. Mr. Payne, New York, who offered the resolution, said that in order not to disquiet the country before election the committee would make no general inquiry involving the question of rates in the schedule. After the election, he said, the subject would be gone into. He further said that the committee will make a revision of the tariff on a protective basis, probably a maximum and minimum tariff, which will put this country on an equality with France, Germany and Russia in that respect.

At a meeting of the Brooklyn Engineers' Club held on the evening of May 14, James W. Nelson, manager of the firm of Richard Dudgeon, New York, presented a paper on "Hydraulic Machinery," which was particularly comprehensive in its treatment of that of the hydrostatic class. The stereopticon views given as illustrations covered the developments from the earliest of such machines on record to those of the present day and included a number showing the latest improvements in hydraulic jacks and high pressure pumps. A synopsis of the paper follows: History of hydraulic pressure; principles of hydrostatics; practical applications of hydrostatic pressure; hydraulic appliances for pressing, lifting and miscellaneous purposes; auxiliary hydraulic appliances; high hydrostatic pressures; compressibility of water; friction of fluids and packings on sliding surfaces; pressure due to shock; practical considerations in the design of hydraulic apparatus; and practical suggestions for the use and care of hydraulic appliances. The paper was received with manifest appreciation.

The May issue of *Graphite*, published by the Joseph Dixon Crucible Company, Jersey City, N. J., begins a series of articles by W. H. Wakeman on "Preventing Corrosion of Steam Machinery." The articles refer particularly to the precautions to be taken with machinery which is to be shut down for a time so that when operations are resumed it will be in perfect condition, and not require a considerable loss of time in cleaning and repairing. The articles should prove of timely interest to the many users of such machinery who, due to the temporary falling off of business, find it desirable to shut down parts of their equipment.

We are advised that the report that the Midland Steel Company, Pittsburgh, which operates a blast furnace at Midland, Pa., would erect two more stacks at that place is untrue. It will probably build one or more stacks at Midland some time in the future, but no plans are under way now for additional furnaces.

Patent Bills Postponed.

WASHINGTON, D. C., May 19, 1908.—The House Committee on Patents, on the recommendation of the Commissioner of Patents, has postponed until the next session of Congress all the pending measures providing for the incorporation in the United States patent laws of provisions requiring patents to be worked in this country within a limited period after their date of issue, and restricting the patent protection granted to citizens of foreign countries to that which such countries extend to citizens of the United States.

In his communication to the committee, the commissioner conveys the interesting information that the State Department is now in negotiation with the leading European countries for the purpose of securing such concessions to American inventors as will put them on a fair basis of equality with their foreign competitors. It is anticipated that as a result of these negotiations the working clause in the laws of Great Britain, Germany and other countries will either be repealed altogether or so construed as not to apply to citizens of the United States. Should these negotiations fail of their object, however, there is little doubt that Congress next winter will pass the so-called retaliatory bill, the practical effect of which would be to close American markets to the products of foreign owners of American patents when such products are made abroad.

The Patent Committee has devoted more than a month to the consideration of a series of four bills intended to prevent the exploitation of American markets by foreigners owning United States patents but manufacturing the protected articles either exclusively or mainly in a foreign country. The first of these measures, H. R. 15,839, limits the protection granted to citizens of foreign countries to that which such countries grant to citizens of the United States; H. R. 17,869 permits the cancellation of an American patent which has not actually been worked in the United States within four years, and is practically identical with the provisions of the recently enacted British law; H. R. 21,180 requires that one-half the goods sold under patents granted to foreigners must be manufactured within the United States; and H. R. 21,525 makes it a valid defense in an infringement suit to show that the demand for the patented article has been mainly, if not exclusively, supplied from abroad.

The Patent Committee practically reached a decision to report with a favorable recommendation the bill H. R. 21,525, in such form as to provide for the amendment of Section 4920 Revised Statutes, which enumerates the various defenses which may be set up in bar of an infringement suit, by the addition of a clause reading as follows:

Sixth. That after four years from the issue of the patent the thing patented, or the product of the patented process, was supplied in the United States or its Territorial possessions exclusively or mainly from abroad, without the consent of the United States by treaty, convention, arrangement or engagement with a foreign country and without reason satisfactory to the court why the same was not supplied mainly by manufacture carried on within the United States or its Territorial possessions.

Views of Commissioner of Patents.

The Commissioner of Patents having been called upon to express his views with regard to the four pending bills, made a report thereon of such tenor, however, that it was promptly concluded to defer action until next December. The letter of the Commissioner, which presents a brief analysis of the pending measures and states the views of the Patent Office upon all phases of the important question as to the advisability of discriminating against foreign inventors, will no doubt be read with interest. It is, in part, as follows:

I regret to say that I am not in favor of the passage of any of the bills now pending before your committee, first, for the reason that in my opinion the passage of a bill providing for the annulment of a patent for a failure to work the same within a stated period in the United States to a greater extent than abroad would work a hardship to American inventors greater than the advantage which would be obtained by the passage of such a bill; and, second, for the reason that there is an apparent movement in the industrial countries in which the working clause is now in force toward a modification of its severity, and in some instances for its entire abrogation. Furthermore, I may say that certain correspondence of the State Department is now in my possession, which, unfortunately, I am unable to place before your committee because of its confidential character, but of which your committee can undoubtedly obtain copies from the State Department on request. This correspondence indicates that efforts are now being made through diplomatic channels to obtain the exemption of American inventors from the working clauses contained in the laws of the greater industrial countries.

H. R. 15,839, which provides that patents to foreign inventors should be granted for the same term, for instance, not exceeding 17 years, and upon the same conditions as to fees, taxes, and workings that are imposed by the patent laws of the country of which the inventor is a citizen, is objectionable, not only upon the broad ground above referred to, that it would work a greater hardship to American inventors than would be justified by the beneficial effects, but also for the reason that the enactment of this measure would throw upon the Patent Office the burden of ascertaining in each instance the character of the laws of the country of which the applicant is a citizen and the issuance of patents of different terms and under different conditions in respect to feees, &c., for which there is no provision at present. This would require a very material increase in the force of the Patent Office. It would also highly complicate the administration of the patent law, both in the Patent Office and in the courts.

H. R. 17,869, which is substantially identical with the provisions of the British act of August 28, 1907, is believed to be in contravention of the intent of section 8 of Article I. of the Constitution, which gives Congress power to promote the progress of science and the useful arts by securing for limited times to authors and inventors the exclusive rights to their respective writings and discoveries. The knowledge possessed by inventors that protection for the statutory period of 17 years will be guaranteed to them by the issuance of a patent of the United States affords a great inducement for them to disclose to the public new ideas which they have conceived. Many such new and useful ideas, especially in cases of processes and articles of manufacture, might be suppressed if the inventors were required to work their inventions in this country within a definite period. In many instances industries are controlled by large corporations which are the owners of basic patents. Patentable improvements upon such manufactures can be made and sold in this country only upon payment of tribute to the holder of the basic patent. It is, therefore, obvious that the enactment of a working clause would give corporations the power, by a refusal to grant a license to use the basic patent, to suppress the use of improvements for a time greater than that in which working would be required. Under such circumstances the inventor would be powerless to license or sell his invention in foreign countries, since by doing so his patent in this country might be annulled.

H. R. 21,180 is thought to be too brief and vague in its terms to warrant serious consideration. It requires merely that one-half the goods and articles sold under patents granted to citizens of any foreign country must be manufactured within the United States. No penalty is provided for the violation of this provision. It does not appear what method is to be used to inquire whether one-half the goods are manufactured in the United States or what shall be done with goods imported in excess of the prescribed amount.

H. R. 21,525 provides for the addition to the provisions of section 4920 of the Revised Statutes, which relates to defenses which may be pleaded in an infringement suit, of a clause that the failure to work the invention mainly within the United States may be urged as a defense in an infringement suit. This, perhaps, is the least objectionable of the measures pending before your committee, but the passage of this bill would vastly complicate the burdens thrown upon the courts of the United States, and it is believed would be of little benefit to the public.

I am informed that the working clause of the British act of August 28, 1907, which became effective January 1, 1908, has not proved entirely satisfactory, and that efforts are being made in England to have this clause modified. Furthermore, efforts are being made through diplomatic channels to secure the exemption of the American inventors from the provision of this clause. It is understood that the German law regarding the working of inventions is not at all satisfactory, and that German commercial circles are endeavoring to have this clause rescinded. This Department has been advised recently, through the State Department, that Switzerland has declared that the working clause of its patent law is not applicable to American inventors.

Finally, it may be said that in a recent meeting of the International Association for the Protection of Industrial Property, a resolution was adopted recommending that the working clauses of the various patent laws of its adhering nations be canceled or replaced by a compulsory license system.

In view of the facts above mentioned, I am of the opinion

that it is not advisable to enact at this session of Congress a law which will require the working of inventions in this country within a stated period. The passage of such a reciprocal measure would of course hinder, if not preclude, the rescision of similar measures in foreign countries or the exemptions in favor of citizens of the United States now being sought from foreign Governments. If no advance has been made through diplomatic channels prior to the convening of Congress in its next session, I shall be glad to give your committee the benefit of any knowledge which I may have obtained in the meantime, and will heartily co-operate with you, if desired, in the preparation of a measure of this character.

Outlook Favorable to American Inventors.

It is reasonable to assume that the action of the Patent Committee in deferring a report upon any of the pending bills until next session, while intimating that the matter will then again be taken up, will have a strong tendency to bring the pending negotiations to a successful conclusion. It will be noted that the Commissioner pledges his co-operation in the formulation of a retaliatory bill in the event that the negotiations fail of their purpose. W. L. C.

The Chicago Freight Rate Convention.

At a conference of shipping interests held in Chicago, May 15, it was decided to contest vigorously the advance in rates which the railroads in official classification territory propose to put into effect in the near future. Notice has been given to the carriers that unless they submit the whole question to the Interstate Commerce Commission, to be decided by the commission before any advance becomes effective, the shippers will appeal to the Federal courts for restraining orders which will hold the new tariffs in abeyance until they can be reviewed by the proper tribunals. The resolutions adopted by the conference are, in part, as follows:

1. That the carriers in official classification territory be notified that the shippers represented by this conference vigorously object to the carriers putting into effect the proposed increases in freight rates, and then leaving to the shippers to thereafter complain and litigate—a course which will involve years of controversy, and during which time the increased rates will continue operative.

2. The shippers represented by this conference now propose to the carriers that the carriers submit to the Interstate Commerce Commission the propriety and reasonableness of the proposed increase, and that such increase be held in abeyance until that tribunal has heard the parties in interest and has passed upon the question. But the shippers object to the carriers putting into effect the increased rates and then leaving to future determination as to whether such increase is reasonable.

3. That unless the carriers, before the increased rates become effective, consent to the above proposed means of adjusting the issue, that this conference, through a committee of action to be by it appointed, take prompt and decisive steps in the appropriate judicial tribunals in the territory to be affected by such increase to stop such action by injunction or otherwise.

4. That this conference, through its chairman, appoint a committee of 15 representative shippers with full power and authority to carry these resolutions into effect, and with further power to add to their number, and to reconvene and report to this conference from time to time as the exigencies of the situation may require.

This conference was called by the Illinois Manufacturers' Association, and was attended by about 100 delegates from all parts of the country, representing industrial and commercial associations. The iron, steel and hardware interests were not directly represented, but delegates were present from the manufacturers of agricultural implements, wagons, carriages and related lines. President F. W. Upham of the Illinois Manufacturers' Association opened the discussion by presenting a strong argument against the advance. He maintained that in the present time, of business depression the railroads should bear their share and not attempt to shift their burden upon the shoulders of the shipper.

The delegates from the Merchants' Association of New York were the only ones who dissented from the view presented by Mr. Upham. They advised moderation, and urged that a committee be appointed to go to the railroads and investigate the claims that are made by railroad officials regarding the increase in the cost of operation and the necessity of the advance. The New York men, however, found themselves alone, and their arguments were not well received.

The Remedy Proposed by Counsel.

Levy Mayer, general counsel for the Illinois Manufacturers' Association, was called upon to address the convention and explain the legal rights and remedies of the shippers should they decide to contest the proposed increase in rates. Mr. Mayer recommended, as the simplest remedy to protect shipping interests, that Congress should pass the Fulton bill, which would require a hearing and approval by the Interstate Commerce Commission before any freight tariff can be advanced. The immediate remedy, by injunction proceedings, he explained as follows:

For many years the shippers enjoyed a mere travesty on pretended legal protection against the constantly advancing freight rates.

The carriers maintained the right to prevent decreases, but resisted the right to prevent increases. Such was the unreasonable and unjust state of the law until a few months ago, when Judge Kohlsaat, in the United States Circuit Court here, at the suit of the creamery companies of this country, entered a restraining order preventing a threatened 100 per cent. increase in freight rates from taking effect, pending a hearing by the Interstate Commerce Commission.

The courts once having taken this forward step and entered an order entirely consistent with right and equity, other judges soon followed and the result has been that in various points in the country other judges are now entering similar orders. There is therefore now available to the shippers of this country a judicial remedy which, though costly and troublesome, is nevertheless thoroughly adequate and efficient.

W. C. Brown, vice-president of the New York Central system, was invited to address the conference. The arguments and statistics which he presented have in the main become familiar to shippers in the discussioon of recent months. He brought to the conference a message to the business men of the country which may have portentious meaning. He declared that if the railroads are unable to make the moderate advance which they propose, to meet the growing expenses of operation, they will be forced to the alternative of making a general reduction in wages. This, he believed, would bring on a disastrous struggle with organized labor that would cost the business men of the country 10 times more than what the railroads ask.

It is fortunate that the iron and steel interests have escaped this great contest, it having been decided by the railroads, as stated last week, to make no increase in rates on the principal articles of iron and steel.

Last Year's Turbine Business.—Retrospective of the development during the past year of the steam turbine, the accompanying figures reported by the Westinghouse Machine Company are interesting as tending to controvert the general impression that the turbine business suffered heavily during the year. Although one month's business in 1906 still holds the record, at 62,100 kw., the year 1907 was marked by an average demand quite as large. As late as July, orders for 34,750 kw. were taken during that month, as compared with 25,750 for July, 1906, which is a particularly gratifying showing. For the first nine months of each year the demand for turbines was as follows: 1907, 158,550 kw., and for 1906, 152,400 kw. Or, taking the middle six months of the year, from April to September, inclusive, thus excluding the usual midwinter activity, as well as the late depression, the average per month is as follows: 1907, 15,833 kw.; 1906, 14,365 kw. Thus it is apparent that up to the period immediately preceding the depression of October the demand for turbine equipment shows a steady increase. It is interesting to note, in this connection, the ultimate results of commercial activity of the past few years. Had the business of the company kept on increasing at the same rate as prevailed during 1904 and 1906, the year 1910 would have been marked by an annual output of 1,912,000 kw., or at the rate of 160,000 kw. per month.

Centrifugal dust collectors for extracting dust from blast furnace gases are being installed at the Zenith Furnace, Duluth, Minn., and at the Wharton furnaces, Wharton, N. J. These dust collectors are designed by Frank C. Roberts & Co., Philadelphia, and are similar to those which have proved successful at a number of Eastern furnaces.

The Scully Steel & Iron Company Absorbs Kelley, Maus & Co.

A deal said to involve over $1,000,000, has just been closed by the Scully Steel & Iron Company, Chicago, whereby this company purchases and takes over all the realty, buildings, merchandise and business of Kelley, Maus & Co. The accounts and bills receivable of the latter company are not included in the transfer nor does the purchaser assume any of its indebtedness.

The buildings, which include two modern warehouses, each 100 x 300 ft., two stories, are located on a site 257 x 700 ft. at Ashland avenue and Twenty-fourth street, Chicago, recently acquired under a 99-year lease. In addition to this property the Scully Steel & Iron Company has closed a 99-year lease for the premises adjoining on the south, making a tract 250 x 1400 ft., having slip and river frontage of 1650 ft. Upon this land the company will at once erect new warehouses of steel construction, which will be equipped with the most modern appliances for handling material rapidly and economically. These new buildings, in connection with those taken over from Kelley, Maus & Co., will comprise one of the largest and most up to date plants in the country for handling steel, iron and kindred lines.

The heavier lines carried by Kelley, Maus & Co. will be incorporated with the stock of the Scully Steel & Iron Company, while the lighter lines, such as wagon and carriage makers' and blacksmiths' supplies, carried by the retiring company, will be taken over by a new corporation, called the Chicago Iron Store, which will be owned by W. M. Thompson and A. B. Scully. This business will be conducted in the building at the west end of Randolph street bridge, now occupied by Kelley, Maus & Co. as a branch store. The Scully Steel & Iron Company and the Chicago Iron Store will work in close affiliation, and as both will be located on the river they will be able to make quick delivery from either plant to customers having dock facilities and also to railroads.

It is understood that Fred K. Maus, president of Kelley, Maus & Co., will for a time be connected with both the Scully Steel & Iron Company and the Chicago Iron Store. W. M. Thompson, who will be at the head of the Chicago Iron Store, has been active manager of the business of Kelley, Maus & Co., and is president of the Hardware Jobbers' Association. A. B. Scully, the founder and president of the Scully Steel & Iron Company, is widely known in iron and steel circles. He looks upon the present time as most favorable for forward business movements, feeling that existing conditions are only temporary and that present expansion will be required to take care of future business.

The merger involved in this transaction covers an extensive line of iron and steel materials, including structural steel, bars, hoops, bands, boiler shop and railroad supplies, sheet iron workers' supplies, electrical steel corrugated sheets, iron and steel machinery, boiler tubes, wagon and carriage makers' and blacksmiths' supplies, and a full line of machinists' supplies and hardware.

The establishment of Kelley, Maus & Co. is one of the oldest steel and iron houses in Chicago, having been founded in 1877 by Messrs. Kelley and Maus, the firm later absorbing the old established houses of S. D. Kimbark & Co., Parkhurst & Wilkinson and the Thompson-Hoof Company.

The Passaic Steel Works May Be Sold.—Upon application of John R. Lee and William A. Arnold, receivers of the Passaic Steel Company, Paterson, N. J., United States Judge William M. Lanning, at Trenton, N. J., May 16, made an order to show cause why the company's plant should not be sold for the benefit of creditors. William B. Gourley, counsel for the receivers, in applying for the order, which is returnable May 25, said that the concern is losing money under the receivership, and the assets are rapidly shrinking in value. The assets are placed at $1,087,262.99 above liabilities, although the total loss for the four months the receivers have been in charge nets $54,157.45.

The Grand Rapids Electrical Show.

The Grand Rapids Electrical Show Association closed a successful week's exhibition at Grand Rapids, Mich., May 16. This was the first show of the kind held in Michigan. About 15,000 sq. ft. of floor space on the first floor of the Waters Building was occupied. The exterior of the building was brilliantly illuminated, while at central points in the downtown district electrical signs were swung across the streets. The interior was beautifully arranged and was a fairyland of light and color. Concerts by band and orchestra were given afternoons and evenings.

Some of the features of the display included the following: The apparatus in daily use on the Great Lakes was exhibited by the Clark Wireless Telegraph & Telephone Company, this Detroit Company having five wireless stations now in operation, located at Buffalo, Cleveland, Toledo, Port Huron and Detroit, with one under construction at Sault Ste. Marie. The Grand Rapids-Muskegon Power Company showed a cottage of seven rooms, completely furnished and fitted up with electrical appliances to make life easy, ranging from cigar igniters in the den to potato parers in the pantry. There were many suggestions for the "house beautiful" in the display of mantels and grates made by the Rathbone & Panigot Company, Grand Rapids. The full list of exhibitors was as follows:

Bryant Manufacturing Company, Chicago.
Globe Mfg. Company, Battle Creek.
Clark Wireless Telegraph & Telephone Company, Detroit.
H. W. Johns-Manville Company, Milwaukee.
Northwestern Storage Battery Company, Milwaukee.
Wagner Electric Mfg. Company, St. Louis, Mo.
Electro-Corno Company, Elkhart, Ind.
M. B. Wheeler Electric Company, Grand Rapids.
Rathbone-Panigot Company, Grand Rapids.
Neuman Electric Company, Grand Rapids.
Erwin & Co., Chicago.
Citizens' Telephone Company, Grand Rapids.
Hy-Cart Battery Company, Grand Rapids.
Michigan State Telephone Company, Grand Rapids.
Western Electric Company, Chicago.
Chicago Fuse Wire Mfg. Company, Chicago.
Illinois Electric Ventilating Company, Chicago.
Toledo Chandelier Mfg. Company, Toledo.
Adams & Hart Company, Grand Rapids.
1900 Washing Machine Company, Binghamton, N. Y.
Holophone Company, New York City.
Electric Renovator Mfg. Company, New York City.
Oliver Machinery Company, Grand Rapids.
Fostoria Incandescent Lamp Company, Fostoria, Ohio.
Grand Rapids Railway Company, Grand Rapids.
International Correspondence Schools, Scranton, Pa.
Lewis Electric Company, Grand Rapids.
National Cash Register Company, Dayton, Ohio.
Grand Rapids-Muskegon Power Company, Grand Rapids.
Fox Typewriter Company, Grand Rapids.
American Electric Fuse Company, Muskegon.
Fort Wayne Electric Company, Fort Wayne.
Grand Rapids Electric Company, Grand Rapids.
Biehl Mfg. Company, Elizabethport, N. J.
Shelton Electric Vibrator Company, Chicago.
Crocker-Wheeler Company, Ampere, N. J.
General Electric Company, Schenectady, N. Y.
National Repair & Cleaning Company, Grand Rapids.
John Merryweather, Grand Rapids.
Brunswick Reflector Company, Brunswick, N. J.
G. F. Blakeslee Mfg. Company, Chicago.
Michigan Mobile Car-Sign Company, Grand Rapids.

Among the most important conventions to be held this year in Europe is the Eighth International Congress for the Prevention of Accidents. Its sessions are held every three years and are always attended by the most influential government officials, publicists and social economists, men of affairs and professors. The reports of this congress are made by the most eminent world specialists, so that the volume of these proceedings is the record of the world's latest and best advance in accident prevention. Of special value will be the report of an international committee on the standardization, so to speak, or accidents—their causes, duration and results—so that a world standard may be agreed upon as the basis for a comparative study. Membership in this congress is $2, which entitles the subscriber to all the reports and the complete proceedings. The membership fee may be sent to Dr. W. H. Tolman, 231 West Thirty-ninth street, New York, by whom it will be acknowledged and forwarded to Rome.

The National Machine Tool Builders' Association.

One of the great advantages that the American has over the man of any other country lies in his ability and his disposition for co-operation.—ANDREW CARNEGIE.

With this quotation printed at the top of their programme, members of the National Machine Tool Builders' Association began their semi-annual convention at the Chalfonte, Atlantic City, Tuesday morning, May 19. That the prominent machine tool builders of this country have the disposition for co-operation is shown by the large number present at this gathering and the enthusiasm and harmony prevailing in meeting the problems brought forward for the betterment of trade conditions and the industry as a whole.

The Question of Prices.

That these men, who represent the backbone of the industry which is the parent of all other machinery manufacture, see signs of an early resumption of business activity is apparent by the absolute unanimity with which they agree that existing prices shall be maintained.

While, of course, no united action can be taken by the organization on such matters, yet it is interesting to note the private attitude of the individual manufacturers in relation to this interesting phase of the present situation. The opinion expressed by the machine tool builders individually that prices should be maintained, dovetailing, as it does, so well with that of the dealers as expressed at Richmond last week on the occasion of the Supply and Machinery conventions, clears the atmosphere of any doubt which may have been entertained on this point by hesitating prospective purchasers. It indicates that both manufacture and merchant have an abiding faith in the near future, and are looking forward toward bright business prospects in store for them. It proves that the machine tool trade has been educated beyond that point where a temporary cessation in buying activity can throw it into confusion. It is an evidence that the making and selling of machine tools like iron and steel is in the hands of men who believe in stability of values and not violent fluctuations, and who are each willing to stand by his convictions and trust that his neighbor will, by following his example, assist in preventing a situation which would be demoralizing to the entire industry, and, in fact, the entire industrial structure.

It is a reassurance to the consumer who always benefits by stability in prices as he knows that in placing an order in a firmly maintained market, he is buying as well as anyone else can buy.

During the last few months machine tool manufacturers have had an opportunity and the time to look carefully into their manufacturing costs and have learned that these have not fallen off with the decline in orders. In fact, there are certain manufacturers who have found that they have been selling too low and have stated that they intend advancing prices. Two of these manufacturers produce drill presses and one is a builder of high grade planers.

President Eberhardt's Address.

As for the actual transaction of the convention, after the usual opening routine, President Fred L. Eberhardt delivered his address, saying:

I have kept in touch with business conditions and the general sentiment of the trade throughout the country, not only by correspondence, but by personal visitation during the last several months, and the general consensus of opinion seems to be that no appreciable amount of new business could have been created by a reduction of prices, and that the margin of profit now existing in machine tools is not great enough to warrant any reduction. I confidently feel that the worst has passed, and with the political horizon cleared, confidence will supplant doubt and normal business conditions return. Some question has arisen as to the eligibility of manufacturers of certain tools, and I certainly believe it would be a good idea for us to consider revising or so specifically wording Article 3 Section 1 of our constitution which covers the conditions governing membership in our association, as to admit these concerns, whose agencies, interests, &c., are identical with ours, and who would no doubt make valuable acquisition to our association.

A very important point, especially in great business depressions, is the moral steadying effect of the high priced manufacturers who know that they must maintain prices because they are based on their true costs and do not bear an unreasonable or an unjust profit.

Too much emphasis cannot be placed on the work of our Cost Committee, for if rightly taken up and considered, I feel it will prove of great benefit to our members.

I would also submit for the consideration of our members a recommendation that an Arbitration Committee be elected annually, to consider and arbitrate differences that may arise between the different manufacturers, which the special committees are unable to adjust. It would be my desire, however, to see all matters adjusted amicably between the manufacturers themselves, or in committee, rather than to necessitate submitting same to a Board of Arbitration, but feel that with our growing membership and varied interests, the possibility of something of this kind arising in the future should be provided for.

Secretary Montanus' Report.

Secretary P. E. Montanus in his report stated that five companies had applied for membership to the association, naming the Ingersoll Milling Machine Company, Rockford, Ill.; International Machine Tool Company, Indianapolis, Ind.; Sibley Machine Tool Company, South Bend, Ind.; T. C. Dill Machine Company and Edwin R. Harrington & Co., both of Philadelphia, Pa. Mr. Montanus referred to the fact that 13 apprenticeship diplomas had been applied for since the last meeting, last October, the first going to a boy in the shop of the Norton Grinding Company, Worcester, Mass. He stated that several other organizations had applied for them and that the scheme was meeting with excellent success.

E. P. Bullard, Jr., chairman of the Committee on Apprenticeship System, introduced a resolution providing that the association print in pamphlet form the complete findings and recommendations of this committee for general distribution. The resolution was referred to the Resolution Committee.

Uniform Cost Accounting.

In the absence of F. A. Geier of the Cincinnati Milling Machine Company, who is chairman of the Committee on Uniform Cost Accounting, C. Wood Walter submitted the report of this committee. He stated that the profits in the machine tool business are not sufficiently large as compared with the capital invested and the risks involved. He attributed this to the fact that many manufacturers do not actually know just what their product costs, and are often led into unintelligent competition. The committee, he said, was appointed to arrive at a schedule which would embrace all the elements entering into the total cost of manufacturing and selling a machine tool with the expectation that such a schedule might be followed by all uniformly in arriving at costs, so that when discussing costs the same elements of expense will be considered by all. He then reviewed the fact that in order to arrive at a final and authoritative form, the association sanctioned the employment of an expert. This form, he said, was now complete, having been compiled by Franklin of Mitter & Franklin of Boston. Continuing, he said:

In the replies which have been made to the questions sent out by Mr. Franklin you will be surprised to learn that quite a large number of our members admit that they are making no effort to figure costs at all; a still larger number admit that they make only a partial effort, figuring simply material and direct labor; others admit that they figure material and direct labor, but estimate the overhead expense; others state they figure in their manufacturing costs—material, labor and overhead expense, but they manifestly omit in their figures many items of expense which certainly must go against their profits at any period when they close their books by inventory.

Mr. Franklin has presented us with a method of figuring these costs. Many of us will have methods which differ somewhat from his, but the essential point is that we shall all, in figuring costs, include at least all the elements of cost as recommended by the committee, and on the basis as therein recommended. The essential features of this recommendation are as follows:

Four fundamental elements embrace complete costs: 1. Materials. 2. Direct labor. 3. All overhead manufacturing expense. 4. All selling expense.

1. Materials should be charged at the prices paid for them and a method devised to take care of this.

2. Direct labor should be charged at the prices paid for it and a method devised for taking care of it.

3. The overhead manufacturing expense may be taken care of by a simple method of bookkeeping which will gather together every month or every quarter these total manufacturing expenses. Here is where the usual method of estimating cost is weak, in that it omits many of these expenses.

In the first report made by this committee and the chart prepared, we endeavored to list these expenses, and the final report is intended to embrace all of these, though you may sub-divide them at your will. These, however, must include all salaries which are not embraced in selling expense; all non-producing labor in the shop; rent, taxes, insurance, water, light, fuel, supplies and the usual expenses which fall within this class; including all maintenance expenditures (and this embraces every expenditure which does not create an actual new inventory value) and to these we have added depreciation and interest on investment.

In the report we have made certain recommendations as regards depreciation, which may be discussed in detail later, and have given our reasons as to why an interest on our investment should be charged into our costs.

We have recommended that all these expenses be charged against the product on which we are figuring cost on a productive hour basis; in other words, each productive hour for the monthly or quarterly period, is charged with its share of the total manufacturing expense. This productive hour basis may not be better than some other basis, but we must use some method which is uniform, and we have considered that a productive hour comes closest to the truth.

4. We have then classified the selling expenses and have recommended their application to the costs on a percentage basis against the selling value.

We believe that the application of these elements on the basis as recommended by the committee will produce safe and complete costs. No elaborate cost system is necessary to accomplish this, nor is it necessary to put these costs through the general books. Practically the only item which requires some expense beyond the slight clerical labor necessary to gather together our manufacturing expenses and selling expenses and prorate them, is the necessary expense of gathering the time on the jobs, something which most of us now do.

Aside from the commercial benefits to be obtained by this uniform method of figuring costs by all of us as competitors, certainly the slight expense to which we will be put in obtaining our costs will pay for itself over and over again, if it pays a manufacturer to work in the light instead of in the dark—to know on what items he is making a fair profit and on what items he is losing money—to know when a cost is advancing, so that he may stop it.

It is earnestly hoped, therefore, by the committee, that the members will accept this report in an open and broad-minded manner, and not too critical a manner, and seize the good results that may be drawn therefrom and take one decided step forward in putting an end to the competition which results from an ignorance of true and complete costs, to the end that we may get a legitimate profit for our product.

Many other bodies of manufacturers have long ago advanced to this point, and surely the line of manufacture in America which leads the world to-day in the merit of its product, should not lag behind other enterprises in demanding a fair and legitimate profit therefor, based upon its fair and legitimate cost.

Mr. Walter's report was enthusiastically received, and a resolution was unanimously carried adopting the report and continuing the committee, and urging the members to compute their costs on the basis recommended by the committee. Printed copies of Mr. Franklin's recommendations were distributed among the members present and Secretary Montanus announced that copies had been mailed to all members of the association.

Mr. Franklin being present he was called upon to address the members and answer such questions as might be asked. He stated that the system recommended was operating very successfully in two plants where about 150 men were employed. In one he said the system was installed without the necessity for any increase in clerical help. In the other, where he said no system of any kind had previously been in operation, a $12 clerk was the only additional clerical help required to maintain the system.

Wednesday Morning.

ATLANTIC CITY, N. J., May 20, 1908 (*By Telegraph*).—A large part of Wednesday morning's session was taken up with the reports of the various machine tool committees, all of which were encouraging and optimistic as to the business situation. I. H. Johnson, Jr., reported for the committee to meet the National Supply and Machinery Dealers' Association when necessary, and submitted for the consideration of the members a proposition for adopting a uniform contract or agreement form. He suggested that the members of the association stipulate that prices may be changed by the manufacturers by telegraphic notice. Copies of the report were ordered sent to the members and the matter will be considered at the next meeting of the organization.

C. H. Norton, as chairman of the Committee on Foundry Matters, made an interesting report, in which he stated that his committee had found on making inquiries among the manufacturers that the average foundryman does not assume as much responsibility as he should in the matter of bad castings. He recommended that the organization take steps to break up the traditional methods of foundry operation. This was only a minority report, however, and the majority of the committee sided with the foundrymen by declaring that in their opinion the foundry trade had many difficulties to contend with, and as a rule is fair in its treatment of the machine tool builder. A recommendation was made by Murray Shipley, Cincinnati, Ohio, chairman of the Committee on Claims of Buyers Against Manufacturers, that the association adopt a rule to the effect that the cost of investigating such claims be assumed by the party at fault. His idea, as he explained it, was that in cases where the buyer's claim was proved to be one without a reasonable foundation, the latter should pay the expense incurred by the manufacturer in investigating it.

An interesting list of papers is announced for the semi-annual meeting of the American Society of Mechanical Engineers to be held in Detroit, Mich., June 23 to 26. Excursions will be made to manufacturing plants, the shipbuilding yards and various points of interest in and around the city. Among the excursions planned is one to the University of Michigan, at Ann Arbor. The Gas Power Section of the society will hold a session, and the Society for the Promotion of Engineering Education and the Society of Automobile Engineers will hold meetings in Detroit at the same time. As far as possible sessions will be arranged so that members interested in subjects treated by the other societies may attend their sessions without missing papers on related subjects read before their own society.

The Executive Committee of the National Prosperity Association has issued a call to all manufacturing and commercial concerns in St. Louis to make June 1 "employment day." They are requested to take back on that day as many as possible of their employees who have been laid off and to start the wheels moving in their factories. Assurances have been given by employers that this will be done, and the committee believes that "employment day" will mark the return of prosperity to St. Louis.

In an effort to reduce the cotton acreage and keep up the price of cotton, the Farmers' Union of Georgia has appealed to its members to plow up at least 20 per cent. of the cotton already planted, and in some regions whole fields have already been so treated. The land is being replanted in corn and peas.

The outlook for emergency currency legislation at Washington is less promising. The indications are that the Senate will stand by the essentials of the Aldrich bill, while the House conferees insist that the provision of the Vreeland bill "that any security, including commercial paper," shall be used as a basis for currency must remain, in any measure, that may be adopted.

A joint committee representing the State of New York, several municipalities and a number of transportation companies appeared, asked the Committee on Rivers and Harbors at Washington this week for $20,000,000 for deepening and widening the channel of the Hudson River between Hudson and Troy, N. Y.

OBITUARY.

ARTHUR KOPPEL.

Arthur Koppel, president of the Arthur Koppel Company, 66 68 Broad street, New York, died suddenly May 13, in Baden-Baden, Germany, of heart failure. He leaves a widow, three sons and one daughter.

Mr. Koppel was born in Dresden, Germany, in 1851, and started in business at the early age of 17 years. He was first interested in the handling of structural iron and established his own firm in Berlin in 1876, taking up the problem of transporting all kinds of material by narrow gauge portable railroads. He made the idea of portable industrial track popular, and this is to-day



ARTHUR KOPPEL.

known all over the world, in industrial, agricultural and mining enterprises, as Koppel material.

The business, which Mr. Koppel founded, was, in 1905, made a stock company. This company now owns 52 branch houses located throughout the world, with eight manufacturing plants, of which three are in Germany, one in France, one in Austria, one in Russia, one in Spain and one in the United States. The American business was established 10 years ago, and in 1906 Mr. Koppel came to the United States and decided to build an American plant. He therefore purchased 700 acres of property in Beaver County, Pa., 30 miles west of Pittsburgh, where he founded the township of Koppel, and erected the most modern plant in this line in the United States.

There will be no change in the policy of the company, the management being in a Board of Directors. One of the managers of the New York office is Kurt Koppel, a son of the deceased, who is at the present time on his way to Germany.

DAVID ORR SETTLEMIRE, president of the Mount Vernon Car Mfg. Company, died at his home in Litchfield, Ill., May 7, aged 81 years. He was a native of Missouri, was raised on a farm and served an apprenticeship as cabinet maker in Carlinville, Ill. He subsequently became a carpenter and contractor and then built a flouring mill at Gillespie, Ill., which he operated for several years. In 1866 he removed to Litchfield and started a grain elevator, continuing in this line until 1876, when he was elected president of the Litchfield Car Mfg. Company, which had just made an assignment. He managed the business of the assignee until the sale of the property, when he purchased it and organized the Litchfield Car & Machine Company, of which he was also elected president, holding that position until 1889, when he sold out his interest in the company and organized the Mount Vernon Car Mfg. Company, erecting a much larger and more complete plant. He was a large employer of labor during the greater part of his life, and the statement is made that he never had a serious strike or labor trouble. He was a progressive man in all his undertakings and took a deep interest in the growth and upbuilding of the two adjoining cities of Litchfield and Mount Vernon. He leaves a widow, a son and a daughter. The daughter is the wife of W. C. Arthurs, vice president of the Mount Vernon Car Mfg. Company, who has for some years been the active manager of the company, owing to the age and infirmity of Mr. Settlemire.

CAPT. SAMUEL MITCHELL, of Negaunee, Mich., one of the pioneer iron miners of the Lake region, died last week in Chicago of pneumonia. He was an Englishman, and 62 years old. In the early '60's he located in the Lake iron region and became a miner, passing through the various stages of employed and employer with the speed and ease that characterized so many of his race and type, at the time. A number of the Marquette District mines were opened and operated by him, and the first sand shaft in the Lake region was sunk by him at the Negaunee mine in 1883. This mine he and his associates owned till it was sold a few years ago to the Cleveland-Cliffs Iron Company.

PERSONAL.

William D. Forsyth, general manager of the Concrete Steel Company, Youngstown, Ohio, has been appointed assistant to Julius Kahn of the Kahn Construction Company, Detroit, Mich. He will be succeeded at the Youngstown plant by William Kain of Toledo.

William C. Tamplin, formerly assistant superintendent of the American Sheet & Tin Plate Company, Sharon, Pa., has been transferred to a similar position at the company's United States Works at Demmler, near McKeesport, Pa.

S. T. Kerr, formerly superintendent of the city electric light plant at Martins Ferry, Ohio, has resigned to accept the position of secretary of the Stanton Heater Company, Martins Ferry, Ohio, to succeed S. L. Wood, who is now located in Los Angeles, Cal.

H. P. Parrock, formerly superintendent of the steel casting foundry of the Youngstown Foundry & Machine Company, Youngstown, Ohio, has been appointed chief consulting engineer of the W. B. Hough Engineering Company, Chicago.

Robert Steele was elected controller of the General Electric Company at the meeting of the board held last week for the purpose of organization. The office of controller was abolished some years ago, but now is to be revived. The retiring officers of the company were re-elected.

The resignation of Frank F. Bullard from the office of general manager of the Morgan Spring Company, Worcester, Mass., which was received by the officers of that company some months ago, has just been made public. The resignation is to take effect July 1.

C. E. De Crow, formerly prominently connected with the power apparatus manufacturing interests of the Western Electric Company, Chicago, has resigned to accept the position of superintendent of the Addressograph Company, manufacturer of addressing machines, Chicago.

T. W. Meachem, president of the New Process Raw Hide Company, Syracuse, N. Y., has been elected president of the Chamber of Commerce of Syracuse.

Richard B. Carr, San Francisco, sales manager for the Carnegie Steel Company and allied companies, with headquarters in the Crocker Building, has returned home from an Eastern trip.

Ellis L. Rowe, secretary and general manager of the Rensselaer Mfg. Company, Troy, N. Y., is visiting R. W. Martindale, who is San Francisco agent for that company's lines, including valves, watergates and Corey fire-hydrants in addition to acting as Pacific Coast sales agent for the United States Cast Iron Pipe and Foundry Company.

Andrew Carnegie sailed for Europe May 14.

W. H. Silverthorn, president of the Railway Steel Spring Company, sailed May 19 for a month's stay in Europe.

The Amalgamated Convention.

As yet but little has been made public regarding the proceedings at the annual convention of the Amalgamated Association of Iron and Steel Workers, which has been in session at Youngstown, Ohio, for two weeks. It is understood that no demands will be made for advances in the puddling and bar iron, sheet or tin plate scales, but some changes have been suggested in the foot notes in these scales, which are likely to be contested by the manufacturers. An attempt was made by the sheet and tin plate wage scale committees to introduce a resolution to put in force again a limit of output in the sheet and tin plate mills, but this was voted down. Some of the delegates favored requests for a general advance in all the scales, but this was also defeated.

After having fought the proposition for 30 years, the Amalgamated Association has decided to admit negroes to membership. In the Pittsburgh District, and also at most of the bar iron mills in the South, negroes are employed, and these mills have been classed as open mills. It is now proposed to admit negroes as members, and to make these open mills union mills in the future, with a demand that the scale be signed.

In the tin plate scale a footnote has been added, asking that the tin plate manufacturers furnish laborers, whose duty it will be to open "stickers." Whether this request will be granted is doubtful.

It is expected that the convention will adjourn this week, and it is probable that the first conference between the Republic Iron & Steel Company and the Western Bar Iron Association with the Amalgamated Association will be held early in June. These conferences will be followed by meetings between the American Sheet & Tin Plate Company and the committees on the sheet and tin plate scales. It is not expected that there will be any trouble this year in reaching a settlement of the various scales, as the men have not asked for any advances and on the other hand it is regarded unlikely that the employers will demand any reductions.

At the bi-monthly examination of prices on shipments of bar iron in March and April, it was found that the scale of wages for puddlers and finishers during the months of May and June will be the same as in March and April. The previous settlement was based on bar iron at 1.45 cents, and the puddling scale will remain at $6.12½ a ton. Wages of sheet mill hands for May and June will be the same as in March and April, the previous settlement having been at base prices, and tin plate hands will be reduced 2 per cent. in May and June, which puts wages for this class of labor at the base price.

Stove Manufacturers' Conventions.

The National Association of Stove Manufacturers held its thirty-seventh annual convention at the Hotel Astor, New York, May 13 and 14. The attendance was large. President Wm. G. Henry, of the Detroit Stove Works, presented an unusually interesting report. Steps have been taken to form a federation, under the control and direction of the National Association, of the local associations, as follows: Pennsylvania, Maryland and Virginia, New York State and Northern Pennsylvania, New England, Western, Central, New York City, Southern, and Noon Day Club. The question of cost systems was exhaustively discussed. Officers were elected as follows: President, William G. Henry, Chicago; vice-presidents, William J. Myers, New York City, Abram C. Mott, Philadelphia; treasurer, T. Darl Buckwalter, Royersford, Pa.; general secretary, E. C. Hanrahan, Chicago; general executive committee: Ralph S. Buck, St. Louis; Charles A. Du Charme, Detroit; Edward Bowditch, Albany, N. Y.; N. H. Burt, Leavenworth, Kan.; R. G. Rennolds, Richmond, Va.; A. W. Walker, Boston, Mass.; J. H. O'Brien, Cleveland, Ohio.

The Stove Founders' National Defense Association met prior to the above at the same place. President Wm. H. Cribben of Chicago presented a report of the year's work, which dealt with the details of a conflict with stove mounters which has been waged successfully. The old officers were elected as follows: President, William H. Cribben, Chicago, Ill.; first vice-president, Fred Will, Rochester, N. Y.; second vice-president, M. B. McKnight, Reading, Pa.; treasurer, Lewis Moore, Joliet, Ill.; secretary, Thomas J. Hogan, Chicago, Ill.

The Standard Specifications for Scrap.

A meeting of the committee appointed by the Railway Storekeepers' Association to consider the proposed specifications for railroad scrap, reference to which was made in *The Iron Age* of May 7, was held in Chicago on May 11. Besides the committee, which is composed of officials connected with the railroad purchasing departments, there were present in behalf of consumers and dealers the following representatives: B. L. Venner, Republic Iron & Steel Company; Wm. Meyers, Highland Iron & Steel Company; C. F. Burch, Pullman Company; G. F. Davies, Interstate Iron & Steel Company; J. S. Miller, U. S. Metal & Mfg. Company; A. L. Joseph, Jos. Joseph & Bros. Company; Jos. Michaels, Block-Pollak Iron Company; S. A. Newman, Ohio Iron & Metal Company; J. J. Cohen, M. Cohen & Son; U. S. Hirsch, Cal Hirsch & Sons Iron & Rail Company.

A tentative schedule which had been compiled by the committee was carefully gone over item by item and discussed with a view to securing a comprehensive classification that would, in so far as possible, eliminate ambiguity and meet the approval of all interests concerned. This discussion resulted in the preparation of a classification which will be presented to the Storekeepers' Association at its meeting to be held at the Auditorium Hotel, Chicago, May 25, 26 and 27, and will be taken up for discussion by that body on May 26. A number of important changes have been suggested, among them being the establishment of various divisions of separate grades, some of which have heretofore been loosely grouped under a single head.

Railroad cast, for instance, under the proposed classification is designated as No. 1, No. 1A, No. 2 and No. 3. No. 1 includes free front burnt grates, stove plates and brake shoes, clean cast iron culvert, soil and water pipe—pieces weighing 150 lb. or less. No. 1A includes cylinders and wheel centers; No. 2, free from burnt grates, stove plates, exclusive of wheel centers and cylinders—pieces weighing over 150 lb. No. 3, all kinds of burnt grate bars, castings, grate frames, stove plates, hand car and truck wheels, with wrought iron spokes. In addition to No. 1 and No. 2 railroad wrought there is added the grade, extra No. 1 railroad wrought, which includes rods and bars 1½ in. in diameter and larger, 6 ft. and over. It is also proposed to eliminate the time honored allowance of 5 lb. for grease and dirt on each car wheel.

When the classification in its present form has been carefully revised by the association in the light of suggestions and information received from all sources, it will doubtless be adopted by the leading Western railroads as an official standard. In the meantime the committee desires to receive criticisms and suggestions from dealers and consumers, which, if addressed to J. P. Murphy, G. S. K., L. S. & M. S. Ry., Cleveland, Ohio, will be carefully considered.

In the communication from "Furnaceman," in *The Iron Age* of May 14, a typographical error destroyed the meaning of one sentence. Instead of "Let," the first word should have been "Yet," the sentence reading, "Yet the railroads of the North participate in extremely low freights from the South, distributing the pig iron of that section over their own territory, without any reciprocal business," &c.

The British Westinghouse Electric & Mfg. Company reports for the calendar year 1907 trading profits of $461,915, from which are to be deducted charges of $405,255, leaving balance forward of $56,660. Indebtedness to the American companies of $931,870 has been liquidated by transfer of shares in the Traction & Power Securities Company, and the company has lately issued $1,250,000 out of $1,500,000 6 per cent. debentures authorized.

Trade Publications.

Harvesting Machinery.—Aultman & Taylor Machinery Company, Mansfield, Ohio. Catalogue. Illustrates the company's line of large grain separators, threshers, hullers, &c., operated by traction engines of a number of types. Exhaustive descriptions of the various machines are given, together with prices and other necessary data.

Concrete Reinforcing Material.—General Fire Proofing Company, Youngstown, Ohio. This is a book consisting of a series of illustrations showing the application of the company's concrete reinforcing material in various lines of construction. There are some particularly interesting views of buildings in course of construction in which the reinforcing material is being applied. Pictures of concrete bars and expanded metal lath of various types are shown in the back of the book. There are 31 illustrations and many of them show the reinforcement in position in advance of concreting, showing the methods of securing the members together properly spaced.

Wire Rope and Insulated Wires.—Hazard Mfg. Company, Pittsburgh, Pa. Catalogue, 6 x 9 in., 96 pages. This is a comprehensive volume embracing views of the company's plant and offices and showing its wire rope in use in various ways. Price-lists and other data regarding the construction of wire rope and cables made by the company are included; and illustrations and prices are given of fittings for cableway installations, such as sheaves, grips, derrick irons, ferry travelers, clips, clamps, sockets, turnbuckles, &c. Prices of transmission wires are also given.

Small Electric Motors.—General Electric Company, Schenectady, N. Y. Two bulletins. No. 4548 is entitled "Small Motors and Their Application to Machine Tools," and illustrates typical applications of direct and alternating current motors driving planers, drills, grinders, boring mills and other tools. Descriptions of the standard General Electric motors, rheostats and controllers is given. No. 4560 illustrates various designs of fan motors and is arranged as a catalogue for that type of motor.

Gas Plants.—Crossley Brothers, Ltd., Openshaw, Manchester, England. Catalogue. Devoted to ammonia recovery gas plants. Several installations of large producer gas plants are shown, together with detailed diagram of the company's producer gas system.

Automatic Galvanizing Barrels.—United States Electro Galvanizing Company, 1 Park avenue, Brooklyn, N. Y. Circular. Describes a patent galvanizing barrel with which it is claimed small material can be galvanized at an average cost of 30 cents per hundred. It is claimed that two of these barrels can be attended by one laborer.

Lifting Magnets.—Cutler-Hammer Clutch Company, Milwaukee, Wis. Booklet. Entitled "Lifting Magnets and Recent Improvements in Them," the subject matter of which appeared in *Cassiers' Magazine*," October, 1907. It reviews the development of the lifting magnet, illustrating the different kinds of magnets used for handling pig iron, metal plates, scrap and other classes of material.

Gas Producer and Reversing Valves.—The Forter-Miller Engineering Company, Pittsburgh, Pa. Catalogue. Devoted to the Forter water seal gas producer and the Forter water seal reversing valve. Recites the advantages of producer gas for fuel and gives detailed drawings of two types of gas producers made by the company. Feeding devices for gas producers are illustrated by detailed drawings and illustrations are given of the reversing valves in different positions. Prices and other data are included.

Water Tube Boilers.—Murray Iron Works Company, Burlington, Iowa. Catalogue No. 60, 9 x 12 in., 38 pages. Contains a short review of the history of the company and the development of its water tube boiler. A number of sections of the company's boilers are illustrated and several buildings where the boilers are in use are shown, together with a number of installations.

Cast Iron Pipe.—United States Cast Iron Pipe & Foundry Company, 71 Broadway, New York. Catalogue, 8½ x 10¾ in., 156 pages, bound in cloth. Contains standard specifications of cast iron bell and spigot pipe and special castings for water, gas, sewage culverts, &c. An interesting review of the history of cast iron pipe manufacturing is given, with illustrations showing the development from its earliest days to the present. Methods of modern manufacture are described and a comprehensive review of present day uses of cast iron pipe is given. Useful tables and some excellent views of the company's various plants are shown.

Economizers.—Green Fuel Economizer Company, Matteawan, N. Y. Bulletin No. 108. Contains an article explaining the theory of mechanical draft and recites its advantages. Some sectional views of forced draft apparatus are shown and the layout for a boiler plant is given.

Steel Concrete Reinforced Material.—Blaw Collapsible Steel Centering Company, Westinghouse Building, Pittsburgh, Pa. Circular. Devoted to the Blaw system of steel centering for concrete work in lining mine shafts, laying conduits, &c.

Hide and Leather Working Machinery.—Charles Holmes Machine Company, Boston, Mass. Catalogue. Illustrates various types of leather working machinery and some unassembled equipment and appliances for use in tanneries and leather finishing shops.

Thermometers, Pyrometers, &c.—Schaeffer & Budenberg Mfg. Company, New York. Catalogue, 7 x 10 in., 156 pages. Illustrates a large number of thermometers for distillers, paint manufacturers, textile works, oil manufacturers, and, in fact, about every kind of thermometer designed for industrial use, including pyrometers for very high temperatures. Price-lists are given. A section of the book is devoted to gauge glasses, barometers and other accessories.

Belt Conveying Machinery.—Jeffrey Mfg. Company, Columbus, Ohio. Booklet. Contains numerous illustrations showing the application of rubber belt conveyors for handling various materials. Some interesting views of the Jeffrey belt conveyor in use in the mining plants in South Africa are included. The book contains price-list and views of sections of conveyors for repair purposes.

Lubricating Specialties.—Graphoil Lubricator Company, 49-61 Clymer street, Brooklyn, N. Y. Booklet. Devoted to graphite lubricators. Gives views of a number of Graphoil graphite cups and oil lubricators, together with testimonials and price-list.

Rotary Pumps.—P. H. & F. M. Roots Company, Connersville, Ind. Catalogue. Gives views of the company's plant and illustrates a number of pumps. A special one has a built-up type of impeller on which patents have been applied for. The main portion of the shaft is a solid forging, and the lobes of the impeller are comparatively small and inexpensive to renew. Engineering data for selecting pumps is given, together with price-list and other necessary information.

Rotary Pumps.—P. H. & F. M. Roots Company, Connersville, Ind. Catalogue No. 35. Illustrates and describes a line of rotary pumps for handling any liquid not containing grit. These pumps are especially adapted for handling oil, tar or ammonia, and are furnished with special linings where the liquids to be pumped would attack cast iron. The design and construction of the pumps are clearly shown in the illustrations, as well as several installations. Engineering data for selecting pumps, including a number of useful tables, are appended.

Hoisting Engines.—Litchfield Foundry & Machine Company, Litchfield, Ill. Leaflet. Contains illustrations of the Litchfield hoisting engines and announcement of the purchase by the company of the machinery equipment, drawings, patterns, &c., of the Ætna Foundry & Machine Company, Springfield, Ill.

Bearing Metals.—Empire Metal Company, Syracuse, N. Y. Booklet. Size 3 x 6 in. Contains a description of the various bearing metals made by this company suitable for machines of different make. Special metals are put out for practically all kinds of machines, from heavy rolling mill machinery to small motors.

Sand Dryers.—Indiana Foundry Company, Indiana, Pa. Pamphlet. Shows outline views of a sand dryer which is made in various sizes up to a furnace capable of drying 10 tons of sand a day. It consists of a furnace with a funnel-shaped skirt into the top of which the sand is shoveled, which when dry runs through holes in the bottom.

Tiling for Water Tube Boilers.—Economy Water Tube Tile Company, 825 South Union street, Chicago, Ill. Catalogue. Economy tiling is shown in diagram, and water tube boilers, the tubes of which are covered with the tiling, are illustrated by detailed drawings.

Steam Specialties.—John T. Lindstrom, Allentown, Pa. Folders. One of these is devoted to a steam separator which is cast in one piece. Sectional views are shown and a price-list is given. Another advocates a Corliss valve steam trap which operates automatically and drains off excessive water without the escape of steam. A third treats of the Lindstrom boiler separator, which is installed in the main between the boiler and the engine to prevent water and impurities from the boiler entering the steam pipe. It supplements the separator at the engine and renders the operation more thorough.

Industrial Railroads.—C. W. Hunt Company, West New Brighton, Staten Island, N. Y. Pamphlet No. 075. This publication contains many small illustrations of industrial cars and describes the company's special industrial track systems as well as giving views of a number of industrial railroad systems which the company has installed.

Gas Furnaces.—Chicago Flexible Shaft Company, Chicago, Ill. Catalogue No. 21, 8¾ x 11 in., 55 pages. Describes a number of uses to which the Stewart gas blast furnace can be put. These furnaces are made with burners for illuminating gas, natural gas, gasoline gas, crude oil or kerosene, and they are shown in sections and assembled. Various styles are shown, including high speed steel furnaces, furnaces especially adapted for use in machine shops, muffle and oven furnaces, case hardening and annealing furnaces, and small crucible furnaces.

NEWS OF THE WORKS.

Iron and Steel.

The annual meeting of stockholders of the Ironton Iron Company, Ironton, Ohio, was held last week, at which the following directors were elected: H. A. Marting, C. B. Fowler, A. Clark Lowry, O. T. Marting, A. H. Mittendorf, W. A. Murdock, F. L. McCauley, Charles Peters and D. C. Davies. The board re-elected the present officers, as follows: H. A. Marting, president; C. B. Fowler, vice-president, and Walter W. Marting, secretary and treasurer. This company has recently completed the building of a blast furnace, which will be started up as soon as improvement in the pig iron market justifies.

Geo. W. McClure, Son & Co., engineers and contractors, Bessemer Building, Pittsburgh, have about completed improvements at Edith Furnace of the American Steel & Wire Company, North Side, Pittsburgh. The firm added one McClure hot blast stove and will finish a second stove within a few days. It is also relining the Martins Ferry Furnace at Martins Ferry, Ohio, and the Belmont Furnace at Wheeling, W. Va., of the Wheeling Steel & Iron Company, and has resumed work on the building of a number of hot blast stoves for the Indiana Steel Company at Gary, Ind. The firm is also making some important improvements at Rebecca Furnace of the Kittanning Iron & Steel Company at Kittanning, Pa.

The Quinn charcoal iron furnace at Gadsden, Ala., which has been closed for some time, and which was in litigation, will resume within the next few days. It will be operated by the receivers.

The United Iron & Steel Company, Pittsburgh, will start its Cherry Valley Furnace at Leetonia, Ohio, this week, on foundry iron. The stack has been idle for some time and has been put in first class condition.

The two blast furnaces of the Lehigh Steel & Iron Company at Allentown, Pa., which were recently purchased by the firm of Frank Samuel, Philadelphia, Pa., which will dismantle them, were sold to Frank Samuel by H. Sofranscy & Co., Allentown, Pa., who purchased the plant from the executors of the estate of the late A. W. Ainey.

General Machinery.

The Twentieth Century Electric & Repair Company, Akron, Ohio, incorporated with a capital stock of $10,000, has been organized to repair electrical machinery, including motors, generators, etc., and to sell new machines and supplies. The incorporators are F. W. Hansen, C. L. Bigler, J. M. Hossler, Geo. J. Schaffer and A. S. Mottinger.

The recent fire at the plant of the Minneapolis Steel & Machinery Company, Minneapolis, Minn., only burned part of the structural shop, none of the other buildings being damaged. The machines that were in use have been repaired and are being reinstalled, and the company does not expect to be in the market for any additional equipment.

The Nutting-Rowe Electric Company, Muncie, Ind., has been corporated with a capital stock of $5,000, to sell and install electrical equipment and supplies, including generators, motors, complete wiring systems for electric light, annunciator telephones, etc.

The Oklahoma Iron Works, Tulsa, Okla., has increased its capital stock from $25,000 to $150,000. A new machine shop has been added to its foundry and forge plant, which is devoted principally to the manufacture of oil and water well tools and supplies.

The Delphos Mfg. Company, Delphos, Ohio, reports about 20 per cent. increase in business the last 30 days over the previous month, and is operating its plant on full time. The company recently added to its products galvanized pails and well buckets, sheet metal corn poppers and several specialties, and has installed the necessary additional machinery to make them. Roll roofing and corrugating machinery have been added to the equipment of the eaves trough department and a two-story addition to the galvanizing department, 60 x 80 ft., is being erected for roofing and cornice work. The company intends to erect another addition to accommodate two more galvanizing kettles, which will be ready for operation about August, the present galvanizing department to be used for making tubs and pails later on. For the various improvements the company will be in the market for a 100 hp. gas engine and producer gas plant, complete outfit of transmission for the new building, air compressor, large corrugating rolls, scales and other equipment.

The capital stock of the Rockford Machine & Shuttle Company, Rockford, Ill., has been increased from $6000 to $20,000.

The machinery for the new plant of the Wichita Falls Foundry & Machine Company, Wichita Falls, Texas, has arrived, and a force of men is completing the building and installing the machinery. The company expects to have its machine shop running by June 1 and foundry October 1.

The Grand Trunk Railroad has not yet definitely decided upon the construction of the proposed extension to its shops at Allendale, Ont.

The Shefold Company, New Albany, Ind., desires prices on two 500,000 gal. pumps and an air lift, to be delivered at Versailles, Ky.

Charles Chadwick has been appointed receiver for the Empire State Engineering Company, New York, whose plant is at Rome, N. Y.

The Lewistown Foundry & Machine Company, Lewistown, Pa., manufacturer of sand mining, sawmill and stave machinery, intends in the near future to enlarge its capacity by installing new machinery.

The town of Salem, Va., is in the market for an electrically driven air compressor and air lift to lift water from a well 800 ft. deep and 8 in. diameter. John E. Shank is a member of the committee.

The Buchanan Machine Company, Charlotte, N. C., has been incorporated with a capital stock of $125,000 by W. F. Buchanan, B. L. Buchanan and H. E. Buchanan, to deal in machinery.

The American Shipbuilding Company intends to move its boiler and machine shops and foundry from Cleveland and consolidate them with the present plant at Lorain, Ohio.

Power Plant Equipment.

Bonds in the sum of $10,000 have been voted by the city of Sylvester, Ga., for the installation of an electric light plant. An additional issue of $20,000 has also been authorized for the construction of a water works system. C. W. Hillhouse is Mayor.

Temple & Sommer, civil and hydraulic engineers, Land Title Building, Philadelphia, Pa., are making surveys for the proposed hydro-electric plant to be built near Hickory, N. C. Plans for the development have not yet been prepared.

The recent fire at the plant of the Frontier Engine Works, Buffalo, N. Y., did not damage the equipment.

The Port Hope Electric Light & Power Company, Port Hope, Ont., whose plant was recently damaged by fire, expects to have it in operation next week, very little damage having been done to the equipment.

The Citizens' Light & Power Company, Gonzales, Texas, has increased its capital stock from $10,000 to $15,000.

We are advised by E. J. Frantz, Conway Springs, Kans., that a new company, backed by local capital, is being organized to build and operate an electric light and power plant at that place. It is proposed in this connection to install new pumps for the city pumping plant to be run by electricity.

The city of Kiowa, Kans., has voted a bond issue of $52,000 for the installation of an electric light plant and water works system. Of this sum $12,000 is to be devoted to the light plant, and $40,000 to the water works. J. N. Herr is Mayor, and Burns & McDonnell, Kansas City, Mo., are the consulting engineers.

The Minneapolis Gas Light Company, Minneapolis, Minn., is contemplating the erection of a new plant in northeast Minneapolis, to provide better facilities for lighting that section of the city. Plans for this improvement, however, are not fully developed.

The Rosedale Foundry & Machine Company, North Side, Pittsburgh, has received an order from the Congress Hotel Company, Chicago, Ill., for four sets of its latest type of electrically operated stokers for installation in one of its new power plants.

Foundries.

The American Blower Company, Detroit, Mich., has purchased the foundry formerly operated by the Northwestern Foundry & Supply Company at Detroit, which manufactured cast iron soil pipe and fittings and plumbers' specialties. The new owner intends to operate the foundry for the manufacture of blower, exhaust fan, engine and heater castings, and desires to dispose of all the soil pipe and fittings, castings and foundry equipment complete as quickly as possible.

The American Manganese Bronze Company, Philadelphia, Pa., has awarded contract for the construction of a one-story brick and concrete foundry and warehouse, 70 x 120 ft.

E. J. Tapping, assignee of the Dutcher Company, Milwaukee, Wis., has obtained permission from the court to spend $500 in making repairs and to lease the plant, tools, &c., to the Dutcher Steel Casting Company, which will continue operations at the plant.

Hertzler & Zook, Belleville, Pa., iron and brass founders, have just purchased the mill with other buildings and land of the Belleville Planing Mill Company, all of which adjoin their present works. These buildings will double the present capacity.

The Central Foundry Company, Bessemer, Ala., will put on a double force of men. It has a large number of orders and expects to continue operations steadily for the remainder of the year.

F. M. Mackin & Co., brass founders and finishers, Baltimore, Md., are to enlarge their foundry by the erection of an additional story, 31 ft. square, on the building at 509 North Spring street, and a two-story brick addition, 18 x 31 ft., in the rear of the foundry at 507 North Spring street.

Bridges and Buildings.

The firm of Lintz Brothers, proprietor of the Fort Branch Machine Works, Fort Branch, Ind., has been incorporated with a capital stock of $10,000. It is the purpose of the company, which does general foundry and machine work, to give special attention to the building of steel bridges.

The Vincennes Bridge Company, Vincennes, Ind., has been awarded the contract for the construction of a steel bridge at Tallulah, La.

The Parkersburg Bridge Company, recently organized by James and Charles Newell of Newell, W. Va., Joseph G. Lee, S. C. Williams and J. H. Brooks of East Liverpool, Ohio, and a number of Parkersburg men, intends to erect a $400,000 steel bridge over the river from Parkersburg, W. Va., to Belpre, Ohio, and secure the controlling interest in a number of important street railways on the Ohio River, which will give the promoters a through railway from Parkersburg to Wheeling and Columbus and ultimately to Cincinnati.

The Sommerville Iron & Bronze Company has completed the erection of a two-story brick and steel building, at 5700 Butler street, Pittsburgh, 80 x 100 ft., which is being equipped with machinery for the manufacture of iron and bronze work for buildings. The company will begin operations by June 1. Julius Baker, who formerly operated the Baker Mfg. Company, Allegheny, Pa., is superintendent of the new company.

Fires.

The machine, blacksmith and boiler shops of the Fort Worth & Denver Railroad at Childress, Texas, were burned May 16. Several box cars and locomotives were damaged, the entire loss being about $100,000.

The tipple and boiler house of the Cahaba Mining Company at Piper, Bibbs county, Ala., were burned May 9, the loss being about $10,000.

The five-story factory of the Sendelbach Wheel Company, East St. Louis, Ill., was burned May 16. The loss is placed at $50,000.

The machine and repair shops of the J. J. Newman Lumber Company at Sumrall, Miss., were destroyed by fire May 9, the loss being about $12,000.

The paper mill and the power plant of the Lake Superior Corporation, Sault Ste. Marie, Ont., were burned May 18, the loss being about $100,000.

Hardware.

The St. Marys Wheel & Spoke Company, consolidated with Crane & MacMahon, Inc., St. Marys, Ohio, has not had its carriage and wagon woodstock factory closed down at any time because of slack business. It has been working eight hours a day since February 1, and the company hopes shortly to resume the regular ten hours a day schedule.

The Caldwell & Drake Iron Works, Inc., Columbus, Ind., successor to the National Machine Company, manufacturer of feed grinders and manure spreaders, has recently erected and equipped a new factory for the manufacture of these goods. The company states that the outlook for business in its line is especially good, and that it is comfortably supplied with orders.

The Chicago Hardware Foundry Company, North Chicago, Ill., manufacturer of light machinery, ornamental brass and iron castings, reports that its business for the past three weeks has been better than in any time within five months.

The Taplin Mfg. Company, New Britain, Conn., manufacturer of hardware specialties, has increased the amount of its authorized capital from $10,000 to $50,000, and $5000 of new stock will be issued immediately, increasing available capital to $15,000. The company states that it is not adding to its plant, and the only additional product it is contemplating during the next few months is a line of magnetic hammers.

The National Bolt & Nut Company, Pittsburgh, manufacturer of nuts, bolts, washers, &c., is increasing its capacity in the tapping and nut department about 25 per cent. by the addition of new equipment.

It is stated that some parties from Knoxville, Tenn., are negotiating for the purchase of the rolling mill plant of the Penn Shovel Company at Warren, Ohio, which is in the hands of receivers.

Miscellaneous.

The Galion Iron Works, Galion, Ohio, has operated its plant on full time since starting, about a year ago, and reports that it has plenty of orders on hand, shipping from four to five carloads per day. The company, which was organized to manufacture Perfection cast iron culvert pipe, has recently added a line of Sterling corrugated sheet metal culvert pipe, for the manufacture of which it has added a complete line of machinery. This additional product has necessitated the erection of another building, 25 x 40 ft., which will be completed within the next ten days.

The American Car & Foundry Company has reopened its car shops at Binghampton, a suburb of Memphis, Tenn. The shops had been closed since last fall.

The Clear Creek Coal & Lumber Company, Isoline, Tenn., recently organized, has taken over the property of the Clear Creek Coal Company and will develop 6500 acres of coal and hard wood timber land. The company is now preparing to open up the coal property and is in the market for a second-hand haulage engine, 12 x 16 in., or 14 x 18 in. double cylinder, double drum, friction reversing gear. A. D. Eatherly is superintendent.

Following an increase in its capital stock from $5000 to $20,000, the Allen-Sparks Gas Light Company, Lansing, Mich., has made arrangements to provide more commodious quarters for the manufacture of its product. The plant will accordingly be transferred to a larger building, which has already been secured. The company manufactures the Little Giant lighting system, for which it reports a steadily increasing demand. The officers are M. B. Allen, president; M. F. Sparks, manager; R. A. Astley, secretary and treasurer.

The Washington Mill Company, Spokane, Wash., whose plant was recently destroyed by fire, has decided to rebuild. While plans for the new factory are not completed it has been determined in a general way to erect buildings of slow burning construction. The warehouse and offices are to be of brick and the entire plant will be equipped with a sprinkler system and machinery, which will include equipment for making doors, K. D. sash, colonial columns and general mill work. It is probable that the machinery will be driven by small motors by current distributed from a dynamo in the main engine room.

The Ohio Blower Company, Cleveland, Ohio, reports recent sales of Swartwout steam specialties as follows: One 30-in. cast iron exhaust head to the Shenango Furnace Company, Sharpsville, Pa.; one 14-in., Buffalo Steel Company, Buffalo, N. Y., and one of the same size to the Rookery Building, Chicago, Ill., to replace a galvanized head; others to the Hamilton Organ Company, Chicago, Ill.; Waterbury Castings Company, Waterbury, Conn.; Geo W. Carmichael & Co., Painesville, Ohio; Bloomer Brothers, Newark, N. J.; Board of Education, St. Louis, Mo.; Jones & Laughlin Steel Company, Pittsburgh, Pa.; National Hotel, Washington, D. C.; John C. Sulton Company, San Francisco, Cal.; American Steel & Wire Company, Cleveland, Ohio; Sears & Nichols Company, Chillicothe, Ohio; Merril Brothers, Maspeth, N. Y.; Great Lakes Dredging Company, Fort Arthur, Ont., and J. P. Eustis Mfg. Company, Boston, Mass.; a 6-in. horizontal oil separator to the Liquid Carbonic Company, New York, N. Y.; horizontal steam separators, Indiana Harbor Belt Railroad, Gibson, Ind.; Western Electric Company, Hawthorne, Ill.; Whiteville Lumber Company, Whiteville, N. C.; vertical steam separators, Standard Oil Company, Rahway refinery, N. J.; Waterbury Castings Company, Waterbury, Conn.; Malta Vitæ Pure Food Company, Battle Creek, Mich.; Eldorado Brewing Company, Stockton, Cal.; Superior Water, Light & Power Company, Superior Wis.; S. Marks Hotel Company, Oakland, Cal., and Jeffrey Mfg. Company, Columbus, Ohio.

Reports are untrue that the Bessemer Coke Company, Lewis Building, Pittsburgh, would build some new coke ovens at Patterson Run, in the Connellsville region. We are officially advised that this company is not interested in the coal property referred to in the report, and will not build any new coke ovens at this place.

The property of the Reese-Hammond Fire Brick Company at Bolivar, Pa., and Garfield, Pa., was sold on May 14 to M. R. Murphy, representing the First National Bank of Pittsburgh, to satisfy a mortgage. The property sold includes all the houses, land and plants Nos. 1, 2 and 4. The sale was conducted by the Union Trust Company of Pittsburgh, which held the first mortgage.

The Aluminum Reduction Company, Connellsville, Pa., has been organized to extract aluminum from the ore. The following officers have been elected: J. A. DeWitt, president; H. B. Moore, secretary; Worth Kilpatrick, treasurer.

The Daisy Automatic Dryer Company, 506 Grant street, Pittsburgh, manufacturer of automatic dryers for operation in railroad, foundry, asphalt and industrial plants, is meeting with success in the sale of its new machine. A recent installation was made of one of these machines in the city asphalt plant, Pittsburgh, for use in drying and heating sand to several hundred degrees, where it is giving satisfaction. Tests have proven the economy of a Daisy machine, the advantages being its greater saving in fuel and the arrangement of the heating surface.

The Liberty Mfg. Company, 6509 Susquehanna street, Pittsburgh, manufacturer of tube cleaners, oil filters, valves, &c., for power plants, has taken over the separator branch of the Greenaway Company, Detroit, Mich., and will hereafter manufacture this separator at its plant in Pittsburgh, under the name of the Liberty-Greenaway.

H. F. Frohman, general manager of the S. Obermayer Company, foundry supplies, Cincinnati, Ohio, contributes an article, entitled "A Composite Guiding Star," to the May issue of *System*. In this article the author expresses his belief that success in almost any vocation, if one has the energy and capacity for the task, may be derived from studying the achievements of successful men.

The Iron and Metal Trades

A good deal of interest has developed in the Pig Iron markets. The inquiries have been numerous in all markets, but many of the buyers seem still imbued with the idea that it is not safe to take hold at over $10.00 to $10.50 for No. 2 Foundry at Birmingham. It is a fact, however, that the Sloss-Sheffield Company, now the largest maker of merchant iron in the South, has placed a good deal of Foundry Iron, estimated as high as 50,000 to 60,000 tons, on the basis of $10.75 for No. 2, at Birmingham. Of this over 20,000 tons has been traced to various melters in the Chicago District alone, the sales including two blocks of 6000 tons each and one of 4000 tons. The company now appears to have withdrawn from the market.

There has been an active demand in the Central West for Basic Pig, and from 20,000 to 25,000 tons have been placed in the Pittsburgh District. There are further inquiries, one of them being for 5000 tons per month for a year.

Along the Atlantic Coast interest has broadened and some business has been done at further concessions in prices on Foundry Irons.

There is not much evidence that the melt of Foundry Iron has materially increased, but the founders are getting low, and the long decline makes at least partial covering fairly attractive at the prices named by makers.

The Steel trade shows very little change. After puzzling for a long time over the persistent advance of the Steel securities in the face of a very serious situation in the industry, the Steel trade is beginning to accept the advance in the stock market as a mysterious though welcome indication of coming improvement.

The meeting of the representatives of the Steel companies Thursday is looked forward to with some interest. The feeling is growing that prices of finished Iron and Steel are out of line with intermediate products and that more business is being withheld, awaiting a readjustment of prices, than is generally assumed.

Chicago reports quite a number of contracts for Structural Material, including 3200 tons for the Anaconda Smelter, 1400 tons for the Duluth Court House, 1500 tons for Birmingham, and 1000 tons for Kansas City.

The advance in Copper is not taken very seriously here. It is attributed to a speculative movement in London.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	May20. 1908.	May13. 1908.	Apr.15. 1908.	May15, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2 Standard, Philadelphia	*$16.25*	$16.75	$17.75	$25.50
Foundry No. 2, Southern, Cincinnati	*14.75*	14.75	15.25	24.25
Foundry No. 2, Local, Chicago	*17.25*	17.25	17.35	26.50
Bessemer, Pittsburgh	*16.90*	16.90	17.65	23.85
Gray Forge, Pittsburgh	*14.90*	14.90	15.40	22.85
Lake Superior Charcoal, Chicago	*20.00*	20.00	20.50	27.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	30.50
Forging Billets, Pittsburgh	30.00	29.00	30.00	....
Open Hearth Billets, Phila	29.20	29.20	29.20	32.50
Wire Rods, Pittsburgh	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	12.00	12.00	12.00	18.50
Steel Rails, Melting, Phila	12.75	12.75	12.75	19.50
Iron Rails, Chicago	*14.75*	14.75	15.00	24.50
Iron Rails, Philadelphia	17.00	17.00	17.00	27.50
Car Wheels, Chicago	13.00	13.00	13.00	25.00
Car Wheels, Philadelphia	14.00	14.00	14.00	24.00
Heavy Steel Scrap, Pittsburgh	12.75	12.75	12.75	18.00
Heavy Steel Scrap, Chicago	*10.50*	10.50	11.00	15.50
Heavy Steel Scrap, Philadelphia	12.75	12.75	12.75	19.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	*1.45*	1.46	1.50	1.83½
Common Iron Bars, Chicago	1.65	1.65	1.65	1.76½
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.75
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.84½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	*1.55*	1.55	1.70	1.85
Skelp, Sheared Steel, Pittsburgh	*1.65*	1.65	1.80	1.90
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	1.90	1.90	1.90	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	13.00	12.75	13.00	24.75
Electrolytic Copper, New York	*12.87½*	12.62½	12.75	24.12½
Spelter, New York	*4.60*	4.60	4.65	6.50
Spelter, St. Louis	4.50	4.50	4.50	6.37½
Lead, New York	*4.25*	4.25	4.00	6.00
Lead, St. Louis	*4.12½*	4.12½	3.85	5.92½
Tin, New York	*30.30*	29.50	32.00	43.50
Antimony, Hallett, New York	*8.50*	8.50	8.75	20.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, May 20, 1908. (By Telegraph.)

Last week's transactions in Pig Iron, comprising the transfer of upward of 25,000 tons, constituted the principal feature of market interest. A number of buyers of Foundry Iron were awaiting the appearance of a price below $11. Birmingham took prompt advantage of $10.75, Birmingham, for second half tonnage offered by the Sloss-Sheffield Company and covered to this extent for their second half requirements. There are, however, several other important consumers who have as yet made no provision for forward tonnage, but are keeping in close touch with developments with a view to getting in as near the bottom as possible. It is generally conceded that this point is not far away, and for the present the market is pretty well sustained at $11.50, Birmingham. Its stability at this level will, however, be severely tested by offers of desirable tonnage within the next week or so. The only activity in Finished Material of noteworthy interest was developed in Structural Shapes, for which contracts aggregating over 16,000 tons were closed. Outside of four jobs ranging from 1000 to 7000 tons, the business was made up of small lots from widely scattered sources. The number of inquiries for estimates on fabricated material coming out give promise of considerable future business, which would doubtless be accelerated by the realization of lower prices. No new Rail tonnage of consequence has been entered by the mills, nor are there any important requirements reported as under negotiation. Extreme quietness rules in Plates, Bars and

Scrap, and the demand for Sheets is lessened. Lettings for 9500 tons of Cast Iron Pipe are in prospect, though the award of the major part of this tonnage is contingent upon the provision of necessary funds. Expectation of an early and radical revision of Finished Material prices is every where prevalent, and interest is centered upon the meeting of representatives of the leading Iron and Steel interests to be held in New York on Thursday of this week. From any viewpoint the situation is regarded as critical, and whatever action is taken at this meeting will be of farreaching importance. In one respect, at least, distinct improvement is observed, and that is in collections which are now quite satisfactory.

Pig Iron.—The feature of the week in Pig Iron was the placing in this market of between 20,000 and 25,000 tons of Foundry Iron by the Sloss-Sheffield Company. This tonnage was distributed among the larger consumers in lots ranging from 1000 to 6000 tons. It is understood that about 6000 tons was taken by the Allis-Chalmers Company and a like amount by the Featherstone Foundry & Machine Company, another lot of about 4000 tons going to a Moline foundry. The remainder of the tonnage was distributed in smaller lots among several consuming interests; the price for all being on a basis of $10.75, Birmingham, for No. 2 Foundry. The recent attitude of buyers has been construed to indicate that any prices below $11 would bring out a considerable tonnage, and this transaction emphatically confirms the general opinion. The effect of these sales has had a strengthening rather than a weakening effect upon the market. It is reported that between 50,000 and 75,000 tons in all was disposed of by the Sloss-Sheffield Company in this movement, practically all of which was sold for delivery through the second half. No more tonnage is being offered by the company at the same figure, the price now asked being $11.50, Birmingham. As far as can be ascertained, all other producers are likewise holding for $11.50, at which level the market seems to be more firmly established than a week ago. Negotiations are in progress on a round lot of anywhere from 10,000 to 20,000 tons of Foundry Iron by a large consumer, the conclusion of which hinges upon a satisfactory price agreement. Smaller melters are seemingly in no hurry to cover for forward requirements, and the demand from these sources has been comparatively light. The following prices are for May and June delivery, f.o.b. Chicago:

Lake Superior Charcoal	$20.00 to $20.50
Northern Coke Foundry, No. 1	17.75 to 18.25
Northern Coke Foundry, No. 2	17.25 to 17.75
Northern Coke Foundry, No. 3	16.75 to 17.25
Northern Soft, No. 1	18.25 to 18.75
Southern Coke, No. 1	16.35 to 16.85
Southern Coke, No. 2	15.85 to 16.35
Southern Coke, No. 3	15.35 to 15.85
Southern Coke, No. 4	14.85 to 15.35
Southern Coke, No. 1 Soft	16.35 to 16.85
Southern Coke, No. 2 Soft	15.85 to 16.35
Southern Gray Forge	13.85 to 14.35
Southern Mottled	13.60 to 14.10
Malleable Bessemer	18.40 to 18.90
Standard Bessemer	19.50 to 19.65
Jackson Co. and Kentucky Silvery, 6 %	18.90 to 19.40
Jackson Co. and Kentucky Silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky Silvery, 10 %	22.90 to 23.40

(By Mail.)

Billets and Rods.—The demand for Steel has dwindled to almost nothing. Up to within the past few weeks there has been some business in Forging Billets in carload lots, but even such orders are now exceedingly scarce. There is likewise an absence of inquiries which indicates profound indifference on part of buyers. Prices are unchanged, Forging Billets being quoted at $31.50 to $32.50, Chicago. Wire Rods are moving slowly, only a fair amount of specifications coming out. Prices continue firm, and are unchanged as follows: Bessemer, $35; Basic, $36; Chain, $37, all at Pittsburgh.

Rails and Track Supplies.—With the exception of a few unimportant orders from some of the smaller steam roads, transactions of the past week have developed nothing of interest. Scattering orders for Light Rails have been entered, but no lots of significant tonnage have been placed. While there has been no change in the nominal price of Light Rails, most of the sales made have been negotiated at concessions of $3 to $5 a ton, owing to competition from re-rolling mills. Some new business in Spikes and Track Supplies is coming out, mostly in small lots; but specifications against recent contracts, notably that of the New York Central for the Lake Shore & Michigan Southern, are being freely furnished. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.50c.; car lots, 1.60c. to 1.70c.; Spikes, 1.80c. to 1.90c., according to delivery; Track Bolts, 2.25c. to 2.35c., base, Square Nuts, and 2.40c. to 2.50c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb. $28; 20-lb. $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—The closure last week of several important contracts, some of which have been long pending, lifted the market out of a rut of dullness and lent it an air of activity not seen before in many weeks. Included in contracts entered by fabricators were the following: Carbon County Courthouse, Utah, 50 tons, taken by the Minneapolis Steel & Machinery Company; Anaconda Smelter, Butte, Mont., 3215 tons, taken by the Jones & Laughlin Steel Company; St. Louis County Courthouse, Duluth, Minn., 1367 tons, and Loose-Wilds Building, Kansas City, 1083 tons, taken by Brown-Ketchum Iron Works; Graff Building, San Francisco, 244 tons, Paris Millinery Company, Seattle, 250 tons, railroad bridge at Rust Mine, Minnesota, 160 tons, La Salle Hotel, 7000 tons, and the Brown & Marx Building, Birmingham, 1500 tons, taken by the American Bridge Company; Armory Building, Seattle, 121 tons, taken by the Puget Sound Bridge Company; Monon railroad bridge, 450 tons, taken by the Wisconsin Bridge Company; Metropolitan Life Building, San Francisco, 80 tons, taken by Dyer Bros.; two banks at Youngstown, 303 tons, and 180 tons of bridge material placed by the Burlington Railroad with the Pennsylvania Steel Company. Quite a number of inquiries on new projects are in the market, a good portion of which will be placed as soon as buyers are satisfied that prices have reached a stable level. An important piece of work undertaken last year by the Bitter Root District Irrigation Company and temporarily abandoned because of bankruptcy proceedings, has been revived by a reorganization of the company under the name of the Bitter Root Valley Irrigation Company. This project, located at Hamilton, Mont., included the construction of 1000 tons of riveted pipe, 63, 66 and 60 in. in diameter, made of ¼ to ½ in. Plates. Contract for this work was placed with the American Bridge Company by the former organization last August, and part of the pipe was made up before the failure of the contracting company. Whether the new company will use this pipe or take new bids on the entire tonnage has not been determined. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—Nothing of interest has developed in Plates, orders for which are coming in slowly and for small lots only. After a run of little more than a week, it is expected that both the Sheared Plate and Universal mills at the South Works will have cleaned up all orders on hand and be shutdown about Wednesday of this week. Prices are reported to be firmly held by the principal mills, and what cutting is done is still confined to concessions of $2 to $3 a ton, made on narrow sizes by smaller mills. We quote mill shipments, as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in, 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72-in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—The amount of business being entered by the mills has fallen off somewhat. Instead of increasing stocks, jobbers are steadily reducing them and are buying only what is imperatively required to meet current demands. Regular prices are well maintained, but for some unimportant concessions by a few of the smaller mills. We are advised that no departures from regular prices are being made on store shipments by jobbers. We quote mill shipments, as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 and 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—It is quite evident from the small part of Bar mill capacity kept in operation that there is no improvement in Steel or Iron Bars. The tonnage of new business coming out is extremely light, and the volume of specifications offered is very small. The Bay View plant of the Illinois Steel Company has three mills on, but unless additional specifications are received will shut down before the end of the week. Other mills in the district are being operated in the same desultory fashion. Prices on Billet Steel Bars are firmly held, but a few of the smaller mills are disposed to make concessions on Iron Bars. Quotations, Chicago, are

as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—Since the first of the year the demand for Pipe has shown a slow but steady improvement, though the tonnage for April was but slightly in excess for that of March. Likewise each week of the present month has shown an improvement over the corresponding weeks of the previous month, but in no case has the gain been conspicuously large. Buyers continue to refrain from placing orders for other than immediate needs, and because of limited demand and distrust of the continued maintenance of prices such orders are naturally small. On what business is moving no concessions are being made from regular discounts. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 71 per cent. on Black Steel Pipe, ¾ to 6 in. From two to three points above these prices is asked for Iron Pipe.

Boiler Tubes.—The total business in Merchant Tubes placed during the week is comprised of a few scattering car lots. No decided improvement can reasonably be expected until new work begins to come to the boiler shops in greater volume. Mill quotations for future delivery, on the base sizes, are as follows: 2¾ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron	Seamless.
1 to 1¼ in.	35	35	35
1¼ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2¾ to 3	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—Beyond a few small filling-in orders there is nothing doing in any of the materials comprised under this head. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1⅛ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 56 per cent. off in car lots; 52 per cent. in less than car lots, base territory delivery.

Cast Iron Pipe.—A letting of 2100 tons of Water Pipe is scheduled for May 22 by the city of Roswell, New Mexico; also one of 500 tons at a nearly date by Columbus, Ohio. The award of 7000 tons by Council Bluffs, Iowa, is to be made to-day, but it is understood that the contract is contingent on a bond issue yet to be voted by the city from the sale of which the necessary funds are to be provided. A contract for a lot of 300 tons was placed last week by Milan, Mich. A little stronger demand for Gas Pipe is noted, and prospects seem favorable for further improvement in this direction. We quote, nominally, per net ton, Chicago, as follows: Water Pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25; with $1 extra for Gas Pipe.

Metals.—Slight improvement is noted in the general volume of orders placed during the week, especially in Copper. But consumers, large and small, are buying material only as they need it, and in small lots, though such orders seem to be a little more frequent. A fair run of small orders for Lead and Tin have been entered, but Spelter and Antimony are extremely quit. Prices on both new and old metals hold practically without change. We quote as follows: Casting Copper, 13¼c.; Lake, 13¾c. to 14c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 32½c.; small lots, 33½c.; Lead, Desilverized, 4.35c. to 4.50c., for 50-ton lots; Corroding, 4.75c. to 4.85c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 10½c., and other grades, 9¾c. to 10¼c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 10½c.; Copper Clips, 11c.; Red Brass, 11½c.; Yellow Brass, 9¼c.; Light Brass, 6½c.; Lead Pipe, 4c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 25c.; Block Tin Pipe, 27c.

Old Material.—The market remains inactive so far as demand from consumers is concerned. A few moderate lots have been taken by the rolling mills, but none of them is tempted by the present low prices to make large additions to their stock piles. There seems to be a fairly ready market for Rerolling Rails, but the supply is equal to the demand, and prices are holding nearly stationary. This is true of nearly all grades, and there has in consequence been very little change within the past week in the general level of values. No railroad tonnage is being offered this week, at least no lists have appeared in the market. We quote, per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$14.75 to $15.25
Old Steel Rails, rerolling	12.75 to 13.25
Old Steel Rails, less than 3 ft.	12.00 to 12.50
Relaying Rails, standard sections, subject to inspection	20.50 to 23.50
Old Car Wheels	14.00 to 15.50
Heavy Melting Steel Scrap	10.50 to 11.00
Frogs, Switches and Guards, cut apart	11.50 to 12.00
Mixed Steel	8.50 to 9.00

The following quotations are per net ton:

Iron Fish Plates	$12.75 to $13.25
Iron Car Axles	15.75 to 16.25
Steel Car Axles	14.50 to 15.00
No. 1 Railroad Wrought	10.75 to 11.25
No. 2 Railroad Wrought	9.75 to 10.25
Railway Springs	10.75 to 11.25
Locomotive Tires, smooth	12.50 to 13.00
No. 1 Dealers' Forge	9.00 to 9.50
Mixed Busheling	7.00 to 7.50
Iron Axle Turnings	5.50 to 6.00
Soft Steel Axle Turnings	5.50 to 6.00
Machine Shop Turnings	5.00 to 5.50
Cast Borings	4.00 to 4.50
Mixed Borings, &c.	4.00 to 4.50
No. 1 Mill	6.50 to 7.00
No. 2 Mill	5.50 to 6.00
No. 1 Boilers, cut to Sheets and Rings	6.75 to 7.25
No. 1 Cast Scrap	11.50 to 12.00
Stove Plate and Light Cast Scrap	10.00 to 10.50
Railroad Malleable	9.75 to 10.25
Agricultural Malleable	9.25 to 10.25
Pipes and Flues	7.50 to 8.00

Cincinnati.

CINCINNATI, OHIO, May 20, 1908.—(*By Telegraph.*)

Developments of the past few days show a gradually increasing speculative spirit in Pig Iron, and one large dealer here to-day makes the statement that he could clean out 100,000 tons of Southern Iron within a few hours if he could supply it at the figure invariably mentioned by the large buyer, namely, $10, Birmingham. But he cannot supply it at that price. Aside from persistent rumors that $11 has been done on a large tonnage sold in Chicago territory, the price seems to stick firmly at $11.50. In Finished Material there is a situation that it likened by some dealers as the lull before the storm. The inquiry is at hand, the buyer apparently anxious, but he awaits the expected order of Steel manufacturers to cut prices all round after the Thursday meeting in New York. The feeling among the selling factors is that there will be no reductions ordered. The inquiries of the car manufacturing concerns for Iron are accepted as prophetic of better times in sight, and there has been some actual buying within the past week. There has been buying of Relaying Rails by Texas roads, and the Old Material market is a trifle firmer in some lines, although a long way from normal.

Pig Iron.—Apparently satisfied that the minimum has been reached, a number of buyers have come in the market within the week to cover necessities, although some still hold out for the expected $11 or less. An incident of the day was a call on two of the largest dealers here by a party from interior Ohio representing bankers and capitalists, or claiming to do so, with an offer to buy 10,000 tons of Southern Iron at $10, but it was scarcely taken seriously by either party visited. The callers frankly stated that their purchase, if successful, was to be purely speculative; that the Iron would be stored for higher prices. The feature of the present Iron market is the scarcity of low grades. One dealer announces the withdrawal of current quoted prices on low grades, and all agree that they are very scarce. The price of $10.50, Birmingham, on Forge is authorized by one representative dealer, effective as long as the furnace can supply it or orders it withdrawn on forward business. Contracting has been done at $11.50 at furnace for No. 2, covering the balance of the year, on Southern Iron and at $15.50 on Southern Ohio. Sharp competition from the valleys, and it is reported also from Toledo and Columbus furnaces, has taken a lot of business that normally belongs to the Hanging Rock District for spot Iron, with promise of lower levels ere the close of the month. A recent sale of 3000 tons of Red River Silvery, 6 to 7 per cent., was about $15.50, Clarksville Furnace, or $18.60 delivered, Chicago territory. Reports in this market indicate that several thousand tons of analysis Iron have been sold the past few days in Chicago territory and at a price less than $11.50, Birmingham. Some good sales have also been made of Open Hearth Basic, 10,000 to 12,000 tons, in St. Louis territory alone, the price being about $15, Valley furnace. There are quite a number of inquiries out for prompt shipment of lots ranging from a carload to 100 tons. A northern Ohio stovemaker wants 200 tons of No. 2 Foundry; an Indiana melter asks for 200 tons of Northern and Southern No. 2; the leading two smaller Pipe companies are out with inquiries for Iron for May and June shipment. For early delivery and balance of the year we quote f.o.b. Cincinnati, freight rates

being $3.25, Birmingham, and $1.20 from the Hanging Rock District, as follows:

Southern Coke, No. 1	$15.25 to $15.75
Southern Coke, No. 2	14.75 to 15.25
Southern Coke, No. 3	14.25 to 14.75
Southern Coke, No. 4	13.75 to 14.25
Southern Coke, No. 1 Soft	15.25 to 15.75
Southern Coke, No. 2 Soft	14.75 to 15.25
Southern Coke, Gray Forge	13.50 to 14.00
Ohio Silvery, 8 per cent. Silicon	19.70
Lake Superior Coke, No. 1	16.70 to 17.20
Lake Superior Coke, No. 2	16.20 to 16.70
Lake Superior Coke, No. 3	15.70 to 16.20
Standard Southern Car Wheel	22.25 to 22.75
Lake Superior Car Wheel	22.00 to 22.50

(By Mail.)

Coke.—An increased inquiry for forward deliveries is noted, with a fairly good movement on spot business, which is admittedly shaded considerably for good sized tonnages. This is confined, however, to Foundry Coke, the low rate of consumption on the part of the furnaces having made furnace grades practically a drug in the market. There is some talk of delay in deliveries brought about by the conservative policy of the railroads in retrenching with small train crews. Cars of Coke are switched at junctions, and made to wait the making up of miscellaneous trains. Contracting through the year, Connellsville Foundry of best grades is selling at about $2.25, at oven; spot business going as low at $2. Wise County Coke is held at $2.25; New River about $2.75, with some sales made at $2.65.

Finished Iron and Steel.—Dealers are anticipating with great interest the meeting of Steel manufacturers in New York on Thursday, which they seem to feel forecasts a general cut in prices on all Finished Material. Some dealers report rumored cuts already of from $1 to $3 per ton on Iron Bars: but the larger stores deny the stories and maintain that there is no cutting as yet. It is the sense of local distributers that consumers are holding off awaiting the expected action of the manufacturers. There is quite a little movement in Structural Iron and Steel, the bulk of sales in this market going to the South. Bars for concrete construction are quite active. Orders from stock are filled at the following prices, which are f.o.b. Cincinnati: Iron Bars, carload lots, 1.65c., base, with half extras; small lots from store, 1.85c., base, half extras. Steel Plates, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2c. Blue Annealed Sheets (Heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.20c. No. 12, carload lots, 2c.; small lots from store, 2.30c. Sheets (Light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.20c.

Old Material.—Dealers are confident of the future, and are still buying, but do not anticipate a return to normal conditions for many months. There has been some buying of Relayers by Texas parties, and the inquiry is fairly good from other parts of the South. Mills are not buying, and Heavy Melting Steel Scrap is quotable this week at 50c. a ton less than last week. There is quite a wide range in the selling price of Relayers of different dealers; one quoting them $20 to $21; another $23 to $24. Cast Scrap is lower, in sympathy with the weak Pig Iron market. Quotations are about as follows, f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$10.50 to $11.50
Cast Borings, net ton	4.00 to 5.00
Heavy Melting Steel Scrap	11.00 to 12.00
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	10.25 to 11.25
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	14.50 to 15.50
Old Iron Rails, gross ton	13.00 to 14.00
Old Steel Rails, long, gross ton	11.00 to 12.00
Old Steel Rails, short, gross ton	11.00 to 12.00
Relaying Rails, 56 lb. and up, gross ton	22.00 to 23.00
Old Car Wheels, gross ton	12.00 to 13.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00

The new collier Vestal for the United States Navy was launched successfully at the Brooklyn Navy Yard on Tuesday. The Worth Brothers Company, Coatesville, Pa., furnished the 4000 tons of steel plates required for the hull. The Vestal, when completed, will be the largest fleet collier in the world. Its length on the water line is 450 ft., and over all, 465 ft. 9 in. The beam is 60 ft. and depth 38 ft. 6 in. The load draft mean is 26 ft., and displacement 12,500 tons. The dead weight cargo capacity is 6,000 tons, and bunker capacity is 1,576 tons. The vessel is designed to maintain a speed of 16 knots an hour, and will carry enough coal to fill the bunkers of five battleships.

San Francisco.

SAN FRANCISCO, CAL., May 13, 1908.

There has been a general replenishing of stocks in the Iron, Steel, Sheet and Pipe lines and there is a better assortment than a few months ago, when lines were badly broken and jobbers were borrowing from each other to complete their orders. The mining situation is still improving, with benefit to the dealers in Steel dies and stamp mill supplies, tool Steel and Steel castings. Collections are pretty fair, everything considered. Oil is having a boom and prices are tending upward. New companies are being organized and old companies are making improvements. Notwithstanding the fact that the price now paid for the petroleum produced by some of the companies in California is about double that of a year ago, the management of an important company predicts that the present price will double within a year, and probably very soon. This means a very active demand in the near future for well casing and oil well supplies generally. There is a good demand already. The proposed new issues of $18,000,000 5 per cent. city bonds were carried by a large majority of the voters at the special election May 11. This insures the construction of the $5,000,000 auxiliary water system, which will require about two and one-half years to construct, after the bonds have been sold. Secretary Garfield has just promulgated the order and approved the maps granting Hetch Hetchy and Lake Eleanor reservoir sites in the Sierras to the city of San Francisco. The city applied in 1901 for these reservoir sites in the Yosemite National Park for a future city water supply. The application has been under consideration in the Department of the Interior ever since. There were several sources of strong opposition to the granting of the permit. The farmers depending upon the Turlock and Modesto irrigation districts in the valley below feared the loss of water for irrigation purposes. It was also feared that the reservoir in the Hetch Hetchy Valley would materially injure one of the most beautiful natural wonders of the Yosemite region. The matter of beginning work upon the proposed municipal water system will be decided by a special vote of the citizens at some future time. The promoters of the new system seem to have overlooked the fact that the city charter will have to be amended before the acquisition of such a water system will be legal.

Structural Materials.—Some large contracts are still hanging fire, but several lots of Structural Steel for large Class A buildings will probably be let soon. A large Steel bridge contract is also pending. There is a better demand for fabricated Steel and for Steel Rods used in the construction of reinforced concrete structures. The San Francisco building inspector's figures showed that during the month of April construction permits aggregating more than $2,000,000 in valuation were issued. In Oakland the total valuation for the month was $722,000. The April valuations in Los Angeles aggregated $664,000.

Cast Iron Pipe.—Inquiries have fallen off somewhat of late, possibly owing to the effects of the shortage of rainfall in many portions of the State. The United States Cast Iron Pipe & Foundry Company was the successful bidder on a small quantity of 4-in. Pipe for Redwood City, Cal., and also secured a small contract at Santa Ana, Cal. Prices are practically unchanged from the last quotations, which were: 6, 8, 10 and 12 in., $38; 4-in., $39, f.o.b. cars Pacific Coast terminal points.

Merchant Pipe.—A fair demand for Merchant Pipe continues at unchanged prices. More tonnage has been coming to the Coast recently than for a long time past. Discounts on Steel Pipe are about as follows on jobbers' carloads:

	Steel. Black.	Steel. Galv.
	%	%
⅛ to ¼ in.	58.5	42.5
⅜ in.	60.5	46.5
½ in.	62.5	50.5
¾ to 6 in.	66.5	56.5
7 to 12 in.	63.5	48.5
Extra strong, plain ends:		
⅛ to ⅜ in.	51.5	39.5
½ to 4 in.	58.5	46.5
4½ to 8 in.	54.5	42.5
Double extra strong, plain ends:		
½ to 8 in.	47.5	36.5

Pig Iron.—Business is still rather quiet at most of the local foundries and engineering works. Consequently there is little activity in Pig Iron and jobbers' stocks are more than equal to the demand, even if but little Iron is imported in the near future. Improvement is hoped for in the manufacturing lines with an increased demand for Iron. Since April 29 three sailing vessels have arrived from European ports with Pig Iron in their cargoes. The Vendee arrived from Newcastle, England, with 800 tons; the Prince George from Sunderland, England, with 820 tons; the Kilmeny from Antwerp with 800 tons. No importations of Chinese Pig Iron have been reported lately. No. 1 English, No. 1 Scotch and Chinese Pig Iron are quoted at about $28 to $29 per ton, ex-yard.

The electric Iron smelting plant at Heroult, Cal., is being enlarged. The present furnace will be replaced by a con-

siderably larger one. The furnace will stand about as high, but the method of feeding the ore and other materials is more like that of an ordinary blast furnace. It will have an exterior diameter of 10 ft. and an interior diameter of 6 ft. The walls, which are 2 ft. in thickness, are of concrete, lined, of course, with fire brick. The hight of the furnace is 8 ft. The new experiments are in charge of Professor Lyon of Stanford University.

Construction work will be pushed on the new army supply depot which is to be built on the northern water front of San Francisco, adjoining Fort Mason. A considerable quantity of Structural Steel will be used. Extensive docks, a sea wall and a warehouse will be built for the army transport service. A number of large Government vessels plying between San Francisco and the Philippines will use these docks and warehouses. Bids were recently opened on this work by Major Geo. McK. Williamson, constructing quartermaster for this department. The bidders and their figures are as follows: On the Government specifications—P. J. Carlin Construction Company, New York, $1,178,000; Warren Improvement Company, $1,826,310; Penn Bridge Company, Beaver Falls, Pa., $1,624,400; San Francisco Bridge Company, $1,479,000; Pacific Construction Company, San Francisco, $1,825,000; Robert Wakefield, Portland, Ore., $1,673,023.

The Nevada Asphalt & Oil Company, with a capital stock of $1,000,000, has filed articles of incorporation at Reno, Nev. This company has been organized for the purpose of immediately developing the deposits of asphalt and petroleum recently discovered in Pine Valley, near Palisade, in Eureka County. The incorporators are H. J. Humphrey, S. H. Wheeler and L. Blakeslee.

Philadelphia.

PHILADELPHIA, PA., May 19, 1908.

Considerably more activity developed in the local Pig Iron market during the past week, and a fair volume of business was transacted in some grades. A good tonnage of delayed business has come out and consumers appear to be willing to place orders at to-day's level of prices. There is also more disposition shown to make contracts for at least a portion of probable requirements for the last half of the year, but sellers show little inclination to take orders for forward business. The general feeling, as far as Pig Iron is concerned, is decidedly more optimistic, and it is believed that prices are pretty close to the bottom, and that any pronounced buying would no doubt result in a decided hardening of prices. In Finished Material there is hardly the same encouraging feeling regarding the future that has been shown in Pig Iron. In some instances there has been an improvement in production. The Pennsylvania Steel Company announces that while its production during January, February and March was but 35 per cent. of its capacity, the April capacity reached 50 per cent., and May is anticipated to run at about the same figures. Some of the other Steel mills, however, have not been so fortunate, and a decreased production is being shown, in some cases a decline of about 10 per cent. being noted. Price agitation no doubt holds business in Finished Material back; consumers believe that lower prices will come in the near future, but makers hold that no increased volume of business would come out at the time, even if prices were shaded.

Pig Iron.—Sales during the week show a fair aggregate tonnage and prices have developed more uniformity. Early last week there was still a wide range in quotations, but prices have now reached a fairly even basis and sellers show a disposition to place orders for their immediate requirements without much delay. There has been considerable shopping round, and inquiries for fair quantities of Foundry Iron, some running up to 2000 tons, for delivery through the third and fourth quarter and even extending to the first quarter of 1909 are to be noted. Sellers, however, refuse in many instances to name prices for anything beyond the third quarter's delivery, and in some cases have marked up their prices for shipment beyond that period. It is now believed that prices have touched bottom, particularly as Ore prices are being maintained, and some producers will not sell large tonnages, even for prompt shipment, at the present level. For both third and fourth quarter delivery a number of producers ask an advance of 50 cents to $1 over to-day's quotations. The firmness with which prices have been held has strengthened the market and some buyers are anxious to place orders, although furnaces do not show the same anxiety to take them. The volume of business placed during the week shows a material increase. Both No. 2 X and No. 2 Plain Foundry have been sold in 50, 100, 200, 300 and a few 500 ton lots, for early delivery at prices ranging from $16.75 to $17.25 for No. 2 X, and around $16.50 for No. 2 Plain, delivered in buyers' yards. Forge Iron has been more active; small lots have been taken at $15.50, delivered, while a sale of 1000 tons for prompt shipment has been made at a delivered price equivalent to $15.25 in this territory. Some little business in Pipe Irons has also come out. A sale of [illegible] River foundries on the basis of $11.50 for No. 2 X, Birmingham, while 2000 tons of Northern Iron, mixed numbers, was sold at $15.25, delivered. There has been more inquiry for Basic Iron, and, while Steel makers as a rule are not in the market for prompt Iron, efforts are being made to find what sellers would be willing to do. One melter has an offer out for 5000 tons of Basic Iron, but the price is not attractive, being about $2 a ton under the market. One or two smaller inquiries are reported, while one from the Western part of the State for 60,000 tons for delivery during 12 months is also reported. Steel mills in this territory are pretty well stocked on this grade of Iron and are not expected to be heavy buyers in the near future, unless business increases. Very little Southern Iron has been placed in this territory recently. Sellers hold firm at $11.50, Birmingham, although there have been several unsuccessful efforts to break this price. Virginia Irons show more activity and sales of No. 2 X and No. 2 Plain in lots of several hundred tons each have been sold at the ruling quotations. Practically all the furnaces in this territory have now made what adjustment they felt was required in the way of prices, and while some few still hold at higher prices, they are doing no business. We quote the following range for delivery during the remainder of the second quarter, but for third quarter delivery many producers add 50 cents a ton and for shipment during the fourth quarter $1 a ton, delivery in each case being in buyers' yards, eastern Pennsylvania and adjoining territory:

Eastern Pennsylvania, No. 2 X Foundry	$16.75 to $17.25
Eastern Pennsylvania, No. 2 Plain	16.25 to 16.75
Virginia, No. 2 X Foundry	17.00
Virginia, No. 2 Plain	16.50 to 16.75
Gray Forge	15.25 to 15.50
Basic	16.00 to 16.25
Low Phosphorus	21.00 to 21.50

Ferromanganese.—Sales of several moderate sized lots have been made, and prices have an upward tendency. Stocks in importers' hands are small, although some good tonnages are afloat. A sale of 1200 tons for delivery in the next nine months and another lot of 300 tons for delivery in the last half is reported. These were made at about $43.50, tidewater. Considerable variation is to be noted in asking prices to-day. Some sellers would still take small tonnages for prompt delivery, at $44 to $45, Baltimore, but others refuse business at $46.50.

Steel.—No improvement is to be noted in the demand for Steel. Orders come out sparingly, and are mostly for small lots for prompt shipment. A waiting market prevails, and mills show no gain in production. Ordinary Rolling Steel for delivery in this territory is quoted at $29.20, with Forging Steel at $31.20, subject to the usual extras for high carbons and special sizes.

Plates.—Orders are numerous, but individually the tonnages are small. Some little car and locomotive work has come out, but the aggregate tonnage received by most of the mills is hardly as good as it was some time ago. No large specifications are before the trade, and the outlook is not very bright. Prices remain unchanged, the following quotations being named for delivery in this territory:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The mills are these prices for [illegible] and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—A fairly good run of small business continues to be received by the mills. Large propositions are still held in abeyance. The city is advertising for proposals on a number of small bridges, and there is a slight improvement to be noted in building work. Orders of a miscellaneous character keep mills fairly well occupied, and in some cases a slight gain in production is to be noted. Prices are unchanged, 1.85c. to 2c. being named, according to specification.

Sheets.—There has been a decided improvement in the demand. Buyers show a disposition to take small tonnages for stock, and some of the mills have increased their production, and are now operating at about 75 per cent. of their capacity. Inquiries are reported better, and the outlook for future business is considered encouraging. For mill shipments, quotations range as follows, a tenth extra being added for small lots: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The demand is light and the trade is in an unsatisfactory shape. New business is scarce and practically no orders are being taken at the established basis of 1.65c.,

quantity to take care of the current demand. Sales, however, are small and prices of Refined Iron Bars range from 1.45c. to 1.55c., delivered in this territory.

Coke.—More activity has developed in the Coke market. Quite a number of sales, both of prompt and contract Foundry Coke, are reported. Furnace Coke is not so active, although some sales of prompt Coke have been made. Quotations range from $2.15 to $2.35 at oven for Foundry Coke, with Furnace Coke at $1.60 to $1.75, at oven. Sales of some fair tonnages of stock Furnace Coke at $1.10 to $1.25, at oven, have been reported, while contracts for 1000 and 2500 ton lots of Foundry Coke have been made at $2.25 and $2.35, at oven. For delivery in this territory the following range of prices is quoted:

Connellsville Furnace Coke	$2.75 to $3.00
Foundry Coke	4.30 to 4.50
Mountain Furnace Coke	3.35 to 3.50
Foundry Coke	3.90 to 4.10

Old Material.—No change is to be noted in the demand for Scrap. Business is confined to small lots, and but little interest is being taken in the market. Mills pick up odd lots at present prices, but any demand for large tonnages would immediately stiffen the market. Prices show little change. Quotations are largely nominal, ranging about as follows for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory:

No. 1 Steel Scrap and Crops	$12.75 to $12.25
Low Phosphorus	17.50 to 18.00
Old Steel Axles	17.50 to 18.00
Old Iron Axles	20.00 to 21.00
Old Iron Rails	17.00 to 18.00
Old Car Wheels	14.00 to 15.00
Choice No. 1 R. R. Wrought	15.00 to 15.50
Machinery Cast	15.00 to 15.50
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	9.50 to 10.00
Stove Plate	11.00 to 11.50
Cast Borings	8.50 to 9.00
Grate Bars	11.75 to 12.25

Cleveland.

CLEVELAND, OHIO, May 19, 1908.

Iron Ore.—The market remains inactive, no sales being reported. Consumers, however, are taking a little more interest in the market, and a few of them who will need Ore early in the fall have announced their intention to buy their Ore during the next few weeks, probably by July 1. The Ore firms, without exception, are still adhering firmly to the established prices, and it seems to be a pretty well settled conviction now that there will be no shading of last year's prices. Now that doubt about the maintenance of prices has about disappeared, it is believed that consumers will not hold off much longer. The first Ore cargo shipped to Lake Erie this season reached this city yesterday. Another is looked for to-morrow, and it is expected that three more will come down next week. The total May receipts will probably not exceed a half a dozen cargoes. A general start in lake navigation will not be made before June 1, and a meeting of the vesselmen will be held here on that date to decide whether to delay the start further. Work at the mines is being further curtailed. Little Ore is moving forward from the docks, shipments being considerably lighter than a month ago. Prices for 1908 delivery at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer $4; Siliceous Bessemer, $2.75; Siliceous non-Bessemer, $2.35 to $2.60.

Pig Iron.—The market shows a great deal of improvement in the volume of inquiries which have come in freely the past week. Although sales were not numerous, the tonnage sold was larger than for some time. The market is somewhat firmer, and there are fewer reports of low priced Iron being offered. With the belief that Ore prices will be maintained this year, furnace interests are not disposed to quote the low prices that have been named in the past few weeks, and consumers seem to think that they will gain no advantage by waiting to make purchases for their requirements for the balance of the year. The inquiries that have come out are for spot, third quarter and last half delivery. While there is still an occasional report that No. 2 Foundry Iron is being offered at $14.50, Valley furnace, $14.75 seems to be nearer the minimum price and some furnace interests are holding firmly to $15. A local furnace is asking $15.50 for No. 2, at furnace, for shipment in this territory, and about $15, at furnace, for shipment outside of the territory. Among the inquiries for No. 2 Foundry Iron is one from a Northern Ohio melter for 1200 tons for the last half, one for 500 tons from a jobbing foundry in this territory for early delivery, one for 500 tons and another for 300 tons from the Buffalo territory, and one from the Toledo territory for 500 tons, these being for the third quarter and last half. In addition there are several inquiries for 100 and 200 ton lots for early delivery. One inquiry is for 1000 tons of No. 2 Foundry, at $16, furnace, for delivery in the next three months, and 200 tons of No. 1 Foundry at $16.50 for delivery outside of this territory. Car lot sales of No. 2 are reported at $15.75, delivered Cleveland, and small lot sales at $15.25, furnace, for third quarter. There is an active inquiry for Basic Iron, among the inquiries of the week being one for 10,000 tons, and another for 15,000 tons, one coming from the St. Louis territory, and the other from the Pittsburgh territory. There is little inquiry for Southern Iron. There is an inquiry from an Eastern broker for 5000 tons of Malleable Iron. Shipping orders on contracts show some improvement. A local furnace that shipped only 40 per cent. of its output in April reports that its May shipments will reach 60 per cent. of its output. For early delivery we quote, delivered, Cleveland, as follows:

Bessemer	$16.90
Northern Foundry, No. 1	$15.75 to 16.40
Northern Foundry, No. 2	15.40 to 15.75
Northern Foundry, No. 3	15.00 to 15.40
Southern Foundry, No. 2	15.60 to 15.85
Gray Forge	14.90

Coke.—A fair amount of inquiry is reported for Foundry Coke for last half delivery, and a few contracts have been closed. Furnace Coke is quiet. Prices remain about stationary. We quote Connellsville Furnace Coke at $1.50 to $1.60, at oven, for spot shipment. Foundry Coke for spot shipment is selling at $2 to $2.25, at oven. Contracts for the last half are being made at the latter price.

Finished Iron and Steel.—The market shows no improvement. In view of the uncertainty about future prices, consumers are allowing their stocks to run low and are buying only for immediate needs. The only sale of any size reported in this territory last week was 500 tons of Standard Section Rails for an interurban traction railroad. There is another inquiry for a large tonnage of Standard Sections for an interurban line that may materialize into an order during the summer. The demand for both Iron and Steel Bars is light, and both the local Bar Iron mills are shut down this week. While the mills are adhering pretty firmly to the Pittsburgh base price on Iron Bars, jobbers are still shading it to 1.40c., Pittsburgh, but the concession is not bringing out business. The price of 1.60c., Pittsburgh, is being firmly maintained on Steel Bars, but lower prices are being offered by mills that reroll Steel Bars from old Rails. The demand for Plates is fully as light as it has been for several months, sales of even car lots being scarce. The price is being shaded $2 a ton on the narrow sizes. The demand for Sheets shows no improvement. Although there are still reports of concessions by a few of the mills, some orders are being taken at the established price. The Structural outlook shows no improvement. Jobbers report a slight increase in warehouse business, but their mill orders are light. We quote Iron Bars at 1.50c. to 1.60c., Cleveland, for car lots; Steel Bars, 1.70c., Cleveland, for car lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼-in. and heavier, 1.80c., Cleveland. We quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. There is no change in warehouse prices. Jobbers quote Iron and Steel Bars out of stock at 1.70c. to 1.80c. Beams and Channels out of stock are 2.10c. to 2.15c., base. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—As a result of practically no demand prices are weaker. Local rolling mills have enough Scrap on hand to fill existing orders and are out of the market. There is little doing among dealers. Yard dealers have good sized stocks on hand and are buying no Scrap unless it is offered at bargain prices. A few consumers are taking a small amount of Scrap on old contracts. There is a scarcity of Turnings at present prices. Dealers have good stocks of Turnings on hand but will not throw them on the market until prices become stronger. Busheling grades are weaker. Several price quotations are only nominal, owing to the absence of market activity. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$11.00 to $11.50
Old Iron Rails	14.50 to 15.50
Steel Car Axles	16.00 to 17.00
Old Car Wheels	12.50 to 13.00
Relaying Rails, 50 lb. and over	21.00 to 22.00
Heavy Melting Steel	11.00 to 11.50
Railroad Malleable	11.00 to 11.50
Agricultural Malleable	10.50 to 11.00
Light Bundled Sheet Scrap	7.50 to 8.50

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	6.00 to 6.25
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	10.00 to 10.50
No. 1 Railroad Wrought	11.00 to 12.00
No. 1 Cast	11.50 to 12.50

Pittsburgh.

PARK BUILDING, MAY 20, 1908. (*By Telegraph.*)

Pig Iron.—For the first time in four or five months the Pig Iron market is showing activity, and there have been some heavy sales of Basic and some moderate transactions in Malleable Bessemer and Foundry. The leading purchaser of Basic has been the American Steel Foundries, which has bought upward of 30,000 tons, divided between Valley furnace interests and the St. Louis Furnace Company, at St. Louis. For the Valley Basic, the company paid $15, Valley furnace, while for the Basic bought in St. Louis it is reported to have paid $16.50 at the local furnace. We can also state that several car coupler concerns in St. Louis are in the market for round tonnages of Basic, and another leading Western consumer is inquiring for a round lot of Malleable Bessemer and Foundry. The deliveries on the Basic bought by the American Steel Foundries are June, July and August. As yet little has been done in Bessemer Iron, but the absolute minimum of the market is $16, Valley furnace, and several makers have refused to sell at this price. There is more inquiry and there have been more sales of Foundry Iron so far this month than in any previous month for some time. Northern No. 2 Foundry is quoted on the basis of $14.50, Valley furnace, but it is possible that on a firm offer from desirable buyers $14.25, at furnace, might be done. As yet there is nothing doing in Gray Forge, but there is a reported inquiry in the market for 3000 to 4000 tons. We quote Northern Forge at $14, Valley furnace, or $14.90, Pittsburgh.

Steel.—A fair amount of buying is reported in Sheet and Tin Bars. Specifications against contracts on Billets are coming in a little more freely, but there is practically no new demand. Leading producers of Steel are firmly holding at $28, Pittsburgh, and $28.50, Youngstown or Wheeling, for Bessemer and Open Hearth Billets; Sheet and Tin Bars taking $1 advance, and Forging Billets $2 advance.

(*By Mail.*)

The Pig Iron market has completely reversed itself in the past week. After a practical suspension of buying for six months, except for actual needs, a number of large consumers have come in the market, and it is estimated that there are inquiries for fully 75,000 tons of Basic, and already 20,000 to 25,000 tons have been closed. Since last October prices of Pig Iron have been steadily declining, Bessemer Iron having gone down from $23 and $24 to $16 or less, at furnace; Basic Iron from $23 to $15; Foundry Iron $10 per ton or more, and Forge Iron $7 to 8. In the rapid decline costs were largely lost sight of, and in the past two weeks prices of Pig Iron reached a point that, to furnaces without raw materials, were below actual cost of production. Consumers have been carefully watching the downward course of the market, buying only small lots for actual needs during the decline, but with Bessemer Iron at $16 or less, Basic at $15 and No. 2 Foundry at $14.50 or less, Valley furnace, they became convinced that the Pig Iron market had about reached bottom, with the result that a large number of consumers have come in and are trying to cover for long periods ahead at present prices. It is said that the Ore situation for this year is absolutely assured, it being estimated that only 20,000,000 tons or less will be brought down this year. Some furnaces that do not have raw materials have been persistent sellers of Pig Iron through the decline, and now that they have pretty well worked up their stocks of Ore they are up against the proposition of paying last year's prices for Ore nad selling Pig Iron at $7 to $8 a ton less than it sold for in the summer and fall of last year. It is emphatically stated that furnaces cannot make Bessemer Iron at $16 and Basic at $15 and pay last year's prices for Ore, even with the low figures that are ruling on Coke. The strong inquiry that has come, and the sales of Pig Iron that have been made, will likely result in the starting up of two or three more Valley furnaces between now and June 1. Nearly all consumers of Pig Iron have low stocks, and the consumers that have bought are willing to take their Iron at once. A local prospective purchaser of Basic Iron has been feeling the market for some time, but as yet has not bought, holding off until absolutely certain that prices have touched bottom. The movement in Pig Iron may possibly extend to Finished lines, but this remains to be seen. The outcome of the action that may be taken in New York on Thursday is anxiously awaited, as it is believed it will have much to do with settling the situation for some time. If the large Steel interests continue to pursue the policy of affirming prices some in the trade believe that business will open up, while, on the other hand, the conviction is stronger that a reduction on all kinds of Finished Iron and Steel is the only remedy that will help the market. This feeling is so strong in certain quarters that jobbers in some lines of Finished products are advising their customers to hold off placing orders, stating their belief that a reduction in prices all along the line is certain. In the meantime jobbers are afraid to carry any stocks for fear of a reduction, while consumers decline to buy more material than they actually need for the same cause. The statement is made that with Bessemer Iron at $16 at furnace, [illegible] the whole market is out of joint, and must be readjusted before business will open up. This week ought to determine whether the Steel interests are of this opinion, or whether they still feel that to reduce prices would not help the situation, but would simply intensify the lack of confidence that has prevailed in the market for some months.

Ferromanganese.—As a result of the low prices, there is more inquiry, and foreign 80 per cent., for prompt delivery, is firm, at $43, seaboard, while for extended delivery $43.50 to $44, seaboard, is quoted, the freight to Pittsburgh being $1.95 a ton. A sale of 150 tons of foreign 80 per cent., deliveries July to December, is reported on the basis of $43.50, seaboard.

Ferrosilicon.—A sharp decline has occurred, and 50 per cent. is quoted at $67 to $67.50, f.o.b. Pittsburgh. A sale of 25 tons at the latter price is reported.

Muck Bar.—No sales have been reported in this market for some time. It is claimed that even with Northern Forge Iron at $14, Valley, or $14.90, Pittsburgh, there is no profit in Muck Bar at $26 a ton. We quote the market, nominally, for best grades of Muck Bar, made from all Pig Iron, at $26 to $27, Pittsburgh.

Skelp.—The mills that are in operation are running entirely on specifications on old orders. We quote, nominally, as follows: Grooved Steel Skelp, 1.55c. to 1.60c.; Sheared Steel Skelp, 1.65c. to 1.70c.; Grooved Iron Skelp, 1.75c. to 1.80c.; Sheared Iron Skelp, 1.85c. to 1.90c., Pittsburgh.

Rods.—In the absence of business, prices are fairly strong. Bessemer Rods are still quoted at $35, Open Hearth $36 and Chain Rods $37, f.o.b. Pittsburgh.

Steel Rails.—While practically no orders for Standard Sections are being placed, the Carnegie Steel Company is receiving enough specifications against old contracts to operate Nos. 1 and 2 Edgar Thomson mills to 35 or 40 per cent. of capacity. Prospects are that these two mills can be operated in this way for the next three or four weeks at least. A fair tonnage is moving in Light Rails, but prices are very uneven, a number of consumers being willing to take chances on the quality of rerolled Rails, which they can buy from $3 to $4 a ton under the regular prices of Light Rails. Some of the lumber interests are in the market for a fair tonnage of Light Rails, and the coal companies are also asking for a moderate tonnage. Regular prices on Light Rails, which continue to be shaded from $3 to $4 a ton by rerolling mills, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—Not enough new business is being placed to test prices, and none of the Plate concerns is able to operate to more than 30 to 40 per cent. of capacity. In fact, most of the mills run a week or two to clean up orders, and then shut down, waiting for enough tonnage to accumulate to warrant starting up again. Reports are current that the Pittsburgh & Lake Erie Railroad had placed 2000 cars with the Standard Steel Car Company, but this is an old order, on which the road is now taking out some of the cars. Prices on Plates, even on the small amount of new tonnage that is being placed, are shaded about $2 a ton by some mills. What would be done if a large order came in the market is a question. Regular prices are as follows: Tank Plates, ¾-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼ in. to and including 3/16 in.	
Plates on thin edges	$0 10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1 00
All sketches (excepting straight taper Plates varying 1/4 inch more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Manganese Steel	.40

Shell grade of steel is shaded about

Terms: Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with 45 cent tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in., of Tank, Ship or Bridge quality.

Structural Material.—Several of the large Structural companies report that inquiries are better, but while a good deal of work is in sight it is slow in coming out. The only local business placed recently was the Renshaw Building, about 600 tons, the Steel for which will be rolled by the Jones & Laughlin Steel Company. Local interests have sent in bids for a bridge for the Chicago, New Orleans & Texas Pacific Railroad, 4500 to 5000 tons, but it will likely be some time before this is placed. The Pittsburgh & Lake Erie bridge at Beaver seems to be hung up, as nothing has been heard of it for some time. There is still much complaint at the low prices being made on fabricated work, which it is

1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—Consumers are still withholding orders in the belief that prices may be reduced, but the Sheet makers insist that lower prices are not contemplated. It is estimated that about 50 per cent. of the Sheet capacity is active, but this is probably a little high. Prices in the main are being held, but occasionally concessions are being made by some mills that are actively seeking business. Regular prices are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed. Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—The season's business in Tin Plate is pretty well over, and on the whole was disappointing. Some of the independent makers report that they have not more than six weeks' work ahead, with the probability that very little business will be placed during the summer months. The American Sheet & Tin Plate Company is operating practically all of its modern plants, only three or four isolated mills being idle. We quote at $3.70 for 100-lb. Cokes, 14 x 20 f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Hoops and Bands.—Specifications against contracts are light, with practically no new business. It is stated that the three leading makers of Hoops and Bands are not operating to more than 50 per cent. of their capacity, if that much. Regular prices are as follows: Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60, base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Cotton Ties.—The tonnage ordered so far since the season opened is disappointing, and is much below that in the corresponding period last year. We quote as follows: 3000 bundle lots and over, 85c., less than 3000 bundle lots, 88c., f.o.b. Pittsburgh.

Iron and Steel Bars.—Absolutely no improvement is seen in the demand for either Iron or Steel Bars, consumers persistently withholding orders in the belief that prices will be reduced. The mills disclaim that any such action is contemplated, and insist that present prices on both Iron and Steel Bars will be maintained. Reports are circulated that Steel Bars are obtainable at less than the fixed price of 1.60c., Pittsburgh, but when this is put up to the mills they deny it, or state that these are Bars rerolled from Old Rails. Reports are also current that the price of 1.50c.. Pittsburgh, on Iron Bars is being shaded about $2 a ton. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further west. Steel Bars remain very firm, at 1.60c., Pittsburgh.

Spelter.—The market is decidedly easier, and prime grades of Western Spelter are quoted as low as 4.40c., St. Louis, equal to 4.52½c., Pittsburgh. Buying is very light, and it is evident there is an overproduction.

Railroad Spikes.—A fair demand is noted for the smaller sizes, but in Standard sizes used by railroads very little business is being placed, and all the Spike mills are badly in need of work. We quote: Standard sizes, 4½ x 9-16 in., at $1.70, and the smaller sizes at $1.80 per 100 lb. in carloads and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Merchant Steel.—The demand for Tire and Spring Steels is reported as a little better, but the general market is dull, new orders being only for small lots and actual needs. Some shading is being done. We quote Cold Rolled Shafting, on contracts for 100 tons and over, 57 per cent. off; carloads, 56 per cent. off, and less than carloads, 52 per cent. off, on which carload freight is allowed within base territory. Nominal prices on Merchant Steel are as follows: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 2.10c. to 2.15c.; Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron, finished, 1½ in. and wider, 1.60c.; under 1½ in., 1.75c. Planished Tire Steel is 1.80c., all f.o.b. at mill.

Pipes and Tubes.—This trade is showing improvement, and indications are that May will show a gain over April, which was the best month in the Pipe trade since last fall. No large business is being placed, buyers confining purchases to absolute needs. Many oil and gas lines are being figured on, but trouble in financing these is delaying the projectors from ordering the Pipe. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 74 and 5 per cent. off list, while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black.	Galv.
	%	%
⅛ to ¼ in.	65	49
⅜ in.	67	53
½ in.	69	57
¾ to 6 in.	73	63
7 to 12 in.	70	55
Extra strong, plain ends:		
⅛ to ⅜ in.	58	46
½ to 4 in.	65	53
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

Discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
	%	%
⅛ and ¼ in.	63	..
⅜ in.	65	51
½ in.	67	55
¾ to 6 in.	71	61
7 to 12 in.	68	53
Extra strong, plain ends:		
⅛ to ⅜ in.	56	44
½ to 4 in.	63	51
4½ to 8 in.	59	47
Double extra strong, plain ends:		
½ to 8 in.	52	41

Boiler Tubes.—The railroads are buying very few Tubes, while consumers of Merchant Tubes are placing orders only for small lots and actual needs. Prices continue to be shaded more or less, depending on the order. Regular discounts on Merchant Tubes in small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ in.	42	47
1¾ to 2¼ in.	42	50
2½ in.	47	61
2¾ to 3 in.	52	65
6 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Iron and Steel Scrap.—A prospective local consumer of Scrap has been feeling the market recently, and is reported to have bought 15,000 tons of Heavy Steel Scrap through a broker. In a general way, trade is exceedingly dull, consumers not being willing to take in a ton more than absolutely necessary to meet current needs. Prices are weak. Dealers quote about as follows, per gross ton: Heavy Steel Scrap, Pittsburgh, Steubenville or Sharon delivery, $12.75 to $13; Cast Borings, $7.25 to $7.50; No. 1 Railroad Wrought, $13.25 to $13.50; No. 1 Cast, $14.25 to $14.50; Bundled Sheet Scrap, $8.50 to $9, at shipping point; Sheet Bar Crop Ends, $16 to $16.50; No. 1 Busheling Scrap, $12 to $12.25; No. 2, $9 to $9.25; Iron Axles, $19 to $19.50; Steel Axles, $16.50 to $17; Low Phosphorus Melting Stock, $16; Old Steel Rails, short pieces for Open Hearth use, $12.75 to $13; Rerolling Rails, lower in price, $13.50 to $13.75; Machine Shop Turnings, $8 to $8.25; Grate Bars, $12 to $12.50; Railroad Malleable Scrap, $11.25 to $12.

Coke.—The H. C. Frick Coke Company has started some additional ovens, and its output of Coke is larger now than at any time since last fall. Several inquiries are in the market for Furnace Coke, but the prices that furnaces are willing to pay are so low, as compared with the ideas of the producers, that no contracts have been closed. Standard grades of Furnace Coke are quoted at $1.50 to $1.55, at oven, for prompt shipment, while 72-hr. Foundry is held at $2 to $2.25, at oven. Main Line Coke, and other grades made outside the Connellsville region, are offered at lower prices. The output of Coke last week was 173,045 tons, a gain of about 6000 tons over the previous week.

St. Louis.

ST. LOUIS, MO., May 18, 1908.

As an index to the general situation in the Iron industry one large producer states that it is running more furnaces—double, in fact—than was the case two months ago, though still far from employing the full capacity of the plant. The sales agency of one of the large Steel companies states that within 10 days the demand for Structural Material has made very encouraging progress. In Pig Iron good business is in prospect, stimulated by the outlook for higher prices. Scrap is still ruling comparatively inactive, so far as demand from the mills is concerned. Crop conditions in this territory promise well and materially aid in promoting confidence in buying Coke.

Coke.—Prices for Coke show no material change. Melting has increased and shipments are coming forward better. The demand shows some improvement.

Pig Iron. Recent large sales have induced quite general inquiry, resulting in moderate buying. In the case of one local concern alone inquiries cover 4000 to 5000 tons, for shipment over the third and fourth quarters. This indicates quite a revival in the demand. Prices for far forward shipment rule from 50c. to $1 per ton over current figures.

Finished Iron and Steel.—The demand is still of a hand to mouth character. In Bar Iron and Steel, however, the market is stiffening and there is no disposition to cut from the Pittsburgh basis of 1.60c. for Steel Bars and 1.70c. for Steel Plates. In general there is distinctly a considerable improvement in sentiment, and indications point to a better demand in the near future. With ideal weather for building operations business in Structural Shapes shows a steady improvement, characterized rather in the number than in the size of the jobs, but in the aggregate the volume reaches a quite satisfactory showing. The Light Rail demand has shown a marked improvement since the settlement of the Coal strike, the inquiries coming from Coal operators. The Bar situation is characterized by orders for sorting up in Bar products. The best demand is for Tire sizes, reflecting more activity in agricultural sections.

Old Materials.—There is more inquiry for Heavy Melting Steel, but it is mainly confined to dealers who wish to cover on prior sales. In the absence of buying by mills the quotations given below are more or less nominal and the market is unsettled, with no material being offered by railroads or for the moment any large offers current. We quote, f.o.b. St. Louis, per gross ton, as follows:

Old Iron Rails	$14.00 to $14.50
Old Steel Rails, rerolling	11.25 to 11.50
Old Steel Rails, less than 3 ft.	11.00 to 11.25
Relaying Rails, standard sections, subject to inspection	22.50 to 23.50
Old Car Wheels	11.50 to 12.00
Heavy Melting Steel Scrap	10.75 to 11.00
Frogs, Switches and Guards, cut apart	10.50 to 11.00
Mixed Steel	9.00 to 9.50

The following quotations are net ton:

Iron Fish Plates	$11.50 to $12.00
Iron Car Axles	14.50 to 15.00
No. 1 Railroad Wrought	10.75 to 11.00
No. 2 Railroad Wrought	8.50 to 10.00
Railway Springs	9.00 to 10.00
Locomotive Tires, smooth	12.00 to 12.50
No. 1 Dealers' Forge	9.50 to 10.00
Mixed Borings, &c.	3.50 to 3.75
No. 1 Boilers, cut to Sheets and Rings	7.00 to 8.00
No. 1 Cast Scrap	10.00 to 10.50
Stove Plate and Light Cast Scrap	9.00 to 9.50
Railroad Malleable	9.25 to 9.75
Agricultural Malleable	8.50 to 9.00
Pipes and Flues	7.25 to 7.50

Birmingham.

BIRMINGHAM, ALA., May 18, 1908.

Pig Iron.—The efforts of large producers to maintain a basis of $12, Birmingham, for No. 2 Foundry have proved futile, and the schedule of $11.50 is established. Such a basis has been adopted by all, and, notwithstanding the fact that an agreement as to the maintenance of quotations does not exist, the transactions reported fail to indicate that shading has been done. As a matter of fact, the largest sale reported was made at $11.75, Birmingham. This was a lot of 1000 tons for prompt delivery, and an offer for an additional 1000 tons to be delivered during the third quarter at the same price was refused. An effort to place 500 tons for delivery covering the last half at $11.75 is also reported as unsuccessful, while an unconfirmed report indicates the sale of upward of 20,000 tons for delivery covering the balance of the year at $11.25. The company to which the tonnage is accredited is known to have made a sale of a round tonnage, but the price received or quantity engaged cannot be ascertained. According to the best information obtainable, the tonnage was engaged by a brokerage house. The number of inquiries pending indicate an improvement in all lines of foundry trades; especially is this true of Pipe manufactures, and the interest manifested by purchasers is such as to warrant the anticipation of activity to some extent whenever prices are established upon a firm basis, but the requirements in no cases are believed to be urgent and the demand will hardly reach sufficient proportions to determine the ultimate level of prices at an early date. In this connection it is to be noted that one of the concerns that recenly revised quotations has been practically out of the market for some months past by reason of its refusal to depart from the basis of $13, and the tonnage thus brought on the market is significant.

Cast Iron Pipe.—The aggregate of tonnage now in sight exceeds the expectations of any time within the past 60 or 90 days, and is not without an effect upon quotations. Recent lettings have failed to develop the eagerness to secure orders that low figures at which contracts were previously placed indicated, and it is believed that better prices were received. It is known that a contract for 1000 tons was recently canceled by the company which was to have produced it, and an effort to have the order reinstated at an advance of $1 per ton was unsuccessful. Among the lettings contemplated within the next 30 days, the following are of most significance: 6000 tons for the city of Council Bluffs, Iowa; 6400 tons for Detroit, Mich., and 800 to 1000 tons for Dayton, Ohio. Specifications have also been received for 750 to 1000 tons for Government use in the Panama Canal zone, and some small lots for Cuba and Mexico are pending. The principal letting of the past week was 1000 tons of Water Pipe for the city of Portland, Oregon. This contract was awarded the United States Cast Iron Pipe & Foundry Company. Quotations are unchanged, and we quote nominally as follows, per net ton, f.o.b. cars here: 4 in. to 6 in., $23; 8 in. to 12 in., $22; over 12 in., average, $21, with $1 per ton extra for Gas Pipe. These quotations are probably shaded on municipal contracts.

Old Material.—Operations at mills recently suspended have not been resumed, and the consumption is at an unusually low rate. The decline in the price of Pig Iron has necessitated further revision of quotations, but purchasers are still unwilling to commit themselves for future deliveries and the aggregate of sales is comparatively small. We revise nominal quotations as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$15.00 to $15.50
Old Iron Axles	14.00 to 15.00
Old Steel Axles	12.50 to 13.00
No. 1 Railroad Wrought	12.00 to 12.50
No. 2 Railroad Wrought	9.00 to 9.50
No. 1 Country Wrought	10.50 to 11.00
No. 2 Country Wrought	9.50 to 10.00
Wrought Pipe and Flues	8.50 to 9.00
No. 1 Steel	9.00 to 10.00
No. 1 Machinery	9.50 to 10.00
Stove Plate and Light Cast	8.50 to 9.00
Cast Borings	5.00 to 5.50

New York.

NEW YORK, May 20, 1908.

Pig Iron.—There has been a good deal more of inquiry, but it is difficult to determine to what extent it is only to test the market. In many instances buyers name prices considerably below the market. It is a fact, however, that quotations are lower, some of the sellers having given way. We quote: No. 1 Northern Iron, $17 to $17.50; No. 2 Foundry, $16.25 to $16.75, and No. 2 Plain, $15.75 to $16. Alabama Irons are selling at $16 to $16.50 for No. 1 Foundry and $15.25 to $15.75 for No. 2 Foundry.

Steel Rails.—Some further business is pending, but the past week has been devoid of important transactions. One mill made a sale of 500 tons, and any other business done was of the small-lot order.

Structural Material.—Shipments of plain material are made with fair promptness, as a rule, though consumers find at times that the starting and stopping of mills and the frequent changes called for in times like these, when there are only small rollings on some sizes, do not conduce to the quick deliveries they had expected in a period of slackness. Fabricating companies note that the expectation of lower prices for Steel is having some effect on the placing of contracts, and the meeting of Steel manufacturers this week has caused some buyers to hold off temporarily. Little business has been closed in the past week. A contract for 450 tons for bridges for the Chicago, Indiana & Louisville Railroad was taken by the Wisconsin Bridge Company, Milwaukee. A large inquiry for bridges is reported to have been made by the Cincinnati, New Orleans & Texas Pacific. In New York City bids are in for the new buildings for Union Theological Seminary, 900 tons, but no award has been made. The Lackawanna Shop work at Scranton, now figured at 4000 tons, is about to be let and this road is in the market for a bridge over Paulin's Creek. Plans have been approved recently for the new Municipal Building in New York, bounded by Centre and Duane streets and Park Row and spanning Chambers street. Construction will not be undertaken probably for some time. The Steel requirements will amount to 7000 to 8000 tons. We quote as follows on mill shipments, deliveries at tidewater: Beams, Channels, Angles, and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—While Bar Iron is still quiet, the outlook is considered a little more reassuring, and some of the leading Eastern manufacturers are feeling decidedly more hopeful than for several months. An improvement has begun in Wrought Pipe, and the Pipe mills, which are somewhat allied to the Bar Iron trade, are steadily running to greater capacity. It is felt that Bar Iron must soon participate in this improvement. Prices are reported on a basis of 1.45c. to 1.50c., New York, although the regular quotation of the leading Eastern mills is 1.50c., Pittsburgh, or 1.66c., New York. The Eastern Bar Iron manufacturers will hold a meeting in this city this week for the purpose of considering the condition of trade. Steel Bars are maintained at 1.60c., Pittsburgh, or 1.76c., New York.

Plates.—Eastern sales agents have not been favored with increased business. The demand is still confined to quite small quantities. Prices of standard sizes of Plates

are continued, as follows, at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—Orders are few and seldom call for more than a carload lot. The manufacturers are more firmly holding their ground, and when they quote a price are refusing to go lower. Competition, therefore, is not quite so keen as it has been. The approximation of selling prices to producing cost is having a decided effect. Carload lots of 6-in. are held at $23.50 to $24 per net ton, tidewater.

Old Material.—Some signs of improvement are observed in Heavy Melting Steel Scrap. A larger demand is noted, but prices cannot yet be advanced. The same remarks would apply to Wrought Pipe, which is being bought more freely. Cast Borings are in fair demand and a trifle higher than a month ago. Wrought Turnings have improved slightly in sympathy with Borings. While the foundries are having a little more work, and are buying at close prices, nevertheless Cast Scrap and Stove Plate are a trifle easier than two weeks ago. Car Wheels are still in overabundant supply, and the demand seems to be wholly lacking. Relaying Rails continue to experience an increasing demand. The impression is strongly prevalent that the market has seen its worst, and that as soon as the rolling mills secure more business prices of all grades of Scrap may show some advance. Three different Steel works in Eastern Pennsylvania have bought blocks of Heavy Melting Steel Scrap at prevailing prices for June, July and August delivery, comprising in the aggregate about 10,000 tons. Quotations are about as follows, per gross ton, New York City:

Old Girder and T Rails for melting	$10.50 to $11.00
Heavy Melting Steel Scrap	10.50 to 11.00
Old Steel Rails, rerolling lengths	10.50 to 11.50
Relaying Rails	20.25 to 21.25
Old Iron Rails	14.00 to 15.00
Standard Hammered Iron Car Axles	15.50 to 16.50
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	11.50 to 12.50
Iron Track Scrap	9.50 to 10.50
No. 1 Yard Wrought, long	10.50 to 11.50
No. 1 Yard Wrought, short	9.50 to 10.50
Light Iron	5.00 to 6.00
Cast Borings	4.50 to 5.50
Wrought Turnings	6.00 to 7.00
Wrought Pipe	9.00 to 10.00
Old Car Wheels	13.50 to 14.50
No. 1 Heavy Cast, broken up	13.00 to 14.00
Stove Plate	9.00 to 10.00
Locomotive Grate Bars	10.00 to 10.50
Malleable Cast	11.50 to 12.00

Ferroalloys.—An increase in business is noted and prices are higher at $45, seaboard, for Ferromanganese. Numerous small orders have been filled during the week under review, and many inquiries for large tonnages have been received. Sellers are reluctant to make contracts for forward deliveries at these prices. The market for 50 per cent. Ferrosilicon continues unsatisfactory but probably nothing better than $75 could now be done.

Metal Market.

NEW YORK, May 20, 1908.

Pig Tin.—Business was fair until Saturday, being mostly for orders for future delivery. Since then the dullness has been excessive. Prices in London are about £1 higher than last week, the market there closing to-day at £135 15s. for Spot, and £134 for Futures. Shipments from the Straits during May will be large, but the arrivals in London small, owing to the dock strike in the far East last month. Arrivals in this country have been good, amounting to 2440 tons, and there are afloat about 2600 tons, of which over 1000 tons will make this month's delivery. The heavy buying early in the month by the leading consuming interest has left the market rather bare of Spot stocks. Prices during the week advanced nearly 1c., the range being as follows:

	Cents.
May 13	29.50 to 29.55
May 14	29.70
May 15	30.25
May 18	30.30
May 19	30.50
May 20	30.30

Those familiar with the Pig Tin situation estimate that May deliveries into consumption will be large, possibly reaching 3600 or 3800 tons. The next Banca sale will occur May 26, and it may be that the present rise in London is hoped to make a better market for this sale. Such maneuvers have been common in the past.

Copper.—Following the lead of the London market, prices in this country have advanced slightly, but without bringing in much business from consumers. Of course, there has been some buying, and perhaps more than usual, as actual consumption shows an increase. The advance in London, however, was clearly the result of manipulation, and some very profitable business was done by houses having connections both in New York and London by selling future Copper in London and buying spot Electrolytic in New York. Electrolytic can be quoted at 12.87½c. Lake at 13c. and Casting at 12.75c. Possibly 12.75c. might be done on Electrolytic for export. It is worthy of note, however, that a considerable quantity of high grade Casting was sold at 12.80c. It is significant to point out at this time that the consumption of Copper throughout the world is so small that the demand can be supplied by the low cost properties; in other words, there is probably enough Copper being made to-day, costing considerably less than 11c. to supply the world's requirements. Exports during the week have been larger, but the total still falls far short of last month's, being but 12,359 tons. Prices abroad are about 10s. higher than last week, closing to-day at £57 15s. for spot and £58 10s. for futures. Best Selected is held at £62.

Spelter.—The Spelter market is very dull and conditions are far from satisfactory. Prices for ore are declining and the demand from consumers shows no increase. Prime Western brands are obtainable in St. Louis at 4.50c., and possibly a shade lower, while the New York market is weak, at 4.60c. to 4.65c. Brass Mill Special can be had at 4.70c. to 4.75c.

Pig Lead.—Prices continue firm and the situation appears to be well in hand. Consumers are taking fair quantities of metal. No Lead is offering at less than 4.25c., New York, the price of the leading interest. The St. Louis price is unchanged, at 4.12½c. to 4.15c.

Nickel.—Prices are without change, at 45c. for ton lots and 50c. to 60c. for smaller quantities.

Aluminum.—Prices are barely steady, as so much material is offered for resale that there is a wide difference in quotations. The nominal price for No. 1 Ingot is 33c.

Antimony.—The market is unchanged. Cookson's being offered at 8.75c. to 8.87½c., Hallett's at 8.50c. to 8.75c., and Outside Brands at 8.25c. to 8.50c.

Tin Plate.—The trade is awaiting with interest the result of the conferences among steel manufacturers being held in this city. Prices are firm, at $3.89, New York, and $3.70, Pittsburgh, for 100 lb. IC Coke Plates. Welsh Tin Plates are unchanged in Swansea, at 12s. 4½d.

Old Metals.—Export business continues fair, but domestic trade is light. Dealers' selling prices are as follows:

	Cents.
Copper, Heavy and Crucible	12.00 to 12.25
Copper, Heavy and Wire	11.75 to 12.00
Copper, Light and Bottoms	11.00 to 11.25
Brass, Heavy	9.00 to 9.25
Brass, Light	7.00 to 7.50
Heavy Machine Composition	11.50 to 11.75
Clean Brass Turnings	8.00 to 8.50
Composition Turnings	9.00 to 9.50
Lead, Heavy	3.90
Lead, Tea	3.55
Zinc	3.50

Iron and Industrial Stocks.

NEW YORK, May 20, 1908.

The stock market mounted to still higher levels in the past week, but railroad stocks were more conspicuous in this respect than industrial securities. Some of the latter, however, showed further gains. The range of prices on active iron and steel stocks from Thursday of last week to Thursday of this week were as follows: United States Steel common 37½ to 39¾, preferred 101¾ to 103¾; Car & Foundry common 37 to 38⅜, preferred 96½ to 98; Locomotive common 50¾ to 52, preferred 103½; Steel Foundries common 6½ to 6⅞, preferred 34 to 34⅞; Cambria Steel 30⅜ to 31⅝; Colorado Fuel 28½ to 29⅞; Crucible Steel common 5⅜ to 5¾, preferred 40¼; Pressed Steel common 28¾ to 30; Railway Spring common 35¾ to 39⅝; Republic common 18½ to 20⅛, preferred 68¾ to 72; Sloss-Sheffield common 48¼ to 52¼; Cast Iron Pipe common 26½ to 29, preferred 75 to 76; American Can common 5 to 5¼, preferred 56 to 56½. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 38¼, preferred 102¾, bonds 96⅜; Car & Foundry common 37¼, preferred 98; Locomotive common 49¼, preferred 103; Colorado Fuel 30⅛; Pressed Steel common 29, preferred 84¾; Railway Spring common 37¼; Republic common 19, preferred 69½; Sloss-Sheffield common 50¼; Cast Iron Pipe common 28, preferred 75½; Can common 5¼, preferred 56.

In a supplementary circular addressed to the stockholders of the Westinghouse Electric & Mfg. Company, Joseph W. Marsh, chairman of the Merchandise Creditors' Committee, urges them to support the plan of subscribing to $6,000,000 additional stock. It is stated that creditors to the extent of $3,600,000, out of a total of $4,250,000, have already signed the agreement to take stock for their claims. A large proportion of the remainder is already promised, and the statement is made that practically the entire amount will join the plan. The circular says: "Under this plan the merchandise creditors show their confidence in the future of your company by abandoning their position as your creditors and becoming your partners."

The Bethlehem Steel Corporation, in the first quarter of the current year, earned a surplus available for dividends on

the stock of approximately $365,000, or at the rate of $1,460,000 a year. These earnings included no return from the new structural mill, which only recently started to contribute anything to the treasury.

The Standard Screw Company has published its annual report covering the operations of the fiscal year ending March 31, 1908, which shows the following income account:

	1908.	Changes.
Combined net profit	$512,137	Dec. $210,952
Interest on bank balance	2,046	Inc. 115
Total income	$514,183	Dec. $210,837
Less expenses	38,002	Inc. 8,342
Net income	$476,181	Dec. $219,181
Deducted as—		
Bond interest	$11,750	Dec. $150
Interest, special	11,684	Dec. 6,610
Dividends	269,634	Inc. 24,939
Total deductions	$293,068	Inc. $18,179
Net surplus for year	$183,113	Dec. $237,360

Dividends.—The Railway Steel Spring Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable June 4.

The Barney & Smith Car Company has declared a quarterly dividend of 2 per cent. on the preferred stock, payable June 1.

The National Enameling & Stamping Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable June 1.

The Saco & Pettee Machine Shops, Newton Upper Falls, Mass., have declared a semiannual dividend of 4 per cent.

The Sloss-Sheffield Steel & Iron Company has declared a quarterly dividend of 1 per cent. on the common stock, payable June 2.

The National Association of Manufacturers.

The National Association of Manufacturers held its annual convention at the Waldorf-Astoria, New York, on Monday, Tuesday and Wednesday of this week, with an unusually large attendance. James W. Van Cleave, of St. Louis, presided. The opening session was held on Monday afternoon and was chiefly occupied in the appointment of committees, receiving reports of standing committees and discussing their recommendations, and listening to several addresses. The first action, however, was the dispatching of the following telegram to the Conference Committee of Congress, on motion of D. A. Tompkins, of Charlotte, N. C.:

The National Association of Manufacturers, in convention assembled, declares in favor of the immediate passage of the ocean mail bill.

Following the appointment of the Organization Committee, George J. Seabury of Seabury & Johnson, New York, addressed the convention on "Industrial and Commercial Problems and How to Promote Foreign Trade." He advanced the well-known arguments presented to the committees of Congress at various times and criticised those who had defeated the ship subsidy bills. He also condemned the German-American tariff agreement. Z. D. Scott of the Scott-Graff Lumber Company, Duluth, vigorously attacked Mr. Seabury's logic and conclusions.

The report of the Committee on Interstate Commerce, consisting of A. B. Farquhar, O. O. Ozias, E. A. Smyth and O. S. Foster, met with enthusiastic indorsement by the members present. It said, in part:

Your committee does not profess to have the complete explanation of the crisis of 1907, but it can point, without serious misgiving, to one factor which has certainly been unfavorable to the values of railroad stocks: the attacks made against property of that kind by the legislation of some of our States. Property, even of railroads, is none the less property, and when the rights of one kind are disturbed all are involved.

The report favored the proposed internal waterways system and had no change to recommend with regard to the Interstate Commerce Commission, believing that it "has power enough at present and is wise enough to seek no more."

Alfred H. Post of A. H. Post & Co., New York, forwarders of freight, spoke on "Export Shipping Problems"; William H. Douglas of Arkell & Douglas, and president of the New York Produce Exchange, on "Exporting"; Allen Ripley Foote, president of the National Tax Association, commissioner of the Ohio State Board of Commerce, on "American Protection for American Industries."

Anthony Ittner of St. Louis, representing the Committee on Industrial Education, presented a long report which dealt extensively with the opposition of the labor unions to trade schools.

President Van Cleave, in his report presented on Tuesday, scored both the labor leaders and President Roosevelt. He declared that the labor leaders, particularly those of the American Federation of Labor, had tried to browbeat national officials and Congressmen who had not come over to their views. Then, after criticising the Hepburn bill, he said it had been framed "under the eye of the President, after a conference with the heads of the labor trust and some of the capitalistic trusts, and with one or two well-meaning visionaries." The report insists on tariff revision, and maintains with vigor that most of the manufacturers of the country favor changes in the tariff.

The following telegram was sent to Speaker Cannon after its adoption by the convention:

The National Association of Manufacturers, regardless of political affiliations, now assembled, urges upon you to use your power and influence against any anti-injunction legislation whatever, thus perpetuating the good work you have already done.

The Committee on Resolutions brought in a report attacking the threatened advance in railroad freight rates and criticising the railroads for their attitude. The report stirred up considerable debate.

The report of the Committee on Tariff was read by H. E. Miles of Racine, Wis. E. H. Dean of Indianapolis, Ind., announced that he had a minority report to present. After a spirited discussion the following resolutions, as reported by the majority, were adopted:

Resolved, First, That we emphasize the importance of maintaining the principle of protection of American interests, of farm, factory and labor.

Second, That we recommend to Congress the creation of a permanent semijudicial tariff commission or board of experts, which shall investigate thoroughly and scientifically all matters pertaining to the subject, to the end that Congress and the Executive may be fully informed and shall assist the State Department when desired in the formulation and negotiation of treaties of reciprocity.

Third, That we recommend as a basis of protective duties upon which the commission shall work the principle of international costs, to wit: Protective duties should represent substantially the permanent differential between the cost of production in foreign countries and that in the United States, with an ample margin for safety.

Judge William H. Speer of New Jersey made an address on the labor legislative programme, analyzing mercilessly the several important measures pending in Congress.

A resolution was adopted authorizing the president to appoint a committee to represent the association before "the national executive committees of the two political parties, to the end that class declaration planks may be omitted from the platforms of both parties." The president is authorized also to invite the co-operation of committees from other associations.

Present adverse conditions affecting railroads as a result of the industrial depression have led to the calling of a conference of members of the railroad commissions of six States, to be held in Chicago, June 12. Among those who will participate are the Railroad Commissioners of Illinois, Indiana, Wisconsin, Michigan and Ohio, and the Public Service Commission of the Second District of New York. It is expected that the results of the conference will be farreaching. Unusual conditions with which the railroads are confronted have caused railroad commissioners to think seriously about whether or not their present policy in matters pertaining to railroad regulations is to the interest of all concerned. This subject will be discussed thoroughly at the conference, and recommendations may be made which will have an important bearing upon the railroad situation.

The April exports of merchandise from the United States were valued at $133,470,333, as against $157,451,781 for April, 1907. The merchandise imports in April were valued at $87,481,258, as against $129,554,075 for April, 1907. The excess of exports for April, this year, was $45,989,075, against $27,897,706 for April, 1907. For the 10 months ending with April, 1908, the excess of exports was $613,560,325, as compared with $412,952,776 in the corresponding 10 months of the preceding fiscal year.

The Southern Steel Company's Reorganization.

Considering the intricate condition of the affairs of the Southern Steel Company at the time of the appointment of receivers, the published plan for the rehabilitation of the company, as prepared by the Reorganization Committee, is certainly a very comprehensive one. The committee has been most fortunate in having as its chairman James T. Woodward, whose thorough knowledge of the condition of the iron and steel business of the South has been of the greatest advantage to the committee in formulating its plans, and the personnel of the balance of the committee is an assurance of the conservative basis on which the properties are to be reorganized.

The Trustees in Bankruptcy, through their thorough knowledge of the properties of the company, their requirements and possibilities, have rendered valuable services in advising with the committee in the preparation of the plan of reorganization, and it should be most gratifying to all concerned to have the plan as adopted meet with the unanimous approval of the Reorganization Committee, the Trustees in Bankruptcy, and their respective counsel.

The company has particularly extensive holdings of ore and coal lands, consisting of 43,613 acres of coal lands and rights and 41,722 acres of ore lands and rights. It has a wire and rod mill with a daily capacity of 250 tons of various kinds of wire, and the steel plant has a monthly capacity of 12,000 tons of steel. There are four furnaces with a monthly capacity of 22,000 tons of pig iron, 918 coke ovens with a monthly capacity of 30,000 tons of coke, 6 coal mines with a capacity of 88,000 tons of coal, three brown ore mines with a monthly capacity of 25,000 tons of brown ore, and five red ore mines with a monthly capacity of 25,000 tons of red ore.

A map accompanies the plan of reorganization, showing the location of the various properties and plants of the company and their close relationship for economical operation. The plan provides the new company with ample funds for present betterments and improvements to the properties and for working capital, in addition to which $2,000,000 of the new first mortgage and refunding bonds are reserved for future betterments and improvements.

It is estimated that the average annual net earnings of the company will be $1,200,000, against which there will be fixed charges of but $352,700, the surplus being equal to twice the amount required for the dividends on the entire authorized issue of the preferred stock, and after the payment of the dividends on the preferred stock there will be a surplus equivalent to 4.27 per cent. on the entire authorized issue of the common stock of the company. The holders of first mortgage bonds and collateral trust notes will receive new first and refunding mortgage bonds to the amount of the principal and interest of the deposited bonds and collateral trust notes and 10 per cent. of the principal of their deposited bonds and notes in the new preferred stock on account of adjustments for interest.

The general creditors of the company will receive new first and refunding bonds to the amount of 50 per cent. of their claims, and preferred stock to the amount of 75 per cent. of their claims. The preferred stockholders of the company will receive 25 per cent. in new common stock, and the common stockholders will receive 5 per cent. in new common stock, in addition to which both classes of old stockholders are given the privilege of subscribing at the rate of $10 per share for their old stock and receiving on account thereof 150 per cent. of such subscription in new preferred stock and 250 per cent. of such subscription in new common stock, at which attractive figures it is presumed the stockholders will avail themselves of their privilege.

The Reorganization Committee will name a strong Board of Directors for the new company, and, through a proposed classification of the board, the continuation of their management for a reasonable time will be assured.

The new company will have a complete organization for the production of pig iron and for the manufacture of various kinds of wire. Part of the pig iron made at the four furnaces of the company is sold in the open market, and part is turned into steel at the company's steel plant. The capacity of the coal mines is entirely sufficient for the coke requirements of the company, and with further development work the output of the coal mines can be considerably increased, so that there will be available a surplus of coal for sale in the open market.

Canadian Stove Founders Organize.—The stove manufacturers of Canada have formed the Dominion Iron Founders' Defense Association, on lines similar to the Stove Founders' National Defense Association, which has so long maintained conference relations with the Iron Molders' Union in the United States. The officers of the new Canadian organization are the following: John H. Tilden, president; T. W. Kirby, secretary and treasurer, and F. Clare, John H. Tilden and T. W. Kirby members of the Conference Committee. It is stated that, following the procedure of the Stove Founders' National Defense Association, matters at issue between the manufacturers and the molders will be handled by joint conference committees.

L. W. Hawley, expert on wood distillation for the United States Forest Service, has gone to Oregon, Washington, Montana and Idaho to investigate the possibilities of a future turpentine industry in the northwestern portion of the United States. He has taken with him a small distillation apparatus, which he will set up at various places in these States, distilling the different woods to determine their value in the production of turpentine. It is believed that a careful study of existing conditions in that section will yield results which will give an accurate idea of the possibility of utilizing the enormous quantity of saw mill refuse now going to waste.

The Berwind-White Coal Company has placed orders with the Westinghouse Electric & Mfg. Company and the Westinghouse Machine Company jointly for the construction and equipment of a central power plant, which will furnish all the power for operating its various coal mines in Central Pennsylvania. The new plant will be located at Windber. The order calls for two 1500-hp. steam turbine engines and six 500-hp. rotary converters, 18 transformers, two 500-hp. and two 225-hp. motors. Under the new plan the Berwind-White Coal Company will abandon the individual power plants at its different mines.

At the monthly meeting of the New England Foundrymen's Association, held at the Exchange Club, Boston, May 13, it was voted that space be engaged in the Process Building, Toronto, to be used as headquarters for the association during the convention of the American Foundrymen's Association in June. Chas. J. Caley, Russell & Erwin Mfg. Company, New Britain, Conn., was appointed a committee to take the matter in charge. W. T. Hatch, construction and power engineer of the Brown & Sharpe Mfg. Company, Providence, R. I., addressed the meeting on "General Service Equipment of the Foundry."

The *Railroad Gazette*, New York, and the *Railway Age*, Chicago, announce that on June 1 the two papers will be consolidated and issued thereafter under the name *Railroad Age Gazette*. The general offices will be in New York, but there will be an editorial and business force at Chicago, of the same size as at the office of publication. The *Railroad Gazette* has been published for 52 years and the *Railway Age* for 32 years, and the two papers have been leaders in their field.

The House of Representatives has passed a bill authorizing the President to accept the invitation for the United States to participate in the exposition at Tokio, Japan, in 1912. The bill appropriates $1,500,000 and authorizes the appointment of three commissioners-general, one at an annual salary of $8000, and the other two at $2000 each, until the year of the exposition, when it shall be $5000, and a secretary at $5000.

The Machinery Trade.

NEW YORK, May 20, 1908.

The reports spread broadcast almost daily of a marked improvement in business must refer to other than machinery lines, for the transactions and inquiries of the past week were neither more numerous nor larger than those of the previous week. It is true that there were a few spurts of buying from some houses and with some there is a better feeling as to business conditions, but many of these latter admit that their business has not increased and is about as dull as it has been for the past month or more. It is certain that a larger volume of inquiries will have to be received and the more important interests will have to come into the market more freely before a revival of activity in the trade will occur. Since our last report no inquiries and few projects of magnitude were announced. Single tool orders for the lighter class of equipment made up a large proportion of the business transacted. As plants are only operating at about half their capacity, it is the opinion of many in the trade that the bulk of the business for some time to come will consist of single tool purchases. Bad features of the situation are the few new enterprises being started and the slowness with which projects already outlined materialize.

During the past two weeks interest was centered in the important conventions held by the dealers and builders of machine tools. In view of the present depression in business the proceedings were naturally watched rather closely, especially any action taken toward the maintenance of prices. At Richmond, Va., the three associations went on record as opposing any reduction of prices, and as the members of these associations represent the selling end of a good portion of the representative builders, their action adds considerable weight to the contention that it is to the best interests of all to maintain the present values. The associations reaffirmed their indorsement of the minimum resale price system on the rebate plan, action was taken toward influencing the United States Government to have all goods it purchases marked with the name of the manufacturer, and resolutions were passed opposing legislative action in behalf of the so-called anti-trust and anti-injunction measures. The proceedings of the conventions of the American Supply and Machinery Manufacturers' Association, the National Supply and Machinery Dealers' Association and the Southern Supply and Machinery Dealers' Association at Richmond, Va., and the National Machine Tool Builders' Association at Atlantic City, N. J., are printed in more detail in other columns.

The Railroad Club opened its new quarters on the twenty-first and twenty-second floors of the Cortland Terminal Building, 30 Church street, New York, May 18. A large number of members and their guests took the opportunity to inspect the sumptuously furnished rooms and partake of a luncheon.

Delaware, Lackawanna and Western Railroad Improvements.

Of the few large projects outlined in these columns some time ago, work upon which has been carried forward, the most important is probably the large repair plant being constructed at Scranton, Pa., by the Delaware, Lackawanna & Western Railroad. This entire plant, complete with tools and machinery, will cost about $2,500,000. Work was started last year on two of the main buildings and considerable equipment has been purchased from time to time, at least three lists of machine tools having been issued through the purchasing department for these shops, one of which was sent out only a few weeks ago. The two buildings for which most of the equipment has been purchased are the foundry and blacksmith shop, which are nearly completed, the structural steel having been erected by the railroad last winter. The foundry is 120 x 400 ft. and the blacksmith shop 125 x 300 ft. The shops included in the original plans which have not yet been erected consist of an erecting, machine, boiler and tank shop, 344 x 582 ft.; paint shop, 90 x 162 ft.; main repair shop, 80 x 250 ft.; power house, 90 x 160 ft., and several smaller buildings. The foundry and blacksmith shop having now been about completed, the company is taking up the construction of the erecting, machine, boiler and tank shop and is getting estimates on the structural steel for this shop. The foundations will be put in this summer ready for the steel, which will be erected the coming winter. This is to be the main building connected with the plant and for its equipment the company will have to purchase a large amount of additional machinery, as the shop is to be wholly devoted to machine work. In addition to the Scranton shops the company intends to make other important improvements to its road, some of which will necessitate the use of considerable mechanical equipment. It is understood that plans are about completed for the construction of a new cut-off between Lake Hopatcong and the Delaware Water Gap which will reduce the distance between Jersey City and Buffalo by several miles. This work will cost several million dollars, and it is probable that contracts will be let within the next month or two.

The recent sale of $17,000,000 of five-year notes by the Tidewater Railroad, Norfolk, Va., for completing the building of the road, will in all probability hasten plans for the repair shops which the road intends to build. For a long time the company has had under consideration the building of main shops, plans for which have not been completed.

The Ingersoll Watch Company, New York, has purchased the plant of the Trenton Watch Company, at Trenton, N. J., which it will operate after improvements have been made. It is the intention of the company to spend considerable money in improving the plant, and quite a little new equipment will probably be purchased. At the Trenton plant a different grade of watch will be manufactured from that made in the company's present plant.

A great deal of interest has been manifested by machinery houses in the large amount of tunnel work projected for New York and vicinity, and though it is probable that it will be a long time before contracts are awarded for the entire work, if only half of it is placed under contract within the next few months it will necessitate the purchase of a considerable amount of contractors' machinery. In addition to the Catskill water shed and the Fourth Avenue Subway in Brooklyn, plans have been taken up for the construction of a subway in the Bronx. The Public Service Commission and the Board of Estimate and Apportionment have adopted plans for new subways and elevated railroads for the Bronx, the lines to connect with the New York Central Railroad at the proposed new station at 138th street.

D. G. Ziegler & Co., architects and engineers, Empire Building, Atlanta, Ga., have about completed surveys for the power plant and electric railroad for the Goose Creek Railroad & Power Mfg. Company, Jesup, Ga., the road to be about 24 miles long and the power plant to develop about 3000 hp. The engineers will purchase for this enterprise, which also includes cotton mill and cotton seed oil mill machinery for these two manufacturing plants, a general line of supplies, and the equipment for the electric railway and the power plant, the latter including generators, water wheels, &c. The firm also has under consideration the establishment of a hydro-electric plant on the Suwanee River, about 50 miles from Jacksonville, Fla., where 25,000 hp. can be developed. A company is now being organized, with a capital stock of about $5,000,000, to develop this latter power and build trolley lines to connect all the cities and towns within a radius of 65 miles and to furnish light and power for the various manufacturing enterprises.

Power plant equipment and a considerable amount of other material is to be purchased by the Giroux Consolidated Mines Company, 42 Broadway, New York, for its plant at Ely, Nev. The company is asking bids until May 26 for two 500,000-gal. horizontal heavy duty pumping engines, operating against a head of 1200 ft.; two 200-hp. boilers, including boiler feed pumps, wrought iron or steel pipe, &c. Specifications can be secured from Alexander Potter, consulting engineer, 143 Liberty street, New York.

Business Changes.

In addition to the companies now represented in this territory, Herman Nieter, 2 Rector street, New York, has been appointed Eastern agent for the Canton Drop Forging & Mfg. Company of Canton, Ohio.

The American File Sharpener Company has moved its office from 296 to 287 Broadway, New York.

Catalogues Wanted.—The Bellwood Mfg. Company, Penn Square Building, Philadelphia, Pa., desires catalogues of motor driven overhead trolley and track system, maximum weight to be lifted 3000 lb.

Chicago Machinery Market.

CHICAGO, ILL., May 19, 1908.

In the machinery trade, as well as other lines, business has certainly not been helped by the unfavorable weather conditions that have prevailed through the first half of the present month. But in spite of the deterrent influence of an almost uninterrupted succession of rain storms covering this period, the aggregate amount of business done by machinery houses and manufacturers has not sensibly declined. There is, it is true, a good deal of unevenness in its distribution, so that while some interests are able to report encouraging improvement, others have experienced contrary results. The spasmodic manner in which orders come out continues to be a characteristic feature of present conditions. Referring to this phase of the situation a manufacturer of machine tools has this to say: "We had a spasmodic pick up in the first week of this month, but since then things have again gone flat. Since the first of the year we have had but two weeks which looked like a business revival, one of the second week

in March and again the first week of May. In order to keep our shop busy we have taken on the building of some special machines entirely outside of our line, which will probably enable us to run about one-half capacity for the next three months." It seems to be a common experience of the trade that a satisfactory volume of business develops for a short time, only to drop back again into the trough of dullness. Practically all of the machine tools in the recent lists issued by the Chicago, Milwaukee & St. Paul Railway and the Chicago Board of Education have been placed. Orders were awarded last week by the latter for 41 engine and woodworking lathes. Besides a fair number of miscellaneous orders, comprising single tools or small lots, entered by the machine tool dealers in the past week, two moderate sized shop equipments are being figured on. It is perhaps needless to add that these are Western enterprises, as requirements of this kind from other sections of the country are extremely rare. The tools required for both equipments will amount to between $25,000 and $30,000. There are but few large industrial plants now in the market for generative and motive power machinery, but there will be several good sized orders for this sort required to supply some of the big buildings to be constructed in this city in the near future. Work has been commenced on a 12-story building of reinforced concrete construction for M. Born & Co., and contracts are being let for the new La Salle Hotel, both of which will require boilers, engines, compressors, pumping and electrical machinery of large capacity.

Stimulated by the building of the Cananea, Yaqui River & Pacific Railroad through the hitherto well-nigh impenetrable Yaqui River valley in Mexico, the demand for mining machinery and equipment from that section has been notably increased. A number of known properties whose developments have been retarded by the lack of transportation facilities and hostile Indians will, as soon as this line is completed, take advantage of its facilities to transport and introduce modern machinery into mines. The Mesa-Rica Gold Company, located at Suahripa, Sonora, Mexico, within 8 miles of the projected line of this road, is arranging to install an aerial tramway about 5000 ft. in length, and is now in the market for a system of this character that will meet its requirements. The president and general manager is A. F. Tanner, West Allis, Wis.

Machinery Requirements of Corn Products Company.

Included in the buildings comprising the Corn Products Company's new plant, work upon which is being actively pushed, there will be a large machine shop. Specifications for the tools required to equip it are now in the hands of the machinery houses, and it is believed that orders will be placed at an early date. A large amount of other machinery will be needed, plans and specifications for which are not yet fully completed. An extensive battery of boilers and several engines of large horse power capacity will be required to furnish the initial motive power which will, as far as possible, be distributed electrically through the plant. This will involve the use of large generators and a great number of motors. An independent pumping plant will be installed and, to supply the volume of water needed, it will necessarily be of large capacity. On account of the magnitude of this enterprise and the varied assortment of machinery that will be required it is commanding wide attention and interest in the machinery trade.

The E. L. Essley Machinery Company, Chicago, has been recently incorporated with a capital stock of $25,000, and has established headquarters at 67 West Washington street, for the purchase and sale of both new and second-hand machine tools. A branch office will be located at Milwaukee, Wis., room 908 Majestic Building. The company was organized by E. L. Essley and J. R. McDonald, both of whom were recently connected with McDowell, Stocker & Co. Mr. Essley will assume management of the Chicago store, where a full line of new and second-hand iron and brass working machine tools will be carried. Mr. McDonald will have charge of the Milwaukee office. Backed by experience in the machine tool business extending over a period of 18 years, the management of this new enterprise is well qualified to serve its clients with discriminating care and judgment.

A company is being organized at Corpus Christi, Texas, with a capital of $30,000, to construct and operate an electric light plant, for which a franchise has been secured from the municipality. It is the purpose of the new company to have the plant completed within six months, and contracts for the necessary material and equipment will be let within the next 60 days. Clark Pease, president City National Bank, is connected with the enterprise, of which E. D. Kelly is general manager.

The Cedar Rapids & Iowa City Railway & Light Company, Cedar Rapids, Iowa, is contemplating the purchase of a 750-kw. motor generator set. The president and general manager is William G. Dows.

Jenkins Bros., New York, manufacturers of Jenkins standard '96 packing, valves, &c., have moved their Chicago store from 31-33 North Canal street to larger quarters at 226-228 Lake street, corner of Franklin.

The Chicago branch of the H. B. Smith Machine Company, Smithville, N. J., has been removed from 10-12 North Canal street to 63-65 West Washington street. The new quarters are centrally located in what is now generally termed the new machinery district.

The Carborundum Company, Niagara Falls, N. Y., which has occupied 10-12 North Canal street with the H. B. Smith Machine Company, has also moved to 63-65 West Washington street, where it will, as before, have offices in conjunction with the same company.

Cincinnati Machinery Market.

CINCINNATI, OHIO, May 19, 1908.

Material increase in the mails of tool houses, with evidenced disposition to negotiate for future deliveries on orders which have been held up since the fall of 1907, lead machinery builders in those lines to believe that better times are in sight. This condition may be said to be the feature with a majority of the largest establishments which six months ago had orders booked ahead six and nine months and a year. True, actual buying or orders for shipment have not been so much in evidence, but it is the better tone to letters and the optimistic note in the utterances of heads of departments that give promise of these things. In several instances orders have come in for shipment of parts of orders booked; three, four and five machines in an order of a dozen and more. Now that the railroads have shown a disposition to come into the market cautiously for a portion of their large needs at this time, other buyers who have held back, awaiting the action of the transportation interests, are coming out from cover, but it is a long way from normal yet.

Manufacturers of metal working, bakers', woodworking machinery and electric power equipment are still running almost normally. The dealers in second-hand machinery report a considerable increase in inquiries, with some fairly good sales. There has been some very close buying of new tools since the first of the month, and some shading of prices is reported, but not by the larger concerns making standard sizes. Price maintenance on the part of the big establishments, prominently identified with the work of the National Machine Tool Builders' Association and the other reputable organizations has been a feature of the long wait for business. In most instances the carefully observed conservatism of heads of large concerns has resulted in sales to the parties clamoring most actively for concessions. Manufacturers of boilers and engines report business but slightly improved, save those establishments making portable and throttling engines for Southern installations. These latter have excellent reports of increased demand, which indicate that the Southern territory is making greater headway in the restoration process than the Northern and Eastern. Reports from other points in this territory suggest material and rapid improvement in certain lines.

Replying to an inquiry, the National Automatic Tool Company, Dayton, Ohio, says that it is running full time, 60 hr., with full force working on contracts entered into two years ago, and has just installed a new shaper in its plant.

Manufacturers of pumping machinery, tobacco presses and the like all report conditions improving. The Crestline Mfg. Company, Crestline, Ohio, maker of pumps, reports business excellent; its plant running full time, with some extra.

The Columbus Pneumatic Tool Company, Columbus, Ohio, reports repair business good, but orders for new tools light, and its plant running with reduced force.

The Defiance Machine Works, Defiance, Ohio, writes hopefully, saying that business has improved quite materially the past 30 days, and that it has recently finished a complete new equipment for machine shop and foundry. About 40 per cent. of the company's business is from foreign countries. Its plant is running with full force on half time.

The Diamond Chain & Mfg. Company, Indianapolis, Ind., reports its business for April 80 per cent. of the same month last year, and running with 75 per cent. of its normal force, full time less five hours weekly. President Wainwright writes that the company has increased its capacity 100 per cent. over last year.

The Edgemont Machine Company, Dayton, Ohio, has installed some machinery and built a two-story brick addition to its plant, containing about 8000 sq. ft. It is putting on the market a new wet grinder. Its plant is running two-thirds force 10 hours per day.

The Fort Wayne Electric Works, Fort Wayne, Ind., is completing a new brass foundry started last summer, and working most departments full time with about two-thirds to three-fourths normal force.

The Fort Wayne Rolling Mill Company, Fort Wayne, Ind., has just completed a new 8-in. finishing mill with five stands of rolls, designed for making small sizes and special sections in either iron or steel, and has operated about 33 per cent. of its normal force and capacity so far this year.

The F. Grote Mfg. Company, Evansville, Ind., has installed a new electric hoist in its foundry, and announces that it is in the market for a good second-hand double punch and shear to punch about ¾-in. hole through ¾-in. metal.

The Reeves Pulley Company, Columbus, Ind., is operating on about three-fourths time, and writes that business is improving, with export trade about normal. It is in the market for a new boiler.

The Sterling Electric Motor Company, Dayton, Ohio, is in good shape with its new plant built last summer to care for an anticipated boom in its line. Its capacity is increased 50 per cent.

The J. M. Robinson Company, Cincinnati, reports improvement in the line of metal working machinery, forming tools, cornice brakes, &c. It is now building for the Delphos Mfg. Company, Delphos, Ohio, a 12-ft. press; C. H. La Flamboy, Detroit, Mich., 8-ft. press, to be used in the manufacture of a patent roofing with cement covering for which a new plant is under construction in Detroit and another in Cleveland. The company has also recently placed on the market a new pattern slip corrugated curving roll for culvert work, which has proved very popular.

A consignment of agricultural machinery is being shipped by the Hoosier Drill Company and Gaar Scott & Co., Richmond, Ind., to Manchuria, on order from the Chinese Empire. The consignment consists of grain drills, thrashing outfits, traction engines, plows, harrows and cultivators.

Assistant Secretary J. M. Manley of the Cincinnati Metal Trades Association has returned from the Richmond, Va., meeting of the Machinery and Supply Dealers' Associations. He reports a better feeling among manufacturers generally, evidenced in the Cincinnati association, particularly through the increasing interest and fine co-operation of the members. Four new applications for membership are now on file.

The Triumph Electric Company, Cincinnati, has increased its capital stock from $125,000 to $1,250,000, of which $500,000 is preferred stock, to take care of the enlarged field of operations of the company, which have been noted before in these columns. Engineers are at work on the plans for the new Oakley factory, which is to be built at once, and which it is hoped will be in readiness for occupancy in about a year.

Cleveland Machinery Market.

CLEVELAND, OHIO, May 19, 1908.

The situation in the local machine tool market remains about stationary. The demand continues light and sales are limited mostly to small single tools. Inquiries are mainly of a similar character, and as they are still scarce there is little or no indication of an improvement in the demand. There is possibly a slight improvement in inquiries from large manufacturing plants that have been buying scarcely any tools during the past few months. While some little concessions may occasionally be made, prices of machine tools are in the main being held firmly by the dealers.

While a fair volume of second-hand tools is being offered the supply is not nearly as large as had been expected, considering the industrial conditions of the past few months. The supply practically all comes from the surrounding territory, not a single local plant having closed up and placed its tools on the market. Dealers are slow in stocking up on second-hand tools, demanding low prices on what they buy. Most of the used tools that are being offered are in very good condition. Conditions are about stationary with machine tool builders and manufacturers in general, although some of them notice a slight improvement. Makers of a varied line of machinery are pushing those of their smaller products for which there is a better demand, and are faring better than makers whose production is limited to large tools. Makers of heavy forgings report no improvement in conditions and the outlook far from satisfactory. Orders for forgings for lake boats under construction have been filled and orders for forgings from Eastern shipyards are scarce. Present indications are that there will be little activity in the lake shipbuilding industry during the present year. Crane builders report a slight improvement in the demand for small single cranes, but there is still an absence of good sized inquiries.

The jobbing foundry situation shows no improvement. Consumers are all placing some orders, but they are for small lots for immediate needs.

Very few new industrial enterprises that will require machinery or machine tool equipment are being started in this city or other manufacturing centers in northern Ohio. A number of projects are still being held up until industrial and financial conditions show an improvement. The local money market is still tight and banks are making but few loans. The situation in this regard has not been improved by the closing during the past two weeks of three local banks. They were all comparatively small financial institutions, however, and while deposits will be tied up for a while, it is not expected that the depositors will lose anything.

The National Rope Computing Machine Company, that was formed some time ago for the manufacture of a machine for measuring and computing the price of rope, after spending some time in perfecting the machine, has established a plant at 1230-1232 East Third street and will soon place the machines on the market. The company may later be in the market for some additional machine tools. C. N. McLean is manager.

Business conditions among the large manufacturing plants in Canton, Ohio, are steadily improving, according to reports received from that city. The Kanneberg Roofing & Ceiling Company, the Canton Mfg. Company and the Canton Hughes Pump Company state that their plants are well filled with orders. The Dueber Watch Company at present has 1600 men on its payroll, working 40 hr. per week.

The Burke Machinery Company, Cleveland, is putting on the market a new 12-in. cold cutting-off saw, for which it is receiving a very satisfactory number of orders which are sufficient to keep the present capacity of the plant fully employ.

The American Brass & Specialty Company, Columbus, Ohio, has been incorporated, with a capital stock of $30,000, by Willis F. Hauser, Frank R. Main, O. O. Walton, G. A. Radford and W. H. Henry. The company will do a general brass foundry and specialty business.

The National Sanitary Mfg. Company, which is building a large plant in Salem, Ohio, for the manufacture of porcelain enameled cast iron bathtubs, lavatories, sinks, &c., has the foundations in and the construction of the buildings will go forward as speedily as possible. It is expected that the plant will be ready for operation about August 1. The company has purchased 7 acres adjoining its site, which will be used for additional buildings as they are needed.

The Board of Public Affairs, Cuyahoga Falls, Ohio, will spend $9000 in rebuilding the lighting plant in that place, the Council having authorized a bond issue for that amount. It is the intention to buy a new engine, generator and condensor. P. E. Welton, mechanical engineer of the Falls Rivet & Machine Company, is in charge of the plans.

The Diamond Match Company, Barberton, Ohio, has commenced the erection of a large addition to its plant, 380 ft. long, the width of the present main building, and with a wing 130 ft. long, all four stories high.

The Taplin, Rice & Clerkin Company, furnace builder, Akron, Ohio, reports that orders are now coming in in a satisfactory manner and that the outlook for the year is good.

The Enameled Pipe & Engineering Company, Cleveland, the erection of whose new plant at Elyria was held up late last fall, has awarded a contract for its factory building, which will now be completed without further delay.

With a capitalization of $10,000, the Guarantee Electric Heater Company, Cleveland, has been incorporated by George Ross, Edward J. Cole, W. J. Barr, J. W. Burrell and William E. Patterson.

The Warren Construction Company, Warren, Ohio, has secured a contract for the erection of two large oil tanks, each with a capacity of 37,500 bbl., at Georgetown, Ky.

Philadelphia Machinery Market.

PHILADELPHIA, PA., May 19, 1908.

The market for tools and machinery has been spotty. While it is possible to note a slight improvement in some directions, a corresponding falling off is usually to be found in others, so that in the aggregate the volume of business coming out shows but little change. New enterprises develop slowly, and, although there are several medium sized propositions before the trade, the general condition of business causes hesitancy in placing orders. Most of the orders placed recently have been for equipment of a minor character, or for specialties. The demand for the usual shop tools of the heavier types has been quiet, and not a great deal of business is expected to develop for this class of tools until the railroads and industrial plants become more active. A little improvement in the railroad buying in outside localities is to be noted, which is considered encouraging by the trade, even though the roads in this vicinity show little disposition to enter the market except for emergency tools.

The greater proportion of the current business comes from the small buyers, who purchase quite a wide variety of tools, but individual orders are not large, being confined mostly to single tools. Inquiries are not plentiful, although there is a large amount of shopping reported on almost every purchase. Prices for the better class of tools are said to be quite firm, although it is understood that concessions have been made by dealers in some of the less prominent tools and for special machinery.

Manufacturers in some few cases report improved conditions, and have temporarily increased the working hours in some departments of their plants. In other instances plants are being operated with the same decreased forces. On the whole, therefore, the situation is to be regarded as unchanged. Special tool builders report business of a very ir-

regular nature. Some weeks a fair run of orders come out, while other weeks practically no fresh business develops.

No change is to be noted in the export demand. Manufacturers of power transmission specialties still report a fair run of orders, but little inquiry is apparent for the general run of machine tools.

A slight improvement is reported for boilers and engines, particularly those of medium capacities, but the demand is still far below the normal. Few inquiries are about for installations of the heavier type and manufacturers of equipment of the latter class are quite dull. Business in the smaller engines and boilers is largely of a day to day character and orders are reported as being rather scarce.

The second-hand machinery trade continues fairly active. Both wood and metalworking tools of the light and medium types have been in demand, particularly when in good condition, and a considerable amount of business which under ordinary conditions would result in purchases of new tools has been diverted to the second-hand branch of the trade, owing to the lessened cost of such equipment. Nevertheless, prices are reported as being good under the circumstances.

The foundry trade shows little sign of improvement. Although every effort is being made to get business, the tonnage of orders taken is small. Machine tool builders show no disposition to anticipate their needs, and the same policy is followed by other users of castings. Business is largely of a day to day character, and many of the jobbing foundries find it difficult to get enough work to enable them to run heats with any degree of regularity.

The West Chester & Wilmington Street Railway Company has awarded the contract for the construction of its line between West Chester, Pa., and Wilmington, Del., to the Eastern Construction Company. The road will be 16 miles long, and work is expected to be started at once.

The American Manganese Bronze Company will build a one-story brick and concrete foundry and storehouse, 70 x 120 ft., at 3501 Rhawn street. It is understood that general equipment for it will be required.

The Montross Metal Casket Company of this city proposes to build a large manufacturing plant at Wilmington, Del. Particulars are not available, although it is said that the company is having a number of heavy special presses built for installation in the new plant.

The John Baizley Iron Works has been awarded the contract for the installation of air cushions in 16 of the passenger elevators in the City Hall. This work was begun by the Standard Elevator Company, but its contract was annulled.

The Borough Council of Saxton, Pa., will receive proposals from individuals or companies for furnishing the borough with water. Specifications and other information may be had from J. S. Crum, secretary of council, Saxton, Pa.

The Department of Public Works, city of Philadelphia, is asking for bids for a number of new bridges, at an estimated cost of about $300,000, of which sum the railroads will contribute $50,000. Bids will be opened June 3. The following is the list of bridges: Forty-second street, over the Pennsylvania Railroad, steel arch bridge, 57 ft. wide, span 250 ft., to be built by the city; amount available, $112,000. Sixty-first street, over the Philadelphia & Baltimore Railroad, to replace old wooden bridge, steel deck plate girder bridge, incased in concrete, 59 ft. 6 in. wide, span 71 ft.; estimated cost, $45,000, of which the railroad company will pay two-thirds. Northeast Boulevard, concrete arch bridge over the Oxford branch of the Connecting Railroad, 100 ft. wide, span 39 ft., to be built by the city; amount available, $60,000. Northeast Boulevard, over the Reading Railroad, reinforced concrete arch bridge, 100 ft. wide, span 60 ft., to be built by the city; amount available, $50,000. Single-track ballasted floor plate girder bridge, to carry the Reading's Frankford branch over Large street, to consist of one center span of 60 ft. and two side spans each 22 ft., with masonry abutments to provide for a second track; toward the cost the city will furnish not more than $20,000 and the railroad company a like amount.

The Stoever Foundry & Machine Company, Myerstown, Pa., reports a material improvement in the volume of business. The foundry department is now running on full time, while work in the machine shop has been increased by five days a week. The demand for medium sized boiler fronts and grates, which are specialties with this concern, has picked up considerably, while that for pipe machines has also largely increased and sales of a number of machines ranging in capacity from 2 to 12 in. have been made. A recent order was for four machines for shipment to the Pacific Coast, while another was for three machines for shipment to Chicago.

New England Machinery Market.

WORCESTER, MASS., May 19, 1908.

It is a common expression among machinery dealers that their customers are showing "a better feeling," which is interpreted to mean greater confidence; that a change for the better in the general market should come earlier than had been anticipated. Probably the buoyancy of the stock market is reflected in the trade, and doubtless an element in the strengthening of stocks is a better aspect of the industrial situation. But the machinery market has not noticed an increase in business. Sales average about the same as during the month past, second-hand tools being most in demand. One or two attractive projects are on foot, it is said, though the dealers who have knowledge of such business are exceedingly reticent, naturally, in the hope that their competitors will be overlooked by the prospective customers. The New England railroads are buying nothing in machinery at this time, and so far as the dealers have been able to learn there is little prospect of business from this source for the present. It is stated that railroad business is a trifle better in this section of the country, but there are still large numbers of idle freight cars in the yards and on the sidings.

New England men who were present at the Supply and Machinery convention at Richmond, last week, expressed much gratification that the sentiment continues of maintaining existing prices. The lists have been held to with remarkable consistency, and no one believes that the volume of business would have been markedly greater had prices fallen with the market. The manufacturers agree that their products are costing them more than they did a year ago, as materials are not noticably cheaper, nor has the cost of labor been reduced sufficiently to overcome the largely increased percentage of overhead expense.

In notable contrast with the machinery and supply trades the woodworking machinery business is suffering from cutting of prices. Charges and countercharges that lists have been lowered in meeting competition are frequently heard. Naturally profits are seriously impaired. There is no association of builders of woodworking machinery, and consequently the intimate relationships resulting from gatherings of competitors have not been created. Without this foundation it appears to be impracticable to secure a maintaining of prices under which each manufacturer adheres to his own lists and places them at a figure which will net for him a suitable profit. It is not that manufacturers of woodworking machinery have not generally made a profit on their sales, but that the profit is not always what it should be. The condition in this branch of the machinery business is much the same as that which prevailed among the machine tool builders before their association was formed and had brought its members to gether for their common good, a result which is being amply proved at the present time.

George W. Fifield, Lowell, Mass., builder of heavy machine tools, whose shop building was destroyed by fire recently, has begun the erection of a new plant, which will be larger than the old. It will cover 30,000 sq. ft., and will be one and two stories. Concrete will be used as far as possible, the plans calling for this material in conjunction with heavy mill construction. The engine and boiler were not injured in the fire, so that no new provision will have to be made for power. Some of the heavy machinery escaped serious damage, and will be used as a part of the new equipment. Mr. Fifield states that he will be in the market for machinery later, but as yet has no definite plans as to what will be required. In the ruined building was a large stock of finished parts of engine lathes, and it has been found that much of this escaped damage by fire, suffering only from water, and that some of it is as good as new, the slush remaining to protect all surfaces. These parts will be worked into machinery, which will be built in the new shops. Work on the building will be rushed in order that manufacturing may begin as soon as possible.

It is announced at Bridgeport, Conn., that the appointment of Hobart E. French as receiver of the Bridgeport Safety Emery Wheel Company has been confirmed by the Superior Court, and that the business will be continued under his direction. It is further stated that arrangements are under way for a reorganization of the business on a substantial basis.

The Hampden Machine Screw Company, Springfield, Mass., has been organized under Massachusetts laws, with capital stock of $60,000, to manufacture screw machine products. A four-story brick factory, containing 38,000 sq. ft. of floor space, has been occupied at Arch street and Birme avenue. The company has bought the screw machine equipment of the F. E. Wells & Son Company, Greenfield, Mass., and has installed it in the new factory. A case hardening department, gas furnace, blacksmith shop and plating department will be established, and the company will be in the market for the complete equipment and requests catalogues from manufacturers. John MacGregor, formerly superintendent of the Pope Mfg. Company, Hartford, Conn., is the president and general manager; Arthur L. Bowen, treasurer, and Stuart M. Robson, secretary.

The Circular Loom Company, Chelsea, Mass., whose plant was destroyed in the recent fire in that city, is buying equipment for a new shop.

Building permits have been issued for the erection of the new buildings of the Crompton & Knowles Loom Works, Worcester, Mass., which have already been mentioned in this column. The machine shop, 72 x 184 ft. and four stories will cost $32,000; the foundry, 225 x 225 ft., $40,000;

the factory building and offices, 80 ft. at front and 60 ft. at rear by 246 ft. and five stories, $68,000.

The Boston office of the Pratt & Whitney Company, Oliver Building, announces the reopening of its small tool department in that city with a full stock at the storehouse, 265 Atlantic avenue. The line includes cutters, reamers, arbors, taps, dies, twist drills and all other equipment for the toolroom. A sample line of the latest designs of the company's machine tools will be shown at the same place.

Because of the rapid growth of the screw machine products department of the George W. Dover Company, Providence, R. I., it has become necessary to incorporate the Screw Machine Products Corporation to properly handle the increasing business. The equipment of the plant operated under the new name is modern, and excellent facilities are afforded for making everything that it is possible to make from automatic or hand screw machines. With additional facilities the new corporation will endeavor to further develop the special order production of articles in steel, brass, German or German silver. Arthur C. Stone is president; George Briggs, Jr., secretary, and Harry M. Mays, treasurer.

Government Purchases.

WASHINGTON, D. C., May 19, 1908.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until May 26 for one molding machine: June 2, two motors, one cutter and reamer grinder, four lathes and two drilling machines. These machines are required for the Norfolk, Boston, New Orleans and League Island navy yards.

The Isthmian Canal Commission will receive bids until June 8, Circular No. 442, for shop machines, pumps, electric motors and other supplies.

Bids will be received until June 9, at Fort Wood, New York, for an electric elevator engine.

The following bids were opened May 12 for machinery for the navy yards:

Class 1.—Four motor generator sets and switchboards—Bidder 36, Crocker-Wheeler Company, Ampere, N. J., $30,207; 71, Fisher Electrical Works, Detroit, Mich., $19,280; 89, General Electric Company, Schenectady, N. Y., $18,000; 254, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., $22,695.

Class 2.—Twelve single phase transformers—Bidder 51, Central Electric Company, Chicago, Ill., $1062; 89, General Electric Company, Schenectady, N. Y., $1083.39; 159, National Electrical Supply Company, Washington, D. C., $1128; 251, Wagner Electric Mfg. Company, St. Louis, Mo., $1147.02; 254, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., $1094.87; 256, Western Electric Company, New York, $1245.

Class 3.—One hot water heating boiler—Bidder 45, Crane Company, Seattle, Wash., $338.80; 82, R. H. Grey, East Oakland, Cal., $545; 99, A. Hambach, Seattle, Wash., $419.50; 105, Frank C. Hibbs, Philadelphia, Pa., $550; 263, Drew Machinery Agency, Manchester, N. H., $611; 266, Central Metal & Supply Company, Baltimore, Md., $420.

Class 171.—Three engine lathes—Bidder 70, Frevert Machinery Company, New York, $532; 72, Fairbanks Company, New York, $515 and $520; 94, Hendey Machine Company, Torrington, Conn., $735; 178, Pratt & Whitney Company, Hartford, Conn., $800.

Class 701.—Four electric motors and spare parts—Bidder 89, General Electric Company, Schenectady, N. Y., $1617.50; 213, B. F. Sturtevant Company, Hyde Park, Mass., $1384.80; 268, Northern Electrical Mfg. Company, Madison, Wis., $1511.40.

Class 711.—One 5 hp. motor—Bidder 13, W. G. Boyd, Jr., Washington, D. C., $199.25; 36, Crocker-Wheeler Company, Ampere, N. J., $215 and $165; 70, Frevert Machinery Company, New York, $222; 89, General Electric Company, Schenectady, N. Y., $269; 95, Holtzer-Cabott Electric Company, Brookline, Mass., $173.25 and $295.25; 107, International Electric & Engineering Company, New York, $181.50; 184, Quincy, Manchester-Sargent Company, Plainfield, N. J., $225 and $175; 213, B. F. Sturtevant Company, Hyde Park, Mass., $192; 221, Sprague Electric Company, New York, $217; 254, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., $219; 256, Western Electric Company, New York, $183.50; 268, Northern Electrical Mfg. Company, Madison, Wis., $158.

Class 712.—One boring bar—Bidder 70, Frevert Machinery Company, New York, $453; 140, Montgomery & Co., New York, $449.25; 141, Manning, Maxwell & Moore, New York, $458; 184, Quincy, Manchester-Sargent Company, Plainfield, N. J., $420; 232, Tucker Tool & Machine Company, New York, $461.

The D'Olier Engineering Company, Philadelphia, Pa., has been awarded contract for the power plant equipment for the new naval training station at North Chicago, Ill., at $126,550.

The following awards have been made for supplies for the navy yards, bids for which were opened April 28:

Lake City Engineering Company, Erie, Pa., class 111, one 10-in. centrifugal pump, $957.

Alberger Pump Company, New York, class 112, one motor driven turbine pump, $1490.

Under bids opened May 4, Circular No. 436, for machinery for the Isthmian Canal Commission, the General Electric Company, Schenectady, N. Y., has been awarded class 5, one 15-hp. motor, $318.

Construction is about to be begin at Sydney, N. S., of a plant for the Marine & General Engineering Company. A site on the city water front convenient to the railroad has been purchased. The machinery, forge and boiler shops are to be in one building 50 x 140 ft., and a separate building is to be erected for the foundry. On the water front a wharf is to be built, with marine slip, carpenter's shop and motor boat storage accommodation. The company is expected to be ready for productive operations in quite a short time.

New Publications.

Telephone Construction, Installation, Wiring, Operation and Maintenance. By W. H. Radcliffe, E. E., and H. C. Cushing, Jr., E. E. Size, 4½ x 7 in.; 171 pages; 125 illustrations. Cloth. Price, $1. Publisher: The Norman W. Henley Publishing Company, New York.

The information needed by an amateur desiring to install a private telephone line is that which it is the fundamental intent of this book to give. Those already expert or fairly well versed in the art of telephony will find little in it that they do not already know. This book has been particularly published for that large class of people who have no occasion to become adepts in the theory or refinements of apparatus and operation, but still may require a practical knowledge sufficient to erect or lay out the erecting of a line between parts of an office building or shop, or between buildings at no very great distance. Such are electricians, wiremen, engineers, contractors, architects and laymen. The book is a practical reference book giving the principles of construction and operation of telephone instruments; approved methods of installing and wiring them; the means of protecting them from lightning and abnormal currents; their connection together for operation as series or bridging stations, and rules for their inspection and maintenance. Line wiring and the wiring and operation of special telephone systems are also given. No previous knowledge of the subject is assumed, and involved mathematics and technical terms are avoided. The practice drawn upon in the preparation of the book is that of the Bell and Independent telephone companies, the equipments of which have become more or less standardized and have demonstrated their practical value. The illustrations in the main are exterior, assembled and unassembled views and sectional views of instruments, diagrams of circuits and systems, and sketches illustrating means of erecting, securing and testing line equipments.

R. F. Downing & Co., customs brokers and international forwarding agents and import agents of the West Shore Railroad, 24 State street and 120 Broad street, New York, have recently published in the German language a little book which has attracted much favorable and friendly comment in forwarding and exporting circles, not only in Germany, but also in Austria. The reason of the book's popularity may be found not only in the fact that the information contained therein in relation to United States customs duties, railroad and express rates, is in very clear and concise form, but also that it is expressed in the language of those whose good will and closer relations are sought. It is pointed out by R. F. Downing & Co. that the rates may change from time to time slightly, but not to such an extent as will prevent Germans from making a very good estimate of the cost of delivering goods in any part of the United States. The fact that the book is published in the German language marks it as a distinct departure from the usual American manner of seeking business abroad, and will prove an element in fostering and making closer the commercial relationship between the United States and the German speaking nations.

The Michigan State Labor Bureau has just completed a canvass of the State electric railroads, showing that 23 separate corporations represent a total investment capital of $38,031,000, with total earnings for 1907 of $10,458,589. The total mileage is 1253. Receipts from passenger traffic increased from $6,581,275 in 1904 to $9,717,474 in 1907. Receipts from freight traffic in a like period increased from $229,612 to $533,330. The electric lines are using 1803 passenger cars and 102 freight cars, a decrease of 40 freight cars since 1904 being noted.

HARDWARE

THE progress which in recent years has been made in transportation has been attended by a great increase in the damage to merchandise in transit. As the railroads are responsible for this damage to property, it is very important that they should be held strictly to account. Heavy locomotives and cars, the air brake, the automatic coupler, the "hump" yards, and the efforts of the roads to give fast service on L. C. L. freight, have all been factors in smashing merchandise that in the old days would not have been injured. The heavy engines and the new cars that carry 100,000 lb. make a shuttlecock of an old style light car in the same train, and the contents of the old car are more than likely to get seasick before they have traveled far. The air brake adds a new complication. On a passenger train, the engineer is educated to apply the air carefully and gradually, as the full force, applied suddenly, known as the "emergency brake," will make havoc with the passengers and perhaps tumble them into the end of the car. If this occurred often the road would have its passenger revenue tied up in personal injury suits. On the freight train, however, there are no witnesses to tell about it in court.

Gravity switching and the automatic coupler have become even more important factors in the growth of loss and damage claims. In the old days of the link and pin coupler, when the switchman had to go between the cars, the man on the engine was very careful, and the danger to the switchman was a protection to the contents of the car. Now the engineer can bump the cars as hard as he pleases, and there is little fear that the damage can ever be traced back to him. Gravity switching is a more recent development of freight traffic which has become possible since the universal adoption of the automatic coupler. Nearly all the roads have installed at their important terminals gravity switching or "hump" yards for handling carload freight. A train is uncoupled and pushed over the "hump," and the cars run down an incline into a field of switch tracks. A man on a bridge over the "hump" controls all the switches by electrical connections, so that each car can be sent to the track desired. The incline must be steep enough so that a light car in cold weather will travel to the end of the field, but this provides opportunities for mischief when a car loaded with 100,000 lb. of iron follows a car of crockery, Buggies, or fragile Hardware. The hand brakes are supposed to be set on the heavy car before it goes down, but it is difficult for a brakeman to judge how tight to set them. The claim departments of the railroads have not been able to keep pace with these modern improvements in the operating department, and the officials are unable to figure whether the saving in expense in handling cars and trains is equal to the increase in damage claims. The facts which have been given, however, show that it is necessary and justifiable for the merchant in Hardware and other branches of trade to give close attention to claims for damage to his property.

Shipping clerks and packers in the wholesale houses should be reminded from time to time of the necessity of guarding as much as possible against the destructive effects of these modern improvements. This is especially important where shipments travel a long distance by fast L. C. L. freight. The shipping interests of the country have tried unsuccessfully to obtain a national reciprocal demurrage law that would guarantee a minimum movement of 50 or 60 miles per day for loaded cars, and it may be easily understood that fast freight trains which cover 250 to 400 miles per day are breaking more than records and traditions.

Condition of Trade.

The possibility of price reductions in certain classes of raw material as a result of conferences now in session is engrossing the attention of the trade. A marked difference of opinion exists as to the wisdom of announcing declines at this time. The opponents of such a movement argue that inasmuch as prices have been artificially maintained so long it would be unsettling to reduce them in mid-season, and declines, if necessary, should be deferred until early summer. On the other hand, it is suggested that the easing up of financial conditions has put corporate interests in a position to modify their policy of rigid economy, and they might be expected to place orders rather freely if prices were low enough to minimize the probability of further important declines. Viewing the country as a whole it would appear that general trade shows improvement. This, moreover, is not due entirely to the advancement of the season, but seems to reflect a more optimistic temper in business communities. As usual of late the West gives more tangible and encouraging evidence of activity than the East, but it is undoubtedly true that Eastern manufacturers and distributers are feeling a little more cheerful over the situation, influenced no doubt by easier money and the sustained improvement in the securities markets. Manufacturers report that they are beginning to receive inquiries regarding contracts for future requirements on lines of goods which are selling at low prices. Such contracts, however, are largely in favor of the purchaser, and few manufacturers show a disposition to cover their customers through the fall at figures now quoted. The surprising firmness of many lines for which demand continues light is still a feature of remark. As a result of the gradual revival in building operations considerable new business is offering in Builders' Hardware, for which, as usual, competition is keen.

Chicago.

As a result of successive deluges of rain in the Northern and Western States, which were interrupted by the intermission of but three clear days in the first fortnight of the month, the distribution of goods of all kinds to consumers has met with serious interference. In many sections of the country the hauling of loads over country roads has been made impossible, and the marketing of farm products has been temporarily checked. While no great permanent damage is anticipated from this abnormal rain fall, its effect has been to reduce purchases by the retail Hardware merchants, whose replenishment orders fluctuate in unison with the immediate consumptive demand. No developments of striking importance respecting price changes have materialized within the past week—that is to say, there have been no formal announcements of decrease of price schedules in leading lines, but where desirable orders are in prospect there is a growing disposition among manufacturers to handle each transaction upon its individual merits without very close regard for established prices applying to the various

commodities involved. Except in a few sections of the country the elimination of Green Wire Cloth has met with distinct approval. The lessening of stock investment thus accomplished is of obvious advantage to merchants, and it has been found that but a small proportion of consumers insist on being supplied with Green Cloth. No difficulty has been experienced by distributers in meeting insistent demands of this character that have arisen from stocks carried over from last year. The movement of Wire goods for the past 10 days, especially of Wire Cloth and Netting, has been somewhat disappointing to the jobbing trade, though it is ascribed more to unfavorable weather conditions than to more permanent causes. At the same time there has been no appreciable diminution of orders coming to the mills over recent weeks. The demand for Cut Nails is exceedingly quiet and a still further softening tendency in prices is noted. In common with all other commercial industries the Hardware trade is concerned over the horizontal advance in freight rates proposed by the railroads. Individually and collectively through representative organizations Hardware interests are voicing their opposition to this action, the final consummation of which is by no means certain.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Weather conditions in the past couple of weeks have been favorable to the sale of seasonable Hardware, and jobbers in this vicinity have been busy with orders for immediate shipment. It is very evident, from the memoranda received, that the average retailer is not carrying a heavy stock, and is depending more upon his jobbing center than for some years past. This will probably continue as long as there is any uncertainty about the stability of prices, and will bring about a condition of affairs which has existed for many years in older communities. It will demonstrate to the retail merchant the value of a good jobbing connection; and it may surprise many, upon invoicing at the end of the year, to find that they have been able to make as much net profit even on a reduced volume of sales, because of the smaller amount of capital used and the more frequent turning of it.

There seem to be many indications of returning activity to industries that have been almost closed down. The Baldwin Locomotive Works of this city are constantly increasing their working force and the hours per week. The Pennsylvania Railroad Company are ordering out a large number of freight cars that have been laid aside for several months, and, unless something very unforeseen should affect the agricultural conditions, there will be more demand for cars than the railroads can supply a few months later.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—After the rains, beautiful weather. Just right for winter wheat. Just right for spring wheat. Just right for plowing. The earth is in splendid condition.

The ultimatum of the "National Prosperity Association" has driven away the clouds and brought forth the sunshine.

There is a good deal of discussion about the "Give-us-a-rest" and "Sunshine" Movement. Many claim it is just the right idea—the proper thing at the psychological moment. Others are scoffers. They stand on the street corners, wag their beards, and say, "Go to! Go to! Are we to have Christian Science business? Is it meet that a man lift himself by his boot-straps?" Some of the envious ones say, "verily, it is free advertising."

The stock market has continued to advance. There is said to be a powerful bull party. Stock brokers say Wall Street always has the national tip months in advance. Wall Street is the express train. The rest of the country get their ideas by slow freight. After a while the country will wake up. Was it not so before the panic? Did not stocks go down? Did not Wall Street know what was coming? Now also Wall Street knows that Prosperity knocketh at the door. Climb on the bandwagon, all ye pessimists!

At this psychological moment we are wondering just what the Steel Corporation will do. With all this prosperity coming, with stocks going up, will the Steel Corporation pull the rope and drop the price elevator several floors lower? Will the elevator hit the basement and jar the passengers?

The Steel Corporation meeting is the 21st. A good many people are wondering what will happen at this meeting. If a decline in prices does not take place—what then? Are there higher levels or will we just stay on this level? One thing is sure and that is stocks throughout the country, both in the hands of jobbers and retail dealers, are very much depleted. All have been holding off and selling out.

Then what has politics to do with the situation? What does the Administration want? Verily, there are several players in the game and we cannot size up the drift of events until they draw cards.

We are all awaiting developments.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—Business days nowadays are something like Mark Twain's Sundays—not solely in the absence of commercial activity, but in the feeling to all of us, at the close of each day of relief, that we have succeeded in "pulling through."

Echoes of the Prosperity Convention while heard, are still like all echoes, a matter of atmospheric disturbance rather than of any substantial result. The assurance that all is well with the other fellow is not exactly what we want; we want it to be a little better with us—the first person singular or plural, as the case may be, then the sign which hangs over our stenographer's desk, with admonition to "Keep Smiling" will have some significance for us, in fact we shall find ourselves doing it without having to look into the mirror of the future for reassurance.

The stock market is showing signs of most encouraging activity. The recommendation of brokers to buy on soft spots (and sell on hard, presumably,) has been extremely difficult to follow for when we expected the soft spots to reappear they very obstinately declined to do so.

Farm commodities are high and an advance in cotton is always stimulating to Southern trade, but with all this there is a prevalence of dullness and inactivity and an absolute refusal on the part of your sales column to figure out to anything respectable.

Some of the local manufacturing concerns have apparently just come to the conclusion that the depression is here to stay for a little while and have been obliged at this late day to reduce their working forces, to which they have held on in the hope of more rapid recovery. There is a steady pull for all that we get and the ornamental gentlemen who a few months ago, after a late breakfast, used to ride down in an automobile, are smoking Wheeling stogies on the rear platform of the surface car and at their desks early and late in the endeavor to justify their salaries.

The study of expense accounts is the most interesting one despite its unhappy features in the necessary shift and reduction of force, but those who have proved truly efficient can felicitate themselves on being chosen while the others have left. It is a severe schooling that some are getting, but probably the result will be better for the individual in the end, as it ofttimes sends him back to the country to plowed ground and soft furrows to which his knee action is specially well adapted.

Money is offered at cheap rates, but the contraction of business has been such that there is no temptation to borrow where ones resources are in any wise commensurate with his business undertakings. After a while this will work out and the cheap money will be taken up for trading and the rates will respond.

Both of the leading business colleges—Yale and Harvard—announce a Post Graduate Course in Business, which is a marked tribute to the demands of the age. A little while back these colleges of the Liberal Arts would have scorned anything quite so material. The Bar, the Ministry, Medicine—all of these laid claim to the graduates of these great institutions almost to the exclusion of anything more practical, but the allurements

of modern business are not to be withstood and the recognition of the place which business has assumed, not only in the everyday work world, but in the intellectual and refined as well, betrays the marked change in college sentiment. The business school is taking its place alongside of the law school and the medical school, and we shall presently be tacking B.B.'s (Bachelor of Business and D.B.'s (Doctor of Business) after our names so that certain pages of *The Iron Age* will look like a report of the General Assembly or the Triennial Conference.

Cleveland.

W. BINGHAM COMPANY.—Bob Evans says, "it is not armor belts and water lines that win battles, but it is the men behind the guns, that shoot the straightest and hardest, and can stand punishment the longest." So in the business world, it is not the tariff tinkers, or the politicians, or the trust busters, that contribute to our Nation's prosperity, but it is the hard-headed solid business men of the country that we must look to for present and future greatness in all business lines, and what they ask for is simply to be let alone.

To save three minutes' time the Pennsylvania Company spent $600,000 to eliminate a curve at Trenton; to save seven minutes' time the Santa Fé Railroad Company spent $10,000,000 on the Belen cut-off; to save two minutes' time the New York Central spent $1,000,000 at the Spuyten-Duyvil cut-off; to save fifteen minutes' time the Baltimore & Ohio spent $7,000,000 on a tunnel at Baltimore; to save these minutes for the public benefit employment was given to many thousand workmen for many months. Now all this kind of work is stopped, for legislative agitation is such that the railroad companies do not know where they are at. Is it not true that the sooner we get back to the "square deal" proposition the sooner we will return to the old prosperity road?

The general Hardware trade since April 1st, and up to the present time, among the country dealers, is almost normal as compared with last year. Orders from country merchants for immediate shipment are frequent and numerous. Our city trade, on account of some of the manufacturing plants not running full blast, is not as good. The salesmen who visit the trade often, and the jobber who has the goods on hand and makes quick shipments, will get the largest amount of business. Dealers who put off ordering futures for fall shipment may not be able to get their wants supplied if they do not place their orders soon; that is, for such goods as Meat Choppers, Stuffers, Axes, Ice Skates, Stove Boards, Elbows, Coal Hods, Fall Sporting Goods and Cutlery, for the manufacturers are not making and piling up goods now at their factories, waiting for belated orders, and they do not intend to carry over any great surplus.

We think that after July, when the two great parties will have selected their presidential candidates, merchants will discount the future and business will pick up fast, and we predict a good trade the balance of this year, and next year will be a record breaker for all kinds of business.

New Orleans.

WOODWARD, WIGHT & Co., LTD.—Prospects for the crops in connection with the recent rains of the last two weeks are very satisfactory. The farmer generally is looking forward with cheerfulness to the future. He is not buying heavily, however, but simply getting what he actually needs.

The large lumber plants are running on about half time—some running two-thirds—and their purchases are very light, and on a purely hand-to-mouth policy. The demand for lumber is still very poor, and with the exception of cypress, lumber is being sold at pretty low prices.

There is not as much contractors' work offering as there was a few months ago, although the city building operations and the city work are still keeping up in good volume.

General results for April and May, so far, seem to show about the same amount of business as in March, with, however, a good deal more cheerful feeling on the part of everybody, and an idea that if there was a reduction in steel and iron prices there would materialize a good many orders that could actually be called stock orders.

Merchants' stocks are low everywhere and supplies in the hands of industrial plants are also of the very lightest.

Payments are still good, and there is a very pronounced feeling here that, while no one looks for any boom, yet business is going to keep along in moderate volume during the rest of the year, with a continuous better tendency.

Portland, Oregon.

FAILING, HAINES & MCCALMAN.—Conditions out in this country on the North Pacific Coast continue to improve. All business continues approximately the same as last year on all lines excepting lumber, and in many lines is ahead of last year's. Should the year continue as it has begun and should we have only a fair crop, this year in the Northwest should be second only to 1907 in the amount of business done, and not so very far behind at that.

Collections have been rather slower than they were last year, but at the present time they are improving, something over 50 per cent. of our customers discounting their bills. If this improvement continues, it will be a very short time before our collections are as good as they have ever been.

The Northwest is well off in one respect. There are comparatively few unemployed men here. This is not to urge newcomers to come out here, because we have enough men here at present to supply the demand for all labor, and will have until the railroads begin work again and the lumber mills open up.

Thus, we have no unemployed problem which, of course, helps materially.

In collections, the writer can see no reason why the latter half of this year should not be as good all over the country as was the first half of 1907.

We have the crops and all the natural products, and we have a vast body of consumers who will have money to buy the products of our factories after the crops have been put in.

It seems that the only thing we are waiting for is for some big interest to show their confidence in the immediate revival of prosperity. As soon as this is done, I can see no reason why we should not have good times immediately, as there seems to be no cause, other than a general waiting to see what will turn up, for the present dullness.

NOTES ON PRICES.

Wire Nails.—The nail business is moving along on similar lines to those which have characterized the market for sometime. The advantage of buying in small lots has been recognized by the trade generally, as quick deliveries can be made and an accumulation of stock avoided. The possibility of revised prices may have recently influenced large buyers to restrict the size of their orders, while the length of time which must elapse before fall demand will commence has dictated the policy of not anticipating requirements so far ahead. Quotations for base sizes continue as follows, f. o. b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

New York.—There is a continual demand for Wire Nails in less than carloads, but requirements are light and orders are for small lots. Stocks in the hands of Nail houses and jobbing comparatively light, but sufficient for present demands. Regular quotations are on the basis of $2.40 per keg for small lots at store.

Chicago.—Considering the lateness of the season, the demand for Wire Nails is holding up well. A fair amount of new orders is coming in, especially from western jobbers. Buyers generally adhere to the practice of buying small lots for quick delivery, but occasionally a fair sized order comes through: as for instance, one of 6,000 kegs, for delivery within sixty days, received this

week by the leading interest. The usual summer dullness when the farmers are busy with their crops will doubtless bring a slowing up in the demand for nails within the next few weeks. Mill prices are reported to be uniformly well maintained. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The Spring trade is over, and few orders for Wire Nails are being placed, and these are only for small lots for actual needs. The impression is strong that a reduction in prices of Wire Nails may be made, and for this reason the trade is holding off placing business, and in some cases, contracts on which specifications should be received, are being held up. There is no intimation from the mills of lower prices, but it is probable something definite will be known within the next week or two, as to whether the market will be lower. In the meantime, current business is light, but we are advised that prices are being firmly held. The Keystone Nail Company, Keystone Building, Pittsburgh, has about completed the building of its new plant at Rochester, Pa., for the manufacture of Galvanized Nails exclusively. It charges $1 per keg for Galvanized Nails over the regular prices charged for Steel Wire Nails. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

Cut Nails.—The market continues in the same unsatisfactory condition, which has been a prominent feature for some time. The market is an open one, and concessions from regular quotations are more or less general. Demand is very light and orders cover immediate requirements only, which are limited. The market is irregular, and concessions of 15 cents or more are being made on regular Steel Nail quotations, so that about $1.90 for carload lots at mill is more representative of the market than $2.05. Iron Nails generally should command about 10 cents more than Steel.

New York.—The movement of Cut Nails, in the local market, is very light, corresponding with the general conditions in this line throughout the country. There are some Nails of inferior material and imperfect in form which are sold for less than regular quotations. Regular quotations are on the basis of $2.30 per keg, for small lots at store.

Chicago.—There are no promising developments in Cut Nails. From any point of view the situation is one of unrelieved dullness. No pretense of maintaining regular prices is made, and concessions of 15 cents a keg and even more are being made on the small orders that make up the scant volume of business moving. Chicago quotations are nominally as follows: Iron Cut Nails, carloads, to jobbers, $2.23; to retailers, $2.28; Steel, to jobbers, in carloads, $2.03; to retailers, $2.08.

Pittsburgh.—The volume of new business that is being placed is extremely light, buyers only ordering such quantities of Nails as they absolutely need, and only in small lots. Steel Cut Nails are generally quoted at $1.85 at mill, but in exceptional cases, as low as $1.80 has been done. We quote Steel Cut Nails at $1.85 f.o.b. Pittsburgh, for carload lots, and $1.90 to $1.95 in small lots. Iron Cut Nails take about 15 cents advance over Steel.

Barb Wire.—The demand for the season is about over, and new orders are comparatively light. The volume of business in this line has been much less than for last season, but this was in a measure anticipated. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—New business is coming forward in fair volume and shipments against specifications are relatively heavy. In view of the lateness of the season some falling off in demand is looked for before long. As compared with the general run of mill products, the tonnage booked by the mills up to this time should be regarded as quite satisfactory, although below last year's remarkable record. Prices are reported to be firmly maintained. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The season's trade is over, and very few new orders are being placed, and these only for small lots. The spring trade this year in Barb Wire was disappointing, being considerably less in tonnage than last year. It is stated that the mills are observing regular prices. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—Conservatism in ordering continues prominent, and buyers are keeping close to actual requirements, which at this time are light. Quotations per 100 lb. to jobbers in carload lots are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the price to retailers being 5 cents additional:

Nos.	6 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.90	1.95	2.00	2.05	2.15	2.25	2.35	2.45
Galvanized	$2.20	2.25	2.30	2.35	2.45	2.55	2.95	3.05

Chicago.—Manufacturers are keeping close to immediate requirements with their purchases. No disposition is shown to depart from the hand to mouth buying, which has been a characteristic feature of this season's trade. Through ordering with greater frequency than usual the aggregate tonnage coming to the mills is only moderate. Prices are unchanged and firm. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—New tonnage being placed is light, and is only in small lots for actual needs, jobbers and consumers not being disposed to place liberal orders in the belief that possibly there may be a reduction in prices. However, nothing official has been given out in regard to a reduction in prices, but as the Steel interests will get together in New York City on the 21st inst, it should be known within a very few days whether any change in the market will be made. The mills advise us that regular prices are being held. Quotations are as follows, f.o.b. Pittsburgh, 60 days, 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Rope.—There have been no important changes in the condition of the cordage market during the week. Hemp continues low in price and the market quiet. Demand for Rope is below normal and prices are fairly steady for small lots. The following quotations, for base sizes, fairly represent the market for small lots, but are not always adhered to on large orders: Pure Manila, 10 to 10¼ cents; lower grades Manila, 8 to 9 cents; Pure Sisal, 7½ to 7¾ cents; lower grade Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5⅞ cents.

Binder Twine.—With a continued low hemp market and crop reports not quite so favorable as former ones, the tone of the Twine market is sustained, according to some in the trade, by the fear that there will not be enough to go around. That this season's output of Twine will be smaller than usual is conceded by many, while the outlook for crops is excelent. The Twine carried over from last year should be taken into consideration in this estimate, and while it is not possible to accurately estimate what this amounts to, this season's output, together with the 1907 surplus, it is calculated, will be ample to cover all requirements, if suitably distributed. It is understood that some Chicago jobbers are quoting standard and Sisal Twine at 8 cents. Regular quotations remain unchanged, as follows.

	Cents per pound.
Sisal	8¼
Standard	8¼
Standard Manila	9¾
Manila	11¼
Pure Manila	13

Carload lots, ¼ cent less; 5-ton lots, ⅛ cent less, central delivery, fall terms.

Axles.—Trade in Axles is dull, and the season's business is estimated at not much over 60 per cent. of last year. As in other lines, however, a comparison going back two or three years would not be so unfavorable. Prices have been fairly steady, as this is a seasonable line, and most of the important business is done by yearly contracts placed in the fall. A degree of uniformity is shown by the quotations of most manufacturers who have not yet benefited by the declines in raw material. The market to the general trade may be represented by a quotation on No. 1 Common Axles of 4 cents per pound, on loose collar Concord Axles, 4¾ cents per pound and on half patent Axles by a discount of 70 per cent.

Seat Springs.—The demand for painted Seat Springs has been light and occasional irregularity in prices has been reported this spring, but on the whole quotations of leading manufacturers show a fair degree of uniformity at the present time. The market to the general trade may be fairly represented by a quotation on 1½ x 2 x 26 Springs of 45 cents per pair, and on 1½ x 3 x 28, 68 cents per pair.

Wire Cloth.—There is no quotable change in the market for Galvanized Wire Cloth. Hardware grade, which has been selling at a low level since prices were established by the manufacturers last fall. Early in the year, it will be remembered, an advance of 25 cents per 100 sq. ft. was made, but this affected only the price to the retail trade. At present quotations manufacturers declare that business is unremunerative, and they show a disposition to side step orders of any considerable size, although they will, of course, execute routine orders from regular customers. It should be remembered that quotations regularly mentioned are for 100-ft. rolls, from 24 to 48 in. wide. For widths narrower than 24 in. and wider than 48 in. there is an advance of 25 cents per 100 sq. ft., while 50-ft. rolls take an advance of 10 cents per 100 sq. ft.

Soldering Coppers.—The base price of Soldering Coppers, 300 lb. and over, declined 2 cents per pound from 19 cents to 17 cents on May 15, there being the usual differentials for less quantities and small sizes.

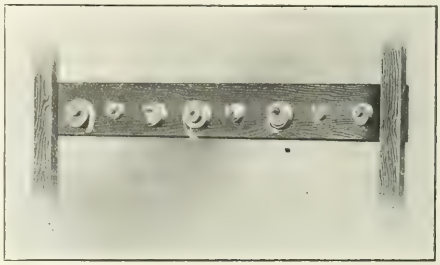
Window Glass.—The result of the recent meeting of Western Jobbers' Association held in Chicago is reported as being a reduction of about 5 per cent. in price, with the understanding that in case of further reductions by manufacturers the jobbers' prices would again drop. At a subsequent meeting of the Eastern Jobbers' Association a decline in price of about 5 per cent. is said to have been decided upon. Prices in metropolitan district are referred to as about 90 and 35 per count. discount for single and 90 and 40 per cent. discount for double strength Glass. It is intimated, however, that the market is an open one. Workmen in hand operated Glass factories are working on a sliding scale, the rate being determined by a commission, upon the average factory selling price of Glass during the period immediately preceding the payment of wages. According to reports the average selling price, from manufacturers' list of the period ending with April 23, was as follows: Single, 90 and 31 per cent. discount; double strength Glass, 90 and 39 per cent. discount. This statement is given here simply as an indication of the average price obtained by manufacturers. It is reported that the American Window Glass Company has announced another cut in the price of machine blown Glass.

Linseed Oil.—On an advancing Seed market crushers put up the price of Linseed Oil 1 cent per gallon during the week under review. A very fair demand for Oil in small lots has characterized the market. The Seed market has weakened somewhat since Oil was advanced, but carload buyers are confining orders to immediate requirements. Some crushers are unwilling to contract further ahead than July 1, while others are willing to accept contracts extending over longer periods. Local quotations are as follows: State and Western Raw, 42 to 44 cents; City Raw, 44 to 45 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—Nothing of importance has occurred in the local Turpentine market and demand has been moderate. Receipts of new crop are heavy at Southern points, but are apparently being purchased. There is a feeling among the trade that prices may go lower. The New York market is represented by the following quotations: Oil Barrels, 45½ to 46 cents; Machine Made Barrels, 46 to 46½ cents.

ECONOMICAL HANDLING OF LEATHER BELTING.

IN the sale of Leather Belting there is danger of considerable waste through the necessity of cutting Belt to the requirements of customers. Of course, short ends and strips would not be deliberately thrown away, but there is a tendency to let them collect in out of the way places and every time a small piece is wanted cut from a big coil.



Odds and Ends of Leather Belting.

In order to guard against the waste of odds and ends, keep them in good shape and make it possible to pick out a piece conveniently when wanted, N. T. Bushnell Company, New Haven, Conn., has put up the rack shown in the accompanying illustration. It is formed by merely sticking a row of wooden pegs in a board about 6 or 8 in. wide, which may be put up between any two convenient joists or posts, high or low. In the store of the Bushnell Company, such a board extends between the two posts which form the frame of the stairway on the second floor. The small coils and end pieces are slipped over these pegs where they can be easily sized up by the eye and worked off whenever occasion offers.

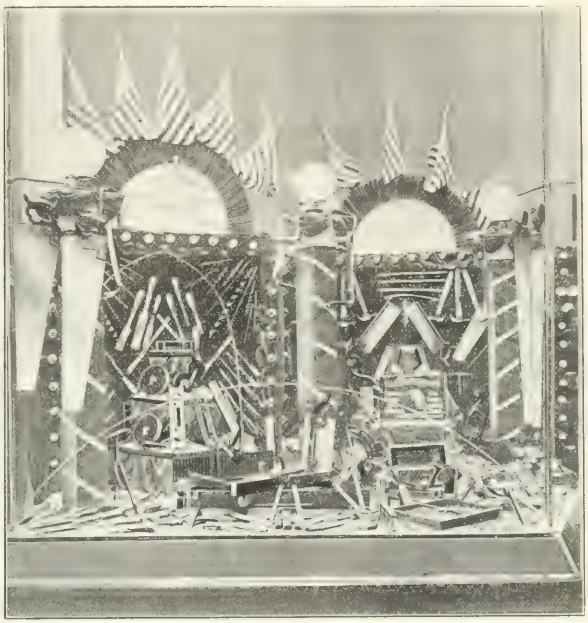
The Roff Hardware & Implement Company, Roff, Okla., has been incorporated with a capital stock of $20,000, and has taken over the entire business of Campbell-Hutcheson Company. The directors are E. T. Summers and Fred W. Warner of Dallas, Texas, and W. A. Fitts, D. C. Abney, R. W. Campbell of Roff. W. A. Fitts is manager.

The Peterson Hardware Company, Albert Lea, Minn., has opened a branch store at Walters, Minn., under the style of Walters Hardware & Implement Company. It has rented a new store building and is handling Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Paints, Oils, and Sporting Goods.

E. P. Heck, Oroville, Cal., is about to move his stock to the building formerly occupied by G. W. Braden. The firm style will be changed to E. P. Heck Hardware Company. The line handled includes Shelf and Builders' Hardware, Stoves, Tin and Enameled Ware, Crockery, Paints and Oils.

A GOOD SHOWING OF TOOLS.

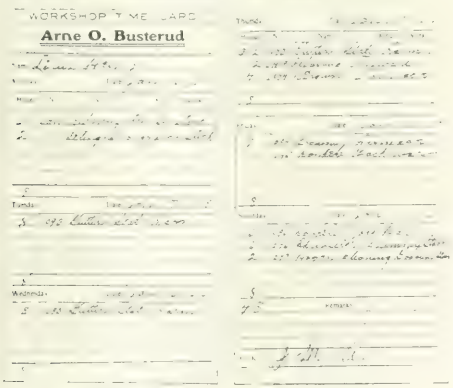
EXTENDED description has previously been given in these columns of the effective use of its prominent show windows made by Union Hardware & Electric Supply Company, Providence, R. I. Herewith is reproduced a tool display installed some time ago, which embodies many of the characteristic features of the company's windows. As usual, there is a harmonious color scheme in this case, orange, white and blue, the decorative effects being obtained by the use of bunting and ribbon. Electric lights are always freely used, 84 being disposed around the panels in the back of the window on which the tools were mounted with display signs in decorative half circles at the top. In front of the panels were upright posts, also decorated and supporting brilliant lights in globes. On stepped stands in front of the panels and on the floor of the window tools of all descriptions were arranged, flanked by a couple of hand saws hanging from arms on either side. Arched above the display in the foreground, the illustration shows a 12-ft. flexible rule. Special attention may be directed in passing to the company's custom of using architectural designs in getting up its windows, such as arches, panels, pillars, &c. These effects are particularly dignified and graceful as well as striking, and lend themselves well to the artistic arrangement of the goods on display. They are rendered doubly effective by the liberal use of the electric bulbs, to which attention has already been called, and which is very much in the company's line of business.



Tool Display of Union Hardware & Electric Supply Company

KEEPING RECORDS OF SHOP WORK.

THE method used by Arne O. Busterud of Crookston, Minn., in keeping track of shop work, including labor and material, is shown in the accompanying illustrations, which represent blanks, filled out as for actual transactions. Figs. 1 and 2 represent both sides of the Workshop Time Card, which covers the entire week commencing January 6. This is printed on white paper 4 x 7 in. in size, five lines being provided for recording how workman's time has been spent each day, and workmen are only paid for the number of hours actually recorded. By referring to Fig. 2 it will be seen that on Thursday half an hour is entered as being spent in the shop, repairing Tinware. Such repair work, as comes into the shop, has the customer's name written on a tag attached, and when the job is completed the price charged for it is marked on the tag. In the same illustration four hours is recorded on Thursday and seven hours on Friday as having been employed in work on "Brown's furnace."

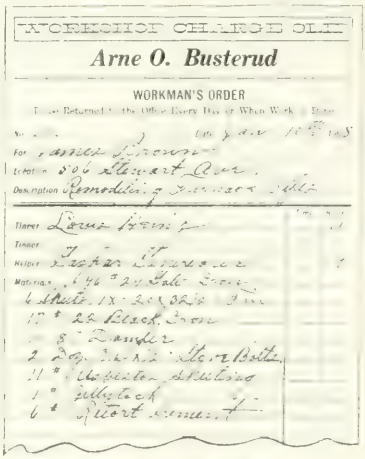

WORKSHOP TIME CARD

Arne O. Busterud

Fig. 1.—Face. Fig. 2.—Back.

Workshop Time Card.

In Fig. 3 is an illustration of the Workshop Charge Slip, 5¼ x 8 in., printed on one side only. This is the workman's order to remodel James Brown's furnace pipe, and is numbered 1094. Such a slip is made out for each job, and the slips are turned into the office when the job is completed. In Fig. 2 the third item under Thursday and the first one under Friday are numbered 1094, corresponding with the number on the charge slip. The slip shows that 11 hr. were spent by the workman and 4 hr. by a helper on Brown's job, and also records the material used. This gives the complete cost of the job, and an itemized record of time and material from which the charge is made.


WORKSHOP CHARGE SLIP

Arne O. Busterud

WORKMAN'S ORDER

Fig. 3.—Workshop Charge Slip.

NO PARCEL POST AMENDMENTS IN P. O. APPROPRIATION BILL.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., May 19, 1908.

A CAREFULLY laid plan to saddle the Postmaster-General's rural parcel post scheme upon the Post Office Appropriation bill in the Senate has been decisively defeated, and the measure having gone to Conference Committee without the addition by either house of an objectionable "postal reform" provision it will not be competent for the conferees to add anything of the kind. The final passage of the bill in a form highly satisfactory to the retail merchants of the country is therefore assured. The only danger now remaining is the possibility that a special parcel post measure may be put through before adjournment, but inasmuch as the leaders now expect to bring the present session to a close within a week this contingency is too remote to cause serious apprehension.

As reported in this correspondence last week, the Appropriation bill came out of the Senate Committee free and clear of all parcel post amendments. The subject was fully considered in committee, which had before it urgent recommendations by the Postmaster-General and a great mass of petitions and memorials from certain farmers' organizations urging the adoption of the rural parcel post project as outlined in the Burnham bill. On the other hand, however, the committee and its individual members had received a large number of strong personal letters from merchants in all parts of the country, supported by memorials forwarded by their respective national organizations, and it was with no feeling of uncertainty as to the wisdom of its course that the committee decided not to touch the parcel post question at this time.

The Burnham Amendment.

When the bill reached the Senate, however, the parcel post boomers were afforded another opportunity to bring forward their pet measure, of which they promptly availed themselves. Senator Burnham, the introducer of the extraordinary Rural Parcel Post bill drafted in the Post Office Department, offered the measure as an amendment in the form of an authorization to the Postmaster-General to conduct a series of experiments with a view to ascertaining the practicability of the "special local parcel post system on the rural delivery routes." The amendment was presented in the following terms:

Provided, That for the purpose of ascertaining the practicability of establishing the special local parcel post system on the rural delivery routes throughout the United States, the Postmaster-General is hereby authorized and directed to experiment and report to Congress, not later than January 1, 1909, the result of such experiment, by establishing a special local parcel post system on rural delivery routes in not to exceed four counties in the United States, for packages of fourth-class matter originating on a rural route or at the distributing post office for delivery by rural carriers to patrons thereof, at such especial rates of postage and under such regulations as the Postmaster-General may deem advisable;

Provided, further, that nothing herein contained shall be taken as authorizing the acceptance or delivery at such special rate of postage of any parcel offered by any person acting as agent or representative, upon commission or otherwise, for any person or company not resident on such rural delivery routes or in the town, or company not resident on such rural delivery routes or in the town from which the route or routes emanate;

And provided further, that only such parcels shall be received for delivery at the special rates of postage as are offered by bona fide merchants or dealers whose regular places of business are on such rural delivery routes or in the town from which the route or routes emanate in their individual capacity.

It is obvious that the amendment offered by Senator Burnham is open to all the many objections that have been made to the Department's original bill. The impracticable character of the proposition was at once apparent to several Senators who followed the reading of the amendment, and Senator Hale, one of the most influential members of the Senate, promptly objected to its adoption.

This incident closed the campaign to secure the addition of a parcel post rider to the Post Office Appropriation bill. The Burnham bill is now being urged before the Senate Post Office Committee as an independent measure, and simultaneously an effort is being made to secure favorable action by the House Committee on the Sims or Griggs bills, which are similar in terms to the Burnham measure. Senator Dick of Ohio has just introduced a compromise measure providing for the consolidation of third and fourth class mail matter at the rate of 8 cents per pound, which means the cutting in two of the present postage rate on merchandise. It is possible that some progress may be made with these bills at the present session, but it is not probable that they will receive any attention. They are on the dockets of the Senate and House committees, however, and the campaign that has prevented legislation at the present session will have to be renewed next winter, when in addition to these individual measures another annual Post Office Appropriation bill will afford an opportunity for parcel post legislation.

A New P. O. Regulation.

The Post Office Department has issued a regulation intended to correct certain abuses of the privilege now accorded patrons of rural routes of ordering through carriers merchandise nonmailable either because of its weight or its character. Under the regulations, which have been in force since the so-called "express package privilege" was withdrawn from carriers by the act of 1904, the patron of a route may commission a carrier to purchase for him and deliver any package of merchandise weighing more than 4 lb., or any article which, like a liquid in a glass container, is unmailable under the postal regulations. It is further provided that if a number of articles are ordered by the same person at one time they may be tied together and considered as one package. The complaint has been made to the Department that merchants in certain localities have evaded the regulation which requires the payment of postage on mailable matter weighing 4 lb. or less by adding to the packages goods not ordered by the purchaser, but which, because of their general usefulness and small cost, would usually be accepted. In one case where a patron of a route ordered a pair of shoes weighing 1½ lb., the postage on which would have been 24 cents, the merchant added to the package a 10-lb. sack of salt, which was not ordered, but which the purchaser of the shoes was willing to accept. Of course, neither the letter nor the spirit of the regulations justify the employment of such a device to escape the payment of postage, and the Fourth Assistant Postmaster-General has therefore issued the following order to the rural service:

All packages of merchandise to be sent by rural carriers by merchants of the town should be presented at post offices for inspection, and in case it is found that extraneous matter not ordered by the patrons has been added to any mailable matter or package for the purpose of making such package of matter unmailable, postmasters should refuse to permit the carrier to carry any such matter or package for hire outside of the mails, and rural carriers should not receive any mail matter from patrons as unmailable matter for hire which they suspect has been made unmailable by such devices as adopted by the merchant referred to.

It should be noted that this order does not in any way amend existing regulations, but simply provides that carriers shall not deliver goods which have not been ordered and which have been added to purchases merely to avoid the payment of postage.

Death of Joseph H. Martin.

JOSEPH H. MARTIN, who had for many years represented the Hussey-Binns Shovel Company, Pittsburgh, died suddenly in the Vanderbilt Hotel, Syracuse, N. Y., on the evening of the 14th inst. He had been apparently in his usual good health, so that his death was entirely unexpected and came as a great shock to his many friends. Mr. Martin had been identified with the company for a period of nearly 24 years and was well and favorably known to merchants and the railroad trade throughout nearly the entire country, especially in the New England, Central and Middle Western States. He was a man of high character and integrity and was greatly esteemed by all who knew him.

The Homestead Hardware Company, Homestead, Pa., has disposed of its business to Thomas R. Bryce, who was formerly foreman of its tin and slate department. Mr. Bryce has engaged in the roofing and sheet metal business at 224 Sixth avenue, where he has removed the stock thus purchased, and will carry on a General Hardware business in connection with the former line.

Mississippi Retail Hardware Association.

THE second annual convention of the Mississippi Retail Hardware Association was held in Greenwood on the 11th and 12th inst. On Monday morning the members assembled in the rooms of the Greenwood Business League and were called to order by P. E. Pegues, Winona, president, who made a brief address. S. L. Gwin, of the Greenwood Business League, was introduced and referred in detail to the program which had been prepared by the business men of that city for the entertainment of the members and other visitors during their stay. It included two theatrical performances, a steamboat excursion and a ball on Monday night at Henderson & Baird Hall.

The following members of the association were registered as in attendance at the meeting:

Henderson Hardware Company, Aberdeen.
S. G. Sadler, Okolona.
Pareliman Bros., Okolona.
Banks Hardware Company, Columbus.
Columbus Hardware Company, Columbus.
D. L. Brown, Kosciusko.
J. L. Martin, Starksville.
Turner Bros., McCool.
Turner Bros., Philadelphia.
Lampkin Hardware & Furniture Company, Tupelo.
L. B. Graham, Louisville.
Winston & Harris Hardware Company, Amory.
Lann & Carter Hardware Company, Aberdeen.
West Point Hardware Company, West Point.
Twiner & Pierce, Starksville.
Kyle Chandler, West Point.
W. R. Graham, Cleveland.
L. F. Holberg, Macon.
Noxubee Hardware Company, Macon.
L. P. Quinn, Greenwood.
Buckley Bros., Water Valley.
Kimbrough Bros., Indianola.
C. H. Flint, Batesville.
Doak Hardware Company, Grenada.
Planters Hardware Company, Grenada.
J. E. Patterson, Wesson.
M. E. Goodwin, W. Valley.
Biggs Bros., Crystal Springs.
A. T. Graham, Canton.
Mallory Davis, Itta Bena.
Slaughter Mercantile Company, Slaughter.
Brittan & Henry, Hazelhurst.
Ecru Hardware Company, Ecru.
Winona Hardware Company, Winona.
Corinth Hardware Company, Corinth.
Moore & Lilly, Hazelhurst.
Jackson Hardware Company, Jackson.
Wainwright & Winters, Kosciusko.
McLeland Hardware Company, Jackson.
Gus Bain, Ackerman.
Adkinson & Banes, Jackson.
W. T. Meek Hardware Company, Shelby.
Lewis & McKee, Oxford.
Orrick & Ricks, Canton.
Crane-Hinman Hardware Company, Yazoo City.
Taylor Bros., Emporia.
D. W. Beal, Lexington.
D. M. Foose, Tchula.
Courtney Bros., Demar.
Yeates & Wallace, Starksville.
W. J. Holt, Jr., Indianola.
Paythres Hardware Company, Gulfport.
Collins Hardware Company, Collins.
Relbue Price, Oxford.
Braden Hardware Company, Pontotoc.
Sommers Hardware Company, Clarksdale.
Hood-Sharkey Company, Greenville.
Henderson & Baird, Greenwood.
A. Henderson, Greenwood.

After payment of dues, distribution of badges, souvenirs, &c., those in attendance were escorted to the Court House by a delegation from the Business League. Here the exercises were opened with singing of national airs by the public school children. Col. W. M. Hamner welcomed the visitors to the city in an address which was closely followed and highly appreciated by all. At the conclusion of his remarks six little girls approached the president's desk and presented to Mr. Pegues a key to the city bearing the inscription, "Greenwood, 1908." The little ones then sang a welcome song which was received with prolonged applause. This feature was one of the most attractive on the delightful program which had been arranged by the people of the city. President Pegues made an appropriate expression of the appreciation of the members. Brief addresses were also made by Messrs. Shapleigh, Reison, Sprague, Stephenson, Whitman, Hooper and Hardy.

Secretary-Treasurer's Report.

Jno. E. Sommers, Clarksdale, the energetic and efficient secretary of the association, presented his report as secretary, from which we make the following extracts:

At the convention held at Winona on August 9, 1907, when this association was organized, 27 became members, and since then I have received the subscriptions of 17 additional firms, making a present total membership of 44.

I have kept up an active canvass among firms in our line, have repeatedly written to each soliciting its membership, using any and all means within my power to bring the entire 200 Hardware firms of the State into our association, which work it is hoped will bear fruit in the attendance of very many who are yet non-members at our meeting and their joining in our work.

I recommend for your serious consideration the subject of mutual fire insurance and would impress on you the advantages of insuring with the Mutuals:

1.—The fire risk in a Hardware store is less than in any other, while the old line companies in general make no modifications on this account.

2.—The Mutual plan gives each policy holder his insurance at actual cost.

3.—These Mutual associations effect to the policyholders a saving of from 25 to 50 per cent. besides building up a surplus which will still further reduce premiums in the future.

On these considerations we should as many as possible insure with some of the Hardware Mutuals, which, in my opinion, are as safe as any of the old line companies.

Mr. Sommers' report of the finances of the association showed that the receipts during the past year amounted



D. H. HALE.



J. E. SOMMERS.

to $237.50 and the disbursements to $195.20, leaving a balance on hand, 1st inst., of $42.30.

Election of Officers.

The following officials were chosen for the ensuing year:

PRESIDENT, D. H. Hale, Aberdeen.
FIRST VICE-PRESIDENT, Mallory Davis, Itta Bena.
SECOND VICE-PRESIDENT, T. H. Baird, Greenwood.
SECRETARY-TREASURER, Jno. E. Sommers, Clarksdale.
EXECUTIVE COMMITTEE: E. S. Crane, Yazoo City, and E. G. Petros, Jackson.

Secretary Sommers and Messrs. Orrick, Jackson and Adkinson were appointed delegates to attend the next annual meeting of the National Retail Hardware Association, to be held at Milwaukee, J. E. Paythres and James McAnnis being chosen alternates.

Resolutions.

Among the resolutions adopted by the association were the following:

1. *Resolved*, That we extend a vote of thanks to the citizens of Greenwood, the Greenwood Business League and the Elks' Club for their genial hospitality and many courtesies shown.

2. We extend to our secretary, John Sommers, our thanks for his diligent work in advancing the interest of the association.

3. We express deepest regrets in the demise of Mr. Hemby, editor of the Memphis *Journal of Commerce*, who promoted with great diligence the organization of the association.

4. We extend our thanks to the National Retail Hardware Association, through M. L. Corey, for services rendered.

5. *Resolved*, That this association go on record as being opposed to the high and unreasonable privilege tax in our State, and we recommend that members make it their duty to see the representatives of their respective counties and urge the repeal of such taxation as seems unjust.

6. *Resolved*, That a committee be appointed to investigate the advisability of organizing in our State a hardware mutual fire insurance company.

A resolution was also adopted tendering thanks to F. W. Sterling, secretary of the Greenwood Business League, and T. H. Baird, of Henderson & Baird, for doing so much to make the visit of the association to Greenwood a memorable one.

Association Expenditures.

E. S. Crane, Crane-Hinman Hardware Company, Yazoo City, moved that the by-laws of the association be amended to provide for the expense of the delegates attending the national convention each year, these expenses to be paid out of the treasury of the association. Mr. Crane also emphasized the importance of having

plenty of money to carry on the work of the association and made a further motion that the annual dues be placed at $6 a year for merchants and $3 for traveling men instead of $5 for merchants and $2.50 for traveling men. After general discussion Mr. Crane's motion was amended, owing to an understanding among the members that the $5 they had paid covered all dues for the coming term, and it was agreed that all those who felt that the organization was worth another dollar to them were at liberty to increase their payment to $6. To the credit of the association, quite a number responded to this proposition and paid the additional dollar.

Mr. Crane also dwelt upon the excellent work which had been done by Mr. Sommers in his capacity as secretary, and called the attention of the members to the fact that his salary was inadequate. He accordingly moved that the secretary's salary be raised from $75 to $150, a suggestion which met with the hearty approval of the members.

Honorary Members.

The following persons have been enrolled as honorary members of the association:

Col. M. B. Belknap, Louisville, Ky.
R. W. Shapleigh, St. Louis.
G. S. Hooper, Memphis, Tenn.
H. M. Ousley, St. Louis.
E. Underwood, Grenada, Miss.
W. T. Bailey, Chattanooga, Tenn.
F. Fisher, St. Louis.
P. E. Ezell, Vicksburg, Miss.
H. M. Todd, Louisville.
L. O. Satterfield, Chattanooga, Tenn.
N. A. Jones, Memphis, Tenn.
J. W. Whittle, Belzoni, Miss.
W. J. McClure, Sr., Columbus, Miss.
H. E. Jackson, Memphis, Tenn.
J. A. McAllister, Memphis, Tenn.
F. B. Baker, Memphis, Tenn.
W. F. Stephenson, Memphis, Tenn.
S. F. Ricks, Memphis, Tenn.
J. R. Egger, St. Louis.
C. E. Mass, Memphis, Tenn.
E. B. Curtis, New Orleans.
G. T. Walton, New Orleans.
R. E. Vance, Buford, Miss.
Charles Slacham, Memphis, Tenn.
L. R. Hardy, Memphis, Tenn.
M. L. Corey, Argos, Ind.
Roy Johnson, Greenwood, Miss.
H. L. Bentley, Memphis, Tenn.
F. F. Fiscarkley, Winona, Miss.
R. J. Angamar, New Orleans.
C. L. Reirson, St. Louis.
W. B. Hamilton, Columbus, Miss.
A. H. Sommers, Memphis, Tenn.
R. E. Langley, New Orleans.
J. W. Osborne, New Orleans.
A. T. Yates, Litchfield, Ky.
B. B. Fitzpatrick, Memphis, Tenn.
A. E. Beasley, Memphis, Tenn.
A. F. Love, Chicago.
Drew Roane, Grenada, Miss.
Mr. Farrel, Jackson, Miss.
A. G. Ray, St. Louis.
Mr. Sprague, St. Louis.
B. B. Gateley, St. Louis.
H. Howard, Memphis, Tenn.
Mr. Lawrent, St. Louis.
J. A. Moral, Jackson, Miss.
A. Guard, Grenada, Miss.
I. M. Stervent, Grenada, Miss.
J. B. Dulap, Memphis, Tenn.
Sam Jones, Winona, Miss.

Association Benefits.

T. H. Baird, Henderson & Baird, Greenwood, read a very interesting paper on the subject, "Benefits to Be Derived from Membership in the Mississippi Retail Hardware Association." He handled the topic so effectively that all present felt that they were affiliated in a great cause and that the future welfare of the Hardware business in the State depended largely upon the success of the organization.

HARDWARE BUSINESS ON CASH BASIS.

Relbue Price, Oxford, read a paper entitled "Can the Hardware Business be Successfully Conducted on a Cash Basis," in which he tersely set forth his reasons for making the change from credit to cash and referred to the success attending his new departure. Mr. Price's paper was as follows:

I have been in the Hardware business for 12 years, commencing as clerk and finally becoming manager and stockholder of the Oxford Hardware Company. Four years ago I bought the remaining interest in the company, and since then I have run the business under my own name. During all this time I have been trying to formulate some plan to keep from doing a credit business, and have sought the advice of several business men on the subject, but they all said that the cash business was a doubtful venture, and advised me not to go into it.



RELBUE PRICE.

Profits Were on the Books.

But as the years rolled around, and I found that the money that I ought to be getting out of the business was on the books, I decided that something had to be done. Not that I had lost so very much through credit, but it kept my surplus tied up all the time.

You all know the fellow who is good, "so good," that you cannot charge him over 10 per cent. on his account. He comes to you and wants credit until fall. When fall comes and your bills are due, cotton is not selling at just the price to suit him, so he holds it, and blandly tells you that he will settle with you when he sells his cotton. You worry along—he is too good for you to push; you may lose his trade—until the first of January, hoping that he will pay you then, but he finally pays you, just in time to start on a new year's supply, and your money is tied up all the time.

Catalogue House Annoyance.

Then we had the catalogue houses to contend with, and customers either bought your goods on credit and sent their cash to the catalogue houses, or you had to meet catalogue prices, and they would want the goods charged. Or you would carry them all the year, and in the fall when they sold their cotton and you expected them to give you their cash trade, you were confronted with catalogue house prices continuously.

Conferring with Competitors.

So I decided to do a strictly cash business. The first thing that I did after coming to this decision was to confer with Lewis & McKee, my competitors, and get them to join with me. They were as tired of the old way of doing business as I was, and readily agreed to the plan. Then we advertised in the county papers for about six weeks that after January 1, 1908, we would do a strictly cash business, and have had very little trouble with it, with the exception of explaining to some of our best customers that it really meant them and not the other fellow.

Writing to Customers.

In the meantime I wrote to each of my customers, telling them the advantage that it would be to them for me to do a cash business, as I could sell them cheaper, &c., and asked them for their support. I think that they appreciated this very much.

Sales on the New Basis.

Comparing my sales for January and March with the two preceding years, I find that there is very little difference in them. In fact, my sales for March were better than during the same months in the two preceding years. My sales for February fell off considerably, but I attribute part of this to the bad weather we had during that month. Lewis & McKee had practically the same experience that I had. Of course, I can give you the benefit of only three months' experience, but I think the cash basis will be a decided success.

A Decided Success.

Even if you do not do as much business as formerly, you can do it with less expense besides what you lose on account. Also I find that you take more interest in your sales when you know you are going to get the cash. We have all had customers that we tried not to sell rather than sell when their account was as large as we thought it ought to be. And let me say in this connection that we have all had them, too, when they thought that they had got all they could from you on credit, and then went to your competitor to spend their cash.

Tendency Is Toward Cash System.

Of course, we must not lose sight of the fact that all of the advantages are not with the cash system. You can sell more goods, sell them more easily, and in many instances at a better profit on credit, and if you have a good crop year and no "panic," you will be all right, but if I read the "sign of the times" right, I think the tendency is toward a cash system, and I know that it will be best for all, and that the sooner we adopt it the better off we will be.

FREIGHT RATES AND CLASSIFICATIONS.

A very practical and instructive paper was read by Mallory Davis, Itta Bena, on the subject of "Railroad Rates and Classifications." Mr. Davis said that there was an average of 15 per cent. overcharge freight made on Hardware and explained that this could be avoided with a little time and care in checking expense bills as they were paid. Mr. Davis' excellent paper was as follows:

Overcharges Average 15 Per Cent.

I have always kept an accurate account of the amounts paid for freights, and I found, after being in business 12 months, that the overcharges on expense bills were 15 per cent. of the entire amount paid. In other words, if I had not checked these bills carefully and made settlements with the railroad on the correct rates and classifications I



MALLORY DAVIS

would have lost $15 on every $100 that I paid for freights.

Methods of Eliminating Errors.

in its scope and so intricate and ambiguous in its

This subject is so wide application that I have deemed best to show you the method I use to eliminate errors, and it has proved satisfactory. The great difficulty that confronts each of you is to know the correct classification of every article in a shipment; also the correct rate from its origin to its destination. I have succeeded in so revising the classification that I have practically a Hardware classification. In other words, I have eliminated everything that I do not need in my individual business. I have got up two sheets for your information. One, Schedule 1, shows the form I use in getting up my tariff; also gives you some idea of the form of my classification. The other sheet, Schedule 2, gives you some information taken from the eleventh biennial report of the Mississippi Railroad Commission. I regret exceedingly that the Business League of Greenwood was unable to procure a copy of this report for each of you. It seems that there were only a few printed, and it was impossible to get more than six copies. If by any means you should be able to secure a copy of this report, you will find it of very great benefit to you and a wonderful source of information in regard to local tariffs, classifications, &c

A Hardware Classification.

A Valuable Report.

Possibility of Concentration.

You will notice on the sheet you hold that under the heading of "Freight Rates to Itta Bena, Miss., from Louisville, St. Louis, Memphis, &c.," that I use these points merely to show you the form I follow in making up this tariff, but you will doubtless be surprised to know that you would rarely ever have occasion to use a rate from more than 10 or 12 cities. I think we can really concentrate our business so that we can buy every article needed from at least 10 cities. I have the correct rates from each of these cities so tabulated that it only requires a minute's time to figure the exact amount due the railroad on any shipment. I desire to explain just how you protect your interest by use of this method. I use Itta Bena as the point of destination for the very good reason that I have the distinction of being located there. To show

The Most Common Way That Overcharges Occur.

it will be necessary for you to follow me through the various stages of transportation of a shipment from point of origin to destination. I have a miscellaneous shipment of goods from Louisville, Ky., via the L. & N., care of the Southern, at Birmingham. The bill of lading covering this shipment may have been made by a type machine, the correct weights, class and rates inserted, and with this typewritten bill of lading from which to copy his way-bill, the billing clerk frequently makes an error. When the bill of lading is indistinctly written with pencil, and the articles not classified, it is an easy matter to see how the billing clerk will make an error. In due course of time the consignment reaches Birmingham and is delivered to the Southern by the L. & N., the Southern assuming responsibility for the freight which the L. & N. has charged. Suppose the clerk at Louisville has made an error of 80 cents or $1; does the Southern at Birmingham verify the correctness of the charge made by the L. & N. before they assume it? No. It is clearly an overcharge, but it is added to the Southern Railway Company's way-bill as an advance charge, and then the rate from Birmingham to Itta Bena is included. The billing clerk of the Southern at Birmingham may possibly have made the correct charge to cover their part of the haul from Birmingham. When the shipment arrives at Itta Bena the clerk very naturally copies the expense bill from the way-bill in a mechanical way. He probably does not ever ask himself the question—what class is Hardware? Then unless you know exactly what the

Errors in Copying.

Passing Along Overcharges.

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Freight Rates to Itta Bena, Miss.

From—	Rates in cents per 100 lb. — Classes — 1	2	3	4	5	6	Special Iron: CL	LCL
Louisville, Ky... St. Louis, Mo.... E. St. Louis, Ill. Memphis, Tenn....	120	100	86	73	62	55	33⅓	40
	83	74	64	55	46	37	25⅓	30⅓

Current Ratings Taken from the Southern Classification, as Related to the Retail Hardware Business.

	Class.
Agricultural Implements, L.C.L.—viz.:	
Hoes, in bundles	3
Plows, N.O.S., S.U.	2
Plows, N.O.S., wooden or metal beams, handles detached	4
Hardware, N.O.S., packed or in bundles	2
Iron and steel articles—viz.:	
Bolts, Nuts, Rivets and Washers, packed or in sacks, or in bundles, L.C.L.	5
Fencing, Woven Wire, in rolls, L.C.L.	5
Nails and Spikes—viz.:	
In kegs or double kegs, estimated weight 106 lb. per keg and 208 lb. per double keg), L.C.L.	6
Pipe—viz	
Wrought Iron, L.C.L.	6
Plow Irons—viz.:	
Bases, Clevises, Coulters, Couplers, Disks, Foots, Frogs, Heel Bolts, Plant, Fenders, Plates, Points, and Wings, in crates, kegs, barrels or casks, or wired together, L.C.L.	6
Wedges, packed	4
Rope—viz.:	
Cotton, L.C.L.	4

Schedule No. 1.

classification is, and the rate applying on same from Louisville, you will pay the overcharge.

A Typical Instance.

I received a shipment of cow peas a few days ago which illustrates just how foolish it is to rely on the rates that the average agent figures on a local shipment. The commission, in order to encourage the fertilization of our land, made a maximum rate on native grown peas from any point to any other point within the State of 18 cents per 100 lb. in any quantity. The shipment I refer to was made me from Kosciusko via the Illinois Central to Winona, then over the Southern to Itta Bena. The agent of the Southern at Winona paid the agent of the Illinois Central 20 cents per 100 lb. to cover the Illinois Central haul to Winona. When the shipment arrived at Itta Bena the Southern had added 11 cents more, and the expense bill rendered me called for a rate of 31 cents per 100 lb. These rates were made and paid by agents in whose offices you will find big placards at least 2 ft. square, which state in big type on authority of the Mississippi Railroad Commission that the maximum rate on this commodity is 18 cents.

Amazing Carelessness.

A Practice That Favors Competitors.

A great many of us have no doubt fallen into the habit of saying, or, rather I should say, very few of us have gotten out of the habit of saying, "Well, it takes 10 per cent. to pay my freight, and I'll just add that to the price. The other fellow will have to pay it." That system will work all right until you come in competition with a fellow who knows his business, and you have him figure against you with a close buying customer. You will be basing your prices on the 10 per cent. theory, while he is figuring correct freight. There is only one result; your competitor sells the bill, and you very probably indulge in some talk about a fool who will actually sell goods at a loss.

Laws Must Be Studied.

When the Hepburn bill became a law in August, 1906, we were then supplied with the means of knowing just exactly what the railroads could legally charge us, but it is necessary for us to make use of the means provided; in other words, that part of the programme is "up to us." Almost every reliable and up to date jobber incloses a bill of lading showing weights and rates with each invoice, but then there are a great many who do not do this. Again, the consignment might originate in territory where the official or some other classification applies, and in that case it would take a different class from what it does under the Southern. Of course, it is always possible for the traffic department of some of the large jobbers to make an error, and, too, the classification is often misleading and might admit of more than one construction.

Up to the Merchant.

Cannot Depend on Jobbers.

Protecting Customers' Interests.

Each of you doubtless ships goods locally to customers throughout your territory. Some shipments go to points where there are no agents, and have to be prepaid. Now, if this is true, and you do not have the last report of the Mississippi Railroad Commission on your desk, you have certainly been negligent of your customer's interest, as well as your own. To illustrate this statement:

I make a shipment of 500 lb. Barbed Wire and two Cotton Planters, K. D., to a prepay station 10 miles away. I make a bill of lading, but do not classify the items or insert any rate. The agent at my station tells me that it will take $1 to prepay the freight. Of course this item of prepaid freight is charged to your customer, and he never questions the correctness of the charge. You can rely on your competitor to handle the shipment in just that way, but by reference to your tariff and classification (and it only takes a minute of your time) you will find Barbed Wire is sixth class, and under an exception to this item, the Southern only charges two-thirds of sixth class, and the rate on sixth class for 10 miles being 9 cents, then the correct charge for this item is 6 cents per 100 lb., or 30 cents for the 500 lb. The two Planters weigh 200 lb., and the rate is 20 cents, making a total of 70 cents on the shipment. Now by showing your customer that you are protecting his interest and saving him 30 cents on the little shipment you might make a better customer of him. At any rate, you have lost 30 cents less when he leaves the country without paying you for your Wire and Implements.

A Case in Point.

A few days ago I received an invoice for a small shipment of goods, and enclosed with the invoice was a bill of lading which I have reproduced on this chart. Each item was weighed accurately, each item is also correctly classified, and the correct rate for each class is inserted. You can readily see the advantage in having this information. There are numbers of houses that do not enclose a bill of lading with their invoice, to say nothing of inserting the correct class and rates. Were I dependent on the jobber for the correct rates, and this information was supplied by being inserted in the bill of lading just as you will observe on the chart, then the jobber who knows nothing of rates, and does not maintain a thorough traffic department, would certainly get none of my business.

A Good Bill of Lading.

The Jobber Owes It to the Retail Merchant

to exercise every care in the proper classification of each item shipped. The laws in regard to false classification are now so strict that the greatest care must be exercised. It has long been a custom to pack a miscellaneous assortment of goods and classify as "Hardware," but the law clearly states that the entire package must take the highest rate applying on any item contained therein. Under this ruling, if a jobber should pack one-half dozen

Local Mileage Scale of Rates Applicable to the Southern Railway Company in Mississippi, as Per Their Current Mississippi Local Tariff.

	Class rates per 100 lb. 1	2	3	4	5	6
5 miles and over	20	16	13	11	9	8
10 miles and over 5	25	20	16	13	11	9
15 miles and over 10	30	24	20	16	14	12
20 miles and over 15	33	26	22	18	16	14
25 miles and over 20	36	20	24	20	18	16

Ratings Taken from Classification Promulgated by the Mississippi State Railroad Commission, as Related to the Retail Hardware Business.

	C. R.	O. R.
Agricultural Implements, L.C.L.—viz.:		
Hoes, in bundles	3	..
Hoes, without handles, in barrels or casks..	4	..
Plows, N.O.S., S.U.	1	2
Same, K.D.	4	..
Hardware, N.O.S., boxed	2	..
Iron and steel articles (not boxed or crated unless so specified)—viz.:		
Bolts, Nuts, Rivets and Washers, in kegs, casks, barrels or drums. See Special Iron.		
Fencing, field, woven wire, in rolls	5	..
Nails and Spikes, in kegs. See Special Iron.		
Pipe, Wrought, released. See Special Iron.		
Plow Clevises, Couplers, Molds, &c. See Special Iron		

NOTE.—Practically every railroad in the State of Mississippi publishes an individual list of exceptions to the Commission's classification. First, determine whether or not the local tariff applicable provides for an exception upon commodity to be shipped; if not, the Commission's classification will apply. The So. Ry. Company in Mississippi carries an exception in their local tariff making any article classified "Special Iron" two-thirds of 6th class

knives (which take first class) in a 200-lb. box of tinware (which is second class), then the consignee is liable to have to pay first-class rate for the 200 lb. when he should pay second. Of equal importance with prompt service on the part of the jobber, is the proper packing and classifying the goods so that the consignee gets the benefit of the lowest rate.

Intelligent Packing Necessary.

Penalties for False Billing, Etc.

The following extract from the Interstate Commerce act, as amended, will be of interest as touching on *Penalties for false billing, &c., by shippers and other persons:*

Any person, or any officer or agent of any corporation or company who shall deliver property for transportation to any common carrier, subject to the provisions of this act, or for whom as consignor or consignee any such carrier shall transport property, who shall knowingly and wilfully, by false billing, false classification, false weighing, false representation of the contents of the package, or false report of weight or by any other device or means, whether with or without the consent or connivance of the carrier, its agent or agents, obtain transportation for such property at less than the regular rates than established and in force on the line of transportation, shall be deemed guilty of fraud, which is hereby declared to be a misdemeanor, and shall upon conviction thereof in any court of the United States of competent jurisdiction within the district in which such offense was committed, be subject for each offense to a fine not exceeding $5000 or imprisonment in the penitentiary for a term of not exceeding two years, or both, in the discretion of the court.

Importance of Prompt Deliveries.

It seems to me that this occasion presents a good opportunity to refer to the railroads who render the best

Wagon No.

Order No. 409573 S
Time 4 30 St. Louis, 4/10/08 190
Route M & O

Received in good order from

NORVELL-SHAPLEIGH HARDWARE CO.

Consignee MALLORY DAVIS
Destination ITTA BENA, MISS
R. R. Station
County *State*
Via GREENVILLE.
Marks

AS PER RULES OF COMPANY'S BILL OF LADING

CLEAR RECEIPT OR NONE.

RATES	No. PKGS.	ARTICLES		WEIGHT
100.	1	BX HDW	2	100
86.	2	CRT 24 HDLED AXES	SR	150
55.	1	BX IRON BOLTS	3	150
100.	1	BX COFFEE MILL	4	25
100.	1	BX S I ENAMEL WARE NSTD	5	50
62.	1	IRON ANVIL	WH	105
86.	2	BDL 60 S I DRIP ANS NSTD S C FASTEND	WH	75

Bill of Lading

service. All of us prefer to buy goods from the jobber who can come nearest filling our orders complete, and getting them out the same day they are received, but, in my opinion, it is of even more importance for the jobber to ship your goods via the line that can get them to you quickest. The effect of the jobber's prompt service is entirely lost if the railroad does not do its part in transporting the shipment quickly. The road that maintains the best service is certainly entitled to the business.

Quickest Routes Should Be Favored.

Public Has Suffered from Attack on Railroads.

In this day when small profits make it necessary to turn your capital often, it is of vast importance to get your goods delivered promptly. I believe that the agitation during the past two years for the regulation of freight rates has been exceedingly detrimental to the interest of every citizen in the South. I do not think the railroads have suffered as much as has the public, but out of all this turmoil of conflicting interests, I think we will all derive great benefit by realizing more fully that to develop our country, we must have the railroads, and at the same time the roads will understand that the public has become more thoroughly educated as to their rights under the existing laws, and that these rights must be respected. The ignorant, indiscriminate denunciation of the railroads by unscrupulous office seekers, who resort to any means to promote their own interests, has created a sentiment at once harmful and antagonistic to every interest of the South, more especially that of the railroads. We have now had time to study this matter from a business standpoint, and, as a result, I predict that the next political aspirant who undertakes to get into office by cussing the railroads will get just what he deserves at the hands of intelligent people.

Intelligence Will Succeed Prejudice.

CONVENTION NOTES.

The Question Box was a feature of the proceedings and provided a number of topics for discussion which was entered into quite generally by the members.

Jackson was selected as the place for the next meeting and the executive committee reported that it had determined on the second Tuesday in May as the opening date.

It was recognized that a grievance committee would be a valuable adjunct of the Association, and it was accordingly determined that such a committee should be appointed by the new president.

During the convention two very interesting and practical addresses were made by Col. M. B. Belknap of the Belknap Hardware & Mfg. Company, Louisville, Ky., and R. D. Warren of the Benedict, Warren & Davidson Company, Memphis, Tenn.

A portion of one of the sessions was turned over to the travelling men who took advantage of the opportunity to thank the association for the cordial reception which they had met and also assuring the members that they had gained a great deal of information and many practical ideas from the discussions.

M. L. Corey, secretary of the National Retail Hardware Association, was present at the meeting and addressed the members on a variety of topics of interest, in the course of which he enforced the advantages of Hardware mutual fire insurance, and urged the importance of merchants subscribing to some good trade journal.

Death of William Beach.

WILLIAM BEACH, one of the oldest Hardwaremen in the country, died at the home of his daughter, Mrs. Charles Mallette, at Etowah, near Henderson, N. C., on the 10th inst. Mr. Beach was in his ninety-fifth year, having been born November 15, 1813, near Trumbull, Conn. At an early age he moved to the South and in the early 30's came to Columbus, Ga., in which place he spent the remainder of his life, with the exception of the past few years. Mr. Beach was for two years with the house of B. Wells & Co., and then became identified with the firm of Hall & Moses, afterward being taken in as a member, and later succeeding to the ownership of the business, the store becoming one of the landmarks of the city. He conducted the leading Hardware business of Columbus for many years, and was widely known in Alabama and Georgia. Upon his retirement from active service a few years since the business was incorporated under the style of the William Beach Hardware Company, of which his son, William B. Beach, was elected secretary and treasurer. Mr. Beach spent the last few years of his life in North Carolina, and visited his old home in Columbus last November on the occasion of his ninety-fourth birthday. He was a man of sterling integrity, unostentatiously charitable, and had acquired a competence by the old-time methods of industry and thrift. Mr. Beach had served in the Seminole War in Florida, and during the Civil War was a member of the home guard.

Valley Hardware Company, L. T. Sherod, proprietor, has succeeded to the Hardware business of Sherod & Hall, Wallowa, Ore.

The New House of McLean Bros. & Rigg.

AMERICAN manufacturers will readily recall the well known Australian house of McLean Bros. & Rigg, formerly Melbourne and Sydney, but in latter years Melbourne only. The financial difficulties of the house in the 90s arose not from any complications in the business proper, but from realty speculations which involved one of the partners to the amount, it is said, of something like £700,000 sterling, the business being capitalized at one time at the equivalent of $2,500,000. The business under bank and other auspices has been continued along the old lines, but recently it has come into the possession of strong financial hands, practically two individuals of experience, who have paid every creditor in full and taken over the entire business to be conducted hereafter on strong lines. The debentures held by the Colonial Bank have been liquidated and destroyed, the account being removed to the Bank of Australia, Ltd. The company, as now constituted, will in the future pay for all its foreign purchases in cash. Ample capital has been provided, we are advised by J. W. Molden, now in the United States, to prosecute the company's business in energetic fashion. The present manager in Melbourne is A. B. Sewell, who became a partner on the amalgamation of the houses of McLean Bros. & Rigg and the Victorian Cricketing & Sports Depot, in 1904.

J. W. Molden, the practical administrative head and largest stockholder, now en route from Australia to London, where he will make his headquarters, is the chairman and managing director of Molden & Budden P't'y, Ltd., 231 Elizabeth street, Melbourne, as well as the managing director of McLean Bros. & Rigg, 147-149 Elizabeth street, Melbourne. He expects to return to New York from a Western trip about May 25, when he will make his headquarters with John G. Rollins & Sons, 15 Whitehall street, until he sails for London, about June 6.

The house conducts both a wholesale and retail trade in Ironmongery, Hardware and Machinery, together with a big Sporting Goods department. The business was first established in 1872 within a few doors of its present location, the last surviving partner of the old house dying in 1905.

AMONG THE HARDWARE TRADE.

The Hardware, Tool and House Furnishing Goods business of Stuart G. Speir & Son, Schenectady, N. Y., has been closed out.

The Holton Hardware Company, Burlington, Vt., has been succeeded by the Vermont Hardware Company. C. M. Russell, who was president and manager with the former company, continues in the same capacity with the latter.

The Ellsworth Hardware Company has been organized at Ellsworth, Wis., and incorporated with a capital stock of $40,000, by W. L. Oltman, Amund Amundson and Jay H. Miller.

Knauf & Tesch, Chilton, Wis., who have conducted a general store under a co-partnership, have incorporated their business under the name of the Knauf & Tesch Company, with a capital stock of $50,000.

The Ware Brothers Company, Spokane, Wash., has increased its capital stock from $40,000 to $100,000. The business was founded 17 years ago by Ware Brothers by the establishment of a Sporting Goods house. The company has now branched out into the Hardware business and also manufactures Tents, Awnings and Canvas Goods. The additional capital will be applied to the enlargement of the business. The officers of the company are A. C. Ware, president and manager; T. B. Ware, secretary and treasurer.

W. S. Woolsey is going into the Hardware business at Dalton, Neb.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM M. E. KIRBY, Bolivar, Mo., who has succeeded to the business of Drake Hardware Company.

FROM LIBERAL HARDWARE & IMPLEMENT COMPANY, Liberal Kan., which has opened for business under the management of W. H. Neale.

FROM OAKLEY IMPLEMENT & HARDWARE COMPANY, Oakley, Idaho, which has purchased the business of Snake River Implement Company.

FROM WAUGH & WILSON, Williamsburg, Kan., who have succeeded to the Hardware business of E. J. Waugh, the latter having sold an interest to F. C. Wilson.

FROM H. D. BACHTELL, who is opening a Hardware, Stove, Tinware and Sporting Goods store at Waterloo, Iowa.

FROM VIG & JOHNS HARDWARE COMPANY, which has purchased the stock of J. T. McNulty & Co., Litchfield, Minn., and has been incorporated with capital stock of $25,000. The company handles a retail stock of Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, Sporting Goods, and also gives attention to plumbing, heating and steam fitting.

FROM OTIS HARDWARE COMPANY, Trenton, Neb., which is erecting a new building for the accommodation of its Shelf Hardware, Stove, Tinware, Paint and Sporting Goods business.

Magazine Screwdriver.

The L. S. Starrett Company, Athol, Mass., and 132 Liberty street, New York, is placing on the market Starrett's patent magazine or telescoping screwdriver, here



Fig. 1.—Magazine Screwdriver.

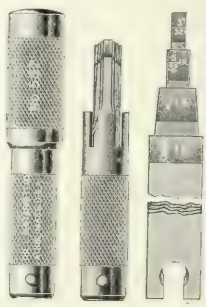


Fig. 2.—Screwdriver Closed and Its Component Parts.

shown, both ready for use and in detail. It offers for pocket use a range of four blades, strong enough for effective service and yet compact in dimensions. The screwdriver as represented in Fig. 1, is 6⅜ in. long, ¾ and ⅝ in., respectively, diameter of barrels, and 4 in. long over all, with blades inside. All blades are of the same dimensions at the heel, but have widths at other ends of 3-32, 5-32, 8-32

and 12-32 in. The point is also made that the smaller blades may frequently be used to make holes in wood for screws as well as to drive them home. The four blades are carried in the small grooved barrel, in which there is a flat, curved spring, extending lengthwise of the cylinder, which not only keeps the pieces from falling out, but from rattling in carrying about. Each blade is held in the socket by pressing a spring button, so that the base of the blade may enter, when releasing the pressure causes the larger diameter of pin to move forward and entirely fill the circular space. The larger part of the handle is rigidly kept from turning by means of the four rectangular openings made to receive a pin riveted to the inner side of the larger cylinder, and frictionally from coming off by the accurate taper fit without the use of screws to bind or hinder.

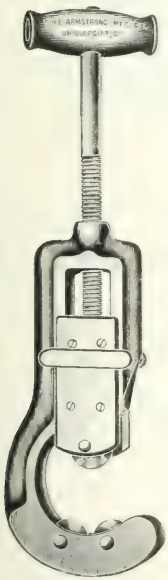
The Simplex Roofing Nail.

The accompanying illustration represents a roofing nail made by H. B. Sherman Mfg. Company, Battle Creek, Mich., being an improvement over the nail the company formerly made under the name of the Sherman roofing nail. The one shown has a different point and a different head, and is also a one-piece article as distinguished from the tin cap and nail. For this reason, the company explains, roofers find that over four times as many Simplex nails can be driven in the same length of time. These nails have the stems riveted both sides of the head, which, it is stated, prevents leaking around the head. Another advantage pointed out is that the cap has a thicker head than a tin cap. This prevents buckling of the head and also increases very materially the life of the nail, as there is a body of metal to resist rusting. The head is 1 in. in diameter, which is referred to as more desirable for use than a wire nail with head a scant ½ in. in diameter, because fewer nails are required, and because the roofing felt is not so liable to tear around the head. The company will send cartons, containing a few samples of its nail, to merchants requesting them.



The Simplex Roofing Nail.

A New Armstrong Pipe Cutter.



Armstrong Pipe Cutter.

The Armstrong Mfg. Company, Bridgeport, Conn., has brought out a new pipe cutter as shown in the illustration, designed to meet the demand from those who prefer a cutter with solid frame instead of the usual quick adjustment. Danger of springing is avoided by the use of the steel tie that binds the frame together. The two blocks of malleable iron give a greater bearing than is usual in this type of tool. The wheels are of the best crucible steel, properly tempered. Two rollers are furnished with each cutter, making of it either a single or three wheel cutter. The use of a taper pin permits the wheels to be easily replaced.

A fire occurred April 18 in the sales department of E. L. Durkee & Co., Gloversville, N. Y., damaging stock to the value of from $8000 to $10,000. About $2500 damage was also done to the building, which is owned by the firm. Good progress has been made toward resumption, and the firm is now in about normal condition.

Cabinet and Wooden Ware Specialties.

The H. Rowe Mfg. Company, Newago, Mich., maker of cabinet and wooden ware specialties, is offering the butter mold and special designed cabinetmakers' and manual training benches here illustrated. The brick form butter mold, Fig. 1, is of lock corner and dowel construction, no nails or screws being used in putting it together. It is made of beech and maple, with print surface carved or plain as preferred in ½ and 1 lb. sizes, packed one dozen in a case. The benches, Figs. 2 and 3, while not designed for the heaviest service, are recommended by the company as admirably suited to light cabinet work and for the equipment of manual training schools. The bench shown in Fig. 2 is 22 in. wide by 6 ft. long, and stands 34 in. high. Its top, 14 in. wide, is made of 2⅜-in. thick maple strips firmly glued together, and at the back there is a 7-in. well, provided as a receptacle for tools. The supporting frame is composed of girts and cross pieces 1¾ x 4 in., legs 1¾ x 3½ in., and is fitted with a drawer 42 in. long, 20 in. wide and 6 in. deep, supplied with brass pulls and lock. Two vises 14 in. long by 2¾ in. thick fitted with 1¼-in. iron bench screws complete the equipment of the bench, which with drawer and shelf weighs when crated 245 lb., or without drawer and shelf 195 lb. Fig. 3 illustrates a manual training bench, which is constructed upon the same general lines as No. 5, but is more compact and of smaller dimension. It is 48 in. long, 32 in. high and 20 in. wide, and has a 14-in. maple top with a tool rack and 6-in. tool well. The vises are 12 x 2¾ in., and the drawer 24 in. wide by 6 in. deep. The weight of this bench with drawer crated is 160 lb., without drawer 135 lb.

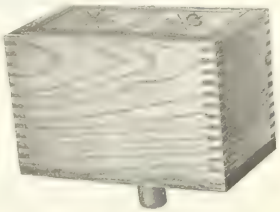


Fig. 1.—Beech Dowel Butter Mold.



Fig. 2.—Cabinet Makers' Bench No. 5.



Fig. 3.—Manual Training Bench No. 6.

Goodell-Pratt Company's Glass Cutters.

The Goodell-Pratt Company, Greenfield, Mass., is putting on the market the two styles of glass cutters illustrated herewith. Each is furnished with a single cutting wheel, which is of the same high quality, as the wheels on its more expensive styles of cutters. The cutter shown in Fig. 1 is furnished with a rosewood handle, and the one illustrated in Fig. 2 has a metal handle with bronze finish.



Fig. 1.—Glass Cutter No. 216.



Fig. 2.—Glass Cutter No. 217.

Hand Tachometers and Tachographs.

Schuchardt & Schutte, 136 Liberty street, New York, are now marketing in the United States as exclusive agents, a comprehensive line of Tachometers and Tachographs, one style of which is here illustrated. Fig. 1 reproduces it half actual size, Fig. 2 showing the device in hinged leather case with accessories, one-third size, weighing complete about 18 oz. This Tachometer serves to indicate on a dial or to record on a chart the revolution rate of engine and motor shafts, the speed of flywheel peripheries, the progressive speed of motor cars and all measurements of rotative and progressive speed. The scales may be divided for any desired readings, such as revolutions, periods, feet, yards, miles, or other units at any desired time rates. Tachometers and Tachographs are based on the action of centrifugal force on weights pivoted on a rotating spindle. The movement of these weights when rotating is controlled by gravity or by springs and is indicated by a pointer mechanically connected to them, the pointer, therefore, at any moment, indicating the exact position of the rotating weights. The pointer gear is provided with a very efficient damping action, which does not affect the accuracy of the readings, but insures a steady movement of the pointer. The interior working parts of this Tachometer do not require oiling, the spindle bearings, being fitted with oil rings, and a minimum of power is requisite to drive the apparatus. Some of the advantages of this form of construction are that the readings are independent of the duration of the test; can be read instantaneously on the dial of the instrument or chart without using a watch or other time piece. The Tachometer indicates instantly the smallest speed variations occurring during a fraction of a minute, the Tachograph registering such variations on a chart. Both the Tachometers and Tachographs are independent of the direction in which they are driven, recording regardless of it. Both styles can be fitted, if desired, with electric contacts for sounding warning bells or for automatic speed regulation, for gas engines, as an example, when the speed rises or falls beyond any predetermined value. Auxiliary pointers can also be provided to indicate the maximum speed at which the shaft has been running at any time. The Hand Tachometers are spring controlled, all the rotating parts carefully balanced so that correct readings are given with the Tachometer held in any position, and are mounted in aluminum alloy cases, highly polished and lacquered. For universality each instrument is equipped with suitable accessories, viz.: triangular steel point (only with instruments having scale readings under 100 revolutions per minute), rubber point and funnel centers and extension bar for the spindle and disk pulley. The disk pulley is used for determining belt, rope and periphery speed. A V-shape groove is turned in the edge of the disk pulley or measuring wheel and where shafts are not readily accessible the measuring wheel can be driven by a thread, which is passed around the shaft and runs in the groove of the measuring wheel. The power absorbed by hand Tachometers is said to be practically negligible. The change from one speed to another can be effected while the Tachometer is in use, by pushing the button controlled slide up or down to bring the horizontal line opposite the various speeds, 30 to 1000 shown. Hand Tachometers are made in various types, with capacities having ranges from 30 to 12,000 rev. per min. There are also many designs and styles of stationary Tachometers and Tachographs and cutmeters, made for a great variety of purposes which are fully illustrated and described in the company's trade literature.

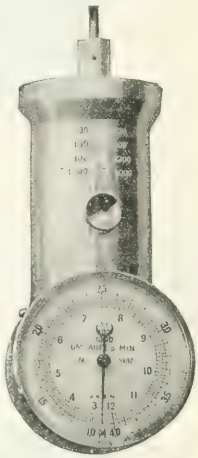


Fig. 1.—Hand Tachometer.

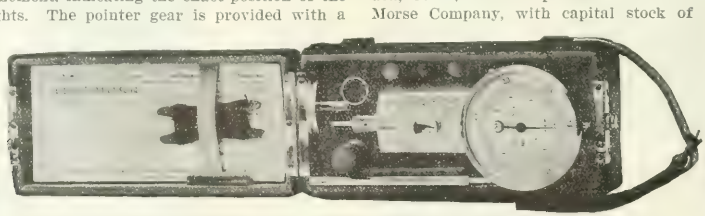


Fig. 2.—Hand Tachometer with Accessories in Leather Case.

H. W. Morse, wholesale and retail Hardware, Meriden, Conn., has incorporated his business as the H. W. Morse Company, with capital stock of $6000. H. W. Morse is president and treasurer, A. A. J. Kantack, vice-president, and W. H. Yauch, secretary. Mr. Kantack and Mr. Yauch have been employed for Mr. Morse for some time.

The Payson Skylight Operator.

An ingenious mechanical device for the opening and closing of skylights recently developed by the Payson Mfg. Company, 1319 Jackson Boulevard, Chicago, is illustrated herewith. The mechanism by which this skylight controller is operated is shown in Fig. 1. Although simple in construction, its successful action is dependent upon a series of successive motions and controls, which

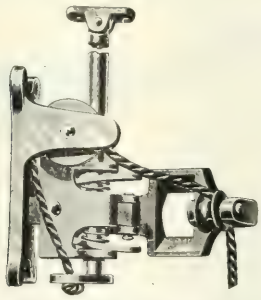


Fig. 1.—The Payson Skylight Operator.

are claimed to be positive and effective. By means of this device the skylight is securely locked at any position within the range of openinng. When the cord is pulled it brings the saddle or yoke of converging planes inclosing the spring into contact with the clamps that rigidly hold the operating rod; the clamps are thereby caused to release their hold upon the rod and the weight of the skylight is thus transferred to the operating cord as long as the pull continues. A slackening of the cord permits the spring between the clamps to resume control, and the latter being thrown outward, instantly grip and hold

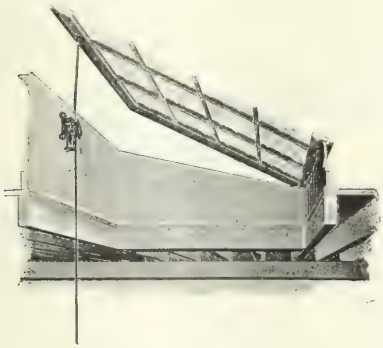


Fig. 2.—The Payson Skylight Operator in Use.

the operating rod. The lock is placed upon a pivot carriage, so that the operating rod easily conforms itself to the sweep of the skylight in opening and closing, and is at all angles free to move in its slides, and is firmly gripped when released from the pull of the operating cord. To open, the cord is pulled until the skylight is raised to the desired hight, when the rope is released and the grip of the lock is automatically fastened upon the rod. In closing the skylight the rope is pulled until it supports the weight of the skylight, when a partial slackening of the line permits it to descend with a speed that is always under control. This control, it is stated, is so positive that the rope may be cut when under full strain and the descent of the skylight will be arrested before it has dropped ⅛ in. The skylight operators weigh about 2 lb. each and are packed ½ doz. in a case.

The Luebkeman Hardware Company, Eau Claire, Wis., has amended its articles of incorporation, changing its name to the Burnham-Benson Hardware Company. C. E. Burnham is secretary of the company under the new title.

Sloan's Aluminum Pancake Griddle.

Included in a line of kitchen specialties made by the Sloan Mfg. Company, 2120 Broadway, Kansas City, Mo., is the aluminum pancake griddle, illustrated in Fig. 1. The novel feature of the utensil is found in the claim that no grease is required on the aluminum surface to prevent

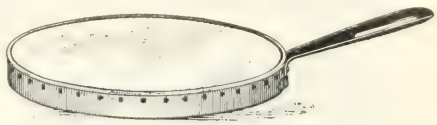


Fig. 1.—Sloan's Aluminum Griddle.

the batter from sticking, provided it is put on when the griddle is hot; the disagreeable smoke and smell of burning grease are thus eliminated. Owing to the high price of the metal cast griddles of pure aluminum, though effective, are necessarily expensive and the aim in this device was to secure the same result at cheaper cost. This is done by the use of a sheet of 16-gauge pure aluminum

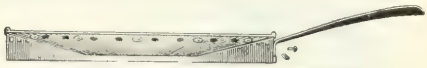
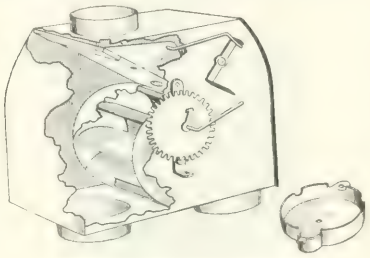


Fig. 2.—Sectional View of Aluminum Griddle.

for the griddle plate, which is 10½ in. diameter. A funnel shaped heat distributor is attached to the under side of the griddle, Fig. 2, by means of which an even heat is secured over the entire surface. The griddle is exceptionally light and is easily handled.

Henkel's Automatic Rain Water Shifter.

The Henkel Mfg. Company, Canal Dover, Ohio, is offering the rain water shifter, shown herewith. It is the design to have one shifter on every down spout leading into the cistern. During a rain the shifter automatically turns the first water from the roof off through the waste spout, and when the stream is running clear it automatically turns it into the cistern. The shifter can be set so that all water will go to waste, if desired, requiring resetting after each rain. It is made of best grade galvanized iron and the gear is cut from brass. There are no springs or intricate mechanism in the construction, and the working parts operate smoothly. The point is made that the shifter will not choke up or freeze although the entire spouting leading to the shifter and



Henkel's Automatic Rain Water Shifter.

the one leading from it may freeze and burst. The advantage in using this device arises from the fact that during a rain fall the first water is usually contaminated with soot, dust, leaves, bird droppings, dirt, &c., all of which are carried into the cistern to breed germs and disease. With the shifter this foreign matter is carried off through the waste spout.

Marlin New Model 24, 12 Gauge Repeating Shot Guns.

The Marlin Firearms Company, New Haven, Conn., is now prepared to furnish the new Model 24 shot gun in grades B, C and D, listing at $30.75, $40.80 and $80, respectively. The guns are referred to as having all the advantages of the Model 24, grade A, described in our issue of March 12 last, including the double extractors, automatic hangfire safety lock and the new takedown construction which allows taking the gun apart very quickly. Grade B has special smokeless steel barrel, with a selected quality black walnut stock and forearm, nicely checked; otherwise it is plain finished throughout like grade A. It is intended for the man who wants every advantage of material and workmanship without expensive ornamentation. Grade C, illustrated in Fig. 1, is made with special smokeless steel barrel, with a selected fancy figured stock and forearm, well finished. The frame is attractively engraved, and the stock and forearm finely checked, all hand work. Grade D, shown in Fig. 2, has imported Circassian walnut stock, specially selected for figure and color, oil filled by the London process which gives a rich, dull surface, brings out all the beauty of the wood and does not show scratches like the highly polished wood. The trigger and all screws in the action are of tool steel, heavily gold plated. The elaborate engraving and checking are spoken of as the highest type of hand work by experts and as combining with the beautiful stock and the imported Damascus barrel to make this an exceptionally fine repeating gun. A new trademark which has been adopted by the company and will be made a feature of its line and advertising in the future, is shown in Fig. 3.

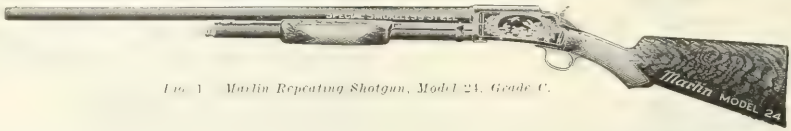


Fig. 1.—Marlin Repeating Shotgun, Model 24, Grade C.



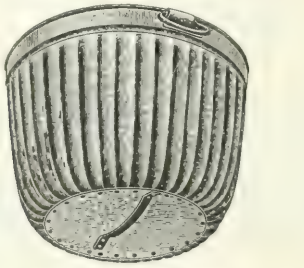
Fig. 2.—Marlin Repeating Shotgun, Model 24, Grade D.



Fig. 3.—The Marlin Co.'s New Trademark.

Concave Bottom Steel Basket.

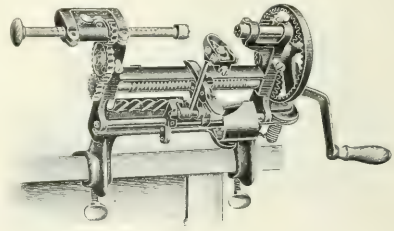
The Steel Basket Company, Cedar Rapids, Iowa, has made a recent addition to its already extensive line of metal baskets in the form of a concave bottom steel basket, especially designed for handling coke in foundries. It conforms in a general way to the pattern of the coal dealers' basket made by the company, but its distinguishing feature is its concave bottom with hand hold provided on the under side, which especially adapts it to foundry use. This arrangement will be appreciated by foundrymen, since it is apparent when used for charging cupolas the hands of the operator are fully protected, and the danger of dropping the basket into the cupola is greatly lessened. The basket is referred to as possessing strength and durability, and being at the same time light and convenient to handle; the close riveting of the double bottom and the fact that the basket has but one seam contribute to its staunchness and serviceability. The style of corrugation employed to impart the desired stiffness and rigidity is claimed to be best calculated to effect this result. By gradually deepening the corrugation toward the bottom it is aimed to meet the point of greatest strain with the most effective resistance, and since the process of corrugating used is such that the metal is in no way strained or weakened, the finished product should possess extreme wear resisting qualities. Having put out a considerable number of the baskets among large foundries where they have met with favor, the company regards their acceptance by these interests as a strong indorsement of their good qualities.



Concave Bottom Steel Basket.

Success Orange Parer.

The Goodell Company, Antrim, N. H., has added to its line of fruit parers the Success orange parer here shown. The company states that there is a growing demand for a machine of this kind from people who make extracts and other products from the skins of citrus fruits. The parer is said to do excellent work. It grips the orange on both sides at the same time, and holds it without cutting through into the pulp. The knife head is so arranged that by the adjustment of only two screws a thick or thin peeling may be removed, which requently comes off in one long strip. The knife head is automatically thrown back into position as soon as the fruit is pared.



Success Orange Parer.

William E. Pratt Mfg. Company.

The William E. Pratt Mfg. Company, 91 Lake street, Chicago, Ill., has recently added to its line of manufactured articles clevises, some wagon hardware malleables, oarlocks, decoys, swivels, &c. The company also makes a large line of hog rings and ringers, including Hill, perfect, Blair, Major, Wolverine, Brown and Champion. During the past year the capacity of its malleable iron foundry has been increased so that it now has a molding floor for something like 300 molders, with capacity close to 10,000 tons of castings per year.

Power Spray Pumps.

Two new power spray pumps, designed and manufactured by F. E. Myers & Brother, Ashland, Ohio, are illustrated herewith. Fig. 1 represents the Myers Pitman Power Spray Pump, as made in the 3-in. size. It is fitted with concave brass valve seats, ground poppet valves, seamless drawn brass lined cylinder and hemp packed plunger. The valves are located on top of the pump, each under an individual cap, and can be removed without disturbing any other parts of the pump. It is fitted with a

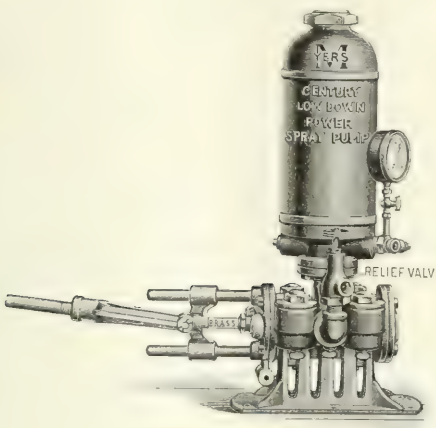


Fig. 1.—Myers Pitman Power Spray Pump.

check valve between the air chamber and pump, which retains the pressure of the air chamber on the nozzles, and relieves the valves of the pump from all strain. The crosshead for power attachment is supported by two heavy steel rods insuring positive alignment under extreme heavy pressure. Fig. 2 represents the Myers Junior Pitman power spray pump with 2-in. brass lined cylinder, ground brass seats and brass ball valves. The valves are located on the side of the pump and can be reached by removing the nut immediately over them. Either valve can be removed separately without disturbing the others. The plunger is hemp packed, adapting it for pumping either hot or cold liquid. The crosshead is operated on drawn steel rods, which are attached directly to the head

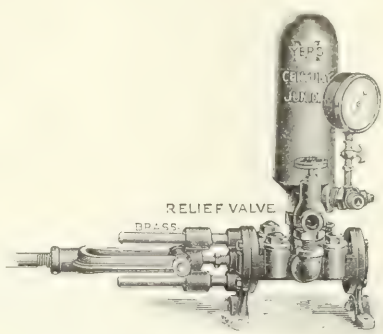


Fig. 2.—Myers Junior Pitman Power Spray Pump.

of the pump. Both pumps are fitted regularly with pressure and safety relief valve.

Seamless Spout Metal Utensils.

Leiller & Thiele, Langsdorf Building, Spring and Crosby streets, New York, have just secured United States patents on the method of making and attaching spouts to their imported line of non-leake Pyro-lite Enameled Ware. The spouts and lips are made in two pieces welded together and to the seamless bodies of the utensils. The welding which is accomplished by a hand tool under oxyhydrogen flame completely fuses the abutting edges, making a perfectly smooth finish. Thus it is claimed that there is no possibility of leaks or rust around the spouts and no danger of springing them loose in handling or shipping. On both Coffee and Tea Pots instead of an enameled hinge, an aluminum hinge is used which will not rust.

The retail Hardware business of the Whitney Hardware Company, Albuquerque, N. M., has been purchased and taken over by the J. L. Bell Company of that city.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal
Linseed, State and West'n, raw	.42 @44
City, Boiled	.45 @46
City, Raw	.41 @45
Raw, Calcutta, in bbls	.50 @ .
Lard, Prime, Winter	.67 @70
Extra No. 1	.55 @.60
No. 1	.47 @52
Cotton seed, Crude, f.o.b. mill	.. @ ..
Summer Yellow, prime	.43½@46
Summer White	.17 @18
Yellow Winter	.17 @18
Tallow, Acidless	.5½ @55
Menhaden, Brown, Strained	.40 @ ..
Light Strained	.50 @ ..
Bleached Winter	.52 @ ..
Ex. Bleached Winter	.44 @ ..
Cocoanut, Ceylon	₱ lb .7½@ .7¾
Cochin	₱ lb .7¼@ .7½
Cod, Domestic, Prime	.42 @44
Newfoundland	.44 @46
Red, Elaine	.9½ @10
Saponified	.5½ @ .5¾
Olive, Yellow	.87 @90
Neatsfoot, Prime	.87 @88
Palm, Lagos	₱ lb .5¾ @ .6

Mineral Oils—

	₱ gal.
Black 29 gravity, 25@30 cold test	.12½@13½
29 gravity, 15 cold test	.13½@14
Summer	.13½@17
Cylinder, light filtered	.20½@21
Dark, filtered	.18 @19
Paraffine, 900-907 sp. gravity	.14½@17
903 sp. gravity	.13½@14
883 sp. gravity	.11 @12½
Red	.13½@14

Miscellaneous—

Barytes:	
White, Foreign	₱ ton $18.50@20.50
Amer. floated	₱ ton 18.00@20.00
Off color	₱ ton 13.00@16.50
Chalk, in bulk	₱ ton 3.00@ 3.10
China Clay, Imported	₱ ton 11.50@18.00
Cobalt, Oxide	₱ 100 lb. 1.45@ 2.60
Whiting, Commercial	₱ 100 lb. .42@ .52
Gilders	₱ 100 lb. .55@ .60
Ex. Gilders	₱ 100 lb 60@ .65

Putty, Commercial—

	₱ 100 lb
In bladders	$1.70 @1.80
In bbls. or tubs	1.20 @1.45
In 1 lb. to 5 lb. cans	2.85 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—

	₱ gal.
In Oil bbls	.45½@46
In machine bbls	.46 @46½

Glue—

	₱ lb
Cabinet	.12 @15
Common Bone	.9 @ ..
Extra White	.19 @21
Fish, liquid, 50 gal, bbls., per gallon	.60 @1.20
Foot Stock, White	.12 @14
Foot Stock, Brown	.9 @10
German Common Hide	.10 @12
German Hide	.12 @18
French	.10 @10
Irish	.13 @16
Low Grade	.10 @12
Medium White	.14 @17

Gum Shellac—

	₱ lb
Bleached, Commercial	@20
Bone Dry	@25
Button	@30
Diamond I	.17 @18
Fine Orange	.29 @32
A. C. Garnet	.23 @24
G. A. L.	.18 @19
Kala Button	.17 @18
D. C.	.18 @19
Octagon B	.28 @30
T. N.	.23½@24
V. S. O.	.17 @18

Colors in Oil—

	₱ lb
Black, Lampblack	.12 @14
Blue, Chinese	.36 @46
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @14
Green, Chrome	.12 @16
Green, Paris	.. @24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, English white, in Oil	.10½@10¾
Lead, American White:	
Lots of 500 lbs. or over, in Oil	@ 6¾
Lots less than 500 lb, in Oil	@ 7¼
Lead, White, in oil, 25 lb tin pails	@ 7½
Lead, White, in oil, 12½ lb tin pails	@ 7¾
Lead, White, in oil, 1 to 5 lb packages	@ 8¾
Lead, American Terms: On lots of 500 lbs and over 2% for cash if paid in 15 days from date of invoice.	

Zinc, Dry—

	₱ lb
American, dry	5½@ 5¾
Red Seal (French process)	6¾@ 7
Green Seal (French process)	7¼@ 7½
German, Red Seal, French process	@ 7
Green Seal	7¼@ 7¾
White Seal	7¾@ 8¼
French, Red Seal	7¼@ 7½
Green Seal	7¾@ 8

Dry Colors—

	₱ lb
Black, Carbon	6½@10
Black Drop, American	3½@ 8
Black Drop, English	5 @15
Black, Ivory	.16 @20
Lamp, commercial	4 @ 6
Blue, Celestial	.4 @ 6
Blue, Chinese	.31 @ 3
Blue, Prussian	.29 @31
Blue, Ultramarine	.3½@15
Brown, Spanish	.1½@ 1
Carmine, No. 40	$3.10@3.25
Green, Chrome, ordinary	.3½@ 5
Green, Chrome, pure	.17 @25
Lead, Red, bbls., ½ bbls., kegs	@ 6¾
Litharge, bbls., ½ bbls., kegs	@ 6¾
Ocher, American	₱ ton $8.50@16.00
American Golden	.2½@ 3½
French	.1½@ 2
Foreign Golden	.1 @ 1
Orange Mineral, English	.10 @12
French	.12½@ ..
German	.12 @15
American	.3½@ 3¾
Red, Indian, English	.4 @ 6
American	.2 @ 3
Red, Turkey, English	.4 @10
Red, Venetian, English	.7 @12
Red, Venetian, Amer.	₱ 100 lb $0.50@1.25
English	₱ 100 lb $1.15@1.60
Sienna, Italian, Burnt and Powdered	.3 @ 9
Italian, Raw, Powdered	.3 @ 7
American, Raw	.2 @ 3
American Burnt and Pow'd.	.1½@ 2
Tale, French	₱ ton $18.00@25.00
American	₱ ton 15.00@25.00
Terra Alba, French	₱ 100 lb .90@ 1.00
English	₱ 100 lb .85@ 1.00
American	₱ 100 lb No. 1 .75@ .80
American	₱ 100 lb No. 2 .65@ .85
Umber, Turk. Ext. & Pow.	.2½@ 7
Turkey, Raw and Powdered	.2½@ 7
Burnt American	.1½@ 2
Raw, American	.1 @ 1
Yellow, Chrome, Pure	.13½@15
Vermilion, American Lead	.7 @ 8
Quicksilver, bulk	.65 @ ..
Quicksilver, flasks	.66 @ ..
English, Imported	.65 @ ..
Chinese	$1.00@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the retail trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol *@*. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent 35%
Taplin's Perfection 35

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ℔ doz. pairs, Nos. 1, $0.75; 2, $0.80; 4, $1.00; 5, $0.50.
Fernald Quick Shifter.....℔ doz pairs .....$2.00@$3.00

Anvils—American—

Eagle Anvils.....℔ lb @8½¢
Hay-Budden, Wrought ....9½@9¾¢
Trenton .....℔ lb 9½@9¾¢

Imported—

Swedish Solid Steel Sisco, Superior, ℔ lb.....10@10½¢
Peter Wright & Sons, ℔ lb, 84 to 319 lb. 11¢, 350 to 630 lb. 11½¢.

Anvil, Vice and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....10%

Augers and Bits—

Com. Double Spur....75&10@80
Jennings' Pats., Bright.65&10@70
Black Lip or Blued...65&10&5
Boring Mach. Augers.....70
Car Bolt Twist, Tri-C.....40&10
Ford's Auger and Car Bits.....40&5%
Ft Washington Auger Co., Cincinnati 35
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, 25&5%
No. 30, R. Jennings' list.....50
Russell Jennings'.....25&10&5%
L'Hommedieu Car Bits.....15%
Mayhew Countersink Bit.....45
Pugh's Bits 20
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's Pattern, No. 1, ℔ doz. $26; No. 2, $18.....60&10
Ives' Clark's Pattern .....60 &5
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $26.00.....60&10
Swan's 60

Gimlet Bits—

Per gro
Common Ibbl. Cut.....$3.00@3.25
German Pattern, Nos. 1 to 10, $3.75; 11 to 13, $3.75

Hollow Augers—

Bonner Pat., per doz. $7.50@6.00
Ames .....25&10
Universal 20

Ship Augers and Bits—

Ship Augers.....70&10@%
Ford's .....33⅓&5
C. E. Jennings & Co.:
L'Hommedieu's 6
Watrous' .....33⅓&7½
Snell's 48

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdld., Shldrd.. gro.6.75@6
Unhandled, Patent..gro.66@70c
Pegging Awls:
Unhandled, Patent...gro. 3.00@3c
Unhdld., Shldrd.. gro. 6.75@7c
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle.*

Axles—

Iron or Steel.
Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose...4¾@5¼¢
No. 1½ Com., New Style..4½@5 ¢
No. 2 Solid Collar.....4¾@5 ¢
Half Patent:
Nos. 7, 8, 11 and 12..65@65&10%
Nos. 13 to 14.....65@65&10
Nos. 15 to 18.....70@70&10
Nos. 19 to 22.....70@70&10

Boxes, Axles—

Common and Concord, not turned .....lb., 5@6c
Common and Concord, turned, lb., 6@7c
Half Patent.....lb..9½@10c

Bait—Fishing—

Hendryx:
A Bait.....20
B Bait 25
Competitor Bait.....20&5

Balances—Sash—

Caldwell new list.....50&10%
Pullman .....50&10%

Spring—

Spring Balances.....50&10@60%
Clothlines:
Lard Spg. Balances.....50&10&5%
Straight Balances .....40@50&5
Circular Balances.....50&10%
Large Dial 50

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 50 lb... per lb., 2¼@2½¢

Towel—

No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beam, Scale—

Scale Beams.....50
Chattillon's No. 1.....30%
Chatillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.80; Tinned .....$.85
No. 11 Wire Coppered ℔ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned.....℔ doz. $1.50

Beaters Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd. $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.: T. & S. Dover.....$6.50

Bellows

Blacksmith, Standard List:
Split Leather.....50@50&10@65%
Grain Leather.....50@50&10 %

Hand—

Inch.. 6 7 8 9 10
Doz..$5.00 5.50 6.00 6.50 7.50

Molders—

Inch.. 10 12 14 16
Doz..$7.50 9.00 12.00 15.00

Bells—Cow—

Ordinary Goods...75&5@75&10&15%
High grade.....70&10@75%
Jesse .....75&10
Texas Star.....60

Door—

Home, R. & E. Mfg. Co.'s.....55&10%

Hand—

Polished, Brass.....50&10@60%
White Metal.....50&10@50&10&5%
Nickel Plated.....50&5
Swiss .....50&5
Cone's Globe Hand Bells.....33⅓@35

Miscellaneous—

Farm Bells.....lb., 2¼@2½¢
Church and School....60@60&5%

Belting—Leather—

Standard .....50&10@70&10&5%
Light .....75&10%
Cut Leather Lacing.....50&10%
Leather Lacing Sides, per sq. ft. 22@23¢

Rubber—

Competition (Low Grade), 70&10@75&5
Standard .....60@60&10%
Best Grades.....33⅓@40&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 25

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Spokes.....50
Tubes 60

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks Tackle—

Common Wooden.....75&75&5%
R. & L. B. Co.:
Boston Wood Snatch, 50; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50; Tarbox Metal Snatch, 50; Tarbox New Style Steel, 50&10; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Jaws 30
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....75%
Embossed 55%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Kendel & Esser Co.....33⅓%

Bolts

Carriage, Machine, &c,—

Common Carriage Cut Thread:
⅝ x 6 and smaller..75&5@—%
Larger and longer.....70&5
Phila. Eagle, $3.00 list...80&5
Bolt Ends .....70&5
Machine Cut Thread:
⅜ x 6 and smaller..75&10&5 %
Larger and longer.....70&5 %

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knobs:

Inch	*4*	*5*	*6*	*8*
Per doz	*$0.90*	*.95*	*1.05*	*1.80*

Cast Iron Spring Foot, Jap'd:

Inch	*6*	*8*	*10*
Per doz	*$1.20*	*1.50*	*2.25*

Cast Iron Chain, Flat, Japanned:

Inch	*6*	*8*	*10*
Per doz	*$1.00*	*1.40*	*1.65*

Cast Iron Flat Shutter, Jap'd, Brass Knobs:

Inch	*6*	*8*	*10*
Per doz	*$0.75*	*.95*	*1.25*

Wrought Barrel Jap'd..80@80&10%
Barrel Bronzed.....60&10%
Spring .....70&10@70&10&5%
Shutter .....50&5@50&10&5%
Square Neck.....75@75&10%
Square .....70&10@10%
Ives' Patent Door 35
Ives' Wrought Metal.....45%

Expansion—

F. H. Evans' Crescent.....40@60%
Richards Mfg. Co.....55&10%
Steward & Romain Mfg. Co.:
Style No. 13, Double.....60%
Style No. 1, Single.....60%
Style No. 100, Dbl. Jaw, Single..55%
Lag Screw.....66⅔%

Plow and Stove—

Plow .....65@50&10
Stove .....50@50&5

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Co.:
Norway Phila. list Oct. 16, '84...80
Eagle Phila., list Oct. 16, '84..82½
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80
Eagle Phila., list Oct. 16, '84..82½
Eclipse, list Dec. 28, '99.....80
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct. '84.....80%
Eagle 82½
Shelton Co.:
Tiger Brand, list Dec. 28, '99...80%
Phila., Eagle, list Oct. 16, 1884..82½%
Upson Nut Co.:
Tire Bolts 72½

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch	*1*	*1¼*	*1¾*	*2*
Per doz	*$4.80*	*5.50*	*6.40*	*8.00*
Inch			*2¼*	*2½*
Per doz			*$8.65*	*11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25

Boxes, Mitre—

C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 20&10 : Langdon Acme .....15&10%
Perfection 40%
Seaver's 45

Braces—

Comman Ball, American....$1.50
Barber's .....50&10&10@60&10
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 125, 207 to 213 60
C. E. Jennings & Co.....30&5
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat....60&10%

Brackets—

Wrought Steel....70&10@75&10%
Bradley Metal Clasp...80&10@80&10&5%
Griffin's Pressed Steel.....75@75&10%
Griffin's Folding Brackets.....70&10%
Taplin Victor Handy Egg Beater Bracket .....℔ doz. $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co .....75&20%
Wire Goods Co.....75

Buckets, Galvanized—

Mf'r's list, price per gross.

Quart..	*10*	*12*	*14*	
Water, Reg...	*25.35*	*28.00*	*32.00*	10@75%
Water, Hvy...	*45.35*	*48.00*	*52.00*	
Fire, Rd. Btm..	*32.00*	*34.65*	*38.65*	
Well	*37.35*	*41.35*	*45.35*	

Bull Rings—See *Rings, Bull.*

Butts—Brass—

Wrought, High List, Oct. 26,'06.55%
Cast Brass, Tiebout's 45

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—

Bright.
Light Narrow, Light Reversible .....70&5
Reversible and Broad..70&5
Steel Joint, Narrow, Light Inside Blind, &c 70
Back Flaps, Table Chest..65%
Japanned.
Light Narrow, Loose Pin, ...70&5
Light Narrow, Ball Tip..60%
Broad .....70&5
Steeple Tipped 70%
Ball Tipped.....70%

Extra, 10@—

Cages, Bird—

Hendrixs Brass, Series 2000, 5000, 1100 net list, 1250, 15 ... 20, 30, 50, 60 ... 80
Hendrixs Bronze, Series 700, 800 ... 40
Hendrixs Enameled ... 35

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 4 prong, per lb. ... 4½@5¢
Sharp, 4 prong, per lb. ... 5½@6¢
Burkes' Blunt, Toe or Heel, per lb. ... 5¢
Burkes' Blunt, Toe or Heel, Sharp, per lb. ... 5½¢
Lanter Blunt, Toe or Heel, Sharp, per lb. ... 5½¢
Parkers' Blunt, per lb., 8 to 1 lb., Sharp, per lb. ... 1 15¢

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Elley's, E. B. ... 35@75¢
G. D. ... per M 45@55¢
E. E. ... per M 90@125¢
G. E. ... per M 180@200¢
Musket ... per M 60@65¢

Primers—

Berdan Primers, $2 per M ... 20@25
Primer Shells and Bullets, 15@20
All other primers per M, $1.50@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:
22 C. F., $5.50 ... 10@15
38 C. F., $7.00 ... 10@15
22 cal. Rim, $1.50 ... 10@15
32 cal. Rim, $2.75 ... 10@15
B. B. Caps, Cen. Ball, Swgd $1.00
B. B. Caps, Round Ball ... $1.10
Central Fire ... 65
Target and Sporting Rifle, 15@75
Primed Shells and Bullets, 15@10%
Rim Fire, Sporting ... 50
Rim Fire, Military ... 15@75

Casters—

Bed ... 65@70
Plate ... 40@65
Philadelphia ... 70@80
Acme, Ball Bearing ... 55
Gem (Roller Bearing) ... 70&10&10%
Steel Gem ... 20%
Standard Ball Bearing ... 45
Yale (Double Wheel) low list ... 40&10

Cattle Leaders—→

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:
3/16 ... 4¼
5/16 ... 3.75 3.75 3.75 3.75 3.75
3/8 ... 3.75 3.75 3.75 3.75 3.75
7/16, 1 ... 1¼ to 1¾ inch.
$3.75 ... 3.75 ... 4
In cask lots, deduct 25¢.
German Coil ... 60@60&5
German Pattern Coil:
6-0 to 1 ... 70@75&10&10%
2 and 3 ... 60@70@60&10&10
4, 5 and 6 ... 50@60@50&10&10

Halter—

Halter Chains ... 60@60&5
German Pattern Halter Chains, list July 21, '07 ... 60@60&5
Covert Mfg. Co.:
Halter ... 35&5

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard—Iron to 6½—6-2, Straight, with ring $2.00
6½—6-2, Straight, with ring $2.00
6½—6-2, Straight, with ring $2.00
6½—6-2, Straight, with ring $2.00
NOTE—Add 20 per pair for Heads. Trot Traces: add per pair for No. 0 and 2, 15; No. 0, 5¢ to price of Straight Lock.
Eastern Standard Traces, Wagon Chain, &c. ... 60@60&10@10&5

Miscellaneous—

Jack Chain, list July 10, '07:
Iron ... 60@10&10%
Brass ... 65
Safety and Plumbers' Chain ... 75
Gal. Pump Chain ... *lb., 4½@5¢*
Bridgeport Chain Co.:
Triumph Halter and Coil ... 35&2½&10
Triumph, Dog ... 50&10&60
Brown Halter and Coil ... 15@60&5
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion ... 45
Oneida Community:
American Halter, Dog and Kennel Chains ... 30&10%
Niagara Dog Leads and Kennel Chains ... 45@50&5
Wire Goods Co.:
Dog Chain ... 75
Universal Dbl. Jointed Chain ... 50

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain ... 60%
Pullman:
Bronze Chain, 60%; Steel Chain, Copper'd ... 60&10
Sash Chain Attachments, per set ... 8¢
Aluminum Sash Ribbon, per 144 ft ... $2.00&5&10
Sash Ribbon Attachments, per set ... 8¢

Chalk—→ (From Jobbers)

Carpenters' Blue ... gro. 70@75¢
Carpenters' Red ... gro. 175@75¢
Carpenters' White ... gro. 40@45¢

Checks, Door—

Bardsley's ... 6
Pullman, per 25 ... $1
Russwin ... 50

Chests, Tool—

American Tool Chest Co.:
Boys' Chests ... No. Tools ... 50
Youths' Chests, with Tools ... 75
Gentlemen's Chests, with Tools ... 25%
Farmers', Carpenters, etc., Chests, with Tools ... 25%
Machinists' and Pipe Fitters' Chests, Empty ... 45%
Tool Cabinets ... 45
C. E. Jennings & Co.'s Machinists' Tool Chests ... 25%

Chisels—

Socket Framing and Firmer

Standard List ... 80@10&10
Buck Bros ... 40
C. E. Jennings & Co.:
Socket Firmer Nos. 1 to 4 ... 25&7½
Socket Framing No. 15 ... 25&7½
Swan's ... 60@70
L. & I. J. White & Co. ... 30@40&5

Tanged—

Tanged Firmers ... 30@50&5
Buck Bros ... 35
C. E. Jennings & Co. Nos. 191, 181 ... 25%
L. & I. J. White Co. ... 25&5

Cold—

lb.
Cold Chisels, good quality, 13@15¢
Cold Chisels, fair quality, 11@12¢
Cold Chisels, ordinary ... 9@10¢

Chucks—

Almond Drill Chucks ... 35
Almond Turret Six-Tool Chuck ... 40
Beach Pat. each $8.00 ... 35&5
Empire ... 35
Blacksmiths' ... 25
Jacobs' Drill Chucks ... 35%
Pratt's Positive Drive ... 25
Skinner Patent Chucks:
Independent Lathe Chucks ... 35%
Universal, Reversible Jaws ... 35%
Combination, Reversible Jaws ... 35%
Drill Chucks, New Model, 25%
Standard, 45%; Skinner Pat. 25%; Positive Drive ... 40%
Planer Chucks ... 20%
Face Plate Jaw Chucks ... 35%
Standard Tool Co.:
Improved Drill Chuck ... 45%
Union Mfg. Co.:
Combinations, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40 ... No. 21, 25
Scroll Combinations, Nos. 83 and 84 ... 25
Geared Scroll, Nos. 33, 34 and 35 ... 25
Independent Iron, Nos. 18 and 318 ... 35
Independent Steel, Nos. 64 ... 25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104 ... 35%
Union Czar Drill ... 25
Universal, 11, 12, 16, 17, 13, 14, 15 ... 40%
Universal, No. 42 ... 25
Iron Face Plate Jaws, Nos. 28, 29, 18 and 50 ... 25
Steel Face Plate Jaws, No. 70 and 72 ... 50
Westcott Patent Chucks:
Lathe Chucks ... 50
Little Giant Auxiliary Drill ... 50
Little Giant Dovetail Grip Drill ... 50
Little Giant Drill, Improved ... 50
Oneida Drill ... 50
Scroll Combination Lathe ... 50
Whitaker Mfg. Co.:
National Drill ... 25

Clamps—→

Adjustable Hammers ... 20@20&5
Carriage Makers', P., S. & W. Co. ... 50&10
Body, Parallel ... 25@ X10
Morse Hay Rack ... 45
Linsman's Swedish Neverturn ... 65
Wood Workers' Hammers ... 40&10
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain,

Iwan's Champion, Adjustable ... 50%
Iwan's Champion, Stationary ... 40%

Sidewalk—

Star Socket. All Steel ... ₰ doz. $1.05 net
Star Shank. ... Other Shank ... 4 net
W. & C. Shank, All Steel ... 7 1/2c.
7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Enterprise ... 30
Eagle Co. R. Plomb ... 25
L. & I. J. White Co. ... 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Co.:
1902 Chicago Horse, each ... $10.75
20th Century Horse, each ... $5.00
Lightning Horse, each ... $15.00
Chicago Belt Horse, each ... $20.00
Stewart's Enclosed Gear Horse, each ... $6.75
Stewart's Patent Sheep Shearing Machine, each ... $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each ... $9.75

Clips, Axle—

Regular Styles, list July 1, '05 ... 80&10&10

Cloth and Netting, wire—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c ... 75
Compression Bibbs ... 75

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list ... 40
Leather, Walter B. Stevens & Son's list ... 40

Compasses, Dividers, &c.

Ordinary Goods ... 70@10&5
Wm. Sellers & Co.:
Excelsior Dividers ... 60%
Lodi Dividers ... 70&10%

Conductor Pipe,—

L. C. L. to Dealers:

	Gal. Steel.	Charcoal Iron.
Northeastern	70&10&2½	70&10&2½
Eastern	70&10&2½	70&10&2½
Pittsburgh	70&10&5	60
Central	75&10	60
Northwestern	75&10	60
Western	70&10&5	70&10&2½
Tennessee	70&10%	50&10&2½
Southern	70	50&10&2½
Southwestern	70	50&10&5

Terms, cash in 30 days. For long shipments quantity delivered.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:
Gal ... 3 4 5 6 7 8
Galvanized Lined ... $1.50 $2.00 $2.25 $2.50 $3.00 $3.50
Galvanized Lined, Side Handles.
Gal ... 3 4 5 6 8
Each ... $1.95 $2.15 $2.40 $3.30 $4.15
White Enameled ... 10%
Agate Lined ... 10%

Coppers' Tools—

See *Tools, Coppers'.*

Coppers, Soldering—

Soldering Coppers, 3 lb. to pair and heavier, 22@25¢; lighter than 3 lb. to pair ... 24@27¢

Cord—Sash—

Braided, Drab ... *lb.* 35¢
Braided, White, Com., Nos. 8 to 12, 20¢; No. 7, 20½¢; No. 6, 21½¢. In lots of 12 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18, 23¢; B, 22¢
Common Italian ... *lb.* 18@18½¢
Cotton Sash Cord, Tufted ... 18@25¢
Patent Russia ... *lb.* ... 20¢
Cable Laid Russia ... *lb.* ... 21¢
India Hemp, Braided ... *lb.* ... 21¢
India Hemp, Twisted ... *lb.* 19@21¢
Patent India, Twisted ... *lb.* 17¢
Pearl Braided ... ₰ lb. 40¢
27½¢; No. 7, 28½¢; Nos. 8 to 12, 26¢
Eldredge Braided Nos. 8 to 12, 26¢; 7, 26½¢; 6, 27½¢
Harmony Cable Laid Italian, Nos. 7 to 12 ... ₰ lb. 23¢
Pullman:
Wire Sash Cord ... 10%
Sash Cord Attachments, per 100 ... $2.00
Samson, Nos. 8 to 12:
Braided, ₰ lb., Drab Cotton, 55¢; Italian Hemp, 40¢ ₰ 50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord ... 50¢
Massachusetts, White ... ₰ lb 40¢
Massachusetts, Drab ... ₰ lb 35¢
Phoenix, White, Nos 8 to 12 ... 37¢
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, Drab, 35¢; White, 45¢
See also Chain and Ribbon.

Wire, Picture—

Full Length ... 90@1
Short Length ... 70@80&5
Hendryx Standard Wire Picture Cord, old list, 85&10
Turner & Stanton Co. Wire Picture Cord ... 85&10

Cradles—

Grain ... 70@125

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers.
Zschocke's Lumber ... ₰ gro
White and Purple, Indelible ... $7.50
Blue, Red, Green, Yellow and Twin Out ... Black ... $4.50
Giant Lumber, 5½ in., 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks ... $10.00
Genuine Soapstone, Metal Workers', 9 in. x ¾ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16 ... $3.00
Suremark, Black, $2.25; Blue, Red and Yellow ... $2.50

Crooks, Shepperds'—

East Madison, per doz., Heavy, $5.50
Light ... $5.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden ... 50

Cutlery, Table—

International Silver Company:
No. 12 M'd'n Knives, 1847 ₰ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor ... ₰ doz. $3.00
Wm. Rogers & Son ... ₰ doz. $2.50

Cutters—Glass—

H. H. Meeker Co. ... 40
Red Devil ... 35
E. M. C. ... 35
Wedge ... 35

Meat and Food—

Angel ... 30
No. ... 1½ 1¾ 1 1¼ 1½ 1¾ 2
Each ... $5 $5 $5 $5 $5 $5 $6
Enterprise:
No. ... 10 12 ... 22 ... 32 ... 42
Each ... $1.50 $2.75 $3 $4 ... 25 ... 35&7½
No. 202, $1.50 ... 40&7½
P., S. & W. ... 50
Dandy ... 50
No. ... 1 ... 2 ... 3 ... 4
... $14.00 $17.00 $19.00 $30.00
Handy ... 40&10&5
Home ... 60&10&5
Little Giant ... ₰ doz. 40@50
No. ... 312 ... 410 ... 50
... $5.00 $11 ... $7.50 $6
New Triumph No. 605, ₰ doz. $24.00 ... 30&10
Russwin Food, No. 1, $24.00; No. 2, ... 45&10&1
... $15.00 $18.00
Enterprise Beef Shavers ... 25@30

Slaw and Kraut—

Henry Disston & Son ... 50
Slaw and Kraut Cutters ... 35
Gem Graters ... 25@50
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife ... ₰ doz. $3.00
Combined Slaw Cutter and Coal Grater ... ₰ doz. $4.00

Tobacco—

All Iron, Cheap ... *doz., $4.25@4.50*
Enterprise ... 25@50
National, ₰ doz. No. 1 $3, No. 2 $18 ... 40

Diggers, Post Hole, &c—

Disston:
Reach, ₰ doz., $24.00 ... 25
Samson, ₰ doz., $34.00 ... 25%
Iwan's Imp'ved Post Hole Auger ... 40%
Vaughan Pattern Post Hole Augers:
₰ doz., $7.00
Perfection Post Hole Diggers, ₰ doz. ... $8.75
Split Handle Post Hole Diggers, ₰ doz., $7.75
Hercules Pattern, ₰ doz. ... 50 10
Kohler's, ₰ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $8.00; Rival, $8.50; Pioneer ... $7.50
Never-Break Post Hole Diggers, ₰ doz., $24.00 ... 60%

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers Emery Wheel—

Sterling Emery Wheel Dressers ... 35%
Sterling Wheel Dresser Cutters ... 35

Drills and Drill Stocks—

Blacksmith's Common Drilling Machines ... $1.50@1.75
Breast, Millers Falls ... 15&10
Breast, P., S. & W. ... 50
Goodell Co., Ratchet Drills ... 50&10&10&10
Millers Falls Automatic Drills, 33⅓&10
Ratchet, Curtis & Curtis ... 25%
Ratchet, Parker's ... 10%
Ratchet, Seaton's ... 40%
Ratchet, Weston's, Style H Improved ... 40
Ratchet, No. 012 ... 40%
Ratchet, Celebrated ... 40%
Ratchet, Whitney's, F., S. & W., ... 50&5
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00 ... 35%

Twist Drills—

Bit Stock ... 70@70&5
Taper and Straight Shank, ... 60@60&10

Drivers, Screw—

Screw Driver Bits, per doz., 75¢@1.50
Buck's Screw Holder and Driver, ₰ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9 ... 50%
Buck Bros.' Screw Driver Bits ... 30%
Champion ... 50
Disston ... 70
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers ... 15&10
Fray's Double Action Ratchet ... 35
Goodell Auto ... 65@65&10
Mayhew's Black Handle ... 40%
Mayhew's Monarch ... 40%
Millers Falls, Nos. 20 and 21 ... 25&10%
Millers Falls, Nos. 11, 12, 41, 42 ... 15&10%
Smith & Homeway ... 50
Stanley, 66½ ... Elmora, 60 ... Stratton, 70&10
Swan's:
Nos. 7565 to 7568, 50%; No. 7549, ... 10&10

Eave Trough, Galvanized—

	Charcoal. Terr. Gal. Steel.	Iron.
Northeastern	75&10&2½	60&10&2½
Eastern	80&10&2½	60&10&2½
Pittsburgh	80&10	65&10
Central	80&10&10&2½	65&10
Northwestern	80&10&10%	65&10%
Western	80&10%	60&10&5
Tennessee	80&5	60&10&5
Southern	80%	60&10&5
Southwestern	75&10&2½	60&10

Terms,—2% to cash. Factory shipments generally delivered.
Note.—Lower prices are made in some sections.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. I. Standard Gauge ... 50&10&10
No. 26 ... 40
No. 27 ... 35
No. 28 ... 30
No. 29 ... 10

Elbows, Stove Pipe—

Edwards, Standard Blue ... 40&10&10%
Edwards, Royal Blue ... 40&10&10%
Reeves, Dover, one piece ... 40&10%

Emery, Turkish—

	1/10	5/10	
	1/6:	2/10:	Flour.
Kegs ... *lb*	7 ¢	5½¢	4¢
½ Kegs ... *lb.*	7½¢	6 ¢	4½¢
¼ Kegs ... *lb.*	8½¢	6 ¢	4½¢
10-lb. cans,			
10 in case ...	6½¢	7 ¢	6 ¢
10-lb. cans, less than 10 ...	10 ¢	10 ¢	8 ¢
Less quantity	10 ¢	10 ¢	8 ¢

NOTE: Labels 1¢ to 2 cents a thousand of 100 to gross.

Extractors, Lemon Juice—

—See *Squeezers, Lemon.*

Fasteners, Blind—

Carpenters' .....50&10%
Clinch ..... 40&10%
Lyons Patent 40%

Cord and Weight—

Hess and Titus 33⅓

Corrugated—

Acme Corrugated Fasteners 75

Faucets—

Cork Lined ..... 5 to 10&10%
Metallic Keg, Leather Lined, ... 20&10%
Red Cedar ..... 40&5% 40&10&5%
Petroleum ..... 70&10&4.75%
B. & L. B. Co:
Metal Key ..... 60&10%
Staf ..... 60&10%
West Lock ..... 50&10%
John Sommer's Peerless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Mtl Key..50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock 40%
John Sommer's I X L Cork Lined 50%
John Sommer's Reliable Cork Lined ..... 50&10%
John Sommer's Chicago Cork Lined..60%
John Sommer's O. K. Cork Lined 50%
John Sommer's No Brand, Cedar 60%
John Sommer's Perfection, Cedar 40%
Self Measuring:
Enterprise, ₱ doz. $36.00 ..... 40&10%
Lane's, ₱ doz $36.00 ..... 40&10%
National Measuring, ₱ doz. $36.40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List Nov. 1, 1899.
Best Brands ..... 70&10@75&10%
Standard Brands ..... 75&10@80%
Lower Grades ..... 75&10&4%@80&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 ..... 33 1-3@40%

Fixtures, Fire Door—

Allith Underwriters' Approved.....50%
Richards Mfg. Co:
Universal, No. 103; Special, No. 104 ..... $3.75
Fusible Links, No. 96 ..... 50%
Expansion Bolts, No 107 ..... 60&10%

Grindstone—

Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.60*	*3.85*	*4.45*	*4.65*

P. S. & W. Co 25
Readin Hardware Co 60%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1905, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato ..... 60&10%
Victor, Hay ..... 60&15&2½%
Victor, Manure 66⅔
Victor, Header 65%
Champion, Hay 60%
Champion, Header 65%
Champion, Manure ..... 60&15&2½%
Columbia, Hay ..... 60&20%
Columbia, Manure 70%
Columbia, Spading ..... 70&12½%
Hawkeye Wood Barley 40%
W. & C Potato Digger ..... 60&10%
Acme Hay ..... 60&20%
Acme Manure, 4 tine ..... 60&10&5%
Dakota Header ..... 60&20%
Jackson Steel Barley ..... 60&20%
Kansas Header 65%
W. & C Favorite Wood Barley 40%
Plated.—See Spoons.

Frames— Wood Saw—

White, S'g't Bar, per doz. .75@$0.80
Red, S'g't Bar, per doz. $1.20@1.25
Red, Dbl. Brace, per doz $1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.25*	*$1.60*	*$1.80*	*$2.20*	*$2.80*

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp $2.75
Cotton 3 20
Waterproof Sgl. Taped.. 3 65
Waterproof Dbl Taped.. 4.40
Waterproof Tpl. Taped.. 5.15

Gates, Molasses and Oil—

Stebbins' Pattern ..... 80@80&8%

Gauges—

Marking, Mortise, &c .50@50&10%
Cary Stebbins Co:
Marking, Mortise &c ..... 50&50&10%
Disston's Marking, Mortise &c 67½
Wire, Brown & Sharpe's 33⅓
Wire, P. S. & W. Co 33⅓

Gimlets— Single Cut—

Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2. $2.40
Spike, Metal, No. 1, $4.00; 2. $3.50
Nail, Wood Handled, No. 1, $2.40; 2. $2.60
Spike, Wood Handled, No. 1, $3.00; 2. $3.60

Glass, American Window

See Trade Report

Glasses, Level—

Clark Stebbins Co ..... 65@65&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush ..... 25&10@50%
Elwell's 66⅔

Grease, Axle—

Common Grade....gro. $6.00@6.50
Dixon's Everlasting, 10 lb. pails or 50 lb. in boxes, ₱ doz., 1 lb. $1.20; 2 lb. $2.00
Helmet Hard Oil 25%

Griddles, Soapstone—

Pike Mfg. Co ..... 33⅓@33⅓&10%

Grinders—

Royal Mfg. Co.:
Aluminum Grinding Machines, each, No. 2, $1.75; 1A. $2.50; 10, $5.00 ..... 30%
Aludum Sickle Grinders, each, No. 20 $5.00; 20A. $6.00, 20A Combined $6.50 ..... 30%
Aludum Disc Grinders, each, $2.50 ..... 30%

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., $2.90 ..... 33⅓%
Richardson Mfg. Co. Ball and Cycle Ball Bearing, mounted 40%

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... 60&5@60&10%
Bridgeport Chain Co.:
Triumph Coil and Halters..35&2½&10%
Brown Coil and Halters ..... 45&10&5%
Brown Cow Ties ..... 50&5&10&5%
Brown Tie Outs ..... 70&10&75&5%
Covert Mfg Co.:
Web ..... 30&2%
Jute Rope 35%
Sisal Rope 45%
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am. Coil and Halters ..... 40@40&5%
Am. Cow Ties ..... 45@50%
Niagara Coil and Halters..45@50&5%
Niagara Cow Ties ..... 45&5@50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists' ..... 55&10@55&10&5%
Heller's Farriers' ..... 40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel ..... 40&10%
Planing ..... 40&10%
Riveting ..... 40&10%
Machinists ..... 40&10%
Blacksmiths 50
Fayette R. Plumb 40%
A. E. Nail ..... 40&2½@40&12½%
Eagle and B. S. Hood ..... 40&5&5%
Machinists' Hammers 40%
Riveting and Tinners' ..... 40&5&5%

Heavy Hammers and Sledges—

Under 3 lb., per lb. ..... 5@...80&10%
3 to 5 lb., per lb. ..... 5@...80&10%
Over 5 lb., per lb., 30@.....
Over 5 lb., per lb., 30@.....80&10&10%

Handles—

Agricultural Tool Handles

Axe, Pick, &c ..... 6@40&10&5%
Hoe, Rake, &c 40%
Fork, Shovel, Spade, &c.:
Long Handles 40%
D Handles 50%

Cross-Cut Saw Handles—

Atkins 40%
Champion 50%
Disston's 40%

Mechanics' Tool Handles—

Auger, assorted....gro. $3.00@$3.50
Brad Awl ..... gro. $1.05@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@$2.65; Hickory ..... $2.15@2.40
Socket Firming, Apple, $1.75@$1.95; Hickory ..... $1.60@$1.75
Socket Framing, Hickry, ... $1.60@$1.75
File, assorted ..... gro. $1.30@$1.40
Hammer, Hatchet, &c. ..... 60&10@60&10&5%
Hand Saw, Varnished, doz. 80@85c; Not Varnished..65@75c
Plane Handles:
Jack, doz. 80c; Fore, doz. 45c.
Chas. Stebbins Co.:
Carving Tool ..... 30@20&10%
Chisel ..... 60@60&10%
File and Awl ..... 60@60&10%
Saw and Plane ..... 30@30&10%
Screw Driver ..... 30@30&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 15&15%
Nicholson Simplicity File Handle, ₱ gro. $0.85@$1.50

J. L. Ogg:
Indestructible File and Tool ₱ gro. No 1, $8.00; No. 2 $8.50; No. 3, $9.00; No. 4, $9.50 No. 5, $10.00 ₱ gro. lots 10 per cent.
W. A. Zehnder Supply Co.:
Hammer ₱ doz., 12 in., $2.00; 14 in. $2.00, 16 in., $2.25, 18 in., $2.50; 20 in., $3.00; 24 in., $3.50; 26 in., $3.50; 30 in., $3.80.
Sledge ₱ doz., cast, 10 in., $3.00; 12 in., $3.50; 14 in., $4.00; cast, 10 in., $4.00; 12 in., $4.50; 14 in., $5.00; 16 in., $5.50; 18 in., $6.00; 20 in., $6.50; 22 in., $7.00; 24 in., $8.00; 26 in., $9.00; 30 in., $10.00.
Axe ₱ doz., 28 in., $5.60; 30 in., $5.80.
Adze ₱ doz., 36 in., $5.80; 36 in., $6.00.
Pick ₱ doz., R R., 36 in., $8.00; coal, 34 in., $5.80.
Hatchet ₱ doz., 12 to 14 in., $2.00.

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable, Nos. 1 and 2; Allith, No. 3, Allith Adjustable No. 0, Reliable Parlor Door 30%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 50%
Railroad 50%
Crook & Carrier Mfg. Co:
Loose Axle ..... 60&2%
Roller Bearing ..... 70&2%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00 ..... 60&10%
Roller Bearing, Ex. Hy. No. 22, $18.00 ..... 60&10%
Ball Bearing, $24.00 ..... 70%
Lane Bros. Co:
Parlor, Ball Bearing, $1.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard ..... 60&10%
Hinged ..... net $6.00
Covered ..... net $7.50
Special ..... 70&5%
Lawrence Bros.:
Advance ..... 55&10%
Cleveland ..... 70&7½%
Clipper, No. 75 ..... 60%
Crown ..... 55&10%
Cyclone, No. 40 ..... net $6.50
Tandem, No. 50 ..... net $7.50
New York ..... 55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2 ..... 70%
Anti Friction 60%
Hinged Hangers, King Charm..60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, ... 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12 $2.20
Roller B'r'g St'l Track No. 13..$2.50
Roller B'r'g, Nos. 39, 41, 43, ... 75&5%
Hero, Adj Track No. 12 ..... 50&10%
Adjustable Track Tandem Trolley Track No. 16 ..... 50&10%
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22 ..... 50&5%
Troller D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150 ..... $2.50
Safety Underwriters F. D. No. 101 ..... 50%
Tandem No. 41..2¼ and 3 ..... 60&10%
Place, Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 122 ..... 50&15%
Ives' Wood Track No. 1..... $2.25
Troller B. D. No. 17 ..... $1.25
Troller B D. No. 24, $1.30; No 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2..70&7½%
Anti friction, No. 42, No. 44, sizes 2½ and 3 ..... 60%
Hinged Tandem No. 48 ..... 60&5%
Folding Door B. B. Swivel No. 135 ..... 60%
Taylor & Boggs Fy Co.'s Kidder's Roller Bearing 50&15&10&5%
Myers' Stayon Hangers 60%

Hangers— Garment—

Pullman Trouser, ₱ gro., No. 1, $9.00; No. 4, $24.00; No. 5 $16.50; No. 8, Black Enamel, $7.50; No. 10, $21.00; No. 12, $8.00; No. 15, Rods, $9.00; No. 17, Loops $12.00
Victor Folding ..... ₱ gro. $9.60

Gate—

Myers' Patent Gate Hangers, ₱ doz. net $4.50

Joist and Timber—

Lane Bros. Co 30%

Hasps—

Griffin's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, ₱ doz..60%

Hatchets—

Regular list, first qual. ..10@21½@—
Second quality ..... 50@37@—

Heaters, Carriage—

Clark No. 5, $1.15 No. 5B, $2.00; No. 3, $2.25 No. 3D, $2.75 No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50 ..... 25%
Clark Coal, ₱ doz., $0.75 ..... 20%

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind:
(Victor; National, 1868 O. P.; Niagara Co., Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutter:
(L. & P., O. S., Acme, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fasteners No. 2, for Wood, $5.00; No. 3 for Brick, $11.50 75
Charles Parker Co ..... 70@75%
Parker Wire Goods Co:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges No. 113, for wood, $9.00; No. 111, for brick, $9.00 ..... 20%
Reading's Gravity 60

Stanley's Steel Gravity Blind Hinges, No. 1665, ₱ doz. sets, without screws, $2.95; with screws, $4.25.
Wrightsville Hardware Co:
O. S., Lull & Porter ..... 75&5%
Acme, Lull & Porter 75%
Queen City Reversible 75%
Shepard's Noiseless, No. 1, 55 ..... 75&5%
Niagara, Gravity Locking, No. 3 & 5 ..... 75&5%
Tip Pat'n, No. 1 ..... 75&10%
No. 3 ..... 75%
Buffalo Gravity Locking, No. 3 & 5 ..... 75&10&5%
Shepard's Double Locking 75%
Champion Gravity Locking ..... 75&5%
Pioneer ..... 75&5%
Empire 65
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 80&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L't'chs	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.35*

New England:
With Latch ..... doz. ...@$2.00
Without Latch ..... doz. ...@$1.60
Reversible Self-Closing:
With Latch ..... doz. ...@$1.75
Without Latch ..... doz. ...@$1.35
Western:
With Latch ..... doz. $1.75
Without Latch ..... doz. $1.15
Wrightsville Hardware Co:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 ..... 70%

Pivot Hinges—

Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—

Holdback, Cast Iron ..$0.75@$0.90
Non-Holdback, Cast Iron..$0.50@$0.75

J. Bardsley:
Bardsley's Non Checking Mortise Floor Hinges 40%
Bardsley's Patent Checking 33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor..40%
Bommer Spring Hinges 40
No. 999 Wrot. Steel Hold Back, ₱ gr. $9
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago Ball Bearing Floor..50%
Garden City Engine House 25%
Keene's Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 15
American 30
Columbia, ₱ gr., No. 14, $9.00; No. 18, $25.00 ..... 30%
Columbia, Adj., No. 7, ₱ gr. $12.00
Columbian Hinges ..... 60&10%
Geiger 30%
Clover Leaf and Acorn, gr. lots, $5.10; ½ gro. lots $6.00
Oxford, new net
Piano Hinges ..... 65&10%
Lawson Mfg. Co., Matchless 30
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door ..... ₱ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door 25%
No. 1 Sheet Steel Holdback, ₱ gr., pr. $9.00
Standard Mfg. Co.:
Champion Double Acting Floor Hinge ..... 10&10%
Standard Double Acting Floor Hinge ..... 25&10&10%
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓%

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges	*50&10%*
Heavy Strap Hinges	*60&5%*
Light T. Hinges	*50%*
Heavy T Hinges	*40%*
Extra Hvy. T Hinges	*50&10%*
Hinge Hasps	*33⅓%*
Cor. Heavy Strap	*60&5%*
Cor. Ex. Heavy T	*50&10%*

Extra 10&7½%.

Screw Hook and strap.

6 to 12 in	*.lb. 3½¢*
12 to 20 in	*.lb. 3½¢*
20 to 36 in	*.lb. 3 ¢*

Screw Hook and Eye:

¾ to 1 inch	*.lb. 6¼¢*
⅝ inch	*.lb. 7½¢*
½ inch	*.lb. 8½¢*

Extra 10&7½%.

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—

M'f'gr's list, price per gross

Inch	*15*	*16*	*17*	*18*
Galv. Open	*$35*	*$40*	*$42*	*$46*
Jap. Open	*26*	*28*	*31*	*33*
Galv. Funnel	*32*	*38*	*42*	*46*
Jap. Funnel	*23*	*25*	*30*	*33*

Extra 10&5%

Masons' Etc.

Cleveland Wire Spring Co:
Steel Brick, No. 167 ..... each $1.95
Steel Mortar, No. 158 ..... each $1.35

Hoes— Eye—

Scovil and Oval Pattern ..... 60&10@60&10&10%
Grub, list Feb. 28, 1899 ..... 70&10@70&10&10%
D. & H. Scovil 70%
Am. Fork & Hoe Co. (Scovil Pattern) 60%

Extra 10% often given on most of these Hinges

Handles—

NOTE—Manufacturers of Sporting Goods from the first of September to the first of January reserve the right to change prices on goods manufactured after August 1, 1908, according to conditions.

Cram Wedding, No. 1 Size, S... $2.50
Star Double Bit ... $2.50
Ft. Madison Cotton Hoe ... 7 & A.
Ft. Madison Crescent Cultivator Hoe ... per doz.
Ft. Madison Mattock Hoe ... per doz.
Regular Weight ... Per doz. $4.50
Junior ... per doz. $3.50
Ft. Madison Spreading Hoe ... per doz. $4.50
Ft. Madison Dixie Tobacco Hoe ... per doz. $4.50
Kretsinger's Cut Easy ... per doz. $4.50
Warren Hoe ... per doz. $4.50
W. & C. Ivanhoe ... per doz. $4.50
B, B, & B. Cultivator Hoe ... per doz. $4.50
B. B., Clip in ... per doz. $4.50
Acme Wedding ... Per doz. but $4.50
W. & C. L'tning Shuffle Hoe ... per doz. $5.25

Hoisting Apparatus

See *Machines, Hoisting.*

Holders— Bit—

Angular, per doz. $24.00 ... 45&10%

Door—

Bardsley's, Iron, 40 ... Brass and Bronze ... 5%
Empire ... 5%
Pullman ... 5%
Richards Mfg. Co., No. 1 ... Ever-ready, 40 ... No. 130 ... Screw Grip ... 5%
Superior ... 33⅓%

File and Tool—

Nicholson File Holders and File Handles ... 33⅓&10%

Fruit Jar—

Triumph Fruit Jar Holder, per gross, $1.80, per doz. ... $1.25

Trace and Rein—

Fernald Double Trace Hooder, per doz. pairs ... $...
Dash Rein Holder, per doz. pairs, $...

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, ... German ... 5%

Hooks—Cast Iron—

Bird Cage, Reading ... 60%
Clothes Line, Reading List ... 40%
Coat and Hat, Reading ... 45&20%
Coat and Hat, Wrightsville ... 5%
Harness, Reading List ... 40%

Wire—

Belt ... 80%
Wire Coat & Hat Hooks ... 80%
Bradley Metal Cap Wire, Coat and Hat ... 70&5...
Columbian Hdw. Co., Gem ... 70&5%
Parker Wire Goods Co., King ... 70&10%
Wire Goods Co.:
Acme ... 60&10%; Chief, 75%; Crown 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton ... doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—
See Wrought Goods

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Rush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz. $...
Grass, common grades, all sizes, per doz. ... $1.50
Whiffletrees ... lb. 5½@6c
Hooks and Eyes:
Brass ... 60@60&10%
Malleable Iron ... 70@70&10%
Corser Mfg. Co. Gate and Scuttle Hooks ... 40%
Ft. Madison Cut-Easy Corn Hooks, per doz. $5.50
Turner & Stanton Co., Cup and Shoulder ... 80&10...
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾ inch:
Competition ... ft. 5@ 6¢
3 ply Guaranteed ... ft. 8@ 9¢
4 ply Guaranteed ... ft. 10@11¢
Cotton Garden, ¾ in., coupled
Low Grade ... ft. 8@ 9¢
Tan Quality ... ft. 10@11¢

Irons— Sad—

From 4 to 10 ... lb. 3@3½¢
P. B. Sad Irons ... lb. 3½@3¾¢
Mrs. Potts', cens per set:

Nos.	50	55	60	65
Japid Tops	85	89	93	97
Tin'd Tops	88	92	96	99

New England Pressing ... lb. 5½@6c

Bar and Corner—

Richards Mfg. Co., Bar ... & Corner ... 60%

Pinking—

Pinking Irons ... doz. 40¢

Irons, Soldering

See *Coppers*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw ... 30&2%; Steel 45%
Lockport ... 50%
Lane's Steel ... 30&5
Richards' Tiger Steel, No. 130 ... 50&10%
Smith & Hemenway Co.'s ... 25%

Ladder—

Richards Mfg. Co., Ladder Locks ... 5...

Kettles—

Brass, Spun, Plain ... 20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Lister Bros., Butcher & ... Williamson Shear & Cutlery Co. ... 60...

Corn—

Columbian Cutlery Co., Without Bread Knives and Hooks ... 60%
Watsontown Axe & Tool Co., $4.65; Dual, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15

Drawing—

Standard List ... sold net
C. E. Jennings & Co., Nos. 40, 10, ... 25&5...
Jennings & Griffin, Nos. 41, 42, ... 60&10%
Swan's ... 60&10%
Watrous ... 60%
L. & I. J. White ... 20&5&2.5...

Hay and Straw—

Serrated Edge, per doz. $3.50@5.75
Iwan's Sickle Edge ... per doz. $5.50
Iwan's Serrated ... per doz. $10.00

Miscellaneous—

Farriers' ... doz. $2.60@3.55
Westcombe's ... per doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber Tip ... gro. $1.25@$1.40
Carriage, Jap., all sizes ... gro. 40¢@45¢
Door, Mineral ... doz. 65¢@70¢
Door, Por. Jap'd ... doz. 70¢@75¢
Door, Por. Nickel ... doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c. 15...

Lacing, Leather—

See *Belting, Leather.*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable ... 50%
Little Giant ... 5...
Myers' Noiseless Store Ladders ... 50
Richards Mfg. Co.:
Improved Noiseless, No. 112 ... 50%
Climax Shelf, No. 113 ... 50%
Trolley, No. 109 ... 50%

Ladles, Melting—

L. & G. Mfg. Co., Cast List ... 20
L. & W. ... 40&10%
Reading ... 60...

Lanterns—Tubular—

Regular, No. 1 ... doz. $1.75@1.50
Side Lift, No. 0 ... doz. $1.60@1.75
Hinge Globe, No. 0, doz. $1.60@1.75
Other Styles ... $1.25@1.50

Bull's Eye Police—

5 inch ... $1.25@1.50

Latches— Thumb—

Roggin's Latches, with screw.. doz. 35¢@40¢

Door—

Allith Mfg. Co., Reliable and Alligator, 50%; Reliable Cold Storage, 50%; Globe & Carrier Mfg. Co., No. 101, ... per doz. $2.30
Richards' Bull Dog, "Heavy, No. 150 ... 50&5%
Richards' Trump, No. 127 ... $1.50

Leaders, Cattle—

Small ... doz. 50¢; *large, 60¢*
Corser Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E. ... 10%

Lines—

Wire Clothes, Nos. 18, 19, 20, 100 feet ... $2.50, 2.25, 2.00
75 feet ... $2.10, 1.90, 1.65
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3 ... 40%
Solid Braided Masons' ... 30%
Silver Lake Braided Chalk, Nos. 0, 50 to No. 1 ... per gr. $2.00
No. 2 ... per gr. $2.50
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 2½ ... $1.80
$2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 5, $4.00 ... 20
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, ... 20
Clothes Lines, White Cotton: 50 ft. $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft. $5.25 ... 20
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines ... 40%
Clothes Lines, White Cotton ... 20%
Shade Cord, Cotton or Linen ... 20%

Locks— Cabinet—

Cabinet Locks ... $3.00...%

Door Locks, Latches, &c.—

NOTE—Net prices are per cent and on these goods.
Reading Hardware Co. ... 4...
R. & E. Mfg. Co. ...

Padlocks—

R. & E. Mfg. Co., Wrought Steel ... 4
Brass ... 70&5%

Sash, &c.—

Iron Pulleys:
Bronze and Brass ... 75&5
60% Iron ... 65% Wrought Steel ... 40&5
Reading Pat. Ventilating Sash Lock ... 75%
Richards Pat. Ventilating Sash Lock ... 75%
Reading Sash Locks ... 4...

Machines—Boring—

Com. Upright, without Countersink ... $2.00@2.50
Com. Angular, without Countersink ... $2.25@2.50
Swan's Improved ... 40&10%
Reading, No. 1 and 4 ...
Millers' Fall ... 5.75
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Invincible Hand Power ... per doz. $18.00

Fence

Williams' Fence Machine ... each $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist ... 30%
Moore's Hand Power ... Chain Block ... 25
Moore's Cyclone High Speed Chain Hoist ... 25

Ice Cutting—

Chandler's ... 12½%

Washing

Boss Washing Machine Co.: Per doz. $5.50 ... $57.00
Boss Rotary ... $57.00
Champion Rotary Banner No. 1 ... $57.00
Standard Champion No. 1 ... $50.00
Standard Perfection ... $27.00
Cincinnati Square Western ... $33.00
Uneeda American, Round ... $33.60

Mallets—

Hickory ... 45&5%; 50...
Lignumvitæ ... 45&5%; 50...
Tinners' Hickory and Applewood ... doz. 45&5%; 50%

Mangers, Stable—

Swett Iron Works ... 50%

Mats, Door—

Acme Flexible Steel ... 50
Elastic Steel (W. G. Co.), new list 50...

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co. ... 20@25%
Nat. Stamping Co. ...
Parker's Columbia and Victoria ... 33⅓
Parker's Rival and Stem ... 5 &
Sandt, Lisk Bros. ...

Motors, Water—

Divine's Red Devil ... 30%
Lippincott's ... 50...

Mowers, Lawn—

NOTE—Net prices are generally quoted
Cheapest, Low ... Steel adjustment, per ... each ...
Cheap, Low ... Steel adjustment, with ... each ...
Better Grade, Low ... Steel adjustment for ... each ...
12 14 16 18 in.
High Grade ... $4.50 5.00 5.50 6.25
Continental ... 6...
Great American ... 6...
Great American Ball Bearing, new list ... 70%
Quaker City ... 5...
Pennsylvania ... 60...
Pennsylvania, Jr. Ball Bearing, 5 in. ...
Pennsylvania Golf ... 5...
Pennsylvania Horse ... 5&5
Pennsylvania Pony ... 40&5
Granite State:
Style A, Low Wheel ... 7...
Style B, Low Wheel ... 7...
Style C, High Wheel, spcl. list, ... 70&10%
Style D, High Wheel, spcl. list ... 70%
Pennsylvania ...
Styles M., S., C., K., T. ... 70&10&5%
Style A, all Steel ... 60&10&5%
Style B, High Wheel ...
Drexel and Gold Coin, special list ... 40%
Horse ... 40&5
Pony ... 40&5%
Quaker City ... 30&10%
Eagle Horse ... 30&5%
I. X. L. Horse ... 50...

Nails—

Wire Nails and Brads, Miscellaneous ... 50&5%; 50&10%
Cut and Wire, See Trade Report
Hungarian, Finishing, Upholsters' &c. See Tacks.

Horse—

Nos	6	7	8	9	10
Acme	25	25	20	18	18
Coleman	13	12	12	11	11
New Haven	20	20	20	18	18
Lancaster	16	15	15	16	16
Western					

net
Jobbers' Special Brands ... per lb. 9@10¢

Picture—

	½	¾	1	1¼	in.
Brass, Hea...	25	25	25	25	25
Par. Head	15	15	15	15	gro

Upholsters—

Brass ... 25...
Picture ... 25...

Nippers—

See *Pliers and Nippers*

Nuts—

Blank or Tapped:
Coarse Thread ... 60&10%
Square ... 6...
Hexagon ... 6...
Hexagon and Square ... 6...
Hexagon Jam ... 6...
Square Jam ... 6...
Hexagon Castle ... 6...
Square Castle ... 6...
Hexagon Flange ... 6...
Square Flange ... 6...
Hexagon Pressed ... 6...
Square Pressed ... 6...
Hexagon ... 6.50...

Oakum—

Per lb. ... 6½@...
Light Navy ... 6...
Navy ... 5...
Packing Spool ... 5...

Oil Tanks

See *Tanks, Oil.*

Oilers—

Steel, Copper Plated ... 75...
Oval Handle:
Brass and Copper ... 5&10
Zinc ... 5&10%
Improved ... 5&10%
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2 & 3, 50%.
Ansonia Brass & Copper Co.:
Railroad Oilers, &c. ... 60&60&10...
Maple City Mfg. Co.:
Spout Bottom ... 5...
Round Oval ... 5...

Openers— Can— Per doz.

Sprague, Iron Handle ... 30@35¢
Sprague, Wood Handle ... 40¢
Sardine Scissors ... $1.75@$3.00
Yankee Can and Bottle Opener ... per doz. net, $3.75, Leather Cases ... per doz., net ... $0.65

Egg

Hartigan Nickel Plate, per doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope, any quantity ... 20¢

Rubber—

(Fair quality goods.)
Sheet, C. C. I. ... 11½12c
Sheet, C. O. S. ... 11½12c
Sheet, C. B. S. ... 12c13c
Sheet, Pure Gum ... 40¢50¢
Sheet, Red ... 40¢50¢
Jenkins '96, per lb. 85¢ ... 55

Miscellaneous—

American Packing ... lb. 7@10c ¢
Cotton Packing ... lb. 16@25 ¢
Italian Packing ... lb. 9@12½¢
Jute ... lb. 4@5¢
Russia Packing ... lb. 8@11 ¢

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List ... 65%; 70&10%
Edwards, Royal Blue ... 65&7½%

Fry—

Common Lipped:

No.	2	3	4	5
Per doz.	$0.75	$0.80	$0.90	$1.10

Refrigerator, Galva.—

Inch	12	14	16	18
Per doz.	$1.75	2.25	2.90	3.15

Paper—Building Paper

Asbestos ... lb.
Roll Board or Building Felt, 5 to 30 lb., per 100 sq. ft. ... 2½@3¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft. ... 3½@4¢
Mill Board, Sheet, 40 x 40 in., 1-32 to ⅛ in. ... 4¢
Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll ... $1.35@$1.50
Medium weight, 30 lbs. to roll ... $1.50@$1.65
Heavy weight, 40 lbs. to roll ... $1.75@$1.90
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply 85¢; 3 ply, $1.10; 4 ply, $1.25
Roofing Felt, 9, 6 and 4½ sq. ft to the ton ... $1.50
Red Rope Roofing, 250 sq. ft. per roll ... $1.75

Tarred Paper—

1 ply (roll 400 sq. ft.), ton ... $4.50...
2 ply, roll 125 sq. ft ... 65¢
3 ply, roll 125 sq. ft ... 80¢
Slater's Felt (roll 500 sq. ft.) .80¢

Sand and Emery—

Flint Paper and Cloth ... 50&10&...%
Garnet Paper and Cloth ... 25...
Emery Paper and Cl'th ... 50&10%60%

Parers— Apple—

Enterprise ...
Family Bay State ... per doz. $15.00
Improved Bay State ... per doz. $36.00
New ...
Turn Tom ... 5...
White Mountain ... per doz. $5.00
Reading ...
Ideal ...
Eureka Improved ... each $20.00
New Century ... each $20.00
Ranger ... each $25.00
Livingston Nail Co.:
Horse ... 5...
Pony ... 5...
Reading Hardware Co.:
Acme ... 5...
Eagle ... 5...
Horse ... 5...

Potato—

Saratoga ... per doz. $7.00
Wire Mountain ... per doz. $6.00

Picks and Mattocks—

(List Jan. 1908)
List ... 70&10&10&10%
Cook's Hip Pat. Garden Mattock, No. 1 ... No. 2 $2.60, No. 3 $2.50,

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass ..... 50@50&10%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—
Standard 2-6 in......60&5@—%
Extra Heavy, 2-6 in...50&5@—%
Fittings, Standard and Heavy, 70&10@75%

Pipe, Merchant—

	Consumers, Carloads. Steel.	Iron.		
	Blk.	Galv.	Blk.	Galv.
	%	%	%	%
⅛ & ¼ in....	64	48	62	..
⅜ in.....	66	52	64	50
½ in.....	68	56	66	54
¾ to 6 in....	72	62	70	60
7 to 12 in....	69	54	67	52

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 8 to 24 in., f.o.b. factory:
First-class 87%
Second-class 90%

Pipe, Stove—

	Per 100 joints.	
Edwards' Nested:	C. L.	L. C. L.
5 in., Standard Blue..	$6.25	$7.25
6 in., Standard Blue....	6.75	7.75
7 in., Standard Blue....	7.75	8.75
5 in., Royal Blue.....	8.00	9.00
6 in., Royal Blue.....	7.50	8.50
7 in., Royal Blue.....	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color..	$7.15	$7.15
6 in., Uniform Color..	6.65	7.65
7 in., Uniform Color..	7.65	8.65

Planes and Plane Irons—
Wood Planes—
Bench, first qual..... 50@50&10%
Bench, second qual..... 40@40&10%
Molding ..... 25@25&10%
Chapin-Stephens Co.:
Bench, First Quality..... 30%
Bench, Second Quality..... 40%
Molding and Miscellaneous..... 30%
Toy and German..... 50%
Union 60%

Iron Planes -
Chaplin's Iron Planes..... 50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06. ..... 25%
Buck Bros..... 30%
Chapin-Stephens Co..... 25%
Union 50%
L. & I. J. White..... 20&50@25%

Planters, Corn, Hand—
Kohler's Eclipse..... ₱ doz. $8.00

Plates—
Felloe ..... lb. 4@4¼¢

Pliers and Nippers -
Button Pliers.....75&10@75&5%
Gas Burner, per doz., 5 in., $1.25 @ $1.50; 6 in., $1.45 @ $1.50.
Gas Pipe.. 7 8 10 12-in.
$2.00 $2.25 $2.75 $3.50
Acme Nippers ..... 50&5%
Cronk & Carner Mfg. Co.:
American Button..... 80%
Improved Button..... 75&10%
Cronk's 60%
No. 80 Linemen's..... 50%
Stub's Pattern..... 45%
Combination and others..... 33⅓%
Heller's Farriers' Nippers, Pincers and Tools..... 40&5@40&10&5%
P. S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, Plain City, 35%; Bernard, Paragon, 50%; Lodi, 55%
Swedish Side, End and Diagonal Cutting Pliers..... 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds..... 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels..... 30@30&10%
Chapin's Imp. Brass Cor.. 40@40&10%
Pocket Levels..... 30@30&10%
Extension Sights..... 30@30&10%
Mariners' Levels..... 40@40&10%
Disston's Plumbs and Levels... 60&10%
Disston's Pocket Levels..... 60&10%
Stanley's Duplex..... 38%
Woods' Extension..... 33⅓%

Points, Glaziers'—
Bulk and 1-lb. papers..... lb. 9 ¢
½ lb. papers ..... lb. 9½¢
¼ lb. papers ..... lb. 10 ¢

Police Goods—
Manufacturers' Lists...25@25&5%
Tower's 25%

Polish—Metal, Etc—
Prestoline Linuid No. 1 (¼ pt.) ₱ doz., $3.00; No. 2 (1 qu.), $9.00. 40%
Prestoline Paste..... 60%

George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50 ¢; ₱ gro. $4.50; ½ lb. boxes, ₱ doz. $1.25; 1 lb. boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz., $1.25.
Barcreepers' Friend Metal Polish, ₱ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ₱ lb 10 ¢
Black Eagle, Liquid, ½ pt cans, ₱ doz. 75 ¢
Black Jack Paste, ¾ lb cans, ₱ gr. $9.00
Black Kid Paste, 5 lb can... each, $0.65
Ladd's Black Beauty Liquid, per 100 tins..... $6.75
Joseph Dixon's, ₱ gr. $5.75..... 10%
Dixon's Plumbago..... ₱ lb 8 ¢
Fireside ..... ₱ gr. $2.50
Gem, ₱ gr. $1.50..... 10%
Japanese ..... ₱ gr. $2.50
Jet Black..... ₱ gr. $3.50
Peerless Iron Enamel, 10 oz. cans, ₱ doz. $1.50

Poppers, Corn—
1 qt. Square...doz.$0.80; gro.$8.75
1 qt. Round...doz.$0.90; gro.$10.00
1½ qt. Square.doz.$1.00; gro.$11.00
2 qt. Square...doz.$1.25; gro.$13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42 ¢; 6 ft., 46 ¢; 6½ ft., 48 ¢.
Steel Hitching Posts..... each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled ..... 35&10%
Tinned ..... 50&10%

Powder—
In Canisters:
Duck, 1 lb..... each 45¢
Fine Sporting, 1 lb.... each 75¢
Rifle, ½-lb..... each 15¢
Rifle, 1-lb..... each 25¢
In Kegs:
12½-lb. kegs..... $3.50
25-lb. keg..... $4.50
King's Semi-Smokeless:

Keg (25 lb bulk).....		$6 50
Half Keg (12½ lb bulk).....		3.50
Quarter Keg (6¼ lb bulk).....		1 90
Case 24 (1 lb cans bulk).....		$8 50
Half case (1 lb cans bulk).....		$4 50
King's Smokeless.	Shot Gun Bulk.	
Keg (25 lb bulk).....	$12 00	$15 00
Half Keg (12½ lb bulk)...	6 25	7 75
Quarter Keg (6¼ lb bulk).	3.25	4 00
Case 24 (1 lb cans bulk)..	14.00	17.00
Half case 12 (1 lb c. bk)..	7.25	8.75

Presses—
Fruit and Jelly—
Enterprise Mfg. Co..... 20@25%

Seal Presses—
Morrill's No. 1, ₱ doz., $20.00..... 50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 60%
Miller's Falls, No. 3, ₱ doz., $12.00..... 33⅓&10%
Morrill's No. 1, Nail Puller, ₱ doz. $20 00..... 50%
Pearson No. 1, Cyclone Spike Puller, each $30.00..... 50%
The Scranton Co. Case Lots:
No. 2B $5 50
No. 3B (small)..... $5 00
Smith & Hemenway Co.:
Diamond B..... 70%
Giant..... 50%
Staple Pullers, Utica and Davison..... 60%

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., 4 in., $1.25; 5 in., $1.55				
Inch	2	2¼	2½	
Hot House, doz.	$0 65	.85	1.20	
Inch	1¼	1½	2	
Screw, doz	$0 16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz	$0.25	.40	.55	.80
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in..... 17@20¢
Auger Mortise, no Face Plate, per doz, 1¾ and 2 in..... 20@21¢
American Pulley Co.:
Wrought Steel American Plain Axle..... 50&10%
Wrought Steel Eagle..... 17@20¢
Top Notch, Electrically Welded, Nos. 2 and 1..... 19¢
Fox-All-Steel, Nos. 3 and 1, 2 in.. ₱ doz 50%
Grand Rapids All Steel Noiseless..50%
Niagara, No. 25, 1¾ in., 19¢; 2 in., 20½¢
No. 26 Troy, 1¾ in., 13½¢; 2 in., 16½¢
Star, No. 28, 1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout..... 75&65@75&10%
Wood Pumps, Tubing, &c... 50%
Barnes Dbl. Acting (low list)....40&5%
Barnes Pitcher Spout..... 45&10%
Contractors' Rubber Diaphragm No. 1, Block Co..... $16 00
Daisy Spray Pump..... ₱ doz. $8 50
Flint & Walling's, Fast Mail Hand, (low list)..... 50%
Flint & Walling's Fast Mail (low list)..... 50%
Flint & Walling's Tight Top Pitcher, ... 75&10%
National Specialty Mfg Co. Measuring, Nos. 2, $6.00; 3, $5.50..... 30%
Myers' Pumps (low list)..... 40&5%
Myers' Power Pumps..... 40&5%
Myers' Spray Pumps..... 40&5%

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No.....	1	2	3	4	
	$5.00	6.00	7.00	8.00	30%
Cup Leathers—Per 100:					
Inch....	2½	3	3½	4	
	$5.00	7.00	9.00	12.00	30%

Punches—
Saddlers' or Drive, good..... doz. 50@75¢
Spring, single tube, good quality $1.75
Revolving (4 tubes)....doz.$3.50
Bemis & Call Co.'s Cast St'l Drive.60%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00..... 50%
Hercules, 1 die, each $5.00..... 50%
Niagara Hollow Punches..... 40%
Niagara Solid Punches..... 55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35%; Paragon, 50%; Lodi..... 55%
Tinners' Hollow, P. S. & W. Co..40%
Tinners' Solid, P. S. & W. Co., ₱ doz., $1.44..... 40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron..... 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢..... 50%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..₱ ft. 3¼¢
O. N. T. Rail..... $3,12
Griffin's
xxx, ₱ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ₱ 100 ft., 1 x 3-16 in. $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ₱ 100 ft $3.45
O. N. T. ₱ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in..... ₱ 100 ft $4.00
Lawrence Bros.:
1 x 3-16 in., ₱ 100 ft., $7 50; 1¼ x 3-16 in., $8.75..... 55&7½%
McKinney's
Hinged Hanger Track, ₱ ft., 11¢, 60&5%
1 x 3-16 Track..... 55&7½%
Myers' Stasion Track..... 60&5%
Richards' Mfg. Co.:
Common, 1 x 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65..... 50%
Gauge Flooring Track, ₱ ft., No. 31, 2¼ No. 32, 14¢; No. 33, 20¢.
No. 50..... 60&10%
Nos. 61, $5.00; 62, $5.25; 63, $5.50; 64, $4.00; 65, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison: Red Head Lawn....$3.25
Fort Madison Shoe Head Lawn... $2.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor..... 80&5%
Queen City Lawn, ₱ doz., 20 teeth, $2.85; 24, $3.00..... net
Anticlog Lawn, ₱ doz..... $4.00
Malleable Garden ..... 70&10%
Ideal Steel Garden, ₱ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00..... 80%
Kohler's:
Lawn Queen, 20-tooth..₱ doz. $3.15
Lawn Queen, 24-tooth..₱ doz. $3.25
Paragon, 20-tooth..... ₱ doz. $2.70
Paragon, 24-tooth..... ₱ doz. $2.75
Steel Garden, 14-tooth..₱ doz. $2.40
Malleable Garden, 14-tooth, ₱ doz. $2 00 @ 2.25

Rasps, Horse—
Disston's 75%
Heller Bros.'..... 70&5@70&10&5%
Liveright Bros.' Gold Medal.70&10@75%
McCaffrey's American Standard, ... 60&10&5%
New Nicholson..... 70&10@75%
See also Files.

Razors—
Liana Boorasie..... 60%
Fox Razors, Nos. 42 $20.00; Nos. 44, $20,00; Nos. 82, Platina $25.00..... 65%
Red Devil..... 65%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008 Rubber, Populo, Nickeled Populo..... 20%
Aluminum German Silv. Bronze 25%
1240 N, 12 N..... 20%
3004 N, 06 N, 6 RM, G 9..... 35%
4 N, 6 PN, 24 N, 26 PN..... 30%
2901 P, 33⅓%; 2901 PN, 33⅓%; 2924 N, 33⅓%; 02904 N, 33⅓%; 002904 PN, 33⅓%; 802 N, 33⅓%..... 25%
986 PN, 2904 N, 974 PN..... 25%
5009 PN, 5009 N..... 30%
Competitor 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR..... 20%
304 P, 304 PN, 00304 P, 00304 PN, 33⅓%..... 30%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed ..... 70@70&10%
White Porcelain Enamel..50&10%
Solid Brass or Bronze Metal..40%

Revolvers—
Single Action..... $5¢@$1.00
Double Action, except 44 cal...$2.00
Double Action, 44 caliber.... $2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grade
16 in..... per doz.$2.50@$2.75
17 in..... per doz.$2.75@$3.00
18 in..... per doz.$3.00@$3.25

Rings and Ringers—
Buil Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.10	1.25	1.65 doz.

Hog Rings and Ringers—
Hill's Rings, gro. boxes.$4.25@$4.50
Hill's Ringers, Gray Iron, doz., 60¢@75¢
Hill's Ringers, Malleable Iron doz.80¢@85¢
Blair's Rings...per gro.$5.00@$5.50
Blair's Ringers...per doz.75¢@90¢

Rivets and Burrs—
Copper ..... 50@50&5%
Carriage, Coopers', Tinners, &c.: Black ..... 70&10%
Metallic Tinned..... 70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, 23@25¢; Tin boxes, 100 count, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—
Cronk's Stay, No. 50..... $1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56, $0.75; No. 60..... $0.75
Lane's Stay..... 40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag, in sizes, No. 55 and 57..... 50%
Underwriters', Nos. 59, 60..... 50%
Favorite, No. 54..... 60%

Rope—
Manila, 7-16 in. diam. and larger: Pure ..... lb., 10½@11½¢
Sisal, 7-16 in. diam. and larger: Pure ..... lb., 7½@8¢
Sisal, 7-16 in. diam. and larger: No. 2 quality..... lb., 6½@7¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed ..... lb., 6½@7¢
Pure ..... lb., 7½@8½¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred: Mixed ..... lb., 5¼@5¾¢
Pure ..... lb., 6½¢
Cotton Rope: Best, ¼-in. and larger...18@20¢
Medium, ¼-in. and larger.16@17¢
Common, ¼-in. and larger..10¢
Jute, ½¢ advance.
Jute Rope: Thread, No. 1, ¼-in. & up, lb., 6¼¢
Thread, No. 2, ¼-in. & up, lb., 5¾¢

Wire Rope—
Galvanized ..... 37½&2½%
Plain ..... 45&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal..... 20%

Rules
Boxwood ..... 60@60&10%
Ivory ..... 35&10@45&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory ..... 25@25&10%
Miscellaneous ..... 50@50&10%
Stephens' Combination..... 55%
Stationers'..... 50@50&10%
Keuffel & Esser Co.:
Folding, Wood..... 35&10%
Folding, Steel..... 33⅓&10%
Lufkin's Steel..... 50&10%
Lufkin's Lumber..... 50&10%
Upson Nut Co.:
Boxwood..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 45%
Band ..... 50@50&10%
Butcher Saws 50
Cross Cuts 35
One-Man Cross Cut 40
Narrow Cross Cut 50
Hand, Rip and Panel ..... 35&5
Mitre Box and Compass 40
Miuday, Mill and Drag 45
Wood Saws ..... 40&10
Chapin-Stephens Co.:
Turning Saws and Frames ..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth ..50%
Band, 2 to 18 in. wide 60%
Band, ¼ to 1¾ 60%
Crosscuts 45
Narrow Crosscuts 50
Mitre, Mill and Drag 50%
Framed Woodsaws 25%
Woodsaw Blades 25%
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 7, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c 25%
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 10%
Butcher Saws ..... 25@27½%
Compass and Key Hole Saws, 33⅓&5%
Framed Wood Saws ..... 25&5%
Hand Saws 12½
Wood Saw Blades ..... 33⅓&5%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&50%
Butcher Saws Blades ..... 35@40%
Peace & Richardson's Hand Saws ..30%
Simonds':
Circular Saws 45%
Crescent Wood Cross Cut Saws ..30%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws ..45%
Band Saws 50%
Back Saws ..... 25@25&5%
Butcher Saws ..... 35@35&5%
Hand Saws ..... 25@25&5%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c ..25@25&5%
Wood Saws ..... 40&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 30%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A ..25%
Disston's:
Compact Blades 25%
Keystone Blades 35%
Hack Saw Frames 30%
Simonds File Co. 35%
C. E. Jennings & Co.'s
Hack Saw Frames, Nos. 175, 180, ... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades ..... 40&10%
Griffin's Hack Saw Frames ..35&5&10%
Griffin's Hack Saw Blades ..35&5&10%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..30&10&5%
Sterling Hack Saw Frames ..30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25 00; No 2, $30 00 ..10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%
Whitaker Mfg. Co.:
National Hand Blades 40%
National Hand Frames ..... 30&5%
National Power Blades ..... 30&10%

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes, Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 25%
Lester, complete, $150 ..... 15&10%
Rogers, complete, $3.50 and $4.00 ..... 15&10%

Scales—

Union Platform, Plain $2.10@2.20
Union Platform, Stpd. $2.20@2.30
Chatillon's:
Eureka 25%
Favorite 40
Crown Top Scales 50
The Standard Portables 40%
The Standard R R. and Wagon ..... 50&10%

Scrapers—

Box, 1 Handle ..... doz. $2.00@2.25
Box, 2 Handle ..... doz. $3.50@2.80
Ship ..... Light, $2.00; Heavy, $1.50
Chapin-Stephens Co., Box ..30@30&10%
Richards Mfg. Co., Foot 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@ 2.75; 2¼, $3.00@3.25; 1¾, $3.50@3.75
Bench, Wood ..... 70@70&10%
Hand, Wood ..... 70&10%@70&10&10%
Chapin-Stephens Co., Hand ..... 70@70&10&10%

Coach, Lag and Hand Rail—

Lag, Cone Point ..... 80&5@ 80&10%
Coach, Gimlet Point ..... 80@ 80&5%
Hand Rail ..... 70@70&5%

Jack Screws—

Standard List ..... 70&10@75%
Millers Falls ..... 50&10&10%
Swett Iron Works ..... 70@75%

Machine—

Cut Thread, Iron, Brass or Bronze:
Flat Head or Round Head, 50@50&10%
Fillister Head ..... 40@40&10%
Rolled Thread, F. H. or R. H., Iron ..... 75&10%
F. H. or R. H., Brass, Tin, 8 to 14 ..... 65&10%

Set and Cap—

Set (Iron) ..... 75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70&10&7½%
Hex Hd. Cap ..... 70&10&7½%
Rd. Hd. Cap ..... 50&7½%
Fillister Hd. Cap ..... 60&7½%

Wood—

List July 23, 1903.
Flat Head, Iron ..... 87½&5@.. %
Round Head, Iron ..... 85&5@.. %
Flat Head, Brass ..... 80&5&5@.. %
Round Head, Brass ..... 77½&5&5@.. %
Flat Head, Bronze ..... 75&5@.. %
Round Head, Bronze ..... 72½&5&5@.. %
Drive Screws ..... 87½&5&5@.. %

Scroll Saws—

See *Saws, Scroll.*

Scythes—

Per doz.
Grass, No. 1, Plain ..... $7.00@7.50
Clipper, Bronzed Webb ..... $7.25@7.75
No. 3 Clipper, Pol'd Webb ..... $7.50@8.00
No. 6 Clipper and Solid Steel ..... $7.75@8.25
Bush, Weed and Bramble, Nos. 11, 12 and 13 ..... $7.25@7.75
Grain, No. 1 ..... $9.00@9.50
Bronzed Webb, No. 1 ..... $9.25@9.75
Nos. 3 and 4 Clipper, Grain ..... $9.50@10.00
Solid Steel, No. 6 ..... $10.00@10.50

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No 4, $12; No. 5, $18 ..20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ₩ doz sets $3.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 50%
Cannon's Diamond Point, ₩ gro. $12 ..... 40&10%
Mayhew's ..... ₩ gro $9.00
Snell's Corrugated, Cup Pt. ..... 40&10%
Snell's Knurled, Cup Pt. ..... 40&10%
Victor Knurled Cup Pt. ..... ₩ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Morrill's No, 1 ..... $15.00
Nos. 3 and 4, Cross Cut $20.60
No. 5, Mill $30.00
Nos. 10, 11, 95 ..... $15.60
No. 1 Old Style $10.00
Special $16.25
Giant Royal Cross Cut ..... ₩ doz. $8.00
Royal, Hand ..... ₩ doz. $4.50
Tainter Positive ..... ₩ doz. $6.75

Shaving—

Fox Shaving Sets, No 30 ..... ₩ doz., net, $24 00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₩ doz $1.50
Mounted Kitchen Sand Stone, ₩ doz $1.50
Natural Grit Carving Knife Hones, ₩ doz $3.00
Quick Cut Emery Carving Knife Hones, ₩ doz $1.50
Quick Edge Pocket Knife Hones, ₩ doz $2.50

Skate—

Smith & Hemenway Co., Eureka ..50%

Shaves, Spoke—

Iron ..... doz. $1.25
Wood ..... doz. $2.00
Barber's (Stanley R & L Co.) 15%
Chapin-Stephens Co. ..... 30@30&10%
Goodell's, ₩ doz. $9.00 ..... 15&10%

Shears—

Cast Iron..	7	8	9 in.
Best ...	*$16.00*	*18.00*	*20.00 gro.*
Good ...	*$13.00*	*15.00*	*17.00 gro.*
Cheap ..	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality Jap ..... 70@70&10%
Best quality, Nickel ..... 60@60&10%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40@40&10%
Heinisch's Tailor's Shears 10%
Wilkinson Shear & Cutlery Co.:
Sheep, 1902 list 33⅓10A5%
Grass 33⅓10A5%
Horse or Mule 50A10%
J. Wiss & Sons Co.:
Best Quality Lipd 60A10%
Best Quality, Nickeled 50A10%
Tailors' 25%

Tinners' Snips—

Steel Blades ..... 20@35@40&10%
Steel Laid Blades ..... 40&10@55%
Forged Handles, Steel Blades, Berlin 40
Heinisch's Snips 40
Jennings & Griffin Mfg. Co.'s 6½ to 10 in ..... 33⅓&7½
Niagara Snips 33⅓%
P. S. & W. Forged Handles, 25" 40%
W. R. W. ..... 40&10%
J. Wiss & Sons Co.:
Wiss Forged Steel 25%

Pruning Shears—

Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ₩ doz $12 ..... 25%
Disston's Pruning Hook only, ₩ doz., $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
P. S. & Co. ..... 40&10%
Columbian Cutlery Co.:
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand, ... 60&10%

Sheaves— Sliding Door—

Reading 40%
R. & E. list 10%

Sliding Shutter—

Reading list 40%
R. & E. list 10%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge ..... 65&10%
Club, Rival, 65&5%; First Quality, ... 60&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, ... 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, ... 25&5%
Union, League, 12 and 12 gauge, Rival grade 30%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%

Shells, Loaded—

Loaded with Black Powder ..40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40%
Nitro Club, Smokeless Powders..40&5%
Arrow, Smokeless Powders..40&10&10%
Winchester:
Smokeless Repeater Grade ..40&5%
Smokeless Leader Grade..40&10&10
Black Powder 40

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted.	Galv
14 x 20	$4 25	$6 10
10 x 14	4 50	6 35
7 x 10	4 75	6.60

Wheeling Corrugating Co.:

Dixie, 14 x 20 in...	$4 25	$5 50
Dixie, 10 x 14 in...	4.50	6.00
Dixie, 7 x 10 in...	5.00	6 75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg $4.10
Steel ..... per keg $3.85
Burden's, all sizes ..... ₩ keg $3.90

Shot—

25 lb. bag
Drop, up to B $1.85
Drop, B and larger 2.10
Buck 2.10
Chilled 2.10
Dust 2.30

Shovels and Spades—

Association List, Nov. 15, 1902..40%
Avery Stamping Co 40%

Snow Shovels—

Long Handle ..... $3.25@$3.50
Wood and Mall. D. Handle ..... $3.75@$4.00

Sieves and Sifters—

Hunter's Imitation ..... gro. $9 50@10.00
Hunter's Genuine ..... per gro. $12.00@12.50

Sifters, Ash—

Acme B. B. Bearing Sifter Co., Acme Automatic Ash Sifter, each, ₩ doz $7.50

Sieves, Seamless Metallic

——Per dozen.——

Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1 15*	*1 15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... doz. $0.90@0.95
Mesh 20, Nested ..... doz. $1.00@1.05
Mesh 24, Nested ..... doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard List:
12 x 18 to 22 x 36 in 60%
20 x 24 to 24 x 28 in 50%
24 x 30 to 24 x 120 in 30%
Barnes' Low list 40%
Unpainted Sinks 40%
20 x 30 to 24 x 60 ..... 40%

NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron ..... 70@75&10%
Steel ..... 40@45%

Slates, School—

Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless ..... 60@65 tens
Victor A, Noiseless ..60@ tens @5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40@40&10%
Covert Mfg. Co.:
Derby, Yankee 33&2; Yankee Roller, 30&2 ..... 33⅓&2
High Grade, 40%; Trojan 40
Jockey 25

Snaths—

Scythe ..... 55@60%

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality ..... 50@10@10@5%
Cheap ..... 60@60@10%
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton ..... 33⅓&5
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous

German Silver ..... 60@60&5%

Tinned Iron—

Teas ..... per gro. 50@ 55¢
Tables ..... per gro. $0.90@$1.00

Springs— Door—

Bardsley's Spring and Check 40
Chicago (Coil) ..... 4&10%
Gem (Coil) 20
Pullman Door and Gate 10%
Reliance (Coil) ..... 40&10%
Star (Coil) 20
Torrey's Rod, 39 in. ..... ₩ doz. $1.10

Carriage, Wagon, &c.—

1¼ in. and Wider: Per 100 lb.
Black ..... $3.75@$5.00
Half Bright ..... $3.75@$5.00
Bright ..... $3.85@$5.50
Painted Seat Springs:
1½ x 2 x 26 ..... per pair, 75¢@ 85¢
1½ x 2 x 28 ..... per pair, 85¢@90¢

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; National, ₩ doz $12 00
Enterprise ..... 25@30%
Philadelphia No. 1, ₩ doz. $12, No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated ..} List Jan. 5, 1900.
Steel and Iron ..} 80@80&5%
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Squares and Bevels, Rosewood Handle ..60&10% ; Iron Stock and Bevel 15%

Squeezers, Lemon

Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.25
Iron, Porcelain Lined ..... doz. $1.75

Staples—

Barbed Blind ..... 50&10@40&10%
Electrocuters ..... 80@10@10@55%
Fence Staples, Plain, $2.15; Galvanized $2.45
Poultry Netting Staples ..... per lb. 3¼@3½¢

Steels, Butchers'—

Dick's 30%
Fort Bros. 30%

Steelyards— ....30@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%
Curtis Rewible Ratchet Die Stock. 25
Derby Screw Plates 25%
Green 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plates 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones—Oil, &c.

Pike Mfg. Co., list:	₩ Pr
Arkansas St. Nr. 1, 3 to 5 in	$3 50
Arkansas St. No. 1, 5½ to 8 in	3 50
Arkansas Slips No. 1	$1.00
Lily White Slips, 4 to 8 in.	60¢
Rosy Red Washita, 4 to 8 in.	60¢
Washita St., Extra, 4 to 8 in.	50¢
Washita St., No. 1, 4 to 8 in.	40¢
Washita St., No. 2, 4 to 8 in.	25¢
Lily White Slips	90¢
Rosy Red Slips	90¢
Washita Slips, Extra	80¢
Washita Slips, No. 1	70¢
Washita Slips, No. 2	40¢
India Oil Stones (entire list)	33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit	40%
Quickcut Emery and Corundum Axe Stone, Double Grit	33⅓%
Quickcut Emery Rubbing Bricks	40%
Hindostan No. 1 Regular	8¢
Hindostan No. 1, Small	10¢
Axe Stones (all kinds)	33⅓%
Turkey Oil Stones, Extra, 5 to 8 in.	₩ Pr 80¢
Queen Creek Stones 4 to 8 in.	25¢
Queer Creek Slips	10¢
Sand Stone	6¢

Scythe Stones—

Mfg. Co. list 33⅓%
Black Diamond S. S. ... gro. $12.90
Crystal ... gro. $11.40
... M ... 7.20
... M ... 5.40
... Imperial ... 3.60
... Imperial ... 2.70
... Imperial ... 1.80
... Red Dot ... 33⅓%
Quick Cut Emery ... gro. $9.00
Pure Corundum ... gro. $18.00
Crescent ... $7.00
... Single Cut $11.00
... Single Cut $11.00
... Single Cut $11.00
Balance of 1904 list 33⅓%
Lenox (Artificial) ... gro.
Lightning (Artificial) ... gro. 33⅓%
$18.00

Stoppers, Bottle—

Victor Bottle Stoppers ... gro. $9.00

Stops— Bench—

Miller-Falls ... 15&10%
Morrill's, No. 1, $10.00 ... 50%
Morrill's, No. 2, $12.50 ... 50%

Door—

Chapin-Stephens Co ... 5-5-5%&10%

Plane—

Chapin-Stephens Co ... 20%

Straps— Box—

Acme Emb. Co.: case lots ... 20&10&10%
Case's Universal case lots ... 20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points ... doz. 55c
All Steel Socket ... doz. $2.00 and $2.25
Excelsior Stretcher and Tack Hammer Combined ... doz. $6.00 ... 20%

Stuffers, Sausage—

Enterprise Mfg. Co. ... 25@25&5%
Nos. 40 list Specialty Co., list Jan. 1, 1902 ... 4 and 5
P., S. & W. Co ... 40%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ... doz.
Superba, Crotch Mahogany ... $36.00
Triumph, Extra Varnished ... $27.00
Parlor Queen, Fac. Nickeled ... $
Leader, Nickeled ... $
Ann Queen, Fac. Nickeled ... $27.00
Ideal, Bird's-Eye Maple ... $
Grand, Rosewood ... $
Jap. Rosewood ... $
Standard, Nickeled ... $21.00, Jap. $14.00
Crown Jewel, Nickeled ... $
Crescent, Cane ... $
Grand, Cane, wide ... $
Parlor Grand ... $
Child, 14 in. wide ... $
Hall, 18 in. wide ... $

NOTE.—Rebates 50c per dozen on three dozen lots, $1 per dozen on two dozen lots, $2 per dozen on twelve dozen lots; $2.50 per dozen on twenty per dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks ... 90@10%
American Cut Tacks ... 90@10%
Swedes' Cut Tacks ... 90@10%
Saddlers' Upholsterers' ... 90@10%
Gimp Tacks ... 90@10%
Lace Tacks ... 90@10%
Trimmers' Tacks ... 90@10%
Looking Glass Tacks ... 90@10%
Bill Posters' and Railroad Tacks ... 90@5@10%
Hungarian Nails ... 80@10%
Finishing Nails ... 70%
Trunk and Clout Nails ... 80@10%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks ... 90@6 tens@1 ...

See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
120	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ... 50@—%
Patent Leather ... 25@40&5%
Steel ... $5 1-8&5%
Chesterman's ... 25@25&5%
Keuffel & Esser Co.:
Extra Ass. Skin ... 40&10&5%
Extra Duck and Leather ... 20&10&5%
Metallic and Steel, list, 35@35&5%; Pocket, 35@35&5%
Lufkin & Co.:
Asses' Skin ... 40&10&10%
Metallic ... 3 to 30&5%
Patent Bend Leather ... 25&5&10%
Pocket ... 40&10&5%
Steel ... 33⅓@35%
Weshnick & Hilger:
Chesterman's Metallic, No. 341, 25%
Chesterman's Steel, No. 1038L, 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger ... per 100 lbs. $2.75@$3.00

Thermometers—

Low Cases, Cabinet, Flange, ... doz. ... 30@33⅓

Ties, Bale—Steel Wire—

Single Loop ... 70
Mountain, Crossed Head, ... doz. 2@2.50

Tinners' Shears, &c.—

See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices

Tire Benders, Upsetters, &c.

See Benders and Upsetters, Tire.

Tools—Coopers'—

L. & I. J. White ... 20@20&5%

Haying—

Myers' Hay Tools ... 45%

Miniature—

Smith & Hemenway Co.'s, Davidson, ... doz. Nickel Plated $1.50; Gold Plated ... $2.00

Saw—

Atkins' Cross Cut Saw Tools ... 35&5%
Simonds, Improved ... 33⅓
Simonds' Crescent ... 25%

Ship—

L. & I. J. White ... 25%

Transom Lifters—

See Lifters, Transom.

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro. ... $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Quail ... 75@10&5%
Newhouse ... 45@10&5%
Hawes & Norton ... 65%
Victor ... 75@75&10%
Victor ... 50%
Oneida Community Jump ... 75@75&10
Hector ...

Mouse and Rat—

Mouse, Wood, Choker, doz. holes ... 12c
Mouse, Round or Square Wire, doz. 85@90c
Marty French Rat and Mouse Traps
Genuine:
No. 1 Rat, per doz. ... $12.00
No. 2 Rat, per doz. ... 9.00
No. 3 Rat, per doz. ... 6.00
No. 4 Rat, per doz. ... 3.00
No. 5 Mouse, per doz. ... 2.00
No. 6 Mouse, per doz. ... 1.50
Oneida Community:
No. 1 Rat, per doz. ... $9.00
No. 2 Rat, per doz. ... 6.00
No. 3 Rat, per doz. ... 4.50
Easy Set Rat, per doz. ... 1.50
Easy Set Rat, per doz. ... 1.00
Wonder Worker Rat, per doz. holes ... .12
Premier Tin Closet, 5 hole, per doz. traps ... .75

Trowels—

Disston Brick and Pointing ... 25%
Disston Plastering ... 20%
Disston "Standard Brand" and Garden Trowels ... 30%
Kohler's Steel Garden Trowels, 4 gro. 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels ... gro. $6.00
Woodrough & McParlin, Plastering ... 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern ... 50&10%
Western Pattern ... doz. $16.00
Handy Trucks ... doz. $15.00
Grocery Trucks ... each, net $10.00
McKinney Trucks ... each, net $10.00
Model Stove Trucks ... doz. $18.50

Tubs, Wash—

M'f'g's list, price per gross.

No.	0	1	2	3
Galvanized	$87	$79	$69	$59

Twine, Miscellaneous—

Flax Twine:
No. 9, 4 and 12-lb. Balls ... 21@23c
No. 12, 4 and 12-lb. Balls ... 19@21c
No. 15, 4 and 12-lb. Balls ... 16@17c
No. 24, 4 and 12-lb. Balls ... 15@17c
No. 30, 4 and 12-lb. Balls ... 15@17c
Chalk Line, Cotton ... doz. Balls ... 24@29c
Cotton Mops, 6, 8, 12 and 16-oz. ... to doz. ... 24@29c
Cotton Wrapping, 3 Ply, 6 to lb., for ordinary requirements ... 13@14c
American 4 Ply Hemp and American 3 Ply Hemp, 12-lb. Balls ... 13@14@15c
American 3 Ply Hemp, 12-lb. Balls ... 13@14c
India 2 Ply Hemp, 12-lb. Balls (Special Factory) ... 21@24c
India 3 Ply Hemp, 6-lb. Balls ... 21@24c
India 4 Ply Hemp, 12-lb. Balls ... 27@31c
2, 3, 4 and 5 Ply Jute, 6-lb. Balls ... 10@11c
Linen Line, Linen, 12-lb. Balls ... 47c
Machine, Mattress and Sash Cord, 12-lb. Balls, according to quality ... 45@60c
Wool, 3 to 6 ply ... 8@9c; 4 ... 12c

Vises—

Solid Box ... 50@50&10&5

Parallel—

Athol Machine Co ... 40%
Simpson's Adjustable ... 40%
Standard ... 25%
Amateur ... 40%
Columbian Hdw. Co ... 40%
Fisher & Norris Double Screw, net, each, No. 2, $20.50; 3, $16.00; 4, $12.50; 5, $27 ...
Fulton Mach. & Vise Co.:
Reed, Swivel ... 25
Star, Solid Jaw ... 40
Hollingsworth ... 40&10&5
Mechanics' ... 60&5%
Keystone ...
Lewis, Tool ... 30
Adjustable Jaw ... 50
Monarch, 57, Solid Jaw ... 50
Massey Vise Co ... 40%
Metropolitan ... 40%
Perfect, 15; Lightning Grip ... 15
Merrill's ... 40
Millers Falls Oval Slide Pattern 60&10
Parsell's:
Victor, 20@25%; Regulars ... 20@25%
Vulcan's ... 4.50@45
Combination Pipe ... 55@65
Premiss ... 20@25
Rock Island ... 25%
Snedeker's, X. L. ... 33⅓
Stephens' ... 33⅓

Saw Filers

Disston's D 3 Clamp and Guide, doz. $24.00, 33; Clamps ... 30%
Perfection Saw Clamps ... doz. $4.50
Reading ... 60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed ... 25%
Star ... 40
Mayo Vise Co ... 40
Lightning Grip, 15; Perfect ... 15%
Wyman & Gordon's Quick Action, 6, $7.00; 8, $8.00; 10, $9.00; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe ... 60@60&5%
Massey's Quick Action Pipe ... 40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 387, 40%
Rock Island Pipe ... 25%

Wads—*Price per M.*

B. E., 11 up ... 60¢
B. E., 9 and 10 ... 70¢
B. E., 8 ... 80¢
B. E., 7 ... $1.00
P. E., 11 up ... 1.25
P. E., 9 and 10 ... 1.50
P. E., 8 ... 1.50
P. E., 7 ... 1.75
Ely's B. E., 11 and larger ... $1.70@1.75
Ely's P. E., 12 to 20 ... $3.00@3.25

Dia. 15

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled ... 55&10%
Ground ... 50&5%
Plain or Unground ... 60%
Country Hollow Ware, per 100 lbs. ... $3.00
White Enameled Ware:
Mashin Kettles ... 65&10%
Corried Ware:
Tinned and Turned ... 85&10%
Enameled ... 45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware ... 33⅓%
Iron Clad Ware ... 70&10%
Lava and Volcanic, Enameled ... 40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	*45¢*	*50¢*	*65¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles ... 65@65&5%
Avery Kettles ... 60%
Perfection ... 50&5%&10
Never Break Spiders and Griddles ... 65&5%
Never Break Kettles ... 60%
Steel Stoe, Spiders and Griddles ... 65&5%
Solid Steel Kettles ... 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone ... 40@40&10%

Washboards—

Solid Zinc ... doz.
Crescent, family size bent frame ... $1.75
Red Seal, family size, stationary protector ... $4.05
Double Zinc Surface:
Saginaw Globe, family size stationary protector ... $3.55
Cataract, family size, stationary protector ... $2.60
Single Zinc Surface:
Naval family size, open back perforated ... $2.85
Single Saginaw Globe ...
Brass Surface:
Brass King, Single Surface, open back ... $3.00
Nickel Plate Surface:
No. 1000, Nickel Plate, Single Surface ... $2.65
Glass Surface:
Glass King, Single Surface, open back ... $3.05
Enamel Surface:
Enamel King, Single Surface, vertical back ... $3.95

Washers—Leather, Axle—

Solid ... 20@30@10%
Patent ... 90@90&5
Coil: ⅞ inch, 1 lb., 1¼ inch, 1½ inch, 1¾c per lb.

Iron or Steel—

Size bolt ... 5/16 ⅜ ½ ⅝ ¾ ⅞
Washers ... $4.00 3.75 2.45 2.25 2.05

The above prices are based on $6.75 off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots ... per lb. 1½@1¾c

Wedges—

Oil Finish ... lb., 2¼@2½c

Weights—Hitching—

Corert Mfg. Co ...

Sash—

Per net ton, f.o.b. factory:
Eastern District ... $21.00@—
Western and Central Districts ... $21.00@$22.00

Wheels, Well—

Sizes, $2.00; 10-in., $2.25; 12-in., $3.25; 14-in., $4.50.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 ... 72½@70&7½%
10 to 18 ... 72½@70&10%
19 to 26 ... 75@70&10@2½%
27 to 36 ... 77½@75%
Galvanized:
6 to 9 ... 72½@70&5%
10 to 14 ... 72½@70&5%
15 to 16 ... 72½@70&7½%
17 to 18 ... 72½ ...
19 to 26 ... 70@65@2½%
27 to 36 ... 65@60&10%
Coppered:
6 to 9 ... 65@60&10%
10 to 14 ... 70@65&10%
15 to 18 ... 65@60&10%
19 to 26 ... 70@65@2½%
27 to 36 ... 72½@70&10%
Tinned:
6 to 18 ... 67½@65&10%
Brass ... 12c lb., base
Copper ... 12c lb., base
Cast Steel Wire ... 50%

Spooled Wire—

Annealed and Tinned, ... 70@70@10%
Brass and Copper, ... 60@60@10%
Retailers' Assortments, per box, ... $2.10@$2.40

Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods ... 90@25@—%
Brass Wire Goods ... 90@90@10%
Brass Cup and Shoulder Hooks, ... 55@10%

Wire Cloth and Netting—

Galvanized Poultry Netting, ... 80@25@10@2½%
Standard Gair. Hardware Grade: 100 ft. rolls, 2½ to 48 in. wide, per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh ... $2.75
Nos. 4 and 5 Mesh ... $3.00
No. 6 Mesh ... $3.25
Nos. 7 and 8 Mesh ... $3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ... 80@40@10%
Alligator or Crocodile ... 70@10@5%
Baxter Pattern S Wrenches ... 70@35@10@10%
Drop Forged S ... 45@45@5%
Acme ... 60&10%
Alligator Pattern, 70%; Bull Dog ... 70%
Bemis & Call:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40% ... 50%
Steel Handle Nut ... 40&5%
Combination Black ... 50%
Merrick Pattern ... 40%
Boardman's ...
Coes' Genuine Knife Hdl. ... 40&10&5&5%
Coes' Genuine Steel Hdl. ... 40&10&5&5%
Coes' Genuine Key Model, 1895 ... 40&5&5%
Coes', Genuine Hammer Handle ... 40&10&5&5%
Coes' "Mechanics'" ... 40&10&10&5%
Donohue's Engineer ... 60&5%
Eagle ... 70
Gem Pocket ... 70
Hercules ...
W. & B. Machinist:
Case lots ... 50&5%
Less than case lots ... 50
W. & B. Railroad Special:
Case lots ... 50
Less than case lots ... 40&10&5%
Solid Handles, P. S. & W. ... 50&20&5%
full cases ... 25
Stillson ...
Uwanta Wrench Co.:
Uwanta Special Iron Handle ... 40&10%
Other Wrenches ...
Vulcan and Acrippa Chain ...
Whitman & Barnes:
Case lots ... 50&5%
Less than case lots ... 50

Wrought Goods—

Staples, Hooks, &c., list March 17, '02 ... 85@10&10%

Zinc—*(Cask lots at mill)*

Sheet ... per 100 lb. $7

THE IRON AGE

New York, Thursday, May 28, 1908.

United States Steel Sheet Piling.

An interesting installation of steel sheet piling has recently been completed in the foundation for the A. A. Pope building, Cleveland, Ohio, near the junction of Euclid avenue and Huron road southeast. The use of it solved a difficult building problem and enabled the builders to effect a very great saving in cost without sacrificing any of the features especially desired by the owner. In excavating the unusually deep basement water was encountered from a very thick and active vein of quicksand which had to be kept out until the foundation walls and grillage beams were in place. As putting in the foundations under compressed air would have been prohibitive in cost, it was decided to inclose the entire excavation in a large cofferdam, approximately 100 x 200 ft., extending through the quicksand and penetrating the hard clay below. On account of the depth of the penetration however, and the nature of the quicksand, wood sheeting could not be used, so steel sheet was decided upon, the type chosen being the United States 35-lb. section, manufactured by the Carnegie Steel Company. The contract for the basement work up to the curb line was let to T. B. Bryson, 60 Wall street, New York City, who undertook to build this great steel cofferdam, and the driving of the piling was sublet to The Great Lakes Dredge & Dock Company, of Cleveland.

The vein of quicksand was met about 20 ft. below the curb line and extended 27 ft. deeper. The entire lot was first excavated to about 4 ft. above the quicksand. The piling, which was furnished in 35 ft. lengths, was then driven through the remaining 4 ft. of water sand and the vein of quicksand, finally penetrating 4 ft. into the clay below.

Work was commenced August 29, 1907, with one drop hammer, beginning at the middle of the west side of the building and working south. After a few days this hammer was changed to steam and steam hammers were used on the balance of the driving, except a portion along the east side. During the first of the work the most difficulties were encountered, chiefly because the crews of the drivers were inexperienced and had to learn that steel piling must be driven differently than ordinary wood sheeting. This was corrected by a representative of the Carnegie Steel Company, who remained until this part of the work was completed. Before the end of the job the crews did some very good driving. At the outset a water jet was tried, but unsuccessfully, and practically all of the piling was driven without its use. Other experiments were tried, such as the use of toggles and blocking, but most of them were found to be unnecessary and were given up.

The work along the east building line required a drop hammer because the piling had to be driven within 8 in. of a party wall, and there was not sufficient clearance for using a steam hammer. Care had to be exercised to get the piling down straight and while the work was necessarily slow, it proved, upon excavation, to be some of the best done on the entire job. Not only were quarters cramped along this side, but the soil proved to be harder than elsewhere, and at times less than ⅛ in. progress was made at a blow. However, this side when completed leaked less than any other part of the work.

Soon after the first hammer had started on the east building line, a second hammer, operating under steam, was started on the west side, working north. Connection was made with the first pile driven by a tee rail, the flange of which was chipped off to fit inside the jaws of the pile driven. This rail was driven to place and the next pile was entered over it. On this part of the work the fastest driving was done, the soil being softer and the crews by this time more expert. In one day this hammer drove 25 piles to the full length of 35 ft., which was the record.

When the second hammer reached Euclid avenue it was elevated about 12 ft. on a staging, and along this end the piles were driven until their tops were level with the



Driving the Piling for the Pope Building Foundation.—The Drop Hammer at the Right Is Working Along a Party Wall on the East Building Line and the One at the Left Is Working on a Staging at the Euclid Avenue End.

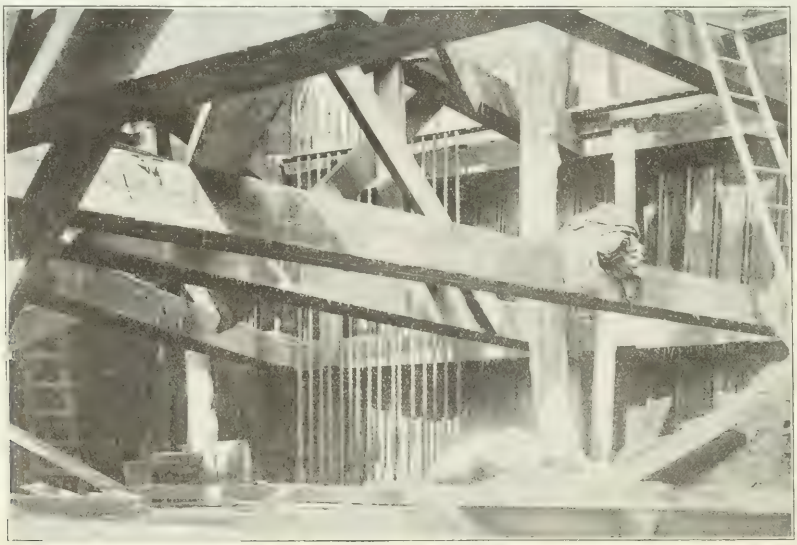


The Completed Installation of United States Steel Sheet Piling for the Pope Building and the Temporary Walling and Bracing.

staging. The hammer was then taken back over the same line, and by means of a follower the piling was driven down to the depth required. This method of driving was applied to decrease danger of a serious cave-in, to maintain a truer alignment and lessen the tendency of the piles to pull apart in driving. The two drivers met near the corner of Euclid avenue and the east building line, completing the circuit of the building

As the excavation proceeded a system of heavy timber walling and bracing was carried down in horizontal tiers about 4 to 6 ft. apart, to the bottom of the final excavation and centering on large, round, wooden piles, driven at intervals in the central part of the excavation. This bracing held the steel cofferdam in place until the permanent walls and interior structure could be built. The walling timber used was 12 x 12 in., and the bracing was put in on about 8-ft. centers. During this work a single centrifugal pump, discharging about 275 gal. per min., was used, but it was not necessary to operate it continually. Where caulking was necessary, oakum was used very satisfactorily.

This job proved the efficiency of steel sheet piling for work of this character, as it enabled constructing a very large and practically water tight cofferdam through treacherous soil, within which it was possible to excavate and set grillage beams and build outside foundation walls at much less cost than would have been possible under the pneumatic caisson system. It is impossible to lay down any very exact rules for handling and driving steel sheet piling, as the nature of the work is nearly always entirely different in different cases. In the present case, for instance, it is hard to say whether the results obtained by the steam hammer were better than those obtained by the drop hammer or vice versa, as the best work on the



A Near View of the Piling at the Euclid Avenue End of the Building, Showing Reinforcing Rods for the Concrete Wall.

job was about equally divided between the two methods; that which would produce the best results in one place might fail utterly in another place. The general adaptability of steel sheet piling to works of this character seems, however, to be established, and its use will probably increase in all manner of cofferdams, ditches, and locks, and especially in cases like the Pope Building, where a large open excavation makes it possible to handle the setting of foundations most economically and rapidly.

The Iron Ore Movement Slowly Gaining.

DULUTH, MINN., May 23, 1908.—Every day adds slightly to the iron ore movement on the lakes and to docks. Several of the railroads shipping large tonnages, notably the Duluth, Missabe & Northern, whose business will exceed that of any other Lake Superior line, have dumped almost no ore into docks, but are accumulating a few train loads daily at the receiving yards near the terminal. This railroad company was last year the victim of a dock strike, with a later organization of 700 dock laborers affiliated with the other labor organizations in general. Its work this spring has been entirely on the open shop basis, and the union is not recognized. There has been no trouble at the docks and probably will be none. The Chicago & Northwestern has sent to Duluth and elsewhere for open shop men to take the place of striking dockmen at its own port, and is running its business on that basis. It is a settled fact that no more ore will be mined or shipped this year than can be handled on the open shop plan.

There is little change in the depressed feeling among ore miners, though it is recognized that conditions in general are brighter and ore shipments will be at a reasonable pace within a week or two. It is rather remarkable, and is in accord with the spirit of the winter rather than with that of the spring, that additional curtailment should now be taking place in the iron mining region. But such is the fact; more mines have gone on half time, and some smaller ones and a few left-over explorations and prospects are closing down.

More inquiry for ore is noted than at any time since fall. This is in part due, no doubt, to the improved outlook East, and in part, too, to the decision of the operators to maintain prices. There is little chance now of getting ore at lower prices, and this fact has had a steadying influence of no small consequence.

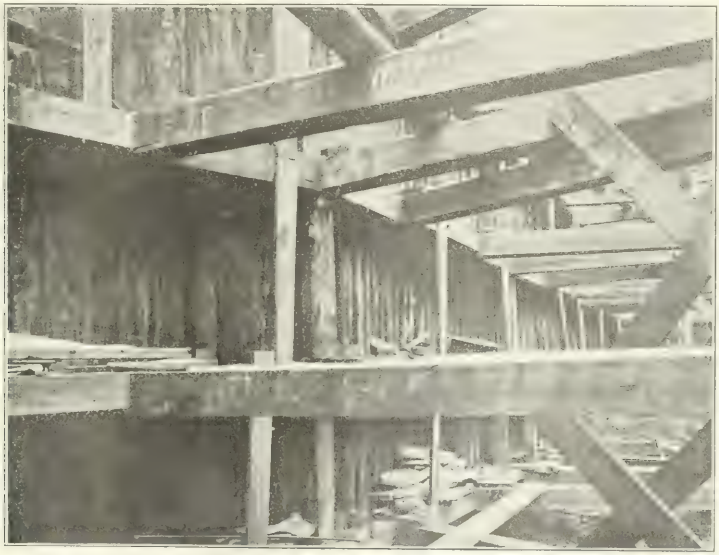
The Chicago, Milwaukee & St. Paul Railroad is going after ore traffic on the Menominee with more vigor than ever. It is building tracks to the mines of the Norway and Vulcan section and to the Aragon, and is connecting its lines at several points with those of the Wisconsin & Michigan, which it now owns and which had been in touch with a number of mines under former ownership. The scheme of this road for the use of ferries for carrying ore trains from Pestigo the length of Lake Michigan to Chicago and elsewhere has been abandoned under the new ownership.

The Young's exploration at the North Armenia, Crystal Falls, is showing well under tests. At about 100 ft. from surface a crosscut is striking a lens of ore where it was expected. Twenty-five feet above this point the lens showed a width of 90 ft., and most of it a fairly good grade. It looks very much as though this property might make a mine. It is one of the few explorations still in progress in that region.

The Spring Valley Company's exploration, at Crystal Falls, has ceased, after sinking a shaft 75 ft. and crosscutting considerably. A small seam of ore was encountered, but the company does not consider it sufficient encouragement at this time, though it may be taken up again later. This company is exploring the Kinney property at Spring Valley, and is opening what looks like a mine. Ore is being taken out and a stockpile is assuming size. Champion mine, at Champion, is now running half time.

No contract has been made by the Interstate Iron Company for stripping the Grant mine, at Buhl, by steam shovel, after the long and unsuccessful attempt to use an electric overhead grab system. Bids were in some time ago, but the property is still idle, and no attempt to begin operations, either by the grab or shovels, is manifest.

D. E. W.



A View Showing the West Building Line, Along Which the Fastest Driving of the Steel Sheet Piling Was Done.

The Oregon Electric Railway Company, Portland, Ore., has increased its capital stock from $2,500,000 to $10,000,000 preparatory to the addition of about 250 miles to its system of interurban roads. Work has already commenced on the Garden Home-Hillsboro extension, and should be completed by September 1; all material for this work is on hand. Other extensions will be made, but active construction on them will probably not be commenced until next year. Geo. B. Moffatt, New York, is president of the company; Guy W. Talbot, Portland, Ore., vice-president; Geo. F. Nevins, Portland, Ore., secretary, and H. W. Brower, New York, treasurer.

The Testing Society's Meeting at Atlantic City.

Announcement is made of the programme for the eleventh annual meeting of the American Society for Testing Materials which will be held at the Hotel Traymore, Atlantic City, N. J., June 23-27. The experience has been that previous meetings were crowded into too short a time, necessitating simultaneous sessions of different sections. The programme given below is a departure in that five days instead of three are given to the meeting and there will be but one section in session at a time. Provision has also been made for recreation time so that the meeting will not prove as strenuous as its predecessors. Wednesday evening is set aside for an engineering smoker and there will be no session on Thursday afternoon, which is reserved as a recreation period. On Friday evening an informal dinner will be given.

TUESDAY, JUNE 23, 3 P.M.

Minutes of the Tenth Annual Meeting.
Annual Report of the Executive Committee.
"Testing Is Not Inspection." W. A. Aiken.
Report of Committee B, on Standard Specifications for Cast Iron and Finished Castings. Walter Wood, chairman.
"Method of Obtaining a Circular and Uniform Chill in Rolls." Thomas D. West.
Report of Committee H, on Standard Tests for Road Materials. L. W. Page, chairman.
"The Acceptance of Stone for Use on Roads Based on Standard Tests." R. S. Greenman.
"Fuel Investigations, Geological Survey: Progress During the Year Ending June 30, 1908." J. A. Holmes.
"The Structural Timbers of the Pacific Coast." R. Thelen.
Miscellaneous Business.
Election of Officers.

TUESDAY, JUNE 23, 8 P.M.

Annual Address by President Chas. B. Dudley: "Some Features of the Present Steel Rail Question."
"The Relative Corrosion of Steel and Wrought Iron Water Pipes." H. M. Howe.
Report of Committee U, on the Corrosion of Iron and Steel. A. S. Cushman, chairman.
"Electrolysis and Corrosion." A. S. Cushman.
"Characteristic Results of Endurance Tests on Wrought Iron, Steel and Alloys." Henry Souther.

WEDNESDAY, JUNE 24, 10 A.M.

"Preliminary Programme and Results of Tests of Steel Columns in Progress at Watertown Arsenal." J. E. Howard.
Discussion to be opened by J. E. Howard and Edgar Marburg.
Report of Committee F, on Heat Treatment of Iron and Steel. H. M. Howe, chairman.
"Some Practical Applications of Metallography." William Campbell.
Report of Committee Q, on the Tempering and Testing of Steel Springs and Standard Specifications for Spring Steel. J. A. Kinkead, chairman.
"Tests of Staybolts." E. L. Hancock.
Report of Committee D, on Standard Specifications for Paving and Building Brick. L. W. Page, chairman.
"The Influence of the Absorptive Capacity of Bricks Upon the Adhesion of Mortar."

WEDNESDAY, JUNE 24, 3 P.M.

On Rails.

Report of Committee A, on Standard Specifications for Iron and Steel. W. R. Webster, chairman.
"Preliminary Programme and Results of Work on the Metallurgy of Steel in Progress at Watertown Arsenal." J. E. Howard. Discussion to be opened by J. E. Howard, W. R. Webster and J. P. Snow.
"A Microscopic Investigation of Broken Steel Rails: Manganese Sulphide as a Source of Danger." Henry Fay.
"Some Results Showing the Behavior of Rails Under the Drop Test, and Proposed New Form of Standard Drop Testing Machine." S. S. Martin.
"Types of Failures in the Base of Cold-Rolled Rails." P. H. Dudley.
"Rail Failures—Split Heads." M. H. Wickhorst.
"Some Notes on the Rail Situation." E. F. Kenney.

THURSDAY, JUNE 25, 10 A.M.

On Cement and Concrete.

Report of Committee C, on Standard Specifications for Cement. G. F. Swain, chairman.
"Portland Cement Standards, Especially for Tensile Strength." W. W. Maclay.
Report of Committee I, on Reinforced Concrete. F. E. Turneaure, chairman.
"Sands—Their Relation to Mortar and Concrete." H. S. Spackman and R. W. Lesley.
"Permeability Tests of Concrete with the Addition of Hydrated Lime." S. E. Thompson.
"Some Tests of Reinforced Concrete Beams Under Oft-Repeated Loading." H. C. Berry.
"An Important Consideration Concerning Cement Analysis." S. F. Peckham.
"Formulas for Reinforced Concrete Beams in the Light of Experimental Data." W. F. Scott.

THURSDAY, JUNE 25, 8 P.M.

On Cement and Concrete.

"The Fireproof Qualities of Concrete." R. F. Tucker.
"Shearing Values of Stone and Concrete." H. H. Quimby.
"Some Methods and Records Used in the Laboratory for Testing Cement and Other Materials for the Subway and Elevated Railway in Philadelphia." S. A. Brown.
"The Influence of Fine Grinding on the Physical Properties of Portland Cement." R. K. Meade.
"Tests of Bond in Reinforced Concrete Beams." M. O. Withey.
"Cement and Concrete Work of U. S. Reclamation Service, with Notes on Disintegration of Concrete by Action of Alkali Water." J. Y. Jewett.

FRIDAY, JUNE 26, 10 A.M.

On Preservative Coatings and Lubricants.

Report of Committee C, on Preservative Coatings. S. S. Voorhees, chairman.
General discussion on the question, "Will 'Pure-Paint' Legislation Give Us Better Paints?" This discussion will be opened by C. D. Rinald, C. B. Dudley, E. F. Ladd, C. B. Heckel, J. Dewar, J. Peters and A. Somers.
"Certain Solubility Tests on Protective Coatings." G. W. Thompson.
"Analysis of Varnishes." P. C. McIlhiney.
Report of Committee N, on Standard Tests for Lubricants. A. H. Gill, chairman.

FRIDAY, JUNE 26, 3 P.M.

On Testing Machines and Apparatus.

"The Use of the Extensometer in Commercial Work." T. D. Lynch.
"Special Features of a Recently Installed 600,000-Lb. Universal Testing Machine." T. Y. Olsen.
"New Forms of Pendulum Testing Machines." T. Y. Olsen.
"An Autographic Recorder for Commercial Tension Tests." H. F. Moore.
Report of Committee G, on the Magnetic Testing of Iron and Steel. J. W. Esterline, chairman.
"Uniformity in Magnetic Testing and in the Specifications of Magnetic Properties." C. W. Burrows.
Report of Committee R, on Uniform Specifications for Boilers. E. D. Meier, chairman.

SATURDAY, JUNE 27, 10 A.M.

Forest Service Tests to Determine the Influence of Different Methods and Rates of Loading on the Strength and Stiffness of Timber: *a.* "The Purpose and Scope of the Investigations." McGarvey Cline. *b.* "Analytical Discussion of Speed-Strength Relation." H. D. Tieman.
"Manganese Bronze." C. R. Spare.
"Notes on the Desirability of Standard Specifications for Hard-Drawn Copper Wire." J. A. Capp and W. H. Bassett.
"The Structural Materials Testing Laboratories, U. S. Geological Survey: Progress During the Year Ending June 30, 1908." R. L. Humphrey.
"Effect of Combined Stresses on the Elastic Properties of Steel." E. L. Hancock.
Report of Committee P, on Fireproofing Materials. I. H. Woolson, chairman.
Report of Committee S, on Waterproofing Materials. W. A. Aiken, chairman.
Miscellaneous Business

The Consolidation in South Russia.

Although the consolidation of nine of the great iron and steel companies in the Donetz basin in Russia has not yet received the official sanction of the government, it is probable that it will go through. The Union Metallurgique Russe, which will be a union of what are chiefly companies backed by French and Belgian capital, is to have a capital of about 100,000,000 roubles (about $51,000,000), divided approximately into equal parts of 6 per cent. preferred A stock and common B stock, at 187.50 roubles. The A stock is to receive 6 per cent. preferred dividends. Then an equal amount is to be paid to the common stock and subsequently all stock shares alike. Capital equal to 3,500,000 roubles entitles to one seat in the board.

The consolidation takes over all assets and liabilities and issues its stock to the individual companies in the following amounts: Dnieprovienne du Midi de la Russie and Metallurgique Russo-Belge, each, 22,500,000 roubles of A stock, and 5,500,000 B stock. Providence Russe, Ural Volga, Makewka and Taganrog, each, 7,500,000 roubles B stock. Briansk, 4,750,000 roubles A stock and 4,750,000 roubles B stock. Donetz-Juriefka, 3,200,000 roubles B stock and cash to cover floating indebtedness.

Hughes, 22,000,000 pounds cash. To meet the latter a further issue of A stock and of bonds is to be provided, in amounts as yet not determined.

Sliding Scale Agreements in Iron and Steel.

In a paper read before the New York Railroad Club W. V. S. Thorne, director of purchases of the Union Pacific Railroad and the Southern Pacific system, presented the following concerning the bases of sliding scale agreements in force between the above systems and the manufacturers of iron and steel and other metal products:

In making agreements with manufacturers it has been found most satisfactory, where practicable, to have the price of the finished articles purchased based on the average price of the raw material from which such articles are produced, as quoted, say, every three months in the most reliable trade journal, with the understanding that when the price of any finished article has once been agreed to, such price will thereafter automatically fluctuate in some fair proportion with the price of the raw material. For instance, the price to be charged for the following articles on orders placed by the railroad companies with the manufacturer during each quarter of any calendar year during the term of the agreement may be based, with proper differentials, on the average price of the raw material mentioned below (opposite the finished product), as quoted in the most reliable trade journal during the month or quarter immediately preceding the quarter of the calendar year in which the finished material is ordered:

Boiler tubes, dry pipes, safe ends, water grates and arch pipes. Firebox steel. Castings, steel and malleable iron. Castings, gray iron. Steel or iron forgings, for locomotives, rough or finished. Rail joints. Stay bolt and boiler brace iron. Screw spikes. Track spikes. Track bolts and nuts. Wheels, rolled steel.	Average price per gross ton of Bessemer pig iron at Pittsburgh, Pa.
Brake-beams. Truck bolsters, if made of rolled steel.	Average price per 100 lb. of beams and channels at Pittsburgh, Pa.
Axles, steel, for cars or locomotives.	Average price per net ton of steel forging billets at Pittsburgh, Pa.
Tie-plates, rolled steel.	Average price per gross ton of Bessemer steel billets at Pittsburgh, Pa.
Steel plate, merchant steel bars, steel angles, tees, channels and beams.	Average price per 100 lb. of steel plates, merchant steel bars, steel angles, channels and beams at Pittsburgh, Pa.
Switches, frogs and crossings, frogs, and repair parts for same.	Price of steel rails per gross ton f.o.b. Chicago, as quoted by the Illinois Steel Company, and price per 100 lb. of steel bars at Pittsburgh, Pa.
Guard rails with adjustable clamp. Taper rails.	Price of steel rails, as above.
New cast iron car wheels and credit to be allowed for scrap wheels.	Average price per net ton of scrap cast iron car wheels f.o.b. Chicago.
Springs, elliptic and coil.	Average price per net ton of spring steel in 1000-ton lots at Pittsburgh, Pa., as quoted by the Carnegie Steel Company.
Steel wire nails.	Average price per pound of steel wire nails f.o.b. Pittsburgh, Pa.
Wire: Barbed and plain; telegraph.	Average price per pound of plain fence wire f.o.b. Pittsburgh, Pa.
Box car metal roofs.	Average price per pound of galvanized iron sheets f.o.b. Pittsburgh, Pa.
White lead and red lead.	Average price per pound of refined corroding per [illegible] 50-ton lots at St. Louis, Mo., as quoted by the American Smelting & Refining Company.
Babbit metal. Car seals.	Average price per pound of desilverized refined pig lead in 50-ton lots at New York, as quoted by the American Smelting & Refining Company.
Journal bearings and brass castings, and credit to be allowed for scrap brass, &c. Safety valves. Locomotive whistles.	Average price per pound of casting copper f.o.b. New York, as quoted on the New York Metal Exchange.
Gravity coppers.	Average price per pound of Lake copper at New York.
Gravity zincs.	Average price per pound of spelter at St. Louis, Mo.
Rubber insulated copper wire.	Average price per pound of Lake bar copper in 25-ton lots f.o.b. New York, and [illegible] price per pound of up-river fine Para new rubber, f.o.b. New York.
Manila rope.	Average price per pound at New York of current spot manila hemp and good current spot manila hemp.
Creosote.	Average price of creosote as quoted in London, England.

These examples show how it is often practicable to make agreements between large consumers and producers, so that when mutually satisfactory prices have once been agreed to, some fair automatic method can be used whereby prices will adjust themselves to future conditions with as little unnecessary labor and friction as possible. Such a sliding scale basis mutually protects the purchasers and sellers, and in agreements extending over long periods avoids disputes and arguments as to how prices should be fairly adjusted when general conditions change. For the protection of the railroads a clause is embodied in nearly all such agreements, stating that in case the manufacturer at any time quotes lower prices on similar articles to any of his other customers he will likewise reduce prices to the railroads mentioned as regards orders they may place with him during the months in which he may have made lower prices to any of his other customers.

About one-quarter of all the continuing agreements thus far made by the director of purchases have had prices based on a sliding scale.

Freight Tariff Sheets Demanded by Shippers.

The Traffic Club of Pittsburgh, at a special meeting on the evening of May 11, called to discuss "Co-operation Between Carriers and Industrials in the Matter of Publication and Distribution of Freight Tariffs," adopted the following resolutions:

Whereas, There is a noticeable growing tendency on the part of some of the interstate carriers to discontinue supplying shippers with copies of freight tariffs, supplements and reissues by discontinuing the mailing list, and in other instances to discontinue, for reasons of economy or other reason, the compilation of numerous tariffs in one book, which latter have been of material advantage to shippers and to initial line agents, particularly where book rates have been used in combination, to make through rates, facilitating the prompt quotation of through rates, issues of bills of lading, &c., and

Whereas, Under the ruling of the Interstate Commerce Commission and of the courts, shippers are now charged directly with the knowledge of knowing what the legal rates of freight are, even though they have no voice in the making or publication of same; therefore, be it

Resolved, That the Traffic Club of Pittsburgh express its disapproval of any actions or contemplated actions on the part of the interstate common carriers which tend in the direction of making it more difficult by abolition of compiled books of freight rates or discontinuance of the mailing list, to ascertain the legal rates of freight, than has been the case prior to April 1; and be it further

Resolved, That because of the broad mutual interest that should exist between the shipping public and the carriers, it should devolve upon the latter as a moral if not a legal duty, to continue to assist shippers at least to the same extent that they have in the past, and if possible in the future to even a greater extent:

And we further recommend that the interstate carriers continue to keep shippers who have heretofore had that privilege upon their mailing list for tariffs, for the reason that with the volume of business now transacted in this country it is impossible and impracticable for shippers generally to obtain through rates of freight from tariffs posted in the freight houses or from local agents.

[illegible] were launched [illegible] May 23, one at the Lorain, Ohio, yard, and the other at the Superior, Wis., yard of the American Shipbuilding Company. The former was named in honor of Price McKinney of Corrigan, McKinney & Co., Cleveland, Ohio. With the launching of these two steamers all vessels which the American Shipbuilding Company had under contract for 1908 delivery have now been placed in the water.

The New Machinery Club.

The Formal Opening of the Club on Thursday, May 21.

(With Supplement.)

One of the most representative gatherings of men in the machinery trade and allied industries ever held in this country took place on Thursday, May 21, at the quarters of the new Machinery Club of the City of New York, on the twenty-first and twenty-second floors of the Fulton Terminal Building, at 50 Church street, the occasion being the formal opening of the club rooms. It is estimated that nearly 3000 persons, consisting of members of the club and invited guests, attended the affair, which was in every way successful. The spacious quarters of the club, a plan of which was shown and the furnishings of which were described in *The Iron Age* of January 30, were crowded, but notwithstanding this fact it was proved that the cuisine was ample to take care of such an assemblage. The Reception Committee of 100 representative members in the trade had been designated by the Plan and Scope Committee to take charge of the guests and make them comfortable, and ably captained by the members of the Plan and Scope Committee and the House Committee, who had arranged the details, the visitors were well taken care of and left with an impression of the club which should be envied by similar organizations.

Some Details of the Reception.

The Plan and Scope Committee, which has been working for several weeks arranging for the reception, consisted of William B. Albright, Sherwin-Williams Company; W. P. Pressinger, Chicago Pneumatic Tool Company; H. B. Kirkland, National Metal Molding Company; J. R. Vandyck, Vandyck-Churchill Company, and T. N. Motley, T. N. Motley & Co. These gentlemen had selected the Reception Committee in conjunction with the Board of Governors of the club, and together with the House Committee arranged the details. Every member of the Reception Committee on his arrival at the club office was handed a badge attached to which was a note requesting the recipient to take his place in the main hall, meet the guests and introduce those who were strangers to some one who could offer them proper entertainment. An orchestra was stationed in the main dining hall to discourse music during the reception. The invitations were issued for 1 o'clock, but even before that time several hundred people were in the club's rooms, and the train of visitors continued until after 6 o'clock.

The National Association of Manufacturers which had been holding its convention in New York and the National Machine Tool Builders' Association in Atlantic City had both adjourned the day before the opening, and many members of these organizations attended the reception.

The opening was decidedly informal, the only ceremony consisting of an address by George A. Post of the Standard Coupler Company. Mr. Post, at one of the meetings of the Plan and Scope Committee, announced that he would like to see the club opened like a bottle of champagne as against a bottle of stale beer, and his speech bubbled with oratory and wit in a manner that was illustrative of his remark. He said:

President Post's Address.

From a casual observation of what has been going on here this afternoon it might be inferred that the Machinery Club is open, but it isn't; not yet. True, the portals are swung wide, the corridors are thronged with distinguished guests and proud members, while strains of sensuous music percolate through the spacious and conveniently appointed suite. The blazing coals in the culinary, doing their perfecting work with the cuisine, under the deft manipulation of the chef; the staff, resplendent in its brand new outfit of togs, omnipresent and awe inspiring; the curling smoke from hundreds of fragrant perfectos; the hum of mirthful chat; the exchange of hearty felicitations, and the joyous sound of merry laughter, all seem to indicate that an opening of some kind has taken place. All about me are open countenances—open for anything, either solid or liquid.

But all these signs of activity are but harbingers. They resemble the eager hounds straining at the leash, or the prancing ponies scoring at the race track; somebody has got to say something before they're off. The Machinery Club awaits the outpour to follow the application of its vocal corkscrew. For this occasion that's me. After me, the deluge—of club delights.

In the business game clubs are trumps. They are an absolute necessity in bringing men together under pleasant auspices, cementing friendships, affording conveniences for social entertainment and providing places of rendezvous for commercial conference. By binding together with the ties of fraternity large numbers of active, influential and intellectual men who learn to know one another well, the asperities of business strife are softened. Unity of action upon matters of common concern can thus be speedily effected, and, radiating from congenial club circles, influences for the betterment of commercial conditions may permeate widely and deeply.

Into this field of beneficent social and commercial endeavor the Machinery Club of the City of New York to-day makes its formal entry. It is the competitor of none; it is the coadjutor of all similar organizations. In this metropolis of our nation, with its millions of population to which men come upon errands of their crafts, there is room—yes, there is need—for this club and more like it. Here its members will find those conveniences that minister to their creature comforts. In its membership will commingle many of the men who make this city, State and nation great, and whose interests ramify throughout our country and foreign lands.

Its name is not intended to signify that its membership is restricted to those who are manufacturers of or dealers in machinery. It includes men in all kinds of occupations. It is like the Lawyer's Club, which is mostly made up of those who are not lawyers; or a Monday club which meets on Tuesday. The real reason, however, I suspect, for its name, is that it is intended to go. Machinery, if it is any good, goes. This club is all right, and is bound to go.

It is the hope and intention of the Machinery Club that it shall be known far and wide as a Mecca for those who seek good cheer. Let the tidings be spread abroad that here within these walls, on Manhattan Isle, is Laughland. If there be those whose nerves are too sensitive, whose moods are too sour, or whose mien is too austere to withstand contact with "live wires," they are not beckoned to these portals. Here shall good fellows, with merry quips upon their lips and the thrill of enthusiasm in their hand clasp, meet to eat, be sweet and merry. This club is not intended to be an emporium for the exploitation of canned grouches, nor as a mausoleum for "dead ones." It is a club for people with red blood in their veins and who cultivate the habit of smiling. Its atmosphere is to be redolent of the joys of comradeship. With its rooms located high in the heavens things hereabout ought to be quite heavenly.

You will note that there is an utter absence of barbaric splendor and garish coloring in our scheme of decoration. In such simple surroundings our membership will be safe from the prurient intrusion of sleuths who hunt for evidences of predatory wealth. As we wander along the corridors or sit about the rooms that are guiltless of any wanton waste of the precious woods of the forests, we shall have the intense satisfaction of knowing that we are true exemplars of that great virtue of the "conservation of our national resources." You know the President, 40 governors and a bunch of brilliant Americans have recently been reading essays down in Washington upon that subject. I am devoutly thankful that not one word has been wafted from the White House against the free and unlimited use of plaster. Patriots are we! Plaster for ours! We can look any old tree in the bark without a blush. We are neat, but not gaudy; we are proud, but not haughty. Our brightest ornaments will be our membership jewels, our greatest luxury the privilege of association with one another.

May the history of this club be a record of success and honor. May we who are enrolled among its thousand members in the beginning of its career long enjoy harmoniously its attractions and its advantages. Let us actively engage in the work of adding new members to its roster from among those who will give its strength and increase its social prestige. Let us hope that in future years, long after we who now attend its christening have lost our appetites for luncheon, the intrepid spirits who will then be doing momentous things in New York, greater than our fertile imaginations can now forecast, will gather about these tables, glad legatees of our work this day.

Gentlemen, the Machinery Club of the City of New York is now open! To our honored guests we accord an 18-carat welcome, and to the members we shout an exuberant "Hallo"!

A fine luncheon was served with other refreshments in the main dining room and grill room, after partaking of which the members and visitors went through the club's quarters, visiting the reception and smoking rooms, shower baths, barber shop, ladies' dining room, roof garden and other features of the club.

Features of the Rooms.

On every side were heard expressions of admiration of the manner in which the rooms were arranged and



J. R. VANDYCK
WALTER L. PIERCE
O. C. GAYLEY
KENYON B. CONGER

GEO. H. POST

F. H. STILLMAN
H. L. SHIPPY
A. B. SEE
OTIS H. CUTLER

CHAS. A. SCHIEREN, J.
W. P. PRESSINGER
WM. B. ALBRIGHT

H. B. KIRKLAND
THORNTON N. MOTLEY
HENRY PRENTISS
CHARLES A. MOORE

GOVERNORS OF THE MACHINERY CLUB OF THE CITY OF NEW YORK

furnished. The great club kitchen on the twenty second floor was one of the appurtenances praised most highly. This section of the club quarters is directly under the roof, and among its most excellent features are ample light and air. One thing that impressed the visitor is the fact that the club is in every sense a dining club. There are no billiard tables or other forms of amusement provided, the larger part of the space being taken up by the dining arrangements.

The House Committee has paid particular attention to the fact that the main feature of a noon day dining club should be that the members can be served quickly and get back to their business, and it was pointed out to visitors that the club will be able to serve 700 people an hour. At the time of the opening of the club, it was announced that there were 1100 members, of which 500 were local members. The membership represents men in the machinery trade and allied interests in 130 cities, including cities in Mexico, Cuba, Japan and Europe. The members were particularly pleased with an innovation in the grill room which is a large table to be known as the club's "open table," at which out of town members and others who have but limited acquaintance in New York can find members who will join in conversation with them, as it is understood that diners at this table will engage in conversation without the formality of an introduction.

The Machinery Club movement was begun April 4, 1907, when F. H. Stillman, president of the Watson-Stillman Company, called a meeting of the trade at the rooms of the Board of Trade and Corporation. More than 200 men in the machinery and metal trades and allied industries responded, and a committee of 27 was appointed to form the organization.

What makes the club especially advantageous to business men as a luncheon resort is its accessibility to many parts of the city. The location is in close proximity to all railroads leading into New York and it can be reached from the railroad terminals of Jersey City by the tubes under the river, which are to be opened shortly, and an underground passage is being constructed from the basement floor of the building to the Fulton street subway station at Dey street. Both the Sixth and Ninth avenue elevated railroads are to have stations in the building, and it has been said that it is possible to go to any important point in the United States from the Machinery Club rooms without going out from shelter.

The officers of the organization are as follows:

F. H. Stillman, president; R. C. McKinney, vice-president; Walter L. Pierce, treasurer; W. Seton Henry, acting-secretary.

Governors: O. C. Gayley, Pressed Steel Car Company; Geo. A. Post, Standard Coupler Company; Walter L. Pierce, Lidgerwood Mfg. Company; F. H. Stillman, Watson-Stillman Company; C. A. Moore, Manning, Maxwell & Moore; H. L. Shippy, John A. Roeblings' Sons Company; T. N. Motley, T. N. Motley & Co.; Henry Prentiss, Prentiss Tool & Supply Company; H. B. Kirkland, National Metal Molding Company; W. P. Pressinger, Chicago Pneumatic Tool Company; A. B. See, A. B. See Electric Elevator Company; W. H. Marshall, American Locomotive Company; R. C. McKinney, Niles-Bement-Pond Company; E. H. Wells, Babcock & Wilcox Company; W. L. Saunders, Ingersoll-Rand Company; Otis H. Cutler, American Brake Shoe & Foundry Company; J. R. Vandyck, Vandyck-Churchill Company; Kenyon B. Conger, Hudson Companies; Wm. B. Albright, Sherwin-Williams Company; Chas. A. Schieren, Jr., Chas. A. Schieren & Co.

House Committee: T. N. Motley, chairman; Charles A. Schieren, Jr., George Howels, Ingersoll-Rand Company; Edw. H. Benners, Crown Casting Company; Percy A. Ware, *The Iron Age*.

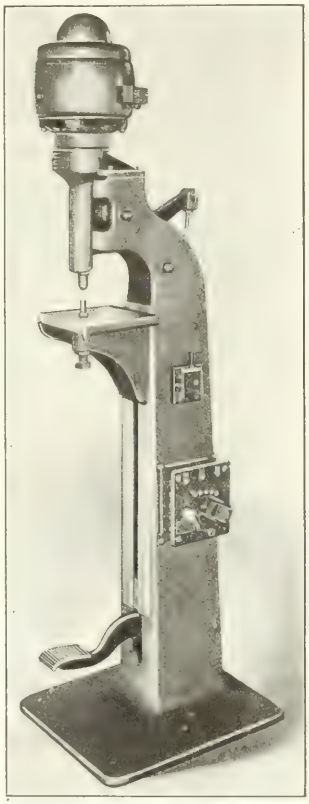
Membership Committee: J. R. Vandyck, chairman; George L. Gillon, Watson-Stillman Company; Charles B. Crook, Lidgerwood Mfg. Company.

Executive Committee: F. H. Stillman, chairman; R. C. McKinney, Walter L. Pierce, George A. Post, Henry Prentiss.

At Wilmington, Del., May 14, an order was issued by the United States Court directing that out of the funds and registry of the court 40 per cent. of the amount of the bonds of the Diamond State Steel Company be paid, and that a credit of the amount be stamped on the bonds held by John B. Newkirk, of Philadelphia, and presented in part payment of the purchase price of the plant. The property was acquired by Mr. Newkirk at public sale some time ago, for $575,000. The total distribution will be $399,600, of which sum $232,800 consists of credits. The balance will be paid in actual cash. Mr. Newkirk had made application for such a distribution.

The Grant Motor Driven Rivet Spinning Machine.

A new rivet spinning machine, the special feature of which is the vertical motor drive, shown in the illustration, has been brought out by the Grant Mfg. & Machine Company, Bridgeport, Conn. In common with the company's other machines, the working parts are specially



The New Motor Driven Rivet Spinning Machine Made by the Grant Mfg. & Machine Company, Bridgeport, Conn.

shaped twin rolls in the holder at the lower end of the revolving spindle, which when brought in contact with the rivet shank, produce a condition that causes each roll to revolve independently on its axis, thereby rolling or swedging the rivet shank into the form desired. The spindle is direct connected with the motor shaft, which does away with all belting and makes the machine more compact.

The machine will handle rivets up to 5-16 in. The spindle speed is 1200 to 2000 rev. per min.; the hight from the floor to the spinning tools is 44 in.; the distance from the column to the spindle, 6 in.; the maximum distance from the table to the spinning tools, 25 in.; the over all hight, 65 in., and the table 8 by 8 in. The floor space required is 17 by 21 in., and the weight of the machine, including the motor, is 415 lb. The machine is furnished fitted with a horn instead of a table, if desired.

Our Offices and the Trade Clubs.

The opening last week of a new club appealing to those interested in the machinery, iron and metal trades, the Machinery Club, suggests the proximity of the offices of *The Iron Age* to the clubs in the iron and allied trades and transportation lines of lower New York City. The accompanying map shows the location of *The Iron Age* offices and the three prominent clubs. The Fulton Club, at the corner of Gold and Fulton streets, is frequented by many in the metal trades; the Hardware Club, in the Postal Telegraph Building, at the corner of Murray street and Broadway, has long been an important meeting place for New York City and out of town hardware men, and



Our Offices and the Trade Clubs

the new Machinery Club, in the Fulton Building, bounded by Fulton, Church and Dey streets, will be the most prominent gathering place in the country for those in the machinery and allied trades.

Within a radius of a quarter of a mile from *The Iron Age* offices are located two express stations and one local station of the rapid transit subway reaching northward well into the Borough of the Bronx at two different places, and south and eastward to Flatbush avenue, Brooklyn, where connections have recently been made with the Long Island Railroad Company, furnishing rapid transportation facilities to a large part of Long Island. Not only these, but the four elevated railroad lines of Manhattan have stations within this circle as well as the terminals of the principal elevated and surface car lines of Brooklyn at the Manhattan end of the Brooklyn Bridge. The Post Office is not more than a stone's throw from *The Iron Age* offices. A wider circle, or one of half a mile radius, reaches to ferries of the four principal railroads, the Erie, the Delaware, Lackawanna & Western, the Pennsylvania and the Central Railroad of New Jersey.

The Terre Haute, Robinson, Olney & Southwestern Railway Company is the title of a corporation recently organized to construct a railroad northeast from Mt. Vernon, Ill., to the Wabash River, from which point it is to be extended to Terre Haute, Ind., by another company yet to be organized under the laws of Indiana. The proposed line will be a steam road, which will have southwestern connections at Mt. Vernon. The distance between Terre Haute and Mt. Vernon is about 125 miles. It is stated that contracts for the first section of 100 miles between the Wabash River and Mt. Vernon have been let, work to be completed in 18 months. H. C. Pugh, Terre Haute, is president of the company; S. C. Wilson, vice-president; F. W. Lewis, secretary; Norman Moss, treasurer, and Baxter L. Brown, St. Louis, Mo., chief engineer.

The Kansas City Galvanizing & Mfg. Company, Kansas City, Mo., has recently completed a new building, 65 x 130 ft., of brick and cement, with truss roof, for its galvanizing plant, in which a complete equipment of automatic machinery for handling metals is now being installed. The plant, which will have a capacity of 30 tons a day, is expected to be ready for operation by June 10, and business is already being booked.

Customs Decisions.

Arched Purves Furnaces.

A long drawn out litigation has been brought to a close regarding the classification under the tariff act of arched Purves furnaces by a decision of the United States Circuit Court of Appeals at Philadelphia. The appellate tribunal sustains the contention of F. B. Vandegrift & Co., the importers of the merchandise, that the articles are dutiable properly at 2 cents a pound under the first section of paragraph 152 relating to boiler tubes or flues. The court denies the claim of the Government that the articles are "furnaces" under another provision of paragraph 152 with duty at the rate of 2½ cents per pound. The court finds the Purves furnaces to be corrugated steel cylinders, or tubes, about 4 ft. in diameter and perfectly plain within; that they are intended to be made into furnaces by the insertion of an elaborate structure and the application of much labor. The case came before Judges Gray, Dallas, and Buffington. Judge Gray writes the decision which is coincided in by Judge Dallas, while Judge Buffington dissents. Judge Gray says that, although the articles were invoiced as "furnaces," and so described by those using them, no trade designation has been shown as comes within the rule applicable in customs cases. After referring to the fact that the cylinders or tubes are fitted up after manufacture with plates, fire brick, grate bars and other adjuncts, the decision in part says:

> When thus completed they undoubtedly were, and were properly called, furnaces. A number of witnesses were also introduced, whose testimony was to the effect that these tubes or cylinders, in the condition in which they were imported, were spoken of by those using or importing them as furnaces, and in fact they were so invoiced in the present case; but this convenient mode of designating them by the use to which they were to be put cannot change the essential character of the article itself. No such trade designation has been shown as comes within the rule applicable in such cases. In fact, the conditions were not such as to allow of a trade designation, as these articles were not kept in stock or dealt in as articles of general merchandise, but were only made to the order of those requiring them. To classify these articles as furnaces would, we think, be doing violence to the ordinary meaning of language, which should always, in the first instance, be resorted to in the interpretation of legislative acts, as well as be in violation of that canon of construction of taxing laws which forbids any tax burden to be imposed except by clear and unequivocal language.

Automobiles and Parts.

Importers of automobiles and their accessories have won an important victory before Judge Platt in the United States Circuit Court, who holds that the Government has no right to assess duty as entireties on automobiles and tires imported separately. The court rules that the customs authorities are not justified in exacting duty on the two items as "manufactures of metal," at 45 per cent., but should properly levy the 45 per cent. rate on the machine only, while the tires should pay 30 per cent., under the rubber schedule. This decision resulted from protests lodged with the court by the Auto Import Company, Archer & Co., and Massenat & Derouche, New York, who determined to test the Government's classification. It was shown in the testimony that in many instances the tires ordered by customers vary, and that, while they accompany the machine, they are not attached, but are packed for shipment separately. Under these circumstances, the importers asked the court to reverse the authorities in their classification of the articles as entireties.

Tin Disks.

Declaring that the Government's assessment of duty on small tin disks is practically prohibitive, the United States Circuit Court of Appeals at Richmond, Va., has reversed the rulings of the Circuit Court and of the Board of Appraisers, and grants duty at 45 per cent. The disks were imported from Canada by Frank H. Shallus, Baltimore. They are by-products of the manufacture of tin cans, being the round pieces cut out of the top of the cans to provide the aperture by means of which the cans are filled. The Government returned the disks for duty at the rate of 1½ cents per pound under the tariff provision for "tin plates." The importer alleged that the classification imposed by the Government was so excessive as to render duties on importations impossible.

In upsetting the heavy duty, Judge Dayton says that the imposition of the tax of 1½ cents a pound has the effect of making the disks pay what is equivalent to 200 per cent. Under these circumstances, the court believes that Congress did not contemplate the assessing of the small disks as "tin plates." The judge says that under the metal schedule, at 45 per cent., the disks are taxed equitably with tin and other metal importations. He accordingly reverses the heavy tax approved of by the lower court and the Board of Appraisers.

Agate Scale Bearings.

During the past week the Board of United States General Appraisers handed down several minor decisions. Claims for reduction in the duty on agate scale bearings from 50 to 10 per cent. were made by the Toledo Computing Scale Company, R. C. Hahn & Co. and G. W. Sheldon & Co. The protests were all overruled, the higher rate imposed by the Government being affirmed.

Safety Device Medals Awarded.

Three gold medals and the diplomas of the American Museum of Safety Devices were awarded at a luncheon meeting at the Engineers' Club, New York, May 25. Charles Kirchhoff, chairman of the Committee of Direction, presided. Dr. W. H. Tolman, Director of the Museum, stated that the exposition was a working model for a permanent museum, and that some of the more important exhibits had been donated to it. There are 10 such museums in Europe. To push this work, an educational committee, under the chairmanship of Bishop Potter, has been organized; another valued member is Cardinal Gibbons.

Dr. Tolman announced that the gold medal offered by the *Scientific American* for the most meritorious invention in transportation at the exposition was awarded to the Rich Marine Fire Detecting and Extinguishing System, with honorable mention to the Welin Quadrant Davit Company, and the Simmen Automatic Railway Signal Company. The jurors were Prof. F. R. Hutton, chairman; H. H. Westinghouse, Cornelius Vanderbilt, Samuel Sheldon, George Gilmour, John Hays Hammond, and Stuyvesant Fish.

For the best invention in mines and mining, the gold medal offered by the Travelers' Insurance Company, Hartford, went to the Droeger Oxygen Apparatus Company, according to the decision of W. R. Ingalls, Charles Kirchhoff, and Prof. Henry S. Munroe, the jury.

For motor vehicles, either on land or on the water, Francis H. Richards, the inventor, offered a gold medal, which was given to the Non-Explosive Safety Naphtha Container Company (McNutt patents), with honorable mention to the Rutherford Wheel Company. The jury consisted of Dr. S. S. Wheeler, Caspar Whitney and A. G. Batchelder.

The exposition at the rooms of the Museum, 231 West Thirty-ninth street, New York, closed Wednesday of this week. It has attracted technical men, railroad officials, architects, and industrialists, all of whom have expressed their satisfaction at its high character and the hope that the movement for a permanent museum may be successful.

The Dutcher Company, Milwaukee, Wis., which recently assigned for the benefit of its creditors, has, through a reorganization, been succeeded by the Dutcher Steel Casting Company, incorporated with a capital stock of $100,000. It is stated that the stock of the new company is held principally by creditors of the old Dutcher Company. The plant has resumed operations. Wm. O. Goodrich is president of the new company, G. A. Goodrich vice-president, John H. Hetherington secretary-treasurer and general superintendent.

Approximately $5,000,000 is stated to be the cost of the coal consumed by the Atlantic battleship fleet when it will have finished its cruise around the world.

The Westinghouse Double Flow Steam Turbine.

The first installation of the new double flow steam turbines developed by the Westinghouse Machine Company, East Pittsburgh, Pa., is that in the Brunot Island power plant of the Pittsburgh Railways Company. This station supplies current to most of the street railroad system and a large part of the lighting in Greater Pittsburgh. The turbine equipment shown in Fig. 1 is more than double the previous capacity in reciprocating engine driven units and occupies less than half as much floor space. The engine room originally contained five 1500-kw. Rice & Sargent cross compound condensing engines, direct connected to Westinghouse generators; three direct current 550-volt dynamos and two 600-volt two-phase alternators running in parallel with the other plants of the system. Space remained for three additional engine driven units of the same size, but these would have been insufficient to meet the increased demand for power. By adopting steam turbines instead, one 3000 and three 5000 kw. units have been installed, and there is still room for another of 5000 kw. The generators are 11,000-volt three-phase alternators, and are operated in parallel with the engine driven alternators. The smaller unit has been in operation nearly a year; the larger ones are in course of erection. The extra boiler capacity required will be provided in a new boiler house to be built parallel with the existing one, which will contain six 400-hp. Babcock & Wilcox water tube boilers, equipped with Westinghouse new model Roney mechanical stokers. The boilers will be arranged in pairs, discharging into eight independent stacks of 7 ft. internal diameter and 250 ft. high.

Condensers and pumps are located beneath the engine room floor between the turbine foundations. A short duct connects the exhaust of each turbine to an Alberger condenser of the centrifugal jet type, Fig. 2. The circulating and discharge pumps are mounted on the same shaft and driven by a Westinghouse compound single acting engine. A steam driven two-stage dry air vacuum pump is also provided for each turbine. Cooling water is pumped to the condensers from an intake tunnel extending the length of the power house, at one side of the foundations, and the discharge from the condensers empties into a similar tunnel parallel to the intakes. As the Ohio River occasionally rises as high as 28 ft. above the tunnels, an adjustable gate is provided in the intake tunnel leading from the screenhouse to a large central well in which

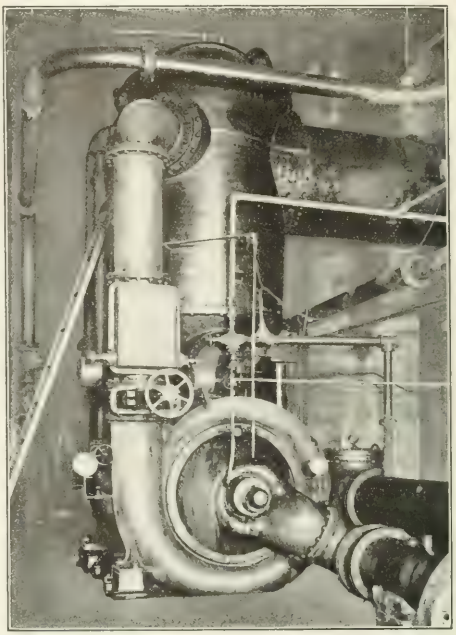


Fig. 2.—One of the Alberger Condenser Equipments in the Basement.

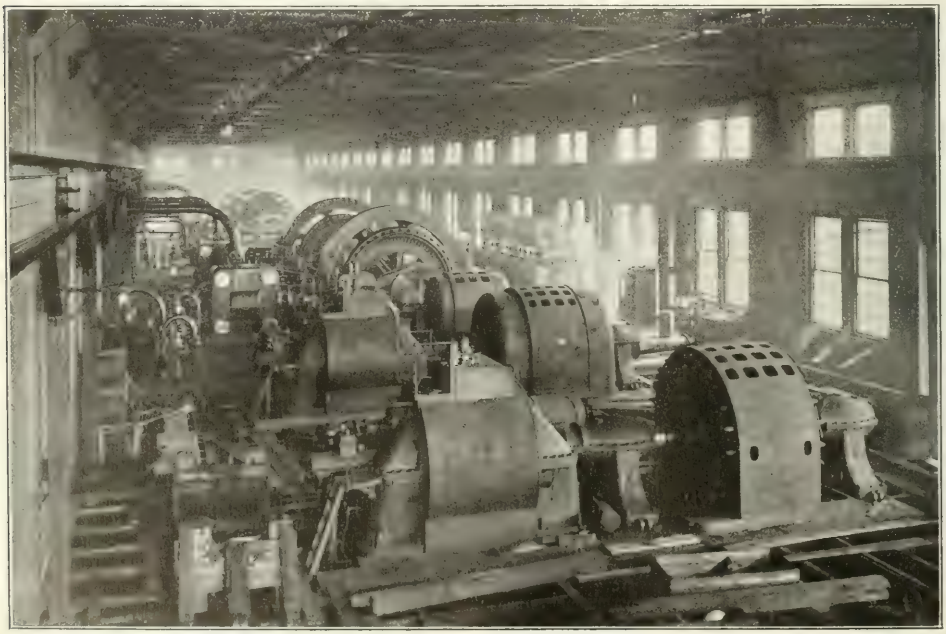


Fig. 1.—A View in the Brunot Island Power Plant of the Pittsburgh Railways Company, Showing the New Westinghouse Double Flow Turbines.

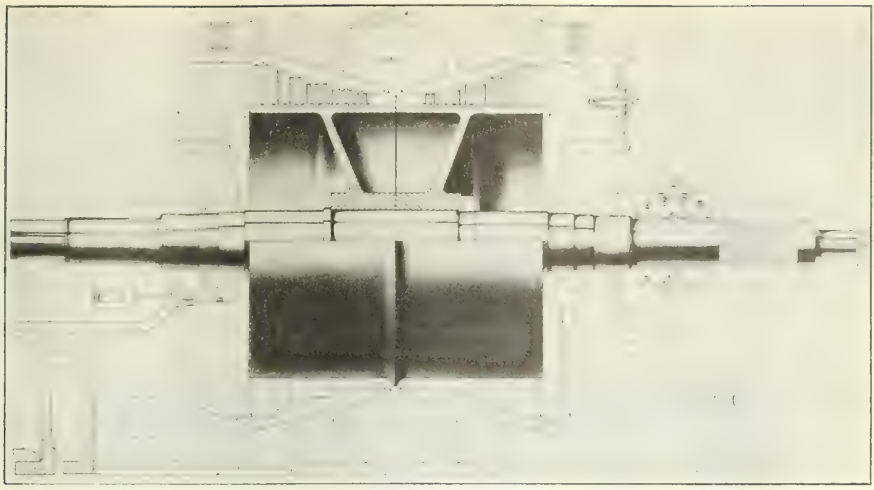


Fig. 3.—Sectional View of a Low Pressure Double-Flow Turbine.

the water level may be maintained at the desired point to prevent flooding the condensers.

The turbine foundations are interesting. Each unit rests upon reinforced concrete plates supported by six reinforced concrete columns, thus giving ample space around the condenser, which could have been placed entirely within the turbine foundations had this been necessary. The concrete employed to construct a foundation for one of the 1500-kw. cross compound engine units would be sufficient to build the four foundations required by the 18,000 kw. in double flow turbines.

The Turbines.

The greatest interest centers in the turbines because of their design. The double flow principle is essentially a modern development, arising from mechanical considerations. It is not altogether new, as the original Parsons turbine, constructed in 1880, was of the simple double flow type. In modern hydraulic work the double flow principle is very largely employed to produce a rotor running in perfect axial equilibrium. In small machines, however, the advantages of the double flow principle are not as important as in the large, because they are not mechanically so necessary, but the economy of two small machines is not likely to be as good as one of twice the capacity. In turbines of very large size proportions exist more favorable to the attainment of high economy. The double flow turbine may thus be regarded as the result of a demand for turbine generating units of large capacity running at high speeds.

The combined impulse and reaction principle of the steam expansion, together with the double flow construction as embodied in this machine, offers special advantages, and the double flow construction will hereafter be the standard in all Westinghouse machines of over 5000 kw. capacity. For smaller capacities the single flow Parsons principle is still considered the best, and in sizes below 3000 kw. the Westinghouse-Parsons construction will be continued. Thermodynamically the Parsons is the most efficient, but because of the mechanical advantages inherent in the double flow type the two types as now built will be of practically equal net economy. The condition is largely brought about by the higher relative speeds permissible in large capacity machines, with which the Parsons element works to so much better advantage as to compensate for the poorer inherent economy of the impulse section. This section may be considered somewhat as a power producing reducing valve from which a lower efficiency may be countenanced.

To best comprehend the advantages of the double flow construction it may be well to examine first the low pressure double flow turbine shown in Fig. 3. This is of the simplest possible construction, consisting of two identical Parsons turbines placed end to end, taking steam at the center and exhausting at both ends, hence the axial

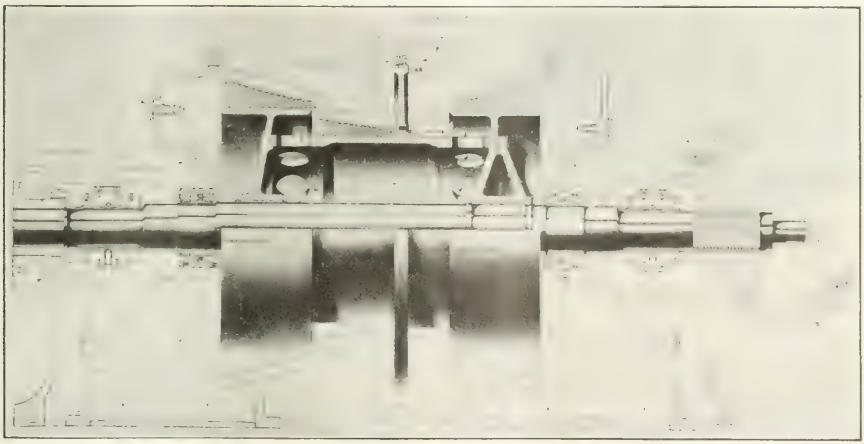


Fig. 4.—Sectional View of a High Pressure Double Flow Turbine.

thrust of the steam on the blades in one half counteracts that in the other and dummy, or balance pistons are not required. As these low pressure turbines are designed to operate on the exhaust steam from a noncondensing reciprocating engine it is possible to tie the engine and turbine together electrically, and under such conditions a governor on the turbine is unnecessary. With this exception the low and high pressure double flow turbines are practically the same in principle, but the latter, as shown in Fig. 4, has in addition a high pressure impulse element at the center of the rotor. This element may be compared to the high pressure cylinder of a triple expansion reciprocating engine.

Features of the double flow turbine are greatly reduced bulk and weight of individual parts as a consequence of the increased speed permissible due to reduced span between bearings; the making of the low pressure section in two opposed parts in axial equilibrium, permitting moderate length of the low pressure blading; the exposing of the cylinder to no higher pressure than 75 lb. as a maximum nor high temperature steam; the admitting of a relatively large volume per pound of steam to the first Parsons section, avoiding the very short blades necessary with large diameters; the need of only one balance piston, and this of moderate diameter; an impulse element well suited to high pressure and superheat which works well into the dimension scheme and reduces the shaft length nearly 50 per cent. and the dividing of the exhaust connections which pass through the bed plate, largely reducing their size.

Steam enters the turbine through a flanged opening in the lower half of the casing and is led directly to the nozzle blocks. Although for convenience the nozzle block in Fig. 4 is shown at the top, it may be located where nearest the inlet. After expanding in the nozzles the steam impinges upon the impulse blades, enters the impulse wheel chamber and is distributed uniformly around the casing to the intermediate Parsons section. The steam then divides, one-half going to each low pressure section. That to the right end section passes through the interior of the rotor shell. From the low pressure sections the steam discharges through the exhaust connections to the condenser.

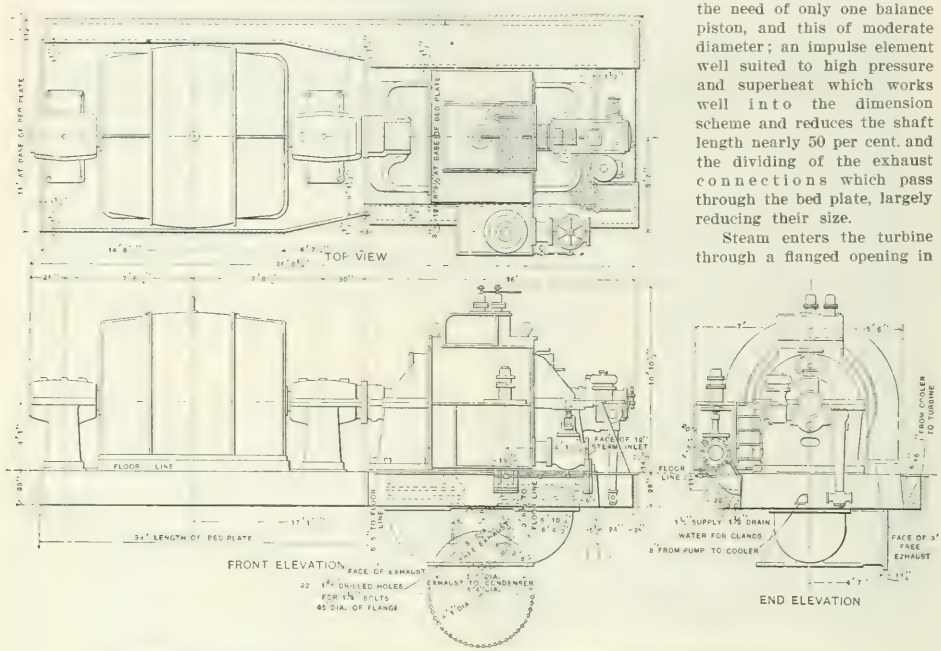


Fig. 5. Plan and Elevations of One of the 5000-Kw. Turbo-Generators in the Brunot Island Station.

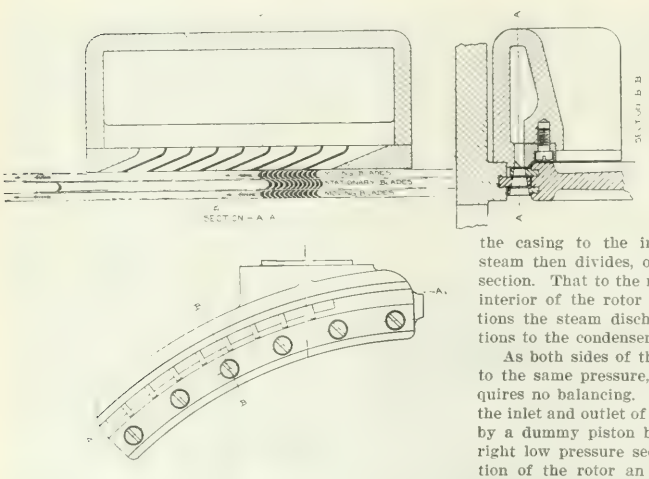


Fig. 6.—Detail of Blading and Nozzles of a Double Flow Turbine.

As both sides of the impulse wheel disk are subjected to the same pressure, it produces no end thrust and requires no balancing. The difference of pressure between the inlet and outlet of the intermediate section is balanced by a dummy piston between the impulse wheel and the right low pressure section. To maintain the axial position of the rotor an adjusting bearing is fitted on the right end of the shaft. A number of collars are turned in the shaft, between which fit brass rings fixed in the adjustment blocks. The upper and lower halves of the bearing may be adjusted by micrometer screws to rectify the axial position of the rotor.

Details of Construction.

The double flow cylinders are made in upper and lower halves, each a single casting of symmetrical design without longitudinal flanges except those for bolting the two parts together. After the flanges have been planed

and drilled the castings are rough bored, and then "seasoned" with high pressure steam until local casting strains are removed. They are then assembled and finish bored, with the boring bar running in the bearing housing to insure a truly concentric bore. Manholes at each end of the cylinder permit examining the interior, and relief valves in each of the manhole covers prevent the pressures in the exhaust passages rising to a dangerous point if the condensing apparatus fails or the atmospheric relief valve sticks. A steam and air tight packing gland is applied at each end of the cylinder where the shaft enters and is described later in detail.

Beneath the turbine a Y connection, containing two corrugated copper expansion joints, connects the separate exhausts to the main exhaust nozzle, as may be seen in the longitudinal elevation of the 5000-kw. Brunot Island turbo-generator, shown in Fig. 5. These expansion joints allow movement of the turbine casing due to expansion and contraction. An atmospheric exhaust nozzle on the side of the exhaust Y permits noncondensing operation.

The rotor, as Fig. 4 indicates, consists of five cast steel members pressed on a through shaft and locked to prevent movement. To the opposite end of the rotor is fitted a bronze bushing surrounding the shaft, permitting it to move axially without appreciable resistance under any differential expansion of shaft and rotor body. The impulse element is a flanged cast steel disk. The flange at the base is grooved and forms the balance piston for the intermediate Parsons section. A typical arrangement of blading and nozzles is shown in detail in Fig. 6.

The nozzle block is a separate casting and, receiving steam from the governor valve, restricts high pressure and high temperature to a comparatively small casting, which is free to expand and contract with changes of temperature and may easily be designed with ample strength. As the steam is expanded in the impulse element to not less than about half the initial pressure, divergent nozzles are unnecessary and simple straight sided nozzles are used. The entire nozzle block may be removed in one piece, and the nozzle walls may be readily renewed if necessary. The area through the buckets of the impulse element increases to provide for the decreasing steam velocity in each rotating wheel.

Except for its division the low pressure Parsons section is the same as in a single flow turbine, consisting of a series of rows of moving and stationary blades, increasing in hight to allow for the increased volume of the steam. The velocities from stage to stage remain practically constant. The blades are inserted in grooves cut in the spindle and cylinder body, and are held in place by caulking the soft spacers, or distant pieces inserted in the grooves between the blades. The diameters of the low pressure section are chosen so as to permit using the same size blades in both intermediate and low pressure sections, thus simplifying the blading considerably, as may perhaps be judged from Fig. 7, a view of a rotor.

The blading material is a special metal known as Monnet or duplex metal, consisting of a steel core covered with a thin copper sheathing. The copper resists corrosion and the steel provides great strength. For reinforcing long blades an improved blade lashing is now used. Comma shaped holes are punched in the blades near their outer ends and a similarly shaped lashing is laced through these holes. After the blades have been caulked into the rotor or stator, the thin part of the lashing is sheared over by a tool, which wedges it into the contracting space between the adjacent blades, acting as a strut, while the lashing wire itself acts as a tie, thus securely interlocking the blades and preventing vibration. The short section remaining in the blade after being sheared off acts as a key to prevent a broken blade from injuring adjacent rows. The uniformity secured by this method is shown in Fig. 8.

A water sealed gland, shown in Fig. 4, is fitted to each end of the turbine shaft where it passes through the exhaust casings. The packing consists of a small centrifugal pump propeller running in an inclosed chamber to which water is supplied under a head of about 10 ft., which is slightly in excess of the head due to the centrifugal force set up by the impeller blades. At starting any external leakage water is caught on circular troughs and drained away. The action of this gland is to maintain a solid mass of water around the periphery of the impeller, which effectually prevents air entering the condenser or steam escaping to the atmosphere when running noncondensing.

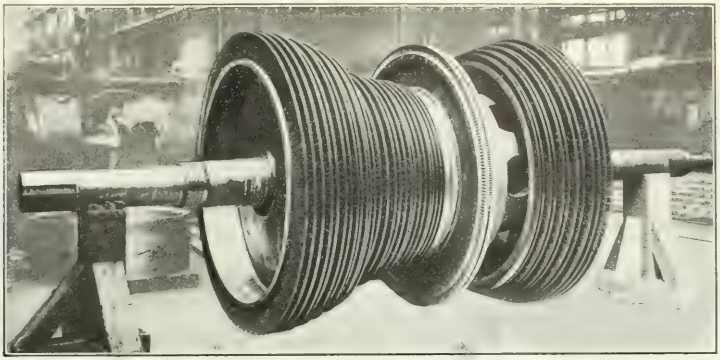


Fig. 7.—Rotor of a Westinghouse High Pressure Double Flow Turbine.

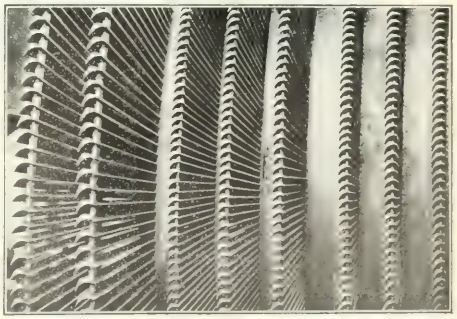


Fig. 8.—A Detail Showing the Uniformity of the Blading.

In all turbines running at or below 1800 rev. per min. self-aligning babbitt lined bearings are used, of sufficient area to require no forced lubricating system. Each is made in two parts, supported in a spherical seat by four pads, by which the bearings and rotor can be centered to preserve uniform clearance. The oil supply is delivered at the top of the journal at the point of minimum pressure, which insures even distribution of oil. All bearings are supplied with oil from a central reservoir, under a

head of about 5 ft. From the bearings the oil is drained through a strainer and returned through a cooler to the reservoir by a small rotary oil pump driven from the turbine shaft by worm and bevel gearing. The cooler contains a nest of flat coils, through which cooling water is circulated.

Between the generator and turbine shaft, to provide for any slight changes in the alignment of the respective bearings, a flexible coupling is used which has two sleeves, one keyed to each shaft. These sleeves have projecting teeth which engage with projections on a surrounding collar. The latter is in two parts to permit removing either shaft without disturbing the other. The coupling allows considerable variation in the shaft alignment and permits the generator to float in its bearings, limited only by a retaining ring at each end.

If the turbine tends to race the main throttle valve is automatically closed by a spring balanced plunger at the end of the main shaft. Normally the spring holds the plunger to its seat, but excessive speed causes the end of the plunger to protrude and trip a relay valve, which operates a quick closing throttle, by releasing the pressure beneath its piston. Any accident to the pipe connections of the speed limit would instantly shut down the turbine.

The governing is by the familiar "puff" or "gust" system, a constant number of admissions per minute being made with a variable duration of admission according to the load. To maintain an equal distribution of work between the several stages of a multi-stage turbine, governed by individual nozzle control, the nozzles in each stage should be governed simultaneously. With the throttling method of governing, stage pressure control has been found unnecessary. Where the expansion in each stage is but a small part of the total expansion range, as in the Parsons turbine, the initial and terminal pressures of each stage rise and fall together, resulting in a fairly constant pressure ratio at each successive expansion, the nozzle and blade areas being reasonably correct through a wide range of load and pressure distribution. The impulse section is properly proportioned for a wide range in load, and may be governed without intermediate nozzle control without sacrificing economy at fractional loads. The governor is of the sensitive fly ball type, as may be seen in Fig. 9. All parts are kept constantly in motion to avoid friction of rest and prevent sluggish action which would follow running a considerable period at constant load. A small relay steam piston does the actual work of moving the turbine valves, thus relieving the governor of practically all work except moving a small pilot valve. For convenience in synchronizing and distribution of alternating current load, the governor is fitted with a small motor and weight, by which the governor spring tension may be controlled from a distance, usually from the switchboard.

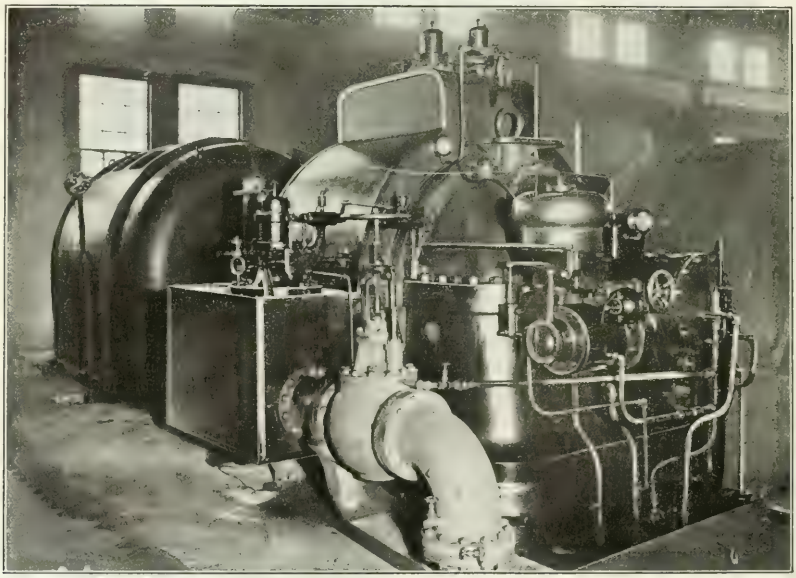


Fig. 9.—A View of the Steam End of One of the Turbo-Generators, Showing the Governor and the Steam Admission Side.

Manganese Steel for Coil Shields on Lifting Magnets.—An example of how the development of one industry helps another is shown in the adoption of manganese steel disks for coil shields on the lifting magnets made by the Cutler-Hammer Clutch Company, Milwaukee, Wis. The shield is a flat disk, fastened to the under side of the lifting magnet for the double purpose of protecting the magnetizing coil and interposing an area of nonmagnetic material between the two poles. Ordinary steel being a magnetic metal cannot be used, as it would serve to conduct the magnetic lines of force from pole to pole instead of compelling them to seek a passage through the material to be lifted. Because of its nonmagnetic properties brass has heretofore been used for this purpose. It is now found that manganese steel seems to be an ideal metal for this service, since it is not only nonmagnetic like brass, but is also very much harder—so hard, in fact, that the continued contact of pig iron or other material on the lifting surface of the magnet makes no impression on it. All of the 50-in. magnets recently furnished by the Cutler-Hammer Clutch Company to a number of steel mills in the Pittsburgh District are equipped with manganese steel coil shields instead of the brass disks formerly used.

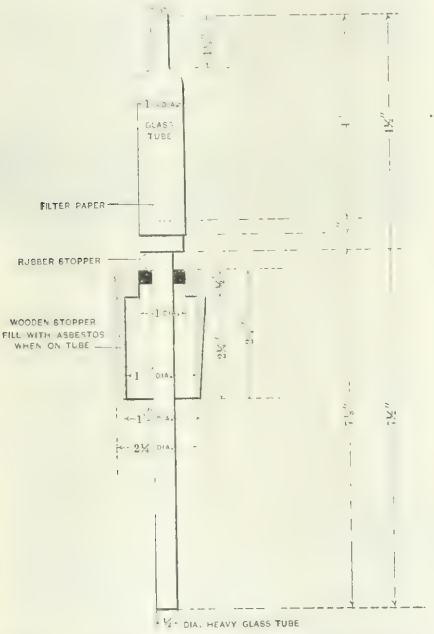
A Large Gas Producer Plant.—At the Duquesne Steel Works of the Carnegie Steel Company 6 of the 18 additional open hearth furnaces for which appropriations have been made were completed recently. Preparatory to their operation the new gas producer plant was started up. The producer building is 1140 ft. long, and contains 64 gas producers of the Hughes' mechanically operated type, built by the Wellman-Seaver-Morgan Company, Cleveland, Ohio. This is the largest installation of this producer yet made. The producers are mechanically fed,

and the removal of ashes is automatic. The coal consumption for the 64 producers will be about 1500 tons a day. As rapidly as the necessary changes can be made, all the open hearth furnaces will receive gas from the new producers, and the use of natural gas will be abandoned.

A Method for Determining the Amount of Dirt in Gases.

The method described below for determing the amount of dirt in blast furnace and other gases has been worked out under the direction of E. L. Messler, general superintendent of the blast furnace department of the Jones & Laughlin Steel Company, Pittsburg, Pa., by Frederick Brinker, assistant chief chemist. It is regarded one of tthe most accurate thus far devised for this purpose, the results of a two-years' trial having been found to check very closely with actual practice.

A 9-c.m. filter is folded so as to fit inside the large glass tube in the shape shown in the drawing. The rubber stopper on the glass tubing fitting inside the filter



A Method for Determining the Amount of Dirt in Blast Furnace and Other Gases.

presses it to the side of the large glass tube, thus making a tight joint. The wooden stopper through which the glass tubing passes is hollowed out to make it more pliable; also to give more heating surface to the glass tubing and thus prevent the separation of moisture in the tube. A little asbestos is put in the bottom of the stopper to keep the heat from the rubber stopper. The stopper is now placed in the 2¼ in. hole in the gas main where the sample is to be taken, care being taken to get it straight so that the flow of gas passes the end of the glass tubing, which must be straight and smooth. The end of the tube with the filter in it is connected to a aspirating bottle with rubber tubing. One cubic foot of gas is drawn through the filter in about 25 min. The filter is taken out of the tube, dried and weighed. The difference between this weight and the weight of the filter is the amount of dirt in one cubic foot of gas. If a little dirt has collected in the glass tubing on its way to the filter, this must be added to the filter before it is dried and weighed.

The filtering tube can also be connected to a gas meter which is operated by a small suction pump, the meter running at the rate of about 3 cu. ft. per hour. By this means a test lasting several hours can be made, which gives much better the average amount of dirt in the gas. When making a long test, the tube with the filter in it must be kept warm (which can be done with one or two 16 candle-power electric lights) so as not to allow the gas to be reduced in temperature to the dew point, as moisture would then separate and clog the filter and burst it.

The National Association of Manufacturers.

The National Association of Manufacturers, at its concluding session May 20, went on record as favoring the "let us alone" policy. This resolution was unanimously adopted:

Resolved, The National Association of Manufacturers believes that we have had excess agitation under the guise of moral crusades, such as child labor, railroad reform and similar movements, which are excellent and desirable in reasonable measure, but not so when pressed to the hazard of vested interests and property. We therefore recommend rest and quiet upon such questions, at least until normal business is restored.

The resolution was presented to the convention by James W. Van Cleave, its president. He said that the manufacturers appeal for the square deal of business, not of politics. They felt that grave injustice had been done to them in the crusades that have been waged.

James A. Emery, general counsel of the National Council for Industrial Defense, attacked President Roosevelt for his utterances about the improper use of injunction. He declared that the President had impeached the whole judiciary without setting forth facts on which a single judge could be impeached. "For four or five years," said he, "there has been a general attempt to push this labor legislation, inimical as it is. For three years past it has been stated and reiterated in executive messages that the right of injunction has been misused against labor, and that there has been wide abuse of the injunction. Now, let us look into it and find out if this is true. How many injunctions, for instances, have been issued by the United States circuit courts in the last five years? There have been issued only 328 injunctions, and only 20 of them in labor disputes." He added that what we want in this country now is not more laws, but more respect for the law.

The association passed resolutions against repealing the national bankruptcy act of 1898.

Gifford Pinchot, head of the United States forest service, delivered an address along the lines of his recent address before the conference of governors, but appealing to the manufacturers personally to lend their aid in conserving the nation's resources.

James W. Van Cleave, as president, and all of the other old officers were re-elected.

An Allis-Chalmers Pump Test.—An official test recently made on two Allis-Chalmers screw pumping engines, together with four centrifugal pumping units installed in the Thirty-ninth street pumping station of the Sanitary District, Chicago, resulted in the award of a bonus to the maker of about $100,000. The contract called for 95,000,000 ft.-lb., while the test developed a duty of 145,000,000 ft-lb. A bonus of $1000 was offered for every 1,000,000 ft. lb. in excess of the contract price, that sum representing but a small proportion of the saving in operating expenses to be effected by every 1,000,000 ft.-lb. increase in the engines' efficiency; it is figured, therefore, that, despite the large bonus to be paid, the Sanitary District is the gainer under the contract. The installation represents an aggregate maximum capacity of 2,160,000,000 gal. of water and sewerage every 24 hr. The test was run under the direction of Henry A. Allen, representing the Sanitary District; Louis E. Strothman of the Allis-Chalmers Company, and W. E. Jennings. Twenty observers checked up the work for the Sanitary District and 16 others were present representing the contractors.

The Gas Process of Case-Hardening.

BY J. I. SPRINGER, NEW YORK.

What promises to be a revolution in the methods of case-hardening is the gas process recently developed by Adolph W. Machlet, superintendent of the American Gas Furnace Company, Elizabeth, N. J., after years of experiment and study. The machine which accomplishes the results is being exploited by the firm mentioned. A distinct concern, the American Metal Treatment Company, also located at Elizabeth, N. J., is engaged in executing care-hardening orders for the trade by this process of gas carbonization.

Before entering upon a description of the machine and the process which it effectuates, it may be well to consider the present-day methods and their defects. Case-hardening is ordinarily performed on articles of iron or low-carbon steel to convert their surfaces into steel containing sufficient carbon to enable hardening to be done by heating and chilling. The essential thing, then, is to impregnate the surface with carbon. Ordinarily, the first step is accomplished by packing the pieces in some carbonaceous material, such as wood charcoal, scrap leather, raw bone, bone charcoal, &c. A wrought or cast iron case is used to hold the work and the packing. In packing, care is exercised that no article is in contact with the iron of the case or with the rest of the work, and that uniformity of compactness is secured to insure uniformity of carbonization.

For high grade results the packing must be done by a skilled man, which is manifestly a considerable item in the expense. The case containing the packed articles is covered by a cap, and the whole sealed with clay or other suitable material. The entire package is now raised to a temperature of about 1500 degrees F. This heating causes the iron or mild-steel articles to expand to a condition receptive to carbon from the surrounding and heated packing. It is necessary, as a rule, to keep the case in the furnace for 18, 24 or even 48 hours, but nothing is gained by prolonged heating after the carbon in the packing is exhausted. Probably the packing nearest an article, and which is soonest exhausted, not only hinders carbon passing from the more distant packing but absorbs it. The carbon already absorbed by the surface of the article undoubtedly also hinders the further penetration of carbon. At any rate, the depth of penetration is not in proportion to the time of the furnace heat—*i. e.*, double the penetration requires more than double the time. To carbonize to a considerable depth, repacking, one or more times, is sometimes resorted to. The case is removed and the whole allowed to cool, when it is repacked with fresh material. This is very costly, involving the expense of more or less skilled labor, loss of time, and the reheat-

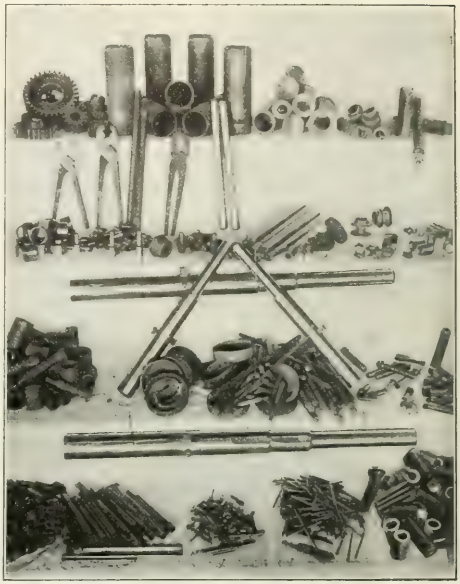


Fig. 2.—Examples of Articles Case Hardened by the American Metal Treatment Company.

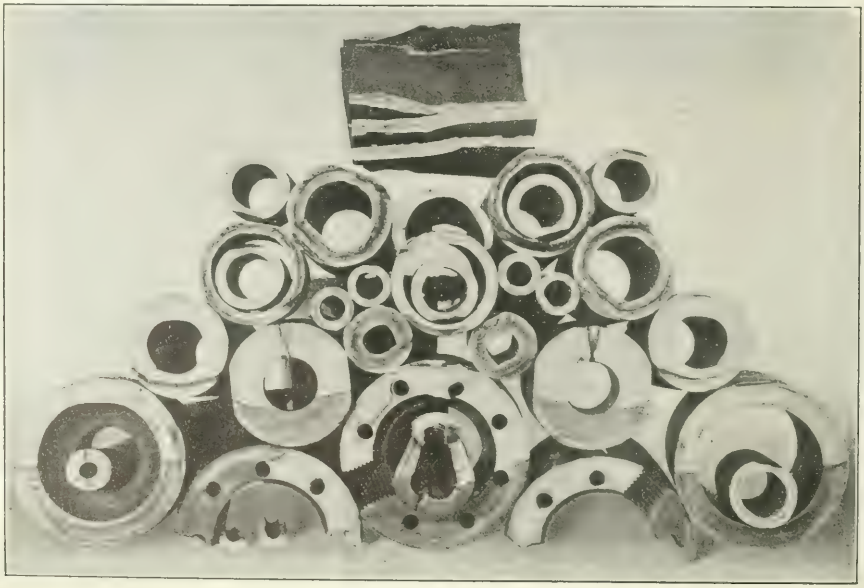


Fig. 1.—Sectioned Case-Hardened Articles Showing the Depth and Uniformity of Penetration Even Around Small Holes.

ing to a carbonizing temperature, but it seems to be pretty reliable. By packing the articles initially in a considerable amount of material to afford a prolonged supply of carbon, the depth desired may sometimes be obtained. This method is also expensive, largely because of the great weight of packing which has to be heated to and maintained at a high temperature for a very long time.

Even when care and expense have not been spared, the results are not uniform and certain. The conditions obtaining in an average packing case will explain this unreliability in part, at least. Active carbonization begins at about 1300 degrees F., and as this heat will not be reached in all parts simultaneously carbonization will proceed irregularly. This might be compensated by cooling in the same gradual manner as heating, if that was possible, but it is not with regard to that heating which immediately precedes the hardening plunge. Moreover, it would seem practically impossible to control materials and packing so that the chemical conditions are every where the same.

The uncertainty, difficulty and expense of the present methods of case-hardening have thus seriously restricted its application. There are many parts about machines that could very advantageously be hardened on their exteriors. A tough interior combined with a glass-hard exterior is a valuable combination. A hard surface may be more permanently polished, is less liable to rust, offers less friction with contacting parts, and is less subject to wear, thus maintaining with greater persistence the precise dimensions of the piece. Also, a case-hardened part derives a rigidity from the skin of high-carbon steel that may be of great value. Shafts, and all moving and turning parts, may usually be treated with advantage by the case-hardening process. The hexagonal heads of screws, the slots of wood screws, nails, &c., would no doubt be welcomed in case-hardened form, if they could be produced commercially. In some cases it is merely the expense which makes case-hardening prohibitive. In others, it is the necessity to finish by grinding, on account of the distortions arising from the inequalities of contraction due to differences in degree of carbonization at various points. In rollers for roller-bearings, it is sometimes advantageous to have a high-carbon exterior combined stronger and so avoid fracture. To case-harden such rollers to a sufficient depth and bring the center to a proper non-crystalline condition for exacting service would by the usual methods be quite an expensive operation. A great many parts could be made of tool steel to realize the advantages desired, but the cost of the raw material—from four to six times that of mild steel—and the difficulty and consequent expense of the machine operations are prohibitive in many cases. In fact, the cost of even mild-steel case-hardened parts is frequently prohibitive.

A process of case-hardening that reduces the cost, eliminates the uncertainty of results and approximates perfection in uniformity would be bound to succeed and improve machine manufacturing. Such an ideal process it is hoped the new method of carbonizing by gas may prove to be. It uses no packing, hence does away with packing and re-packing, which is ordinarily a large item of expense. The carbon is supplied by a current of carbon-laden gas, under pressure, which conduces to uniform treatment, and the penetration of remote parts and holes.

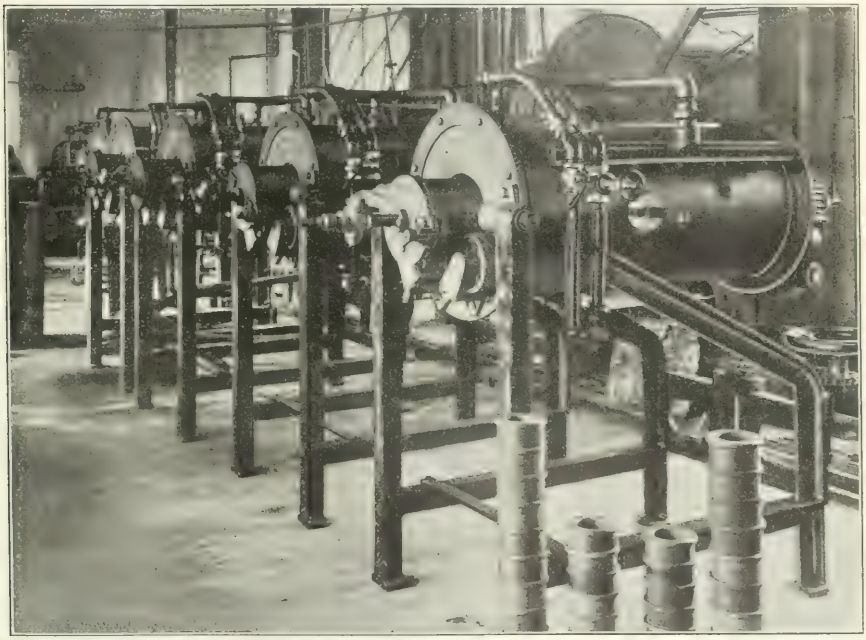


Fig. 3.—A Battery of the Carbonizing Furnaces Made by the American Gas Furnace Company, Elizabeth, N. J.

As the work is agitated while being carbonized, and the exhausted gas is conducted away while fresh gas is admitted, the supply of carbon is continuous and quite deep carbonization can be effected in a moderate time. Case-hardening by this process seems to eliminate guess-work and make possible anticipated results. A further advantage is the possibility of carbonizing under considerable pressures. Experimenting in this direction is as yet incomplete, but it holds the promise of accomplishing the desired results more rapidly. The end principally sought now is to eliminate the danger involved with gas under pressure in a red-hot, and consequently somewhat pliable container.

The evenness of penetration secured by the gas process may be observed in Fig. 1, which shows a variety of work. Attention is especially directed to the case-hardening of the small holes. Fig. 2 suggests something of the range and variety of work which may be performed. The long parts there shown are representative of a class of work on which case-hardening by the new process promises to be especially effective. If in the hardening more than the most insignificant deflections are produced the amount of

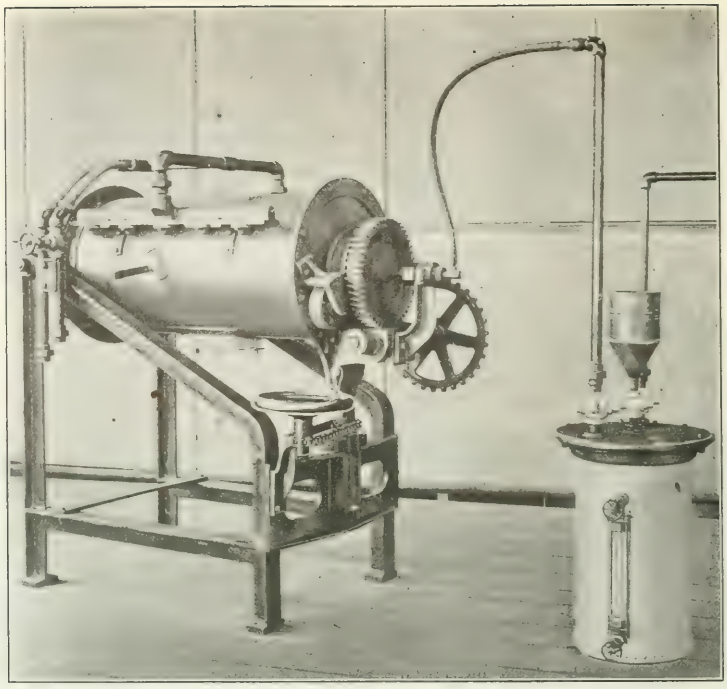


Fig. 4. A Rear View of One of the Carbonizers and the Gas Producer.

economical manufacture. The uniformity of the new process, supplemented by a device for straightening such parts during the hardening, avoids this commercial difficulty.

The carbon laden gas is generated in a gas producer and conducted to the machine where it is admitted to a chamber containing the articles to be carbonized. This chamber is the central portion of a rotatable retort heated by a gas furnace. Before the gas is admitted, the work has been brought to the proper temperature, about 1500 degrees F. Rotating the retort rolls the articles about so that all parts are exposed to the action of the gas. The gas is allowed to pass off at the end of the retort opposite to that at which it was admitted. The carbonization is effected by one continuous process.

The work is readily introduced and withdrawn from the heating chamber, and may also be inspected to determine its temperature or condition. This latter feature is an advantage not found in the older processes. Articles hermetically sealed in an iron box and packed in bone-dust or other material are effectually hidden from observation. Although the temperature may be observed by test wires or rods which have been inserted with the work and can be withdrawn, but in the new process the work itself can be observed.

Fig. 3 is a front view of a battery of carbonizing machines, and Fig. 4 rear view of a single one. In the latter the gas producer is seen to the right. The large horizontal cylinder is the gas furnace, and contains a smaller cylinder, which it heats and within which the carbonizing process is carried on. This smaller cylinder, which is the retort, projects from the furnace at both ends, and rests on four wheels as may be seen in Figs. 3 and 4. The longitudinal expansion of the retort is thus permitted without interfering with the rotatability. The pipe leading from the producer to the carbonizer seen in Fig. 4 conducts the gas to the retort. The sprocket wheel is the driver of the mechanism, and is mounted on the same shaft with a worm meshing the worm wheel on

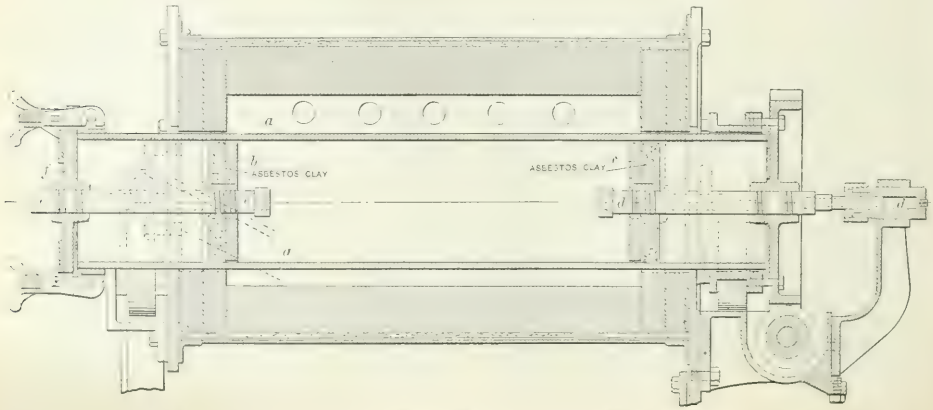


Fig. 5.—Longitudinal Sectional Elevation of the Furnace and Retort of the Carbonizer.

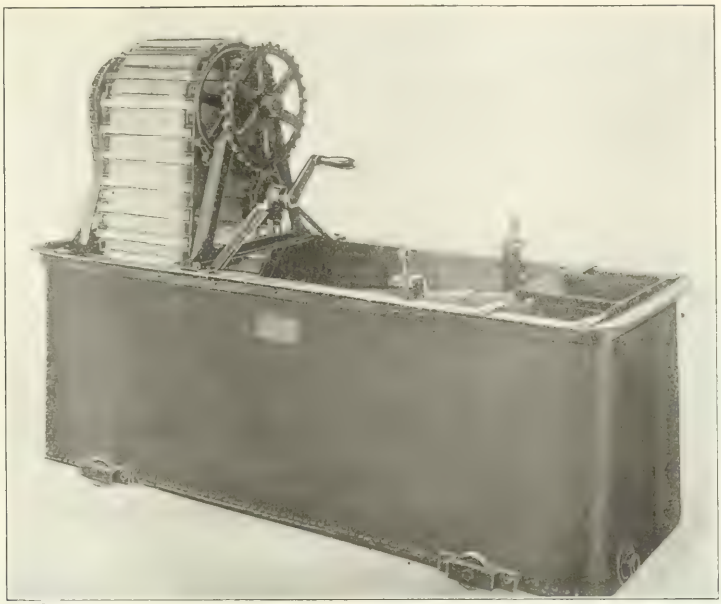


Fig. 6. The Mechanically Operated Quenching Tank Made by the American Gas Furnace Company.

the retort to which it imparts a slow rotary movement. The pipes above the furnace in both illustrations have no connection with the carbonizing gas; one conducts air and the other fuel gas to the heating burners. The furnace is hinged at the forward end, permitting the retort to be tilted by operating the hand wheel. When the cap, seen in Fig. 3, has been removed, the contents of the retort may be discharged into a hardening bath or other receptacle.

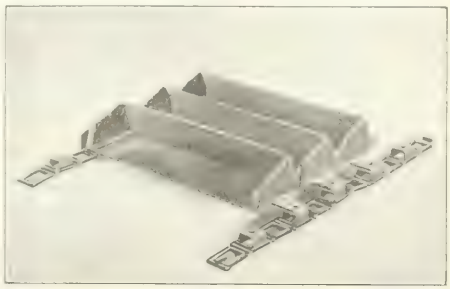
By referring to Fig. 5, a clearer idea may be obtained of the operation and construction. The cylinder *a* is the retort, the part between the piston-like disks *b* and *c* being the carbonizing chamber. Here the work is placed upon suitable holders or loosely in the chamber according to its character. The carbonizing gas is admitted through the tube *d* and discharged through the tube *e*, which latter passes through the sealing cap *f*. The enveloping cylinder is the furnace and is lined with firebrick.

The carbonizing gas is a mixture of carbon vapor and a neutral gas. This carbon laden gaseous mixture is supposed to hold minute particles of carbon in suspension until they are absorbed by the red hot articles in the carbonizing chamber. The materials used to generate the gas are said to be obtainable in the open market.

Having been carbonized to the desired depth and degree the articles are allowed to cool. They are then replaced in the retort and brought to the proper temperature for hardening. While the temperature is still rising the cap (together with the attached disk) is removed, the furnace and retort raised and the contents discharged into a quenching bath. Much depends upon the quenching process. The object is to effect a sudden cooling of the carbonized portion. If the rate of reducing the temperature varies the result will vary. By the ordinary method of chilling small articles in bulk the heated pieces are placed in a basket or other open receptacle and dipped into the cooling bath. Obviously the conditions are not the same for all the articles. The temperature of the interior pieces is maintained, not only by their contained heat, but by that of the surrounding pieces, and the chilling liquid will be more or less heated when it reaches them. In consequence a different hardening is effected in different portions of the mass, giving rise to different degrees of hardness as between different pieces, and even as between different parts of the same piece. A machine manufactured by the American Gas Furnace

At the right-hand end of the apparatus shown in Fig. 6 is a hopper, into which the heated articles are dropped. The large tank contains the quenching liquid—water, oil or whatever it may be. In this tank is a long perforated drum rotatable on an approximately horizontal axis. As the heated articles pass from the hopper they drop into the interior of this drum and thus come into contact with the chilling liquid. The lower surface of the drum is inclined, hence the articles gravitate to the other end of the tank. The inclination of the drum may be altered to suit the work; flat pieces require a more pronounced inclination than spherical pieces to pass them along at a proper rate of speed. The articles are discharged from the drum into an endless chain of buckets, and are thereby raised and delivered from the tank at its extreme left-hand end. The whole may be operated by hand or power. The buckets are perforated, and their construction may be understood from Fig. 7.

The quenching liquid enters the tank near the bottom at the receiving end. As it becomes heated from contact with the work it rises to the surface and is conducted off through an overflow. In this way a fairly constant quenching temperature may be maintained. The rotation of the drum and the movement of the buckets tend to circulate the liquid, and so assist in maintaining equality of temperature. This device is useful also for other purposes than hardening, such as cleansing or chemically coloring various metals. It may be mounted on rollers, as is the one illustrated, to permit transporting from place to place in the shop.



Instead of replacing the articles in the retort of the carbonizer for the final heat—*i. e.*, the one immediately preceding quenching—they may be placed within a heating machine, such as that shown in Fig. 8, and treated as before described. The use of such a machine releases the carbonizer for its special duty of carbon impregnation. However, it must be remembered that the tendency of the heater is to diffuse the carbonization already secured—that is to say, the articles would probably have

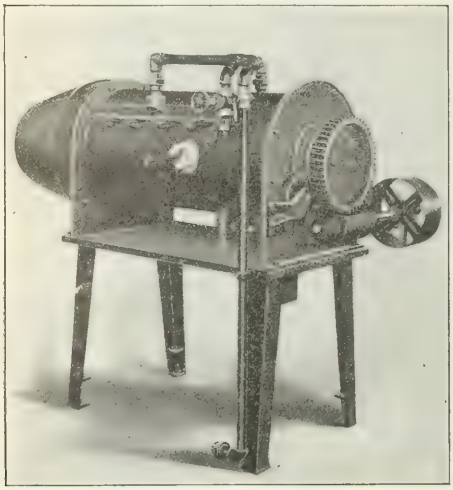


Fig. 8.—A Machine Which May Be Used in Place of the Carbonizer for the Reheating.

an increased depth of carbonization, but a decreased degree at the surface. If the carbonization already effected by the carbonizer is sufficient in degree to permit of this reduction at the surface, then the heater may be used to advantage. But if no slight drop in degree of surface carbonization is permissible, then the carbonizer should be used for the final heat as well.

It is scarcely to be doubted that the reliability, economy and general simplicity of the new process will mean much to the art of case hardening. It is even ventured that steel may be manufactured by this process, suitable shapes and sizes being converted into high carbon steels by impregnating them with carbon. Melting these carbonized pieces or working them thoroughly, the whole would be converted into a homogeneous mass.

The A. Garrison Foundry Company, Pittsburgh, has completed a large roller table, to be used in connection with the new 28-in. billet mill of the Pittsburgh Steel Company, Monessen, Pa. The table was built to specifications furnished by the Garrett-Cromwell Engineering Company, Cleveland, Ohio, and is 113 ft. 6 in. long, and 13 ft. wide, its total weight being 325,000 lb. It is of the latest type and is intended to be motor driven. The contract was placed about April 1 and stipulated that delivery was to be made within two months, but the Garrison Company was able to do even better, cutting the time down to seven weeks. This is a remarkably short time, considering the nature of this machinery, but the company has special equipment for this class of work, which enables it to make record time when necessary.

The Government engineers, reporting on the proposal for a breakwater outside the harbor at Gary, Ind., say that the harbor is designed to be a slip about 4000 ft. in length, under the control of the United States Steel Corporation. It is conceded that a breakwater is necessary, since the harbor will be exposed to the sweep of waves from Lake Michigan in all northerly winds, but the Board of Review considers that as but one company will be benefited by the breakwater, the question of construction by the Government should be left to Congress. It is estimated that it would cost $1,140,000 to build the breakwater, and $10,000 a year to maintain it.

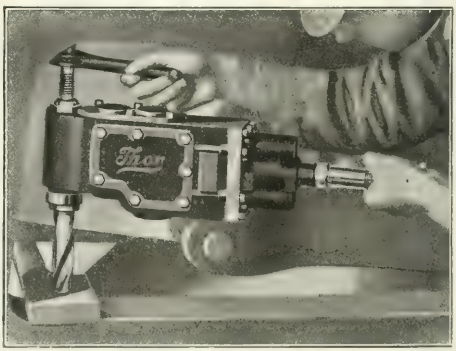
A New Thor Close Quarter Air Drill.

The No. 9 Thor close quarter piston air drill, which has just been brought out by the Independent Pneumatic Tool Company, Chicago, Ill., is similar to the No. 8 drill, but applicable to heavier work. Both drills, as the name implies, are intended for drilling in corners and places where there is limited clearance. The illustration shows the machine in use drilling tie brace bolt holes in a locomotive frame. In the new machine the distance from the throttle connection to the outside of the spindle case is 15⅜ in.; the distance from the point of the feed screw to the end of the socket 8⅞ in.; the radius from the feed screw to the outside of the case, 1 9-32 in.; the width of the case at the cylinder flanges, 5 3-16 in., and the width of the case at the spindle, 6¼ in. It weighs 31 lb., and runs at a speed of 122 rev. per min.

The spindle is at the extreme end of the tool and the air motor is at the opposite end. The motor consists of two cylinders parallel with each other, and perpendicular to the spindle. The center lines of both cylinders intersect the center line of the spindle. The pistons are double acting and operate on a two-throw crank shaft. Between the crank throws at the center are the eccentrics; the cranks and eccentrics are a single forging. The eccentric straps operate directly on balanced cylindrical piston valves, having a reciprocating motion. The air is taken in centrally between the cylinders, and the valves control the air as close to the cylinder bore as the material will permit.

Geared to this crank shaft is another two-throw crank shaft diametrically opposed. These cranks actuate two oscillating levers, concentric with the drill spindle and loosely mounted on it. These levers are provided with pawls of practically the whole thickness of the lever, which engage ratchet teeth cut in the spindle. Each lever operating crank makes its power stroke during the part of its revolution when it is farthest from the spindle. It therefore makes the speed of the lever more uniform, since it pulls forward considerably more than its half revolution and returns quickly to action in the remainder of the revolution, after the manner of a crank shaper. The cranks being opposed, the motion of the drill spindle is continuous and practically constant.

The cranks on the engine shaft are not the usual 90



Drilling a Locomotive Frame for a Tie Brace Bolt with a Thor Close Quarter Drill.

degrees apart, but are at an angle of 135 degrees, thus allowing two pistons to pull when the position of the levers requires the greatest power. This makes the drill in a degree self-regulating and tends to still further insure a uniform angular velocity of the drill spindle. This drill is provided with a reversable ratchet feed mechanism, operated within the width of the body of the drill itself. A poppet valve throttle controls the speed and

The Shelby Iron Company.

The Shelby Iron Company has issued its report for the year ended March 31, 1908. The profit and loss account compares as follows:

	1908.	1907.	1906.
Profits for year	$866,261	$860,802	$846,950
Expenses, depreciation, &c...	22,159	3,536	5,243
Net profits	$844,102	$857,266	$841,707
Previous surplus	251,404	244,138	252,873
Total surplus	$295,506	$301,404	$294,580
Dividends	50,000	50,000	50,442
Profit and loss surplus..	$245,506	$251,404	$244,138

The total assets and liabilities, as of March 31, 1908, were $1,350,565, against $1,316,504 on March 31, 1907. The capital stock is $1,000,000.

As far as ascertained, no bad debts were incurred in the sale of iron during the year. The available assets and current liabilities, as of March 31, 1908, were:

Available Assets.

Cash at Shelby	$9,033
Bills and accounts receivable	36,752
Pig iron on yard	104,937
Merchandise in commissaries	12,253
Stocks and bonds, market value	61,200
Furnace stocks—iron ore, charcoal, &c	85,337
Live stock, wagons, &c	3,517
Repair material	12,896
Total	$325,925

Current Liabilities.

Bills payable for timber and furnace improvements	$27,950	
Bills payable, loan account	3,000	
Accounts payable	11,208	
Payrolls and other liabilities	7,848	
Amount due treasurer	8,790	
		58,796
Net available assets		$267,129

President T. G. Bush., in his remarks to stockholders, says, in part:

"According to our practice, 25 cents per ton of iron made during the year was charged into the cost of iron for extraordinary or prospective repairs. The extraordinary repairs which were made during the year were charged against this account.

"The stock of iron, it will be observed, is unusually large, due to the dullness of the iron market for the last half of 1907; also to the fact that it was not practicable to shut down the furnace, even though so much stock had been accumulated, until a certain quantity of charcoal, &c., on hand or in transit, could be utilized."

To the *Wall Street Journal* President Bush says:

"In connection with this report I desire to call attention to the fact that practically only about three months of the fiscal year had elapsed before the market began to decline, and buyers began holding up their orders; so even at best the results were obtained from six months of the fiscal year of the country. There has practically been no market for iron since about November 1, 1907. I am pleased to report, however, that the outlook is very encouraging. Indications now are that iron of all kinds has about reached the bottom price, and with prospects of good crops, and the question soon to be settled as to who shall be the next President, we can hope for full restoration of confidence and an active and satisfactory business."

The Phillemac Rolling Mill Company.—J. P. McCaslin, superintendent of the Wheatland Mills, Wheatland, Pa.; Myron Phillips, superintendent of a bar mill at Youngstown, Ohio, and Alexander Lamont of Sharon, Pa., a practical mill man, for years a head roller in large mills, have organized the Phillemac Rolling Mill Company and have bought the property of the Brackett Bridge Company at Glendale, a suburb of Cincinnati, Ohio, on the main line of the Cincinnati, Hamilton & Dayton Railroad. The directory of the company will include seven men. Nelson B. Cramer, the Cincinnati attorney who has been prominent through the negotiations, will likely be a member of the board. The plant of the Brackett Bridge Company is regarded by the purchasers as admirably adapted to their purpose of manufacturing bar iron. There will have to be few alterations in the buildings. The main building is 83 x 160 ft., with an attachment on either side, one being 24 x 150 ft., and the other 40 x 100 ft. The plant has a fine office structure with fireproof vaults, &c. Of the necessary machinery and appliances, a train of rolls for a 10-in. mill has been ordered for a 60-day delivery and negotiations are progressing for some gas engines. As soon as practicable after the beginning of operations, which will be in the late summer or early fall, an 8-in. mill will be started and other sizes thereafter.

The Amalgamated Scales of Wages.

The thirty-third annual convention of the Amalgamated Association of Iron, Steel and Tin Workers, recently in session, at Youngstown, Ohio, adjourned May 19. All existing scales for puddling, sheet and tin mills were reaffirmed, with the exception that in the tin plate scale foot-note No. 11, which formerly read "roll hands on sheet and jobbing mills shall be paid one day's work at laborers' wages for changing rolls," was changed to read:

All tin and black plate shall be weighed by the company after being sheared and opened, and stickers are to be opened by the company.

Foot-note No. 24, which formerly read "roughers running over iron to receive 10 cents per day; 15 pair double iron to constitute a heat," was changed to read:

That 25 per cent. shall be paid to shearman on all orders that are cut once on one shears, and then taken to another shears to be finished. When there is more than one size in one pack, causing shearman to throw one cut or piece on the floor, that the company furnish a man to pick them up and place them on the bench for shearman.

In the memorandum of agreement, preceding the boiling and finishing scales, clause five formerly read as follows:

All mills will be allowed to work three turns when practicable. On all mills working three turns, eight hours shall constitute a day's work. Rolling shall not start earlier than o'clock Monday morning, except by local agreement between men and management in mills not equipped with traveling cranes for changing rolls; and in the event of traveling crane installation during scale year, prevailing practice at that time to be continued; and the week's work shall finish after the first eight-hour shift on Saturday. On all mills working three turns a third roller should be employed.

This was changed to read as below:

All mills will be allowed to work three turns when practicable. On all mills working three turns, eight hours shall constitute a day's work. Rolling shall not start earlier than 5 o'clock Monday morning, and the week's work shall finish after the first eight-hour shift on Saturday. On all mills working three turns a third roller should be employed.

These were the only changes recommended. Arrangements have been made to hold a wage conference with the Western Bar Iron Association, composed of some of the Western bar iron mills, at Cambridge Springs, Pa. on Tuesday, June 2. After this conference is over, a meeting will be held between the Amalgamated Association and the Republic Iron & Steel Company at Pittsburgh.

The E. Killing's Molding Machine Works, Ewald Killing, proprietor, Davenport, Iowa, has under construction a new foundry, 50 x 150 ft., which is expected to be ready for occupancy about July 1. It is stated that the equipment will be supplied from the present foundry, and will include several Killing molding machines.

The Falk Company, Milwaukee, Wis., has a contract for the steel castings for 75 new locomotives for the Chicago, Milwaukee & St. Paul Railroad now being built at Milwaukee for use on its Pacific Coast extension.

The second annual convention of the International Master Boiler Makers' Association, of which George Wagstaff, supervisor of boilers on New York Central Lines, is president, held its opening session on Tuesday at the Hotel Pontchartrain, Detroit, and will continue to Friday.

The New Morris Geared-Head Lathe.

When using a high speed steel tool to its fullest capacity in turning a 6 in. shaft it is generally necessary to employ a lathe of about 24-in. swing to furnish sufficient pulling power. The new geared-head engine lathe illustrated in Fig. 1 is designed to have ample power for all diameters within its swing and yet be a general purpose machine. It was designed by W. L. Shellenbach of the J. B. Morris Foundry Company, Cincinnati, Ohio, and is built by that company.

To show in a single specimen of work something of the lathe's range of application, the object shown in Fig. 2 was turned. It is of gray iron in three parts. The flange or base is 14½ in. diameter by 1½ in. thick, and the cut on its periphery was taken at 50 ft. per minute, using 1-16 in. feed, 11-32 in. deep. Three scrolls are chased on its upper face, the outer one a left-hand scroll of six per inch, the middle one a right-hand scroll of three per inch and the inner a left hand of four per inch.

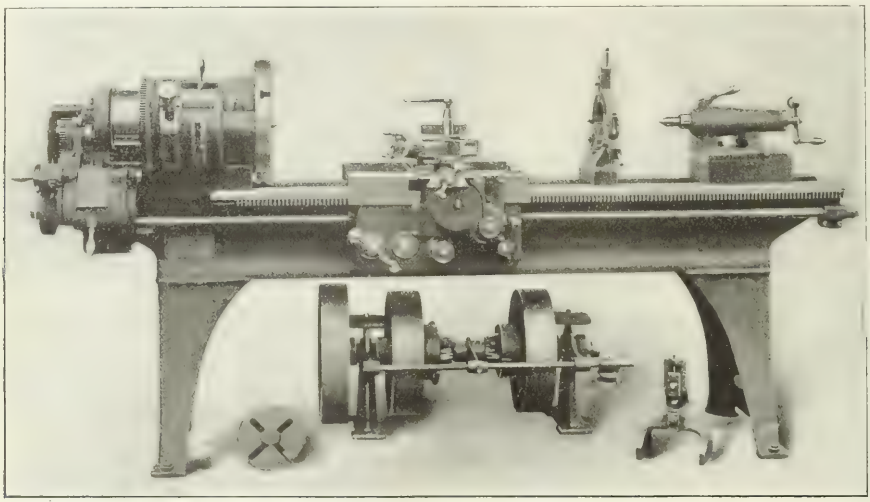


Fig. 1.—The New Geared-Head Lathe Designed by W. L. Schellenbach and Built by the John B. Morris Foundry Company, Cincinnati, Ohio.

Where the column joins the flange, a 4-in. taper per foot, is turned, next, above it the same taper reversed, and above this a ½-in. taper per foot. On top of the latter is a square thread of two per inch pitch, A, more clearly shown in Fig. 3. The square threads were rough chased with the rack feed, after which the half-nut was thrown in and the threads finished part of the way down with the lead screw. This gives an idea of the use of the rack feed in rough chasing to save the lead screw. A left-hand United States standard thread three per inch is chased directly above the square thread. Over this are Acme threads of four and five per inch, and at the top of this section a right-hand Whitworth thread of six per inch pitch. A hole in the pedestal is chased with a left-hand United States standard thread of 2-in. taper per foot to receive the steel bar at B. This contains 19 threads, ranging from 7 to 32 per inch. The top of this bar is bored for a No. 3 Morse taper, and at C has a second steel stem fitted into it, which contains 15 threads from 36 to 112 per inch. A knurled nut, D, chased with 112 V-threads per inch fits the extreme top of this stem, where the latter is ½ in. diameter. Surmounting all is a tool steel screw E 9-32 in. long, 0.105 in. diameter at the body of the thread and 0.175 in. diameter of head. This screw is chased 32 threads per inch, and of special form of thread to screw into the spring of a Brown & Sharpe test indicator.

To controvert the contention that smooth cuts cannot be taken while driving through gearing, but only while [illegible] be benefited by the breakwater, the [illegible]

driving direct with the belt speeds, and that the machine must not be slowed down or stopped while making speed changes, the bottom of the pedestal, shown in Fig. 1, was faced at 1-16 in. feed, and the speed was changed eight times during the cutting with the drive at all times through gearing. The tool marks show but there is no unevenness caused by the gear teeth or changing speeds.

Among the novel features of the lathe are the following: A driving pulley mounted on the spindle which can be locked to it like the ordinary cone pulley when driving with open belt; headstock provided with 16 changes of speed, to which either a direct or alternating current motor may be connected without changing the design or supplying a different headstock; an index within the headstock which shows the exact diameters that can be turned at various cutting speeds, ranging from 20 to 60 ft. per minute, hence the operator need not know the spindle revolutions per minute, but deals entirely with the diameters of the work in hand, and sets the index for the cutting speeds desired.

The quick change mechanism covers a range of threads from 2 to 112 per inch, and is self-contained within a single housing secured to the bed. The carriage feeds are in the same ratio and in the same direction as the screw feeds. The cross feed screw is also in the same ratio as the lead screw, and the index for longitudinal threads also applies to the cross feed screw for chasing scrolls. A taper attachment is used which permits turning tapers up to 4 in. to the foot. It is attached directly to the face of the apron, and can be later applied to a machine not ordered with it. All adjusting screws on the machine and countershaft can be operated by the toolpost wrench.

In the sectional plan of the headstock, given in Fig. 5, the driving pulley is shown at *a* mounted upon and keyed to a steel sleeve pinion, which is bronze bushed and revolves loosely upon the spindle. The sleeve carries a cone of gears, *b*, splined to slide upon it and provided with clutch teeth. The clutch *c* is keyed to a bronze sleeve, which also revolves loosely upon the spindle. The gear *d* is splined to slide upon the clutch sleeve, and corresponds to the cone pinion of the ordinary lathe. Gear, *d*, meshes with gear, d_1, splined to the pinion d_2, located in the bearing on the front of the headstock. The sliding pinion d_2 meshes with a steel face gear, d_3, which is counter bored and threaded to receive the face plate *e*. The face gear is attached to the flange of the spindle by dowel

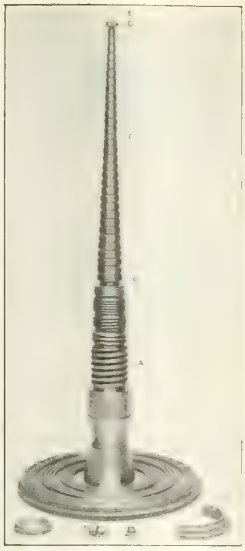


Fig. 2. An Extra Large Face Plate of the Latest Type.

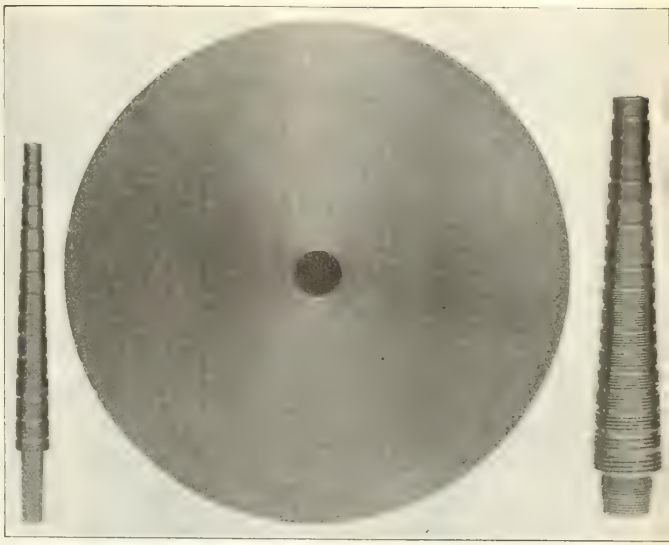


Fig. 4. The Bottom of the Base of the Pedestal and the Two Screw Threaded Studs.

pins and screws. The web of the face gear extends down back of the spindle flange, and when the face plate is screwed into the face gear this gear and the spindle clamp tightly. The extended nose of the spindle fits the bore of the face plate for centering it, and the threads within the face gear fit loosely so that the truth of the face plate will not be affected by inaccuracy in the thread. The pinion d_2 being on the front of the head, the driving effort is downward and on the same side of the center as the tool. Because of this construction the overhang of the chuck and the face plate is reduced. The threads within the face gear d_3 are about the same diameter as the counterbore in the back of the ordinary chuck for a machine of this swing, and in fitting a face plate for a chuck it is only necessary to bore out a blank plate to fit the nose of the spindle and chase a thread on this plate, leaving a portion to be fitted into the chuck. This method of driving the chuck and face plates eliminates torsional stresses within the spindle when driving on all diameters, employing a high gear ratio as the gear d_3 is practically a part of the chuck.

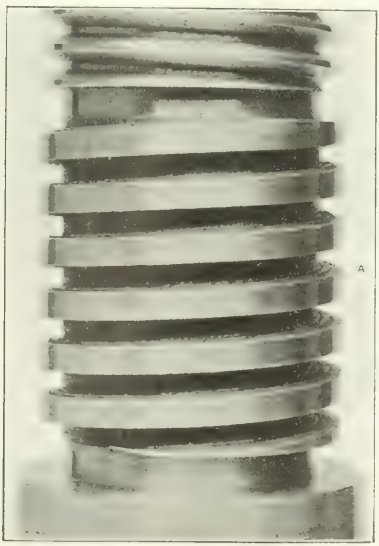


Fig. 3.—A Detail of the Square Thread A of Fig. 2, Showing the Rough and Partly Finished Cuts.

The clutch teeth f, formed upon the spindle, engage corresponding teeth or key-ways within the sliding gear d. When this gear is moved to the extreme left, it is locked to the spindle, but this movement cannot take place until the gear d_2 is disengaged from the face gear d_3. When the clutch c is engaged with the clutch teeth on the gear cone b, and the gear d is clutched to the spindle, the latter is driven direct at its maximum speed. By disengaging the gear d from the spindle and engaging the gear d_2 to the face gear d_3, the slowest drive is obtained. By manipulating the gear d and the pinion d_2 the high and low gears are available. Gear d has an internal gear secured to it, meshed by the tool steel pinion stem g. This revolves in a bronze bushing and carries the gear g_1 at its left end. The telescopic gear g_2 is provided to be mounted over the gear g_1 to impart motion to the pinion stem at a different speed. The pinion stem is contained within a rotatable housing mounted in the casing, which forms the front of the headstock. The housing can be rotated by the extension g_3, shown in the sectional elevation of the headstock. The telescopic gear g_2 may be engaged with any one of the cone gears b or the sleeve pinion, or it may be removed and the gear g_1 engaged with any one of the cone except the sleeve pinion. The gear g_2 can therefore be driven at four speeds, and the gear g_1 at three, and when the clutch teeth on the gear cone b are engaged with the clutch c, and both of the gears, g_1 and g_2 are disengaged, another speed is obtained, making eight in all. These speeds are doubled by using the high or low gear, as before mentioned.

The housing of the pinion stem g is cut out, as shown at h in the sectional elevation of the headstock to permit the clutch c to be engaged, and when such is the case the housing cannot be moved sufficiently to engage the gears g_1 and g_2 with the cone of gears b. Obviously the gear d must not be engaged to the spindle when the pinion d_2 is engaged to the face gear d_3. To prevent this, as shown in the plan section of the headstock, the sliding pinion d_2 is journalled at its left end in a bronze bushing, which has rack teeth milled in it to engage the pinion stem d_4, shown in the sectional elevation of the headstock. This pinion stem has its bearing in a steel sleeve which fits into

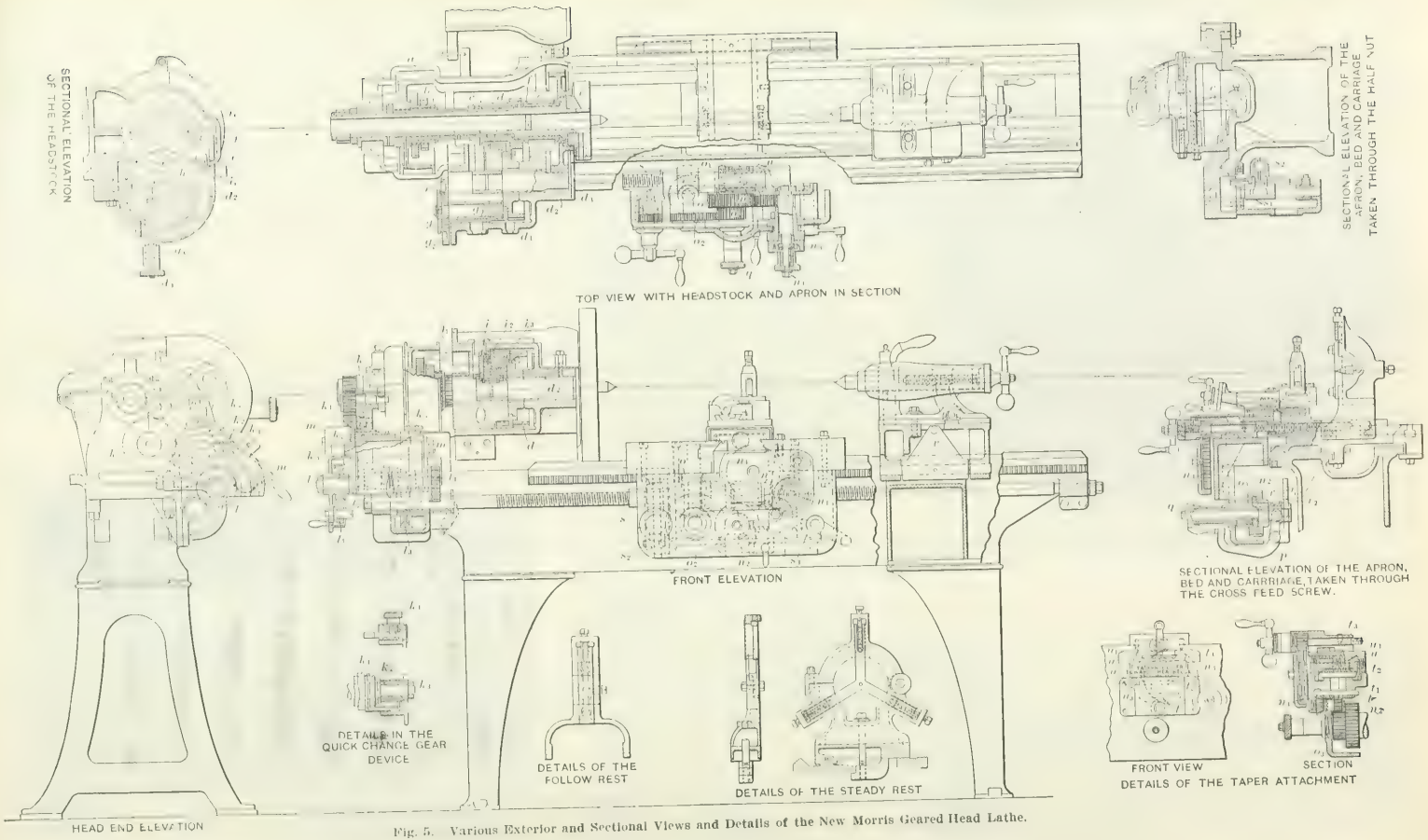


Fig. 5. Various Exterior and Sectional Views and Details of the New Morris Geared Head Lathe.

the rotating housing previously referred to. The sliding detent collar g_3 is mounted over the sleeve and is operated upon it by the knurl which is secured to the pinion stem d_4. The pinion stem is spring seated, to hold the detent collar into the notches milled in the face of the casing. The knurl may be turned in either direction to slide the driving pinion d_2, and may be moved radially to adjust the housing. The housing has a sliding sector i mounted upon and around the pins i_1, which is grooved to receive the flange of the sliding pinion d on the spindle sleeve. The longitudinal movement of the sector transmits movement to this pinion regardless of the position of the housing, and is accomplished by moving the bronze bushing at the end of the pinion stem d_2, which is provided with a specially formed key serving as a dog or tappet. When this key, as shown in the front sectional elevation, is moved to the left, the tappet on it strikes the sector and moves it enough to engage the clutch of the pinion d to the spindle, and at this instant a spring seated latch i_2, contained in the sector i, engages the extension on the key. At this position the machine is operated in the high gear, the pinion d_2 being out of engagement with the face gear. To engage the low gear, the knurl on d_4 is turned to the right, and the sleeve attached to d_2, moving to the right, moves the sector i through the latch i_2 until the pinion d upon the spindle is disengaged from its clutch. At this point the sector i, carrying the latch i_2, is moved sufficiently to engage the counter-sink of this latch with the screw i_3. This engagement raises the latch i_2 and allows the key and sleeve on d_2 to move past, and, doing so, the pinion d_2 is engaged to the face gear d_3.

Fig. 6 shows an index arrangement which is mounted on the front of the headstock, and has a pointer j secured to the rod j_1, which operates the longitudinal movement of the cone gears b upon the spindle pulley a. The position of the pointer is determined by notches milled in the bracket of the casing. An opening in the front of the casing exposes the index plate referred to before. The horizontal columns of the index plate give a list of the diameters to be turned at cutting speeds from 20 to 60 ft. per min., and the vertical columns correspond with those of the plate J_2 which designate the position of the pointer J. The opening is only large enough to expose the figures under the heading of diameters of work at a given speed feet per minute, but the index may be adjusted by the knurl J_3 to expose any one of the columns showing the cutting in feet per minute.

Openings are cored in the bed and permit a belt or silent chain drive from a motor mounted underneath the headstock, these openings being in line with the pulley on the spindle. The headstock is provided with a cover. When it is desired to mount the motor above the headstock, a platform is substituted to receive the motor in place of this cover. On account of the number of gear changes within the head, it is not necessary to use a variable speed motor, as the increment of mechanical speed change does not exceed 28 per cent. These features make the machine very desirable for using induction motor drive.

The front and end elevations in Fig. 5 show the new quick change device, the housing of which has a bearing for supporting the reverse plate k. This plate carries the transmitter or intermediate gears for giving the forward and backward motion to the feed; a shield covers these gears. The reversing is accomplished by a small eccentric and knurl which is contained in an extension of the housing. Power is transmitted from the spindle gear through the transmitters to the telescopic gear k_1, the face of which is one-half that of the transmitters. This telescopic gear has its bearing in the housing concentric with the pivotal point of the reverse plate k, and is splined to slide upon the telescopic gear k_2, while the latter is splined to slide upon the gear k_3. These three gears are the driving members of the quick change. The gear k_3 extends beyond the face of the telescopic gears k_1 and k_2, an amount equal to the width of the change gears and has no endwise movement, but is confined longitudinally within the bearing of the housing by a collar. The telescopic gears are moved longitudinally by an eccentric in the knurl, k_4, to bring them in alignment

A second shaft l has its bearing in the housing and carries a quadrant which carries what is ordinarily the intermediate gear, l_1, of the plain change gear lathe. This gear is mounted on a bronze sleeve and has its bearing on a stud. Gear l_1 meshes with the gear l_2, which is keyed to the second shaft l. The latter has a pinion milled in it, meshing with the gear l_3, which is keyed to a clutch loosely journalled upon the lead screw bearing within this housing. The shaft l also has gear l_4 keyed to its right end, which meshes with the sliding gear splined to slide upon the lead screw. The clutch, previously referred to, receives the teeth of the clutch formed upon the sliding gear, which may be drawn out of mesh with those of gear l_4, and the lead screw locked to revolve with the gear l_2. This makes an 8 to 1 reduction to the index.

An opening is provided in the housing to receive the eight steel change gears, each of which has a three-tooth clutch at its hub. These gears are covered by a swinging plate m, tapped left hand to receive a screw which extends through the clamp m_1; when the plate is brought up exposing the change gears, the clamp is released, and when brought down to cover them, the clamp is tightened. This clamp receives the blank sector of the quadrant on the shaft l, and is used to lock this quadrant. The gear l_5 revolves on a stud and is mounted on a bronze sleeve, the outside diameter of which fits the bore of the change gears. The gear l_5 has clutch teeth to mate those of the change gears, so that any one of them may be secured to it. To make a change of feed, the plate m is raised and the quadrant thrown down in the position shown in Fig. 5. The change gear is now clutched to the gear l_5, and the quadrant brought up until the gear meshes with one of the three gears, k_1, k_2 or k_3. These three gears and the eight change gears provide for cutting all threads from 2 to 14 per inch when the lead screw is driven through the gears l_4, and the sliding gear and the same combination of gears will cut threads from 16 to 112 when driven from the pinion on the shaft l to the gear l_2 of the lead screw.

Fig. 5 also shows a plan view of the carriage, with part of the apron in section, and a front elevation of the apron is shown directly beneath. The right end sectional view of the apron, bed and carriage is taken through the center of the half nut. Directly beneath this is a sectional side view of the apron, bed and carriage taken through the center of the cross feed screws. The peculiar design of the bed is shown in these cross sections. The top of the shears is a solid plate extending to within ¾ in. of the spindle center and the carriage rests on and is guided by a large single V formed upon the plate. A smaller V is provided for the head and tail stock and an extra track planed at an angle forms a bearing for the bridge of the carriage close to the center of the downward line of strain. The carriage bridge has a taper gib resting upon this and adjusting screws to compensate for wear. Heretofore the carriage bridge has been allowed to bear directly on the tailstock bearing on the front side as a support, but this is open to the objection that wear at this point will finally lower the tailstock until its center will not align with the head and it does not form as close a support to the line of strain. The back part of the shear is planed flat to receive the tailstock and the back wings of the carriage, both of which slide upon but a single V.

The lead screw is splined to receive the bevel pinion n, which meshes with a bevel gear secured to the pinion stem n_1. The latter transmits motion through an intermediate gear to the longitudinal friction gear n_2, and extends out through the bearing on the apron to receive a knurl and friction. The friction mates the friction gear n_3, which transmits motion to the cross feed screw through the intermediate gear n_4, meshing with the cross feed screw pinion. The intermediate gear n_4 is mounted on a cover which is removable for reasons explained later.

By referring to the sectional elevation through the cross feed screw, it will be seen that the top slide of the compound rest is fed by an inclined screw; this is to give increased traverse to this part without making it extremely long and also to elevate the compound rest handle to prevent any interference with the cross feed

rest, which meshes with the inclined screw shown. The cross feed screw is provided with a spring seated plunger in the center of the ball crank which operates a friction for locking and releasing the graduated collar of the cross feed screw. By comparing with the front elevation it will be seen that the rack is secured to the bed with the teeth facing outwardly instead of down as usually. This is to enable placing the rack pinion o vertically. This pinion has a solid stem on either side and the top end of it fits directly into the carriage, and is provided with an adjustable dial which is let into the counterbore in the top of the carriage and is graduated to read to sixty-fourths of an inch. The rack is ½ in. circular pitch and is accurately spaced so that a correct longitudinal reading may be had from the dial. The dial has a friction locking device similar to that of the cross feed screw and may always be set at zero. The lower end of the rack pinion o, as shown in the plan and front elevation, has its bearing in the back plate of the apron and has a bevel gear keyed to it, which meshes a bevel pinion keyed to the shaft o_1. This shaft is keyed to the hub of the spur gear o_2, which has its bearing in the apron. The pinion of the apron ball crank stem meshes the gear o_2; one revolution of the ball crank travels the carriage 1 in.

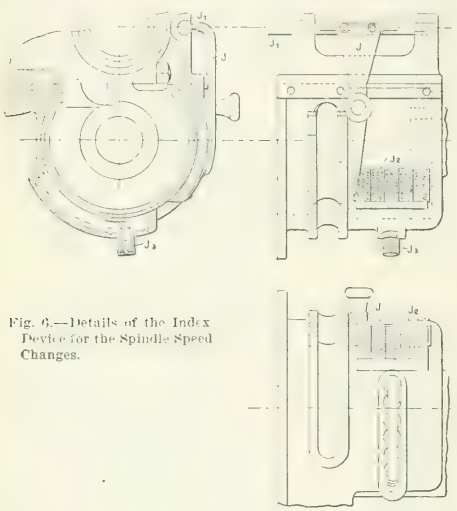


Fig. 6.—Details of the Index Device for the Spindle Speed Changes.

The gear o_2 also meshes the pinion o_3, from which it receives is power for feeding.

In the sectional elevation through the cross feed screw a section of the longitudinal friction is seen, and the positive chasing device for chasing through the rack feed, which is operated by the lever p. The pinion o_8, which transmits motion to the rack pinion, has a friction mounted upon it engaging the friction of the gear n_2. It may be locked and released by the regular longitudinal knurl q. Mounted within the friction gear o_3 is a hardened steel index ring, r. The gear n_2 has a key seat to receive the sliding tool steel key r_1 which is operated by a sliding collar, r_2, and is controlled by a shoe in the crank portion of the lever p. The divisions in the index ring correspond to the pitch of the lead screw, which in this particular machine has four threads per inch, hence the half nuts may be engaged at every quarter inch. Therefore the divisions of the index ring are such that a quarter inch movement of the carriage will allow the key r_1 to enter the slot of the index ring and lock the feed positively. This forms a positive drive through the rack pinion and not through the friction, and, while very accurate chasing cannot be accomplished, threads may be roughed to within a few thousandths of size without wearing the screw and then the half nuts engaged for giving an accurate finish. The half nuts s are mounted to slide within the apron at its left end, and the nuts are placed in this position so that the carriage may be moved to its farthest limit at the tailstock end of the bed without the nuts interfering with the lead screw bearing at this point.

In the sectional view which shows the half nuts is shown the cam s_1 which opens and closes them. This cam is mounted on a shaft having a sector, s_2, keyed to it, which engages a rack extending along the inside of the apron and also engaging the sector s_3, mounted on the stem of the half nut crank. Since the regular rack feeds are in the same ratio as the screw feeds and same direction, even though the rack and screw feeds be simultaneously engaged, nothing serious will occur. The apron has a dummy plate casting secured to it by screws, which is always supplied when the lathe is furnished without the taper attachment to fill out the space that would be occupied by the taper attachment.

Fig. 5 also shows details of the taper attachment, including front and sectional views. The carriage has a slide fitted to it which contains the bearings of the cross feed screw. The slide is arranged to be moved across the carriage by a sliding shoe, u_1, mounted on the slide u of the swivel block u_2 of the taper attachment. When this attachment is not in use dowel screws are tightened which lock the slide to the carriage. The sliding spur gear meshes the friction gear o_3 of the apron and has clutch teeth to engage mating teeth of a bevel pinion, which meshes with the beval gear t_1, and this gear is keyed to the stem of the bevel gear t_2. The latter meshes with a bevel pinion which is keyed to the worm t_3. This worm engages the threads of the sliding block u, which has a pin formed upon it to receive the sliding block u_1. The sliding block u is dovetailed into the swivel u_2 which may be set at any position and locked by the screw u_3. The swivel u_2 is calibrated in degrees from zero to 90 degrees, and is also stamped "tapers larger toward headstock." The other side of the circle is stamped "tapers smaller toward headstock," and is also graduated from zero to 90 degrees. The clutch of the spur gear t is engaged with that of the adjacent bevel gear by a pull pin, which cannot be pulled out unless the cover of gear, n_4 is removed. As the cross feed is never needed while the taper attachment is in use, the removing this cover throws out the automatic feed of the screw. The removable cover when in place bears against the pull pin holding the clutch gear t out of engagement, which will run loosely upon its hollow stud. The rate of feed of the sliding block is one-sixth that of the longitudinal feed of the carriage, and its maximum traverse within the swivel u_2 is 4 in. When the swivel u_2 is set, as indicated in the sectional detail, the block containing the cross feed screw will move 4 in. while the carriage is moving 24 in. Therefore, a taper 24 in. long can be turned at one setting and of any degree up to 4 in. taper per foot.

The shoe u_1 engages a groove planed across the tool post slide and has a gib for taking up wear. If the swivel u_2 of the taper attachment is set at zero the dovetailed slot of this swivel which carries the block u will be parallel to the groove of the tool post slide, in which the block u_1 travels, and the amount of taper will be zero, as the two blocks will be traveling in parallel guides, but if the swivel is set at any division other than zero, it will transmit movement to the tool post slide. A table is furnished with each attachment which gives the tapers in inches per foot from 1-16 to 4 in., and the corresponding included angle. It also gives the setting angle of the taper attachment swivel u_2 in degrees. The power is transmitted to the taper attachment and longitudinal feed through about the same number of gears, so that the back lash of these parts is less than with the ordinary device.

Fig. 5 shows also the tailstock and the method of clamping it to the bed. The clamp v is mounted on a rod, which has its bearings within the lugs of the base of the tailstock. A tool steel screw bears against the tool steel block at the top of the clamp, and these parts are hardened to decrease wear. The tool post wrench fits the adjusting screw, and very slight pressure will cause the clamp to bear tightly under the shear of the lathe bed. The top of the tailstock can be adjusted independently of the clamping of the base to the bed.

The follow rest is shown in a detail in Fig. 5. It straddles the bridge of the carriage, and is provided with

three jaws. Although this style of follow rest has been used before, Mr. Shellenbach is believed to be its originator, having designed such a rest over 15 years ago. The steady rest is also shown in detail in Fig. 5, and is mounted on an auxiliary base, which has a key in it to receive the main portion of the rest. Where a lathe is designed with a single V, it is impossible to apply the steady rest to the machine to face in but one direction, but in mounting it as shown, the steady rest will face in either direction, and can be clamped in position by the long cap screw, which is tapped into the clamp and which also takes the tool post wrench.

The countershaft is provided with two friction pulleys and one 18 x 4 in. driving pulley, and where it is not thought necessary to drive in both directions, the machine may be driven at two forward speeds, thus giving 32 changes of speed to the headstock spindle instead of 16, as is ordinarily given with a one-speed countershaft. This machine is manufactured at the present time in 14, 16 and 18 in. sizes, and is also supplied with a three-step cone type of head, which has some novel features. It is also made with a plain set of change gears instead of the quick change, as shown.

Marking Freight Shipments.

All the railroads east of the Mississippi River, operating in the territory covered by the Official Classification, have notified their agents that on and after July 1 they will refuse to receive for transportation all shipments in less than carload lots which are not plainly marked with the name of the consignee, and the station, city and State of destination. For many years it has been customary among shippers to mark their packages with an initial or some hieroglyphic, the key to which would be on the bill of lading. This has been done partly to save time, but also to prevent competitors from observing the names of a shipper's customers on the outside of the packages.

The railroads claim that great abuses have resulted from this practice. It is stated that when a large number of packages are intended for the same consignee, shippers often only mark one or two, the others having no marks at all. If the shipments become mixed with others at transfer points, there is no way of identifying them. The consequences have been great delay, vexation on the part of both shippers and consignees, and claims against the railroad. The Pennsylvania Railroad Company, on its lines east of Pittsburgh, last year paid out $342,520 for claims for goods "lost in transit," which was an increase of 34 per cent. over 1906. Of this amount $176,260 was traced to the fact that shippers had marked their goods improperly. During 1907 the Pennsylvania Railroad sent to its Unclaimed Freight Station at Downingtown 18,000 packages on which there were no marks to enable the company to forward the freight to the proper consignee and destination.

Figures prepared by the Trunk Line Association for 17 principal lines in the official classification territory show that the total freight earnings for these companies in 1907 were $541,725,712, an increase over 1906 of 10.2 per cent. But against this handsome showing of increase, it is stated that the payment for loss and damage by these lines in 1907 was $5,596,794, which is fully 1 per cent. of the total freight earnings, and an increase over 1906 of 22.4 per cent. It is estimated that about 45 per cent. of loss and damage claims are due to "losses in transit," which means that in 1907 the losses on this account of the lines mentioned were about $2,500,000. Of this amount, probably upward of $1,250,000 was caused by the improper marking of the less than carload shipments. It is the design of the railroads now to stop all losses from this cause.

Some of the roads have, for several years, been seeking to remedy this abuse, but competitive conditions rendered it impossible unless all railroads became a party to the more rigid practice. That harmony of action has now been obtained, and as the new rule will be filed by each line with the Interstate Commerce Commission, it is binding upon each road, and any departure from it becomes, under the law, a "discrimination." The railroads will enforce the rule not only against all shipments originating on their lines, but agents at transfer points will be instructed to refuse to receive from other railroads any shipments which may by error at originating points have been improperly or inadequately marked.

Some 416 railroads are participating in the enforcement of the new rule. The companies are giving very strict instructions to their agents, placards are to be posted conspicuously in all stations, and every effort will be made to impress shippers with the importance of heeding the new rule. In fact, the campaign of education which is planned by the railroads along this line is almost unprecedented in its thoroughness. It is the belief of the carriers that the enforcement of the new rule will be of great value to the public in the removal of such a prolific source of delays and losses.

The Government Deficit and the Currency.

At the end of April the United States Treasury showed a deficit of over $50,000,000, as compared with a surplus of over $55,000,000 a year before, making a difference of $105,000,000. By the end of May, according to exact figures, up to May 25, the deficit will be about $62,500,000, as against a surplus of $65,000,000 at the end of May, 1907. Chairman Tawney, of the House Committee on Appropriations, estimates a deficit of $65,000,000 at the end of the fiscal year, June 30, and predicts that there will be an "almost certain deficit of not less than $150,000,000 at the end of the next fiscal year," due, in part, to the falling off in revenues because of hard times and partly to increased Government expenditures.

The New York *Sun* says in its financial review of May 25: "There is every probability that enormous calls must be made by the Treasury upon the public money still held by the national bank depositories; while if the excess of expenditures over receipts still goes on unabated the money thus called in must be paid out again as soon as it is received at the Sub-Treasuries, just as for the same necessity of meeting expenses the paper currency constantly redeemed by the Government is also immediately again placed in circulation. Thus we are face to face again, even if at a somewhat remote distance, with the old difficulty of a redundant currency which in times of depression under our present bungling currency system is not retired but accumulates in large volume in the financial centres and serves the harmful purpose of encouraging unwise speculation, of expelling gold from the country and ultimately of casting shadows upon the country's powers of gold redemption. It is sincerely to be hoped that the outcome of the matter now will not be the same as it was twelve years ago."

An organization of the superintendents and foremen of the metal trades shops of Cleveland will be formed under the auspices of the Cleveland Branch of the National Metal Trades Association at a meeting and banquet to be held at the rooms of the Cleveland Athletic Club on the evening of May 27. The object of the organization is to bring the superintendents, foremen and employees into closer relationship for the discussion of shop conditions and other matters. The social end of the organization will also be an important feature. It may also be decided to include purchasing agents in the membership. It is expected that 100 members will be enrolled in the club at the start.

The largest clock in the world, which stands on the top of the eight-story concrete building of Colgate & Co., soap manufacturers, in Jersey City, N. J., overlooking the North River, was set in motion on May 25. The center of the dial is 145 ft. above the street. The dial is 40 ft. 6 in. in diameter, and the minute hand, which is 20 ft. long, and has a diameter of 3 ft. 6 in. at the hub, weighs 370 lb. The various counterweights of the clock foot up about 1500 lb. The travel of the minute hand is 12 in. per minute. At night the hands are outlined with incan-

Blast Furnace Calculations.

BY S. J. KOSHKIN, M.E.

Prof. Joseph W. Richards, of Lehigh University, in his "Metallurgical Calculations," deals very clearly with the subject, and no one interested in metallurgy can afford to neglect the study of this able work. The present essay does not pretend to give a full and methodic presentation of all the principles involved in blast furnace calculations, but to those who are familiar with them it may be of some advantage to follow the author in his calculations as they may suggest new ideas even for every-day practice and lead to more accurate results if applied.

Analyses of Materials Used.

All analyses of the materials used have been taken from actual practice and the calculations correspond to conditions which the author has met at two large iron works near Pittsburgh.

Below are the analyses of some of the ores (in natural state) very extensively used.

Ores.

Name.	—Iron—Fe.— 1906 average.	3-Year limits.	Silica —SiO². 1906 average.	3-Year limits.	Alumina Al²O³. 1906 average	3-Year limits.	Combined bases, CaO, MgO, MnO 1906 average.	3-Year limits.	Phosphorus P. 1906 average.	3-Year limits.	—Unfluxed.— 1906 average.	3-Year limits.
Group I	54.3	53.9-55.8	3.6	3.4-4.1	1.3	0.7-1.8	0.8	0.3-1.0	0.039	0.032-0.040	4.1	3.5-4.8
Group II	54.5	54.0-56.0	3.7	3.3-3.9	1.5	0.9-1.8	0.7	0.3-0.9	0.046	0.038-0.048	4.5	3.8-4.9
Group III	49.1	48.2-52.7	4.9	4.2-5.6	2.7	2.1-3.1	0.7	0.4-0.8	0.086	0.053-0.097	6.9	6.2-7.8
Barnhart	52.6	50.7-53.0	10.7	10.2-12.2	2.5	2.1-2.8	1.4	0.9-1.7	0.055	0.049-0.072	11.8	11.0-13.3
Chapin	53.2	52.6-56.1	7.2	6.4-8.2	1.6	1.3-2.0	5.3	3 2-6.0	0.055	0.052-0.059	3.5	3.0-5.4
Pioneer	59.8	57.0-60.5	4.8	4.2-5.7	2.5	1.5-3.2	0.8	0.5-1.1	0.033	0.028-0.035	6.5	6.1-8.0

For greater simplicity in the calculation of the "burden," alumina is generally considered an acid (which is not always true) and its percentage is added to the percentage of silica (which also is incorrect, but seems to give close enough results for practice.) If from this "sum" we deduct the "bases" we reach what is called "unfluxed," given in the last column.

A fair average analysis of limestone is the following:

	Per cent.
Iron—Fe	Negligible.
Silica—SiO²	4.
Alumina Al²O³	1.
Bases (considered as CaO)	53.
Phosphorus	0.006

Such a limestone contains (as we will see further) 45.3 per cent. of "efficient lime" if the "slag" to be produced is a "subsilicate" of what we call the 0.8 type; the difference of 7.7 per cent. of CaO is used to "flux" the silica and alumina with the desired slag as result.

Following are actual limits for the composition of limestones used in the Pittsburgh region:

Name.	Bases in CaO.	SiO².	Al²O³.	P.	Fe.	Efficient lime.
Pittsburgh	53.3-51.0	3.2-4.8	0.5-2.0	0.006-0.007	0.10-0.28	48.7-44.9
Branchton	54.2-51.6	1.7-3.0	0.4-1.8	0.034-0.037	0.20-1.00	51.6-46.9

A fair average analysis for dry coke is:

	Per cent.		Per cent.
Carbon	89	Actually from	89.2 to 88.5
Ash	10	Actually from	10.0 to 10.5
Volatile matter	1	Actually from	0.8 to 1.0

And for coke in the "natural state":

	Per cent.		Percent.
C	84.5		
SiO²	5.5	Actually from	3.0 to 6.0
Al²O³	3.5	Actually from	4.5 to 3.0
S	1.0	Actually from	0.75 to 1.15
H²O	5.0		
Fe	0.5	Actually from	0.2 to 0.8
P	0.010	Actually from	0.010 to 0.025
Bases	Negligible.		

The average composition of ash is:

	Per cent.		Per cent.
SiO²	56.5	Fe²O³	7.25
Al²O³	36.0	P²O³	0.25

To these analyses we must add those of all other products commonly or accidentally used for burdening the furnace, among which are the following:

	Open hearth slag. Per cent.	Roll scale. Per cent.	Converter dust. Per cent.
Fe	14.0	67.5	52.0
SiO²	19.0	1.5	18.0
Al²O³	3.0	..	..
Bases	56.0	..	..
P	1.5	0.05	0.05

The open hearth slag is high in phosphorus and in manganese. It is used only for basic open hearth pig iron. Following are typical analyses of such a slag:

	Per cent.	Mean per cent.
Fe	12.74 to 13.23 and higher.	14
SiO²	17.98 to 19.30	19
Al²O³	2.64 to	3
CaO	34.23 to	36
MgO	10.34 to	11
Mn	5.14 to 7.38	7
P	1.572 to 1.357	1.5

Now we have all the analyses required for an accurate burden calculation. Two more things are necessary:

1. The weight of the coke required for one ton of pig iron produced.

2. The type of slag corresponding to the best running conditions and the kind of iron desired. This information can be obtained only from actual practice. The amount of coke used is very nearly 1 ton per ton of iron, and the "type" of slag for "basic" and "Bessemer" iron is somewhat poorer in SiO² than a "monosilicate"—it is almost accurately, what we will define later as, a 0.8 silicate. There will be given only the accurate method of calculating the amount of limestone required, based on the chemical equivalency,—Al²O³ being considered as a base. The results obtained in this way are accurate, and although they do not generally differ very much from those obtained by the so-called rapid methods, it is always preferable to use the theoretical way, as it represents much better the real nature of the chemical processes and in certain particular cases is less liable to lead to error.

Finding the Analyses of Slags.

The method will be explained and all the useful factors required for quick computation will be given, but it is better not to use them blindly, but to reason each time when there is the slightest doubt as to how to use them. It will be easy to compute on the same principle very elaborate tables based on a few standard data and every time make all the required changes, but it will be found on trial that the direct method, here given, is just as quick and does not involve all the accidental errors liable to occur when tables are used. Good tables are to be found in the "Chemical and Metallurgical Hand Book" of Cremer & Bicknell.

The fundamental principles are the following: SiO² is the only "acid" in the slag,—Al²O³, CaO, MgO, MnO and FeO are all "bases" and may be expressed either in "lime-equivalents" or in "correspondent-silica." In a similar way SiO² may be expressed in "correspondent lime." In this manner two methods of arranging the calculations slightly different in form are obtained.

Now, as Al²O³ has a somewhat different action than all the other bases, and its proportion in the slag may change its properties to a certain extent, it is advisable to consider it separately, and to see after the whole calculation is done whether the proportion of Al²O³ relatively to SiO² and CaO (together with the other bases) is about what practice has shown to be right.

The statement that one molecule of CaO is chemically "equivalent" to one molecule of either MgO, MnO

FeO and only ⅓ of a molecule of Al^2O^3 (as there are 3 "basic" O instead of 1 in the molecule) means that either of these molecules or parts thereof will behave in exactly the same way relatively to SiO^2 (the only acid) and form silicates of the same "type." The statement that any of the bases "corresponds" to so or so much of SiO^2, indicates the quantity of the "acid" required to give with the "base" a slag of a certain type. A slag in which the amount of "acid oxygen" (O in SiO^2) is exactly equal to the amount of "basic oxygen" (the sum of O in all the bases) is called a "monosilicate" or of the type 1. If there is less O in SiO^2 than in the combined bases we have a "subsilicate" and the type (T < 1), if the opposite happens we have a "supersilicate" (T > 1). In blast furnace practice the limits for T are from ½ to 2½, although experimentally all kinds of silicate can be obtained. In common coke blast furnaces T is about 1 and generally less, and for charcoal furnaces about 2. A comparison of a great many slags from "basic" and "Bessemer" iron in the Pittsburgh region shows that T is close to 0.8, and this type of subsilicate has been adopted for the computation.

As a preliminary, a few analyses of blast furnace slags may be given, and one be chosen as an example to show how to find its "type." Then the words "equivalent" and "correspondent" will be clear and the meaning of the "factors of equivalency" and "correspondency" will be obvious.

Analyses of Slags from "Basic" and "Bessemer" Pig Iron.

Composition.	Bessemer iron. Fur. I. Per ct.	Fur. II. Per ct.	Fur. III. Per ct.	Basic iron. Fur. IV. Per ct.	Theoretical mean. Bess. Per ct.	Basic. Per ct.
SiO^2	34.50	34.00	35.30	33.00	34.0	33.0
Al^2O^3	14.96	12.30	14.71	13.80	14.5	14.0
CaO	39.50	42.20	41.90	45.90	39.5	46.0
MgO	7.78	8 03	5.31	4.85	12.0	7.0
Mn RO	0.63	0.29	0.38	0.63		
Fe RO	0.40	0.20	0.40	0.30		
S	1.28	1 48	1.25	1.23	..	..

The two last columns called "theoretical mean" are the results obtained from the following two formulæ representing as nearly as possible the actual composition of these slags:

1. Bessemer Iron Slag—4 (SiO^2) Al^2O^3, 5 (CaO) 2 (R'O).

2. Basic Iron Slag—4 (SiO^2) Al^2O^3, 6 (CaO) R"O.

Both slags are of the same 0.8 type, because there are 8 atoms of O in SiO^2, 10 atoms of O in the combined bases. The symbol (RO) represents the combined bases MgO, MnO and FeO, and as their respective proportions vary the "theoretical equivalent" bases (RO) have in both cases different molecular weights, in the first case it is R'O = 43, in the second (R"O) = 50.

Lime Equivalency.

If CaO be taken as the basis of comparison the following "lime-equivalency" table is obtained:

		Reciprocals.
Al^2O^3	$\frac{3\ CaO}{Al^2O^3} = \frac{168}{102} = 1.647$	0.607
MgO	$\frac{CaO}{MgO} = \frac{56}{40} = 1.400$	0.715
MnO	$\frac{CaO}{MnO} = \frac{56}{71} = 0.789$	1.269
FeO	$\frac{CaO}{FeO} = \frac{56}{72} = 0.778$	1.285
Mn	$\frac{CaO}{Mn} = \frac{56}{55} = 1.018$	0.982
Fe	$\frac{CaO}{Fe} = \frac{56}{56} = 1.000$	1.000
Bessemer, R'O	$\frac{CaO}{R'O} = \frac{56}{43} = 1.302$	0.768
Basic R"O	$\frac{CaO}{R"O} = \frac{56}{50} = 1.120$	0.893

This means that for each part of the base there are so many parts of lime which will be theoretically equivalent, and the reciprocals—that one part of lime is equivalent to so much of any other base.

In considering the silica there will be in the case of a "monosilicate," for each molecule of SiO^2, 2 atoms of O, so that there must be taken 2 molecules of CaO to have the ratio $\frac{\text{acid O}}{\text{basic O}} = 1$, whence the deduction is made that "correspondent lime" is $\frac{2\ CaO}{SiO^2} = \frac{112}{60} = 1.867$. If the aim is a slag of the 0.8 type, $\frac{\text{acid O}}{\text{basic O}} = 0.8$, therefore the correspondent lime is $\frac{2\ CaO}{0.8\ SiO^2} = 2.334 =$ the preceding figure divided by the type.

If instead of finding the amount of lime correspondent to one part of SiO^2 in a monosilicate slag any of the other bases of the form RO or R^2O^3 are considered, then there are two methods of finding the amount of the "correspondent base" either directly by taking one of the quotients $\frac{2\ RO}{SiO^2}$ or $\frac{2\ R^2O}{3\ SiO^2}$ or indirectly by dividing the ratio $\frac{2\ CaO}{SiO^2} = 1.867$ by one of the other ratios $\frac{CaO}{RO}$ or $\frac{3\ CaO}{R^2O^3}$ given above in the table.

If the slag is not a monosilicate, but, say, of the 0.8 type, the result must be divided by this type. As an example, the calculation may be made how much alumina will correspond to 1 pound of silica if the slag is of the 0.8 type.

The ratio $\frac{\text{acid O}}{\text{basic O}} = 0.8$ shows that for 2 molecules of Al^2O^3 there must be 3 × 0.8 molecules of SiO^2 or for 2 × 102 alumina — 3 × 60 × 0.8 of silica, therefore for 1 pound of SiO^2 there are $\frac{2 \times 102}{3 \times 60} \times \frac{1}{0.8} = 1.418$ pounds of Al^2O^3. This result can be obtained indirectly as follows: It has been ascertained that 2.334 lbs. of lime correspond to 1 lb. SiO^2 in a 0.8 type slag, now 1 lb. of lime is equivalent to 0.607 lb. Al^2O^3 (see table), and therefore 2.334 × 0.607 = 1.418 lb. Al^2O^3 corresponds to 1 lb. SiO^2 as before.

Now, it may be ascertained whether the slag of the composition given above in the column, "theoretical mean Bessemer," really corresponds to the formula 4 (SiO^2) Al^2O^3 5 (CaO) 2 (RO)—(where RO = 43), and also whether without having recourse to this formula by the use of factors of "equivalency" and "correspondency" that the type is a 0.8 slag, as stated. We have:

	Per cent.
$4(SiO^2) = 4 \times 60 = 240$	34.0
$Al^2O^3 = 102$	14.5
$5(CaO) = 5 \times 56 = 280$	39.5
$2(RO) = 2 \times 43 = 86$	12.0
Totals	100.0

Al^2O^3 is equivalent to 1.647 × 14.5 = 23.8 CaO
CaO is equivalent to 39.5 CaO
RO is equivalent to 1.302 × 12 = 15.6 CaO
All bases are equivalent to 78.9 CaO

If the slag was a monosilicate, then there would be for each part of SiO^2, 1.867 parts of correspondent lime. Now, there are 34 parts of SiO^2 for 78.9 of CaO, so that in this case the "type" will be:

$$T = \frac{34}{78.9} \times 1.867 = 0.8.$$

This result can be obtained directly in the following way:

O contained in A parts of $SiO^2 = \frac{32}{60} A$.

O contained in B parts of CaO = $\frac{16}{56} B$.

Ratio $\frac{\text{Acid O}}{\text{Basic O}} = T = \frac{A}{B} \times \frac{32}{16} \times \frac{56}{60} = \frac{A}{B} \times \frac{112}{60}$.

The figures are A = 34, B = 78.9, $\frac{112}{60} = 1.867$. The result is the same, T = 0.8.

Taking Silica as the Basis of Comparison.

There is another method of carrying out the calculation by accepting silica as the basis of comparison instead of lime.

I do not use this method very much. I compute my main tables by reducing all bases to the "equivalent lime" and then find the amount of total lime required

to give with the silica the desired type of slag from which amount I subtract the "equivalent lime" actually present. However, there is no particular reason why this other way should not be adopted if desired.

The result is the following table for "silica correspondency" for various bases in the case of a monosilicate:

			Reciprocals.
CaO	$\frac{SiO^2}{2CaO} = \frac{60}{112}$	= 0.536	1.867
Al^2O^3	$\frac{3SiO^2}{2Al^2O^3} = \frac{180}{204}$	= 0.882	1.133
MgO	$\frac{SiO^2}{2MgO} = \frac{60}{80}$	= 0.750	1.333
MnO	$\frac{SiO^2}{2MnO} = \frac{60}{142}$	= 0.422	2.365
FeO	$\frac{SiO^2}{2FeO} = \frac{60}{144}$	= 0.416	2.400
Mn	$\frac{SiO^2}{2Mn} = \frac{60}{110}$	= 0.545	1.835
Fe	$\frac{SiO^2}{2Fe} = \frac{60}{112}$	= 0.536	1.867
Bess. R'O	$\frac{SiO^2}{2R'O} = \frac{60}{86}$	= 0.697	1.433
Basic R"O	$\frac{SiO^2}{2R"O} = \frac{60}{100}$	= 0.600	1.667

This means that to each part of the base there are so many parts of "correspondent" silica in the case of a monosilicate and the reciprocals—that one part of SiO^2 corresponds to so much of any other base under the same assumption.

If the direct numbers of this table be multiplied by the "type" then is ascertained the amount of SiO^2 correspondent to one part of the base. If the reciprocals are divided by the "type," the amount of the base correspondent to one part of SiO^2 is reached. Selecting, for instance, Al^2O^3 we obtain by multiplying 0.882 (see table) by 0.8 the figure 0.706 as the amount of SiO^2 correspondent to 1 pound of Al^2O^3 in a slag of the 0.8 type. If the reciprocal 1.133 is divided by 0.8, then 1.418 is obtained, as the amount of Al^2O^3 correspondent to 1 pound of SiO^2 in the same slag, a figure which has been previously found by the direct method.

The following is a useful table of the correspondency of lime to silica for different types of slag. It has been computed between the limits of 0.75 to 1.25 for the types, but it is very easy to enlarge these limits if desired.

				Composition of slag.	
Type = T.	$\frac{1}{T}$	Corr. lime.	Corr. silica.	Equiv. CaO.	Corr. SiO^2.
0.75	1.333	2.489	0.402	71.3	28.7
0.80	1.250	2.334	0.428	70.0	30.0
0.85	1.177	2.196	0.455	68.7	31.3
0.90	1.111	2.074	0.482	67.5	32.5
0.95	1.053	1.965	0.509	66.3	33.7
Monosil.	1.000	1.867	0.536	65.1	34.9
1.05	0.952	1.778	0.562	64.0	36.0
1.10	0.909	1.697	0.589	62.9	37.1
1.15	0.870	1.623	0.616	61.9	38.1
1.20	0.833	1.556	0.643	60.9	39.1
1.25	0.800	1.494	0.669	59.9	40.1

With this table and the "lime equivalency" table there are found at once the results given in the "silica correspondency table" for different bases (whose figures have been conveniently multiplied or divided by T).

As an illustration of the use of this table together with the "lime equivalency table" let there be sought once more the correspondency of Al^2O^3 to SiO^2 in the case of a 0.8 slag. From the last table there is ascertained that for this type 2.334 CaO corresponds to 1 of SiO^2 and also that 0.428 SiO^2 corresponds to 1 of CaO. From the first table it is noted that 1 of CaO is equivalent to 0.607 of Al^2O^3 and 1 of Al^2O^3 is equivalent to 1.647 of CaO. Combining these figures: 2.334 × 0.607 of Al^2O^3 corresponds to 1 of SiO^2, or 1.418, and 0.428 × 1.647 of SiO^2 corresponds to 1 of Al^2O^3, or 0.706. Both results have been obtained previously in a different way.

The last two columns of the preceding table give the composition of the slag in "equivalent lime" and "correspondent silica." This theoretical composition of the slag must not be confounded with the "probable analysis" which will differ to a certain extent owing to the fact that all the "bases" other than CaO, and even Al^2O^3 have been reduced to a single base—CaO. To illustrate the effect which the introduction of "equivalent lime" has on the percentage of SiO^2 there are presented four different slags of the same 0.8 type in which the percentage of SiO^2 varies from 30% to 34%.

Formula.	SiO^2.	Al^2O^3.	CaO.	R"O.	R'O.
(1+4)SiO^2+10CaO	30.0%	...	70.0%	....	....
(2+4)SiO^2+Al^2O^3+7CaO)	32.7	13.9	53.4	....	....
(3+4)SiO^2+Al^2O^3+6(CaO)R"O) ...	33.0	14.0	46.0	7.0	....
(4+4)SiO^2+Al^2O^3+5(CaO+2R'O)...	34.0	14.5	39.5	....	12.0

R"O combination of bases of the mean molecular weight of 50, R'O molecular weight of 43.

In practice it will be often sufficiently accurate to neglect the effect of the bases of the type RO other than CaO and to simply add their percentage to that of the lime without previously using the lime—equivalency factors as shown above. The influence of Al^2O^3 should not be neglected. There should be studied the question whether no relative proportion to the other two main constituents—SiO^2 or CaO is within the desired limits.

Before making the burden calculation the efficiency of the typical limestone should be studied. The lime under consideration carries 4 per cent. of silica, 1 per cent of alumina and 53 per cent. of lime.

The slag is to be of the 0.8 type. Referring to the lime equivalency table it will be found that 1 per cent. of Al^2O^3 is equivalent to say 1.64 CaO, so that the total amount of CaO may be placed at 54.64. From the silica correspondency table there will be found that for the 0.8 type one per cent. of SiO^2 correspondent to 2.334 CaO and 4 per cent.—to 9.34. This figure must be subtracted from 54.64, leaving 45.3 as the "efficient lime"; in other words, 1 lb. of efficient lime is contained in $\frac{1.0}{0.4530} = 2.2$ lb. of limestone.

The Burden Calculation.

The following mixture of ores is used in the burden:

	lb.
Group III	16,500
Group II	5,000
Barnhart	6,000
Open hearth slag	1,500
Converter dust	1,000
Total	30,000

The following are the average analyses:

Name.	Fe.	SiO^2.	Al^2O^3.	CaO.	MgO.	Mn.	P.	S.
Group III	50.0	5.0	2.5	0.5	....	....	0.09	0.10
Group II	55.0	3.5	1.5	0.5	....	....	0.05	0.10
Barnhart	52.0	11.0	2.5	1.5	....	....	0.06	0.10
Open hearth slag	14.0	19.0	3.0	36.0	11.0	7.0	1.50	0.10
Converter dust	52.0	18.0	...	...	....	....	0.05	0.10
Coke	0.5	5.5	3.5	...	....	....	0.01	1.00
Limestone	...	4.0	1.0	53.0	....	....	0.006	....

It is assumed that the pig iron produced will contain the whole iron present, which will form 95 per cent. of its composition, and that this pig iron will contain one per cent. of silicon, 3.75 per cent. of carbon, half of the manganese present, all of the phosphorus and no sulphur.

This is certainly only hypothetical but does not differ much from the actual analysis and may be taken as the basis of the calculation. It is further assumed that 15,500 lb. of coke will be used for the 30,000 lb. of ore.

The slag to be produced must be of the 0.8 type and contain the whole of the sulphur. This is certainly an assumption since part of the sulphur burns out and part goes into the iron. It is nevertheless better to be on the conservative side. The slag will also contain the other half of the manganese as MnO and all the magnesia.

To give a better oversight the balance sheet per charge is at once given, although it requires the previous calculation of the amount of limestone needed. The iron is supposed to be in the ore as Fe^2O^3; the balance to 100 per cent in each case has been taken as "moisture." This gives: Average moisture of ore, 16 per cent.; of coke, 5 per cent., and of limestone, ½ per cent.

At this stage of the calculation there has not yet been computed the total amount of blast required to give a gas of a certain fixed composition, so that the figures are put down as "gas constituents," most of the carbon remaining yet theoretically unburned.

The Balance Sheet of the Charge.

Charges.	Pig Iron.	Slag.	Gas constituents.
1. Ore, (30,000 lb.)			
Fe_2O_3 .. 21,220.0	Fe ... 14,850.0	.....	O ... 6,370.0
SiO_2 .. 2,125.0	Si 1,67.0	SiO_2 ... 1,789.1	O .. 178.9
Al_2O_3 . 682.5	.....	Al_2O_3 .. 682.5	.....
CaO .. 737.5	.....	CaO ... 737.5	.....
MgO .. 165.0	.....	MgO ... 165.0	.....
MnO . 135.4	Mn .. 52.5	MnO ... 67.7	O ... 15.2
P_2O_5 .. 100.6	P 44.1	.....	O ... 56.5
S 30.0	.....	S 30.0	.....
H_2O .. 4,804.0	.....	.....	H_2O .. 4,804
2. Coke (15,500).			
C 13,094.0	C 589.0	.....	C 12,505
Fe ... 77.5	Fe ... 77.5	.....	.....
SiO_2 .. 852.5	.....	SiO_2 .. 852.5	.....
Al_2O_3 .. 542.5	.....	Al_2O_3 .. 542.5	.....
P_2O_5 .. 3.5	P 1.5	.....	O 2.0
S 155.0	.....	S 155.0	.....
H_2O .. 775.0	.....	.....	H_2O . 775.0
3. Limestone (7,616).		(CaO ..3,712.8	CO_2 .. 3,172.0
$CaCO_3$ ..7,208.5	.....	(Ca ... 231.2	O.... 92.5
SiO_2 ... 304.6	.....	SiO_2 ... 304.6	.....
Al_2O_3 .. 76.2	.....	Al_2O_3 .. 76.2	.....
P_2O_5 ... 1.0	P 0.4	.....	O ... 0.6
H_2O ... 25.7	.....	.....	H_2O . 25.7
Totals 53,116.0	15,772.0	9,346.6	27,997.4
	Fe ...14,927.5	SiO_2 ...2,946.2	C ...12,505.0
	Si ... 157.0	Al_2O_3 ..1,301.2	CO_2.. 3,172.0
	Mn ... 52.5	CaO ..4,450.3	O ... 6,715.7
	P 46.0	MgO .. 165.0	H_2O . 5,604.7
	C 589.0	MnO .. 67.7	.....
	.....	CaS ... 416.2	.....
	15,772.0	9,346.6	27,997.4

If reduced to percentages, we find the composition of the pig iron and slag to be respectively as follows:

Fe	94.65	SiO_2	31.52
Si	1.00	Al_2O_3	13.92
Mn	0.33	CaO	47.62
P	0.29	MgO	1.77
C	3.73	MnO	0.72
		CaS	4.45
	100.00		100.00

To verify that the slag is of the desired 0.8 type the computation is as follows: Each of the bases is reduced to the equivalent lime by using the proper factors, then the amount of silica is multiplied by $\frac{112}{60} = 1.867$. The result is:

SiO_2 ..... $31.52 \times 1.867 = 58.847$
Al_2O_3 ..... $13.92 \times 1.647 = 22.926$
CaO ..... $47.62 \times 1.000 = 47.620$ = 73.592
MgO ..... $1.77 \times 1.400 = 2.478$
MnO ..... $0.72 \times 0.789 = 0.568$

By taking the quotient, $T = \frac{58.847}{73.592}$, we find T = 0.8; also 30 per cent. SiO_2 for 70 per cent. CaO (equivalent).

To find the necessary amount of limestone to produce the results given above the following method is pursued:

First there is figured out the following table giving the composition of the charge in weight:

Ore.	Wt.	Fe	SiO_2	Al_2O_3	CaO	MgO	Mn	P	S	
Group III.	16,500	8,250	825	412.5	82.5	....	....	14.85	....	
Group II..	5,000	2,750	175	75	25	....	....	2.50	....	
Barnhart..	6,000	3,120	660	150	90	....	....	3.60	....	30
O. H. slag	1,500	210	285	45	540	165	105	22.50	....	
Conv. dust.	1,000	520	180	....	....	....	....	0.50	....	
Coke.....	15,000	77.5	852.5	542.5	..	....	....	1.55	155	
Totals..	....	14,927.5	2,977.5	1,225	737.5	165	105	45.50	185	

The 14,927.5 Fe will give ÷ 0.95—15,713 of pig iron containing 1 per cent., or 157 lb. of silicon reduced from $157 \times 2.14 = 335.9$ lb. SiO_2, and leaving, therefore, 2641.6 SiO_2 in the charge.

Now by using the lime equivalency factors the total amount of equivalent lime for each of the bases is ascertained as follows:

Al_2O_3 ..... $1,225 \times 1.647 = 2.017.6$
CaO 737.5
MgO ..... $165 \times 1.400 = 231$
½ Mn ..... $52.5 \times 1.018 = 53.4$
Total equivalent lime = ... 3,039.5

If the slag to be produced were a monosilicate 1 lb. of SiO_2 would correspond to 1.867 lb. of CaO, but in the case of a 0.8 type the quantity is 2.334 lb. instead. Multiplying the 2641.6 lb. of silica by this figure it is ascertained that 6165.5 is the amount of lime required; of this there is already available 3039.5 lb., leaving only 3126 lb. to be furnished. But there are also 185 lb. of sulphur which require a certain amount of CaO to become CaS. Obviously one molecule of CaO corresponds to one atom of sulphur, or, as $\frac{56}{32} = 1.75$, this means that each pound of S requires 1¾ lb. of lime and 185 lb., about 324 lb., which added to the previous 3126 lb. give 3450 lb. of lime to be furnished by the limestone. It has been calculated that the limestone contains 45.3 per cent. of efficient lime, so that the total amount of limestone to be added is $3450 \div 0.453 = 7616$, which was the figure accepted.

The Blast and the Escaping Gases.

It remains now to calculate the amount of blast and to deduce the composition of the escaping gases.

It is assumed that the average combustion of carbon in the furnace is: $3\ C + 2\ O^2 = CO^2 + 2\ CO$, or that 36 lb. of carbon requires 64 lb. of oxygen to give 44 lb. CO^2 and 56 lb. CO, and also that two molecular volumes of O^2 will produce with 3 C one molecular volume of CO^2 and two of CO; in other words, that the ratio $\frac{CO}{CO^2}$ by volume will be as $\frac{1}{2}$ and by weights as $\frac{56}{44}$. From this equation the following ratios are computed:

1 lb. carbon produces ..... $\frac{56}{36} = 1.5556$ CO
1 lb. carbon produces ..... $\frac{44}{36} = 1.2222$ CO^2
1 lb. carbon requires ..... $\frac{64}{36} = 1.7778$ O

Half of the total amount of O, or $\frac{32}{36} = 0.8889$, gives CO and the other half CO^2.

The amount of carbon burning to CO is $\frac{24}{36} = 0.6667$.

The amount of carbon burning to CO^2 is $\frac{12}{36} = 0.3333$.

The carbon to be considered is the total carbon—it is the 12 505 carbon in the balance sheet under coke, and the carbon contained in 3172 of CO^2 in the limestone. The last quantity is $\frac{12}{44} = 0.27273$ of 3172 parts, or 865.1 lb., giving altogether 13,370.1 lb. as the total carbon.

The oxygen present is the sum of the 6715.7 "free" oxygen in the ore, in the balance sheet, and the remaining 2306.9 oxygen of the 3172 CO^2 in the limestone, or altogether 9022.6 lb.

The gas constituents contain:

Total C 13,370.1
Present O 9,022.6
H_2O 5,604.7
Total 27,997.4

By multiplying the total carbon by 1.7778, a total of 23,769 is arrived at as the oxygen. Deducting therefrom the oxygen present, there is ascertained that 14,746.4 is the amount of oxygen to be furnished by the blast.

It is assumed that the air contains 1 per cent. moisture. This moisture will be dissociated at the tuyeres into free O and H. If the normal composition of dry air by weight is accepted as O = 23.1 per cent. and N = 76.9 per cent., then air containing 1 per cent. moisture is composed as follows:

O ..... = 22.869
N ..... = 76.131
H_2O ..... = 1.000
Total 100.000

And after dissociation at the tuyeres:

O ..... = 23.758
N ..... = 76.131
H ..... = 0.111
Total 100.000

And for 1 lb. of O:

O ..... = 1.0000
N ..... = 3.2044
H ..... = 0.0047
Air 4.2091
Tuyere Ores for the ..... 14,746.4 lb. O
47,253.4 lb. N.
69.3 lb. H

The composition of the gases by weight will be found to be:

	Pounds.	Per cent.
CO	20,797.9	23.0917
CO^2	16,341.2	18.1435
N^2	47,253.4	52.4650
H^2	69.3	0.0770
H^2O	5,604.7	6.2228
Totals	90,066.5	100.0000

In order to ascertain the composition of these gases by volume, Professor Richards' method may be followed, based on the following consideration: If the composition of the gases be expressed in "ounce molecules," their respective volumes in cubic feet are arrived at by multiplying with 22.22.

Standard conditions in volumes are arrived at as follows:

		Cubic feet.	Per cent.
CO	$= \frac{20{,}797.9 \times 16}{28} \times 22.22$	= 264,073.8	23.5968
CO^2	$= \frac{16{,}341.2 \times 16}{44} \times 22.22$	= 132,036.9	11.7984
N^2	$= \frac{47{,}253.2 \times 16}{28} \times 22.22$	= 599,983.1	53.6124
H^2	$= \frac{69.3 \times 16}{2} \times 22.22$	= 12,318.8	1.1008
H^2O	$= \frac{5{,}604.7 \times 16}{18} \times 22.22$	= 110,698.7	9.8916
Total	$= \frac{90{,}066.5 \times 16}{28.61} \times 22.22$	= 1,119,111.3	100.0000

The density of the gas relative to H will be $\frac{28.61}{2}$ = 14.305, a little lighter than dry air, whose density is 14.4.

With the same method the composition in volume of the blast after dissociation, but at standard conditions, is as follows:

		Cubic feet.
O^2	$= \frac{14{,}746.4 \times 16}{32} \times 22.22$	= 163,832.5
N^2	$= \frac{47{,}253.4 \times 16}{28} \times 22.22$	= 599,983.1
H^2	$= \frac{69.3 \times 16}{2} \times 22.22$	= 12,318.8
Total	$= \frac{62{,}069.1 \times 16}{28.43} \times 22.22$	= 776,134.4
Leaving for the gas constituents		342,976.9
Total		1,119,111.3

From this the result in volume is:

		Cubic feet.	Per cent.
O^2	$= \frac{14{,}195 \times 16}{32} \times 22.22$	= 157,706.4	20.483
N^2	$= \frac{47.253.4 \times 16}{28} \times 22.22$	= 599,983.1	77.925
H^2O	$= \frac{620.7 \times 16}{18} \times 22.22$	= 12,259.5	1.592
Totals	$= \frac{62{,}069.1 \times 16}{28.66} \times 22.22$	= 769,949.0	100.000

The density of this air is 14.33 relative to hydrogen. The factor of dissociation is 1.00803—its reciprocal 0.99203. So it has been found that 769,949 cu. ft. was the theoretical amount of blast required under standard conditions for a single charge. For 80 charges or per 24 hr. this makes 61,595,920 cu. ft., and per minute, 42,775. To give an idea of the size of the blast engines required to produce the necessary blast there may be presented some data on engines working under similar conditions at one of the Carnegie plants near Pittsburgh. They were vertical compound double relief blast engines, built by Allis-Chalmers—two for each furnace. Their principal dimensions were: Diameter of air cylinders, 84 in.; diameter of steam high pressure cylinders, 44 in.; low pressure cylinders, 86 in., and stroke, 60 in. With a steam pressure of 150 lb. and from 35 to 45 rev. per min. they developed about 1800 hp. each. The average speed of the piston was about 400 ft. per minute; the maximum was 600 ft. With 40 rev. per min. for each engine both furnished 61,600 cu. ft. per minute. If they run 23 hr. a day this makes 85,008,000 cu. ft. of air at, say, 62 degrees F. Under standard conditions they will furnish about 95 per cent. thereof, or 80,757,600 cu. ft. Deducting 20 per cent. for losses, this gives 64,606,080 cu. ft. as the approximate amount of air delivered to the furnace during a day. Theoretically it has been found that 61,595,920 cu. ft. are required for 80 charges of 30,000 lb. of ore each, giving an output of about 600 gross tons of pig iron.

It is of great interest to compare the relative quantity of the various materials and products. The following table has been computed from the data discussed, and the results agree very closely with the actual working conditions in this region:

Comparative Table of Materials and Products.

Name.	Weight—Lbs. Vol.—Cu. ft.	1. Ore.	2. Limestone.	3. Burden.	4. Coke.	5. Air, wt.	6. Air, vol.	7. Gases, wt.	8 Gases, vol.	9. Slag.	10. Pig iron.
1. Ore	30,000	1.00000	3.93908	0.79753	1.93549	0.48333	0.038963	0.33309	0.026807	3.20973	1.90211
2. Limestone	7,616	0.25387	1.00000	0.20247	0.49135	0.12270	0.009892	0.08456	0.006805	0.81484	0.48288
3. Burden	37,616	1.25387	4.93908	1.00000	2.42684	0.60603	0.048855	0.41765	0.033612	4.02457	2.38499
4. Coke	15,500	0.51667	2.03519	0.41206	1.00000	0.24972	0.020131	0.17209	0.013850	1.65836	0.98275
5. Air, wt.	62,069.1	2.06897	8.14983	1.65007	4.00446	1.00000	0.080615	0.68915	0.055463	6.64082	3.93540
6. Air, vol.	769,949	25.66497	101.09624	20.46866	49.67413	12.40470	1.000000	8.54867	0.688000	82.37742	48.81745
7. Gases, wt.	90,066.5	3.00222	11.82596	2.39437	5.81074	1.45107	0.116977	1.00000	0.080480	9.63628	5.71053
8. Gases, vol.	1,119,111.3	37.30371	146.94217	29,75094	72.20074	18.03009	1.453490	12.42540	1.000000	119.73460	70.95557
9. Slag	9,346.6	0.31155	1.22723	0.24848	0.60301	0.15059	0.012140	0.10377	0.008352	1.00000	0.59261
10. Pig iron.	15,772	0.52573	2.07090	0.41929	1.01755	0.25411	0.020485	0.17511	0.014094	1.68746	1.00000

This shows that the blast after dissociation has a density of 14.215 relative to H and forms 69.35 per cent. by volume of the gases.

The furnace under consideration was a 600-ton furnace 100 ft. high. The average number of charges in 24 hr. was 80, so that the total amount of gases produced was 1,119,111.3 × 80 = 80,528,904 cu. ft., or 62,172.9 cu. ft. per minute. In weight it was 90,066.5 × 80 = 7,205,320 lb. in 24 hr., and 5003.7 lb. per minute. The air blown in was 62,069.1 lb. per charge, 4,965,528 lb. per day and 3448.3 lb. per minute.

The amount of air in cubic feet before dissociation is obviously not the same as after, so that 776,134.4 cu. ft. found previously does not show accurately the real amount of air driven into the furnace.

Before the dissociation of H^2O the composition of the 62,069.1 lb. blast was:

		Per cent.
O^2	14,195	= 22.869
N^2	47,253.4	= 76.131
H^2O	620.7	= 1.000
Totals	62,069.1	= 100.000

The American Manganese Bronze Company.—The American Manganese Bronze Company, which was organized some time ago, occupies offices at 99 John street, New York City, as announced in the issue of April 30. This company will make a specialty of copper alloys and various other alloys brought out by Charles R. Spare, formerly chemist at the Cramps shipyards, Philadelphia. Among these products will be Spare's manganese bronze, Spare's white bronze, and Spare's hydraulic bronze. The company will also manufacture regular United States Government alloys and will specialize on marine hydraulic work. A new factory will be located on the outskirts of Philadelphia at Holmesburg, Pa. U. T. Hungerford is president of the company, Charles R. Spare, vice-president, and William A. Lock, secretary and treasurer.

The W. R. Beatty Machinery & Equipment Company, 613 House Building, Pittsburgh, Pa., has been appointed agent for the Pittsburgh District for the line of punches and shears made by the Cincinnati Punch & Shear Company, Cincinnati, Ohio.

Economical Lubrication of Large Plants.*

BY WILLIAM M. DAVIS.†

In lubrication the first consideration is efficiency, then economy. For efficient lubrication the most important thing is lubricant of good quality; next reliable appliances for feeding the oil, so that every drop will go directly to the bearing surfaces. For slow-speed engines, ordinary sight-feed cups are satisfactory, but for heavy high-speed work a continuous oiling system is most efficient. From an economic standpoint, however, the success of such a system will depend entirely upon the means to catch the oil after it leaves the bearings.

Catching the Excess of Oil from Bearings.

With slow-speed engines and all machinery that uses oil in quantities, every bearing should have substantial sheet-steel pans, arranged, if possible, to drain the oil to some central point from which it can be taken to the filter. If the engine is of the horizontal crank case type, care should be taken to keep the oil as free from water as possible, as water will sometimes travel along the piston rod into the crank case, and, if it is the least bit alkaline, as may be the case where compounds are used in the boilers, the oil and water together will sometimes form an emulsion which is hard to separate and lowers the quality of the oil. The above would not apply, of course, to the vertical steam engine, which uses water in the crank case.

To secure economical lubrication, the first thing is to stop the leaks. Every piece of machinery should be provided with drip pans to catch the oil. In a large plant where several engines are close to one another, the oil pans may be piped to a central tank, whence it can be pumped to the filter. On slow-running engines where the pressure is not excessive, and on slow-running shafting, a good grade of grease or tallow compound will often give good results, but where compression cups are used the grease should be quite soft so that it will spread freely. If too hard, great pressure will be required to feed it, and it will also tend to increase the friction load.

Where the hub of a flywheel or large gear is so close to the bearing that there is not sufficient space to fasten oil pans under the bearing all excess of oil will be lost. Such bearings can often be lubricated economically by packing a lump of medium hard grease on the journal at each end of the bearing and feeding a little oil in the middle. The grease will prevent the oil from running out too fast, and at the same time help to lubricate.

Cylinder Lubrication.

The proper amount of oil that should be used will have to be determined by experiment. A good quality of oil should be provided, and to get economical results the conditions should be made as favorable as possible—*e. g.*, the steam should be dry; the water in the boilers not too high; an excess of strong alkaline boiler compounds avoided; and, above all, the piston rings should not be set out too tight. Before putting the rings in the piston the edges should be chamfered off slightly with a file, for if they are sharp they will tend to scrape the oil from the surface. From the lubricator the discharge pipe should extend into the center of the steam pipe, so that the oil will drop into the current of steam. Where the engine speed is constant there is little choice between a force feed pump and an ordinary sight feed lubricator. Either will give efficient and economical service if properly taken care of, but where the work is intermittent, the engine stopping and starting, the force feed pump is more economical.

To determine the proper amount of cylinder oil to use, make the conditions as favorable as possible, then gradually reduce the oil feed and note the action of the valves. If they work smoothly all right, but if they commence to groan increase the oil feed slightly. After this the cylinder head should be removed and the surface of the cylinder examined. If it looks oily, and when wiped with a piece of soft paper a stain is left on the paper, it is certain that enough oil is being used.

The Receiving, Handling and Distributing of Lubricants.

If the plant is a large one the oil house should contain storage tanks sufficient to hold a tank car of each kind of oil. By purchasing the oil in cars there will be a saving in the price per gallon and in labor of handling the oil and empty barrels. In a small plant where only a few barrels of each kind of oil are used a month, tanks holding from 2 to 10 barrels should be provided, so arranged that the oil can flow by gravity from the barrels to the tanks. Care should be taken to see that the barrels drain out clean.

It is customary in a large plant to have a man in charge of the oil house who receives and stores all lubricants, issues and charges them up to the various departments, keeping a record of the amounts given out in a book or on suitable blank forms. To limit the daily amount of lubricants for each department, the chief engineer or master mechanic, when making his daily rounds, can give each engineer an order for his day's supply of oil and grease, and thus know if the amounts required are increasing or decreasing; or an allowance may be made each engine room or department per day or week, which cannot be exceeded except by written order to the oil house storekeeper. At the end of the month the storekeeper totals the amounts of lubricants used and obtains the total cost.

Reduction of Cost.

Nearly all plants spend more than is needed for lubrication, due partly to wasteful methods in use, partly from using unsuitable lubricants, and often to paying prices higher than necessary. The first can be greatly prevented by systematic methods of issuing the lubricants and charging them to the different departments and by installing more economical appliances.

In regard to more suitable lubricants in many plants there is often slow-speed machinery, on which it is not practicable to recover the oil used, in which case a good grade of dark lubricating or black oil will often answer as well as the more expensive oils. A works that was using large quantities of an expensive grade of cylinder oil on its machinery where a heavy machine oil would have answered equally as well, could have effected a saving amounting to over $2,000 a year.

To purchase good lubricants at the lowest prices, it is best to buy on specifications, asking bids and awarding a contract for a year's supply to the lowest responsible bidder.

Grease.

Greases can often be used with good economy, but they have their limitations. Where the speeds and pressure are low, if they are of the proper consistency and fed to the bearings by suitable compression cups, they often give excellent results. Greases are what is known as "plastic lubricants"; their particles have far less tendency to free movement than is the case with oils. Many greases have as their base a petroleum oil combined with some animal fat, the whole solidified by combining them with a solution of caustic soda, lime water or other alkalies, making a plastic compound that will vary in its lubricating value according to the proportions and the quality of its component parts. While greases have certain advantages as regards cleanliness, ease of application, &c., if used on general mill and factory machinery they will tend to add to the friction load over what it would be if oil were used. To see what this would amount to in the case of the plungers of water works pumping engines, a test was made on a vertical compound pumping engine running under a constant load and at 20 rev. per min., having four plungers, two being 31½ in. in diameter and two 22 in. in diameter, all having a uniform stroke of 64 in. The plungers were packed with square hemp packing, which had been well soaked in oil, and several times a day were swabbed with oil. Two sets of indicator cards were taken. The first with the plungers lubricated with oil showed the engine to be developing 762.67 hp. The plungers were then smeared

* Abstract of a paper read before the Boston Society of Civil Engineers, December 18, 1907, and printed in full in the Journal of the Association of Engineering Societies.

† Arthur D. Little Laboratory, Boston, Mass.

with soft grease and another set of cards taken which showed the engine to be developing 835.17 hp., making an increase of 72.5 hp., or over 10 per cent. In this particular case grease would have been a very expensive lubricant to use. On the other hand, there are places where grease is the only lubricant that can be used. In rolling mill work, owing to the nature of the duty and the construction of the machinery, it is the only lubricant that can be used successfully. On rolls used for rolling rails, structural steel and in merchant mills, the journals or necks are kept flooded with water, and a saponifiable grease must be used, that is, one containing a large per cent. of fatty oils, so that it will adhere to the wet surfaces. In sheet steel and tin plate mills where it is impracticable to use water, and the journal or neck temperatures often go over 400 deg., a dense grease compounded with a large per cent. of high flash test petroleum oil must be used.

The Flohr Improvement of the Basic Bessemer Process.

While it does not give actual figures relating to the saving in costs, Dr. P. Goerens' account of the Flohr improvement of the basic Bessemer process is the most admirable review of the conditions affecting that process which we have yet seen in print. From that account, published in *Stahl und Eisen*, we take the following:

The process has been worked out by J. Flohr at the Duedelingen works and has been introuced at a number of other basic Bessemer plants. When pig iron containing carbon, silicon, manganese and phosphorus is blown in a basic converter the first three elements named are oxidized until the dephosphorizing period. Probably these elements are eliminated in this manner: The oxygen entering the bath partly oxidizes some of the excess of the iron, forming a ferrous oxide whose tendency is to go into solution at once. But encountering in the solution substances whose affinity for oxygen to iron is greater at the prevailing temperature, they are oxidized at the expense of the ferrous oxide. The different foreign substances are oxidized and ferrous oxide is again reduced to iron. The rapidity with which these reactions proceed varies with the different substances, and is dependent upon the temperature and the character of the slag present.

As high a temperature as possible is likely to affect favorably the course of the process. The silicon is lowered to traces in the first few minutes. Therefrom there remain, for the first period, chiefly carbon and manganese. So long as carbon is present a notable dephosphorization cannot take place, particularly since there does not yet exist a suitable solvent for the phosphoric acid. If it be the aim to shorten the decarbonizing period, then the carbon must be burnt as rapidly as possible, and this is dependent upon the temperature of the bath, which is due to the fact that the affinity of carbon for oxygen rises more rapidly with the temperature than does that of iron and of manganese. If the temperature during the first period is relatively low, then carbon burns more slowly and a larger quantity of manganese is oxidized.

How the High Temperature is Obtained.

In order to attain this advantageous high temperature during the decarbonizing period a number of methods are at hand. Care should be taken that the heat of the pig iron as it comes from the mixer or the cupola is as high as possible and that the converter itself be hot. This is particularly desirable in those plants where scrap and skulls are charged into the converter with the pig iron. But in such cases, too, a minimum of cooling additions will be made at the outstart, because every cooling during the decarbonizing is unfavorable.

Conditions are different, however, during the dephosphorizing period, in the so-called "afterblow." Unlike carbon, phosphorus possesses the property that its affinity for oxygen grows more slowly as the temperature rises than does that of iron and of manganese. The result is that phosphorus burns more slowly the higher is the temperature of the metal bath; and the less phosphorus is oxidized the more iron is burnt, unless the latter is protected against oxidation by a high percentage of manganese. Therefore, while it is desirable to have as high a temperature during the first period, it is advantageous to keep it low during the afterblow, in order to promote the oxidation of phosphorus and limit the burning of iron.

It is obvious that this cannot be done by starting with a charge cooled at the outstart with an excess of scrap and of lime, because decarbonizing would proceed too slowly. Then a larger proportion of manganese would be consumed, and the result would be that toward the end of the process there would not be enough manganese to protect the iron and the waste would run up.

The Colder Blow During Dephosphorizing.

In order to attain the desired colder blow during the dephosphorizing period a number of steel works use additions of lime or of scrap, or of both, which they charge into the coverter at the beginning of the afterblow. Cooling by means of additions of lime is not advantageous, for these reasons: Aside from the increased cost of larger lime additions, the fact must be considered that the lime is a poor conductor of heat, for which reason the cooling of the bath aimed at by it does not occur quickly enough, unless complete action is awaited by stopping the blow for a while. By the addition of lime the highly calcareous slag has its melting point raised, it becomes less fluid and the absorption of phosphoric acid is delayed. A thick slag, too, entangles larger quantities of iron and thus contributes to increased losses. Nor is the method of cooling by additions of scrap worthy of commendation, quite apart from the high cost. In consequence of the low specific heat of iron energetic cooling calls for a considerable quantity of scrap, and it takes considerable time before it is melted. During this time the bath is filled with half melted pieces of iron, which thicken the bath and increase the resistance against the blast.

Flohr's method skillfully avoids the disadvantageous cooling with lime or with scrap. It consists of charging toward the end of the decarbonizing period, or somewhat later, a mixture of substances containing ferrous oxide, like hammer and roll scale, and of slaked lime, preferably made up into briquettes. A rapid and intense action upon the bath is apparent, and after the briquettes have been added it needs only a relatively short blow to finish the heat. Dr. Goerens goes into some very interesting heat calculations to explain this cooling action.

The briquettes consist of a mixture of roll scale and slaked lime. Sometimes the addition of a certain percentage of manganese ore may be advantageous, since it increases the fluidity of the slag and helps the dephosphorization. The roll scale is screened in order to get rid of the larger particles of iron, and is then ground together in a Chili mill with burnt lime. The lime slakes through the presence of water in the roll scale and the mixture heats up. Then the adequate amount of slaked lime is added. A sample of the mixed material after three days showed 1.06 per cent. of iron shot, 31.40 per cent of iron oxide, 44.70 per cent. of ferrous oxide, 9.89 per cent. of lime, 4.16 per cent. of water and 0.68 per cent. of carbonic acid. Of this material briquettes are made.

The briquettes are best added when the condition of the flame shows a hot heat and when the cinder is liquid enough to allow the briquettes to pass through it. In order to effect the additions the blow is either stopped and the briquettes are charged by hand or the additions may be made during the heat. The quantity depends upon circumstances. At times the blow is unexpectedly hot, which leads to higher cost, through increased waste and larger consumption of lime, and to leaner basic slag. In order to avoid too high a cost of pig iron many basic Bessemer plants must blow a pig iron carrying 0.5 to 1 per cent. of silicon and upward. It is evident that such a silicon contents must be unfavorable, must lead to high consumption of lime and low phosphoric contents of the slag. The blow is exceptionally hot, so that the cooling effects of roll scale briquettes is particularly advantageous.

When Working on Cupola Metal.

In the case of a steel plant working on cupola metal the conditions are generally more favorable, because the

silicon in the pig is somewhat lowered during the remelting in the cupola. In this case two advantages may be expected when the scale briquettes are added during the dephosphorizing period. In consequence of the low silicon the rise in temperature of the bath at the beginning of the process is very small. The affinity of carbon for oxygen is weakened. During this period combustion will extend more to the manganese, so that the manganese contents are small at the beginning of the afterblow. Many steel works seek to avoid the drawbacks of a long decarbonizing period by adding considerable quantities of scrap during the melting in the cupola, in order to crowd down the carbon contents. This method is economically unsound, because there are added to the scrap certain quantities of carbon which must be oxidized later in the converter. The quantity of coke required in remelting, too, is large. In view of the high cost of scrap and the advantages of utilizing it in the open hearth furnace this method should not be commended. During the afterblow there is burnt, besides the phosphorus, a quantity of iron, which increases as the manganese is lowered. A further consequence of low manganese is that the blown metal may carry in solution more oxygen, which calls for increased additions of ferromanganese for its elimination.

The Flohr process leads to the combustion of a certain percentage of the phosphorus without the development of heat. By thus keeping the temperature down the affinity of the balance of the phosphorus for oxygen is increased, and, besides, the finely divided lime in the briquettes aids dephosphorization. During the final blow less iron is oxidized and the blown metal is lower in oxygen, and therefore needs less ferromanganese for deoxidation.

Dr. Goerens summarizes the advantages as follows:

1. The waste is considerably reduced.

2. The consumption of lime is lessened and the capacity of the slag for absorbing phosphoric acid by dissolved ferrous oxide is increased.

3. The contents of phosphoric acid of the slag is increased in proportion to the lessened waste and the lessened contents of lime.

4. The losses by blowing out metal mechanically are lessened in proportion to the shortened blow.

5. The afterblow is shortened and the productive capacity is correspondingly increased.

6. The consumption of steam is lowered in proportion to the shortened heat.

7. In consequence of the shortening of the heat and of the lower temperature in the coverter the bottom and the lining are saved, and they will stand a larger number of heats.

The Lake Superior Mining Institute.

The thirteenth annual meeting of the Lake Superior Mining Institute, which was appointed for 1907 and postponed, will be held on the Mesaba and Vermillion Ranges of Minnesota, beginning Wednesday, June 24, and continuing to Saturday, June 27. Local committees are preparing the programme and an interesting trip is promised. The last meeting on these ranges was in August, 1902. Many changes have taken place in the interval. A number of papers will be presented and the paper of Dr. B. W. Jones on "Mine Sanitation," read at the Houghton meeting in 1906, will probably be further discussed. The secretary, A. J. Yungbluth, Ishpeming, Mich., announces that the following papers have already been prepared for the meeting:

"Sampling of Iron Ores," by Prof. L. S. Austin, Houghton, Mich.

"Biographical Sketches," by J. H. Hearding, Eveleth, Minn.

"The Standard Boiler House of the Oliver Iron Mining Company," by A. M. Gow, Duluth, Minn.

"Automatic Throttle Closing Device for Hoisting Machinery," by Spencer S. Rumsey, Duluth, Minn.

The sampling of ore at mines and at upper and lower lake docks have been receiving much attention from Lake Superior iron mining companies, and will be discussed with interest at the coming meeting. Thomas F. Cole, Duluth, Minn., president of the Oliver Iron Mining Company, is president of the institute.

Our Duluth correspondent states that the opening session will be held at that city June 24, and the institute will meet the next morning at Ely, Vermillion range, followed by an inspection of the Pioneer, Sibley and Savoy mines. The Vermillion will be left that noon and the first Mesaba point will be Biwabik, the mine of that name being looked over during the afternoon. The same afternoon the party will reach Virginia, and the first regular evening session will be held there that night. The following morning mines near by and at Eveleth will be passed through cursorily, and a second evening session will be held at Hibbing. The following day will be passed around Hibbing. It has not yet been decided if a visit will be made to Coleraine. The idea of the management is that Coleraine is not far enough along yet to show what it will be, and that a trip there would necessarily require so much explanation, or so much to be taken on faith and with the prophetic eye, so to speak, that it would not be advisable. The 27th will be spent at Duluth, and that evening the session will close. The probabilities are favorable for a very large attendance.

Bessemer Steel and Puddled Iron in Great Britain in 1907.

The British Iron Trade Association has collected statistics showing that the production of Bessemer steel ingots in the United Kingdom in 1907 was 1,859,259 gross tons, against 1,907,338 tons in 1906, 1,974,210 tons in 1905 and 1,781,533 tons in 1904. The output of 1907 thus showed a decline of 48,079 tons from that of the previous year and 114,951 tons from that of 1905. The figures do not include the production of a number of small converters used in Sheffield, which is considered to be not over 30,000 tons. The district of West Cumberland and Lancashire leads in Bessemer steel production with a total of 527,662 tons in 1907. South Wales is second with 407,737 tons. Sheffield and Leeds together produced 331,697 tons, the Cleveland District 377,809 tons, and Staffordshire and other territory 214,354 tons. The production of acid and basic Bessemer steel in recent years was as follows in gross tons:

	Acid.	Basic.	Total.
1907	1,280,315	578,944	1,859,259
1906	1,307,149	600,189	1,907,338
1905	1,396,233	577,977	1,974,210
1904	1,129,224	652,309	1,781,533

The production of Bessemer steel rails in Great Britain in 1907 was 832,576 tons, as compared with 854,740 tons in 1906, a decline of 22,164 tons. The production of Bessemer bars was 321,138 tons; of blooms and billets, 245,644 tons; of general merchant steel, 72,728 tons. The total of finished and semifinished Bessemer steel products is put at 1,556,548 tons, this including rails and small quantities of channels, squares, rounds, tees, &c., not separated by the manufacturers. It is stated that the 392,711 tons difference between the above total and the output of Bessemer ingots in 1907 is accounted for by crops and other mill loss and by the unascertained output of fishplates, castings, plates, sheets and other products of relatively small tonnage. The total number of Bessemer converters in operation in 1907 averaged slightly under 56, and the average of inactive converters was 11. Of 18 different Bessemer works active in 1907, but one produced over 200,000 tons, while five produced between 100,000 and 200,000 tons.

The Output of Puddled Iron.

The British Iron Trade Association has also compiled statistics of the production of puddled iron in the United Kingdom in 1907, showing a total of 975,083 tons of puddled bars, or 35,263 tons less than in 1906, though an increase of 36,525 tons over 1905. The number of puddling furnaces in operation in 1907 was 1202, as against 1246 in 1906 and 1261 in 1905. The principal products in the finished iron industry in Great Britain are bar iron, which is approximately 45 per cent. of the whole; sheets and plates, which are 12 per cent.; strips and hoops, which are 12 per cent., and rounds and squares, which are about 8 per cent. of the total. The production of finished iron and steel by so-called finished iron works amounted to 1,162,058 tons in 1907. It is stated that the increase over the production of puddled iron is due to the working up at iron rolling mills of considerable quantities of blooms and billets.

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The Iron Age Directory.

There is now being mailed to every subscriber a copy of the twelfth annual edition of THE IRON AGE DIRECTORY, which is a classified index of all the goods manufactured by regular advertisers in *The Iron Age*. Bound in red, and of convenient size for desk use, it is a volume of nearly 350 pages, and is unique in that it is far more searching in its classification than is usual in works of this character. We know that many readers of *The Iron Age* use it constantly in seeking for the names of makers of that very large variety of articles produced by hardware, iron and machinery manufacturers. We feel convinced that one or two tests of its merits will commend it to others.

British and American Steel Production.

The publication of the statistics of open hearth and Bessemer steel production in Great Britain in 1907 makes possible a comparison, both as to tonnage and processes, with the figures for the United States. In the following table the record for the past four years for ingots and castings is given in gross tons:

	United States.		Great Britain.	
	Bessemer.	Open hearth.	Bessemer.	Open hearth.
1907	11,667,549	11,549,088	1,859,259	4,663,489
1906	12,275,830	10,980,413	1,907,338	4,554,936
1905	10,941,375	8,971,376	1,974,210	3,838,072
1904	7,859,140	5,908,166	1,781,533	3,245,346

It will be noticed that the fluctuations in British steel production are very moderate in contrast with what occurs in this country in a three-year interval. Another difference is that while Great Britain produces nearly half as much basic Bessemer as acid Bessemer steel (578,944 tons and 1,280,315 tons, respectively, last year), there is no basic Bessemer steel produced in the United States. A third important difference is that in the United States the open hearth steel production is very largely basic, while in Great Britain the preponderance is with acid steel. For 1907 the figures were as follows:

	Acid open hearth. Gross tons.	Basic open hearth. Gross tons.
United States	1,269,773	10,279,315
Great Britain	3,384,780	1,278,709

It thus appears that the acid open hearth steel production in the United States last year was almost the same as the basic open hearth steel production in Great Britain, while the basic open hearth steel output in this country was three times that of acid open hearth steel in the United Kingdom. The proportion of basic open hearth steel has been growing in Great Britain, however. In 1901 the total was but 351,177 tons; last year it was more than three and a half times that amount. In 1903 the ratio between acid and basic steel in Great Britain was 5 to 1; last year it was less than 3 to 1. The figures show plainly the increasing use of British phosphoric ores and the effort to avoid increasing dependence upon foreign low phosphorus ores.

The Development of Woodworking Machinery.

The woodworking departments of some important shops and factories have not been given the same careful attention and study in the effort to secure highly developed and economical production as have those departments which are devoted to the manufacture of metal parts. In a great many industrial establishments the machining of wood is a more or less important factor in manufacturing. The machine shop, of course, has its pattern room. In general, manufacturing wood may enter into the product itself, or be turned into boxes and cases for goods. Equipment for doing the work is worthy of detailed consideration, that no unnecessary expense may be entailed. Where wood is a chief factor in a product, the manufacturer gives to this class of machinery the same degree of attention that the machine shop manager devotes to his metal working tools. But in works where the wood room is by comparison a minor department, there is a sharp contrast between its machinery, often bearing the imprint of age and a corresponding degree of efficiency and economy, and the essentially modern equipment of the machine shop.

Woodworking machinery has made conspicuous strides in recent years. The advance has not been so great as with machine tools, for the reason largely that the influence of the high speed steels has not been nearly so marked. Yet this factor has entered into the evolution of woodworking tools, and is believed to be destined to become a much more important one as time goes on. It has been demonstrated that such steel has an important place in the working of wood, largely because it can be given a finer edge than the carbon steels, and at the same time maintains its edge much longer. The engineers who have worked out this adaptation of the metal are confident that their theories have been justified by results; that the rate of feed may be increased and that a slower speed of the head is practicable. The cutters are not costly, because they are simply pieces cut from bar stock and may be sharpened by grinding in the head. Moreover, experience has shown that because of the keener edge a better finish is obtained than with the older type of knives—a result the reverse of that secured with the same steels in metal working, where they are useful for rapid reduction only. One machinery builder has featured the cutters in heavy matching machines, and makes the statement that the records of production exceed those of the carbon steels and that the knives endure at least three times as long. In circular saws the steel has been used with excellent results, the body of the saw forming a tool holder for specially designed teeth.

Apart from the influence of the high speed steels, woodworking machinery has been developed in general design in the natural evolution resulting from study by specialized designers. Advantage has been taken of mechanical improvements and new materials adaptable to machinery generally. Features of greater strength or power, or of refinement of design have been introduced. Altogether, woodworking machinery has gone ahead with most satisfactory progress, and is worthy the attention of manufacturers who have use for this class of equipment. Especially is it commended to those who have paid little attention to their woodworking department, putting forth

scarcely any effort to maintain it on the level of efficiency found in other branches of their works.

Case Hardening by Gas.

The same causes under the same conditions produce the same effects, although seemingly contradicted sometimes in iron and steel working. With every endeavor made to reproduce the conditions precisely the results are frequently not those expected. Sooner or later, however, investigation reveals that some factor has been overlooked. Some years ago a certain firm had difficulty in its case-hardening. It seemed to have repeated the cause, but could not repeat the effect. At least the difficulty was found to be grease in the clay used for sealing, which got into it from the machine manipulating it. So many factors enter into the processes through which iron and steel are put, that there is often no certainty that the conditions are really repeated. Whenever a process is introduced which eliminates uncontrollable factors or places them within control, a definite advance has been made.

This seems to be true of the new process for case-hardening by gas described elsewhere in this issue. In the old process there are many factors difficult to control connected with variations in the chemical constitution of the packing and the manner of surrounding the work with it. At one stroke these factors are eliminated; there is no packing to be handled or mishandled. The carbon supply is uniform because it comes from a gas, the pressure of which is everywhere the same, and the circulation constant. Since in addition the temperature may be ascertained and controlled throughout the retort, it would appear that scientific case-hardening is nearly achieved.

The carbonizing gas is now admitted to the work under some pressure, and the article hints at possibilities by case hardening under high pressures. This is a dangerous but fruitful field of research. If mild steel at 1500 degrees F. absorbs carbon from a carbonaceous atmosphere under ordinary pressure, deeper and more rapid carbonization may be expected with increased pressure; deep carbonization hitherto has been difficult to secure, and the old process was very slow. The new process is already faster, but conducted under pressure may accomplish in minutes what now takes hours.

Still more attractive is the suggested possibility of manufacturing high carbon steels from milder forms. The new process is so accurately controlled that it would seem to afford an ideal means of regulating the carbon supply, both as to amount and purity. Certain forms, as sheets and bars, may perhaps be converted into steel in their final form. While absolute homogeneity may prove impossible by this means, still by proper working a commercial product may be obtained, especially in the finer grades. Here also carbonization under high pressures may develop importance.

Definite knowledge as to costs is not at hand. Likely they have not yet been minimized, but if the new process becomes as economical as it appears effective, great changes can be looked for in the manufacture of machines and steel articles generally. Take steel machine shafts alone. Rigidity is one of the main essentials, and a case hardened mild steel shaft, even though the skin be very thin, is considerably stiffened. By increasing the penetration the necessary rigidity should be secured with a much reduced diameter. Both a smaller shaft and a harder surface reduce friction, consequently, smaller, lighter and more efficient machines may be expected. A hardened surface being less subject to wear, case hardening contacting parts here and there will prolong the life of a machine. With the additional possible applications to nails, heads of screws, &c., the new process evidently has a very promising future.

Labor Bureaus and Workmen's Records.

The labor bureaus maintained by the various branches of the National Metal Trades Association are taking advantage of the industrial situation by perfecting and extending their records of workmen. There is, unhappily, little to do as yet in placing men in employment, because the demand for additional labor is comparatively insignificant. But the opportunity for compiling facts that go to show the value of a man to an employer is an unusually fruitful one, and the records will be of much value when the works of members of the association shall begin to fill up again. Records of workmen have always constituted an essential feature of the work of most of the labor bureaus. Trustworthy information regarding applicants for positions is of vital importance to manufacturers in hiring help. In times of full employment, a manufacturer is often misled by the man who falsely states his experience and skill, and works some time until his true status is discovered, an experience which proves quite expensive. The more complete the record of the Labor Bureau, the greater the protection of its members from this type of imposition. At the same time the worthy workman is established at his true value. Whenever possible the wages paid by former employers are included on the card of each man, together with his personal characteristics as to constancy of labor, sobriety, contentment, absence of undesirable affiliations, and the like. A man having a good record will be eagerly sought; even in dull times he may be hopeful of receiving continuous work. The knowledge of his qualifications is of value, both to employers and to himself.

During a period of great industrial activity it is difficult to compile a comprehensive list of workmen. Of course, no labor bureau record will ever be complete, because new men will constantly enter the field, either because they are beginning their careers or because they come from other communities. The bureaus will eventually exchange their lists, which will add to the efficiency of each office, and at the present time there is active cooperation between them in exchanging information regarding applications for employment. With large numbers of men seeking work, many individual records are obtained from them and afterward verified, which can be done in a large percentage of cases. The manufacturers are actively assisting in the work, giving all possible information concerning men who have been on their payrolls. The result should prove one of the benefits which must always commingle with the losses of an inactive market.

CORRESPONDENCE.

Prosperity Preaching and Prosperity Practice.

To the Editor: Over in St. Louis they have organized a National Prosperity League, and a branch has been formed in another large city in the Middle West. This is the way the president of the branch talked for publication:

"Of course there is nothing wrong with this country. We have all the money we ever had and all the natural resources we ever had. We have all the equipment for prosperity except confidence. The only thing needed now

for the country to resume business at the same old stand is to restore confidence. Let the people go out and buy and let them go out and sell; let them resume business the way they were doing 12 months ago. The way to resume business is to resume. Start everything off with a hurrah, and we will forget everything about the panic in a day or two. We must let bygones be bygones. We must run our factories full and we must go out and face the world with a spirit of optimism which is bound to overcome all obstacles."

With a newspaper clipping in his pocket containing this speech one of our representatives the next day called on the head of the Prosperity League branch to sell him some pig iron, and then the gentleman talked in this way:

"Why, you must be crazy to ask me to buy any pig iron at such prices. Pig iron is going to go to pieces; the market is rotten. I think that Southern pig iron will go to $10, and then some. It does not cost you more than $6 to make it. If you have got anything attractive along about $9.50, perhaps I would consider it, but I would not promise to buy even at that price. What! $15.50 at the furnace for Northern iron? Come off. I bought Northern iron once for $12. It will go there again. You cannot hold prices up, you have got to come down. No, I would not give you an order at $12, but I would consider it.

"Now, young man, all you pig iron men are robbers. You have been having your own way too long. The buyer is going to have his way now. You go away and come back in about a month, and when you are ready to chop off $3 or $4 per ton you will be talking sense. I have wasted enough time fooling with you on any such ridiculous basis as the prices you are asking."

All of which goes to show that between preaching and practice there is a wide difference.

PIG IRON SELLER.

CINCINNATI, May 20, 1908.

Steel Prices to Be Maintained.

Much more interest than usual has attached to the meeting of steel manufacturers which occurred in this city last Thursday. The impression had been gaining ground that a disposition to reduce prices had been increasing in the ranks of the manufacturers. In some quarters this belief became so pronounced that predictions were being quite freely made that a general reduction would be agreed upon. It is probable that the cultivation of this expectation of a lower level of prices prevented the placing of a considerable amount of business in the past week or two. It appears, however, that the reports of disagreement among the manufacturers were not well founded. After the meeting, the following announcement was issued by Judge E. H. Gary, chairman of the United States Steel Corporation:

"At the meeting to-day of representatives of the principal manufacturers of steel in this country, the opinion was expressed by each one present that the prices of steel are reasonable and should not be reduced; that reduced prices would not increase purchases; and that most of their customers do not expect or desire any changes. The opinion was unanimous that the meetings should be discontinued for the summer months unless the chairman should deem it advisable to meet at any time for reasons which do not now appear."

On the evening of the same day the representatives of the various steel companies, together with men of prominence in allied lines of business from all parts of the country, participated in a banquet at the Waldorf-Astoria. On this occasion Judge Gary presided, opening the postprandial exercises with an address in which he spoke with great satisfaction of the harmony existing among the various interests represented. He gave considerable attention to the recently organized American Iron and Steel Institute, stating that the list of members was large and steadily increasing and that he had no doubt that substantial benefit would be derived from the development of the plans upon which it had been established. Addresses were made by quite a number of others present, nearly all of whom had something of encouragement to say with regard to the future. The general feeling shown indicated the conviction that trade had seen its worst, and that while improvement might be slow, any change in conditions would be in the direction of better business.

Noteworthy features of this occasion were the strong expressions of esteem and even affection for Judge Gary. Every allusion of this kind was received with great applause. Some of the speakers gave definite instances of the consideration shown to the general interests of the trade by the United States Steel Corporation under his guidance. It was plainly apparent that the selection of this gentleman as chairman of the General Committee of the iron and steel trades was not simply because of the domination of the United States Steel Corporation. While his selection may have been made at the beginning because of the vast interests controlled by his corporation, it is now evident that his personality as a man of broad views, generous impulses and conciliatory disposition has so impressed itself upon the members of the trade that his fitness for the position is universally recognized.

The Iron and Steel Manufacturers' Dinner, May 21.

Following is a list of those present at the dinner of iron and steel manufacturers, at the Waldorf-Astoria, New York, May 21:

MORRIS BACHMAN, president Sharon Steel Hoop Company, Pittsburgh.
EDWARD BAILEY, president Central Iron & Steel Company, Harrisburg, Pa.
GEORGE BARTOL, general manager Otis Steel Company, Cleveland, Ohio.
FRANK J. BILLINGS of Tod, Stambaugh & Co., Cleveland.
C. W. BRAY, president American Sheet & Tin Plate Company, Pittsburgh.
W. L. BROWN, chairman American Shipbuilding Company, Chicago.
E. J. BUFFINGTON, president Illinois Steel Company, Chicago.
JOHN A. BURDEN, president Burden Steel & Iron Company, Troy, N. Y.
J. G. BUTLER, JR., president Bessemer Ore Association, Youngstown, Ohio.
J. A. CAMPBELL, president Youngstown Sheet & Tube Company, Youngstown, Ohio.
H. S. CHAMBERLIN, president Roane Iron Company, Chattanooga, Tenn.
E. A. S. CLARKE, president Lackawanna Steel Company, New York.
D. M. CLEMSON, president Carnegie Natural Gas Company, Pittsburgh.
THOS. F. COLE, president Oliver Iron Mining Company, Duluth, Minn.
E. S. COOK, president Warwick Iron & Steel Company, Pottstown, Pa.
DANIEL COOLIDGE, president Lorain Steel Company, Philadelphia.
GEO. W. COPE, *The Iron Age*, New York.
H. COLBY, president Pittsburgh Steamship Company, Cleveland.
GEORGE G. CRAWFORD, president Tennessee Coal, Iron & Railroad Company, Birmingham, Ala.
T. I. CRANE, of Pilling & Crane, Philadelphia.
H. G. DALTON of Pickands, Mather & Co., Cleveland.
CHARLES DEERING, chairman International Harvester Company, Chicago.
W. B. DICKSON, second vice-president United States Steel Corporation, New York.
A. C. DINKEY, president Carnegie Steel Company, Pittsburgh.
THOMAS A. EDISON, Orange, N. J.
R. H. EDMONDS, *Manufacturers' Record*, Baltimore, Md.
B. F. FACKENTHAL, JR., president Thomas Iron Company, Easton, Pa.
J. A. FARRELL, president U. S. Steel Products Export Company, New York.
E. C. FELTON, president Pennsylvania Steel Company, Philadelphia.
W. J. FILBERT, comptroller United States Steel Corporation, New York.
E. H. GARY, chairman United States Steel Corporation, New York.

JAMES GAYLEY, first vice-president United States Steel Corporation, New York.
T. W. GUTHRIE, president Republic Iron & Steel Company, Pittsburgh.
E. M. HAGAR, president Universal Portland Cement Company, Chicago.
J. A. HAWGOOD, president American Bridge Company of New York, New York.
AUSTIN HECKSCHER, president R. Hoeksoher & Sons Company, Philadelphia.
JOS. H. HOADLEY, president Alabama Consolidated Coal & Iron Company, New York.
JAMES H. HOYT, Cleveland, Ohio.
C. R. HUBBARD, president Wheeling Iron & Steel Company, Wheeling, W. Va.
A. F. HUSTON, president Lukens Iron & Steel Company, Coatesville, Pa.
O. W. HUTCHINSON, president Grand Crossing Tack Company, Grand Crossing, Ill.
ARCHIBALD JOHNSTON, president Bethlehem Steel Company, South Bethlehem, Pa.
J. R. JONES, secretary Alan Wood Iron & Steel Company, Philadelphia.
W. V. KELLEY, president American Steel Foundries, Chicago.
I. A. KELLEY, president Ashland Steel Company, Ashland, Ky.
D. G. KERR, president Pennsylvania & Lake Erie Dock Company, Pittsburgh.
WILLIS L. KING, vice president Jones & Laughlin Steel Company, Pittsburgh.
O. P. LETCHWORTH, Buffalo, N. Y.
JAMES LORD, president American Iron & Steel Mfg. Company, Lebanon, Pa.
C. H. MCCULLOUGH, vice-president Lackawanna Steel Company, Buffalo.
GEORGE G. MCMURTRY, chairman American Sheet & Tin Plate Company, New York.
CHARLES MACVEAGH, general solicitor United States Steel Corporation, New York.
BENJAMIN NICOLL, Wharton Steel Company, New York.
EDWIN N. OHL, president United Iron & Steel Company, Pittsburgh, Pa.
W. P. PALMER, president American Steel & Wire Company, Cleveland, Ohio.
LEONARD PECKITT, president Empire Iron & Steel Company, Catasauqua, Pa.
JOHN A. PENTON, *Iron Trade Review*, Cleveland.
GEORGE W. PERKINS of J. P. Morgan & Co., New York.
H. F. PERKINS of International Harvester Company, Chicago.
VERYL PRESTON, president Eastern Steel Company, New York.
J. H. REED, president Bessemer & Lake Erie Railroad Company, Pittsburgh.
DAVID REEVES, president Phœnix Iron Company, Philadelphia.
JOHN REIS, assistant to president United States Steel Corporation, New York.
F. B. RICHARDS of M. A. Hanna & Co., Cleveland, Ohio.
FERD. W. ROEBLING of John A. Roebling's Sons Company, Trenton, N. J.
WALLACE H. ROWE, president Pittsburgh Steel Company, Pittsburgh.
Z. G. SIMMONS, JR., Simmons Mfg. Company, Kenosha, Wis.
I. M. SCOTT, president La Belle Iron Works, Steubenville, Ohio.
C. M. SCHWAB, chairman Bethlehem Steel Company, New York.
F. C. SMINE, chairman Reading Iron Company, Reading, Pa.
F. B. SMITH, president Crucible Steel Company, Pittsburgh.
H. S. SNYDER, vice-president Bethlehem Steel Company, South Bethlehem, Pa.
W. P. SNYDER, president Shenango Furnace Company, Pittsburgh.
POWELL STACKHOUSE, president Cambria Steel Company, Philadelphia.
MOSES TAYLOR, vice-president Lackawanna Steel Company, New York.
ALEX. THOMPSON, president Inland Steel Company, Chicago.
JOHN A. TOPPING, chairman Republic Iron & Steel Company, New York.
W. R. WALKER, assistant to president United States Steel Corporation, New York.
F. S. WITHERBEE, Witherbee, Sherman & Co., Port Henry, N. Y.
F. W. WOOD, president Maryland Steel Company, Sparrows Point, Md.
EDWARD WORCESTER, vice-president National Tube Company, Pittsburgh.
W. P. WORTH, Worth Bros. Company, Coatesville, Pa.
CHARLES H. ZEHNDER, New York.
AUGUST ZIESING, president American Bridge Company, Chicago.

The American Railway Association's statistics show that on May 13 there were 404,534 idle freight cars on the country's railroads, or 9071 less than the high-point figures reported at the close of April. The Eastern, Northwestern and Canadian groups of railroads show the largest percentage of improvement.

Attention is called in a recent circular of C. W. Leavitt & Co., 220 Broadway, New York, to the results secured from aluminum-magnesium alloy castings, containing 8 to 10 per cent. pure magnesium. Comparisons are made, as to lightness, strength and ease of machining, with castings made from aluminum and copper.

PERSONAL.

Van Leer Wills has been appointed general manager of the blast furnaces of the Northwestern Iron Company, Mayville, Wis.

A. H. Breese, for a number of years in charge of the heating and plumbing departments of the Chicago House Wrecking Company, is now engaged with the Central Machinery & Supply Company, 547-559 State street, Chicago, of which company he is a member.

L. V. Calhoun, 930 First National Bank Building, Chicago, has succeeded William B. Walter & Co., formerly in the Marquette Building, as district agent for the Detroit Steel Casting Company, Detroit, Mich.; American Casting Company, Birmingham, Ala.; St. Louis Malleable Casting Company, St. Louis, Mo.; Love Bros., Inc., Aurora, Ill.

The Link-Belt Company recently made several changes in its official staff. James M. Dodge is now chairman, S. Howard Smith treasurer, and C. A. Fry vice-president, all at Nicetown, Philadelphia; Charles Piez president and S. B. Peck vice-president and secretary, Chicago, and Glenn G. Howe vice-president, Indianapolis, Ind.

Professor Herman Schneider, dean of the Department of Engineering, University of Cincinnati, who has recently returned from visits to various large manufacturing centres in the New England States, where he explained the Cincinnati plan of co-operative education in the shops and the University, has instituted a system of correspondence with educational factors and public-spirited citizens in the large manufacturing cities in southern and central Ohio. It is intended to interest the machinery manufacturers of these cities in the plan and secure their co-operation with those of Cincinnati, where the plan is most successful.

Labor Notes.

The *Review* of the National Founders' Association says that several stove foundries at Philadelphia, Chicago, Albany, N. Y., and Quincy, Ill., are studying how to increase the number of molding machines they are now using. It adds that "the theory that stove plate cannot be made on the molding machine has been exploded." In some of the union stove foundries where the operators of molding machines have been classed as apprentices the manufacturers now contend that the practice is unfair, since the number of new journeymen is so limited as not to take care of the increasing demands of the business.

After a ten months' struggle to enforce their demands for a nine-hour day and increase of a cent an hour in wages, members of the Machinists' Union, at Fitchburg, Mass., on May 24, voted to declare the strike off.

Thirty-five thousand coal miners of Missouri, Kansas, Oklahoma and Arkansas, members of the United Mine Workers of America, who have been on strike since March 1 last, have returned to work, an agreement between miners and operators having been signed. Prices and conditions are to remain the same as they were last year.

A Contract for Lackawanna Sheet Piling. The Lackawanna Steel Company, Buffalo, has received an order from the McArthur Bros. Company, contractor, for 7000 tons of sheet steel piling to be used in the construction of the cofferdam for the 800 ft. lock the contracting company is to build for the Government at the Black Rock harbor end of the United States ship canal at Buffalo. The sheet piling will be made under patents controlled by the Lackawanna Company. Some weeks ago preliminary orders for 100 tons each of several types of sheet piling were placed by McArthur Bros. Company and tests of these have been in progress recently. The contract with the Government for the cofferdam and lock amounts to $825,000.

The National Machine Tool Builders' Association.

Proceedings of the Closing Session of the Spring Convention Held at Atlantic City, May 19 and 20.

The semiannual convention of the National Machine Tool Builders' Association, the opening proceedings of which were reported in *The Iron Age* of May 21, came to a close on the following afternoon after one of the most successful sessions ever held by the organization. The proceedings of the second day of the convention, which were in part outlined in our telegraphic report, were of particular interest, and many problems which come before machine tool manufacturers came up for discussion.

One of the developments of the session was that it was found necessary to increase the special committees, and preliminary steps were taken by the appointment of a committee to revise Article 3, section 1, of the constitution referring to the eligibility of members. The chairman of the various committees now in existence were asked to prepare lists of all members of machine tools along their particular lines. This action will probably result at the next convention of the naming of a Committee on Grinders and perhaps a number of other groups of machine tool manufacture.

Committee Reports.

A report made by Israel H. Johnson, Jr., Philadelphia, as chairman of the committee "to meet the National Supply and Machinery Dealers' Association Committee when necessary," was of particular interest. Mr. Johnson stated that certain members of the association were not entirely satisfied with the draft of a uniform selling agreement with agents as drawn up by the committee. It has been pointed out, he said, that the members had not been satisfied with the stipulation as regards the course to be followed in reference to prices on stocks ordered or in dealers' hands after the manufacturer announces a change in prices. The committee was not unanimous in its recommendation, and accordingly the entire matter was referred to the Executive Committee, and copies of the plans proposed are to be mailed to the members for definite action at the New York meeting. The Committee on Foundry Matters, through C. H. Norton, Worcester, Mass., as chairman, presented a minority report, as was mentioned last week, and a majority report bearing the signature of P. E. Montanus, Springfield, Ohio, and P. G. March, Cincinnati, was submitted to the convention. These reports, giving opposing views on the question of the responsibility of the foundryman for unsatisfactory work, were of much interest. Mr. Norton said, in part:

The Minority Report.

After due consideration a list of questions was sent to our members, intended to bring out the facts in regard to our experience with foundries, to determine, if possible, whether we had cause for complaint. Replies were received from 60 members. Eleven of these members report having their own foundry, and these also report that they have experienced none of the troubles indicated by the list of questions sent out. It is very gratifying to know that people owning their own foundry are free from trouble.

From the questions and answers it would seem evident that the machine tool builder buying castings is handicapped by the necessity of carrying on his shoulders a part of the business of the foundries; that the business methods of the foundries warrant an official protest from us as an organization, and that we, as an organization, take some steps to break up the traditional methods of doing business with foundries, and insist that the iron foundries, like all others with whom we do business, shall take their legal and just burden upon themselves and transact their business with us precisely as we have to do with our customers; that they be responsible for their product, and that they know before their product leaves their works, the same as we have to know before our product leaves our works, whether it is suitable for the use of their customers or not.

A directly opposite view was taken by the majority of the committee, which in its report stated that Mr. Norton's recommendation as a committee report was "considerably 'jug-handled' in character," and was "altogether from the standpoint of the buyer of castings." Continuing the report stated:

The Defense of the Foundryman.

It goes without saying that any one who has had any business at all with the foundries, or has been connected with them directly, knows that many elements, many conditions, many complications arise in daily practice that are difficult to analyze and subject to results over which the foundryman has no immediate control. It is a well-known business fact that the average foundry has not been the financial success that perhaps other businesses are. Largely owing to the fact of the low prices prevailing, the usual buyer of castings seeks absolutely the lowest market, and then expects the best results and the best goods. Such is not the case where fair prices are given for the goods, and when fair prices are given the buyer usually can demand the high excellence that our worthy chairman expects.

We really also believe that the answers to the questions did not show careful attention on the part of the replies, in so far as that on question 3 some of the answers gave a variation of weights in castings as high as 10 to 15 per cent., and one even giving 30 per cent. variation in weight of a large casting. As to questions 4 and 5, we think it no more than fair and proper that the buyer should visit the foundry, furnish blue prints for castings, and even follow them up day by day in case there should be the slightest possibility of a doubt on the part of the foundryman to understand them.

Do not forget that you should not expect the foundryman to know all the details at sight of the castings that you may want, and on which you have yourselves given many hours of thought, beginning from the designing down to the finished pattern.

AS TO INSPECTING CASTINGS.

We are firm in the belief that the average foundryman inspects all the castings before delivering if they show evidence of being imperfect, but it is no more than fair and natural to suppose that in case of a doubtful casting the buyer should be requested to use it if possible, and when it cannot be used at all, no foundryman should object to taking it back, without prejudice.

As to question 10, regarding uniform quality of iron, trade conditions and the source of supplies make it almost impossible for the foundryman to guarantee or even expect uniform quality. Questions 12, 13 and 14 apply largely to the mechanical end of the foundry, and when glaring inaccuracies take place, like misplaced cores, name plates upside down or entirely omitted, the foundryman needs no defense and should not expect it.

We believe that no foundryman can afford to pay for labor on castings that at first examination appear good but on machining develop defects, unless the initial contract price is sufficient to prohibit the foundryman to object to allow such charges to be entered against him.

How many buyers of castings in our association do not send formal orders with their patterns? How many patterns are frequently sent without numbering, and is it not possible that there is a lax system in vogue, in the ordering of castings, that makes it a burdensome problem for the foundryman to keep track of said patterns? Is it not possible, also, that the designer and maker of patterns frequently place a dowel pin (metal or otherwise) in such a place that it is absolutely nonmechanical from the foundryman's point of view?

Questions 27, 28 and 29 are simply ones of detail in foundry practice, and would require considerable space to properly analyze and explain.

REGARDING PROMPT PAYMENT.

The foundryman pays spot cash for his material and labor. Do we always pay our foundry bills promptly, absolutely according to contract?

This report is merely to draw your attention to the golden rule of "give and take"; believing that the average foundryman is ready at all times not to quibble and quarrel with his customers, but to do the fair thing. Have we not all found him accommodating many times? Have we not frequently sent patterns late in the afternoon with the request to have them put in immediately for to-morrow's use? Have we not canceled orders for many of the pieces, after they were made? Have we not asked for castings which, on examination and research, we found had never been formally ordered? Have we not been requested many times to alter patterns that would facilitate better results or quicker operations and not granted them? In other words, and finally, are there not two sides to the question?

We do not wish to drive the job foundry out of business, but if all the conditions as indicated by the 33 questions were fully complied with, from the buyers' standpoint, we honestly believe the foundryman would have to go out of business or raise his prices.

Hoping that this frank and free statement will be of help to all concerned, we submit it.

(Signed) P. E. MONTANUS.
P. G. MARCH.

Collecting Costs of Investigating; Unfair Claims.

Murray Shipley, Cincinnati, as chairman of the committee on claims of buyers against manufacturers, recommended that the association adopt as its rule the recommendation of the committee to give prompt attention to any claims made by the buyer and if necessary send a representative to investigate the claims with the understanding that if substantiated the manufacturer would bear the expense involved, and if not the buyer should recompense the manufacturer for his expenditures.

At this juncture it was asked how the manufacturer was going to persuade his buyer that his claim was without foundation, and even in that event how the committee expected to collect, and William Lodge, Cincinnati, in reply, advised that a definite understanding as to the cost of investigation be made before the manufacturer enters into any expense. This recommendation, with the committee's report, was adopted.

Cancellations of Orders.

The question of indiscriminate cancellation of orders, which has been experienced by many machine tool builders of late, came before the convention, and it was declared that there was a necessity for arranging a remedy for the method of selling machine tools on credit. Buyers, it was stated, frequently acquired title to machines before paying for them in full, and it was recommended that the manufacturer make it a rule to reserve title until fully recompensed for his machine. In this connection C. A. Johnson, as chairman of the committee appointed at the previous meeting of the association to devise a uniform contract with the consumer, submitted a report, in which he stated that his committee had corresponded with all of the members of the organization and with other manufacturers to obtain their views on the question. The report submitted was in part as follows:

MR. JOHNSON'S REPORT.

At the last fall meeting of the association, J. B. Doan, George W. Fifield and the speaker were appointed a committee to inquire into the advisability of the members of this association adopting a uniform sales contract form. It was believed by some of the members that an agreement among the manufacturers who deal directly and the machinery dealers, to use a specific sales contract form, would better protect both the manufacturer and the dealer from losses, which, through various causes, are periodically sustained in machinery transactions with the consumers. Practically all the members of the association responded, and, almost without exception, their expressions were favorable to the adoption, if possible, of some uniform contract form. There were some who misunderstood the intent of the letter, in that they considered it as relating to contracts between manufacturers and dealers. Such is not the case. The committee had simply to investigate the question of a sales contract form to be used by the manufacturers who sell directly and machinery dealers in their transactions with the consumer.

Doubtless no one present will question the desirability of so drafting our sales contract forms that we will be protected against losses of accounts and will also be protected from promiscuous cancellations of orders. This granted, it is just a question as to whether or not contracts embodying such provisions as above outlined can be generally used.

RESULTS OF THE CORRESPONDENCE.

In our correspondence several points have been raised in connection with the above mentioned provisions, and we will first discuss the question of retention of title in the seller until the goods are paid for. The writer firmly believes that this would cause practically no trouble; certainly it would cause no trouble if all sales contracts for machinery were made embodying such a provision. In many lines of business it is practically impossible to make purchases without signing contracts in which title is reserved to the seller. It has been the experience of the company with which the writer is connected that only in one case out of many hundred has the question been raised, and then only by a company whose credit was questionable.

Practically all those who purchase machinery do so expecting to make full payment for it, and it would seem that a purchaser would be subjected to no considerable hardship if, through any cause, he failed to make payment the machinery in question was taken possession of by the party from whom it was purchased. He would have had the use of the machine, and even though a large part of the account had been paid the seller would only be entitled to compensation for the use of the machine and the depreciation thereon.

The whole matter really resolves itself into this proposition: Are machinery manufacturers and dealers more anxious concerning the interests of purchasers than they are for their own interests? No concern could afford to be unreasonable as regards its action in case of sales made on the terms proposed, on account of injury to its reputation. As before stated, those concerns which expect to settle their accounts in full will not object to the above provision, and certainly the manufacturer and the dealer should be protected against those whose financial standing is uncertain.

It appears that the advisability of embodying the provisions could not be questioned provided it can be introduced without too much trouble, and this is a question that will require both time and some expense to investigate. The laws of the different States vary considerably as regards conditional sales. In some States the embodiment of such a clause as above outlined in a contract signed by the purchaser is all that is necessary to keep the title in the seller until the machine is paid for; in other States it is necessary to have witnesses; in others the contracts must be recorded, and so on. Therefore, it may be necessary to use different forms for different States, but if all manufacturers and dealers agree to use specific forms, prospective buyers will have to conform to the requirements or else remain without the desired machinery.

NOT A RADICAL STEP.

It should be said here that this is not a radical step as regards business generally, because, as before stated, in many lines of business this provision is being used generally. If it were found to be impossible to make a form of contract satisfactory for all States, it could be made for those States where such provisions would be legal—ceratinly half a loaf is better than none. But it appears that a way has been discovered whereby those selling machines embodying patented features can, if necessary, regain possession of them by taking proceedings in the United States Court even though the party to whom the goods were originally sold had in turn sold them to another party. A statement to this effect appeared recently in one of the trade journals, although the report may not be authentic.

Concerning a provision against cancellations, this also has been questioned for various reasons. In the past it has been the almost universal custom for the purchaser to cancel orders at will, and the manufacturers or dealers have accepted cancellations as gracefully as possible. It would certainly appear that the manufacturer should have something to say as regards the cancellation of an order when he may have expended up to the time of receiving the cancellation from 5 to 10 per cent. or possibly more of the purchase price.

The purchaser is subjected to no expense in most cases, until he receives the machinery at his plant. On the contrary, the seller is at some expense before he receives the order, and the expense continues until he makes delivery of the machine. No one can question the right of the purchaser to cancel an order if delivery is not made at the promised time, but cancellations on account of temporary business depressions are quite different. Unless profits of machinery manufacturers are greater than generally believed the burden imposed by the necessity of carrying one or more machines would not be much heavier on the purchaser than on the manufacturer, and if the manufacturer is willing to take chances of getting payment he should have something to say as to whether or not shipment should be made. Especially should manufacturers be protected against cancellations from those who take such steps in the belief that they ought to be able to get reduced prices by the time the goods are actually wanted.

ABOUT SPECULATIVE ORDERS.

It is safe to say that there are very few manufacturers of machine tools who would to-day have so large an investment in stock machines had it not been for the fact that many orders were placed by consumers on a speculative basis, knowing that cancellations could be made if desired. The manufacturer, however, considered it necessary for him to make preparations to furnish machines as specified, with the result, as above stated, that many have more stock machines than they would like to carry.

It is not the opinion of the members of the committee that cancellations can be absolutely prevented, but united action on the part of the manufacturers and dealers will undoubtedly improve existing conditions. Neither the manufacturer nor the dealer could afford to be unreasonable, but it certainly seems that the man who has his money invested should at least be consulted.

Not only do we believe that the general use of a sales contract form, embodying the above provisions and other usual and reasonable requirements, would benefit machinery manufacturers and dealers, but it would also have a beneficial effect on business generally.

The Custom in the Automobile Trade.

E. P. Bullard, Bridgeport, Conn., called the attention of the association to the practice of many automobile manufacturers who require a 20 per cent. discount with orders in order to avoid the possibility of cancellations. No definite action was taken on that recommendation, and

the report of the committee was accepted and the committee was directed to act jointly with a committee from the Dealers' Association to devise and, if possible, adopt a uniform contract with the consumer containing a noncancellation clause and stipulating that the manufacturer retain title until fully paid for his product. The committee was given power to obtain legal advice on the matter. One member recommended that a campaign of education be begun, and the manufacturers print a noncancellation clause on their stationery.

About Freight Charges.

The Committee on Freight Charges, which had been appointed at a previous meeting of the association, reported through R. K. Le Blond, Cincinnati, as chairman, that it had been unable to accomplish any definite results in securing a remedy for excess carload shipment charges exacted by the railroads. Efforts had been made, he stated, with various railroad associations, with official classification committees and with the Interstate Commerce Committee, with a view to securing some concessions from the railroad companies on this point.

Secretary Montanus gave it as his opinion that it would be well for the organization to commence a general agitation in the matter, and the committee was instructed to continue its work.

Industrial Education.

An interesting address was made by J. H. Cone, assistant secretary of the National Metal Trades Association, who was in charge of the educational work of that organization, outlining the co-operative training course as practiced at the University of Cincinnati and in the shops of that city. The question of educating apprentices took up a great deal of time at the last convention of the National Trades Association held in New York and reported in the issues of *The Iron Age* of March 26 and April 2.

Mr. Cone stated there was an imperative need of developing public sentiment toward a logical solution of the labor problem, and he spoke of the experience of associations and the cost of strikes to the industrial world. He reviewed the success of his association and similar organizations in preventing the passage of unfair legislation and pleaded for co-operation in the line of educational work. The speaker referred to the number of institutes that were meeting with success in industrial educational work by combining the school work with the practical experience in the shop as originated by Prof. Herman Schneider, Dean of the College of Engineering of the University of Cincinnati.

To Arbitrate Disagreements.

Previous to the conclusion of the business session the Committee on Resolutions offered suggestions for the arbitration of minor differences in the organization arising from patent disputes and the like in the shape of a recommendation to the effect that such disputes be referred to an arbitration committee composed of one member chosen by each of the interested parties, and the third selected by those already chosen. The recommendation was adopted.

The members were particularly impressed with the manner in which President Fred L. Eberhardt conducted the meetings, the sessions being noticeable for the fact that a large amount of business was transacted in a short space of time, and as a result, just before the adjournment, a rising vote of thanks was offered to the president.

While reference was made to Heyl & Patterson, Pittsburgh, Pa., in connection with a portion of the equipment of the gas producer plant of the Ensley steel works of the Tennessee Coal, Iron & Railroad Company, described in *The Iron Age* of May 21, 1908, the extent of this firm's installation was not indicated in the way intended. Heyl & Patterson furnished the entire coal and ash handling and storing apparatus and the coal distributing system serving the gas producers.

For the second time within 24 hours, the House of Representatives, May 23, following a discussion of two hours, rejected the mail subsidy provision for ocean steamships. This disposes of the matter for the present session.

The Customs Administrative Act Amended.

WASHINGTON, D. C., May 26, 1908.—Congress the past week has amended the customs administrative act in certain important particulars by the enactment of a law which passed the two houses in diverse forms but was finally harmonized in Conference Committee. It provides important changes in Sections 14 and 15 of the act which prescribe the method of procedure before the Board of General Appraisers and the courts upon appeals from rulings of the Board.

Changes in Section Fourteen.

Section 14 of the administrative act as modified by the amendatory bill reads as follows, the words stricken out of the existing law being inclosed in brackets and the new matter printed in italics:

Sec. 14. That the decision of the collector as to the rate and amount of duties chargeable upon imported merchandise, including all dutiable costs and charges, and as to all fees and exactions of whatever character (except duties on tonnage), shall be final and conclusive against all persons interested therein, unless the owner, importer, consignee or agent of such merchandise, or the person paying such fees, charges and exactions other than duties shall, within [ten] *fifteen* days after, but not before such ascertainment and liquidation of duties, as well in cases of merchandise entered in bond as for consumption, or within [ten] *fifteen* days after the payment of such fees, charges and exactions, if dissatisfied with such decision, give notice in writing to the collector, setting forth therein distinctly and specifically, and in respect to each entry or payment, the reasons for his objections thereto, and if the merchandise is entered for consumption shall pay the full amount of the duties and charges ascertained to be due thereon. Upon such notice and payment the collector shall transmit the invoice and all the papers and exhibits connected therewith to the board of three general appraisers, which shall be on duty at the port of New York, or to a board of three general appraisers, who may be designated by the Secretary of the Treasury for such duty at that port or at any other port, which board shall examine and decide the case thus submitted, and their decision, or that of a majority of them, shall be final and conclusive upon all persons interested therein, and the record shall be transmitted to the proper collector or person acting as such, who shall liquidate the entry accordingly, except in cases where an application shall be filed in the Circuit court within the time and in the manner provided for in Section 15 of this act: *Provided, however, That the board of three general appraisers, or a majority of them, who decided the case may, upon motion of either party, within 30 days next after their decision, and not afterward, grant a rehearing of said case when, in their opinion, the ends of justice may require it.*

The general Board of nine General Appraisers shall have power to establish from time to time such reasonable rules of practice, not inconsistent with the law, as may be deemed necessary, for the conduct of their proceedings and of the proceedings of the said board of three general appraisers, and to assign or reassign any case to any of such boards of three at any time before promulgation of decision, in order to secure uniformity of decision.

Experience has demonstrated that the ten days' period does not afford a sufficient time for importers to consult their attorneys and brokers in reference to pending issues and increases the number of frivolous protests. The proviso at the end of the section clothes the Board with power to grant a rehearing to correct such errors as the Board may have committed, without requiring the importers or the Government to go through the process of appealing to the courts. Under the present procedure it also sometimes happens that substantially identical issues are diversely decided by two sub-boards and as the general board cannot reassign such cases much confusion results.

Section Fifteen Modified.

The amendatory act changes the form of Section 15 of the customs administrative law so comprehensively as to make a textual comparison difficult. The amended section follows the existing law as to the first paragraph and presents new matter thereafter. The amended text will read as follows:

Sec. 15. That if the owner, importer, consignee or agent of any imported merchandise, or the collector, or the Secretary of the Treasury, shall be dissatisfied with the decision of the board of general appraisers as provided for in Section 14 of this act, as to the construction of the law and the facts respecting the classification of such merchandise and the rate of duty imposed thereon under such classification, they, or either of them, may, within 30 days next after such decision, if a rehearing has not been previously granted, or within 30 days next after the deci-

sion of the board of general appraisers after such rehearing, and not afterward, apply to the Circuit Court of the United States within the district in which the matter arises for a review of the questions of law and fact involved in such decision. Such application shall be made by filing in the office of the clerk of said Circuit Court a concise statement of the errors of law and fact complained of and a copy of such statement shall be served on the collector, or on the importer, owner, consignee or agents, as the case may be. Thereupon the court shall order the board of general appraisers to return to said Circuit Court the record and the evidence taken by them, together with the certified statement of the facts involved in the case, and their decision thereon; and all competent evidence taken by and before said board of general appraisers shall be evidence before said Circuit Court.

The parties thereto shall hereafter be required to introduce all of their evidence before the said board of general appraisers prior to its decision of the case. The return made by the board of general appraisers in pursuance of the order of the Circuit Court shall constitute the record upon which said Circuit Court shall give priority in fact proceed to hear and determine the questions of law and fact involved in such decision respecting the classification of said merchandise and the rate of duty imposed thereon, under such classification: Provided, That the said Circuit Court is further vested with the power to remand any case pending before it on appeal from a decision of the board of general appraisers which, in its opinion, such proceeding is just and proper, but this shall not be ordered except upon motion duly made and after notice to the opposite party. When such order is made the case shall then be remanded to the board of general appraisers whose decision has been appealed from, and the said board shall hear such further testimony as shall be introduced by either party, and shall return to the Circuit Court the additional evidence so taken, together with a further certified statement of facts as supplemented or modified by such additional testimony, and their decisions upon the whole case as thus supplemented or modified, which said additional return shall be added to and become part of the record upon which the case shall be heard and determined by the Circuit Court.

The decision of said Circuit Court shall be final, and the proper collector, or person acting as such, shall liquidate the entry accordingly, unless said court shall be of the opinion that the question involved is of such importance as to require a review of such decision in the Circuit Court of Appeals of the United States within the circuit in which the matter arises, in which case said circuit or the judge making the decision may, within 30 days thereafter, allow an appeal to said Circuit Court of Appeals; but an appeal shall be allowed on the part of the United States whenever the Attorney-General shall apply for it within 30 days after the rendition of such decision. On such original application and in any such appeal security for damages and costs shall be given as in the case of other appeals in cases in which the United States is a party. Said Circuit Court of Appeals shall have jurisdiction and power to review such decision, and shall give judgment to such cases, and may affirm, modify or reverse such decision of such Circuit Court and remand the case with such orders as may seem to it proper in the premises, which shall be executed accordingly.

The decision of such Circuit Court of Appeals may be reviewed by the Supreme Court of the United States in any of the ways provided in cases arising under the revenue laws by the act approved March 3, 1891, entitled "An act to establish circuit courts of appeals and to define and regulate in certain cases the jurisdiction of the courts of the United States, and for other purposes."

All final judgments, when in favor of the importer, shall be satisfied and paid by the Secretary of the Treasury from the permanent indemnity appropriation provided for in Section 24 of this act.

For the purposes of this section the circuit courts of the United States shall be deemed always open, and said circuit courts, respectively, may establish, and from time to time alter, rules and regulations not inconsistent herewith for the procedure in such cases as they shall deem proper.

Where cases arise at ports within any jurisdiction having no Circuit Court, such appeals for review of the decisions of the board of general appraisers provided for in Section 15 of this act shall be taken with the courts of the courts having cognizance of the subject-matter of cases as circuit courts, and such cases shall be heard and determined by such courts, with the same powers and in the manner as herein provided for the hearing and determination of such cases in circuit courts, and such decisions shall be subject to review in the manner provided by law.

Significance of Changes.

The modifications embraced in the above section are of much importance. The first significant change requires litigants to introduce all of their evidence before the Board of General Appraisers prior to its decision of the case. Heretofore importers frequently presented only sufficient evidence before the Board to develop the Government's case and then proceeded to make an entirely new showing before the circuit court. It is further provided that the circuit court may remand any case pending before it on appeal from the decision of the Board of General Appraisers, whereupon the Board shall hear such further testimony as shall be introduced by either party and subsequently return to the circuit court the additional evidence so taken together with a decision upon the whole case thus supplemented. This change, in connection with the power granted to the Board to give rehearings, is counted upon to relieve the circuit court of much unnecessary labor and to expedite appeals as well as to reduce the volume of protests. The final paragraph of Section 15 as modified by the amendatory act is intended to cover cases arising in Porto Rico or Hawaii where there are no United States circuit courts.

The amendatory act also adds a new section to the customs administrative law as follows:

Section [illegible] of the general appraisers of merchandise heretofore or hereafter appointed under the authority of said act shall hold their office during good behavior, but may after due hearing be removed by the President for the following causes, and no other: Neglect of duty, malfeasance in office or inefficiency.

That hereafter the salary of each of the general appraisers of merchandise shall be at the rate of $9000 per annum.

That the said boards of general appraisers and the members thereof shall have and possess all the powers of a circuit court of the United States in preserving order, compelling the attendance of witnesses and the production of evidence, and in punishing for contempt.

Other important changes had been greatly desired by the Treasury Department, the Department of State and by influential importing interests, but Congress decided not to consider them until the comprehensive revision of the Dingley tariff act now in prospect has been actually undertaken.

W. L. C.

The Indiana Express Case.

A decree has been entered in the Federal Court at Indianapolis, Ind., enjoining until final hearing of the case, or until further orders, the members of the Indiana Railroad Commission from attempting to enforce the reduced rates provided in their finding against six express companies. The commission cut the rates 10 to 12 per cent., after an exhaustive investigation lasting several months, of the conditions existing in the State as to the business and rates of express companies. The testimony before the commission is contained in more than 1300 typewritten pages, and the commission's finding takes 52 typewritten pages. Its inquiry and its decision have attracted attention in other States that have sent representatives to Indianapolis to get information concerning the express companies.

The commission had found that express company profits are unduly large, that the companies have little or no tangible property, that profits properly chargeable as railroad earnings are diverted to express companies, that there is practically no competition except that of the Government, and that rates have been practically unchanged for years. To show how the express companies have been able to pay immense dividends and set aside unusually large surplus funds, the commission gives information and reports that indicate that these companies are controlled by railroads and can monopolize the business on certain kinds of traffic not desired by the railroads and raise the prices to suit themselves; that the companies agree on rates and do not have the many great expenses borne by railroad companies. The inquiry demonstrated that the profits of express business in Indiana are 16 to 75 per cent., the commission says.

The six express companies—the Pacific, Wells-Fargo, Adams, American, National and United States—in seeking the injunction contend that the proposed reduction in rates, as set forth in the finding, would prove confiscatory and tend to take the property of the complainants without due process of law, in violation of the Constitution of the United States.

The Pennsylvania Railroad has just completed and put in operation a new double track low grade line from Pittsburg to Tuscan, N. J., and promises to extend it to the seashore soon. There is only a 24-mile climb up the west side of the Allegheny Mountains. On reaching Gallitzin at the crest the new line shoots off to Petersburg on the main line and parallels the latter to Harrisburg, Pa., running thence by a new and shorter route to Trenton.

OBITUARY.

W. D. EWART.

William Dana Ewart died at Rome, Italy, May 3, aged 56 years. His death will be noted with more than ordinary regret by those whom his genial disposition had made his friends, and by the many others to whom his most prominent invention has made his name familiar. He was born in Ohio, and at a comparatively early age gave evidence of an inventive mind and rare mechanical ability.

Mr. Ewart was the inventor of the malleable iron detachable drive chain, first known under his name, and in later years as link-belt, which has formed an important part of agricultural and other duplicate machinery, and has, to possibly a greater extent than any other single invention, helped the wonderful progress in the development of elevating and conveying machinery during the past 30 years. This drive chain has been continuously manufactured by the Ewart Mfg. Company and exploited by the Link-Belt Machinery and Link-Belt Engineering



W. D. EWART.

companies till in 1906 all three companies were consolidated into the Link-Belt Company, a corporation in which he was largely interested and whose fortunes are still principally directed by his former associates. Mr. Ewart, whose abilities brought their proper reward, was not only an inventor but a man of executive capacity, possessing a rare gift for harmonizing differences and securing co-operation. His health becoming impaired, he retired in his early prime from the activities of business and sought renewal of physical strength under more favorable climatic conditions abroad.

HENRY GAY, Winsted, Conn., for many years actively interested in the industrial life of that town, died May 17, aged 74 years. He was a member of the banking firm of Holmes & Gay, a director of the William L. Gilbert Clock Company and Morgan Silver Plate Company, and was formerly president of the Winsted Edge Tool Works and a director of the T. C. Richards Hardware Company. He was a native of Salisbury, Conn.

WALTER HATFIELD, vice-president and treasurer of Hughes & Patterson, Inc., owners of the long idle Philadelphia Iron & Tin Plate Works, died suddenly at the Hotel Stenton, Philadelphia, May 18, aged about 50 years. He was unmarried.

B. H. THWAITE, a London, Eng., engineer, who had paid several visits to the United States, died in London recently, aged 53 years. He contributed the first article on the use of blast furnace gas in gas engines, and had devoted considerable attention to the continuous process of open-hearth steel production, to blast furnace practice, especially pyrometry, and to the use of the electric current in melting steel. He contributed several papers to the proceedings of the Iron and Steel Institute, the last, which was presented at the Vienna meeting in 1907, dealing with the electric distribution of power from blast furnaces.

WM. H. MARSH, founder and president of the Standard Water Meter Company, Brooklyn, N. Y., died May 20, of hydrophobia, aged 58 years. He was born in Ontario, Canada, and had been a resident of this country 25 years. He leaves a widow, three sons and two daughters. His eldest son has succeeded him as president of the company.

GEORGE GARRETT, a partner in the Waverley Iron & Steel Company, Coatbridge, Eng., died May 11, aged 62 years. He was a brother of the late William Garrett,, of Cleveland, Ohio.

Lessons from a Fire in a Reinforced Concrete Factory Building.

The fire at the Dayton Motor Car Company's plant, Dayton, Ohio, some weeks ago, gave an opportunity to test the efficiency of reinforced concrete as a fireproof building material. The main portion of the factory consists of a mill-construction building of five stories and basement, adjoined by a reinforced concrete building, U-shaped in plan and six stories and basement in hight. The two buildings were practically made a continuous unit, as the walls of the brick building served as the boundary of the concrete building on the open side of the U, communication being afforded between the two buildings by doors on each floor. When the fire department arrived, the fire had extended over the entire fourth floor of the concrete building. The contents of this floor were destroyed, but the building escaped with slight damage. Through the absence of fire doors and the inability of the department to withstand the intense heat and smoke, the fire was communicated through an opening to the adjoining five-story brick building and was confined to the two upper floors. It was in this building that the greatest loss was sustained.

The report of the chief of the Dayton Fire Department brings out some suggestions as to proper reinforced concrete construction, from which the following is taken:

"The new building, being of concrete construction, aided us greatly in preventing the fire from wiping out the entire plant, as we were able to concentrate practically our entire force on the old building, it requiring but a small force to subdue the fire in the concrete building. In my opinion, there are a few points that the results of this fire have proved, namely:

"First: That the reinforcing steel should be covered with at least 2 in. of concrete, because the fire, having penetrated the lower inch of concrete, would have affected the strength of the structure had it not been for the rigidly attached diagonals.

"Second: That the finished cement surface should be put on when the floor is being laid, thereby forming a solid mass; because the finished surface was destroyed wherever the heat was intense, the slab underneath being uninjured.

"Third: We were hampered greatly in handling our ladders and several of our firemen had a very narrow escape from being injured or possibly killed by falling sashweights, and we were compelled to force into the building all window frames that had not already fallen before we could use our ladders to advantage. I would suggest that in the construction of a building an iron pipe be imbedded in the concrete for the weights to fall into, in case the window frames are destroyed by fire. If this plan were adopted in the construction of a building it would enable the firemen to reach the fire without endangering their lives and would assist greatly in reducing the fire loss."

The Pittsburgh shops of the McClintic-Marshall Construction Company, builder of steel bridges, buildings, &c., is running on single turn five days per week at present.

NEWS OF THE WORKS.

Iron and Steel.

The Lorain Steel Company is completing the principal part of a new building at Johnstown, Pa., which will be devoted to the manufacture of T rail specialties, and expects to occupy it by June 1. The rest of the structure will require three or four months to complete.

No. 2 City Furnace of the Sloss-Sheffield Steel & Iron Company, at Birmingham, Ala., has been put in blast. Lady Ensley Furnace of the same company, at Sheffield, Ala., has been blown out for repairs.

The John A. Roebling's Sons Company, Trenton, N. J., has taken out a permit for the new buildings to replace those which were burned some time ago.

The receivers of the New York State Steel Company, Buffalo, N. Y., reopened the rolling mill May 25 and will turn out 300 tons daily. The openhearth furnace has been in operation for about a month. An order of the court has been obtained for the payment of a dividend of 25 per cent. to the company's creditors as soon as sufficient assets have been converted into cash for that purpose.

The Ohio works of the Carnegie Steel Company at Youngstown, Ohio, is on practically full this week. At the Union Works of the company in Youngstown, five mills at the upper and four mills at the lower plant are running.

The Bessemer plant of the Republic Iron & Steel Company at Youngstown, Ohio, is in operation this week with fair specifications ahead. The 10-in. continuous, 18-in. continuous, 7-in. continuous, No. 3 bar mill, No. 4 puddle mill and spike factory are on at the Brown-Bonnell Works. At the Valley plant, all mills resumed Monday except the 18-in.

Five of the six hot mills in the plant of the Youngstown Iron & Steel Roofing Company, Youngstown, Ohio, are in operation this week.

General Machinery.

The Angola Engine & Foundry Company, Angola, Ind., is contemplating the removal of its plant from that city to some point affording better shipping facilities. To this end the company is now in correspondence with representatives of commercial bodies in different cities, but as yet no location has been selected.

The American Concentrator Company, manufacturer of mining machinery, Joplin, Mo., intends to move its plant to Basic City, Va., where a location has been selected. The plant at Joplin, Mo., will be discontinued.

The Chamberlain Machine Works, Waterloo, Iowa, which makes a line of cream separator accessories, is preparing to erect a new three story factory.

The Union Pacific Railroad which began the erection of large shops at Omaha, Neb., nearly two years ago, and on which work was stopped the latter part of last year, has decided to proceed with the completion of the plant.

W. S. Bruce & Co., Memphis, Tenn., will require some machinery for the new garage they intend to erect, but have not yet decided just what machinery will be installed.

The Canners Machinery Company has been incorporated at Buffalo, N. Y., with a capital of $75,000, to manufacture machinery for canning factories. The company will not establish a factory of its own at present, having arranged with the Noye Mfg. Company, Buffalo, to manufacture for it under contract. Wm. B. Phinney will be president, and Roger C. Adams, secretary and treasurer.

The Pittsburgh office of the Jeffreys Mfg. Company, Columbus, Ohio, has closed a contract for four 6½ ton electric gathering locomotives for the Ellsworth coal mines of the Lackawanna Steel Company, and another contract for an electric locomotive for the National Mining Company, an identified interest of the United States Steel Corporation.

H. J. Koontz, Bessemer Building, Pittsburgh, Pa., dealer in new and second hand machinery, has recently made sales as follows: One 30 kw. generator and engine, direct connected; one 12 x 12 x 14 in. air compressor; one pressure tank; one 6 x 4 x 6 in. pump; one 45 kw. Westinghouse generator, 125 volts; one 10 kw. 250 volt generator; one 2 hp. Lundell 125 volt motor; eleven 250 volt motors from 5 to 20 hp., direct current; five motors, alternating current, 2-phase, 60 cycle from 5 to 50 hp.; one 20-ton York refrigerating machine; one 2½ ton ice plant complete; one 36 in. throat Cleveland punch and shear; three 6,000 gal. oil tanks; six 50 ft. span roof trusses; one 72 x 18 ft. riveted boiler; one 7x 5 x 7 in. pump for Philadelphia delivery; one 72 x 18 ft. boiler for Coalport, Pa. Mr. Koontz also reports having a number of inquiries for electrical machinery and machine tools.

Foundries.

The Nortmann & Duffke Company, Milwaukee, Wis., founder, has purchased property for an office building about 30 x 50 ft., to be erected adjoining its plant.

The Southern Wisconsin Foundry Company has been incorporated at Madison, Wis., with a capital stock of $25,000, by Henry A. Kanbe, Herman M. Vance and Samuel G. Scanlon.

Power Plant Equipment.

The installation of a pumping plant will be included in an irrigation project about to be undertaken by the Bridgeport Land Company, Bridgeport, Wash., which has been incorporated with a capital of $100,000. Water for irrigation will be taken from the Columbia River and will be distributed through a seven mile ditch. Work on ditches and canals will be begun in the fall. J. B. Valentine is president and general manager; C. M. Phoenix, vice-president; C. W. Ingham, secretary and treasurer.

The City of McKinney, Texas, will issue bonds in the sum of $26,000 for the extension of the water works, electric light system and purchase and improvement of a city park. Of this sum $16,000 will be devoted to the light and water system.

Fred. M. Sadler, Ellsworth, Minn., has secured a franchise to construct and operate an electric light plant in that town.

The Winchester Electric Company, Winchester, Ill., has been recently organized to operate a light and power plant. The new company has a capital stock of $10,000 and has issued bonds for an additional $10,000, all of which, we are advised, has been taken and paid for. Among those interested in the new company are William Milhouse, C. H. Condit and S. Hainsfarther.

The Hewes & Phillips Iron Works, Newark, N. J., has received an order from the Potomska Mills for a 21 and 44 x 54 in. heavy duty tangye cross compound engine; Newark *Evening News*, two 16 x 30 in engines of improved tangye type, equipped with the new Franklin valve gear, direct connected to Crocker-Wheeler generators. This is the fourth order received from the latter company.

The Great Northern Railroad, St. Paul, Minn., recently placed contracts covering an Allis-Chalmers 22 and 44 x 42 in. heavy duty cross compound Reynolds-Corliss engine, driving a 750 kw. Allis-Chalmers engine type alternator, as well as an exciter set and lighting transformers. The new equipment is intended for installation at Superior, Wis., where the power will be used for operating grain elevator machinery.

The Titusville Iron Company, Titusville, Pa., has let contract for the erection of the new warehouse and power plant, 180 ft. sq., in which will be installed modern equipment.

Bridges and Buildings.

The Buckeye Steel Casting Company, Columbus, Ohio, has placed a contract with the Mount Vernon Bridge Company, Mount Vernon, for the erection of the producer gas building at its plant, and it will place a contract very soon for the erection of a pattern shop.

Fires.

The plant of the Sweet Steel Company, Williamsport, Pa., was damaged $20,000 by fire May 24.

The pipe shop of the Dominion Iron & Steel Company at Sydney, N. S., was burned May 19, the loss being about $10,000.

Hardware.

The Rock Island Mfg. Company, Rock Island, Ill., is a new company recently formed for the manufacture of fireless cooking chests, cabinets, and other specialties. The company has commenced operations in a moderate way, and it is expected that the present firm, consisting of C. S. McDanial and Harry Wullenwaber, will be incorporated in the near future.

The Hardware Mfg. Company, Milwaukee, Wis., incorporated with a capital of $5,000, has been organized to manufacture the Brown shade adjuster, an appliance recently invented. Other hardware specialties will later on be added to the line, which for the present, however, will be confined to the manufacture of the new shade adjuster. The president and general manager of the company is Jas. R. Petley, who is also treasurer and purchasing agent of the National Brake & Electric Company.

The Birmingham Sash Weight Company, Birmingham, Ala., which was recently incorporated, will establish a plant in East Birmingham to manufacture cast iron sash weights. M. L. Falk is president of the company, and R. M. Long vice-president and superintendent.

The Southern Skein & Foundry Company, Chattanooga, Tenn., recently began the operation of its plant with a good sized force. In addition to Skeins, the company is prepared to furnish the trade with Blacksmith's tools, sad irons, anvils, jack screws, etc.

The Crescent Forge & Shovel Company, Havana, Ill., has purchased the goodwill, patents, patterns, stock, material, etc., of the Weyburn Mfg. Company, Rockford, Ill., manufacturer of steel shapes. All are being moved to Havana, where additions to the plant are being built to accommodate the growing business. The officers of the company are: President, O. B. Thorp; vice-president, W. J. Stowe; treasurer, C. P. King; secretary, J. W. Barnhisel.

At a meeting of the stockholders and directors of the E. H. Bardes Range & Foundry Company, Cincinnati, recently incorporated for $60,000, with a paid up capital of $28,000, the following officers were elected: E. H. Bardes, president; Charles H. Resor, first vice-president; L. E. Denning, second

vice-president; William Krummel, treasurer, and F. S. Krug, secretary. The new company has remodeled and refurnished the three story plant formerly occupied by the William Resor Company at 2619-2621 Colerain avenue, and will manufacture the best features of both the Resor and Bardes types of stoves. Forty-three molders are now employed, and the company is planning to enlarge and improve the plant, beginning with a new foundry if the necessary adjoining property can be obtained. E. H. Bardes, president, was 24 years with the Kruckemeyer Company, and Charles H. Resor, first vice-president, grew up in the old Resor plant, putting 34 years of his time there.

The Henkel Mfg. Company has completed and equipped a new factory at Canal Dover, Ohio. The building consists of 3 stories and basement, 40 x 70 ft., and is well lighted throughout.

The Theo J. Ely Mfg. Company, Girard, Pa., manufacturer of hardware specialties, has been incorporated with a capital of $75,000, fully paid in. The officers are: Theo. J. Ely, president; M. E. Ellis, treasurer, and Theo. B. Ely, vice-president and secretary. The company contemplates considerable additions to its factory and will also increase its line of hardware and woodenware specialties.

The Swift-Waters Company, Berlin, Conn., has been incorporated under Connecticut laws to manufacture hardware. H. A. Twardoks is the president, A. F. Johnson treasurer and Charles Meng secretary. The capital stock is $25,000. The company will manufacture belt awls, ice picks, screwdrivers, wood chisels, tack fullers and auto repair kits.

Miscellaneous.

J. H. Wagenhorst & Co., Youngstown, Ohio, report that there has been no letup in their sales of automatic electric blue printing machines. Recent sales have been as follows: Haskell-Barker Car Company, Michigan City, Ind.; Pittsburgh Railways Company, Pittsburgh, Pa.; Chicago Railway Equipment Company, Chicago, Ill.; City of Minneapolis, Minn.; H. G. Ferree, Memphis, Tenn.; Bailey & Fuller, Peoria, Ill.; Eller Mfg. Company, Canton, Ohio; United States Government, Washington, D. C.; Cleveland Cliffs Iron Company, Ishpeming, Mich.; Gulf Pipe Line Company, Tulsa, Okla.; A. S. Gilman Printing Company, Cleveland, Ohio; Tuttle & Pike, Kansas City, Mo.; Alexander Blair, Macon, Ga.; Duluth Street Railway Company, Duluth, Minn.; American Optical Company, Southbridge, Mass.; United States Arsenal, Watertown, Mass.; Armour & Co., Chicago, Ill., and Omaha Engineering & Blue Print Company, Omaha, Neb.

Practically the entire plant of the Westinghouse Air Brake Company at Wilmerding, Pa., has shut down in all departments to remain idle until Monday, June 8.

Charles P. Carrothers and John J. Heiser of Denver, Col., who are owners of a patented process for the manufacture of a composition roofing material, have been in negotiation with the Industrial Bureau of Cincinnati, Ohio, with the view of locating a plant for the manufacture of their goods. Cincinnati is an advantageous point because of the close proximity of the southern cotton oil products which enter largely into the manufacture of the material.

The Arthur Koppel Company, Pittsburgh, manufacturer of industrial and portable railways, is erecting an extension to its plant at Koppel, Pa., which will be devoted to the manufacture of portable tracks of special design. The addition is being built with concrete base and corrugated siding over steel frame. The rapid increase of the portable track trade of the company has made this addition to its plant necessary.

The Ritchie Corrugated Culvert Company, Oskaloosa, Iowa, maker of patent corrugated metal culverts, is preparing to move its plant to Ottumwa, Iowa, where it expects to be located about August 1.

It has been decided by the Tri-City Railway & Light Company, Moline, Ill., to overhaul and renovate the gas plant located at the foot of Fourth street in Moline with a view to increasing its efficiency.

The National Cameraphone Company, 423 Water street, Bridgeport, Conn., is to move its factory to larger quarters at Eleventh avenue and Forty-third street, New York. New machinery has been purchased, and the work of manufacturing on a large scale will begin as soon as possible. The company manufactures a combination graphophone and moving picture machine.

The receiver of the Neafie & Levy Shipbuilding Company, Philadelphia, Pa., has been authorized by the court to sell the shipyard at either public or private sale after the property has been advertised five weeks.

The Glacier Metal Company, Richmond, Va., which is erecting a new plant at Manchester, across the James River from Richmond, will install a number of melting furnaces and is in the market for furnaces for the manufacture of Babbitt metal, brass, etc. The company will also be pleased to receive data on reclaiming metals from drosses, extracting tin from cans, etc. Pots containing from about 1,000 to 2,000 lbs. each [illegible] installed.

The blast furnace of the Perry Iron Company, Erie, Pa., will be blown in this week.

British Legislation on Working Hours.

London *Engineering* says of some recent proposals of an increasingly socialistic character which the Labor movement in Great Britain is bringing forward:

The mania for over-legislation is not confined to socialists; it even affects sober-minded members of the House of Commons. Sir Charles Dilke's shop hours bill was read a second time on May 1, by a majority of 145. Now this bill proposes to limit the working hours in any and every case to a maximum of sixty hours per week, not only for shop assistants, but for the owner of the shop. It is an interference with personal liberty to an extent not hitherto attempted in any legislative measure. It does not allow for emergencies which are sure to arise in trade, especially in the case of shopkeepers. It is not at all likely that the bill will be further proceeded with this session, especially as the Government has promised a measure on the subject next year. In reply to a Labor member, it was stated by a member of the Government that its bill would cover the main principles of the bill before the House. But surely the Government will not propose to limit a man's own time; if so, why not that of editors and journalists, of doctors and lawyers, and the time of legislators themselves? It has long been recognized in this country that legislation is essential in cases of danger to life and health, especially as regards children and women. But to endeavor to put legal fetters upon men quite able to look after themselves is beyond the pale of rightful legislation. The plea of the miners may, possibly, be conceded, but even in that case it would be better for the parties concerned, rather than for legislation, to regulate the hours in the pits. Moreover, as it is, the shop hours act in force is scarcely complied with, and the measure before the House of Commons goes a great deal further. If socialism is designed to fetter human conduct in this way, wise men will give it a wide berth.

The Pittsburgh & Lake Erie Bridge, Beaver, Pa.

The Pittsburgh & Lake Erie Railroad Company will construct a double track cantilever bridge over the Ohio River at Beaver, Pa., located about 200 ft. up stream from the present bridge. It will be of cantilever construction, having a channel span of 769 ft., anchor arms 320 ft. long, and an approach span of 370 ft. at the Beaver end, making a total length of 1800 ft.

The weight of the bridge will be 13,500 tons. It is designed to support easily the heaviest train loads of 60,000 lb. per locomotive axle and 6000 lb. per lineal ft. on each of the two tracks. The floor system is made particularly massive, with skid girders along the inside of the trusses about 5 ft. above the track level to protect the bridge under all contingencies.

The masonry piers are about 120 ft. high and are founded on rock about 40 ft. below low water level. The bridge steel work will stand about 150 ft. above the masonry. The steel work has been designed by Albert Lucius of New York, consulting bridge engineer of the Pittsburgh & Lake Erie Railroad, under the direction of J. A. Atwood, chief engineer.

The contract for the masonry has been awarded to the Dravo Contracting Company, Pittsburgh, the work on which is now under way. The contract for the steel superstructure was this week awarded by Vice-President Schoonmaker to the McClintic-Marshall Construction Company of Pittsburgh. The total cost of the bridge is $1,500,000 and it will be ready for service October 31, 1909.

The Franco-British Exposition, undertaken for the purpose of bringing the French and British nations closer together commercially, was opened in London, May 14. The buildings, 28 in number, occupy 200 acres, and the exhibits cover practically all lines of manufactures, arts and sciences, and natural products. The colonies of both countries are well represented.

The Iron and Metal Trades

The developments in the Pig Iron markets have been followed with the closest attention by the whole trade, because they illustrate what follows a sharp decline made to bring out buyers. The dead lock was broken by a leading Southern interest, which promptly booked a very large tonnage, and was followed by others with similar results. Their prices were then restored to the $11.50 basis for No. 2 Foundry at Birmingham, other Southern makers advancing their price to $12, with higher prices for distant deliveries. In some sections, notably the tidewater markets and New England, other sellers followed the break later on, the result being a decline during the past week, which brings them closer into line with prices reached before in the Central West. The result has been that a good deal of additional business has been closed in the Central West, and that a comparatively large tonnage has been placed at tidewater and in New England, Foundry No. 2 selling in that part of the country at $16.75.

The transactions have been characterized as somewhat speculative on the part of the consumers, since they were certainly not made, in some conspicuous instances at least, in order to cover requirements actually in sight. In other words, melters have bought the Pig Iron because they were convinced that the prices were close to bottom, and not because the metal was actually needed. So far as can be learned the actual current consumption of the founders and other consumers of Pig Iron has not materially improved during the past month or six weeks. The atmosphere has cleared pretty thoroughly during the past two weeks and the Pig Iron business is on a much sounder basis.

It is, of course, an open question whether consumption could be stimulated by a reduction in prices of Finished Material. Thus far there is very little evidence that the determination on the part of the Steel interests, announced last week, to maintain prices, has caused the placing of orders which had been withheld in anticipation of a drop. That, at least, is true of the domestic trade. It is a curious fact that in the export business, which is developing very fairly, a number of orders long pending have been entered following the announcement of the result of the conference.

In the discussion of the present wide spread between the selling prices of Basic and Bessemer Pig Iron and of Steel Billets, one important point is forgotten. Nearly all the large rolling mills which have no Steel works, and must buy outside Steel, have sliding scale contracts for Billets based on the selling prices of Bessemer Pig. Such consumers of Billets, and in the Pittsburgh District alone they take far more than one-half of the tonnage, have been getting cheaper and cheaper Steel. It is estimated that the settlements recently were not far from $24 per ton for Billets, when the nominal market rate is $28.

There has been more activity in Structural Material. The McClintic-Marshall Company has during the past week closed for 21,000 tons, which includes about 13,500 tons for the Beaver bridge, 4000 tons for the Scranton shops and 1000 tons for a warehouse in Philadelphia. Quite a considerable number of minor contracts have been placed in Chicago and elsewhere.

There has been no improvement in Bars, and in spite of efforts to hold the industry together low prices continue to be made.

In the Merchant Pipe trade there are some good contracts in prospect. There is some talk of a 400-mile line of 16 to 18 in. pipe for the Hope Natural Gas Company and of 400 miles of 8 to 10 in. line Pipe for a Western oil company.

Cast Iron Pipe makers have little to complain of so far as tonnage is concerned, wretched though selling prices may be. Detroit has placed 6400 tons, and other lots have been contracted for. Syracuse will open bids on June 1 for 20,000 tons of 30 to 42 in. Cast Iron Pipe, and Rome calls for 3700 tons. The report that 20,000 tons of Steel Plates for the Brooklyn Water Works had been ordered is incorrect. There are questions of right of way pending, which may cause very considerable delay.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	May 27, 1908.	May 20, 1908.	Apr. 29, 1908.	May 29, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2 Standard, Philadelphia	*$16.50*	$16.75	$17.50	$25.50
Foundry No. 2, Southern, Cincinnati	*14.25*	14.75	15.00	24.25
Foundry No. 2, Local, Chicago	*16.25*	16.25	17.25	26.50
Bessemer, Pittsburgh	*16.90*	16.90	17.15	24.35
Gray Forge, Pittsburgh	*15.90*	14.90	15.40	22.90
Lake Superior Charcoal, Chicago	20.00	20.00	20.00	27.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	30.00
Forging Billets, Pittsburgh	30.00	30.00	30.00	35.00
Open Hearth Billets, Phila	29.20	29.20	29.20	32.50
Wire Rods, Pittsburgh	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	12.00	12.00	12.00	18.50
Steel Rails, Melting, Phila	**13.00**	12.75	12.75	19.50
Iron Rails, Chicago	15.00	14.75	15.00	24.50
Iron Rails, Philadelphia	**18.00**	17.00	17.00	27.50
Car Wheels, Chicago	13.00	13.00	13.00	25.50
Car Wheels, Philadelphia	14.00	14.00	14.00	25.50
Heavy Steel Scrap, Pittsburgh	**13.00**	12.75	12.75	18.50
Heavy Steel Scrap, Chicago	**11.00**	10.75	10.75	16.00
Heavy Steel Scrap, Phila	**13.00**	12.75	12.75	19.00
FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.45	1.45	1.46	1.83½
Common Iron Bars, Chicago	1.65	1.65	1.65	1.76½
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.75
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.84½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.55	1.55	1.55	1.85
Skelp, Sheared Steel, Pittsburgh	1.65	1.65	1.65	1.90
SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	*1.85*	1.90	1.90	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	*12.87½*	13.00	13.00	24.25
Electrolytic Copper, New York	*12.62½*	12.87½	12.75	23.50
Spelter, New York	*4.55*	4.60	4.70	6.45
Spelter, St. Louis	*4.40*	4.50	4.57½	6.30
Lead, New York	**4.35**	4.25	4.10	6.00
Lead, St. Louis	**4.20**	4.12½	4.00	5.92½
Tin, New York	*28.50*	30.30	32.25	42.50
Antimony, Hallett, New York	*8.50*	8.50	8.75	17.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, May 27, 1908. (By Telegraph.)

From a state of extreme uncertainty as to the real market level in Pig Iron, a clearer and more definite understanding has been evolved by the developments of the past two weeks. After a temporary recession from $11.50, Birmingham, made by a Southern interest, the market has reacted, and this price now represents the inside figure at which tonnage is obtainable. Except for early deliveries, offers of $11.50 would not now find ready acceptance, as most of the leading producers have advanced to $12, Birmingham, for the second half, some even being unwilling to book into the fourth quarter at this price. Instead of being confined to the more important consumers, last week's transactions, which aggregated over 75,000 tons, included purchases by a large number of smaller buyers. While it is believed that not many melters are in urgent need of Iron for immediate use, stocks are generally well reduced and buyers are convinced that forward requirements may be safely covered at present prices. The stirring activity in Pig Iron contrasts sharply with the listlessness which characterizes finished materials in nearly every department. Whether a reduction of Steel prices would result in stimulating buying is a question that is receiving much attention, and those taking the affirmative point to the effect of low prices of crude material in confirmation of their views. While a considerable number of contracts have been closed by fabricators, they were nearly all small, the aggregate being about 4500 tons. Rails, Plates, Bars and Sheets have produced nothing of noteworthy interest, and Wire Products are also on the wane. While there has been

no general improvement in the demand for Metals, some importance is attached to the purchase of a round lot of Copper by the Allis-Chalmers Company.

Pig Iron.—Started by the recent purchases of important tonnage by a few prominent consumers, the buying movement in Pig Iron has gained impetus and become more general, with the result that last week's sales in this market reached a volume far in excess of any like period for months. It is estimated that in all more than 75,000 tons of Foundry Iron was placed, the majority of which was taken by Southern furnaces. The business was fairly distributed among the several leading interests. The prevailing price secured for Southern Iron was $11.50, Birmingham, though it is reported that a few sales were made at $11. The general disposition of sellers was to restrict purchases to third quarter delivery though considerable of the business placed was for the entire second half. Before the end of the week the Woodward and Sloss-Sheffield companies had evidently entered all the tonnage they cared to take on at $11.50, since additional orders amounting to several thousand tons were declined at this figure. The former has withdrawn all prices and the latter has advanced to $12, Birmingham. The Republic Iron & Steel Company is holding at $12, for third quarter business, while the Tennessee Coal, Iron & Railroad Company is taking on some tonnage for this period at $11.50, but in common with all other sellers is not seeking orders for the fourth quarter at this price, nor is it anxious to extend bookings that far ahead, except at an advance over the present market. Notwithstanding the handicap of cheaper prices for Southern Iron, the Northern furnaces secured a fair portion of the business placed, their share of the whole amounting to about 25,000 tons. Included in this was the purchase of 10,000 tons by a local consumer; also several lots of Malleable Bessemer. That interest has not abated, as shown by the large number of inquiries still in the market, reflecting the conviction among the rank and file of melters that the limit of recession has been reached. In spite of the active demand that has developed, it is not believed that the melt has increased, so that practically all of the buying is for prospective requirements. As the situation now stands, the leading Southern furnaces have enough tonnage booked to provide for their present active furnace capacity pretty well through the third quarter at least, and are hopeful of securing higher prices for deliveries beyond that time. The second stack of the Northwestern Iron Company's furnace at Mayville, Wis., will be blown in next week, with the assurance of continued activitiy for the rest of the year. Through a typographical error in the Pig Iron quotations of last week's report, the price of Standard Bessemer was substituted for Malleable Bessemer, making the price $18.40, when it should have been unchanged, at $17.25. The following prices are for May and June delivery, f.o.b. Chicago:

Lake Superior Charcoal	$20.00 to $20.50
Northern Coke Foundry, No. 1	17.75 to 18.25
Northern Coke Foundry, No. 2	17.25 to 17.75
Northern Coke Foundry, No. 3	16.75 to 17.25
Northern Scotch, No. 1	18.25 to 18.75
Southern Coke, No. 1	16.35 to 16.85
Southern Coke, No. 2	15.85 to 16.35
Southern Coke, No. 3	15.35 to 15.85
Southern Coke, No. 4	14.85 to 15.35
Southern Coke, No. 1 Soft	16.35 to 16.85
Southern Coke, No. 2 Soft	15.85 to 16.35
Southern Gray Forge	13.85 to 14.35
Southern Mottled	13.60 to 14.10
Malleable Bessemer	17.25 to 17.75
Standard Bessemer	18.40 to 18.90
Jackson Co. and Kentucky Silvery, 6 %	18.90 to 19.40
Jackson Co. and Kentucky Silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky Silvery, 10 %	22.90 to 23.40

(By Mail.)

Billets and Rods.—New business in Billets is extremely quiet. There is practically no demand for Forging Billets, nor are there any inquiries indicating the prospective development of orders. Prices on Forging Billets are maintained at the regular quotation of $31.50 to $32.50, Chicago. A moderate amount of specifications against contracts is about all there is doing in Wire Rods; very little new business is being placed. Prices of Rods are unchanged, as follows: Bessemer, $35; Basic, $36; Chain, $37, all at Pittsburgh.

Rails and Track Supplies.—Aside from an order of about 700 tons of traction Rails taken by the Illinois Steel Company, no Rail orders of any note have been entered during the week. The prospect of immediate purchases of round lots by any of the railroads is by no means encouraging. Specifications are, however, coming in a little more freely this month, and the local mill is running along at moderate capacity. Some improvement is noted in Light Rails, orders for which, though not of large tonnage individually, are more frequent. Sales made by the principal interest for the present month aggregate up to this time about 3000 tons. The demand for Light Rails is coming principally from the coal mines, with a small percentage of orders from the lumber mills. Not much new business in Spikes and Fastenings has been entered during the week, but the volume of specifications has improved. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.50c.; car lots, 1.60c. to 1.70c.; Spikes, 1.80c. to 1.90c., according to delivery; Track Bolts, 2.25c. to 2.35c., base, Square Nuts, and 2.40c. to 2.50c., base, Hexagonal Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—Following the activity of the previous week, which resulted in the closure of a number of important contracts, the business of last week is in point of tonnage comparatively small. It is comprised of quite a number of small projects, the promoters of which seem to have concluded that the prices offered were about as low as would be available anywhere in the near future. Among the contracts taken by fabricators, which in all amounted to about 4500 tons, the following list comprises the principal ones: University of California, Berkeley, 937 tons; the Illinois Central Railroad, bridge at the Kensington & Eastern crossing of the Nickel Plate, 1500 tons; warehouse at Salt Lake City, 258 tons, all taken by the American Bridge Company; Galloway, Hooch & Francis Building, Salt Lake City, and a small structure for the Kings Hill Irrigation Company, Idaho, comprising about 100 tons, secured by the Minneapolis Steel & Machinery Company; 250 tons for a post office building for Colorado Springs, awarded to the Des Moines Bridge & Iron Works. Dyer Brothers, San Francisco, secured a contract from the United Railways for 375 tons, and about 290 tons of roof trusses for Coliseum Building, St. Louis, went to the Central States Bridge Company, Indianapolis. The general contract for the Chico Landing Bridges over the Sacramento River, requiring 325 tons, was taken by Cotton Brothers, San Francisco. The proposed conversion of an eight track stationary bridge over the Drainage Canal, Chicago, into a rolling lift span has been abandoned by the Drainage Board, and it is understood that plans are being prepared for a new bridge to take the place of this structure. The estimating departments of fabricating shops are fairly busy on new projects which it is believed will develop into actual orders with less hesitation and delay than has been experienced for a number of months. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.: larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—Plate using industries are exceedingly quiet, and are placing only small orders for such material as is needed for current work. Under these conditions the mills are naturally getting very little new business, and their accumulation of tonnage both from this source and specifications is sufficient to keep them running only intermittently at part capacity. The situation as to price is unchanged—the principal producers still maintaining the regular quotations, while concessions of from $2 to $3 a ton on narrow sizes are obtainable from a few sources. We quote mill shipments, as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72-in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—A sagging tendency has developed in Sheets, and new business for the past week or two has been discouragingly light. Neither jobbers nor manufacturers are disposed to anticipate their wants, and the new orders entered are few in number and of small tonnage. No departure from the regular policy of price maintenance is noted so far as the principal mills are concerned, and it is claimed that whatever concessions are being made are confined to a few of the smaller mills. We quote mill shipments, as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 and 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—There is no improvement in Steel Bars and, as far as new business is concerned, orders are coming out quite slowly and in small lots. The volume of specifications offered is likewise greatly reduced, so that it is impossible for the mills to run more than a week or 10 days in a month. Rolling schedules of the Bar mills are made up chiefly from

specifications on existing contracts which, being unsupported by new orders, are but scantily supplied. In the absence of orders of attractive tonnage no adequate test of the market is afforded, although reports of concessions on Bar Iron made by some of the less important mills are current. Regular prices, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—The past week has shown a little improvement in the general tonnage average of orders, which is regarded as an indication of a better movement in jobbers' stocks. The aggregate increase, however, is not notably large, though it is expected that the total business for the present month will show a fair margin of increase over April. Buyers of Tubular goods have not been induced to withhold orders for fear of an impending decline to the same extent as in some other lines since their purchases are protected for a reasonable period. Notwithstanding this, orders are being placed only to cover nearby requirements. Regular prices are reported to be firmly maintained. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 71 per cent. on Black Steel Pipe, ¾ to 6 in. From two to three points above these prices is asked for Iron Pipe.

Boiler Tubes.—A few small orders for Locomotive Tubes on requisitions for repair work represent the extent of railroad purchases. Merchant Tubes are equally quiet, and orders from jobbers for replenishment of stocks are limited and infrequent. Mill quotations for future delivery, on the base sizes, are as follows: 2⅜ to 3 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1¼ in.	55	35	35
1⅜ to 2¼ in.	50	35	35
2½ in.	32½	45	35
2¾ to 3 in.	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—It is quite evident from the meagerness of orders being placed by the implement makers that no developments of interest are in prospect from this quarter. Neither is there anything in the run of orders being entered for Steel and Iron Tire from jobbers and vehicle makers to indicate improvement. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1⅛ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 56 per cent. off in car lots; 52 per cent. in less than car lots, base territory delivery.

Cast Iron Pipe.—Pipe contracts secured by the United States Cast Iron Pipe & Foundry Company include 500 tons from Dayton, Ohio; 1000 tons, Portland, Ore.; 300 tons, Ponca, Okla.; 300 tons, Milan, Mich. In addition to these lettings there were awarded to the Texas State Penitentiary Foundry, 2100 tons for Roswell, N. M., and to the Dimmick Pipe Company, 6500 tons by the city of Detroit, Mich. A letting of 500 tons is scheduled for June 2 by the Board of Trustees of Water Works, Cincinnati, Ohio. There is practically no change in the situation as respects prices. The market is an open one, every seller being governed by circumstances and conditions surrounding his own interests. We quote, nominally, per net ton, Chicago, as follows: Water Pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25; with $1 extra for Gas Pipe.

Metals.—The purchase of Copper for last half requirements by the Allis-Chalmers Company, Milwaukee, was the most notable transaction in Metals for the week. Outside of this sale only a few orders for immediate use were placed by consumers. Apparently it is not distrust of price levels so much as lack of present and prospective business that restricts purchases of Metals. Lead is somewhat firmer while Pig Tin is a little easier. We quote as follows: Casting Copper, 13¼c.; Lake, 13½c. to 13¾c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 32c.; small lots, 32½c.; Lead, Desilverized, 4.40c. to 4.55c., for 50-ton lots; Corroding, 4.80c. to 4.90c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 10½c., and other grades, 9¾c. to 10¼c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12⅝c.; Copper Bottoms, 10½c.; Copper Clips, 11c.; Red Brass, 11½c.; Yellow Brass, 9¾c.; Light Brass, 6½c.; Lead Pipe, 4c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 25c.; Block Tin Pipe, 27c.

Old Material.—Rerolling Steel Rails hold the lead in point of activity over other Scrap grades; at the same time there is no vigorous demand even for these, but the price is sustained by offers from short interests among dealers. Notwithstanding there is but a light demand from consumers, prices have suffered no further decline, save perhaps in Relaying Rails, one small lot of which—52-lb. Section—sold at $19, with Angles attached. A local builder of industrial roads and equipment was in the market during the week for 14 miles of Standard Section Relaying Rails, but as far as known no order was placed. It is reported that a large user of Heavy Melting Steel has an inquiry out for a round lot of this material, which is perhaps responsible for a slight stiffening noted in the prices asked. It is estimated that the stock accumulations in Chicago dealers' yards now amount to fully 200,000 tons, and this is moving too slowly to admit of large additions. The railroads have offered very little tonnage in the past two weeks, and there are no lists reported for this week. The Illinois Central is, however, offering at private sale a lot estimated at about 5000 tons. We quote, per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$15.00 to $15.50
Old Steel Rails, rerolling	13.00 to 13.50
Old Steel Rails, less than 3 ft.	12.00 to 12.50
Relaying Rails, standard sections, subject to inspection	20.50 to 21.50
Old Car Wheels	13.00 to 13.50
Heavy Melting Steel Scrap	11.00 to 11.50
Frogs, Switches and Guards, cut apart	11.75 to 12.25
Mixed Steel	8.50 to 9.00

The following quotations are per net ton:

Iron Fish Plates	$13.00 to $13.50
Iron Car Axles	16.00 to 16.50
Steel Car Axles	14.50 to 15.00
No. 1 Railroad Wrought	10.75 to 11.25
No. 2 Railroad Wrought	9.75 to 10.25
Railway Springs	10.75 to 11.25
Locomotive Tires, smooth	12.50 to 13.00
No. 1 Dealers' Forge	9.00 to 9.50
Mixed Busheling	6.75 to 7.25
Iron Axle Turnings	5.50 to 6.00
Soft Steel Axle Turnings	5.50 to 6.00
Machine Shop Turnings	5.00 to 5.50
Cast Borings	4.00 to 4.50
Mixed Gatings, &c	4.00 to 4.50
No. 1 Mill	6.50 to 7.00
No. 2 Mill	5.50 to 6.00
No. 1 Boilers, cut to Sheets and Rings	6.75 to 7.25
No. 1 Cast Scrap	11.50 to 12.00
Stove Plate and Light Cast Scrap	10.00 to 10.50
Railroad Malleable	10.00 to 10.50
Agricultural Malleable	9.75 to 10.25
Pipes and Flues	7.50 to 8.00

Birmingham.

BIRMINGHAM, ALA., May 25, 1908.

Pig Iron.—Recent developments have been of such a nature as to warrant the statement that the market is on a firmer basis than at any time since the depression. Inquiries from practically all lines of foundry trades have come forward in larger proportions, and the sales that have resulted foot up to figures similar to those commonly reported for the same period when conditions were normal. The percentage of engagements that is known to represent speculative purposes is notable, and the eagerness to cover for anticipated requirements that has been displayed by large melters further indicates an improvement in conditions. Producers generally appear confident that prices have reached their lowest level, and notwithstanding the fact that the recent activity of the market may be to some extent the result of material departures from the established quotations, the schedule of $11.50, Birmingham, is reaffirmed and could hardly be shaded. A number of attempts to place tonnage at such a basis for delivery over the last quarter have been unsuccessful, while the sale of 1000 tons of High Manganese Iron for delivery covering the last half is reported at $13. There seems to be no doubt that producers have the situation well in hand. Order book requirements in all cases are believed to be equal to the stock on furnace yards and the output, without indications that additional capacity will soon be put in operation. The present largest producer is known to be contemplating withdrawal from the market, and the second largest reports 50 per cent. of its output for the third quarter disposed of. One of the smaller concerns is practically out of the market for the third quarter and manifests most reluctance in making quotations on deliveries further advanced. The output of Basic Iron has not been increased, but one furnace has recently been put in operation on Charcoal Iron.

Cast Iron Pipe.—The city of Louisville, Ky., is to place a contract of fair proportions on June 1, and bids on a significant tonnage for Cienfuego, Cuba, will be opened June 15. The aggregate of smaller orders to be placed within the next 30 days is estimated at 85,000 tons. A Southern maker will furnish 6400 tons of Water Pipe for the city of Detroit, Mich. A large contract for Porto Rico has also been placed in the South, as well as contracts for 1000 tons of Gas Pipe

each for gas works at Los Angeles, Cal., and Portland, Ore. The city of Roswell, N. M., has recently placed a contract for 2100 tons of Water Pipe. The decline in prices seems to have been effectually checked and the following quotations are firm for moderate lots of Water Pipe per net ton, f.o.b. cars here: 4 to 6 in., $23; 8 to 12 in., $22; over 12-in., average $21, with $1 per ton extra for Gas Pipe. On large contracts for municipalities these quotations are probably shaded.

Old Material.—The aggregate of sales reported does not indicate an improvement in the demand, but further decline in prices has not been suffered. Recent announcements favor the resumption of operations at Steel plants, and in view of the number of inquiries for Cast Scrap and Stove Plate that are pending dealers are somewhat encouraged. Nominal quotations are as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$15.00 to $15.50
Old Iron Axles	14.00 to 15.00
Old Steel Axles	12.50 to 13.00
No. 1 Railroad Wrought	12.00 to 12.50
No. 2 Railroad Wrought	9.00 to 9.50
No. 1 Country Wrought	10.50 to 11.00
No. 2 Country Wrought	9.50 to 10.00
Wrought Pipes and Flues	8.50 to 9.00
No. 1 Steel	9.50 to 10.00
No. 1 Machinery Cast	9.00 to 9.50
Stove Plate and Light Cast	8.50 to 9.00
Cast Borings	5.00 to 5.50

Pittsburgh.

PARK BUILDING, May 27, 1908.—(*By Telegraph.*)

Pig Iron.—Following the heavy buying movement which broke out a week or 10 days ago in Basic and Foundry Iron, transactions this week have been confined mostly to small lots, but there is a good deal of inquiry in the market, with prospects of some heavy tonnages being sold. The sales of Basic will cause the blowing in of several furnaces in the valleys. Cherry Valley of the United Iron & Steel Company, at Leetonia, Ohio, started up May 20, after being shut down for three or four months, and No. 4 stack of the Shenango Furnace Company, at Sharpsville, Pa., will start about June 1, while the new No. 1 stack, under erection for some months, will soon be finished, and is expected to start about July 1. For the week ending May 23, the output of the merchant blast furnaces in the two valleys that are in blast was 6200 tons. Stocks of Iron at these furnaces decreased last week from 53,000 to 45,000 tons. At present Youngstown Steel and No. 3 of Shenango Furnace Company are running on Bessemer; Dover of M. A. Hanna & Co., on Basic; one Andrews & Hitchcock, on Foundry; one Stewart Iron Company on Low Phosphorus, and Struthers on Basic. We quote Bessemer Iron at $16, Basic $15.25 to $15.50; Northern No. 2 Foundry, $15, and Northern Gray Forge, $14, all at Valley furnace, the freight rate to Pittsburgh being 90c. per ton.

Steel.—The market is very dull and there is no new demand for Billets. About a fair volume of business is moving in Sheet and Tin Bars. Most consumers of Billets are covered by sliding scale contracts based on the price of Pig Iron. On ordinary business we quote $28, Pittsburgh, and $28.50, Youngstown or Wheeling, for Bessemer and Open Hearth Billets; Sheet and Tin Bars taking $1 advance, and Forging Billets $2 advance.

Merchant Pipe.—It is reported that the Columbia Oil & Gas Company, Huntington, W. Va., has placed an order with the National Tube Company for about 180 miles of 16 and 20 in. Line Pipe, for carrying natural gas from Huntington to Cincinnati, Ohio. The order was tentatively placed with the National Tube Company nearly two years ago, but owing to delays in securing rights of way, &c., actual work on the line has not been started. As soon as some minor details are arranged it is probable that deliveries on this contract will begin to go forward.

(*By Mail.*)

The total sales of Pig Iron made by Northern and Southern furnace interests, since the buying movement started about two weeks ago, will aggregate close to 200,000 tons. Of this amount, Western interests are understood to have taken upward of 75,000 tons. The American Steel Foundries is credited with having bought 40,000 tons; the Commonwealth Steel Company, 10,000 tons, and International Harvester Company, 10,000 tons. The Allegheny Steel Company, a local interest with an open hearth steel plant and sheet mills at Avenue, Pa., has bought about 10,000 tons of Basic for delivery over the last six months of the year, and other smaller interests have bought 5000 to 10,000 tons. The Basic went on the basis of $15, Valley furnace, but it is now stated that some of the furnaces are holding their Iron for $15.25, although no sales have been made at this price so far. These are purely speculative purchases on the part of melters, who believe that prices of Pig Iron have touched bottom, and they are willing to go in and buy, it being understood that they have not the orders for Finished Material on their books to use up this Iron. The Sloss-Sheffield Iron & Steel Company, which is credited with having sold a large tonnage of No. 2 Foundry on the basis of $10.75, Birmingham, is now understood to be quoting $12, and other Southern interests have advanced their prices. As yet the buying movement in Pig Iron has not extended to Bessemer or Forge, and nothing is doing in these two grades. There is an impression that after the Republican National convention, should an acceptable candidate be nominated, a buying movement on the part of railroads will start. It is stated that the Pennsylvania Railroad is holding back orders for Rails and other supplies until after the Presidential nomination. The situation in Steel is quiet, but a fair business in Sheet and Tin Bars is being done. Steel Billets are very dull. The large Steel interests are reported as firmly maintaining prices on the basis of $28 for Bessemer and Open Hearth Billets, but, as is well known, most consumers of Billets have sliding scale contracts, based on the price of Pig Iron, by which their Billets cost them much less than this price. The heavy decline in Bessemer Iron carried with it a decline in the price of Steel on these contracts, and it is understood that a number of large consumers of Billets are not paying over $25, at mill. The demand for Finished Iron and Steel on the whole is showing betterment. Some fairly large contracts for Structural Material have been placed, and there is a little better inquiry for Plates and Steel Bars which have been dull for some time. Sheets are quiet, but Tin Plate is fairly active, and Pipe is in moderate demand, with some very large orders pending in oil and gas lines. The Coke situation continues dull, but a better demand for Furnace Coke is expected before long, as a number of furnaces now out of blast are getting ready to resume. Scrap is better, and prices are stronger, but a still better demand is expected after July 1, when the wage scales are out of the way, and the mills have finished taking stock and making repairs. Taken as a whole, the situation in the Steel trade is showing encouraging signs, and there is more optimistic talk in the Steel trade to-day than in the last two or three months.

Ferromanganese.—Quite a few inquiries are in the market, representing 500 to 600 tons, and in sympathy with the better feeling in Pig Iron, prices on Ferro are firmer and probably $1 a ton higher. We quote $44.50 for prompt Ferro and $45 seaboard for delivery over last half of the year. We note a sale of two cars, or about 50 tons, for prompt shipment at $44.50, seaboard. On an inquiry for 200 tons for last half $45 has been quoted. A considerable tonnage of Ferro for second half of the year delivery is likely to be sold in the next week or two.

Ferrosilicon.—A local consumer is in the market for 300 tons, on which it is probable that a fairly low price will be made. We quote 50 per cent. at $67 to $67.50, f.o.b. Pittsburgh.

Muck Bar.—As yet there is no demand, and in the absence of sales we quote best grades of Muck Bar at nominally $26 a ton. The plant of the Shenango Iron & Steel Company, at Wheatland, Pa., which was one of the leading makers of Muck Bar for the open market, is now idle.

Skelp.—Some inquiry is noted for Steel Skelp for reasonably prompt delivery. The mills rolling Skelp are operating to possibly 50 per cent. of capacity, but mostly on specifications against old orders. Grooved Steel Skelp is 1.55c. to 1.60c.; Sheared Steel Skelp, 1.65c. to 1.70c.; Grooved Iron Skelp, 1.75c. to 1.80c.; Sheared Iron Skelp, 1.85c. to 1.90c., Pittsburgh.

Rods.—Although there is practically no inquiry, the leading maker of Rods is holding firmly on the basis of $35 for Bessemer, $36 for Open Hearth and $37 for Chain Rods, f.o.b. Pittsburgh. The Youngstown Sheet & Tube Company, who recently bought the plant of the Morgan Spring Company at Struthers, Ohio, is soliciting inquiries for Bessemer Rods. This company has an excellent plant capable of turning out about 200 tons of Rods per day.

Structural Material.—More actual tonnage has been placed in the past week in this market than in the past two or three months. The McClintic-Marshall Construction Company has taken the contract for the Pittsburgh & Lake Erie bridge at Beaver, about 13,500 tons, and also the material, 4000 tons, for the Scranton shops of the Delaware, Lackawanna & Western, while the Carnegie Steel Company has taken 1400 tons for the extension to the Port Pitt Hotel in this city. The Jones & Laughlin Steel Company has taken about 800 tons for two bank buildings at Youngstown, Ohio, and the American Bridge Company 400 tons for some small girder bridges on the Florida East Coast Railroad. Inquiries are in the market for the extension to the Horne Building in this city, 2500 to 3000 tons, but this work may be held up for some little time. It is understood that a relatively low price was made on the Fort Pitt Hotel, and there is still general complaint among Structural concerns of the low prices ruling for fabricated work, which in some cases are said to be below actual cost. There is a fair amount of new work in sight, but it develops slowly. It is expected that the affirming of prices in New York last week on Structural Material may possibly bring out some work that had been held up in the belief that a reduction in prices would be made. We are advised the mills are holding firmly prices for plain material, as follows: Beams and Channels,

up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card. Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Steel Rails.—The Carnegie Steel Company the past week took orders for about 1500 tons of Light Rails, but as yet no contracts of moment for Standard Sections are being placed. Reports are that two or three leading railroads will give out some large orders for Rails after the Republican Presidential nomination is made. Nos. 1 and 2 Rail mills of the Carnegie Steel Company, at Bessemer, are in operation to about 35 or 40 per cent. of capacity, while No. 3 mill, on which Light Rails are rolled, has been shut down for three weeks, but is expected to start on Sunday night, May 31. Regular prices on Light Rails, which continue to be shaded from $3 to $4 a ton by rerolling mills, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—The city of Seattle, Wash., is in the market for quite a large tonnage of Plates for extensions to its water mains, the contracts having been placed with the T. A. Gillespie Company of this city. The Carnegie Steel Company has taken orders for 200 tons or more of Plates for this work, and additional tonnage is to be placed before long. The general demand for Plates is quiet, only small orders for actual needs being placed. The Steel car interests and the boatbuilders are not placing any orders. On narrow sizes prices are being shaded about $2 a ton by some of the smaller mills. Regular prices are as follows: Tank Plates, ¾-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼ in. to and including 3/16 in.	
Plates on thin edges	.80 to .10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than ¼ in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"U. S. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell grade of steel is abandoned.

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for tortuous shapes. 14 in. wide down to 6 in., of Tank, Ship or Bridge quality.

Sheets.—The demand for both Black and Galvanized Sheets is light, and the Sheet trade is in rather unsatisfactory condition. Consumers still seem to have the idea that prices will be lower and are withholding orders, while specifications on old contracts are hung up in a good many cases. Regular prices, which we are advised are being held by the mills, are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—Indications are favorable for a large fruit crop this year, and it is expected that early in July a heavy demand will set in for Bright Plates from the canning interests. The mills have a fair amount of work ahead of them, and the American Sheet & Tin Plate Company continues to operate to nearly full capacity. We quote at $3.70 for 100-lb. Cokes, 14 x 20 f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Hoops and Bands.—Practically no new business is being placed, and specifications against contracts are only fair. Regular prices are as follows: Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60, base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Cotton Ties.—Most of the Cotton Ties required for this year have been ordered, and buyers are now specifying against their contracts. The quantity needed this year will be some[illegible] We quote $1.00 bundle lots and over, 85c., less than 3000 bundle lots, 88c., f.o.b. Pittsburgh.

Iron and Steel Bars.—As yet there is no improvement whatever in the demand for Iron and Steel Bars, consumers placing orders only for absolute needs. The reaffirming of prices by the Steel interests in New York on May 21 was expected to lead to a larger demand for Bars, but as yet this has not developed. We are advised that the leading mills rolling Iron and Steel Bars are absolutely adhering to regular prices, and that if any shading is being done, it is by small mills that do not make a full assortment of sizes. A conference is to be held at Cambridge Springs, Pa., next Tuesday, between the Western Bar Iron Association and the Amalgamated Association on the puddling and finishing scales which will expire June 30, but it is believed that there will be no trouble in arriving at a settlement for the new scale year. The Amalgamated Association has not asked for any advances, and it is not thought the mills will demand a reduction. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further west. Steel Bars remain firm, at 1.60c., Pittsburgh.

Spelter.—The Spelter market is in an unsatisfactory condition, the demand being dull, while prices of Ores are steadily declining. Prime Western grades are offered at 4.40c., St. Louis, or 4.52½c., Pittsburgh. Consumers are buying only for actual needs and in small lots.

Railroad Spikes.—The Cleveland, Cincinnati & St. Louis Railroad has recently placed an order for 1000 kegs, but the general buying of Spikes by the railroads is light. There is a fair demand for the smaller sizes. We quote: Standard sizes, 4½ x 9-16 in., at $1.70, and the smaller sizes at $1.80 per 100 lb. in carload and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Merchant Steel.—Orders continue only for small lots for actual needs, but it is expected that shortly after July 1 some of the implement makers will come in the market with their season contracts. It is understood that several mills are prepared to guarantee prices against decline in the event of such contracts being placed. The demand for Shafting is dull, the reduction in prices some time ago not having stimulated business. We quote Cold Rolled Shafting, on contracts for 100 tons and over, 57 per cent. off; carloads, 56 per cent. off, and less than carloads, 52 per cent. off, on which carload freight is allowed within base territory. Nominal prices on Merchant Steel are as follows: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 2.10c. to 2.15c.; Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron, finished, 1½ in. and wider, 1.60c.; under 1½ in., 1.75c. Planished Tire Steel is 1.80c., all f.o.b. at mill.

Pipes and Tubes.—This trade is showing steady improvement in the demand, and the reaffirming of prices by the Steel interests on May 21 is expected to bring out a good deal of tonnage that was being held back, waiting to see whether there would be any change. Some heavy contracts for Pipe line work are in prospect. It is reported that the Hope Natural Gas Company will be in the market soon for 400 miles of 16 or 18 in. Line Pipe, while a Western oil interest is reported to be inquiring for 400 miles of 8 to 10 in. Line Pipe. Prices are guaranteed by the mills against decline up to June 30, and we can state positively there will be no reduction in prices on July 1 as reported. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 74 and 5 per cent. off list, while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel Black.	Galv.
[illegible]	[illegible]	[illegible]
¾ to 6 in.	73	63
[illegible]	[illegible]	[illegible]
Extra strong, plain ends:		
[illegible]	[illegible]	[illegible]
Double extra strong, plain ends:		
[illegible]	[illegible]	[illegible]

Discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
Extra strong, plain ends:		
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

Boiler Tubes.—Only scattering orders are being placed for carloads and less quantities, and no improvement can be

expected in the demand until the boiler shops get more work, and until the railroads commence to place orders. Regular discounts on Merchant Tubes in small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in.	42	47
1¾ to 2¼ in.	42	59
2½ in.	47	61
2¾ to 5 in.	52	65
6 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Iron and Steel Scrap.—In addition to buying 30,000 to 35,000 tons of Pig Iron, the American Steel Foundries has been a large purchaser of Heavy Steel Scrap, having bought 12,000 to 15,000 tons for delivery at its Alliance, Ohio, plant, prices ranging from $13.50 to $14, delivered. In a general way, the Scrap trade is showing betterment, consumers having come to the conclusion that prices are probably as low as they will go, and that it is a good time to cover. Some dealers are not anxious to sell at present prices, but are holding their Scrap, believing the market will be higher by July 1 or shortly after. Dealers quote about as follows per gross ton: Heavy Steel Scrap, Pittsburgh, Steubenville or Sharon delivery, $13 to $13.25; Cast Borings, $7.25 to $7.50; No. 1 Railroad Wrought, $13.25 to $13.50; No. 1 Cast, $13.75 to $14; Bundled Sheet Scrap, $8.50 to $9, at shipping point; Sheet Bar Crop Ends, $16 to $16.50; No. 1 Busheling Scrap, $12 to $12.25; No. 2, $9 to $9.25; Iron Axles, $19 to $19.50; Steel Axles, $16.50 to $17; Low Phosphorus Melting Stock, $17 to $17.50; Old Steel Rails, short pieces for Open Hearth use, $12.75 to $13; Rerolling Rails, lower in price, $13.50 to $13.75; Machine Shop Turnings, $8 to $8.25; Grate Bars, $12 to $12.50; Railroad Malleable Scrap, $11.25 to $12.

Coke.—While no actual improvement in demand can be reported for Furnace Coke, there is a prospect of better business, as a number of blast furnaces that are now idle have figured on going in blast. The Shenango Furnace Company has started up in full its Coke works at Wilpen, Pa., and several other producers are getting their ovens ready for operation. Connellsville Furnace Coke for prompt shipment is still being offered as low as $1.50, at oven, but on contracts running over the last half of the year from $1.60 to $1.75 is quoted. Foundry Coke ranges from $2 to $2.25, at oven, depending on quality. Outside makes of Furnace Coke are quoted as low as $1.30, and Foundry as low as $1.75, at oven. The output of Coke last week was 173,082 tons, practically the same as the previous week.

Philadelphia.

PHILADELPHIA, PA., May 26, 1908.

The market shows further signs of strength, the buying movement in Pig Iron being maintained, with sales heavier than at any time so far this year. Consumers show more disposition to enter the market, and in many instances show their willingness to make purchases for at least part of their requirements for the last half of the year and occasionally for deliveries extending into the first quarter of next year. In this respect, however, the views of sellers are more conservative and less disposition is shown to take business for forward delivery. Speculative interests are giving the market some attention, and we understand that some pretty fair sized lots have been taken with the view of holding them for a rise early in the fall. Notwithstanding the pretty general opinion in the trade that manufacturers of finished and semifinished materials would at the New York committee meetings made an adjustment of prices, nothing was done. It was considered that in view of the lowered price of Pig Iron some shading of the price of at least some of the various classes of finished materials would result, but makers, on the other hand, contended that a reduction in price would, under the existing condition of general business, bring out no great tonnage of orders, and, as the cost of production was high, prices should be maintained. It looks, therefore, as if present prices would prevail at least during the summer months.

Pig Iron.—Sales the past week have again aggregated quite a large tonnage, and sellers in some cases are getting close to all the business they want for early shipment. With the reduced productive capacities that have prevailed the past few months, the amount of business that could be taken without blowing in additional furnaces is limited, and there is no disposition shown to increase the output at the prevailing selling prices. Sellers in a number of cases practically refuse to quote on deliveries for extended periods, and some will not take orders for delivery beyond September 1, nor will they take heavy tonnages for delivery during the next 60 or 90 days. Buyers on the other hand seem more anxious to do business, and inquiries for deliveries over the entire last half and even for early 1909 delivery are numerous. In a number of cases firm offers have been made by buyers for good tonnages for delivery the last half of the year, at prices ranging from $1 to $2 under the market, but they receive no attention from sellers. Prices, it is pretty generally believed, are at the bottom, and in a number of cases are now below actual cost. The ruling price for the standard grades of Northern No. 2X Foundry Iron seems to be pretty well established, at $16.75 to $17.25, for deliveries in this territory. Some furnaces which cannot meet these figures are holding for higher prices, but do practically no business, while it might be possible, in the case of less well-known irons, or off grades, to shade these prices slightly for spot shipment. The bulk of the business transacted has been done in the Foundry grades. No. 2X and No. 2 Plain have been sold in tonnages ranging from 100 to 1000 for delivery the next four months. A sale of 1500 tons and another of 1000 tons of No. 2X at $16.75, delivered, are noted. Pipe makers have been in the market for moderate quantities, particularly for low grade Irons, which appear to be somewhat scarce in the Northern brands. A sale was reported, however, of a lot of 2000 tons of mixed numbers for early shipment at $15.25, delivered. Southern Iron has not been extensively sold. Some small lots of No. 2X Foundry were done on a basis of $11.50, Birmingham, and although firm offers have been made for good tonnages at slightly lower figures, sellers refuse to entertain them; in fact, several interests refuse to take orders for forward shipments, and have marked up their price 50c. a ton for delivery beyond September 1. Forge Iron has been in better demand. One seller reports sales aggregating 3000 tons in the past 10 days, all of which was sold around $15.25, delivered. Inquiry from the local consumers of Basic Iron has not been heavy, although some disposition is being shown to enter the market at the prevailing price, so as to even up on the high priced Iron still to come in. One small lot of off Basic was reported sold at close to $16, delivered. A sale of a small tonnage of Low Phosphorus Iron was reported at $21.25. This grade has not been in urgent demand. Prices are unchanged. Some sellers ask 50c. advance over ruling figures for deliveries covering the last half of the year, but the following quotations are named for delivery in buyers' yards, eastern Pennsylvania and adjoining territory, during the next 30 or 60 days:

Eastern Pennsylvania, No. 2 X Foundry	$16.75 to $17.25
Eastern Pennsylvania, No. 2 Plain	16.25 to 16.75
Virginia, No. 2 X Foundry	17.00
Virginia, No. 2 Plain	16.50 to 16.75
Gray Forge	15.25 to 15.50
Basic	16.00 to 16.25
Low Phosphorus	21.00 to 21.50

Ferromanganese.—There has been more inquiry for small tonnages for delivery the last half of the year, although the amount of business done has been small. Prices are stationary, some sellers quoting $44 to $45, for early delivery, others still holding at $46, Baltimore.

Steel.—More inquiry has developed for Billets. Buyers are feeling the market with the hope of finding lower prices, but makers are firm, since the recent determination to maintain prices. Sales have been light, but producers feel more encouraged and expect business heretofore deferred to come out before a great while. Prices are unchanged. For delivery in this territory ordinary Rolling Steel is quoted at $20.30, with Forging Steel at $31.20, subject to the usual extras for high carbons and special sizes.

Plates.—The determination to maintain prices has resulted in the bringing out of some business, which had been held up pending the action of the manufacturers, and it is expected that orders will now be placed more freely. Inquiries are on the market for Steel for boilers, cars and tanks, which aggregate quite a good tonnage. The Maryland Steel Company has orders for harbor work for the city of Baltimore, which will require 2400 tons of Plates. Most of the business taken by the local mills has been small, but the trade feels much encouraged regarding future business:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼ in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
Nos. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—A moderate increase is to be noted in the demand for Structural Material, and mills make slight gains from week to week. Orders are mostly small, although inquiries for larger lots are more numerous. As it has now been definitely decided that there will be no change in prices, it is believed that less hesitancy will be displayed in placing business. Prices continue to be quoted from 1.85c. to 2c., according to specifications.

Sheets.—No change is to be noted in the demand for Sheets. There has been a little better inquiry, but the tonnage of business taken has hardly been up to that of the

previous week. Some buyers show a disposition to buy for forward delivery, but the purchases made are not large. For mill shipments quotations range as follows, a tenth extra being added for small lots: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The Eastern Bar Iron Association, at its recent meeting in New York City, reaffirmed the base price of 1.50c., Pittsburgh, for Refined Iron Bars. Very little business is coming out at this figure, however, there being enough low price contracts around to supply the current demand. New business is light and specifications on old orders are meager. For prompt shipment Refined Iron Bars can be had for delivery in this territory at prices ranging from 1.45c. to 1.55c. Some of the Eastern mills are giving more attention to the rolling of Steel Bars, and some small business has been done in that direction at 1.75c., delivered.

Coke.—The amount of new business has not been large. Some little buying has been done in Foundry Coke, but the demand for Furnace Coke is quiet. Some producers are a little firmer on prices, but no quotable change is to be noted. Foundry Coke ranges from $2.15 to $2.35, at oven, while Furnace Coke is quoted at $1.60 to $1.75, at oven. For delivery in this territory the following range of prices is quoted:

Connellsville Furnace Coke	$3.75 to $3.90
Foundry Coke	4.30 to 4.50
Mountain Furnace Coke	3.35 to 3.50
Foundry Coke	3.90 to 4.10

Old Material.—A little more activity has developed in the Old Material market. Mills continue to pick up small tonnages for prompt delivery of the different grades of Scrap, and prices are a little firmer in some grades. A sale of 1300 tons of Low Phosphorus Scrap is reported at $17.50, at mill. Heavy Melting Steel is stronger, a sale of 100 tons being noted at $13.50, delivered. Turnings and Borings have been a little more active at unchanged prices. Quotations are largely nominal, ranging about as follows for prompt shipment, eastern Pennsylvania and adjoining territory:

No. 1 Steel Scrap and Crops	$13.00 to $13.50
Low Phosphorus	17.50 to 18.00
Old Steel Axles	18.00 to 18.50
Old Iron Axles	20.00 to 21.00
Old Iron Rails	18.00 to 18.50
Old Car Wheels	14.00 to 15.00
Choice No. 1 R. R. Wrought	15.00 to 15.50
Machinery Cast	14.50 to 15.00
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	9.50 to 10.00
Stove Plate	11.00 to 11.50
Cast Borings	8.50 to 9.00
Grate Bars	11.75 to 12.25

St. Louis.

ST. LOUIS, MO., May 23, 1908.

The feature of the situation is the marked improvement in the demand for Pig Iron, and this, in turn, has brought about a firmer general market. In the term demand reference is had both to actual sales and to price or delivery inquiries. While sales of Structural Material are moderate a season of greater activity is near at hand, as contractors are about to place orders for some of the large structures which have been determined upon.

Coke.—Shipments on contract are coming forward more freely and a larger number of inquiries are pending. The current figures are $2 to $2.25, f.o.b. oven, the lower price for immediate shipment and the higher on contract.

Pig Iron.—In case of a local agency recent sales of Pig Iron up to date, including those already reported, foot up to 20,000 tons, mostly Basic. Inquiries are pending for 5000 tons of Malleable Bessemer, 5000 tons of Basic and between 2000 and 5000 tons of Southern Foundry for shipment over the balance of the year. Prices are firm at $11.50, Birmingham, for No. 2, with one of the largest interests advancing this figure to $12.

Finished Iron and Steel.—Brokers report a better demand than at any time during the past two months, mainly local, though some orders are coming from outside points, principally from the smaller railroads. The local call is most pronounced for Steel foundry products for railroad purposes. Light Rails are in better demand, but prices continue to rule low.

Old Materials.—The market for Old Materials is ruling steady and quiet. There is but one list out, that of the Cotton Belt Line, which is offering 600 tons. In Heavy Melting Steel the activity noted last week has not been in evidence, owing to dealers having supplied their wants. No sales of consequence are reported. There is a continued inquiry for Relaying Rails and considerable business would result were the prospective buyers able to meet holders' ideas as to terms of payment. On the whole, the market is firmer and the outlook improving. We quote, f.o.b. St. Louis, per gross ton, as follows:

Old Iron Rails	$14.00 to $14.50
Old Steel Rails, relaying	11.25 to 11.50
Old Steel Rails, less than 3 ft.	11.00 to 11.25
Relaying Rails, standard sections, subject to inspection	22.50 to 23.50
Old Car Wheels	11.50 to 12.00
Heavy Melting Steel Scrap	10.75 to 11.00
Frogs, Switches and Guards, cut apart	10.50 to 11.00
Mixed Steel	9.00 to 9.50

The following quotations are per net ton:

Iron Fish Plates	$11.50 to $12.00
Iron Car Axles	14.50 to 15.00
No. 1 Railroad Wrought	10.75 to 11.00
No. 2 Railroad Wrought	8.50 to 10.00
Railway Springs	9.00 to 10.00
Locomotive Tires, smooth	12.00 to 12.50
No. 1 Dealers' Forge	9.50 to 10.00
Mixed Borings, &c.	3.50 to 3.75
No. 1 Boilers, cut to Sheets and Rings	7.00 to 8.00
No. 1 Cast Scrap	10.00 to 10.50
Stove Plate and Light Cast Scrap	9.00 to 9.50
Railroad Malleable	9.25 to 9.75
Agricultural Malleable	8.50 to 9.00
Pipes and Flues	7.25 to 7.50

Sealed proposals for public work will be received by the St. Louis Board of Public Improvement until June 5 as follows:

For furnishing materials and tools for constructing a conduit line, Steam and return Pipes, Hot and Cold Water Pipes and Air Pipes, with all necessary Manholes and Anchors, for the steam heating system at Quarantine Hospital.

For furnishing materials and tools for the erection of two new Boilers and Boiler settings for the Quarantine Hospital.

Cleveland.

CLEVELAND, OHIO, May 26, 1908.

Iron Ore.—The market shows no indication of taking on any life. The resale of a few small lots on the docks are reported, but no sales of this year's Ore were made, and a general buying movement does not seem near at hand. A few furnace interests will have to come into the market soon for some Ore to mix with what they now have in their furnace yards, but this demand will be only for a limited tonnage. Ore men, however, are watching with considerable interest the present buying movement in Pig Iron, and they believe that if it continues any length of time it will start an active buying of Ore. The first Ore shipped by the Steel Corporation this season reached Lake Erie ports yesterday. About half a dozen boats of the Pittsburgh Steamship Company have loaded with cargoes, which will be unloaded before the end of the week. With the exception of two cargoes all the Ore shipped so far this season has been by furnace interests owning their own Ore properties, and the total May shipments will probably not be much over 100,000 tons as compared with 5,600,000 the corresponding month last year. With the absence of sales there is no inquiry for vessel tonnage in the Ore trade, although a little wild chartering has been done for shipment from the head of the lakes to Tonawanda at 70c., the same as last year. There will be little Ore for shipment at least the first half of June, and it is probable that the general start in lake navigation which was postponed until June 1 will be put off until a later date. Ore shipments from the docks to the furnaces are still light, the movement being less than a month ago. Ore prices are being firmly maintained. Prices for 1908 delivery at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous non-Bessemer, $2.35 to $2.60.

Pig Iron.—The activity in the Pig Iron market which started two weeks ago has continued the past week, with a largely increased volume of inquiries for Foundry Iron for spot, third quarter and last half delivery. A large share of the inquiries are for small lots, ranging from 50 to 200 tons, but there are several larger ones, among them an inquiry for 5000 tons from the International Steam Pump Company. There has also been considerable activity in the Basic Iron market, one furnace interest reporting seven inquiries aggregating about 15,000 tons. Considering the large number of inquiries for Foundry Iron the sales during the week have not been numerous. One local interest with furnaces in western Pennsylvania and New York reports the sale of 4000 tons of Foundry Iron for prompt shipment at an average price of about $15, at furnace, for No. 2. Included in this tonnage was one lot of No. 1 Iron that was sold on the basis of $15.30, Valley furnace. Another local interest sold about 2000 tons of No. 2 at $14.75 to $15, Valley furnace, for third quarter delivery. Other sales in the local market will aggregate not over 1000 tons, none being made by interests that have been holding for prices higher than those that have been prevailing. The market is slightly firmer as a result of the increased inquiries, and some furnaces are asking about 50c. a ton more than a week ago, although there are still reports of sales at $14.50, Valley furnace, for No. 2. Local furnaces are now holding at $15.75 to $16, for spot, third quarter and last half delivery in this territory, for No. 2. A local foundry made an offer of $14.50 for 1000 tons

of No. 2 for last half delivery, but the offer was rejected by a local furnace. There is a difference of opinion among furnacemen as to whether the present activity is only a spurt or whether the improvement in the market will continue. While the present inquiries would no doubt result in considerable buying at prices around $14.50 and $14.75, Valley furnace consumers seem unwilling to buy at higher prices. The Southern Iron market is slightly firmer, and one leading producer, who is still quoting No. 2 at $11.50, Birmingham, for delivery until July 1 is now asking $12 for the third quarter. There is practically no inquiry for Malleable or Bessemer Iron. The Foundry Iron melt in this territory shows a little improvement. For prompt shipment, and for third quarter we quote, delivered, Cleveland, as follows:

Bessemer	$16.90
Northern Foundry No. 1	$15.90 to 16.40
Northern Foundry, No. 2	15.40 to 16.00
Northern Foundry, No. 3	15.00 to 15.50
Southern Foundry, No. 2	15.85 to 16.35
Gray Forge	14.90

Coke.—There is a fair demand for Foundry Coke for the last half, and some inquiry for Furnace Coke. Prices remain about stationary. We quote Connellsville Furnace Coke at $1.50 to $1.60, at oven, for spot shipment, and 72-hr. Foundry Coke at $2 to $2.25, at oven, the latter price being held for last half delivery.

Old Material.—While the market is still dull a better feeling seems to prevail among dealers, and signs of further weakness have disappeared. Some inquiry for Steel Scrap from the Pittsburgh District has made the market slightly firmer, as far as Steel Scrap is concerned, and dealers are trying to buy it at to-day's prices for future delivery. The local demand for Scrap shows no improvement. The mills are running only part of the time and are buying very little. The demand for Cast Scrap is also light. Steel Scrap is somewhat firmer, but all price quotations, which are still largely nominal, are unchanged. Dealers' prices to the trade per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$11.00 to $11.50
Old Iron Rails	14.50 to 15.50
Steel Car Axles	16.00 to 17.00
Old Car Wheels	12.50 to 13.00
Relaying Rails, 50 lb. and over	21.00 to 22.00
Heavy Melting Steel	11.00 to 11.50
Railroad Malleable	11.00 to 11.50
Agricultural Malleable	10.50 to 11.00
Light Bundled Sheet Scrap	7.50 to 8.50

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	6.00 to 6.25
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	10.00 to 10.50
No. 1 Railroad Wrought	11.00 to 12.00
No. 1 Cast	11.50 to 12.50
Stove Plate	10.00 to 10.50
Bundled Tin Scrap	8.00 to 9.00

Finished Iron and Steel.—The volume of business in Finished lines remains about stationary, there being no improvement in orders or specifications. Buying is all in small lots for immediate needs. Some consumers have been holding off in the hope of getting lower prices. The action of the leading Steel interests in reaffirming prices at their meeting in New York last week is expected to stimulate buying slightly, but that effect is not yet noticable. Consumers, as a rule, have allowed their stocks to become low, but they are expected to continue for the present the policy of buying in small lots. The demand for both Iron and Steel Bars is still light. The local Bar Iron mills are running this week but with only a small tonnage on their books. Jobbers are still cutting the price of Iron Bars to 1.40c., Pittsburgh, and it is reported that one mill is offering Steel Bars at 1.50c., Pittsburgh. The demand for Plates shows no improvement. A local mill reports that its Light Plate orders are only for small lots for quick shipment. Prices are weak and there are reports of shading of $2 a ton on Heavy Plates as well as on Light Plates. The demand for Sheets is light and price concessions of $1 to $2 a ton are being made on Black and Galvanized Sheets. No contracts have been made as yet by the agricultural implement makers for Steel Bars for the year beginning July 1, but some inquiries have been received from these consumers and it is expected that they will begin placing orders the coming month. The implement men have been doing a good volume of business the present year, not being seriously affected by the depression, and in view of the good crop prospects it is expected that their requirements for the coming year will be as large as ever. The Structural outlook remains unsatisfactory, although one mill reports some improvement in this line. The warehouse business of jobbers for May will show up better than for April, but their mill business will not be so large. We quote Iron Bars at 1.50c. to 1.60c., Cleveland, for car lots; Steel Bars, 1.70c., Cleveland, for car lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼ in. and heavier, 1.80c., Cleveland. Dealers quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Warehouse prices are unchanged. Jobbers quote Iron and Steel Bars out of stock at 1.70c. to 1.80c.; Beams and Channels out of stock are 2.10c. to 2.15c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Cincinnati.

CINCINNATI, OHIO, May 27, 1908.—(*By Telegraph.*)

Transactions in Pig Iron have constituted the principal feature in the Iron and Steel market, and all auxiliary interests have apparently profited thereby, even the Tool manufacturers, who regard Pig Iron as the barometer of trade and its lead as prophetic of early conditions. The location here of a new rolling mill plant and the visits and correspondence of others contemplating the institution of new industries in the Iron and Steel trade have encouraged allied industries, and the feeling in this center is optimistic to a degree. For the first time in some months the jobbing foundries are buying Iron, and there have been several contracts made of 1000 to 2000 ton lots each, and practically all Southern. In Finished Material the decision to hold prices at the New York meeting seems to have had a stimulating effect, and stores and large selling agencies are getting some carload orders, where the buying for several months has been of the strictly hand to mouth character. In Scrap the bottom seems finally to have been struck in this market, which has reached the lowest levels for many months.

Pig Iron.—Conditions in the large selling offices to-day reminded one somewhat of the prosperous times of early 1907. There have been some large sales of Iron reported, ranging from $11 to $12, Birmingham. While a number of interests continue to quote $11.50 on No. 2 for early delivery, at least two of the largest Southern interests have made $12 the minimum, at which they will take business running as late as September delivery, and others announce that the quoted price of $11.50 to-day is subject to the condition of order books, and liable to be withdrawn at the shortest notice. A large quantity of Basic has been sold through this market the past week, and there are several inquiries out for more. The scarcity of low grades is still as marked as in our last report, and several agencies report inability to fill orders, hence for this reason a price is difficult to obtain. An interesting feature of the week's buying in the local market has been on account of the jobbing foundries, one melter, and not the largest in the district, taking 1500 tons of No. 2 Foundry for delivery extending over one year from June 1 at $11.50, Birmingham; another 2000 tons, another 1200 and another 1000, the majority asking for delivery through the last half. A characteristic of Foundry buying in this territory is the disposition of the entire trade to get into the market at once. Two hundred tons of Mottled sold at about the basis of Forge, $10.25, Birmingham. The American Seeding Machine Company, Springfield, Ohio, is reported to have bought 2000 tons of Nos. 2 and 3 Foundry at about $11, Birmingham basis, on No. 2. A report is received here that all the Valley furnaces have stiffened on prices, as have also the central Ohio interests accredited with placing some good business at shaded figures early in the start of the activity. A large St. Louis interest is out with an inquiry for Open Hearth Basic, 5000 to 15,000 tons, for delivery the last quarter and first of next year. A central Ohio Steel maker wants 3000 tons of Basic, covering the last four months. Another in about the same territory wants 1000 tons a month over the last half. A northern Ohio Steel making concern asks for 250 to 500 tons for June and July. There are inquiries here for about 20,000 tons from the agricultural implement makers alone, and the stove makers are also buying some Iron. Little is heard yet of Northern Iron, although a furnace in the Wellston District, is reported to have withdrawn all quotations under $17 for the last quarter. Most quotations to-day are on the basis of $16, at furnace, although it is reported that $15.50 is still being done by certain interests. Ohio Silveries are firm at $18.50, at furnace, for 8 per cent. For early delivery and extending into the third quarter we quote, f.o.b. Cincinnati, as follows: Freight rates being $3.25 from Birmingham, and $1.20 from the Hanging Rock District:

Southern Coke, No. 1	$15.25 to $15.75
Southern Coke, No. 2	14.75 to 15.25
Southern Coke, No. 3	14.25 to 14.75
Southern Coke, No. 4	14.00
Southern Coke, No. 1 Soft	15.25 to 15.75
Southern Coke, No. 2 Soft	14.75 to 15.25
Southern Coke Gray Forge	13.75
Ohio Silvery, 8 per cent. Silicon	19.70
Lake Superior Coke, No. 1	17.20 to 17.70
Lake Superior Coke, No. 2	16.70 to 17.20
Lake Superior Coke, No. 3	16.20 to 16.70
Standard Southern Car Wheel	22.25 to 22.75
Lake Superior Car Wheel	22.00 to 22.50

(*By Mail.*)

Coke.—Little change is seen in the situation with reference to spot Coke, although some contracting is noted on forward business, which is regarded by local selling factors as likely now to improve, gradually keeping pace with the im-

proved demand for Iron. One agency has made a couple of good sized contracts covering a period of one year beginning on July 1 for Foundry Coke, but not in Cincinnati territory. The price is reported to be in the neighborhood of that prevailing for shorter contract periods, namely, $2 to $2.25, at oven. On Furnace grades there is little or no improvement, although it is expected if the demand for Iron continues there will be some contracting. The ruling price is about $1.50 to $1.60, at oven. Connellsville best brands are quotable at $1.65 to $1.80, at oven; New River Furnace grades at $2.25. Best grades of Foundry Coke are obtainable for immediate delivery at $2; New River at $2.75. Pocahontas Furnace Coke is quoted by one agency at $1.90; Connellsville, $1.70 to $2.

Finished Iron and Steel.—Dealers report a trifle more business coming out in number of orders, but still lament their insignificant size. Within the past few days there have been some good inquiries from Ohio points for Structural Material, one being for 500 tons. There is a universal denial that prices have shown any retrogression on any line, and the larger dealers do not expect any recessions in the light of the recent agreements in New York City. Orders from stock are filled at the following prices, which are f.o.b. Cincinnati: Iron Bars, carload lots, 1.65c., base, with half extras; small lots from store, 1.85c., base, half extras. Steel Plates, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2c. Blue Annealed Sheets (Heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.20c. No. 12, carload lots, 2c.; small lots from store, 2.30c. Sheets (Light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.20c.

Old Materials.—No transactions of any size are reported by the Scrap dealers in this market, although sentimentally the feeling is more optimistic. Steel Scrap is stronger, there being a little more demand, while rolling mill Scrap remains inactive. The good weather has seemingly stimulated the movement a little. The larger dealers who have been buying steadily during the months of depression have taken over the miscellaneous stocks of a number of small dealers, so that the business in this territory will be less divided than in times past. Prices have not changed since last week, and we quote for delivery, Cincinnati, as follows:

No. 1 Railroad Wrought, net ton	$10.50 to $11.50
Cast Borings, net ton	4.00 to 5.00
Heavy Melting Steel Scrap	11.00 to 12.00
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	10.25 to 11.25
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	14.50 to 15.50
Old Iron Rails, gross ton	13.00 to 14.00
Old Steel Rails, long, gross ton	11.00 to 12.00
Old Steel Rails, short, gross ton	11.00 to 12.00
Relaying Rails, 56 lb. and up, gross ton	22.00 to 23.00
Old Car Wheels, gross ton	12.00 to 13.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00

New York.

NEW YORK, May 27, 1908.

Pig Iron.—There has been a considerable tonnage placed during the past week, at prices which were lower than those ruling recently. An increased number of sellers showed determination to meet the market, and the great majority of buyers have taken an interest. The result has been that Pipe makers, Stove founders, Malleable Iron founders and machine shops have purchased, the tonnage in the aggregate being quite large. The buying extended over this territory and over New England, where Buffalo furnaces have for the first time in a long while been active sellers. Basic Pig Iron has sold at $15.50, delivered in eastern Pennsylvania. We quote Northern No. 1 Foundry, tidewater, $16.75 to $17; No. 2 Foundry, $16 to $16.50, and No. 2 Plain, $15.50 to $16. Alabama Irons are selling at $16 to $16.50 for No. 1, and $15.25 to $15.75 for No. 2.

Steel Rails.—The Erie Railroad, which is following a policy of hand-to-mouth buying, has placed an order for 2000 tons of Rails in the past week, early shipment being called for. Generally, the Rail situation is uninteresting, with no apparent likelihood of an early change for the better.

Structural Material.—The mills are running on less than half time, though the general sentiment is that the activity in structural work and the promise of construction projects that have been figured on recently give this department of the market a better position than that of other lines. The month of May is expected to show a total of fabricating contracts closed in excess of 50,000 tons, an important part of which was placed in the past week. The McClintic-Marshall Construction has taken the large business of the week, including the Pittsburgh & Lake Erie Railroad bridge over the Ohio at Beaver, Pa., 13,500 tons, the new Lackawanna shops at Scranton, Pa., 5000 tons, and a warehouse at Philadelphia, 1000 tons. In the territory tributary to Chicago, about 16,000 tons of structural work has been let in the last 10 days. The Queen & Crescent bridge, calling for 5000 tons, is still pending, as is the Horne Building, Pittsburgh, which will take 3000 tons. The American Bridge Company has the contract for 750 tons for the new State University Library, at Berkeley, Cal. It has also closed for 400 tons of bridge work for the Florida East Coast and for small bridges for the New Haven Road and the Duluth, Mesaba & Northern. In New York the Public Service Commission has awarded contracts for the construction of five of the six sections of the Fourth avenue subway in Brooklyn, at an aggregate of $14,764,510, but there are a good many contingencies, and it may be a long time before the mills will hear from this action. Bids will be taken this week on the new Borough Hall in Brooklyn, the Steel amounting to several hundred tons. The Frederick Loeser & Co. store in Brooklyn, which would have required about 1500 tons for the Steel cage construction at first figured on, will be built of reinforced concrete, and only 300 to 400 tons of Steel will be needed. We continue to quote on mill shipments, tidewater delivery, as follows: Beams, Channels, Angles, and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Ferroalloys.—The demand for 80 per cent. Ferromanganese continues of good proportions, and although orders the last week have not been as large as in the preceding one, they have been more numerous, and the tonnage disposed of about the same. Prices are firmer, ranging from $45 to $47, Baltimore. There are no stocks of Ferromanganese anywhere, and the larger consuming interests have not yet begun to buy. Some improvement is noted in the demand for 50 per cent. Ferrosilicon, but it can still be had at $75, and the real buying has not yet set in. Furnace Grade has recently been taken in preference to the high percentage on account of price.

Bars.—The Eastern Bar Iron manufacturers held their usual monthly meeting in this city last Thursday and decided to reaffirm the price of 1.50c., Pittsburgh, or 1.66c., New York. It is understood, however, that only a limited number of manufacturers, representing the leading interests in the trade, are adhering to this price. The usual figures at which orders are being placed are 1.40c. to 1.50c., New York. The manufacturers are now at work on a plan which they hope will impart more stability to the market. The inquiry has improved considerably, buyers now negotiating for quantities which are decidedly larger than anything placed within the last month or more. Steel Bars continue to be held at 1.60c., Pittsburgh, or 1.76c., New York.

Plates.—Locally this branch of trade is in the least satisfactory condition of any. Orders are small and far apart. Local consumers of Plates appear to be doing repair work exclusively and therefore are buying but sparingly. Prices of standard sizes of Plates are continued as follows, at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Old Material.—Dealers unite in reporting a better demand for almost all kinds of Old Material. Heavy Steel Melting Scrap appears to be in strongest demand, with sales aggregating over 5000 tons. Most of this Scrap has been sold for delivery to works in eastern Pennsylvania. The foundries are buying more freely, but so far orders coming to this market for Cast Scrap have been confined to foundries in the immediate territory. Even the rolling mills are now coming into the market to some extent, especially those which manufacture Wrought Iron Pipe. Cast Borings and Turnings are strong, as the supply continues short owing to the slackness of work among the machine shops. Relaying Rails are in some request, but buyers are looking for special weights or sections. Old Car Wheels are most neglected, the demand being slight, while the supply is exceedingly abundant. Quotations are about as follows per gross ton, New York City:

Old Girder and T Rails for melting	$11.50 to $12.00
Heavy Melting Steel Scrap	11.50 to 12.00
Old Steel Rails, rerolling lengths	11.50 to 12.00
Relaying Rails	20.25 to 21.25
Old Iron Rails	14.50 to 15.00
Standard Hammered Iron Car Axles	16.00 to 16.50
Old Steel Car Axles	14.50 to 15.00
No. 1 Railroad Wrought	12.00 to 12.50
Iron Track Scrap	10.00 to 10.50
No. 1 Yard Wrought, long	11.00 to 11.50
No. 1 Yard Wrought, short	10.00 to 10.50
Light Iron	5.00 to 5.50
Cast Borings	5.00 to 5.50
Wrought Turnings	6.50 to 7.00
Wrought Pipe	9.50 to 10.00
Old Car Wheels	12.00 to 13.00
No. 1 Heavy Cast, broken up	13.00 to 14.00
Stove Plate	9.00 to 10.00
Locomotive Grate Bars	10.00 to 10.50
Malleable Cast	11.50 to 12.50

Cast Iron Pipe.—The Board of Contract and Supply of Syracuse, N. Y., is advertising for proposals, to be received

until 1.30 p.m. June 1, for furnishing Cast Iron Pipe for the conduit line from Skaneateles Lake to the city of Syracuse. Bids are being received for 20,000 tons of 30 to 42 in. Pipe in quantities of 5000 tons. The city of Rome, N. Y., is also advertising for 3745 tons of 30-in., proposals to be received until 12 o'clock noon, June 10. These are the only large contracts in sight in this territory, but the general demand is considerably better. Carload buying is much more active and the disposition to purchase appears to be extending. Even the railroads are making some purchases. While it is possible to secure carload lots of 6-in. from some foundries at $23.50 to $24 per net ton at tidewater, most of the manufacturers are now asking an advance of at least 50c. per ton.

The New York offices of the American Spiral Pipe Works, manufacturer of Taylor's spiral riveted pipe, have been moved from 39 Cortlandt street to larger and better equipped offices in the Hudson Terminal Building, 50 Church street. F. B. Sanborn is in charge. This pipe is furnished 3 to 40 in. in diameter up to ¼ in. in thickness, and for pressures up to 500 lb.

Metal Market.

NEW YORK, May 27, 1908.

Pig Tin.—Business during the week has been of small proportions. The heaviest buying season of the year has passed, and it may be that the Tin Plate mills will not run as actively after July 1 as they have during the last month. Trade was eagerly awaiting the result of the Banca sale, which occurred Tuesday, and went at the equivalent of the low figure of 28.45c., c.i.f. New York. The arrivals so far this month have been large, amounting to 3815 tons, and there are afloat 1772 tons. Deliveries into consumption will probably be large and amount to at least 3800 tons. Price changes during the week have been toward lower levels, as follows:

	Cents.
May 20	30.15 to 30.30
May 21	29.55
May 22	29.60
May 25	29.00
May 26	28.95
May 27	28.50

The London market declined further to-day, closing at £128 5s., for spot, and £127 2s. 6d., for futures. This was caused by the announcement that shipments from the Straits for May would break all records, at 6800 tons.

Copper.—Neither domestic nor foreign consumers appear anxious to buy at present levels, although prices have receded somewhat from the figures of last week. Lake can be had at 12.87½c., while stray lots have been offered as low as 12.75c. Electrolytic is available for domestic consumption, at 12.62½c. As yet there has been no appreciable demand from speculative interests for Copper. While a little more activity is noted among consumers, the increased production now coming on the market more than offsets this. In the mining camps considerable headway has been made in reducing the cost of production. The exports continue good, amounting to 19,200 tons so far this month, but these are still considerably below the heavy exports earlier in the year. Prices abroad are about £1 lower than last week, at £56 17s. 6d., for spot, and £57 10s. for futures. The Anaconda report last week shows the stress through which Copper producers passed last year.

Spelter.—The market for Spelter is apparently more unsettled and demoralized than at any time since the October drop. Prime Western is available in the West at 4.40c. to 4.45c., and in New York at 4.55 to 4.60c. Stocks continue to accumulate.

Pig Lead.—The price of Lead has been further advanced to 4.35c., New York, but it is doubtful how much more boosting the market will stand, as there is much Lead in the hands of speculative interests bought at considerably lower figures. Should any further advance be made this is likely to come on the market, if it has not done so already. Lead in St. Louis is quoted at 4.20c. to 4.30c. All sellers are quoting the same prices.

Old Metals.—The decline in ingot Copper has frightened buyers who are now waiting to see how far it will go. Export orders continue fair. Dealers' selling prices are as follows:

	Cents.
Copper, Heavy and Crucible	12.00 to 12.50
Copper, Heavy and Wire	11.50 to 12.00
Copper, Light and Bottoms	10.50 to 11.00
Brass, Heavy	9.00 to 9.25
Brass, Light	7.00 to 7.50
Heavy Machine Composition	11.50 to 11.75
Clean Brass Turnings	7.50 to 8.50
Composition Turnings	9.50 to 10.50
Lead, Heavy	3.50
Lead, Tea	3.55
Zinc	3.50

Nickel.—The unchanged price of 45c. continues for ton lots, and 50c. to 60c. for smaller quantities.

Antimony.—An occasional change in the London price is the only excitement in that trade. Prices here are unchanged, at 8.75c. to 8.87½c., for Cookson's; 8.50c. to 8.75c., for Hallett's, and 8.25c. to 8.50c., for outside brands.

Tin Plates.—Business continues good, the new orders coming in being fair. Prices are without change, at $3.89, New York, and $3.70, Pittsburgh, for 100 lb. IC Coke Plates. Welsh Tin Plates are 1½d. lower in Swansea, at 12s. 3d.

Iron and Industrial Stocks.

NEW YORK, May 27, 1908.

The stock market experienced quite a setback on Thursday of last week, when not only the railroad stocks, but iron and steel stocks declined quite sharply from the prices realized on the previous day. Another weak day was Saturday. Republic preferred was particularly affected, declining to 66, with rumors that the quarterly dividend might perhaps be reduced. In nearly all instances some recovery occurred, but the range of prices now prevailing is materially below that ruling 10 days ago. The range of prices on active iron and steel stocks from Thursday of last week to Tuesday of this week is as follows: United States Steel common 36½ to 39, preferred 100 to 102⅞; Car & Foundry common 35¼ to 37⅞, preferred 97; Locomotive common 48¾ to 50¼, preferred 103; Steel Foundries common 6 to 7, preferred 34 to 34½; Cambria Steel 30⅜ to 31⅛; Colorado Fuel 26½ to 31⅜; Crucible Steel common 5⅝ to 6⅝, preferred 42 to 42⅛; Pressed Steel common 26½ to 28¾, preferred 84 to 85; Railway Spring common 36 to 37; Republic common 17 to 18¾, preferred 66 to 69¼; Sloss-Sheffield common 49½ to 51½; Cast Iron Pipe common 27½ to 28¾, preferred 73¾ to 75; Can common 5, preferred 54⅞ to 55. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 35⅞, preferred 100¼, bonds 96; Car & Foundry common 36½, preferred 97; Locomotive common 47¾, preferred 103; Colorado Fuel 26; Pressed Steel common 27, preferred 84¾; Railway Spring common 35; Republic common 17½, preferred 67½; Sloss-Sheffield common 50; Cast Iron Pipe common 27⅞, preferred 75¼; Can common 5, preferred 54½.

The Buffalo & Susquehanna Iron Company is reducing its funded debt by the redemption of $100,000 of its first mortgage 5 per cent. bonds, Nos. 101 to 200, inclusive, the necessary funds being taken from surplus earnings. Last year at this time the company redeemed a like amount of the same issue.

Dividends.—The General Electric Company has declared the regular quarterly dividend of 2 per cent., payable July 15.

The Cincinnati Foundry Foremen.—The Cincinnati section of the Associated Foundry Foremen held its most important meeting of the year on the evening of May 23 at the Palace Hotel. It was the annual gathering of the section, which includes foundry foremen from most of the foundries in Cincinnati and vicinity, taking in southern and central Ohio, northern Kentucky and eastern and southern Indiana. Additional interest was imparted to the occasion because it was also a meeting of preparation for the campaign to be inaugurated in behalf of Cincinnati for the next convention of the American Foundrymen's Association. The address of the evening was delivered by John Logan, superintendent of the foundry department of the National Cash Register Company, Dayton, Ohio, and it was so much appreciated that he was elected president for the ensuing year. Mr. Logan talked on "Daily Observations in the Foundry." He brought out many technical points not often discussed and developed some very instructive lines of practice. Other officers elected were as follows: Vice-president, George W. Piehl, Blymyer Iron Works Company, Cincinnati; treasurer, John C. Burns, Samuel C. Tatum Company, Cincinnati; secretary, F. W. Weissman.

A Large Coal Contract.—PITTSBURGH, PA., May 27, 1908.—(*By Telegraph.*)—The Washington Coal & Coke Company, Dawson, Pa., N. P. Hyndman, sales agent, Conestoga Building, Pittsburgh, has made a contract with the United Iron & Steel Company for 150,000 tons of coking coal to be shipped at the rate of 20,000 tons a month. The coal will be used by the buyer in making coke at its Cherry Valley Furnace, at Leetonia, Ohio, which started up last week after being idle several months. Reports that the Washington Coal & Coke Company would start up 1000 more coke ovens at its Star Junction Works, Star Junction, Pa., are untrue.

The International Nickel Company.

The International Nickel Company has issued its annual report for the year ended March 31, 1908. The income account, including constituent companies in America, compares as follows:

	1908.	1907.
Earnings from constituent companies	$2,434,952	$2,853,280
Other income	.....	369
Total income	$2,434,952	$2,853,649
Expenses, taxes, &c	149,583	164,186
Net income	$2,285,369	$2,689,463
Interest, sinking fund, depreciation, &c	960,627	899,964
Operating surplus	$1,324,742	$1,789,499
Preferred dividends	534,733	534,730
Surplus for year	*$790,009	$1,254,769

* Equal to 8.95 per cent. earned on the $8,822,661 outstanding common stock.

The profit and loss account shows as follows: Balance April 1, 1907, $1,755,617; surplus for year, $790,009; total surplus, $2,545,626; from which deduct reserve to cover accounts of foreign constituent companies, $28,826, reserve for depreciation, $300,000, leaving a profit and loss surplus on April 1, 1908, of $2,216,799.

During the past year $1,548,481 was expended for new construction, equipment and replacements. In the same period there has been provided out of earnings the sum of $478,576 for the following funds: Regular allowance for depreciation of plants, $215,975; exhaustion of minerals, $94,351, and bond sinking fund, $168,250. There has been appropriated from the surplus for further depreciation of properties, $300,000.

As the sales are either for cash or are guaranteed by selling agents, the company has not provided any contingent or reserve fund for the collection of outstanding accounts. As yet the company has suffered no losses.

All buildings that are not of fireproof construction are fully covered by insurance. In addition, a fund is being accumulated which at the end of a short time will be sufficient to enable the company to dispense with purchase of outside insurance.

The net profits for the fiscal year, after deducting expenses, depreciation, exhaustion of minerals, bond sinking fund and all other charges, were $1,324,742.

The Union Iron & Steel Company's New Owners.—By the purchase at auction in Cincinnati May 25 of $200,000 face value of the bonds of the Union Iron & Steel Company of Delaware, Rogers, Brown & Co. come into control of the corporation at a cost of $25,000. The company went into the hands of a receiver in September of last year. It was a survival of the $60,000,000 Union Steel Chain Company formed by Edward L. Harper, once vice president of the Fidelity National Bank of Cincinnati. The company has been only a small factor in the iron trade, although it has plants at Ironton, Ohio; Big Stone Gap, Va.; Chatham, N. Y.; Denver, Col., and Birmingham, Ala. The bonds are a lien on the Ironton property.

An Incorrect Report.—William G. Park, chairman of the Crucible Steel Company of America, Pittsburgh, and who was one of the receivers of the Clairton Steel Company, advises us that the printed statement that he, with the Union Trust Company, had sued for the sum of $150,000 each, for acting as receivers, and that the courts had granted to each the sum of $20,000, is untrue. Mr. Park says that the matter of compensation was left to the court, which decided that he and the Union Trust Company were each entitled to $20,000 for services, and he further states that he will turn this amount over to the Crucible Steel Company. An injustice was done Mr. Park in the printed statement that suit had been entered, which was not the case.

The Cunard turbine steamship Lusitania beat all records for the westward trip from Europe on its voyage ending at New York May 22, its time being 4 days, 20 hours and 22 minutes. Its average for the run was 24.83 knots an hour, and its best day's run was 632 miles.

A Building with Metal Lumber Framing.

A cement plaster twin dwelling house has been erected at Tuxedo Park, N. Y., which accentuates the use to which metal and noncombustible materials generally can be put in ordinary building construction. Perhaps its most interesting feature lies in the use of metal instead of wood for its frame work. The method of construction is similar to what is known as wood balloon framing, but the structural parts consist of specially designed sheet steel shapes made to serve as the uprights and the roof rafters, these shapes being given the name of metal lumber. The floors and roofing are made of what is known as ferrolithic plate which is metal in a somewhat corrugated form, this metal being covered with concrete plaster as the wearing finish. The exterior and interior surfaces of the building are concrete and plaster respectively, and these are applied to expanded metal lath which is fastened in the usual way to the so-called metal lumber. The structure proper thus has no combustible material in its make up with the exception of the wood trim.

After the foundation walls of concrete were completed, a steel channel track was attached to the foundation by means of expansion bolts. The erection of the studs for the exterior walls was commenced at the corners, special corner studs being first placed in position. The bottom of these studs was placed in the channel track on the foundation, the flanges of the studs were riveted to the flanges of the track and the spaces between the studs were filled in with concrete to a depth of 1½ in., thus anchoring the studs to the foundation. Six inch studs were used for the exterior walls and extended from the foundation to the roof line. Four inch studs were employed for the interior partitions. The first floor was constructed of ferrolithic plate as mentioned, plastered underneath and concreted to a depth of 2½ in. on top. These floor plates rest on concrete girders having a special reinforcement. The girders were in turn supported by concrete piers. In the second floor construction specially designed I-joists 5 in. deep were employed, these joists resting on an angle wall ribbon which was riveted to the exterior studs at the second floor line. The top joists were formed of 6 in. channels and extended 2 ft. over the outer line of the building. The metal rafters were 6 in. in depth and the ferrolithic plates of the roof construction were plastered underneath and concreted above with cement mortar and covered by asbestos waterproofing material attached by heavy pitch. The rafters, joists and studs were braced with strap steel bridging.

Various steel members of the construction were cut to the desired lengths at the factory and erected on the field by means of erection derricks, similar to those in structural steel building. The finished floors were of wood secured to the joists or reinforced concrete floors by means of nailing blocks. The stair forms were constructed of ferro-lithic plate concreted to form treads and risers, and provided with nailing blocks for attaching wood finish. The chimney contains four flues of terra cotta, and the hot air ducts for the heating system were carried up in the partitions, as they would be in a wood constructed building.

The steel construction was designed by H. M. Maugle, Canton, Ohio; the contract was executed by Taft-Howell Company, Cornwall Landing, N. Y., and the structural materials were furnished by the Berger Mfg. Company, Canton, Ohio.

The United States battleship Michigan was successfully launched by the New York Shipbuilding Company, Camden, N. J., May 26. The Michigan is the first of the "all big gun" battleships being built for the Government. It has a displacement of 16,000 tons, and the main battery will consist of 8 12-in. rifles.

The Niles Car Mfg. Company, Niles, Ohio, has received an order for two electric street cars for the Milwaukee Northern Railroad, to be duplicates of cars built last year, and an order for two express cars for the Pittsburgh Interurban Line. The plant is now operating to about full capacity.

The Machinery Trade.

NEW YORK, May 27, 1908.

More inquiries were reported in the trade the past week, and though practically all of them covered small lots of tools they indicate an upward tendency. This increased activity on the part of the smaller buyers, together with better reports from traveling salesmen, has created a more optimistic feeling among machinery houses. Actual business, however, has not increased to any extent. The little being done by the railroads and larger corporations is not encouraging. But few new projects of magnitude have developed since our last report and they are being followed closely by the trade. Among them are the new shops for the Idaho & Washington Northern Railroad, for which Westinghouse, Church, Kerr & Co. will do the buying, and the improvements to be made by the Third Avenue Railroad. Some houses which pay particular attention to export trade report a better demand. The Chicago Pneumatic Tool Company has received some good orders for air compressors from Europe.

Idaho and Washington Northern Railroad's New Shops.

Plans have been completed for the new shops to be constructed at Spirit Lake, Idaho, for the Idaho & Washington Northern Railroad and purchases of the machine tool equipment for these shops will soon be made. The entire plant will cost about $100,000 and will be modern in every respect. The contract for the construction and equipment of the shops has been placed with Westinghouse, Church, Kerr & Co., New York, who will undoubtedly soon place orders for a considerable amount of machine tool equipment, including wheel presses, lathes and all necessary machinery to constitute a complete machine and erecting shop equipment. We understand that the equipment has not yet been purchased. The engineering firm is getting ready to start work of constructing the plant, which will consist of a machine and erecting shop, 70 x 210 ft.; blacksmith shop and boiler room, 40 x 97 ft.; storeroom and office, 30 x 120 ft.; nine-stall roundhouse, 10-pocket coal chute with inclined trestle, 75-ft. turntable and smaller buildings. The construction of these shops has been in contemplation for some months and the trade has been following the matter closely, especially since the contract has been awarded to the New York house, as it will mean the purchase of a considerable amount of machine tool equipment in this territory.

Preliminary plans have been prepared by the Canadian Northern Ontario Railroad, Toronto, Ont., for the erection of new shops on Eastern avenue, but it has not yet been decided to go ahead with the work. W. P. Chapman is resident engineer.

The large amount of money to be spent in improving the Third Avenue Railway in New York will necessitate the purchase of considerable mechanical equipment. The receiver has been authorized to issue certificates to an amount not to exceed $2,500,000 for the improvements, of which $300,000 is to be spent for repairs to cars and for purchasing new motors, controllers and other electrical equipment; $436,000 for renewals and repairs and maintenance of tracks and electrical equipment; $225,000 for the erection of a new power station at 161st street, and $225,000 for the erecting of a new power station upon a suitable site, to be determined by the receiver, in the neighborhood of the Kingsbridge plant of the Union Railway Company.

What is probably one of the largest developments in the way of machinery requirements to come before the trade in this vicinity for some time will develop within the next few weeks, when James Stewart & Co., 135 Broadway, New York, will take bids on equipment for a large plant to be erected by the Cramp Dry Dock Company at Norfolk, Va. This enterprise will constitute a general ship repairing plant, and its construction and equipment will cost about $500,000. Preliminary bids are now being taken on dredging, filling, bulkheading and piling work and the construction of two marine railways. A good sized machine shop is included in the requirements, and plans for this and the rest of the equipment are being prepared under the supervision of J. A. C. Groner, who is the engineer in charge. The full details as to the company's requirements have not as yet reached the office of James Stewart & Co., where it is understood all bids are to be received.

Among the important inquiries received in the trade the past week was that sent out by the Department of Water Supply, Gas and Electricity, New York, covering 10 tools. This equipment, bids for which are to be opened June 10, is required for one of the Brooklyn stations. The machines on which figures are being prepared include one 42-in. vertical boring and turning mill, one 18 in. by 10 ft. quick change gear engine lathe, one 24 in. by 14 ft. quick change gear engine lathe, one 11 in. by 5 ft. speed lathe, one 14-in. upright sensitive drilling machine, one 3¼-in. wet drill grinder, one 20-in. water tool grinder, one 100,000-lb. vertical screw power testing machine, motor driven; one improved recording machine and one 18 in. by 6 ft. improved turret lathe.

Plans are being made by the firm of Robert H. Ingersoll & Bro., New York, watch manufacturers, for making some machinery additions and power alterations in the plant of the Trenton Watch Company, which was acquired by the firm two weeks ago. This plant, which was in fair working order, is to be overhauled and later on perhaps some substantial additions will be made. At present the company has in contemplation the installation of about 150 hp. in boilers and engines and the equipment of the plant throughout with proper electric lighting facilities and motor drives. This will necessitate a good sized motor order, and later on perhaps some machine tools and similar equipment will be added. Eventually the company will make substantial additions to the plant. The company's Trenton establishment will be used for making watches costing from $10 to $12 each, and at present it is equipped to turn out about 600 watches of this class a day. Charles H. Ingersoll, Jr., who is a member of the firm, is in charge, and he is at present dividing his time between the company's Trenton plant and the New York office at 45 John street.

Preliminary surveys are being made under the direction of J. G. White & Co., 43 Exchange place, New York, for developing the water power of the Horsepasture Creek in west North Carolina. These surveys are being made for the purpose of looking into the feasibility of developing the power of this stream for distribution in the vicinity for factory and lighting purposes. It is estimated that about 50,000 hp. can be developed, and if it can be shown that there is sufficient demand for it the project will proceed at once.

The Hudson Valley Construction Company, Troy, N. Y., has a contract for building a good sized power house for the Schaghticoke Electric Company at that place. Viehle, Blackwell & Buck, 49 Wall street, have been engaged as consulting engineers, and it is understood that the details will be worked out and probably the purchasing done at the Hudson Valley Construction Company's office at Troy.

Contracts have been awarded for building five of the six sections of the Fourth Avenue Subway in Brooklyn, bids for which were received a few weeks ago. The successful bidders are William Bradley, New York, section 2, extending from Willoughby street to Ashland place, $3,494,714, and contract No. 3, extending from Ashland place to Sackett street, $3,600,226.50; E. E. Smith Contracting Company, New York, contract No. 4, extending from Sackett street to Tenth street, $2,490,205.30, and contract No. 6, extending from Twenty-seventh street to Forty-third street, $2,982,647.80; Tidewater Building Company and Thomas B. Bryson, New York, contract No. 5, extending from Tenth street to Twenty-seventh street, $2,196,716.50.

Business Changes.

The New York offices of the Warner & Swasey Company, formerly located in the Singer Building Annex, have been removed to the new Singer Building Tower, on the twenty-fourth floor.

Chicago Machinery Market.

CHICAGO, ILL., May 26, 1908.

A review of the trade in machinery lines for the past week fails to disclose anything that can be confidently regarded as indicative of positive permanent improvement. As has been the case for some time past the orders are principally for individual tools or supplementary equipment of various kinds. Here and there, however, some of the larger manufacturers have been favored with new business, which has included some fair sized units in steam and electric generative and motive power machinery. While such orders are helpful in the present situation the fact remains that they are not coming out in sufficient number to warrant the increase of working forces of even the most favored shops. In reply to an inquiry concerning the most fruitful source of machinery orders a prominent manufacturer stated that a tabulation of recent purchases showed a good percentage in favor of coal mines, stone crushing and cement machinery and saw mills, the demand from the latter being principally from the Northwest. Since it is well known that on account of the dull season and the added effects of the industrial depression work in the coal fields is greatly curtailed, it is assumed that operators are taking advantage of the lull to overhaul and renew their machinery equipment. Considering the high pressure under which such plants have been worked during recent prosperous years there is undoubtedly ample room for such renewals in many mines. The development of timber properties in the Northwest, extending up into the British possessions is a natural result of expansion in that direction. The utilization of these timber properties calls for the establishment of extensive lumber mills, for the equipment of which considerable machinery has been and will be purchased.

No recent inquiries for round lots of machine tools have

appeared in the market, and the business is in the main dependent upon scattering requirements of the general trade. In spite of the existing quietness there is no evidence of the deep feeling of discouragement among dealers. None, it is true, is looking for a quick and powerful reaction, but many are convinced that a turn of the tide is not far away. The railroads continue to be conspicuous by their absence in the market for tool requirements of any note. One or two Western lines are reported as contemplating some purchases after the end of their fiscal year, which terminates July 1. Their policy, it is understood, is to restrict expenditures for the current year to the closest possible limits in order to make as favorable a financial showing as possible. It is conjectured by those close in touch with railroad policies that a freer hand will be given purchasing agents after July 1, and the hope of increased business from the roads is in many quarters based on this expectation.

The Milwaukee Machine Tool Company, Milwaukee, Wis., which began business in December of last year, has perfected and is now putting on the market a new 16-in. plain engine lathe, known as the Milwaukee lathe. This tool is of extra heavy design and is provided with a new design of quick feed change attachments, which, together with other features of improvement, are aimed to make it an up to date and effective tool.

The plant of the Stephens-Adamson Mfg. Company, Aurora, Ill., making elevating, conveying and transmitting machinery, whose capacity was practically doubled last year, is now running 10 hr. per day but with reduced force. The company reports that shipments in May show considerable improvement over the first three months of the year and an increasing number of inquiries have been coming in in the past few weeks.

Within the past few days the Kempsmith Mfg. Company, Milwaukee, Wis., has booked orders for several good sized milling machines. While now running at about 50 per cent. capacity, the company reports that new business entered during the first two weeks of May is in excess of that of any like period in the last two months.

The Fred M. Prescott Steam Pump Company, Milwaukee, Wis., is erecting a new one-story pattern storage house, about 100 x 100 ft., designed to take care of surplus pattern accumulations. Among the recent orders booked by the company was one for a municipal pumping plant of fair capacity, installed in a northern Wisconsin city.

A contract has been awarded by the United States Reclamation Service to the Northern Electrical Mfg. Company, Madison, Wis., for furnishing electrical controlling apparatus for the operating of sluice gates in Laguna dam, Yuma irrigation project, California-Arizona. The amount of the contract was $4628.60.

Shipment has been made within the past week from the West Allis Works of the Allis-Chalmers Company, Milwaukee, Wis., of eight turbo-generator units of 9500-kw. normal capacity rating. Included in this shipment were two 1500-kw. units for the Youngstown Sheet & Tube Company, Youngstown, Ohio; one 1500-kw. unit for a Jacksonville, Fla., electric plant; one 500 and one 1000 kw. units, Celluloid Company, Newark, N. J.; one 1500-kw. unit, Tremont & Suffolk Mills, Lowell, Mass., and one 1000-kw. each for the Athens Electric Railway, Athens, Ga., and the Nairn Linoleum Company, Kearney, N. J. It is significant that all of these machines were built on orders placed since the beginning of the recent depression.

A 5-ton, three motor electric steel derrick, of 75-ft. radius and 60-ft. lift, has just been installed in the plant of the St. Louis Basket & Box Company, St. Louis, Mo., by the Northern Engineering Works, Detroit, Mich. This machine is of the high speed type, hoisting 60 ft. to 125 ft. per minute, with all its motions operated by electric motor. The derrick is located on the river bank to handle material from the river to the factory yard, and is supported by legs and frame of latticed steel construction.

The Oklahoma-El Reno Interurban Traction Company, Oklahoma City, Okla., and Kansas City, Mo., has recently been incorporated under the laws of Oklahoma with a capital stock of $2,000,000, for the purpose of constructing an electric interurban line between Oklahoma City and El Reno, a distance of 24½ miles. The company is soliciting information from firms selling rails, cars and electric railway equipment, timber, ties, poles, &c.

The City Council of Edmond, Okla., will receive bids until June 15 for machinery for a complete system of water works, to include two 125-hp. tubular boilers, two duplex steam pumps, one straight line air compressor, one feed water heater, two boiler feed pumps, 250 tons of cast iron pipe and other material.

The American Blower Company, Detroit, Mich., has not yet decided just what equipment it will have to buy for the large foundry which it recently purchased from the North-Western Foundry & Supply Company, and which it is thoroughly overhauling and remodeling, with the intention of making it a modern plant in every respect. The plant, which has a capacity of 50 tons per day, will be equipped with molding machines and the latest foundry appliances of every kind for the manufacture of castings used in the products of the American Blower Company.

Cleveland Machinery Market.

CLEVELAND, OHIO, May 26, 1908.

The past week has been a very quiet one in the local machinery and machine tool market, the volume of orders being less than during the preceding week. Sales were mostly confined to single tools in small sizes. While there are no large new inquiries in the market there is a fair volume of small inquiries coming in, but all inquiries are still very slow in materializing into orders. While there is nothing in the present condition of the market to cause the change, a better feeling seems to prevail among dealers than there has for some time. Current orders are mostly from small concerns, buying being pretty evenly divided among the various kinds of machine tools. The demand for sheet metal working machinery has kept up in fairly good shape during the entire spring, plants engaged in many lines of sheet metal work not being seriously affected by the depression.

The action of the dealers and builders of machine tools in reaffirming prices seems to meet general approval among the local manufacturers and dealers, but the settlement of the price question is not expected to stimulate activity, dealers going on the supposition that any one really wanting new tools could not afford to wait for several weeks to make purchases on the possibility that he might save a few dollars in the price.

From the offerings in the various parts of the State local dealers are picking up good sized stocks of second-hand tools at prices low enough to insure a good margin of profit. The demand for second-hand tools is only fair.

Conditions remain about stationary with builders of machine tools and manufacturers in general. Builders report no improvement in orders for machine tools, but more attention is being paid to special machinery, and some plants are fairly busy that would have little to do were they depending entirely on their machine tool business. Inquiries for heavy machinery are somewhat better and makers are encouraged with the outlook. There is a fair demand for small electric power equipment. The automobile industry shows some further improvement, and at least two local plants are running full with day and night shifts to complete their 1908 machines already under contract. There is some increase in the number of new industrial enterprises formed to engage in various metal working lines, but these new concerns as a rule are slow in carrying out their plans for the starting of new plants.

A slight improvement is noted in the jobbing foundry trade, although orders are still small and for immediate needs.

The Walworth Run Foundry Company has just completed a large addition to its plant on West Twenty-seventh street, Cleveland. A new building has been erected adjoining the company's old foundry, 50 x 170 ft., of brick, four stories high. It will be used for the casing ring, register and steel stamping departments and for cleaning, tumbling and molding rooms. The addition gives the company an increase of about 50 per cent. to its molding shop capacity. All the most modern equipment has been provided for the making and handling of the company's products. A railroad siding and elevator permits the easy loading of cars from every floor direct from the elevator. One floor is used entirely for the storage of patterns. The steel stamping department is an entirely new one with this company. Seven power punch presses have been installed and the company, in addition to doing its own stamping, is now in shape to turn out light steel stampings for the trade.

The Peter Gerlach Company, Cleveland, maker of barrel making machinery, reports that its business has not been affected by the recent depression and that its volume of business during the past few months has been as large as during the corresponding period a year ago. A very satisfactory volume of orders for this class of machinery is coming in from the South.

The Seaton Spring Wheel Company is being formed in Cleveland for the manufacture of a spring automobile wheel. The capitalization will be about $150,000. It is the intention for the present to have only an assembling plant. Men interested in the company have an assembling plant in Detroit, which will be moved to this city as soon as a site is secured. The parent company is located in St. Louis.

The National Nut & Bolt Lock Company, Cleveland, has been incorporated, with a capital stock of $40,000, by F. W. Schwentner, James A. Newkirk, Fred I. Hoff, W. B. Dennon and G. A. Phillips.

The Cleveland Steel Tool Company, formerly a partnership, has been incorporated under the same name, with a capital stock of $30,000. The death of P. S. Kennard, one of the partners, a few months ago, has been followed by the addition of some other interests. The incorporators are J. F. Doolittle, A. P. Fathergill, R. J. Venning, Edith L. Venning and Jennie C. Kennard.

The United Metals Casting Company, Cleveland, has been incorporated, with a capital stock of $10,000, to make plumbers' goods, automobile trimmings, &c., from a new composition of metal. The company is planning to start a foundry. The incorporators are W. C. Rhodes, C. F. Ackerman, Edith M. Fasig, Charles H. Taylor and C. F. Taplin.

The American Roll & Foundry Company, Canton, has increased its capital stock from $200,000 to $300,000.

The Twentieth Century Electric & Repair Company, Akron, recently organized to repair electrical machinery and to sell new machinery and supplies, has elected the following officers: C. L. Bigler, president and general manager; George J. Schaffer, vice-president; F. N. Hansen, treasurer, and J. M. Hassler, secretary. The company has fitted up a two-story factory at 822 Coburn street, South Akron.

The American Railway Signal Company reports a very satisfactory increase during the past few weeks in inquiries for block system equipment for railroads. The company has recently installed its system of block signals on the Pennsylvania Railroad between Cleveland and Alliance.

Some of the excess machinery of the Toledo plant of the Pope Motor Car Company has been purchased by Cleveland machinery dealers. It is reported that an offer of $400,000 has been made for the plant, but that the receivers consider the offer about $200,000 too low.

Cincinnati Machinery Market.

CINCINNATI, OHIO, May 26, 1908.

An easier undertone to the iron market generally lends a feeling of encouragement to the tool manufacturers who have returned from the conventions to their shops and begun preparations for their mid-year inventory of conditions, of which attention to the castings contract is one of the most important. There is considerable interest among all classes who deal in iron, either in its crude or finished state, as to what the future will develop in the matter of the new uniform contract, which is now up to the furnaces for signing, when the buying movement commences. So far as can be learned through the various agencies and brokers of iron none of the Iron Buyers' Association has been successful in buying iron on the new form, which has been out several weeks. About all the iron that has been coming into this market for six months has been on old contracts, of course excepting the pipe makers and a few stove makers. The local foundries which devote the major part of their time and forces to the manufacture of castings for the machine tool makers have just begun to feel the market for their latter half-year needs. A few of the tool manufacturers have practically concluded to begin work on tools for stock. A number of new tools, which their designers and developers had intended to put on the market late in last year or early this one and have been awaiting a more favorable time for announcing them, will be made ready for publication directly after the turn of the half year.

In the local machinery sales departments very little actual improvement is noted, but inquiries are more favorable and the future looks much more promising than it did at the same time last month. While a few manufacturers have increased their forces a trifle, others have reduced them, so that the conditions in this regard may be said to be unchanged. In the line of power transmission specialties the improvement has been slow but steady, and this line bids fair to be among the first to resume normal conditions.

The second-hand dealers are carrying good sized stocks and business with them has been fair to good, with little or no cutting reported, except in cases of other than standard tools.

The Engineers' Club celebrated guests' night at its rooms on Thursday night, May 22, with James Albert Green of Matthew Addy & Co. as speaker. Business was dispensed with and the entire evening given up to a hearing of Mr. Green's delightful talk and reminiscences of a trip with the combined commercial clubs of Cincinnati, Boston and St. Louis to the Canal Zone about a year ago. The lecture was illustrated with a series of interesting slides.

The property of the Crown Drilling Company at Akron, Ohio, is being disposed of at private sale by George W. Billow, the receiver, who has 90 days in which to wind up the affairs of the company.

The Hooven, Owens, Rentschler Company, Hamilton, Ohio, reports its plant operating on about 40 per cent. of normal capacity and force with some indirect export trade.

The F. W. Spacke Machine Company, Indianapolis, manufacturer of air compressors, motors and gasoline engines, reports business good for the past 30 days and that it has added 20 per cent. to its manufacturing equipment since January 1. The company is at work on some new machines and is running a day shift full time, with a small night force in addition.

The Piqua Blower Company, Piqua, Ohio, reports that its plant has been almost continuously occupied the past six months, during which time it has secured some nice contracts for rolls, presses and roofing machines, in addition to its regular blower business. The company recently secured an order from the Hornbrook-Price Company, Indianapolis, Ind., for one of its large presses and dies for early delivery.

The Hetherington & Berner Company, Indianapolis, Ind., manufacturer of asphalt and tile machinery, also steel work, is gradually improving all departments of its business, which began with the erection of a new structural steel shop and power house last year.

The Buckeye Steel Castings Company, Columbus, Ohio, which has been operating one of its furnaces for some time on double turn, is contemplating starting another early in June or within a few weeks, to take care of a satisfactory increase of orders. A new steel pattern shop is one of the early improvements.

The wholesale scrap iron and metal concern of Simon Bohn, Louisville, Ky., will hereafter be known as Simon Bohn's Son. B. S. Bohn, the son, has taken over the management of the business, which is located at 220 Fifth street.

Bids are being taken by the Reliance Engineering Company, Cincinnati, Ohio, for machinery, engines, boilers and other equipment for the $50,000 plant of the Spencer Light, Power, Heat & Water Company, Spencer, Ind. Bids will be closed this week on 300 tons of 4, 6 and 8 in. cast iron pipe, and soon for centrifugal pump, direct acting pump, boiler feed pump, air compressor, 200-hp. engine, arc and incandescent lamps, transformers, poles, wires, &c. The Allis-Chalmers Company secured the contract for the 150-hp. generator.

Philadelphia Machinery Market.

PHILADELPHIA, PA., May 26, 1908.

Developments looking toward any genuine improvement in the demand for machinery and tools in this territory are not pronounced. Inquiries are not numerous, and such as are received by the trade are usually for equipment of a minor character. The week, therefore, has not brought any increased activity, and business is practically stationary. The railroads and the larger industrial plants show no disposition to enter the market. Railroad shops are running short handed, and industrial establishments show but little improvement, and until these interests, which constitute a good share of the tool buyers, come into the market, trade will naturally continue dull. New plants are not being projected at this time, except those of a small size, which, when they do come into the market, take small quantities and usually small tools. Some encouragement is taken by the trade from the increased activity in the iron market, but this must not be taken too seriously at the moment, as it will require some time and continued active buying to get back to anything like normal conditions in that branch of the trade. Foundries and steel mills are hardly as active as would appear on the surface, many still being operated on less than a 50 per cent. basis, and it will require more active conditions than are now apparent for the machinery trade to be benefited to any extent from those sources.

In some directions it is believed that buying would result without much delay, could future conditions be discounted, but those disposed to make purchases hold their orders back pending further developments. Sales during the week, therefore, have been light and confined closely to the smaller tools. Orders for a few heavy tools, a few milling machines, a boring mill and some special tools are noted, but the general line of standard tools was pretty generally neglected.

The convention of the National Machine Tool Builders, at Atlantic City, N. J., last week, commanded a considerable share of attention on the part of both local builders and merchants. Uniform cost accounting was given particular attention by the members. It may be said that prices have been well maintained, particularly when the extreme desire for business on the part of many manufacturers is considered. The expression is general that prices of tools will be maintained.

Manufacturers in this territory report no particular increase in orders, the business received being more or less scattered, and the plants continue to be operated with reduced force. Some tool builders have but a small amount of work ahead, and are dependent on week to week business to maintain their present production; others are more favorably situated and have enough to keep them going 30 to 60 days. Builders who are able to keep full forces employed are few.

Second-hand machinery and tools continue in good demand. Buyers canvass this field pretty thoroughly and fre-

quent sales are reported by the dealers. The business is confined, however, to tools of the medium and smaller classes and sales are usually single tools.

The engine and boiler trade reports no change in general conditions. There is some demand for boiler equipment in the larger capacities, but not much business has developed for the medium and small power equipment.

No material improvement is to be noted in the foundry trade. Machinery castings are in light demand, while other branches of the trade show no betterment to speak of. Orders for both steel and gray iron castings are few, and usually placed for prompt shipment. No contracts for forward delivery have been made, consumers not being inclined to anticipate their requirements.

Proposals will be received by the Commissioner of Health of the State of Pennsylvania until 5 p.m. June 9, for the construction of a water works system for the Pennsylvania State South Mountain Sanatorium, near Mont Alto, Franklin County. The work includes a reinforced concrete reservoir of 300,000-gal. capacity; two concrete collecting wells of 40,000 and 7500 gal. capacity, respectively; a pump house, with two triplex pumps, driven by gasoline engines; 5000 ft. of 6-in. cast iron pipe lines; 4000 ft. of 4-in. pipe lines; 10,000 ft. of 3-in. and 2-in. pipe lines, together with all appurtenances and connections to the existing water system. Copies of specifications and plans may be obtained from Samuel G. Dixon, Commissioner of Health, Harrisburg, Pa., upon depositing $25, which will be returned upon the return of the plans and specifications.

T. P. Conard & Co. report an increased demand for boilers, particularly those of the larger capacities. Railroad and contractors' buying has been light, although there is some little inquiry from the latter source and a sale of a large concrete mixer is to be noted. Several Maxim water tube boilers have been recently sold, one of which was for an installation of 3500 hp. The outlook as far as the boiler trade is concerned is considered encouraging.

Norristown, Montgomery County, Pa., will, it is understood, soon erect a garbage disposal plant, the sum of $25,000 having been set aside for that purpose. A new filter plant is also proposed, for which the site has already been acquired.

The Commissioners of Fairmount Park, Philadelphia, will receive proposals until May 29 for furnishing a steam road roller for use in the park. A quantity of fencing, railing and columns for use in the Zoological Gardens are also required. Specifications may be obtained from J. T. Vogdes, chief engineer, rooms 127-129, City Hall.

The Zephyr Ventilator Mfg. Company, which took over the business of the National Tool & Stamping Company some time ago, is making plans to engage more particularly in that particular branch of work. Some new equipment has been added so that the company is now prepared to handle promptly sheet metal stamping and drawing of every description.

The Baldwin Locomotive Works still continues to operate six days a week, 5 hr. per day, employing about 5000 men. Some little new business has been taken, among which was an order for six mogul locomotives for the Iowa Central Railroad. Railroads generally, however, still withhold orders for engines, although considerable work in the way of repairs is coming out. Most of the business taken is for single engines, largely for industrial plants and some of the minor railroads.

New England Machinery Market.

WORCESTER, MASS., May 26, 1908.

The machine tool dealers will undoubtedly reach larger totals in their sales for May than any month since the year opened. Some fair orders have been booked the past week, and sales of individual machines and second-hand tools have been more numerous. This is not considered to mean, however, that a change has taken place which will intensify during the summer, but rather the usual relative importance of the month of May. General business in this section seems to have stiffened up to some extent. Nearly everyone reports that the outlook seems brighter, though there is nothing actually tangible in the reasons offered to support the view. Certainly a much greater confidence prevails.

Orders are being booked by the dealers from concerns with which they have had but slight business relations in the past, because the salesmen in their greater activity have spent a good deal of time on possible customers who had previously been neglected. One very comfortable order was received a few days ago from a company which had been given little or no attention from the house until times became dull. Persistent effort brought an order which has not been duplicated many times in recent months. This new missionary work will be of important advantage to those who have carried it out consistently.

The New England machinery builders express the greatest satisfaction at the sentiment regarding the maintenance of prices which prevailed unanimously among the members of the National Machine Tool Builders' Association during the meeting at Atlantic City last week. This meeting and that of the suppiy associations have done a great deal of good in bringing together the manufacturers for the purpose of interchanging ideas on various matters, especially as to prices. The announcement in *The Iron Age* of last week that certain machinery builders had even advanced their prices was received with evident pleasure. There is in evidence a feeling of increased confidence begot from the expression by manufacturers from all parts of the country, and this is accentuated by a slightly increased demand for machinery and a new influx of inquiries. The unanimity of sentiment among the steel manufacturers as to maintaining their prices, which was brought out at the meeting in New York last week, is regarded as another important indication of the general feeling in industrial circles. Altogether a general strengthening of sentiment in New England has resulted from the co-operative efforts of the several important organizations which have recently been in conference.

Machinery Requirements of Lowell Textile School.

The Lowell Textile School, Lowell, Mass., will require a 50 kw. steam turbine in addition to other new equipment, an appropriation for which was recently obtained from the Massachusetts Legislature. The management states that no preference exists as to type of turbine, nor is the amount of power restricted to the exact size specified. The machine tool list is as follows: One 14 in. by 6 ft. standard engine lathe, fitted with 12-in. four-jaw independent chuck; one 14 in. by 6 ft. quick change engine lathe, fitted with 12-in. four-jaw combination chuck; one 18 in. by 10 ft. standard engine lathe, with taper attachment, fited with 18-in. four-jaw independent chuck; one 11 in. by 5 ft. speed lathe, with compound rest, fitted with 17-32 in. drill chuck; one 11 in. by 5 ft. speed lathe, without compound rest, fitted with 17-32 in. drill chuck; one 20-in. upright drill, back geared and power feed, fitted with 1 in. drill chuck; one 14 in. sensitive drill, fitted with 17-32 in. drill chuck; one 24 x 24 in. by 6 ft. planer, with 18 in. planer chuck; one universal milling machine with three feeds, automatic; one 20-in. wet tool grinder and wheel; one twist drill grinder; one two-wheel 12-in. grinder and wheels; one 36 x 6 in. grindstone frame with stone; one centering machine, capacity 4 in., with four-jawed chuck; one power hack saw; six 4-in. swivel jaw and base vises; one 16 in. by 8 ft. pattern makers' lathe; one single saw bench; one 36-in. band saw; two pattern makers' vises; two portable forges, 36 x 28 in.; two steel anvils, 150 lb.; two blacksmiths' post vises. It will be noted that the equipment is all full size, following the plan of the engineering schools rather than that of the manual training and many of the trade schools. The establishment of this department of a school whose function is to train young men for the textile industry emphasizes the important part played by the machine shop in the textile mills. Graduates of the school have time after time brought to the attention of the management the need of this department of training, as taught by their own experience, and the management of the school has for some time been trying to get the necessary funds for the purpose, the effort now being crowned with success. The statement is frequently made that the management of a textile manufacturing establishment must give more attention to general engineering problems than those which deal more directly with their products, and consequently the textile schools are laying great stress on this branch of the training of their students.

An unverified dispatch from Pine Meadow, Conn., states that the Chapin-Stevens Company of that place, manufacturer of carpenters' tools, has entered into a combination with the Ohio Tool Company and the Sandusky Tool Company, and that the combination has bought the business of the Martin Dösher Plane & Tool Company, Saugatuck, Conn. The dispatch goes on to state that other concerns will be absorbed.

Another preliminary to the moving of the business of the W. D. Forbes Mfg. Company from Hoboken, N. J., to New London, Conn., is the incorporation of the business under Connecticut laws, with a capital stock of $160,000. The name will be unchanged. The charter authorizes the company to build boilers and engines. The work of erecting a new and larger plant will be hastened.

The Osgood Bradley & Sons Company, Worcester, Mass., car builder, is making tentative plans for the establishment of new works in that city, which will be on a much larger scale than the present establishment. The land occupied by the company's business is included in the property which will be taken by the New York Central Railroad in the abolishing of the city's grade crossings and the building of a new passenger station. It will consequently be necessary that other works be provided, as the company has contracts in hand which almost reach the extreme capacity of present manufacturing facilities for two years to come. Consequently provision will have to be made to replace the existing plant. The company states that the new works will be much larger, employing up to 1000 hands. The business is independent of the combination of car builders effected several years ago. One of the incentives for the maintenance of this position was

a contract awarded it by the New York, New Haven & Hartford Railroad for 100 cars a year for five years, totalling between $4,000,000 and $5,000,000. This contract has two years to run. The new plant will be larger than the 100-car capacity, however, to provide for other business. As to when the work of establishing the works will begin cannot be determined. It may be this year and possibly not until next. Everything depends upon the rapidity with which the work, already begun, of abolishing grade crossings is carried along. The company has not determnied upon a site for its works, but it has a place in mind, it is stated. The present equipment will be inadequate for the shops of the future, and doubtless the company will be a large purchaser when the time arrives that it must enter the machinery market.

One of the most important railroad announcements made in recent years in New England is that of the New York, New Haven & Hartford of its arrangement with the Canadian Pacific by which Western freight rates will be materially reduced for shippers, especially those of southern New England, where are located very important manufacturing interests. The new line will be on the differential basis, which makes possible a reduction of from 1 to 5 cents per 100 lb at the sacrifice of a certain amount of time in transit. Boston, Worcester and other cities on the Boston & Maine system have had the advantage of these rates for some time, but Providence and other centers of Rhode Island, southern Massachusetts and practically all of Connecticut have not been favored and will reap the advantage of the innovation. Freights will be diverted from the Pennsylvania, Lehigh and Lackawanna systems. While some of the places affected have enjoyed the differential of a rail and water route, to most of them the saving will be something hitherto impossible.

The Union Twist Drill Company, Athol, Mass., has completed its line of twist drills, with the exception of a few of the larger sizes, which are not in great demand just now. The company reports an unusual demand for new forms of cutters and an increasing number of orders for hobs for cutting spur gears. The works are running 45 hr. a week.

The Union Hardware Company, Torrington, Conn., is running full time in its roller skate and fishing tackle departments.

Government Purchases.

WASHINGTON, D. C., May 26, 1908.

An act making appropriations for the naval service for the fiscal year ending June 30, provides for the following equipment: New York Navy Yard and magazine at Dover, N. J., for machine tools, $10,000; Mare Island Navy Yard, machine tools, $50,000; Washington naval gun factory, for new and improved machinery, $150,000; machinery, Portsmouth, $30,000; Boston, $25,000; New York, $40,000; Philadelphia, $25,000; Norfolk, $25,000; Pensacola, $10,000; New Orleans, $10,000; Mare Island, $25,000; Puget Sound, $25,000; Cavite, $15,000; Olongapo, $25,000. Machinery and tools in the following equipment buildings which have been appropriated for and are nearly completed: At Charleston, S. C., $50,000; New Orleans, $25,000; Pensacola, $25,000; for the establishment of coal depots, $450,000; Portsmouth, electric plant extension, $20,000, and main central power plant, $9000; Boston, power plant extension, $150,000; New York, electric plant extension, $40,000, and central power plant, $115,000; Philadelphia, chemical power plant extension, $150,000; Washington, machinery for power plant extension, $12,000; Norfolk, electric plant extension, $50,000, central power plant, $200,000; compressed air system extension, $10,000; crane for building No. 23; Charleston, power plant, $7000, and central power plant, $15,000; New Orleans, central heating system, $10,000, and machine shop, $6000; Mare Island, central power plant, $100,000; Puget Sound, electric light plant extension, $5000; heating system, $6000; central power plant extension, $280,000, and foundry, $50,000; Pearl Harbor, Hawaii, construction of dry dock, $300,000; erection of machine shop, $100,000; one 100-ton floating derrick, $100,000; Naval Academy, Annapolis, additional pumps, &c., $40,000; naval magazine, Mare Island, compressed air locomotive, $3500; hoisting crane, $2000; additional machinery for torpedo factory, Newport, $50,000.

The appropriation for the army includes $7000 for the purchase of engines, generators, motors, &c., for the artillery service.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until June 13 for one 5000 cu. ft. air compressor and accessories for the League Island Navy Yard.

The Department of Agriculture, Washington, D. C., will receive bids until June 2 for a portable refrigerating plant.

The Isthmian Canal Commission will receive bids until June 15. Circular No. 443, for shop machines and other supplies.

The Isthmian Canal Commission will soon ask bids for one 5-ton, one 3-ton, two 1½-ton and two 1-ton pneumatic geared air hoists and other supplies.

The following bids were opened May 18, Circular No. 438, for machinery for the Isthmian Canal Commission:

Class 1.—Three locomotive coaling cranes—Bidder 7, American Hoist & Derrick Company, St. Paul, Minn., $18,642; 32, Brown Hoisting Machinery Company, New York, $24,600; 33, Browning Engineering Company, Cleveland, Ohio, $22,330.50 and $24,364.20; 74, Fox Brothers & Co., New York, $29,025; 98, Industrial Works, Bay City, Mich., $25,500; 101, Interstate Engineering Company, Bedford, Ohio, $22,800; 126, McMyler Manufacturing Company, Cleveland, Ohio, $30,900 and $31,800.

Class 2.—One steam hammer—Bidder 34, Buffalo Foundry & Machine Company, Buffalo, N. Y., $1,275; 65, Erie Foundry Company, Erie, Pa., $1,520; 74, Fox Brothers & Co., N. Y., $1,449 and $1,524; 100, International Electric & Engineering Company, New York, $1,625; 123, Manning, Maxwell & Moore, New York, $1,280; 146, Niles-Bement-Pond Company, New York, $1,226; 153, Joseph T. Ryerson & Son, Chicago, Ill., $1,636; 187, William Sellers & Co., Philadelphia, Pa., $1,485 and $1,175; 207, Vermilye & Power, New York, $1,250.

Class 3.—One radial drilling machine—Bidder 48, W. R. Colcord Machinery Company, St. Louis, Mo., $1,600 and $1,700; 74, Fox Brothers & Co., New York, $1,385, $1,460, $1,495, and $1,570; 75, Frevert Machinery Company, New York, $1,578 and $1,502; 123, Manning, Maxwell & Moore, New York, $1,510; 146, Niles-Bement-Pond Company, New York, $1,499; 155, C. T. Patterson Company, New Orleans, La., $1,650 and $1,754; 165, Prentiss Tool & Supply Company, New York, $1,570 and $1,675; 206, Vandyck-Churchill Company, New York, $1,565.

Class 4.—One planer—Bidder 48, W. R. Colcord Machinery Company, St. Louis, Mo., $1,500; 68, Fairbanks Company, New York, $1,365; 74, Fox Bros. & Co., New York, $1,374 and $1,335; 75, Frevert Machinery Company, New York, $1,449 and $1,537; 80, Garvin Machine Company, New York, $1,475; 123, Manning, Maxwell & Moore, New York, $1,325; 133, Motley, Green & Co., New York, $1,310; 146, Niles-Bement-Pond Company, New York, $1,437; 155, C. T. Patterson Company, New Orleans, La., $1,260 and $1,565; 165, Prentiss Tool & Supply Company, New York, $1,133 and $1,326; 187, William Sellers & Co., Philadelphia, Pa., $1,833; 206, Vandyck-Churchill Company, New York, $1,300, $1,410 and $1,465.

Class 5.—One engine lathe—Bidder 48, W. R. Colcord Machinery Company, St. Louis, Mo., $3,300, $3,400 and $3,575; 75, Frevert Machinery Company, New York, $1,898 and $2,449; 105, I. H. Johnson, Jr., Company, Philadelphia, Pa., $3,947; 123, Manning, Maxwell & Moore, New York, $3,239 and $2,500; 133, Motley, Green & Co., New York, $2,300 and $2,700; 165, Prentiss Tool & Supply Company, New York, $4,410; 165, Prentiss Tool & Supply Company, New York, $3,321 and $3,586; 194, Springfield Machine Tool Company, Springfield, O., $2,600; 206, Vandyck-Churchill Company, New York, $2,415.

Class 6.—One engine lathe—Bidder 48, W. R. Colcord Machinery Company, St. Louis, Mo., $1,550; 75, Frevert Machinery Company, New York, $1,096 and $1,393; 89, Hendey Machine Company, Torrington, Conn., $1,883; 105, I. H. Johnson, Jr., Company, Philadelphia, Pa., $1,593; 123, Manning, Maxwell & Moore, New York, $1,570; 133, Motley, Green & Co., New York, $1,275; 146, Niles-Bement-Pond Company, New York, $1,597; 165, Prentiss Tool & Supply Company, New York, $1,694; 169, Rahn-Carpenter Company, Cincinnati, Ohio, $1,176; 194, Springfield Machine Tool Company, Springfield, Ohio, $1,275; 206, Vandyck-Churchill Company, New York, $1,565.

Class 7.—One double punch and shear—Bidder 19, Bertsch & Co., Cambridge City, Ind., $1,860; 47, Cleveland Punch & Shear Works, Cleveland, Ohio, $1,435 and $2,100; 48, W. R. Colcord Machinery Company, St. Louis, Mo., $1,675; 74, Fox Bros. & Co., New York, $1,898, $1,599 and $1,405; 75, Frevert Machinery Company, New York, $2,211; 118, Long & Allstatter Company, Hamilton, Ohio, $1,275; 123, Manning, Maxwell & Moore, New York, $1,865; 157, Henry Pels Company, New York, $1,550; 123, Joseph T. Ryerson & Son, Chicago, Ill., $1,575; 206, Vandyck-Churchill Company, New York, $1,710; 214, Wickes Brothers, Saginaw, Mich., $2,169.58; 216, Williams, White & Co., Moline, Ill., $1,040, $1,260 and $1,630.

Class 8.—One universal crank shaper—Bidder 48, W. R. Colcord Machinery Company, St. Louis, Mo., $750; 68, Fairbanks Company, New York, $695 and $460; 74, Fox Bros. & Co., New York, $570 and $625; 75, Frevert Machinery Company, New York, $658 and $537; 89, Hendey Machine Company, Torrington, Conn., $628; 103, L. M. Jenne, Trenton, N. J., $700; 146, Niles-Bement-Pond Company, New York, $725 and $476; 164, Potter & Johnston Machine Company, Pawtucket, R. I., $854; 165, Prentiss Tool & Supply Company, New York, $866; 167, Queen City Machine Tool Company, Cincinnati, Ohio, $895; 194, Springfield Machine Tool Company, Springfield, Ohio, $652; 206, Vandyck-Churchill Company, New York, $876 and $715.

Class 9.—One sliding head drill press—Bidder 68, Fairbanks Company, New York, $210; 74, Fox Bros. & Co., New York, $120; 123, Manning, Maxwell & Moore, New York, $230; 146, Niles-Bement-Pond Company, New York, $225.

Class 10.—One pipe threading and cutting machine—Bidder 24, W. Bingham Company, Cleveland, Ohio, $550.79; 60, Drew Machinery Agency, Manchester, N. H., $1,120 and $378; 74, Fox Bros. & Co., New York, $1,074 and $572; 75, Frevert Machinery Company, New York, $567; 123, Manning, Maxwell & Moore, New York, $1,073; 146, Niles-Bement-Pond Company, New York, $855; 191, John Simmons Company, New York, $551.65; 206, Vandyck-Churchill Company, New York, $1,235 and $1,690; 207, Vermilye & Power, New York, $274.80.

Class 11.—One single head bolt cutter—Bidder 31, H. B. Brown Company, East Hampton, Conn., $594; 60, Drew Machinery Agency, Manchester, N. H., $908; 68, Fairbanks Company, New York, $855; 74, Fox Bros. & Co., New York, $675; 75, Frevert Machinery Company, New York, $859; 113, Landis Machine Company, Waynesboro, Pa., $800 and $840; 123, Manning, Maxwell & Moore, New York, $1,030; 155, C. T. Patterson Company, New Orleans, La., $888; 165, Prentiss Tool & Supply Company, New York, $663; 206, Vandyck-Churchill Company, New York, $810.

Class 12.—One cold saw—Bidder 73, George S. Fowler, Washington, D. C., $615; 74, Fox Bros. & Co., New York, $759 and $834; 146, Niles-Bement-Pond Company, New York, $435, $836 and $972; 165, Prentiss Tool & Supply Company, New York, $684; 168, Quincy-Manchester Sargent Company, Plainfield, N. J., $615; 183, Joseph T. Ryerson & Son, Chicago, Ill., $640; 206, Vandyck-Churchill Company, New York, $650, $710 and $800.

Class 13.—One drill grinder—Bidder 48, W. R. Colcord Machinery Company, St. Louis, Mo., $120; 68, Fairbanks Company, New York, $115; 74, Fox Bros. & Co., New York, $153, $155 and $124; 75, Frevert Machinery Company, New York, $142; 123, Manning, Maxwell & Moore, New York, $162; 187, William Sellers & Co., Philadelphia, Pa., $290 and $345; 206, Vandyck-Churchill Company, New York, $60, $100 and $155.

Class 14.—One valve reseating machine—Bidder 24, W. Bingham Company, Cleveland, Ohio, $175; 60, Drew Machinery

Agency, Manchester, N. H., $170.50; 67, Excelsior Equipment Company, Pittsburgh, Pa., $150 and $175.75; 74, Fox Bros. & Co., New York, $175; 107, E. F. Keating Company, New York, $250; 111, Knox & Bro., New York, $175; 123, Manning, Maxwell & Moore, New York, $175; 132, Montgomery & Co., New York, $175; 133, Motley, Green & Co., New York, $175; 177, J. B. Roache, New York, $175; 189, Sherman-Brown-Clements Company, New York, $175.

Class 15.—One emery grinder—Bidder 74, Fox Bros. & Co., New York, $256; 75, Frevert Machinery Company, New York, $249; 207, Vermilye & Power, New York, $179.50.

Class 17.—Two portable cylinder boring machines—Bidder 24, W. Bingham Company, Cleveland, Ohio, $940; 60, Drew Machinery Agency, Manchester, N. H., $1,027; 74, Fox Bros. & Co., New York, $525; 75, Frevert Machinery Company, New York, $870; 133, Motley, Green & Co., New York, $900; 165, Prentiss Tool & Supply Company, New York, $555.

Class 18.—One portable hydraulic crank pin and small wheel press—Bidder 36, Camden Iron Works, Camden, New Jersey, $590; 74, Fox Bros. & Co., New York, $649; 123, Manning, Maxwell & Moore, New York, $713; 181, H. A. Rogers Company, New York, $495; 206, Vandyck-Churchill Company, New York, $470.

Class 21.—Two boiler feed pumps—Bidder 10, American Steam Pump Company, New York, $170.26; 26, George F. Blake Manufacturing Company, New York, $90.28; 58, D'Olier Engineering Company, Philadelphia, Pa., $139 and $157; 60, Drew Machinery Agency, Manchester, N. H., $136 and $164; 69, Fairbanks, Morse & Co., Chicago, Ill., $125 and $140; 74, Fox Bros. & Co., New York, $127.90; 78, Gardner Governor Company, Quincy, Ill., $150; 123, Manning, Maxwell & Moore, New York, $325; 133, Motley, Green & Co., New York, $150; 134, National Electrical Supply Company, Washington, D. C., $254; 155, C. T. Patterson Company, New Orleans, La., $108; 207, Vermilye & Power, New York, $97.80.

The following bids were opened May 19 for machinery for the navy yards:

Class 1.—One milling machine—Bidder 135, Frevert Machinery Company, New York, $1240; 162, Harron, Ricard & McCone, San Francisco, Cal., $1,318; 262, Manning, Maxwell & Moore, New York, $1,325.

Class 36.—Twelve electric drills—Bidder 61, Chicago Pneumatic Tool Company, New York, $1,233; 73, Cincinnati Electric Tool Company, Cincinnati, O., $307.50 par; 74, James Card, Jr., Electric Company, Louisville, Ky., $1,332; 104, De Zousche, Hanson & Co., Philadelphia, Pa., $1,029; 135, Frevert Machinery Company, New York, $1,482; 142, R. W. Geidart, New York, $1,224; 162, Harron, Ricard & McCone, San Francisco, Cal., $1,161 and $1,198.80; 178, Hisey-Wolf Machine Company, Cincinnati, Ohio., $1,530 and $15,590; 227, Knox & Bro., New York, $1,530; 262, Manning, Maxwell & Moore, New York, $1,530; 329, Pacific Tool & Supply Company, San Francisco, Cal., $1,212; 416, United States Electric Tool Company, Cincinnati, Ohio, $1,290 and $1,332.

Class 102.—One duplex hydraulic pump—Bidder 20, Buffalo Forge Company, Buffalo, N. Y., $1,799; 40, Bethlehem Steel Company, South Bethlehem, Pa., $2,700; 53, Blake & Knowles Steam Pump Company, New York, $2,987.50 and $2,230.50; 97, Drew Machinery Agency, Manchester, N. H., $2,790 and $2,295; 100, D'Olier Engineering Company, Philadelphia, Pa., $2,435; 101, M. F. Davidson, Brooklyn, N. Y., $2,950; 125, Fairbanks Company, New York, $2,275; 295, National Electrical Supply Company, Washington, D. C., $1,785; 320, Platt Iron Works, Dayton, Ohio, $2,900; 431, Warren Steam Pump Company, Warren, Mass., $2,200 and $2,250.

Under bids opened March 30, Circular No. 429, the Wood Drill Works, Paterson, N. J., has been awarded class 1, 25 rock drills and spare parts, $6660.38, for the Isthmian Canal Commission.

The following awards have been made for supplies for the navy yards, bids for which were opened April 21:

Lucas Machine Tool Company, Cleveland, Ohio, class 141, one boring, drilling and milling machine, $2,675.
Cleveland Punch & Shear Works, Cleveland, Ohio, class 161, one guillotine frame bar shear, $950.

Under bids opened April 20, Circular No. 434, for supplies for the Isthmian Canal Commission, Fox Bros. & Co., New York, have been awarded class 3, one belt driven punch, $697; class 4, one power shear, $317.

Trade Publications.

Asbestos Felt.—H. W. Johns-Manville Company, New York. Folder. Advertises a fibrous asbestos felt adaptable as an insulator against heat and cold and for fireproofing purposes.

Turret Lathes.—Gisholt Machine Company, Madison, Wis. Loose-leaf, pages 83 and 84. Shows a method of chucking a gas engine cylinder and illustrates the Gisholt lathes in the plant of the Landis Tool Company, Waynesboro, Pa.

Gears.—Boston Gear Works, Norfolk Downs, Mass. Catalogue E1. This is a general gear catalogue of 87 pages, booklet size, showing nearly everything made in the way of small gears. Safety steering devices for automobiles, motor boats, &c., are illustrated and described, as well as roller link chains, sash chains, joint couplings and other specialties. Some useful tables are given, together with prices.

Mining Equipment and Coal Dealers' Supplies.—H. B. Sackett Screen & Chute Company, Chicago, Ill. Catalogue, 6 x 9 in., 63 pages. Coal mine supplies, such as conveyors, coal buckets, hoisting tubs, coal breakers and mine cars and screens are shown. The company also makes coal dealers' supplies, such as picks, baskets, shovels and chutes. Most of its principal lines are illustrated.

Gear Cutting Machines.—Eberhardt [illegible], Newark, N. J. Circulars. One describes the company's No. 2A automatic spur gear cutting machine, designed for cutting light and medium class spur gears. The machine has a 28-in. maximum swing and the feed screw operates to draw the cutter carriage, giving smooth feed and eliminates vibration. The other circular shows the No. 3 machine, which is similar but larger, being designed for spur gears, which will swing an actual diameter of 40 in. This machine is furnished with all necessary attachments.

Steel.—Colonial Steel Company, Pittsburgh, Pa. Three booklets. Advertise Red Star, Colonial and other tool and drill steels made in various shapes. One of these booklets, besides listing the various steels the company has to offer, gives useful classification tables. Another lists the steel in the company's New York warehouse ready for delivery on February 1, and a third is devoted to vanadium steel with directions for treating the several grades, and price-lists.

Steam Turbine Machinery.—De Laval Steam Turbine Company, Trenton, N. J. Bulletin No. 501. Describes several types of turbine and motor driven machinery, including dynamos, blowers and centrifugal pumps.

Welding Apparatus.—Goldschmidt Thermit Company, 90 West street, New York. Booklet entitled "Shop Instructions for the Use of Thermit in Repair Work." Besides containing general directions for using the company's apparatus, directions for repairing locomotive parts and motor cases are given, together with valuable tabulated data. The volume is bound in cloth and is illustrated with views calculated to assist operators in making repairs.

Motors.—Crocker-Wheeler Company, Ampere, N. J. Booklet No. 99. Reprint of an article published in *The Iron Age* January 23, 1908, describing the Saucon plant of the Bethlehem Steel Company, with special reference to the application of electric motors to the machinery in that plant.

Steam Specialties.—Strong, Carlyle & Hammond Company, Cleveland, Ohio. Catalogue, 6 x 9 in., 43 pages. Treats of controllers, pump governors, boiler feed regulators, traps, valves and other steam specialties. Detailed piping plans show the application of these specialties and other drawings of installations. Price-lists, tables of dimensions, capacities, &c., are also given.

Machine Tools.—Burke Machinery Company, Cleveland, Ohio. Folder and two inserts for a loose-leaf catalogue. These show a new rotary cutting off saw, which is made in 12 and 20 in. sizes, and an automatic two-spindle milling machine, described in *The Iron Age*, March 19, 1908, which is built especially for typewriter factories and is so arranged that one operator can run several machines, it being necessary only to place the work in its jig, throw in the lever, and the machine will finish the operation and stop.

Engineering Specialties.—Lunkenheimer Company, Cincinnati, Ohio. 1908 catalogue; 564 pages. Covers the company's complete line of valves, injectors, whistles, lubricators, oil and grease cups and steam specialties, and including a number of new products. A very complete index locates the various specialties. Several pages are devoted to illustrations of the interior of the plant. Recent additions include a large brass foundry of over 154,000 sq. ft., of concrete construction, a concrete garage, and a factory containing over 40,000 sq. ft. Of special value to power plant operators and engineers is a section of nearly 100 pages giving tables and useful data.

The British Patent Law Hurts Americans.

A news dispatch from London, dated May 26, says: Representations have been made in the foreign office by Ambassador Reid, with a view to securing a modification of the new patent law of Great Britain. This law was introduced by David Lloyd-George, then president of the Board of Trade, and goes into effect on July 28. It provides for the revocation of all patents unless the actual process is carried on in the United Kingdom. Owners of American patents contend that this act will work a hardship upon them, and, as the United States protects all patents, whether American or foreign owned, they argue that Americans should receive equal treatment in Great Britain. The foreign secretary, Sir Edward Grey, will find great difficulty in dealing with this matter, as the Liberal government has taken considerable credit to itself for passing this act, which is one of the most popular of its administration. The tariff reformers assert that it is a direct step toward the protection of British industries.

Kansas is crying for help, the State Free Employment Agent at Topeka having advertised for 21,500 men and 1195 teams to assist in harvesting wheat in June. The harvest is expected to begin on the southern edge of the State about June 10.

HARDWARE

MANY manufacturers have met the problem of reducing production during the business depression with much greater skill than was shown in other similar periods of the country's industrial history. Not only have better methods been employed in putting manufacturing on an economical basis under conditions which from the very suddenness of their advent were the harder to meet, but there has been more careful regard for the welfare of employees. Enforced idleness for many men and women was inevitable; economic conditions were such that it could not be otherwise. But the effort has been to make the burden as light as possible for the maximum of people, and the results have been far beyond anything that was achieved in this direction in the past. Business ends have entered into the solution of this side of the general problem; the advantages resulting from a considerate treatment of the personnel of an industrial organization are obvious. Yet motives of pure philanthropy have constituted a very important element, and probably the most important in a great majority of cases.

A common policy has been to keep working forces as large as possible. Curtailment has been through shorter hours. The many establishments that have tried this method agree that it has worked out well. It has been better for both employer and employees to operate with 200 hands three days a week than to run full time with 100. Twice as many people received half their regular wages as compared to the number who would have earned full pay if the six days' schedule had prevailed. In a great many works curtailment had to go farther than this, however. The number of people on the payroll had to be reduced, and in this employers have shown a wise discrimination. Everything being equal the married men and others having families dependent upon them were given preference. In many other ways employers have endeavored to stand between their people and want. In villages where manufacturers own the houses occupied by their employees concessions have been made in rents. Two such cases are those of the Draper Company, Hopedale, Mass., and the Whitin Machine Works, Whitinsville, Mass., both large builders of textile machinery, which have permitted those tenants who are out of work, or whose incomes are seriously impaired, to live on in their homes free of rent. The individual circumstances of employees have been carefully scrutinized, that the labor which still remained to be done should go to those needing it most. The man who is known to be able to keep along without his wages is laid off. He may have a small farm, or be otherwise partially independent, while another equally deserving and capable man may have no other source of income than his factory work. The man who owns his own home fared better than his fellows of known roving nature.

During the period of great industrial prosperity every manufacturing establishment accumulates a certain percentage of undesirable help. There are the incompetents, whose labor is not up to the standard desired. There are those of unsteady habits, who cannot be depended upon to work constantly. There is that peculiar class of men who act as the yeast to create the ferment of dissatisfaction; the agitator or malcontent, who strives to establish and widen the gap between capital and labor. The manufacturer in inspecting his payroll in preparation for cutting down expenses finds out the men who have been marked as undesirables. They go early, while those who have been faithful and satisfied, steady and competent, are retained. In the latter class the employer maintains the nucleus of the force which will be necessary when business shall become active again. Such a body of working people, carefully culled of the undesirables, is a first rate asset in business. Upon it can be built a good, economical industrial organization.

A business depression is apt to mark the close of the careers of old employees. Manufacturing concerns that have been in business for many years accumulate upon their payrolls the names of men whose days of usefulness have passed and who are in a sense pensioners. If the force is to be diminished they must be laid off with the others. The effort, however, is often made to give such old hands work suitable to their ability, such as janitor service or operating an elevator or doing odd jobs, for without their wages they might be left without resources. They may not have been forehanded by nature, or may have been unable through circumstances to lay aside something for their old age, and may have no child or others to care for them. Their fate might be an unfortunate one. While business in the abstract is soulless, very many times in practice consideration for employees has an important place. The relations of employers and their old workmen are frequently governed in good part by sentiment, and it is probably the exception when a veteran employee finds himself destitute or a public charge.

Condition of Trade.

While May closes with no important change in the general condition it may safely be said that the past week has been one which is reasonably satisfactory to those who are looking along conservative lines for a gradual improvement in the situation. The promise for good crops does not appear to be negatived notwithstanding some injury here and there by adverse weather conditions, and the indications taken all in all still point to fine harvests, subject of course to the many contingencies which lie in wait. The developments of the past week in regard to the Iron market, especially as related to the conferences between the great interests in this field, are fortunately favorable rather than otherwise. There appears to be no relaxing in the determination of the Steel Corporation and those who are working in harmony with it to continue the policy which they have been pursuing in maintaining prices notwithstanding the moderate volume of current business. Coupled with this there is a perceptible improvement in the demand for Pig Iron especially, but also for some of the finished products. In connection with this it is to be noted that there is no important reduction in the prices of Hardware products, with a continuance of more or less irregularity in a good many lines. There are, however, others in which quotations are maintained without material modification even though the demand is considerably less than normal. In view of the questioning in regard to the course of the

raw material, and especially in view of the wide spread between Pig Iron and the finished products, which are in turn the material out of which many goods are made, together with the uncertainty as to the course of business awaiting a return to more stable conditions, buyers are still acting very conservatively and purchasing in only such quantities as represent their early requirements. There seems to be a general agreement that stocks in the hands of both jobbers and retailers are well reduced and in many cases exceptionally low, so that there is a likelihood that frequent ordering will continue to characterize the trade, with the prospect that when business is materially quickened the demands upon manufacturers will be urgent.

Chicago.

While few, if any, manufacturers of Hardware lines are in receipt of orders sufficient to operate their plants at normal capacity, the degree of activity seen in the various industries of this character is by no means uniform. Some are fairly well occupied, while others are extremely quiet, being compelled in some instances to run on stock orders in lieu of incoming trade requirements. Generally speaking, those engaged in supplying goods for rural consumption are favored with a better volume of business than producers whose product is more directly related to and dependent upon the prosperity of mining, milling and other manufacturing enterprises. In no other direction is the halt in demand as abrupt and keenly felt as in railroad buying, in which instead of improving there is perhaps more hesitancy. Interested observers who have been watching the stringent curtailment of railroad purchases have reasoned that the movement would have reached the limit of safe conservatism ere this but thus far there is apparently no relaxation in the effort to effect economy through the purchasing departments. One very important outlet for a varied assortment of Hardware is therefore closely restricted with the result that a large amount of plant capacity relying on business from this source is necessarily inoperative. The warm sunshine and growing weather of the past week has favorably effected some lines in which the increasing number of orders seems directly traceable to this cause; but in so far as it was expected to inject new life and vigor into trade and start a wide spread forward movement the results are somewhat disappointing. Screen doors are in better demand, and though the season is well advanced recent orders have been fairly plentiful. The exceptionally rapid growth of grass promoted by protracted rains has materially helped the sale of Lawn Mowers; a very satisfactory run of reorders was experienced last week and more are in prospect. There is perhaps nothing in the line of Sporting Goods now in more active demand than Fishing Tackle and Angling Outfits. Curiously enough the general dullness is in a way helpful to the sale of such goods since many persons who are ordinarily too busy to indulge in the sport now find leisure time to go fishing. Three or four large local buildings are taking figures on the Builders' Hardware required in their construction, and it is needless to say that competition for this business is very keen. Notwithstanding the low price of Pig Iron and Cast Scrap Sash Weights are being maintained at around $21, but like other material entering into building construction the demand for them is only fair.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—Business in this section continues to be about the same as reported in our last letter to you. While a fairly good volume of orders is coming in every day and every week, at the same time we are bound to admit that the Hardware business generally throughout the South is not up to the usual standard.

Merchants are buying conservatively in all lines, and are carrying small stocks. They are not disposed to anticipate their wants, or to buy any more than they are absolutely in need of. In the larger towns and cities trade is the dullest, and the best volume of business that we are getting now is coming from the general merchants out in the country and the smaller villages.

We are glad to say that the crop prospects in the South are really excellent. Corn, wheat, oats and cotton are all looking fine, and everything indicates without any bad luck, we will have splendid crops this season. If the crops turn out well we believe that fall and winter business will be good. While we do not think it will be up to what it was last fall before the panic, at the same time it will be satisfactory. Nothwithstanding prices are inclined to be a little weak in some lines, we do not hear of any special cutting. Manufacturers are not making any great effort to force goods on the market, and jobbers and retailers are displaying judgment and discretion and maintaining prices better than we had anticipated. Collections are very good.

NOTES ON PRICES.

Wire Nails.—The somewhat general expectation of the trade that prices on Wire and Wire products might be reduced at the meeting of the steel interests, held on the 21st inst., was not realized. On the contrary, prices on Iron and Steel products were reaffirmed. Purchases continue to be made on conservative lines and only nearby needs appear to be covered by current orders. The market is referred to as steady in tone. Quotations for base sizes continue as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

New York.—Nail houses and jobbers are carrying stocks just sufficient to supply the wants of their customers, who in turn are buying in such small lots as are necessary to keep stocks light and assorted. Regular quotations are on the basis of $2.40 per keg for small lots at store.

Chicago.—New business is coming in slowly, a marked decline in volume being noted in the past week. Expectation that a reduction of prices would be announced following the meeting held in New York last week was quite general. Whether or not buying would have been stimulated by such action is an open question, but that the continuance of the present policy will not produce this result seems likely. Buyers are apparently firmly committed to the policy of buying only in small lots for actual needs, and now that the dull months are at hand there is every prospect of an extremely quiet movement through the midsummer season. We are advised that the principal producers are firmly adhering to regular price schedules. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The reaffirming of prices, not only on Wire Nails, but on all other forms of Iron and Steel by the Steel interests in New York on May 21 has imparted a decidedly stronger tone to the Wire Nail market, and all the leading producers are holding Wire Nails firmly at $2.05 for base sizes, f.o.b. at mill. Whether the reaffirming of prices will lead to a heavier demand remains to be seen, but the tone of the market is undoubtedly stronger. Buyers continue to limit purchases to actual needs, but it is believed by some that there will be a freer buying movement in the very near future. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

Cut Nails.—Existing prices were reaffirmed at the meeting of the Cut Nail Association held last week. While individual mills are selling at any price they desire, the hope was expressed that improved trade conditions will better the Cut Nail situation. Demand continues very light. The market is irregular, and concessions of 15 cents or more are being made on regular Steel Nail quotations, so that about $1.85 for carload lots at mill is more representative of the market than $2.05. Iron

Nails generally should command about 10 cents more than Steel.

New York.—The local Cut Nail market continues without important change, demand being very light. Regular quotations are on the basis of $2.30 per keg, for small lots at store.

Chicago.—The demand for Cut Nails continues discouragingly quiet, and there is no immediate prospect of renewed activity in the industries comprising the principal consumers of this product. Concessions from the nominal prices quoted are obtainable on almost any kind of orders. Chicago quotations are nominally as follows: Iron Cut Nails, carloads, to jobbers, $2.23; to retailers, $2.28; Steel, to jobbers, in carloads, $2.03; to retailers, $2.08.

Pittsburgh.—Movement in Cut Nails is very light, buyers placing orders only for small lots and absolute needs. Some of the Cut Nail mills are closed down, while others are running only to partial capacity in order to keep down stocks. The general quotation on Steel Cut Nails is $1.85, but $1.80 or lower has been done in some cases. We quote Steel Cut Nails at $1.85 f.o.b. Pittsburgh, for carload lots, and $1.90 to $1.95 in small lots. Iron Cut Nails take about 10 cents advance over Steel.

Barb Wire.—As the season is about over, new business received by the mills is light, while shipments on contract orders are in fair quantities. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—Although very little new business is being placed, shipments against specifications are going forward in fair volume. Owing to the lack of stocks at the mills orders are not always being executed as promptly as buyers desire, and some little delay in shipments is frequently occasioned. Prices are reported to be firmly held by the mills. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—New business is very light, the season being over and buying practically suspended. The tonnage in Barb Wire placed with the mills this year was lighter than in the corresponding period last year. We are advised that prices are being firmly maintained by the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—Notwithstanding the favorable outlook for a record breaking hay crop, the volume of business from bale tie manufacturers has been disappointing. It is thought, however, that considerable more business will develop since buyers have been keeping close to present requirements. Fence manufacturers are ordering only in small lots, and are making no purchases save for current needs. Regular prices are reported as applying to all transactions by the mills. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—Consumers continue to restrict their orders to small orders for actual needs, and the amount of new tonnage being placed is light. As the Steel interests have reaffirmed prices on Wire Products, this may possibly lead to a heavier demand, as a good deal of tonnage was being held back in anticipation of a possible reduction in prices. Quotations are as follows, f.o.b. Pittsburgh, 60 days, 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Plain Wire.—Conditions in the Plain Wire market continue as for some time, current requirements being reflected by a limited demand. Quotations per 100 lb. to jobbers in carload lots are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the price to retailers being 5 cents additional:

Nos.	6 to 9	10	11	12	12½	13	14	15	16
Annealed	$1.90	1.95	2.00	2.05	2.15	2.25	2.35	2.45	
Galvanized	$2.20	2.25	2.30	2.35	2.45	2.55	2.95	3.05	

Wheels and Woodstock.—No recent change has occurred in prices of Wheels and Wheel Stock, and no reduction is regarded as probable in view of the small margin of profit on the finished product. Quotations are consequently very firm and buyers, as a rule, are not expecting concessions. The demand has been fair, but materially less, of course, than for the same period last year. Business, however, is referred to by manufacturers as improving gradually, and they are anticipating that normal conditions will be reached in the near future, when they expect an ample supply of orders. It is regarded as a hopeful sign that very few, if any, of the Wagon manufacturers have reduced prices during the financial depression in order to facilitate the moving of stock. It is not considered that parties getting out Wheel Stock are asking exorbitant prices, especially as material is rapidly growing more scarce. Manufacturers are finding that the cost of production during the past six months has been just as high as during the preceding and more prosperous season, and in many cases the cost has been even higher. It is asserted that if demand had continued normal advances would certainly have occurred, since the stringency in the money market has made it difficult to finance lumbering operations and much less timber than usual has been got out.

Galvanized Ware.—Quotations on some lines of Galvanized Ware, notably Pails and Tubs, which have shown weakness recently, have again been considerably reduced, so that they are declared by manufacturers to be below cost. An advance in list prices approximating 5 per cent. has been made in Light Galvanized Pails, but this is more than offset by an increase in discount, which makes the net decline of these goods about 5 per cent. On Light Tubs, list prices have not changed, quotations being about 10 per cent. lower. In view of these changes the market to the general trade may now be represented by a discount of 10, 7½, 5 and 5 per cent. from the following revised list prices on light or regular Water Pails:

Quart	8.	10.	12.	14.	16.
Per gross	$24.15	$26.85	$29.50	$33.50	$41.50

A change has also been made in list prices on Galvanized Oil Cans, which, however, has been offset by a corresponding change in discount.

Bright Wire Goods.—Indications are multiplying that the market for Bright Wire Goods is not in satisfactory condition. For some time it has been possible to obtain concessions on desirable orders, and it would now appear that there is little adherence to so-called established prices. A discount on Steel Wire Goods of 90 and 33 1-3 per cent. is now readily obtainable by average trade.

Rope.—Manufacturers see but little encouragement for the immediate future in the comparatively limited business which is offering or can be solicited. Orders are for small lots, as a rule, covering near by requirements. According to press reports a falling off in receipts of Manila Hemp may be anticipated, with consequent higher prices, while on the other hand the Sisal Hemp planters' pool is said to have gone to pieces which, if true, would indicate lower prices. The following quotations, for base sizes of Rope, fairly represent the market for small lots, but are not always adhered to on large orders: Pure Manila, 10 to 10¼ cents; lower grades Manila, 8 to 9 cents; Pure Sisal, 7½ to 7¾ cents; lower grade Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¾ cents.

Window Glass.—From the standpoint of prices conditions are becoming more unfavorable for manufacturers of Window Glass, resulting from the repeated reduction of prices of machine made Glass by the American Window Glass Company. It is understood that the company is very strict in regard to specifications and insist upon filling orders at its own convenience. However this may be, the hand blown factories, with large stocks and a dull

market, are in no position to dictate prices, while they are but poorly prepared to meet competition from a financial point of view. Prices are regarded as having reached a lower point than for years, if ever in the history of the trade. The American Window Glass Company's prices are represented by the quotation of 90 and 40 per cent. discount on single and 40 and 10 and 10 per cent. discount on double strength Glass, from manufacturers' list. Jobbers' quotations east of the Alleghenies and north of the Carolinas are reported as being 90 and 35 per cent. discount for single and 90 and 40 per cent. discount for double strength Glass, from jobbers' lists. South of the Carolinas quotations are said to be 5 per cent. higher. Western jobbers' prices are about 90 and 40 per cent. discount on single and 90 and 40 and 5 per cent. discount on double strength Glass, from jobbers' list. In estimating these quotations it must be borne in mind that the jobbers' list is about 25 per cent. higher than the manufacturers' list. A continuance of hot weather will possibly close most of the hand blown Glass factories.

Linseed Oil.—The market has considerable strength owing to the fact that crushers have comparatively light stocks of seed and oil. Seed is higher both in this country and Europe and an upward tendency in oil prices is anticipated, rather than lower ones. Buyers have yet shown little anxiety to provide for future requirements, and comparatively few have placed contract orders. Crushers generally do not appear anxious to enter contracts for deliveries further ahead than through July, while some western mills which are better supplied with seed are willing to accept contracts extending over longer periods. Local quotations are as follows: State and Western Raw, 42 to 44 cents; City Raw, 44 to 45 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits of Turpentine.—The trend of the market is toward lower, rather than higher prices, as demand is considerably below normal and receipts of the new crop of Turpentine at Southern points are heavy. This season usually is one of activity in Turpentine, but now business is exceedingly light. The New York market is represented by the following quotations: Oil Barrels, 45 to 45½ cents; Machine Made Barrels, 45½ to 46 cents.

Registers.—It is expected in the trade that an advance in hot air Registers, japanned, electroplated and bronzed, will take effect June 1. The amount of the advance is said to be 10 per cent., which will make the discount to average trade about 70 per cent. Established prices of leading manufacturers are usually shaded a little by two or three independent makers of Registers, whose output, however, is limited.

Wrought Strap and T-Hinges and Butts.—Prices on Wrought Strap and T-Hinges and Butts have maintained a noteworthy steadiness, although the volume of business has been light. Ruling quotations have lately been reaffirmed by leading manufacturers. Stocks in the hands of the trade are believed to be unusually small.

Sandpaper.—Manufacturers and large handlers of Sandpaper state that the volume of trade is not far below the normal, a fact which makes this line somewhat unique among commodities handled by the Hardware trade. Prices have been practically unchanged for some time, and quotations of manufacturers show a marked uniformity. The market on Flint and Emery Paper and Cloth may be represented in a general way by a discount of 50 and 10 per cent., and on Garnet Paper and Cloth by 25 per cent.

The Gooch-Edenton Hardware Company, Jackson, Tenn., has organized with a capital stock of $50,000, and has purchased and taken over the G. C. Anderson Hardware stock. Among those interested are George R. Gooch, Vernon Edenton and W. H. Edenton.

The Nickel Hardware & Supply Company, Wausau, Wis., has been incorporated with a capital stock of $20,000 by Robert J. Nickel, Fred M. Gennich and Herman A. Gennich.

International Rifle Match.

THE National Rifle Association of America has officially determined to send a Rifle team from the United States to compete in the Olympic matches at Bisley, England, next July, against the Riflemen of the world. As previously stated in these columns, the United States Cartridge Company offered to finance the entire expenses of the team, which offer was accepted by the National Association April 22. In consequence of some correspondence from other Ammunition manufacturers, the United States Cartridge Company renews its offer, modified to cover all or any part of the expenses as may be determined, some of the other Ammunition makers offering to contribute proportionally to the fund, with the provision that "the different Cartridge producers so contributing should submit Ammunition for an impartial test, and the best so proven only to be used by the team." After a full discussion of the situation, the National Rifle Association has decided to appeal for a public subscription for the expenses of the team, and divide pro rata among the Ammunition companies the amount necessary to make up the difference between the sum so subscribed and the team's expenses. The following resolution in regard to the proposed Ammunition test has been adopted by the association:

That the ammunition to be used by the United States Rifle team which will be sent to compete in the Olympic Games be determined by an exhaustive test of the different makes on a machine rest; that such test be carried on under the supervision and regulation of the subcommittee consisting of Generals Drain, Hall and Riggs; that the ammunition selected by reason of such test be used in the tryouts by the candidates for places on the team; that the four ammunition companies be invited to send a representative to be present at the test, and that said test begin on Monday morning, June 1, and be continued until the committee arrive at a final decision.

The tryout competitions will be held June 10 to 13, inclusive, at Camp Perry, Ohio, and the selection of successful competitors will be made June 13. The selected team is to sail on June 20, which will allow nine days' practice on the Bisley range before the matches.

The Herculever Company.

THE Herculever Company, 332 Broadway, New York, has lately been organized to manufacture a unique and effective device for removing the cover boards of packing boxes, cases, &c. This device, known as the Herculever Box and Case Opener, and the invention of I. N. Rogers of New York City, does not when properly used damage the cover boards and leaves the nails perfectly straight in the board, so that they can be driven out easily if so desired. The Herculever is covered by two patents and 12 patent claims, the second patent being still pending. The officers of the new company are F. Felt, president and general manager; Charles Glover, vice-president; A. H. Lamborn, treasurer, and C. B. Goding, secretary. The active management of the company will be under the direction of Mr. Felt, late of the Felt & Tarrant Mfg. Company, Chicago, and formerly with the Remington Typewriter Company, London, Monarch Typewriter Company, Syracuse, the Dey Time Register Company, Syracuse, and the Roneo Company, New York City. Mr. Felt has been a sales manager in different parts of the world for the past 15 years, and is familiar with every phase of the specialty business. Charles Glover, vice-president of the company, is president and director of the Corbin Screw Corporation, and a director in the American Hardware Corporation, P. & F. Corbin, Corbin Cabinet Lock Company and Corbin Motor Vehicle Company, all of New Britain, Conn. A. H. Lamborn, treasurer, is head of the large sugar brokerage house of A. H. Lamborn & Co., 106 Wall street.

W. S. Cox, Silver City, N. M., has incorporated under the style of W. S. Cox, Inc., with an authorized capital of $50,000. The incorporators are W. S. Cox, H. J. Burgess and S. E. Pollock.

The Lind Hardware Company, Lind, Wash., has purchased a site on which it will erect a building for the accommodation of its Hardware, Stove, Implement and Sporting Goods store.

Export Topics.

IMPORTANCE OF FOREIGN TRADE.

BY A MANUFACTURER.

Concluding Article.

Prompt Shipments.

If desirable connections with foreign merchants are to be continued, shipments must be made as promised and the long travel considered. American manufacturers have frequently jeopardized their foreign interests by allowing the press of domestic business to unreasonably delay their export shipments.

Some Fallacies.

Occasionally the claim is made, without any verification, that the foreign countries are used as a dumping ground for what is obsolete or unsalable at home, and that very low prices are quoted for export. No manufacturer who is seeking a trade for the future attempts to make a start on out of date lines. The requirements of some countries demand heavier, less complicated and not so well finished goods, which can be produced at a lower cost than a similar article used in the domestic trade. The claim of low prices has been investigated several times without being substantiated. The principal manufactured articles having a large sale abroad yield a larger profit to the manufacturers than similar articles in the domestic trade. In this connection the matter of terms must be considered. At present a large percentage of American shipments are made on a cash basis. The large New York City export houses, who act as brokerage buyers for the foreign merchant, always buy for cash, although they may give the merchant extended terms of several months. Foreign manufacturers are granting longer terms than in past years, and the better class of merchants are insisting upon credit.

Territoria Control?

A noticeable part of the inquiries from abroad, is the almost universal demand made for the control of a very large territory, even when the inquirer is in no way equipped to solicit the business of so large an area, and manufacturers need to be wary about assigning exclusive rights to any important countries. This difficulty is increased by the general omission on foreign letter heads of the name of the country in which the merchant lives. Printed letter heads give only the name of the city or village.

Preferential Advantages.

American made goods are preferred in most countries because they embody a much higher type of technical knowledge and ingenuity; they are usually neater and lighter in construction, and are often better made in every respect; they are more durable and avoid troublesome complications. In short, the American article is frequently of much better quality or greater value for the price. These facts are so obviously true that even when foreigners attempt to duplicate an American article, the result is very crude, and they remain some years late in the development of any line.

Imitations.

Duplication in the most progressive foreign countries is widespread, as foreigners copy even to the labels, color of boxes, &c. These duplicates are usually soon discovered, as the article rarely compares favorably with the American product. All exporters should adopt trademarks or brands, which will be plainly intelligible to all classes of people, as this is a quick method of creating a continuous demand, and is somewhat of a safeguard against general duplication.

Meeting Conditions.

The most successful exporters are those who study the earning power and habits of the people and the articles used by them, and then introduce something that will produce better results. The change, however, must not be too radical, as there are always certain fixed habits in all countries that cannot be changed without a long period of education. A manufacturer in investigating why the demand for a very desirable part of his tool line was not increasing more rapidly, discovered that the style of the Wood Handles was not satisfactory to certain foreign users, although in general use in other countries.

Foreign Competition.

The foreign manufacturer is constantly becoming a stronger competitor of American goods, but there is no reason why American manufacturers should hesitate to enter markets where they know foreigners secure a large business. By using the correct methods, a desirable and profitable business can usually be secured. American Locks and other Building Hardware lead wherever introduced, although where seen for the first time may create skepticism, because of being so much lighter and neater than foreign makes their strength is questioned. England and Germany are strong competitors of America in Hardware lines. England secures a particularly large trade on Blacksmith Hardware and Cutlery. Germany holds a strong position as manufacturer and exporter of Cutlery, various Edged Tools, Guns and Enameled Ware.

Various Fields for Exploiting.

Spain is a virgin field for American Hardware, as the trade is just now being developed. The dealers are supplied by the factories and jobbers of Europe. The trade on American Hardware in India is increasing, and American representatives are covering the country. English factories are supplying their own country with Forks, Hoes, Rakes, &c., and American trade is diminishing, although the quality and finish of the English product are inferior. Shipments of American Hardware and machinery into Mexico during 1907 amounted to over $20,000,000. Of this amount Builders' Hardware, Saws, &c., exceeded $1,000,000. There is considerable inquiry from Russian Poland for American Hardware and machine tools. Austria, England and Germany are the chief competitors, but it should be noted that there is a strong preference for any article made in America. Russia presents almost unlimited opportunities, but at present buys largely from European factories, because the latter's commercial methods are better known and extended credits are granted. Ecuador is increasing its purchases of American Hardware, and native stores are being equipped in a comparatively modern way.

American Hardware Winning Its Way.

The fact that American Hardware is increasing in favor abroad is indicated by a comparison of export statistics. Since 1905 the annual exports of Builders' Hardware, including Locks, Hinges, Saws, Tools, &c., have increased $3,000,000. The shipments during 1907 amounted to $14,000,000. There has been a proportionate increase in the exports of Cutlery, Firearms, Safes, Scales, Stoves, Pipe and Fittings, &c.

The machine tool trade in foreign countries is immensely important and should be of interest to every American manufacturer. America exported during 1907, $10,142,835 of metal working machinery, and $1,386,381 of wood working machines. This is an increase over 1906 of 27 per cent. on metal working machines, and 48 per cent. on wood working machines. The shipments of mining machinery increased over 100 per cent.

Largest Purchasers.

The countries purchasing the largest volume of American metal working machinery, are, in the order of their importance, Germany, United Kingdom, France and Belgium. Many other countries are liberal buyers. While the shipments to Germany during 1907 amounted to over $2,000,000, there was practically no increase over 1906 shipments. The other countries named increased from 30 to 40 per cent. German manufacturers are producing more efficient machines than in past years, and are now able to supply the requirements of ordinary shop work in their own country. Sales of American machines, however, continue to be large on tools of superior merit and high efficiency. American mechanical skill and ingenuity

are more highly developed, and produce machine tools capable of performing wider ranges of work at greater speed. American machine tools are recognized by the principal countries of the world as the product of a very high standard of technical knowledge, considerably in advance of the ideas of foreign designers. No other country has made such rapid progress in reducing the number of men required to operate machines, and in perfecting economical shop methods. Manufacturers will appreciate the advantages to be obtained by taking advantage of this high international reputation, in an effort to enlarge the market for their products. There certainly can be no better time than the present to consider the question of an active or more intelligent effort for export trade.

THE HOT SPRINGS CONVENTIONS.

THE Southern Hardware Jobbers' Association, C. E. Kersey, secretary, Richmond, Va., has issued its formal programme for the eighteenth annual convention, which will be held at Hot Springs, Ark., on June 9, 10 and 11, at the same time and place with the semiannual convention of the American Hardware Manufacturers' Association, the headquarters of both associations being at the Hotel Arlington. The opening session on the 9th will be as usual an open session, to which manufacturers and their representatives and other visitors are invited. Addresses of welcome to the State of Arkansas and city of Hot Springs, respectively, will be made by Governor Pindall and M. H. Jodd, Mayor of Hot Springs. Perhaps the most interesting feature of this session will be a general discussion of the subject, "The Recent Panic, Its Causes and Remedies." This discussion will be opened by a member of the Manufacturers' Association, who will be followed by J. D. Moore, Moore & Handley Hardware Company, Birmingham, Ala., as the representative of the Jobbers' Association.

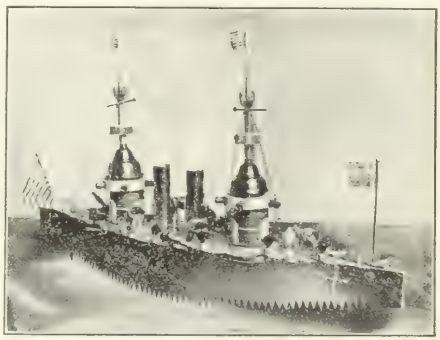
On Wednesday afternoon, 10th, there will be a joint session of the two associations, the jobbers being the guests of the manufacturers. C. W. Asbury, president of the American Hardware Manufacturers' Association, will preside. The principal subjects for discussion at this joint session will be: 1. "Is the Policy of Protection in Its Broadest Sense, as Viewed by the Business Man, Detrimental or Advantageous to the Allied Hardware Interests of the Country?" and 2. "Should Not Associated Manufacturers Who Control Prices Protect the Jobber Against Decline on Stocks on Hand?" The consideration of each of these topics will be opened up in addresses by manufacturers whose names are not yet announced. On behalf of the jobbers W. W. Webber, Webber-Ayers Hardware Company, Fort Smith, Ark., will discuss the former subject, and W. F. Stephenson, Barnes & Miller Hardware Company, Memphis, Tenn., and R. F. Bell, Wm. Henry & R. E. Bell Hardware Company, Fort Worth, Texas, the latter.

At the executive sessions of the Jobbers' Association held on Wednesday and Thursday mornings, papers will be read on the following subjects: "Importance and Benefits of Local Associations," by Harvey L. Anderson, Anderson Hardware Company, Atlanta, Ga.; "Why Should Not the Southern Hardware Jobbers' Association Have the Unqualified Support of Every Eligible Hardware Jobber in the South?" by Hugh Fox, Fox Brothers Hardware Company, Pine Bluff, Ark.; "How Shall We Increase the Profits on our Staple and Seasonable Goods?" by H. Young, Southern Hardware & Supply Company, Mobile, Ala.; "The Compensation of Traveling Men, and the Best Method of Handling Them," by J. Van Dorkum, Fones Bros. Hardware Company, Little Rock, Ark.; "The Best Methods of Departmentizing Business, and the Benefits to be Derived Therefrom," by S. Norvell, Norvell-Shapleigh Hardware Company, St. Louis, Mo. On Thursday morning also there will be a general discussion of the topic, "What Is the Best Method of Computing Profits and Arriving at the Cost of Doing Business."

F. D. Mitchell, secretary-treasurer American Hardware Manufacturers' Association, 309 Broadway, New York, is sending out postals to jobbers and manufacturers in which he requests information in regard to the names of their representatives who will attend the Hot Springs conventions. This information is desired for the purpose of furnishing identification badges similar to those used at recent gatherings and displaying the name of the representative as well as the name and address of the company with which he is connected.

HARDWARE BATTLESHIP.

THE latest addition to the Hardware battleship fleet, which was not authorized by Congress, is the Chico, which was built by the Nichols Hardware Company, Chico, Cal. In the accompanying illustration she is shown lying in the show window of the company's store, doubtless waiting to fire a salute in honor of the arrival of the great fleet from the Atlantic, under command of



Hardware Battleship.

Admiral Evans. The hull of the vessel was made of a Cross Cut Saw, and Hose Nozzles represented the big guns. Fish Hooks afforded natural looking anchors, while Brass Jack and Ladder Chain formed cable chain and stays. The turrets are Mouse Traps, resting on cans of prepared Paint, with Oil Cans above for fighting tops. Other goods used in constructing the gallant ship included Nails, Round Head Screws, Cartridges, Galvanized Cleats, Coat and Hat Hooks, Stove Bolts, Oil Cups, Wire, Towel Bars, Sheet Brass and Copper Brass Knobs, Electric Sockets, Shoe Tacks, Nickel Plated Elbows and Pipe, Washers, Blind Hinges, Shutter Knobs, Nickel Clamps, Solder, &c. The display was lighted by different colored electric lamps.

THE ENTERPRISE ENAMEL COMPANY, Bellaire, Ohio, manufacturer of the Corona Roaster, states that this article, put on the market about a year ago, is meeting with quite a good demand, the company having recently filled large contracts from a number of jobbing houses. This Roaster is oval in shape, 18 x 11 in. in size and 7½ in. deep. Its construction is such that the bottom cannot touch the oven, so that meat may be cooked until tender without burning, the cover keeping every whiff of grease and moisture inside. It is made of one piece of steel, and, being seamless, there is no place for grease or other particles to accumulate. The company which manufactures other household utensils besides the Roaster is operating its plant practically full time.

DIXIE HARDWARE & FURNITURE COMPANY, Gibbsland, La., has been incorporated with a capital of $25,000 to conduct a wholesale and retail business in Shelf and Heavy Hardware, Mill Supplies, Stoves, Implements, Sporting Goods, Harness, &c. A two-story brick store, 40 x 100 ft., affording 8000 ft. of floor space has just been completed.

F. E. MYERS & BRO., Ashland, Ohio, manufacturers of Pumps, &c., have lately opened bids for a substantial business block which they will build at a cost of about $50,000. Work will be begun immediately.

CAMPAIGN AGAINST PARCEL POST CROWNED WITH SUCCESS.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., May 26, 1908.

THE Conference Committee, to which the annual Post Office Appropriation bill was referred after its passage by the Senate early last week, has reported the measure without the addition of a parcel post amendment of any kind and by the time this issue of *The Iron Age* reaches its readers the bill will have received the President's signature. In spite of an energetic attempt on the part of the advocates of numerous postal innovations to put through a special bill consolidating third and fourth class mail matter at the rate of 8 cents per pound, the movement has failed and the most extraordinary campaign relating to the postal service that has been conducted in Congress in 20 years has thus been brought to a termination entirely satisfactory to the retail merchants of the country.

Interesting Disclosures

have been made within the past few days concerning the desperate effort made by the officials of the Post Office Department to force into the Post Office Appropriation bill a provision for an experimental parcel post. Up to the moment that the bill was reported to the Senate from the Post Office Committee, the officials were hopeful that the Postmaster-General's comprehensive rural parcel post plan would be adopted. When the bill was placed on the Senate calendar it was found that all the Department's projects had been thrown out by the committee. Under ordinary circumstances the Department would have made no further attempt to interfere with the due course of legislation, but in this case the Postmaster-General decided to make an effort to force into the bill on the floor of the Senate an amendment to enable the Department to establish an experimental parcel post, and to this end he addressed an urgent communication to Chairman Penrose of the Senate Committee. Mr. Penrose was so fully convinced, however, that the Department's project was both unwise and untimely, that he refrained from laying the Postmaster-General's letter before the Senate until after the passage of the bill. He has since made the communication public, possibly at the request of the Department, which will now be able to utilize it as literature in the campaign which it is understood will be reopened when Congress reconvenes in December.

Conviction of the Post Office Committees.

It is doubtful if the reference in the Postmaster-General's communication to the experimental appropriation which resulted in the establishment of the rural free delivery, which is now costing $40,000,000 a year, of which 80 per cent. is saddled upon the taxpayers at large, was a happy thought; in any event it provided a very strong argument against amendments based upon the Burnham or Lafean bills. Both the House and Senate Post Office committees are convinced that enough has been done for the farmers at the expense of the Federal treasury and that the retail merchants, who have suffered heavy inroads upon their business as the result of the unbridled extension of rural free delivery, should not be called upon to compete on more unequal terms with the big mail order houses.

Retailers' Effective Campaign.

The retailers in all lines have made an extraordinarily effective campaign against the Post Office Department's schemes and the evidence on file in both House and Senate committees is sufficient to demonstrate the absurdity of the claim that the proposed rural parcel post would be "a boom to the retail country merchant." Thousands of protests from this class of merchants have been received, each bearing unmistakable evidence of its genuineness and its individual source. On the other hand, the petitions in favor of the innovation have come almost exclusively from one prominent organization of farmers and belong to the "machine-made" category. When the extraordinary methods employed by the Post Office Department to stimulate public sentiment in favor of a rural parcel post are borne in mind the victory of the retailers is little less than phenomenal.

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Georgia Retail Hardware Association.

THE third annual convention of the Retail Hardware Association of Georgia, which was held at Indian Springs, Ga., May 19, 20 and 21, was very successful, and chronicled a marked advance in association work in that State. The attendance was large and representative and the programme varied and interesting, while the presence of men prominent in the trade had much to do with the pleasure and usefulness of the gathering. Important action looking to the welfare of the association was taken and plans matured to increase its interest and usefulness to the merchants of the state.

The Opening Session.

The convention was called to order on Tuesday, May 19, at 2.45 p. m. by President Tillman, a goodly number of delegates being in attendance. After an invocation by the Rev. Mr. Mitchell, the president delivered the following address:



C. W. TILLMAN.

In the face of the general depression, I am glad to see that so many of my brother retail merchants are yet able to gather a sufficient number of dollars to defray their expenses to this our third annual convention. It is gratifying to note further that we have with us also representatives of the trade from all over the Union. I take occasion just here to thank them for having devoted this much of their valuable time to meet and mingle with us.

If I properly understand the exact meaning of this organization it is for the promotion of a kindlier feeling among the retail Hardware merchants, to promulgate certain principles for our mutual good. Proceeding upon the theory that everybody knows more than anybody, I would admonish you to attend these conventions, thereby keeping in touch with what is going on around you, and by your presence and influence assist an organization that is for you and for your ultimate welfare.

Parcel Post.

A question that should engage our attention at this session is the matter of a parcel post. I am pleased to inform you that our present Congress failed to carry an appropriation for this measure. Our esteemed friend, M. L. Corey, led the opposition to this appropriation, and in belief of this organization I tender to him my heartfelt thanks for his efforts. While the Hardware trade would probably suffer less than any other under the parcel post system, it would be more or less affected by it. And while we won out before it behooves us to guard with jealous care the fruits of our victory. The next administration will no doubt force another contest.

Mutual Insurance.

Another matter to which I would call your attention is that of insurance. The chairman of that committee is in a position to report at this convention a plan that will mean the saving of a considerable sum annually to our members.

Jobbers Selling to Consumers.

Again, we should condemn in no uncertain terms the practice of a few local jobbers quoting and selling direct to consumers. It is manifestly unfair to the retailer in the small towns, and does not prove any great benefit to the jobber. This system must and will be decried by this organization. So far as I am informed this does not extend over all the territory covered by us, but there are sporadic cases.

Garnishment Law.

I would suggest just here that we co-operate with retail merchants in enacting into law at the earliest possible day a garnishment process whereby we would be able to retain, say, 40 per cent. of a laborer's monthly stipend. This measure would have to be handled carefully in order that no hardship might be worked upon an unfortunate fellowman. But I dare say that all of us are carrying accounts against good people (so to speak), and yet they belong to that class who are too good to pay. Of course, I make this statement advisedly, and am referring to those risks particularly in my own territory. Where sickness or death had invaded a home we would be governed in the enforcement of this law purely upon conditions, with no intent to make the worthy suffer.

State Legislation.

In this connection I would further suggest that this organization have a paid representative to attend all sessions of the Legislature and watch out for our interests. Should a matter arise that would prove inimical to us he could advise our secretary, who would in turn take it up with the members, and they could call on their respective legislators, explaining to them the disadvantages of such a measure. Our representatives as a rule are the best men in their community, and having the welfare of their townsmen at heart would be loath to champion a cause that would retard development in their localities.

Railroad Commission Courtesies.

I am fully aware that this is no political mass meeting and I have no desire to inject anything into it of that nature, but in view of the many courtesies shown us by the Railroad Commission in the matter of adjustments of shortages and overcharges, we should tender them a resolution of thanks.

Fifty Per Cent. Increase in Membership.

In conclusion I want to say that we have increased in membership more than 50 per cent. during the past year. I would not be so vain as to arrogate to myself all of the honor, but I do assure you that I have worked honestly and faithfully for the organization in all of its departments. I have (with the assistance of two stenographers) endeavored to inspire you with enthusiasm sufficient to get you to come here. Once here, where we could discuss subjects face to face, I have no fear as to the final result. We are banded together for common good; your misfortune would be my sorrow, your success my greatest joy. And though we should not come within sight of the castles of our dreams may we always be found advancing the interests of others and of ourselves.

Tuesday Evening Session.

At the session on Tuesday evening, which was of an executive character, some matters connected with association work were taken up under the suggestion of reports of the secretary-treasurer and the Auditing and other committees. The consideration of questions which had been placed in the Question Box was then taken up. While it was in progress M. L. Corey, national secretary, whose presence is so highly appreciated at these meetings, entered and made an excellent address abounding in practical suggestions. R. R. Williams, Hardware Editor of *The Iron Age*, was also presented to the delegates and made a brief acknowledgment of the courteous and kindly welcome extended him.

Wednesday's Sessions.

Wednesday may be referred to as the high day of the convention. Both the morning and afternoon sessions were devoted largely to addresses by the guests of the association, representing the jobbing trade, the trade press and the control of public utilities. Addresses were thus made during the forenoon session by R. W. Shapleigh of the Norvell-Shapleigh Hardware



R. W. HATCHER.



THOS. W. BROBSTON.

Company, R. R. Williams of *The Iron Age*, and L. E. Dietrich of the American Steel & Wire Company, New York. In the afternoon the speakers were Col. Morris B. Belknap of the Belknap Hardware & Mfg. Company, M. L. Corey and Judge George Hillyer of Atlanta, who was very happily introduced by Mr. Woodruff, who has taken an active interest in freight matters, and has been influential in framing the policy of the association in regard to them. We regret that the pressure on our space does not permit us to give a full report of the more important of these addresses, but extracts will be found in the following columns.

Committees.

On the first day of the convention the following committees were appointed by the president:

NOMINATIONS.—T. W. Brobston, Z. B. Hamilton, J. J. Golden, W. G. Raines, George E. McRae.
PLACE OF MEETING.—J. R. Hall, S. G. Slack, L. L. Bishop.
ORDINANCES.—W. W. Robinson, R. S. Anderson, S. D. Zuber, Jr.
AUDITING COMMITTEE.—E. E. Dekle, H. G. Stevens, K. T. Wight.
RESOLUTIONS.—C. B. Thomas, T. G. Green, H. C. Briggs.
BY-LAWS AND CONSTITUTION.—G. W. Woodruff, P. M. Harley, D. E. Hogshed.

A committee on applications was subsequently appointed to pass on the applications for membership in the association. The committee consisted of Messrs. Yates, Bartholomew and Turner.

Reports of Delegates to National Conventions.

An example which might advantageously be followed in some of the other associations was furnished in the admirable reports made by the delegates to two meetings of the national association. Both of these reports were carefully prepared and presented in writing, and gave the members an excellent idea of the work of the national



L. L. BISHOP



E. E. DEKLE.

body, thus comparing well with the extemporaneous and off-hand reports sometimes rendered to the state organizations. The late date at which the 1907 national meeting was held called for reports of two meetings instead of one, as would usually be the case. The Boston meeting was described by G. W. Woodruff in an interesting and suggestive manner, thus bringing up some subjects which were appropriate for consideration at the convention just held. The recent national meeting at St. Louis was covered by H. C. Briggs, who referred to the principal subjects considered, such as catalogue house competition, parcel post, Hardware exhibits, mutual Hardware insurance, and the arrangement of the dates of the various State associations so as not to conflict unnecessarily with one another. Both of the reports were thus of value, and contributed not a little to the interest and usefulness of the meeting.

Election of Officers.

On Tuesday evening at an executive session of the association the following nominations were reported by the Nominating Committee, and at the election then held the report was adopted and the nominees unanimously elected:

PRESIDENT.—C. M. Tillman, McRae.
FIRST VICE-PRESIDENT.—T. W. Brobston, Atlanta.
SECOND VICE-PRESIDENT.—L. L. Bishop, Dalton.
SECRETARY-TREASURER.—E. E. Dekle, Valdosta.
INSURANCE MANAGER.—R. W. Hatcher, Milledgeville.
EXECUTIVE COMMITTEE.—C. W. Tillman, McRae; E. E. Dekle, Valdosta; R. W. Hatcher, Milledgeville; Z. B. Hamilton, W. D. Bowers.
DELEGATES TO NATIONAL CONVENTION: E. E. Dekle, Valdosta; C. B. Thomas, Griffin.

Hardware Jobbers at the Convention.

The jobbers of St. Louis, Louisville and Chicago were strongly represented by leading members of the houses, or by gentlemen in close and constant touch with the merchants of the State, as follows:

NORVELL-SHAPLEIGH HARDWARE COMPANY, St. Louis, Mo.: R. W. Shapleigh, J. C. Wimberly, H. M. Owsley, H. Cornelius, J. L. King, C. W. Collier, E. S. Allen.
HIBBARD, SPENCER, BARTLETT & CO., Chicago: H. D. Moore.
BELKNAP HARDWARE & MFG. COMPANY, Louisville, Ky.: Col. Morris B. Belknap, T. W. Brobston, T. W. Hereford, James J. Crawford.
SIMMONS HARDWARE COMPANY, St. Louis: R. F. Paddison, H. H. Jackson, John Welton.

Address of Judge George Hillyer.

An interesting address was made on Wednesday afternoon by Judge George Hillyer of the State Public Service Commission. The Judge referred in an instructive manner to the work of the Commission, especially as related to freight matters, touching upon such topics as the inspection of equipment, delays in transportation, the regulation of rates, freight and passenger, the preventing of rebates and unjust discrimination, and the adjustment of disputes. The impression made upon the convention was exceedingly favorable, and the members were strengthened in their confidence in the conservatism and wisdom of the Commission and its desire to be reasonable and helpful in the discharge of its great responsibilities. The principle which Judge Hillyer announced in his closing words, that a changeless purpose to do right is the best basis for success, individual and governmental, was evidently heartily approved by the convention.

Question Box.

The Question Box was an interesting feature of the gathering, but owing to the pressure of business it was not feasible to devote as much attention to it as might have been desired. A number of important subjects were, however, discussed and practical suggestions elicited. The subject of salesmanship was discussed by R. W. Hatcher, who made an interesting address, in which he alluded to some general principles and gave examples of correct methods. Mr. Hatcher said:

The essence of salesmanship is the ability to bring out points on the article offered for sale that will become favorably fixed in the mind of the purchaser, so that even though he should not purchase immediately, the impression made by the arguments of the salesman will linger with him and cause him to return and buy later. It matters not how commonplace the article shown may be, there are always points about them than can be emphasized and which will assist in making the sale. It is necessary to bring out the points and impress them with your best manner, and talk like you had conviction behind your words.

Selling a Cook Stove.

With an ordinary Cook Stove, for instance: Show the customer the system of flue circulation. Show him how it will bake the bread under the bottom and brown it on top, by reason of this correct circulation. Show him that it is made of pig iron. Take one of the lids, bring it down with force on the top of the Stove to show him the strength of the iron. There are many other points that could be emphasized, but these will serve to illustrate. Now, as a matter of fact, all well made Stoves have practically these same features, but the salesman who brings them out will make the sale.

Hardware offers a larger field for the development of salesmanship than any other business. It is one in the study of which you can grow enthusiastic, and the broadness of its sphere of investigation is as interesting as it is unlimited.

Method of Manufacture.

How many of you have ever studied the method of manufacture of the articles you sell? How many of you could take up the commonplace Manure Fork, as an example, and tell your customer just how the raw material is taken through the various processes of manufacture to the finished product which you are offering him? Likewise the ordinary Hand Saw, Hatchet or other edged tool. Don't you think your customer would go away better satisfied with his purchase if he had the story within his recollection? Don't you believe that he would think more of that tool and take better care of it, and over and above all, that he would go away feeling that you knew

your business and that you were the man for him to consult about any article in the Hardware line?

It behooves us to stir ourselves and begin to investigate and learn something about the vast scope of the Hardware business. You will be surprised at the attraction you will unearth. Talk to your clerks about it. Give them object lessons in the making of sales and in the description of articles.

Trustworthy Statements.

Another thing; impress upon your clerks the absolute necessity of trustworthy and reliable statements, or else the advantage of their arguments will be lost on your customer. Teach them not to let their remarks bear a suspicion of impertinence or a suggestion of superior wisdom that might injure the pride of your customer; but rather let them be of a suggestive nature, making the customer feel that he assists in reaching the conclusion.

Do not forget to cultivate a broad feeling of liberality that will enable you to warm toward your customer and to appreciate the fact, that he is favoring you with his patronage. Thus a mutual esteem will ripen into that good fellowship which makes all the world akin, and which will tend to your success and his betterment.

The Presiding Officers.

President Tillman, to whose wise and unwearied efforts the association is so greatly indebted, made an admirable presiding officer, holding the convention well in hand, and directing its deliberations happily and with dignity. At some of the sessions, on account of the president's indisposition, R. W. Hatcher, Milledgeville, was called to the chair, and his familiarity with the duties of the position were supplemented by his exceptional felicity as a speaker which gave to his introductions and remarks a peculiar grace and appropriateness.

Fire Insurance.

One of the most important questions before the convention was in regard to the organization of a State Hardware insurance company. This matter had been taken up at the last meeting, when a committee was appointed to consider the subject and report at the Indian Springs convention. This report was made on Wednesday evening by R. W. Hatcher, and as a result it was decided after a careful discussion to organize a State Hardware insurance company, and steps were taken to this end. It is evident that such an organization will have the hearty support of the members of the association, and it will doubtless be found an important means of furthering the growth of the organization. Mr. Hatcher will, it is believed make a wise and efficient manager.

Trade Harmony.

The tone of the convention was reasonable and conciliatory in regard to trade matters with a general recognition of the rights of jobbers and manufacturers. There was some incidental criticism of jobbing houses who sell to the retailers' customers, but it appears likely that the work of the association will tend to the correction of such practices.

Next Place of Meeting.

There was an animated canvass in regard to the place of the next meeting of the association, but at the last session on Wednesday evening Valdosta was unanimously chosen. The association is well represented in that city, and the merchants there united in a very hearty invitation. There is no doubt that the event will justify the wisdom of the selection, and that the characteristic hospitality of the city and the admirable arrangements which the merchants there will make for the convention, will do much to make the gathering enjoyable and in every way successful.

Resolutions.

Resolutions were adopted by the Association as follows:

1. That we urge our Georgia Legislature to pass a pure Paint law similar to the North Dakota law.
2. That we take up the question of the price of loaded Shells with the Shell Association and endeavor to secure a graduated price as to the quantity, 1000 being the minimum quantity.
3. That we urge the manufacturers of Steel Plow Shapes to increase their minimum quantities to 5000 lb. instead of 500 lb.
4. That we appreciate to the fullest extent the efforts of the different exhibitors and trust that they will continue to favor us at future conventions.
5. That we extend our sincere thanks to Mr. Shapleigh of St. Louis, Mr. Belknap of Louisville, Mr. Williams of *The Iron Age*, Mr. Jones of Atlanta, and Mr. Corey of Argos, Ind., for the valuable and instructive services rendered us at this meeting.
6. That we express our appreciation of the visit of Mr. Barnett of the Retail Merchants Association of Georgia and pledge to him our hearty support in the work of his association.

Amendments to the Constitution and By-Laws.

The following amendments to the constitution and by-laws recommended by the Committee appointed for that purpose, G. W. Woodruff, Chairman, were adopted: That merchants who handle wagons, buggies and farm implements be eligible to regular membership in the Association; that an insurance manager be elected to work under the supervision of the Executive Committee; that the secretary-treasurer of the association be elected by the Executive Committee and that he be reimbursed for his services at the end of each year to an amount to be determined by the Executive Committee; that annual dues of honorary members shall be $2.50 instead of $5; and that at the annual conventions of the association one or more open sessions be held each day for the discussion of topics of mutual interest and importance to both regular and honorary members.

Co-operation in Business.

R. W. Shapleigh of the Norvell-Shapleigh Hardware Company, delivered an address on "Co-Operation in Business," from which we make the following liberal extracts:

The idea of co-operation in business is very old; as far back as the seventeenth century it was in operation, and it has been adopted more and more extensively ever since in European countries. Indeed, to-day we find very strong organizations in Scotland and England doing an enormous business and paying large dividends. In France, also, co-operative societies are very strong, particularly in building industries and agriculture. In Germany millions of people are connected with them; in that country they take more the form of the "People's Banks."



R. W. SHAPLEIGH.

In Switzerland and Denmark they use this co-operative principle, and the dairy business in those countries is almost entirely operated in this manner. In Hungary the State takes a hand, and adds large subscriptions to the capital of co-operative societies. Austria also has over 5000 co-operative organizations. Millions of shareholders comprise these societies, and in this particular these aggregations of capital are very different from those large corporations that are owned and controlled by a few people.

It would be interesting to go deeper into the operation of co-operation in the old country, but it is a very large subject. The fact that the principle of co-operation has been in use in various forms for so many years, and has been recognized as a legitimate and powerful factor in business is the point that I desire to establish.

Co-operative Societies Not Successful, as a Rule, in the United States.

In looking at the growth of co-operative societies in our own country, we find that they have not been successful as a rule, and this is probably accounted for by the vast difference in physical conditions; the enormous area of our country; the sparseness of population in contrast with European countries, the dissimilarity in the methods of conducting business and in the channels of trade.

A large number of Co-operative Societies have been started in the United States, but about the only ones that have found any ready support have been, what might be called "Farmers' Co-operative Societies"—organizations with a large list of shareholders, comprised of consumers in the territory, who have been led to invest their money with the promise that the organization would procure for them their machines, tools, etc., at the lowest wholesale prices, with freight added. These organizations, after a brief career, have with very few exceptions, gone to pieces.

This is properly the case, as such organizations only disturb and alter the regular and proper channel of trade; take from the enormous number of worthy retailers their trade and their profits. The retail merchants scattered all through this broad land, in the hundreds of thousands of larger or smaller rural settlements

are the strength and character of the communities in which they live, and in fact of the whole country. Any plan that tends to detract from their success and welfare is vicious, un-American and dangerous.

Channels of Trade.

There are, however, methods of co-operation in business that are proper, strengthening and uplifting, and should be constantly encouraged.

The recognized proper channel of trade is from the factory to the jobber, from the jobber to the retailer, and from the retailer to the consumer. The interest of the jobber and retailer are very closely interwoven. They are not antagonistic, but entirely mutual. The jobber is dependent upon the retailer and the retailer upon the jobber. Co-operation between the two then is natural, beneficial and reasonable.

Duty of the Jobbers.

Let us consider then how better co-operation can be brought about between them, and what should be the obligations of each. Speaking from the viewpoint of a hardware jobber, I believe it to be the duty of the jobber to co-operate with the retailer, and I believe that he can do it practically and effectively by observing the following points.

It is the first duty of the jobber to protect his customer in every way. The jobber should never sell to a consumer at all, except with the consent of a dealer that the consumer should select, having it clearly understood with the consumer that the dealer was to receive his proper profit.

To follow this rule is very easy. The most difficult matter to properly adjust and take care of is when a customer who, we will say for the sake of example, is in the stationery business, and is handling Fishing Tackle, sends in a mail order for Screen Doors to put on his own home. In a case of this kind, it is clearly the duty of the jobber to co-operate with his Hardware customer in that town by referring this gentleman in the stationery business to the Hardware dealer who keeps the Screen Doors for sale, and this is what is usually done, but it is done at the risk of making the stationery gentleman very angry and losing his trade on Fishing Tackle, which as you all know, is profitable business.

Protecting Customers.

Of course, the gentleman in the stationery business should have been willing to go to the Hardware dealer and buy his Screen Doors from him, but knowing that he is buying one line of goods from a jobber who also sells Screen Doors, he thought he was entitled to buy Screen Doors also from the jobber.

It is true that a large proportion of the business of some mail order houses is composed of articles bought for private consumption of an entirely different line from that which the merchant carries. For example, a dealer in the millinery business in a town having one of these mail order catalogues will buy a Lawn Mower for his own use and a man in the Hardware businness in the same town will buy a trimmed hat for his wife.

This is one of the great evils of the mail order business, inasmuch as it gives any dealer an opportunity to buy, for his own consumption, goods away from home that are handled by his fellow merchant in his own town, and who should naturally have the benefit of his trade. Of course, the mail order houses make no distinction. Anybody who is a merchant can buy any item from them, no matter what line of business he may be in.

It is the duty of the jobber to co-operate with the dealer by giving his customers clean, fresh, up to date merchandise; by filling his orders promptly and complete, and by giving quick and fair settlement of all claims and errors. It is the duty of the jobber to help and co-operate with his customer by being progressive and up to date in putting in stock and providing his customers with new lines of attractive, salable and profitable goods; by advocating new and helpful ideas on the management of stock; methods of sale, and the general management of the business.

Varied Co-operation.

A practical method by which jobbers can co-operate with their customers is in educating customers and their clerks in regard to the merits and characteristics of different articles; giving them the talking points so that the articles may be more intelligently presented and more easily sold.

The jobber can also aid the retailer by instructing his own salesman to look closely after the wants of his customers by making helpful suggestions as to store arrangement, window dressing, &c.

The salesman for a jobber who has judgment and fact can be of much benefit to a dealer without being at all offensive or intrusive, and the dealer can well afford to listen to him, as the experience gained from constant visits to different dealers in the same territory, gives an intelligent salesman a fund of information that is very valuable to the dealer. The knowledge of the kind of goods used, the new goods introduced in the territory, quantities to obtain, knowledge of the different retail prices prevailing in different parts of the territory, and in a word, any gossip and detail of what is being done by other merchants in different parts of the dealer's section is of great value, and the retailer who will ask such a salesman questions about all sorts of things and find out from him how certain people in that territory do certain things and endeavor to extract all the information possible, will be well repaid.

Salesman's Experience.

We know that this is true from our experience in the jobbing business. The knowledge gained from some salesman in whom we have confidence oftentimes proves of much value to us. Therefore, ask them about any item on which you may want advice. They will be delighted to help you. They understand that their interest and yours are identical, and that fact will urge them to give you the very best information that they have and the very best counsel that they can.

Another little item of practical co-operation is the matter of looking after the transportation of goods to the different sections. We have reduced the time of delivery of goods from St. Louis to Atlanta by means of package cars, wonderfully. From actual test, during the month of March, the average time of these package cars from St. Louis to Atlanta was 38 hr., and at Atlanta they made connections with daily merchandise cars operating from all the lines diverging. It has been a general impression that the distance from St. Louis to Georgia and the Southeast made it hard to get goods from St. Louis, but you will see by this schedule that you can get them from there in much shorter time than you can from the East. All the railroads travel these cars, and all are giving excellent service.

Promptness in Shipments.

The above are some of the details of the way a jobber can co-operate and help his customers, and, in general terms, it is not only the duty of the jobber, but his interest also to watch his customer's welfare in all things; to encourage State retail organizations; to co-operate with the National retail body; to observe all legislation hostile to retail interest and vigorously oppose such and strive by every means to bring the trade to a higher level.

Co-operation from the Retailer's Side.

You will now ask what is the attitude of the retailer to the jobber, and how can he do his part in co-operation between them. Well, the co-operation of the retailer with the jobber cannot, under the circumstances, be as active and direct as that of the jobber. Nevertheless by taking and putting into practice as fast as possible the improvements in goods and in methods; by evincing a willingness to encourage and appreciate good service and by commending and advertising any good thing promulgated by the jobber, he can encourage and support and co-operate practically with the jobber's efforts.

Value of Associations.

Really the most practical thing to a retailer, if he desires to improve his methods and business generally, is to join the State retail organization and attend the meetings. No dealer can come in contact with such a representative body of retail merchants as are here assembled and discuss with them the different methods and ways of improvements of handling the various problems that confront all alike, without learning something that will prove of much benefit, and they will be repaid many fold for the expense and time necessary to attend the meeting. In a multitude of course there is wisdom.

This is the practical and definite advantage, but who can measure the advantage and benefits gained by coming in close personal contact and making the friendship of your fellow-dealers all over the State? The effect of these organizations in this particular, seems to me, to be plainly seen in the more courteous attitude of competitors in the Hardware business toward each other. The old vicious rule or ruin methods of competition are fast disappearing. It is a rare thing now to find a town where competitors in the Hardware business are not on friendly footing, and on account of this co-operation between themselves, all are successful.

The State retail organizations are directly responsible for this improved condition. In no other way can merchants in the same line of business in different parts of the State become acquainted and learn the good points of each other's methods, and thus adopt the best from the experience of all.

Volumes could be written on the advantages of joining State organizations. Their growth and their influence to-day are all the recommendation they need. State organizations should follow out the principle of co-operation by acting in thorough harmony and accord with the national body.

Substantial Results of United Action.

It is very evident to me that had it not been for the National Retail Hardware Association's vigorous cam-

paign in regard to Parcel Post, and the splendid courageous co-operation given the national association on this subject by the State associations, that we would have had on our statute books to-day a bill of some character that would act as an entering wedge in this matter.

If it had not been for the united action of the Hardware trade of the country through their State associations and national associations, acting through the joint committee of retailers and wholesalers on the catalogue house question, the evils of this method of doing business would be double what they are to-day. When this struggle against them had first begun, they were marching on triumphantly, arrogantly and invincibly. To-day they are halted, baffled, undecided, and wavering.

Colonel Belknap's Address.

After a few words of congratulation to the members upon the substantial commercial lines along which the Hardware business in Georgia is established, due largely to the high character and personnel of the merchants, Col. Belknap called attention to the fact that as high an authority as President Eliot, of Harvard now ranked business as a science. Continuing, he said:

The co-ordination of the five departments of a business establishment, viz.: the buying, selling, transporting, accounting and adjusting, requires a systematic treatment. Each must be accorded the importance it deserves, and none deserves to be slighted.

How Little We Know About Money.

Associated with the accounting department is primarily the subject of money. It is very strange, when we think how eagerly we seek to make money, how little we know about it when it is attained. We are up early in the morning, each hour of the day finds us busy with the complicated problem how to make money. According to the figures on our books we have made some, but whether in the shape of accounts debited customers, or actual cash in the drawer, we still realize that this money we have made is much of a mystery to us. If among our cash items we find one or two checks, we realize that now they look very much like money, whereas six months ago they were mere orders which banks seemed to pay or repudiate at will. That panic was a severe storm, but, fortunately, while the wind played havoc with much of our property we were spared the usual concomitant of a drenching rain. And so we congratulate ourselves that we got off rather well, and perhaps the next storm is a long ways off.



MORRIS B. BELKNAP.

We are not just to ourselves when we fail to get nearer to the real problem of the money question. It is not one solely for the banker. Because he is the custodian of what we make, does not constitute him the authority of the true value of the money we deposit with him. "We want what we want when we want it," we can say of our funds in bank, as well as the gouty old Frenchman with whom the saying originated exclaimed of his prerogatives. But we well know that a recurrence of conditions such as we had last fall would likewise mean, as then, a disappearance of cash and a reappearance of certificates.

Greater Elasticity in Currency Desirable.

I do not come to you as the apostle of any one of the financial measures now before Congress. The one which appeals to me strongest is that which will give us greater elasticity to prevent the hoarding which embarrassed us last fall, and at the same time will be as conservative as possible. But our own duty lies in a personal interest in the selection of Senators and Representatives, who will have the intelligence to grapple with this great question. As already stated, money is the thing we are after, and the best we can get is none too good. So in determining its essential features let us give some attention to the class of men we send to Congress to enact the important laws that will give us a currency worthy of our vast business interests.

CONVENTION NOTES.

E. C. Atkins & Co., had a very complete and attractive display and their representatives, A. M. Sinclair, T. L. Hoshall and V. A. Lane, were unremitting in their attention to the members.

The American Steel & Wire Company was efficiently represented by L. A. Dietrich of New York, C. J. McCue, E. A. Nevin and M. H. Conolly. Mr. Dietrich, who has a host of friends in the association and the state at large, was called upon near the close of the Wednesday morning session and made an interesting address.

Prominent among other manufacturers was the Union Metallic Cartridge Company, whose representatives extended many courtesies to the members and guests.

The line of Paints and allied interests which is taking so conspicuous a place in the Hardware trade, was represented by the Patton Paint Company, the F. W. Devoe & C. T. Raynolds Co., and the Pittsburgh Plate Glass Company.

Souvenirs were not greatly in evidence, but some pleasant reminders of the gathering were given out by the Norvell-Shapleigh Hardware Company, F. W. Devoe & C. T. Raynolds Company, and Patton Paint Company.

A pamphlet was distributed at the convention containing the minutes, resolutions, &c., of the last annual meeting held at Tipton. It also presented the constitution and by-laws adopted by the association, names of officers and list of members at the time the pamphlet was printed.

"Plymouth Products."

THE PLYMOUTH CORDAGE COMPANY, North Plymouth, Mass., is distributing a booklet which is described as the first of a series of monthly bulletins giving information concerning the company and its products. The booklet is handsomely and profusely illustrated, containing many views of historical features and characters associated with the town of Plymouth. A sketch of the company's history is given, with a striking comparison of the facilities and output of early years with those of the present day. There is also an article showing the economy of buying high grade Cordage as compared with cheaper varieties. In future numbers of this organ it is designed to include miscellaneous information concerning Cordage matters which will be of general interest, and altogether "Plymouth Products" promises to furnish something of value to every buyer of Rope.

Trade Items.

AMONG the attractive pieces of advertising matter recently issued by Yale & Towne Mfg. Company, 9 Murray street, New York, are booklets entitled "Light on Latches," and "On Getting Yours and a Little More." The former treats of Rim Night Latches; the latter cleverly suggests methods by which merchants may stimulate their Builders' Hardware business, illustrating in this connection electrotypes which the company furnishes gratis to the trade.

HARMON & DIXON, 117 Chambers street, New York, who are sales agents for a number of prominent Hardware manufacturers, have taken on the account of the National Duster Company, Philadelphia, manufacturer of Feather Dusters. The firm will have a full line of samples on display in their show room, and will carry a complete stock.

SAMUEL DISSTON, for many years general manager of Henry Disston & Sons, Inc., Philadelphia, Pa., is about to retire from active service in connection with that company. The employees of the corporation will tender Mr. Disston a complimentary dinner at the Bellevue-Stratford Hotel, on Thursday, 28th inst.

E. S. PEASE, who makes a feature of marketing high class novelties and goods of souvenir character for distribution by manufacturers and merchants, recently moved from Temple Court to the new Hudson Terminal Building at Fulton and Church streets, New York City.

FRENCH & LINFORTH, who have been occupying temporary quarters in Oakland, Cal., have removed to a permanent office in Wells, Fargo & Co.'s building, corner of Second and Mission streets, San Francisco.

AMONG THE HARDWARE TRADE.

M. Weinstein, who handles Shelf Hardware, Cutlery, House Furnishing Goods, &c., has removed from 415 Grand street to 291-293 Bowery, New York, where he will occupy store, basement and subcellar.

Galer & Musser have bought the Hardware, Paint, Mine Supply, Tinning and Plumbing business of James E. Johnston, Barnesboro, Pa.

The Lindsey-Tolson Hardware Company, successor to Lindsey Hardware & Implement Company, Hollis, Okla., has been incorporated with a capital stock of $10,000 and $6500 surplus. A $35,000 retail stock of Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements and Sporting Goods is carried.

The stock of C. A. Robinson, Strong City, Kan., was recently damaged by fire to the extent of $250. The lines handled include Shelf and Heavy Hardware, Agricultural Implements, Paints, Oils, Sporting and Athletic Goods.

The business of G. W. Hoover in Audubon, Iowa, including Hardware, Furniture and Farm Implements, has been partially disposed of to Christensen & Lang of the same town. G. W. Hoover retains the Furniture and Undertaking departments.

Joseph H. Gilmore, Jefferson, N. Y., has sold his stock of Hardware and Implements to Hubbard Bros., who will continue the business at the old stand.

The R. H. Shield Hardware Company is a new concern in Tacoma, Wash., doing a retail business in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints and Sporting Goods.

Hickman Hardware Company, Hickman, Ky., recently suffered loss by fire of $3200. The company handles Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements and Sporting Goods.

Rogers Hardware Company, Rogers, Ark., has incorporated with an authorized capital of $100,000 to do a wholesale and retail business in general Hardware, Harness, Implements, Vehicles, Furniture, &c.

The Jacksonville Hardware Company has been incorporated in Jacksonville, Fla., with a capital stock of $10,000. The company handles Shelf Hardware, Stoves, Tinware, Paints, Oils, Sporting and Athletic Goods, doing both a wholesale and retail business.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM J. H. WHITNEY, Merrill, Mich., ex-president of the Michigan Retail Hardware Association, whose store and stock have been totally destroyed by fire. Mr. Whitney is doing business in a rented building and will at once erect a new store.

FROM MEYER & STEINKAMP, Holland, Ind., successors to the Hardware, Paint, Sporting Goods and Furniture business of Christ Roettger.

FROM J. T. BOYLAN, who has just opened a Hardware, Stove, Mill Supply and Sporting Goods store in Boyne City, Mich.

FROM WILLARD BROS. & HOLT, Chattanooga, Tenn., who have recently added a Hardware department to their builders' and contractors' supply business.

FROM ERNEST HARDWARE & PLUMBING COMPANY, Seattle, Wash., which has been incorporated with a capital stock of $100,000, to conduct a wholesale and retail business in Shelf and Heavy Hardware, Stoves, Tinware, Paints, Sporting Goods and Plumbing and Heating Supplies.

FROM CO-OPERATIVE SUPPLY COMPANY, Dallas, Texas, which will put in a line of Household Hardware and Novelties.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

WINCHESTER REPEATING ARMS COMPANY, New Haven, Conn.: Revised schedule of list and selling prices of Winchester Rifles and Shotguns in effect May 1, 1908.

O. C. WHITE COMPANY, Worcester, Mass.: Illustrated catalogue covering an extensive line of Adjustable Fixtures for Incandescent Lamps.

CHICAGO MODEL WORKS, William Trautman, proprietor, 179-181 East Madison street, Chicago, Ill., illustrated 20-page catalogue of small machinery, patent office, law court and working models, suitable for inventors and others.

THEO. J. ELY MFG. COMPANY, Girard, Pa.: Illustrated catalogue for 1908 referring to Mop Heads and Wringers, Towel Racks, Carpet Beaters, Handles, &c.

EVAN L. REED MFG. CO., Sterling, Ohio: Illustrated catalogue No. 2-B, referring to Hardware and Woodenware specialties.

I-XL FURNITURE COMPANY, Goshen, Ind.: Illustrated catalogues covering an extensive line of Kitchen Cabinets, Cupboards, Tables, Sinks, &c., and other furniture.

BRUNER STEEL WAGON COMPANY, Wapakoneta, Ohio: Illustrated catalogue No. 9, referring to Wagons, Trucks, Doubletrees, Singletrees, Neckyokes, &c.

BRAINERD MFG. COMPANY, East Rochester, N. Y.: Supplement No. 2 to 1907 catalogue, illustrating and listing numerous additions to its line of Hinges, &c.

HOBART ELECTRIC MFG. COMPANY, Troy, Ohio: Illustrated bulletin No. 605, referring to Standard Electric Coffee Mills and Meat Choppers.

TOPPING BROTHERS, 122 Chambers street, New York: Attractive illustrated catalogue, referring to Burrows Ball Bearing Jacks, Lightning Tool Grinders, Lightning Track Drills and Totten Brake Beam Clamps. The booklet contains much information of value to users of this class of goods.

ANDERSON TOOL COMPANY, Anderson, Ind.: Elaborate catalogue, illustrated in colors, referring to Anderson Automatic Computing Scales, and giving schedule of equipment, capacity, &c.

KELLEY-HOW-THOMSON COMPANY, Duluth, Minn.: Illustrated catalogue No. 50 with accompanying net price list, referring to spring and summer Sporting Goods, &c.

Cross Cut and Flexible Egg Whips.

Among the goods recently put on the market by the Wire Goods Company, Worcester, Mass., are the egg whips shown in the accompanying illustrations. A feature of the whip No. 343, shown in Fig. 1, is the cross

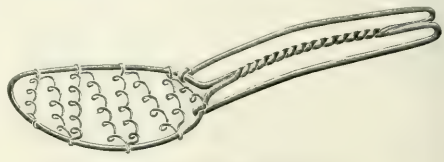


Fig. 1.—Cross Cut Egg Whip No. 343.

cut spiral wires which are alluded to as doing rapid work on account of the large number of cutting edges. The whip measures 10½ in. over all. The No. 390 whip, Fig. 2,

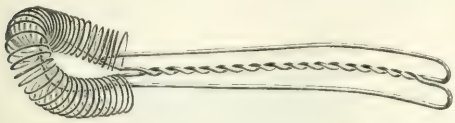


Fig. 2.—Flexible Egg Whip No. 390.

is 9⅝ in. over all, and has a continuous frame to give support to the coiled spring. Both of the whips are retinned.

Commode Slop Pail and Flue Thimble.

Two specialties made by the Weber-Kirch Mfg. Company, Keokuk, Iowa, are shown in the accompanying illustrations. Fig. 1 represents a flue thimble, which combines several features of improvement; the first of these being its adjustability, which adapts it for use in either a 6 in. or 7 in. flue hole, thus relieving the merchant of the necessity of carrying two sizes. The adjustment is quickly and easily made without the aid of tools. Another feature to which attention is directed is the deep ridge pressed in the circumference of the thimble, the function of which is to prevent the pipe being pushed too far into the flue; it likewise serves to hold the pipe from pulling out of the flue, and makes a practically airtight joint around the pipe, preventing water, soot or smoke from entering the room. The flue thimbles are made of common black and galvanized steel and are furnished unadjustable in a 6 in. size only, if desired. They are represented as being no more expensive than the common thimble, are packed closely nested together one dozen in a roll, three gross in a barrel, and weigh about 70 lb. per gross. Fig. 2 illustrates a sanitary combination commode slop pail. It is provided with a roll rim seat, which is fastened to and made part of the pail, and is furnished with a suitable lip for emptying the contents. The lid fits down into the groove between the seat and outer rim, which when filled with water forms an airtight trap, as ¾ in. of water is held in the groove, and suitable provision is made to drain any overflow to the inside of the pail. The advantages of this device and its serviceability as a household convenience are obvious. It is made only in 12 quart size, either of galvanized iron, striped and varnished, or of XXX extra quality charcoal tin, enameled in red and blue with gold stripes, and packed one-third dozen in a crate.



Fig. 1.—Kirch's Adjustable Flue Thimble.



Fig. 2.—Kirch's Sanitary Combination Commode Chamber Pail.

Seacombe Head Protector.

Charles M. Seacombe, 72 East Eighty-second street, New York, is the manufacturer of the Seacombe head protector, two views of which are here given. The protector is made in three models, suitable for the ordinary Derby or soft hat, and for policemen's and firemen's helmets, in three sizes of each of the three models to fit 6¼ to 7½ in. regularly, and in other sizes to order. Fig. 1 shows model 1 for Derby and similar hats. Model 2 is similar in construction, but adaptable particularly to the helmets worn by policemen, while the third shape resembles model 2, but as an additional protection against falling glass and other substances is covered with a steel

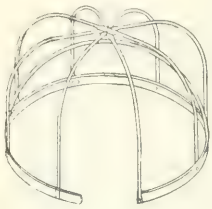


Fig. 1.—Seacombe Head Protector.

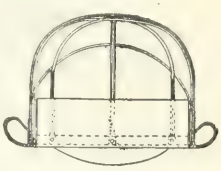


Fig. 2.—Protector Inserted in Derby Hat.

wire gauge, having a ⅛-in. mesh. These head protectors are offered as capable of resisting a crushing weight from a falling object equivalent to 248 lb. The material of which the protector is made is thin, highly tempered spring steel, baked japan finish. While the cagelike construction affords protection to the head of the wearer from falling objects, such as planks, bricks, bolts, rivets, nuts, &c., it can be inserted in an instant, weighs but ¾ oz., and its presence outwardly is not apparent. It also serves as a shock absorber in the event of blows from a black jack, lead pipe, sand bag or club wielded by a thug. While designed for universal use, the protector is especially serviceable for workmen and others whose daily avocations subject them to frequent risks of the character alluded to.

Lipscomb Disk Screw Calks.

The accompanying illustrations represent the goods produced by the Lipscomb Disk Screw Calk Company, 106 Park street, New Haven, Conn. The calks are made in several sizes, for the use of river drivers, timber men, hunters, ice cutters, cricket and golf players, as well as for ice creeping and mountain climbing. The feature of the calks is the concavity of the disk, as illustrated, which is designed to receive the bulging of the leather when the calk is screwed into the boot sole; also allowing the edge of the disk to rest squarely on the leather. It is explained that the concave disk prevents the calk bending and working loose in wet or inferior leather, or breaking



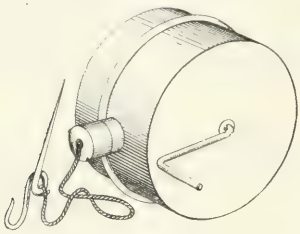
Trademark

Lipscomb Disk Screw Calks.

off just above the disk, as the result of lateral strain. The calks are inserted and removed quickly by means of a small brace wrench, or bit chuck, furnished with the calks. The company states that the calks will not pull out or work into the foot, and that they will stand a severe glancing blow or kick without breaking. They are put up in small pasteboard boxes and cartons, bearing the trademark shown in the illustration.

Eastman's Always Ready Chalk Line.

The Eastman Mfg. Company, 410 Riverside, Spokane, Wash., is offering the chalk line, herewith shown, for the use of painters, paper hangers, decorators, carpenters, sign writers, decorative plasterers, &c. In use the metal case is filled with powdered chalk, any color desired. When the line is reeled up the line is held within the reel, out of the way of moisture, and free from danger of being



Eastman's Always Ready Chalk Line.

cut or tangled, and can be carried in a tool chest, tool bag or pocket without inconvenience. The awl which is attached to the line is held to the case, when unemployed, by a hollow shaft, and is therefore always ready for use. The sharpened hook at one end of the awl is designed for sign writers or others wishing to work on cloth. The company states that the device is not a complicated piece of machinery and cannot possibly get out of order; also that one should last indefinitely, as it is made of the best material.

Top Notch Sash Pulleys.

The American Pulley Company, Philadelphia, Pa., has added to its line the Top Notch sash pulleys shown in the accompanying illustrations. The wheel is made of three pieces, with the two sides electrically welded to-



Fig. 1.—Top Notch Sash Pulley No. 3.

gether, making, it is said, a wheel that will not pull apart with a weight of 150 lb. on one wheel. The bushing is made of 0.042 in. steel and is 31-64 in. long and locked in the wheel. The groove is suitable for cord or chain. The axle pin is shouldered so that the metal of the housing is locked between the shoulder of the pin and the riveted end. The face plate is made with turned in flanges, to which the sides of the housing are electrically welded. The housing is entirely new in design, consisting of two pieces, which, instead of butting opposite the groove of the wheel, lap opposite the center of the wheel, so that the axle pin at each end has the support of two thicknesses of metal. The two pieces of housing are electrically welded to the turned in flanges of the face plate. The holding spuds are integral with the rounded ends of the housing, being cut in the arch so that when set up they hold. Each spud is supplied with

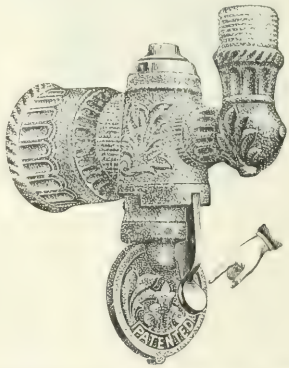


Fig. 2.—Top Notch Sash Pulley No. 4.

a recess to locate the end of the tool used for setting up. Two styles are made, No. 3, Fig. 1, with face plate 2 15-16 x 1 in., and over all length of housing, 2½ in. It fits mortises made by triple gang bits. No. 4, Fig. 2, has the same size face plate, with length of housing 2 11-16 in. It fits mortises made by quadruple gang bits. The pulleys are recommended as labor saving, strong, of good design and easy of application. They are protected from rust.

National Safety Gas Cock.

The National Safety Gas Cock Company, 1061 Lexington avenue, New York, has brought out the National safety gas cock here illustrated. The purpose of this device is to prevent asphyxiation through the unintentional or accidental turning from any cause whatever of the gas cock key. As shown, there is a positive stop caused by the thumb lever fitting snugly into a groove or slot cut in the body of the burner, the lever being kept in position by a phosphor bronze spiral spring, which will withstand the action of acid in dipping, and, it is said,

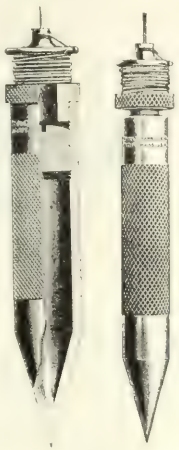


National Safety Gas Cock with Thumb Lever.

last as long as the cock itself. The key turns but one way instead of either way or all around. This method of construction renders necessary deliberate intention to turn on gas, thus preventing accidental carelessness caused by an open key. The click of the finger lever determines when the key is properly seated, locking body and rotary plug together.

Improved Mercury Plumb Bob.

The L. S. Starrett Company, Athol, Mass., and 132 Liberty street, New York, is marketing its improved mercury plumb bob, No. 87, here illustrated as in use and sectionally. The principal improvement is a patented device for carrying and fastening the string without a knot to tie or untie, by merely drawing the cord into the peculiarly slotted neck at the top, after unwinding the necessary length, when the bob will hang perfectly true. The plumb bobs are made from solid steel, bored and filled with mercury, there being a tight fitting screw cap inside to keep the mercury intact. Leading characteristics of this construction are the great weight in proportion to size, low center of gravity, small diameter, hardened and ground points, knurling on the body and the simple yet effective device at top for fastening end of line after winding up the cord, so that the latter is always conveniently at hand, but not in the way. Regularly each bob has 8 ft. of a specially imported braided silk line and the goods are polished and nickel plated. The No. 87 style, mercury filled, is made in 4, 5, 5½ and 6 in. lengths, with diameters of ½, ⅝, ¾ and ⅞ in., weighing respectively 3½, 6, 12 and 16 ounces. Another plumb bob, similar in appearance, No. 177, is made from solid steel and of the same outer dimensions, but weighing 2¾, 5, 8½ and 14½ ounces respectively.



Plumb Bobs, Mercury Filled and Solid.

Ornamental Fireproof Door.

The Kinnear & Gager Mfg. Company, Columbus, Ohio, W. H. Brodie Company, 45 Vesey street, New York agent, is putting on the market the ornamental paneled fireproof door and trim here illustrated. The frame or core of the door is substantially built of wood, and is covered with kalamein or charcoal iron. The metal is applied by a patented process of construction, with double lock seams and joints, so that no nail heads or open joints are visible. The process may be understood by referring to Fig. 2, showing how the edges of the metal sheets are interlocked around the panel, after which they are hammered together, forming a solid joint composed of four thicknesses of metal. The doors are susceptible of high finish or any style of graining. They are made in 169 standard sizes, from 2 x 6 to 4 x 8 in even inches, width and hight, but not in fractional parts of inches. Sash doors and trims are made in the same method of construction.

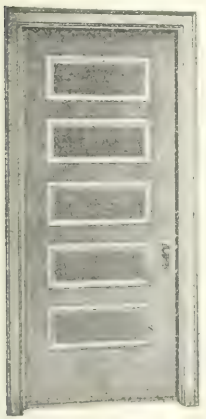


Fig. 1.—Fireproof Door.

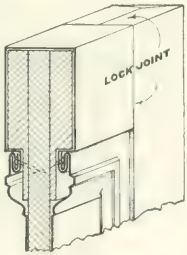


Fig. 2.—Cross Section of Door.

Lightning Portable Hand Punch and Shears.

The American Lock Nut Company, Oregon, Ill., New York branch, Charles Longenecker & Co., 150 Nassau street, is offering a line of portable hand punches and shears of the general type shown in the accompanying illustrations. The tools are designed for general service in punching holes in angles, flanges, tank heads, ferrules,

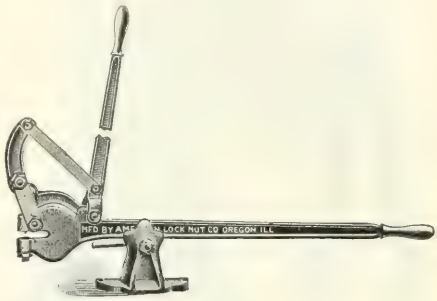


Fig. 1.—Lightning Portable Hand Punch No. 7.

2 in. in diameter and larger, and other miscellaneous uses where hand work is required. They are also referred to as being especially serviceable for punching holes in close corners and intricate places where it is difficult to reach with ordinary tools. As ordinarily constructed, holes to the center of a 1-in. flange or angle can be punched, and when so ordered the tool can be arranged to punch the center of a ⅝ or ¾ in. angle. Fig. 1 illustrates the No. 7 punch, which is provided with a compound lever and punches only with the down motion of the lever, and differs in this respect from the regular construction which is designed to punch and strip with either the upward or downward movement of the lever. The punch takes punches and dies up to ½ in., and is provided with a

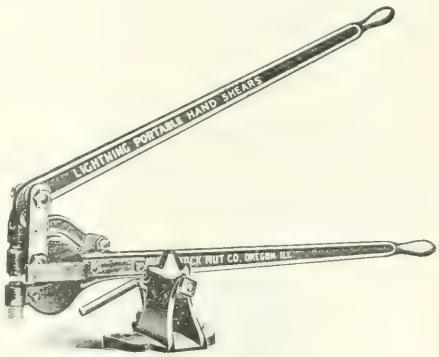


Fig. 2.—Lightning Portable Hand Shears.

power lever 30 in. long. Fig. 2 shows the Lightning portable hand shears, which is of the same general construction as the punches, having shear blades inserted in place of punches. This tool can be used for cutting bands, either round or flat, and has a capacity up to 4 x 3-16 in. bar. A convenient quick acting vise is furnished for holding these tools for stationary work. When used in this way in connection with gauges, which can be easily fitted to the tool, accurate and satisfactory work can be done. The vise is operated by a cam and lever, so that the punch can be instantly fastened or released. The weight of the punch shown in Fig. 1 is 17 lb., and the vises weigh 12 lb. each.

The Carolus Nut Splitter and Bolt Clipper.

A tool designed for general utility service in mechanical work is the nut splitter and bolt clipper made by the Carolus Mfg. Company, Sterling, Ill., and here illustrated. The convenience of such a tool in shop, factory, farm or other work necessitating the cutting of bolts or removal of nuts is readily recognized, and the combination of required mechanical facilities in one instrument was the specific object aimed at in the design of this tool. The tool is provided with three distinct cutting edges, two of



The Carolus Nut Splitter and Bolt Clipper.

which are set at right angles with the handles, the other being parallel therewith. It is thus made possible to cut bolts at different angles, and it is claimed that it makes a clean cut, leaving threads in such condition that the nuts can be easily removed or replaced. In construction the tool is exceedingly simple and, though light and easily handled, it is designed to stand the hard usage of miscellaneous service. The cutting blades are of high grade tool steel, and are set in a frame composed of drop forged spring steel plates; the pivot screws are also of tool steel. The nut splitter and bolt clipper is made in two sizes, Nos. 1 and 3, the former cutting up to ⅜-in. bolts, and the latter up to ⅝-in. bolts.

Rural Free Delivery Mail Boxes.

The Northwestern Mail Box Company, St. Louis, Mo., is offering a line of rural free delivery mail boxes, two of which are represented in the accompanying illustra-

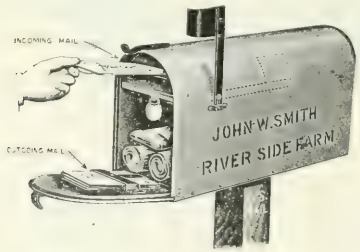


Fig. 1.—Carrier's Friend Mail Box No. 1.

tions. The box illustrated in Fig. 1 contains an upper compartment for incoming mail which offers privacy and security to the patron, in that his first class mail is always under lock for which he only has a key. The first class mail being locked in the upper compartment, makes the use of a padlock on the door unnecessary, thus relieving the carrier of the necessity of carrying a master key. There is a receptacle on the inside of the door for outgoing mail which enables the carrier to collect it quickly without removing his gloves. A positive locking flag signal painted red is attached to the side of the box, and is so shaped that it can be seen from any angle in

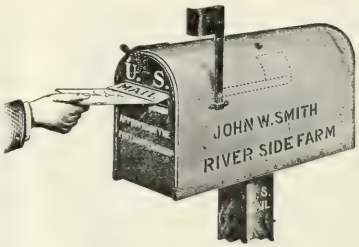


Fig. 2.—Carrier's Friend Mail Box No. 2.

the road. The door is equipped with a strong positive spring latch which cannot be broken open. The size of this box is 19 by 10 by 6 in. Carrier's Friend No. 2, shown in Fig. 2, has one large roomy compartment. A letter slot in the door enables the carrier to insert the mail with one hand and so saves the time of opening the box. The slot is protected with a flap fitting closely to the box, which is equipped with the same catch and flag signal as the No. 1. The size of the No. 2 box is 19 by 8 by 6 in. Fig. No. 3 illustrates the manner in which the end pieces are fastened to the body. It will be observed that it is rolled in such a way as to make it absolutely weatherproof. The boxes are made of galvanized steel finished in aluminum and have been approved by the Postmaster-General. Each box is wrapped in white paper and one-half dozen are packed in a crate, the weight per crate being about 50 lb. The patron's name, if desired, will be stenciled on the box, and the stencil enclosed therein for his future use.

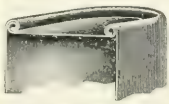
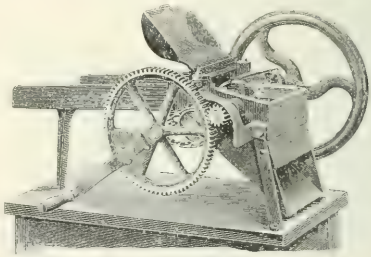


Fig. 3.—Manner in Which End Pieces Are Fastened to Body.

New Model Clover Cutter.

The Silver Mfg. Company, Salem, Ohio, is putting on the market the Clover cutter for poultry, which is shown herewith. It is designed for cutting into ⅛ in. lengths, either green or dry clover, alfalfa, vegetable tops, &c., which are referred to as both cheap and productive egg

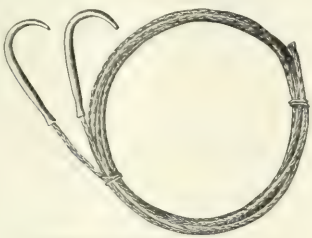


New Model Clover Cutter.

forming poultry foods for cold weather. The machine is 28½ in. long over all and weighs 60 lb., being intended for mounting on a box or bench at any hight to suit the operator. It is made of iron and steel only, has large capacity, and is said to run easily, feed strongly and do good work indefinitely. The feature of the machine is its cutting mechanism, which is patterned after the Ohio cutters made by the company. This can be kept in perfect order because the cutter bar is adjustable and easily accessible and the four 7-in. spiral steel knives can readily be removed for sharpening.

Hendryx Complete Picture Hanger.

The Andrew B. Hendryx Company, New Haven, Conn., is putting on the market the complete picture hanger illustrated herewith. Each hanger is put up in a separate envelope containing what is necessary to hang one picture, namely, two 1-yd. lengths of wire picture cord, each



Hendryx Complete Picture Hanger.

securely fastened to a hook made of strong brass tubing, and two screw eyes for attachment to the frame of the picture. The advantages claimed for the outfit are that it is compact and convenient for buyer and seller and also that the small hooks, while strong and durable are almost invisible on the molding.

Hadaway Electric Glue Pot.

The Westinghouse Electric & Mfg. Company, Pittsburgh, is marketing a variety of electrically heated Glue Pots, made by Hadaway Electrical & Engineering Company, to meet the requirements of different lines of work, one of which is shown in the accompanying illustration. They are provided with a patent water circulating device consisting of a hollow ring of copper carrying at its lower end a diaphragm of copper, which has a small hole at its center. This device is fitted inside the water bath in such a manner that a thin film of water is exposed to the full effect of the heating element and a rapid circulation is set up which results in the water being quickly raised to the proper working temperature. A cut off is provided which reduces the current so that just enough is used to keep the glue at a fixed temperature. A brass wiper is fitted to the glue pot and secured in position by rivets and soldering. The bail is of brass and is attached to the pot by brass ears secured by soldering and rivets. The glue pot is spun from heavy sheet copper and the water bath is a seamless copper vessel. The heating element surrounds the bottom portion of the water bath and is protected by a waterproof tin jacket. Portable and bench glue pots are also made in various sizes.



Hadaway Electric Glue Pot.

Nettleton Reversible Cutting Nipper.



Nettleton Reversible Cutting Nippers.

The Starr-Nettleton Company, East Hampton, Conn., has brought out the new reversible cutting nipper shown in the illustration. Each of the jaws has two fine cutting edges, and held in place by two screws, being consequently easily reversible, adjustable and interchangeable, and at the same time strongly constructed. The nipper is made in five sizes, 6, 8, 10, 12 and 14 in., for 1-16, ⅛, 3-16, ¼ and 5-16 wire.

E. J. Binder and Philip Clotz have opened a Hardware store at Lorain, Ohio, under the firm name of Clotz & Binder.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, State and Western, raw	.42 @44
Oils, Boiled	.45 @46
Oils, Raw	.44 @45
Raw, Cabotta in bbls	.50 @...
Lard, Prime, Winter	.67 @74
Extra No. 1	.55 @65
No. 1	.47 @...
Cotton-seed, Crude, f.o.b. mill,	@...
Summer Yellow, prime	.48 @48½
Summer White	.49 @56
Yellow, Winter	.49 @...
Tallow, Acidless	.52 @55
Menhaden, Brown, Strained	.47 @...
Light Strained	.48 @...
Bleached Winter	.42 @...
Ex. Bleached Winter	.44 @...
Cocoanut Oil,	₱ lb. 6@6½
Cochin	₱ lb. 7@7½
Cod, Domestic, Prime	.42 @...
Newfoundland	.44 @46
Red Elaine	.52 @55
Sperm, Natural	.85 @...
Bleached	.90 @...
Oleic, Yellow	.17 @...
Neatsfoot, Prime	.55 @58
Palm, Lagos	₱ lb. 5½@5¾

Mineral Oils—

	₱ gal.
Black, 29 gravity, 25@30 cold test	.10 @...
29 gravity, 15 cold test	.13½@14
Summer	.14 @...
Crude or light filtered	.18 @...
Dark filtered	.16 @...
Paraffine, 30@32 sp. gravity	.14 @17
900 sp. gravity	.13½@14
880 sp. gravity	.11 @13½
Red	.17½@21

Miscellaneous—

	₱ lb.
Barytes,	
White, Foreign	$22.00@$30.00
Ame. Blanc Fixe	.03 @.04
Off color	.02 @.03
Chalk, in bulk	₱ ton 3.00@ 5.40
China Clay, Imported	₱ ton 11.50@18.00
Cobalt, Oxide	₱ 100 lb. 1.75 @ 2.00
Whiting, Commercial	₱ 100 lb. .52
Gilders'	₱ 100 lb. .70@ .80
Extra Gilders	₱ 100 lb. 60@ .65

Putty, Commercial—

	₱ 100 lb.
In bladders	$1.70 @1.80
In linseed oil tins	.... @1.45
In 1 lb. to 5 lb. cans	.... @1.95
In 12½ lb. to 25 lb. cans	1.50 @1.90

Spirits Turpentine—

	₱ gal.
In Oil bbls	.45@.46
In machine bbls	.46 @.48

Glue—

	₱ lb.
Cabinet	.12 @15
Common Bone	.7½@ 9
Extra White	.18 @24
Fish, liquid, 50 gal. bbls., per gal.	.60 @1.50
Foot Stock, White	.11 @14
Foot Stock, Brown	.09 @11
German Common Hide	.10 @12
German Hide	.12 @18
Isinglass	.30 @40
Ivory Size	.15 @16
Live Grade	.11 @12
Medium White	.14 @17

Gum Shellac—

	₱ lb.
Button, Commercial	.... @...
Bone Dry	.25 @27
Button	.27 @...
Garnet	.... @...
Orange	.... @...
Orange, Superfine	.... @...
Pale, Commercial	.12 @19
Pale, Fine	.... @...
Pale, T. C.	.18 @...
Octagon, B	.38 @40
T. N.	.16 @...
V. S. O.	.17 @18

Colors in Oil—

	₱ lb.
Black, Lampblack	.12 @14
Black, Ivory	.36 @...
Blue, Cobalt	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.... @14
Green, Chrome	.14 @16
Green, Paris	.... @24
Indian, Red	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.... @14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.—

	₱ lb.
Lead, English white, in Oil	.10½@10½
Lead, American White, in Oil	.... @...
Lots less than 500 lb. in Oil	.... @7¾
Lead, White, in oil, 25 lb tin pails	.... @7¾
Lead, White, in oil, 12½ lb tin pails	.... @7¾
Lead, White, in oil, 1 to 5 lb cans	.... @...

Lead, American. Terms: On lots of 500 lbs and over 2% for cash if paid in 15 days from date of invoice.

Zinc, Dry—

	₱ lb.
American, dry	.... @7½
Red Seal, Horse	.... @...
Green Seal, Horse	.... @...
German Red Seal (French Process)	.... @...
Green Seal	.... @...
White Seal	.... @7½
Extra White Seal	.... @...
Lehigh	.... @...

Dry Colors—

	₱ lb.
Black, Carbon	.... @10
Black, Drop, American	.... @ 8
Black, Drop, English	.... @15
Black, Ivory	.... @...
Lamp, Commercial	.... @ 6
Blue, Celestial	.... @ 6
Blue, Chinese	.... @33
Blue, Prussian	.... @31
Blue, Ultramarine	.... @15
Brown, Spanish	.... @...
Carmine, No. 40	$6.00@6.25
Green, Chrome, ordinary	.... @ 5
Green, Chrome, pure	.... @25
Lead, Red, 100 lbs., ½ bbls., kegs	.... @...
Litharge, 100 lbs., ½ bbls., kegs	.... @...
Ochre, American, Golden	.... @...
American, Golden	.... @...
French	.... @...
Foreign, Golden	.... @...
Orange Mineral, English	.... @...
French	.... @...
German	.... @...
American	.... @...
Red, Indian, English	.... @...
American	.... @...
Red, Turkey, Extra	.... @...
Red, Tuscan, Extra	.... @...
Red, Venetian, Fine	.... @...
English	.... @...
Sienna, Italian, Burnt and Powdered	.... @...
Raw	.... @...
American, Raw	.... @...
American, Burnt and Powd.	.... @...
Talc, French	₱ ton $18.00@25.00
American	.... @...
Terra Alba, French	.... @...
English	.... @...
Ultramarine, American	.... @...
Umber, American	.... @...
Vermilion, American	.... @...
Yellow, Chrome, Pure	.... @...
Yellow, Chrome, Pure	.... @...
Vermilion, American Lead	.... @...
Ochre, Red, Imported	.... @...
Ochre, Yellow, Imported	.... @...
Ochre, American	.... @...
Raw, American	.... @...
Yellow, Chrome, Pure	.... @...
Vermilion, American Lead	.... @...
Ochre, Red, Imported	.... @...
Ochre, Yellow, Imported	.... @...
Ochre, American	.... @...

Current Hardware Prices.

General Goods.—In the following quotations General Goods that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol *to*. Thus 33⅓ *to* 33⅓ & 10 signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic 33⅓
Nafis 10
Zimmerman's—See Fasteners, Blind.

Window Stop—

Iris' Patent 35
Taplin's Perfection 35

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ₱ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ₱ doz pairs ..... $2.00@$3.00

Anvils—American—

Eagle Anvils ..... ₱ lb. .08¢@
Hay-Budden, Wrought ..... 9½@9¾ ¢
Trenton ..... ₱ lb. 9½@9¾ ¢

Imported—

Swedish Solid Steel Sisco, Superior, ₱ lb. ..... 10@12½ ¢
Peter Wright & Sons, ₱ lb. 84 to 300 lb., 11¢; 350 to 600 lb., 11½ ¢.

Anvil, Vice and Drill—

Millers Falls Co., $18.00 ..... 15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Lewiston Nail Co. 10

Augers and Bits—

Cone Double Spur ..... 75&10@50
Jennings' Pattern, Bright ..... 60@70
Black Tip or Blued ..... 65@60
Boring Machine Augers 50
Car Bits, Ives' Lever ..... 70@70
Taylor's Lever Car Bits 70
Ft. Wash. Expan. Auger Co., Cincinnati 5
Fuller's Pat. Auger Bits 25
C. E. Jennings & Co.:
No. 10 Ext. up, R. Jennings' list ..... 25&5
No. 9, R. Jennings' list 25
Russell Jennings ..... 25&10
L'Hommedieu Car Bits 15%
Mayhew's Countersink Bits 45
Peck's 20
Peck's Jennings' Pattern 35
Snell's Auger Bits 60%
Snell's Bell Hangers' Bits 60
Snell's Car Bits, 12-in. twist 60%
Snell's King Auger Bits 50
Wright's Jennings' Bits 40

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Clark's Pattern, No. 1 ₱ doz., $26; No. 2 $18 ..... 50&10
Fuller & Clark's Pattern ..... 25&10
C. E. Jennings & Co., Steer's Pat. 25
Lavigne Pat., small size, $18.00; large size, $26.00 ..... 60&10@
Snell's 60

Gimlet Bits—

Per gro.
Common Dbl. Cut ..... $1.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonnot Pat., per doz. $5.50@6.00
Ives ..... 20&10
Universal 20

Ship Augers and Bits—

Ship Augers ..... 30&10@
Douglas ..... 30&5
C. E. Jennings & Co.:
Ship Bits 6
Wrights ..... 33⅓&7½
Snell's 48

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled ..... gro. $2.75@3.00
Unhilted, Shifted ..... gro. 65@66
Unhandled, Patent ..... gro. 66@70c
Pegging Awls:
Unhandled Patent ..... gro. 37½@
Unhilted, Shifted ..... gro. 65@70c
Scratch Awls 60
Ironsides Cone ..... gro. $2.50@3.00
Handled Socket ..... gro. $11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool*

Axes—

Single Bit, base weights: Per doz.
First Quality ..... $7.75@8.00
Second Quality ..... $4.25@4.50
Double Bit, base weights:
First Quality ..... $7.00@7.50
Second Quality ..... $6.50@6.75

Axle Grease—

See *Grease, Axle.*

Axles—*Iron or Steel.*

Comeard, Loose Collar ..... 4½@5 ¢
Comeard, Solid Collar ..... 4½@5¼ ¢
No. 1 Common, Loose ..... 3¾@4¼ ¢
No. 1½ Com., New Style ..... 4½@5 ¢
No. 2 Solid Collar ..... 4½@5 ¢
Half Patent:
Nos. 7, 9, 11 and 12 ..... 65@67½&10%
Nos. 13 to 15 ..... 65@67½&10
Nos. 17 to 19 ..... 70@70&10
Nos. 19 to 22 ..... 70@70&10

Boxes, Axles—

Common and Concord, not turned ..... lb., 5@6c
Common and Concord, turned, lb., 6@7c
Half Patent ..... lb., 9½@10c

Bait—Fishing—

Hardware:
A Bait 20
B Bait 25
Complete Bait ..... 20&5

Balances—Sash—

Caldwell new list ..... 50&10%
Pelouze ..... 50&10

Spring—

Spring Balances ..... 70@70&10
Cotton:
Line Spring Balances ..... 5 @ 70&10
Steelyard Balances ..... 10@10&1
Counter Balances ..... 50&10
Lane Dial 40

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb. ..... per lb., 2¼@2½¢

Towel—

N. Y. Ideal, Nickel Plate ..... ₱ doz. $8.50

Beam, Scale—

Scale Beams 10
Chattillon's No. 1 30
Chatillon's No. 2 ..... 40%

Beaters, Carpet—

Holt Lean Co.:
No. 12 Wire Capped ₱ doz. $9.50
No. 11 Wire Tinned ₱ doz. $8.50
No. 11 Wire Capped ₱ doz. $8.50
Tinned ..... ₱ doz. $7.50
No. 1. Wire Tinned ₱ doz. $5.50

Beaters Egg—

Holt Lean Co.:
Holt's Pat., No. 5 Japd. $0.80; No. 4, Jap'd, $1.15; No. 3, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lean Japd. per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dasher, per gro., No. 60 Japanned, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler Tin'd, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.: T. & S. Dasher $6.50

Bellows—

Blacksmiths', Standard List:
Split Leather ..... 60@10@65%
Grain Leather ..... 55@10&10

Hand—

Inch	6	7	8	9	10
Doz.	$5.00	5.50	6.00	6.50	7.50

Net Prices.

Molders—

Inch	10	12	14	16
Doz.	$7.50	9.00	12.00	17.00

Bells—Cow—

Ordinary Goods ..... 75&10@75&10@70
High grade ..... 70@10@75
Lyon ..... 75&10
Texas Star 50%

Door—

Home R & E Mfg. Co.'s ..... 75&10

Hand—

Polished, Brass ..... 50&10@60%
White Metal ..... 50&10@50&10@45%
Nickel Plated ..... 50@45%
Norris ..... 50@45
Cone's Globe Hand Bells ..... 33⅓@35%

Miscellaneous—

Farm Bells ..... lb., 21¼@21½¢
Church and School ..... 60@60@45%

Belting—Leather—

Standard ..... 70@10@70@10@45%
Light ..... 75@10%
Cut Leather Lacing ..... 50@10%
Leather Lacing Sides, per sq. ft. 22@23¢

Rubber—

Competition (Low Grade), 70@10@75@45%
Standard ..... 60@10@60%
Best Grades ..... 33⅓@10@10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list:
Chain, Parts, Spokes 50
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden ..... 75@75@75
B. & L. B. Co.:
Block with Swivel Hook 50
Steel ..... Hollow Steel, 50&10
Steel ..... Wire Rope, 50
Steel ..... Tarlox Metal Snatch, 50
Steel ..... Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%
Lapham Patent Automatic Lock and Jaw 30
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined 55%
Embossed 50

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Kimball & Esser Co. 33⅓

Bolts

Carriage, Machine, &c.—

Common Carriage (cut thread):
⅜ & 6 and smaller ..... 75&5%—%
Longer and heavier ..... 70@
Phila. Eagle, $3.00 list ..... 80&—%
Bolt Ends ..... 70@
Machine (Cut Thread):
⅜ & 4 and smaller ..... 75&10@—%
Longer and longer ..... 70@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knobs:

Inch	4	5	6	8
Per doz.	$0.20	.35	.45	.60	.80

Cast Iron Spring Foot, Jap'd:

Inch	6	8	10	
Per doz	$1.20	1.50	2.25	

Cast Iron Chain, Flat, Japanned:

Inch	6	8	10
Per doz.	$1.00	1.40	1.65

Cast Iron Flat Shutter, Jap'd, Brass Knobs—

Inch	6	8	10
Per doz.	$0.75	.97	1.35

Wrought Barrel Japd. 50@50@10%
Barrel Bronzed ..... 60@10%
Spring ..... 70@10@70@10@10%
Shutter ..... 50@50@50@10@75
Square Neck ..... 75@75@10%
Square ..... 70@10@10%
Ives' Patent Door 55%
Ives' Wright Metal 45

Expansion—

F. H. Evans' Crescent ..... 40@60
Richards Mfg. Co. ..... 55&10
Steward & Romain Mfg. Co.:
Style No. 13 Double 60
Style No. 100 Single 60
Style No. 100, Dbl. Jaw, Single .. 55%
Lag Screw 66⅔%

Plow and Stove—

Plow ..... 67½@67½
Stove ..... 85@85@5%

Tire—

Common Iron 80%
Norway Iron 80%
American Screw Co.:
Norway Phila., list Oct. 16, '84... 80
Eagle Phila., list Oct. 16, '84... 82½
Bay State, list Dec. 28, '99 80
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84... 80
Eagle Phila., list Oct. 16, '84... 82½
Eclipse, list Dec 28 '99 80
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99 80
Norway Phila., list Oct. '84 80
Eagle 82½
Shelton Co.:
Tiger Brand, list Dec. 28, '99... 80
Phila., Eagle, list Oct. 16, 1884.. 82½
Upson Nut Co.:
Tire Bolts 72½

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch	1¼	1½	1¾	2
Per doz.	$4.80	5.60	6.40	8.00
Inch	2¼	2½		
Per doz.	$8.65	11.50		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75, No. 3, $2.50 each 25

Boxes, Mitre—

C. E. Jennings & Co. 25%
Langdon's New Langdon and Langdon Improved 20&10 .. Langdon Acme ..... 15&10%
Perfection 40
Seaver 15

Braces—

Common Ball, American $1.50
Barber's ..... 50&10&10@50&10
Fray's Genuine Spofford's 60%
Fray's No. 61, 166, 206, 614 ..... 50%
C. E. Jennings & Co. ..... 50&5
Mayhew's Ratchet 60%
Mayhew's Quick Action Hay Pat.. 50%
Millers Falls Drill Braces ..... 25&10%
P., S. & W. Co., Peck's Pat. ..... 60&10%

Brackets—

Wrought Steel ..... 70&10@75&10%
Bradley Metal Clasp ..... 80&10@85&10&5
Griffin's Pressed Steel ..... 75@75&10
Griffin Folding Brackets ..... 70&1
Taplin Victor Handy Egg Beater Bracket ..... ₱ doz. $1.30

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourn Mfg. Co. ..... 75&20%
Wire Goods Co. 75

Buckets, Galvanized—

M'fr's list, price per gross.

	Quart..	10	12	14	
Water, Red	.25	35	28.00	32.00	10&5&5%
Water, Blue	24.35	28.00	32.00		
Fire, Rd. Bim.	32.00	34.65	38.65		
Well	25.35	31.35	35.35		

Bull Rings—See *Rings, Bull.*

Butts—Brass—

Wrought, High List, Oct. 26, '06. 55
Cast Brass Tubular 40

Cast Iron—

Fast Joint, Broad ..... 40&10@50%
Fast Joint, Narrow ..... 40&10@50%
Loose Joint ..... 70@10@75%
Loose Pin ..... 70&10@75%
Mayer's Hinges ..... 70@70@75
Parliament Butts ..... 70@70@75

Wrought Steel—

Bright.
Light Narrow, Light Reversible ..... 70@75
Reversible and Broad .. 70@75%
Loose Joint, Narrow, Light Inside Blind, &c. 70
Back Flaps, Table Chest .. 65%
Japanned.
Light Narrow, Loose Pin, 70@75
Light Narrow, Ball Tip .. 60%
Broad ..... 70@75
Steeple Tipped 70%
Ball Tipped 70%

Extra, 10@

Cages, Bird—

Hendryx Brass: Series 200, 5 to 100, incl. list, 1200, 15 and 20 %; 300 ..... %
Hendryx Bronze: Series 700, 800....30
Hendryx Enameled 35

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb. 12½@13c
Sharp, 1 prong, per lb. 12½@13c
Bates's Blunt 12½c
Bates's Sharp 12½c
Lecain's Blunt 12½c
Lecain's Sharp 12½c
Perkins', Blunt, per lb., 5.00c, Sharp, 4.15c

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Elwell's E. B. ..... 52@55c
G. D. ..... *per M* 45@50c
E. L. ..... *per M* 90@1.20
G. E. ..... *per M* 90@1.00
Musket ..... *per M* 62½@65c

Primers—

Berdan Primers, $2 per M. ..2.00
*Primer Shells and Bullets..*1.75@1.90
All other primers per M..$1.35@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:
32 C. F. $5.00 ..... 10@5%
38 C. F. $7.00 ..... 10@5
22 cal. Rim, $1.50 ..... 10@5
32 cal. Rim, $2.75 ..... 10@5%
B. B. Caps, Con. Ball, Sicgd.$1.90
B. B. Caps, Round Ball.....$1.40
Central Fire 25%
Primed Shells for Sporting Rifle 15@7½
*Primed Shells and Bullets..*15@10%
Rim Fire, Sporting 50
Rim Fire, Military ..... 15@5

Casters—

Bed ..... 65@10%
Plate ..... 60@5%
Philadelphia ..... 70@10
Acme Ball Bearing 35
Gem Roller Bearing..... 70@10&10%
Steel Gem 5
Standard Ball Bearing ..... %
Yale Double Wheel low list..... 50&10

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:
5-16 ..... 5.16 ..... 7.16 ..... 9.16
⅜ ..... 5.55 ..... 7.90 ..... 9.95 ..... 3.75 ..... 3.65 ..... 3.55
⅜ to 1¼ inch.
$3.45 ..... 3.55
In cask lots, deduct 25¢.
German Coil: ..... 60@60&5%
German Pattern Coil:
6-9 to 1 ..... 70@5@70&10%
2 and 3 ..... 60@10@60&10@10&5
4, 5 and 6 ..... 50@10@50&10@5
Halter—

Halter Chains ..... 60@10@5
German Pattern Halter Chains, list July 24, '07. ..... 60@10@5
Corbett Mfg. Co.:
Halter ..... 35&5

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.-

Traces, Western Standard: Two pr.
61—6 3, Straight, with ring ..$28.00
61—6 2, Straight, with ring ..$29.00
61—8 2, Straight, with ring ..$32.00
61—10 2, Straight, with ring ..$37.00

NOTE.—Add 2c per pair for Heel Trace and add 4c per pair for No. 3 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.

Eastern Standard Traces, Wagon Chain, &c. ..... 60@10@10@5
Miscellaneous—

Jack Chain, list July 10, '05
Iron ..... 60@10@10&5%
Brass 65
Safety and Plumbers' Chain ..
Gal. Jack Chain.....lb., 4½@5%
Bridgeport Chain Co.:
Triumph Halter and Coil.35&2%@40
Triumph Dog ..... 50&10@60
Bronco Halter and Coil ..15@5&5
Cowert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion 40
Oneida Community:
American Halter, Dog and Kennel Chains ..... 50&10
Niagara Dog Leads and Kennel Chains ..... 15@5&5
Wire Goods Co.:
Dog Chain 70
Universal Dbl.-Jointed Chain.....50%
Chain and Ribbon, Sash—

Oneida Community:
Steel Chain..... 60%
Pullman:
Bronze Chain, 60%; Steel Chain, Copper ..... 60&10
Sash Chain Attachments, per set..8¢
Aluminum Sash Ribbon, per 100 ft. ..... $2 to $5.00
Sash Ribbon Attachments, per set..8¢
Chalk—(From Jobbers.)

*Carpenters' Blue.....*gro., 50@55¢
*Carpenters' Red.....*gro., 45@50¢
*Carpenters' White...*gro., 40@45¢
Checks, Door—

Parksley's 45%
Pullman, per gro. $4.20
Russwin 33⅓%
Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools ..... %
Youths' Chests, with Tools..... 35%
Gentlemen's Chests, with Tools..25%
Farmers', Carpenters, etc., Chests, with Tools ..... %
Mechanics and Pipe Fitters' Chests, Empty ..... %
Tool Cabinets ..... %
C. E. Jennings & Co.'s Machinists' Tool Chests ..... %
Chisels—Socket Framing and Firmer

Standard List..... 50@50&5
Buck Bros. ..... %
C. E. Jennings & Co.:
Socket Firmer No. 10..... 50&5%
Socket Framing No. 15 ..... 50&5%
Swan's ..... 60@50
L. & I. J. White & Co.....30@30&5
Tanged—

Tanged Firmers..... 50@50%
Buck Bros. ..... %
C. E. Jennings & Co. Nos 191, 181..25%
L. & I. J. White & Co. ..... 20&5
Cold—

lb.
*Cold Chisels, good quality..*13@15¢
*Cold Chisels, fair quality..*11@12¢
Cold Chisels, ordinary.... 9@10¢
Chucks—

Almond Drill Chucks 35
Almond Turret Six-Tool Chuck.....40%
Beach Pat, each $8.00..... 50&5%
Empire 25%
Blacksmiths' 25
Jacobs' Drill Chucks..... 35%
Pratt's Positive Drive..... 25%
Skinner Patent Chucks:
Independent Lathe Chucks..... 35%
Universal, Reversible Jaws..... 35%
Combination, Reversible Jaws..... %
Drill Chucks, New Model, 25 ; Standard, 45 ; Skinner Pat. 25, Positive Drive..... 40%
Planer Chuck Drive..... 20
Face Plate Jaws..... 35%
Standard Tool Co.:
Improved Drill Chuck..... 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 9, 40 ..... 21 35
Scroll Combinations, Nos. 83 and 84 ..... 30%
Geared Scroll, Nos. 33, 34 and 35..25
Independent Iron, Nos. 18 and 318..35
Independent Steel, No. 64 ..... 25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104..... 35%
Union Czar Drill..... 25
Universal, 11, 12, 16, 17, 13, 14, 15..40%
Universal No. 42 33
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50..... 35%
Steel Face Plate Jaws, Nos. 70 and 72 ..... 30%
Westcott Patent Chucks:
Lathe Chucks..... 50%
Little Giant Auxiliary Drill 50
Little Giant Double Grip Drill...50%
Little Giant Drill, Improved..... 50%
Oneida Drill..... 50%
Special Combination Lathe..... 50%
Whitaker Mfg. Co.:
National Drill..... 25%
Clamps—

Adjustable Hammers..... 20@20&5%
Carriage Makers', P., S. & W. Co. ..... 50&10%
Besly Parallel..... 33⅓&10%
Morse Hay Rack 45
Lineman's Swedish Neverturn..... 65%
Wood Workers' Hammers ..... 40&10
Saw Clamps, see Vises, Saw Filers'.
Cleaners, Drain,

Iwan's Champion, Adjustable..... 50%
Iwan's Champion, Stationary..... 40%
Sidewalk—

Star Socket, All Steel, ⅌ doz. $1.05 net
Star Shank, All Steel, ⅌ doz. $3.24 net
W. & C. Shank, All Steel, ⅌ doz., 7½ in., $3.00; 8 in., $3.25.
Cleavers, Butchers'—

Foster Bros. 30%
Fayette R. Plumb..... 30%
L. & I. J. White Co..... 30%
Clippers, Horse and Sheep—

Chicago Flexible Shaft Co.:
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each..$20.00
Stewart's Enclosed Gear Horse, each..... $6.75
Stewart's Patent Sheep Shearing Machine, each $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75
Clips, Axle—

Regular Styles, list July 1, '05. ..... 50@50&5
Cloth and Netting, wire—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c ..... %
Compression Bibbs 70
Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list ..... %
Leather, Walter B. Stevens & Son's list ..... 40&5
Compasses, Dividers, &c.

Ordinary Goods..... 70@10@5%
Wm. Schollhorn Co.:
Excelsior Dividers 6
Lodi Dividers..... 4&5

Conductor Pipe,—

L. C. L. to Dealers:

	Gal. Steel.	*Charcoal*
Northeastern		
Eastern		
Pittsburgh		
Central		
Northwestern,		
Western		
Tennessee		
Southern		
Southwestern		

Terms, 2% 10 days. Factory shipments, 2% 10, 60 days.

Coolers, Water—

L. & G. Mfg. Co.:

Grid	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90

Galvanized, Lined, side handles,

Gal.....	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled..... 10%
Agate Lined 10
Coppers' Tools—

See *Tools, Coopers'.*

Coppers, Soldering—

Soldering Coppers, 3 lb. to pair and heavier, 22@25c; lighter than 3 lb. to pair..... 24@27c
Cord—Sash—

Braided, Drab.....lb. 85¢
Braided, White, Com., Nos. 8 to 12, 30¢; No. 7, 20½¢; No. 6, 21½¢. In lots of 12 doz. or over, 1 per cent. discount.
Cable Laid Italian, lb., No. 18..87¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India.....lb., 11@11½¢
Cotton Sash Cord, Twisted 18@20¢
Patent Russia.....lb.....20¢
Cable Laid Russia.....lb...21¢
India Hemp, Braided.....lb...21¢
India Hemp, Twisted...lb. 13@14¢
Patent India, Twisted..lb...17¢
Pearl Braided, cotton, No. 6, ⅌ lb. 27½c; No. 7, 26½c; Nos. 8 to 12, 26c
Eddystone, Braided, Nos. 8 to 12, 26c; 26½; 6, 27½c
Harmony Cable Laid Italian, Nos. 7 to 10..... ⅌ lb 23c
Pullman:
Wire Sash Cord..... 10%
Sash Cord Attachments, per 100..$2.00
Samson, Nos. 8 to 12:
Braided, ⅌ lb., Drab Cotton, 55c; Italian Hemp, 40c; 50c; Linen, 65c; White Cotton, 50c; Spot Cord 50c
Massachusetts, White, ⅌ lb. 40c
Massachusetts, Drab... ⅌ lb 45c
Phoenix, White Nos 8 to 12.....27c
Silver Lake, per lb.:
A, Drab, 44c; B, White, 40c; B, Drab, 44c; B, White, 35c; Italian Hemp, 40c; Linen...37½c
See also Chain and Ribbon.
Cotton, Picture—

Full Length ..... 90@—%
Short Length ..... 90@20@—%
Hendryx Standard Wire Picture Cord, old list..85&10%
Turner & Stanton Co. Wire Picture Cord ..... 85&10
Cradles—

Grain ..... 40@12½%
Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers.
Zelnicker's Lumber: ⅌ gro.
White and Purple, Indelible....$7.50
Blue and Red, Indelible, and Terra Cotta, $6.50; Black.....$4.50
Grant Lumber, ¾ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks $10.00
Genuine Soapstone, Metal Workers', 5 in. x ¾ in. Round, $2.50; 5 in. x ¾ in. Square, $1.75; 5 x ½ x ½ in. $2.50
5 in. x 1¼ x 3-16 in. $3.00
Suremark, Black, $2.25; Blue, Red and Yellow..... $2.50
Crooks, Shepperds'—

Fort Madison, per doz., Heavy, $5.50; Light $3.00
Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden 50
Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ⅌ doz. $3.50
Simmons Brothers & Hamilton ..... %
Wm. Rogers & Son..... ⅌ doz. $3.50
Cutters—Glass—

H. H. Maltby & Co. 10%
Reed Bros. ..... %
B. Mfg. Co. ..... %
Wood Bros. ..... %
Meat and Food—

Age	8	10	12	14	16	18
No.	8	10	12	14	16	18
Each	$5	$7	$2	$2.2	$3.5	$6	$6

Enterprise:

Nos.....	5	10	12	22	32	
Each	$2	$2.75	$4	$6	25@25&7½%	

No. 202, $1.50..... 40&7½%
P., S. & W. Co.:

Nos...	1	2	3	4	⅌ doz.	33⅓
	$14	$17	$19.00	$20.00		

Ideal ..... 40@10&5
Hales ..... 60&10@5%
Little Giant ..... 40&10
Nos..... 22 32
$18 ..... $41.50 ..... $72.00 ..... $68.00
New Triumph No. 605, ⅌ doz. $24.00, 40&10%
Russwin Food, No. 1, $24.00; No. 2, $27 ..... 15&2½@10
..... $15.00 ..... $18.00
Enterprise Beef Shavers..... 25@30
Slaw and Kraut

Henry Disston & Sons:
Small and Kraut Cutters ..... %
Corn Graters..... 30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife.... ⅌ doz. $3.90
Combined Slaw Cutter and Corn Grater ..... %
Tobacco—

All Iron, Cheap.....doz. $1.25@1.50
Improved ..... 25@5%
National, ⅌ doz., No. 1, $21; No. 2, $18 10
Diggers, Post Hole, &c—

Disstons:
Rural ⅌ doz. 25
Samson ⅌ doz. 30
Iwan's Improved Post Hole Auger..40%
Vaughan Pattern Post Hole Augers, ⅌ doz., $7.00
Perfection Post Hole Diggers, ⅌ doz. $5.75
Split Handle Post Hole Diggers, ⅌ doz. $7.75
Hercules Pattern, ⅌ doz..... $10.00
Kohler's ⅌ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer..... $7.50
Never Break Post Hole Diggers, ⅌ doz., $24.00 60
Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers Emery Wheel—

Sterling Emery Wheel Dressers..... 35%
Sterling Wheel Dresser Cutters..... 35%
Drills and Drill Stocks—

Blacksmith's Common Drilling Machines ..... $1.50@1.75
Breast Millers Falls ..... 15&10
Breast, P., S. & W. 33⅓
Goodell Automatic Drills 50&10@60&10%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Barber & Curtis..... 40
Ratchet, Parker's..... 40%
Ratchet, Weston's..... 40
Ratchet, Weston's, Style H Improved 40
Ratchet, No. 012..... 40%
Ratchet, Celebrated..... 40%
Ratchet, Whitney's, P., S. & W. Co. ..... 50&5%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00..... 33⅓
Twist Drills—

Bit Stock..... 70@70&5%
Taper and Straight Shank, 60&10@70%
Drivers, Screw—

*Screw Driver Bits, per doz..*45@50¢
Balsey's Screw Holder and Driver, ⅌ doz., 2½-in., $6; 4-in., $7.50; 6-in., $8 50
Buck Bros.' Screw Driver Bits..... 40%
Champion 50
Disston's 70
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Double Screw Drivers..... 40
Gay's Double Action Ratchet..... 35%
Goodell's, Auto..... 65@65&10
Mayhew's Black Handle..... 40%
Mayhew's Monarch..... 40%
Millers Falls, Nos. 20 and 21....25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
Smith & Hemenway Co., Neverturn, 66⅔%; Elmora, 60%; Star..... 30&10%
Swan's:
Nos. 7565 to 7568, 50% ; No. 7540, 40&10%
Eave Trough, Galvanized—

Charcoal.

Territory...	*Gal. Steel.*	*Iron*
Northeastern	75@10@5%	60@10%
Eastern	80@10@5%	60@10%
Pittsburgh	80@10	60@10
Central	80@10@10@2½%	65@10%
Northwestern	80@10@10%	65@10%
Western	80@10	60@10@5
Tennessee	80@5%	60@10@5%
Southern	80%	60@10@5%
Southwestern	75@10@5%	60@5

Terms, 2% 10 days. Factory shipments, 2% 10, 60 days.

New Lengths are made in some patterns.

See also Conductor Pipe and Elbows.
Elbows and Shoes—

Factory shipments, all territories: Galv. Steel and Galv. C. I. Standard Gauge ..... 50@50&10%
No. 26..... 50%
No. 24..... 25%
No. 22..... 10%
Elbows, Stove Pipe—

Edwards Standard Blue ..... 45@15&10%
Edwards Royal Blue ..... 40@15&10%
Reeves, Dover, one piece..... 30&10%
Emery, Turkish—

	4 to 6	7 to 9	10 to 12
	⅌ lb.	⅌ lb.	⅌ lb.
Kegs	7½¢	8½¢	11½¢
½ Kegs	8½¢	9½¢	12½¢
¼ Kegs	9½¢	10¢	13½¢
10-lb. cans,			
In 10 cans	8½¢	7¢	6¢
10-lb. cans, less than 10	9¢	8¢	7¢
Less quantity	10¢	9¢	8¢

NOTE—To lots 1 to 3 there is a discount of 10% is given.
Extractors, Lemon Juice—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's ..... 50&10%
Wilding's ..... 40&10%
Upson's Patents 40%

Cord and Weight—

Ives and Titus 33⅓%

Corrugated—

Acme Galvanized Fasteners 75%

Faucets—

Cork Lined ..... 50&10&60%
Metallic Key, Leather Lined, not 10&70%
Red Cedar ..... 40&50 & 10&10&5%
Petroleum ..... 70&10&10&75%
B. & L. & H. Co:
Metal Key ..... 60&10%
Star 60%
West Lock ..... 50&10%
John Sommer's Perfect Tin Key 40%
John Sommer's Boss Tin Key 40%
John Sommer's Victor Mfg. Key ..... 50&10%
John Sommer's Duplex Metal Key 40%
John Sommer's Diamond Lock 40%
John Sommer's I. X. L. Cork Lined 50%
John Sommer's Reliable Cork Lined ..... 50&10%
John Sommer's Chicago Cork Lined 60%
John Sommer's O. K. Cork Lined 50%
John Sommer's No Brand, Cedar 60%
John Sommer's Perfection, Cedar 40%
Self Measuring:
Enterprise, ₱ doz. $36.00 ..... 40&10%
Lister, ₱ doz. $36.00 ..... 40&10%
National Measuring, ₱ doz. $36.40&10%

Felloe Plates—

See Plates, Felloe.

Files— Domestic—

List Nov. 1, 1899.

Best Brands ..... 70&10@75&10%
Standard Brands ..... 75&10@80%
Lower Grades ..... 75&10&10@80&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 ..... $5 1 5@40%

Fixtures, Fire Door—

Allith Underwriters' Approved 50%
Richards Mfg. Co:
Universal, No. 103; Special, No. 104 ..... $3.75
Fusible Links, No. 96 ..... 50%
Expansion Bolts, No. 107 ..... 60&10%

Grindstone—

Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.60*	*3.85*	*4.15*	*4.65*

P., S. & W. Co. 25%
Reading Hardware Co. 60%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato ..... 60&10&25%
Victor, Field 66⅔%
Victor, Manure 66⅔%
Victor, Header 65%
Champion, Hay 66⅔%
Champion, Header 65%
Champion, Manure ..... 60&15&25%
Columbia, Hay ..... 60&20%
Columbia, Manure 70%
Columbia, Spading ..... 70&12½%
Hawkeye Wood Barley 40%
W. & C. Potato Digger ..... 60&10%
Acme Hay ..... 60&20%
Acme Manure, 4 tine ..... 60&10&5%
Dakota Header ..... 60&20%
Dickson Steel Barley ..... 60&20%
Kansas Header 65%
W. & C. Favorite Wood Barley 40%
Plated—See Spoons

Frames— Wood Saw—

White, Sq'd Bar, per doz. 75@80¢
Red, S'd Bar, per doz. ..... *$1.00@1.25*
Red, Dbl. Brace, per doz. ..... *$1.40@1.60*

Freezers, Ice Cream—

Qt. *1* *2* *3* *4* *6*
Each *$1.25* *$1.60* *$1.90* *$2.20* *$2.80*

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped .. 3.65
Waterproof Dbl. Taped .. 4.40
Waterproof Tpl. Taped .. 5.15

Gates, Molasses and Oil—

Stebbins' Pattern ..... 60@60&5%

Gauges—

Marking, Mortise, &c. ..... 50@50&10%
Chapin-Stephens Co. 50%
Marking, Mortise, &c. ..... 50&50&10%
Disston's Marking, Mortise, &c. 67½%
Wire, Brown & Sharpe's 33⅓%
Wire, Mortise 25%
Wire, P., S. & W. Co. 33⅓%

Gimlets— Single Cut—

Numbered assortments, per gro.

Nail, Metal, No. 1. ..... *$2.00 ; 2.* *$2.50*
Spike, Metal, No. 1. ..... *$4.00 ; 2.* *$4.50*
Nail, Wood Handled, No. 1, ... *$2.50 ; 2.* *$2.80*
Spike, Wood Handled, No. 1, ... *$4.50 ; 2.* *$4.80*

Glass, American Window

See Trade Report.

Glasses, Level—

Chapin-Stephens Co. ..... 65@65&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush ..... 25&10@25&10%
Elwell's 40%

Grease, Axle—

Common Grade ..... *gro. $6.00@6.50*
Dixon's Everlasting, 10-lb pails, ea 80¢; in boxes, ₱ doz., 1 lb. $1.25, 2 lb. $2.00
Hemet, Hard Oil 25%

Griddles, Soapstone—

Pike Mfg. Co. ..... 33⅓&33⅓&10%

Grinders—

Royal Mfg. Co:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 ..... 30%
Alundum Sickle Grinders, each, Nos. 20, $3.00; 20A, $6.00; 2 A Combined, $6.50 ..... 30%
Alundum Disc Grinders, each, $4.00 ..... 30%

Grindstones—

Pike Mfg. Co:
Improved Family Grindstones, ₱ inch, ₱ doz. $2.00 ..... 33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted 40%

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... *60¢5@60¢10%*
Bridgeport Chain Co:
Tripple Coil and Halters, 35&2½@40%
Brown Coil and Halters, 45&5&5
Brown Cow Ties ..... 50&5&10&5
Brown Tie Outs ..... 70&10@75&5
Covert Mfg. Co.:
Web ..... 30&2%
Jute Rope 35%
Sisal Rope 40%
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am. Coil and Halters ..... 40@40&5%
Am. Cow Ties ..... 45@50%
Niagara Coil and Halters, 45&50&5%
Niagara Cow Ties ..... 45&5@50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists' ..... 55&10@55&10&5%
Heller's Farriers' ..... 40&5@40&10&10&5%
Peck, Stow & Wilcox Co:
Tinners' Hammers ..... 40&10
Riveting ..... 40&10
Machinists' ..... 60&10
Blacksmiths' 50
Payette R. Plumb:
A. E. Nail ..... 40&2½@40&10&12½
Eng. and B. S. Hand ..... 40&5@40&5
Machinists' ..... 60&10@60&10
Riveting and Tinners' ..... 40&2½@40&10&5

Heavy Hammers and Sledges—

Under 3 lb., per lb., 30¢ ..... 80¢10%
3 to 5 lb., per lb., 30¢ ..... 80¢10%
Over 5 lb., per lb., 30¢ .....
Over 5 lb., per lb., 30¢ ..... 80¢10&10%

Handles—

Agricultural Tool Handles

Axe, Pick, &c. ..... *60¢10@60¢10&5%*
Hoe, Rake, &c. *40%*
Fork, Shovel, Spade, &c.:
Long Handles *40%*
D Handles *40%*

Cross-Cut Saw Handles—

Atkins' 40%
Champion 50%
Disston's 30%

Mechanics' Tool Handles—

Auger, assorted ..... *gro. $3.00@3.50*
Brad Awl ..... *gro. $1.65@1.75*
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65 ; Hickory ..... *$2.15@2.40*
Socket Firming, Apple, $1.75@ $1.95 ; Hickory ..... *$1.60@1.75*
Socket Framing, Hickory ..... *$1.60@$1.75*
File, assorted ..... *gro. $1.30@$1.40*
Hammer, Hatchet, &c. ..... *60¢10@60¢10&5%*
Hand Saw, Varnished, doz. 80¢@85¢ ; Not Varnished ..... *$1.65@75¢*
Plane Handles:
Jack, doz. .80¢ ; Fore, doz. .45¢.
Chapin-Stephens Co.:
Carving Tool ..... 30&30&10%
Chisel ..... 60&60&10%
File and Awl ..... 60&60&10%
Saw and Plane ..... 30&30&10%
Screw Driver ..... 30&30&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 15&10%
Nicholson Simplicity File Handle ..... ₱ gro. $0.85@$1.50
J. L. Osgood:
Indestructible File and Tool ₱ gro. No. 1 $8.00; No. 2 $8.50; No. 3, $9.00. No. 4, $9.50. No. 5, $10.00. ..... gro. lots 10%
W. A. Zelmacker Supply Co.:
Hammer, ₱ doz., 12 in., $2.00; 14 in., $2.50; 16 in., $2.70; 18 in., $2.85; 20 in., $3.00; 22 in., $3.50; 24 in., $3.75; 26 in., $3.90; 30 in., $5.80.
Sledge ₱ doz., oval, 30 in., $3.80; octagon, 20 in., $3.40; oval 20 in., $4.00; octagon 36 in., $4.00.
Axe ₱ doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze ₱ doz., 36 in., $5.80; 36 in., $7.80.
Pick ₱ doz., R. R., 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ₱ doz., 12 to 14 in., $2.30

Hangers—

NOTE—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable, Nos. 1 and 2, Allith, No. 3, Allith Adjustable, No. 6, Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60@25%
Roller Bearing ..... 70@25%
Grant Mfg. Co.:
Solid Axle, No. 10, $12.00 ..... 60&10%
Roller Bearing, No. 11, $13.00, ... 60&10%
Roller Bearing, Ex. Hy. No. 22, $18.00 ..... 60&10%
Ball Bearing, $24.00 ..... 70%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15, No. 105, $2.85; New Model, $2.80, New Champion $2.25
Barn Door, Standard ..... 60&10%
Hinged ..... net $6.08
Corrugated ..... net $7.50
Special ..... 60&5%
Lawrence Bros.:
Advance ..... 55&10%
Cleveland ..... 70&7½%
Clipper, No. 75 ..... 60%
Crown ..... 55&10%
Cyclone, No. 40 ..... net $6.50
Tandem, No. 50 ..... net $7.50
New Yale ..... 55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2, 70%
Anti-Friction 60%
Hinged Hangers, King Charm 60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, ... 60&5%
Pioneer Wood Track, No. 3 ..... $2.25
Roller B'r'g St'l Track No. 12 ..... $2.20
Roller B'r'g St'l Track No. 13 ..... $2.50
Roller B'r'g, Nos. 39, 41, 43, ... 70&7½%
Hero, Adj. Track No. 19 ..... 50&10%
Adjustable Track Tandem, Trolley Track No. 16 ..... 50&10%
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22 ..... 50&5%
Trolley B. B. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45, No. 150 ..... $2.50
Safety Underwriters F. D. No. 101 ..... 50%
Tandem No. 41 2½ and 3 ..... 60&10%
Palace Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 122 ..... 50&10%
Ives Wood Track No. 1 ..... $2.25
Tiffin B. B. No. 2 ..... 50&10%
Trolley B. B. No. 24, $1.30; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2 ..... 70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3 ..... 60%
Hinged Tandem No. 48 ..... 60&5%
Folding Door B. B. Swivel No. 135 ..... 40%
Taylor & Boggis F'y Co's Kid Roller Bearing ..... 50&15&10&5%
Myers' Stayon Hangers ..... 60&10%

Hangers— Garment—

Pullman Trouser, ₱ gro., No. 1, $9.00; No. 1, $24.00, No. 3, $16.50; No. 8, Black Enamel, $7.50; No. 10 $24.00, No. 12, $8.00, No. 15, Reversible, No. 18, Loop $10.00
Victor Folding ..... ₱ gro. $9.60

Gate—

Myers' Patent Gate Hangers, ₱ doz net $4.50

Joist and Timber—

Lane Bros. Co. 30%

Hasps—

Griffin's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, ₱ doz. 60%

Hatchets—

Regular list, first qual. ..... *40&2½@—*
Second quality ..... *50&5@—*

Heaters, Carriage—

Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50 ..... 25%
Clark Coal, ₱ doz., $0.75 ..... 20%

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutter:
(L. & P., O. S., Acme, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2 for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Charles Parker Co. ..... 70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick $9.00 ..... 20%
Reading's Gravity 60%

Extra 5&10% often given.

Stanley's Steel Gravity Blind Hinges No. 1647½, ₱ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter ..... 75&5%
Acme, Lull & Porter 75
Queen City Reversible 75%
Shepard's Noiseless, Nos. 60 to 55 ..... 75&5%
Niagara, Gravity Locking, Nos. 3 & 5 ..... 75&5%
Tip Pat'n, No. 1 ..... 75&10%
No. 3 ..... 75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 70&10&5%
Shepard's Double Locking 75
Champion Gravity Locking ..... 75&5%
Pioneer ..... 75&10%
Empire 65%
W. H. Co's Mortise Gravity Locking, No. 2 ..... 60&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L't'chs.	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.85*

New England:
With Latch ..... doz. ...@$2.00
Without Latch.... doz. ...@$1.60
Reversible Self-Closing:
With Latch ..... doz. ...@$1.75
Without Latch.. doz. ...@$1.35
Western:
With Latch ..... doz. $1.75
Without Latch ..... doz. $1.15
Wrightsville Hardware Co:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 ..... 70%

Pivot Hinges—

Bommer Bros. Pivot 40%
Lawson Mfg. Co. Latchless 50%

Spring Hinges—

Holdback, Cast Iron ..... *$6.75@$7.00*
Non-Holdback, Cast Iron ..... *$6.50@$6.75*
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 40%
Bardsley's Patent Checking 33⅓%
Bommer Bros.
Bommer Ball Bearing Floor 40%
Bommer Spring Hinges 40%
No. 999 Wrot. Steel Hold Back, ₱ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago Ball Bearing Floor 50%
Gardner City Engine House 25%
Keene's Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 25%
American 30%
Columbia, ₱ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ₱ gr. $12.00
Columbian Hinges ..... 60&10%
Gem, new list 30%
Clover Leaf and Acorn, gro. lots, $5.10; ½ gro. lots $6.00
Oxford, new list 30
Floor Spring Hinges ..... 65&10%
Lawrence Bros. Co., Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door ..... ₱ gr. $9.00
Chief Ball Bearing Floor Hinge $8.00
Ball Bearing Door 25%
No. 177, Sheet Steel Holdb'k, ₱ gr. $9.00
Standard Mfg. Co.:
Champion Double Acting Door Hinge ..... 25&10&10
Standard Double Acting Floor Hinge ..... 25&10&10
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓%

Extra 10&7½% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges	*50&10%*
Heavy Strap Hinges	*60&5%*
Light T Hinges	*50%*
Heavy T Hinges	*50%*
Extra Hvy. T Hinges	*50&10%*
Hinge Hasps	*33⅓%*
Cor. Heavy Strap	*60&5%*
Cor. Ex. Heavy T	*50&10%*

Screw Hook and strap,

6 to 12 in.	*.1b. 3½¢*
1½ to 20 in.	*.1b. 3½¢*
22 to 36 in.	*.1b. 3 ¢*

Screw Hook and Eye:

¾ to 1 inch	*.1b. 6½¢*
⅝-inch	*.1b. 7½¢*
½-inch	*.1b. 8½¢*

Extra 10&7½% & 65%

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers ..... 30&2%

Hods— Coal—

M'f'gr's list, price per gross

Inch	*15*	*16*	*17*	*18*
Galv. Open	*$35*	*$39*	*$42*	*$46*
Jap. Open	*30*	*31*	*35*	*39*
Galv. Funnel	*53*	*58*	*52*	*56*
Jap. Funnel	*43*	*46*	*59*	*48*

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick, No. 162 ..... each $1.05
Steel Mortar, No. 158 ..... each $1.35

Hoes— Eye—

Scovil and Oval Pattern ..... *60¢10@60¢10&10%*
Grub, list Feb. 24, 1900 ..... *70¢10@70¢10&10%*
D. & H. Scovil 27½%
Am. Fork & Hoe Co. (Scovil Pattern) 60%

Handled—

NOTE—Manufacturers are selling from the list of September 1, 1903, and mining orders are sold at a reduced list dated May, 1908, at a certain per cent. discount.

Crucible Wrought, No. 1 to 8, No. 9 to 12
Star Double Ball
Ft. Madison Cast to Hoe
Ft. Madison Crescent Contractor Hoe
Ft. Madison Hoes
Ft. Madison Mattock Hoes
Regular Weight
Light Weight
Ft. Madison Spreading Hoe, per doz.
Ft. Madison Dixie Tobacco Hoe
Kretsinger's Cut Easy
Warren Hoe
W. & J. Ives
B. B. Contractor Hoe
B. B.
The Wedding
W. & J. Ives Single Hoe

Hoisting Apparatus—

See Machines, Hoisting.

Holders—Bit—

Augmar, per doz. $4.00 ..... 45&10%

Door—

Bardsley's, Iron 40
Brass and Bronze
Iron
Nickeled
Reading's Mfg. Co., No. 1
No. 2
No. 3
Solid Cast
Superior

File and Tool—

Nicholson Tree Hooders and File Handles ..... 33⅓&10%

Fruit Jar—

Triumph Fruit Jar Holder, per gross, $3.50. per doz. $1.25

Trace and Rein—

Fernald Double Trace Hooder, per doz. pairs $1.00
Dash Rein Holder, per doz. pairs..$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Sawtooth 50
German 25

Hooks—Cast Iron—

Bird Cage, Reading 40%
Clothes Line, Reading List 40%
Coat and Hat, Reading 45%
Coat and Hat, Wrightsville 60%
Harness, Reading List 40%

Wire—

Belt 80%
Wire Cloth & Hooks ..... 80 &
Bradley Metal Casing Wire, Coat and Hat, 70% ..... Ceiling ..... &
Columbian Hdw. Co., Gem ..... &
Parker Wire Goods Co., King..70&10%
Wire Goods Co.,
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; Y Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.90; 8 in., $1.25; 10 in., $2.50.
Cotton ..... *doz. $1.05@$1.25*
Wrought Staples, Hooks, &c—
See Wrought Goods

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Rush, Light, doz...$6.90; Medium, $8.65; Heavy *$10.65*
Grass, best, all sizes, per doz. $3.00
Grass, common grasses, all sizes, per doz *$1.50*
Whalebones ..... *lb. 5¢@6c*
Hooks and Eyes:
Brass ..... *6 @6 &10%*
Malleable Iron ..... *7 @7 &10%*
Covert, Mfd. Gate and Seattle Hooks 40%
Ft. Madison Cut-Easy Corn Hooks, per doz. pairs $2.00
Turner & Stanton Co. Coop and Shoulder ..... 30 &10
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See Nails, Horse.

Horseshoes—

See Shoes, Horses.

Hose, Rubber—

Garden Hose, ¾-inch:
Competition ..... *ft. 5@ 6¢*
3 ply Guaranteed ..... *ft. 8@ 9c*
4 ply Guaranteed ..... *ft 10@11¢*
Cotton Garden, ¾ in., complete:
Four Ply ..... *ft. 8@ 9¢*
Fair Quality ..... *ft. 10@11¢*

Irons— Sad—

From ¼ to 10 ..... *lb. 3¢@3½¢*
B. B. Sad Irons ..... *lb. 3¼@3½¢*
Mrs. Potts', cents per set:

Nos.	50	55	60	65
Jap'd Tops	85	80	95	97
Tin'd Tops	88	85	98	95

New England Pressing ..... *lb. 3¾@4¢*

Bar and Corner—

Richards Mfg. Co., Bar, 65&10%
Corner 60

Pinking—

Pinking Irons ..... *doz. 60¢*

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw ..... 30&2%; Steel, 45%
Lockport 50
Lane's Steel ..... 30&5
Richards Tiger Steel, No. 130.. 50&10%
Smith & Hemenway Co's 25%

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Kettles—

Brass, Spun, Plain ..... *20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Ideal Butcher & 30
Wilkinson Shear & Cutlery Co.....60%

Corn—

Columbian Cutlery Co., Wheat Brand Knives and Hooks 60
Warren Cutlery Assn., per doz. $2.65; Field, $2.75; Adj. Serrated, $2.90; Serrated, $2.10; Yankee No. 1, $1.50, Yankee No. 2, $1.15

Drawing—

Standard List ..... *50&10%*
C. H. Jennings & Co., Nos. 15 to 19, ... 30
Jennings & Griffin, Nos. 11, 12, 13 ..... 60 &
Sargent ..... 60&
Stanley ..... 60&
Wilkinson ..... 60&
R. & I. J. Witte ..... 25&5&5

Hay and Straw—

Serrated Edge, per doz. $2.50@3.75
Iwan's Sickle Edge ..... per doz. $3.50
Iwan's Serrated ..... per doz. $3.00

Miscellaneous—

Farriers' ..... *doz. $2.00@3.75*
Wostenholm's ..... per doz. $3.50@4.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber Tip ..... *gro. $1.25@1.40*
Carriage, Jap., all sizes ..... *gro. 40@45¢*
Door, Mineral ..... *doz. 65@70¢*
Door, Por. Jap'd ..... *doz. 70@75¢*
Door, Por. Nickel ..... *doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—

See Belting, Leather—

Ladders, Store, &c.—

Allith Mfg. Co., Reliable 50%
Lane & Store 25
Myers' Noiseless Store Ladders 5
Richards Mfg. Co.,
Improved Noiseless, No. 112 ..... 50%
Climax Shelf, No. 113 ..... 50%
Trolley, No. 130 ..... 50%

Ladles, Melting—

L. & G. Mfg Co. (new list) 20
P. & W. ..... 40&10
Reading 60

Lanterns—Tubular—

Regular, No. 0 ..... *doz. $4.35@4.50*
Side Lift, No. 0 ..... *doz. $4.60@4.75*
Hinge Globe, No. 0 doz. $4.90@5.05
Other Sizes ..... *40@40&10%*

Bull's Eye Police—

Each ..... *$4.25@4.50*

Latches— Thumb—

Roggyn's Latches, with screw.. *doz. 55@40¢*

Door—

Allith Mfg. Co., Reliable and Alleghany, 60; Enameled and Storage, 50%
Door & Carrier Mfg. Co. No. 101, per doz $2.00
Richards' Bull Dog, Heavy, No. 128 ..... 50&5%
Richards Trump, No. 127 ..... 40&10

Leaders, Cattle—

Small ..... *doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & L. 10%

Lines—

Wire Clothes, Nos. 18 19 20
Per foot *$2.30 2.25 2.00*
75 foot *$2.10 1.80 1.65*
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons' 30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $8.50 ..... per gr. 20
Manson Lines, Shade Cord & Awning, Cotton, No. 1, $1.40; No. 2, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 2, $2.50; No. 4, $3.50; No. 4½, $4.50 ..... 20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 ..... 20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25 ..... 20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines 40
Cotton Lines, White Cotton 20
Shade Cord, Cotton or Linen 20%

Locks— Cabinet—

Cabinet Locks *33⅓%*

Door Locks, Latches, &c.—

NOTE—Net Prices are very often made on these goods
Reading Hardware Co. 40%
R. & E. Mfg. Co. 10

Padlocks

R. & E. Mfg. Co. Wrought Steel and Brass ..... 75&20%

Sash, &c.—

Iron Patent
Brompe and Brass ..... 25&5
Crescent, 60%; Iron, 60%; Vertical Lifting, 40&20%; Rolling Pat. Ventilating Sash Lock, 33⅓%
Dorlon Door Check and Spring Lock 25%
Reading Sash Locks 40%

Machines—Boring—

Com. Upr't, without Augers, ... *$2 and $2.25*
Com. Angler, without Augers ..... *$2.25@2.50*
Swan's Improved ..... 40&10%
Jennings', Nos. 1 and 4 ..... 25&5%
Millers Falls 25
Sheldon, Universal ..... Angular, $2.00

Corking—

Reisinger Improved Hand Power, per doz. $18.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist..30%
Moore's Hand Hoist, with Lock Rings 30%
Moore's Cyclone, High Speed Chain Hoist 30%

Ice Cutting—

Chandler's 12½%

Washing

Boss Washing Machine Co.: Per doz
Boss No. 1 ..... $57.00
Boss Rotary $57.00
Champion Rotary Banner No. 1..$57.00
Standard Champion No. 1 ..... $50.00
Standard Perfection $33.00
Cincinnati Square Western $33.00
Uneeda American, Round $36.00

Mallets—

Hickory ..... *45&5%@50%*
Lignumvitæ ..... *40&10%@30%*
Tinners' Hickory and Apple wood ..... *doz. 45&5%@50%*

Mangers, Stable—

Swett Iron Works 50%

Mats, Door—

Acme Flexible Steel 50%
Elastic Steel (W. G. Co.), new list.50%

Mattocks—

See Picks and Mattocks.

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co. ..... 20@25%
National Specialty Mfg. Co. 30%
Parker's Columbia and Victoria 30%
Parker's Box and Side ..... 50&5%
Swift, Lake Bluff Co. 30%

Motors, Water—

Dirnie's Red Devil 30%
Lippincott's 30%

Mowers, Lawn—

NOTE—Net prices are generally quoted
Cheapest, 10-in., $2.00; advance 15c for each size
Cheap, 10-in., $2.25; advance 15c for each size
Better Grade, 10-in., $2.50; advance 25c for each size

	12	14	16	18-in.
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*
Continental				60
Great American				40
Great American Ball B'r'g, new list.70%				
Quaker City				70%
Pennsylvania				60
Pennsylvania, Jr., Ball Bearing				50&10%
Pennsylvania Golf				50
Pennsylvania Horse				35&5%
Pennsylvania Pony				40&5%
Granite State:				
Style A, 1 to Wheel				70
Style B, 1 to Wheel				70
Style C, High Wheel, spel. list,				70&10%
Style D, High Wheel, spel. list..70%				
Pennsylvania:				75@78%
Styles M., S., C., K., T.				70&10&5%
Style A, all Steel				60&10&5%
Style B, High Wheel				50&10%
Drexel and Gold Coin, special list.40%				
Horse				40&5%
Pony				40&5%
Oehing, Horse				30&10%
Eagle Horse				30&5%
I. X. L. Horse				50%

Nails—

Wire Nails and Brads, Miscellaneous ..... *85@5&10&10%*
Cut and Wire ..... *See Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See Tacks.

Horse—

	Nos.	6	7	8	9	10	
Anchor		22	21	20	19	18	40&5
Coleman		13	13	12	11	11	net
New England		23	21	20	18	17	40&10
Livingston		19	18	17	16	16	10
Western							per lb. 8½@10¢

Jobbers' Special Brands .....

Picture—

	Nos.	2	2½	3	in.
Brass H'd		*45*	*55*	*70*	*... dec.*
Por. Head		*1 10*	*1 10*	*1 10*	*... gro*

Upholsters—

Brass 70
Plated ..... 30&10

Nippers—

See Pliers and Nippers.

Nuts— *Blank or Tapped.*

	Off list
Cold Punched	5 &10
Hexagon	5 &10
Semi-Hexagon C. T. & R.	5 &10
Hexagon C. T. & R.	6 &10
Hot Pressed:	
Square	5 &10
Hexagon	6 &10

Oakum—

Rope	*lb., 6½¢*
U. S. Navy	*lb. 6¢*
Navy	*lb. 5¢*
Plumbers' Spun Oakum	*2¾@3½¢*

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated *75%*
Cannon or Pneumatic:
Brass and Copper ..... *50@10%*
Zinc ..... *40&10*
Railroad ..... *50&10%*
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Sterling Brass ..... 50&10
Railroad Oilers & ..... &10
Maple City Mfg. Co.:
Spring Bottom Cans..... 70&70&10%
Railroad Oilers & ..... &

Openers— Can— *Per doz.*

Sprague, Iron Handle ..... *30@35¢*
Sprague, Wood Handles ..... *50¢*
Sardine Scissors ..... *$1.75@$3.00*
Yankee Can and Bottle Opener, per doz., net, ... $0.65

Egg—

Hartigan Nickel Plate, per doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing Wick and Rope, any quantity ..... *20¢*

Rubber—

(Fair quality goods.)

Sheet, C. I. ..... *11@12¢*
Sheet, C. O. S. ..... *11@12¢*
Sheet, C. B. S. ..... *12@13¢*
Sheet, Pure Gum ..... *40@45¢*
Sheet, Red ..... *40@50¢*
Jenkins' '96, per lb. 31¢ 25%

Miscellaneous—

American Packing ..... *lb. 7@10 ¢*
Cotton Packing ..... *lb. 16@25 ¢*
Italian Packing ..... *lb. 9@12½¢*
Jute ..... *lb. 4@ 5¢*
Russia Packing ..... *lb. 8@11 ¢*

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List ..... *65@70&10%*
Edwards, Royal Blue ..... 65&5%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$2.25*	*2.65*	*2.80*	*3.75*

Paper—Building Paper

Asbestos: ..... *lb.*
Roll Board or Building Felt, 1 to 10 lb., per 100 sq. ft. ..... *21½@24¢*
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft. ..... *3½¢*
Mill Board, Sheet, 40 x 40 in., 1-32 to ⅛ in. ..... *3¢*
Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll ..... *48@58¢*
Medium weight, 30 lbs. to roll, ... *50@70¢*
Heavy weight, 40 lbs. to roll ..... *75@85¢*
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; ¼ ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton *$55.50*
Red Rope Roofing, 250 sq. ft. per roll *$1.75*

Tarred Paper—

1 ply (roll 400 sq. ft.), ton ..... *$35@40 ($0.00)*
2 ply, roll 108 sq. ft. ..... *65¢*
3 ply, roll 108 sq. ft. ..... *85¢*
Slater's Felt (roll 500 sq. ft.) ..... *30¢*

Sand and Emery—

Flint Paper and Cloth ..... *5@10 —%*
Garnet Paper and Cloth *25%*
Emery Paper and Cl'h..50&10@60%

Parers— Apple—

Gardelle ..... per doz. $15.00
Pearl's Bay State ..... per doz. $30.00
Improved Bay State ..... per doz. $36.00
New Leader ..... per doz. $7.50
Turn Table ..... per doz. $6.00
White Mountain ..... per doz. $7.00
Boston Improved ..... each $7.50
Dandy ..... each $14.00
Empire Improved ..... each $20.00
New Century ..... each $20.00
Reading ..... each $25.00
Livingston Nail Co.:
Brass ..... per doz. $4.00
Little Star ..... per doz. $5.00
Robbins Table ..... per doz. $6.20
Reading Hardware Co.:
Advance ..... per doz. $4.00
Baldwin ..... per doz. $4.00
Reading 27 ..... per doz. $3.25
Reading 28 ..... per doz. $6.25

Potato—

Saratoga ..... per doz $7.00
White Mountain ..... per doz. $6.00

Picks and Mattocks—

(List Jan., 1908.)

List ..... *70¢@70&10%@70&10&10%*
Cronk's Handled Garden Mattock, per doz. No. 2, $2.60; No. 3, $6.10.

Pinking Irons—
See Irons, Pinking.

Pins, Escutcheon—
Brass ..... 50@ 50&10%
Iron, list Nov. 11, '05 .. 60@60&10%

Pipe, Cast Iron Soil—
Standard 2-in ..... 60@65@—%
Extra Heavy, 2-in ..... 70@50@—%
Fittings, Standard and Heavy ..... 70@10@75%

Pipe, Merchant—

	Consumers. Steel. Blk.	Galv.	Carloads. Iron. Blk.	Galv.
	%	%	%	%
⅛ & ¼ in.	64	48	62	46
⅜ in.	68	52	64	50
½ in.	68	56	66	54
¾ to 6 in.	72	62	70	60
7 to 12 in.	69	54	67	52

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First-class 87%
Second class 90%

Pipe, Stove—

Per 100 joints.	C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	6.75	7.75
7 in., Standard Blue	7.75	8.75
5 in., Royal Blue	7.00	8.00
6 in., Royal Blue	7.50	8.50
7 in., Royal Blue	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color	$6.15	$7.15
6 in., Uniform Color	6.65	7.65
7 in., Uniform Color	7.65	8.65

Planes and Plane Irons—
Wood Planes—
Bench, first qual ..... 30@30&10%
Bench, second qual ..... 40@40&10%
Molding ..... 25@25&10%
Chapin-Stephens Co.:
Bench, First Quality 30%
Bench, Second Quality 40%
Molding and Miscellaneous 25%
Toy and German 60%
Union 60%

Iron Planes -
Chaplin's Iron Planes ..... 50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06 ..... 25%
Buck Bros. 30%
Chapin-Stephens Co. 50%
Union 60%
L. & I. J. White ..... 20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse ..... ℔ doz. $8.00

Plates—
Felloe ..... lb. 4@4¼¢

Pliers and Nippers—
Button Pliers .... 75@5 75&10@55%
Gas Burner, per doz. 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe .. 7 8 10 12-in.
$2.00 $2.25 $2.75 $3.50
Acme Nippers ..... 50&5%
Cronk & Carrier Mfg. Co.:
American Button 80%
Improved Button ..... 75&10%
Cronk's 60%
No. 80 Linemen's 50%
Stub's Pattern 45%
Combination and others 33⅓%
Heller Bros. Nippers, Pincers and Tools ..... 40&5@40&10@5%
P., S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 35%; Elm City, 35%; Paragon, 50%; Lodi, 55%.
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels ..... 30@30&10%
Chapin's Imp. Brass Cor. 40@40&10%
Pocket Levels ..... 30@30&10%
Extension Sights ..... 30@30&10%
Machinists' Levels ..... 40@40&10%
Disston's Plumbs and Levels ..... 60&10%
Disston's Pocket Levels ..... 60&10%
Stanley's Duplex 50%
Wood's Extension 33⅓%

Points, Glaziers'—
Bulk and 1-lb papers .... lb. 9 ¢
½-lb papers ..... lb. 9½¢
¼-lb papers ..... lb. 10 ¢

Police Goods—
Manufacturers' Lists ... 25@25&5%
Tower 25%

Polish—Metal, Etc—
Prestoline Liquid, No. 1 (¼ pt.), ℔ doz., $3.00; No. 2 (1 qt.), $9.00 ..... 40%
Prestoline Paste 40%
George Wenham Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz 50¢; ℔ gro $4.50; ½ lb boxes, ℔ doz. $1.25, 1 lb boxes, ℔ doz $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt cans ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr $9.00
Black Kid Paste, 5 lb can ..... each, $0.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon's, ℔ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ℔ lb 9¢
Fireside ..... ℔ gr. $2.90
Gem, ℔ gr. $4.50 ..... 10%
Japanese ..... ℔ gr. $3.50
Jet Black ..... ℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans, ℔ doz. $1.50

Poppers, Corn—
1 qt. Square...doz. $0.80; gro. $8.75
1 qt. Round...doz. $0.90; gro. $10.00
½ qt. Square...doz. $1.00; gro $11.00
2 qt. Square...doz. $1.25; gro. $13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts ..... each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled ..... 35&10%
Tinned ..... 30&10%

Powder—
In Canisters:
Duck, 1 lb ..... each 45¢
Fine Sporting, 1 lb ..... each 75¢
Rifle, ½ lb ..... each 45¢
Rifle, 1 lb ..... each 85¢
In Kegs:
12½ lb. kegs $3.50
25 lb. kegs $4.50
King's Semi-Smokeless:

Keg (25 lb bulk)	$6.50
Half Keg (12½ lb bulk)	$3.50
Quarter Keg (6¼ lb bulk)	$1.90
Case 24 (1 lb cans bulk)	$8.50
Half case 12 lb cans bulk	$4.50

King's Smokeless: Shot Gun. Rifle.

Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb c. bk)	7.25	8.75

Presses—
Fruit and Jelly—
Enterprise Mfg. Co. ..... 20@25%
Seal Presses—
Morrill's No. 1, ℔ doz. $20.00 ..... 50%
Pruning Hooks and Shears
See *Shears.*
Pullers, Nail—
Cyclops 50%
Miller's Falls, No. 3, ℔ doz., $12.00 ..... 33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00 ..... 50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 ..... 50%
The Scranton Co., Case Lots:
No. 2B large $5.50
No. 3B (small) $5.00
Smith & Hemenway Co.:
Diamond B 70%
Giant 50%
Staple Pullers, Utica and Davison 60%
Pulleys, Single Wheel—

Inch	1¼	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., 4 in., $1.25; 5 in., $1.55				
Inch	2	2¼	2½	
Hot House, doz	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz	$0.25	.40	.55	.80
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in ..... 17@20¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in ..... 20@21¢
Acme, No. 35, 1¾ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain Axle ..... 50&10%
Wrought Steel Eagle ..... 17@20¢
Top Notch, Electrically Welded, Nos. 3 and 4 ..... 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in 50%
Grand Rapids All Steel Noiseless 50%
Niagara, No. 25, 1¾ in., 19¢; 2 in ..... 20½¢
No. 36 Troy 1¾ in. 14½¢; 2 in., 16½¢
Star, No. 26, 1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.
Pumps—
Cistern 60%
Pitcher Spout ..... 75&5@75&10%
Wood Pumps, Tubing, &c 50%
Barnes Dbl. Acting (low list) ..... 40&5%
Bronze Pitcher Spout 60%
Contractors' Rubber Diaphragm No. 2 B. & L. Block Co. $16.00
Daisy Spray Pump ..... ℔ doz. $8.50
Flint & Walling's, Fast Mail Hand, (low list) 50%
Flint & Walling's Fast Mail (low list) 50%
Flint & Walling's Tight Top Pitcher ..... 45&10%
National Specialty Mfg. Co. Sprayer, Nos. 2, $6.00; 3, $5.50 ..... 30%
Myers' Pumps (low list) ..... 40&5
Myers' Power Pumps ..... 40&5
Myers' Spray Pumps ..... 40&5
Pump Leathers—
Plunger and Valve Leathers—Per gro:

No.	1	2	3	4
	$5.00	6.00	7.00	8.00

Cup Leathers—Per 100:

Inch	2½	3	3½	4	50%
	$5.00	7.00	9.00	12.00	

Punches—
Saddlers' or Drive, good ..... doz. 50@75¢
Spring, single tube, good quality $1.75
Revolving (4 tubes) ..... doz. $3.50
Bemis & Call Co., Last 311 Drive 50...
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00 ..... 50%
Hercules, 1 die, each $5.00 ..... 50%
Niagara Hollow Punches 40%
Niagara Solid Punches ..... 55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35%; Paragon, 50%; Lodi 55%
Tinners' Hollow, P., S. & W. Co. 40%
Tinners' Solid, P., S. & W. Co., ℔ doz., $1.44 ..... 40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron ..... 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢ 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail, ℔ ft. 3¼¢
O. N. T. Rail $3.12
Griffin's,
xxx, ℔ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ℔ 100 ft. $3.45
O. N. T., ℔ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00. ℔ 100 ft. $4.00
Standard, 1¼ in., $4.00. ℔ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ℔ 100 ft., $7.50; 1¼ x 3-16 in., $8.75 ..... 55&7½%
McKinney & Co.:
Hinged Hanger Track, ℔ ft., 11¢; 60&5%
1 x 3-16 Track ..... 55&7½%
Myers' Stayon Track ..... 60&5%
Richards' Daly Co.:
Common, 1 x 3-6 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hauger Rail ..... 60&10%
Lag Screw Rail, No. 65 ..... 50%
Gauge Trolley Track, ℔ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢ ..... 60&10%
No. 50 ..... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn $3.25
Fort Madison Blue Head Lawn $2.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 50%; Victor ..... 80&5%
Queen City Lawn, ℔ doz., 20 teeth, $2.85; 24, $3.00 ..... net
Anticlog Lawn, ℔ doz $4.00
Malleable Garden ..... 60&10%
Ideal Steel Garden, ℔ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00 ..... 80%
Kohler's:
Lawn Queen, 20-tooth ..... ℔ doz. $3.15
Lawn Queen, 24-tooth ..... ℔ doz. $3.25
Paragon, 20-tooth ..... ℔ doz. $2.70
Paragon, 24-tooth ..... ℔ doz. $2.75
Steel Garden, 14-tooth $2.40
Malleable Garden, 14-tooth, ℔ doz. $2.00@2.25

Rasps, Horse—
Diston's 75%
Heller Bros. ..... 70&5@70&10&5%
Lyman Bros.' Gold Medal 70&10@75%
McCaffrey's American Standard, 60&10&5%
New Nicholson ..... 70&10@75%
See also Files.

Razors—
Liana Bo-ras-ic 60%
For Razors, ℔ doz., No. 42, $20.00; No. 44, $20.00; No. 82, Platina, $25.00. } 10% 2%
Red Devil 65%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 8, M 9½, M 16, Q 16, A 16, B 16, 4098, Rubber, Populo, Nickeled Populo 20%
Aluminum, German Silv., Bronze 20
1240 N, 124 N 20%
3004 N, 06 N, 6 RM, G 9 ..... 25%
4 N, 7 PN, 24 N, 96 PN 20%
2904 P, 3¾% 2904 PN, 3¾% 0924 N, 3¾% 02084 N, 3¾% 002904 PN, 3¾% 802 N, 3¾% 902 N 25%
986 PN, 2904 N, 974 PN 20%
5009 PN, 5009 N 20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20%
304 P, 304 PN, 00304 P, 00304 PN, 33¾% 25%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed ..... 70@70&10%
White Porcelain Enamel ..... 50&10%
Solid Brass or Bronze Metal 40%

Revolvers—
Single Action ..... $5@$11.00
Double Action, except 44 cal. $2.00
Double Action, 44 caliber $2.00
Automatic $5.00
Hammerless $7.50

Riddles, Hardware Grade

16 in.	*per doz $2.50@$2.75*
17 in.	*per doz $2.75@$3.00*
18 in.	*per doz $3.00@$3.25*

Rings and Ringers—
Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	1.10	1.25	1.65 doz.

Hog Rings and Ringers—
Hill's Rings, gro. boxes $4.25@$4.50
Hill's Ringers, Gray Iron, doz., 60@75¢
Hill's Ringers, Malleable Iron doz. 80@95¢
Blair's Rings...per gro. $5.00@$5.50
Blair's Ringers...per doz. 75@90¢

Rivets and Burrs—
Copper ..... 50@50&5%
Carriage, Coopers', Tinners, &c.:
Black ..... 70&10%
Metallic Tinned 70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, 23@23¢; Tin boxes, 100 count, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@38¢.

Rollers—
Cronk's Stay, No. 50 ..... $1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56, $0.75; No. 60 ..... $0.75
Lane's Stay 40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw Nos. 55 and 57 ..... 50%
Underwriters', Nos. 59, 60 ..... 50%
Favorite, No. 54 ..... 60%

Rope—
Manila, 7-16 in. diam. and larger: Pure ..... lb., 10½@11½¢
Sisal, 7-16 in. diam. and larger: Pure ..... lb., 7½@8¢
Sisal, 7-16 in. diam. and smaller: No. 2 quality ..... lb., 6½@7¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed ..... lb., 6½@7¢
Pure ..... lb., 7½@8¼¢
Sisal, Tarred, Medium Lay-Yarn, Coarse and Untarred Mixed ..... lb., 5¼@5¾¢
Pure ..... lb., 6½¢
Cotton Rope: Best, ¼-in. and larger...18@20¢ Medium, ¼-in. and larger..16@17¢ Common, ¼-in. and larger...10¢ per coil, ½¢ advance.
Jute Rope: Thread, No. 1, ¼-in. & up, lb., 6¼¢
Thread, No. 2, ¼-in. & up, lb., 5¼¢

Wire Rope—
Galvanized ..... 87½&2½%
Plain ..... 45&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 25%; Sisal 20%

Rules
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory ..... 25@25&10%
Miscellaneous ..... 50@50&10%
Stephens' Combination 55%
Stationers' ..... 50@50&10%
Keuffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel ..... 33⅓&10%
Lufkin's Steel ..... 50&10%
Lufkin's Lumber ..... 50&10%
Union Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See Balance, Sash.
Sash Locks—See *Locks, Sash*
Sash Weights—
See Weights, Sash.
Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*
Saw Frames—
See Frames, Saw.
Saw Sets—See *Sets, Saw.*
Saw Tools—See *Tools, Saw.*

Saws

Circular 45
Band ..... 50@50&10
Butcher Saws 40
Cross Cut 55%
Cross Cut 40
Mitre Box and Cabinet 15
Mitre Mortise and Tenon 15
Wood ..... 10&5
Compass Saws and Cut 40
Lathing Saws and Frames ..... 30@35&10%
Dominion Saw & Stamping Works:
Sterling Kitchen Saws..... 30&10&10%
Lockwood:
Butcher Saws and Inserted Tooth 50%
Band 2 to 15 in. wide 60
Circular 6 to 8 in. 60%
Compass 60
Narrow Cut Saws 50
Mortise Mitre and Drag 50%
Pruning Hand Saws 40
Wrought Handles 35
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100, 15, 7, 8 15
Hand Saws, Nos. 7, 107, 107½, 5, 1, 30 Combination 30
Compass, Key Hole, &c. 25
Butcher Saws and Blades..... 30%
E. Berninger & Co.'s:
Rip Saws 35%
Butcher Saws ..... 35&5%
Compass and Key Hole Saws ..... 35&5%
Frame Wood Saws ..... 25&5%
Hand Saws 12½
Web Saw Blades ..... 50&5%
Butlers Falls:
Butcher Saws ..... 15&10
Stair Saw Blades ..... 15&10
Massachusetts Saw Works:
Antler Kitchen Saws ..... 40&10&5%
Butchers Saw Blades ..... 35&4
Peace & Richardson's Hand Saws..... 30
Simonds
Circular Saws 45
Crescent Ground Cross Cut Saws..... 30
Cross Cut Saws ..... 40&5
Gang Mill, Mulay and Drag Saws..... 45
Band Saws 50
Back Saws ..... 35@35&5%
Butcher Saws..... 35@35&5%
Hand Saws ..... 22@25&5%
Hand Saws, Bay State Brand..... 15%
Compass, Key Hole, &c. ..... 25@25&5%
Wood Saws ..... 40&5%
Weaver, Marden & Clemsen Mfg. Co.'s Cross Cut Saws 60%

Hack Saw Blades and Frames

Atkins Hack Saw Blades A A A 25%
Disston's:
Vanadium Blades 45
Keystone Blades 35
Hack Saw Frames 35
Simonds Mfg. Co.
Hack Saw Blades 50
Hack Saw Frames, Nos. 175, 180..... 40&5
Hack Saws, Nos 175, 180, complete, 40&5
Goodell's Hack Saw Blades ..... 40&10%
Hack Saw Frames ..... 35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Victor Hack Saws and Blades..... 15&10%
Sterling Hack Saw Blades ..... 30&10&5%
Sterling Hack Saw Frames ..... 30&5&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Victor Hack Saw Blades 20
Victor Hack Saw Frames..... 40%
Whitaker Mfg. Co.:
Nicholson Hack Blades 1
Nicholson Hack Frames 8
Nicholson Power Blades 8

Scroll—

Barnes, No. 7, $15..... 25%
Barnes, Scroll Saw Blades..... 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00 ..... 15&10%

Scales—

Union Platform, Plain $2.10@2.25
Union Platform, Stpd. $2.20@2.30
Chatillon's:
Eureka 50
Dormant 40
Counter, Top Scales 30
The Standard Portables..... 40%
The Standard R. R. and Wagon ..... 50&5

Scrapers—

Box, 1 Handle.... doz. $2.00@2.25
Box, 2 Handle.... doz. $2.50@2.60
Shop, Light, $2.00; Heavy, $1.50
Charles Stebbens Co. Box ..... 20&20&10%
Richards Mfg. Co. Box 60

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@3.25; 2 in., $3.00@3.25; 2½ in., $3.50@4.25
Parker, Wood ..... 2½&2&10
Hand, Wood ..... 20&10&5&10
The Stebbens Co. Hex. Head 40
Coach, Lag and Hand Rail
Lag, Cone Point ..... 50&10%&5
Lag, Gimlet Point ..... 50&10%&5%
Hand Rail ..... 70&10&5

Jack Screws—

Standard List ..... 70&10@5
Morse, Peck ..... 5&10&10
Swan Iron Works 40

Machine—

Cut Thread, Iron, Brass or Bronze:
Flat Head or Round Head ..... 50@5&10
Fillister Head ..... 40@10&10%
Rolled Thread, F. H. or R. H., Iron ..... 25&10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65&10%

Set and Cap—

Set (Iron) ..... 75&10&5%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70&10&5%
Hex. Hd. Cap ..... 70&10&5%
Rd. Hd. Cap ..... 50&5%
Fillister Hd. Cap ..... 60&5%

Wood—

List July 25, 1906.
Flat Head, Iron ..... 85@85&5%
Round Head, Iron ..... 85&5%
Flat Head, Brass ..... 85&5%
Round Head, Brass ..... 85&5%
Flat Head, Bronze ..... 85&5%
Round Head, Bronze ..... 85&5%
Drive Screws ..... 85@85&5%

Scroll Saws—

See *Saws, Scroll.*

Scythes—

Per doz.
Grass, No. 1, Plain ..... $7.00@7.50
Clipper, Bronzed Webb ..... $7.25@7.75
No. 3 Clipper, Polished Webb ..... $7.50@8.00
No. 6 Clipper and Solid Steel ..... $7.75@8.25
Bush, Weed and Bramble, Nos. 11, 12 and 14 ..... $7.25@7.75
Grain, No. 1 ..... $9.00@10.50
Bronzed Webb, No. 1 ..... $9.25@9.75
Nos. 3 and 4 Clipper, Grain ..... $9.50@10.00
Solid Steel, No. 6..... $9.00@9.50

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $16; 3, $12..... 20%
Morse Tools and Iron Handles, No. 1, $12; No. 4, $12; No. 5, $18..20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ₱ doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Bees Bros. 37½
Cannon's Diamond Point, ₱ gro, $12.
Mayhew's ..... ₱ gro, $9
Snells Corrugated Cup Pt ..... 40&1
Snells Knurled Cup Pt ..... 40&1
Victor Knurled Cup Pt ..₱ gro $7.50

Rivet

Regular list ..... 75@75&10%

Saw -

Atkins':
Criterion 40%
Armstrong 40
Disston's Star, Monarch and Triumph 30%
Morrill's No. 1 ..... $15.30
Nos. 3 and 4, Cross Cut.... $20.60
No. 5, Mill $33.00
Nos. 9, 15, 95 ..... $15.60
No. 1 Old Style $16.20
Special $16.20
Grand Rapids Cross Cut..... ₱ doz. $8.00
Royal, Hand ..... ₱ doz. $1.50
Taintor Positive..... ₱ doz. $6.75

Shaving--

Fox Shaving Sets, No. 30..... ₱ doz., net, $24.00
Smith & Hemenway Co.'s..... 75

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₱ doz..... $1.50
Mounted Kitchen Sand Stone, ₱ doz..... $1.50
Natural Grit Carving Knife Hones, ₱ doz..... $3.00
Quick Cut Emery Carving Knife Hones, ₱ doz..... $1.50
Quick Edge Pocket Knife Hones, ₱ doz. Pocket $2.50

Skate—

Smith & Hemenway Co., Eureka 50

Shaves, Spoke—

Iron ..... doz. $1.00
Wood ..... doz. $2.
Buffalo Forge & I. Co. 4
Cleveland 4
Ohio ..... 15&10

Shears—

	7	8	9 in
Cast Iron..			
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*13.00*	*15.00*	*17.00 gro.*
Cheap	*5.00*	*6.00*	*7.00 gro.*

Standard Trimmers, &c.
Best quality tap ..... 70@70&10%
Best quality Nickel ..... 60@60&10%
Tailors' Shears ..... 50@50&5
Wilcox Cast Scissors ..... 1 to 4
Wilcox Steel Scissors ..... 1 to 4
Wilson Shear & Cutlery Co.
Sheep, 1900 list..... 40%
Hinge ..... 50&10%
Hinge & Mule 40
J. W. & S. Co.
Bee Quality, No. 1 ..... 6&10
Bee Quality, Nickeled ..... 50&10
Tailors' 25

Tinners' Snips—

Steel Blades ..... 70@70&10%
Steel Lined Blades ..... 60@60&10%
Forged Handles, Steel Blades, Berlin 5
Heinisch & Sons 5
Jos. A. Gesswein Mfg. Co. 5
Kayser 5
Newton 10
Pexto, S. & W. Forged Handles 35
W. R. W. ..... 10&10
J. Wiss & Sons 5
Wiss, Pat. 25

Pruning Shears—

Cronk's Hand Shears..... 33½%
Cronk's Wood Handle Shears..... 33½%
Disston's Combined Pruners, 11608, and Saw 25%
Disston's Pruning Hook only, ₱ doz. 25
John T. Henry Mfg. Co.
Pruning Shears and Grafting Tools ..... 10&10
Columbian Cutlery Co.:
Hedge, Wilcut Brand..... 60&10%
Lawn and Border, Wilcut Brand ..... 60&10%

Sheaves— Sliding Door—

Reading 40
R & E. list 15

Sliding Shutter—

Reading list..... 40%
R & E list 10

Shells—Shells, Empty—

Bees Sons' Empty:
Climax and Leader ..... 65&10
Club, Rival, 65&5%; First Quality, 60&5%

Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 35&10
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader 8 gauge, 25&5
Comet, League, 12 and 12 gauge; Rival Grade..... 25%
New Century, Defiance, 10, 12, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20&5
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Ideal, 14 and 20 gauge, Repeater Grade..20%

Shells, Loaded—

Loaded with Black Powder 50%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders..... 40%
Nitro Club, Smokeless Powders.45&5%
Nitro Smokeless Powders.40&10&10%
Winchester
Smokeless Repeater Grade ..... 10&5
Smokeless Leader Grade ..... 10&10
Black Powder 40

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted	Galv
11 x 24	$1.25	$6.00
12 x 24	1.25	6.50
14 x 24	1.50	6.50

Wheeling Corrugating Co.:

Plain 11 x 24 in.	$1.55	$5.50
IXL 11 x 24 in.	1.80	6.00
Ideal 12 x 25 in.	2.00	6.50

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg $4.10
Steel ..... per keg $3.85
Burden's, all sizes..... ₱ keg $3.90

Shot—

25-lb. bag.
Drop, up to B..... $1.85
Drop, B and larger..... 2.10
Buck 2.40
Chilled 2.30
Dust 2.30

Shovels and Spades—

Association List, Nov. 15, 1902. 40%
Avery Shoveling Co..... 40%

Snow Shovels—

Long Handle..... $3.25@$3.50
Wood and Mail, D. Handle, $3.75@$4.00

Sieves and Sifters—

Hunter's Imitation ..... gro. $9.50@10.00
Hunter's Genuine ..... per gro. $12.00@12.50

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme $3.00

Sieves, Seamless Metallic

—Per dozen.—

Mesh	*14*	*16*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*
Tinned Wire	*$1.15*	*1.15*	*1.20*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... doz $1.00@1.05
Mesh 20, Nested ..... doz $1.00@1.05
Mesh 24, Nested.... doz. $1.30@1.40

Sinks, Cast Iron—

Painted Standard list:
11 x 15 to 22 x 36 in. 60%
22 x 22 to 24 x 30 in. 50%
24 x 24 to 24 x 120 in. 40%
Barnes' low list:
[illegible] 50
[illegible] 15
[illegible] 10
NOTE—There is not entire uniformity between the Dealers.

Skeins, Wagon—

Cast Iron ..... 70@75&10%
Steel ..... 50@55%

Slates, School—

Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless ..... 60&65 tens
Victor A, Noiseless .60&4 tens 45%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 70@75&10%
Corbett Mfg. Co.
Dublin, 20%; Yankee 20&2; Yankee Roller, 30&2%..... 30
High Grade, 40%; Trojan..... 40%
Jocket 25

Snaths—

Scythe ..... 50@50%

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton..... 50&10%
Rogers & Bro., William Rogers' Eagle Brand..... 50&10%
Anchor Rogers Brand..... 60%
Wm. Rogers & Son..... 60&10%

Miscellaneous

German Silver ..... 60@60&5%

Tinned Iron—

Tens ..... per gro. 50@55c
Tables ..... per gro. $0.90@$1.00

Springs— Door—

Bardsley's Spring and Check..... 40%
Chicago Hdw. 25
Gem (Coil) 25
Pullman Door and Gate..... 10%
Reliance Coil..... 10&5
Star (Coil) 25
Torrey's Rod, 39 in..... ₱ doz. $1.10

Carriage, Wagon, &c.—

1¼ in. and Wider: Per 100 lb.
Black ..... $3.75@3.90
Half Bright..... $3.75@3.90
Bright ..... $3.25@3.50
Painted Seat Springs:
1½ x 2 x 26..... per pair, $0.70
1½ x 2 x 28..... per pair, $0.80

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, Japanese, Tulip, Nozzle, Tubal, ₱ doz. 30
Enterprise 30
Philadelphia No. 1, ₱ doz. $12, No. 2, $15, No. 3, $20..... 30

Squares—

Nickel plated ..... List Jan 1 '08
Steel and Iron ..... 80@80&5%
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10&10%
Iron Hdl. Try Squares and T-Bevels ..... 40@40@40@40@10%
Disston's Try Squares and Bevels, Rosewood Handle. 60&10%; Iron Stock and Bevel..... 15%

Squeezers, Lemon

Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.25
Iron, Porcelain Lined... doz. $1.75

Staples—

Barbed Blind ..... 50&10&10%
Electrolytic ..... 50@50&10%
Fence Staples, Plain, $2.15; Galvanized $2.35
Poultry Netting Staples ..... per lb. 3½@3½c

Steels, Butchers'—

Dick's 30%
Foster Bros. 30

Steelyards— ....30@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%
Curtis Reg'lee Ratchet Die Stock..25
Derby Screw Plates..... 25%
Green River..... 25%
Lightning Screw Plate 25%
Little Giant..... 25
Reece's New Screw Plates..... 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones—Oil, &c.

Pike Mfg. Co.:
Arkansas Soft No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1..... $4.00
Lily White Washita 4 to 8 in. 60c
Razor Red Washita 4 to 8 in. 60c
Washita Soft, Extra, 4 to 8 in. 50c
Washita Soft No. 1, 4 to 8 in. 40c
Washita Soft No. 2, 4 to 8 in. 25c
Lily White Slips 90c
Razor Red Slips 90c
Washita Slips, Extra..... 80c
Washita Slips, No. 1..... 60c
Washita Slips, No. 2..... 40c
India Oil Stones, assorted list..... 33⅓
Quick Cut Emery and Corundum Oil Stone, Double Grit 50
Quickcut Emery and Corundum Axe Stone, Double Grit 33⅓
Quick Cut Emery and Corundum Bench Stones 10
Hindostan No. 1 Razor 80
Hindostan No. 1 Small 60
Hindostan No. 2 Small 10c
Turkey Oil Stones, Extra, 5 in. 50
Queen Creek Stones 4 to 7 in. 25c
Queen Creek Slips 10c
Sard Stone 10

Scythe Stones—

Pine Mfg. Co., 1904 list
Black Diam. and S. S., ₱ gro. $12.00
Dismantle, S. S., ₱ gro. $11.00
Coarse Mineral, ₱ gro. $7.00
Coarse Mineral, ₱ gro. $7.00
Extra Diamond Pattern, S. S., ₱ gro. $8.00
Extra Diamond Pattern, Round, ₱ gro. $8.00
Extra Diamond Pattern, Square, ₱ gro. $9.00
Lancet Red Edge, S. S., ₱ gro. $7.00
Queen Cut Emery, ₱ gro. $12.00
Regular Corundum, ₱ gro. $11.00
Crescent, ₱ gro. $7.00
Extra Section Ruby, 3 Cord, ₱ doz. $3.00
Extra Section Ruby, 4 Cord, ₱ doz. $4.00
Extra Section Ruby, 5 Cord, ₱ doz. $5.00
Ruby, Lap at 1904 list 33⅓%
Lancet, Artificial, ₱ gro.
Lightning, Artificial, ₱ gro. 33⅓%

Stoppers, Bottle—

Vitet Bottle Stoppers.....₱ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ₱ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....50@50&10%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Acme Enclosed case lots..20&10&10%
Cary's Universal, case lots....20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 55¢
Adjustable Sawkit, doz. $2.00@$2.25
Excelsior Stretcher and Tack Hammer Combined, ₱ doz. $6.35.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1908.....40&5%
P., S. & W. Co.....40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ₱ doz.
Superba, Quick Mahogany.....$6.00
Triumph, Early Maple.....$6.00
Parlor Queen, Fig. Rosewood..$30.00
Leader, Hungarian Ash.....$27.00
Am. Queen, Fig. Mahogany...$27.00
Ideal, Bird's-Eye Maple.....$25.00
Grand Rapids, Stencil.....$24.00
Jap.....$22.00
Sweeper Nickel, Japan.....$20.00
Crown Jewel, Nickel, $21.00; Jap.$19.00
Queen, Brass Trim.....$16.00
Queen, 27 in. wide.....$18.00
Prince, Nickel.....$54.00
Queen, 24 in. wide.....$54.00
Hall, 28 in. wide.....$60.00

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five dozen lots; $2 per dozen on ten dozen lots, $2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks.....90@4%
American Cut Tacks.....90@4%
Scours' Cut Tacks.....90@4%
Saddlers' Upholsters.....90@5%
Gimp Tacks.....90@6%
Lace Tacks.....90@6%
Trimmers' Tacks.....90@6%
Looking Glass Tacks.....60@
Bill Posters' and Railroad Tacks, 90@65&10
Hungarian Nails.....80@70%
Fishing Nails.....70%
Trunk and Chest Nails...80@10

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks.....90@65 tens@—

See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
50	$3.50	$4.00
100	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ...50@—%
Patent Leather.....25&10&5%
Steel.....$3.75&5%
Chesterman's.....25&10&5&5%
Kraft & Esser Co.:
Linen, Asst. Nos.....10&10&5%
Favorite, Duck and Leather.....
.....25&10&5%
Metallic and Steel, Lower list, 35@35&5%; Pocket, 35@35&5%.
Leather:
Acme Skin.....40&10&10&5%
Metallic.....30&10&5%
Patent Brass Leather.....25&5&10&5%
Pocket.....40&10&5%
Steel.....33⅓&5%
Wright & Hilger:
Chesterman's Metallic, No. 341.....25%
Chesterman's Steel, No. 1098L.....35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c.....30@33⅓%

Ties, Bale—Steel Wire—

Single Loop.....$2.40@—
Monitor, Cross Head, &c.70@—

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Haying—

Myers' Hay Tools.....45%

Miniature—

Smith & Hemenway Co.'s, Davidson, ₱ doz., Nickel Plated, $1.5...
Gold Plated.....$2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%*

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida.....75&10%
Newhouse.....10@40&5%
Hawley & Norton.....65%
Victor.....75@75&10%
Oneida Community Jump.....50%
Beaver.....75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85¢@9¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ₱ doz., $13.25..$11.50 doz.
No. 3, Rat, ₱ doz., $6.50....$5.75 doz.
No. 3½, Rat, ₱ doz., $5.25..$4.70 doz.
No. 4, Mouse, ₱ doz., $3.00..$2.70 doz.
No. 5, Mouse, ₱ doz., $2.25..$2.00 doz.
Oneida Community:
Out o' Sight, Mouse, ₱ doz....$0.60
Out o' Sight, Rat, ₱ doz.....1.25
Easy Set, Mouse, ₱ doz.....
Easy Set, Rat, ₱ doz.....1.00
Wood Choker, Rat, ₱ doz. holes. .12
Premier Choker, 5 holes, ₱ doz. traps.....75

Trowels—

Disston Brick and Pointing.....25%
Disston Plastering.....20%
Peace Nickel Plated Trowels and Garden Trowels.....30%
Kohler's Steel Garden Trowels, ₱ gro., 5 in., $4.80; 6 in., $6.00.....
Never-Break Steel Garden Trowels.....
₱ gro. $6.00
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern.....53&10%
Western Pattern.....60&10%
Handy Trucks.....₱ doz. $16.00
Giant.....₱ doz. $15.00
McKinney Trucks.....each, net $10.00
Main Store Trucks.....₱ doz. $18.50

Tubs, Wash—

Mf'gr's list, price per gross.

No.	1	2	3
Galvanized	86	82@	88@ 89@ 10&10%

Twine, Miscellaneous—

Flax Twine.
No. 1, 4 and 5-lb. Balls, 25¢@28¢
No. 2, 4 and 5-lb. Balls, 19¢@24¢
No. 3, 4 and 5-lb. Balls, best bee
No. 4, 4 and 5-lb. Balls.....
.....15¢@17½¢
No. 1, 4 and 5-lb. Balls, 15¢@16¢
Check Line, Cotton.....
Balls.....24¢@26¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....$1.40@$2.00
Cotton Wrapping, 5 Balls to lb., assorted to quality.....12¢@15¢
American 2-Ply Hemp, 4 and 5-lb. Balls.....15¢@15¢
American 3-Ply Hemp, 4 and 5-lb. Balls, Superior Laid.....22¢@24¢
Indian 2-Ply Hemp, 4 and 5-lb. Balls, Superior Laid.....22¢@24¢
India 3-Ply Hemp, 4-lb. Balls.....
.....24¢@26¢
India 3-Ply Hemp, 1½-lb. Balls.....
.....24¢@26¢
2-Ply and 3-Ply Jute Balls.....9@11¢
Mason Line, Linen, ½-lb. Balls.....17¢
No. 1, Mattress, 4 and 5-lb. Balls, according to quality.....
.....according to quality
Wool, 2 to 6 ply.....Basis 1.25@—

Vises—

Solid Box.....70@75@80@85,

Parallel—

Athol Machine Co.:
Simonds' Adjustable.....40%
Standard.....40%
Amateur.....40%
Columbian Hdw. Co.....40%
Fisher & Norris Double Screw, net, each, Nos. 1, $1.50; 2, 3, $1.75; 4, $2.00; 5, $2.50; 6, $3.00.....4...
Fulton Mach. & Vise Co.:
Reed Swivel.....25...
Steel, Solid Jaw.....40%
Hall, J. H.:
Mechanists'.....40@40&5%
Keystone.....65&5@7...
Leader Tool Co.:
Adjustable Jaw.....33...
Monarch, 50%; Solid Jaw.....50%
Massey Vise Co.:
Cabinet.....40%
Perfect, 15%; Lightning Grip.....15%
Merrill's.....20%
Millers Falls Oval Slide Pattern.60&10%
Parker's:
Victor, 20@25%; Regulars.....20@25%
Vulcan's.....45@45%
Centennial Non-Pipe.....50@60%
Prentiss.....20@25
Rock Island.....25...
Snediker's.....40&5%
Stephens'.....33⅓%

Saw Filers

Disston's D 3 Clamp and Guide, ₱ doz. $24.00, 30%; Clamps.....30%
Perfection Saw Clamps, ₱ doz.....$4.50
Reading.....60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed.....25...
Star.....40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect.....15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870.....
Rock Island Pipe.....25%

Wads—*Price per M.*

B. E., 11 up.....	*60¢*
B. E., 9 and 10.....	*70¢*
B. E., 8.....	*80¢*
B. E., 7.....	*80¢*
P. E., 11 up.....	*$1.00*
P. E., 9 and 10.....	*1.25*
P. E., 8.....	*1.50*
P. E., 7.....	*1.50*
Ely's B. E., 11 and larger.	*$1.70@1.75*
Ely's P. E., 12 to 20.....	*$3.00@3.25*

Dis. 15%

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled.....45&10%
Ground.....50&5%
Plain or Unground.....50%
Country Hollow Ware, per 100 lbs.....$3.00
White Enameled Ware:
Maslin Kettles.....65&10%
Covered Wares:
Tinned and Turned.....35&10%
Enameled.....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....33⅓%
Iron Clad Ware.....70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch.....	*6*	*7*	*8*	*9*
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60%
Porcelained.....50&50&50&10%
Never Break Spiders and Griddles.....65&5%
Never Break Kettles.....65&5%
Solid Steel Spiders and Griddles.65&5
Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ₱ doz.
Crescent, family size, bent frame.$4.05
Rex, family size, frames see stationary.....$4.05
Double Zinc Shield:
Square, family size, frames see stationary protector.....$4.05
Cable Cross, family size, stationary protector.....$3.60
Single Zinc Surface:
Nanta, family size, open back.....$3.25
Single Saginaw Globe.....$2.85
Brass Surface:
Pee Kay, Single Surface, open back.....$4.35
Nickel Plate Surface:
Nanta, Nickel Plate, Single Surface.....$3.60
Glass Surface:
Glass King, Single Surface, open back.....$3.95
Enamel Surface:
Enamel King, Single Surface, rest lated back.....$3.95

Washers—Leather, Axle—

Solid.....20@—and 10%
Patent.....35@—%
Coil: ⅞ 1 1⅛ 1¼ Inch.
90c. 70c. 11c. 14c. per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers....$4.65 3.75 2.45 2.25 2.0...
The above prices are based on $6.75 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots... per lb. 1½@1¾¢

Wedges—

Oil Finish.....lb.. 2½@2¾¢

Weights—Hitching—

Covert Mfg. Co.....30%

Sash—

Per net ton, f.o.b. factory:
Eastern District.....$21.00@
Western and Central Districts.....$21.00@$22.00

Wheels, Well—

8-in., $2.00; 10-in., $2.45; 12-in., $3.25; 14-in., $4.45.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....72¢@70&10%
10 to 18.....72½@70&10
19 to 26.....75¢@70&10
27 to 36.....77½@72½
Galvanized:
6 to 9.....72½@70&10%
10 to 14.....72½@70&5
15 to 16.....72½@70&5
17 to 18.....72½
19 to 26.....70&5&2½
27 to 36.....65@70&10
Coppered:
6 to 9.....65@70&10
10 to 14.....70&5
15 to 18.....65@70&10
19 to 26.....70@70&2½
27 to 36.....72½@70&10
Tinned:
6 to 18.....67¢@70&10%
Brass.....16c lb., base
Copper.....32c lb., base
Cast Steel Wire.....50%

Spooled Wire—

Annealed and Tinned, 70@70&10@70
Brass and Copper...80@70&10@70
Retailers' Assortments, per box.....

Wire Clothes Line see Lines
Wire Picture Cord see Cord

Bright Wire Goods—

Steel Wire Goods....90@25%
Brass Wire Goods....90@10@10%
Brass Cup and Shoulder Hooks, 75@10

Wire Cloth and Netting—

Galvanized Poultry Netting, 70@75@10@5
Painted Screen Cloth, 14 M...
Standard Galv. Hardware Cloth, 100 ft. rolls, 2½ to 4S in. wide, per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh....$2.75
Nos. 4 and 5 Mesh.....
No. 6 Mesh.....
Nos. 7 and 8 Mesh.....

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural.....80@70&10%
Alligator or Crocodile..70@10@5%
Baxter Pattern S Wrenches.....70@65@10%
Drop Forged S.....45@45&5%
Acme.....
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Hub Nut.....50
Combination Black.....
Merrick Pattern.....
Boardman's.....40%
Coes' Genuine Knife Hdl...40&10&5%
Coes, Genuine Steel Hdl...40&10&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle.....40&10&5&5%
Coes' "Mechanics'"....40&10&10&5%
Donohue's Engineer.....40&10
Eagle.....
Gem Pattern.....
Heroules.....
Wm. F. Machinist:
Case lots.....
Less than case lots.....
W. & B. Railroad Special:
Case lots.....
Less than case lots.....40&10&5%
Solid Handles, P., S. & W...50&10%
full cases.....50&10&5%
Stillson.....
Uwanta Wrench Co.:
Canadian Special Iron, H.....
.....
Other Wrenches.....
Vulcan and Acrippa Chain.....
Whitaker Machinists':
Case lots.....
Less than case lots.....

Wrought Goods—

Staples, Hooks, &c., list March 15, '99.....85&10@%

Zinc—*(Cask lots at mill)*

Sheet.....per 100 lb $7.00

THE IRON AGE

New York, Thursday, June 4, 1908.

Electric Welding and Some of Its Products.

The welding of metals by whatever means employed requires that the surfaces to be joined be heated to a plastic condition and forced together with pressure sufficient to intimately unite all parts of the contacting surfaces. A perfect weld should be as strong as any other equal section of the parts welded, but this can only be achieved when air, scale and all other foreign materials are excluded from the joint. The oldest process of welding employed a forge fire for the heating. Later developments were the blow pipe processes, and most recently those using the oxy-acetylene torch, and the electric welding processes. Of the latter there are two, the arc process and the resistance process, also known by the name of the inventor as the Thompson process. It is this which is employed by the Electric Welding Products Company, Cleveland, Ohio, formerly the Cleveland Cap Screw Company, in the manufacture of various machine, engine, automobile and other metal parts.

The metals are heated for welding by the resistence they impose to the passage of an electric current. The parts are held in copper dies with clamps, and when at the proper heat, which can be accurately judged with the eye, they are forced together with horizontal pressure sufficient to throw out a burr at the joint and form a positive weld. The process is clean, accurate and sure, as the clean welding surfaces are heated uniformly and no foreign matter can enter into the weld. The machine pressure which finishes the job may be regulated to insure a perfect weld. Advantages are claimed for the Thompson process over others. For example, the arc process is less uniform, since the metal is heated from the outside to the center, which often means that the outside metal is burnt before the center is ready for welding. The intense heat, light and noxious fumes accompanying it are also cited as objections, and these are in a measure common to the different blow pipe processes. Hand or forge welding is slow and laborious, and so much depends upon the workman that accurate and strong welds are not as certain. Opportunity always exists for foreign substances to enter into the weld when parts are heated in an open fire, and small parts or metals of different nature cannot be handled satisfactorily at all by this process.

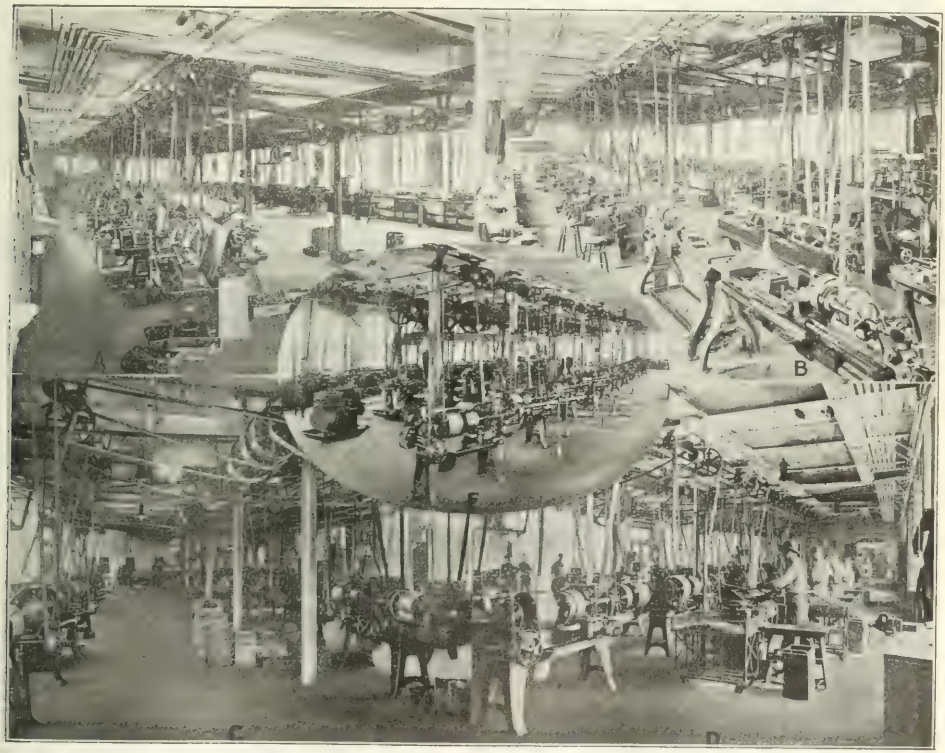


Fig. 1.—Views in the Plant of the Electric Welding Products Company, Cleveland, Ohio.

A—Hand Machine Finishing Department; B—Machine Shop and Hand Screw Machine Department; C—Semiautomatic Department; D—Section of Welding Department; E—Automatic Machine Department.

Before discussing the products made for the market by this company it may be interesting to examine the views in the company's various departments, given in Fig. 1. That designated as A is the hand machine finishing department; B, the machine shop and hand screw machine department; C, the semi-automatic department for finishing screws, &c.; D, a section of the welding department, and E, the automatic machine department for making heads, disks and other parts to be welded. In the years that the company was principally engaged in the making of cap screws, the head and body of which

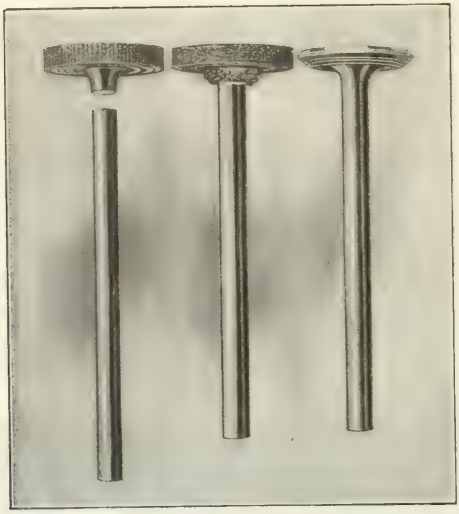


Fig. 2.—Stages in the Making of a Gas Engine Valve Stem with Nickel Steel Head and Carbon Steel Stem.

were joined by electric welding, it gained an experience that it is putting to advantage in the greater range of products which it is now manufacturing, and which caused the name of the company to be changed to one more fitting its present business.

By combining in one piece two different pieces of metal in a part subjected to diverse duties it has become possible to make many machine parts cheaper and more serviceable than before. The valve stem of a high speed gas engine is an example, a little thing which has given a great deal of trouble in gas engine construction, because it was soon destroyed by the deteriorating and corrosive action of the exhaust gases. Such parts are now made by this company, as shown in Fig. 2, which represents three stages in the process of welding a nickel steel head to a carbon steel stem. The nickel steel does not pit, warp nor corrode as does common steel and is much tougher. The stem being made of carbon steel stands the wear of the guide better than a nickel steel stem would. It is stiffer and can be hardened on the end to withstand the cam blow where nickel steel cannot. The construction is not only more desirable but cheaper, both by saving the use of so much high priced metal and the labor that a machine finished forging would require. The valve stems are frequently made with cast iron heads, but cast iron is brittle and likely to break, and it is almost impossible to fasten a cast iron disk on a stem so that it will not wear loose in use, giving rise to leakage.

Another of this company's products is a screw with a brass head and a steel body, which is more than 50 per cent. stronger than an all brass screw, and may be used in place of the latter for ornamental purposes where the head shows. Here again economy as well as additional strength is secured. This is also the case in the making of pinion blanks, the large ends or heads of which can be made of a high carbon steel and the body of mild steel, the teeth being cut in the high carbon steel head. As can readily be appreciated there are very many applications of a similar nature that may be of value in the manufacturing industries.

Fig. 3 shows the three stages in the making of a cap screw. The company has had a very interesting report on the strength of such bolts from the Wellman-Seaver-Morgan Company, Cleveland, Ohio, some of the data from which is given in the following table:

	Cleveland Cap screw, ordinary stock.	Twelve other makers' ordinary stock.	Cleveland Cap Company's greater strength. Per cent.
Per square inch.....	½ to 1¼ in.	½ to 1¼ in.	½ to 1¼ in.
Average tensile strength..	97,862	56,570	73
Maximum tensile strength.	116,400	53,750	82
Minimum tensile strength.	81,750	52,200	53½
Calculated equivalent tensile strength per square inch, from torsional tests....	105,475	63,154	..
Single shear, per square inch	51,250	37,050	..

It was found in all of the tests that the body of the cap screw is of a quality of material superior to that ordinarily used in such work, and that the cap screws in no case gave way in the weld. A special test was made of a part having a round rod body with a head welded on each end. This was submitted to a torsional test, and after twisting through 85 degrees gave way in the head and not in the weld.

The reason why bolts and screws made by this process are so much stronger is because the die drawn surface of

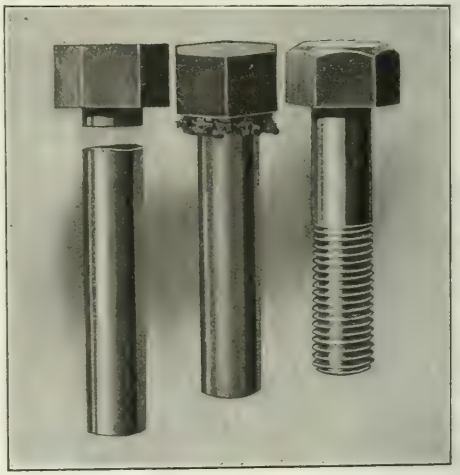


Fig. 3.—Stages in the Making of a Cap Screw with a Welded Head.

the stock is retained on the body, which is much stronger than the center or inside of a bar machined down to the body size from the head size. Often also an inferior grade of stock is used, which of course is not as strong.

Another valuable use of this process is in the welding

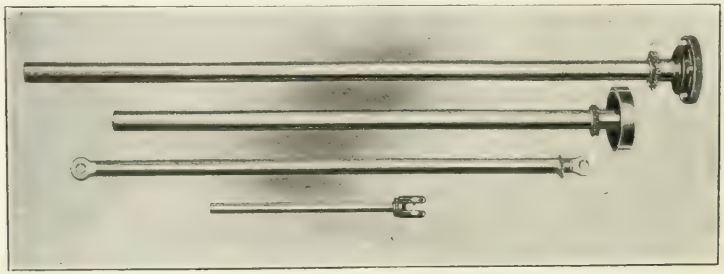


Fig. 4.—Examples of Forged Ends Welded to Solid or Tubular Shafts.

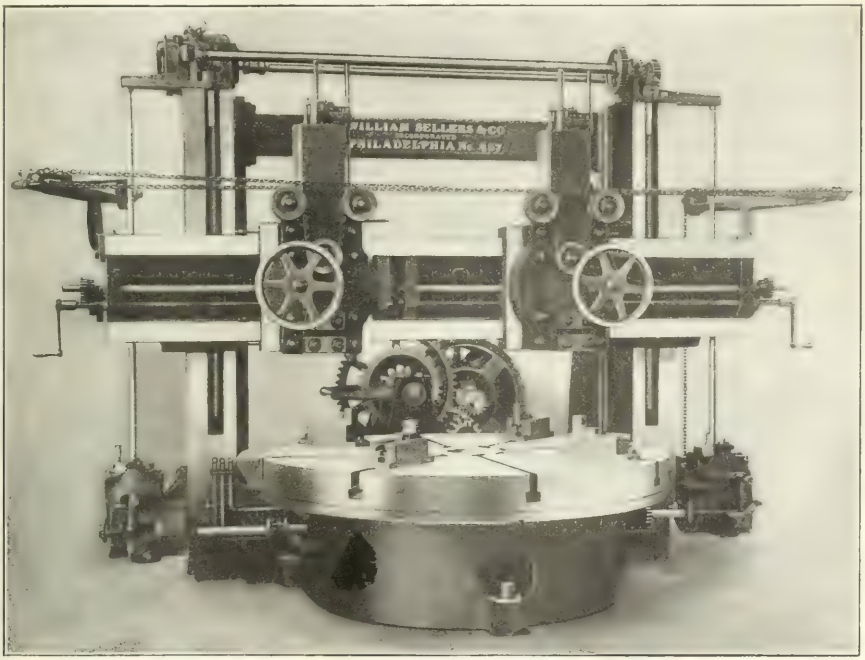
together of two simple forgings making one piece, which in itself might be extremely difficult, if not impossible, to forge. Forgings can be welded to shafts, tubular or solid, as connecting rods, transmission shafts, cam shafts and similar parts. There are those who favor tubular construction in rods of this kind with forged ends welded on. The weight is considerably reduced and an equal and often greater strength can be secured. Fig. 4 shows examples of rods and shafts with forgings welded on the ends.

Electric welding by the resistance or incandescent process has demonstrated its practicability, reliability and economy, and the almost endless variety of its possible applications seems to insure it a very important place in the field of machinery manufacture especially. Hindered as it has been by some prejudice against it from the failures which resulted at the early stages of its development it is not to be wondered that its adoption has been slow, but as it seems to have successfully emerged from the probationary stage there is every reason to expect that in the present improved and perfected state of the art it will be more extensively employed.

The British Iron Trade Association.—The annual meeting of the British Iron Trade Association was held May 13, at the Westminster Palace Hotel, London, with A. Findlay, M.P., presiding. The annual report stated that there were no signs of an early improvement in the iron trade. Reference was also made to the chief unfavorable features, the lower prices of iron and steel products, enhanced cost of raw materials, and slackness of the shipbuilding industry, in which 30 per cent. of all the iron and steel produced in the country was used. Although British makers had not received an adequate share of the world's trade in rails, yet in view of the complaints made as to the quality of rails in different parts of the world, it was satisfactory to record that the reputation of British-made steel rails remains very high. Mr. Shelton said that the unfavorable position of Great Britain was due in part to the want of an adequate supply of iron ore, and that the great development of Germany was promoted by the ability on the part of the Germans to use phosphoric iron ore deposits. Sir J. S. Randles, M.P., said that sooner or later in the iron and steel trade Great Britain should have to look at the effect of foreign tariffs on its production and the sale of manufactured articles.

A Sellers Motor-Driven Boring Mill.

Boring and turning mills although first developed in England, have been so improved by American builders that they are more extensively used in this country than in any other. They have a very wide range of application and often replace lathes, particularly when the work is such that it can be more rapidly set up on a horizontal face plate. Frequently a number of comparatively small pieces can be mounted at a time on the table, or two or more tools can be operated simultaneously, thus materially increasing the economy of production. To procure the greatest output from such a tool all of the driving and feeding movements must be conveniently controlled and the idle movements rapidly accomplished so that the tool can be kept actually working as much of the time as possible. Contributary to the desirable result a variable speed motor may be used for the drive, thus giving the proper cutting speed with the least loss of time in changing speeds, the controller handle being placed within convenient reach of the operator.



An 84-In. Boring Mill Built by William Sellers & Co., Equipped with a Westinghouse Motor.

The boring mill shown in the illustration is one built by William Sellers & Co., Inc., Philadelphia, Pa., and is capable of taking work up to 84 in. in diameter. The variable speed motor supplied by the Westinghouse Electric & Mfg. Company, has a speed range of 2½ to 1, giving the table any speed between 1 and 23.8 rev. per min. with the exception of two small gaps. The feed may be varied from 1-32 to ¾ in. per revolution of the table in eight steps. The machine is entirely self-contained and the only part extending below the floor line is the lever for adjusting the step bearing of the table spindle, which is accommodated by a trough 7 in. wide by 7 in. deep. In addition to this adjustable step bearing the table has a flat bearing under its rim. Using individual motor drive the machine may be located where the work will require the least handling, and the wide range of speeds available permits turning work of various diameters at the maximum cutting speed allowable for each.

The Keystone Works of the Jones & Laughlin Steel Company.

The Keystone Works is the title of the new structural plant of the Jones & Laughlin Steel Company, recently erected on the site of the Keystone Rolling Mill on Second avenue, Pittsburgh, Pa. It is located on the north side of the Monongahela River, on an approximately rectangular plot 540 ft. in length and 400 ft. in width, having an area of about 5 acres. Formerly it was situated at the extreme western end of the south side plant, but the erection there of large modern mills for structural shapes necessarily with sunken tracks. The foundations, including that of the power plant, are all of concrete, the forms for which were located in advance of the filling, saving expense in excavating.

The accompanying illustrations show the lay-out and leading features of the plant. Fig. 1 is the general plan of the works. Shops Nos. 1 and 2, practically under one roof, with spans of 85 ft. and 55 ft., have a total width of 140 x 260 ft. in length. Shop No. 3 has a width of 60 ft.,

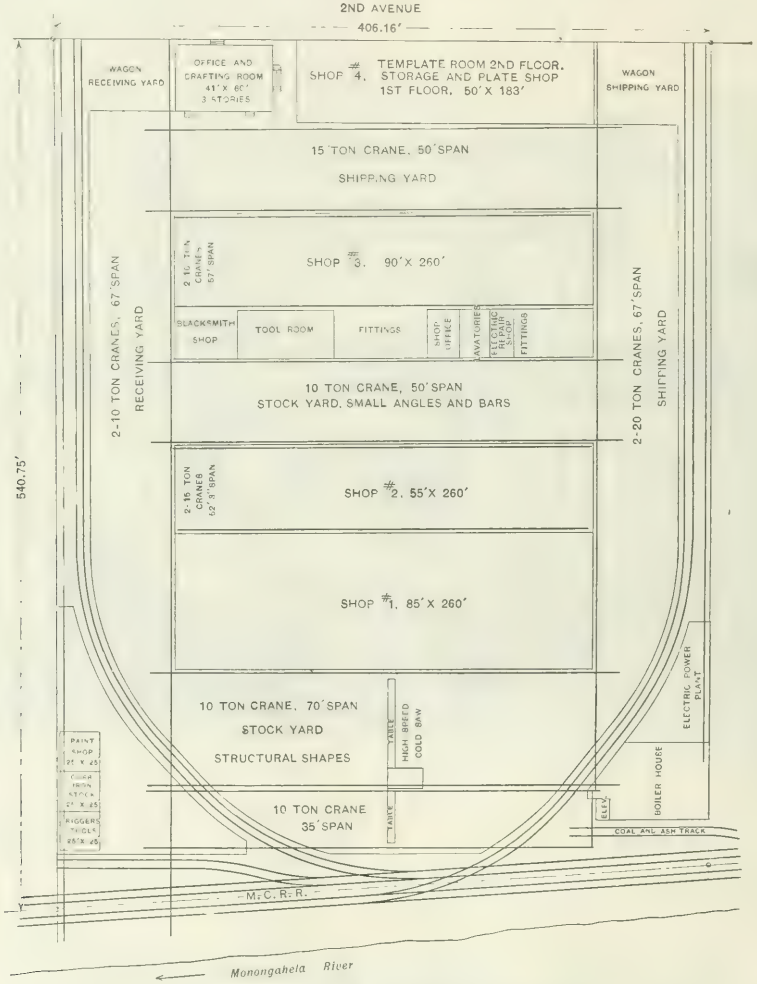


Fig. 1.—General Plan of the Keystone Works of the Jones & Laughlin Steel Company.

and the extension of the open hearth furnace plant rendered its position no longer tenable. It was also the aim of the management to provide better facilities for promptly producing fabricated structural material.

The new location is about midway between the Eliza and Soho furnace plants, allied interests of the same corporation. In order to get out of the reach of all but extraordinary floods, considerable filling was necessary, ranging from 2 to 10 ft. over the entire surface of the property. Railroad connection is had with the Monongahela Connecting Railroad at the river end of the property, with a 30-ft. lean-to, making a total width of 90 ft., maintaining a uniform length of 260 ft. It is well lighted and admirably equipped for the work—the fabrication of columns—for which it is intended.

The lean-to of shop No. 3, Fig. 2, is arranged to take care of the shop office, general lavatory, machine shop, blacksmith shop and various other subsidiary operations. Shop No. 4 is a two-story building running parallel with and next to the street. The lower story furnishes accommodation for the time clock system, by which the employees' time is recorded. The supply department is also

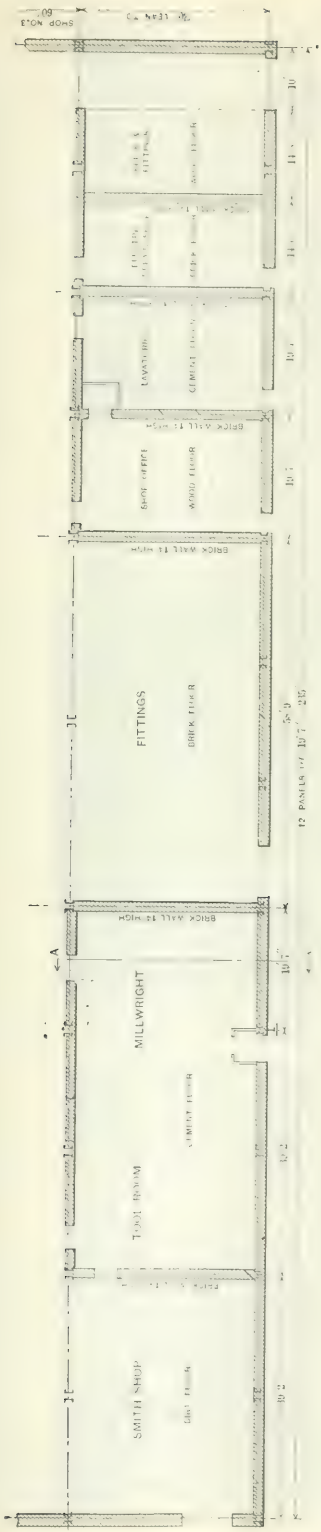


Fig. 2. Lean-to of Shop No. 3, Keystone Works of the Jones & Laughlin Steel Company.

in this building, conveniently arranged for receipt of team deliveries. A stock of template lumber is carried on this floor. The remaining portion is used as a shop for light plate or sheet work. The second story is used as a template room. It is well lighted and equipped for caring for such work, and is directly connected by a bridge with the drafting room on the second floor of the office building.

It will be seen by reference to the plans that the entire site has been covered with cranes or buildings, or both, the receiving and shipping yards being placed at either end of the shops, the purpose being to carry the work to completion as it is passed through them. A view of the receiving yard is given in Fig. 3. The space between the shops is assigned as stock yards. The river front is used as a stock yard for beams and channels, a representative stock being carried for prompt service. Stock material is piled in a 70-ft. span and after being cut with a high speed hydraulic feed cold saw it is carried on live rollers into the 35-ft. span, whence it can be transported to the receiving yard and thence to the shops, or loaded as plain material directly into cars for shipment. The product of the plant can be shipped either by rail or team.

The cranes, 12 in all, of capacities ranging from 10 to 20 tons, are of the Morgan type. They are distributed as follows: Two in the receiving yard, four in the stock yards, two in the shipping yards and four in the shops. The transverse crane ways, carrying the stock yard cranes, project at either end under the longitudinal runways, thus allowing transfer of material without any unnecessary handling, as shown in Fig. 4. Material can be transferred over the whole plant from one point to another so readily that narrow gauge tracks have, therefore, been almost eliminated.

The internal arrangement of the shops was planned with a view of performing certain definite operations in each, but there is sufficient flexibility to allow for the ready execution of various quantities of all classes of work. Shop No. 1, Fig. 5, is arranged primarily for a beam shop, and is well fitted to care for a large tonnage of ordinary punched and framed material. In addition to the punches, coping machines and stationary riveters, there are special tools such as angle rolls, bulldozer, &c. A light telegraph system secured to the bottom chords of the trusses provides an easy means of handling the material, which is usually not excessive in weight.

Riveted work, such as girders, trusses, &c., is fabricated in shop No. 2, Fig. 6. Two electric overhead traveling cranes handle the material to the machines and aid in its assembling. The tools are substantial and of standard types, consisting of a 48-in. gate shear of medium capacity mounted on a turntable; a deep throat multiple punch, arranged with a Thomas spacing table; rotary angle shears, fitting punch, reamers, &c. The assembly skids are secured to foundation beams embedded in concrete, all in perfect alignment, making a good installation with a solid and permanent floor. The riveting is done with pneumatic riveting machines, of which several types are in use. There are also a large number of pneumatic hammers in general use throughout the plant, for work not suitable for the compression riveter.

The column shop, No. 3, Fig. 7, has its full quota of tools, the most important feature being a powerful 42-in. face rotary planer, which, with the assistance of the double ended tool originally in use, furnishes ample capacity for work of this character. An interesting machine located here is a spacer designed by the Standard Bridge Tool Company for punching detail plates without marking them, which, as far as tested, gives great promise of success. Shop No. 4 needs no further description. In the blacksmith shop tool blanks are made under a 5-ton steam hammer, and all the tempering and annealing of finished tools is carried on.

The entire plant is well lighted, most of the buildings having monitors or skylights, the latter being glazed with ribbed glass. It should be noted that all tools are driven electrically, either directly or in groups, the only exception being the bulldozer and 5-ton hammer, which are steam driven. Excellent lavatory facilities have been provided for the men, as, in addition to the instal-



Fig. 3.—The Receiving Yard of the Keystone Works.

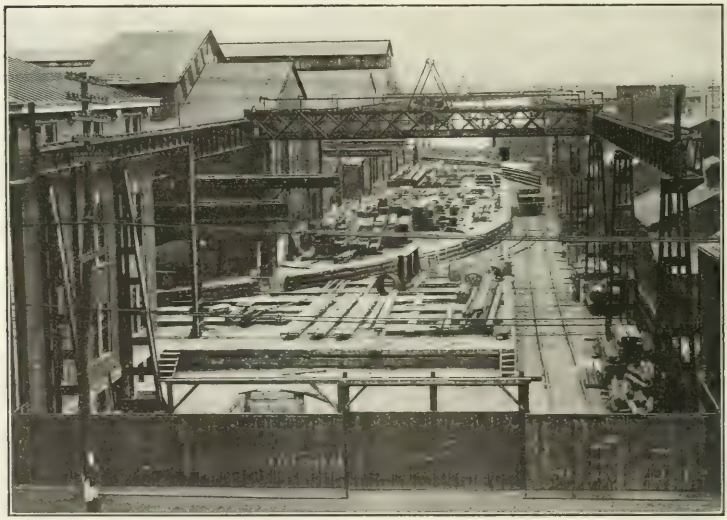


Fig. 4.—One End of the Keystone Works, Showing the Projections of Transverse Craneways Under the Yard Craneway.

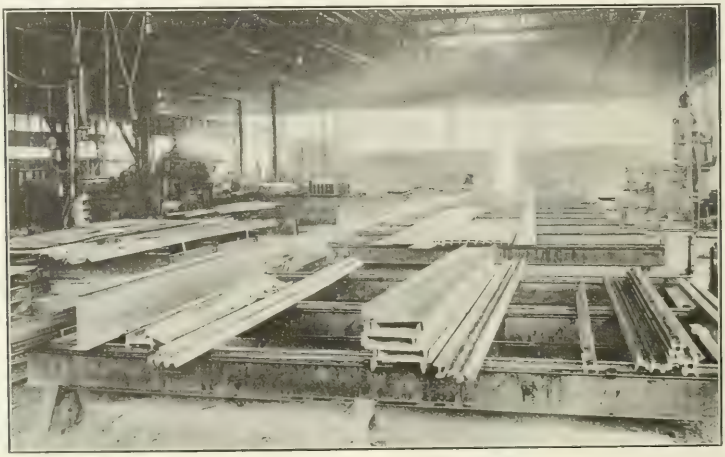


Fig. 5.—The Interior of No. 1 Shop of the Keystone Works.

lation in the general lavatory, there are also other equipments of the same character in Nos. 1 and 4 shops.

The power plant is placed at a higher level than any other part of the works, the purpose being to keep it above the highest range of water that has ever been experienced on the Monongahela River. Two 400-hp. Wickes vertical water tube boilers furnish the steam for operating the 900-hp. single noncondensing Corliss engine. These boilers are equipped with Murphy stokers and the necessary feed water heaters and pumps. The Corliss engine, built by the Wisconsin Engine Company, has direct connection with a 600-kw. Allis-Chalmers generator, providing ample power for all requirements of the plant, including arc and incandescent lighting. The type of current used is 220 volt direct current. The plant is also connected with the power stations of the Soho and Eliza furnaces, so that any temporary disability does not put the works out of commission. Compressed air for pneumatic tools and hoists is supplied by a 24 x 30 in. straight line Rand compressor with two smaller machines, one of the same type and one built by the Hall Steam Pump Company in reserve.

A three-story office building houses the clerical and drafting forces. It is well arranged for taking care of the business of the plant, the executive offices being on the first floor and the drafting room on the second, with room for extension on the floor above. The third floor is partially occupied with a dining room, giving the men an opportunity to eat their lunches out of the offices.

The project was authorized April 16, 1907, and was practically commenced on May 22. On June 17 concrete operations were begun and on August 30 the first tool was turning out fabricated work. The estimated capacity is 50,000 tons per year, and with its ability to turn out a wide range of varied classes of material it should have ample opportunity for development.

The Short Weight Conference.—We have received, through the courtesy of J. L. Anthony, Weir Stove Company, Taunton, Mass., a printed copy of the complete "minutes of the meeting of the committee of representatives of consignors, transportation companies and consignees appointed by Henry A. Carpenter, chairman of the Weight Conference, to further consider the question of discrepancies between shipping and outturn weights of pig iron, coal and coke, in accordance with the resolution passed at the Philadelphia Conference February 5, 1908." This meeting was held at Philadelphia, March 18, 1908. The publication comprises 74 pages.

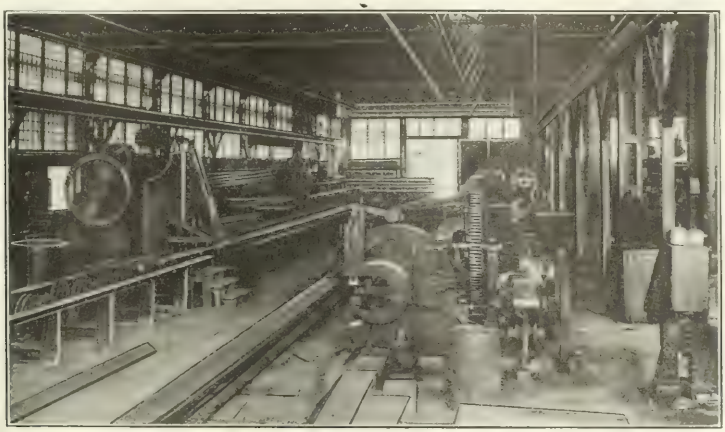


Fig. 6.—The Interior of No. 2 Shop of the Keystone Works.

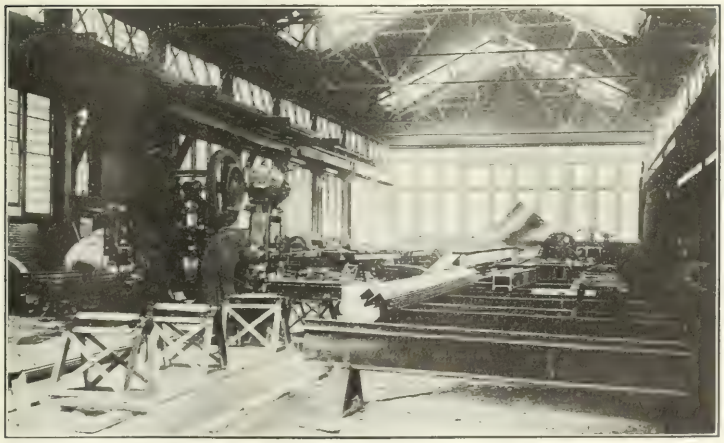


Fig. 7.—The Interior of No. 3 Shop of the Keystone Works.

The receivers of the Pope Mfg. Company have been authorized by Vice Chancellor Howell, Newark, N. J., to make a payment of 25 per cent. on approved claims, the aggregate to be paid out amounting to $387,000. The payment, however, is to be deferred until the receivers shall have in hand $50,000 additional as proceeds of the sale of 1465 shares of stock of the American Wood Rim Company, which the vice chancellor ordered made.

The Natural Wealth of the Land and Its Conservation.*

BY JAMES J. HILL.

The Limited Area of Unoccupied Land.

We now turn to the only remaining resource of man upon this earth, which is the soil itself. How are we caring for that, and what possibilities does it hold out to the people of future support? We are only beginning to feel the pressure upon the land. The whole interior of this continent, aggregating more than 500,000,000 acres, has been occupied by settlers within the last 50 years. What is there left for the next 50 years? Excluding arid and irrigable areas, the latter limited by nature, and barely enough of which could be made habitable in each year to furnish a farm for each immigrant family, the case stands as follows: In 1906 the total unappropriated public lands in the United States consisted of 792,000,000 acres. Of this area the divisions of Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico and Wyoming contained 195,700,000 acres of surveyed and 509,000,000 acres of unsurveyed land. Little of Alaska is fitted for general agriculture, while practically all of the rest is semi-arid land, available only for grazing or irrigation. We have, subtracting these totals, 50,000,000 acres of surveyed and 36,500,000 acres of unsurveyed land as our actual remaining stock. And 21,000,000 acres were disposed of in 1907. How long will the remainder last? No longer can we say that "Uncle Sam has land enough to give us all a farm."

Equally threatening is the change in quality. There are two ways in which the productive power of the earth is lessened; first by erosion and the sweeping away of the fertile surface into streams and thence to the sea, and second by exhaustion through wrong methods of cultivation. The former process has gone far. Thousands of acres in the East and South have been made unfit for tillage. North Carolina was, a century ago, one of the great agricultural States of the country and one of the wealthiest. To-day as you ride through the South you see everywhere land gullied by torrential rains, red and yellow clay banks exposed where once were fertile fields; and agriculture reduced because its main support has been washed away. Millions of acres, in places to the extent of one-tenth of the entire arable area, have been so injured that no industry and no care can restore them.

Soil Exhaustion and Deterioration.

Far more ruinous, because universal and continuing in its effects, is the process of soil exhaustion. It is creeping over the land from East to West. The abandoned farms that are now the playthings of the city's rich or the game preserves of patrons of sport, bear witness to the melancholy change. New Hampshire, Vermont, northern New York, show long lists of them. In western Massachusetts, which once supported a flourishing agriculture, farm properties are now for sale for half the cost of the improvements. Professor Carver of Harvard has declared after a personal examination of the country that "agriculture as an independent industry, able in itself to support a community, does not exist in the hilly parts of New England."

The same process of deterioration is effecting the farm lands of western New York, Ohio and Indiana. Where prices of farms should rise by increase of population, in many places they are falling. Between 1880 and 1900 the land values of Ohio shrank $60,000,000. Official investigation of two counties in central New York disclosed a condition of agricultural decay. In one, land was for sale for about the cost of improvements and 150 vacant houses were counted in a limited area. In the other, the population in 1905 was nearly 4000 less than in 1855.

Practically identical soil conditions exist in Maryland and Virginia, where lands sell at from $10 to $30 an acre. In a hearing before an industrial commission the chief of the Bureau of Soils of the Department of Agriculture said: "One of the most important causes of deterioration, and I think I should put this first of all, is the method and system of agriculture that prevails throughout these States. Unquestionably the soil has been abused." The richest region of the West is no more exempt than New England or the South. The soil of the West is being reduced in agricultural potency by exactly the same processes which have driven the farmer of the East, with all his advantage of nearness to markets, from the field.

The Yield Per Acre Falling.

Within the last 40 years a great part of the richest land in the country has been brought under cultivation. We should, therefore, in the same time, have raised proportionately the yield of our principal crops per acre; because the yield of old lands, if properly treated, tends to increase rather than diminish. The year 1906 was one of large crops and can scarcely be taken as a standard. We produced, for example, more corn that year than had ever been grown in the United States in a single year before. But the average yield per acre was less than it was in 1872. We are barely keeping the acre product stationary. The average wheat crop of the country now ranges from 12½ bushels in ordinary years to 15 bushels per acre in the best seasons. And so it is on down the line.

But the fact of soil waste becomes startlingly evident when we examine the record of some States where single cropping and other agricultural abuses have been prevalent. Take the case of wheat, the mainstay of single crop abuse. Many of us can remember when New York was the great wheat producing State of the Union. The average yield of wheat per acre in New York for the last 10 years was about 18 bushels. For the first five years of that 10-year period it was 18.4 bushels and for the last five 17.4 bushels. In the farther West, Kansas takes high rank as a wheat producer. Its average yield per acre for the last 10 years was 14.16 bushels. For the first five of those years it was 15.14 and for the last five 13.18. Up in the Northwest, Minnesota wheat has made a name all over the world. Her average yield per acre for the same 10 years was 12.96 bushels. For the first five years it was 13.12 and for the last five 12.8. We perceive here the working of a uniform law, independent of location, soil or climate. It is the law of a diminishing return due to soil destruction. Apply this to the country at large and it reduces agriculture to the condition of a bank whose depositors are steadily drawing out more money than they put in.

What is true in this instance is true of our agriculture as a whole. In no other important country in the world, with the exception of Russia, is the industry that must be the foundation of every State at so low an ebb as in our own. According to the last census, the average annual product per acre of the farms of the whole United States was worth 11.38. It is little more than a respectable rental in communities where the soil is properly cared for and made to give a reasonable return for cultivation. There were but two States in the Union whose total value of farm products was over $30 per acre of improved land. The great State of Illinois gave but $12.48 and Minnesota showed only $8.74. No discrimination attaches to these figures, where all are so much at fault. Nature has given to us the most valuable possession ever committed to man. It can never be duplicated, because there is none like it upon the face of the earth. And we are racking and impoverishing it exactly as we are felling the forests and rifling the mines. Our soil, once the envy of every other country, the attraction which draws millions of immigrants across the seas, gave an average yield for the whole United States during the 10 years beginning with 1896 of 13.5 bushels of wheat per acre. Austria and Hungary each produced over 17 bushels per acre, France 19.8, Germany 27.6 and the United Kingdom 32.2 bushels per acre. For the same decade our average yield of oats was less than 30 bushels, while Germany produced 46 and Great Britain 42. For barley the figures are 25, against 33 and 34.6; for rye, 15.4, against 24 for Germany and 26 for Ireland. In the United Kingdom, Belgium, the Netherlands and Denmark a yield of more than 30 bushels of wheat per acre has been the average for the past five years.

* From an address delivered at the Governors' Conference at the White House, Washington, D. C., May 13 to 15, 1908.

Robbing the Soil to Get Quick Returns.

When the most fertile land in the world produces so much less than that of poorer quality elsewhere, and this low yield shows a tendency to steady decline, the situation becomes clear. We are robbing the soil, in an effort to get the largest cash returns from each acre of ground in the shortest possible time and with the least possible labor. This soil is not mere dead matter, subject to any sort of treatment with impunity. Chemically, it contains elements which must be present in certain proportions for the support of vegetation. Physically, it is made up of matter which supplies the principal plant food. This food, with its chemical constituents in proper admixture, is furnished by the decomposition of organic matter and the disintegration of mineral matter that proceed together. Whatever disturbs either factor of the process, whatever takes out of the soil an excessive amount of one or more of the chemical elements upon which plant growth depends, ends in sterility. Any agricultural methods that move in this direction mean soil impoverishment; present returns at the cost of future loss; the exhaustion of the land, exactly as the animal system is enfeebled by lack of proper nourishment.

Our agricultural lands have been abused in two principal ways; first, by single cropping, and, second, by neglecting fertilization. It is fortunate for us that nature is slow to anger, and that we may arrest the consequence of this ruinous policy before it is too late. In all parts of the United States, with only isolated exceptions, the system of tillage has been to select the crop which would bring in most money at the current market rate to plant that year after year, and to move on to virgin fields as soon as the old farm rebelled by lowering the quality and quantity of its return. It is still the practice, although diversification of industry and rotation of crops have been urged for nearly a century and are to-day taught in every agricultural college in this country. The demonstration of the evils of single cropping is mathematical in its completeness. At the experiment station of the Agricultural College of the University of Minnesota they have maintained 44 experimental plots of ground, adjoining one another, and as nearly identical in soil, cultivation and care as scientific handling can make them. On these have been tried and compared different methods of crop rotation and fertilization, together with systems of single cropping. The results of 10 years' experiments are now available. On a tract of good ground sown continuously for 10 years to wheat, the average yield per acre for the first five years was 20.22 bushels and for the next five 16.92 bushels. Where corn was grown continuously on one plot, while on the plot beside it corn was planted but once in five years in a system of rotation, the average yield of the latter for the two years it was under corn was 48.2 bushels per acre. The plot where corn only was grown gave 20.8 bushels per acre for the first five and 11.1 bushels for the second of these years, an average of 16 bushels. The difference in average of these two plots was 32.2 bushels, or twice the total yield of the ground exhausted by the single crop system. The corn grown at the end of the 10 years was hardly hip high, the ears small and the grains light, but the cost of cultivation remained the same. And the same is true of every other grain or growth when raised continuously on land unfertilized.

We frequently hear it said that the reduction in yield is due to the wearing out of the soil as if it was a garment to be destroyed by the wearing. The fact is that soils either increase or maintain their productivity indefinitely under proper cultivation. If the earth, the great mother of human and animal life, is to "wear out," what is to become of the race?

Remedies are Rotation of Crops and Use of Fertilizers.

The two remedies are as well ascertained as is the evil. Rotation of crops and the use of fertilizers act as tonics upon the soil. We might expand our resources and add billions of dollars to our national wealth by conserving soil resources, instead of exhausting them as we have the forests and the contents of the mines. For there is good authority for the assertion that the farmer could take from the same area of ground in four years' grain crops out of a total of seven years as much as the whole seven now give him; leaving the products of the other three years when the land rested from grain as a clear profit due to better methods.

He can do far more than that by joining stock raising with grain raising. Nature has provided the cattle to go with the land. There is as much money in live stock as there is in grain. Looked at in any way, there is money in live stock; money for dairy products, money for beef, money for the annual increase, and most money of all for the next year's crop when every particle of manure is saved and applied to the land.

We need not consider at present really intensive farming, such as is done by market gardeners with high profit, or such culture as in France, in Holland, in Belgium and in the Island of Jersey produces financial returns per acre that seem almost beyond belief. What our people have to do is to cover less ground, cultivate smaller farms so as to make the most of them, instead of getting a scant and uncertain yield from several hundred acres, and raise productively by intelligent treatment to twice or three times its present level.

There is more money in this system. The net profit from an acre of wheat on rundown soils is very small; consequently decreasing the acreage of wheat under certain conditions will not materially decrease profits. Here are some reliable estimates. The price of wheat is given from the United States Department of Agriculture Year Book, average for 10 years:

Yield—Bushels per acre	Price per bushel.	Market value per acre.	Cost of production, including rent.	Net profit or loss
20	$0.638	$12.76	$7.89	+$4.87
16	.638	10.21	7.89	+ 2.32
12	.638	7.66	7.89	— .23
10	.638	6.38	7.89	— 1.51
8	.638	5.10	7.89	— 2.79

From the above table it will be seen that as large a net profit is realized from one crop of 20 bushels per acre as from two crops of 16 bushels; and that a 12-bushel crop or less yields a net loss. It is a safe conclusion that 75 acres of land, growing a crop of clover every fourth year, will yield a larger net profit than will 100 acres sown to grain continually. A small field of 8 acres of clover in the Red River Valley last year yielded 42 bushels, worth over $60. per acre, from the sale of seed.

Commanding Importance of Agriculture.

I have dwelt upon the conservation of farm resources because of the commanding importance of this industry and because of its relation to our future. Nearly 36 per cent. of our people are engaged directly in agriculture. But all the rest depend upon it. In the last analysis, commerce, manufactures, our home market, every form of activity runs back to the bounty of the earth by which every worker, skilled and unskilled, must be fed and by which his wages are ultimately paid. The farm products of the United States in 1906 were valued at $6,794,000,000 and in 1907 at $7,412,000,000. All of our vast domestic commerce, equal in value to the foreign trade of all the nations combined, is supported and paid for by the land. Of our farm areas only one-half is improved. It does not produce one-half of what it could be made to yield; not by some complex system of intensive culture, but merely by ordinary care and industry intelligently applied. It is the capital upon which alone we can draw through all the future, but the amount of the draft that will be honored depends upon the care and intelligence given to its cultivation. Were any statesman to show us how to add $7,000,000,000 annually to our foreign trade, it would be the sensation of the hour. The way to do this in agriculture is open. Our share in the increase would not be the percentage of profit allowed by successful trading, but the entire capital sum. On the other side stands the fact that the unappropriated area suited to farm purposes is almost gone, and that we have been for the last century reducing the producing power of the country. Nowhere in the range of national purposes is the reward for conservation of a national resource so ample. Nowhere is the penalty of neglect so threatening.

By the fixed rate of increase in the past, we must count upon a population of over 200,000,000 in the United States in the year 1950. The annual increase from natural growth is about 1½ per cent. each year. Adding for

immigration only 750,000 a year, which is less than three-quarters of the figures reached in recent years, we shall have about 130,000,000 people in 1925, and at least 200,000,000 by the middle of the century. Where are they to go, how are they to be employed, how fed, how enabled to earn a living wage? The pressure of all the nations upon the waste places of the earth grows more intense as the last of them are occupied. We are approaching the point where all our wheat product will be needed for our own uses, and we shall cease to be an exporter of grain. There is still some room in Canada, but it will soon be filled. The relief will be but temporary. Our own people, whose mineral resources will by that time have greatly diminished, must find themselves thrown back upon the soil for a living. If continued abuse of the land should mark the next 50 years as it has the last, what must be our outlook?

We Cannot Look to Our Foreign Trade for Relief.

Even the unintelligent are now coming to understand that we cannot look to our foreign trade for relief from future embarrassment. Our total exports, about one-fourth in value of the products of our farms, consist to the extent of more than 70 per cent. of articles grown on the soil or directly sustained by it, such as live stock, or made from soil products, such as flour. Of all the materials used in manufacture in this country, 42 per cent. are furnished by the soil. We shall have less and less of this agricultural wealth to part with as population increases. And as to enlarging greatly our sale of manufactured products in the world's markets, it is mostly a dream. We cannot finally compete there, except in a few selected lines, without a material lowering of the wage scale at home and a change in the national standard of living which our people are not ready to accept without a struggle. When capital cannot find a profit there will be no money for the payrolls of an unprofitable business. Doubtless as we grow we shall buy more and sell more; but our main dependence half a century ahead must be upon ourselves. The nation can no more escape the operation of that law than can the man. It is time to set our house in order.

Not only the economic but the political future is involved. No people ever felt the want of work or the pinch of poverty for a long time without reaching out violent hands against their political institutions, believing that they might find in a change some relief from their distress. Although there have been moments of such restlessness in our country, the trial has never been so severe or so prolonged as to put us to the test. It is interesting that one of the ablest men in England during the last century, a historian of high merit, a statesman who saw active service and a profound student of men and things, put on record his prophecy of such a future ordeal. Writing to an American correspondent 50 years ago, Lord Macaulay used these words:

> As long as you have a boundless extent of fertile and unoccupied land your laboring population will be found more at ease than the laboring population of the Old World; but the time will come when wages will be as low and will fluctuate as much with you as they do with us. Then your institutions will be brought to the test. Distress everywhere makes the laborer mutinous and discontented and inclines him to listen with eagerness to agitators who tell him that it is a monstrous iniquity that one man should have a million and another cannot get a full meal. . . The day will come when the multitudes of people none of whom has had more than half a breakfast or expects to have more than half a dinner, will choose a legislature. Is it possible to doubt what sort of legislature will be chosen? . . . There will be, I fear, spoliation. The spoliation will increase the distress; the distress will produce fresh spoliation. . . . Either civilization or liberty will perish. Either some Cæsar or Napoleon will seize the reins of government with a strong hand, or your republic will be as fearfully plundered and laid waste by barbarians in the twentieth century as the Roman Empire in the fifth.

We need not accept this gloomy picture too literally, but we have been already sufficiently warned to prevent us from dismissing the subject as unworthy of attention. Every nation finds its hour of peril when there is no longer free access to the land, or when the land will no longer support the people. Disturbances within are more to be feared than attacks from without. Our Government is built upon the assumption of a fairly intelligent people, conservatively ruling their passions, with power to change their institutions when such change is generally desired. It would not be strange if they should in their desire for change attempt to pull down the pillars of their national temple. Far may this day be from us. But since the unnecessary destruction of our land will bring new conditions of danger, its conservation, its improvement to the highest point of productivity promised by scientific intelligence and practical experiment, appears to be a first command of any political economy worthy of the name.

Men Must Realize Their Duty Toward Coming Generations.

I have endeavored to outline some of the principal issues at stake in the better conservation of our national resources, and especially that one about which all the others revolve, and by whose fortunes we shall eventually stand or fall—the land itself. They are for us quite literally the issues of national existence. The era of unlimited expansion on every side, of having but to reach out and seize any desired good, ready provided for us by the hand that laid the foundations of the earth, is drawing to a close.

The first task, it seems to me, must be to force home the facts of the situation into the public consciousness; to make men realize their duty toward coming generations exactly as the father feels it a duty to see that his children do not suffer want. In a democracy this is a first essential. In other forms of government one or two great men may have power to correct mistakes and to put in motion wise policies that centuries do not unsettle. A part of the price of self-government is the acceptance of that high office and imperative duty as a whole by the people themselves. They must know, they must weigh, they must act. Only as they form and give effect to wise decisions can the nation go forward. And we should not be here to-day were it not that the principle of a conservation of national resources as the foremost and controlling policy of the United States henceforth is coming to be seen by many, and must be heartily accepted by all, as the first condition not only of continued material prosperity, but also of the perpetuation of free institutions and a government by the people. The work now being done by the Department of Agriculture and the agricultural colleges of the various States furnishes a broad and intelligent foundation upon which to build up a new era of national progress and prosperity. It calls for a wise, generous and continuing policy on the part of both Federal and State governments.

If this patriotic gospel is to make headway, it must be by just such organized missionary work as is to-day begun. It cannot go on and conquer if imposed from without. It must come to represent the fixed idea of the people's mind, their determination and their hope. It cannot be incorporated in our practical life by the dictum of any individual or any officer of nation or State in his official capacity. It needs the co-operation of all the influences, the help of every voice, the commendation of nation and State that has been the strength and inspiration of every worthy work on American soil for 120 years. We return, for our gathering in council and for our plan of action for the future, to the model given us by the fathers. State and nation are represented here, without jealousy or any ambition of superiority on either side, to apply to the consideration of our future, such co-operation as that out of which this nation was born and by which it has won to worthy manhood. Reviving the spirit of the days that created our Constitution, the days that carried us through civil conflict, the spirit by which all our enduring work in the world has been wrought, taking thought as Washington and Lincoln took thought, only for the highest good of all the people, we may, as a result of the deliberations held and the conclusions reached here to-day, give new meaning to our future: new luster to the ideal of a Republic of living federated States; shape anew the fortunes of this country, and enlarge the borders of hope for all mankind.

The Allis-Chalmers Company, Milwaukee, Wis., has opened an office at Birmingham, Ala., rooms 319-320 First National Bank Building. Seldon Jones has been placed in charge of this office as district manager.

The Acme Motor Driven Automatic Multiple Spindle Screw Machine.

The machine illustrated in Fig. 1, the No. 56 Acme automatic multiple spindle screw machine, equipped with motor drive, will be exhibited and demonstrated at the Railway Master Mechanics' and Master Car Builders' Convention at Atlantic City, June 17 to 24, by the National-Acme Mfg. Company, Cleveland, Ohio. Recent improvements in this size of machine provide for single belt drive, which is readily converted into a motor drive by substituting a gear, G, Fig 2, for the pulley, and placing the motor platform and motor on the machine as shown.

In Fig. 2 the back gears for the spindle driving shaft are shown at A, the clutch for changing speed at B, the chain driving the oil pump at C, the crank for operating by hand at D, the hand lever controlling the clutch B at E, the change gears at F, the gear substituted for the pulley used on single belt drive at G, and the free wheel at H.

There are several advantages afforded by the single belt drive and the related changes. The speed ratio between the cam shaft and the spindle drive shaft is constant, the drive being positive, which eliminates accidents to tools from belt slips. Only one belt at the most is used, consequently belt troubles are minimized and the countershaft simplified; with motor drive both are entirely avoided. The output of the machine is increased because the positive control of the change of speed for the tools allows the maximum use of the fast speed. In case of accident or stopping for any cause manipulating the lever E, Fig. 2, immediately releases the cam shaft mechanism. It is possible to move tools intermittently, when setting up or testing, by using this same lever which controls the clutch B. Cranking by hand is easier because the transmission mechanism is cut loose entirely by means of the free wheel H. The time necessary for changing the speed of the cam shaft is considerably less because of the more convenient location of the change gears F. The oil pump is driven at a constant speed, and the control of the hand and power movements of the cam shaft mechanism as well as the flow of oil is brought within easy reach of the operator while in position to observe the action of the tools.

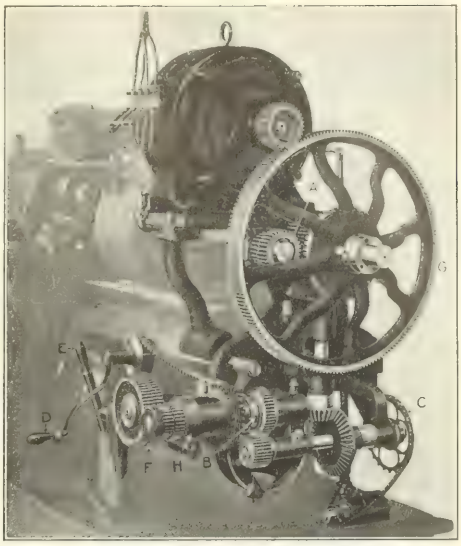


Fig. 2.—Detail of the Drive with Gear Covers Removed.

The system of gearing shown is so designed that it is practically noiseless. These changes in the mechanism of the machine make the work of operating it much lighter than formerly.

The company is in position to supply the No. 56 (2¼ in.) machines equipped for single belt drive or for motor drive, and will furnish the motor or any standard direct or alternating current motor can be applied by the purchaser without altering it in the slightest. The size of the motor required varies from 3 to 5 hp., depending upon the class of work for which the machine is to be used

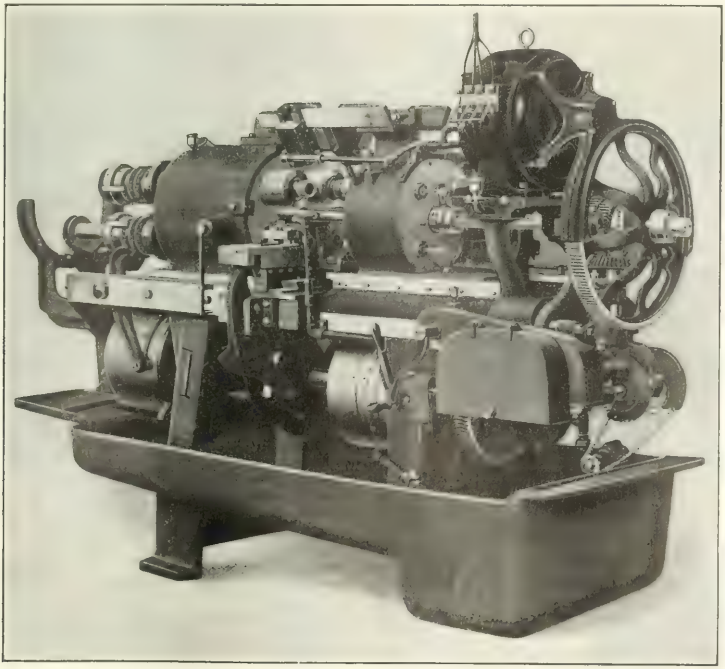


Fig. 1.—The No. 56 Automatic Multiple Spindle Screw Machine, Equipped with Motor Drive, Built by the National Acme Mfg Company, Cleveland, Ohio.

The New G. E. Flame Arc Lamp.

A new flame arc lamp has just been placed on the market by the General Electric Company, Schenectady, N. Y. The external appearance of this lamp is similar to



The New Flame Arc Lamp Made by the General Electric Company, Schenectady, N. Y.

the G. I. enclosed lamp, the casing being drawn seamless from either sheet copper or steel. The standard finish for the copper casing is antique and for the steel bright japan. This lamp has no chain feed or complicated escapement and clock mechanism. It is of the inclined carbon type, with nothing below the arc to obstruct the light, and both carbons feed by gravity simultaneously, while the regulation of the arc is accomplished by the lateral movement of the carbons. When the casing is lowered into the trimming position every part of the lamp becomes accessible.

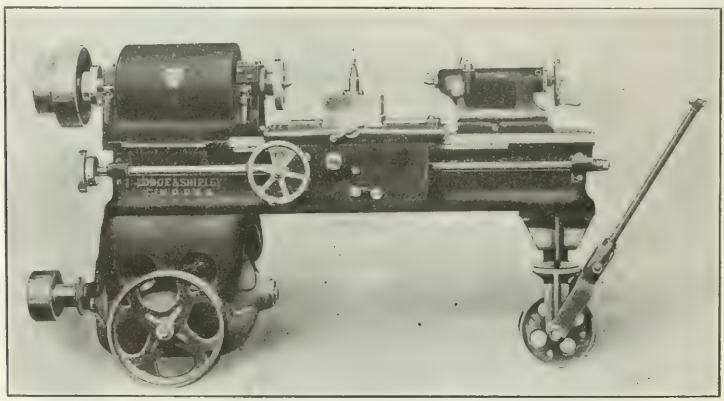
A serviceable economizer of refractory material surrounds the points of the carbons just above the arc to prevent the washing of the carbon ends, and to steady the arc from the effect of air currents as far as possible. A blow magnet is so situated with relation to the arc that it performs the double function of keeping the arc steadily fan-shaped at the carbon tips, and also totally extinguishes the arc if it approaches dangerously near to the economizer. The economizer, therefore, is well protected from burn out and should last indefinitely. A heavy baffle plate of insulating material is provided just above the economizer, effectually preventing any appreciable amount of the products of the arc from depositing on the parts of the mechanism. During operation the lower surface of the bottom plate of the lamp and of the economizer becomes coated with white deposit from the arc which acts as an excellent reflector for the upward light from the arc.

These lamps are designed to burn two in series or singly across 100 to 125-volt direct or alternating current circuits. They can be used on any frequency between 40 and 140 cycles. The lamps may be wound for either 8, 10 or 12 amperes, the latter current being considered standard. All lamps are equipped with light opal globes. On each trimming the lamps burn about 12 hours on indoor circuits and between 10 and 11 hours on outdoor circuits. The simple construction, high efficiency, and the volume of illumination obtained, especially adapt these lamps to the lighting of foundries, mills, wharves, warehouses, and erecting shops and similar places.

A Lodge & Shipley Portable Lathe.

The illustration shows a 16-in. swing portable lathe built by the Lodge & Shipley Machine Tool Company, Cincinnati, O. It is intended for use in fitting frame bolts and turning up studs, &c., in locomotive repair shops, and doing the various odd jobs which come up on the assembling floor of shops manufacturing heavy machinery, where otherwise it would be necessary to carry the parts to be fitted from the erecting floor some distance to the lathe department and back again.

As seen in the engraving, the lathe bed is mounted upon three wheels and on a fairly level floor may be pulled about by one man. A 2½ hp. constant speed, fully inclosed motor is suspended under the headstock and bolted to a two-step cone pulley mounted upon the back gear shaft. For the sake of simplicity, and because the range of work is limited, only two speed changes are provided. The lathe is supplied with a belt feed of two changes, power longitudinal feed and plain rest. When desired it can also be supplied with a taper attachment. It has been designed solely to do the one class of work with the greatest rapidity. When portability is not desired it can be furnished with legs instead of the wheels.



A 16-In. Portable Lathe Built by the Lodge & Shipley Machine Tool Company, Cincinnati, Ohio.

The Burke Cold Saw.

Completeness without complication and moderate cost were the two main objects in designing the cold saw illustrated in Fig. 1. Both of these are claimed by the builder, the Burke Machinery Company, Cleveland, Ohio, to have been accompliished. It is possible with this machine to saw iron stock at any angle, to remove sprues from castings, and cut many kinds of work that cannot be handled on machines of other constructions. Because of the company's special equipment for the manufacture of the saws and the anticipated demand for them it will be able to sell them at a relatively low price.

The saw is mounted on a carriage which travels in guides in the main frame. This carriage is shown removed from the machine in Fig. 2. The saw itself is bolted directly to a worm wheel which is held in place

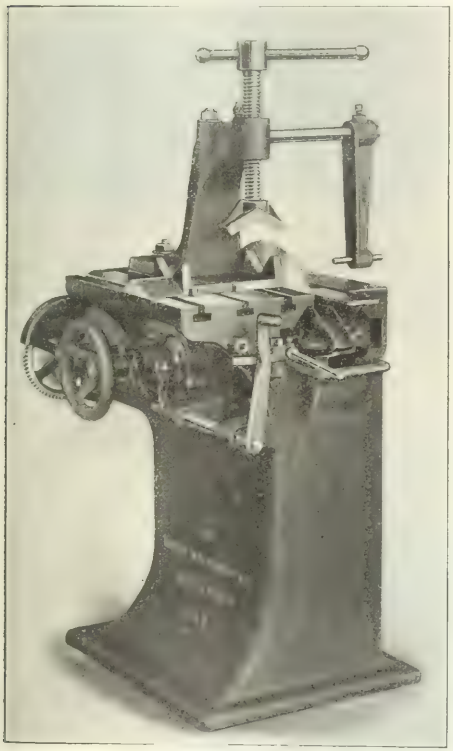


Fig. 1. The New Cold Saw Built by the Burke Machinery Company, Cleveland, Ohio.

by the loose shaft B and is driven by a worm. This manner of driving eliminates back lash and the torsion strain common on arbor driven saws having a bearing between the driving worm wheel and the saw. The worm and worm wheel are enclosed to prevent chips from getting into them. The worm shaft is keyed with freedom to slide in a gear which is mounted on the rear of the frame and meshes a pinion on one end of the shaft carrying the driving pulley. On the front of the saw carriage is the hardened steel casting A, which acts as a guide plate for the saw and at the same time as a stripper to carry away the chips from the saw.

The pinion on the driving pulley shaft also actuates the feed of the saw carriage through a system of gearing driving a worm shaft on the outside of the machine. The worm on this shaft engages a worm wheel having one member of a jaw clutch cast on its side. The other member of the clutch is engaged with the first by sliding and is splined to a cross shaft, the inner end of which has a pinion meshing a rack secured to the lower side of the saw carriage. The clutch is manipulated by a lever on the front of the machine and is normally held disengaged by a spring. When the saw is running and the lever is operated to engage the clutch, the lever is retained by a latch on the front of the machine. An adjustable rod passing through one end of this latch may be set to trip the latter at any desired point and thus stop the feed of the carriage by the contact of the carriage with the end of the rod. To protect the feeding mechanism and the saw blade from overcrowding there is a yielding connection in the train. Between the driving pinion and the feed worm gear shaft there is a gear held between leather lined flanges. A spring, the tension of which is regulated by a hand nut, clamps the flanges to the gear, thus providing a friction drive. With the friction clamped tight and by using a fine tooth saw the machine can be successfully used for sawing tubing. This is largely because of the type of saw drive employed. Attention has been paid to material and workmanship throughout. The worm wheels are made of phosphor bronze, and wherever steel castings are advisable in the construction of the machine they are used.

The machine illustrated will cut 3-in. round stock or 5-in. I-beams, its maximum capacity being a 3x5 in. section. The saw carriage has a travel of 9 in., so that flat stock up to 9 in. wide may be cut. For holding small round or square stock a guide block is furnished which is

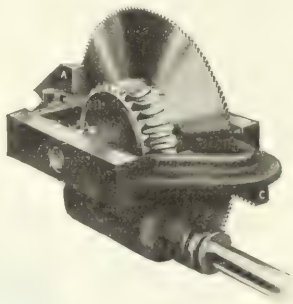


Fig. 2.—The Saw Carriage.

secured to the T-slots in the top of the table. A removable screw clamp holds the work in the trough of this block. When these attachments are taken off from the table a large clamping surface is left to which various shaped pieces of work may be attached, as no part of the machine except the saw projects above this table. The saw carriage travels over an oil pan cast in the frame of the machine, and the saw blade dips into the oil to a depth of 1 in., so that lubricant is carried to the work.

The company is also preparing for the market a larger saw, carrying a 20-in. blade and having a capacity for 5½-in. rounds or 12-in. I-beams. This saw will have a clamping table of 14 x 34 in. In many cases there is need of a saw for a variety of general work, including the cutting of tool steel, machinery steel, cast iron and brass, &c. For such conditions a cone pulley and countershaft can be supplied for the drive instead of the standard tight and loose pulleys mounted directly on the machine. The speed of the saw can then be varied to suit different materials.

The *Locomotive* refers to the desirability of stamping boiler tubes with the manufacturer's name, so that after having been in service for some time it might still be possible to know their origin and the degree of excellence assigned them by their makers. The case is cited of a new 4-in. tube, represented to be of first quality, from which it was necessary to cut off 6 in. before it was set in the boiler to replace a ruptured tube. While the cut was being made the tube split apart at the weld for some distance. Examination of the end of the tube showed that the weld had been made by merely butting the edges of the tube together, without any attempt at scarfing.

The New Ingersoll Horizontal and Vertical Miller.

Combined horizontal and vertical spindle milling machines, having the planer type of bed and housings, are familiar products of the Ingersoll Milling Machine Company, Rockford, Ill., but the machine illustrated is a departure for this company in that it follows the knee type construction common to the ordinary horizontal or vertical milling machines. For heavy milling machines, which this company has made a specialty of for over 20 years, it is preferable to support the work on a solid base resting on the floor, and to adjust and feed the spindles to the work by carrying them on a cross rail having vertical adjustment. This new machine reverses the conditions, the spindles being rigidly supported by the main frame column and the work carried on a knee capable of vertical adjustment. This machine is still, however, to be regarded as one adapted to heavy work, as its appearance indicates, and in a sense it occupies a position between either the horizontal or vertical spindle milling machines built for medium and light work by other makers and the extremely heavy machines made by the Ingersoll Company. Either spindle can be used independently or both simultaneously.

There are a number of mechanical features in the machine which are either unusual or special in their particular application. It will probably be interesting then to first trace through the operation by referring to Figs. 1 and 2 herewith. The power is transmitted to the machine by belt through pulley *a*, Fig. 2, or by a motor connected to a gear or sprocket substituted for the pulley. The pulley or gear, as the case may be, is mounted on the same shaft with gears *b* and *c*, which, alternately meshed with gears *d* or *e*, give two series of speeds to both spindles in the same ratio. The lever A shown on Fig. 1 shifts the gears *b* and *c* of Fig. 2 to their respective positions.

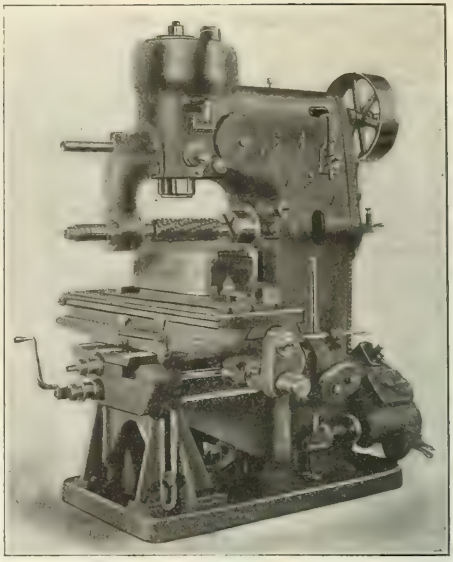


Fig. 2. The Machine as Set Up for Horizontal Milling.

The horizontal spindle is rotated by a train of gears, *f*, *g*, *h* and *i*, or *f*, *g*, *j* and *k*, depending upon the position of the sleeve clutch which engages the gears *i* or *k* alternately to their shaft. The sleeve of this clutch is moved to its respective positions by lever B, shown on Fig. 1. The vertical spindle is rotated from the shaft carrying the gears *d* and *e* through gears *l*, *m*, *n* and *o*,

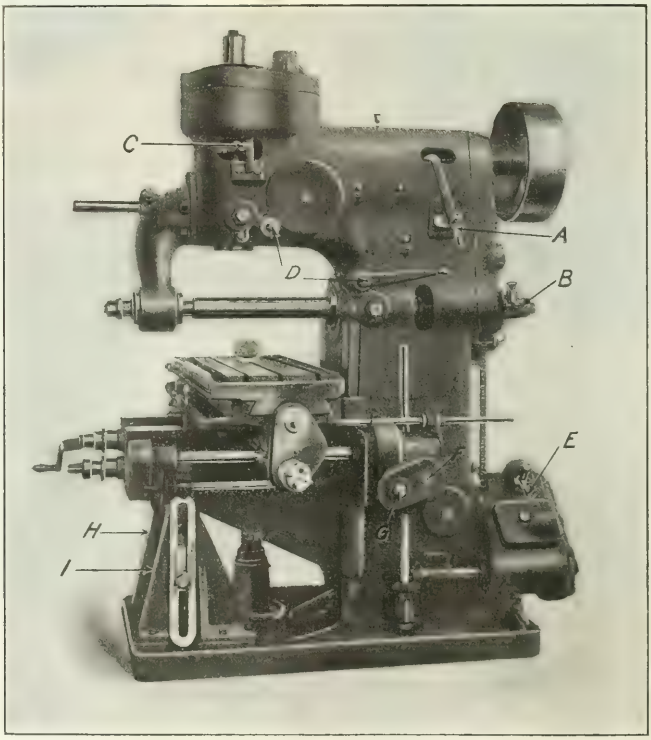


Fig. 1.—The New Knee Type Combined Horizontal and Vertical Spindle Milling Machine Built by the Ingersoll Milling Machine Company, Rockford, Ill.

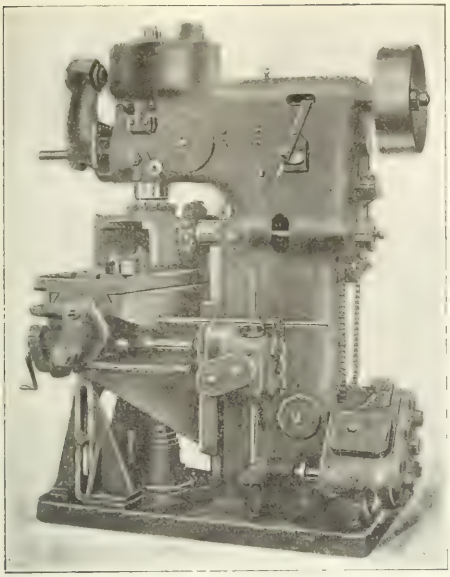


Fig. 3. Both Spindles Simultaneously Operating Face Mills.

or through gears *l*, *m*, *p* and *q*, depending upon the position of the sleeve clutch which engages the gears *o* or *q*. This sleeve is moved to its respective positions by the lever C, shown on Fig. 1.

The feed is driven by a sprocket wheel on the main drive shaft connected by a chain to a sprocket wheel, *s*, in the feed box. This sprocket wheel is yieldingly secured to the feed works by being mounted on two reverse cones, one of which is keyed to the shaft, while the other is splined to the hub of the first cone. A coil spring, the tension of which is adjustable by a nut, tends to force the cones together, binding the sprocket to the shaft. This arrangement reduces the shock when changing feed clutches while the machine is in operation. Upon the shaft of the sprocket wheel *s* are mounted two gears of different ratios, which give two speeds to a cone of gears mounted on the shaft *t*. The change is made by sliding the clutch on the sprocket wheel shaft through the lever E of Fig. 1. The lever *u*, Fig. 2, carries a trunnion gear which can be meshed with any of the eight gears in the cone, giving 16 feed changes instantly and independent of the spindle speed changes. The double clutch *v* gives feed reverse, and is operated by table dogs for longitudinal feed, or saddle dogs for cross feed, and also by the hand lever *w*. Pick-off gears F and G, Fig. 1, when reversed give table feeds up to 34 in. per minute.

The braces H and I support the knee and make a very rigid construction. The machine throughout is of correspondingly substantial design. It is easy to manipulate, and is intended to be a general utility machine, to be able to take the heaviest cuts without injury from the strain or giving evidence of chatter in the work. Figs. 3 and 4 show the machine performing typical operations and are suggestive of its powerfulness.

The machine column is 84 in. high over all and has a section 22 in. deep by 18 in. wide. The knee is 36 in. long and has a bearing on the column 28 in. deep by 22 in. wide. The saddle carrying the table is 60 in. long, 19 in. wide and 5 in. thick, and has a top working surface 48 in. long by 18 in. wide, which contains three T-slots cut from the solid and drilled pin holes. The spindles are 4½ in. in diameter in the bearings and are made of hammered open hearth crucible steel. The wear of the spindles is taken up by nuts which adjust cones rotated with the spindles by splines. These run in phosphor bronze boxes. The spindles are carried by sleeves *r*, Fig. 2, which are 7½ in. in diameter by 12 in. long, and have rack teeth engaged by pinions, with squared ends, D, Fig. 1, to take a crank handle. The adjustment is 6 in., and is made with reference to graduated scales. The

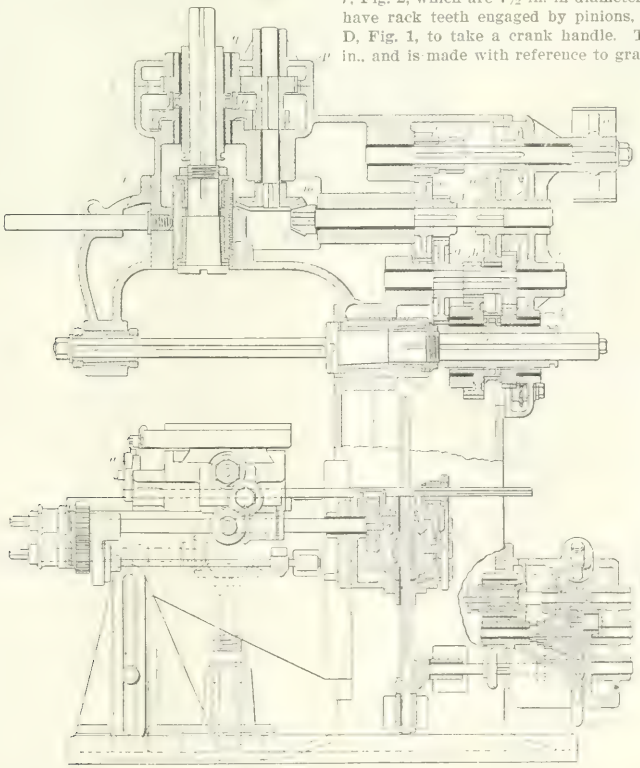


Fig. 4.—A Transverse Section of the New Ingersoll Combined Horizontal and Vertical Spindle Milling Machine.

arbor is 2 in. in diameter and is driven by a clutch on the end of the spindle.

The larger of the two spindle gears mounted on each spindle, and referred to before, are 13 in. pitch diameter, 4 pitch, 2½ in. face, and the smaller 10¼ in. pitch diameter, 4 pitch, 2½ in. face. As was also previously explained, there are two mechanical changes in the drive gearing in the column, affecting both spindles in the same ratio. These, with two independent changes at the spindles, give four mechanical changes in the machine. When the machine is to be belt driven a two-speed countershaft is furnished with it, running at 200 and 400 rev. per min., which again doubles the spindle speeds, making eight in all. These are 15, 23, 30, 33, 46, 66 and 100 rev. per min. If the machine is to be motor driven the motor is mounted on the top of the column and connected to the driving shaft by a silent chain and sprocket wheels. The motor should be of 10-hp. capacity, of variable speed type, with a 2 to 1 range, including speeds from about 500 to 1000 rev. per min., in which case the spindle speeds will range from 15 to 100 rev. per min., as in the belt driven machines. There will be two mechanical changes within these limits, and the number of intermediate speeds will depend upon the steps on the controller.

There are 16 table feeds for each cutter speed, giving feeds of from 0.48 to 8.9 in. per min. when the countershaft is running at 200 rev. per min., and from 0.97 to 17.8 when the countershaft is running at 400 rev. per min. If the machine is motor driven there will be the same ranges of feeds with the motor running at its slowest and highest speeds; there will be 14 mechanical changes between these limits, and they will be effected in direct ratio according to the speed of the motor. The two pick-off gears on the reverse feed box, as before stated, give feeds running up to 34 in. per minute. The cross feeds of the knee are the same as the table feeds, and the vertical feeds of the knee are one-half of the table feeds.

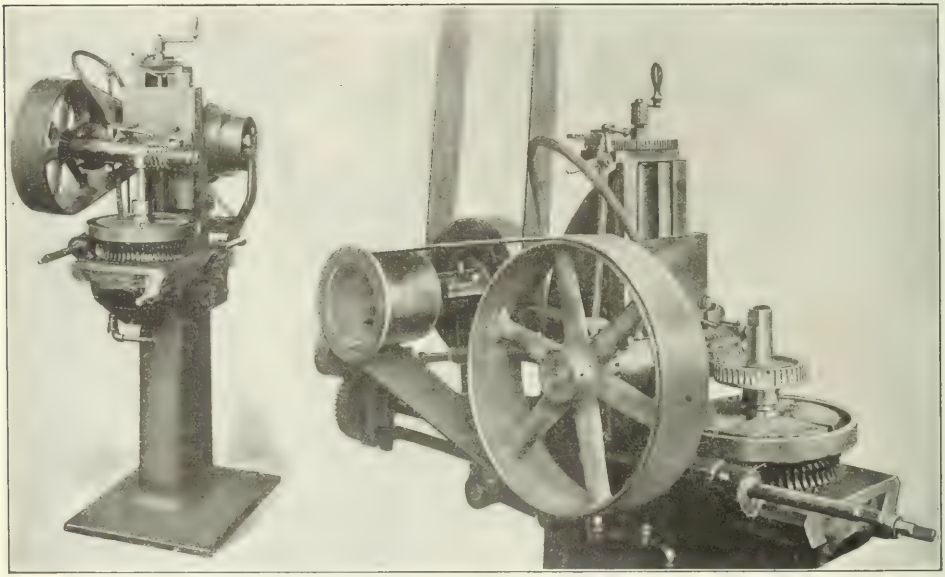
The greatest distance between the center of the table and the column is 24 in. and the least 8 in. The maximum distance from the top of the table to the face of the vertical spindle is 26 in., and the minimum distance with the sleeve extended is 2 in. The maximum distance from the center of the horizontal spindle to the top of the table is 16 in and the minimum 0 in.

A circular table 16 in. in diameter, equipped with automatic stops, can be furnished with the machine when desired. Without the circular table the machine weighs 9700 lb. The floor space occupied at right angles to the table is 81 in. and parallel with the table 110 in.

The Farwell Automatic Gear Hobber.

The hobbing process of cutting spur gears has many advantages that are responsible for its increasing popularity, and gear hobbing machines are likely to be as extensively used in this country as they already are in Germany. Milling one tooth at a time is faster than planing because there is only one idle return stroke for each tooth, but hobbing is still faster, the cutting being continuous from start to finish of the gear, and limited only by the strength of the hob teeth. The accuracy and the smooth and quiet running qualities of gears cut on a gear hobbing machine are declared to be equal, if not superior, to those of a gear formed on a gear generating planer. With both, theoretically correct tooth curves result, and the teeth are uniform in thickness and contour.

The gear hobbing machine illustrated is one of simple



The Farwell Automatic Gear Hobbing Machine and a Detail of the Head, Built by the Adams Company, Dubuque, Iowa.

form, built by the Adams Company, Dubuque, Iowa, as a moderate priced machine, suitable for cutting accurately and economically a large part of the gears used in manufacturing. When equipped with the necessary hobs it will cut all sizes and pitches of gears up to its capacity of 12 in. diameter and 6 in. face. This capacity will cover nearly all the requirements for automobile transmission gears; lathe, boring mill, milling machine and other machine tool change gears, and drill press and other back gears. One hob is required for each pitch desired, but it will cut gears with any number of teeth up to the full swing of the machine table (12 in.). The same hob will also cut worm gear wheels. The spindle is driven by a 4-in. belt on a 15-in. diameter pulley from a swinging cone pulley shaft, and the driven belt is kept taut in all positions of the spindle head by a distance rod provided with a turn buckle for adjusting. Three hob speeds are obtained by the three step cone pulleys for a 2¼-in. belt on the swinging shaft and countershaft. The countershaft is provided regularly with one 4 x 10 in. friction clutch pulley. Two pulleys may be provided where more spindle speeds are desirable, but as the hobs do not vary greatly in diameter three spindle speeds are generally sufficient.

The spindle head is swiveled upon the saddle so that the hob may be set at the proper angle for cutting spur

gears with different pitches or for cutting worm gears. The saddle is gibbed to slide on the column for providing vertical feed.

The hobs for cutting spur gears are regularly right hand, single thread, 3 in. in diameter, 3 in. long, with 1¼-in. arbor hole and ¼-in. keyway. Other sizes, of course, may be used. The hobs may be moved lengthwise so the entire length of hob can be used before requiring sharpening.

The table revolves on a wide angular surface that gives the table greater rigidity. A small plunger pump forces a stream of lubricant upon the cutter and work when desired. The knee that supports the table saddle is hollow and forms a tank or reservoir for the lubricant. Holes through the table hub conduct the lubricant back to this reservoir. The table is revolved at the proper speed (varying according to number of teeth in the gear to be cut) by means of one pair of bevel gears at the spindle head, one worm at the table, and one pair of spur gears connected to a bevel gear by a universal jointed rod. As there are only a few joints and all gears and shafts are large, a steady positive drive of the table in unison with the cutter is insured, which is essential for accurate work. Usually only one of the spur gears is changed when the number of teeth to be cut is changed.

The vertical feed is by means of a pawl and ratchet operated through a reducing gear by an eccentric on the worm shaft. The feed may be changed without stopping the machine by shifting the button on the bell crank at the top of the machine. A trip automatically stops this feed when the hob has finished the gear. No attention is required by the operator other than putting on blanks and taking off finished gears, hence one operator may run several machines or attend this gear cutting machine while operating other tools.

A rigid stop is provided, against which the table saddle may be run, to give the proper depth to the teeth. Instead of setting this stop by micrometer graduations, which requires considerable care, a hardened steel gauge is provided which is of a thickness equal to the depth of teeth of the pitch desired. To set the stop, the saddle is advanced until the blank contacts with the hob. The stop is then screwed up against the gauge block. When the gauge block is removed and the table is advanced to the stop, the correct depth is obtained. After the stop is set for a given diameter any number of gears of the same size can be cut to the proper depth by feeding the table each time to this rigid stop. Even a careless operator is not so likely to spoil work as when using a micrometer depth gauge.

The spindle is 1¾ in. in diameter, and has a bearing 6¾ in. long, with provision for taking up wear and end play, and an outer bearing 1¾ in. long and 1⅝ in. in diameter. These supports for the cutter hob are very rigid, and overhang only enough to swing a 3-in. hob. The saddle is heavily gibbed to the housing and has a bearing on it 8½ in. long. The swivel head is 8½ in. in diameter, and is secured to the saddle by three T head bolts. The head is counterbalanced by weights in the column. The table is supported and revolves on a cone surface 9½ in. in diameter at the outer edge and 2½ in. wide. In addition to this there is a center hub bearing 3½ in. in diameter extending through the saddle with an adjusting ring nut below. The table saddle is 12½ in. long, and is strongly gibbed to the knee, which is 8 in. wide. The feed screws for the head and for the table are both ⅞ in. in diameter and square threaded. The stop screw is ¾ in. in diameter, and has hardened steel contact points in the screw end and in the saddle. The countershaft furnished has 10 in. pressed steel hangers, a 1 7-16 in. shaft, 4 x 10 in. clutch pulley, and a three-step cone pulley for a 2½-in. belt. It is intended to run at 130 rev. per min.

Purdue University, Lafayette, Ind., has shipped to the University of Illinois, Champaign, Ill., a Purdue University impact machine, used for testing reinforced concrete beams. It is the third of its kind in existence. Of the others, one is at Purdue and the second in California. The machine has a 10-ft. bedplate, with two upright guides for weights of 50, 100, 250 and 500 lb., which may be dropped from a hight of 6 ft. An ironclad magnet attached to a chain is raised and lowered by a motor on top of the guides, lifting the weights to the proper hight, when the shutting off of the current allows them to drop. The machine weighs 8000 lb. It is made in the workshops of Purdue University. The design and plans were made by Prof. Wm. K. Hatt, head of the School of Civil Engineering, and Prof. W. P. Turner, of the Mechanical Engineering School.

The Coates Unit-Link Flexible Shaft.

The Coates Clipper Company, Worcester, Mass., has brought out an entirely new flexible shaft in which the unit link idea has been developed, and which is so designed that much greater efficiency is obtainable than in the older type, especially when running at low speeds.

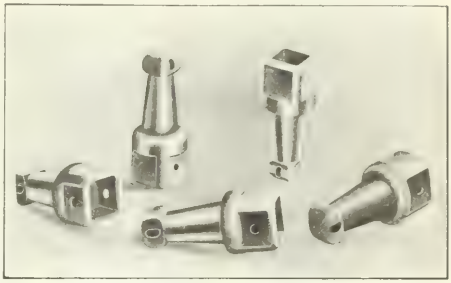


Fig. 1.—Unassembled Links of the New Flexible Shaft Made by the Coates Clipper Company, Worcester, Mass.

The simplicity of the new shaft is a marked characteristic. In the older design each unit had eight parts; the new is one solid piece, with a pin, the only function of which is to keep the units together; it takes no part whatever in the drive, nor is there any tension upon it.

Shaft links in various positions are shown in Fig. 1, and two links assembled with one cut through at its socket end to expose the engagement and the position of the pin, in Fig. 2. Each link has a square rounded knob at one end, and a square socket at the other, and at the base of the socket end a cylindrical exterior bearing surface. Two of the squared exterior walls of the socket are drilled through, and in the knob end is cut an

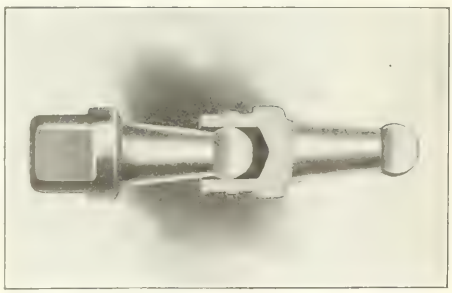


Fig. 2.—Two Links Assembled, with One Partly in Section.

elongated slot which permits a universal motion about the pin. The pins are riveted on the outer surface of the square part of the links. The pins are of soft steel and the links of hardened steel. The socket and knob in engagement give a positive drive.

While the maximum efficiency is realized at high speeds the shaft affords sufficient efficiency at low speeds for any work which is likely to be placed upon it. This has been a weakness of flexible shafting, that at low speeds a tearing strain has been experienced, and efficiency has been very small. The shaft runs inside of a steel spring which in turn is covered with leather.

The Le Blond Universal Cutter and Tool Grinder.

For about two years the R. K. Le Blond Machine Tool Company, Cincinnati, Ohio, has been testing out in its own shops and correcting and improving a new universal cutter and tool grinder. As a manufacturer of milling machines it was in a position to appreciate what is necessary in a grinder for sharpening milling cutters, and it was principally because of this that it undertook the designing of the machine illustrated. Rapid and accurate work were the first essentials sought in its capabilities. While it is especially adapted to cutter grinding it is in every sense a universal machine, suitable for grinding all kinds of cylindrical, internal face and angular work, face mills, end mills, reamers, counterbores, circular saws, snap gauges, gear cutters, rose reamers, flat surfaces, and all other tool room work. The machine will grind any shape of cutter at any angle, or any taper or face, and embodies in its design many original ideas and modifications new to a tool of this type.



Fig. 1. The New No. 1 Universal Cutter and Tool Grinder Built by the R. K. Le Blond Machine Tool Company, Cincinnati, Ohio.

Figs. 1, 2, 3 and 4 will be found useful to an understanding of the construction and operation of the machine; Figs. 5 and 6 show two of its attachments, and the remainder of the illustrations, Figs. 7 to 13, inclusive, show the grinder set up for various operations, indicating quite clearly its capacity and range of work.

As will be appreciated from Fig. 1, which shows the complete machine as viewed from the front, with all of its attachments on the floor around the base, and the side view, Fig. 3, the machine is not unlike a universal milling machine in the arrangement of its parts. The column, knee, saddle, swivel carriage, and table are all present, although in somewhat modified form, as the sectional views, Figs. 2 and 4, indicate, due to the different and more complex functions of a grinder. These are proportioned and disposed to give the greatest rigidity and adapt the machine for taking large inserted tooth cutters. A point worthy of note is that there are no stems, posts, slip bearings, and joints such as are frequently found in grinders. The convenience of the operator has been carefully considered as evidenced by the location of all the operating levers, which allow the operator to manipulate them all while keeping watch of the action of the wheel on the work. The cross feed screw and quick traverse shaft extend through the machine, and have a crank at both ends, so that they can be adjusted from either side according to where the operator happens to stand. All adjustments have a fine feed through hand wheels at the front of the machine, and fixed clamping handles are provided for locking all parts in any position.

Equally careful attention has been given to the lubricating and protecting of all cylindrical and flat bearings from grinding dust. Dust proof covers are provided for the oil holes, and the bearings are kept lubricated through belt pads. The spindle bearings have dust proof collars, and the saddle and table bearings have covers, so that they are never exposed. The knee bearing on the column has felt wipers.

A single pulley for a 2-in. belt drives the wheel spindle. The latter has taper boxes and may be driven at three different speeds from the countershaft, these being 3175, 4200, and 6365 rev. per min., so that the proper peripheral speed may be obtained for various sized grinding wheels. One end of the spindle is bored for a Le Blond SA collet, which enables the wheels to be removed and replaced without the necessity of truing up. The wheel spindle is eccentric to the column, and with the cross movement the minimum and maximum range of cutters that can be admitted is greatly increased.

The knee is of box section and swivels in a complete circle, on a supplementary sleeve on the column. It has a vertical adjustment of 8¼ in. below the center of the wheel spindle through the elevating screw operated by the hand wheel at the left in Fig. 1, and formed cutters,

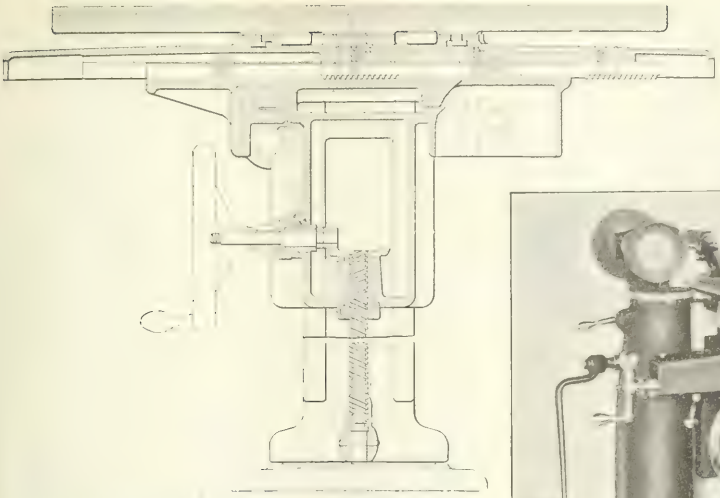


Fig. 2.—Longitudinal Section Through the Table, Saddle and Knee.

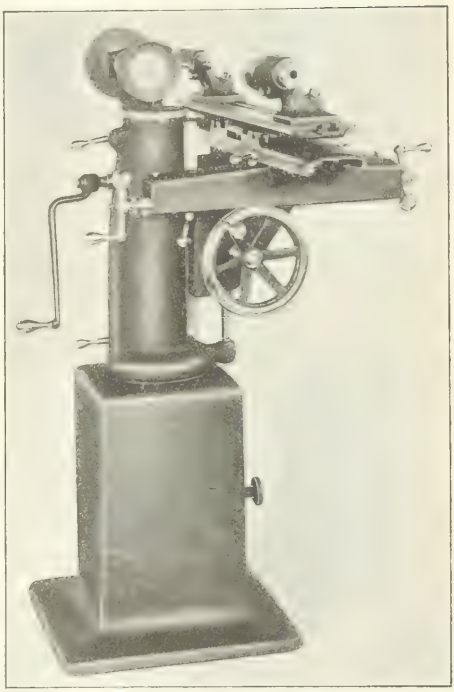


Fig. 3.—Side View of the Grinder.

hobs, reamers, &c., can be ground on their radial surfaces without the use of drop centers. The saddle has an apron cast completely around it that forms a cover for the knee as well as the cross feed screw, and has a cross movement of 6¼ in. The table swivels through an arc of 90 degrees on either side of the center, and has a fine screw adjustment so that it may be accurately set to any taper. The base is graduated and is clamped securely in any position with two clamping bolts. The table has a longitudinal movement of 17 in., made with a quick traverse through the long lever handle which operates a pinion engaging a rack on the under side of the table, or with a fine feed for circular and internal grinding through the inclined hand wheel at the right in Fig. 1, which drives the rack pinion through spiral gears.

The head and footstock centers swing 8 in. and take 18 in. between them. The headstock spindle, which is tapered, revolves in a removable sleeve which can be clamped in the V block of the universal attachment shown in Fig. 6. The front end is threaded to receive a chuck. The footstock center is projected by a spring and can be quickly retracted by a thumb lever. This center can be removed and a special center for grinding reamers inserted in its place.

A complete set of stops and tooth rests are provided for all classes of work. With the machine is also furnished a countershaft, the journal boxes of which are provided with ring oiling bearings which need to be filled only once a month. The countershaft is arranged to give three wheel speeds, as before stated, and has tight and loose pulleys intended to run at 425 rev. per min.

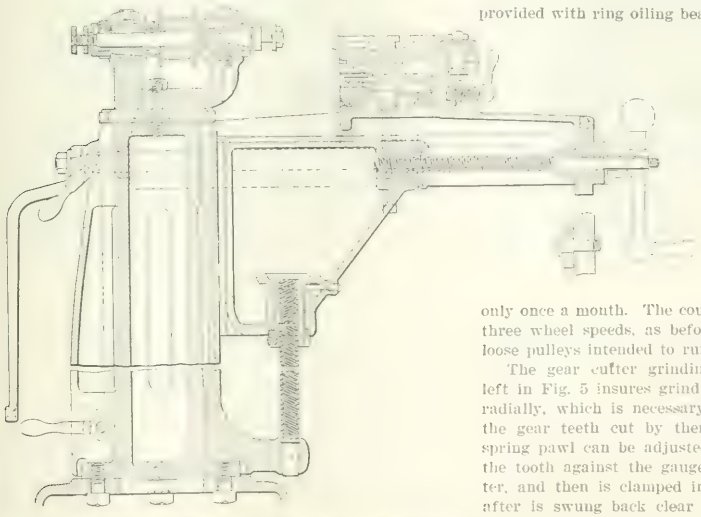


Fig. 4.—Transverse Section Through the Center of the Machine.

The gear cutter grinding attachment shown at the left in Fig. 5 insures grinding the teeth of gear cutters radially, which is necessary, as otherwise the shape of the gear teeth cut by them would be incorrect. The spring pawl can be adjusted to bring the radial face of the tooth against the gauge which swings over the cutter, and then is clamped in position. The gauge thereafter is swung back clear of the cutter. The table is provided with stops regulating the depth of the cut. The

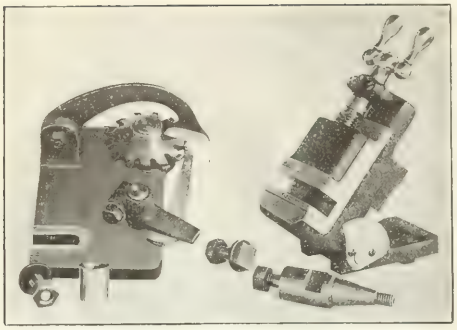


Fig. 5.—The Gear Cutter Grinding Attachment and Universal Vise.

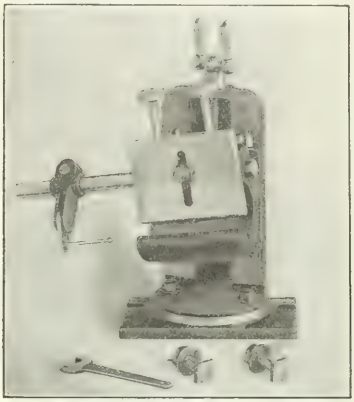


Fig. 6.—The Universal Work Holding Attachment.

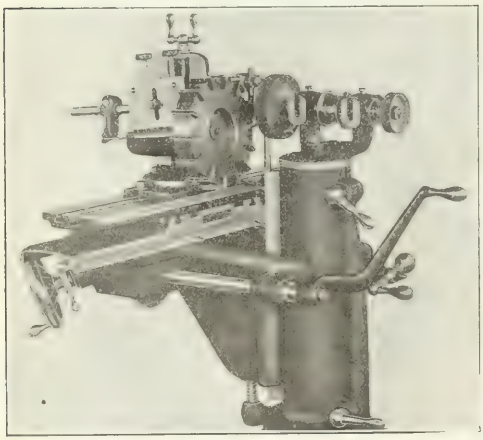


Fig. 7.—Grinding the Face of an Inserted Tooth Milling Cutter.

attachment will take in cutters up to 6 in. in diameter. Two bushings are furnished for cutters of ⅞ in., 1 1-16 and 1¼ in. holes. Fig. 5 also shows a universal vise which is convenient for holding many kinds of work.

The work holding attachment, shown in Fig. 6, is more completely universal in its adjustments and applications. The head swivels upon the base and the sleeve block can be swiveled completely around through a vertical plane. It will hold work mounted directly upon arbors or on straight or taper shanks. The headstock sleeve and spindle can be clamped in its V blocks and can be used for grinding work held in a chuck, such as cones, cups, collars, &c. The work is clamped by an adjustable jaw. Two thumbscrews at either end admit a delicate adjustment to the proper position. A floating center attached to an adjustable bar can be set for any length or diameter of work. The head has vertical adjustment.

A few of the many ways in which the universal work holding attachment can be used are indicated in the engravings showing the setting of the machine for difficult operations. Fig. 7 shows an inserted tooth milling cutter in position for grinding the sides of the teeth. The work is being held in the universal work holding attachment, and an adjustable tooth rest is supported from the table. When the operation is completed the work holding attachment can be swung through a horizontal angle of 90 degrees, and the ends of the teeth ground with the work in the position shown in Fig. 9.

Another example of milling cutter grinding is shown in Fig. 8. The work is in this case supported on an arbor held between the head and tailstock centers. The knee is partly swung around the column, and the table swiveled as indicated, so that the cutter can be ground

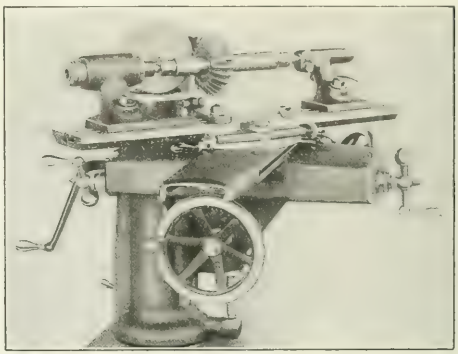


Fig. 8.—Grinding a 45-Degree Angle Cutter.

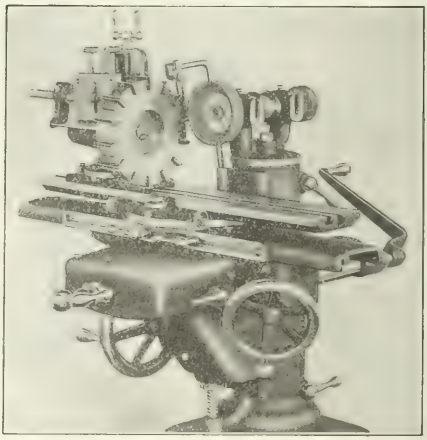


Fig. 9.—Grinding the Ends of the Teeth of the Cutter Shown in Fig. 7.

at the required 45-degree angle. For the setting of this angle the thumbscrew adjustment facilitates accuracy. The setting for the grinding of a formed milling cutter is presented in Fig. 10, where a thin grinding wheel is used, the work supported on an arbor between the centers and the tooth rest mounted on the table.

A case where the tail centers could not be used is seen in Fig. 11, where a 5½-in. stem reamer is being ground while being held in the universal attachment, without the necessity of removing it from the stem. Fig. 12 is an example of the setting up for internal grinding. In place

of one of the grinding wheels a belt pulley is substituted, and the auxiliary spindle secured to the face of the wheel spindle head, is belted from the latter and drives a small high speed internal grinding wheel. The work being done is the grinding of a taper hole in a spindle, which is held in a chuck in the head stock. To obtain the taper the table is swiveled the required amount, the adjustment being very accurately made by the thumbscrews.

A radically different piece of work is that shown in Fig. 13, where the teeth of a 16-in. disk saw are being cut. The saw is mounted on an arbor held in the universal work holding attachment, and the tooth rest, which was referred to before, will be seen to be secured in another position.

These illustrations, while typical of the operations possible on the new Le Blond grinder, are only suggestive of its versatility. A great many other settings can be made for standard or special jobs, and in the hands of an operator that is at all resourceful it would be hard to imagine a piece of grinding work too difficult to be accomplished.

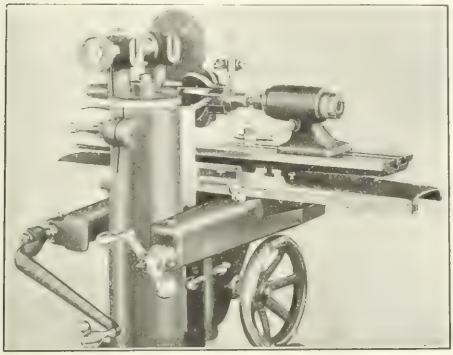


Fig. 10.—Grinding the Faces of a Formed Cutter.

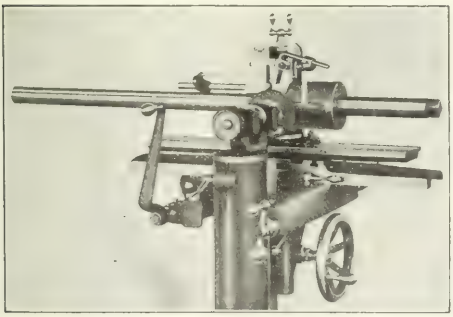


Fig. 11.—Sharpening a 5½-In. Stem Reamer.

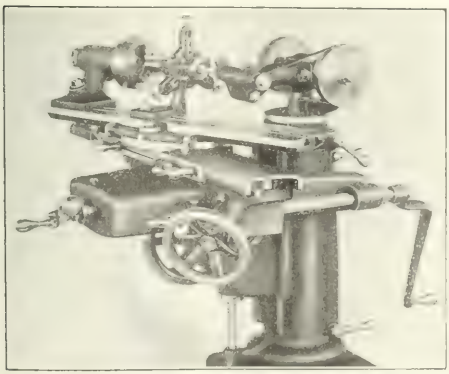


Fig. 12.—Grinding a Taper Hole in a Spindle.

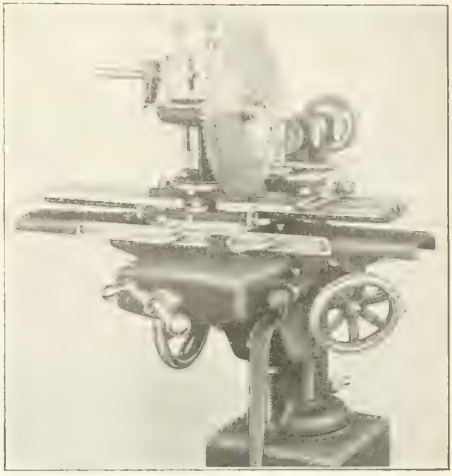


Fig. 13.—Sharpening a 16-In. Cut-off Saw.

Efforts to Modify the British Patent Act.

Advices from London, England, indicate that there is little chance of securing any material modification of the British Government's Patent Act of 1907, which becomes operative August 28 of this year. Judge C. H. Duell, formerly associate justice of the Court of Appeals of the District of Columbia, who went over to confer with British Government officials on the subject, particularly with the controller general of patents, is of the above opinion, and says that the immediate effect of the new law is to nullify the advantages accruing to many American manufacturers from the British free trade policy. The Patent Act specifies that all patents registered in Great Britain by foreigners shall become null and void at the expiration of four years after registration if the owner of the patent fails to build a factory in Great Britain and manufacture the article patented to "an adequate extent." The expectation of those who framed it was that American manufacturers would be forced to expend many thousands and probably millions of dollars in the construction of plants in Great Britain. Four or five retaliatory measures were introduced at the last session of Congress at Washington, but as there are about three times as many American patents registered in Great Britain as British patents in the United States it has been concluded that conference rather than retaliation is the best policy to pursue. Perhaps the strongest influence for a modification of the new British act is the movement to that end among British inventors and also inventors in the British Colonies who have patents in Great Britain. The latter threaten to work up retaliatory measures against the mother country. Among American manufactures which will be particularly affected by the new act are typewriters, cash registers, metal working machinery, laundry, boot, shoe, and leather working machinery, elevators and pneumatic tools.

The Golden-Anderson Valve Specialty Company, Fulton Building, Pittsburgh, has received an order from Armour & Co., Chicago, for 32 10-in. Anderson cushioned triple acting nonreturn valves for the protection of its power station. The Anderson automatic cushioned nonreturn valves are claimed to be the heaviest valves made, and, owing to their correct inside mechanical construction, they are guaranteed not to chatter, hammer or stick, and to be satisfactory, durable and entirely automatic. These valves can be tested at any time, and as often as desired without any interference whatever in the operation of the plant.

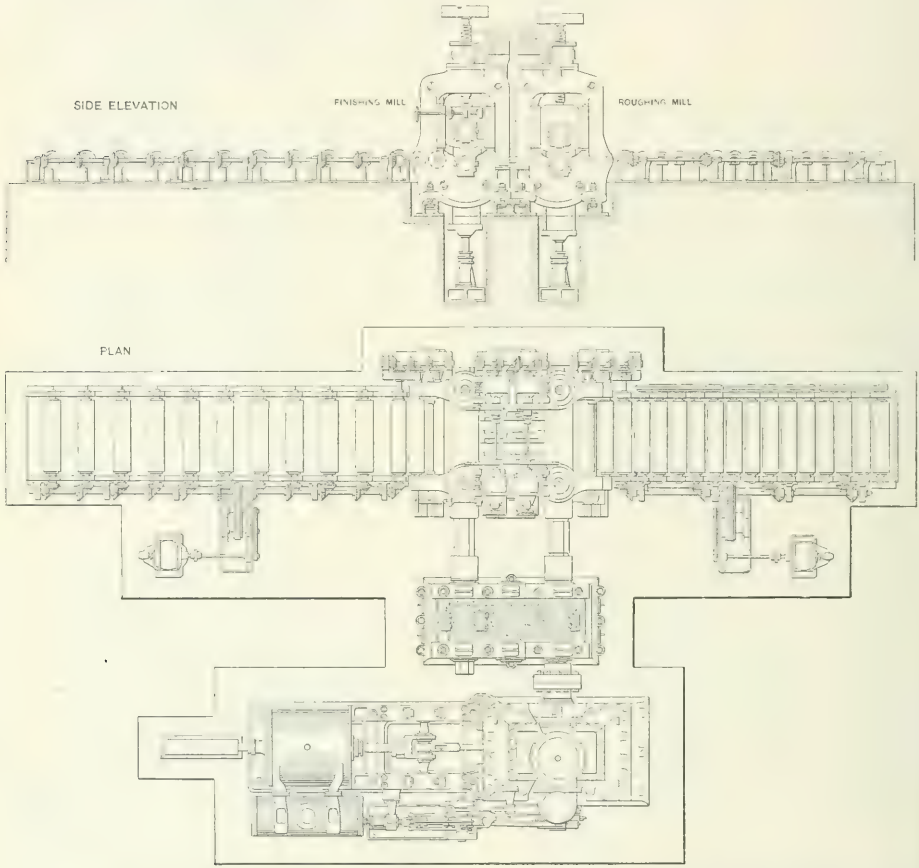
Improvements in Plate Rolling Mills.*

BY ANDREW LAMBERTON.

During recent years a large demand has arisen for thin plates, and the question as to what type of mill is best adapted for rolling such plates is one of very considerable interest to steel makers. The three principal conditions which plate makers must fulfill are:

1. Quality, represented by the usual tensile and bending tests.
2. First class surface finish throughout.
3. Close adherence to gauge thickness.

It is well known that these conditions are imposed much more rigorously in this country than in America or on the Continent of Europe. Here surface finish must be first class, and adherence to gauge thickness must be within 2½ per cent. over or under.



Figs. 1 and 2.—Side Elevation and Plan of Plate Mills at the Glasgow Iron & Steel Works, Wishaw, Scotland.

Objections to the Three-High Type of Mill.

In America steel plate makers are not under such stringent conditions, and the writer has seen thin plates being rolled in which a margin of 15 per cent. variation in thickness was accepted. Were it not for the stringency of the conditions to which he has referred, the probability is that plate rolling mills of the American three-high type would have been adopted in this country before this time. It is unquestionable that for thin plates the three-high mill has some advantages; but, unfortunately, it has the great drawback of being unable to maintain high surface finish on plates for more than two or three days, when the rolls require to be changed. This defect is inherent in the design of the mill where the roughing down of the slab and the finishing of the plate are done in one set of rolls, causing rapid deterioration of their surfaces. The usual practice is to use a top roll and a bottom roll of equal diameter with a mid roll of two-thirds their diameter. At every pass of the plate, whether between top and mid, or bottom and mid, the mid roll does work, so that twice the work is put upon it that the top and bottom rolls are required to do, and, as it has only two-thirds of their surface, it wears much more rapidly, the surface becomes quickly injured, and necessitates the changing of the rolls every two or three days, which is a drawback of a very serious nature.

The writer observed the outputs from three-high mills both in America and on the Continent, and while the surface finish of the plates delivered during the first 24 hr. working was good, there was a subsequent steady deterioration in quality of surface finish, until the rolls had to be taken out for re-dressing. To meet this, the practice is to roll all plates requiring the highest finish during the first 24 hr. working of the mill, and devote the subsequent one or two days' working to plates which do not require such fine surface or close adherence to gauge thickness. There can be little doubt that it is largely this difficulty of surface finish and adherence to gauge thickness, together with the undoubted complication of the three-high mill, which has prevented its adoption in this country, where the conditions of finish and thickness are so rigorously enforced.

Advantages of the Two-High Mill.

Our steel makers have, with practical unanimity, adopted the two-high reversing mill as the best to meet

*Read before the Iron and Steel Institute, London, May, 1908. Mr. Lamberton is head of the firm of Lamberton & Co., Coatbridge, Scotland.

the conditions obtaining here, and there can be no question that the surface finish got from two-high reversing mills is superior, and can be maintained with greater regularity and for a much longer time without changing rolls, than where three-high mills are used. The drafting of the rolls is also much simpler in two-high mills, and admits of more ready adjustment than when three rolls have to be regulated to work together with perfect exactitude. The live roller tables in two-high mills are likewise much more reliable in that they are fixed, and can be made as heavy and strong as desired, while in three-high mills these tables have to rise and fall at each pass, and therefore their mass and inertia have to be reduced to the lowest possible point commensurate with safety. This cutting down of weight tends to reduce the margin of safety, and frequent breakages occur, and it is well known that these tables are very costly in repairs, and in many cases complete spare tables are kept ready to put in when a breakdown occurs, so as to minimize the delay to the mill.

Another very important advantage possessed by the two-high reversing mill is that, when roughing down slabs, during which the passes are short, the mill can be driven at slow speed, so as to minimize the shock when the slab enters the rolls, while during the long passes the speed can be accelerated to any desired extent compatible with safety. The writer has taken notes of the speed at which reversing engines are regularly driven, and finds 140 rev. per min. quite common. This is quite twice the speed of three-high mills, so that the slowing down during the initial passes is amply compensated for before the finish. This method of working is obviously much easier on the mill plant than where the slab enters the rolls at full speed, as in the three-high system, causing violent shock and increased liability to breakage.

These are some of the practical considerations that have influenced steel plate makers in choosing the type of mill best suited at all points to meet the stringent conditions imposed, and, so far, the all but unanimous choice of the two-high reversing mill has been fully justified by results.

It is to be observed, however, that two new installations of three-high mills have been made during the last few months, one in Scotland and one in England, and the results from these will be watched with much interest.

The writer has thought it might prove of interest to members of the Institute if he gave a description of a new form of plate mill, having rolls 30 in. diameter by 6 ft. 6 in. long, which he has designed specially for rolling light plates, but which is equally suitable for ordinary ship and girder plates, now successfully at work at the Glasgow Iron & Steel Works, Wishaw. This mill possesses some quite novel features, for which the following claims may fairly be made:

1. Simplification in the operation of the mill.
2. Reduction in the amount of machinery required.
3. Reduction in the work done by finishing rolls, and consequent reduction in their wear.
4. Acceleration in delivery speed of finishing rolls, and equalization of power used in roughing and finishing rolls.
5. Final delivery of plates, straightened and free from wave.
6. Reduction in space occupied by the whole plant.
7. Large output capacity.
8. Economy in steam consumption of driving engine.

Simplification in the Operation of Mill, and Reduction in the Amount of Machinery Required.

This is accomplished by arranging the roughing and finishing rolls in tandem, instead of the usual practice of arranging them in the same extended line. [See illustration.] The slab is first reduced in the roughing rolls, and finally in the finishing rolls. During the process of roughing down, the top finishing roll is held up clear by its hydraulic balances, and the plate under treatment passes freely through the finishing rolls until reduced to the thickness ready for finishing, when the upper roughing roll is raised and the upper finishing roll lowered, and the subsequent finishing of the plate takes place through the finishing rolls.

It will be observed that, by this means, two sets of live roller tables—which in the ordinary type of reversing mills would be fitted at the front and back of the finishing rolls—are rendered unnecessary, one set of two tables serving both roughing and finishing mills. Further, by this new arrangement the transfer or skid gear, required in the former type of mill to transfer the roughed-down plate across to the finishing rolls, is also done away with, these constituting a very substantial reduction in the machinery employed, and decidedly simplifying the operations, as the slab to be rolled never leaves the straight line of travel during the whole process of rolling, and passes out, a finished plate, in the same line as the original slab is received at the commencement of the operation.

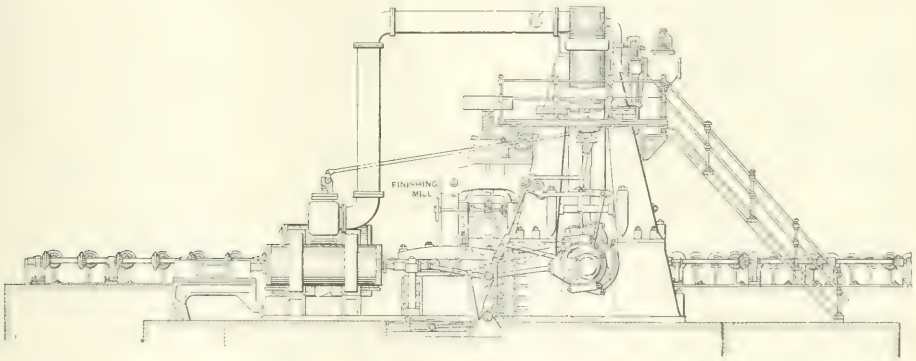


Fig. 3.—Side Elevation of Engine and Plate Mill.

Reduction in the Work Done by Finishing Rolls and Consequent Reduction in Wear.

In the ordinary type of mill, where the roughed-down slab has to be transferred sideways to the finishing rolls, the practice is to make this transference while the plate is still of considerable thickness, that it may not cool too rapidly during the process, so that, generally speaking, as many passes are made in the finishing rolls as in the roughing-down rolls. The writer considers this bad practice, inasmuch as it imposes a great deal more work and entails much more wear on the finishing rolls than is necessary. The operation of finishing should be done with the minimum number of passes, so as to reduce the wear on the costly finishing rolls to the lowest possible point, and maintain their surfaces perfect as long as possible.

This new form of mill is specially designed to effect this, as the roughing-down process can be carried on during 80 per cent. of the whole operations of rolling a plate, owing to the fact that it never requires to leave its direct line of travel, and the finishing process, representing some 20 per cent. only of the whole work, is all that

need be put on the finishing rolls. It is obvious that a very considerable saving must be effected in the finishing rolls, which have their work so substantially reduced, and their surface will be maintained in good condition for a much longer time. Further, the expense in changing and dressing rolls will be greatly reduced, and stoppage of the mill rendered less frequent.

Acceleration in Delivery Speed of Finishing Rolls and Equalization of Power Used in Roughing and Finishing Rolls.

From careful observations and diagrams taken from engines driving two-high plate rolling mills, it has been found that the process of roughing-down requires very considerably greater power than that for finally finishing the plate in the hard rolls. This means that the engine, which must be of sufficient power to give out the maximum demand made upon it, is over power when the finishing process is in operation, and the writer has utilized this excess power in accelerating the speed of the finishing rolls over that of the roughing. This results in the double advantage of equalizing the load upon the engine during the whole of the operations, and consequently increasing its efficiency, and also of providing a most useful increase in speed during the final passes when finishing the plate, which, when rolling thin plates, is of very great importance.

In the ordinary type of two-high reversing mill the power required for driving both roughing and finishing rolls is transmitted through the bottom roughing roll, and as it is the practice to partially rough down the slab while the preceding plate is being finished in the hard rolls, this doubles the strain on the neck and wobbler of the lower roughing roll and greatly increases the wear and tear on them. This system of working is followed in order to increase the output capacity of the mill, but it is obviously obtained at greatly increased cost, as the driving engine must be able to develop nearly twice the power required where work is only done in one set of rolls at a time, and is consequently much more costly.

At the best, it is only a few of the short initial passes that can be done simultaneously with the finishing of the preceding plate, so that for quite three-fourths of the whole operation only one piece is in the rolls, and the engine is then twice as powerful as is necessary, and must do the work with a substantially lower efficiency than when the load on the engine is kept constant during the whole operation. Further, this large surplus engine power is a source of danger when by accident a stall occurs in the mill, as the shock and strain induced in bringing the engine suddenly to rest are much intensified by its greater power and mass of moving parts.

Final Delivery of Plates, Straightened and Free from Wave.

In mills driven at high speed there is a tendency for the plate to become waved, particularly if it is of thin gauge, and the higher the speed the more pronounced is this tendency. To correct this, during the final pass in the finishing rolls the roughing rolls are also put down in light contact with the plate, and the mill then practically forms a four-roller mangle, which very effectually flattens out the plate before going to the shears.

Reduction in Space Occupied by the Whole Plant.

This consideration may not be of such importance where new works are being laid out; but in carrying out improvements in existing works the question of space occupied is almost always one of great importance. The total space occupied by a two-high reversing mill of the ordinary type, measured over its extreme length and including the driving engines, amounts to 70 ft. A mill of the same size and capacity of this new design, occupies 42 ft., representing a saving of 40 per cent. in the space occupied without in any way being more congested in its arrangements. This reduction in space is effected by (1) the design of the engine, which is of the vertical and horizontal type, and occupies only half the floor space of the ordinary side-by-side reversing engine; and (2) the design of the mill, in which the whole space occupied by the finishing mill, together with its two live roller tables and transfer gear, is saved.

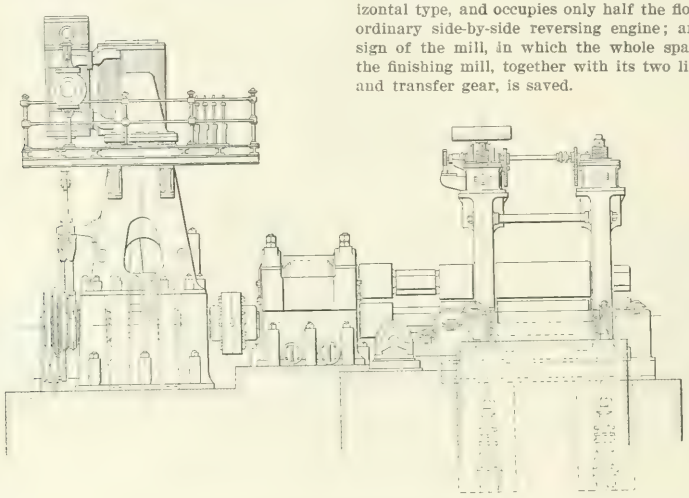


Fig. 4. End Elevation of Plate Mill and Engine.

Large Output Capacity.

This is obtained (1) by the simplification of the operation of the mill, in which the transference of the plate from roughng to finishing mills is abolished and the time taken for this operation saved; and (2) by the acceleration of the speed of the finishing rolls, which are driven 15 per cent. faster than the speed of the engine. The result is that a plate of, for example, 5 ft. x 30 ft. x 5/8 in. can be rolled in 2 min., and if this rate of feed could be kept up the output of such plates would be 400 tons per day of 10 hr. In rolling to thin gauge the slab is thinner, and the time taken for a plate of, for example, 5 ft. x 30 ft. x 3-16 in. is 2½ min., or at the rate of 130 tons per day of 10 hr.

Economy in Steam Consumption.

The steam efficiency of rolling mill engines has not in the past been conspicuous except for its absence; but much greater attention has been directed toward this subject lately, and substantial improvement has resulted. The engine driving the mill described is of the vertical and horizontal type, compound condensing, and has a high pressure cylinder 42 in. diameter and a low pressure cylinder 67 in. diameter by 4 ft. stroke. The steam pressure is 160 lb. per square inch, the exhaust is connected to a central condensing plant giving a vacuum of about 24 in., and the engine under these conditions develops the exact amount of power required. To insure quick reversing, the handling valves of both high pres-

sure and low pressure cylinders are connected and worked in unison from the same starting handle, as is now usual in modern compound engines. The closing of both these valves simultaneously acts as a most efficient brake, stopping the engine quickly, and preventing racing at the finish of the passes. The resulting increase in pressure in the receiver is then available for accelerating the speed of starting for the return pass, and so the efficiency of the whole operation is substantially improved.

Before closing, the writer desires to refer to a matter in regard to which there seems to be some difference of opinion in rolling mill practice. The question as to whether, in rolling plates, the rolls should be worked wet or dry is practically settled so far as regards the finishing rolls; but many makers still work roughing rolls dry. It seems only reasonable to believe that, if all rolls could be worked wet, it would greatly extend their life, and would prevent necks overheating and cutting into their bushes. The solution is to be found in the increased speed of driving, which enables plates to be rolled with such rapidity that the cooling effect produced by working the rolls wet is discounted by the heat generated by the work expended on the plate in reduced time. From careful experiments made on a large number of plates rolled from the same slabs it has been ascertained that the surface quality of plates rolled when both roughing and finishing rolls are worked wet is very distinctly superior to those produced when only the finishing rolls are worked wet. This clearly points to the advisability of all plate rolls being worked wet; and when consideration is given to the increased durability of the rolls, necks and brasses, and the reduction of frictional losses, the advantages gained by the great increase in the speed of rolling which has made all this possible are clearly demonstrated.

The performance of this new type of plate mill described in the paper has now been proved in actual daily work to be of the most satisfactory character, all the aims of the designer being more than realized.

DISCUSSION.

James Riley recalled that when he went to Scotland 30 years ago the output of the plate mill at the Hallside Works of the Steel Company of Scotland was 80 tons a week for one shift. He pressed for larger outputs, and was told by plate mill workmen that it could not be done, and that if what he proposed was carried out the rolls would become red hot and burst. At present the output is around 2000 tons a week. About 15 years ago the speaker put down the first three-high plate mill in Great Britain, which had about three times the capacity of the old two-high mill which stood alongside of it. It was a universal mill and for the tables American drawings were used. There were some troubles such as Mr. Lamberton pointed out. He did not agree with Mr. Lamberton in his comparison of the three-high mill and the old two-high mill, but believed it warranted if the comparison were between the three-high mill and the mill which had been described in the paper.

J. H. Harrison, referring to the statement of the paper that one pair of rolls was let down in order to form a four-roller mangle to flatten the plates before shearing, did not consider that straightening in that way would have a great effect. Either the rolls would be put down too hard and excessive work would be done because the plates stretched or the rolls would not be down sufficiently close to do any good. He thought it would be better to let the rolling mill be purely a rolling mill and do the straightening independently. While he thought it desirable that plates should not be finished in the way that American and Continental mills finished them, at the same time the mills in these countries produce a plate which is flat. It is not the province of the construction engineer to straighten plates; they should come from the rolling mill straight and flat.

J. M. Gledhill regarded the arrangement of tandem housings shown by Mr. Lamberton an excellent one, and if he were reconstructing his own mill he should adopt it, having roughing rolls and finishing rolls parallel. On the question of rapidity of rolling, the speaker said that when rolling plates beyond a certain thickness the surface of the slabs is worked at a higher rate than the interior and a varying action results, part of the plate being hollow and not homogeneous. He thought this was a point to watch in overrolling. The arrangement described permitted of running the mills at a slow rate, and then when the plates have got thinner, to go at a much higher speed. Probably that would have some effect in overcoming the difficulty, although he thought if once the hollow condition were produced and the plate even rolled thinner, the result might not be good.

P. N. Cunningham believed that the design of the mill shown by Mr. Lamberton would be the one adopted for plate mills in the future. When the speaker was in the United States four years ago he saw a plate mill the designer of which told him that he was the first to arrange the vertical rolls on the issuing side of the mill. It was a three-high mill and the vertical rolls were in contact with the plate. In that way the vertical rolls were assumed to be running at nearly the same peripheral speed with the horizontal rolls. In previous mills variations in these speeds had been the difficulty. The speaker agreed that Mr. Lamberton had overcome the difficulty of time lost by skidding across, but he found in his practice that the work done by the hard roll was 37 per cent., leaving 63 per cent. of the work done by the soft roll. He had made experiments in rolling with both sets of rolls wet, and found that with plates 5-16 in. thick and under, this method showed a saving in the pickling solution of 1½ per cent. as against having both sets of rolls dry. He was satisfied that under the former method there is less oxide than when plates are rolled perfectly dry.

H. Crowe, referring to the point made that the finish of the plate could not be made as good in the ordinary three-high mill as in the two-high mill, thought this could be taken care of easily by putting up two sets of three-high mills. The three-high mills in England generally have two sets of housings, the roughing down being done in soft rolls and the finishing in hard rolls. He thought there was no doubt that if the hard rolls and the soft rolls are driven by independent engines the output would be greater than is possible with Mr. Lamberton's mill. Referring to the saving of the time required for skidding the plate from the hard to the soft rolls as in two-high mills the speaker put over against this the time required, when changing from roughing to finishing rolls, for screwing down the lattetr. He considered that the output of a plate mill depends on the shape and size of the slab with which the plate mill starts. In the United States large outputs are secured by getting the steel from the slabbing mill in a shape that workers in Great Britain would call a piece of plate. He did not see how very much straightening is possible with the mill described, though if the soft rolls are run at a slower speed than the hard rolls a slight stretching action will result. In fact, in Germany an arrangement is in use by which plates are given a pull which straightens them effectually.

E. J. Duff believed that while Mr. Lamberton's mill might be made a success the same results might be accomplished with a three-high mill. The three-high mill to which Mr. Riley had referred turned out plates of perfect finish, and he had not seen its work equaled in this respect either in the United States or Great Britain. The defects in that mill were chiefly due to the fact that the tables were too weak, American designs having been followed. Had the directors of the plant eliminated these defects and gone ahead with the principle of three-high rolling he believed they would have accomplished everything claimed for the mill described.

Mr. Lamberton, replying to the discussion of the paper, said that he had succeeded in having a compound two-cylinder reversing engine work as rapidly in reversing as the double compound tandem type. There are only two cylinders, as against four, giving all the advantages in steam economy available in the double compound tandem, but with much less complication. What was said by Mr. Gledhill as to the defect produced in

the slab by too fast rolling no doubt applied particularly to armor plates. In referring to the power required, respectively, for soft and hard rolls, the speaker showed diagrams, according to which the indicated horse power was 3425 for the soft roll and only 2210 for the hard roll, showing a considerable margin of power at his disposal. He proposed later to equalize the power used in both sets of rolls as far as possible, believing that to be the proper way to work plate rolls. He emphasized the desirability of working plate mill rolls wet, as in that way the life of the roll would be much increased and the surfaces preserved a longer time. The necks would be prevented from heating and cutting, and there would be a saving in lubricants, in rolls and in everything. When to this is added improved quality of plates the working of rolls wet seems the only way. As to the suggestion that surface finish could be maintained by putting in two sets of three-high mills, that is not to the point, as the problem to be dealt with is the designing of one mill which will give the largest output for the smallest expenditure. But even with three-high mills, and double mills at that, far more changes of rolls would be necessary to keep up good surface than with the speaker's mill. As to the time saved in transferring or skidding being offset by that taken up in screwing down hard rolls and throwing off soft rolls he said that as a matter of fact in the working of his mill no time was lost. Beginning with a slab 4 in. thick from the roughing rolls, it is reduced to ½ in., and then the drawing of the screw gear follows down with the hard rolls keeping only a trifle behind. Replying to a question as to electric driving he said that while the design lends itself to electric driving the question of price comes in. If the suggested idea were carried out of putting a motor on the roughing rolls and one on the finishing rolls, there would be three motors with 3000 hp. to supply. Instead, he had one. Any advantage to be had from the use of two motors would be secured at a great increase of cost. Referring finally to output, he thought the crux of this question to be this: Can an ordinary plate mill be fed any faster than a slab every two minutes, the day through? Can it be said that there are facilities for this? Is there the heating power and the handling power? He had not seen the works in Great Britain at which such a rate of feed could be kept up. The mill having reached a speed greater than that of the feed, what is now wanted is to increase the facilities for serving it.

Tests of a Liquid Air Plant.—On this subject Bulletin No. 21 of the Engineering Experiment Station of the University of Illinois, by C. S. Hudson and C. M. Garland, has been issued. The plant on which the tests were made consists of a four-stage Norwalk air compressor and a Hampson liquefier of the laboratory type. The compressor was driven by a 15 hp. Westinghouse induction motor. The objects of the tests were to determine (1) the power required to liquefy the air; (2) the cost; and (3) the most favorable conditions for operating. The effect of the temperature and pressure upon the efficiency of the liquefier was determined; and, incidentally, some data were obtained upon the keeping properties of liquid air in Dewar bulbs of different sizes, and under different conditions. An interesting paragraph relates to the efficiency of liquid air as a medium in the production of power. The ratio of the available energy of the liquid air to the work required to produce it was calculated, and it was found that, under the most favorable conditions, not more than 2½ per cent. of the work required to produce the liquid air can be recovered by using the air to drive a motor. Copies of this bulletin may be obtained gratis upon application to the Director, Engineering Experiment Station, Urbana, Ill.

The rise in the price of cotton seed oil is directing the attention of the steel trade to fish oils for tempering steel. The N. B. Cook Oil Company, successor to Nehemiah B. Cook, 148 Front street, New York, is an old established house in this line, carrying heavy stocks of all kinds of fish oils, thus being well prepared to meet any demand for prompt shipment.

The Apprenticeship System of To-Day.*

W. R. WARNER.†

If we study men without an education, either trade or commercial, we realize that they are the men who are the laborers and we all know that the laborer is a good deal of a machine. In the words of a well-known manufacturer, "the man without an education is an automatic traveling crane." He has hands that can lift something, and by the aid of his feet and legs he can carry that something to another place. Without education that man will remain a traveling crane, but give him some education and if he has other qualities he becomes a more capable man, and can raise the price for which his service sells in the market. We pay the traveling crane $1.50 a day, and really it is a pretty high price. The uneducated man gets more than the educated man for what he does. The cheapest man the great manufacturing concern can hire is the $10,000 a year man; but the traveling crane gets $1.50 a day.

Some years ago the American Society of Mechanical Engineers met in Philadelphia and the Baldwin Locomotive Works invited us to inspect its plant. At that time it was making one locomotive a day. I did not care a snap for locomotives, after I had been there 5 min. I hung to the superintendent to ascertain wherein was his power over the men, for this power was apparent everywhere. Afterward I learned that he received a salary of $20,000 a year. A large salary, I thought, until I ascertained that that man had increased the output of that shop 50 locomotives a year, and it took but the sale of three to pay his salary. He was thus the cheapest man in the shop.

In considering the apprenticeship system I cannot help going back to the time when I left the district school in New Hampshire and started in to learn the machinist's trade. The differences between the opportunity given the boy then and now are as wide as you can imagine. We had to take our turn in wheeling the castings, in oiling the shafting, and in sweeping the floor, and then we were given excellent work in putting in boiler fronts. No apprentice would be given such work to-day, and yet it served to give me ideas I have always remembered.

The apprenticeship system is not obsolete; it still exists. I think there are more apprentices to the iron and mechanical trades to-day than ever before in this country. For 40 years the Brown & Sharpe Mfg. Company has had a system of apprenticeship and has turned out excellent workmen, foremen, superintendents and managers. The Pratt & Whitney Company of Hartford for over 45 years has taken apprentices and has turned out superintendents who are scattered all over our country. The New York Central Lines at this time have over 500 apprentices in their shops. Even the little concern with which I am associated has for over 25 years had many apprentices, and at the present time has some 35 or 40. It is plain, therefore, that the apprenticeship system is not obsolete.

A Business Proposition.

The aims of the manufacturer are purely commercial; this is to be admitted frankly. Our schools are founded on philanthropic principles to aid those who come to them, but the manufacturer takes an apprentice for only one purpose, to make money out of his services, certainly not to lose money. It is purely a business proposition.

The apprentice comes to the manufacturer for a purpose—for an education in mechanical lines. Can these two purposes be realized? Can I take an apprentice and so guide and manage his work that the result will be profitable to me and at the same time give him an education? I believe it can be done, indeed, it is being done by all the concerns I have mentioned, for the young men who are in the shops referred to do acquire a knowledge of the work. There are discouraging experiences at times; I could mention several, but you would not care to hear them. I will, on the other hand, refer to two or

*From a paper read at the first annual meeting of the National Society for the Promotion of Industrial Education, Chicago, Ill.

†Of Warner & Swasey Company, Cleveland, Ohio.

three encouraging ones. They are illustrative of the working of the apprentice system under favorable circumstances.

Apprentices Who Went to the Top.

A doctor in Cleveland came to our place and stated that he wanted to get a position for a young fellow who lived up in Maine and who wanted to learn the machinist's trade. I told the doctor that the boy ought not to come as far as Cleveland from Maine. I said: "Why doesn't he go to Portland or Boston? There are plenty of good jobs there. While we would like to have a good apprentice, it seems hardly worth while for him to come that distance." He replied: "Let me tell you about this boy. He lives 12 miles from a railroad. For years he fixed his mother's sewing machine, the clock in the house and everything of that sort, and finally he undertook to make a model of a locomotive. He had read about a locomotive and seen pictures of a locomotive, but there was one thing he couldn't understand, so he walked 12 miles to see one." When I heard all this, I said: "Send the boy along. That is the kind of a boy we want." So that boy came from Maine clear to Cleveland to learn the machinist trade. Before he had finished his apprenticeship he had won such a reputation that we took him in the drafting room and gave him six months there. In 1893 we sent this boy to the Chicago Exposition to study the exhibits there from all parts of the world. We wished him to bring home a lot of information, and he did. Very soon he was made superintendent and then manager of the works, and finally general manager. Now for several years his pay has been greater than the pay of any Government official in Washington, except the President.

Another of our apprentices came from a manual training school in Cleveland. He, too, got into the drafting room and became chief draftsman. One day he told us that he had decided to resign and start in business for himself. In a few years he was known all over the country, and now we buy his machines. He has made a splendid reputation, and is making a fortune because he knew how to think. That is the secret of success. Cases like these largely repay the care that a manufacturer must give to his employees, and they serve to counterbalance the other unsatisfactory experiences of which I spoke. In these instances, and in many others I might mention, the boys are taught much. One of the important things for them to learn is to look at the subjects from the right standpoint and to think all alone. That is one of the difficult things to teach them—to think alone.

Apprenticeship Debits and Credits.

One feature of the apprenticeship system we must not overlook is that it must pay for itself. The president of our college in Cleveland once remarked, when he had all the students together, "I see before me some charity students." The boys began to look all around to pick out the charity students; then he added, "you need not look; you are all charity students. For every dollar you pay the trustees have to provide $4 to put with it to furnish the facilities you have here." But the apprentices pay their own way, and I think they ought to feel that it is a square bargain. I am sure I felt when I left that old shop in New Hampshire that they did not owe me anything and I did not owe them anything. It was a square deal; I carried away all I could, and they had given me all they could. The students in our trade schools do not thus pay for their education, nor do the students in our colleges and universities. How much better, therefore, ought they to strive to make adequate return.

It is not possible to give full details in regard to the apprenticeship in individual factories. Each factory has its own system and code of rules, and changes them occasionally as necessity arises. We take the boys for a four-year term, and the first year we pay them 80 cents a day; the second year $1 a day; the third year $1.20 a day; the fourth year $1.50. At the completion of the four years we make the boy a present of $100 in gold. These are the terms on which our boys enter. We make no distinction and no difference whatever.

There is, however, one reward of merit that we hold out to them that has served to supply our drafting room with draftsmen for many years. This reward is for the boy who will qualify himself during the earlier years of apprenticeship by studying drawing. This boy we take into the drafting room for the last six months of his apprenticeship. It is a special reward, and I am sorry to say that not many go forward into the drafting room. The incentive, however, has served to develop those who have become our chief draftsmen, our foremen and our superintendents.

The progress of every boy in the apprenticeship system, as I presume it is in trade schools and in the colleges and universities, is wholly governed by the boy himself. One of the important things we try to impress upon the boy's mind is to think for himself and to think in practical lines. There are many illustrations of the success of the trade schools, of the technical institutes and the colleges. We all know them, but we know also that there are many failures. One of the things wherein we are weak is that we do not teach the boys, whether in the apprenticeship system, the trade schools, the technical institutes or the colleges, along lines sufficiently practical.

I once visited one of our leading technical institutes and was shown about by the professor of mechanical engineering with much pride and satisfaction on his part. We went through the laboratory and machine shop and brought up in the drafting room. A senior there had a series of drawings of a machine which stood beside him. He had made the plans and detailed drawings of every piece so that the patternmakers could make the necessary patterns. I asked the student how long he had been on this work and he told me the number of weeks. The drawings looked well, and the professor, I think, was not a little proud of that boy's work, yet all the threads on every piece were "left handed." "Not very important," you may say, but could that boy think alone? No. The mistake simply showed that the boy was not thinking of what he was doing.

Tests of Concrete and Reinforced Concrete Columns.—On this subject the University of Illinois Engineering Experiment Station has issued Bulletin No. 20, by Prof. Arthur N. Talbot. It records experiments upon concrete and reinforced concrete columns, which have already become quite notable and which will have a marked influence in fixing the standing of certain types of construction. A feature of reinforced concrete in which engineers and architects are much interested is the column having the concrete hooped or bound with steel bands or spirals. Tests on this form of column reported from France and Germany indicate great strength, but the results have not been considered conclusive. Professor Talbot's tests go to show that in hooped columns the steel hooping does not come into action to any great extent before a load equivalent to the ultimate strength of plain concrete, or a little below, is reached, and that up to this point the action of the coulmn is very like one of plain concrete. Beyond this load the column shortens rapidly and the deformation becomes very marked. The extreme amount of shortening is a great disadvantage. The amount of strength added by the hooping before ultimate failure is reached is two to three times as much as the effect of an equal amount of longitudinal reinforcement. Copies of this bulletin may be obtained gratis upon application to the Director, Engineering Experiment Station, Urbana, Ill.

The Ajax Mfg. Company, Cleveland, Ohio, builder of forging machinery, has entered into an arrangement with de Fries & Co., Düsseldorf, Germany, under the terms of which the latter will build the products of the Ajax Company and distribute them among the European trade. The London office of the company, at 9 Leonard street, will be discontinued. The Ajax Company will discontinue its export business to Europe, but will devote its attention in this line to the countries of North, Central and South America and the Orient.

The Brown Iron Ore Deposits of Alabama.—I.

BY WILLIAM B. PHILLIPS, BIRMINGHAM, ALA.

The area within which workable deposits of brown iron ore may be found in Alabama comprises about 7080 square miles. The geological formations involved are the following:

	Square miles.
Crystalline (below the Cambrian)	100
Cambrian Weisner 125 / Montevallo 400 / Coosa 15 \	540
Lower Silurian Knox Dolomite 1,450 / Pelham 30 \	1,480
Upper Silurian. Red Mountain	15
Lower subcarboniferous, (Lauderdale, Keokuk), Fort Payne.	1,100
Upper subcarboniferous, (Bangor, Hartselle,), Oxmoor	400
Carboniferous. Coal measures	2,285
Cretaceous	1,160
Tertiary	As yet unknown

Each of the above formations will be referred to briefly:

Crystalline.

The Talladega slates in Talladega County belong to this class, but they are not worked. In Calhoun County there is an area of about 20 square miles of these slates and they carry beds of brown ore, not, however, at present worked. The Clear Creek deposits, Chilton County, are in the crystalline and have yielded some excellent ore. With this exception little or no brown ore is now mined from these slates. The exact age of these slates is somewhat in dispute. Until the discovery of carboniferous fossils near Moseley, Clay County, a few years ago, they were considered as pre-Cambrian, but the age of at least a part of the so-called crystalline area must now be referred to the Carboniferous. In a general way the Talladega slates are to be found in that portion of the State lying east of the Central of Georgia Railroad and south of the Southern Railroad. This area has the general form of an equilateral triangle of 90 miles to the side, or about 3500 square miles. The area within which workable beds of brown ore may be found does not seem to exceed 100 square miles, but some of the best deposits in the State are within this limit. In the Talladega slates the brown ore occurs, both as residual deposits and as the gossan of underlying pyritic material. In the later case it is merely a question of time when the ore will carry too much sulphur to come into use for blast furnaces without previous roasting. There is, however, less phorphorus in these ores than is usually met with in brown ores from Alabama.

Cambrian.

Three divisions of the Cambrian carry brown ore in Alabama, viz., the Weisner (Chilhowee) sandstone, the Montevallo shales and the Coosa shales. (1.) The total thickness of the Weisner sandstone in Alabama is in excess of 2500 ft. In Calhoun County it has an area of about 59 square miles, and attains a thickness of 2500 ft. Brown ore is extensively mined near Anniston in this formation, although there is no well marked line of separation between the Weisner and the overlying Montevallo.

In Cherokee County, northwest of Calhoun County, this formation has a thickness of some 2500 ft. The famous Baker Hill deposits may be referred here to the Montevallo shales and the Knox dolomite. The excavations at Baker Hill are on a very large scale. The main pit is now down 300 ft. below the original top of the hill and is 2000 ft. long by 900 ft. wide. Mining has been prosecuted here since 1872, and there is no diminution of the supply. In Cherokee County the superficial area covered by the Weisner sandstone is about 30 square miles. In Cleburne County, east of Calhoun County, the area involved is about 45 square miles, but no deposits are now worked. The formation is also to be observed in Talladega County, but no deposits are now worked.

At present, therefore, the working deposits in the Weisner sandstone are confined to the deposits near Anniston, Calhoun County, and, in part, at Baker Hill, Cherokee County. In many parts of the brown ore regions there is no very distinct line of separation between the Weisner and the overlying Montevallo. In speaking of the deposits in the Weisner sandstone it must be understood that they are not restricted to this formation.

(2.) Montevallo Shales and Sandstones (Aldrich Limestone, Hayes' Lower Connesauga, Rome Formation, Beaver Limestone), constitute the second division of the Cambrian, which carries brown ore. The thickness in the State varies from 1200 to 3000 ft. In Calhoun County the thickness is from 1500 to 2500 ft., and the area involved is about 150 square miles. The deposits at Anniston belong here and in the underlying Weisner sandstone.

In Shelby County, south of Birmingham, the area is about 50 square miles, and the total thickness varies from 1500 to 3000 ft. The celebrated Shelby deposits, long used by the Shelby Iron Company in the production of its excellent charcoal iron, lie on the eastern edge of this formation and above strata, which are at the bottom of the Knox dolomite (Lower Silurian). In Talladega County the Montevallo covers an area of about 200 square miles and has a thickness of 3000 ft. The brown ore deposits it contains are not now worked.

(3.) The Coosa Shales, the third division of the Cambrian, have a thickness in the State of more than 1800 ft. The deposits of brown ore near Woodstock, Bibb County, and Goethite and Greeley, in Tuscaloosa County, can be referred here, as also to the Knox dolomite, and the Tuscaloosa formation of the Cretaceous. They overlie the Coosa shales and limestones. In this general locality the overlying Lafayette (tertiary) is practically barren of ore.

The group of brown ore deposits along the line of the Birmingham Mineral Railway between Wawah and Woodstock, as also those along the line of the Alabama Great Southern Railway in the vicinity of Greenpond, viz., Greeley, Goethite, Williamson, Edwards, Martaban, Greenpond, &c., cannot be referred positively to the Coosa shales, for they are in close association also with the Knox dolomite (Lower Silurian). The Tuscaloosa clays (tertiary), also come in, but they seem to be free of workable ore.

The maximum thickness of the Cambrian in this State, which contains brown ore deposits, is about 3000 ft. The area covered is about 540 square miles, of which the Weisner has 125, the Montevallo 400 and the Coosa 15. The most famous localities are at Anniston, Baker Hill, Shelby and around Woodstock.

Lower Silurian.

(1.) The Knox dolomite and chert (including Hayes' Upper Connesauga), belong under this head. In this State the total thickness of this formation varies from 2000 to 4000 ft., and the total area is about 1500 square miles. In Bibb County the thickness goes to 3000 ft., with about 40 square miles of area. The Bright Hope deposits, not now worked, are in this formation. As already observed, the deposits around Woodstock, Greenpond, &c., are referable partly to this formation and partly to the underlying Coosa shales. In Blount County the thickness is not exactly known, but the area is about 30 square miles, in the broken central part of Murphree's Valley. The Champion mines, which have yielded much fine ore and which have recently been reopened, belong here. They have been famous for fine specimens of needle ore.

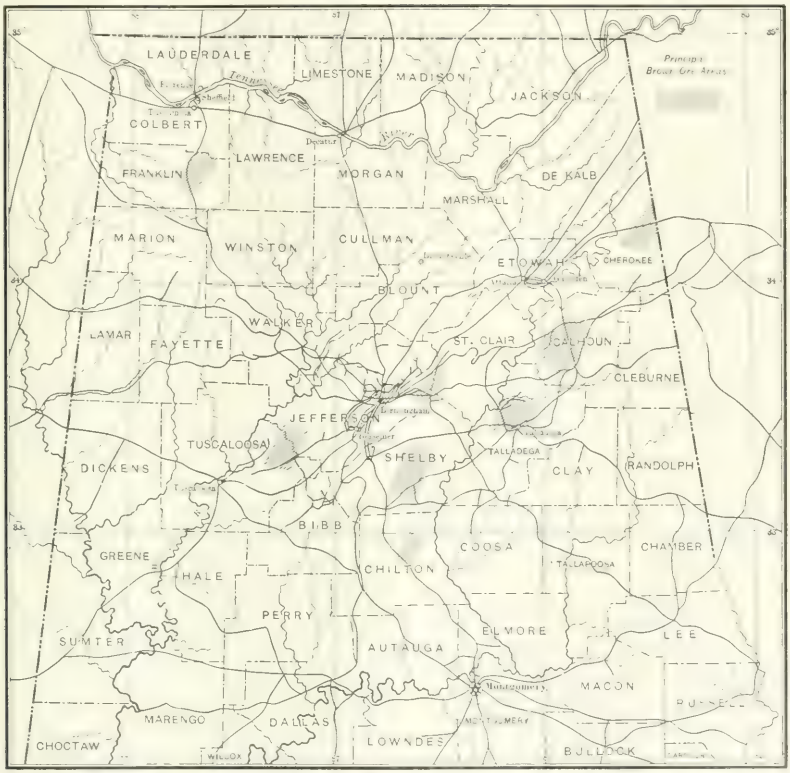
In Calhoun County the thickness of the Knox dolomite is from 3000 to 4000 ft., and the area covered is about 200 square miles. Many brown ore "banks" have been opened in this county in this formation, as the Windom, Walker, Edmundson, Pine Grove Church, Leatherwood, Cooper, Alexander (Morris Mining Company), &c. Cherokee County contains this formation over about 150 square miles, with a thickness of 3000 to 4000 ft. The deposits known as Weems, Dyke, Taylor, Carr, Washer, McClung, &c., belong here. It is possible also that a portion of the Baker Hill deposits is to be referred to the Knox dolomite. Chilton County contains about 12 square miles of this formation, but it yields no ore. Cleburne County has only about 3 square miles, but some "banks" have been opened, viz., Tibbs, Brewster, &c. Dekalb County contains about 55 square miles

of the Knox dolomite, with a total thickness of 2500 ft. No deposits are now worked in this county.

Etowah County has 100 square miles, with a thickness of 2000 to 2500 ft. There is one good deposit in this county which has been opened—the Robert Jelkes (northwest base of Colvin Mountain). Jackson County contains 80 square miles, with a thickness of 2000 ft., but no deposits are worked. Jefferson County has 50 square miles, with a thickness of 2000 to 3000 ft. No deposits are worked in this county, although the deposits at Greeley and Goethite would seem to come into the extreme southern part and to afford good ground. Marshall County has two small areas of Knox dolomite, but no mines. St. Clair County has 140 square miles, with a thickness of 2000 to 3000 ft. The deposits near Seddon, on the Southern Railway, are to be referred here. Shelby County has 200 square miles, with a thickness of 3500 to 5000 ft. The famous deposits at Shelby lie on the eastern edge of the Montevallo shales and above the Knox dolomite.

Talladega County has a large development of the Knox dolomite, 400 square miles, with a thickness of 3000 to 4000 ft. The deposits known as the Ledbetter, Singleton, Fournoy, Welch, Reynolds and Whiting, Carlton, Webb, Weisinger, Jones, Seay, Irona, Hurst, Pace, Lennard, Logan, Washer, Dye, Curry and Fox, Parker, Poorhouse, &c., belong here. The ores from the Knox dolomite in Talladega County have been used in the furnaces at Ironaton and Jenifer. It is probable that Talladega County will be the great brown ore county of the State. The Knox dolomite is especially favorable for the occurrence of extensive beds of brown ore, and it is developed on a very large scale in this county. The deposits that have been opened and worked have shown a good grade of ore, easily washed. The ore from some of the "banks" carries more phosphorus than is generally the case with our brown ores, but this seems to be a local circumstance. On the other hand, it may be stated that there were shipped from a Talladega County furnace some years ago 3000 tons of pig iron which was within the Bessemer limit for phosphorus. Tuscaloosa County has about 15 square miles of the Knox dolomite, with a thickness of 2000 to 2500 ft. The deposits around Greeley and Goethite belong partly here and partly in the Coosa shales (Cambrian), as already observed.

The maximum thickness of the Knox dolomite in the State is about 5000 ft., and the total area covered is about 1450 square miles, of which Bibb County has 40, Blount County 30, Calhoun County 200, Cherokee County 150, Chilton County 12, Cleburne County 3, Dekalb County 55, Etowah County 100, Jackson County 80, Jefferson County 50, St. Clair County 140, Shelby County 200, Talladega County 400, and Tuscaloosa County 15. The Knox dolomite is to be regarded as the most important source of brown ore. It is not known how much of the 1450 square miles under consideration contains work-



Map of the Northern Two-thirds of Alabama, Showing the Principal Brown Ore Areas in the State.

able beds, but many of the best ore "banks" have been opened in this formation.

(2.) The Pelham limestones (including also the Trenton, Chickamauga and Rockmart slates) have a thickness in the State of 600 to 1800 ft. They yield but little brown ore. Jackson County has about 30 square miles, with a thickness of 700 to 900 ft., but no ore is mined there.

The Lower Silurian, which furnishes brown ore, has a maximum thickness in the State of about 4000 ft., and covers a total area of 1480 square miles, of which 1450 belong to the Knox dolomite and 30 to the Pelham limestones, which lie between the Knox dolomite (Lower Silurian) and the Red Mountain (Clinton) of the Upper Silurian.

Upper Silurian.

The Red Mountain (Clinton, Rockwood) formation belongs here. In Jackson County there is an area of about 15 square miles, with a thickness of 200 to 225 ft.

It contains some deposits of brown ore that have not been opened. There are other isolated patches of brown ore in the Red Mountain formation, but they have not yet attained commercial importance.

Lower Subcarboniferous.

The Fort Payne (Lauderdale, Keokuk) chert is thus identified: The maximum thickness of this formation in the State is about 600 ft. and it covers about 1100 square miles. Bibb County has 8 to 10 square miles, with a thickness of 50 to 175 ft.; Blount County, 20 square miles, with a thickness of 175 to 225 ft.; Calhoun County, 30 square miles, with a thickness of 25 to 150 ft.; Dekalb County, 35 square miles, with a thickness of 200 to 300 ft.; Etowah county, 15 square miles, with a thickness of 150 to 275 ft. In the last named county, in Sand Valley, on the northwest slope of Red Mountain, the brown ore is associated with manganese ore.

Jackson County has 50 square miles, with a thickness of 100 to 150 ft., and Jefferson County 30 square miles, with a thickness of 250 to 300 ft. In Lauderdale County this formation reaches its greatest development, with a thickness of 175 to 250 ft., and an area of 450 square miles. In Limestone County, also, the development is extensive, with an area of 400 square miles and a thickness of 175 to 225 ft. The O'Neal deposit belongs here. Marshall County has an area of 15 square miles, with a thickness of 150 to 185 ft. St. Clear County has an area of 35 square miles, with a thickness of 150 to 275 ft. Shelby County has an area of 15 to 20 square miles, and the thickness varies from nothing to 150 ft. The following deposits appear to be in this formation: Bluff Creek, Lauderdale County; Cane Creek, Calhoun County; Janey Furnace, Calhoun County; Monahan, Calhoun County; O'Neal, Lauderdale County. Only a few of the deposits in the Fort Payne chert have reached commercial development.

Upper Subcarboniferous.

Under this head are Oxmoor, or Shale and Sandstone Phase; Bangor or Limestone Phase, and Hartselle Sandstones. The thickness is about 2600 ft., and the area involved about 400 square miles. Bibb County has an area of 10 square miles, with a thickness of 600 to 1000 ft. Chilton County has an area of 17 square miles. Franklin County has an undefined area around Franklin Springs. St. Clair County has an area of 120 square miles, with a thickness of 600 to 1500 ft. Shelby County has an area of 250 square miles, with a thickness of 1200 to 1800 ft. The Upper Carboniferous is not yet commercially important as a source of brown ore.

Carboniferous.

The thickness in the State of the carboniferous formation or coal measures is 5500 to 6000 ft., and the area involved 2285 square miles. Cherokee County has an area of 150 square miles, with a thickness of 400 ft. Dekalb County has an area of 600 square miles, with a thickness of 600 ft. Franklin County has an area of 150 square miles, with a thickness of 250 ft. The Rockwood deposits belong here. Jefferson County has an area of 700 square miles, with a thickness of 2000 to 2500 ft. Marshall County has an area of 325 square miles, with a thickness of 325 ft. The Ridgeway deposit belongs here. Tuscaloosa County has an area of 360 square miles, with a thickness of 4000 to 5000 ft. There are no deposits in this formation which are now at work.

Cretaceous.

The thickness of this formation is not yet known. The area involved is about 1160 square miles. Bibb County has an area of 415 square miles, with a thickness not yet known. The deposits around Woodstock lie partly in this formation, partly in the Knox dolomite and partly in the Montevallo. They belong to the Cretaceous, the Lower Silurian and the Cambrian. Tuscaloosa County has an area of about 745 square miles, thickness not yet known.

Tertiary or Lafayette.

The thickness is not yet known, nor is the area. Bibb County has an area of unknown extent. The deposits in this county may belong to the Lafayette, or to some earlier formation. The deposit a mile west of Centerville is a case in point. Colbert County has an area of 290 square miles, thickness unknown. The deposits known as the Wingo and the Linewood belong here. Franklin County has 460 square miles, thickness unknown. The deposits at Russellville and Parish probably belong here. Lauderdale County has an area of 125 square miles, with a thickness of 80 ft.

In Lauderdale County there is some brown ore in the Lafayette. In Shelby County, on Camp Branch, and in the southern part of Township 22, Range 1, East, two miles west of the Coosa River, there is an area which carries brown ore, and it may belong to the Lafayette. Tuscaloosa County has a little good ore in the Lafayette, but the commercial outlook is not very promising. Having thus considered the area within which commercial deposits of brown ore are found, we will consider, in subsequent articles, some of the more important deposits in detail.

A Map of the Principal Brown Ore Deposits.

The map accompanying this article has been prepared from a map kindly loaned by Dr. Eugene A. Smith, State Geologist of Alabama. Upon it the chief brown ore areas are delineated by cross hatching. It has not been thought necessary to show every deposit in the State, but only the principal ones, such, for instance, as the deposits in the counties of Cherokee, Calhoun, Talladega, Shelby, Tuscaloosa, Franklin, Chilton, &c., with the area in the eastern part of Jefferson County and the southwestern part of St. Clair. It is not meant that there are no other areas worthy of consideration. The mines now in operation are within the counties named.

While the area covered by the formations within which workable deposits of brown ore may be found is in excess of 7000 square miles, as already stated, this does not mean that there are 7000 square miles of brown ore lands in Alabama. It is not now known what is the workable area of brown ores in this State, and a great many years will pass before reliable data of this kind can be expected, if ever. From the very nature of brown ore deposits in this part of the country it is practically impossible to give the area within which this variety of ore may be profitably worked, or the reserves of ore in areas that have already been opened and from which ore has been and is being mined. Statements of the area within which workable deposits may be found must be taken with the understanding that each sub-area and almost each deposit is to be judged for itself. While there are certain general principles governing the matter they must not be accepted too literally. It is a very common remark that brown ore deposits are treacherous; they are workable to-day and not workable to-morrow. To-day the clay may yield pay ore, to-morrow there will be a "white horse" or a bed of stiff bluish clay that contains no ore at all. All of this, of course, is not to be denied, and yet there is a deposit of brown ore in Alabama that has been worked continuously since 1850, another since 1872, another since 1880. These deposits are being worked to-day and promise to afford good ore for years to come.

During the last 10 years there has been mined in Alabama nearly 7,500,000 tons of brown ore, and the present demand is active and at times insistent. There is every reason to believe that in the next 10 years the demand for good brown ore will be much larger than it has been in the last 10 years. As more and more of the limy ore is mined, more brown ore will be wanted. Some furnaces run entirely on brown ore, and there is scarcely a furnace in the State that would not gladly increase its use of brown ore if the supply of good material were to hand. The recent bringing in of 3000 to 4000 tons of Texas brown ore into Alabama was rendered possible by two considerations: It is very high grade for brown ore, the metallic iron running from 56 to 58 per cent., and it is remarkably low in phosphorus, 0.10 to 0.15 per cent. The average brown ore in Alabama does not contain more than 45 per cent. of metallic iron, nor below 0.30 per cent. of phosphorus.

The American Can Company, New York, has purchased the plant of the Acme Can Works, Montreal, Canada.

The Chilled Cast Iron Car Wheel.

Problems Growing Out of the Present Practice of Makers and the Railroads.

BY P. H. GRIFFIN.

The conditions that prevail in the manufacture and use of car wheels are so serious that the need of some prompt action to better them has become very urgent. The life of wheels has been reduced to less than half of what it was a few years ago, causing a heavy increase in cost of that service; certain causes of removal have become intensified and are increasing at a rate that indicates grave danger unless some remedy for them is found, and accidents caused by failures of certain kinds are becoming more frequent. In recent years steps have been taken by the Master Car Builders' Association and by representatives of the chilled car wheel makers to investigate the whole matter, and important action in the way of standardizing the section of chilled wheels has been secured. In fact, the whole subject has received more active attention in the past few years on the part of the makers and users of wheels than ever. A number of obstacles to be overcome in dealing with matters of this kind cause delay. These include the time necessarily required to make investigations and to secure the approval of railroads and manufacturers to one course of action; the cost of making the proposed changes; the time actually required to carry them out when decided upon; and above all is the disposition of wheel makers and of railroad officials immediately in charge of such questions to avoid any action that would indicate conditions involving responsibility that might be definitely located by public discussion.

Early Action Demanded.

If present conditions were such that considerable time could safely be taken to deal with them, it might be well enough to treat the matter that way. But unfortunately the causes that have created the present conditions do not properly admit of much time in dealing with them, and the danger to life and property is becoming so grave on account of the rapid development of these causes that it is high time the matter were plainly dealt with.

Naturally the winter season is the one in which the results are the most serious, on account of the decreased resistance of steel and iron to strain and shock under low temperatures, and at such seasons the difficulty of handling cars and the congestion at terminal points throw added burdens on all concerned. Thus arises such a question of physical endurance in dealing with this matter that it must be attended to during the milder season.

To review the subject and present some essential facts may enable railroad officials and wheel makers to get it in mind better. In this connection it is vitally important to give the whole matter reasonable and general consideration and to have united action from the standpoint of the grave responsibilities involved. It is not a question that can be individually dealt with.

Individual Action Does Not Meet the Case.

The handling of interchange traffic constitutes the principal part of the business of all railroads, and the danger involved in the failure of any one wheel reflects in a general way on all wheels of the same class. It will not do for any single railroad to think its responsibility is fulfilled by establishing certain orders of test inspections and purchase of wheels, or for any single wheel maker to content himself with his own practice and methods. The railroads are responsible as a whole for the rapid change that has been made in the loads carried and speeds attained, and the wheel manufacturers as a whole are responsible for such action as will preserve to the greatest extent possible the factor of safety in the product supplied. Unfortunately many causes have operated in recent years to reduce this factor until it is now at the lowest point ever known.

There certainly must be some limit at which the increase of speed and load must stop, and some limit at which the effort to reduce wheel costs ceases to be either practicable or possible. So far as the manufacturers of chilled wheels are concerned, the question of the cost and returns of wheel service has reached such limits in recent years that there can be no further progress in that direction. Of all items of railroad equipment none can compare with the chilled car wheel in low prices and reduced cost.

Many Unfit Wheels in Service.

To what cause this is due and to what extent it is really economical is not so important as the cold fact that hundreds of thousands of wheels are in service that should never have been put in, and many more that should be removed as quickly as possible because of defective condition. Railroad officials having a knowledge of these facts do not like wheelmakers to admit them, and unforunately such knowledge is possessed more in a general than a particular way. Assertions that present conditions are not very bad, and that the necessary, in fact all possible, steps are being taken to remedy the trouble are frequently made; but the continual and rapid increase of certain fatal defects found in nearly all wheels removed from under heavy equipment (and in the standard design of wheel generally adopted) does not bear out such assertions. The general practice in this country in matters of this kind is to make changes that promise the results sought for, then to institute them as current practice and later to develop the necessary means of meeting the situation.

The introduction of heavy capacity freight cars is an illustration. Their use involves a load of about 8 tons, frequently rising to 10 tons, per wheel. Under this burden the wheel must do its work in all seasons, often on heavy grades with brake application long continued, causing rapid heating of tread and flange. Rapid cooling in snow or water often follows, creating conditions that in any mechanical operation would never be expected to contribute to safety.

Price Factor.

So far as the chilled wheel is concerned the maximum available to produce an article for this arduous labor will not exceed $3.50, plus the delivery of an equal weight of wornout or scrap car wheels. Out of this small sum the maker must provide for all labor required; for coke, sand and all the sundry merchandise required for the manufacturing operation; for all cost of supervision, freight and general business expenses; for all claims on guarantee account; for cost of inspection and tests, and for the difference in value of all new iron used and of the scrap wheels received in part payment.

There are many ways of buying and selling wheels that appear to produce a different result in this matter of net payment, but the prices paid for years past and at present will not average that named. A standard 33-in. wheel for 50-ton car service weighs 700 lb., and on the basis named the maker receives $3.50. For this net price the railroads receive wheels guaranteed to give service of four years or more against all causes for which the maker can be held responsible. This means a theoretical cost of less than $1 per wheel per annum. It would seem as if the greatest theoretical economy in this direction has been attained.

Of course, all wheels do not remain in service for four years, an increasing proportion being removed in less time. Then a struggle between the railroad and the wheelmaker often takes place to see whether a claim for replacement under guarantee can be made or resisted.

To such length has this order of practice grown up that it is safe to say that the cost of inspecting and testing, of keeping guarantee records and of putting in and removing wheels from service, and of wrecks and accidents caused by wheel failures, far exceeds the net cost of new wheels purchased. It is not so material whether this condition is the fault of the wheelmaker, who, as some railroad officials say, should insist on a price sufficient to enable the production of good wheels and refuse to accept orders on any other basis, or of too rapid change in the wheel burden by rapid increase in carrying capacity of car.

The Steel Wheel.

The all important question is, what can be done to remedy present conditions It is said by some that steel

wheels must be used if chilled wheels cannot do what is demanded of them. With no desire to discuss a question that can only be settled by service results, it is interesting to consider the possibility of getting railroads to pay the price at which the cheapest steel wheel can be bought and its relative value as scrap when worn out compared with their unwillingness to add 25 or 50 cents per annum, on the basis set forth above, to the price paid for chilled wheels in order to secure a better article. Just what arguments and inducements will accomplish this result are not easy to see, but it is important for all concerned to weigh the matter fairly and squarely.

Divided Responsibility of Railroad Officials.

That the average wheelmaker wants to make and the average railroad official wants to buy good wheels, may be admitted. But it is necessary to say that these desires are not realized, the reason appearing to be one of a certain order of practice that has gradually grown up. The mechanical officer draws up specifications and tests; the purchasing agent gets competitive prices and guarantees; the order is placed, the wheels are made, presented for inspection and delivered if accepted. In drawing up specifications and tests or changing them from time to time, the mechanical officer inclines to the idea of making them more severe; it indicates more stringent practice. Each increase in test requirements naturally involves increased cost to the maker. But that is a question to be settled between the purchasing agent and the wheelmaker and one on which the mechanical officer is generally if not always silent. His duty is to make the tests exacting enough and to see that his inspectors enforce them.

The purchasing agent's duty is to buy the wheels subject to the tests and inspection, at the best competitive price and terms obtainable. Railroads generally place orders with manufacturers located on or near their lines. They generally establish current prices for new and scrap wheels annually or when prices change; but purchasing agents have been bargaining over car wheels so many years to gain a few cents (theoretically) from year to year on prices paid, that the average prices have gone down so far that the quality of iron that should be used to make a good wheel can hardly be bought for the price paid. It follows that cheaper iron and the least expensive methods of manufacture must be used to meet the price paid and avoid loss. This has gone on so long, and so many wheels have been made and put in use under these conditions that the reckoning has now come.

Railroads Getting What They Pay For.

Just why railroads should expect wheel makers to do business at a loss or whether they expect them to make and deliver good wheels regardless of the price paid, it is not easy to say. It is not probable that the railroads would accept the responsibility of conditions that prohibit the delivery of good and safe wheels. But are they relieved from responsibility for the purchase and use of car wheels, by reason of the fact that specifications, tests and guarantees call for the delivery of good wheels, when the fact is that the price paid is too low? An answer frequently made is that the wheel makers are eager for orders at present prices. Of course they are. To stand any chance of coming out even, the daily output must be kept up. Making a few wheels at $3.50 each is not an operation that can be profitably conducted; therefore, orders for more must be secured. But the total result is that the railroads will get what they pay for, and ultimately pay for what they get—somehow.

The Tread and Flange Changes.

To show the limit to which these matters have gone, the increase in thickness of wheel tread and flange officially adopted by the M. C. B. Association may be cited. Naturally, the increase would add to the weight of the wheel, necessitating a slight increase in cost for the extra metal. How many railroad companies have been willing to pay this slight extra cost? Wheelmakers, after much attention given this question, find themselves in the position of having to furnish the heavier wheel at the same price received for the wheel with lighter tread and flange.

It is argued on the part of railroad officials that the wheel with heavier tread and flange can be made within the standard weight limit. It is manifest that any maker altering his standard patterns to furnish the heavier tread and flange must cut them down somewhere else or leave the reduction to be accomplished in the process of ramming and molding in the foundry—a very dangerous method.

Better Iron Mixtures.

The question of mixtures of iron required to make a good wheel is being considered, but the experience of makers that have supplied wheels on specified mixtures has never been satisfactory. One of the large railroad systems specified mixtures for many years, publishing elaborate tables of mileage results, but in due course this practice reached the point where the mixture of iron specified could not be purchased at market prices, for the price paid for the wheels. Although this was known to the railroad in question orders were placed for some years on the old basis. No mixture, however good, will make good wheels without proper and experienced shop practice.

The Question of Chill.

The manufacture of chilled car wheels is unlike that of any other foundry product. To make wheels that will give sufficient mileage and pass tests for depth of chill the operation is always up to the limit of chilling quality in the iron, and thus many causes not properly regulated will increase hardness to the point where safe wheels cannot be made. These variations in chilling quality or hardness of mixture are constantly occurring in the operation, even when the same mixture of iron is used, and are due to slight variations in the quality of coke used for melting, to variations in charging the cupolas and to other causes, any one of which is sufficient.

It is only by constant vigilance and a proper and experienced knowledge of the work in hand that these matters can be controlled. After the molten iron leaves the cupola the time occupied and the method and care used in casting the wheel are equally important. The conditions are such nowadays, often a necessary result of using labor saving devices, that when any interruption occurs the molten iron is not properly handled to and cast into the mold, with the result that the wheel made from it is not of proper quality. After the wheels are made the same general conditions apply as to the process of handling to annealing pits, cooling, annealing, &c.

Cheapness the Ruling Motive.

It may be said that similar conditions apply to any mechanical operation. This is true; but no other mechanical operation of like importance or magnitude has to be conducted under the rigid rule of low cost that controls the making of chilled car wheels. There is no room for progressive or experimental work at the prices paid, and although a capable wheel maker can do business in good times successfully, if he has sufficient output, the important fact is that the whole operation has gradually progressed to the point where under the average practice, in the average business condition, it is not possible for the average wheel manufacturer to turn out proper wheels at the price paid.

This fact does not in the least prove that the chilled wheel has reached the limit of its efficiency. It simply proves that the limit of theoretical economy in the purchase and use of car wheels has been reached and that there is but one remedy that must be applied as a precedent to all others: that is to pay the price that will enable the production of wheels from good material made in a proper manner. Just how soon it will be possible for railroads to bring about such a change in the general practice, or whether it will be possible to do it at all, remains to be seen.

The condition is so grave that it may call for the attention of those higher up, and then the practical officials may feel disposed to deal with it more freely. There is not the slightest doubt of one fact—that no argument and no amount of discussion will begin to produce the

desired and actually necessary result shall all the important factors in the present situation are squarely recognized and dealt with.

A Matter of Grave Concern.

It does not profit the railroads to maintain any theoretical order of practice in such an important matter. It will cost far more in life and property to do so than to get down to the real facts and remedy the trouble. And it does not pay the wheel manufacturers, large or small, to consider and act on this subject from any standpoint but the right one. No advantage of competition, no securing of larger orders, can compensate for the responsibility and risk of making and selling wheels that are not equal to the service.

That the chilled wheel can be made of a quality and kind fully equal to any demands upon it in present service is certain, but it must be properly made and properly used.

The question is not, who can escape the responsibility for not arriving at this result? but how soon can the result be accomplished? And there is no one connected with the operation of railroads in any position, high or low, that should not be concerned as a result of the conditions described. There are many wheels in use which are absolutely unsafe, sure to fail at some time, undoubtedly to bring loss of life and property as the result. The matter has passed the point of theoretical discussion and reached that of vital concern to every one interested, either as entitled to reasonable protection of life in traveling or as responsible for the safe operation of railroads.

Increased Duties on Mexican Imports.

As indicated in *The Iron Age* of April 16, an increase in the import duties on iron and steel and a number of other products will, in all probability, soon be imposed by the Mexican Government. The nature of the pending changes in the customs tariff of that country is set forth as follows by a Mexican journal:

"The Mexican Department of Finance has submitted to Congress a bill for the increase of import duties on certain classes of merchandise. The Department states that, as a result of the monetary reform and the firmness in exchange rates, imported merchandise is sold cheaper than heretofore, the home industries suffering in consequence from foreign competition. Various industries have complained, and have made applications for a raise in import duties, and while the Department has been unable to take into consideration all the changes proposed by the Mexican industries, the most important have been given careful attention by the Government.

"Changes are made in the import duty on jute and jute manufactures, chewing tobacco, iron and steel, ordinary lime, Roman and Portland cement, benzol, cotton clothing, antiseptic cotton, common salt, and carriages.

"The present duty on steel is $5.50 per 100 kilos. The bill asks for a raise to 6 cents a kilo, which makes an increase of 50 cents per 100 kilos, or 6 pesos per ton.

"The duty on iron and steel in common bars will be 6 cents per kilo, instead of being 5½ cents. Iron and steel bars having some particular design will pay 7 cents per kilo. Iron and steel rails, weighing 10 kilos or less per meter, will pay $25 per ton, instead of from $10 to $20, as they now pay. Screw plates and nails for rail connections will pay 4 cents per kilo.

"Iron and steel bars for construction will pay from 3 to 5 cents per kilo.

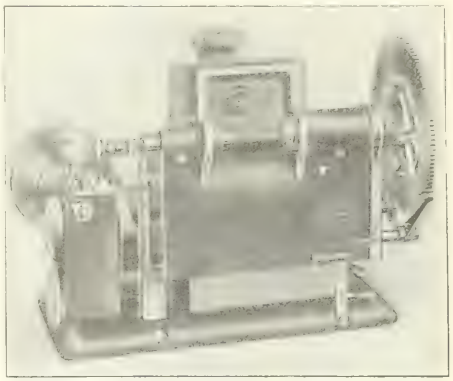
"The duty on cement will be increased from 55 to 70 cents per 100 kilos."

The iron ore production of Russia in 1907 is reported by the German consul-general at St. Petersburg to have been larger than in any other year. Excluding the manganese ore exported from Poti, it amounted to 262.1 million poods, or about 4,400,000 metric tons, as compared with 236.4 million poods in 1906. The amount exported was 60.5 million poods, as compared with 33.3 million poods in 1906. The South Russian metallurgical works received some 5.2 million poods more iron ore than in 1906, but the stock on hand at the end of 1907 was 31 million poods, as compared with 10 million poods a year previously. A pood is 36 lb. avoirdupois.

A Waltham Automatic Clock Gear Cutter.

The automatic gear cutter shown in the illustration is designed primarily to cut brass gears such as are used in clock and similar movements. It can also be used, however, to cut iron or steel gears of fine pitch, and, by the use of heavier spindles, gears as coarse as 24 pitch. A number of its mechanical principles are the same as those of the pinion cutter described in *The Iron Age*, Jan. 30, 1908, and also built by the Waltham Machine Works, Waltham, Mass.

All the movements of the machine are controlled by a cam shaft, which is driven through a worm and worm gear. The cutter spindle is made to endure a high speed and the slide carrying it is automatically lifted



A Machine for Cutting Small Gears, Built by the Waltham Machine Works, Waltham, Mass.

during the return stroke of the work slide, so that the indexing can be done without loss of time. This in connection with the quick return gives the machine a high rate of production, which may be further increased on gears than can be cut in a stack by providing duplicate arbors, so that one can be loaded while the other is in the machine.

An index 10 in. in diameter is used and on account of its proportionately large size very accurate divisions of the work are obtained. A range from 12 to 240 teeth can be had by providing the necessary indexes. The largest diameter that can be cut in brass is 3 in., but for steel work this can be increased to 4 in., because the protection from chips ordinarily provided is unnecessary. Provision is made for an attachment by means of which the machine will cut twice around the work before stopping, and also shift the depth of cut the second time around. This is unnecessary in ordinary work, but it is desirable where very smooth teeth are required.

The protection of the index and cams from chips is a feature, and is afforded by a scraped plate attached to the cutter slide and fitting closely to the hood of the work carrying slide. The hood has a detachable cover, shown at the left in the illustration, which, when in place, causes the chips to fall directly in front, where they can be removed easily. The opening of the hood at the back is large enough to allow for the longest movement of the slide and for the highest position of the cutter. When the cover is removed, which is accomplished by simply lifting it from the locating pins, there is ample room for removing and replacing the work and to see to the setting of the cutter on the center.

The Wilmarth & Morman New Combination Grinder.

A combination drill, cutter and reamer grinder known as style BX and made by the Wilmarth & Morman Company, Grand Rapids, Mich., is shown in the accompanying engravings. Beyond saying that the drill grinder is the familiar New Yankee type with its time consuming adjustments practically eliminated, there is scarcely need of further description. The machine can be furnished with a range of drill grinding capacity adapted to the range of drills in use in various shops. The cutter grinding attachment is of substantial weight and is firmly attached to the main column of the machine. Fig. 1, which is a view of the complete machine as seen from the cutter grinding attachment side, shows clearly the type of drive employed. The bearings, ways and all constructional features, it is claimed, have received the careful attention necessary to insure convenience and generally satisfactory service, and for almost all cutter grinding

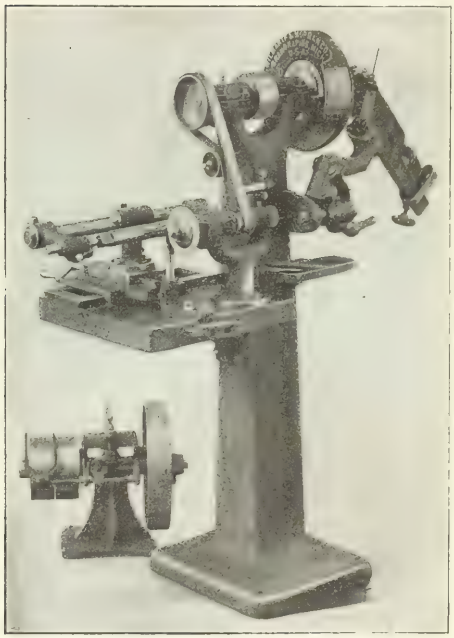


Fig. 1.—The Style B X Drill, Cutter and Reamer Grinder Made by the Wilmarth & Morman Company, Grand Rapids, Mich.

the machine is declared to be as convenient as a grinder specially intended for that class of work.

The manner in which the machine is set up and operated for grinding face and side mills is indicated in Fig. 2. The grinding is performed by sliding the work past the face of the wheel, to effect which movement a convenient lever is provided. Fine movements of the cutter to and from the wheel are made by a screw adjustment, and the clearance can be readily regulated as desired. Face and side mills up to 12 in. in diameter can be handled by the cutter grinding attachment.

Angle cutters are ground in much the same way as side mills, except that, as Fig. 3 shows, the head which carries the cutter is swiveled to the desired angle. To facilitate this the circular base of the head is graduated in degrees. The illustration shows a 45-degree double angle cutter in position, but cutters of any angle can be ground and of any diameter up to 8 in.

The gear cutter grinding device, which is shown in Fig. 4, possesses a universal adjustment that provides convenient means of grinding gear cutters correctly. The sliding

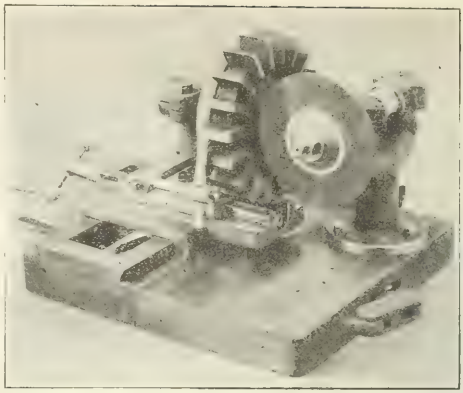


Fig. 2.—Setting for Grinding Face and Side Mills.

table is first set so that a radial line from the center of the cutter intersects the grinding edge of the saucer-shaped wheel. This position of the slide is fixed by a thumb screw. By a micrometer adjustment the cutter is elevated so that it centers in hight with the center of the wheel. The gauge is then set in the position which corresponds with the grinding edge of the wheel and while the face of the tooth is thus retained the spring index dog

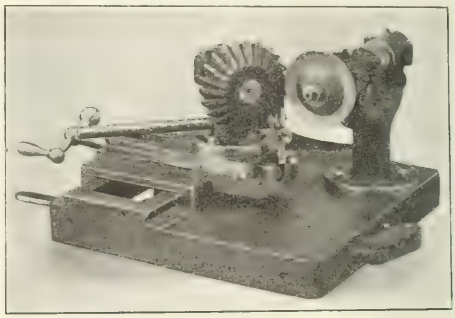


Fig. 3.—Setting for Grinding Angle Cutters.

is clamped in position as shown. The grinding movement is controlled through a screw, a couple of turns of the handle of which passes the work in and out once for the grinding of each tooth. The capacity of the device includes gear cutters up to 6 in. in diameter.

The grinding of reamers is illustrated in Fig. 5. The swivel base makes it possible to grind reamers either parallel or with any required taper. The reamers may also have either straight or spiral flutes up to 8 in. long and the diameter capacity is also 8 in. Ordinary straight

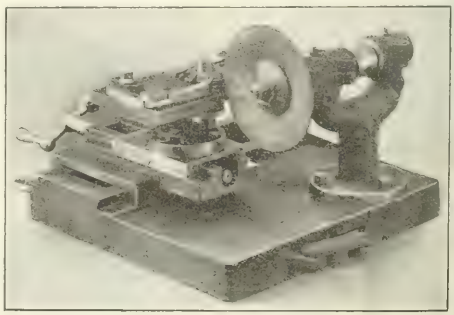


Fig. 4.—The Gear Cutter Grinding Device.

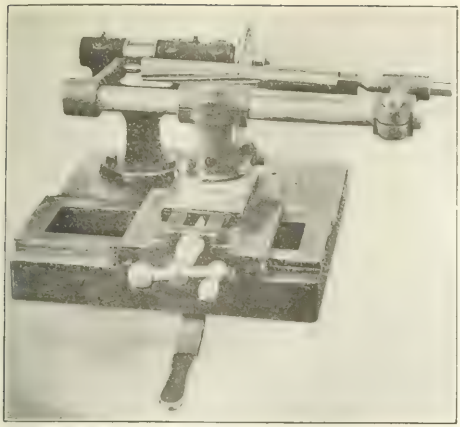


Fig. 5.—Setting for Grinding Reamers.

or spiral milling cutters are ground in the same way as is shown in this illustration for reamers.

The New Currency Act Epitomized.

As passed by Congress, May 31, the new measure starts with a provision for note currency based on commercial paper. This is to be issued by "national currency associations," to consist of banks 10 in number, and with a combined capital and surplus of at least $5,000,000. Such associations are to be organized in substantially the same way as the "clearing house associations" of the old Vreeland bill. The notes, however, are not to be allotted to banks unless the latter already have out notes based on national bonds and equal to at least 40 per cent. of their capital stock. When issued the notes shall not equal more than 75 per cent. of the paper and securities deposited with the association. The issue may, however, be raised to 90 per cent. of the securities deposited, which are State, county or municipal bonds.

In any case the notes issued are not to exceed 30 per cent. of the capital and surplus, while the term "commercial paper" is to be limited to notes with two responsible names, running not over four months. The banks are to be jointly and severally liable for the notes issued, and in case any bank lets its redemption fund in the Treasury run down the department may fall back for cash by a complicated method, upon the other banks in the national currency association to which it belongs.

The provisions of the Aldrich measure are seen in section 3, which provides that banks of the classes already specified may take out notes based on State, county and municipal bonds to the extent of 90 per cent. of such bonds deposited with the Treasury. This will figure out about the proportion of 60 and 40 per cent., or $300,000,000 and $200,000,000, as announced yesterday. The banks are to keep with the Treasury 10 per cent. of the new circulation taken out under the terms of the bill, such 10 per cent. to be used and treated the same as the redemption fund now held by the department against the old notes.

The maximum issue of notes is to be $500,000,000, and the issues are to be apportioned to the several States by the Secretary of the Treasury so far as possible in proportion to capital and surplus of the national banks in each State. The tax on the notes is to be 5 per cent. the first month, rising at the rate of 1 per cent. per month to 10 per cent. When presented at the Treasury the notes are to be redeemed in lawful money. Government deposits in banks are to pay interest at not less than 1 per cent. per annum. The national monetary commission is to be organized substantially as originally provided in the Aldrich commission bill.

On May 11 No. 4 Ensley Furnace of the Tennessee Coal, Iron & Railroad Company, at Ensley, Ala., broke the record at that plant by producing 414 tons in 24 hours. The best previous record was 403 tons, made March 31.

April Exports and Imports of Iron and Steel.

The report for April of the Bureau of Statistics of the Department of Commerce and Labor presents no marked changes in exports and imports of iron and steel. The total value of such exports shows a continuance of the increased outward movement, while the figures for imports indicate that the diminution of the inflow has not been checked. The total value of the iron and steel exports, not including ore, for the month of April was $15,467,319, against $15,165,910 in March, $14,069,249 in February, and $13,643,828 in January. Taking the commodities for which quantities are given, the total for April, a 30-day month, is 93,522 gross tons, against 96,437 tons in March, 81,755 tons in February, and 74,352 tons in January. The following table gives details of the exports of such commodities for April and for the 10 months of the current fiscal year ending with April, as compared with corresponding periods of the previous year:

Exports of Iron and Steel.

	April.		Ten months.	
	1908.	1907.	1908.	1907.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	5,153	8,211	43,991	71,701
Scrap	2,929	3,786	16,040	14,392
Bar iron	302	1,161	11,810	38,765
Wire rods	713	626	5,671	9,021
Steel bars	3,494	8,485	57,289	36,451
Billets, blooms, &c.	3,822	8,867	83,482	102,811
Hoop, band, &c.	331	78	8,115	5,272
Steel rails	20,999	40,293	252,315	261,238
Iron sheets and plates	3,050	4,234	35,692	24,234
Steel sheets and plates	4,347	9,825	51,463	81,724
Tin and terne plates	5,095	1,882	12,766	6,131
Structural Iron and steel	13,741	13,724	120,788	103,799
Wire	13,619	14,846	134,467	138,666
Cut nails	1,039	1,202	5,366	6,554
Wire nails	2,253	4,195	32,643	33,277
All other nails, including tacks	313	566	5,036	5,651
Pipes and fittings	12,731	10,811	150,755	105,038
Totals	93,522	132,792	1,027,689	1,044,725

Turning to the imports, it is found that the total value of iron and steel imports, not including ore, for April was $1,633,812, against $1,696,800 in March, $1,697,525 in February, and $2,076,766 in January. Taking the commodities for which quantities are given, the April total is only 12,342 gross tons, against 15,885 tons in March, 19,054 tons in February, and 28,008 tons in January. The following table shows the details of the imports of these commodities for April and for the 10 months of the current fiscal years ending with April, as compared with corresponding periods of the previous year:

Imports of Iron and Steel.

	April.		Ten months.	
	1908.	1907.	1908.	1907.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	3,003	61,304	189,776	453,685
Scrap	111	1,408	17,077	14,654
Bar iron	830	1,189	31,345	31,244
Rails	417	400	2,626	3,924
Hoop, band, &c.	26	10	463	4,068
Billets, bars, and steel in forms n.e.s.	797	926	14,582	16,156
Sheets and plates	245	247	2,230	3,024
Tin and terne plates	6,155	6,468	48,538	51,875
Wire rods	706	1,395	11,831	14,530
Structural iron and steel	52	338	1,418	8,925
Totals	12,342	73,685	319,886	602,085

The imports of iron ore in April were 48,153 gross tons, against 52,729 tons in March and 80,094 tons in February. All but 96 tons of the April imports came from Cuba.

The total value of all kinds of exports of iron and steel, not including ore, for the 10 months ending with April was $161,034,823, against $149,710,569 in the corresponding period of the previous year. The total value of similar imports for the 10 months ending with April was $24,500,926, against $32,795,503 in the corresponding period of the previous year.

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Terminal Railroads at Iron and Steel Works.

An interesting question has arisen, following the vigorous campaign against rebates by railroads either by direct refund or by the indirect method of unwarranted allowance for switching on terminals owned by shippers, or of low special rates given to shippers furnishing their own cars. Argument was made before the Interstate Commerce Commission recently on a matter involving a discrimination by carriers in their treatment of shippers having their own terminal facilities. The outcome naturally to be expected is that the railroads will be required to discontinue certain allowances made for work performed by manufacturing companies in switching and spotting cars, or to grant compensation on equal terms to all shippers doing such work.

For about 30 years it has been the custom in certain iron producing sections for the railroad carriers either to do themselves the work of switching and spotting loaded cars consigned to or shipped by blast furnace companies, for example, at such places in the yards of the companies and at such times as the manufacturing company directs. Thus the furnace company would have its iron ore, coal, coke and limestone spotted at the point of consumption without charge other than the established tariff rates. A different form of the same custom has grown up in connection with very large plants, such as those of steel companies having their own blast furnaces. The intricate track systems needed at such plants and the extent of the internal traffic would make it inconvenient for the railroad to go into the yards and spot inbound material or cars having outbound product, as required by the industrial company. The latter in a good many cases has organized a terminal railroad company, which does the work of switching and spotting cars for an allowance of, say, $2.50 a car made by the carriers in proportion to their participation in the freight rates. This has applied to practically all inbound material and outbound product on which the freight rate is 50 cents a ton or more. One instance is known in which the railroad company and the manufacturing company agreed upon a per diem allowance representing the actual cost to the terminal railroad of doing the work.

Some time ago a furnace company in the Central West brought a complaint against a railroad before the Interstate Commerce Commission. The furnace company had provided terminal tracks of its own, but the railroad company had refused either to perform the service referred to or to make an allowance to the terminal railroad for doing the work. It was alleged that inasmuch as the practice above outlined had prevailed for 30 years the refusal of the railroad to perform it or to make an allowance to the shipper for performing it constituted a preference in favor of the shipper's competitors and was therefore discrimination against its plant. The ground taken by the complainant was that while it might not have been possible 30 years ago to compel a railroad to furnish such service, yet the railroads having seen fit to render it as part of the service covered by their regular rates, or to pay for it where performed for them, they must afford it equally and without discrimination to all shippers similarly situated. The relief asked for was that the commission require the railroad companies to make an allowance to the complainants of $2.50 a car on inbound material and outbound product producing a net revenue of 50 cents a ton or more to the carriers, or compel the railroad companies to cease from performing this service or paying for it to competitors of the complainant. Two other cases were brought in which the same general issue was joined, but they differed from the one cited above in that no charge of discrimination in favor of competitors was made, the shipper through its terminal railroad company demanding an allowance from the railroad company merely on the theory of *quantum meruit*, claiming that it rendered a service to the railroads and should be paid for it.

The position taken by the railroads before the Interstate Commerce Commission was that the complainant industrial companies had provided their own terminals for reasons of their own, without any reference to the railroad, and that the railroad had performed all the services it was legally bound to give when it delivered cars within the property line of the shipper.

The question involved is one of many arising under the new régime which gives so large a discretion to the Interstate Commerce Commission. It suggests the wide swing that has been made from the time when the railroads readily granted inordinate advantages to the owner of a terminal railroad to this day of their unwillingness to yield up a jot beyond the requirements of the constituted authorities.

American Patents and Trademarks in Japan.

It is officially stated that negotiations between the United States and Japanese governments relative to conventions which will secure protection to American patents, trademarks and copyrights in Japan and Corea have been brought to a satisfactory conclusion and that a treaty on the lines of those existing between this country and other important nations will become operative in the near future. Protection for American ideas in Japan has long been needed. There have been flagrant cases where patents and trademarks have been deliberately appropriated by Japanese manufacturers and merchants. American inventions, protected by patents at home and in those countries with which we have treaty relations, have been patented by Japanese in their own country. American trademarks have been similarly registered, to the consequent exclusion of the products which rightfully bore them. In one case a manufacturer of firearms discovered that a Japanese jobbing house which had been acting as his agent, but which had given up the line, had registered his trademark, which is one well known throughout the world, and is consequently a valuable trade asset. When it was decided to place the line with another house the fact was brought to light that the

American firearms could not be sold in Japan under the trademark, because to do so would be in violation of the trademark as registered by the native merchant. Other complaints of this character have been frequent. Manufacturers in other countries have suffered similarly. The Japanese have proved themselves marvelously well equipped to adopt or adapt the ideas of others, and at the same time their business ethics differ from ours.

While details of the proposed treaty are not available, it is probable that its operation cannot be retroactive. Patents and trademarks lost to Americans in the past cannot be restored unless the treaty provisions differ from those with other countries. Priority of date of patent or trademark will count for little. But in the future Americans will be protected; the Japanese courts will doubtless see justice done. An important element of business friction and distrust will then disappear.

Arbitrating Machinery Trade Disputes.

In accepting the principle of arbitration in the settlement of differences between its members, the National Machine Tool Builders' Association has established itself in a new and important usefulness, especially in disputes arising from patents. The recommendation of the Committee on Resolutions, which was adopted by the association, provides that members shall refer their disputes to an Arbitration Committee consisting of one member chosen by each of the interested parties and a third selected by the original two. This is the common arrangement when arbitration is made the means of bringing about an equitable settlement of business contentions, and is undeniably a fair one.

The history of the American machine tool trade covers a number of instances in which litigation between manufacturers now belonging to the association have been carried to costly lengths in the courts. The patent laws are conducive to protracted legal contests. Probably no shorter cut to the determining of the rights of the parties is feasible, but however that may be, a patent case is notoriously expensive. If it can be avoided, the litigants are spared serious expenditures, which must be figured into their overhead costs and thence into prices and margins of profit. Occasionally there is a case that cannot be handled outside of the courts because the issues are so very important that a final decision is essential to the complete establishment of the patent. With certain inventions, notably those where basic claims are allowed, a test case in the courts may be considered as a necessary part of the patent proceedings, and may even be courted by the owner of the invention.

Usually, however, disputes between members of an engineering trade may be settled as satisfactorily before a fair minded Arbitration Board as in the courts. The expense must be decidedly less, while the saving of time is another important consideration. As between members of an association which already includes by far the greater number of the important people of the trade, and which continues to grow in size, the settlement of one dispute would establish a precedent that would probably be followed generally. If a member should claim that another is infringing upon a patented feature, and an Arbitration Committee should uphold the contention, then other members would abide by the finding, and either avoid the use of the mechanism or else arrange some basis of royalty or shop rights. The same general condition exists in the use of trademarks, and even copyrights, where trade literature is copied to the detriment of the interests of its originator. These are not the only possible contentions in which the Arbitration Committee might be employed to advantage. Even disputes over causes for which the courts provide no redress might be handled in this way, as, for example, where one member is hiring men from another, disrupting his working force, which may be fair enough from the standpoint of cold business, but which at the same time may constitute a source of just complaint as between members of an association that is working for the common good of a great branch of industry. Then there are those cases where laws are involved, but where the issues are not of sufficient magnitude to warrant the expense of going to the courts. Naturally, ill-feeling is engendered in even such minor matters, which is the more enduring because no settlement is ever reached.

It should be simple enough to develop the machinery of the arbitration system for practical operation. The parties in dispute may deal directly one with another, which would usually be possible, or the official board of the association may use its influence to bring about the disposal of the case through the medium of a committee tribunal. Circumstances must govern the individual case. There can be nothing binding upon the members to compel them to arbitration, but the method is one that should appeal to the business instincts of most manufacturers, because of its economy of time and money. The results of the association's existence have made this possible. Friendliness is now a factor in the machinery trade. The antagonism which has sometimes characterized the relations of rival manufacturers in the past has been eliminated to an astonishing extent. This is likewise the condition in other engineering and metal trades, though it is not yet universal. The trend is sharply in the direction of co-operation, and there are few ways in which this phase of business relationship may be better directed than in the settlement of trade disputes by friendly arbitration.

The Case of the Chilled Car Wheel.

The developments at the recent conference in New York of car wheel manufacturers and representatives of railroad operating departments are the occasion of the article printed elsewhere, which Mr. Griffin has prepared at our request. Hackneyed as the car wheel discussion has come to be, this further statement of the case is timely, in view of the consideration car wheel specifications will have at the railroad conventions this month. Much as has been said, repetition is still in order so long as a question of so much moment to the railroads, the wheel manufacturers and all who travel, is so far from satisfactory settlement. The fact that the passenger car wheel is not in itself a part of the problem does not eliminate the traveling public as a party in interest, for there are the well known possibilities of accident to passenger trains from wheel failures on freight trains traversing adjoining tracks.

We referred some time ago to the wheel problem as differing from the rail problem both in its conditions and its treatment. While the rail has had none too much attention, albeit railroad comment has been at times most ill considered, the real awakening to the seriousness of the car wheel situation has come late. What Mr. Griffin writes, out of his experience as a car wheel manufacturer, gives the impression that while some palliatives have been employed at times, the cure for the combination of maladies from which the chilled car wheel trade has long been suffering has not been found. Furthermore, if found, there are apparently a long road and many obstacles between its discovery and its application. Yet when it is considered that out of apparently irre-

concilable differences between the railroads and manufacturers a way was made to agreement on a new steel rail specification, the car wheel situation is not to be given up as hopeless. Thus far the railroad purchasing department has had a preponderating influence. The technical staff, as the recent New York conference indicated, is aroused to a new sense of the gravity of the situation. What is yet to come is the attacking of the problem by the highest railroad authority and the elimination of those administrative practices that in so many cases have put cheapness before the highest wheel quality and the highest attainable degree of safety.

The Protection Movement in England.

What are known as special elections in this country, elections due to the resignation or death of a member of Congress, are known as by-elections in England; and when a by-election is contested it arouses a keen and widespreed popular interest quite unknown in this country in connection with a special election to the House of Representatives. The general election in England took place in January, 1906. Between that time and the end of April there had been 38 contested by-elections, in which two seats were captured by the Labor party from the Government, and six seats were regained by the Tories and protectionists. The question of protection was to the front at many of the more recent of these by-elections, particularly at Worcester, northwest Manchester and Dundee.

The Contest in East Wolverhampton.

But of all the by-elections since 1906 there has been only one in an exclusively iron and steel manufacturing constituency. This was the election which took place for the division of East Wolverhampton at the beginning of May, where there was a vacancy due to the promotion of Sir Henry Fowler to a peerage. Fowler is a free trader, and at the general election in 1906 he carried the seat by 2865 votes in a constituency in which there are 10,000 electors. Wolverhampton for more than 70 years had been an absolutely safe Liberal seat, and it easily fell again into Fowler's possession at the general election, in 1906, when Chamberlain's policy of protection and colonial preferences was for the first time submitted to the whole of the British electorate.

At the by-election last month protection was again the leading issue. The Government's education policy, to which Episcopalians and Roman Catholics all over England are hostile, and its licensing bill, which has aroused the bitter opposition of the brewing and liquor retailing trades from Berwick-on-Tweed in the north to Land's End in the southwest, were of the issues of this Wolverhampton contest. But the Tory candidate—L. S. Amery, who is of the *Times* staff—from beginning to end of the campaign laid most stress on the question of protection. Willenhall, the largest center of the lock making industry in England, is within the division of East Wolverhampton. The lock trade just now is bad; and other of the lines of builders' hardware, as well as the hardware industry generally, are suffering from the prevailing depression in English trade. The lock making industry, in particular, is so bad, that many of the men are not earning $2 a week. The Tory candidate attributed all these conditions to the lack of a protective tariff in England and to the protective tariffs of the United States and Germany.

The Liberal candidate's answer to this was that depression in trade was not confined to England—that it was more acute and more widespread in Germany and in the United States than it was in England. Moreover, the free traders at Wolverhampton laid stress on the fact that the Chamberlain Tariff Commission—the nonofficial commission of inquiry that was appointed as part of the protectionist propaganda—recommends a duty of 6¼ per cent. on steel bars, and 10 per cent. on iron and steel sheets. Such duties on imported raw material, it was insisted, would greatly hamper the Willenhall District in its oversea trade, and tend also to reduce the home demand for its products.

The Protection Candidate Loses by Only Eight Votes.

A two weeks' campaign preceded the polling. Protection was more persistently discussed than at any recent by-election; and instead of being discussed on general lines, as had been usual, it was discussed almost exclusively from the point of view of the different branches of the iron and steel industry of Wolverhampton. The free traders had almost everything in their favor. The Liberal candidate was a local man, while the Tory was a carpet bagger. But it was only by eight votes, in an election at which over 9000 votes were polled, that the seat was retained for the Liberal and free trade candidate.

Protectionists all over the country were almost as gratified with Amery's heavy poll of votes as though he had carried the seat. It is their most outstanding "moral victory" since Chamberlain announced his new policy in May, 1903; and taken in conjunction with the successes which the Tories and protectionists have achieved at the by-elections since 1906, it is good proof of the headway which the protectionist movement is making to-day in England.

The English Protectionists and the Colonies.

With the recent gains for the protectionist movement there has come a change in the English propaganda that has so far received little or no notice in the American daily press. From 1903 to 1906 most emphasis was laid on Chamberlain's wholly unfounded conviction that the British colonies, and Canada in particular, would at once let down their tariff bars to British manufactures if Great Britain would tax foodstuffs from the United States and other non-British countries, and admit these products from the Dominion and other British colonies duty free. The underlying idea of Chamberlain's scheme was to enlarge the market for British exports in the colonies, and set up preferences for colonial products in England. Empire was behind the idea; and it was on the value of the plan as a means of knitting the Empire together that most stress was laid in Parliament, on the platform, and in the press between May, 1903, and the general election in 1906.

But since then Canada has revised its tariff, and in so doing has imposed higher duties on many British imports that were levied under the preferential tariff of 1897. Australia also has followed Canada's example, both as regards high duties on British imports, and bounties in aid of the iron and steel industry at the antipodes. Information as to these changes is gradually percolating into the British mind; with the result that at these recent by-elections less was heard of the lowering of colonial tariffs in return for preferences on colonial products at British ports than at any time since Chamberlain five years ago took England by surprise with his scheme for the abandonment of free trade.

It is just as well for the English people that the colonial position is at last becoming popularly understood, for there would be nothing but disappointment and heart burning if Great Britain adopted protection, and stood ready to set up preferences for the colonies, and the colonies were then to inform the other country that they had nothing to concede in return for these preferences. That they would concede nothing of value to British manufacturers can be judged from a recent pronouncement on the subject from the Canadian Manufacturers' Association, the organization which 11 years ago was completely successful in inducing the Liberal government, then newly in power at Ottawa, to abandon every fiscal and economic principle that the Liberals had advocated while in opposition in the Dominion Parliament from 1879 to 1896. The message to England, sent at this juncture in the tariff controversy there by the Canadian Manufacturers' Association, through its organ, *Industrial Canada*, reads as follows:

The policy of Canada, backed up by the vast majority of the people of this country, is to build up our own manufacturing industries, and no country, not even Great Britain, can hope

to cater to this market on even terms with our own people. Canada has already done all that can fairly be expected of her for the British manufacturer, and if a preference for Canadian products in the British market depends upon further concessions from Canada, it is to be feared that there will never be a preference. The preference already given has been a serious blow to some lines of Canadian manufactures, and the chances are all in favor of its being wiped out, so far as these lines are concerned.

Chamberlain had paid only a flying visit to Canada before he became Colonial Secretary. He was there for a few days in 1898; but this was five years before he turned his attention to breaking down the free trade system of England. Of Canada he knew next to nothing at first hand when he launched his new scheme in 1903. Had he known more of it he would never have framed his new scheme on the lines he did; and it would not have been necessary for the Canadian Manufacturers' Association to send to England in May, 1908, the message from *Industrial Canada*, that there are to be no more concessions in the Dominion tariff to British manufacturers, with the curt intimation to British tariff reformers, with which the message is concluded, that "preference, like charity, should begin at home." E. P.

The Status of American Manufacturers in the Philippines.

Wm. C. Gregg, president of the Gregg Company, Ltd., Newburgh, N. Y., takes exception to the appeal for free admission of Philippine products made by John Stryker Hord before the Machinery and Supply Convention at Richmond, Va., May 13. Mr. Hord's address was published in *The Iron Age* of May 21. Mr. Gregg spoke on this subject before the convention of the National Association of Manufacturers in New York City May 19, offering also the following resolution, which was adopted:

Resolved, That the National Association of Manufacturers is opposed to opening the United States markets to free importation of the products of the Philippine Islands, as long as the American manufacturers are not given the same tariff protection in the Philippine Islands that they have in the other tropical possessions of the United States.

Mr. Gregg's address in support of his resolution was in part as follows:

The Philippine Islands Have Their Own Tariff.

"The United States tariff is not in force in the Philippine Islands, but Congress has enacted a special tariff for the islands, which is levied against the imports from the United States on the same basis as imports from other countries. This Philippine tariff is enacted for the purpose of raising revenue to run the Philippine Government, and is drawn up with little or no regard to any interests except those in the islands.

"I am very sure I will surprise my hearers by stating that the Filipinos are buying agricultural machinery in Europe, and importing it into their islands under a duty of only 5 per cent. ad valorem. The people in the United States, Hawaii, or Porto Rico, who wish to import similar machinery from Europe, have to pay 45 per cent. duty. Let me quote from the Philippine tariff the paragraph covering the machinery in question, that I may be thoroughly understood.

"'Sec. 245. Agricultural machinery and apparatus, machinery and apparatus for pile driving, dredging, hoisting and making or repairing roads, for refrigerating and ice making, sawmill machinery and apparatus for extracting vegetable oils, and for converting the same into other products, for making sugar, for preparing rice, hemp and other vegetable products of the islands for the markets, and detached parts therefor, also traction and portable engines and their boilers, adapted to and imported for and with rice-threshing machines, and steam plows, 5 per centum ad valorem.'

"Before further discussing this paragraph, I wish to say I do not propose to touch on the great American tariff question at all. The arguments for high and low tariff are entirely foreign to the point I wish to bring before the American people at this time.

"I am not taking a position antagonistic to the free admission of Philippine products into the United States, except as such acts, coupled with the present Philippine tariff, would work hardships on the American manufacturers. Take the sugar industry, for example. You will note in the quoted section the three words, 'for making sugar,' and if you will look back in the paragraph, you will see this refers to 'machinery and apparatus.' If we should open our sugar markets and allow Philippine sugar free entry to the United States, there is no reason why it should not cause as big a boom to the island sugar business as was caused by similar tariff treatment to Hawaii and Porto Rico. The machinery for making sugar bought by Hawaii and Porto Rico, made a large amount of business, and is still making it, scattered all over the United States from San Francisco to Philadelphia.

"There is no reason why this section might not be made to cover an entire sugar mill, costing, including structural material, corrugated iron, glass foundation, building hardware and all equipment, from $200,000 to $1,000,000. The first requisite in making sugar is a mill, and mills are made in Germany and England as well as the United States, and shipped to various tropical countries encircling the globe. The promoters of Philippine plantations would buy their machinery in the cheap markets of Europe, because they would have to pay a duty of only 5 per cent. to enter it in the Philippine Islands. If I owned a plantation in the Philippines, I would certainly do the same thing under such conditions.

"The reports of the Treasury Department at Washington show that for the six years 1901 to 1906 we bought 40 per cent. of their products, while they gave us 15 per cent. of their trade.

"You understand that in admitting Philippine sugar free of duty we take so much revenue out of the Treasury of the United States. It is interesting to think where this money will go: 1. The moment such a bill passes Congress and is approved, the value of all good sugar land in the Philippines will double at once. Much of this land is held by foreigners; I mean by others besides native Filipinos, and they, on account of their business acumen, will be the principal ones to organize and get the money from the United States Treasury. 2. The Chinese merchants, or middlemen, both in Manila and in China, are the ones who buy and handle the Philippine sugar. 3. The European manufacturers of sugar machinery.

An Unfair Course to American Manufacturers.

"It seems strange to me that such an unfair course to American manufacturers should be persistently advocated by a number of very intelligent Americans. It is because they have become so unselfishly interested in the Philippine Islands, and have become so much imbued with the missionary spirit of giving freely to those whom we wish to help, that they have quite lost sight of the United States bread-and-butter side of the question, and I think they have quite lost sight of the large proportion of the profits which would go, not to their proteges, the native Filipinos, but to the sharp business men of the Orient and Europe, to whom I have just referred.

"It has been urged by Secretary Taft and others that the development of the Philippine sugar business would be very slow and it would be years before it would reach volume enough to affect any interests. Well, let us see. The Hawaiian production of sugar is now almost double what it was at the time of annexation, just 10 years ago. As I was in business there at the time, I happen to know that practically all the mills and machinery to produce this increase were contracted during the first 12 months of annexation; by the same process, millions of dollars worth of machinery would be hurried into the Philippines from Europe if they were given 'free sugar' into the United States.

"Perhaps I would not be discussing the Philippine situation with full candor if I did not lay down some plan for the future of the islands. Those in power seem dissatisfied with the present condition of things. One of two courses is open: The first is to give them free trade with the United States, and extend the United States tariffs to the islands, making them, in all respects, like Hawaii and Porto Rico in their relations to us. The second is to use the ability of the Americans in pointing out to the Filipinos the way by which they can best develop their own resources without regard to tariff advantages with the United States.

"The history of the 10 years of uncertain and timid control of the Philippines would suggest a change to full adoption or education toward independence."

The Standard Screw Company.

W. P. Pearson, in his report as president of the Standard Screw Company, states that before the sudden cessation of business in October the company had fortunately passed through about seven months of the greatest prosperity and seemed in a fair way to fulfill the suggestion in the president's last report that the notes payable of the company might be wiped out. As it was, they were reduced from $375,000 to $160,000. The Standard Screw Company owns the Chicago Screw Company, the Illinois Screw Company, the Western Automatic Machine Screw Company, the Pearson Machine Company, the Worcester Machine Screw Company, the Detroit Screw Works, the Hartford Machine Screw Company and the Walker & Ehrman Mfg. Company.

A summary of the income account for the year ending March 31, 1908, shows a combined net profit of all branches and subcompanies of $512,137.47, to which is added $2045.85 for interest. Deducting $38,001.98 for Standard Screw Company expenses, leaves $476,181.34, from which are deducted $11,750 for bond interest, $11,-684.37 for special interest, and $269,634 dividends, leaving a net surplus of $183,112.97. The following shows the distribution of income:

Inventories of raw material and finished goods increased	$4,213.68
Other quick assets (net) increased	27,965.09
Investment accounts increased	131,129.06
Investments—other companies increased	400 00
Debentures purchased	3,000.00
Interest (special) paid	11,684.37
Bond interest paid	11,750.00
Dividends paid	269,634.00
Changes in net quick assets through surplus	16,405.14
Total as per income sheet	$476,181.34

The assets and liabilities on March 31 were:

Assets.

Cost of properties, per books	$4,747,627.61
Investments—other companies	1,636.88
In treasury—company's debenture bonds, 5 per cent	39,000.00
Unexpired insurance and taxes	7,777.88
Interest paid in advance	1,159.33
Inventories of finished product in stores and in process, raw material, supplies, &c	719,804.10
Notes receivable	25,069.09
Accounts receivable	184,247.21
Cash in banks and on hand	160,032.74
Total	$5,886,354.84

Liabilities.

Preferred stock	$2,000,000.00
Common stock	2,494,000.00
Debenture bonds, 5 per cent	274,000.00
Notes payable	160,000.00
Accounts payable	68,807.92
Surplus	889,546.92
Total	$5,886,354.84

Isthmian Canal Cement Bids.

After repeated postponements, the Isthmian Canal Commission, Washington, D. C., June 1, opened proposals for furnishing 4,500,000 barrels of Portland cement for construction work on the Isthmus. Twenty-five proposals were made by American and European manufacturers. Bids offering to supply the entire amount included the following:

Lehigh Portland Cement Company and the Alpha Portland Cement Company, Allentown, Pa., joint bid, delivered at Colon, $8,212,500; delivered United tSates ports, $6,412,500.

F. J. Duggan, New York, delivered at Colon, $7,830,000.

Santa Cruz Portland Cement Company, San Francisco, delivered on dock at Portland, Ore., $6,243,750.

Atlas Portland Cement Company, New York City, delivered on dock, United States, $5,355,000.

All the foreign bids were for quantities less than the full amount required. The bids will be sent to Panama for inspection before any awards are made.

The recent purchase of the Union Iron & Steel Company's bond issue by Rogers, Brown & Co., Cincinnati, means, it is reported, the rehabilitation of Union Furnace at Ironton, Ohio, which secured the bond issue, and the blowing in of that stack as soon as conditions warrant. It will be put on foundry iron. With this new property Rogers, Brown & Co. control 20 furnaces, with a practically complete and absolute ownership of 13. It is understood that the recent purchase by this firm of a large block of Southern iron will be held intact for future profits.

Michigan Copper Production in 1907.

In the recent annual report of James L. Nankervis, Commissioner of Mineral Statistics of Michigan, the copper production in that State is given as 220,217,892 lb. in 1907, a decrease of only 4,377,000 lb., or about 2 per cent., compared with 1906. This decrease is more than accounted for in the Calumet & Hecla output alone, which in 1907 was 88,000,000 lb., a decrease of 7,000,000 lb., as compared with the previous year. The Atlantic mine, which was shut down in May, 1906, owing to serious falls, was not operated in 1907, and endeavors are now being made to reach the vein through adjacent shafts and not under the foot walls, as first contemplated. A notable increase is observed in Quincy, from which much copper came on the market early in the year. In the following table is given the production of the principal mines in both years:

	1907.	1906.
Calumet & Hecla	88,000,000	95,000,000
Quincy	19,796,058	16,194,838
Baltic	16,704,868	14,397,557
Champion	16,489,436	16,954,986
Osceola	14,134,753	18,588,451
Tamarack	11,078,604	9,882,644
Mohawk	10,107,266	9,352,252
Wolverine	9,372,351	9,681,706
Tri-Mountain	8,190,711	9,507,933
Ahmeek	5,510,985	3,077,507
Franklin	4,401,248	4,368,538
Allouez	2,934,116	3,486,900
Isle Royale	2,667,608	2,937,098
Michigan	2,556,365	2,875,341
Centennial	2,373,572	2,253,015
Mass	2,078,677	2,106,739
Winona	1,285,863	278,182
Adventure	1,244,874	1,352,628
Victoria	1,207,337	546,334
Atlantic	.....	1,493,982
Tecumseh	.....	58,008
Miscellaneous	83,200	.....
Totals	220,217,892	224,594,639

The Metal Trades Superintendents' and Foremen's Club of Cleveland, Ohio, was organized on the evening of May 27 at a meeting held at the Cleveland Athletic Club under the auspices of the Cleveland Branch of the National Metal Trades Association. The organization starts out with 75 members. A committee was appointed to prepare a constitution and by-laws, and the organization will be completed at another meeting to be held soon, when officers will be elected. After the banquet speeches were made by James F. Barker, principal of the Technical High School, who spoke on "Industrial Education," by F. W. Siberlin of the Cleveland Twist Drill Company on "Organization Among Superintendents and Foremen," and by C. O. Bartlett of the C. O. Bartlett & Snow Company on the "Employers' View of It."

The incorporation of the Wood River, East Alton & Bunker Hill Traction Company, with offices in East St. Louis, Ill., has been certified for $1,500,000. It is the purpose of the company to construct and operate an electric road extending from Wood River, Madison County, to Gillespie, Macoupin County, Ill., traversing the intermediate towns of East Alton, Bathalto, Moro, Dorsey, Bunker Hill and Dorchester. The company also expects to furnish current for lighting these towns which range in population from 600 to 6000. Preliminary work of securing the right of way and making surveys is practically completed, and it is stated by the secretary, S. B. Knepper, East St. Louis, Ill., that active construction work will be commenced within 90 days. The length of the proposed line is 30 miles.

The Republic's Mining Operations.

DULUTH, MINN., May 30, 1908.—The attitude of the Republic Iron & Steel Company as to ore shipments this year is indicative of the general feeling among independent concerns in the ore mining fields. This company has a number of small mines, with some of larger size, but having ore rather low in grade. On the Mesaba range it has the Kinney and Alexander, open pits, and the Pettit, Mariska, Bessemer, Franklin, Victoria and Union, all underground; while on the Marquette it has the Cambria and Lillie, two small underground mines, and the properties of the Antoine Ore Company, on the Menominee, operated by it, though only a 50 per cent. interest is owned by the Republic.

Its Mesaba work is at present confined to small operations, one of which is cleaning up the small Alexander deposit, which it will have entirely taken out in the course of the next few weeks, there being an estimate of about 30,000 tons left in the pit. In doing this it will clean up the Forest pit, containing a few thousand tons. Its big Kinney is idle, and if conditions do not improve materially will do nothing there during the season. It is now operating the Pettit, Mariska and Bessemer, and these on day shifts alone with a small tonnage. On the Marquette range its Cambria and Lillie are both operating, day shift alone, one of them having recently cut down from double shift to one. Its Antoine Ore Company operations were stopped some time ago, and the pumps are being pulled and the properties will now be permitted to fill with water. There is no likelihood of these latter mines resuming this year, even in a small way. Their ore is a low grade siliceous Bessemer, running about 40 to 45 per cent. iron and is of a flaggy nature, requiring crushing, a large Gates plant being used for this purpose. But in common with other concerns, the Republic is not mining any low grades this year.

The total shipments of the Republic Company, while not yet determined, are not likely to be more than 40 to 50 per cent. of those of 1907. Its Alexander mine is a very small Mesaba deposit, containing, all told, about 225,000 tons, of which 195,000 have been shipped. This mine and the Forest are one deposit, and were stripped as one, the entrance to the Alexander being through the Forest end of the pit. Their ore is of high grade, and is most desirable from every standpoint. They are typical of many little bodies of ore found in recent years along the Mesaba, subsequent to the time when explorers were looking for great tonnages merely, and when it had come to be realized that a small tonnage of good ore easily mined was not to be scorned. The total tonnage of the entire deposit, on both properties, was originally not more than 450,000 tons, a mere trifle when compared with the big mines that ship several times as much any season, but the course of recent events on the Mesaba has brought out the importance and value of these little mines, and a surprising number of them is now under development. They are so small that one to three years cleans them out, and they pass from the list. The nature of the Mesaba formation is such that these have not the possibility for future ore at depth which small producers on old ranges always show, and there is no hope that, once scrammed out to the bottoming quartzites, they may be reopened at greater depths and new deposits found. It is so much easier to reach the bottom of a Mesaba mine than to find the bottom of an old range property that the element of chance for the future is quite accurately eliminated. In the course of a very few years, after the iron trade has recovered its pace, there will be many of these worked out mines, which will doubtless be referred to by alarmists, by the way, as proof of the brevity of the existence of the district.

The Newport Mining Company.

The Newport Mining Company, Gogebic range, has completed and placed in commission its big D shaft, on which work has been in progress for some years. It is one of the largest shafts in the district, being five-compartment, 28 x 8.5 ft. inside its steel lining. Four of the compartments are used for hoisting ways, the fifth being for ladder way and pump columns. It is steel lined throughout, except from surface to ledge, where the lining is concrete, and is surmounted by a great steel shaft house of the most approved design. It is sunk in the foot wall some distance back from the ore formation, and is 2000 ft. deep, driven on a 62-degree incline, making it parallel to the lode. Some years ago extensive finds of ore at and beneath the 2000-ft. level in the east end of this mine were discovered and developed, and it was decided to sink a deep, permanent shaft to open them.

These finds were almost the first of the new deep discoveries of the Gogebic, which have reversed the situation in that district by their assurance of continued life at greater depths than former operators considered possible. As the direct result of this discovery at the Newport nearly a dozen great steel and concrete shafts of from 2000 to 3000 ft. in depth are being sunk or are planned at points along the Gogebic, and the range is seen to be not in its decadence, but in its young life. At the east end of the Newport, then known as the Bonnie portion of the mine, a small chimney of ore was followed from surface down to the fourteenth level in the hope that at some point it might flatten out on a cross dyke and spread into a considerable tonnage. It was so small that only about 35,000 to 40,000 tons of ore could be taken from each 100 ft. of depth attained. When the fourteenth level had been passed the hoped for spreading out on a dyke was found, and the dyke itself was cut on the fifteenth level, where the ore bottomed, and where, according to most former explorations, it might be considered to cease. But the ore has been followed along the dyke for more than 2000 ft., of the usual width and character of Gogebic ores, and the company is now mining on several levels, and has sunk considerably deeper. The Newport, by reason of this development, has become one of the very important mines of the range. Shaft sinking was commenced in the fall of 1905 and it was not expected that much ore could be hoisted through it before 1909. Old A shaft will soon be abandoned and the mine handled through the new D.

Some Other Operations.

Ground was broken a few days ago for a concrete shaft on another property in the new Gwinn District of the Marquette for the Cleveland-Cliffs Iron Company. This is to be known as the Northwestern mine, and lies east of the Smith mine, for which a concrete shaft was recently completed by the Foundation Company. This shaft is now being sunk to water level, about 15 ft. from surface, and there will be some 140 ft. of concrete lining beneath, making the work a very costly one. The mine is not of great tonnage, but its ore is good. The mine will be operated underground from a central power plant. At the new village the company is making rapid progress in its development of a model townsite.

Ore loading shovels have been placed in operation at several of the chief open pit mines of the Oliver Iron Mining Company, and the movement from outside companies is slowly improving. The Oliver mines to start are the Hull-Rust and Burt, at Hibbing, and six shovels are loading there, days only. In the meantime shovels loading at some other mines of the district have ceased for the time being. But the tonnage moving is improving a little. The pessimism in ore loading circles, which is evidenced by the continued curtailment of estimates for season shipments, is liable to lead the estimators too far, as indeed it may already have done. But it looks as though the shipowners operating vessels independently of mine ownership will do well to have 50 per cent. of their capacity taken.

Ore dock difficulties at Escanaba have been compromised, and the Top Dock Workers' Union is recognized, the railroad officers not having held out. But they do retain the privilege of picking those union men whom they will permit to work, in return giving up their former contention of nonrecognition or open shop.

As an instance of the way in which mining communities on Lake Superior rely on the mining companies for the money with which to run the public is the case of Iron Mountain, on the Menominee range, whose total tax assessment is $5,193,000, and of which total the Oliver and two smaller mining companies are assessed for $3,561,000.

D. E. W.

The Pittsburgh Foundrymen's Association.

On the evening of June 1, the regular monthly meeting of the Pittsburgh Foundrymen's Association took place at the Hotel Henry. An enjoyable dinner preceded the meeting.

The business session was called to order by President H. E. Field. Four new members were added. A communication was read from the Philadelphia Foundrymen's Association, asking whether its delegation to the convention of the American Foundrymen's Association at Toronto might arrange to accompany the Pittsburgh delegation in a special car, which will receive the secretary's attention.

President Field and Treasurer Seaman stated that some remittances had been received covering contributions to the fund being raised by the American Foundrymen's Association for research work, a worthy cause, but that many members had not been heard from. In view of what the Pittsburgh Association had done along this line in the past, they asked that a special effort be made to have these contributions sent in immediately, as the time was getting short.

Secretary F. H. Zimmers presented data covering the itinerary of the trip to the Toronto convention by the Pittsburgh delegation, and asked that each member who intended to avail himself of this trip send in his name promptly, so that the necessary arrangements could be made for their accommodation. From present indications Pittsburgh will be well represented.

President Field then introduced the speaker of the evening, Charles E. Pope, of the Coal & Coke By-Products Company, Pittsburgh, who made an interesting address on "By-Product Coke." The customary discussion did not follow, as this was the last meeting till September, and a special effort had been made to have all the past presidents of the association present. The time was taken up by remarks by such past presidents as were able to attend. Among those heard from were Messrs. Yagle, McLaren, Spilker (who also spoke for Mr. Thomas in his absence), Seaman, McFadden, Fuller and Field. The latter stated he was glad to feel he had helped the association in any way, and said that when he took up the presidency the membership was 83; five members were lost by moving away or resigning, but with the 28 new members gained so far this year, the present membership numbered 106. The amount of money in the hands of the treasurer is also satisfactory.

On motion of Secretary F. H. Zimmers, the old Programme Committee was renominated. The committee consists of Edward Frohman, W. B. Robinson, and H. E. Field. A vote of thanks was also passed to Mr. Pope, for his instructive address.

A. M. Spencer, technical engineer of the Harbison-Walker Refractories Company, Pittsburgh, who was scheduled to talk on "Cupola Brick," was unable to attend on account of business matters. He will likely present his address at a later meeting. The July and August meetings of the association will be dispensed with.

All the boats that were ordered for early delivery in 1908 at the Great Lake shipyards have been launched, with one exception. The total number built, including one to be launched this month, is 26. All the new vessels are freight boats except one. They range in capacity from 2200 to 10,000 tons. Eighteen boats have been built by the American Shipbuilding Company, six by the Great Lakes Engineering Works and one by the Toledo Shipbuilding Company.

The report for 1907 of J. Obalski, Superintendent of Mines for the Province of Quebec, notes that in that year the charcoal blast furnaces of the Canada Iron Furnace Company, Ltd., at Radnor, and of John McDougall & Co., at Drummondville, produced 10,047 net tons of pig iron, using mostly bog ore. The totals of raw materials charged were as follows, the ore and limestone being given in net tons: Ore, 22,681 tons; limestone, 4300 tons; charcoal, 1,151,149 bushels, counting 20 lb. to the bushel.

The Foundrymen's Convention at Toronto.

The secretary, Dr. Richard Moldenke, announces the following tentative list of papers and topics for discussion at the Toronto convention of the American Foundrymen's Association June 8-12:

"Prevention of Accidents in the Foundry," by Thomas D. West, Sharpsville, Pa.

"Annealing Castings," by W. M. Carr, New York City.

"Foundry Warehouse Methods," by F. C. Everitt, Trenton, N. J.

"Pattern Making for the Specialty Shop," by H. M. Lane, Cleveland, Ohio.

"Core Sands and Mixtures," by A. M. Loudon, Elmira, N. Y.

"Shop Management," by H. F. J. Porter, New York City.

"Foundry Waste," by Harrington Emerson, New York City.

"Ferroalloys in the Foundry," by W. M. Saunders, Providence, R. I.

"Cupola Thermics," by S. H. Stupakoff, Pittsburgh, Pa.

"Specifications for Castings to Be Machined," by H. E. Diller, Chicago, Ill.

"Foundry Transportation Methods," by David Goehr, Cleveland, Ohio.

"Coke Making in the United States," by Dr. R. Moldenke, Watchung, N. J. (Illustrated.)

"Further Notes on Sandless Castings," by V. B. Lamb, New Haven, Conn.

"Titanium in Cast Iron," by Dr. R. Moldenke, Watchung, N. J.

"Machine Molding," by E. H. Mumford, Philadelphia, Pa. Discussion.

"The Production of Automobile Cylinders," by L. N. Perrault, Waterbury, Conn.

"Automobile Cylinder Making," by F. W. Stickle, Hartford, Conn.

"Chemical Reactions in Foundry Cupola Practice," by Jules de Clercy, Montreal, P. Q.

"Notes on Cupola Practice," by Prof. H. McCormack, Chicago, Ill.

Report of Cost Committee, with special discussion by Harrington Emerson and E. M. Taylor, and a special paper on "Cost Accounts," with the committee report by Kenneth Falconer, chairman.

Industrial education: Report of P. Kreuzpointner, chairman. General discussion, with some special papers and descriptions of schools.

Papers are also expected on the "Development of Thermit in the Foundry," on "Valve Making" and on "Oxy-Acetylene Welding of Castings."

Discussions are scheduled on the following subjects: "Turnings and Borings in the Cupola," "Clamping Molds," "Radiator Cores," "Sea Coal Facings," "Castings for Mine Water," "The Ethics of Selling Castings" and "The Proposed Change in Foundry Pig Iron Specifications."

The Indiana Manufacturers' and Shippers' Association, with headquarters at Indianapolis, will send representatives to South Bend, Ind., June 10, to become acquainted with the varied business, manufacturing and shipping interests of that city. This organization is to have its representatives visit other cities of the State, with similar purpose. The party will spend three days at South Bend, during which time the members will be the guests of the South Bend Merchants' Association. The delegation will consist of J. E. Frederick, Kokomo, president of the association; J. V. Zartman, Indianapolis, secretary; C. H. Jones, Indianapolis, assistant secretary; James E. McCullough, attorney, Indianapolis; C. M. Kimbrough, manufacturer, Muncie; and Union B. Hunt and William J. Wood, members of the Indiana Railroad Commission.

The James McNeil & Brother Company, Pittsburgh, builders of heavy plate work, has received a contract from the Municipal Light & Power Company, Seattle, Wash., for 2200 ft. of 48-in. riveted steel pipe for water service. This pipe averages 310 lb. per foot in weight, and ranges from ⅜ to 9-16 in. thickness of shell. The plates will be rolled by the Carnegie Steel Company.

We are officially advised by the Youngstown Sheet & Tube Company, Youngstown, Ohio, that the report that it would build a tin plate mill this year is incorrect. The company has considered the matter of building such a plant, but nothing will be done with the project this year.

Pig Iron Output in May.

Merchant Furnaces Show a Falling Off.

Total Active Capacity Less Than on May 1.

Returns from the producers of pig iron show that the output of coke and anthracite iron in the 31 days of May was 1,163,997 gross tons, as compared with 1,149,602 tons in the 30 days of April. This shows a falling off in the daily rate from 38,289 tons in April to 37,548 tons. The steel works furnaces increased their total production over that of April as well as their daily rate. The weekly capacity of both steel works and merchant furnaces active on June 1 was 260,584 tons, as compared with 268,674 tons on May 1.

The daily output of the steel works and merchant furnaces respectively in the first five months of the year was as follows:

Daily Rate of Production—Gross Tons.

	Steel works.	Merchant.	Total.
January	21,432	12,286	33,718
February	25,717	11,446	37,163
March	27,145	12,474	39,619
April	24,185	14,104	38,289
May	24,509	13,039	37,548

The table below gives the production of coke and anthracite furnaces in May and the four months preceding:

Monthly Pig Iron Production—Gross Tons.

	Jan. (31 days)	Feb. (29 days)	March. (31 days)	April. (30 days)	May. (31 days)
New York	82,962	65,567	49,231	62,263	64,746
New Jersey	22,447	19,880	23,243	22,701	20,889
Lehigh Valley	47,538	39,732	39,105	28,919	28,712
Schuylkill Val.	24,002	22,338	29,104	28,654	25,566
Lower Susquehanna and Lebanon Val.	20,323	19,363	23,907	28,315	29,943
Pittsburgh Dis.	304,521	324,418	325,953	276,883	285,833
Shenango Val.	69,149	68,919	76,377	71,970	53,720
West. Penn.	60,355	51,283	62,782	54,570	54,202
Md., Va., and Kentucky	30,621	27,775	41,452	48,955	48,773
Wheeling Dis.	0	12,961	18,988	17,930	18,121
Mahoning Val.	64,437	93,332	105,310	94,780	99,788
Central and North. Ohio.	52,297	75,137	94,952	88,047	87,862
Hocking Valley and Hanging Rock	8,404	12,296	20,108	18,572	20,409
Mich., Minn., Mo., Wis., Colo.	38,172	36,129	39,327	36,808	36,831
Chicago Dis.	120,874	99,289	147,014	157,633	165,291
Alabama	81,541	91,209	114,295	94,754	104,210
Tennessee, Georgia and Texas	17,607	18,112	17,056	17,648	19,101
Totals	1,045,250	1,077,740	1,228,204	1,149,602	1,163,997

Production of Steel Companies.

Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Republic, Youngstown Sheet & Tube Company, Jones & Laughlin, La Belle, Bethlehem, Calumet, Inland, Colorado and Tennessee (Ensley) companies show the following totals of product month by month. We give separately a statement of the output of spiegeleisen and ferromanganese, which is included for each month in the total production:

Production of Steel Companies—Gross Tons.

	Pig—Total production.			Spiegeleisen and ferromanganese.	
	1906.	1907.	1908.	1907.	1908.
January	1,358,015	1,406,397	664,415	21,477	20,254
February	1,226,760	1,317,923	745,802	19,444	9,402
March	1,400,395	1,424,827	841,502	31,091	13,750
April	1,333,591	1,446,788	725,548	26,527	12,363
May	1,372,423	1,470,080	759,674	28,822	17,823
June	1,293,437	1,457,230	.....	30,942	.....
July	1,323,391	1,452,557	.....	25,343	.....
August	1,287,485	1,445,685	.....	23,696	.....
September	1,264,380	1,417,153	.....	30,270	.....
October	1,452,200	1,514,521	.....	35,105	.....
November	1,411,350	1,084,114	.....	21,861	.....
December	1,145,528	659,459	.....	19,480	.....

Capacity in Blast June 1 and May 1.

The table below gives the weekly capacity of coke and anthracite furnaces in blast June 1 and May 1:

Coke and Anthracite Furnaces in Blast.

Location of furnaces	Total number of stacks.	June 1.—Number in blast.	June 1.—Capacity per week.	May 1.—Number in blast.	May 1.—Capacity per week.
New York:					
Buffalo	14	7	13,372	7	13,291
Other New York	10	1	1,253	1	1,237
New Jersey	8	4	4,956	4	5,297
Spiegel	2	0	0	0	0
Pennsylvania:					
Lehigh Valley	25	5	5,965	5	6,612
Spiegel	3	1	128	1	136
Schuylkill Valley	15	4	5,768	4	5,487
Lower Susquehanna	7	2	3,350	2	3,610
Spiegel	1	0	0	0	0
Lebanon Valley	10	4	3,423	4	3,199
Pittsburgh District	45	19	57,610	23	69,150
Spiegel	3	2	1,957	1	766
Shenango Valley	20	6	13,937	5	12,584
West. Pennsylvania	27	10	14,650	8	12,435
Maryland	4	2	4,214	2	4,126
Wheeling District	14	2	4,088	2	4,184
Ohio:					
Mahoning Valley	18	10	25,648	9	21,026
Central and North. and Michigan	22	7	18,669	8	21,669
Hocking Valley and Hanging Rock	12	6	4,206	6	4,464
Illinois and Indiana	23	14	38,012	13	36,781
Spiegel	2	1	1,125	1	1,379
Minnesota	1	0	0	0	0
Wisconsin	6	1	962	1	1,400
Missouri	1	0	0	0	0
Colorado	6	2	4,326	3	5,817
The South:					
Virginia	23	8	5,677	9	6,470
Kentucky	7	1	1,148	1	972
Alabama	46	16	22,430	16	22,444
Tennessee	18	6	3,710	7	4,138
Georgia and Texas	3	0	0	0	0
Total	396	141	260,584	146	268,674

A Record of Active Capacity.

The active weekly capacity in coke and anthracite iron has shown the following fluctuations since January 1, 1903:

	Capacity per week.		Capacity per week.
June 1	260,584	September 1	412,563
May 1	268,674	August 1	410,088
April 1	264,890	July 1	408,617
March 1	267,437	June 1	443,092
February 1	241,925	May 1	452,031
January 1, 1908	232,652	April 1	439,564
December 1, 1907	347,372	March 1	403,157
November 1	491,436	February 1	405,792
October 1	511,397	January 1, 1905	377,879
September 1	507,768	December 1, 1904	357,846
August 1	513,471	November 1	334,249
July 1	528,170	October 1	319,249
June 1	523,220	September 1	291,573
May 1	524,538	August 1	246,092
April 1	496,456	July 1	272,301
March 1	511,035	June 1	336,107
February 1	492,359	May 1	368,244
January 1, 1907	507,397	April 1	387,257
December 1, 1906	513,860	March 1	308,751
November 1	500,580	February 1	273,692
October 1	469,665	January 1, 1904	185,636
September 1	441,426	December 1, 1903	244,156
August 1	449,908	November 1	273,715
July 1	460,570	October 1	353,142
June 1	472,622	September 1	360,197
May 1	484,031	August 1	353,681
April 1	484,240	July 1	384,825
March 1	479,737	June 1	388,178
February 1	482,156	May 1	373,496
January 1, 1906	463,673	April 1	386,215
December 1, 1905	475,814	March 1	347,424
November 1	460,449	February 1	335,239
October 1	445,468	January 1, 1903	346,073

Furnaces in and Out.

Among furnaces blown in in May were Buffalo C in New York, one Carrie and one Edgar Thomson in the Pittsburgh District, one Shenango in the Shenango Valley, Colonial and Perry in western Pennsylvania, one Calumet in Illinois, Cherry Valley and one Ohio in the Mahoning Valley, two Sloss in Alabama.

The list of furnaces blown out last month includes one Colorado, one Niagara at Tonawanda, Musconetcong in New Jersey, one Bethlehem and two Thomas Iron Company in the Lehigh Valley, one Duquesne, two Shoenberger and Midland in the Pittsburgh District, Alleghany in Virginia, one Central at Cleveland, Mattie in the Mahoning Valley, and Woodstock in Alabama, besides one Sheffield furnace of the Sloss-Sheffield Steel & Iron Com-

NEWS OF THE WORKS.

Iron and Steel.

The Warwick Iron & Steel Company, Pottstown, Pa., blew out its No. 3 furnace in April following the blowing in of its No. 1 furnace. The shell of No. 3 furnace, which was built about 1866 or 1868, was in such a condition that it was found necessary to take it down. The company now intends to rebuild the stack and reline it in order to have it ready for operation as soon as an improvement in business shall warrant its operation. No other changes or additions will be made to the furnace other than to replace the worn-out shell.

The Sweet's Steel Company, Williamsport, Pa., has not yet decided upon plans for rebuilding the part of its plant which was recently destroyed by fire, and has not yet ascertained just what machinery will have to be replaced.

Victoria Furnace of the Goshen Iron Company, Goshen, Va., was banked from May 13 to May 25.

Hamilton Furnace of the Hanging Rock Iron Company, Hanging Rock, Ohio, was blown in May 22.

The Northwestern Iron Company expects to blow in its Furnace B this week.

Owing to a break out June 1 the furnace of the Struthers Furnace Company, Struthers, Ohio, will be idle about two weeks.

One of the Ohio furnaces of the Carnegie Steel Company, Youngstown, Ohio, was blown in May 27, and all four stacks are now active.

The furnace of the Woodstock Iron & Steel Corporation, Anniston, Ala., was blown out May 31.

The furnace of the Embree Iron Company, Embreeville, Tenn., was blown out May 23 for relining.

The blast furnace of the Midland Steel Company at Midland, Pa., was blown out June 1.

Furnace A of the Wisconsin Steel Company, South Chicago, Ill., was blown in May 23. The No. 2 stack of this company is expected to be blown in about July 1, when it will have three furnaces in blast.

One furnace of the Colorado Fuel & Iron Company, Pueblo, Colo., was blown out May 31.

Furnace C of the Buffalo Union Furnace Company, Buffalo, N. Y., was blown in May 30.

Furnace A of the Tonawanda Iron & Steel Company, Tonawanda, N. Y., was blown out May 23.

The furnace of the Musconetcong Iron Works, Stanhope, N. J., was blown out May 25.

Furnace D of the Bethlehem Steel Company, South Bethlehem, Pa., was blown out May 10.

The No. 4 furnace of the Shenango Furnace Company, Sharpsville, Pa., was blown in May 27.

One stack of the Colonial Iron Company, Riddlesburg, Pa., was blown in June 1.

The Commonwealth Securities Company, San Diego, Cal., has been incorporated with a capital stock of $1,000,000 to establish steel works in the vicinity of that city. Charles R. Hill is president and treasurer, Frederick W. Stearns, vice-president and general counsel, and V. A. Vehnel, secretary.

It is announced that Nos. 1 and 4 blast furnaces of the Tennessee Coal, Iron & Railroad Company at Ensley, Ala., will be put in operation. It is also announced that Alice Furnace, at Birmingham, belonging to the same company, will be put in blast. A second furnace at Bessemer starts up this week.

No. 2 furnace of the Woodward Iron Company is being relined and will make basic iron when put in operation.

General Machinery.

New plant improvements being made by the Continental Motor Mfg. Company, Muskegon, Mich., builder of automobile and marine equipment, include the erection of a one-story fireproof machine shop, 110 x 160 ft., of concrete and steel, with saw tooth roof; also a new pattern shop and timekeeper's office. Work on these extensions are already in progress, and the company expects to occupy the new buildings about the middle of August.

The American Sheet & Tin Plate Company is having a new office built at the machine shop at Scottdale, Pa., and as soon as this office is completed the company will remodel the entire shop and about double its present capacity.

E. E. Morris has been appointed receiver for the American Machine Works, Seattle, Wash. The assets of the company are stated to be about $15,000 and the liabilities about $5000.

The Lake Superior Corporation, Sault Ste. Marie, Ont., has not completed plans for rebuilding its paper mill, which was recently destroyed by fire, and has not yet ascertained what machinery it will have to purchase to replace that destroyed.

The American Machinery Company has been organized at Port Huron, Mich., to manufacture machinery, and has taken over the plant of the Meisel Mfg. Company.

Power Plant Equipment.

The Public Service Company, St. Cloud, Minn., will build a water power station to develop about 1600 hp. This will include the construction of a power house, 28 x 97 ft., which will be of brick and reinforced concrete.

The city secretary of Houston, Texas, will receive bids until July 27 for the erection of a 15,000,000 gal. pumping engine at the water plant, bidders to furnish plans and specifications, which must provide for complete installation of the engine.

The Newport Water, Light & Power Company, Newport, Ark., incorporated with a capital stock of $100,000, has purchased the property of the Newport Water Company, and having secured from the city a 30-year franchise will either purchase the electric light plant now operating there or erect a new one. The company is about ready to purchase 4, 6 and 8 in. cast iron pipe for water main extensions, of which about two miles will be laid. Other improvements are also in contemplation. The officers are A. N. Walker, president, Marion, S. C.; N. V. H. Walker, vice-president and general manager, Aurora, Mo.; Col. L. Minor, treasurer and secretary, Newport, Ark.

The Parker Boiler Company, Philadelphia, Pa., has in course of erection a 499-hp. boiler for the Astoria Veneer Mills, Long Island City, N. Y.; two 236 and one 223-hp. boilers, Lawyers' Title Insurance & Trust Company, New York, and two 260-hp. boilers, Raymond Lead Company, Chicago, Ill.

The Mitchell Power Company, Mitchell, S. D., having purchased the electric light and gas plant of the Mitchell Gas Company, is preparing to enlarge and improve it; the construction of a new coal gas plant is also in contemplation.

Bonds in the sum of $10,000 have been issued by the town of Weston, Neb., to provide funds for the erection of a water works plant. No plans or specifications have been prepared.

Plans for changes and improvements to be made in the electric light and water plant at Buhl, Minn., are being prepared by Oscar Claussen, engineer, St. Paul, Minn., and as soon as completed bids will be received for material and work of construction.

The recent fire at the plant of the Port Arthur Electric Light & Power Company, Port Arthur, Ont., destroyed seven dynamos and 16 transformers, lathe, tools and a quantity of supplies, leaving intact only the walls of the building, two steel penstocks and two water wheels, with the shafting. The damage amounted to about $35,000. New dynamos, gear wheels with new shafting, bearings and pinions were placed in position, a new roof was put on the building and the plant was placed in operation and light and power furnished to the town 17 days after the fire.

Foundries.

The Auburn Foundry Company, Auburn, Ind., incorporated with a capital stock of $15,000, has a new foundry in course of construction, which it is expected will be ready for occupancy about July 1. Light and medium gray iron castings will be made and special attention will be given to the production of automobile castings of all descriptions, of which the local automobile factories are large users. All of the buildings in this plant, including the office building, will be constructed of concrete blocks. F. W. Payne is secretary and treasurer.

The Gadsden Pipe & Fitting Company, Gadsden, Ala., has resumed operations after an idleness of a number of months.

Bridges and Buildings.

The Interstate Engineering Company, Bedford, Ohio, has been given the contract for the steel superstructure for the new factory being erected by the Enameled Pipe & Mfg. Company in Elyria, Ohio.

Fires.

The main building of the Imperial Stove Works, Morrisburg, Ont., was destroyed by fire May 26, the loss being about $25,000.

The plant of the Krell Piano Company, Cincinnati, Ohio, was burned May 26, the loss being about $25,000.

The pulp mill of the Wolf River Fibre & Paper Company, Shawanee, Wis., was burned last week. The loss is placed at $50,000.

John Abrams & Sons' machine shop at Moncton, N. B., was recently destroyed by fire.

Hardware.

The Kaneville Supply Company, manufacturer of pumps and pump supplies, is removing its plant to Kaneville, Ill., from Chicago, where under another name it manufactured the Star Pointer pumps. The company will occupy a new factory building provided for it by the town of Kaneville.

Miscellaneous.

The Columbia Mine, Sumpter, Ore., has substituted electricity as a motive power instead of steam, and is successfully operating its machinery under 2300 volts of generative current.

By the organization of the Tomah Electric Light & Power Company, Tomah, Wis., incorporated with a capital of $30,000, the C. A. Goodyear Lumber Company has divided its lumber mill and lighting business into two distinct units. The business of the new company will be conducted in the same manner as

heretofore, the stock being owned entirely by the C. A. Good year Lumber Company.

D. Miller & Sons, Green Bay, Wis., wholesale dealers in junk, metals and scrap iron, have improved their facilities for handling material by the installation of an electrically operated shear and derrick. A cement floor, 53 x 100 ft., is being laid in the stock yard, which, together with new loading platforms, will make it one of the most conveniently arranged plants of its kind in that vicinity.

Benjamin Lawter of Newcastle, Ind., has invented and patented a new engine for automobiles, and the Safety Shredder Company of that city is preparing to manufacture automobiles equipped with this engine.

The recent fire at the plant of the Republic Belting Company, Cleveland, Ohio, did but little damage and will only inconvenience the company for a few days. The loss is fully covered by insurance, which is expected to be promptly adjusted.

The Staples Valve Company, Newburgh, N. Y., has increased its capital stock from $150,000 to $300,000.

The Howard Stove & Mfg. Company, Savannah, Mo., has under consideration the removal of its plant to Omaha, Neb., arrangements for which have not yet definitely been decided upon. If the company should decide to move the entire plant will be electrically driven.

The B. A. Berger Mfg. Company, Richmond, Va., has been incorporated with a capital stock of $50,000, to manufacture a patented bracket and other steel specialties used by plumbers. The bracket was formerly manufactured by B. A. Berger, and the capacity of the present plant will be enlarged by installing additional machinery. B. A. Berger is president; H. N. Francis, vice-president, and James Estes, secretary and treasurer. The company is not in the market for new machinery.

The Howie Roofing Company, Detroit, Mich., was the successful contractor for the sheet metal work on the new chapel building now being erected for the Eastern Michigan Asylum at Pontiac, Mich. Wherever tin is required Scott's extra coated, made by the Follansbee Brothers Company, Pittsburgh, with open hearth steel plant, sheet and tin mills at Follansbee, W. Va., will be used.

The National Radiator Company, Johnstown, Pa., has completed patterns and is now manufacturing a full line of plain radiators.

The Lorain Iron & Metal Company, Lorain, Ohio, has been incorporated with a capital stock of $10,000, by Sam Hample, A. Gordon, G. A. Resek, L. R. Rawson and C. F. Adams. The company will deal in scrap. A yard will be established for handling the material.

OBITUARY.

WILBUR FISK LUNT, for the past 17 years a member of the Board of United States General Appraisers, died at his residence in New York City May 28, aged 60 years. He was appointed by President Harrison in 1891, and during his tenure of office traveled through all sections of the country hearing customs protests. He became widely known, and was the author of many important decisions of the customs tribunal. He was born at Biddeford, Maine, and was United States District Attorney for the District of Maine when he was named for the General Appraisership. He served in the Union Army, and a wound received at the battle of Antietam was the direct cause of death.

ROBERT F. MANN, Cincinnati, died May 26. He was a native of Bathurst, New Brunswick, and was a well known machinist, having attained promiuence in the trade. He had been connected with Schumacher & Boyé, manufacturers of machine tools, Cincinnati, for about eight years, being assistant superintendent at the time of his death.

GEORGE E. HAIGHT, president of the Henry G. Thompson & Son Company, New Haven, Conn., died May 27, after a long illness, aged 62 years. He was a man of inventive genius.

FRED. A. JOHNSON, president of the Gisholt Machine Company, Madison, Wis., died in Denver, Colo., May 26. He had been connected with the company since its incorporation, in 1887, and became its president in 1901. He took an active part in the management of the business, and spent several years in Europe in the interests of the company. Since 1904, however, owing to ill health, he had been unable to attend to business.

James S. Watson, manager of the drive chain department of the Link-Belt Company, has transferred his headquarters from the Philadelphia Works to the company's chain manufacturing plant at Indianapolis. In his new field he will combine supervision of manufacture with direction of the selling force handling the Renold silent and roller chains.

PERSONAL.

William R. Webster, Philadelphia, attended the recent meeting of the Iron and Steel Institute in London.

H. B. Thwing, of the Whitcomb-Blaisdell Company, Worcester, Mass., sailed from New York May 28 for Europe, to be absent about six weeks.

Israel H. Johnson, Jr., of Israel H. Johnson, Jr., & Co., Philadelphia, Pa., left for Europe May 28 to be gone several weeks.

S. Madison, manager of the Ryder-Ericsson Engine Company, Sydney, Australia, which was formed several months ago to take care of the Australian business of the Ryder-Ericsson Company, is in New York on a business trip for a two weeks' stay.

James R. Anderson, of the Lunkenheimer Company, Cincinnati, Ohio, sailed May 30, for Jamaica. From this point Mr. Anderson will go to Panama and then work his way down the west coast of South America, stopping at all the important Eastern ports on his return. He expects to return to New York some time next November.

Edward S. Illig, Pacific Coast sales manager for the Bethlehem Steel Company, has returned to San Francisco after a month's visit on the Atlantic Coast.

J. A. McGregor, president of the Union Iron Works, San Francisco, recently visited New York on a short business trip.

Arthur Lucian Walker, for many years identified with copper and lead smelting enterprises, has accepted the post of professor of metallurgy and administration branch of the department of metallurgy at Columbia University. Mr. Walker is a graduate of the School of Mines. Professor Howe will continue to deliver his lectures on iron and steel as heretofore.

Ill health has forced J. S. Jeans, who has been secretary for upward of 30 years of the British Iron Trade Association, to retire. He has been succeeded by C. J. F. Scott, who was selected out of some 400 candidates.

Joseph Butler, Jr., of Youngstown, Ohio, expects soon to sail on the Amerika for an absence of about two months.

William B. Simpson, for several years treasurer and sales manager of A. M. Castle & Co., Chicago, has been elected president of the company, to succeed A. M. Castle, deceased. Owing to Mr. Castle's declining health, Mr. Simpson has been in practical charge of the company's affairs for the past three years, and the business will therefore continue without change.

Humphrey D. Bond of Vivian Bond & Co., New York, sailed May 30 for a short European business trip.

E. F. Jones has been made general manager of the Morgan Spring Company, Worcester, Mass., succeeding Frank F. Bullard, resigned. Mr. Jones has been manager of the Southern Steel Company for the past year, with headquarters at Birmingham, Ala., and for the prior 12 years was connected with the Deering Harvester Company and its successor, the International Harvester Company.

The Mexican Minister of Finance has drafted a measure, which it is expected will pass the Mexican Congress, providing for subsidies for irrigation companies. The amount to be expended is limited to $25,000,000, but if the movement is a success it is likely to be increased. The bill also confers upon the Federal Government the right to grant for 10 years free importation of agricultural implements, cattle for breeding purposes, materials, seed and other things that may be determined upon. The Government may also exempt for 10 years the products of irrigated lands from export duties. It is said that many agricultural products can be raised near the Rio Grande border and exported to the United States at a profit under these provisions.

The Iron and Metal Trades

The full significance of the concerted reduction in the price of Steel Bars and Small Shapes cannot yet be measured. It will probably lead to readjustments of such collateral lines as Bands and Merchant Steel. Many in the trade regard it as the forerunner of lower prices along the whole line of finished products, and are encouraged in this conviction by the fact that only a few weeks ago the selling forces of large interests freely advised their customers that lower prices were coming, and then had to recall the intimation after the last general Steel meeting. The fact that the large steel interests are still in conference in this city is worthy of mention in this connection.

In some respects the conditions surrounding the Steel Bar trade are not typical of the others. The steel interests have far less influence in it than they have in Billets, Shapes or Plates. The rerolling mills have been very active recently and have been making low prices. The Bar Iron makers have been cutting and on the seaboard went down to 1.35 cents delivered, which is far below the Pittsburgh base. Advices from the West show that the Bar Iron makers there have responded to the decline in Steel Bars by reducing their price.

The developments in the Steel Bar trade have been precipitated by the fear among the larger interests that too large a share of the pending season business of the agricultural implement makers might go to those who have not co-operated in the price maintenance policy. These important season contracts are usually made for the requirements for a year beginning on July 1 and cover a large tonnage.

Another factor which has come up for discussion among the leading interests is the differential of $2 per ton on Bars, which is given by some to a few of the largest jobbing houses in the country.

There has been some uneasiness for some time past in the Structural trade, due to the fact that fabricators have been taking business at prices so low that they seem to be backed by special figures on the plain Structural material.

After the rush of buying in the Pig Iron trade throughout the country, the markets have quieted down. This appears to be most pronounced where sellers have marked up their prices. This has been done chiefly by Southern makers, who now ask generally $12 for No. 2 Foundry, Birmingham, for second half delivery, while some June iron is still available at $11.50.

To a lesser degree, makers in the Central West and in the East have put up their prices. There is still some business pending, notably in Malleable Iron, but the rush is over.

The blast furnace statistics collected by *The Iron Age* show that the Pig Iron output in May was 1,164,000 tons, compared with 1,150,000 tons in April, the merchant furnace product declining from 14,104 tons daily in April to 13,039 tons daily in May. Productive capacity, however, appears to be decreasing further, there having been active on May 1 146 furnaces with a weekly capacity of 268,674 tons, as against 141 furnaces and 260,584 tons capacity on June 1.

The 20,000-ton Syracuse water pipe contract went at a low figure, $23 per net ton.

LATER.—The Western Bar Iron mills have fixed the prices of Iron Bars at 1.40c., base, for Pittsburgh, northern and eastern Ohio, West Virginia and western New York, and at 1.35c., base, for points west of the Grand Rapids & Indiana Railroad, which includes the Chicago District. These prices are at Pittsburgh, plus freight to destination.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	June 3, 1908.	May 27, 1908.	May 6, 1908.	June 5, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	*$16.75*	$16.75	$17.50	$25.50
Foundry No. 2, Southern, Cincinnati	**15.25**	14.75	14.75	24.25
Foundry No 2, Local, Chicago	*17.85*	17.25	17.35	26.50
Bessemer, Pittsburgh	*16.90*	16.90	17.90	24.10
Gray Forge, Pittsburgh	14.90	14.90	14.90	23.15
Lake Superior Charcoal, Chicago	20.00	20.00	20.00	27.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	30.00
Forging Billets, Pittsburgh	30.00	30.00	30.00	35.00
Open Hearth Billets, Phila	29.20	29.20	29.20	32.50
Wire Rods, Pittsburgh	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	**12.25**	12.00	12.00	18.50
Steel Rails, Melting, Phila	**13.00**	13.00	12.75	20.00
Iron Rails, Chicago	**15.50**	15.00	14.75	24.50
Iron Rails, Philadelphia	**18.00**	18.00	17.00	27.50
Car Wheels, Chicago	**13.00**	13.00	12.50	25.50
Car Wheels, Philadelphia	14.00	14.00	14.00	25.50
Heavy Steel Scrap, Pittsburgh	**13.00**	13.00	12.75	18.50
Heavy Steel Scrap, Chicago	**11.50**	11.00	10.50	16.00
Heavy Steel Scrap, Phila	**13.00**	13.00	12.75	19.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	*1.40*	1.45	1.46	1.83½
Common Iron Bars, Chicago	*1.58*	1.65	1.65	1.78
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.75
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.84½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.55	1.55	1.55	1.85
Skelp, Sheared Steel, Pittsburgh	1.65	1.65	1.65	1.90
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	*1.85*	1.85	1.90	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	**13.00**	12.87½	12.87½	24.25
Electrolytic Copper, New York	12.62½	12.62½	12.62½	23.37½
Spelter, New York	*4.55*	4.55	4.65	6.50
Spelter, St. Louis	*4.40*	4.40	4.50	6.40
Lead, New York	**4.30**	4.35	4.20	5.75
Lead, St. Louis	**4.20**	4.20	4.10	5.65
Tin, New York	*28.85*	28.50	31.05	41.50
Antimony, Hallett, New York	8.50	8.50	8.50	17.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, June 3, 1908. (*By Telegraph.*)

Foremost in the week's events in market interest is the reduction of $4 a ton on Steel Bars. In view of the recent meeting of leading manufacturers and the statement issued thereafter to the effect that prices would be maintained, coupled with a strong intimation that there would be no change until fall, the news of the cut occasioned no little surprise. What effect the reduction will have in stimulating buying can only be conjectured, as the trade has not had time to respond. The implement makers, whose annual contracts are made to cover from July to July, were already making inquiries as to prices on their requirements for the coming year, but no tonnage has been placed. If the new price of 1.40c., Pittsburgh, or 1.58c., Chicago, is accepted as the final word, a brisk business in Steel Bars may be expected to develop within the next week or two. Very few new orders for either Steel or Iron Bars have been entered in the past few weeks, and with outstanding contracts practically completed the incoming tonnage has been greatly reduced. The specification last week of 52,000 tons of Rails by the Illinois Central Railroad furnishes a welcome addition to tonnage available for rolling schedules in the Rail mills of the Tennessee Coal, Iron & Railroad Company and the Illinois Steel Company. The major part of this order, 42,000 tons, being Open Hearth Rails, will be rolled by the former, and the remaining 10,000 tons by the latter company. No new orders of any consequence are being placed by the railroads, nor is it expected that the present restriction upon purchases will be relaxed until after the close of

the present fiscal year, which terminates June 30. The belief is prevalent, however, that next month will mark the beginning of a liberal policy in this respect, resulting in substantial increase of orders from this most important consuming interest. As compared with the volume of business placed during the recent buying movement, last week's transactions in Pig Iron were rather light. The advance to $12, Birmingham, by all the leading Southern furnaces seems to have had the effect of discouraging extensive buying for anticipated requirements, but quite a number of orders from the smaller melters for moderate tonnage have been entered at this price. Producers are not at all eager to fill up furnace capacities for the last quarter at the prevailing price, and are offering no concession to that end, the future strength of which is not yet clearly enough outlined to furnish a confident forecast.

Pig Iron.—The recent active movement in Pig Iron has abated considerably, with the result that last week's sales were scattering and dropped off sharply both in the aggregate and individual tonnages. Three or four lots of 1000 tons were included in the purchases made, but the bulk of the business was composed of smaller lots. Practically all the Southern furnaces are now squarely on a $12, Birmingham, basis for second half deliveries, and while most of them will book through the entire period at this price, all are apparently unwilling to take on fourth quarter alone, except at an advance of not less than 50c. a ton. It is likely that Iron can still be had for June delivery at $11.50, Birmingham; at least some sales of this character have been included in the week's transactions. Considerably more inquiry for Malleable Bessemer has developed, and several lots ranging from a few hundred up to 1000 tons were taken; the demand is largely from implement makers and other interests outside of the railroad Malleable shops, which are not yet evincing any interest in the market. Northern Iron has firmed up, and some sellers are asking $17.50, furnace, for No. 2 Foundry and Malleable Bessemer. Whether consumers will continue to buy at the $12 price, for Southern, will doubtless depend on collateral conditions. Unless there is an early improvement in the demand for foundry products it seems probable that the market will soon lapse into its former quiet state. Transactions will be limited to current needs. The American Radiator Company is credited with the purchase of 10,000 tons, bought in odd lots from various sources within the past two weeks. The following prices are for June delivery, f.o.b. Chicago:

Lake Superior Charcoal	$20.00 to $20.50
Northern Coke Foundry, No. 1	17.75 to 18.25
Northern Coke Foundry, No. 2	17.25 to 17.75
Northern Coke Foundry, No. 3	16.75 to 17.25
Northern Scotch, No. 1	18.25 to 18.75
Southern Coke, No. 1	16.85 to 17.35
Southern Coke, No. 2	16.35 to 16.85
Southern Coke, No. 3	15.85 to 16.35
Southern Coke, No. 4	15.35 to 15.85
Southern Coke, No. 1 Soft	16.85 to 17.35
Southern Coke, No. 2 Soft	16.35 to 16.85
Southern Gray Forge	14.35 to 14.85
Southern Mottled	14.10 to 14.60
Malleable Bessemer	17.25 to 17.75
Standard Bessemer	18.40 to 18.90
Jackson Co. and Kentucky Silvery, 6 %	18.90 to 19.40
Jackson Co. and Kentucky Silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky Silvery, 10 %	22.90 to 23.40

(*By Mail.*)

Billets and Rods.—A few straggling orders for Forging Billets, mostly for less than carload lots, represents the full measure of market activity. What little demand there is comes mainly from the smaller shops making light forgings. Under present conditions there is nothing to tempt a departure from established prices which, we are advised, are being absolutely maintained at the regular quotations of $31.50 to $32.50, Chicago. In sympathy with the declining demand for Wire products, Wire Rods are correspondingly quiet, and while a fair amount of specifications are coming in very little new business is being offered. Prices remain unchanged as follows: Bessemer, $35; Basic, $36; Chain, $37, all at Pittsburgh.

Rails and Track Supplies.—The receipt of specifications by the United States Steel Corporation from the Illinois Central Railroad for 52,000 tons of Rails was the central feature of last week's transactions. This tonnage will be distributed between the mills of the Tennessee Coal, Iron & Railroad Company and the Illinois Steel Company, 42,000 tons of Open Hearth being awarded to the former and 10,000 tons Bessemer to the latter. No new orders for steam Rails of noteworthy tonnage have been entered, but the local mill has specifications enough in hand to keep it in operation well into July, with prospects of an uninterrupted run through the greater part of the year. The tonnage of Light Rails booked by the principal interest for the month of May exceeded that of any previous month this year. Little new business in Spikes, Bolts and Track Supplies is being offered, but specifications against recent contracts are being liberally furnished. An order for 800 tons of High T Open Hearth Rails placed by the Detroit United Railways Company was secured by the Pennsylvania Steel Company. It is noted that there are more inquiries in the market from traction companies, but they generally represent moderate requirements. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.50c.; car lots, 1.60c. to 1.70c.; Spikes, 1.80c. to 1.90c., according to delivery; Track Bolts, 2.25c. to 2.35c., base, Square Nuts, and 2.40c. to 2.50c., base, Hexagonal Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—Less business was developed last week in Structural Shapes than has been the case for some time, and most of the inquiries received concern small projects of unimportant tonnage. The only closures reported were for 600 tons of bridge material placed by the Chicago, Milwaukee & St. Paul Railroad, of which the Wisconsin Steel Company secured 300 tons, the remaining 300 tons going to the Minneapolis Steel & Machinery Company. The prospect for the immediate future lends small encouragement for the development of a large amount of business, since there are few bridge or structural enterprises involving large tonnage that promise early closure. The low bids offered on some recent contracts give evidence of the keenness of competition among fabricators; in many instances it is impossible to distinguish any margin of profit in the prices named. Structural specifications are coming out slowly, and though the mill at the South Works is still in operation it is occupied in part at least with stock orders. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—New orders are not only scarce, but they continue to comprise only small lots for immediate use. Stock orders from jobbers are limited to sorting up lots absolutely required to maintain an unbroken assortment of stock sizes. Regular mill prices are being maintained except for occasional concessions of $2 to $3 made on narrow sizes by a few mills. We quote mill shipments as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72-in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—Owing to a sharp falling off in the demand for Sheets in this market during the last two weeks of the month, business for May failed to equal the tonnage for the preceding month. There is little doing in the heavier gauges, what movement there is being mainly concentrated upon light Roofing Sheets, both Black and Galvanized. Jobbers and manufacturing consumers continue the policy of buying in small lots for present requirements. Prices remain unchanged and are generally well maintained. We quote mill shipments as follows, Chicago: Blue Annealed No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 and 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—A reduction of $4 a ton on Steel Bars was announced on Tuesday, which drops the price from 1.60c. to 1.40c., Pittsburgh, and from 1.78c. to 1.58c., Chicago. In the absence of any authoritative advice it is assumed that Iron Bars will at least recede to the same level. It is too early to know what the effect of this unexpected concession will have in stimulating trade, but favorable results are hoped for. Whether or not the fact that the time is at hand for the closure of implement makers' contracts for the coming season's requirements was considered in the action taken, it none the less occurs opportunely for these interests. Practically no new business either in Iron or Steel Bars has been entered for the past two weeks. The very moderate tonnage coming to the mills is supplied by specifications on the few remaining contracts yet unfilled. Revised prices, Chicago, are as follows: Steel Bars, 1.58c., with half extras; Iron Bars, 1.58c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.68c., half extras. Store prices are as follows: Par

2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—While some improvement is noted from week to week and month to month in the volume of business entered, the margin of gain is too narrow to admit of notable progress. Orders keep coming in in the same conservative way, jobbers buying only what is actually needed for current requirements. Judging from the smallness of their orders, their stocks are likewise moving slowly. Prices hold firm, and they are reported by the mills as being absolutely maintained. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 71 per cent. on Black Steel Pipe, ¾ to 6 in. From two to three points above these prices is asked for Iron Pipe.

Boiler Tubes.—Trade in Merchant Tubes is restricted to the immediate requirements of the boiler shops, which are extremely light. The same conditions prevail in Locomotive Tubes, there being but little demand from the railroads. Mill quotations for future delivery, on the base sizes, are as follows: 2⅜ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1¼ in.	35	35	35
1¼ to 2¼ in.	50	35	35
2¼ in.	52½	35	35
2¾ to 5 in.	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—Nothing more than a very moderate business in routine orders from manufacturers and jobbers is being entered; nor are specifications being furnished with encouraging promptness. Although the season is close at hand for inquiries from implement makers concerning contracts for the new season, nothing is heard from these sources. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1⅛ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 56 per cent. off in car lots; 52 per cent. in less than car lots, base territory delivery.

Cast Iron Pipe.—The week has been barren of results as far as the closure of any large contracts is concerned. Miscellaneous orders comprising small lots have been fairly numerous, but no new lettings of considerable tonnage are reported as in sight for the immediate future. It is expected that the firming up of the Pig Iron market will favorably affect Pipe prices, which under the stress of competition have reached an unduly low level. We quote, nominally, per net ton, Chicago, as follows: Water Pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25; with $1 extra for Gas Pipe.

Metals.—Measured by the actual amount of business transacted, the market shows no improvement, but an encouraging feature of last week's developments was the appearance of several inquiries from some large consumers for round lots to cover forward requirements. An advancing tendency of a positive nature, it is believed, would bring many buyers into the market; but as long as the price holds at the present level there is, under the circumstances, nothing to induce the anticipation of future wants. Lead is a trifle stronger, but in the main prices on both old and new Metals are unchanged. We quote as follows: Casting Copper, 13¼c.; Lake, 13½c. to 13¾c. in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 32c.; small lots, 32½c.; Lead, Desilverized, 4.45c. to 4.50c., for 50-ton lots; Corroding, 4.80c. to 4.90c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 10½c., and other grades, 9¾c. to 10¼c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 10½c.; Copper Clips, 11c.; Red Brass, 11½c.; Yellow Brass, 9¾c.; Light Brass, 6½c.; Lead Pipe, 4c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 25c.; Block Tin Pipe, 27c.

Old Material.—Due mainly to competition among dealers, the market has recorded an advance in nearly all grades of 25c. to 50c. a ton. On two items—Rerolling Steel Rails and Heavy Melting Steel—the upward tendency has been strengthened by a demand from consumers, but with this exception it is almost wholly a dealer's market. The American Steel Foundries bought a considerable tonnage of Heavy Melting Steel, and a local mill has been bargaining for an additional supply of Rerolling Rails. Very little material has been offered by the railroads in the past two or three weeks, and only one list, that of the Great Northern, including a moderate tonnage, is up for distribution this week. Considering the large amount of material now stored in dealers' yards, and the little demand there is for it, it seems doubtful if even the present slight advance can be long maintained unless supported by an actual consumptive demand. We quote, per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$15.50 to $16.00
Old Steel Rails, rerolling	13.50 to 14.00
Old Steel Rails, less than 3 ft.	12.25 to 12.50
Relaying Rails, standard sections, subject to inspection	19.00 to 20.00
Old Car Wheels	13.00 to 13.50
Heavy Melting Steel Scrap	11.50 to 12.00
Frogs, Switches and Guards, cut apart	11.75 to 12.25
Mixed Steel	9.50 to 10.00

The following quotations are per net ton:

Iron Fish Plates	$13.50 to $14.00
Iron Car Axles	16.50 to 17.00
Steel Car Axles	14.75 to 15.25
No. 1 Railroad Wrought	11.25 to 11.75
No. 2 Railroad Wrought	10.00 to 10.50
Railway Springs	11.00 to 11.50
Locomotive Tires, smooth	12.75 to 13.25
No. 1 Dealers' Forge	9.50 to 10.00
Mixed Busheling	6.75 to 7.25
Iron Axle Turnings	5.75 to 6.25
Soft Steel Axle Turnings	5.75 to 6.25
Machine Shop Turnings	5.50 to 6.00
Cast Borings	4.50 to 5.00
Mixed Borings, &c.	4.50 to 5.00
No. 1 Mill	6.50 to 7.00
No. 2 Mill	5.50 to 6.00
No. 1 Boilers, cut to Sheets and Rings	7.00 to 7.50
No. 1 Cast Scrap	11.75 to 12.25
Stove Plate and Light Cast Scrap	10.00 to 10.50
Railroad Malleable	10.25 to 10.75
Agricultural Malleable	9.75 to 10.25
Pipes and Flues	7.75 to 8.25

E. S. Jackman & Co. is the new name of the Chicago agency of the Firth-Sterling Steel Company. E. S. Jackman announces that his brother, D. E. Jackman, formerly of Pittsburgh, joined the Chicago agency May 1 and that the firm's name has been changed accordingly. The warehouse is located at 164 to 168 West Lake street.

Philadelphia.

PHILADELPHIA, PA., June 2, 1908.

There has been a continued strong demand for Pig Iron, and sales have in some cases been larger than in the previous week. Many of the transactions have a speculative appearance, consumers taking tonnage beyond their immediate requirements or for business in sight, owing to their belief that prices can not under existing circumstances recede very materially. It is hardly probable that buying of this character can be maintained for any length of time, inasmuch as the actual amount of business coming to the steel mills, foundries, machine builders and industrial plants, does not as yet show an increase sufficient to warrant heavy buying, and while some few plants show a betterment the larger number are still unable to get their production much above the 50 per cent. mark. Sentimentally, the market is decidedly better. Sellers of Pig Iron are firm on prices, and in many cases refuse to do business for forward delivery or even spot deliveries in any quantity, at to-day's prices. The demand for finished materials does not appear to improve to any marked extent. Some of the deferred business, held up until the question of prices was settled, has come out, but the tonnage is not large, and mills do not show much gain. Structural Material has probably been the most active. The reduction in the price of Steel Bars made in the West will no doubt lead to the meeting of those prices in the East, although some mills have for some time been selling Iron Bars at lower figures than established quotations. There has been a little more buying of Steel Scrap and the Old Material market has a somewhat better tone.

Pig Iron.—Buying continues active, consumers placing orders quite freely for both prompt and forward delivery. Sellers in a number of instances report the largest aggregate tonnage of sales for some time and a few have practically withdrawn from the market. Some are refusing to quote on Iron for prompt delivery, while others will not consider business for forward shipment. The Foundry grades continue to command the greatest attention and sales ranging from 100 tons up to lots of several thousand tons, for various deliveries, are reported. Eastern Pennsylvania No. 2X Foundry has been sold in round tonnages at $16.75, delivered, for shipment up to September 1, but advances of 50c. are obtained for delivery during the entire last half of the year, while for deliveries during the last quarter alone some sellers hold for $1 a ton advance. Larger sales of Southern Foundry Iron are announced. One lot of 3000 tons and another of 1000 tons were sold to local pipe foundries for June and July delivery, at the $11.50 f.o.b. Birmingham basis. Several other sales of smaller lots made on the same basis are also reported. Pipe makers still have a number of inquiries in the market, one of which is reported to be for 10,000 tons for delivery during the third quarter. Virginia Irons have been more active. Sales of 2500 tons of No. 2X Foundry, composed of several lots for third quarter delivery, have been made at $17.50, delivered, while a lot of 1000 tons for shipment during the fourth and part of the first quarter of

1909 was sold at $17.75, delivered. Moderate lots of No. 2 Plain have been sold for third quarter delivery at $17.25, while sales of No. 2X and No. 2 Plain, ranging up to several hundred tons, were sold at $17 and $16.75, delivery, respectively. A sale of 2500 tons of Virginia Basic, for Western shipment, during the fourth quarter and first quarter of next year, was also closed, the price being equivalent to about $16, delivered, in this territory. Locally, the demand for Steel making Irons has been pretty quiet, mills still having considerable Iron due them on old contracts. There has been some inquiry, however, and business may develop in this line before a great while. A sale of 1000 tons of Low Phosphorus is reported, for Western shipment, the price being equal to $21.25, delivered, in this territory. Forge Iron has not been active, and prices for this grade range close to $15.25, delivered. Inquiries are still numerous. Some firm offers have been made by melters but the prices are not satisfactory to sellers, who are not inclined to load up tonnage even at the present prices. There seems to be no increase in the production of Pig Iron in this territory, and stocks at some of the furnaces are not large, so that any material increase in bookings would necessitate the blowing in of furnaces, which is not considered advantageous at the ruling prices. Sellers look for a moderation in the buying movement in the near future unless the railroads come into the market or more activity is shown in general business, as it is believed that melters have in many cases bought in excess of their present needs. Prices have been very firm, and, while unchanged for prompt shipments, advances of 50c. to $1 a ton are obtained by the majority of sellers, for deliveries ranging over the last half of the year. For prompt deliveries in buyers' yards, Eastern Pennsylvania and adjoining territory, the following quotations are named:

Eastern Pennsylvania, No. 2 X Foundry	$16.75 to $17.25
Eastern Pennsylvania, No. 2 Plain	16.25 to 16.75
Virginia, No. 2 X Foundry	17.00
Virginia, No. 2 Plain	16.50 to 16.75
Gray Forge	15.25 to 15.50
Basic	16.00 to 16.25
Low Phosphorus	21.00 to 21.25

Ferromanganese.—The demand is still light, and with the exception of a sale of 500 tons at about $45, seaboard, for delivery during the last half, the business transacted has been extremely small. Prices have an upward tendency, and sellers now quote $46 to $46.50, Baltimore, for last half deliveries.

Billets.—While there was more inquiry last week, but little actual business developed, and it is believed the prospective buyers were simply feeling the market. Shipments on the part of the mills have decreased, and stocks are in some cases increasing. Prices are being maintained. For Ordinary Rolling Steel Billets, delivered in this territory, $29.20 is quoted, with Forging Billets at $31.20, subject to the usual extras for high carbons and special sizes.

Plates.—Little change is to be noted in the demand for Steel Plates. Some fair inquiries for moderate lots of Boat and Tank Steel are out, but orders are not placed promptly. The bulk of the business taken by the mills is small, and of a miscellaneous character, and but little gain has been made in production. Prices are unchanged, the following range being quoted for delivery in this territory:

	Carload. Cents.	Parts carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼ in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
Nos. 9 to 11, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—There has been a fairly even demand for Structural Material. Business, while largely of a small and miscellaneous character, is placed pretty freely, and there is a fair amount of bridge and building work of a moderate size before the trade. Some of the larger propositions under consideration are slow in development. No change is to be noted in the price of the usual range of Shapes, quotations running from 1.85c. to 2c., according to specification.

Sheets.—Buyers show a more active interest in the market, and orders have been placed for a number of small quantities for prompt shipment. No disposition is shown to buy for forward delivery, inasmuch as under the present conditions practically no difficulty is experienced in getting quick shipments from the mills. The aggregate tonnage taken during the week has been somewhat larger, and mills show some little improvement in production. For mill shipments prices range as follows, a tenth extra being added for small lots: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—There is but little demand. The market is unsettled, and, if anything, weaker. The reduction of $4 a ton in the price of Steel Bars in the West will no doubt be met by the mills in the East. In fact, Refined Iron Bars have been on the market for some time at prices materially under the established basis. The tonnages taken, however, have been small and for prompt shipment, and while the established price for Refined Iron Bars delivered in this territory is 1.65c., no difficulty is experienced in obtaining even small tonnages at 1.40c. to 1.50c., delivered.

Coke.—The demand for Coke has been more active, and some few contracts for moderate tonnages of Foundry Coke have been made. Furnace Coke has not been so active, although spot Coke has been offered rather freely at $1.50, at oven. For forward delivery $1.75 is about the best that can be done. Foundry Coke is unchanged at $2.15 to $2.35, at oven. We quote for delivery in this territory about as follows:

Connellsville Furnace Coke	$3.65 to $3.90
Foundry Coke	4.30 to 4.50
Mountain Furnace Coke	3.25 to 3.50
Foundry Coke	3.90 to 4.10

Old Material.—A little more strength is shown in some grades of Old Material. Heavy Melting Steel has been taken more freely during the week, one melter taking 5000 tons and another 500 tons for early delivery, the price in each case being $13.50, delivered. Another melter has picked up several odd lots of this grade at prices ranging from $13.25 to $13.50. Turnings and Borings have been in better demand, but the rest of the list has been somewhat neglected. Quotations are largely nominal, and range about as follows, for prompt deliveries in buyers' yards, eastern Pennsylvania and nearby territory:

No. 1 Steel Scrap and Crops	$13.00 to $13.50
Low Phosphorus	17.50 to 18.00
Old Steel Axles	18.00 to 18.50
Old Iron Axles	20.00 to 21.00
Old Iron Rails	18.00 to 18.50
Old Car Wheels	14.00 to 15.00
Choice No. 1 R. R. Wrought	15.00 to 15.50
Machinery Cast	14.50 to 15.00
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	9.50 to 10.00
Stove Plate	11.00 to 11.50
Cast Borings	8.50 to 9.00
Grate Bars	11.75 to 12.25

Birmingham.

BIRMINGHAM, ALA., June 1, 1908.

Pig Iron.—The market continues active and quotations on deliveries for this month and the third quarter have been advanced to $12, Birmingham, for No. 2 Foundry. This basis has been adopted by all makers who are in position to deliver Iron within the period specified, and transactions reported for the week fail to evince a disposition to depart from the schedule of prices thus established. One of the leading interests that has disposed of its output for the third quarter has adopted a schedule of $12.50, Birmingham. Another large producer quotes $12.50, Birmingham, for the last quarter, and at least two others would accept orders for delivery covering the last half of the year only at figures around such a basis. One of the smaller makers, whose output until September 1 has been disposed of, quotes firmly at $12 for the third quarter, but refuses to accept orders for delivery further advanced. This company reports the sale of approximately 10,000 tons within the past week at $11.50, and an aggregate of 3000 tons at $12, and 1000 tons of anaylsis Iron at figures equivalent to $12.50, Birmingham, for No. 2 Foundry. The delivery of the entire tonnage is not to extend beyond the third quarter. The sale of 35,000 tons of Basic Iron at $12, Birmingham, is reported, and will be produced by capacity heretofore operated on Foundry grades. It is notable that the quantity of Foundry Iron in the hands of merchants has not been increased by recent transactions. The tonnage involved in some instances reached significant proportions, but shipping instructions furnished were such as to indicate that requirements only had been provided for. However, the fact remains that the territory covered by Southern producers since the inception of the buying movement is unusual, and the condition of the Southern market can hardly be considered an index to the condition of the general Foundry trade.

Cast Iron Pipe.—With the volume of new business in sight steadily increasing, and the Pig Iron market on a firmer basis, the condition of this market could hardly be more encouraging. The output of present producing capacity is reported taken care of for some months in advance, and in view of the indications that a turning point in prices has been reached, some hesitancy is noted in efforts to increase the proportions of order book requirements. It is reported that three manufacturers will probably withdraw from the market for July and August deliveries. The prices received for the tonnage to be placed within the next fort-

night will no doubt materially affect the attitude of all parties concerned. Transactions reported for the week indicate a maintenance of quotations, but the quantity involved in each instance was comparatively small. We quote the following for Water Pipe, per net ton, f.o.b. cars here: 4 to 6 in., $25; 8 to 12 in., $22; over 12-in., average $21, with $1 per ton extra for Gas Pipe. These quotations are probably shaded for municipal contracts.

Old Material.—Consumers of all grades manifest more interest, while the scarcity of low grade Foundry Iron has created such a demand for Stove Plate and Light Cast that practically all accumulations have been depleted. The movement of Wrought Iron and Steel Scrap is also worthy of note, and dealers have replenished their stocks in small proportions. Quotations are firmer, and we quote as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$15.00 to $15.50
Old Iron Axles	14.00 to 15.00
Old Steel Axles	12.50 to 13.00
No. 1 Railroad Wrought	12.00 to 12.50
No. 2 Railroad Wrought	9.00 to 9.50
No. 1 Country Wrought	10.50 to 11.00
No. 2 Country Wrought	9.50 to 10.00
Wrought Pipe and Flues	8.50 to 9.00
No. 1 Steel	9.00 to 9.50
No. 1 Machinery	8.50 to 9.00
Stove Plate and Light Cast	5.00 to 5.50
Cast Borings	

Pittsburgh.

PARK BUILDING, June 3, 1908.—(*By Telegraph.*)

Pig Iron.—Inquiries now are mostly for small lots, but the tone of the market is firm, especially on Basic, due to the recent heavy sales. In the Mahoning and Shenango valleys seven stacks are now in blast, these being Nos. 3 and 4 of Shenango Furnace Company, at Sharpsville, on Bessemer, the latter stack having started May 28; Youngstown Steel, on Bessemer; Dover and Struthers, on Basic; Andrews & Hitchcock, on Foundry, and Stewart Iron Company, on Low Phosphorus. We quote Bessemer Iron at $16; Malleable Bessemer, $15 to $15.25; Basic, $15.25 to $15.50; No. 2 Foundry, $15, and Northern Forge, $14, all f.o.b. Valley furnace, the freight rate to Pittsburgh being 90c.

Steel.—There is absolutely no new demand for Billets or Sheet or Tin Bars, but a fair amount of tonnage is being taken out in specifications against contracts. We quote $28, Pittsburgh, and $28.50, Youngstown or Wheeling, for Bessemer and Open Hearth Billets; Sheet and Tin Bars taking $1 advance, and Forging Billets $2 advance.

(By Mail.)

At a meeting of the large Steel interests, held in New York on Monday, it was decided to reduce the price of Steel Bars from 1.60c. to 1.40c., effective at once. It is understood that the principal reasons advanced for the reduction in prices were, first, the differential that has existed for some time of $3 to $4 a ton in favor of Iron Bars, and, second, the fact that usually about this time the Agricultural Implement makers and Wagon makers come in the market and cover their requirements for a year ahead. It was feared that if no reduction was made in prices of Steel Bars these large interests would make contracts for Iron Bars. The opinion is now stronger than ever that reductions on other lines of finished products, such as Structural Steel, Plates, &c., are inevitable. Consumers of Iron and Steel will very likely regard the reduction in prices of Steel Bars as simply a forerunner of reductions that are to be made on other products and will hold off and not buy a pound of material other than what they absolutely need. Following the heavy purchases of Pig Iron about two weeks ago, the market has quieted down very much. While there is a fair inquiry, sales the past week have been light, and only for small lots. Steel Billets and Sheet and Tin Bars are absolutely lifeless, as far as new demand is concerned, but a fair amount of tonnage is being taken out in specifications, May showing an increase of about 10 per cent. over April with one large producer. The demand for Finished Iron and Steel continues very quiet, and is altogether for small lots for actual needs.

Ferromanganese.—Some fairly large inquiries are in the market for delivery over the last half of the year, and prices are firmer than for some time. We quote 80 per cent. foreign Ferro at $44.50 to $45, seaboard, the freight rate to Pittsburgh being $1.90 a ton. A sale of 50 tons for June and July shipment is reported at $44.50, seaboard.

Ferrosilicon.—The inquiry for 300 tons noted last week has not yet been closed, but in the meantime prices have gone up fully $2.50 a ton. We quote 50 per cent. at $70, f.o.b. Pittsburgh, and can report sales of about 75 tons at that price.

Muck Bar.—In the absence of sales we quote best grades of Muck Bar, made from all Pig Iron, at nominally $26 a ton.

Skelp.—Some small tonnage in Steel Skelp has recently been closed, but the general market is quiet. Prices are nominally as follows: Grooved Steel Skelp is 1.55c. to 1.60c; Sheared Steel Skelp, 1.65c. to 1.70c.; Grooved Iron Skelp, 1.75c. to 1.80c.; Sheared Iron Skelp, 1.85c. to 1.90c., Pittsburgh.

Rods.—The extreme quietness in the Wire trade is reflected in Rods, for which there is practically no new demand. Regular prices on Rods are $35 for Bessemer, $36 for Open Hearth, and $37 for Chain Rods, f.o.b. Pittsburgh, but not enough tonnage is being placed to test the market.

Structural Material.—The material for the Pittsburgh & Lake Erie bridge, at Beaver, about 13,500 tons, and the Delaware, Lackawanna & Western shops, at Scranton, about 4000 tons, taken by the McClintic-Marshall Construction Company, has nearly all been placed, being divided between the Jones & Laughlin Steel Company and the Carnegie Steel Company. No local work has been placed in the past week, and little is in sight, outside of the new Horne Building, 2500 to 3000 tons, but which may not come up for some time. The reduction of $4 a ton in prices of Steel Bars will likely lead to still lower figures being made for erection. We quote plain material as follows: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card, Angles, Channels and Tees under 3 in. are 1.50c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Steel Rails.—The Carnegie Steel Company has received in the past week specifications against old contracts for Standard Section Rails amounting to about 4000 tons, but no new tonnage of moment has been placed. The demand for Light Rails has quieted down, the Carnegie Steel Company having taken about 700 tons in the past week. Nos. 1 and 2 Rail mills of the Carnegie Steel Company, at Bessemer, are in operation to about 30 to 35 per cent. of capacity on Standard Sections, but No. 3 mill, on which Light Sections are rolled, is still shut down. It is said that Light Rails made by rerolling mills have recently sold below $23 a ton. Regular prices on Light Rails are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—Some additional tonnage in Plates, for the extensions to the water system of the city of Seattle, Wash., has been placed with the Carnegie Steel Company through James McNeil & Brother of this city, who have taken the contract for the building of some of the mains. The general demand for Plates is dull, and only small orders for material needed for current work are being placed. Large consumers like the car builders and others are buying practically nothing. On narrow sizes prices are being shaded about $2 a ton by some of the smaller mills. Regular prices are as follows: Tank Plates, ¾-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in.	
Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge, No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell grade of Steel is abandoned.	

TERMS—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in., of Tank, Ship or Bridge quality.

Sheets.—New Sheet orders are small and are only for such tonnage as is needed for current work. The consuming trade evidently believes that a reduction in prices of Sheets is not improbable, and for this reason is holding off. It is claimed, however, that any concessions in prices that are being made are by a few of the smaller mills and that, in the main, regular prices are being maintained, as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11

and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—With indications good for a large fruit crop, the Tin Plate manufacturers expect a material improvement in demand shortly after July 1, when the canning trade usually places its contracts. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Hoops and Bands.—The reduction of $4 a ton in prices of Steel Bars will likely carry with it the same reduction in Steel Bands, which are sold on the Steel Bar card. Practically no new business is being placed, buyers holding off in the expectation that prices will be lower. While we have not reduced prices on Steel Bands, it is likely these will be put on the basis of 1.40c. within a day or two, to conform to the new price of Steel Bars. Regular prices in effect to-day (Tuesday) are as follows: Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60c. base, half Steel card extras, all f.o.b. cars, Pittsburgh, in carload lots, for delivery during 1908.

Cotton Ties.—The tonnage so far placed in Cotton Ties is said to be not over 50 to 60 per cent. of what it was at this time last year. We quote as follows: 3000 bundle lots and over, 85c.; less than 3000 bundle lots, 88c., f.o.b. Pittsburgh.

Iron and Steel Bars.—On Monday the large Steel Bar interests in session in New York City reduced prices of Steel Bars $4 a ton, or to a basis of 1.40c., Pittsburgh. It is probable the Bar Iron makers will also reduce prices this week, but whether it will be to the basis of 1.40c., the same as Steel Bars, or to 1.30c., which latter price would maintain the differential existing for some time in prices of Iron Bars over Steel Bars, cannot be stated at this writing. It is hoped the reduction in Steel Bars will stimulate the demand. It is understood that the new price of 1.40c. is in effect only to October 1, to the general trade, but large consumers, like the Implement makers and the Wagon makers, will be allowed to contract for their full year's supply from July 1 at the new price. The reduction in Steel Bars has complicated the settlement of the Amalgamated wage scales for puddling and finishing mills, and it is probable the mills will ask for a heavy reduction in the present scale, which expires on June 30. At this writing (Tuesday p.m.) the Amalgamated Association is in conference with the Western Bar Iron Association at Cambridge Springs, Pa., in an attempt to settle wage scales for the year beginning July 1, but it is doubtful if an agreement will be reached, unless the men agree to accept a material reduction. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further west. Steel Bars remain firm, at 1.60c., Pittsburgh.

Spelter.—The Spelter market seems to be completely demoralized, owing to lack of demand and heavy production, and prime grades of Western are reported as having been offered as low as 4.30c., St. Louis, or 4.42½c., Pittsburgh.

Railroad Spikes.—There is a fair demand for the smaller sizes, but for standard sizes practically no orders are being placed. We quote: Standard sizes, 4½ x 9-16 in., at $1.70, and the smaller sizes at $1.80 per 100 lb. in carload and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Merchant Steel.—Implement and vehicle makers are buying only for actual needs and in very small lots. Whether the reduction in price of Steel Bars will be followed by reductions in prices on the different grades of Merchant Steels is not known now, but it is probable that the whole market will be readjusted. Prices in effect at this writing are as follows: Cold Rolled Shafting, on contracts for 100 tons and over, 57 per cent. off; carloads, 56 per cent. off, and less than carloads, 52 per cent. off, on which carload freight is allowed within base territory. Nominal prices on Merchant Steel are as follows: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 2.10c. to 2.15c.; Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron, finished, 1½ in. and wider, 1.60c.; under 1½ in., 1.75c. Planished Tire Steel is 1.80c., all f.o.b. at mill.

Pipes and Tubes.—It is stated emphatically by the Pipe interests that there will be no reduction in prices of Pipe, and that the trade runs no risk in placing orders. None of the large inquiries for gas and oil lines noted last week has yet developed into orders, but new business in May showed a material increase over April. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 74 and 5 per cent. off list, while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers' Discounts. Steel. Black.	Galv.
⅜ in.	65	49
½ in.	67	53
¾ in.	69	57
1 to 3 in.	71	59
3½ to 4 in.	70	57
Extra strong, plain ends:		
⅜ in.	58	46
½ to 4 in.	65	53
Double extra strong, plain ends:		
½ to 4 in.	54	43

Discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
⅛ to ¼ in.	63	—
⅜ in.	66	51
½ in.	67	55
¾ in.	71	61
1 to 3 in.	68	59
Extra strong, plain ends:		
⅜ to ¾ in.	56	44
½ to 1 in.	63	51
1¼ to 2 in.	59	47
Double extra strong, plain ends:		
½ to 2 in.	52	41

Boiler Tubes.—New buying is light. The railroads are placing few orders for Railroad Tubes, while demand for Merchant Tubes is from hand to mouth. Prices are somewhat uneven, regular discounts on Merchant Tubes in small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 in.	42	47
1¼ in.	42	50
2¼ in.	47	61
2½ in.	52	67
3 in.	42	50

[illegible] 18 to 22 B.W.G., 10 per cent. net extra.
2 in. 20 B.W.G. 10 per cent. net extra.

Iron and Steel Scrap.—A local producer of Low Phosphorus melting stock, but which has not been a seller for two or three years, has recently come in the market and sold from 6500 to 7000 tons, at prices equal to about $18 and higher, f.o.b. Pittsburgh. Part of this is guaranteed to run under point 0.04 in Phosphorus and part of it under 0.05. Other large sales by this interest are pending and will likely be closed this week. We also note that a local consumer has bought from 2500 to 3000 tons of Heavy Steel Scrap, at prices ranging from $13.50 to $14, Pittsburgh. However, the specifications for this Scrap are severe, the consumer using it in hand charged furnaces. No pieces over 5 ft. in length and 18 in. wide, or lighter than 25 lb. nor heavier than 100 lb., will be accepted. The Scrap must also be free of Steel Castings. Aside from the above, little has been done in the Scrap market in the past week. None of the large consumers like La Belle, Republic or Sharon Steel Hoop are taking in any tonnage at present. Dealers quote about as follows per gross ton: Heavy Steel Scrap, Pittsburgh, Steubenville or Sharon delivery, $13 to $13.25; Cast Borings, $7.25 to $7.50; No. 1 Railroad Wrought, $13.25 to $13.50; No. 1 Cast, $13.75 to $14; Bundled Sheet Scrap, $8.50 to $9, at shipping point; Sheet Bar Crop Ends, $16 to $16.50; No. 1 Busheling Scrap, $12 to $12.25; No. 2, $9 to $9.25; Iron Axles, $19 to $19.50; Steel Axles, $16.50 to $17; Low Phosphorus Melting Stock, $17 to $17.50; Old Steel Rails, short pieces for Open Hearth use, $12.75 to $13; Rerolling Rails, lower in price, $13.50 to $13.75; Machine Shop Turnings, $8 to $8.25; Grate Bars, $12 to $12.50; Railroad Malleable Scrap, $11.25 to $12. We note sales of 400 tons of Old Car Wheels at a price equal to about $13.50, Pittsburgh, and 100 tons of Old Iron Rails at a price equal to about $17, Pittsburgh.

Coke.—Inquiries for both Furnace and Foundry Coke are a little better, and more ovens have been fired. The Stewart Iron Company has started 100 ovens and the Bessemer Coke Company has started the same number at its Griffin Works. The H. C. Frick Coke Company has started work on the building of four new Coke plants in the Connellsville region, which will give work to hundreds of men for some months. We quote Connellsville Furnace Coke for prompt shipment at $1.50 to $1.60, while on contracts for delivery over last half of the year as high as $1.75 is asked. Foundry Coke is held at $2 to $2.25 for Connellsville grades, while outside makes are offered as low as $1.75, at oven. The output last week in the Upper and Lower Connellsville regions was about 170,000 tons, a decrease over the previous week of 3000 tons.

The new turbine steamship Mauretania of the Cunard Line broke the record last week by sailing 625 miles in one day, thus averaging 25.40 knots. This was done with one blade of the propeller broken.

San Francisco.

SAN FRANCISCO, CAL., May 27, 1908.

The jobbing situation in Iron, Steel and Pipe is more satisfactory than at the opening of the year. While the local foundries and machine shops are not so busy as they should be at this season, the resumption of work at some of the tributary Copper mines and the preparations for the starting up of more smelters have stimulated the market for Steel Bars, Tool Steel, Steel Castings, &c. Pipe and fittings of all kinds are also in fair demand. The recent increase of 5c. per 100 lb. in the price of Lead by the Selby Smelting & Lead Company indicates improvement. The building situation is quite encouraging, there being a large volume of work in progress, with many good inquiries. The use of metal doors and windows is now the regular thing for high class buildings, and Steel ceilings are becoming more popular. The Western Pacific Railroad has received all of the Steel for the completion of the ferry slips at Oakland, Cal., and is also getting large quantities of Steel Rails for the early laying of tracks to tidewater. The fruit crops are looking well, and money will soon be more plentiful for building and new enterprises of all kinds. Collections are good.

Structural Materials.—While comparatively little Steel is being erected in this city at present, and lack of ready money is preventing the closing of contracts for several large buildings, there is a good deal of inquiry for small lots. The American Bridge Company has taken a contract for 1000 tons for the new Library Building of the University of California at Berkeley. The foundations are already in for this fine structure, which will be constructed without unnecessary delay. A great deal of massive granite work and elaborate stone carving are included in the plans for this building. The American Bridge Company has also a 200-ton contract for the six-story Graff Building, which is being erected on Post street, in this city.

Pig Iron.—Although there has not yet been a marked improvement in the demand for Iron castings at the local foundries and engineering works, there are indications of better times, and increased buying of Pig Iron may be expected in the near future. Arrivals have been light the past month, but there is enough stock on hand to supply the city for some time. The bark René arrived May 19 from Newcastle, England, with 1080 tons of Pig Iron consigned to a local importer. No. 1 English, No. 1 Scotch and Chinese Pig Iron are quoted in this market at about $28 to $29 per ton, ex-yard.

Merchant Pipe.—There is a good demand for Merchant Pipe and prompt deliveries are being made by the railroads on shipments from the East to supply the Coast jobbers. Prices are well maintained. There has been an advance on cast fittings. Discounts on Steel Pipe are about as follows on jobbers' carloads:

	Steel. Black	Galv.
	%	%
⅛ to ¼ in	58.5	42.5
⅜ in	60.5	46.5
½ in	62.5	50.5
¾ to 6 in	66.5	56.5
7 to 12 in	63.5	48.5
Extra strong, plain ends:		
⅛ to ⅜ in	51.5	39.5
½ to 4 in	58.5	46.5
4½ to 8 in	54.5	42.5
Double extra strong, plain ends:		
½ to 8 in	47.5	36.5

Cast Iron Pipe.—Bids have been taken for several Cast Iron Pipe contracts of moderate size, and there are some fair inquiries. The use of Cast Iron Pipe by the military engineers in connection with new water developments in this State has been gratifying to the dealers. A small quantity of 6-in. was specified for the water system which is to supply the new Government coaling station at California Point, in San Francisco Bay. The bids are in for this. Bids are to be received up to June 1 by Major George McK. Williamson, constructing quartermaster, for the new water system at the Presidio Garrison, San Francisco. An entirely new water supply will be installed, including reinforced concrete reservoirs, pumping stations, &c. About 8100 ft. of 10 and 12 in. is called for. Two steam boilers, pumps and auxiliaries are also wanted. Bids were opened May 25 at San Bernardino for 4100 ft. of 12-in. for the municipal water system, and the United States Cast Iron Pipe & Foundry Company, R. W. Martindale, Pacific Coast manager, was awarded the contract. The water situation in San Francisco is getting to be a serious one, and notwithstanding the fact that the city is now taking active steps to secure a supply of mountain water from the Hetch Hetchy Valley, in the Tuolumne watershed, local conditions will be worse before such a municipal system can be completed. It is stated that the Spring Valley Water Company's present capacity to deliver water to the city lines not exceed 55,000,000 gal. per day, and that such capacity can be increased only by laying an additional main from the storage reservoirs down the peninsula to the distributing reservoirs in the city, and, probably, some additions to the pumping plant. The bid of the United States Cast Iron Pipe & Foundry Company was the lowest for the 3000 ft. of 4-in. Pipe required by the city of Vallejo, Cal., for its water works. There has been little change in the market in the past month. Prices of Cast Iron Pipe, f.o.b. cars Pacific Coast terminal points, are about as follows per net ton: 6, 8, 10 and 12 in., $36; 4-in., $37.

Coke.—With the expected increase in the operations of smelters, especially on Copper Ore, the demand for the lower grades of Coke will increase. There are still large stocks of both Australian and English Foundry Coke in the jobbers' hands in this market. There is little change in prices, with only small transactions as a rule. The only recent arrival of Coke was 1800 tons from Newcastle, England. English Foundry Coke is quoted at about $14 to $15 per ton, ex-yard. German Syndicate and Australian Coke are sold at lower prices.

The Palace Hotel Company has awarded a $60,000 contract to the John G. Sutton Company, San Francisco, for the electric wiring and the temporary electric lighting plant for the new eight-story hotel on the corner of Market and New Montgomery streets. Chas. C. Moore & Co. have the power plant contract, including boilers, auxiliaries, &c., at $49,900, and the Westinghouse Electric & Mfg. Company has already delivered two large D. C. generators for this plant.

The Board of Public Works of Seattle, Wash., has rejected the bid of the Puget Sound Bridge & Dredging Company for the Cedar River pipe line as the company would not consent to take its payment for the work from the $2,250,000 bond issue recently authorized. The bid was for $1,263,982.

The present bridge crossing Lake Union at Latona, near Seattle, will be replaced within a year or two by a Steel structure costing approximately $1,000,000. The present bridge has been ordered removed by the War Department because of the necessity for a drawbridge on account of the construction of the proposed Lake Washington Canal. Detailed plans for the structure will be submitted by prominent bridge companies of the country.

St. Louis.

ST. LOUIS, June 1, 1908.

The responses to an organized propaganda on the part of leading merchants and manufacturers fixing upon June 1 as the date to make additions to their working forces have been of sufficient volume to indicate a decided improvement in the general situation. A canvass of the leading Iron interests, however, discloses quite an uneven state of business. Those having to depend mainly upon the railroads are still lacking orders of consequence, while companies supplying machinery, castings and industrial material are finding conditions improving. The best reports come from interests identified with supplies and appliances required in agricultural operations. Concerns dealing principally in farming districts state that their trade is about normal.

Coke.—An increased demand is reported for Coke, with but little change in prices. Some new business is being booked for immediate and future shipment.

Pig Iron.—Orders are being received, ranging from car lots to 500 tons. We note one order for 700 tons, and an inquiry for 2000 tons for shipment in first half 1909. Negotiations are pending for 5000 tons of Basic, and quite a satisfactory number of inquiries are coming daily for all deliveries. We learn that the price of $11.50, Birmingham, has been withdrawn, the minimum rate now being $12. It is further reported that some of the large furnace interests are holding for $12.50, Birmingham. Large sales of Pig Iron are being reported from the South. It is noteworthy that most of the sales in this territory are being made to consumers, rather than to brokers and others on speculative account.

Finished Iron and Steel.—The demand for Structural Steel is showing marked improvement, the number of inquiries being large, although in the main not for large quantities. Light Rails continue in demand from lumbering and mining interests, and specifications are liberal for immediate wants. Standard Rail business remains dull. Concerning the market buyers are divided as to their views regarding the recent decision to maintain prices, but sales are better for Bar products, and with the exception noted above the outlook is brighter than in the early spring for all classes of Steel products. Inquiries from railroads have been light, owing to rains and floods in the Southwest. With the better weather now prevailing, it is thought the coming week will witness an improvement in this demand.

Metals.—The slump in Tin and weakening in Copper have checked trade in Brasses, the demand for which had been slowly but steadily gaining in volume.

Old Materials.—With the starting up of the local mills of the American Car & Foundry Company, the Republic Iron & Steel Company, the Commonwealth Steel Company and others, causing a demand for Heavy Melting Steel, there has been some advance in prices. Relaying Rails, first class, Hunt's inspection, are being held by the railroads at $22.50

to $23.50 and are in demand. There are no railroad lists out yet for this month. We quote, f.o.b. St. Louis, per gross ton, as follows:

Old Iron Rails	$14.00 to $14.50
Old Steel Rails, rerolling	12.25 to 12.50
Old Steel Rails, less than 3 ft.	12.00 to 12.25
Relaying Rails, standard sections, subject to inspection	22.50 to 23.50
Old Car Wheels	13.00 to 13.50
Heavy Melting Steel Scrap	12.00 to 12.25
Frogs, Switches and Guards, cut apart	12.00 to 12.25
Mixed Steel	10.00 to 10.25

The following quotations are per net ton:

Iron Fish Plates	$12.00 to $12.25
Iron Car Axles	16.00 to 16.50
No. 1 Railroad Wrought	11.50 to 12.00
No. 2 Railroad Wrought	10.50 to 11.00
Railroad Springs	10.50 to 11.00
Locomotive Tires, smooth	13.00 to 13.50
No. 1 Dealers' Forge	9.50 to 10.00
Mixed Borings, &c	3.75 to 4.25
No. 1 Boilers, cut to Sheets and Rings	8.25 to 8.75
No. 1 Cast Scrap	10.00 to 10.50
Stove Plate and Light Cast Scrap	8.25 to 8.75
Railroad Malleable	10.00 to 10.25
Agricultural Malleable	8.50 to 9.50
Pipes and Flues	8.00 to 8.50

Cleveland.

CLEVELAND, OHIO, June 3, 1908.—(*By Telegraph.*)—Bar Iron manufacturers have reached an agreement reducing the price $3 per ton.

(*By Mail.*)

CLEVELAND, OHIO, June 2, 1908.

Iron Ore.—At a meeting of the independent vessel owners, held in this city yesterday, it was decided not to start their boats until June 16, with the exception of a few that have contracts to deliver cargoes. Another meeting will be held here on that date, and unless there has been a decided improvement by that time the general start in navigation will be put off until July 1. The Ore market is still lifeless. It was expected that the activity in Pig Iron would result in some buying of Ore without further delay, but that expectation has not yet been realized. While Ore men do not look for a great deal of buying this month, they believe that many of the furnace interests will come into the market soon for a portion of their requirements for the year. Shipments in June will be very light and it is estimated that the movement until July 1 will be 10,000,000 tons behind the same period last year. In April, May and June of last year the Ore shipments were 12,685,516 tons. More boats of the Pittsburgh Steamship Company were started during the past few days and about 25 boats, or a quarter of the vessels of that fleet, are in commission. Three of the leading merchant Ore firms have not yet started a boat. Another shipper has a few boats in commission. The estimate made a few weeks ago that not over 20,000,000 tons of Ore will be needed from the mines this year still holds, and vesselmen say that there will be no trouble in bringing down that amount of Ore even if the movement is very light until August. Then shipments can be rushed the remainder of the season. Very little Ore is going forward from the docks and the amount on docks May 1 has been diminished very slightly. Prices for 1908 delivery at Lake Erie docks, per gross ton, are firm, as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous non-Bessemer, $2.35 to $2.60.

Pig Iron.—The activity in the Pig Iron market has continued the past week, and the large volume of inquiries still coming in indicates the sale of considerable tonnage the next week or two. The most of the buying has been of Foundry Iron, but some sales of Basic are reported, and the activity has extended to Malleable Iron. Bessemer alone remains quiet. While the buying is regarded to a certain extent as speculative, buyers as a rule are following a conservative policy and are covering for only about one-half of their expected requirements for the balance of the year. Prices are firmer and $1.0, Valley furnace, seems to be bottom price for No. 2 Foundry for the third quarter. Most of the interests are holding firmly at $15.25, Valley furnace, for the third quarter for No 2, and $15.50 is being asked for the last half. Local furnaces are holding firmly at $15.75 to $16, at furnace, for No. 2 Foundry for delivery in this territory. Three furnace interests report the sale during the week of about 7000 tons of Foundry Iron, mostly for third quarter delivery, but some for the entire last half. A large portion of the Iron was sold to consumers in this territory, the majority of them being in the market for Iron for a portion of their requirements. Many Foundry Iron inquiries are still pending for lots ranging from 100 to 1000 tons. The melt is improving in this territory, and shipments have increased considerably. We note the sale of 5000 tons of Basic Iron and 5000 tons of Malleable Iron at about $15.50, Ohio furnace. An offer of $15 for 6000 tons of Malleable Bessemer from a Buffalo car coupling manufacturer was rejected by a local interest. There are still pending some good inquiries for Basic and Malleable Iron, but the large consumers of Malleable have not yet come into the market. Among the inquiries is one for 1000 tons of Foundry and 1000 tons of Malleable for the first half of 1909. For prompt shipment and for third quarter we quote, delivered, Cleveland, as fololws:

Bessemer	$16.90
Northern Foundry, No. 1	$16.25 to 16.75
Northern Foundry, No. 2	15.90 to 16.25
Northern Foundry, No. 3	15.40 to 15.90
Southern Foundry, No. 2	16.35
Gray Forge	14.90

Coke.—The Foundry Coke market shows an improvement, and prices are firmer. Considerable tonnage has been sold for last half delivery. We quote 72-hr. Foundry Coke at $2.25, at oven, for last half delivery, and $2.15 for spot shipment. While the demand for Furnace Coke does not yet show an improvement, the market is firmer, because of the improvement in the Pig Iron situation. We quote Connellsville Furnace Coke at $1.75 to $1.85, at oven, for the last half.

Finished Iron and Steel.—Business in all Finished lines has been quiet, buying being confined to small lots for immediate needs. Mill agents to-day notified their customers of the reduction of $4 a ton in Steel Bars. It is expected that the lower price will stimulate the demand, and result in some increase in specifications. For the past month there had been persistent rumors that the price was being cut $2 a ton by one or more mills. Consumers of Structural Material and Plates now expect that a reduction will be made in the prices of those materials, and will probably be slow in placing orders until a cut is made, or they are satisfied that prices will be maintained. About the only improvement noted in the local demand past week has been in Structural Material, some fair specifications having been received from bridge building concerns. There is some Structural work in sight in the building line requiring small tonnages, but fabricators are taking that work at very low prices. The demand for Plates shows no improvement, and price cutting of $2 a ton is reported on both Light and Heavy Plates. Sheets are weak and in light demand, concessions of $1 to $2 a ton being made. Jobbers report a slight improvement in warehouse business. Pending a probable readjustment we quote Iron Bars at 1.50c. to 1.60c., Cleveland, for car lots. We quote Steel Bars, 1.50c., Cleveland, for car lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼-in. and heavier, 1.80c., base, Cleveland. Dealers quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Warehouse prices are unchanged. We quote Iron and Steel Bars out of stock at 1.70c. to 1.80c.; Beams and Channels out of stock are 2.10c. to 2.15c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—The improvement in the demand for Heavy Steel Scrap, as noted last week, has continued, and dealers have advanced the price of this Scrap and Steel Rails $1 a ton and over. The demand comes largely from the Pittsburgh District and mills in the Valley. There is also a slightly better demand for Bushelings, and their price is a little firmer. As far as local demand is concerned the market shows no improvement, but the spurt in Steel Scrap has stirred up some trading among dealers, and the whole list outside of Steel Scrap is possibly a little firmer, although prices remain about stationary. A small tonnage is offered this week by the Wheeling & Lake Erie Railroad. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$12.50 to $13.00
Old Iron Rails	14.50 to 15.50
Steel Car Axles	16.00 to 17.00
Old Car Wheels	12.50 to 13.00
Relaying Rails, 50 lb. and over	21.00 to 22.00
Heavy Melting Steel	12.00 to 12.50
Railroad Malleable	11.00 to 11.50
Agricultural Malleable	10.50 to 11.00
Light Bundled Sheet Scrap	7.50 to 8.50

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	6.00 to 6.25
Steel Axle Turnings	7.50 to 8.00
No. 1 Railroad Wrought	11.00 to 12.00
No. 1 Cast	11.50 to 12.50
Stove Plate	10.00 to 10.50
Bundled Tin Scrap	8.00 to 9.00

Records kept by the steamship companies at New York show that in the first five months of 1908 but 153,027 immigrants landed at Ellis Island, as against 583,835 in the same period last year. The returns of immigrants to Europe this year had reached a total of 311,995 at the end of May, as against 114,137 for the first five months of 1907.

Cincinnati.

CINCINNATI, Ohio, June 3, 1908. (By Telegraph.

While with some sales agents the rather abrupt slump in inquiries for Pig Iron has suggested the usual dullness following a sudden buying movement, others predict that still lower levels than have been reached are inevitable, and that the ultra conservative buyers are holding off in that expectation. Aside from the Agricultural Implement makers, the Pipe people and some Stove manufacturers, there is indicated no early need for Iron, and with the prospect of five or six months of business inertia, with the Presidential programme to deal with, manufacturers and foundrymen who buy for actual requirements are not figuring very largely in the markets. The announcement that the large Steel manufacturers had reduced Steel Bars $4 a ton came as a distinct surprise to the trade. Inquiry of the seven or eight largest interests here in the jobbing line indicates that all will maintain store prices, which are 1.85c., and none believe that the reduction will bring out any business of consequence. It is understood here that the proposition affects favorably only the large Wagon makers and Agricultural Implement manufacturers, who can contract on the basis of 1.40c., Pittsburgh, to July 1, 1909, others being restricted to October 1, this year. A feeling exists also that there is something more on the inside which is yet to come out, and that the drop on Steel Bars is but the precursor of some larger and more vital doings. There is a little buying movement on in Heavy Melting Steel Scrap for export. The machine Tool market continues featureless.

Pig Iron.—Considerable uncertainty exists in this market, taking into consideration all factors having to do with the sale of Iron at this time—namely, the depleted condition of stocks on furnace yards, especially marked in the low grades, the firmness of the price governing the Southern product, now $12, Birmingham, for No. 2 Foundry, with an insignificant inquiry and the continued dullness of the machinery markets. There is no Southern Iron offered in this market less than $12, and some are asking $12.50. On low grades, but one agency was found willing to quote on No. 4 Foundry and Forge, the prices being $11 to $11.50, and $10.50 to $11, Birmingham, respectively. There is still a good demand for Basic, which is quoted around $15.50, Valley furnace. Showing confidence in the future, one inquiry for a 5000-ton per year requirement, covering balance of this year, and for 1909 is significant. It is reported that the Woodward Iron Company, Birmingham, will put one of its stacks on Basic soon. Southern Basic is quotable on a basis of about $11.50 to $12, at furnace, although it is understood that one interest is holding for $12.50. A southern Ohio Steel maker has purchased 6000 tons, July to December delivery, and a number of other Steel makers in central territory have closed for good sized tonnages. Many of the local foundries have bought Iron, but save the several who bought speculatively last week the contracts are for comparatively small lots. Northern Irons remain unchanged. While the asked price is $15.50 to $16, Hanging Rock furnace, it is persistently reported that one interest has sold some big blocks at $15. Ohio Silveries are firm, at $18.50 for 8 per cent., at furnace. Southern Silvery can be bought at about $1 above No. 1 Foundry for 4 to 5 per cent., and $1.50 advance for the 5 to 6 per cent. grades. For early delivery and for the balance of the year we quote f.o.b. Cincinnati, as follows, freight rates being $3.25 from Birmingham, and $1.20 from the Hanging Rock District:

Southern Coke, No. 1	$15.75 to $16.25
Southern Coke, No. 2	15.25 to 15.75
Southern Coke, No. 3	14.75 to 15.25
Southern Coke, No. 4	14.25 to 14.75
Southern Coke, No. 1 Soft	15.75 to 16.25
Southern Coke, No. 2 Soft	15.25 to 15.75
Southern Coke, Gray Forge	13.75 to 14.25
Ohio Silvery, 8 per cent. Silicon	19.70
Lake Superior Coke, No. 1	17.20 to 17.70
Lake Superior Coke, No. 2	16.70 to 17.20
Lake Superior Coke, No. 3	16.20 to 16.70
Standard Southern Car Wheel	22.25 to 22.75
Lake Superior Car Wheel	22.00 to 22.50

(By Mail.)

Coke.—In sympathy with the improved tone of the Pig Iron market, Coke is stronger, and there is inquiry for Furnace grades. Some sales of fair size of Wise County Coke are reported for the last half. Sellers appear reluctant to quote for this delivery, but affirm positively that there will be no more cheap Coke. It is reported here that all the cold Frick ovens in the Connellsville field are to be lighted at once; about 60 per cent. have been out. Of spot Foundry Coke, choice brands are quotable at $2.10 to $2.25; on contract for balance of the year, $2.20 to $2.50, at oven. For nearby shipment there have been some fairly good sales of Foundry grades. The record for the first five months in this market shows about 40 per cent. of the 1907 sales. No change is reported in New River prices. One agency made a shipment last week of 7500 tons of Furnace Coke; another order of the same grade to-day is for 25 cars.

Finished Iron and Steel.—Little improvement is shown in Finished products. A few inquiries of the week are for Structural Iron and Steel, principally from the South. Some fairly good sales of Steel Bars for concrete construction are being booked. Generally speaking, it is dull, and dealers look for little improvement for 30 to 60 days. Business in this territory for the five months ending May 30 totals about 50 per cent. of the volume for the same period of 1907. Orders from stock are filled at the following prices, which are f.o.b. Cincinnati: Iron Bars, carload lots, 1.65c., base, with half extras; small lots from store, 1.85c., base, half extras. Steel Plates, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼in. and heavier, carload lots, 1.85c.; small lots from store, 2c. Blue Annealed Sheets (Heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.20c. No. 12, carload lots, 2c.; small lots from store, 2.30c. Sheets (Light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.20c.

Old Materials.—The domestic Scrap market shows no improvement, but some sales have been made for export. One dealer last week shipped 2000 tons of Melting Steel Scrap to New Orleans, where it was loaded in two steamers destined for Italy. Another shipment will go out this week, making 3000 tons in two weeks from this market. The price is withheld, but it is understood to have been at the prevailing price quoted for this market. The largest dealers have immense stocks of all grades. Cast Scrap is very dull. An advance of about 25c. a ton is asked by dealers over quoted prices on some material, but in the main Scrap is purchaseable at the following figures, which are f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$10.50 to $11.50
Cast Borings, net ton	4.00 to 5.00
Heavy Melting Steel Scrap	11.00 to 12.00
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	10.25 to 11.25
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	14.50 to 15.50
Old Iron Rails, gross ton	13.00 to 14.00
Old Steel Rails, long, gross ton	11.00 to 12.00
Old Steel Rails, short, gross ton	11.00 to 12.00
Relaying Rails, 56 lb. and up, gross ton	22.00 to 23.00
Old Car Wheels, gross ton	12.00 to 13.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00

Metal Market.

NEW YORK, June 3, 1908.

Pig Tin.—Prices, while considerably unsettled, did not fluctuate widely, but there was only a little business. Consumers in the city took some Tin. The holiday of course is blamed for some of the falling off in business. Prices have moved slowly, as follows:

	Cents.
May 27	28.45 to 28.50
May 28	28.25 to 28.30
May 29	28.60 to 28.70
June 1	28.20 to 28.25
June 2	28.60 to 28.70
June 3	28.85

The advance to-day was the result of higher prices in London, which market closed at £130 10s. for spot and £129 17s. 6d. for futures. The arrivals so far this month are 410 tons, and there are afloat for American ports 2422 tons. The statistics of Tin compiled by C. Mayer, show that visible supplies at the end of May were 15,424 tons, the largest since January, 1905, and with that exception since March, 1904. Deliveries into consumption in May were large, 4000 tons, but the total deliveries for the first five months of 1908 show a falling off of 2550 tons compared with last year. Stocks in this country are still low, amounting to 1166 tons. The visible supply at the end of May this year is 3400 tons larger than at the end of May last year.

Copper.—Buying is small, domestic and foreign consumers alike holding off. Perhaps rather more inquiry is noted, especially from consumers in New England, but that section of the country seems to be the center of good news this week. Of course some business is constantly being done, and the ruling prices are 13c. for Lake and 12.62½c. to 12.75c. for Electrolytic. As usual, rumors are abundant of large sales at higher prices, but are not received with much faith. The one encouraging factor in this trade is the ability of manufacturers of finished lines to get a considerable increase in business by shading prices. Already Brass Sheets and Tubes are moving more freely and the same can be said of Copper Sheets. The London market is firmer than last week at £57 17s. 6d. for spot and £58 7s. 6d. for futures. The exports from Atlantic ports in May were 22,600 tons, making the total so far this year 133,800 tons, compared with 66,000 tons in the same months last year. The importation of Copper in April, complete figures for which are now available, amounted to 7300 tons, a falling off of 4000 tons compared with the corresponding month last year. The imports during the first four months of 1908 amounted to 29,600 tons, contrasted with 44,440 tons during the same months in 1907. The exports of Copper on this

movement since October 1, 1907, amount to 234,800 tons. In the year of maximum exports, 1904, the total exports were about 248,000 tons. The report of the Amalgamated Copper Company, issued this week, states that the companies owned wholly or in part produced in 1907 about 212,000,000 lb. of Copper, of which the parent company received the benefit from about 178,000,000 lb. The same items in 1906 were 275,000,000 lb. and 224,000,000 lb., respectively.

Waterbury Average.—The Waterbury average for May was 13c.

Pig Lead.—The advance noted last week was evidently too rapid, as outside sellers are now shading the price to 4.30c., New York. The demand is not so good as a month ago, at least from the principal sellers. This indicates that what business there is is taken by outside holders. The St. Louis market is dull, at 4.20c. It would be a simple matter to take foreign Ore out of bond should prices go higher. Soft Spanish Lead is quoted at £13 5s. in London to-day.

Nickel.—Prices are unchanged at 45c. for ton lots and 50c. to 60c. for smaller quantities.

Spelter.—Prices of Spelter continue unchanged at 4.40c. to 4.45c., St. Louis, and 4.55c. to 4.60c., New York. On the present cost of Ore there is no money in Spelter at these prices.

Antimony.—Prices continue nominal, and the market is dull. Cookson's can be imported at 8.50c.; Hallett's at 8.50c. to 8.62½c. and outside brands at 8.25c.

Tin Plates.—Orders for prompt shipment continue to come in freely, but there is no disposition among consumers to stock up. Prices are without change, at $3.89 New York and $3.70 Pittsburgh, for 100-lb. IC Coke Plates. In Swansea Welsh Plates are unchanged, at 12s. 3d.

Old Metals.—Little change is observed in prices, some being advanced and others lowered, the reason being that more business is going on, and it is possible to quote prices with more accuracy than recently. Consumers are buying more freely to cover actual wants. Frequently of late orders have been received for prompt shipment which confirms again, if such confirmation be necessary, that stocks of raw materials in consumers' hands are almost insignificant. Some speculative buying is likewise making itself felt. Dealers' selling prices are as follows:

	Cents.
Copper, Heavy and Crucible	12.00 to 12.25
Copper, Heavy Wire	11.75 to 12.00
Copper, Light and Bottoms	10.75 to 11.00
Brass, Heavy	9.00 to 9.25
Brass, Light	7.00 to 7.50
Heavy Machine Composition	11.50 to 11.75
Clean Brass Turnings	7.50 to 8.00
Composition Turnings	9.50 to 10.00
Lead, Heavy	4.00
Lead, Tea	3.75
Zinc	3.50

New York.

NEW YORK, June 3, 1908.

Pig Iron.—The volume of business has fallen off somewhat and the buying movement seems to be again drawing to a close. There has been quite a number of round lots sold and there are still pending negotiations for some important lots, which will determine whether buyers may be found to pay the higher prices demanded by many of the furnace interests. We quote, at tidewater: Northern No. 1 Foundry, $16.75 to $17; No. 2 Foundry, $16 to $16.50, and No. 2 Plain, $15.50 to $16. Alabama Irons are selling at $16.50 to $17 for No. 1, and $15.75 to $16.25 for No. 2 Foundry.

Steel Rails.—The 42,000-ton sale of Open Hearth Rails to the Illinois Central Railroad, to which widespread reference has been made in the past week, is an old order for 1908 delivery, reported last year, the business being taken by the Tennessee Company. The odd 2000 tons represents the usual 5 per cent. of seconds. The original award of the Illinois Central included also 10,000 tons of Bessemer Rails, placed with the Illinois Steel Company. It is noticed lately that as various railroads, principally smaller lines, which placed Rail orders last year, succeed in making their financial arrangements, they become urgent at once about deliveries, and the mills have been asked to expedite these in several cases.

Structural Material.—The effect of the reduction in the price of Steel Bars on the Structural market is a matter of immediate interest to the fabricating companies. Particularly is this true in view of the fact that contracts for fabrication and erection have been taken lately on a basis that corresponds to a very considerably less price than 1.60c. for Structural shapes. In one recent case where a steel company bid for a Structural contract a 2.10c. price for fabricated material was named, which would represent about 1.25c. for Steel. The belief is that the placing of construction work will be delayed by the Bar reduction, and the expectation of buyers of Shapes that a readjustment will be made there also is now expressed with more confidence. The leading fabricating company, basing its bids on the price of Steel that has been maintained by the leading interests, still books a relatively small fraction of current business—this in the face of the fact that the amount of work figured on in New York City in May was several thousand tons more than in May, 1907. Among business likely to be let in the next few days is the Astor House addition, amounting to about 4000 tons. The Sinclair Realty Company will let the contract soon for the building at Broadway and Eighth street, on the site of the old Sinclair Hotel. About 1000 tons will be needed. Another job coming up soon is the new Farmers' Loan & Trust Company Building on William street, calling for 3000 to 4000 tons. In May, the American Bridge Company booked 21,000 tons, while its average for the first five months of the year was 17,000 tons. We quote on tidewater deliveries, shipments from mill, as follows: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c.. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2.50c.

Bars.—The past few days have been quite notable in this branch of trade. A heavy increase occurred in orders placed for Bar Iron, and leading Eastern mills are understood to have secured a number of large orders. The business was taken at some sacrifice of prices, and quotations are now 1.35c. to 1.40c., New York. The Eastern manufacturers are still at work on a plan which they are undertaking for the purpose of getting the market in better shape. Numerous inquiries are in hand, and a continuance of the buying movement appears probable. Prices of Steel Bars were reduced on Monday to 1.40c., Pittsburgh, or 1.56c., New York.

Plates.—No improvement is reported in this line. Some orders are being taken for Universal Plates, but the demand for Sheared Plates is exceedingly light. Prices of standard sizes of Plates are maintained, as follows, at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—Proposals for the Syracuse contract for 20,000 tons of 30 to 42 in. Pipe were opened on Monday, and the leading interest was the lowest bidder, at $23 per net ton, delivered. The same company was the lowest bidder on 350 tons of 6, 12 and 24 in. Pipe, on which bids were opened by Yonkers, also on Monday, at $25.60 per gross ton, deliv red. The city of New York will open bids for 3500 tons of 12, 16 and 20 in. Pipe for Staten Island, June 10. On the same day the city of Rome, N. Y., will open bids on 3745 tons of 30-in. Pipe. The demand for carload lots and slightly larger quantities is improving, and prospects are encouraging for a continuance of what now appears to be a seasonable demand. Although the prices named on large lots are still quite low, manufacturers are advancing their figures on carload lots, and $24 per net ton, at tidewater, is probably the inside price for such quantities of 6-in.

Old Material.—The market is steadily becoming more active. Within the week sales have been made of Heavy Steel Melting Scrap which total at least 10,000 tons. Foundries are taking more Cast Scrap and prices of this class of Old Material are stronger. Rolling mill stock has been quiet, but it is expected that the increased buying of Bar Iron will shortly compel some of the Bar Iron manufacturers to make purchases of Old Material to cover the contracts taken. Relaying Rails are in continued good demand and prices show firmness. Old Car Wheels are inactive, with abundant stocks in dealers' hands. Quotations are about as follows per gross ton, New York City:

Old T Rails for melting	$11.50 to $12.00
Heavy Melting Steel Scrap	11.50 to 12.00
Old Steel Rails, rerolling lengths	11.50 to 12.00
Relaying Rails	20.50 to 21.50
Old Steel Axles	14.50 to 15.00
Standard Hammered Iron Car Axles	16.00 to 16.50
Old Steel Car Axles	14.50 to 15.00
No. 1 Railroad Wrought	12.00 to 12.50
Steel Rail Scrap	10.00 to 10.50
No. 1 Yard Wrought, long	11.00 to 11.50
No. 1 Yard Wrought, short	10.00 to 10.50
Light Iron	5.50 to 6.00
Cast Borings	5.00 to 5.50
Wrought Turnings	6.50 to 7.00
Wrought Pipe	9.50 to 10.00
Old Wheels	12.00 to 12.50
New Cast Scrap	13.00 to 14.00
Stove Plate	9.50 to 10.50
Locomotive Grate Bars	10.50 to 11.00
Malleable Cast	11.50 to 12.50

Ferroalloys.—Business has not continued so active as last week; still trade has been fair. Sales of 50 per cent. Ferrosilicon were made at $70, Pittsburgh. Prices on Ferromanganese are 50c. per ton easier, at $44, Baltimore. Same sellers, however, are holding out for $46.

Iron and Industrial Stocks.

NEW YORK, June 3, 1908.

A reversal of sentiment has characterized the stock market and prices have shown a marked advance since our last report. The lowest prices of the intervening period were realized on Thursday and Friday. The improved feeling is

bill by Congress. The range of prices on active iron and steel stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 35⅞ to 39¼, preferred 100½ to 103; Car & Foundry common 35¼ to 38, preferred 98; Locomotive common 48 to 51½; Steel Foundries common 6½, preferred 34; Cambria Steel 30¼ to 31⅜; Colorado Fuel 25½ to 29¼; Crucible Steel common 5⅞ to 6¼, preferred 40¼ to 42¾; Pressed Steel common 28 to 29⅛, preferred 82; Railway Spring common 37 to 38¾, preferred 91; Republic common 17¼ to 19¾, preferred 66¾ to 71½; Sloss-Sheffield common 49¾ to 53; Cast Iron Pipe common 27½ to 27½; Can preferred 54 to 55¾. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 38¼, preferred 102¼; Car & Foundry common 35¾, preferred 98; Locomotive common 50½; Colorado Fuel 27¾; Pressed Steel common 28⅜, preferred 82; Railway Spring common 37¼; Republic common 18⅝, preferred 70; Sloss-Sheffield common 51¼; Cast Iron Pipe common 27½, preferred 75¼; Can preferred 56.

Dividends.—The American Can Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable July 1.

The American Car & Foundry Company has declared a quarterly dividend of 1¾ per cent. on preferred stock, and ½ per cent. on the common stock, both payable July 1.

An International Congress of Refrigerating Industries.

The announcement is made of the first International Congress of the Refrigerating Industries, to be held in Paris, France, September 17 to 23, 1908, under the patronage of the French Ministers of Agriculture, Commerce and Industries. The French committee has invited other countries to participate. The United States Government has accepted the invitation, and delegates will be appointed by the Secretary of State and the Secretary of Agriculture to represent this Government. An American committee has been formed in part, having the following officers: President, Homer McDaniel, Cleveland, Ohio; vice-president, John E. Starr, 258 Broadway, New York; treasurer, John S. Field, Chicago, Ill.; secretary, J. F. Nickerson, 315 Dearborn street, Chicago, Ill. The purpose of the congress is to bring together the leading experts and representatives of the various industries and enterprises in all countries in which refrigeration is used for facilitating the preservation and transportation of food products. The congress is divided into six sections, as follows: Section 1, Low Temperatures and Their General Effects; Section 2, Refrigerating Appliances; Section 3, The Application of Refrigeration to Food; Section 4, The Application of Refrigeration to Other Industries; Section 5, The Application of Refrigeration in Commerce and Transportation; Section 6, Legislation.

One of the topics to be considered by Section 4 is "Air Drying at Blast Furnaces," this coming under the general title, "Mines and Metallurgy, Public Works, Stearine, Paraffin, Margarine, &c." This section will also consider in general new industrial applications of refrigeration. Arrangements have been made for a documentary exhibit and a display of plans, models and small appliances. American manufacturers are invited to send exhibits. Of these, particulars may be obtained from the secretary of the American committee.

The Niles Iron & Steel Company, Niles, Ohio, will enlarge its plant by the erection of two additional two-story brick buildings. One of these will be used for a machine shop and the other for manufacturing purposes. The company will add to its present products, the manufacture of eaves trough and conductor pipe and pressed steel seats and other pieces for agricultural implements. A new engine will also be installed.

The Passaic Steel Company's property is to be sold. The United States Court at Trenton, N. J., May 28, decided that it must be sold subject to the holdings of the first mortgage bondholders. It is also held that the mortgage may be foreclosed, with the receivers as party defendants to the proceedings to protect the interests of the general creditors. The first mortgage bonds, all issued, aggregate $2,500,000.

The Production of Aluminum in 1906.

The consumption of aluminum in the United States in 1901 amounted to 17,211,000 lb., as compared with 14,910,000 lb. in 1906, according to the forthcoming annual report of the United States Geological Survey, compiled by W. C. Phalen. Aluminum shared in the greatly increased demand, along with the other metals, in the first nine months of the year 1907, and the rise in the price of copper and tin no doubt served to widen the field of application of aluminum. Contrary to the general expectation and to numerous prophecies, the great increase in the domestic production did not materialize. This is to be accounted for to a certain extent, but probably not to the extent that is generally supposed, by the great falling off in the demand toward the close of the year, owing to the general business depression. In no branch of the aluminum industry has the influence of the general depression been felt more than in the manufacture of electric railroad cars and motor cars. The absolute increase in quantity of metal produced was less in 1907 than in either 1905 or 1906, and the percentage of increase was only about half that of 1905 and 1906. The following table gives the production in the past five years:

Years	Pounds.	Years.	Pounds.
1903	7,500,000	1906	14,910,000
1904	8,600,000	1907	17,211,000
1905	11,347,000		

The figures for 1904 to 1907, inclusive, represent consumption.

New Industrial Developments.

In August, 1888, the Pittsburgh Reduction Company, now the Aluminum Company of America, was organized, and a factory in which to manufacture the metal was started in Pittsburgh in November of that year. In 1890 the works were greatly enlarged, and in the following year they were removed to New Kensington, a suburb of Pittsburgh, and in 1893 were again enlarged. In 1896 the production of pig aluminum at New Kensington was abandoned, since which time the works have been devoted to the manufacture of pig aluminum into more or less finished forms. Other works now operated by the company are located at Niagara Falls and Massena, St. Lawrence County, N. Y., and at Shawinigan Falls, Quebec, Canada, also at East St. Louis, Ill. During 1907 the capacity of the chemical plant at East St. Louis was greatly enlarged. The material from the Arkansas mines is washed and treated to free it from iron, silica, titanium, &c., at the East St. Louis plant.

At New Kensington the company has installed a continuous mill for rolling aluminum sheets, the only one of its kind in existence. A new rolling mill has also been in course of construction at Niagara Falls, which will be one of the largest and most complete sheet rolling mills in America. At Massena, the company has purchased the entire plant of the St. Lawrence Power Company with its canal and powerhouse of 40,000 hp. capacity, and is preparing to dredge out the canal to double this capacity. A new powerhouse for this enlarged capacity was started in 1907, and eight large waterwheels to absorb the capacity of the first canal have been purchased for installation in the old powerhouse. The plans referred to in the Survey's report for the year 1906 as being formulated for extensive water power development and aluminum works on the Cumberland River near Corbin, Ky., have so far as known not yet materialized. Twenty thousand horsepower, according to the plan proposed, will first be developed, and most of this is to be used in the works.

The Thomas Carlin's Sons Company, 1600 River avenue, N. S., Pittsburgh, has received an order from the Monongahela River Consolidated Coal & Coke Company, Pittsburgh, for a 6 x 8 in. four drum hoisting engine. The company is building a No. 18 shear to cut 2¼ in. square soft steel cold and one No. 40 to cut 1¼ in. material, for shipment to Baltimore, Md.

The Bethlehem Steel Company, South Bethlehem, Pa., rolled 30-in. beams successfully on its Grey structural mill Tuesday and Wednesday.

The Machinery Trade.

NEW YORK, June 3, 1908.

The demand for machinery since the first of the year has been so light and irregular that a few additional sales in a week often increased the business of a company to an extent that afforded considerable encouragement, which would be offset by a decrease of trade the following week. The demand has fluctuated within such a narrow limit and so frequently as to indicate that confidence has not been fully restored. With some houses the totals of business for May were a little larger than those for the previous month, but others report a slight decrease. The increase with many was due to the orders received the last week of the month, and they feel somewhat encouraged as during the first few days of June this was maintained. There is undoubtedly a better feeling among machinery houses and, taken as a whole, the trade shows some improvement. Business continues to consist of single tool orders from the small industrial plants, neither the larger works nor the railroads having come into the market as yet. It is hoped that the recent financing by some of the important railroads will result in the early purchases of mechanical equipment.

It is reliably stated in machinery circles that a number of large railroads will begin some extensive purchasing about July 1. Several machinery men who follow the railroads closely have been in receipt of inquiries in the past few weeks on which they have bid and heard nothing further about. In following up these inquiries they were informed that the railroads were not prepared to buy as yet, but of late word has gone out that a buying movement will be started by a number of the more important interests within two months. It is well known in the trade that the railroads in general are short of equipment in the majority of their large repair plants and they all seem to take the same attitude in the situation, which has been that of awaiting the outcome of business conditions. It is now announced that the railroad authorities are encouraged over the outlook and they have given orders to prepare specifications for bringing up their various shops to the proper standard. This information comes from a number of machinery and railroad supply men who make it a point to keep well informed as to the railroad situation. The machine tool list recently issued by the Delaware, Lackawanna & Western Railroad is expected to be closed shortly, and orders for the equipment for the new shops of the Idaho & Washington Northern Railroad will likely be placed by Westinghouse, Church, Kerr & Co. within the next few weeks. The Philadelphia & Reading Railroad is reported to be preparing to buy some mechanical equipment.

The Board of Governors of the Machinery Club, at a meeting held on Tuesday, June 2, re-elected F. H. Stillman as president for the ensuing year. R. C. McKinney was made vice-president, and Walter L. Pierce resigned as treasurer and was succeeded by Charles A. Schieren, Jr. According to the new by-laws of the organization Mr. Schieren will be *ex-officio* member of the House Committee. Directly succeeding the meeting President Stillman announced that he would reappoint all the committees that have worked during the formation of the club.

Mining machinery men, who have been doing an unusually good business in Mexico during the last few months, are congratulating themselves on the fact that the Mexican Congress has for another year extended the exemption of mining and smelting machinery from import duty. There was a lull in the inquiries for a time, because of the fact that the Mexican Congress had the matter under consideration and mine operators were not certain as to what action would be taken. The exemption of mining and smelting machinery from taxation will include power apparatus designed for that purpose and in consequence manufacturers in that line will be materially benefitted, or, rather, will continue doing a thriving business in the mining equipment end of their trade. It is stated in the trade that Mexican representatives have advised that mine operators will undoubtedly extend their activities during the year and many of them have planned extensive operations. Because of the fact that the exemption was only extended one year, many operators and mining machinery men think that it is highly probable that next year the Mexican Government will take steps to impose duties on machinery shipped from this country. In this connection it is said in the trade that the Juanuato Development Company, which intends to spend about $4,000,000 for machinery equipment to develop mining properties in Mexico, will shortly come into the market with its inquiries, as it is understood that this company was watching with considerable interest the action of Congress. The company is one of the subsidiary interests of the Securities Corporation, Ltd., 40 Wall street, New York, and it has been one of the largest purchasers of mining machinery in Mexico. It controls a number of large mining properties in the vicinity of Juanuato and is now building an extensive railroad system connecting its properties. Its plans include the erection of a 1000-stamp mill at La Luz at a cost of $2,000,000, and an equal amount will be spent on general mining equipment, such as power drilling machinery, conveying equipment and the like.

The New York Central Railroad is making a number of improvements at its various shops which will necessitate the installation of considerable new machinery. We understand from a reliable source that the road has for some time been buying in small lots, the aggregate amounting to a considerable sum of money. Some small purchases were made the past week and additional machinery has been decided upon, the orders for which are expected to be sent out in the near future.

Bids are now in the trade covering some of the equipment which will be needed for the plant of the Cramp Dry Dock Company to be erected at Norfolk, Va., by Joseph Stewart & Co., 135 Broadway, New York, but we are informed that they are only of a preliminary nature and were sent out with a view to ascertaining the probable cost of some of the equipment that might be needed. As has been stated in these columns, the plant will cost about $500,000 and will include a fair sized machine shop. The bids now out include equipment for the two marine railways it is proposed to erect and some other outdoor equipment. The machine shop end has not been reached, and it is thought that no inquiries will be sent out for that line of equipment until the plans are passed upon by the Cramp Dry Dock Company's engineers.

The Fuller Engineering Company, Allentown, Pa., has been awarded contract for the designing and construction of a 7000-bbl. Portland cement plant for the Seaboard Portland Cement Company, to be erected near Alsen, N. Y.

The Board of Water Supply of New York has decided to throw out all bids received for the construction of the Walkill siphon and to advertise the work again, or possibly change the plans and do the work itself.

The State Canal Board has approved two new plans for work on the Erie Barge Canal, involving an expenditure of about $2,000,000. One contract covers work near Medina, at a cost of about $1,200,000, and the other for modifying dams and for general construction in the Mohawk River at Little Falls, at a cost of about $800,000.

The Finance Committee of the Board of Freeholders, Newark, N. J., is understood to have appropriated $10,000 for enlarging the electric light and power plant in the penitentiary, the equipment to consist of a 150-hp. boiler, 80-hp. engine and generator. An appropriation of $26,500 for installing a new electric light plant in the Court House was deferred for later action.

Bids were opened June 2 for the construction of the Rondout syphon section of the Catskill Aqueduct, the lowest bid being that of S. Pearson & Sons, who were also the lowest bidder for the Wallkill siphon two weeks ago, and whose bid was thrown out as being too low. The tunnel is to be 4½ miles long, and the estimated cost of the work is $5,514,000.

A number of foreign consular representatives accepted an invitation to visit the offices of the C. I. F. Company, 11 Broadway, New York, on Thursday, May 28, when the system of that company for handling and filling export inquiries was explained to them by A. M. Fisher, president of the company, and other representatives of the organization. The initials in the name of the company mean cost, insurance and freight, and it means that the seller furnishes the goods, paying the cost, freight and insurance to the point of delivery. Representatives of the company explained to the visitors its system of handling the export problem and demonstrated the results of the excellent plan which has been designed for that [illegible]

Chicago Machinery Market.

CHICAGO, ILL., June 2, 1908.

The final summing up of results for the month of May will, it is believed, not prove disappointing as compared with previous months of the present year. It seems highly probable that in most machinery lines a gain—not large, but still a gain—will be recorded, and even if it can only be shown that there has been no actual recession, this, under present circumstances, should be gratifying. In considering the general volume of business it should be remembered that among dealers and manufacturers in this territory deriving trade from Western sources largely it has been proportionately larger than in other less favored sections of the country. The machine tool houses are devoting their energies to securing a share of the miscellaneous orders from shops and factories, which are generally limited to indispensable tools. It is observed, however, that the sales departments are extremely vigilant, and every hint suggesting a possible source of business is carefully followed up. Stocks are plentiful and the factories are in position to execute orders promptly, so that when a sale is effected delivery can be made without

the vexatious delays that last year gave rise to so much trouble to both seller and buyer. Machinery salesmen have remarked upon the larger percentage of orders that are now developing from inquiries, the greater number of prospective purchasers seeming to be prompted by actual needs rather than anticipated future requirements. At the same time the vigorous efforts of the salesmen themselves may have something to do with the increased percentage of closures.

A few new plants building here and there and replacements in old plants continue to supply the boiler shops with some new business, but the volume is much too small to keep capacities fully engaged. Some fair sized installations of water tube boilers have recently been made by various manufacturers of this type of equipment, and a number of orders are in prospect. Some of the larger manufacturers of electrical machinery report recent improvement and note the entry of some important orders for such machinery. It may be said in general that the machinery market is without notable change in any direction, but the belief is prevalent that a gradual betterment of conditions may be expected.

The firm of D. O. James, Chicago, manufacturer of cut gears, has been succeeded by the D. O. James Mfg. Company, incorporated with a capital stock of $75,000. The company, which was formerly located at 35 North Canal street, now occupies a well appointed two-story building, 50 x 120 ft., at 351-353 West Monroe street. With increased space and added facilities the company is now able to handle its growing business with greater economy and serve its customers more promptly.

The Citizens Gas Company, Indianapolis, Ind., is preparing to erect during the coming summer a by-product coke oven plant, consisting of 50 ovens, with a capacity of 7½ tons each per day, and will be in the market for coal handling machinery; also for all apparatus and equipment connected with the condensing house and purifying plant of a gas works. Plans for the power plant required for this installation are now in course of preparation. All of the machinery will, as far as possible, be electrically driven, and it is estimated that at least 250 kw. will be required for operating the small machinery about the place. Boilers, engines, generators, &c., have not been specified, but plans in the hands of the engineers will probably be completed in two weeks. Geo. M. Brill, consulting engineer, Marquette Building, Chicago, will have charge of the mechanical equipment. B. J. T. Jeup, Indiana Trust Building, Indianapolis, being the local consulting and construction engineer.

Figures are being taken on three 200-hp. boilers for installation in the Coliseum Building, Chicago. It is probable, however, that nothing will be done in the matter until after the meeting of the Republican National Convention, which will be held in this building. Two 250-hp. boilers will also be required for the Forest Park water power plant, Forest Park, Ill. The Merrimac Portland Cement & Material Company, St. Louis, has purchased a battery of 10 300-hp. water tube boilers.

An electric light and water plant to be constructed at Bruce, Wis., will require a 30-kw. 220-volt direct current dynamo, direct connected to a simple high speed engine; 70-hp. boiler, 2500 ft. of cast iron pipe, steam fire pump and auxiliary equipment. This work is in charge of Oscar Claussen, consulting engineer, St. Paul, Minn.

The Black Hills Traction Company, Spearfish, S. D., is arranging to construct a 1200-hp. hydro-electric plant on Sand Creek, near Beulah, Wyo., about 5 miles above the company's present plant.

The Carrollton Electric Light Company, Carrollton, Miss., whose plant was destroyed by fire some months ago, has made arrangements for its reconstruction, and bids for the machinery and equipment will be taken on June 15. We are advised by W. H. Hafner, Mayor, that plans and specifications are now completed and on file.

The Menominee & Marinette Traction Company, Menominee, Mich., has increased its capital stock to $1,000,000, and is considering the installation of a power house and dam on the Grand Rapids, near Ingalls. Bids will be asked on material as soon as plans and specifications are prepared.

St. Louis Machinery Market.

ST. LOUIS, MO., June 2, 1908.

The metal working machinery interests find a slight improvement manifested over conditions that existed in the spring. Inquiry shows this to be the more marked in case of light machinery, and the demand is mainly from the small shops. There still continues to be considerable call for various kinds of second-hand machinery. In heavy machinery the demand is quite uneven, a week of activity being followed by one in which there is a dearth of orders.

Those lines which depend upon railroad business mainly complain that the situation is still ruling very dull. While outside of the machinery department, yet as an indication of improved conditions, it may be stated that a local company has done more in freight car roofs the past four weeks than in the preceding four months.

Manufacturers of shoe machinery are in a cheerful mood. A local company states that it has been running full since January 1 and is behind on orders. The main difference between the present time and a year ago is merely in the number of unfilled orders.

In woodworking machinery there is more doing, and there is also a good call for threshing machinery. Concerns having business in seasonable agricultural appliances are finding a satisfactory demand.

There is an improved call for elevating and conveying machinery and also for crushing and grinding machinery.

A large local company reports the present month the best for machinery castings experienced this year.

There is a good demand for all classes of electrical appliances and machinery.

Cincinnati Machinery Market.

CINCINNATI, OHIO, June 2, 1908.

In some lines of the machinery trade in this district there is a marked improvement in both inquiry and orders; in others the prevailing lassitude is none the less in evidence. The special machinery lines—the manufacturers of metal working, bakers' machinery, &c.—report encouragingly. The manufacturers of motors and generators and other electric power standards are quite busy. A better feeling prevails throughout the tool manufacturing district because of the firmer tone of the iron markets, and a number of plants are being overhauled by their owners and preparations made for an expected early resumption of operations on an enlarged scale. Mails of those that were caught with a large stock of tools lead to the hope that the unloading movement is a feature of the comparatively near future.

A number of Cincinnati machine tool builders will exhibit at the Atlantic City convention of the Railway Master Mechanics and Master Car Builders, which opens on June 17 for six days. For the display, which is to be elaborately quartered on the new Young's Pier, the Cincinnati Milling Machine Company will ship two of its latest machines, representing both the vertical and horizontal types. J. L. Bishop of the company's technical department will have charge of the exhibit. Mr. Gingrich will doubtless spend a few days there during the convention, as will also President F. A. Geier and Secretary-Treasurer Wood Walter. The Cincinnati Machine Tool Company will send two machines, a 20 and a 24 in. upright drill, and August H. Tuechter and Sherman C. Schauer will both be in attendance. The Bickford Drill & Tool Company will have on exhibition one of its new type full universal radial drills, 5-ft. size, motor driven. H. M. Norris, manager of the works, will have charge, and Mr. Bjeler, an official, will also put in as much of his time there as he can consistently. The Lodge & Shipley Machine Tool Company will place on exhibition in the combined section a 24 in. by 12 ft. patent head engine lathe, motor driven, and will make a special exhibit of a double end axle lathe and a 16-in. engine lathe with Derrer universal shaper attachment. R. G. English, mechanical engineer and office salesman, will have charge of the exhibit. R. D. Betts, office manager, will put in some time there also. The Triumph Electric Company will exhibit some of its latest types of machinery.

All local manufacturers of medium and smaller sized units in electric power developing machinery note improved conditions. The Triumph Electric Company has orders for two carloads of all sizes of induction motors, from the smallest size manufactured to 65 hp., and two carloads of direct current, all for St. Paul, Minn., shipment during the next three months.

The I. & E. Greenwald Company has given to the Provident Savings Bank & Trust Company a mortgage securing a new bond issue of $100,000 to cover contemplated improvements to the plant at Pearl street and Eggleston avenue, which occupies 100 x 254 ft. The company is one of the oldest manufacturers of engines and accessories in this section.

The Desmond-Stephan Company, Urbana, Ohio, has purchased what is known as the Mosgrove property, at the corner of South Main and West Water streets, adjoining its works, and it is reported will in a short time build an addition to its plant. The consideration is said to have been in the neighborhood of $6000.

In order to make extensive repairs the Dover Mfg. Company, Canal Dover, Ohio, maker of sad irons, has closed down its plant for a few weeks.

It is reported that the Marion Steam Shovel Company, Marion, Ohio, has decided to make its own steel and that plans are now being prepared for the erection of an addition to the plant about 80 x 300 ft. The most modern steel making furnaces and machinery will be installed. The company notes an improvement in business and is gradually taking on additional men.

The Dayton Globe Iron Works Company, Dayton, Ohio, has had sufficient contracts on hand to keep its plant in operation at practically normal capacity for several months. The two new units for which it has been awarded contract

by the Winchester & Washington City Railroad, Winchester, Va., consist each of a pair of 49-in. turbines, mounted horizontally and inclosed in a steel flume 12 ft. 6 in. in diameter, which will connect to the thimble now built in the bulkhead wall. Each pair of wheels will develop 1000 hp. and the power will be transmitted to the generators above through a rope drive of the American continuous type, to be designed and built by the Dodge Mfg. Company, Mishawaka, Ind. The generators will be of the alternating type and furnished by the Westinghouse Electric & Mfg. Company, Pittsburgh.

An encouraging increase in business is noted by President Loeb of the Ohio Metal Company, Columbus, Ohio, who looks for an early resumption of business on a nearly normal scale.

The American Brass & Specialty Company, recently incorporated in Columbus, Ohio, will take over the Auto Brass Company, manufacturer of brass parts for automobiles. The plant of the new company will be located in East Gay street. The officers are Frank R. Maine, president; George F. Hill, vice-president; Willis F. Houser, secretary-treasurer, and Louis G. Parrott, general manager. The officers named, together with Clarence Osborne, constitute the Board of Directors.

Reports from Columbus, Ohio, indicate that the American Cash Register Company is employing a full complement of hands and working every department full time. It is claimed that the factory is behind almost 500 orders, and because of this and the bright outlook for the future an enlargement of the plant is contemplated.

The Reliance Engineering Company, Cincinnati, has the contract for building the new water works plant at Newton Falls, Ohio, which is to cost about $25,000, and bids are expected to close about June 15 for 300 tons of pipe and other equipment. A steel stand pipe, with a capacity of 100,000 gal., will be erected. The main building will be 35 x 60 ft., and the pumps will be electrically driven.

Cleveland Machinery Market.

CLEVELAND, OHIO, June 2, 1908.

If any improvement has appeared in the local machine tool market during the past week it is very slight. While the volume of orders remains nearly stationary, a few of the dealers notice some increase in inquiries, and the general opinion of the trade is that the outlook is better. While some of the dealers report no increase in their May sales as compared with April, the majority did a little more business last month than during the previous month.

Dealers are looking for a fair volume of business from the automobile builders during the next few months. It is understood that several of the automobile plants in this city and other Ohio points and in Detroit will need some tools before beginning work on their 1909 output, and during the past week one concern, the Dayton Motor Car Company, placed an order for 12 machine tools, six of which were milling machines.

The interest of the week was centered in the bids that were received by the Cleveland Board of Education June 1 for machine shop and woodworking tools for the new Technical High School. Competition was very strong among builders and dealers, and it is expected that the successful bidders will get the orders at a small margin of profit. These requirements attracted so much attention that the 20 typewritten copies of the list and specifications were soon exhausted, and the large number of inquiries for the specifications led the Board of Education to have the list printed for distribution.

Sales for the most part are still limited to single tools, orders for more than two or three tools being very rare. The new inquiries that are coming in are all limited in size, there seldom being one for over three or four tools.

Second-hand tools are in fairly good demand, the market showing an improvement in this regard, and dealers are quickly disposing of good used tools that they have picked up during the past few weeks.

Some builders of machine tools report a slight improvement in orders and have been able to add to the working forces in their plants. Others, however, notice no change in the demand. Builders of transmission machinery report orders slightly better and a fair increase in the volume of inquiries. There is some improvement in the demand for industrial cars from industrial plants and other users. Some orders are coming from Western mines, but the demand from Mexican mining companies, which was fairly good early in the spring, has fallen off. Makers of steam specialties report a satisfactory increase in their volume of orders. Conditions in most manufacturing lines, outside of machine tools, show a little improvement. Plants that make automobile parts are fairly busy.

The Atlas Car & Mfg. Company, Cleveland, has recently taken two large orders for industrial railways, one for a foundry and the other for a large electrical plant. The orders include tracks, motor cars and other equipment. One order includes 56 cars and the other 30 cars. This company is now building 10 electric coke quenching cars on an order from a leading coke producer. The cars are of 30 tons capacity and equipped with air compressors and two 50-hp. motors. The company is also building 12 air dumping cars for a Canadian mining company, the doors of the cars being opened and closed by the engineer. The company is also getting a fair volume of orders from Western mines and industrial plants.

The Davis Clutch Company, Cleveland, has been incorporated, with a capital stock of $15,000, to manufacture an improved friction clutch. The officers are G. O. Groll, president; C. E. Monck, vice-president and general manager; A. G. Doherty, secretary, and C. L. Howells, treasurer. The company has opened temporary quarters in the Sigler Power Block on East Third street.

The plant of the Lane Tool Company, Cleveland, which was recently purchased by the Massillon Foundry & Machine Company, Massillon, has been moved to the latter city and installed in an addition erected for that purpose by the purchaser. The Massillon Company will commence the manufacture of forge and drop hammers within the next few weeks. After the plant is placed in operation the company will probably be in the market for a few machine tools, including a radial drill and a cylinder boring machine.

The Peerless Motor Car Company, Cleveland, will soon begin the erection of a two-story addition to its plant, of brick, steel and concrete construction, 106 x 144 ft. The building will be used for the erecting department. No machinery will be required for this building, but the company will add a number of tools to its machine shop equipment, having already placed an order for some tools in its preparation to build its 1909 machines.

The Wire Goods Company, Worcester, Mass., recently established a branch plant in Cleveland, at 1144 West Third street, for the manufacture of kitchen wire goods and some of its other articles. The company reports that the volume of its orders has continued very satisfactory during the past few months and that the outlook for the balance of the year is good.

The Central Foundry Supply Company, Columbus, Ohio, has been incorporated, with a capital stock of $20,000, by John S. Ball, Dwight R. Mason, Lena B. Whiton, Ella M. Mason and Elizabeth P. Fenton.

At the annual meeting of the Capitol Lock-Nut & Washer Company, Columbus, Ohio, held recently, the Board of Directors was reduced from nine to seven, and the following were elected: J. F. Dickson, A. M. Gaines, H. B. Hutchinson, Frank B. Hubbard and W. E. Meade of Columbus, A. M. Foster of Cleveland and O. E. Foster of Buffalo. The officers elected were J. F. Dickson, president; A. M. Gaines, vice-president and general manager, and William Singleton, [illegible] treasurer.

New England Machinery Market.

WORCESTER, MASS., June 2, 1908.

Nothing has occurred to check the impression that conditions are strengthening in general business in New England. The volume of orders is somewhat greater, though in the machine tool market the increase is not sufficient to be considered important in actual figures. To most observers the outlook seems better than it has for some time, and the hope is that a further stiffening of sentiment will bring substantial returns in the near future, probably in the autumn. There are those who look for a sudden accession of strong demand. But the usual belief is that the return to prosperity will be gradual and consequently healthful. To-day every one seems to be waiting for some one else to start active buying, and no one cares to take the initiative. Some new condition will undoubtedly arise, which will start the upward movement.

The dealers are having a better month than last, a fact more pronounced in the supply than in the machinery trade, but the increase over April is only about the same percentage as in other years, and if seasonable buying continues on the same relative basis there will be a falling off as the weather gets warmer. There is much interest in the effect that the closing of the national conventions will have upon the situation. There is no longer a strong belief that a reaction for the better will immediately follow. The usual prophecy is that it will require the autumn influence, and possibly the settlement of the Presidential campaign before any very important change develops in business. The excellent crop reports for the West are having a cheering effect, and in New England the starting up of large textile mills on full time has added buoyancy to the situation.

The important announcement is made that Eugene Childs, recently general superintendent of the Trimont Mfg. Company, Roxbury, Mass., manufacturer of wrenches, is organizing a new company, which will locate a factory in Charleston, W. Va., where a general line of wrenches similar

to that of the Trimont Company will be manufactured. Mr. Childs, whose address is 112 School street, Roxbury District, Boston, states that he is not ready to make detailed announcement of the company's plans beyond the location and product, and the fact that the capital stock will be $300,000.

The T. R. Almond Mfg. Company, Ashburnham, Mass., manufacturer of chucks, has been compelled to double its floor space because of increased business, which was especially noticeable during the month of May. The working force is now larger than at any time since the removal of the business from Brooklyn.

There is a noticeable improvement in the power boiler business. The new Massachusetts boiler rules have had their effect, because they have compelled the replacing of quite a number of boilers which did not come up to the restrictions. Another, and perhaps the most important, influence is that manufacturers have taken advantage of the situation to have needed work done in their boiler rooms. This includes permanent improvements, as well as work that is ordinarily done in the autumn. The fact that it is cared for in the spring and summer may have a tendency to affect the usual fall briskness in the boiler trade. One large boiler works reports that it has booked a greater number of orders in May than in the total of the first four months of the year, though the statement must be corrected as to totals in money value of the business, because the May orders include a large percentage of small items. But on the whole the boiler business is showing marked betterment, and the manufacturers are hoping that it is a permanent one. It is known to them that a good many New England concerns have power plant improvements in view, but most of them are unable or unwilling to spare the money for the purpose at this time. These orders may be expected later, however.

The Bridgeport Wire-Wound Box Company, Bridgeport, Conn., is to establish a plant in that city for the manufacture of a new type of box, and states that it will be in the market for woodworking machinery of various kinds. The company has a capital stock of $60,000. W. H. P. Roots is the president, Charles O. Collett, vice-president, and William Arthur, secretary and treasurer, all of Stamford, Conn. The product will be a patented wire bound box for use in shipping goods. The advantages claimed for it are lightness and strength and an arrangement which allows of a lead seal in a simple manner.

Work has begun on the establishment of a hydraulic plant on the Carrabassett River, between Embden and North Anson, Maine, by the Franklin Power Company, formerly known as the Carratunk Power Company. An electric generating equipment will be installed and the power carried in high potential current to New Vinyard, Farmington and Wilton, Maine. The company has a capital stock of $100,000. S. O. Tarbox, Farmington, is president, and C. O. Sturtevant, Winthroy, Maine, treasurer.

The Oxy-Carbi Company, 17 Webster street, New Haven, Conn., has begun the manufacture of oxy-acetylene welding and cutting plants, and a general business of welding and brazing in cast iron, semisteel, soft steel, copper and brass.

A dispatch from Waterbury, Conn., states that the American Brass Company has resumed work on new mills and purposes to rush them to completion in order to have the buildings ready for occupancy in the fall. The dispatch goes on to state that much of the rougher work done by the company will be concentrated in the new buildings.

The Supreme Knitting Bobbin Company, 99 Stewart street, Providence, R. I., has been incorporated under Maine laws to manufacture a new knitting bobbin, the invention of Simon W. Wardwell of that city. Edwin C. Smith, Seekonk, Mass., is president; Arthur I. Harvey, Providence, vice-president; Daniel McNiven, Pawtucket, R. I., secretary; Charles A. Eddy, Providence, treasurer; Simon W. Wardwell, manager; William A. Booth, Woonsocket, R. I., general superintendent; the officers and Arthur A. Armstrong, Providence, constituting the Board of Directors. While the company states that it is not ready to announce its plans, the plant for the manufacture of the new device will be located in Providence. It is stated that the invention has been given ample test under manufacturing conditions.

The Chapin-Stevens Company, Pine Meadow, Conn., states that the report of the acquiring of the Martin Doscher plant at Saugatuck has little foundation in fact. Since the death of Mr. Doscher the Chapin-Stevens Company has purchased a small amount of the machinery, and finished and unfinished stock has been variously disposed of in the trade, but there is no truth in the report of a combination of the carpenter tool industry.

The Chelmsford Foundry Company, Medford, Mass., announces its complete reorganization, which was accomplished by the resignation of the old Board of Directors and officers. The board now consists of George M. Harrigan, president of the Lowell Trust Company, Lowell, Mass., as president; Fred A. Houdlette, president of Fred A. Houdlette & Son., Inc., Boston, as treasurer, the third director being William H. Perry, Warwick, R. I., president of the William H. Perry Company, iron merchant, and a director of the Industrial Trust Company, Providence, R. I. The general offices have been removed from 159 Devonshire street, Boston, to the works at Medford, which are easy of access from the Boston & Maine Railroad, Medford Branch, and from a new street railroad line now under construction from the Sullivan square elevated station, Charlestown. The company states that it has at its plant a good stock of steel for structural purposes, which is being consantly increased, and that its foundry is in first-class condition to handle orders.

Philadelphia Machinery Market.

PHILADELPHIA, PA., June 2, 1908.

Manufacturers and dealers generally report the volume of business transacted in May as having exceeded that for the previous month, but the amount, with the exception of a few cases, was not large. The market has been quite irregular. One week's business will come out quite freely and the most optimistic feeling will prevail; the next week, however, may be extremely dull and the hopeful feeling disappears, only to be revived again when the next spurt in buying comes along. There is, however, a slow, moderate gain, which does not show itself on the surface, and it is pretty generally felt that this moderate improvement will continue during the summer months, with more active buying in the fall—after political matters, crops and other features on which prosperity is based have become closed incidents.

Some manufacturers and merchants report more active conditions. One seller has received orders for several lathes, milling machines and a number of small tools; while others report sales of drill presses and special tools. Sales in almost every case have been of a single tool to a customer, the larger propositions before the trade being still held in abeyance. Some of these are believed to be getting near the point when they will develop into actual orders, while there are one or two other pretty good propositions in the way of equipment that are being considered by the probable purchasers. Some business which has been held back pending more definite information regarding prices has been placed since the Atlantic City convention, it being evident that no concessions will be made by manufacturers of the usually termed standard grades of tools.

The railroads and the larger industrial concerns in this territory are still out of the market, and as there seems to be but little improvement in their respective lines, the amount of business expected from those sources is small.

There has been practically no change in the export demand. Some little business in the way of special machinery has come out but the demand for the general line of machine tools is decidedly small. Power equipment specialties continue in good demand, but while orders are numerous their individual size is hardly up to the normal.

Second-hand machinery merchants report increased inquiries and resultant sales are more numerous. This branch of the trade continues quite active, and buyers are canvassing the market pretty thoroughly, owing to the reduced cost of equipment, before placing orders for new tools. Most of the business is confined to single tools of the medium and smaller classes, but the aggregate sales reach very fair proportions.

Some improvement is to be noted in foundry trade, but the plants are still running on short time. Orders are largely of a hand to mouth nature, and while the field is being actively canvassed for orders few contracts for any considerable tonnage come out.

Sealed proposals will be received by the Pennsylvania Commission to erect a State Hospital for the Insane, at its office, room 207, 1435 Chestnut street, this city, for buildings, reservoirs, sewage disposal plant, coal handling machinery, cast iron water pipe, special castings, valves, excavation and concrete work for the Homeopathic Hospital for the Insane in Hanover Township, Lehigh County, Pa. Bids will be received until June 8. Plans and specifications may be had of Philip H. Johnson, architect, 1824 Land Title Building, Philadelphia, Pa.

John T. Windrim, architect and engineer, is preparing plans for a one-story central steam heating and electric light plant, to be built in this city for the Girard Estate. This plant is to be operated for the purpose of furnishing light and heat for a large number of houses to be built in the southwestern section of the city.

The Board of Managers of the State Hospital for the Insane, Trenton, N. J., will make extensive improvements at that institution. Among the equipment to be installed are new apparatus for the laboratory, new baking machinery, artesian wells and casing, pumping machinery for water supply, telephone, fire alarm and night clock systems, &c. The amount appropriated for the work is over $60,000.

The city of Salem, N. J., contemplates extensive improvements to the water works.

The Pressed Steel Mfg. Company reports a stiffening in the demand for pressed steel shaft hangers and pillow blocks from various parts of the country. Orders received are from widely scattered points, but the number is larger and

the quantities being taken are better. The foreign demand continues quite active, and a number of shipments for export have been made, while orders recently taken include one for 150 hangers, for stock, for Manila, P. I.; another for 100 large hangers from Switzerland, and a large order for miscellaneous hangers from France.

Government Purchases.

WASHINGTON, D. C., June 2, 1908.

The Isthmian Canal Commission will receive bids until June 24, Circular No. 444, for boiler room equipment, consisting of boilers, induced draft fans with direct coupled turbine and motor, feed water heater, boiler feed pumps, &c.

The Isthmian Canal Commission will soon ask bids for four long stroke riveting hammers, two wood boring machines, two water tube boilers, 18 air hammer rock drills, 4 12-in. engine lathes, 4 24-in. back geared crank shapers, 4 sliding head upright drill presses and other supplies.

Circular No. 445, bids to be opened June 22 at the office of the Isthmian Canal Commission, covers pneumatic hoists, jacks and various supplies.

Bids for the material and installation of a complete electric lighting system for the United States Government at Jefferson Barracks, Mo., will be received until June 15. The machinery required for this installation will include three 150-hp. water tube boilers, two 156 and one 112 hp. tandem compound engines, three electric generators, pumps, 20 street arc lamps, with all necessary auxiliary equipment, and the wiring of about 80 buildings. Detailed information concerning these requirements can be had on application to Capt. O. W. Bell, constructing quartermaster.

The following bids were opened May 25, Circular No. 440, for supplies for the Isthmian Canal Commission:

Class 1.—Six reversing hoisting engines—Bidder 2, American Hoist & Derrick Company, St. Paul, Minn., $12,132 and $7368; 9, Bethlehem Steel Company, South Bethlehem, Pa., $8550; 10, H. L. Bond Company, Boston, Mass., $8775; 16, Thomas Carlin Sons Company, Allegheny, Pa., $9708; 33, G. & W. Mfg. Company, New York, $8640; 36, Glover Machine Works, Marietta, Ohio, $9000; 48, Lambert Hoisting Engine Company, Newark, N. J., $9600 and $10,200; 49, Lenher Engineering Company, New York, $7800; 50, Ludgerwood Mfg. Company, New York, $11,820, $12,120, $12,540 and $12,870; 54, Mead-Morrison Mfg. Company, Cambridge, Mass., $11,400; 59, New Jersey Foundry & Machine Company, New York, $9486; 65, C. T. Patterson Company, New Orleans, La., $10,326; 66, Queen City Supply Company, Cincinnati, Ohio, $8400; 72, J. Jacob Shannon Company, Philadelphia, Pa., $8262; 82, Vermilye & Power, New York, $9600; 86, Williamson Brothers Company, Philadelphia, Pa., $7200.

Class 2.—One vertical car tenoning machine—Bidder 3, Atlantic Works, Philadelphia, Pa., $952.50; 6, Bentel & Margedent Company, Hamilton, Ohio, $885; 28, J. A. Fay & Egan Company, Cincinnati, Ohio, $1013.50; 31, Fox Bros. & Co., New York, $1022.83; 37, Greenlee Brothers & Co., Chicago, Ill., $785; 53, Manning, Maxwell & Moore, New York, $1050.

Class 3.—One extra large automatic power gaining machine—Bidder 3, Atlantic Works, Philadelphia, Pa., $1105; 6, Bentel & Margedent Company, Hamilton, Ohio, $1200 and $1300; 28, J. A. Fay & Egan Company, Cincinnati, Ohio, $1498; 31, Fox Bros. & Co., New York, $1516.16; 37, Greenlee Brothers & Co., Chicago, Ill., $1120; 53, Manning, Maxwell & Moore, New York, $1570; 89, S. A. Woods Machine Company, South Boston, Mass., $1209.

The following bids were opened May 26 for machinery for the navy yards:

Class 152.—One universal sand papering machine—Bidder 5, American Wood Working Machinery Company, Rochester, N. Y., $248; 61, J. A. Fay & Egan Company, Cincinnati, Ohio, $396; 197, H. B. Smith Machine Company, Smithville, N. J., $414.39.

Class 153.—One pony planer—Bidder 5, American Wood Working Machinery Company, Rochester, N. Y., $647; 148, Oliver Machinery Company, New York, $840; 197, H. B. Smith Machine Company, Smithville, N. J., $656.

Class 154.—One motor driven fan and condenser outfit—Bidder 189, B. F. Sturtevant Company, Hyde Park, Mass., $558.95.

Class 155.—Two wet emery grinders—Bidder 64, Frevert Machinery Company, New York, $329 and $338; 141, Niles-Bement-Pond Company, New York, $280; 175, Ransom Mfg. Company, Oshkosh, Wis., $281; 197, H. B. Smith Machine Company, Smithville, N. J., $277.50.

Class 321.—One portable mobiling machine—Bidder 149, S. Obermayer Company, Cincinnati, Ohio, $310; 164, J. W. Paxson Company, Philadelphia, Pa., $225; 205, Tabor Mfg. Company, Hamilton, Ohio, $270; 217, Vermilye & Power, New York, $290.

The Pratt & Whitney Company, Hartford, Conn., has been awarded class 71, one tool makers' engine lathe, $1413.25, under opening of April 14, and class 134, one hand milling machine, $282, under opening of April 21, for machinery for the navy yards.

Under opening of May 10 for machinery for the navy yards, the Frevert Machinery Company, New York, has been awarded class 1, one milling machine, $1240.

The following awards have been made for machinery for the navy yards, bids for which were opened May 12:

General Electric Company, Schenectady, N. Y., class 1, four motor generator sets and switchboards, $16,000; class 2, 12 single phase transformers, $1083.39.

Crane Company, Chicago, Ill., class 7, one hot water heating boiler, $338.80.

Pratt & Whitney Company, Hartford, Conn., class 171, three engine lathes, $870.

B. F. Sturtevant Company, Hyde Park, Mass., class 701, four electric motors and spare parts, $1384.80.

Quincy, Manchester, Sargent Company, Plainfield, N. J., class 711, one 5-hp. motor, $225; class 712, one boring bar, $420.

Customs Decisions.

The Steel Wool Case.

Within a few days the Supreme Court is expected to decide whether it will hear arguments in a test case relating to the rate of duty applicable to so-called steel wool. Most of the steel wool used in this country is said to be imported from Germany, but recently the manufacture of the product, which is used chiefly in polishing furniture and floors, has begun in this country. The domestic industry, it is alleged, cannot thrive unless protected by a high duty against the German product. The Buehne Steel Wool Company, Freiburg, Germany, maintains, on the other hand, that the American concern, aided by the Government, is seeking to have levied a duty prohibitive to foreign importations.

Henry M. Hoyt, Solicitor-General of the United States, and his assistant, Edward T. Sanford, in a brief filed with the Supreme Court, state that the recent decision of the Circuit Court of Appeals, at New York, in the steel wool case will, if allowed to stand, "inflict a blow of the most far-reaching and serious character to the steel industries of this country." Albert H. Washburn of the law firm of Comstock & Washburn, counsel for the Buehne Company, tells the court in his brief opposing the issuance of a writ, that the finding of the Appellate Court is right, and should not be reviewed by the tribunal of last resort. Mr. Washburn holds that the decision of the Court of Appeals classifying the steel wool under paragraph 137 as a manufacture from steel wire at a rate of duty depending upon the gauge and value of such wire is equitable and should not be disturbed. Solicitor-General Hoyt insists in his brief that the case should be heard and a decision made holding the article dutiable at 45 per cent. under the provision for "manufactures of metal or steel."

The decision of the Circuit Court of Appeals is the latest of a series of cases, and is in conflict with all other previous decisions on the subject. It was held by the Board of United States General Appraisers in 1899 and again in 1905 by a majority decision that steel wool is dutiable under paragraph 135 of the tariff act as "steel in all forms and shapes not specially provided for."

When the issue reached the Circuit Court that tribunal reversed the former decision, and found that both the importers and the Government were wrong in their contentions. The court held the merchandise dutiable under paragraph 137 referring to manufactures of wire. This latter claim was affirmed by the Circuit Court of Appeals, and forms the basis for the importer's brief filed with the Supreme Court. The Solicifor-General warns the Supreme Court that the imposition of duty under either paragraph 135 or 137 would deprive American manufacturers of adequate protection. The court is asked in view of this to declare for the imposition of the 45 per cent. duty as "manufactures of metal."

The Transvaal Government and the Johannesburg Chamber of Mines have arranged for a rock drill contest beginning in April, 1909, and extending over a number of weeks. The conditions for entering the contest are that the drills must not exceed 100 lb. in weight, and compressed air drills are preferred. Contestants are to furnish three drills of each type, at least, but can supply more if they wish. All drills are to be tested at six or more mines by operators furnished by those conducting the contest. Dust allayers, either attached or otherwise, are to be furnished, and entries will be closed by December next. Inquiries for application conditions should be addressed to the Johannesburg Chamber of Mines, Johannesburg, South Africa.

Cammell Laird & Co., Ltd., have removed their office and warehouse to 25 Cliff street, New York. This is the firm's principal warehouse in the United States. A large stock of Cammell Laird & Co.'s high speed and carbon steel is carried there, from which its numerous subagencies throughout this country and Canada are supplied.

HARDWARE

WHILE the Philippines are an insignificant market compared with other foreign fields the progress which has been made in the extension of American business with these islands may have some bearing on the general question of the development of our export relations and may illustrate some of the conditions under which foreign business is carried on. There may also be some lessons in regard to the realizing of the ambition of this country to occupy a prominent place in the world's trade. In this connection some figures covering our export trade with the Philippine Islands during the calendar year 1907, as compared with previous year, which have been compiled by the Bureau of Insular Affairs, are of interest. They show a steady increase in the imports into the archipelago of Hardware and other manufactures of metal, but at the same time indicate that American manufacturers are not increasing their trade in these lines at least, but are permitting their European rivals, and especially their British competitors, to supply the steadily increasing demands of the people of the islands. Even in those items in which the share of the United States is greater than that of any other country there has been a proportionate decline in the American exports.

The statistics in regard to the sales of Hardware and related goods by this country and by other countries to the Philippines during 1907, are certainly not especially encouraging. It is, however, gratifying to note that there was during 1907 an increase in the total importations into the islands from all sources as compared with 1906. This is indicated in the following table, which is based on official statistics according to the classification used by the Government:

	1906.	1907.
Tools	$96,562	$111,510
Builders' Hardware	29,110	36,898
Cutlery	52,363	84,710
"Fine Articles," Pens, Hooks, &c.	27,295	36,142
Nails, Spikes, &c.	38,173	46,227
Bar Iron	51,936	59,668
Steel Bars and Rods	29,508	58,354

While these aggregates are not of imposing volume, their general tendency to increase is of interest, showing that progress is being made in the purchasing power of the Philippines and in the development of their international trade. A study of the figures, however, does not yield conclusions altogether gratifying to our manufacturers.

Comparing the years 1907 and 1906, the total importations of tools into the Philippines increased about 15 per cent. While the amount supplied by the United States shows a slight increase the shipments of Germany increased nearly 60 per cent., and those of Great Britain over 20 per cent. Carried back to 1905 the competition is equally unfavorable, the proportionate share of this country having steadily declined, while that of German and British manufacturers has risen. In Locks, Hinges and other Builders' Hardware the contribution of the United States decreased about one-half, while that of England increased over 50 per cent. Equally significant is the fact that in 1906 we furnished more than one-half the total imports of these items and in the succeeding year only about one-fifth. German importations of cutlery increased 50 per cent., while those of the United States declined 15 per cent., carrying us down from second place to fifth, below Germany, Belgium, France, and Great Britain, in the order named. In "fine articles," a total increase in importations is shown, amounting to nearly 33 1-3 per cent., but the United States only gained between 20 and 25 per cent., and fell from second to third place among the competing nations. Similar tendencies are shown in Nails, Spikes, Tacks, &c., our share declining about 20 per cent., while the total imports increased upward of 20 per cent. In bar iron Great Britain easily held the lead, the contributions of the United States showing fair relative increase, but amounting to a very small percentage of the total trade.

So far as the Philippines are concerned, these facts would indicate that special attention must be given to the cultivation of these markets, unless the great bulk of the business is to revert to German and English houses. Whether or not it is worth cultivating is, of course, a question which each manufacturer must determine for himself. The patriotic desire to have a lion's share of the business of our Asiatic possessions is laudable, but it is being more and more recognized, as announced by Andrew Carnegie, that trade follows the price-list rather than the flag. The figures which show how things are going in the Philippines may, however, serve a more important purpose if they impress upon manufacturers and merchants the difficulty of securing and holding foreign markets in general. With our splendid facilities for production it must be remembered that our competitors abroad are very much awake, and with their constant contact with foreign markets, their experience in cultivating them and their thorough familiarity with their methods and requirements it is not the work of a summer's holiday for the United States or its manufacturers to capture distant markets. It is better to look on this endeavor as involving, as it undoubtedly does, uphill work and a long fight. This, however, is no reason why individual manufacturers should not push energetically for the placing of their goods in foreign fields in the many cases in which what can be accomplished will justify the labor and the outlay.

Condition of Trade.

Taken all in all reports do not show any important change in the general situation and the market is still subject to conflicting influences. There is probably on the whole a generally better feeling throughout the trade without special increase in the volume of business. With the opening of summer the trade is experiencing the quieting influence expected at this season, without any such change in the general state of the market or in Hardware lines in particular as would call for more courageous buying than has of late been indulged in. Orders are consequently small and frequent to meet the needs of stocks which, both in jobbers' and retailers' hands, are moderate and in some cases depleted in spots. The startling event of the week was the reduction in the price of Steel Bars, which, notwithstanding the evident difficulty of maintaining the old price, came as a surprise to the trade, following as it did so closely on the confident announcement that the policy of maintaining prices would be adhered to by the great Iron interests. The immediate effect of this reduction will probably be to weaken con-

[illegible] in the strength of the market as a whole, illustrating as it does the ability of keeping up quotations in the presence of trade influences tending toward the lowering of prices, evidently a wise and conservative course of great interests. Questions are also naturally suggested as to whether changes in other Iron products may not follow under the pressure of the same influences as were found in the case of Steel Bars to be too strong to be further resisted. While the trade is conjecturing in regard to the course of the market there is enough current business to continue the good work of clearing up stocks, getting accounts in shape and laying a foundation for a return to better times. Fortunately the outlook for the crops continues excellent, and it is hoped that good harvests will contribute substantially to promoting a return to full confidence and a large measure of prosperity.

Chicago.

Beset by adverse weather conditions through the first half and unsupported by marked improvement in general conditions at any time, the month of May can hardly be expected to outrank its predecessor in jobbers' sales totals; they will, in fact, probably fall a little below those of April, and as compared with the corresponding month a year ago will show a loss of not less than 25 per cent. In comparing the results of last year periods with those of this year it should be taken into account that whatever change in values has taken place in the meantime has been almost uniformly downward, and therefore the volume of goods represented by a given sum at the present time will be somewhat greater than for a similar sum last year. Perhaps the most notable feature of trade development is seen in the demand for Screen Cloth, which in the past 10 days has been highly satisfactory. It was felt as the season advanced without bringing out even the usual percentage of reorders that hopes of their appearance would be disappointed, and but for the excessively wet weather of the spring months this would doubtless have been the case. Fostered by the abundance of water, flies, mosquitos and other insects have multiplied prolifically and their presence in countless swarms has recently emphasized the need of protection from their annoying attentions. The result has been that even now at the end of the season there is an exceptionally good demand for Wire Cloth and Screen Doors. Moreover, the prospect for its continuance for some time yet is most encouraging. In no other line has any noteworthy movement developed. The summer season is not, as a rule, favorable to vigorous market reactions, and if business can be maintained at its present volume through this period the expectations of the trade will perhaps be fully met. Barb Wire, Nails and other Wire products which have held the lead in the market are falling back and the season's business is practically ended. It is believed that purchases by both jobbers and retailers have been conservative, and that when buying for the fall trade begins there will be no surplus stocks either at the mills or in stores.

New Orleans.

WOODWARD, WIGHT & CO., LTD.—Business for May is quite a little more slack than it was for April, not only in the Hardware and Supply lines, but also with the grocers and feed merchants and the wholesale and retail dry goods people. A demand will, however, spring up here on Heavy Hardware, Supplies and Machinery in June and July for the sugar planters in getting their refineries ready to operate in the fall.

In the country around here, the pay of the ordinary day laborer has decreased from about $1.75 to $1.10 per day, and as a consequence the demand for the better grades of dry goods and groceries has fallen off and there is general complaint among the laboring classes about the high prices of food products.

The financial situation here in the city is in very good shape. Money rates are comparatively easy, and funds can readily be got by merchants in good standing, but the consuming demand everywhere is very light.

There is a small but steady business coming in for all of us, and while we anticipate a little spurt in June and July from the sugar planters and some from the cotton planters, there does not seem to be any buying demand in sight before the fall of the year.

Collections are coming in very well, however, in fact better than they were this time last year.

Baltimore.

CARLIN & FULTON.—Since our last letter the uncertainty attending the actions and prices of the steel interests of the country has been dispelled by the meeting of a few days ago. The announcement made of no intention to reduce prices fixes the stability for some time to come of a large part of the cost of many manufactured goods. The adjournment of the meeting for the summer indicates that there is no probability of an early change of opinion as to the wisdom of maintaining present prices. This action may or may not be disappointing to many. Undoubtedly there had been expectations that following the dullness of the winter and spring a slump in prices would be in order, but overlooking the fact that prices had never been advanced to any great extent, having been arbitrarily held within bounds by the conservatism of the largest interests in the trade in spite of great opportunities to do differently.

Trade seems to be gradually improving, and the demand for seasonable goods is quite active. The advent of hot weather has brought the growing fruit crop through with safety, and soon the country will be harvesting another wheat crop. A large acreage of cotton is in process of cultivation, and while the price is less than that of a year ago, it is hoped the difference will be compensated for by a larger yield.

The combination recently in this city of the circus, the races, and one of the largest church conferences proved too great for the elements and throughout this section we have had a great deal of rain, resulting, however, in great benefit to the grass, and the hay crop will be of large proportions.

The general crop prospects being good, once more the agricultural interests will come to the relief of the country, and probably the emergency currency obtainable under the new bill just passed by Congress will never be needed, at least for some years to come.

The country has passed through a process of [illegible] and by the time the fall season approaches the stocks of merchandise, whether in the hands of manufacturers, wholesalers or retailers, will undoubtedly be so depleted that the every day consumption of the nation insures business independent of who may be elected to the Presidential chair.

Cleveland.

THE W. BINGHAM COMPANY.—We can see a decided improvement in the number and size of orders that are coming to us from our salesmen who solicit business from the country trade; also the orders from our city salesmen are larger and coming oftener, consisting of a pretty fair assortment of miscellaneous goods as well as season goods. Customers are taking heart and buying more goods for shipment in the future, as they realize if they are going to do business at the same old stand, they have got to keep their shelves stocked up.

It looks very much as though the turn of the tide had come and we are very hopeful of the future. If only the manufacturers could see their way clear to increase their output, and the railroad companies could feel safe in putting money into new lines and replenishing the old ones, we would be on "Easy Street" very soon.

There is one thing sure, with the outlook for the abundant crops of grain and fruit this fall, if something is not done very soon to put our railroad traffic in good shape, there will be a great many complaints about service that the railroad companies are not able to give to move these crops. Confidence is surely being restored in many quarters.

Now that Congress is about to adjourn, legislative agi-

tation will cease, and business will resume its normal state soon.

Spring and summer goods of all kinds are going forward in good volume. There is considerable inquiry for Black and Galvanized Sheets, Pipe and Fittings, and in some sections they are buying quite freely.

The dividends that the large corporations have been able to pay their stockholders are putting a lot of money into circulation. When you stop and think that the Pennsylvania Company have 59,415 stockholders who will participate June 1 in a dividend of $9,437,839.50, it shows that somebody is going to have some money to spend on their summer vacation. This is a good omen of future prosperity.

All the business man asks is, to be let alone, and he will take new heart and do a great deal to keep the dinner pail full and make prosperous times.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—Nails and Wire did not decline. We must admit we were surprised. We confidently expected a reduction. The tires have been pumped up good and hard. How long will they run without requiring more pumping?

The action of the large Steel interests certainly indicates confidence in their own strength. It also indicates confidence in the general situation. This point of view is at least reassuring.

The argument is used that Steel products are no higher proportionally than farm products. Corn in Missouri and Illinois is to-day selling at 75 cents per bushel. Wheat has passed the dollar mark. There was a time when corn at 40 cents was considered high and wheat at 60 cents was good money. The comparison of Steel and agricultural products is at least ingenious.

The comparison, however, does not go when it comes to hogs and cattle. Low priced hogs with 75 cents for corn! There must be a lot of hogs or a lot of manipulation. Which is it?

We live in the exact center of prosperity. On June 1 in this neck of the woods, employees will be taken back. We never discharged any employees. We have more salesmen now than we had a year ago. In some departments we have more employees than we had a year ago.

Up to this writing (May 30) we have not seen any wonderful increase in business. But next Monday, June 1, we expect to see it all different. We are glad the time has come, because, with the exception of one month (February), our business has fallen off every month this year.

Laying joking aside, we anticipate a quiet June and July. In the present mood of the trade merchants will not buy heavily until they feel a substantial demand from consumers.

The situation reminds us of the story told by Mark Twain. He could not eat. The sight of food nauseated him. He had no appetite. He went to a sanitarium. They shut him up in a nice room with plenty of books and flowers. There was a chart of his case hanging on the wall. They gave him everything but food. Meal times came and went, but there was no bell and nobody came with a tray. After the second day Mark Twain sent for the doctor and said: "Look here! I want something to eat." The doctor replied: "Why, I understood the sight of food nauseated you." "Cut that out," answered the great author. "Bring me a good square meal, and bring it quick."

So we feel that some of these days the consumer of this country will want goods and he will want them quick. Just now he is preparing a good, big appetite.

Present conditions are natural, and in many ways beneficial. Things are getting down to a healthy basis. Balloons are being pricked.

In our territory collections are quite fair, and losses from failures have not been serious.

We believe the general trade to-day is in much better shape than it was this time last year. Merchants have been paying off their debts. They have been trimming up their stocks. They have been buying carefully. Why has not all this been a good thing? In the boom days, some merchants bought too much and they bought recklessly. But after all, there has been very little actual suffering. We do not believe many of our customers have missed any of their meals.

We are not enthusiasts and we are not overly optimistic, but we cannot see, if we have a fairly good crop this year, at the very high ruling prices of agricultural products, how we can help having a large business this fall—politics or no politics.

You must, however, take into consideration a large portion of our business is in the agricultural districts and in the medium and small size towns. Probably conditions may be distinctly different with those jobbers who draw the larger share of their business from manufacturing sections. Nevertheless, we cannot have good crops and good prices in the agricultural districts of this country without the good times being felt in the manufacturing centers.

Taking the situation all in all, it looks good to us, but the past month we were not worked to death by the size of our orders. Competing salesmen please take notice and don't work so hard.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—Trade is passing through the usual quietude of May with the prospect of similar experience in June. We await on the one hand the results of farmers' work and weather conditions as to what shall be produced, and on the other hand the outcome of sundry meetings in New York as to whether anything in the way of Iron or Steel shall be reduced. The latter is determined by men's votes to a large extent. The committee gets together and decides whether or not there shall be any attempt to stimulate the market by a reduction in price, and what they decide on is good until next time. At least that is the theoretical working out of the trust's operation, and this time they have decided in the negative.

There are still those who believe it is healthier to let things take their natural course up or down according to the market. The present condition is something like that of a sea sick individual, who is not quite sea sick enough to let go. We are told in all such cases it is better to have it up and over with for the health and comfort of the patient; that he has less reckoning—dead or otherwise—with the dinner table and sidewalks after he gets on shore, if he has really and actually paid his debt to Father Neptune.

Just when we are told that things are truly prosperous, and are enjoined to get into the band wagon possibly (we ourselves do not see it because we do not open our eyes wide enough or look in some particular direction), then there comes a revelation like that of the Pittsburgh Terminal Company, with its shortage of earnings and general disappointment to the people, who had reasons to expect over half a million should be disbursed for their benefit, or the failure of an Allegheny National Bank, with an untold deficit.

Now we have to go to work and earn something before we can have it, we might as well recognize that. People are not swallowing securities at a gulp, as they were two or three years ago, but must be persuaded at their actual worth. It is good, healthy reaction that we are bound to undergo. Nature intends that every now and then we should take a day or a year off. It gives us an opportunity to reflect how we may best spend the money that we earned in the times of genuine prosperity. It makes us realize that we could have done something better with it than we did, and persuades us that there is something more imperishable than even bonds in a strong box; and we reflect on the good causes that we failed to encourage because we did not take time enough to consider their claims, and the margin that would have looked very handsome as a subscription opposite our names on some worthy list has gone glimmering as the stocks or notes or bonds took their place on the steeply inclined toboggan. It is better now, somewhat, and margin taking is once more a pastime of the bulls.

Meanwhile there are evidences of improved condi-

tions in other directions, too. The column "help wanted" is gradually swelling in the evening papers; bakers, barbers and blacksmiths, no end of painters and farmhands are advertised for; and, while the column of "situations wanted" has not shrunk, there is evidently something to be said on both sides. The vacations asked for are not shorter than usual, but, on the contrary, are longer, showing that money has been saved up to tide over this non-earning period, and that the practice of taking several weeks off for a "good time" is becoming more and more universal. So be it; the picture of the girl in the hammock is just as attractive as it used to be, although somewhat trite as an advertisement. No one is a slave when under the apple tree.

Portland, Oregon.

FAILING, HAINES & MCCALMAN. The conditions on the North Pacific Coast continue comparatively good, and we out here really cannot complain when we read the "hard luck" stories that the newspapers are publishing under Eastern headlines. We hope, however, that this is not as bad as it is painted. We notice in one of the trade papers an item commending the so-called Prosperity Association, started in St. Louis for the purpose of encouraging confidence in the future of business. This seems to us to be a good thing, if it is necessary, but when we look over the country and see the boundless possibilities of the Pacific Coast we do not feel out here the need of any association to make us believe in a bright future for business, and when we say a bright future we do not mean that it is far in the future, but right at hand.

Our belief is largely explained by the fact that the crops could not promise better in all lines, and that there is a prospect of a favorable price. The lumber industry, while still in a very poor condition, is possibly, we are informed, in a better condition than it has been for some time past.

The railroads that had stopped their work have commenced again, and in every way it looks as though the latter half of the year would be prosperous.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY. The Hardware jobbers of the South are now passing through the dullest period of the whole year. A great majority of them are working on their annual inventory, and otherwise rounding up the year's work. When they finish up this work and review the past 12 months' business, they will no doubt find it far from satisfactory, as we do not suppose there is a single jobber in the South who has made much money in the last six months.

As for the present and the future, we are glad to report that things look like they are slowly improving. The improvement, however, is in spots, some sections reporting much better conditions than others. The best feature of the situation is the splendid crop prospect that now exists almost over the whole South. With good crops we certainly ought to have pretty good business this summer and fall, and we think jobbers and retailers should make their preparations to take care of a good fall trade. The dealer who has a well assorted stock of goods this fall is going to be the man who will get the business and make the money.

While we would not advise overbuying in any way, we certainly think it will pay the trade to carry well assorted stocks from now on. Collections continue to be remarkably good, and we are surprised at the number of merchants who are discounting their bills.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—The month of May closes with trade conditions in the trans-Missouri region fully as favorable as could be expected. A season of continuous rough and cool weather has retarded farm work of all kinds, particularly corn planting, and everything in this way is in a backward condition. Owing to the effect of the constantly cool temperature small grains do not show up to advantage as in former seasons, and the growth of these cereals is somewhat retarded.

In this section corn is the principal staple, and a great deal will depend upon the size and value of the coming season's crop, but it is too early yet to form any kind of an opinion on this important feature. With the advent of warm and genial weather an altogether different aspect would surround the situation. It will undoubtedly come all right, but is very slow and tardy this season.

The whole country west of the Mississippi is in good condition financially, and outside of the annual uncertainty as to the extent of the coming crops there are no developments in sight calculated to disturb the satisfactory volume of business now being enjoyed.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Since our last letter to *The Iron Age*, there has been but little change in trade conditions in our surrounding section. There is, however, nothing in the situation to create any great anxiety as to the future. We write this especially now for the reason that very recently matters of this kind have been investigated by persons high in authority in the Government, as well as by the banks throughout the country and manufacturers in various lines, and it has lately been published that the period of stagnation of American industry is at an end and the tide of prosperity again rapidly coming forward. We note also that the prospect to-day is far better than at any time since the depression set in, and the mills are gradually increasing their working force and output.

It is thought that the iron business will be the last to experience the improved conditions, but this is largely owing to the fact that the demand was so very large during the years 1906 and 1907 that it would be hard to reach that level until the railroads give equally large orders, which is not to be expected.

Some feeling may have existed from the published reports that the gross earnings of the railroads were over 20 per cent. less for the month of May this year than for the same month in 1907. Now this is not surprising or unexpected, as business men are all doubtless aware of the fact that the railroad shipments during the entire year of 1907 were unequaled in this country, and manufacturers, jobbers and retail merchants have not forgotten the trouble that existed in railroad shipments during 1907, owing to the large trade. However, the railroads are coming into the market slowly, and the steel business, as we know, largely depends upon them.

Recent reports on crops estimate the output of winter wheat as over that of a year ago. Spring wheat is said to be of unusually high condition. The financial conditions of the country have largely improved, general bank deposits have increased, reduced rates of interest are charged by banks and quite as low as one year ago. This also appears to exist in foreign countries, and the reduction of the rate of interest by the Bank of England makes it lower than any time (but once) during the past 10 years, and well protected bonds are now bringing high prices.

As we all understand, there has been but a very slight reduction in the price of manufactured Hardware, but had great changes taken place it might have caused considerable excitement not only to wholesale and retail merchants, but to consumers.

It is predicted by many that after, if not before, the election of President and Vice-President provided that crops don't fall down between now and then, trade will largely increase.

Present collections are very fair.

NOTES ON PRICES.

Wire Nails. New business [illegible] by the mills is comparatively light, being confined to sorting up stocks. The principal activity is specifications on contract orders, which the mills are able to ship promptly. It is understood that prices are being firmly maintained. Quotations for base sizes continue as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

New York.—A slight improvement is noted in the local demand for small lots of Wire Nails at store, but the volume of business is far below normal. Nail houses are holding Nails on the basis of $2.40 per keg for small lots at store.

Chicago.—Specifications against existing contracts now constitute the principal volume of business. New orders are coming in slowly, and represent chiefly dealers sorting up requirements. A lull is to be expected at this season of the year, and there will probably not be very much doing until fall buying begins. Price schedules are reported to be uniformly observed. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—New demand for Wire Nails is very light, being confined entirely to small lots for actual needs. What effect the reduction of $4 a ton in prices of Steel Bars will have on the Wire Nail market remains to be seen, but at this writing the large Wire Nail interests are maintaining regular prices, absolutely, but at the same time the trade is apprehensive of a reduction, and is confining purchases to actual needs. It is understood that stocks of Wire Nails in hands of jobbers are at a minimum, which is one argument being used in favor of a reduction. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

Cut Nails.—No improvement is noticed in the demand for Cut Nails, orders being for small lots, aggregating a small volume. The market is irregular, and concessions of 15 cents or more are being made on regular Steel Nail quotations, so that about $1.85 for carload lots at mill is more representative of the market than $2.05. Iron Nails generally should command about 10 cents more than Steel.

New York.—Local demand continues light, and small lots fill the requirements of buyers. In view of the lower prices at which Cut Nails are being sold by mills the Nail houses are making the price on the basis of $2.15 per keg for small lots at store.

Chicago.—A revival of activity in Cut Nails naturally waits upon improved conditions in the industries which use them most freely, and there is unfortunately no immediate prospect of such developments. Trade is confined to small orders from miscellaneous sources, the aggregate volume of which is small. Chicago quotations are nominally as follows: In car lots to jobbers, Iron Cut Nails, $2.18; Steel, $2.03; in small lots from store, Iron Cut Nails, $2.30; Steel, $2.15.

Pittsburgh.—While regular prices of Cut Nails have been reaffirmed by the Eastern Cut Nail Association, this action is really without importance as the mills are pursuing an independent policy and selling Nails at whatever prices they see fit. Demand for Cut Nails is for small lots only and for actual needs. The general quotation on Steel Cut Nails is $1.85, but $1.80 or lower has been done in some cases. We quote Steel Cut Nails at $1.85, f.o.b. Pittsburgh, for carload lots, and $1.90 to $1.95 in small lots. Iron Cut Nails take about 10 cents advance over Steel.

Barb Wire.—The advancing season brings with it a diminished demand, and comparatively little new business is expected by the mill in the near future. Shipments on contract orders are in fair volume. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.55
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—Very few new orders are being entered, although a fair amount of shipments against contract are still going forward from the mills. The season is practically over, and pending the beginning of the fall trade no new tonnage of consequence will be entered. Prices are firmly held at the regular schedule. Prices are reported to be firmly held by the mills. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The season is practically over and new business has dwindled to almost nothing, but a fair tonnage is still going out from the mills on contracts. It is not likely that a reduction in prices of Barb Wire would stimulate demand at this time, but at the moment regular prices are being maintained by the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Plain Wire.—Demand, for the most part, is for small lots, coming from manufacturers of Wire Fencing. Prices are being maintained. Quotations per 100 lb. to jobbers in carload lots are as follows, on a basis of $1.90 for Plain and $2.20 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the price to retailers being 5 cents additional:

Nos.	6 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.90	1.95	2.00	2.05	2.15	2.25	2.35	2.45
Galvanized	$2.20	2.25	2.30	2.35	2.45	2.55	2.95	3.05

Chicago.—What business is being entered by the mills consists of small orders, representing actual present needs of manufacturers. Fence manufacturers are ordering moderate lots in this way, but the aggregate tonnage being booked by the mills is light. Prices are firmly maintained at the regular quotations, which are as follows: Car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—Demand is light, and is only for small lots for actual needs. Jobbers are placing orders sparingly in the belief that a change is possible in the attitude of manufacturers towards prices and that possibly a reduction may be made in the near future. In the meantime the mills advise us they are absolutely maintaining regular prices. We quote: Jobbers in carload lots are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the price to retailers being 5 cents additional:

Nos.	6 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.90	1.95	2.00	2.05	2.15	2.25	2.35	2.45
Galvanized	$2.20	2.25	2.30	2.35	2.45	2.55	2.95	3.05

Registers.—Confirmation has been received of the reported advance in Registers referred to in these columns a week ago. On June 1, the leading manufacturers announced an advance in Japanned, Electro Plated and Bronzed Registers and Borders, amounting to about 10 per cent., to take effect at once. The present discount to average trade is 70 per cent. Prices on Register Faces remain unchanged, as do those on Porcelain Enamel, Solid Brass and Bronze Metal Goods.

Pipe Cutters.—As stated some weeks ago, the market on Pipe Cutters is now an open one, and prices have developed decided irregularity. Low quotations, said to approximate manufacturing costs, are now reported, one Western manufacturer openly publishing a discount of 85, 10 and 10 per cent. on Barnes pattern, and 85 and 10 per cent. on Saunders pattern Cutters.

Galvanized Ware.—Although leading manufacturers have recently made two noteworthy reductions in their quotations on light Galvanized Pails and Tubs, prices on these goods still show irregularity, due to the competition of independent manufacturers.

Copper and Brass.—The market in Copper and Brass materials continues featureless and quiet, with orders for nothing in excess of actual necessities, notwithstanding the quarter of a cent per pound reduction in Brass Sheets, Rods, Wire and Tubing announced early in May. Some of the factories are running on from a half to three-quarters normal capacity, and orders held up last fall pending a recovery from financial disturbances have been about cleaned up. The work at present is mainly on new orders, which are moderate in volume. The prices of Copper materials, while nominally fixed at the various bases, can be shaded in most instances.

Bolts and Nuts. Leading manufacturers have made a change in their list prices on common carriage bolts, sending out new price-list, dated June 1. The change affects only 5-16 and ¾ in. bolts, representing an irregular advance in these diameters ranging from less than 10 to nearly 20 per cent. in the different lengths. Another feature of interest in connection with this market is an apparently general movement on the part of the manufacturers to revert to the old terms of 2 per cent. cash discount. For some months a number of manufacturers have been allowing 1 per cent., but the effort to establish this rate seems to have been abandoned in recognition of the demand of the trade.

Window Glass.—One of the quite prominent hand blown Glass factories has gone out of blast, while others that have been making Glass are understood to be in operation. The warm weather has already had its effect upon the workmen, materially curtailing the production, and continued heat will result in factories becoming short handed. Prevailing conditions certainly point to the desirability of closing down factories, which include low prices, low range of wages and light demand for Glass. No doubt the quantity of Glass now being produced is materially in excess of demand, which may possibly lead to lower prices. The American Window Glass Company's prices are represented by the quotation of 90 and 40 per cent. discount on single and 90 and 40 and 10 per cent. discount on double strength Glass, from manufacturers' list. Jobbers' quotations east of the Alleghenies and north of the Carolinas are reported as being 90 and 35 per cent. discount for single and 90 and 40 per cent. discount for double strength Glass, from jobbers' lists. South of the Carolinas quotations are said to be 5 per cent. higher. Western jobbers' prices are about 90 and 40 per cent. discount on single and 90 and 40 and 5 per cent. discount on double strength Glass, from jobbers' list. In estimating these quotations it must be borne in mind that the jobbers' list is about 25 per cent. higher than the manufacturers' list.

Binder Twine.—As the time for harvest in the Southwest approaches the Twine market shows some indications of weakness, reports being to the effect that quotations have been made, supposedly by jobbers and commission men, from ¼ to ½ cent below the original schedule prices. Concessions in price are not regarded as having had much effect upon the market thus far, and the majority of sellers are said to be holding to regular prices. The Sisal hemp market is weak and lower than for some time, but there is no evidence that Twine producers will increase their output, for this reason, to any considerable extent. The production of Twine has been considerably curtailed this season, while the outlook is for a larger demand than usual. Regular quotations are as follows:

	Cents per pound.
Sisal	8¼
Standard	8½
Standard Manila	9¾
Manila	11¼
Pure Manila	13

Carload lots, ¼ cent less; 5-ton lots, ⅛ cent less, central delivery, fall terms.

Rope.—A slight improvement is noted in demand, orders being more frequent, but still for limited quantities, evidently covering only immediate requirements. Manila hemp is firmer in tone, but sales of Sisal hemp for June-July delivery are reported at the low price of 4¾ cents per pound. The following quotations, for base sizes of Rope, fairly represent the market for small lots, but are not always adhered to: Pure Manila, 10 to 10¼ cents; lower grades Manila, 8 to 9 cents; Pure Sisal, 7½ to 7¾ cents; lower grade Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¾ cents.

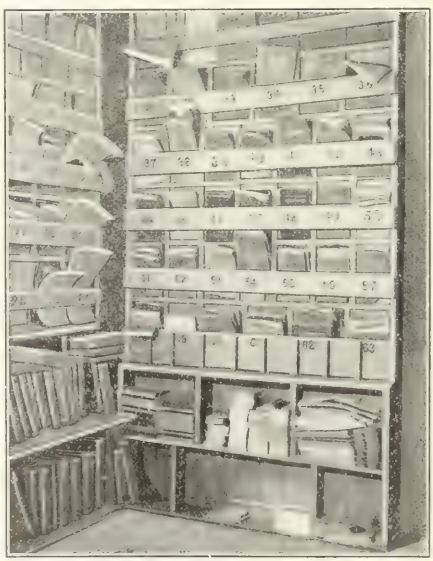
Linseed Oil.—Receipts of Flax Seed at Northwestern points are light, and this is causing crushers some uneasiness, while the Seed market is receiving more than usual strength as the result of this condition. With comparatively light stocks of Seed and Oil in crushers' hands, especially in the West, and all buyers of Oil pursuing a hand to mouth policy in supplying their requirements, it would appear that the Oil market should be strong. Local quotations are as follows: State and Western Raw, 42 to 44 cents; City Raw, 44 to 45 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—Demand for small quantities has been fairly good on a declining market caused by heavy receipts of new crop Turpentine at Savannah. Notwithstanding low prices, manufacturers are not stocking up beyond nearby requirements. Prices have fallen off in this market about 2½ cents per gallon, reflecting conditions in the South. The New York market is represented by the following quotations: Oil Barrels, 42½ to 43 cents; Machine Made Barrels, 43 to 43½ cents.

A CONVENIENT CATALOGUE RACK.

IN the Hardware store of James R. Gladwin, Westfield, Mass., there are a number of original ideas utilized which commend themselves to the student of Hardware business methods. This store is well known in the State, having been long established and being one of the pioneers in installing modern methods of accommodating and sampling goods and taking care of various details of the business.

Among other interesting features is the catalogue department, which, while exceedingly simple in arrangement and requiring but little time to keep it up, is distinctly practical and convenient as far as it goes. The catalogues are kept in a rack, the construction of which on the two walls forming one corner of the office will be entirely clear from the accompanying illustration. The rack is divided into compartments which are numbered consecutively, each accommodating three or four books. Catalogues are marked with the number of the section in which they belong and an index arranged alphabetically under manufacturers' names is kept in an ordinary blank book. A cross index under goods is considered unnecessary. Large bound catalogues which must be referred to frequently are numbered and kept in undivided shelves, as shown at the foot of the rack. Besides the fact that catalogues are so accessible and so easily looked up this form of rack has the advantage that it is directly under the eye of the user, who will be able as time goes on to pick out more and more of the catalogues without referring to the index, his memory for the numbers being supplemented by having so many of the catalogues in plain sight, so that he soon becomes accustomed to their appearance, color, &c., and their location in the rack.



Catalogue Rack of J. R. Gladwin, Westfield, Mass.

Alabama Retail Hardware Association.

THE Alabama Retail Hardware Association held its first annual convention at Montgomery on Thursday and Friday, 28th and 29th ult. The sessions were held in the rooms of the Commercial Club. This association was organized last summer, and in view of its youthfulness the attendance was large and creditable, and those present manifested much interest and enthusiasm in the proceedings.

The convention was opened with prayer by the Rev. Leander M. Woods, D.D. B. F. Luttrell, Florala, president of the association, was unable to be present, owing to illness in his family, and Vice-President J. W. Beasley, Birmingham, directed the proceedings in his absence.

Hon. Walter D. Seed, State treasurer, welcomed the association to Birmingham in a felicitous address.

Presidential Address.

Mr. Beasley read Mr. Luttrell's presidential address, which was, in part, as follows:

It is indeed with deep regret that I cannot be with you on the occasion of our first annual meeting, for it is the realization of my fondest hope to see the rank and file of the Hardware trade of our grand old State lining up for its best interests.

It must certainly be a source of especial satisfaction to all of us who have kept up with the doings of Congress through our Hardware journals and otherwise that the proposed Parcel Post measure has been set aside.

While our membership to the present has been small we have had the strong arm of the National Association to wage our battles for us, as it were. Their moral support has been extended in many ways, which were beneficial to the whole trade of the country, but particularly to the more poorly organized branches of the Hardware trade. The Mail Order problem which has been a vexed question for some years past, is fast becoming an uninteresting one, as the manufacturers are not slow to realize that they depend not so much on the catalogue house for the distribution of their wares as upon the great body of retail Hardware dealers. So it appears unnecessary to further attempt to show the great good to be obtained from organization.

Educating Clerks.

Just here I wish to call attention to the fact that many of us need better organization in our own places of business. There are many clerks in Alabama who apparently think little of serving their employers' interest except to such degree as will keep their salary coming. This, in the main, is due to the fact that there are few who do not dread work. We need young men in a Hardware store who don't fear to wilt their collars or get their hands black. In a recent edition of the "Gimlet" by our friend, Mike Kenney, he says there is more loafing done to the square inch in retail Hardware stores than anywhere in the United States. It's true. Our clerks are like the father of the boy who, when asked if his father was a Christian, said: "Yes, but I don't think he is working at it much now." Hard work is the very essence of success in almost anything.

On the other hand, there are many of us employing young men who take no interest in their welfare or our own. To train them is the employer's duty first. We cannot expect efficient help from a boy just let "stay" in the store any more than we would expect to make a good boy by letting him do just as his inclinations might lead.

Let us not feel that money is all there is to live for on this old earth while teaching a boy the intricacies of the Hardware business; let us feel also that it is our solemn duty to instill in him good habits. We can show him that the boy who drinks or gambles or smokes cigarettes is the one that will not last long anywhere.

Let us look carefully into the mutual insurance companies that have grown up with our organization, and if they are founded solidly divide our risks with them.

Helping the Farmers.

Another item we believe will be of inestimable mutual value is for the retail Hardware merchant to help educate the farmer by pointing to improved methods of seeding and cultivation. To take an interest in our farmer friends brings us into closer personal contact, which results in closer understanding.

Let us encourage the passage of laws which will give us pure Paint, pure seed, good roads, irrigation, &c. While we ask the co-operation of the jobber and manufacturer let us in turn show our appreciation by a loyal support of all who are trying to help us by confining their sales to our ranks.

M. L. Corey's Address.

The presence of M. L. Corey, national secretary, was much appreciated. Mr. Corey brought greetings from the national body, and said that with three or four exceptions it now included all the States expected to enlist in the organization. He spoke at length on the operations of the catalogue and mail order houses, and advised that their catalogues be carefully studied and their methods intelligently met. Mr. Corey also touched on parcel post legislation, and its defeat at the session of Congress just closed.

Co-operation with Competitors.

An interesting paper on the subject of co-operation with competitors was read by Vice-President Beasley. We make the following extracts from it:

We learn from standard authority that to co-operate means to work together in harmony toward one general purpose. I am sure all would readily agree that in trade the general purpose is not only to earn a livelihood for one's self and family and lay aside something for a rainy day, but in addition to reap a reasonable compensation for invested capital.

Value of Sharing Experience

Before one can reasonably hope for success to any marked degree, he must have a store of knowledge, which for the most part comes only from the school of experience, and it matters not how much experience he may have had, there come times and arise problems, the solution of which requires in addition to his own knowledge all the observation and all the co-operation and experience which can be obtained from his competitors. There is not a man in the Hardware business to-day, however humble his place may be, who cannot give valuable information if one will approach him respectfully in a heart to heart talk.

Interdependence of Strong and Weak.

It matters not how rich in experience one may be nor how strong financially, he never gets to where he does not need the good will, the experience and the co-operation of every competitor he may have, and it would be absurd to doubt that every one of his competitors needs his co-operation, as well as that of every other competitor. I am sure there is not a member of our Association nor a reasonably intelligent Hardware dealer anywhere who would not readily agree with me that co-operation with competitors is both profitable and pleasant, provided, however, the competitor (or the competitor's competitor) is not the sort of person who would sooner see a $5.00 note burn to ashes than fall into the hands of a neighbor Hardware dealer.

Local Co-operation.

If it is profitable for us as Hardwaremen throughout the State to meet together in annual conventions and exchange ideas and assist in the solution of each other's problems, it must be eminently profitable for local competitors to exchange ideas, share each other's experience and offer friendly suggestions toward the solution of each other's problems. In fact, if only two merchants honestly co-operate they form a miniature convention. I think I am correct when I say that Hardware merchants as a whole possess a higher average of intelligence than perhaps any other class of merchants; then I prefer to treat the subject under the presumption that all competitors are men as well as merchants.

Even Competitors May Be Trustworthy.

Because your neighbor has chosen the same vocation that you chose is not positive proof that he is a rascal, an unscrupulous prevaricator, a man entirely unworthy of trust, as some narrow merchants seem to think. Do not do yourself nor your competitor the injustice to count as Bible truth every statement, however unreasonable, that may come from the professional shopper, but rather

Draw the Golden Rule

on him. Be as charitable toward him as you would expect him to be toward you. Think upon the reasonableness of the proposition and if you decide that it is not a reasonable thing for a sane man to do, nine times out of ten, he has deemed it unwise and would plead "not guilty." If you have been looking upon your competitor in this light, it is high time that you take a double dose of "familiar drops" and

Pay Your Competitor a Social Call

at his place of business. Talk with him as you would to a gentleman, and it will not require many minutes for you to learn that he is one. Talk with him as you would to an honest, upright, honorable business man, place some confidence in him, and you will find that he is worthy of it all, and that you have done him a grave injustice. Tell him some of your experiences, lay some of your unsolved problems before him and you will find that he has met and correctly solved many of them, and that he is ready to give you the benefit of his experience and advice. Rid yourself of petty jealousies, and feel a genuine interest in your competitor's welfare.

Sending Customers to Competitors Is Good Policy.

The man who can cheerfully direct his customers to his competitor for that which he does not handle not only confers a favor on his competitor, but renders a service to his customer, who will show his appreciation of unselfish service not only in expressed gratitude, but in a form which will prove a valuable asset that can be counted in the cash drawer. The happy man of to-day is the man who has done his neighbor a kindness. Gladden has truthfully said, "Men cannot cope successfully for any purpose if the sole bond between them is self-interest."

Telling Things.

The limit of the value of co-operation is dependent only on the extent of the co-operation itself. Tell your competitor that "Odom Moore" bought Hardware of you promising to pay in 30 days and that 15 months have elapsed and you have been unable to collect a penny of the account; you will find that he will reciprocate by telling you of many of his customers who are unworthy of trust. Tell him of the man who repeatedly comes to you with the statement that he can buy certain articles from him at unreasonable prices, and you will find that the same party has been going to him with similar statements regarding you.

Bitter Competion Ruins Both Sides.

The man who refuses to co-operate must, of necessity, to a degree at least, antagonize, and Hardware men are not angels. They are human, as other men, and there is a limit to their patience. When a good man has exhausted his patience in an honest effort toward mutually helpful co-operation and is continually met with antagonism proving a hopeless situation, he almost invariably turns and meets his antagonist in a deadly fight, the ultimate consequent result of which is the financial ruin of both. Let us open our eyes, and avoid paying the dear price of experience, with its high percentages of fatality.

Much to Be Accomplished.

By co-operation we learn to consider others, as well as ourselves, learn to appreciate and come to be appreciated. "In union there is strength," and by co-operation we cannot only influence local and State legislation, which will be profitable to us locally, but by thorough co-operation with all competitors we can effect the enactment of national laws which will greatly redound to the good of our country. We can also prevent the enactment of certain laws which are clearly detrimental to the best interests of the country at large and beneficial solely to a few master merchants. In short, in co-operation we have everything to gain with nothing to lose. Let us cry to those beyond and about us, "Hold high your lights and I may see my way," and to those below us, "Brothers, come on; come up." All the steps of human life are hard enough to climb when each shares his light and divides his neighbor's burdens. May God help us all to help one another.

Mutual Fire Insurance.

The subject of mutual fire insurance was brought up in the reading of a communication from W. P. Lewis, secretary of the National Hardware Mutual Fire Insurance Company, who was unable to be present. Mr. Lewis said that mutual fire insurance was superior, first, because of the theory or principle on which it operates, and, second, because actual operation has squared to the theory, completely demonstrating that this form of insurance is the best that the Hardware merchant can buy. He briefly described the plan and referring to the fact that the companies were organized for the benefit of the Hardware trade said:

These insurance companies were created by the Retail Hardware Association for the benefit of the Hardware trade. They are managed by men who are familiar with, in touch with, and loyal to the Hardware trade, and your money in these companies will bring you far larger profits than you are making on your Hardware business. These companies are growing stronger every year. They will ultimately reach the time when they can with safety carry all the insurance the Hardware trade will need and in doing it they will effect a saving of countless thousands of dollars. They are doing this now. An estimate of the money refunded the Hardware mutual policy holders is at present $100,000 annually. Alabama is entitled to participate, and, while it is the ambition of the officers of these companies that they shall grow to a state of power and dignity, yet the primary reason for their existence is that their influence shall be used for the development of the Hardware organization.

Marking Prices in Plain Figures.

Second Vice-President Rane McMillen, Demopolis, read a practical paper on the subject of "Why Not Mark All Goods in Plain Figures?" The paper was an argument in favor of plain marking, and was as follows:

In considering this subject or any subject in regard to the retail Hardware business it should at once be reduced to the simple question, will it increase the sales? The business is a selling proposition, and must be considered entirely on that basis.

Confidence of the public is the main thing to work for, and this can only be gained in one way, to conduct the business upon honest, straightforward methods, to have it recognized in the community that a child may be able to buy goods in your store as cheap and with the same satisfaction as could an expert of values.

Marking goods in plain figures interests the customer who, while waiting to purchase some special article, is often prompted to buy other things by being able to know the price. This is particularly noticeable during the holiday season, when shoppers are making selections which must necessarily be governed by the price.

Easier Choice.

The cost being plainly marked renders the matter of choice easier to the customer, and is of very great assistance to the salesman.

If you had reason to believe that your grocer, your shoe or dry goods dealer had two prices you would never know which one you paid, and you would often think it was the higher of the two. Do you know any good reason why it should be different with the buyer of Hardware?

The Merchant's Best Price?

Can you suggest any better way to send the would-be purchaser to your competitor's store, or cause him to send his money away to catalogue houses than to get the idea that he might not be getting the Hardware dealer's best price on a Cook Stove, Refrigerator, Lock or Tool, which he might chance to want or need to buy.

There is a price on every article at which more of the same goods can be sold to a better advantage than any other price, either higher or lower. The merchant should decide what that price should be, and when the decision is made it must be established in the store. Mark it in plain figures, put it in the show windows, the showcases and send it out in circulars.

Don't Be Afraid

of your competitor! He doubtless has *his* troubles, and you have quite enough in your own business to plan and devise the methods of increasing your trade.

The merchant should give convincing evidence of his own faith that his prices are right and his goods right.

A Store Motto.

There is no way by which he can more quickly and thoroughly establish this than to display prominently in his store the following motto: "Your money back if you want it—one price, and that price in plain figures." Practically all the large retail stores in the cities adopt this plan and find that it pays.

Some goods may be returned that ought not to be; competitors will cut some of your prices, but the balance at the end of the year will be found largely upon the profit side, and the annoyance you will have to contend with will serve to remind you not to expect perfection in the conduct of any business enterprise.

Manufacturers' Advertising on the Retailer's Behalf.

A paper on the subject of "What Kind of Advertising by the Manufacturer Benefits the Retailer to the Greatest Extent?" was read by C. A. Simpson, Troy. We give the following extracts from Mr. Simpson's address:

Advertising can be divided into a great many different classes. This is called a money age, but you have to advertise to get the business, and if it is properly handled, you will get the money. It is a broad subject, and covers every branch of business, from the smallest retailer to the largest wholesaler and manufacturer. They all advertise, and for the same purpose—to increase the sale of their wares.

Advertising Is Like Seed Sown.

It must have time to grow before you can reap the harvest. To cover the subject assigned to me, I have divided it into two parts—advertising for city trade, and advertising for country trade. I will treat first the city trade.

Magazine Advertising.

I have been very much impressed with the growth, system and kind of advertising the wholesaler and manufacturer are pursuing, especially their magazine advertising. I noticed in a magazine a few days ago that a certain manufacturer claims to have spent $1,000,000 in a year in advertising his products for the benefit of the retailer. No doubt every Hardware dealer present has received in the last few days sample copies of the advertising campaign that a certain Auger Bit Company has entered into. They have contracted with about 35 of the great national advertising mediums for big space advertising the entire year, some to cover center pages in magazines. The plan they have adopted, is in every respect for the benefit of the retailer. This advertising will bring thousands of inquiries from people all over the country, to each of which they propose sending a letter referring them to their local dealer. They also proposed giving souvenirs to those answering their advertisement, and the plan they have adopted in distributing these souvenirs alone is a great benefit to the retailer.

Beneficial Effects.

Some manufacturers advertise in magazines, periodicals, and newspapers, while some send out circulars and letters from a mailing list furnished by their retail agents, stating who handles their goods in their respective towns. Jobbers advertise their private brand goods and trade mark. There will be a call at the local hardware store for some article that the factory advertises when possibly there has never been a piece of their goods sold in that territory. This causes the retailer to inquire into the merits of the article and the demand for it, and the result may be beneficial to all concerned.

Advertising for the Country Trade.

Circulars, booklets, pamphlets and newspaper advertising appeals very strongly to the country trade. With the rural routes and service that "Uncle Sam" has given us for the distribution of mail matter in the country we have a way to reach daily any person in the country. By this convenience there are thousands of circulars, booklets, &c., of different kinds sent out to the farmers and their wives. These people will read a circular letter carefully, and it will make a lasting impression on them. If this letter states what firm in town handles certain goods they will remember it better than people who live in larger places.

It Pays Manufacturers to Furnish Advertising Matter.

I was recently asked by a leading hardware journal if it paid the manufacturer to furnish the retailer with advertising matter. My answer in substance was that, judging by my own experience in handling this class of advertising matter, it has been very profitable, and I always appreciate anything of the kind that the jobbers and manufacturers send me. In order to secure the best results I sometimes distribute it by hand, and sometimes I use it as newspaper advertising. I often get good ideas from them and I think the jobbers and manufacturers would do the retailer as well as themselves a great injustice to discontinue the distribution of folders, booklets, etc.

National Delegate's Report.

L. G. Smith, secretary-treasurer of the association, who attended the meeting of the national organization at St. Louis in March, delivered an interesting and carefully prepared report of the proceedings, which was listened to with close attention.

Election of Officers.

The following officers were chosen for the ensuing year:

PRESIDENT, J. W. Beasley, Birmingham.
FIRST VICE-PRESIDENT, J. N. Chrisco, Dothan.
SECOND VICE-PRESIDENT, J. R. Gamble, Wetumpka.
SECRETARY-TREASURER, L. G. Smith, Ensley.
EXECUTIVE COMMITTEE: F. M. Kelley, Selma, and C. A. Simpson, Troy.
DELEGATE TO NATIONAL CONVENTION, Rane McMillen, Demopolis.

Resolutions.

Resolutions were adopted extending thanks to the Commercial Club for the use of its rooms and to Secretary Dowse for courtesies received; to M. L. Corey, national secretary, and J. D. Moore of the Moore & Handley Company, Birmingham, for interesting talks at the convention, and to the Birmingham jobbers for entertainment provided. A resolution was also adopted expressing the sympathy of the association with ex-President Luttrell in the illness in his family, which prevented his attendance at the convention.

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Retirement of Samuel Disston.

IN the year 1850 Samuel Disston entered the employ of Henry Disston, Philadelphia, who at that time employed only about 35 men. He served his apprenticeship as a sawmaker, gaining a general knowledge of the business, and then entered the office. Subsequently, he became the road representative of the firm, traveling extensively, and becoming widely known. As a result, Mr. Disston is held in the highest esteem by the Hardware trade and others with whom he came in contact. The business of Henry Disston & Sons grew rapidly, and in the year 1894 Mr. Disston was made secretary and general manager of the company, which at the present time employs over 3500 men, its plant at Tacony covering over 50 acres. The company has branch houses at Chicago, Cincinnati, New Orleans, Memphis, Toronto, Nashville, Boston, San Francisco, as well as representatives in most of the large cities throughout the entire world. Advancing years and ill health have, however, made it impossible for Mr. Disston to give the close and undivided attention to business which had been his characteristic trait ever since his connection with it, and he has been compelled to realize that nature's demands must be heeded, and to announce his retirement from active duties and responsibilities connected with the management of this great industry.



SAMUEL DISSTON.

On Thursday evening last at the Bellevue-Stratford Hotel, Philadelphia, a complimentary dinner was tendered to him by the foremen and the old employees of Henry Disston & Sons, and a large number of experts in the different departments of the business representing both the manufacturing and commercial sides, were thus brought together. There was abundant evidence of the affection and honor in which Mr. Disston is held, in token of which a handsome loving cup was presented to him. While the trade throughout will regret Mr. Disston's withdrawal from the position which he has occupied for so many years, the duties of which have been transferred to others, they will recognize the appropriateness of his enjoying a much needed respite from the work to which he gave himself for so long a period and with such marked success. They will be glad to know while the active conduct of the business will devolve upon others thoroughly qualified to conserve and advance the great interests committed to them, that he will still, as the chairman of the Board of Directors, give to the corporation the benefit of his ripe experience.

In view of the retirement of Samuel Disston, the personnel of the management has undergone a change. The officers and directors now are as follows:

PRESIDENT, William Disston.
FIRST VICE PRESIDENT, Henry Disston.
SECOND VICE-PRESIDENT, Robert J. Johnson.
TREASURER, Jacob S. Disston.
SECRETARY, William Miller.
ASSISTANT SECRETARY AND ASSISTANT TREASURER, E. F. Cooper.

BOARD OF DIRECTORS: Samuel Disston, chairman; William Disston, Jacob S. Disston, Henry Disston, Robert J. Johnson, Frank Disston, Albert H. Disston, Henry C. Disston, William Miller, E. F. Cooper.

The broad foundation on which the business has been established will be strengthened wherever possible, and the high reputation achieved for the quality of Disston goods will be maintained in the future as in the past.

Minnesota Hardware Association.

THE Executive Committee of the Minnesota Retail Hardware Association held its quarterly meeting on the 28th ult., and fixed the dates for the next annual convention of the association. The time selected is February 23, 24, 25 and 26, 1909, at Minneapolis. The Minneapolis armory has been secured, and a Hardware exposition will be held in connection with the convention, as was the case last year.

The Retail Hardware Mutual Fire Insurance Company of Minnesota on the same date held its annual meeting, at which the following officers were chosen: Charles F. Ladner, St. Cloud, president; D. H. Evans, Tracy, vice-president; H. Hauser, Franklin, treasurer; M. S. Mathews, Guaranty Building, Minneapolis, secretary, and Thomas G. McCracken, assistant secretary. A very favorable financial statement was presented by Secretary Mathews, showing that losses were somewhat below the average, and expense ratio lower than for any previous quarter in the history of the company. The insurance in force on February 29, the date of the former report, amounted to $6,242,900, while on May 25 it had increased to $6,984,011.

Whitman & Barnes Mfg. Company's Catalogue.

THE WHITMAN & BARNES MFG. COMPANY, Chicago, Ill., has issued its general catalogue No. 68, containing about 325 pages, illustrating, listing and describing the extensive lines of goods which it manufactures. The company's product includes lines of interest to Hardware and Implement merchants alike, among which may be mentioned: Cutting Apparatus for Mowers and Harvesters, Diamond Haying Tools, Tubular Steel Frame and Wood Frame Grindstones, Lawn Mowers, Diamond Twist Drills and a complete line of Screw, Drop Forged and Bull Dog Wrenches. The value of the book to the trade is increased by the fact that it contains complete repair price-lists for the various lines.

Pittsburgh Steel Company's Chicago Offices.

THE PITTSBURGH STEEL COMPANY, with general offices in the Frick Building, Pittsburgh, works at Monessen and Glassport, Pa., manufacturer of Wire Rods, Wire Nails and other Wire products, also Hoops and Bands and Cotton Ties, has opened branch offices in the First National Bank Building, Chicago, in charge of R. D. Carver, Assistant General Sales Agent, and who for some years was secretary of the Southern Steel Company, Birmingham, Ala. Mr. Carver will handle the sales in the Chicago District, and with his long and favorable connection with the trade, will no doubt be able to secure his full share of the business offering.

THE NEW ENGLAND IRON AND HARDWARE ASSOCIATION met at dinner at Young's Hotel, Boston, May 26. At a short business session following the dinner a committee was appointed to make up a list of officers to be elected at the annual meeting to be held on Tuesday, 16th inst. President R. M. Boutwell presided, and the principal entertainment was an address by Hon. Henry M. Shute, author of "A Real Diary of a Real Boy." A quartette furnished music during the dinner and afterward.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

NORTH BROS. MFG. COMPANY, Philadelphia, Pa.: Handy pocket catalogue of Yankee Tools for 1908, including Ratchet Screwdrivers, Pocket Magazine Screwdrivers, Spiral Screwdrivers and Automatic Drills. The comparative size of the Tools is shown by excellent illustrations in groups, one-third actual size.

WINCHESTER REPEATING ARMS COMPANY, New Haven, Conn.: Illustrated catalogue No. 74, March, 1908, with price-lists of repeating Rifles, Carbines and Muskets, repeating Shotguns, single shot Rifles and Ammunition. Attention is called to several changes in list prices and additions to the line.

L. C. POND COMPANY, Los Angeles, Cal.: Illustrated circulars referring to various Hardware specialties, including Dew Drop, Wilgus, Sharpe Square and Thompson Lawn Sprinklers, Havil Lawn Weeders, Ellis Wood Smoother, Wood Folding Saw Vise, A. B. C. Vise, &c.

BUTLER BROS., Chicago: "Our Drummer" catalogue for June, 1908, refers to an extensive line of seasonable goods suitable for the Hardware trade, and quotes special prices. Several pages are devoted to Fireworks; also to "Resultful Plans," suggesting methods by which enterprising merchants may increase their business.

PRESSED STEEL TANK COMPANY, Milwaukee, Wis.: Catalogue, handsomely illustrated and got up, referring to Seamless Steel Barrels.

L. D. BERGER, Philadelphia: Pocket catalogue for 1908 illustrating and listing an extensive line of Sheet Metal Goods and roofers' and sheet metal workers' Tools and Supplies.

AMERICAN TOOL CHEST COMPANY, 200 West Houston street, New York: Illustrated 48-page catalogue, No. 20, with discount sheet No. 1, showing an exhaustive line of Tool Chests from mechanics' of the highest grade to the amateurs', youths' and children's Chests. They are listed both with the finest Tools and those more moderately priced, as well as for those of the toy variety. Empty Chests are also shown in all grades.

WHEELING CORRUGATING COMPANY, Wheeling, W. Va., Chicago branch house: General catalogue No. 265, with accompanying net price-list No. 1, referring to the company's extensive line of sheet metal products, including Conductor Pipe, &c., Metal Shingles, Metal Ceilings, Roofings, Sidings, Galvanized Ware, &c.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM UEHLING HARDWARE, Uehling, Neb., which handles Shelf and Heavy Hardware, Stoves, Paints, Sporting Goods, Harness, &c.

FROM GEO. B. MAIN COMPANY, 70 Warren street, New York, which has been incorporated to handle Hardware, Agricultural Implements, &c., as manufacturers' agent. The incorporators are G. B. Main, I. T. Freye and Thos. Kilvert.

FROM T. G. POSTANS COMPANY, which has bought out the Hardware, Stove, Paint and Sporting Goods business of T. J. Lindsay & Co., Bellevue, Pa.

Edward T. Tichacek has purchased the business of Frank A. Bouzek in Linwood, Neb., and will handle Shelf Hardware, Stoves, Tinware, Paints, Oils and Sporting Goods.

LETTERS FROM THE TRADE.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

Manufacturers' Sales to Retailers and Consumers.

To the Editor: Referring to the article in a recent issue of *The Iron Age* as to manufacturers selling to retailers, I find a great difference of opinion among manufacturers as well as jobbers and retailers as to what differences should be made in prices. Suppose a manufacturer's discount to jobbers is, say, 50 and 5 and 5 per cent., what discounts should the large retailer receive, also what would be the proper discount to the smaller retailer and large consumer?

I usually make prices so as to allow a profit to each of about 10 per cent., which at a bottom of 50 and 5 and 5 per cent. would make the other discounts about 50, 45 and 40 per cent., respectively.

An expression of opinion on these points from those interested might lead to some uniformity of action.

MANUFACTURER.

AMONG THE HARDWARE TRADE.

The Coweta Hardware Company, Coweta, Okla., has been organized and incorporated with a capital stock of $5000, the incorporators being R. W. Lumpkin, C. E. Trumbo and C. K. Leslie.

The Atoka Hardware Company, Atoka, Okla., has been incorporated with a capital stock of $10,000, to deal in Shelf and Heavy Hardware, Stoves, Implements, Vehicles and Plumbing Goods.

G. T. Falk, Foley, Minn., is building an addition to his store. He handles Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Sporting Goods, Buggies and Wagons.

W. C. Cameron has purchased the stock of McDougal Bros., Tecumseh, Neb., and will handle Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils and Sporting Goods.

Sam. M. Biddison has purchased the Hardware stock of Gibson & Miller, Americus, Kan., while the firm retains the Implement department of the business.

W. W. Nixon has purchased the business of W. J. Martin in Barada, Neb., and will handle Shelf and Heavy Hardware, Paints, Oils, Sporting and Athletic Goods.

The Hardware and Furniture store of W. Floyd, Vergennes, Ill., has been destroyed by fire, entailing a loss of $5500, which was partially covered by insurance.

The Clarke & Eaton Company has sold its property in Elberton, Wash., and established a Hardware, Implement and Plumbing business at Endicott, Wash.

W. B. MILLER & SON, Springfield, Ill., completed a half century in the retail business in April. The house is the second oldest retail concern in that city. The business was started by W. B. Miller in 1858, and was continued by him for a period of 30 years. On the death of Mr. Miller the business passed into the hands of L. S. Miller, his son, and W. C. Starck, the former having been identified with it for 25 years and the latter for two years longer. To commemorate the beginning of a new half century the firm has inaugurated a number of special sales. These sales are for cash only, and purchasers have been limited to one item at a visit. The first special sale covered the period from Monday, May 18, to Saturday, May 23, and included a well-known make of Food Choppers and family Scales, the prices on which were made exceptionally attractive and considerably below the regular quotations on the goods.

Trade Items.

THE GEORGE B. MAIN COMPANY, 70 Warren street, New York, is the title of a new house just organized by George B. Main, as direct factory representative of Hardware manufacturers to the jobbing trade. Mr. Main has been in this line of business for over 25 years, having recently severed his connection with the Lockwood Company. Associated with him are William G. Van Ness, secretary and treasurer, and Ira T. Freye, vice-president. All of the principals are well known in the Hardware trade, and have worked together in the same company for years.

THE AMERICAN FILE SHARPENER COMPANY, manufacturer of a machine for resharpening used Files, the Hercules Steel Link Folding Ladder and the "Best" File Handle, has removed from 296 Broadway to new quarters at No. 287 Broadway, New York.

THE GRIFFIN MFG. COMPANY, Erie, Pa., manufacturer of Wrought Steel Butts and Hinges, Steel Shelf Brackets and miscellaneous Hardware, has made arrangements with Benjamin S. Alder Company, 37 Warren street, New York, to act as its selling representatives in New York City and for export. J. M. Cole, who has traveled for the Griffin Mfg. Company for some years, becomes associated with B. S. Alder Company and will give special attention to the export department.

THE CONNEAUT SHOVEL COMPANY, Conneaut, Ohio, has recently established agencies in the South with J. E. Lastrapes, New Orleans, La., and Atlanta Mills Supply Company, Atlanta, Ga. The company has been getting an increasing business from this section and the new agents will maintain stocks to take care of the trade.

C. T. BRACE, who is well known to the trade from his connection for many years with the former Paddock-Hawley Iron Company, St. Louis, and later as vice-president of the Beck & Corbitt Iron Company, St. Louis, is no longer identified with the Heavy Hardware business. Mr. Brace has become secretary of the Reuter Hub & Spoke Company, with general office at Dexter, Mo., an old established wood stock concern, which is operating in an excellent hardwood timber district. The company, in addition to the plant at Dexter, also operates factories at Marianna and Batesville, Ark.

THE CHANDLER & FARQUHAR COMPANY, Boston, gave its annual banquet for the Chandler & Farquhar Association, the organization of its employees, at the American House, May 21. Dinner followed an informal reception, and afterwards there was speaking, President Charles S. Farquhar of the corporation presiding. Those who spoke included Robert J. Lynde, F. Alexander Chandler and W. N. Schofield of the company, and R. M. Jones, M. D. Farnum, W. A. Dow, R. R. Somes and others of the sales force. The remarks developed valuable points of interest, information and instruction. The members of the association provided an interesting programme of entertainment.

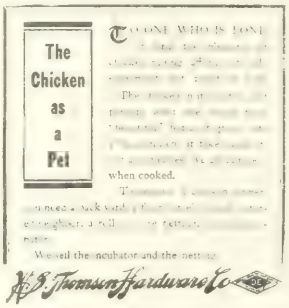
THE Hardware merchants of Springfield, Ill., have organized a local association and elected the following officers: Lewis S. Miller, president; L. C. Mathies, vice-president; Fred P. Schlitt, secretary; Charles H. Robinson, treasurer. Springfield was chosen as the meeting place of the next annual convention of the Illinois Retail Hardware Association in February, 1909, and the necessity for co-operation of local merchants in perfecting suitable arrangements for the entertainment of the convention resulted in the long contemplated formation of a local association. One of the first official acts of the new association was the confirmation of the appointment by the Chamber of Commerce of the following committee, to have charge of the State Convention, which will be held in the Armory Building: Charles W. Zumbrook, Fred P. Schlitt, and Charles H. Robinson.

REFERENCE has already been made to the fire which a few weeks since destroyed the Hardware stock and building of the John S. Menagh Company, Jersey City, N. J. The structure, which had entrances on Newark avenue and Grove street, and was owned by Mr. Menagh, will be rebuilt. The Newark avenue end, however, will be rented, Mr. Menagh continuing the business in the Grove street portion, which will provide a total floor space of 13,500 sq. ft. Mr. Menagh is temporarily located at 191 Morgan street, where he is taking care of his trade as far as possible.

WILLIAM G. FISHER, Fitchburg, Mass., assistant secretary of the Simonds Mfg. Company, and sales manager for the Fitchburg, Mass., office, died May 13, aged 28 years. He was a native of Brattleboro, Vt., and after leaving the high school entered the employ of the company as a clerk. His marked ability lead to rapid promotion to positions of responsibility and trust. He was prominent as a Mason and was a Knight Templar. He leaves a widow, a son and a daughter.

HARDWARE MERCHANTS' ADVERTISING

THE advertisement reproduced herewith comes from the W. S. Thomson Hardware Company, Craig, Mo. It occupied a double column space, 5 in. high. It will be observed that it draws attention in an attractive way to



A Newspaper Advertisement. Actual Size 4½ x 5 In.

the subject of incubators and poultry netting. The wording is good and also the typographical arrangement. For the benefit of those in remote parts of the territory covered by the company it would have been well to have coupled the location with the name of the house.

THE J. M. THOMPSON & SONS HARDWARE COMPANY, Owatonna, Minn., has recently distributed among the farmers in territory tributary to Owatonna a yellow covered catalogue of 32 large pages, which is referred to as the company's "Hardware Catalogue." It covers a varied line of merchandise, including Roofing, Paints, Enameled Ware, Galvanized Iron Ware, Hay Tools, Locks, Mechanics' Tools, Separators, Wire Fencing, Gasoline Stoves, Cutlery, Guns, Sewing Machines, Buggies, &c. Reference is made to the company's "Great 5 and 10 cent Counter," which is said to be "the best place in town to seek bargains in small wares." It is remarked that the display of these goods is changed every two weeks, so that visitors are always pretty sure to find something new and interesting in this department.

On the front cover of the catalogue appear the following statements indicating the policy of the store and its guarantee:

[illegible] ity considered. We guarantee to meet any price on any article of Hardware in any catalogue. Prices for proper grade for grade, freight considered.

[illegible] without any argument and return your money or give you goods of equal value. Just as we wish to be done by.

The company sells for cash only, which is referred to as permitting it to sell goods at a closer margin than on the credit basis.

McNEILL, SCHLOSSER & CO., have engaged in business in Olympia, Wash., and are handling Shelf Hardware, Stoves, Tinware, Sporting Goods, Lime and Cement. They also do plumbing and heating.

Peerless Flexible Bit Gauge.

Sargent & Co., New Haven, Conn., and New York, are putting on the market Sargent's Peerless flexible bit gauge, patent applied for, here illustrated. It can be used in connection with the various sizes of auger bits, twist drills, &c., the single thumb screw holding the gauge securely in position and accurately gauging a hole of any depth to within ¾ in. of the brace chuck. The gauge proper, 5¼ x ¼ in., is made of spring steel wire, and every part is polished and nickeled. The gauge is flexible, owing to its spiral or spring like character, there being 20 turns to the inch, and from the nature of its construction will not mark the wood, slip upwards or interfere with the chips. There is a six turn spiral steel expansion spring around the screw with thumb nut, which causes the two polished wrought steel clamps that grip both gauge and bit shank to expand automatically in attaching to auger bit. The gauges are put up 12 in a box.



Sargent's Peerless Flexible Bit Gauge Attached to Shank.

Wire Hooks and Hangers.

The coat and hat hook and the folding garment hanger, shown herewith, are manufactured by the Wire Goods Company, Worcester, Mass. The coat and hat hook illustrated in Fig. 1 is made of No. 9 wire, is 5½ in. long over all, and is furnished in the following finishes: Coppered, japanned, chestnut bronzed, retinned, brass and nickel plated. The hook is recommended for use in hotels, barber shops, railway stations, &c., as it is claimed that there is no chance of a hat being knocked from the hook. The garment hanger, Fig. 2, is made of steel wire, retinned. A feature of the device is the interlocking of the double wires.

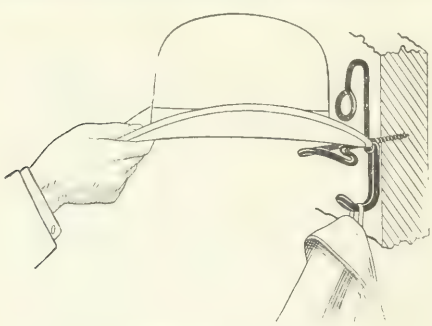


Fig. 1. Stop Coat and Hat Hook.



Fig. 2.—Traveler Folding Garment Hanger No. 49.

McConchie Bros. have purchased the business of Geo. F. Poor, Frankfort, Kan., and will handle Shelf Hardware, Stoves, Tinware, Paints, Oils and Sporting Goods. Furnace work and plumbing will also be carried on by the new proprietors.

The Bradley Metal Clasp Ceiling Hook.

An improvement has been made in the ceiling hook of the Atlas Mfg. Company, New Haven, Conn., as shown herewith. The hook has full parallel wires made from a single strand, one end of which is carried through the metal clasp and threaded. The arms of the hook are brought together with a curve, which makes the lines more pleasing to the eye. The clasp forms a base with ample bearing, and binds the wires together at this point so firmly as to prevent working and weaving of the wires. The thread on the hook has been improved, and the pull down from the garment is more nearly in line with the screw.



The Bradley Metal Clasp Ceiling Hook.

Hampden Machine Screw Company.

The Hampden Machine Screw Company, Springfield Mass., will devote practically all its facilities to the manufacture of specialties and automatic screw machine products. The company does not make standard screws of any kind, but is prepared to turn out special machine screws if wanted. It is the belief of the company that there is a large field for a concern supplying strictly high grade work of this class at reasonable prices, and states that the quality of its output will be as near right as experienced mechanics and good equipment can make it. A plant is being installed for nickel plating, lacquering, galvanizing, and all kinds of metal coloring, and the company is also prepared to do case hardening, designing and model building.

Red Devil Auger Bit.

The Smith & Hemenway Company, 108-110 Duane street, New York, as selling agent for W. A. Ives Mfg. Company, Wallingford, Conn., is introducing the Red Devil razor edge auger bit here illustrated. It is made of a high grade of English tool steel, and finished from tip to tip. The pitch of the thread and pitch of worm, it is said, work in harmony, so that there is no backing up in either hard or soft wood boring across the grain or with it. It is easy to sharpen the cutting members because the lip is on the side opposite the scorer, so that it may be whetted with an oil stone. The assertion is also made that this form of construction insures the boring of a straight hole. The bit is said to bore in any direction in hard wood, including a diagonal in quartered oak. It engages the wood at a point nearest the screw or fulcrum, working its way out to the scorer, thus preventing the thread from disengaging the wood, backing up or the



Two Views of the Red Devil Auger Bit.

wood clogging in the worm. The manufacturer recommends the bit for boring in either hard or soft wood. It is made in all sizes from 4 to 16-16, inclusive, with square shank for brace chuck.

The Sloan Kitchen Utensils.

Three utensils included in the line of kitchen specialties made by the Sloan Mfg. Company, 2120 Broadway, Kansas City, Mo., are shown in the accompanying illustrations. Fig. 1 represents the Sloan oven, which is designed for use on gas, gasoline or oil stoves, and is claimed to be not only of great convenience, but also an economizer of fuel for cooking. The base consists of a supporting shelf upon which the articles to be baked are placed; the shelf being provided with a conical heat distributor underneath, which spreads the heat evenly over the bottom of the perforated baking shelf. A removable shelf is provided, to be placed above the first, so that two articles, such as biscuits, pies or cake, can be baked at the same time. The interior arrangement is clearly shown in the cutaway section. The round form of the heat retainer or hood contributes to the maintenance of an even temperature in every part of the oven. In addition to its utility as a baking oven the hood is recommended as a fuel saver in heating sad irons, as it retains much of the heat that would otherwise be dissipated. It is light enough to be easily lifted by one hand, and can be easily used for this purpose. The oven is large enough to accommodate a chicken or roast weighing as much as 7 lb., and it is claimed by means of the conical top, evaporating juices are precipitated on the roast, thus basting it automatically. The oven is furnished with two biscuit pans and a round dripping or roasting pan, suitable for baking puddings, &c. Fig. 2 illustrates the Sloan toaster and stove mat. The chief feature of the device is the conical sheet iron heat distributer set underneath the wire netting to prevent the concentration of heat upon the center of the utensil. All of the toasting surface, 10½ in. in diameter, is equally available and effective for toasting, and gives room for six ordinary slices of bread at a time, which, it is claimed, can be toasted in 2 or 3 min. Used as a stove mat it is placed under a stewing pan, skillet or griddle, the bottom of which being subject to an even heat over its whole surface minimizes the damage of burning food. Fig. 3 illustrates the Sloan water cooling can. It is made of galvanized sheet iron, and is 17⅛ in. thick by 10½ in. long, and of a shape and size that adapts it to storage in the ice or cooling compartments of refrigerators. It is furnished with an air tight stopper, so that the water does not come in contact with odors arising from other contents of the refrigerator. Its convenience in providing cool drinking water will be readily appreciated. It is made in three sizes, holding ½ gal., 3 quarts and 1 gal., respectively.



Fig. 1.—The Sloan Oven.

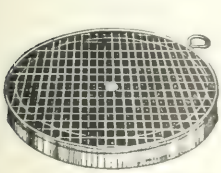


Fig. 2.—The Sloan Toaster and Stove Mat.



Fig. 3.—The Sloan Cooling Can.

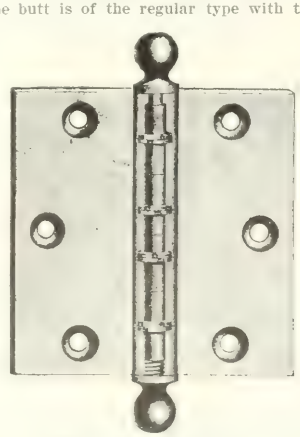
The Pierce Lawn Trimmer.

The advantages of the lawn trimmer, here illustrated, will be readily appreciated by those who have had the care of lawns. It is made by the Northwestern Consolidated Iron & Steel Mfg. Company, Burlington, Iowa, which recommend it as an efficient and acceptable substitute for hand shears or sickle commonly used to trim the grass along sidewalks, fences, buildings, flower beds, borders, and other places inaccessible to lawn mowers. The blades of the tool are made of high grade crucible steel, oil tempered, and carefully ground. The frames to which they are attached are of malleable iron. Suitable 4-ft. wooden handles are bolted to the frames, the implement being designed to cut with an ordinary shear motion. It is supported in position for cutting by a wooden roller set underneath the frame, the effect of which is to give it a steady even motion. In handling the trimmer the operator stands erect and is spared the fatigue of stooping or kneeling. The tool is provided with ball bearings, is neatly painted and striped, and comes packed in ¼ doz. boxes.



Wrought Loose Pin Butt.

The Russell & Erwin Mfg. Company, New Britain, Conn., and 94-98 Lafayette street, New York City, has added to its line the wrought loose pin butt here shown, which is furnished in both bronze metal and steel. The butt is of the regular type with the added feature that the knuckles are lined throughout the entire length with hardened steel bushings as indicated in the illustration. The butt is therefore recommended as combining the tensile strength of wrought metal with the extra wearing qualities of hardened steel bushings.



Gem Adjustable Cap with Dayton Swing Top and Hood.

The Kramer Bros., Foundry Company, Dayton, Ohio, is placing on the market a combination adjustable cap with swing top and hood, illustrated herewith. The company claims that the device embodies both economy and convenience, as it prevents waste of time in measuring up



Fig. 1.—Adjustable Cap.

sizes of flues for the base of galvanized stacks and other measurements. The collar of the chimney cap has an adjustment up to 6 in., and is bolted onto the main stack of pipe. The swing top is riveted in turn to the top of the pipe and hood, all of which are punched with necessary holes and shipped knocked down. It is stated that a combination is thus provided which enables the filling of any order for any size of chimney quickly and more

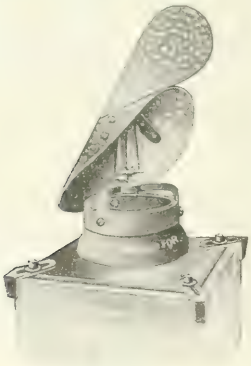


Fig. 2.—Swing Top and Hood.

economically than by older methods, and that in addition, when the stack proper wears or rusts out a new pipe is readily put in place by the removal of bolts and rivets. It is remarked that as the parts are made of gray iron they will last indefinitely.

The Recht Safety Emery Wheel Dresser.

Jas. L. Neefus, 103 Chambers street, New York, is placing on the market the safety emery wheel dresser illustrated herewith, manufactured by Frederick Recht, also of this city. The dresser is referred to as differing from the Huntington only in the addition of a safety hood. This is designed to protect the operator in case of



The Recht Safety Emery Wheel Dresser.

accident to the dresser wheels, and also to prevent fine particles of emery being thrown into the face and eyes of the operator. The handle is made of the best malleable iron with hardened steel bushings and pin, while the dresser wheels are alluded to as of the best quality tool steel hardened to the proper temper. The handles are finished in bright vermilion, and the tools are packed one in a box, with an extra set of dresser wheels.

The Westinghouse Electric Tailors' Goose.

To meet the demand upon the part of manufacturing and custom tailors for an iron embodying the same principles as the Westinghouse electrically heated sad iron, the Westinghouse Electric & Mfg. Company, Pittsburgh, has brought out the goose shown in the illustrations. This is designed to endure the same rough usage as the plain cast iron goose and to fulfill all the requirements of the tailor with the elimination of the heat, dirt and inconvenience incident to other methods. It is made in two shapes, wide and narrow. The wide goose, Fig. 1, is

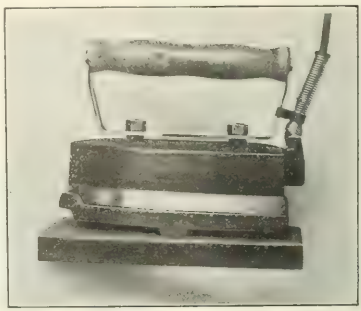


Fig. 1.—Wide Electric Tailors' Goose.

5½ x 8½ in., and comes in four different weights, 12, 15, 18 and 22 lb. The narrow goose, Fig. 2, is 3 x 10 in., and is furnished in three different weights, 12, 15 and 18 lb. Both types are made for three different voltage ranges, 100-107, 108-115 and 116-125. In order to avoid complication, a single heat alone is provided, which is sufficient to rapidly bring the iron to a working temperature and to maintain it uniformly during the heaviest service. On intermittent or light work the current can be turned off a considerable portion of the time, and the irons are constructed so that their working surface will remain hot a long time, after the iron has been thoroughly heated. The heating element is a thin steel grid, arranged to distribute the heat evenly over the entire working sur-

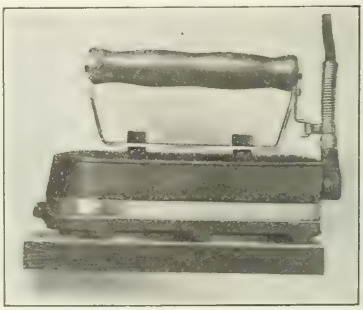


Fig. 2.—Narrow Electric Tailors' Goose.

face of the iron. The grid is hermetically sealed within a fireproof dielectric of good thermal conductivity, and is held between two solid iron blocks, one of which forms the working surface of the iron, the other, immediately above it, serving as a heat reservoir or thermal equalizer by which the constant input of heat from the heating element is stored up and given out to suit the irregular demands of the work. These two portions of the iron are solidly secured together, and in effect form a solid mass which is separated from the top of the iron by means of an air space which forms an effective heat insulator.

Liberty Cold Blast Lantern No. 553/2.

The accompanying illustration, Fig. 1, represents a new lantern put on the market by the Simmons Hardware Company, St. Louis, Mo. The brass burners with which the lanterns are equipped have a slot in the cone, which is brought to a point at each end to make the light burn wide and bright. The burner is fastened to the fount by a double bayonet lock on the burner cone, and, in addition, by a protruding arm which covers the wick raiser. This latter acts also as a lock and prevents the wick dropping into the fount. The lanterns are fitted with patented bails, which will stay in any position in which they are placed. The holdfast lever catch is made in such a way as to do its work, of raising the globe for lighting, quickly



Fig. 1.—Liberty Cold Blast Lantern No. 553/2.

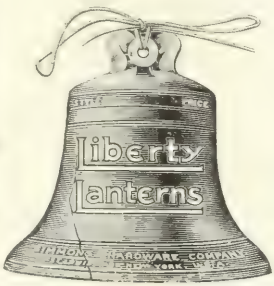


Fig. 2.—Liberty Lantern Tag.

and accurately. Wicks are fitted in the burners of each lantern, and the globes are of clear lead flint glass. All founts are air tested by air under water before they leave the factory, and are guaranteed to be oil tight. The lantern illustrated is covered with a bright maroon bicycle enamel, baked on in the same manner as the enamel is put on a bicycle. This is referred to as a most durable finish that will not scratch or come off easily like paint, and also serves as a protection against dampness, and will outwear plain lanterns on that account. In addition to cold blast lanterns, the Liberty line is made in full nickel plated, old copper finish and blue japan, with and without dashboard attachment and bull's-eye globes. Each lantern has a little bell shaped tag, Fig. 2, showing the number and suggested retail selling price, and enumerating some of the points of excellence.

The Insulated Wire Grip.

To meet the demand for a grip that will handle insulated wire without injury to the covering, Mathias Klein & Sons, 87-89 West Van Buren street, Chicago, have designed and are offering a new grip which is here illustrated. The principal object sought was to provide a tool that would effectively grip and hold insulated wire without subjecting it to the rough treatment incident to the use of ordinary bare grips. To accomplish this the gripping surface of the jaws is provided with a series of serrations, so arranged that while they tightly grip

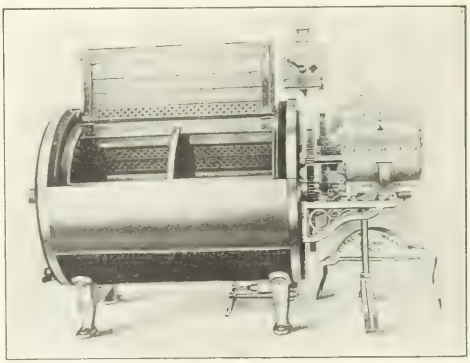


The Insulated Wire Grip.

the wire they do not cut the insulation. The entire tool is made of steel, the lever and body piece being drop steel forgings; this feature of construction gives the grip standing up qualities that guard against buckling under strain. The draw link is so arranged that it will not fall in the way of the wire when the grip is placed in position. The size now ready for the market is suitable for handling No. 4 and smaller insulated wire and larger sizes are in process of manufacture.

Motor Driven Laundry Washer.

The laundry washer here illustrated represents one of the latest type motor driven machines made by the Conkling Company, Ninety-sixth street and Erie avenue, Chicago, Ill. It embodies several important features of improvement, the chief of which is the automatic reversing mechanism by which the motion of the cylinder is reversed at regular intervals. The device, shown at the right in the illustration, is gear connected to a Westinghouse motor, and consists of a unique arrangement of friction clutches, whose operation is controlled by suitable gears which run in oil in a tightly inclosed case. This mechanism together with the motor is mounted on cast iron brackets supported by a central pillar post, which form a firm foundation, reducing vibration to a minimum. The cylinder dimensions of the washer are 36 x 48 in. inside measurement, and it has a holding capacity of 200 shirts or their equivalent in other goods. The cylinder staves are perforated with over 2100 ¾-in. holes, and are prevented from swelling out of alignment by dowel pin connections. The hoops, which are ⅛ x 1¾ in. wide, together with all hinges, rings and catches, are of brass, and the flange hinges are made to rest ½ in. upon the hoops, through the entire length of the hinges, thus adding materially to the strength of construction and the tight closure of the cylinder. The shell is made with heavy iron ends, to which are bolted 2-in. staves of long leaf yellow pine, and it has a one-piece brass protecting

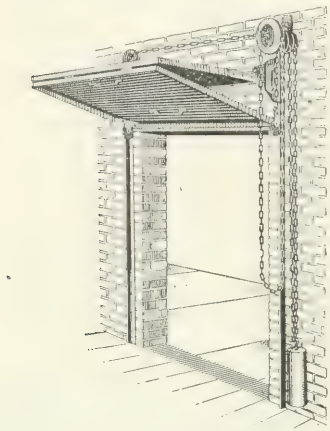


Motor Driven Laundry Washer.

apron 18 in. wide, turned up at the bottom to prevent drippings running under the shell. The cylinder is closed by a sliding door of galvanized iron fitted with brass knobs, which being set equi-distant from the edges, balance the lift so that the door is kept from binding while sliding in its bearing. Quick and uniform heating of the water is accomplished by a perforated steam pipe which traverses the bottom of the cylinder partially incased in an iron stave running the full length of the machine, which also serves as a drain. A water inlet connection is provided at either end of the washer by means of a slotted stave, and the outlet valve is made in one piece with the washer leg and is arranged to be operated by a foot lever. The difficulty of articles dropping between the cylinder and shell in loading is overcome by a provision that admits the insertion of a wire through the opening of the gauge glass holder to the outlet valve; the necessity for taking the machine apart for this purpose is thus obviated. The gauge glass being open at the top allows all lint and ravelings to run out, and the tube may thus be cleaned without removing it from its place by taking off the bronze cap covering. It is claimed the equal cylinder reverses provided by the automatic mechanism prevents packing of the clothes and keeps them in loose condition; also that the close proximity of the shell and cylinder and the elimination of the usual long waste pipe result in a saving of soap and water.

The Erwood Folding Door No. 3.

A new folding door designed to meet the requirements of convenience, security, durability and ease of operation has just been brought out by the Union Drop Forge Company, 67 and 69 Indiana street, Chicago, Ill. The device is referred to as simple in construction, positive in action and embodying what are claimed to be distinctive features of improvement. The door consists of two leaves hinged together, and is hung at the top on segmental racks fastened to the wall or building projecting from the radial centers of the segmental gears are trunion bolts which, as the door is folded, travel upward in machine guideways cut in the rack frame upon which the gears travel or roll. As the door is lifted the folding process progresses until the rollers on the lower leaf approach the lower ends of the rack frame. The weight of the upper half of the door is supported by the meshed teeth of the segments and rack, but when folded the weight of the overhang is sustained by the trunion bolts. The strength thus provided is ample not only to support the door itself, but additional weight if required. Particular stress is laid upon the adjustability of the door to the changes in sill hights that are often occasioned by the accumulation of dirt or by wear, settlement or shrinkage. If from any of these causes the bottom of the door is prevented from resting evenly on the sill, the adjustment necessary to keep the door in perpendicular alignment can be made by slightly rotating the segmental gears on the trunion bolts by means of set screws; the door can thus be raised or lowered as conditions demand without the necessity of taking it down or rehanging. Another feature of originality is claimed in the provision made for the prevention of overfolding. This is accomplished by the flexible arrangement of trunion bolts which permits the top leaf to travel away from the lower one as the door is folded, thus leaving, when drawn up, proper clearance between the upper and lower points upon which the entire structure is carried; it also permits a door of given hight to be closely folded in a limited radius. Differential gears and a balancing counterweight combine to make the opening and closing of the door a positive and easy operation. The doors are made of wood or iron, or both, and when raised leave an unobstructed doorway.



Erwood Folding Door No. 3.

The Pearce Spring Joint Rule.

To meet a demand for something in the line of flexible folding rules cheaper than its Flexifold rules, the Chapin-Stephens Company, Pine Meadow, Conn., has recently put on the market a line of spring joint rules, as illustrated herewith. These are alluded to as being cheap in price only as they are well made and well finished, having well constructed joints and are protected by metal tips the same as the company's higher grade of rules, but not quite so highly finished. The Pearce line is made at present in yellow enamel only, in lengths of 2, 3, 4, 5, 6 and 8 ft., packed one dozen in a box.



The Pearce Spring Joint Rule.

C. F. Jackson, Norwalk, Ohio, has decided to add a complete line of Hardware, Tools, Stoves, House Furnishing Goods, Paints, Harness, &c., and will at once begin the erection of a two-story brick building, 60 x 76 ft., for the accommodation of this department.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, State and Western, raw	42 @44
City, Boiled	45 @46
City, Raw	44 @45
Raw, Calcutta, in bbls	73 @..
Lard, Prime, Winter	62 @64
Extra No. 1	54 @56
No. 1	47 @52
Cotton-seed, Crude, f.o.b. mill	@..
Summer Yellow, prime	47½@48
Summer White	49 @49½
Yellow Winter	49 @49½
Tallow, Acidless	52 @55
Menhaden, Brown, Strained	30 @..
Light Strained	40 @..
Bleached Winter	42 @..
Ex. Bleached Winter	44 @..

	₱ lb
Cocoanut, Ceylon	6½@ 6¼
Cochin	7 @ 7¼
Cod, Domestic, Prime	42 @44
Newfoundland	44 @46
Red, Elaine	37½@39
Saponified	5¼@ 5½
Olive, Yellow	87 @90
Neatsfoot, Prime	55 @58
Palm, Lagos	5½@ 5⅝

Mineral Oils—

	₱ gal
Black 20 gravity, 25@30 cold test	12 @13½
20 gravity, 15 cold test	13½@14
Summer	12½@13
Cylinder, light filtered	20½@21
Dark, filtered	18 @19
Paraffin, 900 32° sp. gravity	14½@15
900 lb. 32 gravity	13½@14
880 sp. gravity	11 @11½
Red	13½@14

Miscellaneous—

Barytes:	
White, Foreign	₱ ton $18.50@20.50
Amer., Roated	₱ ton 18.00@20.00
Off color	₱ ton 13.50@16.50
Chalk, in bulk	₱ ton 3.00@ 3.40
China Clay, Imported	₱ ton 11.50@18.00
Cobalt, Oxide	₱ 100 lb 1.45@ 2.60
Whiting, Commercial	₱ 100 lb .42@ .52
Gilders	₱ 100 lb .55@ .60
Ex. Gilders	₱ 100 lb .60@ .65

Putty, Commercial—

	₱ 100 lb
In bladders	$1.70 @1.80
In bbls. or tubs	1.20 @1.45
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—

	₱ gal.
In Oil bbls	43½@44
In machine bbls	44 @45

Glue—

	₱ lb
Cabinet	12 @15
Common Bone	7½@ 9
Extra White	18 @24
Fish, liquid, 50 gal. bbls., per gallon	.60 @1.20
Foot Stock, White	12 @14
Foot Stock, Brown	9 @11
German Common Hide	10 @12
German Hide	12 @18
French	10 @10
Irish	15 @16
Low Grade	10 @12
Medium White	14 @17

Gum Shellac—

	₱ lb
Bleached, Commercial	20 @22
Bone Dry	25 @27
Button	30 @40
Diamond I	7 @ 8
Fine, Orange	29 @32
A. C. Garnet	24 @24
C. A. L.	18 @19
Kala Button	17 @ 8
D. C.	18 @19
Octagon B	38 @40
T	26 @26
V. S. O	47 @48

Colors in Oil—

	₱ lb
Black, Lampblack	12 @14
Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	13 @16
Brown, Vandyke	11 @14
Green, Chrome	12 @16
Green, Paris	@24
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, English white in Oil	19¼@19⅜
Lead, American White:	
Lots of 500 lb or over, in Oil	@ 6¾
Lots less than 500 lb, in Oil	@ 7¼
Lead, White, in oil, 25 lb tin pails	@ 7¼
Lead, White, in oil, 12½ lb tin pails	@ 7¾
Lead, White, in oil, 1 to 5 lb assorted tins	@ 8¾

Lead, American Terms: On lots of 500 lbs and over 2% for cash if paid in 15 days from date of invoice.

Zinc, Dry—

	₱ lb
American, dry	5½@ 5⅝
Red Seal (French process)	6¾@ 7
Green Seal (French process)	7¼@ 7½
German Red Seal (French process)	6½@ 6⅞
Green Seal	7¼@ 7½
White Seal	7¾@ 8¼
French, Red Seal	8¼@ 8¾
Green Seal	10¼@10¾

Dry Colors—

	₱ lb
Black, Carbon	6½@10
Black Drop, American	3½@ 8
Black Drop, English	5 @15
Black, Ivory	16 @20
Lamp, commercial	4 @ 6
Blue, Celestial	4 @ 6
Blue, Chinese	.31 @33
Blue, Prussian	.29 @31
Blue, Ultramarine	2½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.10@3.25
Green, Chrome, ordinary	3½@ 5
Green, Chrome, pure	.17 @25
Lead, Red, bbls., ½ bbls., kegs	@ 6¾
Litharge, bbls., ½ bbls., kegs	@ 6¾
Ocher, American	₱ ton $8.50@16.00
American Golden	2¼@ 3¼
French	1¾@ 2
French Gilders	3 @ 4
Orange Mineral, English	.10 @12
French	12¾@13
German	.12 @13
American	3½@ 3¾
Red, Indian, English	4½@ 6
American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer	₱ 100 lb $1.50@1.25
English	₱ 100 lb $1 15@1.60
Sienna, Italian, Burnt and Powdered	3 @ 9
Italian, Raw, Powdered	3 @ 7
American, Raw	1½@ 2
American Burnt and Pow'd	1½@ 2
Talc, French	₱ ton $18.00@25.00
American	₱ ton 15.00@25.00
Terra Alba, French	₱ 100 lb .90@ 1.00
English	₱ 100 lb .80@ 1.00
American	₱ 100 lb, No. 1, .75@ .85
American	₱ 100 lb, No. 2, .60@ .65
Umber, Turkey, Ext. & Pow.	2¾@ 3
Turkey, Raw and Powdered	2¾@ 3
Burnt American	1½@ 2
Raw, American	1½@ 2
Yellow, Chrome, Pure	13¾@15
Vermilion, American Lead	.7 @25
Quicksilver, bulk	.65 @..
Quicksilver, bags	@66
English, Imported	.75 @70
Chinese	$0.90@1.00

Current Hardware Prices.

General Goods. In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices. A range of prices is indicated by means of the symbol %. Thus 33⅓ % 33⅓ & 10 signifies that the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also the INDEX TO DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic ...
Eclipse ...
Zimmerman's See Fasteners, Blind.

Window Stop—

Ives Patent ...
Taplin's Perfection ...

Ammunition—*See Caps, Cartridges, Shells, &c.*

Anti—Rattlers—

Fernald Mfg. Co., Rattle Anti-Rattlers, ⅜ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ⅜ doz. pairs ...

Anvils—American—

Eagle Anvils ...
H. Buckley Wright ...
Trenton ...

Imported—

Swedish Solid Steel Sisco, Superior, ⅜ lb. ...
Peter Wright & Sons, ⅜ lb. steel, ⅜ lb. iron to 600 lb. ...

Anvil, Vice and Drill—

Millers Falls Co., $18.00 ... 15&10

Apple Parers—*See Parers, Apple, &c.*

Aprons, Blacksmiths'—

Lumaster Nail Co. ...

Augers and Bits—

Com. Double Spur ... 75&10&5%
Dowinys' Path., Bright 65&10&5%
Black Lip or Blued ... 65&10&5%
Boring Mach. Augers ... 70
Car Bits, 12-in. twist ... 40&10
Irwin's Solid Car Bits ... 40&5
Ft. Washington Auger Co., Coraddi's ... 5
Forstner Pat. Auger Bits ... 25%
C. E. Jennings & Co.:
No. 10 ext. lip R. Jennings' list ... 25&5
No. 30, R. Jennings' list ... 25&10&2½
Russell Jennings' ... 25&10&2½
L'Hommedieu Car Bits ... 15
Mayhew's Countersink Bits ... 45
Pugh's Blacksmith ... 40&5
Pugh's Jennings' Pattern ... 35%
Snell's Auger Bits ... 60
Snell's Bell Hangers' Bits ... 60
Snell's Car Bits, 12-in. twist ... 60
Snell's King Auger Bits ... 50%
Wright's Jennings' Bits ... 50%

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Clark's Pattern, No. 1, ⅜ doz., $36, No. 2, $48 ... 60&5
Ford's, Clark's Pattern ... 66⅔&5
C. E. Jennings & Co., Stow's Pat. ... 25
Lavigne Pat., small size, $18.00; large size, $26.00 ... 60&10
Swan's ... 60%

Gimlet Bits—

Pattern ...
Common Dbl. Cut ... $1.00@1.25
German Pattern, Nos. 1 to 15, $1.75; 11 to 15, $2.25 ...

Hollow Augers—

Bonnon Pat., per doz. ... $5.50@6.00
Ames ...
Universal ...

Ship Augers and Bits—

Ship Augers ... 30&10&5
Ford's ... 40&5
C. E. Jennings & Co.:
L'Hommedieu's ... 65%
Watrous ... 50&25
Snell's ... 40

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled ... gro. $2.75@3.00
Unhdld., Shldrd ... gro. 1.65@1.75
Unhandled, Patent ... gro. 1.50@1.60
Pea Awls:
Unhandled, Patent ... gro. 1.75@2.00
Unhdld., Shldrd ... gro. 1.65@1.70
Scratch Awls:
Handled, Com. ... gro. $1.75@2.00
Handled, Socket ... gro. $11.75@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First quality ... $7.75@8.00
Second Quality ... $5.50@5.75
Double Bit, base weights:
First Quality ... $7.00@7.25
Second Quality ... $6.50@6.75

Axle Grease—

See Grease, Axle.

Axles—*Iron or Steel.*

Common Loose Collar ... 1½ c
Common Solid Collar ... 1¾ c
No. 1 Common Loose ... 2¼@2½ c
No. 1½ Com. New Style ... 2½@2¾ c
No. 2 Solid Collar ... 2½@2¾ c
Half Patent
Nos. 7, 8, 11 and 12 ... 3c@3½c
Nos. 13 to 17 ... 3c@3½c
Nos. 15 to 18 ... 3c@3½c
Nos. 19 to 22 ... 3c@3½c

Boxes, Axles—

Common and Concord, not turned ... lb. 7c@8c
Common and Concord, turned, lb. ... 6½@7c
Half Patent ... lb., 9½@10c

Bait—Fishing—

Hi-Lex ...
A Bait ... 20
B Bait ... 25
Complete Bait ... 30&

Balances—Sash—

Caldwell new list ... 50&10%
Pullman ... 50&10

Spring—

Spring Balances ... 50&10&10%
Chatillon's:
Light Spg. Balances ... 50@50&10%
Standard Balances ... 10@10&10
Circular Balances ... 50&10%
Large Dial ... 30

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb. ... per lb. ... 2¼@2½c

Towel—

No. 10 Ideal, Nickel Plate ... ⅜ gro. $8.50

Beam, Scale—

Scale Beams ... 30%
Chattillon's No. 1 ... 30%
Chatillon's No. 2 ... 40

Beaters, Carpet—

H. it Lyon Co.:
No. 12 Wire Coppered ⅜ doz. $0.85; Tinned ... $.85
No. 11 Wire Coppered ⅜ doz. $1.15; Tinned ... $1.20
No. 10 Wire Tinned ... ⅜ doz. $1.50

Beaters Egg—

Holt-Lyon Co.:
Hi-Lex, No. 7, Japd. $0.85; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. C, Japd. $2.65; Ladies, Japd. per doz., No. 2, $1.35
Taplin Mfg. Co.:
Improved Dover, per gro. No. 60 $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.: T. & S. Dover ... $6.50

Bellows—

Blacksmith, Standard List:
Split Leather ... 50&10&5%
Grain Leather ... 50&10&5%

Hand—

Inch ... 6 7 8 9 10 12
Doz. ... $3.00 3.50 4.00 5.00 6.50 7.50

Molders—

Inch ... 12 14 15 16 18
Doz. ... $7.50 9.00 12.00 15.00 ...

Bells—Cow—

Ordinary Goods ... 75&50&25&10&5%
High grade ... 70&10&5%
Texas ... 75&5%
Texas Star ... 50%

Door—

Home, R. & E. Mfg. Co.'s ... 55&10%

Hand—

Polished Brass ... 75&10&5%
White Metal ... 50&10&5&10&5%
Nickel Plated ... 50&5
Steel ... 50&5
Cow or Door Hand Bells ... 50&5

Miscellaneous—

Farm Bells ... lb., 21¼@21½¢
Church and School ... 40&10&5

Belting—Leather—

Standard ... 50&10&5&10&5%
Light ... 75&10
Cut Leather Lacing ... 40&10
Leather Lacing Sides, per sq. ft. ... 20@.22¢

Rubber—

Competition Close Grades ... 70&10&5&10&5%
Standard ... 60&10&5%
Best Grades ... 33⅓&10&5&10&5%

Bench Stops—

See Stops, Bench

Benders and Upsetters, Tire—

Grace Rivet Tire Benders and Upsetters ... 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list:
Chain Plate Sprocket ... 50
Tubes ... 60

Bits—

Auger, Gimlet, Bit Stock Drills, &c. *See Augers and Bits.*

Blocks Tackle—

Common Wooden ... 75&25&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%
Lane's Patent Automatic Lock and Jumper ... 30
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined ... 35%
Embossed ... 35%

Boards, Wash—

See Washboards.

Bobs, Plumb—

Kaufel & Esser Co. ... 33⅓

Bolts Carriage, Machine, &c.—

Common Carriage (cut thread):
⅜ inch and smaller ... 75&50&10%
Larger and longer ... 70&10
Plain Eagle, $4.00 list ... 50&10
Bolt Ends ... 70&10
Machine (Cut Thread):
⅜ inch and smaller ... 75&10&5&10%
Larger and longer ... 70&10&5&10%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knobs:
Inch ... 4 5 6 8
Per doz. ... $0.30 .35 .45 .60 .80
Cast Iron Spring Foot, Jap'd:
Inch ... 6 8 10
Per doz. ... $1.00 1.50 2.25
Cast Iron Chain, Flat, Japanned:
Inch ... 6 8 10
Per doz. ... $1.00 1.25 1.65
Cast Iron Flat Shutter, Jap'd, Brass knobs:
Inch ... 6 8 10
Per doz. ... $0.75 .95 1.25
Wrought Barrel Jap'd ... 80&10&5&10%
Barrel Japanned ... 60&10%
Spring ... 70&10&5&10%
Shutter ... 50&35&10&5&10&5%
Square Neck ... 70&10&5
Shutter ... 75&10&5%
Flush Door ... 50&10&5%
Wrought Mortise ... 60%

Expansion—

C. H. Evans' Cresc. ... 15&10
Ives' Mfg. Co. ...
Russell & Erwin Mfg. Co.:
Style No. 10, Plated ...
Style No. 1, Single ... 60%
Style No. 100, Dbl. Jaw, Single ... 55%
Lag Screw ... 60%

Plow and Stove—

Plow ... 60&10&5%
Stove ... 50&10&5

Tire—

Common Iron ... 80%
Nonpareil Iron ... 80%
American Screw Co.:
Norway Phila., list Oct. 16, '84 ... 80%
Eagle Phila., list Oct. 16, '84 ... 82½%
Bay State, list Dec. 28, '99 ... 80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84 ... 80%
Eagle Phila., list Oct. 16, '84 ... 82½%
Eclipse, list Dec. 28, '99 ... 80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99 ... 80%
Norway Phila., list Oct. '84 ... 80%
Eagle ... 82½
Shelton Co.:
Tiger Brand, list Dec. 28, '99 ... 80%
Phila., Eagle, list Oct. 16, 1884 ... 82½%
Upson Nut Co.:
Tire Bolts ... 72½%

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch	1¼	1½	1¾	2
Per doz	$4.80	5.60	6.40	8.00
Inch			2¼	2½
Per doz			$8.65	11.50

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each ... 25

Boxes, Mitre—

C. E. Jennings & Co. ... 25
Langdon, New Langdon, and Langdon Improved ... 2&10 Langdon Adjustable ... 15&10
Perfection ... 10
Seavey ... 45

Braces—

Common Ball, American ... $1.50
Barber's ... 50&10%10&60&10
Fray's Gennine Specialties ... 60
Fray's No. 61, 166, 206, 614 ... 50%
C. E. Jennings & Co. ... 50&5
Mayhew's Ratchet ... 60%
Mayhew's Quick Action Hay Pat. ... 50%
Millers Falls Drill Braces ... 25&10%
P., S. & W. Co., Peck's Pat. ... 60&10%

Brackets—

Wrought Steel ... 70&10@75&10%
Bradley Metal Clasp ... 80&10@80&10&5
Griffin Sliding Shelf ... 75@75&10%
Griffin's Folding Brackets ... 70&10%
Taplin Victor Handy Egg Beater Bracket ... ⅜ doz. $1.50

Bright Wire Goods—

See Wire and Wire Goods.

Broilers—

Kilbourne Mfg. Co. ... 75&20%
Wire Goods Co. ... 75

Buckets, Galvanized—

M'fr's list, price per gross.

Quart	10	12	14
Water, Pat.	26.00	29.50	34.00
Water, Heavy	45.35	49.00	52.00
Fire, Rd. Btm	32.00	34.65	38.65
Well	...	36.65	45.35

Bull Rings—See *Rings, Bull.*

Butts—Brass—

Wrought, High List, Oct. 26, '05 ...
Cast Brass, Tubular ...

Cast Iron—

Fast Joint, Broad ... 50&10@50%
Fast Joint, Narrow ... 50&10@50%
Loose Joint ... 70&10@75%
Loose Pin ... 70&10@75%
Mayer's Hinges ... 70&75%
Parliament Butts ... 70&10&5

Wrought Steel—

	Bright	
Light Narrow, Light Regular	70&5	
Removable and Rising	70&5	
Loose Joint, Narrow, Light Regular	70&5	Extra.
Back Flaps, Table Chest	65%	
Japanned, Light Narrow, Loose Pin	70&5	
Light Narrow, Ball Tip	60%	
Broad	70&5	
Steeple T-pivot	70%	
Ball Tipped	70%	

Cages, Bird—

Calipers—See Compasses.

Calks, Toe and Heel—

Can Openers—

See Openers, Can.

Caps, Percussion—

Primers—

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

Casters—

Cattle Leaders—

See Leaders, Cattle.

Chain, Proof Coil—

Halter—

Cow-Ties—

See Halters and Ties.

Trace, Wagon, &c.-

Miscellaneous—

Chain and Ribbon, Sash—

Chalk—

Checks, Door—

Checks, Tool—

Chisels—

Socket Framing and Firmer

Tanged—

Cold—

Chucks—

Clamps—

Cleaners, Drain,

Sidewalk—

Cleavers, Butchers'—

Clippers, Horse and Sheep—

Clips, Axle—

Cloth and Netting, wire

See Wire, &c.

Cocks, Brass—

Coffee Mills—

See Mills, Coffee.

Collars, Dog—

Compasses, Dividers, &c.

Conductor Pipe,—

Coolers, Water—

Coppers' Tools—

See Tools, Coppers'.

Coppers, Soldering—

Cord— Sash—

Dividers—See Compasses.

Drawing Knives—

See Knives, Drawing.

Dressers Emery Wheel—

Drills and Drill Stocks—

Drivers, Screw—

Eave Trough, Galvanized—

Elbows and Shoes—

Elbows, Stove Pipe—

Emery, Turkish—

Extractors, Lemon Juice—

—See Squeezers, Lemon

Slaw and Kraut—

Tobacco—

Diggers, Post Hole, &c—

Fasteners, Blind—

Zimmerman ..... 50&10%
Universal ..... 40&10%
Upson Patents 40%

Cord and Weight—

Ives and Pratt 33⅓

Corrugated—

Acme Fastener Co. 70

Faucets—

Cork Lined ..... Trade List 1906
Medium and Leather Lined 50
Brass ..... 40&7½
Red Cedar ..... 70&10&4%
Pettingell ..... 70&10&4%
B. & L. B. Co:
Metal Key ..... 60&10
Staf 60
West Lock ..... 50&10%
John Sommer's Peerless Tin Key 40
John Sommer's Red Tin Key 50
John Sommer's Victor Metal Key ..... 50&10
John Sommer's Perfect Metal Key 60
John Sommer's Disinfected Cork 50
John Sommer's A. L. C. & Co. Lined 50
John Sommer's Reliable Cork Lined ..... 50&10
John Sommer's Chicago Cork Lined 60
John Sommer's O. K. Cork Lined 50%
John Sommer's No. Brand, Cedar 50%
John Sommer's Perfection, Cedar 40%
Seal Monogram:
Engraving, per doz. $.6.00 ..... 40&10
Lining, per doz. $.6.00 ..... 40&10
National Monogram, per doz. $.6 ..... 40&10

Felloe Plates—

See Plates, Felloe.

Files— Domestic—

List Nov. 1, 1899.

Best Brands ..... 70&10%&75&10%
Standard Brands ..... 70&10%&10&5%
Lower Grades ..... 75&10&10%&10%

Imported—

Stubs' Tapers, Stubs list, July 24, '97 ..... 33⅓&40%

Fixtures, Fire Door—

Automatic Sprinklers Approved 5
Bommer Bros. Mfg. Co:
Universal No. 103, Special, No. 14 ..... $3.75
Fusible Links, No. 26 ..... 50%
Expansion Bolts No. 137 ..... 60&10%

Grindstone—

Net Prices:

Inch	15	17	19	21
Per doz.	$3.00	3.85	4.75	6.65

P. S. & W. Co. 60%
Reading Hardware Co. 60%

Fodder Squeezers—

See Compressors.

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig Ley Potato ..... 60&10%
Victor, Hoe ..... 60&10&5%
Victor, Manure 60%
Victor, Header 60%
Champion, Hay 60%
Champion, Header 60%
Champion, Manure ..... 60&10&5%
Columbia, Hay ..... 60&20
Columbia, Manure 70
Columbia, Spading ..... 70&10%
Hassock Wood Barley 40
W. & P. Potato Digger ..... 60&10
Acme Hoe ..... 60&10
Acme Manure, 4 tine ..... 60&10&5%
Dakota Header 60%
Jackson Steel Barley ..... 60&20
Kansas Header 65%
W. & C. Favorite Wood Barley 40%
Plated.—See Spoons.

Frames— Wood Saw—

White, S'g't Bar, per doz. 75@80¢
Red, S'g't Bar, per doz. $1.00@1.25
Red, Dbl. Brace, per doz $1.40@1.50

Freezers, Ice Cream—

Qt.	1	4	6
Each	$1.25	$1.60	$1.90

Qt.	8	10	12	14
Each	$2.10	$2.60	$2.80	$3.20

Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Fuse— Per 1000 Feet.

Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped 3.85
Waterproof Dbl. Taped 4.50
Waterproof Tpl. Taped 5.15

Gates, Molasses and Oil—

Stebbins' Pattern ..... 40&10&5%

Gauges—

Marking, Mortise, &c. ..... 50&10&10%
Marking, Mortise & ..... 50&10
Disston's Marking, Mortise, &c. 67½
Wm. Brass & Sharpen 50
Wire, Brass 35
Wire P. S. & W. Co 33⅓

Gimlets— Single Cut—

Numbered consecutively, ninety per gro.

Nail, Metal, No. 1, $2.00; 2, $2.40
Spike, Metal, No. 1, $3.00; 2, $3.40
Nail, Wood Handled, No. 1, $2.00; 2, $2.40
Spike, Wood Handled, No. 1, $3.00; 2, $3.60

Glass, American Window

See Trade Report.

Glasses, Level—

Clay Stevens Co. ..... 65&10&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush ..... 25¢&10&10%

Elwell's 40%

Grease, Axle—

Common Grade....gro. $6.00@6.50
Dixon's Excelsior, 3 lb. box, per box $.....
Dixon's Graphite, 3 lb. box, per box $.....
Hunt Hard Oil .....

Griddles, Soapstone—

Pike Mfg. Co ..... 50&10&10%

Grinders—

Royal Mfg. Co.:
Alundum Grinding Machines, each, No. ..... $.....
$5.00 ..... 30%
Alundum Sickle Grinders, each, No. ..... $.....
$6.00 ..... 30%
Alundum Disc Grinders, each $.....

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstone ..... per doz. $2.00
Richards Mfg. Co., Eli and Cycle, Bar Fixtures to match .....

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... 65&10&10%
Bridgeport Chain Co.:
Halters ..... 35&5&2%
Halter Chain Halters ..... 50&5
Breast Chain Ties ..... 40&10&5%
Bronze Chain Ties ..... 70&10&5%
Conrt Mfg. Co.:
Halters ..... 30&2
Jute Rope 35
Sisal Rope 35
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am. Coil and Halters ..... 40&10&5%
Am. Cow Ties ..... 45&5%
Niagara Coil and Halters ..... 45&50&5%
Niagara Cow Ties ..... 45&5&50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists' ..... 55&10&5%
Heller's Warrant ..... 50&5&40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel ..... 40&10
Forrance ..... 40&10
Riveting ..... 40&10
Machinists 40
Blacksmiths 40
Plumb:
A. E. Nail 40
Eng. and B. S. Hand ..... 50&10&5&60&5
Machinists' Hammers 40
Riveting Hammers ..... 40&5

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢ ..... 80&10%
3 to 5 lb., per lb. ..... 80&10%
Over 5 lb., per lb., 30¢ .....
Over 5 lb., per lb., 30¢ ..... 80&10%

Handles—

Agricultural Tool Handles—

Axe, Pick, &c. ..... 60&10&60&10&5%
Hoe, Rake, &c. 40%
Fork, Shovel, Spade, &c.:
Long Handles 40
D Handles 50%

Cross-Cut Saw Handles—

Atkins' 40%
Champion 50%
Disston 50%

Mechanics' Tool Handles—

Auger, assorted ..... gro. $3.00@$4.00
Brad Awl ..... gro. $1.50@$1.75
Chisel Handles, Ash'd, per gro.:
Tanged Firmer, Apple, 40¢@ $2.85; Hickory ..... $2.15@2.40
Socket Firming, Apple, $1.75@ $1.95; Hickory ..... $1.60@$1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted ..... gro. $1.30@$1.40
Hammer, Hatchet, &c. ..... 60&10&60&10&5%
Hand Saw, Varnished, doz. $0.65@.75¢
Piano Handles:
Back, doz. $.....; Face, doz. .75¢.
Chun-Stephens Co.:
Carving Tool ..... 30@30&10%
Cross Cut 50
Hand Axe ..... 50&10%
Hand Pump ..... 50&10%
Screw Driver 50
Millers Falls Adj. and Ratchet Auger Handles ..... 50&10%

J. L. Osgood:
Ash, No. 1 ..... per M $.....
No. 2 ..... per M $.....
No. 3 ..... per M $.....
No. 4 ..... per M $.....
Oak ..... per M $.....

W. A. Zelnicker Supply Co.:
Hickory, 1 to 1¼ in. $2.00
1¼ to 1½ in. .....
1½ to 1¾ in. .....
1¾ to 2 in. .....
$3.00; 24 in., $3.30; 26 in., $3.50
30 in., $3.80.....
Ash, 1 to 1¼ in. .....
1¼ to 1½ in. .....
1½ to 1¾ in. .....
1¾ to 2 in. .....
$4.00; 24 in., $4.30; 26 in., $4.50
30 in., $4.80.....
Axe, 36 in., $5.80; 42 in., $6.80
Adze Eye, 36 in., $5.80; 42 in., $6.80
Pick, per doz., R. R., 36 in., $8.00; coal, 31 in., $5.80.
Hammer .....
Sledge .....

Hangers—

NOTE.—Extra Heavy Hangers are generally sold at about list. Extra Heavy Hangers per double set with track, &c.:

Allith Mfg. Co.:
Regular, No. 1 and 2 ..... Allith No.
3; Allith Adjustable, No. 6; Reversible Barn Door 50%
Extra Heavy Barn Door .....
Extra Heavy 25
Regular 25
Ball Bearing 25
Allith & Miner Mfg. Co.:
Regular Barn Door 50
Extra Heavy Barn Door 50
Reversible 50
Carlisle & Carrier Mfg. Co.:
Loose Axle 50
Roller Bearing 50
Extra Heavy 50
Solid Axle, No. 1 ..... 60&10%
Roller Bearing, No. 11, $15.00.....
Extra Heavy 50
Roller Bearing, Pat. Hanger, No. 22, $18.00 ..... 60&10%
Ball Bearing 50
Lane Bros. Co.:
Parlor, Bag, Bearing, $1.....
Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard ..... 60&10%
Hinged 50
Curved 50
Special 50
Lawrence Bros.:
Adjustable 50
Concealed 50
Clipper, No. 75 ..... 60%
Cyclone 50
Cyclone, No. 40 ..... net $6.50
Tandem, No. 50 ..... net $7.50
New York ..... 50&5
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2 ..... 70%
Anti-Friction 60%
Hinged Hangers, King Charm 60
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, Pioneer Wood Track, No. 3, $2.25
Roller Bear'g Std'l Track No. 12 $2.20
Roller Bear'g Std'l Track No. 13, $2.50
Roller Bear'g, Nos. 2, 4, 12 ..... 70&7½%
Hero, Adj. Track No. 19 ..... 50&10%
Adjustable Track Tandem Trolley, Track No. 15 ..... 50&5%
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22 ..... 50&5%
Trolley, B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150 ..... $2.50
Safety Underwriters F. D. No. 101 ..... 50%
Tandem No. 41, 2½ and 3 ..... 60&10%
Parlor Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 222 ..... 50&5%
Ives' Wood Track No. 1 ..... $2.25
Trolley B. D. No. 24 ..... 50%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2 ..... 70&7½%
Anti-friction, No. 42; No. 44, sizes 1 and 3 60
Hinged Tandem No. 48 ..... 60&5%
Folding Door B. B. Swivel No. 135 ..... 50%
Taylor & Boggis Foundry Co.'s Kid Roller Bearing Barn ..... 50&5%
Myers' Stayon Hangers 60%

Hangers— Garment—

Pullman Trouser, per gro., No. 1, Steel ..... $.....
No. 8, Black Enamel, $7.50; No. 10 $21.00; No. 12, $8.00; No. 15, Rods, Steel ..... $.....
Victor Folding ..... per gro $2.60

Gate—

Myers' Patent Gate Hangers, per doz. pair $4.80

Joist and Timber—

Lane Bros. Co. 30%

Hasps

Gaither's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, per doz. ..60%

Hatchets—

Regular list, first quality ..... 50&5%
Second quality ..... 50&5%

Heaters, Carriage—

Clark's No. 1 70
Clark's No. 2 70
No. 2 ..... $2.25
No. 1 ..... $2.50
Clark Coal Heater $2.25

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara, Clark's O. P.; Clark's Tip; Buffalo.)

No. 1 2
Doz. pair ..... $0.75 ..... 1.85 ..... 2.70

Mortise Shutter:
(Victor; National; 1868 O. P.; Clark's O. P.; Buffalo.)
No. ..... 1 ..... 2 ..... 2½
Doz. pair ..... $0.75 ..... 0.90 ..... 1.05

Mortise Removable Shutter (Buffalo, &c.):
No. 1 2
Doz. pair ..... $0.70 ..... 0.85 ..... 1.00

Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind .....
Blind Bead Staying Hinges, No. 1 .....
No. 2 .....
No. 3 .....
Brick .....
Reading's Gravity 60%

Extra Heavy often given

Hinges—

Allith Mfg. Co.:
Regular, No. 1 and 2 ..... Allith No.
3; Allith Adjustable, No. 6; Reversible Barn Door 50%
Extra Heavy Barn Door .....
Extra 25
Regular 25
Ball Bearing 25
Allith & Miner Mfg. Co.:
Regular Barn Door 50
Extra Heavy Barn Door 50
Reversible 50
Carlisle & Carrier Mfg. Co.:
Loose Axle 50
Roller Bearing 50
Extra Heavy 50
Solid Axle, No. 1 ..... 60&10%
Roller Bearing, No. 11, $15.00.....
Extra Heavy 50
Roller Bearing, Pat. Hanger, No. 22, $18.00 ..... 60&10%
Ball Bearing 50
Lane Bros. Co.:
Parlor, Bag, Bearing, $1.....
Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard ..... 60&10%
Hinged 50
Curved 50
Special 50
Lawrence Bros.:
Adjustable 50
Concealed 50
Clipper, No. 75 ..... 60%
Cyclone 50
Cyclone, No. 40 ..... net $6.50
Tandem, No. 50 ..... net $7.50
New York ..... 50&5
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2 ..... 70%
Anti-Friction 60%
Hinged Hangers, King Charm 60
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, Pioneer Wood Track, No. 3, $2.25
Roller Bear'g Std'l Track No. 12 $2.20
Roller Bear'g Std'l Track No. 13, $2.50
Roller Bear'g, Nos. 2, 4, 12 ..... 70&7½%
Hero, Adj. Track No. 19 ..... 50&10%
Adjustable Track Tandem Trolley, Track No. 15 ..... 50&5%
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22 ..... 50&5%
Trolley, B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150 ..... $2.50
Safety Underwriters F. D. No. 101 ..... 50%
Tandem No. 41, 2½ and 3 ..... 60&10%
Parlor Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 222 ..... 50&5%
Ives' Wood Track No. 1 ..... $2.25
Trolley B. D. No. 24 ..... 50%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2 ..... 70&7½%
Anti-friction, No. 42; No. 44, sizes 1 and 3 60
Hinged Tandem No. 48 ..... 60&5%
Folding Door B. B. Swivel No. 135 ..... 50%
Taylor & Boggis Foundry Co.'s Kid Roller Bearing Barn ..... 50&5%
Myers' Stayon Hangers 60%

Hangers— Garment—

Pullman Trouser, per gro., No. 1, Steel ..... $.....
No. 8, Black Enamel, $7.50; No. 10 $21.00; No. 12, $8.00; No. 15, Rods, Steel ..... $.....
Victor Folding ..... per gro $2.60

Gate—

Myers' Patent Gate Hangers, per doz. pair $4.80

Joist and Timber—

Lane Bros. Co. 30%

Hasps

Gaither's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, per doz. ..60%

Hatchets—

Regular list, first quality ..... 50&5%
Second quality ..... 50&5%

Heaters, Carriage—

Clark's No. 1 70
Clark's No. 2 70
No. 2 ..... $2.25
No. 1 ..... $2.50
Clark Coal Heater $2.25

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara, Clark's O. P.; Clark's Tip; Buffalo.)

No. 1 2
Doz. pair ..... $0.75 ..... 1.85 ..... 2.70

Mortise Shutter:
(Victor; National; 1868 O. P.; Clark's O. P.; Buffalo.)
No. ..... 1 ..... 2 ..... 2½
Doz. pair ..... $0.75 ..... 0.90 ..... 1.05

Mortise Removable Shutter (Buffalo, &c.):
No. 1 2
Doz. pair ..... $0.70 ..... 0.85 ..... 1.00

Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind .....
Blind Bead Staying Hinges, No. 1 .....
No. 2 .....
No. 3 .....
Brick .....
Reading's Gravity 60%

Extra list 10% given on most of these Hinges

Stanley's Steel Gravity Blind Hinges, No. 60
Screws, $0.95; with screws, $1.25.....
Wrought .....
O. S., Lull & Porter ..... 75&5%
Acme, Lull & Porter 75%
Screw Cup Reversible 75%
Screw .....
Square Gravity Locking No. 3 & 5 ..... 75&5%
No. 1 ..... 75&5%
No. 3 ..... 75&5%
Loose Pin .....
3 & 5 ..... 70&10&5%
Shepard's Double Locking 75%
Champion Gravity Locking ..... 75&5%
Hinge 50
Empire 65%
Wire .....

Gate Hinges—

Clark's or Shepard's ..... Doz. sets.
No. ..... 1 ..... 2 3
Hinges only ..... $5 ..... 4 ..... 3.50
Hinge only ..... 1 ..... 75 ..... .50
Latches only ..... .50 ..... .50 ..... .35

New England:
With Latch ..... doz. ....@$2.00
Without Latch ..... doz. ....@$1.60

Reversible Self-Closing:
With Latch ..... doz. ....@$1.75
Without Latch ..... doz. ....@$1.35

Western:
With Latch ..... doz. $1.75
Without Latch ..... doz. $1.45

Wrought .....
Shepard's or Clark's Hinges and Hardware, Hinge only, as catalogued 70%

Pivot Hinges—

Bommer Bros. Pivot .....
Lawson Mfg. Co. Mat Hinge 50

Spring Hinges—

Holdback, Cast Iron ..... $6.75@$7.00
Non-Holdback, Cast Iron ..... @$6.75

J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 40%
Bardsley's Patent Checking 33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor 40%
Bommer Spring Hinges 40
No. 999 Wrot. Steel Hold Back, per gr. .....
Chicago Spring Butt Co.:
Chicago Spring Hinges 25
Tripie End Spring Hinges 50%
Chicago (Ball Bearing) Floor 50%
Garden City Engine House 25%
Ives's Screen Door 25
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme Brass 25
American 30
Columbia, per gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, per gr. $12.00
Columbian Hinges ..... 60&10%
Verin Wrought 50
Cast Loose Joint Adjustable 25
Cast Loose Joint 25
Hollow Case 25
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co.: Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Hookeye All Steel Holdback Screen Door ..... per gr. $9.00
Chief Ball Bearing Floor Hinge 50
Ball Bearing Door 25%
No. 1 Sheet Steel Holdback, per gr. $9.00
Stanley Mfg. Co.:
Champion Double Acting Floor Hinge 40%
Standard Double Acting Floor Hinge 40%
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges ..... lb.
Heavy Strap Hinges and T ..... lb.
Light T Hinges ..... lb.
Heavy T Hinges ..... lb.
Extra Heavy T Hinges ..... lb.
Home Hinges ..... lb.
Cast Steel Hinges ..... lb.
Cast Iron Hinges ..... lb.

Screw Hinges: 6 to 7 in. ..... lb.
8 to 10 in. ..... lb.
12 to 14 in. ..... lb.

Screw Hook and Eye:
3 to 4 in. ..... lb.
5 to 6 in. ..... lb.
7 to 8 in. ..... lb.

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers ..... 30&2%

Hods— Coal—

M'f'gr's list, price per gross

Inch	15	16	17	18
Galv. open	$8.00	$8.50	$9.25	$9.75
Galv. japan	8.00	8.50	9.25	9.75
Tap Bottom	7.50	8.00	8.50	9.00

Masons' Etc.

Steel Brick Hods ..... each $1.35
Steel Mortar Hods ..... each $1.35

Hoes— Eye—

Scroll and Oval Pattern.....
Grub, list Feb. 28, 1880 ..... 70&10&70&10&10%
Iron & Steel .....
Am. Field & Hoe Co. Steel Pattern .....

Handled—

NOTE—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1903, or selling at net prices.

Crank's Weeding, No. 1, $2.00.. No. 2, $2.50
Star Double Bit $3.20
Ft. Madison Cotton Hoe.. 75%&10%
Ft. Madison Crescent Cultivator Hoe, ₩ doz. ..... 70&10%
Ft. Madison Mattock Hoes:
Regular Weight ..... ₩ doz. 40&5%
Ideal ..... ₩ doz. $4.00
Ft. Madison Sprouting Hoe, ₩ doz. ..... 60&5%
Ft. Madison Dixie Tobacco Hoe ..... 75&10&5%
Kretsinger's Cut Easy ..... 45&10%
Warren Hoe ..... 45&10%
W. & C. Trans 75%
B. B. 6 in. Cultivator Hoe ..... $.40
B. B., 6½ in. ..... $.50
Acme Weeding ..... ₩ doz. net, $4.35
W. & C. L'ning Shuffle Hoe, ₩ doz. $5.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ₩ doz. $21.50 ..... 45&10%

Door—

Bardsley's, Iron, 4 in. Brass and Bronze 50%
Lilipute 50%
Pullman 25%
Richards Mfg. Co.: No. 117, Ever-ready, 4 in. Nos. 115, 116, Sure Grip 50%
Superior 33⅓%

File and Tool—

Nicholson File Hoders and File Handles ..... 33⅓&40%

Fruit Jar—

Triumph Fruit Jar Holder, ₩ gross, $10.80, ₩ doz. $1.25

Trace and Rein—

Fernald Double Trace Holder, ₩ doz. pairs $1.25
Dash Rein Holder, ₩ doz. pairs, $1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%.; German 50%

Hooks—Cast Iron—

Bird Cage, Reading 50%
Clothes Line, Reading List 40%
Coat and Hat, Reading ..... 45&20%
Coat and Hat, Wrightsville ..... 60&5%
Harness, Reading List 40%

Wire—

Belt 80%
Wire C. & H. Hooks 80%
Bradley Metal Clasp Wire, Coat and Hat, Nickel Coating ..... 75&10%
Columbian Hdw. Co., Gem ..... 70&5%
Parker Wire Goods Co., King ..... 70&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton ..... doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Hush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz $3.00
Grass, common grade, all sizes, per doz $1.50
Whiffletrees ..... lb. 5½@6¢
Hooks and Eyes:
Brass ..... 60&10&10%
Malleable Iron ..... 70@70&10%
Covey Mfg. Co. Gates and Scuttle Hooks 40%
Ft. Madison Cut Easy Corn Hooks ..... ₩ doz. $3.25 net
Turner & Stanton Co. Cup and Shoulder ..... 80&10%
Bench Hooks See Bench Stops.
Corn Hooks See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition ..... ft. 5@ 6¢
3 ply Guaranteed ..... ft. 8@ 9¢
4 ply Guaranteed ..... ft. 10@11¢
Cotton Garden, ¾-in., coupled:
Low Grade ..... ft 8@ 9¢
Fair Quality ..... ft. 10@11¢

Irons— Sad—

From ¼ to 10 ..... lb. 3@3½¢
B. B. Sad Irons ..... lb. 3¼@3½¢
Mrs. Potts', cents per set:

Nos.	50	55	60	65
Jap'd Tops	85	80	93	91
Tin'd Tops	88	85	98	95

New England Pressing ..... lb. 3¾@4¢

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%; Corner 60%

Pinking—

Pinking Irons ..... doz. 60¢

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw ..... 30&2%; Steel, 45%
Duplex 50%
Lake's Steel ..... 30&5%
Richards' Tiger Steel No. 130.. 50&10%
Smith & Hemenway Co.'s 25%

Ladder—

Richards Mfg. Co., Ladder Jacks.. 50%

Kettles—

Brass, Spun, Plain ..... 20@25%
Enameled and Cast Iron—See Ware, Hollow

Knives—

Butcher, Kitchen, &c.—

Foster Bros. Butcher, &c. 30%
Wilkinson Shear & Cutlery Co. 60%

Corn—

Columbian Cutlery Co., Wilcut Braid Knives and Hooks 60%
Winningstad's Acme, ₩ doz. $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10, Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List ..... 80&10&10 —%
C. E. Jennings & Co. Nos. 40, 46, 50 ..... 50%
Jennings & Griffin Nos. 11, 12, 60 ..... 60&10%
Swan's ..... 60&10%
Watrous ..... 60&10%
L. & I. J. White ..... 20&5&2½%

Hay and Straw—

Serrated Edge, per doz. $5.50@$5.75
Iwan's Sickle Edge ..... ₩ doz. $5.50
Iwan's Serrated ..... ₩ doz. $10.00

Miscellaneous—

Farriers' ..... doz. $2.50@$3.35
Westenhaven's ..... ₩ doz. $2.00@$2.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber Top ..... gro $1.25@$1.40
Carriage, Jap., all sizes ..... gro. 40@45¢
Door, Mineral ..... doz. 65@70¢
Door, Por. Jap'd ..... doz. 70@75¢
Door, Por. Nickel ..... doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable 50%
Lane's Store 25%
Myers' Noiseless Store Ladders 50%
Reversible Mfg. Co.:
Improved Noiseless, No. 112 ..... 50%
Climax Shelf, No. 113 ..... 50%
Trolley, No. 109 ..... 50%

Ladles, Melting—

L. & G. Mfg. Co. (new list) 20
F. S. & W. ..... 40&10%
Reading 60%

Lanterns— Tubular—

Regular, No 0 ..... doz. $3.35@4.50
Side Light, No. 0 ..... doz. $4.60@5.75
Hinge Globe, No. 0, doz. $4.60@5.75
Other Styles ..... 40@50&10%

Bull's Eye Police—

3-inch ..... $4.25@4.50

Latches— Thumb—

Roggin's Latches, with screw... doz. 35@40¢

Door—

Allith Mfg. Co., Reliable and Alligator, 50%; Reliable Cold Storage, 50%
Crouse & Carrier Mfg. Co., No. 101, ₩ doz $2.30
Richards' Bull Dog, Heavy, No. 125 ..... 50&5%
Richards' Trump, No. 127 ..... $1.50

Leaders, Cattle—

Small ..... doz. 50¢; large, 60¢
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E. 10%

Lines—

Wire Clothes, Nos. 18 19 20
100 feet $2.50 2.25 2.00
75 feet $2.40 1.80 1.65
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3.. 40%
Solid Braided Masons' 30
Silver Lake Braided Chalk, No. 0, $6.30; No. 1, $6.50; No. 2, $6.60; No. 3, $7.50. ..... ₩ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50. Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50 ..... 20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 ..... 20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25 20
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines 40%
Clothes Lines, White Cotton 20%
Shade Cord, Cotton or Linen 20%

Locks— Cabinet—

Cabinet Locks 33⅓%

Door Locks, Latches, &c —

NOTE—Net Prices are very often made on these goods
Reading Hardware Co. 40%
R. & E. Mfg. Co. 10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass ..... 75&10%

Sash, &c.—

Iron Patent
Bronze and Brass, 55&5%; Crescent, 60%; Iron, 60%; Window Ventilating, 40&20%; Robinson Pat. Ventilating Sash Lock, 33⅓%
Dullman Patent Ventilating Lock ..
Reading Sash Locks 40%

Machines—Boring—

Com. Up'r, without Augers. $2.00@2.25
Com. Angl'r, without Augers, $2.25@2.50
Swan's Improved ..... 40&10%
Jennings', Nos. 1 and 4 ..... 25&2½%
Millers' Falls 5.75
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Invincible Hand Power.... ₩ doz. $18.00

Fence—

Williams' Fence Machines ..... each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist.. 30%
Moore's Hand Hoist, with Lock Brake 20%
Moore's Cyclone, High Speed Chain Hoist 25%

Ice Cutting—

Chandler's 12½%

Washing

Boss Washing Machine Co.: Per doz.
Boss No. 1 ..... $5.00
Boss No. 2 ..... $7.00
Champion Rotary Banner No. 1.. $57.00
Standard Champion No. 1 ..... $37.50
Standard Perfection $27.00
Cincinnati Square Western $33.00
Uneeda American, Round $33.00

Mallets—

Hickory ..... 45¢@$3.50
Lignumvitæ ..... 45¢@50%
Tinners' Hickory and Apple-wood ..... doz. 45¢@$1.50

Mangers, Stable—

Swett Iron Works 50%

Mats, Door—

Acme Flexible Steel 50%
Elastic Steel (W. G. Co.), new list.. 50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co. ..... 20@25%
National list Jan. 1, 1906 ..... 30%
Parker's Columbia and Victoria.. 33⅓%
Parker's Arcade and Sidewalk ..... 50&10%
Swift, Lane Bros. Co. 30%

Motors, Water—

Divine's Red Devil 30%
Lippincott's 50%

Mowers, Lawn—

NOTE—Net prices are generally quoted
Cheapest, 10-in., $2.00; advance 10¢ for each size.
Cheap, 10-in., $2.25; advance 15@ 20¢ for each size.
Better Grade, 10-in., $3.00; advance 25¢ for each size.

	12	14	16	18-in.
High Grade	$4.50	4.75	5.00	5.25

Continental 60%
Great American 70%
Great American Ball Bearing, new list.. 70%
Quaker City 70%
Pennsylvania 60%
Pennsylvania, Jr., Ball Bearing, 50&10&5%
Pennsylvania Golf 50%
Pennsylvania Horse ..... 33⅓&5%
Pennsylvania Pony ..... 40&5%
Granite State:
Style A, Low Wheel 70%
Style B, Low Wheel 70%
Style C, High Wheel, spcl, list.. 70&10%
Style D, High Wheel, spcl, list.. 70%
Philadelphia ..... 75&10%
Styles M., S., C., K., T. ..... 70&10&5%
Style A, all Steel ..... 60&10&5%
Style E, High Wheel ..... 70&10&5%
Drexel and Gold Coin, special list.. 40%
Horse ..... 40&5%
Pony ..... 40&5%
36-in, Horse ..... 30&10%
Eagle Horse ..... 30&5%
I. X. L. Horse 30%

Nails—

Wire Nails and Brads, Miscellaneous ..... 85&5&10&5%
Cut and Wire, Trade Report.
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	...40&5%
Coleman	13	12	12	11	11	..... net
New Haven..	23	21	20	19	18	...40&5%
Livingston	19	18	17	16	16	...10%
Western						₩ lb 8½¢

Jobbers' Special Brands ..... per lb. 9@10¢

Picture—

	1½	2	2½	3	in.
Brass H'd	.45	.55	.60	.70	... gro
Por. Head	1.10	1.10	1.10		... gro

Upholsters—

Brass 70
Plated ..... 50&10

Nippers—

See *Pliers and Nippers*

Nuts— *Blank or Tapped.*

Cold Punched:	*Off list.*
Square	*5.20¢*
Hexagon	*5.80¢*
Square C. T. & R.	*5.60¢*
Hexagon, C. T. & R.	*6.30¢*
Hot Pressed:	
Square	*7.80¢*
Hexagon	*8.70¢*

Oakum—

Best ..... lb., 6½¢
U. S. Navy ..... lb., 6¢
Navy ..... lb., 5¢
Plumbers' Spun Oakum.. 8½@ 9¢

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated 75%
Chase or Hexagon—
Brass and Copper ..... 50&10%
Zinc ..... 50&10%
Bemis & Call ..... 60&10&10%
Machine, Hammers Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.: Nickel Plated ..... 50&10&5%
Rushlight Tube & Nozzle ..... 60&10%
Maple Leaf Mfg. Co. 75%
Spring Bottom Cans ..... 75&10&10%
Railroad Oilers & Nozzles ..... 60&10%

Openers— Can— *Per doz.*

Sprague, Iron Handle ..... 30@35¢
Sprague, Wood Handle ..... 35@40¢
Sardine Scissors ..... $1.75@$3.00
Yankee Can and Bottle Opener, ₩ doz. net, $0.75. Little Gem, ₩ doz., net $0.65

Egg—

Hartigan Nickel Plate, ₩ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope, any quantity ..... 20¢

Rubber—

(Fair quality goods.)

Sheet, C. C. ..... 11@12¢
Sheet, C. O. S. ..... 11@12¢
Sheet, C. B. S. ..... 12@13¢
Sheet, Pure Gum ..... 40@45¢
Sheet, Red ..... 40@50¢
Jenkins '96, ₩ lb. 80¢ 25%

Miscellaneous—

American Flexible ..... lb. 70@80 ¢
Cotton Packing ..... lb. 16@25 ¢
Italian Packing ..... lb. 9@12½¢
Jute ..... lb. 4¢ 4½¢
Russia Packing ..... lb. 80@11 ¢

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List ..... 65&5&10@70%
Edwards, Royal Blue ..... 65&7½%

Fry

Common Lipped:

Nos.	1	2	3	4	5
Per doz.	$0.75	0.80	0.90	1.10	1.30

Refrigerator, Galva.—

Inch	12	14	16	18
Per doz	$1.75	2.25	2.80	3.15

Paper—Building Paper

	lb.
Asbestos:	
Felt Board or Building Felt, 5 to 50 lb., per 100 sq. ft.	*3½@4¢*
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft	*3½¢*
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in	*3¢*
	Per roll
Rosin Sized Sheathing; 500 sq. ft. Light weight, 25 lbs. to roll	*$1.45@1.58¢*
Medium weight, 30 lbs. to roll	*56@70¢*
Heavy weight, 40 lbs. to roll	*75@78¢*
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.	
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton	*$54.50*
Red Rope Roofing, 250 sq. ft. per roll	*$1.75*

Tarred Paper—

1 ply (roll 400 sq. ft.), ton ..... $34.00@38.00
2 ply, roll 198 sq. ft ..... 65¢
3 ply, roll 198 sq. ft ..... 85¢
Slater's Felt (roll 500 sq. ft.) .80¢

Sand and Emery—

Flint Paper and Cloth.. 50&10@—%
Garnet Paper and Cloth 25%
Emery Paper and C'l'h.. 50&10@60%

Parers— Apple—

Goodell Co.:
Family Bay State ..... ₩ doz. $15.00
Improved Bay State ..... ₩ doz. $36.00
New Model ..... ₩ doz. $7.00
Turn Table '98 ..... ₩ doz. $6.00
White Mountain ..... ₩ doz. $5.00
Bonanza Improved ..... each $7.50
Dandy ..... each $10.80
Eureka Improved ..... each $20.00
New Century ..... each $20.00
Ranger ..... each $25.00
Livingston Nail Co.:
Daisy ..... ₩ doz. $4.00
Little Star ..... ₩ doz. $5.00
Rocking Table ..... ₩ doz. $6.20
Reading Hardware Co.:
Advance ..... ₩ doz. $4.00
Baldwin ..... ₩ doz. $4.00
Reading 72 ..... ₩ doz. $3.25
Reading 78 ..... ₩ doz. $6.25

Potato—

Saratoga ..... ₩ doz. $7.00
White Mountain ..... ₩ doz. $6.00

Picks and Mattocks—

(List Jan., 1908.)

List ..... 70&10@70&10&10%
Cronk's Handled Garden Mattock, ₩ doz., No. 2, $2.60; No. 3, $6.10.

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass ..... 50@50&10%
Iron, list Nov. 11, '85. ..... 60@60&10%

Pipe, Cast Iron Soil—
Standard 2-6 in. ..... 60&10%
Extra Heavy, 2-6 in. ..... %
Fittings, Screwed and ..... %
Add for 75%

Pipe, Merchant—

	Consumers, Carloads. Steel. Blk	Galv.	Iron. Blk	Galv.
	%	%	%	%
⅛ & 1¼ in.	67	62	62	57
⅜ in.	66	62	64	59
½ in.	66	66	64	64
¾ to 6 in.	72	62	70	60
7 to 12 in.	69	57	67	52

Pipe, Vitrified Sewer—
Carload lots
Standard Pipe and Fittings, 8 to 24 in., f.o.b. factory:
First-class 87½
Second-class 70

Pipe, Stove—

	Per 100 joints C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	6.75	7.75
7 in., Standard Blue	7.75	8.75
5 in., Royal Blue	7.00	8.00
6 in., Royal Blue	7.50	8.50
7 in., Royal Blue	8.50	9.50
Wheeling Corrugating Co.'s, Nested:		
5 in., Uniform Color	$6.15	$7.15
6 in., Uniform Color	6.65	7.65
7 in., Uniform Color	7.65	8.65

Planes and Plane Irons—
Wood Planes—
Bench, first qual. ..... 30@30&10%
Bench, second qual. ..... 30@30&10%
Molding ..... 25@25&10%
Chapin-Stephens Co.:
Bench, First Quality 30%
Bench, Second Quality 30%
Molding and Miscellaneous 30%
Toy and German 30%
Union 60%

Iron Planes—
Chaplin's Iron Planes ..... 5&10
Union 60%

Plane Irons—
Wood Bench Plane Irons, list
Dec. 12, '06. ..... 25%
Buck Bros. 30%
Chapin-Stephens Co. 30%
Union 30%
L. & I. J. White ..... 20&5@25%

Planers, Corn, Hand—
Kohler's Eclipse ..... ₰ doz $8.00

Plates—
Fellow ..... lb. 4@4¼¢

Pliers and Nippers—
Button Pliers ..... 75&10@75&10%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe, 7 in. & 10 in., per doz. $2.00 $2.25 $2.75 $3.50
Acme Nippers ..... 50&5%
Cronk & Carrier Mfg. Co.:
American Button 30%
Improved Button ..... 75&10%
Cutting 60%
No. 80 Linemen's 50%
Stub's Pattern 45%
Combination and others 33⅓%
Heller's Farriers' Nippers, Pincers and Tools ..... 10&5@14&10&5%
P. S. & W. Tinners' Cutting Nippers 40%
Swedish, Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels ..... 30&10%
Chapin's Imp. Brass Cor. ..... 40@40&10%
Pocket Levels 30%
Extension Sights 30%
Machinists' Levels ..... 40@40&10%
Diston's Plumbs and Levels ..... 60&10%
Diston's Pocket Level ..... 50&10%
Stanley's Duplex 35%
Wood's Extension 33⅓%

Points, Glaziers'—
Bulk and 1 lb. papers ..... lb. 9 ¢
½ lb. papers ..... lb. 10 ¢
¼ lb. papers ..... lb. 10 ¢

Police Goods—
Manufacturers' Lists ..... 25@25&5%
Towers 35%

Polish—Metal, Etc—
Prestolene Liquid, N. 1, ½ pt. ₰ doz. $3.00; No. 2 (1 qt.) $8.00 ₰ doz.
Prestolene Paste 60%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₰ doz. 50 ¢; ½ gro. $4.50; ½ lb. boxes, ₰ doz. $1.25; 1 lb. boxes, ₰ doz. $2.25
U. S. Liquid, 8 oz. cans, ₰ doz. $1.25.
Housewives' Friend Metal Polish, ₰ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb. cans ..... ₰ lb. 15¢
Black Eagle, Liquid, ½ pt. cans ..... ₰ doz. 75¢
Black Jack Paste, ¾ lb. cans ..... ₰ gr. $9.00
Black Kid Paste, 5 lb. can ..... each $6.85
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon's, ₰ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ₰ lb. 25¢
Fireside ..... ₰ gr. $2.50
Gem, ₰ gr. $1.50 ..... 10%
Japanese ..... ₰ gr. $3.50
Jet Black ..... ₰ gr. $3.50
Peerless Iron Enamel, 10 oz. cans ..... ₰ doz. $1.50

Poppers, Corn—
1 qt. Square ... doz. $6.80; gro. $8.75
1 qt. Round ... doz. $6.90; gro. $11.00
1½ qt. Square ... doz. $8.00; gro. $11.00
2 qt. Square ... doz. $7.25; gro. $13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42 ¢; 6 ft., 46 ¢; 6½ ft., 48 ¢.
Steel Hitching Posts ..... each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled ..... 35&10%
Tinned ..... 30&10%

Powder—
In Canisters:
Duck, 1 lb. ..... *each 15¢*
Fine Sporting, 1 lb. ..... *each 75¢*
Rifle, ½ lb. ..... *each 15¢*
Rifle, 1 lb. ..... *each 25¢*
In Kegs:
12½ lb. kegs *$3.50*
25-lb. kegs *$4.50*
King's Semi-Smokeless:
Keg (25 lb. bulk) $6.50
Half Keg (12½ lb. bulk) 3.50
Quarter Keg (6¼ lb. bulk) $1.20
Case 24 (1 lb. cans bulk) $8.50
Half case (1 lb. cans bulk) $4.50
King's Sporting—Shot Gun Rifle:
Keg (25 lb. bulk) $12.00 $15.00
Half Keg (12½ lb. bulk) 6.25 7.75
Quarter Keg (6¼ lb. bulk) 3.25 4.00
Case 24 (1 lb. cans bulk) 14.00 17.00
Half case 12 (1 lb. c. bk.) 7.25 8.75

Presses—
Fruit and Jelly—
Enterprise Mfg. Co. ..... 20@25%

Seal Presses—
Morrill's No. 1, ₰ doz., $20.00 ..... 50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 60%
Miller's Falls, No. 3, ₰ doz., $12.00 ..... 33⅓&10%
Morrill's No. 1, Nail Puller, ₰ doz. $2.00 ..... 50%
Parker's No. 1, Cyclone Spike Puller, each $30.00 ..... 50%
The Scranton Co. Case Lots:
No. 0 ..... $5.50
No. 1 ..... $5.00
Smith & Hemenway Co.:
Diamond B 50%
Globe 50%
Staple Pullers, Utica and Davis 60%

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., 4 in., $1.25; 5 in., $1.55				
Inch	1¼	1½	2¼	2½
Hot House, doz.	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz.	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz.	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in. ..... 17@20¢
Auger Mortise, no Face Plate, per doz, 1¾ and 2 in. ..... 20@21¢
Acme No. 15, 1¾ in., per doz. ..... 21¢
American Pulley Co.:
Wrought Steel, American Plate, Axle ..... 50&10%
Wrought Steel, Ends 75%
The Smith Electrical Weld Co., Nos. 2 and 3 ..... 50%
Box-All-Steel, Nos. 3 and 7, 2 in. ..... ₰ doz. 50¢
Grand Rapids All Steel Nos. 3 and 7 ..... 50%
Niagara, No. 25, 1¾ in., per doz. ..... 20¢
No. 26, Trio, 1¾ in., 14¢; 2 in., 16¢
Star, No. 26, 1¾ in., 12¢; 2 in., 20¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout ..... 75&5@75&10%
Wood Pumps, Tubing, &c. 50%
Barnes Dbl. Acting (low list) ..... 40&5%
Blake ..... 60&10%
Contractors' Rubber Diaphragm 50%
D. P. & L. Brass Co. $16.00
Daisy Spray Pump ..... ₰ doz. $8.50
Field & Wenning's East Mail Hand, w list) .....
Field & Wenning's East Mail ..... &
Flint & Walling's Tight Top Pitcher, ... &
Nonpareil Spray Mfg. Co. ..... &
Page Spray Pump $6.00
Myers' Power Pumps ..... 40&5%
Nelson ..... &

Pump Leathers—
Plunger and Valve Leathers—Per

No.	1	2	3	4
Cup Leathers—Per 100				
Inch	2	2½	3	3½

Punches—
Saddlers' or Drive, good ..... doz. 50@75¢
Spring, single tube, good quality $1.75
Excelsior ..... doz. $3.50
Dodds & Cate Co.'s Cast Steel Drive 50%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, 1E&F 50%
Hercules, 1 die, each $5.00 ..... 50%
Niagara Hollow Punches 40%
Niagara Steel Punches ..... 35&10%
Tinners' Hollow, P., S. & W. Co. 40%
Tinners' Solid, P., S. & W. Co. 40%
doz., $1.44 ..... 40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron ..... 2½@2¾¢
Sliding Door, Wrought Brass, 1¼ in., lb., 36¢ 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail, ₰ ft. 3¼ ¢
O. N. T. Rail $3.12
Griffin's:
xxx ₰ 100 ft., 1 x 3-16 in., $3.25, 1¼ x 3-16 in., $6.75.
Hinged Hanger, ₰ 100 ft. 1 x 3 16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ₰ 100 ft $3.15
O. N. T. ₰ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in. ₰ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ₰ 100 ft., $7.50, 1¼ x 3/16 in., $8.75. ..... 55&7½%
McKenney's:
Hinged Hanger Track, ₰ ft. 11¢
O. N. T.
1 x 3-16 Track ..... 55&7½%
Myers' Sliding Door 40%
Reed Mfg. Co.:
Common, 1 x 3-16 in., $2.50, 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail ..... 60&10%
Long-section Rail, No. 80 ..... 50%
Gauge Trolley Track, ₰ ft., No. 31, O. N. T. No. 33, 20¢
No. 50 ..... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE—Many goods are sold at net prices.
Fort Madison Red Head Lawn $3.25
Fort Madison Steel Head Lawn ..... $.75
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor ..... 80&25%
Queen, 14-tooth, lawn, ₰ doz., 20 teeth, $2.85, 24, $3.10 ..... net
Acme Lawn, ₰ doz. $1
Model Steel Garden ..... 70&10%
Ideal Steel Garden, ₰ doz. 12 teeth, $15.00; 14, $16.00; 16, $18.00 80
Ives':
Lawn Queen, 20-tooth, ₰ doz. $3.15
Lawn Queen, 24-tooth, ₰ doz. $3.35
Paragon, 20-tooth, ₰ doz. $2.70
Paragon, 24-tooth, ₰ doz. $2.75
Steel Garden, 14-tooth, ₰ doz. $2.40
Malleable Garden, 14 tooth, ₰ doz. $2.00 & 2.25

Rasps, Horse—
Disston 75%
Heller Bros. ..... 70&5@70&10&5%
Lovejoy Bros.' Globe Model ..... 70&10@75%
McCaffrey's American Standard ..... 60&10&5%
New Nicholson ..... 70&10@75%
See also Files.

Razors—
Lamb Bros. & Co. 60%
Fox Razors, ₰ doz., No. 42 $30.00; No. 11 $25.00, No. 92, Platina $25.00 }
Red Devil 65%

Reels, Fishing—
Hendryx:
M. 6, Q. 6, A. 6, B. 6, M. 9½, M. 15, Q. 15, A. 15, B. 15 ..... Rubber Finish, Nickeled Plate 25%
Aluminum, German Silv., Bronze 25%
1200 N., 1201 N. 20%
1000 N., 1001 N., RM, G. 8 ..... 35%
A, A 1, A 2, A 3 ..... 40%
2994 PN, 2995 PN, 3394 PN, 3395 PN, 3396 PN, 20994 PN, 21394 PN, 21395 PN, 992 N, 3395 ..... 25%
986 PN, 2991 N, 974 PN 25%
Competitor 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20%
304 P, 304 PN, 00304 P, 00304 PN, 3314 P, 3314 PN, 3315 P, 3315 PN, 3316 P, 3316 PN, 3317 P, 3317 PN, 3318 P, 3318 PN, 3319 P, 3319 PN, 3320 P, 3320 PN, 3321 P, 3321 PN, 3322 P, 3322 PN, 3323 P, 3323 PN,

Saws—

Atkins':
Circular 45%
Band ..... 50@50&10%
Butcher Saws 50
Cross Cuts 30
One-Man Cross Cut 40
Turn-w Cross Cut 50
Hand, Rip and Panel ..... 35&5
Miter Box and Compass 40
Mulay, Mill and Drag 45
Wood Saws ..... 40&10
Chapin Stephens Co.:
Turning Saws and Frames ..30@20&10
Diamond Saw & Machine Co.:
Sterling Kitchen Saws....30&10&10%
Disston's:
Circular, Solid and Insited Tooth ..50
Band, 2 to 18 in. wide 60%
Band ¾ to 1¾ 50%
Crosscuts 45
Narrow Crosscuts 50%
Mulay, Mill and Drag 50%
Framed Woodsaws 35
Woodsaw Blades 35
Woodsaw Rods, Tinned 15
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 35%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30
Compass and Key Hole Saws 25
Butcher Saws and Blades 30
C. E. Jennings & Co.'s:
Back Saws ..... 10@5
Butcher Saws ..... 25&5
Compass and Key Hole Saws ..... 33⅓&5
Framed Wood Saws ..... 25&5
Hand Saws 12½
Wood Saw Blades ..... 33⅓&5
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws..... 40&10&50%
Butcher Saw Blades..... 35@40%
Peace & Richardson's Hand Saws...30%
Simonds:
Circular Saws 45%
Crescent Ground Cross Cut Saws..30%
One-Man Cross Cut Saws ..... 40&10
Gang Mill, Mulay and Drag Saws ..45
Band Saws 50%
Back Saws ..... 25@25&5%
Butcher Saws ..... 35@35&5%
Hand Saws ..... 25@25&5%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c...25@25&5%
Wood Saws ..... 40&5%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A A..25%
Disston's:
Concave Blades 25%
Keystone Blades 35%
Hack Saw Frames 30%
Simonds Mfg Co..... 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180..... 40&5%
Hack Saws, Nos. 175, 180, complete, ..40&5%
Goodell's Hack Saw Blades..... 40&10%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades..... 35&10&10%
Star Hack Saw Blades ..... 15&10%
Sterling Hack Saw Blades..... 30&10&5%
Sterling Hack Saw Frames ..30&10&10%
Sterling Power Hack Saw Machines, each, No. 2, $30.00..10%
Victor Hack Saw Blades..... 20%
Victor Hack Saw Frames..... 40%
Whitaker Mfg. Co.:
Natural Hand Blades..... 40
Natural Hand Frames..... 30&5
National Power Blades..... 30&10

Scroll—

Barnes, No. 7, $15..... 25%
Barnes' Scroll Saw Blades..... 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $20.. 20%
Lester, complete, $19.50..... 15&10%
Rogers, complete, $3.50 and $4.00.. 15&10%

Scales—

Union Platform, Plain $2.50@3.20
Union Platform, Stpd. $2.20@2.30
Chatillon's:
Eureka 25%
Elevator 10
Counter, Trip Scales 50
The Standard Portables..... 40%
The Standard R. R. and Wagon ..... 50&10%

Scrapers—

Box, 1 Handle.....doz. $2.00@2.25
Box, 2 Handle.....doz. $2.50@2.60
Ship.....Light, $2.00; Heavy, $4.50
Chapin-Stephens Co., Box.....20@20&10%
Richards Mfg. Co., Foot..... 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1½, $3.00@3.25; 1¾, $3.50@3.75
Bench, Wood..... 20@20&10%
Hand, Wood..... 50@50&10@10%
Chapin-Stephens Co., Hand.....
.....70@70&10&2½%
Coach, Lag and Hand Rail—

Lag, Cone Point...80@85@80&10%
Coach, Gimlet Point...80@80&5%
Hand Rail.....70@10@75%

Jack Screws—

Standard List.....70@10@75%
Weller Mfg. Co..... 50&10&10%
Sweet's Iron Works..... 70@75%

Machine—

Cut Thread, Iron, Brass or Composition
Flat Head or Round Head, ...50@50&10%
Fillister Head.....40@40&10%
Rolled Thread, F. H. or R. H., Iron..... 75&10%
F. H. or R. H. Brass, Nos. 8 to 14..... 65&10%

Set and Cap—

Set (Iron)..... 75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap..... 70&10&7½%
Hex Hd. Cap..... 70&10&7½%
Rd. Hd. Cap..... 50&7½%
Fillister Hd. Cap..... 60&7½%

Wood—

List July 23, 1903.
Flat Head, Iron..... 87½&5@..%
Round Head, Iron..... 85&5@..%
Flat Head Brass..... 80&5@..%
Round Head, Brass..... 77½&5@..%
Flat Head, Bronze..... 75@10..%
Round Head, Bronze..... 72½&5@..%
Drive Screws..... 87½&5@..%

Scroll Saws—

See *Saws, Scroll.*

Scythes— *Per dos.*

Grass, No. 1, Plain.....$7.00@7.50
Clipper, Bronzed Webb.....$6.75@7.25
No. 3 Clipper, Pol'd Webb.....$7.50@8.00
No. 6 Clipper and Solid Steel.....$7.75@8.25
Bush, Weed and Bramble, Nos. 11, 12 and 13.....$7.25@7.75
Grain, No. 1.....$9.00@9.50
Bronzed Webb, No. 1.....$8.25@9.75
Nos. 3 and 4 Clipper, Grain.....$9.50@10.00
Solid Steel, No. 6.....$9.00@10.50

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $16; 3, $12..... 50
Millers Falls Awl Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18..20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel..... ₰ doz sets $9.00

Sets, Nail—

Octagon .....gro. $3.50@3.75
Buck Bros..... 25%
Cannon's Diamond Point, ₰ gro. $12 ..... 40&10%
Mayhew's ..... ₰ gro $9.00
Snell's Corrugated, Cup Pt.....40&10%
Snell's Knurled, Cup Pt.....40&10%
Victor Knurled Cup Pt.....₰ gro. $7.50

Rivet—

Regular list.....75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Morrill's, No. 1..... $15.00
Nos. 3 and 4, Cross Cut.... $20.60
No. 5, Mill..... $20.00
Nos. 10, 11, 95..... $15.60
No. 1 Old Style..... $10.00
Special..... $16.25
Giant Royal Cross Cut.....₰ doz. $8.00
Royal, Hand.....₰ doz. $4.50
Taintor Positive.....₰ doz. $6.75

Shaving—

Fox Shaving Sets, No 30.....
₰ doz., net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₰ doz..... $1.50
Mounted Kitchen Sand Stone, ₰ doz..... $1.50
Natural Grit Carving Knife Hones, ₰ doz..... $3.00
Quick Cut Emery Carving Knife Hones, ₰ doz..... $1.50
Quick Edge Pocket Knife Hones, ₰ doz. $2.80

Skate—

Smith & Hemenway Co., Eureka 50%

Shaves, Spoke—

Iron.....doz. $1.25
Wood.....doz. $2.00
Bailey's (Stanley R. & L. Co.)..... 45%
Chapin-Stephens Co.....30@30&10%
Goodell's ₰ doz. $9.00..... 15&10%

Shears—

Cast Iron..	7	8	9 in.
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Cheap	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality Jap.....70@70&10%
Best quality, Nickel..60@60&10%
Tailors' Shears.....40@40&10%
Acme Cast Shears..... 40@40&5%
Hounsfield Tailors' Shears..... 10%
Wilkinson Shear & Cutlery Co.:
Shear, 1900 list..... 30&10&5%
Grass..... 50&10%
Horse or Mule..... 50&10%
J. Wiss & Sons Co.:
Best Quality Japed..... 60&10%
Best Quality Nickeled..... 50&10%
Tailors'..... 25%

Tinners' Snips—

Steel Blades..... 20@5@20&10%
Steel Laid Blades....40&10@50%
Forged Handles, Steel Blades, Berlin, ... 50%
Heinisch's Snips..... 40%
Jennings & Griffin Mfg. Co.'s 6½ to 10 in..... 33⅓&7½%
Niagara Snips..... 40%
P. S. & W. Forged Handles, 25%; W. R. W., ₰ doz. $18.00..... 25%
J. Wiss & Sons Co.:
Wiss Forged Steel 25%

Pruning Shears—

Cronk's Hand Shears..... 33⅓%
Cronk's Wood Handle Shears..... 33⅓%
Disston's Combined Pruning Hook and Saw, ₰ doz. $18.00..... 25%
Disston's Pruning Hook only, ₰ doz. $12.00..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades..... 40%
P. S. & W. Co..... 40&10%
Columbian Cutlery Co.:
Hedge, Wilcut Brand..... 60&10%
Lawn and Border, Wilcut Brand. ..... 60&10%

Sheaves— Sliding Door—

Reading 40%
R. & E. list..... 15%

Sliding Shutter—

Reading list..... 40%
R. & E. list..... 10%

Shells—Shells, Empty—

Brass Shells Empty:
Climax, 10 and 12 gauge..... 65&10%
Club, Rival, 65&5%; First Quality ..... 60&5%

Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, ... 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, ... 25&5%
Union, League, 12 and 12 gauge; Rival Grade..... 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge..... 20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%

Shells, Loaded—

Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade..... 40&5%
Loaded with Smokeless Powder, high grade..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders..... 40%
Nitro Club, Smokeless Powders.40&5%
Arrow, Smokeless Powders.40&10&10%
Winchester:
Smokeless Repeater Grade..... 40&5%
Smokeless Leader Grade...40&10&10%
Black Powder..... 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:	Painted.	Galv.
14 x 20.....	$3.25	$6.00
10 x 14.....	4.50	6.25
7 x 15.....	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20 in....	$4.25	$5.50
Dixie, 10 x 14 in....	4.50	6.00
Dixie, 7 x 10 in....	5.00	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron.....per keg. $4.10
Steel.....per keg. $3.85
Burden's, all sizes..... ₰ keg $3.90

Shot— *25-lb. bag.*

Drop, up to B..... $1.85
Drop, B and larger..... 2.10
Buck..... 2.10
Chilled..... 2.10
Dust..... 2.30

Shovels and Spades—

Association List, Nov. 15, 1902..40%
Avery Stamping Co..... 40%

Snow Shovels—

Long Handle..... $3.25@3.50
Wood and Mall, D. Handle, $3.75@4.00

Sieves and Sifters—

Hunter's Imitation.....
.....gro. $9.50@10.00
Hunter's Genuine.....
.....per gro. $12.00@12.50

Sifters, Ash—

Acme Ball Bearing Sifter Co., Acme Automatic Ash Sifter, each, $0.25; ₰ doz..... $3.00

Sieves, Seamless Metallic

—Per dozen.—

Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested.....doz. $0.90@0.95
Mesh 20, Nested.....doz. $1.00@1.05
Mesh 24, Nested.....doz. $1.30@1.40

Sinks. Cast Iron—

Painted, Standard list:
12 x 12 to 22 x 36 in.....60%
20 x 40 to 24 x 50 in.....50%
24 x 60 to 24 x 120 in.....30%
Barnes' low list:
Up to and including 20 x 36 in.50&5%
20 x 40 to 24 x 50 in..... 45%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron.....70@75&10%
Steel.....40@45%

Slates, School—

Factory Shipments.
"D" Slates.....50@50&10%
Eureka, Unexcelled Noiseless, 60&5 tens
Victor A, Noiseless .60&5 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German.....40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%..... 40%
High Grade, 40%; Trojan..... 40%
Jockey 25%

Snaths—

Scythe .....75@10@60%

Snips, Tinners—See *Shears*

Spoons and Forks—

Silver Plated—

Good Quality.....50@10@40@5%
Cheap.....60@60@10%
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton ..... 50&10%
Rogers & Bro., William Rogers, Eagle Brand..... 50&10%
Anchor, Rogers Brand..... 60%
Wm. Rogers & Son..... 60&10%

Miscellaneous

German Silver.....60@60@5%

Tinned Iron—

Teas .....per gro. 50@55c
Tablets .....per gro. $0.90@$1.00

Springs— Door—

Bardsley's Spring and Check..... 40%
Chicago Cone..... 40&10
Gem 20
Pullman Door and Gate..... 10%
Reliance (Coil)..... 40&10%
Star 30
Torrey's Rod, 39 in..... ₰ doz. $1.10

Carriage, Wagon, &c.—

1¼ in. and Wider: Per 100 lb.
Black.....$4.75@5.00
Half Bright.....$4.75@5.00
Bright.....$5.25@5.50
Painted Seat Springs:
1½ x ⅜ x 26..... per pair, 45c@47c
1½ x ⅜ x 28..... per pair, 63c@65c

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; Nautilus ..... ₰ doz..... $12.00
Enterprise ..... 25@30%
Philadelphia No. 1, ₰ doz. $12; No. 2, $15; No. 3, $20..... 30%

Squares—

Nickel plated..} List Jan. 5, 1900.
Steel and Iron..} 60@60&5%
Rosewood Hdl. Try Square and T-Bevels .....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels .....40&10@40&10@45%
Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel..... 15%

Squeezers, Lemon

Wood, Porcelain Lined:
Cheap.....doz. $1.00
Good Grade.....doz. $1.25
Tinned Iron.....doz. $0.75@1.25
Iron, Porcelain Lined...doz. $1.75

Staples—

Barbed Blind.....50&5@15&10%
Electricians'.....50@10@10&5%
Fence Staples, Plain, $2.15; Galvanized $2.45
Poultry Netting Staples.....per lb. 3½@3¾c

Steels, Butchers'—

Dick's 30%
Foster Bros.'..... 30%

Steelyards— ....30@30&10%

Stocks and Dies—

Blacksmiths' .....60@30&10%
Curtis & Curtis Co., Die Stock..... 25%
Derby Screw Plates..... 25%
Green River..... 25%
Lightning Screw Plate..... 25%
Little Giant..... 25%
Reece's New Screw Plates..... 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones—Oil, &c.

Pike Mfg. Co., 1907 list: ₰ lb
Arkansas St. No. 1, 3 to 5½ in.2.80
Arkansas St. No. 1, 5½ to 8 in.3.50
Arkansas Slips No. 1..... $1.00
Lily White Washita, 4 to 8 in.60c
Rosy Red Washita, 4 to 8 in..60c
Washita St., Extra, 4 to 8 in.50c
Washita St., No. 1, 4 to 8 in.40c
Washita St., No. 2, 4 to 8 in.25c
Lily White Slips..... 90c
Rosy Red Slips..... 90c
Washita Slips, Extra..... 80c
Washita Slips, No. 1..... 70c
Washita Slips, No. 2..... 40c
India Oil Stones (entire list)... 33⅓
Quickcut Emery and Corundum Oil Stone, Double Grit..... 40%
Quickcut Emery and Corundum Oil Stone, Double Grit..... 33⅓
Quickcut Emery Rubbing Bricks 10c
Hindostan No. 1 R'g'lar, ₰ lb. 8c
Hindostan No. 1, Small..₰ lb 10c
Axe Stones (all kinds)..... 10c
Turkey Oil Stones, Extra, 5 to 8 in..₰ lb 60c
Queer Creek Stones, 4 to 8 in.20c
Queer Creek Slips..... 40c
Sand Stone..... 6c

Scythe Stones—

Pike Mfg. Co., 1908 list
Pike's Diamond S. S. ₰ gro. $12.00
Pike's Monitor S. S. ₰ gro. $...00
Pike's Monitor Imp. S. S. ₰ gro. $...00
Pike's Genuine Imp. S. S. ₰ gro. $...00
Pike's Indian Head S. S. ₰ gro. $...00
Pike's Indian Head Imp. S. ₰ gro. $...00
Pike's Indian Head Imp. S. S. ₰ gro. $...00
Leader Red End S. S. ₰ gro. $... 33⅓%
Quick Cut Emery ₰ gro. $...
Pure Corundum ₰ gro. $14.00
Crescent ₰ gro. $7.00
Emery Scythe Rifles, 4 Coat. $13.20
Emery Scythe Rifles, 4 Coat. $...
Emery Scythe Rifles, 4 Coat. $...
Emery Scythe Rifles, 4 Coat. $13.20

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1½ in. round and square	₡ lb 1.90¢
1½ to 4 in. x ⅜ to 1 in.	₡ lb 1.90¢
1¼ to 4 in. x ⅛ to 3-16	₡ lb 2.10¢
Rods—⅜ and 11-16 Round and Square	₡ lb 2.10¢

Angles:

	Cts ₡ lb
3 in. x 2½ in. and larger	2.25¢
3 in. x 3-16 in. and 4 in.	2.50¢
1½ to 2½ in. x ¼ in.	2.30¢
1¼ to 2½ in. x 3-16 in. and thicker	2.25¢
1 to 2¼ in. x ⅜ to ½ in.	2.30¢
1 to 1¾ x ¼ in.	2.35¢
⅞ x ⅛ in.	2.50¢
⅝ x ⅛ in.	2.60¢
½ x ⅛ in.	3.65¢
½ x 3-32 in.	4.15¢

Tees:

1 in.	2.60¢
1¼ in.	2.40¢
1½ to 2 in.	2.30¢
3 in. and larger	2.35¢
Beams	2.25¢
Channels, 3 in. and larger	2.25¢
Bands—1 to 6 x 3-16 to No. 8	2.45¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
"Ulster"	3.10¢
Norway Bars	3.50¢

Merchant Steel from Store—

	per ₡
Bessemer Machinery	2.10¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black

	One Pass, C.R. Soft Steel.	R. G. Cleaned.
No. 11	₡ lb 2.90¢	3.00¢
Nos. 18 to 21	₡ lb 2.95¢	3.10¢
No. 27	₡ lb 3.15¢	3.40¢
No. 28	₡ lb 3.20¢	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment, W. Dewsnewood	₡ lb 13½@14½¢
Patent Planished	₡ lb A, 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16	₡ lb, 3.15¢
Nos. 22 to 24	₡ lb, 3.55¢
No. 27	₡ lb, 4.00¢
No. 28	₡ lb, 4.25¢

No. 20 and lighter 35c higher

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:	
IC, 14 x 20	$6.40
IX, 14 x 21	7.65
A. Charcoal:	
IC, 14 x 20	$5.45
IX, 14 x 20	6.55

American Coke Plates—Bessemer-

IC, 14 x 20 107 lb	$4.45
IX, 14 x 20	5.45

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.60
IX, 20 x 28 with an 8 lb. coating	10.60

Seamless Brass Tubes—

List December 4, 1905. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List December 4, 1905. Base price 18¢

Copper Tubes—

List December 4, 1905. Base price 21¢

Brazed Brass Tubes—

List June 6, 1898. 21 ¢ ₡ lb

High Brass Rods—

14¾¢ ₡ lb

Roll and Sheet Brass—

List June 6, 1898. 14½¢ ₡ lb

METALS—

Tin—

Straits Pig ₡ lb 31 @32 ¢

Copper—

Lake Ingot	₡ lb 14 @14¼¢
Electrolytic	₡ lb 14 @14¼¢
Casting	₡ lb 13¾@13¾¢

Sheet Copper Hot Rolled, 16 oz.	₡ lb 17@...¢
" " " 14 "	₡ lb ...@...¢

Sheet Copper Cold Rolled, 1¢ ₡ lb advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, 1¢ advance over Cold Rolled.
Sheet Copper Polished over 20 in. wide, 2¢ advance over Cold Rolled.
Bottoms, Pits and Flats ₡ lb 21¢ basis
Planished Copper, 1¢ ₡ lb more than Polished.

Spelter—

Western ₡ lb 5¾@6 ¢

Zinc.

No 9, base, casks, ₡ lb 7.50¢ | Open ₡ lb 8.00¢

Lead.

American Pig	₡ lb 4¾@5¼¢
Bar	₡ lb 6 @6¼¢

Solder.

½ & ½, guaranteed	₡ lb 19½@20 ¢
No. 1	₡ lb 17½@18¼¢
Refined	₡ lb 15½@16 ¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₡ lb ...@11¢
Hallett's	@10½¢
Other Brands	@9½¢

Bismuth—

Per. ₡ $1.75

Aluminum—

No 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:

Small lots	38¢
100-lb. lots	37¢
Rods & Wire	Base Price 88¢
Sheets	Base Price 40¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents. —
Copper, Heavy and Wire	₡ lb 10.75@11.00
Copper, Light and Bottoms	₡ lb 10.00@10.25
Brass, Heavy	₡ lb 8.00@8.25
Heavy Machine Composition	₡ lb 10.25@10.50
Clean Brass Turnings	₡ lb 6.75@7.25
Composition Turnings	₡ lb 8.00@8.50
Lead, Heavy	₡ lb ...@3.50
Tea Lead	₡ lb ...@3.25
Zinc Scrap	₡ lb ...@3.00
No. 1 Yard Wrought, Long	$...@11.50
No. 1 Yard Wrought, Short	$ ...@10.50
Wrought Pipe	$...@8.50

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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THE IRON AGE

New York, Thursday, June 11, 1908.

The Wheeling Electric Induction Clutch.

Heavy machinery that must be frequently and quickly started and reversed should, for many reasons, be driven by a continuous running motor through reversing clutch gearing rather than by a reversible motor. The more frequent the reversing and the quicker the acceleration demanded, the more pronounced are the advantages. This contention assumes that the clutch mechanism used is ideal in regard to wear, heat dissipation, ease of control, simplicity of construction, and relatively low inertia of reversing parts.

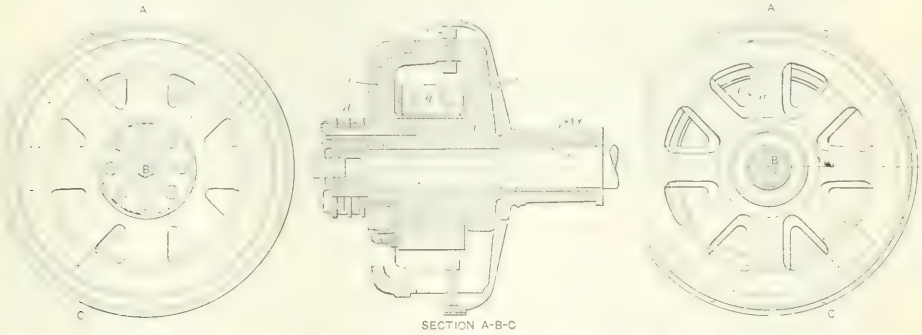


Fig. 1.—Details of the Wheeling Induction Clutch for Driving Reversing Machinery, Made by the Wheeling Mold & Foundry Company, Wheeling, W. Va.

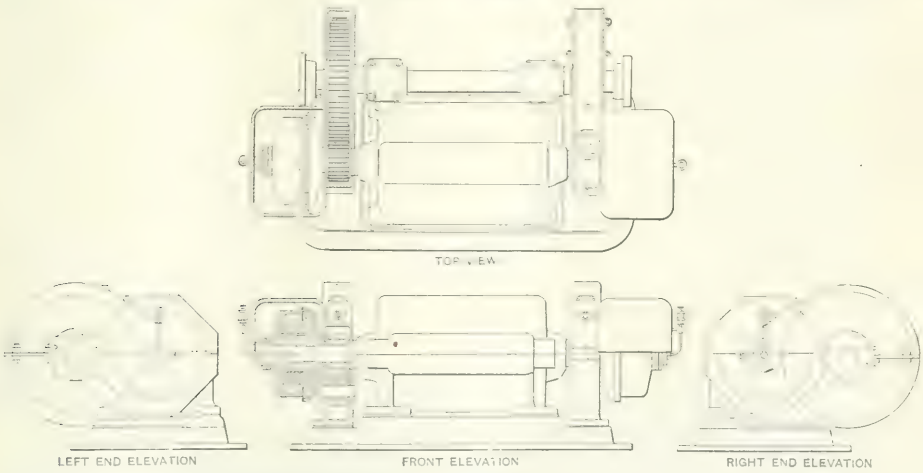


Fig. 2.—A 50-Hp. Reversing Drive for Rolling Mills, Showing the Wheeling Clutches Combined with a Crocker-Wheeler Motor.

Nonreversing Motor Advantages.

The reversing motor has the disadvantage of having to overcome its own inertia at start and stop in addition to that of the driven machinery. This not only puts an additional load on the motor but limits the size of motor that can be used if quick reverse is required, because the larger the motor the longer the time required to reach full speed without overload, simply on account of armature inertia. For this reason the trouble is often increased by replacing small motors with larger ones for driving quick reversing tables. On the other hand a continuous running motor doing the same work through clutch gearing uses its own inertia to advantage during acceleration and reverse of driven machinery, hence the larger the motor the less the danger of overload other things being equal. Furthermore a continuous running motor with a drooping speed characteristic, when used with clutches of proper design, smooths out the load curve by utilizing flywheel energy during the short periods of acceleration and reverse of driven machinery. This smoothing-out feature may be carried to any desired degree by providing sufficient flywheel capacity in the continuous running members.

A direct current reversing motor, unless it has commutating poles, is at a disadvantage by perforce having its brushes set at a point midway between the most advantageous points for forward and reverse rotation. This amounts to little where the motor is not heavily loaded, but it becomes significant when the motor is working under full load or over load in either direction.

Controllers for quick reversing motors, and especially for large motors in the hands of presumably careless and ignorant operators, which can be considered thoroughly satisfactory have not yet appeared and probably never

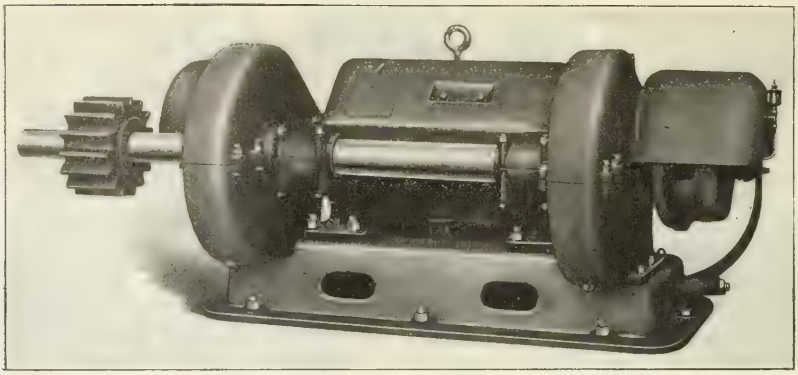


Fig. 3.—A Photographic View of the Drive, Drawings of Which Are Given in Fig. 2.

will if simple construction is regarded necessary. There are controllers which under favorable conditions protect the motors, but they are complicated, involving solenoids, plungers, contacts for making and breaking full-load motor current, interlocking devices, circuit breakers, &c., requiring care to maintain their adjustment, frequent renewal of parts, and an expert to keep them in condition.

The Induction Clutch.

A continuous running motor, used with the electrical induction clutch gearing made by the Wheeling Mold and Foundry Company, Wheeling, W. Va., can be started under no load and requires no controller except an ordinary starting box. The motor as well as the clutch gearing and driving machinery, because of properties inherent in the clutch, are protected against careless handling. In addition to being simpler and more fool-proof, this drive insures quicker acceleration on account of not having to handle the high inertia of the motor armature.

The construction of the clutch is shown in Fig. 1, and examples of its applications in the other illustrations. In the longitudinal section in Fig. 1, the relatively light spider *a*, containing at its center a bearing bushing *b* loose on the shaft and at its circumference holding a ring of copper *c*, is the driven member of the clutch, which may deliver power directly or through a pulley or pinion mounted on its hub. All other parts mounted on the shaft revolve with it and constitute the continuously running driving member. Except for the collector rings *d*, this has only three parts—two steel castings *e* and *f* and a bobbin between them holding the exciting coil *g*. The two castings form a magnetic circuit broken by the air gap at the circumference in which the copper ring *c* is situated. The castings are cut away at the outside to concentrate the magnetic flux at eight poles, leaving spaces between them through which there are no magnetic lines except the few due to leakage. The copper ring has ample running clearance between the oppositely facing poles.

When current is flowing in the exciting coil and the driving member is revolving, the copper ring is dragged after the driving member by mutual attraction of the magnetic flux and the eddy currents set up in the copper. The action is the same as that in an induction motor except that the revolving field is fixed relative to the driving member and is revolved mechanically by revolving that member.

The clutch is thrown into action by turning current into the exciting coil through brushes which bear on the collector rings. When this circuit is broken the clutch instantly releases. The forces on the copper ring being tangential, the ring has no tendency to be drawn to the poles on either side, and, since there is no friction, there is no wear. The relations between slip and torque are substantially the same as those obtained in an induction motor and variations in these relations can be produced by making the ring thicker or thinner in the web or flanges or both, or by varying the strength of the exciting current. Greater or less exciting current gives greater or less torque for the same slip, and conversely less or greater slip for the same torque. The speed of the driven member may thus be controlled by varying the strength of the exciting current, but unless speed control is wanted it is most economical to throw on the full exciting current because then the clutch transmits a certain torque with the minimum slip.

The Clutch Ratings.

It is the practice to rate these clutches at the power which they can transmit at an efficiency of 90 per cent. at a given rate of speed. For example, a clutch rated at 25 hp. at 500 rev. per min. receives that power at that speed on the driving side and delivers 22½ hp. at 450 rev. per min. from the driven side. The loss in the clutch is a speed loss due to slip, but the full torque is transmitted. When only one-half rated torque is called for, the slip will be only about one-half as great, and the efficiency 95 per cent. At more than full load torque the clutch

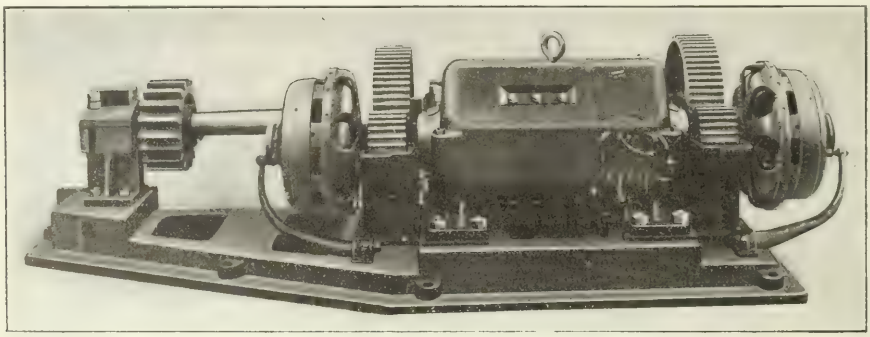


Fig. 4.—A View from the Opposite Side of a 75 Hp. Rolling Mill Reversing Drive.

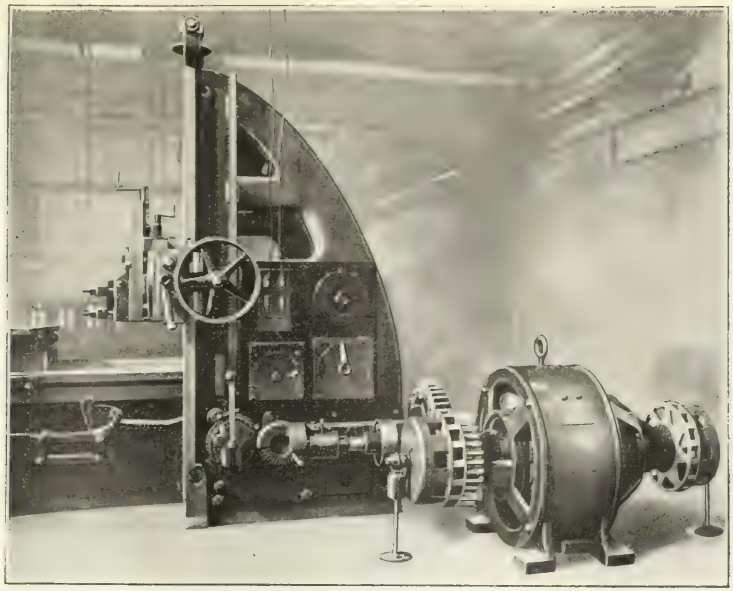


Fig. 5.—A Planer Equipped with the Induction Clutch Reversing Gearing

loses more than 10 per cent. of the revolutions of the driving member. The limiting torque transmitted is usually fixed at 50 per cent. above full load rated torque; then the driven side of the clutch is stalled, but the driving side continues to revolve without exceeding the 50 per cent. overload on the driving motor, all the power being converted into heat in the copper ring. This heat is dissipated by a blast of air thrown against the ring by the revolving poles which act as fan blades. The ring is so proportioned that it heats uniformly and hence does not buckle even at red heat. Freedom for expansion is allowed by holding the ring at its outside circumference by fastenings which allow radial movement but positively rotate the ring with the spider. At full load the ring is hardly warm.

In rating these clutches the temperature rise is not a limiting factor, as with dynamos and motors, because all parts are designed to stand very high temperatures; the copper ring is indestructible, and the exciting coil is wound with asbestos covered wire. The clutches are therefore rated at the pull which they can exert and it is immaterial whether this pull is momentary or continuous so far as temperature is concerned. The clutches are remarkably small compared with the motors whose power they transmit; a clutch of 90 per cent. efficiency usually weighs only one-seventh as much as the motor with which it is used.

Applications of the Clutch.

From the foregoing it is apparent that the clutch is adapted for use between a continuous running motor and driven machinery which must be very frequently started, stopped, and reversed, and is subject to stalling and careless handling. The full exciting current is about two per cent. of the full motor current, and it is only this that is handled by the operating switch, the motor circuit being undisturbed while the drive is in use.

Fig. 2 shows a drive of 50 hp. capacity as built for operating rolling mill tables. The motor is of the Crocker-Wheeler rolling mill type, all parts being extra heavy, especially the shaft, and the same rugged construction is used in the clutch gearing. The motor is compound wound, having a no-load speed of about 700 rev. per min. and a full load speed of 500 rev. per min. The difference between these speeds gives a good range for utilizing the flywheel energy of the motor armature and the relatively heavy driving members of the clutches. The clutches, two in number for reversing drives, are hung on the extended ends of the motor shaft, which is always heavy enough to allow this simple mounting.

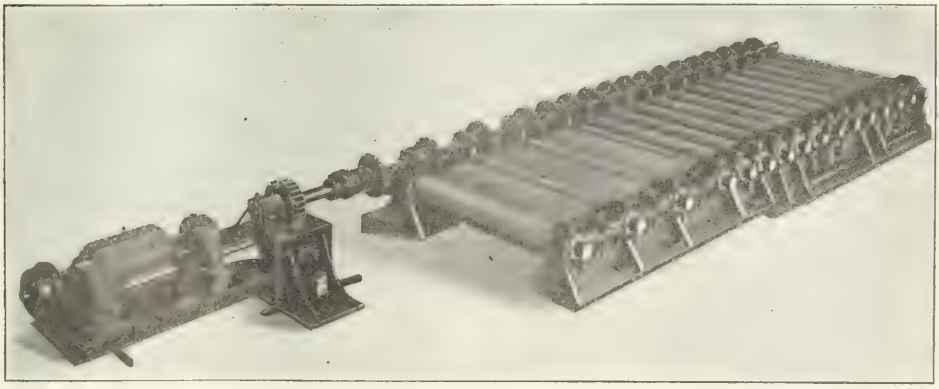


Fig. 6.—Blooming Mill Tables with a 75-Hp. Induction Clutch Drive Such as that Shown in Fig. 4.

The clutch on the right in the front elevation, Fig. 2, carries a gear on its driven member, which meshes a pinion on the motor shaft. The arrangement on the left is the same except that there is an intermediate gear between the driving pinion and gear to give the reverse rotation. The idler turns on a stationary pin held by the heavy gear case, as indicated in the left end elevation. No controller is used except a two-point switch which, for this 50 hp. drive, handles only a 5-amp. clutch exciting current, directing it to either clutch to drive with full power in either direction. Reversing the switch as rapidly and often as possible can do no harm since only 50 per cent. overload can be thrown on the motor even if the back gear shaft is locked, and the clutches are able to dissipate in heat all the power that the motor can deliver to them even under this, the severest condition. As soon as the driven side is unlocked the drive will resume, the action of the clutches being practically the same when red hot as when cold.

On account of the self-induction of the clutch exciting coil a short but definite time is required for the exciting current to reach full strength after the switch is thrown. This reduces the shock to the gears of the driving and driven machinery and contributes to smoothness of operation. The clutch can be made to respond practically instantaneously to the throw of the control switch by winding the exciting coils with heavier wire and limiting the strength of exciting current by external non-inductive resistence left permanently in the exciting current. This has not been found necessary in any work so far encountered, as sufficiently quick response for all practical requirements is obtained by the use of wire small enough to furnish of itself all the resistance needed.

The idler gear bushing and the loose bearing inside the driven spider are lubricated by oil returning bushings which are filled with oil through central holes in the idler pin and motor shaft while the drive is in operation; one filling of oil lasts for 10 days. Other bearings are of the ring oiling type. If the bearings are given oil every few days and the brushes are in contact with the collector rings no other attention is required.

At the Bethlehem Steel Works 13 of these drives, each of 30 hp. capacity, are in use driving reversing tables and manipulators, and one of 50 hp. operating a beam transfer. Ordinarily hydraulic power would have been used for the manipulators on account of frequent stalling, but these drives are declared to be very satisfactory. Two of 50 hp. each are in operation at the South Works of the Illinois Steel Company, driving slabbing mill tables, and two of 75 hp. each are installed at the Ensley plant of the Tennessee Coal, Iron & Railroad Company on roughing mill tables. Views of the rolling mill type of drive are shown in Figs. 3 and 4.

Fig. 5 shows the drive as applied to a planer. This drive is in use on several heavy planers, where it seems to be satisfactory on account of its simplicity, smoothness of acceleration, ability to stall without injury, and ease of control. When used as a planer drive reverse is accomplished by the dogs throwing the control switch and a very simple attachment to this switch gives a large range of cutting and return speeds independent of each other by regulating the shunt field current of the motor. Fig. 6 shows a 75 hp. induction drive with motor attached, temporarily, to heavy blooming mill tables in the Wheeling Mold & Foundry Company's shop.

Another manner of assembling clutch gearing is shown in Fig. 7. In this arrangement the drives with their gears are at one end of the motor with a central driving shaft connected to the motor by a flange coupling. Each spider sleeve has an outside ring oiling bearing on each side of its pinion, so that the sleeve does not come in contact with the driving shaft.

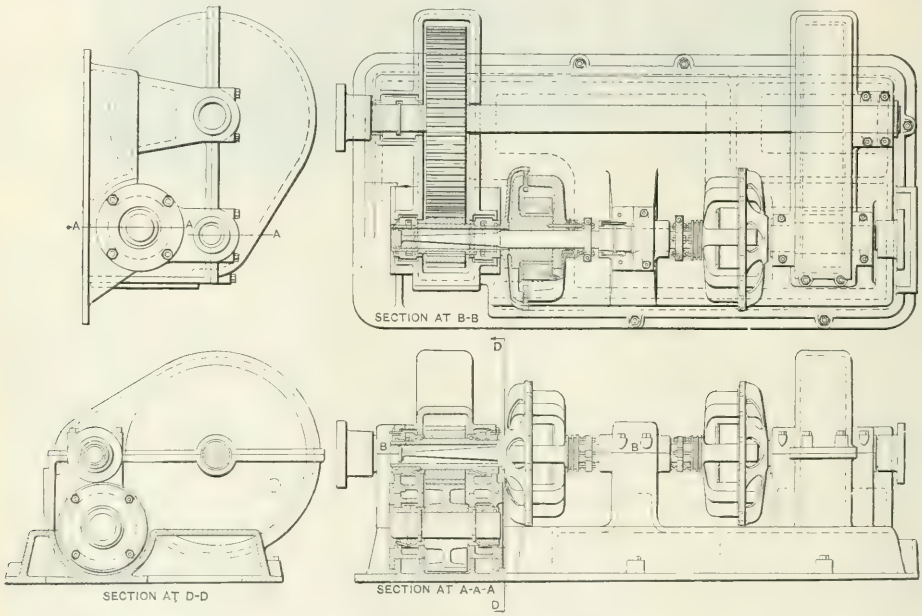


Fig. 7.—Details of a Reversing Drive Built Independent of the Motor and Intended to Be Connected to It at One End.

Performance Tests.

Fig. 8 shows performance curves of a clutch 16 in. in diameter, the abscissas being slip in revolutions and the ordinates torque in pounds at one foot radius and corresponding horsepower at 800 rev. per min. The curves in full lines show performance where a relatively high resistance copper ring is used, and the curves in broken lines that where a relatively low resistance copper ring is used. On each curve is indicated the exciting current used throughout points on that curve. Two amperes at 220 volts is the full exciting current used for this 16-in. clutch. It will be observed from the curves that, other things being equal, a ring of greater conductivity gives greater torque at lower rates of slip than one of less conductivity, and that this condition is reversed at high rates of slip. Hence rings of high resistance are used where high starting torque is desired more than high running efficiency under steady load, and low resistance rings are used where high running effi-

ciency is of greater importance than high starting torque. Both high efficiency in steady full load running and high starting torque can always be obtained if desired by using a larger clutch. By using rings of relatively high resistance a very simple slip control is obtainable by varying the exciting current with the rheostat. The curves show why this can be done over a wider range with high than with low resistance rings.

Field of Usefulness.

The induction clutch is capable of being applied in numerous connections simply as a clutch to be thrown in and out by closing the exciting circuit. However used, it has the property of positively protecting the driving and driven machinery against overload beyond the capacity of the clutch, which capacity is under control by fixing the strength of the exciting current. In reversing drives its most important field seems to be that of rolling mill tables, metal planers, elevators, mine hoists, and reversing rolling mills, using power from either direct or alternating current continuously running motors. The clutch and drive have been redesigned in most particulars to suit requirements for the last two applications named, and give promise of competing with the Ilgner system in simplicity, first cost, and efficiency.

Exclusive rights to the manufacture and sale of the

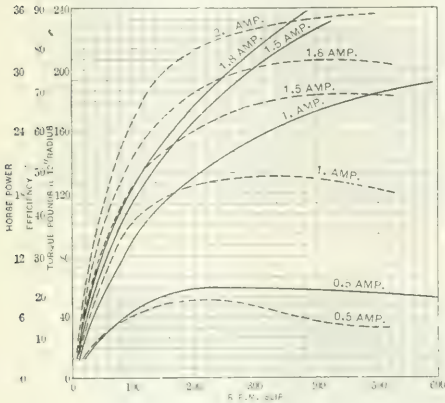


Fig. 8.—Performance Curves of a 16-In. Electric Induction Clutch.

induction clutch in various forms, and of the induction drive, are held by the Wheeling Mold & Foundry Company under patents taken out by A. P. Steckel of Buffalo, N. Y., and F. du P. Thomson of Wheeling, W. Va.

Steel Imbedded in Concrete.

The London *Times Engineering Supplement* published the following report by R. T. Glazebrook, director of the National Physical Laboratory, of the result of investigations undertaken at the request of Sir John Brunner:

A strong wooden box was made and divided into five partitions, each partition being 12 in. long, 7½ in. wide and 7½ in. deep. Specimens of mild steel of the following dimensions were prepared: 1. One inch diameter, 8 in. long, turned all over. 2. Eight-inch lengths cut from a 1½ x 1½ in. bar with the scale left on. The partitions were half-filled with good Portland cement concrete and a specimen of each kind laid on the top, and the partitions were then filled up. This was done on December 21, 1906. The blocks were covered with water several times a week for a year, and for three months afterward were left in the open subject to the weather. On April 20 one of the blocks was removed from the box and broken up, and the specimen removed. On examining the specimens carefully no trace of any action by the cement could be detected. The turned specimen was practically as bright as when it was put in, and the scale on the rough specimen was undisturbed. To test the possibility of any slight action the surface of the turned specimen was polished and etched and examined under the microscope side by side with a specimen of the same material cut from the center of the bar. No difference in the micro-structure of the two specimens could be detected, and the conclusion is that in 16 months no action has taken place between the metal and the concrete. It is proposed to immerse one of the remaining blocks in the comparatively warm water of the cooling pond for six months and then to examine the specimen.

The Philadelphia Foundrymen's Association.

The one hundred and seventy-eighth regular monthly meeting of the Philadelphia Foundrymen's Association, the last before the summer recess, was held at the Manufacturers' Club on the evening of June 3. President Thomas Devlin was in the chair. The business transacted was largely of a routine nature. The treasurer's report showed a balance of $2481.31 on hand, with all indebtedness paid.

The secretary read the various circular letters sent out by Dr. Richard Moldenke, secretary of the American Foundrymen's Association, regarding the Toronto convention, and it was noted that a good number of foundrymen from Philadelphia and vicinity had expressed their intention of attending.

A. A. Miller, secretary of the Committee of Representatives of the Consignors, Transportation Companies and Consignees, which held a meeting to consider the question of discrepancies in shipping and outturn weights of pig iron, coal and coke in Philadelphia March 18, presented the final report of that committee. This comprised a publication of 74 printed pages. The statement was made that an understanding had—in a measure—been arrived at with some of the transportation interests and shippers, particularly regarding coke, whereby methods of check weighing might be employed to meet the railroads' requirements to establish losses of material in transit, and also to establish the correctness or incorrectness of the marked tare weight on cars. Transportation interests declared that, to obtain a check weight establishing a loss of coke in transit, it would be necessary for the consignee to use the same methods in weighing at the delivery point as at the shipping point. Cars must be weighed on railroad track scales by representatives of the railroad company and the marked tare used as the light weight of the car. Errors in marked tare may be arrived at by the same method of weighing, after the car had been cleaned out to the satisfaction of the railroad company's representative. A number of the transportation companies expressed a willingness to allow for shortages, if established to their satisfaction by approved methods, and after such allowances had been made by the railroads the shippers (where railroad weights govern the shipment) expressed a willingness to reimburse the consignee for shortages in material delivered.

Fire insurance was the special subject under discussion at this meeting of the association. The subject was presented in an able manner by Louis S. Amonson, president of the People's National Fire Insurance Company, Philadelphia, who treated the question along broad lines rather than from a technical standpoint.

Following the meeting a luncheon was served on the roof garden of the club.

Postmaster-General Meyer announced June 3 that an agreement had been reached with the British Government providing for a letter postage of 2 cents an ounce between the United States and Great Britain and Ireland to become operative October 1, 1908. It is not improbable that in the near future, a reciprocal rate of 2 cents an ounce on letters will be in effect between the United States and Italy, Germany, France and other European countries.

The American Roll & Foundry Company, Canton, Ohio, has just completed a 40-in. slabbing mill for the Ohio Works of the Carnegie Steel Company, Youngstown, Ohio.

A Carlin Grinding Pan Installation.

In its new open hearth steel plant at Monessen, Pa., the Pittsburgh Steel Company is installing a complete equipment for crushing and grinding clay in preparing the refractory linings for furnaces and ladles. This includes a crusher, belt conveyer, dry and wet pans, &c., furnished by Thomas Carlin's Sons Company, 1600 River avenue, North Side, Pittsburgh, Pa., all arranged to be driven by Westinghouse direct current motors.

The view of the machinery given in Fig. 1 shows the crusher in the foreground. This is of the unmounted Blake type with 20 x 12 in. openings, and will be belted to a 30 hp. motor running at 1025 rev. per min. and supported from the ceiling. This crusher will reduce the ganister, dolomite, &c., to about two in. size before calcining.

The dry pan is also shown in Fig. 1 and is of the Carlin standard type, 9 ft. in diameter. This will be used for grinding clay, lime, &c., in a dry or semi-dry state. The pan proper is a single casting with heavy deep ribs underneath, and a false or removable bottom beneath the tread of the rolls. The perforated plates are bolted to the arms of the pan and have chilled openings insuring uniformity and preventing excessive wear. The pan when running at its proper speed causes the ground

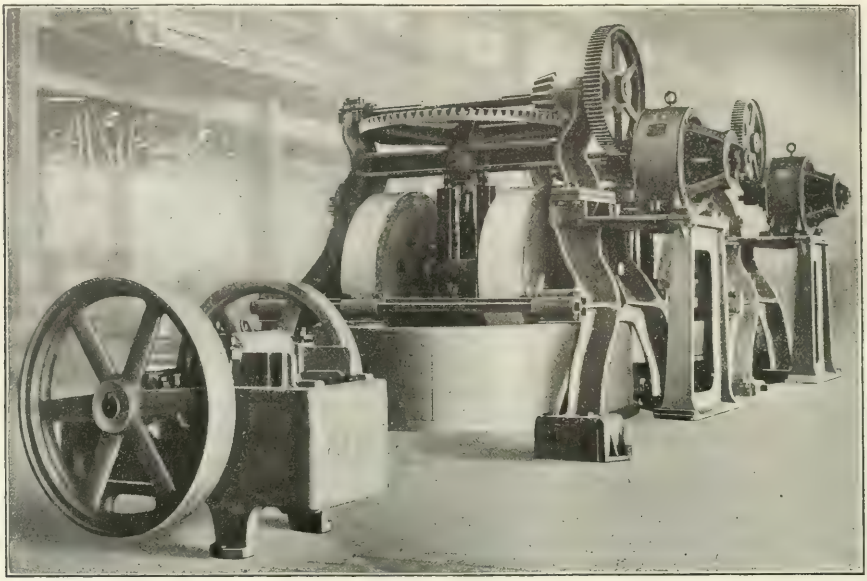


Fig. 1.—The Crushing and Grinding Equipment Furnished the Pittsburgh Steel Company by Thomas Carlin's Sons Company, Pittsburgh, Pa.

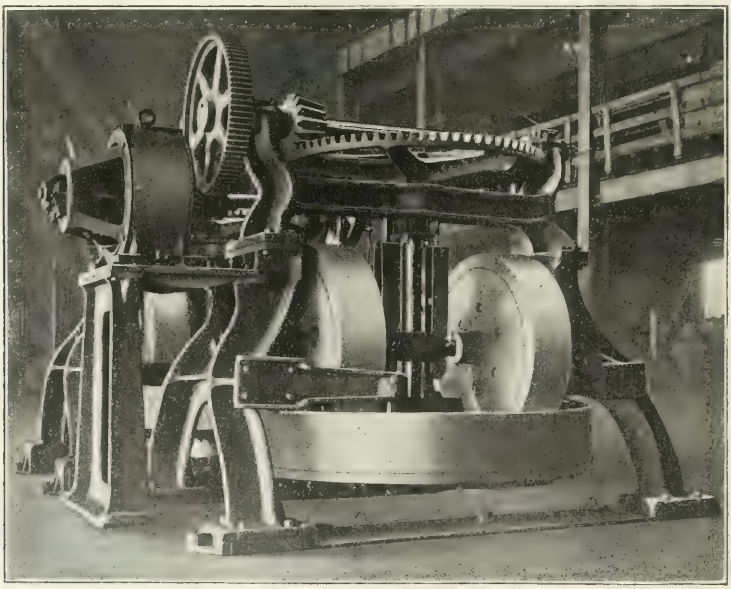


Fig. 2.—The Carlin Standard 8 Ft. Wet Pan Grinder.

material to slide to the outer edge and over the sifter plates; that sufficiently fine falls into a stationary iron catch pan and that too coarse is thrown under the rolls again by stationary scrapers which can be adjusted. The ground material in the catch pan is drawn by scrapers attached to the arms of the revolving pan to an opening leading to a bucket elevator. The elevator is operated by a 5-hp. motor and a series of bins are provided for storing the different materials. The dry pan is directly connected to a 40-hp. direct current motor mounted on an extended casting. This outfit weighs 52,000 lb.

The wet pan is shown in Fig. 2 and is of the Carlin standard type, 8 ft. in diameter. This machine is provided with a rigid iron housing, and is fitted with patent rolls, the shafts of which are supported at either end by coil springs, tool steel toe and hard bronze plate heavy gearing, &c. The pan bottom has deep, heavy arms to support the weight of the unusually heavy rolls, with a large bearing on the vertical shaft and its collar. Its rim is removable. The false bottom plates are made of a special mixture of iron and are secured in place with taper head bolts in the path of the rolls. This pan is directly driven by a 40-hp. motor, and the total outfit weighs 44,500 lb.

The plant is complete is every respect and will enable the Pittsburgh Steel Company to prepare its refractory lining material to advantage at its own plant.

The Monarch Valve Seat Grinder.

Although intended primarily for grinding the seats of locomotive slide valves, the Monarch valve seat grinder, invented by J. A. Chadwick, Moberly, Mo., and made by the Quincy Enameling & Foundry Company, Quincy, Ill., is not strictly limited to this service. It is, however, especially adapted to locomotive work and is said to be the only machine of the kind regularly manufactured for this specific purpose.

Both in its construction and operation the machine is exceedingly simple. As may be seen in Fig. 1, it is composed of an abrasive wheel mounted on the extension of an air motor shaft, the whole being supported on a frame consisting of two parallel guide rods with housings set on cross travel rails. Being light and portable the machine is set over the valve seat of a locomotive steam chest as shown in Fig. 2, and is bolted thereto with studs or cap screws extending through the slots in the guide rails.

The cutting and travel feeds are under hand control. The former is regulated by the feed screw above the machine which raises and lowers the wheel and the cross feed is controlled by a feed screw at the back of the grinder turned by the small crank observed at the extreme right corner of the frame. The grinder is driven by a specially designed air motor, the throttle of which is controlled by a conveniently placed thumb lever. For taking up wear in the working parts journals with taper bearings running in bronze bushings with suitable lock nuts have been provided, thus avoiding the necessity of frequent rebushing.

No special skill is required to operate the machine, and an ordinary mechanic should be able to do accurate work and finish the seat true and smooth regardless of hard spots or hard castings that may be encountered. It is obvious from the character of the grinder that it can be used with equally good results upon any flat surface job within the range of its capacity where a smooth and accurate finish is desired.

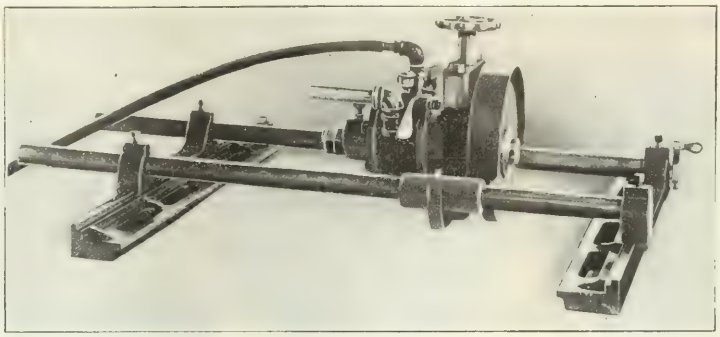


Fig. 1. The Monarch Valve Seat Grinder Sold by the Quincy Enameling & Foundry Company, Quincy, Ill.

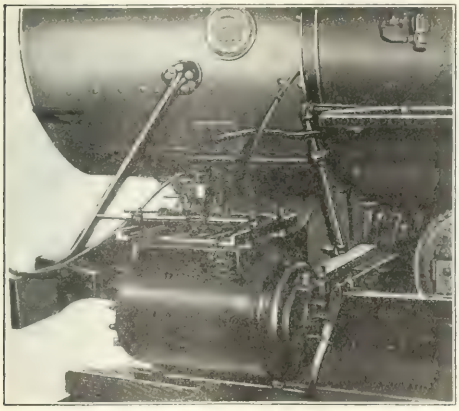


Fig. 2.—The Machine in Use Grinding the Seat of a Locomotive Slide Valve.

A Frevert Souvenir.

An interesting little puzzle is being distributed by the Frevert Machinery Company, 18 Dey street, New York City. It consists of two small metal pieces fitted together with what appear to be opposing dovetails, so that at first glance it looks to be impossible to separate the parts, the dovetails being undercut in the two directions that evidently are the only ones in which the parts could slide apart. While the joint is perplexing to the average person, most carpenters would recognize it as what is known as a dovetail halved joint with two bevels, although it is very seldom used in practice. As a matter of fact it is not what it appears to be—a double dovetail, but a single dovetail inserted endwise on a slight angle so that at the abutting end the groove is deeper than at the outer end, consequently the exposed side appears deceptively to be another dovetail. The parts are simply held together by friction, and what is perhaps most interesting is the fact that the parts were cast to fit and not machined.

The report of H. S. Pell, receiver of the Niles Boiler Works, Niles, Ohio, has been filed. The total amount of claims filed is $111,276.66. The receiver recommends the allowance of $109,969.21 on these claims.

Examination of a 100-lb. Rail.

BY G. B. WATERHOUSE, PH. D.

(*With Supplement.*)

The strength, composition and structure of the material in different parts of rail have always been somewhat unsettled points. The work described in this article bears directly on these questions, and serves as a contribution to our knowledge of rails and rail steel.

In order to obtain material for the tests, a first quality rail was taken from stock—weight 100 lb. to the yard and section advocated by the American Society of Civil Engineers; in other words, a 100-lb. A. S. C. E. rail. The steel was made by the acid Bessemer process and the ingots were rolled without reheating.

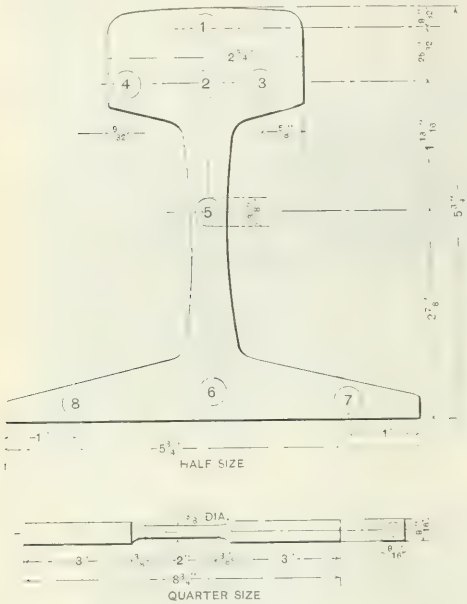


Fig. 1.—Position, Numbers and Dimensions of Test Pieces in the Examination of a 100-Lb. A. S. C. E. Rail.

From this rail two adjacent pieces 8¾ in. long were cut with a slow speed cold saw, and from these pieces tensile tests were machined of the dimensions and in the positions shown in the drawing, Fig. 1. The results of the tensile tests are given in the following table, the figures being the average of those obtained from the duplicate pieces:

Table 1.—Tensile Tests.

No.	Elastic limit.	Ultimate stress.	Elongation. Per cent. in 2 in.	Reduction of area. Per cent.
1	52,290	108,400	16.75	29.9
2	52,200	109,850	16.25	28.4
3	54,460	110,750	18.50	33.2
4	55,000	110,150	18.50	28.6
5	53,100	110,300	18.25	29.4
6	53,820	110,400	18.00	31.0
7	51,740	109,850	18.25	35.4
8	53,340	111,300	17.00	36.4

Drillings were taken from the ends of the test pieces, which gave the following results on analysis, the figures having been averaged as before:

Table 2.—Analysis.

No.	Car.	Sil.	Man.	Sul.	Phos.	Copper.
1	0.52	0.140	0.77	0.074	0.089	
2	0.51	0.145	0.77	0.076	0.089	
3	0.52	0.152	0.77	0.079	0.090	
4	0.52	0.144	0.77	0.078	0.090	0.185
5	0.52	0.150	0.78	0.077	0.090	average.
6	0.50	0.146	0.76	0.080	0.089	
7	0.53	0.153	0.77	0.080	0.090	
8	0.52	0.147	0.77	0.080	0.090	

Pieces were also cut from the ends of the test pieces and prepared for microscopical examination. Photographs were taken at a magnification of 70 diameters, as nearly the center of the positions shown in the sketch as possible. These are reproduced in the accompanying plate. The transverse sections are those looking at the end of the rail, while the longitudinal are those looking from the side. They correspond, therefore, with a front and side elevation.

Consideration of Results.

The average composition of the rail is:

	Per cent.		Per cent.
Carbon	0.51	Sulphur	0.078
Silicon	0.147	Phosphorus	0.089
Manganese	0.77	Copper	0.185

The analyses from the different positions show that the steel is very uniform, none of the figures departing greatly from the average. The physical tests also show the steel to be very uniform in its mechanical properties, particularly in regard to ultimate stress. The elastic limit was taken by observing the drop of the beam and the other measurements obtained in the usual way. The effect of the greater amount of work on the web and flanges is not pronounced, the only notable difference being in the reduction of area.

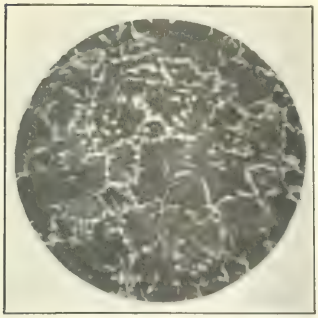
The microphotographs of Nos. 1 to 6 indicate that the finishing temperature was also of considerable uniformity, for the transverse sections are very similar in pattern and in size of crystals. The much lower temperature of the flanges is well illustrated by the photographs of Nos. 7 and 8.

The correlated evidence of the chemical, mechanical and microscopical results is that the steel is of very good and even quality, which is also supported by the print given in Fig. 2 of a polished section of the rail, etched in hydrochloric acid, 1 to 1, for 20 hr.

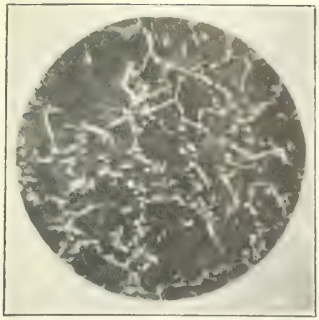


Fig. 2.—Photographic Reproduction, Half Size, of a Polished Section of a 100-Lb. Rail, Etched in Hydrochloric Acid, 1 to 1, for 20 Hr.

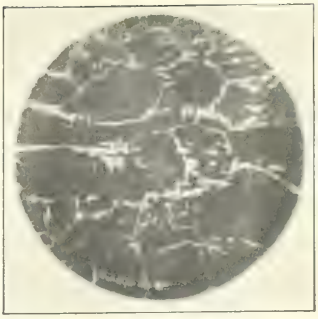
The Iron City Coal & Coke Co., Pittsburgh, Pa., has purchased three-fourths of the capital stock of the Peerless Connellsville Coke Company. The latter company is capitalized at $40,000, and owns and controls approximately 50 acres of the 9 ft. Connellsville vein of coal. This includes adjoining coal to its property, part of which is under an option, and the balance can be secured when needed. The plant is located at Alverton, Pa., on the southwest branch of the Pennsylvania Railroad near Scottdale, includes 32 ovens at present, and is a fully equipped modern coke plant. The Frick Coke Company has three large plants at this point, and the Rainey interest has one. G. W. Wilson, vice-president of the Iron City Coal & Coke Company, has been elected president of the Peerless Connellsville Coke Company. The plant is now in full operation, and the coke is sold ahead on contracts for 60 days.



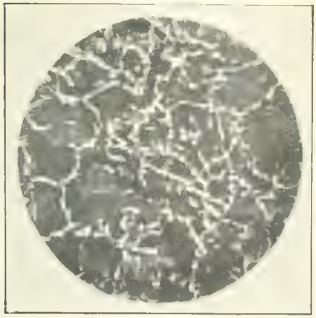
No. 1.—Transverse



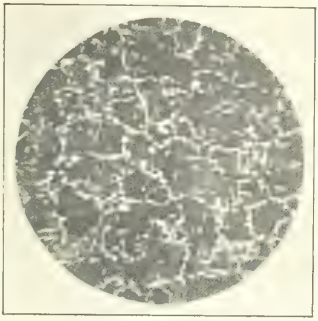
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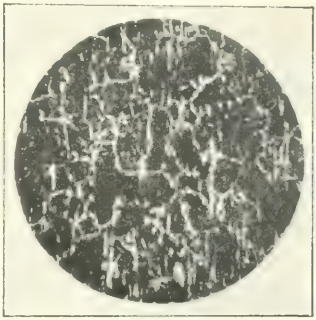
No. 2.—Longitudinal



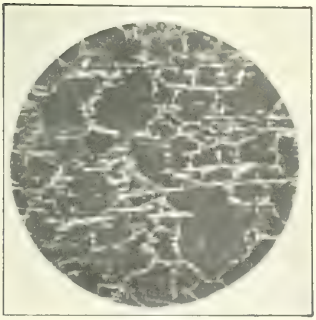
No. 3.—Transverse



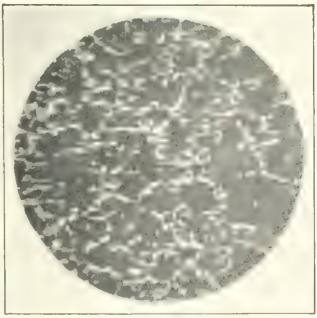
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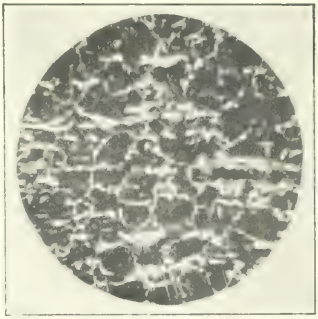
No. 5.—Transverse



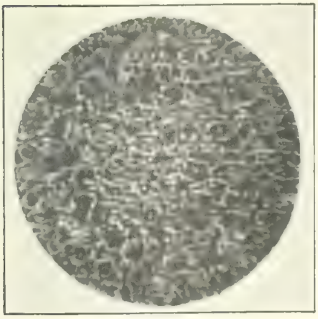
No. 5.—Longitudinal



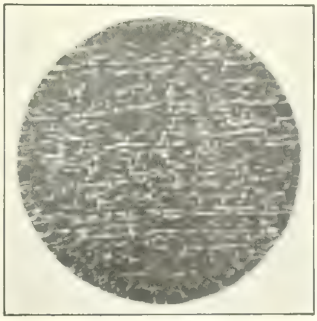
No. 6.—Transverse



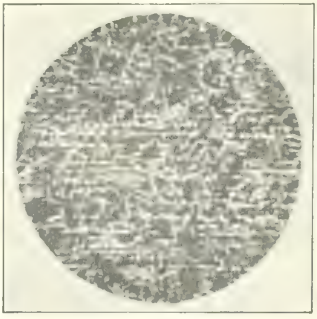
No. 6.—Longitudinal



No. 7.—Transverse



No. 7.—Longitudinal



No. 8.—Longitudinal

Microphotographs of Portions of the Rail, Magnified 70 Diameters. Etched in Diluted Nitric Acid

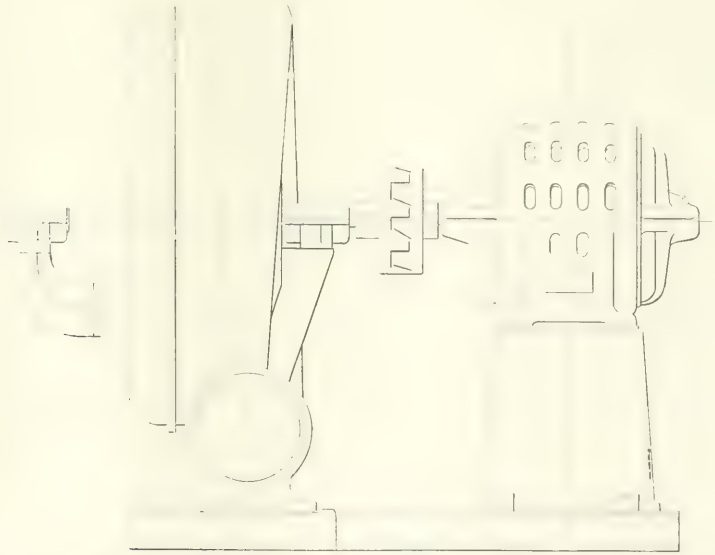
EXAMINATION OF A 100-LB. RAIL

Buffalo Compound Pressure Blowers.

Since the pressure at which air is delivered by a centrifugal fan is determined by the peripheral speed of the blast wheel, fans of large size generally cannot be driven by direct connection to electric motors because the speed of the latter is limited. Where a pressure of over 6 or 8 oz. is required it is necessary to drive the ordinary blower with a belt. Such outfits require more floor space, more attention to bearings and are also less efficient than the direct connected sets.

The Buffalo Forge Company, Buffalo, N. Y., builds a compound blower which will deliver the air at double the pressure of the simple fan with the same diameter blast wheel when run at the same speed. This permits blowers of practical and efficient proportions to be directly connected to large motors of 50 to 75 hp. The blast wheels are mounted on a single shaft and incased in a cast iron housing, built up in transverse sections, permitting the interior parts to be easily inspected or removed. These [illegible] stages.

A number of these fans of the larger sizes have been installed by the Lehigh Valley Railroad; Fanner Mfg. Company; Strong, Carlisle & Hammond Company, and the Indiana Steel Company of Gary, Ind. Two are now being constructed for the latter to supply blast to the cupolas at a pressure of 16 oz. per square inch. Each fan will deliver a maximum of 9500 cu. ft. of air per minute at this pressure when running at 1420 rev. per min., and will be driven by a 75-hp. General Electric form K three-phase 440-volt 25-cycle induction motor. Each blower with its motor is mounted on a cast bed plate, occupying a floor space of 7 ft. 3 in. and the height is about 7 ft., or the same as a simple blower of this capacity delivering the air at one-half the pressure. Connection between each blower and motor is made with a flexible coupling designed by the Buffalo Forge Company, which, in addition to being flexible, acts as an insulator between the motor and the blower; there is no metal contact, the torque being transmitted through solid rubber cylinders imbedded in machined grooves in each half of the coupling.



[illegible] Buffalo Compound Pressure Blower Direct Connected to an Electric Motor.

wheels are of a special design, the arms being secured to the hub tangentially instead of radially, the usual practice. This eliminates the necessity of bending the T irons through a large angle, which, in addition to weakening the wheel, offers more resistance to the flow of air.

One inlet is on the side opposite the motor and, being unobstructed, can be made of smaller diameter. The advantage of this is that the air entering the fan does not strike a part of the blade, which is moving at a high velocity, until the direction of the air has changed and the air itself has attained a high velocity. The curvature of the blade is such that the velocity of the air is gradually increased as it approaches the tip, at which point the velocity of the air is slightly above that of the blade. The air from the first stage is discharged into a pressure chamber around the entire circumference of the wheel, and at a pressure approximately half the total pressure at which the air is discharged. The air next enters the second stage, in which the blast wheel is the same as in the first. The scroll in this stage is involute in form and so designed as to increase the area in the casing directly as the increase in volume of air discharged from the blast wheel through [illegible] rev. turbine. Substantial [illegible] bearings are provided, one on each side of the housing, as shown in the illustration herewith, and when the width of the blower is sufficient to require such, another bear-

The Buffalo Forge Company makes these blowers in all sizes up to capacities of 12,000 cu. ft. of air per minute, at any pressure up to 24 oz. per square inch.

An Arkansas Valley Improvement Project.—A recent convention held in La Junta, Colo., and attended by over 400 delegates representing the business interests of the Arkansas Valley, including the 27 towns located in that territory, was called to formulate plans for the carrying out of an extensive power, irrigation and transportation enterprise. Construction of the proposed systems involves a cost roundly estimated at about $15,000,000, and embraces the building of a large dam for irrigation and power purposes, the installation of a hydro-electric plant and the building of about 350 miles of electric railroad through the Arkansas Valley. A committee on organization composed of prominent financial men from the districts interested was selected, and at a subsequent meeting prepared the application for incorporation. Among those named as prominently connected with this movement are Gov. Alva Adams, Pueblo, Colo.; F. D. Pastorius, Colorado Springs, Colo.; J. A. Lockhart, Rocky Ford, Colo.; Robert Patterson and A. B. Hulit, La Junta, Colo.

The Brown Iron Ores of Alabama.—II.

BY WILLIAM B. PHILLIPS.

Having in the first article of this series briefly sketched the geological horizons in which brown ores may be found, we now propose to discuss the mode of their occurrence, methods of mining, washing and concentration and the use of this variety of iron ore in the blast furnace. In so far as concerns the geological relations of these ores and their occurrence in the State, acknowledgments are freely made to the publications of the Alabama Geological Survey, especially the two volumes by the late Henry McCalley entitled "The Valley Regions of Alabama," published in 1896. In these reports Mr. McCalley collected a vast fund of data concerning the occurrence of brown ores in Alabama, and the reader is referred to them for more specific information.

Before taking up methods of mining, washing, &c., it might be well to devote this article to certain general features of the brown ore industry. The table below gives the production of hematite (red ore), limonite (brown ore) and pig iron in Alabama for the 17 years ending with 1906. There is also a column giving the proportional production of brown ore. Some of the brown ore used in Alabama has come from Georgia and Tennessee, but the total amounts are not of great moment, so far as concerns the purpose of the table:

Production of Iron Ore and Pig Iron in Alabama, Gross Tons. 1890-1906.

Year.	Hematite (Red ore).	Limonite (Brown ore).	Total ore.	Per cent. of brown ore.	Pig Iron.
1890	1,538,297	359,518	1,897,815	18.9	816,911
1891	1,524,783	462,047	1,986,830	23.3	795,672
1892	1,657,028	655,043	2,312,071	28.3	915,296
1893	1,281,292	461,118	1,742,410	26.5	726,888
1894	1,182,362	310,724	1,493,086	20.8	592,392
1895	1,830,987	368,403	2,199,390	16.7	854,667
1896	1,694,948	346,845	2,041,793	16.9	922,170
1897	1,738,583	360,038	2,098,621	17.1	947,831
1898	1,853,111	548,637	2,401,748	22.9	1,033,676
1899	1,911,097	751,846	2,662,943	28.2	1,083,905
1900	1,989,689	769,558	2,759,247	27.9	1,184,337
1901	2,070,422	731,310	2,801,732	26.1	1,225,212
1902	2,565,635	1,008,839	3,574,474	28.2	1,472,211
1903	2,779,691	905,260	3,684,951	24.6	1,561,398
1904	2,894,423	787,514	3,681,937	21.4	1,453,573
1905	2,974,413	781,561	3,755,974	20.9	1,604,062
1906	3,173,797	821,301	3,995,098	20.6	1,674,848
Total tons and average per cent.	34,660,558	10,429,562	45,090,120	23.1	18,865,049

An examination of the table will show that in the last 17 years the production of hematite ore has been 34,660,558 tons, with a maximum production of 3,173,797 tons in 1906. The production of limonite or brown ore in this period was 10,429,562 tons, with a maximum of 1,008,839 tons in 1902. The total production of hematite and limonite in the 17 years was 45,090,120 tons, and of this total the production of brown ore was 23.1 per cent. on the average. The largest proportional production of brown ore was 28.3 per cent. in 1892, and the smallest was 16.7 per cent. in 1896.

The production of the so-called gray ores from the Sylacauga District, formerly classed as magnetite, but now as hematite, while encouraging from the standpoint of a future supply of ore, does not affect the general results.

Red Ore and Brown Ore Production.

In the 17 years under consideration the production of brown ore has been about one-third of the production of red ore and over one-fifth of the entire production of ore. Some of the brown ore mined in Alabama goes to furnaces outside of the State, but this is counterbalanced by the ore brought in from other States. We may, therefore, take the figures given in the table as representing, with a reasonable degree of accuracy, the situation of the brown ore industry with respect to the production of nearly 19,000,000 tons of pig iron.

The use of brown ore in the Alabama furnaces has varied from 16.7 per cent. in 1895 to 28.3 per cent. in 1892, the general average being 23.1 per cent. In other words, for each 1000 tons of red ore used there have been used 332 tons of brown ore in the production of 18,865,049 tons of pig iron. This statement does not represent the proportional production of pig iron from these ores, for the reason that the brown ore carries more metallic iron than the red ore; and this excess has been, it is thought, an average of five points in the period named in comparison with the soft (lime-free) red ore and 10 points in comparison with the hard (limy) red ore.

The table shows that for the 17 years there were required for a ton of pig iron an average of 2.39 tons of ore, the average content of metallic iron in the ore being 41.84 per cent., which is very close to the average content of iron in the soft ore of the Birmingham district. The average content of iron in a fair brown ore may be taken at 47 per cent. On this basis the 10,429,562 tons of brown ore mined in Alabama in the period named would represent 4,896,481 tons of pig iron, leaving 13,968,568 tons to be derived from the hematite (red ore, both lime-free and lime-bearing). In other words, practically 26 per cent. of the production of iron during the 17 years, ending with 1906, was due to brown ore and 74 per cent. to red ore.

Virginia a Brown Ore State.

It is interesting to compare Virginia and Alabama in this connection. In the 17 years ending with 1906 the production of red ore in Virginia (and West Virginia) was 455,041 tons and of brown ore 12,269,542 tons. Virginia has been the largest producer and user of brown ore, exceeding Alabama in this period by 1,739,980 tons. For the 17 years the production of pig iron in Virginia was 6,616,459 tons, nearly all of it from brown ore. It is not likely that more than 200,000 tons of pig iron have been produced in Virginia from red ore in the years under consideration, leaving 6,416,459 tons to be derived from brown ore, or 1,519,978 tons more than was produced in Alabama in the same period from similar ore.

Incidentally it may be remarked that the quality of the Virginia brown ore is superior to that of the Alabama ore, this difference being about five points in metallic iron.

The Rate of Increase in Red and Brown Ores.

Do the statistics given in the table indicate a tendency on the part of the Alabama furnacemen to use increasing proportions of brown ore? It cannot be said that they do. The general average for the period was exceeded in only seven years, and then the excess was not notable. The statistics indicate clearly that from one-fourth to one-fifth of brown ore is used and that this proportion maintains a fairly constant figure. Are there any indications that the use of brown ore will increase in Alabama and that the next few years will show a decidedly different state of affairs? Upon the answer to these questions depends the future of brown ore mining in Alabama and the utilization of the extensive deposits of brown ore that are to be found here.

What encouragement is to be held out to those who propose to acquire brown ore lands either for investment or for practical operations? What is the next period of, say, five years, to show in the direction of ore production and consumption? A closer study of the table may throw some light on this very important question. In 1890 the production of red ore was 1,538,297 tons. In 1906 it was 3,173,797 tons, an increase of 1,635,500 tons; so that we now mine a little over 2 tons for each ton mined in 1890. In 1890 the production of brown ore was 359,518 tons and in 1906 821,301 tons, an increase of 461,783 tons; or we now mine 2.28 tons for each ton mined in 1890. The proportional increase in the production of brown ore is a little in excess of the proportional increase in the production of red ore.

Perhaps it is not exactly fair to go back as far as 1890, because the iron industry was then, so to speak, feeling its way along. It was not until 1898 that the production of pig iron reached the million ton mark and not until 1905 did it exceed the million and a half ton mark. In 1894 there were in Alabama 38 completed stacks and of these only four were of a hight of 80 ft. Ten years later, in 1904, there were 43 completed stacks, and 15 of these had a hight of 80 ft. The period immediately

preceding 1904 was characterized by the erection of larger furnaces, whether new ones or old ones remodeled. In spite of the fact that for each of the four years preceding 1902 the production of pig iron was in excess of 1,000,000 tons, it is thought that Alabama caught her stride about the year 1902, when it became apparent that larger furnaces were demanded.

Future Production Computed on Percentage Increase.

But the larger furnaces and the more active demand for ore to supply them have not brought about a larger relative consumption of brown ore. It maintains its normal ratio of between one-fourth and one-fifth. For the 10 years 1897-1906 the production of pig iron was 13,241,053 tons, as against 6,993,349 tons in the ten years immediately preceding, 1887-1896. Of the 13,241,053 tons produced between 1897 and 1906, 7,766,102 tons, or more than 51 per cent., has been produced in the five years ending with 1906. In other words, in the twenty years ending with 1906 the production of pig iron in Alabama was 20,234,402 tons, and of this amount 7,766,102 tons, or more than 38 per cent., has been produced in the five years ending with 1906. This is an increase of 7.6 per cent. a year. If this ratio of increase is kept up we may expect a production of 2,316,290 tons in 1911. If it is (and "if" is a word of large import) we may expect an ore production of 5,500,000 tons in 1911, provided the quality of the ore remains the same. On this assumption there will be an increase in ore production of 1,530,835 tons, or 306,167 tons a year for five years. Under the conditions which have obtained in Alabama in the 17 years we have been considering, the amount of brown ore mined each year for the next five years should be as follows:

	Tons.
1907	892,719
1908	964,137
1909	1,035,555
1910	1,106,973
1911	1,178,391
For the five years	5,177,775

This is the business which brown ore miners may reasonably expect, it is thought, provided there is no serious backset to the iron industry. How much more they can expect depends upon the quality of the ore and the regularity with which it can be supplied.

Increased Use Contingent on Improved Quality.

A careful survey of the entire field of ironmaking in Alabama leads to the conclusion that a great deal more brown ore would be used if it were of a better quality and if regular shipments could be made. In the present depressed condition of the trade it is thought that considerable contracts for brown ore could be made if the quality could be guaranteed to be not less than 50 per cent. of metallic iron and not above 0.50 per cent. of phosphorus.

The production of brown ore last year was less than the amount indicated by the above figures and will be less this year. But the business offering during the period 1907-1911 will depend, on the whole, upon the quality of the ore. There is a wide field in Alabama for the mining of brown ore, provided there is a considerable improvement in the quality.

The articles to follow will indicate, it is hoped, how this may be done profitably.

The United States Court of Appeals, sitting at Boston, has handed down its decision in the patent suit of the Hendey Machine Company, Torrington, Conn., against the Prentice Bros. Company, Worcester, Mass., alleging infringement of the patent covering the so-called quick change feed device. The court finds for the defendant, setting forth in the decision that there is no infringement.

The Morgan Construction Company, Worcester, Mass., is completing the installation of a double strand Morgan continuous rod mill for the Société Anonyme d'Ougrée-Marihaye, Ougrée, Belgium. This mill is a duplicate of the Morgan mill now operated by Aciéries & Laminoirs de la Plaine, St. Denis, in Paris, except that it has been arranged to roll 400-lb. coils.

The Mechanical Engineers' Spring Meeting.

Following is the programme of the spring meeting of the American Society of Mechanical Engineers, to be held at Detroit, Mich., June 23 to 26:

Opening Session.

Tuesday evening, June 23, at 9 o'clock, in the Convention Hall of the Hotel Cadillac.

Address of welcome.

Response by M. L. Holman, president of the society.

A social, informal and informal reception will be held after the addresses, which will give an opportunity for members and guests to meet and exchange greetings.

Second Session.

Wednesday morning, June 24, at 9:30 o'clock.

Business meeting. Report of the tellers on election of members and reports of standing and special committees. New business may be presented at this session.

SYMPOSIUM ON MACHINERY FOR HOISTING AND CONVEYING MATERIALS.

"Hoisting and Conveying Machinery," by G. E. Titcomb.

"Continuous Conveying of Materials," by S. B. Peck.

"The Belt Conveyor," by C. Kemble Baldwin.

"Conveying Machinery in a Cement Plant," by C. J. Tomlinson.

"Belt Conveyors," by E. J. Haddock.

Third Session.

Wednesday afternoon, at 2 o'clock.

Conveying Materials, discussion continued.

"Thermal Properties of Superheated Steam," by Prof. R. C. H. Heck.

"A Rational Method of Checking Conical Pistons for Stress," by Prof. G. H. Shepard.

"A Journal Friction Measuring Machine," by Henry Hess.

Lecture.

Wednesday evening, at 8.30 o'clock.

"Contributions of Photography to Our Knowledge of Stellar Evolution," by Prof. John A. Brashear, astronomer and scientist, Allegheny, Pa.

Excursion.

Thursday morning, June 25, at 10 o'clock.

Through the courtesy of A. C. Pessano, member of the Detroit local committee and president and general manager of the Great Lakes Engineering Works, the society will be entertained by a steamer trip to the shipyard of the Great Lakes Engineering Works at Ecorse to witness the launching of the 10,500-ton steamer, the William B. Meacham, and to see the sinking into place of the fourth section of the Detroit tunnel.

Fourth Session.

Thursday afternoon, June 25, at 2.30 o'clock.

"Surge Tanks in Water Power Plants," by Raymond D Johnson.

"Some Pitot Tube Studies," by Prof. W. B. Gregory and Prof. E. W. Schoder.

"Comparison of Screw Thread Standards," by Amasa Trowbridge.

"Identification of Power House Piping by Colors," by Wm. H. Bryan.

Gas Power Section.

Thursday afternoon, June 25, at 2.30 o'clock, simultaneous with the fourth regular session.

"The By-Product Coke Oven," by W. H. Blauvelt.

"Power Plant Operation on Producer Gas," by G. M. S. Tait.

"Horsepower, Friction Losses and Efficiencies of Gas and Oil Engines," by Prof. Lionel S. Marks.

"A Simple Method of Cleaning the Conduits," by W. D. Mount.

Reception.

Thursday evening, at 9 o'clock, the reception will be held at the Hotel Cadillac. This is the distinctively social feature of the meeting.

Fifth Session.

Friday morning, June 26, at 9.30 o'clock.

"Economy Tests of High Speed Engines," by F. W. Dean and A. C. Wood.

"Air Leakage in Steam Condensers," by Thos. C. McBride.

"Clutches," by Henry Souther. Discussion continued from the May meeting.

Excursion.

Friday afternoon, at 3 o'clock, the members, guests and ladies are invited by the local committee to an afternoon and evening sail on the Detroit River. The steamer Britannia will leave the Detroit, Belle Isle and Windsor Ferry dock, at the foot of Woodward avenue, sail around Belle Isle, thence down the river to Amherstburg and to the head of Lake Erie, returning to the Bois Blanc Island, where supper will be served, and afterward returning to Detroit.

The Colorado Fuel & Iron Company announces that June 1 its branch office was removed from Oakland, Cal., to rooms 614-615 Balboa Building, Second and Market streets, San Francisco.

The Wallis Chain Grate.

Efforts to secure more perfect combustion and consequent economical and smokeless use of fuel in steam generating plants, have been successful largely through the introduction of mechanical devices, important among which is the traveling chain grate. Of the several efficient types now on the market the Wallis chain grate, designed and manufactured by the Wallis Stoker & Mfg. Company, Terre Haute, Ind., is one of the latest offered. Though not differing in principle from prevailing types, it embodies certain features of improvement which are designed to contribute to its durability, efficiency and economical service. One of these, which forms a departure from common practice, is the method adopted for propelling the chain which, contrary to the usual plan, is pulled from front to rear by power applied to the rear chain shaft. Another innovation is the provision for exposing each charge of fresh fuel to the heat of the furnace before depositing it on the grate; the purpose being to coke the coal, so that the finer particles of fuel will not sift through into the ash pit on striking the grate.

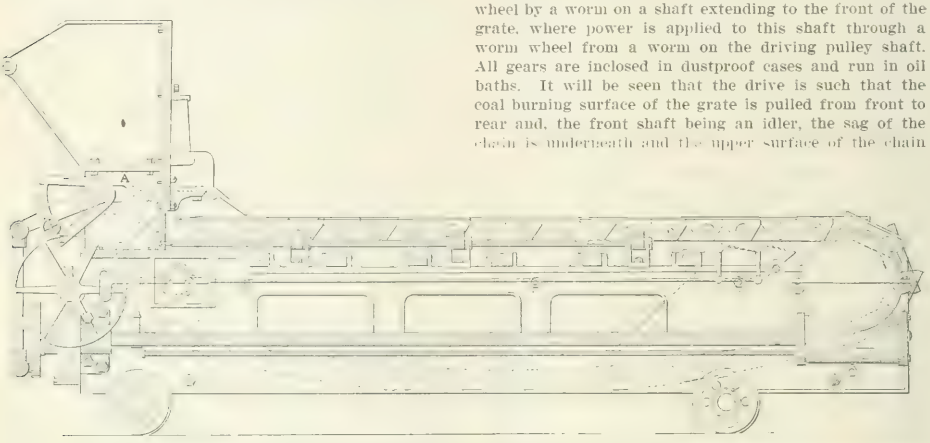


Fig. 1. Side Elevation of the Automatic Traveling Chain-Grate Stoker Built by the Wallis Stoker & Mfg. Company, Terre Haute, Ind.

From the drawing shown in Fig. 1 a general idea may be had of the design and arrangement of the component parts of the machine. The chain and driving mechanism are supported by a carriage composed of heavy cast iron side frames joined by transverse steel rods passing through pipe distance pieces and secured at the ends by nuts. The grate chain is composed of rectangular link blocks, views of which, in different positions are given in Fig. 2. These are 12 in. long by 6 in. wide and have center webs 1⅜ in. thick, with air openings of herringbone pattern. They are connected together in staggered relation, to form a continuous surface, by 1⅛-in. steel rods passing transversely underneath the grate surface through holes in the vertical flanges of the blocks; these flanges are 4¼ in. deep by ⅝ in. thick. The body of the grate is flanked on each side by wrought chains comprised of binder links carried on the ends of the transverse rods. A certain proportion of the grate blocks are driving blocks and have rollers mounted on the binding rods between the vertical flanges of the blocks, as in the right hand block of Fig. 2, to engage the sprocket wheels. The latter carry the grate and are mounted on 4-in. shafts at the front and rear which run in roller bearings.

All of the rear sprocket wheels are keyed to their shaft, while those on the front shaft, with one exception, run loose; the purpose of this construction is to relieve the chain of strain due to unequal expansion or contraction. The rear sprocket shaft is driven through a worm wheel by a worm on a shaft extending to the front of the grate, where power is applied to this shaft through a worm wheel from a worm on the driving pulley shaft. All gears are inclosed in dustproof cases and run in oil baths. It will be seen that the drive is such that the coal burning surface of the grate is pulled from front to rear and, the front shaft being an idler, the sag of the chain is underneath and the upper surface of the chain is kept taut and level. The importance of preserving a smooth even grate surface is apparent from the fact that unevenness would not only permit the fine fuel, such as is usually used, to sift through and waste, but would expose the ends of links projecting above the level to the direct action of the fire and consequent damage from burning.

Coal is supplied from a hopper equipped with an adjustable stroke pusher, providing a positive and easily regulated feed, the driving mechanism of which is clearly shown at A in Fig. 1. The pusher is operated through a rack and segment pinion oscillated by a lever connected to a crank on the shaft which drives the chain. The pusher is a plate fitted in the bottom of the hopper, and having a vertical face. When it is withdrawn—*i. e.* makes a stroke to the left, as viewed in Fig. 1—the coal above it drops on the stationary or floor plate of the hopper. On the return stroke of the pusher a charge of coal, equal in depth to the hight of the vertical face of the pusher and in length to the width of the grate, is pushed forward into the firebox. By loosening a hand wheel the feed can be

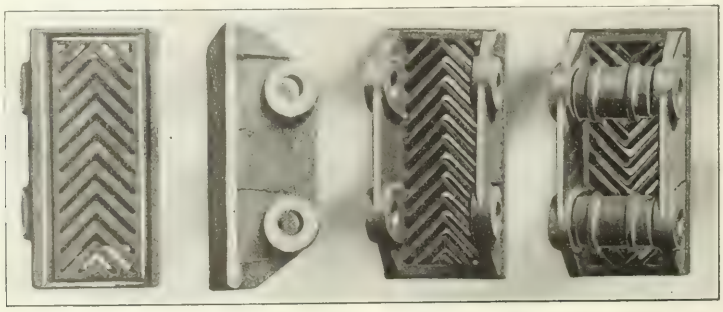


Fig. 2. Different Views of the Blocks Which Form the Chain Grate.

changed in quantity by altering the position of the pusher stroke so that more or less coal falls in front of it at each cycle. Upon entering the firebox the charge is not dropped directly upon the grate, but is deposited on a solid iron coking plate attached to the rear of the hopper above the grate. As now made the grate openings provide for a little more than 30 per cent. of air space.

Connected with and forming part of the equipment, as shown in Fig. 3 though not in the drawing, is a cast iron spiral ash conveyor which passes the ashes and clinkers forward beneath the stoker and deposits them in a con-

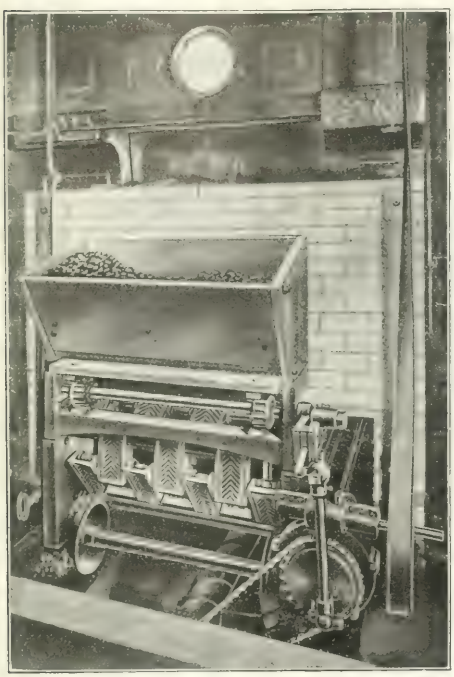


Fig. 3.—View from the Front of a Wallis Chain-Grate Stoker Installed

venient pit at the front of the boiler. Roller bearings are provided for all the principal journals and all parts of the machine are interchangeable.

By-Product Coke and the Foundry Trade.

Following is a report of the address on "By-Product Coke," delivered before the Pittsburgh Foundrymen's Association June 1 by Charles E. Pope of the Coal & Coke By-Products Company, Pittsburgh:

The speaker began with a description of the character of coal deposits and turning to the use of the beehive oven in wood and charcoal burning and its adoption in the present manufacture of coke. He said the beehive type of oven accomplished only one purpose, which is the coking of coal, as it burns all the gas, tar, ammonia, besides 20 per cent. of the coal over the Rothberg. This is a closed oven, heated by means of horizontal flues between the coking chambers in which the coke can be charged loose or stamped, thus coking the coal and preserving all the valuable by-products, the coke being controlled in quality and manufactured on a scientific basis to answer the foundrymen's requirements. The retort oven, in his opinion, is the oven of the present and future and the beehive that of the past. He claimed that, although opposed by about 90 per cent. of the coke manufacturers, the by-product oven is coming into use, on account of its saving and its being able to produce a suitable coke for the foundry from a lower grade of coal than the beehive oven. The output of by-product coke is steadily increasing and it is only a question of time until, on account of its superior quality, it will lead.

Mr. Pope referred to the recent meeting called by President Roosevelt for the purpose of discussing the protection of our natural resources, coal being one of the matters that received attention. Coal is being burned up shamefully every year, its valuable by-products are wasted in millions of dollars, and it is necessary that we economize and get the benefit of this waste. He stated that some foundrymen are opposed to the use of by-product coke on account of its black appearance, but that this did not affect the quality of the coke. This black appearance is caused by its being quenched on the outside of the oven, while the coke with the silvery appearance, quenched inside the oven, would have the black appearance were it treated as the former. Foundrymen are ahead of blast furnace operators in using by-product coke in greater tonnages, they having investigated the matter and ascertained that it would answer their requirements by being hard, dense, burning quickly and fiercely, and its carrying the burden of pig iron, besides enabling them to specify and receive the grade they require.

He made a suggestion to the effect that the firms represented, the association as a body or the American foundrymen's Association erect their own by-product coking ovens. They would thereby effect great savings in the by-products and get their coke when they wanted it and in the quantities and grades desired. This in turn would greatly benefit their casting business by, first, bringing up the average profits and, second, increasing their trade to the extent of supplying castings to new by-product coke companies that are sure to come in the near future. He estimated such requirements on the basis of 1000 tons of castings for each 500 tons output per day of by-product plants erected.

The Proposed Institute of Chemical Engineers.

The committee appointed at Atlantic City last June to consider the formation of an American Institute of Chemical Engineers, has found (after obtaining the votes of the chemists of this country) that there is a strong sentiment for bringing together into closer relationship those men who more particularly specialize in chemical engineering. A very decisive vote has been received in favor of the formation of the society, and a circular issued by W. M. Booth, temporary secretary, Syracuse, N. Y., calls a meeting for the purpose of organization. This will be held at the Engineers Club, 1317 Spruce street, Philadelphia, June 22.

The following programme has been arranged: At the morning session, beginning at 10.30, the visitors will be welcomed by Prof. Samuel P. Sadtler, after which Dr. Chas. F. McKenna, chairman of the committee appointed at Atlantic City, will address the meeting on "The Justification of the Institute of Chemical Engineers." Committees will then be appointed on Plan and Scope, Organization, Nomination of Officers, &c. At the afternoon session, beginning at 3.30, reports of the committees will be heard and action will be taken thereon. The election of officers and the perfection of the organization will take place at the evening session. Short addresses by eminent chemical engineers will be made during the evening.

As the outcome of the views expressed in response to the circular letters and at subsequent meetings, it seems probable that membership will be established on the basis of extent of practice in chemical works or in technological applications of chemical principles on a large scale.

The Waterloo Gasoline Engine Company, Waterloo, Iowa, has recently completed plant extensions and improvements, which included the construction of a new foundry, the remodeling of the machine shop, and the addition of a number of new machines, among which are a Landis crank grinder, Barrett cylinder boring lathe, turret head lathe and a stationary and radial drills. As a result of these improvements, the capacity of the plant has been increased about 40 per cent.

The Blake-Knowles High Vacuum Pump.

For years the mercury air pump was the only successful means for exhausting air to the high degree required in making incandescent lamps and in laboratory use, &c., but it is exceedingly slow in its operation. The accompanying Fig. 1 shows a belt driven vacuum pump, made by the Blake & Knowles Steam Pump Works, 115 Broadway, New York City, which is especially designed to produce a substantially perfect vacuum for commercial purposes. The pump illustrated is in the Westinghouse Electric Lamp Company's plant at Watsessing, N. J. It is a two-stage pump, having two vacuum cylinders 12 in. in diameter by 12 in. stroke, intended to run at 100 rev. per min. It will produce a vacuum of within 0.02 in. of the barometric hight as registered by the mercury gauge, which is shown in the engraving. The pump withdraws the air from a closed receiver which is piped to the stands containing the incandescent lamps to be exhausted. The large capacity of the pump and its ability to produce a high vacuum particularly adapt it to this class of service. It works strictly on the dry system, as no water is necessary or permitted to enter the cylinders. It is also adapted for all other work where an exceedingly high vacuum is desirable, as in connection with the evaporative processes of sugar refineries, distilling plants, chemical and dye works, glue works, salt works, soap works, the manufacture of prepared foods, medicines, essences, glycerine, &c., preserving processes and the production of high vacuum in central steam condensing systems and steam turbine work.

These vacuum pumps are also built with steam cylinders for direct steam drive, and with extended bases and gearing for electric motor drive. The vacuum cylinders are thoroughly water jacketed. The valves are mechanically operated by eccentrics keyed to the main shaft.

Experience with work where the highest possible degree of vacuum is required has shown that the correct practice is to handle the air by means of two air cylinders —that is, in two stages—one cylinder discharging into the other. By thus reducing the difference in pressure between the opposite sides of each piston it is possible to take care of the leakage past the piston rings, &c., that may occur in the intake cylinder, which, however slight, seriously affects the capacity and efficiency of the pump on the higher ranges of vacuum.

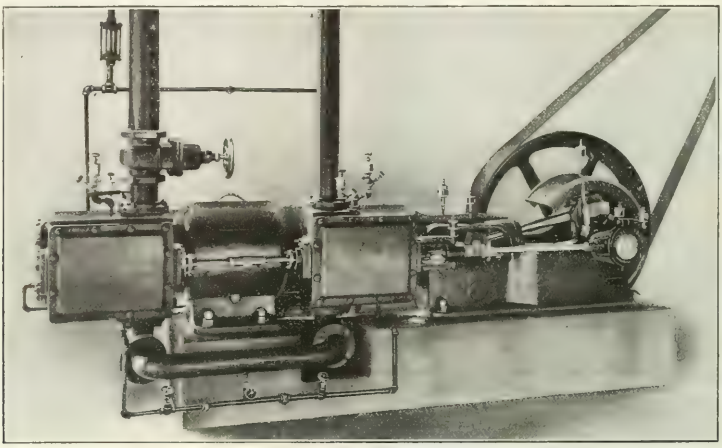


Fig. 1.—The Two-Stage Rotative Dry Vacuum Pump, Type LV, Built by the Blake & Knowles Steam Pump Works, New York.

This successful production of a machine, not difficult of management and capable of maintaining an extremely high vacuum, has revolutionized many industrial processes and has opened up new possibilities in the arts. Particularly in the case of incandescent electric lamp bulb manufacture the above type of machine has proved its value. It has symplified former methods and has made less difficult and expensive the rapid production of finished bulbs.

A further and more extended application of these pumps is, as mentioned, in the production of high vacuum in connection with evaporative processes, &c. With every fractional part of an inch gain in the high ranges of vacuum, the boiling point temperature is reduced in a much greater proportion, so that with a given apparatus the higher the vacuum the greater its capacity, and, incidentally, the greater the improvement in the quality of the product.

Fig. 2 shows a set of indicator cards taken from the two vacuum cylinders. It is interesting to note the difference in the work performed by the intake or suction cylinder and that of the final cylinder. The latter cylinder does by far the majority of the work, while the intake cylinder produces just that fraction of an inch of vacuum which reduces the resultant pressure to practically absolute zero. This machine is manufactured in larger and smaller sizes suitable for various capacities.

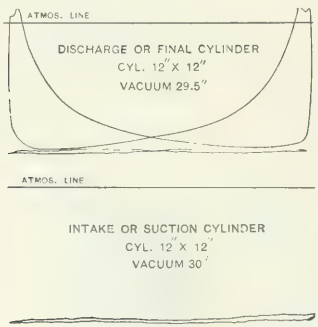


Fig. 2.—A Set of Indicator Cards from the Two Vacuum Cylinders.

E. R. C. Clarkson & Sons, Toronto, trustees, receivers and liquidators of the Canadian Shipbuilding Company, announce that negotiations have been going on for some time, and are now reaching what is believed will be a satisfactory conclusion, for the granting by the Canadian Government of a yearly bonus of 3 per cent. for 20 years upon the cost of the proposed drydock at the Bridgeburg yards—inclusive of the cost of the works previously erected there by the company.

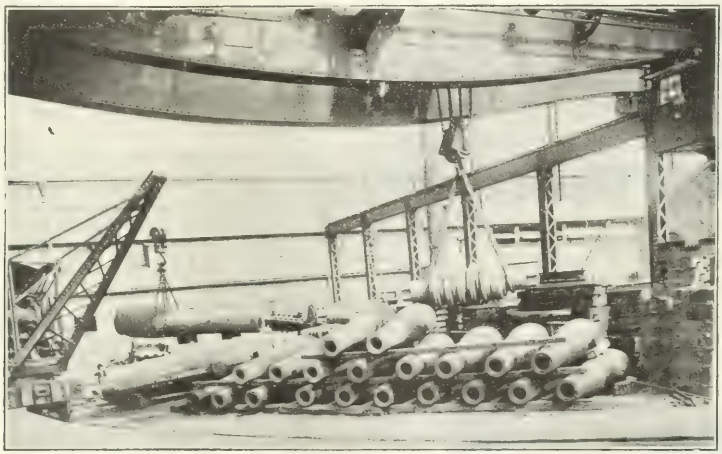
Old Cannon Utilized for Rolls.

The form and size of discarded cannon militate against their being commonly utilized as a scrap material. The cost of handling and breaking is so high as to prove prohibitive except to those engaged in the manufacture of a product which demands an especially high quality of material. To those so engaged, however, the old cannon discarded by the Government are exceptionally valuable. Among the largest and most successful of those whose product demands such material ranks the Philadelphia Roll & Machine Company, Philadelphia, Pa. This company manufactures cast iron sand and chilled rolls and general machinery for rolling mills, as well as dies, gearing and general castings for which the quality of the material has to be of the highest grade. It is enabled to meet these requirements largely through the use of cannon, the strength of which forms one of the essential qualifications of its product. The company thinks so highly of the quality of the material in these old cannon that it is constantly buying large quantities of them, and whenever there is such a sale by the Government it is in the market for them.

The accompanying illustration shows a portion of a large consignment of guns recently purchased. The majority of these guns had been cast at the West Point Foundry many years ago, and at the time of their manufacture were the latest and strongest type of gun. After finishing they were subjected to a rigid inspection and some of them were sent to old forts, while others were placed at points along the seaboard as coast defense guns. All of them played an important part in the history of our country. Their weights range from 15,000 to 50,000 lb., the coast defense guns being of the latter type. Some conception of the size of these guns can be formed from the fact that only one can be shipped on a modern freight car. The illustration shows one of the smaller type guns suspended and also a rolling mill roll, which is one of the company's principal products of which they are destined to form an essential part. The illustration is also of interest as showing the facilities provided by the Philadelphia Roll and Machine Company for handling heavy materials and products in its yard.

After the arrival of the guns at the works they are cut into pieces weighing from 3000 to 5000 lb. This cutting presents one of the many problems connected with the utilization of the larger type guns, and is performed in very large lathes of especially heavy construction and strong design. The cuts are only extended a limited distance into the material, as it is dangerous to the machine to make the cuts sufficiently deep to risk any chance of premature breakage. After enough of these cuts are made the gun is removed from the lathe and taken to a large breaker of the gravity type, where the gun is broken into pieces corresponding to the cuts previously made. They are next loaded into large furnaces of special construction and melted, together with a proper quantity of high grade charcoal iron. This molten mixture is drained into ladles which are provided with suitable means for pouring the metal. The ladles are then raised by large electric traveling cranes and carried to the previously prepared molds. The larger part of these molds are for rolls. After the molten iron has cooled and thoroughly hardened, the molds are removed and the rolls are taken into a machine shop, where all parts are turned perfectly round, and they are then ready to be shipped to the rolling mill where they perform their active work on iron, steel, brass, copper, nickel, silver and gold in all variety of shapes.

Thus these discarded, obsolete and apparently worthless cannon play a very important part in our daily existence and progress. Their life does not even then end with the life of the rolls of which they form a part, for after these rolls are worn out or broken they are sent back to the manufacturer, who again remelts them, with other high grade pig iron and some fresh pieces of cannon. They are again cast into new rolls, which in their turn go out and perform the work of their predecessors, and this process will probably be continued as long as any old cannon can be obtained.



Old Cannon Utilized for Rolls.—A Scene in the Yard of the Philadelphia Roll & Machine Company

Joseph T. Ryerson & Son, Chicago, have moved their general offices and warehouses from Milwaukee avenue and Lake street, where they had been established for many years, to Sixteenth and Rockwell streets. For a long time a considerable part of their business has been conducted there, but they have just completed a new building for general offices and extensive warehouses. The new plant affords exceptional facilities for the handling of iron and steel stocks, including the modern equipment of electric traveling cranes and commodious railroad trackage for loading in and out. Downtown branch offices have been established in the Commercial National Bank Building, corner Clark and Adams streets. An hourly automobile service will be maintained between the general and branch offices for the convenience of their patrons.

The R. D. Nuttall Company, Pittsburgh, has added to its already comprehensive list of gears and pinions the well-known Titan brand of manganese steel gears and pinions, having arranged with the Atha Steel Casting Company for the exclusive sale. This places the Nuttall Company in a position to furnish practically everything in the way of gears and pinions for the requirements of traction and electric railroad service.

The Pond Sash Operating Device.

A device for opening and closing pivoted windows and louvers, which consists of few parts and is easily operated, has been designed by Clarke P. Pond of the David Lupton's Sons Company, Philadelphia, Pa., and is manufactured and sold by that company. It is so constructed that the force is exerted with the greatest leverage at the time when the greatest is needed, that is when the pivoted sash is in a perpendicular position and in contact with the frames, and the leverage decreases and again increases in proportion to the load, so that a minimum amount of power is required for operation. This will be understood from Fig. 1 which shows one line of windows open and the opposite side closed. The power is applied through an operating gear, which (if all the sashes are to be opened or closed at once, which is quite feasible in buildings of considerable length by this method) is placed at one end of the building and the power is transmitted by tension through a flexible rod to the hinged levers attached to each side of each sash. No torsion enters in and no friction other than that in the pivots of the levers.



Fig. 1.—A Monitor with the Pond Operating Devices Made by David Lupton Sons Company, Philadelphia, Pa.

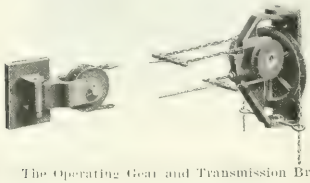


Fig. 2.—The Operating Gear and Transmission Bracket.

The operating gear, which is shown in Fig. 2, is carried on a hinged bracket, and is driven by a chain through a cast iron wheel 12 in. in diameter. The latter carries a steel worm meshing with phosphor bronze worm wheel, both immersed in oil, and all the bearings are of phosphor bronze. Two small drive wheels are attached to the worm wheel and transmit the power through short lengths of chain to steel cross arms connected at their centers to the operating rods. A flexible transmission bracket is placed at the opposite end of the drive, over which a length of chain passes and connects the other ends of the rods.

The compound levers or arms on each side of the sash are connected directly to the flexible transmission rods. These are so designed as to exert the greatest power when the sash is closed and in an upright position. All the bearing points on the arms or levers are bushed with phosphor bronze, so that friction is minimized at all points and a greater capacity given the complete system.

Special dies are used in making the various parts of the apparatus, the material used is carefully selected, and the uniformity in manufacture make it possible, with the small amount of friction developed in the operation of the device, to obtain results with material of less weight than could otherwise be used.

This device is particularly adapted for powerhouses, foundries, workshops and other buildings requiring special ventilation, as it enables by one operation the opening of all of the windows from one point and therefore permits of the escape of gases or smoke more rapidly. If the opening of the windows in sections is desired this also can be accomplished by installing the necessary number of operating gears, or special arrangements in the transmission rods are made when operation in a straight line is interfered with by traveling cranes or other obstructions, preventing the use of standard fixtures.

Fig. 3 shows an installation of the Pond sash operating device, at the powerhouse of the Union Terminal at Washington, D. C., which is somewhat unique. In this case one gear controls three lines of sash, each 200 ft. long, or 600 lineal feet of sash, comprising 1100 sq. ft. of surface, there being 99 sashes. A 15-lb. pull on the operating chain is sufficient to operate the sash—which indicates the ease with which this device is operated. The louvers in the two lower rows are operated from the upper row being connected therewith by vertical rods and brackets, so that all are controlled by one gear.

Gulick-Henderson & Co., engineers' and founders' laboratories, have installed an engine and generator in their establishment at 439 Third avenue, Pittsburgh, for furnishing power for the furnaces and testing machines.



Fig. 3.—An Installation of the Pond Sash Operating Devices in the Power House of the Union Terminal, Washington, D. C.

Tariff Revision Plans.

WASHINGTON, D. C., June 9, 1908.—The announcement by Chairman Payne of the House Ways and Means Committee to the effect that until after the November elections his committee will not avail itself of the privilege granted it by a special resolution of the House to sit during the current Congressional recess may be supplemented by a statement made by Senator Aldrich that the Senate Finance Committee will not take up any phase of the tariff question until after the elections. The industries of the country, therefore, will not be obliged to contend with any form of tariff agitation before the elections, and it can be stated on high authority that this was the object in view when the tariff discussion at the recent session was brought to an end by the passage of resolutions authorizing the Ways and Means and Finance committees to sit during the recess.

Relation of Duties to Cost.

While no formal sessions of the committees will be held during the recess, much valuable data will be gathered to be used in the projected tariff revision. A task to which the experts of the Ways and Means Committee are preparing to address themselves is the drafting of comparative schedules for the purpose of showing the relation of the rates of the Dingley act to the cost of articles covered thereby both at the time the law was passed and at the present date. An important feature of that law was the transformation of a large number of ad valorem rates of the Wilson act into specific rates, the object being to prevent the undervaluation of importations and the consequent reduction in revenue. Theoretically, the ad valorem principle of tariff duties is ideal, especially in that the rates readjust themselves automatically to increases or decreases in foreign market price or cost of production, but experience under the Wilson act, in which many specific rates of the McKinley law were transformed into ad valorem rates, was so unsatisfactory that Democratic Secretaries of the Treasury were among the strongest advocates of a return to a specific duty basis. An investigation made under the authority of the Treasury Department demonstrated beyond question that reputable importers were driven out of certain lines of business because of the wholesale undervaluations of unscrupulous competitors.

Basis for Revision.

As a basis for the revision of the Dingley act, however, it is necessary to transform all the specific rates of the existing law into ad valorem rates as of the date of 1897 and as of the present date. It may be assumed that, all other things being equal, where the foreign market value and domestic cost of production of an article have declined materially, so that the existing rate of duty is a much greater ad valorem to-day than it was when the Dingley act was passed, such rate will be subject to reduction; provided, of course, that present conditions promise to be reasonably permanent. In the case of articles now paying ad valorem rates or compound rates in which the ad valorem factor predominates there would be no necessity on this score of making a change in existing rates.

It has already been stated by the majority leaders on the floor of the House that the Ways and Means Committee contemplates a maximum and minimum, or dual, tariff, such as is now maintained by Germany, France, Russia and other important commercial countries. It is clearly understood, however, that the minimum tariff will afford as much protection to American industries as the Republican leaders believe they should enjoy under any circumstances, and the method pursued in the preparation of the twin schedules will be to fix the minimum rates as if an independent, single column tariff were in course of preparation, and subsequently to prepare the maximum schedule by adding to these rates from 20 to 50 per cent., except in the case of a few articles which are not produced in the United States and which do not offer opportunities for negotiating advantageous reciprocal trade agreements with foreign countries.

It is already obvious that the forthcoming revision of the tariff must be along revenue lines and with a view to a decided increase in the national income. The present condition of the Treasury is such as to cause the Administration very serious concern, and the great problem before those who undertake to revise the Dingley act will be how to secure an increased customs revenue without stimulating importations to a point that would threaten the prosperity of domestic industries.

In view of the big Treasury deficit now in sight it would not be surprising should the next revision of the revenue laws include important changes in internal taxes made with a view to permanency. The most probable course is the reimposition of certain documentary stamp taxes which are widely distributed and easily collected, and which bear but lightly on the people after they have become accustomed to the change. The minority in Congress has already fixed upon a graduated income tax as a proposition that will be urged in lieu of documentary stamp taxes and to meet the argument that reductions in tariff duties, and especially the transfer of certain articles to the free list, may decrease the revenue below the danger point.

W. L. C.

Canada's Lead Bounty.

TORONTO, June 6, 1908.—The Minister of Finance has given notice of a resolution which is to be the basis of an amendment to the act respecting bounties on lead. The five-year period covered by this act expires June 30, and the effect of the amendments summarized in the resolution is to renew the bounties for another five-year period. But the conditions to which the payment of the bounties is subject are to be modified. At present the bounty is greatest when the standard price of pig lead in London, England, does not exceed £12 10s. per ton of 2240 lb. At or below that price the bounty is 75 cents per 100 lb. on the lead in lead bearing ores mined in Canada. When the London price exceeds this minimum the bounty rate is reduced by the amount of such excess. Thus, when the London price is higher than £12 10s. per ton by the equivalent of 10 cents per 100 lb. the bounty declines 10 cents—that is, to 65 cents per 100 lb. When the price rose to £16 per ton the bounty vanished. Another limitation is that the total sum paid on lead bounty account shall not exceed $500,000 in any fiscal year.

The amendment outlined in the Finance Minister's resolution is in response to the urgent petition of the silver-lead mining and smelting interests of British Columbia, which petition was presented by a strong deputation that waited on the Government last winter. Two requests were submitted—first, that the bounty be renewed for another five-year period; second, that the minimum price specified in the act be raised. As has already been stated, the renewal of the bounty is provided for in Mr. Fielding's scheme of amendment, the rate to be the same—namely, 75 cents per 100 lb. The second request of the petitioners is also complied with, for the minimum price is to be raised from its present amount of £12 10s. per ton to £14 10s. This is an extremely important concession to the lead producers, inasmuch as it permits them to enjoy the full benefit of the bounty, even after the market has advanced £2 per ton. Another change proposed by the Finance Minister is the removal of the restriction upon the total amount payable on lead bounty account in any one fiscal year. Under his amendment the Government may, if it pleases, pay out more than $500,000 in one year. The restriction, however, comes in at another point—the total sum payable on this account in the five years is to be not greater than $2,500,000. Consequently if the mines and smelters are active and copious in their productiveness they may in less than five years exhaust the sum at the Government's disposal on lead bounty account. In the last five years the amount paid in lead bounties was $617,000.

According to the annual report of the Minister of Mines for British Columbia 47,738,703 lb. of lead was produced in that province in the calendar year 1907, the market value being $2,291,458. This is 4,669,514 lb. less than the output for 1906. Of the total nearly 7.9 per cent. came from the Fort Steele mining division.

C. A. C. J.

Direct Air Pressure Pumping.

Last year extensive experiments on pumping by direct air pressure were made near the Westinghouse Air Brake Company's plant at Wilmerding, Pa., to determine the amount of water raised, air required, &c., using different sizes of pipe and different combinations of lift and submergence. The lift is the vertical distance from the water level in the well to the point at which the water is discharged, and the submergence the distance from the water level to the point in the well where air is admitted to the discharge pipe.

Arrangement of Apparatus.

The well is 174 ft. deep from the surface of the ground, has a 6-in. casting and the water level is ordinarily from 16 to 20 ft. below the surface. A tower was constructed over the well with platforms at various hights corresponding to different lifts. The lower part of the tower was inclosed to house the tanks, measuring apparatus, &c. The distance to the air inlet and to the point of discharge was obtained by measuring each length of pipe introduced, and the distance from the ground to the water level by using a float, consisting of a sealed tin tube ½ in. in diameter and 4½ ft. long, weighted at the bottom and attached to a graduated cord.

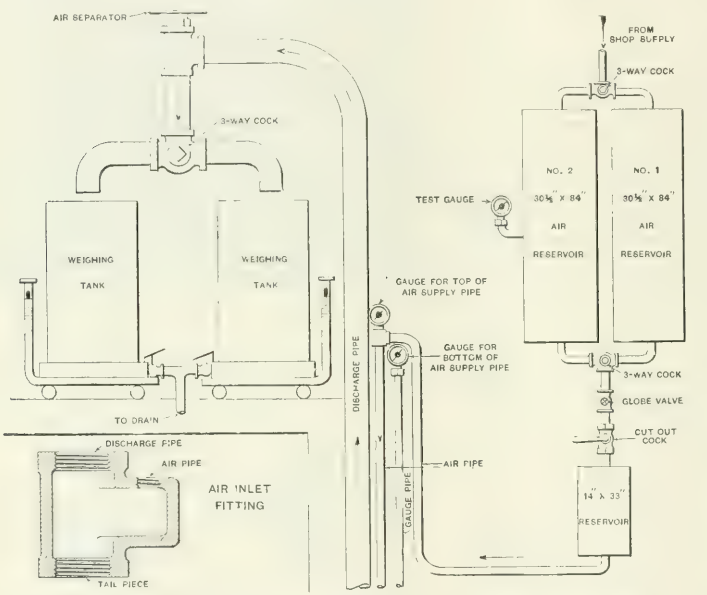


Fig. 1.—Piping Diagram of the Direct Air Pressure Pumping Tests Made by the Westinghouse Air Brake Company.

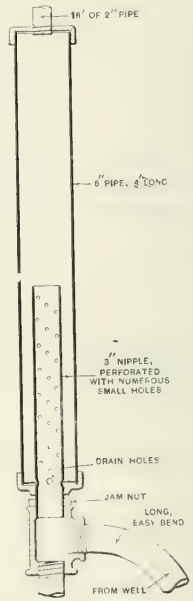


Fig. 2.—Air Separator and Top of Discharge Pipe.

The air supply was obtained through a 1-in. connection to the shop compressed air system, the pressure of which ranges from 140 to 160 lb. The arrangement of piping, reservoirs, &c., is shown diagrammatically in Fig. 1. Two air storage reservoirs, 30½ x 84 in. received air from the supply through a three-way cock, so that only one tank could be charged at one time. At the other end of these tanks connection was made through a similar three-way cock to the line to the well. In this line was placed a 14 x 33 in. reservoir, a globe valve and a cut out cock. Tank No. 2 was used for measuring the air in the tests and tank No. 1 for starting the pumping operation. The volumes of these tanks and their piping was measured by filling with water. A special test gauge was attached to tank No. 2 and the globe valve in the well line regulated the pressure in the tank to keep it constant. The cut out cock was used for cutting off all supply to the well. The small reservoir simply increased the volume of the well line to make it easier to hold its pressure constant.

The special fitting used for admitting air into the discharge pipe is also shown in Fig. 1; the upper surface of its enlarged part was drilled and tapped for three air pipes and 1¼ in. gauge pipe. With the large discharge pipes there was not room enough inside the casing to get a large air supply pipe, so that two or three smaller sizes were substituted. By this arrangement, also, the effect of changing the sizes of air supply pipes was easily obtained, since any one of these pipes could be closed at the top by suitable cut out cocks. The gauge pipe was connected with a test gauge to show the pressure of the air entering the well. The water is always blown out of this pipe when starting the pumping operation. Another test gauge was placed in the air line to the well, so that pressures at the top and bottom of the air inlet pipe were noted.

The discharge pipe passed up through the roof of the tank room to the point of discharge, where the air and water lifted passed into an air separator, shown in Fig. 2, the air escaping to the atmosphere and the water falling into one of the two weighing tanks. Just under the roof was a large three-way cock, by which the water was directed into either tank to be weighed on platform scales.

The Tests.

Nearly 1800 tests were made, covering from 350 to 400 different combinations of discharge pipe, lift and submergence. From the figures obtained in these tests, curves were plotted showing the variation in cubic feet of air used per gallon of water raised and the gallons of water delivered per minute for the different ratios of lift to submergence, and it was found that they are practically the same for each ratio of lift to submergence for any submergence of a given size of discharge pipe. For example, a lift of 10 ft. and a submergence of 20 ft. will take the same amount of air per gallon or lift the same number of gallons per minute as a lift of 100 ft. and a submergence of 200 ft., the size of discharge pipe being the same. In both cases the ratio is identical, while the submergence in the second is 10 times that in the first. It was also found that, for a given size of discharge pipe the gallons of water raised per minute decreases as the ratio of lift to submergence increases. Also, the cubic feet of free air per gallon of water raised increases as the ratio increases for a given size of discharge pipe and for a given ratio it decreases as the size of discharge pipe increases.

Air Pressure.

It was found that the lowest air pressure possible that would give a continuous flow from the well was the

proper one to use. Slightly reducing the pressure caused the water to issue intermittently, and although the air required per gallon was less than with the continuous flow the water delivered was considerably less. Gradually increasing the pressure above that required for a steady flow somewhat increased the quantity of water delivered, but the air per gallon increased in greater proportion and, as the air pressure is further increased the gain in the quantity of water delivered grows less, until, at a certain point, it stops, and from then on the water delivered decreases in amount. It is very easy to regulate the air supply by the sound of the discharge. The point at which the flow becomes steady is quickly recognized.

Proper Ratios and Other Considerations.

From the results obtained it would appear that for a given lift the deeper the submergence the more economical the result. This is true as far as the well is concerned, but it must be considered that the greater the depth of the air inlet the greater the air pressure must be. Fig. 3 shows a compound arrangement of piping for pumping from a shallow well to get the effect of a deep submergence. The quantity of air required to operate the well decreases as the depth is greater, while the horsepower required to compress a cubic foot of air increases with the depth. A curve representing the horsepower per gallon of water raised for varying depths and constant lift will at first decrease as the depth increases, until it reaches a minimum point, after which it increases. This point represents the most economical ratio for the given lift. To learn where this point would be some tables and curves were made, which gave the horsepower per gallon of water raised for the different lifts and different sizes of pipe, with various ratios of lift and submergence, from which it appears that the most economical ratio for a given discharge pipe decreases as the lift increases and for a given lift increases as the discharge pipe increases.

It was found that a tail piece in the discharge pipe below the air inlet is essential when starting the pumping operation, as it tends to prevent the air from backing down into the well and rising in the casing outside of the discharge pipe.

The fitting used for introducing the air into the discharge pipe was particularly well adapted to the purpose, because it offered no impediment to the free passage of the water. The results obtained indicate beyond doubt that anything in the shape of a jet or pipe introduced into the discharge pipe not only has no value in assisting the pumping operation, but is actually detrimental, by forming an obstacle to the free passage of water. The enlarged sleeve not only offers little resistance to the water, but makes it possible to install the air pipe very close to the discharge pipe.

The size of air pipe depends upon the quantity of air required, its pressure and velocity; the latter depends upon the difference in pressure between the top and bottom of the air supply pipe, or how many pounds' pressure one is willing to sacrifice to force the air through the pipe.

Taking the results of the tests and assuming that the drop in pressure is proportional to the length of the air supply pipe, it was found that for 1 lb. drop per hundred feet, the velocity is about 27 ft. per second; for 2 lb. drop, 42 ft. per second, and for 3 lb. drop, 53 ft. per second. Economical operation is more easily maintained by having the drop in air pressure as small as possible.

The Action in the Well.

As the compressed air enters the discharge pipe at a pressure only slightly above the hydrostatic head, the column of water above is forced upward. Air continues to enter, filling up the space left by the rising body of water until the top of the water column reaches the discharge opening. The moment that a portion of the rising water is discharged the weight of the column is thereby reduced and the air beneath it will correspondingly expand, thus reducing the pressure on the water in the discharge pipe below the air inlet. The weight of the water in the well, outside of the discharge pipe, then forces the water upward into the pipe, stopping the inflow of air. The pressure in the air supply pipe is quickly reinstated by its connection with the supply, so that it again forces an entrance into the discharge pipe. This is repeated until the whole discharge pipe, above the air inlet, is filled with alternate bodies of air and water, the combined weight of which is enough less than the water in the well to keep up a constant flow of water into the discharge pipe. As each body of air rises the total weight above it grows less, so that it continues to expand until, when it reaches the discharge, it issues at atmospheric pressure. In this way a continuous flow from the well is maintained as long as a sufficient quantity of air is supplied, and the capacity of the well is not overtaxed.

This action was plainly demonstrated in a model of a

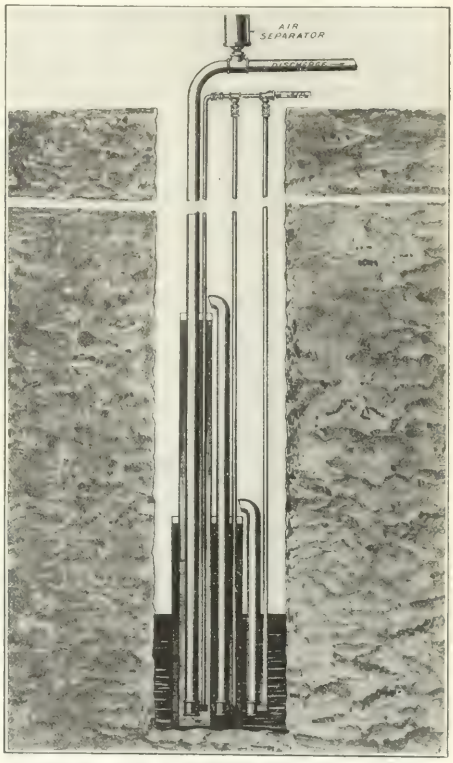


Fig. 3. A Compound Arrangement for Direct Air Pressure Pumping from Shallow Wells.

deep well, having casing and discharge pipe in glass, and this model also revealed the cause of some of the losses encountered. The principal loss appears to be due to a slip back of a portion of each layer of water to the next succeeding layer, caused by friction with the sides of the discharge pipe. Each change in diameter of the pipe, such as a coupling or joints, materially increases this slip. Also, any obstruction or sudden bend adds to this loss. The bodies of air are not clear, but are filled with bubbles and foam, caused by the presence of the water slipping back, but the bodies of water are clear and distinct.

In starting the well operation it is necessary to admit the air slowly by opening the valve only a little to gradually build up the pressure required. After opening the valve the pumping will not commence immediately, but several seconds, perhaps even a minute, will elapse before the water discharges, then it comes with a rush, after which follows a lull for a few seconds, and then the pumping operation begins more uniformly. The first slight opening of the valve starts the intermittent flow and as soon as gradually increasing the opening produces a continuous flow, the valve should be left in that position.

The Peters Rotating Reversing Valve.

The use of valves of other than the double seated and the Siemens butterfly types for reversing the heats in regenerative furnaces has been making progress, but perhaps not as great as might have been expected in view of the important savings the more recent improvements have made possible. Siemens in his first regenerative furnace used two stacks. He saved one stack after the invention of his butterfly valve, which is still holding its field where a chief consideration is simplicity in the operation of regenerative furnaces in the steel, glass and other industries. Still these valves are a source of loss on gas and repairs. They are liable to warp and become leaky on account of the difference in temperature of the gas passing to the regenerator on one side and the escaping hot products of combustion on the other side of the cover. This condition becomes rapidly worse, owing to the burning of the valve seats at the leaks and the constant repair and renewal of the former. Valves of water seal construction, on the other hand, cause the gas to become cooled while the water evaporates and passes into the furnace, reducing the thermal efficiency of the gases. In reversing, some valves make a direct connection between the gas supply flue and stack, which means a direct loss of gasified coal.

The above considerations prompted the improvements embodied in a new construction of the reversing valve, of which Ulrich A. Peters, mechanical engineer, Pittsburgh, Pa., is the inventor, and for which a patent was granted to him recently. Fig. 1 gives details of its construction and Fig. 2 illustrates the method of reversing the furnace. In the new design some traces of the butterfly type appear. The valve proper is cast in one piece and comprises a two-chambered cylindrical casing with a diagonal partition and two extending segmental hoods of a conical shape oppositely disposed, one leading from the gas box to the furnace and the other leading from the furnace to the stack. The valve is also provided with cover plates extending angularly upwardly from the base and occupying the space between the hoods. The hoods are provided each side with seals, consisting of cast iron strips and asbestos. The valve is supported by pivotally mounted wheels, furnishing the adjustment for a proper seating. Washers on the journals are used for centering the valve with the frusto-conical base casting. This base casting is provided with a circular track for the four wheels referred to and with circular sand and water seal troughs for the depending flanges of the rotatable valves. The aim was to dispense as much as possible with flat plates, which warp under the alternate expansion and contraction of different temperatures. The conical shape was adopted as giving the most strength to the casting as compared with the thickness, and as giving the least frictional resistance to the flow of gases.

A feature of the new valve on which emphasis is put is that in reversing the connection between the stack and the gas flue is closed, so that all or most all the gas remaining in the regenerator chamber is allowed to pass into the furnace. For short stops of the furnace the valves are closed by a quarter turn, all flues being thus shut off without disturbing any damper adjustments which had been made for the proper working of the furnace. It is claimed that by the use of nonsplashing valves, which, it is stated, can be completely dry sealed, there is an increase in furnace heat with considerable saving in fuel; also that the valve cannot burn. It is clay or brick lined throughout, and has no parts that may cause leakage or that are likely to stick. As shown in the illustrations, preference is given to a vertical hydraulic plunger motion connected to ratchet gearing for the operation of the casing. In order to make use of all the gas contained between the gas valve and the furnace ports likely to be drawn back into the stack while reversing, a gas saving device has been provided, as indicated in Fig. 1. The method of reversing is as follows: The gas valve is turned 90 degrees, shutting off all flues. Air is admitted on the gas filled side of the valve by lifting one cover plate by means of the lever arrangement shown. The remaining gas goes on to the furnace and there is not sufficient time to form an explosive mixture with the air which follows. A weak blue flame explosion indicates the consumption of all gas in the furnace and is the sign for turning the gas valve 90 degrees further simultaneously with the complete reversal of the air valve.

Attention is called by the inventor to this further feature: The valve is to a certain extent self-sealing with

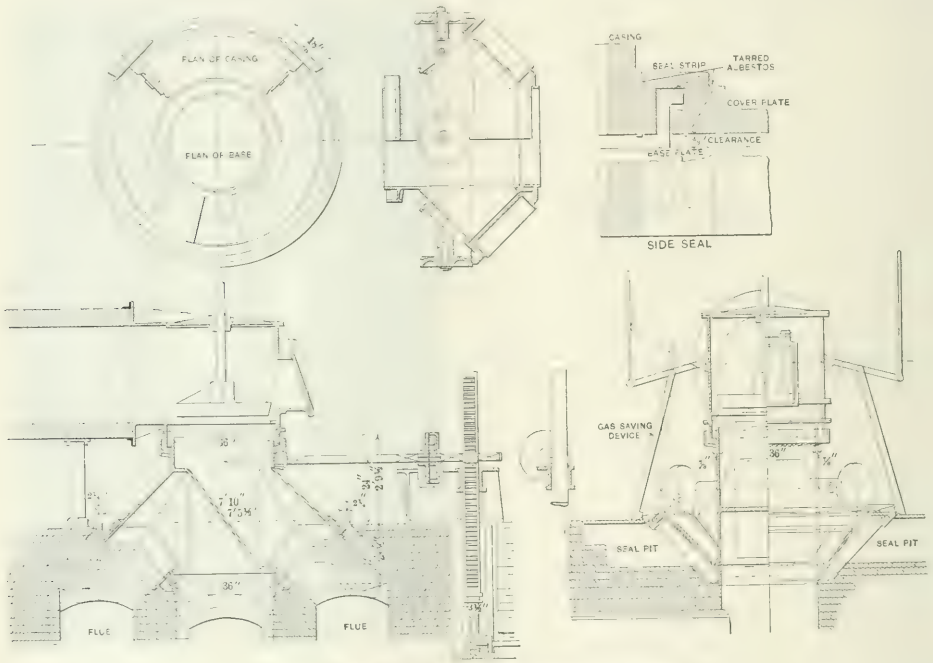


Fig. 1. Plan and Sections of Peters Reversing Gas Valves.

respect to the narrow spaces at the sides of the hoods. In case of any small leakage the gases must pass between relatively cold and narrow spaces one-quarter of the circumference and then out through a second leak before getting to the other flue. The only result is the accumulation of some tar, which soon clogs the leak. Pits are provided for reaching the lowest seal conveniently. The water in the seal troughs is used up economically through a cascade arrangement of overflow to the lower rings.

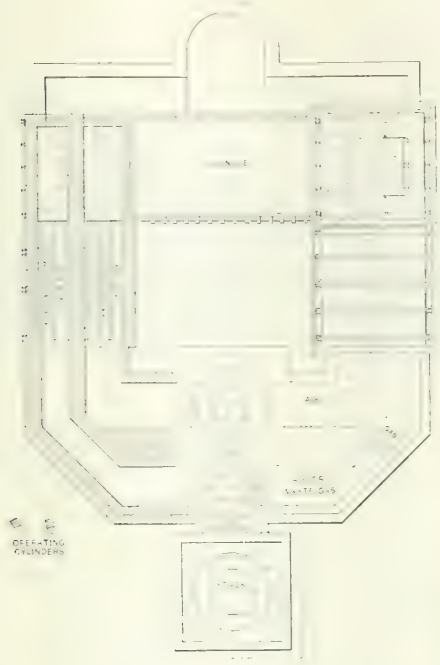


Fig. 2. Method of Rocking a Furnace with Peters Gas Saving Device.

Leaving the cover plates over the flue ports, the valve may be lifted out bodily at any time while the furnace is in operation.

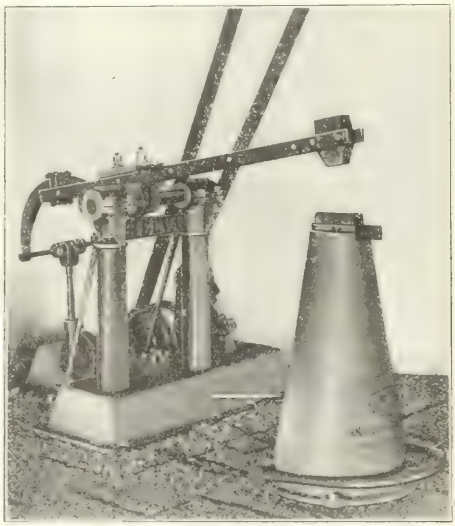
The Helva Power Hammer.

A low power hammer of the helve type, manufactured by the Novelty Iron Works, Dubuque, Iowa, and known as the Helva Hard Hitter hammer, is here illustrated. It is designed for general service in forge shops and is especially adapted to shaping plow lays, listers, cultivator shovels, and similar jobs common in the average smith shop.

The hammer is simple in construction. The helve is formed of two parallel steel bars connected by separators and bolts with a wooden stiffener between them which increases the rigidity without adding materially to the weight. The helve is adapted to take a reversible hammer die; one end for instance shaped for plow work and the other for general forge work, including the welding of axles, tires, &c., and also for drawing out material of large dimensions. The die is recessed so as to be firmly held between the helve bars and bolts, and requires no key to secure it. The clamp bolts are screwed into one of the bars of the helves and jamb nuts prevent their working loose. The helve is attached to its rocker shaft by three castings; the lower and middle ones encircle the shaft and the middle and upper ones are grooved to bind the helve bars. One V bolt clamps the three castings together.

A treadle connected by a rod to a rocker arm engaging the combination belt tightener and brake lever furnishes the means for stopping, starting and controlling the machine. By a slight pressure of the foot on the treadle the brake is released and the tightener pulley simultaneously pressed against the belt. Releasing the treadle reverses the actions, the tightener being removed from the belt and the brake applied stopping the hammer instantly. The force of the blow is regulated by the amount of pressure applied to the lever, and it is claimed that under this control the machine can be made to forge material 5 in. thick or strike lightly enough to hit an egg without crushing. The balanced helve, it is said, enables the operator to strike rapidly on the work, thus retaining the heat in the metal which is being forged.

A feature is the spring drive which is designed to eliminate vibration and undue strain. The driven end of the helve carries a leaf spring the ends of which are connected by links to a pitman in turn connected to a crank on the driving shaft. The leaf spring serves to cushion the reversals of the hammer motion, the arrangement being such that the pitman is on its downward stroke before the dies come together and on its upward stroke before the hammer reaches the limit of its upward travel. By means of a telescoping pitman the hammer may be quickly adjusted for heavy blows required to forge thick material, or to strike lightly at full speed. No adjustment is necessary for light forging at reduced speed since this is accomplished through the sliding tightener operated by the foot lever. A tension spring beneath the



The Helva Power Hammer Manufactured by the Novelty Iron Works, Dubuque, Iowa.

hammer frame regulates the brake application so that the hammer always stops with the dies separated to receive the work. The tightener and brake may be placed on the opposite side of the driving pulley when that is necessary on account of the direction in which the belt runs. The tightener pulley shank may be adjusted in its holder by releasing a set screw to take up or slacken the belt without altering the position of the treadle so that the proper force of the brake application will not be disturbed. This avoids relacing the belt when it stretches.

The Buckeye Steel Castings Company, Columbus, Ohio, has let the contract to the Mount Vernon Bridge Company for the erection of a large pattern shop. The building will be 60 x 345 ft., of steel construction. The company has already under course of erection another building of similar size in which will be installed a gas producer plant.

The Garrison Motor-Driven Roll Lathe.

The turning of rolls being necessarily a manual operation, the roll lathe of the past has been a crude machine and hardly an instrument of precision. The improvements made in late years in tool steel and the adaptation of the electric motor to the driving of machine tools, have produced a change in this machine that is possibly more marked than in any other similar tool. The 50-in. roll lathe shown in Fig. 1 is the latest design of the A. Garrison Foundry Company, Pittsburgh, Pa., and was built for the Pittsburgh Steel Company, Monessen, Pa. It is capable of turning 48-in. diameter sand and steel rolls. A Westinghouse type S variable speed motor drives the headstock gearing by means of a belt.

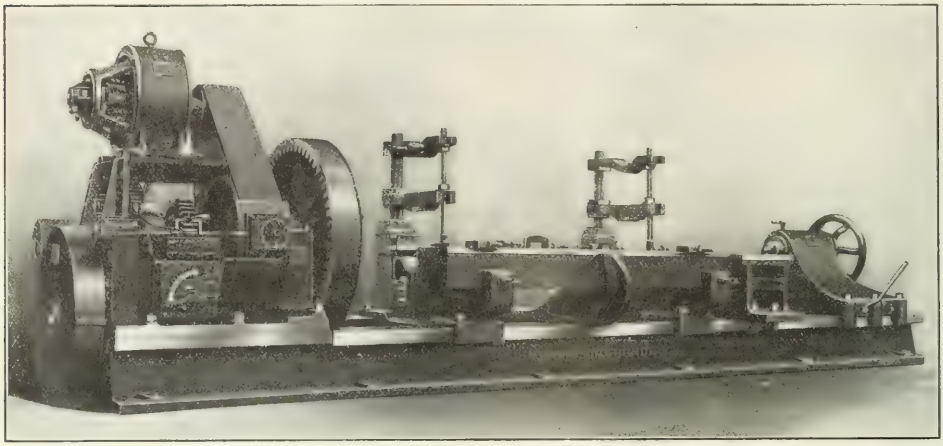


Fig. 1.—A 50-In. Electrically Driven Roll Lathe Built by the A. Garrison Foundry Company, Pittsburgh, Pa.

Belt drive was adopted for the reason that it has been the builder's experience that a belt of ample size has a life quite as long as a cast iron or even a steel pinion, that it is much more durable than a rawhide pinion or chain, and that it is noiseless, efficient and less expensive, besides providing a flexible connection between the motor and the work, a consideration of very considerable importance. This belt connects the motor and a flywheel pulley. The function of this flywheel is to absorb the intermittent shocks due to the hand feed and the cutting of the wabblers, thereby protecting the motor and increasing the efficiency of the tool.

The gearing, as the detail of the headstock given in Fig. 2 shows, is unusually simple. The basic change in speed is obtained by throwing the jaw clutch, which is an operation of only a few seconds. A variation of 100 per cent. on this change can be made while the tool is cutting by means of the variable speed motor through the field rheostat. The latter, with the starting rheostat, the switch and the pilot lamps is conveniently arranged on a plate, which also incloses and protects the gear wheels. This feature of protection is important. Not only are accidents to or from the gears eliminated, but

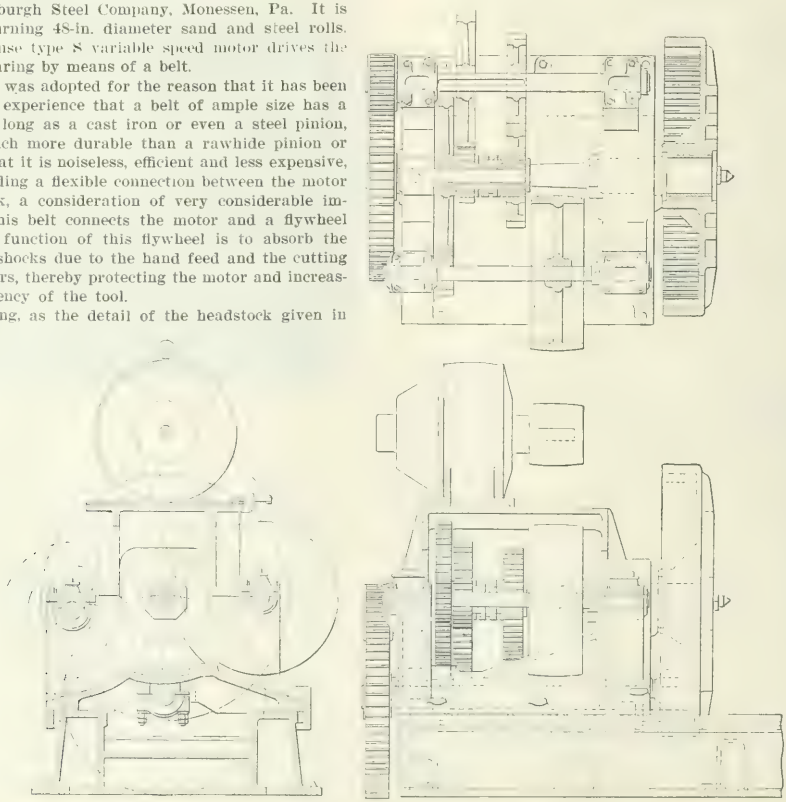


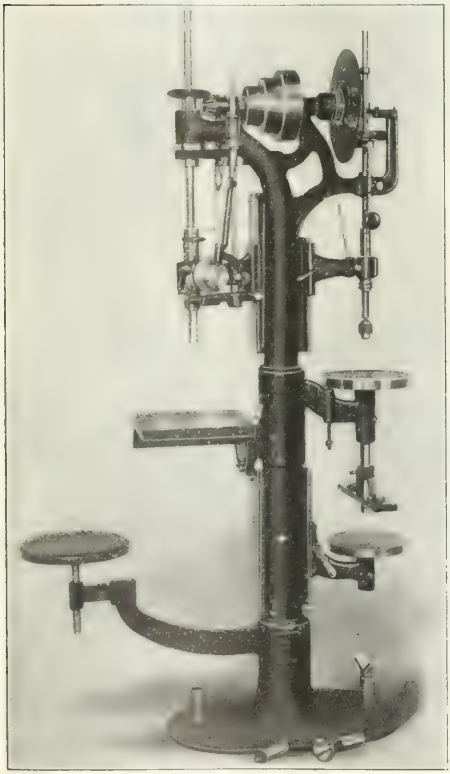
Fig. 2.—Details of the Headstock of the Garrison Motor Driven Roll Lathe.

the operator is protected from contact with the accumulations of grease and dust so familiar on the old time tools.

That which the maker lays particular emphasis on is the accuracy of the machining and fitting of the parts. Heavy construction is perforce necessary and has its foundation in a deep and heavy bed of box pattern. One of the interesting features is the topping arrangement, which consists of cast steel carriers above the yokes on the threaded pillars. Both the yoke and carriers are carried on steel capston headed nuts, while the heavier yokes are supported also by ball bearings, contributing to easy and rapid adjustment. The tailstock is carried on eccentric roller bearings. It is so easily manipulated that it can even be pushed by hand when riding on the rollers. For convenience in ejecting the center from the tailstock mandrel, the screw operating the mandrel is so designed that by reversing the direction—that is, by running the mandrel back—the center is pushed out of its tapered bearing by the end of the screw.

The Lapointe Double Drill.

A somewhat curious construction in a drill press will be observed in the one herewith illustrated, which combines a hand or power feed upright drill and a sensitive



A Combined Upright and Sensitive Drill Built by the Lapointe Machine Tool Company, Hudson, Mass.

drill on the same supporting column. The machine is built by the Lapointe Machine Company, Hudson, Mass., and between its two parts provides for drilling holes of all sizes up to 1 in. in diameter. With the various interchangeable attachments furnished with it it is remarkably convenient for a very wide range of general work. Both drill spindles are at the same distance from the center of the column, each allowing drilling to the center of a 14-in. circle; consequently the swinging tables can be used under either spindle, which is an advantage when both large and small holes are to be drilled in the same piece. By swinging the table the work may be quickly brought under the opposite spindle, and in many cases the time lost in changing drills is saved. The driving arrangement allows either drill to be used independently or both to be operated simultaneously. The sensitive drill has a capacity up to ⅜-in. holes.

The positive drill, the one at the left in the engraving, is bevel gear driven from the cone pulley shaft, and can be instantly connected or disconnected by means of a lever which slides the driving bevel pinion out of engagement with the bevel gear on the spindle. The spindle is carried by a sliding head and is provided with power feed, a lever feed and a quick return. There is an automatic stop for a feed knockout for drilling to a predetermined depth.

The sensitive drill on the right side is driven from a friction disk on the cone pulley shaft, contact with which is made by a roller which may be adjusted in its distance from the center of the disk to alter the spindle speeds according to the size of drill used. An interesting feature is the arrangement for feeding the work to the drill by the use of the knees, the operator being seated at the time on the adjustable seat, which in the engraving is shown on the heavier drill side. The bracket supporting it can be swung so that it may be used by an operator on either side of the drill. When used on the sensitive drill side the operator sits with his knees beneath the cross bar on the lower end of the shank of the upper drill table, and by upward pressure exerted through his knees he can accomplish the feeding, with both hands free for holding the work. An adjustable stop is provided for the table, consisting of a screw with lock nuts to limit the hight to which the table may be raised and so regulate the depth of hole drilled. When desired the feeding can be done in the usual way, the table being stationary and the spindle brought down to the work by means of the hand lever shown. When the driven disk on the spindle is raised to its upper position by means of the sliding rod and knob handle shown, the contact with the driving disk is broken as the disk is recessed near its center and the drill stops, while the driving pulley continues to run.

All of the work tables and fixtures shown on the base can be used with either spindle. The 13-in. square table on the left of the engraving can be swiveled for drilling holes to any angle in a piece of work. The lower round table shown under the sensitive drill spindle does not swing about the column, but is secured to a dovetailed slide. It may be transferred, however, to the slide on the opposite side of the column if it should be desired to use it under the larger drill. The trough block, cups and point centers shown near the base may be used inserted, as the first is shown in a bracket provided on the base vertically under either spindle, or in the bracket holding the lower work table at the right when this table is removed. It is thus possible to handle various lengths of stock in a vertical position.

New Loss or Damage Rule by Western Railroads.

The Western railroads have abandoned their efforts to make the shipper assume the risk of loss or damage in transit. The Western Classification Committee has adopted a new rule, effective July 15, in place of the objectionable Rule 4, the amended rule reading as follows:

Ratings made in this classification are for shipments made subject to the following conditions: No carrier or party in possession of any of the property provided for in this classification shall be liable for any loss thereof, or damage thereto from causes beyond its control.

In this new version of the rule the carriers accept their common law liability. The old rule, if enforced, would have made the shipper bear practically all losses excepting those due to wrecks or a total failure to deliver. An article in *The Iron Age* of March 12 called attention forcibly to the dangers in these rules of the various classifications. Important shipping interests then took the matter up with the Western roads and succeeded in getting several important lines to abandon the old rule, after which the Western Classification Committee adopted the new rule above quoted.

It is understood that the Transcontinental roads also have under favorable consideration the abandonment of the loss and damage condition which they inserted in their tariffs to and from the Pacific Coast last winter. An article in *The Iron Age* of December 19, 1907, gave the shippers of the country advance information regarding this move of the Transcontinental lines, which was the first attempt of any important roads to limit their liability by a rule incorporated directly in a tariff.

R. L. A.

The Detroit Foundrymen's Association, after a dinner tendered to Dr. Richard Moldenke, secretary of the American Foundrymen's Association, on June 1, listened to an address by him on "Malleable Cast Iron." The Detroit foundrymen have a booth and headquarters at the Toronto convention this week, which is attended by a large delegation from Detroit. The organization at Detroit has been growing rapidly, and it is expected the membership will soon reach 100.

The British Government recently announced that the steamers Lusitania and Mauretania had fulfilled all the conditions in the agreement whereby it was understood that if the two steamers made the two transatlantic trips at an average speed of 24½ knots for the round trip they would receive the subsidy of $750,000 per year.

Foundry Sand Conveying.

The need of mechanical conveyors for distributing sand in foundries is emphasized where moulding machines are in use, because the advantage of the machines depends largely upon the sand supply. Two types of apparatus stand out prominently in this work—the belt conveyor and the reciprocating conveyor. The former well fits the conditions when the sand is to be carried on straight or slightly inclined runs for a single discharge over the end of the conveyor; but if arranged for a number of deliveries, or for a single delivery at any point other than over the end, a tripper, usually cumbersome and heavy, is necessary, and the reversing pulley of this tripper subjects the belt to excessive wear both by the added strain imposed and the continual grinding in of sand. A conveyor of the reciprocating type, however, is easily adapted for delivering at several points. The illustrations, Figs. 1 and 2, show the details of such a conveyor, which consists of a trough for holding the material, surrounded by a steel frame on wheels, which carries hinged flights extending down into the trough. Reciprocating motion is given to the frame and flights by a crank mechanism. When moving forward the hinged flights push the material along, as in Fig. 1, while in the reverse movement back to the starting point, they drag over the top of it as in Fig. 2. A noteworthy feature is that the working parts—which are few—are entirely away

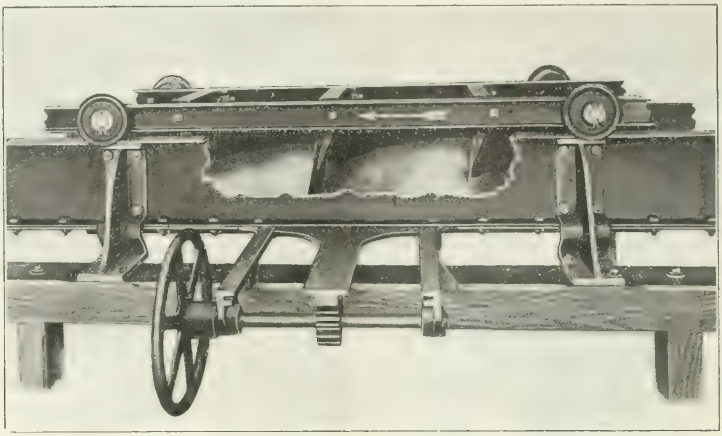


Fig. 1. The Link-Belt Reciprocating Conveyor with the Flights Pushing the Sand Forward

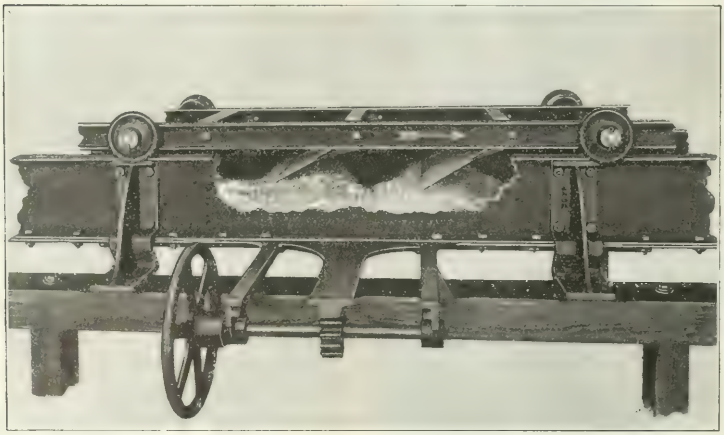


Fig. 2. The Reciprocating Feeder on Its Return Stroke, with the Flights Feathering Back Over the Sand.



Fig. 3.—Sand Conveying Equipment Installed in the Atha Steel Casting Company's Foundry by the Link-Belt Company.

from the material handled; consequently they are less subject to wear and the cost of maintenance is reduced.

Fig. 3 illustrates an installation of sand-handling machinery at the foundry of the Atha Steel Casting Company, Newark, N. J., furnished by the Philadelphia branch of the Link-Belt Company. A Link-Belt elevator, outside of the building, receives sand from cars and feeds it at the rate of 37 tons an hour to the reciprocating conveyor shown, and this carries it to the bins, delivery being controlled by gates of special design, which are opened or closed by a hand wheel, as indicated in Figs. 1 and 2.

In many foundries reciprocating conveyors are installed under the floor, for removing sand from the room where the moulds are broken up.

Annealing Steel Castings.*

BY W. M. CARR, NEW YORK.

Annealing methods in the foundry industry are recognized as established practices. No one will deny that in the malleable foundry annealing is a very important step. Whatever differences of opinion there may be hinge rather on methods. In the manufacture of chilled castiron car wheels also no dispute exists regarding their treatment in annealing pits. They would never be shipped or put into service without such treatment. The value of the treatment is fully recognized and it receives as much attention and care as any step in car wheel manufacture. In the production of gray iron castings annealing is sometimes followed, with a view to lessening certain stresses or strains set up in the cooling of the castings from the pouring temperature. The influence of the process in the case of gray iron upon the formation of the carbon compounds is not so important. If, however, changes should occur they would be in the direction of softening the surface of the castings.

In the three branches of the foundry industry just cited annealing is employed in the first instance primarily to change the formation of the carbon compounds from a hard, glasslike carbide of iron to the temper carbon, a substance not unlike graphite in its characteristics, conferring softness and malleability by certain methods of heat treatment upon a previously hard, brittle substance. In the second case, annealing lessens intense cooling strains in the plate and other parts of the wheel but does not so affect the carbon compounds as to damage the depth and hardness of the chilled tread, throat and flange. In the third instance annealing concerns mainly the avoidance of cooling strains.

Coming to the steel casting industry, the practice of annealing is open to some doubt. When specifications so demand, steel castings are put through an annealing furnace, frequently without any consideration of the conditions of time and temperature. In the absence of annealing specifications, steel castings are frequently shipped without such treatment.

Here we have the paradox of pains taken in the selection of raw materials, watchful manipulation of the melting and refining process in converting pigiron and steel scrap of proper quality into steel, pouring it into molds of particularly refractory sand, stripping and cleaning, followed by rigid inspection for flaws and imperfections outwardly visible, and finally shipping to the customer without annealing, delivering the castings with unknown stresses present, a coarse internal structure and other variables more or less liable to vitiate the value of the castings in service. If a casting shipped under such conditions should fail in service, all the precautions thrown around the methods of treating the raw material entering into it are wasted. The casting may be smooth, solid, true to pattern, of the proper chemical composition and the test bars examined from the same heat of steel may meet standard specifications in tensile strength, etc. Still, with all apparent evidences in its favor, if it is not annealed before going into service there will always remain a doubt as to the life of usefulness. The casting may fail unexpectedly. I do not mean to say that annealing will make the casting infallible, but I do know with other conditions being equal an annealed casting is less liable to fail in service than one not annealed.

In annealing steel castings we have conditions that are not entirely comparable with conditions existing in other branches of the foundry industry where annealing is more or less essential. The operation is not concerned with the changes in the carbon compounds. That is to say, the same carbide of iron will be present both before and after the treatment. In the matter of internal structures there are mainly two components: first, the crystalline formation and its refinement resulting from proper thermal treatment, and secondly the removal or lessening of internal stresses set up in cooling down from the casting temperature. It is peculiar to most metals that they should crystallize when cooling from a temperature at which they are cast, and the size of the crystals varies with the temperature and rate of cooling. The size and formation of the crystals have a decided influence upon the physical properties of the castings. Upon reheating metals to what is known as a refining or annealing temperature the grain or crystals of the metal will become smaller than their original form and with the change in structure will come better conditions physically. The castings will be tougher and better fitted to accomplish the work for which they may be designed. The refining temperatures are not the same for all metals, but generally speaking a suitable temperature to grain refined cast steels is about 825 to 850 deg. C.

There are, however, practical considerations to take into account that cannot be determined entirely by laboratory tests, such as the length of time to anneal a casting of a given shape and size, the style and type of furnace best suited to certain requirements. These points are capable of determination in view of the character of the product and the probable tonnage.

* A paper read at the Detroit meeting of the American Foundrymen's Association, June, 1908.

New Weinland Boiler Tube Cleaners.

Two new additions to the line of Weinland boiler tube cleaners, manufactured by the Lagonda Mfg. Company, Springfield, Ohio, are shown in the accompanying engravings. Fig. 1 illustrates the new Weinland four-arm, wing head turbine machine, and Fig. 2 the cleaning head of the steam or air driven cleaner.

The wing head is used on all of the company's turbine cleaners and is claimed to work fast on any scale, to have good wearing qualities and to be strong and capable of withstanding strain and severe jolts. It has few parts, namely, a spider, swinging arms and cutter wheels. The spider is steel and is milled from the solid bar, and the arms are drop forged. They are hinged securely to slotted arms of the spider, are free to swing by centrifugal force to the full diameter of the tube being cleaned, and are slotted at one end, which furnishes substantial support for the cutter wheels. There are four of these arms all alike, one pair preceding the other, each interchangeable. The cutter wheels are of both the star and solid steel cone pattern, and are carried on steel pins. The forward pair of arms each carry one cone cutter in front and three star cutters following. The rear arms carry only star cutters. All these cutters revolve freely on their pins and each pair cuts in a different path from the other, thus removing every particle of scale. As the cleaner revolves in a clockwise direction in the tube centrifugal force throws the cutter wheels against the scale forcibly, yet yieldingly, so that the tubes themselves are not injured. The four-arm wing head is used for 3½ and 4 in. tubes and is the largest size. Other types of heads are manufactured for various sizes of tubes. The cleaner is driven by direct connection to a small water turbine. The latter is made in two forms, one with ball bearing and one with a special thrust bearing. A special hose-coupling is used in connection with the cleaners, and water under 150 lb. pressure or more if convenient is recommended for operating.

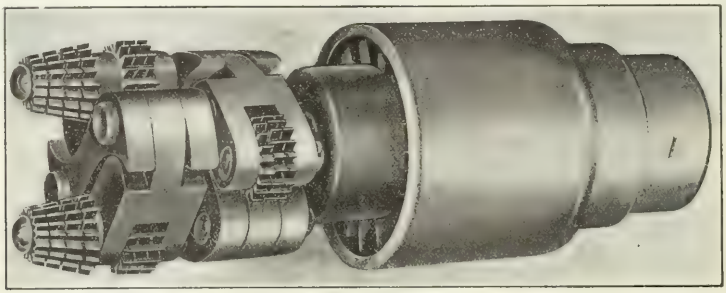


Fig. 1.—The New Weinland Wing Arm Turbine Tube Cleaner Made by the Lagonda Mfg. Company, Springfield, Ohio.

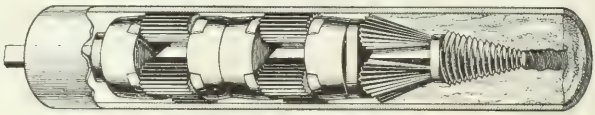


Fig. 2.—The Weinland Mechanical Cleaner.

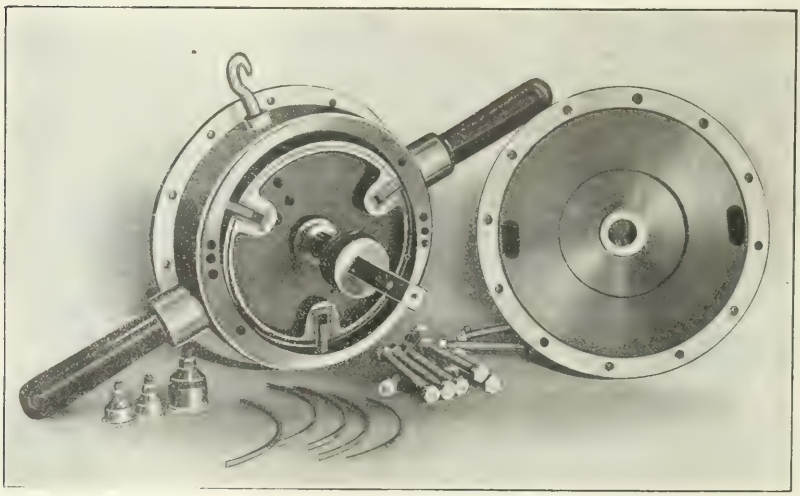


Fig. 3.—The Steam or Air Motor for Driving the Weinland Mechanical Cleaner.

The illustration of the cleaning head of the Weinland steam or air driven cleaner, Fig. 2, shows its method of action upon scale. It consists of a screw point which first bores into the lime, which is followed by a series of cone cutters arranged at an angle. These cut away the remaining scale and two sets of cylinder cutters follow, which remove any remaining particles and polish the tube. The machine consists of a jointed steel shaft with the cleaning head on one end and a rotary engine

on the object. For supporting it a trolley is used, consisting of a hand-operated differential pulley block and an overhead pipe on which it rolls across the boiler front to align to each vertical row of tubes. None of the weight of the motor is supported by the operator, and the two handles are merely for guiding the machine and pushing it against the scale.

The interior of the motor is exposed in Fig. 3. The steam or air pressure enters through a hose connected on the rear side of the case, and operates against three radial paddles or pistons, thus compelling the rotor to revolve at a speed determined by the pressure of the steam and the forward thrust against the scale. The pistons are forced outward to a steam tight fit with the case by the admission of pressure at the back end of the cages in which they slide. The admission ports, the three holes near the handles, admit steam or air to the space between the rotor and case. Each piston is under full steam or air pressure until the rotor has made a quarter turn, and, as there are three pistons, the rotative effort is practically continuous. The important bearing surfaces and cages in which the pistons slide are hard bronze and wear is further minimized by lubri-

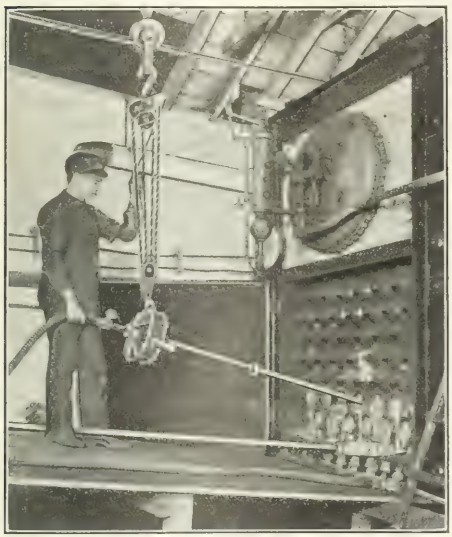


Fig. 4.—The Weinland Mechanical Cleaner at Work in the Foos Mfg. Company's Boiler Plant.

cators on both the front and rear of the case which force oil to the bearings. From 5 to 7 hp. may be brought to bear upon the scale and by throttling the steam the torque of the shaft and the speed of the cutting head may be adapted to any hardness or thickness of scale. At slow speeds and under heavy torque, the cleaner head is claimed not to become stalled in the worst scale.

Fig. 4 shows this cleaner under test of both steam and air pressure at 75 lb. in the plant of the Foos Mfg. Company, Springfield, Ohio. As this plant was too busy to shut down its boilers, scale had accumulated until it was ⅜ to ½ in. thick and very hard. The cleaner, using steam as motive power, was started at 9 o'clock one night and by 6:30 the next morning 49 tubes had been cleaned. Many of the tubes were cleaned in from 4 to 5 min. each. Equally good results were obtained on a similar boiler in the same plant with compressed air. At the Pittsburgh Plate Glass Company's works at Crystal City, Mo., scale which almost filled the tubes of Green fuel economizers was removed. The scale in this instance was as hard as rock, and although three men at times placed their whole weight on the motor the cleaning head bored its way through without stopping.

Customs Decisions.

The Steel Wool Case.

The Government and the domestic manufacturers of steel wool received a setback Friday when the Supreme Court of the United States declined formally to issue a writ of certiorari, which would have had the effect of reviewing a recent decision of the Federal Circuit Court of Appeals.

Henry M. Hoyt, solicitor-general of the United States, and his assistant, Edward T. Sanford, asked the court of last resort to grant a writ, while Albert H. Washburn of the law firm of Comstock & Washburn of this city, opposed the consideration of the case by the court on the ground that the finding of the tribunal below was equitable and should not be disturbed. The refusal of the court to take up the case is believed to be based on the arguments advanced by Mr. Washburn in his brief filed with the court.

Unless the Government can find a way to bring what is known as a new case the decision of the Court of Appeals will stand. This decision found steel wool used in polishing furniture and floors dutiable under paragraph 137 as a manufacture from steel wire at a rate of duty depending upon the gauge and value of such wire. The contention of the Government was that the product is dutiable under the metal schedule at 45 per cent. ad valorem. The question of classification under the tariff has been in litigation since 1902.

Miners' Diamonds.

The question of the classification of so-called miners' diamonds was the subject of a decision by the Board of United States General Appraisers handed down on Monday. The case came before the customs tribunal through the medium of a protest filed by the Sullivan Machinery Company, New York, objecting to the 10 per cent. duty assessed under the provision in the law for "diamonds and other precious stones advanced in condition, but not set." Instead, the importer alleged that free entry should be accorded in harmony with paragraph 545 specifying "miners' diamonds not set." General Appraiser Sharretts, who writes the decision for the board, states that nowhere in the record is it shown that the stones in suit are commercially known as miners' diamonds. Carbonado, or black diamonds, which are used chiefly in the construction of drills for mining and prospective purposes, are, in the opinion of the board, the articles embraced within the term "miners' diamonds." At the same time, however, the board is unwilling to accept the claim of the importer that, irrespective of whether the diamonds have been advanced in value, they are exempt from duty. On this point the decision overruling the protest says in part:

It is shown that the process of breaking or cutting miners' diamonds involves a loss in waste of from 15 to 30 per cent. besides the cost of cutting; hence it follows that the stones in question have been increased in value to a corresponding degree. We accordingly find as facts that the articles in dispute are miners' diamonds, not bort, and that they have been advanced in condition or value from their original condition by cleaving, splitting, cutting or any other process. We hold that they are excluded from free entry as precious stones in their natural state.

Announcement is made by the Standard Roller Bearing Company, Philadelphia, of the installation at its factory of a thoroughly equipped testing laboratory, in charge of Walter H. Hart, an expert chemist formerly connected with the Alan Wood Iron & Steel Company.

The Burt Mfg. Company, Akron, Ohio, has received an order for 10 of the company's glass top or combination skylights and ventilators for shipment to Canton, China, and has recently made shipments to Valparaiso, Chile; city of Mexico and Barcelona, Spain.

Reports from Coshocton, Ohio, state that plans have about been completed for the large cast iron pipe plant to be erected in that place by James B. Clow & Sons, Chicago, and that bids will soon be received for the buildings.

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A. I. FINDLEY, - - - - - - - - - }
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Southern and Northern Merchant Pig Iron.

Attention has been called from time to time in the market reports of the past few months to the relatively larger sales of Southern than of Northern foundry pig iron. The reason is well known. The price maintenance policy apparently had more active and consistent adherents among pig iron makers in the East than in other sections, and Eastern buyers of pig iron found Southern offers more attractive. A pig iron merchant refers to the matter as it is suggested by our own pig iron statistics for June 1, in the following letter to *The Iron Age:*

I am very much interested in the figures you give in the issue of June 4 concerning the pig iron output for May. I carefully note the total production of the South, including Maryland, Virginia and Kentucky. This production, together with that of Alabama, Georgia and Tennessee, presumably includes the entire output of those districts, including the pig iron made by the Tennessee Coal, Iron & Railroad Company and the Maryland Steel Company. I also note that about this time a year ago we were very close to the maximum tonnage in pig iron output. Would it be possible for you to submit the merchant production in the South and give a comparison of the production of May, 1908, with that of 1907? I believe that it would show how extremely small the present merchant demand is and also the probable capacity of the Southern merchant furnaces under favorable conditions.

It is altogether probable that a much larger percentage of the merchant furnaces of the South are now employed than of those of the North and West, and I believe that the reserve capacity in Southern districts is relatively unimportant; therefore, should a demand set in which is greater than those districts can supply, manifestly the excess must be furnished by furnaces in other districts, and therefore we might suppose that better prices would be established immediately after such increased demand. I believe a mere statement of facts concerning Southern capacity now employed and that employed one year ago, would be most interesting to the trade.

The Southern merchant furnaces producing coke iron are those of Virginia, Kentucky, Tennessee, Georgia, Alabama and Texas. The Maryland coke iron product enters into steel, largely for export. West Virginia produces only steel making iron, and its raw materials and markets are Northern. The comparison asked for, therefore, would be between the merchant pig iron output of the six states named in May, 1907, and that of May, 1908. This eliminates from the account the production of the Ensley furnaces of the Tennessee Coal, Iron & Railroad Company, which goes to the adjoining steel works, as well as that of the Southern Steel Company which was largely consumed at the latter company's steel plant at Gadsden, Ala. Our correspondent is correct in saying that in May, 1907, we were very close to our maximum pig iron output. May of last year showed a total output of 2,294,005 gross tons of coke and anthracite pig iron, and that month was only exceeded by the banner month of October, also a 31-day month, which showed a total of 2,336,972 tons. The total merchant furnace production and that of the South compare as follows for the two May periods, in gross tons:

	Total merchant pig iron.	Southern merchant pig iron.	Per cent. of Southern
May, 1907	779,777	197,736	25+
May, 1908	404,523	134,195	33

It appears that the Southern furnaces produced one-fourth of the merchant pig iron in May, 1907, and one-third of the merchant pig iron in May, 1908. Some increase in Southern merchant furnace capacity has been made in the past year, notably the new furnace of the Alabama Consolidated Coal & Iron Company at Gadsden, Ala., and the new Vanderbilt furnace at Boyles, Ala. It is true, however, that the reserve merchant capacity in the South is unimportant, reckoned by the consumption of last year or even that of an average year, but in a time like the present a possible increase of more than 50 per cent. upon the present production of Southern merchant furnaces is a factor of no small importance. To be sure there is no such possibility to be reckoned with on any such price basis as that of to-day, but the outstanding fact is that on the low level lately prevailing the Southern merchant furnaces have persisted in taking a considerably larger percentage of the total business than they were securing a year ago.

Industrial Schools and the Small Towns.

A law just enacted providing State aid for free industrial schools in Massachusetts establishes the right of a resident of any city or town in the State to attend an industrial school located in any other community and compels his residential city or town to pay his tuition fee. This wholly logical provision is designed to meet the wants of the young people of places so small as to be unable to support schools of this character. It is intended as a factor in the plan of dividing the State into districts, each with its industrial school supported in part by the State. With the fulfilment of the plan the new law should go far towards solving the problem of industrial training in communities the children of which would otherwise be without its advantages. It is a just provision, for it would be manifestly unfair to use public money in extending privileges to residents of places important enough to bear part of the expense themselves, to the exclusion of those living elsewhere in the State. The only objectors, doubtless, will be towns so small and so poor as to grudge the tuition fees of their children.

The principle of State aid for schools of this character is an excellent one. Their benefits are far from local to the places where they are situated. The students go out into the world to use the results of their training wherever it will reap them the most benefit. Not a few of the graduates enter the engineering schools and advance to higher work, which is generally more profitable to themselves and to the State and the country as well. Another important element in State aid lies in the encouragement which it gives to industrial education as a whole, helping to establish it as an accepted part of the school curriculum of every center of population, whether that center shall be a place of large size or a central point in a district from which the students will be recruited. In other words, the participation of the State gives impetus to a great movement the need of which is now being accepted generally as an essential part of the foundation of the country's future industrial welfare.

The idea seems to be strongly implanted that the industrial school proper should be developed to a point of complete efficiency and accessibility to students before

the attempt is made to establish the so-called industrial colleges, referred to editorially in *The Iron Age* of April 2. The legislative bill in Massachusetts providing for the creation of a commission to investigate the subject has been vetoed by Acting Governor Draper, himself one of the heads of the Draper Machine Works, Hopedale, manufacturer of textile machinery and a large employer. In his veto message he voices what seems to be a general opinion among manufacturers when he states: "I do not think it is time for the Commonwealth to consider the erection of one or more of these colleges providing for a three or four years' course of extended training, before any industrial schools of similar character have been organized or started." In other words, the schools are considered the basis of the system of education. Once established, the industrial college, occupying an intermediate position between the industrial school and the polytechnic or engineering schools, would be a natural development of the system. Probably the idea is a correct one, that it is better to concentrate energies on the one branch of industrial education until it is perfected and established to cover the entire territory. The college would be an evolution from the school, and doubtless would be the better because of the experience gained in the interim before its actual foundation.

The movement for this general branch of training is so strong, its acceptance has become so general, closing to a marked degree the old controversy between exponents of manual training and trade schools, combining in a sense the best ideas of each, that at no distant day the industrial schools of the United States will become as well recognized as an essential part of the general educational system as the high school, college and polytechnic institution of to-day. Abroad the test has already been made, especially in Germany. We believe that few persons doubt the great direct benefits which have accrued to that country from this source.

The Lesson of the Fall River Wages Agreement.

The practical operation of the agreement between the cotton manufacturers of Fall River, Mass., and the Textile Council, the union of their employees, has demonstrated that where both sides to such a contract live up to the automatic adjustment of wages based on market conditions, the system works out with excellent results. In this case the wages are based on the average margin for the previous six months. When the agreement was reached as the result of the work of a commission appointed by the Governor of the State, there was a slight increase in wages, though not near the percentage for which the union was fighting by a protracted and costly strike. Later on the agreement automatically produced an advance in wages corresponding with the market. Now it has effected a decrease of nearly 18 per cent., which has been accepted by the employees of the great mills, numbering many thousands. No friction was created. The manufacturers granted advances when they were due, and the employees took the decrease without a murmur. It was no important element in the acquiescence of the latter that they have confidence that, as times improve and the foundation of wages becomes more favorable, conditions will again adjust themselves, always on a basis of equity to all concerned.

In most lines of manufacturing such an arrangement would be hardly feasible, it is claimed, owing to a lack of uniformity of conditions of labor and prices of material. It is only with the great staples that an automatic adjustment of this character can be made. No one can doubt that in order to produce results under the system the union of employees must conduct itself according to strictly business methods, with full regard for the rights of property represented in the capital invested to employ them. That a cut in wages of 18 per cent. was accepted without a protest proves that the textile workers have lived up to this principle. The Fall River agreement is an example of the possibilities of the relations of employers and employees, where the latter are willing to let existing conditions govern their welfare.

The Railroads' Opportunity.

It is to be hoped that the example of the Erie Railroad in placing its repair shops in full operation will be followed by other roads. On most of the large systems, and practically all of the small ones, motives of immediate economy forbade all expenditures for shop work excepting where repairs were imperatively needed. The policy may have been unavoidable under conditions of the money market, as they existed last fall and winter. But now, with radical changes in sentiment, as indicated by the ease with which railroad bonds are being marketed, there should be no reason why in most cases the policy of the Erie should not be followed out. Rolling stock depreciates very rapidly under the methods that have been in practice lately. Procrastination in the making of repairs is always expensive. The best preparation for an era of protracted heavy traffic is to put every locomotive and car in first class condition.

During the period of congested freights there was no time for more than superficial repairs if they could be made to suffice. Everything that could run was kept in constant service. With the sudden, serious falling off of railroad business, resulting in a large percentage of rolling stock standing idle, it became necessary to avoid the expenditure of every cent beyond actual necessary expenses. Consequently equipment is in little better shape than a year ago; in some cases it is in much worse condition. The natural business method would be to take advantage of the first possible moment when finances will permit and begin the rehabilitation of equipment. Otherwise the next serious strain upon railroad resources will mean so very rapid a deterioration that locomotives and cars which would have had years of usefulness will have to go to the scrap heap before their time, or be retired for repairs so comprehensive as to amount to rebuilding, which will mean high cost and protracted delay. Those in active charge of railroad operations are of this opinion and are looking to those who have the financial direction of affairs to take the same view of the situation. If they do, there will be a quick return of busy times in repair shops all over the country, with a wholesome effect upon the general market.

Blast Furnace Gas Engines Develop a Problem in Germany.

Our Berlin correspondent, whose report upon the condition of the iron trade in Germany will be found in another part of this issue, mentions a fact which is of much interest in connection with the use of blast furnace gas in gas engines. He points out that the rate of pig iron production in Germany has been kept at its high point for a considerable time after the flood tide of prosperity in the iron trade had passed. The explanation, he says, is to be found largely in the use of furnace gas in gas engines. As the gas was needed for creating power the furnaces were in many cases kept running without respect to the actual demand for iron. The consequence is that considerable stocks have been accumulated at the

furnaces, much beyond the immediate demands of the market.

This is a point which has not been overlooked in the discussions of the production of power for other purposes from the operation of combustion engines on blast furnace gas. Up to this time, however, it had simply been a theory that such a condition of affairs might develop. Here we have the actual realization of the contingency. It naturally brings up the question of the effect on the pig iron trade of anything like a widespread practice of utilizing blast furnace gas in the development of power to operate other portions of an iron and steel plant, or for near-by colleries or general power purposes. If another plant, which must be kept running, depends entirely or even largely on the power obtained in this way there is no escape in a time of depression in the iron trade from the burdensome accumulation of stocks of pig iron.

The experience in Germany suggests that the reserve gas producer plant, fed with bituminous coal, which has been regarded desirable as supplementary to a blast furnace group, where large power requirements are supplied by the latter, would need to be increased beyond what has been generally contemplated. It is to a large extent a case of balancing the benefits of a close regulation of pig iron output, in times of reaction, against an investment in gas producers that much of the time would lie idle.

The Mesaba Range Labor Situation.

DULUTH, MINN., June 6, 1908.—That not all the bitterness rising out of the organization of many miners into a branch of the Western Federation, and its strike last year, is over has been evidenced from time to time by sporadic outbreaks of the fever for destruction. A mine captain's dwelling has been blown up, fires have been set about properties, attempts have been made to injure development and exploratory work, machinery has been destroyed and air pipe lines have been broken by dynamite charges. Doubtless many more acts of a like or worse nature would have been committed before this but for the care exercised by the mining companies and the watch they have maintained at their properties all over the Mesaba District.

Lawlessness on the Ranges

is something that must be expected, for a considerable time to come, at any rate. The class of work done, particularly on the Mesaba, the consequent character of the population, the examples set these men by a large portion of those with whom they come in contact, all tend toward a condition that makes lawlessness certain. Manual labor on the Mesaba Range is simply muscle, not brains; little initiative or thought or brains is necessary for the workman who is in a steam shovel gang on a stripping pit or dump and who spends his time in the least skilled of employments. The men are foreigners, chiefly from eastern Europe. Probably nowhere in the United States are the Balkan countries so represented among the laborers. Montenegrins, Servians, &c., Hungarians, Austrians, South of Italy men, Russians, Fins and Swede-Fins make up the bulk of unskilled labor. Some of these people speak English, but many do not. Ignorant, and not understanding what is said, they are suspicious; accustomed only to government by repression and fear, they are likely to misconstrue any attempt on the part of a mine management to deal fairly with them, considering it as evidence of weakness and to be met by boldness and abandon on their own part. Convinced by the specious argument of some labor agitator that they are wronged, they will be proof against reason and judgment, for they have neither, and will be like the dry grass of early spring when a match is set to it.

The Character of the Men.

Notwithstanding the pleas of professional philanthropists, who protest against considering these men as mere adjuncts of machinery, any other method of treatment is impossible. Steve Donjonovich may be employed at one contract to-day; to-morrow he will be Kalas Paripopovich at another location, and in a week will be back at his first job under the name of Marks Ylijari. Nothing but a system of numbers can keep track of such a man as this. He has no home, no friends, no morals, no desires but to satisfy his appetite for food, drink, &c. He receives no letters, and has as far as can be learned, no tender memories of home nor ties of childhood. He drinks beer in such quantities occasionally as to become more of a beast than usual, during which time he and his male and female associates carry on orgies the lubricity of which is such as to stun a man of ordinary moral sense. His home is a shelf in a boarding house whose keeper is an illicit dealer in liquor. He carries a long and murderous knife, and the stabbing and cutting affrays that occasionally result fatally are looked upon as mere diversions for Sundays and holidays, and as scarcely worth arrest, much less indictment by the grand juries. He lives on a plane so low as to remind the onlooker of beasts; his food is of the coarsest and is not especially nutritious. On this account beer, containing a certain proportion of alcohol, hops and barley, is perhaps necessary as a food adjunct, and is consumed in great quantities.

Beer is Necessary.

So well understood is this demand for liquor as food that, during the strike of miners last year, the companies were compelled to recognize it. The sheriff had closed all saloons and prohibited the importation of beer by brewers. Men could not then be secured for mine operation until it had been promised by employers that beer should be delivered to the locations guarded by the deputies. Recently a delegation of citizens of one Mesaba town, alarmed at the increasing degeneracy of children, the obscene and ribald exhibitions on their streets, and the disregard of all laws of property and private rights by men in drink, protested to brewers against the unlimited sale of beer illegally in their town. The committee recognized, it said, the apparent need of liquor as food, brought about by the character of the sustenance of the workmen, but it did think that the breweries might arrange matters so that there should not be above one gallon per man per day supplied, in addition to what might be bought at saloons. The inference is that the illicit traffic alone in that town amounted to considerably more than "one gallon per man per day."

The disregard of law, thus shown, has its natural effect on these ignorant foreigners. They think that if men with whom they are brought into daily contact can thus break laws with impunity, why cannot they also break any they see fit? This has accounted for not a little of the spirit of anarchy that has pervaded the district for some time, and that at any moment might break out into unrestrained riot were it not for the strict repressive steps that were taken some time ago. There is probably no labor center in the United States where conditions are more complex and where the future must be viewed with more serious consideration by the student of political economy than on the Mesaba Range.

D. E. W.

The Gladstone Furnace of the Pioneer Iron Company, one of the important charcoal stacks in the Lake District, will soon be blown out for repairs and relining. It has been in constant operation for more than six years, and needs some changes. This is one of the Cleveland-Cliffs Company's subsidiary enterprises, and is equipped with very complete chemical works for the distillation of the wood products, &c.

Railroad interests are greatly exercised over their inability to comply with the terms of a bill passed by the Senate requiring all roads after a certain date to equip their locomotives with automatic ashpans. The bill was demanded by labor unions for the supposed benefit of locomotive firemen. It is declared emphatically by railroad men that no device of the kind required has yet been produced.

The American Foundrymen's Association.

TORONTO, ONT., June 9, 1908.—(*By Telegraph.*)—The registration at the twelfth annual convention of the American Foundrymen's Association reached 975 this afternoon and is expected to be fully 1200 by to-morrow. Both in spirit and in the size of the representation of the important foundry centers of the United States it is up to the Philadelphia convention of last year, while the exhibits under the auspices of the Foundry Supply Association are the best yet shown.

Though Canadians are indifferent about commercial reciprocity with the United States, their foundrymen seem to be hearty believers in reciprocating the good fellowship they have found at previous conventions of the association. L. L. Anthes of the Toronto Foundry Company, Ltd., chairman of the General Committee, and Fred Somerville of Someville, Ltd.; Robert Cluff of the King Radiator Company, Ltd.; Peter McMichael of the Dominion Radiator Company, Ltd., and W. P. Near of the Page Hersey Company, Ltd., chairmen of the various local subcommittees, have put in weeks of hard work on the preparations, and the result is a meeting that in its social and educational features promises to make a new record.

The reception to-night to the delegates by the Mayor, City Council and other officials is a recognition such as these conventions have not previously had. Furthermore, the local papers give the convention generous attention, albeit some of their statements have a touch of humor, one article telling how at an exhibit building "a company is using iron that is molded in the cupola and is melting souvenir molds and castings."

Three buildings at the Canadian National Exhibition, which is about two miles from the business center of the city, are given up to the convention, two being filled with exhibits and the third devoted to the sessions for papers and business.

Stanley G. Flagg, Jr., president of the association, called the meeting to order Tuesday afternoon and introduced Mayor Oliver for the address of welcome. The Mayor exhibited the reigning Canadian spirit when he expressed the hope that some of the visiting foundrymen would start branch shops in Toronto. He also served notice that the piecemeal annexation of the people of the United States by Canada would go on. Responses to the welcome were made by President Flagg for the American Foundrymen's Association; President E. H. Mumford, Philadelphia, for the Foundry Supply Association; President Charles J. Caley, New Britain, Conn., for the American Brass Founders' Association, and President W. S. McQuilan, Warren, Pa., for the Associated Foundry Foremen.

Mr. Flagg then gave the presidential address, which referred to the Philadelphia meeting of last year as marking an epoch in the prominence it gave, just as is being done at the Toronto meeting, to the practice and actual operations of the foundry. The address discussed ably the province of such an association, and pointed out how the foundries of the United States owe an incalculable debt to the organization. The possibilities of a larger work of investigation given by the provision of sufficient funds were outlined, and an increase in the annual dues was suggested, so that the special fund for research work to which a number of members had contributed in the past year might be increased.

Secretary Moldenke read his report, showing among other things a present membership of 730, including 67 in Canada. The special fund for investigation collected in the year amounted to $585, and in addition $300 from Pittsburgh was raised by J. S. Seaman of that city. The effect of vanadium and titanium on cast iron had already been investigated, the secretary reported, and a scientific study of molding sands is well under way.

Adjournment was taken to Wednesday morning, when the Brass Founders' Association will hold a session for the reading of papers, while on Wednesday afternoon will come the first session of the American Foundrymen's Association for papers and discussions. A movement is on foot for a closer federation of the four associations next year. This may require some change in the basis of organization.

A Jones & Laughlin Employees' Banquet.

On Saturday, June 6, about 50 of the various department superintendents and foremen of the coke ovens and blast furnaces of the Jones & Laughlin Steel Company gathered together at a most enjoyable banquet for the purpose of promoting good fellowship and harmony among all the employees in these works of the company. The banquet was served in the Hotel Henry, Pittsburgh, and was enlivened by the Lindsey Crescent Quartette of negroes and by various toasts and speeches from the employees and guests, who were introduced by E. L. Messler, general superintendent of the coke oven and blast furnace departments, who acted as toastmaster.

Among the guests who responded were B. F. Jones, Jr., president of the company, on "Our Future"; W. L. Jones, vice-president and general manager, on "Our Past"; R. B. Drum, superintendent coal mines, on "The Black Diamonds"; M. J. Dowling, general superintendent steel works, "Those Furnace People"; W. H. Lewis, general superintendent Aliquippa Works, "What Aliquippa Is Going to Show the Pittsburgh Works"; G. M. Laughlin, Jr., general superintendent Soho Furnace, "The Plates That Were Always Wanted Yesterday."

Some of the employees who responded were as follows: P. H. Gilday, assistant general superintendent coke oven and furnace departments, "My Dream of the Future"; N. C. Neemes, superintendent coke ovens, "The Old Plant;" Wm. Smith, master mechanic, "The New Plant;" J. O. Willard, engineer furnace department, "Get Together."

The Amalgamated Wage Scales Unsettled.

The conference between the Amalgamated Association and the Western Bar Iron Association at Cambridge Springs, Pa., last week, adjourned without a settlement being reached. The manufacturers asked for reductions in boiling and finishing scales averaging 10 per cent. or more, basing these on the recent lowering of prices on iron and steel bars. These reductions came at the time the conference was in session and were entirely unexpected. Settlement of the scales was then deferred to see whether there would be further reductions in prices on finished iron and steel. No arrangement has yet been made between the Amalgamated Association and the Republic Iron & Steel Company for a conference. A conciliation agreement exists between the Amalgamated Association and the Western Bar Iron Association by which the mills belonging to the latter may continue in operation after July 1, pending a final settlement of the scale, and pay the present rates of wages, but whether the manufacturers will agree to operate their mills after July 1 on present scale rates is doubtful.

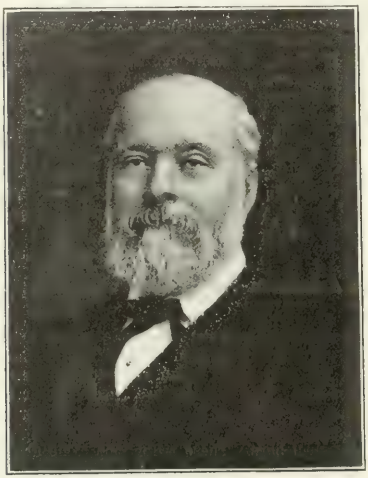
The Northern Motor Car Company and the Wayne Automobile Company, Detroit, Mich., have been consolidated into a new company to be known as the Everitt-Metzger-Flanders Company, which will have a capital stock of $1,000,000. The new company plans to build 12,500 motor cars next year, to be equipped with a 30 hp. four cylinder motor. The car will be called the Everitt and will be licensed by the Association of Licensed Automobile Manufacturers. The Board of Directors consists of Charles L. Palms, William T. Barbour, president of the Detroit Stove Works; Dr. J. B. Book, A. D. Bennett, B. F. Everitt, W. E. Flanders and William Metzger. B. F. Everitt, who is president, has been a large builder of automobile bodies, and W. E. Flanders was formerly manufacturing manager of the Ford Motor Company. William T. Barbour is vice-President, and Charles L. Palms, treasurer.

OBITUARY.

PETER WHITE.

Peter White probably the best known citizen of the Upper Peninsula of Michigan, died suddenly of heart disease at Detroit on Saturday morning, June 6. Born in Rome, N. Y., in 1831, Mr. White went as a boy to Green Bay, Wis. At 15 he set out in quest of the fortune which awaited him in the Northern Peninsula, then a wilderness, making his way to Mackinac, which had long been a trading post for the French Canadians. He lived on the island for several years, gaining much by contact with the Indians, traders, government officials and voyageurs. Mastering the dialects of the Indians and French, he made himself popular with all classes. For a time he attached himself to one of the schooners plying between Detroit and the Soo, and later he worked in a store in Detroit. Then followed two years in the lighthouse service.

In 1849 he set out for the Marquette country with a party of prospectors. At first he served an apprenticeship in a company store at Marquette, and the second winter he carried the mail on snowshoes and by dog train over 75 miles of wilderness to L'Anse, Mich. For this service



PETER WHITE.

with all its hazard he was promised $1200, but actually received $3. This experience was the subject of one of Mr. White's most entertaining stories, and here it may be said that as a raconteur he was known not only throughout Michigan, but in other States and many an important function, political and otherwise, has been made memorable to its attendants by Mr. White's rare gift of story telling. In 1851 he was elected to the joint offices of County Clerk and Registrar of Deeds at Marquette, and later treasurer of the local school board, a position he held for more than 50 years. In the early fifties he was appointed postmaster at Marquette and opened a general store. He was manager at Marquette for the Cleveland Iron Mining Company in its early days, and he acquired the land on which the main business portion of Marquette was built.

Late in the fifties he studied law and was admitted to the bar, being for 10 years senior member of the law firm of White & Maynard. In 1863 Mr. White incorporated what is now the First National Bank of Marquette. His business sense led him into a number of prosperous ventures, and for most of the past 40 years he has been identified with iron mining. At his death he was a director in the Cleveland Cliffs Iron Company and in the People's State Bank of Detroit. He was elected Mayor of Marquette some years ago, but declined the office. Several times he had been asked to accept political appointments, but did not care for such honors. He was a member of the Michigan Legislature in 1857 and was elected State Senator in 1875, being a Democrat in politics. He was Michigan commissioner to the Chicago, Buffalo and Nashville expositions, and in recent years had been regent of Michigan University, member of the State Library Commission and member of the Mackinac Island Park Commission. He was the leading spirit in the semi-centennial celebration in 1905 of the opening of the Sault Ste. Marie Canal.

Marquette contains two enduring monuments to Mr. White. One is Presque Isle Park, comprising 380 acres, just north of the city. Through Mr. White's efforts a bill was passed at Washington ceding this park, which was government property, to the city of Marquette. Mr. White spent large sums in the improvement of this park. He gave the Peter White Library to Marquette and endowed it. In a book written by Ralph D. Williams, Cleveland, Ohio, under the title "The Honorable Peter White," the life story of Marquette's benefactor is told most attractively, and interwoven with it is what may be termed the romance of the iron ore trade of Lake Superior. Mrs. White died a number of years ago. There is one surviving child, Mrs. Shiras of Pittsburgh, wife of ex-Congressman George Shiras, a grandson of Justice George Shiras, retired, of the United States Supreme Court.

CHARLES AUGUSTUS LUNDELL, Boston, Mass., formerly prominently identified with the Swedish iron trade in that city, died June 1, aged 67 years. He was a native of Sweden, coming to America when a young man.

JULIUS G. WAGNER, Milwaukee, Wis., died May 31, aged 74 years. He had lived in Milwaukee since 1855 and was one of the pioneers of the city in the manufacture of iron and steel. He was the founder of the J. G. Wagner Company, which a few years ago became a part of the American Bridge Company. He leaves a son and two daughters.

SIR ROBERT G. REID, builder of one of the early bridges over the Niagara River at Niagara Falls, and the Lachine Bridge across the St. Lawrence River, died at Montreal, Canada, June 3. He was a native of Scotland, coming to America in 1871, after several years of Australian experience in mining and the construction of public works. Embarking in railroad construction and bridge building, he attained fame and wealth. For years he was in almost absolute control of the affairs of Newfoundland.

CALEB B. WICK, Youngstown, Ohio, one of the best known financiers and business men of the Mahoning Valley, died June 3, aged 72 years. He had been ill for a long period. He was born in Youngstown, and attended the local public schools until he was 17 years old, when he began his long and successful business career by accepting a position as clerk in the old Mahoning County Bank, which is now known as the First National Bank. By the time he was 23 years of age, he had risen to the position of cashier, serving as such until 1862. He was the youngest bank cashier in that section when he accepted the position. A short time prior he had become a member of the banking firm of Wick Bros. & Co. of Youngstown, and, in 1865, in connection with William Coleman and S. Q. Porter, he started the first bank in Sharon, Pa., under the name of Wick, Porter & Co. Soon after he became prominently identified with the development of numerous railroads and was largely interested in iron, coal and other industries.

The Taylor-Wilson Mfg. Company, McKees Rocks, Pittsburgh, manufacturer of castings, machine molded gears, tube works machinery, &c., has just completed shipments on an order for 250 standard gauge charging cars to the Indiana Steel Company, Gary, Ind. The cars placed end to end would run over a half mile in length, and 50 railroad cars were required to make the entire shipment.

The special meeting of the American Steel Foundries stockholders to pass on the proposed capital reorganization, which has been postponed from time to time since last winter, has been again adjourned, this time to June 12.

PERSONAL.

Charles B. Crook of the Ludgerwood Mfg. Company, New York, has returned from a several weeks' business trip to Panama.

J. T. Ware, who has been connected with the operating department of the Birmingham Coal & Iron Company, for a number of years, has been appointed assistant sales agent with headquarters in Birmingham, Ala.

F. L. Fairchild of the C. & G. Cooper Company, engine manufacturer, Mt. Vernon, Ohio, spent several days in New York this week on a business trip.

A party of directors and others interested in the Moose Mountain Ore Company left Toronto June 9 on an inspection trip to the company's iron mine at Moose Mountain, going via Sudbury, Ont. The railroad to the property, which has been under construction for some time, has recently been completed and shipments will be made this season if there is demand for the ore. The party includes J. J. Mitchell, John Lambert and J. C. Hutchins, Chicago; John W. Gates, New York; E. W. Oglebay and L. B. Miller of Oglebay, Norton & Co., Cleveland; D. D. Mann of McKenzie & Mann Company, Toronto; C. H. McCullough, Lackawanna Steel Company, Buffalo, and Joseph Sellwood, Duluth.

O. P. Cherdron, San Francisco, has severed his connection with the Arthur Koppel Company and will start East on an extended business trip, going to Europe before returning to California.

J. B. McColl, formerly associate professor of steam engineering at Purdue University, Lafayette, Ind., and now connected with the engineering department of the American Blower Company, Detroit, has been delivering a series of illustrated lectures before engineering classes of the technical schools in the Middle West on the movement and heating of air for heating, ventilating and drying systems, the theory and practice of blower design and installation, and kindred topics.

John S. Stover, Milwaukee, has been named as the Wisconsin representative of the Columbus Machinery Company, Columbus, Ohio, which has recently filed articles of incorporation to do business in the State of Wisconsin.

Archibald Johnston, president of the Bethlehem Steel Company, has gone abroad in the interests of his company. Charles M. Schwab, chairman, sailed on the same steamer for the ocean trip.

Francis G. Echols of the Pratt & Whitney Company, Hartford, Conn., has returned from a European trip on the business of the company.

Leroy A. Williamson has severed his connection with the Niles-Bement-Pond Company and associated himself with the Automatic Sealing & Stamping Machine Company, 48 Custom House street, Providence, R. I. He had been ill for some time, but is now in condition to resume attention to business.

August Marx, general manager of the Philadelphia Roll & Machine Company, Philadelphia, Pa., will sail early in July for a sojourn of several months in Europe.

Ira A. Thomas has become connected with the sales department of the Niles Iron & Steel Company, Niles, Ohio.

Emil Swensson, consulting engineer, Pittsburgh, has received credentials from the Pittsburgh Chamber of Commerce for the gathering of data in foreign lands on how to prevent damage by floods. He will probably go abroad this summer for that purpose.

Dr. R. W. Raymond, secretary of the American Institute of Mining Engineers, and Dr. C. B. Dudley of Altoona, Pa., made addresses at the opening of the Drown Memorial Building at Lehigh University, South Bethlehem, Pa.

James Gayley, first vice-president of the United States Steel Corporation, expects to sail for Europe early in July on matters connected with his dry air process.

W. J. A. London has accepted the position of chief engineer of the Terry Steam Turbine Company, Hartford, Conn., succeeding C. E. Terry, recently deceased. Mr. London's experience in the turbine industry has been extensive, dating from his early connection with the C. A. Parsons Company, Newcastle, England, and later with the Brown-Boveri Company, Baden, Germany, and the British and American Westinghouse companies.

The History of Expanded Metal.

Expanded metal, the commercial name for a material having a worldwide use and which consumes yearly many thousand tons of steel sheets in its manufacture, had its beginning in an occurrence in which a half-grown hog played a prominent and useful part. The inventor, John F. Golding, then a Chicago newspaper man, was on a sleeping car on his way to New York in the fall of 1884, when his train was stopped for a while near a field of ripening corn, inclosed by a fence made of plain wire stretched from post to post. While looking out of the window, he noticed a pig approaching the fence, through which he passed by pushing his head and body between the wires, thereby gaining easy access to the desired corn. This was done with an air of assurance indicating that the spring of the wires had been numerously under previous tests.

The evident defect in the fence led Mr. Golding to study methods of prevention. His first conclusion was to connect the wires at intervals by perpendicular strands as is now done in the woven wire fencing in common use. This prompted the further inquiry, why not utilize sheet steel and make large meshes by slitting the metal and then push out or expand to form a diamond shape?

Realizing the value of the invention, Mr. Golding went to Washington and filed application for patents, and then sought the co-operation of capital, which he found in the person of Oscar Bradford, then president of the Curtis & Co. Mfg. Company, St. Louis, who interested Henry Semple Ames, Henry S. Turner and R. H. Floyd-Jones, all of that city, in a company of which he became president, which position he has held continuously to this time.

Mr. Golding's mechanical ingenuity devised practicable machines of the "guillotine" type, and the industry was launched, first as a material for fencing, but later its adaptability in smaller meshes for plastering lath and for concrete reinforcement led to an invasion of fields with wider opportunities.

Manufacturing plants were established in the leading European countries and Australia, and the business enjoyed a healthy growth, but realizing the necessity for more rapid methods of production Mr. Bradford began to look around for a rotary machine. The initial idea came from W. L. Caldwell, now of Canton, Ohio, which when improved upon by the inventions of Lewis E. Curtis of Chicago, reached fruition in a machine with a capacity twenty times greater than the old time guillotines. This second birth of the industry gave it an immense impetus, and it is now going forward by leaps and bounds to a development which will make it one of the leading factors in sheet tonnage. The manufacture and distribution of the material have been well taken care of by Chess Bros., Pittsburgh; the Eastern Expanded Metal Company, Boston, and the Northwestern Expanded Metal Company, Chicago. More recently the American Sheet & Tin Plate Company has entered the field under license from the Ames Steel Lath Company, St. Louis, which controls the patents on the rotary process.

The Reineke & Wagner Pump & Supply Company, Pittsburgh, has secured the contract from the city of Johnstown, Pa., for two 7 x 8 triplex pumps, to be operated by two engines manufactured by the Otto Gas Engine Company. Other sales include a 24-in. Gould deep well working head, to the Ivanhoe Furnace Company, Ivanhoe, Va.; a 4½ x 6 electric sinking pump, to the Dan Gold Mining Company, Baker City, Ore.; a 6 x 8 pump to the Armstrong Cork Company, Pittsburgh, and a 12 x 36 in. steam head for forcing water from a deep well, to the Andrews & Hitchcock Company, to supply its plant at Youngstown, Ohio.

A Systematic Scheme for the Analysis of Basic Slags, &c.

BY GORDON MILLS.

The analytical methods described in most text books are usually most painfully slow and cannot as a rule be carried out exactly as given, without getting badly "left," as regards time. Especially so is this the case with the complete analysis of basic slags and similar material, which contain so many constituents of like nature, thus requiring great care in manipulation, which, of course, means the expenditure of more or less valuable time.

After considerable experience with such material, the writer can strongly recommend the following scheme of analysis, which has the advantage of being conducted in a systematic manner, combining accuracy with rapidity—most important considerations for the busy work's chemist. Naturally this scheme will be equally applicable, with suitable modifications, for the analysis of any other material of a similar nature.—*e. g.*, iron ores, &c.

The Method.

Silicon.—One gram of the sample ground to an impalpable powder is placed in a No. 1 beaker, to which about 10 c. cm. of water has been added. After thoroughly disseminating the sample by shaking, add about 30 c. cm. strong hydrochloric acid, gradually shaking the beaker in the meantime. Now heat to boiling, evaporate to complete dryness, and bake for a few minutes. When cool add 20 c. cm. hydrochloric acid, bring to boil, and add about 30 c. cm. water. After boiling for a few minutes, filter on an ashless filter paper, wash well with hot water and a little hot dilute hydrochloric acid (1 to 4), afterward finishing with the hot water again. Dry and ignite, and weigh the residue, which should be perfectly white (which is usually the case with basic slags, unless much chromic acid be present). If the residue is not white add a few drops of hydrofluoric acid and sulphuric acid, and treat in the usual way, the loss in weight after ignition being the silica. The residue remaining in the platinum crucible is dissolved out by means of hydrochloric acid and added to the filtrate.

The Filtrate.—This is made up to 500 c. cm. in a graduated flask, and well shaken. This, for convenience, is designated the "stock solution."

Alumina.—Half, that is 250 c. cm. of the "stock solution" is taken by means of a standard pipette, such being equal to 0.5 g. of the sample and transferred to a liter flask. About three drops of strong nitric acid is now added and the solution brought to boiling; then ammonia is added drop by drop until a slight permanent precipitate shows up, which dissolve with about two drops of hydrochloric acid. Now dilute to about 500 c. cm. with water, heat to boiling and add about 15 c. cm. of ammonia acetate (saturated solution), quickly filter while hot, washing well with hot water. If the slag contains a large percentage of manganese, the basic acetate separation must be repeated as before, the second filtrate being added to the first, but this refinement is not usually necessary in ordinary routine work. The filtrate is reserved for estimation of the manganese, &c. The precipitate of the basic acetates is dissolved in hydrochloric acid and diluted to about 500 c. cm. with water, heated to boiling, when ammonia is added drop by drop until the solution is of a dark brick red color, but contains no precipitate. Add 3 c. cm. of strong hydrochloric acid and 2 g. of sodium phosphate, previously being dissolved in water and filtered; stir until the precipitate formed has all disappeared. Now add 10 g. sodium hyposulphite, and 15 c. cm. acetic acid (1.04 sp. gr.). Boil for about 10 min., filter as rapidly as possible, washing with hot water very thoroughly, dry and ignite,* and weigh as aluminum phosphate, which multiplied by 0.4185 gives the weight of alumina.

Manganese.—The filtrate from the basic acetate separation is evaporated to about 300 c. cm. if necessary. Now add a quantity of bromine water, allow to stand a little time, with occasional shaking, afterward adding ammonia in sufficient excess to smell strongly; heat to boiling. Allow to stand a little while, afterward filtering and well washing the precipitate with hot water; ignite and weigh as Mn_3O_4. If preferred, however, the manganese tetroxide precipitate may be dissolved in sulphurous acid and precipitated as ammonium-manganese phosphate.

Lime.—To the filtrate add a little C. P. tartaric acid* and a little ammonia, if necessary, to make the solution smell strongly. Heat to boiling and add a boiling saturated solution of ammonium oxalate, and continue boiling for a few minutes. Allow to settle, filter upon a close filter paper, and wash thoroughly with hot water. Return the filter and contents to the beaker in which the precipitation was effected. Add about 500 c. cm. water and enough sulphuric acid to dissolve the calcium oxalate, heat to boiling and titrate with potassium permanganate until a pink tinge is produced, exactly as is usual with the titration of iron. The iron value of the potassium permanganate multiplied by 0.50 equals the value for lime.

Magnesia.—Evaporate the filtrate to small bulk, allow to cool, add microcosmic salt or ammonium phosphate and about one-fourth bulk of ammonia, stand in ice cold water, stirring vigorously in the meantime and allow to stand over night. Filter and wash thoroughly with water containing one-third volume of ammonia and about 100 g. of ammonium nitrate per liter; ignite carefully at low heat, raising the temperature when the carbon of the paper has been consumed, and weigh as magnesium hypophosphate, which multiplied by 0.36243, gives the weight of magnesia.

Phosphorus.—Take 50 c. cm. of the original stock solution by means of a standard pipette, which will be equal to 0.1 gm. of the sample. (If, however, the slag is not very high in phosphorus, 100 c. cm. or more must be taken.) Evaporate the solution to a syrup in a suitable sized beaker, when add about 5 c. cm. strong nitric acid and again evaporate to a syrup, in order to drive off all the hydrochloric acid; now take up with about 30 c. cm. nitric acid (1.2 sp. gr.), add ammonia and precipitate the phosphorus by means of ammonium molybdate in the usual manner. The phospho-molybdate precipitate is either dried and weighed, or, which is more preferable, estimated volumetrically by the alkalimetric or potassium permanganate titration methods, just as the operator desires.

Iron.—The remainder of the original stock solution, which in this case will be equal to 200 c. cm., and equivalent to 0.4 g. of sample, is evaporated somewhat, the ferric iron being reduced by means of zinc or other convenient reductor, and titrated in the usual manner, either with potassium bichromate or potassium permanganate, as the operator chooses. In most cases, however, it is preferable to estimate the iron upon a fresh sample, in which case 1 g. is taken and dissolved with hydrochloric acid in a suitable sized flask, it being reduced just as soon as the solution is complete, it being entirely unnecessary to remove the silica previous to reduction.

Sulphur.—This can be most conveniently estimated volumetrically by the following method with rapidity and a fair amount of accuracy: From 2 g. to 5 g. of the sample is placed in an ordinary sulphur flask, together with about an equal weight of metallic zinc, and treated exactly as though estimating the sulphur in iron or steel.

The Riter-Conley Mfg. Company, Pittsburgh, is about to begin the construction work on four more blast furnaces for the Indiana Steel Company, Gary, Ind. About 12,500 tons of plates and other shapes will be used in these four furnaces. The Riter-Conley Company has already built four furnaces at Gary, its contract having provided for eight. All through the industrial depression the building of the Gary plant has continued with unabating energy. The prediction has been made that the entire new plant will be in full operation by the middle of next year.

* Ignite in a porcelain crucible at a very low heat until all the carbon of the filter paper has been consumed, afterward increasing the temperature.

* This addition of tartaric acid, which must be free from lime, is very important, especially if the slag be very high in phosphoric acid, as it prevents a proportion of the phosphorus from being precipitated with the calcium oxalate.

NEWS OF THE WORKS.

Iron and Steel.

The damage done by the recent fire at the plant of the Dominion Iron & Steel Company, Sydney, Cape Breton, was much exaggerated in the press reports. The building destroyed was a light frame structure, one story high, which covered three or four pipe threading machines used in connection with an outdoor bending forge where the pipe fitters worked on larger jobs than could conveniently be accommodated in the machine shop. Such repairs as will be required to put the machines in working order again and to reconstruct the building will only cost about $2000, which is fairly covered by insurance. The fire caused no interruption in operations, and the machines are being repaired and will probably be housed in a convenient building within a few weeks.

General Machinery.

The Albany Foundry & Machine Works, Albany, Ga., recently organized, has leased the plant of the Bacon Equipment Company and will do general foundry and machine work, making a specialty of boiler and locomotive repairs. J. J. Anderson is president and general manager, and F. M. Farley, Jr., secretary and treasurer.

The Poughkeepsie Foundry & Machine Company, Poughkeepsie, N. Y., has increased its capital stock from $25,000 to $50,000. The increased capital will be used for improvements which have already been made. The company has a comparatively new plant and anticipates making no additions at the present time.

The Department of Parks, New York, will receive bids until June 18 for one 12-ton three-wheeled steam road roller.

It is stated that the Marin County Gas Company, Sausalito, Cal., will erect a plant to produce gas from crude petroleum for cooking and heating purposes for which the following equipment will be required: Boilers, engines, steam pumps, blowers, gas compressors, &c. Charles P. Greenwood & Co., San Francisco, are the engineers in charge.

Some little equipment will probably be purchased through the purchasing department of the Fort Worth & Denver City Railroad at Denver, Colo., for replacing the machines burned at the recent fire which completely destroyed the shops at Childress, Texas. The machine shop, blacksmith shop, boiler shop and copper shop at Childress were completely destroyed by fire and some of the machinery was only slightly damaged; the boilers were not injured very much. It is the intention of the company to rebuild these shops as quickly as possible.

The Moore Drop Forge Company, Springfield, Mass., is enlarging its plant by the erection of a 40 x 90 ft. addition to its machine shop and entirely new offices.

Power Plant Equipment.

The York Haven Water & Power Company, York Haven, Pa., has placed contracts for the additional machinery for enlarging the capacity of its plant from 10,000 to 20,000 hp. The generators will be furnished by the General Electric Company, Schenectady, N. Y., and the water wheels by the Poole Engineering & Machine Company, Baltimore, Md. An electric crusher to be installed in the quarries has also been purchased.

The Board of Aldermen of Columbia, Miss., will receive bids until June 30 for the construction of a complete water works and sewer system, plans and specifications for which can be seen after June 15.

The Board of Public Works, Grand Rapids, Mich., will receive bids until June 25 for a 12-000,000-gal. vertical triple expansion pumping engine for the water works pumping station.

The Louisiana Light, Power & Traction Company, Louisiana, Mo., of which F. E. Murray is secretary, has under consideration the erection of a new power plant and extension of lines.

The City Council of Elizabeth, N. J., will receive bids until July 1 for a pumping station.

The Gillie Machine Company has been incorporated at North Tonawanda, N. Y., to take over the business of the Gillie Engine & Machine Company. The capital stock is $15,000. The directors of the new company are John B. Gillie, Wm. M. Gillie and Paschal S. Hartigan.

Foundries.

The Aluminum Foundry Company, Manitowoc, Wis., which makes a specialty of automobile castings in aluminum, has in contemplation the making of some additions to its plant, but plans are as yet undeveloped and nothing will be done until this fall, and possibly next year.

Fires.

The plant of the Lorenna Foundry Company, Bridgeport, Pa., was damaged $10,000 by fire June 3.

The plant of the Best Mfg. Company, Pittsburgh, Pa., was damaged $25,000 by fire June 3. The fire will not interfere in the filling of contracts by the company for piping equipment for power plants and blast furnaces.

The plant of the Graff Stove & Furnace Company at Dickson City, near Scranton, Pa., was burned June 6, with a loss of $50,000.

The plant of the Erie Foundry Company, Erie, Pa., was damaged $50,000 by fire June 2.

The packing plant of the National Packing Company at Portland, Ore., was destroyed by fire May 28, the loss being about $2,000.

An explosion of dynamite wrecked a 20-ton steam derrick at the plant of the Van Dorn Iron Works, Cleveland, Ohio, June 3.

The machine shop of the Victoria Machinery Depot, Victoria, B. C., was burned June 8, the loss being about $50,000.

Hardware.

The Denton Woven Wire Fence Company, Denton, Texas, has been incorporated with a capital stock of $25,000, the incorporators being M. S. Stout, G. H. Blewett, L. L. Fry and T. K. Blewett.

Miscellaneous.

The National Fire Proofing Company, Pittsburgh, has secured a large contract for fireproofing for the new depot of the Pennsylvania Railroad in New York, another large contract for fireproofing in New York and the material for the new post office being erected at Atlanta, Ga.

The Wolf River Paper & Fibre Company, Shawano, Wis., has not yet prepared plans for rebuilding its plant which was recently destroyed by fire, and does not know just when it will be ready to receive bids for reconstructing and equipping the buildings.

Joseph R. Ford, Arthur G. Wellington and Howard Carlton have been appointed ancillary receivers of the South Baltimore Steel Car & Foundry Company, Baltimore, Md.

The S. B. Patch & Sons Company, Streator, Ill., has been incorporated, with a capital of $8000, to manufacture and deal in iron, steel and metal.

Bids will be asked by the city of East Moline, Ill., in a short time, on pipe and material for the extension of water mains. The amount to be expended is estimated at $29,600.

The Dahlquist Mfg. Company, 36-40 West Third street, South Boston, Mass., has added a metal spinning department to its factory and will do general work in all metals from sheet iron to silver.

The G. Drouvé Company, Bridgeport, Conn., has completed orders for the Lovell window operating apparatus for the United Illuminating Company, Bridgeport, installed in the new addition to the power house; Bristol Company, Waterbury, Conn., and the General Fire Extinguisher Company, Providence, R. I.

The Chapman Ball Bearing Company, Boston, Mass., has secured the contract for equipping the new shops of the Grand Trunk Railroad at Battle Creek, Mich., with the 2 5-16 in. double ball bearings, of which 124 will be used. The company is also equipping the plant of the Wiegele Riveted Pipe Company, Denver, Colo.

Trade Publications.

Melting Furnaces.—The Hawley Down Draft Furnace Company, Chicago, Ill. Catalogue. Illustrates the Schwartz metal melting and refining furnace, adapted to brass, copper and other metals. Gives numerous views of the Schwartz furnace, which is of a tilting type, using crude oil, fuel oil or gas for fuel. The furnaces are lined with fire brick, the combustion being abetted by a down draft, and are built in eight regular sizes. The smallest one, designed for experimental and metallurgical uses, has a capacity of 100 lb. of bronze, while the large size, having a shell 120 in. in diameter, has a capacity for 10 tons of bronze or 6 tons of iron. Considerable miscellaneous information regarding the various alloys of copper, zinc and lead is given.

Precision Bench Lathe and Watchman's Clocks.—McDowell, Stocker & Co., Chicago. Post card. Announces the completion of a new illustrated catalogue describing the Cataract precision bench lathe with its attachments, which is now ready for distribution; also states that the firm is agent for the Beyer watchman's portable clocks.

Gas and Gasoline Engines. Angola Engine & Foundry Company, Angola, Ind. Catalogue, 24 pages. Describes a line of stationary and portable engines of 2½ to 15 hp., designed for pumping or other service. A particular feature to which attention is especially directed is an improved timing device. It is designed to retard the spark until the crank is past the inner center, thus compelling the engine to rotate in the desired direction.

Conveying and Transmission.—A monthly publication issued by the Stephens-Adamson Mfg. Company, Aurora, Ill., contained in the April number a series of complete tables giving the dimensions of hubs and arms for cast iron double belt pulleys, which is said to be the first table of the kind published. Sectional drawings are also given of 33 different patterns of cast iron pulleys, both of standard and special types.

Works and Products.—Allis-Chalmers Company, Milwaukee, Wis. Booklet. Gives some interesting facts and figures re-

gardless the various plants of the company, chief of which is the works at West Allis, Milwaukee. Illustrative of the character of work turned out by the company are given several engravings and descriptions of notable machines, both finished and in the process of construction. Attention is especially directed in this pamphlet to the rapid advances made in steam turbines, cement making machinery and electrical generative units.

Blowers.—The Connersville Blower Company, Connersville, Ind. Catalogue No. 11, 12 x 19 in. Cloth covers, 32 pages. Describes a line of smelter blowers the design of which is well illustrated by drawings and line engravings, showing detail of construction. A number of photographs of special installations are shown, notably one of special heavy duty smelter blowers coupled directly to tandem compound Corliss engines. Pages 25 to 27 contain valuable data of a series of tests made on these units. Views of the company's latest cycloidal pumps, which are built in sizes ranging from 1000 to 10,000 gal. per minute, are also shown. Page 5 is devoted to a compilation of facts relative to combustion which will be found convenient for reference.

Shoemaking Machinery, &c.—Booth Bros., 22 Brown's Race, Rochester, N. Y. Leaflets. These deal respectively with the Booth ink shaker, box strap, impression stitch wheeling and burnishing machines, Victor beader, second row marker, patent leather tip scourer, improved Columbia beader, and Fudge edge maker.

Motors, Generators and Panels.—Crocker-Wheeler Company, Ampere, N. J. Four bulletins. No. 95 illustrates and describes the company's belt type alternating current generators; No. 97, type 1, 125-250 volt direct current switchboard panels; No. 98, superseding No. 78, form L, belt type, direct current motors in sizes from 1-20 to 5 hp. and generators from 0.6 to 2.5 kw. and No. 100, form I, belt type, direct current motors in sizes from 5 to 45 hp. and generators from 4½ to 40 kw.

Lathes and Boring Mills.—Gisholt Machine Company, Madison, Wis. Bulletins and binder. This comprises a new series of Gisholt bulletins so far as issued, and to which new ones will be added from time to time, describing different labor saving machine tools such as turret lathes, vertical boring and turning mills and universal tool grinders. The initial six pages treat of the Gisholt turret lathe, and 30 and 36 in. vertical boring mills.

Riveters, Reamers and Shakers.—Hanna Engineering Works, 820 Elston avenue, Chicago, Ill. Circulars. One gives illustrations and brief specifications of Hanna riveters, which are made in a variety of styles and sizes; Hanna reamers for bridge, ship, car and other structural shops, and Hanna shakers for riddling foundry sand by air, electricity or steam. The other circular contains facsimiles of testimonial letters received by the company.

Motors, Generators and Outlet Boxes.—Sprague Electric Company, 527 West Thirty-fourth street, New York City. Instruction book and circular. The instruction book, No. 226, pertaining to round type motors and generators, discusses their installation and care, location, unpacking, connections, their various parts, instructions for starting, and gives a number of wiring diagrams. Circular 428, applying to section 10 of price-list 423, contains illustrations, specifications and prices of stamped steel outlet boxes and fittings.

Hoisting Crabs and Winches.—Harry E. McCoy, 609 Ferguson Block, Pittsburgh, Pa. Pamphlet. Shows hoisting crabs and winches for wire and manila ropes. Dimensions and prices are included.

Steam and Water Specialties.—Golden-Anderson Valve Specialty Company, Fulton Building, Pittsburgh, Pa. Gives illustrated descriptions of Anderson cushioned nonreturn valves, the Gould safety continuous feed water regulator, and the Golden self-closing and tempering protective water gauge.

Locomotive Cranes.—Brown Hoisting Machinery Company, Cleveland, Ohio. Catalogue K. Size 6 x 8¾ in.; pages 39. Contains illustrations of Brownhoist locomotive grab bucket cranes handling coal, sand, ore, ashes, &c., from stock piles, gondola cars, barges, &c., from which the possibilities attending the use of the equipment will be apparent. A partial list of users classified by States is appended.

Gaskets.—U. S. Indestructible Gasket Company, 16 South William street, New York. Circular. Refers to the company's U. S. Indestructible elastic metal gaskets of copper, lead, bronze, brass, steel, &c., and special gaskets of wood, silver and prepared paper.

Internal Grinders.—Heald Machine Company, Worcester, Mass. Catalogue. Gives illustrations, a general description, details of construction, specifications, and a summary of superior points of the Heald No. 70 internal grinder. An illustrated description of this machine appeared in *The Iron Age* April 2, 1908.

Gasoline Engines.—Waterloo Gasoline Engine Company, Waterloo, Iowa. Catalogue No. 10, 7½ x 9½ in., 32 pages. Describes a line of gasoline engines, including stationary and portable types, especially adapted for various kinds of service. The horizontal type of construction is adopted for machines which are built on the alternating or four-cycle principle, having an impulse at each second revolution. A line of small engines for pumping and dairy service is prominently shown, and attention is called to a special vapor cooling device operated by a fan, which in connection with the heat of the engine cylinder converts a water spray into vapor which is introduced through the cylinder head for cooling. A line of hand portable engines is also shown and the uses to which they may conveniently be put are illustrated.

Small Motors, Dynamos and Annunciators.—Holtzer-Cabot Electric Company, Brookline Station, Boston, Mass. Bulletins. No. 304B, displacing No. 304A, describes self-starting single phase induction motors and gives illustrations of assembled machines, parts and dimension sketches. No. 313 deals with type SS, ⅛ and ¼ hp. direct current motors, and No. 314 shows inclosed and semiinclosed direct current motors and dynamos, type C. Electric annunciators of the new pattern O are described in bulletin No. 150A.

Motor Driven Forge Blowers.—Emerson Electric Mfg. Company, St. Louis, Mo. Bulletin No. 3305, replacing No. 3304, briefly describes the company's forge blowers direct connected to direct and alternating current motors and particularly designed for small factories, blacksmith shops, &c. No. 3213 describes a small bipolar ventilated motor which is made in ⅛ and ½ hp. sizes.

Metal Punches.—W. A. Whitney Mfg. Company, Rockford, Ill. Circular. Shows the Whitney hand metal punch, which is made in sizes to punch holes up to ½ in.

Blast Furnaces.—William B. Pollock Company, Youngstown, Ohio. Supplement No. 10 to the company's general views of blast furnaces it has constructed. Shows progressive views of the Madeline furnaces of the Inland Steel Company at Indiana Harbor, Ind.

Structural Steel Construction.—Kenwood Bridge Company, Chicago. Album. Gives numerous views of steel bridges and buildings in course of construction which have been erected by the company. The buildings include some large machine shops, railroad plants, steel works, grain elevators, &c., as well as some particularly large steel bridges. Sectional views of different forms of roof construction are also included.

Coil and Elliptic Springs.—Fort Pitt Spring & Mfg. Company, Pittsburgh, Pa. Circulars and specification sheets. Show types of coil and elliptic springs and how to order them. Another circular calls attention to the fact that the company repairs broken elliptic springs.

Gas and Gasoline Engines.—New Era Gas Engine Company, Dayton, Ohio. Catalogue No. 20N. Describes the New Era line of engines, which can be operated by natural gas, producer gas, gasoline, kerosene or alcohol. The different types of engines are shown and unassembled parts of machines are illustrated and their construction and special features are fully described. The engines are built in vertical pattern in sizes from 1½ to 5 hp. and in horizontal types from 8 to 150 hp.

Oil Firing Systems.—Schutte & Koerting Company, Philadelphia, Pa. Catalogue 6, section 0, pages 1 to 12. Describes two methods of the Koerting oil firing system, one devised for marine or stationary boilers or locomotives and another for steam jet oil burners. The first employs centrifugal spray nozzles. Both systems are illustrated with drawings and graphically explained.

Water-Jet Eductors and Primers.—Schutte & Koerting Company, Philadelphia. Catalogue 2, section M, pages 1 to 12. Illustrates the Koerting water-jet eductors, water economizers for fountains, sand washing plants and water-jet ash conveyors. Catalogue 4, section Q, shows the company's water-jet primers for priming siphons, centrifugal pumps, &c.

Steam Specialties.—Lagonda Mfg. Company, Springfield, Ohio. Pamphlet. Describes principally the Lagonda automatic boiler cut-off valve and reproduces newspaper clippings describing steam pipe and boiler explosions and accidents resulting from the breaking of ammonia pipes, which would have been avoided if the cut-off valves had been installed. The Weinland thrust bearing turbine cleaner and the Lagonda boiler tube cutter and reseating machines are also referred to in the pamphlet, and the former more at length in another circular.

Gas and Gasoline Engines.—Jacobson Machine Mfg. Company, Warren, Pa. Bulletin F. Contains a general description of the company's line of hit-and-miss type engines, which operate on the four-cycle system, taking an explosion every two revolutions. A general description of the line, with details of the parts, is followed by brief specifications and illustrations of the different types, including one for farm and general power purposes built in 3 to 6 hp. sizes; the same in portable equipments on skids; larger stationary engines, 8 to 35 hp., and the same in portable equipments on wheels.

Steam Specialties.—John Davis Company, Chicago, Ill. Catalogue, 6 x 9 in., 40 pages. Illustrates and describes the company's line of steam specialties, comprising about everything in the way of valves, indicators, regulators, governors, separators, &c., used in a steam power plant. The volume includes a sketch of a power plant showing the application of the company's specialties and the relative position of appliances. Useful tables and price-lists are given.

The Iron and Metal Trades

So far as the attitude of the Iron trade can be gauged so soon after the announcement of the readjustment in prices on Steel Billets and certain lines of finished materials, it is one of disappointment. It is not radical enough and merely recognizes concessions which had been more or less openly made during recent weeks, and which had been undermining confidence both among sellers and among buyers.

The earlier cut in Steel Bars is now understood to have been the outcome of some low prices made at Chicago on material for agricultural implement makers and the lowering in the official price which followed has brought out only a part of the contract tonnage. This is believed to have aggregated about 60,000 tons out of total estimated requirements of about 200,000 tons.

We are officially advised that one of the leading independent sellers of Lake Iron ores is not yet ready to quote prices, although the firm in question is widely reported in the trade to have sold at a reduction of 50c. per ton. Other sellers, apparently, are now willing to make that concession to the furnacemen.

Although it was not specifically referred to at the meeting, it is understood that the delivered prices on Steel Billets and Sheet Bars make the same additions for freight to the new base price at Pittsburgh as heretofore; in other words, generally speaking, one-half the freight.

It is of course too early to judge whether the new prices on Finished Materials will encourage buying. The experience in the Steel Bar trade does not hold out much hope in that direction, and the character of the reduction does not seem to foreshadow any energetic movement in Shapes, Plates or Wire.

Steel Rails were not even referred to at the meeting Tuesday. It is understood that the Rail makers and the railroads have come much closer together, so far as the specifications are concerned, and that the acceptance of more onerous conditions is equivalent to a considerably increased cost to the makers.

Pig Iron in Birmingham has settled quite firmly down to $12 for No. 2 Foundry, and the markets west of the Alleghenies are steadier and quieter. On the seaboard and in New England, however, the markets have been quite demoralized, owing to very sharp competition among Eastern makers. Eastern Pennsylvania makers have sold No. 2 Foundry as low as $16.50 to $16.75, delivered, in New England, the Buffalo makers apparently holding back. Considerable sales have been made on that basis. Foundry Iron has sold in the New York territory as low as $15.50 to $16, and low grade Irons have been placed below $15 on the Delaware River. There have been large sales, aggregating 30,000 tons, of Basic Pig in eastern Pennsylvania, down to $15.25, delivered.

An interesting transaction in the Pittsburgh District is the sale, on a sliding scale, of a total of about 75,000 tons of Basic Pig, to cover the requirements of an Open Hearth Steel plant in the district for a period of three years.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At [illegible] one week, one month and one year previous.

	June 10, 1908.	June 3, 1908.	May 13, 1908.	June 12, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2 Standard, Philadelphia	$16.75	$16.75	$16.75	$24.50
Foundry No. 2 Southern, Cincinnati	15.25	15.25	14.75	24.25
Foundry No. 2, Local, Chicago	17.25	17.25	17.25	26.50
Bessemer, Pittsburgh	16.90	16.90	16.90	24.40
Gray Forge, Pittsburgh	14.90	14.90	14.90	23.15
Lake Superior Charcoal, Chicago	20.00	20.00	20.00	27.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	*25.00*	28.00	28.00	29.50
Forging Billets, Pittsburgh	*27.00*	30.00	29.00	34.00
Open Hearth Billets, Phila	*28@29*	29.20	29.20	32.50
Wire Rods, Pittsburgh	....	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	**12.25**	12.25	12.00	18.50
Steel Rails, Melting, Phila	**13.00**	13.00	12.75	20.00
Iron Rails, Chicago	**15.50**	15.50	14.75	24.50
Iron Rails, Philadelphia	**18.00**	18.00	17.00	27.50
Car Wheels, Chicago	13.00	13.00	13.00	25.50
Car Wheels, Philadelphia	14.00	14.00	14.00	25.50
Heavy Steel Scrap, Pittsburgh	**13.00**	13.00	12.75	18.50
Heavy Steel Scrap, Chicago	**11.50**	11.50	10.50	16.00
Heavy Steel Scrap, Philadelphia	**13.00**	13.00	12.75	19.00
FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	*1.40*	1.40	1.46	1.83½
Common Iron Bars, Chicago	*1.50*	1.58	1.65	1.78
Common Iron Bars, Pittsburgh	*1.40*	1.50	1.50	1.75
Steel Bars, Tidewater, New York	*1.56*	1.76	1.76	1.84½
Steel Bars, Pittsburgh	*1.40*	1.60	1.60	1.60
Tank Plates, Tidewater, New York	*1.76*	1.86	1.86	1.86
Tank Plates, Pittsburgh	*1.60*	1.70	1.70	1.70
Beams, Tidewater, New York	*1.76*	1.86	1.86	1.86
Beams, Pittsburgh	*1.60*	1.70	1.70	1.70
Angles, Tidewater, New York	*1.76*	1.86	1.86	1.86
Angles, Pittsburgh	*1.60*	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.55	1.55	1.55	1.85
Skelp, Sheared Steel, Pittsburgh	1.65	1.65	1.65	1.90
SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	*1.95*	2.05	2.05	2.00
Cut Nails, Pittsburgh	*1.80*	1.85	1.90	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	**13.00**	13.00	12.75	24.25
Electrolytic Copper, New York	**12.75**	12.62½	12.62½	23.00
Spelter, New York	*4.57½*	4.55	4.60	6 50
Spelter, St. Louis	*4.42½*	4.40	4.50	6.40
Lead, New York	**4.50**	4.35	4.25	5.75
Lead, St. Louis	**4.35**	4.20	4.12½	5.65
Tin, New York	*28.25*	28.85	29.50	42.10
Antimony, Hallett, New York	8.50	8.50	8.50	14.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, June 9, 1908.

The [illegible] last week shifted the focal point of market interest from Pig Iron to Finished Material. This was [illegible] due to the waning force of activity in the former, but principally to the increased declines in Steel and Iron Bars. Since the implement makers' annual requirements, comprising an aggregate estimated at around 200,000 tons, were seemingly the target aimed at in this quick reversal of position by the associated Steel makers, the fact that the price basis seems to have met with approval is of pertinent interest. In addition to 40,000 tons of Steel Bars booked since then by the United States Steel Corporation mills, contracts secured by other interests will bring the total for the week well up to 60,000 tons. In the meantime specifications are tardy in coming out and rolling schedules are too scantily supplied to permit other than intermittent runs. The effect of the decline in Bars upon other finished products has been distinctly unfavorable. Such an announcement at the time of the May meeting of the allied interests in New York would have been regarded as a carefully considered step; but closely following the assurance then given that prices would be maintained, it gives rise to impression that it was due to some cause unforeseen at that time. More hesitancy in the closing of Structural contracts involving large tonnage is observed, but a considerable number of small deals are going through which altogether are of material help in sustaining activities in fabricating shops. Bids on recent contracts disclose the offer of low prices that make it plain

there has been no improvement in this direction. Between the three lowest bids tendered on the Structural Material for the Aqueduct Cement plant at Los Angeles, Cal., there was a difference of about 20 per cent., the bids running respectively $40,800, $44,000 and $49,365. Plates, Sheets, Pipe, Tubes and Metals are in extremely light demand, the strength of which is directly commensurate with actual consumption. Although consumers generally are not actively in the market for Scrap, prices exhibit a degree of firmness that under the circumstances is unusual. This condition is ascribed to important purchases by dealers made to cover short sales; it is especially true of Rerolling Steel Rails, of which several thousand tons offered last week by the railroads were taken mostly by dealers.

Pig Iron.—Sales for the week were in the main comprised of the requirements of small melters who, failing to get in at the bottom, are being gradually convinced that the present price level is the best that will be offered for third quarter, at least. Though the orders entered were considerable in number, the entire tonnage placed was small, in comparison with that of recent transactions. The market has settled quite firmly at $12, Birmingham, and it is doubtful if any business even for June shipment would find acceptance at lower than this price. The Woodward Furnaces are reported to be practically out of the market for third quarter business. Some of the Southern furnaces have advanced to $12.50, for fourth quarter, which of course means practical withdrawal from the market, since buyers are not ready to accept such an advance. On the other hand, the majority of furnaces are unwilling to adversely discount the future. Under these conditions, therefore, the prospects for a quiet period of several weeks seem good, unless there is in the meantime a decided improvement in the foundry melt. The Northern situation has been likewise strengthened, and while $17, at furnace, generally prevails, at least one prominent interest has moved its price to $17.50, at furnace, on all deliveries subsequent to July 1. The following prices are for June delivery, f.o.b. Chicago:

Lake Superior Charcoal	$20.00 to $20.50
Northern Coke Foundry, No. 1	17.75 to 18.25
Northern Coke Foundry, No. 2	17.25 to 17.75
Northern Coke Foundry, No. 3	16.75 to 17.25
Northern Scotch, No. 1	18.25 to 18.75
Southern Coke, No. 1	16.85 to 17.35
Southern Coke, No. 2	16.35 to 16.85
Southern Coke, No. 3	15.85 to 16.35
Southern Coke, No. 4	15.35 to 15.85
Southern Coke, No. 1 Soft	16.85 to 17.35
Southern Coke, No. 2 Soft	16.35 to 16.85
Southern Gray Forge	14.35 to 14.85
Southern Mottled	14.10 to 14.60
Malleable Bessemer	17.25 to 17.75
Standard Bessemer	18.40 to 18.90
Jackson Co. and Kentucky Silvery, 6 %	18.90 to 19.40
Jackson Co. and Kentucky Silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky Silvery, 10 %	22.90 to 23.40

Billets and Rods.—There is no market for Billets nor is there any inquiry that would indicate even passive interest on the part of consumers.

Rails and Track Supplies.—New Rail orders amounting in all to about 7000 tons have been entered since last report, in which were included 1000 tons for the new Chicago-Milwaukee traction line. As far as known, no other Rail orders of significant size are pending. Specifications, however, are being furnished more liberally, enabling the No. 1 mill at the South Works to continue operations at a fair gait. A considerable number of moderate sized orders for Light Rails are coming out, and though the aggregate tonnage for last month showed a marked increase, there is yet much room for improvement. Very few new orders for Track Supplies are in evidence, but it is generally expected that the railroads will pass a lot of held up requisitions for such material soon after July 1. We quote as follows: Angle Bars, accompanying Rail orders. 1908 delivery, 1.50c.; car lots, 1.60c. to 1.70c.; Spikes, 1.80c. to 1.90c., according to delivery; Track Bolts, 2.25c. to 2.35c., base, Square Nuts, and 2.40c. to 2.50c., base, Hexagonal Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb. $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—As indicative of the character of orders now being placed, it may be mentioned that in the 1300 tons which comprised the aggregate of closures for the week by the leading interest, the largest lot was under 100 tons. The execution of small enterprises seems to be progressing without much hesitation, but many of the larger projects are still holding back. The effect of the recent reduction in Steel Bars has been felt in Structural Shapes in that it has strengthened existing doubt as to the future maintenance of prices in this and other departments. Material for several good sized structures are being figured on by fabricators, principal among which are 500 tons for the Chicago City Railway Company's new car barn; 1000 tons for a Y. M. C. A. building, Milwaukee, and a tonnage of fair size for a large Steel warehouse, to be erected at Market street, near Randolph street, Chicago, by B. A. Eckhart. Bids will soon be asked for on the new Chicago City Hall, for the construction of which about 12,000 tons of Steel will be required. No new railroad contracts have been closed and not much is in prospect for the immediate future.

Plates.—Business is still confined to scattering small orders and shows no signs of early improvement. The principal Plate using industries, such as car works, shipyards and boiler and tank shops, are either shut down or running very light, and are not extending purchases beyond absolute present needs. Jobbers are not increasing stocks, being anxious to reduce them as far as possible.

Sheets.—New business coming to the mills is sharply reduced. Orders from jobbers include only such small lots as are imperatively required to keep size assortments unbroken. Manufacturers in placing orders consider only work in hand and are not inclined to make provision for prospective needs. Prices are firm and regular, at ruling quotations, except for concessions of $1 to $2 a ton offered by a few unimportant producers. We quote mill shipments, as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 and 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—The implement interests have responded with fair liberality to the late concession of $4 a ton on Steel Bars. Since the announcement of the price of 1.58c., Chicago, last Tuesday, the principal interest has entered contracts for about 40,000 tons to apply on the requirements of implement makers for the ensuing season. Another prominent maker has booked contracts of like character for around 8000 tons. This tonnage alone represents nearly 25 per cent. of the estimated total of the agricultural requirements, which amounts to something like 200,000 tons. This movement has no bearing on present mill activities as specifications are not yet furnished against the new contracts and little is coming in on old ones. A corresponding reduction has been made on Iron Bars, making the price $1.50, Chicago; the new price has not brought out many new orders but more inquiries have developed, which indicate renewed interest. Revised prices, Chicago, are as follows: Steel Bars, 1.58c., with half extras; Iron Bars, 1.50c.; Hoops, No. 13 and lighter, 1.98c., full extra Hoop card; Bands, No. 12 gauge and heavier, 1.58c., half extra Steel Bar card; Soft Steel Angles and Shapes, 1.68c., half extras. Store prices are as follows: Bar Iron, 2c. to 2.15c.; Steel Bars, 1.90c. to 2c.; Steel Bands, 1.90c., as per Bar card, half extras; Soft Steel Hoops, 2.25c. to 2.35c., full extras.

Merchant Pipe.—In view of the long continued practice of buying in small lots only to meet current demands, jobbers' stocks must of necessity be greatly reduced; but the situation offers no inducement for materially increasing them or placing forward contracts. The recent drop in prices of Steel and Iron Bars has weakened the not over strong confidence of buyers in the ultimate success of the effort to maintain values at their present level, and it is likely that for the present, at least, the demand will be measured by the requirements of consumers.

Boiler Tubes.—Reflecting the inactive operation of boiler shops, orders for Merchant Tubes are both infrequent and small. The demand for Locomotive Tubes is equally quiet, but a better run of orders is expected from the railroads after July 1. Mill quotations for future delivery, on the base sizes, are as follows: 2⅜ to 5 in., in carload lots. Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1¼ in.	35	35	35
1¾ to 2½ in.	50	35	35
2½ in.	52½	35	35
2¾ to 5 in.	60	47½	47½
6 in. and larger	50	35	...

Merchant Steel.—Following the news of a decline in Steel Bar prices, inquiries have increased though there has, thus far, been no material improvement in actual demand. It is expected that implement makers will now enter the market for next year's supplies and a renewal of forward purchases is looked for. Revised quotations are as follows: Planished or Smooth Finished Tire Steel, 1.78c.; Iron Finish up to 1½ x ½ in., 1.73c., base. Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base. Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.08c., and 1⅛ in. and larger, 1.98c.; Smooth Finished Machinery Steel, 2.13c.; Flat Sleigh Shoe, 1.63c.; Concave and Convex Sleigh Shoe, 1.83c.; Cutter Shoe, 2.05c.; Toe Calk Steel, 2.13c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 56

per cent. off list prices, 52 per cent. in less than car lots, base territory delivery.

Cast Iron Pipe.—Last week's transactions included no lots of notable tonnage, though a number of small orders for Water Pipe were placed by various municipalities. Among those awarded were Ponca City, Okla., 300 tons; Cincinnati, Ohio, 700 tons; Springfield, Ill., 300 tons; Moorhead, Minn., 300 tons; Deshler, Neb., 325 tons; all of which were secured by the United States Cast Iron Pipe & Foundry Company. Quite a fair run of smaller lots ranging from 50 to 100 tons was booked. Such orders, it is noted, have grown more frequent in the past week or two. Since Pig Iron prices have stiffened up, a number of inquiries have been received for figures on Pipe for deliveries extending into next year, but founders are unwilling to consider propositions of this sort. We quote, nominally, per net ton, Chicago, as follows: Water Pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25; with $1 extra for Gas Pipe.

Metals.—There has been a material increase in inquiries within the past week, and a somewhat better run of small orders. The latter feature is regarded as encouraging, since buying is almost exclusively for present consumption, and any improvement in the former means increase of the latter. Lead has stiffened up somewhat, and an upward tendency in price has developed. We quote as follows: Casting Copper, 13¼c.; Lake, 13½c. to 13¾c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 32c.; small lots, 32½c.; Lead, Desilverized, 4.55c. to 4.60c., for 50-ton lots; Corroding, 4.90c. to 5c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 10½c., and other grades, 9¾c. to 10¼c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 10½c.; Copper Clips, 11c.; Red Brass, 11½c.; Yellow Brass, 9¾c.; Light Brass, 6½c.; Lead Pipe, 4c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 25c.; Block Tin Pipe, 27c.

Old Material.—The market is sustained only by the buying of dealers. Consumers are taking very little material of any kind except Rerolling Steel Rails; these are in good demand, several purchases having been made in the past week by the Bar mills. The price has been kept up by the effort of dealers to cover for deliveries on short sales, and it is largely due to this influence that prices have advanced 25c. a ton and are strong at the figures quoted. One sale to a local mill of 2000 tons of Rerolling Rails is reported to have brought $14.50. Of the lots of railroad material reported, three, aggregating over 7500 tons, have been offered and the prices realized are said to be well in line with present quotations on all grades. Included in this tonnage was nearly 4000 tons of Steel Rails. Market conditions, however, do not seem to justify the apparent upward tendency of values except on Steel Rails. Lack of buying by consumers and heavy stocks in the hands of dealers, for which there is but scant demand, coupled with the heavy tonnage advertised for disposition by the railroads, form a combination of circumstances little calculated to inspire confidence in an upward movement. Railroad material included in the lists presented for bids this week amounts to 19,000 tons, of which over 5000 tons is Steel Rails, distributed as follows: Illinois Central, 5200 tons; Santa Fé, 2500 tons; Chicago & Northwestern, 1500 tons; Chicago, Milwaukee & St. Paul, 2500 tons; Northern Pacific, 1200 tons; Baltimore & Ohio, 6100 tons; Wisconsin Central, 350 tons. We quote per gross tons, f.o.b. Chicago, as follows:

Old Iron Rails	$15.50 to $16.00
Old Steel Rails, rerolling	13.75 to 14.25
Old Steel Rails, less than 3 ft.	12.25 to 12.50
Relaying Rails, standard sections, subject to inspection	19.00 to 20.00
Old Car Wheels	13.00 to 13.50
Heavy Melting Steel	11.50 to 12.00
Frogs, Switches and Guards, cut apart	11.75 to 12.25
Mixed Steel	9.50 to 10.00

The following quotations are per net ton:

Iron Fish Plates	$13.50 to $14.00
Iron Car Axles	16.50 to 17.00
Steel Car Axles	14.75 to 15.25
No. 1 Railroad Wrought	11.25 to 11.75
No. 2 Railroad Wrought	10.00 to 10.50
Railway Springs	11.00 to 11.50
Locomotive Tires, smooth	12.75 to 13.25
No. 1 Dealers' Forge	9.50 to 10.00
Mixed Busheling	6.75 to 7.25
Iron Axle Turnings	5.75 to 6.25
Soft Steel Axle Turnings	5.75 to 6.25
Machine Shop Turnings	5.50 to 6.00
Cast Borings	4.50 to 5.00
Mixed Borings, &c.	4.50 to 5.00
No. 1 Mill	6.50 to 7.00
No. 2 Mill	5.50 to 6.00
No. 1 Boilers, cut to Sheets and Rings	7.00 to 7.50
No. 1 Cast Scrap	11.75 to 12.25
Stove Plate and Light Cast Scrap	10.50 to 10.75
Railroad Malleable	10.25 to 10.75
Agricultural Malleable	9.75 to 10.25
Pipes and Flues	7.75 to 8.25

The Seneca Wire & Mfg. Company, Fostoria, Ohio, has increased its capitalization from $100,000 to $150,000.

Philadelphia.

PHILADELPHIA, PA., June 10, 1908.

The week's sales in Pig Iron will aggregate a larger tonnage than has been done for some time. The Steel makers have entered the market and placed orders for round tonnages, while the Pipe interests and some of the other foundries have also bought quite heavily. Sales have been for both prompt and forward delivery, and the situation in the Iron market is stronger. Buyers are anticipating their requirements, but sellers in some cases refuse to quote for shipment during the last quarter. The Finished Material market is still unsettled owing to the uncertainty as to prices.

Pig Iron.—Buying has been quite heavy, and some sellers have made record sales. The Steel makers have placed orders for some good tonnages for Basic Iron. Sellers have made concessions on this grade, but on the Foundry grades prices have been very firm. Some of the eastern Pennsylvania furnaces have sold Foundry grades quite heavily for New England delivery, and in certain instances a slashing of prices was to be noted, but it is understood that some of these furnaces have now obtained all the tonnage they wanted at the price, and have stiffened up materially on quotations. In this immediate territory the tonnage taken by the foundries, outside of the Pipe interests, has not been large, the sales usually ranging from 100 up to 500 tons, mostly for delivery in the next 30 or 60 days, or for shipment in the third quarter. There has been considerable inquiry for delivery the last half of the year and for the fourth quarter, but sellers are not disposed to sell for forward delivery at the same price for which they are willing to do business for delivery in the next month or two. An advance of 50c. to $1 is generally asked for shipment in the last half of the year, dependent on the tonnage taken, and the delivery date; No. 2X Foundry for prompt shipment being quoted at from $16.75 to $17, delivered in this territory. The Steel makers have come into the market quite extensively—not because they needed the Iron, as almost all of them still have large tonnages due them on old contracts, but concessions for prompt Iron on the part of sellers proved interesting, and at the price round lots were taken for early delivery. Total sales of Basic in this vicinity during the week aggregate about 31,000 tons, made up of lots of 15,000, 10,000, and 6000 tons. In several cases the price was confidential, but it is known that $15.60, delivered, was done for several thousand tons, and that this was shaded somewhat in other cases. From what we can learn, $15.50, delivered, is about the price at which Basic can be had to-day, but this would likely only be for prompt shipment. Most of the Basic Iron sold recently was for early delivery, but some was for August, September, and October shipment, and delivery on one lot extended over the last half of the year. Low Phosphorus Iron has also been in better demand. The Steel Casting plants are making some inquiry for forward delivery, while a sale of 1000 tons was made for shipment in the last half, at close to $21, delivered. The Pipe foundries still have inquiries out for large tonnages of low grade Iron. One interest which was in the market for 10,000 tons last week has not yet placed the business. Southern Iron is firmer, and another 50c. advance has been made by some sellers, and $12 to $12.50, Birmingham, is apparently the best that can be done for No. 2X Foundry for third quarter delivery, but while some business has been done recently in this territory, no large sales are reported. Forge Iron has been in little demand, a few small sales having been made at ruling prices. Virginia Irons continue to be quite freely sold, mostly, however, for Western delivery, a sale of 1500 tons of Basic and several round lots of No. 2X and 2 Plain at the ruling quotations being reported. The Iron market on the whole shows decided strength. The fact that large tonnages have been taken is looked upon as encouraging, and prices with the exception of Basic Iron have been pretty firmly held. We quote for prompt deliveries in buyers' yards, eastern Pennsylvania and adjoining territory, the following range of prices, but for deliveries during the last half, the majority of sellers ask an advance of from 50c. to $1 a ton, according to quantity and delivery:

Eastern Pennsylvania, No. 2 X Foundry	$16.75 to $17.00
Eastern Pennsylvania, No. 2 Plain	16.25 to 16.50
Virginia, No. 2 X Foundry	17.00
Virginia, No. 2 Plain	16.50 to 16.75
Gray Forge	15.25 to 15.50
Basic	15.50
Low Phosphorus	21.00 to 21.25

Ferromanganese.—There seems to be some variance in the prices asked for Ferro for early delivery. Some sellers appear willing to do business on a basis of $44.50, Baltimore, while others hold at $46 to $46.50, seaboard. Transactions are very light, and no orders of any consequence have been reported.

Steel.—The demand for Steel Billets is light. What little business has been done has been confined to small lots for prompt shipments. Buyers will not anticipate requirements, particularly when there is some uncertainty regarding prices.

Plates. The demand [illegible] has not been large. Orders placed are mostly for small lots for prompt shipment. Some inquiries for moderate tonnages are being received, but there is little disposition to place contracts or any heavy tonnages until the matter of prices is definitely settled.

Structural Material.—The uncertainty regarding prices has caused a temporary withholding of some business, particularly where any large tonnage was involved. Small and miscellaneous business for prompt shipment, however, comes out quite freely, and the aggregate volume of business keeps up fairly well.

Sheets.—The demand continues to show a little improvement, and some of the local mills hold the gains in production recently made, a number now operating at about 75 per cent. of their capacity. Orders are mostly small, and for prompt shipments, stocks in buyers' hands being light. Under existing conditions, however, buyers will not contract for forward deliveries. Prices are unchanged. For mill shipments quotations range as follows, with a tenth extra for small lots: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The market has been decidedly unsettled owing to the recent cut in the price of Steel Bars. Buyers hold off until they can see just what move will be made in reference to prices by the Eastern mills. The Eastern Bar Iron Association will hold a meeting to-morrow, at which it is generally believed that the base price will be made 1.35c. Pittsburgh, equal to 1.50c. delivered in this territory. It is questionable, however, whether this will meet the situation as iron bars are still being sold in this territory at 1.40c. delivered, and, unless more business applying on old contracts comes out, the low prices will continue to prevail, at least for a time. Some of the Eastern mills, it is reported, have not held to the agreed price, but have made sales at much lower figures. At the time quotations are largely nominal, but Iron Bars have been sold at 1.40c. to 1.45c. delivered. Steel Bars are in light demand, 1.55c. delivered, being quoted for this territory, with Rerolled Bars at 1.50c.

Coke.—No particular change is to be noted in the demand for Coke. Some small contracts have been made for Foundry Coke, at $2.40 at oven. Makers of some of the better grades are firmer in their prices for Foundry Coke for forward delivery, although some brands can still be had for prompt delivery at low figures. Furnace Coke has not been active, and quotations are unchanged at $1.50 to $1.75 at oven. Foundry Coke is quoted at $2.25 to $2.45 at oven. For delivery in this territory the following range of prices is named:

Connellsville Furnace Coke	$1.75 to $1.90
Foundry Coke	4.40 to 4.60
Mountain Furnace Coke	3.25 to 3.50
Foundry Coke	4.00 to 4.20

Old Material—The market has been quiet, with no quotable change in prices. Steel Scrap is not in as active demand, the mills which bought recently now having about all the tonnage they want. Sales of small lots of Borings and Turnings are reported, but little attention has been given to the general list. Quotations are largely nominal, and range about as follows for prompt deliveries in buyers' yards, eastern Pennsylvania and nearby territory:

No. 1 Steel Scrap and Crops	$13.00 to $13.50
Low Phosphorus	17.50 to 18.00
Old Steel Axles	18.00 to 18.50
Old Iron Axles	20.00 to 21.00
Old Iron Rails	18.00 to 18.50
Old Car Wheels	14.00 to 15.00
Choice No. 1 R. R. Wrought	15.00 to 15.50
Machinery Cast	14.50 to 15.00
Railroad Malleable	11.75 to 12.25
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	9.50 to 10.00
Stove Plate	11.00 to 11.50
Cast Borings	8.50 to 9.00
Cast Scrap	11.75 to 12.25

St. Louis.

ST. LOUIS, MO., June 8, 1908.

Speaking broadly, there is a slow, but steady improvement going on in the Iron interests of St. Louis, the gain being most marked with the makers and consumers of Pig Iron. The metal interests, more especially Zinc producers, complain of unevenness in the demand. The demand for Spelter is good, especially for the production of white lead, as the paint manufacturers find trade very active. Structural Material is doing better, and the branch of the Carnegie Steel Company reports May as a good month for business in this line. Light Rails and track material. The reduction in Bar Steel has induced more liberal buying. Plates and Sheets are dull. A feature is the matter of immediate delivery on orders, as against a delay of often three months last season. Tubes and Pipe continue quiet. The demand for Pig Lead is not steady. High water at this point has caused some uneasiness at East St. Louis, the river having reached the danger line of 30 ft., but the crest is passing and in three or four days there will be a recession.

Coke.—There is no material change in Coke except that shipments are coming forward somewhat faster on contracts. The demand is fair, with some price inquiries pending. Market quotations on Connelsville and Virginia Coke remain about the same.

Pig Iron.—A local company has just sold another lot of 5000 tons of Basic, for shipment over the last four or five months, to one of the largest Steel foundries in St. Louis. The price is not given, but is stated to have been higher than last sales made. One inquiry is pending for 2000 tons of Nos. 3 and 4 Foundry for shipment over last half. The order for 2000 tons for delivery over first half of next year has not as yet been placed. Inquiries are plentiful and numerous orders are being booked, ranging from one car up to between 200 and 300 tons, mostly for shipment during third quarter, but sometimes covering all the last half. Prices are firm at $12, Birmingham, for No. 2, covering third quarter, with usually an advance of 50c. per ton asked for last quarter shipment.

Spelter.—The market is firm at 4.50c., with more buyers than sellers at that figure.

Finished Iron and Steel.—Floods and prolonged rains have been general in the Southwest, and in consequence the demand has been somewhat affected, particularly from railroads. With settled weather a marked improvement is anticipated. Outside inquiries for Structural Material are rather light, but there is an active demand in small orders from city contractors. There is considerable business in sight. The recent reduction in Bars has brought about considerable increase in activity. The demand for Light Rails from coal and lumber interests holds up well, but the inquiry for Standard Rails remains small. In other track material —Spikes, Splice Bars, &c., a good run of orders is being received.

Cast Iron Pipe.—While there is little doing with railroads, there is a fair demand for Pipe for municipal water works.

Old Materials.—There being a lack of business with mills, there is practically a dealers' market prevailing. Lists are expected from various railroads the coming week. We hear of no large sales. In some circles it is thought the mills are awaiting the new wage schedule soon to be promulgated by the Amalgamated Association. We quote, per gross ton, f.o.b. St. Louis, as follows:

Old Iron Rails	$14.00 to $14.50
Old Steel Rails, rerolling	12.25 to 12.50
Old Steel Rails, less than 3 ft.	12.00 to 12.25
Relaying Rails, standard sections, subject to inspection	22.50 to 23.50
Old Car Wheels	13.00 to 13.50
Heavy Melting Steel Scrap	12.00 to 12.25
Frogs, Switches and Guards, cut apart	10.00 to 10.25

The following quotations are per net ton:

Iron Fish Plates	12.00 to 12.25
Iron Car Axles	16.00 to 16.50
No. 1 Railroad Wrought	11.25 to 11.75
No. 2 Railroad Wrought	9.50 to 10.00
Railway Springs	10.50 to 11.00
Locomotive Tires, smooth	10.50 to 11.00
No. 1 Dealers' Forge	13.00 to 13.50
Mixed Borings, &c	9.50 to 10.00
No. 1 Boilers, cut to Sheets and Rings	8.25 to 8.75
No. 1 Cast Scrap	10.00 to 10.50
Stove Plate and Light Cast Scrap	8.25 to 8.75
Railroad Malleable	10.00 to 10.25
Agricultural Malleable	8.50 to 9.00
Pipes and Flues	8.00 to 8.50

In view of the fact that St. Louis and vicinity produces more Cast Steel for railroad purposes than perhaps any other point, the capacity of the five large manufacturing establishments being 220,000 tons of steel castings per annum, furnishing employment for 9000 to 10,000 men, it will be seen that there must of necessity be a large demand to take so great an output and this is not, at present, the case, though there is more doing than in the spring.

The American Car & Foundry Company state that it expects soon to start the construction of a new wheel foundry, and a new soft foundry. The company has a bill pending in the House of Delegates of the city of St. Louis, providing for the closing of a few disused streets near the site of the proposed new plant.

The Bridge & Beach Mfg. Company, manufacturer of stoves, states that it is placing orders for its supply of pig iron for the balance of this year on the basis of present prices, being of the opinion there is little chance for a reduction.

The St. Louis Blast Furnace Company has recently executed a deed of trust for $300,000 for 20 years at 5 per cent., on a number of parcels of property in South St. Louis, and all the machinery of the plant. The money has been raised to modernize and equip the company's plant with modern machinery, to cost in the neighborhood of $200,000. The new equipment includes boilers, engines, &c. It will practically double the capacity of the plant.

Pittsburgh.

PARK BUILDING, June 10, 1908.—(*By Telegraph.*)

Pig Iron. Opinion is divided as to whether the reduction of 50c., a ton in prices of Ore will have a weakening effect on Pig Iron, but it is not believed that it will, for the reason that prices of Pig Iron have reached such a low point that it practically means that the lower prices on ore have already been discounted. Aside from the deal by which the Shenango Furnace Company will furnish the Page Woven Wire Fence Company its entire supply of Basic Iron for three years, the Pig Iron market has been quiet, and there is not much inquiry. We quote Bessemer Iron at $16 to $16.25; Malleable Bessemer, $15.50; Basic, $15.25 for third quarter, and $15.50 to $16 for fourth quarter; Northern No. 2 Foundry, for delivery over the next two or three months, about $15, all at Valley furnace, with 90c. freight to Pittsburgh.

Steel.—A reduction has been made of $3 a ton on Billets, and $2 a ton on Sheet and Tin Bars, effective from June 10. We now quote Bessemer and Open Hearth Billets, 3⅜ in. and larger, up to and including 0.25 carbon, $25; 0.26 to 0.60 carbon, $1 extra; over 0.60 carbon, $2 extra, all f.o.b. Pittsburgh. For Wheeling, Martins Ferry, Follansbee, Newcastle, Sharon, Steubenville and Washington (Pa.) delivery, half the freight or 50c. additional is charged. Sheet and Tin Bars in random lengths are $27, f.o.b. Pittsburgh.

Merchant Pipe.—Reports that the National Tube Company has secured an order from the Standard Oil Company for 1000 miles of line pipe are absolutely untrue.

(*By Mail.*)

Since last week's cut in prices of Bars orders for other forms of Finished Material have been held up, the trade fully believing that reductions in prices were certain. In the Pig Iron trade it is noteworthy that the Shenango Furnace Company has made a contract with the Page Woven Wire Fence Company, Monessen, Pa., for its entire requirements of Basic Iron for a period of three years. The Page Company operates two 15-ton Open Hearth furnaces, and has just completed the building of a 50-ton furnace, so that its output of Steel runs from 150 to 200 tons a day. The company uses about 50 per cent. of Scrap and will need about 2000 tons of Basic Pig a month, so that it will need in the next three years upward of 75,000 tons of Basic Iron. The Shenango Furnace Company had a similar contract with the Page Company which expired last January, but which was not renewed at that time for the reason that the latter preferred to buy its requirements of Pig Iron in the open market until conditions became more settled. The Shenango Furnace Company also furnishes the entire requirements of Basic Iron to the Sharon Steel Hoop Company, Sharon, Pa., and the Thomas D. West Foundry Company, Sharpsville, Pa. The three contracts aggregate 500 tons a day or more. Aside from the above, very little in Pig Iron has been done in the past week. It is not believed that the reduction of 50c. a ton on Ore will have the effect of causing a decline in prices of Pig Iron, as the reduction has really been anticipated in the low prices that have been ruling on Pig Iron for some time. There is no new demand for Billets, Sheet or Tin Bars, and only a limited tonnage is being taken out on contracts. It is believed that with the pending reductions on Finished Iron and Steel announced, with the Presidential nominations out of the way and the assurances of good crops, there will be a material improvement in demand.

Structural Material.—The only local jobs in sight are the First National Bank Building, about 1000 tons, and the Horne Building, about 2500 tons, both of which are expected to be placed in the near future.

Ferromanganese.—There is a fair amount of inquiry, but some sellers of Ferro are not inclined to press the market for sales in the belief that possibly prices will be higher in the near future. A local consumer has bought about 50 tons for July and August on the basis of about $44, at seaboard, or $45.95, Pittsburgh. We quote foreign 80 per cent. Ferro at $44.50, seaboard, for third quarter and about $46, seaboard, for delivery over last quarter. The Pittsburgh Steel Company has been a large buyer of Ferro for its new Steel plant at Monessen, Pa.

Ferrosilicon. We have sales of about 50 tons of 50 per cent. for June and July delivery at $70, Pittsburgh, and quote the market at that price.

Muck Bar.—In the absence of sales on which to base authentic prices, we quote best grades of Muck Bar, made from all Pig Iron, at nominally $26 a ton, f.o.b. Pittsburgh. Northern Forge Iron is $14, Valley, or $14.90, Pittsburgh, and it is claimed it cannot be put into Muck Bar at $11 a ton and allow a profit. The mills that roll Muck Bar have asked the Amalgamated Association for a reduction of 10 per cent. or more in the Muck Rerolling scale.

Skelp.—No recent sales have been made in this market, and the mills are running only to about 30 or 40 per cent. of capacity. We quote nominally as follows: Grooved Steel Skelp is 1.55c. to 1.60c.; Sheared Steel Skelp, 1.65c. to 1.70c.; Grooved Iron Skelp, 1.75c. to 1.80c.; Sheared Iron Skelp, 1.85c. to 1.90c., Pittsburgh.

Rods.—Any tonnage that might be wanted is being held back until it is known whether there will be a reduction in prices of Wire products, which would naturally carry lower prices for Rods.

Steel Rails.—While large tonnage in Standard Sections has been placed, the Carnegie Steel Company has received some fair specifications against contracts and has taken an order for 700 tons of Rails for a lumber interest. The switch and signal companies are buying a few Rails, and this is regarded as a favorable indication. Negotiations are under way for a fairly large tonnage of Rails for export, but nothing is known here as to the report that Russia is in the market for a heavy tonnage for the Siberian railroad, which it is reported will be relaid with heavier sections and double tracked. The demand for Light Rails is fairly active, the Carnegie Steel Company having taken over 2000 tons the past week. Re-Rolled Light Rails have sold as low as $21 a ton, Pittsburgh. Regular quotations on Light Rails, which are shaded $4 to $5 a ton to meet competition of mills that re-roll Rails, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—The demand continues dull and is only for small lots for actual needs. The Steel car builders and the lake boat builders are not buying, while the general trade is taking only such tonnage as it actually needs. Prices continue to be shaded $2 a ton by a few of the mills, but not enough new business is being placed to test the market.

Sheets.—The demand does not show any betterment, the tonnage booked in May showing a decided falling off as compared with April. The American Sheet & Tin Plate Company is operating only about 45 per cent. of its Sheet capacity, and the independent mills are not doing any better. In some cases the prices we give may be slightly shaded by the mills absorbing part of the freight: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—The demand is only fairly active, but the mills have a moderate tonnage on their books, against which specifications are coming in quite freely. The American Sheet & Tin Plate Company is operating about 95 per cent. of its Tin Plate capacity, having only two of its large plants idle, these being Morewood and Anderson. Nothing is known here of a reported reduction in prices of Tin Plate, and it is not believed that any will be made, as Tin Plate was reduced 20c. a box in January last, to meet a reduction of $2 a ton in Tin Bars. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Hoops and Bands.—As foreshadowed in this report last week, Hoops and Bands have been reduced $4 a ton, to correspond with a like reduction in Steel Bars. Very little new business is being placed, and specifications against contracts are only fair. Selling agents of the Steel Hoop interests report that the local option movement is so strong in certain sections of the country that it is decidedly cutting down the tonnage needed in Steel Hoops. We quote: Regular prices are as follows: Steel Hoops $1.80, base, full Hoop card extras; Steel Bands, $1.40, base, half Steel card extras, all f.o.b. cars, Pittsburgh, in carload lots, for delivery during 1908.

Iron and Steel Bars.—No settlement of the puddling and finishing scales was reached at the conference between the Western Bar Iron Association and the Amalgamated Association, held at Cambridge Springs, Pa., last week. The manufacturers asked for a reduction of 10 per cent. or more in puddling and finishing mills, basing this on the recent reductions in prices of Iron and Steel Bars. No time was set for another conference, but one will likely be held between now and June 30, when the present scales expire. We quote Iron Bars at 1.40c., base, for Pittsburgh delivery, and 1.35c., base, for Western points, to which freight is added, except Chicago, the price for which is 1.50c., delivered. We quote Steel Bars at 1.40c., Pittsburgh, for base sizes.

Spelter.—The market continues dull and prices are weak. We quote prime grades of Western Spelter at about 4.30c., East St. Louis, equal to 4.42½c., Pittsburgh.

Railroad Spikes.—A fair amount of new tonnage in

small lots is being placed for the smaller sizes, but the demand for standard sizes is practically stagnant. We quote: Standard sizes, 4½ x 9-16 in., at $1.70, and the smaller sizes at $1.80 per 100 lb. in carload and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Merchant Pipe.—New business is showing a small but gradual increase, May having been about 10 per cent. larger than April, and the outlook for June is fair.

Boiler Tubes.—Very little new business in Locomotive Tubes is being placed by the railroads, while the demand for Merchant Tubes among the general trade is only fair and is mostly for small lots for actual needs. Prices are somewhat uneven, regular discounts on Merchant Tubes in small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes	Iron.	Steel.
1 to 1¼ in.	42	47
1½ to 2¼ in.	47	50
2½ in.	47	61
2¾ to 3 in.	52	65
3½ to 4½ in.	42	59

2¼ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2½ in. and larger, over 22 ft. long, 10 per cent. net extra.

Iron and Steel Scrap.—Some inquiry is in the market for Low Phosphorus Melting Stock, but the general Scrap trade is quiet, and prices are only fairly strong. Dealers quote about as follows, per gross ton: Heavy Steel Scrap, Pittsburgh, Steubenville or Sharon delivery, $13 to $13.25; Cast Borings, $7.25 to $7.50; No. 1 Railroad Wrought, $13.25 to $13.50; No. 1 Cast, $13.75 to $14; Bundled Sheet Scrap, $8.50 to $9, at shipping point; Sheet Bar Crop Ends, $16 to $16.50; No. 1 Busheling Scrap, $12 to $12.25; No. 2, $9 to $9.25; Iron Axles, $19 to $19.50; Steel Axles, $16.50 to $17; Low Phosphorus Melting Stock, $17 to $17.50; Old Steel Rails, short pieces for Open Hearth use, $12.75 to $13; Rerolling Rails, lower in price, $13.50 to $13.75; Machine Shop Turnings, $8 to $8.25; Grate Bars, $12 to $12.50; Railroad Malleable Scrap, $11.25 to $12.

Coke.—As noted last week, there is a little more inquiry for Furnace and Foundry Coke, and few more ovens in the Connellsville region have been started up. As yet prices have not shown much betterment, and we continue to quote Connellsville Furnace Coke for prompt shipment at $1.50 to $1.60, and 72-hr. Connellsville Foundry Coke at $2 to $2.25, at oven. The output of Coke last week in the Upper and Lower Connellsville regions was about 175,000 tons, a gain of about 5000 tons over the previous week.

Cleveland.

CLEVELAND, OHIO, June 9, 1908.

Iron Ore.—Sales of 1908 Ore aggregating 125,000 tons have been made by merchant Ore firms the past week. With the exception of a few small lots amounting to about 25,000 tons, sold several weeks ago, this is all the Ore that has been sold so far this season. Furnacemen, however, are taking more interest in the market than they have for some time, and it is believed that a fairly active buying movement will develop within the next two weeks. All sales have been made at the established prices, which, so far, are being firmly maintained by the Ore firms. The Ore shipments from the upper lake ports in May, being the total for this season, were only 285,315 tons, as compared with 6,252,261 tons up to June 1, 1907. Shipments have increased only slightly so far this month, and it is not believed that the June movement will exceed 2,000,000 tons. Most of the Ore that is coming down is being sent forward to the furnaces, but the shippers are having trouble in getting shipping orders. The movement of last year's Ore from the docks is still very light, and the dock piles have been reduced but little since May 1. The small tonnage of Ore that has been sold does not warrant the starting of any more boats, and three of the leading Ore interests that have not shipped a ton of Ore are as yet making no preparations for starting their boats, and it is not expected that they will make a general start before July 1. The merchant Ore interests are holding a meeting to consider the price question again, but no action has thus far been taken.

Pig Iron.—The market has quieted down after the recent heavy buying movement, and no new inquiries of any size are appearing. Considerable tonnage of Foundry Iron, however, was sold late last week by three furnace interests on inquiries that came out in the latter part of the buying movement. A local furnace sold 1000 tons to a northern Ohio foundry for June delivery, and reports the sale of 12,000 tons of Foundry Iron during the recent buying movement, mostly to consumers in this territory, for third quarter delivery. While some No. 2 Foundry Iron is reported sold at $14.50, Valley furnace, yet $15, Valley furnace, seems to be the minumum price with some of the furnace interests, and the most of the sales have been made at that price. The majority of Valley furnaces are now holding pretty firmly to $15.25 to $15.50 for third quarter and last half delivery, for No. 2. Local furnaces are asking $15.75 to $16, at furnace, for delivery in this territory. The majority of the consumers have covered for a portion of their requirements for the last half and producers believe that the market has settled down to another quiet spell. With Northern Iron cheaper than Southern there is very little inquiry for the latter. A local Basic interest is holding its price at $16, at furnace, but reports no sales or further inquiries. The Bessemer Iron market is still quiet, there being no inquiries. The melt of Foundry Iron in this territory shows no particular improvement. Some of the furnace interests that have large stock piles of Foundry Iron announce their intention to hold their product for better prices. For prompt shipment and for third quarter we quote, delivered, Cleveland, as follows:

Bessemer	$16.90
Northern Foundry, No. 1	$16.25 to 16.75
Northern Foundry, No. 2	15.90 to 16.25
Northern Foundry, No. 3	15.50 to 15.90
Southern Foundry, No. 2	16.35 to 16.85
Gray Forge	14.90

Coke.—While there is not a great deal of activity, the market continues firm. Some furnace interests that expect to put their furnaces in blast later in the year have covered the past week for their last half requirements. We quote Connellsville Furnace Coke at $1.75 to $1.85, at oven. High grade 72-hr. Foundry Coke is quoted at $2.25, at oven, for last half delivery. Some interests are asking slightly higher prices.

Finished Iron and Steel.—While a little more activity has been aroused in the market by the reductions in prices of Iron and Steel Bars, the improvement in the actual demand is not very large. Several of the agricultural implement makers have closed contracts for their Steel Bar requirements for the year ending July 1, 1909, at the new price of 1.40c., Pittsburgh, and others are expected to make contracts in the next few days. The implement manufacturers, as a rule, are contracting for about the same tonnage as last year. Some other consumers have also taken advantage of the lower prices and closed contracts for Steel Bars for delivery until October 1, when their specifications must be in, according to the price reduction agreement. Some of these consumers are offering to make contracts providing that they be allowed until January 1 to specify, and it is rumored that some mills are making this concession. Specifications for Steel Bars have come in a little more freely, but as the actual consumption has not materially improved, the lower prices are not expected to improve conditions very much. The reduction in the price of Bar Iron has had somewhat of a stimulating effect, and some orders and specifications have come in at the new price of 1.35c., Pittsburgh. Local Bar mills that have been running barely half the time for several months have enough orders on hand to keep them running the balance of the month. While implement makers are contracting for Steel Bars they are not placing contracts for Steel Specialties, of which their requirements for making implements are large, but are holding off with the expectation of getting lower prices. Because of the reduction in Bars, consumers of Structural Material and Plates are looking for lower prices in these lines and the demand is lighter. A reduction of $4 a ton has been made in Chain Rods. We quote Iron Bars at 1.45c., Cleveland, for car lots: Steel Bars, 1.50c., Cleveland, for car lots, half extras. Dealers quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Jobbers have slightly reduced their warehouse price on Iron and Steel Bars, which we now quote out of stock at 1.65c. to 1.70c. Owing to the reduction of $4 a ton on Hoops, the stock price has been reduced from 2.50c. to 2.30c. Other store prices remain unchanged. Beams and Channels out of stock are 2.10c. to 2.15c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—Steel Scrap is still firm and there is considerable activity among dealers to cover on contracts made about two weeks ago with the American Steel Foundries. For this Scrap, for which specifications are rather severe, dealers are paying $13.25 to $13.75, delivered at Alliance. Yard dealers, as a rule, have good stocks of Steel Scrap on hand, but are unwilling to sell at present prices. There is some improvement in the demand for Busheling Scrap and Borings and Turnings from outside mills. Local Rolling Mills are buying some Scrap in small lots. Among the railroad offerings this week is a Baltimore & Ohio list of about 3000 tons and a Norfolk & Western list of 1000 tons. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$12.50 to $13.00
Old Iron Rails	14.50 to 15.50
Steel Car Axles	16.00 to 17.00
Old Car Wheels	12.50 to 13.00
Relaying Rails, 50 lb. and over	21.00 to 22.00
Heavy Melting Steel	12.00 to 12.50
Railroad Malleable	11.50 to 12.00
Agricultural Malleable	10.50 to 11.00
Light Bundled Sheet Scrap	7.50 to 8.50

The following quotations are per net ton, f.o.b. Cleveland:

Iron [illegible]	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	6.00 to 6.25
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	10.50 to 11.00
No. 1 Railroad Wrought	11.50 to 12.50
No. 1 Cast	11.00 to 11.50
Stove Plate	9.50 to 10.00
Bundled Tin Scrap	8.00 to 9.00

Cincinnati.

CINCINNATI, OHIO, June 10, 1908.—(*By Telegraph.*)

The various agencies report some good sales on the new basis of $12, Birmingham, for Southern No. 2, while it is reported that one Northern interest has taken considerable business in Foundry grades at a shade below the published market price of $15.50, Ironton furnace. There has been some further buying of Bessemer, Malleable and Basic Iron in this territory, and sellers are deriving some encouragement from the fact that manufacturers of railroad equipment are feeling the market cautiously for Iron and some are out with specifications. There is much confusion among the jobbers of Iron and Steel finished products over the announced reductions, and the report here this afternoon of the general drop on all lines save Steel Rails, Sheets and Tin Pltaes, has added to the discussion. The move has not the indorsement of any large local selling interests, who aver that nothing is gained and much may be lost. No material improvement is shown in the local machine tool market, although some representatives of large tool producing establishments in other sections claim to have made some good sales here during the week.

Pig Iron.—Attention seems to have been diverted for a time from the Southern situation to the Northern product, which is considerably more of a factor this week among consumers than it was last week in the Cincinnati market. A sale to a local melter of between 1500 and 2000 tons of Bessemer is accredited to a central Ohio interest at a price unattractive to local agencies. Scarcity of low grades is still as pronounced as ever. A small tonnage of Mottled brought $10.50, Birmingham, and there is very little Forge or No. 4 to be had in the South. Southern Iron is held firmly at $12, Birmingham, for No. 2, and some furnaces are asking $12.50 for third quarter, with the prohibitive price of $13 for last quarter. The Pipe companies are nearly all in the market with inquiries which, however, give but little indication of their respective needs, as all purchases are guarded more carefully on a market of the present peculiar character. The foundry melt is increasing slowly, and some local melters have come into the market during the week for a portion of their requirements as far ahead as they can cover at the prevailing price, but so far as can be learned no figures have been secured for any part of next year. A number of Malleable concerns have bought during the week at close to $15.50, Ohio furnaces. A large manufacturer of harvesting machinery is asking for 6000 to 7000 tons for early delivery. A central Ohio car manufacturing concern is expected to close at once for 5000 tons of Foundry Iron and some Malleable. Another concern making railroad supplies wants 2000 tons of No. 2 and 3 Foundry, both Northern and Southern, for the last half. Ohio Silveries, 8 per cent. Silicon, are still quotable at $18.50, at furnace, for early delivery. To the close of the third quarter we quote f.o.b. Cincinnati, as follows, freight rates being $3.25 from Birmingham and $1.20 from the Hanging Rock District:

Southern Coke, No. 1	$15.75 to $16.25
Southern Coke, No. 2	15.25 to 15.75
Southern Coke, No. 3	14.75 to 15.25
Southern Coke, No. 4	14.25 to 14.75
Southern Coke, No. 1 Soft	15.75 to 16.25
Southern Coke, No. 2 Soft	15.25 to 15.75
Southern Coke, Gray Forge	13.75 to 14.25
Ohio Silvery, 8 per cent. Silicon	19.70
Lake Superior Coke, No. 1	16.95 to 17.45
Lake Superior Coke, No. 2	16.45 to 16.95
Lake Superior Coke, No. 3	15.95 to 16.45
Standard Southern Car Wheel	22.25 to 22.75
Lake Superior Car Wheel	22.00 to 22.50

(*By Mail.*)

Coke.—There has been some business placed in both Furnace and Foundry grades, but not what might be expected if the buying of Pig Iron had indicated permanency. As it is, the bulk of those needing Coke came into the market at once and early requirements have about been filled. Some contracting is being done on Furnace Coke for the last half and also for Foundry grades for the last half and for the year beginning July 1. Connellsville 72-hr. Foundry is quotable at about $2.10, minimum, for spot Coke and at $2.25 to $2.45 on contract. Furnace Coke has slumped off somewhat, but prices are unchanged. One effect of the buying movement was to remove all the low priced lots. There is no perceptible increase in production.

Finished Iron and Steel.—Almost as a unit, dealers declare that there will be no reductions ordered on store lots of Finished Material. Some months ago the larger factors entered into a sort of tentative clearing house arrangement, and there was a more or less mutual reduction of stocks, anticipating some such move as the reduction in Bars. The consensus of opinion here is that the price reductions were ill advised, and the dealers go further and announce that their customers are also sorry that they were made. With all this, there seems to be a better feeling and there have been some fairly good sales of Iron Bars. Orders from stock are still filled at the following prices, which are f.o.b. Cincinnati: Iron Bars, carload lots, 1.65c., base, with half extras; small lots from store, 1.85c., base, half extras. Steel Plates, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c. base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼ in. and heavier, carload lots, 1.85c.; small lots from store, 2c. Blue Annealed Sheets (Heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.20c. No. 12, carload lots, 2c.; small lots from store, 2.30c. Sheets (Light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.20c.

Old Materials.—The feature of the Scrap market for the week has probably been the billing of several thousand tons of Cast Scrap to interior points where dealers seem to have been short on that line. One shipment of 2000 tons went to Cleveland for foundries and Steel mills. Some more Melting Steel Scrap has been shipped to Europe. Local dealers are somewhat apprehensive of some Chicago and Western dealers who are loaded up with Scrap of all kinds, and who, it is reported, are getting ready to unload it at reductions, if necessary, to move it. The following prices are as nearly representative of this market as possible to obtain and are f.o.b. Cincinnati:

No. 1 R. R. Wrought, net ton	$10.50 to $11.50
Cast Borings, net ton	4.00 to 5.00
Heavy Melting Steel Scrap	11.00 to 12.00
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	10.25 to 11.25
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	14.50 to 15.50
Old Iron Rails, gross ton	13.00 to 14.00
Old Steel Rails, long, gross ton	11.00 to 12.00
Old Steel Rails, short, gross ton	11.00 to 12.00
Relaying Rails, 56 lb. and up, gross ton	22.00 to 23.00
Old Car Wheels, gross ton	12.00 to 13.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00

Birmingham.

BIRMINGHAM, ALA., June 8, 1908.

Pig Iron.—The market is not so active as at the time of last report, but producers are apparently satisfied with the situation as presented and quotations have not weakened. Three of the smaller makers are now practically out of the market for the third quarter and have advanced quotations to $12.50, Birmingham. Leading interests are making preparations to increase their output, but their attitude as to engagements for delivery beyond the third quarter has not changed and indicates that an increased rate of production is warranted by order book requirements. It has developed that a significant proportion of large tonnages recently engaged is for delivery covering the remainder of the year. The schedule of $12, Birmingham, for No. 2 Foundry is being adhered to for prompt deliveries and the third quarter, and could hardly be shaded. A basis of $12.50 is considered market price for the last quarter, and delivery covering the last half of the year could probably be had at figures slightly under this basis. A favorite brand of High Manganese Iron is being held at $13, Birmingham, for No. 2 Foundry. Recent transactions have involved comparatively small lots and negotiations have been by melters direct, but, with the exception of Cast Iron Pipe, there is still no tangible evidence of a material improvement in the foundry trade. Among the sales reported within the past week 600 tons of No. 2 Foundry for delivery within three months is most significant. This lot was sold at $12, Birmingham, and 250 tons for the third quarter brought the same price. The sale of 100 tons of 2.25 per cent. Silicon Iron is reported at $12.75 per ton, Birmingham. The principal inquiry known to be pending is from an Ohio melter for 2000 tons, but the aggregate of smaller lots furnishes an encouraging outlook. The scarcity of off grade Iron continues, and in some cases producers refuse quotations.

Cast Iron Pipe.—The principal contract awarded within the week was 1600 tons of Water Pipe for the city of Louisville, Ky. This tonnage was awarded the Dimmick Pipe Company, but the price to be paid has not been made public. A number of comparatively small lots have recently been placed at exceptional prices, but transactions were of such a nature as not to determine definitely the status of the market. It is reported on good authority that the tonnage recently awarded the United States Cast Iron Pipe & Foundry Company for Syracuse, N. Y., will be furnished from Buffalo, which would mean a net price of $21.80 per ton to the producer. The result of bids on contracts for Cuban points and Council Bluffs, Iowa, is being awaited with much

interest by Southern concerns. We quote the following for Water Pipe per net ton, f.o.b. cars here: 4 to 6 in., $23; 8 to 12 in., $22; over 12-in., average $21, with $1 per ton extra for Gas Pipe. These quotations are probably shaded on large municipal contracts.

Old Material.—A better feeling prevails with all parties concerned in the market, but the volume of business transacted has not increased. Purchasers are apparently unwilling to cover for anticipated requirements, with dealers indisposed to force a market by making concession in prices. The sales reported indicate a maintenance of prices, and we quote as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$15.00 to $15.50
Old Iron Axles	14.00 to 15.00
Old Steel Axles	12.50 to 13.00
No. 1 Railroad Wrought	12.00 to 12.50
No. 2 Railroad Wrought	9.00 to 9.50
No. 1 Country Wrought	10.50 to 11.00
No. 2 Country Wrought	9.50 to 10.00
Wrought Pipe and Flues	8.50 to 9.00
No. 1 Steel	9.50 to 10.00
No. 1 Machinery	9.50 to 10.00
Stove Plate and Light Cast	8.50 to 9.00
Cast Borings	5.00 to 5.50

The German Iron Market.

BERLIN, May 28, 1908.—The ebb tide in the Iron industry continues, and no signs of a change are as yet apparent. The rate of production and distribution is lower from month to month. The make of Pig Iron had kept up remarkably well to the end of March, considering the pronounced weakening of the general situation; but with April production began to shrink at an accelerated pace. The production for the month reached only 979,866 metric tons, which means a drop of 67,000 tons as compared with March, and not less than 98,000 tons, as against April, 1907. With the exception of the Februaries, last month was the first time that the monthly output dropped below 1,000,000 tons for nearly two and a half years.

Influence of Gas Engines on Pig Iron Production.

The explanation of why the rate of Iron production kept up so long after the high tide of prosperity had been passed is to be found largely in the use of the furnace gases in gas engines. As the gases were needed for creating power, furnaces were in many cases kept running without respect to the actual demand for Iron. The consequence is that considerable stocks have been accumulated at the furnaces, beyond the immediate demands of the market. Conditions, however, have grown worse and worse, and the blowing out of furnaces is now reported more frequently than several months ago. Hence it is certain that the rate of Pig Iron production will continue to shrink.

Owing to the large volume of supplies at the furnaces, consumers refuse to place orders for long terms, knowing that they can have all the Iron they need at any time and upon the shortest notice. They are, therefore, only buying hand-to-mouth quantities. Owing to the situation here described, unusual competition among the five Pig Iron syndicates of the country is reported, while considerable English Iron still finds its way into Germany, the price being 70 to 72 marks for No. 3 Foundry. Spiegeleisen is now quoted at 82 to 85 marks, Puddling at 74, Thomas at 65, Luxemburg Puddling at 52 to 53, German No. 1 Foundry at 76, No. 3 at 71, Luxemburg Foundry at 54, German Bessemer at 80. It will be noted that some of these prices are still pretty high.

Dissatisfaction with Pig Iron Syndicates.

Much dissatisfaction prevails in some sections of the trade over the course of the Duesseldorf Syndicate in keeping prices higher than the state of trade warrants. This dissatisfaction has found expression particularly in the Siegerland Syndicate, which is to all intents and purposes an annex to the Duesseldorf organization. In the Siegerland region, which is the chief producing center for Spiegeleisen and some other high grade qualities, the furnaces are only running upon a 50 per cent. basis of production, but their orders are only 30 per cent. of their producing capacity. Furnacemen there complain bitterly that prices are kept up so high as to check sales and they are threatening not to continue the arrangement with the Duesseldorf Syndicate after the end of the year, when it expires.

At the same time the feeling has spread among furnacemen in various sections of the trade that the present splitting up of the furnaces into five separate syndicates is not advantageous. At a preliminary informal conference on the subject several days ago, some important producers flatly declared that they were not going to remain in their syndicates under the existing circumstances. They demanded that all the furnaces in the western part of the empire get together in one common organization. While the idea of a single combination has been received with much favor, cool observers regard the prospects for any organization whatever as rather doubtful. The chief difficulty appears to be found in the new furnaces now springing up on the seacoast. These have the advantages of cheap foreign Ores and Coke and the proximity of large districts where no Iron is produced; hence they will demand that big allotments be guaranteed to them as a condition for joining any combination.

The Steel Works Association.

The April shipments of the Steel Works Association were the lightest since the combination was organized, with the single exception of last December. The total movement for the month was only 371,956 metric tons, against 486,468 tons in March, and 481,974 tons in April, 1907. The shrinkage was chiefly in Steel Rails and Ties, which had hitherto kept up their rate of production better than any other section of class A goods. As compared with March, the drop in this specialty was 57,700 tons, and as compared with the high water mark touched last November it was 81,000 tons. The shipments of Billets were 104,703 tons, which is about 28,000 tons less than in March, but somewhat more than in January and December. Structural Steel was shipped to the amount of 126,125 tons, which is a reduction of 29,300 tons from March, but considerably more than for any one of the four preceding months.

It is a significant fact that the association's usual report has this time been cut down to narrow limits. It says in respect to Billets that consumers are holding back and buying only the most necessary amounts of Steel, and that it is consequently difficult to say anything about the demands for the next few months. In Structural Steel, too, the report says that consumers are holding off, inasmuch as building activity is not brisk. In the Heavy Rail section, says the report, the contracts with the various domestic railroads have now been concluded, and some contracts for Grooved Rails have been taken. It is hopefully mentioned that quite a number of projects for street and branch railroads are under negotiation, and are only held up pending an improvement in the money market. Some foreign contracts have also been arranged, but sharp competition prevails in neutral markets. The passage of a bill by the Reichstag for building railroads in the German colonies opens the prospect of considerable orders for Rails and Ties, and these will probably extend over a number of years.

The Small Rolling Mills.

The weakest section of the Iron industry continues to be that of the unattached rolling mills, which are under the necessity of buying their Steel from the great works of the association. The latter has maintained prices at a very high level, at the same time that it has been pushing its export trade by making heavy price cuts on foreign orders. The Cologne *Gazette*, which gives close attention to matters affecting the Iron trade, says that German Muck Bars and Billets are sold laid down in Glasgow at 80 marks, while the home consumer has to pay 100 to 102.50 marks per ton; also that German Wire Rods are put on board at Antwerp and Rotterdam at 100 marks, whereas the price in the home market is 132.50 marks. This policy, it says, of favoring the foreigner at the expense of the home manufacturer of finished goods must result in ruining the latter, the span between home and export prices being so great that it cannot be compensated for by the drawback guaranteed by the trade organizations on exported finished goods.

These unattached rolling mills are feeling the pinch and are also casting about for a remedy. Recently some 30 representatives of such concerns met a dozen members of the Reichstag here at Berlin for a conference on their dilemma. These members were from nearly every political party, and at their suggestion it was decided to petition the Imperial Government to pass a law abolishing the protective duties on Pig Iron and Billets. It has been intimated in the press that the representatives of these mills have received evidences of sympathy from the Government. Under the circumstances it seems probable that an effort will be made next winter to abolish the duties mentioned. The members of the Reichstag who attended the conference assured the Iron men that such a bill could easily be passed.

Efforts have been in progress for some time to organize the manufacturers of Plates and Sheets. The plan was to create two organizations, one for thin and one for heavy goods. The negotiations for the former had reached such an advanced state that a final meeting was held several days ago to complete the organization, but one important mill in Lorraine and one or two smaller concerns refused to enter it and the whole plan was abandoned. This also means the failure to organize in Heavy Plates.

Reports that the Republic Iron & Steel Company would build a three high 38 in. blooming mill at its Bessemer steel plant, Youngstown, Ohio, are untrue. The company recently added an extra stand to the train on which tin bars are rolled, but aside from this no improvements or additions at the plant are under way or contemplated.

The sheet bar mill and 10 hot mills in the McKeesport Works of the American Sheet & Tin Plate Company, McKeesport, Pa., are scheduled to start up June 15.

New York.

NEW YORK, June 10, 1908.

Pig Iron.—Sharp competition between furnacemen in eastern Pennsylvania has led to a demoralized market both in this district and in New England, and quite a considerable tonnage has been booked, chiefly of Foundry Iron, at a wide range of prices. During the week $16.50 has been freely done at New England points for No. 2 Foundry, and in this market $15.50 to $16 for the same is quoted. At the close the eagerness to book business seems to continue. We quote at tidewater, Northern No. 1 Foundry, $16.50 to $17; No. 2 Foundry, $15.50 to $16, and No. 2 Plain, $15 to $15.50. Alabama Irons are quoted at $16.75 to $17 for No. 1, and $16.25 to $16.75 for No. 2 Foundry, so that Southern Irons are now considerably above local Irons.

Structural Material.—The placing of contracts for buildings and bridges has undoubtedly been checked to a considerable extent by the general belief that a reduction in prices of Structural Material would shortly be made. A great deal of business is pending, and as the uncertainty surrounding the market is now relieved the negotiations may be expected to result in orders speedily. The Pennsylvania Railroad Company has at last begun to purchase material for viaducts over its car storage yards on Long Island, having placed one order for 1500 tons with the Pennsylvania Steel Company for this purpose. The Hamburg-American Company is negotiating for 1500 tons for a new pier at Hoboken, N. J. The Public Service Corporation of New Jersey and the New York City Railway Company are expected to place orders for buildings taking about 500 tons. These are only a few of the orders now in sight. It is claimed that although the price of Structural Material has been reduced the fabricators will not make lower prices on bridges and buildings than they have been doing, as they had been anticipating this lower cost of their material. The demand for plain material has naturally been quiet also. We quote on tidewater deliveries, shipments from mill, as follows: Beams, Channels, Angles and Zees, 1.76c.; Tees, 1.81c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Ferroalloys.—More inquiries are in the market, but these are mostly for small lots. Some 80 per cent. Ferromanganese has been sold at about $43.50 Baltimore. Some foreign makers claim this price is below cost and their agents are holding for higher prices. No change is noted in 50 per cent. Ferrosilicon, which is held at $70 Pittsburgh.

Bars.—The lower prices made on Steel and Iron Bars have brought out considerable buying, and the volume of business has been quite large in the past week. Quotations on Bar Iron have improved slightly, and it is understood that 1.40c. New York is the bottom price to be secured now. Quite a number of the Eastern mills are making their minimum 1.40c. at mill. A meeting of the Eastern Bar Iron manufacturers is being held to-day for the purpose of endeavoring to effect some arrangement which will put business in better condition. Steel bars are quoted at 1.40c. Pittsburgh, or 1.56c. New York.

Plates.—The local demand continues to be confined to small lots. Prices of standard sizes of Plates are now as follows, at tidewater: Sheared Plates, 1.76c. to 1.86c.; Flange Plates, 1.86c. to 1.96c.; Marine Plates, 2.16c. to 2.26c.; Fire Box Plates, 2.65c. to 3.50c., according to specifications.

Cast Iron Pipe.—The city of Worcester, Mass., which purchased 1000 tons of Pipe in February, is about to contract for 1000 tons more of 14 and 16 in. The city of New York will to-day open bids for 3500 tons, and the city of Rome, N. Y., for 3745 tons, as stated in last week's report. It is believed that the bids on these lots will be somewhat higher than those named at recent lettings, as the foundries are getting well filled on large Pipe and are therefore feeling rather more independent. There is further a better carload inquiry and more actual placing of orders. Manufacturers are asking a slightly higher price on carload lots of 6 in. at tidewater, and the inside figure is now said to be $24.50 per net ton.

Steel Castings.—Bids were opened May 25 by the New York Dock Department on 172,000 lb. of Cast Steel Mooring Ports, with anchor blocks and washers, on which the price ranged from 2.78c. to 3.67c. per lb. The following were the bids: Foster F. Booth, Dover Boiler Works, $5900; J. K. Larkin, $4834.93; Hobson, Halliday & Co., $5100; Motley, Green & Co., $6320; Maryland Steel Company, $5263; J. Shewan & Son, $4789; New Jersey Foundry & Machine Company, $5382; Griscom-Spencer Company, $5867; J. Edward Ogden Company, $4786.03; Mesta Machine Company, $6020; G. & W. Mfg. Company, $5543.

Old Material.—The cut in prices of Steel and Iron Bars has had a rather depressing influence on the Scrap market, and it has further not been helped by the expectation of lower prices on other Finished products. Nevertheless, a somewhat larger volume of business has been done in some directions, particularly with rolling mills, which have found it desirable to cover the sales of Bars recently made, and have been buying more freely than for some time such stock as Cast Scrap, Borings, Turnings, Wrought Pipe and No. 1 Railroad Wrought. The demand for Heavy Melting Steel Scrap is quieter than it has been for the past three or four weeks. Car Wheels are being purchased in good quantities by dealers, who consider them good property at current quotations, although consumers are still manifesting no interest in them. Quotations are about as follows, per gross ton, New York City:

[illegible]	$11.00 to $11.50
Heavy Melting Steel Scrap	11.00 to 11.50
[illegible]	11.50 to 12.00
Relaying Rails	20.50 to 21.50
[illegible]	14.50 to 15.00
Standard Hammered Iron Car Axles	16.00 to 16.50
[illegible]	14.50 to 15.00
No. 1 Railroad Wrought	12.00 to 12.50
Iron Car Axles	10.00 to 10.50
No. 1 Yard Wrought, long	11.00 to 11.50
No. 2 Yard Wrought, short	10.00 to 10.50
Light Iron	5.50 to 6.00
Cast Borings	5.00 to 5.50
Wrought Turnings	6.50 to 7.00
Wrought Pipe	9.50 to 10.00
Old Car Wheels	12.00 to 13.00
No. 1 Heavy Cast, broken up	13.00 to 14.00
Stove Plate	9.50 to 10.50
Locomotive Grate Bars	10.50 to 11.00
Malleable Cast	11.50 to 12.50

Rogers, Brown & Co., 30 Church street, New York, have been appointed selling agents for the Western Foundry & Supply Company, producer of ground and lump ferromanganese, ferrosilicon, ferro chrome, manganese, copper and other alloys. The Western Foundry & Supply Company has plants at East St. Louis, Ill., and Elizabethport, N. J.

Metal Market.

NEW YORK, June 10, 1908.

Pig Tin.—Dullness continues. Since June 1 less Tin has been sold than in any like time this year. The total sales this week will probably not exceed 150 tons. The holidays in London had no effect on prices because there was no business. Price changes during the week, although small, have been toward lower levels, as follows:

	Cents
June 3	28.70 to 28.85
June 4	28.55
June 5	28.45
June 8	28.20
June 9	28.25
June 10	28.25 to 28.37½

Deliveries this month will be light, as, in addition to the 1275 tons arrived, only about 1000 tons more will make this month's delivery. The price of Future Tin in London is now above Spot—an unusual condition. It is explained that this is not a premium but is more of a carrying charge, and it is possible that it may increase. The London market closes firm, at £128 17s. 6d. for Spot, and £129 5s. for futures, a decline, since last week, of £2 for Spot, and £1 for futures.

Copper.—The market is a shade firmer, with Electrolytic obtainable at 12.75c., and Lake at 13c. The price of Electrolytic might be shaded for export. Some better inquiry is noted, especially from the larger trade. Much of this, however, has been stimulated by the rumors that railroad companies would again enter the general market after July 1. The largest consumers of Ingot Copper—the wire drawers—have very little business. Those manufacturing lighter forms, however, report some increase. One factor, which seems to impart confidence, is the refusal of the selling companies to sell other than to actual consumers. In other words, they want no Copper but their own to come on the market when prices advance. No buying of consequence from Europe has been noted this week, but this absence is clearly traceable to the holidays in London. The market there is firmer, closing to-day at £58, 10s. for spot, and £58, 18s., 9d. for futures. The exports for the first 12 days of this month were 8700 tons. L. Vogelstein & Co., agents for Aron Hirsch & Sohn, Halberstadt, Germany, figure the deliveries of foreign Copper into Germany for the first four months of 1908 as 53,810 tons, compared with 36,225 tons during the same period in 1907.

Pig Lead.—The unexpected announcement of a 5c. advance in Lead June 3 was followed by a still greater surprise June 5, when a further advance of 10c. was made. The price of 4.50c., New York, is now quoted alike by the leading interests and independent sellers. No cutting of prices is made by merchants, some of whom must have considerable Lead which now shows a handsome profit. The St. Louis price has been advanced to 4.35c. In London, Soft Spanish Lead has again declined, being now quoted at £12 10s., or about 2.75c. per lb.

Spelter.—Business is dull, and the efforts to stimulate activity have so far been without avail. Prices are slightly

higher, at 4.42½c. to 4.45c., St. Louis, and 4.57½c. to 4.60c., New York.

Nickel.—Prices are without change, at 45c., for ton lots, and 55c. to 60c., for smaller quantities.

Antimony.—Business is dull, and prices are without change. Cookson's is held at 8.50c., Hallett's at 8.50c., and outside brands at 8.25c.

Tin Plates.—The heavy buying for the season is about over, but the mills are actively engaged in turning out orders. The old quotation of $3.70, Pittsburgh, and $3.89, New York, for 100-lb. IC Coke Plates, continues. In Swansea, Welsh Plates are 1½d. easier, at 12s. 1½d.

Old Metals.—Domestic consumers are buying more freely, but in small lots. The tonnage disposed of is therefore small. The export trade continues good. Dealers' selling prices are about as follows:

	Cents
Copper, Heavy and Crucible	12.00 to 12.25
Copper, Heavy and Wire	11.75 to 12.00
Copper, Light and Bottoms	10.75 to 11.00
Brass, Heavy	8.75 to 9.00
Brass, Light	7.00 to 7.25
Heavy Machine Composition	11.50 to 11.75
Clean Brass Turnings	7.75 to 8.25
Composition Turnings	9.50 to 10.00
Lead, Heavy	4.20
Lead, Tea	3.85
Zinc	5.50

Iron and Industrial Stocks.

NEW YORK, June 10, 1908.

Stock values are maintaining themselves quite well under what might be considered adverse conditions. Possibly the very encouraging outlook for this year's crops is having much to do with the stability of stock prices. The fluctuations have recently not been wide, but at the same time it must be said that transactions have not been large. The range of prices on active iron and steel stocks from Thursday of last week to Tuesday of this week has been as follows: United States Steel common 36¾ to 38½, preferred 101⅛ to 102¼; Car & Foundry common 33⅝ to 34¾, preferred 98; Locomotive common 48¾ to 50½, preferred 102½ to 102¾; Steel Foundries common 6, preferred 33½ to 34; Cambria Steel 30⅝ to 31; Colorado Fuel 26¾ to 28; Crucible Steel common 5¾ to 5⅞, preferred 42½ to 43; Pressed Steel common 27 to 28⅝, preferred 82 to 83; Railway Spring common 37½; Republic common 17½ to 18½, preferred 66¼ to 70; Sloss-Sheffield common 49¾ to 51; Cast Iron Pipe common 27 to 27⅜, preferred 74¾; Can common 5, preferred 55 to 55½. Allis-Chalmers stocks have had quite a movement, the common closing at 10, and the preferred at 29¼ on Tuesday. Last transactions up to 1.30 p.m. to-day are reported as follows: United States Steel common 37⅝, ex-div., preferred 101½, bonds 96⅜; Car & Foundry common 34⅛, preferred 98; Locomotive common 49½, preferred 102½; Colorado Fuel 27¼; Pressed Steel common 28⅜, preferred 83; Railway Spring common 37½; Republic common 17⅝, preferred 67; Sloss-Sheffield common 51½; Cast Iron Pipe common 27½, preferred 74¾; Can common 5, preferred 56.

The directors of the Pressed Steel Car Company have decided to anticipate the redemption of $500,000 bonds due February 1 next by paying off the amount of the securities in interest on or before August 1. The bonds are part of an issue of $5,000,000 put out in 1901, of which $500,000 have been redeemed annually. The anticipated redemption of $500,000 at this time will reduce the amount outstanding to $1,000,000.

The profits of the Barney & Smith Car Company for the fiscal year ended March 31, are reported at $508,639. The balance transferred to the undivided profit account, after charging bond interest and dividends, brought that item to $474,163. No reduction was made for depreciation, as repairs and betterments were charged against earnings.

Dividends.—The American Smelting & Refining Company has declared the regular quarterly dividend of 1 per cent. on the common stock, and 1¾ per cent. on the preferred stock, payable June 26 and July 1, respectively.

The Ingersoll-Rand Company has declared a semiannual dividend of 3 per cent. on the preferred stock, payable July 1.

The Canadian Westinghouse Company, Ltd., has declared a quarterly dividend of 1½ per cent., payable July 10.

The International Silver Company has declared a quarterly dividend of 1 per cent. on the preferred stock, payable July 1.

The Otis Elevator Company has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable July 15.

The Empire Steel & Iron Company has declared a semiannual dividend of 3 per cent. on the preferred stock, payable July 1.

The Hydro-Electric Power Commission of Ontario will receive up to June 15, inst., at its office in Toronto, tenders for the construction of steel transmission towers, transmission line cable and the erection of a complete transmission system, first between Niagara Falls and Toronto, and, second, between Niagara Falls and St. Thomas.

Steel Prices Reduced.

An important meeting of the steel trade was held in New York on Tuesday. There were present about 50 representative steel men, who included the heads of the leading independent companies, as well as the presidents of a number of the United States Steel Corporation's subsidiaries. The proceedings were summarized by Judge Gary in the following official statement:

"The representatives of the leading steel manufacturing companies have been in session during the day. It is understood the price of iron ore has been, or will be soon, reduced 50 cents per ton, base.

"Each one of the steel manufacturers expressed the opinion that there should be a readjustment in the prices of their respective commodities as follows: Billets from $28 per ton to $25, Pittsburgh; sheet bars from $29 per ton to $27 per ton, Pittsburgh; plates from $1.70 per 100 lb. to $1.60 per 100 lb., Pittsburgh; structural iron from $1.70 per 100 lb. to $1.60 per 100 lb., Pittsburgh; merchant pipe a reduction of two points, or $4 per ton, Pittsburgh; wire nails from $2.05 per 100 lb. to $1.95 per 100 lb.

"Sheet and tin plates were reduced early in the year, therefore no changes were considered in the prices of these products.

"It is hoped these changes will not necessitate a general or radical readjustment of wages, which it is desirous to avoid."

The Association of Iron & Steel Electrical Engineers will hold its first annual meeting in Philadelphia June 24 and 25. The committees that have been appointed are as follows: Finance, E. W. Yearsly, G. H. Winslow, James Farrington; Papers, E. W. Yearsly, P. D. Brown, G. W. Richardson, G. M. Sturgess; Library, G. H. Winslow, L. R. Palmer; Board of Examination, B. R. Shover, J. C. Reed, L. R. Palmer; Editing, L. R. Palmer, G. H. Winslow; Standardization, F. P. Townsend, G. W. Richardson, G. M. Sturgess. G. H. Winslow is secretary and treasurer, 559 Frick Annex, Pittsburgh, Pa.

The decision of independent vessel owners to hold shipping in ports until about July 1 emphasizes the dullness of the ore trade. Dividends to stockholders in lake craft can only be paid this year out of surplus, if any such exists, and the lake shipbuilding industry has received a setback from which it will take some years for recovery. So many ships have been financed from high dividends in past years, for which there was no real need, that the lakes are overbuilt. Capacity for more than 50,000,000 tons annually now exists, in big, modern ships.

The graduates from the Winona Technical Institute, Indianapolis, Ind., this year number 202, against 108 last year. The commencement exercises took place May 28. Graduates from the foundry school came from four States. The other graduates were from the schools of metallurgy, electricity, pharmacy, printing, lithography, carpentry, tile and mantel setting, painting and decorating, press work, typography and linotype and library.

The promoters of the National Rolling Mills Company, whose works are to be established at Sydney, Nova Scotia, speak hopefully of the progress of their financial arrangements. The plant they have in contemplation is to be a large one.

At Morrisburg, Ont., the mills of the Canada Tin Plate & Sheet Steel Company have resumed operations. The company, which has had its works closed down since the fire of last January, is said to have enough business booked to keep it going up to the end of the year.

South African Trade Conditions.

DOUGLAS, CAPE COLONY, May 2, 1908.—A description of the state of trade at present prevailing in South Africa would be incomplete without a reference to the progress of the country in the recent past. It is well, perhaps, to mention that the state of the market as affecting the commercial world has been grossly exaggerated in some of the leading English and American trade journals; and although a long list of comparative figures would be somewhat wearisome to American readers it is necessary to indicate that some progress on the previous year's trade, especially with reference to hardware and machinery, has been a feature of the past 12 months.

The importation of American goods has declined considerably, now amounting to practically nil. This fact is doubtless due to the keen competition by Canada for the foremost place in the agricultural implement and machinery market, and also to the preferential customs tariff in favor of British-made goods.

An Effect of the Depression in America.

The depression, although affecting the country throughout, is undoubtedly at its worst in Kimberley. The chief cause attributable to the gloominess witnessed in this hitherto exceedingly prosperous center, is consequent upon the financial crisis in America. In spite of the attetmpts made to avert disaster to the city, the De Beers Company has been compelled to cease operations at two of its leading mines. Business everywhere in Kimberley is at an inconceivably low ebb. Probably no other center of importance in the world is so dependent upon one industry as Kimberley is. Ever since the opening of the diamond fields a little over 30 years ago, no attempt has been made to introduce a fresh source of business in case of the proverbial "rainy day" putting in an appearance.

Railroad development, excepting a few small lines already begun, has not been a feature of the year's progress. There are several reasons accountable for stagnation in this direction. First, there is the ever-present friction prevailing between the various administrations with regard to tariffs. Second, the wave of excitement witnessed in the move now being made toward unification or federation has caused the several governments to postpone all measures for increasing their railroad systems. Last, there is the general depression. In the Cape Colony, however, sufficient optimism prevails with regard to the future; for, although financial experts decry the movement, the Cape Parliament has agreed to commence several branch lines of railroads at an early date. Indeed, the laxity of the government in two instances, resulting undoubtedly through lack of funds, has caused two companies to petition Parliament for the right to construct two branch lines by private enterprise.

South African farming methods are not, generally speaking, commendable to older countries; nevertheless, signs are not wanting to show that there is an improvement upon the traditional system fast approaching. Everywhere farmers are boring for water, constructing dams, introducing up to date appliances in their dairies, adopting modern methods for sheep shearing, erecting windmills, &c. They are generally awakening from that lethargic state which has been characteristic of South African farming since the days of early settlement. All this goes to prove that the demand for implements, machinery and other farming requisites is encouraging to manufacturers. So much for farming.

Mining Interests.

Dealing next with mining (though strictly speaking this branch of industrial development should be accorded the first place in spite of all that has been said of late rating it as of second import), very satisfactory data can be given, excepting for the time being the diamond industry. On the Rand (Johannesburg) considerable progress has been made. New propositions have been opened up and the deeper levels are fast becoming prominent as contributors to the gold output. In addition to the ordinary facilities for working the reef, the latest improvements in methods and machinery employed all along the Rand warrant more than a mere passing reference. These mines are equipped as probably no other mines in the world are equipped, especially as regards electrical appliances, and recently electrical furnaces for sharpening drills have further augmented the already replete list.

In Rhodesia—although an insignificant contributor of the yellow metal—much progress has been made in small mining properties. Small stamp batteries have been in great demand; so also have the lesser items of hardware—picks, shovels, &c.—connected with mining equipment. The tobacco industry has also provided several opportunities for machinery firms. Farming implements, however, have not been in demand owing to the unsatisfactory conditions of settlement proffered by the Chartered Company to intending settlers.

Natal, as a whole, has not done so badly. The leading colliery companies have had a satisfactory increase over the previous year, and indeed bid fair to have a better show of trade than ever. Machinery has been acquired for the purpose of washing the small coal, and the results from this source alone have been highly gratifying; so much so, in fact, that all companies now intend adopting the system. The demand for coal occasioned by the steamship companies has compelled the Natal Government to construct an additional line along the sea front to the collieries, and also place orders for heavier rolling stock in order to meet the coal companies' demands. Several factories have been completed and others are now being erected in various places near the coast for the manufacture of dynamite, candles, soap, matches, &c.

The advocates of American farming methods received a considerable setback during the last session of the Natal Legislature, when it was proved that the steam plow as a feature of South African farm life was doomed to extinction. It appears that several months back some £7000 were expended on steam plows, with a view to providing farmers with increased facilities for cultivating their lands, but in every instance, owing to the terrible nature of the ground under treatment and the smallness of the farms concerned, these plows were a complete failure. In the Transvaal also the same discouraging results have been witnessed.

Supporting Home Industry.

The great cry, "support colonial industry," is everywhere bearing fruit, and in this direction the prominence now being given to metal manufactures is worthy of attention. Several firms have established themselves in the more important centers, and the products from their workshops are equal in every way to the imported article. There are besides ordinary sheet metal goods, castings from recently built foundries and lead work of an almost endless variety in evidence. In nearly every case the metal used has been brought from mines in the country. It may here be stated that much assistance has been accorded the metal makers by the general legislation of the various governments in the direction of opening up and facilitating development in every way of the base metal properties observed on every hand. One satisfactory feature of the latter is the fact that quite recently over 60 tons of pure tin (alluvial) has actually been exported from the Transvaal. Thus it will readily be seen that South Africa is destined to become a manufacturing country of no mean import at some future date.

A discovery which promises to revolutionize boiler covering processes has recently been announced from the Transvaal. The substance, which is a natural earth, is known as "Kieselguhr," and exists in unlimited quantities in several places in the colony named. At first no attention was paid to the discovery, but the investigations of a scientist have resulted in practical tests being made by several large firms in the direction above named. It appears that by mixing Kieselguhr with a small quantity of asbestos, a substance is formed which is far superior as a covering for boilers and the like to any material at present known. Leading politicians aver that from this source alone the Transvaal can build up a large trade.

It is pleasing to note the dawn of an electrical age. Throughout the country, town councils are vieing with one another in installing electrical plants. Some hun-

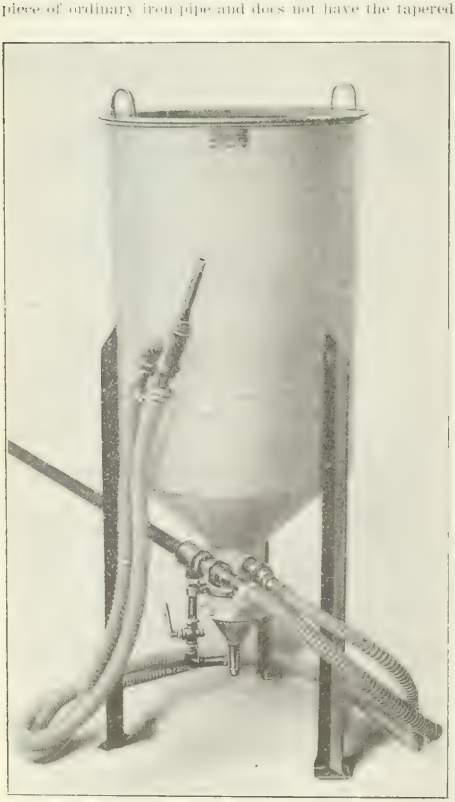
dreds of thousands of pounds sterling have recently been expended in this direction—a feature which certainly does not signify depression, surely! At East London £35,000 has been voted for an extension of plant and buildings, while at Johannesburg £27,000 is being utilized for a similar purpose. In addition to the latter scheme the Victoria Falls Power Company is erecting a gigantic power station, with which to supply the Rand mines with electrical energy. The schemes just mentioned are but a few of the most important; many others of lesser import are being carried into effect at various places.

The Slope drill contest has excited the interest of drill manufacturers the world over; and although the competition will not take place until January next (1909), many of the world's leading drill manufacturers are now seeking information on the subject. It may therefore save considerable time, and thereby enable American firms intending to compete, to state that all types of rock drills will be eligible. Drills using compressed air will be supplied with a pressure varying from 60 to 75 lb. per square inch at the surface. The mining regulations require the provision of dust allaying appliances. Competitors must make arrangements accordingly. There will be two prizes, one of £3000 and one of £1000.

The Leiman Sand Blast Apparatus.

Most foundries have use for a sand blast, either to clean sand from castings or patterns or to produce some style of finished surface on metals. A moderate priced, compact apparatus for all classes of light or heavy work is illustrated herewith as made by Leiman Brothers, Brill street and Bonykamper avenue, Newark, N. J., and 139 Center street, New York City.

The nozzle of this new machine is a long, straight piece of ordinary iron pipe and does not have the tapered hole used on other sand blast nozzles and therefore is less subject to wear. The air goes directly from the compressor to the mixing chamber at the base of the nozzle, the vacuum there created drawing the sand through the sand feed pipe from the body of the machine. As the sand reaches the mixing chamber it receives the full pressure of the air to drive it through the nozzle so that there is not the necessity of making the nozzle tapered to increase the velocity. In this way not only can a larger nozzle be used, thereby covering a much larger surface with a given pressure of air, but it may be longer (even to the extent of several feet), enabling the operator to stand at a distance from his work with just as satisfactory results.



A Sand Blast Equipment for Foundries Made by Leiman Brothers, Newark, N. J.

Since the air does not go through the body of the machine, the latter does not need to be of steel, and heavy galvanized iron answers the purpose. The sand is dried by heating and is then simply thrown into a depressed sieve at the top of the machine being then sifted automatically. The machine holds enough sand for 3 or 4 hr. continuous operating and the 10-ft. double length of wire-covered rubber hose with which the machine is equipped makes it possible to operate the nozzle in any direction.

Leiman's rotary high pressure blowers or any air compressor may be used with this machine. The sand blast machine when mounted on a movable platform with a blower may be moved out of the way when not in use and the sand blasting room used for other purposes.

The Monitor Stove & Range Company.—Injustice was unintentionally done to this company in a paragraph regarding the new E. H. Bardes Range & Foundry Company, published in *The Iron Age* of May 28. The Monitor Stove & Range Company, organized in the early part of last year, is the direct successor to the old and very widely known William Resor Company and is operating the plant in Cincinnati, Ohio, which was run for so many years by that company, having in addition taken over all the patterns and acquired everything else pertaining to its business. The Monitor Company is therefore the exclusive manufacturer of the Resor lines of stoves. The plant remodeled for the Bardes Company was formerly occupied by John A. Schulte & Co., and not by the William Resor Company.

At Pittsburgh last week an answer was filed in court by 23 creditors of the Shenango Iron & Steel Company against which bankruptcy proceedings were recently commenced. They deny the allegations of the complainants that the Shenango Iron & Steel Company transferred a portion of its property to Bole, Ross & Co., while insolvent, or that it is a bankrupt corporation. It is also alleged that the petitioners became creditors of the Shenango Iron & Steel Company after a mortgage, under which that alleged preference was made, had been recorded. The Shenango Iron & Steel Company is now in the hands of a receiver, appointed in the bankruptcy proceedings.

The Riter-Conley Mfg. Company, Pittsburgh, is finishing a job under a contract involving in the neighborhood of $1,000,000 for the Rio de Janeiro Tramway, Light & Power Company in Brazil. This has included the construction of power houses, transmission towers and the laying of three miles of 8-ft. steel riveted pipe in connection with a hydro-electric system having as its power source a reservoir in one of the mountains at a point about 56 miles from Rio. The water thus piped under a tremendous head will furnish the power for generating electricity, which will be carried to the city.

The Atikokan Iron Company's furnace at Port Arthur, Ont., has not yet been relighted. It is stated that present prices are below the cost of production at that plant.

Canadian manufacturers of motor cars are increasing their sales in Australia since the amended duties came into operation there.

The Machinery Trade.

NEW YORK, June 10, 1908.

Reports in the machinery trade are encouraging and well informed houses are receiving an increased demand from the more important interests, particularly the railroads during the summer, but thus far none has actually come into the market for extensive equipment. As a result of the adherence to the policy of retrenchment the demand the past week was almost wholly from the smaller manufacturing enterprises, and, though better with many houses, the business placed was not large enough to distribute more than a fair amount to the greater number of dealers and manufacturers. Inquiries with some houses were not so numerous as they were the last week of May. Manufacturers of power plant equipment have been aided by the large number of municipal plants being established throughout the country, but machine tool houses have been less favored, new projects and substantial additions to works being few and slow in consumation.

Supplementing our recent statement that many railroads are preparing to make machinery purchases to put their shops in shape to repair the rolling stock standing in the yards of most of the important roads, comes the information that in the South and New England especially master mechanics and other shop officials are making up lists of needed machinery equipment. A number of machinery men on receipt of the information mentioned in these columns last week, to the effect that some of the roads would commence buying on July 1, made hasty trips to the more important railroad shop centers and several of them came back this week with cheerful information. It has been known, of course, in machinery circles for some time that many railroads were badly in need of repair equipment, as during the prosperous times they were running their car service to full capacity and when the slump came it was found that a great deal of the rolling stock was in urgent need of repairs. With the lessening of the demand for freight service many of these cars were sent to the yards because most of the roads were curtailing expenses and laying off hands. Many needed repairs were not attended to as there was no urgent need of cars. With the demand for added freight service from manufacturers many railroads would be unable to cope with the future and, realizing this, efforts are being made to put shops in shape to handle the repair work. One house reported a number of sales to Southern roads, and on investigating conditions at the shops the machines were ordered sent to it was found that they would not be put in operation at once, but were to be held ready for a resumption of heavy freight traffic when shop officials would be justified in adding more mechanics to their repair force.

Considerable buying was done the past week by the Japanese Government through the export houses in this city, the more prominent of which are Mitsui & Co. and Takata & Co. It is learned from a reliable source that the Japanese Government will buy large quantities of material for Manchuria, which it is opening up, and from the orders already placed it is evident that the purchases yet to be made will include a great deal of mechanical equipment. At various times within the past few months considerable buying has been done by the Japanese houses, but it is expected that the material to be bought will greatly exceed in volume any buying that the Government has done lately.

Manufacturers of steel castings are encouraged as to the outlook for future business, because of the fact that many machinery manufacturers now show a disposition to make long time contracts for castings. As has been stated here before, machinery manufacturers in general have been loth of late to bind themselves to any agreement covering the purchasing of castings in set quantities, preferring to buy them in small quantities as they needed them. Some of them are now making inquiries, however, with a view to ascertaining terms for extending their contracts over a period of six months or more, and this is taken as an indication that they see sufficient business ahead to warrant their placing orders for a quantity of material to be delivered at regular periods.

Some of the automobile manufacturers are overhauling their equipment and sending out inquiries for the new machinery they will require for bringing out their 1909 model. Among those is the Maxwell-Briscoe Company, Tarrytown, N. Y., which has inquiries out for a few machines.

Machinery Requirements for Cement Plant.

Within the next few weeks contracts will be closed for a large amount of equipment for the plant in course of construction at Wampum, Pa., for the Crescent Portland Cement Company. The Curtin-Ruggles Engineering Company, 39 Cortlandt street, New York, is superintending the construction of the plant and acting as consulting engineer, but the machinery equipment, it is understood, will be purchased by R. H. Hughes, who represents the cement company [illegible] headquarters at Wampum. The trade is now bidding on engines and boilers to furnish about 3600 hp., and it is understood that a Corliss engine will be favored in the selection. The dryers will be furnished by the Curtin-Ruggles Engineering Company, but the other cement making equipment and conveying machinery will be purchased in the market. The buildings are to be of steel and concrete construction, and the plant will be capable of turning out about 3000 bbl. of cement a day. The structures to be erected include a kiln building, 120 x 200 ft.; raw grinding building, 100 x 280 ft.; dry grinding building, 60 x 240 [illegible] pulverizing building, 70 x 100 ft.; store house, 70 x 500 ft., and a machine shop and office building. In addition to the cement making equipment a small machine shop outfit will be purchased, to include probably one or two planers, one or more lathes, drills and some blacksmithing appliances. The contract for the power will be let, it is understood, within the next two weeks, and machine shop equipment and conveying machinery will be gone into next. Work of constructing the plant is already under way. The Portland cement company has a plant in operation at Wampum at present, and although the buildings now being erected may be looked upon as an addition, they will constitute a complete cement making plant. The company owns several acres of land which is underlaid with veins of coal, shale, cement rock and cement stone.

Reference was recently made in these columns to the new plant to be erected near Fort Trumbull, Conn., by the W. D. Forbes Company, Hoboken, N. J. Contract has been awarded for the erection of a plant to consist of a main building, 50 x 200 ft.; power house, 30 x 40 ft., and an office building, 35 x 65 ft., all two stories high. The company has not yet decided upon the additional machinery it will purchase for completely equipping the new buildings.

The National Conduit & Cable Company, Hastings-on-Hudson, N. Y., is preparing to make some extensive additions to its plant. It is understood that inquiries will shortly be sent to the trade for power equipment of from 8000 to 9000 hp. The improvements will include, it is understood, an extensive addition to the company's rod mill and a good sized sheet mill. It is not thought that any of the buying has been done as yet, but it is said that the power inquiries will be before the trade before the month is out.

The Bethlehem Steel Company, South Bethlehem, Pa., is receiving bids on power equipment to furnish about 1000 kw. for an addition to the plant. It is said in the trade that this will be used to furnish power for the section of the plant devoted to the construction of gas engines, and it is probable that the company will require some additional machinery for that department.

The Board of Water Commissioners of Atlanta, Ga., will receive bids until July 8 for three 300-hp. horizontal water tube boilers, to have a working pressure of 200 lb. The boilers are to be erected and bricked in complete on foundations furnished by the city at Hemphill pumping station No. 2, on the Southern Belt Railroad, and are to be ready for steam connections by October 1.

The Board of Contract & Supply of Schenectady, N. Y., will receive bids until June 24 for machinery and other equipment for the Ferry street pumping station, consisting of one low duty and two high duty pumps, with all piping and valves, and four return tubular boilers.

The tabulation of the bids opened June 3 for the construction of the Rondout siphon of the Catskill Aqueduct shows that the lowest bid was submitted by the T. A. Gillespie Company, New York, and that it was considerably in excess of the estimated cost of the work. The bids received were as follows: T. A. Gillespie Company, $6,290,803; Bradely Construction Company, $6,414,335; McArthur Brothers Company, $6,419,173; Degnon Contracting Company, $6,579,410; S. Pearson & Son, $6,787,111.

Philadelphia Machinery Market.

PHILADELPHIA, PA., June 9, 1908.

Buying has been of a desultory character. Inquiries in some cases are reported to have been somewhat more numerous, but are largely of the class which do not result in immediate business. The trade is following up all available prospects closely, but finds it difficult to get buyers to place orders except for tools urgently needed for work of some special character, under which circumstances single tools are usually purchased. The larger industrial concerns are practically out of the market, inasmuch as they themselves have a considerable amount of tools and machinery idle, and until they obtain sufficient business to keep the present equipment engaged there is little chance of their making any heavy purchases of new tools. A number of concerns needing equipment have practically decided on their purchases, but withhold actual orders until such time as they see some substantial improvement in general business.

The railroads make no move to enter the market. One small road has bought a few tools, but the purchase was not

such as to have any effect on the trade or warrant the belief that the railroads, generally speaking, were about to begin to purchase.

Dealers report sales as very much scattered. One concern, which received a number of good orders week before last, reports almost an entire absence of business last week. Another reports several single sales of shapers and lathes, while others have sold radial drills and a general line of small tools. New propositions are scarce, most of those which have developed recently having been small, although one pretty fair one embracing the purchasing of some $10,000 or $12,000 is before the trade and expected to develop the current month.

No particular improvement is to be noted in the export demand. Some little business of a special character has developed, and is being figured on, but actual orders are not plentiful. In the usual line of standard machine tools, practically nothing has come out in this territory. Manufacturers who have an established trade abroad report business slow except in the power transmission line, which is holding up pretty satisfactorily.

The demand for second-hand tools and machinery holds up particularly well. Some dealers report aggregate sales as quite large, and as covering a wide range. The greater part of the business is confined to tools of the smaller and medium sizes, although an occasional sale of a tool of the larger size is reported. Second-hand boilers and engines are not in as good demand as second-hand machine tools, and sales do not aggregate a large total. There is a better demand for new power equipment, particularly in the way of boilers, and some fair sales of the medium and the larger sizes are reported.

Business in the gray iron foundry trade does not improve rapidly. Jobbing foundries report the demand light and irregular. Some steel casting plants have picked up a little business, but no particular gain in production is to be noted. Until machine tool builders, the railroads and other large users of castings come into the market, no marked improvement in the foundry trade is anticipated.

Bids were opened last week by the Department of Public Works, city of Philadelphia, for the construction of five bridges, mention of which has already been made. For the bridge over the Philadelphia & Frankford Railroad at Large street, 10 bids were presented, the proposals varying from $36,810 to $24,300. Eight bids were received for the bridge over the boulevard in the Thirty-fifth Ward, ranging from $41,612 to $25,325. Another boulevard bridge also had eight bidders, the proposals ranging from $46,312 to $32,340. Bidders for the Forty-second street bridge over the Pennsylvania Railroad numbered nine, the bids varying from $116,000 to $76,950; while for another bridge over the Baltimore & Philadelphia Railroad there were 14 bidders, the cost of the work ranging from $44,100 to $27,800. The time in which the various bidders agreed to complete the work also varied greatly. The bids were ordered scheduled and will be awarded at a later date.

Felin & Co., packers, have taken out city permits for an additional abattoir at their plant, 4144 to 4152 Germantown avenue. The plans provide for a three and two story addition of steel and concrete, 89 x 234 ft. Plans are also being made for further additions to the plant. It is understood that considerable equipment incident to the packing business is to be installed.

The Pennsylvania Railroad Company awarded contracts last week for building new passenger stations at Broadway, Camden, N. J., and Swissvale, Pa. The former involves an expenditure of $25,000, and was awarded to James McGroth Company, of this city, the structural steel and covered platforms being furnished by the Wayne Iron Company, Wayne, Pa. The contract for the Swissvale station was awarded to the Pittsburgh Construction Company.

The Philadelphia Roll & Machine Company notes an increase in orders for both sand cast and chilled charcoal iron rolls, special rolling mill machinery, mill machinery parts and special air furnace charcoal iron castings. The plant is now being operated four and five days a week alternately. Orders are coming in from a widely scattered territory, and the outlook is considered favorable. Shipments of rolling mill machinery have been numerous to both nearby mills and concerns in the Middle West. Several heavy retorts, weighing upward of 12,000 lb. each, are also about ready for delivery.

The Tropenas Steel Company, New Castle, Del., now has its new foundry building under roof, and the general construction work about the plant is said to be coming on satisfactorily. The company will purchase two 150-hp. return tubular boilers in the next few days. Practically all the general equipment, except machine tools, has been purchased, and these, which will include a complete machine and pattern shop equipment, estimated to cost between $10,000 and $12,000, will be purchased early in August.

The Schutte & Koerting Company, Philadelphia, Pa., manufacturer of steam and engineering specialties for power plants, chemical and other industries, has opened a branch sales office in the Keenan Building, Pittsburgh, Pa., where it is represented by E. A. Knowlton. The company's new catalogues, which are being distributed in three sections, one section pertaining to apparatus for the chemical industry, one to apparatus for use in power plants, &c., and a general catalogue illustrative and descriptive of its entire line, is probably one of the most up to date and complete catalogues published by any engineering firm. These will be sent on request to those interested.

Chicago Machinery Market.

CHICAGO, ILL., June 9, 1908.

There is nothing in the volume or character of transactions for the opening week of June indicative of progressive improvement in the demand for machinery; this result, however, is not fraught with disappointment, since it has not been generally expected that a strong revival of business would be realized at this time. While the demand is far from satisfactory in all lines Western dealers and manufacturers find a source of congratulation in the fact that, considering the severity of depression, it has receded no farther than it has. Although comparative figures contrasting the present volume of business in the various machinery lines with those of last year, or even with normal average, are not obtainable, individual experiences serve to give some idea of the situation. One prominent machine tool house states that at no time during this year has its sales fallen below 33 per cent. of those in corresponding periods of last year, and last month its aggregate sales were two-thirds as large as those for May, 1907. While in the latter respect the results are doubtless exceptional, reports from other sources would indicate that in the average the general experience has been as good or better than that of the house in question. When it is considered that there has been a practical cessation of buying by the large interests, including the railroads, and that the principal part of the entire volume is comprised of incidental requirements of the less important manufacturing industries, it will be realized that, in spite of adverse conditions, the country's activities and the tide of prosperity have not ebbed as far as is sometimes assumed. There is on every hand a growing conviction that the month of July will mark the beginning of more liberal purchases by the railroads, and it is thought that among requisitions held up for some time there are not a few for tools and other machinery equipment that will begin to come out after the close of the fiscal year, June 30. It is not assumed, however, that the expected freer purchasing by the railroads will assume extraordinary proportions, but it is reasoned that there is a good deal of machinery and material they will be compelled to buy, the expenditures for which they wish to carry over into next year's budget.

Two new shop equipments are included in recent sales of boiler shop and fabricating machinery, to which were added a fair number of sales of individual tools. The boiler shops are admittedly running very slack, but even in the absence of present activity manufacturers are not wholly unmindful of the requirements of the future and of the need of preparing to meet them. It is understood that the machine tools required for the equipment of the machine shop at the Corn Products Company's new plant have been purchased, the orders being concentrated in the hands of a few dealers.

Among the orders for machinery recently taken by Joseph T. Ryerson & Son, Chicago, were tools for the equipment of the Mesaba Boiler & Mfg. Company, Duluth, Minn., comprising an air compressor; boiler punches, including one 36-in. throat, with capacity of punching 1¼-in. hole, through 1 in.; a set of 10 ft. 2 in. bending rolls; an 8-ft. radial drill, and a complete equipment of air tools and hoists; also to the C. H. Sharp Contracting Company, Kansas City, Mo., for installation in its shops at Sheffield, Mo., one 10-ft. flange clamp, one air compressor, two plate punches, and one flue welding machine.

The Hildreth Mfg. Company, Lansing, Mich., maker of high grade marine engines and gray iron castings, has recently added a new core oven and core room to its plant, and states that it is running full time on gas engines and general jobbing work, its output at the present time being 25 per cent. greater that at any time in its history.

The Colorado Springs Electric Company, Colorado Springs, Colo, has decided to make extensive improvements to its power station on West Cucharas street, which will include the construction of a generating station to take the place of a sub-station now located at that point. Plans for this work have been completed, and it is stated that work will begin at once with a view to having the plant ready for operation in the early fall. The brick portion of the present plant will be used as a storeroom and the frame buildings

will be torn down and replaced by a new structure to house the new equipment. The generating capacity of the new installation will be about 1500 kw., and the outlay required for the estimated improvements will be in the neighborhood of $100,000. Geo. Bullock of New York is president of the company.

The United States Reclamation Service, 777 Federal Building, Chicago, will take bids until June 24 for furnishing machinery equipment required for the installation of a large hydro electric plant at the Minidoka Project, Idaho. Included in the requirements for this work are four 1200 kw. 2300 volt alternating current generators of the vertical turbine type with a revolving field and stationary armature; eight 600 hp. synchronous vertical motors for direct connection to pumping units; one 360 hp. synchronous motor, vertical type; four belt driven air compressors to deliver 20 cu. ft. of free air per minute against 80 lb. pressure; four vertical turbines equipped with penstock and draft tube, each of capacity to drive a 1200 kw. alternator; two vertical turbines of 120 kw. capacity; three centrifugal pumps, capacity 125 second-ft.; one centrifugal pump, capacity 75 second-ft.; three 6-in. top suction standard vertical centrifugal pumps. In connection with this machinery there will be required all electrical accessories and auxiliary hydraulic equipment required to complete the installation.

Cleveland Machinery Market.

CLEVELAND, OHIO, June 9, 1908.

Some improvement is noted in the demand for many lines of special machinery, but in the machine tool market conditions remain about stationary, although a few dealers notice a slight improvement in orders. As few manufacturing plants are running at their normal capacity and the majority have tools that are still idle, there is practically no demand from this class of the trade and sales are limited to an occasional single tool. Inquiries are light in volume and are limited to single tools, or two or three at the most. While tool dealers are doubtful if the cut in the price of iron and steel bars will have any tendency to improve their business, they believe that if the price reduction should be extended to structural material it would indirectly have some beneficial effect. In view of the existing conditions, however, dealers do not look for much change in the machine tool market before the end of the summer.

With the exception of a few sales of small lots of machine tools to automobile plants, the demand at present comes almost entirely from small new concerns that are buying a few light tools. A large share of this trade is satisfied with second-hand tools, for which there is a fair demand, the sales of used tools probably being as large in volume as the sales of new tools.

Manufacturers of heavy machinery report some improvement in the outlook. Some fair inquiries are pending, but prospective purchasers are very slow in placing orders. Builders of coal handling machinery notice considerable improvement in inquiries, and some coal companies that have been holding off until general conditions showed an improvement are expected to place orders soon for coal handling plants. The demand for cranes is still light. The jobbing foundry situation shows no improvement, orders being for small lots of castings for immediate needs. Dealers in mill supplies report their orders very light.

The Western office of the Waterbury Farrel Foundry & Machine Company, Williamson Building, Cleveland, reports an improvement in its orders for special machinery and that its sales during May were larger than during any previous month since last August. With a fair run of inquiries and prospective orders that have not yet been closed up, the company expects a very satisfactory volume of business during June.

Bids were received by the Osborn Engineering Company, Cleveland, on June 6, for the erection of two large buildings for additions to the plant of the American Seeding Machine Company, Springfield, Ohio. One will be a foundry, one story, 200 x 200 ft., and the other a three-story manufacturing building, 50 x 250 ft.

The Long Arm System Company, Cleveland, has secured contracts to equip three battleships, now under construction for the American Navy, with power doors, and that department of the company's plant is now running to full capacity.

The McMyler Mfg. Company reports an improvement in inquiries for coal handling machinery, and expects to secure some good sized orders for that class of machinery within the next few weeks.

The Fixler Trolley Stand Company, Delta, Ohio, has been formed, with a capital stock of $25,000, to build trolley pole stands for cars. C. R. P. Waltz is president: Dr. A. M. Wilkins, vice-president; J. M. Longnecker, treasurer; J. H. Gehring, secretary, and D. H. Lavenberg, manager.

The Carnahan Stamping & Enameling Company, Canton, O., has increased its capital stock from $300,000 to $500,000.

The Peerless Match Company, Akron, Ohio, and the Rockford Match & Machine Company, Rockford, Ill., have been consolidated and the Peerless Company will be reorganized, with a capital stock of $150,000. It is the intention to establish a plant at either Akron or Cuyahoga Falls for the manufacture of matches and match making machinery.

The Lyman Mfg. Company, which will start a plant in Warren, Ohio, for the manufacture of pails, has been incorporated, with a capital stock of $20,000, by E. M. Lyman, A. J. Lyman, M. E. Lyman, W. G. King and Harvey L. Williams.

F. H. Froehlich, consulting engineer, Toledo, Ohio, has been engaged to prepare plans for an electric light and power plant in Bucyrus, Ohio. The city has not yet decided whether to build its own plant or to sell the franchise to a private corporation.

The Wooster Machine Company, Wooster, Ohio, has been incorporated, with a capital stock of $25,000, by E. E. Porter, Elmer S. Lands, J. E. Schultz, Nick Amster, E. O. Dix and Wesley Zaugg.

The Board of Trustees of the Massillon State Hospital, Massillon, Ohio, will receive bids until July 9 for mechanical stokers for one Heine 400-hp. boiler and two Bonus 350-hp. boilers.

The National Nut & Bolt Lock Company, Cleveland, Ohio, will erect a new building for the equipment of which it will require a gas engine, electric generator, punch presses and other machinery.

New England Machinery Market.

WORCESTER, MASS., June 9, 1908.

The machine tool trade shows no improvement. Comparatively few machines are being sold. There are instances of spasmodic changes for the better, but usually the improvement does not endure. Some of the manufacturers are feeling preliminary effects of machinery lists which Western railroads have put out, or which it is known will be issued shortly. The machinery builders report that inquiries are taking the more active form of personal visits to works to look over tools. It is generally accepted as probable that of the large amount of new business which for months past has been in evidence for the future there should be a constantly increasing percentage of culminations in the form of orders. The usual answer to questions to manufacturers as to the condition of their business is that it is dull, but that the prospect looks brighter. The reasons given for believing in this change are, however, still somewhat theoretical. Reports received from various sources abroad do not show any marked change from the dullness which came coincidently with that of the United States.

The Boston machinery dealers find things almost as quiet as at any time since the first of the year. With the advancing of June there would normally come the beginning of the summer slackening of activity, and when the change is from a stagnant market the effect is striking. The slight spurt of May would naturally disappear unless some new influence should assert itself, and to date no such influence has been noted, nor is it expected for the present. It is accepted by practically every one that nothing radically different from present conditions is to be anticipated before the fall months, but at the same time there are many believers in a gradual strengthening of the market even in the face of the hot weather.

General manufacturing presents all degrees of activity from actual paralysis to full production. Certain seasonable lines are very busy. Reports from the cotton industry, some of the paper mills and some of the shoe manufacturers indicate that there is a stronger demand for these great staples. Other industries that have had their season are dull. Such a one is the wire fence and poultry netting trade. The wire business as a whole is showing few signs of increasing prosperity. But while no figures are available it looks as if manufacturing as a whole in New England is somewhat more prosperous than at any time this year. And underlying the whole industrial structure is a feeling voiced by many business men that the worst is over. The crop reports; the optimism voiced in the daily press from men whose opinions are looked upon as worthy of consideration; the maintenance of prices in most lines; the constantly improving condition of the money market, are all entering into the foundations of this expression of confidence. The bond houses, which have been notorious pessimists, are now talking favorably. The highest classes of bonds are having ready sale, and the industrials are looked upon as soon to find a responsive market. The situation is sprinkled indiscriminately with the cheerful and the depressing, with a growing percentage of the former.

The shop vacations which have become a fixed custom with a great many manufacturing works in New England will probably be longer than usual this summer. Announce-

ments of their dates are already being made, conveying the idea that there will be a lengthening out, unless business improves in the meanwhile.

The revival in the automobile industry, already noted, has become very marked, and manufacturers all over the country are regretting their action in reducing the season's output, which resulted from a belief that they faced a serious falling off in demand. Some of the large companies have sold the last machine of the 1908 model and could sell a good many more. One such reduced the product from the 1800 originally planned to some 1400. Now the works are running day and night, and this is not an exceptional case. The trade in the West is buying some machinery, a condition which was not anticipated by any one. As a consequence of this revivifying experience it is believed that the companies will plan for a generous product for 1909, and that in preparation for it some degree of benefit will accrue to the machine tool trade.

In this connection it is interesting to note that the receivers of the Pope Mfg. Company, Hartford, Conn., are petitioning the court for permission to proceed with the product of 1909, their estimate being 700 automobiles and 50,000 bicycles. In the petition it is stated that all of the machines built for this season have been disposed of.

Satisfaction is expressed over the announcement that the proposed general advance in freight rates by the railroads of the country will not become operative for the present, in the belief that the time is not ripe for such radical action. This is only a postponement, however, and not an abandonment of the plan. Theoretically all will suffer alike as between competing interests in business, but there will be accentuation of the fact that those producers who are distant from any given market must be at greater expense than those who are nearer.

It is stated that the Conant & Donelson Company, Greenfield, Mass., manufacturer of dies, has decided not to move its business to Turners Falls, Mass., which had been contemplated.

The Stratton Rotating Engine Company, Fitchburg, Mass., builder of a new rotary engine, is selling its machine tools and other equipment, and states that hereafter it will have its product manufactured by outside parties.

The authorization of an issue of $7,000,000 in bonds of the Boston & Albany Railroad for general improvements on its system will result in large expenditures for miscellaneous equipment, though it is not understood that new shops will be included, excepting such as are necessary in connection with roundhouses. Among the items specified are new engine houses and additions, $1,149,000, including one at Rensselaer, N. Y.; coaling and water stations, $52,500; automatic signal systems, including 30 new interlocking towers, $77,850, and third tracking, $1,022,800.

The Central Tool Company, Providence, R. I., has been organized under Rhode Island laws with a capital stock of $10,000, to manufacture tools, the nature of which it is not yet ready to state. The incorporators are Arthur P. Mowry, Louis S. Moulthrop and Fernando O. Jaques, Jr., all of Providence.

An important street railroad scheme, of which the New York, New Haven & Hartford Railroad is to be the backer, was divulged in a bill before the Massachusetts Legislature asking for the right to build four new trolley lines in western Massachusetts, at a cost of $2,000,000, the work to be completed inside of two years. The most important line will connect the towns of Lee and Huntington, a distance of 19 miles, to cost $915,000; while a line from Great Barrington to Egremont will cost $635,000. A line to the summit of Mt. Greylock, the highest point in the State, is estimated to involve an expenditure of $450,000. The bill would consolidate the Bennington & North Adams Street Railway Company with the Berkshire Street Railway, which is owned by the New York, New Haven & Hartford interests, and which will make the extensions if the bill becomes a law.

Charles W. Arnold, Haverhill, Mass., has begun the erection of a new factory building at Lynn, Mass., which will be rented for general manufacturing purposes. It will be 99 by 111 ft., and six stories, though in the beginning only a single story will be erected, to be extended upwards as space is desired by tenants.

New England has a good deal of interest in the attempt at reorganization of the business owned by the Hardware & Woodenware Company, formerly the National Novelty Corporation, many of whose plants are located in this territory. An offer for the company's property has been made the receiver, and the matter will come up for consideration before the court this week. These factories are now practically idle, and their reopening for business would have an influence on the welfare of a number of communities.

The New England Transportation Company, Portland, Maine, is planning to establish a shipyard at Providence, R. I., and move its business to that city. The city of Providence has been asked to grant a lease of its land situated on the Seekonk River, and the matter is still in abeyance. William H. Reed is president and Wilbur F. Dresser treasurer. The business was formerly conducted by the Casco Shipbuilding Company. A specialty is made of schooners up to five masters. The plan is to build a mill for sawing frames and a blacksmith shop at the new yard.

The Page-Storms Drop Forge Company is about to move from Springfield, Mass., to its new works in the nearby city of Chicopee. The new plant is a model of its kind, consisting of six buildings, including drop forge shop, 60 by 200 ft.; machine shop and finishing building, 50 by 163 ft., three stories; annealing house, 40 by 70 ft., and power house in which is installed a producer gas engine unit capable of developing 300 hp.

Cincinnati Machinery Market.

CINCINNATI, OHIO, June 9, 1908.

In summing up results for the month of May, and in a comparison with those of the month immediately preceding and for the third month of the year, most tool concerns in this field find that March and May were about equally productive in business and inquiries, with April showing in a few cases a considerable decrease, in others 10 to 15 per cent. While not discussed openly or even very aggressively, the action of some concerns in making special prices on late specifications from such railroads as are in the market has received the attention of large manufacturers who are committed to price maintenance, and the action was generally condemned. Most manufacturing concerns report conditions unchanged and announce that they do not expect any kind of general buying before the first of the year.

Machinery sales agents visiting this section from other fields report the outlook much better, with some sales which would have been an utter impossibility early in the year.

The unheralded visit to this market of a representative of the Government last week who made some inquiries and special observations in the tool districts, has had an encouraging effect with manufacturers who have filled Government specifications in the past, undismayed by the official red tape and tedious trend of negotiations. It is reported that one requirement for planers alone footed up $92,000, and that lathes, shapers, drills and other tools were on the list. Manufacturers visited are reticent and are unwilling to give out any details. Manufacturers of electric power machinery report conditions greatly improved; there is a good inquiry for small and medium sized units, and some sales are being made of the heavier machinery also, on which there has been but little inquiry for some time.

The idea of the National Prosperity Association, which has made splendid progress here, is being taken up by manufacturers generally throughout this district, and these are lending their support and co-operation. In a special circular just sent out broadcast the statement is made that 50 of the progressive industrial organizations representing over 12,000 employees are going to meet good times half way, and will increase their forces on July 1, to be called "re-employment day," in some instances to their normal payrolls.

The jobbing foundries are slowly emerging from their apathetic conditions, and the melt is being increased slightly. One of the largest local foundries which has been running a couple of large heats a week—65 or 70 tons—will change its cupola to accommodate 12 or 15 tons a day, distributing the work over five days a week, believing the change will prove beneficial to the men and not inimical to the business. The foundries making small castings are without exception very busy, with prospects good for a continuance.

The National Machine Tool Company, Cincinnati, is in the hands of a receiver—Dr. W. R. Thrall, who has just been named by the United States District Court. The business has been under the control of Charles F. and Walter P. Dolle, who control the stock. The receiver was named on the application of the Bollman & Wilson Foundry Company, a creditor.

The two concerns known respectively as the Ohio Bevel Gear Company and the Cincinnati Gear Works, have been consolidated, and are now doing business under the new management, at 120 Opera place, occupying half of the fourth floor of the power building at that number. Philip Fosdick is president; John Christensen, vice-president; Charles A. Stub, secretary, and John Clairmont, treasurer. These, with S. J. Sorenson, constitute the Board of Directors. The new concern reports business in its line improving, with a good local output of its specialty, which is used largely in the manufacture of lathes, drills, and the like.

The Steptoe Shaper Company reports a fairly good week with some appreciated orders from abroad, including a 20 in. and a 24 in. crank shaper, both with automatic down feed and automatic circular feed attachments; one from Melbourne, Australia, a 24 in. triple gear, and also some single machines for domestic shipment, a couple—a 16 and a 20 in. back gear crank shaper—going to Chicago.

The Long & Alstatter Company, Hamilton, Ohio, has not, so far, noticed the ill effects of the early year depression, having had some good orders ahead for special machines of its manufacture—power punches and shears, tire welding machines, &c. A big multiple punch weighing about 80,000 lb., built for a large Chicago concern, delivered recently, has

a steady run of 75 days before it working on sheet steel perforation. The adjustment is very fine, so gauged as to run 82 strokes a minute, punching 98 holes at each stroke through 16 gauge steel sheets 48 in. wide. Another special tool built by the Long & Alstatter Company is a special gate shear with a cut of 16½ ft. through 5-16 in. material. This machine weighs about 35,000 lb., and was delivered in Ohio. An order in the shops is for a big bending machine to bend 24-in. I beams, for one of the Ohio bridge building companies. It is a 30,000 lb. machine. For another concern the company is working on a heavy tire welding machine to weld 6 x 1 in. and 5 x 1¼ in. heavy tires and axles, with a speed of 80 per minute, and is said to weld as fast as six fires can heat. Another machine ready for delivery is a big cross cut shear to cut 4 in. square and 4½ in. round. The variety of demand as witnessed by this concern argues a general brightening of the industrial horizon, according to Secretary C. E. Macbeth.

The Hooven, Owen, Rentschler Company, Hamilton, Ohio, manufacturer of Hamilton Corliss engines, is operating on a 45-hr. per week schedule, and compared with the state of activity in the same line of plants in other parts of the country should have no special complaint. Just now the company is busy finishing a municipal order, the power equipment for the new water works and electric light plant of the city of Hamilton. One 500-kw. and one 300-kw. cross compound condensing engine have already been installed, and a 200-kw. of the same type will be placed within a month. The 6,000,000-gal. pumping engine built by the company has also been placed. The city is spending about $75,000 on the plant.

In the iron department at the Fred J. Meyers Mfg. Company, Hamilton, indications point to gradually increasing activity with an early resumption of normal conditions. This department is working on a 54-hr. per week schedule; other departments 9 hr. a day, with half holiday on Saturday. The wire goods department, according to President Fred J. Meyers, shows for the five months about 15 per cent. decrease in volume of business as compared with 1907, but is about even with 1906. The Meyers Company has made a splendid record during the months of depression; not a single man has been laid off, and, anticipating the opening of the fall trade in July, it is expected that an additional force will have to be employed. President Meyers is one of the aids to the prosperity movement, and has a very fair sized part of the Simmons Hardware Company's million dollar order sent out June 1.

At the plant of the Hamilton Foundry & Machine Company, East Hamilton, the small castings department presents a busy scene. Almost a normal force in this department is working on full time, 60 hours, but exclusively on miscellaneous small castings. The other plant owned by officers and directors of this plant—the Sohn & Rentschler Company—is still busier, if anything, on the same general line of work, and working on full time, with a full force.

President Hilker of the Hamilton Machine Tool Company, Hamilton, has a firm and abiding faith in the quick recuperative qualities of the American public—industrial and commercial—and is a loyal believer in a fine shop and office organization to take care of changing conditions.

During the recent depression the Bentel & Margedant Company, Hamilton, developed a new and improved line of railroad and car shop woodworking tools and is preparing to bring out a new catalogue. The factory is working on a five-day, 8-hr. schedule, and with about a two-thirds force.

President O. N. Ritchie of the Advance Mfg. Company, Hamilton, has been out on a little trade jaunt, feeling the commercial pulse. The company's line of gas and gasoline engines, from 1 hp. to 35 hp., is now quite complete, and Mr. Ritchie, who is a firm believer in the country's ability to recover quickly from little trade worries, has prepared to push his company's products to the front in an aggressive and progressive manner.

Lintz Brothers, proprietors of the Fort Branch Machine Works, Fort Branch, Ind., have secured the contract for furnishing eight steel bridges for Centre Township, that county.

The Buckeye Traction Ditcher Company, Findlay, Ohio, has made some heavy shipments of ditchers the past few weeks and reports improving conditions.

The Chamberlin Cartridge & Target Company, Findlay, Ohio, reports some good sized shipments to interior points and to Canada of targets and target throwing apparatus, averaging recently about eight cars a week.

Wickes Brothers, Pittsburgh, dealers in machinery and electrical equipment, report business in their line greatly improved. They recently placed the boilers and some machinery in the Keystone Nail Company's new plant in Rochester, Pa.

The city of New York has found it cheaper to purchase electric current than to generate it, and the municipal lighting plants for the Brooklyn and Williamsburg bridges have therefore been shut down.

Government Purchases.

WASHINGTON, D. C., June 9, 1908.

The Isthmian Canal Commission will receive bids until June 29, Circular No. 446, for a quantity of supplies, including class 1, two water tube boilers and one stack breeching, with necessary pipe and fittings; class 2, four engine lathes; class 3, four sliding head upright drill presses; class 4, four back geared shapers; class 5, four water tool grinders; class 6, 18 air hammer rock drills; class 7, 12 rock drills; class 8, eight long stroke riveting hammers and spare parts and two pneumatic wood boring machines and spare parts.

Bids will be received until June 18, at the office of the Building for National Museum, Library of Congress, Washington, D. C., for engines and dynamos for the new building.

The Isthmian Canal Commission will soon ask bids for two 75 hp. direct current shunt wound open type motors for the La Boca machine shop.

The Bureau of Yards and Docks, Navy Department, Washington, has completed plans and specifications, and will shortly ask bids for a coaling plant, coaling pier and other work at the Key West Navy Yard. About $200,000 will be spent on this work. Plans have also been completed for a marine railway at Key West.

The following bids were opened June 2 for machinery for the navy yards:

Class 11—Four screw cutting lathes—Bidder 90, Fairbanks Company, New York, $855, $865 and $795; 106, Garvin Machine Company, New York, $725; and $620, 124, Hendey Machine Company, Torrington, Conn., $882; 170, Manning, Maxwell & Moore, New York, $785; 205, Pratt & Whitney Company, Hartford, Conn., $1172.

Class 30—Two electric motors—Bidder 87, Fisher Electrical Works, Detroit, Mich., $2299; 108, General Electric Company, Schenectady, N. Y., $1681.15; 299, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., $1728; 304, Western Electric Company, New York, $1711.30; 315, Burke Electric Company, Erie, Pa., $1501.

Class 31—Two radial drilling machines—Bidder 83, Frecrt Machinery Company, New York, $1749; 89, Fairbanks Company, New York, $1628; 109, Garvin Machine Company, New York, $1570; 128, Hill, Clark & Co., Philadelphia, Pa., $1714; 170, Manning, Maxwell & Moore, New York, $1960; 185, Niles-Bement-Pond Company, New York, $1719; 294, Vandyck-Churchill Company, New York, $925; 317, Dezouche, Hanson & Co., Philadelphia, Pa., $1752.

Class 32—One cutter and reamer grinder—Bidder 25, Becker-Brainard Milling Machine Company, Hyde Park, Mass., $550; 29, Brown & Sharpe Mfg. Company, Providence, R. I., $284.07; 84, Fairbanks Company, New York, $590; 185, Niles-Bement-Pond Company, New York, $275, $298 and $715; 203, C. T. Patterson Company, New Orleans, La., $774.

The following bids were opened June 2, Circular No. 441, for machinery for the Isthmian Canal Commission:

Class 1—One traveling jetter, Bidder 28, Brossard & Baldwin Company, New York, $6870; 55, Day Steel Engineering Company, Philadelphia, Pa., $9240, $9270 and $8774; 57, Drummond, McCall & Co., Montreal, Canada, $6000 and $4360, price based on entry duty free; 152, Watson-Stillman Company, New York, $4575 and $4660; 160, Henry R. Worthington, New York, $7286.32, $7710.10 and $7616.84; 162, Alberger Pump Company, New York, $5970.

Class 2—Two duplex water pumps—Bidder 55, D'Olier Engineering Company, Philadelphia, Pa., $940; 66, Fairbanks, Morse & Co., Chicago, Ill., $830; 74, Gardner Governor Company, Quincy, Ill., $760; 102, Manning, Maxwell & Moore, New York, $815.49; 106, Motley, Green & Co., New York, $825; 108, National Electrical Supply Company, Washington, D. C., $829; 160, Henry R. Worthington, New York, $728.98.

Class 3—One blower outfit—Bidder 24, Beaudry & Co., Boston, Mass., $690; 65, Fairbanks Company, New York, $656; 98, [illegible] & Co., New York, $757.58; 125, Interborough Electric & Engineering Company, New York, $732.50; 102, Manning, Maxwell & Moore, New York, $775; 115, Nies-Bement-Pond Company, New York, $730 and $698; 125, Prentiss Tool & Supply Company, New York, $690.

Class 4—One 10-foot portable crane and large gasoline ladle—Bidder 68, Fox Bros. & Co., New York, $225.25; 73, G. & W. Mfg. Company, New York, $285; 102, Manning, Maxwell & Moore, New York, $225; 154, Whiting Foundry Equipment Company, Harvey, Ill., $260.

Class 7—One large pneumatic sand shaker—Bider 40, Chicago Pneumatic Tool Company, New York, $80; 77, Hanna Engineering Works, Chicago, Ill., $180 and $125; 160, Henry R. Worthington, New York, $192.72.

The following bids were opened by the secretary of the Department of Agriculture, Washington, D. C., June 2, for the installation of machinery and the completion of a portable refrigerating plant for the bureau of plant industry:

Penn Engineering Company, Philadelphia, Pa., $5300. Wilmington Machine Company, Wilmington, Del., $7145. Dickerman & Yeakley, Philadelphia, Pa., $7400.

Under bids opened April 21 for machinery for the navy yards, the General Electric Company, Schenectady, N. Y., has been awarded, class 121, two turbo generator sets, one motor and one switchboard, $9705.

The offices and works of the Hadaway Electric Heating & Engineering Company, some time since acquired by the Westinghouse Electric & Mfg. Company, have been removed from 238 West Broadway, New York, to the works of the electric company at East Pittsburgh. This change will permit the business to be carried on upon a much larger scale than formerly. A New York office will be maintained on the twenty-second floor of the City Investing Building, 165 Broadway.

HARDWARE

THE adjournment of Congress without action upon the pending bills relating to pure Paint naturally suggests questions as to the status of the matter, and especially as to the significance of the failure of either House or Senate to consider measures which at a comparatively recent date seemed to be in a fair way of enactment. The failure of these measures does not, however, mean their abandonment, but simply that the developments of the final fortnight of the recent session were such as to make it impracticable to secure action in either house before adjournment, and it was therefore decided to put the subject over until next winter. In view of the occurrences of the past season it is hard to forecast the disposition or the action of Congress when the matter comes up again.

The course of things at Washington in connection with the efforts to enact the laws in question furnishes indeed a curious commentary on the vicissitudes of legislation and the danger there is that undigested and unwise laws will be passed, even after careful consideration by the committees of the House and Senate, with public hearings to ascertain the views of the trade. At one time the Paint manufacturers were practically a unit in favoring a pure Paint law, but at the end they united in opposing any such legislation. For it will be remembered that when the pure Paint bills were pending the Senate Committee on Manufactures gave an extended hearing early in May to prominent representatives of the Paint trade, nearly all of whom were manufacturers. But, with the exception of a delegation of master painters who strongly favored the pending bill, all present not only opposed the proposed legislation, but any measure whatever dealing with the subject of pure Paints! The pending bill, introduced by Senator Heyburn of Idaho, chairman of the Senate Committee on Manufactures, was strongly objected to, first, because it required the manufacturer to print his formula on the package; and, second, because its provisions were extended to Varnishes, Japans and Dryers, the chemical composition of which, it was declared, could not be ascertained by any known method of analysis.

The probability seems to be that the representations made to the Senate Committee at the hearing referred to have been so far convincing that the Heyburn bill will probably be amended in two important particulars, namely, the requirements regarding the placing of formulas on packages will be eliminated, and Varnishes, Japans and Dryers will be exempted from the operation of the proposed law. As thus modified, the bill will provide merely against misbranding and will be denominated an "honest Paint" bill rather than a "pure Paint" bill. Under its provisions a manufacturer will not be required to make any statements whatever upon his labels unless he elects to do so, but he cannot make a false statement thereon without subjecting himself to the penalties provided by the bill. While the Paint manufacturers as a class are opposed to any legislation, they are on record as declaring that they will not attempt to obstruct the passage of a bill which merely prohibits false branding, and while such a measure falls far short of the desires of the master painters and of not a few merchants, yet it is probable that this is as far as Congress can be induced to go in what must be regarded as an experimental and somewhat questionable field of legislation.

Condition of Trade.

The event of greatest importance in the week under review is the concerted reduction in prices by the great Steel manufacturers, which was determined on Tuesday evening. Whether or not this cut will give consumers of raw material and the trade generally confidence in the market remains to be seen. In this decline Wire Nails and Wire products participated, the reduction of Nails being 10 cents from the recent schedule price of $2.05, which was, however, to a certain extent nominal. The change is thus a very moderate one and will disappoint the expectations of those who were looking for a more radical cut. It may, however, be regarded as an indication of the conservatism of these great interests which has characterized their management of the situation thus far. The question of principal interest in this connection is the effect on the market of the abandonment of the policy of maintaining prices at the old level, and whether or not this action will stimulate purchasing by the merchants and great consumers. Since the open reduction in the price of Steel Bars the trade has been in a waiting attitude, and business in general has probably fallen off rather than increased. This matter is of interest in the Hardware field in its relation especially to the opinion of the trade in regard to the extent to which existing prices are likely to be maintained. While it can be argued on the one side that the decline which has occurred is small and does not greatly change existing values of material in hand, and has thus only a slight and indirect bearing on the cost of the finer finished products, the point may, on the other hand, be made that the trade will be disposed to consider the possibility that there may be further recessions, unless orders for the cruder products are promptly attracted by the change which has been made. Many, however, will welcome this change as a move in the right direction. Meanwhile the news from the agricultural sections of the country is singularly encouraging, and the indications point to fine crops at good prices. If these hopes are realized even in good part the effect should be quickly felt all along the line. The first half of the year thus draws to a close with conditions which, whether or not in themselves altogether satisfactory, undoubtedly indicate progress toward commercial and industrial improvement.

Chicago.

June is not a month, even in normal times, when an expanding volume of business is looked for in Hardware lines, and it is hardly to be expected under existing conditions that the present month will prove exceptional in this respect. That the past week has not developed any signs of increasing activity and has, if anything, disclosed a tendency toward more pronounced quietness in some lines is not regarded as significant of general retrogression, and is therefore not disappointing in the sense of defeated expectations. Preparations for the coming harvest are now occupying the attention of farmers, from whom there is now but little demand for goods other than binder twine and other accessories directly connected with the gathering of crops. On this account the consumption of Nails, Fencing Wire and the cheaper lines of Builders' Hardware has fallen off, and, in consequence, replenishing orders for these goods from retailers have declined both in number and volume. But the promise of abundant crops that will soon be convertible into cash at good prices is an element of strength which serves as a founda-

tion for hopes of future reaction that will go far toward restoring trade to a basis of something like normal activity. Doubt as to the successful maintenance of prices, especially of the heavier staples, such as Bolts, Nuts, Wire Nails, Fencing and other Steel goods, has been emphasized by the reduction of $4 a ton on Steel and $3 a ton on Iron Bars, announced last week by the leading manufacturer of these products. Until fully assured that prices of finished products, more or less nearly related to these materials, will be sustained at somewhere near the present level, buyers will doubtless be disposed to continue to hold their purchases closely within the limits of actual immediate requirements. The hope is entertained that after the first of July the railroads will buy more freely, and in view of their long continued policy of retrenchment, it is believed that their storehouses are practically bare of supplies. Even if they come into the market for only a modest portion of their needs the effect will be sensibly felt in swelling the aggregate volume of business. Houses carrying Heavy Hardware are anticipating the early entry into the market of the implement makers, who are already making inquiries concerning their wants for the coming season. These inquiries have grown more numerous in the past few days since the revision of Steel and Iron Bar prices were announced, and it is evident that the concessions offered will result in a better movement. Whether the basis established will be generally regarded as acceptable for the conclusion of the usual yearly contracts remains to be seen.

NOTES ON PRICES.

Wire Nails.—Since the recent reduction in the price of Steel Bars and small shapes there has been a feeling, more or less general, among the trade that reductions in other Steel and Iron prices might follow. Reductions in Wire Nails and other products were decided upon Tuesday evening by the manufacturers who have been working together in maintaining the market. The new price for carloads to jobbers for Steel Nails is on the basis of $1.95, usual delivery and terms, or a reduction of 10 cents per keg from the late established quotation. A good many Nails had, however, been sold "on old orders" at $2.00, so that the decline is from 5 to 10 cents per keg. Whether the reduction in the price of Wire Nails is calculated to remove doubt as to the immediate future of the market and to open the way for placing more liberal orders remains to be seen. Quotations for base sizes are as follows, f. o. b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$1.95
Carload lots to retail merchants	2.00

New York.—The improvement in the local demand is slight and yet it is noticeable. Merchants who continue buying in small lots to cover only immediate requirements would without doubt purchase more liberally if prices were reduced so that they could feel confidence in the market.

Chicago.—Few new orders are being entered, the demand being now limited to small lots required to meet present requirements. Dealers, both retail and wholesale, are not carrying more stock than is necessary to supply the current demands of the trade and at this season consumption is much reduced. There is a general feeling of apprehension that prices may recede from the present level and on this account there is no disposition to accumulate stocks.

Pittsburgh.—Those who have been arguing that on account of some improvement in the general conditions in the Steel trade the manufacturers of the raw material might decide to stand pat on the policy they have pursued for so long and not make any reductions, have been disappointed in view of the announcement of reduced prices on Wire Nails and other products. During the past week the demand has been very light, calling only for occasional small lots, the trade holding up orders as long as possible in view of the chance of a reduction in price.

Cut Nails.—The market continues without improved demand, orders being confined to actual requirements, which are exceedingly light. The market is irregular, and concessions are being made on regular Steel Nail quotations, so that about $1.80 for carload lots at mill is more representative of the market than $2.05. Iron Nails generally should command about 10 cents more than Steel. It remains to be determined what effect the decline in Wire Nails will have on the Cut.

New York.—The demand is comparatively light in proportion to that for Wire Nails. Nail houses are holding Steel Cut Nails on the basis of $2.15 per keg for small lots at store.

Chicago.—The demand continues extremely light. No orders for lots of considerable size are being entered, either by the mills or jobbers. Stocks of the latter are moving very slowly, necessitating infrequent orders for replenishment. Both mill and store prices are irregular and what are recognized as regular prices are being freely cut. Chicago quotations are nominally as follows: In car lots to jobbers, Iron Cut Nails, $2.18; Steel, $2.03; in small lots from store, Iron Cut Nails, $2.30; Steel, $2.15.

Pittsburgh.—New demand is confined entirely to very small lots for actual needs, and orders are few and far between. No general improvement in demand for Cut Nails can be expected until there is betterment in the whole situation, and renewed activity in building operations. We quote Steel Cut Nails at $1.80, but as low as $1.75 has been done on only carload lots. Small lots are held at $1.85 to $1.90, at mill. Iron Cut Nails are about $1.85, at mill.

Barb Wire.—There has been only a limited demand. The advanced stage of the season and the uncertainty as to the course of prices are influences which have united in curtailing the volume of business in this line. A reduction of 10 cents per 100 lb. was made Tuesday in the price of Barb Wire, Painted and Galvanized, the new price to jobbers in carload lots being now $2.10 for Painted and $2.40 for Galvanized, f. o. b. Pittsburgh, 60 days or 2 per cent. for cash in 10 days. The price to retailers is 5 cents additional.

Chicago.—So far as new orders are concerned there is very little doing. Farmers in all sections of the country are too busy with crops to devote attention to fence building. Shipments of fair volume against contracts are still going forward from the mills, but until fall buying begins nothing more than desultory orders are expected.

Pittsburgh.—Practically no new business is being placed, only an occasional order for a small quantity being received by the mills, jobbers and small dealers holding up any tonnage they have as long as possible, until it is known absolutely whether prices will be reduced. It is expected that within 24 or 48 hours definite announcement will come as to a reduction on Wire products.

Plain Wire.—A reduction of 10 cents per 100 lb. was made in Plain Wire, as in Wire Nails and Barb Wire, by the manufacturers at their conference on Tuesday. This makes the base price to jobbers in carload lots $1.80 for Plain, and $2.10 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. for cash in 10 days. The price to retailers is 5 cents higher.

Chicago.—Manufacturers of Fencing and other Wire products are still confining their orders to actual needs, which almost without exception are very meager. There is no incentive to purchase ahead of present requirements, as the general tendency of values is downward, rather than the reverse, and the feeling prevails that cheaper prices must rule.

Pittsburgh.—Demand is only for very small lots and few new orders are being placed. The trade is holding back orders until it is known absolutely whether a reduction will be made in prices. The leading Steel interests are expected to make an announcement about prices within a very short time.

Belt Lacing.—Considerable irregularity has been observed recently in the market for leather Belt Lacing. As might be expected, however, weakness is most pronounced in the cheaper grades and leading manufacturers state that there is little or no change in their stand-

ard lines. They also express the belief that prices cannot long remain on the present level in the face of the strengthening leather market. The market on competition goods may now be represented by a quotation on cut Lace of 60 to 60 and 10 per cent. discount, and on Sides of 20 cents per sq. ft.

Spring Balances.—Quotations recently sent out by leading manufacturers of Spring Balances show a decline approximating 10 per cent. on the general line. The market may be represented in a general way by a discount on light Balances of 60 to 60 and 5 per cent.

Shot.—Manufacturers of Shot have sent out the following reduced schedule of prices, effective June 8, representing a decline of 5 cents per 25 lb. bag on all grades except dust Shot, which remains unchanged:

Drop Shot, sizes smaller than B	25-lb. bag, $1.80	5-lb. bag, $0.40
Drop Shot, B and larger sizes	25-lb. bag, 2.05	5-lb. bag, .45
Buck and Chilled Shot	25-lb. bag, 2.05	5-lb. bag, .45
Dust Shot	25-lb. bag, 2.30	5-lb. bag, .50

On ton lots these prices are subject to a discount of 10 cents per bag of 25 lb.

Rope.—Conditions remain practically unchanged, and the moderate demand emphasizes the fact that there is no snap to the market. The following quotations, for base sizes of Rope, fairly represent the market for small lots, but are not always adhered to: Pure Manila, 10 to 10¼ cents; lower grades Manila, 8 to 9 cents; Pure Sisal, 7½ to 7¾ cents; lower grade Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¾ cents.

Window Glass.—The demand from hand blown factories is reported as continuing light, while Glass is being turned out in excess of what is required. It is understood that half a dozen or more factories have gone out of blast for the summer, but it is estimated that there is still operating from 900 to 1000 pot capacity, most of which will continue in operation till the last of June. Some factories may operate throughout the entire summer. Quotations vary considerably, both from jobbers' and manufacturers' lists. From jobbers' list prices range from 90 and 30 and 10 to 90 and 40 and 5 per cent. discount on single, and on double strength from 90 and 40 to 90 and 40 and 10 per cent. discount. More general quotations are 90 and 30 and 90 and 40 per cent. discount for single and double strength. Carload lots from manufacturers' list have been quoted from 90 and 40 to 90 and 40 and 5 per cent. discount for single, and 90 and 40 and 10 to 90 and 50 per cent. discount for double strength. More general quotations are 90 and 40 and 90 and 40 and 10 per cent. discount for single and double strength. The present prices of Glass are considered by manufacturers of hand blown Glass as ridiculously low, and as having been caused by a total disregard of the simple laws of supply and demand. The optimistic view of the Glass situation by a large hand blown manufacturer is that the Window Glass business is on the eve of a great change for the better. Prices, it is said, have never been so much of a bone of contention between hand blown interests and the company operating machines as the period of production. The latter has insisted on operating continuously throughout the year, regardless of the laws of supply and demand, and has doubtless reasoned it would thereby reduce its cost by so doing. The hand blown factories have not been carefully organized and have hitherto had a flat scale to pay workmen. When prices were reduced to a point below cost by the machine blown interest the hand plants had to cease operations. But hand plants now have a flexible labor scale, and the recent cuts made by the machine people have not had the same effect upon hand plants. In view of the ability of the hand plants to meet all cut prices by the machine interest the carrying of surplus stock has fallen upon the latter, as hand blown Glass is preferred in all markets at the same price. It is therefore regarded as not unreasonable to believe that a shut down will be forced on the machine interest, and the dealers who have leaned upon them to fill their requirements through the summer will be found short. Hand blown Glass manufac-

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turers generally are following the prices made by the machine interest, and in some cases without restricted specifications. Window Glass workmen in some Glass making districts are regarded as feeling that the machine interest has for the last few years forced them out of business when the weather began to get warm and that this put the machine interest in a position to sell Glass while the hand blown factories were idle. The workmen are said to fully realize their condition and are willing to do anything to improve it. Some manufacturers think that the machine interest will advance prices about July 1, as present prices mean a loss to hand factories, and it is regarded by hand blown manufacturers as doubtful whether the machine interest can show any profit on its product.

Paris Green. Orders by merchants which had been on the manufacturers' books, were practically all shipped by June 1. Since that time the weather has not been conducive to the development of Potato Bugs, therefore duplicate orders have not been forthcoming. Materials entering into the composition of Green are lower than in 1907, when manufacturers placed their orders, so the price of Green is not likely to be advanced. The desire to protect customers who have placed orders for the bulk of their season's supply, will probably deter manufacturers from lowering prices. Therefore it is anticipated that prices will remain steady. Quotations are as follows:

	Arsenic kegs	175 lb.	28-56 lb.	2 & 5 lb.	Boxes. 1-lb.	Boxes. ½-lb.	Boxes. ¼-lb.
10,000 lb. and over	21½	22	23	23½	24½	25½	26½
5000 to 10,000 lb.	22	22½	23½	24	25	26	27
1000 to 5000 lb.	23	23½	24½	25	26	27	28
500 to 1000 lb.	24	24½	25½	26	27	28	29
Less than 500 lb.	25	25½	26½	27	28	29	30

Linseed Oil.—Deliveries on contract orders are continuous, and a limited amount of business has been done in single carloads for delivery through July. Orders for small lots, covering immediate requirements, represent market conditions more accurately. Local quotations are as follows: State and Western Raw, 42 to 44 cents; City Raw, 44 to 45 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—The market in the South has been strengthened by heavy buying for export, at the low prices which have ruled. In the local market business has been moderate, as demand from manufacturing interests has been light, and buyers generally have little confidence in the stability of the market. As a result of fluctuations during the week, the local market is higher. The New York market is represented by the following quotations: Oil Barrels, 44 to 44½ cents; Machine Made Barrels, 44½ to 45 cents.

THE HOT SPRINGS CONVENTIONS.

(By Telegraph.)

The eighteenth annual convention of the Southern Hardware Jobbers' Association, the semiannual meeting of the American Hardware Manufacturers' Association and the ninth annual convention of the Arkansas Retail Hardware Association were opened simultaneously at Hot Springs, Ark., on Tuesday morning under conditions of weather highly favorable to the comfort, pleasure and profit of those in attendance.

The two bodies first named held their opening session co-jointly in the assembly room of the Arlington Hotel, while the latter meeting was held at the Majestic Opera House nearby. Despite the remoteness of location from the larger industrial centers of the North and East there were present at the joint session of manufacturers and jobbers about 250 members, and the meeting of the State retail dealers also opened with a good attendance, in which practically every part of the State was represented.

The morning was occupied by all three associations mainly with the preliminary work of organization, which included addresses of welcome and greeting and the appointment of convention committees. Executive sessions were held in the afternoon by each of the three bodies. At the meeting of the jobbers and manufacturers reports of various standing committees were presented and acted upon. A highly satisfactory degree of harmony in the relationship of these interests was disclosed in the reports. Discussion of matters relating to transportation in the Jobbers' Association revealed no important grievances against the railroads or other carriers. The consideration in detail of the Executive Committee's report was deferred until a later session.

The real work of all the associations will begin on Wednesday morning, when the attendance will doubtless be augmented by new arrivals and instructive and entertaining programs will be taken up by each organization. Entertainment features have not been overlooked by those in charge of arrangements, the first being a reception and ball given Tuesday evening at the Arlington Hotel.

A STEREOPTICON WINDOW DISPLAY.

BY FAR WEST.

A WINDOW trimmer is sometimes perplexed as to ways of displaying the same goods time after time. The change of seasons, with the consequent change of goods, affords a great relief, and the manufacturers are also coming to his aid with pictorial helps. By using these helps the stereopticon window is made. A rather small window is best for the purpose, and one that has sash at the back without mirrors. Mixed Paints, Varnishes, Enamels and the great variety of Stains on the market serve admirably for the display.

After the Window Is Cleaned

fasten the border the manufacturer sends around the top, sides and bottom of front glass with either stickers or a touch of liquid glue. The border usually has some figure in bright color on white, the particular one in mind has a small figure holding a Paint Bucket in one hand, while the other hand points toward the center of the window. Next fasten directly in center of glass a small figure containing a good deal of color, as one of the rosettes sent to finish the corners of the border. Raise the bottom of the window to a level with the top of border by placing boxes of suitable hight or boards resting on boxes, covering them with some light colored material, manila wrapping paper serving very well.

Going Outside and Looking In

we find a bright border, with balance of window in shadow. If the sides are painted a light color they should be hung with dark cloth, also if the sash is filled with anything but glass, black cloth should hang over it. The bright border accentuates the gloom of the bare window. Now place in front, close to the glass, but with space of an inch or so between, small cans of Enamel or Varnish with bright covers. Back of them arrange the cans in pyramid shape by using half gallon cans as base: on these a quart can, then a pint and so on, being careful to keep plenty of space between each pyramid. Take gallon cans for trimming the sides, rising in steps. On top of each pyramid place a Paint Brush.

At the back suspend one of the lithographs showing a house with proper combinations of color for painting. When you look into the window now you will find the bright colored packages stand out against the shadow or black cloth, as the figures do in a stereopticon.

THE first annual edition of the Sporting Goods Trade Directory has lately been issued by the Sporting Goods Publishing Company, St. Louis, Mo. The directory presents a classified index of the goods made by Sporting Goods manufacturers and a list of Sporting Goods jobbers and manufacturers' agents. A copy of the book will be sent to each subscriber to the *Sporting Goods Dealer*.

The H. G. Lewis Hardware Company, Portage, Wis., has been incorporated with a capital stock of $7000, to deal in Hardware, Stoves, Ranges, Sewing Machines, Paints, &c. The officers are: H. G. Lewis, president; C. J. Kutzke, vice-president; H. Senger, secretary.

An explosion of oil recently caused serious damage in the store of Fred J. Hibbs Company, Bridgeport, Ohio.

MINNESOTA RETAIL HARDWARE ASSOCIATION.

ABOUT 70 per cent of the Hardware merchants of Minnesota are now affiliated with the association in that State. The map presented herewith indicates the towns in which this large and very successful association has members. It will be observed that the association idea has penetrated practically to every part of the State. Among the larger cities St. Paul and Winona appear to be the only ones in which the value of the State organization has never been fully appreciated. While Minneapolis has a very good local organization and has learned and profited by the benefits derived from associated effort, the twin city of St. Paul has never had very much of a city association, and at the present time has nothing of this kind. For some unknown reasons the Hardware merchants of Winona have always fought shy of the State Association, and at the present time only one firm in that city is a member. With these exceptions the association is thoroughly representative of the State.

The membership of the association is now well on the way to the 900 mark, the increase in number during and since the annual convention held in February approximating 50. Among the new towns which have thus been added to the association realm are the following: Myrtle, Manchester, Hayward, Zimmerman, Kent, Elba, Kandiyohi, Alvarado, Okabena, Kinbrae, Greenbush and Montrose.

While the association thus includes quite a large proportion of the total Hardware merchants of the State, no effort will be spared to induce many of those now outside the fold to become affiliated with the organization and share directly in its benefits. It is planned to send out circular letters to every Hardwareman in the State, members and nonmembers, about every 60 days, making as strong an appeal as possible to the latter, with a view to adding them to the membership roll. We understand that each of these letters has thus far brought in a few accessions.

In addition to the regular stock arguments of unreasonable competition between local merchants, the catalogue house proposition and threatened parcel post legislation the State Association of Minnesota presents a very strong financial inducement to Hardwaremen in the saving secured by its members by insuring with the Minnesota Retail Hardware Fire Insurance Company, the pioneer company of this class, the return premium amounting this year to 50 per cent. The limit of risk is now $5000, having been raised from $3000 several months since.

The able secretary of this large and influential organization is M. S. Mathews, Guaranty Building, Minneapolis, who occupies a similar position with the insurance company.



Hardware Association Map of Minnesota, All the Towns Indicated Containing One or More Members of the State Organization.

The Iron Age Directory.

NOTWITHSTANDING the painstaking care and effort which characterizes the compilation of "The Iron Age Directory," it is perhaps to be expected, in view of its great scope and detail, that errors will occasionally crop up. It is pleasant to record, however, that during the years of its publication remarkably few breaches of accuracy have taken place, and the book as a whole has been especially free from errors of any kind.

We regret that through a clerical error the name of the Alaska Freezer Company, Winchendon, Mass., was omitted under the head of "Freezers, Ice Cream," in the 1908 edition of "The Iron Age Directory" lately sent out to our subscribers.

The address also of the American Spiral Pipe Works, Chicago, whose name appears under Fittings, Flanges, Forgings, Pipe, &c., should have been changed to Forty-eighth avenue and West Fourteenth street, that city, where they are now located. We will ask the trade to note the above and make appropriate correction in the Directory.

Reed & Wyman Company, San Diego, Cal., has succeeded Pierce-Field Hardware Company, the change being one of name and not of proprietorship.

Wisconsin Retail Hardware Association.

THE Wisconsin Retail Hardware Association, of which C. A. Peck, Berlin, is the energetic and efficient secretary, has just issued a folder, under date June 1, entitled "Information of Interest to You," in which the attention of members of the association and others is effectively called to association matters. The Executive Committee held a meeting in Milwaukee on the 20th ult., at which it was decided to adopt a trademark for association use, which is reproduced herewith. The folder refers to "some of the work done" at the meeting in the following entertaining vein:



Association Trademark.

> To have the association manage the exhibit feature next winter.
>
> To admit traveling representatives of legitimate jobbers and manufacturers of Hardware and kindred lines to associate or honorary membership upon the payment of $1 per annum, and furnish them with the *National Bulletin* and admit them to all the privileges of the association except attendance at executive sessions.
>
> To adopt a distinctive trademark. See first page. How do you like it?
>
> To try and have the constitution amended next winter so that the last three ex-presidents shall constitute an advisory board.
>
> To plan some work on desirable lien and garnishee laws for our members of Legislative Committee to "get busy" on.
>
> To have a bi-monthly circular issued to every Hardware dealer in the State.
>
> The Milwaukee local association presented a resolution against fake advertising, and the secretary was instructed to try and get the National Association interested and at work for the passage of a law by Congress "cutting it out."
>
> Secretary Bruce of the Merchants' and Manufacturers' Association, who is chairman of the Building Committee of the new Auditorium, was present, and felt safe in assuring us that the new Auditorium would be ready in advance of our next annual.
>
> Some complaints were presented, and discussed, cussed and recussed.

Other paragraphs of a general character in this catchy circular are as follows:

> This is a good time to get after some of those slow accounts.
>
> You have probably learned that Parcels Post legislation is effectually killed for this session of Congress.
>
> Let us work unitedly for—
> 1. One-cent letter postage;
> 2. Abolishing post office box rent.
> 3. Against fake advertising.
>
> We claim credit for the association for the defeat of Parcels Post, abolishing of billboard ads. on freight cars, distribution of catalogues by railroad agents, putting sale of fixed ammunition to Gun clubs on a remunerative basis.
>
> If you have a competitor who is not a member of the association, can't you get him interested? It will make him a better competitor. Try it.
>
> We have 687 out of 950, but want 800, and can get them, with your help.

On the last page, under the head of "Go Out After the Trade," several pointers are given:

> The proprietor can do more to increase his trade out by the front entrance with a smile and a glad hand than he can back in the office.
>
> Several dealers hold a weekly meeting of an hour, talking over any items of interest with their clerks, porters and tin shop force.
>
> Where your contractors get into the habit of dropping in is the place where they will likely leave their orders.

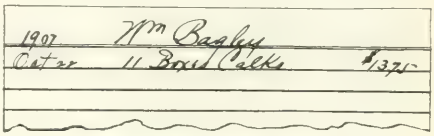
It is planned to issue these circulars every two months and judging from the initial number they should prove effectual in interesting the members in association work and gaining recruits among those outside the organization. We have quoted at length from the folder in view of its general interest and perhaps suggestiveness to Hardware associations in other States.

A Card Record of Petty Charges.

JAMES R. GLADWIN, a Hardware merchant of Westfield, Mass., employs an original and convenient method of recording petty charges. By this is meant charges against casual customers or against persons or firms who do not run an account because they purchase infrequently or regularly pay cash. In the bookkeeping department of the establishment a very simple and efficient system is employed for handling the regular open accounts, and the scheme of segregating petty charges above referred to was devised with the idea of keeping down the number of inactive book accounts and reducing transcription and unnecessary detail work.

A Card File.

The practice of the firm is merely to keep petty charges on cards, filing them under the name of the purchaser in an ordinary alphabetical index drawer. The appearance of the card and the form of entry is shown



Card Recording Transient Charge.

in the accompanying illustration. The number on file at any one time is never very large and it is an easy matter to run over them and follow up any that should be collected. When payment is received, the card is destroyed, or, if convenient, it is given to the customer as a receipt. These small items are considered as cash and so treated.

No Permanent Record

of such charges is kept, since, of course, there is no other entry made. This suggests that at times it might be inconvenient not to be able to refer back to find out what was purchased or what was paid for it. It is also possible that all records of a charge might be lost, through the accidental loss or destruction of a card on which an entry had been made. In practice, however, the firm does not find these considerations important. No card is known to have been lost since the system was put in operation. The file drawer is kept in the safe and is handled by only one man, so that the possibility of losing, misplacing or destroying the record of an unpaid charge is very remote. The advantages of the plan, as already brought out, are its simplicity, convenience of handling, economy of time and labor and the reduction of the number of inactive book accounts.

The H. F. Hobbick Company, Winchester, Ind., incorporated with a capital of $6000, has been organized to handle Hardware in a wholesale and retail way, the stock including Stoves, Tinware, Wire Fence, Pumps, Cutlery, Sporting Goods, &c. The company will also give attention to plumbing, hot water heating, furnace work, roofing, cornice manufacturing, &c.

THE E. S. BRACE COMPANY, Niagara Falls, N. Y., has been incorporated with a capital of $35,000 to manufacture Carpenters' Braces and other tools. The officers of the company are G. M. D. Heard, Painsville, Ohio, president; J. F. Ziefang, Niagara Falls, vice-president, and John Goffin, Niagara Falls, secretary and treasurer.

HARDWAREMAN MARKELL'S EVERY DAY ALPHABET.

JACOB MARKELL, Greenport, N. Y., handling Hardware, House Furnishings, Yacht Fittings, &c., is the author of the Hardware alphabet reproduced herewith. It was first published in the local paper, occupying a full two-column space, which permitted prominent display and attracted much attention. Subsequently, Mr. Markell issued the alphabet in the form of a folder, for general distribution to his customers and others, whom he desired to interest in his store offerings. It will be observed that the matter is presented in a very catchy fashion and that a multiplicity of Hardware and related goods are pleasantly and effectively treated. Under the head of letters Q, U, X, Y and &, the opportunity is embraced to say something on quality, prices, prompt delivery of goods, co-operative interest between merchant and customer, appreciation of patronage extended, &c.



Hardwareman Markell's Everyday Alphabet.

Retail Hardware Conventions.

THE dates for the next annual convention of the Michigan Retail Hardware Association are August 12, 13 and 14, instead of August 13, 14 and 15, as published in a recent issue. The meeting will be held in Detroit.

Other retail Hardware conventions of the next two or three months are those of the Carolinas Association at Wrightsville Beach, N. C., on July 8, 9 and 10, and the Oklahoma Association at Oklahoma City, July 14, 15 and 16.

ACCEPTING BUSINESS AT A POSITIVE LOSS.

BY H. N.

SOME time ago I heard of a "business" transaction in which a Hardwareman figured disastrously, although he seemed to feel that the circumstances justified his course of action. It is well for him that all his business clients are not built on the lines of the purchasing agent against whom he was pitted. This merchant was endeavoring to sell goods to a mill whose purchasing agent said that he was in the market for Sandpaper. The merchant did not remember the discount on Sandpaper, so, returning to his store, found he could buy it at 60, 10 and 5 per cent. Once more he goes to the mill and finally, after much figuring, gets the order for 5 reams at 60 and 10 per cent., an apparent profit of 5 per cent. Now if this was No. 2 Sandpaper, listing at $4.75, the entire order would be $8.55, net, and the enterprising dealer's profit 43 cents.

In course of time the Sandpaper has been used, and the merchant seeks another order from the same mill. Meantime he hears that his competitor, who formerly had this trade, has received 10 reams of this particular Sandpaper. Knowing this fact, the Hardwareman calls up the purchasing agent, asking for another order. He is told "There is some one after your scalp; you must come down in your price." "Well," says the merchant, "I'll take the order at 60 and 10 and 2½ per cent." He gets the order, and the buyer adds, "That's the way to talk business."

Pretty Poor Business for the Merchant.

Yes, it may be the way to "talk business," but its business for the sharp purchasing agent rather than for the enterprising Hardwareman. Its pretty poor business for the merchant, who gets the order this time at a gross profit of 2½ per cent., or about 22 cents, out of which must come his regular expense of transacting business—store rent, light and heat, freight and cartage, wages, postage, &c.—which probably amounts to at least 15 per cent. of his annual business, this bright transaction meaning a positive loss of more than a dollar.

The purchasing agent can't be blamed for buying his goods as low as possible; that's his business. He was a sharp buyer, and that is why he holds his job as purchasing agent. And when he can buy goods below the market it certainly is the way to talk business for him. But for the Hardwareman "talking business" in such a way demoralizes trade and breeds still more competition, and, perhaps, leads to bankruptcy.

Position of the Competitor.

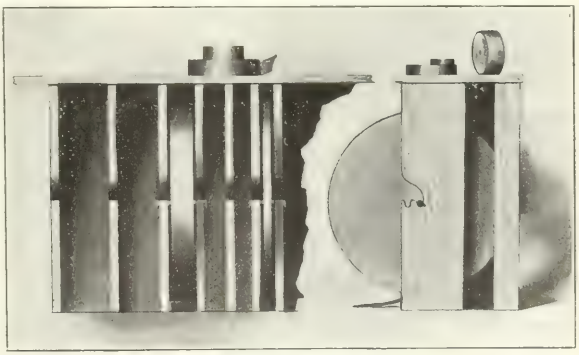
To carry this illustration to its logical conclusion, the Hardwareman who formerly had this mill trade in Sandpaper will in time find his competitor has secured the business. He has 10 reams on hand. As probably there is no other market for it, he will sell it to the mill at cost. This will bring the price down to 60, 10 and 5 per cent. Then both merchants will endeavor to buy Sandpaper cheaper—some jobber may try to help one out. The result is they all suffer a cutting down of a legitimate profit. It is just this foolhardy way of going after business that ruins many a merchant and brings permature gray hairs upon the head of the Hardwareman. Such methods should be discouraged, not encouraged.

The only possible excuse for a merchant taking business of this sort would be because he was securing with it a larger and more profitable trade in other goods.

For some business it is better for the Hardware dealer not to compete. It's better to let the mill supply house or the manufacturer sell Sandpaper direct rather than to handle the business at 2½ per cent. or even 5 per cent. It's far better to go without than to have business on which there will be a positive loss. Figure it as best you may, the fact remains true that just in the same proportion as such trade is handled will the Hardware retailer be worse off at the year's end.

Rack for Handling Belting in Rolls.

THE NOVELTY IRON WORKS, Dubuque, Iowa, has in use a Belt Rack from which Belting can be conveniently reeled, as shown in the accompanying illustration, giving front and side views of the rack. Each compartment is ¼ in. wider than the Belting that it is designed to accommodate. In reeling off the belt it is taken from the under side of the roll. Two notches in the partitions are made, so that the pins upon which the Belting revolves will not interfere with one another. Remnants may be kept on the top of the rack, and thus always in sight may be disposed of as opportunity offers.



Rack for Handling Belting in Rolls.

Edward Hart Company, Gallup, N. M., has been incorporated with an authorized capital of $100,000, succeeding to the Hardware, Implement, Vehicle and Sporting Goods business of Edward Hart. The latter is president of the new company and R. S. Platt is secretary and treasurer.

JOHN W. HUGHES, for many years agent for W. S. Butcher, Sheffield, England, has removed his office to 109 Duane street, New York, where he will carry a full line of Razors.

THE H. W. JOHNS-MANVILLE COMPANY, 100 William street, New York, manufacturer of Asbestos goods, &c., is opening a branch office at 30 South Pennsylvania street, Indianapolis, Ind., to take care of the local requirements of the trade in that territory. The office will be under the management of C. E. Wehr, who has for several years represented the company in that territory.

The Value of Associations.

"YES," remarked the man, whose line was semiprofessional, "we have trade associations now, both national and State, but for a long time it was the hardest thing in the world to get the men together to consider the advisability of the association plan."

"That was unusual, wasn't it?" asked his companion. "In most lines of business that is considered a valuable trade asset, these days. An interchange of opinions and discussion of plans and policies has been the making of many a business I know of."

"That's just where the rub comes in," replied the first; "in our line there was formerly a great deal of jealousy, and I am sorry to say that many of us regarded our neighbors in the same line as robber barons. It was thought that the success or failure of the business depended entirely upon the owner's individual study and planning; that what he had thought out for his business was his personal property to which he should cling tenaciously, and any effort to form an acquaintance was regarded with suspicion that well nigh placed the inquisitor in the ranks of ordinary thieves."

"But haven't you made a practice of cultivating the acquaintance of your competitors and of visiting the out of town firms in your own line?" persisted the companion. "Surely your long and successful experience is not based entirely upon your own ideas and individual work. Life would be too short to build such an enterprise as yours under such close and hampered conditions."

"Well," replied the semiprofessional man, "I have been very active in helping to form our associations, and we now have fairly strong ones, but prior to the time that I made trips for this purpose I did not do much visiting. It would not have been permitted. I will say, though, that within the past five years I have been accorded a cordial welcome whenever I have called upon firms in this line."

"What brought about the changed attitude?" was the next question.

"Association conventions," was the terse reply. "I regard them as the greatest possible business helps. I have frequently made valuable acquaintances and obtained priceless ideas on these occasions that otherwise I should never have had."

This is the gist of a conversation which recently took place in a New York City street car. The merchant was not a Hardware merchant, but his experience should interest Hardwaremen.

C. A. Fowler, De Witt, Neb., has sold his Hardware, Stove, Paint and Sporting Goods business to De Witt Hardware Company, C. A. Rowlinson, manager.

LETTERS FROM THE TRADE.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

How the Catalogue Houses Jolly Their Customers.

To the Editor: Since there has been so much discussion during the past few years regarding catalogue houses and their competition, which has to a certain extent interfered with the legitimate retail dealer, I thought that it might be of advantage to the trade if they knew the methods by which some of the larger catalogue houses secure business. If a general knows the plans and the tactics under which his enemy is to advance he can better prepare himself for a defense; so that if we know their plans of getting business, we can better handle the "catalogue house customer."

In their letters to the trade, which are mimeographed, they make a personal appeal to the customer. When a customer is shown that this letter is a circular letter and is sent to all classes and kinds of people he at once loses the respect for them that he thought he had.

If you have never read one of these letters, it will pay you to get one. They are so full of deceit and so bold that it is astonishing how they can bring the desired results, but the catalogue houses have evidently studied the situation until they know just what kind of a letter it takes. Below are extracts from a letter sent out by a mail order house:

> As a special favor to me, won't you please tell me on the inclosed card if we may expect an order from you this spring?
>
> I am more than ever anxious to hear from every one of what we call our "A" grade customers, of which I am pleased to say you are one.

When a prospective customer is shown that this is simply taffy and that all their customers are "A" grade customers, since they have to send their money in advance, he weakens a little, and after these things are explained to him in a businesslike and diplomatic way about loses confidence in what the catalogues have said about the goods, and with confidence gone all is gone. The letter goes on:

> I regret much that we cannot meet you face to face and know you personally as I would like to.
>
> I do hope that you can send me an order amounting to $5 or more, as I want to give your answer to this letter my personal attention.
>
> Dear customer, if you will send me an order amounting to $5 or more and send the order right away so that it will reach me not later than one week from Wednesday, I will see that your order is filled promptly and ship with your goods one of our latest big catalogues.

Of course this letter is not dated, so that at any time the order would be acceptable, and when the trade can be shown that these things are being worked on them they will get ashamed of giving their patronage to this kind of a house.

Of course circular letters are all right, but they should not be written with an idea of deceiving, and practices of this kind when run down will certainly revert to the legitimate retail dealer's advantage.

I also suggest that when any of our merchants are in a city where one of these houses is located he should call on them, not as a merchant but as a visitor, and if their experience is like the writer's they will become so much disgusted with the class of people in their employ and methods practiced that they can enthuse this disgust into would-be customers of the mail order houses.

This article is not written as a "cure all," for the conditions may be very different in other localities; but the writer has found this information to be of much advantage to him and hopes that it may be some to some fellow merchant.

MISSOURI.

WILLIAM M. SANFORD of Hannibal Green's Son & Co., wholesale and retail Iron, Steel and Heavy Hardware, Troy, N. Y., celebrated on the 19th ult. the fifty-second anniversary of his advent into that firm. Mr. Sanford, who was born in Bennington, Vt., October 7, 1838, and is still active in the management of the business, received the congratulations of many friends. The business with which Mr. Sanford became identified May 19, 1856, was originally established in 1809 by Jacob Hart and Henry Nazro, under the firm name of Hart & Nazro. On May 28, 1821, the partners separated, Henry Nazro continuing business by himself until 1832, when he formed a co-partnership with Augustus A. Thurber and Hannibal Green, under the style of Nazro, Thurber & Green. After the death of Mr. Green March 29, 1875, the firm became Hannibal Green's Son & Co., composed of Edward M. Green and William M. Sanford. The latter has been general manager since that time.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM CENTRAL SQUARE HARDWARE COMPANY, 974 Massachusetts avenue, Cambridge, Mass., which has lately been incorporated with a paid up capital of $10,000. The company is successor to the business formerly carried on under the name of Edward T. Bynner, who is president. The business will be under the efficient management of Hiram W. Colton, formerly with Chandler & Barber and lately with the Burditt & Williams Company, both of Boston. The new company's lines include general Hardware, Cutlery, Paints and Oils, &c. Extensive alterations are now going on in the establishment, as a result of which the business facilities will be materially enlarged and improved.

FROM DAY & RICHARDSON, Monmouth, Maine, who have bought the Hardware, Stove, Implement and Sporting Goods business of F. K. Blake.

FROM WILCOX HARDWARE COMPANY, Waverly, Va., which has been incorporated with a capital of $15,000. The officers of the company are J. E. Wilcox, president; J. E. Moss, treasurer and general manager, and E. N. Burt, secretary.

FROM G. A. LININGER & Co., who have succeeded to the Hardware, Tinware, Implement and Paint business of J. E. Englehardt, Accident, Md.

FROM J. R. SMITH, Mangum, Okla., who has succeeded Smith & Brown in the Shelf Hardware, Stove, Tinware, Implement and Sporting Goods business.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

NEW CASTLE STAMPING COMPANY, New Castle, Pa.: Catalogue No. 5, for 1908, illustrating and listing Austrian blue and white and New Castle gray Enameled Ware.

EDWARD STINSON MFG. COMPANY, Baltimore, Md.: Price-lists No. 15 and 17 referring to Vehicle Wheels and Wheel material.

HARDINGE BROTHERS, 1034-1040 Lincoln avenue, Chicago, Ill.: Catalogues relating to the Beyer Watchman's Portable Time Clock and station, and to Cataract Precision Bench Lathes and attachments.

AMERICAN CARBON & BATTERY COMPANY, Signal Hill, East St. Louis, Ill.: Folders devoted to the company's American street railway Motor and Generator Brushes.

F. E. KOHLER & Co., Canton, Ohio: Illustrated price-list on Snow Shovels and Sidewalk Scrapers for the coming season.

The American Vest Pocket Shaft Speed Counter.

The accompanying illustration shows a speed counter, not quite 3 in. in length, that registers the exact number of revolutions, only requiring one to take the initial reading and substract it from the final reading of the

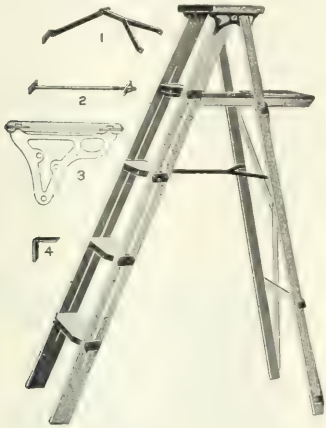


The American Vest Pocket Shaft Speed Counter.

machine. The device is referred to as being accurate and durable, and while very small and convenient to carry, is by no means fragile. It is offered by the American Steam Gauge & Valve Mfg. Company, 206 Camden street, Boston, Mass.

The Unique Stepladder.

The stepladder herewith illustrated is made of Norway pine in the white, no yellow entering into its make up. No. 1 of the parts shown separately is a patented four-way brace, which firmly locks the legs when open; 2 represents an iron rod, which is placed under each step to prevent the stiles spreading; 3 shows a malleable fastened to and extending through the ladder to give



The Unique Stepladder.

it exceptional strength, while 4 represents the stamped heel fitted to strips and legs to prevent weather checks and splitting. The ladder is made by the Udell Works, Indianapolis, Ind., in 4, 5, 6, 7, 8, 9 and 10 ft. lengths, weighing, respectively, 12, 15, 19, 22, 25, 29 and 38 lb. Ladders are made in larger sizes also, under the names Excelsior and Anchor.

Graduated Steel Rule with Equivalents.

The Lufkin Rule Company, Saginaw, Mich., and 280 Broadway, New York, has added to its comprehensive assortment of graduated steel rules one, the extreme dimensions of which are 6¾ x 1⅛ in., the article itself having all right angles except at the top, which is rounded, with a 3-16 in. hole by which to hang it up. On one side it is graduated as finely as sixty-fourths and thirty-seconds of an inch to 6 in. On the same side there is a "Decimal Equivalent Table" ranging in inches from 1-64 in. to 63-64 in., and decimally from .0156 to .9844. On the reverse side of the blade a similar 6 in. measure by sixteenths is provided, with two columns of "Decimal Equivalents of Wire Gauges." In one column there is the number of wire gauge from 0000 to 40, inclusive, and in parallel columns the American or Brown & Sharpe and Birmingham or Stubs' decimal equivalents.

The Queen Corrugated Ash and Garbage Can.

A new form of ash and garbage can has been brought out by the Edwards Mfg. Company, Cincinnati, Ohio. The general appearance of the can and detail of its construction are shown in the accompanying illustrations. It is a combination of three pieces of sheet steel stamped into shape and galvanized after the parts are assembled. All joints are double seamed and locked to make them watertight, and the bottom, cover and body are all made from No. 21 gauge metal. The rim band is ⅛ in. thick. Special attention has been paid to give the structure of the corrugations such a form that, while they will be capable



Fig. 1.—The Queen Ash and Garbage Can.

of sustaining high stress on the outside, the interior surface is made of maximum smoothness to facilitate emptying the contents of the can. The lower end of the body is crimped, as shown in Fig. 2, and is set in a U-shaped flange at the bottom. The free edge of the bottom is pressed up over the shoulder of the crimping, and the bottom rim is thus formed of three thicknesses of steel. The top reinforcing band is driven inside the upper end of the can and rests against a shoulder, provided for it in the body. While being galvanized the cans are withdrawn from the coating pot in an upright position, causing the drip to run toward the base. The surplus metal drains through an opening left in the center of the bottom for the purpose, and after galvanizing this hole is

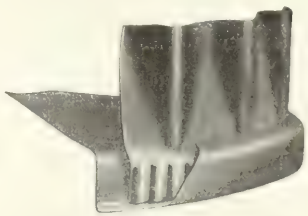


Fig. 2.—Construction at Bottom of Can.

capped, flanged and soldered. This method of galvanizing is pursued to give a heavier coating of zinc in the base, the wearing portion of the vessel, and a thorough filling of the joint crevices left as a natural result of construction. In other words, the intention is to have the lower end and bottom of the can with a thicker coating of zinc, where such a protection is most needed. It is made in three sizes, 15, 18 and 36 in. in diameter and all 26 in. deep.

Herculever Case & Packing Box Opener.

The accompanying illustrations show a tool for removing the cover boards of packing boxes, cases, &c., which has just been put on the market by the Herculever Company, 332 Broadway, New York. It is described as a powerful, upwardly inclined lever having a piercing and a lifting member fulcrumed to a bracket which also acts as a box or lifting fulcrum. In operation (Figs. 2 and 3), the piercing and lifting member is driven underneath the cover boards of the box by a sliding handle shaped weight on the lever. A bracket follows the piercing member under the cover board and rests on the end or side of the box when the depression of the lever resulting in the upward inclination of the lifting member causes the point of contact with the board to travel in a vertical plane, resulting in the maximum of lift with the minimum of travel, and enabling the operator to lift the board and nails together. The piercing and lifting member is a forging made of 0.45 carbon open hearth steel, hardened slightly at the points and tested to meet the strain necessary under any conditions of operation. The fulcrumed bracket is also made of high grade steel, well finished, these two parts being held firmly together by a plunger spring device, and all assembled by a ¼-in. steel rivet. The driving handle is made of the best grey iron casting and is assembled to the other two members by a pin similar to that used in the old style nail puller. The forward end of the handle, however, is said to be so designed that it cannot pinch the hand of the operator. The tool takes off a whole board at a time and should not be confused with a nail puller which removes one nail at a time. The makers claim that when properly used the Herculever leaves the board and nails in as good condition as it found them. If, however, any nails pull through the cover board and are left in the edge of the box, they can be readily pulled by reversing the tool and drawing the nail, as with the claws of a hammer.

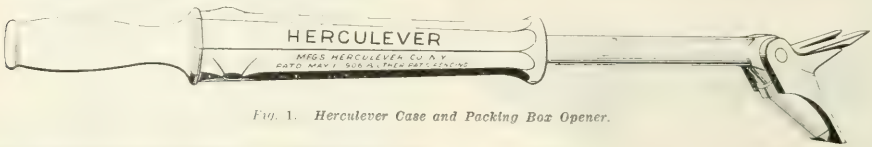


Fig. 1. Herculever Case and Packing Box Opener.

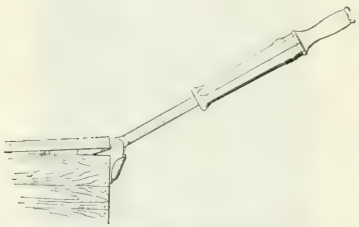


Fig. 2. Herculever Box Opener in Operation—First Movement.

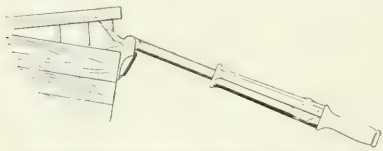


Fig. 3.—Herculever Box Opener in Operation. Second Movement.

The Bruner Cold Pressed Steel Wagons.

The Bruner Steel Wagon Company, Wapakoneta, Ohio, has added to its product a full line of all steel log trucks and special heavy capacity wagons and trucks, ranging in capacity up to and including 15 tons, equipped either to be used with teams or in train behind traction engine. The high grade steel used in the construction of the goods is made especially for the company, which claims that there is not a piece that will not bend double without breaking. The gear is made entirely of cold pressed steel, as are the axles and tongue. The wheels are made of steel and fully covered by patents. The company refers to its wagons as being durable, stronger and lighter for equal capacity than the ordinary wagon. They are further recommended as light of draft, handsome and neat in appearance, convenient and not affected by heat, cold, or any climatic conditions.

The Champion Floorscraper.

The Dosch Mfg. Company, Bridgeport, Conn., is offering the floorscraper shown herewith. The machine contains four knives with eight edges available for use before a new knife has to be inserted. The knives are sharpened on both edges and when one knife becomes dull the operator can reverse the handle and a new knife is ready. In this way all four knives and the eight edges can be brought into play. It is interesting to note that all the weight is around the knife, holding it right down to the floor. When pulling, the operator lifts the handle so that the wheels clear the floor about half an inch, and thus the benefit of every ounce of weight is obtained. The piece of steel between the knives has three uses: it acts first as a positive gauge for setting the knives, doing away with all guesswork or going by the eye. The knives are set so that they come within 1-32 of an inch of the edge of the chip breaker, as the steel is called, and since the jaws spring open as soon as the bolts are loosened it is readily seen that the knives can be quickly and easily inserted whenever necessary. In its second capacity this steel acts as a support for the knife, bracing the knife right down to the cutting edge and preventing the knife from springing or chattering. In its third use the steel acts as a means for releasing the shaving from the floor without leaving a ridge. When near the end of the cut the operator merely lifts the handle a little higher and the shaving comes loose from the floor as the weight of the head is held by the chip breaker. One of the important features of the machine is that the handle is bolted solidly to the head, rendering the whole machine rigid. The handle is, however, adjustable to the hight of any operator and yet the angle of the knife and head always remains the same. Twelve knives with 24 cutting edges are furnished with each machine. The knives are made of a very fine grade of steel and were selected by the company after a long search and many tests.



The Champion Floorscraper.

Auger Bit and Chisel Sets in Rolls

The Simmons Hardware Company, St. Louis, Mo., has a new way of putting up Keen Kutter auger bits and chisels in sets, as shown herewith. They are referred to as especially convenient for carpenters and others who need to carry them about. Boxes containing such sets

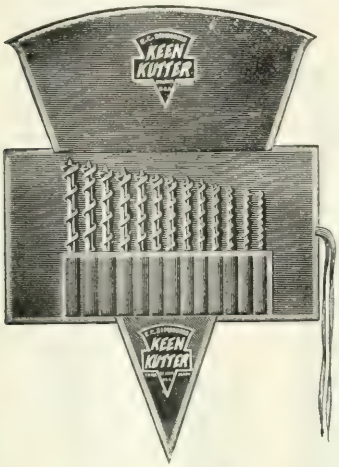


Fig. 1.—Set of 13 Keen Kutter Auger Bits in Roll.

are alluded to as being heavy and bulky, but the rolls are light and do not occupy much space in a tool kit. The auger bit roll is 11½ in. long and 3½ in. in diameter, and are made of heavy black duck with red binding. No. K S R 9 contains nine bits, one each—4, 5, 6, 7, 8, 10, 12, 14 and 16 16th; it weighs about 3 lb. No. K S R 13 contains 13 bits, one each—4 to 16-16ths, and weighs about 4 lb. The chisel roll is 10 in. long and 4 in. in diameter, and weighs with tools about 2 lb. No. E 5

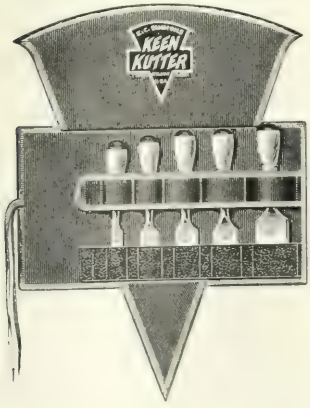
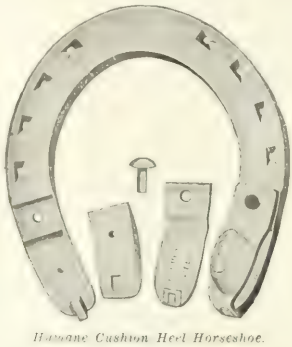


Fig. 2.—Set of Five Keen Kutter Butt Chisels in Roll.

contains five plain back butt chisels, one each—½, 1, 1¼, 1½ and 2 in. No. F 5 contains five beveled edge butt chisels, same sizes.

Humane Cushion Heel Horseshoe.

The Humane Horse Shoe Company, Lima, Ohio, is putting on the market the cushion heel horseshoe shown herewith. It is made of approved horseshoe steel and furnished in regular sizes and half sizes up to 4½, light or heavy web, and with high or low calks. The company's principal claim for these shoes is that by reducing the concussion of the horse's feet on hard surfaces they prevent soreness of tendons and tend to increase ma-



Humane Cushion Heel Horseshoe.

terially the usefulness of the animal. It is also urged that the shoes deaden the noise of horses' feet, prevent slipping on smooth pavements and on ice and remove danger of rotting or other injury to the hoof. The shoes are said to be very durable and easy fitting, being adapted to fit low plain or sharp ice calks to the same shoe.

The Perfection Cooking, Steaming, Preserving and Strainer Kettle.

The accompanying illustrations relate to a cooking kettle put on the market by the American Specialty Stamping Company, Johnstown, Pa. It is made of enameled stamped ware of excellent quality, and is designed to prevent accidents resulting from draining boiling fluids from ordinary cooking kettles. The nesting arrangement is shown in Fig. 1; also the hook, opposite the spout, which catches the lid, when used for straining, making it impossible for the lid to come off. Before straining, the handle with the cover is pulled backward as far as the slot in



Fig. 1.—The Perfection Cooking, Steaming, Preserving and Strainer Kettle.

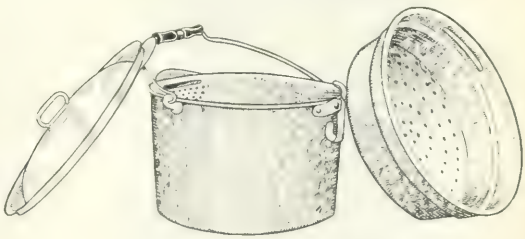
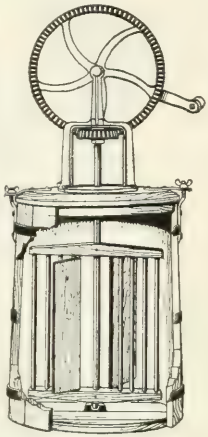


Fig. 2.—Parts of Strainer Kettle.

the safety ear will allow, when the opening in the spout is sufficient to allow the liquid in the kettle to drain out. This can be done, it is explained, without the slightest danger of the cook being scalded or burned, and none of the solid contents in the kettle can fall out. Among other points of excellence, the following are emphasized: That the steam can be let off without removing the cover; that all boiling liquids can be drained from the kettle without removing or holding the cover and that the cover can be kept on the kettle from the time the victuals are placed on the fire until they are cooked, and none of the nourishment can escape.

The Dairy Queen Churn.

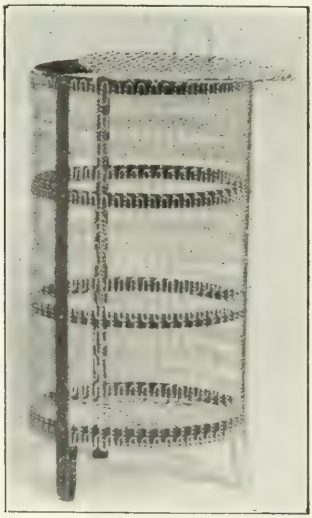
The latest addition to the line of churns made by the Dairy Queen Churn Company, Monmouth, Ill., is shown in the accompanying illustration. The body of the churn, which is designated as No. 0, is a heavy glass jar of 2 quarts capacity, and has an aluminum screw top with polished nickel gearing. It is built upon exactly the same lines as the larger wooden body churns holding from 3 to 8 gal. The dash which is made of clear birch wood is provided with sharp perpendicular bars, which are designed to cut the cream globules and let the grain of butter out intact. The dash also carries two perpendicular wings set at right angles with the bars, whose function is to drive a current of air through the cream. In churning the dash is reversed and, working back and forward, gathers and works the butter in a compact mass on each side of the dash. The lid being countersunk fits tightly into the mouth of the jar, and prevents splashing of its contents on the outside. None of the metal parts of the churn comes in contact with the cream. It is stated that butter can be made in 2 min., and the operation completed in 5 min.



The Dairy Queen Churn.

The Standard Rubbish Burner.

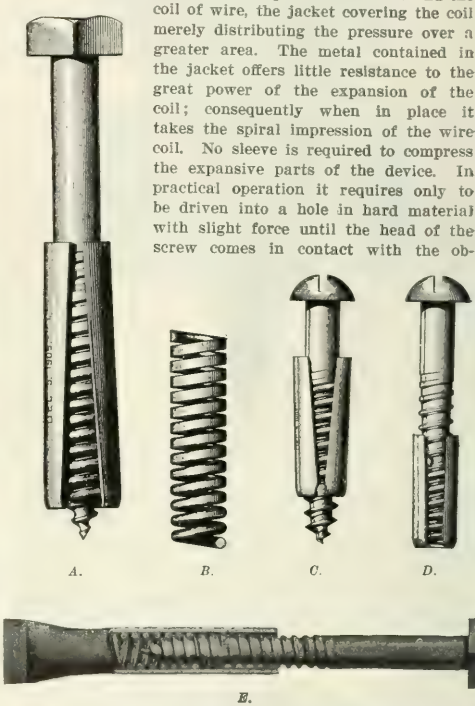
The Standard Wire Company, New Castle, Pa., is offering the rubbish burner shown herewith. It is made of galvanized wire with iron supports that have been dipped in asphaltum. It is made in sizes 14 x 20 in. and 15 x 28 in., and is designed for the disposal of waste papers and all kinds of rubbish which accumulates about the home, store or office. The company states that the burner is highly commended by life and fire insurance companies.



The Standard Rubbish Burner.

Farrington Expansion Bolts.

H. Farrington, 45 Broadway, New York, is putting on the market the expansion bolts, several forms of which are shown in the accompanying illustrations. They depend for their expansive qualities upon the flexibility of a coil of wire engaging the thread of a common wood screw, or for larger and heavier work on the taper of the mandrel of a screw bolt especially threaded. They are practically made up of two parts: The screw and the coil of wire, the jacket covering the coil merely distributing the pressure over a greater area. The metal contained in the jacket offers little resistance to the great power of the expansion of the coil; consequently when in place it takes the spiral impression of the wire coil. No sleeve is required to compress the expansive parts of the device. In practical operation it requires only to be driven into a hole in hard material with slight force until the head of the screw comes in contact with the object to be held; then a few turns of the screw will permanently and efficiently hold the fixture in place. The pressure is equally distributed on all sides of the hole in which it is inserted, and owing to the hardness of the wire there is no tearing or stripping effect, as in devices using soft material. Thus it is claimed that the anchors are not loosened by vibration, and can be removed and replaced as often as a common bolt with nut, without impairing the holding power. A shows a jacket and coil expanded by a lag screw, the coil itself appearing in B. C shows a jacket with coil expanded by the taper of a wood screw at the shank, and D shows same expanded by the taper of the screw at the point. The concrete expansion anchor E is said to afford a secure fastening for embedding in green concrete or grouting in old concrete. The coil of wire inside the anchor is internally tapered, and therefore is expanded by screwing the lag screw into the anchor.



A. *B.* *C.* *D.*

E.

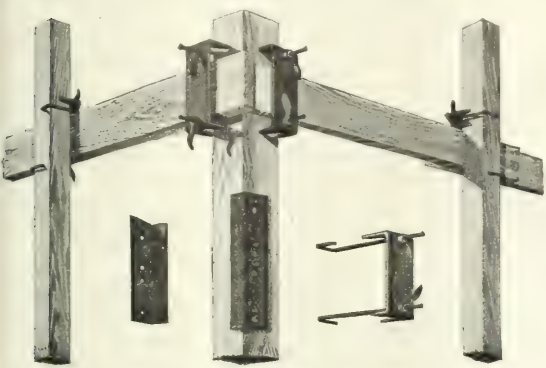
Farrington Expansion Bolts.—A, Jacket and Coil Expanded by Lag Screw; B, Coil of Wire; C, Jacket Expanded by Taper of Wood Screw at Shank; D, Jacket Expanded by Taper of Screw at Point; E, Concrete Expansion Anchor.

Non-Explosive White Metal Polish.

C. M. Kimball, Winthrop, Mass., manufacturer of metal polish, is bringing out a new polish known as Kimball's Non-Explosive White Metal Polish for polishing metals and glass. This polish, it is claimed, contains no naphtha, thus insuring against explosions or fire.

Mason's Ledger Clamp and Pole Splice.

A clamp for fastening the ledger board to the scaffold pole without the use of nails has been brought out by the New England Patent Stage Company, 45 Banks street, West Somerville, Mass., and is illustrated herewith. It is designed for the use of masons, carpenters and building contractors. By the use of the device there is a great saving in lumber when taking down the staging, as the boards are not split or broken as when nailed, and the ledgers will last a long time because they have not been injured by nail holes. The clamp is made of a 9-16-in. steel plate, and will take a board 6, 7 and 8 in. wide. It is the intention to make the clamp also for use in connection with a board 1¼ in. thick. The pole splice, also



Mason's Ledger Clamp and Pole Splice.

shown in the illustration, is 15 in. long and made of 3-16 x 4 in. steel. It is put on with 5-16 lag screws. The company recommends that the builder use 3 x 4 in. poles standing 4 in. way out and 1 x 7 in. ledger boards. It is suggested that to put on the ledger clamp quickly the ledgers be tacked on the entire length of the building and then the carpenter may go along putting on the clamps. It will be seen from the illustration that the clamp will fasten either one or two ledgers, according to requirements. The point is made that the clamp is cheaper to use inside a building than horses when going higher than on staging, besides taking up much less room. It is impossible to loosen any part of the clamp as it is only necessary to burr up the thread on the end of the bolt so the handle cannot come off.

West's Sanitary Fruit Gatherer.

Montpelier Cup & Metal Works, Montpelier, Ind., is offering the fruit gatherer herewith illustrated. This shows the fruit as it is released by opening a trap at the bottom of the gatherer, falling into the box ready for shipment. The gatherer is made of very heavy tin, well soldered, and will be manufactured in any size desired, so as to suit the requirements of the fruit grower in the



West's Sanitary Fruit Gatherer.

different parts of the country. The device is said to combine three desirable features: first, that of being able to collect more fruit in a given time than by hand picking; second, to pick fruit without touching it with the fingers, thus avoiding bruising it and leaving it in a sanitary condition for the market; and, third, to place upon the market a gatherer that would be within the reach of all from the point of view of price. It is remarked that the fruit grower using this gatherer can rest assured of marketing his produce at the highest prices, also that the stem is not pulled from the limb proper and does not affect the bud of future crops.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, State and West'n Raw	42 @44
City, Boiled	45 @46
City, Raw	44 @45
Raw, Calcutta, in bbls	50 @...
Lard, Prime, Winter	60 @65
Extra No. 1	47 @50
No. 1	42 @45
Cottonseed, Crude, f. o. b. mill, Summer Yellow	35 @...
Summer White	40 @...
Yellow Winter	42 @45
Tallow, Acidless	5 @...
Menhaden, Brown, Strained	29 @...
Light Strained	33 @...
Bleached Winter	40 @...
Ex. Bleached Winter	45 @...
Cocoanut, Ceylon	5 @7½
Cocoa	7½ @8
Cod, Domestic, Prime	37 @38
Newfoundland	44 @46
Red, Elaine	37 @39
Neatsfoot, Extra	55 @...
Olive, Yellow	90 @...
Neatsfoot, Prime	60 @...
Palm, Lagos	6 @...

Mineral Oils—

	₱ gal.
Black 20 gravity, 25@30 cold test	10 @11
20 gravity, 15 cold test	10 @11
Summer	10 @11
Cylinder, light filtered	20 @...
Dark, filtered	15 @...
Paraffine, 900@907 sp. gravity	10 @...
907 sp. gravity	12 @...
880 sp. gravity	12½@14
Red	12½@14

Miscellaneous—

Barytes:	
White, Foreign	₱ ton 35.00@40.00
American, Blanc fixe	₱ 100 lb 1.50@2.00
Off color	₱ ton 20.00@25.00
Chalk, in bulk	₱ ton 3.00@3.40
China Clay, Imported	₱ ton 11.50@18.00
Cobalt, Oxide	₱ 100 lb 1.45@2.00
Whiting, Commercial	₱ 100 lb .42@ .52
Gilders'	₱ lb .07@ .08
Ex. Gilders'	₱ 100 lb 60@ .65

Putty, Commercial—

	₱ 100 lb
In bladders	$1.70 @1.80
In tubs, or kits	.70 @1.85
In 1 lb to 5 lb cans	.75 @1.85
In 12½ to 50 lb cans	1.55 @1.90

Spirits Turpentine—

	₱ gal.
In Oil Hds	47½@48
In machine bbls	44 @45

Glue—

	₱ lb
Cabinet	12 @15
Common Brown	7½@10
Extra White	15 @...
Fish, liquid, 50 gal. bbls., per gallon	.60 @1.20
Fish, liquid, 50 gal. bbls., per gallon	.60 @1.20
Foot Stock, White	12 @15
Foot Stock, Brown	9 @15
German Common Hide	10 @12
German Hide	12 @18
French	10 @10
Irish	12 @16
Low Grade	10 @12
Medium White	14 @17

Gum Shellac—

	₱ lb
Bleached, Commercial	20 @...
Button, Dark	28 @30
Button, Pale	35 @...
Garnet	17 @...
Orange, Fine	30 @...
Orange, Superfine	35 @...
Seed, No. 1	15 @...
Shellac, Regular	18 @...
Kala, Button	15 @...
Kala, Pale	17 @...
Orange, Button	15 @...
T. N.	27 @...
V. S. O.	15 @...

Colors in Oil—

	₱ lb
Black, Lampblack	12 @14
Black, Ivory	26 @...
Blue, Prussian	32 @36
Blue, Ultramarine	15 @16
Brown, Vandyke	11 @14
Green, Chrome	12 @16
Green, Paris	30 @31
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, English white in Oil	10½@11½
Lead, American White:	
Lots 1 ton or more, in Oil	@ 6¾
Lots less than 500 lb, in Oil	@ 7¼
Lead, White, in oil, 25 lb tin kegs	@ 7¼
Lead, White, in oil, 12½ lb tin kegs	@ 7¾
Lead, White, in oil, 1 to 5 lb tins	@ 8¾
Lead, American, Tints: On lots of 500 lbs and over 2% for cash if paid in 15 days from date of invoice.	

Zinc, Dry—

	₱ lb
American, dry	5½@ 5¾
American, French Process, Red Seal	6 @...
American, French Process, Green Seal	7 @...
German, Red Seal (French Process)	6½@ 6¾
German, Green Seal (French Process)	7 @...
German, White Seal	7¾ @ 8¾
French, Red Seal	8¾@ 8¾
French, Green Seal	10¾@10¾

Dry Colors—

	₱ lb
Black, Drop	6½@10
Black, Lamp, American	3½@ 8
Black, Ivory, English	5 @15
Black, Ivory	16 @20
Lamp, commercial	4 @ 6
Blue, Celestial	4 @ 6
Blue, Chinese	21 @23
Blue, Prussian	27 @31
Blue, Ultramarine	13 @15
Brown, Spanish	1 @ 1
Carmine, No. 40	$3.10@3.25
Green, Chrome, ordinary	3½@ 5
Green, Chrome, pure	17 @25
Lead, Red, bbls.	6½
Lithargе, bbls.	6¾
Ocher, American	₱ ton $8.50@16.00
American Golden	25@30
French	1½@ 2
French, Golden	2 @ 4
Orange Mineral, English	10 @12
French	12½@13
German	12 @13
American	8 @...
Red, Indian, English	4½@ 6
American	3 @ 4
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, American	₱ 100 lb $0.50@1.25
English	₱ 100 lb $1.25@1.60
Sienna, Italian, Burnt and Raw	2 @ 3
Sienna, Italian, Burnt and Raw, Imported	2 @ 3
Italian, Raw, Powdered	3 @ 7
American, Raw	1½@ 2
American Burnt and Raw	1½@ 2
Tale, French	5 @ 7
American	1 @ 2
Terra Alba, French	90 @1.00
English	8 @ 10
American	₱ 100 lb 75 @...
American	₱ 100 lb 50 @75
Ultramarine, Blue	15 @...
Turkey, Raw and Powdered	25@30
Burnt, American	3 @ 4
Raw, American	3 @ 4
Yellow, Chrome, Pure	13¾@15
Vermilion, American, Lead	7 @25
Quicksilver, bulk	65 @...
Quicksilver, flasks	@65
English, Imported	@...
Chinese	5 @ 30

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol *&*. Thus 33⅓ *&* 33⅓ & 10 signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—
Columbian and Domestic 33⅓
North's 10
Zimmerman's—See Fasteners, Band.

Window Stop—
Ives' Patent 35
Taplin's Perfection 35

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—
Fernald Mfg. Co. Burton Anti-Rattlers, ₱ doz. pairs, Nos. 1, $0.75; No. 00, 1, $1.00; 3, $0.50.
Fernald Quick Shifter, ₱ doz. pairs ..... $2.00@$3.00

Anvils—American—
Eagle Anvils, ... ₱ lb. @81¢
Hay Budden, Wrought ..... 9½@9¾¢
Trenton ..... ₱ lb. 9½@9¾¢

Imported—
Swedish Solid Steel Sisco, Superior, ₱ lb. ..... 10¢@10½¢
Peter Wright & Sons, ₱ lb. 84 to 349 lb. 11¢ ; 350 to 699 lb. 11½¢.

Anvil, Vice and Drill—
Millers Falls Co., $18.00 ..... 15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—
Livingston Nail Co. 10%

Augers and Bits—
Com. Double Spur ..... 75&10&10%
Jennings' Patn., Bright ..... 65&10&10%
Blued or Blacked ..... 60&10&5%
Boring Mach. Augers 50
Car Bits, 12-in. twist ..... 40&10%
Ford's Auger and Car Bits ..... 40&5
Ely Washington Auger Co., Cordis 25
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, ... 25&10%
No. 30, R. Jennings' list 50%
Russell Jennings ..... 25&10&5%
L'Hommedieu Car Bits 15%
Mayhew's Countersink Bits 45
Pugh's Black 20
Pugh's Jennings' Pattern 35%
Snell's Auger Bits 60
Snell's Bell Hanger Bits 60%
Snell's Car Bits, 12 in. twist 60
Snell's King Auger Bits 50%
Wright's Jennings' Bits 50%

Bit Stock Drills—
See *Drills, Twist.*

Expansive Bits—
Clark's Pattern, No. 1, ₱ doz., $26; No. 2, ... 50&10%
Ford's, Clark's Pattern ..... 66⅔&5%
C. E. Jennings & Co., Steer's Pat. 25%
Lavigne Pat., small size, $18.00; large size, $26.00 ..... 50&10%
Smith's 60

Gimlet Bits—
Per gro.
Common Dbl. Cut ..... $3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—
Bonney Pat., per doz. ..... *$5.50@6.00*
Ames ..... 25&5%
Universal 50

Ship Augers and Bits—
Ship Augers ..... 50&10&10 —%
Ford's ..... 33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Wright's ..... 33⅓&5%
Snell's 40

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—
Brad Awls:
Handled ..... gro. $2.75@3.00
Unhdld. Shldrd ..... gro. 63¢@66¢
Unhandled, Patent ..... gro. 66¢@70¢
Pac Awls:
Unhandled, Patent ..... gro. 37½¢@40¢
Unhdled. Shldrd ..... gro. 65¢@70¢
Scratch Awls:
Handled, Com ..... gro. $3.50@4.00
Unhandled, Socket ..... gro. $11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—
Single Bit, base weights: Per doz.
First Quality ..... $4.75@5.00
Second Quality ..... $4.25@4.50
Double Bit, base weights:
First Quality ..... $7.00@7.50
Second Quality ..... $6.50@6.75

Axle Grease—
See *Grease, Axle.*

Axles—*Iron or Steel.*
Concord, Loose Collar ..... 4½@5 ¢
Concord, Solid Collar ..... 4¾@5¼¢
No. 1 Common, Loose ..... 3¾@4¼¢
No. 1½ Com., New Style ..... 4½@5 ¢
No. 2 Solid Collar ..... 4½@5 ¢
Half Patent:
Nos. 7, 8, 11 and 12 ..... 65@65&10
Nos. 13 to 14½ ..... 65@65&10
Nos. 15 to 18 ..... 70@70&10
Nos. 19 to 22 ..... 70@70&10

Boxes, Axles—
Common and Concord, not turned ..... lb. 5¢@6¢
Common and Concord, turned, lb. ..... 6@7¢
Half Patent ..... lb. 9½@10¢

Bait—Fishing—
Hendryx:
A Bait 20%
B Bait 25
Competitor Bait ..... 20&5%

Balances—Sash—
Caldwell new list ..... 50&10
Pullman ..... 50&10

Spring—
Spring Balances ..... 50&10&10&5%
Chatillon's:
Ladd Spec. Balances ..... 50&50&10
Straight Balances ..... 40&40&10
Circular Balances ..... 50&10
Large Dial 30

Barb Wire—See *Wire, Barb.*

Bars—Crow—
Steel Crowbars, 10 to 40 lb. ..... per lb., 2¼@2½¢

Towel—
No. 10 Ideal, Nickel Plate ..... ₱ gro. $8.50

Beam, Scale—
Scale Beams 10
Chattillon's No. 1 30
Chattillon's No. 2 40

Beaters, Carpet—
Holt-Lyon Co.:
No. 12 Wire Coppered ₱ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ₱ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned ..... ₱ doz. $1.50

Beaters Egg—
Dover Stamping & Mfg. Co.:
Genuine Dover, per gro.: No. 1, Tumbler Size, $7.50; No. 2, Family Size, $7.20; No. 3, Extra Family Size, $24.00; No. 4, Hotel Size, $30.00.
Holt-Lyon Co.:
Hotel, per gro.: No. 5, Jap'd $9.80; No. 4, Jap'd, $1.15; No. 8, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler, Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.

Bellows—
Blacksmith, Standard List:
Split Leather ..... 60&10&5%
Grain Leather ..... 50&10&10

Hand—
Inch ... 6 7 8 9 10
Doz ... $7.00 7.50 6.00 6.50 7.50

Molders—
Inch ... 10 12 14 16
Doz ... $7.50 9.00 12.00 15.00

Bells—Cow—
Ordinary Goods ..... 75&5@75&10&5%
High grade ..... 70&10@75%
Brass ..... 75&5%
Tower Stop 50

Door—
Home R & E Mfg. Co.'s ..... 35&5%

Hand—
Polished, Brass ..... 50&10@60%
White Metal ..... 70&10@70&10&5%
Nickel Plated ..... 50&5%
Weiss ..... 20&5%
Cone's Globe Hand Bells ..... 33⅓@35%

Miscellaneous—
Farm Bells ..... lb., 25½@24¢
Church and School ..... 60@60&5%

Belting—Leather—
Standard ..... 70&10&10&10&5%
Light ..... 75&10%
Cut Leather Lacing ..... 50&10%
Leather Lacing Sides, per sq. ft. ..... 22½@23¢

Rubber—
Competition (Low Grade), ... 70&10&10&5%
Standard ..... 60&10&10&10%
Best Grades ..... 33⅓&10&10&10%

Bench Stops—
See *Stops, Bench*

Benders and Upsetters, Tire—
Green River Tire Benders and Upsetters 20

Bicycle Goods—
John S. Leng's Son & Co.'s 1907 list:
Chain, Parts, Spokes 50
Tubes 60%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—
Common Wooden ..... 75&10&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30
See also Machines, Hoisting.

Boards, Stove—
Paper and Wood Lined 55%
Embossed 35

Boards, Wash—
See *Washboards.*

Bobs, Plumb—
Kenfiel & Esser Co. 33⅓

Bolts
Carriage, Machine, &c.—
Common Carriage (cut thread):
⅜ x 6 and smaller ..... 75&5&10 —%
Larger and longer ..... 70&10 —%
Phila Eagle, $3.00 list ..... 50&10 —%
Bolt Ends ..... 70@— —%
Machine (Cut Thread):
⅜ x 4 and smaller ..... 75&10&10 —%
Larger and longer ..... 70&10 —%

Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knobs:
Inch ... 3 4 5 6 8
Per doz ... $0.30 .35 .55 .60 .80
Cast Iron Spring Foot, Jap'd:
Inch ... 6 8 10
Per doz ... $1.20 1.50 2.25
Cast Iron Chain, Flat, Japanned:
Inch ... 6 8 10
Per doz ... $1.00 1.40 1.65
Cast Iron Flat Shutter, Jap'd, Brass Knobs:
Inch ... 6 8 10
Per doz ... $0.75 .95 1.25
Wrought Barrel Jap'd ..... 80&10&10%
Barrel Bronzed ..... 60&10%
Spring ..... 70&10&10&10%
Shutter ..... 50&5@50&10&5%
Square Neck ..... 75@75&10%
Square ..... 70&10&10%
Ives' Patent Door 55
Ives' Wrought Metal 45%

Expansion—
E. H. Evans' Crescent ..... 40@60%
Richards Mfg. Co. ..... 55&10%
Steward & Romain Mfg. Co.:
Style No. 15 Double 60
Style No. 1 Single 60%
Style No. 100, Dbl. Jaw, Single 55%
Lag Screw 66⅔

Plow and Stove—
Plow ..... 65&10&5%
Stove ..... 85@85&5%

Tire—
Common Iron 80%
Norway Iron 80%
American Screw Co.:
Norway Phila., list Oct. 16, '84.. 80%
Eagle Phila., list Oct. 16, '84.. 82½%
Bay State, list Dec. 28, '99 80
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84.. 80%
Eagle Phila., list Oct. 16, '84.. 82½%
Eclipse, list Dec. 28, '99 ..... 80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99 80
Norway Phila., list Oct. '84..... 80%
Eagle 82½
Shelton Co.:
Tiger Brand, list Dec. 28, '99.. 80%
Phila., Eagle, list Oct. 16, 1884.. 82½%
Upson Nut Co.:
Tire Bolts 72½

Borers, Bung—
Borers Bung, Ring, with Handle.
Inch 1¼ 1½ 1¾ 2
Per doz ... $4.80 5.60 6.50 8.00
Inch 2¼ 2½
Per doz $8.65 11.50
Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each 25%

Boxes, Mitre—
C. E. Jennings & Co. 25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme ..... 15&10
Perfection 40
Seaver 35

Braces—
Comman Ball, American $1.50
Barber's ..... 50&10&10&10&10%
Fray's Genuine Spofford's 60%
Fray's No. 61, 166, 206, 614 ..... 50%
C. E. Jennings & Co. ..... 50&5%
Mayhew's Ratchet 60%
Mayhew's Quick Action Hay Pat.. 50%
Millers Falls Drill Braces ..... 25&10%
P., S. & W. Co., Peck's Pat.... 60&10%

Brackets—
Wrought Steel ..... 70&10@75&10%
Bradley Metal Clasp.. 80&10@85&10&5%
Griffin's Pressed Steel ..... 75@75&10%
Griffin's Folding Brackets ..... 70&10%
Taplin Rector Handy Egg Beater Bracket ..... ₱ doz. $1.50

Bright Wire Goods—
See *Wire and Wire Goods.*

Broilers—
Kilbourne Mfg. Co. ..... 75&20%
Wire Goods Co. 75

Buckets, Galvanized—
Mfr's list, price per gross.

	Quart..	10	12	14	
Water, Reg...	26.85	29.50	33.50		10&10&10&5%
Water, Heavy	47.35	48.00	52.00		
Fire, Rd. Btm	32.00	33.65	38.65		10&10&5%
Well	37.35	41.35	45.35		

Bull Rings—See *Rings, Bull.*

Butts—Brass—
Wrought, High List, Oct. 66⅔%
Cast Brass, Tiebout's 40%

Cast Iron—
Fast Joint, Broad ..... 40&10&10&5%
Fast Joint, Narrow ..... 40&10&10&5%
Loose Joint ..... 70&10&10&75%
Loose Pin ..... 70&10&10&75%
Mayer's Hinges ..... 70&10&5%
Parliament Butts ..... 70&10&10&5%

Wrought Steel—
Bright.
Light Narrow, Light Reversible ..... 70&5%
Reversible and Broad ..... 70&5%
Loose Joint, Narrow, Light Inside Blued, &c 70
Back Flaps, Table Chest 67½
Japanned.
Light Narrow, Loose Pin ..... 70&5%
Light Narrow, Ball Tip 60%
Broad ..... 70&5%
Steeple Tipped 70%
Ball Tipped 70%

Extra, 10@—

Cages, Bird—

Hendrix Brass: Series ... list, net list, 12½, 15, 20 ...

Hendrix Bronze: Series 700, 800.....30
Hendrix Enameled.....

Calipers—See Compasses.

Calks, Toe and Heel—

Blunt, 1 prong, per lb.
Sharp, 1 prong, per lb.
Barnes Bros' ...
Lawrence Bros' ...
Perkins Blunt ...

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Eley's E. B. ...
G. D. ... per M
E. E. ... per M
G. E. ... per M
Musket ...

Primers—

Berdan Primers $2 per M
Primer Shells and Bullets
All other primers per M $1

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges
.32 C. F. ...
.38 C. F. ...
22 cal. Rem. $1.20 ...
32 cal. Rem. ...
B. B. Caps, Gun Wad Shells
B. B. Caps, Round Ball.....$1.20
Central Fire
Target and Sporting Rifle
Primed Shells and Bullets.....15&10%
Rim Fire Sporting
Rim Fire, Military ...

Casters—

Bed .....65&10%
Plate .....60&5%
Plate, Japanned
Ajax Ball Bearing
Ajax Roller Bearing
Steel Gray
Standard Ball Bearing
Yale Double Wheel

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:
No. 1 ...
No. 2 ...
No. 3, 4, 5 and 6 ...
No. 7, 8 and 9 ...
No. 10 and 11 ...
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Chests, Tool—

American Tool Chest Co.:
Rose Chests with Trays ...
Yankee Chests with Trays ...
Cantilever Chests with Trays ...
Farmers', Carpenters, etc., Chests, with Trays ...
Machinists' and Pipe Fitters' Chests, Empty ...
Tool Cabinets 15
C. E. Jennings & Co.'s Machinists' Tool Chests .....

Chisels—Socket Framing and Firmer

Standard List .....
Buck Bros ...
C. E. Jennings & Co.:
Socket Firmer ...
Socket Framing ...
Socket Corner ...
L. & I. J. White & Co. ...

Tanged—

Lanyard Turners .....
Buck Bros ...
C. E. Jennings & Co. Nos. 191, 181 ...25
L. & I. J. White Co. .....25&5

Cold—

lb.
Cold Chisels, good quality..13@15c
Cold Chisels, fair quality..11@12c
*Cold Chisels, ordinary.....*9@10c

Chucks—

Vulcan Drill Co.:
Vulcan Three Jaw Drill Chuck ...
Beach Drill Chuck .....
Universal ...
Double Chucks ...
Power Lathe Drill ...
Sensitive Drill ...
Combination Lathe Chucks ...
Independent Reversible Lathe Chucks ...
Reversible Lathe Chucks ...
Drill Chuck Mandrels ...
Standard, 45%; Skinner Patent, ... Drill ...
Power Drill ...
Standard Tool Co.:
Improved Drill Chuck.....45
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7 ...
Geared Scroll, Nos. 33, 34 and 35 ...25
Independent Steel, No. 64.....25
Union Drill, Nos. 000, 00, 100, 101, 102 ...
Universal, 11, 12, 16, 17, 13, 14, 15 ...10
Iron Face Plate Jaws, Nos. 28, 39, 48 and 50 35
Westcott Patent Chucks:
Little Giant Auxiliary Drill.....50
Little Giant Double Grip Drill...50
Little Giant Drill, Improved.....50
Oneida Drill 50
Scroll Combination Lathe.....50
Whitney Mfg. Co.:
National Drill 25%

Clamps—

Adjustable Hand Screw Clamps:
Metal, Parallel, S. & W. Co. .....50&10
Besly, Parallel .....33⅓&10
Metal, Rack 60
Lineman's Spanish Neverturn.....65
Wood Workers' Hammers.....40&10
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain,

Iwan's Champion, Adjustable.....50%
Iwan's Champion, Stationary.....40%

Sidewalk—

Star Socket, All Steel, ₱ doz. $4.05 net
Star Shank, All Steel, ₱ doz. $3.24 net
W. & B. Sidewalk, All Steel, ₱ doz. $3.25

Cleavers, Butchers'—

Buck Bros ...
Parker H. Plumb ...
L. & I. J. White Co. 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Co.:
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each..$20.00
Stewart's Enclosed Gear Horse, each $6.75
Stewart's Patent Sheep Shearing Machine, No. 7, each..$12.
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75

Clips, Axle—

Regular Styles, list July 1, '05.

Cloth and Netting, wire

See *Wire, &c.*

Cocks, Brass—

Hard cast list.
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c.
Compression Bibbs .....

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son
Leather, Walter B. Stevens & Son's list

Compasses, Dividers, &c.

Goldsmith's Goods ...

Conductor Pipe,—

List 1 to Jobbers.
Gal. Steel. Charcoal.
Northeastern ...
Eastern ...
Pittsburgh ...
Central ...
Northwestern ...
Western ...
Tennessee ...
Southern ...
Southwestern ...

Coolers, Water—

L. & G. Mfg. Co.: 4 6 8
Galvanized, ea. $1.85 $2.00 $2.25 $2.90 $3.90
Galvanized, Lined, side handles, ...
Eagle ...
Arctic ...
Arctic Lined ...10

Coppers' Tools—

See *Tools, Coppers'.*

Coppers, Soldering—

Soldering Coppers, 3 lb. to pair and heavier, 22&25c; lighter than 3 lb. to pair.....24@27c

Cord—Sash—

Braided Hemp ...lb. 25c
Braided White Cotton, Nos. 8 to 12, No. 7, No. 6, 40c lb. Cut to 1 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18, 37c
Italian, lb., A, No. 18, 25c; B, 22c
Common India .....lb., 11@11½c
Cotton Sash Cord, Twisted..18@20c
Patent Russia .....lb....20c
Cable Laid Russian .....lb....24c
India Hemp, Braided.....lb. 17c
India Hemp, Twisted...lb.13@14c
Patent India, Twisted..lb....17c
Pearl Braided, cotton, No. 6, ₱ lb. ...
Eddystone, Braided, Nos. 8 to 12, ...
Harmony Cable Laid Italian, Nos. 7 ...
Pullman:
White ...
Sash Cord Attachments, per 100..$2.00
Samson, Nos. 8 to 12:
Braided, ₱ lb., Drab Cotton, ...
Twisted, ...
Massachusetts, White...₱ lb 40¢
Massachusetts, Drab...₱ lb 45¢
Phoenix, White, Nos 8 to 12.....37¢
Silver Lake, per lb.:
A, ...
B, ...
Italian Hemp, 40¢; Linen.....57½¢
See also Chain and Ribbon.

Wire, Picture—

Full Length Coil ...
Short Length ...
Hendryx Standard Wire Picture Cord, old list, 85&10
Turner & Stanton Co. Wire Picture ...

Cradles—

Buck Bros ...

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but ... by jobbers.
Zelnicker's Lumber: ₱ gro.
Mathews ...
Eagle ...
Tiger ...
Giant Lumber, 5¼ in. x 15-16 in. Indelibles, $14.00; Blacks.....$10.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, ...
Suremark, Black, $2.25; Blue, Red and Yellow.....$2.50

Crooks, Shepperds'—

Fort Madison, per doz., Heavy, $5.50; ...

Crow Bars—See *Bars, Crow.*

Cultivators—

Vim ...

Cutlery, Table—

Imperial ...
Nonpareil Metal Knives ...
Nonpareil Wood Knives ...
Nonpareil Horn Handles ...
Wilcox ...

Cutters—Glass—

H. H. ...
Ideal ...
B. ...
Enterprise ...

Meat and Food—

Enterprise ...
Universal ...
Peerless ...
Standard ...
New Triumph No. 605, ₱ doz. $21.00
Universal ...
Bell ...

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters.....35%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife...₱ doz. $3.00
Combined Slaw Cutter and Cabbage Grater ...₱ doz. $4.00

Tobacco—

All Iron, Cheap...doz, $4.25@4.50
Enterprise ...
Vim ...

Diggers, Post Hole, &c—

Disston ...
Ideal ...$4. ...25
Samson, ₱ doz. ..$31.00.....25%
Iwan's Imp'ved Post Hole Auger..40%
Vaughan Pattern Post Hole Augers, ₱ doz., $7.00
Perfection Post Hole Diggers, ₱ doz. $8.75
Split Handle Post Hole Diggers ...
Hercules Pattern, ₱ doz. $10.00
Kohler's, ₱ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8. ...
Newark Brass Post Hole Diggers ...
See *Bars, Crow.*

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers Emery Wheel—

Sterling Emery Wheel Dressers.....35%
Sterling Wheel Dresser Cutters.....35%

Drills and Drill Stocks—

Blacksmith's Common Drilling Machines .....$1.50@1.75
Breast, Millers' Falls.....15&10%
Bridgeport, A & W ...
Goodell Automatic Drills.50&10&60&10
Millers Falls Automatic Drills.33⅓&10
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's 30%
Ratchet, Weston's.....40%
Ratchet, Weston's, Style H Improved ...10
Ratchet, No. 012.....40%
Ratchet, Celebrated.....40%
Ratchet, Whitney's, P., S. & W., ...
Whitney's Hand Drill, No. 1, $10.00; ...

Twist Drills—

Bit Stock .....70@70&65%
Taper and Straight Shank, ...
Buck Bros ...

Drivers, Screw—

Screw D'ver Bits, per doz..35@50¢
Baisey's Screw Holder and Driver, ₱ doz., 2½-in., $6; 4-in., $7.50; 6-in., ...
Buck Bros.' Screw Driver Bits.....30%
Champion 50%
Disston ...
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Bruce Screw Drivers....40&10%
Gay's Double Action Ratchet.....35%
Goodell's Auto.....65@65&10%
Mayhew's Black Handle.....40%
Mayhew's Monarch 40%
Millers Falls, Nos. 20 and 21.....25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
Smith & Hemenway Co. Nickel Plated, ... Ebonized, ...
Swan's:
Nos. 7565 to 7568, ...%; No. 7540, ...40&10%

Eave Trough, Galvanized—

Charcoal.
Territory...Gal. Steel. Iron.
Northeastern ...
Eastern ...
Pittsburgh ...80&20% 65&10%
Central ...80&10&10&2½% 65&10%
Northwestern ...
Western ...
Tennessee ...80&5% 60&10&5%
Southern ...
Southwestern ...75&10&2½% 60&5%

See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories: Galv. Steel and Galv. C. I.
No. 24 ...
No. 25 .....25%
No. 27 ...

Elbows, Stove Pipe—

Edwards, Standard Blue....40&10&10%
Edwards, Royal Blue.....40&10&10%
Reeves, Dover, one piece.....40&10%

Emery, Turkish—

	¼ to	½ to
	...	...
Kegs ...	15	14
¼ Kegs ...	16	15
¼ Kegs.....lb.	5½¢	6¢ 4¢
10-lb. cans, less	...	...

Extractors, Lemon Juice—

—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's ..... 50&10
Wallings ..... 40&10
Upson's Patent 40

Cord and Weight—

Ives and Titus 33⅓

Corrugated—

Acme Corrugated Fasteners 70

Faucets—

Cork Lined ..... 50&10@60%
Metallic Key, Leather Lined .. 60&10@70
Red Cedar ..... 40&5@40&10@45
Petroleum ..... 70&10@75
B. & L. B. Co.:
Metal Key ..... 60&10
Star 63
West Lock ..... 50&10
John Sommer's Peerless Tin Key 40
John Sommer's Boss Tin Key 50
John Sommer's No Brand, Cedar 50
John Sommer's Perfection, Cedar 40%
Self Measuring:
Enterprise, ₱ doz. $36.00 ..... 40&10
Lance, ₱ doz. $36.00 ..... 40&10
National Measuring, ₱ doz. $36.40 ..... 40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List Nov. 1, 1899.
Best Brands ..... 70&10@75&10%
Standard Brands ..... 75&10@80
Lower Grade ..... 75&10@80&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 ..... 33⅓@40%

Fixtures, Fire Door—

Allith Underwriters' Approved 50
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 ..... $3.75
Fusible Links, No. 96 50
Expansion Bolts, No. 107 ..... 60&10

Grindstone—

Net Prices:

Inch	15	17	19	21
Per doz.	$3.60	3.85	4.15	4.65

P. S. & W. Co. 25
Reading Hardware Co. 60

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1905, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Em Potato ..... 60&10
Victor, Hay ..... 60&15@2½
Victor, Manure 66⅔
Victor, Header 66⅔
Champion, Hay 60
Champion, Header 65
Champion, Manure ..... 60&15&2½
Columbia, Hay ..... 60&20
Columbia, Manure 70
Columbia, Grubbing ..... 70&12½
Hawkeye Wood Barley 10
W. & C. Potato Digger ..... 60&10
Acme Hay ..... 60&10
Acme Manure, 4 tine ..... 60&10&5
Dakota Header ..... 60&20
Jackson Steel Barley ..... 60&20
Kansas Header 60
W. & P. Wire Wood Barley 40%
Plated,—See Spoons.

Frames— Wood Saw—

White, S'g't Bar, per doz. 75@80¢
Red, S'g't Bar, per doz. $1.00@1.25
Red, Dbl. Brace, per doz. $1.50@1.50

Freezers, Ice Cream—

Qt. 1 2 3 4 6
Each $1.25 $1.60 $1.90 $2.20 $2.80

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse—

	Per 1000 Feet.
Hemp	$2.75
Cotton	3.20
Waterproof Sgl. Taped	3.60
Waterproof Dbl. Taped	4.00
Waterproof Tpl. Taped	5.15

Gates, Molasses and Oil—

Stebbins' Pattern ..... 50&10&5%

Gauges—

Marking, Mortise &c. ..... 50&10&10
Cleveland Steel Co.:
Marking, Mortise &c. ..... 50&10&10
Improved Marking, Mortise &c. 60
Mill Bevels & Shutter Dogs 60
Wire Marking 60
Wm. P. S. & W. Co. 33⅓

Gimlets— Single Cut—

Numbered assortments per doz.
Nail, Metal, No. 1, $2.00; 2, $2.20
Shell, Metal, No. 1, $2.00; 2, $2.20
Nail, Wood Handled, No. 1 ..... $2.00
Spike, Wood Handled, No. 1, Spiral, $2.00

Glass, American Window

See *Trade Report.*

Glasses, Level—

Cross ..... 65&5&1
Hill 50

Glue, Liquid Fish—

Bottles or Cans ..... 10c Brush, 25¢ each $2.00

Grease, Axle—

Common Grade . . . gro. $6.00@$6.50
Dixon's Everlasting, 1-lb. pails, ea. 35¢; in boxes, ₱ doz., 1 lb. $1.20, 2 lb. $2.00
Helmet Hard Oil 25

Griddles, Soapstone—

Pike Mfg. Co. ..... 33⅓@33⅓&10

Grinders—

Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 31, $1.75; 1A, $2.50, 10, $5.00 ..... 30%
Alundum Sickle Grinders, each, Nos. 20, $5.00, 20A, $6.00, 20A Combined, $6.50 ..... 30%
Alundum Disc Grinders, each, $2.50 30

Grindstones—

Pike Mfg. Co.:
Imported Family Grindstones, ₱ inch, ₱ doz., $2.00 ..... 33⅓%
Richards Mfg. Co., Ell and Cycle Ball Bearing, mounted 40

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... 65@65&10%
Bridgeport Chain Co.:
Triumph Coil and Halters ..... 35&2½&40
Brown Coil and Halters ..... 45&50&5
Brown Cow Ties ..... 50&5&60&10&5
Brown Tie Outs ..... 70&10@75&5
Covert Mfg. Co.:
Web ..... 30&2
Jute Rope 35
Sisal Rope 20
Cotton Rope 45
Hemp Rope ..... 45&10
Oneida Community:
Am Coil and Halters ..... 40@40&5
Am. Cow Ties ..... 45@50
Niagara Coil and Halters ..... 45@50&5
Niagara Cow Ties ..... 45&5@60&10&5

Hammers—

Handled Hammers—

Heller's Machinists' ..... 55&10@55&10&5
Heller's Farriers ..... 40&5@40&10&5
Peck, Stow & Wilcox Co.:
Crucible Steel ..... 40&10
Farriers ..... 40&10
Riveting ..... 40&10
Machinists ..... 60&10
Blacksmiths 50
Fayatte R. Plumb:
A. E. Nail ..... 40&2½@40&12½
Eng. and B. S. Hand ..... 50&10&5@60&5
Machinists' Hammers ..... 60@60&10
Rivet and Tinners' ..... 40&7½@40&12½&5

Heavy Hammers and Sledges—

Under 3 lb., per lb. ..... 50¢ . . . 80&10%
3 to 5 lb., per lb. ..... 40¢ . . . 80&10%
Over 5 lb., per lb. ..... 30¢
Over 5 lb., per lb. ..... 30¢ . . . 80&10&10%

Handles—

Agricultural Tool Handles

Axe, Pick, &c. ..... 60@10@60&10&5%
Hoe, Rake, &c. 40
Fork, Shovel, Spade, &c.:
Long Handles 40
D Handles 40

Cross-Cut Saw Handles—

Atkins 10
Champion 50
Disston's 50%

Mechanics' Tool Handles—

Auger, assorted . . . gro. $3.00@$3.50
Bead . . . gro. $1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory ..... $2.15@2.30
Socket Firming, Apple, $1.75@ $1.95; Hickory ..... 1.60@1.75
Socket Framing, Hickory,
File assorted . . . gro. $1.30@$1.40
Hammer, Hatchet, &c.,
60&10@60&10&5%
Hand Saw, Varnished, doz., 80¢ 85¢; Not Varnished ..... 65@75¢
Plane Handles:
Jack, doz., 30¢; Fore, doz. ..45¢
Chapin-Stephens Co.:
Carving Tool ..... 30@30&10%
Chisel ..... 60@60&10
File and Awl ..... 60@60&10%
Saw and Plane ..... 30@30&10
Screw Driver ..... 30@30&10
Millers Falls Adj. and Ratchet Auger Handles ..... 15&10
Nicholson Simplicity File Handle . . . ₱ gro $6.80@$11.50
J. L. Ogden:
Indestructible File and Tool ₱ gro., No. 1, $8.00; No. 2, $8.50; No. 3, $9.00; No. 4, $9.50; No. 5, $10.00 ..... gro. lots 10%
W. A. Zelaznik Supply Co.:
Hatchet, doz. ₱ in. $2.50; 11 in. $2.00; 16 in., $2.30; 18 12., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Shelving ..... doz. 29 in. $2.90; [illegible] $3.00; [illegible] $3.10; [illegible] $3.20; [illegible] $4.00; [illegible] $4.10; [illegible] $5.00; 34 in. $5.00; 36 in., $5.80.
Adz ..... 26 in. $5.80; 28 in. $6.00.
Pick, ₱ doz., R. R., 36 in., $8.00; coal, 34 in., $5.80.
Hammer ..... 11 in. $2.00.

Hangers—

NOTE.—Barn Door Hangers are designated by name only, without track or Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable, No. 1 and 2; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door 50
Chicago Spring Butt Co.:
Friction 25%
Oscillating 35
Big Twin 25
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50
Elevator 30
Railroad 50
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60&2½
Roller Bearing ..... 70&2½
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00 ..... 60&10
Roller Bearing, No. 11, $15.00 ..... 60&10%
Roller Bearing, Ex. Hy., No. 22, $18.00 ..... 60&10
Ball Dog, $24.00 70
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard ..... 60&10
Hinged ..... net $6.50
Covered ..... 60&5
Special ..... 70&5
Lawrence Bros.:
Advance ..... 55&10
Cleveland ..... 70&7½
Clipper, No. 75 60
Crown ..... 55&10
Cyclone, No. 40 ..... net $6.50
Tandem, No. 50 ..... net $7.50
New York ..... 55&10
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2 ..70%
Anti Friction 60
Hinged Hangers, King Charm ..60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3 ..$2.25
Roller B'r'g St'l Track No. 12 $2.20
Roller B'r'g St'l Track No. 13 $2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½
Hero, Adj. Track No. 19 ..50&10%
Adjustable Track Tandem Trolley Track No. 16 ..... 50&10
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22 ..50&5%
Trolley B, D, No. 17, $1.25; F, D, No. 120, $2.25; No. 121, $2.45; No. 150 ..... $2.50
Safety Underwriters F. D. No. 101 50
Tandem, No. 11, 2½ and 3 ..60&10
Palace, Adjustable Track No. 132 ..... 50&5
Royal, Adjustable Track No. 129 ..... 50&10
Ives' Wood Track No. 1 ..... $2.25
Trolley B, D, No. 20 ..... 50&10
Trolley B, D, No. 24, $1.30; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2 ..70&7½
Anti friction, No. 42; No. 44, sizes 2½ 60
Hinged Tandem No. 48 ..60&5
Folding Door B. B. Swivel No. 135 40
Taylor & Boggis Fy Co.'s Kinder's Roller Bearing ..50&15&10&5%
Myers' Stayon Hangers 60

Hangers— Garment—

Pullman Trouser, ₱ gro., No. 1 $9.00; No. 4, $24.00; No. 5, $16.50; No. 8, Black Enamel, $7.50; No. 10, $21.00; No. 12, $8.00; No. 15, Rods, $9.00; No. 18, Loops $10.00
Victor Folding ..... ₱ gro. $9.60

Gate—

Myers' Patent Gate Hangers, ₱ doz. net $4.50

Joist and Timber—

Lane Bros. Co. 30

Hasps—

Griffin's Security Hasp ..... 50&10
McKinney's Perfect Hasp, ₱ doz. ..60

Hatchets—

Regular list, first qual. ..40&2½@—
Second quality ..... 50&5@—

Heaters, Carriage—

Clark, No. 5, $1.75; No. 5R, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3R, $3.25; No. 1, $3.50 ..... 25%
Clark Coal, ₱ doz., $0.75 ..... 20%

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind:
(Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	2	3
Doz. pair	$0.75	1.45	2.70

Mortise Shutter:
(I. & P., O. S. Acme, &c.)

No.	1	2	3
Doz. pair	$0.50	.65	.90

Mortise Reversible Shutter (Buffalo, &c.):

No.	1	2	3
Doz. pair	$0.70	.85	.90

Narrow Art Square Blind Fixtures No. 1 Set Wood $0.90 No. 2 Iron Brick, $1.50 10
Charles Parker Co. ..... 70@75%
Parker Wire Goods Co.
Hale & Beecham Automatic Blind Hinge 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for iron 20
Reading's Gravity 60

Stanley's Steel Gravity Blind Hinges, No. 1647½, ₱ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
No. 5, Lull & Porter ..... 75&5
Acme, Lull & Porter 75%
Queen City Reversible 55
Shepard's Noiseless, Nos. 61, 65, 66 ..... 75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&5
Tip Pat'n, No. 1 ..... 75&10%
No. 3 ..... 75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 70&10&5
Shepard's Double Locking 75%
Champion Gravity Locking ..... 75&5%
Palmer ..... 75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60&10

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3	4
Hinges with Lt'chs	$2.40	2.70	3.00	
Hinges only	1.50	2.05	3.80	
Latches only	.70	.70	.85	

New England:

With Latch	*doz.*	*@*	$2.00
Without Latch	*doz.*	*@*	$1.60

Reversible Self-Closing:

With Latch	*doz.*	*@*	$1.75
Without Latch	*doz.*	*@*	$1.35

Western:

With Latch	*doz.*		$1.75
Without Latch	*doz.*		$1.15

Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 ..... 70%

Pivot Hinges—

Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—

Holdback, Cast Iron . . . $6.75@$7.00
Non-Holdback, C'st Iron $6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 40%
Bardsley's Patent Checking ..33⅓
Bommer Bros.:
Bommer Ball Bearing Floor ..40%
Bommer Spring Hinges 40%
No. 999 Wrot. Steel Hold Back, ₱ gro. $9.00.
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50
Chicago (Ball Bearing) Floor ..50
Garden City Engine House 25
Keene's Saloon Door 25
Columbian Hardware Co.:
Acme, Wrought Steel 30
Acme, Brass 25%
American 30
Columbia, ₱ gr., No. 14, $9.00, No. 18 ..... $25.00
Columbia, Adj., No. 7, ₱ gr. $12.00
Columbian Hinges ..... 60&10%
Gem, new list 30%
Clover Leaf and Acorn, gro. lots, $5.10; less than gro, lots $6.00
Oxford, new list 30%
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co., Matchless ..30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door ..... ₱ gr. $9.00
Chief Ball Bearings Floor Hinge 50
Ball Bearing Door 25%
No. 707, Sheet Steel Holdb'k, ₱ gr. pr. $9.00
Standard Mfg. Co.:
Champion Double Acting Door Hinge ..... 25&10&10%
Standard Double Acting Door Hinge ..... 25&10&10%
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓%

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1905:

Light Strap Hinges	.50&10
Heavy Strap Hinges	.60&5
Light T Hinges	.50
Heavy T Hinges	.40
Extra Hvy. T Hinges	.50&10
Hinge Hasps	.33⅓
Cor. Heavy Strap	.60&5
Cor. Ex. Heavy T	.50&10

Screw Hook and Strap:

Screw Hook	6 to 12 in. .1b .3
and Strap.	14 to 18 in. .1b .3
	22 to 36 in. .1b .3

Screw Hook and Eye:

¾ to 1 inch	.1b .3
1¼ inch	.1b .3
1½ inch	.1b .3

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers ..30&2

Hods— Coal

M'f'gr's list, price per gross:

Tuck	15	16	17	18
Gable, Open	$8.5	$9.0	$9.5	$10.1
Jap, Open	7.6	8.0	8.4	
Gable, Funnel	7.9	8.3	8.8	9.3
Jap, Funnel	7.3	7.6	7.9	8.3

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick, No. 162 ..... each $1.0
Steel Mortar, No. 158 ..... each $1.0

Hoes— Eye—

Scovil and Oval Pattern.

Grub, list Feb. 23, 1899.				
	6	7	8	10
D. & H. Scovil	27½	30	32½	37½
Am. Tool & Hoe Co.	Scovil Pat.			

Extra 10c often given on most of these things.

Handled—

NOTE—Manufacturers are selling from the list of September 1, 1903, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cranks Wrecking, No. 1, $2.00 ... $2.50
Slot Drilling Bit ... $5.50
Ft. Madison Cotton Hoe ... 75&10%
Ft. Madison Crescent Cultivator Hoe, per doz. ... 75&10
Ft. Madison Mattock Hoes:
Regular Weight ... ₱ doz. 10&5
Junior Size ... ₱ doz. $1.00
Ft. Madison Sprouting Hoe, ₱ doz. ... 60&10
Ft. Madison Dixie Tobacco Hoe ... 75&15&5%
Kretsinger's Cut Easy ... 75&10
Warren Hoe ... 10&5
W. & C. Ivanhoe ... 75&5
B. B. 6 in. Cultivator Hoe ... $5.40
B. B., 6½ in. ... $6.00
A. and E. Weeding ... ₱ doz. net $4.35
W. & C. L'ning Shuffle Hoe ... $5.25, $5.25

Hoisting Apparatus—

See Machines, Hoisting.

Holders— Bit—

Angular, ₱ doz. $24.00 ... 45&10

Door—

Bardsley's, Iron, 40; Brass and Bronze ... 25
Empire ... 50
Pullman ... 25
Richards Mfg. Co.: No. 117, Electric, 40; Nos. 118, 119, Surge Grip ... 50
Superior ... 50

File and Tool—

Nicholson File Holders and File Handles ... 30&5&40

Fruit Jar—

Triumph Fruit Jar Holder, ₱ gross $10.80, ₱ doz. ... $1.25

Trace and Rein—

Fernald Double Trace Holder, ₱ doz. pairs ... $1.25
Dazé Rein Holder, ₱ doz. pairs $1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty ... 50
German ... 33⅓

Hooks—Cast Iron—

Bird Cage, Reading ... 40
Clothes Line, Reading List ... 40
Coat and Hat, Reading ... 40&20
Coat and Hat, Wrightsville ... 60&5
Harness, Reading List ... 40

Wire—

Belt ... 80
Wire C. & H. Hooks ... 80
Bradley Mfg. Co., Bradley Wire, Coat and Hat, 70&10%; Ceiling ... 70&10
Columbian Hdw. Co., Gem ... 70&5
Parker Wire Goods Co., King ... 70&10%
Wire Goods Co.: Acme, 60&10; Chief, 70; Crown, 75; Czar, 65; V Brace, 75; Czar Harness, 50&10%

Wrought Iron—

Bor, 6 in., per doz., $1.00; 8 in., $1.15; 10 in., $2.50.
Cotton ... *doz. $1.00 to $1.25*
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see Stops, Bench.
Rush, Light, doz., $6.20; Medium, $8.65; Heavy, $7.65.
Grass, best, all sizes, per doz. $1.60
Grass, common grades, all sizes, per doz. ... $1.50
Whalebones ... *lb. 5¼ cents*
Hooks and Eyes:
Brass ... 60&10&5
Malleable Iron ... 70&10&5
Coat and Mfg. Co. Gate and Snap Hooks ... 40
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $3.25 net
Turner & Stanton Co. Cap and Shoulder ... 50&10
Bench Hooks, see Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See Nails, Horse.

Horseshoes—

See Shoes, Horses.

Hose, Rubber—

Garden Hose, ¾-inch:
Competition ... *ft. 7½ to 8c*
Alpha Guaranteed ... *ft. 9½ to 10c*
Alpha Guaranteed ... *ft. 11½ to 12c*
Cotton Garden, ¾ in., Coupled Line Goods ... *ft. 9½ to 10c*
Line Goods ... *ft. 11½ to 12c*

Irons—

Sad—

Flat, 3 to 10 ... *lb. 4½c*
B. & S. Sad Irons ... *lb. 6½c*
Miss Patter, cents per set ... *50*
Tinned ... *50*
Polished ... *50*
Nickel Plated ... *50*
New England Pressed Steel ... *50*

Bar and Corner—

B. & E. Mfg. Co. Bar ... 50

Pinking—

Pinking Irons ... *each 50c*

Irons, Soldering

See Copper.

Jacks, Wagons—

Coes Mfg. Co.: Lever Jack ... 50
Lever ... 50
Ratchet ... 50
Ratchet ... 50
Ratchet

Pinking Irons—
See Irons, Pinking.

Pins, Escutcheon—
Brass ..... 50@50&10
Iron, list Nov. 11, '85 ..60@60&10@5

Pipe, Cast Iron Soil—
Standard, 4-6 in. ..... 60@60&10
Extra Heavy, 4-6 in ..... 70@70&10
Fittings, Standard and Heavy, ... 70@70@70

Pipe, Merchant—

	Consumers, Carloads, Steel	*Iron*
	Blk. Galv.	*Blk. Galv.*
	%	%
¼ and ⅜ in.	67	62
½ in.	66	62
⅝ in.	68	66
¾ in.	72	70
⅞ to 6 in.	72	70
7 to 12 in.	69	67

Pipe, Vitrified Sewer—
Carload lots
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First class 85
Second-class 90

Pipe, Stove—

	Per 100 joints.	
Edwards' Nested:	C. L.	L. C. L.
5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	6.75	7.75
7 in., Standard Blue	7.75	8.75
5 in., Royal Blue	7.00	8.00
6 in., Royal Blue	7.50	8.50
7 in., Royal Blue	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color	$6.15	$7.15
6 in., Uniform Color	6.65	7.65
7 in., Uniform Color	7.65	8.65

Planes and Plane Irons—
Wood Planes
Beach, first qual ..... 30@30&10
Beach, second qual ..... per cent.
Mahlon ..... 25@25@10
Chapin-Stephens Co.:
Beech, First Quality 1
Beech, Second Quality 1
Miller & Metcalf 25
Turned German 6
Union 6

Iron Planes -
Complete Iron Planes ..... 50@1
Irons 6

Plane Irons—
Wood Bench Plane Irons, list Jan 12, 06 25
Beck Bros 5
Chapin-Stephens Co 5
Union 5
L. & J. White ..... 20&10

Planters, Corn, Hand—
Keller's Eclipse ..... 2 doz $8.00

Plates—
Felloe ..... *lb. 4@4¼¢*

Pliers and Nippers -
Button Pliers ..... 75&10@75&10@75
Gas Burners, per doz., 5 in., $1.25; 6 in., $1.45; 8 in., $1.75; 10 in., $2.50

Gas Pipe	*7*	*8*	*10*	*12-in.*
	$2.00	*$2.25*	*$2.75*	*$3.50*

Acme Nippers ..... 50&5
Cronk & Carrier Mfg. Co.:
American Button 80%
Improved Button ..... 75&10%
Cronk's 60%
No. 3 Linemen's 50%
Stubs's Pattern 40
Combination and others 30
Heller's Farriers' Nippers, Pincers and Tools ..... 40&10@50
P., S. & W. Tinners' Cutting Nippers 40
Seabrook, Stile, Etd and Diagonal Cutting Pliers 40
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels ..... 50@50&10
Chapin's Imp. Brass Cor. ..40@40&10
Pocket Levels ..... 30&10
Extension Sights ..... 50@50&10
Mongrel Levels ..... 40@40&10
Disston's Plumbs and Levels ....60&10%
Disston's Pocket Levels ..... 60&10%
Stanley Plumbs 35
Wood Extension 30

Points, Glaziers'—
Bulk and 1 lb papers ..... *lb* 9 c
½ lb. papers ..... *lb* 10 c
¼ lb. papers ..... *lb* 11 c

Police Goods—
Manufacturers' Lists ..... 35@35&5
Tower 35

Polish—Metal, Etc—
Crocus 5
Emery ..... 5@5&10
Flour 5
Rouge ..... 5@5&10

George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₰ doz., 50¢; ¼ gr., $1.50; ½ lb. boxes, ₰ doz., $1.25; 1 lb. boxes, ₰ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₰ doz., $1.25.
Barkeepers' Friend Metal Polish, ₰ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ₰ lb 14¢
Black Eagle Liquid, ½ 1¼ cans, ₰ doz 75¢
Black Jack Paste, ¼ lb cans, ₰ gr $9.00
Black Kid Paste, 5 lb can, each $6.65
Laddie Black Beauty Liquid, 1 qt 100 tins $6.75
Joseph Dixon, ₰ gr. $5.75 ..... 10%
Dixon's Plumbago, ₰ lb 8¢
Pineoke ..... ₰ gr. $2.50
Gem, ₰ gr. $4.50 ..... 10%
Japanese ..... ₰ gr. $3.50
Jet Black ..... ₰ gr. $3.50
Peerless Iron Enamel, 10 oz. cans, ₰ doz. $1.30

Poppers, Corn—
1 qt. Square, doz. $0.80; gro. $8.75
1 qt. Round, doz. $0.90; gro. $10.00
Pint Square, doz. $1.00; gro. $11.00
½ pt Square, doz. $1.25; gro. $14.50

Post Hole and Tree Augers and Diggers—
See also Diggers, Post Hole, &c.

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 8 ft., 48¢.
Steel Hitching Posts ..... each $1.30

Potato Parers—
See Parers, Potato.

Pots, Glue—
Enamelled ..... 85&10%
Tinned ..... 30&10%

Powder—
In Canisters:
Duck, 1 lb. ..... *each 4¢*
Fine Sporting, 1 lb. ..... *each 75¢*
Rifle, ¼ lb. ..... *each 15¢*
Rifle, 1 lb. ..... *each 25¢*
In Kegs
12½ lb kegs *$3.50*
25 lb. kegs *$6.50*
King's Semi-Smokeless:
Keg (25 lb bulk) $6.50
Half Keg (12½ lb bulk) 3.50
Quarter Keg (6¼ lb bulk) 1.90
Case (1 lb cans bulk) 8.50
Half case (½ lb cans bulk) 4.50
King's Smokeless:

	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb c. bk)	7.25	8.75

Presses—
Fruit and Jelly—
Enterprise Mfg. Co. ..... 20@25

Seal Presses—
Merrill's No. 1 to 4 ..... $20.00 ..... 50%

Pruning Hooks and Shears
See Shears.

Pullers, Nail—
Coulter 50
Miller's Falls, No. 3, ₰ doz., $12.00 ..... 50&10
Morrill's No. 1, Nail Puller, ₰ doz. 50
Pearson No. 1, Cyclone Spike Puller, each $30.00 ..... 50%
The Scranton Co., Case Lots:
No. 2B (large) $5.50
No. 3B (small) $5.00
Smith & Hemenway Co.:
Diamond B 70%
Giant 50
Staple Pullers, Utica and Davis-ville 60

Pulleys, Single Wheel—

Inch	*¾*	*1*	*1¼*	*1½*	*2*	*3*
Acming or Tackle, ...						
per doz	*$0.40*	*.45*	*.60*	*.75*	*1.05*	
Hay Fork, Swivel or Solid Eye, doz., ¼ in., $1.25; 5 in., $1.55						
Inch			*1¼*	*1½*	*2*	*2½*
Hot House, doz	*$0.65*	*.85*	*1.20*			
Inch	*1¼*	*1½*	*1¾*	*2*		
Screw, doz	*$0.50*	*.70*	*.75*	*.80*		
Inch		*1¼*	*1½*	*2*	*2½*	
Stub, doz	*$0.45*	*.50*	*.55*	*.60*		
Inch		*1½*	*1¾*	*2*	*2½*	

Sash Pulleys—
Common Frame; Square or Round End, per doz., 1¾ and 2 in ..... *12¢@20¢*
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in ..... *20¢@21¢*
Acme, No. 35...1¾ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain ..... 50&10
Wrought Steel Ball ..... 17½&10
Tubular Steel Ball ..... Welded
No. 2 ..... 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in. 50
Grand Rapids All Steel Noiseless 50%
No. 26, Troy...1¾ in., 14½¢; 2 in., 16½¢
Star, No. 26...1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Canton 60
Double Spout ..... 75&10@75&10
Wood Pumps, Tubing, &c. 50%
Barnes Pitcher Spout ..... 75&10
Contractors' Rubber Diaphragm, No. 2, B. & L. Block Co. $16.00
Daisy Spray Pump ..... ₰ doz. $6.50
Flint & Walling's Fast Mail Hand (low list) 50%
Flint & Walling's Fast Mail (low list) 50%
Flint & Wallings' Tight Top Pitcher ..... 75&10
National Specialty Mfg. Co., Measure, No. 2, $6.00; 3, $5.50 ..... 30%
Myers' Pumps (low list) ..... 40&5%
Myers' Power Pumps ..... 40&5
Myers' Spray Pumps ..... 40&5

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No.	*1*	*2*	*3*	*4*
	$5.00	*6.00*	*7.00*	*8.00*

Cup Leather—Per 100:

Inch	*2½*	*3*	*3½*	*4*
	$5.00	*7.00*	*9.00*	*12.00*

Punches—
Saddlers' or Drive, good, doz ..... *50¢@75¢*
Spring, single tube, good quality *$1.75*
Revolving (4 tubes) ..... *doz. $3.50*
Bemis & Call Co.'s Cast St'l Drive ..50%
Merrill Bros., 1AA, 1A, 1B, 1C, 1D, $15.00 ..... 50%
Hercules, 1 in. each $5.00 50
Niagara Hollow Punches 40
Niagara Solid Punches ..... 55&10%
Tinners' Hollow, P., S. & W. Co. ..40%
Tinners' Solid, P., S. & W. Co., ₰ doz., $1.41 40

Rail—Barn Door, &c.—
Sliding Door, Painted Iron, ... *2½@2¾¢*
Sliding Door, Wrought Brass, *Pin in. lb.* 30
Allith Mfg. Co.: Reliable Hanger Track 55
Cook's Boarded Braced Steel Rail...₰ ft. 3¼¢
O. N. T. Rail $3.45
Griffin's:
xxx, ₰ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ₰ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ₰ 100 ft. $3.45
O. N. T., ₰ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in. ..... ₰ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in. ₰ 100 ft. $7.50; 1¼ x 3-16 in., $8.75 ..... 55&7½%
McKinney's:
Hinged Hanger Track, ₰ ft., 11¢
1 x 3-16 Track ..... 55&7½
Myers' Stavoil Track ..... 60&5
Richards Mfg. Co.:
Compass x 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail..60&10%
Lag Screw Rail, No. 65 ..... 50%
Gauge Trolley Track, ₰ ft., No. 31, 2¼ in., 11¢; No. 32 ..... 60&10%
No. 50 ..... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn $2.25
Fort Madison Blue Head Lawn....$2.75)
Cronk's:
Steel Garden, Champion, 23 Ideal, 98½; Victor ..... 80&25
Queen City Lawn, ₰ doz., 20 teeth, 22 25, 24 30 ..... net
Anticlog Lawn, ₰ doz. $4.00
Malleable Garden ..... 70&10
Ideal Steel Garden, ₰ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00 ..... 80%
Kelleher's:
Lawn Queen, 20-tooth...₰ doz. $3.15
Lawn Queen, 24-tooth...₰ doz. $3.25
Paragon, 20-tooth ..... ₰ doz. $2.70
Paragon, 24-tooth ..... ₰ doz. $2.75
Steel Garden, 14-tooth...₰ doz. $2.40
Malleable Garden, 14-tooth, ₰ doz. $2.00@2.25

Rasps, Horse—
Disston's 75
Heller Bros. ..... 70&5@70&10&5%
Liverpool Rasps, Gold Medal, 70&10@75%
McCaffrey's American Standard ..... 60&10&5%
New Nicholson ..... 70&10@75%
See also Files.

Razors—
Liana Bo-ras-ic 60
Fox Razors, ₰ doz., No. 42, $20.00; No. 14, $29.00; No. 82, Platina, $38.00 } 10%
Red Devil 65%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 10, A 10, B 10 ..... Raised
Pemelo, Jacket, Pomplo 20%
Aluminum, German Silv., Bronze..25%
1240 N, 124 N 20%
3004 N, 06 N, 6 RM, G 9 ..... 25%
2504 N, 2504 PN, 2504 P 25%
2504 N ..... 2504 N 25%
2504 PN ..... 2504 N 25%
906 PN, 904 N, 904 PN 25
506 PN, 506 N 25
Complete ..... 202 P, 202 PN, 202 P
202 PN, 202 PR, 202 PR 20%
304 P, 304 PN, 06304 P, 06304 PN..33⅓%

Registers—*List July 1, 1908*
Japanned, Electroplated and Bronzed 70%
White Porcelain Enamel ..50&10%
Solid Brass or Bronze Metal ..40%

Revolvers—
Single Action ..... *list@$1.00*
Double Action, except 44 cal. ..$2.00
Double Action, 44 caliber ...$2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grad—
16 in ..... *per doz. $2.50@$2.75*
17 in ..... *per doz. $2.75@$3.00*
18 in ..... *per doz. $3.00@$3.25*

Rings and Ringers—
Bull Rings—

	2	*2½*	*3 inch*
Steel	*$0.70*	*0.75*	*0.80 doz*
Copper	*$1.10*	*1.25*	*1.65 doz*

Hog Rings and Ringers—
Hill's Rings, gro. boxes $4.50@$4.5
Hill's Ringers, Gray Iron, doz., 90@95
Hill's Ringers, Malleable Iron, doz. 80@85
Blair's Rings...per gro. $5.00@$5.5
Blair's Ringers...per doz. 75@90

Rivets and Burrs—
Copper ..... 50@50&5%
Carriage, Coopers', Tinners', &c., Black ..... 70&10
Metallic Tinned 70

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, paste board boxes, 50 count, 20@25¢
Tin boxes, 100 count, 30@32¢
Tubular, per doz. boxes, 50 count, 20@22¢; 100 count, 51@58¢.

Rollers—
Cronk's Stay, No. 50 ..... $1.00
Cronk's Brickerhoff No. 55, $0.60; No. 56, $0.75; No. 60 ..... $0.90
Lane's Stay 40%
Richards' Stay:
Handy Arm and Reversible No. 55 75%
O. K. Adj. and Reversible No. 58.50%
Lead Casting, Nos. 55 and 56 ..... 50%
Underwriters', Nos. 59, 60 ..... 50%
Favorite, No. 54 60

Rope—
Manila, 7-16 in. diam. and larger: Pure ..... *lb. 16@16½¢*
Sisal, 7-16 in. diam. and larger: Pure ..... *lb. 7½@7¾¢*
Sisal, 7-16 in. diam. and larger: lower grade ..... *lb., 6½@7¢*
Sisal, Ung. Hide and Rub Rope, Medium and Coarse: Mixed ..... *lb., 6½@6¾¢*
Pure ..... *lb., 7½@7¾¢*
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred: Mixed ..... *lb., 7@7½¢*
Pure ..... *lb., 6¾¢*
Cotton Rope:
Best, 1/4-in. and larger...18@20¢
Medium, 1/4-in. and larger..16@17¢
Common, 1/4-in. and larger...10@12¢
In coils, ½¢ advance.
Jute Rope:
Thread, No. 1, 1/4 in. and up, lb ..... *6½¢*
Thread, No. 2, 1/4 in. and up, lb ..... *7¼¢*

Wire Rope—
Galvanized ..... *37½@42½%*
Plain ..... *47½@52½%*

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35 ..... Sisal 20%

Rules
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60
Firenfold 40
Ivory ..... 25@25&10
Miscellaneous ..... 50&10%
Stephens' Combination ..... 50&10%
Stanley ..... 50&10
Keuffel & Esser Co.:
Folding, Wood ..... 35&5
Folding, Steel ..... 33⅓&5
Lufkin's Steel ..... 50&5
Lufkin's Lumber ..... 50&5
Upson Nut Co.:
Boxwood ..... 60@60&10
Ivory ..... 35&10@35&10&5

Sash Balances—
See Balance, Sash.

Sash Locks—See *Locks, Sash.*

Sash Weights—
See Weights, Sash.

Sausage Stuffers or Fillers—
See Stuffers or Fillers, Sausage.

Saw Frames—
See Frames, Saw.

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 45
Band ..... 50@50&10
Butchers' 50
Cross Cut 40
One-Man Cross Cut 50
Narrow Cross Cut 50
Hand, Rip and Panel ..... 50&5
Miter Box and Compass 40
Mulay Mill and Drag 45
Wood ..... 10&5
Clipper Steel Co.:
Taper Saw and Frame, 30 to 36 in.
Diamond Saw & Stamping Works:
Silver Steel Butcher Saw ..... 30&10&10
Disston's:
Circular, Solid and Ins'ted Tooth..50%
Band, 2 to 18 in. wide 50
Butcher 50
Crosscuts 45
Narrow Crosscuts 50
Mulay Mill and Drag 50
Diamond Wood Saws 25
Woodsaw Blades 25
Woodsaw Rods, Tinned 50
Hand Saws, 22, 24, 26, 28, 30 and 32 in. 25
Hand Saws, Nos. 7, 10, 10½, 3, 1, 1-10, Combination 25
Compass, Key Hole & Saw 25
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws ..... 25&5
Butcher Saws ..... 30&5
Compass and Key Hole Saws ..... 25&5
Framed Wood Saws ..... 25&5%
Hand Saws 12½%
Web Saw Blades ..... 35&5%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kut-kan Saws ..... 40&10&50
Butcher Saws Blades ..... 35@40%
Peace & Richardson's Hand Saws..50
Simonds':
Circular Saws 45
Crescent Ground Cross Cut Saws..30
One-Man Cross Cuts ..... 40&10
Gang, Mulay and Drag Saws..45%
Band Saws 50
Back Saws ..... 25@25&5%
Butcher Saws ..... 35@35&5%
Hand Saws ..... 25@25&5%
Hand Saws, Bay State Brand 45
Compass, Key Hole, &c..25@25&5%
Wood Saws ..... 40&5%@
Wheelock, Mosher & Clemson Mfg. Co.'s Cross Cut Saws 50

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A 25
Disston's:
Concave Blades 25%
Keystone Blades 35%
Hack Saw Frames 35
Simonds' Hack Saw Blades 35
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180.... 40&5%
Hack Saws, Nos. 175, 180, complete, 40&5%
Goodell's Hack Saw Blades ..... 40&10
Griffin's Hack Saw Frames..35&5&10
Griffin's Hack Saw Blades..... 35&5&10
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades..30&10&5%
Sterling Hack Saw Frames, 9&12&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00...10%
Victor Hack Saw Blades 20
Victor Hack Saw Frames..... 40%
Whitaker Mfg. Co.:
Natural Hand Blades..... 40%
National Hand Frames..... 30&5%
National Power Blades..... 30&10

Scroll—

Barnes, No. 7 $15 ..... 25%
Barnes' Scroll Saw Blades 40
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20..... 20%
Lester, complete, $10.00..... 15&10%
Rogers, complete, $3.50 and $4.00..... 15&10%

Scales—

Twin Platform, Plain $2.10@2.20
Twin Platform, Stpd. $2.20@2.30
Chatillon's:
Eureka 25
Favorite 40
Grocers' Trip Scales..... 50%
The Standard Portables..... 40%
The Standard R. R. and Wagon ..... 50&10

Scrapers—

Bar, 1 Handle.... doz. $2.00@2.25
Bar, 2 Handle.... doz. $2.50@2.60
Ship, Light, $2.00; Heavy, $1.50
Chapin-Stephens Co., Box..30@30&10%
Richards Mfg. Co., Foot..... 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1½ in., $3.00@3.25; 1¾ in., $3.50@3.75
Bench, Wood ..... 50@50&10
Hand, Wood ..... 70@70&10
Chapin-Stephens Co., Hand ..... 70@70&10

Coach, Lag and Hand Rail—

Lag, Cone Point....80&5@80&10%
Coach, Gimlet Point....80&5@80&5%
Hand Rail ..... 70@70&5%

Jack Screws—

Standard List..... 70@70&5%
Miller-Falls ..... 50&10%
Swett Iron Works..... 70@75%

Machine—

Cut Tread, Iron, Brass or Bronze:
Flat Head or Round Head, 75@75&10%
Fillister Head ..... 70@70&10%
Rolled Thread, F. H. or R. H., Iron ..... 75@75&10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65@65&10%

Set and Cap—

Set (Iron) ..... 75@70@67½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70@70@67½%
Hex. Hd. Cap ..... 70@70@67½%
Rd. Hd. Cap ..... 50@67½@70%
Fillister Hd. Cap ..... 60@67½%

Wood—

List July 24, 1903.
Flat Head, Iron ..... 87½@65@...%
Round Head, Iron ..... 85@65@...%
Flat Head, Brass ..... 80@65@...%
Round Head, Brass ..... 75@65@...%
Flat Head, Bronze ..... 75@65@...%
Round Head, Bronze ..... 72½@65@...%
Drive Screws ..... 87½@65@...%

Scroll Saws—

See *Saws, Scroll.*

Scythes—

Per doz.

Grass, No. 1, Plain.... $7.00@7.50
Clipper, Bronzed Webb.. $7.25@7.75
No. 3 Clipper, Pol'd Webb. $7.50@8.00
No. 6 Clipper and Solid Steel, $7.75@8.25
Bush, Weed and Bramble, Nos. 11, 12 and 13..... $7.25@7.75
Grain, No. 1..... $9.00@9.50
Bronzed Webb, No. 1.... $9.25@9.75
Nos. 3 and 4 Clipper, Grain, $9.50@10.00
Solid Steel, No. 6.... $10.00@10.50

Seeders, Raisin—

Enterprise ..... 25@50

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $16; 3, $12..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18...20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel..... ₱ doz. sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 35%
Cannon's Diamond Point, ₱ gro, $12, 40&10%
Mayhew's ..... ₱ gro $9.00
Snell's Corrugated, Cup Pt..... 40&10%
Snell's Knurled, Cup Pt..... 40&10%
Victor Knurled, Cup Pt.... ₱ gro. $7.50

Rivet—

Regular list..... 75@75&10%

Saw—

Atkin's:
Criterion 40
Adjustable 40
Disston's Star, Monarch and Triumph 50
Morrill's Nos. 1 ..... $15.00
Nos. 3 and 4, Cross Cut.... $20.60
No. 5, Mill..... $30.00
Nos. 10, 11, 95..... $13.00
No. 12 Old Style..... $10.00
Special $16.25
Giant Royal Cross Cut..... ₱ doz. $8.00
Royal, Hand..... ₱ doz. $4.50
Taintor Positive..... ₱ doz. $6.75

Shaving—

Fox Shaving Sets, No. 30 .....
₱ doz., net, $24.00
Smith & Hemenway Co.'s..... 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₱ doz..... $1.50
Mounted Kitchen Sand Stone, ₱ doz. $1.50
Natural Grit Carving Knife Hones ₱ doz $2.00
Quick Cut Emery Carving Knife Stones, ₱ doz.... $3.00
Quick Edge Pocket Knife Hones, ₱ doz..... $2.50

Skate—

Smith & Hemenway Co., Eureka..50%

Shaves, Spoke—

Iron ..... doz. $1.25
Wood ..... doz. $2.00
Bailey's (Stanley R. & L. Co.)..... 45%
Chapin-Stephens Co..... 30@30&10%
Goodell's, ₱ doz. $9.00..... 15&10%

Shears—

Cast Iron.. 7 ... ...

Best ...	*$16.00*	*18.00*	*20.00 gro.*
Good ...	*13.00*	*15.00*	*17.00 gro.*
Cheap ...	*5.00*	*6.00*	*7.00 gro.*

Strought Trimmers, doz.

Best quality Jap.			*7.00@8.00*
Best quality Nickel.			*6.00@6.50*
Tailors' Shears			*4.00@4.50*
Iron Cast Shears			*4.00@4.50*
Hemmeches Tailor's Scissors			4
Wilkinson Sword & Cutlery Co.:			
Sheep 1900 list			30&5
Grass			30&5
Horse or Mule			50&10
J. Wiss & Sons Co.:			
Best Quality, Japed			60%
Best Quality Nickeled			50&10
Tailors			50%

Tinners' Snips—

Steel Blades ..... 20@75@75%
Steel Laid Blades.. ..... 70@70&10%
Forged Handles, Steel Blades, Bernisch's Snips 40%
Jennings & Griffin Mfg. Co.'s 6½ to 12 in. 50%
Nonpareil Snips 40
P. S. & W. Forged Handles 25
P. S. & W. ..... 10&1
J. Wiss & Sons Co.:
Wiss Forged Steel..... 25%

Pruning Shears—

Cronk's Hand Shears 25%
Cronk's Wood Handle Shears.....33⅓%
Disston Combined Pruning Hook and Saw, per doz. $18.00 ..... 25%
Disston's Pruning Hook only, ₱ doz., $12.00..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades 10
P. S. & W. Co. ..... 10&1
Columbian Cutlery Co.:
Hedge, Wilcut Brand..... 60&10%
Lawn and Border, Wilcut Brand, ... 50&1

Sheaves— Sliding Door—

Reading 40
R. & E. list 10

Sliding Shutter—

Reading list..... 40%
R. & E. list..... 10

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge..... 65&10%
Club, Rival, 65&5%; First Quality, 60&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, ... 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade ..... 25&5%
Unit League, 12 and 12 gauge; Rival Grade 25
New Climax, Defiance 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20&5
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%
Shells, Loaded—
Loaded with Black Powder 50%
Loaded with Smokeless Powder, medium grade ..... 40&5
Loaded with Smokeless Powder, high grade ..... 40&10&10
Union Metallic Cartridge Co.:
New Club, Black Powders..... 40%
Nitro Club, Smokeless Powders.40&5
Arrow, Smokeless Powders.40&10&10
Winchester Co.:
Smokeless Repeater Grade..... 40&5%
Smokeless Leader Grade....40&10&10
Black Powder..... 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

Drive, 16 x 20 in....	$4.25	$5.50
Drive, 10 x 14	4.50	6.00
Drive, 7 x 10 in....	5.00	6.75

Shoes, Horse, Mule, &c.—

Peb. Pittsburgh:
Iron ..... per keg. $4.10
Steel ..... per keg. $4.85
Burrell, all sizes..... ₱ keg $3.90

Shot—

25 lb. bag.
Drop, up to B..... $1.85
Drop, B and larger..... 2.10
Buck 2.10
Chilled 2.10
Dust 2.30

Shovels and Spades—

Association List, Nov. 15, 1902..10%
Avery Stamping Co 40%

Snow Shovels—

Iron, Handle ..... $3.25@$3.50
Wood and Mall, D Handle, $3.75@$4.00

Sieves and Sifters—

Hunter's Imitation .....
per gro. $9.50@10.00
Hunter's Genuine .....
per gro. $12.00@12.50

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each, $3.25; $3.00

Sieves, Seamless Metallic

— Per dozen —

Mesh	*14*	*16*	*18*	*2*
Iron Wire	*$1.00*	*1.05*	*1.10*	*1.2*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.3*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 10, Nested ..... doz. $1.00@1.05
Mesh 20, Nested ..... doz. $1.10@1.15
Mesh 30, Nested ..... doz. $1.20@1.25

Sinks, Cast Iron—

Painted, Standard list:
12 x 16, to 22 x 36 in..... 60
24 x 30, to 24 x 48 in..... 50
24 x 60, to 24 x 120 in..... 40
Barnes' low list:
Up to and including 20 x 36 in...50&5%
20 x 40 to 24 x 50 in..... 45%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron ..... 70@75&10%
Steel ..... 40@45%

Slates, School—

Factory Shipments.
Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless.. 60@60&10%
Victor A, Noiseless, 60@65 less 40%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 50@50&10%
Covert Mfg. Co.:
Dorlon, Yankee ..... 50&2 ..... Yankee Roller, 30&25
High Grade, 40%; Trojan..... 40%
Jockey 25

Snaths—

Scythe ..... 55@60%

Snips, Tinners—See *Shears*

Spoons and Forks—

Silver Plated—

Good Quality..... 50@50@50&5
Cheap ..... 50@50@50&10
International Silver Co.:
1847 Rogers Bros. 40&10 ..... Rogers & Hamilton ..... 50&10
Rogers & Bro., William Rogers, Extra Plate..... 50&10%
Anchor, Rogers Brand..... 60%
Wm. Rogers & Son ..... 60&10

Miscellaneous

German Silver..... 60@60&5%

Tinned Iron—

Teas ..... per gro. 50@75c
Tables ..... per gro. $0.90@$1.00

Springs— Door—

Bardsley's Spring and Check..... 40
Chicago (Coil)..... 40&10%
Gem (Coil)..... 20%
Pullman Door and Gate..... 10%
Reliance ..... 40&10%
Star (Coil)..... 30%
Torrey's Rod, 39 in..... ₱ doz. $1.40

Carriage, Wagon, &c.—

1¼ in. and Wider: Per 100 lb.
Black ..... $3.75@$4.00
Half Bright..... $3.75@$4.00
Bright ..... $3.75@$4.00
Painted Steel Springs:
1¼ x ¼ x 26.... per pair.. 1.70@1.75
1¼ x ¼ x 28.... per pair..1.65@1.68

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Garden 65; Japanese, 75 ..... National, ₱ doz. $12.00
Enterprise ..... 25@50
Philadelphia No. 1, ₱ doz. $12. No. 2, $15; No. 3, $20..... 30%

Squares—

Nickel plated.. } List Jan. 5, 190..
Steel and Iron, } ..... 80@80&5
Rosewood Hdl. Try Square and T-Bevels ..... 40@40&10@40&10%
Iron Hdl. Try Squares and T-Bevels ..... 40@40&10@40&10%
Disston's Try Squares and Bevels, Rosewood Handle, 60 & 10%; Iron Stock and Bevel..... 15%

Squeezers, Lemon

Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron, 4 doz. $4.75@$5.25
Iron, Porcelain Lined.. doz. $1.75

Staples—

Barbed Blind..... 85&5@85&10%
Electricians ..... 80&10@80&5%
Fence Staples, Plain, $2.15; Galvanized $2.45
Poultry Netting Staples..... per lb. 3¼@3½¢

Steels, Butchers'—

Dueks 30
Fuller Bros. 50

Steelyards— ..... 30@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates..... 25%
Green River 25
Lightning Screw Plate 25
Little Giant 25
Reece's New Screw Plate..... 25%

Stoners, Cherry—

Enterprise ..... 25@50

Stones—Oil, &c.

Pike Mfg. Co., 1907 list: ₱ lb.
Arkansas St. No. 1, 3 to 5½ in.$2.80
Arkansas St. No. 1, 5½ to 8 in.$3.50
Arkansas Slips, No. 1..... $4.00
Lily White Washita, 4 to 8 in..60¢
Rosy Red Washita, 4 to 8 in..60¢
Washita St., Extra, 4 to 8 in..50¢
Washita St., No. 1, 4 to 8 in..40¢
Washita St., No. 2, 4 to 8 in..25¢
Lily White Slips..... 90¢
Washita Slips, No. 1..... 70¢
Washita Slips, No. 2..... 40¢
India Oil Stones (entire list)..33⅓%
Quickcut Emery and Corundum Oil Stone, Fine Grit..... 40%
Quickcut Emery and Corundum Axe Stone, Double Grit..... 33⅓%
Quickcut Emery Rubbing Bricks..40%
Hindostan No. 1, Regular..... ₱ lb. 8¢
Hindostan No. 1, Small.. ₱ lb 10¢
Axe Stones (all kinds)..... 33⅓%
Turkey Oil Stones, Extra..... 30%
8 in. ..... 80¢
Quincy Oil Stones, No. 1..... 90¢
Quincy Oil Stones, No. 2..... 80¢
Sand Stone 33⅓%

Scythe Stones—

Pike Mfg. Co.'s list:
Extra Diamond S. S., ₰ gro. $12.00
Imperial S. S., ₰ gro. $11.00
White Mountain S. S., ₰ gro. $9.50
Green Mountain S. S., ₰ gro. $7.00
Extra Indian Pond S. S., ₰ gro. $8.00
No. 1 Indian Pond S. S., ₰ gro. $7.50
No. 2 Indian Pond S. S., ₰ gro. $6.00
Leader Red Etc. S. S., ₰ gro. $5.00
Quick Cut Emery, ₰ gr. $10.00
Pike Curriedum, ₰ gro. $18.00
Grass, ₰ gro. $12.00
Emery Scythe Rifles, 2 Coat, $8.50
Emery Scythe Rifles, 3 Coat, $11.00
Emery Scythe Rifles, 4 Coat, $13.20
Extra on 1 and list, 33⅓
Electric Artificial, ₰ gro. 33⅓
Lightning Artificial, ₰ gro. 33⅓

Stoppers, Bottle—

Victor Bottle Stoppers.....₰ gro. $9.00

Stops— Bench—

Millers Falls.....15&10⅔
Merrill's, ₰ doz., No. 1, $10.00.....50
Merrill's, No. 2, $12.50.....50

Door—

Chapin-Stephens Co.....50&50&10

Plane—

Chapin-Stevens Co.....20

Straps— Box—

Acme Embossed, case lets..20&10&10
Carr's Universal, case lots..20&10&10

Stretchers, Carpet—

Cast Iron, Steel Points...doz. 55c
All Steel Socket...doz. $2.00@2.25
Excelsior Stretcher and Tack Hammer Combined, ₰ doz., $6.00....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1, 1902.....30&5
P., S. & W. Co.....40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ₰ doz.
Superba, Crotch Mahogany.....$36.00
Triumph, Fancy Veneers.....$33.00
Parlor Queen, Fig. Rosewood..$30.00
Elite, Hungarian Ash.....$29.00
Am. Queen, Fig. Mahogany.....$27.00
Ideal, Bird's Eye Maple.....$25.00
Grand Rapids, Nickel, $24.00; Japan.....$22.00
Standard, Nickel, $22.00; Japan.$20.00
Crown Jewel, Nickel, $21.00; Jap $19.00
Crystal, Glass Top.....$36.00
Grand, 30 in. wide.....$36.00
Parlor Grand.....$48.00
Club, 24 in. wide.....$54.00
Hall 28 in. wide.....$60.00

NOTE.—Rebates: 50c *per dozen on three dozen lots;* $1 *per dozen on five dozen lots;* $2 *per dozen on ten dozen lots;* $2.50 *per dozen on twenty-five dozen lots.*

Tacks, Finishing Nails, &c.

American Carpet Tacks...90@40%
American Cut Tacks.....90@50
Sweet Cut Tacks.....90@40
Swedes' Upholsterers'.....90@50
Gimp Tacks.....90@50
Lace Tacks.....90@50
Trimmers' Tacks.....90@40%
Looking Glass Tacks.....67½
Bill Posters' and Railroad Tacks, 90@50&10
Hungarian Nails.....80@20
Finishing Nails.....70
Trunk and Clout Nails...90@10

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks, 90@60 tens@—%
See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin.....50@—%
Patent Leather.....25@30&5%
Steel.....33⅓&5
Chesterman's.....25@25&5%
Keuffel & Esser Co.:
Paper, Linen Silk.....1 A 1 &5%
Favorite, Duck and Leather.....75&5&5%
Metallic and steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkins:
Anvil Skin.....10&10&5%
Metallic.....30@30&5%
Patent Bend, Leather...25&50&25&10%
Linen.....10&10&5%
No. 1.....30&10&5
Wrenn & Hilger.....
Chesterman's Metallic, No. 34L, ... 25
Chesterman's Steel, No. 100L, ... 35

Teeth, Harrow—

Steel Harrow Teeth, plain or bolted, 6 inch and larger, per lb.....$2.75@$3.00

Thermometer—

Tea Case, Cabinet, Flange, Dairy, &c.....30@33⅓%

Ties, Bale—Steel Wire—

Single Loop.....$2½@40
Monitor, Cross Head, 20@22½;

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5

Haying—

Myers' Hay Tools.....45

Miniature—

Smith & Hemenway Co.'s, Davidson, ₰ doz., Nickel Plated, $1.50; Gold Plated.....$2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simond's Improved.....33⅓
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz., $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz., $1.25@1.40; g. o. $13.00@13.50

Game—

Imitation Oneida.....75@10%
Newhouse.....45@45&5
Hawley & Norton.....65
Victor.....75@75&10%
Oneida Community Jump.....50
Hector.....75@75&10

Mouse and Rat—

Mouse, Wood, Choker, doz. holes, 12c
Mouse, Round or Square Wire, doz. 85@90c
Marty French Rat and Mouse Traps (Steinfeld):
No. 1, Rat, ₰ doz., $13.25..$11.50 doz.
No. 3, Rat, ₰ doz., $6.50...$5.75 doz.
No. 3½, Rat, ₰ doz., $5.25. $4.70 doz.
No. 4, Mouse, ₰ doz., $3.85. $3.00 doz.
No. 5, Mouse, ₰ doz., $3.00. $2.25 doz.
Oneida Community:
Out o' Sight, Mouse, ₰ doz.....$0.60
Out o' Sight, Rat, ₰ doz.....1.25
Easy Set, Mouse, ₰ doz.....75
Easy Set, Rat, ₰ doz.....1.00
Wood Choker, Rat, ₰ doz. holes, .12
Premier Tin Choker, 5 hole, ₰ doz. traps.....75

Dis. 15%

Trowels—

Disston Brick and Pointing.....25
Disston Plastering.....20
Disston "Standard Brand" and Garden Trowels.....
Kohler's Steel Garden Trowels, ₰ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels, ₰ gro. $6.00
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern.....50&10
Western Pattern.....60&10
Handy Trucks.....₰ doz. $16.00
Grocery.....₰ doz $15.00
McKinney Trucks.....each, net $10.00
Model Stove Trucks.....₰ doz $18.50

Tubs, Wash—

M'f'gr's list, price per gross.
No. 0 1 2 3
Galvanized..$67 $79 $89 $99 10&7½&5%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls..21@ 23c
No. 12, ¼ and ½-lb. Balls..19@ 21c
No. 18, ¼ and ½-lb. Balls..16@ 18c
No. 24, ¼ and ½-lb. Balls.
No. 36, ¼ and ½-lb. Balls..15@17½c
Chalk Line, Cotton ½-lb. Balls.....24@29c
Cotton Mops, 6, 9, 12 and 15 lb to doz.....8½@19c
Cotton Wrapping, 5 Balls to lb., according to quality..13½@19c
American 2-Ply Hemp, ¼ and ½-lb. Balls.....12½@15c
American 3-Ply Hemp, 1 lb. Balls .....13½@16c
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine)...7½@9c
India 3-Ply Hemp, 1 lb. Balls .....7½@9c
Indin 2-Ply Hemp, ½-lb. Balls.....7½@9c
2, 3, 4 and 5-Ply Jute, 1-lb. Balls.....9@1 c
Mason Line, Linen, ½-lb. Bls.17c
No. 264 Mattress, ¼ and ½ lb. Balls, according to quality .....30@35c
Wool, 3 to 6 ply....B 6c; 1 5½c

Vises—

Solid Box.....50@5&50@10&5

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....10
Standard.....4
Amateur.....25
Columbian Hdw. Co.....40
Fisher & Norris Double Screw, net, each Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00.
Fulton Mach. & Vise Co.:
Reed Swivel.....25
Star, Solid Jaw.....10
Hollands':
Machinists'.....40&10&5
Keystone.....65&5&10
Lewis Tool Co.:
Adjustable Jaw.....30%
Monarch, 50; Solid Jaw.....50
Massey Vise Co.:
Clincher.....40
Perfect, 15; Lightning Grip.....15
Merrill's.....20
Millers Falls Oval Slide Pattern.60&10%
Parker's:
Victor, 20@25; Regulars..20@25
Vulcan's.....40@45
Combination Pipe.....55@60%
Prentiss.....20@25
Rock Island.....25
Snediker's X. L.....33⅓%
Stephens'.....33⅓%

Saw Filers

Disston's D 3 Clamp and Guide, ₰ doz., $24.00, 30; Clamps.....30
Perfection Saw Clamps, ₰ doz....$4.50
Reading.....60

Wood Workers—

Fulton Mach. & Vise Co.:
Reed.....25
Star.....40
Massey Vise Co.:
Lightning Grip, 15; Perfect....15
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%
Rock Island Pipe.....25%

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10.....1.25
P. E., 8.....1.50
P. E., 7.....1.50
Ely's B. E., 11 and larger..$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Dis. 15%

Ware, Hollow—Cast Iron, Hollow—

Store Hollow Ware:
Enameled.....45&10%
Ground.....50&5%
Plain or Unground.....60%
Country Hollow Ware, per 100 lbs.....$3.00
White Enameled Ware:
Muslin Kettles.....65&10%
Covered Wares:
Tinned and Turned.....35&10%
Enameled.....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....33⅓
Iron Clad Ware.....70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:
Inch..... 6 7 8 9
Each..... 45¢ 50¢ 55¢ 65¢

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60%
Porcelained.....50&5@50&10
Never Break Spiders and Griddles.....65&5
Never Break Kettles.....60
Solid Steel Spiders and Griddles.65&5
Solid Steel Kettles.....60

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10

Washboards—

Solid Zinc: ₰ doz.
Crescent, family size, bent frame.$4.05
Red Star, family size, stationary pattern.....$4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$3.55
Cable Cross, family size, stationary protector.....$3.60
Single Zinc Surface:
Naiad, family size, open back perforated.....$3.00
Single Saginaw Globe.....$2.85
Brass Surface:
Brass King, Single Surface, open back.....$4.05
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface.....$5.60
Glass Surface:
Glass King, Single Surface, open back.....$3.05
Enamel Surface:
Favorite King, Single Surface, ventilated back.....$3.95

Washers—Leather, Axl

Solid.....90@60&5
Patent.....50@50&5
Cast: ⅞ 1 1¼ 1½ inch.
9c 10c 11c 13c per b

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝
Washers.... $4.65 3.75 2.45 2.25
The above prices are based $6.75 off list.
In lots less than one keg a 1½c per lb.; 5-lb. boxes add to list.

Cast Washers—

Over ½-inch, barrel lots, per lb. 1½@2c

Wedges—

Oil Finish.....lb., 2½@2

Weights—Hitching—

Covert Mfg. Co.....30&

Sash—

Per net ton, f.o.b. factory:
Eastern District.....$21.00@
Western and Central Districts.....$21.00@$22

Wheels, Well—

8-in., $2.00; 10-in., $2.45; 12-i $2.25; 14-in., $4.45.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....72¢10¢7½
10 to 14.....72½¢10¢1
15 to 18.....75¢10¢10¢2½
19 to 26.....75¢10¢10¢2½
27 to 36.....77½¢7½
Galvanized:
6 to 9.....72½¢10¢
10 to 14.....72½¢10¢2
15 to 16.....72½¢10¢2
17 to 18.....72½
19 to 26.....70¢5¢2½
27 to 36.....65¢10¢10
Coppered:
6 to 9.....65¢10¢10
10 to 14.....70¢10¢
15 to 18.....65¢10¢10¢2
19 to 26.....70¢5¢2½
27 to 36.....72½¢10¢2½
Tinned:
6 to 18.....67½¢10¢10
Brass.....17¢ lb., ba
Copper.....82¢ lb., ba
Cast Steel Wire.....50

Spooled Wire—

Annealed and Tinned, 70¢10¢10¢10
Brass and Copper...60¢10¢10¢10
Retailers' Assortments, per box, $1.00@$2.

Wire Clothes Line, See Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods..90¢33⅓%@—
Brass Wire Goods....90@90&10
Brass Cup and Shoulder Hooks, 85¢10

Wire Cloth and Netting—

Galvanized Poultry Netting, 80¢2½¢10¢7½
Painted Screen Cloth, 100 ft., $1.2
Standard Galv. Hardware Grade 100 ft. rolls, 2½ to 48 in. wide, Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh....$2.7
Nos. 4 and 5 Mesh.....$3.0
No. 6 Mesh.....$3.2
Nos. 7 and 8 Mesh.....$3.7

Wire, Barb—See *Trade Repor*

Wrenches—

Agricultural.....80¢10¢10
Alligator or Crocodile..70¢10¢7
Baxter Pattern S Wrenches..... 70¢5¢70¢10
Drop Forged S.....45@45&5
Acme.....60&10
Alligator Pattern, 70%; Bull Dog..70
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe 40; Briggs Pattern, 40; Combination Bright, 40%.
Steel Handle Nut.....50
Combination Black.....40&5
Merrick Pattern.....50
Boardman.....40
Coes' Genuine Knife Hdl...40&10&5&5
Coes' Genuine Steel Hdl...40&10&5&5
Coes' Genuine Key Model..40&10&5&5
Coes' Genuine Hammer Handle..... 40&10&5&5
Coes' "Mechanics'"....40&10&10&5&5
Donohue's Engineer.....40&10
Eagle.....70
Gem Pocket.....70
Hercules.....70
W. & B. Machinist:
Case lots.....50&5%
Less than case lots.....50
W. & B. Railroad Special:
Case lots.....50
Less than case lots.....40&10&5
Solid Handles, P., S. & W...50&10
full cases.....50&10&5
Stillson.....65
Uwanta Wrench Co.:
Uwanta Special, Iron Handle.....
Other Wrenches.....
Vulcan and Acme Chain.....50
Whitaker Machinists':
Case Lots.....50&10%
Less than case lots.....50%

Wrought Goods—

Staples, Hooks, &c., list March 15, 2.....54@40&10%

Zinc—*(Cask lots at mill.)*

Sheet.....per 100 lb., $7.00

THE IRON AGE

New York, Thursday, June 18, 1908.

A Modern Wood Working Machinery Factory.

The Rochester Works of the American Wood Working Machinery Company.

BY H. R. COBLEIGH.

(*With Supplement.*)

The largest plant of the largest manufacturer in its line is that of the American Wood Working Machinery Company, in Rochester, N. Y. In its functions it is complete, being independent of outside sources for all except raw materials. Given transportation facilities, and it is excellently located for these on the New York Central & Hudson River Railroad, and it is self-reliant for the rest, having even its own foundry and power plant. Among the noteworthy general features are the arrangement of the buildings and the intercommunication for convenient and economical manufacture, and the disposition and extensiveness of the equipment in the machine shop which are important to the same end. Before taking up in detail the description of these works it may be interesting to give a little concerning the company as a whole.

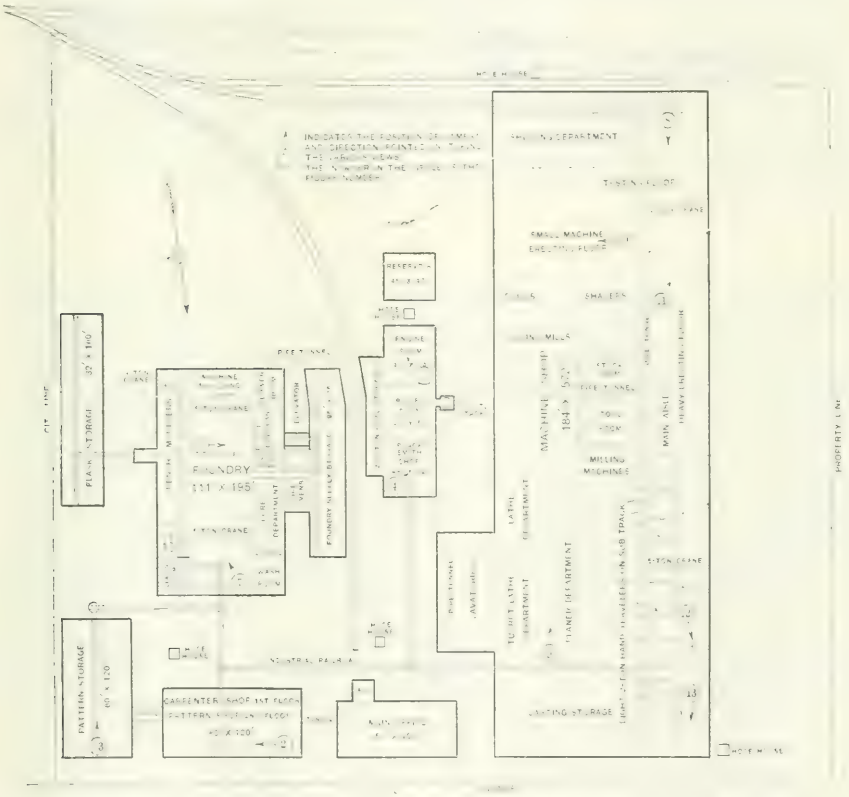


Fig. 1. Plan of the Rochester, N. Y., Works of the American Wood Working Machinery Company.

Organization.

The American Wood Working Machinery Company was incorporated September 30, 1901, as the successor by purchase to the F. H. Clement Company, Glen Cove Machine Company, Ltd., Hoyt & Bros. Company, Levi Houstan Company, Globe Machine Company, Lehman Machine Company, Milwaukee Sander Mfg. Company, C. B. Rogers & Co., Rawley & Hermance Company, Williamsport Machine Company, and the Young Bros. Company. When the consolidation was first made the company was operating twelve factories, and, while it had the advantage of a centralized selling force, it did not have the efficient producing organization that has since been developed. The factories are now concentrated in six, located where they are approximately most convenient to the territories that create the greatest demand for the products in which each specializes.

The Rochester Works combine what were formerly the F. H. Clement Company, Glen Cove Machine Company, and C. B. Rogers Company branches. The R. & H. Works, at Williamsport, Pa., combine the Rawley & Hermance Company and the Lehman Machine Company branches. The Williamsport Works, also in Williamsport, Pa., combine the Williamsport Machine Company

and the Young Bros. Company branches. The Houstan Works, at Montgomery, Pa., were formerly those of the Levi Houstan Company, now one of the branches. The Sander Works, at Green Bay, Wis., were formerly known as the Milwaukee Sander Mfg. Company, and the Hoyt Works, at Aurora, Ill., combine the Hoyt & Bros. Company and the Globe Machine Company branches. The executive offices of the company were removed over a year ago from New York to the Rochester Works. The officers are J. E. McKelvey, president; Gen. Hiram Duryea, vice-president; A. N. Arms, secretary-treasurer, and F. H. Clement, chief of construction and manager of the Rochester Works, to whom credit is principally due for the mechanical features of the new plant at Rochester.

Among these six factories the work has been reassigned to some extent so as to avoid duplication and promote specialization to secure the well recognized benefits that attend that method of manufacture. For example, the Rochester branch specializes in heavy planing mill and furniture machinery and pattern shop machinery to a certain extent; the R. & H. branch makes molders and the heavier sash, door and blind machinery; the Houstan branch, molders and lighter sash, door and blind machinery; the Williamsport branch, band saws and sawing machinery; the Sander branch, triple-drum sanders exclusively, and the Hoyt branch, heavy planing mill machinery. In the Rochester works a distinct line is drawn between heavy planing mill machinery and furniture machinery; each department has its own machine tool equipment and forces of workmen, and except in emergencies the two are practically distinct factories.

Buildings.

The plant occupies about 10 acres on Lyell avenue, on the western boundary line of the city. The buildings, eight in number, are shown in relation to one another in the plan view, Fig. 1, and as may be seen are arranged so that the progress of the work through the plant is continuous from the drafting room in the main office, when it is a new machine that is being built, or the pattern shop, for all standard machines, to the shipping department at the rear of the machine and erecting shops. The main office is the logical beginning and ending of a trip through the works, and yet is centrally located, so that all departments of the plant may be reached by the most direct line from this point. The buildings, mentioned in the order which will be adhered to in the description which follows, are the main office, carpenter and pattern shop, pattern storage, flask storage, foundry, foundry supply storage, blacksmith shop and power house, and the machine shop. All of the buildings are of brick, except the flask storage, and, with the exception of the foundry, power house and blacksmith shop, which are essentially fireproof buildings, all buildings are provided with automatic sprinkler systems for protection against fire. The machine shop, power house, foundry and supply house are of steel frame construction, reinforced by concrete and brick.

Points to be noted are that all of the buildings are capable of extension with growth, and are connected by an interworks railway system which communicates with crane or trolley service in the principal buildings. Spurs from the railroad facilitate the receiving and shipping of freight. One passes between the foundry supply storage and the power plant, over which are brought the sand, coke, pig iron, &c., for the foundry, and the coal for the boiler room. Two spurs pass, one into and the other along the end of the machine shop building, where the shipping department is located, and from which the heavy machines can be loaded by crane direct into cars.

The buildings are heated by a steam heating system, supplied with exhaust steam from the engines and auxiliaries in the power plant. When the available exhaust steam is insufficient make-up live steam is supplied to the system through reducing valves. This covers emergencies such as a shut-down of the engines. In all there is a total of some 32,000 sq. ft. of radiation. The system is proportioned to heat all buildings to a temperature of 62 degrees, with the exception of the pattern shop and the office buildings, which are heated to 70 degrees. The Paul vacuum system is used and maintains an average of 12 in. of vacuum on the radiators and coils. The heating system supply lines are carried from the power plant to the different buildings through tunnels which are indicated in the plan Fig. 1. These are concrete conduits 5 ft. sq. in section, and also allow underground distribution of electric current for lighting and power in the different buildings.

Main Office.

The office building is 50 x 104 ft., two stories high. The first floor contains the works offices as well as the offices of the purchasing agent, chief of construction, superintendent, and the general engineering department, including the drafting room. The second floor is occupied by the executive offices. The basement of this building has fireproof vaults for valuable papers and other matters, and also affords storage space for circulars and printed matter and an emergency hospital room, where accidents and illnesses of employees are treated. The key to this room is kept in the main office. In charge of the work is an employee ordinarily engaged in the millwright department, who has had experience as a trained nurse. He is assisted in his hospital work by other employees in each department, there being a staff of about six in all. The equipment includes that necessary for first aid to the injured, such as a cot, stretcher, medicines, liniments, bandages, &c. Serious cases are always turned over to a competent physician having an office nearby.

Pattern Shop.

The building to the east of the office is a two-story building, 60 x 120 ft., containing on the first floor the carpenter shop, where flasks are made and repaired and boxes and crates constructed. The second floor is the pattern shop, a view in which is given in Fig. 2. This view indicates something of the well-lighted condition of the interior. The benches are arranged near the windows and the machines in the center of the room. The tool equipment includes a hand-feed upright drill, a surfacer, a 20-in. buzz planer, a 32-in. 16-ft. bed patternmaker's lathe, 20 in. x 8 ft. patternmaker's lathe, a 36-in. band saw, a double saw bench, a universal saw bench, and a speed lathe, all of the company's own make, and a grindstone, and a 30-in. Boston blower for the dust exhausting system. A 15-hp. Rochester motor drives all of the foregoing. There are also six Fox hand trimmers and two embossing presses for making designating plates for patterns. The movable work tables are all of the same hight, and two or more can be moved together end to end or side to side and secured to one another with cleats, to give as large a continuous table area as may be needed. A bridge connects the pattern shop with the pattern storage.

The Pattern Storage.

The pattern storage is a 60 x 120 ft., two-story building. As shown in the view given in Fig. 3, the patterns are stored on shelves supported on iron columns made of gas pipe. Attached to the columns are cast iron brackets for supporting the shelves, as clearly shown in the illustration. The racks have the advantage that the shelves can be adjusted vertically, and also, if rearrangement in the pattern storage department becomes desirable, the columns themselves can be easily moved to change the location of any given tier of shelves.

The Foundry Department.

Immediately south of the pattern shop and pattern storage is the foundry, with the flask storage on one side and the foundry supply storage on the other. The flask storage is a building 32 x 160 ft., in which are stored the wood and iron flasks used in the foundry. Although this building is of wood it is so isolated that it would not be likely to take fire and could not communicate it nor do any very serious damage. The foundry supply storage, a 25 x 150 ft. building, holds the stock of iron, coke, sand, coal, wood, &c. It is somewhat unusual to have all of the stores under cover, but the advantages of it can readily be appreciated.

Two interior views in the foundry are given in Figs. 6 and 7. This building is 111 x 195 ft., and has brick walls and a reinforced concrete roof, supported by steel

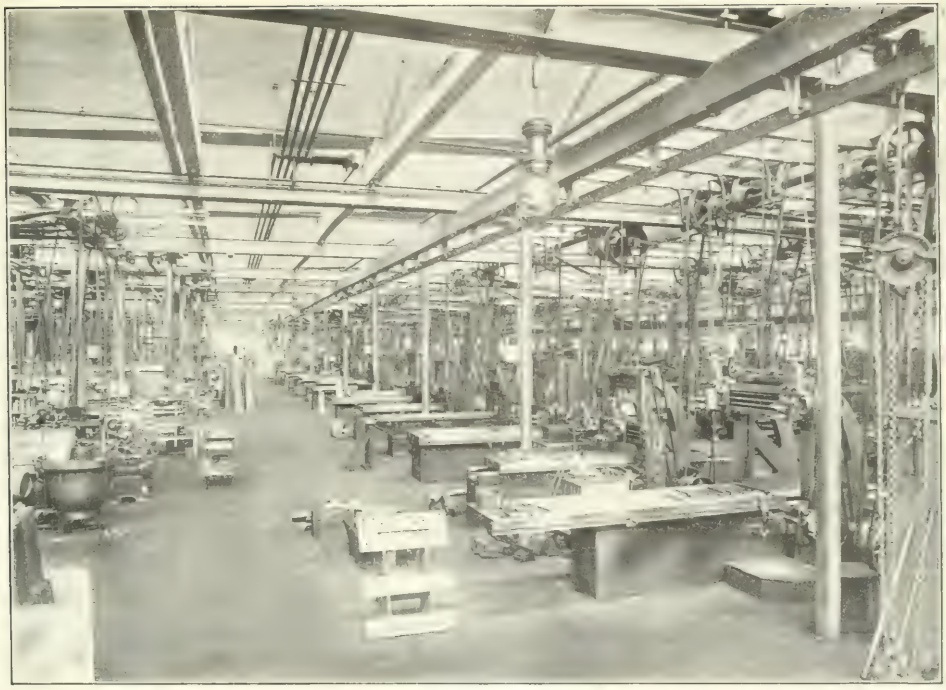


Fig. 9. Looking South in the Machine Shop. Planer Section on the Right.

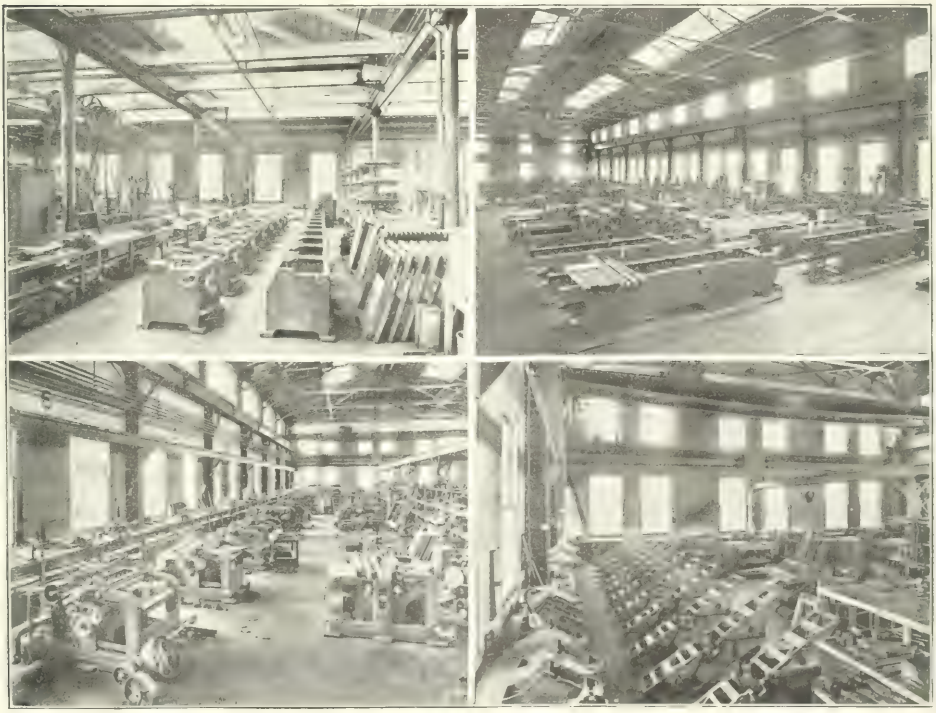


Fig. 10. Universal Saw Bench Assembling.
Fig. 11. Planer and Matcher and Timber Sizer Floor.
Fig. 12. Surfacer Erecting Floor.
Fig. 13. Jointer Erecting Floor.









VIEWS IN THE ROCHESTER, N. Y., WORKS OF THE AMERICAN WOOD WORKING MACHINERY COMPANY





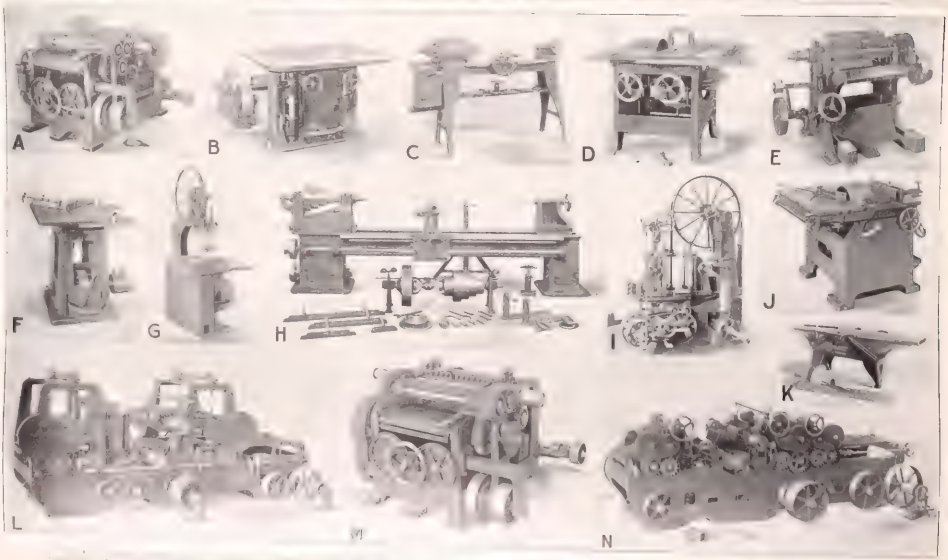
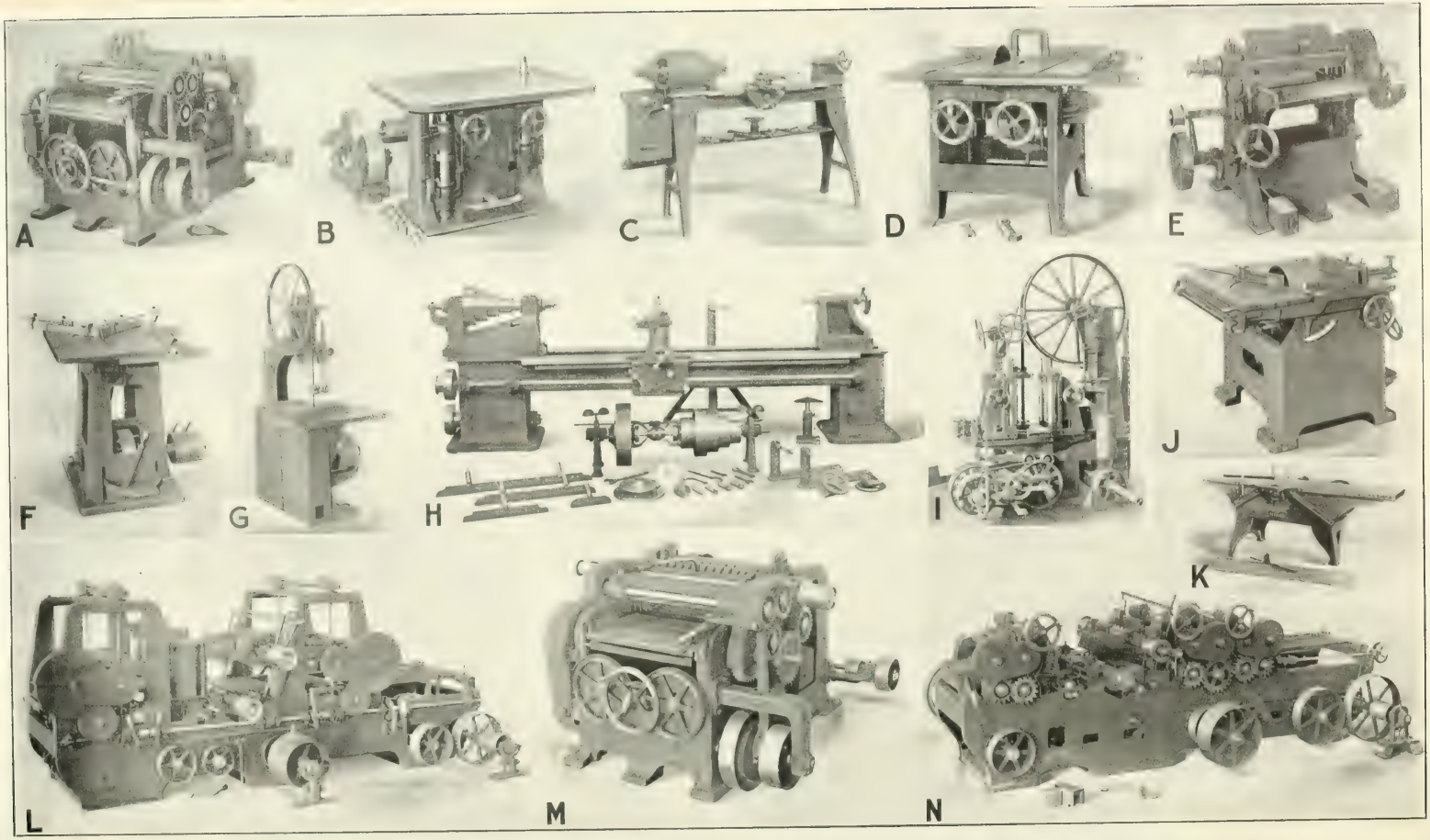


FIG. 13. TYPICAL PRODUCTS OF THE AMERICAN WOOD WORKING MACHINERY COMPANY'S ROCHESTER BRANCH



A—Six-Roll Double Surfacer; B—Two-Spindle Shaper; C—Motor Headstock Speed Lathe; D—Double Saw Bench; E—Single Surfacer; F—Mitre Saw Bench; G—Patternmaker's Band Saw; H—Patternmaker's Lathe; I—Band Resaw; J—Universal Saw Bench; K—Hand Jointer; L—American Boss Timber Sizer; M—Single Surfacer; N—Six-Roll Planer.

FIG. 14. TYPICAL PRODUCTS OF THE AMERICAN WOOD WORKING MACHINERY COMPANY'S ROCHESTER BRANCH

trusses. In place of the ordinary monitor skylight there are inclined skylights in the roof of both the center and side bays, and ventilation is obtained by roof ventilators controlled by dampers. The illustrations show these features and also the type of heating apparatus installed. The radiators are sectional cast iron heaters, assembled in tiers between the flanges of the channels in the built-up columns. The radiators are thus disposed, where they are entirely out of the way and yet well distributed to insure uniform heating. Along the walls below the windows are series of ordinary steam pipe coils.

The center bay of the foundry is served by two 5-ton electric cranes and the small molding machine department by a 4000-lb. floor-controlled crane, all built by the General Pneumatic Tool Company, now the Shepard Electric Crane & Hoist Company. The castings made in this department are mainly small ones, such as gears, bearings, caps, brackets, &c. To the north of the bench molding department is the sand blast room, which contains an American Diamond sand blast apparatus, furnished by Thomas W. Pangborn Company, N. Y. Beyond this is the cleaning room, which contains five tumblers, two double grinders, and one swing grinder, all driven by a 25-hp. Crocker-Wheeler motor.

The small bay on the opposite side of the foundry contains the wash room and lockers, core department, sand room, cupolas, and the blower room. In addition to the large built-in core ovens, which are directly behind the core department, there is an Eli-Millett small core oven. Common forms of cores are made by a motor-driven core machine in the core department. In the sand room, next adjoining, are a Hanna pneumatic screen and a motor-driven sand mixer, made by the Standard Sand Mixer Company. The motor is a 3½-hp. Crocker-Wheeler motor.

The two cupolas were furnished by the Whiting Foundry Equipment Company. One is a No. 4, 56 in. in diameter, and the other a No. 7, 72 in. in diameter. The two have a combined capacity of 16 to 19 tons per hour. Blast for the cupolas is furnished by a No. 5½ Root blower, driven by a 30-hp. Rochester motor in the blower room, next to the cupolas. This room also contains an Ingersoll-Rand 12¼ x 12 in. class E, belt-driven, single-stage compressor, connected to a 42 in. x 8 ft. vertical air receiver and driven by a 45-hp. Rochester motor. Compressed air is used at a pressure of about 90 lb. to supply the sand blast room and the molding machines, and also for blowing out molds and for cleaning and chipping castings. The machine molding floor at the south end of the foundry contains two Tabor molding machines and a Tabor pulley molder. There is also one more machine in the small molding department. The ventilating system in the foundry was installed by the Empire Blower and Pipe Company.

Power Plant and Forge Shop.

Between the foundry supply storage and the machine shop is the fireproof building containing the engine room, boiler room and blacksmith shop. The building, 146 ft. long x 48 ft. wide, is flanked on one side by a coal storage of 250 tons capacity.

The blacksmith shop, of which Fig. 4 is an interior view, contains a centering machine for shafting, a cutting-off machine, a Bradley 1800-lb. power hammer, power shears, hacksaw, Taft rolling lever shears, bolt cutters, Doty punch and shear, four emery grinders, Perkins power press, tool grinders, seven Buffalo forges, a No. 5B Buffalo blower, and a 24-in. exhaust fan for removing the gases, all driven by a 15-hp. Westinghouse motor.

In the boiler room are three Keeler dry tube boilers, which have a capacity of 150 hp. each and are fitted with Diamond tube blowers. The feed water is heated in a No. 27 Cochrane heater and delivered at a temperature of 208 degrees to the boilers by two 6 x 4 x 6 in. Worthington duplex steam pumps. Two boilers carry the normal load and one is held in reserve. The coal bin is on a level with the boiler-room floor, and below the track level outside, so that the coal can be dumped from the cars directly into the openings in the top of the coal bins.

The engine room, as Fig. 5 shows, contains a Hamilton Corliss 20 x 42 in. engine, running at 100 rev. per min., and directly connected to a 200-kw. Crocker-Wheeler generator, and a Skinner high-speed 15 x 16 in. engine, running at 250 rev. per min., directly connected to a 100-kw. Crocker-Wheeler generator. Ordinarily the larger unit supplies the load, the smaller one being a reserve for extra demand or a substitute for the larger engine when the demand for power is small. The two together have a combined capacity of 500 to 600 hp. There is space for the installation of another unit of the size of the larger one. Both engines are oiled by a White Star gravity system, the oil from which is returned to a filter and forced back to the supply tanks by a small duplex steam pump, having a capacity of 150 gal. per day.

In the engine room is also a Worthington Underwriter duplex fire pump, having a capacity of 1000 gal. per min. at 100 lb. pressure. Its suction is connected to a concrete reservoir south of the engine room, which has a capacity of 150,000 gal. The water is then forced through the mains to supply in all 2100 sprinkler heads, as well as the five housed hydrants located about the grounds, as indicated in Fig. 1. Each hydrant has attached to it 150 ft. of fire hose, ready for instant use. About once a month a fire drill is held, but not on any regular day or time, so that the force is not prepared by previous knowledge as to when it will occur. Each department has its own fire brigade chief, with assistants under him.

The Machine Shop.

The largest and for some reasons the most interesting building is the one which contains the machine and erecting shops. At present the erecting shop is a broad aisle on the west side of the shop, surmounted by a sky-lighted roof, and the remainder of the building has a saw-tooth roof to give north light without direct sunlight. Eventually the building will be extended by a similar bay flanking the main aisle on the other side. The machine tools are mainly placed under the saw-tooth roof part, and so far as possible are grouped according to their classes, about as is indicated in the plan Fig. 1. The erecting floors are similarly divided into departments, covering each class of machines built, and each different class has its own foreman and gang of men, who are specialists in building that particular machine. The building is at present 184 ft. wide x 572 ft. long, and has excellent natural light, as may be judged from the various views given in Figs. 8 to 13 inclusive. As the key on the plan of Fig. 1 explains, the points of view from which these different photographs were taken are indicated, so that keeping this in mind the reader may obtain a pretty good conception of the interior.

The erecting aisle is traversed by two Shaw electric cranes, one of 10 and the other of 15 tons capacity. Both cranes have a span of 58½ ft. and a hoist of 25 ft. The north end of this aisle is divided in halves, longitudinally, and each half is served by four 2-ton hand traveling cranes on lower runways. These were furnished by the Reading Crane & Hoist Company and the Shepard Electric Crane & Hoist Company. There are also two portable cranes, furnished by William S. Nicholls. A trolley system supplements the cranes, serving the machine shop proper, and carries Yale & Towne 1-ton Triplex blocks. The industrial railway system connects the crane and trolley service with the other buildings and at one point contains a platform scale.

A wide passage divides the machine shop section. Passing down this aisle from the north end the turret lathes are on the left, forming a department by themselves, and the planer section on the right. Near the turret lathes are specially designed racks to hold bar stock of different sizes. The turret lathes are all furnished with oil pumps, so that oil drills may be used, which are very important in the machining of steel cutter heads, of which large numbers are made. On the right side, directly beyond the planers, are the milling machines, and facing them the thread millers used to make the special screws which enter into the different machines. Soda water tanks and oil filters are con-

veniently placed, so that work may be cleansed before being sent to the different erecting departments.

The next section on the left is the lathe department. The lathes are placed in groups of about eight or 10 and each group is driven by an independent motor. Individual lathes are generally kept on one line of work, such as shapers, resaws, surfacers, &c., so that the workmen on these tools become proficient. Among these lathes are several special machines for certain lines of work. One is a double end lathe with a very powerful drive, which is used for roughing out cylinders or cutter heads. Another is used for grinding resaw wheels and is a massive machine, automatic in action and capable of very fine adjustment. Beyond the lathe department is the pulley and gear department, where stock parts of these kinds are made and then sent to large racks near the erecting floors, where they are needed. Similarly there are several departments devoted to drill presses. Running the length of each of the drill press bays are shelves containing drilling jigs. The work is thus done in quantities very rapidly and the several departments requiring the drilled and tapped parts are easily kept supplied.

The larger planers project into the main aisle, where they have the service of the electric traveling cranes, while the smaller ones and the other machines in the machine shop section proper have the trolley and hoist service before mentioned. At about the middle of the right side of the shop is the stock room and tool room, and beyond, on the left of the passage, are the boring mills, and on the right the shapers. The small machine erecting floor is near the south end, under the saw-tooth roof section. The tool room has a complete compliment of machines for making all kinds of special tools. The stock room adjoins it and is under separate supervision. Here are kept all supplies, both raw and finished, for the machine and erecting shops.

Tool Equipment.

The following summary of the tools contained in the machine shop gives striking evidence of how extensive is the equipment. It is a somewhat remarkable collection, considering the number of different makers represented. In fact the shop affords an excellent chance of comparing the various makes of machine tools and studying particularly the usefulness of each in specific applications. The tools are not all, nor very largely, new ones; some of them are no longer built and many are not the latest types of their builders, for the old shops supplanted by this one have contributed to the present outfit. Even the old tools, however, are interesting, as they all attest their enduring qualities. In the new shop no tools were retained that had outlived their usefulness or even ceased to be efficient work producers.

Of all kinds of drills, including radial, upright, sensitive and electric, there are 51, these being of Bickford, Reed, Warren, Prentice Brothers, Cincinnati, Blaisdell, Dwight Slate, Snyder, Sweetser & Merritt, F. P. Michael, W. P. Davis, C. H. Baush & Son, Barnes and Hoefer makes. There are 14 shapers: Steptoe, Hendey, L. S. Graves, Lodge & Davis, Walcott, Smith & Mills, and Stockbridge, and 40 planers: Woodward & Powell, Pond, Pease, Rochester, Whitcomb-Blaisdell, Cincinnati, and Gray. The largest planers are a Cincinnati 62 x 48 in. x 18 ft. planer, having two heads; a Gray 30 x 36 in. x 10 ft. planer, with power rail elevating device; a Cincinnati 56 x 42 in. x 12 ft. double head planer, and a Whitcomb-Blaisdell 30 x 30 in. x 12 ft. planer, with two heads. The milling machines, 17 in all, are Brown & Sharpe, Gould & Eberhardt, John L. Bogart, Garvin, Pedrick & Ayer, Becker-Brainard, Whitney Mfg. Company, and Pratt & Whitney makes. Lathes, including engine, pulley and turret lathes, are 73 in number, and of Le Blond, Jones & Lamson; Bullard, Blaisdell, Bogart, Reed, Parker & Knight, Lodge & Davis, Gisholt, Bridgeport, Prentice Brothers, Flather, F. S. Perkins, Springfield, Stevens, Fay & Scott, Hendey, Streit, Bridgford, and Draper types. The Stevens and Streit lathes are pulley lathes. The largest lathe is 36 in. x 10 ft. and the longest is 32 in. x 12 ft. There are two vertical boring mills of Colburn make. Other machines include a keyseater, worm cutter, hack saws, balancing lathes, cutter head and pulley balancing machines, belt-lacing machines, pulley groover, &c.

Other equipment than machine tools proper includes 15 arbor presses and a hydrostatic wheel press, 29 grinders, including tool, cutter, drill, universal, emery, reamer and cutter, grindstones, electric, center, plain, disk and the special grinder of the company's own make for grinding the surfaces of band wheels, mentioned before. The grinders represent the following makes: Diamond, Springfield, Gould & Eberhardt, Brown & Sharpe, Putnam, Brainard, Landis, Keath, Norton, Pratt & Whitney, Garnder, and Hisey-Wolf. Several of the knife and emery grinders are of the American Wood Working Machinery Company's own make.

In all there are 27 motors in the machine shop of an aggregate rated capacity of about 460 hp. Group drive is employed entirely for the smaller machines and all very large tools are individually driven. The motor manufacturers represented are the General Electric Company, the Rochester Motor Company, the Crocker-Wheeler Company and the Westinghouse Electric & Mfg. Company.

Erecting Shop.

The erecting shop strictly includes more than the main aisle at the west side of the building. There is a small erecting machine floor at the south end of the saw-tooth section, as indicated in the plan. In general the erecting floors are divided, each to take care of one class of machines, of which there may be from 24 to 48 on the floor at a time. The workmen on these tools each have their particular part to perform and follow one another in the progressive assembling of the machine. In this way each one becomes more expert and rapid. The assembling bays are lined with shelves containing the finished smaller parts for the machines being constructed. All of the larger machines, such as sizers, planers and matchers, molders, surfacers, resaws, &c., are erected in the main bay, which is 60 ft. wide. The cranes over this bay are capable of carrying the heaviest machines from one end to the other. The testing floor is at the south end of the main aisle and the packing department next beyond it, so that the shipping is done from the south end of the building. Several motors are here used for driving the machines under test.

Products.

To give something of an idea of the work of the Rochester branch, Fig. 14 has been included, which shows a group of machines typical of those built at this plant. These will be identified in the following statement of the complete product manufactured by the company by the letters in parenthesis, which correspond to those in the engraving:

SURFACERS.—No. 6½ double furniture and cabinet six-roll surfacers (A) built in three sizes having capacities of 24, 27 and 30 in. wide by 7 in. thick and equipped with solid, divided or sectional rolls. No. 4½ furniture and cabinet surfacers, single (M) or double, four sizes working 24, 27, 30 and 36 in. wide by 7 in. thick, having solid, divided or sectional rolls. No. 1½ single surfacer (E), for pattern and general woodworking shops, working 24 in. wide and having solid or sectional rolls and a table which will lower 7 in. No. 51 30 in. x 8 in. six-roll planing mill and box factory surfacers. No. 50 four-roll planing mill and box factory surfacers, two sizes working 26 and 30 in. wide by 8 in. thick and having divided rolls.

HAND JOINTERS.—Tripod frame jointers (K) built in seven sizes working from 8 to 36 in. wide. Pedestal frame jointers built in four sizes working 12 to 24 in. wide. The beds of the latter rise and fall on four short inclines.

BAND SAWS.—Band resaws (D), three sizes, 48, 54 and 60 in., for cutting timbers to dimensioned stock, resawing veneers and similar work, equipped with variable cone feed. Pattern-maker's band saw (G), 36 in., with table tilting 45 deg. to the right and 5 deg. to the left, and the lower wheel enclosed.

INSIDE MOLDERS.—Four sizes working 8, 10, 12 and 14 in. wide by 6 in. thick.

FLOORING MACHINES.—No. 60 fast feed flooring machines working 104 ft. of flooring per min., built in three sizes taking 9, 15 and 24 in. wide by 6 in. thick and having six powerfully driven rolls all preceding the cutter head to avoid marking or marring the finished product. No. 55½ special flooring machines, two sizes, 10 and 14 in. wide x 6 in. thick and having six rolls the same as No. 60. No. 54 planer and matcher (N), two sizes working 14 and 24 in. wide by 6 in. thick and having six rolls, four rolls in advance of the cutter head and one pair of out-feeding rolls.

TIMBER SIZERS.—For dressing dimensioned stock, car sills,

factory flooring, etc. Built in six and eight roll patterns. The first, four sizes, work 12 and 14 in. thick either 20 or 30 in. wide; the 30-in. machine has divided rolls, and the 20-in. machine solid rolls. The eight-roll machines (L), six sizes work 16, 18 and 20 in. thick up to 20 or 30 in. wide; the rolls are solid in the 20-in. machine and divided in the 30-in.

LATHES.—Heavy patternmakers' lathes (H) with 20, 26 and 32 in. swing having 10, 12, 14 or 16 ft. beds, and power feed and compound rest. When desired, these are arranged for motor drive application.

SPEED LATHES.—Built with 12 in. swing, 55 and 72 in. beds and with plain bed, or with carriage and compound rest. Those with motor driven headstock (C) are equipped with General Electric motors of special design.

BACK KNIFE LATHES.—Three sizes. No. 1½ built in four sizes working 28, 36, 45 and 52 in. long; No. 2 in two sizes working 40 and 50 in. long, and No. 3 in two sizes working 40 and 50 in. long. These machines are used for turning ballisters, chair rails, rungs, table legs, and a variety of other spindles.

BENDING PRESSES.—For bending chair backs and other regular curved work where the diameter is from 30 to 42 in. and the material not over 1½ in. thick.

BORING MACHINES.—Double horizontal boring machines with radial attachment for boring holes in chair backs or other similar work, built in two sizes. Triple dowel boring machine for boring three dowel holes at once. Multiple boring machines for table leaf and similar work. Vertical three-spindle car borer. Double vertical chair borer. Bit mortising machine used for ordinary boring and cutting mortises.

DOWEL MACHINES.—For turning dowels and rods from 3/16 to 2 in. diameter, equipped with either hand or power feed.

SAW BENCHES.—Universal saw benches (J) for pattern making and similar work, carrying a cross cut and a rip saw and if desired a dado head, and having a table tilting to 45 deg. to the right, a graduated sector in the table which enables the operator to cut any angle without figuring it out, and a rolling segment in the left hand table. Double saw bench (D) having both saws but without the tilting table, and arranged to receive boring attachments. Rip saw tables built in two sizes, light and heavy. No. 2 combination saw benches with or without boring attachments and carrying dado heads. No. 1 saw bench—a variety saw bench—equipped with or without boring attachments and having a table tilting to 45 deg., and carrying a dado head or plain heads which will carry jointing, grooving and rabbiting bits. No. 0 saw bench made with stationary or tilting table. Mitre saw bench (F) having graduated scales on the four corners for setting gauges to cut any angle up to 45 deg. in any direction, or arranged as a plain cut-off saw only. Clipper saw for cutting off the butt ends of flooring and similar work as it leaves the matcher.

SHAPERS.—Three styles, No. 3, extra heavy with two spindles 30 in. apart; No. 2½ double spindle shaper (B) with spindles 24 in. apart, built either with plain or bronze conical bearings, and equipped with an adjustable countershaft and an adjustable guide stand; and No. 1 single spindle shaper with friction reverse countershaft.

Such an array of product apparently contradicts the statement made earlier that this plant specializes, until it is remembered that it was also explained that the individual workmen are kept on the same kind of work and under the same foreman, who has charge of building only one class of machine. It is practically as though there was a separate factory for each type of machine. This arrangement is possible because, while there may be certain sizes that are only occasionally made, each class is always represented in the work in progress. This system of managing it is quite as much a credit to the American Wood Working Machinery Company as the factory itself.

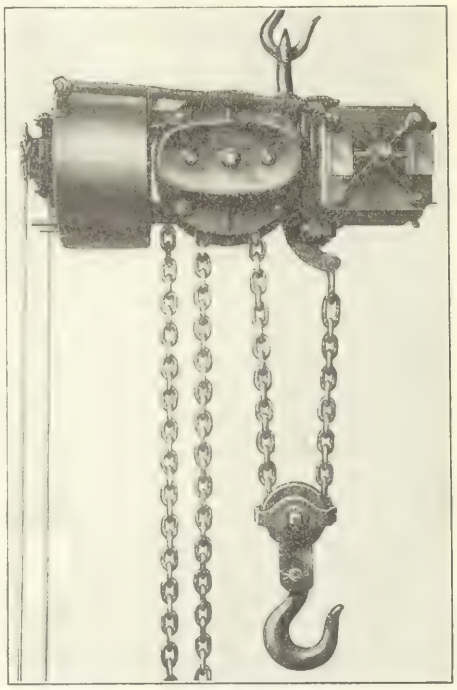
Foundry Sand Conveying.—In the article on the above subject which appeared in *The Iron Age* last week a typographical error appeared in the sentence, "The illustrations, Figs. 1 and 2, show the details of such a conveyor, which consists of a trough for holding the material, surrounded by a steel frame on wheels, which carries hinged flights extending down into the trough." The word "surrounded" should have been "surmounted." It was also a mistake to say that the gate mechanism in the installation in the Atha Steel Casting Company's foundry was like that indicated in Figs. 1 and 2. As a matter of fact, it is a modification of the Link-Belt Company's undercut gate, and is so made as to deflect the sand from the delivery point.

The highest point in Texas has been found by the United States Geological Survey to be located in the Guadalupe Range in the northern part of El Paso County, not far from the New Mexican boundary line. The elevation is 8690 ft. above the sea and the peak is significantly called El Capitan by the Mexicans.

A Northern Electric Hoist.

Wherever it is possible or convenient to use a hand chain block, the type C electric hoist made by the Northern Engineering Works, Detroit, Mich., can be used, as it is practically an ordinary hand chain block adapted for motor drive. The hoist here illustrated is a redesign of the original C type placed on the market three years ago, in which the distance between the suspension and lifting hooks has been reduced to obtain higher lifts under low ceilings; it is also made for either direct or alternating current.

Being equipped with a crane motor and standard controller capable of wide range of control and ample resistance, the hoist can be operated at fast or slow speed, ranging from five to ten times the speed of a hand operated hoist. To provide for the severer service to which the power hoists are naturally subjected they are built about double the size and strength of hand hoists



The Redesigned Type C Electric Chain Hoist Made by the Northern Engineering Works, Detroit, Mich.

of like capacity. As compared with some drum hoists, it has the advantage of suspension by a single hook, which gives it a flexibility that enables it to sustain a side pull without pulling the chain out of the sprocket groove.

A direct drive through a set of cut spur gears compactly arranged affords ample power, and wear is reduced to a minimum by running the principal gears in oil. The hoist is recommended for moderate service, especially in boiler shops, machine shops, over tools, in warehouse service, and in some kinds of foundry work. It is supplied with a brake of automatic disk type and can be equipped with motors of any standard make. These hoists are made in capacities of from one to six tons, with standard hight of lift from 8 to 12 ft.

The approximate dimensions of the 1, 2 and 3 ton hoists when equipped with direct current motors are 20½ in. wide, 46 in. long and 2 ft. 8 in. minimum distance between centers of hooks. For the 4, 5 and 6 ton hoists they are respectively, 24 in., 55 in. and 3 ft., except for the 6 ton, in which the least distance between hooks is 3 ft. 4 in. With alternating current motors the lengths and widths are increased, depending on the make of motor applied.

The American Foundrymen's Association at Toronto.

Molding Machines, Cost Systems, Automobile Cylinders, By-Product Coke and Other Topics Discussed—Working Exhibits of Foundry Appliances.

The Toronto, Canada, meeting of June 8 to 12 was a climax in the convention history of the American Foundrymen's Association. It was thought that going into another country, even but a little distance beyond the border and to a pleasant and accessible city, would cut down the attendance. On the contrary, a new record was reached, the registration on the last day mounting to 1430, as against 1371 in 1907 at Philadelphia, which was considered a phenomenal figure.

There was everywhere the expression of satisfaction with the arrangements at Toronto. Members and guests and exhibitors were well cared for; the city itself was an attraction, and the provision of a separate building at the Canadian Industrial Exhibition grounds, for the technical and business sessions, was a distinct improvement over the arrangement at other meetings where machinery was exhibited. More persons heard the papers read and more took part in their discussion than at any preceding meeting. It is noteworthy, moreover, that the American Foundrymen's Association conventions are now sought for as they have never been. Cincinnati is the meeting place for next year; Detroit is conceded to be in line for 1910, and Pittsburgh wanted the convention of that year, but will probably be satisfied to wait until 1911, while there is a possibility that a Western city, Denver, perhaps, will be visited before a return to Pittsburgh, which was the convention city of 1899.

The grounds of the Canadian Exhibition were an ideal place for the convention, which has taken on much more the aspect of an exposition, now that the operation of molding machines and all other foundry equipment is made so prominent a feature. The Foundry Supply Association, at a large expenditure of money, sets up these working exhibits and aids in defraying the general expense of the convention and its entertainment features. The crowded aisles of the exhibit buildings and the deeply interested and sharply observant groups of foundrymen surrounding every operated machine showed that these demonstrations are the chief magnets of the meeting.

WEDNESDAY MORNING.

The sessions for the reading of papers began Wednesday morning in the Dairy Building, a circular structure with cement floor and the seats arranged to form an amphitheatre. The light comes through skylights in the center of the roof.

At the outset a word is in place concerning the excellent work of the presiding officer, Stanley G. Flagg, Jr., of Philadelphia. Mr. Flagg's technical equipment made it easy for him to start discussion, and the free interchange of views secured on several of the papers was due largely to the good initiative of the president. The traditions of the association do not permit it, but it was suggested at the meeting that when so excellent an executive is secured and one with progressive ideas as to the province of the association, much might be gained by keeping him in office two or three years.

Automobile Cylinder Work.

Secretary Moldenke read the paper on "The Production of Automobile Cylinders," by L. N. Perrault, manager of the Waterbury Casting Company, Waterbury, Conn. It is given elsewhere in this issue.

E. H. Mumford said that he had no idea of the care used in the preparation of cores and molds for automobile cylinder work until he had specially looked into the matter. He recalled being shown a core that had just been used in such work and wondered at the foundry superintendent breaking it in pieces. The fact that it had a very small pit on one side ruined it for gas engine purposes, though this would not have prevented its re-use in ordinary work.

J. J. Wilson, Cadillac Motor Car Company, Detroit, Mich., referred to the pickling of automobile cylinders as having advantages and disadvantages. If the core sand is not all out of the water chamber, which it is impossible to ascertain without breaking up the casting, the pickle will harden the sand and later treatment will not remove it. Tumbling will jar it out, however, where there has been no pickling, particularly if the tumbler has been packed by an expert, in which case cleaner cylinders can be got than by pickling. The speaker had noticed variations in the analysis of automobile cylinders made in France from those of cylinders made in the United States. He had had a number of analyses made of French cylinders, the silicon ranging from 1.64 per cent. to 2.30 per cent., and the phosphorus from 1.20 per cent. to 1.70 per cent. A cylinder having the last named phosphorus content would be weak and brittle and would not withstand much shock. In the United States the phosphorus in cylinder castings is considerably less, ranging from 0.30 to 0.60 per cent., while silicon runs from 1.50 per cent. to 3.00 per cent., with manganese from 0.50 to 0.90 per cent. In sulphur the French and American castings run about the same, though the latter are usually a trifle lower. Analyses of French cylinders had shown 0.09, 0.10 and 0.11 in sulphur. In reply to questions, Mr. Wilson said that he had used manganese for cylinder castings, sometimes introducing it into the ladle and sometimes in the cupola. He preferred buying pig iron with sufficiently high manganese to introducing the manganese separately into the cupola mixture or into the ladle. It was suggested by a member that it would be difficult to secure sufficient strength in cylinders of thin section carrying as high sulphur and phosphorus as the French cylinders; in reply it was said that French cylinders are not subjected to the same shock as American.

The Chemistry of Cylinder Mixtures.

W. A. Jenkins, Oldsmobile Company, Lansing, Mich., presented the analyses of 12 automobile cylinders, one of which, No. 3, was made in France and the others in the United States. These analyses as published in an automobile trade journal are as follows:

No	Total carbon.	C. C.	Mn.	S.	Si	Phos.	Tensile strength lb.
1	3.35	.51	.43	.094	2.31	.05	22,360
2	3.02	.43	.22	.053	2.70	.463	18,970
3 Fr.	3.47	.40	.40	.102	2.45	.717	17,940
4	3.34	.10	.469	.083	2.59	.566	15,880
5	3.04	.08	.322	.10	2.55	.820	19,750
6	3.24	.098	.385	.111	2.67	.733	23,930
7	3.34	.59	.525	.084	2.30	.807	22,900
8	3.74	.65	.410	.083	1.60	.536	18,460
9	2.87	.028	.440	.159	3.56	...	25,930
10	3.52	.624	.476	.091	1.72	.578	25,260
11	3.91	.62	.823	.068	1.67	.444	21,330
12	3.61	.75	.518	.093	1.38	.620	14,710

In answer to a question Mr. Jenkins said there was no specification as to hardness, though in his opinion it is possible to get too soft iron for cylinder work in the effort to get castings that will machine readily.

French and American Practice Compared.

F. W. Stickle, Hartford, Conn., who was on the programme, presented a verbal contribution. Analyses of the castings made in his shop, taken six months apart, showed the following:

	Total Carbon.	C. C.	Phos.	Mn.	S.	Si.
April, 1907.....	3.17	0.45	0.65	0.39	0.13	1.99
October, 1907...	3.34	0.76	0.70	0.39	0.09	1.89

No tensile tests are made, but all test bars are broken transversely. The aim is to get iron with the greatest elastic limit, since the withstanding of shock is an important factor. Iron with high tensile strength is not adapted to such usage. With a 1-in. test bar, 12 in. between supports, cast iron of the above analyses showed 3800 lb., breaking strength with deflection of 0.15 in. The speaker gave the following analysis of a French cylinder used on a Mercedes car, the principal difference from his

own cylinders being in the higher phosphorus. Total carbon, 3.36; combined carbon, 0.10; phosphorus, 0.83; manganese, 0.60; sulphur, 0.09; silicon, 2.29. The higher phosphorus content in the French cylinders Mr. Stickle considered to be a great detriment. Apparently straight pig iron of one grade had been used, and there was not a mixture of irons as in this country. The trouble the foundryman has with this automobile work is to get iron that will run well between the cores and at the same time give a sound, strong casting. If an automobile manufacturer finds in such a casting a hole as big as a pin head he sends it to the scrap heap. The speaker had examined foreign cylinders that would never get through the inspection rooms of the automobile manufacturers of the United States. Formerly at the plant the speaker represents, rings and cylinders were made from different irons, but now the same mixture is generally used. The aim is to get the cores out thoroughly before pickling the cylinders, as it is found that cores get pasty in this operation. It was hard to get a mixture that would free itself, though success has now been attained in this regard.

A question came up as to the ratio of the transverse and tensile strength of cylinder test bars, and the speaker answered that it was about 1 to 9. The statement of A. E. Outerbridge, Jr., that usually the ratio between transverse and tensile strength of cast iron is between 1 to 8 and 1 to 10, was referred to, and W. J. Spencer, Philadelphia, said that he more often found it 8 than 10. A member, referring to Mr. Stickle's report of 3800-lb. transverse strength, said that he himself had not been able to get more than 2800 lb. from test bars of practically the same analyses as those Mr. Stickle had given.

Molding Machines.

E. H. Mumford, Philadelphia, was on the programme to open the discussion on "Molding Machines," and he did this by presenting the following questions:

1. Is there anything by which to appraise a molding machine other than the ratio of value of castings produced to cost of production?
2. When do portable molding machines pay better than stationary machines? Why?
3. When do stationary molding machines pay better than portable machines? Why?
4. What part of the work of machine molding is getting sand to machines and getting the molds off the machines to the floor (a) in hand rammed or portable machines? and (b) in power rammed or stationary machines?
5. What increase of output is afforded stationary machines by power sand supply over that when sand is shoveled from the heap?
6. What increase of output is afforded stationary machines by immediate disposal of mold parts, so that the operator does not have to set and close his own work on the floor?
7. What does power sand supply cost per machine?
8. What does off-bearing of molds by off-bearers or power mold tables cost?
9. What is the limit of depth and the size of flask at which power ramming of pressure ceases to pay?
10. What is the limit of depth and weight of mold at which jolt ramming ceases to pay?

Mr. Mumford read a letter from one who had had considerable experience with molding machines and who considered that progress with them had been slow. Had they been introduced as aids to molding and not purely as machines, the writer thought greater results might have been reached by this time. He took the view that too much had been expected from the machine itself, and said that the sooner the idea was eliminated that any laborer can take a molding machine and produce better castings than a molder, and that in a short time, the better for the future of the machine.

Prefacing his remarks by saying that he had introduced the questions read for the purpose of drawing out the views of others, Mr. Mumford asked whether there is not a commercial basis on which the molding machine may be better operated by a molder than by untrained labor. The question of the labor ethics of the molding machine is a very important one. The manufacturer often says, "Will my molders stand for it if I put in the machine?" and thus the question comes up, how can a basis be arranged by which the foundrymen in introducing machines will give the molder a square deal and vice versa? Mr. Mumford suggested that it might even be possible to give the molder operator some share in the profits of the molding machine.

A very general interchange of views followed. The point was brought out by one speaker that the present more tolerant attitude of the molder toward the machine simply resulted from the success attained with the machine in spite of the molder's long unwillingness to use it. On the other hand it was argued that if the molder is now willing to meet the manufacturer half way and to give the molding machine a square deal, this is the time to make an arrangement with him. The question was asked what other advantages than his skill in pouring are to be obtained by employing the molder on machines. Mr. Mumford replied that on small castings there is probably no other advantage, but that on large and more intricate castings the differentiation of the ramming of various parts of the mold gives place for the skill of the molder. A Canadian member said that the nub of the whole question was limitation of output. This, he felt, could never be submitted to; but if the molder were willing to take off the limitation of product, then perhaps the foundrymen might be willing to consider him as a machine operator.

S. C. Gale, Pennsylvania Malleable Company, Pittsburgh, believed that if the molder would take hold of machine work with the same spirit that he showed in hand work there would be a very much smaller contribution to the scrap heap. The difficulty he had encountered after every effort to adjust machine work on a fair basis and to distribute the tasks of setting cores, tempering sand, &c., and using picked men, was that when the molders reached on the machine the same output that they had formerly regarded as a day's work with hand labor they thought their day's work finished.

G. S. Custer, Hamilton, Ohio, remarked that the pouring of the molds was an important factor in connection with machine work. A man cannot be expected to make 300 molds a day on a machine, then pour the molds and shake out. It is a physical impossibility. Where a man performs the variety of operations above referred to he should have more pay than for performing one. When a machine operator becomes thoroughly broken in to that work, it will be found that he will prefer a hand job to the machine job, and this is natural. The speaker emphasized the point that it should be made an object to a man to take hold of the machine and work up to the large outputs expected from its use.

Abram C. Mott, Abram Cox Stove Company, Philadelphia, said he had been much struck with the way in which the molding machine absolutely did away with the molder's duty. The drawing of the pattern by a machine represented the grand elimination of the molder's work. He had noticed, however, that the molding machine men in demonstrating the capabilities of a machine, do not go to New York and hire a newly arrived immigrant to show the manufacturer what a handy man can do. As men become proficient on the machine as demonstrators they are advanced to $5, $6 and $7 a day. It is not surprising that the molder opposes taking up the machine at the same pay as before. The molding machine requires a molder. In teaching a handy man to operate a machine you make a molder. It has been the history of all machine introduction that the operator receives more than his predecessor who worked by hand. The chauffeur gets more than the coachman. It is reversing all history to attempt to introduce a machine at a decreased price for the operator. It has come to be the habit to fight over 5 cents on the price of work in the shop, while a cut of $1 by the selling department causes no comment.

WEDNESDAY AFTERNOON.

The discussion on molding machines was resumed at the afternoon session, the first question raised being "What part of the work of machine molding is getting sand to the machine and getting the molds off the machine to the floor?" No very definite data were brought out in answer. S. S. Knight told of an experience with the molding of soil pipe tees. The actual molding operation amounted to 50 per cent. of the cost. It was found in this particular work that it was impossible to get the sand to the machine and the molds away from the machine and poured at anything like a fast enough rate to get the full capacity of the machine.

Chairman Flagg called attention to the effect of the various operations connected with machine molding upon the character of the sand. Oftentimes the sand balls in a horizontal conveyor, the clay separating from the silica. Where machine operations are multiplied and a large number of men is involved the gain from machines is not so great as might be inferred from the result with a single machine. In this connection Dr. Moldenke remarked that in German foundries much is being done of late in the direction of sand handling economies. Very soon much data should be available from Germany on this subject.

Lazard Kahn, Hamilton, Ohio, was asked to speak of the molding machine from the standpoint of a stove manufacturer. He said that if he could make dividends for his stockholders by making stoves on the floor he would have nothing to do with the molding machine. He could not say that his company had thus far done itself a great deal of good by introducing the machine; yet it had done something in aiding a scientific movement that in the end will be of general benefit. Ultimately the chief beneficiary of the molding machine will be the molder himself. The day may come when the skilled molder will direct the machine operations of others not his equals in skill. With from 250 to 500 pieces in a stove the application of the machine to that industry has special problems, and the case is not nearly so clear as with work on single pieces like tees, where there are many to make and all are alike. There has never been a time when a man who took up the operation of the machine did not earn more money than when he worked by hand. Moreover, it is absurd to think that when we have made a smart machine workman we are ever afterward going to deal with him entirely apart from organizations which from their standpoint are seeking the same things for their members as manufacturers are seeking when they come together in associations.

The Prevention of Foundry Accidents.

After the secretary had given a synopsis of the paper of W. M. Carr on "Annealing Steel Castings," published in *The Iron Age* of June 11, page 1871, and of the paper by H. E. Diller, Chicago, on "Specifications for Castings to be Machined," Thomas D. West read a brief paper on "The Prevention of Accidents in the Foundry." He summarized the chief causes of such accidents, the difficulty of securing proper care on the part of operatives and the necessity of improving the shop organization in addition to the installation of proper safety devices. Mr. West spoke of the work of the Anti-Accident Association which he recently organized at Sharpsville, Pa., and suggested that the American Foundrymen's Association investigate the subject of accidents in foundries with a view to reducing their number and securing a more general observance of safety requirements. Acting on this suggestion the association at its Friday morning session authorized the appointment of a committee to take up this work.

Coremaking.

In a paper under the above title, A. M. Loudon, Elmira, N. Y., summarized his experience with a variety of cores, giving their composition and the proportions of old and new sand and binder.

Titanium in Cast Iron.

Secretary Moldenke presented the results of his investigation of the effect of ferrotitanium on cast iron, in a paper which is given in full elsewhere. Referring to his investigation of the effect of vanadium on cast iron, presented a few months ago, the secretary noted a contrast in the action of vanadium and titanium. By the addition of a small percentage of the former the strength of white iron was increased 50 per cent., while with a similar addition to grey iron the strength was increased but 18 per cent. With similar additions of titanium the above increases of strength were reversed—that is, with grey iron the increase was about one-half, and with white iron only about one-fifth.

F. C. Everitt, Trenton, N. J., read a paper on "Foundry Warehouse Methods," to which more extended reference will be made in a later issue. The secretary read by title the other papers on the programme of the afternoon, including "Ferro Alloys in the Foundry," by W. M. Saunders, Providence, R. I.; "Pattern Making for the Specialty Shop," by H. M. Lane, Cleveland; "Oxy-Acetylene Welding of Castings," by G. H. Taylor, Philadelphia.

The following Committee on Nomination of Officers was announced: H. E. Field, Pittsburgh; B. M. Shaw, Watertown, Mass.; Dr. E. E. Brown, Philadelphia; J. P. Golden, Columbus, Ga.; David Reid, Hamilton, Ont..

THURSDAY MORNING.

A paper on "Cupola Thermics," by S. H. Stupakoff, Pittsburgh, was read by title in the absence of the writer. Secretary Moldenke, in the absence of V. B. Lamb, New Haven, Conn., who was on the programme to give some further data on "Sandless Castings," a subject he had presented at the convention of 1907, told of a trip to the foundry at which casting is being done in permanent molds, according to Mr. Lamb's method. The product is brake shoes. Four M.' C. B. brakeshoes per hour are cast in each mold. At present the molds are arranged in line on the floor. Later a circular table or some similar arrangement may be provided. The cost is $5 a ton less than with sand molds. The mixture contains 30 per cent. pig iron and the balance is brakeshoe scrap. The silicon percentage is 2.25 in the casting. It is necessary to have more silicon than in sand cast brakeshoes, so that there may not be too heavy a chill. The annealing of brakeshoes cast in the manner described is an important part of the process. One secret of success with permanent molds, it was said, is to get the mold almost as hot as the iron. This is done by discarding one or two castings from the first metal poured. It was suggested that foundrymen might find it quite worth while to give more attention to the use of permanent molds.

Ira B. Lesh, Montreal, said that iron chillers should be of the same chemical composition as that of the metal poured into them. Another point is to keep the phosphorus down. He believed that with proper annealing, in addition, the results would be such as to lead to a much larger use of permanent molds in the foundry. The speaker expressed some skepticism as to the wearing quality of a brakeshoe high enough in silicon to keep down the chilling effect.

In the discussion following, the amount of experience brought out indicated a larger attempt to employ permanent molds than was generally supposed. One member told of the use of such molds for gear work without any warping of the molds. Another member, whose product is sash weights, spoke of uniformly unsatisfactory results with chills. He considered the problem to be largely one of heat treatment. The possibilities of molds which would be good for a limited number of castings rather than an indefinite number, was spoken of, and David Reid referred to an experience of 10 years back, when several large castings were made from one loam mold.

Improved Cupola Practice.

A paper entitled, "Chemical Reactions in Foundry Cupola Practice," by Jules de Clercy, Montreal, was read by Louis H. Bacque, Montreal, who is connected with the J. de Clercy Company of that city. The Baillot cupola, which the above company manufactures, was shown in operation in the Machinery Building, and supplied molten iron for the pouring of molding machine molds. M. de Clercy's paper, after discussing at length the reactions in the cupola, referred to the improved practice exemplified in the Baillot cupola, and summarized the conditions most suitable for the proper operation of a cupola as follows:

1. Distribute the blast through several rows of tuyeres, with a view to securing as complete and perfect a combustion as possible of the carbon and of the combustible gases: keeping an even temperature throughout the entire melting zone and taking care to make the cross section of the upper tuyeres much smaller than that of the lower ones, so as to avoid sending an excess of air into the upper strata of the melting zone.

2. See that the position of these tuyeres varies according to the nature of the fuel, according to its degree of average humidity and according to its size, always bearing in mind that any fuel will always act with regard to the blast in the same manner as if it were all composed of pieces of the smallest size it contains; also, that anthracite and dense cokes will have a

deoxidizing power considerably inferior to that of light porous cokes.

3. It will [illegible] to mix in with the blast a stated amount of gases subject to bring deoxidized by carbon at a high temperature. [illegible] or carbonic gas. This will prevent the temperatures becoming excessive at points where the combustion is most active, and so preclude the possibility of burning the iron; it will also transfer any excess of heat existing around the lower row of tuyeres, to the upper strata of the melting zone, and in particular to that part of the fuel bed immediately in contact with the metal. As to the manner in which these auxiliary gases are to be procured, it is one of extreme simplicity, for all that is required is to draw them off from the upper part of the cupola itself, just beneath the level of the charging door where they are drawn off by means of an apparatus specially designed so as not to develop excessive temperatures in the blast piping. The result of this is to mix with the air of the blast, not only the carbonic gas resulting from the combustion of the coke and the steam coming from the humidity carried by the fuel, but also a portion of the carbon monoxide, which is just so much more fuel saved, as well as a certain amount of B.t.u's. furnished by the apparent heat of all the gases.

These processes and reactions were turned to practical use by A. Baillot, and so far the results obtained by him, both in Europe and in America, in the various applications he has made of them, have been highly satisfactory. As much as 13 lb. of iron have been turned out per pound of coke, bed included, and the iron has always been found to be of quite a superior quality. In fact, Mr. Baillot has realized in actual practice all the desirable advantages enumerated above and at the same time secured greater speed of melting and increased capacity of cupolas for a given size than was heretofore possible.

The remainder of the morning session was given up to a discussion of the paper, Mr. Bacque answering various questions propounded by members as to the theoretical and actual results of the construction he had advocated.

THURSDAY AFTERNOON.

Secretary Moldenke referred briefly to the paper on "Shop Management," by H. F. J. Porter, New York, the writer being absent.

By-Product Coke in the Foundry.

G. A. T. Long of Pickands, Brown & Co., Chicago, presented a paper on "By-Product Foundry Coke," from which the following extracts are taken:

I claim to-day that by-product foundry coke, such as is produced at the plants named [at Syracuse, Detroit, Chicago and Milwaukee] will give better results with all kinds of iron melted in a cupola, let it be for stove plate, machinery or car wheels, high or low carbon irons. Car wheels require more coke to melt than stove plate or machinery, owing to the use of low carbon irons, and more carbon has to be supplied to the metal, as a mixture going into the cupola is 3.20 in total carbon, and a wheel should contain 3.50 to 3.55 total carbon. The difference must be supplied from the carbon in the coke. Therefore the higher carbon in the coke the less fuel it takes to melt the metal and the better the casting. For instance, I was called a short time ago to investigate a little trouble they were having at a certain plant in the West. On reaching the plant I found they were using the same iron right along, had not got any new iron in five months, and knew the analysis of every car on the ground. They were using 6000 lb. of iron to each charge and 720 lb. of coke, before their iron would be fluid enough to run their castings; but their trouble was in their machine shop. They were using a Connellsville coke which stood 0.98 per cent. sulphur, 83 per cent. fixed carbon, 13 per cent. ash. While I was there they received a car of by-product foundry coke, which ran 0.54 sulphur, 91 fixed carbon, 7.23 ash. After starting this coke going I had to cut down, after the bed charge, to 600 lb. to each charge of 6000 lb. of iron; also increased the scrap 15 per cent., which made stronger castings and remedied all the trouble in the machine shop. In this case the charge of 720 lb. of Connellsville coke contained 7.05 lb. of sulphur and 597 lb. of carbon, while the charge of 600 lb. of by-product coke contained 3.84 lb. of sulphur and 546 lb. of carbon—approximately half the sulphur and only 50 lb. less of fixed carbon, although using 120 lb. of coke less per charge.

Mr. Long, in reply to a question as to the burden carrying quality of by-product coke, referred to a cupola in which the charging door was 33 ft. from the bottom. By-product coke was used, and had carried 148 tons of iron in 9 hr. To the question, "Why does by-product coke run into slag more than beehive coke?" he replied, "It doesn't."

A Chicago foundryman testified to the good results secured with by-product coke. His firm found that it saved time and coke. On a 15-ton heat he had saved from 25 to 45 min.

Foundry Waste.

Harrington Emerson, New York, addressed the meeting on the above subject, citing many examples of loss in foundry operations which had come under his observation. These were shown to be due to the lack of a [illegible] cost system, to badly designed castings, to the performance of unnecessary work, to hard iron, to inefficiency in cupola charging and operation, to curtailment of output, to disagreements between employer and employee. The speaker laid emphasis upon efficiency in the operation of the foundry, and laid it down as a principle of general application that the lower the manufacturing cost the higher are individual earnings.

Foundry Cost Systems.

The secretary presented the report of the association's Cost Committee, of which Kenneth Falconer, Montreal, is chairman. It was accompanied by a cost chart prepared for the committee by Harrington Emerson, one of its members. Following the presentation of the report E. M. Taylor, New York, a member of the committee, read a paper entitled "The Development of a Cost System for the Foundry." The committee's report and Mr. Taylor's paper will be presented in a later issue of *The Iron Age*.

P. Kreuzpointner, Altoona, Pa., chairman of the Committee on Industrial Education, presented a progress report, and explained some lantern slides illustrative of apprenticeship conditions in Germany 40 and 50 years ago. Mr. Kreuzpointner referred to the interest taken by public school authorities in Canada and the United States in the matter of industrial training. He also presented a resolution expressing the association's appreciation of such interest and of the efforts of educators to solve the problem of adapting the public schools to the new industrial conditions.

The secretary showed a number of interesting lantern slides illustrating the manufacture of coke as carried on at various plants he had visited in connection with his work for the United States Geological Survey.

FRIDAY MORNING.

The closing session of the association was held Friday morning at 10.30 o'clock. Routine business was transacted. A resolution was adopted indorsing the proposed elimination of numbers in designating the grade of pig iron under the present form of contracts, and favoring chemical analysis alone as a basis of purchases of iron. It was also requested that the American Society for Testing Materials concur in this resolution.

Votes of thanks were extended the various officers for their services during the past year, and to the Toronto committees for their entertainment.

New Officers.

The Nominating Committee presented the names of the following persons for election to office for the coming year. They were unanimously chosen:

President, L. L. Anthes, Toronto Foundry Company, Toronto, Ont.

Vice-Presidents: First District—F. B. Farnsworth, McLagon Foundry Company, New Haven, Conn.; Second District—William H. Parry, National Meter Company, Brooklyn, N. Y.; Third District—H. E. Field, Mackintosh, Hemphill & Co., Pittsburgh, Pa.; Fourth District—J. W. Jeffrey, Ohio Malleable Iron Company, Columbus, Ohio; Fifth District—S. T. Johnston, S. Obermayer Company, Chicago, Ill.; Sixth District—T. W. Sheriffs, Sheriffs Mfg. Company, Milwaukee, Wis.; Seventh District—J. W. Kissick, Columbus Iron Works, Columbus, Ga.; Eighth District—R. J. Cluff, King Radiator Company, Toronto, Ont.

Secretary-Treasurer, Dr. Richard Moldenke, Watchung, N. J.

Representatives from Cincinnati, Detroit, Pittsburgh and Wheeling, W. Va., presented petitions for the next convention of the association. On motion Cincinnati was recommended to the Executive Committee as the meeting place in 1909. The convention then adjourned.

ALLIED ORGANIZATIONS.

The Foundry Supply Association.

The business meeting of the Foundry Supply Association was held at the King Edward Hotel, Thursday evening, June 11, when the report of the secretary-treasurer, H. M. Lane, was received. At this meeting it was decided to continue the exhibition during Saturday, for the convenience of those who had not had an opportunity

to go over it thoroughly. The following officers were elected:

President, F. N. Perkins, Arcade Mfg. Company, Freeport, Ill.

Vice-Presidents: John Hill, Hill & Griffiths Company, Cincinnati, Ohio; E. J. Woodison, Detroit Foundry Supply Company, Detroit, Mich.; T. W. Pangborn, Thomas W. Pangborn Company, New York; George H. Wadsworth, Falls Rivet & Machine Company, Cuyahoga Falls, Ohio.

Secretary, H. M. Lane, Cleveland, Ohio.

Treasurer, J. S. McCormick, J. S. McCormick Company, Pittsburgh, Pa.

Trustees: J. S. Rayner, Carborundum Company, Niagara Falls, N. Y.; J. S. Smith, J. D. Smith Foundry Supply Company, Cleveland, Ohio; A. D. Backert, Cleveland, Ohio; E. H. Mumford, E. H. Mumford Company, Philadelphia, Pa.; J. H. Whiting, Whiting Foundry Equipment Company, Harvey, Ill.

The proposal to draw up a new constitution was taken up, and a committee will be appointed to take charge of the matter. Consideration has been given informally to the establishment of a credit department of the association.

The Brass Founders' Sessions

The American Brass Founders' Association convened in its final business session Friday morning at 10.30. C. J. Caley, presiding. The committee having in charge the preparation of a new constitution, to broaden the scope of the association work, presented its report, which was adopted as read. There was some informal discussion of a proposal to change the name of the association, but no action was taken. From the beginning the scope of the organization has been greater than its name indicates, rolling mills, electroplating works and all having to do with the non-ferrous metals, being included. The election of officers for the following year ensued, the Nominating Committee presenting the names of the following persons, who were unanimously elected:

President, Charles J. Caley, Russell & Erwin Mfg. Company, New Britain, Conn.

Secretary, W. M. Corse, Detroit Lubricator Company, Detroit, Mich.

Treasurer, John H. Sheeler, Sheeler-Hempsher Company, Philadelphia, Pa.

Vice-Presidents: New England—Wm. R. Webster, Bridgeport Brass Company, Bridgeport, Conn.; Walter C. Allen, Yale & Towne Mfg. Company, Stamford, Conn.; A. H. Warner, E. Stebbins Mfg. Company, Springfield, Mass.; New York and New Jersey—W. L. Abate, Nathan Mfg. Company, New York; Pennsylvania, Maryland and Delaware—Thomas Evans, Eynon-Evans Mfg. Company, Philadelphia, Pa.; Central States—Charles B. Bohn, Allyne Brass Foundry, Detroit, Mich.; Western States—J. N. Gamble, Western Tube Company, Kewanee, Ill.; Northwestern States—W. D. Allen, W. D. Allen Mfg. Company, Chicago, Ill.; Southern States—J. Cessna Sharpe, Chattanooga, Tenn.; Quebec, Canada—Alexander Mitchell, Robert Mitchell & Co., Montreal; Ontario, Canada—N. K. B. Patch, Lumen Bearing Company, Toronto Junction.

The report of the treasurer showed receipts in the past year of $725 and disbursements of $479.86, leaving a balance in the treasury of $245.14. The secretary reported that the present membership is 145, representing 18 States and Territories and Canada.

President Caley announced that an effort would be made to hold joint sessions of the Brass Founders' Association and the American Foundrymen's Association in 1909 as the members of both organizations are interested in general foundry practice, and in discussions bearing on the operations of both the brass and iron foundry.

Separate sessions for the consideration of papers were held by the American Brass Founders' Association on Wednesday forenoon, Thursday morning and Thursday afternoon. The following papers were presented and discussed at these sessions:

"The Electro-Chemical Cleaning of Metals and Its Application to Commercial Uses," by Chas. H. Proctor, Arlington, N. J.

"How to Use Membership Privileges in This Association," by Andrew M. Fairlie, Copperhill, Tenn.

"The Outside *Versus* the Inside Man," by W. A. Porter, Toronto, Canada.

"The Efficiency of Brass Melting Furnaces," by F. A. Coleman, Cleveland, Ohio.

"The Value of Liquid Fuel in Brass Foundry Practice," by W. N. Best, Brooklyn, N. Y.

"Oil as Fuel," by W. S. Quigley, New York.

"Commercial Insulation," by F. H. Dimock, New York.

"Prolonging the Life of a Crucible," by Dudley A. Johnson, Chicago, Ill.

"The Metallurgy of the Bronze Age in Europe," by W. M. Corse, Detroit, Mich.

"The Relation Between the Physical and Chemical Characters of Molding Sands," by Dr. Heinrich Ries, Ithaca, N. Y.

"Quality *Versus* Quantity," by J. N. Gamble, Kewanee, Ill.

Associated Foundry Foremen.

The annual meeting of the Associated Foundry Foremen was held in the Process Building at the exhibition grounds, Monday evening, June 8. In the absence of the president, J. F. Webb, Davenport, Iowa, Vice-President W. S. McQuillan, Warren, Pa., presided. In his opening remarks he laid emphasis on the fact that the objects of the association are purely educational.

The secretary, F. C. Everitt, Trenton, N. J., reported that the finances of the association are in better condition than in previous years and that with a present membership of 469 the association made a gain of 99 in the year. A number of changes in the constitution were adopted by the meeting, these relating particularly to the method of electing officers. The committee on the publication of an association paper reported that the efforts in this direction had not been successful and it was recommended that nothing further be done about the matter. Reports were presented from local associations, some of which were said to be quite active, while others are not flourishing. The associations at Chicago and Cincinnati were reported in a very live condition. The matter of a closer affiliation of the American Foundrymen's Association, the American Brass Founders' Association, the Foundry Supply Association and the Associated Foundry Foremen came up and statements were made by Dr. Richard Moldenke, H. M. Lane and L. L. Anthes. A committee was appointed to confer in the coming year with the Executive Committees of the other three associations so that a mutally agreeable plan of action might be adopted. This committee consisted of A. W. Loudon, Elmira, N. Y.; W. A. Perrine, Philadelphia; H. J. Holmes, Cincinnati; E. W. Smith, Chicago, and F. C. Everitt, Trenton, N. J.

The election of officers resulted in the choice of the following:

President, W. S. McQuillan, Warren, Pa.

First Vice-President, J. Gaffney, Toronto.

Second Vice-President, Eugene W. Smith, Chicago.

Secretary-Treasurer, C. E. Hoyt, instructor in foundry practice at Lewis Institute, Chicago.

District Vice-Presidents: W. F. Grunau, Erie, Pa.; Henry Biegel, Milwaukee; E. W. Smith, Chicago; D. C. Wilson, New York; W. A. Keller, Indianapolis, Ind.; C. A. Olsen, Cleveland, O.; W. A. Perrine, Philadelphia; David Reid, Hamilton, Ont.; John Logan, Cincinnati, Ohio; M. J. Walsh, Montreal, Que.; J. F. Webb, Davenport, Iowa, representing the Tri-City Association of Rock Island, Moline and Davenport.

Mr. Webb, the retiring president, was made an honorary member of the association. Mr. Everitt, after a number of years of able and energetic work for the association, felt compelled to give up the secretaryship. As an expression of their gratitude the members presented him with a purse containing $150 in gold.

NOTES.

It is interesting to see the appearance at the A. F. A. conventions of a second generation of foundrymen. Among those in attendance at Toronto, whose fathers are now, or have been, active members of the association, were the following: Ralph H. West, West Steel & Iron Casting Company, Cleveland, Ohio; A. E. Pfahler, Model Heating Company, Philadelphia; Abram C. Mott, Jr., Abram Cox Stove Company, Philadelphia; Emmet Dwyer, Michigan Stove Company, Detroit, Mich.; Stanley G. Flagg, 3d, Stanley G. Flagg & Co., Philadelphia, and the younger Walker of the Erie Malleable Iron Company, Erie, Pa.

Japan had five representatives at the convention. Y. I. Kawa, T. Kaishimar and K. Kaishimar of the Tobata Foundry Company, Tobata, Fukuokaken, and B. Nakagawa and L. Hayashi of the Army Arsenal at Tokio, Japan.

The entertainment features were elaborate. First came the reception to the delegates and their wives given by the Mayor, City Council and other officials at Toronto's beautiful City Hall Tuesday evening. There was a steamer ride on Lake Ontario Wednesday morning, a trolley ride to Scarboro Beach Thursday evening and a smoker Friday evening. The ladies were entertained by trolley and automobile rides and shopping excursions, and on Friday evening by a theatre party.

The following committee, representing the National Association of Stove Manufacturers attended the convention and spent much time in investigating the adaptability of the molding machine to stove plate work: Grange Sard (chairman), Rathbone, Sard & Co., Albany, N. Y.; Philip Will, Sill Stove Company, Rochester, N. Y.; Fredk. Sattler, Belleville Stove Company, Belleville, Ill.; B. M. Shaw, Walker & Pratt Mfg. Company, Watertown, Mass.; Lazard Kahn, Estate Stove Company, Hamilton, Ohio.

THE EXHIBITS.

The exhibits of the members of the Foundry Supply Association numbered 67, as compared with 70 at Philadelphia last year. Operating exhibits, requiring power, were located in Machinery Hall, while all others were shown in the Process Building. The exhibitors had adequate room for their displays, which in some cases were more elaborate than heretofore. In Machinery Hall power was furnished by a 125-hp. Evans engine, which also operated generators for electric power. Compressed air at 80 lb. pressure was furnished by a compressor of the Canadian Pneumatic Tool Company. The molding machine exhibits were of particular interest to the foundrymen, while the Baillot cupola, which was operated daily, also came in for a large share of attention. The various displays are described below:

J. W. PAXSON COMPANY, Philadelphia, Pa.: A Paxson rock-over molding machine operating on stove fronts; a Paxson-Sawyer metal separator; portable air power sifting machine, with interchangeable sieve; aluminum snap flasks; air or steam power core machine of the plunger type, making cores from ¾ to 3 in. diameter; No. 3 Paxson fan blower; vibrators for brass molding tubs; iron, steel and brass castings, cleaned by Paxson-Warren sand blast machine; Paxson parting compound and miscellaneous supplies and tools.

JOSEPH DIXON CRUCIBLE COMPANY, Jersey City, N. J.: Plumbago crucibles, retorts, brazing crucibles, phosphorizers and special shapes; also a number of "old soldiers"—pots long in service and such as had been damaged by improper handling; stoppers, nozzles and graphite facing.

OSBORN MFG. COMPANY, Cleveland, Ohio: General foundry supplies, molders' tools, brushes, etc.; also the Economy wire wheel for cleaning steel castings.

MERRICK FOUNDRY SUPPLY COMPANY, Toronto, Can.: The Hauck oil burner. Kerosene or crude oil used as fuel. Practical demonstration of skin drying molds and ladles, as well as brazing operations.

W. W. SLY MFG. COMPANY, Cleveland, Ohio: Exhaust tumbling barrels, cinder mill and iron separator, dust arresting system and pattern gear cutting machine.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y.: Centrifugal air compressor driven by 50-hp. Curtis steam turbine.

KROESCHELL BROTHERS COMPANY, Chicago, Ill.: Kroeschell-Schwartz gyrating flame crucible furnace, for gas or oil.

CALUMET ENGINEERING WORKS, Harvey, Ill.: Model Calumet cupola, showing shell extending outside of wind box; turntables, Calumet air hoist.

HOLLAND LINSEED OIL COMPANY, Chicago, Ill.: Core oils.

MITCHELL-PARKS MFG. COMPANY, St. Louis, Mo.: No. 2 gravity molding machine, taking in flasks 28 x 44 in. up to 44 in. square, working on machinery castings, grate bars, etc.; portable gravity molding machine, molding cope and drag; combination jar and squeezing machine, operating on stove work 12 x 18 x 6 in. deep. Castings being poured daily with iron from Baillot cupola.

E. H. MUMFORD COMPANY, Philadelphia, Pa.: Plain power ramming molding machines in operation; power ramming split pattern machines; Bonvillain & Ronceray sand mill in operation; hydraulic rollover molding machine, 22 x 32 in. flasks, 13 in. draft, with pump and accumulator and pattern making demonstration; vibrators, stripping plates, &c.

ARCADE MFG. COMPANY, Freeport, Ill.: No. 1 automatic power driven molding machine for light work, with sand elevator and dropping attachment; No. 3 modern machine, double table, cope on one side and drags on the other; modern machine, 16 x 24 in. flasks, cope and drag work, with a lifting range of 7 in.; modern rockover for deep work, 12 in. lift, double stand 24 in. table; modern rockover for shallow work; castings shown ranging from plow shares to extremely light gated work in brass and iron.

H. E. PRIDMORE, Chicago, Ill.: Rockover molding machines, rockover drop machines, stripping plate machines, small 16-in. rockover drop machine. The larger machine was on heavy pipe fitting work.

STANDARD SAND & MACHINE COMPANY, Cleveland, Ohio: Special mixing screening, elevating and conveying machinery, including a continuous batch mixer, motor driven adjustable screen, portable motor driven pulverizer; centrifugal sand pulverizer and continuous loam sand mixer.

E. KILLING MOLDING MACHINE COMPANY, Davenport, Iowa: Rollover straight molding machine, two 18 x 18 stripping plate machines operating on implement work; rollout molding machine on plow wheels; universal sand table, with direct connected motor; automatic steel flasks; steel jackets for snap flask work.

[illegible] MFG. COMPANY, Cleveland, Ohio: Rockover molding machine, taking a flask up to 14 x 22 in., with sand conveyor and rotary riddle operating on an assorted work in 14 x 18 flask; variety of sample castings, showing work done on the machine.

HAWLEY DOWN DRAFT FURNACE COMPANY, Chicago, Ill.: Hawley-Schwartz melting furnaces—No. 1, class A, 32 in.; No. 3, class D. 60 in.; No. 5, class D, 90 in.; No. 2, class D, 42 in.; castings made with metal from Hawley-Schwartz furnaces in steel, brass, bronze, semi-steel, copper, aluminum and malleable iron.

TABOR MFG. COMPANY, Philadelphia, Pa.: Two 10-in. power ramming molding machines, one molding souvenir ash tray; one 14 x 16 split pattern machine; one 30—8-in. power rollover hinge machine, having flask 29 x 48 in. weighing 600 lb.; one 18—8-in. hinge machine molding segment of Tupper grate bar.

CANADIAN PNEUMATIC TOOL COMPANY, Montreal, Can.: A line of pneumatic tools, including sand rammers, riddles, chipping hammers, pneumatic drills, &c.

HERMAN PNEUMATIC MACHINE COMPANY, Zelionople, Pa.: Class B jar molding machine, taking in flask 24 x 45 in.; model of class B, bumper jar machine for heavy copes and drags, operated with 8 x 8 in. flask on cross screw work.

In a temporary building, outside Machinery Hall, several working exhibits were placed. The Baillot cupola and Steele-Harvey melting furnaces furnished iron and brass respectively for pouring molds, which were made in demonstration. A molder's floor was laid out and snap flask work with special equipment was demonstrated. The oven for drying cores and the tumbling barrels used in this connection were part of the exhibit of the J. D. Smith Foundry Supply Company, Cleveland, Ohio. The exhibitors were the following:

MONARCH ENGINEERING & MFG. COMPANY, Baltimore, Md.: No. 60 tilting oil melting furnace using crucible; No. 60 non-tilting melting furnace; No. 125 nontilting furnace; special Babbitt melting pot; a ladle heater and rivet furnace or tempering forge; No. 6 Monarch blower. The tilting furnace poured red brass daily for souvenirs and general castings.

DOMINION IRON & STEEL COMPANY, Sydney, N. S.: Dominion and disk brands of pig iron used in demonstrating the Baillot cupola.

BAILLOT CUPOLA AND GAS REGENERATING SYSTEM, JULES DE CLERCY, Montreal, Can.: The cupola was of the smallest type made, 26 in. in diameter at the bottom and 21 in. at the charging door; capacity, 2½ tons per hour. Each afternoon a heat was taken off to pour various molding machine castings. The regenerative principle of the cupola is that the gases are taken from the region of the charging door and returned to the tuyere zone, resulting in a material raising of the temperature of the blast in the center of the charge. The danger from sparks is also considerably lessened.

J. D. SMITH FOUNDRY SUPPLY COMPANY, Cleveland, Ohio: Roller door and combination core oven in operation, drying cores for molds poured in brass or iron. In 84 hours' continuous run, which included heating up, coke consumption was 440 lb. Ridding machinery, tumbling barrels and the Smith injector sand blast cleaning apparatus were shown in operation.

The Process Building.

In the Process Building firms not operating any portion of their display by steam or electric power made their exhibits. In this building were the headquarters of the American Foundrymen's Association and the Foundry Supply Association. The registration desk was located at the principal entrance. Among the exhibits were the following:

"THE BIG THREE" (Whiting Foundry Equipment Company, Harvey, Ill.; S. Obermayer Company, Cincinnati, Ohio; Dominion Foundry Supply Company, Montreal, Que.): Overhead tramway systems, air hoists, electrical and mechanical brake mechanism and geared ladles; facings, partings and general foundry supplies; photographs of foundry installations.

JONATHAN BARTLEY CRUCIBLE COMPANY, Trenton, N. J.: Distributed literature in connection with their new plant. Will be ready to furnish plumbago crucibles for all classes of work early in the fall.

ROBESON PROCESS COMPANY, Au Sable Forks, N. Y.: Rest room, with exhibits of raw materials used in the manufacture of Glutrin.

FRANCIS HYDE & CO., Montreal, Que.: Foundry supplies; Blodgett's core oven; crucibles made by Bridgeport Crucible Company; King portable oil furnace; King molding machine.

HILL & GRIFFITHS COMPANY, Cincinnati, Ohio: Peerless per-

brazed chaplets; patent snap molder's bench; steel coke baskets; general foundry supplies.

PICKANDS, BROWN & CO., Chicago, Ill., (also Solvay Process Company, Syracuse, N. Y.): Solvay by-product coke. It was used in the demonstration of the Baillot cupola in the temporary foundry.

NORTHERN ENGINEERING COMPANY, Detroit, Mich.: Photographs of the company's cranes and other foundry equipment.

R. B. SEIDEL, INC., Philadelphia Black Lead Crucible Works, Philadelphia, Pa.: Plumbago crucibles for steel, brass and other metals; special pots for brass foundry work; stoppers and nozzles for steel ladles; brazing pots, phosphorizers and special shapes.

W. W. LINDSAY & CO., Philadelphia, Pa.: Foundry chaplets and anchors.

J. S. MCCORMICK COMPANY, Pittsburgh, Pa.: The "McCormick Roadster," a model bicycle built up of the smaller foundry supplies attracted general attention. Mallets, brushes, sieves, rapping irons, rammers, bars and bellows were prominent in its construction. Foundry ladles, exhaust tumbling mills, molders' tools, the Farnham sand blast machine, core ovens, facings and general supplies also shown.

GREGG MFG. COMPANY, Cleveland, Ohio: Core wire cutting machine, for straightening and cutting wire up to lengths of 12 in.

NORCROSS MOLDING MACHINE COMPANY, Terre Haute, Ind.: Photographs of machine and castings, showing character of work done.

DETROIT FOUNDRY SUPPLY COMPANY, Detroit, Mich.: Foundry supplies and molders' tools; sprue cutting machine; Woodison crucible oil furnace; Webb molding machine; brass founders' tilting tumbling barrel; molders' steel traveling bench; McPhail flasks, firebrick, facing, &c.

PAROID ROOFING COMPANY, Hamilton, Ont.: Felt and asphalt roofing.

ARTHUR KOPPEL COMPANY, Pittsburgh, Pa.: Industrial railroad systems, mill supplies, foundry and industrial railroads, miniature cars and equipments.

CLEVELAND WIRE SPRING COMPANY, Cleveland, Ohio: Foundry barrels, boxes and trucks, factory shelving, steel racks for toolrooms, &c.

J. C. KNOEPPEL, Buffalo, N. Y.: Model of improved cupola, showing tuyere system.

FALLS RIVET & MACHINE COMPANY, Cuyahoga Falls, Ohio: Wadsworth core machines, quick speed changing core cutting off and coning machine, power and electrically driven; Wadsworth core ovens and a display of standard core prints which are to be made and supplied the trade.

CANADIAN LABORATORIES, Toronto, Can.: Collection of test bars.

FOUNDRY SPECIALTY COMPANY, Cincinnati, Ohio: Parting compounds and flutes, flutine and partine.

HAMILTON FACING MILLS COMPANY, LTD., Hamilton, Ont.: Canadian silica sands, facings and foundry supplies.

TORONTO TESTING LABORATORY, Toronto, Can., and DETROIT TESTING LABORATORY COMPANY, Detroit, Mich.: Chemical and metallurgical engineers.

WESTERN FOUNDRY SUPPLY COMPANY, New York: Ferroalloys; ground 80 per cent. ferromanganese.

STANLEY DAGGETT, New York: Perfection parting, iron and steel cements.

REID FOUNDRY & MACHINE COMPANY, Ingersoll, Ont., and Worcester, Mass.: Reid molding machine—a split pattern, hand ramming type, shown fitted with patterns for agricultural castings.

GOLDSCHMIDT THERMIT COMPANY, New York and Toronto: Demonstrations of the use of thermit, showing welding and burning apparatus; also crucibles, firebrick shapes, alloys, &c.

FOX MACHINE COMPANY, Grand Rapids, Mich.: Universal trimmers and core box machines, cutting irregular and straight cores.

S. F. BOWSER COMPANY, INC., Fort Wayne, Ind., and Toronto, Can.: Oil tanks and oil storage systems.

P. H. & F. M. ROOTS COMPANY, Connersville, Ind.: Roots' positive pressure blower for foundry purposes; rotary pumps.

U. S. GRAPHITE COMPANY, Saginaw, Mich.: Foundry facings.

CARBORUNDUM COMPANY, Niagara Falls, N. Y.: Carborundum grinding wheels, rubbing bricks, fire sand for brass furnaces, paper and cloth carborundum disks, grinding and polishing materials, crude materials, &c.

B. F. STURTEVANT COMPANY, Boston, Mass.: Sturtevant blower, used for furnishing blast to Baillot cupola.

AUTO-SAND MIXER COMPANY, Piqua, Ohio: Gasoline driven sand mixer for cutting sand on the floors; in operation.

FREDERIC B. STEVENS, Detroit, Mich., and Windsor, Ont.: Elaborate display of foundry tools, emery wheels, facings, molders' tools, &c.

CANADIAN GAS POWER & LAUNCHES, LTD., Toronto, Ont.: Launches, gasoline engines, running blower and electric generators; propeller blades, &c.

The New England Foundrymen's Association held its last regular meeting before the summer outings at the Exchange Club, Boston, June 10. The occasion developed into one of entire informality, as it was voted to dispense with all business. A supper was served with novel features, and afterward Charles Everett Beane, Somerville, Mass., gave his story on Newfoundland, illustrated by moving pictures taken by himself.

Automobile Cylinder Manufacture.*

BY L. N. PERRAULT.†

The automobile has undoubtedly done more than anything else to develop the highest degree of skill and accuracy in the foundry. The successful making of the various types of cylinders demands the utmost painstaking, intelligent forethought and supervision. To such an extent is this feature carried out that some foundries which make a specialty of this class of work find it profitable and even necessary to employ a skilled man, whose sole duty consists of a constant oversight of each new job from the arrival of the drawings or patterns, noting the efficiency, or lack of it, with which each operation is conducted, and conferring with the superintendent and foreman on ports noted, until all are satisfied that no further improvement can be made to hasten production or better the product.

A thorough knowledge of the subject, which can be acquired only by long experience, is indispensable to the foundryman who hopes to make a success of casting water cooled cylinders with the jackets integral. His judgment is also indispensable to the designer, who many times sees only the virtues of his design as compared with others, and either does not recognize or ignores its drawbacks from the foundry point of view. Again, unless the man who makes the pattern has a liberal foundry experience, his ideas of making the pattern and core boxes so that the molds and cores can be readily assembled would be laughable. That is, if the foundryman could be induced to laugh after spending several hours filing, scraping and fitting cores, and trying them in the mold again and again in an endeavor to get an even thickness around ports, valve chambers and jacket walls, so that he may get a sample casting to cut open for inspection. This, by the way, is a wise move if the order is large, for a casting sawed into a number of sections and along the right lines exposes every imperfection. With the most skilfully made patterns and core boxes it is often necessary to make some slight alterations after the cylinder is cast, and it seems almost wonderful that the patternmaker can work as closely to the many curves and odd shapes as he does and not vary more in the thickness of the metal walls.

A Complicated Process.

Take for illustration, the twin cylinder unit in common use in the two, four and six cylinder cars both here and abroad. In some patterns the entire core, with the exception of the barrel cores, and consisting of the top and bottom jacket, two ports, one inlet and one exhaust core, are assembled and pasted in a form (which may be made of iron, plaster of paris or oil sand, and which is an exact replica of the bottom of the mold), then dried in the oven, and, when ready, set into the mold as one core. In this case one can readily see the necessity of each core having suitable provision made for locating and locking into exact place, for the variation of even 1-64 in. in one core only would cause the casting to be scrapped. In other patterns of the same outward design, the bottom jacket is first located in the mold; next the barrel cores, which in this case have port and valve seat cores made integral with them, are set. Then the second section of the jacket core is pasted in place, and the first cheek closed; next, the inlet and exhaust cores are set in place and the top jacket pasted on and dried in the mold with a gasoline torch, and the second cheek and cope closed and clamped ready to cast. Either method is reasonably safe, but the writer prefers the second, as one has the opportunity to see that the cores are properly located after each operation. On this work it is very necessary to have just the right materials for making both the mold and cores.

Consider for a moment the skill and accuracy called for on the part of the coremaker, which enable him to make a jacket core as large as a water bucket, varying in thickness from ⅝ in. in some parts to 2½ in. in others,

* A paper read at the Toronto meeting of the American Foundrymen's Association, June, 1908.

† Manager of the Waterbury Castings Company, Waterbury, Conn.

and which must successfully withstand a pressure of ⅛ in. of metal outside against ½ in. pressure from the inside. How nicely must the interlacing of wires and wax vents be carried out; 1, To support the core against this pressure and in the right location; and, 2, to furnish a free and quick egress for the rapidly generated gases.

A Great Increase in Output.

Only a few years ago the American foundryman who could successfully make automobile cylinders was looked upon as a wonder and was much talked of among the fraternity. Even then his best efforts only produced a good one now and then. His daily production per man is exceeded hourly to-day, owing to the experience that time has brought in simplifying the design and construction of both patterns and core boxes, as well as educating some of our brightest molders, who have been quick to appreciate the advantages of being specialists in this very interesting line of work. The writer has seen some of the prominent automobile builders increase their output several hundred per cent. in the past few years. Starting with only one model, and that largely an experiment, to-day their line includes several types, all of which are standard and wholly successful, and now several foundries in the United States devote the greater part of their time to this great and growing demand for automobile cylinders.

Thin Walls Demanded.

The great stress laid by the automobile engineer upon saving weight has made thin castings a necessity in cylinders with the water jackets cast integral. Little by little the thickness was reduced until the danger line was reached. Then strengthening ribs were added, and these coming in the jacket core boxes make the problem all the more difficult for the foundryman. Again, the presence of bosses for the various studs, &c., often necessitates the use of internal chills to hasten cooling and prevent shrinkage. The enormous strains put upon the cylinders in actual service, by reason of vibration, and the unequal heating of different parts by the exploded gases, make the question of strength an important one. Strong irons, by reason of their chemical composition, are inclined to be rather hard when cast into such thin sections, yet the engineer demands a strong casting, which must machine uniformly and be absolutely free from either hard or spongy spots and sound in bosses and jackets.

Analyses of Foreign Mixtures.

As the result of careful study and patient experiment, the writer has settled on a mixture which has stood the test of time and has been uniformly satisfactory, giving a tensile strength of about 36,000 lb. per square inch. Strange and complex are the opinions of some of the designers with whom we come in contact in the course of our investigations. As an illustration, A says: "I wouldn't use any but French castings; they are the only good ones made." He kindly allowed me to take borings for analysis. B says: "I have had them from France, Germany and Italy, but the only man I ever knew who could turn out a decent cylinder has a little shop in England and he makes all of mine." I append the analysis of both, selecting these as the two extremes for your consideration:

	French	English
Silicon	1.72	2.73
Sulphur	0.110	0.083
Phosphorus	1.10	1.141
Manganese	0.590	0.41

Molding.

When the size of the order will permit, interchangeable iron flasks should be used. These should be as light as is consistent with safety, for in three or four parted work the handling of flasks is quite an item in the molder's labor. The patterns and core boxes should be of metal, or if of wood the parts most exposed to wear should be protected by metal facing. All loose bosses, &c., should be so fitted that even the slightest displacement cannot occur, and such bosses as will permit of it should be cored to avoid shrinkage, for every part of the cylinder must be tight to stand the strains of service. The sand should be of fine texture and open grained, very carefully mixed or ground, worked rather dry, and well blackened with a good grade of plumbago. These points if carefully observed should produce smooth round castings in green sand. The following methods of molding are used in our foundry, the selection being governed by the type of pattern, size of order, &c.:

1. In this case one molder makes and casts his work.

2. The different parts of the pattern are fastened to coldboards. Skilled molders are used on the difficult parts and cheaper men on the simpler parts, while the coring, closing, &c., are done by another gang and the molds cast by laborers.

3. The patterns are mounted on molding machines operated all day by one gang, while the core setting, casting, &c., are done by others.

The writer has in mind a certain cylinder, for several years molded by the first method at a cost per cylinder of 66⅔ cents each. Later it was made on a three parted molding machine at a cost of 16 cents, while there was a saving in cost in machine shop of 25 per cent. over the old method of hand molding.

Coremaking.

Iron forms should be provided for such cores as need support while drying, others also for shaping the core wires. These can be made by a boy or laborer and stored till wanted. The sand should be strong, sharp and sufficiently fine to give a smooth surface. We prefer an oil binder for various reasons. The wax vents must be of a composition which will neither flatten out nor break under the rammer, will melt readily in the oven and be absorbed by the sand with no detriment to the core. Some wax leaves the core rotten about the vents and is liable to give way to the pressure of the iron while being cast, causing the loss of the cylinder.

The wires should be pliable, yet strong enough to hold their shape when set, and should be led to all parts of the core in a manner which will permit their ready removal after casting. They are not only necessary for support, but they assist greatly in the removal of the core, which becomes somewhat loosened by their withdrawal and flows through in their wake. After drawing off the box, all jacket cores should be carefully examined for exposed wires or vents, and these attended to before the cores are placed in the oven. After being dried, the cores should be well blackened and again dried, and if they are to be assembled and pasted by the coremaker should be accurately measured by the proper forms and gauges and set aside ready for the mold. Our practice is to have the sand and oil carefully measured, mixed and stored in bins and delivered to the benches, the cores placed in the ovens and again delivered to their makers by a gang of laborers, this confining the whole of the coremakers' time to the skilled part of the production. The ovens are fired at night only, and the heat regulated by pyrometers, insuring a perfect bake.

Each foundry should have its own wax vent machine (the writer will gladly recommend a good one on inquiry), with dies for the various sizes needed. One man by two hours' work with this machine can turn out vents enough to supply a hundred coremakers.

There are various compounds in the market, which are of good quality but more expensive than that made on the premises need be.

Casting the Cylinders.

The iron should be melted "hot" and handled as quickly as possible to avoid cold shuts in the jackets, also because a casting poured hot is more likely to finish sound than one poured dull. With good sized pouring basins and risers where needed, hot iron of the right mixture, sound cores and a well made mold, the losses on this class of work will be about the usual foundry average.

Cleaning.

We prefer to pickle our castings, first, because there is less risk of breakage than in tumbling; second, because pickling softens the skin or scale which otherwise is hard on the cutting tools, and, lastly, because dirty spots or other blemishes are more apt to be readily found than in a black polished surface. Our method is as follows: The gates, risers and fins are first removed.

Next the wires are drawn out and the casting is lightly tapped with a hammer and rolled from side to side on a plank, bringing each cored hole in turn to the bottom so that the core sand may flow freely out. Then at last by running a wire from the cored holed to all the remote places we make sure that all the sand is out. The casting then goes to the pickling bench, is well drenched and left till the following morning, when it is washed and goes to the inspector. He carefully looks it over for outward defects and if none are apparent he measures it with the proper gauges and sets it aside to be chipped and filed. The castings are next subjected to a hydrostatic pressure of 100 lb. to ascertain if there are any leaks from the water jacket, both externally and internally. This done, if good they are ready for shipment.

Titanium in Cast Iron.*

BY DR. RICHARD MOLDENKE, WATCHUNG, N. J.

Among the numerous applications of electrical energy, none stands higher in the eyes of the iron and steel metallurgist than the electric furnace. Ferro-alloys containing metals formerly regarded as practically infusible



Fracture of Chill Piece of Titanium Iron, Also Excrescence at Top as the Metal Set.

can now be obtained for simple addition to the ladle and their effect studied, and the reduction of the cost to a commercial point has brought us nearer to the much sought goal of physical perfection in our iron products.

Probably no one has done more to study the scientific and commercial side of titanium as applied to iron and steel than Auguste J. Rossi. Due to his efforts, titanium, from having the blackest kind of a reputation in the blast furnace, has been given a place in the metallurgy of iron which is beginning to grow in importance. The benefit to be derived from a formerly despised material and the eventual opening up of immense resources of ore heretofore considered valueless will remain the best monument of his career.

Titanium Alloy from the Electric Furnace.

Of the two methods of preparing titanium for use in iron, the aluminothermic and the electric furnace, the latter seems destined to make the cheaper product; and as the selling price of a 10 per cent. titanium iron alloy is now within commercial limits, its use for the foundry is worth considering closely. For this purpose a series of tests was instituted on behalf of the American Foundrymen's Association, the results of which are given herewith. In the preliminary tests two classes of alloys were tried, one in which the material was free from carbon, and the other having some 5 per cent. of this element present. The tests showed that while both alloys could be used for the rather small quantities of iron treated, the carbon titanium alloy was better adapted for foundry work, as the melting point is lower. However, the alloy free from carbon can be used in the foundry where large bodies of metal are to be treated, and time can be given for a thorough incorporation of the material.

How to Use the Alloy.

The apparent infusibility of the titanium iron alloys has therefore militated heavily against their use, and hence a word about this matter. When the lumps of alloy are thrown into the ladle, they must be given time enough to heat up and alloy with the bath by thorough stirring. This takes some time, and usually, especially with steel, fear that the metal may cool too much results in pouring before the titanium has done its work. Hence the writer suggests that where large lumps of either alloy are used, they be heated up to redness in any convenient way before use.

In making the tests in question, the standard 1¼ in. diameter test bar cast on end in a dry sand mold was used. The bars were brushed clean and then tested transversely on supports 12 in. apart. Two classes of metal were used—broken car wheels and machinery pig iron. This gave gray iron and white iron castings. The alloy contained 10 per cent. titanium, so that 1 lb. alloy to 100 lb. iron would mean the addition of 0.1 per cent. titanium. The results of the tests were as follows:

TABLE I.

Machinery Pig (gray iron). No titanium alloy added.

No. 1	broke at	2,240 lb.,	with	0.10 in.	deflection.
" 2	"	2,260	"	0.10	"
" 3	"	2,010	"	0.09	"
" 4	"	1,840	"	0.08	"
" 5	"	1,970	"	0.08	"
" 6	"	2,150	"	0.10	"
" 7	"	2,100	"	0.10	"
" 8	"	1,770	"	0.09	"
" 9	"	1,890	"	0.10	"
Average..		2,020 lb.		0.09	"

Analysis of pig iron: Silicon, 2.58; sulphur, 0.042; phosphorus, 0.54; manganese, 0.74.

TABLE II.

Machinery Pig (gray iron). 0.05 titanium (no carbon) added.

No. 10	broke at	3,140 lb.,	with	0.09 in.	deflection.
" 11	"	2,750	"	0.09	"
" 12	"	2,880	"	0.09	"
" 13	"	3,070	"	0.09	"
Average..		3,100 lb.		0.09	"

TABLE III.

Machinery Pig (gray iron). 0.05 titanium (carbon) added.

No. 14	broke at	3,050 lb.,	with	0.09 in.	deflection.
" 15	"	3,140	"	0.10	"
" 16	"	3,150	"	0.10	"
" 17	"	3,230	"	0.10	"
" 18	"	2,850	"	0.10	"
" 19	"	2,990	"	0.09	"
Average—		3,070 lb.		0.10	"

TABLE IV.

Machinery Pig (gray iron). 0.10 titanium (no carbon) added.

No. 20	broke at	2,880 lb.,	with	0.09 in.	deflection.
" 21	"	3,070	"	0.09	"
" 22	"	3,150	"	0.09	"
Average—		3,030 lb.		0.09	"

TABLE VI.

Machinery Pig (gray iron). 0.10 titanium (carbon) added.

No. 23	broke at	3,080 lb.,	with	0.09 in.	deflection.
" 24	"	2,850	"	0.09	"
" 25	"	2,850	"	0.09	"
" 26	"	3,150	"	0.10	"
" 27	"	3,050	"	0.10	"
" 28	"	2,880	"	0.10	"
Average..		2,990 lb.		0.095	"

TABLE VII.

Machinery Pig (gray iron). 0.15 titanium (carbon) added.

No. 29	broke at	3,270 lb.,	with	0.11 in.	deflection.
" 30	"	3,030	"	0.10	"
" 31	"	3,270	"	0.10	"
" 32	"	3,180	"	0.10	"
Average—		3,190 lb.		0.10	"

A test with 0.15 titanium in the alloy free from carbon failed, as the metal had to be poured before the alloy was completely dissolved.

*A paper read at the Toronto meeting of the American Foundrymen's Association, June, 1908.

TABLE VIII.

Machinery Pig (gray ... Titanium ... free from carbon, placed on the coke ... the cupola and metal charged ... making the titanium ... on 0.10 per cent.

No.	33	broke at	2,540 lb.,	with	0.09 in. deflection.
"	34	"	3,020	"	0.10 "
"	35	"	2,000	"	0.10 "
"	36	"	2,740	"	0.11 "
"	37	"	2,560	"	0.10 "
"	38	"	2,500	"	0.10 "
"	39	"	2,420	"	0.10 "
"	40	"	2,300	"	0.09 "
"	41	"	2,880	"	0.09 "
"	42	"	2,810	"	0.09 "
"	43	"	3,250	"	0.10 "
"	44	"	2,570	"	0.09 "
"	45	"	2,980	"	0.10 "

Average not taken, as the results show irregularity due to portions of the metal being treated and other portions not.

It will be noticed that the variation in strength is from 2,300 up to 3,300 lb., or practically the range of results obtained by adding the alloy to the ladle, but the results are not uniform.

TABLE IX

Scrap Car Wheels (white iron ... No titanium added

No.	46	broke at	2,110 lb.,	with	0.05 in. deflection.
"	47	"	2,100	"	0.05 "
"	48	"	2,110	"	0.05 "
"	49	"	2,000	"	0.05 "
"	50	"	1,920	"	0.04 "
"	51	"	2,060	"	0.04 "
"	52	"	2,070	"	0.05 "
"	53	"	2,010	"	0.04 "
		Average..	2,050 lb.		0.05 "

Analysis of car wheels: Silicon, 0.85; sulphur, 0.07; phosphorus, 0.420; manganese, 0.60.

TABLE X.

Scrap Car Wheels (white iron), 0.05 titanium (no carbin) added.

No.	54	broke at	2,310 lb.	with	0.06 in. deflection.
"	55	"	2,660	"	0.06 "
"	56	"	2,260	"	0.05 "
"	57	"	2,210	"	0.05 "
"	58	"	2,440	"	0.05 "
"	59	"	2,420	"	0.05 "
"	60	"	2,400	"	0.05 "
"	61	"	2,440	"	0.05 "
"	62	"	2,480	"	0.05 "
"	63	"	2,440	"	0.05 "
"	64	"	2,310	"	0.06 "
		Average..	2,400 lb.		0.05 "

TABLE XI

Scrap Car Wheels (white iron), 0.05 titanium (carbon) added.

No.	65	broke at	2,420 lb.	with	0.05 in. deflection.
"	66	"	2,610	"	0.05 "
"	67	"	2,340	"	0.05 "
"	68	"	2,720	"	0.06 "
"	69	"	2,230	"	0.06 "
"	70	"	2,430	"	0.05 "
"	71	"	2,440	"	0.05 "
"	72	"	2,320	"	0.05 "
"	73	"	2,300	"	0.06 "
		Average..	2,420 lb.		0.05 "

It was not possible to get good results with larger quantities of the alloy free from carbon, as the white iron chilled too quickly.

TABLE XII.

Scrap Car Wheels (white iron), 0.10 titanium (carbon) added.

No.	74	broke at	2,380 lb.	with	0.05 in. deflection.
"	75	"	2,460	"	0.05 "
"	76	"	2,440	"	0.05 "
"	77	"	2,340	"	0.05 "
"	78	"	2,420	"	0.05 "
"	79	"	2,320	"	0.05 "
"	80	"	2,360	"	0.05 "
"	81	"	2,440	"	0.05 "
"	82	"	2,400	"	0.05 "
"	83	"	2,400	"	0.05 "
		Average..	2,400 lb.		0.05 "

TABLE XIII.

Scrap Car Wheels (white iron), 0.15 titanium (carbon) added.

No.	84	broke at	2,600 lb.	with	0.06 in. deflection
"	85	"	2,590	"	0.06 "
"	86	"	2,500	"	0.06 "
"	87	"	2,620	"	0.06 "
"	88	"	2,300	"	0.05 "
"	89	"	2,580	"	0.06 "
"	90	"	2,280	"	0.06 "
"	91	"	2,590	"	0.07 "
"	92	"	2,430	"	0.06 "
"	93	"	2,600	"	0.07 "
		Average..	2,520 lb.		0.06 "

Summary of Results.

Original iron—Gray	(9 tests),	2,020 lb.	White	(8 tests),	2,050 lb.
Plus 0.05 Ti..	" (4 tests),	3,100 lb.	"	(11 tests),	2,400 lb.
Plus 0.10 Ti..	" (3 tests),	3,030 lb.			
Plus 0.05 Ti. and C.....	" (6 tests),	3,070 lb.	"	(9 tests),	2,420 lb.
Plus 0.10 Ti. and C.....	" (6 tests),	2,990 lb.	"	(10 tests),	2,400 lb.
Plus 0.15 Ti. and C.....	" (4 tests),	3,190 lb.	"	(10 tests),	2,520 lb.
Total tests and aver. strength.	23	3,070 lb.		40	2,430 lb.

Increase in strength treated iron over original, Gray, 52 per cent.; White, 18 per cent.

From the above summary it will be seen that the greatest increase in strength was in the gray iron. This is of interest in connection with the recent tests made with vanadium in cast iron where the contrary was observed. The improvement in gray iron is more marked than was the case in tests made by Mr. Rossi and the writer in 1902. The same peculiarities, however, were observed in the behavior of the metal as will be described later.

The Minimum of Titanium Effective.

Looking over the averages above presented, it will be noted that the improvement is almost as marked whether 0.05, 0.10 or 0.15 titanium was used, which would seem to indicate that once the deoxidation has been effected, any additional titanium added is partially wasted. Hence, for ordinary foundry practice, 0.05 titanium added will be practically sufficient, larger amounts only being necessary in exceptionally bad cases or for special work.

Titanium and Chill.

A further curious fact in connection with the use of titanium in the foundry is the lessening of the chilling action. And yet whatever chill may remain shows very much harder iron. This is important in car wheel work. Test pieces made in the Keystone Car Wheel Works with iron which chilled 1½ in. deep when treated with titanium in the ladle gave but 1 in. chill. Prisms cut from these chilled portions, the castings having been made from the same metal, when subjected to compressive strain and also tested for hardness with Brinell's test (use of diamond) gave the following results. (Tests made at the Carnegie Technical Schools): The original iron crushed at 173,000 lb. per square inch and stood 445 in the test for hardness, soft steel running about 105. The treated piece ran 298,000 lb. per square in. and showed a hardness of 557. Testing the soft metal below the chilled portion for hardness gave 332 for the original and 322 for the treated piece, or practically the same material so far as hardness was concerned.

The Remelting of Titanium Iron.

The writer wishes to call attention to another curious phenomenon in connection with these tests. In order to see what effect the remelting of a titanium pig iron would exhibit, a special batch made in the electric furnace, containing 3.14 titanium and 5.78 graphite, was run through the cupola. The product was cast into test bars the usual way, and part of one ladle into a chill cup. The metal as it came from the electric furnace originally was so tough that it could be broken only with severe exertion. Much of this strength was lost in the cupola remelt, and the composition of the bars was as follows:

Silicon	0.97	Graphite	2.38
Sulphur	0.067	Total carbon	3.94
Phosphorus	0.084	Titanium	0.72
Manganese	0.27		

An average of the 11 bars cast gave 2,290 lb., though this is of no special value, lacking comparison with anything.

The bars were dark gray, where one would expect a heavily mottled or at least only very light shade of gray to exist, considering the composition and comparatively small diameter. It was noticed, however, that the bars when cast retained their red heat at least three times as long as ordinarily, and this opportunity for graphite to form may account for the dark gray fracture.

Now, the further curious fact with this experiment was seen in the chill piece cast from the same ladle as some of the bars. The metal set in such a way that a large excrescence was forced out at the top, as shown in the illustration. Further, when the chill piece was

broken the fracture showed distinctly the cross of St. Andrew in its crystallization (but faintly reproduced in the illustration). Incidentally, the graphite of the chilled piece was 0.05 per cent., the other constituents being practically the ones given.

The Prolongation of Fluidity.

Just what may be the true explanation for this must be left for future investigation, but perhaps some light may be thrown upon the subject by the following: Experiments made by Mr. Fitzgerald at Niagara Falls in treating molten iron with 1 per cent. titanium, the bath of metal being 2300 degrees F., showed that the addition in question raised the temperature some 25 degrees for a minute; it then slowly dropped to the original again. Evidently there was a reaction involving the giving out of heat. Possibly this may account for the long continued redness of the test bars cast in dry sand molds.

Further, it is well known that a burnt heat causes badly "skulled" ladles, the slight drop in temperature of what looks like highly overheated metal being sufficient to do this. Here is a case of raising the melting point of the metal through oxidation. Possibly by the addition of titanium and the consequent removal of this oxidation or even of absorbed nitrogen, more particularly noticeable in steel work, the melting point is dropped again, and longer continued fluidity gives rise to the phenomenon above described.

Cleansing Action.

While this cleansing action of titanium is exceedingly interesting to the iron founder, the producer of copper is really far more concerned. Titanium copper alloy, when added to molten copper, deoxidizes it so rapidly that it is perfectly possible to make absolutely sound copper castings with a very small addition of titanium. The writer cannot present much along this line at present, but hopes to do more later. In the meantime the experiments with titanium and other alloys will be continued on behalf of the American Foundrymen's Association, and the result duly reported to the membership.

The Cincinnati Metal Trades Quarterly Meeting.

More than 100 members of the Cincinnati Metal Trades Association responded to the call for the quarterly meeting and dinner of the organization at Chester Park on the evening of June 12. It is chronicled in the records of the association as one of the best meetings in its history. President John W. Neil, John H. McGowan Company, presided, and there were present as speakers and special guests, in addition to Commissioner Robert Wuest and Editor Dingwall of the National Association *Bulletin*, President Thomas P. Egan of the Cincinnati Chamber of Commerce, President C. A. Hinsch of the new Fifth-Third National Bank, Dean Hermann Schneider of the University of Cincinnati Department of Engineering, President Frank B. Wiborg of the National Prosperity Association of Cincinnati, and others representing important local civic bodies.

After the discussion of a typical prosperity menu Secretary John M. Manley of the Cincinnati Association made a vigorous and telling address on the importance of the now widely popular plan of co-operative industrial education. Through Mr. Manley and the Cincinnati Association, Cincinnati takes its full share of the credit due for the firm establishment of the new plan which has been manifested through the work of the Cincinnati committees and the indefatigable and progressive methods of Dean Schneider of the University of Cincinnati. Through the association's secretary it was also made manifest that Cincinnati intends to retain its leadership in this regard, working through its numerous and splendidly equipped shops devoted to the manufacture of machine tools. The Cincinnati association approved in no uncertain language the strong support given the movement and the development of the plan in other cities by the National Metal Trades Association. A strong indorsement of the recently instituted movement backed by the National Prosperity Association of Cincinnati was also given. J. C. Hobart talked interestingly of the possibilities of the new system in the way of producing increased efficiency and earning capacity of workmen shown in the increased quality and quantity of product made necessary by reason of the great skill of foreign workmen. President Neil called on Dean Schneider, who made the point that the plan had been found so good that it has spread to the public schools, and now a number of these in various parts of the country are figuring on instituting the system of co-operative education on a half-time basis. From the correspondence in relation to the plan it is evident that practically all the engineering institutions in the industrial centers of this country will eventually adopt it. In spite of the recent depression a larger number of students have entered in this co-operative course in connection with the large manufacturers of Cincinnati than last year—a year of unusual prosperity—which is taken by the workers in the movement as indicating that the manufacturers want them and are pleased with the system. Dean Schneider was given a hearty ovation at the close of his address.

In accepting the introduction of President Neil, Mr. Wiborg, Ault & Wiborg Company, took up the special topic of the evening, "The Sunshine Movement and Re-employment Day, July 1." He claims that there is nothing fundamentally wrong with the situation, taking the view that all the manufacturers need at this time is a mutually helpful and optimistic policy, which should manifest itself in the employment of as many idle workmen as could possibly be used by July 1, and a spirit of go-aheaditive-ness that would literally force the conservative capitalists and railroad corporations to come into the markets of the world for their needs which have been deferred so long.

Charles A. Hinsch followed Mr. Wiborg, and told of the financial side of the situation. He likened cycles of business to the swing of the pendulum. "We've been to one extreme," said he, "now we're swinging on the return," He called attention to the fact that Cincinnati's ample banking capital had at all times been available during the depression, and that none of the large local establishments had suffered in consequence.

President Thomas P. Egan of the Chamber of Commerce and of the J. A. Fay & Egan Company paid a glowing tribute to the Advertisers' Club of Cincinnati, which has fathered the sunshine and prosperity movements. He spoke of Cincinnati's wonderful growth as a tool manufacturing center, and gave the praise for its inception to John Steptoe, who in 1835 established a shop making lathes, shapers, planers and almost everything at that time known in the line of machine tool construction. According to Mr. Egan, no other manufacturing city in the United States can show so great a number of skilled workmen to its population. He reminded his hearers that Cincinnati took more Grand Prix trophies at the Paris Exposition than any other American city, and also noted that there were more exhibits of manufactured articles from Cincinnati at the Paris Exposition than from any other one city in the world.

An extensive project for developing the water power along the Cuyahoga River in the vicinity of Cuyahoga Falls, Ohio, has been started by the Big Cuyahoga Light, Heat & Power Company, recently incorporated. The company is empowered in its charter to build and maintain a system of dams, construct canals, generate electricity for light, heat and power, and sell electricity to municipal corporations. As preliminary to carrying out the project the company has brought an appropriation suit in Akron against a number of property owners to secure land along the river.

Edward Sherwood Meade of the University of Pennsylvania, in an article in the *Quarterly Journal of Economics*, discusses the policy of the United States Steel Corporation in standing for the maintenance of prices, which he approves. He characterizes this as "a unique industrial experiment," especially approving the course followed by the corporation in preventing a runaway market in steel products throughout the late period of extraordinary demand.

Tariff Revision Preliminaries.

WASHINGTON, D. C., June 16, 1908.—Interesting and important work for the experts of the Ways and Means and Finance committees in connection with the projected revision of the tariff act has been laid out the past week. The statement of Chairman Payne of the Ways and Means Committee to the effect that no formal meetings of his committee would be held until after the November elections appears to have been quite generally misunderstood, if not purposely misconstrued. Certain newspapers opposed to the principle of protection in any form have declared that the chairman of the Ways and Means Committee had "thrown off the mask" and that the passage of the recess resolutions was "only a bluff." In a statement made at his home in Auburn, N. Y., to which he had just returned, Mr. Payne sharply challenged these publications and declares that the tariff will be revised in the near future. In this connection he says:

I see that some of the papers claim that this whole business is a subterfuge, and that no tariff revision is contemplated. Exactly the opposite is the truth. As surely as the next administration is Republican the preparation of a bill will be undertaken by the committee very soon after the election, with the view of a special session of Congress to enact it into law.

One of the most important reasons for a new tariff is the fact that our strongest competitor, Germany, as well as France and other countries, has adopted a maximum and minimum rate. The minimum rate is a protective one. The maximum rate is often prohibitive. In order to meet our competitors on this ground it is necessary that we provide a tariff with a maximum and minimum rate so that we may have a chance for reciprocal trade and get the advantage of their minimum rates.

Classification of Imported Goods Obsolete.

Offices in the Federal Building at Auburn have been secured by Mr. Payne, and a staff of experts, including the regular clerks of the Ways and Means Committee, will immediately begin the work of preparing a revised classification of imported goods to be used as the basis of the new tariff. This is a departure the importance of which has been impressed upon every one who has had occasion to deal in detail with any of the schedules of the tariff laws enacted in the past 20 years. Since the tariff act of 1883 the framers of the revenue laws have made every possible effort to adhere to old classifications and have but grudgingly recognized industrial progress by the addition of new categories.

An important consideration has governed them in this, for it is obvious that it is desirable that statistical statements, appraisers' classifications and court decisions under the various laws should be closely comparable. For this reason the language of existing statutes has been followed whenever possible and often to good advantage. It is perfectly clear, however, that the industrial progress of the past two decades has rendered many old classifications entirely obsolete, and it is a well known fact that the failure of the Dingley act to specify a large number of articles of imported merchandise, some of which were known to the various trades long before 1897, has resulted in endless litigation and in many cases has cost the Government large amounts of revenue.

Specialization in the leading manufacturing industries abroad has resulted in a diversification of importations which has far outstripped the nomenclature of the existing tariff law and emphasizes the necessity for the elaboration of the present classification. On this account also the statistics laboriously gathered at the various ports of entry and compiled by the Bureau of Statistics of the Department of Commerce and Labor are in many cases absolutely valueless either to importers or to competing domestic manufacturers.

A comparison of the Dingley act with the new German tariff graphically illustrates this point. Under nearly every general classification the German schedules supply from three to ten "brackets," each of which describes more or less minutely an item included in the general classification. The customs returns follow these schedules closely and the periodical statistical bulletins reproduce them, so that it is possible at any time to ascertain the exact amount of the importations of any particular item for any given period. Such statistics are of great value to the business community, and both importers and domestic manufacturers will be glad to learn that the Ways and Means Committee has become aroused to the necessity of elaborating and bringing up to date the imperfect and altogether antiquated classification of the Dingley law.

Chairman Aldrich Appoints Sub-Committees.

Senator Aldrich has taken advantage of the sittings of the recently appointed Monetary Commission, which embraces nearly all the members of the Senate Finance Committee, to appoint three sub-committees to handle the various divisions of the tariff investigation to be undertaken in November. Taking the text of the resolution passed by the Senate authorizing the Finance Committee to sit during the recess, the chairman of the committee has divided its provisions among his colleagues as follows:

Sub-committee A: To consider what further legislation is necessary to secure equitable treatment for the agricultural and other products of the United States in foreign countries, composed of Senators Aldrich, Allison, Hale, Daniel and Teller.

Sub-committee B: To consider what legislation is necessary to secure more efficient administration of the customs laws, including the question of classification, composed of Senators Burrows, Hansbrough, Platt, Hopkins, Bailey, Money and Taliaferro.

Sub-committee C: To consider what changes in the customs rates are desirable and to secure data on the relative cost of products in this and the competing foreign countries and the various articles affected by changes, composed of Senators Hopkins, Burrows, Penrose, Money and Taliaferro.

In accordance with requests made upon them by Chairmen Aldrich and Payne, the executive departments have begun the work of gathering data to be used in the coming revision. The Department of Commerce and Labor, through the special agents of the Bureau of Manufactures, will make a study of the present foreign cost of production in the leading schedules as compared with the cost when the Dingley act was passed in 1897 and with the domestic cost at both periods. The consular service will co-operate in this work. The Treasury Department, through the experts of the Customs Division and Internal Revenue Bureau, will make suggestions regarding classification and rates based upon the experience of the past 11 years in the administration of the Dingley act. The Board of United States General Appraisers will also make a valuable contribution in the form of an elaborate report suggesting a more modern classification and a careful revision of rates from the compensatory standpoint, with a view to a more scientific relation between the duties on finished products and raw and partly manufactured materials.

Semi-official advices received here confirm the press reports that Speaker Cannon will favor the summoning of an extra session of Congress immediately after the inauguration of the new President on March 4, 1909, to enact into law the tariff bill, which it may be assumed will be practically formulated before its actual introduction in the House of Representatives. It is the best opinion here, in view of the preliminary work now outlined, that a new tariff law can be passed in about 60 days. This would admit of its taking effect July 1, 1909, with nearly two months' notice to the public.

W. I. C.

The Oliver Iron Mining Company is preparing two immense new stripping jobs on the Mesaba—one at the Rust mine, at Hibbing, and one a new property on Great Northern lands, east of Coleraine. Rust is a portion of the great West Hibbing ore body, of which the Mahoning, Hull and Penobscot mines are parts, and the stripping of many million yards from this tract will expose one of the largest of the great mines of that district. The Great Northern tract is in Section 16-56-23, a piece of State land, which will ultimately return in royalties to the State school funds more than $10,000,000. It contains some 40,000,000 tons of ore, of which a considerable share is low grade, but which is deep and easily mined.

The autumn meeting of the Iron and Steel Institute will be held at Middlesbrough, England, on Monday, Tuesday, Wednesday and Thursday, September 28, 29 and 30 and October 1, 1908.

Factors of Safety in Marine Engineering.

At the forty-ninth annual general meeting of the British Institution of Naval Architects, recently held in London, an important paper was read on the above subject. The author is Prof. J. O. Arnold, head of the Metallurgical Department, Sheffield University. The paper and the attending discussion are abstracted below.

Calculation of Factors of Safety.

The opening part is devoted to a discussion of the methods used by engineers, as a basis for their calculations on the strength of materials. Broadly speaking, they always employ the ultimate stress of the material, but some have insisted on the importance of taking the elastic limit. The reasons for taking the ultimate stress are (1) it is a value capable of accurate and rapid measurement in ordinary works practice, and (2) it is accepted as more or less true that the ultimate stress is really an indirect measurement of the elastic limit, in the ratio of two to one. The latter is approximately true in the majority of cases, but in a small, though nevertheless extremely important number of instances it is hopelessly inaccurate. As far as the author could ascertain, factors of safety in engineering practice are calculated as follows:

1. In a rough and ready fashion by subjecting the material to a working stress, varying from one-tenth to one-fourth of the ultimate stress, according to circumstances.

2. In scientific engineering the working load of the material equals the ultimate stress divided by the factor of safety. The factor of safety is obtained by multiplying together several sub-factors, which may be designated *a*, *b*, *c* and *d*.

Sub-factor *a* is the ration of the elastic limit to the ultimate stress, which is almost universally assumed to equal 1½ to 2½, in mild structural steel.

Sub-factor *b* is variable, depending on the character of the stress to which the material is subjected. Broadly speaking, it is based on Wöhler's classical work, published in 1871, on the action of alternating stresses. Taking three typical cases, we have:

1. A steady load, as in bridges, where it equals 1.

2. Loads varying between a zero and the maximum, as in single acting connection rods, where it equals 2.

3. Alternating loads, in which the stress varies from tension to compression, as in a double acting connecting rod, where it equals 3.

Sub-factor *c* is a variable, depending upon the rapidity with which the stress is applied. For a steady load it equals 1; for a suddenly applied load 2, and for a load including impact 3.

Sub-factor *d* is used as a margin for unknown contingencies, and is a variable ranging from 1½ to 3. The following table gives concrete examples of the application of these sub-factors:

Table 1.—Illustration of Factors of Safety—Nature of Sub-factors.

	a Uses tests	*b* Wöhler.	*c.* Rapidity of load.	*d* Unknown	Factor of safety *a* × *b* × *c* × *d*
Rollers	2	1	1	2½ to 3	4½ to 6
Double acting connecting rod	2 to 2	3	2	1½	13½ to 18
Single acting rod	1½ to 2	2	2	1½	9 to 12
Shaft with propeller	1½ to 2	3	1	1½	6¾ to 9
Steel cast wheel rim	2	1	1	4	8
Steel castings	2	1	1	2	4
Nickel steel	1½	1	1	1½	2¼

Dangers of Over-Annealing.

The dangers of over-annealing are then illustrated. Tests are given of pure carbon steel, ranging from 0.1 to 0.4 per cent. carbon, in two widely differing microchemical conditions. The first of these conditions may be spoken of as "normalized." The bars as rolled were heated to a bright red or orange, and cooled in air. The annealed, or rather over-annealed, samples were maintained at a slightly higher temperature for 72 hours and were then cooled slowly for 100 hours. The results are given in tables 2 and 3.

It has been found that the true elastic limit is approximately 3920 lb. per square inch lower than the yield point in normal structural material, and about 7840 lb. lower in the over-annealed conditions.

Table 2.—Results of Normalized Steels.

No.	Carbon Per cent.	Approximate true elastic limit.	Yield point.	Ultimate stress.	Elongation. Per ct. in 2 in.	Reduction of area. Per ct.
1	0.08	23,385	27,300	47,920	46.6	74.8
1½	0.21	34,340	38,260	56,880	42.1	67.8
2	0.38	36,200	40,210	67,070	34.5	56.3

Table 3.—Results on Annealed Steels.

No.	Carbon Per cent.	Approximate true elastic limit	Yield point.	Ultimate stress.	Elongation. Per ct. in 2 in.	Reduction of area. Per ct.
1	0.08	11,920	19,760	41,080	52.7	76.7
1½	0.21	12,370	20,210	47,600	42.3	65.7
2	0.38	13,560	21,400	56,050	35.0	50.6

The appended results were obtained with an experimental steel casting, both as cast and after drastic annealing as before. The steel contained 0.4 per cent. carbon, 0.26 silicon, 0.10 manganese, and sulphur and phosphorus about 0.23.

Table 4.—Results Obtained on a Steel Casting.

Condition of steel.	Approximate true elastic limit.	Yield point.	Ultimate stress.	Elongation. Per ct. in 2 in.	Reduction of area. Per ct.
As cast	25,510	39,430	57,120	5.0	5.6
Annealed	8,740	16,580	54,430	32.5	37.7

The astonishingly low result of the true elastic limit of this over-annealed steel justifies the tentative hypothesis that mild steel, by over-annealing, may have, like pure copper, practically no elastic limit; that is to say, under any stress the metal may assume plastic, as distinct from, elastic deformation. The figures given in table 3 probably represent the extreme possibility of over-annealing, because of the practical absence of manganese in the series dealt with. Open hearth steel usually contains from 0.4 to 0.8 per cent. of this element, which considerably modifies the action of over-annealing in its excessive lowering of the elastic limit.

A great change is brought about in the microstructure by over-annealing. The texture is much coarser than that of normal steel. The carbide of the pearlite sharply segregates, some passing into the parallel lines characteristic of Sorby's laminated pearlite, and some into masses marking the beginning of the decomposition into cementite and ferrite. The true elastic limit of pure normal pearlite, roughly speaking, is about 61,520 lb. per square inch, while that of well laminated pearlite is only about 29,120 lb. That of pure normal ferrite is about 22,400 lb., while that of over-annealed ferrite is only about 11,200 lb. For manganiferous pearlite and ferrite these figures are considerably raised.

Failure of Factor of Safety Calculations in Actual Practice.

A typical example may be given of the failure of factor of safety calculations in actual practice. The following results are really the average of several cases, investigated from time to time. They include about 20 careful determinations each, of the ultimate stress and elastic limit of the steels involved. The steels were, for the most part, in the form of hollow shafts, ranging between 22 and 25 in. in diameter.

Table 5.—Results Obtained in Practice.

True elastic limit	Ultimate stress.	Elongation. Per ct. in 2 in.	Reduction of area.—Per ct.
19,040	63,840	30.5	52.5

All the shafts involved had evidently been over-annealed, not necessarily in the sense that they had been overheated, but rather they had been kept for too long a time at a low red heat. It is quite probable that in designing these shafts the material was supposed to have an ultimate stress of 67,200 lb. per square inch, and an elastic limit of, say, 33,600 lb. per square inch; and that the factor of safety was to be, say, 7 to 1. This is equivalent to a working stress of 9600 lb. per square inch. The intention and actual achievement of our abstract designer are embodied in table 6.

Table 6.—Factors of Safety.

Calculated on assumed ultimate stress.	Calculated on actual ultimate stress.	Calculated on assumed elastic limit.	Calculated on actual elastic limit.
7	6.65	3.5	1.9
Adequate.	Adequate.	Adequate	Quite inadequate.

The shafts, of which the results given in tables 5 and 6 are typical, all fractured in use, and the result in the last compartment of the table distinctly understates the worst case involved therein. The annealed large shafts nearly always exhibit decarburized "ghosts." In a large ingot, irrespective of the rejected part, there is always more or less a segregation of carbon, sulphur and phosphorus, to a series of centers. Under the microscope they show, in the ingot, as dark etching nodular segregated areas. On forging the nodule is drawn down into a dark etching red. This elongated segregation, which is relatively hard, is jumped by the tool during turning, leaving in faint relief a relatively white line; hence the machinists' term of "ghost."

Dynamic Testing.

The increasingly important subject of dynamic testing is then taken up, in its relation to factors of safety. The pioneer, valuable and extensive researches of Wöhler, published in 1871, on the influence of alternating stresses have deservedly largely influenced engineering design ever since. It must be remembered, however, that Wöhler was not a twentieth century steel metallurgist, and that some of his supposed disciples have made and acted upon deductions from his experiments not authorized by more thoughtful confirmers and exponents of his work. One of the most complete accounts of his experiments, and probably the most thoughtful and judicious commentary thereon, is to be found in Professor Unwin's work on "The Testing of Materials of Construction."

Perhaps the most valuable of Wöhler's alternating stress tests were carried out by gripping a cylindrical test bar in a die, and rotating while in a horizontal position, these stress being applied by a weight near the end, remote from the die. The author has devised a modification of Wöhler's methods, which in the first place was applied to the testing of some large boiler plates that had split under the hydraulic test. It was argued that if the tests were always made just beyond the elastic limit instead of just within it, as is the usual case, the results would quickly reflect the liability to fracture under stresses, applied for a long period, within the elastic limit.

It was found, however, that the test predicted liability to fracture from causes altogether absent from Wöhler's fatigue phenomenon, and registered potential brittleness. This the Wöhler test not only failed to detect, but emphatically pronounced to be absent. In the author's test, the test piece, ⅜ in. in diameter and 5 or 6 in. long, is gripped vertically in a die, and the stress is applied near the upper end by a slotted plunger. The deflection at the zero of stress is ⅜ in. on each side from the vertical, insuring a strain just beyond the elastic limit. The standard conditions adopted for works practice are 650 alternations of stress per minute.

As comparative bending tests accumulated, made by the method of the author and that of Wöhler, it became evident that the latter was a reflection of the elastic limit. It certainly reflected danger of fracture under excessive strains, but insidiously conceals danger from other causes which determine fracture generally attributed to fatigue. In fact, no matter how dangerously brittle the steel may be from chemical or physical causes, if such causes have co-produced a high elastic limit, the Wöhler test indicates the steel to be quite safe if stressed well short at that limit.

As a matter of practical fact, it is inevitable that the steel must suddenly rupture sooner or later under stresses theoretically quite safe. For perhaps the strongest proof of the foregoing statement the author is indebted to J. C. Stead, who determined to investigate the points at issue. Mr. Stead made and tested a series of mild steels with ascending phosphorus up to 0.5 per cent. There is no possible doubt of the dangerous character of the latter steel, and to deliver such a steel for the construction of engine parts would be the act of a metallurgical madman. The steels were forged from 6 in. to 2 in. square, and were practically identical in composition, with the exception of the phosphorus. The general analysis gave: Carbon, 0.30 per cent.; silicon, 0.21; manganese, 0.40; sulphur, 0.58, and the phosphorus was 0.041, 0.303 and 0.59, respectively. The static tests are given in table 7.

Table 7.—Results on Phosphorus Steels.

No.	Phosphorus. Per cent.	Yield point.	Ultimate stress.	Elongation. Per cent. in 2 in.	Reduction of area. Per cent.
1	[illegible]	45,700	74,150	25.6	52.6
2	0.303	56,900	89,200	23.0	45.3
3	0.509	71,680	98,560	20.0	45.3

The Wöhler tests carried out by Mr. Stead gave the results shown in table 8, the stresses being plus and minus 33,600 lb. per square inch—namely, a range of 67,200 lb.

Table 8.—Results of Wöhler Tests Carried Out by Mr. Stead.

No.	Phosphorus. Per cent.	Reversals of stress endured.	Ratio of resistance.
1	0.041	61,000	1.0
2	0.303	167,000	2.7
3	0.509	651,000	10.6

The author's tests, made in complete ignorance of the nature of the steels, gave the figures shown in table 9.

Table 9.—The Author's Tests.

No.	Phosphorus. Per cent.	Average alternations endured	Ratio of resistance
1	0.041	272	100
2	0.303	200	73
3	0.509	100	37

The curves of the results are plotted in Fig. 1. Speaking in round numbers, the Wöhler test indicated

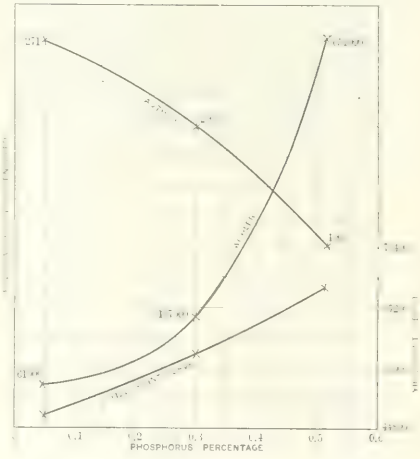


Fig. 1.—Alternating Test Curves of Stead's Phosphoric Steels.

that a mild steel containing 0.5 per cent. phosphorus was, with equal stresses, ten times as capable of resisting alternating stresses as a similar steel containing 0.04 per cent of phosphorus. The author's test, on the other hand, indicated that the steel with 0.5 per cent. had about one-third of the endurance of the steel containing only 0.04 per cent. phosphorus. From the curves in Fig. 1 it will be seen that the Wöhler is similar in type to that registered by the yield point or apparent elastic limit, the author's curve being in the opposite direction, and indicating what is well known to be a mechanical effect of phosphorus in steel.

Does High Elastic Limit Necessarily Make for Safety?

The author unhesitatingly answers the above question in the negative. It is a great mistake to suppose that because a steel of high elastic limit associated with a satisfactory statical test gives a good result under the Wöhler test it will be, therefore, faithful in practice. It has already been shown that the obviously dangerous steels in which Mr. Stead raised the elastic limit by chemical means—namely, by the addition of excessive amounts of phosphorus—quite fail to indicate under the Wöhler tests their inherent brittleness. Had they gone

into use, this brittleness must soon have brought about their fracture under alternating stress or shock. Some engineers have become so obsessed with the high elastic limit as to have altogether overdone it, and so stepped out of the frying pan into the fire, for instance with reference to holding down bolts, a pernicious practice of raising the elastic limit by mechanical strain, which has been used to some extent.

As an example, small bolts of ¾ in. diameter may be taken, which have been hot rolled almost precise and then cold drawn to the exact size. The final product is a clean smooth bar of high elastic limit, capable of resisting an excellent Wöhler test.

This steel also makes excessively dangerous bolts, and the failure of such bolts in practice has been frequently investigated by the author. Some time ago, to test this question, the following experiments were made on acid steel ¾ in. round bolts, both as rolled and in the rolled and drawn condition. The chemical composition of the four steels was practically constant except in carbon. The silicon averaged 0.12 per cent.; manganese, 0.85; phosphorus, 0.44, and the sulphur, 0.041. The carbons were 0.26, 0.31, 0.41 and 0.49 per cent., respectively. The tests are set forth in table 10.

Table 10. Results on Bolts.

Mark.	Carbon. Per cent.	Yield point.	Ultimate stress.	Elongation Per cent. in 2 in.	Red'tion of area. Per cent.
		Hot Rolled Set.			
A	0.26	54,000	79,100	34.5	61.6
B	0.31	57,600	84,250	31.8	59.6
C	0.41	64,800	95,700	26.5	48.0
D	0.49	67,000	105.100	25.5	50.8
		Rolled and Drawn Set.			
A	0.26	82,200	87,200	19.0	50.8
B	0.31	78,650	94,000	17.5	47.2
C	0.41	87,150	104,400	16.0	40.4
D	0.49	85,150	117,400	15.0	42.0

It may be observed how the yield point has been raised by the cold drawing. Under the author's standard alternating test the results given in table 11 were obtained.

Table 11.

Mark.	Carbon. Per cent.	Yield point.	Alternations endured.	Condition of steel.
A	0.26	54,000	346	Hot rolled.
A	0.26	82,200	248	Rolled and drawn
B	0.31	57,600	344	Hot rolled.
B	0.31	78,650	222	Rolled and drawn.
C	0.41	64,800	336	Hot rolled.
C	0.41	87,150	206	Rolled and drawn.
D	0.49	67,000	320	Hot rolled.
D	0.49	85,150	156	Rolled and drown.

The average endurance of the hot rolled material was 337 alternations of stress, and that of the rolled and drawn steels 208—a difference of 129 reversals. The drawn steels were 43 per cent. below the minimum specified endurance for this class of steel.

The exact effect of manganese sulphide on the mechanical properties of steel is still imperfectly understood. It exists in the form of millions of little pointed rods parallel with the direction of rolling. In many cases these rods, which are equivalent to fissures filled with a fused and brittle material, are stressed at right angles to their length. Under the static test the material gives better results when pulled longitudinally, but a series of dynamic tests on mild steel shafts show that there is a startling difference in the results on pieces cut transversely and longitudinally with the sulphide rods. A series of transverse tests endured 283 alternations; longitudinal only 193. A second series gave 293 and 118, respectively, and a third 303 and 117.

Possible Remedial Measures.

It is very hard to formulate remedial measures to improve the quality, especially of large masses, but a few suggestive remarks may be offered. The necessity of rejecting a sufficient weight of the upper part of a large ingot is too well known to need any remarks. Even in the other parts, however, it is impossible to prevent some segregation, and, in the author's opinion, in all heavily stressed engine parts the maximum phosphorus and sulphur should never exceed 0.05 per cent. Even with low sulphur and phosphorus, it is desirable to reduce segregation to a minimum, and the only practical and reliable way of doing this is by the use of fluid compression. In the heat treatment of forgings anything like a protracted cooling, especially at a low red heat, is dangerous.

The forging, after the mechanical operation is over, may be simply allowed to cool in air, as far as possible out of drafts. It may be reheated to a good orange or dark yellow heat, quenched in oil and reheated to a temperature between 300 and 400 degrees C. (570 to 750 F.). A third method, which in the author's opinion is likely to give the best results is to reheat the forging to about 900 degrees C., a dark yellow heat, and cool in air as quickly as the circumstances of the case will permit. In regard to the mechanical testing of forgings, the author considers that a static test must always be the main method of testing between engineer and metallurgist, but most strongly advocates the abandonment of ultimate stress as a basis for the calculation of factors of safety.

As a base for such calculations, the yield point or an apparent elastic limit offers the most promising features, since it is generally connected with a decisive drop in the beam of the testing machine. It is, therefore, almost as easily, though not quite as accurately, determinable at the ultimate stress. The latter, of course, should always be noted in order to obtain a reasonable ratio between the yield point and the ultimate stress, say from 45 to 55 per cent.

The Discussion.

Prof. J. Ewing, who opened the discussion, was in entire agreement with the author as to the unsatisfactory nature of the usual specifications in force to-day, which treat the ultimate stress as the main criterion. This ought to be stopped, as the elastic limit is far more important. It must also be recognized that an important point is the plastic deformation beyond the elastic limit. He suggests the elastic limit and the total elongation of the test piece, as the two indications of quality. According to modern ideas, the elastic limit is due to a sudden slip along planes in each individual crystal. It is the point at which the slip first occurs in any one crystal. The phenomenon known as "fatigue" is influenced by whether or not the elastic limit has been exceeded in any of the chystals.

He considers the practice of giving a piece of material over-strain in order to raise the elastic limit most pernicious. It deprives the material of reserve power, and, though it may raise the elastic limit, renders it less fit to withstand any stress beyond this, except under very restricted conditions.

R. A. Hadfield, who followed, also agreed that the ultimate stress is a very poor criterion, and gave an instance from his experience of the danger of over-annealing. He was inclined to agree with the author that the high limit of manganese in mild steel gave the best results, but pointed out that such steel would require different heat treatment from ordinary mild steel. Mr. Stromeyer spoke against the tendency to use high phosphorus material for bolts because it threads more readily in the machines. G. B. W.

The French Treaty Commission.—James B. Reynolds, Assistant Secretary of the Treasury and chairman of the commission chosen to confer with a similar body appointed by France to draw up a new reciprocity treaty between the two countries, announces that the American members will sail from New York June 27. On reaching Paris they will begin immediately their series of conferences with the French Commission. Mr. Reynolds recently requested that all persons having commercial intercourse between this country and France favor the commission with suggestions in the interest of trade expansion. Many helpful replies have been received, and it is expected that by the time the commission sails much data of a useful character in framing a new treaty will be at hand.

Henry Grey & Son, consulting engineers and inventors of the Grey beam and column mills, have removed their offices from 68 William street, New York City, to the Union Building, Clinton street, Newark, N. J.

Armstrong Short Ratchet Drills.

The desirability of a short head ratchet drill for working in contracted spaces is readily appreciated by machinists, boiler makers and other metal workers; but to produce such a tool without sacrificing important features, such as length of feed, strength and simplicity, is something of a problem. This the Armstrong Brothers Tool Company, Chicago, Ill., claims to have solved in the short ratchet drills shown in the illustrations herewith. The compactness of these tools enables the operator to drill holes in places wholly inaccessible with the ordinary long body ratchet drill. This is accomplished, too, without shortening the feed, by telescoping the feed screw over the drill socket, a feature of construction that is clearly shown in the sectional views of the tools.

The spindle and drill socket are made in one piece, the former being deeply recessed to receive the hollow feed screw. The drill can be instantly reversed. It is built for heavy service, the handle and head being made of one piece of drop forged steel, while the pawl and center are of tempered tool steel; all other parts are turned from bar steel and hardened.

The drills are furnished with three styles of spindles. Style R, shown in Fig. 1, takes drills with No. 3 Morse

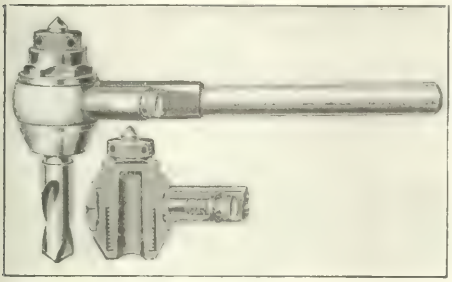


Fig. 1.—Style R.

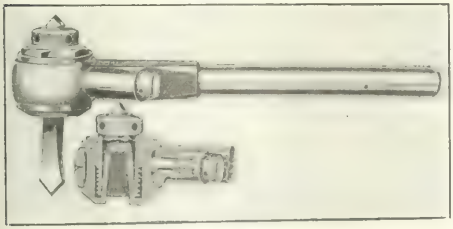


Fig. 2.—Style A.

Short Ratchet Drills Made by the Armstrong Brothers Tool Company.

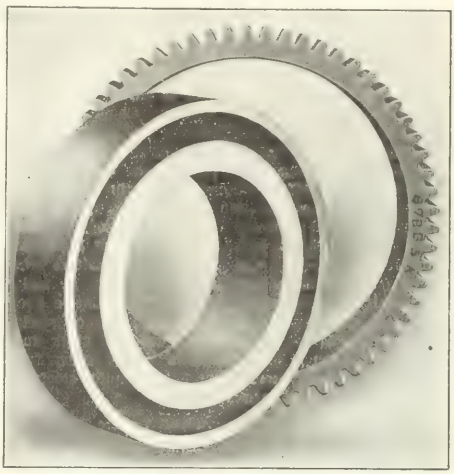
taper shank, but steel sleeves and sockets fitting style 12 spindle and taking Morse taper shank drills or taper square drills will be furnished by the makers. Fig. 2 shows the ratchet equipped with a spindle to take taper square shank drills, of which there are two styles, A and E, the former taking drills with No. 1 taper square and the latter No. 2 taper square shank. All spindles are interchangeable. The tool, Fig. 1, has a handle 12 in. long, a head 3¾ in. long and a feed of 2¾ in.; that in Fig. 2 has a handle [illegible] head 2¼ in. long and a feed of 1½ in.

The new Metal Trades Superintendents' and Foremen's Club of Cleveland, has completed its organization by the election of the following officers: President, J. H. Francis, Kilby Mfg. Company; vice-president, D. L. Larimer, Cleveland Punch & Shear Works Company; treasurer, C. P. Dole, C. O. Bartlett & Snow Company; secretary, Philip Frankel; sergeant-at-arms, C. G. Fleming, Perro Machine & Foundry Company; Executive Board: [illegible] White, Baker Motor Vehicle Company; S. W. Sebelin, Cleveland Twist Drill Company, and John N. Mortimer, Central Brass Mfg. Company.

The Nuttall Removable Rolled Rim Gear.

The illustration shows a new gear with removable rolled rim for high speed and heavy haulage trolley service now being placed upon the market by the R. D. Nuttall Company, Pittsburgh, Pa. The gear has been put to severe tests in actual service and is declared to have shown exceptionally satisfactory performance.

The rim is made of a special grade of rolled steel of



The New Removable Rolled Rim Gear Made by the R. D. Nuttall Company, Pittsburgh, Pa.

high tensile strength and is shrunk on a cast steel center, making the two members practically a single piece. When worn, however, the rim can be easily removed and replaced at nominal cost, so as to make a practically new gear.

The rim can be attached to any style of center or spider. It is not limited to trolley service, but can be applied to any service where the diameter does not exceed 10 ft.

The Traffic Club of Pittsburgh has elected the following officers: President, S. L. Seymour, division freight agent of the Pennsylvania Railroad; vice-president, L. H. Constans, traffic manager of the Pittsburgh Steel Company; second vice-presidents, J. B. Nessle, assistant general freight agent of the Pittsburgh & Lake Erie, and B. A. Worthington, general manager of the Wheeling & Lake Erie; secretary, T. J. Walters, commercial agent of the Baltimore & Ohio; treasurer, W. V. Taffner, commercial agent of the Burlington; Board of Governors, transportation, G. W. Johnston, general freight agent of the Pittsburgh & [illegible] Railroad; [illegible] W[illegible] Hodge, freight traffic manager of the Pennsylvania Lines; Robert Hunter, commercial agent of the Merchants & Miners Transportation Company; industrial, H. E. Graham, general freight agent of the Pressed Steel Car Company; E. C. Sattley, traffic manager of the Page Woven Wire Fence Company.

The Occidental Metal & Mfg. Company, with headquarters at Kansas City, Mo., has leased a tract of 213 acres of land at Eureka, St. Louis County, and is taking the preliminary steps necessary to establish a large manufacturing plant. Surveyors are platting the ground and representatives are negotiating with the Frisco and Missouri Pacific railroads for switches. The plant is to occupy about 8 acres. The company will manufacture brass [illegible]

The International Harvester Company.

The International Harvester Company has made application to have placed upon the regular list of the New York Stock Exchange the following securities now issued:

(a) Stock trust certificates issued under a voting trust agreement representing 600,000 shares of the par value of $100 each, of 7 per cent. cumulative preferred stock.

(b) Stock trust certificates issued under such voting trust agreement representing 600,000 shares of the par value of $100 each of common stock.

The application is a comprehensive statement from which the following is taken:

All the stock of the company except 18 shares held by the directors has been deposited under a voting trust agreement, dated August 13, 1902, to be held until August 1, 1912, unless a majority of the voting trustees elect, as they may, to terminate the agreement after August 1, 1907, upon not less than 90 days' notice. The voting trustees are George W. Perkins, Charles Deering and Cyrus H. McCormick.

The International Harvester Company was organized under the general corporation laws of the State of New Jersey August 12, 1902. The duration of the corporation is perpetual. At organization the capital stock of the company consisted entirely of common stock to the amount of $120,000,000, but by amendment of the charter on January 8, 1907, the plan of capitalization was changed (without increasing the total amount) by making one-half of the stock 7 per cent. cumulative preferred stock and leaving the other half common stock. Stockholders received one share of preferred stock and one share of common stock in exchange for every two shares of the original stock. The entire capital stock of the company has been issued.

Harvesting Machinery, Wagon and Twine Plants.

Shortly after organization the company purchased and now owns, or has sold affiliated or subsidiary companies, the plants and business formerly owned by the following concerns engaged in the manufacture and sale of harvesting machinery and twine: Warder, Bushnell & Glessner Company, McCormick Harvesting Machine Company, Deering Harvester Company, Milwaukee Harvester Company, Piano Mfg. Company.

Of the company's capital stock of $120,000,000, $60,000,000 was issued for an equal amount of cash working capital, and $60,000,000 for the manufacturing plants and other physical properties formerly owned by the five companies above named. The plants and properties were valued by the independent appraisers, exclusive of any allowance for good-will or patents, at a sum in excess of $6,000,000. The company has no bonded or other funded indebtedness, and its properties are free and unincumbered.

The company has since purchased the plants and business of the Aultman & Miller Buckeye Company, Akron, Ohio; J. S. Kemp Mfg. Company, Newark Valley, N. Y., and Waterloo, Ia. (Waterloo plant leased); Keystone Company, Sterling, Ill.; Macleod & Co., Philippine Islands; Minnie Harvester Company, St. Paul, Minn.; D. M. Osborne & Co., Auburn, N. Y., including the twine business of Columbian Cordage Company; Weber Wagon Company, Chicago, Ill.

The following is a statement of the location and character of the manufacturing plants now owned and operated by the company (exclusive of plants owned and operated by affiliated and subsidiary companies which are described later):

Harvesting Machine and Farm Implement Plants.

Akron Works (Akron, Ohio), manufacturing auto-buggies and tractors.

Champion Works (Springfield, Ohio), manufacturing harvesting machinery and tillage implements.

Deering Works (Chicago, Ill.), manufacturing harvesting machinery.

Keystone Works (Sterling, Ill.), manufacturing harvesting machinery and tillage implements.

McCormick Works (Chicago, Ill.), manufacturing harvesting machinery.

Milwaukee Works (Milwaukee, Wis.), manufacturing gasoline engines and cream separators.

Newark Valley Works (Newark Valley, N. Y.), manufacturing manure spreaders.

Osborne Works (Auburn, N. Y.), manufacturing harvesting machinery and tillage implements.

Piano Works (West Pullman, Ill.), manufacturing wagons and manure spreaders.

Waterloo Works (Waterloo, Iowa, leased), manufacturing manure spreaders.

Weber Works (Chicago, Ill.), manufacturing wagons.

Twine Mills.

Akron Twine Mill (Akron, Ohio), manufacturing Sisal binder twine.

Deering Twine Mill (Chicago, Ill.), manufacturing Sisal and Manila binder twine.

McCormick Twine Mill (Chicago, Ill.), manufacturing Sisal and Manila binder twine.

Osborne Twine Mill (Auburn, N. Y.), manufacturing Sisal and Manila binder twine.

Subsidiary Companies Owned.

The company owns or controls the entire capital stock of the following companies:

International Harvester Company of Canada, Ltd.: The capital stock authorized and issued is $1,000,000. The company owns and operates a plant at Hamilton, Canada, constructed in 1903, for the manufacture of harvesting machinery and tillage implements. No dividends have been paid on the capital stock of this company.

International Flax Twine Company: Its capital stock authorized and issued is $250,000. The company owns and operates a flax twine mill at St. Paul, Minn. No dividends have been paid.

Wisconsin Steel Company: The capital stock authorized and issued is $1,000,000. The company operates under leases about 480 acres of iron ore land in Wisconsin, Minnesota and Michigan, including the Agnew and Hawkins mines in the Mesaba Range, the La Rue mine in the Baraboo Range, and the Victoria and Lot Three mine in the Menominee Range. These leases run from 30 to 50 years, and it is estimated that the mines contain at least 25,000,000 gross tons of ore. This company also owns about 22,500 acres of undeveloped coal lands in Harlan County, Kentucky. It also owns and operates three blast furnaces at South Chicago, Ill., with a total annual capacity of 360,000 gross tons pig iron. It also owns and operates steel mills at South Chicago, Ill., which commenced operations in 1903. The Bessemer converting mill has an annual capacity of 300,000 gross tons of ingots. The blooming mill has an annual capacity of 250,000 gross tons of billets and blooms. The bar mills have an annual capacity of approximately 200,000 gross tons of finished bars and shapes. It also leases and operates the Deering Rolling Mill at Chicago, with an annual capacity of 24,000 gross tons of finished bars and shapes. No dividends have been paid.

Wisconsin Lumber Company: Its capital stock authorized and issued is $250,000. The company owns 58,000 acres of timber land in Pemiscot and Dunklin counties, Missouri, and 22,000 acres in Mississippi. It owns and operates a sawmill at Pascola, Mo. No dividends have been paid.

Eastern Building Company, Ltd.: The capital stock authorized is $80,000, of which $50,600 has been issued. This company owns various dwelling houses and lots in Hamilton, Canada, against which there is an outstanding mortgage of $84,600. No dividends have been paid.

Calumet & Southeastern Railroad Company: The capital stock authorized and issued is $100,000. The company operates at the Wisconsin Steel Company's mills at South Chicago and connects them with adjacent railroad lines. Mileage—9.29 miles leased from Wisconsin Steel Company. Equipment owned—6 engines, 31 gondolas and flat cars. No dividends have been paid.

Deering Southwestern Railway: The capital stock authorized and issued is $212,500. The company operates in and about the Wisconsin Lumber Company's timber lands in Missouri and connects them with adjacent railroad lines. Mileage owned—8.12 miles. Equipment owned—1 engine, 1 log loader, 58 log cars. No dividends have been paid.

Illinois Northern Railway: The capital stock authorized and issued is $500,000. The company operates in and around the McCormick Works at Chicago and connects them with adjacent railroad lines. Mileage—12.5 miles leased from International Harvester Company; 6 miles leased from A., T. & S. F. R. R. Company. Equipment owned—6 engines, 28 gondolas and box cars. No dividends have been paid.

Owasco River Railway: The capital stock authorized and issued is $30,000. The company operates at the Osborne Works at Auburn, N. Y., and connects them with adjacent railroad lines. Mileage—0.34 mile owned, 5.31 miles leased from International Harvester Company. Equipment—4 engines, 29 flat cars. No dividends have been paid.

Chicago, West Pullman & Southern Railway Company: The capital stock authorized and issued is $50,000. The company operates at the Piano Works at Chicago and connects them with adjacent railroad lines. Mileage—1.81 miles owned; 2.45 miles leased from International Harvester Company. Equipment—1 engine. Dividend of $5000 paid in January, 1907.

Lagonda Western Railway Company: The capital stock authorized and issued is $25,000. The company operates at the Champion Works at Springfield, Ohio, and connects them with adjacent railroad lines. Mileage—1.92 miles leased from International Harvester Company. Equipment—1 engine. No dividends have been paid.

The products of the International Harvester Company, the International Harvester Company of Canada, Ltd., and the International Flax Twine Company are

principally sold to the International Harvester Company of America, which owns or leases agency warehouses throughout the United States and in foreign countries and maintains an organization for the sale and distribution of these and allied products.

The International Harvester Company of America controls certain foreign incorporated trading companies which handle a portion of the foreign trade. This company was organized as Parker-Dennett Harvesting Machine Company, Ltd., under the laws of the State of Wisconsin, December 15, 1881. The name of the company was changed to International Harvester Company of America, September 5, 1902. Its capital stock authorized and issued is $1,000,000 and, except nine shares, is held by trustees for the benefit of the stockholders of International Harvester Company as a class. The duration of the corporation is perpetual. No dividends have been paid on the capital stock of this company.

COMBINED INCOME ACCOUNT FOR 1907

Total net earnings, after deducting expenditures for ordinary repairs and maintenance ($1,973,677,991, and current experimental and patent expenses $875,949.27)		$11,228,317.87
Deduct appropriation for renewals and minor improvements charged off.	$307,821.08	
Reserves for plant depreciation and ore extinguishment	1,000,000.00	
Reserves for contingent losses and collection expenses on receivables.	700,000.00	
		2,007,821.08
		$9,220,496.79
Deduct interest paid on purchase money obligations and current loans		1,140,039.28
Net profits		$8,080,457.51
Deduct preferred stock dividends for the season 1907, 7 per cent.		4,200,000.00
Undivided profits for 1907 carried to surplus.		$3,880,457.51

Surplus at December 31, 1907.

	Net profits.	Dividends paid.	Undivided profits.
Season 1903	$5,641,180.61	$3,600,000.00	$2,041,180.61
Season 1904	5,658,534.68	4,800,000.00	858,534.68
Season 1905	7,479,187.36	4,800,000.00	2,679,187.36
Season 1906	7,846,947.32	4,800,000.00	3,046,947.32
Total			$8,625,849.97
Deduct special appropriation from surplus at December 31, 1906, as a reserve to meet future collection expenses on outstanding receivables			500,000.00
Undivided profits at December 31, 1906			$8,125,849.97
Add balance of undivided profits for season 1907			3,880,457.51
Total undivided profits at December 31, 1907			$12,006,307.48

The above surplus is composed solely of the balance of net earnings of the business during the five years of operations, after deducting dividend payments, the Board of Directors having decided to charge off the surplus of $7,076,225.65 existing at organization, October 1, 1902, by reason of the excess of the appraised value of the physical properties (including inventories) then acquired ($67,076,229.65) over the par value of the capital stock issued therefor ($60,000,000).

The General Balance Sheet.

The following is the general balance sheet of the company (including the assets and liabilities of affiliated and subsidiary companies) as of December 31, 1907 (the close of its last fiscal year):

Property account:		
Appraised valuation of real estate and plant property acquired at organization, plus additions, improvements and [illegible] to date		$62,206,844.12
Expenditures for stripping and development at ore mines		550,292.36
		$62,844,136.48
Deferred charges to operations:		
Advanced payments for mine royalties, &c.		285,287.66
Current assets:		
Inventories. Finished product, raw material, &c., at close of 1907 season	$35,140,415.69	
Subsequent material purchases and manufacture for 1908 season	15,147,210.08	
	$50,287,625.77	
Receivables:		
Farmers' and agents' notes	$25,783,001.10	
Accounts receivable	14,511,387.27	
	$41,094,388.37	
Deduct accumulated reserves for contingent losses	1,802,878.06	
	39,291,510.31	
Cash	3,573,893.94	
		93,153,030.02
Total		$156,282,454.16

Liabilities.

Capital stock:		
Preferred	$60,000,000.00	
Common	60,000,000.00	
		$120,000,000.00
*Purchase money obligations		3,450,194.63
†Bills payable		10,465,775.36
‡Accounts payable:		
Audited vouchers, accrued interest and taxes, &c.	$4,543,442.94	
Preferred stock dividend (payable March 2, 1908)	1,050,000.00	
		5,593,442.94
§Reserves:		
Plant depreciation and extinguishment	$3,841,502.11	
Collection expenses on receivables	600,000.00	
Insurance	325,231.64	
		4,766,733.75
Surplus—Undivided profits at December 31, 1907		12,006,307.48
Total		$156,282,454.16

NOTE.—Capital stock was issued at par as follows: $60,000,000 for cash for working capital; $60,000,000 for real estate, plants and physical inventories which were valued by independent appraisers in excess of that amount. No capital stock was issued for goodwill, patents, promotion fees or organization expenses.

The surplus of the company consists entirely of the balance of net earnings since organization, after deducting dividend payments.

* The purchase money obligations issued in part payment for new properties acquired which were still outstanding at December 31, 1907, amounted to $3,450,194.63. Of this sum there matures and is being paid in the current fiscal year ending December 31, 1908, $3,173,398.21. The balance of $276,796.42 matures in 1909 and 1910.

† The bills payable at December 31, 1907, consist of:

Loans maturing from 1910 to 1913	$7,000,000.00
Loans maturing in January and February, 1908 (paid at maturity)	2,272,615.36
Fiber drafts discounted at Manila, P. I. (paid at maturity)	778,560.00
Real estate purchase notes maturing from 1908 to 1911	414,600.00
Total	$10,465,775.36

‡ The accounts payable at December 31, 1907, consist of:

Audited vouchers (principally paid in January, 1908)	$3,243,972.78
Interest accrued, not due	214,028.08
Taxes accrued, not due	253,169.56
Miscellaneous	832,278.52
	$4,543,442.94
Preferred stock dividend, fourth quarter, paid March 2, 1908	1,050,000.00
Total	$5,593,442.94

§ The reserves for plant depreciation and extinguishment include:

Plant depreciation	$3,399,772.73
Ore extinguishment	408,058.24
Timber depletion	33,671.14
Total	$3,841,502.11

Since the formation of the company, liberal expenditures have been made annually for repairs and renewals to the physical properties to maintain them at their maximum of efficiency. All such expenditures have been charged, when incurred, to operating expenses, and have been absorbed in the cost of production. A comparison of these expenses for the last three seasons is:

	Season 1905.	Season 1906.	Season 1907.
Harvester works and twine mills	$1,004,069.26	$1,190,939.73	$1,599,116.13
Furnaces and steel mills	194,227.50	240,840.70	231,873.99
Miscellaneous properties	99,067.41	102,829.83	142,687.87
Totals	$1,297,364.17	$1,534,610.26	$1,973,677.99

There were also charged off during 1907 expenditures for special renewals amounting to $307,821.08 for minor improvements and equipment, and for special alterations and renovation of plant properties incidental to the manufacture of the new lines of wagons, manure spreaders, gasoline engines, cream separators, auto-buggies and tractors.

The fiscal year of the company ends on December 31 of each year. The annual meeting of the stockholders of the company is held on the third Thursday of April at Hoboken, N. J., and the regular meetings of the Board

of Directors are held bi-weekly. The principal office of the company is at 237 Michigan avenue, Chicago, Ill.

The directors are as follows: Charles Deering, chairman; George F. Baker, William J. Calhoun, Cyrus H. McCormick, Norman B. Ream, Charles Steele, Cyrus Bentley, Paul D. Cravath, Elbert H. Gary, Richard F. Howe, Stanley McCormick, John P. Wilson, James Deering, John J. Glessner, William H. Jones, Harold F. McCormick, George W. Perkins, Leslie D. Ward. The members of the Finance Committee are George W. Perkins, chairman; George F. Baker, Charles Deering, Elbert H. Gary, Cyrus H. McCormick, Norman B. Ream. The officers of the company are as follows: President, Cyrus H. McCormick; vice-presidents, James Deering, John J. Glessner, William H. Jones, Harold F. McCormick; secretary, Richard F. Howe; treasurer, Harold F. McCormick; general counsel, Edgar A. Bancroft.

The Van Dorn Iron Works Outrage.

On the night of June 2 damage to the extent of $10,000 was inflicted by unknown parties on the plant of the Van Dorn Iron Works Company, Cleveland, Ohio, through the wrecking of a derrick and other machinery by dynamite. More dynamite was found near the engine room, but it failed to explode. A meeting of the employees was held on the following Friday, at which a patrol was voluntarily organized for the purpose of guarding the works at night to prevent any further outrage. The company has issued the following explanatory statement:

"The Van Dorn Iron Works Company's plant, located at the junction of the Pennsylvania and the New York, Chicago & St. Louis railroads, consists of eight acres, about one-half of which is covered with the most modern steel frame fireproof buildings and their manufactories, consisting of four departments, each under a separate chief. The departments consist of one manufacturing jail prison and burglar proof vault work; the art metal work department manufacturing office files and appliances; the general iron department manufacturing iron fences, ornamental house and stable work, lawn seats, ornamental iron and bronze work, &c., and the structural iron department manufacturing such work as coal tipples, coal bins, &c.

"For nearly 35 years this factory has run continuously, commencing very small, and during the whole time there has been no labor friction whatever in connection with the factory employees. On the contrary, the best of feeling always has prevailed, and this feeling is shown by the eagerness and promptness of the employees to protect the works. In the erection of the structural material, which has been mostly done by union labor, there has never been any difficulty with the men. There has been a good deal of friction between the walking delegates, who appeared to be unreasonable. In the erection of the White Automobile Works, covering four acres, the plant was erected quicker than any other job of its size in this country, *i. e.*, in 30 days. The erectors disregarded the walking delegate entirely. There is no trouble in connection with the actual labor employed and never has been. The motive of the outrage referred to is not with the employees of the Van Dorn Iron Works, either union or non-union."

Fire Prevention.

Powell Evans, president of the Merchant & Evans Company, Philadelphia, delivered an address on "Fire Prevention" before the National Association of Manufacturers at its convention in New York, May 20, which has been printed in pamphlet form. This address is the result of years of painstaking study and inquiry on the part of Mr. Evans. He has gathered numerous facts bearing on the very great desirability of the adoption of measures to check the great loss which is annually visited on this country by fire. He gives statistics of annual fire losses ,making comparisons of the huge total with the annual revenues of the United States Government, the net earnings of railroads in the United States, the dividends paid on railroads, &c., showing in a most effective way the magnitude of such losses. He puts the total fire loss of 1907 at $215,671,250.

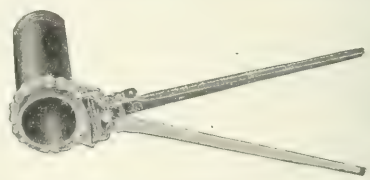
It would appear that the national loss in this way is increasing, as the fire loss of 1907 was greater than for any previous year. In January of the present year by far the worst record ever known was made in the losses sustained in the United States and Canada, aggregating $29,582,600. For the first four months of 1908 the fire loss in the United States and Canada was $91,464,600, or at the annual rate of $275,000,000 for both countries.

He calls attention to the burden on business by the payment of insurance against fire, as well as the great loss of capital in fires themselves, and draws comparisons with the much more effective prevention of fire loss in the countries of Western Europe. He suggests that the United States Government should investigate authoritatively a proper building code for adoption by municipalities all over the country, elastic enough to be applicable to every sized city and town. The work of the National Fire Protection Association, which is the engineering organization of the insurance world, is commended. Through this association an educational campaign is conducted which is expected to result in a better fire prevention condition of property. The address is well worthy of thoughtful attention.

The Duplex Chain Wrench.

For making up joints in wrought iron pipe of various sizes, and especially large sizes, the chain pipe wrench is looked upon as the most practical device, as one tool suits a wide range of work. In the accompanying illustration is shown the Duplex chain wrench, manufactured in several sizes by the Standard Nipple Mfg. Company, Pittsburgh, Pa., for use on all sizes of pipe from ⅛ to 12 in. The smallest size weighs 1¾ lb. and is 13¾ in. long, while the largest size weighs 54 lb. and is 65 in. long.

The chain is one capable of standing a tremendous tensile strain. The jaws are made to endure the rough usage they may receive, and are designed to take hold on the pipe so that it will not slip and yet will not be cut or crushed. The jaws hold the wrench securely in



The Duplex Chain Pipe Wrench Made by the Standard Nipple Mfg. Company, Pittsburgh, Pa.

place, while the encircling contact of the chain with the pipe insures a friction hold which prevents slipping or the force of the power being exerted on the pipe in such a manner as to indent or crush it.

The wrench will work either way and reverse or release itself instantly without the need of readjusting, which saves a great deal of time and labor, particularly when it is used on large piping. Owing to the fact that a close grip is obtained on the pipe, it is explained that it is well adapted for use against walls, between floors, in corners or in ditches, as the lever has a large sweep without loss of motion in catching a firm hold on the pipe. After the chain has once encircled the pipe and the chain is caught in the catches provided in the lever handle, it is only necessary to release the grip to permit the position of the wrench to be shifted so that the pipe can be moved in the opposite direction, or screwed up or unscrewed, as may be necessary. This convenience obviates the necessity of seeing that the wrench is on the pipe in the right way, for there is no wrong way with this wrench.

The Production of Coal in 1907.

STATISTICS RECORDED OF TOP.

Practically complete returns to Edward W. Parker statistician in charge of the division of mineral resources, United States Geological Survey, show that the production of coal in the United States in 1907 not only far exceeded any previous record, but also exceeded by a considerable amount all estimates of the output for that year.

The aggregate production of anthracite and bituminous coal in 1907 amounted to 480,450,042 net tons, valued at $614,831,549, against 414,157,278 net tons, valued at $513,079,809 in 1906. The increase in production in 1907 over 1906 was 66,292,764 net tons, or 16.01 per cent. in quantity, and $101,751,740 or 19.83 per cent. in value.

Of this large production in 1907, 76,432,421 gross tons, or 85,604,312 net tons, were anthracite coal from Pennsylvania. In 1906 the production of Pennsylvania anthracite was 63,915,009 gross tons, or 71,282,411 net tons, valued at $131,917,694, so that the increase in the production of hard coal in 1907 amounted to 12,587,411 gross tons, or 14,321,901 net tons, with an increase in value of $31,666,362.

The total production of bituminous coal in 1907 was 394,845,730 net tons, valued at $451,247,493, an increase over 1906 (when the production amounted to 342,874,867 net tons) of 51,970,863 net tons, or 15.16 per cent. The value of the bituminous production increased from $381,162,115 in 1906 to $451,247,493 in 1907, a gain of $70,085,378, or 18.39 per cent.

Decrease in Only Two States.

Of the 31 States in which coal was produced during 1907, there were only two in which the output in 1907 was less than that of 1906. These were both unimportant producing States—California and Oregon—and in both the decrease in production in 1907 was due to the increased production and use of oil for railroad and manufacturing purposes. Nearly all of the coal mined in Oregon is sent to San Francisco, and the increase in the output of California oil has materially reduced the production of coal in Oregon.

Had it not been for the depressed condition of the iron and steel trade, which followed the financial depression of October, 1907, the coal production for the year would undoubtedly have exceeded a total of 500,000,000 tons, and the value would probably have exceeded $650,000,000. As it was, the value of the coal product of 1907 exceeded by 68 per sent. the value of the total mineral product of the United States in 1880, and was nearly equal to the value of the entire mineral product of the United States in 1897, only ten years before.

The average price for bituminous coal at the mines in 1907 was $1.14, against $1.11 in 1906 and $1.06 in 1905. The average price in 1907 was higher than that in any other recent year except 1903, when prices were abnormally high because of the famine produced by the great anthracite strike in 1902. The average value of the anthracite produced in 1907, taking into consideration the quantity of coal used at the mines in the operation of properties, was $2.14 per gross ton, as against $2.05 in 1906. Excluding the quantity of coal used in the operation of the mines, which is designated as "colliery consumption" and which has been in the past considered an unmarketable product, the value at the mines of the anthracite coal produced in 1907 was $2.39 per gross ton, against $2.30 in 1906.

Illinois Again in Second Place.

An interesting feature in connection with the coal-mining industry in 1907 was the re-establishment of Illinois in second place as a coal producing State, its production in 1906 having been exceeded by that of West Virginia.

Pennsylvania continues to outrank all of the other States in coal production, for in addition to the 85,604,312 tons of anthracite produced in that State in 1907, there were also 150,321,437 tons of bituminous coal, making a total of nearly 236,000,000 net tons for Pennsylvania alone.

A Red Letter Year.

The year 1907 may be considered a red-letter year in the history of the coal-mining industry. In addition to the enormously increased production and the general advance in prices, a condition of peace reigned generally throughout the coal-mining regions, this being the result of the labor agreements made in 1906 after the suspension on April 1 of that year.

Production by States.

The following table gives the quantity and value of the coal production in the United States in 1907, by States:

Coal Produced in the United States in 1907, by States.

State	Quantity (net tons)	Value
Alabama	14,250,451	$18,167,448
Arkansas	2,670,488	4,174,695
California, Oregon, Nevada	24,089	91,845
Colorado	10,790,236	15,079,449
Georgia	362,401	499,986
Idaho	7,588	21,139
Illinois	51,317,146	54,687,382
Indiana	13,985,713	15,114,300
Iowa	7,574,322	12,258,012
Kansas	7,322,449	11,159,698
Kentucky	10,753,124	11,405,038
Maryland	5,532,628	6,623,697
Michigan	2,035,858	3,660,833
Missouri	3,906,294	6,399,616
Montana	2,098,857	3,867,082
New Mexico*	2,628,959	3,832,128
North Dakota	347,760	560,199
Ohio	32,142,419	35,324,746
Oklahoma (Ind. T.)	1,642,658	2,433,504
Oregon	70,981	166,304
Pennsylvania		
Anthracite	85,604,312	163,584,056
Bituminous	150,321,437	55,837,770
Tennessee	6,810,243	8,490,334
Texas	1,648,069	2,778,811
Utah	1,947,607	2,959,769
Virginia	4,710,895	4,807,533
Washington	3,680,532	7,679,801
West Virginia	48,091,583	47,846,630
Wyoming	6,252,990	9,732,668
Total	480,450,042	$614,831,549

*Includes production of Nebraska and Nevada.

The United States Leading the World.

Great Britain's production of coal in 1907 was 267,828,276 gross tons, or 299,969,669 net tons, and Great Britain is the second coal-producing country of the world. The coal production of the United States in 1907 exceeded by 180,480,373 net tons, or more than 60 per cent., that of the British Isles. It was more than double that of Germany, and was equal to 40 per cent. of the total coal production of the world.

The American Steel Foundries Readjustment.—The stockholders of the American Steel Foundries at an adjourned meeting held in Jersey City June 12, formally approved of the plan submitted to them last fall for a readjustment of the company's capitalization by which the present preferred and common stock is to be retired and a new issue of one class substituted. The plan also provides for the satisfaction of accumulated dividends on the preferred stock through the distribution to the preferred stockholders of 4 per cent. debentures running for 15 years at the rate of $1,000 in bonds, with every $5,000 par value of the new stock given in exchange for the old preferred. In addition a 3 per cent. cash payment is to be made. The basis upon which the new stock is to be given in exchange for the old preferred is 70 shares for each 100, and for the old common stock 25 shares for each 100. The total issue of new stock is $17,184,000, as compared with a total of $37,650,000 of old common and preferred.

The Association of Iron and Steel Electrical Engineers will hold its first annual convention June 24 and 25 in Philadelphia. The place of meeting will be in the home of the Engineers' Club, 1317 Spruce street. The association headquarters will be in the Hotel Walton.

THE IRON AGE

Established in 1855.

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Conventions and Foundry Progress.

It has seemed at times as though the amount of foundry literature produced in the United States in the past ten years has been out of proportion to the amount of real progress the foundry industry has made in that interval. Data have been poured out generously by the experimenters in cast iron, and figures have been tabulated sufficient to fill volumes; but there has always remained the question, how far the rank and file of foundrymen have been reached by these abundant labors. President Flagg of the American Foundrymen's Association may have had this condition in mind when he said in his address at Toronto that the time has come when the association must carry its work farther: that page after page of analyses have been put on record: and now it is in order to know more of what these analyses mean; that there has been much traversing of old lines in the discussions of the foundrymen's associations, and now new investigations must be taken up, particularly in the lines of chemistry and metallurgy.

Only within two years has the educational value of the foundrymen's convention been really appreciated. In the early days of the American Foundrymen's Association its annual meetings were looked upon more as an outing for proprietors, superintendents and foremen than as a school of instruction. The entertainment features had the right of way, and in the slimly attended sessions for the reading of papers only a few participated in the discussions. An attendance of 300 to 400, with a ratio of 1 to 1 of supply men to foundrymen, was usual, and sometimes the 300 mark was not reached. The organization and rapid rise of the National Founders' Association and the concentration of attention and resources upon foundry labor issues detracted so much from the movement for the betterment of practice that for a time it seemed that the original association was doomed. And the point was reached several times where, but for the determined and unrewarded labors of its secretary, Dr. Moldenke, it could have quietly and conveniently passed out of existence.

The contrast between the moribund condition of a few years ago and the splendid vitality shown at the Toronto convention last week is a marvel. The record registration of 1130 reached at Toronto would not have been dreamed of three years ago. It does not explain everything to say that the change is due to the exposition features that are now so prominent; though they are to be credited largely with the increased attendance. The time seemed to have been ripe for a forward movement in foundry practice. Moreover, the law of compensation has been at work. While the National Founders' Association well nigh caused the death of the American Foundrymen's Association, the upheaval in the foundry labor situation with which the former has had much to do has brought the molding machine prominently to the front, with all other labor saving foundry devices, causing many foundrymen to journey to the annual conventions to see these machines in operation. The practice of many manufacturers, to send superintendents and foremen on tours of discovery to such other shops as will admit them, is in vogue to some extent among foundrymen; but it is now found that a trip to the annual convention, where all forms of foundry equipment are in operation, may yield larger returns at much less expense. One important company with plants in different parts of the country sent 14 men holding responsible positions in its foundries, to the Toronto exhibition. Another company sent four of its foremen and in scores of cases one, two and three representatives were sent to find out about the latest appliances and exchange experiences with progressive men from other foundries. It is significant, also, that a committee of the National Association of Stove Manufacturers should appoint a meeting at Toronto during the convention, to observe and compare the operations of various molding machines, working side by side, especially as adapted to stove plate work.

In contrast with some previous meetings in the day of the American Foundrymen's Association's small repute, the discussions at Toronto last week had very general and very intelligent participation. If the metallurgical section of the association has not thrived as a separate organization, there is a better diffusion throughout the body of a knowledge of practical foundry metallurgy, for a new generation of foundrymen has come up since the association movement started. While the mechanical side of the business seems to have the greatest prominence at conventions, because demonstrations with machines are spectacular and convincing, there is a more careful study than ever of the composition of foundry raw materials—of sand and coke, as well as pig iron, which for so long monopolized attention. It was evident, too, from the discussions at last week's convention, that heat treatment is the subject of much experiment, and that important results are to be expected. The consideration of the effect of titanium on cast iron, of the use of permanent molds in the foundry, of more scientific cost finding systems, and of the most approved methods of casting automobile cylinders showed that many talented men are at work on foundry problems and are making their impress upon present-day practice. It would seem, in short, that the modern foundrymen's convention has brought the practical abolition of the day of the foundry's reproach.

The Protection of Foreign Patents.

The incorporation of the compulsory working clause in the British patent act appears to have created almost a sensation in industrial circles in Germany. Other European nations have found the matter one for serious consideration, although their own laws include the same provision. The Germans are threatening to make more sternly operative that section of their patent act which accomplishes the effect of compulsory working on penalty of revocation of the patent. In America the feeling long existing that some similar measure should be introduced into the patent system has been strongly stimulated by the example of Great Britain, and probably

will grow still more rapidly as our manufacturers realize more fully what the effect of the new condition in the United Kingdom and that promised for Germany will mean to them. The general subject, with special attention to the British act and the need of similar legislation in America, was discussed editorially in *The Iron Age* of March 5. Since that time the British act has gone into force, and the press of other countries, notably Germany, apparently inspired by industrial interests, have had much to say on the question, including the urging of reprisals. The British answer is that their manufacturers will not grumble if other nations adopt similar stringent measures, but at the same time it is pointed out that countries having protective tariffs have far less need of the compulsory working clause than has free trade England. The tariff alone, it is asserted, gives sufficient protection to the manufacturer from the importation of the products of his foreign competitors, though they may be made cheaper and perhaps better because of inventions covered by patents granted to the foreigner and unworked by him excepting at home.

The *Engineer*, London, has an interesting review of the general situation in Great Britain, Germany and the United States, which, in part, is as follows:

"Although the compulsory working clause was directly framed for the purpose of securing the manufacture of commodities by foreigners of all nationalities in this country, it has been declared in some quarters to have been solely aimed at Germany; but the assumption is far from being the case, as the act is equally applicable to the United States, which country is a large exporter to the United Kingdom, and to all other countries. Not only so, but the section in question makes no discrimination between British inventors and the foreign owners of patents in this country.

The fact that British patentees are placed upon an equal footing with foreign competitors in regard to compulsory working has very largely been overlooked. It is, indeed, no more possible for British firms to secure the benefit of cheap labor in foreign countries and omit to manufacture at home than it is for foreign firms to fail to work their British patents in the United Kingdom. British inventors will be liable to have their patents revoked unless they give satisfactory reasons why the patented articles are not manufactured or the patented processes are not carried on to an adequate extent in this country.

The act is not directed against the foreigner; it is directed against the misuse of patent rights. Nothing can be fairer and more reasonable than that, and Englishmen will be the last to grumble if it is true, as reported, that the question of compulsory working has also been brought forward in the United States, where proposals are under consideration for an alteration of the patent act in the sense that foreign holders of United States patents should be compelled to work them in that country within a stipulated period.

The German Government, according to the Berlin *Tageblatt* of May 23, should now wait no longer in view of the developments in the United States, following upon the enactment of compulsory working in the United Kingdom. The German newspapers contain advertisements offering sites for the erection of works in Great Britain, and capital is being diverted from the former to the latter country. It is, of course, impossible to arrest this migration, unless arrangements are made with British firms for manufacturing by license under the foreign patents granted by the Patent Office. Nevertheless, it is considered that the German Government should assume an attitude of defense by putting into operation Section 11 of the German Patent act. This particular section provides that at the end of three years patents held by foreigners can be revoked if the owners fail to work the invention in that country. The section has hitherto, it is said, remained inoperative, but the Berlin newspaper suggests that it should not be unwelcome to the Government if the various manufacturers forming one branch of business were to combine and demand that foreign inventions should either be carried on in German workshops or the patents declared void. In this way, it is contended, many British and American exporting industries, as, for instance, the makers of typewriters, machine tools and agricultural machinery, would be compelled to establish branch works in Germany.

We must not, however, lose sight of the fact that the conditions in the United Kingdom are very different from those in Germany and the United States. In both of these countries high import tariffs exist, and it is in their power to make the importation of many things practically impossible. The need of compulsory working is, therefore, comparatively small, as their industries are already protected from foreign-made manufactures. Under free trade, on the other hand, we cannot exclude foreign-made goods, and it has become absurd that we should actually assist the foreign importer by refusing permission to the home manufacturer to compete with him.

While it is true that our protective tariff operates to the especial advantage of our manufacturers, it does not cover the case of our foreign market. Our industries can be better protected abroad in competition with those of other countries if compulsory working is made a principle of our patent laws. If the foreigner can patent his invention in the United States, and permit it to lie idle so far as employing it in manufacturing in this country, and with benefits resulting from its use can meet his American competitor abroad at an important advantage, then the failure to adopt the compulsory working is an injustice to American industries. To be sure, if the foreign manufacturer establishes works in this country he may, because of the ownership of the invention, be a more formidable adversary in the home market than would otherwise have been the case, but by so doing he would become an American manufacturer and employer of labor, a purchaser of American raw materials, equipment and supplies, and thus add to the national welfare. If, under compulsory working, he should not establish works here, then he must either dispose of rights to American manufacturers, or else the latter might cause the patent to be revoked after the period specified by law and employ the invention as if no patent had ever existed.

The mere existence of the clause in the German law, coupled with the German tariff, has resulted in the establishment of branch works of American industries in that country. It has been the influence through which Germans have procured rights which would not have been for sale otherwise. If it is true, as now declared, that the law has been practically inoperative, then its rigid enforcement should be much more sweeping and serious in its effects. With no thought of retaliation, it is just to assume that what is good for the industries of other great nations, as frankly acknowledged by them, must be equally good for our own.

The Steel Car Repair Account.

Reference has been made to the results of experience with steel cars in the matters of maintenance and repair. In the earlier days of their use steel cars made a more favorable showing, it was thought, than might be the case later, since in the wrecking of trains made up of both steel and wood cars the latter would get the brunt of the damage. With solid trains of all-steel cars it was expected that steel against steel would run up a much heavier metal working bill in case of accidents. This proved true; but more than an offset was the experience of a system having over 100,000 steel cars in use. It was found that a steel car after being in a wreck that would totally destroy the body and frame of a wooden car could be repaired for about $50; also that a steel hopper car so badly wrecked that scrapping was considered was repaired at a cost of $150.

More recent data on the subject are furnished by the *Railroad Age Gazette*, which gives a three-year record of the cost of repairs to steel and wooden cars on the Harriman Lines, the period ending with September, 1907. All cars of steel or composite construction were included on one hand, and on the other substantially the same number of wooden cars of like age and capacity. The

average monthly cost of repairs to steel cars in the three years was $2.89 per car, and of repairs to wooden cars $4.24 per car. The average total yearly saving on the steel cars was $147,037. If this amount were capitalized at 4 per cent. our contemporary figures that it would buy more than 3000 new steel cars at $1200 each.

In the same connection reference is made to the results secured with the all-steel box cars of the Union Pacific type, which have been in service over a year on that and other Harriman roads. These cars have stood the roughest service known on this road, carrying 90,000 lb. of coal, and under weeks of this severe treatment showed no bad effects. Nor was there complaint of damage to any class of freight carried, because of the heating up of the metal sides under the high temperatures, 130 degrees at times, of the desert country traversed by the Southern Pacific. Being 3750 lb. lighter than a standard wooden car of the same capacity, a steel box car represents an important saving in operating cost. At an average travel per car of 10,000 miles a year on the Southern Pacific, a steel car gives a yearly reduction of over 16,000 gross ton miles, which on the basis of the operating cost of that road would mean an annual saving in operating cost of over $20 a car.

Niagara Falls Power Conditions.

At 1 o'clock on the morning of Sunday, June 14, the Niagara Falls Power Company shut down its two big generating plants, closing off all water from the tunnel in order that the International Railway Company might make a thorough inspection of the condition of one of the American abutments of the great upper steel arch bridge, which it owns. This abutment stands very close to the water that rushes out from the portal of the tunnel, and it has long been suspected that it was in danger. In fact, unsuccessful efforts had been made to protect it with steel plates on the portal stream side. When the water was off a large force of men, including three divers, worked about the abutment making the examination. It was found that the rushing water had eaten away the shale back of the retaining wall, having got in under the wall, which does not appear to have been given a proper foundation. The damage can be repaired, now that the extent is accurately known. Engineer R. S. Buck, and Mr. Moran, the latter of the Foundation Company of New York, were present at the examination.

The Niagara Falls Hydraulic Power & Mfg. Company also shut down its power houses and joined with the Niagara Falls Power Company in making it possible for members of a lake survey corps to take levels of the river above the Falls of Niagara at a time when no water was being diverted for power purposes. The level of the water in the river was naturally high that morning, but, as there was no wind, the time was ideal for the effort to secure data as to the river's flow at a time when the American Fall was receiving all the water that would naturally flow over it. It is understood that the levels taken at Prospect Point indicated a rise of 11-5 in. in the level there.

While the power stations were shut down, the Niagara Falls Power Company had its engineering corps make a very complete investigation of the wheel-pits, the tunnel and the giant power producers. It was about 1:45 a.m. that the first party went down into the tunnel. The pits and tunnel were found in ideal condition. A few brick had dropped out of the roof in the connecting tunnel between the pits, but this was of little moment. There was a slight leakage through the brick lining here and there. The water line, as shown in the tunnel, indicates clearly that the tunnel, which is 21 ft. high by 18 ft. wide, is of sufficient size to carry off all the discharge of the two great stations. The inspection greatly pleased the power company. At 9:30 a.m. the first machine was thrown in, and at 11:20 a.m., all the big generators were again carrying their accustomed load. All the Niagara factories closed down during the inspection, but the Canadian Niagara Power Company's station carried the trolley load of the western New York section served from these great stations. A number of people were guests of the Niagara Falls Power Company in the trip through the tunnel.

Coal Briquetting.

For the purpose of determining the extent to which the manufacture of briquettes from slack coal may succeed under the conditions existing in the United States an investigation has been carried on at the fuel testing plant of the United States Geological Survey at St. Louis by James E. Mills, whose report on the work has just been published by the Survey as Bulletin 343. The problem to be solved was not alone how to make the best possible briquette, but how to produce at a profit a briquette of satisfactory grade for the use intended with the slack and binders available. The experiments made by Mr. Mills include tests of the behavior of a large number of different coals with a few binders and of a few coals with a large number of different binders. Tests were made with each coal and with each binder until the percentage of binder required to produce a satisfactory briquette with that coal was determined. The behavior of the briquettes in the fire and, when necessary, in water, was noted. The binders used were examined as to their chemical or physical properties, and such modification of each binder was made as seemed likely to produce most efficient results. The desirable qualities of a binder are stated by Mr. Mills as follows:

1. It must be sufficiently cheap to make the manufacture of briquettes profitable.
2. It must bind strongly, producing a briquette sufficiently hard but not too brittle.
3. It must hold the briquette together satisfactorily in the fire.
4. It must produce a briquette sufficiently waterproof to stand the conditions of use.
5. It should not cause smoke or foul-smelling or corrosive gases, nor should it foul the flues.
6. It should not increase the percentage of ash or clinker.
7. It should increase, or certainly it should not diminish, the heat units obtainable from a given weight of fuel.

The experiments show that in general, for plants situated where it can be obtained, the cheapest binder will prove to be the heavy residuum from petroleum, often known to the trade as asphalt. This is particularly available in California, Texas and adjacent territory. Second in importance comes water gas tar pitch, and third, coal tar pitch. Of local importance, where the price permits, are natural asphalts and tars derived from wood distillation. Pitch made from producer gas tar will produce excellent briquettes with a lower percentage of binder than other coal tar pitches. It is not yet on the market, but will doubtless be available in the future. Starch, waste sulphite liquor from paper mills and magnesia may also be utilized as binders for briquettes.

Mr. Mills' report, which contains details of his experiments, may be obtained free of charge by applying to the Director of the Geological Survey at Washington, D. C.

The first temporary cable between the towers of the new Manhattan Bridge, New York City, was stretched June 15. This will be followed by 15 others, and from these will be suspended the footpaths for the workmen who are to build up the four 21-in. permanent cables. Each of these cables will be composed of 9742 galvanized steel wires 192-1000 in. in diameter. The suspenders for the bridge structure will be 1¾-in. wire ropes, and the shore spans as well as the water span will be supported from them as in the Brooklyn Bridge. The assembling of the main cables is expected to begin in August, and it is estimated that the bridge will be ready for service by the end of next year. The Manhattan Bridge, specifications for which were printed in *The Iron Age* July 27, 1905, will be the third and largest between Manhattan and Brooklyn boroughs. The Blackwell's Island Bridge extends from Manhattan to Queens Borough.

Seattle Business Notes.

SEATTLE, WASH., June 8, 1908.—An offer of $2,000,000 has been made by the Chicago, Milwaukee & St. Paul Railroad for the site of the Moran Brothers Company's shipbuilding plant on the Seattle waterfront. The deal is still pending, but it is likely to be closed within the next few days. The owners of the shipyard have been holding out for $500,000 more. It is likely that a compromise will be reached, as the Moran interests have been considering plans to move their plant away from the center of Seattle. They have long been of the opinion that their works could be much more economically conducted were they in an outlying location in the low taxation district.

When the Moran yards were laid out, years ago, Seattle was a mere village compared with its present proportions. At that time the plant represented the extreme southern limit of Seattle's waterfront. Since then the Moran frontage has been completely surrounded by big works, docks, railroad yards and large improvements generally, so that it is really much too valuable for its present use, when it is considered that the establishment does not require a location in the center of the city. Where the plant will be moved is a question, but the managers are casting about Puget Sound for a suitable location. It has been suggested that a site may be acquired at Irondale, near Port Townsend, where a blast furnace is located. The furnace company is headed by James A. Moore, who is also president of the Moran company. Eagle Harbor, directly across from Seattle, is also suggested. Improvements planned for the plant will reach $500,000.

The founders of the company, the Moran brothers, sold the establishment a couple of years ago, after building the battleship Nebraska, which was the biggest piece of work they ever undertook. To aid in its construction, in fact to make the building of the battleship in Seattle possible, the people of the city gave the Morans $100,000 in cash as a bonus. The new owners of the concern are largely Philadelphians and other Eastern men, and they sent George H. Higbee of the United States Shipbuilding Company to Seattle to take charge of the works. He not long ago resigned to return to Philadelphia.

The Chicago, Milwaukee & St. Paul Railroad, which expects to complete its Pacific Coast extension by the middle of next year, had made large purchases of terminal grounds in Seattle, but needs more water frontage. Work on its Seattle properties began last week. The Union Pacific has also begun active operations in Seattle, and the fact that work for the two lines was taken up simultaneously has revived the old rumor that both will make use of the same terminals.

The Washington Iron Works Company, Seattle, one of the largest and oldest establishments of the kind in the Northwest, whose charter is about to expire, has petitioned the Superior Court for permission to disincorporate preparatory to a reorganization as the Washington Iron Works. The company was formed in 1881 with a capital stock of $100,000. The stockholders are J. M. Frink, Gerald Frink, Egbert Frink, Francis G. Frink, W. P. Fuller and Fred W. Fuller. The company is in excellent financial condition and is arranging for large improvements.

The Vulcan Iron Works, Seattle, is planning to move to Georgetown, a suburb, and is seeking a site of 50 acres. It is estimated that about a year will be required to construct the new plant. The enlargements planned will increase the capacity considerably. Fifty thousand dollars has been offered for a site, and the people of Georgetown may give a bonus.

A large shipment of steel pipe from Germany has arrived in Seattle to be forwarded to Alaska, where it will be used in mining operations by the Guggenheims. The pipe makes 31 carloads, is 44 in. in diameter and is in 30-ft. sections, each section weighing 5 tons. It is constructed in accordance with severe specifications for the main pipe line of the hydraulic works which the Guggenheims are building near Dawson and will be used for the inverted siphon which is to cross the Klondike River valley for the mines below.

The Seattle Hardware Company was awarded the contract by the Government to supply part of an order of brass pipe and fittings for the Atlantic squadron, a part of which has been undergoing repairs at the Puget Sound Navy Yard. The total amount of the order was $5000. The other successful bidder was the A. Hambach Company.

The Seattle Car Mfg. Company has given estimates to agents of the Sun Ning Railway Company of China on the cost of 20 freight cars, and instructions have been received to make the shipment across the Pacific as soon as possible. The builder of the railroad is Chin Gee Hee, who made a large fortune in Seattle years ago in the old Chinese mercantile firm of Wah Chung. His sentimental regard for this city, along with other considerations, has sent to it many orders for material. The cars to be built for the line under this order will cost $15,000. Regarding the railroad, Chin Keay, Seattle representative of the builder, says:

> The Sun Ning Railroad is now operating 20 miles of road between Sun Ning Hsien and Sun Kup. As soon as the grading will be carried forward it will extend from 160 to 200 miles. I have a letter from a Philadelphia firm asking for information regarding this order of cars, but we like to get as much of our equipment as possible in Seattle, and in the future will place large orders. There are about 40 Seattle stockholders in the railroad. About a month ago I shipped a pile driver, engine and all, to the Sun Ning Railroad. I have been informed that other machinery of this kind will be needed this summer. The cars should be finished within three or four months, and perhaps by that time I will be able to place still more orders. The railroad is a paying enterprise so far. It is the plan to put parts of the line into operation as rapidly as possible, so that there may be returns immediately from the investment. The company is capitalized at $3,000,000, all paid in.

Fire last week destroyed three machine shops of the Victoria Machinery Depot Company, Ltd., at Victoria, B. C., doing damage amounting to $180,000. Insurance amounted to $30,000.

Customs Decisions.

Hematite Iron Ore.

For the second time, the Government met with defeat last week when the United States Circuit Court of Appeals at Philadelphia refused to reverse the lower courts in holding that hematite iron ore is dutiable at 40 cents per ton under the provision in the tariff for this material. The merchandise in controversy was imported by Francklyn & Ferguson, Philadelphia. The customs authorities assessed the product as a "pigment," with duty at the rate of 30 per cent. ad valorem. In an earlier litigation, the Government was defeated in its contention for the higher duty, but in the present case the Treasury Department hoped that, with the introduction of additional testimony, the judiciary might see its way clear to affirm the ad valorem duty. Judge Dallas, who writes the decision for his colleagues, Judges Gray and Buffington of the Appellate Court say that the additional testimony is not convincing. It, therefore, follows that the ruling of the court below and the Board of Appraisers must stand. The decision says in part:

> It is contended, however, that the prior decision in this instance was had upon an incomplete record, and wholly without any such convincing and unequivocal testimony as is found in the present record as to the proper description of the merchandise as "pigments." In view of this contention, so much of the testimony as was not adduced in the preceding one has been considered with especial attention. But we have not been convinced by it, nor by the proofs as a whole, that this merchandise should have been classed as a "pigment" and not as an "iron ore." Witnesses more or less experienced in handling similar merchandise have applied to it such inconclusive terms as "crude pigment," "dry material or dry coloring matter suitable for making paint," and the like.

In conclusion the court reaches the belief that the merchandise is in fact crude hematite ore, which in its present state cannot be used as a pigment. Nothing in the record submitted by the Government tends to change the impression created on the first trial of the issue.

Negotiations are pending for the absorption of the Heany Fireproof Wire Company and the Teter-Heany Developing Company, York, Pa., by the Habirshaw Wire Company, Yonkers, N. Y. It is probable that the deal will be consummated in the near future.

The Dominion Iron and Steel Company.

The result of the operations of the Dominion Iron & Steel Company, Sydney, Nova Scotia, for the year ended May 31 compares as follows with the two preceding years:

	1908.	1907.	1906.
Total net earnings	$2,613,825	$2,247,536	$1,406,305
Interest payments	696,814	684,384	694,532
Surplus	$1,917,011	$1,563,152	$711,774

The profit and loss account shows:

Cr.	
Brought forward	$318,711
Net for 1907-08	1,917,011
Total	$2,235,722
Dr.	
Transferred to contingent fund	$1,376,831
Sinking fund	69,712
Carried forward	789,179
Total	$2,235,722

Earnings, says the report, have again to be considered in the light of the judgment against the Dominion Coal Company, which entitles us to recover cost of coal in excess of the contract price of $1.28 per ton. As in the previous year, all coal used has been charged against operations at the contract price, and on this basis earnings for the year were $2,613,815. The various departments have been carried on steadily throughout the year, with increased production and lessening costs. The output of steel reached 290,953 gross tons, against 235,505 tons in 1907.

The effect of the dullness of trade which set in last autumn has not been felt to any serious degree. There is already a perceptible increase in the demand for our products, which indicates reviving confidence, but until a return of prosperity is fully assured, the directors think it best to pursue a conservative policy.

Floating liabilities are larger than usual, but the increase is more than covered by further increase in value of raw and finished materials on hand. A considerable portion of finished materials are merely awaiting shipment. The increase in floating liabilities is due to both increased business and to the change in its character, at a time when a large part of earnings have temporarily to be paid over to the coal company. In view of the larger working capital we are henceforward likely to require, the directors think it well that a scheme for reorganization of the company's finances should now be under consideration. As a preliminary step, the stockholders will be asked at the annual meeting to authorize an increase in the capital stock, and the creation of consolidated mortgage bonds. The claim of damages against the coal company is as follows up to May 31:

Paid for extra cost of coal purchased	$1,847,450
Paid for extra cost of coal purchased from others	465,005
Damages due to short deliveries in August, September and October, 1906	132,252
Damages due to cessation of deliveries in November, 1906, estimated	479,000
Total	$2,923,808

The interest to the same date amounted to over $80,000.

Efforts have recently been made by friendly intermediaries to bring about a settlement of the suit, but without result. No definite offer has ever been received by the steel company and the most favorite arrangement put forward as likely to be acceptable to the coal company—in other words the best settlement which it appears open to us to make—is not one which the directors could recommend. The directors are not disposed to act in an unreasonable or litigious spirit and any settlement which deals justly with the rights of the steel company will receive their recommendation, notwithstanding it may fall a good deal short of the rights accruing under the strong judgments in the company's favor.

The May issue of the *American Wire Rope News*, published by the American Steel & Wire Company, is unusually interesting. The leading article, which is contributed by W. L. Jackson, chief engineer of the First National Bank Building, Chicago, describes "The Different Kinds of Elevators" as used in buildings. The second article is entitled "Wire Rope on a Battleship," and shows the important part which such rope plays in war vessel construction. E. W. Green furnishes an article entitled "Wire Rope on the Great Lakes," and describes how this rope enters into the equipment of great ore carriers. An article by H. A. Whitney, entitled "Patent Non-Spinning Wire Rope," describes how rope is constructed so that it will not rotate while a load is being hoisted. J. E. Evans furnishes an article entitled "Crushing Strains," which treats of the action of rope running over drums and sheaves. The concluding article treats of "Wire Rope in Stone Quarries" and gives much information regarding the quarrying of stone by machinery in addition to the part played in this work by wire rope.

The Hanson & Van Winkle Cold Galvanizing Process.

On June 8 Judge Cross of the United States Circuit Court for the District of New Jersey handed down an opinion in favor of the Hanson & Van Winkle Company of Newark, N. J., and Chicago, Ill., in a suit for infringement brought by the United States Electro Galvanizing Company. The suit was founded on reissue patent 11,624, issued August 3, 1897, to Hans Alexander, assignor to Louis Potthoff. The decision traverses the evidence in the case, which is unnecessary to be reproduced here, but it makes plain the fact that the suit for infringement could not be maintained. The judge says:

> The specification of the patent, with the testimony, makes it clear that the bath of the patent is necessarily basic and was so intended. The defendant's bath, on the contrary, is acid and contains free sulphuric acid; it is the opposite of the basic bath, and not only is it acid in the first instance, but it is maintained so by the introduction from time to time of additional acid to keep it in proper working condition.

The judge quotes approvingly from the testimony of Professor Chandler, the eminent chemist, who said:

> The defendant's bath is not the bath of the patent in suit, nor is it any one of the baths of the patent in suit, nor is it the bath of any one of the claims of the patent in suit. . . .
>
> Defendant's bath is not prepared in the same way as the bath of the patent in suit. The most striking feature of the patent in suit is the employment of a bath containing basic salts, and extraordinary means are resorted to in the specification to render the bath basic; that is, to secure a bath in which the salts shall be the basic salts of aluminum and zinc. . . . .
>
> No such conditions as described in the specification exist in defendant's baths. The baths are not basic baths. No such extraordinary methods are employed to render them basic as are described and claimed in the patent in suit. In fact, the very opposite treatment is resorted to.

The opinion concludes: "For the following among other reasons, then, the defendant does not infringe: It does not make the alloyed coating of the patent; employs no basic salts, but rather makes and maintains throughout an acid bath; does not use chloride of aluminum in its salts; does not use any organic substances with its salts or bath, or any equivalent thereof; and its bath is composed in part of different ingredients from the complainant's, is prepared differently and under different conditions, and its ingredients, insofar as they are the same, appear in different proportions. The bill of complaint will accordingly be dismissed with costs."

The Hanson & Van Winkle Company is gratified that, after a contest which it has conducted single handed and at great expense for six years, its process has been pronounced free from claims of infringement. It will proceed to install at once in the larger cities outfits in connection with its improved mechanical devices to show the prospective users the advantage of its methods.

Andrew Dall & Son, Cleveland, Ohio, have recently placed an order with the New York Belting & Packing Company, Ltd., for the installation of interlocking rubber tiling in the Cuyahoga County Court House, Cleveland, Ohio, amounting to $125,000. This is believed to be the largest order for rubber tiling ever placed. The contract was secured after an exhaustive examination into its merits. The tiling will be laid in the large court rooms, corridors, judges' chambers, ante-rooms, &c., in different designs to conform with the color scheme of the various rooms.

Slag Cars for Open Hearth Furnaces.

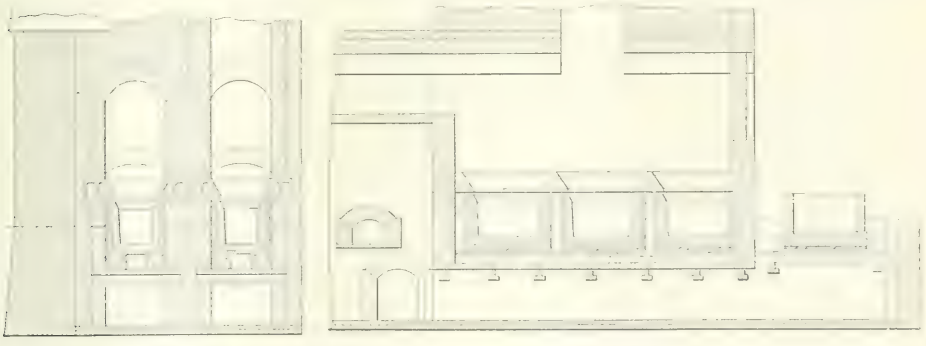
H. E. Smythe, president of the S. R. Smythe Company, Pittsburgh, Pa., furnishes the accompanying drawings, which illustrate a patented system of cars for the removal of slag accumulations from the slag pockets of open hearth furnaces. Provision is made for cooling the cars to prevent destruction from heat and to seal the space between the cars and at the top, so as to prevent any leakage or connection between the cars and the interior of the furnace or gas and air uptakes or the pockets. It is in the base of the pockets or uptakes that the slag is deposited, consisting of lime, metallic substances, fluxes used and material from which the furnaces are constructed, all of which fuses and becomes a solid mass, which is practically as hard as the steel itself.

The only present methods of removal of such slag are by sheer physical force or manual labor, necessitating the closing down of the furnace so that men can enter the pockets. Not only is the accumulation of this slag a detriment to the operation of open hearth furnaces when it amasses in large quantities, but it destroys the walls or lining of the pockets, the replacing of which is a continual source of expense. The cost in time and labor of removing slag by present methods is so great that a superintendent will operate a furnace as long as he possibly can; in fact, will often run it until the slag so accumulates as to take care of this accumulation of slag and removed when making customary repairs. But the object is to provide for the removal of slag often and at the pleasure of the superintendent.

The plan herewith shows the cars made in three sections. It will be preferable to make them either in one or two sections. The cars are supported on cast iron grooved tracks. Cast iron balls, 7 in. in diameter, are used, over which the cars roll to the pit at the back of the furnace. The tracks are supported on cast iron bearing bars and plate, having an air space entirely under the cars, the air for circulation being introduced at the neck or chamber leading from the regenerators through an air duct to the pit at the back of the furnace.

The seals in the walls at the top of the cars, along their sides and at the end next to the regenerators consist of hollow cast iron water cooled supporting bars. These not only protect the top of the cars and divert the slag to the cars, but they also increase the life of the silica walls forming the division wall and lining for the port uptakes and pockets.

The construction is durable and substantial, the cars being protected from the heat. The water cooled mantle plate seals can be eliminated if desired and the type of car used having a cast iron bottom only, upon which the brick lining is built. This car, when filled with slag, can be run out of the furnace to the pit under the traveling crane and all the slag, including the brick lining, can be dumped at one time, the latter being a small item of expense.



Cross Section. Longitudinal Section.

Slag Cars for Open Hearth Furnaces as Built by the S. R. Smythe Company, Pittsburgh.

that there is no room left for the gas and air to pass into the furnace. Of course the greater the accumulation of slag the more difficult and expensive it is to remove.

The system of slag cars here illustrated, which is applicable to any furnaces having slag pockets, has been devised to overcome and reduce to a minimum these troubles, delays and expensive conditions. The method is mechanical and practical, being the production of William Carr and H. E. Smythe, both of whom have had many years' experience both in building and observing the operation of steel furnaces. The cost of installation is not expensive, and, further, it costs little to maintain.

The cars for each pocket can be made in one section or more, with seals between and along the sides. Two designs of cars can be used, one with cast iron sides and ends, lined with fire brick, or one with cast iron bottom plate and a cast iron rim around the top lined with fire brick.

In both cases the cars can be pulled out into a pit at the back of the furnace, there secured to an overhead traveling crane and taken to a point where they can be conveniently dumped. Empty cars can be in readiness to be placed in the pockets, the ends being at once bricked up, thus completing the operation every week, month or as often as deemed necessary. This can be done without loss of output, as the cars can be removed and replaced at any time between Saturday and the Sunday shutdown, or at any time when the gas is taken off the furnace. Should it be desired not to shut the gas off during a continuous run of the furnace, the cars can be constructed so

A New Cincinnati Chuck.

An improved independent chuck with reversible jaws is made in sizes from 8 to 24 in. by the Cincinnati Chuck Company, Cincinnati, O., which was organized nearly a year ago. The company's shop is on the second floor of the Triumph Mfg. Company's new building, at Sassafras street and Spring Grove avenue, Camp Washington. The floor space is 60 x 100 ft. and the shop's capacity 300 chucks per month. Eventually the company expects to include several other types of chucks in its line. Spindle steel is used for all screws, and the bodies are extra heavy. Philip Fosdick, formerly of the Fosdick Machine Tool Company, is president; R. K. Le Blond of the Le Blond Machine Tool Company, vice president, and Alpheus Collins, secretary and treasurer. The company has established an agency in London, and is arranging other points of representation in European and other foreign countries.

A considerable number of the manganese ore firms of the Caucasus have consolidated under the name of the Caucasian Manganese Ore Export Company of Poti, Russia, and Paris, and it is claimed are now in a position to guarantee deliveries contracted for with buyers.

PERSONAL.

Dr. W. H. Tolman, director of the American Museum of Safety Devices, sails for Europe June 20, to study the most recent developments abroad.

Joseph Campbell, president of the Diamond Saw & Stamping Works, Buffalo, N. Y., has just returned from a European trip, in which he has made new connections for Great Britain and Ireland. John G. Rollins & Sons, 124 Holborn street, London, E. C., who also have an office at 15 Whitehall street, New York, are now acting as selling agents for the Sterling brand of goods manufactured by Mr. Campbell's company.

Claire L. Barnes, sales manager of the Detroit Steel Products Company, has resigned that office to assume a similar position with the Billings & Spencer Company, Hartford, Conn. In addition to the usual office duties of the position, Mr. Barnes will continue to call on the trade.

Isaac W. Semans, the prominent coke operator, entertained a large number of his fellow coke operators and others prominent in local business and professional life at the Summit Hotel, Connellsville, Pa., June 4. James R. Cray acted as toastmaster, and interesting addresses were made by L. W. Fogg, A. Plumer Austin, Fred C. Keighley, John P. Brennan, E. D. Fulton and others of note in coke circles. The general themes were harmony in the coke trade and the maintenance of coke prices, but attention was also called to the "criminal waste of the by-products of coking as practiced in the Connellsville region."

Charles Raht, sales agent for the Calumet & Hecla Mining Company, sailed Tuesday for Europe.

U. T. Hungerford of the U. T. Hungerford Brass & Copper Company, New York, sails to-day for a three months' automobile trip through Europe.

G. J. Weale, private secretary to the general superintendent of the Tennessee Coal, Iron & Railroad Company's plant at Ensley, Ala., has resigned his position to accept the general superintendency of the Ontario Steel & Iron Works, Toronto, Canada.

John A. Mathews, heretofore assistant engineer at the Sanderson works of the Crucible Steel Company of America, has been appointed operating manager and general superintendent of the Halcomb Steel Company, Syracuse, N. Y.

Charles E. Lawrence has been appointed local manager of sales for the Massachusetts Fan Company, with headquarters in the Hudson Terminal Building, 50 Church street, New York City.

Dr. James Douglas, of the Copper Queen and other copper mining companies controlled by Phelps, Dodge & Co., has sailed for Europe.

L. J. Grimmsey, who represents the machinery firm of Bagnall & Hillis, Yokohama, Japan, and who has been spending several weeks in this country purchasing machinery, left New York on Tuesday for Japan.

The Oliver Iron Mining Company has been in the market for timber for several years and is now perhaps the largest owner of standing pine in Minnesota, Wisconsin and Michigan. It is contemplating the purchase of the large sawmill plant of the Tower Lumber Company, located at Tower, on the Vermillion Range, and may close the purchase soon. This plant has an annual capacity for about 50,000,000 ft. of lumber. If bought it will be used principally for the manufacture of mine timbering for the company's operations in Minnesota.

The armored cruiser Maryland, now on the Pacific Coast, has made a record as the fastest warship of the United States navy. The Maryland on a four-hour, full speed, forced draft trial, averaged 133.1 revolutions per minute, making an average of 22.25 knots. The West Virginia, a sister ship, tried under the same conditions, averaged 131.8 revolutions and a speed of 22.1 knots. The revolutions made by both cruisers exceeded those made on the contractors' trials. The ships were handicapped by a slight adverse current.

OBITUARY.

WILLARD BEAM, San Francisco, Cal., died May 28, aged 54 years. He was born in Newark, N. J., and went to California in 1878, engaging in the iron and steel business, in which he continued up to his death. He leaves a widow, a son and a daughter.

HERMAN E. SCHNABEL, once prominent in the Western barb wire trade, died by his own hand in Chicago June 2. He had been despondent since the death of his wife, and probably over the loss of his wealth through speculation.

JOHN R. JOHNSON died June 4 at his residence in Philadelphia, aged 69 years. He was head of the firm of John R. Johnson & Co., car axle manufacturers, Richmond, Va.

HENRY LOMB, of the optical firm of Bausch & Lomb, Rochester, N. Y., died June 13, aged 80 years. He was born in Germany, and after receiving his education in that country he came to the United States in 1849.

SILAS J. WILLIAMS, president of the Transue & Williams Company, Alliance, Ohio, aged 65 years, died June 1 at West Harwich, Mass., where he had gone for the benefit of his health. He was largely interested in the Alliance Steel Casting Company before it became a part of the American Steel Foundries.

J. M. ROBINSON, until three years ago head of the J. M. Robinson Mfg. Company, Cincinnati, maker of metal working machinery, died June 15. He was a member of the Cincinnati Board of Education for 27 years, was prominently connected with the Union Board of High Schools, was a University of Cincinnati trustee, also a trustee of Christ Hospital, the Humane Society and Christie Chapel.

JOHN BAKER ROACH, president of the Delaware River Iron Shipbuilding & Engine Works, Chester, Pa., died June 16 of apoplexy, aged 68 years. He was born in New York, and was trained from boyhood for a shipbuilder. On the death of his father he was elected president of the company at Chester, and has since had complete charge of the business. He was a member of the Union League of Philadelphia, the Engineers' Club of New York, the New York Chamber of Commerce, the Penn Club of Chester, the Board of Managers of the Chester Hospital, and a director in the Seaboard Steel Casting Company, the Chester National Bank and the Cambridge Trust Company. He leaves a widow, two sons and two daughters.

Another merger of technical journals has been made. On June 6 the first issue appeared of the *Electric Railway Journal*, which is the name adopted for the consolidation of the *Street Railway Journal* and the *Electric Railway Review*. It is published by the McGraw Publishing Company, whose main office is at 239 West Thirty-ninth street, New York. Henry W. Blake is editor; L. E. Gould, Western editor, and Rodney Hitt and Frederic Nicholas are associate editors.

The forty-second annual convention of the Master Car Builders' Association is this week in session at Atlantic City, N. J. The meetings are being held in the Greek Temple, on Young's new pier, and the Marlborough-Blenheim Hotel is the official headquarters. Next week the forty-first annual convention of the American Railway Master Mechanics' Association will be held at the same place. Manufacturers of machinery in great variety are making extensive exhibits on the pier.

The Westinghouse Electric & Mfg. Company's employees are greatly interested in the efforts now being made to rehabilitate that company. They are showing their interest in a decidedly practical way by subscribing for stock to assist the Merchandise Creditors' Committee which is striving to raise $4,000,000 before June 22, so that the plan of reorganization may be made effective. It is understood that the workmen will subscribe for at least $250,000 in stock to aid the movement, in the effort to avert the disintegration of the company's property which seems to be threatened.

NEWS OF THE WORKS.

Iron and Steel.

[illegible] at the National Tube Company at London, Ohio, as [illegible] skelp mills at this plant resumed operations June 8, and the entire plant is running to larger capacity than for some time.

The furnace of the Williamson Iron Company at Birmingham, Ala., will be put in operation about July 1.

The charcoal furnace of the Quinn Furnace Company at [illegible] will be put in blast [illegible].

The Youngstown Sheet & Tube Company's tool and wire mills, Bessemer steel plant and butt weld pipe mills are idle this week and were also idle last week. The company's two lap weld pipe mills, the sheet mills and the puddle mill are the only departments in operation this week.

General Machinery.

The Elmira Foundry Company, Elmira, N. Y., has broken ground for the erection of a large machine shop in connection with its plant at Main street and Woodlawn avenue. The new building will be equipped with modern machinery throughout, which is expected to be ready for installation by August 1. When in full operation the plant will employ 100 men.

The H. G. Trout Company has been incorporated at Buffalo, N. Y., with a capital stock of $60,000 to continue the manufacture of small engines and machinery, and the brass and iron foundry business heretofore conducted under the name of H. G. Trout and located at 226 Ohio s treet. Henry G. Trout is president.

The firm of Mohr & Bates, Marshalltown, Iowa, has been organized to operate a local garage and do automobile and general machine repair work, and has equipped a building with machinery suitable for this work. Under the name of Brock-Mohr Trowel Company the same interests manufacture a line of high-grade aluminum trowels for which there is a growing demand.

The Wichita Falls Foundry & Machine Company, Wichita Falls, Texas, has completed its machine shop which is already in operation. Machinery and equipment for the foundry department are on the ground, and will be installed as soon as the building for that portion of the plant is finished, which will be about October 1. The company will also carry a full line of pipe fittings, valves, shafting, journal boxes, shaft couplings, pulleys, belting, packing, &c.

Payson Merrill has been appointed receiver for Julian Scholl & Co., New York, manufacturer of road making machinery, whose factory is at Kingston, N. Y. The liabilities are stated to be $80,000, and the nominal assets about $191,000.

Frank G. Hynes, Camden, N. Y., manufacturer of canners' supplies, steam specialties, electric generators, &c., has purchased a site, 30 ft. front, upon which he will erect a new shop which will more than double the capacity of his present plant. It is not likely that much new machinery will be required, as the equipment of the present plant will be moved into the new building, the erection of which is necessitated by increased business. The present shop will be used for storage purposes.

The Erie Foundry Company, Erie, Pa., manufacturer of steam hammers, punches, shears, rolling mill machinery and castings, will probably decide upon plans for rebuilding its plant, which was recently destroyed by fire, as soon as the insurance is adjusted.

Power Plant Equipment.

The Ashcraft Cotton Mills, Florence, Ala., intends to make improvements to its power plant and desires information as to the best course to pursue in increasing the capacity. Until the company is satisfied as to the most economical way to increase the capacity no orders for equipment will be placed.

Under a reorganization recently effected the Vicksburg Street Railway & Lighting Company, Vicksburg, Miss., two companies, the Electric Power Company and the Vicksburg Traction Company, have been formed. The former organization will own and operate the manufacturing plant, while the latter will control and manage the lighting and street railroad systems.

The University of Mississippi will receive bids until July 1 for the construction of a steam power plant to cost about $35,000. Generators and other machinery will be required. F. G. Proutt, Memphis, Tenn., is engineer.

The Board of Public Works, South Bend, Ind., has asked for an appropriation of $100,000, which if secured will be devoted to the improvement of the water system and the purchase of additional high duty pumps. A. J. Hammond is city engineer.

Bids will be closed June 19 for the construction of a power house for the Department of Charities and Correction, Pittsburgh, Pa., to cost about $100,000. John F. Brennan is assistant superintendent of the Bureau of Building Inspection.

The Coleman Fare Box Company has been incorporated at Buffalo, N. Y., with a capitalization of $500,000 to manufacture a fare collecting device for pay-as-you-enter cars under the patents of J. H. Coleman of Tottenham, Ontario, the rights in which have been acquired. A factory will be established in Buffalo. The directors are Charles Kuhn, Vernon Cole, Wm. J. Warner and Charles R. Whiting. The company's office is at 934 Prudential Building.

The Brooks plant of the American Locomotive Company at Dunkirk, N. Y., which last year put in foundations for a new power house and condenser building, will soon start construction on the superstructures, which will be one story in hight, of brick and concrete. The power house will be 165 x 192 ft. and the condenser building 115 x 140 ft.

The State Agricultural Experiment Station, Geneva, N. Y., is to be equipped with gas engine, dynamo, switchboard, pole and line connections and motors. Lyman P. Haviland, chairman of the Building Committee, will furnish specifications and receive proposals. Specifications can also be obtained from Franklin B. Ware, State Architect, Albany.

The city of Stockton, Kan., through its City Council, is considering the installation of an electric plant to be owned and operated by the municipality in connection with the established water works plant.

The Poseyville Milling Company, Poseyville, Ind., will build an electric light plant to supply street lights.

The Wenatchee Electric Company, Wenatchee, Wash., expects to construct an extensive power plant on the Icicle River, near Leavenworth the ultimate capacity of which will be about 12,000 hp. The initial installation, however, will provide about 2000 hp. Preliminary surveys for this work have been made.

Foundries.

Some time ago J. W. Hance, formerly treasurer and general manager of the Hance-Brown Casting Company, Columbus Ohio, purchased the plant of the Westerville Foundry & Machine Company at Westerville, Ohio, and it is now being operated under the name of the J. W. Hance Foundry Company, manufacturing gray iron castings, with a capacity of about eight tons per day.

The Lorenna Foundry Company, Bridgeport, Pa., whose plant was recently damaged by fire, will not need any new machinery at the present time.

Fires.

The extensive plant of the American & British Mfg. Company, Providence, R. I., was destroyed by fire June 13, the loss being about $100,000.

The plant of the American Malleable Company, Bloomfield, N. J., was damaged $25,000 by fire June 14.

The plant of the Bath Iron Works, Bath, Me., was damaged $90,000 by fire June 13, the boiler and coppersmith shops and storage house being burned.

The Dickson Car Wheel Company's plant at Houston, Texas, was burned June 6, the loss being placed at $100,000.

The plant of the American Seeding Machine Company at Louisville, Ky., was burned June 7. The loss is about $30,000.

The plant and coal ripple of the Royal Coal Mines at Argentine, near Butler, Pa., were destroyed by an explosion of dynamite June 16 the loss being about $20,000.

Miscellaneous.

The Thomas W. Irwin Mfg. Company, Pittsburg, Pa., is completing work on a contract calling for about 30,000 sq. ft. of structural skylight for the Cuyahoga plant of the American Steel & Wire Company, Cleveland, and has recently finished work on the structural skylight for Dock No. 2 of the Pennsylvania Railroad Company, Cleveland. The company also has important contracts for skylights for the Erie City Iron Works, Erie, Pa., on which erection will shortly commence and for the Titusville Iron Company, Titusville, Pa., which material is now being shipped. Late orders received include the Ritter Dental Mfg. Company, Rochester, N. Y., 14,000 sq. ft. of No. 22 galvanized Carnegie bar, and McClintic-Marshall Construction Company's plant at Rankin, Pa.

The United States Radiator Company, Dunkirk, N. Y., has increased the capital stock from $300,000 to $400,000 to provide for the enlargement of its business.

Ambrose Petry, Detroit, Mich., and associates have secured a franchise at Newcastle, Ind., for an artificial gas plant, estimated to cost $40,000. They have acquired the stock of the Newcastle Light, Heat & Power Company.

The Western United Gas & Electric Company, Aurora, Ill., has acquired a property along the drainage canal at Joliet upon which to erect a new gas plant. Plans for its construction are now under consideration and while nothing has been definitely decided on it is probable that something will be done in the near future.

The recent statement in these columns that B. H. Lawter, superintendent of the Safety Shredder Company, New Castle, Ind., had patented a new engine for automobiles and would erect a building for the manufacture of automobiles is incorrect. Mr. Lawter's invention covers an improvement in the transmission system which can change from faster to slower without disengaging the engine or letting go of the load.

The New York office of the Hill Clutch Company, Cleveland, Ohio, has been awarded a contract by the Isthmian Canal Com-

grooved for ten 1¼-in. ropes. It is understood that these rope sheaves are to be installed in one of the crushing plants used in connection with the construction of the Panama Canal.

The Pittsburgh Gage & Supply Company, Pittsburgh, Pa., reports decided increase in the sales of its White Star oil filters and continuous oiling systems. A number of oiling systems have been installed in the various plants of the Carnegie Steel Company in the past and two more installations have just been completed at the Carrie Furnace, Rankin, Pa. The following is a partial list of other sales and recent installations: Republic Iron & Steel Company, Raimond, Ala.; American Iron & Steel Mfg. Company, Lebanon, Pa.; Shawinigan Water & Power Company, Montreal, Canada; Memphis Cold Storage & Warehouse Company, Memphis, Tenn.; Philadelphia & Reading Railroad, Rutherford, N. J.; Monongahela River Consolidated Coal & Coke Company, Pittsburgh, Pa.; New River Collieries Company, Thurmond, W. Va.; Liberty Mills, Nashville, Tenn.; General Fire Extinguisher Company, Warren, Ohio; Austin Biscuit Company, Boston, Mass.; Ridgway Pure Ice Company, Ridgway, Pa.; Hastings Table Company, Hastings, Mich.

John F. Robertson, for many years secretary and treasurer of the A. W. Cadman Mfg. Company, and H. A. Statenfield, formerly in the sales department of James Bonar & Co., have established themselves under the name of Statenfield & Robertson, at 621 Park Building, Pittsburgh, where they will deal in steam specialties, gravity oiling systems and supplies. Both have had long experience in this line, and will represent the following: Warren Webster & Co., water heaters and purifiers; Bridgeport Metallic Packing Company, packing; Hoyt's Metal Company, babbit metals; Metalic Valve Company, Kinghorn patent metallic pump valves; Anti-Selenite Company, carbon cleaning compound for automobile cylinders; Bohm Metallic Packing Company, fibrous babbit metal packing, and Robertson's patent blow off valves.

The Wisconsin State Capitol Commission has awarded contracts for pumps for the new State House at Madison and for hardware for the west wing. The contract for the hardware was awarded to the Kiefer-Haessler Hardware Company, Milwaukee, representing the Russell-Irwin Company of New Britain, Conn., for $4000. The contract for steam pumps was awarded to the Fred Prescott Steam Pump Company of Milwaukee for about $7000, the price for the general service pumps being $1380 and for the electric fire service pumps $5580.

A large part of the main building of the plant of the Standard Chain Company, Pittsburgh, Pa., at Sarnia, Ont., was blown down by a cyclone last week. No damage was done to the power house and very little to the machinery equipment.

Trade Publications.

Export Selling System.—C. I. F. Company, 11 Broadway, New York. Pamphlet describing problems of export trade, explaining the company's method of handling export business, which connects the consumer directly with the manufacturer. The function of the company and its purpose and aims were explained in *The Iron Age* May 9, 1907.

Machine Tools.—Garvin Machine Company, Spring and Varick streets, New York. Circular No. 72. Consists of a number of leaflets illustrating Garvin milling machines, screw machines, cutter grinding machines, bench grinders, die slotters, &c. Also a leaflet devoted to second-hand machine tools and a circular calling attention to the company's catalogue.

Heavy Duty Engines.—Allis-Chalmers Company, Milwaukee, Wis. Bulletin 1505. Devoted to the company's line of Corliss engines and calls particular attention to the valve gear, which has a new steel detaching device which it claims does not show excessive wear in prolonged operation. Another feature is the safety stop, consisting of blocks of steel on the cut-off cams which come into position and shut off the steam if the governor belt breaks.

Jaw Crushers.—Allis-Chalmers Company, Milwaukee, Wis. Bulletin 1429. Describes the company's line of jaw crushers, explaining their adaptability as crushers when initial expenditure is a factor of importance and when a small machine with a large receiving opening is required and great capacity is nonessential.

Positive Blowers.—Piqua Blower Company, Piqua, Ohio. Circulars. Show several types of the company's positive blowers for smelting furnaces, oil burning furnaces, &c. A blower attached to direct current motor is shown in one of the circulars which it is claimed is particularly adaptable for foundry use.

Incandescent Lamps.—General Electric Company, Schenectady, N. Y. Two bulletins. No. 4566 shows new type of tantalum lamps, which are rated for 40, 50 and 80 Watts, to replace the 44-Watt lamp. An interesting table is given showing the saving secured for 750 hr. of service at various loads per kilowatt-hour by use of the new sizes. No. 4571, superseding No. 4505, describes the tungsten lamp for street series lighting.

Brass Specialties.—Midland Brass Works, Fort Worth, Texas. Catalogue C. Gives illustrations and price-lists of the company's line of brass specialties and engineers' supplies, which include water cocks, brass cylinders, tank nipples, stuffing box heads, flange pipe holders, force pumps, couplings and engine room supplies.

Portland Cement.—Edison Portland Cement Company, New Village, N. J. Catalogue, 8 x 11 in., 64 pages. Describes the manner in which the Edison cement is made, concerning, which mention was made in *The Iron Age* May 21, 1908, in connection with an excursion of the Brooklyn Engineers' Club to the plant. The catalogue also gives views of the plant, which was described in complete detail in *The Iron Age* December 24, 1903, and shows a number of buildings constructed with Edison cement. It also illustrates some concrete dam work and pipe lines in which the cement was utilized, and contains as a frontispiece an excellent photograph of Thomas A. Edison.

An Indiana Coal Mining and Electric Power Project.—The People's Light & Heat Company, Indianapolis, Ind., has increased its capital stock from $50,000 to $1,000,000, under reorganization plans, by which the property comes into the hands of a new company of the same name, headed by Frank M. Fauvre, president, and Paul H. White, secretary and general manager. The new company has acquired the coal mines of the Fauvre Coal Company in Vigo County. It is proposed to erect there a central power plant and to distribute electricity to cities and towns of central and western Indiana and eastern Illinois. Factories in cities as far removed as Chicago, St. Louis and Louisville can be reached and supplied, the promoters say. It is proposed to begin with 5000 hp. delivered on a line to run through Terre Haute, Brazil, Greencastle, Danville and Plainfield to Indianapolis. Coal will be dumped from the mine cars into hoppers of gas producers, making gas to operate gas engines, which, in turn, will drive the electric generators. It is believed that power can be furnished to manufacturers at 10 to 50 per cent. below the present steam cost. The company has options on other large coal areas in different parts of Indiana.

The returns from the Scotch shipyards for May represent a very depressed condition. In that month the shipyards turned out only 14,290 tons. The Clyde proportion of that was 10,770 tons in 25 vessels, as against 43,670 tons in April and 62,240 tons in May of last year. The Clyde output for the five months ending with May has been 114,520 tons, as against 242,390 tons in the corresponding portion of last year. The Forth output for the five months was only 5780 tons, that of the Tay 19,900 tons, and that of the Dee 3578 tons. No vessel at all was launched on the Forth in May. The contracts booked during May consisted only of two dredges and two ocean steamers—not 10,000 tons in all.

The London *Telegraph* states that the British Government will start in September to build at Portsmouth a battleship still larger than any so far contemplated. It probably will be of 21,000 tons, will cost £2,250,000, and is intended to be completed for sea in 18 months after the keel is laid. It will have two novel and important features. Instead of 12-in. guns, which are now the largest guns used in the British fleet, it will mount weapons of the new 13.5-in. type, which for some time have been the subject of experiment. The other feature, the *Telegraph* understands, will be equipment with gas engines, by using which no smoke will be made and therefore the new ship will have no funnels.

The Cleveland Chamber of Industry has started an employment day movement, in which it asks the co-operation of the business men of the city and northern Ohio. July 1 is designated as employment day, and business men are urged to employ on that day and thereafter all the men their business will warrant, to send out traveling salesmen, and to take every means possible to make the wheels of business move more rapidly. A number of other organizations have been asked to take part in the movement.

Shipments of finished material by the Westinghouse Electric & Mfg. Company, East Pittsburgh, in the month of May amounted to $2,250,000, an increase of nearly $700,000 over April.

The Iron and Metal Trades

The consensus of opinion from all the leading markets throughout the country is that the reductions in the prices of Finished Iron and Steel made last week have done little to stimulate buying. The exception is in Steel Bars, in which a considerable tonnage has been placed. From Pittsburgh comes the report that the three leading interests of the district have booked about 250,000 tons with agricultural implement makers, a considerable part, however, prior to the announcement of the reduction. It must be considered, in connection with the agricultural implement requirements, that quite a large tonnage of unspecified contracts was carried over from the contract year just ending.

The reduction in the price of Steel Billets has not led to any placing of new orders as yet.

There has been a fair movement of Pig Iron in the Chicago District, from which emanate reports of a sale of 40,000 tons by a Southern furnace company to a large local manufacturing interest. Along the seaboard there have been some sales of Foundry, Forge and Basic Irons, but the consumers now seem fairly satisfied while there is still some pressure to sell.

Apparently there is a modest increase in the melt, while Steel makers report that their capacity is slightly better engaged, the percentage now coming close to 50. It is probable, however, that quite a number of manufacturing plants will close down in July for a longer period than usual.

The Sheet and Tin Plate makers held a meeting at Pittsburgh and decided to make an effort to maintain prices, or, in other words, not to concede to the buyers the reduction of $2 per ton just made in Sheet and Tin Plate Bars.

The sellers of Lake ore have formally announced the reduction of 50 cents per ton. The Pig Iron makers state that this is not likely to lead to a corresponding reduction in the metal because the decline in Pig Iron during the past few months has more than discounted any lowering in the price of raw material.

In the Chicago District some strength has developed in Old Material, as the result of quite heavy buying by the mills of Rerolling Rails, estimated at 10,000 tons, and of Heavy Melting Scrap by steel founders.

In Steel Rails the only transaction reported is the sale of 8000 tons to the Missouri & Northern Arkansas Railroad.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date of each week, one month and one year previous.

	June 17, 1908.	June 10, 1908.	May 20, 1908.	June 19, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	*$16.50*	$16.50	$16.75	$24.50
Foundry No. 2, Southern, Cincinnati	**15.25**	15.25	14.75	23.75
Foundry No. 2, Local, Chicago	**17.50**	17.25	17.25	26.00
Bessemer, Pittsburgh	16.90	16.90	16.90	24.15
Gray Forge, Pittsburgh	14.90	14.90	14.90	23.15
Lake Superior Charcoal, Chicago	20.00	20.00	20.00	27.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	*25.00*	25.00	28.00	29.50
Forging Billets, Pittsburgh	*27.00*	27.00	30.00	34.00
Open Hearth Billets, Phila	*26.20*	26.20	29.20	32.50
Wire Rods, Pittsburgh	*32.00*		35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	**13.00**	12.25	12.00	19.00
Steel Rails, Melting, Phila	**13.50**	13.00	12.75	20.00
Iron Rails, Chicago	**15.50**	15.50	14.75	24.50
Iron Rails, Philadelphia	**18.00**	18.00	17.00	27.50
Car Wheels, Chicago	13.00	13.00	13.00	25.50
Car Wheels, Philadelphia	*13.50*	14.00	14.00	25.50
Heavy Steel Scrap, Pittsburgh	**13.25**	13.00	12.75	18.25
Heavy Steel Scrap, Chicago	**12.00**	11.50	10.50	16.50
Heavy Steel Scrap, Philadelphia	**13.50**	13.00	12.75	18.75
FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	*1.40*	1.40	1.45	1.83½
Common Iron Bars, Chicago	*1.50*	1.50	1.65	1.78
Common Iron Bars, Pittsburgh	*1.40*	1.40	1.50	1.70
Steel Bars, Tidewater, New York	*1.56*	1.56	1.76	1.86
Steel Bars, Pittsburgh	*1.40*	1.40	1.60	1.60
Tank Plates, Tidewater, New York	*1.76*	1.76	1.86	1.86
Tank Plates, Pittsburgh	*1.60*	1.60	1.70	1.70
Beams, Tidewater, New York	*1.76*	1.76	1.86	1.86
Beams, Pittsburgh	*1.60*	1.60	1.70	1.70
Angles, Tidewater, New York	*1.76*	1.76	1.86	1.86
Angles, Pittsburgh	*1.60*	1.60	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	*1.45*	1.55	1.55	1.90
Skelp, Sheared Steel, Pittsburgh	*1.50*	1.65	1.65	1.90
SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	*1.95*	1.95	2.05	2.00
Cut Nails, Pittsburgh	*1.75*	1.80	1.90	2.03
Barb Wire, Galv., Pittsburgh	*2.40*	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	13.00	13.00	13.00	23.75
Electrolytic Copper, New York	12.87½	12.75	12.87½	22.50
Spelter, New York	4.57½	4.57½	4.60	6.40
Spelter, St. Louis	*4.42½*	4.42½	4.50	6.35
Lead, New York	**4.50**	4.50	4.25	5.75
Lead, St. Louis	**4.40**	4.35	4.12½	5.65
Tin, New York	*28.00*	28.25	30.30	43.25
Antimony, Hallett, New York	8.50	8.50	8.50	12.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, June 17, 1908.—(*By Telegraph.*)

The formal announcement made last week of a revision of Finished Material prices was received with apathetic indifference by the trade, and no signs of interest promising acceptance of the new schedules as a permanent level of values have developed. In fact, the net result up to date seems to be an accentuation of distrust in the permanency of the newly established prices, as well as impaired confidence in the cohesiveness of forces acting to support them. In any event, it is quite evident that instead of showing increased activity the market for the past week has been extremely quiet. The spurt of buying which followed immediately upon the reduction in Steel and Iron Bars was short lived, and but small additions have been made to the first purchases. Implement makers are apparently in no hurry to close for their coming season's requirements, and are holding off in the hope of a more advantageous market later on. Builders of threshing engines who usually contract for Plates and Tubes at about this time are not as yet actively in the market, the only order of this kind so far reported being one for 500 tons of Plates. An order for 8000 tons of Rails, placed by a Western road for early delivery, was secured by the Illinois Steel Company, and an order for 800 tons of high T Rails was taken by the Pennsylvania Steel Company. No change was made in the price of either Standard Section or Light Rails, although the latter are still persistently shaded. Last week's tonnage of Structural Material taken by fabricators was very light, and

the inquiries received were neither numerous nor individually important. The purchase of a considerable tonnage of Re-rolling Steel Rails by the mills has resulted in a further price advance, and active buying by dealers of this and other grades of Scrap Material has strengthened the entire market. In view of the fact that there is but little general demand from consumers, present values are without the support that is needed to guarantee permanency. The only finishing mills now in operation at the South Works of the Illinois Steel Company are the Rail mills, both the Structural and Plate mills being shut down. Most of the Bar mills in this vicinity are preparing to shut down the month of July and the prospects are that during that period mill activities will be reduced to a minimum. After receding to an extremely low level, Pig Iron prices have reacted, and are now quite firm, at current quotations. There has, on the whole, been some increase in the melt, but improvement in this respect is only moderate. Long abstinence from buying, however, caused depletion of foundry stocks, so that there is now room for replenishment. Purchases on this account continue to furnish a fair run of orders.

Pig Iron.—While the demand is by no means insistent, it is of a wholesome character and constitutes a moderate tonnage, which represents the conservatively estimated forward requirements and present needs of smaller melters. Last week's sales were composed chiefly of lots ranging from carloads up to a few hundred tons; a notable exception to this rule was found in three or four purchases made by the principal implement interests which aggregated around 4000 tons, about equally divided between No. 2 Foundry and Malleable Bessemer. The firm establishment of $12, Birmingham, as a minimum price for Southern Iron, and its ready acceptance by such consumers as are now in the market, have encouraged some of the furnaces to advance to $12.50; but, in view of the fact that Iron of well-known brands is obtainable at $12 for delivery through the second half, such advances have no special market significance. The furnaces asking $12.50 and $13 for the third and fourth quarters are generally pretty well supplied with third quarter tonnage, and are willing to take the chance of disposing of fourth quarter at the higher price. The Northern furnaces of this district are emphatic in the statements that $17.50, at furnace, for No. 2 Foundry is now their absolute minimum price. It is noted, however, that Valley Irons are being offered at $15, at furnace, or $17.40, Chicago, though no sales at this price are reported. The proportion of Malleable Iron in the tonnage moved is distinctly better, though very little of it is being taken by the railroads. Northern furnace stocks are being steadily reduced, and if the demand continues even at the present rate some stacks will probably be blown in within the next 30 days. The Federal Furnace Company, whose stack has been idle for several months, is arranging to blow it in shortly after July 1. The following prices are for June delivery, f.o.b. Chicago:

Lake Superior Charcoal	$20.00 to $20.50
Northern Coke Foundry, No. 1	18.00 to 18.50
Northern Coke Foundry, No. 2	17.50 to 18.00
Northern Coke Foundry, No. 3	17.00 to 17.50
Northern Scotch, No. 1	18.50 to 19.00
Southern Coke, No. 1	16.85 to 17.35
Southern Coke, No. 2	16.35 to 16.85
Southern Coke, No. 3	15.85 to 16.35
Southern Coke, No. 4	15.35 to 15.85
Southern Coke, No. 1 Soft	16.85 to 17.35
Southern Coke, No. 2 Soft	16.35 to 16.85
Southern Gray Forge	14.35 to 14.85
Southern Mottled	14.10 to 14.60
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	18.40 to 18.90
Jackson Co. and Kentucky Silvery, 6	19.90 to 20.40
Jackson Co. and Kentucky Silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky Silvery, 10	22.90 to 23.40

(By Mail.)

Billets and Rods.—Last week's concessions in the price of Steel have not been reflected in an increased demand. The market remains inactive, with only such incidental orders for Forging Billets coming out as happened to be needed for immediate use. Delivered prices are governed by the same freight absorption arrangement as applied to the former quotation, under which we now quote for Forging Billets, $28.50, base, Chicago. No stimulation in the demand for Wire Rods is observed, which are selling only in small lots. Revised prices are as follows: Bessemer, $33; Basic, $34; Chain, $33, all at Pittsburgh.

Rails and Track Supplies.—Chief in importance among last week's transactions in Rails was the placing of an order for 8000 tons by the Missouri & Northern Arkansas Railroad with the Illinois Steel Company. This business is especially desirable since early deliveries are required, specifications being furnished for shipments to begin in July and extending through August and September. An order for 800 tons of high T Rails was also included in last week's business; this was taken by the Pennsylvania Steel Company. Very little new business in Spikes, Bolts and Track Supplies was entered, and no Light Rail tonnage of importance has been booked. Rails were not included in the revision of prices made last week, but Track Bolts are a little easier and quotations on them are revised. Prices named on Light Rails continue to represent only a nominal level, as competition from rerolling mills is still effective in compelling concessions of $3 a ton or more from regular quotations. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.50c.; car lots, 1.60c.; Spikes, 1.80c. to 1.90c., according to delivery; Track Bolts, 2.20c. to 2.25c., base, Square Nuts, and 2.35c. to 2.40c., base, Hexagonal Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—Fabricators report a very light week, in which but few contracts were closed, and such as were taken were uniformly of small tonnage. As far as can be ascertained, not more than 1000 or 1200 tons was included in the week's transactions, the largest of which was 526 tons for the Tacoma, Wash., post office, which was taken by the American Bridge Company. Bids are in on a few small bridges and building structures, among which are 600 tons for the Old Men's Home, Chicago; 1900 tons for the B. A. Eckhart warehouse, Chicago, and about 400 tons of railroad bridge material for the Lake Superior & Ishpeming Railway, contracts for which will probably be let this week. It was expected that plans for the new Chicago City Hall would be distributed last week among the fabricators for estimates, but they have not yet been furnished. The reduction announced last week of $2 a ton on Structural Material has failed to develop renewed interest among buyers. The general feeling is that this reduction has no special significance, since it is generally believed that it has been more than anticipated by the prices that have for some time been offered on fabricated work. Prices are herewith revised and are quoted from store at 1.95c. to 2c. Mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.78c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.78c.; larger than 6 in. on one or both legs, 1.88c.; Beams, larger than 15 in., 1.88c.; Zees, 3 in. and over, 1.78c.; Tees, 3 in. and over, 1.83c., in addition to the usual extras.

Plates.—An order of 500 tons of Plates, placed by a builder of threshing engine boilers and tanks with the principal interest, is only noteworthy because of the extreme scarcity of Plate orders. The general run of business is made up of special requirements, the total tonnage of which is exceedingly small. No important inquiries have been received in response to the new schedule of prices based upon a recent reduction of $2 per ton. Revising prices, we quote mill shipments as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.78c.; 3-16 in., 1.88c.; Nos. 7 and 8 gauge, 1.93c.; No. 9, 2.03c.; Flange quality, in widths up to 100 in., 1.88c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.88c.; Flange quality, 1.98c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72-in. wide, 2c. to 2.10c.; from 72 to 96 in. wide, 2.10c. to 2.20c.; 3-16 in. up to 60 in. wide, 2.10c. to 2.25c.; 72 in. wide, 2.30c. to 2.40c.; No. 8, up to 60 in. wide, 2.10c. to 2.15c.; Flange and Head quality, 0.25c. extra.

Sheets.—The quietness of demand for Sheets has, if anything, been more pronounced within the last week or two. Buyers are rigidly adhering to hand to mouth purchases, and the demand upon warehouse stocks is too moderate to call for frequent replenishment orders. In view of a reduction made early in the year, Sheet prices were not included in last week's revision of Finished Materials. There is not enough business moving to test the market adequately, which is regarded as fairly firm under present conditions. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 and 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—Practically all of the business entered as a result of the recent reduction in Steel Bars was booked immediately after the announcement of the new price. As compared with the total average requirements of the implement makers, the contracts closed are disappointing, both in number and volume. In estimating these requirements it must be borne in mind that there is yet a considerable tonnage of unspecified contracts from implement makers which will be added to new orders. Specifications on both Steel and Iron Bars have been offered a little more freely in the past week, as a result of which nearly all of the mills in the district have been started up for temporary runs. Quotations, Chicago, are as follows: Steel Bars, 1.58c., with half extras; Iron Bars, 1.50c.; Hoops, No. 13 and lighter, 1.98c., full extra

Hoop card: Bands, No. 12 gauge and heavier, 1.58c., base; extra Steel Bar card; Soft Steel Angles and Shapes, 1.68c., half extras. Store prices are as follows: Bar Iron, 2c. to 2.15c.; Steel Bars, 1.90c. to 2c.; Steel Bands, 1.90c., as per Bar card, half extras; Soft Steel Hoops, 2.25c. to 2.35c., full extras.

Merchant Pipe.—The two point reduction made last week in Pipe discounts has not resulted in a decided increase of business, but some improvement is nevertheless observed. It is significant, however, that buyers continue to order sparingly for actual needs, and manifest no disposition to increase stocks. The demand from local jobbers' stocks is quite moderate. Store prices have been reduced in about corresponding ratio with mill prices. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 73.2; 7 to 12 in., 70.2; Galvanized, ¾ to 6 in., 63.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 73 per cent. on Balck Steel Pipe, ¾ to 6 in. About three points above these prices is asked for Iron Pipe.

Boiler Tubes.—Builders of threshing engine boilers usually begin looking after their season's requirements at this time, and a few inquiries from such sources have been received. A few desultory orders for Merchant Tubes are coming out, but they comprise only such small lots as are actually needed for work in hand. Prices are unchanged, and mill quotations for future delivery, on the base sizes, are as follows: 2¾ to 5 in., in carload lots. Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	55	35	35
1½ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2¾ to 5 in.	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—Inquiries have been somewhat more numerous, but the orders growing out of them are hardly what was expected, in view of the recent revision of prices. Some of the implement makers have come in for a moderate tonnage, but in the main buying is restricted to the necessities of immediate demand. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.78c.; Iron Finish up to 1½ x ½ in., 1.73c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.58c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.08c., and 1¼ in. and larger, 1.98c.; Smooth Finished Machinery Steel, 2.08c.; Flat Sleigh Shoe, 1.63c.; Concave and Convex Sleigh Shoe, 1.83c.; Cutter Shoe, 2.05c.; Toe Calk Steel, 2.13c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 56 per cent. off in car lots; 52 per cent. in less than car lots, base territory delivery.

Cast Iron Pipe.—At a letting held last week at Sheridan, Wyo., for 3000 tons, all bids were rejected and new offers will be asked on revised specifications, which will be changed to suit the requirements of a main to bring the water supply from the mountains. Contracts closed during the week were comprised of small lots, of which there were a fair number. Lettings to be held in the near future include Covington, Ky., 700 tons of 20-in. Pipe, and Berwyn, Ill., 1000 tons. Besides these there are several of smaller tonnage, from various municipalities. It is noted that public utility bonds, especially those of the smaller cities, are being readily absorbed, and in view of the stiffening of Pig Iron prices a more active demand for Pipe is anticipated. We quote, nominally, per net ton, Chicago, as follows: Water Pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25; with $1 extra for Gas Pipe.

Metals.—General improvement of the industrial situation has not progressed far enough to change the character of orders, which continue to represent present needs of consumers. There has been a slight increase in the number of carload orders for Copper in the past week which encourages the belief that manufacturers are securing more new business. Lead continues firm with an upward tendency, and is perhaps the most active item in the list. Old Metals are in somewhat better demand, though the improvement is not particularly pronounced. We quote as follows: Casting Copper, 13¼c.; Lake, 13½c. to 13¾c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 32c.; small lots, 32½c.; Lead, Desilverized, 4.60c. to 4.65c., for 50-ton lots; Corroding, 4.95c. to 5.05c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 10½c., and other grades, 9¾c. to 10¼c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 10⅝c.; Copper Clips, 11c.; Red Brass, 11½c.; Yellow Brass, 9½c.; Light Brass, 6½c.; Lead Pipe, 4c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 24c.; Block Tin Pipe, 27c.

Old Material.—A degree of strength, quite out of line with general market conditions, has developed in Scrap materials. This is attributed to buying by dealers for the covering of short sales. Except in Rerolling Steel Rails and Heavy Melting Steel, there have been no notable purchases by the consuming interests, so that the large tonnages recently offered by the railroads have been taken by dealers by whom they are held. Nearly all of the local mills using Rerolling Rails have recently bought round lots and are believed to have accumulated enough of such material to meet their needs for some time in advance, at the present rate of consumption. It is estimated that over 10,000 tons have been taken by these interests in the past two weeks. The same is true of Heavy Melting Steel which was bought at what are regarded as bargain prices for future use by the large Steel foundries. Dealers seem to be impressed with the belief that the railroads have unloaded a large part of their collected tonnage, and are of the opinion that offerings from them will be comparatively small for the next 60 days at least. Among the sales reported were 100 tons of Iron Car Axles, at $17.50; 300 tons Railroad Malleable, at $11.75; 2500 tons Rerolling Steel Rails, at $15. In explanation of the present price level, as represented by this week's quotations, it may be said that users regard them as more or less artificial; but at the same time no material concessions are obtainable on actual requirements to be placed. We quote, per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$15.50 to $16.00
Old Steel Rails, rerolling	14.25 to 14.75
Old Steel Rails, less than 3 ft.	13.00 to 13.50
Relaying Rails, standard sections, sub-	
ject to inspection	19.00 to 20.00
No. 1 Car Wheels	13.00 to 13.50
Heavy Melting Steel Scrap	12.00 to 12.50
Frogs, Switches and Guards, cut apart	12.75 to 13.25
Mixed Steel	9.50 to 10.00

The following quotations are per net ton:

Iron Fish Plates	$14.50 to $15.00
Iron Car Axles	17.00 to 17.50
Steel Car Axles	15.50 to 16.00
No. 1 Railroad Wrought	12.25 to 12.75
No. 2 Railroad Wrought	11.25 to 11.75
Railway Springs	12.00 to 12.50
Locomotive Tires, smooth	13.00 to 13.50
No. 1 Loaded Pipes	10.00 to 10.50
Mixed Axles	7.00 to 7.50
Iron Axle Turnings	5.75 to 6.25
Soft Steel Axle Turnings	5.75 to 6.25
Machine Shop Turnings	5.50 to 6.00
Cast Borings	5.00 to 5.50
Mixed Borings, &c	5.00 to 5.50
No. 1 Mill	6.50 to 7.00
No. 2 Mill	5.50 to 6.00
No. 1 Boilers, cut to Sheets and Rings	7.75 to 8.25
No. 1 Cast Scrap	12.25 to 12.75
Stove Plate and Light Cast Scrap	10.25 to 10.75
Railroad Malleable	11.25 to 11.75
Agricultural Malleable	10.25 to 10.75
Pipes and Flues	8.50 to 9.00

Pickands, Brown & Co., Chicago, have been appointed exclusive selling agents in Chicago territory for the product of the new furnace of the Jackson Iron & Steel Company, Jackson, Ohio. Under the brand of Jisco, this furnace will turn out High Silicon Iron and will have a capacity of from 75 to 100 tons per day. It is expected that it will be ready to go into blast some time in August or September.

San Francisco.

SAN FRANCISCO, CAL., June 10, 1908.

Business in general is fair, with the volume of building work gradually increasing. The jobbers in Iron, Steel and Merchant Pipe are more or less upset by the news of reductions in Steel products in the East, which means a general readjustment of Pacific Coast prices in those lines. Fortunately for the local jobbers, stocks are not large, as a rule, and it will not take long for them to adapt themselves to the changed conditions. The trade is awaiting definite information as to the contemplated changes in the Pacific Coast differentials on Structural Steel, Plates, &c., resulting from the drop in Eastern prices. Some of the dealers think buying will be stimulated, while others say that the jobbers will not buy much, even at lower prices, unless they can see a better outlook for future sales of Steel products. Things are still looking up in the mining districts, and better orders are coming in, though spasmodically, for pumps, machinery, pipe and repair parts from some districts. More business of the same kind is earnestly desired by local manufacturers and engineering works. The recent revival of activity in the oil regions of California is bringing in more business in the lines of pipe, fittings and nearly everything that is required around the oil wells. This is one of the hopeful features of the present situation, but there is still room for more improvement. In May 598 building permits, representing a total valuation of $2,709,084, were granted in San Francisco. This was a very slight increase, as compared with the month of April. In Los Angeles during the month of May 558 permits were issued, with a total valuation of $830,320. Collections are fair.

Structural Materials.—The tonnage of Structural Steel contracted for during the past two weeks has not been large, but there are some inquiries. The local concerns dealing in fabricated Steel are doing some small work. There has been an increase in the demand for Steel Bars used in the

erection of reinforced concrete buildings. Quite a number of these structures are under way in this city and surrounding territory. The Thompson-Starrett Company has taken a contract, amounting to $183,000, for the erection of a Class A building of three stories and a basement for Hyman Bros. on the corner of O'Farrell and Stockton streets. Building permits have been applied for for a 10-story Class A building on Market street for the Academy of Sciences, costing $290,000, and for Steel and brick hospital buildings for the Southern Pacific Company, costing $265,000. Cotton Bros., who have a contract for a bridge across the Sacramento River, have ordered 325 tons of Structural Steel from the American Bridge Company. Dyer Bros. of San Francisco will furnish 325 tons of Structural Steel for the United Railroads.

Pig Iron.—No improvement in the market has been noted, although stocks have been reduced somewhat recently. No receipts of Pig Iron by sea have been reported for several weeks, either from Great Britain or China. There is more inquiry among the local foundries and engineering works, but not much increase in the actual demand for Iron castings. No. 1 English, No. 1 Scotch and Chinese Pig Iron Ore quoted at about $28 per ton, ex-yard.

Merchant Pipe.—There is a fair demand for Merchant Pipe, with not a great quantity moving at present. The volume of business has declined since the spurt of two months ago. A drop of 2 per cent. in the discount has just been announced. Discounts on Steel Pipe are about as follows on jobbers' carloads:

	Steel. Black.	Steel. Galv.
	%	%
⅛ to ¼ in.	56.5	40.5
⅜ in.	58.5	44.5
½ in.	60.5	48.5
⅜ to 6 in.	64.5	54.5
7 to 12 in.	61.5	46.5
Extra strong, plain ends:		
⅛ to ⅜ in.	49.5	37.5
½ to 4 in.	56.5	44.5
4½ to 8 in.	52.5	40.5
Double extra strong, plain ends:		
½ to 8 in.	45.5	34.5

Cast Iron Pipe.—There is more inquiry for Cast Iron Pipe for new municipal water projects and extensions. The United States Cast Iron Pipe & Foundry Company, R. W. Martindale, Pacific Coast manager, was awarded the contract for a quantity of 6-in. Cast Iron Pipe for the Government coaling station, which has been completed at California City. A small quantity of 6-in. Cast Iron Pipe has also been ordered from the same company for the water system at the State Farm at Davis, Cal. The Waterworks Commission has let a contract for installing water and sewer systems at Roswell, N. M., to Glenn & Rich, Webb City, Mo., the total amounting to about $53,000. The vote on water bonds at the recent city election at Mesa, Ariz., was in favor of them. A proposition is under consideration to lay a Pipe line from Oro Fino to Fort Jones via Greenview, Cal., and supply domestic water at an estimated cost of $60,000. The People's Water Company purposes to lay larger Cast Iron Pipes in Alameda, on many cross streets, in order to insure a better pressure for fire protection. The market on Cast Iron Pipe is a little firmer on account of the increased demand in the East, and the latest prices, f.o.b. cars, Pacific Coast terminals, are about as follows: 6, 8, 10 and 12 in., $36; 4-in., $37.

Oil Well Supplies.—In many of the oil producing districts things are more active than for several years, and there is a good demand for supplies of all kinds. Several new districts are also being prospected. The discovery of traces of crude oil east of Livermore, Cal., is to be followed up by systematic investigation of the district. Leases have been filed in Oakland, where parties have secured the right to sink oil wells and make a careful inquiry to determine whether oil exists in the district in paying quantities. The leases cover an area of several hundred acres, part in Alameda County and part in Contra Costa County. Advices from Santa Maria say that there are indications that the old oil fields will be connected with the new Eastern field, several miles distant, before winter.

Bars.—The local market has not been much perturbed by the further reduction just announced in the price of Steel Bars along with Structural Steel and other Steel products. There has been some price cutting, but buying was not very active. While there is a probability that jobbers will buy a little more freely, the rolling mills of the Pacific Coast producing Bar Iron of good quality will probably continue to keep Bar Iron prices so low as to limit the consumption of Steel Bars to small quantities. The rolling mill of the Judson Mfg. Company, near Oakland, is in operation most of the time. The mill controlled by the Pacific Hardware & Steel Company, San Francisco, runs intermittently, but keeps sufficient stock on hand to control the market here. Pacific Coast prices have been reduced as follows: Steel Bars, 2.20c., base, San Francisco; Iron Bars, 2.10c., base, San Francisco.

The Morton Company, a branch of W. T. Garratt & Co., San Francisco, which has been operating its brass manufacturing plant east of Bay Point, Cal., for several months, owns nearly a section of land surrounding its plant, and expects to make considerable additions in the near future. The site of the factory is at the crossing of the Southern Pacific and Santa Fé tracks, has a mile of water frontage, and is traversed by two large oil pipe lines and an electric power line. These features encourage the building up of a manufacturing town.

Pittsburgh.

PARK BUILDING, June 17, 1908.—(*By Telegraph.*)

Pig Iron.—While there is a fair amount of inquiry, it is mostly for small lots, large consumers apparently holding off until the Presidential nomination is made, and also until it is demonstrated whether the reduction of 50c. a ton on Iron Ore will bring any lower prices for Pig Iron. This is not likely, however, as the low price at which Pig Iron has been selling for the past two or three months seems to have fully discounted the lower Ore rates. There is some inquiry for Malleable Bessemer and Foundry, but Bessemer and Gray Forge are extremely quiet. We quote Sand Cast Bessemer Iron at $16 to $16.25; Malleable Bessemer, $15.25 to $15.50; Basic, $15.25 to $15.50; No. 2 Foundry, $15 to $15.25, and Northern Forge $14, all f.o.b. Valley furnace. A sale is reported of 1000 tons of Basic at a price equal to about $15.25, at Valley furnace, and 300 tons of Malleable Bessemer at about $15.25, at Valley furnace.

Steel.—The reduction in prices has not brought out any new business, but a fair tonnage in Sheet and Tin Bars is being taken out on specifications against contracts. We quote Bessemer and Open Hearth Billets, 3⅞ in. and larger, up to and including 0.25 carbon, $25; 0.26 to 0.60 carbon, $1 extra; over 0.60 carbon, $2 extra, all f.o.b. Pittsburgh. For Wheeling, Martins Ferry, Follansbee, Newcastle, Sharon, Steubenville and Washington (Pa.) delivery, half the freight or 50c. additional is charged. Sheet and Tin Bars in random lengths are $27, f.o.b. Pittsburgh. Forging Billets take $2 advance over Rolling Billets.

(*By Mail.*)

The cut of $4 a ton in the price of Steel Bars has resulted in orders for upward of 250,000 tons being placed for delivery over the 12 months commencing July 1, but so far this is the only product that has shown an improved demand since the reduction in prices was made. Structural Steel, Plates and other finished products, on which prices were reduced $2 a ton last week, have not responded in demand; but, on the contrary, reports are current that some business in Structural Material and Plates that was pending before the reduction was made is still hung up, prospective buyers believing that the reduction was not large enough and should have been as heavy as in Steel Bars. The national convention in Chicago this week is also having the effect of causing buyers to hold off until the Republican nomination for President has been actually made. Reports are that two or three leading railroads will come in the market about July 1, or shortly after, with some large inquiries for Rails, Cars, Iron and Steel Bars and other material. The local situation continues quiet, the demand for Pig Iron having fallen off considerably since the heavy sales of two or three weeks ago. Some consumers of Pig Iron are evidently waiting until they find out whether the reduction of 50c. a ton in Ore will bring any lower prices for Pig Iron. The demand for Steel Billets and Sheet and Tin Bars has not perceptibly improved since the cut of $3 a ton in Billets and $2 a ton in Bars was made, but consumers are taking out a fair tonnage in Bars on contracts, which have been adjusted to meet the lower prices. The actual new tonnage in Finished Iron and Steel placed so far this month shows a slight increase over May. The demand for Furnace and Foundry Coke is reported as a little better, but Scrap continues quiet with prices fairly strong.

Ferromanganese.—The demand has quieted down somewhat, consumers naturally looking for a reduction in prices of Ferro, on account of the lower prices made last week on Steel. We quote foreign 80 per cent. Ferro at $44, seaboard, for third quarter, and $45 to $45.50, seaboard, for delivery over last quarter. We note a sale of about 125 tons of Ferro for delivery over last half of the year, at about $45, seaboard, or $46.95, Pittsburgh.

Ferrosilicon.—No sales are reported, and we quote 50 per cent., for July and August delivery, at $70, Pittsburgh. The market is quiet, and a recent inquiry for about 300 tons has been withdrawn.

Muck Bar.—With no sales of Muck Bar in this market for some time, we quote nominally $26 a ton, f.o.b. Pittsburgh, for best grades made from all Pig Iron. No settlement of the wage scales for puddling and finishing mills has yet been made, but it is probable the Amalgamated Association will allow a reduction on account of the lower prices for Iron and Steel Bars.

Skelp.—The market is quiet, but a fair amount of specifying is being made on contracts. None of the mills is able

to run full. We have advanced prices to correspond with the lower quotations on Billets, and now quote Grooved Steel Skelp, 1.45c. to 1.50c.; Sheared Steel Skelp, 1.50c. to 1.60c.; Grooved Iron Skelp, 1.60c. to 1.70c., and Sheared Iron Skelp, 1.70c. to 1.75c., f.o.b. Pittsburgh.

Rods.—We note a reduction of $2 a ton in prices of Rods, but there is practically no demand. We now quote Bessemer Rods at $33; Open Hearth at $34, and Chain Rods, $35, f.o.b. Pittsburgh.

Sheets.—A largely attended meeting of the Sheet and Tin Plate interests was held in this city last week, at which James A. Campbell of the Youngstown Sheet & Tube Company was chairman. The situation was gone over carefully and it was decided by the mills represented to endeavor to maintain prices. It was pointed out that a reduction of $1 or $2 a ton would not stimulate the demand, but would only have the effect of causing buyers to hold off. Two or three large mills that were not represented sent letters to the meeting stating they would be guided by the action taken, and that they would co-operate in the matter of maintaining prices if they were reaffirmed. The Sheet mills evidently intend to take advantage of the reduction of $2 a ton in Sheet Bars, and not give this away to customers, which has been done in the past. It is claimed that, to Sheet mills that buy their Bars in the open market, present prices on Sheets, based on Bars at $27 a ton, allow only a fair margin of profit. The demand for Black and Galvanized Sheets has quieted down in the past two weks, and it is estimated that not over 40 per cent. of the Sheet capacity is active at present. Regular prices, which were reaffirmed at the meeting of the independent mills last week, and which are also being firmly held by the leading interest, are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Steel Rails.—No large orders in Standard Sections have yet been placed, but the Carnegie Steel Company booked the past week about 1600 tons of Light Rails, made up of foreign and domestic orders. Nos. 1 and 2 Edgar Thomson Rail mills of the Carnegie Company continue in operation to about 40 per cent. of capacity, while No. 3 mill, on which Light Rails are rolled, is still shut down. Regular quotations on Light Rails, which are shaded $4 to $5 a ton to meet competition of mills that reroll Rails, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—It is a little too early yet to judge definitely whether the cut of $2 a ton made in Plates last week will bring out a heavier demand. So far this has not been the case, actual new orders being placed being for small lots for current needs. We have reduced our prices $2 a ton, and now quote: Tank Plates, ¾-in. thick, 6¼ in. up to 100 in. wide, 1.60c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼ in. to and including 3-16 in.	
Plates on Gulf Coast	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell quality	Advanced cost

Terms: Net [illegible] Pacific Coast base, 1.60c. f.o.b. Pittsburgh. Cost [illegible] rate of freight to destination added, [illegible] shapes, 14 in. wide down to 6 in. of Tank, Shell or Flange quality.

Structural Material.—No large contracts have been placed the past week, and no large tonnage is in sight. The impression is strong that the cut of $2 a ton in Structural Steel was not enough. The McClintic-Marshall Construction Company is making a large addition to its template shop at Rankin, Pa., and it is reported that a local Steel concern has placed a contract for four small Steel buildings, aggregating about 1000 tons. We have reduced prices $2 a ton and now quote: Beams and Channels, up to 15 in., 1.60c.; over 15 in., 1.70c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.60c.; 8 x 8 and 7 x 3½ in., 1.70c.; Zees, 3 in. and larger, 1.60c.; Tees, 3 in. and larger, 1.65c.; Bulb Angles and Deck Beams, 1.90c. Under the Steel Bar card, Angles, Channels and Tees under 3 in. are 1.50c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Tin Plate.—Only a fair amount of new business is being placed, but the Tin Plate concerns have a fair number of orders on their books, against which buyers are specifying quite freely. The American Sheet & Tin Plate Company is operating 213 Tin mills, which is about 95 per cent. of its capacity. The three or four leading independent mills, including the Pope Tin Plate Company and McKeesport Tin Plate Company, are running to about the same capacity. A meeting of the independent mills was held in this city last week, at which it was agreed to maintain prices. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Hoops and Bands.—Practically no new orders are being placed, but fair specifications are coming in against contracts, prices on which have been adjusted to meet the recent reduction of $4 a ton. Regular prices are as follows: Steel Hoops, 1.80c., base, full Hoop card prices; Steel Bands, 1.40c., base, half Steel card extras, all f.o.b. cars, Pittsburgh, in carload lots, for delivery during 1908.

Iron and Steel Bars.—There has been a heavy buying movement in Steel Bars since the reduction in price, and it is stated that implement makers, wagon builders and other large consumers have placed upward of 250,000 tons for delivery over the year, beginning July 1. The Carnegie Republic and Jones & Laughlin companies, who are the three leading producers, are credited with having taken about 200,000 tons, while the other 50,000 tons have gone to smaller mills. So far there has not been much movement in Iron Bars, but this may come later. We quote Iron Bars at 1.40c., base, for Pittsburgh delivery, and 1.35c., base, for Western points, to which freight is added, except Chicago, the price for which is 1.50c., delivered. We quote Steel Bars at 1.40c., Pittsburgh, for base sizes.

Merchant Steel.—The recent reduction in the price of Steel Bars has brought about a readjustment in prices of Merchant Steels, which on nearly all grades are from $2 to $4 a ton lower. We note a fairly active demand for Tire Steel, one concern reporting that it has booked orders for close to 1,000 tons in the past week or 10 days. The low prices ruling for Shafting do not stimulate the demand, which is very dull. We quote: Cold Rolled Shafting, on contracts for 100 tons and over, 57 per cent. off; carloads, 56 per cent. off, and less than carloads, 52 per cent. off, on which carload freight is allowed within base territory. Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 1.90c. to 1.95c.; Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron, finished, 1½ in. and wider, 1.40c.; under 1½ in., 1.55c. Planished Tire Steel is 1.60c., all f.o.b. at mill.

Spelter.—Efforts on the part of the smelters to stimulate demand has so far been without avail, and the Spelter market is dull, while prices are weak. We quote prime grades of Western at about 4.30c., East St. Louis, equal to 4.42½c., Pittsburgh.

Railroad Spikes.—As yet the expected buying movement in Spikes by the railroads has not materialized, and the demand from that direction is very quiet. A fair amount of business is being placed in the smaller sizes. We quote: Standard sizes, 4½ x 9-16 in., at $1.70, and the smaller sizes at $1.80 per 100 lb. in carload and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Iron and Steel Scrap.—Aside from a sale of about 500 tons of Low Phosphorus Melting Stock, and inquiries from an Eastern Ohio Steel plant for about 1500 tons of Old Material, the market is quiet and prices are only fairly strong. Some consumers expect to close down their plants about July 1 for inventory and repairs and will not take in any Scrap until these have been completed. We quote per gross ton, Heavy Steel Scrap, Pittsburgh, Steubenville and Sharon delivery, $13.25 to $13.50; Cast Iron Borings, $7 to $7.25; No. 1 Railroad Wrought Scrap, $13.50 to $13.75; No. 1 Cast, $14 to $14.25; Bundled Sheet Scrap, $9.25 to $9.50 at shipping point; Sheet Bar Crop Ends, $17.25 to $17.50; No. 1 Busheling Scrap, $12.75 to $13; No. 2, $8.75 to $9; Iron Axles, $19 to $19.50; Steel Axles, $17.50 to $18; Low Phosphorus Melting Stock, 0.04 and under, $18; Old Steel Rails, short pieces for melting purposes, $13.25 to $13.50; Rerolling Rails, $14.50 to $15; Machine Shop Turnings, $8.25 to $8.50; Grate Bars, $12 to $12.25; Railroad Malleable Scrap, $11.50 to $12, all f.o.b. Pittsburgh. We note sales of 100 tons of Pipe and Tank Busheling Scrap at $13 and 100 tons of Heavy Steel Scrap at $13.75, f.o.b. Pittsburgh.

Coke.—There are some inquiries for Furnace and Foundry Coke for last half of the year, and prices on the whole

seem to be a little firmer. The improvement in the demand for Pig Iron is reflected to a slight extent in Furnace Coke, shipments from the ovens being larger now than for some time. Strictly Connellsville Furnace Coke for prompt shipment is now held at $1.60, and 72-hr. Foundry at $2 to $2.10, at oven. On contracts for last half of the year strictly Connellsville Furnace Coke is held at about $1.85 and 72-hr. Foundry at about $2.25, but it is possible that on desirable contracts these prices might be slightly shaded. The output of Coke in the Upper and Lower Connellsville regions last week was 155,846 tons, an increase of nearly 3000 tons over the previous week.

Merchant Pipe.—The reduction of two points, or $4 a ton, in prices of Iron and Steel Pipe made last week is too recent to demonstrate whether it will result in more active buying. Several of the larger mills advise us that since the reduction in prices was made the demand has gone up, but one or two other mills state that buying has fallen off since the lower prices were made, jobbers evidently expecting still further reductions. We have increased our discounts two points, net discounts on Steel Pipe to the large trade on ¾ to 6 in. now being 76 and 5 per cent. off list. Discounts are now as follows:

Merchant Pipe.

	Jobbers, carloads. Steel.	
	Black.	Galv.
	%	%
⅛ to ¼ in.	67	51
⅜ in.	69	55
½ in.	71	59
¾ to 6 in.	75	65
7 to 12 in.	72	57
Extra strong, plain ends		
⅛ to ⅜ in.	60	48
½ to 4 in.	67	55
4½ to 8 in.	63	51
Double extra strong, plain ends:		
½ to 8 in.	56	45

Discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
	%	%
⅛ to ¼ in.	65	53
⅜ in.	67	55
½ in.	69	57
¾ to 6 in.	73	63
7 to 12 in.	70	55
Extra strong, plain ends:		
⅛ to ⅜ in.	58	46
½ to 4 in.	65	53
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

Boiler Tubes.—No change was made in discounts on Boiler Tubes, but there has been more or less cutting in prices for some time. New business is very light. Regular discounts on Merchant Tubes in small lots, on which an extra 5 per cent. is allowed in carloads, but which discounts are being shaded, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ in.	42	47
1¾ to 2¼ in.	42	59
2½ in.	47	61
2¾ to 3 in.	52	65
6 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Philadelphia.

PHILADELPHIA, PA., June 16, 1908.

The leading feature in the week's Iron and Steel markets was the reduction in the prices of some of the lines of finished and semifinished materials. Owing to the circumstances under which the reductions were made, confidence in the stability of prices has been disturbed, and consumers, who in a number of cases are said to be willing to do business, hesitate when it comes to placing orders for any considerable tonnage, preferring to wait a while in order that they may feel sure that the bottom has been reached. In instances the reductions can hardly be termed as such, but are looked upon rather in the nature of readjustments, and some tonnage which was held back pending the decision of the manufacturers regarding the reduction has been placed, but the aggregate amount has not been large. A disturbing feature has also developed in the Pig Iron market, some sellers reducing prices on the Foundry grades in order to secure business. Some furnaces do not seem to be able to resist the temptation to do business at low prices for prompt Iron, so as to enable them, it is said, to get ready money. Most of the business done at the lower prices, however, has been for New England and New York delivery, buyers in this territory not being disposed to buy heavily, even when concessions have been made.

Pig Iron.—While the aggregate tonnage sold the past week has been heavy, there have not been so many large orders placed. There has been pretty good tonnage taken in the Foundry grades, but the individual lots are smaller and largely for prompt shipment. The Steel makers who bought heavily last week have been less active, although there is still some inquiry about. Furnaces in a number of instances have sold more than they are able to make at their present rate of production, and stocks in some cases have been considerably reduced. The cutting in Foundry Iron prices has been done by a few furnaces who still have considerable stocks, which they are anxious to turn into money, and these interests have not sold extensively in this territory. It has resulted, however, in some other furnaces meeting the quotations, while others still refuse to sell No. 2X Foundry for prompt shipment below $16.75 to $17. Sales of No. 2X Foundry for prompt delivery in lots ranging from 50 to several hundred tons have been numerous, while some few of 500 and 1000 tons for delivery in June, July and August are also reported, prices ranging from $16.50 to $17, delivered, according to the tonnage and brand. For forward deliveries many brands command an advance of 50c. to 75c. a ton, and quite a tonnage of No. 2X and No. 2 Plain has been sold for shipment in the last quarter, although sellers as a rule discourage forward buying. There have been some fair sales of Virginia Foundry for prompt and forward delivery, at ruling prices. The bulk of the recent sales has been for Western shipment. The Pipe foundries have bought some fair tonnages of Forge and low grade Foundry, and are still in the market for further tonnages. One lot of 5000 tons of Gray Forge was sold at about $15, delivered, while another lot of 1000 tons of mixed numbers was sold at about the same figure. Standard Gray Forge has not been in urgent demand, as the Bar mills are still operating on a restricted basis. Nearly all the Steel mills in this territory are understood to have bought all the Basic they want at the time. A sale of 5000 tons, at $15.25, was reported last week. One or two interests, however, have not yet entered the market, although it is believed that they will make some purchases in the near future. Low Phosphorus Iron has not been active; some inquiries have been before the trade, but buyers have not placed orders for any further heavy tonnages. Southern Iron is on a firmer basis, and while efforts have been made to get lower prices for considerable tonnages, sellers hold firmly on the basis of $12 to $12.50, Birmingham, for No. 2 Foundry. Notwithstanding the shading of prices on some grades, the undertone of the market is strong. Iron is being taken pretty freely by customers, and some of the furnaces have booked as much tonange as they want for deliveries up to October 1. Prices for prompt deliveries in buyers' yards, eastern Pennsylvania, and adjoining territory, range about as follows; for last half shipment, however, sales have been made at an advance of 50c. a ton, while for fourth quarter delivery an advance of $1 a ton is pretty generally asked:

Eastern Pennsylvania, No. 2 X Foundry	$16.50 to $17.00
Eastern Pennsylvania, No. 2 Plain	16.00 to 16.50
Virginia, No. 2 X Foundry	17.00
Virginia, No. 2 Plain	16.50 to 16.75
Gray Forge	15.00 to 15.50
Basic	15.25 to 15.50
Low Phosphorus	21.00 to 21.25

Ferromanganese.—The demand is light. Inquiries for small lots ranging from 25 to 50 tons are reported, but there are few sales. Quotations seem to be on a more even basis, $45 to $46, Baltimore, being pretty generally named by sellers.

Steel.—The reduction in the price of Steel Billets has not resulted in any increased business. Some few orders, which had been held up pending price adjustment, have been placed, but the aggregate tonnage has been small. Mills in this territory are not actively engaged and customers order what they need for prompt shipment, but show no inclination to contract for forward deliveries. Under the new price arrangement, ordinary Rolling Steel, for delivery in this territory, is quoted at $26.20, with Forging Steel at $28.20, subject to the usual extras for high carbons and special sizes.

Plates.—Some moderate sized orders have been placed since prices were reduced. More disposition is shown to enter into contracts, although the large buyers still hesitate. Most of the business placed has been of a miscellaneous character, orders in some cases running up to several hundred tons. Mills, however, do not yet feel any particular benefit from the increased buying, and it will require considerable business to enable them to get up to anything like a normal output. The following range of prices is now quoted for delivery in this territory:

	Carload. Cents.	Parts carload. Cents.
Tank, Bridge and Boat Steel	1.75	1.80
Flange or Boiler Steel	1.85	1.95
Commercial Firebox	1.95	2.00
Marine	2.15	2.20
Locomotive Firebox Steel	2.25	2.30

The above are base prices for ¼ in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16 in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
Nos. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—Considerable activity is expected

[illegible] of Structural Material... but it is too early yet for sellers to note any particular improvement in the demand. Some little urgent business has come out, but the larger propositions will most likely be again figured on, and the lower prices may bring out some [illegible] Most of the business of the week has been of a miscellaneous character, the aggregate tonnage, however, being of fair volume. The new schedule of prices ranges from 1.75c. to 1.90c., according to specification.

Sheets.—There is a continued improvement in the demand. Consumers show no disposition to contract for future needs, but rather place orders for quantities required for prompt shipment. Some of the mills in this territory are running full time this week, but are dependent entirely on current orders to maintain that rate of production. Prices are unchanged and for mill shipments range as follows, with a tenth extra for small lots: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The market continues unsettled. The Eastern Bar Iron Association held a meeting in this city last week, but the matter of adjusting prices was deferred. The regular meeting of the association will be held June 18, when this matter will likely be taken up. The demand is light, and sales have mainly been of small lots. Refined Iron Bars can be had considerably under the base price, quotations for delivery in this territory ranging from 1.40c. to 1.45c. Steel Bars are in moderate demand only, the price quoted being 1.55c., delivered, with Rerolled Bars at 1.50c.

Coke.—There has been a little more activity in the demand for Coke, and some small contracts for deliveries in the last half of the year have been made. Foundry Coke continues the most active, there being little demand for Furnace Coke. Foundry Coke is quoted at $2.25 to $2.45, at oven, with Furnace Coke at $1.50 to $1.75, at oven. For delivery in this territory, the following range of prices is quoted:

[illegible]	$3.65 to $3.90
Foundry Coke	4.40 to 4.60
Mountain Furnace Coke	3.25 to 3.50
Foundry Coke	4.00 to 4.20

Old Material.—There is not much improvement in the demand. Consumers are taking small quantities from time to time, but no large sales are reported. The railroads have disposed of a considerable tonnage during the past 10 days, a large share of which was taken by merchants. Prices are fairly steady, and in one or two instances show a slight forward movement. Quotations are largely nominal and range about as follows for deliveries in buyers' yards, eastern Pennsylvania and nearby territory:

No. 1 Steel Scrap and Crops	$13.50 to $14.00
Low Phosphorus	18.00 to 18.50
Old Steel Axles	18.00 to 18.50
Old Iron Axles	20.00 to 21.00
Old Iron Rails	18.00 to 18.50
Old Car Wheels	13.50 to 14.00
Choice No. 1 R. R. Wrought	15.50 to 16.00
Machinery Cast	14.00 to 14.50
Railroad Malleable	11.75 to 12.25
Wrought Iron Pipe	12.00 to 12.50
New Rerolled [illegible]	12.00 to 12.50
No. 1 Forge [illegible]	11.50 to 12.00
No. 2 Light [illegible]	9.00 to 10.00
Wrought Turn[illegible]	9.50 to 10.00
Stove Plate	11.00 to 11.50
Cast Borings	9.00 to 9.50
Grate Bars	11.75 to 12.25

Birmingham.

BIRMINGHAM, ALA., June 15, 1908.

Pig Iron.—The week just ended has been a very quiet one in Pig Iron circles. Melters have apparently covered for actual requirements as far advanced as desired, and recent developments relative to price of Northern Ores and Steel products have had a decided tendency to check speculative negotiations. There is no evidence, however, that the cessation of buying has affected quotations. The business offered is being taken at prices around the established schedule, and notwithstanding the fact that purchasers are indisposed to engage tonnage for advanced delivery, producers are not solicitous of such engagements. Prohibitive quotations on last quarter deliveries are being adhered to by practically all makers. One interest quotes $13, Birmingham, for last quarter deliveries, while a smaller one would accept orders covering the last half at $12.25, although the tonnage available is limited. The principal sale reported during the week was 750 tons of No. 2 Soft, for delivery in August and September at $12, Birmingham. A lot of 500 tons of Gray Forge for the third quarter recently brought $10.50 per ton. An inquiry for an additional 500 tons of this grade is pending, as well as an inquiry for 800 to 1000 tons of Nos. 2 and 3 Foundry for shipment over the remainder of the year. Shipments as originally specified are being made against all engagements, and indications are that tonnage is being consumed promptly. The rate of production is to be further increased within the next week or 10 days by two additional stacks. A third stack is undergoing repair, and will probably be ready for operation within 30 days. The production in the State is now represented by 24 stacks, of which 15 are on Foundry Iron, 7 on Basic Iron and 2 producing Charcoal Iron.

Cast Iron Pipe.—Reports for the week are without transactions of significance. The demand has been principally for small municipalities, and the tonnage engaged was limited, although the aggregate reaches attractive proportions and prices received show a higher average than formerly. The prospects for small orders is encouraging, and a number of inquiries have recently been made for quotations on large tonnages, but no contracts of importance are expected at an early date. It is learned that the proposed letting for Cuban points has been deferred pending arrangement as to finances. The market is generally considered on a firmer basis, but an advance in quotations is not authorized, and we continue to quote Water Pipe as follows, per net ton, f.o.b. cars here: 4-in. to 6-in., $23; 8-in. to 12-in., $22; over 12-in., average $21, with $1 per ton extra for Gas Pipe. These quotations are probably shaded on large municipal contracts.

Old Material.—The condition of the market is very unsatisfactory. Dealers are more hopeful by reason of indications favoring an increased rate of consumption, but the fact that the present schedule of prices apparently offers no inducement to purchasers is a significant one and developments in this connection will be awaited with interest. Quotations as published are being adhered to, and in the case of Cast Scrap an advance is authorized, yet the demand for any grade is hardly sufficient to afford a test of values. We quote as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$15.00 to $15.50
Old Iron Axles	14.00 to 15.00
Old Steel Axles	12.50 to 13.00
No. 1 Railroad Wrought	12.00 to 12.50
No. 2 Railroad Wrought	9.00 to 9.50
No. 1 Machinery Wrought	10.50 to 11.00
No. 2 Country Wrought	9.50 to 10.00
No. 1 Steel	9.50 to 10.00
No. 1 Machinery	10.00 to 11.00
Wrought Pipe and Tubes	8.50 to 9.00
Stove Plate and Light Cast	8.50 to 9.00
Cast Borings	5.00 to 5.50

St. Louis.

ST. LOUIS, MO., June 15, 1908.

An interesting feature of the local situation is that the large railroads are doing some buying, and while their purchases are mostly confined to Track Supplies, it is a step in the right direction. The smaller railroads, together with coal and lumber interests, are becoming free buyers of Rails. There is an improved demand for Structural Material, Bars, Plates and high grade Iron. The activity in Pig Iron continues to hold. In Lead the course of the market is toward higher prices, which may not be checked until within the range of importing figures. Manufacturers of Sheet Metal Goods find the market getting bare of stocks. Copper manufacturers report an improvement. A large local engine builder has begun running full. During the week the City Comptroller awarded $5,000,000 of the $10,200,000 public improvement bonds. The total bids were six times the aggregate amount of bonds to be sold, and went to local institutions, these having outbid Eastern interests. It is expected that bids will be out for the construction of the Central Public Library between July 1 and 15. The appropriation is $1,200,000.

Coke.—The market for Coke is stronger, under a steady demand, without any advance in prices. Connellsville Foundry is offered in St. Louis territory at $2.15 to $2.50, f.o.b. oven, for all deliveries.

Pig Iron.—Local companies report the receipt of numerous small orders of Pig Iron for shipment over the next three or four months, and the aggregate tonnage is quite satisfactory. The reduction in prices of several finished Steel products thus far has not affected either the demand or prices of Pig Iron. Consumers of Pig Iron realize there was a good margin of profit in Steel products, leaving room for a decline, while the price of Pig Iron had already been reduced. Inquiries are pending amounting to between 4000 and 5000 tons for all grades, delivery over last half of the year.

Structural Material.—Bookings for the week have been moderate, comprising a number of small orders, but no large contracts. The recent reduction will, it is believed, stimulate business.

Bars and Rails.—Since the new list went into effect Bars have met with an active demand, and a satisfactory business is being done. For Light Rails there is still a good inquiry from coal operators, and considerable tonnage is being ordered out. Track Supplies, including Spikes, Bolts, &c., are in excellent demand, some of the large railroads having come into the market.

Metals.—The demand for Metals is improving. A large local company states that for Alloys the month thus far

shows an increase of 30 per cent. Lead for corroding purposes is also in active inquiry.

Old Materials.—As the large mills are not running steadily as yet, the market is featureless, most of the business passing being between dealers. There is, however, a better feeling owing to mills making preparations for operating and there being more business in sight. As for offerings, the Missouri Pacific is out with 600 tons miscellaneous Scrap and the Vandalia with 400 tons Steel Rails. We hear of sales by one local company of 2000 tons Rerolling Rails at $15.50 per gross ton, and another of 1200 tons Relaying at $24. Rerolling and Relaying Rails are in demand and are the strength on the entire list. We quote as follows:

Old Iron Rails	$14.25 to $14.50
Old Steel Rails, rerolling	13.00 to 13.25
Old Steel Rails, less than 3 ft	12.00 to 12.25
Relaying Rails, standard sections, subject to inspection	23.00 to 23.50
Old Car Wheels	12.25 to 12.50
Heavy Melting Steel Scrap	12.00 to 12.25
Frogs, Switches, Guards, cut apart	12.00 to 12.25
Mixed Steel	10.00 to 10.25

Following quotations are per net ton:

Iron Fish Plates	$12.50 to $12.75
Iron Car Axles	15.00 to 15.25
No. 1 Railroad Wrought	11.25 to 11.50
No. 2 Railroad Wrought	10.25 to 10.50
Railway Springs	10.50 to 10.75
Locomotive Tires, smooth	12.00 to 12.50
No. 1 Dealers' Forge	9.00 to 9.50
Mixed Borings, &c.	4.25 to 4.50
No. 1 Boilers, cut to Sheets and Rings	8.00 to 8.50
No. 1 Cast Scrap	12.00 to 12.25
Stove Plate and Light Cast Scrap	9.25 to 9.50
Railroad Malleable	9.50 to 9.75
Agricultural Malleable	8.50 to 8.75
Pipes and Flues	8.00 to 8.25

Cincinnati.

CINCINNATI, OHIO, June 17, 1908. *(By Telegraph.)*

Business is in a quiescent state this week. None of the announced price reductions in Finished Material, Ore or anything else seems to have stimulated a sluggish market following the heavy buying of a couple of weeks ago. Sentimentally, however, there is a better feeling, and persistent reports of pressing needs at headquarters of great railroad systems in the matter of urgently needed repairs, and from the agricultural districts of splendid crops imparts hope that there will be a greater consumption of Iron in the comparatively early future. Foundries in this section engaged on small and miscellaneous castings for cash register and similar concerns are running almost up to their normal capacity, but the machine tool markets are still quiet.

Pig Iron.—Prices on the Southern product remain unchanged, and No. 2 Foundry is still quotable at $12, Birmingham, for the remainder of the year. Figures for 1909 are not obtainable. It is reported here that the Valley Iron makers are now holding firm at $15, at furnace. There is a wider range in prices of the Hanging Rock product—namely, $15 to $16 for the balance of the year. One prominent interest in this district, which is accredited with a stock of something like 12,000 to 15,000 tons of Foundry grades on its yards, is selling at $15, at furnace. A large Central Ohio car manufacturing concern, which was out last week with an inquiry for about 2000 tons of No. 2 Foundry, equally divided between Northern and Southern, for balance of the year, has postponed negotiations indefinitely. Local foundries practically all covered for their requirements of the half year in the buying movement of late May, but several outside foundries have been in the market recently for quantities ranging from 50 to 250 tons each. It is announced that the large Southern interest which has been booking for one of its stacks, which is to be blown in on Basic soon, has already sold up for the balance of the year. The scarcity of low grades is still marked, and some very good prices have been obtained for prompt shipments of Mottled and Forge and even White Iron, some demand for the latter having developed recently from bell manufacturers and makers of building materials. Eight per cent. Silicons, Ohio Silveries, are firm at $18.50, at furnace, and some are selling now at that figure. Southern Basic is quotable at about $12.50, at furnace, and Ohio Malleable at $15.50. An inquiry is out for 100 tons each of Northern and Southern No. 2 Foundry for early shipment from a Central Indiana melter. For early delivery and balance of the year we quote, f.o.b. Cincinnati, as follows, freight rates being $3.25 from Birmingham and $1.20 from the Hanging Rock District, as follows:

Southern Coke, No. 1	$15.75 to $16.25
Southern Coke, No. 2	15.25 to 15.75
Southern Coke, No. 3	14.75 to 15.25
Southern Coke, No. 4	14.25 to 14.75
Southern Coke, No. 1 Soft	15.75 to 16.25
Southern Coke, No. 2 Soft	15.25 to 15.75
Southern Coke, Gray Forge	13.75 to 14.25
Ohio Silvery, 8 per cent. Silicon	19.70
Lake Superior Coke, No. 1	16.70 to 17.70
Lake Superior Coke, No. 2	16.20 to 17.20
Lake Superior Coke, No. 3	15.70 to 16.70
Standard Southern Car Wheel	22.25 to 22.75
Lake Superior Car Wheel	21.75 to 22.25

(By Mail.)

Coke.—There is a little stiffening in tone of the market, so far as it applies to forward deliveries, but no change is noted in spot business. Some fairly good sized contracting has been done on Foundry Coke for forward shipment for the year, and for six months from July 1, and at a price ranging from $2.10 to $2.25, at oven, according to grade. For spot shipment best grades are obtainable at $2 to $2.25. Connellsville Furnace brands are bringing $1.75 to $1.90, and for forward shipment the price is nearer $2, as there is a disposition to turn down contracts for forward business at the prevailing "bargain figures." The Cincinnati market depends very largely on the Virginia product, of which Pocahontas Foundry is quotable at $2 to $2.25, at oven.

Finished Iron and Steel.—The market is still in a very unsettled condition, which the recently published reductions in prices seems not to have remedied, and if anything have aggravated. Much correspondence is going on between the various factors, and there are already rumors of price slashing. There have been some bargain lots of Bar Iron offered in this market, it is said, but the lots have been so small and the prices so carefully covered that no apprehension is felt; and it is reasonably certain at this writing that the jobbers and store dealers are all maintaining prices, and there is no immediate prospect for any reduction to the small dealer and the small user. One of the opinions expressed by a large factor in the central West, whose keenness of vision and general success in his line of business should lend weight to his utterances, is that the Steel manufacturers should have announced the reduction in force for 60 or 90 days, when contracts could have been made, with the declaration that the price would be restored at the expiration of the time stipulated. As it is, existing contracts have been disturbed, and no new business has come out. There is some fear also that the rumors of labor troubles in July may not be unfounded, and if this be so the stores and jobbers are given another reason to hold firmly on prices in small lots. Orders are filled here at the following prices, which are f.o.b. Cincinnati: Iron Bars, carload lots, 1.65c., base, with half extras; small lots from store, 1.85c., base, half extras. Steel Plates, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼ in. and heavier, carload lots, 1.85c.; small lots from store, 2c. Blue Annealed Sheets (Heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.20c. No. 12, carload lots, 2c.; small lots from store, 2.30c. Sheets (Light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.20c.

Old Materials.—The local Scrap market has been dull, with no change in prices. There have been some fairly good lots of Heavy Melting Steel Scrap sold, and some special lots of Cast. Dealers express confidence in the situation, and are hopeful of a revival after the work of the Chicago nominating convention is over and attention is turned to manufacturing. Local dealers are still somewhat disturbed by rumors of impending price cutting on the part of overstocked outsiders. The following prices are about representative of the present market, and are f.o.b. Cincinnati:

No. 1 R. R. Wrought, net ton	$10.50 to $11.50
Cast Borings, net ton	4.00 to 5.00
Heavy Melting Steel Scrap	11.00 to 12.00
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	10.25 to 11.25
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	14.50 to 15.50
Old Iron Rails, gross ton	13.00 to 14.00
Old Steel Rails, long, gross ton	11.00 to 12.00
Old Steel Rails, short, gross ton	11.00 to 12.00
Relaying Rails, 56 lb. and up, gross ton	22.00 to 23.00
Old Car Wheels, gross ton	12.00 to 13.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00

The Jonathan Bartley Crucible Company, Trenton, N. J., is building a plant along the Pennsylvania Railroad in that city, for the manufacture of plumbago crucibles and plumbago products for foundry use. The factory, which is now under roof, is expected to be the most up to date crucible plant in the country. The main building will have a floor space of over 60,000 sq. ft., and the equipment will include several machines of a special character which will be material factors in crucible making. The plant is expected to be in operation early in August, making deliveries about November 1. The officers of the company are as follows: Lewis Lawton, president; Joseph Crossley, vice-president; A. M. Maddock, treasurer; Lewis H. Lawton, secretary, and Jonathan Bartley, general manager.

Cleveland.

CLEVELAND, OHIO, June 16, 1908.

Iron Ore.—The anticipated reduction of 50c. a ton in the price of Ore was made at a meeting of representatives of the leading merchant Ore firms held in this city June 12. The reduction was made on both Bessemer and non-Bessemer Ore, both Old Range and Mesaba. While the Ore men were urged by some of the large Iron and Steel interests to make a reduction, there was a strong feeling against cutting prices, and it is said that the reduction would not have been made had it not been generally reported among the trade that one seller who usually does not take part with the others in making a price agreement was offering Ore at 50c. lower than the established price, although this was denied by the concern in question. It is the general opinion that the new prices will be firmly maintained. Enough time has not elapsed since the price reduction to bring on much of a buying movement, although a number of small lots of Ore have been sold in the past few days. A number of buyers have made inquiries, and it is expected there will be quite an active buying movement in the next three or four weeks, or as soon as consumers have time to figure out their requirements. No action was taken on reducing the price of Siliceous Ore. There have been no inquiries for this Ore as yet. When consumers get ready to buy, the sellers will act individually in fixing prices, which will probably be 25c. a ton lower than last year. Last year's prices were $2.75 for Siliceous Bessemer, and $2.35 to $2.60 for Siliceous non-Bessemer. Because of the reduction in Ore prices, some of the shippers are urging the vesselmen to make a reduction in the carrying charges for Ore, believing that the rate of 75c. per ton from the head of the lakes should be reduced 5c. or 10c. a ton, and rates from other ports in proportion. No action has been taken by the vesselmen as yet regarding rates, and the little chartering that has been done so far has been with the understanding that this season's rates are to be paid. Some of the Ore firms that operate their own boats have started to fit out their vessels in the past few days, and it is expected that about all the boats operated by the shippers will be running by July 1. The independent vessel owners will hold a meeting to-day to decide whether to start their boats at once or to wait until July 1. If an immediate start is decided upon, there will not be much Ore for shipment in independent boats before July. Ore shipments down the lakes are slowly increasing. About all the Steel Corporation boats that will start will be in commission by the end of this week. Some of the corporation's small boats will not be placed in commission unless conditions later in the season warrant their operation. As soon as the movement of Ore is well under way, trouble is feared at the Lake Erie ports with hoisters and engineers who refused to sign individual contracts under the open shop plan. A meeting of the three Cleveland locals of the International Longshoremen and Marine Transport Workers' Association was held June 14 to consider the matter of declaring a strike, but definite action was postponed until the latter part of the week. Ore prices, for 1908 delivery at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, $4.50; Mesaba Bessemer, $4.25; Old Range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The market has been very quiet. A few sales were made of small lots for early delivery, but no inquiries came in for large quantities of any grade. Following the reduction of Ore prices some of the furnace interests that had been holding their prices above the prevailing market have reduced their quotations about 50 cents a ton. Others are holding their prices at the same basis that they were. We quote Northern No. 2 Foundry Iron at $15 to $15.25, Valley furnace, for the third quarter. Some interests are asking $15.50 for the fourth quarter. Local furnaces quote No. 2 Foundry at $15.50, at furnace, for delivery in this territory during the third quarter, and $15.25 for shipments outside. During the recent buying movement the majority of the local consumers covered for at least a portion of their requirements for the last half of the year and not much activity is expected next month. In Southern Iron a few sales in small lots are reported. The prevailing price is $12, Birmingham, for No. 2 for the third quarter, although some interests are refusing to quote under $12.50, Birmingham. The melt in this territory shows very slight, if any, improvement. Some consumers are sending in fairly good shipping orders for low priced Iron, but high priced Iron under old contracts is moving very slowly. There are practically no inquiries for Basic, Bessemer or Malleable Iron. For prompt shipment and for the third quarter we quote, delivered, Cleveland, as follows:

Bessemer	$16.90
Northern Foundry, No. 1	16.15 to 16.65
Northern Foundry, No. 2	15.65 to 16.15
Northern Foundry, No. 3	15.15 to 15.65
Southern Foundry, No. 2	16.35
Gray Forge	14.90

Coke.—The market is quiet in both Furnace and Foundry grades, the only sales reported being of small lots. Prices remain about stationary. We quote Connellsville Furnace Coke at $1.75 to $1.85, at oven, for the last half. Some Coke for spot shipment is offered at lower prices. We quote high grade 72-hr. Foundry Coke at $2.25 to $2.35, at oven, for last half delivery.

Finished Iron and Steel.—The result of the cut in prices has so far been rather disappointing. The reduction has stimulated some activity in Steel Bars, and a few contracts have been closed in addition to contracts placed by the implement makers. Lower prices, however, have brought little improvement in specifications. About the only change noted in this regard is the bringing out of a few fairly good specifications from jobbers. The reduction has not improved the demand for Structural Material and Plates. A few inquiries have developed for these lines, but prospective purchasers are holding off in the belief that prices will be further reduced. The new prices for Bars, Plates and Shapes are being fairly maintained so far, although Eastern mills are offering Bar Iron at 1.30c., and one Western mill is reported to be selling Steel Bars at 1.30c. In all Finished lines consumers are continuing the policy of buying in small lots for their immediate requirements. Some of the implement makers in this territory have not yet placed contracts, but one interest expects to book orders aggregating about 5000 tons within a few days. Some additional contracts for Steel Bars are also expected from consumers other than the implement makers who have contracts that have not yet expired. The demand for Sheets continues light and some producers continue to make concessions of from $1 to $2 a ton. We quote Iron Bars at 1.45c., Cleveland, for car lots; Steel Bars, 1.50c., Cleveland, for car lots, half extras; Beams and Channels, 1.70c., base, Cleveland, and Plates, ¼-in. and heavier, 1.70c., base, Cleveland. Dealers quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Warehouse business continues light. Jobbers quote Iron and Steel Bars out of stock at 1.65c. to 1.70c. Beams and Channels out of stock are 2c. to 2.10c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.65c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—Quotations are 50c. a ton higher than a week ago on the majority of grades of Scrap. On Borings and Turnings the advance is $1 per ton. All Steel Scrap is particularly strong. The strength that has developed is attributed, not to the present demand, but to an increase in the demand that is expected within the next two or three weeks, greater activity on the part of the mills being looked for because of the reduction in prices. Considerable tonnage of Scrap sold by the Baltimore & Ohio Railroad last week brought good prices, and about 1200 tons of Old Steel Rails sold by the Nickel Plate Railroad are reported to have brought a little over $14. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$13.00 to $13.50
Old Iron Rails	15.00 to 16.00
Steel Car Axles	16.50 to 17.50
Old Car Wheels	13.00 to 13.50
Relaying Rails, 50 lb. and over	22.00 to 23.00
Heavy Melting Steel	12.50 to 13.00
Railroad Malleable	11.50 to 12.00
Agricultural Malleable	10.50 to 11.00
Light Bundled Sheet Scrap	8.00 to 9.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	6.00 to 6.50
Iron and Steel Turnings and Drillings	7.00 to 7.25
Steel Axle Turnings	8.50 to 9.00
No. 1 Busheling	11.00 to 11.50
No. 1 Railroad Wrought	12.00 to 13.00
No. 1 Cast	11.50 to 12.00
Stove Plate	9.50 to 10.00
Bundled Tin Scrap	8.00 to 9.00

New York.

NEW YORK, June 17, 1908.

Pig Iron.—Since the closing of some round lots of Foundry Iron for a leading pump interest, and for a railroad casting shop, aggregating for different plants a total of about 20,000 tons, little has been done. There is, however, one additional order for 7500 tons pending. Low prices continue to be made, but the buying movement seems to be pretty well exhausted for the present. We quote at tidewater, Northern No. 1 Foundry, $16.75 to $17; No. 2 Foundry, $15.75 to $16.50, and No. 2 Plain, $15.25 to $15.50. Alabama Irons are quoted $16.75 to $17, for No. 1, and $16.25 to $16.75 for No. 2 Foundry.

Steel Rails.—No new business has come out in the Eastern market. At Ensley, Ala., the new Rail mill of the Tennessee Coal, Iron & Railroad Company has started up, having an accumulation of specifications that will insure steady operation for some time.

Structural Material.—Following the contract for 1500 tons for the Pennsylvania Railroad Company's Thompson avenue viaduct at its new yards at Long Island City, an additional purchase of 400 tons has been made for the same

work and 800 ton contract is pending. The Hamburg-American Company's pier work at Hoboken, N. J., one section of which calls for 1500 tons, has been let to the McClintic-Marshall Construction Company, Pittsburgh. The New York Central has asked bids on a further small tonnage of Steel for its work at the Grand Central Station, and the New Haven road will shortly place an additional 600 tons on its extensive Harlem Division improvements. The Pennsylvania Steel Company was awarded the 1500 tons of Steel required by Snare & Triest for the South Ferry pier work. Opinions are divided as to the relation of the new and old prices of Structural Steel to the volume of construction work. On the one hand it is argued that as the bids made for some time on fabricated work have been based on a $4 cut in Steel, there will now be a further wait for the additional $2. The other view is that as any reduction in Structural Shapes that has been discussed in recent months represents but a small fraction of the total cost of a Steel building, the question of price is not now a determining factor and has not been. The chief problem from the standpoint of the Steel manufacturer is the situation that has grown out of the guaranteeing of prices and the carrying over of so-called contract tonnage, which in effect is tonnage on which the buyer has an option, his taking it out being entirely contingent on the amount of business he gets. One of the possibilities of the unsatisfactory condition in which the trade finds itself in this regard is the elimination of this looseness in contracts, both as concerns prices and the carrying over of unspecified tonnage. We continue quotations on tidewater deliveries, mill shipments, as follows: Beams, Channels, Angles and Zees, 1.76c.; Tees, 1.81c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—The deliberations of the Eastern Bar Iron manufacturers at the meeting held in Philadelphia last Wednesday resulted in no conclusion, and another meeting has been called for Thursday of this week in New York City. While some are doubtful of a successful outcome, nevertheless the prospect of something being done continues hopeful until meetings are abandoned. The current demand for Bar Iron is spasmodic, and the aggregate volume of business for the week is believed to have been much less than that of the previous week. Quotations are a trifle higher at 1.42c. to 1.45c., New York, on ordinary specifications. Steel Bars continue to be held at 1.40c., Pittsburgh, or 1.56c., New York.

Plates.—Local conditions continue quiet. Orders are confined to small quantities. Prices of standard sizes of Plates are held as follows at tidewater: Sheared Plates, 1.76c. to 1.86c.; Flange Plates, 1.86c. to 1.96c.; Marine Plates, 2.16c. to 2.26c.; Fire Box Plates, 2.65c. to 3.50c., according to specifications.

Old Material.—The situation in the local Scrap market shows a few changes. Heavy Melting Steel Scrap is possibly a trifle lower. Some of the large buyers of this Scrap, who were in the market about three weeks ago, are understood to have bought quite large quantities and have withdrawn. The restricted demand for Finished Steel and the fact that a considerable quantity of Scrap is made in their own works make the Steel companies less important factors in the market. No. 1 Railroad Wrought has been selling a little more freely and at better prices. A somewhat improved demand is noted for Heavy Cast Scrap, Stove Plate, Wrought Pipe, Borings and Turnings. At last Car Wheels show a disposition to firmness, but the demand is still coming from dealers, as consumers have hardly begun to take an interest in this class of material. Relaying Rails are in good request. Quotations are about as follows per gross ton, New York City:

Old Girder and T Rails for melting	$10.50 to $11.50
Heavy Melting Steel Scrap	10.50 to 11.00
Old Steel Rails, rerolling lengths	11.50 to 12.00
Relaying Rails	20.50 to 21.50
Old Iron Rails	14.50 to 15.00
Standard Hammered Iron Car Axles	16.00 to 16.50
Old Steel Car Axles	14.50 to 15.00
No. 1 Railroad Wrought	13.00 to 13.50
Iron Track Scrap	10.00 to 10.50
No. 1 Yard Wrought, long	11.00 to 11.50
No. 1 Yard Wrought, short	10.00 to 10.50
Light Iron	5.50 to 6.00
Cast Borings	5.00 to 5.50
Wrought Turnings	6.50 to 7.00
Wrought Pipe	9.50 to 10.00
Old Car Wheels	12.50 to 13.00
No. 1 Heavy Cast, Broken Up	13.00 to 14.00
Stove Plate	9.50 to 10.50
Locomotive Grate Bars	10.50 to 11.00
Malleable Cast	11.50 to 12.50

Cast Iron Pipe.—The outlook is rather more encouraging. The demand for small lots is much better, and quite a number of orders for 200 to 400 tons are being placed, especially with foundries having favorable freight connections with portions of the South. An interesting feature of present conditions is the sudden scarcity of some sizes of Pipe, more particularly 8-in. Of course the Pipe is to be had if buyers are willing to pay an advanced price. The firmness of Pig Iron is making the price of Pipe stronger. The contract for the city of Rome was secured by a foundry in central New York. The contractors to whom business recently placed in this city has been awarded have not yet made their Pipe purchases. About 6500 tons is thus still to be placed. Carload lots of 6-in. are quoted at $24.50 to $25 per net ton, at tidewater.

Ferroalloys.—The market for Ferroalloys continues unsettled. Whenever a specially desirable order appears in the market for any Alloy, most of the trade appears to be willing to make concessions. For 80 per cent. Ferromanganese $43.50 is quoted, at Baltimore. The price of 50 per cent. Ferrosilicon is unchanged at about $70, Pittsburgh. The demand for Ferrophosphorus, apparently, is beyond the supply, particularly because this material is a by-product.

John Leonard & Co., dealers in Old Material, have removed their offices from the seventh to the seventeenth floor of the Singer Building, 149 Broadway, New York. The suite of rooms now occupied is in the famous Singer tower. Much more space has been secured as well as better light and an incomparably finer outlook.

Metal Market.

NEW YORK, June 17, 1908.

Pig Tin.—Business in the Tin trade is almost at a standstill; in fact, sales since the first of the month are estimated to be considerably less than 500 tons, and it is thought that deliveries into consumption during June will run less than 3000 tons. The apparent discrepancy in these figures arises from the fact that much Tin will be delivered this month that was bought previously, and at higher prices. This week has been duller than usual, and price fluctuations have been within the narrow limits of 15 points for a week, an unusual condition. To-day, however, prices dropped sharply on London advices. Price changes have been as follows:

	Cents.
June 10	28.35
June 11	28.40
June 12	28.30
June 13	28.35
June 15	28.35
June 16	28.35
June 17	28.00

Arrivals so far this month are good, aggregating 1836 tons, and there are afloat for American ports 2927 tons, considerable of which, however, will not come in until July. The London market is lower than last week, closing at £127 2s. 6d. for spot and £128 17s. 6d. for futures. The premium of futures over spot represents more a carrying charge than anything else, as stated in the report of last week.

Copper.—The market is again quotably firmer. Electrolytic is offered at 13c., delivered, 30 days, and can probably be obtained at 12.87½c., net cash. Sales, however, have been made at 12.85c., net cash. Considerably more inquiry is noted, probably stimulated by the advance in prices, but there is not much faith in attempts to boost the market at this time. Consumption is still too far below normal. Then it must be remembered that American production is now, or will shortly be, at the highest known rate. Practically all properties are now working with the exception of the Greene, and these will possibly be restarted shortly. Then, too, the Copper from new properties is beginning to come on the market, and unless things change considerably the last half of the year will show a very large production. The Lake properties in the first half of 1908 will probably make 100,000,000 lb. of Copper, or a rate slightly lower than last year. Sellers of Lake report quite a few sales of August Copper at 13c. No inquiry, however, is in the market for later deliveries, and there is an unsold surplus of June and July Copper. A slight improvement is noted in the Wire trade, especially for Telephone Wire. Exports so far this month are fair, amounting to 12,400 tons. The London market closes slightly below last week at £58 5s. for Spot and £58 15s. for Futures.

Pig Lead.—The market is steady at 4.50c., New York, for shipments. Considerable metal has been sold at this figure. Lead bought at lower prices, of which there is much on hand, is not offered at concessions. Spot is held at 4.57½c., with little business. The chief demand has been from corroders, but Lead Pipe manufacturers have also been large takers of Lead. In St. Louis the price is slightly firmer at 4.40c. The London market is practically unchanged at £12 13s.

Spelter.—The consumption of Spelter is not more than half of normal, and the prices quoted in New York 4.57½c. to 4.60c. are barely steady. On desirable orders they might be shaded. The St. Louis market is about 4.40c. to 4.45c. Some interest was aroused in the metal trade last week over the bids for the Brooklyn Navy Yard, where a round lot of Spelter was offered at 4.35c., delivered.

Nickel.—Prices are without change, at 45c. for ton lots and 55c. to 60c. for smaller quantities.

Antimony.—Business continues light and prices are without change. Cookson's is held at 8.50c.; Hallett's at 8.50c. to 8.62½c. and outside brands at 8.25c.

Tin Plates.—The mills are actively engaged in turning out orders and prices are absolutely without change at $3.70, Pittsburgh, and $3.89, New York, for 100-lb. IC Coke Plates. In Swansea Welsh Plates are unchanged, at 12s. 1½d.

Old Metals.—More inquiries from domestic consumers are in evidence. These, however, continue to take the form of small orders for prompt shipment, yet buying with more freedom than formerly is noticeable, and consumers of Copper bearing Scrap are not unwilling to accumulate some stock of low priced metal. Quotations generally are steady and without change, save in Composition Turnings, where a reduction of ½c. per pound has been made. Dealers' selling prices are about as follows:

	Cents.
Copper, Heavy and Crucible	12.00 to 12.25
Copper, Heavy and Wire	11.75 to 12.00
Copper, Light and Bottoms	10.75 to 11.00
Brass, Heavy	8.75 to 9.00
Brass, Light	7.00 to 7.25
Heavy Machine Composition	11.50 to 11.75
Clean Brass Turnings	7.75 to 8.25
Composition Turnings	9.00 to 9.50
Lead, Heavy	4.00
Lead, Tea	3.85
Zinc	3.50

Iron and Industrial Stocks.

NEW YORK, June 17, 1908.

The stock market has attracted little attention for some time, as political matters are now receiving preference. Daily transactions are decidedly limited and prices fluctuate but slightly. The market has maintained consistent strength. The range of prices on active industrial stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 36⅜ to 37⅞, preferred 100¾ to 102; Car & Foundry common 33¼ to 34½, preferred 96¼ to 98½; Locomotive common 48½ to 49¾, preferred 102 to 103; Steel Foundries common 6½ to 7, preferred 34½ to 37; Cambria Steel 30¼ to 31; Colorado Fuel 26 to 27½; Crucible Steel common 5¾ to 6; Pressed Steel common 25¾ to 28; Railway Spring common 37; Republic common 17½ to 18, preferred 65 to 67; Sloss-Sheffield common 50 to 51, preferred 96; Cast Iron Pipe common 26¾ to 27, preferred 75; Can common 4¾ to 4⅞, preferred 56 to 57. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 37¼, preferred 101⅝, bonds 96⅜; Car & Foundry common 34⅛; Locomotive common 46; Colorado Fuel 27; Pressed Steel common 28; Republic common 18⅛, preferred 65⅞; Sloss-Sheffield common 50; Cast Iron Pipe common 26¾; Can preferred 55¾, ex-dividend.

The Crucible Steel Company of America, in its report for the nine months ended May 31, issued, shows a deficit after charges, dividends and adjustments in inventory values of $649,804. The net earnings for the period were $93,352. The surplus on August 31 last year was $2,457,284, so that the profit and loss surplus on May 31, after deducting the deficit for the nine months period, was $1,807,480. Unfilled orders on hand on May 31 were 70,566 tons, against 101,910 tons on August 31.

Dividends.—The Westinghouse Air Brake Company, Wilmerding, Pa., has declared a quarterly dividend of 2½ per cent., payable July 10.

The Garvin Machine Company, New York, has declared a semiannual dividend of 3½ per cent. on the preferred stock, payable July 1.

The American Iron & Steel Mfg. Company has declared quarterly dividends of 1¼ per cent. on the common and preferred stocks, payable July 1.

The Sloss-Sheffield Steel & Iron Company has declared a quarterly dividend of 1¼ per cent. on the preferred stock, payable July 1.

The American Screw Company has declared a quarterly dividend of 1¾ per cent., payable June 30.

The Standard Coupler Company has declared a semiannual dividend of 4 per cent. on the preferred stock, payable June 30.

The Standard Screw Company has declared semiannual dividends of 3 per cent. on the preferred and common stocks, payable July 1.

The United Shoe Machinery Company has declared a quarterly dividend of 1½ per cent. on the preferred and 2 per cent. on the common stock.

The International Nickel Company has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable August 1.

The Republic Iron & Steel Company will blow in its No. 3 furnace of the Thomas, Ala., group, about July 1, and will operate the three stacks, after having but two active at once for several years. The No. 3 furnace has been entirely reconstructed. At present the company has its Potter ore property opened up so that shipments of 1000 tons a day could be made.

Canadian Rail Demand.

TORONTO, June 15, 1908.—In the House of Commons, R. L. Borden, leader of the opposition, recently asked if the Department of Railways and Canals intended to order rails from the Algoma Steel Company, whose works, he understood, were shut down for want of orders. The Minister of Railways and Canals replied that the Department could not buy rails without money, that retort evidently having reference to the opposition's obstruction to the voting of supplies, which obstruction continues, and seems likely to continue until a modus is reached on the pending Election bill. The Minister added that some orders might in the near future be given to the Algoma Steel Company by the Transcontinental Railway Commissioners. Nothing was said as to the possibility of the Department itself having any orders to place, but as it would be buying for the Intercolonial Railway, it is almost a certainty that the Dominion Iron & Steel Company would be the Canadian company most likely to secure them, on account of its comparative proximity to the points of delivery.

The Grand Trunk Pacific Railway Company's own buying power will be improved by a measure now before Parliament. The measure in question was introduced by the Minister of Finance. It is to authorize the company to pledge on road construction account the bonds guaranteed by the Government. Of course, the company's power to sell the bonds was always indisputable, but it appears not to have been enabled to use them as security for temporary loans. It recently offered some of its guaranteed bonds in London, but the underwriters were not successful in finding buyers for them at the price sought. The company, desiring to be in a position to hold its bonds for a more favorable market and yet to make use of them for present financing, asks authority to pledge them for short term loans. This the Government has consented to, and the bill is for the purpose of validating such use of them. The bill also provides for the granting of a letter of credit to the company for $1,000,000 out of the proceeds of the guaranteed bonds, such letter of credit being necessary to permit the use of money belonging to the special account in which the company is required to keep the proceeds of the guaranteed bonds.

As to the rail needs of the Intercolonial, some information brought down in the House some days ago suggested that they are not at the moment of market importance. According to the statement referred to a sufficient quantity of 80-lb. rails to lay 52 miles of track is piled along the line, where the rails have lain since they were delivered a year ago last winter.

The rail business is waiting on other developments, the cardinal one being the outcome of the crops. If the crops are good and prices of agricultural products keep up or advance, there will be a strong forward movement in railroad construction. In the absence of these conditions there will be a great curtailment in railroad building plans. Railroad companies have not the aid of the banks as they had in recent years. For some time previous to the slowing down of business last autumn, some of the larger banks were important aids to railroad building. They did not hesitate to make big advances and take care of large floating indebtedness, as they had full confidence in the ability of the borrowers to sell bonds against their property, which had been brought so much farther into earning utility by the advances. But many things have happened to make the banks less disposed, if not less able, to anticipate the successful issue of bonds for millions of dollars, and the railroad company that desires to construct new lines must market its own issues in order to raise the money even for the initial stages of the work.

C. A. C. J.

At the annual meeting of the Mt. Vernon Car Mfg. Company, held at Mt. Vernon, Ill., June 9, the following officers were elected: W. C. Arthurs, president, to succeed D. O. Settlemire, deceased; R. K. Weber, vice-president; D. P. Settlemire, secretary and treasurer; Frank Snyder, superintendent.

The Machinery Trade.

NEW YORK, June 17, 1908.

The demand for machinery is holding up well to the level of the past few months, and with few exceptions no increase in business is noticeable, particularly with the machine tool houses. Though the demand has been very light for some time, and there was practically no change either one way or the other the past week, the fact that trade has shown no further decrease and that conditions seem to be improving has created a better feeling among machinery houses, many of which are of the opinion that the worst is over and that business is developing an upward tendency. The various classes of mechanical equipment are experiencing different degree of activity, the loss of one offsetting the gain of the other, and there does not appear to be that uniform demand which usually accompanies a genuine improvement. In contrast to the dullness in the machine tool trade is the activity among the buyers of power plant equipment. The railroads, which are usually looked to for a great deal of machine tool business are still a negligible factor in the market and from reports we have received from a large majority of the important systems throughout the country there is but little liklihood that they will purchase much mechanical equipment this summer, aside from a few machines here and there for replacement. On the other hand manufacturers of power plant equipment are enjoying a better trade. The number of municipal works established have aided them much, and within the past week two large propositions have come to the front that will necessitate the purchase of an extensive line of equipment. These two projects are bound to exert a favorable influence on the machine tool trade, as cranes and some tools are usually installed in connection with every large installation of power plant equipment.

Large Purchases by Delaware, Lackawanna & Western Railroad.

Machinery to the amount of $75,000 was recently purchased by the Delaware, Lackawanna & Western Railroad for its new shops now in course of construction at Scranton, Pa. These machines were on the several lists sent out some time ago and are to be installed in the new foundry and blacksmith shop. The company has built only a part of the entire locomotive plant contemplated at that point and the purchases of machine tools for the main shop will not be made for some time to come. It will be remembered that inquiries were sent out a few weeks ago for the structural steel for the new machine shop, and it is the intention to have this well under way before taking up the purchase of equipment. This shop will be the largest of the group of buildings and will be 346 x 582 ft. At the present time the company is not purchasing any shop or power house equipment exceptng such as will be needed in connection with its new foundry and blacksmith shop at Scranton, but during the next few months it will probably purchase a few tools for its Keyser Valley freight car repair shops, the cost of which will be about $12,000. No definite sum, however, has as yet been appropriated for the purchase of mechanical equipment during the next fiscal year.

Machinery houses are interested in the new building to be erected by the Christie Iron Works, New York. It will be 49 x 75 ft.

The American Concentrator Company, Joplin, Mo., manufacturer of mining machinery, which is to move its business to Basic City, Va., has built and equipped its new plant. In about six months the company expects to purchase some additional machinery, including a bulldozer, bolt machine, 25 ton wheel press and a No. 3 or 4 milling machine.

Fred A. Phelps, 22 Clinton street, Newark, N. J., is purchasing equipment for a large four-story plant to be erected in Newark for Larter & Co., jewelry manufacturers. The equipment needed will include a 35-kw. generator, 75-hp. boiler and a 55-hp. direct connected engine, besides four small motors, a freight elevator, &c. The company will move its present plant into the new building and later on it is probable that some machine tools and other manufacturing equipment will be purchased to bring the plant up to date.

Important Power Plant Equipment Inquiries.

The Public Service Corporation of New Jersey has let contract for the construction of an extensive addition to its Marion power house, which was erected about three years ago, and in which, it will be remembered, considerable machinery purchased in this market was installed. The new addition will more than double the capacity of the power house, as the company is figuring on installing about 18,000 kw. in two sets. The addition will consist of a building, 80 x 180 ft., and it will be of steel and concrete construction. One section, devoted to power equipment, will have an elevation of about 60 ft., while the section in which the switchboards and light equipment will be installed will be three stories in hight. The equipment will include two generating sets of about 9000 kw. each, coal conveying machinery in which belt conveyors will probably be used, switchboard equipment, boilers, mechanical stokers and about everything that goes to make a complete power house equipment. The company has equipment to generate about 16,000 kw. of power at present, and its equipment in the Marion plant includes Curtiss turbines, Babcock & Wilcox boilers, Green fuel economizers and Robins belt conveyors.

The Southern Power Company, Charlotte, N. C., which has been figuring on constructing a large steam power plant near Charlotte, has inquiries in the market for about 50,000 hp. of power equipment, which it is estimated will cost about $2,000,000. It is understood that turbines will be preferred. The requirements cover coal conveying machinery, mechanical stokers, fuel economizers and other power equipment. The company was for some time considering the advisability of putting in a producer gas plant, but its inquiries now out indicate that that plan has been abandoned. This plant will supplement a hydro-electric plant the company now operates of 75,000 hp., and the inquiries are sent out under the signature of J. W. Fraser, who is assistant chief engineer, and can be addressed at Charlotte. W. S. Lee is the chief engineer.

The Standard Steel Company of Lewistown, Pa., which is a subsidiary interest of the Baldwin Locomotive Works of Philadelphia, has inquiries in the market for about 10,000 kw. of power equipment, in which, it is understood, turbines will be favored. This company manufactures accessories to be used in the construction of locomotives, and its entire output is controlled and used by the Baldwin Locomotive Works.

There are inquiries in the market for power equipment and power house accessories from the New York Edison Company to generate about 8000 kw. of power.

Some inquiries are out from Henry L. Dougherty & Co., 80 Wall street, New York, for machinery for a good sized power house for the Denver Gas & Electric Light Company, Denver, Col. Mr. Scott, who is with Henry L. Dougherty & Co., is in charge of the purchases.

All bids opened May 28 for the installation of an air lift pumping plant at Alta Loma to increase the water supply of Galveston, Texas, and for the erection of an addition to the pumping station, have been rejected and new bids will be received until July 2 by the City Secretary of Galveston for the complete mechanical equipment of an air lift pumping station, to consist of one 1200 cu. ft. air compressor, one 700 cu. ft. air compressor, one 200 hp. water tube boiler and all accessories, including about 16,615 ft. of air pipe to wells.

Business Changes.

The Cleveland Pneumatic Tool Company, Cleveland, Ohio, has removed its eastern office from 120 Liberty street to 676 Fulton Terminal Building, New York. C. A. McInturff, who has represented the company in the East for several years, remains in charge.

The Buffalo Foundry & Machine Company, Buffalo, N. Y., which, besides making exceptionally large castings, builds vacuum drying and impregnating machinery, vacuum drum, shelf and rotary dryers, compressors, pumps, condensers, and the Bell steam hammer, recently established a New York office at 143 Liberty street, having engaged H. E. Jacoby as resident engineer and manager of New York office.

Catalogues Wanted.—W. Barclay, Edmonds, Wash., is in the market for nut machinery, and will be pleased to receive catalogues and other information on the subject.

Chicago Machinery Market.

CHICAGO, ILL., June 16, 1908.

While there is nothing that can be pointed to in the volume or character of machinery sales as indicating unmistakable improvement, yet the feeling of confidence in the beginning of a forward movement soon after the midyear turn is undoubtedly stronger and more general. By this is meant, not that the trade is expecting a phenomenal increase of business at that time, but rather that orders will be enough more plentiful to leave no doubt as to the improved strength of demand. There is moreover no question that most of this confidence is based on the expectation of a change in the attitude of railroad purchasing departments. Information has filtered through from these and other railroad sources giving strong assurance that hopes of more liberal patronage will not be wholly disappointed. In addition to this, inquiries of a significant nature have been lately received by the machine tool houses from some of the larger industrial interests which seem to portend some moderate purchases, at least, in the near future. Prior to the money stringency of last year a number of large concerns put out extensive lists of machinery requirements on which bids were taken, but owing to adverse developments orders

were not placed. R[illegible] to the effect that some of these deferred lists will be issued before long, at least in part, are current in the market, but it is thought by those best advised that any considerable buying of this kind will depend to a large [illegible] trend of events developing within the next 30 days. Locally the atmosphere is surcharged with political interest, which centers upon the National Republican Convention convened in this city on Tuesday, June 16. It is difficult to judge how far the settlement of preliminary questions involved in party nominations will go toward quieting the hurtful disturbing effects which such political uncertainties always have upon business. That much of the hesitancy shown in the projecting of commercial plans and enterprises is due to apprehension as to the results of election is not doubted and each step toward the final solution ought to exert a helpful influence upon the machinery and all other trades.

The Independent Pneumatic Tool Company, Chicago, has arranged for a complete exhibit of its line of Thor piston air drills and reamers, pneumatic flue rolling, tapping and wood boring machines, portable pneumatic grinding machines, pneumatic chipping, calking, beading and riveting hammers, pneumatic wood saws, hose couplings, and other air appliances, at the Railroad Master Mechanics' and Master Car Builders' Conventions to be held at Atlantic City, N. J., June 17 to June 24, inclusive. The company's exhibit will be located in spaces 205, 207, 209 and 211 on Young's Pier, where there will be about eight representatives in attendance.

Bonds in the sum of $20,000 have been authorized by a vote of the citizens of Kewaunee, Wis., the proceeds of which are to be used for the installation of a municipal light plant. Plans and specifications for the plant are being drawn by Oscar Clausen, consulting engineer, which will be submitted to contractors for bids within the next two or three weeks. Whether steam power or producer gas will be employed is a question now under discussion.

The Central Light & Power Company, Limited, Yolseley, Sask., Canada, has decided to increase the capacity of its plant by 150 hp.; the machinery employed will consist of a gas engine and suction producer operating an alternating current generator of 90 kw., connected to engine through a flexible coupling. In addition to the power equipment a motor driven centrifugal pump will be installed to deliver water to the cooling tower, also a motor driven fan for the tower. Should the company find it impracticable to get delivery of the gas engine equipment in time to meet the demands of the winter load it will install a temporary steam plant, possibly second hand, to help handle the load until such a time as the gas engine equipment can be erected. The manager of the plant is Lee Boyer.

The Consolidated Supply Company has been incorporated and will make a specialty of general steam and electric railroad, mill and mining supplies, with headquarters at 321 Dearborn street, Chicago, Ill. The office and store occupy the ground floor in the Manhattan Building, the storeroom extending through and fronting on 60 Plymouth place. The incorporators are L. C. Hopkins, John P. Mahoney and J. L. Benedict. Mr. Hopkins has had some eight years' experience in the railroad and supply business. For the past year he was connected with the sales department of the Chicago Pneumatic Tool Company, and previous to that was four years with Fairbanks, Morse & Co. Mr. Mahoney was formerly chief clerk to the purchasing agent of the Toledo, St. Louis & Wabash Railroad. Mr. Benedict was in the railroad business 10 years, and for the past five or six years was connected with the Chicago Pneumatic Tool Company as manager of its Chicago office and on the road.

Philadelphia Machinery Market.

PHILADELPHIA, PA., June 16, 1908.

While actual business is still of comparatively small proportions, there is a decidedly more optimistic feeling and the trade looks forward to a somewhat better demand in the near future. While single tool orders still predominate, there have been a few of larger size placed. The greater proportion of the recent orders has been coming from the smaller buyers, but some new and larger concerns are apparently now about ready to enter the market. The larger industrial concerns are still practically out of the market, and while little is expected from the railroads during the current month it is believed that after July 1 railroad buying will become more active, but no extensive purchasing is expected until the general situation improves.

Considerable attention by both manufacturers and merchants will be given the Master Car Builders' and Railway Master Mechanics' conventions at Atlantic City, N. J., during this and next week. A number will make exhibits of tools and machinery at the conventions.

Manufacturers vary somewhat in their reports as to the condition of the trade. Some find a slow, gradual improvement from month to month, while others note little change in the demand. The belief is general that some betterment will be noted before long, probably late in the summer or early in the fall. In the meantime plants continue in operation on a more or less restricted basis.

Second-hand tools and machinery continue fairly active. For some classes of medium size metal working tools there has been a larger inquiry, and some of the better grades of tools are becoming somewhat scarce. Dealers report sales as being quite large on the whole and prices are being pretty well maintained. A little better demand for medium size second-hand boilers is reported, but the trade is not brisk. Manufacturers of new boilers of the medium powers report the demand as somewhat better, and several good sales have been reported.

Foundries report a slightly better demand, but the business is much scattered, and while some iron and steel casting plants show a small increase in the tonnage booked, others have made practically no gain. The absence of railroad work is being severely felt by both iron and steel foundries. Jobbing foundries as a rule are dull and dependent to a large extent on day to day business.

Ballenger & Perrot, architects and engineers, have completed plans and specifications for a modern manufacturing building for Edward Stern & Co., Inc., to be erected at the northeast corner of Seventeenth and Vine streets. The building will be 117 x 126 ft., six stories. Reinforced concrete will enter largely in its construction. There will be a 40,000 gal. sprinkler tank and a 5000 gal. house supply tank, on a concrete tank tower. One passenger and two freight elevators are to be installed, while modern toilet equipment and other features will also be installed.

The United Gas Improvement Company is taking estimates for a one story and basement valve house, 58 x 62 ft., and foundations, for a 3,000,000 cu. ft. gas holder, 117 ft. 6 in. in diameter, to be built at the West Philadelphia station of that company, Forty-seventh and Chestnut streets.

The Millard Construction Company, it is understood, has taken title to a plot of ground of about 6½ acres, adjacent to the New York Division of the Pennsylvania Railroad between Tacony and Holmesburg. It is said that the purchase has been made for use as a site for storage and a repair plant for its machinery, and that engineers will begin at once to draw plans for buildings for storage and work shops.

The Detrick & Harvey Machine Company, Baltimore, Md., reports no particular improvement in business the past month. While a number of inquiries have been received, orders do not materialize rapidly for machinery of any size. No genuine improvement in the general demand is looked for by this concern until confidence in industrial progress is restored.

Plans are being prepared by P. A. Kley, architect and engineer, for additions to the packing plant of E. J. Schwarz, Brother & Co., Newark, N. J. A two-story rendering and hide house 50 x 200 ft. is to be erected, as are also a one-story power house and other buildings.

N. J. Doyle & Co. have been awarded contracts for the erection of a ward building and sewage system at the State Homeopathic Hospital for the Insane, near Allentown, Pa. Their bids were $153,600 and $29,518, respectively, for the two items. The same firm was awarded the contract for pipe fitting in connection with the work.

The Newton Machine Tool Works, Inc., notes the active business obtainable to be slowly growing, while the increase in prospective business is quite pronounced. A slight gradual improvement has been noted from month to month, and it is believed that considerable business will come out early in the fall. A fairly satisfactory demand is reported for medium size cold saw cutting off machines and slotting machines. Recent orders include one for a large double chord boring machine, 60 ft. between centers, and others for a heavy melting machine, a large cold saw cutting off machine and several special tools.

The Hilles & Jones Company, Wilmington, Del., reports that there has been no material change in the demand. Orders are not very plentiful although several of interest have been recently booked, including two motor driven machines for the Saucon Works of the Bethlehem Steel Company, one a heavy angle shearing machine of capacity equal to shear 8 x 8 x 1½ in. angles; the other a horizontal bending and straightening press for bending and straightening beams, channels, &c., up to 20-in. sections. One of the shipments made by this company last week comprised 18 rail straightening presses, each driven by an individual motor, and designed for use in straightening 100-lb. rails, for the Indiana Steel Company, Gary, Ind. An outfit of machinery, including a heavy multiple punch, spacing table, bar shearing machine, flanging clamps and heavy plate bending rolls, is also being completed for the new plant of the Standard Oil Company at Bay Way, N. J.

The Steel Heddle Mfg. Company has had plans drawn for considerable improvement to its plant at 2110 Allegheny avenue. New boiler and pump rooms, with equipment, are contemplated, as well as a coal pocket and other improvements.

The Commissioner of Health, Harrisburg, Pa., will re-

ceive proposals until June 25 for furnishing all labor, material and the necessary equipment for a laundry to be installed in the Pennsylvania State South Mountain Sanatorium, Palo Alto, Pa. Plans and specifications in connection with the equipment to be furnished may be obtained from Samuel G. Dixon, Commissioner of Health, Harrisburg, Pa.

Cleveland Machinery Market.

CLEVELAND, OHIO, June 16, 1908.

The local machine tool market shows no improvement; in fact, the volume of orders and inquiries seems to have fallen off slightly during the past few days. This is particularly true of second-hand tools, for which there was a fair demand about the first of the month. Dealers continue to receive some scattering orders, but they are mostly for single tools and come from small concerns. The larger industrial plants are still practically out of the market. Little business is expected from this source as long as the plants are running on limited capacity and still have many tools that are idle. About the only exception is the automobile plants, several of which have placed orders for a few tools and others are expected to be in the market soon for a limited amount of additional machine tool equipment. The automobile people are greatly encouraged by the volume of orders that came in late in the season and some of the local plants have been running at full capacity for several weeks, one at present being operated with full force both day and night. Some new industrial propositions are being developed, but in most cases the projects are small and very few machine tools will be required.

The Cleveland Board of Education last week awarded the contracts for the machine tools and the woodworking machinery for the new Technical High School. There were a large number of bidders, and the strong competition for the business resulted in considerable price cutting by bidders. The purchases were divided between a number of dealers and manufacturers.

Builders of machine tools report little, if any, improvement in the volume of their orders, and most of the plants that make tools exclusively are running on half or less of their capacity. In some lines of special machinery, however, there is considerable improvement in the outlook. Some very good inquiries have come out for mining machinery for Western mines, and it is expected that some good orders for machinery of this character will be placed in a few days. Makers of pneumatic tools report no improvement in their orders, the volume of business being very light. While the immediate outlook is not good, makers of pneumatic tools believe that the reduction in structural steel will stimulate activity in structural shops and create a new demand for pneumatic tools in the fall.

Outside of tool building lines the general situation looks considerably brighter. Many manufacturers engaged in various metal trades report a fair improvement in the volume of orders, and the general feeling regarding the gradual return of normal activity is far more hopeful than it was a few weeks ago. In foundry lines little improvement is noted as yet. The jobbing trade reports the demand light and irregular, orders being small and for immediate needs.

The Dover Mfg. Company, maker of sad irons, Canal Dover, Ohio, has just about completed additions to its plant which will double its capacity. The company has installed a new power plant of 300 hp. capacity, including a Corliss engine and water tube boiler, with rope transmission power, and has added considerable special machinery. The company reports that its business kept up very satisfactorily during the months of depression, except in April and May, when there was some falling off. Conditions improved again materially with the first of June and the company is now receiving a good volume of orders. The plant will be shut down during a portion of the summer, when some further improvements will be made. The company, which enjoys a good foreign trade, is now making preparations to extend its sales to some important European territory which previously it had not attempted to reach.

The Ohio Shovel & Stamping Company, Canal Dover, Ohio, has recently been reorganized. O. C. Eben, the former president and general manager, retired and was succeeded by D. Defenbacher, the former vice-president. The other new officers are Victor Wentz, vice-president, and J. F. Defenbacher, secretary and treasurer.

The Buckeye Steel Castings Company, Columbus, will erect another building, 60 x 345 ft., of steel construction, similar to the two buildings that are now being built by the company, except that it will be higher. The building will be used for a machine shop, and an addition will contain the blacksmithing, electrical and fitting departments and repair shop.

The Ohio Steel Pipe Mfg. Company, New Philadelphia, Ohio, reports considerable improvement in the volume of its orders during the past few weeks. Its business so far this year is fully 75 per cent. as large as a year ago.

The Lake Erie Nail & Supply Company, 412 Frankford avenue, Cleveland, is preparing a new catalogue showing its line of mine, mill and factory supplies. The catalogue will be ready for distribution August 15.

The Standard Tool Company, Cleveland, maker of twist drill, chucks, reamers, &c., reports a very satisfactory improvement in orders during the past few weeks. The company's export business is good and kept up well during the dull period of domestic trade. The company is now operating its plant five and one-half days per week.

The Enterprise Electric Company, Warren, Ohio, that was organized a few months ago to make transformers, has leased a building for new quarters, its present plant being too small for its increasing business. Some new machinery will probably be installed.

The Quad Stove Mfg. Company, Columbus, has received notice from the War Department that its bid for furnishing field ranges for the United States Army for the year beginning July 1 has been accepted. The contract provides that a maximum of 100 steel ranges per month can be ordered for camp outfits.

With a capital stock of $25,000, the Multiplex Concrete Machinery Company, Toledo, has been incorporated by R. E. Teits, A. E. Seikel, W. R. Dawson, G. A. Coldwell and A. Feilbach.

The Columbus Mfg. Company, Columbus, has been incorporated, with a capital stock of $10,000, to make automatic vending machines and other specialties. The incorporators are J. W. Haynie, W. H. Sutherland, W. H. Whitford, C. A. Collins and B. B. Wells.

Harry Klar and C. C. Klar have under construction a new foundry in Canal Dover, Ohio. The plant will be operated under the name of the Valley Foundry Company. It is expected that it will be completed in about six weeks.

New England Machinery Market.

WORCESTER, MASS., June 16, 1908.

Interest in the trade centers on the outcome of the reduction in the price of steel, as it may influence the general situation, and especially on its effect upon the machine tool market. There is already an inclination on the part of buyers to argue that machinery should respond to what is termed in this connection a general tendency toward lower prices; and more specifically that prices of machinery should be reduced because its raw materials have gone down. But it is well known that the difference in the cost of a machine resulting from the lower price of steel as announced would be so trifling as to be unworthy of consideration; and even if the effect of the new schedules were an important one in this respect the machine tool builders would see small reason for changing their view that a reduction in their lists would mean little if any increase in the volume of their orders. In response to tentative inquiries sent out by purchasing agents to sound the market, no inclination is shown anywhere to change prices. The purpose of maintaining them as they are, which was greatly strengthened at the time of the Atlantic City convention, will undoubtedly stand. In so dull a market there is naturally a temptation to make concessions to customers, but it is still true that there are few cases of yielding, and these are confined, so far as can be learned, to houses that are not members of the National Machine Tool Builders' Association.

The machinery trade is no more active than it has been. The little spurt of May has faded, and things are as they have been most of the time since the first of the year. Some tools are being sold, but the number is not great. Inquiries are less numerous if anything. The dealers have settled down to the belief that the summer will be a dull one, and any improvement will come in the nature of a pleasant surprise. But with most business houses they believe that a revival of business is not very far away. The local crop situation in New England is a promising one, in common with the great agricultural regions of the West, which means business for those houses which sell machinery and equipment to the farmers.

The sudden return of activity in cotton manufacturing has made conspicuous the exceedingly low stocks of mill supplies and accessories in manufacturing, a condition that is probably typical of industrial establishments in general. The cotton mills have placed not a few rush orders for supplies and machine parts during the past fortnight. While the mills were dull, necessary repair parts were obtained by robbing idle machinery, and such accessories as spools and bobbins have been used up in the same manner, until, with the return of better business and the consequent starting up of a much larger percentage of available machinery it became necessary to go into the market in a hurry and order

with lack of delivery as the factor rather than price. The business of certain manufacturers of these goods has received a notable impetus in this way, even to the extent of night work. It seems fair to assume that the same condition will arise in other lines of manufacturing when the influence arrives which will start up business again.

One of the large machinery houses whose storehouse was wet down during a recent fire has settled its losses with the fire underwriters on a new basis, and has established a precedent which will doubtless be followed in the future. There was no loss by fire; the heat did not reach the large stock of new machines. Immediately after the blaze was extinguished a force of men was set to work cleaning the tools, removing all traces of water as far as possible until the stock looked to be in as good condition as ever. The adjusters took the ground that there was little damage. The answer of the dealer was that it was impossible to tell what loss had been incurred unless the machines were taken down in their home shops; that idle machinery, especially new machinery, was apt to suffer from water in the bearings or other parts which could not be reached in the cleaning up, and consequently it would be impossible to sell the stock with the usual guarantee to customers. The machinery could be sold, however, at a discount, without the guarantee, customers being willing to take the risk for a saving of $50 or $100 or more, especially at a time when they could overhaul the tools in their own shops and make necessary repairs if they should be required. Consequently the dealer proposed that the insurance people bear the amount of this shrinkage in value. At first this logic did not appeal to the adjusters, and they suggested taking the entire stock themselves and disposing of it in the market, in the belief that the inducement of say 5 or 10 per cent. reduction would be sufficient to make the sale an easy one. Investigation revealed to them the condition of the market. The only other option, if the suggestion of the dealer was not adopted, was to send the machines back to their respective factories for overhauling, this to be done at the expense of the insurance companies. It was finally decided that the shrinkage plan, as described, was the most feasible one, and it was accepted. As a consequence a large number of new machines without a guarantee has been placed on the market.

The Commission on Industrial Education, Worcester, has submitted a report to the city government recommending the erection of an industrial school building, to cost $133,000, to have accommodations for 200 boys. The commission recommends that in view of the importance of the metal trades in the locality and the fundamental character of the machinists' trade the school shall be for the training of boys in that trade and kindred lines. The plans for the building include a machine shop, 50 x 120 ft.; woodworking room, 50 x 90 ft.; tool making and die room, molding room, casting, cleaning room, blacksmith's shop; engine and boiler room, to contain a 30 hp. engine; 50 hp. boiler; feed water heater, pump, &c.; draughting room, &c. With the establishment of the school the State of Massachusetts will pay one-half and the city one-half of the cost of maintenance, totaling, it is estimated, about $22,000 per annum.

The Western Electric Company has established a branch house at 113-115 Purchase street, Boston, where a complete line of power apparatus, electrical supplies and telephones will be carried. H. B. Gilmore will be the Boston manager. The company has bought the supply business of the Electric Goods Mfg. Company, Boston, which will, however, continue the manufacturing end of its business. The Boston house is the twentieth to be established by the Western Company.

The United States Court of Appeals sitting at Boston has handed down a decision for the plaintiff in the suit brought by the Blake & Knowles Steam Pump Works against the Warren Steam Pump Company, alleging infringement of patents on improvements on pumping engines known as as the Whiting and Wheeler and the Hall and Gage patents. This type of engines is used to withdraw water and air from steam condensers for the purpose of maintaining a vacuum.

The Leeds & Catlin Company, Middletown, Conn., has established a department for the manufacture of phonographs, this being an addition to the line of disk and cylinder records. The company states that it has purchased the machinery needed for the present.

Word comes from Pittsfield, Mass., that the effort will be made to reorganize the business of the Berkshire Motor Car Company of that place. The company became insolvent some time ago, and the stock and equipment were purchased at auction by the bondholders. It is stated that as soon as certain litigation is ended the work of re-establishing the business will begin.

The Bigelow Carpet Company, Clinton, Mass., has begun the erection of a new power house, which will cost, equipped, some $500,000. It will be the central plant from which power will be supplied to the entire great plant.

The Rhodes Year Clock Company, Hartford, Conn., has been incorporated in Connecticut, with authorized capital stock of $30,000, to manufacture a patented clock. C. M. Rhodes, Westfield, Mass., is president; C. F. Wood, Hartford, secretary and treasurer; William W. Pomroy, Suffield, Conn., vice-president; these officers and M. A. Barden, Westfield, directors. The company states that it has not yet prepared its list of machinery and other requirements.

The Standard Company, Torrington, Conn., manufacturer of automobile and bicycle accessories, states that there is no truth in the published rumor that it is to begin the manufacture of automobiles.

The Waterbury Mfg. Company, Waterbury, Conn., has begun the foundations of the first of its new group of manufacturing buildings which are planned to replace the older of the present structures and at the same time increase manufacturing capacity. The building will be of mill construction, 40 x 180 ft. and 40 x 87 ft., and six stories.

The Davis Mills, Fall River, Mass., cotton manufacturer, is planning to increase its capital stock from $500,000 to $1,250,000, the purpose being to erect a new mill with capacity of 65,000 spindles and corresponding weaving and other machinery. It is presumed that an additional power plant will be required.

Hobart E. French, receiver of the Bridgeport Safety Emery Wheel Company, Bridgeport, Conn., states that when business revives steps will be taken to put the business on a substantial financial basis, and that in the meanwhile the plant is being run on as economical a basis as possible owing to the depression in business.

The H. W. Caldwell & Son Company, Chicago, Ill., engineer, founder, machinist and manufacturer of elevating, conveying and power transmitting appliances, has opened a New England engineering and sales office at Room 337, Oliver Building, 141 Milk street, Boston, Mass. This office is in charge of Malcolm R. White, mechanical engineer, who will give attention to engineering propositions, inquiries and orders from the New England States.

Cincinnati Machinery Market.

CINCINNATI, OHIO, June 16, 1908.

Machinery and machine tool manufacturing interests are much in evidence just now through the work of the National Prosperity Association of Cincinnati; in fact, these interests are easily taking the lead in the movement to make July 1 reemployment day in this section. Great impetus was given the movement at the dinner of the Cincinnati Metal Trades Association in Chester Park June 12, and whether or not the machinery producing interests will find it profitable to increase their forces materially on that date, the sentiment is productive of a commendable form of optimism, and it is believed by the most conservative that the industrial situation is bound to profit, generally speaking.

In special machinery lines business continues good; that is, considering general conditions, the situation is satisfactory. Inquiries have increased in volume, and, to judge from their tenor as evidenced in correspondence with a dozen or more large concerns in this district during the past week, foreshadow an early buying movement. Particularly true is this of the manufacturers of boiler and engine and electric power equipment. Boiler manufacturers report a good business on small lots and from all parts of the country. In the main these are for medium and small sized power units. One manufacturer reports inquiries heavier during the past 10 days than for a year, and that his concern is now three and four days behind in estimates, much of which is of a character that presages an early placing of contracts. Most of the inquiry for boiler equipment is for the horizontal tubular type, and there is also considerable interest manifested in tank work and small structural shapes. Pressed steel specialties are also active. As a rule, the action of the steel manufacturers in announcing the published list of reductions is deplored; that is, the prevailing sentiment seems to be that the cut is insufficient and it was too long deferred. Machinery men hereabout feel that the long awaited buying movement was imminent just when the cut was announced, and it has only served to defer contracting; the buyers believing that the bottom has not been reached, entailing therefore another tedious delay.

In the machine tool lines the situation remains about the same—neither better nor worse than at the opening of June. Inquiries are somewhat better—a little firmer in tone, and more promising, but the large railroad interests and general machinery establishments are still holding off. Machinery selling agencies report a much better feeling, and prospects good, with considerable inquiry for second-hand tools, and within the past few days and weeks some fine inquiries for the larger and more expensive tools. All the large producing interests here in the tool line are awaiting the close of June with more than ordinary interest and anticipation; for it marks the close of the fiscal year with the great railroad corporations, and much of the late correspondence with these interests indicate that some fair-sized specifications are in preparation.

On Saturday, June 13, Cincinnati organizations entertained a group of engineers from the Department of the Interior, who were here to look over the ground in the

matter of the proposed central fuel and mineral testing plant of the United States Geological Survey. They visited various locations in the city and suburbs. The new plant will be located in one of four cities, Pittsburgh, Cincinnati, Chicago or St. Louis, although the Government has applications and invitations from 36 other cities. The city will first be selected, then the location in that city. A tract of not less than 20 acres is needed, and it must have good switching facilities. The equipment from the seven branch plants now in operation will then be moved to the new centralized location where 180 experts and many laborers will be employed. The visitors included Dr. J. A. Holmes of the Survey, Prof. W. F. M. Goss of the University of Illinois, J. Knox Taylor, supervising architect of the United States Government; Capt. Robert W. Hunt of Chicago, and Secretary Manning of the commission.

Federal Judge A. M. J. Cochran, at Covington, Ky., on June 13, handed down an opinion dismissing the case of Emil Pollak and Gustav Hilb as trustees, against the Licking Coal & Iron Company of Covington, for lack of jurisdiction. The mill is one of the oldest in this section, and has been idle since the beginning of the litigation, which began with the case filed by the parties mentioned against J. C. Droege, Fred J. Droege and William Droege, to prevent their voting 2488 shares of stock at the stockholders' meeting several months ago.

Considerable local interest is taken in the incorporation of the Freericks Hot Water Heating System Company, which will erect a large manufacturing establishment, and will have a capital to start of $1,000,000. Various sites are being visited and a selection, it is said, will be made within a few days. The incorporators are Dr. Arthur Freericks, F. S. Goldsmith, Charles S. Nagel, George E. Brill, and W. B. Stier. The third and fourth floors of a large power building at Pearl and Lawrence streets have been rented by the company for present needs.

Motive power superintendents of all the railroads met with the Cincinnati Smoke Abatement Committee, June 13, to consider ways and means for eliminating the smoke from locomotives. It was decided that electricity as motive power was the only solution. Engines are to be watched and records made of results.

The United States Tool Company, Vincennes, Ind., which recently moved its plant into the building of the Vincennes Woolen Mills on the South Side, has begun operations in the new establishment with a full force of employees. The company announces that it has a good list of orders ahead.

Capitalists from Dayton, Cleveland and Detroit, it is said, have been looking up a desirable location in Toledo for a rolling mill. The East Side Improvement Association of Telodo has the matter in hand.

The Multiplex Concrete Machinery Company is a new incorporation for Toledo, Ohio, with a capital stock of $25,000. The incorporators are Ritchie E. Teets, Alfred F. Seibert, G. A. Caldwell, Andrew Feilbach and W. R. Dawson.

Government Purchases.

WASHINGTON, D. C., June 16, 1908.

The Bureau of Yards and Docks will receive bids until July 11 for installing a coal and ash handling plant at the navy yard at Philadelphia.

The Isthmian Canal Commission will receive bids until July 6, Circular No. 448, for electric motors and other supplies.

The following bids were opened June 8, Circular No. 442, for machinery for the Isthmian Canal Commission:

Class 1.—One universal milling machine—Bidder 10, Becker-Brainerd Milling Machine Company, Hyde Park, Mass., $1086; 24, Brown & Sharpe Mfg. Company, Providence, R. I., $1248 and 1400; 38, W. R. Colcord Machinery Company, St. Louis, Mo., $925; 56, Fairbanks Company, New York, $1227 and 1231; 60, Fox Bros. & Co., New York, $988; 73, Handlan-Buck Mfg. Company, St. Louis, Mo., $1064; 75, Hendey Machine Company, Torrington, Conn., $1200; 99, Manning, Maxwell & Moore, New York, $1184; 109, Motley, Green & Co., New York, $1300; 121, Niles-Bement-Pond Company, New York, $1181; 124, Osterlein Machine Company, Cincinnati, Ohio, $1050.05; 133, C. T. Patterson Company, New Orleans, La., $1255; 137, Prentiss Tool & Supply Company, New York, $1213; 147, C. E. Robidoux, St. Louis, Mo., $1160; 175, Vandyck-Churchill Company, New York, $1200.

Class 2.—One universal radial drill—Bidder 38, W. R. Colcord Machinery Company, St. Louis, Mo., $1950 and $2050; 56, Fairbanks Company, New York, $1920; 60, Fox Bros. & Co., New York, $1474 and $1559; 61, Frevert Machinery Company, New York, $1618 and $1570; 73, Handlan-Buck Mfg. Company, St. Louis, Mo., $1498; 99, Manning, Maxwell & Moore, New York, $1560 and $1694; 121, Niles-Bement-Pond Company, New York, $1815 and $1855; 133, C. T. Patterson Company, New Orleans, La., $2064; 137, Prentiss Tool & Supply Company, New York, $1838 and $1942; 147, C. E. Robidoux, St. Louis, Mo., $1725; 175, Vandyck-Churchill Company, New York, $1585.

Class 3.—One slotter—Bidder 56, Fairbanks Company, New York, $1755; 60, Fox Bros. & Co., New York, $1444 and $1873; 82, International Electric & Engineering Company, New York, $1607; 99, Manning, Maxwell & Moore, New York, $1900; 109, Motley, Green & Co., New York, $1975; 121, Niles-Bement-Pond Company, New York, $1651; 153, William Sellers & Co., Philadelphia, Pa., $1535; 175, Vandyck-Churchill Company, New York, $1796.

Class 4.—One stay bolt cutter—Bidder 51, Drew Machinery Agency, Manchester, N. H., $638; 56, Fairbanks Company, New York, $705; 60, Fox Bros. & Co., New York, $724 and $744; 61, Frevert Machinery Company, New York, $687; 82, International Electric & Engineering Company, New York, $806; 92, Landis Machine Company, Waynesboro, Pa., $700 and $744; 99, Manning, Maxwell & Moore, New York, $647 and $742; 133, C. T. Patterson Company, New Orleans, La., $795; 137, Prentiss Tool & Supply Company, New York, $673; 147, C. E. Robidoux, St. Louis, Mo., $815; 175, Vandyck-Churchill Company, New York, $843.

Class 5.—One elevating crank pin and small wheel press—Bidder 51, Drew Machinery Agency, Manchester, N. H., $630; 60, Fox Bros. & Co., New York, $419 and $444; 99, Manning, Maxwell & Moore, New York, $408 and $437; 149, H. A. Rogers Company, New York, $587; 175, Vandyck-Churchill Company, New York, $570.

Class 6.—One power hack saw—Bidder 38, W. R. Colcord Machinery Company, St. Louis, Mo., $17.25; 56, Fairbanks Company, New York, $22; 60 Fox Bros. & Co., New York, $17.95; 61 Frevert Machinery Company, New York, $16; 82, International Electric & Engineering Company, New York, $20; 99, Manning, Maxwell & Moore, New York, $20; 109, Motley, Green & Co., New York, $29; 137, Prentiss Tool & Supply Company, New York, $17.25; 147, C. E. Robidoux, St. Louis, Mo., $26; 175, Vandyck-Churchill Company, New York, $24; 187, J. B. Kendall, Washington, D. C., $28.

Class 7.—One cold saw—Bidder 60, Fox Bros. & Co., New York, $1138; 82, International Electric & Engineering Company, New York, $1230; 99, Manning, Maxwell & Moore, New York, $844 and $871; 121, Niles-Bement-Pond Company, New York, $1673; 140, Quincy, Manchester, Sargent Company, Plainfield, N. J., $970 and $1240; 167, L. W. Swind, Philadelphia, Pa., $975; 175, Vandyck-Churchill Company, New York, $935.

Class 8.—One engine lathe—Bidder 38, W. R. Colcord Machinery Company, St. Louis, Mo., $887, $932 and $995; 56, Fairbanks Company, New York, $830; 60, Fox Bros. & Co., New York, $783; 61, Frevert Machinery Company, $855; 73, Handlan-Buck Mfg. Company, St. Louis, Mo., $747; 75, Hendey Machine Company, Torrington, Conn., $1095; 82, International Electric & Engineering Company, New York, $803; 99, Manning, Maxwell & Moore, New York, $880; 109, Motley, Green & Co., New York, $725; 121, Niles-Bement-Pond Company, New York, $877; 133, C. T. Patterson Company, New Orleans, La., $760; 137, Prentiss Tool & Supply Company, New York, $854; 141, Rahn-Carpenter Company, Cincinnati, Ohio, $685; 147, C. E. Robidoux, St. Louis, Mo., $780; 175, Vandyck- Churchill Company, New York, $725, $830, $715 and $810.

Class 9.—One flanging clamp—Bidder 60, Fox Bros. & Co., New York, $319 and $414; 99, Manning, Maxwell & Moore, New York, $338; 121, Niles-Bement-Pond Company, New York, $571 and $568; 151, Joseph T. Ryerson & Son, Chicago, Ill., $293; 175, Vandyck-Churchill Company, New York, $425.

Class 10.—One casting grinder—Bidder 38, W. R. Colcord Machinery Company, St. Louis, Mo., $65; 60, Fox Bros. & Co., New York, $48.79; 99, Manning, Maxwell & Moore, New York, $48; 137, Prentiss Tool & Supply Company, New York, $57.

Class 12.—Two duplex steam pumps—Bidder 26, Buffalo Steam Pump Company, New York, $10.49; 48, D'Olier Engineering Company, Philadelphia, Pa., $1490; 58, Fairbanks, Morse & Co., Chicago, Ill., $1090; 64, Gardner Company, Quincy, Ill., $1054; 73, Handlan-Buck Mfg. Company, St. Louis, Mo., $1116; 90, Knox & Bro., New York, $1168; 99, Manning, Maxwell & Moore, New York, $577.50; 109, Motley, Green & Co., New York, $1030; 147, C. E. Robidoux, St. Louis, Mo., $1260; 185, Henry R. Worthington, New York, $967; 189, National Electrical Supply Company, Washington, D. C., $1046.

Class 13.—Two motors for main shaft drives—Bidder 48, D'Olier Engineering Company, Philadelphia, Pa., $750; 51, Drew Machinery Agency, Manchester, N. H., $780; 58, Fairbanks, Morse & Co., Chicago, Ill., $640; 67, General Electric Company, Schenectady, N. Y., $620; 84, Jenney Electric Mfg. Company, Indianapolis, Ind., $898; 122, Northern Electric Mfg. Company, Madison, Wis., $678; 145, Ridgway Dynamo & Engine Company, Ridgway, Pa., $700; 150, Roth Bros. & Co., Chicago, Ill., $760; 161, Sprague Electric Company, New York, $630; 164, B. F. Sturtevant Company, Hyde Park, Mass., $584; 170, Triumph Electric Company, Cincinnati, Ohio, $1104; 177, Western Electric Company, New York, $583.20; 178, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., $695.

The following bids were opened June 6 for installing one 5000 cu. ft. air compressor and accessories at the navy yard, Bremerton, Wash.:

Sullivan Machinery Company, Chicago, Ill., $40,877; Laidlaw-Dunn-Gordon Company, New York, $27,100; Nordberg Mfg. Company, Milwaukee, Wis., $35,296; Allis-Chalmers Company, Milwaukee, Wis., $44,325 and $42,075; Ingersoll-Rand Company, New York, $28,974.

The following bids were opened June 9 for supplies for the navy yards:

Class 63.—One band saw—Bidder 4, American Woodworking Machinery Company, Rochester, N. Y., $490; 66, Frevert Machinery Company, New York, $383; 67, Fox Machine Company, Grand Rapids, Mich., $444; 73, J. A. Fay & Egan Company, Cincinnati, Ohio, $547; 85, Greaves, Klusman & Co., Cincinnati, Ohio, $494 and $383; 118, Manning, Maxwell & Moore, New York, $390; 140, Oliver Machinery Company, New York, $562 and $512.

Class 71.—One motor driven grinder—Bidder 66, Frevert Machinery Company, New York, $364; 71, Fairbanks Company, New York, $370; 138, Northern Electrical Mfg. Company, Madison, Wis., $386; 187, Vandyck-Churchill Company, New York, $382.

Under bids opened June 2 for machinery for the navy yards the Burke Electric Company, Erie, Pa., has been awarded class 21, two electric motors, $1501.

The following awards have been made for supplies for the Isthmian Canal Commission, bids for which were opened June 2, Circular No. 441:

Henry R. Worthington, New York, class 2, two duplex water pumps, $728.98.

Manning, Maxwell & Moore, New York, class 5, one power hammer, $660.

G. & W. Mfg. Co., New York, class 6, one interchangeable crane and buggy geared ladle, $213.

Hanna Engineering Works, Chicago, Ill., class 7, one large pneumatic sand shaker, $180.

Time for depositing securities of the Southern Steel Company under the reorganization plan of May 15 has been extended to July 1.

HARDWARE

THE press of [illegible] and the consequent call for ingenuity and invention and for the adoption of the best methods are influences which have contributed greatly to the extraordinary development of American manufacturing interests which has been characteristic of recent years. It has been a long, hard battle, every step of which has been attended by its own peculiar difficulties. In the early days when the profits were proportionately large the volume of business was usually correspondingly small. When, however, there was progress all along the line competition became greatly intensified, and the narrowing of the margin of profit was the inevitable result. In this condition of affairs there were those who were unable to realize that the old condition of things was gone forever and that a new order, presenting new problems, had been entered upon. Under these circumstances many successful men, some of them pioneers in their particular lines of business, mercantile or manufacturing, were unwilling or unable to adapt themselves to the new conditions. There were, however, others, often younger men, who promptly met the changed situation and the new tendencies, and set about to find some means of making the best of the state of affairs which the evolution of industry and commerce had produced. There was thus in the recognition of the difficulties which had developed the beginning of a new progress in manufacturing.

Industrial enterprise under the stress of necessity was thus able to meet the requirements of the situation with eminent success. The result is seen in the great and varied industries which have been established, the fortunes which have been accumulated and the proud position attained by this country as a great manufacturing nation. The manufacturer first of all naturally looked about for means of reducing the cost of producing his goods and at the same time of increasing the volume of his output. He began to improve his methods of manufacture by the invention and installation of automatic machinery and labor saving devices. In connection with this there has been more gradually introduced a most careful regard for economies which though concerned about trifles have had in the last analysis much to do with the diminished cost of the manufactured products.

With these improvements in the making of the goods there was also the general adoption of better business methods in the factory. It was brought home to the manufacturer that he could not as in former days assume the direct oversight of everything himself. In many cases the head of an enterprise was financier, superintendent, buyer, salesman, correspondent, all in one. This was not only too strenuous, but it was not efficient management. The changed conditions emphasized the necessity for a complete business organization. Good men suitable for the positions of responsibility which they were needed to fill were found, who being educated in accordance with the manufacturer's methods and plans relieved him of the burden of detail, while at the same time he retained a supervision which enabled him to keep in touch with everything in the factory. There was thus introduced little by little the installment of complete cost systems and the adoption of accounting methods which kept him informed as to what was done in every department. He was thus given information, not only as to the profit of the business as a whole, but as to the profit realized in each department and if need be on each separate article manufactured.

Notwithstanding the progress which has been made one would have a short memory and be blind to the signs of the times who supposes that the end has been reached. The conditions which have recently developed are in some respects different from those which have characterized any former period in our industrial history. New problems are coming up and new difficulties are being encountered. There is thus a summons to a renewed enterprise and energy and the adoption of better, perhaps novel methods. There is little doubt that our manufacturers who have achieved so much in the past will be equal to the demands made upon them. These expectations, however, will be realized only as each manufacturer sees to it that his own business is conducted on the wisest lines and the traditions of the past departed from in so far as improved methods can be adopted. The present period of relaxed business and accumulating stocks may thus serve a good purpose.

Condition of Trade.

The present month maintains its reputation as one when business is of moderate volume and beginning to feel the effect of the summer quiet. It is indeed going well beyond recent Junes in this respect, making in some ways a new record of sluggish movement of goods and limited placing of orders. To this state of things the uncertainty in regard to the values of Hardware products contributes not a little. Jobbers are not only buying very carefully and in only such quantities as cover their requirements, but many of them are advising their customers to pursue the same policy, deeming it the part of wisdom to sacrifice present sales rather than load up the merchants with goods in excess of their needs, and which might decline upon their shelves. There is, indeed, on the part of intelligent merchants the general recognition of the wisdom of this course, and stocks, as a rule, are being kept small. While it would be gratifying to be able to report a quickened demand there is no doubt that the conservative policy followed so generally by both wholesale and retail merchants, as well as by the manufacturers in the purchase of material and the making of goods, is giving an excellent preparation for a return to a normal demand and better conditions. The recent reduction in heavy material and in Wire Nails and Wire is taken by the trade as indicating the increased probability of the establishment for a time at least of a somewhat lower level of prices. The reduction in Ore, while not having so immediate an effect on finished products, is an element in the situation which is also t be taken into account. It should, however, be borne in mind that the decline in general Hardware and the finished products is not likely to be radical or sudden, and the merchants are, therefore, justified in keeping stocks well assorted so as to be able to take care of current business. There is apparently more danger of excessive caution in buying than of overpurchasing. A fact, the importance of which can hardly be overestimated, is the [illegible]

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—So prices on Nails and Wire go down 10 cents after all. The news came to the trinity of hardware conventions at Hot Springs, Ark. It was received with a good deal of surprise. The general opinion expressed was that the reduction of 10 cents will not do any good. The trade will expect another reduction in the near future. Therefore buyers will continue to hold off.

We remember the time when Mr. Gates locked up the Board of Directors and reduced prices $1. We will not analyze his motives, but the effect was good. Everybody knew bottom had been reached. The trade of course were stunned. When they recovered they commenced buying.

To one outside of the sanctuary the recent decline looks like a wavering and uncertain policy—probably a compromise measure.

It has rained so much in this immediate section it is hard to understand how a farmer could do any plowing. Nevertheless our salesmen's crop reports are generally of a very encouraging nature. Passing through Arkansas the writer saw some excellent fields of corn. The plant was a strong, dark green, with a good stand, and well cleaned.

The rivers in this section are all up and the low lands are flooded. But after all, these low-lying farms and plantations, in area, are a very small part of the whole. Crops on the high lands are all reported to be in good condition.

Fortunately for us, like ancient Rome, St. Louis sits on her seven hills. Therefore we are dry notwithstanding the moisture all around us. Our freight service is never seriously interrupted by high water.

May was a poor month with us. Business so far in June is very much better. Orders are more "meaty."

A well-informed Texas jobber told me at Hot Springs that this has been a year of liquidation in Texas. Everybody has been collecting. Both buying and selling have been relegated to the background. He states he expects a good, late fall business.

The Arkansas merchants were quite cheerful, and it is surprising how well business in Arkansas has held up during the recent depression. While the bottom seems to have dropped out of things in Texas, Arkansas merchants, judging by their purchases, have been doing a normal business.

Three Southern jobbers (Messrs. Barker of Lynchburg, Va., Sanford of Sherman, Texas, and Ireland of Greensboro, N. C.) addressed the Arkansas retailers' convention. Their addresses were along widely divergent lines. Each one was of remarkable excellence. Surely, eloquence grows with tropical luxuriance south of Mason and Dixon's line.

Mr. Moore, of Birmingham, set a new pace by his speech commending and defending the various trusts and combinations in the Hardware line.

Mr. Sanford's address was a strong argument in favor of the local jobber. It was not only well written but delivered in an attractive and forceful manner. We naturally take exceptions to the logic of his conclusions, but he surely made a telling address.

As the writer sat as an interested observer in the various conventions he could not help but meditate upon the advantages of these meetings.

Here were prominent manufacturers from the far East hob-nobbing with jobbers and retailers from the South and Southwest.

Here were retailers from small towns weighing the addresses and claims of the jobber who sells goods over a wide scope of country, and the local jobber who depends for his business upon his home trade.

Here was an expert in store arrangement outlining his plans to both jobbers and retail merchants.

Here was a representative of a Correspondence School of Salesmanship—an exponent of the higher education in the art of selling goods.

The convention halls were like forums where the various interests, through their orators, appealed to the critical intelligence of their audiences.

The writer was particularly glad to note that the appeals to sectionalism, so common in most Southern meetings, were almost but not quite absent. Being a Southerner and of Southern people, I may be permitted to say that the present and future opportunities of the South are too great for them to allow themselves to be narrowed by old-time local prejudices.

The great development of the next generation and of succeeding generations will be in the Southern and Southwestern States. These States have weighty problems before them. The men of these States must be as big as their opportunities.

Why poor people will live in the North when they can live in the South I must admit is past my understanding. The South is the country of all countries for poor people. The negro is there waiting to serve them.

Times are going to change. Things are going to be different in the South.

Recently in New York a friend of mine, who has grown rich as a stockbroker, told me the secret of his success was to play everything in the North to win and everything in the South to lose. "Why, sir," said he, "look at the Northern and Southern railroads. What is the matter with my system?" I predict my New York friend will have to change his system or he will wind up in a Home for the Friendless.

Mr. Belding, ex-Mayor of Hot Springs, read a paper giving the resources of Arkansas, which were startling. He told not only of corn and cotton, but of the preeminence of Arkansas in the production of the apple. Of the strawberries and peaches that are shipped out of the State. Of lead, zinc, coal, gypsum and even gold. Of the pearls that are found in her rivers. Of course all we Hardwaremen know of the wonderful Arkansas Oilstone, but do we know that they have near Hot Springs a mountain of clay that can be used in the manufacture of pottery without any other preparation except the addition of water?

The tremendous resources of some of these Southern States have never been made known to the world. Horace Greeley once said, "Young man go West." The young men did go West and have built up empires. If Horace Greeley were living to-day he would say, "Young man go South." There new empires await you that will rival the conquests of Cortes and Pizarro.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—There has been but little change in the last few weeks in business to report. The demand for goods has continued steady and has been fully up to expectations. The trade is buying only for actual wants and the orders average some smaller than usual and mail orders especially are correspondingly more frequent, and, indeed, are making a remarkably good showing.

Less rain and more sunshine would help business to some extent and yet upon the whole crop conditions are still very favorable, notwithstanding there is too much water in some sections, and especially in the low lands.

Montana and Washington are now having the usual June floods, which have been of unusual violence this season. Country roads must necessarily be in bad shape and the railroads have suffered largely, both passenger and freight service having been greatly disturbed. The worst now appears to be over and things will probably soon be in about normal condition.

Change in prices have been made in a number of lines of goods, but generally they have not been heavy and business has not been greatly interfered with.

The long expected decline in prices of nails and wire has at last come. Its effect on the trade had already been largely discounted and probably will cause no disturbance of consequence.

Prices in general are coming to the lower levels that are necessary in some lines with as little disturbance in the readjustment as can be expected.

If crops come on nearly as well as they now promise a good Fall trade may be expected, notwithstanding political and other disturbances. Prices of farmers' products will be affected to some extent by foreign crops and

markets, but, let the latter be unfavorable as they may be, reasonably good prices may still be expected for most of our farmer's products. It looks now as if the American farmer is likely to stay in the saddle for some time ahead, and, if so, there will be a place somewhere for manufacturers and commercial men

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—The all important matter of interest during the past week, and one which has called for more comment, not only in the trade papers, but also in the daily press, is the action of the steel companies in reducing products all along the line, beginning with billets from $28 to $25, $3, passing through merchant pipe at $4 off, going down the slide to wire nails at $2 per ton, or 10 cents per keg.

It was a confession of the inevitable and came none too soon. Atlas holding up the earth must have felt something of the same relief, when he shifted the weight for a little while on to the shoulders of Hercules, as Hawthorne describes in his story of the Gorgon's Head. Shall we now win our golden apples from the Garden of Hesperides?

There is only one thing left undone which is more or less mystifying to the lay mind, and that is while billets are decapitated to the extent of $3, steel rails are holding up, or are being held up to their higher uniform figure of $28. Why not give the railroads a slice out of this water melon, and let them put in their telling tonnage at the inside figure of at most $25? The low price made on rails some years ago was the one thing which attracted attention and buying once started on such a scale as had never been seen. That was what put under way the great industrial movement and continued down through the following years, rolling with immense increment like the snowball of our youth.

It seems rather rough that the railroads should be held up to recognized excess prices just because the sellers believe that with the help of the tariff they can be. This condition furnishes the strongest argument in regard to the reduction of tariff and the policy may be pursued too far. They will be well employed this season and the idle cars, concerning which so much has been said, will start moving, for we have had abundant rain and are now enjoying warm, proper sunshine, so that the rows in the gardens and fields are vieing with each other in rapid growth, and unless all signs fail us, we shall soon have the realization of the promised bumper crop. There is, of course, no reason to look for immediate large buying. Farmers are busy in the fields and need all of the help they can get to plow and cultivate the soil.

Wheat fields look ready for the harvest hereabouts, and we shall soon be hearing from the mowing machine as it passes by down the hillside or over level field. Whether with all of the good reasons here given why we should have excellent trade, we are going to have it, the deponent sayeth not. It depends upon whether the people feel voluminously disposd. They are certainly able to get along with a smaller supply of goods than seemed possible a year ago. We believe they are rehandling their old axes and hatchets; they are reshaping their battered tools at the blacksmith's forge, and they rather enjoy making their old clothes last yet another season. It is simply the swing of the pendulum. For a time we like to spend freely and then we like to save, and the following years that come in between are apparently necessary to our business life. It certainly gives us something to think about.

Meantime the nation is growing and there is a new lot of young people with unsatisfied wants coming along. These we shall have to provide for in the course of time unquestionably.

Cleveland.

THE W. BINGHAM COMPANY. It is a well known fact that consumption of commodities is the greatest factor and help to stimulate trade in all branches. It also is true that our country is so rich and prosperous in all agricultural lines that business is normally good in most all directions. Manufacturing plants that were partially closed down and the output curtailed, are beginning to resume operations at quite a lively gait.

It is said that Henry Disston & Sons during all the depression did not curtail their output very much if any, simply caught up on old orders, and they retained all their employees, and have been working, as they are now steadily five and a half days each week. They had very large orders for their goods last Fall that they were unable to fill promptly, now they are accumulating stock so as to be ready for the jobbers' and retailers' requirements during the summer and Fall.

Orders are coming to us now in a fair volume, and we confidently believe after July, when the turmoil of Republican and Democratic nominations is over, business men will discount the future, and our great and glorious country generally will settle down, and our business the last six months of this year will be much larger than it was the first six months. We have every reason to be hopeful of the future. Everything in the way of crops, confidence, stability and influence of the clear headed business men, who are really the mainstay of the country, all point to a return of prosperity. We are encouraged greatly by the volume and size of orders that are coming to us at this time of the year from many sources.

A little more confidence among moneyed men will open up their coffers, and the railroads and manufacturers will resume buying, and peace and plenty will be our lot in the near future. We do not see any dark clouds on the horizon to bring about opposite results.

Our semiannual meeting with our salesmen is near at hand, and we expect our plans will result in renewed energy for the midsummer and Fall campaign.

Owing to the dry weather that we have had in this section, it has made a very large sale on lawn hose, sprinklers, reels and accessories.

A short time ago, you will remember, the U. S. Steel Corporation declared their intention not to make any change in the price of their commodities, but for reasons best known to themselves, a short time afterward, they did lower the price on structural and bar steel, and new prices are now announced on wire and nails and wrought steel and iron merchant pipe, and it has made the dealers a little skittish about placing orders on other lines. Now that the deed is done and we know what the price is to be we are expecting a larger volume of business on these lines of goods.

When we talk about consumption it is gratifying to know that the United States of America is so prosperous that they can consume the largest amount of luxuries of any nation on the globe. It is reported that in 1907 the world's consumption of coffee was 16,825,000 sacks, of which 6,980,000 were consumed in the United States, more than one third of the whole amount; twice as much as Germany; six times as much as France, and more than all the balance of the other countries, consumed. Surely we are great people in this U. S. A. that can and do spend so much money for one of our most delicious elixirs.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—June is considered in this section the dullest month of the year in the Hardware business, and it is not proving an exception this year. Many jobbers are taking advantage of this dull month to take inventory, and see the result of the unsettled business conditions for the past six or eight months.

Business at the present time is unsatisfactory, but prospects for future business based on the condition of the country and the purchasing power of the people of the South seem favorable. The crop prospects, taken as a whole throughout the South are far better than they were in 1907, and we made a pretty good crop in 1907.

If we make a good crop there is certainly no local reason why we should not have a good trade, though we must admit we had every reason to expect a good business during the past seven months, but for some reason not easy to locate trade has been unsatisfactory.

We hope before many months to see a full "dinner

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Financial conditions as well as trade conditions have improved in various departments during the last 30 days. Manufacturers of various kinds of goods throughout the country are starting up, and the Government's estimate for the products of the country is in excess of last year, and far in excess of the average for the last 10 years. Money that was withdrawn from banks during the Wall Street crisis has gradually been redeposited, and the banks generally in large cities have loaned to manufacturers at less rates than were paid one year ago, having in view the prospects for trade throughout the country in the fall. At the present time everything looks encouraging for the fall trade, which we look to begin within the next two months.

NOTES ON PRICES.

Wire Nails.—There has been no pronounced increase in demand as a result of the reduction of $2 per ton in the price of Wire Nails and Wire. The disinclination shown by jobbers to stock up beyond immediate requirements reflects a moderate demand from their customers and their own conviction that the decline in price has not put the market on a firm basis and justifies them in anticipating their needs to any considerable extent. Quotations for base sizes are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$1.95
Carload lots to retail merchants	2.00

Less than car lots from mill, 5 cents advance per keg.

New York.—City demand continues in about the same moderate volume as for some time, but orders from nearby territory show some increase in volume. Nails are being held on the basis of $2.40, in small lots at store, with occasional concessions of 5 to 10 cents per keg.

Chicago.—Realization of the anticipated reduction in the price of Wire Nails has not been followed by an immediate stimulation of demand. Whether buyers regard the decline of 10 cents a keg as inadequate and prefer to await further developments, or are merely disinterested at the present time because of light consumptive demand, is not yet apparent. It is plainly evident, however, that the announcement of the new price schedule has evoked no enthusiastic interest. Interviews with a number of jobbers as to their attitude respecting future purchases elicited the uniform declaration that they saw no reason at this time for buying for other than current requirements. Revised quotations are as follows: $2.13, in car lots to jobbers, and $2.18 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—As announced last week, prices on Wire products have been reduced $2 a ton, the new price on Wire Nails being $1.95 in carloads and larger lots, to jobbers. For some time the trade has been holding up orders, fully believing a reduction would be made, and as soon as it was announced, a fair amount of new business was placed, made up mostly, however, of small lots, the trade still pursuing the policy of buying only for actual needs. Opinion is divided as to whether a larger reduction should have been made, and the situation is still characterized by a waiting attitude on the part of buyers. It is not likely the situation will change much for some little time, and it is probable jobbers will continue the policy of placing only such orders as are needed to replenish stocks. Quotations for base sizes are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$1.95
Carload lots to retail merchants	2.00

Cut Nails.—The Cut Nail market has felt the reduction in the price of Wire Nails, this being shown in a weakening of prices. Orders from jobbers cover only actual requirements, which are small. The price for Steel Nails at mill is reported to be a $1.75 base, with the probability that it would be shaded for desirable orders, small lots being held at $1.80 to $1.85, base, at mill. For Iron Cut Nails about $1.80, base, is being quoted at mill.

New York.—Local demand continues moderate and small lots fill the requirements of buyers. Cut Nails are held on the basis of $2.15 per keg for small lots at store.

Chicago.—Cut Nail orders comprise only actual present needs, which are extremely meager. Prospects for immediate improvement in demand are not at all encouraging, as this must of necessity await a renewal of activities in building, car repair work and new car construction. Prices are irregular. Chicago quotations are nominally as follows: In car lots to jobbers, Iron Cut Nails, $2.18; Steel, $2.03; in small lots from store, Iron Cut Nails, $2.30; Steel, $2.15.

Pittsburgh.—Following the reduction of 10 cents a keg in Wire Nails, prices of Cut Nails have declined to about the same extent, but as yet demand does not show any betterment. Jobbers are placing orders only for actual needs, and the amount of new business going to the mills is very small. We quote Steel Cut Nails at $1.75, at mill, but on a desirable order this price could be shaded. Small lots are held at $1.80 to $1.85, at mill. Iron Cut Nails are quoted at about $1.80, at mill.

Barb Wire.—It was not generally anticipated that the reduction of 10 cents per 100 lb. in the price of Barb Wire would stimulate demand to any great extent, owing to the lateness of the season. The policy of buying in small lots will probably be continued, at least, for the present. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.10	$2.40
Retailers, carload lots	2.15	2.45
Retailers, less than carload lots	2.25	2.55

Chicago.—Not much is expected in the way of new orders at this season of the year, and the fact that none of consequence is being entered is not particularly discouraging. It was hardly expected that last week's reduction of 10 cents per 100 lb. would result in an immediate quickening of business, so that the results are in this respect not disappointing. Prices revised in accordance with the new schedule are as follows: Jobbers, Chicago, car lots, Painted, $2.28; Galvanized, $2.58; to retailers, car lots, Painted, $2.33; Galvanized, $2.63; retailers, less than car lots, Painted, $2.45; Galvanized, $2.75; Staples, bright, in car lots, $2.25; Galvanized, $2.55; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The reduction of $2 a ton in prices as yet has not stimulated demand to any extent, nor was this expected, as the season is about over and a new buying movement is not expected in the near future. The trade will probably continue the policy of buying in small lots for actual needs, until it is more fully demonstrated whether there will be any further reduction in prices.

Plain Wire.—Some business has evidently been held back in anticipation of lower prices, as demand has been stimulated to some extent since the reduction of 10 cents per 100 lb. on June 10. The mills are looking forward to a moderate volume of business for some time. Quotations per 100 lb. to jobbers in carload lots are as follows, on a basis of $1.80 for Plain and $2.10 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the price to retailers being 5 cents additional:

Nos.	6 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.80	1.85	1.90	1.95	2.05	2.15	2.25	2.35
Galvanized	2.10	2.15	2.20	2.25	2.35	2.45	2.85	2.95

Chicago.—So far as demand is concerned, there is no change observable as a result of reduced prices. Manufacturers are not hastening to cover future requirements on the new basis, but seem content to order in quantities required for nearby needs. Prices are herewith revised on a basis of 10 cents per 100 lb. reduction from previous quotations. We quote as follows: Car lots to jobbers, $1.98, f.o.b. Chicago, and to retailers, $2.05.

Pittsburgh.—The reduction of $2 a ton announced by the mills last week has stimulated demand for Fence Wire to some extent, as a large number of orders have been held up waiting for the lower prices to be an-

nounced, and consider[illegible] this business has been placed. The mills expect a moderate demand from this time forward, but do not look for heavy business, as the trade will likely continue the policy of placing orders only for actual needs, which policy has been followed for some time past.

Sledges, Picks and Mattocks, Crowbars, Etc.—The market on heavy tools is commanding the attention of buyers who have been looking for a possible reflection of the decline in steel. It is asserted, however, that these lines have been selling on a level that discounted a moderate reduction in raw material and that further concessions of any account are unlikely for the present.

Steam and Water Brass Goods.—There are some indications of a slight stiffening tendency in the market for Steam and Water Brass Goods, including Cocks, Bibbs, Valves, &c. Some low quotations of a special character have been withdrawn, and manufacturers show little disposition to book a large amount of business at ruling prices.

Dripping Pans.—Quotations on Dripping Pans show a slight tendency to wavering. Concessions are not general or important, but buyers are inclined to watch the market carefully, especially as this line has been maintained at a fairly high level, as compared with the course of the general market.

Window Glass.—There is little new to be said in addition to the comprehensive report of the condition of the Window Glass market given in our last issue. Quietness has been a prominent feature during the past week, with both manufacturers and jobbers. Two factories in the East are reported as having gone out of blast and it is understood that only about one-third of the productive capacity in the Kansas territory is being operated. As stated last week, general quotations from jobbers' list are 90 and 30 per cent. discount on single and 90 and 40 per cent. discount on double strength Glass; while quotations of 90 and 30 and 10 to 90 and 40 and 5 per cent. discount on single and 90 and 40 to 90 and 40 and 10 per cent. discount on double strength have been made. From manufacturers' list general quotations are 90 and 40 per cent. discount on single, and 90 and 40 and 10 per cent. discount on double strength in carloads. Quotations have, however, been made of 90 and 40 per cent. to 90 and 40 and 5 per cent. discount on single and 90 and 40 and 10 to 90 and 50 per cent. discount on double strength. It should be borne in mind that the jobbers' list is about 25 per cent. higher than the manufacturers' list.

Binder Twine.—The reassuring Government crop report, with the prospect of the largest crop of oats and the second largest yield of wheat in the history of the country, and increases in the yield of other small grains, is an excellent reason for sustained prices of Binder Twine. As the greatest proportion of Twine required for the nearby harvest has been purchased from manufacturers and guaranties have expired, a firm market should be comparatively easy to sustain, as increased strength has been shown during the past week. Quotations continue as follows:

	Cents per pound.
Sisal	8¼
Standard	8¼
Standard Manila	9¾
Manila	11¼
Pure Manila	13

Carload lots, ¼ cent less; 5-ton lots, ⅛ cent less, central delivery, fall terms.

Rope.—Manufacturers report good days and bad days, the latter predominating, as indicating the character of the demand during the past weeks. Orders are usually for small quantities and represent only immediate requirements. The Hemp market is quiet and cordage manufacturers seem to have purchased all they require at present. Manila Hemp is quoted at 6⅝ cents for fair current shipment and Sisal at 5⅛ cents for shipment. The Rope market is not very firm at the following quotations: Pure Manila, 10 cents; Pure Sisal, 7 cents; No. 1 Jute [illegible] No. 2 Jute, 4 cents and up, 5¼ cents.

Linseed Oil.—The demand for small lots continues moderate, but orders are frequent, and in the aggregate amount to quite a fair business, considering general conditions. A limited amount of business is being done in carload lots for delivery through July. The price of flaxseed fluctuates from day to day without, however, affecting the price for small lots of oil. Local quotations are as follows: State and Western Raw, 42 to 44 cents; City Raw, 44 to 45 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—While the net results of fluctuations during the week have been a decline of ½-cent per gallon in this market, the Savannah price has not gone below 40 cents. This is regarded by some as reflecting the stability of Turpentine conditions. The demand at this point has been steady, but only for jobbing lots, showing the disinclination to accumulate stock beyond immediate requirements. The New York market is represented by the following quotations: Oil Barrels, 43 to 43½ cents; Machine Made Barrels, 43½ to 44 cents.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM HOLDER-ATHEY HARDWARE COMPANY, Bloomington, Ill., which is about adding to its line steam and hot water heating.

FROM TAYLOR BROS., who have been incorporated with a capital stock of $5000 to succeed the Enumclaw Hardware Company in Enumclaw, Wash. The stock has been moved to a new location and Harness added to the former lines—including Shelf and Heavy Hardware, Stoves, Tinware and Sporting Goods.

FROM UNIONTOWN HARDWARE & SUPPLY COMPANY, Uniontown, Pa., which handles general Hardware, Mine, Mill, Plumbers' and Steam Supplies.

FROM HARPER HARDWARE COMPANY, Chester, Pa., which has been organized, with a capital of $20,000, to succeed Paiste-Harper Hardware Company, with the following officers: J. M. Harper, president and treasurer; A. Hodge, secretary, and W. F. Hargrove, manager. The company wishes catalogues of Hardware, Foundry and Mill Supplies.

FROM OWENSBORO HARDWARE & IRON COMPANY, Owensboro, Ky., a concern representing the wholesale interests of W. A. Guenther & Sons, which has been incorporated with a capital of $125,000. The company handles a wholesale stock of Shelf and Heavy Hardware, Stoves, Paints, Sporting Goods, Harness, Mine and Railroad Supplies, Building Materials, Wagon Wood Stock, &c.

FROM I. P. REESE, Lancaster, Pa., for some years a traveler in the East for Simmons Hardware Co., who is about to open a new Hardware and House Furnishing Goods store.

J. Stevens Arms & Tool Company, Chicopee Falls, Mass., is prepared to supply to the trade a varied and attractive assortment of Stevens advertising material, consisting of recently issued abridged catalogues, part envelopes, pamphlets, illustrating targets, circulars for mailing and for counter distribution, single and double column mortised electrotypes featuring hunting scenes, cuts of different models, &c. The company will furnish these supplies gratis to Hardware and Sporting Goods merchants who will pay transportation charges.

The John S. Solenberger & Co., Inc., has been organized with a capital of $30,000 to conduct a general Hardware business in Winchester, Va.

Local Advertising by Window Display.

THE value of striking window displays as a means of local advertising appeals with increasing force to the Hardware trade, and much attention is being given to the designing of effective show window arrangements. Formerly it was thought that Hardware stocks were of too prosaic character to be used effectively in window dressing, but in later days it has been abundantly demonstrated that one need not go outside the ordinary goods

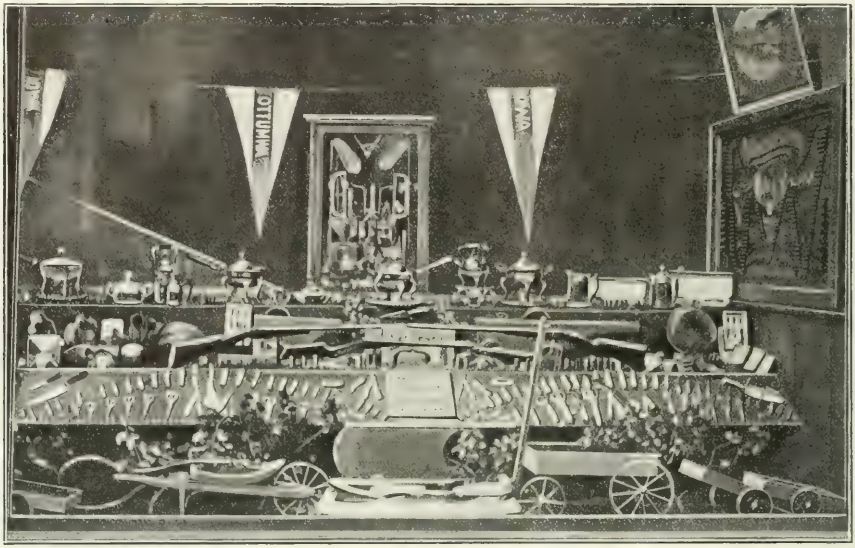


Fig 1.—Local Advertising by Window Display.

composed in the average stock of a Hardware store to find material that if properly arranged will arrest attention as quickly as the artistic drapings seen in dry goods windows. The accompanying illustration shows a window designed and set up by the clerks of the Ottumwa Hardware Company, Ottumwa, Iowa, and the entire expense involved in its preparation did not exceed $5.

Fig. 2 shows a cross section of the display stand frame, which was built to facilitate the arrangement of

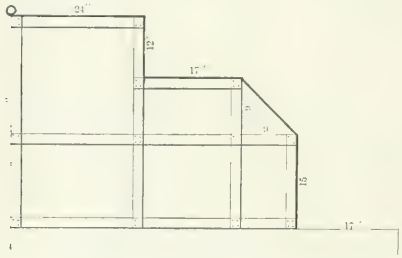
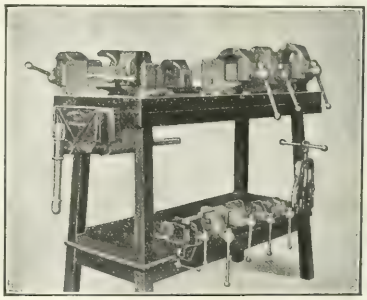


Fig. 2.—Skeleton Frame for Display Stand.

articles, and may offer suggestions that will be helpful to other merchants. The display was made up of the following articles, taken from the company's regular stock: Chafing Dishes, Trays, Baking Dishes, Five o'Clock Teas, Tea Pot, Coffee Pots, Sets of Carvers, Nickel Plated Pitcher, Gun Cases, Shell Belts, Shotguns, Rifle, Air Gun, Revolvers, Baseball Mask, Catcher's Mit, Wrist Supports, Decoy Ducks, Baseball Gloves, Child's Set, Baseball Cap, Childs' Carts, Baseballs, Boxes of Cartridges and Shells, Whistles, Punching Bag, Foot Ball, Boxing Gloves, Skates, Razors, Barbers' Shears, Lather Brushes, cakes of Shaving Soap, Scissors, Pocket Knives, Boys' Wagons, Boys' Wheelbarrows, Pearl Handle Nail File, Pearl Handle Manicure Knife, Pocket Shears, Manicure, Embroidery and small Scissors, Leather Knife Pockets, Paring Knife, Sabatier Knives, large and small Shears, &c.

Movable Stand for Displaying Vises.

KASPER & KOETZLE, 565 Bushwick avenue, Brooklyn, N. Y., have devised the convenient stand shown in the accompanying illustration for displaying Vises. The stand is about 4 ft. high, strongly constructed, having two shelves to which the Vises may be attached. The firm carry a large stock of these goods and display a complete assortment of samples set up ready for use. A feature of the stand is that it is on casters and, in spite of



Vises Displayed on Movable Stand.

its weight when loaded, may easily be moved around as desired.

Ross Hardware & Supply Company, Grand Junction, Colo., has been incorporated with a capital of $15,000, to conduct a retail business in Shelf and Heavy Hardware, Stoves, Tinware and Sporting Goods.

Gardner Hardware Company, Hillsdale, Mich., has been incorporated with a capital of $10,000 to deal in Shelf and Heavy Hardware, Stoves, Tinware, Implements and Sporting Goods.

The Jenkins-McKay Hardware Company, Central City, Colo., has been incorporated for $35,000 to deal in Shelf and Heavy Hardware, Stoves, Paints, Sporting Goods and Mining Supplies.

Death of Jonathan S. Haselton.

JONATHAN S. HASELTON, a leading citizen and prominent [illegible] of Rome, N. Y., died of pneumonia on Monday, 14th inst., after an illness extending over [illegible] a month. He was in his sixty first year. He was born in Lawrence, Mass., going to Rome when very young. He became president of the Rome Brass & Copper Company, and is said to have been entirely responsible for the upbuilding of the following affiliated companies, in which, including the parent company, he owned a controlling interest: Rome Metal Company, Rome Tube Company and Rome Tack & Nail Company. He was a man of great executive ability and high character, and greatly esteemed by business and social associates. Recently he presented to the Baptist Church an expensive chime of 10 bells in memory of his mother, which were rung for the first time on Memorial Day. He is survived by a widow, one son and two daughters.

DEPARTMENT STORE RECORDS OF SALES.

BY CLARFIELD.

IT may be interesting to Hardware merchants to know how sales records are kept and made and met by the managers and proprietors of the large department stores where the accounts of the various departments are segregated and details are watched with much greater care than is usual in a retail store of smaller proportions. It possibly may not be generally known that the management of these great enterprises has constantly accessible in tabulated form the daily sales record of every separate department for every business day of the concern's existence. These records are referred to as a basis upon which to judge and arrange current plans and operations. It is always the aim and endeavor of the executive staff to surpass all previous records.

Sales Totals Known Some Day.

In these great stores, despite the enormous volume of business, the total sales of each day are accurately known at the end of the day, and each department chief knows with the same accuracy the separate result of the day's selling in his own department. Of course, the total results for the entire store are known from the cashier's report of his day's receipts, but the various department managers learn their amounts by footing up the amounts shown in the individual sales books in their department. The actual balance is found in the auditing department, where a large force is constantly kept busy sorting and footing up the sales checks and tabulating the results.

Triplicate Check System.

Some concerns use a duplicate check system, but the one probably most in vogue is the triplicate sales check book, which provides an original and two carbon copies. In this system the original goes to the cashier and verifies the amount of the sale, the second goes to the packer as his voucher for sending out the goods which will bear his number, and the third goes into the parcel for the customer, and always proves valuable when some subsequent adjustment is required. The first and second check then go to the auditing department where they are filed after having been sorted, footed with others and checked. These two show a complete record of the sale, as they carry a serial number of the transaction as well as the numbers of the salesman and packer, and if the sale happened to be of unusual or special nature they will also show the floor manager's or superintendent's signature. It is thus comparatively an easy matter to trace all transactions and discover any irregularities.

The Tubulated Results.

Most general managers keep before them the daily results of the previous year, for from a week to a month in advance of the current year's date, in order that they may plan to strengthen the weak days and to eclipse the heavy ones. In addition to this, they have a tabulated book showing the daily results in each individual department, and they can readily see in which sections good or poor records have been made. In reference to the records of the separate departments, it might be well to explain that these represent much smaller divisions than the average retail merchant might suppose. For instance, whereas the Hardwareman might believe that one department would represent nearly everything that he sells in his store, as a matter of fact the lines carried by the Hardware store usually represent several different departments in one of these large organizations. Carpenter's Tools, Housefurnishings, Paints, Cutlery, Silverware, Sporting Goods and other subdivisions are quite likely to be treated separately, and frequently will be found under the supervision of different buyers or managers. It will thus be seen that the Hardware merchant can subdivide his business upon the same plan if he desires, and it might prove the means of effectively increasing his business.

The Executive Staff.

Every man who has served in an executive capacity in one of these large stores knows the meaning of these tabulated results, and has experienced the nervous strain brought on by being confronted with them and being requested to overcome them. The firm, the merchandise manager and the advertising chief have almost daily conferences upon this subject, and every possible means is employed to push the business ahead, to keep the stocks clear of slow moving merchandise and to strengthen every weak point that can be found. The department manager is provided in advance with the previous daily sales of his respective section, but of course he does not know the results in other departments. He is also given the percentage of his profits, as related to his sales, and if he accomplishes big sales at the expense of his percentage, which he can easily do by cutting prices too liberally, he is sure to hear from the "inner office."

Department managers are often sent for and reminded that on a certain date they have unusually large records to meet, or that such a day the year previous was abnormally small, and that they will be expected to cooperate energetically with the merchandise and advertising managers to overcome these resords. This means "hustle," and woe to the man that fails!

In many large stores regular weekly or monthly meetings of the executive staff are held, with a member of the firm presiding. All sorts of general policies and propositions looking to the betterment of the business are discussed, and a great deal of good is usually accomplished.

GILES HUMPHREY ALFORD of G. H. Alford & Son, Willimantic, Conn., died June 7 of heart disease. He was born in Otis, Mass., April 18, 1827, and when of age, after preparation in Normal school, commenced to teach first in Massachusetts and afterward in Connecticut. In 1851 he entered commercial life as clerk for his uncle and later purchased a business in another line. He was in the Army of the Potomac in the early years of the Civil War, afterward returning to business life in Willimantic. He then became a traveling salesman for the Upson Nut Company, continuing for eight years, when he purchased a bankrupt hardware stock. He was a Mason for 50 years and since 1844 a member of the Congregational church, in which he was very active, having been a deacon for a long period. For his years Mr. Alford's vigor was remarkable, having been actively engaged daily in business until the last.

THE NATIONAL RIFLE ASSOCIATION OF AMERICA, which has had charge of the selection of ammunition for use by the American team in the International Olympic Rifle Match, to be shot at Bisley, England, next month, has chosen that made by the United States Cartridge Company, Lowell, Mass., for which the U. T. Hungerford Brass & Copper Company, New York, are the representatives. The committee in charge of the matter chose the 180 grain bullet cartridge.

C. M. RUSSELL has resigned as president of the Vermont Hardware Company, successor to Holton Hardware Company, Burlington, Vt. D. R. Campbell, treasurer, and P. C. Russell also retire from the company, which has elected the following new officers: President, S. F. Henry; vice-president, A. E. Tryon; secretary, F. H. Prouty.

Orr & Lockett's "Red Book."

A NEW edition of the "Red Book," a catalogue of manual training benches and tools published by the Orr & Lockett Hardware Company, Chicago, is just off the press and being distributed to the trade. This is said to be one of the most complete catalogues of tools and equipment required in manual training schools published in the country. It shows a great variety of hand tools, which includes a line of high grade Auger Bits, Hammers, Chisels and Gouges under the brand "Orlock," the company's own distinctive mark. This brand, it is stated, will not be put upon any tools that cannot be guaranteed. One of the new features presented in this book is the "Orlock" Combination Cabinet, Work Bench and Tools, No. 50, shown on page 2. The Cabinet is especially designed for manual training instructors and others living in apartment houses where there is no work shop or place to set a bench. Another interesting feature is the Combination Bench and Lathe designed by Frank Henry Seldon, teacher of woodwork at the University of Chicago, for the use of instructors in woodwork and wood turning. The Bench is provided with eight tool drawers which have a lever locking device that prevents the scholar from entering any but his own drawer, while the teacher can remove any drawer desired in case it should stick or the pupil forget his key.

Old Guard Southern Hardware Salesmen.

AN event of collateral interest in connection with the Hot Springs conventions and one that foreshadows the successful fruition of a long contemplated purpose was the preliminary organization of the Old Guard Southern Hardware Salesmen. The leading spirits in this movement called a meeting at the Arlington Hotel on Wednesday, which was attended by a number of the veteran Southern salesmen, and after careful canvass of the plans outlined the following officers were elected: President, H. H. Beers; first vice-president, C. F. Forsyth; second vice-president, O. C. Mead; Secretary and treasurer, F. M. Higgins. Executive Committee: W. A. Chenoweth, D. K. Stucki, John Hoen, J. H. Gossett, John K. Wilson, F. S. Seeley and P. C. Cauthorn.

The next meeting of the society will be held at Memphis, Tenn, in November on dates coincident with those of the conventions of the National Hardware Association and American Hardware Manufacturers' Association at which time a constitution and by-laws will be adopted. The membership will be limited exclusively to salesmen who have been visiting the Southern jobbing Hardware trade for 15 years or more. The society will be largely social in its nature, but will afford a channel for co-operative effort along any line touching the interests of its membership.

THE HOT SPRINGS CONVENTIONS.

American Hardware Manufacturers' Association—Southern Hardware Jobbers' Association.

THIS year, for the first time in their history, a location west of the Mississippi River was chosen as a meeting place for the conventions of the Southern Hardware Jobbers' Association and the American Hardware Manufacturers' Association. And in selecting Hot Springs, Ark., as the scene of their deliberations June 9, 10 and 11, a fitting tribute was paid to the loyalty of Western members of both Associations, who for years have traveled to far Northern and Eastern cities to lend by their presence, aid and encouragement to the aims and purposes represented in the efforts of these assemblages. Following the announcement of their choice of cities it was decided by the Arkansas Retail Hardware Association to abandon an established precedent under which its annual conventions have for several years been regularly held in Little Rock, and meet on simultaneous dates with the two above named Associations at Hot Springs. The triple meetings which resulted, and of whose opening sessions a brief synopsis was given in *The Iron Age* of last week, combined to make the occasion one of notable interest.

The assembly halls provided for the business sessions of the conventions were admirably suited to the convenience and comfort of members. The retail merchants whose headquarters were at the Majestic Hotel held their meetings in the Majestic Opera House nearby, while the Arlington Hotel, at which the Manufacturers and Jobbers were quartered, provided suitable rooms within the building for both general and committee meetings.

Because of the length of journey involved for the majority of manufacturers and jobbers and the anticipation of encountering the discomforts of sultry weather, even the most sanguine and enthusiastic scarcely dared to predict anything more than a scattered and meager attendance. That such estimates failed to take account of the importance which in the minds and judgment of members of these bodies attaches to their annual and semiannual concourses was evident from the size of the gathering, about 150 names appearing on the registry of the manufacturers and upward of 100 on that of the jobbers.

Entertainment.

No dull moments were experienced by the members or guests of any of the three conventions during their stay in Hot Springs. Had no formal plans for entertainment been made there were features of interest in abundance to be found in this wild region of the Ozark Mountains to occupy more time and attention than the casual visitor usually has at command; but the convention visitors were not left to their own resources. Beginning with a delightful reception and ball at the Arlington Hotel on Tuesday night, the entertainment furnished included a tally-ho ride up the winding government road to the top of the mountain from which the hot springs flow. A beautiful view of the city and surrounding country was enjoyed from this point. At 1 o'clock Thursday afternoon a "Burgoo" dinner was given by the Hardware jobbers of Arkansas at Whittington Park.

The delightful weather which prevailed during the three days of the convention lent especial attractiveness to the out-of-door entertainments. Morning horseback rides over the winding valley and hill roads of the mountains were indulged in by many of the convention visitors, who pronounced this enjoyable exercise one of the most pleasing features of their trip.

President Asbury's Address.

President C. W. Asbury of the Manufacturers' Association stated that as this was the semi-annual meeting of that body, his address would be merely in the nature of a report calculated to keep the members in touch with the work being done. He referred to a conference of employers held in New York City, and also to the meeting of the Atlantic Deeper Waterways Association, of which the association has become a member. He also stated that a conference had been held with a committee from the American Exporters' and Importers' Association of New York, relative to desired coöperation, which he was pleased to recommend. Referring to the convention of the National Retail Hardware Association, President Asbury said that the relations of the manufacturers with that body were most friendly and declared that fairness of spirit and action were the only requisites for continued coöperation and good will. A conference held with representatives of leading business associations by the Secretary of Commerce and Labor was given attention, showing the efforts of the administrative departments to get in closer current touch with

the business world. As a result of this conference the National Council of Commerce has been organized, the question of affiliation by membership being submitted for action of the association. Mr. Asbury continued:

Cost Keeping Systems.

Your officers have not forgotten your instructions relative to continued attention to cash discount abuses, and to the encouragement of the installation of cost keeping systems among your members. You have been currently advised by circular letter from the secretary's office, of the steps taken in these matters, and I can only add that your officers will keep themselves in position to willingly and actively pursue any course which you may outline. There have been quite a few of our members who have expressed an active interest in the matter of providing adequate cost keeping systems in their respective plants. Quite a few have adopted the suggestions made by this association, and I am confident they have done so with large advantage to themselves. This line of activity will be continued in the hope of removing some of the primary causes for destructive and disastrous competition in certain lines of Hardware. This kind of competition can best be controlled by knowledge. If actual costs can be determined by positive rule and method, instead of by estimate, these costs will naturally be a guide in making up selling prices. We especially invite correspondence with any of our members upon this subject, as we feel confident we can be of service.

Legislation and Tariff.

Your officers have found it advisable to keep in touch with general legislation at Washington, because it is naturally true that many bills are introduced into Congress at each session which affect the interests of manufacturers generally. Your officers have assumed the responsibility of using the influence of this association for or against legislation which might affect the membership favorably or unfavorably. It now appears as though a readjustment of schedules in the tariff will be effected shortly after the opening of the new Congress in March next. I recommend such steps as your wisdom will dictate to provide against disastrous alterations in these items which might affect your interests. This is a large work, and should be approached from the business viewpoint rather than from the political.

President Donnan's Address.

The address of President Donnan of the Southern Hardware Jobbers' Association embodied a thoughtful review of the financial and industrial events of the past year in the course of which he voiced the belief that never in the history of the Hardware associations has their work been so necessary and effective as within the past few months. It was pointed out that the influence of organized effort had been a powerful factor in staying hurtful demoralization which might otherwise have wrought havoc to business interests generally. In the course of his remarks, President Donnan said:



C. W. ASBURY



W. L. SANFORD

Need of Loyalty.

How can any association be fully effective without the loyalty of all its members? Each year the experience of every organization is that a few of its members are faithful, and by letters and suggestions to their executives help to carry the burden; but is this true of all?

A Year to Be Remembered.

The year through which we have just passed will long be remembered by every merchant and manufacturer of this country. The causes given for the panic are many. Some say the cause was overcapitalization; others want of confidence; others, governmental prosecution of trusts and State and Federal attacks upon railroads. Be this as it may, the fact remains, we have passed through a terrible period and millions have been lost at a time when our country was on the top wave of prosperity, and when the United States Department of Commerce and Labor states that $430,000,000 was the balance in our favor during 1906 in the increase of exports over imports. Our exports in 1907 exceeded those of 1906 by $125,000,000. The national debt in 1907 was $86,000,000 less than that of the previous year, being a reduction of $1.20 per capita. In the production of cotton, corn, wheat, tobacco, coal, petroleum, pig iron, steel, copper and silver the United States led the world.

Currency Problems.

With a knowledge of these facts, surely something must be radically wrong with our currency system. If the stringency in our money market is caused by having to provide currency to handle 13,000,000 bales of cotton, in what condition will we be when the South doubles and trebles its cotton crop?

Necessity of Export Markets.

One of the greatest dangers to this country is its prosperity. With the cheapest fuel and raw material, modern machinery and skilled workmen, we are able to produce far more than we can consume, and to prevent congestion, it is absolutely necessary that we should export our surplus, both of crops and manufactured goods. Have you realized that England, our largest customer, has not only in Egypt and the Soudan, but also in Uganda, in British East Africa, a country as large as Louisiana, Mississippi, Alabama, Georgia and South Carolina? Protected by Great Britain and backed by her millions, more cotton is produced and sold by the people of this territory than by any nation, except our own. The quality of cotton produced in that soil, from American seed, is equal, if not superior, to the same cotton grown in America; and the price paid for labor is 2 cents per pound for planting, harvesting and bringing to factory. Last year, 2,000,000 lb. were made, and during the current year 5,000,000 lb., which was ginned with the most modern machinery.



JOHN DONNAN.



F. S. KRETSINGER.

Interests of the South.

With the rapid development of the South both in agriculture and manufacture, and the prospect of our very best customer preparing to grow cotton in the land of her possession, we Southerners are vitally interested in the rapid construction of the Panama Canal, which, when completed, will not only give us easy access to the Western coast of South America, but put the markets of the Orient in direct connection with all of our South Atlantic and Gulf States.

The time has now arrived when the solution of the great questions confronting this country must not be left alone to lawyers and politicians to solve, but must be grappled with by the practical brains of the mercantile and manufacturing world; by men whose daily life not only brings them in contact with large affairs, but whose everyday experience with worldwide questions pre-eminently fits them for the task.

Foreign Born Population.

The distribution of immigrants as to numerical preponderance in the year 1906 was in the following order: New York, Pennsylvania, Illinois, Massachusetts, New Jersey and Ohio. It is a fact that two-thirds of the immigrants to this country settle in the Atlantic or Middle Western States, already thickly populated, and the proportion of foreign born to native population in many of the cities of that section has already become startling. Speaking generally we have 38 cities of over 100,000 population. Of these only 11 have a native element of over 50 per cent. I am glad the South is a homogeneous people. I believe the day will come when it will prove to this great republic a shelter in the time of storm. North and South Carolina have almost no foreign element, Georgia almost none; Mississippi but little; Virginia, Arkansas and Tennessee no significant admixture.

True, this is the land of the free, but may God save us

from being deluged with the riffraff and offscum and offscouring of South Europe; men who are members of the mafia; who consider license, liberty; men who have no reverence for and desecrate our Sabbath; men who are permeating this land with ideas of anarchy and polygamy—a class who are not only undermining the sanctity of our family life, but who will, if not restrained, in the future undermine the very foundations of our Government. These are some of the great and complex problems we are compelled to face, and which for the future peace of our country and the happiness of coming generations we must have the courage to settle.

Secretary Kersey's Report.

In his annual report, Secretary Kersey of the Southern Hardware Jobbers' Association said, in part:

I desire first to thank most heartily those members of the association who have so generously extended their aid, sympathy and support in making light the duties of my office. We have had our moments of discouragement, but these were only transitory. When these would come, some one of the kind-hearted and faithful would drop us a line, telling us of the good work we were doing, and by appreciative words encourage us to even greater efforts. If a few letters like those above alluded to renew our waning spirits and spur us on to greater efforts, what would be the result if they should come in larger numbers? We have no desire or inclination, however, to criticise our membership for a want of interest, or lack of co-operation in the many steps taken during the year just closing, to foster the projects, and carry forward to a successful conclusion those recommendations which had for their object only the good of our association as a whole. It is true there have been

Some Differences of Opinion

as to a few matters which have been brought to the attention of the manufacturers for correction, but in the majority of instances, unanimity has marked our action, and the best of feeling prevailed. As the years go by, we hope to see our membership come closer, and closer, together. My one ambition, when taking this office, was to discharge its duties in a way that would tend only to the uplift of the association, and foster that feeling of friendship which has always been our prominent characteristic.

Value of Correspondence.

We have not consumed the time to enumerate the number of letters sent out to the association, both circular and otherwise. In our opinion it is not the frequency of letters from the secretary's office that should count with our membership. But when a letter is placed upon the desk of the head of the firm, and on opening it, he finds some meat in the shell, his interest is aroused, and when another comes he is apt to regard it with the same interest. We may have been somewhat prolific in our letters to the membership, urging them to attend this convention, but any seeming insistence on our part can be readily explained. We felt sure if we could get the membership in full attendance at this meeting, they would hear by ear the things we could not place before them so forcibly on paper.

The good feeling which has existed between the manufacturers and members of this association for so long a time has not been disturbed during the present year. Some few complaints have been entered, but they were of a minor character.

THE RECENT PANIC: ITS CAUSES AND REMEDIES.

At the opening session of the jobbers on Tuesday morning, at which the manufacturers were present by invitation, after the addresses of welcome by President Donnan and the Rev. M. W. Manville, the latter welcoming those present to Arkansas in place of Governor Pindall, who was unavoidably absent, a formal discussion of "The Recent Panic—Its Causes and Remedies" took place. The discussion was opened by F. S. Kretsinger, American Fork & Hoe Company, Cleveland, representing the Manufacturers' Association, who spoke in part as follows:

Remarks of F. S. Kretsinger.

The one thing which appealed to me as the reason why on the 23rd of last October there should be a panic was simply that people who had a few dollars lost confidence in the banks that held the money. Ninety-nine per cent. of the banks were sound and conservative; but among them were a few who used the money which belonged to their depositors in promoting one scheme and another. When these facts came to the surface, naturally confidence was disturbed and the panic followed; and yet the mystery of it is that it should follow when we know, as we all do, that the farmer and the planters all over the country are practically rich. The States in the North with which I am familiar, where for years they were in debt, borrowing from the Eastern capitalists and mortgaging their farms, have paid off those debts, and the country banks—by that I mean those banks out of the large industrial centers—the country banks today are overflowing with money, and indeed in the large cities the banks are now overflowing with money.

Now, as I said in the start, this question is too much of a conundrum for me to answer satisfactorily to myself. It is sufficient to know that we are in it now. It is a question now of patience. We are entering a period when in most lines there is always a dullness, and I look for no return of even a normal trade until after we are assured of having a fair or a large cotton, wheat and corn crop, and even then we will not recover. It may be years before we return to our old prosperous times, and it is perhaps undesirable that we should return to conditions that existed a year ago. We were all rushed; we were running up hill, we manufacturers of merchandise; we were crowded for material, and you jobbers were crowding the manufacturers for goods. We were running night and day. Now we are glad to run on half time; but let us not get discouraged; let us run on economically and run our affairs at home as well as in our business in an economical way and wait for a recovery of the times which will follow when we have good crops, because the farmer and the planter are the foundations for our prosperity.

Address of J. D. Moore.

Following Mr. Kretsinger's opening remarks, the subject was taken up by J. D. Moore, Moore & Handley Hardware Company, Birmingham, Ala., who delivered an able address showing a thorough study of the subject. Mr. Moore said that it was necessary in order to understand the matter aright to follow the movement of great unseen forces extending over long periods of years. He said that

Panics Serve Many Good Purposes.

They are needed as much as prosperity and teach valuable lessons. We must be shocked now and then and made to think and reflect. In the midst of prosperity we are too apt to forget many important things, which the leisure of quiet times gives us the opportunity to consider. The panic of 1893 produced the corporations. The panic of 1907 was produced by a strenuous effort to regulate and purify them. Yea, many thought the idea was to destroy them and resolve them into their original elements and return to the good old days of competition and individual effort.

Growth of Co-operative Idea.

Mr. Moore referred to the organization of the Southern Hardware Jobbers' Association as the birth of a spirit of coöperation in trade and manufacturing, which has spread to all parts and throughout the entire country. This was thrust forward by the logic of conditions. The panic of 1893 left the resources of the country in a sadly depleted state. All the material elements of prosperity were broken down and the financial and business world was made up largely of weak elements, hardly strong enough to stand the loan. After suffering from the effects of this panic some one conceived the idea of combining a number of these weak elements in order to get an organization strong enough to operate. The idea proved successful and was widely copied, resulting in the birth of the great corporations.

Corporations Became Giants.

Referring to the subsequent period of national development in which the corporations grew to enormous strength, Mr. Moore said:

In the midst of all this prosperity some of these corporations, with their aggregations of strength, conceived a false notion of their power and became too autocratic and too dictatorial, and committed a great many things that needed correcting. Some of them undertook to take charge of legislation and make the laws. In fact, they felt that they were superior to the people, and committed a great many practices, such as the giving of rebates, passes, and extending a great many privileges to a favored class. The people became aroused and concluded that they could not stand this longer. Thus began an agitation against the corporations, which has been going on for a series of years.

Repressive Measures.

Mr. Moore showed clearly how corporation regulation and repressive legislation were carried to extreme, resulting in the frightening of investers and the depreciation in securities. This weakened the banks and trust companies, some of which had to close their doors, and the panic was on. Coming to the features of the situation to-day, Mr. Moore declared that by purchasing stocks at low prices, the poor man has become co-partner with the rich, although the amount of his stock may not be altogether as large as some of the others, but what he has is just as well managed and as well taken care of as the larger stockholders. Now that the laborer has become a partner with Mr. Morgan, he thinks

more kindly of him, and he will make a better juror when it comes to damage suits, he will be more considerate when it comes to a question of strikes; and the question of capital and labor has thus been solved in a way that we were not looking for, and instead of Government ownership, as some of our great politicians have been preaching, we will get another and better thing, which is people ownership. We will have

The People Owning the Corporations,

and then they will not [illegible] such [illegible] as the politicians would have [illegible] and thus the great problem of the brotherhood [illegible] worked out. Commerce is coming to recognize the principles of Christianity, which have been taught for thousands of years, that the brotherhood of men is the correct doctrine, and when commerce shall begin to apply the principles taught by Christ, we can suffer the evils of a panic temporarily in order to obtain such results.

Let Us Not Make the Mistake

that the corporations are to be destroyed, since they were produced out of the logic of the conditions of 1893. They have come to stay and the principle is the correct one. What we do want is to have purification accomplished through corporate publicity and Government regulation. When the Government shall have examined into these corporations and can place its approval upon those that are managed correctly and right, it will be a great assistance to the corporations themselves, and it will force them to be honest, as they should be, so that the investor in their stocks shall invest on the character of the corporation and not be easily swindled, and when that day comes it will be an easy matter to finance the corporation, because all the people are able to do whatever they desire and set their heads to do.

Some of us perhaps have been abusing different classes for bringing on this panic. The fact of the business is that perhaps all of these have been contributory, and no one of them has been wholly responsible. The real fact is, that

We Have All Had a Part In It

and there has been too much general extravagance; people have been living too high, borrowing too much money, too ambitious to get rich quick, and hence we are all responsible. Then we need not stop to complain of others or abuse any particular class, and we can be more reconciled when we see that the panic is to teach a great lesson, that of the brotherhood of man, the settling of the question of capital and labor by making them partners in the same institution, and when people become partners they become more friendly and considerate of each other.

We have learned that we cannot disturb any of the great interests of our country or any section of our country without we all suffer. Our interests are linked together and our interests are mutual, and if it takes panics to teach this then panics are good things.

POLICY OF PROTECTION AND ITS EFFECT ON HARDWARE INTERESTS.

Another joint session of the manufacturers' and jobbers' associations was held on Wednesday afternoon, over which Mr. Asbury, president of the former body, presided. The session was given up entirely to the discussion of two papers, one, "Is the Policy of Protection in Its Broadest Sense, as Viewed by the Business Man, Detrimental or Advantageous to the Allied Hardware Interests of the Country," and 2, "Should Not Associated Manufacturers Who Control Prices Protect the Jobber Against Decline on Stocks on Hand?" The subject of protection was first taken up. Mr. Asbury introducing W. T. Johnson, [illegible] Axe & Tool Company, Glassport, Pa., to present the matter from the manufacturers' standpoint. Mr. Johnson spoke as follows:

Address of W. T. Johnson.

At the present time it seems to me well to be guided in a measure by precedent and what has been done along those lines before.

We are down here in the grand old South, where since the time when slavery was at question it has not been decent to be anything else but a Democrat. I happened to have been born in one of the old Southern States myself and that was the programme that I was brought up on.

Now, I have prepared a little paper here and taken up some records of how protection has been considered in the past and that is all that I will dare to present to you.

I do not claim that our present Tariff system is correct. I do not claim that it should not be revised, but I am a protectionist and I believe sincerely that it is to the interest of jobbers and manufacturers alike for the protectionist policy to continue.

That the policy of imposing duties upon competing products from abroad, sufficient to discourage their use, and to make them unprofitable to the dealer, indirectly promotes the growth of national industries, which means the growth of our country, can hardly be gainsaid.

From the Rise of General Feeling in Europe,

at the close of the middle ages, to the Congress of Vienna, in 1815, all governments pursued the policy of protection to home industry. Among economic theorists, a protest against this was begun by the French Economists, in 1754. It found its finest exposition and defense in their Scotch Disciple, Adam Smith, who contended that the interplay of self interest is quite sufficient to secure the best industrial development, and that, when every man is left to do as he will with his own, he will do what is best for society.

The antipathy of Napoleon I. to this theory and the questionable methods he employed to counteract it in his Continental System, seemed likely to give it a chance of being applied in the States represented at the Congress of Vienna, but a few years of actual experience satisfied the rulers and cabinets of the Continent that the path to national prosperity did not lie in that direction. They returned to protection, which England and France indeed never had abandoned, and which Germany made effective for the whole country, through the Zollverein, 1817.

It was in the United Kingdom, in 1846, after eight years of popular agitation, by the Anti Corn-Law League, that a European government, first took steps to abandon protection, and that after 510 years of it, had lifted England out of the dire poverty of a merely agricultural country, into the first rank among manufacturing nations. And even she protected her silk and glove industries against French competition, until the Cobden Treaty of 1860 agreed to the abolition of these duties.

In Our Country the Need of National Government,

which could extend protection to the prostrate industries of the States, was one of the most powerful motives to the formation and adoption of the Constitution of 1787, which authorized Congress to impose duties on imports to pay the debts and provide for the common defense and general welfare of the United States.

The harsh experience of the war for independence had shown the country the need of manufactories for the defense of the nation. It was on this ground that our First President repeatedly pressed for adequate legislation, and in this he was supported by his Secretary of the Treasury, Alexander Hamilton, who possessed one of the brightest minds known to history to-day.

The South, during its adhesion to slavery, antagonized protection, and this led to the adoption of the tariff of 1833—which provided for a gradual reduction of all duties to a 20 per cent. level by 1840. The general suspension of manufacturing through this reduction, and the derangement of the currency, brought about the severe depression of 1837 to 1842, and caused another political revolution, resulting in the election of a protectionist to the Presidency.

Then followed four years of tariff and a general restoration of prosperity. England's example and the prospects of an open market in that country for Western and Southern products, brought about another change. The tariff of 1846 embodied no economic principles, but effected a large reduction of duties below the protection level. In 1857, these duties were further reduced, and another severe depression of industry helped to the election of Abraham Lincoln.

For 30 years, our country persisted in the policy of protection, with some unhappy experiments in the reduction of duties, notably those on wool and woolens, in 1883. The presence of a surplus in the National Treasury was made the pretense for demanding tariff reform—meaning an advance towards free trade. In 1893, during Mr. Cleveland's second term, material reductions were made, then followed a return to Protection, which the country gives no sign of abandoning at an early date.

The Reasons for Protection

are numerous. 1. The necessity of varied industries, for the national defense has been shown by our history. It was shown in the Boer War, in which a brave people were handicapped by their being merely an agricultural population in conflict with a great manufacturing country.

It may be illustrated in the next great European war that involves Great Britain, through that country's long neglect of her agriculture, exposing her to the gravest peril. A single defeat of her navy may result in rendering it possible for an enemy to starve her people into submission.

2. The variety of industry, which protection establishes, is not less necessary to defend the country against famine. A country which produces food only is liable to famine and its consequent pestilence, whenever the rains are too scanty or too plentiful, for the harvesting of the crops. Such a country has all its eggs in one basket, and should that fail it has nothing to fall back upon.

3. Protection secures the general welfare of the producers of the country by bringing each class into the neighborhood with the others, which supply its wants and demand its goods. It thus saves the cost of carrying products

over land and sea to find a market and bring back at a like cost of carriage whatever is taken in exchange.

4. The naturalization of varied industries by protection gives the people of the country greater liberty to choose the kind of work they prefer and a finer opportunity to develop their natural capacities, in improving old methods or inventing new ones. This has been specially true of us. We were taunted for our backwardness in invention before this became a manufacturing country. At one time an English manufacturer said: "We could not make so much as a mouse trap for ourselves." American inventions have lightened the burden of toil for half mankind. They have made many staple articles, such as Steel, Cutlery, Cotton, and Silks—cheaper to the whole world. The American character has been distinctly improved by emergence out of the stage at which farming and shipping furnished almost the only employments.

5. By preventing adverse balances of trade, protection guards the national supply of solid money from being drained out of the country.

Money is not a commoditiy like any other—as to whose incoming and outgoing, we can afford to be indifferent. It is the means of organizing labor for the conquest of nature, and the production of wealth, and it is not indefinitely replacable, as are many other commodities. To exchange it for Hardware, textiles, is to exchange power itself for products of power.

Address of W. W. Webber.

W. W. Webber, Webber-Ayers Hardware Company, Fort Smith, Ark., as the representative of the jobbers, followed Mr. Johnson. His remarks were, in part, as follows:

As a naked question a protective tariff is not detrimental, but advantageous, but it depends on how far the Government goes, as to which it is. Under the present schedules I do not hesitate to say that it is detrimental. I will not tire you with a rehearsal of the various duties on raw and finished products, but will content myself with pointing out the effects resultant upon the present tariff rates.

Demonstration by Comparison.

I shall not adhere strictly to a discussion of the effects on the Hardware business, but must be permitted to take a wider range, and prove, if I can, the iniquity of the present Tariff by comparison. It is a generally accepted fact that the tariff is responsible for the existence of what are termed the trusts. The proper definition of a trust is an aggregation of capital, or an agreement between two or more makers of identical articles that the price shall not be less than a certain sum. There was a time, in the early history of manufacturing in this country, when makers of similar or identical articles sought patronage on the grade of the article offered, but that day has passed, because all, or almost all interests of a similar nature are pooled, and a buyer is left to pay his money and take his choice and very frequently no choice is left him. This condition could not prevail but for the present tariff schedule.

Present Effect of the Tariff.

If the tariff offered incidental protection only it would be practically impossible to maintain the high scale of prices now prevailing on many manufactured articles. As it is now, all that is necessary is to name a selling price just under what foreign goods of like character will cost with the duties added, and no particular concern need be felt as to where the market is to be found. It is right here under their nose, and cannot be elsewhere because of the tariff. It has been said that if the tariff is revised the revision should be made by its friends, but I am wholly unable to grasp the wherefore. It were like having

A Jury of Relatives

sit in the trial of a criminal. It is a patent and conceded fact that tariff revision looking to a reduction has long been demanded, especially is this true in the West, Northwest and the South. One reason it has not come is because of the antipathy of the now dominant political party to any political move that will endanger its supremacy. The tariff should not be, but is, regarded as a political question, when it is purely one of business. If any factory, just beginning the manufacture of some new and untried item of trade, needs protection it is right that they have it, but when one has grown great, powerful and rich, and has taken advantage of the conditions created by the tariff to the extent that our people at home pay more for the same goods than said goods sell for abroad, then it is

Time to Call a Halt

and have a reckoning. The first promoters of the tariff had no conception, I opine, that its duties and operation would ever result in one section of the country, and one class of people using it to the detriment of the remainder, but that this is done now, and has been done for long years, is not subject to successful denial. These agreements that we know exist have no place in an open market where the question is the survival of the fittest, and if we continue to hedge them about with a tariff, we will be

Doing an Injustice

to the public at large, and render the coming generation of manufacturers less able "to paddle their own canoe." They will come to regard government favors as their due, and will not be qualified for a change when one does come, and come it will. Protection is not now administered in its broadest sense, but in its narrowest, and so long as it is so administered our government cannot escape the indictment that it is

Playing Favorites.

All good citizens, irrespective of party affiliations, will hail with delight the day when we will be represented by men who are sovereigns of their own conscience, and masters of their own judgment, who do not wait to hear the crack of the party whip, nor wait until the leader takes snuff ere they sneeze. When this time does come, the millennium may arrive with it, but we wish for it just the same. In view of all that can be truthfully said anent the unfair workings and effects of the tariff, when we consider that it is responsible for the existence of the great trade octopi, when we consider that it is national law that makes it

Possible for a Few Men to Dictate

the price we must pay for the vital necessaries of life, we cannot say that it is administered in its broadest sense, and are forced to the conclusion that it is detrimental to the allied Hardware interests, as well as all allied interests, unless they are in position to avail themselves of the advantages the present schedule gives. I may be charged with seizing this occasion to make a political address, but such is not my desire. I have only attempted to state some wholesome truths, and if doing so brings down condemnation on my head, it is the subject that is responsible and not myself. I did not care to present a labyrinth of figures which are tiresome, but deemed it sufficient to treat the subject in a general way. I have done so without animus, and if some of my terms and expressions appear harsh, I can account for it only on the ground that no other words would properly set forth my opinion. The tariff creates an unfair condition between citizens of the same country, and that is enough to condemn it.

Address of F. S. Kretsinger.

The subject was then thrown open for general discussion. F. S. Kretsinger, American Fork & Hoe Company, Cleveland, Ohio, spoke as follows:

I most heartily agree with many of the points taken by Mr. Webber. Seven or eight years ago that great organization, the National Association of Manufacturers, at its convention in Detroit, spoke out forcibly on the subject of the revision of the tariff, favored by every organization present and every industry as I recall it, except the textiles. Singularly they had been protected to the extent of 30 per cent., and were not willing to sacrifice any of that, notwithstanding France at that time offered us most generous terms which would have profited this country from that day to this, and France will never offer them again.

Some Duties Are Detrimental.

Among the ten thousand and one articles now classed as Hardware (many of which are so rated, not because of their actually being Hardware, or because of their being composed of iron or steel, either wholly or in part, but simply and only because they are bought and sold by the wholesalers of Hardware), there are, perhaps, some, and possibly, many, articles which are protected by import duties to the detriment of the interests of the Hardware trade in some sections of the country.

I take it that we are not discussing this subject with a view to urge legislation by those having the power to make and unmake duties, but rather that we are considering the matter in a broad and a general way as a pastime for this particular session.

With the average citizen, the parting with money, whether for taxes as generally understood, or for duties on imports of any kind, is not celebrated as an occasion for joy and congratulation. We seldom sing while on our way to the assessor's or tax collector's office, nor would we seek out and inquire for the Custom House officer were we able to leave and carry our luggage from the steamer's dock unseen and unembarrassed. And yet we all admit that funds are required to carry on Governments, whether National, State or other, under which we seek protection.

Not Imposed Equitably.

Neither ordinary taxes nor duties on imports are imposed equitably and readjustments and modifications of the tariff should occasionally be made in keeping with times and conditions.

So far as I have any knowledge, no duties on Shelf Hardware importations in general can be characterized as extreme, when one gives fair consideration to cost of mate-

rial, fuel, labor, &c., at home country and the cost of same in foreign countries. As a general proposition,

Protection Benefits the People as a Whole

and is an aid to prosperity. Then it naturally follows and is a self-evident fact that the allied Hardware interests share equally in its advantages with the rest of the people.

If protection tends to increase the number of factory, shop and mill operatives, to enhance the price of their labor, it in turn improves the manner of living, and elevates the masses in a moral and educational way; there is less pauperism; more attention is given to schooling; skill and inventive genius are encouraged; men are better citizens in times of peace, and are better fitted for national defense when called upon for such duties, and we all share alike in the advantages of these conditions, whether Hardware dealers or those engaged in other pursuits.

Direct Advantages.

Not only do Hardware interests share in a general way in the advantages of protection, along with all other classes and other industries, but directly and specifically in other ways; for instance, a few, and perhaps the majority of Hardware wholesalers are located in manufacturing districts and no small part of their trade, directly or through their distributers and retailers, comes from these same factories, their principals and their operatives, which trade contributes materially to the prosperity of such dealers.

You, certainly as buyers, come into more frequent and closer contact with domestic manufacturers than you possibly could with manufacturers from across the water; you in very many instances have a long personal and friendly acquaintance with them; your influence as an individual and through your association with them is of no inconsiderable importance, and as against this, it is practically *nil* with the foreign producer of Hardware. You, in a measure, influence and at times regulate his prices, for you daily meet his competitors.

The domestic manufacturer, more readily and promptly than the foreigner, conforms in patterns, weights, sizes, &c., of his wares, and in many other ways, to your views and to the especial requirements of the many sections of the country from which you come. He is a near-by source of supply for you, enabling frequent purchases and comparatively short periods for their receipt.

If these few things count in your favor, then just so far and probably much farther is protection advantageous to the allied Hardware interests of this country.

Address of C. W. Asbury.

Mr. Dornan taking the chair at his request, Mr. Asbury spoke as follows on the question under discussion:

There were one or two points in Mr. Webber's paper which it seems to me ought to be made clear, if it be possible, from the manufacturer's standpoint. The first was, as I understand it, a direct charge that a protective policy was food for trusts. That does not seem to me to be logical. It seems to me that it is answered rather directly by a consideration of the fact that trusts are actually more numerous in Great Britain and in Germany, our principal industrial competitors, than here, and Great Britain is a free-trade country, practically so.

A Trust Cannot Be Fostered by Protection

unless more than a reasonable protection is afforded. If it has a reasonable protection, and goes one step beyond it, then foreign competition comes in. If it has an excessive protection that is not what we are here to protect; it is the policy of protection as such and not the abuse of it, as I understand.

The next point was as to the selling prices of goods at home and abroad. If I understood Mr. Webber correctly, he stated that that was not properly a subject to deny. I am not going to undertake to deny it, because I think that manufacturers generally will admit that such is the case in certain exceptional instances only. Now, as to those exceptional instances and the warrant for doing so: Suppose, for instance, you are making a line of goods where the natural and consumptive demand of the United States is not sufficient in volume to enable you to manufacture these goods with a maximum of economy. I am going to ask whether it is detrimental or injurious to the people of the United States if the manufacturer of such a class of goods will make a lower price for export than he does for home consumption and thereby produce a larger volume from his plant at a greater economy in production, which means actually in net results that the American purchaser buys those goods for a lesser price than if not protected.

Protection of Labor.

There is another point which should be touched upon. The allied Hardware interests are all interested in the permanency and the lucrativeness of laborers' wages. The policy of protection is primarily designed for the protection of labor. I would like to ask in all seriousness how any of you who might be engaged in a manufacturing business can compete with Germany, as an example, where the labor of Germany gets a net return of about one-third the return that the American laborer gets for an equal quality of labor, and that the laborer in Germany works twelve hours against an average of nine hours in the United States. If that labor is not protected and those wages are reduced consistently with the difference to which I have just referred, then the labor in this country will be practically pauperized and their purchasing power will be reduced so fearfully that every gentleman in this room will be affected by it.

Now, the manufacturers generally do not ask for excessive protection. They do ask for protection in the interest of their labor; in the interest of themselves naturally as against the foreign competition.

Tariff Commission.

In fact, the National Association of Manufacturers, composed of over three thousand manufacturers in various lines, have recently reiterated the position which they took a year ago in advocating the appointment or the creation by Congress of a commission for the purpose of arranging tariff schedules, the idea being that such a commission might possibly be able to arrange those schedules upon a fairer basis to all interests than the committees of Congress could direct. I confess that I myself think there is perhaps a little bit of an overdose of theory in the proposition, but it shows nevertheless that the manufacturers as a class ask for only that which is fair. They are quite willing and they are desirous of having a commission created, which commission could send an agent to their plants and determine the cost of production at their plants; send agents abroad and compare the costs of production of a similar article in foreign lands and arrange the tariff schedules so as to provide for the difference between the cost of production at home and abroad.

The strong protectionist goes a little farther than that. He says in addition to the difference between the cost of production there should be added a sufficient margin of safety to provide against varying conditions. What he means by that is that the time might come when the business activity of this country would be such as to necessitate the payment of exceptionally high wages. During that same period it might well be that a period of depression would be in progress in some foreign industrial country. The costs in that foreign industrial country then would decline and costs in this country would advance, which would bring the unfair competition to which I have referred.

PROTECTING JOBBERS AGAINST PRICE DECLINES IN STOCKS ON HAND.

Inaugurating the discussion on the question "Should Not Associated Manufacturers who Control Prices Protect the Jobbers Against Decline on Stocks on Hand?" W. F. Stephenson, Barnes & Miller Hardware Company, Memphis, Tenn., read a paper as follows in part:

Address of W. F. Stephenson.

To say the manufacturers should be responsible for depreciation on stock on hand, caused by declines in prices, would, at first, appear unfair to them but after viewing this matter from the different standpoints, I believe if conservative methods are followed, both jobbers and manufacturers can be benefitted by working in harmony.

The Jobbers in Handling the Wares of Associated Manufacturers

devote their time and capital in marketing the goods at a price fixed by the manufacturers, receiving as their profit a fixed percentage on the sale and in most cases the profit reserved for the jobber is slightly above the average expense of operating a general Hardware jobbing business.

In such case, the jobber or the buyer for the jobbing house has very little, if anything, to say regarding the amount of profit that is to be received as a compensation for marketing the goods of the associated manufacturer; and as the jobber is the selling agent marketing the goods, we might say, on a commission basis, the manufacturer, in my opinion, should take care of the jobbers on stock on hand in case of declines.

Some manufacturers would doubtless take the position that the jobber gets the benefit of increased value of stocks on hand in case of advanced prices, which is true, but this is not the point that needs special attention and consideration, as it is very easy for both the jobber and manufacturer to make a profit on advancing market. It is the decline that takes away the profit and needs to be given special attention.

Policy of Some Leading Manufacturers.

There is one point that I wish to direct your attention to in this connection, and that is, it is now, and has been for some time, the policy of some of the leading manufacturers to take care of the jobbers on stocks on hand, which is no doubt beneficial to the manufacturers in having the jobbers order the goods when needed, thereby keeping the factories

in full operation and keeping their stocks in position to care for the orders received from the retail dealers.

This is one benefit we can all obtain, and I am firmly of the opinion that if the leading manufacturers would show a disposition to take care of the jobbers on stocks on hand the markets would oftentimes remain firm and unchanged and the wheel of the mills continue turning, when otherwise they would be running on short time and the jobbers would suffer for want of goods to supply the general demand.

Market Changes Are More Apt to Occur

in times of depression, when the manufacturers are in actual need of orders, than when they are running on full time and do not need the business to keep their plants in operation. The associated manufacturers have the advantage of the jobbers to the extent that they know by coming together and going over the situation just what a change in price means to them, as they can determine the amount of raw material on hand and they know the costs of operating their plants. I beg to suggest it would be fair to the Hardware jobber to ascertain from the jobber the amount of stock on hand and consult his wishes before reducing prices on goods sold at restricted prices, and by pursuing the policy above outlined, to work in conjunction with the jobbers, orders would be placed more freely, and, besides, jobbers would be more loyal to manufacturers than if they felt they would not be taken care of in case of a break in the market.

I do not believe, however, associated manufacturers should be expected to allow rebates on goods that have been carried in stock for unlimited time, but should be limited to purchaser for a reasonable period.

The Value of Merchandise Should Be Fixed

by supply and demand. The manufacturers are entitled to a legitimate profit on the amount of capital invested and the time and attention in operating the plants and placing the goods in the hands of the jobbers. The jobbers are also entitled to a reasonable compensation for carrying stocks and distributing the goods to the retail dealers, and with manufacturers and jobbers working on a conservative basis supplying the demands at a fair market value and keeping the prices on a conservative basis there should be very little need to take into consideration the question of taking care of stock on hand in cases of declines, as there would be very few declines.

During the Past Few Months.

when a great many of the factories were in actual need of business to keep their plants in operation, some of the manufacturers have taken a very firm stand and have refused to reduce the prices, claiming, and justly so, a decline in price would mean heavy loss to the manufacturers, jobbers and retailers alike, without increasing sales, but would have a tendency to lessen same, and I am frank to say, I fully agree with the manufacturers taking this stand. What we now need is to have goods in stock, thereby being in position to supply the retail dealers promptly and at a fair price, working in harmony with the manufacturers by keeping the factories running and stocks turning without fear of heavy loss to any one.

It is in my judgment much better for the manufacturer to take care of a reasonable amount of stock in the hands of the jobbers than to have the goods in their own warerooms and be compelled to sell at less than actual value to move them.

It is frequently the case when manufacturers disband associations to make a rush for business at reduced prices, which is no doubt unprofitable to the manufacturers and also takes away the profit of the jobber and in regard to this one particular point, I will say, as I have already said, we should be conservative.

If the goods are not being sold at more than actual value, there should be no reduction in prices as the manufacturers, as well as the jobbers, are entitled to a reasonable profit and they should not forfeit profit because of dissolution of associations.

I am opposed to advancing prices in times of prosperity unless the cost of production makes it necessary and am likewise opposed to reducing prices in times of depression unless the cost of production and distributing can be reduced accordingly and in case of declines on goods controlled by associated manufacturers it is but right that stocks in the hands of dealers should be taken into consideration before making changes. Seasonable goods might here be given a thought. If we work on a conservative basis there should be very little change in prices on seasonable goods which would be beneficial to jobbers and manufacturers on stocks carried over from one season to another.

Address of Walter W. Birge.

The manufacturers' position on the question was reflected by Walter W. Birge, Fayette R. Plumb, Inc., Philadelphia, who spoke in part as follows:

In the first place I want to say that this whole question resolves itself into the fact as to whether or not the manufacturers are honest with the jobbers. If they are not I think the jobbers will agree with me that they will not succeed. You know as well as I do that the success of almost every manufacturer here is due to the fact that he has taken care of the jobbers. Now, when I say taken care of the jobbers that is a particular term. I have had a good many jobbers say to me, "Will you take care of me," and I always want the terms specified if it is going to be anything definite; but I feel that the jobbers will agree with me that any manufacturer in the hardware trade who has not taken care of the jobber has failed sooner or later. The jobbers pretty soon find out who their friends are, and they "eye up," if I may use the expression, to a greater or less degree with their friends—taking that word "friends" in the broad sense in which it is meant.

Now associate manufacturers reduce prices owing to certain conditions. No manufacturer is going to reduce prices unless it is brought about by competition or by a great reduction in the cost of his material. And what is the result when prices are reduced? I dare say I don't believe the average jobber can contradict it that in 99 cases out of 100 where reductions are made 99 jobbers out of 100 are

Tipped Off Before the Reductions Are Made.

not one day, but, if the manufacturer can do it, tipped off three or four months in advance. I believe that every manufacturer who is a successful and honest manufacturer will tell every jobber with whom he does business as far in advance as possible when there is likely to be a weakening in price.

Profiting on Advances.

What is more, on the other hand, I believe that the average jobber profits by every advance which is made. It is no uncommon thing for a jobber to come to a manufacturer and say, "I take it for granted that in case any change is made in your prices in the way of advances you will keep me posted." It is no uncommon thing for a manufacturer to get an order two or three days after an advance which through an error of some stenographer has been due two weeks before, and in very many cases it is very difficult for the manufacturer to prove to the jobber that the order was not absolutely in the mail, or at least turned over to some irresponsible office boy to be mailed before the advance took place; and I think in most cases the manufacturers do take care of the jobbers on such advances to a greater or less degree, and I vouchsafe the opinion that in the last 15 years the jobbers have made more money due to advances in stock than they have lost through declines.

Jobbers have told me in the last few years of the thousands of dollars which they have made due to advances in price of stocks on hand. Why is it that jobbers do not make profits when advances take place? They say it is because of the cutting of profit, or due to the fault of the manufacturer. It is due to the fact that there are certain manufacturers who will not profit by the goods they have on hand, and if they are bought at a reduced price will not get the advance when it is made. That cannot be controlled by the manufacturers, and in the case of declines the same thing is true.

A great many jobbers take the position that the manufacturer can control his purchasing department. I know of manufacturers who have lost thousands of dollars—large manufacturers—due to the reduction of the stock on hand of steel. The same thing exists with his labor: he cannot control that. If there is anything arbitrary it is certainly manufacturers' labor.

Re-sale Prices.

The last speaker said that they fixed the percentage of profits—the percentage of profits were made by the manufacturers to jobbers. Perhaps I misunderstood him, but I believe there are very few cases where the re-sale price is made by the manufacturer. Where they are made it is almost universally made after consultation with jobbers either individually or through their own association, and I believe that a great many manufacturers—in fact, most of them—would be very glad to make a re-sale price on any reasonable basis if the jobber could agree to those prices. There are jobbers in this house to-day that will not make re-sale prices.

The preceding speaker spoke of jobbers being the selling agents of the manufacturers. I wish that were so: we would have less special brand business; the manufacturers could perhaps regulate their selling agents to a better advantage than they can at present. I think many things could be worked out if the jobbers would accept as a fact that they are the selling agents of the manufacturers.

I think the question we have before us, as I said at the start, resolves itself into a question of common-sense and reliance of the jobber upon the manufacturer. I know that we expect to take care of our customers. I don't mean to say by that that we expect to rebate their stock on hand, for we do not, but we expect to treat them fairly, and if we shipped goods to-day and reduced the price to-morrow I think we would be inclined to do something for the jobber.

I take the position that the manufacturer should treat the jobber as an agent and keep him in condition to sell his goods to the best advantage and to sell them in competition with any other jobber.

Jobbers' Local Associations.

A paper on "Importance and Benefits of Local Associations" was read by Harvey L. Anderson, Anderson-Hardware Company, Atlanta, Ga., which strongly urged the importance of local organizations, holding them to be quite as necessary as the larger associations. We give the following extracts from it:

The fact that [illegible] is or should be a prime reason for having Local Associations. For what does it profit us to meet one week out of each year and fight each other during the other fifty-one?

Equal Pleasure and Profit.

I know every member loves our Association, not only for the good it has done us, but for the strong ties we have formed, and we look forward [illegible] with delight as the time rolls around to meet at our next gathering, and, if you will form a Local Association, you will look forward with just as much pleasure to your local meetings, and my word for it—it will be just as much—if not more money in your pockets to have and cultivate these meetings. I would not undervalue our Association, but Local Associations are quite as important as the large Association. It is just as important [illegible]

The Trouble with Some of Us

is, we are perfectly willing that the other fellow hold up his prices, and we be allowed to sell at any old price we see fit. We should be allowed more latitude because of the fact we cover more territory and sell more goods than our neighbor. In forming a local Association, we are inclined to expect too much all at once. We have been fighting each other too long to reach perfect harmony on the jump. When our neighbor or competitor falls down, be just as lenient with him as you would expect him to be with you were you placed in his position.

Take Poultry Netting for an example. Not infrequently your neighbor across the street or on the other side of town is long on 4 ft. Netting, and you happen to have every other size in stock, but happen to be out of the 4 ft. He would be just as anxious to have you exchange with him and swap you the size you are out of and get in exchange some of the other sizes. In doing this you can the better serve your customer, rather than keep him waiting two and sometimes three weeks for what you could get for him at no expense to yourself, simply the time it takes to call on your neighbor. He has just as big a heart as you have, and the Lord made him just as well as He made you.

You Will Serve Your Customers Better

by having a Local Association. One of our customers may be in a shaky way and wants to owe us too much money, and your neighbor may be as good if not a better credit man than you are, and in this manner you will save money that you would possibly lose, or if your customer is worth saving, your neighbor will join hands with you and possibly save a good man, when if you were fighting each other, it would be impossible to get together on any kind of a friendly basis.

If you have a competitor handling a certain line of goods, let him keep on handling them. You can put in another line of goods and in this manner you will be fighting each other and both of you will make money by working along these lines. The trouble with the most of us is, we are willing to give credence to a customer living in another town who has an object in view, rather than believe our neighbor. Let me appeal to you that we see the good in each other, rather than believe the petty reports that come to us, and by having a local association you will learn to think better of your friend and competitor.

Upon motion [illegible] was declared to be the sense of the meeting that such associations should be established in all jobbing cities in the territory of the Southern Hardware Jobbers' Association.

Jobbers' Executive Committee's Report.

The report of the executive committee of the Southern Hardware Jobbers' Association was rendered by O. B. Barker, of the Barker-Jennings Hardware Company, Lynchburg, Va., chairman. We give the following extracts from it:

We want to impress upon our membership the fact that the many benefits which they have received as members of this association have not been by accident, nor the generosity of the manufacturers, but as the result of painstaking effort, and persistent determination of your association. The same effort which accomplished these results in the past will achieve greater ends, if intelligently and persistently continued in the future. Remember always that the individual member is the unit which counts in summing up the results, and, therefore, each member should be willing to sacrifice his individual preferences for the benefit of the membership as a whole.

Your committee feels it would be derelict in duty should they fail to make mention of and to give some expression to the very arduous, painstaking and efficient duties performed by the president and secretary of this association, John Donnan and C. E. Kersey, during this year just closing. Matters of the gravest character, and difficulties of the most trying nature, have arisen, and in each instance it gives us the greatest pleasure to testify to the more than competent and efficient manner in which they have discharged these difficult and delicate duties, and we, therefore, recommend that a rising vote be given them as a token of the high esteem and great regard in which they are held by their associates.

Supporting the Southern Association.

Hugh Fox, Fox Bros. Hardware Company, Pine Bluff, Ark., presented a paper under the title "Why Should Not the Southern Hardware Jobbers' Association Have the Unqualified Support of Every Eligible Hardware Jobber in the South?" Mr. Fox said that:

All successful movements, whether religious, political or commercial, had their starting point in organized effort. The Southern Hardware Jobbers' Association is composed of men who stand together, move together and act together. Joining this association is not like trying some new experiment. The Southern Hardware Jobbers' Association is not in its infancy, but is to-day celebrating its eighteenth annual convention. Let us consider the benefits of membership. Membership in this association enables us to keep in close touch with the Hardware jobbers of the South. The individual jobber can do little to protect his business interest, but when he allies himself with the common interest of the association the combined strength becomes a mighty power. This union and hearty co-operation on the part of our association has already demonstrated to the manufacturers the strength of our organization and the loyalty of its membership in upholding the hands of the executives.

The speaker then cited a few instances where the influence of the association had been used with great advantage to the members in their relations with certain manufacturers. He also referred to the social advantages derived from membership in the association.

Profits on Staple and Seasonable Goods.

"How Shall We Increase the Profits on Our Staple and Seasonable Goods?" was the subject of a paper read by H. Young of the Southern Hardware & Supply Company, Mobile, Ala.

Mr. Young said that it had been fully demonstrated that thorough organization and co-operation is essential to the successful administration of any business. While he did not believe it practicable or desirable to undertake to fix arbitrary selling prices for all territory he thought in every city in which there were two or more jobbers they should meet for their mutual benefit and protection, not for the purpose of making unreasonable or unjust demands upon customers nor for the purpose of forming any combination or violating any laws, but simply to correct any abuses that may exist and where feasible regulate prices upon a fair and equitable basis. He believed that salesmen were to some extent responsible for the present demoralized prices from lack of proper discipline by the sales manager. They should not be allowed to use their own discretion in making prices.

Officers of the Jobbers' Association.

The following officers of the Southern Hardware Jobbers' Association were chosen for the ensuing year:

PRESIDENT, W. L. Sanford, Sherman, Tex.
FIRST VICE-PRESIDENT, H. R. Miller, Memphis, Tenn.
SECOND VICE-PRESIDENT, S. C. Dinkens, Atlanta, Ga.

President-elect Sanford announced the selection of the following Executive Committee: O. B. Barker, Lynchburg, Va.; Bruce Keener, Knoxville, Tenn.; J. D. Moore, Birmingham, Ala.; F. A. Heitman, Houston, Tex.

Next Year at Pittsburgh.

Invitations from Pittsburgh, Chattanooga and Washington, D. C., were considered by the jobbers and manufacturers, but in the final division the choice fell upon the first-named city, so that the next annual meeting of the Jobbers and the 1909 semi-annual meeting of the Manufacturers will be held in Pittsburgh on identical dates.

THE AKRON STAMPING COMPANY, Cleveland, Ohio, is sending out an advertising novelty in the form of a celluloid "Teddy Bear" pocket pin cushion, the object of which is to further the sale of the company's Never-Break Steel Spiders and other Cooking Utensils.

THE BEST METHOD OF DEPARTMENTIZING BUSINESS AND THE BENEFITS TO BE DERIVED THEREFROM.

The following practical and suggestive paper under the above title was read before the jobbers' association by S. Norvell, Norvell-Shapleigh Hardware Company, St. Louis:

The invitation from the Southern Hardware Jobbers' Association to address them on "The Best Method of Departmentizing Business and the Benefits to Be Derived Therefrom," is taken by me as a personal compliment, and I do not hesitate to say this compliment is very much appreciated. The fact that you ask another jobber, member of another Hardware Association, to talk to you on this subject indicates you are broad gauged and liberal minded, and that you are not actuated in your deliberation by any petty jealousies.



Now I do not presume to give you any advice on this subject. Each jobber has his own problems. He must work out these problems in his own way. Each of us in our efforts must be guided by our own environment. A good system for one jobber may not fit the business of another. A system that is a good thing for a large jobber may not be at all desirable for a small jobber.

In this paper I naturally speak from the point of view of the jobber doing business over a large area of country. I cannot speak from the viewpoint of the local jobber, because I have never had any experience in local jobbing.

Experience with a Professional Systematizer.

Allow me to say in the beginning that in our own business we have taken a dose of the professional systematizer, and we have gradually and slowly recovered. It may not have been his fault—it may have been ours. I believe if a jobber has not enough brains in his own establishment to evolve a suitable system for his business, such a jobber has not brains enough to successfully carry out a system outlined by some one else.

We paid the expert systematizer $40 per day, and the net result of his work was that for the rest of our lives we would be compelled to use the books and forms that are printed exclusively by his company. He had certain ideas which he attempted to force upon our business whether they fitted or not. He did not know enough about the peculiarities of our business to see where exceptions must be made. He kept two of our best stenographers at work several days making his report, and one of these stenographers told me most of the report was dictated by him from printed forms.

Not a Single "Professional" Idea Adopted.

About a year later I received a letter from this firm of systematizers asking me how we were getting along. I replied briefly we were "convalescent, but not quite recovered." We learned afterward they went to other jobbers and told them how they had systematized our business, and what a large part of our business we owed to them. Now it is the plain truth that while we have filched a good many ideas from other jobbers in the course of our business career, and still have our eyes open for new ideas, we did not adopt a single idea put forth by this expert business systematizer, and we have a notion he picked up quite a few pointers on his own hook in going through our establishment, which we have since learned have been adopted by some of our competitors.

Ever on the Lookout for Improvements.

I am giving you some of the conclusions I have reached in my experience as a Hardware jobber. Some of these conclusions may not apply to the present, but all men in business who have ideals look to the future. They must dream of improvements. They must think of that perfect business, which perfection they know they will never attain.

There cannot be a perfect business until there is a perfect executive, and until there are perfect employees. This condition will not come until the millennium, and then probably we will not be worrying about the departmentization of any business.

My personal friend, Mike Kinney, says a wise man makes questions, and only a fool makes statements. Therefore, in making this address I am placing myself in the position of the man who is foolish. I am about to make a number of statements. I am going to make some of these statements without qualifications, which I would qualify if I had more time.

As this paper is on the subject of departments, it is

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only proper the paper should be in departments. Therefore, I will call this part my introduction.

Ideal Hardware Jobbing Business.

I must not say, below par in the mental attitude of a man who has [illegible] $5,000,000 in cash, who intends to establish an ideal Hardware jobbing business, with a view of selling goods in all parts of the country. I mean enough cash to erect the most modern and up to date building; to carry the most modern and up to date goods; to put in the most modern and up to date system of handling that business, and to employ the very best talent in the Hardware trade to be obtained in this country.

Such a venture I have not the slightest doubt in the end would be successful; I believe it would pay very satisfactory profits, but I seriously question if you could find many men, even if they had the ability, who would be willing to sacrifice their lives to such an undertaking.

Besides, if a man had enough money to carry it through I am inclined to believe he would be like the fellow down here in the State of Arkansas who asked the price of a sawmill. When told it was $5000, his answer was, "Why, if a man had that much money what would he want with a sawmill?"

The Organization.

The organization of a jobbing Hardware business naturally falls into five divisions—executive, financial, buying, selling, warehousing and stockkeeping. Each of these divisions should be in charge of at least one director of the company.

The executive has general oversight of all departments.

The financial director should be in charge of banking, datings, credits, accounts, books, records, &c.

The buying director is in charge of the buying, addition of new lines of goods, maximum and minimum stock, &c.

The director in charge of sales is in charge of the sales managers, salesmen's routes, selling prices, and the general selling policy of the house.

The director in charge of stock and warehousing should have charge of the filling of orders, the use of room in the warehouse, employment of stock people, and the receiving and shipping of goods. The shipping department should come under his jurisdiction.

The Building.

Your building is of the greatest importance—it is the very basis of your organization. If you desire to do business economically your building must be fixed for it. It must be built to exactly fit your business. Every detail must be figured out in advance.

Your building should all be under one roof. If land is not too high priced the best building would be one of large area, but not very high—not over four or five stories. This building should be on the incline of a hill. Then you would have two levels. In the basement or lower level you could carry your heavy goods and unload or load them immediately on the cars. The tracks should run along your building on the lower level; but outside, not inside.

Two Levels.

On the upper level or first floor you should establish your general offices, city department, &c.

Your sample department should be on the top floor. This space is the most inexpensive in your house. With passenger elevators the sample room could be reached without delay. On the top floor you could have plenty of skylights, as many as you desire. Therefore, there would be no limit to the supply of light. Having your sample room on the top floor you also avoid the noise, dust and irritating interruptions when the sample room is on the first or second floors near busy offices or stock departments.

Sample Room on Top Floor.

The old-fashioned way is to have sample rooms on the first or second floor. We inherited this condition from pre-elevator days. A customer could not be asked to walk up more than one flight of stairs. Such sample rooms are usually dark and dingy and consume valuable space. All freight elevators lose time and power in passing these sample rooms. On the other hand, when the sample room is on the top floor the freight elevators do not go to that floor.

In this connection, will say, most jobbers have decided the old-time sample room showing each and every item costs more than it is worth. It is not necessary these days for many merchants to study a 6-in. Heavy Strap Hinge before purchasing. As a result, in the modern sample room only specialties and new goods are shown. It is folly to sample staple and well-known goods.

Specialties and New Goods.

Elevators should be of large capacity and should be placed on the side of the building near the railroad tracks, so goods could be transferred on large platform trucks from the cars to the elevators and delivered immediately to the proper department.

Elevators.

Be careful on the various floors opposite the elevators to leave plenty of space to temporarily store goods in case the stock clerks haven't time to put them just where they belong. Many stores in their desire to use every square foot of space forget a certain amount of temporary storage room is needed on every floor.

It is also very important that your main aisles should be large enough to take care of your large platform trucks. Room may be saved by making the [illegible] aisles smaller. Every large floor should have at least two main arteries—one running north and south and the other east and west.

Main Aisles of Ample Size.

In arranging your tiers of bins you should take light into careful consideration. Be sure to arrange them so as to have the most natural light. Inexperienced stockkeepers will arrange their large aisles next to the windows; in other words, have the aisles go around the outside of the department with the stock inside. This is not economical. The best plan is to have the bins go clear up the outside walls, having your aisles through the inside of the building.

It is a great saving to have plenty of bin room. The bins should be properly numbered to correspond with the catalogue. When cars are received the bins should be ready for the contents of these cars. It often seems like waste of space to have room waiting for goods to come in, but this waste of space more than offsets the confusion resulting from making no preparation for goods coming in and storing them when they do arrive in any space that can be found. As a result of this latter system goods of the same kind are found in different parts of the building, and stock clerks have great difficulty in getting out orders and many errors are made.

Arrangement of Bins.

Speaking tubes should be made with tubes of large diameter, and with large funnels in place of mouth pieces. Those who have used small tubes hardly realize how large tubes improve the service. There should be, of course, a central telephone station with telephones in every department. Not only this, but the telautograph can be used to advantage. This not only works as rapidly as the telephone, but there is an absolute record in writing of the transaction. I predict this little electric machine will be used very much more in the future.

Speaking Tubes and Telephones.

Automatic tubes for conveying papers by compressed air from one department to another are a convenience, but are expensive. A similar plan is to carry papers up the elevators to the various departments and then arrange tubes so they can be dropped down to the departments below. This system is not nearly so expensive, and it gives you work where you can start young boys distributing papers. These messenger boys become thoroughly familiar with the house, and if they are made of the right kind of material develop into first-class men.

Conveying Papers.

Electricity is the best form of lighting. In a very large business money can be saved by operating your own electric plant.

Elevators can be relieved of work by steel conveyors, in which goods are dropped by gravity, all through the building. Not only are the circular conveyors good, but the regular steel chute from floor to floor will be found of great advantage. It is surprising more jobbing Hardware houses do not use these chutes. After the first expense of installation these chutes cost nothing for operation. They do not require elevator men. They do not require any power. They are always ready for business; no waiting is necessary, and a package that starts at the top makes a through trip. With occasional repairs they will last as long as your building.

Steel Conveyors and Chutes.

Departments.

Heads of departments should have their offices in their departments. Each department should be run just as far as possible as a separate business.

The department manager should have supervision over all men in his department—both the office and stock forces. He should have charge of buying goods for that department under general supervision of the head buyer of the house. Of course, this system makes it necessary to have a very strong man at the head of the department. The advantages of the system are he knows his stock, and can keep in touch with it much better than a buyer located in a far-away office. This system develops first-class, all-round men.

Department Manager.

The main advantage, however, of having your best posted man at the head of the department, in his department, is that the orders of that department are handled with more skill than by machine labor. The head man is in the department to be referred to at any hour of the day. He teaches the clerks in that department better than they would be taught simply by a stock manager. It develops better clerks. In fact, it gives to that particular department the close relationship between the head man and the clerks which exist in a small business. It also gives the head man an opportunity to study the men in his department and develop extraordinary talent.

Studying Men and Developing Talent.

The only danger to this system is in a poor department

manager who would not be a good disciplinarian or who was not sufficiently broad in his ideas to be able to attend to both the stock and office work at the same time. With a careful system of department records inefficient department management will be immediately shown.

Goods should also be packed by departments. This not only prevents damage to goods by being passed from one department to another, but it fixes the responsibility for errors and bad packing. Packers pack the same kind of goods all the time, and, therefore, become more expert. Another advantage of packing by departments, if the goods are properly classified, is in the fact that the proper kind of goods will be packed together—goods that take the same freight rate. Therefore, freight bills to customers will be less. To illustrate this point, will say, in the basement naturally such heavy goods as Bolts, Hinges, &c., will be carried. These goods will be packed together and will be marked so as to take the lowest classification. When there are not sufficient goods in one department to make a box, they are sent to the general packing room and are packed with other goods.

Packing Goods by Departments.

An advantage in dividing a business into departments is in the fact that if one department happens to fall behind in its work it is immediately evident. You can place your finger on the slow department, and at once investigate the cause of delay and supply additional help if necessary. It is also found with this system that a few nights' work on the part of certain departments will lead to their catching up, making it unnecessary for the entire force to work.

Helping Out Slow Departments.

The head of the department should naturally be fully posted on all things concerning his lines of goods. He would suggest selling prices for the salesmen, and would also post the salesmen on his lines. He would also take care of visiting customers, and sell them or see that they were properly sold the goods in his department. With this system of departmentization a customer is taken by a general salesman from one department to another, and the department manager or his assistant helps the general salesman in selling the customer. It is obvious no general salesman can be as well posted on a line of goods as a department manager. Therefore, a dealer who is sold a line of goods by departments receives the benefit of expert advice and counsel in his buying. Then it is a pleasant change for a dealer in purchasing a complete line of goods to come in contact with the various department managers. Each department manager who takes up the work is fresh and naturally enthusiastic in regard to his own lines of goods, and anxious to make the best showing possible for his department.

Taking a Customer Through Departments.

By this department system an accurate record is kept of the number of employees and the total amount of salaries for each department; the number of square feet of floor space used, and the cost; the amount of stock carried and the amount of money used and the amount of "turn over" in that particular department per annum. To illustrate: In the Sporting Goods department the management of the business would know every month the value of the floor space used by that department; the total of salaries; the amount of money invested in stock, and also the sales and profits of the department. To show the advantage of the system, if for any reason sales of the Sporting Goods department fell off 20 per cent. (as shown by the monthly records) and the salary account advanced 20 per cent., the management would immediately know something was wrong in this department. There should be a close relationship between the percentage of increase and decrease of expenses to sales, also of stock to sales.

Comprehensive Department Records.

With the proper records in a business so departmentized it can be told at a glance whether the head of a department is getting more efficient work out of his employees or whether he is letting up in his efforts; whether he is taking more stock to handle the same amount of business, or whether he is doing more business with a small stock. No department manager could be stuck with a large lot of seasonable goods and carry them over without this fact showing up very plainly in the department records.

Following this system of dividing into departments a large jobbing business is simply an aggregation of a number of small businesses under the same roof, with the same general management and selling policy. This system leads to all the advantages of the small store, combined with the advantages of concentrated selling force and large purchasing power. The great saving in such an organization is in the fact that the various departments need the maximum number of men at different periods of the year. The house manager sees that each department is supplied with the proper number of men when needed, and those men are taken away as soon as business in that department decreases. This is the great advantage a large house has over smaller houses. In small houses doing a local business there are periods of the year when the employees have nothing to do, and they cannot use them anywhere else. In a large business properly arranged, with sales covering a wide territory, one department after another is busy, and men are shifted to points where they are most needed. Therefore, labor is kept constantly employed. This practice of changing employees from one department to another leads to the employees receiving a general education in all the various lines carried by the house.

A Combination of Advantages.

General Education of Employees.

The Sales Department.

The territory is divided into sections by States, and each section is placed in charge of a sales manager. This sales manager is in immediate charge of the salesmen in that particular territory.

The sales manager also looks after the trade, keeps track of increasing or decreasing customers' accounts, and writes the necessary letters to keep in touch with the customers of the house.

He also has charge of the salesmen's routes, looks after the salesmen's sales by towns, checks up the salesmen's expense accounts, and does everything in his power to help the salesmen of the company achieve the largest and best results in the territory.

When a customer visits the house he is immediately waited upon by the general sales manager for his territory, who is familiar with the class of goods he uses and knows all the details of the local competition.

The Mail Order Department.

This is a separate and distinct department that handles and develops mail or open orders from the trade.

In turn the mail order department is divided into sections corresponding with those of the sales department, certain men handling the mail orders from certain States. By this system both sales managers and mail order men become very familiar with the needs of the customers and the peculiarities of the trade in the section under their supervision. These various mail order men also make quotations.

It is much better for this work to be done by the mail order department than under the direction of the sales manager, simply because the sales manager has not time to look after the mail orders from and make quotations to the trade in his territory. If he looks after his salesmen and his accounts he is doing all that can be expected of him.

The General Catalogue.

There is a question in the minds of jobbers as to the success of the loose leaf catalogue to be distributed generally to the trade. In my opinion a solidly bound catalogue, issued at comparatively frequent intervals, would be better than a loose leaf catalogue. Experience has shown that not 25 per cent. of the retail dealers who receive loose leaf catalogues keep them up properly. The binders of these catalogues are very expensive; in fact, almost as expensive as the catalogue itself. It is also very expensive to send change pages to a large number of customers. All this is wasted if the pages are not inserted.

Loose Leaf Catalogue Not Satisfactory.

A good system would be to issue a solidly bound catalogue to those customers who will not keep them posted, and a loose leaf or salesmen's catalogue to those customers who are sufficiently systematic and fond of work to change the prices.

An approximate price-list has been found to be of advantage to the retail dealer. These price-lists, however, being separate from the regular catalogue, are more or less troublesome. The time is ripe for the jobber who will print his approximate prices in the body of the catalogue he distributes to his customers, using an easily learned selling mark.

Approximate Price-List.

Goods are arranged in the catalogue according to the various departments of the house. In other words, the general catalogue is a collection of department catalogues bound together. Salesmen in writing up their orders send them in written up by departments. The advantages of this system are as follows: When the order reaches the house it is immediately divided into departments and sent to the various stock departments, and in a few minutes a number of stock departments are at work getting out the same order. The various departments work on the salesmen's original order. They can see in his own handwriting just what he orders. The system of copying for departments is slow and expensive. It is also full of errors. When an error is made it is necessary to look up the original order and find out whether it was the salesman's error or an error made in the house in copying up the order. Under this system when an order is filled and put together and goes to the entry department all the goods of the same character are billed together. For instance, all Cutlery, all Sporting Goods, all Tinware, all Shelf Hardware and all heavy goods will be invoiced together. They will also be invoiced exactly as they are packed.

Salesmen's Orders.

Goods of Same Kind Billed Together.

Therefore, in opening a box a dealer will not have to skip all over his invoice to find the goods. This is also of

Advantages to the Merchant.

he prices the invoice all goods in one line come together. It is of advantage to the dealer in checking with the invoice because he will find all goods in a certain part of the catalogue come together on the invoice. It is also of advantage in our auditing of profit figuring department, because in going over the invoice seeking errors the goods are classified on the copy of the invoice according to their price books.

To simplify the idea, if our catalogue was split up into its various departments and each department was split up we would have a number of complete stock and selling units, the only difference being that all the invoices for the entire business are written up in one department, and the selling for the whole house is in the hands of one force of salesmen.

The economy of a jobbing business conducted in this manner, where one salesman sells many lines of goods instead of selling only one line, must be obvious to all.

Printing Plant.

In every up to date jobbing Hardware house there is necessarily a large printing plant in connection with its catalogue department. Their salesmen's catalogues are of the loose leaf variety. Their prices are printed on the pages and these pages are mailed to the salesmen as changes take place. It is only necessary for a salesman to insert these pages in his book when it is fully posted to date. What an improvement over the old methods when the salesmen were expected, but did not, post their catalogues from date to day by pencil!

The BookKeeping Department.

Books are all kept by one department, but even here the idea of dividing into territories is carried out, certain bookkeepers working on the books for certain States.

All books are of the loose leaf variety. The ledgers are arranged by States, by towns, and then by customers. In other words all the accounts for a certain town are side by side and can be referred to at a glance. With this system it is an easy matter to find out the amount of business done in a certain State or the condition of accounts in a certain town.

The Credit Department.

This department, as its name implies, passes upon all credits, and has correspondence with customers in regard to their accounts.

The collection department is under the general direction of the credit department.

The Filing Department.

All correspondence is filed by States, by towns and by customers. The numerous members of the Jones family under this system do not come together, but are separated according to their States and towns.

Orders are filed in binders and correspondence in upright files.

The Claim Department.

This department is also divided by sections following the same sections as the sales department, with claim men for the various sections of the country. The claim department is under the direct control of the sales managers, and claims are handled in line with the selling policy.

The Traffic Department.

This department, as its name implies, looks after all incoming and outgoing shipments. All freight claims are handled in this department. It also had jurisdiction over the shipping room and wagons.

Remarks in General.

Every ship has its chart house. Every day observations are taken as to the location of the ship, then the position of the ship is marked out on the charts.

If any business is to be kept off the rocks its latitude and longitude must be just as thoroughly and carefully taken. This cannot be done unless the executive of that business has a system of accurate records showing the volume of sales, the profits and the expenses of each department. He must not only have these records in dollars and cents, but I consider it of the greatest importance that he has it figured out on a percentage basis, and this percentage should be carried out to the fraction of 1 per cent. If your business increases 15 per cent. and your total expense for the entire business increases 15 per cent. where does it come in? Then you find the seat of the trouble by referring to your department records. Without department records you do not know what part of your business is making money and what part is being conducted at a loss.

Percentage as Well as Dollars and Cents Records.

These records should at times be carried even beyond the department. You should figure the cost of selling certain lines of goods in a department. How many jobbers here know the cost to them of carrying a dozen cheap Screen Doors in their warehouse for one year? If some of them would figure out the profit on those Doors and the cost of warehousing, insurance and taxes they would have something to think about.

Even Selling Certain Lines Should Be Figured.

What are the relations of your salesman's charges for drayage and excess baggage on sample trunks to his profits on the goods he sells from these samples? Have you ever figured that out? Probably some will decide it does not pay to carry samples.

Divide your cost of doing business into two heads: One, all the expenses of the house. The other, all the expenses of your salesmen for salaries and traveling expenses. Keep this record year after year, and see whether your expenses are growing with your salesmen or growing in the house.

Divide Business Cost into Two Heads.

One of the greatest dangers to any business is lack of harmony among the managers of that business. A loose and indistinct division of responsibilities and duties by departments generally leads to this kind of friction. In your directors' meetings have each director report for his department, with the plain figures before all the directors. Then have your general discussions afterward.

Harmony In Management.

Have a department for returned goods. Have it carefully inclosed. There is great danger of pilfering in this department. Keep an accurate record of all goods returned and the customers who return them, and you will get some light on various subjects.

Returned Goods.

When you have a large and very satisfactory account have the profit on that account figured, and may be you will wake up. When you find one of your departments has no trouble selling practically all of a certain class of goods used in your territory, have the factory cost, the cost of handling and the selling price on these goods carefully figured. When anything is too easy and too prosperous look out for danger.

Occasions for Investigation.

All jobbers should charge extra for broken packages. Nothing breaks up stock and causes the loss of parts more than the habit we jobbers have of selling goods in retail quantities to merchants at wholesale prices. We can learn something in this respect from the wholesale mail order houses who never break boxes, and who, therefore, have no trouble keeping their stock in good condition.

Extra Charge for Broken Packages.

Carefully study your business and your methods and see whether you are adjusting your business to the exception of your trade and not the rule. I mean by this that the customer who is always complaining, who makes forcible complaints and who asks special consideration, impresses himself upon your mind. You know him and correspond with him. He becomes an exception in your business. Does he not impress his ideas too forcibly upon you and upon your salesmen? On the other hand, the majority of your customers who make no complaints and who pay promptly are ofttimes forgotten. I believe it is the tendency of most jobbers to adjust their ideas to 20 per cent. of their sales, not the 80 per cent.

Troublesome Customers.

It is my opinion, when a retail account always requires special attention or special prices it is almost invariably unprofitable. If we had the moral courage we would drop such accounts, save time and worry and make more money. We can only get at the facts in regard to these accounts by careful analysis by department reports.

It is exceedingly important to have a monthly record of large business by States. Then you can see where you are growing strong and where you are becoming weak. If all the business is done in one State then you should have before you a monthly record of sales [illegible].

Monthly Records by States or Towns.

Recently we have been experimenting with Graphophones for correspondence, and we believe the graphophone has a great future in business. It seems to me it would be especially valuable to merchants in small towns where expert stenographers are not easily obtained. They are worth your investigation.

Individually I have always opposed the system of selling goods through branch houses. I believe a strong central organization handling the business in departments, can handle a business, even over a great area of country, more satisfactorily and more economically. A great variety of goods and a heavy stock under one roof simplifies the keeping of stock and the filling of orders. I consider this advantage greater than either the advantage in time or freight.

Branch Houses Not Favored.

I believe the general trend of the times is toward a one-price system, with possibly a lower price for quantities. This system is now being brought about by manufacturers' controlled prices and by the sale of jobbers' special brands.

To sum up this long paper, the difference between one jobber and another is narrowing down not so much to the question of prices, but to the question of good service, which means a large variety of goods from which to make a selection and the prompt and complete filling of orders with satisfactory merchandise.

Arkansas Retail Hardware Association.

It was generally conceded by the Arkansas retail merchants present that their ninth annual convention at Hot Springs was one of the most profitable and enjoyable since the organization of that body, and it was likewise agreed that this was in no small measure due to the fortunate conjunction in time and place of meeting of the retailers', jobbers' and manufacturers' associations which made the services of a number of able speakers available. The addresses by W. T. Sanford, O. B. Barker, Charles H. Ireland, S. Norvell and other prominent jobbers on Wednesday were listened to by a large and attentive audience, which gave unmistakable evidence of its lively appreciation of the programme



R. F. ROYS.



J. P. SIMPSON.

The headquarters of the association were at the Majestic Hotel and the meeting was held in the Majestic Opera House nearby.

President Plummer's Address.

Addresses of welcome and responses, the president's annual address, and the reading of the secretary's report occupied the first session on Tuesday forenoon, which was an open one. The interesting and able annual address of John A. Plummer, president of the Association, was as follows in part:

The business of a retail Hardware dealer comes nearer being a profession than that of any other mercantile pursuit; in all other mercantile lines it takes but a few months to familiarize yourself with the salient points of the business, but in the Hardware line this is not a fact. In this line it takes years of hard study to be fairly well posted. A Hardwareman has to learn just what is needed to build a shack or a mansion; what is the best roofing to use, the style of Locks and Hinges; how a flue should be built; the most convenient place for the Refrigerator, Sink or Range; how the barn should be built, its size, capacity, &c.

The poultry yard comes in for your attention; the lawn claims a part of your time and study. You must know as to house furnishings. Even the young ladies will want you to know just the size Brass Ring they should use for such and such fancy work; the boys want to know all about the Bicycle, the size they should have; the sporting inclined man wants to know all about the different makes of Guns, Rifles, Cartridges, Shells, Fish Hooks, Trolls, Lines (and sometimes the best brand of fish bait).

You have to know the particular style of Plow, Harrow or Cultivator that will work best in such and such soil and crop; how many rods of fence it will take to fence off the cow lot, farm or pasture; how many Staples, Nails and Posts. Stoves and Ranges—you have almost to know the name of the miner who mined the iron. Pocket Knives, Razors and Shears you have to study hard and long; Granite Ware you must know the number of coats and its acid resisting quality, &c.; Iron Pipe and Steam Fitting Goods of a necessity have to be studied long. Pumps you will never know much about, no matter how hard you try. Tools and Implements of architecture demand years of study. You must, in fact, be a know all; for when any article is wanted and it is not known who keeps it, or, in fact, what it is, straight away the party goes to the Hardware store; so you see that it is more of a profession than any other line.

An Educational Campaign.

Now, since we are saddled with all of these studies, let's be generous and take on other studies that are being sadly neglected all over the country—that is the improvement of our country, cities, towns, farms, homes, public buildings, roads, waterways and forests. In the rush for dollars in this country these things have been sadly neglected; the success of the country depends upon our keeping these up to the standard. There are too many young folks leaving the farm for the city life. The foundation of our State rests upon the farm; we must have farmers, farmers' wives, daughters and sons, and means must be devised to keep some of them on the farms.

We must commence a system of education on this line. To keep the young folks on the farm, the farm and home must be made attractive; some attention must be paid to the wants and desires of the children to make their life on the farm pleasant. Why should not the children in the country have such things as Lawn Swings, Tennis Sets, Croquet Sets, Hammocks, Lawn Furniture, like their friends in the cities? Why should not their lawns be cut nice and smooth with a Lawn Mower, the fences and outhouses neatly whitewashed? We must call the attention of the farmer to these things. Show him how much it will add to the pleasure of his household and himself, and how much it will add to the attractiveness and value of his farm.

We must advocate good roads, streets, clean premises, attractive homes, public conveniences, up to date schools and school houses, court houses, parks, &c., and that they be kept so as to be attractive. We want good, live, up to date farmers, mechanics, laborers, merchants, lawyers and doctors to come and live in our country towns and cities, and nothing will do more to make a man who is looking for a new location decide to cast his lot with you than to show him that you have a live up to date community. The undesirable citizen seldom makes a move to find a better location. It is hard to get him out of the community where he exists. It is the man who wants to better his condition, who wants to live in a progressive locality that seeks the new location. He is the man we want; to get him, we must be abreast of the times.

The Hardwareman in Politics.

It has almost become a maxim, that a merchant must have nothing to do with politics. Now this, like many other wise sayings, is a thing of the past. The merchant is nothing unless he is a good citizen. To be a good citizen, he must take an active part and interest in whatever is for the good and the advancement of his State, county, town or locality; he must use his influence to see that men of good, sound business ability are sent to our legislative bodies; for they make the laws that either make or undo our country. In the past years we have had much legislation that has been a detriment to every interest in the State. Our State is of a necessity a borrowing State; we must borrow money to develop its resources, build railroads and carry on our



JOHN A. PLUMMER.



C. E. TAYLOR.

business. To do this, we must give good security, safe insurance. The better the security the safer the insurance, the easier it is to get the money the cheaper the rate of interest will be. To induce capital to come to us, we must convince capital that we want to and will treat it right.

Railroads Should Be Fairly Treated.

We need more railroads to develop our State, more factories to turn our raw material into money producing articles. We are getting but a very small percentage of what we should in this line, and it is largely if not solely due to the fact that it has become quite popular for everybody most to fight the railroads and capital. The slogan of war of the politician is, "Down with the railroads!" They want to make them carry our freight and passengers at a rate that does not leave them a fair return upon their investment and risk, and demand that they build depots and sidings where there is not a sufficient amount of trade to

justify the outlay, and [illegible] that are unjust to them.

We need the [illegible] and capital. Other States are wanting them, and [illegible] to point where people show by their actions that they will deal fairly with them. We need them to penetrate [illegible] to make farm and timber lands treble their present value; to make towns and cities where now there is only a wilderness. Let's give them the glad hand and convince them that we, after giving all sorts of inducements (in resolutions), will not so soon as they spend their money with us, commence to demand that they do things which the business will not justify. Let them make a fair profit on their investment, still have a line of justice and right that all must come to; first give them justice and then demand from them justice.

Let's show them that there are men in this State who are determined to relegate the man whose only battle cry is "down with the railroads; down with capital!" to the rear, where he justly belongs. That we are going to send men to our legislative bodies, broad gauged men, men who will endeavor to pass laws that will encourage capital to come to us; that will bring more railroads, more factories; that will bring those to us who want, in themselves, to be fair and just; that we are going to send men who have the interest of the State at heart, men who are a success, progressive men, men who want to see the grand State of Arkansas take her just rank with the foremost of her sisters; that we are going to let the failures stay at home.

Secretary Taylor's Report.

The report of Secretary C. E. Taylor contained several suggestions for the furtherance of the work and aims of the Association. Among other things recommended was one with reference to the location and time of meeting of the next annual convention, which was favorably acted upon at a later session. The hope was expressed that there might be a large attendance from the state of Arkansas at the annual convention of the National Retail Hardware Association to be held next year at Milwaukee, regardless of the result of the home campaign for State-wide prohibition. It was stated that the few complaints of grievances reaching the Secretary's office during the year had in each instance been satisfactorily disposed of, and recognition was made of the efficient aid rendered by the traveling men who have been admitted as associate members of the association. Continuing the report was in part as follows:

You have already been advised in my secretary's letters from time to time of the progress of work which has been done by the Hardware Associations of the United States to defeat the proposed legislation in favor of parcels post. Congress has adjourned without enacting such a law, and perhaps our associations can now enjoy a breathing spell for a while.

Mutual Insurance.

Investigation at our last annual meeting disclosed the fact that in our State only 14 concerns were carrying Hardware mutual insurance. In conference with the Executive Committee the secretary was directed to endeavor to make an arrangement with one of the larger of the Hardware mutual insurance companies whereby that company could enter the State in accordance with the requirements of our State laws and solicit business from our members. Also to accept business from other dealers in Hardware, Vehicles and Implements, provided, they will join our association. In other words, to sell no insurance to dealers who are not members of our association. Negotiations looking to such arrangement were opened with the following Hardware mutuals: The Minnesota, the Iowa and the National. They all gave careful consideration to the matter and each company was apparently anxious to make the arrangement suggested, but each company in turn has advised us that it cannot at present make such arrangement with us for the reason that our State laws are too drastic for them to meet the requirements. The Iowa Company in particular went into the matter carefully, but its secretary who had correspondence at length with the insurance commissioner of our State, Hon. A. E. Moore, advises that they would be very greatly handicapped in entering the State under the requirements of our laws and that at present they cannot attempt to do it.

Finding that it was not practical at the present time to have the companies come into the State, I endeavored to ascertain whether our association could put a man in the field to secure new members and let him accept applications for mutual insurance as he went from town to town calling on the dealers. Chapter 3, Sections 26 and 29 of our insurance laws seem to be very full of penalties for representatives who solicit business for companies unauthorized in Arkansas. The wording of the law is very broad. It says:

Any representative [illegible] soliciting applications in any other way transacting [illegible] any insurance company not in this State is liable to [illegible] $500 for each month during which [illegible] such business was conducted, and after such conviction that he deemed guilty of a second [illegible] and upon conviction shall be fined in any sum not less than $500.

The Iowa Association writes us that there is no question as to the right of the individuals of our association to secure mutual insurance and to use the United States mails for that purpose. He stated that the matter had been tested before the United States Supreme Court and that the gist of this decision is that a man can purchase his insurance just as he does his sugar or Nails, wherever he pleases. He stated that if we should put out a representative they would be glad to get out some printed matter for him which he could hand to proposed members, explaining the whole situation to them. He could state explicitly that the insurance company is not permitted to enter the State of Arkansas to solicit business; neither can they have an authorized agent to solicit. The insurance people suggest that the dealer could make out his application and forward direct to the company for consideration.

Now my reasons for wanting mutual Hardware insurance made popular are twofold. First, the mutual companies are offering good insurance for less money than the old line companies. Second, a properly directed campaign for new members on the basis outlined above, dependent upon membership in our association, would mean that we would during this year ahead of us receive a great many new members. I believe we will never grow as we should as an association until we are able to offer to many dealers who now should belong to our association something attractive, like the mutual insurance proposition. When we do that we will build up our association rapidly.

Freight Rates.

At the last convention the secretary was directed to endeavor to make arrangements with A. R. Bragg, manager of the Merchant's Freight Bureau of Little Rock, to audit expense bills for over charges, quote freight rates, look after claims, &c., for our members. On going into the matter thoroughly with Mr. Bragg I found that such an arrangement was not possible nor advisable for two reasons; on account of the cost to us and on account of the fact that the Bureau for which Mr. Bragg is manager could not arrange for him to give to our association the time that such work would have demanded of him.

Legislation.

The Legislature will meet next January, and it seems to the writer that it will not only be advisable, but show good judgment on our part as business men, to give some time in our discussions to matters that may be suggested by that committee. Surely the members of the Legislature will be glad to listen to suggestions from our association. If our members can agree on the need of any suggested laws or the repeal of laws now in existence, we should be able to exert a strong influence in the passage by the Legislature of any such helpful measures.

Convention Committees.

The following committees were appointed by President Plummer to serve during the convention:

Resolutions: J. P. Simpson, Malvern; W. H. Wornock, Magnolia; W. W. McMinn, New Port.

Press: H. E. McRae, Hot Springs; C. E. Taylor, Little Rock.

Time and Place of Next Meeting: J. F. Mayo, Little Rock; Wm. Heburt; R. P. Graham, Fordyce; R. W. Merriweather, Pine Bluff; Frank B. Gregg, Little Rock; Dan Watkins, Mena.

Auditing: W. A. Jackson, Dardenelle; Charles Pittman, Prescott; Harry Hankins, Jr., Monticello.

Nominating: Hamp Williams, Hot Springs; K. G. McRae, Hope; H. E. Lyncn, Carendon; C. H. Stout, Black Rock; W. T. Richmond, Ft. Smith.

To Consider Report of Secretary-Treasurer: E. E. Mitchell, Morrillton; W. A. Jackson, Dardenelle; Hamp Williams, Hot Springs.

Extending Credit to Customers.

A paper on the subject, "How Can We Improve the Present Credit Condition of Our Business?" was read by E. E. Mitchell of E. E. Mitchell & Co., Morrilton, and a former president of the association. The paper was as follows, in part:

The very first thing to do is to become careful in extending credit. If you are now careful then the next thing to do is to get more careful. In extending credit we should take into consideration, first, Honesty. If a man can pay, but will not, he is a bad customer. A customer should not be so good as not to be required to pay his account when due. Second, look well to a man's ability to pay, honesty alone does not pay debts; if he does not produce anything to pay with, he is a good man to keep off your books. Third, consider his probable income in connection with his habits, responsibilities and expenses. He may be a willing payer and his income great and yet prove a bad customer because of bad habits, or big responsibilities and expenses such as a large, extravagant family, &c.

Clear Understanding.

Have a clear understanding. If we are selling a customer who we have some doubts about, but for some reason we do not wish to ask him for security we should have a clear understanding with him as to what line of credit we are willing to extend him, so as to be able to hold him within reasonable bounds, without friction. Without some agreement such men are apt to think their credit better than it is, forcing us to curb them after they are in debt to us, which so often offends, and they retaliate by not paying their account.

If credit is extended on a basis of paying any time you please, or "that's all right" manner, the customer is very apt to carry out that spirit, and consider that his bill is not due until it is entirely convenient for him to pay it.

We often hear the expression, "goods well bought are half sold." This expression has a twin brother, much larger in point of value, yet a stranger to many, namely: "Accounts well made are half collected."

Do not get too anxious to sell goods when they are to be charged in order to increase the volume of your business, as you might have the experience the preacher complained of when his congregation talked of raising his salary. He said he did not want it raised as it was then taking so much of him time to collect what they had promised him that he feared that he would not have any time to devote to the preparation of his sermons if he had more salary to collect.

Collecting Tactics Vary.

It is hard to have any given set of rules to collect accounts by. Every customer is different, the same tactics that will work successfully on one will not collect money from the other. Again each merchant or collector can best collect accounts by not trying to ape some one else, but have some originality of his own in approaching the customer.

We think that every customer should be seen or written to when his account is due and asked to settle either at once or some stated time, and that statements of all past due accounts should go to every customer at least once every 30 days. If sent by mail to a man that a mere statement does not appeal to, write something specific and to the point on the bottom of the statement, and if you do not hear from that, follow it up with a letter or your collector.

Charles H. Ireland's Paper.

Chas. H. Ireland of the Odell Hardware Company, Greensboro, N. C., read a very thoughtful and suggestive paper under the title, "What? Whither?" in which reference was made to the momentous changes now going on in the world's affairs, changes that were, he believed, "the first rumblings prior to awakenings of the dawn of a new and better day, a time for which the race has sighed, dreamed and hoped for." Mr. Ireland expressed the view that in the great part which the United States shall perform in the world's future progress the South would be most conspicuous, and "will yet again lead this nation in those things that will make for its widest and best progress." Concluding, he said, that while the retailer, like the farmer, must ever be the bone and sinew of the country, he must by a due appreciation of his true worth fortify himself against undue competition by the observance of the following rules:

1. By a settlement in his own mind of the dignity of his calling. He should never forget that he is not a junk dealer, and the meritorious act of passing an article across his counter and sending it out wrapped in paper with his imprint upon, should add materially to its intrinsic value. Moral, don't buy junk if you don't run a junk shop.

2. If he is not a junk dealer then it should be his aim to let the community know it. Profession amounts to nothing unless the life back of it bolsters up the same. The only correct social and commercial position for the Hardwareman in any community is with the bank, factory and railroad presidents and merchant princes of the community, and if he happens to have his lot cast in a community where none of this class reside he should embrace all within himself and feel perfectly easy as to his right to maintain the dignity of his position.

3. By all means he should belong to his local and State associations, because in union only there is strength, and he should lend all aid in the effort to control department stores and catalogue houses.

But let him, while his eyes are elevated to see the dangers that threaten him from the large catalogue house, take care to make his place of business so clean and attractive that ladies will resort there, rather than shun it. Nor forget that the department store makes a specialty of household goods, and ladies buy these goods only; that women are interested in Fancy China and Cut Glass and Silver Ware more than in Steel Plow Shapes and Trace Chains; that a Cook Stove will look just as well exhibited in the back of the store as in the front; that women do not cook by choice but perforce, and that when they go out for a pleasant shopping trip they do not want a reminder of what's awaiting them at home; that drug stores sell Razors and Pocket Knives; that the law of the Medes and Persians is no longer applicable, hence a man can afford to put in a supply of Cut Glass and Sterling Silver and Chafing Dishes for the purpose of cultivating the best patronage in his town.

That the best way to oppose a catalogue house is to carry a well-assorted, up to date, carefully selected Hardware stock in your own town. That it will not harm his business to display his goods nor fear competition by plainly marking his prices in figures on the same. That the secret of the 5, 10 and 25 cent store is its ability to properly angle a Knife or Hatchet on the counter. That this is the twentieth century and things move on a pace. That the duty of the present hour is *personal*, and upon the manner in which we discharge it rests the destiny of this great land of ours. I know not what others may do, but I shall esteem it a privilege of great opportunity to answer the What of life by the trend which shall leave no room to doubt as to the Whither.

The Local Jobber and What He Deserves.

A very interesting and forcible address was that by W. T. Sanford of the Roberts, Sanford & Taylor Company, Sherman, Texas, and newly elected president of the Southern Hardware Jobbers' Association, on "The Local Jobber and What He Deserves." After touching at some length on catalogue house competition and its mischievous effects, Mr. Sanford spoke in part, as follows:

The jobber occupies the same relative position with the retailer that the retailer does with the consumer. Did you ever think of that? Did it ever occur to you, my friends (and I ask the question in all the courtesy and frankness which the occasion demands), that, while you are making a war upon the catalogue houses, perhaps you are inflicting upon your home jobber the same injustice that you complain of on the part of your customer?

Your Home Jobber

is a citizen of the same great State as yourself. He is contributing his part to the maintenance of the municipal, county and State governments. He is supporting all the public institutions in which you are interested. He stands behind you in times of financial distress. He is your fellow citizen, your neighbor and friend. With you he is working for the advancement of the same people and for the upbuilding, the honor and the glory of the same proud commonwealth. Is he not entitled, therefore, on equal grounds to your liberal patronage? Does he get it? You will observe that I say on equal grounds.

I am aware that no local jobber in the Southwest is prepared to handle the entire account of a large retail Hardware dealer, nor does any assume to do so. There are lines which must necessarily be secured in foreign markets. There are special brands of goods which have been widely advertised for a number of years, which cannot be bought in the home markets; there are some goods for which there is only a local demand, which the home jobber cannot afford to stock; there are lines in which the home jobber cannot offer as large and varied assortment as his foreign competitors, and consequently the retail dealer must go outside his State to supply his wants.

But the question which I would emphasize is this: Do you buy from your local jobber everything that you can buy at the same price or cheaper, freight considered, as from his foreign competitor? If not, I ask with the utmost consideration, are you treating him fairly, or as the President would say, are you giving him a square deal?

A Powerful Ally.

Has it ever occurred to you what a powerful ally you have in your home jobber, or what a tremendous loss of profit you should sustain if he were removed from the field? As you anticipate the wants of your customers, so he anticipates your requirements and frequently ships in an enormous stock of season goods months before the demand begins, that he may fill your orders when your own trade opens up. You can gauge your purchases by the conditions of the crop at harvest, without incurring a single element of risk, but he has to stock the goods long before the ground is plowed, and if crops fail he must carry over the goods and stand the loss of interest on the investment. Or late in the season you can order from hand to mouth, promptly supply your customers without carrying over any surplus stock.

With his stock to draw from and with the terms which he offers, you can sell an article for cash, order it by telephone, get it in a few hours by express, make your profit, have the use of the money for 60 days and never have 1 cent invested. A retail merchant if he will patronize his home jobber as freely as the conditions justify can do the same amount of business on half the capital necessary where he sends to foreign markets for his goods.

Buying at Home.

As a jobber, I have made it a rule never to buy away from Sherman anything that I could buy on equal terms at

home. I buy what I can in Texas, and I buy everything that I can in Arkansas. I am pleased to say that I buy a good deal in Arkansas. If I were in the retail business I would buy at the same price every dollar's worth of goods from a home jobber. I will go a little further and say I would be willing to pay my local jobber a little more, because what I might lose in price I would make up by having him carry the stock, thereby saving time, interest on the investment, freight investment, insurance, taxes, and the risk of a decline.

Existence of Home Jobber Keeps Prices Down.

There is another feature which I wish to emphasize in this connection. The home jobber is the greatest protection the retailer has against paying unreasonably high prices for his goods. Remove the home jobber and you would find some enormous and sudden advances. You wouldn't read about them in the trade journals, but you would hear about them when the foreign drummer came around.

On Nails, Wire, Horseshoes and similar heavy commodities, you would pay from 15 to 75 cents per cwt. more, according to the differential between carload and less than carload rates: you wouldn't get a cent more for the goods, and your stocks would be broken half the time. Therefore, while you may not fully realize it, the average retailer, situated at a great distance from the large jobbing centers is in a large measure dependent upon the local jobber for his success in business.

If it is true, and the fact is not debatable, that it is better for the retailer to buy an article from the local jobber, if he can buy it to an advantage, then it follows that the more items he buys from the local jobber at a favorable price, the more is he benefited; consequently, it is to the interest of the retailer not to weaken his home jobber through lack of patronage, but to strengthen him by his patronage and his influence, thereby enabling him to extend his business, increase his stock, buy in larger quantities and cheaper, and therefore become of more benefit to the retailers in his territory.

Address of J. E. Smith.

J. E. Smith, vice-president of Simmons Hardware Company, St. Louis, and president of the Business Men's League of that city, at the invitation of the convention, discussed the need of a greater inland waterway. He outlined the plans of the Lakes-to-the-Gulf Deep Waterway Association, which is endeavoring, through the co-operation of the Governors of the States, Mayors of cities and towns and commercial and river improvement organizations, to hasten definite favorable action by Congress on a Rivers and Harbors bill carrying sufficient appropriation for deepening the Mississippi River. Of this movement President Roosevelt has declared that the building of this lakes-to-the-gulf deep waterway, which carries with it the improvement of the Mississippi River, is of the first importance among all the meritorious river improvement projects. Mr. Smith urged action by the convention indorsing the project, and invited the attendance of prominent men at the Chicago convention of the Waterways Association, which will be held October 7, 8 and 9 next.

The association unanimously adopted the following resolution:

Resolved, That we extend to J. E. Smith of St. Louis president of the Business Men's League of that city and A. [illegible] president of the Simmons Hardware Company, our thanks and appreciation for his very [illegible] address on The Need of Greater Inland Waterways, and that we endorse the work of the Lakes-to-the-Gulf Deep Waterway Association, and pledge our hearty co-operation.

Resolved, That the Secretary be instructed to send a copy of the proceedings of this meeting to each of the Senators and Representatives in Congress from the States bordering on the Mississippi River, and to the Governors of said States, requesting that they use their best endeavors to secure for the Mississippi River, from the mouth of the Ohio River to the Gulf of Mexico, a channel of sufficient depth to accommodate the largest vessels that navigate the Gulf of Mexico, and that the Secretary be instructed to send a copy of these resolutions to the President of the United States and to all United States Senators and Members of Congress.

The Question Box.

Lively interest was developed at Wednesday's meeting when the question box was taken up under the able direction of President A. T. Stebbins of the National Retail Hardware Association. The first question presented related to mutual fire insurance and the protracted discussion on the subject which followed disclosed a strong sentiment in favor of the Hardware Mutual plan which, however, is scarcely feasible at the present time in Arkansas on account of the drastic nature of Insurance Laws in force in that State. Spirited discussion was aroused by consideration of the question, "Is it best to have strictly one price for every customer?" Opinion was much divided as to the practicability of this policy, but an interesting account of its successful practice was given by a member who has permanently adopted it after a satisfactory trial. Other questions considered were the Hardwareman's credits, uniformity in size of catalogues and post office box rent. As a result of the discussion of the latter topic the following resolution was adopted:

Whereas, It appears by the published reports of the Post Office Department that our Government has collected over $3,500,000 for box rent in our post offices throughout the country during the last year, and

Whereas, This vast sum is demed to be an unjust tax on the business interests of the rural communities. Now, therefore, be it

Resolved, By the Retail Hardware Association of Arkansas, that we hereby protest against this unjust discrimination against the patrons of post offices in smaller towns and villages who do not have mail delivered at their doors, and respectfully request that this matter be presented to the post office authorities for their careful consideration; and be it further

Resolved, That our secretary send a copy of these resolutions to our Senators and Representatives in Congress, with the request that they use their best endeavors to remedy this evil, which seems to us to be class legislation.

Standing Committees.

The following standing committees were chosen:

EXECUTIVE: [illegible] Hot Springs; J. F. Mabry, Ozark; John M. Pittman, Prescott.

LEGISLATIVE: W. A. Jameson, Dardanelle; F. B. Gregg, Little Rock; Joe B. Hughes, Benton; C. E. Matthews, Mulberry; B. J. Underwood, Stuttgart; P. W. Johnson, Pocahontas; M. E. West, Helena.

PROGRAMME NEXT CONVENTION: H. E. Lynch, Clarendon; V. R. Harris, Fordyce; F. E. Pharr, Texarkana; R. N. Vail, Morrilton; G. W. Edmondson, Des Arc; W. W. McMinn, Newport; C. E. Taylor, Little Rock.

MEMBERSHIP: J. Hardcastle, Arcadia; C. H. Stead, Brook Rock; W. H. Warnock, Magnolia; Herman Carlton, Lake Village; Will Hill, Charleston; Isaac J. Morris, Mountain Home; George Stanley, Mcneely; Tom Dickinson, Lonsdale; Dan M. Watkins, Mena.

Jobbers' Sales to Consumers and Non-Hardware Dealers.

Jobbers selling to consumers was the subject of a good deal of discussion at one of the sessions, many of those present contributing their experience and views. It was finally resolved that all complaints of this nature should be referred to the secretary and that he in turn take the matter up with the offending parties.

The following resolution was also adopted:

That this convention declare at this time that we do not approve of the action of any jobbing house that accepts business from customers in our towns and then refuses to sell us Hardware in stock.

Cards containing this resolution will be printed and distributed among the members of the association.

Enlistment Committees.

Valuable assistance in the numerical development of the association is rendered by the enlistment committees comprising traveling men who are associate members. These committees for the ensuing year will be constituted as follows:

HARDWARE DIVISION: J. M. Lofton, chairman, Chicago; W. G. Barnes, St. Louis; H. M. Todd, Louisville; M. C. Talley, Chicago; R. P. Young, Memphis, Tenn.; W. A. Cook, St. Louis; B. Morrison, Little Rock; P. N. Warren, Memphis; Otis J. Johnson, Little Rock; H. N. Billinger, St. Louis; J. H. Wall, St. Louis; William R. Neblett, Memphis; O. C. Word, Fort Smith; A. S. Sutton, Little Rock; Frank Lyon, Little Rock; M. O. Martin, St. Louis; J. A. Mason, St. Louis; T. D. Rowan, Louisville; W. H. [illegible], Memphis.

VEHICLE DIVISION: J. M. Hughes, chairman, Memphis; E. B. Richards, Memphis; Frank Laster, Fort Smith; T. B. Imgram, Florence, Ala.

IMPLEMENT DIVISION: H. L. Taylor, chairman; Louisville; W. E. Wadsworth, Springfield, Ill.; G. L. Turner, St. Louis; Geo. S. Hooper, Memphis, Tenn.; Lafayette Burris, Memphis; H. P. Alexander, St. Louis; O. M. Wylie, Longview, Texas; G. G. Armistead, Louisville; Lewis R. Hardy, Memphis; H. A. Guild, St. Louis.

STOVE DIVISION: J. C. Stephan, Evansville, Ind.; H. W. Giers, Memphis; F. E. Moraney; J. Rosenthal, Belleville, Ill.; J. Bailey Gordun, Rome, Ga.; Geo. C. Robinson, St. Louis; John [illegible], Louisville; N. Rosen, Nashville.

HARNESS AND SADDLERY DIVISION: P. K. Gunter, chairman, Little Rock; A. C. Appleby, Dallas, Texas; J. W. Green, Louisville.

MISCELLANEOUS DIVISION: James K. Lewis, chairman, Little Rock; C. L. Trolinger, Kokomo, Ind.; J. D. Waters, St. Louis; T. T. Johnson, Pittsburgh; J. C. Britt, St. Louis; Duff Green, St. Louis; W. A. Smith, St. Louis; F. W. McMiller, Memphis, Tenn.; R. S. Anderson, Little Rock; Paul R. Litzke, Little Rock; T. C. Cole, St. Louis; H. S. Speck, Little Rock; J. H. Martin, Little Rock.

Election of Officers.

The election of officers resulted as follows:

PRESIDENT, R. E. Boys, Russellville.
FIRST VICE-PRESIDENT, J. P. Simpson, Malvern.
SECOND VICE-PRESIDENT, J. B. Burley, Warren.
SECRETARY TREASURER, W. L. Harlan, Little Rock.

John A. Plummer, Marianna; C. E. Taylor, Little Rock, and N. T. Richmond, Fort Smith, were elected to fill places of three retiring members of the Executive Committee.

Next Meeting at Fort Smith.

In response to an urgent invitation extended by the Commercial Club of Fort Smith through representative Hardwaremen present at the convention, it was decided to hold the next annual meeting in that city. It was suggested that by going over to the west side of the State many dealers in the Northwestern portion of the State might be induced to attend and become members of the association.

Convention Notes.

W. L. Harlan, Little Rock, the newly elected secretary of the association, presented the report of the proceedings of the last national convention at St. Louis. Mr. Harlan went into considerable detail, and his report was listened to with interest and attention.

An address which held the undivided attention of the convention at its morning session on Wednesday was delivered by J. D. Kenyon of New York City, vice-president of the Sheldon School of Scientific Salesmanship. Mr. Kenyon spoke for an hour upon the science of salesmanship and its application to everyday transactions in the distribution of goods.

An appreciative tribute to the helpful influence of the trade press was voiced by two members, who told of the valuable suggestion and information they constantly gleaned from the leading Hardware journals. Speaking from his own experience, Hamp Williams said that every Hardware merchant should urge his clerks to read them also.

"The Development of a State" was the subject of an interesting and suggestive address of the Hon. George R. Belding, Hot Springs, president of the State Fair Association and Industrial Exposition of Arkansas. Mr. Belding referred to the vast undeveloped resources of the State, and called attention to the third annual State fair and industrial exposition to be held next October, which he urged the Hardware merchants to make as large a success as possible.

By a two-thirds vote of the convention Article XI section 1 of the constitution, relating to the time of holding the annual convention, was changed to read as follows: "The meeting of this convention shall be held at any time in the months of May or June, as may be fixed each year by the Executive Committee." This action was taken to secure such latitude as would enable the fixing of dates that would best harmonize with those of neighboring States, it being desirable to have them run as far as possible in consecutive order.

The local retail Hardware houses vied with each other in preparing attractive window displays, and the competitive efforts thus evoked resulted in a showing creditable alike to the trade itself and to the city.

A. T. Stebbins, president of the National Retail Hardware Dealers' Association, was the recipient of a handsome alligator traveling bag, which was presented to him by President John A. Plummer of the Arkansas State Association as a personal token of regard and esteem as well as memento of the occasion of his visit.

No exhibit of goods by manufacturers and jobbers was shown at this meeting, but the Arkansas retailers are considering the advisability of inviting displays to be made at their next convention. The question has been referred to the officers and Executive Committee with power to act.

Addresses by S. Norvell, president of the Norvell-Shapleigh Hardware Company, St. Louis, Mo., were interesting features of both the retailers' and jobbers' meetings. A genial group of salesman from this house was also in attendance to extend greetings to their friends and customers among the assembled dealers. This delegation consisted of J. P. Walker, M. O. Martin, J. A. Mason, F. Millard, C. D. McManus, W. A. Cooke.

A pleasing incident of the meeting not down in the official programme occurred in the final hour of the closing session. It was the presentation by the association of a silver tea service to C. E. Taylor, the retiring secretary. Overcome with surprise and emotion by this unexpected tribute of love and esteem from his friends and associates, Mr. Taylor was for the moment unable to respond, but in a brief pause, gathering his composure, he acknowledged his appreciation of the gift and the spirit prompting it, in words that rang with the eloquence of feeling and kindest sentiment of kindred sympathy.

An attractive collection of photographs illustrating the line of Hardware store fixtures made by the J. D. Warren Mfg. Company, Chicago, was displayed in the lobby of the Arlington Hotel. These were examined with interest by a large number of delegates and visitors, and information sought respecting them was furnished by J. D. Warren, whose careful study of the problem of arrangement, disposition and display of Hardware stocks has made him an acknowledged authority on this subject.

Headed by James E. Smith, vice-president, who delivered an interesting and able address before the convention on the subject of "Waterways," the following representatives of the Simmons Hardware Company, St. Louis, were present: C. L. Rierson, W. G. Barnes, J. H. Wall, H. N. Bellinger and H. S. Speck.

Success Chemical Fire Extinguisher.

The H. W. Johns-Manville Company, 100 William street, New York, has recently put on the market the Success Portable Fire Extinguisher. It is made of extra heavy Lake Superior cold rolled copper, securely riveted and reinforced by heavy shoulders of solder, every one of which is tested to withstand a pressure of 350 lb. to the square inch, or four times the required strength. The joint where the cover is attached is ordinarily the weakest part, but the method of attaching the dome to the body of the shell is said to make that joint the strongest part in this extinguisher. The large wheel at the top of the machine is a convenience in opening and closing it, at the same time serving as a base on which to rest it when reversed, as in use for playing on a fire. The frame work, or bottle holder, containing the supply of sulphuric acid, is cast brass and virtually indestructible. The bottle of standard size and type for holding the acid is obtainable anywhere in case of accidental fracture from any cause. The hose, tested to 400 lb. to the square inch, cannot be pulled off and is only detachable with a wrench, being joined to the body by a swivel ground joint. The nozzle is said to be absolutely noncorrosive. No mechanical force is needed to put the apparatus in action; it is simply turned bottom up and the resultant mixture of sulphuric acid in the three gallons of water charged with bicarbonate of soda develops instantly force enough to throw a chemical stream 50 ft. This chemical stream acts as a blanket and smothers fire which water cannot reach. By means of a lead stopper, fitting loosely, the flow of sulphuric acid is regulated to just the correct amount of gas generated at all times, making explosion impossible, the company states. As this extinguisher neutralizes the acid before it leaves the machine, the stream will not injure material with which it may come in contact.

The General Electric Company.

The General Electric Company, Schenectady, N. Y., has added to its product some new designs of luminous electric radiators, both portable and mantel types, and tubular air radiators for domestic and central station heating. An illustrated booklet has been issued, giving catalogue numbers with ratings, capacities, voltages, price lists, &c., which will be of much assistance to the prospective purchaser. The booklet also refers to the balance of the company's line of electric heating and cooking devices, including flat irons of various types, water heaters, combination cereal cookers, tea kettles, percolators, chafing dishes, stoves, frying pans, grids, ovens, &c.; cooking and baking outfits, consisting of combinations of the most desirable apparatus, are also described, and such specialties as cigar lighters, shaving mugs, heating pads, corn poppers, &c.

Hoag Combination Padlock.

Arthur W. Hoag, 145 East Twenty-third street, New York, has recently brought out the patented Hoag combination padlock here shown actual size. It is substantially made of cast bronze metal, machined and polished. The combination is set on three numbers, 0 to 30 inclusive, as indicated on the dial, the various possible combinations reaching into the thousands. While the lock as sold is usually set at certain figures at random, the construction is such that its possessor may at any time alter the combination as frequently as there is occasion for it. This is easily done with the right side of shackle swung back, as illustrated, when with a slender screw driver inserted in the 3-16 in. opening a screw is receded, which enables the entire dial mechanism to be taken out. Back of the dial are three disks, a slight change in which by the loosening of a screw entirely alters the combination, full directions for accomplishing which accompany each lock. To open the lock, assuming it is set on 25, 20, 6, the dial is revolved to the left first to 25 three times, then to right to 20 twice and finally once to the left to 6, so that in each instance the dial graduation is in alignment with the line in center of outer beveled rim, when

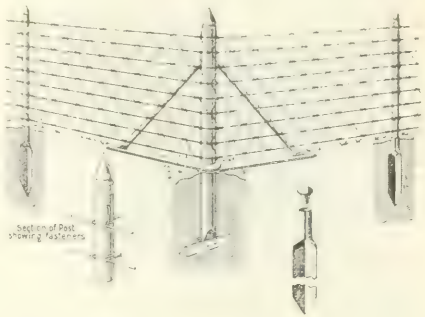


Hoag Combination Padlock, Open.

a partial turn to the right unlocks and throws the hasp upward 3-16 in. and backward, say, ¾ in. The locks are put up singly in pasteboard boxes, with the combination figures and explicit directions how both to unlock and change the combination. It is regularly furnished in polished bronze, but if necessary to match trim can be finished specially as required at an additional cost, dependent on the finish.

Milwaukee Steel Fence Post.

The Milwaukee Steel Fence Post Company, Milwaukee, Wis., is offering the metal fence post which is herewith illustrated. The distinctive feature of the post is its separable base, so constructed as to be easily driven into the ground. The lower end of the base is trough shaped and pointed, while the upper end is formed into a ferrule, in the top of which a metal cap is fitted for the purpose of driving it into the ground. It is stated that but a few strokes of the sledge are required to drive the base to its full depth of 2 ft. into the ground in any soil. When driven in position the metal cap or driving plug is removed and the post inserted in the ferrule. The posts are made of 1¼-in. high carbon steel tubing, without reinforcements; but to make their rigidity doubly sure the tube is filled with cement, which in addition to added strength prevents rusting on the inside. Posts are furnished thickly coated with black Metalastic paint, which is said to make a lasting coating. Corner, end and gate posts are made of the same material as the line posts, but are larger, being 2⅜ in. in diameter and set 3 ft. in the ground; they are likewise filled with cement. Special bracing is provided for these posts, consisting of steel tubes, and in conjunction with flat steel ground braces at the bottom of the posts an angle bar is riveted which

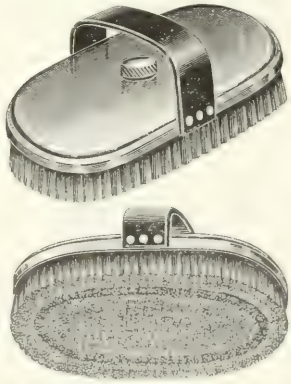


Fence Erected on Milwaukee Steel Fence Posts.

contributes to its rigidity against strain. The manner of attaching the fencing is shown in the illustration, the ties used being of 14-gauge galvanized wire. The line posts are made in lengths from 3 to 5 ft., with ½-ft. graduations, the 4-ft. length weighing 11 lb. Bases 3 ft. long for use in swampy ground are supplied at a slightly advanced cost.

The Sanitary Horse Brush.

A sanitary horse brush recently placed on the market by the Milwaukee Dustless Brush Company, Milwaukee, Wis., as shown, top and bottom, in the accompanying illustrations. The feature of particular interest in this brush is found in the provision made to eliminate dust rising from the brushing of horses and the application of sanitary fluids for destroying disease germs and insects. In its general construction this brush is similar to other high grade horse brushes, but is distinguished therefrom



[illegible]

by a steel oil reservoir mounted on the back. This receptacle is filled with kerosene or coal oil, which is fed through a row of special feed tufts in sufficient quantities to moisten the dust. The reservoir being airtight, the flow of oil is regulated by simply tightening and loosening the screw cap seen in the top of the brush. The brush is said to be of durable construction throughout and the steel back is copper plated, giving it an attractive finish. It is made in one size only, No. 8, and each brush is packed in a neat cardboard box, in which it can be displayed to good advantage. The company offers to send a brush on 30 days' trial to responsible merchants.

Coal Chutes.

William U. Koons, Danville, Ill., is offering two patterns of coal chutes for buildings, which are shown in the accompanying illustrations. Fig. 1 represents a style

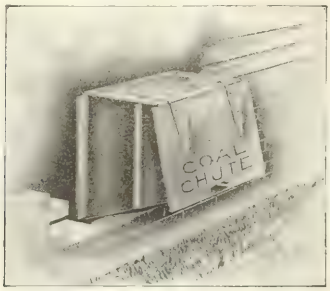


Fig. 1.—Coal Chute to Rectangular Openings.

adapted to rectangular openings. It is constructed of 3-16 in. steel plate, and is provided with angle irons riveted to the sides, which not only serve to stiffen the case, but hold it firmly in the wall. The mouth of the chute is covered with a drop door strap hinged to the top of the body. This chute is 16 by 21 in. in size and made

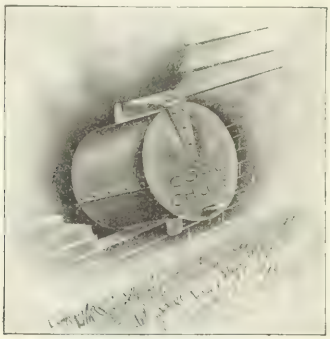


Fig. 2.—Circular Pattern Coal Chute.

only for 8 in. walls. Fig. 2 represents the circular pattern which is made of No. 12 steel, and is likewise held in the wall by angle irons riveted to the top and bottom of the cylinder. It is 22 in. in diameter and is also designed for 8 in. walls.

The Wonder Washer.

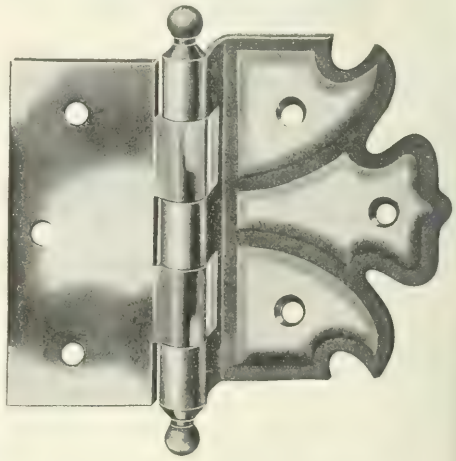
The Wonder Washer made by the Victor Mfg. Company, Leavenworth, Kan., is in some respects a departure from common practice in machines of this class. The tub is rectangular, as shown in the accompanying illustration, and is separable from the four legged stool on which it is mounted. When not in use the stool may be turned upside down and the tub nested in it, in which form it can be conveniently stored under the table or hung on the wall. The stool or stand is made of yellow pine with steel or wooden braces. The tub, which measures 19 by 21 in. on top and holds 16½ gal. of water, is made of No. 27 galvanized steel; has a neat molding around the top, which improves its appearance and also serves to prevent water and slop reaching the floor, all being drained back into the tub. Particular effectiveness is claimed for the agitator which is a distinctive feature of the machine and differs in shape and construction from those of other washers. Its frame is made of galvanized iron rod in one piece and includes the handle as well as the loops to which the canoe shaped agitator or suction cup is attached. Broad and substantial splash boards the hight of the tub are set inside at the center of both front and back of the machine to assist in dividing and distributing the currents of water, thus increasing its agitation. This movement is further promoted by vertical wings set in each corner of the tub. Since the agitator works down among the clothes no space is required above the water, so that the tub may be worked full. By the combined action of suction, squeezing, rubbing and swinging of clothes through the water, it is claimed that the cleansing process is accomplished in short time without damage to the fabric.



The Wonder Washer.

Crown and Crescent Surface Half Mortise Butt.

The McKinney Mfg. Company, Pittsburgh, Pa., has added to its line the Crown and Crescent surface half mortise Butt here illustrated. The goods are full size, made of heavy cold rolled steel and heavily plated in all standard finishes. They can be used on either right or left hand doors without any adjusting. Each pair is packed in a separate box with screws, 100 pairs in a case. To hang a door the regular butt part should be mortised in the jamb. Then set the door, wedge to proper hight and insert screws in ornamental part. To remove a door it is only necessary to withdraw the screws from the ornamental part.



Crown and Crescent Surface Half Mortise Butt.

The Faultless Carpet Stretcher and Tacker.

The elimination of much of the tiresome and laborious effort connected with carpet laying is aimed at in the design of the carpet stretcher and tacker made by the J. W. Quilling Mfg. Company, Quincy, Ill., and illustrated herewith. Both the construction of the tool and the method of operation are clearly outlined in the illustrations, Fig. 1 showing it unfolded and in working position. A feature of interest is the device provided for automatically feeding the tacks, point down, under the driving rod, shown in Fig. 3. The tacks are held in a hopper, D, on the side of the wooden lever, from which they pass without regard to arrangement in the feed channel, where they are deposited in uniform position. One blow of the driving rod is usually sufficient to drive the tack home, but successive blows can be struck if required. It is claimed that tacks can be driven close to the wall or in a corner without danger of marring adjacent woodwork, Fig. 2, and, what is of special importance, the entire operation of stretching and tacking can be performed without stooping. The stretcher attachment B, Fig. 1, is furnished with front and rear plates, F and G, which engage the carpet, and it is claimed that a pull strong enough to stretch the heaviest carpet, while carrying the operator's weight, can be exerted. The machine is described to use either 8, 10 or 12 oz. tacks.



Fig. 1.—The Faultless Carpet Stretcher and Tacker.



Fig. 2.—Stretcher and Tacker in Operation.

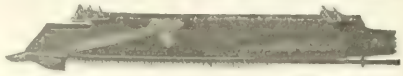
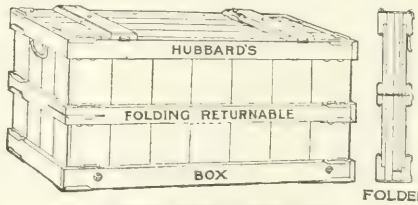


Fig. 3.—Enlarged View of Tack Hopper.

Hubbard's Folding Delivery Box.

The Puffer-Hubbard Mfg. Company, Minneapolis, Minn., is putting on the market the folding packing box illustrated herewith. The feature of it is that after it has been used in forwarding merchandise it can be compactly folded as shown in the illustration and retruned at a very low rate to the shipper for successive use. The box is wire sewed, containing no nails. There are no loose parts and all metal is tinned. The hinges are made of pressed steel plate. The box locks and seals in a simple manner, so that it cannot be opened until the seal is broken. There is no expense or trouble in setting up the box, as all parts merely swing into their respective positions. When folded the lid and bottom are securely protected inside. Boxes are made in hights from 12 to 30 in., widths from 12 to 24 in. and lengths from 24 to 40 in. Owing to the method of folding, the hight must always be made to equal or exceed width.



Hubbard's Folding Delivery Box.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, State and Western	
raw	.42 @.44
City, Boiled	.44 @.46
City Raw	.41 @.43
Raw, Calcutta, in bbls	
Lard, Prime, Winter	
Extra No. 1	
No. 1	
Cotton-seed, Crude, f.o.b. mill	@
Summer Yellow, prime	
Summer White	
Yellow Winter	
Tallow, Acidless	
Menhaden, Brown, Strained	.38 @
Light Strained	
Bleached Winter	
Ex. Bleached Winter	
Cocoanut, Ceylon	
Cochin	
Cod, Domestic, Prime	
Newfoundland	
Red, Elaine	
Saponified	
Olive, Yellow	
Neatsfoot, Pure	
Palm, Lagos	

Mineral Oils—

Black 29 gravity, 25 cold test	
29 gravity, 15 cold test	
Summer	
Cylinder, light, filtered	
Dark, filtered	
Paraffine, 32 deg. sp. gravity, 903 sp. gravity	13½@14
885 sp. gravity	
Red	13½@14

Miscellaneous—

	₱ lb.
Barytes:	
White, Foreign	
Amer. floated	₱ ton
Off color	₱ ton
Blanc Fixe, Dry	
Pulp	
Blue Stone	
Bone Ash	
Bone Black	
Bone Dust	
Bone Meal	
Bone, Ground	
Bone, Steamed	
Bone, Unsteamed	
Chalk	₱ ton 3.00@3.40
China Clay, Imported	₱ ton 11.50@18.00
Copper, Oxide	₱ lb. 1.10@1.20
Whiting, Commercial	₱ 100 lb. .42@.52
Gold Size	₱ lb. .55@.65
Ex. Gilders	₱ 100 lb. 60@.65

Putty, Commercial—₱ 100 lb

In bladders	$1.70 @1.80
In bbls. or tubs	.@1.65
In 1 lb. to 5 lb. cans	.65 @.85
In 12½ to 50 lb. cans	1.50 @1.90

Spirits Turpentine—₱ gal.

In Oil bbls	.42 @44½
In machine bbls	.43½@44

Glue—

	₱ lb
Cabinet	.12 @15
Common Bone	.7 @9
Epsom Acetic	.3 @4
Fish, liquid, 50 gal. bbls., per gal.	.80 @1.00
Flake Stock White	.12 @14
Flake Stock Brown	.9 @11
German Common Hide	.10 @12
German Hide	.12 @18
French	.10 @14
Irish	.12 @16
Low Grade	.10 @12
Medium White	.14 @17

Gum Shellac—

	₱ lb
Fine Orange Commercial	.27 @28
Fine Orange Dry	.32 @35
Fine Orange Pale	.38 @40
Fine Orange Powdered	.42 @45
Garnet	.25 @30
A. A. Garnet	.18 @20
Button	.28 @30
D. C.	.48 @49
Orange, B.	.8 @11
T. N.	.27 @30
Y. S. O.	.47 @48

Colors in Oil—

	₱ lb
Black, Lampblack	.12 @14
Bone, Chinese	.15 @16
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @14
Green, Chrome	.12 @16
Green, Paris	.14
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, English white, in Oil	.10¾@10¾
Lead, American White:	
Lots of 500 lb or over, in Oil	@ 6¾
Lots less than 500 lb, in Oil	@ 7¼
Lead, White, in oil, 25 lb tin kegs	@ 7¼
Lead, White, in oil, 12½ lb tin kegs	@ 7¾
Lead, White, in oil, 1 to 5 lb tins, packed 5 lbs in a case	@ 8¾
Lead, American. Terms: On lots of 5 bbls or over, 2 per cent off if paid in 15 days from date of invoice.	

Zinc, Dry—

	₱ lb
American, dry	.4 @5
Red Seal, French process	.5 @6
Green Seal, French process	.5 @6
Green Seal, French	.6 @7
French	.6 @7
Green Seal	.7 @8
White Seal	.8 @9
French	.9 @10
Green Seal	.10½@10¾

Dry Colors—

	₱ lb
Black, Carbon	.6½@10
Black Drop, American	.3½@ 8
Black Drop, English	.5 @15
Black, Ivory	.16 @20
Lamp, commercial	.4 @ 6
Blue, Celestial	.4 @ 6
Blue, Chinese	.21 @23
Blue, Prussian	.29 @31
Blue, Ultramarine	.3½@15
Brick, Spanish	.1
Carmine, No. 40	.5 @.5
Green, Chrome, ordinary	.5 @ 5
Green, Chrome, pure	.17 @25
Lead, Red, bbls., ½ bbls., kegs	@ 6¾
Litharge, bbls., ½ bbls., kegs	@ 6¾
Ochre, American	₱ ton $8.50@16.00
American, Golden	.3½@ 3½
French	.1¼@ 2
Passing Golden	.1
Orange Mineral, English	.10
Domestic	.15
Orange, Chrome	.15
Vandyke	.6
Red, Indian, English	.6
Persian	.6
Red, Turkey, English	.4 @10
Red, Tuscan, English	.8 @10
Red, Venetian, American	.2½@ 2½
Rose Pink, English	₱ lb $.50@1.60
Sienna, Italian, Burnt and Powdered	.9
Italian, Raw, Powdered	.7
American, Raw	.1¼@ 2
American Burnt and Powd	.1½@ 2
Talc, French	.2½@ 3½
American	.1 @ 2
Terra Alba, French	.2½@ 3
English	.1 @ 1½
American	.1 @ 1½
Umber, Raw	.1½@ 2
Umber, Turkey, Burnt & Powd	.2½@ 3
Turkey, Raw and Powdered	.2 @ 3
Burnt American	.1½@ 2
Raw American	.1½@ 2
Yellow, Chrome, Pure	.13¾@15
Vermilion, American	.3 @5
Orange Lead	.6 @6
Orange Lead	.6 @6
English, Imported	.6 @7
Chinese	.6 @7

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10 signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic 75%
North 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Iron Patent 35
Taplin's Patent 5

Ammunition—See Caps, Cartridges, Shells, &c.

Anti—Rattlers—

Fernald Mfg. Co, Burton Anti-Rattlers, ₰ doz. pairs, Nos. 1, 2, 3 ..... ₰ doz. $2.00
Fernald Quick Shifter, ₰ doz. pairs ..... $2.00@$3.00

Anvils—American—

Eagle Anvils ..... 7½@8c
Hay Bedder, Wrought ..... 5½@6c
Trenton ..... 5½@6c

Imported—

Swedish Solid Steel Sisco, Superior, ₰ lb ..... 9½@10c
Peter Wright & Sons ..... 9½@10c
B. Tyler ..... 9½@10c

Anvil, Vice and Drill—

Mulkey Falls Co. ..... 50&10

Apple Parers - See Parers, Apple, &c.

Aprons, Blacksmiths'—

Lancaster Nail Co 10

Augers and Bits—

Comp. Double Spur.....75&10@75&10
Jennings' Pats., Bright.65&10@65&10
Gilmore Lip and Bland.....65&10@65&10
Barney Patch Augers.....70
Car Bits, 12-in. twist.....40&10
Ford's Auger and Car Bit ..... 10&5
Ft Washington Auger Co., Conard's 35%
Forstner Pat. Auger Bits 25
C. E. Jennings & Co.:
No. 10 ext. lip R. Jennings' list ..... 25&5%
No. 30, R. Jennings' list 50%
Russell Jennings ..... 25&10&2%
L'Hommedieu Car Bits 15%
Mayhew's Countersink Bits 45
Pugh's Black 20%
Pugh's Jennings' Pattern 35%
Snell's Auger Bits 60
Snell's Auger-Bar 70
Snell's Car Bits, 12-in. twist 60
Snell's King Auger Bits 50%
Wright's Jennings' Bits 50%

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Clark's Pattern, No. 1, ₰ doz., $26; No. 2, $18 ..... 50&10
Ford's, Clark's Pattern ..... 66⅔&5%
C. E. Jennings & Co., Steer's Pat. 25%
Lavigne Pat., small size, $18.00; large ..... 50&10
Steer ..... 50&10

Gimlet Bits—

Per gro.
Common Jobbers' Cut ..... $2.00@2.25
German Pattern, Nos. 1 to 12, $3.75; 13 to 15, $4.75 50

Hollow Augers—

Bonney Pat., per doz. ..$5.50@6.00
Mayhew ..... 50&10
Snell ..... 50&10

Ship Augers and Bits—

Ship Auger ..... 40&10@—%
Ford's ..... 50&10
C. E. Jennings & Co.:
Ship Auger 50
Worm 50
Screw 40

Awl Hafts —See Handles, Mechanics' Tool.

Awls—

Brad Awls:
Handled, ... gro. $2.75@3.00
Unhdld., Shielded ..... gro. 65@66c
Unhandled, Patent ..... gro. 60@70c
Pegging Awls:
Unhandled, Patent ..... gro. 50@55c
Unhdld., Shielded ..... gro. 65@70c
Scratch Awls:
Handled, Com ..... gro. $3.50@4.00
Handled, Socket ..... gro. $11.50@12.00

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

Single Bit, base weights: Per doz.
First Quality ..... $7.50@8.00
Second Quality ..... $5.25@4.50
Double Bit, base weights:
First Quality ..... $7.00@7.50
Second Quality ..... $6.50@6.75

Axle Grease—

See *Grease, Axle.*

Axles— *Iron or Steel.*

Concord, Loose Collar ..4½@5c
Concord, Solid Collar ..4½@5½c
No. 1 Common, Loose ..3¾@4¼c
No. 1½ Com., New Style ..4½@5 ¢
No. 2 Solid Collar ..... 4½@5 ¢
Half Patent:
Nos. 7, 8, 11 and 12 ..65@65&10%
Nos. 13 to 15 ..... 65&10@70
Nos. 17 to 19 ..... 70@75&10
Nos. 19 to 22 ..... 70@75&10

Boxes, Axles—

Common and Concord, not tapped ..... lb. 5@6c
Common and Concord, turned, lb. 6@7c
Half Patent ..... lb. 9@10c

Bait— Fishing—

Henshaw:
A Bait 25
B Bait 25
Complete Bait 2.00

Balances— Sash—

Caldwell new list ..... 50&10
Pullman ..... 50&10

Spring—

Light Spring Balances..60@—%
Chatillon's:
Light Spg. Balances ..... 50@50&10
Straight Balances ..... 40&10%
Circular Balances ..... 50&10
Large Dial 30

Barb Wire—See *Wire, Barb*

Bars— Crow

Steel Crowbars, 10 to 30 lb. per lb., 2¼@2½c

Towel—

No. 10 Ideal, Nickel Plate..₰ gro. $8.50

Beam, Scale—

Scale Beams 30
Chatillon's No. 1 30
Chatillon's No. 2 40

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₰ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ₰ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned ..... ₰ doz. $1.50

Beaters Egg—

Dover Stamping & Mfg. Co.:
Genuine Dover, per gro., No. 1, Tumbler Size, $7.50; No. 2, Family Size, $7.50; No. 3, Extra Family Size, $24.00; No. 1, Hotel Size, $9.00.
Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd. $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.35; No. 1, Jap'd, per doz. No. 2, $1.35
Taplin Mfg. Co.:
Imperial Dbl. Tinned ..... No. 60
$6.00; No. 75, $6.50; No. 100, $7.00; No. 125, $7.50; No. 150, $8.00
Hotel Size, No. 175, Hotel Tinned, $17.00; No. 200, Tumbler, $9.00; Tumbler Tinned ..... No. 200
Mammoth ..... Tinned

Bellows—

Blacksmith, Standard List:
Split Leather ..... 50&10@—%
Grain Leather ..... 50&10@—%

Hand—

Inch	6	7	8	9	10
Per doz.	5.50	6.00	6.50	7.50	

Molders—

Inch	10	12	14	16
Per doz.	$7.50	9.00	12.00	15.00

Bells— Cow—

Wrought Cow Bells 55
Brass ..... 75&10
Tea 50

Door—

Home, R. & E. Mfg. Co.'s ..... 35&10

Hand -

Polished, Brass ..... 50&10@60%
White Metal ..... 50&10@50&10&5%
Nickel Plated ..... 50&5%
Swiss ..... 50&5
Coe's Globe Hand Bells ..... 33⅓@35%

Miscellaneous—

Farm Bells ..... lb., 2¼@2½¢
Church and School ..... 60@60&5

Belting— Leather—

Standard ..... 70&10@75&10&5%
Light ..... 75@80
Cut Leather Lacing ..40@40&10
Leather Lacing Sides, per sq. ft. ..... 20¢

Rubber—

Competition (Low Grade), 70&10@75&5%
Standard ..... 60&10@70
Best Grades ..... 33⅓@40&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list:
Chain, Parts, Sundries 50
Tubes 60

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks Tackle—

Common Wooden ..... 75@75&5
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%
Lane's Patent Automatic Lock and Jointer 30
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined 55%
Embossed 55%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuhel & Esser Co. 33⅓%

Bolts Carriage, Machine, &c.—

Common Carriage (cut thread):
⅜, ½ & smaller ..75&5@—%
Larger and longer ..... 70@—
Phila. Eagle, $3.00 list ..80@—%
Bolt Ends ..... 70@—
Machine (cut thread):
⅜, ½ and smaller ..75&10@—%
Larger and longer ..... 70@—

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knobs:

Inch	7	8	9	10
Per doz.	$0.30	.35	.45	.60	.80

Cast Iron Spring Foot, Jap'd.

Inch	6	7	8	9	10
Per doz.	.80	.90	1.00	1.50	2.25

Cast Iron Chain, Flat, Japanned:

Inch	6	7	8	9	10
Per doz.	.84	.90	1.00	1.25	1.65

Cast Iron Flat Shutter, Jap'd. Brass Knobs:

Inch	6	8	10
Per doz.	$0.75	.95	1.25

Wrought Barrel Jap'd .80@80&10%
Barrel Bronzed ..... 60&10%
Spring ..... 70@70&10@75&10%
Shutter ..... 50@50&10@55%
Square Neck ..... 75@75&10%
Square ..... 70@70&10%
Iles Pabst Door 55
Ives' Wrought Metal 45%

Expansion—

E. H. Evans' Cresent ..... 40@60
Richards Mfg. Co. ..... 55&10%
Steward & Romain Mfg. Co.:
Style No. 13, Double 60%
Style No. 1 Single 60
Style No. 100, Dbl. Jaw, Single 55
Lag Screw 66⅔%

Plow and Stove—

Plow ..... 65@70&10
Stove ..... 85@85&10

Tire—

Common Iron 80
Norway Iron 80%
American Screw Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Bay State, list Dec. 28, '99 85
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Eclipse, list Dec. 28, '99 ..... 80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99 ..... 80%
Norway Phila., list Oct. '84 ..... 80%
Eagle 82½
Shelton Co.:
Tiger Brand, list Dec. 28, '99...80%
Phila., Eagle, list Oct. 16, 1884..82½%
Unson Nut Co.:
Tire Bolts 72½

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch	¾	1	1¼	1½
Per doz.	$4.80	5.60	6.40	8.00

Inch	2	2½
Per doz	$8.65	11.50

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.

Boxes, Mitre—

C. E. Jennings & Co. 25%
Langdon ..... New Langdon and Langdon Improved, 20&10%; Langdon Acme ..... 15&10
Perfection 40
Seavey 15

Braces—

Comman Ball, American $1.50
Barber's ..... 50&10&10@60&10%
Pray's Genuine Sppoffords 60%
Fray's No. 161, 206, 614 ..... 50%
C. E. Jennings & Co. ..... 50&5
Mayhew's Ratchet 60%
Mayhew's Quick Action Hay Pat... 50%
Millers Falls Drill Braces ..... 75&10%
P., S. & W. Co., Peck's Pat... 60&10

Brackets—

Wrought Steel....70&10@75&10%
Bradley Metal Clasp...80&10@80&10&5
Griffin's Pressed Steel ..... 75@75&10%
Griffin's Folding Brackets ..... 70&10
Taplin Victor Handy Egg Beater Bracket ..... ₰ doz. $1.50

Bright Wire Goods—

See *Wire and Wire Goods*

Broilers—

Kilbourne Mfg. Co. ..... 75&20
Wire Goods Co. 75

Buckets, Galvanized —

Mfr's list, price per gross.

	Quart	10	12	14
Water, Reg	26.87	29.50	33.50	
Water, Heavy	27.75	30.50	34.50	
Fire, Rd. Bttm.	32.00	35.00	38.00	
Well	37.50	41.25	47.25	

Bull Rings—See *Rings, Bull*

Butts— Brass—

Wrought, High List, Oct. 26, '06 75
Cast Brass, Tiebout's 40%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow....40&10@50%
Loose Joint ..... 70@70&5%
Loose Pin ..... 70@70&5%
Mayer's Hinges ..... 70@70&5%
Parliament Butts ..... 70@70&5%

Wrought Steel—

Bright.
Light Narrow, Light Reversible ..... 70@65
Reversible and Broad..70@65%
Loose Joint, Narrow, Light 70%
Inside Blind, &c. 70%
Back Flaps, Table Chest..65%
Japanned.
Light Narrow, Loose Pin, 70@65%
Light Narrow, Ball Tip..60%
Broad ..... 70@65%
Steeple Tipped 70%
Ball Tipped 70%

Butts, Wrought Steel—Broad, Light, Narrow, Reversible, Loose Joint, Loose Pin, Mayer's Hinges, Parliament Butts, Steeple Tipped, Ball Tipped, Inside Blind, &c., Back Flaps, Table Chest, Japanned, Light Narrow, Loose Pin, Light Narrow, Ball Tip, Broad, Steeple Tipped, Ball Tipped — 70%

Cages, Bird—

Hendrix Bros. ... list ... 30%

Hendrix Bros. ...

Hendrix Bros. ...

Calipers—

Calks, Toe and Heel—

Blunt, 1 pound ...

Sharp, 1 pound ...

Bass ... Blunt ...

Lenthall Blunt ...

Perkins, Blunt ...

Can Openers—

See Openers, Can

Caps, Percussion—

Eley's E. B. ...

G. D. ...

E. E. ...

G. E. ...

Musket ...

Primers—

Bordan Primers ...

Primer Shells and Bullets ...

All other primers ...

Carpet Stretchers—

See Stretchers, Carpet

Cartridges—

Blank Cartridges:

32 C. F. ...

38 C. F. ...

22 cal. Rim ...

32 cal. Rim ...

B. B. Caps, Con. Ball ...

B. B. Caps, Round Ball ...

Central Fire ...

Target and Sporting Rifle ...

Primed Shells and Bullets ...

Rim Fire, Sporting ...

Rim Fire, Military ...

Casters—

Bed ...

Plate ...

Philadelphia ...

Acme Ball Bearing ...

Gem Roller Bearing ...

Steel Gem ...

Standard Ball Bearing ...

Yale Double Wheel ...

Cattle Leaders—

See Leaders, Cattle

Chain, Proof Coil—

American Coil, Straight Link:

5/16 in. ... 3/8 in. ... 7/16 in. ... 1/2 in. ... 9/16 in. ... 5/8 in. ... 3/4 in. ... 7/8 in. ... 1 in. ... 1 1/8 in. to 1 1/4 inch.

$3.45 ... 3.55

In cask lots, deduct 2%

German Coil ...

German Pattern Coil:

5/16 in. ... 3/8 in. ... 7/16 in. ... 1/2 in. ... 9/16 in. ... 5/8 in. ... 3/4 in. ... 7/8 in. ... 1 in. ... 1 1/8 in. to 1 1/4 inch.

3 and 4 ... *50¢@10%*

4, 5 and 6 ... *50¢@10@10¢@7½%*

Halter—

Halter Chains ...

German Pattern Halter Chains, list July 25, '07 ...

Covert Mfg. Co.: ...

Halter ...

Cow Ties—

See Halters and Ties

Trace, Wagon, &c.-

Traces, Western Standard ...

6½—6-2, Straight ...

6½—6-2, Straight ...

6½—8-2, Straight ...

6½—10-2, Straight ...

NOTE.—Add 2¢ per pair for Twist Traces, and 5¢ per pair for Straight Link.

Eastern Standard Traces ...

Chain, &c., list July 1, '07 ...

Miscellaneous—

Jack Chain, list July 1, '07 from ...

Brass ...

Safety and Plumbers' Chain ...

Gas Pump Chain ...

Beaudette Chain ...

Triumph Bicycle ...

Triumph Dog ...

Brown Bros. Co. ...

Covert Mfg. Co.: ...

Breast, Halter, Heel, Rein, Stallion ...

Oneida Community: ...

Novelty Dog ...

Wire Goods Co.: ...

Dog Chain ...

Universal Dog ...

Chain and Ribbon, Sash—

Oneida Community: ...

Pullman: ...

Bronze Chain, 60%; Steel Chain, Galvanized ...

Sash Chain Attachments, per set ...

Yale ...

Sash Ribbon ...

Chalk— (From Jobbers.)

Carpenters' Blue ...

Carpenters' Red ...

Carpenters' White ... *gro., 90¢@1.75*

Checks, Door—

Bordan ...

Tubular, per gro. ...

Russia ...

Chests, Tool—

Automatic Tool ...

Boys' ...

Youth's and Tool ...

Gentlemen's Chest ...

Farmers', Carpenters, etc., Chests, with Tools ... 20%

Mechanics' Tool ...

Tool ...

Tool Cabinets ... 45%

Tool Chests ... 7½%

Chisels—

Socket Framing and Firmer

Socket Firmer ... *Socket Framing* ...

Socket Firmer No. 10 ... 25&7½%

Socket Framing ...

L. & I. J. White & Co. ... 30@30&5

Tanged—

Tanged Firmers ... *30¢@50&5%*

B. B. ...

C. E. Jennings & Co. Nos. 191, 181 ... 25%

L. & I. J. White & Co. ...

Cold—

lb.

Cold Chisels, good quality ...

Cold Chisels, fair quality ... *11¢@12¢*

Cold Chisels, ordinary ... *9¢@10¢*

Chucks—

Adjustable Drill Chucks ...

Almond Turret Six-Tool Chuck ... 40

Bell Pat. ... $8.00 ...

Lancaster ...

Reversible ...

Jacobs' Drill Chucks ... 35%

Pratt's Positive Drive ... 25

Skinner Patent Chucks: ...

Independent Lathe Chucks ... 35%

Universal, Reversible Jaws ... 35

Combination, Reversible Jaws ... 35

Drill Chucks, Key, Nickel ... 50%

Standard, 45%; Skinner Pat. 25%; Positive Drive ... 40%

Pratt Chucks ...

Face Plate Jaws ... 35

Standard Tool Co.: ...

Improved Drill Chuck ... 45%

Union Mfg. Co.: ...

Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21 ... 35%

Scroll Combinations, Nos. 83 and 85 ... 30

Geared Scroll, Nos. 33, 34 and 35 ... 25%

Independent Iron, Nos. 18 and 318 ... 35

Independent Steel, No. 04 ...

Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104 ... 35%

Union Czar Drill ... 25

Universal, 11, 12, 16, 17, 13, 14, 15 ... 10%

Two-Jaw ...

Face Plate Jaws, Nos. 28, 30, 32 ...

Three Face Plate Jaws, Nos. 2 ... 30%

Westcott Patent Chucks: ...

Lathe Centers ...

Little Giant Auxiliary Drill ... 50%

Little Giant Double Grip Drill ... 50

Little Giant Drill, Improved ... 50%

Oneida Drill ... 50

Scroll Combination Lathe ... 50%

Whittaker Mfg. Co.: ...

National Drill ... 25%

Clamps—

Adjustable Hanger ...

Carpenters' Malleable Pipe Screw ...

Besly, Parallel ... 33⅓&10

Metal Hand Screw ...

Wood Workers' Hand ...

Wood Workers' Vises, Steel Parallel ...

Cleaners, Drain,

Iwan's Champion, Adjustable.

Iwan's Champion, Stationary ...

Sidewalk—

Star Socket. All Steel ... *p* doz. $4.05 net

Star Shank. All Steel ... *p* doz. $3.24 net

Wood Shank. All Steel ...

Cleavers, Butchers'—

Foster Bros. ...

Parker, Field & Sons ...

I. & I. J. White & Co. ...

Clippers, Horse and Sheep—

Chicago Horse, each ... $4.00

20th Century Horse, each ... $5.00

Lightning Belt Horse, each ... $15 00

Chicago Belt Horse, each ... $20.00

Stewart's Enclosed Gear Horse, each ... $6.75

Stewart's Patent Sheep Shears ...

Mayhew ...

Stewart Enclosed Gear Shears ...

Stewart Horse, &c. ...

Clips, Axle—

Regular Styles, list July 1, '07 ...

Cloth and Netting, wire

See Wire, &c.

Cocks, Brass—

Hardware Trade ...

Pratt's Patent Globe, Regular, Radiator, Lavatory, Bathing, &c. ...

Compression Bibbs ...

Coffee Mills—

See Mills, Coffee.

Collars, Dog—

Novelty Dog ... Walter B. Stevens & Son ...

Lawrence, Walter B. Stevens & Son, list ...

Compasses, Dividers, &c.

Carpenters' Goods ... *list July 1, '07*

Conductor Pipe,—

L. C. L. to Dealers:

	Gal. Steel.	*Charcoal Iron*
Northeastern	...	...
Eastern	...	...
Pittsburgh	...	...
Central	...	...
Northwestern	...	...
Western	...	...
Tennessee	...	...
Southern	70%	50&6¼%
Southwestern	...	...

Less carload lots ...

Corrugated ...

See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.: ...

Gal.	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90

Galvanized, Lined, side handles, ...

Ice ... $4.15

Wire ... .10

Coppers' Tools—

See Tools, Coppers

Coppers, Soldering—

Soldering Coppers, 3 lb. to pair and heavier, 30¢; lighter than 3 lb. to pair ... *25¢*

Cord and Sash—

Braided, Drab ... *lb. 25¢*

Braided, White, Com., Nos. 8 to 12, 20¢; No. 7, 20½¢; No. 6, 21¢; in lots of 12 doz. or over, 1 cent less per pound

Cable Laid Italian, lb., No. 18 ... *32¢*

Italian, lb., No. 18 ... *25¢; lb. 42¢*

Common Index ... *lb., 17@17½¢*

Cotton Sash Cord, Tufted ... *18@25¢*

Patent Russia ... *lb.* ... *30¢*

Cable Laid Russia ... *lb.* ... *21¢*

India Hemp, Br'd'd ... *lb.* ... *21¢*

India Hemp, Twisted ... *lb., 18@19¢*

Patent Braid, Tufted ... *lb.* ... *17¢*

Pearl Braided, Cotton, No. 6, *p* lb. ...

Pearl ... No. 8 to 12, 25¢

Eddystone, Braided, Nos. 8 to 12, 20¢; No. 7, 20½¢

Harmony Cable Laid Italian, Nos. 7 to ...

Pullman: ...

Wire Sash Cord ...

Sash Cord Attachments, per 100 ... $2.00

Samson, Nos. 8 to 12: ...

Braided, *p* lb., Drab Cotton, 50¢; Linen, 65¢; White Cotton, 55¢; Linen ...

Massachusetts, White, *p* lb. ...

Massachusetts, Drab ... *p* lb 45¢

Phoenix, White, Nos 8 to 12 ... 27¢

Silver Lake, per lb.: ...

A. B. Drab, 40¢; B. White, 35¢; Italian Hemp, 40¢; Linen ... 57½¢

See also Chain and Ribbon.

Wire, Picture—

Full Length ... *90¢@*

Short Length ... *90¢@20¢@—%*

Hendryx Standard Wire Picture Cord, old list, 85&10

Taylor & Stanton Co. Wire Picture ... 50&5

Cradles—

Grain ... *90¢@1.25*

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but prices quoted by jobbers.

Zelnicker's Lumber: ... gro.

White and Purple, Indelible ... $7.50

Blue, Red, Green, Yellow and Gilt ... Black ...

Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks ... $10.00

Genuine Soapstone, Metal Workers' 5 in. x 5-8 in. Round, $2.50; 5 in. x 5-8 in. Splints, $1.75; 5 x 1¼ x 3-16 ... $2.50; 5 x 1¼ x 3-16 ... $3.00

Submark, Black, $2.25; Blue, Red, Yellow ...

Crooks, Shepperds'—

Fort Madison, per doz., Heavy, $5.50; Light ...

Crow Bars—*See Bars, Crow*

Cultivators—

Victor ...

Cutlery, Table—

International Silver Company ...

No. 12 Mid'n Knives, 1847 *p* doz. $3.50

Star, Eagle, Rogers & Hamilton ...

Wm. Rogers & Son ...

Cutters— Glass—

H. H. Mayhew Co. ... 40

Ball ...

Ideal ...

Meat and Food—

Little Giant ...

Enterprise Beef Shavers ... $15.00 ... $18.00

Slaw and Kraut—

Hand ...

Slaw and Kraut ...

Corn Graters ... 30

J. M. Mast Mfg. Co.: ...

Slaw Cutters, 1 Knife ... *p* doz $3.00

Slaw Cutters, 2 Knife ... *p* doz ...

Slaw and Kraut ...

Tobacco—

All Iron, Cheap ... doz, $4.25@

Plug ...

National, *p* doz., No. 1, $21; No. 2, $18 ... 40

Diggers, Post Hole, &c—

Disston's: ...

Iwan's Improved Post Hole Auger ... 40

Vaughan Pattern Post Hole Augers, *p* doz., $7.0

Post Hole Digger ...

Split Handle Post Hole Diggers, *p* doz., $7.7

Hercules Post ...

Kohler's, *p* doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $7.5

Nevers Bros. Post Hole ...

Post ...

Dividers—*See Compasses.*

Drawing Knives—

See Knives, Drawing.

Dressers Emery Wheel—

Sterling Emery Wheel Dresser ...

Sterling Wheel Dresser Cutters ... 35%

Drills and Stock Drills—

Blacksmith's Common Drilling Machines ... *$4.50@11*

Breast, Millers Falls ... 15&10

Breast, P., S. & W. ... 33⅓%

Goodell Automatic Drills ... 50&10@60&10

Millers Falls Automatic Drills, 33⅓&10

Ratchet, Curtis & Curtis ... 25

Ratchet, Parker's ...

Ratchet, Weston's ... 40

Ratchet, Weston's, Style H Improved ... 40

Ratchet, No. 012 ... 40

Ratchet, Celebrated ... 40

Ratchet, Whitney's, P.; S, & W., ... 50&5

Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00 ... 33⅓%

Twist Drills—

Bit Stock ... *50¢@75¢*

Taper and Straight Shank, 90¢@1.50

Drivers, Screw—

Screw Driver Bits, per doz., 25¢@50¢

Balsey's Screw Holder and Driver, *p* doz., 2's, $6; 4-in., $7.50; 6-in., $9 ... 50%

Book Bits, Screw Driver Bits ...

Champion ...

Disston's ...

Fray's Hol. H'dle Sets, No. 3, $12 ... 50%

Ford's Quick Blade Screw Drivers ... 40&10%

Gay's Double Action Ratchet ... 35%

Goodell's Auto ... 65@65&10%

Mayhew's Black Handle ... 40%

Michael's Magazine ...

Millers Falls, Nos. 20 and 21 ... 25&10%

Millers Falls, Nos. 11, 12, 41, 42 ... 15&10%

Smith & Hemenway Co. Ratchet, Blue, Ebonized ... 50&5

Stanley ...

Nos. 705 to 750 ... 50%; No. 740 ... 10&1

Eave Trough, Galvanized—

Territory	*Gal. Steel.*	*Charcoal Iron*
Northeastern	...	...
Eastern	...	...
Southeastern	...	...
Central	*80¢@10¢&2½%*	*65¢@10%*
Northwestern	...	...
Western	...	...
Tennessee	...	...
Southern	*80%*	*60¢&10¢&7½%*
Southwestern	...	...

Less carload lots ...

Corrugated ...

sections.

Elbows and Shoes—

Galv. Steel and Galv. C. I.

No. 26 ...

No. 24 ...

No. 22 ... *10%*

Elbows, Stove Pipe—

Emery, Turkish—

Extractors, Lemon Juice—

—See Squeezers, Lemon

asteners, Blind—

Cord and Weight—

Corrugated—

Faucets—

Felloe Plates—

See Plates, Felloe.

Files— Domestic—

List Nov. 1, 1899.

Best Brands ..... 70d 10&15%
Standard Brands ..... 75d 10&15%
Lower Grade ..... 75d 10&15%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 ..... 331/3&10%

Fixtures, Fire Door—

Allen, Underwriters' Approved 50
Richards Mfg. Co.:
Universal, No. 103; Special, No. 1 ..... 50&5
Fusible Links, No. 36 70
Expansion Bolts, No. 107 ..... 60&10%

Grindstone—

Net Prices:
Inch 15 16 20 24
Per doz. $3.00 3.85 4.80 7.05
P. S. & W. Co. 25
Reading Hardware Co. 60

Fodder Squeezers—

See Compressors.

Forks—

NOTE — Manufacturers are selling from the list of September 1, 1897, but agent jobbers are still using list of August 1, 1899, selling at net prices.

Frames— Wood Saw—

White, Sid't Bar, per doz. ..... 75@80c
Red, Sid't Bar, per doz. ..... $1.00@1.25
Red, Dbl. Bar, per doz. ..... $1.00@1.50

Freezers, Ice Cream—

Qt. 1 2 3 4 6
Each $1.25 $1.60 $1.90 $2.20 $2.80

Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Fuse—

Per 100 Feet
Hemp $2.75
Cotton 3.25
Waterproof Sal Tapeal 3.00
Waterproof Dbl. Tapeal 3.50
Waterproof Tpl. Tapeal 3.75

Gates, Molasses and Oil—

Stebbins' Pattern ..... 50@60&75

Gauges

Marking, Mortise, &c. ..... 50@60&10
Cutting 50
Mortise ..... 50&10
Mortise & Marking ..... 50&10
Wire, Brass 50
Wire, Morse's 50
Wire, P. S. & W. Co. 33⅓

Gimlets— Single Cut—

Net Prices:
Per dozen assorted sizes per inch
Nos. 000 to 0 ..... $0.15
Nos. 1 to 5 ..... 0.20
Nos. 6 to 9 ..... 0.25
Spike, Wood Handled, No. 1 ..... 1.00

Glass, American Window

See Jobbers' List.

Glasses, Level—

Glue, Liquid Fish—

Grease, Axle—

Griddles, Soapstone—

Grinders—

Grindstones—

Grips, Nipple—

Halters and Ties—

Hammers—

Handled Hammers—

Heavy Hammers and Sledges—

Handles—

Agricultural Tool Handles

Cross-Cut Saw Handles—

Mechanics' Tool Handles—

Hangers—

Gate—

Joist and Timber—

Hasps—

Hatchets—

Heaters, Carriage—

Hinges—

Blind and Shutter Hinges

Hangers—

Hangers— Garment—

Wrought Iron Hinges—

Gate Hinges—

Pivot Hinges—

Spring Hinges—

Hitchers, Stall—

Hods— Coal—

Masons' Etc.

Hoes— Eye—

Handled

Hoisting Apparatus—

See Machinery, Hoisting.

Holders— Bit—

Door—

File and Tool—

Fruit Jar—

Trace and Rein—

Hones—Razor—

Hooks—Cast Iron—

Harness, Reading List.....40

Wire—

Hat, 70&10; Ceiling.....70&10

Parker Wire Goods Co., King...70&10

Wrought Iron—

$1.5; 10 in., $2.50.

Miscellaneous—

Hooks, Brush or Shoe, Bright, doz. 50c.

Horse Nails

See Nails, Horse.

Horseshoes—

See Shoes, Horse.

Hose, Rubber—

Cotton Garden, ¾-in., coupled:

Irons— Sad—

Bar and Corner—

Pinking—

Irons, Soldering

Jacks, Wagons—

Covert Mfg. Co.:

Ladder

Kettles—

Hollow.

Knives

Butcher, Kitchen, &c.—

Corn—

Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Hay and Straw—

Miscellaneous—

Westenholm's .....per doz. $3.00@3.25

Knobs—

Door, Por. Nickel.. doz. $2.07@2.15

Lacing, Leather—

See Belting, Leather.

Ladders, Store, &c.—

Richards Mfg. Co.:

Trolley, No. 109.....50%

Ladles, Melting—

Lanterns—Tubular—

Bull's Eye Police—

Latches— Thumb—

Door—

gator, 50%; Reliable Cold Storage, 50%

Cronk & Carrier Mfg. Co., No. 101.

Leaders, Cattle—

Covert Mfg. Co.:

Leathers, Pump—

See Pumps.

Lifters, Transom—

Lines

Solid Braided Chalk, Nos. 0 to 3..40%

Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $8.50

Masons' Lines, Shade Cord, &c.:

$2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75:

No. 4½, $4.50.....20%

White Cotton, $7.50; Drab Cotton.....

Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75:

Turner & Stanton Co.:

Clothes Lines, White Cotton....20%

Shade Cord, Cotton or Linen....20%

Locks— Cabinet—

Door Locks, Latches, &c—

R. & E. Mfg. Co.....10%

Padlocks

Sash, &c.—

Ives' Patent:

60: Iron, 67½; Window Ventilator

Pullman Patent Ventilating Lock, 25%

Machines—Boring—

Swan's Improved.....40&10

Millers' Falls.....5.75

Snell's, Upright, $2.65, Angular, $2.90

Corking—

Roisinger Invincible Hand Power....

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist.30

Moore's Cyclone High Speed Chain

Ice Cutting—

Washing

Boss Washing Machine Co.: Per doz.

Boss Rotary.....$57.00

Champion Rotary Banner No. 1.$57.00

Standard Champion No. 1.....$30.00

Standard Perfection.....$27.00

Eureka American, Round.....$33.60

Mallets—

Mangers, Stable—

Mats, Door—

Elastic Steel (W. G. Co.), new list.50%

Mattocks—

See Picks and Mattocks.

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Victoria..33⅓

Motors, Water—

Mowers, Lawn—

Cheap, 10-in., $2.25; advance 15@ 20c for each size.

Better Grade, 10-in., $3.00; advance 25c for each size.

Great American Ball Bearing, new list.70%

Quaker City.....70%

Pennsylvania, Jr., Ball Bearing.....

Granite State:

Style B, Low Wheel.....70%

Style C, High Wheel, spcl. list, 70&10%

Style D, High Wheel, spcl. list..70%

Philadelphia:

Styles M., S., C., K., T....70&10&5%

Style E, High Wheel.....70&10&5%

Drexel and Gold Coin, special list.40%

Eagle Horse.....30&5

Nails—

Cut and Wire. See Trade Report.

Hungarian, Finishing, Upholstery.

See Tacks.

Horse—

N 6 7 8 9&10

Coleman .... 13 12 12 11 11 .....net

Jobbers' Special Brands, per lb. 9@10c

Picture—

Per Head, avg. .. 1.10 1.10 1.10

Upholsters—

Nippers

Nuts

Cold Punched: Off list.

Hot Pressed:

Oakum—

Bell Yarn, lb.

Packers' Spun Oakum, lb.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated.....75%

Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20; Old Pattern, Nos. 1, 2, 3, 50

American Tube & Stamping Co.:

Spring Bottom Cans.....70&10%

Railroad Oilers, &c.....60&10

Maple City Mfg. Co.:

Openers— Can— *Per doz.*

Sprague's, Wood Handle...45@50c

Egg—

Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope, any quantity.....30c

Rubber

(Fair quality goods.)

Sheet, C. I.....11@12c

Sheet, C. C. S.....11@12c

Sheet, C. R. S.....12½@13c

Sheet, Pure Gum.....50@75c

Sheet, Red.....40@50c

Miscellaneous—

Asbestos Packing, lb. 50@60c

Cotton Packing, lb. 10@25c

Italian Packing, lb. 20@25c

Jute, lb. 10@15c

Russia Packing, lb. 50@60c

Pails, Water, Well, &c.—

See Buckets.

Pans— Dripping—

Standard List.....65&7½%

Edwards, Royal Blue.....65&7½

Fry—

Common Tipped

Per doz...$0.75 0.80 0.90 1.10 1.30

Refrigerator, Galva.—

Per doz....$1.75 2.25 2.50

Paper—Building Paper

Asbestos: lb.

Roll Board or Building Felt, 6 to 8 lbs. per 100 sq. ft.

Roll Board or Building Felt, 9 to 12 lbs. per 100 sq. ft.....$1.25

Mill Board, Sheet, 40 x 40 in., Per roll.

Light weight, 25 lbs. to roll.

Medium weight, 50 lbs. to roll.

Heavy weight, 70 lbs. to roll.

Black Water Proof Sheathing, 500 sq. ft. 1 ply, 400 lbs. per roll.....$1.25

Impenetrable Felt, 4 Gauge, 500 sq. ft. to lb., ton.....$75.00

Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—

1 ply, roll 400 sq. ft.....

2 ply, roll 108 sq. ft.....67c

3 ply, roll 108 sq. ft.....88c

Slater's Felt (roll 500 sq. ft.).80c

Sand Paper and Cloth—

Garnet Paper and Cloth.....23%

Parers—Apple

Goodell Co.:

New Century.....each $20.00

Reading Hardware Co.:

Reading 72.....½ doz. $3.25

Potato—

Picks and Mattocks—

Pinking Irons—

See Irons, Pinking.

Pins, Escutcheon—

Brass ..... 70&5%&10%
Iron, Bost Nor. 11, 85 ..... 60&60&10

Pipe, Cast Iron Soil—

Standard, 2-6 in ..... 60&5%—
Extra Heavy, 2-6 in ..... 50&5%—
Fittings, Standard and Heavy ..... 70&10%&75

Pipe, Merchant—

	Consumers, Carloads, Steel	*Iron*
	Blk. Galv.	*Blk. Galv.*
	%	%	%	%
¼ and ⅜ in.	64	48	62	
½ in.	66	52	64	50
¾ in.	68	56	66	54
1 to 6 in.	72	62	70	60
7 to 12 in.	69	54	67	52

Pipe, Vitrified Sewer—

Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First class 85
Second class ..... 90&5

Pipe, Stove—

	Per 100 joints.	
	C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	6.75	7.75
7 in., Standard Blue	7.25	8.25
5 in., Royal Blue	7.00	8.00
6 in., Royal Blue	7.50	8.50
7 in., Royal Blue	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color	$6.15	$7.15
6 in., Uniform Color	6.65	7.65
7 in., Uniform Color	7.65	8.65

Planes and Plane Irons—

Wood Planes—

Beach, first qual ..... 30&10&10%
Beach, second qual ..... 40&10&10%
Molding ..... 25&10&10%

Chapin-Stephens Co.:
Beach, First Quality 50
Beach, Second Quality 40
Molding and Miscellaneous 35
Tool and German 60
Union 65

Iron Planes -

Chaplin's Iron Planes ..... 50&10
Union 60

Plane Irons—

Wood Beach Plane Irons, list Dec 12, '06 25
Buck Bros 50
Chapin-Stephens Co 50
Stanley 50
L. & I. J. White ..... 20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse ..... ₰ doz. $8.00

Plates—

Fellow ..... *lb.* 40@45c

Pliers and Nippers -

Button Pliers ..... 75&5%&75&10@75%
Gas Burners, per doz., 5 in., $1.25; 6in $1.90; 7 in., $1.45 $1.50
Gas Pipe.. 7 8 10 12-in.
$2.00 $2.25 $2.75 $3.50

Acme Nippers ..... 50&5%
Cronk & Carrier Mfg. Co:
American Button 80
Barbed Steel Button ..... 75&10%
Cutting 60
No. 56 Lineman's 55
Studs Pattern 55
Combination and others 50
Heller's Farriers' Nippers, Pincers and Tools ..... 10&5%&10&5%
P. S. & W. Tinners' Cutting Nippers 40
Swedish Side End and Diagonal Cutting Pliers 50
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels ..... 20&5&10%
Chaplin's Imp. Brass Cor ..... 40&10&10%
Pocket Levels ..... 30@30&10%
Extension Sights ..... 30@30&10%
Mortising Level ..... 40&10&10%
Disston's Plumbs and Levels ..... 60&10%
Disston's Pocket Levels ..... 60&10%
Stanley's Plumbs 50
Wood Extension 50

Points, Glaziers'—

Ball, and 1 lb papers ..... *lb* 6 c
¼ lb papers ..... *lb* 10 c
½ lb papers ..... *lb* 10 c

Police Goods—

Manufacturers' Lists ..... 25@25&10%
Tower 25

Polish—Metal, Etc—

Parker's, No. 1 50
Parker's, No. 2 Copper 40
Prestoline Paste 40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes ₰ doz. 55c; ₰ gro. $4.50; 5 lb boxes ₰ doz. $1.25; 1 lb boxes, ₰ doz. $2.25
U. S. Liquid, 8 oz. cans, ₰ doz. $1.25
Rubberpads, Finish Metal Polish ₰ doz., $1.75.

Stove—

Black Eagle Boxblue Paste, 5 lb cans, ₰ lb. 6c
Black Eagle, Liquid, ½ pt. cans, ₰ doz. 75c
Black Jack Paste, ¼ lb cans, ₰ gr. $9.00
Black Kid Paste, 5 lb can ..... each, $0.65
Ladies' Black Beauty Liquid, per 100 cans $6.75
Joseph Dixon, ₰ gr. $5.75 10
Dixon's Plumbago ..... ½ lb 8c
Fireside ..... ₰ gr. $2.50
Gem, ₰ gr. $4.50 10
Japanese ..... ₰ gr. $3.50
Jet Black ..... ₰ gr. $3.50
Peerless Iron Enamel, 10 oz cans, ₰ doz. $1.50

Poppers, Corn—

1 qt. Square ..... doz. $0.80; gro. $8.75
1 qt. Round ..... doz. $0.90; gro. $10.00
½ qt. Square ..... doz. $1.00; gro. $11.00
2 qt. Square ..... doz. $1.25; gro. $13.50

Post Hole and Tree Augers and Diggers—

See also Diggers, Post Hole, &c.

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42c; 6 ft., 46c; 8½ ft., 18c.
Steel Hitching Posts ..... each $1.30

Potato Parers—

See Parers, Potato.

Pots, Glue—

Enameled ..... *35&10%*
Tinned ..... *30&10%*

Powder—

In Canisters:
Duck, 1 lb ..... *each 1½c*
Fine Sporting, 1 lb ..... *each 75c*
Rifle, ½ lb ..... *each 15c*
Rifle, 1 lb ..... *each 25c*
In Kegs:
12½-lb. kegs *$3.50*
25-lb. kegs *$4.50*
King's Semi-Smokeless:
Keg (25 lb bulk) $6.50
Half Keg (12½ lb bulk) 3.50
Quarter Keg (6¼ lb bulk) $1.90
Case 24 (1 lb cans bulk) $8.50
Half case (1 lb cans bulk) $4.50

King's Smokeless	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb c. bk)	7.25	8.75

Presses—

Fruit and Jelly—

Enterprise Mfg. Co ..... 20@25%

Seal Presses—

Morrill's No 1, ₰ doz., $20.00 ..... 50%

Pruning Hooks and Shears

See Shears.

Pullers, Nail—

Cyclops 50
Miller's Falls, No. 3, ₰ doz., $12.00 ..... 20%&10%
Morrill's No. 1, Nail Puller, ₰ doz. $20.00 50
Pearson No. 1, Cyclone Spike Puller, each $30.00 ..... 50%
The Scranton ..... Case Lots:
No. 2B (large) $5.50
No. 3B (small) $5.00
Smith & Hemenway Co.:
Diamond P 70
Giant 50
Staple Pullers, Utica and Dayton 60%

Pulleys, Single Wheel—

Inch *1½ 1¾ 2 3*
Awning or Tackle, doz ..... *$0.50 .55 60 1.05*
Hay Fork, Swivel or Solid Eye, doz., 4 in., $1.25; 5 in. $1.55
Inch *2 2¼ 2½*
Hot House, doz ..... *$0.65 .85 1.20*
Inch *1¼ 1½ 1¾ 2*
Screw, doz ..... *$0.16 .19 .23 .30*
Inch *1½ 2 2¼ 2½*
Side, doz ..... *$0.25 .30 .35 .60*
Inch *1½ 1¾ 2 2½*

Sash Pulleys—

Common Frame: Square or Round End, per doz., 1¾ and 2 in ..... *15@20c*
Lame Mortise, no Face Plate, per doz., 1¾ and 2 in ..... *20@25c*
Acme, No. 35, 1¾ in., 19c; 2 in., 20½c
American Pulley Co.:
Wrought Steel American Plain Axle ..... 50&10%
Wrought Steel Eagle ..... 50&10%
Tip Noted, Electrically Welded, Nos. 3 and 4 ..... 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in. 50%
Grand Rapids All Steel Noiseless, 50%
Niagara, No. 25, 1¾ in., 19c; 2 in., 20½c
No. 26, Tips, 1¾ in., 19c; 2 in., 16½c
Star, No. 26, 1¾ in., 19c; 2 in., 20½c
Tackle Blocks—See Blocks.

Pumps—

Cistern 60
Pitcher Spout ..... 75&5%&75&10%
Wood Pumps, Tubing, &c 50
Barnes Dbl. Acting (low list) ..... 40&5%
Barnes Pitcher Spout ..... 75&10
Contractors Rubber Diaphragm, No. 2, R. & L. Block Co $16.00
Daisy Spray Pump ..... ₰ doz. $6.50
Flint & Walling's Fast Mail Hand (low list) 50%
Flint & Walling's Fast Mail Hose (low list) 50
Flint & Walling's Tight Top Pitcher ..... 75&10
National Specialty Mfg. Co., Measure-Rite, Nos. 2, $6.00 50
Myers' Pumps (low list) ..... 40&5%
Myers' Power Pumps ..... 10&5
Myers' Spray Pumps ..... 10&5

Pump Leathers—

Plunger and Valve Leathers -Per gro

No	*1*	*2*	*3*	*4*	
	$7.00	6.00	5.00	8.00	
Cup Leathers. Per 100:					
Inch	*2½*	*3*	*3½*	*4*	
	$5.00	7.00	9.00	12.00	

Punches—

Saddlers' or Drive, good, doz ..... *50&75c*
Spring, single tube, good qual doz *$1.25*
Revolving (4 tubes) ..... doz. $4.50
Bemis & Call Co.'s Cast Steel Drive 50%
Merrill's Nos. 1A, 1A, 1B, 1C, 1D, $15.00 ..... 50%
Hercules, 1 die, each $5.00 ..... 50%
Niagara Hollow Punches 10%
Niagara Solid Punches ..... 55&10
Tinners' Hollow, P. S. & W. Co 40%
Tinners' Solid, P. S. & W. Co., ₰ doz., $1.44 40

Rail—Barn Door, &c.—

Sliding Door, Painted Iron, ₰ doz. 12¼@
Sliding Door, Wrought Brass, 1¼ in., lb., 36c 30
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail ₰ ft 39c
O. N. T. Rail $4.12
Griffin's:
NNN ¼ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 5-16 in., $4.75.
Hinged Hanger, ₰ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ₰ 100 ft $3.45
O. N. T., ₰ 100 ft., in, $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in ..... ₰ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ₰ 100 ft., $7.50; 1¼ x 5-16 in ..... $8.75 ..... 55&5%
McKinney's:
Hinged Hanger Track, ₰ ft., 11¢ ..... 60&5
1 x 3-16 Track ..... 55&5%
Myers' Stayon Track ..... 60&5
Richards Mfg. Co.:
Coupon, 1 x 3-16 in., $3.00. 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50
Special Hinged Hanger Rail..60&10
Lag Screw Rail, No. 65 50
Gauge Track Rail, ft., No. 31, 9c; No. 32 11c; No. 33, 20c.
No. 50 ..... 60&10
Nos. 61, $3.00; 62, $4.25; 63, $5.50; 64, $4.00; 65, $5.25; 66, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—

NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn $3.25
Fort Madison Blue Head Lawn $2.75
Cronk's:
Steel Garden; Champion, 75; Ideal, 60; Victor ..... 80&25%
Queen City Lawn, ₰ doz., 20 teeth, $2.85; 24, $3.00 ..... net
Antrobe Lawn ₰ doz $4.00
Malleable Garden ..... 70&10
Ideal Steel Garden, ₰ doz., 12 teeth, $15.00, 14, $16.00, 16, $18.00 80
Kohler's:
Lawn Queen, 20-tooth ..... ₰ doz. $3.15
Lawn Queen, 24-tooth ..... ₰ doz. $3.25
Paragon, 20-tooth ..... ₰ doz. $2.70
Paragon, 24-tooth ..... ₰ doz. $2.75
Steel Garden, 14-tooth ..... ₰ doz. $2.40
Malleable Garden, 14-tooth, ₰ doz. $2.00@2.25

Rasps, Horse—

Disston's 55
Heller Bros. ..... 70&5@70&10@75
Liverpit Bros. Gold Medal..70&10@75
McCaffrey's American Standard ..... 60&10&5
New Nicholson ..... 70&10@75
See also Files.

Razors—

Liam Borassie 60
Fox Razors, ₰ doz., No. 42 $20.00; No. 44 $20.00, No. 52, Platinum $25.00 ..... 65%
Red Devil 65%

Reels, Fishing—

Hendryx:
M. 6, 0, 6, A. C., B. 6, M. 9½, M. 16, O. B. 36, B. 36 N. 9, B. 108 Rubber Pomelo, Nickeled Pomelo 20
Aluminum, German Silv., Bronze 25
1240 N, 124 N 30
2004 N, 06 N, RM, G, 9 25
1 N, 6 PN, 11 N, 36 PN 20
2004 P ..... 2001 PN 25
1023 ..... 02004 N 30
06004 PN 35
06 PN, 2004 N, 974 PN 40
3009 PN, 3009 N 50
Competitor 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20
304 P, 304 PN, 00304 P, 00304 PN 33½

Registers—*List July 1, '03.*

Japanned, Electroplated and Bronzed 70%
White Porcelain Enamel ..... 50&10%
Solid Brass or Bronze Metal 40%

Revolvers—

Simple Action ..... *95c@$1.00*
Double Action, except ½ cal *$2.00*
Double Action, ½ caliber *$2.00*
Automatic *$4.00*
Hammerless *$4.50*

Riddles, Hardware Grade

16 in ..... *per doz. $2.50@$2.75*
18 in ..... *per doz. $2.75@$3.00*
18 in ..... *per doz. $3.00@$4.25*

Rings and Ringers—Bull Rings—

	2	*2½*	*3 inch.*
Steel	*$0.50*	*0.75*	*1.00 doz.*
Copper	*$1.10*	*1.25*	*1.65 doz.*

Hog Rings and Ringers—

Hill's Rings, gro. boxes $4.50@$4.50
Hill's Ringers, Gray Iron, doz., 60@75c
Hill's Ringers, Malleable Iron, doz. 80@95c
Blair's Rings, per gro $5.00@$5.50
Blair's Ringers...per doz. 75@90c

Rivets and Burrs—

Copper ..... 50@50&5%
Carriage, Coopers', Tinners', &c.:
Black ..... 70&10%
Metallic Tinned 70%

Bifurcated and Tubular—

Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, 20@25c;
Tin boxes, 100 count, 20@35c.
Tubular, per doz. boxes, 50 count, 20@25c; 100 count, 35@50c.

Rollers—

Cronk's Stay, No. 50 ..... $1.00
Cronk's Quackenbush No. 55, $0.60, No. 56, $0.75; No. 60 ..... $0.75
Lane's Stay 40%
Richards Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57 ..... 50%
Underwriters', Nos. 59, 60 ..... 50%
Favorite, No. 51 ..... 60%

Rope—

Manila, 7-16 in. diam. and larger: Pure ..... *lb., 10@10¼¢*
Sisal, 7-16 in. diam. and larger: Pure ..... *lb., 7¾@8¢*
Sisal, 7-16 in. diam. and larger: lower grade ..... *lb., 6½@7¢*
Sisal, Hay, Hide and Bale Ropes, Medium and Course: Mixed ..... *lb., 6½@6¾¢*
Pure ..... *lb., 7½@7¾¢*
Sisal, Tarred, Medium Lath Yarn, Course and Untarred: Mixed ..... *lb., 6½@6¾¢*
Pure ..... *lb 6¾¢*
Cotton Rope: Best, ¼ in. and larger...18@20¢
Medium, ¼ in. and larger..16@17¢
Common, ¼ in. and larger..10¢
In coils, ½¢ advance.
Jute Rope: Thread, No. 1, ¼ in and up. lb ..... *6½¢*
Thread, No. 2, ¼ in and up. lb ..... *7¾¢*

Wire Rope—

Galvanized ..... *37½@42½%*
Plain ..... *47½@52½%*

Ropes, Hammock—

Comet Mfg. Co.:
Jute, 35 ..... Sisal 20%

Rules

Boxwood ..... *60@60&10%*
Ivory ..... *35@40&5&10@10%*
Chapin-Stephens Co.:
Boxwood 60
Flexifold 30
Ivory ..... 25@25&10
Miscellaneous ..... 50@50&10
Stephens' Combination 55
Stanley ..... 50@50&10
Keuffel & Esser Co.:
Folding, Wood ..... 35&10
Folding, Steel ..... 40&10
Lufkin's Steel ..... 50&10
Lufkin's Leader ..... 50&10
Upson Nut Co.:
Boxwood ..... 60@60&10
Ivory ..... 35&40@35&10&10%

Sash Balances—

See Balance, Sash.

Sash Locks—*See Locks, Sash.*

Sash Weights—

See Weights, Sash.

Sausage Stuffers or Fillers

See Stuffers or Fillers, Sausage.

Saw Frames—

See Frames, Saw.

Saw Sets—*See Sets, Saw.*

Saw Tools—*See Tools, Saw.*

Saws—

Atkins':
Crescent
Hol
Butcher Saw
Cross Cut
Ore. Mfg. Co.'s Cut
Narrow Cross Cut.....50%
Hand Rip and Cross
Mill Rip Saws
Meese Mill and Lo
Wood Saws
Cyclone Spring Co.:
Tiger Saw
Disston Saw & Steel Works:
Saw Gauge, Saw Set
Handled
Circular, Solid and Inserted
Rip & Cross Cut
Hand Saws
Compass Saws
Nos. 1 Combination
Compass, Key Hole &
Butcher Saws and Blades
C. E. Lawless & Co.:
Back Saws
Butcher Saws
Compass and Key Hole Saws
Framed Wood Saws
Hand Saws
Wood Saw Blades
Millers Falls:
Butcher Saw
Star Saw Blades
Massachusetts Saw Works:
Victor Key Hole Saws
Butcher Saws Blades
Peace & Richards:
Simonds':
Circular Saws
Cross and Grooving Saws
One-Man Cross Cuts.....10&10
Gang Mill, Mulay and Drag Saws
Band Saws.....50%
Back Saws.....25&25&7½
Butcher Saws
Hand Saws
Hand Saw Blades
Compass, Key Hole &
Wood Saws.....40&7½%
Weeden Meddle & Company:
One Cross Cut Saws

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades
Disston's:
Hack Saw Blades.....25%
Keystone Blades.....35%
Hack Saw Frames
Simonds File Co.....35
Hack Saw Frames, Nos. 175, 180.....
Hack Saws, Nos. 175, 180, complete.
Goodell's Hack Saw Blades
Goodell's Hack Saw Frames
Goodell's Hack Saw Blades
Sterling Hack Saw Blades
Sterling Hack Saw Frames
Sterling Power Hack Saws
Victor Hack Saw Blades
Victor Hack Saw Frames.....40%
Whitaker Mfg. Co.:
Whitaker Hack Saw Blades.....10%
National Hand Frames
National Power Blades.....30&10

Scroll -

Barnes' No. 7
Barnes' Scroll Saw Blades.....10%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $15; with boring attachment, $18.
Hand scroll
Rotary complete
15&10%

Scales—

Lamm Platform, Plain
Salon Platform, Stpd. $2.20@2.50
Chatillon's:
Grocers'
Grocers' Trip Scales.....50%
Standard Platform
The Standard Beam

Scrapers—

Box, 1 Handle
Box, 2 Handle
Sleigh, Light, $2.00; Heavy
Cabinet, Reg. Pattern
Richards Mfg. Co.'s

Screws—Bench and Hand

Bench, Iron, doz., 1
Bench, Wood.....20&20&10%
Hand, Wood
Cabinet, Brass

Coach, Lag and Hand Rail—

Lag, Cone Point
Coach, Gimlet Point.....65%
Hand Rail

Jack Screws—

Standard List
Millers Falls
Stow Mfg. Co.

Machine -

Cut, Tinned, Iron, Brass or Bronze:
Flat Head
Fillister Head.....40%10&10%

Under Cut, Flat or Round Head
Nickel or Brass
Flat or Round Head, Brass
Nickel

Set and Cap—

Set Screws, not inserted
Set, Cup
Set, Hollow Cup
Set, Oval Cup
Set, Flat Cup

Wood

Flat Head, Iron.....87½&56%
Round Head, Iron.....85&56%
Flat Head, Brass
Round Head, Brass
Flat Head, Bronze
Round Head, Bronze
Oval Head, Bronze

Scroll Saws -

See *Saws, Scroll.*

Scythes—

Per doz.

No. 1, Plain
Bronzed Webb
Clipper, Polished Webb
No. 6 Clipper and Solid Steel
Brush, Weed and Bramble, Nos. 1, 2 and 3
Grain, No. 1.....$9.00@9.50
Bronzed Webb, No. 1.....$9.25@9.75
Nos. 2 and 3 Clipper, Grass
Solid Steel, No. 6.....$10.00@10.50

Seeders, Raisin—

Sets— Awl and Tool—

Peace & Richards' Tool Handles Nos. 1, $12; 2, $9; 3, $14
Millers Falls Adj. Tool Handles, No. 1, $12; No. 2, $12; No. 5, $18.
Garden Tool Sets—
Ft. Madison Three Plows, Hoe, Rake and Scraper

Sets, Nail-

Ordinary.....@1.25&75%
Buck Bros.
Cannon's Diamond Point, ₱ gro. $12.
Mayhew's
Snell's Corrugated, Cup Pt.
Snell's Knurled, Cup Pt.
Victor Knurled, Cup Pt.

Rivet—

Regular list.....75@75&10%

Saw—

Atkin's:
Criterion
Adjustable
Disston's Star, Monarch and Tri-
Morrill's No. 1
Nos. 3 and 4, Cross Cut
No. 5, Mill
Special
Royal, Hand
Tanner Patent

Shaving-

₱ doz., net, $24.00
Smith & Hemenway Co.'s

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₱ doz.
Mounted Kitchen Sand Stone, ₱ doz.
Quick Cut Carving Knife Hones, ₱ doz.
Quick Cut Electric Carving Knife Hones, ₱ doz.
Quick Edge Pocket Knife Hones, ₱ doz.

Skate—

Simonds & Hemenway Co. Patent

Shaves, Spoke—

Jennings
Wood
Ellis
Goodell's, ₱ doz.

Shears—

Clover
Gem
Good
Cheap
Straight Trimmers, &c.:
Best quality Cap
Best quality Nickeled
Tailors' Shears
Tailors' Cut Shears
Tailors' Pinking Shears
National Cutlery Co.'s Nickel Plated, 60&10%; Japan Handles
Wilkinson Sheet & Cutlery Co.:
Horse or Mule
J. Wiss & Sons Co.:
Best Quality Jap'd
Best Quality Nickeled
Tailors'
Shoe

Tinners' Snips—

Steel Blades.....20&5%
Steel Laid Blades

Forged Handles, Steel Blades, Ber
Clover
Heinisch's Snips
Jennings & Griffin Mfg. Co.'s 6½ to 10 in.
National Cutlery Co.'s Forged Steel
Nonesuch
P. S. & W. Forged Handles, 25%
Wiss & Sons Co.:
Wiss Pattern Shears

Pruning Shears—

Corona Hand Shears
Corona Wood Handle
Disston's Combined Pruning Hook
Hook
Pruning
doz., $12.00
John T. Henry Mfg. Co.:
Lopper
P., S. & W. Co.
Columbian Cutlery Co.:
Hedge, Wilcut Brand
Lopper, Beaver Brand

Sheaves—Sliding Door—

Richards
R. & L.

Sliding Shutter—

Richards
R. & L.

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, No. 1 to 12 gauge
Club, Rival, 65&5; First Quality,
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge.
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade
Duck Loads, 12 and 16 gauge; Rival grade
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade

Shells, Loaded—

Loaded with Black Powder
Loaded with Smokeless Powder, medium grade
Loaded with Smokeless Powder, high grade.....40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders
Nitro Club, Smokeless Powders
Arrow, Smokeless Powders
Winchester:
Smokeless Repeater Grade
Smokeless Leader Grade
Black Powder

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted	Galv.
	$4.25	$6.00
	4.50	
	4.75	
	5.00	

Wheeling Corrugating Co.:

Dixie	14 x 20 in.	$4.25
Dixie		4.50
Dixie		5.00

Shoes, Horse, Mule,&c.—

F.o.b. Pittsburgh:
Iron.....*per keg.$5 10*
Steel.....*per keg.$5.85*
Borden's, all sizes

Shot—

Drop, up to B
Drop, B and larger
Lead
Chilled
Dust

Shovels and Spades—

Association List, Nov. 15, 1902
Ames Shovel & Tool Co.

Snow Shovels—

Long Handle
Wood and Mall, D Handle

Sieves and Sifters—

Hardware Association
per gro.
Handle, Screen
per gro. $12.00@12.50

Sifters, Ash—

Ames Bell Bottom
Ames Ash & Sifter

Sieves, Seamless Metallic

Mesh
Iron Wire
Tinned Wire

Sieves, Wooden Rim—

Nickel Plated Hand
Nickel Plated
Nickel Plated
Wood Nickel Plated

Sinks, Cast Iron—

Painted, Standard list:
Barnes' low list:

NOTE -There is no entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron
Steel

Slates, School—

Factory Shipments.
Eureka, Unexcelled Noiseless
Victor A, Noiseless

Slaw Cutters—See Cutlery

Snaps, Harness—

Covert Mfg. Co.:
Roller, 30&2
Snap

Snaths—

Snips, Tinners—See Shears

Spoons and Forks—

Silver Plated—

Good Quality
Cheap
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton
Rogers & Bro., William R. Rogers
Eagle Brand
Wm. Rogers Mfg. Co.

Miscellaneous

German Silver

Tinned Iron

Teas.....*per gro. 50&75c*
Tables.....*per gro. $0.90@$1.00*

Springs— Door—

Richards Spring and Cork
Chicago (Coil)
Pull
Pullman Door and Gate
Reliance (Coil
Torrey's Rod, 29 in.

Carriage, Wagon, &c.—

1¼ in. and Wider: Per 100 lb.
Black
Half Bright
Bright
Painted Seat Springs:

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
tional, ₱ doz.
Enterprise
Philadelphia, No. 1, ₱ doz.
No. 2, No. 3,

Squares—

Nickel plated
Steel and Iron
Rosewood Hdl. Try Square and 1-Bevel
Iron Hdl. Try Squares and T-Bevels
Disston's Try Squares and Bevels, Rosewood Handle, 60 & 10%; Iron Stock and Bevel

Squeezers, Lemon

Wood, Porcelain Lined:
Cheap
Good Grade
Tinned Iron
Iron, Porcelain Lined

Staples—

Barbed Rhnd.
Electricians'
Fence Staples, Plain, $2.15; Gal
Poultry Netting Staples

Steels, Butchers'—

Dick
Porter Bo

Steelyards—....30@30&10%

Stocks and Dies—

Blacksmiths'
Curtis Rev'ble Ratchet Die Stock
Derby Screw Plates
Green River
Lightning Screw Plate
Little Giant
Reed

Stoners, Cherry—

Stones—Oil, &c.

Pike Mfg. Co.:
Arkansas St. No. 1, 3 to 5½ in.
Arkansas St. No. 2, 5 to 8 in.
Arkansas Slips No. 1
Lily White Washita, 4 to 8 in.
Lily White Slips
Washita St., Extra, 4 to 8 in.
Washita St., No. 1, 4 to 8 in.
Washita St., No. 2, 4 to 8 in.
Lily White Slips
Washita Slips No. 1
Washita Slips No. 2
India Oil Stones (centre list)
Quicknet Emery and Corundum Oil Stone, Double Grit
Quicknet Emery and Corundum Axe Stone
Quicknet Emery Rubbing Bricks
Hindostan No. 1, Regular
Hindostan
Axe
Turkey
Queen Creek Slips
Sand Stone

Scythe Stones—

Fine Mfg. Co. list as:
Razor Hard Stones, $12.00
Lumber Scythe Stones, $12.00
White Mountain S. S., gro, $9.50
Green Mountain S. S., gro, $8.00
Extra Indian Pond S. S., gro, $8.00
No. 2 Indian Pond S. S., gro, $5.00
Indian Razor Hone, gro, $5.00
Quick Cut Emery..., gro. $10.00
Fine Combination, gro, $7.00
Fine Scythe Stones, gro, $6.00
Fine Scythe Rifles, 4 Coat, $11.00
Emery Scythe Rifles, 4 Coat, $13.20
Diamond Hard Stone, gro, $6.00
Razor Hard Stone, gro, $5.00
Lightning (Artificial), gro, $28.00

Stoppers, Bottle—

Victor Bottle Stoppers, per gro, $6.00

Stops— Bench—

Millers Falls, 25%
Morrill's, per doz., No. 1, $10.00....50%
Morrill's, No. 2, $12.50....50

Door—

Clemmer Stoppers, C....50 & 10%

Plane—

Chapin-Stevens Co....20

Straps— Box—

Acme Embossed, case lots, 20&10&10
Carbo Tanned, case lots, 20&10&10

Stretchers, Carpet—

Cast Iron, Steel Points..doz. 55¢
All Steel Socket...doz. $2.00@2.25
Excelsior Stretcher and Tack Hammer Combination, doz., $6.00....20

Stuffers, Sausage—

Enterprise Mfg. Co....25@25&7½%
National Specialty Co., list Jan. 1, 1902....30&5%
P. S. & W. Co....10&10&5

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: per doz
Superba, Crotch Mahogany....$36.00
Triumph, Fancy Veneers....$30.00
Parlor Queen, Fine Rosewood....$30.00
Elite, Hungarian Ash....$27.00
Am. Queen, Fig Mahogany....$27.00
Ideal, Birdseye Maple....$25.00
Grand Rapids, Stained, Ash....$24.00
Ideal....$22.00
Standard, Nickel, $22.00; Japan $20.00
Crown Jewel, Nickel, $21.00; Jap. $19.00
Crystal Glass Tip....$36.00
Grand, 10 in., wide....$36.00
Parlor Grand....$48.00
Club, 24 in., wide....$54.00
Hall 28 in. wide....$60.00

NOTE.—Rebates: 50¢ per dozen on three dozen lots, $1 per dozen on five dozen lots, $2 per dozen on ten dozen lots; $2.50 per dozen on twenty two dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks...90&10
American Cut Tacks...90&10
Swedes Cut Tacks...90&10
Swedes' Upholsterers...90&10
Gimp Tacks...90&10
Lace Tacks...90&10
Trimmers' Tacks...90&10
Looking Glass Tacks...65
Bill Posters' and Railroad Tacks, 90&10&10
Hungarian Nails...80&5%
Finishing Nails...70
Trunk and Clout Nails...80&10%

NOTE.—The above prices are for straight Weights.

Miscellaneous—

Double Pointed Tacks, 90&10 less 5%
See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
50	$5.00	$4.00
60	$5.50	$4.50
110	$5.00	$5.75

Tapes, Measuring—

American Associated Skin...50&10—
Patent Leather...25&10&5%
Steel...33⅓&5%
Chesterman's...25&10&5%
Kendall & Hoppe:
Patent Ass'd....10&10&5
Patent Duck and Leather....25&10&5%
Metallic and Steel Lower list, 25%
Patent, Ass'd....10&10
Ass'd....10&10
Metallic....10&10
Patent Bend, Leather....25&5%25&10%
Duck....10&10
Steel....10&10
Stevens & Hubbard:
Chesterman's Metallic, No. 341, 25%
Chesterman's Steel, No. 541, 25%
Kendall & Hoppe's Patent Leather....25&10&5%

Teeth, Harrow—

Steel Harrow Teeth, plain, per 100....$2.50@$2.60
Steel Harrow Teeth, plain, per 100....$2.50@$2.60

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c....30&10&10

Ties, Bale—Steel Wire—

Single Loop....80&10&10
Monitor, Cross Head, &c....70&25

Tinners' Shears, &c.—

See Shears, Tinners', &c.

Tinware—

Stamped Japanned and Plain I. C. sold very generally at net prices.

Tire Benders, Upsetters, &c.

See Benders and Upsetters, Tire.

Tools—Coopers'—

L. & I. J. White....25%

Haying—

Myers' Hay Tools....45

Miniature—

Smith & Hemenway Co.'s, David Copp. 2 doz., Nickel Plated, $1.50; Gold Plated....$2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5
Simond's Improved....30&5
Simonds' Crescent....25

Ship—

L. & I. J. White....25%

Transom Lifters—

See Lifters, Transom.

Traps—Fly—

Balloon, Globe or Acme, doz., $1.15@$1.25; gro....$11.50@12.50
Harper, Champion or Paragon, doz., $1.25@1.40; gro. $13.00@14.50

Game—

Imitation Oneida....75&10
Newhouse....Discount
Hilles & Nauen....50
Victor....25&5%
Oneida Community....Discount
Hector....75@75&10

Mouse and Rat—

Mouse, Wood, Choker, doz. holes, 12
Mouse, Round or Square Wire, doz. Staples
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, per doz., $13.25..$11.50 doz.
No. 2, Rat, per doz., $6.50....$5.75 doz.
No. 3, Rat, per doz., $4.75....$4.25
No. 4, Mouse, per doz., $2.85....$2.50 doz.
No. 5, Mouse, per doz., $2.40....$2.25 doz.
Oneida Community:
Out of Sight, Mouse, per doz., $.90
Out of Sight, Rat, per doz., 1.25
Easy Set, Mouse, per doz., 1.00
Easy Set, Rat, per doz., 1.50
Wire Spring, Rat, per doz., 1.00
Perfection Tip Cricket, 5 holes, per doz., traps....75

Trowels—

Disston, Brick and Pointing....25
Disston Plastering....20
Disston "Standard Brand" and Garden Trowels....40&10
Kyle's Steel Garden Trowels, Worcester, 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels....
Woodrough & McParlin, Plastering....25

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern....50&10
Western Pattern....60&10
Handy Trucks....per doz. $16.00
Grocers....per doz. $20.00
M. Kinney Trucks....per doz $16.00
Model Stove Trucks....per doz $18.50

Tubs, Wash—

M'f'gr's list, price per gross. No. 0 1 2 3
Galvanized, 80¢ 85¢ 90¢ 99¢ 10&10 d50¢

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls...21¢ 25¢
No. 12, ¼ and ½-lb. Balls...19¢ 21¢
No. 18, ¼ and ½-lb. Balls...16¢ 18¢
No. 24, ¼ and ½-lb. Balls...13¢ 15¢
No. 36, ¼ and ½-lb. Balls...11¢ 12¢
Chalk Line, Cotton Balls....24¢ 29¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz....$1.2¢ 10¢
Cotton Wrapping, 5 Balls to lb. according to quality...13¢@17¢
American 2-Ply Hemp, ¼ lb. Balls....12½¢ 15¢
American 3 Ply Hemp, ¼ lb. Balls....13¢@16¢
India 2 Ply Hemp, ¼ and ½ Balls (Spring Twine)...20¢@25¢
India 3-Ply Hemp, ¼ lb. Ball....
Indian 4 Ply Hemp, ¼ lb Ball....
2, 3, 4 and 5-Ply Jute, ¼ lb. Balls....
Mason Line, Linen, ¼ lb. Balls....
No. 24 Mattress, ¼ and ½ lb. Balls, according to quality....
Wool, 2 to 6 ply Rope....12½¢

Vises—

Solid Box....50&5&5&10&5

Parallel—

Athol Machine Co.:
Simpsons....40%
Standard....40%
Amateur....25%
Columbian Hdw. Co....40
Fisher & Norris Double Screw, net, Cash Net $16.50 $18.50 $20.50 $25.00
Fulton Mach. & Vise Co.:
Reed....5
Star, Solid Jaw....40
Hollands:
Machinists....40&10
Knight....60&10
Lewis Tool Co.:
Adjustable Jaw....50
Monarch, 50%; Solid Jaw....50
Mossy Vise Co.:
Climax....40
Peerless....Discounts
Metallic....20
Millers Falls Oval Slide Pattern....60&10
Parker's:
Victor, 2 doz., Reamer....25&5
Vulcan....Discounts
Combination Pipe....25
Peerless....20&5
Rock Island....25
Snedeker's X. L....33⅓
Stephens'....50

Saw Filers

Disston's D 3 Clamp and Guide, per doz., $24.00, 30%; Clamps....50
Perfection Saw Clamps, per doz., $4.50
Reading....60

Wood Workers—

Fulton Mach. & Vise Co.:
Reed....25
Star....40
Mossy Vise Co.:
Lightning Grip, 15%; Perfect....15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe....40%
Parker's Combination Pipe:
87 Series 60 187 Series, 60&5 No. 870, 40%
Rock Island Pipe....25

Wads—*Price per M.*

B. E., 11 up....60¢
B. E., 9 and 10....70¢
B. E. 8....80¢
B. E., 7....80¢
P. E., 11 up....$1.00
P. E., 9 and 10....1.25
P. E. 8....1.50
P. E. 7....1.50
Elvi's B. E., 11 and larger...$1.70&1.75
Elvi's P. E., 12 to 4....$2.00&1.75

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled....75&10
Ground....70&5
Plain or Unground....60%
Country Hollow Ware, per 100 lbs....$2.00
White Enameled Ware:
Muslin Kettles....65&10
Covered Ware:
Tinned and Turned....65&10
Enameled....75&10
See also *Pots, Glue.*

Enameled—

Acme Nickel Steel Ware....
Iron Clad Ware....70&10
Lava and Volcanic, Enameled....40&10

Tea Kettles—

Galvanized Tea Kettles:

Each	6	7	8	9
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Acme Spiders and Griddles....60&5
Avery Steels....60
Perfection....50&5&5&10
Never Break Spiders and Griddles....65&5
Never Break Kettles....60
Solid Steel Spiders and Griddles....65&5
Solid Steel Kettles....60%

Warmers, Foot—

Pine Mfg. Co., Soapstone....10&10&10

Washboards—

Solid Zinc:
Crescent Favorite size, bent frame....$4.05
Red Star Favorite size, stationary bent frame....$4.05
Double Zinc Surface:
Seymour Globe, family size, stationary bent....$3.55
Cobb Cross Bend size, stationary bent....$3.40
Single Zinc Surface:
No. 1001 Nickel Plate, Single Surface....$3.60
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface....$3.60
Glass Surface:
Glass King, Single Surface, reversible back....$3.95
Enamel Surface:
Enamel King, Single Surface, reversible back....$3.95

Washers—Leather, Axle—

Solid....90¢@90&10¢
Patent....90¢@90&7
Cut: ⅞ 1 1⅛ 1¼ inch.
9¢ 10¢ 11¢ 12¢ per box

Iron or Steel—

Size bolt. ⅜ ½ ⅝ ¾
Washers....$3.65 3.75 3.85 3.95
Above discount prices are based on $6.75 off list.
In lots less than one keg add 15¢ per lb.; 5 lb. boxes add ½ to list.

Cast Washers—

Over ½ inch, barrel lots, per lb. 1½@1¾¢

Wedges—

Oil Finish....1b, 2¼@2½¢

Weights—Hitching—

Covert Mfg. Co....30&2

Sash—

Pine and Hard Wood Interior Finished Doors:
Eastern District....$24.00@$30.00
Western and Central Districts....$24.00@$22.00

Wheels, Well—

8 in., $2.00; 10-in., $2.45; 12-in., $2.85; 14 in., $3.75.

Wire and Wire Goods—

Bright and Annealed:
6 to 9....72&10&10¢
10 to 14....72&10&10¢
15 to 16....75&10&10¢
17 to 18....77½&10¢
19 to 26....77½&10&2½¢
27 to 36....77½&10&5¢
Galvanized:
6 to 9....72½&10¢
10 to 14....72½&10&5¢
15 to 16....72½&10&5¢
17 to 18....72½¢
19 to 26....70&5&2½¢
27 to 36....67&10&10¢
Coppered:
6 to 9....65&10&10¢
10 to 14....70&10&5¢
15 to 18....65¢10&10&10%
19 to 26....70&5&2½¢
27 to 36....72½¢10&10¢
Tinned:
6 to 18....67&10&10¢
Brass....75¢ lb., base
Copper....75¢ lb., base
Cast Steel Wire....70

Spooled Wire—

Annealed and Tinned, 70&10&10&10¢
Brass and Copper...60&10&10&10%
Retailers' Assortments, per box, $2.10@$2.40

Wire Clothes Line, See Rubber.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods...90&10&10&60
Brass Wire Goods....90@90&10%
Brass Cup and Shoulder Hooks, 85&10%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80&10&10&5&2½
Painted Screen Cloth, 100 ft., $1.35
Standard Galv. Hardware Goods: 100 ft. rolls, 2½ to 48 in. wide, Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh....$2.75
Nos. 4 and 5 Mesh....$3.00
No. 6 Mesh....$3.25
Nos. 7 and 8 Mesh....$3.75

Wire, Barb—See Trade Report

Wrenches—

Agricultural....80&10&10%
Alligator or Crocodile..70&10&5%
Baxter Pattern 8 Wrenches, 70&50&10&10
Drop Forged S....45&10&5
Acme....60&10
Alligator Pattern....Ball Dog....70
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe 40; Bilgo Pattern, 40%; Combination Bridge, 40....
Steel Handle Nut....50%
Combination Black....40&5
Merrick Pattern....50
Boardman's....40
Coes' Genuine Knife Hdl....10&10&5&5
Coes' Genuine Steel Hdl....10&10&5&5
Coes' Genuine Key Model....10&10&5&5
Coes' Genuine Hammer Head....10&10&5&5
Coes' "Mechanics"....10&10&10&5&5
Doubleday's Engineer....10&10
Eagle....70
Gem Pocket....
Hercules....
W. & B. Machinist:
Case lots....50&5
Less than case lots....50
W. & B. Railroad Special:
Case lots....50
Less than case lots....10&10&5
Solid Handles, P., S. & W....50&10
Stillson....30&10&5
Union....65
Uncle Wrench Co.:
Uwanta Special, Iron Handle....40&10&5
Other Wrenches....50
Screw, Pipe and Chain....50
Warnock Manufacturing Co.:
Case Lots....50&10
Less than case lots....50%

Wrought Goods—

Staples, Hooks, &c., list March 17, 1902....40&10

Zinc—(Cash rates at mill.)

Sheet....per 100 lb., $7.60

THE IRON AGE

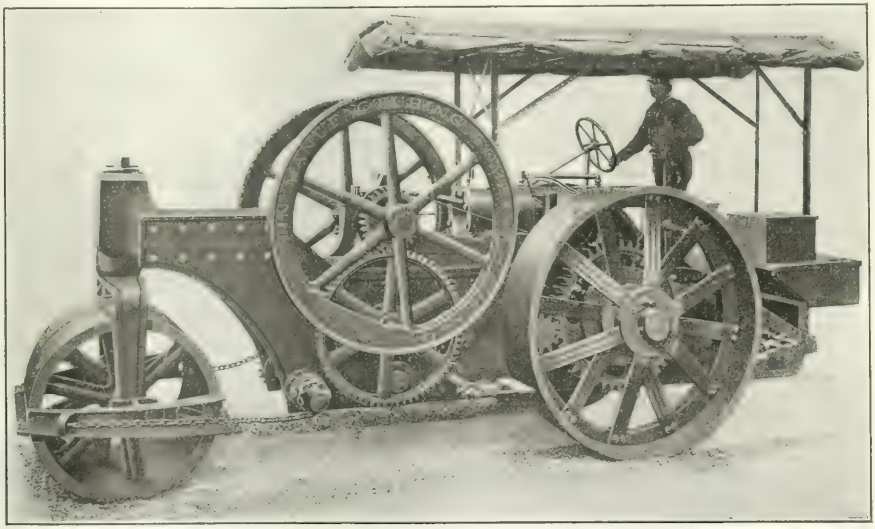
New York, Thursday, June 25, 1908.

The American Motor Road Roller.

The first gasoline engine driven road roller ever made in America is declared to be the one put out by the Austin Mfg. Company, Chicago, Ill., an example of which is illustrated. It was the logical conclusion of the company that if gasoline engines can be used satisfactorily in place of steam engines in so many other fields they might be equally well adapted to the driving of road rollers. Still more to the point is the fact that motor road rollers are being used with entire success in France and England, two countries that are especially famous for their fine roads and excellent methods of rolling them. In the design of the machine it has been the endeavor to embody the best points of steam rollers and the best practice in gasoline engine construction.

The machines are built in four sizes of 7, 10, 12 and 15 tons capacity respectively. The 10-ton and larger sizes water jacketed, the water being circulated by a pump. The same water is used over and over repeatedly and except for a slight loss by evaporation requires no replenishing. The exhaust gases from the cylinder are carried into a muffler. The crankshaft is steel, and the fly wheels are balanced to prevent vibration. A pulley can be fitted when required for purposes of power drive by belt. Although the center of gravity is low, so that the machine is not likely to capsize, the clearance over the ground is unusually great. There is a driving gear on each end of the axle just inside of the road wheels so that torsion on the axle is eliminated. The bearings are easily accessible for inspecting, oiling, and removing when required.

The machine is steered by a worm gear operating windlasses in the forward end of the frame near the bottom, and the worm gear is driven by a worm on the lower end of the hand wheel rod shown in the engraving.



The American Gasoline Engine Driven Road Roller Made by the Austin Mfg. Company, Chicago, Ill.

will haul road scarifiers, graders, road plows, or stone wagons, being, in such cases, used substantially as a traction engine, or they will furnish power to operate a rock crusher or other machines. The 7-ton size will operate a small crusher satisfactorily. The roller has a powerful truss frame made of heavy steel plates, the sole function of which is to carry the working parts. Any wearing part can be easily and quickly removed from the frame. The mechanism is comparatively simple, there being few parts. On the engine there are but two valves and these are operated by a single cam. The start, stop and reverse are controlled by a single lever, and the speed of travel can be varied easily through a lever control from the slowest motion required up to the highest speed that could be needed in any roller.

The frame is supported in front on the steel yoke of the front roller and in the rear on the main axle. The engine is built on this frame and its power is transmitted by steel gears to the rear road wheels. The engine is of the four-cycle single cylinder type with high compression. The governor is of centrifugal type directly controlled from the fuel intake. The ignition is generally by a magneto, but batteries can be used if desired. The gasoline tank is below the level of the engine to which it is connected through a small pump. The cylinder is

The oscillating motion of the steering head and fork allows the front rollers to adapt themselves to irrgularities of the road. The rollers are fitted with a variable speed regulator acting through the governor on the piston speed of the engine. They have also two positive speed changes by gears, so that the rate of road travel is elastic and can be varied at will. Powerful brakes, two in number, operated by one foot lever, are provided. In case of emergency these can be operated instantly to hold the roller on a steep hill. The rear and front roller rims are specially cast to give a correct degree of hardness without brittleness. They are beveled rear and front to give them proper camber to the crown of the road and to effect this without change of pressure on the road surface or without loss of overlap in the track of the rear rollers on the front rollers. The rear wheels of the 10-ton and larger rollers are 6 ft. in diameter, and of the 7-ton 5 ft.

As points of superiority over steam rollers the company makes special mention that the fuel supply is more easily carried, enough for 10 hours' run being easily taken on the machine itself, and for three months' run in a tank which it can itself haul. A steam roller requires teams to haul water and coal. The motor road roller has no need of more than a bucketful of water a

day. A specially licensed engineer is not required; there is no loss of time in raising steam; there is not a risk of boiler explosions; there is no laying up for boiler repairs, and smoke, steam, sparks or soot blowing about are entirely eliminated. The man operating the motor road roller having simply the single lever which controls the stop and start and reverse to watch, can give his time more fully to watching the work he is doing

As the rear wheels of power rollers have to stand the wear of both drive and rolling they wear more rapidly than the front rollers. The American road roller has rear wheels with patent renewable rims which admit of replacing when worn without throwing away the centers and spokes. The rear heels can be fitted with spikes traveling over soft ground or when hauling a scarifier, grader, &c. The front and rear roller wheels are both kept free from adhering mud by adjustable scrapers on both sides.

Homer Bowes, North Side, Pittsburgh, Pa., is an agent for the American motor road roller.

The Latest Bell Steam Hammer.

The steam hammers designed by David Bell and now made as a specialty by the Buffalo Foundry & Machine Company, Buffalo, N. Y., have been redesigned and contain a number of features that contribute to enhanced usefulness. The hammer illustrated is a combined hammer, so called because it is suitable either for light drop forged work or the heavier work requiring a standard pattern guide hammer. It is of single frame type, in which the anvil block is attached to and forms a part of the main frame casting. This construction obviates any shifting of the anvil block when the blow is struck, which movement would prevent the hammer being used on fine work where a maintained accurate alignment of the dies is necessary. The main frame casting is of open hearth steel, which is regarded by the builder to be the only material equal to the service required, as the shearing strains which come on the casting from the continued hammering and the tendency to crystallize from the constant shock and jar are considerable. The fact that the hammer has balanced valve motion enables its operation to be accurately controlled even by the foot treadle, so that a blacksmith's helper may be often dispensed with. These hammers, while useful in any shop where iron or steel has to be bent or forged to shape, are especially suitable for dressing tools used on planers, lathes, boring mills, &c. The hammer is essentially a self-contained machine and therefore does not need much in the way of a foundation. Being heavy it absorbs the shock and blow of the hammering, so that there will be little vibration of the surrounding ground. Where steam is not available the hammer can be operated quite as well by compressed air. For example, a plant which uses gas engines as its source of power nearly always has compressed air supply and can use it to operate the hammer.

The guides are through bolted to the main casting, and the upper and lower dies maintain perfect alignment even when repeated blows are struck. The hammer is double acting, taking steam or air at the top and bottom of the stroke through ports arranged to give maximum force of blow. Continuously sustained automatic action may be obtained with close and sensitive regulation by the throttle valve through the foot treadle connection. The latter can be disconnected and the valve operated in the usual way by the hand lever. There are few parts in the valve motion, and these are carefully fitted to give accurate sensitive control to the blow. It is not connected except by sliding contact with the hammer head, and is therefore free from all shock or jar of the blow. The valve gear is arranged to take up its own wear, and the only attention it requires is lubrication. The valve moves downward by gravity and up by the thrust of a bevel slot in the hammer head against a cam.

The square shaped anvil block has a dovetailed slot into which the lower die is keyed. The dies are set at an angle of 45 degrees in the main frame casting, so that long work will clear the column both ways of the die and the full size of the die face. Through a hole in the center of the anvil block long work may be inserted for upsetting. The cylinder casting is in one piece with the valve chest and has extra heavy top and bottom flanges and vertical reinforcing ribs. The throttle valve is of circular form, ground to its seat and held tight by steam or air pressure, and is operated by the swinging lever or foot treadle connection.

The hammer head is of hammered steel and is set at an angle of 45 degrees in the main frame. It is finished from the solid, and has milled V-grooves which work in V-shaped guides in the main frame. The guides are adjustable by taper gibs to take up wear between them and the hammer head. The piston rod is a solid steel forging in one piece with the piston and is secured to the hammer in a taper hole, the jam of which taper constitutes the real holding of the rod in place. By removing the buffer springs and piston rod glands, which is in halves bolted together, the falling parts can be raised without disconnecting, so that the piston projects above the top of the cylinder to permit examining the piston rings or inserting new ones.



The Bell Combined Steam Hammer Made by the Buffalo Foundry & Machine Company, Buffalo, N. Y.

To the under side of the reinforced cylinder flange are fastened spiral springs to cushion the up stroke and prevent injury from careless handling. When these springs are compressed solid there is still clearance between the top of the piston and the cylinder cover. An automatic force feed oil pump is furnished and supplies a constant feed of oil to the valves and cylinders while the hammer is operated. The automatic feed is easily regulated or can be augmented at will by hand operation.

The hammers are made in five sizes—100, 150, 200, 250 and 300 lb. blow capacity. The cylinder of the smallest is 4¼ x 14 in. and of the largest 5¼ x 16 in. The total hight of the smallest is 7 ft. 3 in. and that of the largest 8 ft. ½ in. In the smallest the usual die face is 3 x 6¼ in. and in the largest 4¾ x 7¾ in. These hammers are rated entirely by the actual scale weight of the falling parts, no consideration being given to the added force of the blow from the steam or air pressure on top of the piston. One set of plain forging dies, which are special open hearth steel castings, are regularly furnished with the hammer.

Some Very Large Machined Castings.

Two noteworthy pieces of work recently executed by the H. W. Caldwell & Son Company are shown in the accompanying illustrations. Fig. 1 shows a rope sheave of unusual dimensions and Fig. 2 two very large cut gears.

The sheave is 20 ft. in diameter, has 20 grooves for 2-in. rope and weighs finished 48,000 lb. It will be noticed from the illustration that the sheave has a double set of arms. The sheave was cast in one piece and then split for convenience in handling and erecting. The sheave was cast in the foundry of the Caldwell Company and finished on a 20-ft. boring mill, as indicated by the engraving. It is intended for use in the main drive in a refrigerating plant in Mexico. The large sheave will be driven from an electric motor by what is generally known as the American or single rope system.

The gears of Fig. 2 are of a semi-steel mixture, and both have a face width of 27 in. and a pitch of 3 in. The large gear weighs 13,200 lb. and has a pitch diameter of 95.51 in., and the small gear or pinion weighs 8100 lb. and has a pitch diameter of 55.41 in. The diameters of the gears are unusual on account of the small pitch, as compared with the wide face. The gears were cast in halves and the joints planed. The teeth were machined in a large gear planer; it was considered preferable to plane the teeth rather than mill them on account of the extraordinary dimensions of the rings have protecting lugs, between which are fitted suitable springs. The toothed rings are independent of each other, and act separately on their own sets of springs, so that if one chain tends to take more load than the other it simply closes its set of springs until the load is equalized. In addition to this compensating effect, the springs

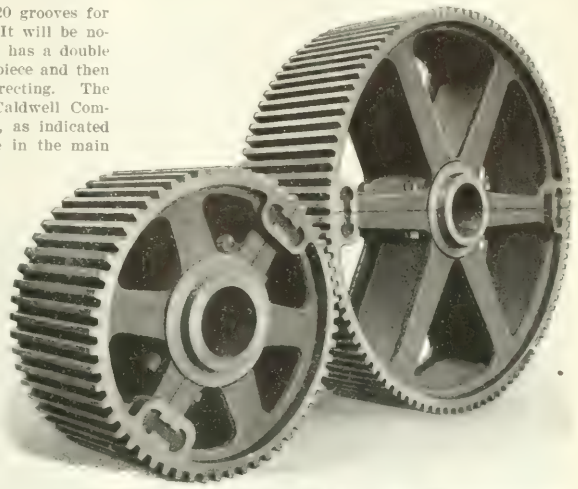


Fig. 2.—Two Gears Approximately 11 and 8 Ft. Diameter Respectively, and of a Combined Weight of Over 10 Tons.

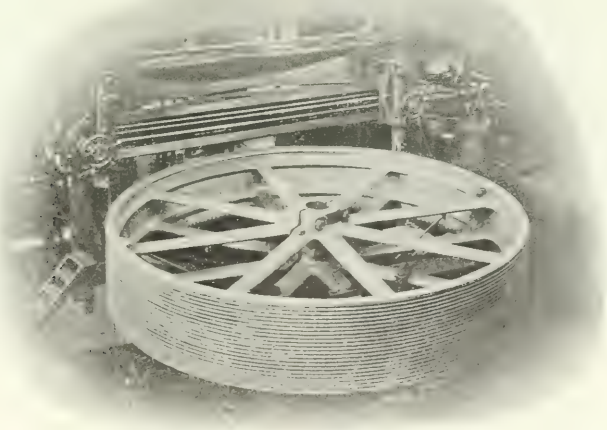


Fig. 1.—A 20-Ft. Rope Sheave in Process of Erection in a Refrigerating Plant in Mexico.

gears. The gears are to be used in the drive of a mining hoist in one of the Lake Superior copper mines. The H. W. Caldwell & Son Company's works are at Seventeenth street and Western avenue, Chicago.

Large Chain Drives.—The London *Times Engineering Supplement* says: "We are informed that some drives have been supplied by Hans Renold, Ltd., to Head, Wrightson & Co., intended for service at a tidal dock in Japan, and it is stated that the installation includes the largest spring wheels that have ever been made for chain driving, each weighing about two tons. The springs, which are of two sizes, have been placed alternately, the larger set transmitting the power, while the smaller softens the recoil. The even distribution of the load is effected by the special type of driven wheel employed. This is of the compensating type, and the outer and inner absorb irregularities in the load. The pinions have 28 teeth, and are 15¾ in. in diameter. The large spring wheels have 108 teeth and are 60 in. in diameter, the width being 17½ in. The driver wheel makes 286 rev. per min., and the driven wheel 74, so that the ratio is practically 4 to 1, and the chain speed 1170 ft. per min. The chains are 1¾ in. pitch and 8 in. wide, the center distance being 11 ft. 5 in. Each chain has a breaking load of 70,000 lb., and the total pull on the drive is 5650 lb., giving a factor of 25 with the two strands.

Structural shapes and other steel products are being rushed into Mexico by trainloads by American manufacturers in order to avoid the increase of duty which goes into effect July 1, says a press dispatch from the City of Mexico. The new duty is practically prohibitive, for the benefit of the Mexican steel manufacturers.

The Brown Iron Ores of Alabama.—III.

BY WILLIAM B. PHILLIPS.

A great deal has been written in technical journals and elsewhere concerning the treacherous nature of brown ore deposits. It has been claimed that the risks attending this class of mining operations are greater than usual and that the returns on the investment should correspond with the risks. It is not to be denied that some brown ore deposits have not fulfilled the expectations of the owners, either in the quantity of ore present or in the quality. This may be said of other mining properties, not only in Alabama, but in many parts of the country. Many of the failures in brown ore mining have been due not so much to the nature of the deposit as to the character of the mining and subsequent treatment of the ore. It is freely granted that many of the places now abandoned could not have been worked to advantage under the system then employed. So long as the ore was mixed with material that could be removed in the ordinary log washer—*i. e.*, so long as commingled or admixed chert was comparatively a negligible matter—these deposits were worked successfully. But the brown ore deposits that can be profitably worked with the ordinary log washer and such jigging as has been practiced are few and far between. They are the gilt edge properties and have always been in demand.

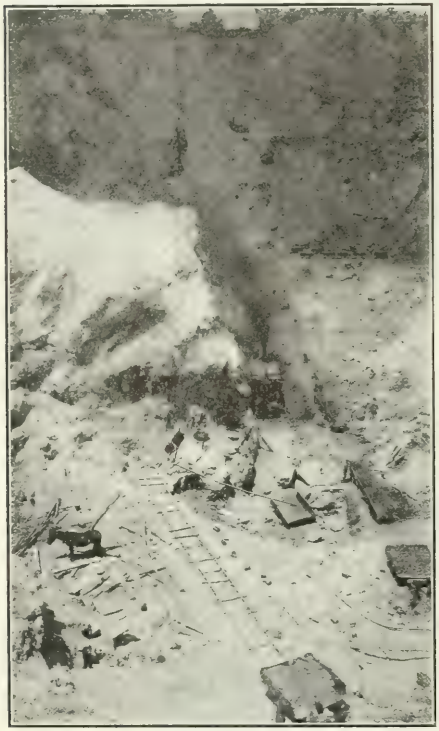


Fig. 1.—The Baker Hill, Ala., Brown Ore Pit, with Steam Shovel at Work Alongside a Bank of Clay and Ore.

Some Large Pockets.

From the very nature of most brown ore deposits, with the possible exception of some favored localities, they are more or less of a pocketty character. They are not held between regular walls, except, for instance, the Oriskany ores in Virginia and certain ores in Colorado, but are bedded in an irregular manner in various clays and appear to continue with them down to the unaltered rock beneath. Some of these pockets are of great extent and have been mined for many years. The workings at Shelby and Baker Hill, Ala., have been carried on so long that the present excavations are enormous. The Shelby deposits have been worked since the year 1845 and the Baker Hill deposit since 1872. At this latter locality, 97 miles east of Birmingham, the depth of the pit is nearly 300 ft. below the original crest of the hill and is now 160 ft. below the rim. The excavation there is 2000 ft. long, 900 ft. wide at the top and (counting from the original top of the hill) 300 ft. deep. At Shelby the pits are more than 100 ft. deep and cover a considerable area, although the somewhat more scattered operations there do not give one the same impression as the great pit at Baker Hill. These may be pockets, but they are certainly of great extent. From such pockets more than 10,000,000 tons of brown ore has been mined in Alabama since 1830, and from the more regular deposits of the Oriskany formation in Virginia more than 12,000,000 tons. The total value of the brown ore produced in Alabama from such pockets in the last 20 years is more than $15,000,000.



Fig. 2.—Drillers at Work on a 50-Ft. Breast of Ore.

The accompanying views show the appearance of the Baker Hill deposit as it is at present, with the exception of the new incline which has been constructed to facilitate the hauling of the material from the bottom of the pit to the washer. Fig. 1 represents the bottom of the pit, with a steam shovel at work and the lower end of the cable for conveying the waste to the dump. In the foreground and immediately alongside of the shovel is a bank of clay and ore 50 ft. high. Below the upper right hand corner, where the small cars are seen, is the point at which the new incline from the pit to the washer track comes down, so that the ore trams are now taken direct from the pit. In the foreground and on the left is seen a great bank of clay and ore, and Fig. 2 shows drillers at work on the face and above the steam shovel. The bank where the drillers are at work is 50 ft. high, almost a solid breast of ore. At the far end of the short track in Fig. 1 a "whitehorse" (clay without ore) is seen, and the overhead cable is engaged in removing it to the waste dump, which is not shown. Fig. 3 shows

another face of 40 ft. or so, around the bank shown in Fig. 1.

A Remarkable Bed of Ore.

Baker Hill, in [illegible] County, is one of the most remarkable sights in the brown ore regions of Alabama, not only on account of the great exposures of ore, but also on account of the distribution of the ore in the clay. The excavation is now in the form of an inverted truncated pyramid, the base of which is about 900 ft. across and the bottom about 200 ft. across at the widest part. The slope is not uniform, for where the ore is most abundant the walls are practically vertical. The ore is unusually free from chert and the washing operations are of the simplest character.

The old Tecumseh charcoal furnace, shown in Fig. 4, derived its ore from this place and has the distinction of having been for seven years in blast on one lining. It was built in 1873, was 60 x 12 ft. and had a capacity

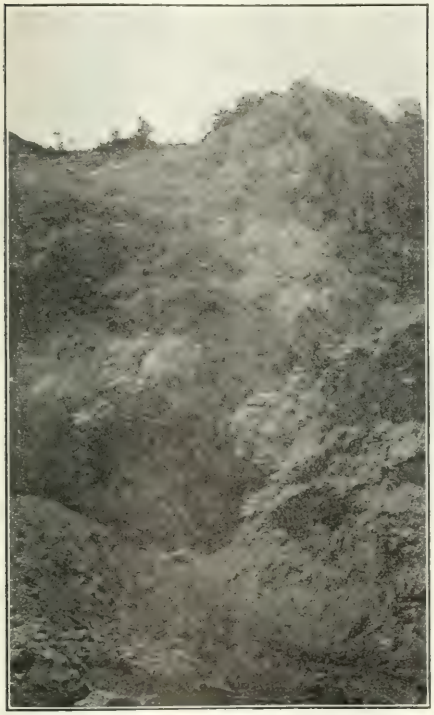


Fig. 3. Another 50 Ft. Face of Ore.

of 15,000 tons a year. It has been idle since 1890. During its long run the average content of metallic iron in the ore was more than 49 per cent. This was probably hand picked ore, or ore very crudely washed. The present operations are giving a better ore than this, the average being about 52 per cent. in metallic iron. Baker Hill probably affords a larger supply of heavy lump ore than any other deposit in the State. The larger the proportion of this lump ore the less does the mine have to depend on the washer for shipping acceptable material. At the same time the lumps should not be so large as to require crushing before going to the furnace, "bulldozing," as it is called, or crushing by hand with a heavy hammer. The deposits of brown ore in that immediate part of the State, such as Bluffton, Rock Run, Round Mountain, &c., partake largely of the character of the Baker Hill deposit in the proportion of lump ore to gravel or wash ore.

The Geology of the Baker Hill Deposit.

Henry McCalley ("Report on the Valley Regions of Alabama," Alabama Geological Survey, 1897, Part II, page 792) puts the Baker Hill deposit in the Knox dolomite (lower Silurian), although he remarks that the ore looks like that at the top of the Weisner sandstone (Cambrian). Both Cambrian and Lower Silurian strata are developed at this locality, and the lower levels appear to be in the Montevallo shales above the Weisner sandstone. These shales are seen in considerable exposures on the west side of the hill, much above the present bottom of the pit. There are many other limonite deposits in this part of the State, 75 to 100 miles east of Birmingham, which are referred to the Knox dolomite —*e. g.*, the Carr, Dyke, Weems, Taylor and McClung. It is noteworthy that in this same horizon are to be found bauxite deposits, some of which have been worked. At Baker Hill there are extensive developments of a white and cream colored clay, high in alumina. The Knox dolomite, with the Cambrian strata which lie immediately below it (Coosa, Montevallo and Weisner), is characterized by large deposits of brown ore and is to be regarded as the chief formation for this kind of ore in east-Alabama. It affords not only the lump ore, but also great deposits of gravel ore, held for the most part in reddish brown and purplish clay. These clays go down to a considerable depth and at Baker Hill are now found 300 ft. below the original crest of the hill. The disintegration of the rocks, whether dolomite or shale, has proceeded to depths at present unknown, but certainly

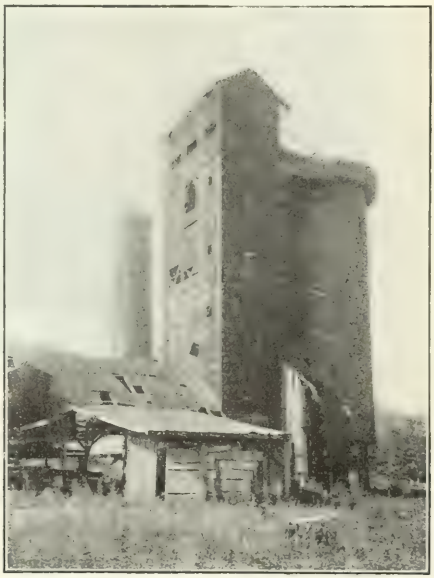


Fig. 4. The Old Tecumseh Charcoal Iron Furnace, Which Used the Baker Hill Brown Ores.

in excess of 300 ft. This point is of importance to the miner of brown ore, for it is likely that the ore will continue to run with the clay. In these deposits it is not so much a question of the depth to the underlying rocks as of the disintegration that has taken place in them. We might expect to find, as we do find, that in certain localities this disintegration has been both extensive and intensive, altering the rocks over considerable areas and concentrating the ore along certain lines. It may be that, in places, the matrix of the ore, with the ore itself, has been washed into depressions in the underlying formations and that it does not belong to the same age as the rocks now holding it. In many cases, however, the stratification we would expect to find under these conditions is not apparent. The remoteness of the period and the plastic nature of the material filling the depressions may account for the absence of well defined stratification. After each influx of ore bearing material, the ore itself, being so much heavier, would sink to the bottom, and we would have layers of ore and layers of clay practically free of ore. If no subsequent movement took

place this would be the situation now. But we do not find it to be so, and if the deposits have been formed by the filling in of previously existing cuplike depressions there must have been a subsequent and perhaps a long continued movement by which the materials were intimately mixed. These remarks apply to such deposits as are relatively free of admixed chert and sandstone. When these are present in notable amounts we may have to refer the origin of the deposit to the inclosing rocks themselves.

The Scotch "malleable iron" manufacturers who produce bars, hoops, strips, &c., have had close working arrangements for a good many years in their home market, though on export business the market has been open. Some of the mills have for a long time imported basic billets which have been rolled into steel bars. Two new mills started up in Lanarkshire some months ago and have been underbidding the established concerns. Efforts to bring the new sellers into the arrangement having failed, the associated manufacturers have made very deep cuts in prices. Basic steel bars and iron bars have been reduced recently 7 shillings 6 pence a ton, and hoops 5 shillings a ton. The iron bar base price is now £6 2 shillings 6 pence, less 5 per cent., the lowest figure named since 1905. It is stated that the new price means a loss to all manufacturers and that if it does not bring the new mills into line further reductions will be made.

The Acheson Oildag Company, Niagara Falls, N. Y., manufacturer of Oildag and Aquadag, has elected the following officers: President, Edward G. Acheson, Jr.; secretary, W. H. Arison; treasurer, A. M. Williamson. The president is a son of the well-known inventor and electric furnace expert, Edward Goodrich Acheson, who discovered the Oildag and Aquadag processes.

The United Iron & Steel Company, Pittsburgh, started up this week its Fannie Furnace at West Middlesex, Pa., which has been idle since last December.

Milling Gas Engine Beds.

Fig. 1 shows a special horizontal spindle milling machine, built by the Ingersoll Milling Machine Company, Rockford, Ill. This machine has a vertical spindle and an angular spindle for milling gas engine beds, having crank shaft boxes divided on an angle without resetting the work. Fig. 2 shows three views of the engine bed to be machined, and Fig. 3 the machine in operation.

The first operation on the bed, milling the seat for the cylinder, is performed by the gang of solid cutters on the arbor, as shown in Fig 2. After the cylinder seat has been milled the rail of the machine is raised and the four large face mills (shown with the cutters for the first operation, in Fig. 2) are used to mill off the ends of the crank shaft boxes. These face mills are large enough in diameter so that the first gang of cutters used clears the boxes. After milling the ends of the boxes the pad on the side of the bed is milled with the cutter shown on

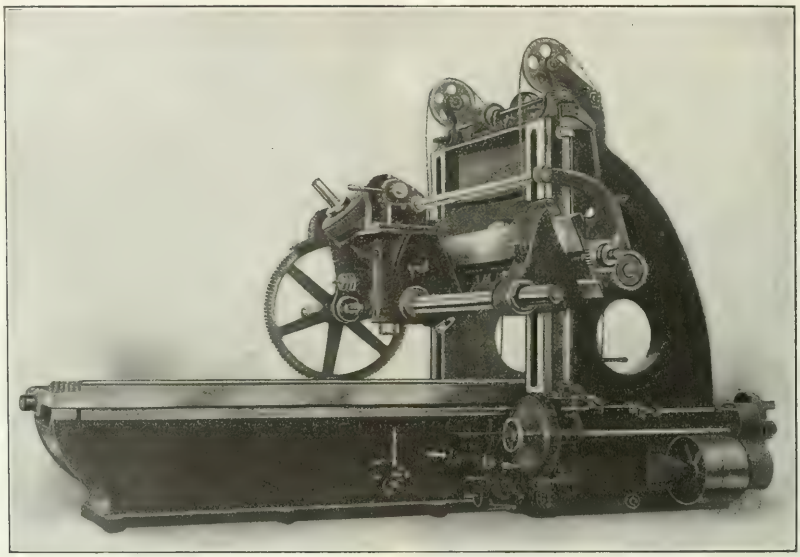


Fig. 1.—A Special Combined Horizontal, Vertical and Angular Spindle Ingersoll Milling Machine.

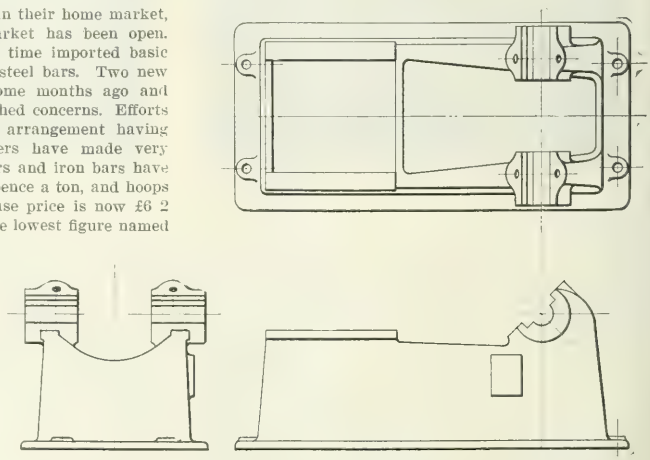


Fig. 2 Plan and Elevations of a Gas Engine Bed, All of the Milling on Which Is Done at One Setting by the Machine Shown in Fig. 1.

the vertical spindle, Fig. 2. The angular spindle is then used to mill out the boxes for the bearing caps. This carries a gang of cutters so that the box is finished with one pass of the spindle head across the work.

The cross feed is automatic and covers the whole width of the machine. The machine is arranged so that after once setting up the cutters there is no changing; the gangs on the arbor remain in place and move with the saddle carrying the vertical and angular spindles. The angular and vertical spindles have adjustment independent of the rail, which makes it easy to set the cutters in the positions wanted. There is a marked saving in time in finishing beds in this way, as there is no time lost in resetting the work or changing the cutters. All

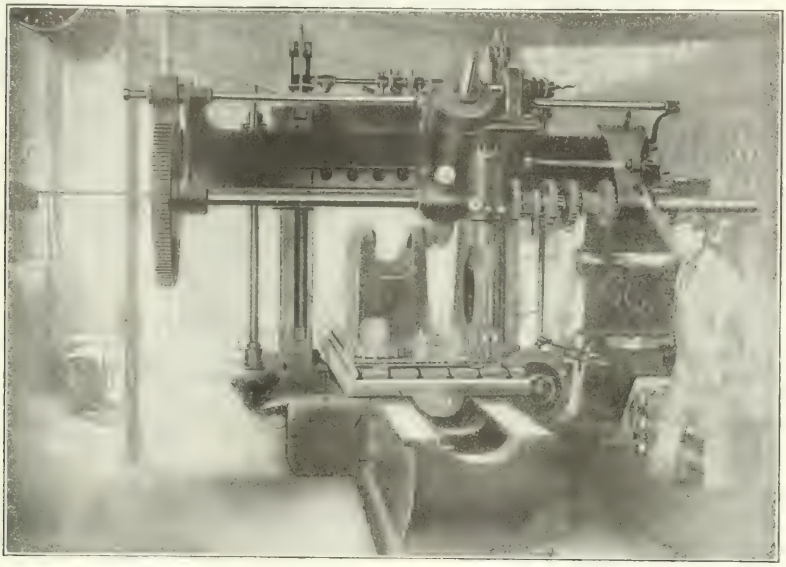


Fig. 3.—The Ingersoll Special Milling Machine Performing All Finishing on a Gas Engine Bed at One Setting.

cutters are of the simplest and cheapest forms and are inexpensive in up keep. All beds are finished alike and the accuracy and quality of the work are certain to be uniform.

The time required for doing the foregoing operations on a 10-hp. bed is two hours, and on a 40-hp. bed three hours. The machine shown has a distance of 42 in. between the housings, a table 10 ft. long, and weighs 30,000 lb. The utility of the machine for ordinary milling operations is not impaired by the special features added to it. This combination of spindles is new and a machine so equipped has proved to be a valuable addition to the line of machines built by the Ingersoll Milling Machine Company.

The British Pig Iron Market.—The pig iron situation in Great Britain shows improvement. Consumers are more willing to contract for forward delivery, and with this gain in confidence the warrant market is stronger. Short sellers of warrants were driven in in May, the squeeze causing settlements of some short sales on the basis of 56 shillings 6 pence, although as low as 49 shillings had been done in warrants for forward delivery. The cash price did not advance with that of warrants, but since the opening of June there has been a slight strengthening of makers' prices, the present basis for No. 3 being about 51 shillings. The exports of pig iron from the Cleveland district in May were 115,555 tons, which compares with 171,194 tons for May, 1907. Warrant stocks decreased 3551 tons in May and the total in Connál's stores at the end of the month was 63,433 tons. In February, 1906, when these stocks were at high point, the total was 750,000 tons.

Cast Iron Car Wheels Discussed.

At the convention of the Master Car Builders' Association at Atlantic City, June 18, a report of progress was made by the Committee on Cast Iron Car Wheels. In the discussion R. F. McKenna of the Lackawanna Railroad called attention to the statement of the car wheel manufacturers that they were not given a fair chance, in view of the low prices insisted upon by some of the railroads. They claimed that if the railroads were willing to make a reasonable increase in price it would be possible to furnish a better grade of cast iron wheels. In the discussion it developed that a sentiment exists in favor of the use of the best cast iron car wheels made under more rigid stipulations as to wheel mixtures and wheel foundry practice.

Indicative of the increased interest recently taken by important railroad systems in means of securing better car wheels is an elaborate article in the *Railroad Age Gazette*, by J. E. Muhlfeld, general superintendent of motive power of the Baltimore & Ohio Railroad. He specifies a number of steps which should be taken in order to secure better wheels, including among these a definite requirement as to the mixture to insure a quality of material giving adequate strength and resistance to the heat effect of brakes, as well as uniform wear. He refers to the discontinuance of the use of the proper mixture of charcoal pig iron as one of the causes of wheel failures, also to too large dependence on the thermal test which can be passed by wheels in which ferromanganese has been used in combination with inferior metal. Mr. Muhlfeld believes that changes can be made in the specifications for chilled cast iron wheels which will materially improve their performance and prevent a further depreciation in quality due to some of the methods in vogue in foundries as well as in the purchasing departments of the railroads. These methods, if continued, he says, will displace a commodity which can be made to meet the requirements of the railroads for many years.

The American Steel Wheel Company, Alexandria, Ind., has been incorporated, with a capital of $250,000, to make a pressed steel vehicle wheel, which will be an exact facsimile of the ordinary wood wheel. The officers of the company are as follows: J. G. Brannum, president; J. T. Postal, vice-president; J. R. Welch, secretary; A. A. Gallman, treasurer.

The Eclipse Power Hack Saw.

An exceedingly novel power hack saw is the one recently put on the market by the Eclipse Machine Company, Elmira, N. Y., and illustrated herewith. By revolving the work while the cut is being taken it is possible to make an accurately square cut. The stock is revolved in clockwise rotation, as viewed in Fig. 1 herewith, and the cutting stroke is the forward one of the saw. By adjusting the balance weights so as to let the saw make a light cut in starting in on squares and flat pieces it works perfectly, and by using the adjusting collar which is on the saw guides, tubing can be cut without any difficulty.

Fig. 2 shows a section of the chuck which holds the work and is self-explanatory of the construction. It will be observed that the chuck operates by one screw, and through this it is adjustable to any size of stock from ⅜ up to 6 in. Figs. 3 and 4 show samples of work cut on this saw. On all such work the saw is claimed to cut with a variation of not over 2-1000 in. in a 4-in. bar. The round pieces shown in Fig. 3 check up very accurately in the parallelism of the cut surfaces. The square section shown in Fig. 4 was cut on one side with an ordinary hack saw and on the other with the Eclipse saw. The two sides can be distinguished in the engraving. The Eclipse saw, besides doing perfect work, is claimed to saw bars of steel in about one-quarter the time taken by other saws. A striking contention is that the machine has the speed and accuracy of a circular saw at about one-half its cost. It will also trim the ends of hexagonal or round stock in bundles, and in the range of its work is declared to excel any other.

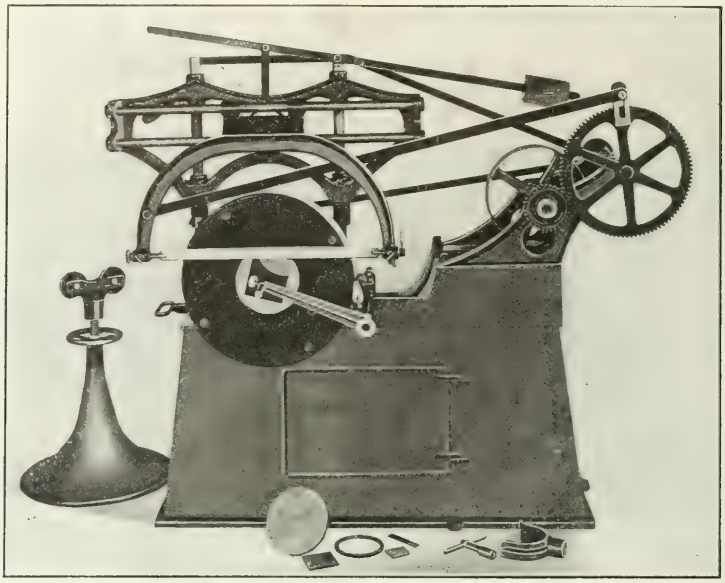


Fig. 1. The New Power Hack Saw Built by the Eclipse Machine Company, Elmira, N. Y.

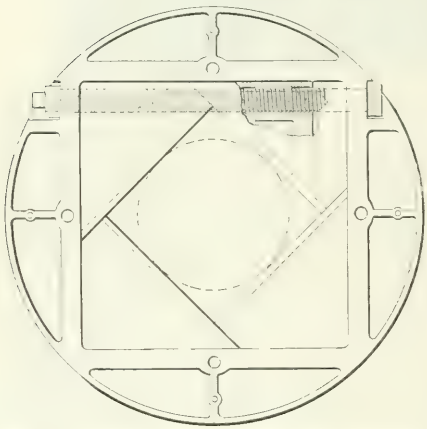


Fig. 2. A Section of the Chuck Used on the Eclipse Saw.

The patent chuck for holding the material is a new and unique one, designed to hold firmly any size of round steel, from ⅜ in. up to and including 6 in. and squares up to 4 in. across the flats. It is equally effective in all sizes and shapes. The single screw which actuates it is quickly operated to clamp the work. The saw is equipped with a simple stop device for setting the stock to the length it is desired to cut off. After once being started the saw is automatic in its operation and requires little or no attention. An ordinary 20-in. hack saw blade is used, and since the stock is revolved the saw is always presented with an easy cutting surface, which saves the saw and makes it last longer, so that it is maintained that the cost for saws is less in this machine than any other. In cutting tool steel or high speed steel and in sawing cutter blanks the machine is very rapid, and since there is not the expense of truing up the faces as they come from the saw considerable time is saved, which is important in a toolroom, particularly as the tool makers are expert and high salaried workmen.



Fig. 3.—Examples of Round Stock Cut on the Eclipse Saw.

The [illegible] substantially built and has a box base with a [illegible] of metal, so that it is guaranteed to stand excessive strain. In all other particulars it is also built for the severe usage which it is likely to receive. The power required to drive the machine is not over ½ hp. The weight is 650 lb. and the floor space required [illegible] is regularly furnished with an adjustable [illegible] shown in the illustration.

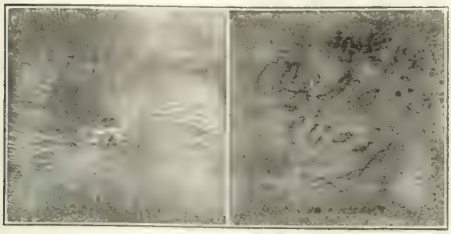


Fig. 4.—The Two Saws: [illegible] a Square Section; One Side Cut with an Ordinary Saw and the Other with an Eclipse Saw.

Fig. 1, and also with three fork rests, wrenches, &c. Manning, Maxwell & Moore, Inc., 85 Liberty street, New York, are selling agents.

Allsteel Filing Units.

The development of a new line of business, which promises a large market for sheet steel, is indicated by a departure recently made by the General Fireproofing Company, Youngstown, Ohio. For some years certain forms of furniture have been manufactured of steel, notably shelving and other equipment for vaults, library stacks, bank fixtures, &c. More recently the use of sheet steel as a material has been enlarged by the manufacture of doors, moldings, window casings, and the like.

A recent bulletin issued by the United States Forestry Bureau indicates a condition in the lumber market which has been foreseen for some years by those manufacturers of various kinds of furniture who require large quantities of oak, beech and other hard woods. The investigations of the bureau indicate that at the present rate of consumption the hard wood supply will practically have been exhausted in 16 years' time. The approach of this condition is already felt. Within five years the cost of quarter sawed oak, which is used largely in the manufacture of office furniture, has advanced more than 50 per cent. If this rate of increase continues, long before the lumber supply has been exhausted, prices will have become so high that the use of lumber as a material for ordinary purposes, will be impossible.

As a substitute for wood there has been a tendency on the part of manufacturers of bank and library equipment to construct office furniture, and particularly filing devices from sheet steel. Certain advantages commend the use of steel in place of wood. For instance, on an average, a filing equipment composed entirely of steel devices will occupy 25 per cent. less floor space than an equipment of wood devices having the same capacity and built on the same general lines. As a matter of economy many wood devices are built of a cheaper wood, veneered with a hard wood, and the veneer is likely to blister, permanently marring the appearance of the piece. In some localities at certain seasons of the year there is a good deal of fog, and owners of wood devices have been annoyed by the drawers in filing cases swelling, making it hard to open them.

Agitation for fire protection and construction which will reduce insurance rates and minimize fire losses has caused the owners of some fireproof buildings in large cities to take the stand that when they have made the building as nearly as possible fireproof with metal moldings, casings and doors, it is not unreasonable that they should require their tenants to equip their offices with furniture which cannot be a menace to the safety of the building. This attitude is the outgrowth of necessity. While vertical letter files, document files and card index cases are not uncommon, made of steel, it has remained for the General Fireproofing Company to work out [illegible] steel devices [illegible] which has proved so successful in wood furniture. To-day this company is the pioneer in providing a complete line of these devices made entirely of steel. As indicating the material the trade name Allsteel has been adopted.

The line which is now ready for the market includes 40 separate devices, built on the unit idea. Any device may be used with any other device, horizontally or vertically. The utility of this arrangement is fully understood when the requirements of the average user are considered. For filing purposes, for instance, a business man may require a vertical letter file of small capacity, and a flat letter file for invoices, &c., and document files for insurance policies, leases, and the like; perhaps a storage drawer or two, and a limited number of card index cases. Such an equipment may be had in four units, which may be placed one above the other and interlocked, so that they will not be dislodged by any sudden jar. As the business grows and additional filing capacity is required it may be increased a sectional unit at a time. The illustration herewith shows a case built up of nine separate steel units, which from bottom to top are: Base, storage drawers, map and plan drawers, top plate, smaller storage drawers, legal blank drawers, document file, flat letter file and top plate.



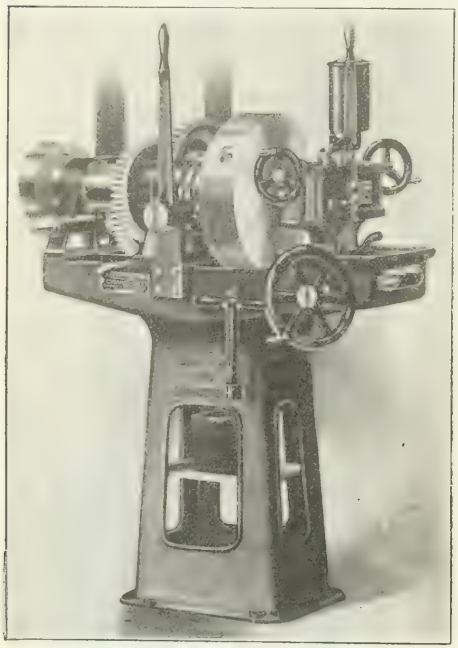
A Typical Case of Allsteel Filing Units Made by the General Fireproofing Company, Youngstown, Ohio.

In addition to the unit filing system, the General Fireproofing Company is building desks and tables of stock designs, which are carried by dealers ready for immediate delivery. All of these cases are finished, either in an enamel or plain color, and finished to closely resemble oak or mahogany grains.

Taylor & Dean, manufacturers of ornamental iron work, fencing, cellar doors, stairs, &c., are erecting a new four story steel and brick building, 48 x 100 ft., on the site occupied by one of their old buildings at Twenty-fifth street and Penn avenue, Pittsburgh, Pa. The building will contain a full line of new machinery and a power and lighting plant. It is expected that it will be completed by the latter part of this year.

A New Crane Pipe Machine.

A moderate priced pipe cutting and threading machine, known as the No. 1¼ and having a capacity of ⅛ to 2 in. pipe, has been placed on the market by the Crane Company, Chicago, Ill. It is operated by hand or power and is intended for high class service. All parts have been designed to withstand any strains that such a machine may be subjected to. Simplicity of adjustment and arrangement have been aimed at and this tool possesses many features which increase output and facilitate ease of operation. The gripping, threading, cutting-off and adjustment have been arranged to eliminate unnecessary operations. The frame is one casting, having bed and column in one piece, avoiding the use of light legs and giving the greatest rigidity with a minimum weight and floor space. The die head is bolted to a movable carriage with ample travel. Upon the die head are the dies, pipe guides and cutting-off tool. The dies are of the improved adjustable type, made collapsible, and are similar to those



The No. 1¼ Pipe Threading and Cutting-off Machine Built by the Crane Company, Chicago, Ill.

supplied in Crane hand die stocks. They are carried in frames sliding in guides. These frames are moved by a screw operated by a hand wheel. The dies are set to gauge by a simple locking device, which allows any number of pieces of pipe of the same size to be threaded without repeated adjustment. These dies have four cutting edges and are claimed to give good service on either steel or wrought iron pipe. They are made interchangeable and one die of a set may be replaced if broken, thus reducing the cost of repairs. When not in use on the machine the dies may be used in a hand stock. A change in size of dies may be made in a few seconds.

When cutting off, the pipe is guided by two steel guides, hardened on the face. These guides are operated by a right and left screw and hand wheel. The cutting-off tool is operated by a lever and rack. This makes a rapid, simple, positive and extremely powerful device. The gripping chuck is of the quick acting type, and is also very powerful. The pipe may be released and gripped by the throwing of a lever without stopping the machine. The chuck is adjustable to the different sizes of pipe within the range of the machine, without moving or altering the jaws. The jaws are of tool steel carried in steel holders and are removable for grinding or replacing. The rear end of the spindle contains a universal centering chuck, compact in design and readily adjusted to the various sizes of pipe.

Oil is supplied by a small tank supported on a swivel joint above the die head. A second tank is placed in the frame and to this the oil from the dies returns, the supply being controlled by a pet cock. From a single-speed driving pulley three changes of speed are obtained by gears, which are shifted by a lever on the frame. This device is declared to be positive, simple and incapable of getting out of order. All machines are supplied with a crank for hand operation. Bolt dies ¼ to 1½ in. can be furnished if desired. With the machine all necessary pipe gauge blanks, wrenches, etc., are supplied. The machine occupies a floor space of 44 x 23 in. and weighs 700 lb.

The Institute of Metals.

At a representative gathering of the trades interested, held at the Institute of Mechanical Engineers, London, June 10, the Institute of Metals was formally launched. W. H. Johnson of Johnson, Clapham & Morris, Ltd., Manchester, who has been prominent in the work of founding such a society, read a number of letters of approval.

Sir William White presided. He stated that the proposed institution would extend knowledge in regard to non-ferrous metals and alloys, and would establish means of communication between members of those trades directly interested. It was proposed to exclude the question of wages and points in regard to labor. Periodical meetings would be held to discuss matters of interest and importance to manufacturers who used non-ferrous metals; they meant to exclude all reference to iron. He said that so far there had only been one contentious point raised in connection with the founding of the society, and that was the bearing the institute might have on what were called trade secrets. There was one sufficient statement which might be made to such an objection; the members would be allowed to exercise their individual right in regard to showing members of the institute over their works, and they could, of course, personally determine how far they would participate in the discussions which would be arranged. There was room enough for serious and valuable work without touching upon disputable points where they were likely to prejudice the interests of individual members. He remembered the formation of the Naval Architects' Society. Secrets were preserved in the most rigid fashion, but experience showed that there was no occasion for timidity on that account, for no difficulty ever arose. Again, in the Iron and Steel Institute there was the same idea of individual fear, which had proved groundless. He was convinced that a combination of scientific interests would be better for the individual, better for the country and better for the world.

A resolution was unanimously adopted stating that "in view of the widely recognized need for a medium of communication for the advancement of knowledge in connection with the production, manufacture and use of non-ferrous metals, a society to be called the Institute of Metals shall be and is hereby started."

The following interim council was appointed: Sir William White (president), Professor Gowland (science), Professor Turner (science), J. T. Milton, (marine engineering), Vice-Admiral Oram (marine engineering), Dr. F. Elger (shipbuilding), A. F. Yarrow (shipbuilding), Odo Vivian (copper), L. Summer (copper), J. D. Bonnor (British aluminum), Mr. Ristori (aluminum), C. A. Baeddicker (nickel), Norman Cookson (lead antimony), G. W. Nisbet (cables), R. Kaye Gray (cables), J. A. Bayliss (Birmingham trades), G. B. Hunter (shipbuilding), Williams Harvey (tin), Harry Riches (locomotive engineering), Cecil Wilson (Sheffield smelting and precious metals), Ralph Heaton (Birmingham mint) and Mr. Corfield (spelter). Prof. H. C. H. Carpenter and W. H. Johnson were appointed joint secretaries.

The Portsmouth Steel Company, which operates plate and jobbing mills at Portsmouth, Ohio, is now manufacturing a full line of Economy tin plates. The Spencer-Otis Company, Chicago, Ill., has the exclusive selling agency for this product.

Alcohol for Power Purposes in France.

WASHINGTON, D. C., June 23, 1908. Official inquiries were recently forwarded to United States Consul-General Robert P. Skinner of Marseilles, with regard to the status of alcohol and [illegible] power producers in France and the efforts which have been made toward the general use of denatured spirits. The statements he makes are not so encouraging as those who are hopeful of the eventual use of alcohol as a power producer would like to read. He says:

Recent Progress.

"Former reports showed that the high cost of alcohol, excessive consumption and the resulting oxidation of mechanical parts had not been counterbalanced by any discoverable advantages. How seriously these problems have been attacked may be judged from the expression of an informant—perhaps the most important French manufacturer of carburetors—who writes under date of March 28, 1908:

We esteem the question of the industrial use of the alcohol motor as definitely solved, and the carburetors created in view of this utilization have given satisfactory results. The use of alcohol will become more advantageous when an understanding is brought about between the producers, whereby prices shall obtain some fixity, and when the State shall have solved the question of the denaturing agent.

"If ingenuity has mastered the material difficulties in the way of substituting alcohol for gasoline, commercially the problem is almost as insolvable as ever; and if it is insolvable in France, where gasoline is dear and alcohol relatively cheap, it must be still more so in the United States, where gasoline is cheap and alcohol dear. Nevertheless, with raw material available for the manufacture of alcohol in every country under the sun, and with very few gasoline producing centers, it is hardly venturing too much to assume that ere many years there will be a permanent and general use of alcohol as a source of motive power.

One Successful Use Due to Local Taxes on Gasoline.

"The one serious and sustained practical experience with alcohol as a driving force in France is that of the Campagnie Générale des Omnibus de Paris, the heavy public vehicles of which traveled 2,218,291 miles between June 11, 1906, and November 1, 1907, propelled by a mixture of 50 per cent. of carbureted alcohol and 50 per cent. of benzol. Benzol, it may be added, is of recent manufacture in France, where it is obtained by the condensation of gases recovered from coke. The company named is more than satisfied with its venture and proposes to continue the use of this mixture.

"This experiment is conclusive in its material aspects, but it is successful commercially only because of the artificially high price of gasoline in the city of Paris, brought about by the imposition of an octroi tax of 20 francs per hectoliter ($3.86 per 26.41 gal.). The effect of this municipal taxation is such that in Paris gasoline was worth in November last 56 francs per hectoliter ($10.81 per 26.41 gal.), against 39 francs ($7.52) for carbureted alcohol, the octroi duty upon which is only 5.10 francs (98 cents) per hectoliter. These octroi taxes vary greatly in different municipalities, and, leaving them out of consideration, the general price of gasoline in France last November was 36 francs ($6.95) per hectoliter and that of carbureted alcohol 33.90 francs ($6.54). Though the advantage as to price is apparently with carbureted alcohol, it must always be remembered that the consumption of this fuel exceeds that of gasoline by about 5 per cent.

"Thus, for the moment, while alcohol motors can be used and are used, no real economy has yet been effected by the use of alcohol as a driving fuel, granting its equal efficiency, and there is the further disadvantage that no commercial organization exists whereby automobile owners are assured of obtaining supplies throughout the country.

French Government's Interest.

"The French Parliament is now actively considering the subject in all its aspects, and the proper committee has recently summoned to its sittings various distillers of alcohol and manufacturers interested in its use. The following are translations of two letters addressed to the parliamentary commission by automobile manufacturers. A firm at Vierzon wrote:

In reply to the questions which you have addressed to us in regard to the means necessary to extend the industrial and commercial use of alcohol, we beg to say that carbureted alcohol with 50 per cent. of benzol possesses all the advantages of gasoline. This product, employed in a good carburetor, does not grease the motors, and only attacks the valves. The slight accumulation of grease which we have recognized arises chiefly from the denaturing agents employed by the administration. During several years we have made use of carbureted alcohol, and the only disadvantages which we have recognized are the difficulty of obtaining supplies while en route and the awkwardness growing out of the instability of prices, which discourage the partisans of alcohol.

"A concern at Billancourt wrote as follows:

We desire to state that we have few devices constructed for the use of alcohol, for these reasons: Up to this time there has been no economical reason why carbureted alcohol should be employed; on the contrary, the cost of gasoline is lower. Moreover, carbureted alcohol causes a more rapid deterioration of the motors than gasoline, on account of the presence of water which is found in the alcohol, and which, producing a condensation upon the metallic linings, causes them to rust.

In order that pure alcohol or carbureted alcohol may replace gasoline, it is necessary that the cost per horsepower be notably lower than the cost obtained by the use of gasoline.

It is possible to put motors in movement with carbureted alcohol without first heating them, although this is less easy and less sure than with gasoline; but with pure alcohol it is necessary to heat the carbureting apparatus by means of an exterior envelope before satisfactory results can be obtained. In conclusion, we have only utilized alcohol or carbureted alcohol in order to conduct laboratory experiments and for one or two races in which our machines participated."

Increasing Production in United States.

In connection with Mr. Skinner's report it is interesting to note that the U. S. Commissioner of Internal Revenue reports a production of denatured alcohol in this country in the Month of May, 1908, of 321,530 gal., which is the largest month's output since January 1, 1907, the first month after the law took effect, when a large quantity of alcohol made in previous months was denatured in anticipation of a heavy demand. The increase in the production in May, 1908, as compared with the corresponding month of 1906 was nearly 100 per cent. Of the month's output, 167,277 gal. were completely denatured and 154,253 gal. specially denatured. Alcohol prepared by special formulas is used exclusively for manufacturing purposes, and the large proportion which it bears to the total product reflects the extent to which it is being utilized in a great variety of industries. The consumption of completely denatured alcohol has been limited by a lack of utilities for the production of heat, light and power, for which it is chiefly used, but a considerable expansion in the utilization of this variety of denatured spirits may be expected in the near future. The Commissioner of Internal Revenue has just issued a series of supplemental regulations liberalizing the rulings heretofore in force, and this removal of restrictions will tend to increase consumption.

W. L. C.

The receivers for the Pope Mfg. Company have promised Vice Chancellor Howell, at Newark, N. J., to pay a total of 75 per cent. of all approved claims against the company within four months. This promise was made at the conclusion of argument as to the continuance of the business under the receivers for a year longer. The application for leave to continue was strenuously resisted by counsel for the creditors, who argued that if the stockholders desired to have the business continue they should provide capital for that purpose and not use the creditors' money. The report submitted showed cash in hand to the amount of $1,200,000 and profits earned by the Hartford plant in the last six months of over $200,000. The estimated profits for the full year since the appointment of the receivers were $405,000.

The Erie Railroad is asking bids for 15 Pacific type passenger locomotives. The company is increasing its rolling stock in expectation of a good fall business and is operating its shops with full force, repairing its cars and locomotives. A number of locomotives which it is unable to repair in its shops have been sent to outside shops for repairs.

Method of Obtaining a Circular and Uniform Chill in Rolls.*

BY THOMAS D. WEST.

The determination by actual test of the difference in strength of turned chill and sand cast rolls of like diameters, both cast from the same ladle of metal, would be very valuable to engineers and manufacturers. So far as the writer is aware, no such tests have been made. It is

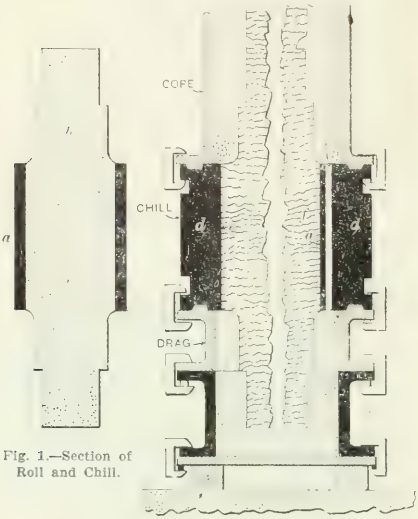


Fig. 1.—Section of Roll and Chill.

Fig. 2.—Section of Roll Mold, Showing Crust Formation Soon After Pouring.

reasonable to expect, however, that the strength of the sand cast roll will exceed that of the chill roll if both be cast from the same metal, especially if there should be any variation in the thickness of the chill. This view will doubtless be shared by those who have had extended experience in the use of chill rolls.

In casting a chill roll the general conditions are as shown in Fig. 1. The metal in the outer part, *a* (shown in black) will present a white appearance for a depth of ¼ to 2 in. or more, while that in the necks and body, *b* and *c*, will be mottled or nearly gray. In *a* the carbon exists in the combined form, while in *b* and *c* it is largely graphitic. The fact that the shrinkage of the former in solidifying is considerably greater than that of the latter is an important consideration in the manufacture of rolls. If two test bars, under 2 in. square in section, be cast from the same ladle, the one in an iron the other in a sand mold, the contraction of the former will be about twice that of the latter. This is shown by tests made by the author, treated more fully in his "Metallurgy of Cast Iron" (pp. 413-415).

When a chill roll mold is being filled with metal the cooling qualities of the chill *d*, Fig. 2, cause the outer body of the inflowing metal, as it comes in contact with the chill face *e*, to solidify so rapidly that a contracting crust is formed in 2 to 5 min., according to the diameter of the roll.

The formation of the sustaining crust is easily explained as follows: On the side *e*, Fig. 2, the metal is shown as it fills the mold, while on the opposite side *f* the ditions that exist 2 to 5 min. after the roll is cast are indicated. It is seen that the chill *d* has ceased to offer any support to the crust *a* by reason of the space created at *x*, and that the chill *d* might be removed, so far as the body of the roll is concerned, if that were practicable. It is also evident that the metal inside of the crust *a* and

*Read before the American Society for Testing Materials. Abstract from Metallurgy Iron, Iron.

the necks of the rolls is still in almost as hot and liquid a condition as when first poured. Its fluidity may, in fact, be maintained for 20 to 60 or more minutes, according to the size of the roll. This condition serves to explain in large part the difficulty of obtaining satisfactory chill rolls. The thin, almost semi-molten, crust *a* must sustain during the early period of the operation the static pressure of the confined liquid metal. The result in obtaining a chill roll castings is affected by small variations in the level of the mold, the quality of the metal, the temperature in pouring, the catching of fins at joints or crevices in the face of the chill, the operation of feeding devices, &c. It is no wonder, therefore, that with a process so sensitive and difficult to regulate that the losses range from 10 to 30 per cent. of the nominal output by the systems now in use, and that the rolls cast in this manner are rarely truly circular with a uniform thickness of chill.

Again, a buyer who accepts a roll of uneven thickness of chill and not truly round runs great risk of breakage. It is certain, at least, that such rolls cannot stand the rough usage and wear that may be expected of truly circular ones with a uniform thickness of chill.

For the successful casting of chill rolls the appliance should be such as to enable the chill *d* to remain constantly in intimate contact with the crust *a*, and that it be controllable likewise vertically to take care of the con-

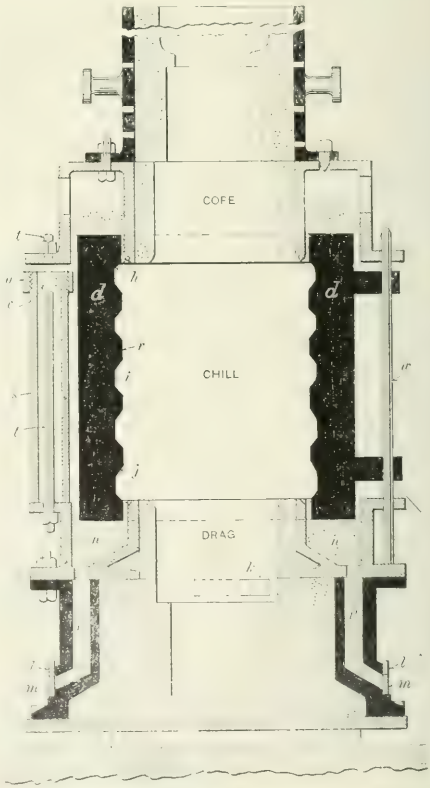


Fig. 3. The Improved Chill and the Method by Which in Settling It Is Kept in Close Contact with the Roll Metal.

traction in that direction. Numerous devices designed to overcome the evil effects of a contracting crust have been tried, but none of these meet the requirements in anything like the same measure as the appliance represented in Fig. 3, which differs radically from anything previously attempted, and is the invention of the author's son, Ralph H. West, who has had considerable experience in the manufacture of chill rolls.

In the use of this device the action of the contracting

crust was demonstrated in a way never done before, and it serves to show what may be accomplished to insure a truly circular roll casting of uniform thickness of chill. To make this clear a detailed description of the operation will first be presented.

The chill *d*, Fig. 3, has grooves, *i*, which are shown in an exaggerated form in the illustration. These grooves vary in hight and number to suit varying requirements, and exhibit gradual variations from bottom to top in the inclination of the sloping surfaces *h* and *j* for the purpose of taking care of the vertical contraction of the solidifying crust. This serves to insure a close contact between the upper slope of every groove and the corresponding bead cast on the chill roll during the entire period of settlement to final rest, which is brought about in the following manner.

After the metal is poured through the swirl gate *k* the band *l*, operated by a lever not shown, is moved, which serves to bring holes in the band to positions opposite *m*, this action allowing fine sand and other flowable material to run out of the partitions *n* and *p* at any desired speed. The chill *d* is lowered by this action, causing the sloping surfaces *h* and *j* to remain in intimate contact with the upper sloping surfaces of the beads cast on the chilled surfaces of the roll.

In the first roll cast by this device the chill commenced to settle in about 2 min. after the pouring was finished, and in about 7 min. the grooved face *r* had slid over the bead face *i*, thus giving direct indication of the internal action of the contracting chill crust, a matter never before accomplished.

In this device the outer diameter at the points *i* is such that when the roll is cold enough to be removed from the chill it can be hoisted out of the latter, or the latter off the roll, as may be desired. The body of the sample roll cast in this chill was 11 in. in diameter and 14 in. long. When put in the lathe to be turned it was found to be perfectly round and of an exact thickness of chill at all points of its circumference.

Five other devices, differing in the form of the grooves and the method of insuring contact, have been designed. In one case the chill remains stationary while the cope, casting and drag can be lowered. In another the crust is depressed. In a third the cope and casting settle into the drag, while the chill remains stationary. In some of these devices the grooves, or hugging faces, are so arranged that they remain in constant contact with the beads on the roll until the latter is removed from the chill or its molds.

Roll turners claim that the extra labor in turning up chill rolls to remove the slight projections or beads cast on the rolls by this system is, on the average, much less expensive than that required to turn up smooth faced chill rolls that are not truly circular, manufactured by processes now in use in our chill roll foundries.

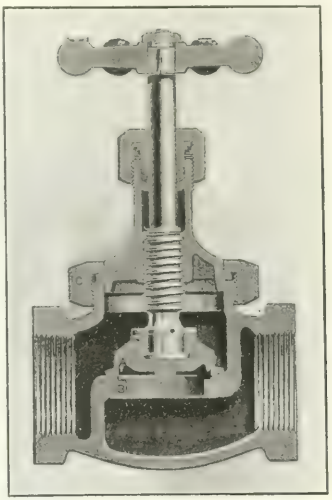
Returning to Fig. 3, the cope is supported from the drag independent of the chill by means of four wrought iron tubes *s*, bolts *t*, adjustable sleeves *u* and set screws *v*. Three or four long turned rods or pins, *w*, serve to center the chill and cope with the drag.

It is believed that with the above explanation those familiar with founding will readily understand the operation of the device and appreciate its utility. The system is expected to change greatly the present practice of casting chill rolls.

The Lunkenheimer Renewo Valve.

For those preferring a renewable seat regrinding valve the Lunkenheimer Company, Cincinnati, Ohio, has designed the valve shown in the sectional view herewith. This valve differs from the Lunkenheimer regrinding valve only in the construction of the disk and seat. The disk A is provided with a projecting ring, which enters the valve seat B. Its principal function is to preserve the seat. This it accomplishes by deflecting the current of steam from the seat ring face as it enters the cylindrical part of the seat, thus preventing the wire drawing which would otherwise occur, and would be serious if the valve was left partly open for any length of time, and also by keeping the seating surface free from scale and grit by the action of the thin current of steam discharged over it as the disk is brought home. Another function of this ring is to prevent water hammer, which is caused by the sudden admission of steam; no matter how quickly the hand wheel may be operated the flange will only permit the steam to enter gradually.

The seat is renewable and can be removed from the valve body by using a flat bar to engage the lugs on the inside of the ring, but it may be reground a number of times before it is necessary to renew it. All of the other wearing parts, including the disk, can be renewed if necessary. The hub is securely held to the body by a union ring, owing to which it is impossible for the hub and the body to become corroded together, as the thread which holds the union to the body is protected from the action of the steam, the joint being made between the flange on the hub and the neck of the body. This connection also acts as a tie or binder in screwing over the body, and tends to strengthen the valve. The stuffing box can be repacked under pressure when the valve is



Section of the Renewo Valve Made by the Lunkenheimer Company, Cincinnati, Ohio.

wide open, as a shoulder on the stem, directly above the threads, forms a seat beneath the stuffing box. All valves above the ½-in. size have a gland follower in the stuffing box.

Lunkenheimer renewable seat valves are guaranteed to stand 200 lb. working pressure, and are made with both screw and flange ends. Up to 1½ in., inclusive, valves are regularly furnished with hexagon bonnet rings and above that size with round slotted rings, but either style of ring can be had for any size valve. English instead of American standard pipe threads and flanges are furnished when so ordered. The valves are also made with navy standard flanges, and brass hand wheels.

With the exception of the seat rings, Lunkenheimer Renewo valves are made entirely of high grade bronze, according to the formula specified by the United States Navy. The seat rings are made of hard, close grained nickel, and will permit of many regrindings. The regrinding is done by unscrewing the union ring C, taking the trimmings from the body, placing a little powdered sand or glass and soap or oil on the disk, inserting a wire or pin through the slot in the disk lock nut and hole in the stem, then replacing the trimmings in the valve body and regrinding, leaving the ring unscrewed, so that the hub rotates in the body and acts as a guide for the stem while regrinding.

The German Society of Engineers now has 22,430 members.

The Crane Company in the Pittsburgh District.

An industrial project, which at the present time is of special significance, is embraced in a decision reached by the Crane Company, Chicago, to establish another large manufacturing plant in the Central West. In pursuance of its plans to this end, a tract of 30 acres has just been purchased at Oakmont, a suburb of Pittsburgh, as a site for the new works. The Crane Company, which is capitalized at $13,000,000, now operates plants in Chicago, employing a normal force of about 6000 men, and another at Bridgeport, Conn., employing 3000 men.

While the proposed plant at Oakmont will in the beginning hardly equal the Bridgeport plant, it is being laid out on a scale that will admit of extensive development, and will eventually be one of the most important constituencies of the present organization. Plans for buildings and equipment are now in course of preparation, but are not far enough advanced to furnish detailed information; but it is stated that two structures, 100 x 120 ft. each, will comprise the initial buildings. The company is considering the use of gas engines for motive power, and because of the convenient available supply of gas in its immediate vicinity some type of gas engine will probably be selected. Preliminary work of survey and preparation for the construction of the plant will be begun at once, and it is designed to have the plant in operation within a year. Its product will consist of steam and water goods, including brass and iron valves, pipe fittings, and other specialties which comprise the line now manufactured by the company in the Chicago and Bridgeport plants.

The report that the Washington Coal & Coke Company, Pittsburgh, would start up its entire 1000 ovens in the Connellsville region is an exaggeration. It has been operating about 300 ovens and has recently started 150 more to take care of several orders for furnace coke recently received.

The Williams No. 2 Pipe Machine.

The improvement in the No. 2 pipe threading and cutting-off machine built by the Williams Tool Company, Erie, Pa., is principally in the method of drive. Changes of speed are obtained mechanically from a single-speed driving shaft, which may be driven by belt, as in the type illustrated in Fig. 1, or by motor, as in Fig. 2. A constant-speed motor is entirely sufficient, but a variable-speed motor may be used and a greater number of speeds be thereby obtained. The size of motor required is 2 hp. The drive is through machine cut gears under the headstock in the bed of the machine, where they are out of the way and are protected from dirt and chips. The changes in gear combinations are made by sliding gears; three changes are effected through the short lever at about the middle of the front of the bed, as seen in Fig. 1, and these three are doubled by the long vertical lever in front of the headstock. The central position of this lever is the neutral position where the drive is disengaged and the machine idle. Reversing for cutting left-hand threads is done outside of the machine; for the belt-driven machine the countershaft has two loose pulleys and an open and a crossed belt, and for the motor-driven machine a two-throw switch is provided to reverse the motor. The fact that shifting of belts or replacing of gears is unnecessary to the changing of speeds means a considerable saving of time and adds correspondingly to the output of the machine and the economy of operating.

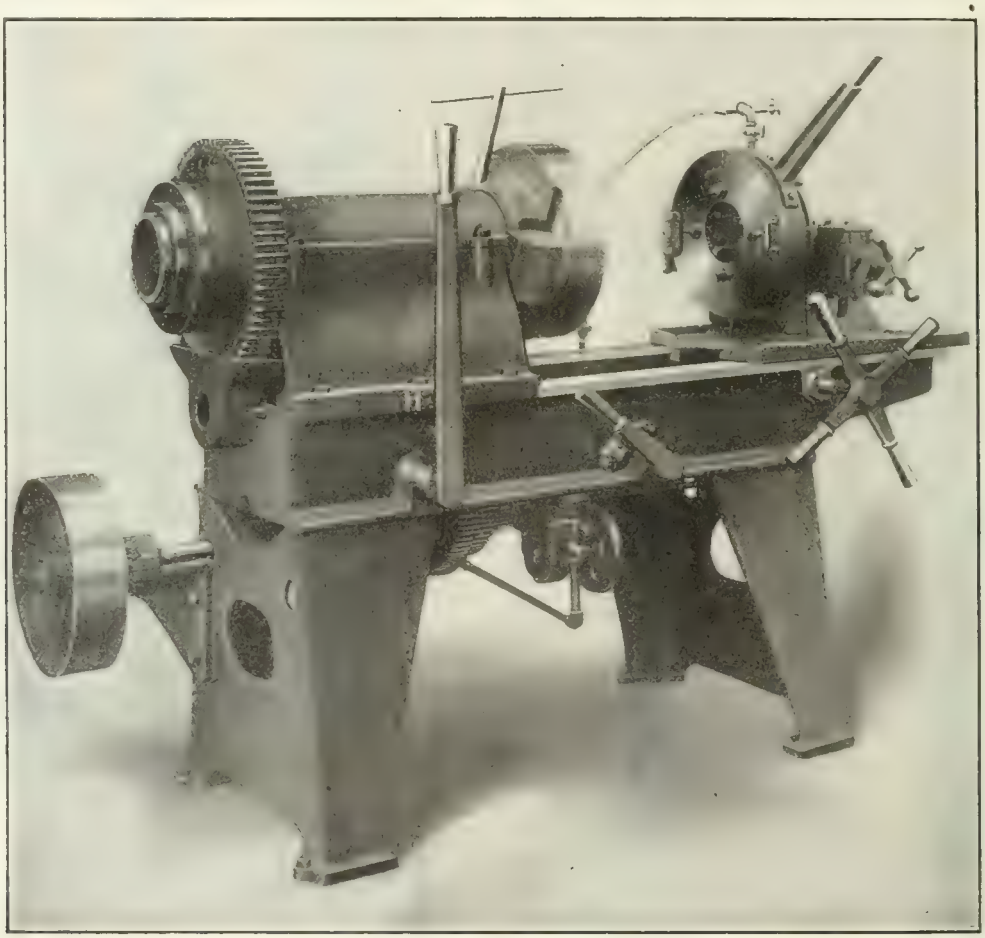


Fig. 1.—The Operating Side of the Belt-Driven No. 2 Pipe Threading and Cutting-off Machine Built by the Williams Tool Company, Erie, Pa.

Figs. 1 and 2 show not only the two manners of driving but the two sides of the machine, and indicate its simplicity of design. In it the company believes it has combined maximum strength, durability and efficiency with minimum cost, weight and number of parts. The equipment is calculated to contribute to easy operating and turning out accurate work rapidly and economically, and includes the following: Powerful self-centering universal gripping chuck, pipe self-centering scroll chuck, graduated die head with lever for instantly setting dies,

stop pin for duplicate threads on the same size of pipe, cutting-off tool, die-head scroll chuck for supporting pipe while being cut off, [illegible] oil pump connected to the die head and cut-off knife by flexible steel hose, and dies which are claimed to have excellent cutting and lasting qualities. For the No. 2 machine there are four sets of dies, each threading two sizes of pipe—1 and 1¼; 1½ and 2; 2½ and 3, and 3½ and 4 in. The dies are easily reground and can be several times, thus reducing the die expense.

The frame is strong and rigid and has broad ways for the sliding carriage. The headstock is bolted to the bed and doweled to prevent its getting out of line. The No. 2 machine weighs 3000 lb. and requires a floor space of 2½ by 6 ft. As additional equipment it can be supplied with one extra set of dies for threading ½ and ¾ in. pipe, a nipple holder for threading short nipples, bolt dies for threading ⅝ to 3 in. bolts by using the nipple holder, and a nut-gripping chuck and taps for tapping nuts. The company also builds five other sizes of the same type of machine—No. 1 having a capacity of from ¼ to 2 in.; No. 1½, capacity ½ to 3 in.; No. 3, capacity 1½ to 6 in.; No. 4, capacity 2½ to 8 in., and No. 5, capacity 3½ to 12 in.

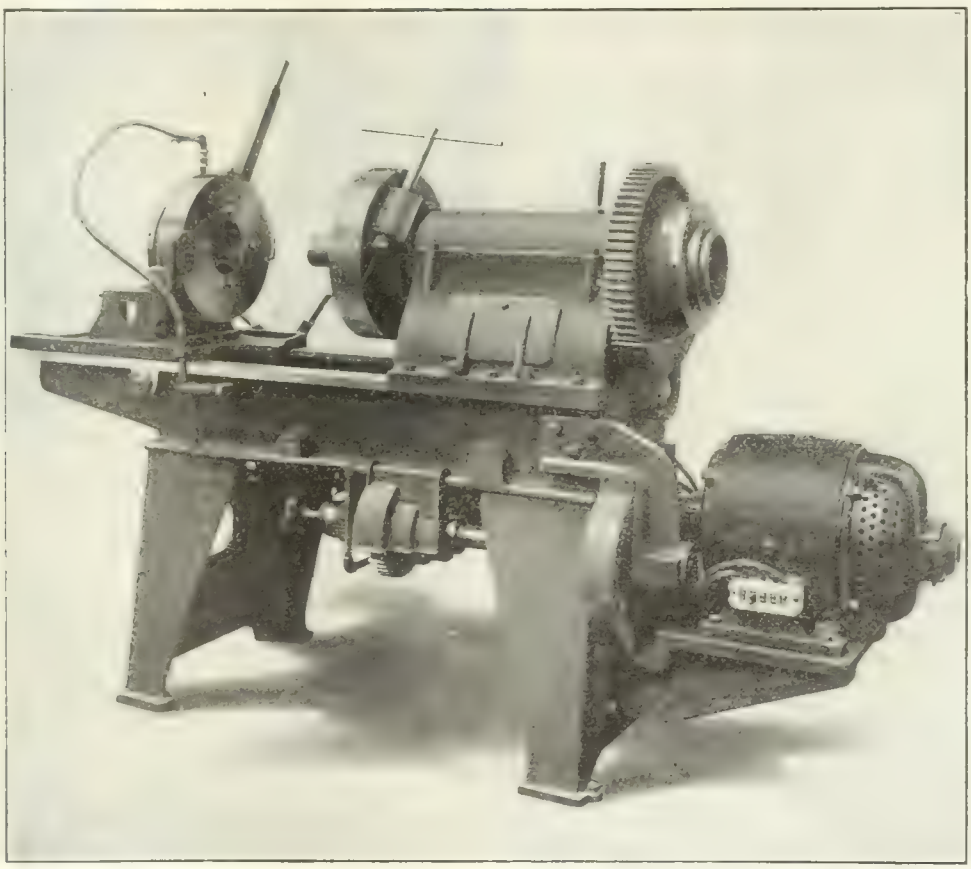


Fig. 2.—Left Reverse Side of a No. 2 Williams Pipe Machine Equipped with Constant Speed Motor Drive.

The Cape Girardeau Smelting & Mfg. Company.—The unfinished plant of the Southern Metal & Mfg. Company, at Cape Girardeau, Mo., has been purchased by the Cape Girardeau Smelting & Mfg. Company. The latter company was recently incorporated with a capital of $150,000, $65,000 of which is represented by the value of the plant. The remainder of the stock is to be held by a trustee, and proceeds from its sale are to be used to complete and operate the property. It is the purpose of the new company to get in shape to smelt lead ore and make lead pipe at the earliest possible date. Adequate transportation facilities are supplied by connections with the 'Frisco and Iron Mountain railroads and the Mississippi River, on the bank of which the plant is located. The officers of the company are as follows: H. M. Leonard, St. Louis, president; D. A. Glenn, Cape Girardeau, Mo., vice-president; J. H. Himmelberger, Cape Girardeau, treasurer; T. M. Williams, Cape Girardeau, secretary.

A New Method of Quenching Coke.

To overcome the drawback of too much water in connection with the ordinary method of quenching coke, a process has been invented by Charles E. Arnold. After being removed from the ovens the coke is forced by the use of a ram into a cooling chamber. It is said that the air admitted to this chamber with the coke soon loses its oxygen and becomes inert, and there is admitted into the chamber carbon dioxide and nitrogen, which take up the heat from the coke. These inert gases are then drawn to an adjacent chamber containing coils in which cooling water circulates. After giving up their heat the gases are again forced into the chamber containing the coke, and this process is repeated until the coke is brought down to a temperature below the igniting point so that it can be removed to the air. It is claimed that coke treated in this way is harder than that quenched in the ordinary way, in addition to being delivered practically dry to the blast furnace. Data as to the expense of the process are not given.

The Southern Steel Company's Reorganization.—The plan and agreement of reorganization of the Southern Steel Company, dated May 15, having been approved by all the depositing first mortgage bondholders and collateral trust noteholders and by creditors to a majority in amount of all the claims filed, proved and allowed in the bankruptcy proceedings and by stockholders to a large amount, the Reorganization Committee, J. T. Woodward, chairman, in order that all security holders and creditors may become parties to the plan, has announced an extension of the time for the making of deposits thereunder to July 1, after which further deposits will be received only subject to such terms and conditions as the committee may see fit to impose.

From all countries the number of immigrants for May this year was 36,317, as compared with 184,886 in the corresponding month of last year and 150,927 the year before. The falling off, as compared with 1907, was 80 per cent.

The Silver Improved 20-Inch Band Saw.

Illustrations are herewith given of an improved band saw brought out by the Silver Mfg. Company, Salem, Ohio. Fig. 1 shows the machine arranged for foot power exclusively. Fig. 2 shows it as a combined machine, arranged for either foot or belt power.

The table of this saw is made of iron, planed perfectly smooth, and capable of being tilted for angle sawing up to 45 degrees by loosening a nut with an attached lever. It can be firmly locked where desired. The entire frame is in one piece, cored out. It is heavy but symmetrical, the base resting on the floor all round, insuring solidity and cleanliness. The operator can conveniently control the upper wheel adjustment, the saw guide, the tension of the saw blade and the tilting of the table without changing his position at the saw. The wheels are turned true and perfectly balanced. Rubber bands are securely cemented to the rims.

The foot power mechanism on this machine is a novel as well as valuable feature. It is completely different from the ordinary dead center construction. Ordinary foot treadle machines can only be started in certain positions because of the dead centers at the top and bottom of the drive wheel. Each downward stroke then requires enough power to drive the wheel a complete revolution. Even when two treadles are used alternately, dead centers still prevail. The new mechanism of the Silver machine allows it to be started in any position whatever. The heavy strap attached to the treadle is fastened to a ratchet pulley. As soon as the pressure of the stroke is relieved the ratchet automatically winds up, raising the foot lever with it. The ratchet will engage anywhere, permitting any length of stroke up to 15 in. There is consequently no dead center. Exactly the same amount of power is generated from the beginning to the end of the stroke. During a single downward tread the saw blade travels about 8 ft., and the power and speed that can be attained are very great. No alteration is necessary in changing the combined machine from belt to foot power and *vice versa*.

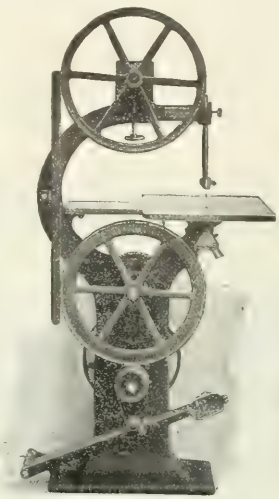


Fig. 1.

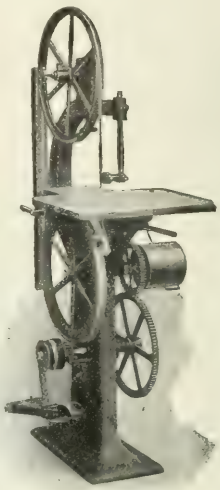


Fig. 2.

Improved 20-In. Band Saw Manufactured by the Silver Mfg. Company, Salem, Ohio.

The American Institute of Chemical Engineers.

The American Institute of Chemical Engineers was formed under most auspicious circumstances at a meeting held at the Engineers' Club, Philadelphia, June 22. The meeting convened at the call of a committee, which for some time had in charge the formation of such an organization, and was responded to by 35 eminent engineers from different sections of the country.

The morning session opened at 10.30 o'clock, Dr. Samuel P. Sadtler of Philadelphia welcoming those in attendance to this city, which he said had large establishments of interest to the chemical engineer. He was heartily in sympathy with the organization of a society such as was proposed and believed that much of interest and benefit to the profession would result. Temporary organization was proceeded with, Dr. Charles F. McKenna, New York, being elected temporary chairman, and David W. Horn, Philadelphia, temporary secretary.

W. M. Booth, secretary of the Committee on Formation of the Institute, made a brief report, stating that several meetings of the committee had been held; that all phases of the formation of a society of chemical engineers had been gone into; those both in favor of and opposed to the movement had been heard; circulars had been sent to chemical engineers in all parts of the United States asking for their approval of the committee's plans, and the large majority of replies favored such an organization, the result of which was the call by the committee for the organization meeting.

A Committee on Credentials examined the qualifications for membership of those present, and while this committee was preparing its report Dr. McKenna made an able address on "The Justification of the Institute of Chemical Engineers." Following Dr. McKenna's address, committees were appointed to prepare a constitution and by-laws, to nominate officers, and to consider the question of finances in connection with the preliminary work of the Committee on Organization. Dr. H. A. Hunicke, St. Louis, Mo., made a brief address in which he stated that he heartily approved of the expressions on the part of Dr. McKenna regarding the justification of the formation of the organization.

At the afternoon session Dr. J. C. Olsen, chairman of the Committee on By-laws, presented and read the proposed constitution, which was afterward taken up by articles, and with sundry corrections was unanimously adopted. It provides that the name of the organization be the American Institute of Chemical Engineers. Membership is confined to one grade, that of active members (although a provision for honorary membership is also made) over 30 years of age. Any graduate from an approved college or university, having a regular four years' technical course and having had six years' experience in practical chemical engineering, is declared eligible for membership, provided they have expert knowledge in some one branch of applied chemistry. The initiation fee and yearly dues for membership are fixed at $15 each. The initiation fee will be omitted until the membership reaches a total of 200.

Officers as follows were elected to serve until the next meeting of the institute, which was to be considered the annual one, and which would probably be held in December: President, Dr. Samuel P. Sadtler, Philadelphia; first vice-president, Dr. Charles F. McKenna, New York; second vice-president, Dr. H. A. Hunicke, St. Louis; third vice-president, E. F. Atcheson, Niagara Falls, N. Y.; treasurer, Wm. M. Booth, Syracuse, N. Y.; secretary, Dr. C. F. Olsen, Brooklyn, N. Y.; auditor, R. K. Meade, Nazareth, Pa. Directors elected for one year: Ludwig Reuter, Berkeley, Cal.; Thomas Smith, Isabella, Tenn.; H. F. Brown, Wilmington, Del. Directors elected for two years: Eugene Haanel, Ottawa, Canada; J. M. Camp, Duquesne, Pa.; C. A. Catlin, Providence, R. I. Directors elected for three years: G. P. Adamson, Easton, Pa.; David Wessen, Montclair, N. J.; E. F. Guverman, Chicago, Ill. These officers collectively form the Administrative Council.

The standing committees, comprising the Financial, Membership, Meetings, Publication, Library and House committees, will be appointed later by the president.

Iron Making North and South Contrasted.

Under the [illegible] from the *Manufacturers' Record* of June 18 [illegible] communication from Joseph G. Butler, Jr., Youngstown, Ohio, from which we take the following:

I realize more than ever the difficulty in managing the Southern properties as compared with the Northern properties. For instance, in the North our ores are mined by one set of men; the people who run the furnaces have absolutely nothing to do with the mining of the ore except incidentally; the care and burden of this are done by an entirely separate organization. The properties are stripped, the ores are mined, sorted if necessary, hauled to the Lake Erie ports, and then another set of men take hold with the boats; the samples are made and the ore is delivered down at the Lake Erie ports. Then it is taken hold of by another set of people, either docked or placed on the cars, resampled, shipped to the furnaces, and there our work begins. Our limestone is quarried for us, handled by the railroads, crushed and delivered to the furnaces in perfect condition for use. Our coke is made for us in the Connellsville region and elsewhere, the coal being mined and the coke made by another organization. It is then delivered to the different lines of railroads and shipped to our furnaces, and we have nothing to do with it but to unload it and use it up.

Now, *per contra*, in the South all this burden of mining and shipping the ore, mining the coal and making it into coke, quarrying the limestone and delivering it to the furnace, and, to a very great extent, the management of the railroads, is done by one single, effective management. It is therefore my judgment that even a higher grade of talent is required in the South than in the North. It is also quite apparent that the management in the South has, since 1890, gradually improved in every respect, and there is still room for improvement in the matter of preparing the ore and the coke. The quantity of ore in the South is, of course, largely a matter of computation, and I have no doubt the figures given me are correct. It is simply fabulous.

The increased use of the basic process is going to be a very great help to the South. Bessemer ores are getting scarcer and the use of the basic process is widening both North and South. The time is coming when a great deal of the pig iron shipped North will be manufactured at home into various different forms. This, I think, will be first taken in hand by the Tennessee Coal, Iron & Railroad Company. I believe it is the intention of the United States Steel Corporation to build additional finishing plants in the South.

The South at present has the advantage in the matter of lower costs than the North in the making of foundry iron. This, however, is largely a matter of bookkeeping. The ore and coke and limestone and nominal transportation charges are all bulked together and the cost arrived at in that way, while in the North the furnace is charged with the ore at the market price, with the coke at the market price and with the limestone at the market price, each of these items giving to the producer a return for the investment. If Northern costs were figured in the same way as Southern, the difference would be found not to be so great.

It is a matter of surprise to me that Southern producers would think of selling their product as low as has been done during the past few months.

There is under consideration at the present time a statistical bureau for the entire pig iron interests of the United States. I am quite sure that if the Southern producers will join heartily in this movement it will be very much to their advantage, as well as to the advantage of their brother producers in the East and North. The committee who had the matter of forming this bureau of statistics in hand decided that to start it in a practical way the manufacturers should be asked to report to a commissioner.

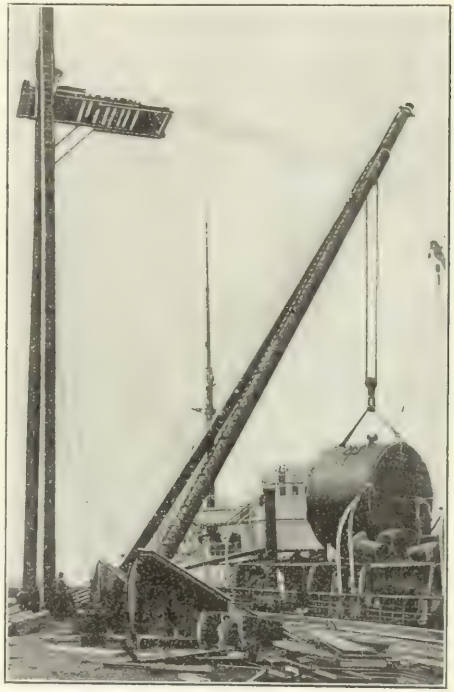
1. In the first report to give the stock on hand in tons by grades, and subsequently—
2. To report the weekly make in tons by grades.
3. The weekly shipments in tons by grades.
4. The weekly sales in tons by grades.

That the commissioner be instructed to tabulate the information received and to give the recapitulation each week only to those furnishing reports, and that a uniform blank be prepared and sent each member of the bureau, and that weekly reports be made at the close of business as of 6 o'clock p.m. each Saturday.

An Electric Dock Hoist.

The remarkable record which is credited to the electric hoist shown in the illustration is the handling of a 65-ton boiler from the dock to the hold of a steamship in twenty minutes. The illustration shows the boiler about to be placed in the hold. The hoist is in the yards of the Commercial Boiler Works, at Seattle, Wash., which manufactures marine boilers and executes ship repairs. The boiler was one of the largest ever built in Seattle. The worm gear hoist which was previously used would have required three hours' time to raise the same load.

The hoist proper was supplied by the Lambert Hoisting Engine Company, and is driven by a 40-hp. type K Westinghouse direct-current motor, controlled by a drum-type controller, affording nine forward and nine reverse speeds. From the drums of the hoist a ¾-in. steel cable runs to the top of the shear legs, where it reeves through a set of blocks capable of lifting from 75 to 90 tons. A 15-ton boiler was recently loaded by the Lambert hoist in 4½ min.



An Electric Hoist on the Dock of the Commercial Boiler Works, Seattle, Wash., Loading a 65-Ton Boiler Into the Hold of a Vessel.

The power which drives the hoist and the motors in the shop, where the tools are individually driven, is purchased from the Seattle-Tacoma Power Company, and is transmitted by a two-phase line at 2300 volts. It is utilized on the dock as direct current and in the shops as alternating current for two 50 hp. motors driving heavy rolls, one 50 hp. motor driving an air compressor and various small motors, all of standard Westinghouse manufacture. A motor-generator set is installed in the shop to supply the necessary direct current for the hoist.

THE IRON AGE

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New York, Thursday, June 25, 1908.

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Steel-Making Pig Iron and the Merchant Furnaces.

The new capacity under construction by blast furnace and steel companies has a vastly different significance in a time of prosperity from that given it under conditions like the present. Last year, before any signs of recession were found in actual industrial operations, it seemed as though the new plant could not be hurried along fast enough, though there was no overlooking the general rule that extensions are built in high pressure time and are ready for operation when the country's buying power has fallen away greatly. Now that the consumption of pig iron and steel is around 50 per cent. of the rate of a year ago the new construction programmes partly completed, some of them nearly so, give by no means auspicious indications of the future of prices.

It is to be kept in mind, however, that new blast furnaces such as the Steel Corporation and other important producers are now building do not mean that their potential product is so much more metal for the market to absorb, whether as pig iron or finished steel. It does mean that the total monthly output made when high point was reached last year could be increased to the extent of the monthly capacity of the new furnaces; but this would happen only under market conditions enabling the smaller furnaces now cold to make iron at a profit. What actually would happen in the early stages of an increasing consumption of pig iron is the starting up of some of these new furnaces, rather than of furnaces whose cost is at or above the present market level. Thus the building movement now under way means rather that some furnaces heretofore active will be a long time out of commission, than that the market must bear the weight of an enormous new output of pig iron, in addition to the maximum of last year, which was at a yearly rate of nearly 28,000,000 tons. The boom that took its departure last year, like every one of its predecessors, marked the last run of a number of furnace stacks and a long rest for many others.

While the Steel Corporation's new furnace construction will mean the idleness for many months of some of its smaller and less favorably located furnaces, as at Zanesville, Steubenville and Columbus, Ohio, they will likewise, in conjunction with the new furnace construction of other steel companies, as at Aliquippa, and that of the Youngstown Sheet & Tube Company, raise again the question of the future of the merchant furnace running on steel making iron. The Steel Corporation's eight building furnaces at Gary, the two at Duquesne and the two at Youngstown, together with those of the two so-called independent steel companies referred to, represent a yearly output of nearly 3,000,000 tons of pig iron. As all the companies named were buyers of Bessemer iron from the merchant furnaces last year, it is perfectly plain that the latter must turn to other kinds of pig iron or await the coming of another boom. The elimination to so large an extent of Bessemer iron as a market factor in the Pittsburgh and Mahoning and Shenango Valley districts is not merely an incident of the present period of depression. It brings up again the old question of the future of the merchant furnaces, that for a period of years previous to the fall of 1907, not omitting the lean year 1904, when the Steel Corporation came to their rescue, made up the difference between the pig iron requirements of the large steel companies and the output of the connected blast furnaces.

The same question has come up so often and has so regularly been answered by an unlooked for expansion of the country's requirements, that it may seem like a hunt for trouble to raise it now. Not only have the steel companies been providing for the making in their own furnaces of metal heretofore supplied from outside, but they have gone much beyond this in blast furnaces, while the Steel Corporation has built and is now building new steel works that will carry its production of open hearth steel far in advance of the largest output it has ever made. The first view of the vast plant at Gary might be that as it is in a district heretofore self-contained as to steel making pig iron, it has no bearing on the status of the merchant furnaces. Yet, as Gary is to supply Western consumers of steel who have hitherto drawn upon the Pittsburgh District, its operations might be for a time at the expense of Pittsburgh works, and thus have a direct bearing on the Bessemer pig iron market in Ohio and western Pennsylvania.

If the steel companies are right in the measure they have taken of the future—and history and reasonable expectation bear them out—there must also be an expansion in the foundry trade that will call for all the foundry and malleable Bessemer grades the temporarily displaced Bessemer and basic pig iron furnaces can produce and more. But so great an expansion in cast iron, like that looked for in steel, is not a matter of next month, nor of next year. Meantime the problem of profitable employment for a good many merchant furnaces may become acute.

The Development of Metal Drawing.

The development of the art of drawing and stamping metal has been exceedingly rapid of late. The press builders have kept pace with the fast increasing knowledge of the physical properties of the various metals, especially as to their flow. New steels have entered into the progress of the art, not only in the product itself, but also in the tools used in its working. One after another, obstacles have been overcome which had hitherto been considered insurmountable. The press designers are turning out machines to do work which had been supposed to be impossible of accomplishment. Precision work, involving the manufacturing of parts in which the limit of variations is a small fraction of a thousandth of an inch, is now being carried on commercially quite as a matter of course, with an enormous saving of time and money as compared with what had been practically hand work, and at the same time with a greater uniformity of product. In automatic press work marvels of manufacturing have been developed recently. An instance of drawn metal is the manufacture of very long slender tubes of various metals, closed at one end.

The field of pressed metal has been enlarging ever

since its beginning [illegible] was not many years ago, but lately the growth seems to have been given a new impetus, doubtless because the knowledge of the various elements that enter into the art has been more nearly perfected. The efforts of research by many experts have been brought to fulfillment, furnishing more exact data as to details of the properties of metal, with important results in the design of the machines and tools with which it is worked. Beneath all is the basis of the experience of many practical men. The pressed metal people have always held that their branch of industry was only at the threshhold of its usefulness, and this would seem to be a better grounded prophesy to-day that ever before, because its foundation in fact is the more apparent.

The first drawn work was done to supply a demand for seamless parts to replace castings, which were too heavy and cumbersome for convenience or appearance. Ferrules for various purposes, stove knobs and a few other specialties were produced and sold at a great margin of profit, because even at very high prices as compared with their cost the expense to the purchaser was little if any more than under old methods, and the drawn metal was greatly superior for the purpose. From the small beginning the business progressed rapidly. The possibilities of its application were seen, and as time went on many manufacturers entered the field. Finally general manufacturing companies established departments for the manufacture of metal parts of their products, or the cans or metal boxes in which to pack them.

With competition came the spur to better and cheaper methods of production, and in this the press builders have played the most important part. The development has included greater power, greater speed of production, greater precision, automatic feeds, combinations of processes in one machine and special machines of wonderful ingenuity, with principles of design conforming to the knowledge gained by the experience of the pressed steel manufacturers and the investigations of their experts, and by the manufacturers of the metals which are used as tools and as raw materials for manufacture. The adaptation of the products has been so broad as to be revolutionary. There are few articles in which metal plays a part to which the press does not contribute its share, as a rule improving the quality and lessening the cost. Other branches of mechanics have entered into the work, especially important being the new welding processes, notably the electric and the oxy-acetylene, both of which produce results previously impossible, and consequently adding their important functions in developing the field.

There are instances of manufacturers or those who would be manufacturers who have abandoned ideas because the special machinery people in the past have been unable to give them the equipment with which to manufacture cheaply by automatic processes. To-day these machines could be furnished in many cases. Manufacturing has been simplified by the reduction of the number of operations necessary to accomplish a certain work, which constitutes a very important development in pressed metal working. The manufacturer who is equipped with the most modern tools can compete successfully at a satisfactory profit, for what to him is a sufficient price, would be below cost to a competitor less well equipped. Figuring is frequently very close indeed in this line, and as in many other branches of business, first-class machinery is necessary if money is to be made.

The trade literature of all the leading manufacturing countries exhibits some curiously common features. There is the same bitter complaint of the neglect and inefficiency of the consular service of the country, to which the writer belongs; the same abundant praise of the industry and intelligence of the Government agents of rival countries; the same dark hints at their going to any lengths to serve patriotic ends; the same savage denunciation of absurd methods, and the same tearful pleas for reform. The English, German and French globe drummers and commercial exiles all sing the same song, until one reaches the conclusion that they all exaggerate alike and that all are eager to have the home government do as much of their work for them as it can be made to do by threats or cajolery.

Replacing Old Tools with New Ones.

One of the important duties of the salesman who handles shop and factory equipment lies in the education of customers in his effort to sell them new tools to replace those that are less efficient. With the rapid progress in the design of machinery of all classes, there are few manufacturing establishments presenting no chance for an argument along these lines. But the greatest opportunity lies in some of the older works. It is almost an anomalous condition that an occasional plant makes money in spite of the fact that its machinery is far from modern and its cost of manufacturing is necessarily much higher than it would be were the same work done under advanced methods. Such a condition may be capable of explanation. The reputation of the goods, long experience and resultant excellence of design, which may put a product in a class by itself; the skill of the sales department—any combination of these and other factors may serve to overcome disadvantages at the manufacturing end of the business. But the observer cannot fail to see how much more profitable a business would be, with all other elements as advantageous as before, if old equipment, which in many instances may be classed as obsolete, should be replaced by the best that modern mechanical art has evolved for the various required purposes. Almost always, these cases occur where the business is an old one, directed by the same influences that have controlled it for many years, and housed in old buildings. The experience of such a management is a large item of value in itself, as an offset to the failure to make improvements. A new management that would modernize the works would perhaps lack other valuable qualities begot by long acquaintance with the product and its market. It becomes almost an ideal condition when a veteran management establishes new works, with new machinery, cheaper power, cheaper insurance because of lessened fire risk, better light and sanitary surroundings; a change that comes usually after a serious fire.

The salesman often sees the oportunity for a large order in looking about an old but prosperous shop or factory, and undertakes the education of those in control in the effort to sell new machinery. It is frequently true that a new machine will pay for itself in a short time by the saving in cost of production as compared with the tool which it supersedes. To establish this fact to the point of an order is one of the difficult experiences in selling machinery. The owner is apt to fight shy of changes. But it is well worth the while to keep up the effort, for to the conservative management that has finally made a start on a policy of improved equipment the advantages in money saved become too apparent to be passed by, and more or less quickly the modernizing of the plant will be carried out, or new works erected.

This is especially true where the manufacturer has a cost system sufficiently exact to give him the precise figures of his saving. There is no doubt that the cost system is one of the most important factors in bringing

bout radical improvements in manufacturing methods, id those who are benefited in the market by such changes ould do less important missionary work than to equip emselves to be able to point out intelligently improved stems of ascertaining costs of a product in its various erations. If by installing a sample machine it can be emonstrated that the cost of an operation can be re-ced one-half or three-quarters or even more, then few ccessful business men, even if they are not easily con-rted to the progressive ideas of the present day, must strongly influenced. It is not the whole story to show at a machine will perform a certain operation on twice many parts in a given time as did the older tool. The emonstration of costs should go beyond this; the ele-ents of the item of labor and of the various factors that ter into general expenses should all be figured in the mparison, to emphasize the economy effected. The edu-tion of customers is a common enough practice, but we lieve it is seldom accompanied by the effort to place a rallel of exact costs, the most convincing argument of l. Where it is possible to instal a machine on trial, a an more feasible, of course, with light than with heavy ols, much good is accomplished providing the builder of e tool can back up his claims with results. It is also ssible to get from some manufacturer, who has had the xperience of the change to the new type of tool under milar conditions, abstracts from his cost system show-g exactly the difference in manufacturing expense that sulted.

The United States Steel Corporation is not the dic-tor of prices in the steel trade. It has at no time since s organization fixed a price for others to sell by nor bsolutely determined on its own volition the course of e market. It is true that the policy of the corporation as impressed itself on the trade, but only through the illingness of other manufacturers to co-operate along e lines suggested. This statement is made because a ide misunderstanding seems to prevail regarding the tion on steel prices since the panic of last fall. Ref-ences made to this matter in the daily press, in trade mmunications and in conversation among members of e trade have so frequently ascribed the maintenance prices or a change in prices to the United States Steel rporation as to make it appear that it had either as-med or was intrusted with the management of the tire steel trade of the country. This assumption is cer-inly not flattering to the 50 or more representatives of her companies who have had much to do with the direc-on of affairs in the steel trade not only since the panic t ever since the organization of the United States Steel rporation.

A. M. Byers & Co., Inc., Pittsburgh, owners of Mat-e Furnace at Girard, Ohio, have recently bought 40 res of ground adjacent to the furnace, on which they ill build a puddling plant to contain 40 puddling fur-aces and a skelp mill to contain a 16-in. roughing stand nd a 12-in. finishing stand. It is the intention of the m to manufacture skelp for use in its pipe mills in ittsburgh. Press reports that the firm would abandon ose mills are absolutely untrue. They will continue to e operated, and there is no intention of removing or dis-antling them.

The Department of Health of New York City esti-ates that the population of Greater New York July 1 ill be 4,422,685. At Chicago, estimates made by those charge of the school census indicate a present popula-on for that city of about 2,140,000. The total reported 1901 when the last general school census was taken as 1,704,044

The Niles Iron & Steel Company's Improvements.

The Niles Iron & Steel Company, Niles, Ohio, manufacturer of sheet iron, sheet steel and corrugated roofing, has under construction large additions to its plant which will enable the company to increase the output of its present products and to add new lines. Its new products will include eaves trough and conductor pipe, pressed steel seats, cultivator shields and other steel stamping pieces for agricultural implements, washers, weigh boxes, &c. The company is erecting one large one-story building of steel construction, 74 x 260 ft., one half of which will be used for the stamping department and the other half for the eaves trough and conductor pipe department. A 400-hp. Corliss engine has been installed in this building. Other equipment will include two hammers and four drawing presses, a conductor pipe machine and a ridge roll machine, which have been bought, and two power squaring shears. The company is now in the market for the shears, as well as for shafting and hangers. A new eaves trough, conductor pipe and seat department has been created, with R. G. Hird in charge. The strong selling point will be made that conductor pipe will be sold only to the large jobbers. The company will also make its own crates, and is in the market for a rip saw and a swinging cross cut saw.

In the rolling mill a new 2500-hp. Corliss engine, with rope drive, will be installed. A new building is being erected for a machine shop. This will also contain two generators and other electrical equipment and two smaller engines. An addition is being made to the galvanizing department, where two new galvanizing pots will be installed, bringing the capacity up to 4000 tons per month. With the completion of the additions and improvements the capacity of the rolling mill will be increased to about 5000 tons per month. The company is spending about $100,000 in the additions and improvements, with the intention of making the plant one of the best of its kind in the country. It is expected that the improvements will be completed by August 1. The officers of the company are W. A. Thomas, president; C. G. Thomas, vice-president and treasurer, and C. R. Thomas, secretary.

A Book on Rolls and Rollmaking.

The United Engineering & Foundry Company, Pittsburgh, Pa., has issued a handsomely illustrated and beautifully printed book of 40 pages which treats exclusively of rolls. The book bears the title, "Largest Roll Makers in the World—Makers of the Largest Rolls." The company operates three of its six foundries on rolls. These are the Lloyd Booth Company Department, Oak street plant, Youngstown, Ohio; Lincoln Foundry Company Department, Pittsburgh, Pa.; Chilled Roll Foundry Company Department, Vandergrift, Pa. Views are given of each of these establishments.

A chapter is appropriately devoted to the requirements imposed on manufacturers of rolls and the methods which have been adopted by scientific and practical roll makers to meet these requirements. The process of modern roll founding is described, from the production of cold blast pig iron in the blast furnace to the methods of completing molds in the foundry. Separate chapters are assigned to chilled rolls, sand rolls and steel rolls. The methods of manufacturing each of these kinds of rolls are described, and the users of rolls are informed regarding the special adaptability of each.

The company dwells with pardonable pride on its metallurgical system, its roll mixtures at each of its shops being made up to its own chemical specifications by metallurgists who have acquired their training at the laboratory at the Lincoln Foundry Company Department, Pittsburgh. At this laboratory all the company's principal research work is done, and well qualified metallurgists are constantly experimenting to improve further the quality of the product. This publication is by no means the conventional catalogue, but is laid out on original lines which cannot fail to interest the users of rolls.

UNIFORM FOUNDRY COSTS.

A Chart Showing the Distribution of Labor, Materials and Burden.

At the Toronto meeting of the American Foundrymen's Association, June 8 to 12, a report was made by the association's Committee on Costs, Kenneth Falconer chairman, which also submitted a chart outlining the main divisions of foundry costs. We present extracts from the report below, accompanying them with a reproduction of the chart:

The Jobbing Founders' Association having appointed a committee to work along similar lines, it was deemed advisable that the committees of the two associations should work together. In the past year several joint meetings of these committees were held—J. S. Stirling, of the Hilles & Jones Company, representing the Jobbing Founders' Association, and the American Foundrymen's Association being represented by Dr. Moldenke, Harrington Emerson, E. M. Taylor and Kenneth Falconer. Under date of November 27, 1907, Mr. Stirling submitted to his association a report on "Uniform Cost Methods for Jobbing Foundries," which we understand has been approved, and largely adopted by members of that association.

Your committee recognizes that it is impossible to lay down hard and fast rules regarding details of figuring costs, making estimates and basing bids, but at the same time it feels that the best interest of the foundry business demands some degree of uniformity in the basic principles on which costs are figured. With this idea in mind the preparation of a chart outlining the main divisions of costs was delegated to Harrington Emerson, and the chart as prepared by Mr. Emerson is attached hereto. Your committee desires it understood that it only endorses this chart for general use so far as main divisions are concerned, leaving details to be arranged in each instance according to the requirements of individual plants. The final decision of the two committees was that to secure the best possible results certain clear-cut lines should be drawn, defining cost of product up to and including certain processes; but that further analysis of such costs should be left in each instance to the individual judgment of those in charge of the plants.

In view of the fact that in the majority of cases it is commercially impracticable to obtain a record of the cost of individual castings, the accompanying chart was designed with the idea of dividing the foundry output into classes, the number of which would depend on conditions and circumstances. In the chart the output is divided by Mr. Emerson into approximately ten classes. The actual cost of the foundry output has been divided, as will be seen by reference to the chart, into the following main divisions:

1. Metal.
2. Direct labor.
3. Indirect expenses chargeable on basis of weight of output.
4. Indirect expenses chargeable as a percentage of direct labor.

If those competing in the foundry industry for orders would base their figures on some such classification, subdivided to such detail as may be found advisable in individual cases, the result would be of benefit to the entire trade, and would tend to eliminate the reckless competition which is largely responsible for the present unsatisfactory condition of the foundry business.

Comment on the Committee's Report.

Ellsworth M. Taylor, New York, a member of the Committee on Costs, presented at the Toronto meeting more extended data and more detailed information as to the method of applying the cost system. His paper is as follows:

The chart submitted by the committee has been made as simple as possible, and is designed to illustrate merely the elementary principles of the burden of surcharge distributions agreed upon as the standard units to be used by all foundrymen. It is not intended to be a complete cost system in itself, nor should the arrangement of the items in the different sections necessarily be maintained, so long as the various kinds of labor and material are distributed to individual costs in accordance with the formula shown. Briefly stated it has been determined that, in order to correctly obtain the cost per pound of good castings, according to classes or individual patterns, after the cost of the metal and direct or applied labor has been ascertained, certain kinds of burden or surcharge labor and materials must be distributed to each class into which the product may be divided in two general ways:

1. According to weight of good castings.
2. According to a percentage of the direct or applied labor used in producing each class.

In order to get a clearer insight into the subject let us discuss the various sections of the chart in the order in which they occur. We will then take up in a general way the application of the principles to different kinds of foundries.

Metal.

This section of the chart requires little explanation. It is simply necessary for the foundryman to make up his report showing the cost of the metal actually consumed in the making of the good castings produced. This means a fairly close check on what goes into the cupola, and what we ultimately get out of it.

Distribution of Burden or Surcharges on Metal.

This section of the chart shows in a general way the kinds of labor and materials which will be distributed to classes or individual patterns in accordance with the weight of good castings into which the product may be divided. In studying the items named in this section of the chart it should be remembered that the arrangement is perfectly elastic, and may be modified and enlarged upon according to the individual requirements and desires of each foundryman. The examples given are merely to illustrate the kinds of labor and materials which are to be included in this section.

It is suggested, however, that in arranging the items in this section the foundrymen group together those expenditures which relate to the successive steps through which the metal passes from the pig up to the finished castings. For example:

1. Cost of metals delivered at yard.
2. Cost of materials and all expenditures to cupola.
3. Cost of materials and labor to cover molten iron in ladle.
4. Cost of molding supplies and all items incidental to the same.
5. Cost of all general and miscellaneous items which must be distributed into the costs on a basis of weight of good castings.

The total cost of these items when divided by the weight of the good castings gives the number of cents per pound of burden or sur-charge cost to be apportioned to each class of castings or individual patterns into which the production may be divided. The grouping of the items in this way is to enable the foundryman to analyze his costs logically and make comparisons for the purpose of detecting excessive expenditures. It is sometimes the wish of the foundryman to group these and other items so as to put the responsibility for the economical handling of the iron in the various stages up to certain foremen or individuals. All of these matters, however, must be decided according to individual desires and conditions.

Direct or Applied Labor.

The subdivisions in this section are merely suggestive. The list must be added to or decreased to meet conditions. As stated in the note, it is not always possible to class all of the labor of these employees as direct or applied labor, and likewise it is sometimes possible to class all or part of the labor of pattern makers, carpenters and blacksmiths as applied or direct labor. The rule is that all labor is direct or applied when capa-

ble of direct distribution to any class of castings or individual patterns, and when it would be included as a direct labor charge in making up the cost of an individual job. Otherwise the labor items must be classed as burden or sur-charge cost.

The foundryman should be careful to observe this rule when figuring detail costs, as the percentage of burden or sur-charge apportioned to individual costs on a basis of direct or applied labor is obtained by dividing the total cost of the section "Surcharge on Applied Labor Distributed on Per Cent. Basis" by the total of the "Applied Labor" section.

Therefore, if we include in the applied labor section any considerable amount of labor which does not come within the above named definition of direct labor, we are apt to develop a percentage rate which will not cover our real burden or sur-charge.

Commercial Costs.

This section is intended to cover all costs beyond the shipping office door which have to do with the selling of the product. Consequently item 80 of the chart, "Administration," should be understood to mean only that portion of the executive cost which is used for the benefit of the selling department. The balance of the administrative cost should be included in item 66, "Proportion of General Office Expense," or may be made a separate subdivision thereof. Item 81 of the chart, "Sales Costs," may be subdivided as each foundryman desires; for example, salesmen's salaries, salesmen's commissions, traveling expense, etc.

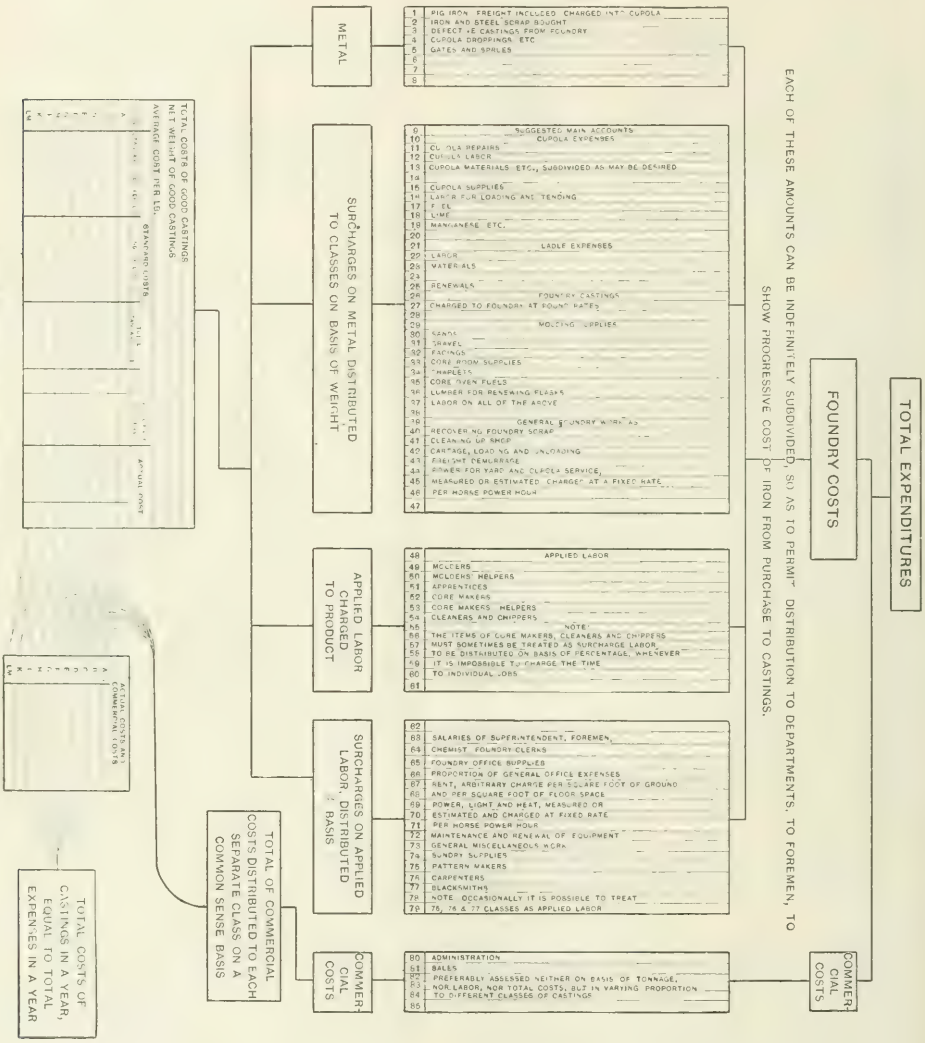
In apportioning the commercial cost to the classes into which the product may be divided the unit of distribution should be made up on a basis of equity, taking into consideration the real conditions governing the sale of each class, such as the amount of sales, the costs up to the "Commercial Costs" section, the difficulty in making sales, the volume of advertising, etc.

Individual conditions must be carefully studied before the unit of distribution for this class of costs is adopted.

Summary of Costs.

After completing the arrangement of the sections described above we are in a position to secure a summary of costs which may be drawn up as submitted below, changing the arrangement to meet individual conditions. The grand summary will be based on the following data:

1. Total good castings produced.



A Chart Showing the Main Divisions in a Scheme of Foundry Cost Distribution.

2. Cost of metals used.

3. Cost of applied labor.

4. Cost of [illegible] charge divided into (a) cost of items to be distributed as "sur-charges or burden on metal distributed on basis of weight of good castings." (b) Cost of items to be distributed as "surcharges or burden on basis of per cent. of applied or direct labor."

5. Total cost of output.

6. Commercial costs.

7. Gross cost of output.

8. Net cost of metals used per pound of good castings (obtained by dividing item 2 by item 1).

9. Burden or sur-charge to be distributed to individual costs on a basis of per pound of good castings (obtained by dividing item 4a by item 1).

10. Burden or sur-charge to be distributed to individual costs on a basis of per cent. of direct or applied labor (obtained by dividing item 4b by item 3).

The examples given in this schedule illustrate the classification of costs necessary for all kinds of foundries, and must be used to meet the conditions in the five general classes of foundries described below, and all others.

The Small Jobbing Foundry Selling Its Entire Product to the Trade.

This foundry wants to know:

a. What is the gross cost of production? See items 5 and 7.

b. How should we figure the cost of an individual casting? Multiply the weight of casting by item 8. Get the cost of the direct or applied labor used to produce the casting. Multiply the weight of casting by item 9. Multiply the direct labor by the percentage rate obtained by item 10. The total of these amounts is the cost of the casting up to the shipping office door. Add the proper proportion of item 6. The total is the gross cost of the casting.

c. Suppose it is desired to divide the production into two or more classes, say, for example, "heavy work" and "light work," so that you may obtain the average cost of these classes without getting the detail cost of each casting? Separate item 1 into "heavy work" and "light work." Keep a record of amount of item 3 used for each class. Then proceed exactly as outlined for b.

d. Suppose it is desired to secure the cost of Smith's work, Jones' work, and Brown's work to find out which is the most profitable, and without getting the detail cost of each casting? Separate item 1 according to customers. Keep a record of amount of item 3 used for each customer. Then proceed exactly as outlined for b.

The Jobbing Foundry Having Two or More Departments.

e. Suppose one section of a plant is continually producing large loam castings, and another section produces machine made castings. Treat each department as a separate business proposition. This means:

Separate item 1 according to departments. Separate item 3 according to departments. Separate item 4a according to departments. Subdivide 4a: 1, according to those expenditures capable of direct charge to each department; 2, according to those expenditures incapable of direct charge to each department.

Examine carefully all of the items in the second subdivision of 4a, take into consideration all of the conditions prevailing in each department and apportion the amounts in accordance with the units of equity which the examination develops.

Separate item 4b according to departments: 1, according to those expenditures capable of direct charge to each department; 2, according to those expenditures incapable of direct charge to each department.

Examine carefully all of the items in the second subdivision of 4b, take into consideration all of the conditions prevailing in each department and apportion the amounts in accordance with the units of equity which the examination develops.

Separate item 6 according to departments: 1, according to those expenditures capable of direct charge to the sale of castings from each department; 2, according to those expenditures incapable of direct charge to each department.

Examine carefully the items in the second subdivision of 6 and distribute the amounts in accordance with the general instructions given under the heading "Commercial Costs."

When the above distributions have been made we will find ourselves in possession of two sets of reports. Then proceed exactly as outlined for b in order to obtain any detail information.

The Foundry Selling Its Entire Product to Its Own Machine Shop.

With this class of foundry the first step is to treat the two properties as separate institutions. Draw the line sharply between expenditures made for each property, and consider the foundry as an outside concern. Fix the selling prices of the castings to the machine shop, taking into consideration general market conditions, and the fact that the foundry will be relieved of the usual commercial or selling expense. The foundry must then operate within these theoretical selling prices in order to be profitable. The next thing to consider is whether the foundry is large enough to warrant subdividing it into departments. If it is not necessary to make these departmental subdivisions we will obtain our costs and detail in the same general manner as outlined for a and b. If a departmental subdivision into departments is advisable for any reason proceed in the manner outlined for e.

The Small Foundry Selling Both to the Trade and to Its Own Machine Shop.

This class of foundry may be handled in several ways, the suggested division of the production being:

1. Cost and profits on castings sold to outside customers.

2. Cost and profits on castings sold to machine shop.

To get this information proceed as outlined for d, being careful to apportion the commercial or selling costs as between the two divisions of the product. If we wish to obtain detail costs proceed as outlined for b and by posting these costs against sales we may get profits on individual jobs or by any class desired.

If we desire to divide our product first into perhaps "heavy work" and "light work" without going into the detail cost of each job, proceed as outlined for c. And if it is still our wish to secure figures in the broad divisions of "Costs and profits on castings to 'outside customers'" and "Costs and profits on castings to machine shop," we must divide 1 and 2 into the pounds of "heavy work" and "light work" in each class, and multiply the amounts by cost as developed by c. If we further wish to subdivide costs of "work for outside customers," by customers, such as Brown's work, Jones' work, &c., we must know the pounds of "heavy work" and "light work" produced for each. Then multiply the amounts by the cost developed by c.

The Large Foundry Selling Both to the Trade and to Its Own Machine Shop.

This class of foundry has the greatest complications and likewise the greatest possibilities for the application of the principles enumerated, and as its costs will be determined primarily by a combination of the illustrations given it does not seem necessary to go into much description. A careful reading of the outline for *e* and for "The Small Foundry Selling Both to the Trade and to Its Own Machine Shop" should give a clear idea of points to be covered.

In General.

In reading this paper it should be borne in mind that the intention is to illustrate correct principles of distribution and not to outline a complete cost system. No attempt is being made to deal with the subject of handling of patterns, the handling of orders, the handling of metals, the record of stock, the books of account, statistics, &c. All of these matters come under the heading of a cost system, and they were treated of in a general way by the writer in the paper prepared for the convention of the American Foundrymen's Association held in New York City in June, 1905.

The Carbon Steel Company, Pittsburgh, manufacturer of plates, locomotive driving axles, pins and rods, is operating its plant to about 60 per cent. of capacity.

The Steel Rail Situation.

Dr. Charles B. Dudley's Address Before the American Society for Testing Materials.

The presidential addresses of Dr. Charles B. Dudley, chemist of the Pennsylvania Railroad, before the American Society for Testing Materials, have been notable features of the annual meetings of that society. Below is given a synopsis of the address delivered Tuesday evening, June 23, at the Hotel Traymore, Atlantic City, on "Some Features of the Present Steel Rail Situation."

In his introduction Dr. Dudley took up the changes of the past 25 years, particularly the increase in the average speed of trains, the increase in loads, amounting to 75 per cent. in average wheel loads of cars, and over 100 per cent. in locomotives, and in the third place the increase in the volume of traffic which for more important railroads has amounted to 300 per cent. or more. Answering the question what the railroads have done to meet the changed conditions, the speaker referred, first, to the increase in weight of rails, and came to the conclusion that "if 12,500 lb. per square inch is assumed as a safe working stress for such steel as rails are made of, the present 85 and 100 lb. rails show stress well within this limit, even under a static wheel load of 30,000 lb., with a dynamic augment of 60 per cent. of the static load." Consideration was given in turn to what the railroads have done as to ties, tieplates, splice bars and fastenings, ballast, subgrade, maintenance of track, &c. Dr. Dudley considered that the importance of the subgrade had not been sufficiently appreciated, and said that if more study had been put on the problem of keeping water out of the subgrade, there would have been fewer rail failures.

Economies of Better Steel and Heavier Rails.

Referring to the discussions and committee meetings over rail specifications, it was stated that some railroad engineers had contended for a rail of minimum weight per yard so good that even though the track might not always be up to standard, there would still be no failures. The speaker could not endorse such shifting of responsibility, but in this connection raised a question as to where true economy lies in this contrast between the rail and the track maintenance. Three possibilities were considered as follows, and it was said that while data do not exist at present for a satisfactory answer to any one of the questions, the field opened up is most important:

1. Would better rails with the same weights per yard as are now in use, even though obtained at increased cost, result in such diminution of track expenses that economy would result?

2. Would the same so-called inferior grades of steel that are now being furnished, with increased weights per yard, it being conceded that increased weights per yard are not essential from the standpoint of strains, result in such diminution of track expenses that economy would follow after paying for the increased weights?

3. Would better steel and increased weights per yard, at even still greater cost, be followed by such saving in other track expenses that it would be true economy to obtain such rails?

The Attitude of Rail Manufacturers.

After saying that, in spite of mistakes and of a disposition to lay the whole burden on the railmaker, conscientious and faithful effort had been made by the railroads to meet the problems of changed conditions, the speaker turned to the record of the manufacturer. Many times rail manufacturers have said in effect: "Our mills are open to you. Here are the rails; take them or leave them." From the nature of the case the producer has essential information which the consumer does not have, and where safety to human life is involved he cannot assume an air of indifference or justly fail to co-operate in every reasonable way to the end that only safe material goes into the tracks. "Within two years entirely reputable engineers of railroad companies have said in my presence that they had been told by rail manufacturers that if they did not take the rails offered, irrespective of specifications and tests, they would not get any. Still further, if I may judge from my own experience, it is only within the past year or perhaps a year and a half that it has been possible to have what might fairly be called a consultation with the experts of the steel railmakers, over any point that involved the quality of the product in a conciliatory, co-operating way."

The New Sections.

The question of section was then considered and details were given of the A and B sections adopted by the American Railway Association and the new P. S. section of the Pennsylvania Railroad. All three have been illustrated and described in these columns. The A section, with its comparatively shallow head, wide base, thin flanges and greater hight than either of the other two, was pronounced undoubtedly the strongest, regarded as a girder. Those who opposed it feared that with such steel as is now possible the pounding of heavy traffic would cause crushing and splitting of the head, owing to internal physical defects in the metal. This led to the designing of section B. The Pennsylvania section is a step still farther away from the A section, having a heavier head, narrower base and thicker flange than the B section, with the same thickness of web. The Pennsylvania Railroad adopted it because it found that more rails fail from crushing and disintegration of the head, apparently due to the pounding of the traffic, than from any other one cause. The three sections meet the criticisms of the steel makers that proper finishing temperatures could not be secured with the sections heretofore in use. It was observed that "it may happen that progress in steel metallurgy will so diminish physical defects in the steel and so minimize the adverse effect of segregation that all three sections will be found worthy of perpetuation."

The Quality of Steel.

Asking the question, "Is the steel that goes into rails to-day better or worse than that made 15 or 20 years ago?" Dr. Dudley said that he was not able to go as far as some critics among railroad engineers who considered that the steel in the rails to-day is nothing like as good as it was 20 or 25 years ago. In two respects, however, he found inferiority: 1, the larger ingots of to-day necessarily lead to increased segregation; 2, the more rapid working of the Bessemer process has led to incomplete action between the final additions and the blown metal and to higher finishing temperatures in the finished rail. He thought, however, that a large percentage of the output of rails of the last 20 years has been approximately as good as that previously made. What he considered certain is that the need of to-day is for a steel even better that than earlier made.

Leave Discard to the Manufacturer.

On the subject of discard the position of the Pennsylvania system and the American Railway Association was spoken of as reasonable, in that they left the discard to the manufacturer and safeguarded the product by proper tests and by choosing the test piece from such a location as would make it to the manufacturer's interest voluntarily to discard the metal which would not stand the test. An illustration from the practice of the Pennsylvania Railroad was cited here:

> When our axle specification was issued the whole question of discard was most carefully considered, and it was finally decided to select one axle at random for test from each heat of steel, after the axles from that heat had all been made up, stamped with the heat number, and put in a pile by themselves, and further if the test axle stood all the tests all the axles made from that heat were accepted, and if not all were rejected. After the specification had been in operation a short time, a manufacturer who had worked with us during the development of the specification, said to me: "There is steel enough in each one of our heats to make 12 axles of the size you are now using. As a matter of fact we only make and offer you for test nine, for if we should make the whole ingot into axles and you should get for test one made from the steel which we now discard, you would condemn the whole heat, quite to our loss." We are firmly of the opinion that the matter of testing rails can be so handled as to give similar satisfactory results.

Methods of Testing.

Passing to the subject of tests and testing Dr. Dudley reviewed the conditions as they have existed. He found much looseness in previous practice. The manufacturers have in many cases selected the rail end as sample for test, and they have taken the best steel in the ingot. There has also been in force the best two in three principle. If the first rail end stood the test the heat was

accepted but if it failed a second was tested. If the second then stood the test a third was tested, and the fate of the heat was decided by the majority. Then steel from only one heat out of five was tested, but as every heat is a law unto itself, this practice gave no reasonable assurance that only good rails were accepted. The wonder is with such loose testing as has been in vogue that there have not been more rail failures. Equal looseness is found in the use of the drop test, particularly in having light weight anvils, and these not rigidly supported. The drop test the speaker considered the only available one for the present for these reasons:

1. It tests the whole rail in the condition in which it goes into the track. [illegible] of the rail, as is requisite in all cases of prepared test pieces.

2. It is sufficiently rapid, so that even though every blow is tested there is no fear of delaying the output of the mills while waiting for test pieces to be prepared or for slower tests to be made. We have known of a case where, with sufficient force to handle the test samples 55 tests have been made in half an hour on a modern drop testing machine.

3. There seems little doubt that some of the strains or shocks which the rail actually receives in track are similar to those produced by the drop testing machine. This is clearly the case with a loose joint and a rapidly moving train. In case the track bolts have become loosened, the end of the rail, when the approaching wheel mounts it, certainly gets a blow similar to that given by the drop testing machine. We have known rails which have given long service in track to be broken in this way, and the fracture showed perfectly clean, sound metal.

4. If the specification requires that the deflection be taken, the drop test reveals a good deal in regard to the physical properties of the steel.

The selection of the test piece should always be made by the inspector, and the bottom end of the top bloom was regarded as the best place from which to take the piece to make sure of sound steel, especially since covers and cooling devices are sometimes used on the top of the ingot when it is cast. For the drop test something a little more severe than the rail will receive in actual service was considered sufficient, though one trouble is that it is not known just how severe the shocks in service are. Recent tests of rails which had broken short off in track seem to indicate that a 15-ft. drop with a 3000-lb. tup and a 20,000-lb. anvil would have rejected two-thirds of the rails which railed in service on the Pennsylvania system; also that the 15-ft. drop acutally broke as many test pieces as a 19-ft. drop, other conditions being the same. "These tests should be much amplified before final conclusions can be reached, but as far as they go they seem to indicate that we must look to other causes than defective or poor steel for a portion of the rail breakages and that extremely severe testing is not necessary."

The Demands of the Situation.

Summing up his views on the present situation, Dr. Dudley said:

1. The crying need of the hour is positive, definite information. Upon dozens of points no positive data exist. During the discussions of the past two years or more, opinions have been as plentiful as leaves in autumn, but of positive, reliable, statistical information, or figures taken from properly kept records, there has been a dearth that was fairly oppressive. The steelmakers have not been as deficient in this respect as the railroad engineers.

2. The time seems opportune for genuine progress to be made. The railroads through their organization, which in a sense speaks for them all, the American Railway Association, have taken hold of the matter with vigor and have developed a large amount of valuable information, and for the first time in my 25 years' study of this subject, the steel rail manufacturers have shown a less antagonistic and more conciliatory and co-operative spirit than has usually characterized them.

3. The specifications proposed by the Pennsylvania Railroad system and by the American Railway Association seem to us to represent genuine progress and to be worthy of most careful study and trial. While they may be said to represent perhaps the best that can be done, until more positive knowledge is obtained, he would be a bold man that would claim that they will ultimately be satisfactory or final.

4. Whether the Bessemer process can be so modified and improved as to enable it to furnish rails that will be entirely satisfactory under the heavier wheel loads and denser traffic of to-day and the near future, or whether the basic open hearth will soon be the source from which steel for these rails will be furnished, are questions worthy of serious attention. Our own feeling is that if a small fraction of the time and money that has been spent in the past over the commercial development of the Bessemer process should in the next few years be spent in getting sound ingots, free from blowholes, slag and manganese sulphide, if this shall be found to be as serious as it now looks, and in overcoming or minimizing segregation, it will last for many years to come.

5. The American Society for Testing Materials has a most important duty to perform at this juncture. By stimulating the development of information, by furnishing an arena for the presentation of such papers on the metallurgy of steel as are on the programme for this meeting, by arousing interest in testing machines and methods of testing, by furnishing a forum where producer and consumer can meet on common ground and discuss their differences unhampered by commercial considerations or by artificial distinctions of professional ethics, and by keeping their own specifications up to date and utilizing new information as fast as it is obtained, it can so fill the field it occupies that when the ultimate record is made up its contribution will be by no means among the least.

The Mechanical Engineers' Convention.

DETROIT, MICH., June 23, 1908.—(*By Telegraph.*)—Detroit, noted for its popularity as a convention city, is likely to maintain its usual record of an average of one convention a day during the convention season. There are eight scheduled for this week, of which four will attract many of the same people—the American Society of Mechanical Engineers, the American Society for the Promotion of Engineering Education, the Society of Automobile Engineers and the Society of Gas Engine Manufacturers. This fact is largely responsible for the unusually large first night registration of members of the American Society of Mechanical Engineers and guests—304.

The opening session was held Tuesday evening at the convention headquarters, the Hotel Cadillac. Mayor Thompson made the address of welcome, which was responded to on behalf of the society by the president, M. L. Holman of St. Louis.

The usual informal reception followed, the principal purpose of which is to help the visitors become acquainted with the members of the local Entertaining Committee. The importance of this is emphasized by the large number of manufacturing and engineering enterprises located in and around this city, only a few of which at the most it will be possible for any individual to visit during his stay. It is therefore to the advantage of each to select early those which particularly interest him.

The local Ladies' Committee has been active in preparing for the visiting ladies, and several trips calculated to make their stay pleasant have been arranged for.

The iron industries in the territory naturally tributary to Nashville, Tenn., are of considerable importance. In this territory are the following furnaces: Napier Furnace, Napier, Lawrence County; Rockdale Furnace, Rockdale, Maury County; Bon Air Coal & Iron Company's furnaces, Mannie, Wayne County; Cumberland Furnace, Dickson County, and Red River Furnace Company's Helen Furnace, Clarksville, Montgomery County. Practically all of these furnaces are running and making an increased output. At a recent date the Napier furnace was relined. The Bon Air Coal & Iron Company is running one of its two furnaces. Important improvements have recently been made at the Rockdale Furnace.

NEWS OF THE WORKS.

Iron and Steel.

At the recent annual meeting of the Burden Iron Company, Troy, N. Y., James A. Burden was elected president; Williams P. Burden, vice-president; John I. Arts, general manager, and Nicholas J. Gable, secretary.

Operations have been resumed in all departments of the steel mill of the Tennessee Coal, Iron & Railroad Company at Ensley, Ala.

The rolling mill of the Tennessee Coal, Iron & Railroad Company at Bessemer, Ala., will be put in operation July 1. Repairs are being made to the company's furnaces, Nos. 2 and 3, at the same place.

General Machinery.

In addition to the erection of four new buildings at its Austin, Minn., plant, the Geo. A. Hormel Packing Company of that city has acquired a site on Michigan street, Duluth, Minn., for the erection of a six-story cold storage plant. Work on this plant may possibly be commenced this fall, but as yet no plans or specifications have been prepared.

The plant of the Kentucky Drill Company at Louisville, Ky., a subsidiary of the American Seeding Machine Company, which was recently destroyed by fire, will not be rebuilt, as the business has been moved to Richmond, Ind., where it has been merged into the plant at that place.

Power Plant Equipment.

The plans of the new power house, recently completed by Charles T. Main, mill engineer and architect, Boston, for the Bigelow Carpet Company, Clinton, Mass., call for brick buildings comprising a power house, 63 x 102 ft.; boiler house, 50 x 197 ft.; coal pocket, 70 x 197 ft., and a pump house, 27 x 48 ft. The equipment will consist of two electrical units, one of about 750 kw. and the other of about 350 kw. Six new 84-in. by 19-ft. boilers are to be added to the eight old boilers of the same size. Two fire pumps and four feed pumps complete the power outfit. Pipe tunnels will connect the boiler house with the dye house, and the power house with the weave mill, the former for steam piping and the latter for electric power cables.

The Board of Aldermen of New York has appropriated $2,580,000 for improvements to the Brooklyn water supply system.

Plans and estimates are being prepared by Burns & McDonnell, Kansas City, Mo., for an electric light and water works system at Moundridge, Kan. When the estimates are received the question of a bond issue for this purpose will be submitted to the voters.

W. F. Lyons, Bryant Building, Kansas City, Mo., will build an ice plant, 160 x 390 ft., in which will be installed machinery with a daily capacity of 100 tons. The plant will cost about $100,000 and the equipment will include one 100-kw. and one 300-kw. generator. C. E. Sample is engineer in charge.

Bonds in the sum of $10,000 have been authorized by the City Council of Miles City, Mont., for the improvement of its electric plant.

Plans are being prepared for a municipal electric light plant at Little Rock, Ark., by J. W. Bleidt, city electrician. The system contemplated, it is estimated, will cost about $40,000, and will generate current for 750 arc lamps. Motive power will be supplied by a 450-hp. steam turbine.

The city of Brainard, Minn., has in contemplation the construction of an electric light and water works system for which plans have been prepared by George Cadogan Morgan, Royal Insurance Building, Chicago. The question of a bond issue to provide the necessary funds for this improvement will be submitted to the voters, and when the bonds are approved and sold the machinery and equipment required will be advertised and let.

Through the sale of bonds a fund of $16,000 has been provided by the city of McKinney, Texas, for water works and electric light improvements. The sum will be equally divided between the two systems.

Dravo, Doyle & Co., Lewis Building, Pittsburgh, have recently received a number of contracts for Erie (Ball) engines and other power appliances as follows: A 20 x 20 in. automatic engine, directly connected to a 200-kw. generator, and an 18 x 18 in. automatic engine, directly connected to a 150-kw. generator, to the Pittsburgh & Belmont Coal Company, Lafferty, Ohio; two 16 x 16 in. automatic engines, each directly connected to 100-kw. generators, Erner-Hopkins Company, Columbus, Ohio, to be installed to furnish power and light for the Ohio & Texas Sugar Company, Brownsville, Texas; an 8 x 28 x 24 in. horizontal, side crank, cross compound, Ball, nonreleasing, valve Corliss engine, Carnegie Technical School, Pittsburgh; two 16 x 18 in. Ball side crank, nonreleasing Corliss valve engines, directly connected to 150-kw. generators, Iron City Improvement Company, to be installed in the new Fort Pitt Hotel Annex. The company also reports steam turbines to be moving in a satisfactory manner, several sales in that line having been made recently. Tiffany & Co., New York, have purchased a complete power plant, consisting of two De La Val Steam Turbine Company's generator sets, including Heine water tube boilers, Cochrane feed water heaters, &c. The Board of Public Service of Sandusky, Ohio, has purchased two 6,000,000-gal. De La Val steam turbine driven pumps to be used in connection with the new filtration plant, recently contracted for by the city of Sandusky. Other sales of De La Val steam turbine and motor driven turbine pumps, Cochran heaters and Cochran live steam and exhaust steam separators are reported.

Foundries.

Chas. A. Lyerly, Chattanooga, Tenn., recently purchased at public auction the Herron Pump & Foundry Company's plant for $27,000. A company will be organized and the plant put in operation at an early date.

For the reconstruction of the Douglas, Wyo., water works system bids will be received until June 30 on approximately 1000 ft. of 4, 6 and 12 in. cast iron pipe and the necessary fittings and material for laying it; seven 12-in.; seven 8-in.; 42 6-in.; 28 4-in. valves and valve boxes; 17 fire hydrants and 13 extra hydrant boxes, 6-in. openings. Funds to the amount of $50,000 have been provided by the sale of bonds to defray the expense of this work.

The American Malleables Company, New York, has not yet definitely decided upon the rebuilding of its plant at Bloomfield, N. J., which was recently destroyed by fire.

T. H. Symington & Co., Corning, N. Y., are having plans prepared for a new manufacturing plant for the production of journal boxes and other railroad specialties, to be erected either at Corning or Elmira. The plant will consist of a foundry, 400 x 700 ft., carpenter and pattern shops.

Bridges and Buildings.

Bids are being taken by the Paxton & Vierling Iron Works, Omaha, Neb., for the construction of an extensive addition to its structural shops. The new building will be 64 x 300 ft., and will greatly increase the capacity of the works. Most of and machinery equipment and tools have been purchased.

The Nashville, Tenn., Bridge Company is erecting a five-story office structure at its manufacturing plant in the eastern part of the city.

Fires.

The plant of the Tamaqua Mfg. Company, Tamaqua, Pa., consisting of foundry and machine shop, was destroyed by fire June 19, the loss being about $100,000.

The Gallipolis Foundry & Machine Company's plant at Gallipolis, Ohio, was recently burned. The loss is placed at $10,000.

The large plant at Shelby, Ohio, of the Shelby Steel Tube Company, a subsidiary of the United States Steel Corporation, was burned June 19, the loss being estimated at over $500,000. The buildings destroyed covered several acres of ground. The fire is thought to have been due to spontaneous combustion.

The plant of the Richmond Stove Company, Richmond, Va., was destroyed by fire June 17, the loss being about $100,000

Hardware.

The Union Steel Screen Company, Ltd., Albion, Mich., manufacturer of oven racks, sand and coal screens, &c., has bought the plant and equipment of the Ideal Mfg. Company, Lafayette, Ind., which will be removed immediately to Albion, where the manufacture of the goods formerly made by the Ideal Company will be continued. The Union Steel Screen Company will thus manufacture a much larger line, including oven racks, refrigerator shelves, wire guards, sand and coal screens, elevator inclosures and novelties.

Miscellaneous.

Edgar M. Moore & Co., Lewis Building, Pittsburgh, Pa., have sold and installed a monorail system, alternating current, 1700 ft. long, of 2 tons capacity, for handling scrap material, and a magnet for the Sligo Iron & Steel Company, South Connellsville, Pa.

The Pennsylvania Steel Pulley Company, N. S., Pittsburgh, Pa., manufacturer of Keystone steel split pulleys, has completed the installation of additional grinding machinery and made other improvements doubling the capacity in several departments. The company is operating its plant and reports inquiries more plentiful and that orders are increasing in number and for large quantities.

An oil mill is to be erected at Snyder, Okla., for the construction of which $100,000 will be expended.

Plans are being prepared by M. F. Sullivan, city engineer, for a water works concrete reservoir at Gulfport, Miss., the construction of which is now under consideration.

The Massachusetts Fan Company, Watertown, Mass., is making a large export shipment of fans to the Sutcliffe Ventilating & Drying Company, Manchester, England. This comprises six three-quarter housed steel plate fans in various sizes, equipped with new frictionless ball bearings.

The entire plant of the Neafie & Levy Shipbuilding Company at Beach and Palmer streets, Philadelphia, Pa., will be sold at public auction July 28. The property comprises a group of buildings covering eight acres, with a frontage of 400 ft. on the Delaware River, which will be sold subject to ground rents of $101.06 per year, and a mortgage of $277,000. A de-

push of Slocum was [illegible] on the day [illegible] the schedule [illegible] confirmation by the United States Court.

PERSONAL.

F. J. Stoffel, treasurer of the S. W. Card Mfg. Company, Mansfield, Mass., has returned from a brief business trip abroad.

Edward Brooke Cook, manager of the Warwick Iron & Steel Company, Pottstown, Pa., has returned from a brief trip to Europe.

J. C. Maben, president of the Sloss-Sheffield Steel & Iron Company, is expected back at an early date from a several months' stay abroad.

Dr. R. W. Raymond, secretary of the American Institute of Mining Engineers; Edgar S. Cook, president of the Warwick Iron & Steel Company, Pottstown, Pa.; T. W. Robinson, vice president of the Illinois Steel Company, and H. A. Brassert, blast furnace manager of the Illinois Steel Company, will sail for Europe with James Gayley on July 1.

W. E. Corey, president of the United States Steel Corporation, is expected back from France toward the middle of July.

At a meeting of the Board of Directors of the Lake Superior Corporation J. Tatnall Lea was elected a vice-president and F. W. Ayer, president of the Merchants' National Bank, a director, both to succeed Francis B. Reeves, who resigned recently.

C. S. Redfield, advertising manager of the Yale & Towne Mfg. Company, and the recently elected president of the Technical Publicity Association, has gone to Europe, expecting to return late in August.

A. K. Church, for the past five years manager of the National Tube Company's American Works at Middletown, Pa., has resigned, effective July 1.

H. E. Miles, president of the Racine-Sattley Company, Racine, Wis., and vice-president of the National Association of Manufacturers, has accepted an invitation to speak at the annual banquet of the American Chamber of Commerce in Paris on July 4. Mr. Miles will speak on the tariff question and reciprocity. In August he will attend, as a delegate from the United States, the International Council to be held at Westminster, London, for the discussion of free trade relations between the countries of the world.

William A. Roome, who has been connected with A. M. Castle & Co. for several years in the capacity of sales agent, and prior to that with the Scully Steel & Iron Company in its sales department, has opened an independent sales agency at 943 Monadnock Block, Chicago, representing manufacturers of boiler and tank plate, iron and steel boiler tubes and boiler and structural rivets.

Having disposed of his interest in the Ajax Forge Company, Chicago, T. A. Griffin, formerly president of the company, has retired and is succeeded as president by Rudolph Ortmann. Mr. Ortmann is also vice-president of the Griffin Wheel Company.

T. F. Salter, well known as an engineer in the field of hoisting and conveying apparatus, is now located in a new position as chief engineer of the Standard Roller Bearing Company, Philadelphia.

Geo. A. Tripp, treasurer of the Iroquois Iron Company, Chicago, sailed June 18 for an absence of about two months in Europe.

W. W. Dean has been elected president of the Dean Electric Company, Elyria, Ohio, to fill the vacancy caused by the recent death of Samuel B. Rawson. A. E. Barker was made first vice-president in place of Mr. Dean, and Max Koehler was made second vice-president and T. M. Brush third vice-president. F. H. Sadro was elected to fill the vacancy on the Board of Directors.

Cass Harkins, for more than 20 years a representative of several prominent machinery concerns in the Columbus, Ohio, District, has been appointed general agent for the States of Ohio and West Virginia for the Goulds Mfg. Company, Seneca Falls, N. Y. He expects to open his Cleveland offices about July 1, and will continue to look after the interests in his new territory of the Atlas Engine Works, Indianapolis, Ind.

Sidney B. Williamson, division engineer in charge of the Miraflores locks and dams on the Panama Canal, who has been visiting the trade for two weeks past to gather necessary information for the construction work there, left New York on Wednesday to resume charge of the work on his division.

OBITUARY.

WILLIAM B. LEEDS.

William B. Leeds, at one time a leading figure in the American tin plate industry, died suddenly at Paris, France, June 23. Born in Indiana in 1861, he began life as a florist in Richmond, that State, and in 1883 he married a relative of Harry Miller, then an official of the Pennsylvania Railroad. Mr. Miller started the young man in the railroad business, and eventually he was made a division superintendent.

About this time Mrs. Leeds inherited a considerable sum of money, which Mr. Leeds utilized in advancing the interests of the tin plate industry. There was in Elwood, Ind., at the time, the first tin plate plant of any importance. Mr. Leeds was quick to recognize the opportunities in this branch of industry presented by the McKinley tariff act, and D. G. Reid, who was also in Richmond, became interested in the promotion of tin plate interests. The two men succeeded from the outset.

In 1898, with the brothers J. H. and W. H. Moore, they formed the great consolidation of tin plate interests, known as the American Tin Plate Company, Mr. Leeds becoming chairman of the Executive Committee and Mr. Reid president. After the formation of the United States Steel Corporation, they sold to it their tin plate interests. Much of the profit was invested forthwith in the Rock Island Railroad system. The four assumed control of the Rock Island at once, and made a holding company of it. Other roads were acquired, until the Rock Island system became what it is to-day. After continuing to be a director of the Rock Island until February 1, 1906, Mr. Leeds resigned from all boards of directors and from all committees associated with the system. He retained, however, his connection with the American Sheet & Tin Plate Company, of which he was a director until his death, and many other financial and industrial companies.

CURTIS S. BARRETT, president of the Dover Fire Brick Company, Cleveland, Ohio, died suddenly of heart failure June 20, aged 68 years. He had been identified with the coal and fire brick industry in Cleveland for nearly 40 years.

PETER H. JACKSON, one of the founders of the James L. Jackson Iron Works, said to be the first firm to make iron and steel work for building purposes in New York City, died June 17, at his home in East Oakland, Cal., aged 79 years. He leaves a daughter and three sons, one of the latter being Francis D. Jackson, vice-president of the Hecla Iron Works, Brooklyn.

In their eagerness to reduce operating expenses, some of the railroads appear to be going pretty far. The statement is made on good authority that on some lines the broken parts of cars in service are replaced by robbing rolling stock sidetracked for want of tonnage. It looks as though there might be a good deal of rush repair work when the crops begin to move and that some lines may find themselves unable to handle traffic in spite of a nominal large reserve of rolling stock.

Mexico is to manufacture its own tin plate, according to a press dispatch from Tampico, which says that a British syndicate has acquired the site for a tin plate and corrugated iron manufacturing plant, and that the Government has granted a favorable concession for the new industry.

The Iron and Metal Trades

There is a slightly more cheerful tone in the Steel industry, due to the fact that bookings in some branches are a little larger, and that specifications are coming in a little more freely. The improvement, however, is not marked, nor is it general.

Quite a fair tonnage of Foundry and Basic Pig Iron has been purchased in New England and on the seaboard, at prices which show no improvement. In the Central West and in the Chicago District buying is rather light, and while the majority of furnaces maintain their firm attitude, there are a few who are still willing to make concessions in order to place metal.

In New England one interest has bought 12,000 tons of Foundry Iron at close prices, while in eastern Pennsylvania sales of Basic Pig aggregating 15,000 tons have been made at $15.25, delivered. One large consolidation which recently placed 10,000 tons of Foundry Iron for Buffalo delivery still has nearly as large a quantity to place for Eastern works, and is buying from hand to mouth in the meantime.

Steel Billets are very dull. There is an inquiry in the market for 16,000 tons of small Billets for a horse shoe company, for delivery at Chicago and in the East, the greater part going to the former district.

The Rail trade continues very quiet, so far as new orders are concerned. American mills secured only 7000 tons out of the large tonnage recently placed by Canadian roads. The Grand Trunk Railroad has not yet allotted its requirements, of which a more considerable share is likely to come to works on this side of the border.

Quite a number of small Structural contracts have been awarded in different parts of the country during the last week. In the aggregate the tonnage is quite fair. The largest single item is 3000 tons of the Hotel Astor extension. The contract for the 10,300 tons of Structural Material for the Educational Building, at Albany, has not yet been let.

There is no truth in the story widely circulated that the Youngstown Sheet & Tube Company has taken a large order for Tubes for the Pacific Coast which will keep the mills busy for a long period. The Tube mills are running at the rate of about 50 per cent. of capacity.

While inquiries for Bars, Hoops, Bands and some lines of Merchant Steel are more numerous, and specifications are more plentiful, the Sheet trade continues in an unsatisfactory condition. The Tin Plate mills are still very busy.

The export trade in Iron and Steel is showing more animation. India and China are buying more liberally and some good business has been done in South Africa lately.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date one week, one month and one year previous.

	June 24, 1908.	June 17, 1908.	May 27, 1908.	Jun. 26, 1907.
PIG IRON, Per Gross Ton:				
Foundry No 2, Standard, Philadelphia	*$16.50*	$16.50	$16.75	$24.50
Foundry No. 2, Southern, Cincinnati	**15.25**	15.25	14.75	24.25
Foundry No. 2, Local, Chicago	**17.50**	17.50	17.25	26.00
Bessemer, Pittsburgh	16.90	16.90	16.90	24.15
Gray Forge, Pittsburgh	14.90	*14.90	14.90	23.15
Lake Superior Charcoal, Chicago	20.00	20.00	20.00	27.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	*25.50*	25.00	28.00	29.50
Forging Billets, Pittsburgh	*27.00*	27.00	30.00	33.00
Open Hearth Billets, Phil.	*26.20*	26.20	29.20	32.50
Wire Rods, Pittsburgh	*33.00*	33.00	35.00	34.50
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	**12.50**	13.00	12.00	18.75
Steel Rails, Melting, Phila.	**13.50**	13.50	13.00	19.00
Iron Rails, Chicago	**15.50**	15.50	15.00	24.50
Iron Rails, Philadelphia	18.00	18.00	18.00	27.50
Car Wheels, Chicago	13.00	13.00	13.00	25.00
Car Wheels, Philadelphia	*13.50*	13.50	14.00	25.00
Heavy Steel Scrap, Pittsburgh	**13.25**	13.25	13.00	18.25
Heavy Steel Scrap, Chicago	**11.50**	12.00	11.00	16.50
Heavy Steel Scrap, Phila.	**13.50**	13.50	13.00	18.25
FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	*1.40*	1.40	1.45	1.83½
Common Iron Bars, Chicago	*1.50*	1.50	1.65	1.78
Common Iron Bars, Pittsburgh	*1.40*	1.40	1.50	1.70
Steel Bars, Tidewater, New York	*1.56*	1.56	1.76	1.86
Steel Bars, Pittsburgh	*1.40*	1.40	1.60	1.60
Tank Plates, Tidewater, New York	*1.76*	1.76	1.86	1.86
Tank Plates, Pittsburgh	*1.60*	1.60	1.70	1.70
Beams, Tidewater, New York	*1.76*	1.76	1.86	1.86
Beams, Pittsburgh	*1.60*	1.60	1.70	1.70
Angles, Tidewater, New York	*1.76*	1.76	1.86	1.86
Angles, Pittsburgh	*1.60*	1.60	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	*1.45*	1.45	1.55	1.90
Skelp, Sheared Steel, Pittsburgh	*1.50*	1.50	1.65	1.90
SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	*1.95*	1.95	2.05	2.00
Cut Nails, Pittsburgh	*1.75*	1.75	1.85	2.05
Barb Wire, Galv., Pittsburgh	*2.30*	2.40	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	**13.00**	13.00	12.87½	22.50
Electrolytic Copper, New York	**12.87½**	12.87½	12.62½	22.00
Spelter, New York	4.55	4.57½	4.55	6.40
Spelter, St. Louis	4.40	4.40	4.40	6.35
Lead, New York	**4.50**	4.50	4.35	5.75
Lead, St. Louis	**4.40**	4.40	4.20	5.62½
Tin, New York	*27.60*	28.00	28.50	43.75
Antimony, Hallett, New York	8.50	8.50	8.50	12.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, June 24, 1908.—*(By Telegraph.)*

The favorable influence of promising crop prospects is the paramount factor of strength underlying present market conditions, and its positive effects are seen in the heavy shipments of agricultural machinery now being made by the manufacturers. These are reported by some of the leading makers to be as great in volume as in any former season. Naturally this movement is reflected in more liberal purchases of material by these interests, which are the first to show an increase in consumption of Pig Iron. Other manufacturers, especially those dependent upon the railroads for business, have not yet felt a pronounced forward impulse, and the demand from this source still lags. Rumors to the effect that the purchasing departments of a number of railroads have instructions to resume purchases on a more liberal scale at an early date are still persistent. While confirmation in the way of an actual increase in orders is yet lacking, it seems highly probable that hopes inspired by these rumors will be in some measure realized in the near future owing to preparations that must of necessity be made for moving the coming crops. Only a few small fabricating contracts were closed last week, the chief of which was one for a bascule bridge requiring 1600 tons. Plates, Sheets, Merchant Pipe and Boiler Tubes are without any developments of interest, there being no improvement in demand since the recent revision of prices. Together with new orders placed since the reduction of prices in Bars and the tonnage due on unspecified contracts, it is believed that the greater part of implement makers' requirements for the new

have not yet begun to come in, and those from other industries are light. The Scrap market has reacted somewhat, and though prices have not materially declined, yet the market is essentially weaker. Forces which have been acting to support it during the past two or three weeks have been withdrawn, and with no improved demand from consumers lower prices are looked for. Only a small part of the mill capacity in this district will be active in July. The Moline, East Chicago and East St. Louis mills of the Republic Iron & Steel Company will be closed for most of that period, as will all those of the Inland Steel Company, except the Sheet department.

Pig Iron.—A fair degree of support is afforded to the Pig Iron market by the considerable number of orders of moderate tonnage still being placed. These are coming largely from the makers of agricultural implements and machinery, there being little demand from the jobbing foundries. An encouraging feature of the situation is the unmistakable increase shown in the melt of the former interests, who are now taking their regular quota of shipments without hesitation. Requests for hold up of deliveries, which are not numerous, come almost wholly from the jobbing foundries. The week's transactions have included several lots of 1000 tons and over, but the majority of orders range from 200 to 500 tons. Northern furnaces secured the greater part of the tonnage placed, which included a fair proportion of Malleable Bessemer. While it is maintained that $17.50, furnace, is being firmly held by the principal sellers of Northern Iron, it is nevertheless true that Valley Iron is being offered below this figure. One sale of a few hundred tons of No. 2 Foundry is reported on the basis of $14.50, Valley furnace, which, however, was not for delivery in this immediate market; $14.35, Valley, which was offered by another seller for a small tonnage, failed of acceptance. It is evident therefore that the minimum price quoted on Northern Iron is not as regularly held as is the case with Southern Iron, which continues firm, at $12, Birmingham. Several of the principal producers of that district are still asking $12.50 for fourth quarter, but no business is being placed on this basis. It is expected that within the next 30 days at least three Northern stacks will be blown in, all of which will start with a fair amount of orders. As to the future strength of the market, something depends upon the prompt acceptance of deliveries against recent contracts, but in view of the conservatism shown in amounts purchased it is believed they are prepared to take care of what they have bought. Altogether the situation in Pig Iron is one in which strength rather than weakness predominates. The following prices are for June delivery, f.o.b. Chicago:

Lake Superior Charcoal	$20.00 to $20.50
Northern Coke Foundry, No. 1	18.00 to 18.50
Northern Coke Foundry, No. 2	17.50 to 18.00
Northern Coke Foundry, No. 3	17.00 to 17.50
Northern Scotch, No. 1	18.50 to 19.00
Southern Coke, No. 1	16.85 to 17.35
Southern Coke, No. 2	16.35 to 16.85
Southern Coke, No. 3	15.85 to 16.35
Southern Coke, No. 4	15.35 to 15.85
Southern Coke, No. 1 Soft	16.85 to 17.35
Southern Coke, No. 2 Soft	16.35 to 16.85
Southern Gray Forge	14.35 to 14.85
Southern Mottled	14.10 to 14.60
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	18.40 to 18.90
Jackson Co. and Kentucky Silvery, 6 %	19.90 to 20.40
Jackson Co. and Kentucky Silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky Silvery, 10 %	22.90 to 23.40

(*By Mail.*)

Billets and Rods.—An inquiry is in the market from a prominent manufacturer of Horseshoes for small Rerolling Billets, asking a price on 16,000 tons, on the greater part of which local delivery is specified, the remainder going to supply an Eastern branch. It is understood that the inquiry has thus far elicited no offers that seem attractive to the buyer, and as far as known the order has not yet been placed. There is nothing doing in Forging Billets, which are quoted at $28.50, base, Chicago. Wire Rods are moving slowly in sympathy with the slack demand for Wire Products. We quote prices as follows: Bessemer, $33; Basic, $34, all at Pittsburgh.

Rails and Track Supplies.—Last week's market brought out nothing of interest either in orders or inquiries on Standard Section Rails. The only sale of any kind reported as made during the week was about 200 tons of high T-Rails by the Pennsylvania Steel Company. A moderate run of orders for Light Rails is being entered, the bookings of the principal interest being at the rate of about 2500 tons per month. New business in Track Supplies from the railroads is still closely restricted, and not much change in this respect is looked for until after the close of the present month. Regular quotations on Light Rails continue to be shaded from $3 to $4, and even more in competition with rerolling mills. We quote, as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.50c.; car lots, 1.60c.; Spikes, 1.80c. to 1.90c., according to delivery; Track Bolts, 2.20c. to 2.25c., base, Square Nuts, and 2.35c. to 2.40c., base, Hexagonal Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—The few fabricating contracts closed last week were principally of small tonnage, the aggregate of which was even less than that of the week previous. The chief transactions comprised 500 tons for the South Side car barns of the Chicago City Railway Company, taken by the Hansell-Elcock Company, Chicago; 140 tons placed by the Central Colorado Power Company with the Springfield Boiler & Mfg. Company, and 125 tons for a converter building for the Bakaklala Consolidated Copper Company, which was awarded to the Minneapolis Steel & Machinery Company. The King Bridge Company, Cleveland, was the lowest bidder on the 1600 tons of material required for the Erie street bascule bridge, Chicago; its bid of $126,800 was $7098 lower than the highest of the remaining six bidders. No inquiries of notable size are included among those recently received, and there is still a pronounced disposition among builders to hold off. Specifications are accumulating very slowely at the mills, the Structural mill at the South Works not having enough to warrant starting up. Prices from store at 1.95c. to 2c. Mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.78c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.78c.; larger than 6 in. on one or both legs, 1.88c.; Beams, larger than 6 in. on one or both legs, 1.88c.; Beams, larger than 15 in., 1.88c.; Zees, 3 in. and over, 1.78c.; Tees, 3 in. and over, 1.83c., in addition to the usual extras.

Plates.—Plate orders are extremely scarce. This is especially true of Sheared Plates for boiler, tank and car work. The demand for Universal Plates is relatively better, but the fact that local mills, both Sheared and Universal, have been shut down for some weeks for lack of specifications is plainly indicative of the situation. However, enough specifications have come in in the meantime to warrant starting up, and it is expected the mills at the South Works will begin operation next Monday. We quote mill shipments as follows: Tank Plates, ¼-in. and heavier, wider than 6¾ and up to 100 in. wide, inclusive, car lots, Chicago, 1.78c.; 3-16 in., 1.88c.; Nos. 7 and 8 gauge, 1.93c.; No. 9, 2.03c.; Flange quality, in widths up to 100 in., 1.88c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.88c.; Flange quality, 1.98c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72-in. wide, 2c. to 2.10c.; from 72 to 96 in. wide, 2.10c. to 2.20c.; 3-16 in. up to 60 in. wide, 2.10c. to 2.25c.; 72 in. wide, 2.30c. to 2.40c.; No. 8, up to 60 in. wide, 2.10c. to 2.15c.; Flange and Head quality, 0.25c. extra.

Sheets.—The general volume of business has, if anything, diminished somewhat in the past two weeks. The demand for the heavier gauges is extremely light, and while a somewhat better business for the thinner sizes is noted it is only moderate there. Prices are reported to be firmly held, except for concessions of $1 a ton made by a few small mills. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 and 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—Specifications have been coming out a little better in the past week or so, but the principal makers of Steel Bars have not added much tonnage to their first bookings under the new price. There are still some contracts from implement makers pending which when closed will add around 15,000 tons to the total already placed by these interests. The volume of new Bar Iron orders is a little greater and specifications are better, in consequence of which mills are running fuller. There will not be many Bar mills in operation in this district in July, but the Interstate Iron & Steel Company expects to keep its East Chicago plant running through that month. Quotations, Chicago, are as follows: Steel Bars, 1.58c., with half extras; Iron Bars, 1.50c.; Hoops, No. 13 and lighter, 1.98c., full extra Hoop card; Bands, No. 12 gauge and heavier, 1.58c., half extra Steel Bar card; Soft Steel Angles and Shapes, 1.68c., half extras. Store prices are as follows: Bar Iron, 2c. to 2.15c.; Steel Bars, 1.90c. to 2c.; Steel Bands, 1.90c., as per Bar card, half extras; Soft Steel Hoops, 2.25c. to 2.35c., full extras.

Merchant Pipe.—Jobbers are not specifying any more freely now than before the recent reduction in prices. They are seemingly holding their orders closely within the range of actual consumption, and are apparently not yet willing to anticipate future requirements. The following mill dis-

counts are quoted: Black Pipe, ¾ to 6 in., 73.2; 7 to 12 in., 70.2; Galvanized, ¾ to 6 in., 63.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 73 per cent. on Black Steel Pipe, ¾ to 6 in. About three points above these prices is asked for Iron Pipe.

Boiler Tubes.—Both jobbers and manufacturers are ordering for only actual needs, which as yet in Merchant Tubes show no signs of expansion. Railroads have not yet commenced buying Locomotive Tubes, although it is believed some improvement in orders from this source will be seen in the near future. Prices continue unchanged. Mill quotations for future delivery, on the base sizes, are as follows: 2¾ to 5 in., in carload lots. Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1¼ in.	55	35	35
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2¾ to 5 in.	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—Quite a number of contracts have been entered the past week from implement makers, but specifications are offered sparingly. Some betterment in this respect is noted among the jobbers whose sorting up orders have been more liberal under the new scale of prices. Shafting orders of any considerable size are quite infrequent, the demand being generally inactive. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.78c.; Iron Finish up to 1½ x ½ in., 1.73c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.58c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.08c., and 1⅛ in. and larger, 1.98c.; Smooth Finished Machinery Steel, 2.08c.; Flat Sleigh Shoe, 1.63c.; Concave and Convex Sleigh Shoe, 1.83c.; Cutter Shoe, 2.05c.; Toe Calk Steel, 2.13c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 56 per cent. off in car lots; 52 per cent. in less than car lots, base territory delivery.

Cast Iron Pipe.—A few small lettings have been closed and a fair number of miscellaneous orders have been entered, but the aggregate tonnage of all is diminished. There are, moreover, no large requirements from municipalities or other sources reported, though prospectively the situation is not without features of encouragement. The continued firmness of Pig Iron at its present level furnishes an element of strength to the market, and is believed to be responsible for a number of inquiries that have been received respecting forward requirements. We quote, nominally, per net ton, Chicago, as follows: Water Pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25; with $1 extra for Gas Pipe.

Metals.—Only a moderate amount of business has developed, the greater part of which is comprised of small orders for present consumption. There has not been enough improvement in the industrial situation as yet to make consumers anxious regarding prospective requirements. Prices continue practically stationary in all Metals, with no significant movement in any of them. We quote as follows: Casting Copper, 13¼c.; Lake, 13½c. to 13¾c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 32c.; small lots, 32½c.; Lead, Desilverized, 4.60c. to 4.65c., for 50-ton lots; Corroding, 4.95c. to 5.05c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 10½c., and other grades, 9¾c. to 10¼c.; Sheet Zinc is $7, list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 10⅝c.; Copper Clips, 11c.; Red Brass, 11½c.; Yellow Brass, 9¾c.; Light Brass, 6½c.; Lead Pipe, 4c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 24c.; Block Tin Pipe, 27c.

Old Material.—The temporary rise in values of Old Material has, apparently, reached its limit and signs of reaction are not wanting. Most of the strength developed was due to a spurt of activity in Rerolling Steel Rails, other grades being only sympathetically affected. That this demand has subsided is evident from the meager sales of the week, which have included no important lots of Steel Rails or other material. The effective support of dealers, who have recently been buying to cover short sales and also speculatively, has to a large extent been withdrawn. Neither the mills nor melters are now in the market for tonnage other than that needed for immediate consumption. Under the circumstances, therefore, the necessary sustaining influences are withdrawn and the tendency is toward further weakness, although prices have actually receded on but few grades. Not much material is being offered by the railroads, there being no lists reported in the market this week. We quote, per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$15.50 to $16.00
Old Steel Rails, rerolling	14.25 to 14.75
Old Steel Rails, less than 3 ft.	12.50 to 13.00
Relaying Rails, standard sections, subject to inspection	19.00 to 20.00
Old Car Wheels	13.00 to 13.50
Heavy Melting Steel Scrap	11.50 to 12.00
Frogs, Switches and Guards, cut apart	12.25 to 12.75
Mixed Steel	9.50 to 10.00

The following quotations are per net ton:

Iron Fish Plates	$14.25 to $14.75
Iron Car Axles	16.50 to 17.00
Steel Car Axles	15.25 to 15.75
No. 1 Railroad Wrought	12.00 to 12.50
No. 2 Railroad Wrought	11.00 to 11.50
Railway Springs	11.75 to 12.25
Locomotive Tires, smooth	12.75 to 13.25
No. 1 Dealers' Forge	9.50 to 10.00
Mixed Busheling	7.00 to 7.50
Iron Axle Turnings	5.75 to 6.25
Soft Steel Axle Turnings	5.75 to 6.25
Machine Shop Turnings	5.50 to 6.00
Cast Borings	5.00 to 5.50
Mixed Borings, &c.	5.00 to 5.50
No. 1 Mill	6.50 to 7.00
No. 2 Mill	5.50 to 6.00
No. 1 Boilers, cut to Sheets and Rings	8.25 to 8.75
No. 1 Cast Scrap	12.25 to 12.75
Stove Plate and Light Cast Scrap	10.25 to 10.75
Railroad Malleable	11.25 to 11.75
Agricultural Malleable	10.25 to 10.75
Pipes and Flues	8.50 to 9.00

Philadelphia.

PHILADELPHIA, PA., June 23, 1908.

The situation is regarded by manufacturers of Pig Iron and of some lines of finished material as more encouraging. At the meeting of the Eastern Pig Iron Association last week reports showed the tonnage of orders booked during the month to have increased on an average of 50 per cent. over that of the previous month, while the average decrease in stocks on the furnace banks is reported as being between 20 and 25 per cent. The volume of business coming out was considered good under the circumstances, and represented very fairly about the present rate of production, and with a few was somewhat in excess of the output. In some lines of finished material, principally Plates and Sheets, makers report an improvement in the tonnage of orders booked. This comes mostly from the small buyers, the larger propositions being withheld in nearly all lines, buyers not being satisfied as yet that prices are at rock bottom. Taken all in all, the amount that has come out since the reduction in prices has not been large, the opinion being that the cut was not sharp enough to cause consumers to enter the market extensively, nor to encourage the undertaking of new propositions, particularly at a time when the political situation is looming up conspicuously.

Pig Iron.—While the larger proportion of sales of Foundry Iron have been made up of small and medium sized tonnages, there have been some few sales of large lots, and the aggregate sold during the week reaches a very fair total. As a rule stocks in foundry yards are not large and melters are coming into the market more frequently and for somewhat better quantities. There is a strong disposition to buy for forward delivery, but this is discouraged by nearly all the producers, who much prefer to do business for the third quarter only. For delivery in this territory in the last quarter the majority of sellers ask and have made sales at an advance of 50c. a ton over the price for third quarter delivery. For New England delivery there still seems to be a disposition to shade quotations, and a sale of 2500 tons of No. 2X Foundry for delivery the last half of the year is reported, at a price equal to $16.50 here. In this territory, however, where buying is more conservative no shading is reported. Eastern furnaces refusing to go below a basis of $16 at furnace for No. 2X Iron. Sales of both No. 2X and No. 2 Plain are freely reported, tonnages running from 50 to 500, with an occasional 1000-ton lot, mostly for third quarter shipment. Prices on these grades are pretty firm. Standard No. 2X selling at $16.50 to $16.75, delivered, with No. 2 Plain at $16 to $16.25, delivered. A few off grade Irons are still available at a slight concession from these figures. There has been a little more business in Southern Iron. Some moderate quantities of No. 2 Iron have been sold on the basis of $12, Birmingham, and while it is reported that this figure would be shaded by one interest, for prompt shipment, no business is reported at lower figures. The pipe makers are in the market for some fair blocks of low grade Southern Iron, but as yet sellers have not met their views regarding price. Virginia Irons have been a little more active; while some tonnage has been placed in this territory, the bulk of the business has been for Western delivery. Prices of these Irons are firm, and $17, delivered, appears to be the best that can be done for prompt No. 2X Iron. Some of the Steel makers have been in the market for Basic Iron and sales aggregating about 15,000 tons have been made at about $15.25, delivered, shipment to extend over the last half of the year. Low Phosphorus Iron has been quiet, no sales having been recently reported. The inactivity of the Bar Iron mills has kept them out of the market for any considerable quantity of Forge Iron. Some inquiries are now reported, but buyers want lower prices, which sellers are not inclined to concede. Small sales have been made at $15 to $15.25, delivered, while larger lots have been sold by some furnaces to the Pipe foundries at $15 and slightly less, for delivery in this vicinity. The market shows a somewhat stronger appearance. Furnaces that some weeks ago were willing either to make or meet concessions in price are not

so strongly inclined to do so at the time, and it is believed that with a somewhat further reduction in stocks this will [illegible] in the price of Ore. Ore has had no effect on the market, the decline some time ago in the price of Pig having fully discounted the reduction made. Prices are practically stationary. While there is no material change in quotations for delivery in the third quarter, for strictly fourth quarter shipment an advance of 50c. a ton is asked by the large majority of sellers. For delivery in buyers' yards, eastern Pennsylvania and adjoining territory the third quarter of the year, quotations range as follows:

[illegible]	$16.50 to $16.75
[illegible]	16.00 to 16.25
[illegible]	15.50 to 15.75
Virginia, No. 2 Plain	16.50 to 16.75
[illegible]	15.00 to 15.50
Basic	15.25 to 15.50
Low Phosphorus	21.00 to 21.25

Ferromanganese.—But one sale was reported and that a single carload at $45, Baltimore. There is little inquiry, and what there was has been confined to small lots. Prices are unchanged, $45 to $46, Baltimore, being quoted for early deliveries.

Steel.—The demand has been light. Some small tonnages have been placed for prompt delivery, but no business of any size has come out. The Ivy Rock plant of the Alan Wood Iron & Steel Company closed down this week for general repairs. The furnaces went out a week ago and the blooming mill was shut down this week. The plant will be idle two or three weeks. Prices of Billets are unchanged. For delivery in this territory ordinary Rolling Steel is quoted at $26.20, with Forging Steel at $28.20, subject to the usual extras for high carbons and special sizes.

Plates.—A little more business has been coming out. Small buyers are reported in some instances to be doubling their orders, and this branch of the trade therefore shows improvement. There is more railroad bridge and boat business around, but buyers still hesitate when it comes to placing any large orders, preferring to wait until they are fully satisfied that there will be no further recession in prices. Quotations are firmly maintained and range as follows for deliveries in this territory.

	Carload. Cents.	Parts carload. Cents.
[illegible]	1.75	1.80
Flange or Boiler Steel	1.85	1.95
Commercial Firebox	1.95	2.00
Marine	2.15	2.20
[illegible]	2.25	2.30
[illegible]		The following Extras per 100 lbs. are to be added to the above base:
[illegible]		.35
No. 9, B. W. G.		.25
Plates over 100 to 110 in.		.05
Plates over 110 to 115 in.		.10
Plates over 115 to 120 in.		.15
Plates over 120 to 125 in.		.25
Plates over 125 to 130 in.		.50
Plates over 130 in.		1.00

Structural Material.—No particular increase in the volume of business is yet to be noted. There is considerable figuring being done, and it is expected that a fair volume of business will ultimately result. The Pennsylvania Steel Company is understood to have booked an order for some terminal work in New York City, requiring some 1500 tons of Structural Steel. The Lehigh Valley has placed an order for a small bridge with the American Bridge Company, but the bulk of the business placed has been of a small and miscellaneous character. Quotations for delivery in this territory range from 1.75c. to 1.90c., according to specification.

Sheets.—The demand for Sheets, while largely of a day to day character, aggregates a fair tonnage, and the leading mills are running on full time. Buyers, however, are not anticipating their requirements, orders as a rule being for prompt delivery and individually small. Prices are unchanged, and for mill shipment range as follows, with a tenth extra for small lots: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—No increase is to be noted in the demand for Iron Bars. The recent meeting of the Bar Iron Association resulted in the fixing of no definite price, although a base of 1.35c., Pittsburgh, was generally spoken of. This would be equal to 1.50c., delivered, in this territory, but Refined Iron Bars can be pretty freely had at from 1.40c. to 1.45c. The business coming out even at this price is small, and mills continue to operate irregularly. Steel Bars have not been active, and are quoted at 1.55c., delivered, with Rerolled Bars at 1.50c.

Coke.—Somewhat better sales of Foundry Coke are reported, but there is little demand for Furnace Coke. Contracts covering the last half of the year have been made for moderate tonnages of Foundry Coke, at $2.25, at oven, and while some brands can be had for less, others refuse to do business except at higher figures. Foundry Coke is quoted at $2.15 to $2.35, at oven, with Furnace Coke at $1.50 to $1.75. For deliveries in this territory the following range of prices is quoted:

[illegible]	$2.75 to $3.00
[illegible]	4.30 to 4.50
Mountain Furnace Coke	3.25 to 3.50
[illegible]	3.90 to 4.10

Old Material.—The market shows little activity. Transactions have been confined to small lots, no disposition being shown by the mills to buy in any large quantity, and most of the sales made have been in odd lots. Quotations are practically unchanged, except No. 2 Light Iron, for which dealers refuse to pay over $7.50 to $8, the mills in this district being apparently out of the market for this material. Quotations are largely nominal, and range about as follows, for prompt deliveries in buyers' yards, eastern Pennsylvania and nearby:

[illegible]	$13.50 to $14.00
Low Phosphorus	18.00 to 18.50
[illegible]	18.00 to 18.50
Old Iron Axles	20.00 to 21.00
Old Iron Rails	18.00 to 18.50
Old Car Wheels	13.50 to 14.00
Choice No. 1 R. R. Wrought	15.50 to 16.00
Machinery Cast	14.00 to 14.50
Railroad Malleable	11.75 to 12.25
Wrought Iron Pipe	12.00 to 12.50
New Bundled Sheets	12.00 to 12.50
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	7.50 to 8.00
Wrought Turnings	9.50 to 10.00
Stove Plate	11.00 to 11.50
Cast Borings	9.00 to 9.50
Grate Bars	11.75 to 12.25

Pittsburgh.

PARK BUILDING, June 24, 1908. (By Telegraph.)

Pig Iron.—The Pig Iron market seems to be as quiet as at any time this year. June and July, however, are always dull months, when consumers usually take in as little as possible, and this is the condition just now. Inquiries are only for small lots, for current needs, and while several of the large consumers would probably buy Iron for last half the prices they offer are much below the views of the furnaces. The United Iron & Steel Company started its Fannie Furnace at West Middlesex on Tuesday, and its Cherry Valley furnace at Leetonia is also in operation. We quote Sand Cast Bessemer Iron at $16 to $16.25; Basic, $15.25 to $15.50, the latter price for fourth quarter; Malleable Bessemer, $15.25 to $15.50; No. 2 Foundry, $15, and Forge, $14 to $14.10, all f.o.b. Valley furnace, the freight rate to Pittsburgh being 90c. a ton. We note a sale of 300 tons of Bessemer for prompt delivery to a Wheeling interest on the basis of $16, Valley furnace; 1000 tons of Basic to a local consumer at $15.30, Valley furnace; 1000 tons of Forge to a local consumer at $14, Valley furnace, or $14.90, Pittsburgh.

Steel.—No new buying is reported in Billets or Sheet Bars, and specifications against old contracts for the latter have fallen off, but on Tin Bars a fair amount of tonnage is being shipped out by the mills. We quote Bessemer and Open Hearth Billets, 3½ in. and larger, up to and including 0.25 carbon, $25; 0.26 to 0.60 carbon, $1 extra; over 0.60 carbon, $2 extra, all f.o.b. Pittsburgh. For Wheeling, Martins Ferry, Follansbee, Newcastle, Sharon, Steubenville and Washington (Pa.) delivery, half the freight or 50c. additional is charged. Sheet and Tin Bars in random lengths are $27, f.o.b. Pittsburgh. Forging Billets take $2 advance over Rolling Billets.

[illegible]

The Steel trade is showing signs of betterment in some directions, while in others the outlook is not so promising as desired. There is undoubtedly more business being placed in some lines, but there has been a falling off in others. The market is surprisingly firm in prices on the limited trade doing, and predictions of a wide open market after the recent reductions in prices were announced are not being verified. June and July are usually the dullest months in the year in the Steel business. A large number of plants will be closed down on June 30 for the customary stock taking and annual repairs, and for this reason shipments this month are likely to show an increase over May, as the large trade is anxious to get in as much material as possible before the shutdown takes place. The Pig Iron market is quiet, but there has been no decline in prices following the recent reduction of 50c. a ton on Ore. Consumers are buying cautiously. While there is a fair amount of inquiry the actual tonnage being sold is limited and is only for current needs. Several large consumers are willing to buy for the rest of the year, but the prices they offer are below the views of the furnace people, and their offers are usually turned down. The reduction in Billets and Sheet and Tin Bars has not brought an increased new business, nor was this expected. Most large consumers of Steel are covered by special contracts, which are not affected by the recent reduction, and they are not taking in any more Steel than before. Prices of Bessemer and Open Hearth Billets to these concerns for June shipment will be about $24 or less, so that these consumers are still getting their Steel below the official price, which is $25, Pittsburgh, plus half the freight rate to destination. The demand for Finished Iron

business is being taken by the mills, Tin Plate, Pipe and Fence Wire being the most active articles on the list. Later information about the tonnage in Steel Bars taken by the mills after the recent reduction of $4 a ton was made indicates that the first estimate, which was 250,000 tons, was too low. We are reliably informed that all of 400,000 tons of Steel Bars have been placed, of which at least 300,000 tons was new business, and about 100,000 tons comes from extensions on old contracts. We can state that reports that Steel Bars rolled from Billets have been sold in the Chicago market at prices ranging from 1.20c. up to 1.30c. are absolutely untrue. A limited tonnage in Steel Bars rolled from Old Steel Rails has been sold in the Chicago District at low prices, but the mills making such Bars can only furnish a limited range of sizes and shapes, and they are not desirable, except for certain kinds of work. The actual price of Steel Bars is 1.40c., Pittsburgh, the full freight rate of 18c. to Chicago being charged.

Ferromanganese.—No sales have been made, and inquiries are light. We quote 80 per cent. foreign Ferro at $44, seaboard, for third quarter, and about $45, for fourth quarter, the freight rate to Pittsburgh being $1.95 a ton.

Ferrosilicon.—The recent advance in prices is being maintained, and we continue to quote 50 per cent. at $70, Pittsburgh, but do not hear of any sales.

Muck Bar.—The market is stagnant, and prices are merely nominal. Best grades of Muck Bar, made from all Pig Iron, are quoted at $26, Pittsburgh, but if any business was offering probably a lower price would be made.

Rods.—Little inquiry is coming out, and practically nothing is being sold. We quote Bessemer Rods at $33, Basic at $34, and Chain Rods at $33, f.o.b. Pittsburgh.

Skelp.—The mills will close down June 30, for inventory and repairs. Prices are largely nominal, in the absence of business, and we quote: Grooved Steel Skelp, 1.45c. to 1.50c.; Sheared Steel Skelp, 1.50c. to 1.60c.; Grooved Iron Skelp, 1.60c. to 1.70c., and Sheared Iron Skelp, 1.70c. to 1.75c., f.o.b. Pittsburgh.

Steel Rails.—The Carnegie Steel Company has received specifications from the Erie Railroad on an old contract for about 7500 tons of Standard Sections, and has sold about 2000 tons of Light Rails, made up of domestic and export orders. The demand for Light Rails has been fairly good this month, that company having booked upward of 5000 tons. Its No. 3 mill, at Edgar Thomson, which has been closed for some time for lack of orders, will likely resume within 10 days or two weeks. Nos. 1 and 2 mills, which roll Standard Sections, are still in operation to about 35 or 40 per cent. of capacity. The reported inquiry from Russia for 1,000,000 tons of Rails to be used in double tracking the Manchurian Railroad never had any basis in fact. The Steel works in Russia that roll Rails have been putting themselves in shape for some time to take care of any home demand that may come up. Regular quotations on Light Rails, which are shaded $4 to $5 a ton to meet competition of mills that reroll Rails, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—New business in Plates is still confined to small lots for current needs. The recent reduction to 1.60c. on Plates does not represent the bottom of the market, as a few mills are shading this price from $1 to $1.50 a ton. Regular prices are as follows: Tank Plates, ¾-in. thick, 6¼ in. up to 100 in. wide, 1.60c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell grade of Steel is abandoned.

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—The only local work of moment in sight comprises the Horne Building, about 2500 tons, and the First National Bank Building, about 1000 tons, but neither of these jobs has been placed. The Structural mills are operating at present to about 40 to 50 per cent. of capacity. We quote: Beams and Channels, up to 15 in., 1.60c.; over 15 in., 1.70c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.60c.; 8 x 8 and 7 x 3½ in., 1.70c.; Zees, 3 in. and larger, 1.60c.; Tees, 3 in. and larger, 1.65c.; Bulb Angles and Deck Beams, 1.90c. Under the Steel Bar card, Angles, Channels and Tees under 3 in. are 1.50c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—As far as new demand is concerned, the Sheet trade is in rather unsatisfactory condition, but we are advised that prices, as reaffirmed at the recent meeting in this city, are being fairly well maintained. The American Sheet & Tin Plate Company is operating about 40 per cent. of its Sheet capacity, and the outside mills are doing about equally as well. Regular prices are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—Not much new business is being placed, but the Tin Plate mills have a fair amount booked for forward delivery. The American Sheet & Tin Plate Company and the leading independent Tin Plate mills are able to operate to nearly full capacity. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Hoops and Bands.—Contracts have been adjusted to meet the lower prices, and a fair amount of tonnage is being specified for against these contracts, but practically no new business is being placed. Regular prices are as follows: Steel Hoops, 1.80c., base, full Hoop card prices; Steel Bands, 1.40c., base, half Steel card extra, all f.o.b. cars, Pittsburgh, in carload lots, for delivery during 1908.

Iron and Steel Bars.—As noted above, it is now stated that the actual amount of business in new orders and in extensions to old contracts placed in Steel Bars will aggregate fully 400,000 tons. One leading Steel Bar interest has booked close to 150,000 tons, another has taken about the same and fully 100,000 tons have been divided up between the smaller Steel Bar interests. The price of 1.40c., Pittsburgh, on Steel Bars is being maintained in spite of reports of sales as low as 1.20c., in the Chicago District. That price was made on Steel Bars rolled from old Rails, which never command as high a price as Bars rolled from Billets. The price of Steel Bars rolled from Old Steel Rails is now 1.35c., Chicago, and this is being maintained. A limited business in Iron Bars is being placed, some former consumers of Iron Bars having gone over to Steel Bars owing to the slight difference in prices in the two grades. We quote Iron Bars at 1.40c., base, for Pittsburgh delivery, and 1.35c., base, for Western points, to which freight is added, except Chicago, the price for which is 1.50c., delivered. We quote Steel Bars at 1.40c., Pittsburgh, for base sizes.

Merchant Steel.—Inquiries are more numerous, and the amount of business being placed is probably larger, but has not increased to the extent expected when the recent reduction in prices was made. The most active article is Tire Steel, for which some fair sized orders have recently been booked. The demand for Shafting is very dull, and is confined to scattering orders for small lots for current needs. We quote: Cold Rolled Shafting, on contracts for 100 tons and over, 57 per cent. off; carloads, 56 per cent. off, and less than carloads, 52 per cent. off, on which carload freight is allowed within base territory. Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 1.90c. to 1.95c.; Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron, finished, 1½ in. and wider, 1.40c.; under 1½ in., 1.55c. Planished Tire Steel is 1.60c., all f.o.b. at mill.

Railroad Spikes.—Railroad Spike orders taken this year make a sorry showing as compared with the first half of last year. The railroads are not buying and the demand is almost stagnant. The demand for the smaller sizes is mostly for current needs. We quote: Standard sizes, 4½ x 9-16 in., at $1.70, and the smaller sizes at $1.80 per 100 lb. in carload and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Spelter.—It is said that consumption is much below one-half what it should be, and the market is weak. We quote prime grades of Western Spelter at about 4.30c., East St. Louis, equal to 4.42½c., Pittsburgh. If any business was offering, possibly 4.25c., St. Louis, could be done.

Merchant Pipe.—Reports that the Youngstown Sheet & Tube Company had taken large orders for line Pipe for shipment to the Pacific Coast, which would keep its Pipe mills in full operation for the next 12 months, are absolutely untrue, and have caused some annoyance to that company. A moderate amount of business is being placed, jobbers buy-

ing to replenish broken stocks when necessary, but there is no disposition to anticipate future requirements. In a general way, the Pipe mills are operating to probably 50 per cent. of capacity and the actual new orders entered each month show a slight increase over the previous month. Discounts on Steel Pipe, ¾ to 6-in., to the large trade are now 76 and 5 per cent. Regular discounts are as follows:

Steel Pipe.

	Jobbers, carloads. Steel. Black.	Galv.
¼ to ⅜ in.	67	51
½ in.	69	55
¾ in.	71	59
¾ to 6 in.	75	65
7 to 12 in.	72	57
Extra strong, plain ends:		
¼ to ⅜ in.	60	48
½ to ⅝ in.	61	55
4½ to 8 in.	63	51
Double extra strong, plain ends:		
½ to 8 in.	56	45

Discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
¼ to ⅜ in.	65	
½ in.	67	55
¾ in.	69	57
¾ to 6 in.	73	63
7 to 12 in.	70	55
Extra strong, plain ends:		
¼ to ⅜ in.	58	46
½ to 4 in.	65	53
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

Boiler Tubes.—Only small lots for current needs are being placed, and prices are more or less uneven. The railroads are buying practically no Tubes. Regular discounts on Merchant Tubes in small lots, on which an extra 5 per cent. is allowed in carloads, but which discounts are being shaded, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in.	42	47
1¾ to 2¼ in.	42	59
2½ in.	47	61
2¾ to 3 in.	52	65
6 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Iron and Steel Scrap.—Some inquiry is in the market for Low Phosphorus Scrap, and negotiations involving 4000 to 5000 tons are under way. The market on this grade of Scrap has improved materially recently, and it is now held as high as $18.50, Pittsburgh, if the Phosphorus and Sulphur are guaranteed 0.04, or under. The general demand for Scrap is quiet, which is natural in view of the shutdown of a number of mills on June 30 for annual inventory and repairs. In spite of the rather light demand, prices are fairly strong, and it is believed will be better early in July, when an increased demand is expected. We quote per gross ton. Heavy Steel Scrap, Pittsburgh, Steubenville and Sharon delivery, $13.25 to $13.50; Cast Iron Borings, $7 to $7.25; No. 1 Railroad Wrought Scrap, $13.50 to $13.75; No. 1 Cast, $14 to $14.25; Bundled Sheet Scrap, $9.25 to $9.50 at shipping point; Sheet Bar Crop Ends, $17.25 to $17.50; No. 1 Busheling Scrap, $12.75 to $13; No. 2, $8.75 to $9; Iron Axles, $19 to $19.50; Steel Axles, $17.50 to $18; Low Phosphorus Melting Stock, 0.04 and under, $18; Old Steel Rails, short pieces for melting purposes, $13.25 to $13.50; Rerolling Rails, $14.50 to $15; Machine Shop Turnings, $8.25 to $8.50; Grate Bars, $12 to $12.25; Railroad Malleable Scrap, $11.50 to $12, all f.o.b. Pittsburgh.

Coke.—We can report a slight increase in the demand for Furnace Coke, and more ovens in the Connellsville region have been put in operation. The W. J. Rainey Coke Company will start this and next week upward of 1000 ovens, and the Washington Coal & Coke Company has started up 150 more ovens. Prices on Furnace Coke are firmer, and strictly Connellsville for prompt shipment is held at $1.60 a ton, at oven, while on contracts for last half of the year $1.85 to $1.90 is quoted. Strictly Connellsville Foundry Coke for second half of the year delivery is held at $2.25, at oven, but other grades made outside of the Connellsville region are being offered at $2 or lower. The output of Coke in the Upper and Lower Connellsville regions last week was 102,947 tons, an increase over the previous week of about 7000 tons.

The Continental Steel & Supply Company, 409 Fulton Building, Pittsburgh, was recently formed by Ira E. Bixler and C. T. Heron. Mr. Bixler is president of the Bixler Coal & Coke Company, which has adjoining offices. Mr. Heron was formerly with the purchasing department of the Westinghouse Machine Company. The new company will represent the J. D. Smith Foundry Supply Company, Cleveland, on foundry supplies and the McGinness Steel Company, Corry, Pa., on Tool Steel, and will also do a business in Cement Coated Nails, Sheets, Iron Bars, &c.

Cleveland.

CLEVELAND, OHIO, June 23, 1908.

Iron Ore.—Sales are still light, the reduction in price not having started an active buying movement. Sales reported the past week aggregate in the neighborhood of 600,000 tons. Prices remain firm at the new basis, and it is believed that they will be maintained for the season. The long time contracts of a number of consumers expire this year and these consumers, who have been getting their Ore at lower prices than those now prevailing will be compelled to come into the market and buy at the present prices. The majority of these long time contracts were made for 10 years. Some chartering of vessel tonnage has been done at 5c. a ton under last year's rate. This fixes the present rate, although it is possible that it will not keep up all the season. The rate per ton as it now stands is 70c. from the head of the lakes, 65c. from Marquette and 55c. from Escanaba. All the Ore firms that operate their own boats now have some of their vessels in commission, but the movement is still light and, owing to the light sales, it is not expected to increase materially before July. Shippers are hoping for an early increase in the movement so that they can reduce their stock piles at the mines. The movement of last years's Ore from the Lake Erie docks is still light. Ore prices for 1908 delivery at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, $4.50; Mesaba Bessemer, $4.25; Old Range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The only sales reported are a few small lots of Foundry Iron ranging from carloads to 300 and 400 tons. Nearly all the consumers in this territory are now covered for at least a portion of their requirements for the last half. Good inquiries for Foundry Iron have come from Eastern consumers, including one for 5000 tons from an implement maker, but some of them are believed to be mainly for the purpose of testing the market. The high freight rate will prevent Ohio furnaces from competing for this tonnage. Prices remain firm at the same level that has prevailed for the past month. We quote No. 2 Foundry Iron at $15 to $15.25, Valley furnace, for the last half. Local furnaces quote the same Iron at $15.50 to $15.75, at furnace. The melt in this territory shows some improvement, and shipping orders are coming in slightly better. The Southern Iron market is lifeless, and the same condition prevails regarding Basic, Bessemer and Malleable Iron. The Malleable melt has not improved materially, and consumers are slow in taking Iron on contract. For prompt shipment and for the last half we quote, delivered, Cleveland, as follows:

Bessemer	$16.90
Northern Foundry, No. 1	$16.25 to 16.65
Northern Foundry, No. 2	15.75 to 16.15
Northern Foundry, No. 3	15.25 to 15.65
Southern Foundry, No. 2	16.35
Gray Forge	14.90

Coke.—The market is quiet, although some sales of Foundry Coke are reported. Prices remain firm for future delivery. Foundry Coke for spot shipment is bringing low prices, sales of high grade Coke being reported at $2 and lower, at oven. For future delivery we quote Connellsville Furnace Coke at $1.75 to $1.85, at oven, and 72-hr. Foundry Coke at $2.25 to $2.35, at oven.

Finished Iron and Steel.—The demand for both Iron and Steel Bars shows some improvement, but otherwise the condition of the market remains about stationary. Some further contracts have been closed by the implement makers for Steel Bars for the year beginning July 1, and the majority of these interests in this territory are now under contract for the year. Few other consumers of Bars are making contracts. Their orders are for small lots for immediate requirements, but the tonnage placed shows that the actual consumption has increased as compared with the past few months. To the slight improvement in business activity, rather than to the price reduction, is attributed this improvement in the demand. The demand for Plates in car lots and under is slightly better, a few orders coming from consumers that have been out of the market for several months. The Structural situation shows no change. The demand is still very light, the price reduction not having a stimulating effect. Bids will be received this week for a local store building, which will require about 1200 tons of Structural Steel. The proprietors of another local store, who have had additions under consideration for some time, have decided to carry out their plans for a new 10-story building, on which work will be started in a few months. No other local work is in sight requiring much tonnage of Structural Material. The Board of Public Service will receive bids June 27 for 3400 tons of Iron Pipe and 240 tons of miscellaneous and special castings for the Cleveland Water Works Department. Bar contracts closed with implement makers during the week, aggregate about 10,000 tons, and include one order for 1000 tons of Hard Steel Bars. While there are occasional reports of cutting by a few of the smaller mills, prices are being firmly maintained by the leading producers on all lines of Finished Material. The demand for Sheets is light. Warehouse business shows a slight improvement. We quote Iron Bars at 1.45c., Cleveland, for car lots; Steel Bars, 1.50c., Cleveland, for car lots, half extras; Beams and Channels, 1.70c., base, Cleveland, and Plates, ¼-in. and heavier,

1.70c., base, Cleveland. Dealers quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Jobbers quote Iron and Steel Bars out of stock at 1.65c. to 1.70c. Beams and Channels out of stock are 2c., and Plates, 1-in. and heavier, 1.90c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2¼ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, 71 per cent. discount.

Old Material.—The market remains quiet. Prices are firm, the recent advance being maintained. The demand is light. The increase in the demand that was expected a week or two ago has not appeared, and the only sales reported are small lots for immediate needs. No contracts are being made for future delivery. There are some inquiries for fair tonnages, but dealers and consumers are unable to come together on prices, the former holding firmly to the present prices, which the latter are unwilling to pay. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, which are unchanged, are as follows:

Old Steel Rails	$13.00 to $13.50
Old Iron Rails	15.00 to 16.00
Steel Car Axles	16.50 to 17.50
Old Car Wheels	13.00 to 13.50
Relaying Wheels, 50 lb. and over	22.00 to 23.00
Heavy Melting Steel	12.50 to 13.00
Railroad Malleable	11.50 to 12.00
Agricultural Malleable	10.50 to 11.00
Light Bundled Sheet Scrap	8.00 to 9.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	6.00 to 6.50
Iron and Steel Turnings and Drillings	7.00 to 7.25
Steel Axle Turnings	8.50 to 9.00
No. 1 Busheling	11.00 to 11.50
No. 1 Railroad Wrought	12.00 to 13.00
No. 1 Cast	11.50 to 12.00
Stove Plate	9.50 to 10.00
Bundled Tin Scrap	8.00 to 9.00

Bialosky Bros. & Co., Scrap Iron and Steel, Cleveland, Ohio, announce the withdrawal of L. Bialosky from the firm. The business will be carried on as heretofore by J., S. J. and I. Bialosky.

St. Louis.

ST. LOUIS, MO., June 22, 1908.

The consensus of opinion among sales managers, both of St. Louis manufacturers and the local representatives of outside interests, is that a gradual improvement is in evidence. The railroads are beginning to buy material for putting their equipment, as regards idle cars and engines in shape to handle fall business. There has been quite a large tonnage of Steel Bars sold for the manufacture of agricultural implements, and manufacturers are asking for shipments to be made in anticipation of contracts. Forgings and Structural Material are in better demand. Stove manufacturers report their salesmen advising that country dealers are buying freely for fall delivery. There is a seasonable demand for Wire.

Coke.—The market for Coke shows indications of increasing activity. There is an inquiry out for 1300 cars of Connellsville, the contract to cover from July to July. Price still rules at $2.15 to $2.50, at oven, with upward tendency.

Pig Iron.—Buying of Pig Iron is for the present confined to small lots for prompt shipment. Most consumers are either carrying over stock or are so well supplied in nearby deliveries they are not buying. Owing to the concession of 50c. per ton in Northern Ore, some buyers look for a corresponding allowance. Reports from Birmingham, however, indicate that, with one exception, the whole district is sold up for the third quarter. There is quite general inquiry for Iron into the first quarter of next year. A better inquiry is reported for High Silicon Iron. No. 2, or Soft Foundry, for shipment over last half, is ruling at $12.50, Birmingham, and with some furnaces for all deliveries, while a few others are quoting $12 for third quarter and $12.50 for last quarter.

Structural Material and Rails.—A large inquiry is reported for Structural Material, principally for small jobs, mainly from the Southwest, both in building and bridge work. An improvement is noted in the demand for Rails.

Metals.—Spelter is in good demand, and firm at 4.45c. to 4.47½c. Antimony is off 10c., and Tin is weaker.

Old Material.—The situation remains practically unchanged. As the demand from the mills is small, such movement as obtains comes from dealers. The only offering of consequence from railroads is 250 tons by the Vandalia. Dealers' prices to the trade, per gross ton, f.o.b. St. Louis, are as follows:

Old Iron Rails	$14.00 to $14.50
Old Steel Rails, rerolling	11.25 to 11.50
Old Steel Rails, less than 3 ft.	11.00 to 11.25
Relaying Rails, standard sections, subject to inspection	22.50 to 23.50
Old Car Wheels	11.50 to 12.00
Heavy Melting Steel Scrap	10.75 to 11.00
Frogs, Switches and Guards, cut apart	10.50 to 11.00
Mixed Steel	9.00 to 9.50

The following quotations are per net ton:

Iron Fish Plates	$11.50 to $12.00
Iron Car Axles	14.50 to 15.00
No. 1 Railroad Wrought	10.75 to 11.00
No. 2 Railroad Wrought	8.50 to 10.00
Railway Springs	9.00 to 10.00
Locomotive Tires, smooth	12.00 to 12.50
No. 1 Dealers' Forge	9.50 to 10.00
Mixed Borings, &c.	3.50 to 3.75
No. 1 Boilers, cut to Sheets and Rings	7.00 to 8.00
No. 1 Cast Scrap	10.00 to 10.50
Stove Plate and Light Cast Scrap	9.00 to 9.50
Railroad Malleable	9.25 to 9.75
Agricultural Malleable	8.50 to 9.00
Pipes and Flues	7.25 to 7.50

The Bethlehem Steel Company reports closing contract with a Kansas City contractor for Steel Material for the State University Building, at Columbia, Mo., and also for a small office building in St. Louis.

The Missouri Pacific Railroad has placed a contract with the American Car & Foundry Company for the repair of 1000 cars, and it is reported that the Mobile & Ohio has contracted with the same company for the repair of cars.

A large local Zinc company reports a good demand for its product, particularly for galvanizing purposes.

The Commonwealth Steel Company is running moderately; in fact, it shut down but one month this year.

The American Metal Company reports the demand improving, and the Hoyt Metal Company states that Lead for corroding is in good request.

The Crucible Steel Company of America, manufacturer of Tool Steel, is in receipt of a good many small orders, but there is not much demand from parties who supply railroads.

The Hoyt Metal Company has recently been incorporated under the same style; capital stock, fully paid, $250,000.

The Stewart Supply Company, in which James Stewart & Co. and other leading contractors of the city are interested, has recently been incorporated, and will build a plant to cost upward of $100,000, at Grey Summit, Mo., for mining sand for glass and other industries.

The Meramac Land, Labor, Supply & Maintenance Company has been incorporated to build at Sherman, Mo., homes for the new cement company. Ultimately an investment of $200,000 will be made.

The Handlan-Buck Mfg. Company states that it is filling up its warehouses with material in anticipation of a good fall business.

Birmingham.

BIRMINGHAM, ALA., June 22, 1908.

Pig Iron.—There have been no developments within the past week that have changed the status of the market. All parties concerned are apparently satisfied with the situation as presented, and willing to await further developments before increasing the proportions of their commitments. There has been an improvement in general lines of foundry trades, as is indicated by the aggregate of recent sales for prompt delivery, but purchasers are not disposed to engage additional tonnage for anticipated requirements, and the demand is expected to increase in proportions similar to the actual increase in the melt. Producers continue to discourage negotiations for advanced deliveries by adhering to prohibitive quotations without evidence that their attitude would be changed unless the demand for such deliveries was stimulated materially. It is generally conceded that the tonnage available for prompt deliveries and the third quarter is now practically in the hands of one concern, and notwithstanding the fact that the rate of production will be increased within a few weeks, indications are not unfavorable for advanced quotations on the surplus tonnage. In this connection, however, the fact that the tonnage engaged has so far been delivered according to specifications and the likelihood of requirements having been over-estimated, thereby resulting in shipments being withheld, should not be overlooked. Among the sales reported for the week, a lot of 200 tons of No. 2 Foundry for prompt delivery, at $12, Birmingham, is the most significant. A number of carload lots are reported at $12, as well as lots of less than 100 tons. The sale of 200 tons of Gray Forge for shipment in July and August is reported at $10.75 per ton, Birmingham. The scarcity of low grades is somewhat a feature and has resulted in the usual differential in quotations being reduced by practically all producers.

Cast Iron Pipe.—The appearance of additional strength in other markets is not without a salutary effect on conditions in the South. The business recently developed has consisted principally of small orders, but all concerns have manifested less disposition to shade quotations, and prices are on a much firmer basis. It is estimated that orders of 200 to 600 tons each that are now in sight aggregate approximately 36,000 tons. Of this tonnage a significant proportion is for export, consisting principally of large sizes. The fact that financial arrangements have recently been perfected for the construction of another plant is probably the best index offered as to the status of the Pipe trade. We quote

Water Pipe [illegible] to 6 in., $23; 8 [illegible] 12 in., average, $24, with $1 per ton extra for Gas Pipe. These quotations are probably shaded for large municipal contracts.

Old Material.—The anticipated improvement in the demand has so far failed to materialize, but dealers are still indisposed to force matters by concessions in prices. In the absence of evidence to the contrary, prices have been maintained, but the volume of business transacted hardly indicates a market, and nominal quotations only are warranted. We quote nominally as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$14.00 to $15.00
Old Car Wheels	14.00 to 15.00
Old Steel Axles	12.50 to 13.00
No. 1 R. R. Wrought	12.00 to 12.50
No. 2 R. R. Wrought	9.00 to 9.50
No. 1 Country Wrought	10.50 to 11.00
No. 2 Country Wrought	9.50 to 10.00
No. 1 Machinery	10.00 to 11.00
No. 1 Steel	9.50 to 10.00
Wrought Pipe and Flues	8.50 to 9.00
Stove Plate and Light Cast	8.50 to 9.00
Cast Borings	5.00 to 5.50

Cincinnati.

CINCINNATI, Ohio, June 24, 1908. (By Telegraph.)

Late developments in the local Iron and Steel markets do not give any great encouragement to those who have expressed a belief that the year's second half would mark the beginning of a permanent improvement. There is little doing in the Pig Iron sales offices, and the hot wave now enveloping the Central West seems to have stifled inquiries and sales of all kinds alike. Indications of activity are, however, noted in or about the three idle local plants, namely, the Steel Foundry, the Weber Iron Foundry and the Licking Rolling Mill. The last is expected to be rolling Iron Bars within 30 days. There is said to be an offer on the Steel Foundry which is under consideration, and parties are making inquiries about the Weber Foundry. Buyers have responded but meagerly to the promise held forth in published price reductions on finished lines. While there is a healthier undertone in Pig Iron inquiries, the ruling price of $12, Birmingham, for No. 2 Foundry, applied to spot business, shows weakness. Reports from interior manufacturing points indicate that the holding off policy is still in vogue, and railroad purchasing agents are not yet ready to put up anything definite to tool manufacturers for figures.

Pig Iron.—No change is to be noted in the prices, of either the Northern or Southern product this week, save that some furnaces which were firm at an advance of 25c. to 50c. over the ruling market price, have apparently receded from their position. It is persistently reported that the Southern price of $12 has been shaded a trifle for prompt shipments and for cash. On the other hand, the disinclination to take on business for fourth quarter delivery at that price is quite confirmed. There has been a little movement of low grades, and the price of Grey Forge is given all the way from $10.50 to $11, Birmingham, and No. 4 Foundry is subject to negotiation. Ohio Silveries, 8 per cent., are still quotable at $18.50, at furnace. The new furnace of the Jackson County Iron & Steel Company is now announced as to be blown in about August 1, and will manufacture High Silicons, with a capacity of 75 tons a day. Northern Foundry Irons have shown the greater weakness of the week, and the same wide range in prices still exists, namely, $15 to $16, with the tendency toward the lower price. The largest inquiry noted to-day is for 2000 tons, divided 1000 Northern, 500 Southern, and 500 Silvery, for Michigan delivery, August to October. A number of inquiries for 200 to 300 ton lots for nearby delivery are in the hands of leading agencies, and mostly for Foundry Iron. An Indiana melter asks for 200 tons of No. 3 Foundry for the third quarter. A St. Louis manufacturer wants 500 tons of No. 2 Foundry for the third quarter, and a local foundry is asking a price on 200 tons of Foundry for third quarter delivery. There is a good inquiry from Chicago territory, one manufacturer wanting 2000 tons analyzing 2 per cent. Silicon for immediate use. For early delivery and balance of the year we quote, f.o.b. Cincinnati, as follows, the freight rate being $3.25 from Birmingham, and $1.20 from the Hanging Rock District:

Southern Coke, No. 1	$15.75 to $16.25
Southern Coke, No. 2	15.25 to 15.75
Southern Coke, No. 3	14.75 to 15.25
Southern Coke, No. 1 Soft	14.75 to 15.25
Southern Coke, No. 2 Soft	15.25 to 15.75
Southern Coke, No. 3 Soft	14.75 to 15.25
Ohio Silvery, No. 1	19.50
Lake Superior Coke, No. 1	16.70 to 17.70
Lake Superior Coke, No. 2	16.20 to 17.20
Lake Superior Coke, No. 3	15.70 to 16.70
Standard Silvery	22.25 to 22.75
Lake Superior Silvery	21.75 to 22.25

Coke.—Unwillingness to contract beyond the close of the year at ruling prices has affected somewhat a Coke market that otherwise looks quite promising to local sellers. Consumers contracted for their requirements for the balance of the year, as a rule, several weeks ago; and with the continued uncertainty as to the foundry melt, the market at this writing cannot be said to be brisk, although prices are firm. Connellsville Furnace Coke is quotable in this market at $1.75 to $1.90, and Foundry about $2.25 to $2.40, at oven, on forward deliveries. The contract price on Pocahontas Furnace is about $1.75 to $1.85. The Wise County product is selling at $2 to $2.25 for Foundry Grades and $1.60 to $1.75 for Furnace; New River Foundry $2.65 to $3, and Furnace Grades about $2.50.

Finished Iron and Steel.—No change is noted in jobbing and retail circles in this territory on Finished Material and store prices are being well maintained for such business as is going. If any improvement is noted at all, it is confined to Iron and Steel Bars, some little demand for which is coming out, but the inquiry is still a long way from normal. Dealers are not enthusiastic over the prospect and the majority are not looking for any permanent improvement before the first of the year, if then. Orders from store stocks are filled at the following prices, which are f.o.b. Cincinnati: Iron Bars, carload lots, 1.65c., base, with half extras; small lots from store, 1.85c., base, half extras. Steel Plates, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼ in. and heavier, carload lots, 1.85c.; small lots from store, 2c. Blue Annealed Sheets (Heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.20c. No. 12, carload lots, 2c.; small lots from store, 2.30c. Sheets (Light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No., 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.20c.

Old Material.—The local Scrap market has lapsed into its accustomed state of inactivity, and beyond some interesting inquiries from mills and dealers in other sections the situation has not improved. Prices are unchanged, but are a little firmer in tone. There is hope in some quarters of an early advance, but it is based rather on expectancy than on actual conditions to warrant it. Dealers' prices to the trade, f.o.b. cars, Cincinnati, are about as follows:

No. 1 R. R. Wrought, net ton	$10.50 to $11.50
Cast Borings, net ton	4.00 to 5.00
Heavy Melting Steel Scrap	11.00 to 12.00
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	10.25 to 11.25
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	14.50 to 15.50
Old Iron Rails, gross ton	13.00 to 14.00
Old Steel Rails, long, gross ton	11.00 to 12.00
Old Steel Rails, short, gross ton	11.00 to 12.00
Relaying Rails, 56 lb. and up, gross ton	22.00 to 23.00
Old Car Wheels, gross ton	12.00 to 13.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00

The Wisconsin Steel Company, Chicago, has established an office in Cincinnati, and placed Maynard French & Co. in charge, with headquarters in the First National Bank Building. The company's principal products are steel bars, angles and small shapes. Mr. French was for some years connected with W. H. D. Totten, Cincinnati.

The Writ of Injunction.—Justice Brewer of the Supreme Court of the United States, in an address at Clark University, at Worcester, Mass., said that the restraining power of the court of equity should be enlarged and not diminished, and that to restrict this power would be a "step backward toward barbarism." He believes in preventive [illegible] He says: "As population becomes more and more dense and activities increase, the restraining power of the equity court is worth vastly more than the punishing power of the criminal court." He strongly [illegible] restraining power and [illegible] the [illegible] power is only used when necessity requires and the restraint imposed only when justice demands." Somehow, says the New York *Journal of Commerce*, this position of the jurist seems more reasonable than that of the labor autocrat.

A hydro-electric plant on Black River, Wis., near Black River Falls, is in contemplation by the La Crosse Water Power Company, La Crosse, Wis., which has just finished [illegible] plant at [illegible] has in view the development of about 10,000 hp. Although some preliminary work is now being done, it is not expected that preparations for actual construction will be made until next year.

New York.

NEW YORK, June 24, 1908.

Pig Iron.—Some transactions of some importance have been closed, which were in suspense, pending final action by the buyers. Among these were one lot of 12,000 tons, for New England, and one lot of 1500 tons. Another large interest which has been in the market for some weeks for upward of 7000 tons has not yet closed. Competition continues as keen, and close prices are being made. We quote, at tidewater, Northern No. 1 Foundry, $16.75 to $17; No. 2 Foundry, $16 to $16.50, and No. 2 Plain, $15.25 to $15.50. Alabama Irons are quoted $16.75 to $17, for No. 1, and $16.25 to $16.75 for No. 2 Foundry.

Structural Material.—Bids went in on Monday on the Educational Building at Albany, to be erected by the State of New York, involving 10,300 tons of Steel. This is the largest Structural contract in sight at present. Quite a number of small contracts have lately been closed in this vicinity. The largest of these was 700 tons for a building, secured by the Cambria Steel Company. Other contracts for buildings and viaduct work, ranging from 300 to 500 tons, were taken by the Eastern Steel Company, the J. B. & J. M. Cornell Company, and the McClintic-Marshall Construction Company. In every instance the bids showed that fabricators are still competing sharply. While this is the case, the prices made by the successful bidders were somewhat higher than those recently named, indicating that some progress is being made toward a better range of values. The American Bridge Company received an order for several hundred tons from the Boston Elevated. Steel manufacturers report an improving demand for plain material, indicating that consumers generally are not withholding their orders in the expectation of lower prices. Quotations on tidewater deliveries, mill shipments, are as follows: Beams, Channels, Angles and Zees, 1.76c.; Tees, 1.81c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—The Eastern Bar Iron manufacturers held a meeting in this city on Thursday of last week, which was without result, and no concerted attempt is now being made to maintain prices. Bar Iron and Steel Bars are in moderate demand, with orders seldom running larger than for carloads. Quotations range from 1.41c. to 1.46c., tidewater, on Bar Iron and 1.56c., tidewater, on Steel Bars.

Plates.—Some little demand is noted for Plates for repair work, but the market still waits the general resumption of buying by railroads to stimulate business. Prices of standard sizes of Plates are as follows at tidewater: Sheared Plates, 1.76c. to 1.86c.; Flange Plates, 1.86c. to 1.96c.; Marine Plates, 2.16c. to 2.26c.; Firebox Plates, 2.65c. to 3.50c., according to specifications.

Cast Iron Pipe.—M. J. Drummond & Co. secured a contract for 3100 tons of the Pipe required for the city of New York, mainly 16 and 20 in. This lot of Pipe has been erroneously reported to have been awarded to other interests. The city of New York will purchase 2800 tons of 6 and 12 in. in about two weeks. Carload orders for 4 to 8 in. are fairly numerous and the foundries in this territory are getting better filled with small sizes. Carload lots of 6-in. are held at $24.50 to $25 per net ton at tidewater.

Old Material.—The foundries are buying in moderate quantities, and some of the rolling mills have been in the market for various grades of stock. The demand has consequently been quite fair for Cast Scrap, Stove Plate, Wrought Pipe and Borings and Turnings. No. 1 Railroad Wrought has also shown a better movement. Car Wheels are still being picked up by dealers. The market for Steel Scrap is quiet, with prices slightly lower. Quotations are about as follows, per gross ton, New York City:

Old Girder and T Rails for melting	$10.00 to $11.00
Heavy Melting Steel Scrap	10.00 to 11.00
Old Steel Rails, rerolling lengths	12.50 to 13.00
Relaying Rails	20.50 to 21.50
Old Iron Rails	14.50 to 15.00
Standard Hammered Iron Car Axles	16.00 to 16.50
Old Steel Car Axles	14.50 to 15.00
No. 1 Railroad Wrought	13.00 to 13.50
Iron Track Scrap	10.00 to 10.50
No. 1 Yard Wrought, long	11.00 to 11.50
No. 1 Yard Wrought, short	10.00 to 10.50
Light Iron	5.50 to 6.00
Cast Borings	5.00 to 5.50
Wrought Turnings	6.50 to 7.00
Wrought Pipe	9.50 to 10.00
Old Car Wheels	12.50 to 13.50
No. 1 Heavy Cast, broken up	13.00 to 14.00
Stove Plate	9.50 to 10.50
Locomotive Grate Bars	10.50 to 11.00
Malleable Cast	11.50 to 12.50

Representatives of the Western Bar Iron Association and the Amalgamated Association will meet in Detroit July 7 to endeavor to effect a scale settlement, as follows: For the Western Bar Iron Association, S. J. Llewellyn, W. A. Meyers and J. E. Kreps; for the Amalgamated Association, P. J. McArdle, Elias Jenkins and Richard Fitzgerald.

Metal Market.

NEW YORK, June 24, 1908.

Pig Tin.—Trade has been duller even than last week. The volume of business is as small as during November and December, but confidence prevails that after the summer season there will be more activity. The ability of the London market to withstand, so well, the heavy arrivals from the Straits, a maximum for any one month, is considered reassuring. Price changes during the week have been as follows:

	Cents.
June 18	27.90
June 19	28.00
June 22	27.80
June 23	27.75
June 24	27.60

Arrivals so far this month are 2742 tons, and there are afloat 2487 tons. The London market closes at £125 15s. for spot, and £126 7s. 6d. for futures.

Copper.—The market here is a shade firmer, but in Europe a trifle easier. Lake cannot be had at less than 13c., and small lots, at least, of Electrolytic, are held at 12.87½c., net cash. Some appear to think that a round order for prompt Electrolytic would be accepted at 12.75c. Inquiries for late second half deliveries are more numerous. The interests of the Copper trade would probably be best served by as few fluctuations in price as possible, during the rest of this year at least. Exports for the month are good, amounting to 21,000 tons, up to June 22. The London market is about £1 lower than last week, at £57 7s. 6d. for spot, and £58 2s. 6d. for futures.

Pig Lead.—Prices are without change, at 4.50c., New York, for shipment, and 4.55c. to 4.60c., for spot. A steady market prevails in St. Louis, with the price unchanged, at 4.40c. The foreign market is also steady, at £12 12s. 6d. Apparently there is an abundance of Lead there, and no advance is expected until conditions change.

Spelter.—The market is easier, with Prime Western Spelter to be had at 4.55c., New York, and 4.40c., St. Louis. The demand is limited. It is unusual that Spelter and Lead are quotable at the same price, as is now the case. If quotations only were taken into consideration it would indicate that the one was too high or the other too low. Lead, however, has many diversified uses which in a measure account for its strength.

Nickel.—Prices are unchanged, at 45c., for ton lots, and 55c. to 60c., for smaller quantities.

Antimony.—Trade is duller than ever, with not enough transactions to make quotations. Prices are nominally unchanged, at 8.50c., for Cookson's; 8.50c. to 8.62½c. for Hallett's, and 8.25c. for outside brands.

Tin Plates.—With the near approach of July 1 it is expected that the activity at the mills will be curtailed to some extent. Prices, however, are firm, and unchanged, at $3.70, Pittsburgh, and $3.89, New York, for 100-lb. IC Coke Plates. In Swansea Welch Plates are unchanged, at 12s. 1½d.

Old Metals.—Domestic consumers have inquired much more freely regarding prices, particularly for late third quarter and last quarter delivery. The tone of these inquiries leads holders of Metal to believe that substantial orders would be placed if prices were shaded slightly. There is little possibility of this being done, unless a decided change should occur in the ingot market, as scrap is now scarce, and first hands are reluctant to part with it at these prices. Dealers' selling prices are about as follows:

	Cents.
Copper, Heavy and Crucible	12.00 to 12.25
Copper, Heavy and Wire	11.75 to 12.00
Copper, Light and Bottoms	10.75 to 11.00
Brass, Heavy	8.75 to 9.00
Brass, Light	7.00 to 7.25
Heavy Machine Composition	11.50 to 11.75
Clean Brass Turnings	7.75 to 8.25
Composition Turnings	9.00 to 9.50
Lead, Heavy	4.20
Lead, Tea	3.85
Zinc	3.50

Iron and Industrial Stocks.

NEW YORK, June 24, 1908.

Values of securities were unfavorably affected in the past week by a number of circumstances. A sharp decline took place in Republic preferred, owing to the passing of the regular quarterly dividend, and Locomotive common similarly suffered under a report that its dividend would be reduced. Naturally, prices of other iron and steel stocks sympathized. The market was also affected by declines in leading railroad stocks. The range of prices from Thursday of last week to Tuesday of this week on active industrial stocks was as follows: United States Steel common 36¼ to 38¼, preferred 100¾ to 102; Car & Foundry common 33½ to 34⅝, preferred 96; Locomotive common 40⅞ to 46, preferred 100 to 101; Steel Foundries common 6¾ to 7, preferred 35; Cambria Steel 30¾ to 31½; Colorado Fuel 25⅜ to 27; Crucible Steel common 57⅛, preferred 41½ to 42½; Pressed Steel

common 25½ to 27. Republic common 16½ to 18, preferred 63 to 66½. Sloss-Sheffield common 49¾ to 50½; Cast Iron Pipe common 26 to 26¼, preferred 75¾. Can common 6⅝, preferred 53⅞ to 54¾. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 36¾, preferred 101¼; Car & Foundry common 33, preferred 96; Locomotive common 41½, preferred 101; Colorado Fuel 26; Pressed Steel common 26¼, preferred 84; Republic common 16½, preferred 63½; Sloss-Sheffield common 49¾; Cast Iron Pipe common 26⅝, preferred 75¾; Can common 6⅝, preferred 53¾.

The Alabama Consolidated Coal & Iron Company reports net earnings for May of $26,000. It is stated authoritatively that its order book is well filled into the last quarter of the year.

Dividends.—The quarterly dividend on the preferred stock of the Sloss-Sheffield Steel & Iron Company, declared last week, and which is payable July 1, was 1¾ per cent.

Manning, Maxwell & Moore, Inc., have declared a quarterly dividend of 1½ per cent., payable July 1.

The General Electric Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable July 1.

The Yale & Towne Mfg. Company, New York, has declared a quarterly dividend of 1½ per cent. and an extra dividend of ½ per cent., both payable July 1.

Customs Congestion in the Courts.

With the closing of the Federal courts for the summer, as far as tariff litigation is concerned, nearly 47,000 appeals by importers are now pending on the suspended files of the Board of United States General Appraisers. No more customs cases will be heard by the Circuit Court, the Circuit Court of Appeals and the Supreme Court until October at least.

Most of the issues now pending are those arising under the present or Dingley tariff, although a few questions under the tariffs of 1890 and 1894 are before the courts for final determination. The imminence, however, of new tariff legislation by Congress at a special session to be held early next year is disturbing to those interests desirous of having existing litigation cleared up as soon as possible. It is claimed by the members of the Board of Appraisers that that tribunal cannot properly be held responsible for the great number of customs appeals now pending. According to responsible members of the lower tariff court, litigation has been followed closely, and the board is well up with its routine.

As is well known in customs circles, a new tariff invariably brings in its train thousands of new questions, all of which must eventually be settled judicially by the board and the courts. It is feared that in the event of a new tariff being enacted the courts may become hopelessly clogged.

Some years ago the calendars of the local United States courts became so seriously burdened with customs cases undecided that a conference was held by officials of the Treasury Department, the Department of Justice and the Judges of the courts in this city. At the time it was stated that further delay in the courts, as far as tariff litigation was concerned, would be done away with. Unfortunately, however, this desired object has not been attained.

The explanation of present conditions seems to lie in the fact that the Federal courts are in no position to devote their entire time, or actually even a small part of it, to the adequate hearing of questions arising under the revenue law. All of the time of the justices, or at least most of it, is taken up with legions of questions wholly irrelevant to the tariff, such as bankruptcy, admiralty, civil and general miscellaneous issues. Under these conditions the judges are said to do the best that they can with tariff cases. The fact remains, however, that material progress is not being made to clear up the issues between importers and the Government, with the result that a new tariff soon to be enacted is sure to add to existing confusion.

Further than this, thousands of dollars in duties are tied up pending final adjudication of the various issues, while more or less uncertainty exists in importing and domestic manufacturing circles regarding the eventual outcome of the litigation. Both importers and American manufacturers or producers of goods realize that a slight advantage in the rate of duty may decide whether dealing in such merchandise in the United States will be profitable, if, in fact, possible at all. While official figures were not obtainable it is believed that several millions of dollars are tied up pending final tariff decisions by the courts, while much American capital which might be used profitably is held back until it is determined whether the rates of certain lines of imports will warrant home manufacture of the foreign products.

The existing condition of affairs in customs litigation lends strength to a measure introduced into Congress two years ago creating a purely customs court. This bill was drawn by one of the members of the Board of Appraisers, and provides that all tariff cases shall be brought before the tribunal for determination. In certain instances, however, appeals may be prosecuted to the Supreme Court of the United States. The promoters of the contemplated court argue that by taking all tariff litigation out of the Circuit Court and the Circuit Court of Appeals customs cases will be accelerated, while the two courts named will be freed of the existing burden of deciding revenue issues. The further claim is made that the proposed customs court, being composed of tariff experts, would be in the natural course of things much better able to handle questions than the general courts.

During the terms of the courts just closed comparatively few issues of importance have been determined, although a considerable number of unimportant issues have been settled. Those in a position to know say that, when the new tariff becomes law, importers' appeals to the courts will be increased during the first few years of the new law, in comparison with present conditions, more than 1000 per cent.

Labor Notes.

At Pittsburgh, on June 22, a conference was held between the Amalgamated Association and the Republic Iron & Steel Company for the purpose of trying to arrange wage scales for puddling and finishing mills for the year beginning July 1. The Republic Company was represented by T. J. Bray and T. R. Akin, together with managers of the various plants. The Amalgamated Association presented a wage scale calling for a slight reduction in wages, while the Republic Iron Company asked for a considerably larger reduction. No agreement was reached, and the conference adjourned without date.

The Aetna Nut Company, Southington, Conn., recently requested its rolling mill employees to agree to a reduction of 10 per cent. in their wages. After due consideration the employees decided to accept the reduction and the works are now in operation as usual. It is hoped that the reduction will not be permanent, and that when business conditions improve the old rate can be restored.

At Detroit, Mich., June 22, the usual order of things in labor injunction cases was reversed when the Metal Polishers, Buffers and Platers' Union, No. 1, obtained a temporary injunction from a State court restraining the police department from interfering with the peaceful solicitation of employees of the Art Stove Company to join the union, setting up that it threatened the ruin of the union. Judge Hosmer warned the men that he was not authorizing any picketing that was contrary to law.

The summer courses at Columbia University, New York, extending from July 7 to August 14, are in four lines as follows: Civil engineering, hydraulics, structures and reinforced concrete. Electrical engineering, electric train movement. Mechanical engineering, gas engines, metallurgical engineering, metallography of iron, steel and industrial alloys. Instruction will also be given in chemistry, drawing, mathematics, mechanics, mineralogy, physics and shop work. The work done in the summer courses counts toward degrees in the various schools of the university.

The Homestead steel plant of the Carnegie Steel Company is now operating more nearly to capacity than at any time since last fall. There is a total of 60 open hearth furnaces in the plant, of which 53 are now in operation.

The Liability of Freight Carriers.

[illegible]

The greatest service that has ever been rendered to the shippers of the country by the Interstate Commerce Commission is embodied in a recent decision "in the matter of released rates." This decision clears up the mists that have enveloped the question of the liability of railroads under the Hepburn law for loss or damage in transit, and their right to limit their liability in tariff rules or conditions in bills of lading. The report can only be summarized here, as it would fill six pages of *The Iron Age*, and any shipper who wishes to examine a complete and authoritative review of the question by one of the most eminent lawyers of the country, Commissioner Lane, should obtain a copy of the document from the commission.

Ever since railroad traffic attained considerable magnitude in this country the carriers have endeavored to limit the broad liability which the common law imposes upon them. In recent years these limitations have not only appeared in bills of lading, but have been incorporated in tariff rules which are filed with the commission. As reported in *The Iron Age* last December, the Transcontinental roads went to the length of publishing in their commodity tariffs a rule which made them exempt from liability for practically everything excepting a wreck or failure to deliver. An article in *The Iron Age* of March 12 pointed out the dangers in these rules, if they were to be construed literally as tariff "law."

The Additional Charge of 20 Per Cent Unreasonable.

In all of these rules it was provided that the owner must assume the risk unless he paid a rate 20 per cent. higher. The commission has disposed of these rules by holding: "A stipulation that an additional charge of 20 per cent. shall be collected on property that is shipped not subject to limited liability is unreasonable." This makes an end of the provisions of the "uniform" and "standard" bills of lading, used in official and Southern territory, and the rules that have been heretofore published in the three classifications which cover the entire country—the Official, Western and Southern. The Western roads have already modified their rule, effective July 15, and the Transcontinental lines have withdrawn the objectionable rule in their tariffs.

The decision goes a great deal farther. In practical effect it places the railroads in a position where they cannot make any general rules or tariff provisions to throw on the shipper the ordinary risks to which property is subject in transit. The carrier may say that it will not be liable for loss or damage "from causes beyond its control," but it cannot in a general tariff, or in a bill of lading condition, make the shipper bear the risk of breakage and other ordinary losses which result from the negligence of the railroad or its employees.

The most intricate question passed upon is the right of the carrier to limit the amount or value for which it shall be liable in case of loss. This has been attempted in the classification of brass, copper, lead, base bullion, valuable ores, manufactures of marble and slate, and in the case of household goods. It is held that the railroad cannot fix the valuation arbitrarily, in a tariff, unless it offers a graded scale of rates for different valuations, so that the shipper can have a fair choice in the matter. To a limited extent the right of contract is conceded to the shopper and carrier. Wherever the conditions are such that the shipper has the opportunity to make a fair contract in which he assumes specified risks, or agrees to [illegible]

Fire Loss Not Mentioned.

The decision is silent on the question of fire loss. All the tariff rules and conditions and provisions in bills of lading have emphasized the claim that the railroad will not be liable for loss by fire. This is usually a "cause" beyond the control of the carrier. On the other questions the ruling of the commission is so clear, and reinforced with so many decisions of the courts, which are quoted, that it will scarcely be called in question. There are doubts regarding liability for fire loss which may have [illegible] by the commission.

The Hepburn law fixes the responsibility for loss or damage "caused" by the railroad or its connecting lines, and gives the shipper the right to recover from the initial carrier. The commission holds that the word "caused" must be interpreted in a broad sense, "broad enough to comprehend all losses due to the carrier's misconduct, whether positive or negative in character." The shipper can well be satisfied with this clear definition of the law. The cases that it does not cover are rare. A fire loss usually occurs after the goods have arrived at destination, when the State law governs under present conditions. In some States the carrier remains liable for a specified period—two days, after arrival—while in other States the railroad ceases to be liable for fire loss, or for any risk as a common carrier, after the car has arrived, or, in the case of less than carload shipments, after the property has been unloaded and stored in a depot.

The "conference" bill of lading, which was submitted to the commission a year ago by a joint committee representing the Eastern railroads and various associations of shippers, would have settled the question of fire loss in a definite manner. It provided that the railroad should be liable for fire loss in transit and until 48 hr. after notice of arrival. Shippers of grain, flour, cotton and other commodities offered violent objections to this document. There was a clause in it which gave the railroad the benefit of any insurance on the property. The commodities mentioned are generally insured in transit, as they are shipped on "order" bills of lading, and it was claimed that the cost of insurance would be increased. The railroads were willing to accept the "conference" document and adopt it, but the grain and cotton men have apparently blocked the matter indefinitely. The commission cannot force an agreement nor settle the controversy, as its power does not extend beyond tariffs and rates.

Bringing Order Out of Confusion.

After reviewing fully the questions of law involved, the commission gives as its conclusion: "All tariff or classification rules or regulations which attempt to state, or which involve any of the conditions or principles herein discussed should be constructed clearly in the light of these conclusions, and any such rules or regulations now existent which are not so constructed should be promptly revised." The law places the commission in a strong strategic position in a ruling of this character. The federal courts would not overturn its rulings unless it is clearly in the wrong, and the railroads must now eliminate the objectionable rules from their tariffs, or show good cause for an appeal to the courts.

There has been endless confusion in the law. Under the old principles of the common law, established in the days of the stage coach, a common carrier is liable for everything excepting an act of God or the public enemy. The courts in the United States, in railroad cases, have broadened the old exemptions somewhat. It has been generally held in this country that the carrier is not liable for damage or injury caused by an act of the Government, like a quarantine regulation. A mob which a railroad could not be expected to control or repel is recognized, in this country, as a "public enemy." The railroad is also exempt for loss or damage resulting from the act or default of the shipper, or any inherent vice or defect in the property.

The confusion has resulted from the State and federal courts traveling in different directions in the interpretation of bills of lading. Some States forbid any limitation of the common law liability in a bill of lading, while others permit the railroad to throw the burden on the shipper, if he has accepted a bill of lading which makes him assume the risk. The federal courts have generally refused to recognize the "fine print" in a bill of lading, and have followed their own theory of the liability of the carrier. There has also been difficulty in fixing the liability in many cases where a shipment has passed over two or more roads.

The commission, in its ruling, calls attention to a recent decision by the federal circuit court for the western district of Arkansas (Smeltzer *vs.* St. Louis & San Francisco Railroad Company), in which the Hepburn law was upheld in making the initial carrier liable for loss occurring on a connecting line.

The Machinery Trade.

NEW YORK, June 24, 1908.

The most interesting developments in the trade the past week [illegible] that have come forward and which will necessitate the purchase of the new equipment will not be required for some months as plans for the buildings have not yet been completed. The fact that some of these, which were contemplated last year and were held in abeyance because of the business depression, are now showing signs of early consummation is affording considerable encouragement. Aside from these indications of a resumption of a more active demand toward the fall, nothing has developed to give promise of a substantial expansion of trade the next month or two. Since our last report the demand for machine tools has been light, varying but little from the previous week. An increase in the number of inquiries is noted, but these came from the smaller plants and call for only one or two tools each. The larger corporations apparently take no interest in the market, judging from their continued inactivity. It is thought that the railroads and other important interests will have to come into the market more freely before a noticeable improvement in trade will take place. It is stated that the railroads will soon need supplies and machinery, and it will not be surprising to see them do some moderate buying within the next week or two as a result of the conventions held this week of the Railway Master Car Builders' and Mechanics' associations at Atlantic City. A large display of machine tools and railroad supplies was made and manufacturers were well represented.

The engineers in charge of the construction of locks and dams for the Panama Canal have been looking into the question of machinery for that work and it is understood that they have complete data on the subject. It is said in the trade the purchasing for that equipment will be begun before long. This construction work will entail some extensive expenditures for immediate machinery equipment, which will include cranes, conveying apparatus, hoisting engines and a good assortment of machinery for excavation and construction work. Judging from the extensive inquiries made in the trade with a view to gathering necessary information, it is expected that the purchasing will include a large assortment of machinery, some of which will be permanent equipment used in operating the locks.

Recent changes made in the tariff by the Japanese Government will undoubtedly be of material benefit to manufacturers of this country, especially as among the articles which will be admitted free of duty is mining machinery. The Japanese buy large quantities of mechanical equipment in this country and only recently made some extensive purchases, which, we understand from a reliable authority, will be followed by purchases of large quantities of material.

Arrangements have been completed whereby the Ames Iron Works, Oswego, N. Y., has secured the property necessary for enlarging its plant, and it is understood that the city authorities have consented to the closing of certain streets which is necessary to the carrying out of the plans the company has in view for enlarging the capacity of its works to meet the demand for its engines and boilers. On the property secured modern buildings for the manufacture of boilers will be erected, covering a space of about 200 x 400 ft. Plans for the additions have not been completed, and only in a general way have the improvements been gone over. When the new additions are completed important changes will be made in the present departments. The foundry will be moved from the present location in the north end of the main building adjoining the machine shop to the present [illegible] shop will include the space from Cayuga to Seneca streets, having a ground area of 100 x 400 ft., with one gallery extending through from street to street, about 50 x 400 ft. Between the present main buildings and the proposed new boiler shop two warehouses will be built, one with track connections to the machine shop for the storage of engines, to be served by overhead traveling cranes, and the other connected by tracks to the boiler shop for the storage of boilers, also to be served by overhead cranes. These buildings will be approximately 100 x 265 ft. each. A main power plant will be established in which will be installed all the power machinery, including engines, boilers, generators, air compressors, &c. The total present area of floor space of the shops is about 134,000 sq. ft., which will be increased to 259,000 sq. ft. by the new buildings. With the proposed warehouses and rearrangement of tracks, and additional yard room, much better facilities for the handling and shipping of products will be assured.

Reference was made in these columns some months ago to the new plant to be constructed by the Heine Safety Boiler Company, St. Louis, Mo. The matter has been held in abeyance some time because of the financial panic which [illegible] 1907. [illegible] is starting preliminary work of grading the property pre[illegible] been decided, however, when actual construction work will begin. Plans for the new plant are being prepared, the buildings of which will be equipped throughout with new machinery.

The Graff Furnace Company, whose plant at Dickson City, Pa., was recently destroyed by fire, has acquired the fully equipped plant of the Computing Scale Company, Scranton, which is adapted for the Graff Company's work. Accordingly the company will not purchase as much as it was expected in the trade it would be obliged to buy. It has a complete power plant fully adequate for its needs and a good line of machine tool equipment. A small blower and motor to operate it will be bought, as well as some drills and a few small lathes, and perhaps a scattered line of small machinery to bring the new plant up to its requirements.

The New York Edison Company has been placing orders during the week for equipment to generate about 8000 kw. of power, inquiries for which, as was mentioned in these columns last week, were sent out two weeks ago. This equipment, it is understood, is to be used at the Waterside Station.

Hardy, Voorhees & Co., proprietors of a lumber mill on Metropolitan avenue, Brooklyn, are inquiring for equipment to generate about 500 kw. of power. Richard W. Wright is the engineer in charge and he will probably purchase turbines.

Julliard & Co., 70 Worth street, New York, proprietors of the Atlantic Mills at Providence, R. I., have inquiries in the New York market for power equipment to generate about 1500 kw. Turbines will be used and Charles A. Broman can be addressed at 70 Worth street, as he is in charge of the buying.

Business Changes.

The Main Belting Company, Philadelphia, Pa., has opened a branch office at 208 Third avenue, Pittsburgh, Pa., for the sale of Leviathan belting for main driving and heavy service, to run in heat, steam or water. The company reports a good trade and believes the business throughout the country is steadily improving.

The Pressed Radiator Company, Pittsburgh, Pa., has opened a branch office in the Brunswick Building, Fifth avenue and Twenty-sixth street, New York, for the sale of Kinnear pressed radiators.

The Wm. B. Scaife & Sons Company, Pittsburgh, has moved its New York office to the Havemeyer Building, 26 Cortlandt street. H. F. Reynolds is in charge of New York sales of the company's products, which include structural steel work, steel tanks and barrels, water filters and water [illegible]

Chicago Machinery Market.

CHICAGO, ILL., June 23, 1908.

It cannot be said of last week's transactions in the machinery market that they show signs of decisive movement in either direction. Some concerns have been more fortunate than others in competition for the moderate business that has developed, but on the whole the demand seems to be much the same in volume and character as for weeks past. A considerable number of moderate sized orders for water works and electric power equipment are resulting from municipal projects which include extensions to existing systems or the installation of new plants. Some private enterprises of this kind are also going forward, the most important of which concern hydro-electric installations in the West. Beyond incidental orders for individual tools there is no new business in machine tools emanating from the railroads. What may come in July at the beginning of the new fiscal year for the transportation lines is a matter of conjecture, but as has been intimated before in these reports there is good reason to believe that the improved demand that is expected to follow the entrance of this period will include a fair proportion of machine tool equipment. The present quietness in manufacturing plants is especially conducive to overhauling operations, which during the several preceding years of extreme activity have been more or less neglected. It is a noteworthy fact that however much business may have been disturbed and confidence impaired by unsettled financial and industrial conditions of the past few months, no doubt is expressed in any quarter as to the ultimate restoration of business activities on a normal basis; nor is it expected that the hoped for improvement will be indefinitely delayed. Opinions, of course, differ as to the time and manner of its coming, but the general belief is strong that before the year is closed there will be an unmistakable upward turn in the general trend of affairs. An improved demand for motive power and electrical machinery is reported by some of the larger manufacturers, the demand being ascribed in some measure to the requirements of industrial plants, but more especially to the orders for additional equipment placed by interurban power plants and central stations supplying electric light and power to cities. In this connection it is

stated by the Allis-Chalmers Company that its increase in new business during the month of May shows an advance of 80 per cent. over the preceding month. The orders going to make up this volume are distributed over a wide range of industrial concerns, among which mines, smelters and plants engaged in furnishing building material such as stone, lumber and cement are important factors.

Some recent public sales of second-hand tools and equipment have emphasized the fact that desirable second-hand machinery still commands relatively high prices. Dealers find it difficult to purchase second-hand tools at prices that admit of an adequate margin of profit for rehandling, and while there are still some stocks of considerable size in the various warehouses the percentage of really desirable tools is comparatively small.

The Southern Wisconsin Foundry Company, Madison, Wis., has purchased a site upon which it intends to erect a foundry plant that will include a molding shop, 60 x 160 ft., with additions for core room, cleaning room, rattlers and cupola; also a pattern shop, 25 x 50 ft. The building now occupied, which is 40 x 100 ft., will be used for warehouse and storage purposes. Motive power will be supplied by gasoline engines, one of which will be purchased, together with an electric generator; two cupolas, two cranes to handle castings up to 10 and 12 tons, and other machinery necessary for an up to date equipment. In addition to gray iron castings the new foundry will have facilities for furnishing brass castings. The company, which is capitalized at $25,000, paid in, is officered as follows: George C. Riley, president; Henry A. Knabe, vice-president and superintendent; H. M. Vance, secretary and treasurer.

Among the Western machinery plants which continue fairly active is that of the Wilmarth & Morman Company, maker of grinding machinery, Grand Rapids, Mich. This factory we are advised is running with full force 12 hr. a day for four days in the week. While it is impossible to accurately forecast the future, present indications are that shipments during the month of June will not be far from normal. Recent additions to its line of new tools, including a new surface grinder, combination cutter, reamer and drill grinder, are held to be largely responsible for the increase noted in orders.

The city of University Place, Neb., is preparing to make improvements to its water system which will include the replacement of one duplex pump, 12 x 7 x 12 in., and two deep well pumps, 10 x 36 in., by three electrically driven pumps for either direct or belted connection. Bids are now being asked on this equipment and further details can be had by communicating with F. Harbican, water commissioner, Box 443.

Proposals are asked by the Public Lighting Commission, of which F. T. Bowler is secretary, on machinery for an electrical generating plant in the public lighting station at 40 Atwater street, East, Detroit, Mich, bids being received until July 8. The specifications of machinery to be purchased include a two-phase alternating current 60-cycle 2300-volt electric generator, with a rated capacity of 2000-kw. power; steam turbine of 2000-kw. power capacity; condensing apparatus consisting of one condensing cone, one centrifugal pump with direct connected vertical engine, one steam driven dry vacuum pump. Requirements also include auxiliary appliances and apparatus necessary for the complete fitting and installation of these units. The following machinery will be displaced by the new plant: five generators, one steam engine, one condenser.

Bids are being asked on material and equipment for a water works plant to be constructed at Dickson, Tenn. The specifications include 2600 ft. of 8-in. and 13,700 ft. 6-in. pipe, 33 hydrants and connections, two hoist pumps, two force pumps with capacity of 700 gal. per min. J. R. Neblew is city engineer in charge of the work.

Contracts recently closed by the Corn Products Company for motive power equipment to be installed in its new plant at Summitt, near Chicago, include one 1500-kw. and one 600-kw. Allis-Chalmers compound Corliss engine, eight 500-hp. units Babcock & Wilcox water tube boilers, one 5,000,000 and one 3,000,000 gal. cross compound Corliss pump, furnished by Laidlaw-Dunn-Gordon Company.

The construction of an interurban traction line connecting the towns of Sparta and Melrose, Wis., is being promoted by the Sparta-Melrose Electric Railway & Power Company, Melrose, Wis. Town bonds in the sum of $63,000 have been voted in furtherance of this project and another issue of $45,000 will be passed upon in like manner at an early date. Two routes are being considered, one of which would be 18 miles and the other 28 miles in length. The company is desirous of securing information relative to the adaptability of gasoline electric motor engines for both freight and passenger traffic, including some data as to cost of equipment as compared with electric power stations and overhead trolley. The officers of the company are Charles Newland, president; James Cole, vice-president; Howard Teasdale, secretary, and W. A. Sholes, treasurer. The president resides at Melrose, Wis., and the secretary at Sparta, Wis.

The Blaisdell Machinery Company, manufacturer of air and gas compressing machinery, Bradford, Pa., has opened an office at 428 Monadnock Block, Chicago, to take care of its business in the Middle and Western States.

The Standard Roller Bearing Company, Philadelphia, Pa., announces further expansion of its sales organization by the opening of a branch office at 327 Jefferson avenue, Detroit, Mich., in charge of Ernest L. Smith, recently appointed Western representative.

Bids will be received until July 29 by the Commissioners of the Bay Island Drainage and Levee District No. 1, New Boston, Ill., for a pumping plant and sluiceway, including three 250-hp. water tube boilers, three 500-hp. horizontal compound condensing engines and three 60-in. centrifugal pumps, together with foundations, appurtenances, piping, &c., necessary for complete working plant, as described in detail in the specifications. Alternate bids will also be received for gas producers and gas engines instead of steam boilers and engines. Plans and specifications can also be seen at the office of the Harman Engineering Company, Peoria, Ill.

Cleveland Machinery Market.

CLEVELAND, OHIO, June 23, 1908.

While the orders received by machine tool and machinery manufacturers as yet show little change, the feeling of confidence that the demand will show considerable improvement in the near future is expressed on all sides. This feeling is the result of a very satisfactory increase of inquiries received by the tool makers. There is a slight change for the better in the volume of orders, and the inquiries indicate that many consumers that have been out of the market for a number of months will soon be in the market for some additional equipment. While a decided improvement is not expected during the hot summer months, it is the belief that orders will pick up slowly during July and August, and that with the coming of the fall months there will be considerable improvement all along the line. The movement started by the Cleveland Chamber of Industry to make July 1 employment day, on which the local industrial plants are to take on as many workmen as possible, is meeting with general favor and has been indorsed by the Manufacturers' Club and other organizations.

Dealers in machine tools report no change in the situation. Orders are about as they have been for a number of weeks, being mostly for single tools or very small lots. There are some inquiries pending for larger lots, but buyers are slow in placing orders. Fewer second-hand tools are being offered, and while two or three fairly good lots are in the market the owners are holding them for good prices. The demand for second-hand tools is fairly good and dealers do not keep them in stock long before finding purchasers.

In most manufacturing lines some improvement in orders is reported. Stocks of all kinds are low, so that a change for the better in general conditions is expected to be quickly followed by an increase in the volume of orders. There is better inquiry for special machinery. Crane builders report the outlook some better, inquiries being a little more numerous, but purchasers are still slow in placing orders. Structural shops are receiving a larger number of small orders, their business being stimulated somewhat by the reduction in price of structural material. Boiler makers report their volume of orders rather light.

The National Nut & Bolt Lock Company, Cleveland, recently incorporated with a capitalization of $40,000, will manufacture nut locks, principally for steam railroad car trucks. The company has opened offices at 1130 Schofield Building. Albert M. Allen is the president; John F. Crowl, secretary, and George B. Martin, treasurer. The company expects to build a plant and is now looking for a site in some northern Ohio city. The company will be in the market for some machinery, including punch presses, hardening furnaces and an electrical welding outfit.

The National Cash Register Company, Dayton, Ohio, has a good sized inquiry out for machine tools. While the company has temporarily delayed its purchases, it is understood that orders for the additional equipment will be placed soon.

The Gregg Mfg. Company has established a plant at 1318 West Fourth street for making machines for cutting core wire, dies and special machinery. The core wire machine is said to be the only machine of the kind on the market and the company has already received a satisfactory number of orders. F. M. Gregg is proprietor of the company.

The Cleveland Wire Spring Company reports a gradual increase in orders, every month showing up better than the previous one, and the outlook encourages the company to believe that the volume of its business will soon be back to normal.

The Hamilton Mfg. Company, Columbus, of which W. K. Field is president and W. E. Hamilton general manager, has purchased a new site on East Fifth street and the Big Four tracks in that city and will build a new plant. The company makes pit car loaders and patent coal and coke

storage machines. The growth of its business has made it necessary for the company to have a larger plant.

The Borden Company, Warren, Ohio, maker of die stocks, reports a considerable improvement in the volume of its orders and its working force is being increased from day to day. A change has just been made in the organization of the company, Alfred W. Howe, who recently returned from a trip to Europe, where he visited the leading plumbers' supply houses, being made vice-president.

S. C. Cutler, formerly vice-president of the Republic Belting Company, Cleveland, Ohio, has severed his connections with that company and has opened an office in the Schofield Building, where he is handling the entire lines manufactured by the B. F. Sturtevant Company, Boston, Mass. This line includes mechanical heating and ventilating apparatus, mechanical draft, economizers, engines, motors, generating sets and forges, also electric ventilating fans and a new steam turbine and high pressure rotary blower. Mr. Cutler is devoting his entire energy to the Sturtevant line and is well equipped to handle any matters that may come up. The Cleveland office has closed up several nice orders of late, including the heating and ventilating apparatus for the new chemical laboratory, Adelbert College, consisting of fan, heater, tempering coil, exhauster and engine; the heating and ventilating apparatus for the new Technical High School, consisting of four large steel plate fans, four tempering coils, two electric exhausters, four electric propeller fans and a cast iron electric exhauster; also a large high pressure blower, with direct connected engine, for the Board of Public Service, Water Works Department, Sandusky, Ohio, to be used in connection with a 6,000,000-gal. filtration plant.

The Central Foundry Supply Company, Columbus, which was recently incorporated to take over a foundry supply business located on North Fourth street, has organized by the election of the following officers: John S. Ball, president; Dwight R. Mann, vice-president; Charles E. Whiton, secretary and treasurer.

Through the efforts of the Zanesville Chamber of Commerce, J. Burkhart & Son, bent wood manufacturers, of Caldwell, Ohio, will move to Zanesville, where they will build a new plant.

The Falls Heat, Light & Power Company, Cuyahoga Falls, Ohio, has been incorporated, with a capital stock of $10,000, to operate under a franchise recently granted to C. M. Walsh. The company expects to furnish power to a number of Cuyahoga Falls enterprises. The incorporators are W. A. Searl, S. D. Tifft, W. B. Middleton, C. A. Davis and C. K. Fowler.

The Ohio State Board of Public Works and Superintendent of Canals Charles Hatch have awarded a contract to the Marion Steam Shovel Company, Marion, Ohio, for an $8000 steam dredge to be used in canal improvement work between Massillon and Cleveland.

J. C. Lassen of Cleveland has started a machine and repair shop at the corner of Main and Vine streets, Oberlin. He will repair machinery, boilers and engines.

The plant of the Sandusky Grille & Mfg. Company, Sandusky, Ohio, will be offered for sale July 1 by V. K. McBride, the trustee. The plant includes factory and storage sheds, appraised at $38,430; warehouse, appraised at $8235; dock, appraised at $8235, and personal effects, including line shafting and 150 woodworking machines, appraised at $11,201. The property will be sold either entire or in parcels.

Cincinnati Machinery Market.

CINCINNATI, OHIO, June 23, 1908.

While actual transactions cannot be said to show any special increase in number and value to the builders of machinery and machine tools in this market, the tone of correspondence is infinitely more satisfactory. A definite time is set for the filling of a part or the whole of specifications for tools and equipment. This feature of the situation was brought up enough by representative manufacturers in this section the past week to justify the statement that there is a distinct improvement, although nothing permanent or approximating the situation of the early part of 1907 is expected this year. Another pleasing feature of the situation is the altered attitude of the railroad corporations and others which have been holding off so stubbornly.

Late correspondence now indicates that these corporations are beginning to go over shop requirements in the way of tools and equipment, and it is believed that some fairly good purchases have been ordered within the past few days, or since the Chicago nominations. Approaching the midyear turn, July 1, all industrial establishments in this field are particularly alert, for besides marking the date for the fruition of efforts of the National Prosperity League of Cincinnati, re-employment day, it is expected to mark a change of heart in machinery and shop circles all through this section.

Manufacturers of the medium and smaller sizes of lathes, shapers, planers and the like almost uniformly report good sales to automobile companies and shops devoted to light manufacturing specialties. Buyers are still very conservative and it is still only the most urgently needed tools that are being purchased. A traffic manager of a railroad interest in this section, speaking of the situation, reported a conversation held with the manager of a large car building plant employing 4500 men in normal times, in which he noted that a certain large railroad corporation had asked bids on a large amount of car equipment. In addition to the improved outlook from car building and repairs, the character of correspondence from other lines of manufacture gives tool manufacturers much encouragement, and while some do not look for any material improvement before 1909, others expect to fill some fairly good sized orders within the course of two or three months. A number of prominent tool manufacturers have been in the East and at Atlantic City in attendance upon the conventions of the Railway Master Car Builders' and Master Mechanics' associations.

President Wm. Lodge of the Lodge & Shipley Machine Tool Company was to sail for Europe this week, and it is not thought that the little fire which visited the plant Saturday will interfere. The reports in the daily press were considerably exaggerated. Originating in the pattern shop, it was confined to that department and the loss will not exceed $10,000. Some patterns, pattern lumber and woodworking machinery, mainly saws and woodworking lathes, were burned.

The Sebastian Lathe Company, Covington, Ky., makes an encouraging report. The statement is made that the company is running 55 hr., has not lost an hour nor laid off a hand during the months of depression. It is accumulating a little stock, but believes it is good property at the present price of material.

The Queen City Shaper Company reports encouraging conditions and some evidences of improvement. A special machine just shipped to a large machinery house in London is of the universal type, 16-in. revolving table, with tilting top for compound angles and power down feed to head. Another machine of the regular 20-in. type goes to Atlanta, Ga. The company is now running on a series of 24-in. machines for stock, a size that seems to be in fairly good demand.

One of the large local planer manufacturers recently sold to Chicago parties a 72-in. machine, the largest size made in its shop. In planers the smaller size and lighter builds seem to have the call in this market, with the few exceptions of special machines noted.

The Fay Equilibrium Power Company will be incorporated to manufacture an apparatus for increasing power by Alpheus Fay, the inventor; Edward F. Smith, a local inventor and electric experimenter; Peter J. Yung, Robert Glier and C. J. Stace. Temporary quarters are now utilized in the building at 44 Walnut street, the shop of the Lektro Mfg. Company, of which Mr. Smith is general manager. The company will within the course of a few weeks equip an Ohio River boat and conduct a series of demonstrations. The invention will be put out on a royalty basis only.

Manufacturers of pumping machinery report inquiries increasing, especially for the larger units. The John H. McGowan Company has shipped during the past 10 days equipment for water works plants in the States of Texas, Georgia, two; Illinois, North Carolina and Florida. The company has equipment on the floor in process of construction for four more plants and several scattering orders for parts. It has maintained recently a full schedule, and for some weeks has worked overtime on some of its larger work.

The Zanesville, Ohio, plant of the American Rolling Mill Company is shut down for a short time, or until orders justify resumption of work.

The three new buildings for the American Seeding Machine Company, Springfield, Ohio, are in process of construction by the Eilenberger Construction Company of that city and will be pushed to completion, the contract naming November 1. The cost of construction is estimated at between $50,000 and $60,000.

The contract for the construction of the new factory of the Union Embossing Company in Anderson, Ind., was secured by John Clifton & Son, Indianapolis, Ind. On the company's 9 acres in the southeastern part of the city three buildings will be erected, one 65 x 400 ft., one 30 x 210 ft. and a two-story office building 30 x 50 ft. Work has already commenced.

The Climax Machine Company, recently organized by Grant Border and George Reiser, has established a shop in Richmond, Ind., for doing all kinds of machine work.

The Victor Stamping Company, Twightwee, a suburb of Cincinnati, manufacturer of coal hods, will erect a one-story addition, 80 x 260 ft., at a cost of approximately $10,000. The company reports business very fair, and since it has been determined to add a line of other specialties, such as water pails, washtubs, bushel baskets, garbage cans, &c., the need of additional room for special machinery, which is being purchased, was so obvious that plans were prepared and the building, which is to be of brick, will be rushed to completion.

Robert McIntosh and Clarence Morkel, superintendent and chief bookkeeper respectively of the Galion, Ohio, Iron Works, have leased the foundry department of the Ashland Steel Range & Mfg. Company at Ashland, Ohio, and will conduct a jobbing foundry business in that city. It is understood that they already have practically all the castings specifications of three large machinery concerns, and as the new acquisition is well equipped with the necessary appliances all that they will need is a stock of iron for immediate use.

New England Machinery Market.

WORCESTER, MASS., June 23, 1908.

Dullness continues to prevail in the machinery trade, neither dealers nor manufacturers finding much new business. An occasional good order is recorded, and some small sales are booked, but beyond this small volume of trade there is little activity, even inquiries having fallen off. It is thought that this condition will continue with little change until the autumn.

The foundries are correspondingly dull, not only in the jobbing trade, but also in those works where the foundry plays an essential part in manufacturing. In Taunton, Mass., for example, the stove manufacturers are not busy. Their works are running on short time with reduced forces, the stove trade not having responded to its season to the extent expected.

The New England foundries have stopped buying pig iron. Very heavy sales were made previous to the increase in price early in June, but with the advance came a sudden cessation of activity, those who had failed to take advantage of what they now term the bottom price deciding to wait until business is in sight that will make the iron necessary. They do not expect a recession to the lower price, however. It is estimated that contracts have been placed for 65 per cent. of the iron for the third quarter of the year, but that less than 35 per cent. of that for the final quarter has been arranged for.

It is an interesting fact that some of the machine tool builders are deferring the announcement of new tools, believing that they will be better served to await the return of greater activity in their market before advertising improvements or innovations or additions to lines. The argument is that there will be greater interest in such things later on. However, their representatives are doing missionary work by spreading the information to known prospective customers. On the other hand, the large majority of the trade believes that this is the time to let the public know what they have for sale; that buyers have more time to go into the details of new tools than they will have later. In some cases one form of economy has been to avoid the expenditure of money for developing new ideas, so that work on some improvements will be postponed until business has resumed a normal condition.

The promised demand in New England for power equipment, allusion to which has been made, extends in an important way to the electrical industry. The Boston dealers have long lists of concerns which by inquiry or otherwise are known to be coming into the market in the near future. The requirements include all types of industrial electrical equipment, from generating units, motors and other accessories of power installations, to telephone systems and general supplies. This branch of the trade is keenly confident that there will be a good deal of business within a short time, the general situation being influenced by the enterprise of manufacturers who are availing themselves of the period of slack business to place their plants in condition for the revival.

The revival of the cotton industry, the effect of which on the supply trade was noted last week, is also having a marked influence on the cotton machinery builders, who are increasing their production, running in some cases longer hours, and in others with larger working forces. The machine tool people have knowledge of practical benefits, which will accrue to them from this source in the near future, but they are not advertising the information. There is naturally an unusual reluctance to part with inside knowledge of probable orders.

Charles A. Clarke, head of the machinery house of Hill, Clarke & Co., Inc., Boston and Chicago, has returned from a business trip abroad, where he visited the machinery centers of England, France, Germany and Holland. He states that he found business in Europe in much the same condition as in this country, the depression following that in America, to which it is attributed. Its termination, according to general opinion, will be dependent upon a return of prosperous times here. The basis of present business is perhaps a little stronger over there, said Mr. Clarke; probably the percentage of production as compared to total industrial capacity is greater. There is little market for machine tools, excepting some of those of the higher grades. He was impressed with the fact that American machinery is still well in the lead as compared to that of foreign builders. They have copied our machines in a great many cases, and as a consequence are always behind, producing what are termed here old style. Their machinery is not so well built, lacking thoroughness in some details, largely for the reason that their workmen are less thorough. There are exceptions to this, however, for some European built machinery is first-class in every way. There is still far too little specialization in manufacturing. The shops build too great a variety of machinery, instead of concentrating on a single line or a very few, thus following the practice that has had so great an influence in putting American machinery where it is. Shop conditions are not so advantageous in bringing about the best work. Workmen have not the same conveniences. In spite of the lower cost of labor foreign machines of equal grade sell at higher prices than American tools. The trade abroad insists on perfect workmanship, and where this is combined with superiority in design and invention there is no difficulty in interesting customers in American machinery. Mr. Clarke found a great interest in the subject of compulsory working of patents, especially in Germany and England, in which latter country a new law to that effect has gone into force. Crop conditions appeared to be excellent everywhere in Great Britain and on the Continent.

The extension of shop vacations into periods much longer than usual, already noted, is becoming an important factor in summer plans, it being considered wise to adopt this form of curtailment of production. A number of announcements of a month's vacation have been made, and others will come during the next fortnight.

The Whitin Machine Works, Whitinsville, Mass., manufacturer of textile machinery, is buying machinery for the equipment of an addition to its works. Another customer is William F. Draper, Hopedale, formerly head of the Draper Company, who will occupy a part of the new building of the C. F. Roper Company as a shop for the development of textile machinery in which he is interested.

The newspaper announcement that the Boylston Mfg. Company, Boston, Mass., is to begin the manufacture of shoe machinery on a large scale appears to be premature, as the company states it has no intention of proceeding with any radical enlargement at the present time. The company is developing a complete line of shoe machinery at its shops on A street, South Boston, and in practical operation in the shop building owned by H. H. Rogers at Fairhaven, Mass., where shoes are manufactured, with the purpose of perfecting details in machinery. At the present time there is no intention of doing more than carry out the work of development.

A number of textile manufacturing concerns are planning enlargements of their works this season. The Lyman Mills, Holyoke, Mass., will erect a mill, 100 x 300 ft., and five stories. A. D. Ellis, Monson, Mass., will erect a three-story factory building, 65 x 120 ft., with ell, 40 x 100 ft., and dye house, 30 x 75 ft., besides an office building. At Woonsocket, R. I., the Lowland Worsted Company will build an additional mill, 75 x 150 ft., two stories and basement.

The plans for the new Manual Training School at Chicopee, Mass., call for a machine shop and woodworking room, 38 x 54 ft., and forge shop and molding room.

The loss to the American & British Mfg. Company by the fire June 13 at its works at Providence, R. I., formerly the Corliss Engine Works, was a serious one, totaling, it is estimated by the company, $200,000. The power plant was destroyed; about 400 ft. in length of the No. 1 shop was burned and the remainder damaged. The new shop was not seriously affected, excepting that the cranes were bunched where they got the fire and are seriously damaged. The foundry escaped. About 10 per cent. of the machine tools in the No. 1 shop had been moved to the new building; the rest were ruined or badly damaged and will have to be replaced. It will be necessary to rebuild a part of the burned structures immediately, but some of the new work will be deferred for the present. Arrangements have been made for buying electric power, so that work will resume again, almost immediately. Business at the works was at a low ebb, so that loss by inability to fill orders is not material.

The American Typewriter Company, 265-267 Broadway, New York, has established a factory for the manufacture of its typewriters in the building of the Hurwood Mfg. Company, Bridgeport, Conn. A general manufacturing room is 40 x 100 ft., and in addition there are rooms for nickeling, japanning, polishing and rough machine work. It is expected to employ from 100 to 125 men. The product of the company has formerly been manufactured by contract by outside parties. Automatic screw machines, drill presses and other machinery have been purchased, and more tools will be purchased as requirements demand.

The Bath Iron Works, Ltd., Bath, Maine, shipbuilder and engineer, states that it proposes to rebuild at once that part of its plant which was recently destroyed by fire, including the boiler and copper shops, and will be in the market for equipment to replace that which was lost, including machine tools, traveling crane and steel for the buildings. The loss included eight of the boilers for two new torpedo boat destroyers in process of construction.

The Bridgeport Wire Bound Box Company, Bridgeport, Conn., which will manufacture a new patent wooden box bound with wire in such a manner as to tend toward

strength and lightness, has leased a tract of land on the water front at Bridgeport, and will build a plant and will as soon as possible. The company is not yet ready, however, to give out details as to the buildings, nor the machinery which will be required to equip the works. The stock of the company is held principally by men prominent in the management of the Yale & Towne Mfg. Company, Stamford, Conn. W. H. P. Roots is president, Charles O. Collett, vice-president and William Arthur, secretary and treasurer.

The John T. Young Boiler Company, Norwich, Conn., which will manufacture heating boilers as already stated, has organized with John T. Young, Norwich, as president; A. W. Dodge, Springfield, Mass., secretary and treasurer, with A. J. Dawley, Norwich, as the third director. The officers state that the equipment for the new shops has been contracted for.

The Hydrocarbon Converter Company, New London, Conn., has bought a tract of land with water front in that city, and will erect works for the manufacture of a new device designed to make possible the use of crude oil as fuel in the ordinary type of combustion engine. The plan is to proceed with the building immediately, though details are not yet ready for announcement. According to description furnished by the company the device is attached to the exhaust pipe close to the engine, and the crude oil passing through it is decomposed, and the resulting gas fed to the engine between the carburetter and cylinder, or may be stored in a tank and used as required. It is claimed that a very high per cent. of pure gas is obtained, the figure given out being 93 per cent., and that the device will not only make possible the use of crude oil in gasoline engines but one-third more power is produced. The relative cost of the two fuels is about as 4 to 12 cents. The company is incorporated in Delaware, with an authorized capital stock of $100,000.

Philadelphia Machinery Market.

PHILADELPHIA, PA., June 23, 1908.

The past week has brought out somewhat more than the usual run of business. Sales of single tools have been a little heavier, and there have also been a few sales of larger lots of tools for small plants and minor extensions. The trade feels more encouraged with the prospects, and while it is not expected that any great volume will come out during the summer months, it is anticipated that a material resumption will develop during the fall months, and that normal conditions may be looked for early next year.

The railroad situation is looked upon more hopefully. The conventions of the Railway Master Mechanics' and Master Car Builders' associations at Atlantic City the past week have brought the trade in closer touch with the railroad situation, and it is believed that, with the large number of idle cars on railroad sidings, the larger proportion of which are in need of considerable repair, it will be necessary for the railroads shortly to begin work on these cars to place them in order for service in the fall, when crops begin to move and business generally is expected to revive. Some roads are said to be already having lists prepared, so as to cover their needs, but it is more than likely that these will be held up for a time, pending a little clearer insight into the situation. The industrial plants show little inclination to enter the market, their present equipment, in most cases, being far more than sufficient to take care of the business already in hand. These, like many other industries, are dependent to a large extent on the railroads.

There has been but little development of importance in the foreign trade. Inquiries have been comparatively light, and are largely confined to special tools, for which some few orders have been booked.

The demand for second-hand tools and machinery continues quite brisk. The business transacted has been largely in single tools, particularly those of the medium classes, although some inquiry for tools of the heavier types is reported. In the aggregate, sales have averaged up fairly well, and prices are reported as being satisfactory. In the second-hand boiler trade business is only fair, there being not as large a demand for power equipment as there is for tools. Sales of some few installations of new, medium and larger power boiler equipment are reported.

Neither the steel casting plants nor the gray iron foundries report much increase in business. There have been some gains made in tonnage, but orders are still pretty well scattered and usually small and for prompt shipment. But little business develops from the machine tool trade. The railroads show no disposition to buy, and business on the whole is still largely of a day to day character.

The Commissioner of Health, Harrisburg, Pa., will receive bids until June 30 for furnishing and erecting a complete garbage and refuse disposal plant at the State South Mountain Sanatorium, Mont Alto, Pa. Ingenuity of design and economy of operation will, it is understood, be given consideration in the awarding of the contract.

The Ferracute Machine Company, Bridgeton, N. J., reports business to have improved considerably in the past three weeks, particularly in the Philadelphia District. May showed an improvement in orders over April, and in the first 10 days of June orders amounting to half of the entire amount booked in May were received, so that the outlook for June is considered favorable.

The Union Twist Drill Company, Athol, Mass., will establish on July 1 a branch sales and distributing office for its line of milling cutters and twist drills in Section Z, Bourse Machinery Hall, in charge of George J. Hawkey. A large stock of both milling cutters and drills is to be maintained at the new branch.

The Millville, N. J., City Council has instructed its Sewer Committee to consult an engineer and have plans prepared for the construction of a sewage disposal plant and to begin work at once. The new plant is estimated to cost about $20,000.

The Bethlehem Foundry and Machine Company, South Bethlehem, Pa., reports a steady improvement in business since January 1. May was the best month of the year. This company has a number of important contracts on hand, including one for highly ornamental electroliers, designed by Carrere & Hastings, New York City, for Atlantic City, N. J. Further orders include power pumps for water works and contracts for ornamental iron work for the Whitney Building, San Francisco; Seneca Hotel, Rochester, N. Y.; Sage Building, Rochester Polytechnic Institute, Rochester, N. Y., and entrance kiosks for the Hudson River tunnels at Hoboken, N. J.

It is understood that the Fowler & Wolfe Mfg. Company, Norristown, Pa., has awarded a contract for an addition to its machine shop.

The Fairbanks Company has completed alterations to its offices and salesrooms at the northwest corner of Seventh and Arch streets. These included the taking in of the ground floor of the two adjoining buildings, 707 and 709 Arch street, and the complete rearrangement of the interior. Over 8000 sq. ft. of floor space, more than double the former amount, is now given over to the display of machine tools, scales, gas engines, power transmission equipment, valves, small tools and general supplies, each department being given a separate floor space. The small tool department has been increased materially, and the arrangement and facilities made for handling this class of business are most complete. The business and accounting department, as well as the display floor, are exceptionally well lighted by means of a large overhead skylight, and the whole general arrangement embraces the most modern ideas in connection with the machinery and supply business. Business is reported by the company to be in fairly satisfactory condition.

St. Louis Machinery Market.

ST. LOUIS, June 23, 1908.

Of late both manufacturers and dealers are finding an increase in the inquiry for machinery, and more sales are resulting than was the case last month. While in general the feeling is better, there are some lines which have no marked improvement to report. There is a fair demand for second-hand machinery.

In metal working machinery a better inquiry is found, without much increase in sales. Business in machine tools shows some improvement. Saw mill machinery is still in slow demand, though an improvement is noted in the sale of woodworking machinery. Pumps and small boilers are in better request. Flour mill machinery is ruling dull. Heavy boilers are in some demand and there is a moderate call for small engines. Wire rope is in steady and fairly good demand. Electrical appliances of all kinds meet with ready sale and the automobile industry is finding conditions improved.

The Vacuum Cotton Picking Machine Company of St. Louis has been incorporated, with a capital stock of $750,000, to manufacture and place on the market a cotton picker operated by compressed air, with gasoline power. John S. Thurman, who is president, is also head of the General Compressed Air & Vacuum Machinery Company.

Government Purchases.

WASHINGTON, D. C., June 23, 1908.

The Bureau of Yards and Docks, Navy Department, Washington, will soon ask bids for a coal handling plant for the new central power house at the New York Navy Yard.

The Isthmian Canal Commission will shortly ask proposals for six-roller bearing geared ratcher screw jacks, 35 tons capacity, one single and six duplex cableways, with the necessary motors, and other supplies.

The following bids were opened June 15, Circular No. 443, for supplies for the Isthmian Canal Commission:

[illegible]

New York, $190; 42, J. A. Fay & Egan Company, Cincinnati, Ohio, $243; 44, Fox Bros. & Co., New York, $213.25; 45, Fox Machine Company, Grand Rapids, Mich., $242; 52, Handlan-Buck Mfg. Company, St. Louis, Mo., $257; 60, International Electric & Engineering Company, New York, $164.45; 74, Manning, Maxwell & Moore, New York, $285; 94, Oliver Machinery Company, New York, $275; 109, Charles E. Robidoux, St. Louis, Mo., $266; 123, H. B. Smith Machine Company, Smithville, N. J., $224; 147, J. K. Larkin & Co., New York, $257.48.

Class 4.—One universal saw table—Bidder 2, American Woodworking Machinery Company, Rochester, N. Y., $320; 14, Bentel & Margedant Company, Hamilton, Ohio, $200 and $225; 37, Drew Machinery Agency, Manchester, N. H., $189; 40, Fairbanks Company, New York, $196; 42, J. A. Fay & Egan Company, Cincinnati, Ohio, $257; 44, Fox Bros. & Co., New York, $198; 45, Fox Machine Company, Grand Rapids, Mich., $346; 52, Handlan-Buck Mfg. Company, St. Louis, Mo., $272; 60, International Electric & Engineering Company, New York, $188; 74, Manning, Maxwell & Moore, New York, $290; 82, Motley, Green & Co., New York, $150; 94, Oliver Machinery Company, New York, $370; 101, Prentiss Tool & Supply Company, New York, $328, $335.50 and $348; 109, Charles E. Robidoux, St. Louis, Mo., $205; 123, H. B. Smith Machine Company, Smithville, N. J., $207.50.

Class 5.—One band saw—Bidder 2, American Woodworking Machinery Company, Rochester, N. Y., $110; 4, Atlantic Works, Philadelphia, Pa., $105; 14, Bentel & Margedant Company, Hamilton, Ohio, $150; 37, Drew Machinery Agency, Manchester, N. H., $90; 40, Fairbanks Company, New York, $92.50; 42, J. A. Fay & Egan Company, Cincinnati, Ohio, $132; 44, Fox Bros. & Co., New York, $98; 45, Fox Machine Company, Grand Rapids, Mich., $115; 52, Handlan-Buck Mfg. Company, St. Louis, Mo., $139; 60, International Electric & Engineering Company, New York, $85.25; 74, Manning, Maxwell & Moore, New York, $152; 82, Motley, Green & Co., New York, $115; 94, Oliver Machinery Company, New York, $189; 109, Charles E. Robidoux, St. Louis, Mo., $149; 123, H. B. Smith Machine Company, Smithville, N. J., $134; 124, Southern Trading Company, New Orleans, La., $105.

The following bids were opened June 16 for supplies for the navy yards:

Class 1.—Twenty ammunition hoist equipments—Bidder 38, Cutler-Hammond Mfg. Company, Milwaukee, Wis., $1826.75, $1857.25 and $1927.50; 86, General Electric Company, Schenectady, N. Y., $2198.50 and $2550.50.

Class 2.—Twenty ammunition hoist equipments—Bidder 38, Cutler-Hammond Mfg. Company, Milwaukee, Wis., $1826.75, $1856 and $1917.50; 86, General Electric Company, Schenectady, N. Y., $2183.50 and $2546.

Class 3.—Twenty 15-hp. elevating equipments—Bidder 51, Diehl Mfg. Company, Elizabethport, N. J., $10,946; 86, General Electric Company, Schenectady, N. Y., $9984 and $10,044; 139, Northern Electrical Mfg. Company, Madison, Wis., $9160; 183, B. F. Sturtevant Company, Hyde Park, Mass., $8960.

Class 4.—Twenty 10-hp. rammer motors—Bidder 51, Diehl Mfg. Company, Elizabethport, N. J., $4114.60; 86, General Electric Company, Schenectady, N. Y., $4090 and $4106; 139, Northern Electrical Mfg. Company, Madison, Wis., $3955; 183, B. F. Sturtevant Company, Hyde Park, Mass., $4558.

Class 5.—Twenty 10-hp. rammer controllers—Bidder 38, Cutler-Hammond Mfg. Company, Milwaukee, Wis., $3500; 86, General Electric Company, Schenectady, N. Y., $5346 and $5658.

Class 6.—Twenty 30-hp. breech opening equipments—Bidder 51, Diehl Mfg. Company, Elizabethport, N. J., $4816; 86, General Electric Company, Schenectady, N. Y., $4882 and $4942; 139, Northern Electrical Mfg. Company, Madison, Wis., $3020; 183, B. F. Sturtevant Company, Hyde Park, Mass., $3136.

Class 21.—One Dow vertical plunger pump—Bidder 16, Baker & Hamilton, San Francisco, Cal., $613.50 and $893.10; 20, Berry & Aikens, Philadelphia, Pa., $764; 49, George E. Dow Pumping Engine Company, San Francisco, Cal., $800; 55, Dean Steam Pump Company, New York, $470; 135, National Electrical Supply Company, Washington, D. C., $584.

Class 71.—One 20-inch geared bench engine lathe—Bidder 83, Garvin Machine Company, New York, $1216; 91, Hendey Machine Company, Torrington, Conn., $1420 and $1460; 115, Manning, Maxwell & Moore, New York, $1420 and $1460; 136, Niles-Bement-Pond Company, New York, $1399; 146, Prentiss Tool & Supply Company, New York, $1325; 195, Springfield Machine Tool Company, Springfield, Ohio, $1520.

Class 72.—One 6-inch stock turret brass lathe—Bidder 4, American Tool & Machine Company, Boston, Mass., $720; 115, Manning, Maxwell & Moore, New York, $805; 156, Pratt & Whitney Company, Hartford, Conn., $1363; 195, Springfield Machine Tool Company, Springfield, Ohio, $915; 222, Warner & Swasey Company, Cleveland, Ohio, $810; 71, Fairbanks Company, New York, $811.

Class 73.—One turret hand screw machine—Bidder 24, Brown & Sharpe Mfg. Company, Providence, R. I., $891; 156, Pratt & Whitney Company, Hartford, Conn., $845; 222, Warner & Swasey Company, Cleveland, Ohio, $695; 71, Fairbanks Company, New York, $652 and $719.

Class 74.—One mounted precision milling machine—Bidder 213, Waltham Watch Tool Company, Springfield, Mass., $715 and $725; 71, Fairbanks Company, New York, $697.77.

Class 75.—One internal keyway cutting machine—Bidder 74, W. H. Bodfer Company, New York, $785; 130, Nutt & Merrill, Saginaw, Mich., $690 and $740; 146, Prentiss Tool & Supply Company, New York, $775; 71, Fairbanks Company, New York, $75[illegible].

Class 80.—Twelve chain hoists—Bidder 18, Brown Hoisting Machinery Company, New York, $883.50; 69, Frevert Machinery Company, New York, $615.78; 76, G. & W. Mfg. Company, New York, $612; 79, R. W. Geldart, New York, $750; 105, Wm. B. Kendall, Washington, D. C., $712.68; 115, Manning, Maxwell & Moore, New York, $669.96; 123, Manhattan Supply Company, New York, $657.08; 124, Motley, Green & Co., New York, $705.60; 194, Ivan Spangerberg, New York, $762 and 670.26.

Class 81.—Four induction motors—Bidder 23, Burke Electric Company, Erie, Pa., $1774; 50, Drew Machinery Agency, Manchester, N. H., $1932.64; 86, General Electric Company, Schenectady, N. Y., $1678; 110, Lincoln Electric Company, Cleveland, Ohio, $1600; 216, Western Electric Company, New York, $1696; 217, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., $1706; 219, Wagner Electric Mfg. Company, St. Louis, Mo., $1547.08, $1347.96 and $1256.68.

The following bids were opened at the Bureau of Yards and Docks, Navy Department, Washington, D. C., June 13, for an air compressor with accessories for the navy yard, Philadelphia, Pa.:

Item 1. Net price for compressor machinery complete in accordance with plan and specification.

Item 2. Net price for compressor machinery complete in accordance with plan and specification, except that all condensor equipment shall be omitted.

Nordberg Mfg. Company, Milwaukee, Wis., item 1, $26,800; 2, $22,600; Sullivan Machinery Company, Chicago, Ill., item 1, $35,677.

The Laidlaw-Dunn-Gordon Company, New York, has been awarded contract for the air compressor and accessories for the Bremerton, Wash., Navy Yard, at $27,000.

The Compressed Air Machinery Company, San Francisco, Cal., has been awarded contract at $1678 for installing a 150-hp. boiler in the pumping station at Fort Miley, Cal.

Under bids opened May 19 for machinery for the navy yards, the Chicago Pneumatic Tool Company, New York, has been awarded class 36, 12 electric drills, $1233.

Under bids opened June 9 for machinery for the navy yards, the Frevert Machinery Company, New York, has been awarded class 71, one motor driven grinder, $364.

The following awards have been made for supplies for the Isthmian Canal Commission, bids for which were opened June 8, Circular No. 442:

Manning, Maxwell & Moore, New York, class 10, one casting grinder, $48.

Henry R. Worthington, New York, class 12, two duplex steam pumps, $967.

The following awards have been made for machinery for the navy yards, bids for which were opened June:

Pratt & Whitney Company, Hartford, Conn., class 11, four screw cutting lathes, $1172.

Niles-Bement-Pond Company, New York, class 31, two radial drilling machines, $1719.

Becker-Brainard Milling Machine Company, Hyde Park, Mass., class 32, one cutter and reamer grinder, $550.

First Ore Cargo for the Wickwire Furnace.—The Wickwire Steel Company this week received its first consignment of ore at the docks of its new blast furnace plant, now nearing completion on the Niagara River just north of Buffalo, by the steamer Kensington from Duluth. It is expected that the furnace will be put in operation about September 1, and before navigation closes the company is to receive 350,000 tons of ore. An interest has been purchased by the company in the steamers Caledonia and Italia, and these boats will be placed in commission at once to bring forward stock ore. A contract has also been given to John G. Borland & Co. of Buffalo to bring 140,000 tons of ore down the lakes to the new plant before the season closes.

Press reports that the Youngstown Sheet & Tube Company, Youngstown, Ohio, has received large orders for pipe lines for delivery in California and Oregon, which would keep its pipe mills in full operation for the next 12 months, are absolutely untrue. The reports probably arose from the fact that recently Geo. E. Day, secretary and general sales agent of the company, and H. W. Hock, superintendent of the pipe department, made a visit to the California oil fields to investigate the situation and become acquainted with the trade in general on the Pacific Coast. Mr. Hock has returned from the coast and Mr. Day is on his way home, making stops in different large cities, and expects to reach Youngstown early in July.

The Westinghouse electric interests in Germany are stated to have formed a combination with the Bergmann Electric Company of Berlin, whereby the latter will install the Westinghouse electric traction system in that country. The Prussian State Railway Administration has decided to electrify the steam railroads, $12,500,000 having been appropriated to begin this work. The Bergmann Electric Company is a semi-American concern, as the head of the company, Sigmund Bergmann, was the partner of Thomas A. Edison for a number of years. The company has works in Berlin, employing 5000 men.

The Arthur Koppel Company, Koppel, near Beaver, Pa., recently made shipment of 200 mine cars to the Copper Queen Consolidated Mining Company, Bisbee, Ariz. The cars are side dumping and specially designed for this work. The Koppel Company is building six dump cars of the three-body standard gauge type, each of 12 cu. yd. capacity, for a Western railroad.

The Standard Iron Company's furnace at Goodrich, Tenn., which has been out of blast since late in December, will be blown in about July 1 on foundry iron. The capacity is 50 tons a day.

HARDWARE

WHILE something has been accomplished in the way of inducing the catalogue houses to refrain from quoting unreasonably low prices on special or trademarked goods, there is still ground for complaint in this regard. It may indeed be said that the naming of low prices on such articles in a certain way operates to the manufacturer's advantage, as it results in a larger sale than there would be if materially higher prices were quoted. The publication of a low price in catalogues which are scattered broadcast establishes, however, a general price which yields a narrow margin of profit to the retail merchant. Under such circumstances he is tempted to stop selling the goods in question or at least takes little interest in them, and perhaps pushes something else that pays him better. This is a matter which should continue to receive the careful attention of manufacturers whose goods are handled by the great retail mail order houses. While the human nature which is dominant in the control of the catalogue houses will resent anything like dictation, it will be found that reasonable requests, courteously made, will often result in a prompt correction of the trouble. This suggestion is made in view of the success of recent efforts in this direction.

Very interesting and suggestive if true is the report given currency in the daily press that a prominent Chicago catalogue house has announced that it will discontinue selling groceries and drugs, on account presumably of the inconvenience suffered from the operation of the pure food law. It will remind the trade that the retail mail order houses, notwithstanding their great business, have their own troubles, and have to reckon not only with the opposition of the merchants and manufacturers, but also with statutes which were enacted without any thought of their bearing upon the business of these houses.

A desire on the part of employers to secure the comfort and well being of their workmen is unquestionably more general than is commonly supposed. The problem, however, is confessedly difficult and is seriously complicated by the fact that injury is likely to result from patronizing the men and giving to them opportunities and facilities which they are able to provide for themselves. It is essential that the self respect of the employees should be preserved and that measures looking to their health, comfort and uplifting should not tend to pauperize them, as is too often the case where charities are unwisely bestowed. Some of the most successful efforts along this line are in connection with clubs or organizations for which the men themselves are responsible and which they conduct under rules and regulations of their own making. The furnishing by the manufacturers of the rooms or building for the men, with a few fundamental restrictions, as for example, that there shall be no drinking or gambling, leaves ample scope for the activities and ability of the men in directing the affairs of the club, in which, as an institution of their own, they can take a genuine pride. This is much better than to thrust upon them comforts and refinements in the providing of which they have no part. How best to secure the welfare of employees is one of the problems of management, the responsibility of which cannot be evaded and the proper recognition of which adds dignity to the position of the manufacturer, for there are thus put within his reach opportunities of broad and permanent usefulness.

Condition of Trade.

Whether the season, so far as climatic conditions are concerned, is early or late, there is general agreement that the mid-summer dullness is here a little in advance of schedule. Whatever may be the feeling suggested by current business a good deal of satisfaction is expressed that a retrospect of the past eight months shows many dangers and disasters escaped, while a look into the future finds in the prospects for great crops an admirable foreground for better commercial and industrial conditions, the coming of which, it is hoped, will not be too long deferred. The proximity of the vacation season also has its part in contributing to the relaxed pressure. While it may be a matter of regret to employers and those in positions of responsibility that trade is less exacting than a year ago they are usually able to take refuge in the consideration that it is, so far as the immediate demands of business are concerned, easier than it was last summer to get away from store or factory and enjoy a respite from business cares. This is especially the case as conditions are such that no important change in their main features is regarded as imminent, the general impression being that the coming months will witness a gradual working out of existing conditions; and, unless the unexpected occurs, without violent upheaval or disturbance of a fairly satisfactory state of things by either a sudden reappearance of prosperity on the one hand or of anything disastrous on the other. It should be said, however, that in some agricultural sections business is reported, especially by the retail merchants, as moving along without material diminution from last year's volume. Such experience is, however, far from uniform, and most retail merchants report, with a good measure of cheerfulness it may be hoped a falling off more or less serious in the volume of their business as compared with last June. Meanwhile it is to be noted that the preparation which is being made for better times is constant, but very gradual. Little by little the finances of the country at large, and it may be assumed of individual business houses generally are getting in better shape. Stocks certainly are constantly being depleted, and will soon, if the present process be continued, be very small. From week to week there are a good many recessions in price, few of which are violent, and most of them of only moderate extent. There are indications on many sides of a returning confidence and a renewal of enterprise, still however on conservative lines. Taken all in all, the existing situation gives little ground for complaint and still less for apprehension. The first half of 1908 has made a good record when all the circumstances are considered, and will serve as an admirable prelude to the months to come in which great harvests are to be gathered, to be followed by an era when labor will again be generally employed, and merchants and manufacturers busy in taking care of the wants of a prosperous people.

Chicago.

Coming at a time when the Hardware trade is, under any conditions, seasonably dull it was hardly to be expected that the recent reduction in price of Wire and Nails would be followed by an immediate rush of new business. The cut made was in the first place too conservative to invite speculative purchases, and, moreover, the present rate of consumption is not rapid enough to compel increased buying for actual needs. While the total volume of business for June will doubtless show some

falling off, as compared with May, the result will be accepted with equanimity by the trade, since it is realized that the industrial problem involved in the present situation is one that requires the exercise of courageous patience. One by one, however, the doubt breeding uncertainties which retard commercial progress are being settled. Recent favorable crop reports have done much to inspire confidence, for with the outpouring of another bountiful harvest must come a stimulus whose potent force will be felt in every line of business. Another element of political uncertainty having a more or less direct influence upon industrial developments has been disposed of in the recent Presidential nominations made at the Chicago convention. The deep seated conviction in the public mind that following the November elections, when the political issues will have been definitely settled, there will be a positive forward movement in trade activities, will go far toward establishing that feeling of confidence which is a necessary prerequisite to this much desired result. It is evident that buyers, both retail and wholesale, are not disposed to consider more than their immediate requirements in placing orders, and no immediate change in this respect is in prospect. Exceptional activity of noteworthy prominence is not observed in any special line of goods, save that Lawn Mowers have been in relatively better demand than other seasonable goods. Dealers also state that in addition to a fair run of second orders there has been a gratifying increase in the demand for the better grades of Mowers, indicating a tendency among users to give more consideration to quality. A belated demand for Garden Hose is beginning to make its appearance, but its extent will be largely determined by future weather conditions which, up to this time, have been decidedly unfavorable to its sale.

NOTES ON PRICES.

Wire Nails.—In view of the present condition of trade in general the business received by the mills is regarded as of fair volume. Orders are restricted to immediate requirements, which are light, with no immediate indications of a change of policy in ordering. Quotations for base sizes are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$1.95
Carload lots to retail merchants	2.00
Less than carload lots from mill	2.25

Galvanized Nails are quoted at $1 over the price of the regular Nails.

New York.—City business is comparatively quiet, while that from near-by points is somewhat more active. A few out of town merchants who had been buying in small lots at store, have ordered carloads since the reduction in price. This is not at all general, however, and the volume of business is light. Nails are being held on the basis of $2.40, in small lots at store, with occasional concessions of 5 to 10 cents per keg.

Chicago.—Although buyers are restricting their orders very closely to the immediate demands of the trade a fair amount of such business, considering the usual seasonable dullness, is being entered by the mills. Under existing circumstances it is unlikely that there will be any immediate change in the situation as respects the attitude of buyers. Confidence in the stability of present price levels and improved demand will probably precede a change in the present hand to mouth order of buying. Quotations are as follows: $2.13, in car lots to jobbers, and $2.18 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The recent reduction of 10 cents per keg has not as yet stimulated demand, which is still confined to small lots for current needs. Jobbers do not show any inclination to stock up beyond requirements, being of the opinion that present conditions do not justify them in anticipating future needs. An increase in demand for Wire Nails is expected early in August for the fall trade, but the general belief is that July will be a quiet month. The mills are able to make spot shipments on orders, and we are advised that prices are being maintained. Quotations for base sizes are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$1.95
Carload lots to retail merchants	2.00

Cut Nails.—The quietness which has characterized the Cut Nail market continues, while prices have not regained the position held before the recent reduction in Wire Nails. Iron Nails, made from Muck Iron or Wrought Scrap, are in more demand in the Western section of the country than in the Eastern, and command an advance of about 10 cents a keg over Steel Cut Nails. Eastern buyers as a rule are unwilling to pay the difference in price, and the preference is usually given to the Steel Nails. The price for Steel Nails at mill is reported to be a $1.75 base, with the probability that it would be shaded for desirable orders, small lots being held at $1.80 to $1.85, base, at mill.

New York.—No increase is noted for Cut Nails in the local market and orders are for small quantities. Cut Nails are held on the basis of $2.15 per keg for small lots at store.

Chicago.—Prices have declined in ratio with the recent reduction in price of Wire Nails, but are not established on as firm a basis as the latter. The demand is exceedingly light, and in consequence jobbers' stocks are reduced slowly, necessitating but infrequent orders for replenishment. Prices are revised and Chicago quotations are about as follows: In car lots to jobbers, Iron Cut Nails, $1.98; Steel Cut Nails, $1.93; in small lots from store, Iron Cut Nails, $2.10; Steel, $2.05.

Pittsburgh.—Orders being placed are few and are still confined to small lots for actual needs. Jobbers still decline to buy ahead, and claim that present conditions of the market justify their course. We quote Steel Cut Nails at $1.75, at mill, but on a desirable order this price could be shaded. Small lots are held at $1.80 to $1.85, at mill. Iron Cut Nails are quoted at about $1.80, at mill.

Barb Wire.—The volume of new business being received by the mills is exceeding light, owing to the advanced season, and no improvement is anticipated at present. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.10	$2.40
Retailers, carload lots	2.15	2.45
Retailers, less than carload lots	2.25	2.55

Chicago.—Mid-season dullness, in which under normal conditions trade is usually inactive, rules in this commodity. There is practically no new buying and not much is expected for 30 days, at least, when the new season opens. Crop conditions hold promise of a generous demand when fall trade begins. Quotations are as follows: Jobbers, Chicago, car lots, Painted, $2.28; Galvanized, $2.58; to retailers, car lots, Painted, $2.33; Galvanized, $2.63; retailers, less than car lots, Painted, $2.45; Galvanized, $2.75; Staples, bright, in car lots, $2.25; Galvanized, $2.55; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—This is the off season of the year in this trade, and the fact that very few orders and for only small lots are being placed is not construed by the mills to be other than the natural result of present conditions. A fair amount of tonnage is being placed, but not much betterment in demand is expected for some little time. We are advised that prices are being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.10	$2.40
Retailers, carload lots	2.15	2.45
Retailers, less than carload lots	2.25	2.55

Plain Wire.—Demand continues quiet and is likely to continue so until purchases are made for the fall season. Quotations per 100 lb. to jobbers in carload lots are as follows, on a basis of $1.80 for Plain and $2.10 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the price to retailers being 5 cents additional:

Nos.	6 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.80	1.85	1.90	1.95	2.05	2.15	2.25	2.35
Galvanized	2.10	2.15	2.20	2.25	2.35	2.45	2.85	2.95

Chicago.—Governed largely by the requirements of fence makers, the demand for Plain Wire reflects the quiet movement of Barb and other fencing. Except in so far as it influenced the placing of waiting orders, the recent reduction in Wire prices did not stimulate buying. In view of the excellent crop prospects manufacturers are hopeful of decided improvement when the new season opens. We quote as follows: Car lots to jobbers, $1.98, f.o.b. Chicago, and to retailers, $2.05.

Pittsburgh.—The recent reduction of $2 a ton has stimulated demand to some extent, and in the past week local mills have entered some good sized orders for Fence Wire, showing that the farmers have again resumed Fence building, and that jobbers are buying more [illegible] mills anticipate a moderate volume of business for the next two or three months. Quotations per 100 lb. to jobbers in carload lots are as follows, on a basis of $1.80 for Plain and $2.10 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the price to retailers being 5 cents additional:

	9	10	11	12&12½	13	14	15	16
Annealed.....	$1.80	1.85	1.90	1.95	2.05	2.15	2.25	2.35
Galvanized.....	2.10	2.15	2.20	2.25	2.35	2.45	2.85	2.95

Vitrified Sewer Pipe.—The market on Standard Sewer Pipe and Fittings is in an unsatisfactory condition from manufacturers' standpoint, owing to animated competition for the little business in sight. While no change has been made in prices, to obtain desirable orders concessions are quite freely made from regular discounts which are as follows on carload lots of Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:

First class	87½
Second class	90½

Casters.—Slightly lower prices are reported on Casters. The market may now be represented by the following discounts: Bed, 65 and 10 to 70 per cent.; Plate, 60 to 60 and 5 per cent.; Philadelphia, 70 and 10 to 75 per cent.

Hatchets.—Some uncertainty is felt regarding the future course of the market on Hatchets, which has for some time presented a pretty regular appearance. A feature of the situation is the appearance in the Hatchet field of a well-known manufacturer of Axes, the effect of which remains to be seen. There is also a possibility that manufacturers may think it unwise to continue working along the lines which they have been following. A conference is being held in this city as we go to press.

Nuts. A general decline has been made in prices on Cold Punched Nuts, which are now quoted as follows:

	Off list.
Square	5.40 @ 5.50
Hexagon	6.00 @ 6.10
Square C. T. & R.	5.80 @ 5.90
Hexagon C. T. & R.	6.60 @ 6.70

Prices on Hot Pressed Nuts remain nominally unchanged. As in the case of Bolts, concessions on Nuts will be made by most manufacturers to secure business.

Coil Chain.—[illegible] condition which has for several months prevailed in the Coil Chain market. Prices are irregular and very low quotations are named in efforts to secure orders of any account.

Spoke.—[illegible] and Annealed are quoted on a base of 75 per cent. and the Copper and Brass on a base of 70 per cent. Beyond these base discounts further concessions are obtainable.

Sad Irons.—Declines in raw material are reflected in lower quotations on common Sad Irons. A quotation of $2.50 to $2.75 per 100 lb. may be named as representing the market in a general way for small lots, factory shipments being given a lower figure, which varies with quality of the goods and the special circumstances.

Bolts, Common Carriage and Machine.—While there is little material change in the situation, the Bolt market seems a trifle weaker, concessions formerly confined to the very largest buyers being offered with less discrimination. [illegible] carry a [illegible] that certain [illegible] prices which they recommend must be regarded as somewhat nominal. Many are apparently desirous of booking orders and inclined to make concessions to buyer's views when the narrow margin of profit will justify it.

Asbestos.—The market for Asbestos products, in some of the heavier lines, has experienced a decline, the prices in many instances depending in a measure on the necessities of producers. The stronger houses, manufacturing specialties also, peculiar to themselves, are holding Mill Board at about 3 cents per pound, while as low as $2.35 to $2.40 per 100 lb. has been made in large lots by other makers. Asbestos Paper regularly is held at about 2½ cents per pound, but this also has been cut in some [illegible] to 2 cents in large lots. [illegible] Packing for several reasons seems to show no diminution in price, it being held at 20 cents per pound in any quantity. Asbestos Material is approaching the basis of several years ago when raw stock and labor was much lower.

Copper Products.—Sheet Copper is [illegible] nominally 17 cents per pound base, but it has been sold at much lower prices, largely by Western mills. There is also quite a concession in the price of extras, varying from 15 to 25 per cent. discount from the list. Copper Rods, round are held at 15½ cents, rectangular Rods, 16½ cents; Copper Tubes, base, 18 cents; Brass Rods, 14¾ cents; Brass Wire, 15½ cents, and Sheet Brass, 14½ cents, base, per pound. There is very little doing, every one apparently waiting for a turn in the market, when, with some advances, it is expected buying will become [illegible]

Window Glass.—Additional Glass factories have closed down during the week, and July 1 will probably see nearly all of the hand operated factories out of blast, except a few that purpose making Glass throughout the summer months. Workmen have already begun dropping out of factories on account of the heat, and it is questionable whether enough men can be induced to remain at work to fully man all departments in the different factories that expect to continue operations. It has been estimated that stocks carried by hand operated factories do not now exceed 500,000 boxes, and that the American Window Glass Company may have an equal amount on hand, making the total stocks in the hands of all producers about 1,000,000 boxes. This, with stocks in jobbers' hands, is regarded as sufficient to meet all demands during the summer and early fall. Reports from different sections indicate that Window Glass is best purchased by retail merchants at 90 and 40 to 90 and 40 and 5 per cent. discount on Single, and 90 and 45 to 90 and 50 per cent. discount on Double Strength. At a meeting of the Eastern Jobbers' Window Glass Association, held last week, the following prices were recommended: New England and New York Metropolitan District, 90 and 30 per cent. discount for Single, and 90 and 35 per cent. discount for Double Strength: Eastern and Southern States, including the Carolinas, 90 and 35 Single, and 90 and 40 per cent. discount for Double Strength; extreme Southern States, including Florida, Georgia and Alabama, 90 and 30 for Single, and 90 and 35 per cent. discount for Double Strength Glass.

Rope.—No revival of interest has been manifested in the Rope market during the past week, and conditions remain [illegible] the same as previously noted. The demand is very moderate and buyers are keeping stocks down to the lowest possible dimensions. Quotations on Hemp remain unchanged. The Rope market is not very firm at the following quotations: Pure Manila, 10 cents; Pure Sisal, 7 cents; No. 1 Jute, ¼-in. and up, 5¾ cents; No. 2 Jute, ¼-in. and up, 5¼ cents.

Linseed Oil.—The market is a little easier as a result of a moderate demand both in the way of prompt and nearby delivery. Crushers are not soliciting contract orders covering a long period of deliveries, as the future of the Oil market is too uncertain to offer them inducements to take risks. The demand is largely restricted to small lots for immediate delivery. Local quotations are as follows: Standard Western Raw, 12 to 13

cents; City Raw, 44 to 45 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—Operators at Savannah continue to keep prices from going below 40 cents, despite the lack of active buying and large receipts. In the local market the demand is of a hand to mouth character, while manufacturing interests are commencing to cut down purchases for the summer months. The New York market is represented by the following quotations: Oil Barrels, 42½ to 43 cents; Machine Made Barrels, 43 to 43½ cents.

Automobile and Bicycle Supplies.

AN interesting addition to Hardware trade literature is furnished in a new Automobile and Bicycle Supply catalogue recently issued by Hibbard, Spencer, Bartlett & Co., Chicago. Many wideawake Hardware merchants are gradually and progressively extending their lines of Automobile Supplies, which are found to embrace many articles that can be conveniently and profitably handled in connection with Hardware stocks. It is not intended, nor is it practicable to carry Heavy Engine and Machinery Parts, this being the province of the garage and manufacturer; but there is a growing number of Accessories which are more easy of access to the cross country tourist in Hardware stores than elsewhere, and as soon as it is understood that they can be found in such stores the trade will profit by this new patronage. It will, of course, be only the simpler needs that are thus served in the beginning, but there is even more room for development here than was the case with Bicycle Acessories, which have long found an established place in Hardware stocks. The catalogue above referred to is 9¼ x 12 in., with paper covers, and contains 63 well illustrated pages, in which are listed and described 1908 models of Hibbard, Ajax, Mars and Oriole Bicycles, 1907 Hibbard Motor Cycles and an extensive assortment of supplies for both Bicycles and Automobiles. The latter include Carburettors, Oilers, Dry Batteries, Tires, Patching, Rubber Tire Lacing, Lamps, Liquid Rubber Cement, Chain Lubricants, Sparkers and Spark Coils, Spark Plugs, Ammeters, Indicators, Timers, Speedometers, Clocks, Windshields, Tires, Chain Tire Grips, Horns, Goggles and Automobile Repair Kits and Wrenches. For those interested in such goods, the catalogue will prove a useful reference book.

Pittsburgh Screw & Bolt Company.

THE PITTSBURGH SCREW & BOLT COMPANY, Pittsburgh, Pa., manufacturers of Machine Bolts, Boiler Stay Bolts, H. P. and C. P. Nuts, Set and Cap Screws, Special Finished Work, &c., has taken advantage of the recent depression in business to make some large additions to its plant, including a steel frame building 100 x 100 ft. in size, which will very much increase the capacity for cold work. Since the business of the company was established in Pittsburgh, it has steadily grown and it now occupies the entire square bounded by Liberty avenue, Penn avenue, Twenty-fourth and Twenty-fifth streets. The officials of the company are John R. McGinley, president; Thomas W. Smith, vice-president and treasurer, and Wm. G. Costin, vice-president and general manager.

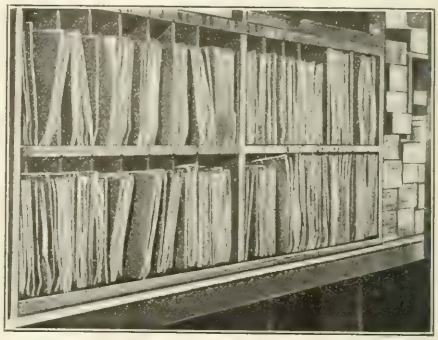
LEE & UNDERHILL, 98 Chambers street, New York, manufacturers and wholesalers of Sporting Goods, will act as salesmen for the National Arms & Stamping Company, maker of a single pattern of juvenile adjustable steel wheel sidewalk Roller Skates, which can be advantageously retailed at 50 cents per pair. The Skates have the extension principle for adjustment to varying lengths of foot, black leather heel and toe straps of excellent quality with tongued buckles. This line of Skates has been recently put on the market and they are especially adapted for use on sidewalks, asphalted streets and similar surfaces.

EDWARD H. KEATING, formerly with the Joseph Woodwell Company, Pittsburgh, Pa., and later with the Schwabacker Hardware Company, Seattle, Wash., has located in Denver, Colo., and is now connected with the George Tritch Hardware Company of that city.

An Eastern Merchant's Alphabetical File.

DESCRIPTIONS have recently appeared in our columns of several interesting features of the Hardware store of J. R. Gladwin, Westfield, Mass. The accompanying illustration shows an original and convenient file used by that merchant for the accommodation of graphophone records. In passing it may be noted that Talking Machines are now handled by many Hardware merchants all over the country, especially those who make a good deal of their Sporting Goods department. The former line is frequently connected with the latter and forms a popular and profitable off season specialty.

Such a file as that illustrated is very simple and easily constructed, but obviously might be successfully



Alphabetical File Constructed by J. R. Gladwin, Westfield, Mass.

applied to a variety of purposes. The horizontal shelves may be made as long or as wide as desired for the purpose in mind, and the width of the vertical compartments may be regulated accordingly. The latter are formed by cutting gains in the shelves and inserting thin partition boards, as will be clear from the reproduction. A different compartment may be devoted to each letter, or two or three letters may be grouped, as in the present case. A feature of this file is that the letters on the upper shelves apply also to the lower, the compartments of the former containing vocal records and the latter instrumental. Methods of applying this idea to files for other purposes will readily suggest themselves.

AMONG THE HARDWARE TRADE.

Ruby Valley Mercantile Company, Laurin, Mont., which handles Heavy Hardware, Stoves, Implements, Paints, &c., has disposed of the Dry Goods and Grocery departments of its business.

Bailey & Cathcart, Brock, Neb., have just completed an addition to their store building. It is of iron clad construction, 40 x 66 ft. in size, and affords the firm increased space, which was greatly needed.

Thompson Bros Hardware Company, Memphis, Texas, has succeeded to the general Hardware, Stove, Implement, Vehicle, plumbing and Sporting Goods business of Thompson Bros.

The Hurdland Hardware Company has been incorporated in Hurdland, Mo., to deal in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, Sporting Goods and Harness.

The Rosenthal Hardware Company, Batesville, Ark., wholesale and retail Hardware, Iron, Steel, &c., has amended its articles of incorporation reducing the capital stock from $50,000 to $25,000.

Hines & Prentice have succeeded to the Hardware, Stove, Implement, Paint and Sporting Goods business of J. D. Hines, Merid

9	10	11
80	1.85	1.90
2.10	2.15	2.20

KEEPING RECORD OF STOCK.

FOR the past four years a coal mining and steel manufacturing company has had in successful operation the system for keeping a record of stock herewith described. Record cards 4 x 6 in. in size are used, ruled and printed as in Fig. 1. Each article or size of article is given a separate record card, the one illustrated being devoted to ⅝ x 4½ in. Machine Bolts with Hexagon Nuts.

"Ave. Cons.," in the upper right hand corner of the card, means Average Consumption, this entry being made at the end of the year, when the monthly average is taken of the material used.

The card shows that the record is kept in the form of a ledger; for instance, Bolts are debited with the quantity received and credited with deliveries. As receipts and deliveries are entered the day after goods are received or delivered, the exact balance on hand may be struck at any time.

The Record Shown on the Card

is for the entire year of 1907. The first division to the left is used for entering dates on which stock was received, from whom purchased and the different quantities. The rest of the card is used to record the number

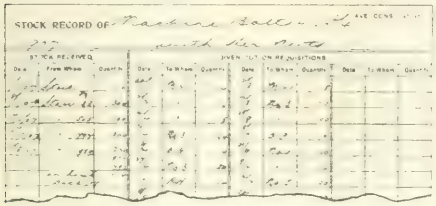


Fig. 1.—Card for Keeping Record of Stock.

of Bolts given out on requisitions and to whom. The receipts of goods are taken either from the receiving clerk's daily report or from invoices, provided they are vouchered immediately upon receipt of goods. Deliveries are taken from the shipping clerk's daily report.

The Card Index

has 600 guide or index cards, and more than 3000 record cards, upon which approximately $80,000 of stock is recorded, covering all material used in the plant. It re-



Fig. 2.—Arrangement of Guide and Record Cards in Box.

quires a clerk four hours of each working day to keep the record up to date. It has been found desirable not to have more than five or six record cards to each guide card. It will be recognized that in a manufacturing business it is not necessary to carry a complete assortment of any line of goods, but that certain standards in the various lines would cover all requirements. The same system may be applied to stocks of Hardware and kindred lines which would require a much larger card index.

The Arrangement

of the guide and record cards is shown in Fig. 2. Three colors of guide cards are used—pink, blue and buff. The heading "Facings" is on a pink card, "Fans" on blue and "Ferro-Silicon" on buff, the colors being repeated in the same order in successive rows. In front of the guide card "Facings" are record cards for Cream Soapstone, Charcoal, No. 2 Silver Lead, Ingot Mold and Sea Coal Facings, these being the different kinds required in the plant.

A Few of the Headings Used.

Following is a list of the headings on guide cards, from Fac to Lub:

Fans,
Facings,
Ferrosilicon,
Ferromanganese,
Felspar,
Felt,
Ferrules,
Figures,
Files,
Fishplates,
Fillett,
Fluorspar,
Flour,
Flanges,
Forgings,
Forks,
Frames,
Frogs and points,
Funnels,
Fuse,
Gaskets,
Gasoline,
Gauges,
Gears,
Glands,
Gluetrin,
Glue Pots,
Glue,
Glass,
Glasses,
Globes,
Gongs,
Graduates,
Grease,
Graphite,
Grindstone,
Grabs and parts,
Grates,
Hack Saws and parts,
Hammers,
Handles,
Hatchets,
Hay,
Hemp,
Heaters,
Headlights,
Hinges,
Hooks,
Hose,
Hoists,
Hydrant,
Ink,
Injectors,
Iron,
Jacks,
Jaws,
Japan,
Knives,
Knobs,
Lamp Black,
Lamps,
Lamps (Safety),
Lacing,
Lanterns,
Lagging,
Lathe,
Latches,
Level,
Leather,
Linings,
Lime,
Linen (tracing),
Links (railway),
Locks,
Lubricators.

The First Step

necessary in installing a record of this kind would be the taking of a detailed inventory of all material on hand, which would be entered on the cards. If desired, a column could be added on the right hand side of the card in which the balance on hand could be shown. Among the advantages which have resulted from the use of this stock record by the company are the following:

Purchasing agent can tell at any time what quantity has been received to date.

When requisitions are sent to him by the warehouseman he can ascertain the quantity required to order for stock for any period.

He can find the quantity of any article purchased from any particular firm during the year.

He can obtain the quantity on hand at any time.

It is also advantageous to the manager, as he can always be in touch with the consumption of any article in any part of the plant. It has been proved in a number of instances that the consumption of certain lines of goods could be considerably cut down. For instance, the company has been able to decrease its Oil and Waste consumption by 25 to 30 per cent.

The Burrows Hardware Company, Beeville, Texas, handling Hardware and Agricultural Machinery, has been incorporated with a capital of $40,000 under the State laws of Texas. The business, which was formerly owned by Burrows Brothers, has since 1890, when J. C. Burrows became sole owner of the present business, been run under the present title. The business will be conducted under the management of J. C. Burrows, as heretofore. The officers of the company are J. C. Burrows, president; B. P. Stephenson, vice-president; C. E. Williamson, secretary and treasurer.

J. S. Wallace of the firm of Yeates & Wallace, Starkville, Miss., has sold his interest to Zeno Yates, who will continue the business at the same location, handling Hardware, Stoves, Tinware, Agricultural Implements, Buggies, Wagons, Glass and China Ware.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

FLINT & WALLING MFG. COMPANY, Kendallville, Ind.: Illustrated Catalogue No. 57 describing in detail the Star Steel Back Geared Windmill, Model 7, together with Pumps, Tanks, Parts and Fittings, &c. The booklet is an attractive one intended for distribution among farmers and other consumers, and contains information of value to any one interested in the subject.

ALASKA FREEZER COMPANY, Winchendon, Mass.: Illustrated catalogue of Alaska and North Star Ice Cream Freezers, Parts, &c.

BUFFALO SCALE COMPANY, Buffalo, N. Y.: Illustrated catalogue and price-list, No. 500, covering an extensive line of Scales for all purposes.

CHANDLER & BARBER, Boston, Mass.: Illustrated Catalogue No. 9, referring to a complete line of Tools and Equipment for educational manual training with special reference to manual training schools and the requirements of the Sloyd system.

HARTWELL BROTHERS, Chicago Heights, Ill.: Illustrated catalogue and price-list of Hand Made Hickory Handles, Hickory, Ash and Oak Handles, &c.

CHICAGO DRYER COMPANY, Chicago: Catalogue No. 11, illustrating Chicago Sun Clothes Dryers for lawns, roofs, balconies, porches, drying rooms, &c.

MARSHALLTOWN DROP FORGE COMPANY, Marshalltown, Iowa: Large display card illustrating and describing several of the company's Drop Forged Tools.

SAMUEL WINSLOW SKATE MFG. COMPANY, Worcester, Mass.: 1908 illustrated catalogue of Ice Skates, illustrating and listing complete line and giving full information in regard to ordering; also attractive illustrated booklet referring to Roller Skates.

CLEVELAND TWIST DRILL COMPANY, Cleveland, Ohio: Illustrated circular and price-list referring to perfect double tang Sockets, which are said to prevent twisting off the tangs of taper shank tools and permit using tools with broken tangs.

NOVELTY IRON WORKS, Sterling Ill.: Illustrated catalogue of Porcelain Lined Cylinders for wood and iron Pumps, Iron Trimmings for wood pumps, Automatic Stock Fountains, Lawn and Cemetery Vases, Registers, Engine Grates and Gray Iron Castings.

JOHN LUCAS & Co., Philadelphia, Pa.: Descriptive price-list, including color cards, referring to a complete line of Paints and Varnishes for all purposes.

LETTERS FROM THE TRADE.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

A Window Display Criticised.

To the Editor: In your issue of the 18th inst. you illustrate a hardware show window display which struck me as very poorly got up, and I should like to know the opinions of others in regard to it. Who ever sells or displays hand sleds, skates, wheelbarrows and toy wagons (winter and summer goods) at the same season of the year?

Do table ware, chafing dishes, rifles and shotguns make a good combination for a display? Also wheelbarrows, machinists' tools and nickel plated ware?

Hand sleds and skates are not used when grape vines or trees are in leaf. This window trimmer certainly tried to put a sample of nearly every article in the store in one window.

WISCONSIN.

Trade Items.

NELSON LYON, secretary-treasurer of the Holt-Lyon Company, Tarrytown, N. Y., sailed on the Mauretania on the 24th inst., for an extended business trip to England, France and Germany. Mr. Lyon will visit these countries in the interest of the Egg Beaters, Carpet Beaters and other specialties manufactured by the company. We understand that a good demand for the Beaters has already been established in England.

JOHN DOUNAN of the W. S. Dounan Hardware Company, Richmond, Va., has been tendered and has accepted the position of secretary-treasurer of the Southern Hardware Jobbers' Association. The organization is to be congratulated on securing the valuable services of Mr. Dounan, who is a prominent and influential member of the association and who served most efficiently as president during the past year.

THE MARLIN FIRE ARMS COMPANY, New Haven, Conn., has issued a very attractive wall hanger, presenting a reproduction of an oil painting by Muss-Arnolt, depicting the flight of ducks at the close of the day, and showing two sportsmen in an old dug-out, with decoys well placed, taking toll of the passing flocks. A copy of the hanger will be sent postpaid on receipt of 10 cents in stamps.

IN a circular letter dated 15th inst., addressed to the members of the Michigan Retail Hardware Association, C. M. Alden, Grand Rapids, president, refers to business conditions and the outlook. A confident position is taken as to future trade, and merchants are urged to conduct their business with enterprise and energy.

THE 1908 IMPLEMENT BLUE BOOK, a trade directory of Farm Implements, Vehicles, &c., has been issued by the publishers of *Farm Machinery*, St. Louis, Mo. The first 284 pages give the kinds of goods, with their trade names, manufacturers and addresses. A Vehicle section relates to various kinds of Vehicles, including Automobiles. Appendix A, pages 302 to 369, groups the manufacturers by States and towns alphabetically, with brief references to principal lines, while Appendix B, pages 372-478, contains another arrangement of branch, jobbing and transfer houses for the sale and distribution of Implements, Repairs, Wagons, &c., by States and towns alphabetically. The last schedules enables buyers instantly to locate the nearest distributers of a given line.

IWAN BROS., Streator, Ill., manufacturers of Post Hole Augers and Diggers, Drain and Mining Tools, &c., are calling attention to their 12 and 14 in. Augers which differ somewhat from smaller sizes and are especially recommended for telephone and electrical companies and others requiring an Auger for large holes. The handles of these Tools are usually 5 ft. long or more, the 14 in. Auger weighing about 24 lb. and taking out about a foot of earth at each filling. While one man can operate this large tool, it is better for two to work it in stiff soil.

THE YALE & TOWNE MFG. COMPANY, 9-15 Murray street, New York, is having its enlarged quarters at this address thoroughly renovated, this being largely necessitated by the water damage resulting from a fire in one of the upper stories of the building more than two months ago. An important detail of the work is the rewiring of the whole building according to the latest practice to prevent fire from defective electrical insulation. In addition to the entire first floor above the street and other portions below previously occupied, the removal of Wiebusch & Hilger has enabled the company to secure a large amount of additional room on the second floor, which has direct connection with the main offices, the new space being in course of preparation for the company's purposes. This readjustment also provides room for the accommodation of the advertising department, which heretofore has been in a distant part of the building. These changes make possible a more convenient and compact organization which markedly improves the working facilities.

GEORGE F. TAYLOR, manager and secretary of the Corbin Cabinet Lock Company, New York, sailed recently for a pleasure tour of Europe, to occupy about three months.

AUSTRALIAN NOTES.

FROM OUR SPECIAL CORRESPONDENT.

MELBOURNE, May 11, 1908.

QUIETNESS is the phrase which will most accurately describe Hardware trade conditions during the past couple of months. While Australia as a whole has had fairly good rainfalls, the State of Victoria, holding one-fourth of the population of the continent, has had less than half its average fall for the first four months of the year. Country folk have got alarmed and have tied up their pockets rather closely. With good winter rains we shall be all right; without them trade will temporarily slump.

But it is well to note that the other States of the Commonwealth are having a good season, and it is a curious commentary on the vagaries of the clerk of the weather that Victoria, usually the most favored by him, is now under his displeasure. Our geographical position, however, practically assures an early return to better conditions.

Throughout the States there is a good and steady demand for Fencing Wire and allied lines, while building requirements of every kind are in general demand throughout Australia and New Zealand. Indeed, to introduce a personal note, your correspondent, with more than the average share of Australian enthusiasm for Australia, can scarcely reconcile the building activity of the past couple of years with the actual needs of the community. Yet trade was never on a better basis, financial engagements generally were never better kept, and failures are few.

Heavy goods are in fair, general demand for contracts under Government and municipal requirements. Shrinkage is chiefly apparent in household requirements, and can be no more than transitory.

A letter received 24 hr. ago from New Zealand contains the glad news that weather conditions there are once more favorable and everything augurs well for another real good season.

America's Share of Australian Trade.

There can be little danger, in spite of critics, of Australia "looking backward" in trade, unless we get another seven years' drought. And your correspondent has often been puzzled why your country appears to continue content with so small a proportion of Australian trade. One hears a good deal of American enterprise and "hustle," and yet the fact remains that the Hardware imports into Australia for 1906 totaled roughly £45,000,000 sterling, of which America sent us only one-ninth.

This share is surely capable of increase. As a suggestion would it not pay to have a warehouse in each capital city, or at least in Melbourne and Sydney? If a number of firms combined together to share the cost of this, the individual expense would be small. It would never do to sell goods there, the premises could only be used as a sample room for the exhibition of each firm's lines, and as a general bureau of information. The objection may be raised that every American firm possessed with the solid determination to "get in" here already has a representative on the spot, or could send one. True, but he can't be in every place on this big continent at once, and the permanent sample rooms in Sydney and Melbourne would invite numbers of casual callers whom he would otherwise never be likely to hear of.

It may be urged that the various lines of American make are stocked by the leading wholesalers. True again. But how far does this apply? Travelers and wholesale salesmen are generally kept full time on stock lines, and their hours of labor are necessarily limited, since the entire day has only 24 in it all told. And new lines are so multitudinous that they cannot always differentiate between the good and the bad.

But the establishment of a central sample room in each of our two chief centers—a sort of American commercial consulate—open for the inspection of wholesaler, retailer or consumer, and with a live man in charge, could not fail to pay for itself almost from the jump.

It would be a permanent exhibition—a permanent advertisement—a permanent stimulus to trade. There could be no objection to admitting the public, because, boiled down, it is the public—the consumer—who ultimately pays for everything. Convince the consumer, and one's future is made.

The Real Success or Failure of the Scheme

would rest solely on the man in charge, who would need to be a brainy commercial enthusiast of the highest type. A 100-ton gun is potent for defense with brains behind it. Otherwise it has little more value than scrap iron. Our agricultural shows at Brisbane, Sydney, Melbourne and Adelaide are becoming real educational exhibitions each year. No man of even ordinary commercial capacity and with a good line to handle, could possibly exhibit at these annual shows without creating some added demand through the trade for the lines exhibited.

There can be found plenty of objections to the initial ideas laid down above. It would be a departure from precedent. But things move rapidly nowadays. And we don't wait for precedents. It is well to note that the Manufacturers' Association of Great Britain has had its representative, B. H. Morgan, among us lately, inquiring as to the possibilities of further increasing British trade and winning still more of our business.

The general opinion is that, with a few exceptions, American houses are paying less attention to this rising market than formerly. Possibly their home market is taking all they can turn out. So much the better for the Britishers. But—*it doesn't seem American!*

A new South Wales firm, Henry Vale & Sons of Auburn, have secured the second contract for Wire Netting machinery for the Victorian long sentence prison at Pentridge, near Melbourne. The contract price is £2080 for four weaving machines to turn out 600 yd. of 1½ x 14 x 17 B. W. G. double rolls per day of 8 hr. The Victorian Government are fully satisfied with the result of their experiment in Wire Netting production, and thus utilizing prison labor for public good. What private manufacturers of Wire Netting may think is, as Kipling says, "another story."

The Sydney agricultural show, held at Easter time each year, proved a huge success, the gate money totaling over £8000 in spite of heavy rainfall on what are usually the best days, Good Friday and the following Saturday. These agricultural shows take high rank with our traders as opportunities of making good sales to the country people who usually bring well lined pockets to the inspection of exhibits.

Large public works are progressing in every direction. Irrigation is being tackled earnestly, and large dams are being constructed for water conservation in New South Wales and Victoria. Railroad and tramway extensions are progressing throughout the States and calling for engineering requirements of all kinds.

THE PHILLIP GROSS HARDWARE COMPANY, Milwaukee, Wis., has lately issued an elegantly printed booklet, entitled "What Cupid Whispers to the Bride." Its purpose is "to assist the bride or bride-to-be in selecting such furnishings for her home as are most necessary with the least amount of trouble and expense." An illustrated love story runs through the booklet, interspersing which on alternate pages are references to goods comprised in the comprehensive Gross stock for the dining room, for the kitchen, for the laundry and around the house.

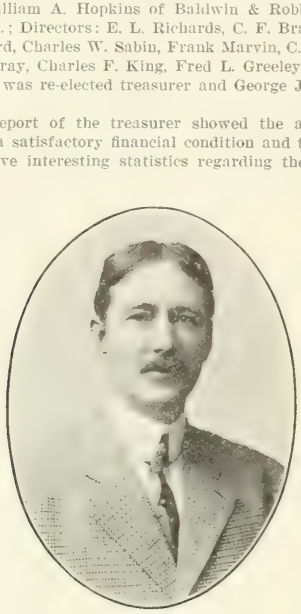
THE COLUMBIA JOBBING HOUSE has opened a salesroom at 441 Third avenue, Pittsburgh, where a general line of Enameled and Galvanized Ware and Tinware will be handled.

Swain Hardware Company, Shawnee, O. T., has been succeeded in the General Hardware and Sporting Goods business by Swain-Hartman Hardware Company.

New England Iron & Hardware Association.

THE annual meeting of the New England Iron & Hardware Association was held at Young's Hotel, Boston, on the 16th inst., following a dinner at which there was a large attendance. The following officers were unanimously elected for the ensuing year: President, A. B. Marble of Jones & Laughlin Steel Company; vice-president, William A. Hopkins of Baldwin & Robbins Company, Inc.; Directors: E. L. Richards, C. F. Bragg, Oscar A. Shepard, Charles W. Sabin, Frank Marvin, C. C. Lewis, George Gray, Charles F. King, Fred L. Greeley. Charles A. Breck was re-elected treasurer and George J. Mulhall, clerk.

The report of the treasurer showed the association to be in a satisfactory financial condition and the clerk's report gave interesting statistics regarding the work of



A. B. MARBLE, President.

the year. During the year the association lost two prominent members by death, John G. Brown of Brown & Wales Company, and Michael McBarron of McBarron & Co. The bureau of credit continues to be a useful feature of the association.

Retiring President Boutwell thanked the members and directors for their hearty co-operation and support during his administration, and, while the meeting was waiting for the Nominating Committee to report, ex-President C. F. Bragg, Bangor, Maine, gave an interesting talk on Porto Rico, which he recently visited. On taking the chair after his election, President Marble expressed his appreciation of the honor and promised the association his best service.

A. B. Marble, the new president, has been connected with the iron and steel trade for the past 22 years, and is district sales agent of the Jones & Laughlin Steel Company, Boston. He is well and favorably known to the trade of New England and New York City, where he formerly resided, and has always been active in the association and particularly prominent in its social activities.

Pittsburgh Emery Wheel Company.

WE regret that through a clerical error the products of the Pittsburgh Emery Wheel Company, Park Building, Pittsburgh, Pa., are given inadequate representation in THE IRON AGE DIRECTORY for 1908 recently issued. While the company is classified under Borundum and Adamite Wheels, its name and address should also have been given a place under Emery Wheels, Corundum Wheels and Grinding Machines, of which the company is a prominent manufacturer.

It has been reported that F. S. Lovitt, Colby, Kan., sold his Hardware business recently, but we are advised the negotiations were not consummated and Mr. Lovitt will continue business as heretofore.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM BOWEN BROS., Lenora, Kan., who have bought the Hardware and Implement business of O. M. Elliott & Co.

FROM S. W. COLLINS HARDWARE COMPANY, which has been incorporated with a capital of $50,000 to conduct a Hardware, Stove, Implement, Paint, Sporting Goods, Mining and Building supply business, with headquarters at Fallon, Nev.

FROM OTIS & VORSE, Wilsey, Kan., who have purchased the Hardware business of Harry Farrar.

FROM W. A. MCKENZIE & SON, Goldendale, Wash., whose Hardware, Stove, Paint and Sporting Goods store has been destroyed by fire.

FROM J. W. MCCAULEY & Co., who have bought out the Hardware, Stove, Paint and Sporting Goods business of Thompson Hardware Company, Marysville, Kan.

FROM BOND-GEORGE HARDWARE COMPANY, San Antonio, Texas, which has been incorporated with a capital of $35,000, and succeeds to the general Hardware, Stove, Implement, Paint, Vehicle and Sporting Goods business of Bond Hardware Company.

FROM CAMERON HARDWARE COMPANY, Cameron, Texas, which has been incorporated with a capital of $10,000 and has bought the plant of Bryant & Bond Company and will continue that business, carrying Shelf and Heavy Hardware, Stoves, Tinware, Paints and Implements. The officers of the company are J. T. Brown, president, Leonard Brown, secretary, and T. E. George, treasurer.

FROM CHELSEA HARDWARE & PLUMBING COMPANY, Chelsea, Mass., which is just starting business and will handle general Hardware, House Furnishing Goods, Electrical and Automobile Supplies, Sporting Goods, Plumbers' and Steam Fitters' Supplies, Marine Hardware, Paints, &c.

FROM H. D. BACHTELL, who has opened a new store at 222 West Fourth street, Waterloo, Iowa, and is handling Shelf and Heavy Hardware, Stoves, Tinware, Sporting and Athletic Goods.

FROM STICHTER HARDWARE COMPANY, Reading, Pa., whose establishment was destroyed by fire on the 19th inst. The company will resume business and desires catalogues covering general Hardware and related lines.

FROM WATT & HOLMES HARDWARE COMPANY, Cordele, Ga., about to erect a new block with three stores, one of which will be occupied by the company. The company will be pleased to hear from manufacturers of store fittings suitable for an establishment of this sort.

THE regular semiannual meeting of the Board of Directors of the Washington Hardware and Implement Dealers' Mutual Fire Insurance Association of Spokane, Wash., was held on the 27th ult. This company, of which E. W. Evenson, Hutton Building, Spokane, is secretary, was organized in 1905, and its officers are prominently identified with the retail Hardware association movement in that section of the country. The report made under date 27th ult., showed that the insurance in force at that time amounted to $892,150, as compared with $689,200 in force on December 16 last. The ratio of expenses to premiums was reported as 12.2 per cent., and the ratio of net losses to net premiums as 10.5 per cent. The return payment on premiums for 1908 is 33 1-3 per cent.

TRADE TRACERS.

BY FAR WEST.

THE plan herewith presented of following up those customers who grow out of observing the habits of people who come to the store, and after examining an article repeat to the clerk the stereotyped expression: "I did not want to buy today. I was just looking around. I will send in my wife," or husband, as the case may be. Whenever a person enters a store and makes inquiry for an article the clerk has a much better opportunity to make a sale than if the case were reversed and the clerk was in a dwelling soliciting an order. So if a sale is not made the proprietor should know the reason. The plan described not only places this information in his hand, but provides him with a list of names and addresses for future business.

Information Cards

about the size of a postal card are prepared and kept in a convenient place. The clerk does not use them in the presence of the customer, merely jotting down the information at the time and filling the card afterward. To make the use of the cards clear an actual case will be taken. Mr. A——, a stranger to the clerk, comes in to look at Cook Stoves. After the line has been shown to him he stops before a Six-Hole, 18-In. Oven Cook Stove priced at $24, and the following dialogue ensues:

CUSTOMER: "I like the looks of that Stove all right, but they showed me one at Black & White's that looks to me to be just as good as this for $20."

CLERK: "It is very difficult to carry in one's eye all the details as to size. If the two Stoves were set side by side a great difference would be seen. Take this casting (lifting a lid); notice the weight and that it measures full 8 in. in diameter. Then we give you a guarantee of a firm that has been selling this same make of Stoves in this town for 13 years, and we can give you the names of 50 people who are using these Stoves. We set up the Stove for you, and if it don't bake and give satisfaction and we cannot make it work, we'll take it back and refund your money."

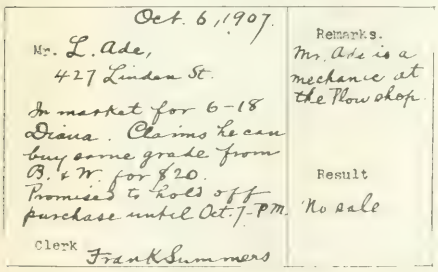
CUSTOMER: "Well, Black & White are an old firm, too, and they told me Mr. Burns at the Cash Store had one, also Mrs. Smith Jones, and they give a guarantee also. I have bought lots of stuff from them and they are all right."

CLERK: "As you have given them a good share of your trade, let us put up the Stove for you."

CUSTOMER: "I'll have to be shown where that $4 difference comes in first."

CLERK: "Well, let me present this matter to the proprietor before you decide, and if anything can be done I know he will do it."

The clerk then takes the prospect's name and address, later filling out the card, which is reproduced herewith, and handing it to the proprietor.



Prospect Customer's Tracer Card.

The proprietor now has two propositions to consider. First, the arguments the clerk used, their weak or strong points; second, the tracing of the customer.

Weakness in Clerk's Argument.

He notices an error in the way the clerk presented his argument, showing him that in his broad, general statement that 50 people could be shown who had bought Stoves to their satisfaction, the opposition had gained a point by mentioning two persons' names, which was more convincing because specific. Again, that the castings were not only heavier, but were made of a combination of North and South grades of iron that made them tougher; further, that Black & White had tried their best to get the agency for this line of Stoves. This talk leaves the clerk fortified for the next Stove customer, and it can readily be seen that the continued absorbing of information gained in this way, makes of him a better clerk in every way.

Going after the customer is the next step. The ice is broken and the strongest card is a personal visit from the proprietor. Even if no sale is made the customer will feel flattered by the attention, and good will come out of the experience.

The card is now out of the clerk's hands and into those of the proprietor, who makes such notes on the margin as the occasion requires and files it away, providing in time a list of people that need only the proper attention to make blossom into regular customers.

The use of the information cards should not be confined to the clerks alone. The outside men have splendid opportunities for gathering information. The collector going his rounds and even the delivery man see new work undertaken and gain many pointers that may be turned to profit. The interest shown in the business is indicated by the use made of the cards, and the mere word of approval from the proprietor will be sufficient incentive to keep the working force united and interested in their efforts to bring to the house all the business possible.

FOURTH OF JULY WINDOW EXHIBIT.

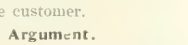
BY F. B. M.

A VERY simple and attractive exhibit emblematic of the great and glorious Fourth can be made by placing a large imitation of a cannon in the show window. Take a wooden Rolling Pin (the same as used for pie crust) for the axle and hubs of the wheel. Let the handles project beyond the wheel and on each end one inch back draw a lead pencil line around the circumference, spacing this off evenly for the spokes of the wheel. Next take a Gimlet and bore small holes from which the spokes are to emanate. For the spokes, select from stock a number of ½-in. Bits and run just the worm end or point of the Bit into the Gimlet holes already made. If this is done carefully not a particle of harm will be done to the Bits used, so as to hurt their sale after the exhibit is over.

This leaves the square shank end of the wood Bits or spokes projecting outward. The rims of the wheels are formed by placing a link of Iron Chain over each of these Bit Shanks, the loose links of the Chain filling up the intervening space. Sagging of the Chain between the spokes can be avoided by interweaving a stiff piece of Wire.

The barrel of the cannon is made out of Stove Pipe, fastened to the Rolling Pin axle by running two Stove Pipe Rings or Collars over the Pipe, one from each end until they just span the center axle, nailing the under sides of the Rings fast to each side of the central portion of the Rolling Pin.

Now take a piece of board and a Compass Saw and cut out a circular piece of wood just large enough to fit in one end of the Pipe. Bore a hole through the exact center of this piece large enough to take in the spindle of a Door Knob. Screw fast to this a surface Lock, so that the Lock comes on the outside of the board, and the Door Knob projects therefrom. Place in end of cannon and secure in place with a few Tacks driven through the Stove Pipe. Place a small placard in the window as follows:



A gasoline Soldering Fire Pot recently exploded in the store of Gough & Snyder, Farmland, Ind., starting a slight fire. The damage was only nominal.

Annual Conference of Sargent & Co.'s Salesmen.

THE regular summer meeting of the selling staff of Sargent & Co., New Haven, Conn., and New York, was held in New Haven, June 16-18, inclusive. The purpose of these gatherings is to exchange views and experiences, discuss plans for the future and thoroughly acquaint salesmen in regard to what is being accomplished in the factory relative to new goods and improved conditions. The business hours of the three days were devoted solely to commercial matters, but advantage was taken of the evenings for various forms of recreation. There was a banquet on Wednesday night provided by the officials of the company, at which about 100 were in attendance. Informal remarks were made by a number of those present, including President George H. Sargent of the New York house.

A HARDWARE DREADNAUGHT.

REPORTS from the Pacific Coast state that the Northern progress of our great fleet has been distinctly marked by the appearance of miniature cruisers and battleships in the show windows of retail merchants. Hardware stores are fortunate in handling a class of goods peculiarly adapted to such displays and several houses in the trade had battleships in their windows constructed entirely or in part of articles taken from stock.



Fig. 1.—A Hardware Dreadnaught.

A Veritable Dreadnaught

of Hardware battleships is the craft shown in the accompanying illustration, as she lay in the show window of Chas. Brown & Sons, San Francisco, where she was built on the designs and under the supervision of Geo. Meierdierks. The surrounding floor of the window, as shown in Fig. 2, contained an attractive assortment of Tools and Cutlery. Regarding this floating fortress, the

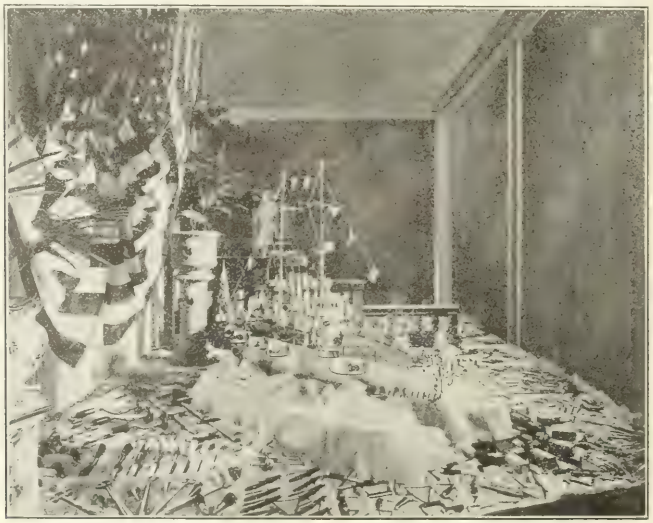


Fig. 2.—Hardware Dreadnaught and Surrounding Display of Tools and Cutlery.

firm writes us that it was complete in every detail and accurate in arrangement. Every part of the ship from waterline to topmast and from stem to stern was made of articles taken from regular stock, and such as are usually carried in a Hardware and House Furnishing Goods store. The following schedule was made up listing the various parts of the vessel in the terms usually applied to them in the navy and the corresponding articles of merchandise used to represent them.

Hull of ship.	Sides. Hardware Mfrs' Cut Nails. Figure head. 1 to 7 in Brass Rod (cut and Hinge. Water line. Brass Oval Cut Nails. Rail. No. 18 Brass Jack Chain. Rudder, stern post, etc. 2 1/2 x 12 in. Strap Hinges. Brass Screws.
Aft superstructure.	Mizzen mast. 2 No. 4 galv. Mast Hoops (soldered together). Rope cleats. Flag pole Cleats. Capstan. Floor Door Stop. Ventilators. 2-in. galv. Street Elbows. Superimposed turrets with 8-in. guns. Section of 1-qt. Tin Pudding Pans and Gem Nozzles. Superimposed turrets with 12-in. guns. Section of 3-qt. Tin Pudding Pans and plain Brass Hose Pipes. Rubber "Gauge Glass" Gas Tube. Life boats. Galv. Pails.
Aft deck of superstructure.	Superstructure. 1 1/2 x 17 in. Sheet Iron Drip Pan. Bridge. No. 01 tin Bread Pan (reversed). Wheel. Vane Wheel. Military mast. 1-oz. and 1/4-lb. Spools Cop Wire and 1/4 in Brass Rod.
Forward fighting tops.	Upper fighting top. 3-in. Scolloped Patty Pans. Lower fighting top. 5-hole tin Mouse Trap (reversed). Guns in upper fighting top. Brass Gas Pillars. Guns in lower fighting top. Shotgun Shells (12 gauge). Searchlight. 1/4-pint Tin Funnel with 1-cp. Electric Bulb. Monkey yard. 1/4-in. Brass Rod. Truck lights. 1-cp. Electric Bulb. Foretopmast stay lifts and signal halyards. No. 18 Copper Wire.
Aft superstructure.	Forward cranes. 2-lb. bars Solder (bent to shape). Crane falls and cabl. Brass Pulleys and Curtain Cord. Smokestacks. 2-in. Leader Pipe (painted yellow with black band at top). Smoke. Steel Wool. Forward superstructure ventilators. 1 1/2-in. galv. Ells and Sockets. After superstructure. Brass Pulleys and Sockets. After cranes. 2-lb. bars Solder (bent to shape).
After fighting tops.	Mainmast. Same as military mast. Main fighting top. Same as forward fighting top. Main upper fighting top. Same as forward upper fighting top. After turrets. Entire 2-qt. Tin Pudding Pans and Gem Nozzles.
Forecastle.	Ventilators. 2-in. galv. Street Elbows. Capstan. Floor Door Stop. First whaler and gig. No. 4 Sensible Sad Irons without handles. Boat cleats. Galv. flag pole Cleats. Flagstaff. Pc. No. 10 Steel Wire. Small boats. No. 4 Sensible Sad Irons (less hdl.) on davits. Davits. Mantel Brass Picture Hooks (bent to shape). Boat falls. 1/2-in. Jap'd Pulleys and Curtain Cord. Gun sponsons. 1/2 of 1-qt. tin Pudding Pans. 6-in. batteries. Gem Hose Nozzles. American ensign No. 1.
Flag and signaling line.	International Z. International B. International H. International E.

The firm writes that the model was an excellent advertisement inasmuch as it proved of unusual interest, not only to the visiting officers and men who complimented it highly, but also to the public in general, some of whom were observed to stand at the window for the better part of an hour scrutinizing and comparing the various articles used in the miniature with the parts of a vessel which they were supposed to represent.

E. T. Wilson, Gas City, Kan., has sold his Hardware business to G. P. Lamberton.

The Brown Shade Adjuster.

A simple, convenient and effective device for the adjustment of window shades made by the Hardware Mfg. Company, Milwaukee, Wis., is represented in Fig. 1 of the accompanying illustrations, its application being shown in Fig. 2. The controlling cord when pulled releases the escapement ratchet allowing the shade with its roller to be raised or lowered to any desired position where it is firmly held by the adjuster until again released. In this manner the shade may be dropped when the upper window sash is lowered as in Fig. 2, giving unobstructed ventilation without the annoyance incident to a flapping shade. The adjuster is adapted to windows of any style or width and requires no special stops. No difficulty is experienced in its operation, as it is as easily worked, it is said, as the curtain on its roller.



Fig. 1.—The Brown Shade Adjuster.

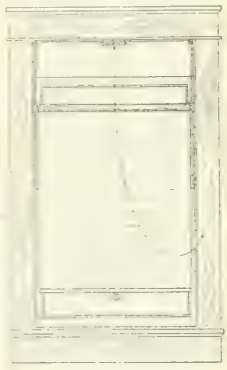
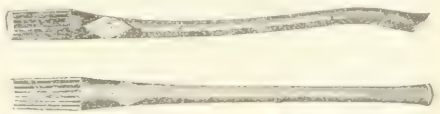


Fig. 2.—*Application of Brown Shade Adjuster.*

Old Hickory and Honest Abe Handles.

[illegible] handles herewith illustrated, carrying the brands Old Hickory and Honest Abe, are the product of the factory of Hartwell Brothers, Inc., Chicago Heights, Ill., and [illegible] sledge hammer, hatchet and railroad and mining tools made by the company from hickory, ash and oak. To secure material for the best handles only the young, small bodied, second growth hickory trees, 6 to 10 in. in diameter, are selected. More than two cuts are rarely obtained from a trunk, and general only one, and these must be free from defects such as knots, streaks, bird pecks

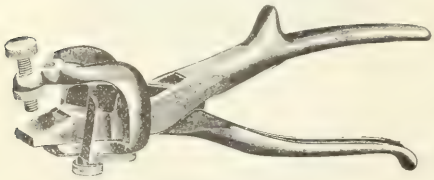


and the like. The handles are blocked out and hand shaved with a draw knife in the woods and are then sent to the Chicago Heights factory, where they are carefully inspected and finished. After being thoroughly seasoned by exposure to atmosphere in a dry room—not kiln dried—they are sandpapered and highly polished over a fine sand belt, and are then put over a waxing belt, which brings out their whiteness and leaves them with a brilliant gloss. After again being reinspected they are labeled and carefully packed. The octagon and oval double bit axe handles are made in 30 to 36 in., 38 in., 40 in., 42 in. and 44 in. lengths; single bit axe handles are made in 30 to 26 in. and 38 in. lengths. At the buyer's request Honest Abe handles will be packed one dozen

in a carton, an attractive metal edge box. Ten to 20 of these cartons constitute a case.

Saw Set No. 201.

The saw set shown herewith, manufactured by the Goodell-Pratt Company, Greenfield, Mass., has malleable iron frame and handles and tempered steel jaw and anvil. Its construction is such, it is stated, that it can be

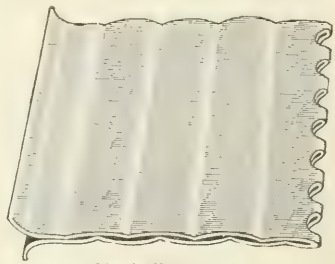


Saw Set No. 201.

used on saws of any width and has an adjustment to insure the evenness of the set. The teeth of the saw are at all times in plain sight of the operator. The tool is 8 in. long, polished and nickel plated, each one packed separately in a pasteboard box.

Lincoln Nailing Plug.

The Pittsburgh Channel Pin Company, Pittsburgh, Pa., is offering the device shown in the accompanying illustration for holding nails in a wall joint in concrete work, &c. The plug is made by corrugating a piece of galvanized iron, perforating it in the center, bending over the ends to form a lip through which the nails may enter readily, and then folding the sheet of iron together so that the grooves of the corrugations are alternating one to the other. The grooves extend clear across. The plug and the nail in being driven between the lips forces its way between the alternating grooves, thereby insuring a powerful grip. If the nail is long enough it extends through the perforations on the inside of the plug. The plug is designed to take the place of a piece of wood which has been generally used for the purpose of fastening furring strips, expanded metal, &c., to brick and other walls. In using wooden blocks or plugs it is necessary first to saw the piece to a given length and then



Lincoln Nailing Plug.

shape it in the form of a wedge to allow driving in place, or else cut a piece the size of the brick to fit in place for nailing to. The nailing plug does away with all such labor and will not warp, shrink or rot as a wooden plug would be likely to do, thus weakening the hold. Plugs are put up 500 to a box, which weighs about 45 lb.

Niksah Duplex Copper Snow Guard.

The Niksah Snow Guard Company, Pittstown, N. Y., is putting on the market its Niksah snow guard, made of wire with steel core, with an outside covering of pure copper. The steel core gives the needed strength and stiffness, and the copper coating is sufficiently heavy to insure durability. The guard is especially recommended by the company for localities where smoke and gases might corrode steel guards.

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The Wagner Barn Door Latch No. 55.

The gravity latch locking device here illustrated and made by the Wagner Mfg. Company, Cedar Falls, Iowa, is designed for use on barn doors and outbuildings. The

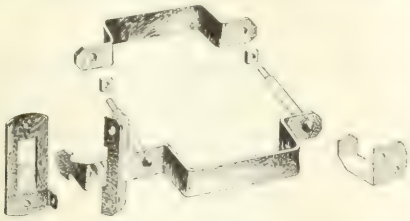


Fig. 1.—The Wagner Barn Door Latch No. 55.

objects aimed at in its design were to furnish a simple, secure and easily operated latch without a protecting catch piece. This, as will be noted in Fig. 1, is accomplished by the use of a steel plate set flush with the door post, with an inwardly projecting catch piece. The purpose of this arrangement is obvious, since the tendency of projections about the barn door openings to catch harness

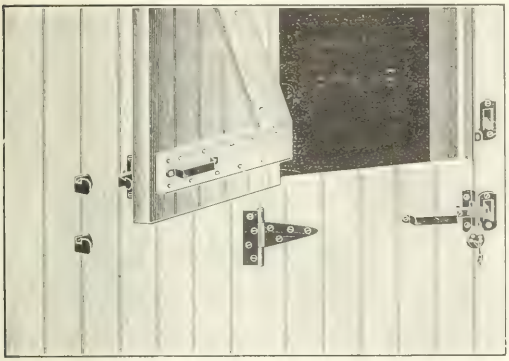


Fig. 2.—Application of Barn Door Latch.

and clothes makes their presence undesirable. A locking plate is furnished with the latch for use if desired, the manner of its application being shown in Fig. 2. Latch plates are also furnished for attachment to the side of the building to hold the door open. The latches are made of steel, japanned, and are packed one dozen in a box, the weight of which is 15 lb.

The Chicago-Sun Clothes Dryer.

A clothes dryer adapted for lawns, roofs, balconies, porches, courts and drying rooms, illustrated herewith.

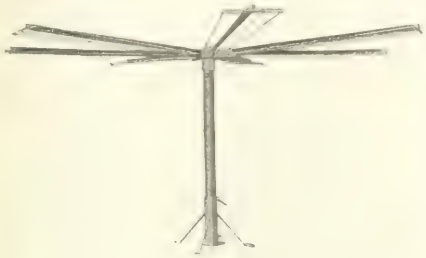


Fig. 1.—The Chicago-Sun Clothes Dryer.

It is made by the Chicago Dryer Company, 381 to 385 Wabash avenue, Chicago, Ill., in such variety as to meet many requirements, and is so simple in construction that it can be quickly installed by anybody. The arrangement of parts is such that the dryer can be removed almost instantly from the balcony, the roof, or yard, and stored away when not in use. The wooden parts are made of the best Norway pine, while the castings are of the best refined malleable iron. Fig. 1 shows the dryer in position with socket equipped with supports for attaching to a roof. The post measures 6 ft. in hight, thus bringing the clothes within an easy reach. The distance from the base to the top of the post is 6 ft. 6 in. and from end to end of the extended arms is 13 ft. 4 in. The dryer contains seven arms, each measuring 6 ft. 3 in. in length, and contains four lines 5 ft. 10 in. long upon which to hang clothes, thus making a total of 164 lineal feet of hanging line. The dryer for the lawn consists of a cast iron socket which is placed in the ground with the center standard or post fitting into this socket. The top of the post is supplied with a pivot and the latter contains a steel wheel to which there are seven steel holders, each holder containing one protruding arm. The arms are interchangeable, and by securing additional steel holders the arms can be used in the laundry or the drying room. The balcony dryer is also useful to suspend from the piazza posts of private dwellings, and is especially useful in boarding houses and homes where laundry work is done every day. When the dryer is not in use the arms may be lowered to a vertical position, as shown in Fig. 2.

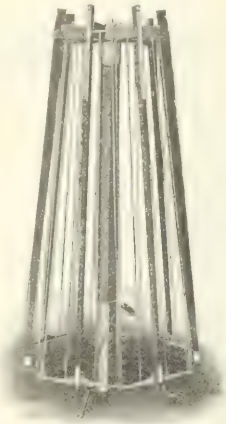
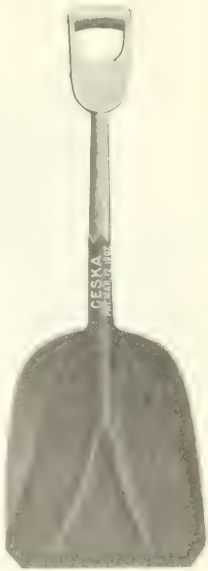


Fig. 2.—Chicago-Sun Dryer Lowered.

The Ceska Firing Scoop.

The firing scoop shown in the accompanying illustration is being put on the market by the Hukill-Hunter Company, Pittsburgh, Pa. It is made of 90 carbon crucible steel which the company refers to as an exceptionally high grade, hard material to put into shovels, insuring long life. The tongues which will be observed in the bowl add to the strength of the tool and assist in scattering fuel evenly over the firebox, effecting a saving in labor and an economy in fuel by admitting of carrying a light fire. In locomotive firing the scoop is said to be a great help in getting the coal up to the front end of the firebox, since when bearing the scoop it is well scattered instead of in a long string, and the draft aids materially in carrying it up.



The Ceska Firing Scoop.

Hand Bending Tools.

Two hand bending tools made by Estep & Dolan, Sandwich, Ill., and here illustrated, are designed to meet the miscellaneous requirements of small shops and factories where the character of service required does not justify the use of expensive power machines. The No. 1 ring bender, Fig. 1, is suited to such work as the bending

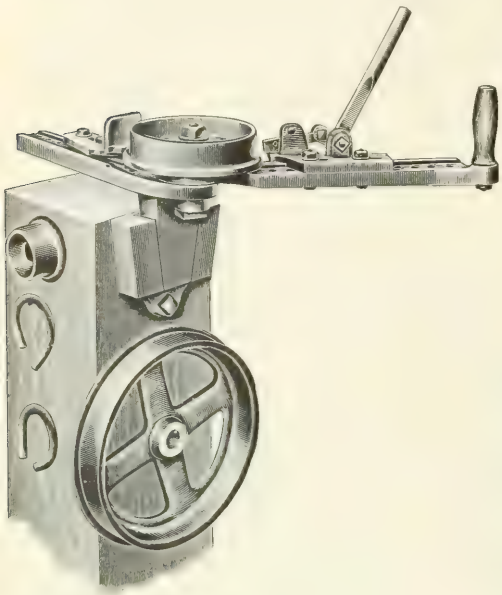


Fig. 1.—Ring Bender No. 1.

of rings for hub bands, garden cultivator wheels, wheelbarrow tires, chain links, &c., and has a capacity for forming bands up to 20 in. in diameter. It is of very simple construction, being composed of a central wheel form, around which the shapes are bent by means of a pivoted hand lever. Upon the latter is mounted an adjustable clamping device, which locks the piece against the form. Sizes of forms up to 10 in. vary by graduations

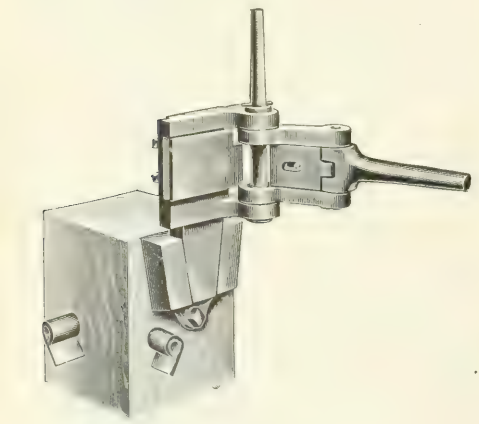


Fig. 2.—Hinge Bender No. 1.

of ¼ in. and above this size by even inches up to 20 in.; forms from 1¼ in. in hight and up can be supplied. For the bending of U shapes forms are also furnished when required. Fig. 2 represents the No. 1 hinge bender, which is referred to as being the only tool of this character on the market. It is adapted to the forming of heavy hinges and flat eyes without offsets, such as are used on barn doors, gates, &c. One pin and bushing are furnished with each machine, but others are supplied on order. It is adjustable only to a limited extent, though special sizes are built for specific work. Both tools can be interchangeably mounted on the same block.

Von Duprin Self-Releasing Fire Exit Latch.

The Vonnegut Hardware Company, Indianapolis, Ind., as distributor, is offering the self-releasing fire exit latches for single and double doors manufactured by the Von Duprin Self-Releasing Fire Exit Latch Company and

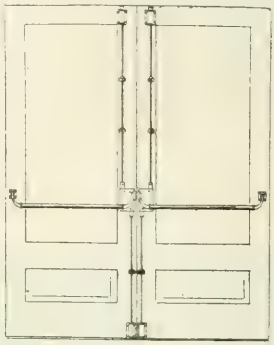


Fig. 1.—Von Duprin Self-Releasing Fire Exit Latch No. 23, for Double Doors.

designed for use in schoolhouses, churches, halls, public buildings, &c. The device on the inside of the door is represented in Fig. 1. It combines in one the usual features of locking devices, the dead lock and top and bottom latches. About waist high a solid bar stretches across the door, standing away from the wood, and connects directly with mechanism of the latch. Any pressure applied to any part of the bar instantly and positively releases the dead lock and latches simultaneously and permits doors to open. It is pointed out that in fire catastrophes the loss of life is due primarily to the fact that the exit doors refuse to operate at the critical moment, when terrified people mass themselves about the exits.

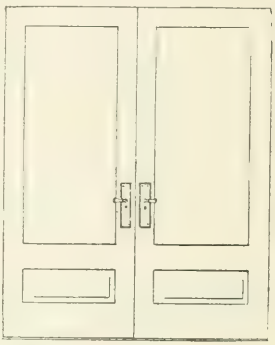


Fig. 2.—The Usual Hardware Trim Applied on Outside of Doors.

With the device illustrated it is explained that when people rush blindly toward the exit doors and the leaders are forced against the bar across the opening the latches operate automatically and the doors swing open, even though the latch bolts are dead locked from outside. In Fig. 2 the lever and escutcheon is shown on the outside of doors. The latch is operated from the outside in the same manner as any ordinary lock and latch device. The device is carried in stock in a number of finishes, for doors up to 3 x 8 ft., and is easily adusted to doors of lesser widths and hights.

Universal Ball Bearing Caster.

The Universal Caster & Foundry Company, 1170 Broadway, New York, has put on the market the Universal oblong ball bearing platform or plate caster, here



Fig. 1.—Universal Ball Bearing Steel Caster.

shown in detail. The parts are made of high grade open hearth basic steel. The rivet fastening the horn to the plate is proportioned to the strength required in each size; greater as the sizes increase, to prevent bending. The balls are of steel 7-32 in. uniform diameter in all

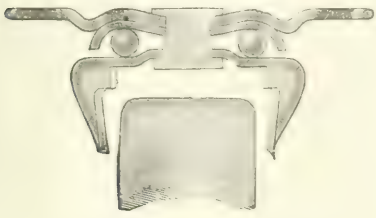


Fig. 2.—Sectional View of Horn and Ball Race.

sizes of casters. One of the new features in this style is the ball retainer, Fig. 2, by means of which the balls are securely kept in the proper position and free to roll in any direction regardless of obstructive particles incidental to any position so near the floor. Fig. 3 is a sectional view of the new style steel wheel, as now made, having fewer parts and better shape. The casters are made in Nos. 3 to 8 inclusive, with wheels from 1 1-16 in. to 1⅞ in. diameter, the horns of which may be obtained in steel, brass or nickel plated. The wheels can be supplied in iron, steel, lignum vitæ, brass, nickel plated, solid brass, leather and soft and hard rubber, according to preference and service required. The plates range from 1½ x 1 3-16 to 2 9-16 x 2 in.

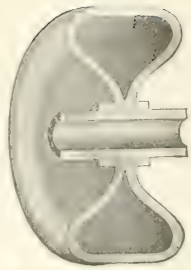


Fig. 3.—Section of Steel Wheel.

The Howard Dustless-Dusters.

The Howard Dustless-Duster Company, 164 Federal street, Boston, Mass., is manufacturing dusters of chemically treated cloth, designed to dust, clean and polish all furniture, finish, metal, glass, &c. The material of which the dusters are made is a soft black fabric, calculated to be used on the most delicate surfaces without scratching them. The peculiar feature of the dusters is their dust retaining quality. It is explained that when rubbed over a dust covered surface they absorb the dust, and can be immediately used on a dark colored material like a derby hat without communicating to it the dust already absorbed. The dust can be washed out of the duster with warm water and soap, but the company states that the properties cannot be washed out of the cloth. The article is made in four varieties: Standard dusters, office dusters, floor—or bag broom—dusters and auto dusters.

THE WHEELING CORRUGATING COMPANY, Wheeling, W. Va., is distributing a series of card calendars, which are cleverly designed to advertise the company's leading lines of sheet metal products. They are of convenient size for inclosure in business envelopes and have on one side a full calendar for 1908 and on the other side, 1909. Above the calendars are illustrations with brief printed descriptions referring to the products, including Sheets, Ceilings, Shingles, Roofing, Stove Pipe, Galvanized Ware, Dripping Pans, &c.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, State and West'n raw	.42 .44
City, Boiled	.47 .48
City, Raw	.44 .46
Raw, Calcutta, in bbls	.47
Lard, Prime, Winter	.67 .67
Extra No. 1	.61 .65
No. 1	.57
Cottonseed, Crude, f. o. b. mill	.41
Summer Yellow, prime	.47 .47½
Summer White	.44
Yellow, Winter	.44
Tallow, Acidless	.06½
Mohawk, Brandt, Strained	.58
Light, Strained	.56
Bleached, Winter	.61
Ex. Bleached, Winter	.71
Cocoanut, Ceylon	.16 .16½
Cocoa	.12 .13
Cod, Domestic, Pure	.51 .54
Newfoundland	.44 .46
Red, Elaine	.13
Saponified	.12 .14
Olive, Yellow	.60 .75
Neatsfoot, Pure	.65 .70
Palm, Lagos	.06½ .06

Mineral Oils—

	₱ gal.
Black, 29 gravity, 25 to 30 cold test	.12½@13½
29 gravity, 15 cold test	.13½@14
Summer	.13
Cylinder, light, filtered	.20 .21
Dark, filtered	.13 .13
Paraffine, 30 to 32 gravity	.17 .17
903 sp. gravity	.10 .11
883 sp. gravity	.11 .11½
Red	.12½ .14

Miscellaneous—

Barytes	
White, Foreign	₱ ton $18.50@20.50
Amer., floated	₱ ton 18.00@20.00
Off color	₱ ton 15.00@17.50
Chalk, precipitated	₱ lb. .07@.10
China Clay, Imported	₱ ton 11.50@18.00
Cobalt Oxide	₱ lb 1.40@1.60
Whiting, Commercial	₱ 100 lb .42@.52
Gilders'	₱ lb .06@.07
Ex. Gilders	₱ 100 lb 60@.65

Putty, Commercial—

	₱ 100 lb
In bladders	$1.75 @1.85
In kegs or tubs	1.70 @1.80
In 1.75 to 5 lb cans	1.75 @1.85
In 12½ to 50 lb cans	1.50 @1.80

Spirits Turpentine—

	₱ gal
In 01 bbls	.42 .43
In less than bbls	.44 .45

Glue—

	₱ lb
Calfskin	.15 .17
Common Bone	.07 .08
Extra White	.12 @14
Fish, liquid, 50 gal. bbls., per gal.	.60 .65
Fish, liquid, 50 gal. bbls., per gal.	.50 .55
Foot Stock, White	.11 @14
Foot Stock, Brown	.10 @11
German Common Hide	.10 @12
German, Hide	.10 @11
French	.10 @10
Irish	.10 @10
Low Grade	.10 @12
Medium White	.14 @17

Gum Shellac—

	₱ lb
Bleached, Commercial	.28 .30
Bone Dry	.30 .32
Button	.30 .32
Diamond, I	.32 .34
Orange, A	.30 .32
A. C. Garnet	.30 .32
E. M. I.	.30 .32
Kalo, Bleached	.30 .32
D. C.	.30 .32
Orange, B.	.30 .32
T. N.	.30 .32
V. S. O.	.30 .32

Colors in Oil—

	₱ lb
Black, Lampblack	.12 @14
Carbon	.14 @16
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @13
Green, Chrome	.12 @16
Green, Paris	.14 .15
Sienna, Raw	.11 .14
Sienna, Burnt	.12 @15
Umber, Raw	.11 .14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, English white in Oil 100 lb kegs	.05½
Lead, American White:	
In 100 lb kegs	.05½
Lots less than 500 lb, in Oil	@ 7¼
Lead, White, in oil, 25 lb tin	.07
Lead, White, in oil, 12½ lb tin	.07½
Lead, White, in oil, 1 to 5 lb assorted tins	@ 8½
Lead, White, Dry	.06½
in 15 days from date of invoice.	

Zinc, Dry—

	₱ lb
American, dry	.07 .07
Red Seal (French process)	6½@ 7
Green Seal (French process)	7½@ 7½
Green Seal	.07
Green, Special	.07
White Seal	.07
French, No. 1	.07
French, No. 2	.06
American, No. 1	.06
American, No. 2	.05

Dry Colors—

	₱ lb
Black, Carbon	6½@10
Blue, Deep, American	2½@ 8
Blue, Deep, English	5 @15
Blue, Light	.07 .08
Lamp, Commercial	4 @ 6
Blue, Celestial	.4 @ 6
Blue, Chrome	.3 @3
Blue, Prussian	.32 .33
Blue, Ultramarine	3½@15
Brown, Spanish	½@ 1
Carmine No. 1	.5 .5
Green, Chrome	.25 .25
Green, Chrome, pure	.17 @25
Lead, Red, bbls., ½ bbls., kegs	@ 6¾
Lemon	.25 .25
Other American	₱ ton $8.50@16.00
Ochre, American	.3½@ 3½
Orange Mineral	.12 .12
Pink	.4 .4
Purple Oxide	.12 .12
Red, American	.9 .9
Red, English	.4 .10
Red, Turkey	.4 .10
Red, Venetian, American	₱ 100 lb $1.50@1.75
Red, Venetian, Foreign	₱ 100 lb $3.50@4.50
Sienna, Burnt, American	.8 .9
Sienna, Burnt, Italian	.8 .9
Sienna, Raw, American	.3 .3
Sienna, Raw, Italian	.3 .3
Umber, Burnt, American	.8 .9
Umber, Burnt, Turkish	.8 .9
Umber, Raw, American	.3 .3
Umber, Raw, Turkish	.3 .3
Terra Alba, French	₱ 100 lb .90@1.00
Terra Alba, German	.80 .80
Vermilion, American	.60@ .65
Vermilion, English	.66 .66
Vermilion, Quaker	.50 .50
Yellow, Chrome, Pale	.12½@15
Yellow, Chrome, Orange	.25 .25
Yellow, Ochre, French	.2 .2
Yellow, Ochre, American	.2 .2
Yellow, Ochre, Strontian	.2 .2

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are classified in *Tables*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Chamberlain and Domestic .....
Sellers .....
Universal .....
See Fasteners, Blind.

Window Stop—

See Fasteners, Window.

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti—Rattlers—

Gerould Mfg. Co., Boston, Anti-Rattlers, ₱ doz. pairs, Nos. 1, 80 .....; No. 4 .....
Gerould ..... pairs ..... $2.00@$3.00

Anvils—American—

Eagle Anvil ..... ₱ lb. .....
H. Boldien Wrought Iron ..... ₱ lb. .....
Trenton ..... ₱ lb. .....

Imported—

Swedish Solid Steel Sisco, Superior, ₱ lb. .....
Vaughan & Sons' Solid Steel ..... ₱ lb. .....

Anvil, Vice and Drill—

Millers Falls Co., Scale ..... 15@10

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Canvas, Nail Or 25

Augers and Bits—

Cone Double Spur ..... 75@60&5
Common Pattern, Bright or Black Lip or Blued ..... 60@40&5
Bronze Mach. Augers 50
Jo Bit, Patent Lipped ..... 60@40
Irwin Auger and Bit Co.:
Ft. Washington Auger Co., Conard's 35%
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip R. Dominion list 50%
No. 1 R. Jennings' list 50%
Russell Jennings' ..... 50&10
Hommedieu Car Bits 15%
Morse Twist Drill Co.:
Taper Bits 25%
Pugh's Jennings' Pattern 35%
Snell's Auger Bits 60
Snell's Bell Hangers' Bits 60
Snell's Nose Bits 60
Snell's King Auger Bits 50%
Wright's Jennings' Bits 50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's Patent, No. 1 ₱ doz. $20; No. 2 ..... 15%
Clark's Patent 50%
C. E. Jennings & Co., Steer's Pat. 25%
Carigne Pat., small size, $18.00; large size, $30.00 ..... 50%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dbl. Cut ..... Standard
Jennings Pattern, Nos. 1 to 16, $4.75; 11 to 13, $5.75

Hollow Augers—

Common Pat., per doz. ..$7.50@6.00
Universal 20

Ship Augers and Bits—

Ship Augers ..... 40@10&5—%
Ship Bits .....
C. E. Jennings & Co.:
Ship Augers .....
Ship Bits .....

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled ..... gro. $2.75@3.00
Tinned Shoe ..... gro. $1.75@2.00
Lindsay's Patent ..... gro. $2.75@3.00
Peg ..... gro. $1.75@2.00
Harness, Oval ..... gro. $2.75@3.00
Saddlers' Pocket ..... gro. $2.75@3.00
Unhandled, Patent ..... gro. 81@33⅓c
Unhandled Shoemakers' ..... gro. 65@15c
Hand Awls:
Harness, Oval ..... gro. $2.75@3.00
Saddlers' Pocket ..... gro. $2.75@3.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Scarfe Pat. base weights: Per doz.
First Quality ..... $17.50@—
Second Quality ..... $15.50@—
Double Bit, base weights
First Quality ..... $20.00@—
Second Quality ..... $18.00@—

Axle Grease—

See *Grease, Axle.*

Axles—*Iron or Steel.*

Concord, Loose Collar ..... 4¼@4½c
Concord, Solid Collar ..... 4½@4¾c
No. 1 Common, Loose ..... 3½@3¾c
No. 1½ Coal, New Style ..... 3¾@4c
No. 2 Solid Collar ..... 4¼@4½c
Half Patent:
Nos. 7, 8, 11 and 12 ..... 70%
Nos. 13 to 15 ..... 70&10@70&10&5
Nos. 17 to 18 ..... 70&10@70&10&5
Nos. 19 to 22 ..... 70&10@70&10&5

Boxes, Axles—

Common and Concord, not turned ..... lb. 7½@8c
Common and Concord, turned, lb. ..... 6½@7c
Half Patent ..... lb. 9½@10c

Bait—Fishing—

Hedden:
A Bait .....
B Bait .....
Competitor Bait ..... 20&5

Balances—Sash—

Caldwell new list ..... 50&10
Pelham ..... ₱ M

Spring—

Light Spring Balances ..... 60@40&10
Coiled ..... 50@40&10
Lane Bros. Balances ..... ₱ M
Standard Balances ..... ₱ M
Ontario Balances ..... ₱ M
Latest Design ..... ₱ M

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb. ..... per lb. 2½@2¾c

Towel—

No. 10 Ideal, Nickel Plate ..₱ gro. $8.50

Beam, Scale—

Scale Beams 40%
Chatillon's 1
Chatillon's No. 2 ..... 40%

Beaters, Carpet—

Hub L. .....
No. 12 Wire Coppered ₱ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ₱ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned ..... ₱ doz. $1.50

Beaters Egg—

Dover Stamping & Mfg. Co.:
Genuine Dover, per gro., No. 1, Tumbler Size, $7.50; No. 2, Family Size, $7.50; No. 3, Extra Family Size, $24.00; No. 4, Hotel Size, $30.00.
Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd $0.80; No. 6, Jap'd, $1.15; No. 8, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon ..... per doz. No. 2 $1.35
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.5. No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.

Bellows—

Blacksmith, Standard List:
Solid Leather ..... 70&10@70&10&5
Grain Leather ..... 70&10@70&10

Hand

Inch	6	7	8	9	10	*Net Prices*
Doz.	$5.50	6.50	7.50			

Molders—

Inch	10	12	14	16	
Doz.	$7.50	9.00	12.00	15.00	

Bells—Cow—

Wrought Cow Bells 50%
Steel 50%
Texas Star 50%

Door—

Heine, R. & E. Mfg. Co.'s 50%

Hand—

Polished, Brass ..... 60@60&10
White Metal ..... 60@60&10%
Nickel Plated ..... 50&10%
Sargent ..... 70&10
Corbin Globe Hand Bell ..... each

Miscellaneous—

Farm Bells ..... lb. 25@25c
Church and School ..... 60@60&10%

Belting—Leather—

Standard ..... 70&10@70&10@70&5
Light ..... 75&10
Cut Leather Lacing ..... 60@60&10%
Leather Lacing Sides, per sq. ft. 20c

Rubber—

Competition (Low Grade) ..... 70@70@75
Standard ..... 60@60@70
Best Grades ..... 40@50

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list:
Chain, Parts, Spokes 50%
Tubes 60

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden ..... 75@75@5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined 55%
Unlined 55%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Kent & Esser Co. 33⅓%

Bolts

Carriage, Machine, &c.—

Common Carriage Coat threads, ⅝ & 6 and smaller ..... 75@75@—%
Larger and longer ..... 70@—%
Phila. Eagle, $3.00 list ..... 80@—%
Bolt Ends ..... 70@—%
Machine Coat Threads:
⅝ & ¾ and smaller ..... 75@70@—%
Larger and longer ..... 70@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knobs:

Inch	4	5	6	8	
Per doz.	.85	.90	1.00	.80	

Cast Iron Spring Foot, Jap'd:

Inch	6	8	10	
Per doz.	$1.20	1.50	2.25	

Cast Iron Chain, Flat, Japanned:

Inch	6	8	10
Per doz.	$1.00	1.40	1.65

Cast Iron Flat Shutter, Jap'd, Brass Knobs:

Inch	6	8	10
Per doz.	$0.75	.95	1.25

Wrought Barrel Japanned, Solid Brass Knobs ..... 50@50&10@50&5
Barrel Bronzed ..... 60&10%
Spring ..... 70@70@70@70&10
Shutter ..... 50@50@50&10@50%
Square Vesta ..... 70@70@50
Square ..... 70@70@70@50
Iron Bolt & Door 50
Ives' Wrought Metal 45%

Expansion—

E. H. Bacon's Cement ..... 40&6
Richards Mfg. Co. ..... 50&10
Stewart & Bryan Mfg. Co.:
Style No. 10, Dbl. 60
Style No. 20, Dbl. 60
Style No. 100, Dbl. Jaw, Single. 55%
Lag Screw 66⅔

Plow and Stove—

Plow ..... 65@50@50
Stove ..... 85@85@5%

Tire—

Common Iron ..... 80@80&5%
Norway Iron ..... 20@20@10
American Screw Co.:
Norway Phila., list Oct. 16, '84... 80%
Eagle Phila., list Oct. 16, '84... 82½%
Bay State, list Dec. 28, '99..... 80
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84... 80
Eagle Phila., list Oct. 16, '84... 82½
Eclipse, list Dec. 28, '99 80
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99..... 80
Norway Phila., list Oct. '84..... 80%
Eagle 82½
Shelton Co.:
Tiger Brand, list Dec. 28, '99.... 80%
Phila., Eagle, list Oct. 16, 1884. 82½%
Upson Nut Co.:
Tire Bolts 72½%

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch	1¼	1½	1¾	2
Per doz.	$4.80	5.60	6.40	8.00
Inch	2¼	2½		
Per doz.	$8.65	11.50		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each 25%

Boxes, Mitre—

C. E. Jennings & Co. 25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Adjustable ..... 15&10
Perfection 40
Seavey 45%

Braces—

Common Ball, American $1.50
Barber's ..... 50&10@10&60&10
Fray's Genuine Spofford's 60%
Fray's No. 61, 166, 206, 614 ..... 50%
C. E. Jennings & Co. ..... 50&5
Mayhew's Ratchet 60%
Mayhew's Quick Action Hay Pat... 50%
Millers Falls Drill Braces ..... 25&10%
P., S. & W. Co., Peck's Pat.... 60&10%

Brackets—

Wrought Steel ..... 75@75@10&10
Bradley Metal Clasp.. 50&10@50&10&5
Griffith's Pressed Steel ..... 75@75&10
Griffith's Folding Brackets ..... 70&10
Taplin Victor Handy Egg Beater Bracket ..... ₱ doz. $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co. ..... 75&20
Wire Goods Co. 75

Buckets, Galvanized—

Mf'r's list, price per gross.

Quart..	10	12	14	
Water, Reg...	26.85	29.50	33.50	*Nesting, 10@—*
Water, Hvy...	45.35	48.00	52.00	
Fire, Rd. Btm..	32.00	34.65	38.65	
Well	37.35	41.45	45.35	

Bull Rings—See *Rings, Bull.*

Butts—Brass—

Wrought, High List, Oct. 26, '06. 55
Cast Brass, Tichnor's 10

Cast Iron—

Fast Joint, Broad ....40@10@50%
Fast Joint, Narrow ....40@10@50%
Loose Joint ..... 70@10@75%
Loose Pin ..... 70@10@75%
Mantels Hinges ..... 70@70@65
Parliament Butts ..... 70@70@5

Wrought Steel—

Bright.
Light Narrow, Light Reversible ..... 70@5
Reversible, Broad ..... 70@5%
Loose Joint, Narrow, Light 70
Inside Blind, &c 70
Back Flaps, Table Chest.. 65%
Japanned.
Light Narrow, Loose Pin, ... 40@5%
Light Narrow, Ball Tip.. 60%
Broad ..... 40@5%
Steeple Tipped 70%
Ball Tipped 70%

Nesting, 10@—

Cages, Bird—

Hendrix Brass: Series ... 1100, net list, 12c.; 15 ... 900 ... 30
Hendrix Bronze: Series 2 ... 800 ... 30
Hendrix Enameled ... 2

Calipers—

See Compasses.

Calks, Toe and Heel—

Blunt, 1 prong, per lb. ... 4@5½c
Sharp, 1 prong, per lb. ...
Bauer Bluntz ...
Lambert Bluntz ...
Perkins' Bluntz, 1 ... 4 ... 4½c

Can Openers—

See Openers, Can.

Caps, Percussion—

Eley's E. B. ... 75@75c
G. D. ... per M ...
F. L. ... per M ...
G. E. ... per M ...
Musket ... per M ...

Primers—

Berdan Primers, $2 per M ...
Primers with Round Bullets ...
All other primers per M ...

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

Blank Cartridges:
32 C. F. ... 1st
38 C. F. ... 2nd
22 cal. Rim, $1.00 ... 2nd
32 cal. Rim, $2.75 ... 1st
B. B. Caps, Con. Ball, Sm'gd..$1.90
B. B. Caps, Round Ball.....$1.30
Central Fire:
Target and Sporting Rifle ...
Primed Shells and Ball ...
Rim Fire, Sporting ...
Rim Fire, Military.....15@5%

Casters—

Bed ... 65@70%
Plate ... 60@70%
Philadelphia ... 70@70&10%
Acme Ball Bearing ...
Gem Roller Bearing ... 70&10%
Steel Gem ... 5
Standard Ball Bearing ...
Yale Ornamental Wood ... 10&10

Cattle Leaders—

See Leaders, Cattle.

Chain, Proof Coil—

American Coil, Straight Link:
⅛ in. ... 5.40
⅜ in. 3.95 3.75 3.65 3.55
½ to ⅝ inch. ...
$3.45 3.55
In cask lots, deduct 25c
German Coil.....60@60&5%
German Pattern Coil:
6-9 to 1 in. ...
2 and 2½ in. ... 60&10@60&10%
3, 3½ and 4 in. ... 70@70&10%

Halter—

Halter Chains. ... 60@60&10%
German Pattern Halter Chains, list July 24, '05 ... 60@60&10%
Cow Tie ...
Halter ...

Cow Ties—

See Halters and Ties.

Trace, Wagon, &c.—

Tennessee-Ohio Standard ...
6-6, Straight, with ...
6-6-2, Straight, with ...
6½-8-2, Straight, with ring .$32.00
6½-10-2, Straight, with ...
NOTE—Add 2 ... *Trace Chains, add 1* ... *and 3* ... *Straight Link.*
Eastern Standard Traces, Wagon Chains, list ... 60&10@60&10%

Miscellaneous—

Jack Chain, list July 1 ...
Iron ... 60&10@60&10%
Brass ... 25
Safety and Plumbers' Chain..75%
Gal. Pump Chain....lb., 4½@5%
Brassfield ...
Tie and Halter ...
Trace ...
Brass, Halter and ...
Cover ...
Breast Halter Head ...
Chain ...
Oneida Community:
American Halter ...
Chains ...
Nickel Dog ...
Steel ...
Wire Goods Co: ...
Dog ...
Universal Dog ...

Chain and Ribbon, Sash—

Oneida Community:
Steel ...
Pullman:
Brass Chain ...
Chappell ...
Sash Chain ...
Aluminum Seal ...
Jr. ...
Sash Ribbon Attachments, per set..8c

Chalk—

Carpenters' Blue ... gro. 75c
Carpenters' Red ... gro. 75c
Carpenters' White.....gro., 40c

Checks, Door—

Barbour ...
Pullman, per gro. ... $3.00
Russwin ... 33⅓

Chests, Tool

American Tool ...
Kennedy ...
Union ...
Gem ...
Kelley ...
Mayhew ...
Peck, Stow & Wilcox ...
Pexto ...
Stanley Rule & Level ...

Chisels—

Socket Framing and Firmer

Standard List ... 50&10
Buck Bros.
C. E. Jennings & Co.:
Solid ...
Tubular ...
I. & L. J. White ...

Tanged

Tanged Firmers ...
Buck Bros.
C. E. Jennings & Co. Nos. 191, 181, 25
L. & I. J. White Co. ... 25&5

Cold—

lb
Cold Chisels, good quality..13@15c
Cold Chisels, fair quality..11@12c
Cold Chisels, ordinary.... 9@10c

Chucks—

Van Dorn Combination ...
Van Dorn Taper Shank ...
Reed ...
Jacobs ...
Beaver ...
Power Drive Chuck ...
Skinner Patent Chucks:
Universal ...
Universal, Reversible Jaws.....35%
Combination, Reversible Jaws...
Drill Chucks, New Model, 25%
Standard, 45%; Skinner Pat. ...
Plain ...
Plain ...
Standard Tool Co.:
Improved Drill Chuck.....45%
Hand ...
Combination, Nos. 1, 2, 3, 4, 5, 6, ...
Scroll Combinations, Nos. 83 and ...
Geometric ...
Independent Steel, No. 61, ...
Union Drill, Nos. 000, 00, 100, 101, ...
Universal ...
Universal, Universal ...
Universal, 11, 12, 16, 17, 13, 14, 15..40%
Universal ...
Iron Face Plate Jaws, Nos. 28, 30, ...
Plain ...
Steel Face Plate Jaws, Nos. 70 and ...
Plain ...
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill...50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%
Whitaker Mfg. Co.:
Universal Drill ...

Clamps—

Adjustable Hangers ...
Carpenters' Mitre, P., S. & W. Co. ...
Iron ...
Myers' Hay Rack.....45%
Pipe ...
Wrought Iron ...
Saw Clamps, see Vises, Saw Filers'

Cleaners, Drain.

Bower Chemical Manufacturing Co. ...
Iwan's Champion, Stationary.....40%

Sidewalk—

Star Socket, All Steel..⅓ doz. $4.05 net
Star Shank, All Steel..⅓ doz. $3.24 net
Wood ...

Cleavers, Butchers'—

Enterprise ...
Kelley ...
L. & I. J. White Co. ... 30

Clippers, Horse and Sheep—

Chicago Flexible Shaft Co.:
1002 Chicago Horse, each..$10.75
20th Century Horse, each...$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each, $20.00
Sheep ...
Horse, each.....$6.75
Stewart Patent Sheep Shearing Machine, each.....$12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each...$9.75

Clips, Axle—

Regular Styles, list July 1, '05, ...

Cloth and Netting, wire

See Wire, &c.

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c. ...
Compression Bibbs ...

Coffee Mills—

See Mills, Coffee.

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's ...

Compasses, Dividers, &c.

Ordinary Goods.....70&10@75%

Conductor Pipe,—

Gal. Steel. Charcoal
... ...
... ...
... ...
... ...
... ...
... ...
... ...
... ...
... ...
... ...
... ...
... ...

Coolers, Water—

L. & G. Mfg. Co.:
... 4 5 6 8
Galvanized, each $1.85 $2.00 $2.25 $2.90 $3.90
... 2 3 4 6 8
Wall ...

Coppers' Tools—

See Tools, Coopers'.

Coppers, Soldering—

... lb. to pair and heavier, 20¢; lighter than 3 lb. to pair.....22¢

Cord— Sash—

Braided, Drab.....lb. 35c
Braided, White, Com., Nos. 8 to 14 ...
Braided, White, Com., Nos. 6 to 4, 25½c. In lots of 12 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18..37¢
... ...
... lb. ...
Cotton Sash Cord, Tested ...
Patent Hemp ... lb. ...
Cotton Clothes ... lb. ...
India Hemp, Brd'd.....lb...21c
India Hemp, Twisted...lb. 13@14c
Patent India, Twisted..lb...17c
Pearl Braided, cotton, No. 6, ⅓ lb. ...
... ...
Harmony Cable Laid Italian, Nos. 7 ...
Pullman:
Wire ...
Sash Cord Attachments, per 100..$2.00
Samson, Nos. 8 to 12:
Braided, ⅓ lb., Drab Cotton, 50¢; Linen, 65¢; White Cotton ...
... ...
Manila ...
Manila ...
Phoenix, White, Nos 8 to 12....27c
Silver Lake, per lb.:
A, Drab, 35¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; D ...
See also Chain and Ribbon.

Wire, Picture—

Full Length ...
Short ...
Hook & Screw ... old list, 85&10%
Wire ...
Tape & Screw ...

Cradles—

Grain ...

Crayons—

White Round Crayons, Cases, 100 ... and Semi-round, according to grade.
Zehnicker's Lumber: ⅓ gro.
White and Purple, Indelible....$7.50
Red ...
Terra Cotta, $6.50; Black.....$1.50
Boxes ...
round, all colors, $12.00; Indelible, $14.00; Blacks.....$10.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ⅜ in. Square, $1.75; 5 x ½ x 3-16, ...
Suremark, Black, $2.25; Blue, Red ...

Crooks, Shepperds'—

Fort Madison, per doz., Heavy, $5.50 ...

Crow Bars

Cultivators—

Various ...

Cutlery, Table—

Nickel ...
Bone ...
Stag ...
and Anchor.....⅓ doz. $3.00
Wire ...

Cutters— Glass—

Hall ...
Keen ...
Kutter ...

Meat and Food—

Enterprise ...
Kelley ...
Peck, Stow & Wilcox ...
Pexto ...
P. S. & W. Co.: ...
... ...
... ...
... ...
... ...
... ...
... ...
... ...
... ...
New Triumph No. 605, ⅓ doz. $21.00
... ...
... $15.00 $18.00

Slaw and Kraut—

Hall ...
Slaw and Kraut Cutters.....37½
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....⅓ doz. $3.00
... ...

Tobacco—

All Iron, Cheap...doz. $1.25@1.50
... ...
... ...
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Fasteners, Blind—

Zimmerstaples ..... 50&10
Wallings ..... 40&10
Upson's Patent 10

Cord and Weight—

Ives and Truen 33⅓

Corrugated—

Acme Corrugated Fasteners..... 70

Faucets—

Cork Lined. ..... 50&10&60%
Metallic Key, Leather Lined, .. 60&10&70%
Red Cedar ..... 70&5&50&10&75%
Petroleum ..... 70&10&10&75
B. & L. B. Co.:
Metal Key ..... 60&10
Star 80%
West Lock ..... 50&10
John Sommer's Peerless Tip Key 40
John Sommer's Bess Tip Key 50
John Sommer's Victor Mfl. Key. 50&10
John Sommer's Duplex Metal Key. 60
John Sommer's Diamond Lock 40
John Sommer's I.X.L. Cork Lined. 50%
John Sommer's Reliable Cork Lined ..... 50&10
John Sommer's Chicago Cork Lined 60
John Sommer's O. K. Cork Lined..50%
John Sommer's Leather Lined, Cedar.....50
John Sommer's Perfection, Cedar.....40%
Self Measuring:
Enterprise, ℔ doz, $36.00.... 10&10
Lane's, ℔ doz. $36.00..... 10&10
National Measuring, ℔ doz, $36.40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List Nov. 1, 1899.
Best Brands ..... 70&10&75&10
Standard Brands ..... 75&10&10
Lower Grade ..... 75&10&10&10&80%

Imported -

Stubs' Tapers, Stubs' list, July 24, '97. ..... 33⅓&10

Fixtures, Fire Door—

Allith Underwriters' Approved.....50%
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 ..... $3.75
Fusible Links, No. 96..... 50
Expansion Bolts, No. 107 .... 60&10

Grindstone—

Net Prices:

Inch	15	17	19	21
Per doz	$3.60	3.85	4.45	5.65

P. S. & W. Co..... 25
Reading Hardware Co..... 60

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig. Ezy Potato ..... 60&15&2½
Victor, Hay..... 60
Victor, Manure..... 66⅔
Victor, Header..... 65
Champion, Hay..... 66⅔
Champion, Header..... 65
Champion, Manure..... 60&15&2½
Columbia, Hay..... 60&20
Columbia, Manure..... 70
Columbia, Spading..... 70&12½
Hawkeye Wood Barley..... 10
W. & C. Potato Digger..... 60&10%
Acme Hay..... 60&20
Acme Manure..... 60&10&10
Dakota Header..... 60&20
Jackson Steel Barley..... 60&20
Kansas Header..... 65
W. & C. Steel Wood Barley.....40
Plated,—See Spoons.

Frames— Wood Saw—

White, S'g't Bar, per doz. ..75@80¢
Red, S'g't Bar, per doz. ..$1.00@1.25
Red, Dbl. Brace, per doz. ..$1.40@1.50

Freezers, Ice Cream—

Qt. 1 2 3 5 6
Each $1.25 $1.60 $1.90 $2.20 $2.80

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp $2.75
Cotton 3.20
Waterproof Sqf. Taped .. 3.65
Waterproof Dbl Taped .. 4.50
Waterproof Tpl. Taped .. 5.45

Gates, Molasses and Oil—

Stebbins' Pattern ..... 80&10&65%

Gauges—

Marking, Mortise, &c. ..50&10&10%
Chapin-Stephens Co.:
Marking, Mortise, &c ..... 50&10&10
Disston's Marking, Mortise, &c..67½
Wire, Brown & Sharpe's 33⅓
Wire, Morse 33⅓
Wire, P. S. & W. Co..... 33⅓

Gimlets— Single Cut—

Numbered assortments per doz.

Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $3.00; 2, $3.30
Nail, Wood Handled, No. 1, $2.00; 2, $2.60
Spike, Wood Handled, No. 1, $3.00; 2, $3.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co..... 65&5&10

Glue, Liquid Fish—

Bottles or Cans, with Brush, ... 75&10&50%
Elwell's 40

Grease, Axle—

Common Grade...gro. $6.00@$6.50
Dixon's Everlasting, 10-lb. pails, ea. 85¢; in boxes of doz. 1 lb, $1.20
2 lb. $2.00
Helmet Hard Oil..... 25

Griddles, Soapstone—

Pike Mfg. Co ..... 33⅓&10

Grinders—

Royal Mfg. Co.:
Abundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 50
Abundum Sickle Grinders, each, Nos. 20 $3.50, 20A, $6.00; 20A Combined, $6.50 30
Abundum Disc Grinders, each, $2.50 ..... 30%

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, ℔ inch, ℔ doz., $2.00..... 33⅓%
Richards Mfg. Co., Eli and Uncle Ball Bearing, mounted..... 40%

Grips, Nipple—

Perfect Nipple Grips..... 40&10&2%

Halters and Ties—

Cow Ties ..... 65¢@ 65&10%
Rindgnet Cow Tie 75
Triumph Coil and Halters..35&2½&10
Brown Coil and Halters ..45&50&5
Brown Cow Ties.... 50&30&50&10&5
Brown Tie Outs ..... 70&10&75&5
Covert Mfg. Co.:
Web ..... 30&2
Jute Rope..... 35
Sisal Rope..... 45
Cotton Rope..... 45
Hemp Rope..... 45
Oneida Community:
Am. Coil and Halters ..... 40&10&5
Am. Cow Ties..... 45&50
Niagara Coil and Halters...45&50&5
Niagara Cow Ties..... 45&5&50&10&5

Hammers—

Handled Hammers—

Heller's Machinists'....55&10&55&10&5
Heller's Farriers..... 40&5&40&10&5
Peck, Stow & Wilcox Co.:
Crucible Steel..... 40&10
Farriers' ..... 40&10
Riveting ..... 40&10
Machinists' ..... 60&10
Blacksmiths' 50
Estabrook R. Plumb:
A. E Nail ..... 43&2½&10&12½
Eng. and B. S. Hand..50&10&5&60&5
Machinists' Hammers ..... 60&60&10
Riveting and Timber..40&2½&40&12½&5

Heavy Hammers and Sledges—

Under 3 lb., per lb. ..50¢ ..80&10%
3 to 5 lb., per lb., 40¢ ..80¢&10&10%
Over 5 lb., per lb. ..30¢
Over 5 lb., per lb. 30¢..80¢&10&10%

Handles—

Agricultural Tool Handles

Axe, Pick, &c. ..... 60¢&10&60¢&10&5%
Hoe, Rake 40
Fork, Shovel, Spade, &c.:
Long Handles 40%
D Handles 40%

Cross-Cut Saw Handles—

Atkins 40
Champion 50
Disston's 50

Mechanics' Tool Handles—

Auger, assorted...gro. $3.00@$3.50
Brad Awl ..... gro. $1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; *Hickory* ..... $2.15@2.30
Socket Firming, Apple, $1.75@ $1.95; Hickory ..... 1.60@1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted ..... gro. $1.30@$1.40
Hammer, Hatchet, &c. ..... 60¢&10¢&60¢&10¢&5
Hand Saw, Varnished, doz., 80¢ 85¢; Not Varnished ..... 65¢@75¢
Plane Handles:
Jack, doz., 30¢; Fore, doz... 75¢
Chapin Stephens Co.:
Carving Tool ..... 30¢&20&10
Chisel ..... 60¢&60&10
File and Awl ..... 60¢&60&10
Saw and Plane ..... 30¢&50&10
Screw Driver ..... 30¢&20&10
Millers Falls Adj. and Ratchet Auger Handles ..... 15¢&10
Nicholson Simplexity File Handle ..... ℔ gro. $0.85@$1.50
J. L. Osgood:
Indestructible File and Tool ℔ gro., No. 1, $8.00; No. 2, $8.50 No. 3, $9.00; No. 4 ..... $10.00
5, $10.00..... gro. lots 10%
W. A. Zelnicker Supply Co.:
Hammer, ℔ doz 12 in. $2.00 14 in., $2.50; 16 in., $2.30; 18 in., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, ℔ doz., oval, 30 in., $2.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe, ℔ doz. 28 to 34 in., $5.60; 36 in., $7.00.
Adze, ℔ doz. 36 in., $5.80; 36 in., $7.80.
Pick, ℔ doz. R. R. 36 in., $8.00; coal, 34 in., $8.80.
Hatchet, ½ doz. 12 to 14 in., $3.00

Hangers—

NOTE—Barn Door Hangers are generally quoted per pair, without track and Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable, Nos. 1 and 2; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door..... 50%
Chicago Spring Butt Co.:
Friction 25
Oscillating 25
Big Twin 25
Chisholm & Moore Mfg. Co.:
Baggage Car Door..... 50%
Elevator 30%
Railroad 50
Cronk & Carrier Mfg. Co.:
Loose Axle..... 60&2½
Roller Bearing ..... 70&2½
Grubin Mfg Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, ... 60&10%
Roller Bearing, Ex. Hy., No. 22, $18.00..... 60&10%
Bull Dog, $24.00..... 70%
Lane Bros, Co.:
Parlor, Ball Bearing, $1.00:
Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard..... 60&10
Hinged ..... net $6.08
Covered ..... 60&5
Special ..... 70&5
Lawrence Bros.:
Advance ..... 55&10%
Cleveland ..... 70&7½%
Clipper, No. 75..... 60
Crown ..... 55&10
Cyclone, No. 40 ..... net $6.50
Tandem, No. 50..... net $7.50
New York..... 55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2..70
Anti-Friction 4
Hinged Hangers, King Charm.60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12.$2.20
Roller B'r'g St'l Track No. 13.$2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16..... 50&10
Seal, Steel Track No. 8..... $2.25
Auld, Iron Track No. 22..50&5%
Trolley B, D, No. 17, $1.25; F, D. No. 120, $2.25; No. 121, $2.45; No. 150..... $2.50
Safety Underwriters F. D. No. 101 50
Tandem No. 44..2¼ and 3 60&10
Palace, Adjustable Track No. 122 ..... 50&5
Royal, Adjustable Track No. 122 ..... 50&10
Ives' Wood Track No. 1..... $2.25
Trolley B, D, No. 2..... 50&10
Trolley B, D, No. 24, $1.30; No. 27, $1.40; No. 28..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2 70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3 60
Hinged Tandem No. 48 ..... 60&5
Folding Door B. B. Swivel No. 105 40
Taylor & Boggis Fty Co.'s Kidder's Roller Bearing 50&15&10&5
Myers' Stayon Hangers..... 60

Hangers— Garment—

Pullman Trouser, ℔ gro., No. 1 $9.00; No. 4, $24.00; No. 5, $16.50; No. 8, Black Enamel, $7.50; No. 10, $21.00; No. 12, $8.00; No. 15, Rods, $9.00; No. 18, Loops..... $10.00
Victor Folding..... ℔ gro. $9.60

Gate—

Myers' Patent Gate Hangers, ℔ doz, net $4.50

Joist and Timber—

Lane Bros. Co..... 30%

Hasps—

Grubin's Security Hasp ..... 50&10
McKinnon's Perfect Hasp, ℔ doz..60

Hatchets—

Regular list, first qual..$04.25@—
Second quality ..... 50&5%—

Heaters, Carriage—

Clark No. 5, $1.75, No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No 3E, $3.25; No. 1, $3.50..... 25%
Clark Coal, ℔ doz., $0.75..... 20

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind:
(Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	3	5
Doz. pair	$0.75	1.35	2.70

Mortise Shutter:
(L. & P., O. S., Acme, &c.)

No	1	1½	2	2½
Doz. pair	$0.50	.65	.80	.95

Mortise Reversible Shutter (Buffalo, &c.):

No.	1	1½	2
Doz. pair	$0.70	.85	.100

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3 for Brick, $11.50..... 10%
Charles Parker Co..... 70&75
Parker Wire Goods Co.
Hale & Benjamin Automatic Blind Hinges 20
Hale Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $8.00 20
Reading's Gravity..... 60

Extra 50&10 often given.

Stanley's Steel Gravity Blind Hinges, No. 16½ ℔ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter..... 75&5%
Acme, Lull & Porter..... 75
Queen City Reversible..... 75
Shepard's Noiseless, Nos. 60, 65, 55 ..... 75&5
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&5
Tip Patn, No. 1..... 75&10
No. 3 ..... 75&5
Buffalo Gravity Locking, Nos. 1, 3 & 5..... 70&10&5%
Shepard's Double Locking..... 75
Champion Gravity Locking.....75&5%
Pioneer ..... 75&10
Empire 65
W. H. Co.'s Mortise Gravity Locking, No. 2..... 65&10

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3	4
Hinges with L't'chs	2.00	2.70	3.40	
Hinges only	1.25	1.90	3.32	
Latches only	.70	.75	.85	

New England:
With Latch ..... *doz. @$2.00*
Without Latch ..... *doz. @$1.60*
Reversible Self-Closing:
With Latch ..... *doz. @$1.75*
Without Latch ..... *doz. @$1.35*
Western:
With Latch ..... *doz. $1.75*
Without Latch ..... *doz. $1.15*
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3..... 70%

Pivot Hinges—

Bommer Bros. Pivot..... 40%
Lawson Mfg. Co. Matchless..... 50

Spring Hinges—

Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, C'st Iron $6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges..... 40%
Bardsley's Patent Checking.33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor..40%
Bommer Spring Hinges..... 40%
No. 999 Wrot. Steel Hold Back, ℔ gro. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges..... 25%
Triple End Spring Hinges..... 50
Chicago Ball Bearing Floor.. 50
Garden City Engine House..... 25
Keene's Saloon Door 25
Columbian Hardware Co.:
Acme, Wrought Steel 30
Acme, Brass 25
American 50
Columbia, ℔ gr., No. 14, $9.00; No. 16 ..... $35.00
Columbia, Adj., No. 7, ℔ gr. $12.00
Columbian Hinges..... 60&10
Gem, new list..... 30%
Clover Leaf and Acorn, gro. lots. $5.10; ½ gro. lots..... $6.00
Oxford, new list..... 30
Floor Spring Hinges..... 65&10
Lawson Mfg. Co., Matchless...30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges..... 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door..... ℔ gr. $9.00
Chief Ball Bearings Floor Hinge..... 50%
Ball Bearing Door..... 25
No. 777, Sheet Steel Holdback, ℔ gr, pr..... $9.00
Standard Mfg. Co.:
Champion Double Acting Door Hinge ..... 25&10&10%
Standard Double Acting Floor Hinge..... 50&10%
Superior Spring Hinge Co.:
Superior Floor Hinges..... 33⅓%

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges	.50&10%
Heavy Strap Hinges	.60&5
Light T Hinges	.50
Heavy T Hinges	.50
Extra Hvy. T Hinges	.50&10
Hinge Hasps	.33⅓
Cor. Heavy Strap	.60&5
Cor. Ex. Heavy T	.50&10%

Extra 10% often given on most of these Hinges.

Screw Hook and Strap.	*6 to 12 in.*	*.3%*
	14 to 20 in.	*.3½*
	22 to 36 in.	*.3*

Screw Hook and Eye:

to 1 inch	*.1b*	*6¼¢*
1¼ inch	*.1b*	*7½¢*
1½ inch	*.1b*	*8½¢*

Extra 10&7½%

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—

M'f'gr's list, price per gross:

Inch	15	17	18
Galv. Open	$37	$39	$42
Jap. Open	26	28	31
Galv. Funnel	53	58	52
Jap. Funnel	33	36	39

Extra 10&5%

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick, No. 162..... each $1.05
Steel Mortar, No. 158..... each $1.35

Hoes— Eye—

Scroll and Oval Pattern,

	6to8	*10¢&10*	*12¢&10*
Grub, list Feb. 23, 1899	*70¢*	*10&7½*	*10¢&10%*

D. & H. Scroll 37½
Am. Fork & Hoe Co. (Scroll Pattern) 60

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Chonk's Wedding, No. 1, ⅜ in., No. 2 ⅝ in., ... 50
Star Double ... 50&5
Lee's Genuine Cotton Hoe ... 70&10&5
Ft. Madison, Crescent Cultivator Hoe ... ⅜ doz.
Ft. Madison Mattock Hoe ... ⅜ doz.
Regular Weight ... ⅜ doz. net $4.1
Junior Size ... ⅜ doz. net $3.6
Ft. Madison Sprouting Hoe ... ⅜ doz. net $3.2
Ft. Madison Dixie Tobacco Hoe ... 70&10&5
Kitchener's Cut Easy ... 70&5
Warren Hoe ... 70&5
W. & O. Combination ... 70&5
B. B. 6 in. Cultivator Hoe ... 50
B. B. 6 in. ... ⅜ doz. net $3.2
Acme Weeding ... ⅜ doz. net $3.2
W. & O. L. Hoeing Shuffle Hoe ... ⅜ doz. net $3.2

Hoisting Apparatus—

See Machines, Hoisting.

Holders—Bit—

Angular, ⅜ doz. $21.00 ... 15&5

Door—

Barndley's, Iron ... Brass and Bronze ... 50
Empire ... 50
Pullman ... 50
Richards Mfg. Co.: No. 137, Everready, 40; Nos. 138, 139, Sure Grip ... 50
Superior ... 50&5

File and Tool—

Nicholson File Holders and File Handles ... 50

Fruit Jar—

Triumph Fruit Jar Holder, ⅜ gross, $10.80 ... ⅜ doz. $1.25

Trace and Rein—

Fernald Double Trace Holder, ⅜ doz. pairs ... ⅜ doz. $1.2
Dash Rein Holder, ⅜ doz. pairs $1.2

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty ... 50; German ... 50

Hooks—Cast Iron—

Bird Cage, Reading ... 1
Cloth's, Line, Reading List ... 1
Coat and Hat, Reading ... 45&5
Coat and Hat, Wrightsville ... 60&5
Harness, Reading List ... 40

Wire—

Belt ... 50
Wire C. & H. Hooks ... 50
Bradley Metal Clasp Wire Coat and Hat ... 70&10
Coat and Hat, Reading ... 70&10
Columbian Hdw. Co., Gem ... 50
Parker Wire Goods Co., King ... 70&1
Wire Goods Co.:
Acme, 65; Chief, 70; Crown, 75; Czar, 65; V Brace, 75; Czar Harness, 30&10

Wrought Iron—

Bar, 6 in., per doz., $0.90; 8 in., $1.15.
Cotton ... *doz. $1.25@$1.50*
Wrought Staples, Hooks ... 50

See Wrought Goods.

Miscellaneous—

Hooks, Bench, see Stops, Bench
Rush, Light, doz., $0.20, Medium, $0.25; Heavy, $0.30
Grass, best, all sizes, per doz., $2.75@$3.00
Grass, common grades, all sizes, per doz ... *$1.25@$1.50*
Whalebone ... *lb. 15@20*
Hooks and Eyes:
Brass ... *60@70 and 10*
Malleable Iron ... *50@70&10*
Covert Mfg. Co., Gate and Screen Hooks ... 50
Ft. Madison Cut-Easy Corn Hooks, ⅜ doz. $2.25
Turner & Seaman Corn Shoulder ... 35&5
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

orse Nails—

See Nails, Horse.

Horseshoes—

See Shoes, Horses.

Hose, Rubber—

Garden Hose, ¾-inch:
Competition ... *ft., 6@6½¢*
Alpha Guaranteed ... *ft. 9@10¢*
3-ply Guaranteed ... *ft. 9@10¢*
Cotton Garden, ¾-in., coupled:
Low Grade ... *ft. 4½¢*
Fair Quality ... *ft. 5¢*

Irons—Sad—

From ¼ to ½ ... *lb. 6¢*
R. R. Sad Irons ... *lb. 6¢*
Mrs. Potts', cents per set:
Nos. ... *9 10 11 12 13*
Japan Tops ... *45 50 55 60 65*
Tin'd Tops ... *50 55 60 65 70*
New England Pressed Steel ... *50*

Bar and Corner—

Richards Mfg. Co. ... 10
Corner ... 10

Pinking—

Pinking Irons ... *doz. 60@85¢*

Irons, Soldering

See Coppers.

Jacks, Wagons—

Covert Mfg. Co.:
Auto Screw ... 70&5 Steel ... 50
Lockport ... 50
Lattrell Steel ... 50&5
Richards: Eagle Steel, No. 130 ... 50&10
Smith & Hemenway Co. ... 25

Ladder—

Richards Mfg. Co., Ladder Jacks ... 50%

Kettles—

Brass, Spun, Plain ... *20@25*
Enameled and Cast Iron, See Wash Tubs.

Knives—

Butcher, Kitchen, &c.—

Porter Bros. Butcher &c. ... 60
Wilkinson Sheaf & Cutlery Co. ... 60

Corn—

Columbian Cutlery Co., Wire Bound Knives and Hooks ... 50
Wiscasset Auto ... 50
Dodge Mfg. Co., Scalloped, 5; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List ... *50&10*
C. L. Jaques & Co., Nos. 45 to ... 25&5
Jennings & Gribbs, Nos. 1 to ... 60&5
Sears ... 10
Wilcox ... 10&5
L. & L. J. White ... 25&5

Hay and Straw—

Serrated Edge, per doz. $5.50@5.75
Ft. Madison ... 25&5
Iowa, Serrated ... ⅜ doz. $4.00

Miscellaneous—

Farriers' ... *doz. $2.00@3.75*
Wiscasset Co. ... ⅜ doz. $4.00

Knobs—

Base, 2½ inch, Birch or Maple, Rubber Tip ... *gro. $1.25@1.50*
Carriage, Jap., all sizes, gro. 40@45¢
Door, Mineral ... *doz. 65@70¢*
Door, Por. Japan ... *doz. 70@75¢*
Door, Por. Mineral ... *doz. $2.00@2.15*
Berkeley's Wood Door, Shutters, &c. 15%

Lacing, Leather—

See Belting, Leather

Ladders, Store, &c.—

Alliance Mfg. Co., Reliable ... 50
Lane's Store ... 25
Myers' Noiseless Store Ladders ... 50
Richards Mfg. Co.:
Improved Noiseless, No. 112 ... 50
Climax Shelf, No. 113 ... 50
Trolley, No. 109 ... 50

Ladles, Melting—

L. & G. Mfg. Co. [no list] ... 20
P. S. & W. ... 40&10
Reading ... 60

Lanterns—Tubular—

Reading, No. 0 ... *doz. $3.50@4.50*
Side Lift, No. 0 ... *doz. $4.00@4.75*
Hump Globe, No. 0 ... *doz. $4.00@4.75*
Other Styles ... *doz. $4.00@5.00*

Bull's Eye Police—

Lunch ... *$4.25@4.50*

Latches—Thumb—

Rogers's Latches, with screw, doz. 35@40¢

Door—

Acme Mfg. Co., Reliable and Alligator, 50%; Reliable Cold Storage, 50%
Cronk & Carrier Mfg. Co., No. 101, ⅜ doz. $2.00
Richards' Ball Dog, Heavy ... 50&
Richards' Trump, No. 127 ... $1.30

Leaders, Cattle—

Small ... *doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cattle, Hand ... 45%; Jute, 35%; Sisal, 20%

Leathers, Pump—

See Pumps.

Lifters, Transom—

R. & E. ... 10

Lines—

Wire Clothes, Nos. 18 to 20, two feet ... *$4.50 2.25 2.00*
Three feet ... *$2.40 1.80 1.65*
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3 ... 40%
Solid Braided Masons' ... 30%
Solid Lake Braided Chalk, Nos. 9, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $8.00 ... 40 & 2%
Masons' Lines, Shade Cord, &c.; White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 5 ... 20
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $6.50 ... 20
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25 ... 20
Turner & Seaman Co.:
Solid Braided Chalk, Masons' and Sewing Lines ... 25
Clothes Lines, White Cotton ... 20
Shade Cord, Cotton or Linen ... 20

Locks—Cabinet—

Cabinet Locks ... 40&

Door Locks, Latches, &c—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co. ... 1
R. & E. Mfg. Co. ... 1

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass ... 75&10

Sash, &c.—

Ives' Patents:
Brass and Brass ... 70&5
Cresco ... 60%; Iron, 60%; Window Ventilating, 40&20%; Robinson Pat. Ventilating Sash ... 40
Pullman Patent Ventilating Lock ... 25
Reading Sash Locks ... 10

Machines—Boring—

Cam, Lipet, without Lugs ... *$2.00@2.75*
Cam, Lipet, with Lugs ... *$2.25@2.50*
Swan ... 1
Jones ... 1
Millers' Falls ... 5.75
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Invincible Hand Power ... ⅜ doz. $48.00

Fence—

Williams' Fence Machines ... each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist ... 30
Weed ... 1
Moore's Cyclone High Speed Chain ... 25

Ice Cutting—

Clair Brothers ... 12½

Washing

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rubber	57.00
Champion Rotary Banner No. 1	$57.00
Standard Champion No. 1	$50.00
Standard Perfection	$27.00
Cincinnati Square Western	$33.00
Uneeda American, Round	$33.60

Mallets—

Hickory ... *75c@$1.50*
Lignumvitæ ... *100@$2.50*
Tinners' Hickory and Apple Wood ... *doz. 75c@$1.50*

Mangers, Stable—

Swan Iron Works ... 50

Mats, Door—

Acme Flexible Steel ... 50
Eagle Steel W. G. Co., new list ... 50

Mattocks—

See Picks and Mattocks.

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co. ... 50
Nourse [list Jan. 1, 1902] ... 50
Parker's Columbia and Victoria ... 33⅓
Parker's Box and Side ... 50&10
Swift, Lane Bros. Co. ... 30

Motors, Water—

Dayton Red Devil ... 50
Lippincott ... 50

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 16 in., $2.00; advance 50c for each size.
Cheap, 10-in., $2.25; advance 15@20¢ for each size.
Better Grade, 10 in., $4.00; advance 25¢ for each size.

	12	14	16	18 in.
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*
Continental				60
Great American				70
Great American Ball B'r'g, new list				70
Quaker City				70
Pennsylvania				60
Pennsylvania, Jr., Ball Bearing				50&10&5
Pennsylvania Golf				25
Pennsylvania Horse				33⅓&5
Pennsylvania Pony				10&5
Granite State:				
Style A, I. & Wheel				70
Style B, Low Wheel				70%
Style C, High Wheel, spcl. list,				70&10%
Style D, High Wheel, spcl. list				70&10%
Philadelphia:				
Styles M., S. C., K., T.				70&10&5%
Style A, all Steel				60&10&5%
Style E, High Wheel				70&10&5%
Drexel and Gold Coin, special list				40%
Horse				40%
Pony				40
36-in. Horse				30&10%
Eagle Horse				30&5%
I. X. L. Horse				30

Nails—

Wire Nails and Brads, Miscellaneous ... *85&5@8.40&5*
Cut and Wire, See Trade Report
Hungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

N	6	7	8	9	10	
Acme	2	2	2	2	2	10&5
Colonial	2	2	2	2	2	10
Diamond	2	2	2	2	2	10&5
Liverpool	2	2	2	2	2	10
Wrought						5

Jobbers' Special Brands, per M, $0.60@0.80

Picture—

	1½	2	2½	3 in.
Brass, Bd.				5
Por. Head, gro.	*1.10*	*1.10*	*1.10*	

Upholsters—

Iron ... 5
Tinned ... 5 @10

Nippers—

See Pliers and Nippers.

Nuts—

Blank or Tapped

Cold Punched: *Off list.*
Semi-C ... 70&5
Hexagon ... 70&5
Semi-C. T. & R. ... 70&5
Hexagon C. T. & R. ... 65&5
Hot Pressed:
Square ... 70&5
Hexagon ... 65&5

Oakum—

Best	*lb. 6½¢*
U. S. Navy	*lb. 6¢*
Navy	*lb. 5¢*
Plumbers' Spun Oakum	*25@30¢*

Oil Tanks—*See Tanks, Oil*

Oilers—

Steel Copper Plated ... 75
Chase or Paragon:
Brass and Copper ... 50&10
Zinc ... 60&10
Japanned ... 60&10&5
Malleable, Hammers' Improved, No. 1, 2, 3, 50
American Tube & Stamping Co.:
Spring Bottom Cans ... 70&10&5
Railroad Oilers, &c. ... 60&10&5
Maple City Mfg. Co.:
Tube, Bell in Cap ... 70&10&5
Railroad Oilers, &c ... 60&10&5

Openers—Packing Box—

Horseshoe, per doz. $2. ... 50

Can Openers—

Per doz.
Sprague, Iron Handle ... *30@35c*
Sprague, Wood Handle ... *35@40c*
Sardine Scissors ... *$1.75@3.00*
Vaissier, Cans and Bottle Opener, ⅜ doz., list ... $0.75, Little Gem, ⅜ doz., list ... $0.65

Egg—

Hartigan Nickel Plate, ⅜ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope, any quantity ... *20c*

Rubber—

(Fair quality goods)

Sheet, C. T.	*110@12c*
Sheet, C. O. S.	*110@12c*
Sheet, C. B. S.	*120@13c*
Sheet, Pure Gum	*40@45c*
Sheet, Red	*40@50c*
Jenkins ...	25

Miscellaneous—

American Packing ... *lb. 70@10 ¢*
Cotton Packing ... *lb. 16@25 ¢*
Italian Packing ... *lb. 90@12½¢*
Jute ... *lb. 7@9c*
Russia Packing ... *lb. 80@11 ¢*

Pails, Water, Well, &c.—

See Buckets.

Pans—Dripping

Standard List ... *65@75@70*
Edwards, Royal Blue ... 65&5%

Fry—

Common Lipped:

Inch	2	3	4	5
Per doz	*$0.75*	*0.80*	*0.90*	*1.10*

Inch	6	7	8	9	10
Per doz	*1.30*	*1.50*	*1.80*	*2.25*	*3.00*

Refrigerator, Galva.—

Inch	12	14	16	18
Per doz	*$1.75*	*2.25*	*2.80*	*3.45*

Paper—Building Paper

Asbestos: *lb.*
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft., ... *3½@4.8*
Roll Board or Building Felt, 3-32 and ⅛ in., 35 to 60 lb., per ton sq. ft ... *33@*
Mill Board, Sheet, 50 x 40 in., 1-32 to ⅛ in. ... *3@*
Per roll.
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll, ... *$3.75@*
Medium weight, 30 lbs. to roll, ... *$4.50@*
Heavy weight, 40 lbs. to roll, ... *$5.50@*
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65c; 2 ply, 85c; 3 ply, $1.10; 4 ply, $1.35
Deafening Felt, 9, 6 and 3½ sq. ft. to lb., ton ... *$35.50*
Red Rope Roofing, 250 sq. ft. per roll ... *$1.75*

Tarred Paper—

1 ply (roll 400 sq. ft.), ton, $35@$38.50
2 ply, roll 200 sq. ft ... *90*
3 ply, roll 133 sq. ft ... *80c*
Slater's Felt (roll 500 sq. ft., ... *90c*

Sand Paper and Cloth—

Flint and Emery ... *4@10c*
Garnet Paper and Cloth ... *25%*

Parers—Apple—

Goodell Co.:		
Eureka Bay State	⅜ doz.	$15.00
Improved Bay State	⅜ doz.	$36.00
Monitor	each	$2.00
Tip Top	each	$2.00
White Mountain	each	$2.00
Universal Leader	each	$3.00
Ideal	each	$4.00
Eureka Improved	each	$20.00
New Century	each	$30.00
Reliable	each	$75.00
Livingston Nail Co.:		
Thorn	⅜ doz.	$4.80
Little Star	⅜ doz.	$5.00
Reading	⅜ doz.	$8.25
Reading Hardware Co.:		
Acme	⅜ doz.	$4.00
Reliable	⅜ doz.	$4.00
Reading 72	⅜ doz.	$3.25
Reading 78	⅜ doz.	$6.25

Potato—

Acme	⅜ doz.	$7.00
Wire Mountain	⅜ doz.	$6.00

Picks and Mattocks—

(List Jan., 1908.)
List ... *70c@90c@1.00@1.10*
Covert Mfg. Co.: Hudson, Mattock, ... 60; Nos. 1, 2 ... $0.45

Pinking Irons—

See Irons, Pinking.

Pins, Escutcheon—

Brass ..... *50c@70c doz.*
Iron, list Nov. 11, '05 ..... *.60@60&10%*

Pipe, Cast Iron Soil—

Standard, 4-in. ..... *60c@65c*
Extra Heavy, 4-in. ..... *70c@75c*
Fittings, Standard and Heavy ..... *70@100%*

Pipe, Merchant—

	Consumers, Carloads, Steel.	*Iron.*
	Blk. Galv.	*Blk. Galv.*
	% %	% %
¼ and ⅜ in.	64 48	62 —
½ in.	66 52	64 50
¾ in.	68 56	66 54
1 to 3 in.	72 62	70 60
7 to 12 in.	69 54	67 52

Pipe, Vitrified Sewer—

Carload lots.

Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:

First class	*.85*
Second class	*.90*

Pipe, Stove—

	Per 100 joints.	
	C. L.	L. C. L.
Edwards Nested:		
5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	6.75	7.75
7 in., Standard Blue	7.75	8.75
5 in., Royal Blue	7.00	8.00
6 in., Royal Blue	7.50	8.50
7 in., Royal Blue	8.50	9.50
Washburn Nesting & Co., Nested:		
5 in., Uniform Color	$6.15	$7.15
6 in., Uniform Color	6.65	7.65
7 in., Uniform Color	7.65	8.65

Planes and Plane Irons—

Wood Planes—

Bench, first qual. ..... *30@40c list*
Bench, second qual. ..... *.40@50c list*
Molding ..... *25@25c list*

Chapin Stephens Co.:

Bench, Fine Quality	50
Bench, Second Quality	4
Molding and Miscellaneous	25
Tool and Garnet	5
Union	60

Iron Planes—

Chapin's Iron Planes ..... 50&10
Union 60

Plane Irons—

Wood Bench Plane Irons, list Dec. 12, '06 25
Buck Bros. 25
Chapin Stephens Co. 25
Union 50
L. & I. J. White ..... 20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse ..... *½ doz. $6.00*

Plates—

Fellow ..... *lb. .50@55c*

Pliers and Nippers—

Button Pliers ..... *75c@$1.50 doz.*
Gas Burners, per doz., 5 in., $1.25 @$1.30; 6 in., $1.45 $1.50.

Gas Pipe	*7*	*8*	*10*	*12 in.*
	$2.00	*$2.25*	*$2.75*	*$3.50*

Acme Nippers ..... 50&5%
Cronk & Carrier Mfg. Co.:

American Button	80%
Improved Button	75&10%
Cronks	60
No. 50 Lineman's	50
Stub's Pattern	45%
Combination and others	33⅓%

Heller's Farriers' Nippers, Pincers and Tools ..... 10&5&5
P. S. & W. Tinners' Cutting Nippers 40
Scottish Sole, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—

Chapin-Stephens Co.:

Plumbs and Levels	20&5&5
Chapin's Cap, Brass Cor.	40&10&10
Pocket Levels	30&30&10
Extension Sights	30&30&10
Machinists' Levels	15&10&10
Disston's Plumbs and Levels	60&10%
Disston's Pocket Levels	60&10%
Stanley's Dulex	35
Wood's Extension	25

Points, Glaziers'—

Bulk and 1 lb. papers ..... *lb. .9 c*
½ lb. papers ..... *lb. 9½ c*
¼ lb. papers ..... *lb. 10 c*

Police Goods—

Manufacturers' Lists ..... *25@25&10%*
Peace 25

Polish—Metal, Etc—

Electric Metal Polish, ½ pt. bottles, doz., $3.00; No. 2 (1 qu.), $9.00 ..... 40%
Electric Paste 40

George William Hoffman:

Metal Polish Paste, ½ oz. tins, ½ doz.	$0.50
½ lb. tins, ½ doz.	1.00
1 lb. tins, ½ doz.	1.75
2 lb. tins, ½ doz.	3.25
5 lb. tins, ½ doz.	7.50
10 lb. tins, ½ doz.	14.00
25 lb. tins, ½ doz.	32.50
50 lb. tins, ½ doz.	60.00
100 lb. tins, ½ doz.	110.00
Silver Polish Paste, ½ oz. tins, ½ doz.	1.00
½ lb. tins, ½ doz.	1.75
1 lb. tins, ½ doz.	3.00
2 lb. tins, ½ doz.	5.50
5 lb. tins, ½ doz.	12.50
10 lb. tins, ½ doz.	24.00
25 lb. tins, ½ doz.	57.50
50 lb. tins, ½ doz.	110.00
100 lb. tins, ½ doz.	210.00
Liquid Polish, 1 pt. bottles, ½ doz.	1.50
1 qt. bottles, ½ doz.	2.50
½ gal. bottles, ½ doz.	4.50
1 gal. bottles, ½ doz.	8.00
Boxes, ½ doz.	2.25

U. S. Liquid, 8 oz. cans, ½ doz., $1.25
Barbeyrac's Fine Metal Polish, ½ doz., $1.75.

Stove—

Black Eagle Bronze Paste, 5 lb. cans, ½ lb. 10c
Black Eagle, Liquid, ½ pt. ..... each, 75c
Black Jack Paste, ¾ lb. cans, ½ gr. $9.00
Black Kid Paste, 5 lb. can ..... each, $0.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon, ½ gr. $5.75 ..... 10%
Dixon's Plumbago, ½ lb. 8¾
Fireside ..... ½ gr. $2.50
Gem, ½ gr. $4.50 ..... ½ doz. 10%
Japanese ..... ½ gr. $3.50
Jet Black ..... ½ gr. $3.50
Peerless Iron Enamel, 10 oz. cans, ½ doz. $1.50

Poppers, Corn—

1 qt. Square ..... doz. $0.80; gro. $8.00
1 qt. Round ..... doz. $0.90; gro. $10.00
1½ qt. Square ..... doz. $1.00; gro. $11.00
2 qt. Square ..... doz. $1.25; gro. $14.50

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42c.; 6 ft., 46c.; 6½ ft., 48c.
Steel Hitching Posts ..... each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled ..... *35&10%*
Tinned ..... *30&10%*

Powder—

In Canisters:

Duck, 1 lb. ..... *each 15c*
Fine Sporting, 1 lb. ..... *each 75c*
Rifle, ½ lb. ..... *each 15c*
Rifle, 1 lb. ..... *each 25c*

In Kegs:

12½ lb. kegs *$3.50*
25 lb. kegs *$4.50*

King's Semi-Smokeless:

Keg (25 lb. bulk)	$6.50
Half Keg (12½ lb. bulk)	3.50
Quarter Keg (6¼ lb. bulk)	1.90
Case 24 (1 lb. cans bulk)	8.50
Half case (½ lb. cans bulk)	4.50

King's Smokeless ..... Shot Gun, Rifle.

Keg (25 lb. bulk)	$12.00	$15.00
Half Keg (12½ lb. bulk)	6.25	7.75
Quarter Keg (6¼ lb. bulk)	3.25	4.00
Case 24 (1 lb. cans bulk)	14.00	17.00
Half case 12 (1 lb. c. bk)	7.25	8.75

Presses—

Fruit and Jelly—

Enterprise Mfg. Co. ..... 20&5

Seal Presses—

Morrill's No. 1, ½ doz. $24.00 50

Pruning Hooks and Shears

See *Shears.*

Pullers, Nail—

Cyclops 50%
Miller's Falls, No. 3, ½ doz., $12.00 ..... 50&10
Morrill's No. 1, Nail Puller, ½ doz. $2.00 50
Pearson No. 1, Cyclone Spike Puller, each $2.00 ..... 50%
The Scranton Co. Case Lots:
No. 2B (large) $5.50
No. 3B (small) $5.00
Smith & Hemenway Co.:
Diamond B 70%
Grant 60
Staple Pullers, Claw and Pinch 60

Pulleys, Single Wheel—

Inch	*1½*	*1¾*	*2*	*3*
Awning or Tackle, doz.	*$0.50*	*.55*	*.60*	*1.05*
Hay Fork, Swivel or Solid Eye, doz., 4 in., $1.25; 5 in., $1.55				
Inch	*2½*	*2¾*	*3*	
Hot House, doz.	*$0.65*	*.85*	*1.20*	
Inch	*1½*	*1¾*	*2*	
Screw, doz.	*$0.16*	*.19*	*.23*	*.30*
Inch	*1¾*	*2*	*2½*	*3*
Side, doz.	*$0.21*	*.26*	*.35*	*.60*
Inch	*1½*	*1¾*	*2*	*2½*

Sash Pulleys—

Common Frame; Square or Round End, per doz., 1¾ and 2 in. *$0.50*
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in. ..... *.20@25c*
Acme, No. 35, 1¾ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain Axle 15
Wrought Steel, Eagle ..... 17@20
Top Notch, Electrically Welded, Nos. 3 and 4 19
Fox-All-Steel, Nos. 3 and 7, 2 in. ..... ½ doz. 50%
Grand Rapids All Steel Noiseless 50%
Niagara, No. 25, 1¾ in., 19¢; 2 in., 20½¢
No. 2 Parallel, 1¾ in., 19¢; 2 in., 20½¢
Star, No. 28, 1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—

Canton ..... *.60*
Pitcher Spout ..... *75@75&10%*
Wood Pumps, Tubing, &c. *50%*
Barnes Dbl. Acting (low list) ..... 40&5
Barnes Pitcher Spout ..... 75&10%
Contractors' Rubber Diaphragm, No. 2, B. L. Rack Co. $16.00
Daisy Spray Pump ..... ½ doz. $6.50
Flint & Walling's Fast Mail Hand (low list) 50%
Flint & Walling's Fast Mail Iron (low list) 50%
Flint & Walling's Tight Top Pitcher ..... 75&10
National Specialty Mfg. Co., Measure, No. 1 ..... ½ doz. $5.50
Myers' Force Pumps (low list) ..... 40&5
Myers' Power Pumps ..... 40&5
Myers' Spray Pumps ..... 40&5%

Pump Leathers—

Plunger and Valve Leathers—Per doz.:

No.	*1*	*2*	*3*	*4*
	$5.00	*6.00*	*7.00*	*8.00*

Cup Leathers—Per 100:

Inch	*2½*	*3*	*3½*	*4*
	$5.00	*7.00*	*9.00*	*12.00*

Punches—

Saddlers' or Drive, good, doz. .50@75c
Spring, single tube, good quality *$1.75*
Revolving (4 tubes) ..... *doz. $3.50*
Bemis & Call Co.'s Cast St'l Drive 50%
Merrill Bros. 1VA, 1A, 1B, 1C, 1D, $15.00 50
Hercules, 1 die, each $5.00 ..... 50%
Niagara Hollow Punches 40
Niagara Solid Punches ..... 35&10%
Tinners' Hollow, P., S. & W. Co. 40%
Tinners' Solid, P., S. & W. Co., ½ doz., $1.44 ..... 40%

Rail—Barn Door, &c.—

Sliding Door, Painted Iron, 2½@2¾c
Sliding Door, Wrought Brass, Plain, lb. .35c
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk:
Double Braced Steel Rail, ½ ft. 3¼ c
O. N. T. Rail $3.12
Grilmore:
xxx, ½ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ½ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $1.00.
Lane's:
Hinged Track, ½ 100 ft. $3.45
O. N. P., ½ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard 1¼ in. ..... ½ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ½ 100 ft., $7.50; 1¼ x 3-16 in., $8.75 ..... 55&7½%
McKinney's:
Hinged Hanger Track, ½ ft., 11¢. 60&5
1 x 3-16 Track ..... 55&7½
Myers' Stayon Track ..... 60&5%
Richards Mfg. Co.:
Common, 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail ..60&10%
Lag Screw Rail, No. 65 ..... 50%
Gauge Hay Track, ½ ft., No. 31, 9c; No. 32, 11c; No. 33, 20c.
No. 50 ..... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 65, $3.75; 66, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—

NOTE.—Many goods are sold at net prices.

Fort Madison Red Head Lawn $3.25
Fort Madison Blue Head Lawn $2.75
Cronk:
Steel Garden: Champion, 75%; Ideal, 80%; Victor ..... 80&25
Queen City Lawn, ½ doz., 20 teeth, $2.85; 24, $3.00 ..... net
Auticlog Lawn, ½ doz $4.00
Malleable Garden ..... 70&10
Ideal Steel Garden, ½ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00 ..... 80%
Kohler:
Lawn Queen, 20-tooth ..... ½ doz. $3.15
Lawn Queen, 24-tooth ..... ½ doz. $3.25
Paragon, 20-tooth ..... ½ doz. $2.70
Paragon, 24-tooth ..... ½ doz. $2.75
Steel Garden, 14-tooth ..... ½ doz. $2.40
Malleable Garden, 14-tooth, ½ doz. $2.00 25

Rasps, Horse—

Disston 75
Heller Bros. ..... 70&5@70&10&5
Hivright Bros. Gold Medal ..... 70&10@75
McCaffrey's American Standard ..... 60&10&5
New Nicholson ..... 75&10@75

See also Files.

Razors—

Barnes Barber 60
Fox Razors, ½ doz., No. 42, $30.00; No. 41, $24.00; No. 82, Plaintail, $25.00 50
Red Devil 65%

Reels, Fishing—

Heddon:
Meteor, 0, 2, 4, 6, 8, 9, 10; Model, 0, 2, 4, 6, 8, 9, 10, 12, 15, 17, 18, Rubber Pompio, Nickeled Pompio 20
Aluminum, German Silv., Bronze 25
1 N, 2 N, 3 N, 4 N, RM, G, 0 25
1 N, 2 N, 3 N, 4 N, 2 PN

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Engin.

Iron age

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